

## **SAR EVALUATION REPORT**

**IEEE Std 1528-2013**

*For*

**GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT, & NFC**

**FCC ID: PY7-76732V**

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*Prepared for*

**Sony Corporation  
1-7-1 Konan Minato-ku  
Tokyo, 108-0075, Japan**

*Prepared by*

**UL LLC  
12 LABORATORY DR  
RTP, NC 27709, U.S.A.  
TEL: (919) 549-1400**



**Revision History**

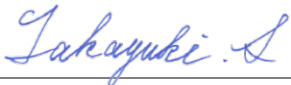
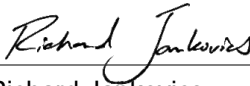
| Rev. | Date      | Revisions                                                                                                                                                                                                                | Revised By        |
|------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| V1   | 7/21/2023 | Initial Issue                                                                                                                                                                                                            | --                |
| V2   | 8/2/2023  | Updated §1 to include NFC estimation and Extremity (10g) for Simultaneous TX. Updated §6 and 7 to include NFC exclusion. Updated §12 to include Estimated SAR for NFC and Sum of the SAR for Wi-Fi Normal State and NFC. | Richard Jankovics |
|      |           |                                                                                                                                                                                                                          |                   |
|      |           |                                                                                                                                                                                                                          |                   |

## Table of Contents

|            |                                                                  |           |
|------------|------------------------------------------------------------------|-----------|
| <b>1.</b>  | <b>Attestation of Test Results .....</b>                         | <b>5</b>  |
| <b>2.</b>  | <b>Test Specification, Methods and Procedures.....</b>           | <b>6</b>  |
| <b>3.</b>  | <b>Facilities and Accreditation.....</b>                         | <b>7</b>  |
| <b>4.</b>  | <b>SAR Measurement System &amp; Test Equipment.....</b>          | <b>8</b>  |
| 4.1.       | <i>SAR Measurement System.....</i>                               | <i>8</i>  |
| 4.2.       | <i>SAR Scan Procedures.....</i>                                  | <i>9</i>  |
| 4.3.       | <i>Test Equipment.....</i>                                       | <i>11</i> |
| <b>5.</b>  | <b>Measurement Uncertainty.....</b>                              | <b>13</b> |
| <b>6.</b>  | <b>Device Under Test (DUT) Information .....</b>                 | <b>14</b> |
| 6.1.       | <i>DUT Description .....</i>                                     | <i>14</i> |
| 6.2.       | <i>Wireless Technologies.....</i>                                | <i>15</i> |
| 6.3.       | <i>General LTE SAR Test and Reporting Considerations.....</i>    | <i>16</i> |
| 6.4.       | <i>LTE (TDD) Considerations.....</i>                             | <i>18</i> |
| 6.5.       | <i>Power Back-off Operation.....</i>                             | <i>19</i> |
| <b>7.</b>  | <b>RF Exposure Conditions (Test Configurations).....</b>         | <b>19</b> |
| <b>8.</b>  | <b>Dielectric Property Measurements &amp; System Check .....</b> | <b>20</b> |
| 8.1.       | <i>Dielectric Property Measurements .....</i>                    | <i>20</i> |
| 8.2.       | <i>System Check.....</i>                                         | <i>22</i> |
| <b>9.</b>  | <b>Conducted Output Power Measurements.....</b>                  | <b>24</b> |
| 9.1.       | <i>GSM .....</i>                                                 | <i>24</i> |
| 9.2.       | <i>W-CDMA .....</i>                                              | <i>27</i> |
| 9.3.       | <i>LTE.....</i>                                                  | <i>32</i> |
| 9.4.       | <i>LTE Down-Link Carrier Aggregation .....</i>                   | <i>45</i> |
| 9.5.       | <i>Wi-Fi 2.4GHz (DTS Band).....</i>                              | <i>48</i> |
| 9.6.       | <i>Wi-Fi 5GHz (U-NII Bands).....</i>                             | <i>50</i> |
| 9.7.       | <i>Bluetooth .....</i>                                           | <i>54</i> |
| <b>10.</b> | <b>Measured and Reported (Scaled) SAR Results.....</b>           | <b>56</b> |
| 10.1.      | <i>GSM850.....</i>                                               | <i>58</i> |
| 10.2.      | <i>GSM1900.....</i>                                              | <i>58</i> |
| 10.3.      | <i>W-CDMA Band II.....</i>                                       | <i>58</i> |
| 10.4.      | <i>W-CDMA Band IV .....</i>                                      | <i>59</i> |
| 10.5.      | <i>W-CDMA Band V .....</i>                                       | <i>59</i> |
| 10.6.      | <i>LTE Band 5 (10MHz Bandwidth) .....</i>                        | <i>59</i> |

|            |                                                                                |           |
|------------|--------------------------------------------------------------------------------|-----------|
| 10.7.      | <i>LTE Band 12 (10MHz Bandwidth)</i>                                           | 60        |
| 10.8.      | <i>LTE Band 13 (10MHz Bandwidth)</i>                                           | 60        |
| 10.9.      | <i>LTE Band 25 (20MHz Bandwidth)</i>                                           | 61        |
| 10.10.     | <i>LTE Band 41 (20MHz Bandwidth)</i>                                           | 61        |
| 10.11.     | <i>LTE Band 66 (20MHz Bandwidth)</i>                                           | 62        |
| 10.12.     | <i>Wi-Fi (DTS Band)</i>                                                        | 63        |
| 10.13.     | <i>Wi-Fi (U-NII Band)</i>                                                      | 64        |
| 10.14.     | <i>Bluetooth</i>                                                               | 68        |
| <b>11.</b> | <b>SAR Measurement Variability</b>                                             | <b>69</b> |
| <b>12.</b> | <b>Simultaneous Transmission Conditions</b>                                    | <b>70</b> |
| 12.1.      | <i>Simultaneous transmission SAR test exclusion considerations</i>             | 70        |
| 12.2.      | <i>Estimated SAR for Simultaneous Transmission SAR Analysis</i>                | 70        |
| 12.3.      | <i>Sum of the SAR for WWAN CELL Main1 &amp; Wi-Fi Normal State &amp; BT</i>    | 71        |
| 12.4.      | <i>Sum of the SAR for WWAN CELL Main1 &amp; Wi-Fi Simultaneous 2G_5G State</i> | 71        |
| 12.5.      | <i>Sum of the SAR for WWAN CELL Main2 &amp; Wi-Fi Normal State &amp; BT</i>    | 71        |
| 12.6.      | <i>Sum of the SAR for WWAN CELL Main2 &amp; Wi-Fi Simultaneous 2G_5G State</i> | 71        |
| 12.7.      | <i>Sum of the SAR for Wi-Fi Normal State &amp; NFC</i>                         | 71        |
|            | <i>Appendixes</i>                                                              | 72        |
|            | <i>Appendix A: SAR Setup Photos</i>                                            | 72        |
|            | <i>Appendix B: SAR System Check Plots</i>                                      | 72        |
|            | <i>Appendix C: SAR Highest Test Plots</i>                                      | 72        |
|            | <i>Appendix D: SAR Tissue Ingredients</i>                                      | 72        |
|            | <i>Appendix E: SAR Probe Certificates</i>                                      | 72        |
|            | <i>Appendix F: SAR Dipole Certificates</i>                                     | 72        |

# 1. Attestation of Test Results

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                               |                                                                 |                                                                                      |       |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------|-------|-------|
| Applicant Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Sony Corporation                                              |                                                                 |                                                                                      |       |       |
| FCC ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PY7-76732V                                                    |                                                                 |                                                                                      |       |       |
| Applicable Standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Published RF exposure KDB procedures<br>IEEE Std 1528-2013    |                                                                 |                                                                                      |       |       |
| Exposure Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | SAR Limits (W/Kg)                                             |                                                                 |                                                                                      |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Peak spatial-average<br>(1g of tissue)                        | Extremities (hands, wrists, ankles,<br>etc.)<br>(10g of tissue) |                                                                                      |       |       |
| General population /<br>Uncontrolled exposure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.6                                                           | 4                                                               |                                                                                      |       |       |
| RF Exposure Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <a href="#">Equipment Class</a> - Highest Reported SAR (W/kg) |                                                                 |                                                                                      |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PCE                                                           | DTS                                                             | NII                                                                                  | DSS   | NFC   |
| Head                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.118                                                         | 0.362                                                           | 0.276                                                                                | 0.305 | N/A   |
| Body-worn*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.266                                                         | 0.169                                                           | 0.068                                                                                | 0.088 | N/A   |
| Hotspot/BT Tethering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.470                                                         | 0.169                                                           | 0.075                                                                                | 0.088 | N/A   |
| Extremity (10g)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | N/A                                                           | N/A                                                             | 0.420                                                                                | N/A   | 0.501 |
| Simultaneous<br>TX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Head/Body-<br>worn/Hotspot/<br>BT Tethering<br>(1g)           | 0.796                                                           | 0.796                                                                                | 0.796 | 0.767 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Extremity<br>(10g)                                            | N/A                                                             | N/A                                                                                  | 1.293 | N/A   |
| Date Tested                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6/5/2023 to 7/14/2023                                         |                                                                 |                                                                                      |       |       |
| Test Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Pass                                                          |                                                                 |                                                                                      |       |       |
| <p><b>*Note:</b> The Body-worn minimum separation distance is 10 mm. To cover both body-worn and hotspot RF exposure conditions testing was performed at a separation distance of 10 mm.</p> <p>UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p> <p>This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.</p> <p>The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.</p> <p>This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the U.S. Government, or any agency of the U.S. government.</p> |                                                               |                                                                 |                                                                                      |       |       |
| Approved & Released By:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                               |                                                                 | Prepared By:                                                                         |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                               |                                                                 |  |       |       |
| Takayuki Shimada<br>Lead Project Engineer<br>UL Japan, Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                               |                                                                 | Richard Jankovics<br>Operations Leader<br>UL LLC                                     |       |       |

## 2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE Std 1528-2013, the following FCC Published RF exposure [KDB](#) procedures:

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 447498 D03 Supplement C Cross-Reference v01
- 648474 D04 Handset SAR v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02
- 941225 D06 Hotspot Mode v02r01
- 941225 D07 UMPC Mini Tablet v01r02

In addition to the above, the following information was used:

- [TCB Workshop](#) October 2014; RF Exposure Procedures (Other LTE Considerations)
- [TCB Workshop](#) April 2015; RF Exposure Procedures (Overlapping LTE Bands)
- [TCB Workshop](#) October 2015; RF Exposure Procedures (KDB 941225 D05A)
- [TCB Workshop](#) October 2016; RF Exposure Procedures (Bluetooth Duty Factor)
- [TCB Workshop](#) October 2016; RF Exposure Procedures (DUT Holder Perturbations)
- [TCB Workshop](#) May 2017; RF Exposure Procedures (Broadband Liquid Above 3 GHz)
- [TCB Workshop](#) April 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))
- [TCB Workshop](#) April 2019; RF Exposure Procedures (802.11ax SAR Testing)

### 3. Facilities and Accreditation

UL LLC is accredited by A2LA, cert. # 0751.06 for all testing performed within the scope of this report. Testing was performed at the locations noted below.

The test sites and measurement facilities used to collect data are located at 2800 Perimeter Park Dr, Morrisville, NC, USA.

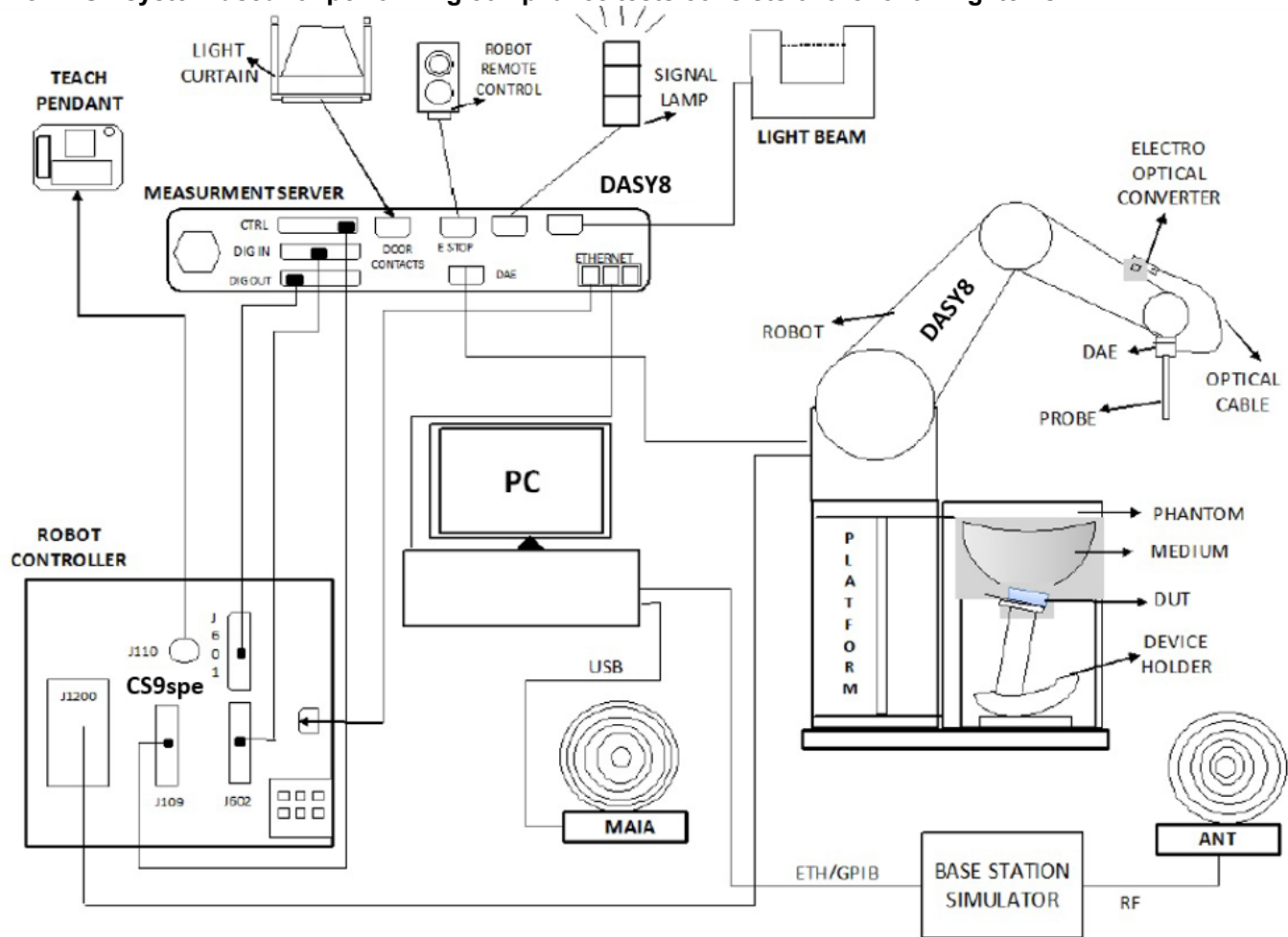
- SAR Lab 1A
- SAR Lab 2A
- SAR Lab 2B

|                                     | Address                                                                      | ISED CABID | ISED Company Number | FCC Registration |
|-------------------------------------|------------------------------------------------------------------------------|------------|---------------------|------------------|
| <input type="checkbox"/>            | Building:<br>12 Laboratory Dr<br>RTP, NC 27709, U.S.A                        | US0067     | 2180C               | 825374           |
| <input checked="" type="checkbox"/> | Building:<br>2800 Perimeter Park Dr. Suite B<br>Morrisville, NC 27560, U.S.A | US0067     | 27265               | 825374           |

## 4. SAR Measurement System & Test Equipment

### 4.1. SAR Measurement System

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win10 and the DASY8<sup>1</sup> software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

<sup>1</sup> DASY8 software used: DASY16.0.2.83 and older generations.



## 4.2. SAR Scan Procedures

### Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

### Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEC/IEEE 62209-1528, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

|                                                                                                        | $\leq 3$ GHz                                                                                                                                                                                                                                                           | $> 3$ GHz                                              |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | $5 \pm 1$ mm                                                                                                                                                                                                                                                           | $\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm     |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location              | $30^\circ \pm 1^\circ$                                                                                                                                                                                                                                                 | $20^\circ \pm 1^\circ$                                 |
| Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$                 | $\leq 2$ GHz: $\leq 15$ mm<br>$2 - 3$ GHz: $\leq 12$ mm                                                                                                                                                                                                                | $3 - 4$ GHz: $\leq 12$ mm<br>$4 - 6$ GHz: $\leq 10$ mm |
|                                                                                                        | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device. |                                                        |

**Step 3: Zoom Scan**

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

|                                                                                                                                                                                                                                                                                                             |                                           |                                                                                             | $\leq 3$ GHz                                         | $> 3$ GHz                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------|
| Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$                                                                                                                                                                                                                      |                                           |                                                                                             | $\leq 2$ GHz: $\leq 8$ mm<br>2 – 3 GHz: $\leq 5$ mm* | 3 – 4 GHz: $\leq 5$ mm*<br>4 – 6 GHz: $\leq 4$ mm*                            |
| Maximum zoom scan spatial resolution, normal to phantom surface                                                                                                                                                                                                                                             | uniform grid: $\Delta z_{\text{Zoom}}(n)$ |                                                                                             | $\leq 5$ mm                                          | 3 – 4 GHz: $\leq 4$ mm<br>4 – 5 GHz: $\leq 3$ mm<br>5 – 6 GHz: $\leq 2$ mm    |
|                                                                                                                                                                                                                                                                                                             | graded grid                               | $\Delta z_{\text{Zoom}}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface | $\leq 4$ mm                                          | 3 – 4 GHz: $\leq 3$ mm<br>4 – 5 GHz: $\leq 2.5$ mm<br>5 – 6 GHz: $\leq 2$ mm  |
|                                                                                                                                                                                                                                                                                                             |                                           | $\Delta z_{\text{Zoom}}(n>1)$ : between subsequent points                                   | $\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$         |                                                                               |
| Minimum zoom scan volume                                                                                                                                                                                                                                                                                    | x, y, z                                   |                                                                                             | $\geq 30$ mm                                         | 3 – 4 GHz: $\geq 28$ mm<br>4 – 5 GHz: $\geq 25$ mm<br>5 – 6 GHz: $\geq 22$ mm |
| Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.                                                                                                                                                           |                                           |                                                                                             |                                                      |                                                                               |
| * When zoom scan is required and the <u>reported</u> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz. |                                           |                                                                                             |                                                      |                                                                               |

**Step 4: Power drift measurement**

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

### 4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

#### Dielectric Property Measurements

| Name of Equipment | Manufacturer      | Type/Model    | Serial No.    | Cal. Due Date |
|-------------------|-------------------|---------------|---------------|---------------|
| Network Analyzer  | Keysight          | E5063A        | MY54100681    | 9/30/2023     |
| Dielectric Probe  | SPEAG             | DAKS-3.5      | 1051          | 10/17/2023    |
| Shorting Block    | SPEAG             | DAK-3.5 Short | SM DAK 200 DA | 10/17/2023    |
| Thermometer       | Fisher Scientific | 15-078-181    | 1817705017    | 3/30/2024     |

#### System Check

| Name of Equipment            | Manufacturer    | Type/Model             | Serial No. | Cal. Due Date |
|------------------------------|-----------------|------------------------|------------|---------------|
| Signal Generator             | Keysight        | N5181A                 | MY50140788 | 1/31/2024     |
| Power Meter                  | Keysight        | N1912A                 | MY55116004 | 9/02/2024     |
| Power Sensor <sup>1</sup>    | Keysight        | E9323A                 | MY55110007 | 6/14/2023     |
| Power Sensor                 | Keysight        | N1921A                 | MY55090047 | 2/02/2024     |
| 3-Path Diode Power Sensor    | Rohde & Schwarz | NRP8S                  | 112236     | 6/02/2024     |
| 3-Path Diode Power Sensor    | Rohde & Schwarz | NRP8S                  | 112237     | 6/02/2024     |
| Amplifier                    | MITEQ           | AMF-4D-00400600-50-30P | N/A        | N/A           |
| Directional coupler          | Mini-Circuits   | ZUDC10-183+            | 1438       | N/A           |
| DC Power Supply              | Miteq           | PS 15V1                | 1990186    | N/A           |
| RF Power Source              | Speag           | PowerSource1           | 4278       | 6/13/2024     |
| RF Power Source <sup>1</sup> | Speag           | PowerSource1           | 4278       | 6/21/2023     |

#### Note(s):

- Equipment not used for calibrated measurements past calibration due date.

#### Lab Equipment

| Name of Equipment            | Manufacturer    | Type/Model | Serial No. | Cal. Due Date |
|------------------------------|-----------------|------------|------------|---------------|
| E-Field Probe                | SPEAG           | EX3DV4     | 7709       | 12/12/2023    |
| E-Field Probe                | SPEAG           | EX3DV4     | 7710       | 2/3/2024      |
| E-Field Probe                | SPEAG           | EX3DV4     | 7711       | 3/29/2024     |
| Data Acquisition Electronics | SPEAG           | DAE4       | 1714       | 11/23/2023    |
| Data Acquisition Electronics | SPEAG           | DAE4       | 1715       | 1/23/2024     |
| Data Acquisition Electronics | SPEAG           | DAE4       | 1716       | 3/16/2024     |
| System Validation Dipole     | SPEAG           | D750V3     | 1139       | 10/12/2023    |
| System Validation Dipole     | SPEAG           | D1750V2    | 1136       | 10/17/2023    |
| System Validation Dipole     | SPEAG           | D1900V2    | 5d202      | 10/12/2023    |
| System Validation Dipole     | SPEAG           | D2450V2    | 963        | 10/18/2023    |
| System Validation Dipole     | SPEAG           | D2600V2    | 1104       | 10/21/2023    |
| System Validation Dipole     | SPEAG           | D5GHzV2    | 1213       | 10/11/2023    |
| Environmental Indicator      | Control Company | 06-662-4   | 200037610  | 2/24/2024     |
| Environmental Indicator      | Control Company | 06-662-4   | 200037635  | 2/24/2024     |

**Other**

| Name of Equipment                   | Manufacturer    | Type/Model | Serial No. | Cal. Due Date |
|-------------------------------------|-----------------|------------|------------|---------------|
| 3-Path Diode Power Sensor           | Rohde & Schwarz | NRP8S      | 112236     | 6/2/2024      |
| 3-Path Diode Power Sensor           | Rohde & Schwarz | NRP8S      | 112237     | 6/2/2024      |
| RF Power Meter                      | Keysight        | N1911a     | MY55116001 | 7/07/2023     |
| RF Power Meter                      | Keysight        | N1911a     | MY55116002 | 9/10/2023     |
| RF Power Meter                      | Keysight        | N1912a     | MY55116004 | 9/2/2023      |
| RF Power Sensor                     | Keysight        | N1921a     | MY55090025 | 9/27/2023     |
| RF Power Sensor <sup>1</sup>        | Keysight        | N1921a     | MY55090030 | 6/15/2023     |
| RF Power Sensor <sup>1</sup>        | Keysight        | E9323A     | MY55110006 | 6/15/2023     |
| Base Station Simulator              | R & S           | CMW 500    | 170733     | 12/14/2023    |
| Base Station Simulator              | R & S           | CMW 500    | 170732     | 12/8/2023     |
| Base Station Simulator              | R & S           | CMW 500    | 170193     | 1/6/2024      |
| Base Station Simulator <sup>2</sup> | R & S           | CMW 500    | 170194     | 6/6/2024      |
| Base Station Simulator <sup>2</sup> | Anritsu         | MT8821C    | 6262116751 | 6/5/2024      |
| Base Station Simulator <sup>2</sup> | Anritsu         | MT8000A    | 6272354129 | 6/9/2024      |

**Note(s):**

1. Equipment not used for calibrated measurements past calibration due date.
2. Equipment not used for calibrated measurements prior to the calibration due date.

## 5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is  $< 1.5$  W/kg and the measured 10-g SAR within a frequency band is  $< 3.75$  W/kg. The expanded SAR measurement uncertainty must be  $\leq 30\%$ , for a confidence interval of  $k = 2$ . If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

## 6. Device Under Test (DUT) Information

### 6.1. DUT Description

| Device Dimension              | This is a Phablet Device (display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm)<br>Refer to Appendix A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------------|-------------------------|------------|---------------------|------------|---------------------------------|------------|--------------------------------------|------------|------------------|------------|---------------------------------------------|------------|---------------------------------------------|------------|---------------------------------------------|------------|------------------|------------|------------------|------------|---------------------|
| Back Cover                    | The Back Cover is not removable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| Battery Options               | The rechargeable battery is not user accessible.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| Accessory                     | Headset and wireless power charger                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| Wireless Router (Hotspot)     | Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices.<br><input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz)<br><input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 5.2 GHz and 5.8 GHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| Wi-Fi Direct                  | Wi-Fi Direct enabled devices transfer data directly between each other<br>Per Manufacturer, the DUT support only as a group client and not support as a group owner.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| Bluetooth Tethering (Hotspot) | BT Tethering mode permits the device to share its cellular data connection with other devices.<br><input checked="" type="checkbox"/> BT Tethering (Bluetooth 2.4 GHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| Test sample information       | <table> <thead> <tr> <th>S/N</th><th>Notes</th></tr> </thead> <tbody> <tr> <td>QV77002SG9</td><td>FCC 2G/3G SAR Conducted</td></tr> <tr> <td>QV770058HJ</td><td>A4 FCC SAR 2G/3G #1</td></tr> <tr> <td>QV77007YG9</td><td>FCC 4G SAR Conducted - Low band</td></tr> <tr> <td>QV77008AG9</td><td>FCC 4G SAR Conducted - Mid/High band</td></tr> <tr> <td>QV7700AAHJ</td><td>A4 FCC SAR 4G #5</td></tr> <tr> <td>QV7700CXG9</td><td>RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #3</td></tr> <tr> <td>QV7700F5G9</td><td>RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #2</td></tr> <tr> <td>QV7700F8G9</td><td>RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #1</td></tr> <tr> <td>QV7700JZHJ</td><td>A4 FCC SAR 4G #3</td></tr> <tr> <td>QV7700K1HJ</td><td>A4 FCC SAR 4G #4</td></tr> <tr> <td>QV7700LSHJ</td><td>A4 FCC SAR 2G/3G #2</td></tr> </tbody> </table> | S/N | Notes | QV77002SG9 | FCC 2G/3G SAR Conducted | QV770058HJ | A4 FCC SAR 2G/3G #1 | QV77007YG9 | FCC 4G SAR Conducted - Low band | QV77008AG9 | FCC 4G SAR Conducted - Mid/High band | QV7700AAHJ | A4 FCC SAR 4G #5 | QV7700CXG9 | RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #3 | QV7700F5G9 | RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #2 | QV7700F8G9 | RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #1 | QV7700JZHJ | A4 FCC SAR 4G #3 | QV7700K1HJ | A4 FCC SAR 4G #4 | QV7700LSHJ | A4 FCC SAR 2G/3G #2 |
| S/N                           | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV77002SG9                    | FCC 2G/3G SAR Conducted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV770058HJ                    | A4 FCC SAR 2G/3G #1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV77007YG9                    | FCC 4G SAR Conducted - Low band                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV77008AG9                    | FCC 4G SAR Conducted - Mid/High band                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV7700AAHJ                    | A4 FCC SAR 4G #5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV7700CXG9                    | RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV7700F5G9                    | RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV7700F8G9                    | RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV7700JZHJ                    | A4 FCC SAR 4G #3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV7700K1HJ                    | A4 FCC SAR 4G #4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| QV7700LSHJ                    | A4 FCC SAR 2G/3G #2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| Hardware Version              | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |
| Software Version              | 2G-4G Conducted: 2.108<br>WLAN/BT Conducted: 2.127<br>SAR Measurements: 2.108                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |       |            |                         |            |                     |            |                                 |            |                                      |            |                  |            |                                             |            |                                             |            |                                             |            |                  |            |                  |            |                     |

## 6.2. Wireless Technologies

| Wireless technologies                                                                                                  | Frequency bands                                                                                                                  | Operating mode                                                                                                                                                                                            |                                                               | Duty Cycle used for SAR testing                                                                                               |
|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| GSM                                                                                                                    | 850<br>1900                                                                                                                      | Voice (GMSK)<br>GPRS (GMSK)<br>EDGE (8PSK)                                                                                                                                                                | GSM Class : B<br>Multi-Slot Class:<br>Class 33 - 4 Up, 5 Down | GSM Voice: 12.5%<br>(E)GPRS: 1 Slot: 12.5%<br>2 Slots: 25%<br>3 Slots: 37.5%<br>4 Slots: 50%                                  |
| Does this device support DTM (Dual Transfer Mode)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                                                                                                  |                                                                                                                                                                                                           |                                                               |                                                                                                                               |
| W-CDMA (UMTS)                                                                                                          | Band II<br>Band IV<br>Band V                                                                                                     | UMTS Rel. 99 (Voice & Data)<br>HSDPA (Rel. 5)<br>HSUPA (Rel. 6)                                                                                                                                           |                                                               | 100%                                                                                                                          |
| LTE                                                                                                                    | FDD Band 2<br>FDD Band 4<br>FDD Band 5<br>FDD Band 12<br>FDD Band 13<br>FDD Band 17<br>FDD Band 25<br>TDD Band 41<br>FDD Band 66 | QPSK<br>16QAM<br>64QAM<br>Rel. 15 Carrier Aggregation (1 Uplink and 6 Downlinks)                                                                                                                          |                                                               | 100% (FDD)<br>63.3% (TDD) Power Class 3                                                                                       |
| Wi-Fi                                                                                                                  | 2.4 GHz                                                                                                                          | 802.11b<br>802.11g<br>802.11n (HT20)<br>802.11ax (HE20)                                                                                                                                                   |                                                               | 99.9% (802.11b) <sup>1</sup><br>99.1% (802.11g/n 20MHz BW) <sup>1</sup>                                                       |
|                                                                                                                        | 5 GHz                                                                                                                            | 802.11a<br>802.11n (HT20)<br>802.11n (HT40)<br>802.11ac (VHT20)<br>802.11ac (VHT40)<br>802.11ac (VHT80)<br>802.11ac (VHT160)<br>802.11ax (HE20)<br>802.11ax (HE40)<br>802.11ax (HE80)<br>802.11ax (HE160) |                                                               | 99.6% (802.11n/ac 40MHz BW) <sup>1</sup><br>99.0% (802.11ac 80MHz BW) <sup>1</sup><br>99.7% (802.11ac 160MHz BW) <sup>1</sup> |
|                                                                                                                        | Does this device support bands 5.60 ~ 5.65 GHz? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No              |                                                                                                                                                                                                           |                                                               |                                                                                                                               |
|                                                                                                                        | Does this device support Band gap channel(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                |                                                                                                                                                                                                           |                                                               |                                                                                                                               |
| Bluetooth                                                                                                              | 2.4 GHz                                                                                                                          | BR, EDR, LE                                                                                                                                                                                               |                                                               | 76.8% <sup>1</sup>                                                                                                            |
| NFC                                                                                                                    | 13.56 MHz                                                                                                                        | Type A/B/F /V                                                                                                                                                                                             |                                                               | N/A <sup>2</sup>                                                                                                              |

### Notes:

- Duty cycle is referenced from the Section 9.
- Measured Duty Cycle is not required due to SAR test exemption.

### 6.3. General LTE SAR Test and Reporting Considerations

| Item                                                        | Description |                                                |                  |                               |                  |                  |                  |
|-------------------------------------------------------------|-------------|------------------------------------------------|------------------|-------------------------------|------------------|------------------|------------------|
| Frequency range, Channel Bandwidth, Numbers and Frequencies | Band 2      | Frequency range: 1850 - 1910 MHz (BW = 60 MHz) |                  |                               |                  |                  |                  |
|                                                             |             | Channel Bandwidth                              |                  |                               |                  |                  |                  |
|                                                             |             | 20 MHz                                         | 15 MHz           | 10 MHz                        | 5 MHz            | 3 MHz            | 1.4 MHz          |
|                                                             | Low         | <b>18700</b><br><b>/1860</b>                   | 18675/<br>1857.5 | 18650/<br>1855                | 18625/<br>1852.5 | 18615/<br>1851.5 | 18607/<br>1850.7 |
|                                                             | Mid         | <b>18900/</b><br><b>1880</b>                   | 18900/<br>1880   | 18900/<br>1880                | 18900/<br>1880   | 18900/<br>1880   | 18900/<br>1880   |
|                                                             | High        | <b>19100/</b><br><b>1900</b>                   | 19125/<br>1902.5 | 19150/<br>1905                | 19175/<br>1907.5 | 19185/<br>1908.5 | 19193/<br>1909.3 |
|                                                             | Band 4      | Frequency range: 1710 - 1755 MHz (BW = 45 MHz) |                  |                               |                  |                  |                  |
|                                                             |             | Channel Bandwidth                              |                  |                               |                  |                  |                  |
|                                                             |             | 20 MHz <sup>1</sup>                            | 15 MHz           | 10 MHz                        | 5 MHz            | 3 MHz            | 1.4 MHz          |
|                                                             | Low         | 20050/<br>1720                                 | 20025/<br>1717.5 | 20000/<br>1715                | 19975/<br>1712.5 | 19965/<br>1711.5 | 19957/<br>1710.7 |
|                                                             | Mid         | <b>20175/</b><br><b>1732.5</b>                 | 20175/<br>1732.5 | 20175/<br>1732.5              | 20175/<br>1732.5 | 20175/<br>1732.5 | 20175/<br>1732.5 |
|                                                             | High        | 20300/<br>1745                                 | 20325/<br>1747.5 | 20350/<br>1750                | 20375/<br>1752.5 | 20385/<br>1753.5 | 20393/<br>1754.3 |
|                                                             | Band 5      | Frequency range: 824 - 849 MHz (BW = 25 MHz)   |                  |                               |                  |                  |                  |
|                                                             |             | Channel Bandwidth                              |                  |                               |                  |                  |                  |
|                                                             |             | 20 MHz                                         | 15 MHz           | 10 MHz <sup>1</sup>           | 5 MHz            | 3 MHz            | 1.4 MHz          |
|                                                             | Low         |                                                |                  | 20450/<br>829                 | 20425/<br>826.5  | 20415/<br>825.5  | 20407/<br>824.7  |
|                                                             | Mid         |                                                |                  | <b>20525/</b><br><b>836.5</b> | 20525/<br>836.5  | 20525/<br>836.5  | 20525/<br>836.5  |
|                                                             | High        |                                                |                  | 20600/<br>844                 | 20625/<br>846.5  | 20635/<br>847.5  | 20643/<br>848.3  |
|                                                             | Band 12     | Frequency range: 699 – 716 MHz (BW = 17 MHz)   |                  |                               |                  |                  |                  |
|                                                             |             | Channel Bandwidth                              |                  |                               |                  |                  |                  |
|                                                             |             | 20 MHz                                         | 15 MHz           | 10 MHz <sup>1</sup>           | 5 MHz            | 3 MHz            | 1.4 MHz          |
|                                                             | Low         |                                                |                  | 23060/<br>704                 | 23035/<br>701.5  | 23025/<br>700.5  | 23017/<br>699.7  |
|                                                             | Mid         |                                                |                  | <b>23095/</b><br><b>707.5</b> | 23095/<br>707.5  | 23095/<br>707.5  | 23095/<br>707.5  |
|                                                             | High        |                                                |                  | 23130/<br>711                 | 23155/<br>713.5  | 23165/<br>714.5  | 23173/<br>715.3  |
|                                                             | Band 13     | Frequency range: 777 - 787 MHz (BW = 10 MHz)   |                  |                               |                  |                  |                  |
|                                                             |             | Channel Bandwidth                              |                  |                               |                  |                  |                  |
|                                                             |             | 20 MHz                                         | 15 MHz           | 10 MHz                        | 5 MHz            | 3 MHz            | 1.4 MHz          |
|                                                             | Low         |                                                |                  |                               | 23205/<br>779.5  |                  |                  |
|                                                             | Mid         |                                                |                  | <b>23230/</b><br><b>782</b>   | 23230/<br>782    |                  |                  |
|                                                             | High        |                                                |                  |                               | 23255/<br>784.5  |                  |                  |
|                                                             | Band 17     | Frequency range: 704 - 716 MHz (BW = 12 MHz)   |                  |                               |                  |                  |                  |
|                                                             |             | Channel Bandwidth                              |                  |                               |                  |                  |                  |
|                                                             |             | 20 MHz                                         | 15 MHz           | 10 MHz <sup>1</sup>           | 5 MHz            | 3 MHz            | 1.4 MHz          |
|                                                             | Low         |                                                |                  | 23780/<br>709                 | 23755/<br>706.5  |                  |                  |
|                                                             | Mid         |                                                |                  | <b>23790/</b><br><b>710</b>   | 23790/<br>710    |                  |                  |
|                                                             | High        |                                                |                  | 23800/<br>711                 | 23825/<br>713.5  |                  |                  |
|                                                             | Band 25     | Frequency range: 1850 - 1915 MHz (BW = 65 MHz) |                  |                               |                  |                  |                  |
|                                                             |             | Channel Bandwidth                              |                  |                               |                  |                  |                  |
|                                                             |             | 20 MHz                                         | 15 MHz           | 10 MHz                        | 5 MHz            | 3 MHz            | 1.4 MHz          |
|                                                             | Low         | <b>26140/</b><br><b>1860</b>                   | 26115/<br>1857.5 | 26090/<br>1855                | 26065/<br>1852.5 | 26055/<br>1851.5 | 26047/<br>1850.7 |
|                                                             | Mid         | <b>26365/</b><br><b>1882.5</b>                 | 26365/<br>1882.5 | 26365/<br>1882.5              | 26365/<br>1882.5 | 26365/<br>1882.5 | 26365/<br>1882.5 |
|                                                             | High        | <b>26590/</b>                                  | 26615/           | 26640/                        | 26665/           | 26675/           | 26683/           |



|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>1905</b>                                     | 1907.5        | 1910        | 1912.5        | 1913.5        | 1914.3        |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------|-------------|---------------|---------------|---------------|------------|---------------------------------------------------------------|--|--|--|--|--|----------|---------|---------|-------|--------|--------|--------|------|-----|-----|-----|------|------|------|-----|--------|-----|-----|-----|------|------|------|-----|--------|-----|-----|-----|------|------|------|-----|--------|-----|-----|-----|------|------|------|-----|--------|-----|-----|-----|------|------|------|-----|---------|-----|--|--|--|--|--|-----|
|                                            | Band 41 <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Frequency range: 2496 - 2690 MHz (BW = 194 MHz) |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Channel Bandwidth                               |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 20 MHz                                          | 15 MHz        | 10 MHz      | 5 MHz         | 3 MHz         | 1.4 MHz       |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | Low                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>39750 / 2506.0</b>                           |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | Mid- Low                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>40185 / 2549.5</b>                           |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | Mid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>40620 / 2593.0</b>                           |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | Mid-High                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>41055 / 2636.5</b>                           |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | High                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>41490 / 2680.0</b>                           |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | Band 66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Frequency range: 1710 - 1780 MHz (BW = 70 MHz)  |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Channel Bandwidth                               |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 20 MHz                                          | 15 MHz        | 10 MHz      | 5 MHz         | 3 MHz         | 1.4 MHz       |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | Low                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>132072/1720</b>                              | 132047/1717.5 | 132022/1715 | 131997/1712.5 | 131987/1711.5 | 131979/1710.7 |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | Mid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>132322/1745</b>                              | 132322/1745   | 132322/1745 | 132322/1745   | 132322/1745   | 132322/1745   |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | High                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>132572/1770</b>                              | 132597/1772.5 | 132622/1775 | 132647/1777.5 | 132657/1778.5 | 132665/1779.3 |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| LTE transmitter and antenna implementation | Refer to Appendix A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                 |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| Maximum power reduction (MPR)              | <p><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</b></p> <table> <tr> <th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N<sub>RB</sub>)</th><th rowspan="2">MPR (dB)</th></tr> <tr> <th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr> <tr> <td>QPSK</td><td>&gt; 5</td><td>&gt; 4</td><td>&gt; 8</td><td>&gt; 12</td><td>&gt; 16</td><td>&gt; 18</td><td>≤ 1</td></tr> <tr> <td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr> <tr> <td>16 QAM</td><td>&gt; 5</td><td>&gt; 4</td><td>&gt; 8</td><td>&gt; 12</td><td>&gt; 16</td><td>&gt; 18</td><td>≤ 2</td></tr> <tr> <td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr> <tr> <td>64 QAM</td><td>&gt; 5</td><td>&gt; 4</td><td>&gt; 8</td><td>&gt; 12</td><td>&gt; 16</td><td>&gt; 18</td><td>≤ 3</td></tr> <tr> <td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr> </table> <p>MPR Built-in by design</p> <p>The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values.</p> <p>A-MPR (additional MPR) was disabled during SAR testing</p> |                                                 |               |             |               |               |               | Modulation | Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> ) |  |  |  |  |  | MPR (dB) | 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | QPSK | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 | 16 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 | 16 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 | 64 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 2 | 64 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 3 | 256 QAM | ≥ 1 |  |  |  |  |  | ≤ 5 |
| Modulation                                 | Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                 |               |             |               |               | MPR (dB)      |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
|                                            | 1.4 MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3.0 MHz                                         | 5 MHz         | 10 MHz      | 15 MHz        | 20 MHz        |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| QPSK                                       | > 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | > 4                                             | > 8           | > 12        | > 16          | > 18          | ≤ 1           |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| 16 QAM                                     | ≤ 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ≤ 4                                             | ≤ 8           | ≤ 12        | ≤ 16          | ≤ 18          | ≤ 1           |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| 16 QAM                                     | > 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | > 4                                             | > 8           | > 12        | > 16          | > 18          | ≤ 2           |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| 64 QAM                                     | ≤ 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ≤ 4                                             | ≤ 8           | ≤ 12        | ≤ 16          | ≤ 18          | ≤ 2           |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| 64 QAM                                     | > 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | > 4                                             | > 8           | > 12        | > 16          | > 18          | ≤ 3           |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| 256 QAM                                    | ≥ 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                 |               |             |               |               | ≤ 5           |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| Power reduction                            | No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                 |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |
| Spectrum plots for RB configurations       | A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                 |               |             |               |               |               |            |                                                               |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |         |     |  |  |  |  |  |     |

**Notes:**

- Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices.
- LTE band 41 test channels in accordance with October 2014 TCB workshop for all channels bandwidths.
- SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

## 6.4. LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

LTE TDD Bands support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

| Special subframe configuration | Normal cyclic prefix in downlink |                                |                                  | Extended cyclic prefix in downlink |                                |                                  |
|--------------------------------|----------------------------------|--------------------------------|----------------------------------|------------------------------------|--------------------------------|----------------------------------|
|                                | DwPTS                            | UpPTS                          |                                  | DwPTS                              | UpPTS                          |                                  |
|                                |                                  | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink |                                    | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink |
| 0                              | $6592 \cdot T_s$                 | $(1+X) \cdot 2192 \cdot T_s$   | $(1+X) \cdot 2560 \cdot T_s$     | $7680 \cdot T_s$                   | $(1+X) \cdot 2192 \cdot T_s$   | $(1+X) \cdot 2560 \cdot T_s$     |
| 1                              | $19760 \cdot T_s$                |                                |                                  | $20480 \cdot T_s$                  |                                |                                  |
| 2                              | $21952 \cdot T_s$                |                                |                                  | $23040 \cdot T_s$                  |                                |                                  |
| 3                              | $24144 \cdot T_s$                |                                |                                  | $25600 \cdot T_s$                  |                                |                                  |
| 4                              | $26336 \cdot T_s$                | $(2+X) \cdot 2192 \cdot T_s$   | $(2+X) \cdot 2560 \cdot T_s$     | $7680 \cdot T_s$                   | $(2+X) \cdot 2192 \cdot T_s$   | $(2+X) \cdot 2560 \cdot T_s$     |
| 5                              | $6592 \cdot T_s$                 |                                |                                  | $20480 \cdot T_s$                  |                                |                                  |
| 6                              | $19760 \cdot T_s$                |                                |                                  | $23040 \cdot T_s$                  |                                |                                  |
| 7                              | $21952 \cdot T_s$                |                                |                                  | $12800 \cdot T_s$                  |                                |                                  |
| 8                              | $24144 \cdot T_s$                |                                |                                  | -                                  | -                              | -                                |
| 9                              | $13168 \cdot T_s$                |                                |                                  | -                                  | -                              | -                                |
| 10                             | $13168 \cdot T_s$                | $13152 \cdot T_s$              | $12800 \cdot T_s$                | -                                  | -                              | -                                |

Table 4.2-2: Uplink-downlink configurations & Calculated Duty Cycle

| Uplink-Downlink Configuration | Downlink-to-Uplink Switch-point Periodicity | Subframe Number |   |   |   |   |   |   |   |   |   | Calculated Duty Cycle (%) |
|-------------------------------|---------------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---------------------------|
|                               |                                             | 0               | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |                           |
| 0                             | 5 ms                                        | D               | S | U | U | U | D | S | U | U | U | 63.3%                     |
| 1                             | 5 ms                                        | D               | S | U | U | D | D | S | U | U | D | 43.3%                     |
| 2                             | 5 ms                                        | D               | S | U | D | D | D | S | U | D | D | 23.3%                     |
| 3                             | 10 ms                                       | D               | S | U | U | U | D | D | D | D | D | 31.7%                     |
| 4                             | 10 ms                                       | D               | S | U | U | D | D | D | D | D | D | 21.7%                     |
| 5                             | 10 ms                                       | D               | S | U | D | D | D | D | D | D | D | 11.7%                     |
| 6                             | 5 ms                                        | D               | S | U | U | U | D | S | U | U | D | 53.3%                     |

Calculated Duty Cycle = Extended cyclic prefix in uplink \* ( $T_s$ ) \* # of S + # of U / period

### Note(s):

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing: configuration 0 at 63.3% duty cycle.

## 6.5. Power Back-off Operation

The DUT supports power reduction when Simultaneous WLAN transmission is active (i.e. WLAN Chain 0 and Chain 1 transmitting simultaneously).

| Power Back-off mode  | Technologies Supported     | Exposure Conditions Active |           |         |                             |
|----------------------|----------------------------|----------------------------|-----------|---------|-----------------------------|
|                      |                            | Head                       | Body-worn | Hotspot | Phablet SAR (Extremity 10g) |
| WLAN Simultaneous Tx | Wi-Fi 2.4GHz<br>Wi-Fi 5GHz | ✓                          | ✓         | ✓       | ✓                           |

### Note(s):

Tune-Up Limits for WLAN (Simultaneous 2G\_5G state) is Reduced Average Power. Please refer to §9 for all conducted power measurements.

### Phablet SAR (Extremity 10g):

When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

When hotspot mode does not apply, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.

## 7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

| Antenna                 | Band                                       | Head | Rear | Front | Edge 1     | Edge 2       | Edge 3        | Edge 4      | Extremity<br>(0 mm) |
|-------------------------|--------------------------------------------|------|------|-------|------------|--------------|---------------|-------------|---------------------|
|                         |                                            |      |      |       | (Top Edge) | (Right Edge) | (Bottom Edge) | (Left Edge) |                     |
| Cellular Main Antenna 1 | GSM 850<br>W-CDMA BV<br>LTE B5/12/13       | Yes  | Yes  | Yes   | No         | No           | Yes           | Yes         | No                  |
| Cellular Main Antenna 2 | GSM 1900<br>WCDMA BII/BIV<br>LTE B25/41/66 | Yes  | Yes  | Yes   | No         | Yes          | Yes           | No          | No                  |
| Wi-Fi Main Antenna      | Wi-Fi 2.4GHz<br>Wi-Fi 5GHz<br>Bluetooth    | Yes  | Yes  | Yes   | Yes        | No           | No            | Yes         | Yes                 |
| Wi-Fi Sub Antenna       | Wi-Fi 2.4GHz<br>Wi-Fi 5GHz<br>Bluetooth    | Yes  | Yes  | Yes   | No         | No           | Yes           | Yes         | Yes                 |

### Notes:

- SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
- The Body-worn minimum separation distance is 10 mm. To cover both body-worn and hotspot RF exposure conditions testing was performed at a separation distance of 10 mm.
- When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg. When hotspot mode does not apply, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.
- Per KDB 447498 D01 v06, the NFC extremity SAR test exclusion threshold for below 100 MHz is 593 mW. Per the manufacturer, the maximum transmit power for the NFC radio is 403 mW, and therefore meet SAR test exclusion.

## 8. Dielectric Property Measurements & System Check

### 8.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within  $\pm 2^\circ\text{C}$  of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

The dielectric constant ( $\epsilon_r$ ) and conductivity ( $\sigma$ ) of typical tissue-equivalent media recipes are expected to be within  $\pm 5\%$  of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for  $\epsilon_r$  and  $\sigma$  may be relaxed to  $\pm 10\%$ . This is limited to frequencies  $\leq 3\text{ GHz}$ .

#### Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

| Target Frequency (MHz) | Head         |                | Body         |                |
|------------------------|--------------|----------------|--------------|----------------|
|                        | $\epsilon_r$ | $\sigma$ (S/m) | $\epsilon_r$ | $\sigma$ (S/m) |
| 150                    | 52.3         | 0.76           | 61.9         | 0.80           |
| 300                    | 45.3         | 0.87           | 58.2         | 0.92           |
| 450                    | 43.5         | 0.87           | 56.7         | 0.94           |
| 835                    | 41.5         | 0.90           | 55.2         | 0.97           |
| 900                    | 41.5         | 0.97           | 55.0         | 1.05           |
| 915                    | 41.5         | 0.98           | 55.0         | 1.06           |
| 1450                   | 40.5         | 1.20           | 54.0         | 1.30           |
| 1610                   | 40.3         | 1.29           | 53.8         | 1.40           |
| 1800 – 2000            | 40.0         | 1.40           | 53.3         | 1.52           |
| 2450                   | 39.2         | 1.80           | 52.7         | 1.95           |
| 3000                   | 38.5         | 2.40           | 52.0         | 2.73           |
| 5000                   | 36.2         | 4.45           | 49.3         | 5.07           |
| 5100                   | 36.1         | 4.55           | 49.1         | 5.18           |
| 5200                   | 36.0         | 4.66           | 49.0         | 5.30           |
| 5300                   | 35.9         | 4.76           | 48.9         | 5.42           |
| 5400                   | 35.8         | 4.86           | 48.7         | 5.53           |
| 5500                   | 35.6         | 4.96           | 48.6         | 5.65           |
| 5600                   | 35.5         | 5.07           | 48.5         | 5.77           |
| 5700                   | 35.4         | 5.17           | 48.3         | 5.88           |

**Dielectric Property Measurements Results:**

| SAR Lab | Date      | Band (MHz) | Tissue Type | Frequency (MHz) | Relative Permittivity ( $\epsilon_r$ ) |        |           | Conductivity ( $\sigma$ ) |        |           |
|---------|-----------|------------|-------------|-----------------|----------------------------------------|--------|-----------|---------------------------|--------|-----------|
|         |           |            |             |                 | Measured                               | Target | Delta (%) | Measured                  | Target | Delta (%) |
| 1A      | 6/5/2023  | 2450       | Head        | 2450            | 37.5                                   | 39.2   | -4.31     | 1.7                       | 1.8    | -3.89     |
|         |           |            |             | 2400            | 37.6                                   | 39.3   | -4.34     | 1.7                       | 1.8    | -3.52     |
|         |           |            |             | 2480            | 37.5                                   | 39.2   | -4.30     | 1.8                       | 1.8    | -4.50     |
| 1A      | 6/8/2023  | 5600       | Head        | 5600            | 34.9                                   | 35.5   | -1.73     | 5.0                       | 5.1    | -1.19     |
|         |           |            |             | 5500            | 35.1                                   | 35.6   | -1.51     | 4.9                       | 5.0    | -1.47     |
|         |           |            |             | 5725            | 34.7                                   | 35.4   | -2.01     | 5.2                       | 5.2    | -0.72     |
| 1A      | 6/13/2002 | 750        | Head        | 750             | 42.9                                   | 42.0   | 2.26      | 0.9                       | 0.9    | 1.83      |
|         |           |            |             | 660             | 43.2                                   | 42.4   | 1.74      | 0.9                       | 0.9    | -0.81     |
|         |           |            |             | 850             | 42.6                                   | 41.5   | 2.75      | 0.9                       | 0.9    | 3.32      |
| 1A      | 6/21/2023 | 2600       | Head        | 2600            | 38.1                                   | 39.0   | -2.28     | 2.0                       | 2.0    | 0.50      |
|         |           |            |             | 2495            | 38.3                                   | 39.1   | -2.10     | 1.9                       | 1.8    | 1.91      |
|         |           |            |             | 2690            | 38.0                                   | 38.9   | -2.44     | 2.0                       | 2.1    | -0.75     |
| 2A      | 6/12/2023 | 1750       | Head        | 1750            | 40.0                                   | 40.1   | -0.26     | 1.3                       | 1.4    | -1.82     |
|         |           |            |             | 1710            | 40.0                                   | 40.1   | -0.39     | 1.3                       | 1.3    | -1.89     |
|         |           |            |             | 1780            | 39.9                                   | 40.0   | -0.30     | 1.4                       | 1.4    | -1.87     |
| 2A      | 6/14/2023 | 2600       | Head        | 2600            | 40.5                                   | 39.0   | 3.71      | 2.0                       | 2.0    | 0.30      |
|         |           |            |             | 2495            | 40.6                                   | 39.1   | 3.82      | 1.9                       | 1.8    | 1.59      |
|         |           |            |             | 2690            | 40.3                                   | 38.9   | 3.63      | 2.0                       | 2.1    | -0.94     |
| 2A      | 6/19/2023 | 1900       | Head        | 1900            | 38.1                                   | 40.0   | -4.70     | 1.4                       | 1.4    | 1.50      |
|         |           |            |             | 1850            | 38.2                                   | 40.0   | -4.40     | 1.4                       | 1.4    | -0.71     |
|         |           |            |             | 1970            | 38.0                                   | 40.0   | -5.00     | 1.5                       | 1.4    | 4.50      |
| 2A      | 6/22/2023 | 750        | Head        | 750             | 40.7                                   | 42.0   | -3.05     | 0.9                       | 0.9    | -2.01     |
|         |           |            |             | 660             | 40.9                                   | 42.4   | -3.54     | 0.8                       | 0.9    | -4.64     |
|         |           |            |             | 850             | 40.4                                   | 41.5   | -2.63     | 0.9                       | 0.9    | -0.49     |
| 2A      | 6/29/2023 | 5750       | Head        | 5750            | 34.3                                   | 35.4   | -3.12     | 5.3                       | 5.2    | 1.06      |
|         |           |            |             | 5700            | 34.3                                   | 35.4   | -3.11     | 5.2                       | 5.2    | 0.88      |
|         |           |            |             | 5850            | 34.1                                   | 35.3   | -3.34     | 5.4                       | 5.3    | 0.75      |
| 2B      | 6/7/2023  | 1900       | Head        | 1900            | 39.9                                   | 40.0   | -0.27     | 1.5                       | 1.4    | 3.86      |
|         |           |            |             | 1850            | 40.0                                   | 40.0   | -0.05     | 1.4                       | 1.4    | 1.43      |
|         |           |            |             | 1920            | 39.9                                   | 40.0   | -0.30     | 1.5                       | 1.4    | 4.79      |
| 2B      | 6/28/2023 | 5250       | Head        | 5250            | 35.8                                   | 35.9   | -0.37     | 4.7                       | 4.7    | -0.90     |
|         |           |            |             | 5150            | 36.1                                   | 36.0   | 0.20      | 4.6                       | 4.6    | -0.50     |
|         |           |            |             | 5350            | 35.7                                   | 35.8   | -0.47     | 4.9                       | 4.8    | 1.07      |
| 2B      | 6/28/2023 | 5750       | Head        | 5750            | 35.0                                   | 35.4   | -1.17     | 5.3                       | 5.2    | 1.65      |
|         |           |            |             | 5700            | 34.9                                   | 35.4   | -1.35     | 5.3                       | 5.2    | 2.26      |
|         |           |            |             | 5850            | 34.8                                   | 35.3   | -1.56     | 5.3                       | 5.3    | 0.00      |
| 2B      | 7/12/2023 | 5250       | Head        | 5250            | 34.5                                   | 35.9   | -4.04     | 4.6                       | 4.7    | -2.32     |
|         |           |            |             | 5150            | 34.6                                   | 36.1   | -3.93     | 4.5                       | 4.6    | -2.24     |
|         |           |            |             | 5300            | 34.4                                   | 35.9   | -4.11     | 4.6                       | 4.8    | -2.47     |
| 2B      | 7/14/2023 | 5750       | Head        | 5750            | 34.1                                   | 35.4   | -3.51     | 5.1                       | 5.2    | -2.91     |
|         |           |            |             | 5700            | 34.2                                   | 35.4   | -3.44     | 5.0                       | 5.2    | -3.52     |
|         |           |            |             | 5850            | 34.1                                   | 35.3   | -3.48     | 5.3                       | 5.3    | -1.39     |

## 8.2. System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

### System Performance Check Measurement Conditions:

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0  $\pm$  0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be  $\geq$  15.0 cm for SAR measurements  $\leq$  3 GHz and  $\geq$  10.0 cm for measurements  $>$  3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.  
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 3 mm.  
For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 50 mW.
- The results are normalized to 1 W input power.

## System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within  $\pm 10\%$  of the manufacturer calibrated dipole SAR target. Refer to Appendix B for the SAR System Check Plots.

| SAR Lab | Date      | Tissue Type | Dipole Type_Serial #        | Dipole Cal. Due Date | Dipole Power (dBm) | Measured Results for 1g SAR |                  |                     |                  | Measured Results for 10g SAR |                  |                     |                  | Plot No. |
|---------|-----------|-------------|-----------------------------|----------------------|--------------------|-----------------------------|------------------|---------------------|------------------|------------------------------|------------------|---------------------|------------------|----------|
|         |           |             |                             |                      |                    | Zoom Scan                   | Normalize to 1 W | Target (Ref. Value) | Delta $\pm 10\%$ | Zoom Scan                    | Normalize to 1 W | Target (Ref. Value) | Delta $\pm 10\%$ |          |
| 1A      | 6/5/2023  | Head        | D2450V2 SN: 963             | 10/18/2023           | 17.00              | 2.440                       | 48.68            | 52.40               | -7.09            | 1.140                        | 22.75            | 24.50               | -7.16            | 1        |
| 1A      | 6/8/2023  | Head        | D5GHzV2 SN: 1213 (5.60 GHz) | 10/11/2023           | 17.00              | 3.790                       | 75.62            | 82.40               | -8.23            | 1.070                        | 21.35            | 23.50               | -9.15            | 2        |
| 1A      | 6/13/2023 | Head        | D750V3 SN: 1139             | 10/12/2023           | 17.00              | 0.419                       | 8.36             | 8.51                | -1.76            | 0.275                        | 5.49             | 5.58                | -1.67            | 3        |
| 1A      | 6/21/2023 | Head        | D2600V2 SN: 1104            | 10/21/2023           | 17.00              | 2.730                       | 54.47            | 56.70               | -3.93            | 1.230                        | 24.54            | 25.30               | -3.00            | 4        |
| 2A      | 6/12/2023 | Head        | D1750V2 SN: 1136            | 10/17/2023           | 17.00              | 1.750                       | 34.92            | 36.10               | -3.28            | 0.938                        | 18.72            | 19.10               | -2.01            | 5        |
| 2A      | 6/14/2023 | Head        | D2600V2 SN: 1104            | 10/21/2023           | 17.00              | 2.860                       | 57.06            | 56.70               | 0.64             | 1.300                        | 25.94            | 25.30               | 2.52             | 6        |
| 2A      | 6/19/2023 | Head        | D1900V2 SN: 5d202           | 10/12/2023           | 17.00              | 2.060                       | 41.10            | 39.20               | 4.85             | 1.070                        | 21.35            | 20.40               | 4.65             | 7        |
| 2A      | 6/22/2023 | Head        | D750V3 SN: 1139             | 10/12/2023           | 17.00              | 0.414                       | 8.26             | 8.51                | -2.93            | 0.274                        | 5.47             | 5.58                | -2.02            | 8        |
| 2A      | 6/29/2023 | Head        | D5GHzV2 SN: 1213 (5.75 GHz) | 10/11/2023           | 17.00              | 3.660                       | 73.03            | 78.80               | -7.33            | 1.050                        | 20.95            | 22.40               | -6.47            | 9        |
| 2B      | 6/7/2023  | Head        | D1900V2 SN: 5d202           | 10/12/2023           | 17.00              | 1.990                       | 39.71            | 39.20               | 1.29             | 1.020                        | 20.35            | 20.40               | -0.24            | 10       |
| 2B      | 6/28/2023 | Head        | D5GHzV2 SN: 1213 (5.25 GHz) | 10/11/2023           | 17.00              | 3.740                       | 74.62            | 79.40               | -6.02            | 1.070                        | 21.35            | 22.70               | -5.95            |          |
| 2B      | 6/28/2023 | Head        | D5GHzV2 SN: 1213 (5.75 GHz) | 10/11/2023           | 17.00              | 3.700                       | 73.82            | 78.80               | -6.31            | 1.050                        | 20.95            | 22.40               | -6.47            | 11       |
| 2B      | 7/12/2023 | Head        | D5GHzV2 SN: 1213 (5.25 GHz) | 10/11/2023           | 17.00              | 3.740                       | 74.62            | 79.40               | -6.02            | 1.060                        | 21.15            | 22.70               | -6.83            | 12       |
| 2B      | 7/14/2023 | Head        | D5GHzV2 SN: 1213 (5.75 GHz) | 10/11/2023           | 17.00              | 3.760                       | 75.02            | 78.80               | -4.79            | 1.050                        | 20.95            | 22.40               | -6.47            |          |

## 9. Conducted Output Power Measurements

Tune-Up Power Limits provided by the manufacturer are used to scale measured SAR values.

### 9.1. GSM

#### Per KDB 941225 D01 3G SAR Procedures:

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

When different maximum output power applies to GSM voice or GPRS/EDGE time slots, GSM voice and GPRS/EDGE time slots should be tested separately to determine compliance by summing the corresponding reported SAR.

The GMSK EDGE configurations are grouped with GPRS and considered with respect to time-averaged maximum output power to determine compliance

#### Per October 2013 TCB Workshop:

When the maximum frame-averaged powers levels are within 0.25 dB of each other, test the configuration with the most number of time slots.

#### Maximum Output Power (Tune-up Limit) for GSM

SAR is not required for EDGE (8PSK) mode because the maximum output power and tune-up limit is  $\leq 1/4$ dB higher than GPRS/EDGE (GMSK) or the adjusted SAR of the highest reported SAR of GPRS/EDGE (GMSK) is  $\leq 1.2$ W/kg.

| RF Air interface | Mode                | GSM Burst Power Tune-up Limit (dBm) |            | GSM DTM CS Burst Power Tune-Up Limit (dBm) |            | GSM DTM PS Burst Power Tune-Up Limit (dBm) |            |
|------------------|---------------------|-------------------------------------|------------|--------------------------------------------|------------|--------------------------------------------|------------|
|                  |                     | CELL Main1                          | CELL Main2 | CELL Main1                                 | CELL Main2 | CELL Main1                                 | CELL Main2 |
|                  |                     | Normal                              | Normal     | Normal                                     | Normal     | Normal                                     | Normal     |
| GSM850           | Voice/GPRS (1 slot) | 32.9                                |            | 32.9                                       |            |                                            |            |
|                  | GPRS 2 slots        | 29.9                                |            | 29.9                                       |            | 29.9                                       |            |
|                  | GPRS 3 slots        | 28.1                                |            | 28.1                                       |            | 28.1                                       |            |
|                  | GPRS 4 slots        | 26.9                                |            |                                            |            |                                            |            |
|                  | EGPRS 1 slot        | 28.0                                |            | 32.9                                       |            |                                            |            |
|                  | EGPRS 2 slot        | 25.0                                |            | 29.9                                       |            | 25.0                                       |            |
|                  | EGPRS 3 slot        | 23.2                                |            | 28.1                                       |            | 23.2                                       |            |
|                  | EGPRS 4 slots       | 22.0                                |            |                                            |            |                                            |            |
| GSM1900          | Voice/GPRS (1 slot) |                                     | 28.0       |                                            | 28.0       |                                            |            |
|                  | GPRS 2 slots        |                                     | 25.0       |                                            | 25.0       |                                            | 25.0       |
|                  | GPRS 3 slots        |                                     | 23.2       |                                            | 23.2       |                                            | 23.2       |
|                  | GPRS 4 slots        |                                     | 22.0       |                                            |            |                                            |            |
|                  | EGPRS 1 slot        |                                     | 27.0       |                                            | 28.0       |                                            |            |
|                  | EGPRS 2 slot        |                                     | 24.0       |                                            | 25.0       |                                            | 24.0       |
|                  | EGPRS 3 slot        |                                     | 22.2       |                                            | 23.2       |                                            | 22.2       |
|                  | EGPRS 4 slots       |                                     | 21.0       |                                            |            |                                            |            |



**GSM850 Measured Results**

| Mode             | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Normal Average Power (dBm) |           |               |           |
|------------------|---------------|------------|--------|-------------|----------------------------|-----------|---------------|-----------|
|                  |               |            |        |             | Measured                   |           | Tune-up Limit |           |
|                  |               |            |        |             | Burst Pwr                  | Frame Pwr | Burst Pwr     | Frame Pwr |
| GPRS/EDGE (GMSK) | CS1           | 1          | 128    | 824.2       | 31.6                       | 22.6      | 32.9          | 23.9      |
|                  |               |            | 190    | 836.6       | 31.8                       | 22.8      |               |           |
|                  |               |            | 251    | 848.8       | 31.9                       | 22.8      |               |           |
|                  |               | 2          | 128    | 824.2       | 28.5                       | 22.5      | 29.9          | 23.9      |
|                  |               |            | 190    | 836.6       | 28.6                       | 22.5      |               |           |
|                  |               |            | 251    | 848.8       | 28.6                       | 22.6      |               |           |
|                  |               | 3          | 128    | 824.2       | 26.1                       | 21.9      | 28.1          | 23.8      |
|                  |               |            | 190    | 836.6       | 26.2                       | 21.9      |               |           |
|                  |               |            | 251    | 848.8       | 27.0                       | 22.7      |               |           |
|                  |               | 4          | 128    | 824.2       | 25.6                       | 22.6      | 26.9          | 23.9      |
|                  |               |            | 190    | 836.6       | 25.7                       | 22.7      |               |           |
|                  |               |            | 251    | 848.8       | 25.7                       | 22.6      |               |           |
| EDGE (8PSK)      | MCS5          | 1          | 128    | 824.2       | 26.6                       | 17.6      | 28.0          | 19.0      |
|                  |               |            | 190    | 836.6       | 26.8                       | 17.8      |               |           |
|                  |               |            | 251    | 848.8       | 26.8                       | 17.7      |               |           |
|                  |               | 2          | 128    | 824.2       | 23.8                       | 17.7      | 25.0          | 19.0      |
|                  |               |            | 190    | 836.6       | 23.8                       | 17.8      |               |           |
|                  |               |            | 251    | 848.8       | 23.9                       | 17.9      |               |           |
|                  |               | 3          | 128    | 824.2       | 21.9                       | 17.7      | 23.2          | 18.9      |
|                  |               |            | 190    | 836.6       | 21.9                       | 17.7      |               |           |
|                  |               |            | 251    | 848.8       | 22.0                       | 17.7      |               |           |
|                  |               | 4          | 128    | 824.2       | 20.8                       | 17.8      | 22.0          | 19.0      |
|                  |               |            | 190    | 836.6       | 20.7                       | 17.7      |               |           |
|                  |               |            | 251    | 848.8       | 20.7                       | 17.7      |               |           |

**GSM1900 Measured Results**

| Mode             | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Normal Average Power (dBm) |           |               |           |
|------------------|---------------|------------|--------|-------------|----------------------------|-----------|---------------|-----------|
|                  |               |            |        |             | Measured                   |           | Tune-up Limit |           |
|                  |               |            |        |             | Burst Pwr                  | Frame Pwr | Burst Pwr     | Frame Pwr |
| GPRS/EDGE (GMSK) | CS1           | 1          | 512    | 1850.2      | 27.1                       | 18.1      | 28.0          | 19.0      |
|                  |               |            | 661    | 1880.0      | 27.1                       | 18.1      |               |           |
|                  |               |            | 810    | 1909.8      | 27.1                       | 18.1      |               |           |
|                  |               | 2          | 512    | 1850.2      | 24.1                       | 18.1      | 25.0          | 19.0      |
|                  |               |            | 661    | 1880.0      | 23.8                       | 17.8      |               |           |
|                  |               |            | 810    | 1909.8      | 23.8                       | 17.8      |               |           |
|                  |               | 3          | 512    | 1850.2      | 22.0                       | 17.7      | 23.2          | 18.9      |
|                  |               |            | 661    | 1880.0      | 21.7                       | 17.5      |               |           |
|                  |               |            | 810    | 1909.8      | 21.7                       | 17.4      |               |           |
|                  |               | 4          | 512    | 1850.2      | 20.8                       | 17.8      | 22.0          | 19.0      |
|                  |               |            | 661    | 1880.0      | 20.8                       | 17.8      |               |           |
|                  |               |            | 810    | 1909.8      | 21.1                       | 18.0      |               |           |
| EDGE (8PSK)      | MCS5          | 1          | 512    | 1850.2      | 25.7                       | 16.7      | 27.0          | 18.0      |
|                  |               |            | 661    | 1880.0      | 26.1                       | 17.1      |               |           |
|                  |               |            | 810    | 1909.8      | 26.0                       | 16.9      |               |           |
|                  |               | 2          | 512    | 1850.2      | 22.7                       | 16.7      | 24.0          | 18.0      |
|                  |               |            | 661    | 1880.0      | 22.9                       | 16.9      |               |           |
|                  |               |            | 810    | 1909.8      | 22.9                       | 16.9      |               |           |
|                  |               | 3          | 512    | 1850.2      | 21.0                       | 16.7      | 22.2          | 17.9      |
|                  |               |            | 661    | 1880.0      | 21.3                       | 17.0      |               |           |
|                  |               |            | 810    | 1909.8      | 21.3                       | 17.0      |               |           |
|                  |               | 4          | 512    | 1850.2      | 19.8                       | 16.7      | 21.0          | 18.0      |
|                  |               |            | 661    | 1880.0      | 19.7                       | 16.7      |               |           |
|                  |               |            | 810    | 1909.8      | 19.8                       | 16.8      |               |           |

**GSM850 DTM Measured Results**

| Mode                           | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Normal Average Power (dBm) |              |              |              |               |              |              |              |
|--------------------------------|---------------|------------|--------|-------------|----------------------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|
|                                |               |            |        |             | Measured                   |              |              |              | Tune-up Limit |              |              |              |
|                                |               |            |        |             | CS Burst Pwr               | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr | CS Burst Pwr  | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr |
| GSM (Voice) + GPRS/EDGE (GMSK) | CS1           | 1          | 128    | 824.2       | 31.4                       |              | 22.3         |              | 32.9          |              | 23.9         |              |
|                                |               |            | 190    | 836.6       | 31.5                       |              | 22.5         |              |               |              |              |              |
|                                |               |            | 251    | 848.8       | 31.6                       |              | 22.6         |              |               |              |              |              |
|                                |               | 2          | 128    | 824.2       | 28.5                       | 28.6         | 22.5         | 22.6         | 29.9          | 29.9         | 23.9         | 23.9         |
|                                |               |            | 190    | 836.6       | 28.6                       | 29.2         | 22.6         | 23.2         |               |              |              |              |
|                                |               |            | 251    | 848.8       | 28.5                       | 28.6         | 22.5         | 22.6         |               |              |              |              |
|                                |               | 3          | 128    | 824.2       | 26.5                       | 26.5         | 22.2         | 22.3         | 28.1          | 28.1         | 23.8         | 23.8         |
|                                |               |            | 190    | 836.6       | 26.8                       | 26.8         | 22.6         | 22.5         |               |              |              |              |
|                                |               |            | 251    | 848.8       | 26.7                       | 26.8         | 22.4         | 22.6         |               |              |              |              |
| GSM (Voice) + EDGE (8PSK)      | MCS5          | 1          | 128    | 824.2       | 31.4                       |              | 22.3         |              | 32.9          |              | 23.9         |              |
|                                |               |            | 190    | 836.6       | 31.5                       |              | 22.5         |              |               |              |              |              |
|                                |               |            | 251    | 848.8       | 31.6                       |              | 22.6         |              |               |              |              |              |
|                                |               | 2          | 128    | 824.2       | 28.5                       | 23.7         | 22.5         | 17.7         | 29.9          | 25.0         | 23.9         | 19.0         |
|                                |               |            | 190    | 836.6       | 28.6                       | 23.7         | 22.6         | 17.7         |               |              |              |              |
|                                |               |            | 251    | 848.8       | 28.5                       | 23.7         | 22.5         | 17.7         |               |              |              |              |
|                                |               | 3          | 128    | 824.2       | 26.5                       | 22.0         | 22.2         | 17.7         | 28.1          | 23.2         | 23.8         | 18.9         |
|                                |               |            | 190    | 836.6       | 26.8                       | 21.8         | 22.6         | 17.6         |               |              |              |              |
|                                |               |            | 251    | 848.8       | 26.7                       | 21.8         | 22.4         | 17.6         |               |              |              |              |

**GSM1900 DTM Measured Results**

| Mode                           | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Normal Average Power (dBm) |              |              |              |               |              |              |              |
|--------------------------------|---------------|------------|--------|-------------|----------------------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|
|                                |               |            |        |             | Measured                   |              |              |              | Tune-up Limit |              |              |              |
|                                |               |            |        |             | CS Burst Pwr               | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr | CS Burst Pwr  | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr |
| GSM (Voice) + GPRS/EDGE (GMSK) | CS1           | 1          | 512    | 1850.2      | 27.0                       |              | 18.0         |              | 28.0          |              | 19.0         |              |
|                                |               |            | 661    | 1880.0      | 27.1                       |              | 18.1         |              |               |              |              |              |
|                                |               |            | 810    | 1909.8      | 27.2                       |              | 18.1         |              |               |              |              |              |
|                                |               | 2          | 512    | 1850.2      | 23.4                       | 24.2         | 17.4         | 18.2         | 25.0          | 25.0         | 19.0         | 19.0         |
|                                |               |            | 661    | 1880.0      | 23.5                       | 23.9         | 17.4         | 17.9         |               |              |              |              |
|                                |               |            | 810    | 1909.8      | 23.5                       | 23.9         | 17.5         | 17.8         |               |              |              |              |
|                                |               | 3          | 512    | 1850.2      | 21.4                       | 22.0         | 17.1         | 17.7         | 23.2          | 23.2         | 18.9         | 18.9         |
|                                |               |            | 661    | 1880.0      | 21.3                       | 21.8         | 17.1         | 17.6         |               |              |              |              |
|                                |               |            | 810    | 1909.8      | 21.4                       | 21.7         | 17.1         | 17.5         |               |              |              |              |
| GSM (Voice) + EDGE (8PSK)      | MCS5          | 1          | 512    | 1850.2      | 27.0                       |              | 18.0         |              | 28.0          |              | 19.0         |              |
|                                |               |            | 661    | 1880.0      | 27.1                       |              | 18.1         |              |               |              |              |              |
|                                |               |            | 810    | 1909.8      | 27.2                       |              | 18.1         |              |               |              |              |              |
|                                |               | 2          | 512    | 1850.2      | 23.4                       | 22.8         | 17.4         | 16.8         | 25.0          | 24.0         | 19.0         | 18.0         |
|                                |               |            | 661    | 1880.0      | 23.5                       | 23.0         | 17.4         | 17.0         |               |              |              |              |
|                                |               |            | 810    | 1909.8      | 23.5                       | 23.0         | 17.5         | 17.0         |               |              |              |              |
|                                |               | 3          | 512    | 1850.2      | 21.4                       | 21.0         | 17.1         | 16.8         | 23.2          | 22.2         | 18.9         | 17.9         |
|                                |               |            | 661    | 1880.0      | 21.3                       | 21.1         | 17.1         | 16.9         |               |              |              |              |
|                                |               |            | 810    | 1909.8      | 21.4                       | 21.4         | 17.1         | 17.1         |               |              |              |              |

## 9.2. W-CDMA

### Per KDB 941225 D01 3G SAR Procedures for W-CDMA:

Maximum output power is verified on the high, middle and low channels and using the appropriate 12.2 kbps RMC with TPC (transmit power control) set to all "1's"

### Release 99 Setup Procedures used to establish the test signals

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1. A summary of these settings is illustrated below:

| Mode                   | Subtest                 | Rel99        |
|------------------------|-------------------------|--------------|
| WCDMA General Settings | Loopback Mode           | Test Mode 2  |
|                        | Rel99 RMC               | 12.2kbps RMC |
|                        | Power Control Algorithm | Algorithm2   |
|                        | $\beta_c/\beta_d$       | 8/15         |

### HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to procedures in table C.10.1.4 of 3GPP TS 34.121-1. A summary of these settings is illustrated below:

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH**

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{HS}$<br>(Note 1,<br>Note 2) | CM (dB)<br>(Note 3) | MPR (dB)<br>(Note 3) |
|----------|-------------------|-------------------|-------------------|-------------------|-------------------------------------|---------------------|----------------------|
| 1        | 2/15              | 15/15             | 64                | 2/15              | 4/15                                | 0.0                 | 0.0                  |
| 2        | 12/15<br>(Note 4) | 15/15<br>(Note 4) | 64                | 12/15<br>(Note 4) | 24/15                               | 1.0                 | 0.0                  |
| 3        | 15/15             | 8/15              | 64                | 15/8              | 30/15                               | 1.5                 | 0.5                  |
| 4        | 15/15             | 4/15              | 64                | 15/4              | 30/15                               | 1.5                 | 0.5                  |

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ .

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ , and  $\Delta_{CQI} = 24/15$  with  $\beta_{HS} = 24/15 * \beta_c$ .

Note 3: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{HS}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

### HSUPA Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to procedures in table C.11.1.3 of 3GPP TS 34.121-1. A summary of these settings is illustrated below:

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{HS}$<br>(Note 1) | $\beta_{EC}$ | $\beta_{ed}$<br>(Note 4)<br>(Note 5)         | $\beta_{ed}$<br>(SF) | $\beta_{ed}$<br>(Codes) | CM<br>(dB)<br>(Note 2) | MPR<br>(dB)<br>(Note 2)<br>(Note 6) | AG<br>Index<br>(Note 5) | E-<br>TFCI |
|----------|-------------------|-------------------|-------------------|-------------------|--------------------------|--------------|----------------------------------------------|----------------------|-------------------------|------------------------|-------------------------------------|-------------------------|------------|
| 1        | 11/15<br>(Note 3) | 15/15<br>(Note 3) | 64                | 11/15<br>(Note 3) | 22/15                    | 209/25       | 1309/225                                     | 4                    | 1                       | 1.0                    | 0.0                                 | 20                      | 75         |
| 2        | 6/15              | 15/15             | 64                | 6/15              | 12/15                    | 12/15        | 94/75                                        | 4                    | 1                       | 3.0                    | 2.0                                 | 12                      | 67         |
| 3        | 15/15             | 9/15              | 64                | 15/9              | 30/15                    | 30/15        | $\beta_{ed1}: 47/15$<br>$\beta_{ed2}: 47/15$ | 4                    | 2                       | 2.0                    | 1.0                                 | 15                      | 92         |
| 4        | 2/15              | 15/15             | 64                | 2/15              | 4/15                     | 2/15         | 56/75                                        | 4                    | 1                       | 3.0                    | 2.0                                 | 17                      | 71         |
| 5        | 15/15             | 0                 | -                 | -                 | 5/15                     | 5/15         | 47/15                                        | 4                    | 1                       | 1.0                    | 0.0                                 | 12                      | 67         |

Note 1: For sub-test 1 to 4,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ . For sub-test 5,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 5/15$  with  $\beta_{HS} = 5/15 * \beta_c$ .

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{HS}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPCCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: In case of testing by UE using E-DPCCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPCCH power scaling at max power which could results in slightly smaller MPR values.

**DC-HSDPA Setup Procedures used to establish the test signals**

The following 4 Sub-tests for DC-HSDPA were completed according to procedures in table C08.1.12 of 3GPP TS 34.121-1. A summary of subtest settings is illustrated below:

**Table C.8.1.12: Fixed Reference Channel H-Set 12**

| Parameter                                                                                                                                              | Unit      | Value |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|
| Nominal Avg. Inf. Bit Rate                                                                                                                             | kbps      | 60    |
| Inter-TTI Distance                                                                                                                                     | TTI's     | 1     |
| Number of HARQ Processes                                                                                                                               | Processes | 6     |
| Information Bit Payload ( $N_{INF}$ )                                                                                                                  | Bits      | 120   |
| Number Code Blocks                                                                                                                                     | Blocks    | 1     |
| Binary Channel Bits Per TTI                                                                                                                            | Bits      | 960   |
| Total Available SML's in UE                                                                                                                            | SML's     | 19200 |
| Number of SML's per HARQ Proc.                                                                                                                         | SML's     | 3200  |
| Coding Rate                                                                                                                                            |           | 0.15  |
| Number of Physical Channel Codes                                                                                                                       | Codes     | 1     |
| Modulation                                                                                                                                             |           | QPSK  |
| Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.               |           |       |
| Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used. |           |       |

**HSPA+ Setup Procedures used to establish the test signals**

The following 1 Sub-test was completed according to procedures in table C.11.1.4 of 3GPP TS34.121. A summary of these settings is illustrated below:

**Table C.11.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM**

| Sub-test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | $\beta_c$<br>(Note 3) | $\beta_d$ | $\beta_{HS}$<br>(Note 1) | $\beta_{ec}$ | $\beta_{ed}$<br>(2xSF2)<br>(Note 4)            | $\beta_{ed}$<br>(2xSF4)<br>(Note 4)            | CM<br>(dB)<br>(Note 2) | MPR<br>(dB)<br>(Note 2) | AG<br>Index<br>(Note 4) | E-TFCI<br>(Note 5) | E-TFCI<br>(boost) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------|--------------------------|--------------|------------------------------------------------|------------------------------------------------|------------------------|-------------------------|-------------------------|--------------------|-------------------|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1                     | 0         | 30/15                    | 30/15        | $\beta_{ed1}$ : 30/15<br>$\beta_{ed2}$ : 30/15 | $\beta_{ed3}$ : 24/15<br>$\beta_{ed4}$ : 24/15 | 3.5                    | 2.5                     | 14                      | 105                | 105               |
| Note 1: $\Delta_{ACK}$ , $\Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$ .<br>Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).<br>Note 3: DPDCH is not configured, therefore the $\beta_c$ is set to 1 and $\beta_d = 0$ by default.<br>Note 4: $\beta_{ed}$ can not be set directly; it is set by Absolute Grant Value.<br>Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm. |                       |           |                          |              |                                                |                                                |                        |                         |                         |                    |                   |

**Maximum Output Power (Tune-up Limit) for W-CDMA**

SAR measurement is not required for the HSDPA, HSUPA. When primary mode and the adjusted SAR is  $\leq 1.2$  W/kg and secondary mode is  $\leq 1/4$  dB higher than the primary mode

| RF Air interface | Mode     | Tune-up PowerLimit<br>(dBm) |
|------------------|----------|-----------------------------|
|                  |          | CELL Main1                  |
|                  |          | Normal                      |
| W-CDMA<br>Band 2 | R99      | 19.7                        |
|                  | HSDPA    | 19.0                        |
|                  | HSUPA    | 19.0                        |
|                  | DC-HSDPA | 19.0                        |
| W-CDMA<br>Band 4 | R99      | 18.7                        |
|                  | HSDPA    | 18.0                        |
|                  | HSUPA    | 18.0                        |
|                  | DC-HSDPA | 18.0                        |
| W-CDMA<br>Band 5 | R99      | 22.7                        |
|                  | HSDPA    | 22.0                        |
|                  | HSUPA    | 22.0                        |
|                  | DC-HSDPA | 22.0                        |

**W-CDMA Band II Measured Results**

| Mode       |                         | UL Ch No. | Freq. (MHz) | Normal Average Power (dBm) |     |               |
|------------|-------------------------|-----------|-------------|----------------------------|-----|---------------|
|            |                         |           |             | Measured Pwr               | MPR | Tune-up Limit |
| Release 99 | Rel 99 (RMC, 12.2 kbps) | 9262      | 1852.4      | 19.0                       | N/A | 19.7          |
|            |                         | 9400      | 1880.0      | 18.9                       |     |               |
|            |                         | 9538      | 1907.6      | 19.0                       |     |               |
| HSDPA      | Subtest 1               | 9262      | 1852.4      | 18.0                       | 0   | 19.0          |
|            |                         | 9400      | 1880.0      | 17.9                       |     |               |
|            |                         | 9538      | 1907.6      | 17.9                       |     |               |
|            | Subtest 2               | 9262      | 1852.4      | 17.9                       | 0   | 19.0          |
|            |                         | 9400      | 1880.0      | 17.9                       |     |               |
|            |                         | 9538      | 1907.6      | 17.9                       |     |               |
|            | Subtest 3               | 9262      | 1852.4      | 17.4                       | 0.5 | 18.5          |
|            |                         | 9400      | 1880.0      | 17.4                       |     |               |
|            |                         | 9538      | 1907.6      | 17.4                       |     |               |
|            | Subtest 4               | 9262      | 1852.4      | 17.4                       | 0.5 | 18.5          |
|            |                         | 9400      | 1880.0      | 17.4                       |     |               |
|            |                         | 9538      | 1907.6      | 17.4                       |     |               |
| HSUPA      | Subtest 1               | 9262      | 1852.4      | 18.0                       | 0   | 19.0          |
|            |                         | 9400      | 1880.0      | 18.0                       |     |               |
|            |                         | 9538      | 1907.6      | 17.9                       |     |               |
|            | Subtest 2               | 9262      | 1852.4      | 16.0                       | 2   | 17.0          |
|            |                         | 9400      | 1880.0      | 16.1                       |     |               |
|            |                         | 9538      | 1907.6      | 15.9                       |     |               |
|            | Subtest 3               | 9262      | 1852.4      | 17.0                       | 1   | 18.0          |
|            |                         | 9400      | 1880.0      | 17.0                       |     |               |
|            |                         | 9538      | 1907.6      | 16.9                       |     |               |
|            | Subtest 4               | 9262      | 1852.4      | 16.0                       | 2   | 17.0          |
|            |                         | 9400      | 1880.0      | 16.0                       |     |               |
|            |                         | 9538      | 1907.6      | 15.9                       |     |               |
|            | Subtest 5               | 9262      | 1852.4      | 18.1                       | 0   | 19.0          |
|            |                         | 9400      | 1880.0      | 18.1                       |     |               |
|            |                         | 9538      | 1907.6      | 18.0                       |     |               |
| DC-HSDPA   | Subtest 1               | 9262      | 1852.4      | 17.9                       | 0   | 19.0          |
|            |                         | 9400      | 1880.0      | 18.0                       |     |               |
|            |                         | 9538      | 1907.6      | 17.9                       |     |               |
|            | Subtest 2               | 9262      | 1852.4      | 18.0                       | 0   | 19.0          |
|            |                         | 9400      | 1880.0      | 18.0                       |     |               |
|            |                         | 9538      | 1907.6      | 17.9                       |     |               |
|            | Subtest 3               | 9262      | 1852.4      | 17.5                       | 0.5 | 18.5          |
|            |                         | 9400      | 1880.0      | 17.5                       |     |               |
|            |                         | 9538      | 1907.6      | 17.4                       |     |               |
|            | Subtest 4               | 9262      | 1852.4      | 17.5                       | 0.5 | 18.5          |
|            |                         | 9400      | 1880.0      | 17.5                       |     |               |
|            |                         | 9538      | 1907.6      | 17.4                       |     |               |

**W-CDMA Band IV Measured Results**

| Mode       |                         | UL Ch No. | Freq. (MHz) | Normal Average Power (dBm) |     |               |
|------------|-------------------------|-----------|-------------|----------------------------|-----|---------------|
|            |                         |           |             | Measured Pwr               | MPR | Tune-up Limit |
| Release 99 | Rel 99 (RMC, 12.2 kbps) | 1312      | 1712.4      | 17.9                       | N/A | 18.7          |
|            |                         | 1413      | 1732.6      | 18.0                       |     |               |
|            |                         | 1513      | 1752.6      | 18.0                       |     |               |
| HSDPA      | Subtest 1               | 1312      | 1712.4      | 16.9                       | 0   | 18.0          |
|            |                         | 1413      | 1732.6      | 17.0                       |     |               |
|            |                         | 1513      | 1752.6      | 17.0                       |     |               |
|            | Subtest 2               | 1312      | 1712.4      | 16.8                       | 0   | 18.0          |
|            |                         | 1413      | 1732.6      | 17.0                       |     |               |
|            |                         | 1513      | 1752.6      | 17.0                       |     |               |
|            | Subtest 3               | 1312      | 1712.4      | 16.4                       | 0.5 | 17.5          |
|            |                         | 1413      | 1732.6      | 16.5                       |     |               |
|            |                         | 1513      | 1752.6      | 16.5                       |     |               |
|            | Subtest 4               | 1312      | 1712.4      | 16.4                       | 0.5 | 17.5          |
|            |                         | 1413      | 1732.6      | 16.6                       |     |               |
|            |                         | 1513      | 1752.6      | 16.5                       |     |               |
| HSUPA      | Subtest 1               | 1312      | 1712.4      | 16.9                       | 0   | 18.0          |
|            |                         | 1413      | 1732.6      | 17.1                       |     |               |
|            |                         | 1513      | 1752.6      | 17.0                       |     |               |
|            | Subtest 2               | 1312      | 1712.4      | 14.9                       | 2   | 16.0          |
|            |                         | 1413      | 1732.6      | 15.1                       |     |               |
|            |                         | 1513      | 1752.6      | 15.0                       |     |               |
|            | Subtest 3               | 1312      | 1712.4      | 15.9                       | 1   | 17.0          |
|            |                         | 1413      | 1732.6      | 16.1                       |     |               |
|            |                         | 1513      | 1752.6      | 16.0                       |     |               |
|            | Subtest 4               | 1312      | 1712.4      | 14.9                       | 2   | 16.0          |
|            |                         | 1413      | 1732.6      | 15.1                       |     |               |
|            |                         | 1513      | 1752.6      | 15.0                       |     |               |
|            | Subtest 5               | 1312      | 1712.4      | 16.9                       | 0   | 18.0          |
|            |                         | 1413      | 1732.6      | 17.1                       |     |               |
|            |                         | 1513      | 1752.6      | 17.0                       |     |               |
| DC-HSDPA   | Subtest 1               | 1312      | 1712.4      | 16.9                       | 0   | 18.0          |
|            |                         | 1413      | 1732.6      | 17.0                       |     |               |
|            |                         | 1513      | 1752.6      | 17.0                       |     |               |
|            | Subtest 2               | 1312      | 1712.4      | 16.9                       | 0   | 18.0          |
|            |                         | 1413      | 1732.6      | 17.0                       |     |               |
|            |                         | 1513      | 1752.6      | 17.0                       |     |               |
|            | Subtest 3               | 1312      | 1712.4      | 16.4                       | 0.5 | 17.5          |
|            |                         | 1413      | 1732.6      | 16.5                       |     |               |
|            |                         | 1513      | 1752.6      | 16.4                       |     |               |
|            | Subtest 4               | 1312      | 1712.4      | 16.4                       | 0.5 | 17.5          |
|            |                         | 1413      | 1732.6      | 16.5                       |     |               |
|            |                         | 1513      | 1752.6      | 16.5                       |     |               |

**W-CDMA Band V Measured Results**

| Mode       |                         | UL Ch No. | Freq. (MHz) | Normal Average Power (dBm) |     |               |
|------------|-------------------------|-----------|-------------|----------------------------|-----|---------------|
|            |                         |           |             | Measured Pwr               | MPR | Tune-up Limit |
| Release 99 | Rel 99 (RMC, 12.2 kbps) | 4132      | 826.4       | 21.9                       | N/A | 22.7          |
|            |                         | 4183      | 836.6       | 21.9                       |     |               |
|            |                         | 4233      | 846.6       | 21.8                       |     |               |
| HSDPA      | Subtest 1               | 4132      | 826.4       | 20.9                       | 0   | 22.0          |
|            |                         | 4183      | 836.6       | 20.9                       |     |               |
|            |                         | 4233      | 846.6       | 20.8                       |     |               |
|            | Subtest 2               | 4132      | 826.4       | 20.9                       | 0   | 22.0          |
|            |                         | 4183      | 836.6       | 20.9                       |     |               |
|            |                         | 4233      | 846.6       | 20.8                       |     |               |
|            | Subtest 3               | 4132      | 826.4       | 20.4                       | 0.5 | 21.5          |
|            |                         | 4183      | 836.6       | 20.4                       |     |               |
|            |                         | 4233      | 846.6       | 20.3                       |     |               |
|            | Subtest 4               | 4132      | 826.4       | 20.4                       | 0.5 | 21.5          |
|            |                         | 4183      | 836.6       | 20.4                       |     |               |
|            |                         | 4233      | 846.6       | 20.3                       |     |               |
| HSUPA      | Subtest 1               | 4132      | 826.4       | 21.0                       | 0   | 22.0          |
|            |                         | 4183      | 836.6       | 21.0                       |     |               |
|            |                         | 4233      | 846.6       | 20.9                       |     |               |
|            | Subtest 2               | 4132      | 826.4       | 19.0                       | 2   | 20.0          |
|            |                         | 4183      | 836.6       | 18.9                       |     |               |
|            |                         | 4233      | 846.6       | 18.9                       |     |               |
|            | Subtest 3               | 4132      | 826.4       | 19.9                       | 1   | 21.0          |
|            |                         | 4183      | 836.6       | 19.9                       |     |               |
|            |                         | 4233      | 846.6       | 19.9                       |     |               |
|            | Subtest 4               | 4132      | 826.4       | 19.0                       | 2   | 20.0          |
|            |                         | 4183      | 836.6       | 19.0                       |     |               |
|            |                         | 4233      | 846.6       | 18.9                       |     |               |
|            | Subtest 5               | 4132      | 826.4       | 21.0                       | 0   | 22.0          |
|            |                         | 4183      | 836.6       | 21.0                       |     |               |
|            |                         | 4233      | 846.6       | 20.9                       |     |               |
| DC-HSDPA   | Subtest 1               | 4132      | 826.4       | 20.9                       | 0   | 22.0          |
|            |                         | 4183      | 836.6       | 20.9                       |     |               |
|            |                         | 4233      | 846.6       | 20.8                       |     |               |
|            | Subtest 2               | 4132      | 826.4       | 20.9                       | 0   | 22.0          |
|            |                         | 4183      | 836.6       | 20.9                       |     |               |
|            |                         | 4233      | 846.6       | 20.8                       |     |               |
|            | Subtest 3               | 4132      | 826.4       | 20.4                       | 0.5 | 21.5          |
|            |                         | 4183      | 836.6       | 20.4                       |     |               |
|            |                         | 4233      | 846.6       | 20.3                       |     |               |
|            | Subtest 4               | 4132      | 826.4       | 20.4                       | 0.5 | 21.5          |
|            |                         | 4183      | 836.6       | 20.4                       |     |               |
|            |                         | 4233      | 846.6       | 20.3                       |     |               |

### 9.3. LTE

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3**

| Modulation | Channel bandwidth / Transmission bandwidth ( $N_{RB}$ ) |         |       |        |        |        | MPR (dB) |
|------------|---------------------------------------------------------|---------|-------|--------|--------|--------|----------|
|            | 1.4 MHz                                                 | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |          |
| QPSK       | > 5                                                     | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 1      |
| 16 QAM     | ≤ 5                                                     | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18   | ≤ 1      |
| 16 QAM     | > 5                                                     | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 2      |
| 64 QAM     | ≤ 5                                                     | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18   | ≤ 2      |
| 64 QAM     | > 5                                                     | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 3      |
| 256 QAM    | ≥ 1                                                     |         |       |        |        |        | ≤ 5      |

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS\_01".

**Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)**

| Network Signalling value | Requirements (subclause) | E-UTRA Band | Channel bandwidth (MHz) | Resources Blocks ( $N_{RB}$ ) | A-MPR (dB) |
|--------------------------|--------------------------|-------------|-------------------------|-------------------------------|------------|
| NS_01                    | 6.6.2.1.1                | Table 5.5-1 | 1.4, 3, 5, 10, 15, 20   | Table 5.6-1                   | N/A        |



**Maximum Output Power (Tune-up Limit) for LTE**

According to April 2015 TCB workshop, SAR test exclusion can be applied for testing overlapping LTE bands as follows:

- a) The maximum output power, including tolerance, for the smaller band must be  $\leq$  the larger band to qualify for the SAR test exclusion.
- b) The channel bandwidth and other operating parameters for the smaller band must be fully supported by the larger band.
  - LTE Band 2 (1850-1910 MHz) is covered by LTE Band 25 (1850-1915 MHz)
  - LTE Band 4 (1710-1755 MHz) is covered by LTE Band 66 (1710-1780 MHz)
  - LTE Band 17 (704-716 MHz) is covered by LTE Band 12 (699-716 MHz)

For some LTE Bands, certain channel bandwidths do not support at least three non-overlapping channels. When a device supports overlapping channel assignments in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices. Please refer to section 6.3. for a detailed list of LTE test channels

- LTE Band 5 (824-849 MHz)
- LTE Band 12 (699-716 MHz)

LTE QPSK configuration has the highest maximum average output power per 3GPP standard.

SAR measurement is not required for the 16QAM and 64QAM. When the highest maximum output power for 16QAM and 64QAM is  $\leq \frac{1}{2}$  dB higher than the QPSK or when the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg.

| RF Air interface | Mode | Tune-up PowerLimit (dBm) |            |
|------------------|------|--------------------------|------------|
|                  |      | CELL Main1               | CELL Main2 |
|                  |      | Normal                   | Normal     |
| LTE Band 2       | QPSK |                          | 20.0       |
| LTE Band 4       | QPSK |                          | 19.0       |
| LTE Band 5       | QPSK | 22.0                     |            |
| LTE Band 12      | QPSK | 22.0                     |            |
| LTE Band 13      | QPSK | 22.0                     |            |
| LTE Band 17      | QPSK | 22.0                     |            |
| LTE Band 25      | QPSK |                          | 20.0       |
| LTE Band 41      | QPSK |                          | 20.0       |
| LTE Band 66      | QPSK |                          | 19.0       |

**LTE Band 5 Measured Results**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |           |     |                  |
|-------------|-------|------------------|--------------|----------------------------|-----------|-----------|-----|------------------|
|             |       |                  |              | 20450                      | 20525     | 20600     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 829 MHz                    | 836.5 MHz | 844 MHz   |     |                  |
| 10 MHz      | QPSK  | 1                | 0            | 20.8                       | 20.8      | 20.9      | 0   | 22               |
|             |       | 1                | 25           | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 1                | 49           | 20.8                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 25               | 0            | 20.7                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 25               | 12           | 20.8                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 25               | 25           | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 50               | 0            | 20.8                       | 20.8      | 20.8      | 0   | 22               |
|             | 16QAM | 1                | 0            | 21.0                       | 21.0      | 21.1      | 0   | 22               |
|             |       | 1                | 25           | 20.9                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 1                | 49           | 21.0                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 25               | 0            | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 25               | 12           | 20.9                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 25               | 25           | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 50               | 0            | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             | 64QAM | 1                | 0            | 21.1                       | 21.1      | 21.2      | 0   | 22               |
|             |       | 1                | 25           | 21.1                       | 21.2      | 21.2      | 0   | 22               |
|             |       | 1                | 49           | 21.2                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 25               | 0            | 20.4                       | 20.5      | 20.6      | 0   | 22               |
|             |       | 25               | 12           | 20.5                       | 20.5      | 20.6      | 0   | 22               |
|             |       | 25               | 25           | 20.4                       | 20.6      | 20.6      | 0   | 22               |
|             |       | 50               | 0            | 20.4                       | 20.5      | 20.6      | 0   | 22               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |           |     |                  |
|             |       |                  |              | 20425                      | 20525     | 20625     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 826.5 MHz                  | 836.5 MHz | 846.5 MHz |     |                  |
| 5 MHz       | QPSK  | 1                | 0            | 20.7                       | 20.8      | 20.8      | 0   | 22               |
|             |       | 1                | 12           | 20.8                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 1                | 24           | 20.7                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 12               | 0            | 20.8                       | 20.8      | 20.8      | 0   | 22               |
|             |       | 12               | 7            | 20.8                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 12               | 13           | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 25               | 0            | 20.8                       | 20.9      | 20.8      | 0   | 22               |
|             | 16QAM | 1                | 0            | 20.9                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 1                | 12           | 21.0                       | 21.2      | 21.2      | 0   | 22               |
|             |       | 1                | 24           | 20.9                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 12               | 0            | 20.8                       | 20.9      | 20.7      | 0   | 22               |
|             |       | 12               | 7            | 20.8                       | 21.0      | 20.8      | 0   | 22               |
|             |       | 12               | 13           | 20.8                       | 21.0      | 20.8      | 0   | 22               |
|             |       | 25               | 0            | 20.8                       | 20.9      | 20.8      | 0   | 22               |
|             | 64QAM | 1                | 0            | 20.9                       | 21.2      | 21.1      | 0   | 22               |
|             |       | 1                | 12           | 21.0                       | 21.2      | 21.2      | 0   | 22               |
|             |       | 1                | 24           | 20.9                       | 21.2      | 21.2      | 0   | 22               |
|             |       | 12               | 0            | 20.4                       | 20.5      | 20.5      | 0   | 22               |
|             |       | 12               | 7            | 20.5                       | 20.5      | 20.5      | 0   | 22               |
|             |       | 12               | 13           | 20.4                       | 20.6      | 20.6      | 0   | 22               |
|             |       | 25               | 0            | 20.4                       | 20.5      | 20.4      | 0   | 22               |

**LTE Band 5 Measured Results (continued)**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |           |     |                  |
|-------------|-------|------------------|--------------|----------------------------|-----------|-----------|-----|------------------|
|             |       |                  |              | 20415                      | 20525     | 20635     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 825.5 MHz                  | 836.5 MHz | 847.5 MHz |     |                  |
| 3 MHz       | QPSK  | 1                | 0            | 20.7                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 1                | 8            | 20.8                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 1                | 14           | 20.7                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 8                | 0            | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 8                | 4            | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 8                | 7            | 20.8                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 15               | 0            | 20.7                       | 20.9      | 20.9      | 0   | 22               |
|             | 16QAM | 1                | 0            | 20.9                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 1                | 8            | 21.0                       | 21.2      | 21.1      | 0   | 22               |
|             |       | 1                | 14           | 20.9                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 8                | 0            | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 8                | 4            | 20.9                       | 20.9      | 21.0      | 0   | 22               |
|             |       | 8                | 7            | 20.8                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 15               | 0            | 20.8                       | 20.9      | 20.9      | 0   | 22               |
|             | 64QAM | 1                | 0            | 21.0                       | 21.2      | 21.0      | 0   | 22               |
|             |       | 1                | 8            | 21.2                       | 21.3      | 21.1      | 0   | 22               |
|             |       | 1                | 14           | 21.0                       | 21.2      | 21.0      | 0   | 22               |
|             |       | 8                | 0            | 20.4                       | 20.5      | 20.5      | 0   | 22               |
|             |       | 8                | 4            | 20.5                       | 20.6      | 20.5      | 0   | 22               |
|             |       | 8                | 7            | 20.5                       | 20.6      | 20.5      | 0   | 22               |
|             |       | 15               | 0            | 20.4                       | 20.5      | 20.5      | 0   | 22               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |           |     |                  |
|             |       |                  |              | 20407                      | 20525     | 20643     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 824.7 MHz                  | 836.5 MHz | 848.3 MHz |     |                  |
| 1.4 MHz     | QPSK  | 1                | 0            | 20.7                       | 20.8      | 20.8      | 0   | 22               |
|             |       | 1                | 3            | 20.7                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 1                | 5            | 20.7                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 3                | 0            | 20.7                       | 20.8      | 20.8      | 0   | 22               |
|             |       | 3                | 1            | 20.7                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 3                | 3            | 20.7                       | 20.9      | 20.8      | 0   | 22               |
|             |       | 6                | 0            | 20.7                       | 20.8      | 20.8      | 0   | 22               |
|             | 16QAM | 1                | 0            | 20.8                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 1                | 3            | 20.8                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 1                | 5            | 20.9                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 3                | 0            | 20.8                       | 21.0      | 20.8      | 0   | 22               |
|             |       | 3                | 1            | 20.9                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 3                | 3            | 20.9                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 6                | 0            | 20.7                       | 20.8      | 20.8      | 0   | 22               |
|             | 64QAM | 1                | 0            | 21.1                       | 21.2      | 21.0      | 0   | 22               |
|             |       | 1                | 3            | 21.1                       | 21.2      | 21.0      | 0   | 22               |
|             |       | 1                | 5            | 21.1                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 3                | 0            | 20.9                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 3                | 1            | 20.9                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 3                | 3            | 20.9                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 6                | 0            | 20.4                       | 20.5      | 20.5      | 0   | 22               |

**LTE Band 12 Measured Results**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |           |     |                  |
|-------------|-------|------------------|--------------|----------------------------|-----------|-----------|-----|------------------|
|             |       |                  |              | 23060                      | 23095     | 23130     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 704 MHz                    | 707.5 MHz | 711 MHz   |     |                  |
| 10 MHz      | QPSK  | 1                | 0            | 21.0                       | 20.9      | 21.0      | 0   | 22               |
|             |       | 1                | 25           | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 1                | 49           | 21.0                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 25               | 0            | 20.9                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 25               | 12           | 21.1                       | 21.0      | 21.1      | 0   | 22               |
|             |       | 25               | 25           | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 50               | 0            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             | 16QAM | 1                | 0            | 21.1                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 1                | 25           | 21.1                       | 21.1      | 21.2      | 0   | 22               |
|             |       | 1                | 49           | 21.2                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 25               | 0            | 20.9                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 25               | 12           | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 25               | 25           | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 50               | 0            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             | 64QAM | 1                | 0            | 21.3                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 1                | 25           | 21.2                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 1                | 49           | 21.3                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 25               | 0            | 20.4                       | 20.5      | 20.5      | 0   | 22               |
|             |       | 25               | 12           | 20.5                       | 20.5      | 20.6      | 0   | 22               |
|             |       | 25               | 25           | 20.5                       | 20.5      | 20.6      | 0   | 22               |
|             |       | 50               | 0            | 20.5                       | 20.5      | 20.6      | 0   | 22               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |           |     |                  |
|             |       |                  |              | 23035                      | 23095     | 23155     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 701.5 MHz                  | 707.5 MHz | 713.5 MHz |     |                  |
| 5 MHz       | QPSK  | 1                | 0            | 20.9                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 1                | 12           | 21.0                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 1                | 24           | 20.9                       | 20.9      | 21.0      | 0   | 22               |
|             |       | 12               | 0            | 20.9                       | 20.9      | 21.0      | 0   | 22               |
|             |       | 12               | 7            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 12               | 13           | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 25               | 0            | 21.0                       | 20.9      | 20.9      | 0   | 22               |
|             | 16QAM | 1                | 0            | 21.0                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 1                | 12           | 21.1                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 1                | 24           | 21.0                       | 21.2      | 21.2      | 0   | 22               |
|             |       | 12               | 0            | 20.9                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 12               | 7            | 21.0                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 12               | 13           | 21.0                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 25               | 0            | 21.0                       | 20.9      | 20.9      | 0   | 22               |
|             | 64QAM | 1                | 0            | 21.3                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 1                | 12           | 21.2                       | 21.3      | 21.4      | 0   | 22               |
|             |       | 1                | 24           | 21.2                       | 21.2      | 21.3      | 0   | 22               |
|             |       | 12               | 0            | 20.4                       | 20.5      | 20.5      | 0   | 22               |
|             |       | 12               | 7            | 20.5                       | 20.5      | 20.6      | 0   | 22               |
|             |       | 12               | 13           | 20.5                       | 20.6      | 20.6      | 0   | 22               |
|             |       | 25               | 0            | 20.5                       | 20.4      | 20.5      | 0   | 22               |

**LTE Band 12 Measured Results (continued)**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |           |     |                  |
|-------------|-------|------------------|--------------|----------------------------|-----------|-----------|-----|------------------|
|             |       |                  |              | 23025                      | 23095     | 23165     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 700.5 MHz                  | 707.5 MHz | 714.5 MHz |     |                  |
| 3 MHz       | QPSK  | 1                | 0            | 20.9                       | 20.9      | 20.9      | 0   | 22               |
|             |       | 1                | 8            | 20.9                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 1                | 14           | 20.9                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 8                | 0            | 20.9                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 8                | 4            | 20.9                       | 21.0      | 21.1      | 0   | 22               |
|             |       | 8                | 7            | 21.0                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 15               | 0            | 20.9                       | 20.9      | 20.9      | 0   | 22               |
|             | 16QAM | 1                | 0            | 21.0                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 1                | 8            | 21.1                       | 21.3      | 21.2      | 0   | 22               |
|             |       | 1                | 14           | 21.0                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 8                | 0            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 8                | 4            | 21.0                       | 21.0      | 21.1      | 0   | 22               |
|             |       | 8                | 7            | 21.0                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 15               | 0            | 20.9                       | 21.0      | 20.9      | 0   | 22               |
|             | 64QAM | 1                | 0            | 21.3                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 1                | 8            | 21.3                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 1                | 14           | 21.3                       | 21.3      | 21.2      | 0   | 22               |
|             |       | 8                | 0            | 20.5                       | 20.5      | 20.5      | 0   | 22               |
|             |       | 8                | 4            | 20.5                       | 20.5      | 20.6      | 0   | 22               |
|             |       | 8                | 7            | 20.5                       | 20.6      | 20.6      | 0   | 22               |
|             |       | 15               | 0            | 20.5                       | 20.4      | 20.5      | 0   | 22               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |           |     |                  |
|             |       |                  |              | 23017                      | 23095     | 23173     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 699.7 MHz                  | 707.5 MHz | 715.3 MHz |     |                  |
| 1.4 MHz     | QPSK  | 1                | 0            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 1                | 3            | 21.0                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 1                | 5            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 3                | 0            | 21.0                       | 21.0      | 20.9      | 0   | 22               |
|             |       | 3                | 1            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 3                | 3            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 6                | 0            | 21.0                       | 20.9      | 21.0      | 0   | 22               |
|             | 16QAM | 1                | 0            | 21.1                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 1                | 3            | 21.2                       | 21.2      | 21.2      | 0   | 22               |
|             |       | 1                | 5            | 21.1                       | 21.1      | 21.1      | 0   | 22               |
|             |       | 3                | 0            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 3                | 1            | 21.1                       | 21.0      | 21.0      | 0   | 22               |
|             |       | 3                | 3            | 21.1                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 6                | 0            | 21.0                       | 21.0      | 21.0      | 0   | 22               |
|             | 64QAM | 1                | 0            | 21.3                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 1                | 3            | 21.4                       | 21.4      | 21.3      | 0   | 22               |
|             |       | 1                | 5            | 21.3                       | 21.3      | 21.3      | 0   | 22               |
|             |       | 3                | 0            | 21.1                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 3                | 1            | 21.1                       | 21.1      | 21.0      | 0   | 22               |
|             |       | 3                | 3            | 21.1                       | 21.2      | 21.0      | 0   | 22               |
|             |       | 6                | 0            | 20.5                       | 20.4      | 20.5      | 0   | 22               |

**LTE Band 13 Measured Results**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |         |           |                  |                  |
|-------------|-------|------------------|--------------|----------------------------|-----------|---------|-----------|------------------|------------------|
|             |       |                  |              |                            | 23230     |         | MPR       | Tune-up<br>Limit |                  |
|             |       |                  |              |                            | 782 MHz   |         |           |                  |                  |
| 10 MHz      | QPSK  | 1                | 0            |                            | 20.9      |         | 0         | 22               |                  |
|             |       | 1                | 25           |                            | 20.9      |         | 0         | 22               |                  |
|             |       | 1                | 49           |                            | 20.9      |         | 0         | 22               |                  |
|             |       | 25               | 0            |                            | 20.9      |         | 0         | 22               |                  |
|             |       | 25               | 12           |                            | 20.9      |         | 0         | 22               |                  |
|             |       | 25               | 25           |                            | 20.9      |         | 0         | 22               |                  |
|             |       | 50               | 0            |                            | 20.9      |         | 0         | 22               |                  |
|             | 16QAM | 1                | 0            |                            | 21.0      |         | 0         | 22               |                  |
|             |       | 1                | 25           |                            | 21.1      |         | 0         | 22               |                  |
|             |       | 1                | 49           |                            | 21.1      |         | 0         | 22               |                  |
|             |       | 25               | 0            |                            | 20.9      |         | 0         | 22               |                  |
|             |       | 25               | 12           |                            | 20.9      |         | 0         | 22               |                  |
|             |       | 25               | 25           |                            | 21.0      |         | 0         | 22               |                  |
|             |       | 50               | 0            |                            | 20.9      |         | 0         | 22               |                  |
|             | 64QAM | 1                | 0            |                            | 21.1      |         | 0         | 22               |                  |
|             |       | 1                | 25           |                            | 21.1      |         | 0         | 22               |                  |
|             |       | 1                | 49           |                            | 21.1      |         | 0         | 22               |                  |
|             |       | 25               | 0            |                            | 20.4      |         | 0         | 22               |                  |
|             |       | 25               | 12           |                            | 20.4      |         | 0         | 22               |                  |
|             |       | 25               | 25           |                            | 20.4      |         | 0         | 22               |                  |
|             |       | 50               | 0            |                            | 20.4      |         | 0         | 22               |                  |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |           |         |           |                  |                  |
|             |       |                  |              |                            | 23205     | 23230   | 23255     | MPR              | Tune-up<br>Limit |
|             |       |                  |              |                            | 779.5 MHz | 782 MHz | 784.5 MHz |                  |                  |
| 5 MHz       | QPSK  | 1                | 0            | 20.9                       | 20.9      | 21.0    | 0         | 22               |                  |
|             |       | 1                | 12           | 21.1                       | 21.0      | 21.1    | 0         | 22               |                  |
|             |       | 1                | 24           | 20.9                       | 20.9      | 21.0    | 0         | 22               |                  |
|             |       | 12               | 0            | 20.9                       | 20.8      | 20.9    | 0         | 22               |                  |
|             |       | 12               | 7            | 21.0                       | 20.9      | 20.9    | 0         | 22               |                  |
|             |       | 12               | 13           | 20.9                       | 20.9      | 20.9    | 0         | 22               |                  |
|             |       | 25               | 0            | 21.0                       | 20.9      | 20.9    | 0         | 22               |                  |
|             | 16QAM | 1                | 0            | 21.0                       | 21.0      | 21.2    | 0         | 22               |                  |
|             |       | 1                | 12           | 21.1                       | 21.1      | 21.1    | 0         | 22               |                  |
|             |       | 1                | 24           | 21.0                       | 21.0      | 21.1    | 0         | 22               |                  |
|             |       | 12               | 0            | 20.9                       | 20.8      | 20.9    | 0         | 22               |                  |
|             |       | 12               | 7            | 21.0                       | 20.8      | 20.9    | 0         | 22               |                  |
|             |       | 12               | 13           | 20.9                       | 20.9      | 20.9    | 0         | 22               |                  |
|             |       | 25               | 0            | 20.9                       | 20.9      | 20.8    | 0         | 22               |                  |
|             | 64QAM | 1                | 0            | 21.1                       | 21.2      | 21.0    | 0         | 22               |                  |
|             |       | 1                | 12           | 21.1                       | 21.2      | 21.1    | 0         | 22               |                  |
|             |       | 1                | 24           | 21.2                       | 21.2      | 21.0    | 0         | 22               |                  |
|             |       | 12               | 0            | 20.4                       | 20.4      | 20.4    | 0         | 22               |                  |
|             |       | 12               | 7            | 20.5                       | 20.4      | 20.4    | 0         | 22               |                  |
|             |       | 12               | 13           | 20.5                       | 20.5      | 20.5    | 0         | 22               |                  |
|             |       | 25               | 0            | 20.5                       | 20.4      | 20.4    | 0         | 22               |                  |

**LTE Band 25 Measured Results**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |            |     |                  |
|-------------|-------|------------------|--------------|----------------------------|------------|------------|-----|------------------|
|             |       |                  |              | 26140                      | 26365      | 26590      | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1860 MHz                   | 1882.5 MHz | 1905 MHz   |     |                  |
| 20 MHz      | QPSK  | 1                | 0            | 18.8                       | 18.8       | 18.7       | 0   | 20               |
|             |       | 1                | 49           | 18.8                       | 18.8       | 18.6       | 0   | 20               |
|             |       | 1                | 99           | 18.7                       | 18.8       | 18.6       | 0   | 20               |
|             |       | 50               | 0            | 18.8                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 50               | 24           | 18.8                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 50               | 50           | 18.7                       | 18.8       | 18.7       | 0   | 20               |
|             |       | 100              | 0            | 18.8                       | 18.9       | 18.7       | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.0                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 1                | 49           | 19.2                       | 19.2       | 19.1       | 0   | 20               |
|             |       | 1                | 99           | 18.9                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 50               | 0            | 18.8                       | 18.8       | 18.7       | 0   | 20               |
|             |       | 50               | 24           | 18.8                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 50               | 50           | 18.8                       | 18.8       | 18.7       | 0   | 20               |
|             |       | 100              | 0            | 18.8                       | 18.8       | 18.7       | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.1                       | 19.1       | 18.9       | 0   | 20               |
|             |       | 1                | 49           | 19.3                       | 19.3       | 19.0       | 0   | 20               |
|             |       | 1                | 99           | 19.1                       | 19.0       | 18.7       | 0   | 20               |
|             |       | 50               | 0            | 18.8                       | 18.8       | 18.7       | 0   | 20               |
|             |       | 50               | 24           | 18.8                       | 18.8       | 18.7       | 0   | 20               |
|             |       | 50               | 50           | 18.8                       | 18.8       | 18.7       | 0   | 20               |
|             |       | 100              | 0            | 18.8                       | 18.8       | 18.7       | 0   | 20               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |            |     |                  |
|             |       |                  |              | 26115                      | 26365      | 26615      | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1857.5 MHz                 | 1882.5 MHz | 1907.5 MHz |     |                  |
| 15 MHz      | QPSK  | 1                | 0            | 18.8                       | 18.8       | 18.8       | 0   | 20               |
|             |       | 1                | 37           | 18.9                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 1                | 74           | 18.8                       | 18.8       | 18.7       | 0   | 20               |
|             |       | 36               | 0            | 18.9                       | 18.9       | 18.9       | 0   | 20               |
|             |       | 36               | 20           | 18.9                       | 18.9       | 18.8       | 0   | 20               |
|             |       | 36               | 39           | 18.9                       | 18.9       | 18.8       | 0   | 20               |
|             |       | 75               | 0            | 18.9                       | 18.8       | 18.8       | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.1                       | 19.1       | 19.0       | 0   | 20               |
|             |       | 1                | 37           | 19.2                       | 19.2       | 19.0       | 0   | 20               |
|             |       | 1                | 74           | 19.1                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 36               | 0            | 18.9                       | 18.8       | 18.8       | 0   | 20               |
|             |       | 36               | 20           | 18.9                       | 18.8       | 18.8       | 0   | 20               |
|             |       | 36               | 39           | 18.9                       | 18.8       | 18.8       | 0   | 20               |
|             |       | 75               | 0            | 18.9                       | 18.8       | 18.8       | 0   | 20               |
|             | 64QAM | 1                | 0            | 18.8                       | 19.2       | 19.0       | 0   | 20               |
|             |       | 1                | 37           | 19.0                       | 19.2       | 19.0       | 0   | 20               |
|             |       | 1                | 74           | 18.9                       | 19.2       | 18.9       | 0   | 20               |
|             |       | 36               | 0            | 18.8                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 36               | 20           | 18.8                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 36               | 39           | 18.8                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 75               | 0            | 18.8                       | 18.9       | 18.8       | 0   | 20               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |            |     |                  |
|             |       |                  |              | 26090                      | 26365      | 26640      | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1855 MHz                   | 1882.5 MHz | 1910 MHz   |     |                  |
| 10 MHz      | QPSK  | 1                | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 1                | 25           | 18.9                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 1                | 49           | 18.9                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 25               | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 25               | 12           | 19.0                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 25               | 25           | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 50               | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.3                       | 19.3       | 19.2       | 0   | 20               |
|             |       | 1                | 25           | 19.2                       | 19.3       | 19.1       | 0   | 20               |
|             |       | 1                | 49           | 19.3                       | 19.3       | 19.1       | 0   | 20               |
|             |       | 25               | 0            | 19.0                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 25               | 12           | 19.0                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 25               | 25           | 19.0                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 50               | 0            | 18.9                       | 19.0       | 18.8       | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.2                       | 19.3       | 19.0       | 0   | 20               |
|             |       | 1                | 25           | 19.2                       | 19.3       | 19.0       | 0   | 20               |
|             |       | 1                | 49           | 19.2                       | 19.4       | 19.0       | 0   | 20               |
|             |       | 25               | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 25               | 12           | 19.0                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 25               | 25           | 19.0                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 50               | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |

**LTE Band 25 Measured Results (continued)**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |            |     |                  |
|-------------|-------|------------------|--------------|----------------------------|------------|------------|-----|------------------|
|             |       |                  |              | 26065                      | 26365      | 26665      | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1852.5 MHz                 | 1882.5 MHz | 1912.5 MHz |     |                  |
| 5 MHz       | QPSK  | 1                | 0            | 18.9                       | 19.0       | 18.7       | 0   | 20               |
|             |       | 1                | 12           | 19.1                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 1                | 24           | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 12               | 0            | 18.9                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 12               | 7            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 12               | 13           | 19.0                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 25               | 0            | 18.9                       | 19.0       | 18.8       | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.3                       | 19.3       | 19.1       | 0   | 20               |
|             |       | 1                | 12           | 19.5                       | 19.5       | 19.2       | 0   | 20               |
|             |       | 1                | 24           | 19.3                       | 19.4       | 19.1       | 0   | 20               |
|             |       | 12               | 0            | 19.0                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 12               | 7            | 19.1                       | 19.0       | 18.9       | 0   | 20               |
|             |       | 12               | 13           | 19.1                       | 19.1       | 18.9       | 0   | 20               |
|             |       | 25               | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.2                       | 19.3       | 19.0       | 0   | 20               |
|             |       | 1                | 12           | 19.4                       | 19.4       | 19.1       | 0   | 20               |
|             |       | 1                | 24           | 19.3                       | 19.3       | 19.0       | 0   | 20               |
|             |       | 12               | 0            | 19.0                       | 19.0       | 19.0       | 0   | 20               |
|             |       | 12               | 7            | 19.0                       | 19.1       | 19.0       | 0   | 20               |
|             |       | 12               | 13           | 19.1                       | 19.1       | 19.0       | 0   | 20               |
|             |       | 25               | 0            | 19.0                       | 18.9       | 18.8       | 0   | 20               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |            |     |                  |
|             |       |                  |              | 26055                      | 26365      | 26675      | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1851.5 MHz                 | 1882.5 MHz | 1913.5 MHz |     |                  |
| 3 MHz       | QPSK  | 1                | 0            | 18.9                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 1                | 8            | 18.9                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 1                | 14           | 18.8                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 8                | 0            | 18.9                       | 18.9       | 18.8       | 0   | 20               |
|             |       | 8                | 4            | 19.0                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 8                | 7            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 15               | 0            | 18.9                       | 18.9       | 18.8       | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.2                       | 19.2       | 19.0       | 0   | 20               |
|             |       | 1                | 8            | 19.3                       | 19.4       | 19.1       | 0   | 20               |
|             |       | 1                | 14           | 19.2                       | 19.2       | 19.0       | 0   | 20               |
|             |       | 8                | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 8                | 4            | 19.0                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 8                | 7            | 19.0                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 15               | 0            | 19.0                       | 18.9       | 18.8       | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.1                       | 19.3       | 19.1       | 0   | 20               |
|             |       | 1                | 8            | 19.2                       | 19.4       | 19.1       | 0   | 20               |
|             |       | 1                | 14           | 19.2                       | 19.2       | 19.0       | 0   | 20               |
|             |       | 8                | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 8                | 4            | 19.0                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 8                | 7            | 19.0                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 15               | 0            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |            |     |                  |
|             |       |                  |              | 26047                      | 26365      | 26683      | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1850.7 MHz                 | 1882.5 MHz | 1914.3 MHz |     |                  |
| 1.4 MHz     | QPSK  | 1                | 0            | 18.8                       | 18.9       | 18.6       | 0   | 20               |
|             |       | 1                | 3            | 18.8                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 1                | 5            | 18.8                       | 18.8       | 18.6       | 0   | 20               |
|             |       | 3                | 0            | 18.8                       | 18.8       | 18.6       | 0   | 20               |
|             |       | 3                | 1            | 18.8                       | 18.9       | 18.6       | 0   | 20               |
|             |       | 3                | 3            | 18.8                       | 18.9       | 18.6       | 0   | 20               |
|             |       | 6                | 0            | 18.8                       | 18.9       | 18.6       | 0   | 20               |
|             | 16QAM | 1                | 0            | 18.9                       | 19.2       | 18.9       | 0   | 20               |
|             |       | 1                | 3            | 19.0                       | 19.2       | 18.9       | 0   | 20               |
|             |       | 1                | 5            | 19.0                       | 19.3       | 19.0       | 0   | 20               |
|             |       | 3                | 0            | 19.0                       | 19.1       | 18.8       | 0   | 20               |
|             |       | 3                | 1            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 3                | 3            | 19.0                       | 19.0       | 18.8       | 0   | 20               |
|             |       | 6                | 0            | 18.8                       | 19.0       | 18.7       | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.2                       | 19.2       | 18.9       | 0   | 20               |
|             |       | 1                | 3            | 19.2                       | 19.2       | 18.9       | 0   | 20               |
|             |       | 1                | 5            | 19.1                       | 19.2       | 18.9       | 0   | 20               |
|             |       | 3                | 0            | 18.9                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 3                | 1            | 18.9                       | 19.0       | 18.7       | 0   | 20               |
|             |       | 3                | 3            | 19.0                       | 18.9       | 18.7       | 0   | 20               |
|             |       | 6                | 0            | 18.8                       | 18.9       | 18.8       | 0   | 20               |



**LTE Band 41 Measured Results**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |          |            |          |     |                  |
|-------------|-------|------------------|--------------|----------------------------|------------|----------|------------|----------|-----|------------------|
|             |       |                  |              | 39750                      | 40185      | 40620    | 41055      | 41490    | MPR | Tune-up<br>Limit |
|             |       |                  |              | 2506 MHz                   | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz |     |                  |
| 20 MHz      | QPSK  | 1                | 0            | 19.1                       | 19.0       | 19.0     | 18.9       | 19.1     | 0   | 20               |
|             |       | 1                | 49           | 19.2                       | 19.0       | 19.0     | 18.9       | 19.0     | 0   | 20               |
|             |       | 1                | 99           | 19.1                       | 18.9       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 50               | 0            | 19.1                       | 19.0       | 19.1     | 18.8       | 19.0     | 0   | 20               |
|             |       | 50               | 24           | 19.2                       | 19.1       | 19.2     | 19.0       | 19.2     | 0   | 20               |
|             |       | 50               | 50           | 19.2                       | 19.0       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 100              | 0            | 19.2                       | 19.1       | 19.1     | 18.9       | 19.0     | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.1                       | 19.0       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 1                | 49           | 19.4                       | 19.1       | 19.1     | 19.0       | 19.3     | 0   | 20               |
|             |       | 1                | 99           | 19.1                       | 19.0       | 19.2     | 19.2       | 19.2     | 0   | 20               |
|             |       | 50               | 0            | 19.2                       | 19.0       | 19.0     | 18.9       | 19.1     | 0   | 20               |
|             |       | 50               | 24           | 19.2                       | 19.1       | 19.1     | 19.0       | 19.2     | 0   | 20               |
|             |       | 50               | 50           | 19.2                       | 19.1       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 100              | 0            | 19.2                       | 19.1       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.1                       | 19.1       | 19.0     | 18.9       | 19.1     | 0   | 20               |
|             |       | 1                | 49           | 19.2                       | 19.1       | 19.1     | 18.9       | 19.1     | 0   | 20               |
|             |       | 1                | 99           | 19.1                       | 19.0       | 19.1     | 19.0       | 19.0     | 0   | 20               |
|             |       | 50               | 0            | 19.1                       | 19.1       | 19.0     | 18.8       | 19.0     | 0   | 20               |
|             |       | 50               | 24           | 19.2                       | 19.1       | 19.1     | 18.9       | 19.1     | 0   | 20               |
|             |       | 50               | 50           | 19.2                       | 19.1       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 100              | 0            | 19.2                       | 19.1       | 19.1     | 19.0       | 19.0     | 0   | 20               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |          |            |          |     |                  |
|             |       |                  |              | 39750                      | 40185      | 40620    | 41055      | 41490    | MPR | Tune-up<br>Limit |
|             |       |                  |              | 2506 MHz                   | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz |     |                  |
| 15 MHz      | QPSK  | 1                | 0            | 19.1                       | 19.1       | 19.0     | 18.9       | 19.0     | 0   | 20               |
|             |       | 1                | 37           | 19.2                       | 19.1       | 19.0     | 18.9       | 19.0     | 0   | 20               |
|             |       | 1                | 74           | 19.1                       | 19.1       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 36               | 0            | 19.2                       | 19.0       | 19.0     | 18.9       | 19.0     | 0   | 20               |
|             |       | 36               | 20           | 19.2                       | 19.1       | 19.1     | 18.9       | 19.0     | 0   | 20               |
|             |       | 36               | 39           | 19.2                       | 19.1       | 19.1     | 18.9       | 19.1     | 0   | 20               |
|             |       | 75               | 0            | 19.2                       | 19.1       | 19.1     | 18.9       | 19.1     | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.1                       | 19.0       | 18.9     | 18.9       | 19.0     | 0   | 20               |
|             |       | 1                | 37           | 19.2                       | 19.1       | 18.9     | 18.9       | 19.1     | 0   | 20               |
|             |       | 1                | 74           | 19.2                       | 19.1       | 19.0     | 18.9       | 19.0     | 0   | 20               |
|             |       | 36               | 0            | 19.2                       | 19.1       | 19.0     | 18.8       | 19.0     | 0   | 20               |
|             |       | 36               | 20           | 19.3                       | 19.1       | 19.0     | 18.9       | 19.0     | 0   | 20               |
|             |       | 36               | 39           | 19.2                       | 19.1       | 19.1     | 18.9       | 19.1     | 0   | 20               |
|             |       | 75               | 0            | 19.2                       | 19.1       | 19.1     | 18.9       | 19.1     | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.2                       | 19.1       | 19.0     | 18.9       | 19.1     | 0   | 20               |
|             |       | 1                | 37           | 19.2                       | 19.1       | 19.0     | 18.9       | 19.1     | 0   | 20               |
|             |       | 1                | 74           | 19.2                       | 19.1       | 19.1     | 19.0       | 19.2     | 0   | 20               |
|             |       | 36               | 0            | 19.2                       | 19.1       | 19.0     | 18.8       | 19.0     | 0   | 20               |
|             |       | 36               | 20           | 19.3                       | 19.1       | 19.1     | 18.9       | 19.0     | 0   | 20               |
|             |       | 36               | 39           | 19.2                       | 19.1       | 19.1     | 18.9       | 19.1     | 0   | 20               |
|             |       | 75               | 0            | 19.2                       | 19.1       | 19.1     | 18.9       | 19.1     | 0   | 20               |

**LTE Band 41 Measured Results (continued)**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |          |            |          |     |                  |
|-------------|-------|------------------|--------------|----------------------------|------------|----------|------------|----------|-----|------------------|
|             |       |                  |              | 39750                      | 40185      | 40620    | 41055      | 41490    | MPR | Tune-up<br>Limit |
|             |       |                  |              | 2506 MHz                   | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz |     |                  |
| 10 MHz      | QPSK  | 1                | 0            | 19.3                       | 19.2       | 19.1     | 18.9       | 19.1     | 0   | 20               |
|             |       | 1                | 25           | 19.3                       | 19.2       | 19.1     | 19.0       | 19.2     | 0   | 20               |
|             |       | 1                | 49           | 19.3                       | 19.2       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 25               | 0            | 19.4                       | 19.2       | 19.1     | 18.9       | 19.2     | 0   | 20               |
|             |       | 25               | 12           | 19.4                       | 19.3       | 19.2     | 19.1       | 19.3     | 0   | 20               |
|             |       | 25               | 25           | 19.4                       | 19.3       | 19.2     | 19.0       | 19.2     | 0   | 20               |
|             |       | 50               | 0            | 19.4                       | 19.3       | 19.2     | 19.1       | 19.3     | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.3                       | 19.3       | 19.1     | 19.1       | 19.1     | 0   | 20               |
|             |       | 1                | 25           | 19.3                       | 19.3       | 19.0     | 19.1       | 19.2     | 0   | 20               |
|             |       | 1                | 49           | 19.4                       | 19.3       | 19.1     | 19.1       | 19.1     | 0   | 20               |
|             |       | 25               | 0            | 19.4                       | 19.1       | 19.1     | 19.0       | 19.2     | 0   | 20               |
|             |       | 25               | 12           | 19.4                       | 19.3       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 25               | 25           | 19.4                       | 19.3       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 50               | 0            | 19.4                       | 19.2       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.3                       | 19.2       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 1                | 25           | 19.4                       | 19.2       | 19.2     | 19.1       | 19.3     | 0   | 20               |
|             |       | 1                | 49           | 19.3                       | 19.3       | 19.2     | 19.0       | 19.2     | 0   | 20               |
|             |       | 25               | 0            | 19.4                       | 19.2       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 25               | 12           | 19.4                       | 19.3       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 25               | 25           | 19.4                       | 19.3       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 50               | 0            | 19.4                       | 19.2       | 19.2     | 19.1       | 19.2     | 0   | 20               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |            |          |            |          |     |                  |
|             |       |                  |              | 39750                      | 40185      | 40620    | 41055      | 41490    | MPR | Tune-up<br>Limit |
|             |       |                  |              | 2506 MHz                   | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz |     |                  |
| 5 MHz       | QPSK  | 1                | 0            | 19.3                       | 19.1       | 19.1     | 18.9       | 19.2     | 0   | 20               |
|             |       | 1                | 12           | 19.5                       | 19.2       | 19.2     | 19.0       | 19.3     | 0   | 20               |
|             |       | 1                | 24           | 19.3                       | 19.1       | 19.1     | 19.0       | 19.2     | 0   | 20               |
|             |       | 12               | 0            | 19.4                       | 19.2       | 19.1     | 18.9       | 19.2     | 0   | 20               |
|             |       | 12               | 7            | 19.4                       | 19.3       | 19.2     | 19.1       | 19.3     | 0   | 20               |
|             |       | 12               | 13           | 19.4                       | 19.2       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 25               | 0            | 19.4                       | 19.3       | 19.2     | 19.0       | 19.2     | 0   | 20               |
|             | 16QAM | 1                | 0            | 19.3                       | 19.2       | 19.2     | 19.0       | 19.2     | 0   | 20               |
|             |       | 1                | 12           | 19.5                       | 19.3       | 19.4     | 19.2       | 19.4     | 0   | 20               |
|             |       | 1                | 24           | 19.3                       | 19.2       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 12               | 0            | 19.4                       | 19.1       | 19.1     | 18.9       | 19.2     | 0   | 20               |
|             |       | 12               | 7            | 19.4                       | 19.2       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 12               | 13           | 19.3                       | 19.1       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 25               | 0            | 19.3                       | 19.2       | 19.1     | 19.0       | 19.2     | 0   | 20               |
|             | 64QAM | 1                | 0            | 19.3                       | 19.2       | 19.1     | 19.0       | 19.2     | 0   | 20               |
|             |       | 1                | 12           | 19.4                       | 19.3       | 19.2     | 19.1       | 19.2     | 0   | 20               |
|             |       | 1                | 24           | 19.3                       | 19.2       | 19.1     | 19.0       | 19.1     | 0   | 20               |
|             |       | 12               | 0            | 19.3                       | 19.2       | 19.2     | 19.0       | 19.2     | 0   | 20               |
|             |       | 12               | 7            | 19.4                       | 19.2       | 19.3     | 19.1       | 19.3     | 0   | 20               |
|             |       | 12               | 13           | 19.3                       | 19.2       | 19.3     | 19.1       | 19.2     | 0   | 20               |
|             |       | 25               | 0            | 19.3                       | 19.1       | 19.2     | 19.0       | 19.2     | 0   | 20               |

**LTE Band 66 Measured Results**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |          |            |     |                  |
|-------------|-------|------------------|--------------|----------------------------|----------|------------|-----|------------------|
|             |       |                  |              | 132072                     | 132322   | 132572     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1720 MHz                   | 1745 MHz | 1770 MHz   |     |                  |
| 20 MHz      | QPSK  | 1                | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 1                | 49           | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 1                | 99           | 18.1                       | 18.0     | 17.8       | 0   | 19               |
|             |       | 50               | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 50               | 24           | 18.1                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 50               | 50           | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 100              | 0            | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             | 16QAM | 1                | 0            | 18.3                       | 18.3     | 18.2       | 0   | 19               |
|             |       | 1                | 49           | 18.5                       | 18.4     | 18.3       | 0   | 19               |
|             |       | 1                | 99           | 18.3                       | 18.3     | 18.1       | 0   | 19               |
|             |       | 50               | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 50               | 24           | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 50               | 50           | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 100              | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             | 64QAM | 1                | 0            | 18.2                       | 18.2     | 18.1       | 0   | 19               |
|             |       | 1                | 49           | 18.3                       | 18.3     | 18.1       | 0   | 19               |
|             |       | 1                | 99           | 18.2                       | 18.2     | 18.1       | 0   | 19               |
|             |       | 50               | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 50               | 24           | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 50               | 50           | 18.0                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 100              | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |          |            |     |                  |
|             |       |                  |              | 132047                     | 132322   | 132597     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1717.5 MHz                 | 1745 MHz | 1772.5 MHz |     |                  |
| 15 MHz      | QPSK  | 1                | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 1                | 37           | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 1                | 74           | 18.1                       | 18.0     | 17.8       | 0   | 19               |
|             |       | 36               | 0            | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 36               | 20           | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 36               | 39           | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 75               | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             | 16QAM | 1                | 0            | 18.4                       | 18.2     | 18.1       | 0   | 19               |
|             |       | 1                | 37           | 18.3                       | 18.2     | 18.1       | 0   | 19               |
|             |       | 1                | 74           | 18.4                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 36               | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 36               | 20           | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 36               | 39           | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 75               | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             | 64QAM | 1                | 0            | 18.3                       | 18.3     | 18.1       | 0   | 19               |
|             |       | 1                | 37           | 18.3                       | 18.3     | 18.2       | 0   | 19               |
|             |       | 1                | 74           | 18.4                       | 18.3     | 18.1       | 0   | 19               |
|             |       | 36               | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 36               | 20           | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 36               | 39           | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 75               | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |          |            |     |                  |
|             |       |                  |              | 132022                     | 132322   | 132622     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1715 MHz                   | 1745 MHz | 1775 MHz   |     |                  |
| 10 MHz      | QPSK  | 1                | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 1                | 25           | 18.1                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 1                | 49           | 18.1                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 25               | 0            | 18.2                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 25               | 12           | 18.2                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 25               | 25           | 18.2                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 50               | 0            | 18.2                       | 18.1     | 17.9       | 0   | 19               |
|             | 16QAM | 1                | 0            | 18.6                       | 18.5     | 18.3       | 0   | 19               |
|             |       | 1                | 25           | 18.5                       | 18.5     | 18.3       | 0   | 19               |
|             |       | 1                | 49           | 18.6                       | 18.4     | 18.3       | 0   | 19               |
|             |       | 25               | 0            | 18.2                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 25               | 12           | 18.2                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 25               | 25           | 18.2                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 50               | 0            | 18.1                       | 18.1     | 17.9       | 0   | 19               |
|             | 64QAM | 1                | 0            | 18.4                       | 18.4     | 18.3       | 0   | 19               |
|             |       | 1                | 25           | 18.4                       | 18.4     | 18.3       | 0   | 19               |
|             |       | 1                | 49           | 18.4                       | 18.4     | 18.2       | 0   | 19               |
|             |       | 25               | 0            | 18.1                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 25               | 12           | 18.2                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 25               | 25           | 18.1                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 50               | 0            | 18.1                       | 18.1     | 17.9       | 0   | 19               |

**LTE Band 66 Measured Results (continued)**

| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |          |            |     |                  |
|-------------|-------|------------------|--------------|----------------------------|----------|------------|-----|------------------|
|             |       |                  |              | 131997                     | 132322   | 132647     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1712.5 MHz                 | 1745 MHz | 1777.5 MHz |     |                  |
| 5 MHz       | QPSK  | 1                | 0            | 18.0                       | 18.0     | 17.9       | 0   | 19               |
|             |       | 1                | 12           | 18.2                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 1                | 24           | 18.0                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 12               | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 12               | 7            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 12               | 13           | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 25               | 0            | 18.1                       | 18.0     | 17.9       | 0   | 19               |
|             | 16QAM | 1                | 0            | 18.3                       | 18.4     | 18.2       | 0   | 19               |
|             |       | 1                | 12           | 18.5                       | 18.5     | 18.3       | 0   | 19               |
|             |       | 1                | 24           | 18.3                       | 18.5     | 18.3       | 0   | 19               |
|             |       | 12               | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 12               | 7            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 12               | 13           | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 25               | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             | 64QAM | 1                | 0            | 18.3                       | 18.4     | 18.3       | 0   | 19               |
|             |       | 1                | 12           | 18.4                       | 18.5     | 18.4       | 0   | 19               |
|             |       | 1                | 24           | 18.3                       | 18.4     | 18.3       | 0   | 19               |
|             |       | 12               | 0            | 18.1                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 12               | 7            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 12               | 13           | 18.1                       | 18.2     | 17.9       | 0   | 19               |
|             |       | 25               | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |          |            |     |                  |
|             |       |                  |              | 131987                     | 132322   | 132657     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1711.5 MHz                 | 1745 MHz | 1778.5 MHz |     |                  |
| 3 MHz       | QPSK  | 1                | 0            | 18.0                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 1                | 8            | 18.1                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 1                | 14           | 18.0                       | 18.1     | 17.9       | 0   | 19               |
|             |       | 8                | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 8                | 4            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 8                | 7            | 18.1                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 15               | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             | 16QAM | 1                | 0            | 18.4                       | 18.4     | 18.3       | 0   | 19               |
|             |       | 1                | 8            | 18.5                       | 18.5     | 18.3       | 0   | 19               |
|             |       | 1                | 14           | 18.3                       | 18.4     | 18.3       | 0   | 19               |
|             |       | 8                | 0            | 18.1                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 8                | 4            | 18.2                       | 18.2     | 18.1       | 0   | 19               |
|             |       | 8                | 7            | 18.2                       | 18.3     | 18.1       | 0   | 19               |
|             |       | 15               | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             | 64QAM | 1                | 0            | 18.3                       | 18.3     | 18.2       | 0   | 19               |
|             |       | 1                | 8            | 18.4                       | 18.3     | 18.3       | 0   | 19               |
|             |       | 1                | 14           | 18.3                       | 18.3     | 18.2       | 0   | 19               |
|             |       | 8                | 0            | 18.3                       | 18.1     | 18.1       | 0   | 19               |
|             |       | 8                | 4            | 18.3                       | 18.2     | 18.1       | 0   | 19               |
|             |       | 8                | 7            | 18.3                       | 18.3     | 18.1       | 0   | 19               |
|             |       | 15               | 0            | 18.2                       | 18.1     | 18.0       | 0   | 19               |
| BW<br>(MHz) | Mode  | RB<br>Allocation | RB<br>offset | Normal Average Power (dBm) |          |            |     |                  |
|             |       |                  |              | 131979                     | 132322   | 132665     | MPR | Tune-up<br>Limit |
|             |       |                  |              | 1710.7 MHz                 | 1745 MHz | 1779.3 MHz |     |                  |
| 1.4 MHz     | QPSK  | 1                | 0            | 18.2                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 1                | 3            | 18.2                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 1                | 5            | 18.2                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 3                | 0            | 18.1                       | 18.1     | 18.0       | 0   | 19               |
|             |       | 3                | 1            | 18.1                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 3                | 3            | 18.1                       | 18.2     | 18.0       | 0   | 19               |
|             |       | 6                | 0            | 18.2                       | 18.2     | 18.0       | 0   | 19               |
|             | 16QAM | 1                | 0            | 18.5                       | 18.6     | 18.3       | 0   | 19               |
|             |       | 1                | 3            | 18.5                       | 18.6     | 18.4       | 0   | 19               |
|             |       | 1                | 5            | 18.5                       | 18.5     | 18.3       | 0   | 19               |
|             |       | 3                | 0            | 18.3                       | 18.4     | 18.1       | 0   | 19               |
|             |       | 3                | 1            | 18.3                       | 18.3     | 18.2       | 0   | 19               |
|             |       | 3                | 3            | 18.4                       | 18.4     | 18.2       | 0   | 19               |
|             |       | 6                | 0            | 18.2                       | 18.2     | 18.1       | 0   | 19               |
|             | 64QAM | 1                | 0            | 18.4                       | 18.3     | 18.2       | 0   | 19               |
|             |       | 1                | 3            | 18.5                       | 18.5     | 18.2       | 0   | 19               |
|             |       | 1                | 5            | 18.4                       | 18.4     | 18.2       | 0   | 19               |
|             |       | 3                | 0            | 18.3                       | 18.3     | 18.1       | 0   | 19               |
|             |       | 3                | 1            | 18.2                       | 18.3     | 18.1       | 0   | 19               |
|             |       | 3                | 3            | 18.3                       | 18.3     | 18.0       | 0   | 19               |
|             |       | 6                | 0            | 18.1                       | 18.3     | 18.1       | 0   | 19               |

## 9.4. LTE Down-Link Carrier Aggregation

The tables below show the supported frequency bands of the device for DL Inter-band and DL Intra-band combinations.

Power measurements were performed on the channel with the highest maximum output power from Tune-up Procedure on ANT1 antenna.

When carrier aggregation is limited to downlink only, uplink maximum output power (single carrier) is measured for the supported combinations of downlink carrier aggregation listed in the table below. In applying the power measurement procedures of KDB 941225 D05A and April 2018 TCB workshop for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the subset in each row with the largest combination of frequency bands and CCs (far right most configuration highlighted in the table below).

| Index    | 2CC        | Restriction  | Completely Covered by Measurement Superset | Index    | 3CC            | Restriction  | Completely Covered by Measurement Superset | Index    | 4CC               | Restriction  | Completely Covered by Measurement Superset | Index    | 5CC                  | Restriction  | Completely Covered by Measurement Superset | Index   | 6CC           | Restriction  | Completely Covered by Measurement Superset |
|----------|------------|--------------|--------------------------------------------|----------|----------------|--------------|--------------------------------------------|----------|-------------------|--------------|--------------------------------------------|----------|----------------------|--------------|--------------------------------------------|---------|---------------|--------------|--------------------------------------------|
| 2CC # 1  | CA_2A-12A  |              | 3CC #1                                     | 3CC # 1  | CA_2A-12A-66A  |              | 4CC #                                      | 4CC # 1  | CA_2A-12A-66A-66A |              |                                            | 5CC # 1  | CA_2A-13A-46D        | B46 SCC only | No                                         | 6CC # 1 | CA_2A-46E-66A | B46 SCC only | No                                         |
| 2CC # 2  | CA_2A-13A  |              | 3CC #2                                     | 3CC # 2  | CA_2A-13A-66A  | B46 SCC only | No                                         | 4CC # 2  | CA_2A-12A-66C     |              | No                                         | 5CC # 2  | CA_2A-2A-12A-66A-66A |              | No                                         |         |               |              |                                            |
| 2CC # 3  | CA_2A-2A   |              | 3CC #4                                     | 3CC # 3  | CA_2A-13A-66A  |              | 4CC #                                      | 4CC # 3  | CA_2A-13A-46C     | B46 SCC only | No                                         | 5CC # 3  | CA_2A-2A-13A-66A-66A |              | No                                         |         |               |              |                                            |
| 2CC # 4  | CA_2A-66A  | B46 SCC only | 3CC #6                                     | 3CC # 4  | CA_2A-2A-12A   |              | 4CC #                                      | 4CC # 4  | CA_2A-13A-66A-66A |              |                                            | 5CC # 4  | CA_2A-2A-46D         | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 5  | CA_2A-4A   |              | 3CC #7                                     | 3CC # 5  | CA_2A-2A-13A   |              | 4CC #                                      | 4CC # 5  | CA_2A-13A-66B     |              | No                                         | 5CC # 5  | CA_2A-2A-5A-66A-66A  |              | No                                         |         |               |              |                                            |
| 2CC # 6  | CA_2A-5A   |              | 3CC #8                                     | 3CC # 6  | CA_2A-2A-66A   | B46 SCC only | No                                         | 4CC # 6  | CA_2A-13A-66C     |              | No                                         | 5CC # 6  | CA_2A-2A-5A-66B      |              | No                                         |         |               |              |                                            |
| 2CC # 7  | CA_2A-66A  |              | 3CC #20                                    | 3CC # 7  | CA_2A-2A-4A    |              | 4CC #                                      | 4CC # 7  | CA_2A-2A-12A-66A  |              |                                            | 5CC # 7  | CA_2A-2A-5A-66C      |              | No                                         |         |               |              |                                            |
| 2CC # 8  | CA_2C      |              | 3CC #3                                     | 3CC # 8  | CA_2A-2A-5A    |              | 4CC #                                      | 4CC # 8  | CA_2A-2A-13A-66A  |              |                                            | 5CC # 8  | CA_2A-46A-46C-66A    | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 9  | CA_12A-66A |              | 3CC #25                                    | 3CC # 9  | CA_2A-2A-66A   |              | 4CC #                                      | 4CC # 9  | CA_2A-2A-46C      | B46 SCC only | No                                         | 5CC # 9  | CA_2A-46A-46D        | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 10 | CA_12B     |              | 3CC #27                                    | 3CC # 10 | CA_2A-66A-66A  | B46 SCC only | 4CC #                                      | 4CC # 10 | CA_2A-2A-4A-4A    |              | No                                         | 5CC # 10 | CA_2A-46D-66A        | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 11 | CA_13A-66A | B46 SCC only | 3CC #28                                    | 3CC # 11 | CA_2A-66A-66A  | B46 SCC only | No                                         | 4CC # 11 | CA_2A-2A-4A-5A    |              | No                                         | 5CC # 11 | CA_2A-46E            | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 12 | CA_13A-66A |              | 3CC #30                                    | 3CC # 12 | CA_2A-46C      | B46 SCC only | 4CC #                                      | 4CC # 12 | CA_2A-2A-5A-66A   |              | No                                         | 5CC # 12 | CA_2A-5A-46D         | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 13 | CA_41A-66A |              | No                                         | 3CC # 13 | CA_2A-4A-12A   |              | No                                         | 4CC # 13 | CA_2A-2A-66A-66A  |              | No                                         | 5CC # 13 | CA_2A-5B-66A-66A     |              | No                                         |         |               |              |                                            |
| 2CC # 14 | CA_41C     |              | No                                         | 3CC # 14 | CA_2A-4A-13A   |              | No                                         | 4CC # 14 | CA_2A-2A-66B      |              | No                                         | 5CC # 14 | CA_2A-5B-66B         |              | No                                         |         |               |              |                                            |
| 2CC # 15 | CA_46A-66A | B46 SCC only | 3CC #36                                    | 3CC # 15 | CA_2A-4A-4A    |              | 4CC #                                      | 4CC # 15 | CA_2A-2A-66C      |              | No                                         | 5CC # 15 | CA_2A-5B-66C         |              | No                                         |         |               |              |                                            |
| 2CC # 16 | CA_4A-12A  |              | 3CC #41                                    | 3CC # 16 | CA_2A-4A-5A    |              | 4CC #                                      | 4CC # 16 | CA_2A-46A-46A-66A | B46 SCC only | No                                         | 5CC # 16 | CA_13A-46D-66A       | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 17 | CA_4A-12A  |              | 3CC #42                                    | 3CC # 17 | CA_2A-5A-66A   | B46 SCC only | No                                         | 4CC # 17 | CA_2A-46A-46C     | B46 SCC only | No                                         | 5CC # 17 | CA_13A-46E           | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 18 | CA_4A-25A  |              | No                                         | 3CC # 18 | CA_2A-5A-66A   |              | 4CC #                                      | 4CC # 18 | CA_2A-46C-66A     | B46 SCC only | No                                         | 5CC # 18 | CA_41A-46E           | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 19 | CA_4A-66A  | B46 SCC only | 3CC #39                                    | 3CC # 19 | CA_2A-5B       |              | 4CC #                                      | 4CC # 19 | CA_2A-46D         | B46 SCC only | No                                         | 5CC # 19 | CA_46A-46D-66A       | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 20 | CA_4A-4A   |              | 3CC #41                                    | 3CC # 20 | CA_2A-66A-66A  |              | 4CC #                                      | 4CC # 20 | CA_2A-4A-4A-5A    |              | No                                         | 5CC # 20 | CA_46D-66A-66A       | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 21 | CA_4A-5A   |              | 3CC #43                                    | 3CC # 21 | CA_2A-66B      |              | 4CC #                                      | 4CC # 21 | CA_2A-4A-5B       |              | No                                         | 5CC # 21 | CA_46E-66A           | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 22 | CA_5A-66A  | B46 SCC only | 3CC #45                                    | 3CC # 22 | CA_2A-66C      |              | 4CC #                                      | 4CC # 22 | CA_2A-5A-46C      | B46 SCC only | No                                         | 5CC # 22 | CA_4A-46A-46D        | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 23 | CA_5A-6A   |              | 3CC #47                                    | 3CC # 23 | CA_2C-66A      |              | 4CC #                                      | 4CC # 23 | CA_2A-5A-66A-66A  |              |                                            | 5CC # 23 | CA_5A-46D-66A        | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 24 | CA_5A-66A  |              | 3CC #48                                    | 3CC # 24 | CA_66A-66C     | B46 SCC only | No                                         | 4CC # 24 | CA_2A-5A-66B      |              |                                            | 5CC # 24 | CA_5A-46E            | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 25 | CA_5B      |              | 3CC #51                                    | 3CC # 25 | CA_13A-66A-66A |              | 4CC #                                      | 4CC # 25 | CA_2A-5A-66C      |              |                                            | 5CC # 25 | CA_5B-46D            | B46 SCC only | No                                         |         |               |              |                                            |
| 2CC # 26 | CA_66A-66A |              | 3CC #53                                    | 3CC # 26 | CA_13A-66C     |              | 4CC #                                      | 4CC # 26 | CA_2A-5B-66A      |              |                                            |          |                      |              |                                            |         |               |              |                                            |
| 2CC # 27 | CA_66B     |              | 3CC #21                                    | 3CC # 27 | CA_12B-66A     |              | No                                         | 4CC # 27 | CA_2A-66A-66A-66A |              | No                                         |          |                      |              |                                            |         |               |              |                                            |
| 2CC # 28 | CA_66C     |              | 3CC #22                                    | 3CC # 28 | CA_13A-46A-66A |              | No                                         | 4CC # 28 | CA_2C-66A-66A     |              | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 29 | CA_13A-46C     | B46 SCC only | 4CC #                                      | 4CC # 29 | CA_13A-46C-66A    | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 30 | CA_13A-66A-66A |              | 4CC #                                      | 4CC # 30 | CA_13A-46D        | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 31 | CA_13A-66B     |              | 4CC #                                      | 4CC # 31 | CA_41A-46D        | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 32 | CA_13A-66C     |              | 4CC #                                      | 4CC # 32 | CA_46A-46C-66A    | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 33 | CA_41A-46C     |              | No                                         | 4CC # 33 | CA_46C-66A-66A    | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 34 | CA_41D         |              | No                                         | 4CC # 34 | CA_46D-66A        | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 35 | CA_46A-46A-66A | B46 SCC only | 4CC #                                      | 4CC # 35 | CA_4A-46A-46C     | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 36 | CA_46A-56A-66A | B46 SCC only | No                                         | 4CC # 36 | CA_4A-46D         | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 37 | CA_46C-66A     | B46 SCC only | 4CC #                                      | 4CC # 37 | CA_4A-4A-5B       |              | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 38 | CA_4A-12B      |              | No                                         | 4CC # 38 | CA_5A-46C-66A     | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 39 | CA_4A-46A-66A  | B46 SCC only | No                                         | 4CC # 39 | CA_5A-46D         | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 40 | CA_4A-46C      | B46 SCC only | No                                         | 4CC # 40 | CA_5A-5A-66A-66A  |              | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 41 | CA_4A-4A-12A   |              | No                                         | 4CC # 41 | CA_5A-5A-66B      |              | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 42 | CA_4A-4A-13A   |              | No                                         | 4CC # 42 | CA_5A-5A-66C      |              | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 43 | CA_4A-4A-5A    |              | 4CC #                                      | 4CC # 43 | CA_5B-46C         | B46 SCC only | No                                         |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 44 | CA_4A-5B       |              | 4CC #                                      | 4CC # 44 | CA_5B-66A-66A     |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 45 | CA_5A-66A-66A  | B46 SCC only | No                                         | 4CC # 45 | CA_5B-66B         |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 46 | CA_5A-46C      | B46 SCC only | 4CC #                                      | 4CC # 46 | CA_5B-66C         |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 47 | CA_5A-5A-66A   |              | 4CC #                                      |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 48 | CA_5A-66A-66A  |              | 4CC #                                      |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 49 | CA_5A-66B      |              | 4CC #                                      |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 50 | CA_5A-66C      |              | 4CC #                                      |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 51 | CA_5B-46A      |              | No                                         |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 52 | CA_5B-66A      |              | 4CC #                                      |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 53 | CA_5B-66A-66A  |              | 4CC #                                      |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 54 | CA_5B-66B      |              | No                                         |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 55 | CA_5B-66C      |              | No                                         |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |
|          |            |              |                                            | 3CC # 56 | CA_5B-66D      |              | No                                         |          |                   |              |                                            |          |                      |              |                                            |         |               |              |                                            |

In applying the power measurement procedures of KDB 941225 D05A for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the CA configuration with the largest aggregated DL CA BW in each frequency band, independently for contiguous and non-contiguous CA; however, if the same frequency band is used for both contiguous and non-contiguous CA, power measurement was performed using the configuration with the largest aggregated BW and maximum output power among contiguous and non-contiguous CA.

## 2CC DL CA Measured Results

| E-UTRA CA configuration | CC1 (UL) |          |         |            |           | CC1 (DL) |         |            | CC2 (DL) |         |            | Aggregated BW | CA Inactive (dBm) | CA Active (dBm) | Delta | 2CC # |
|-------------------------|----------|----------|---------|------------|-----------|----------|---------|------------|----------|---------|------------|---------------|-------------------|-----------------|-------|-------|
|                         | Mode     | BW (MHz) | Channel | Freq (MHz) | RB Offset | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) |               |                   |                 |       |       |
| CA_41A-46A              | QPSK     | 20       | 39750   | 2506       | 50.24     | 20       | 39750   | 2506       | 20       | 50690   | 5540       | 40            | 17.61             | 17.60           | -0.01 | 13    |
| CA_41C                  | QPSK     | 20       | 39750   | 2506       | 50.24     | 20       | 39750   | 2506       | 20       | 39948   | 2525.8     | 40            | 17.62             | 17.60           | -0.02 | 14    |
| CA_4A-28A               | QPSK     | 20       | 20175   | 1732.5     | 1.0       | 20       | 2175    | 2132.5     | 20       | 9410    | 778        | 40            | 15.66             | 15.66           | 0.00  | 18    |

## 3CC DL CA Measured Results

| E-UTRA CA configuration | CC1 (UL) |          |         |            |           | CC1 (DL) |         |            | CC2 (DL) |         |            | CC3 (DL) |         |            | Aggregated BW | CA Inactive (dBm) | CA Active (dBm) | Delta | 3CC # |
|-------------------------|----------|----------|---------|------------|-----------|----------|---------|------------|----------|---------|------------|----------|---------|------------|---------------|-------------------|-----------------|-------|-------|
|                         | Mode     | BW (MHz) | Channel | Freq (MHz) | RB Offset | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) |               |                   |                 |       |       |
| CA_2A-13A-46A           | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 10       | 5230    | 751        | 20       | 50690   | 5540       | 50            | 19.30             | 19.31           | 0.01  | 2     |
| CA_2A-2A-46A            | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 1100    | 1980       | 20       | 50690   | 5540       | 60            | 19.28             | 19.27           | -0.01 | 6     |
| CA_2A-46A-66A           | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 50690   | 5540       | 20       | 66886   | 2155       | 60            | 19.27             | 19.29           | 0.02  | 11    |
| CA_2A-4A-12A            | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 2175    | 2132.5     | 10       | 5060    | 734        | 50            | 19.29             | 19.33           | 0.04  | 13    |
| CA_2A-4A-13A            | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 2175    | 2132.5     | 10       | 5230    | 751        | 50            | 19.32             | 19.33           | 0.01  | 14    |
| CA_2A-5A-46A            | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 10       | 2450    | 874        | 20       | 50690   | 5540       | 50            | 19.31             | 19.37           | 0.06  | 17    |
| CA_46A-66C              | QPSK     | 20       | 132323  | 1745.1     | 1.0       | 20       | 66787   | 2145.1     | 20       | 66985   | 2164.9     | 20       | 50690   | 5540       | 60            | 16.90             | 16.95           | 0.05  | 24    |
| CA_12B-66A              | QPSK     | 5        | 23048   | 702.8      | 1.25      | 5        | 5048    | 732.8      | 10       | 5120    | 740        | 20       | 66886   | 2155       | 35            | 22.82             | 22.85           | 0.03  | 27    |
| CA_13A-46A-66A          | QPSK     | 10       | 23230   | 782        | 1.0       | 10       | 5230    | 751        | 20       | 50690   | 5540       | 20       | 66886   | 2155       | 50            | 22.05             | 22.12           | 0.07  | 28    |
| CA_41A-46C              | QPSK     | 20       | 39750   | 2506       | 50.24     | 20       | 39750   | 2506       | 20       | 54142   | 5885.2     | 20       | 54340   | 5905       | 60            | 19.95             | 19.94           | -0.01 | 33    |
| CA_41D                  | QPSK     | 20       | 39750   | 2506       | 50.24     | 20       | 39750   | 2506       | 20       | 39948   | 2525.8     | 20       | 40146   | 2545.6     | 60            | 19.97             | 19.95           | -0.02 | 34    |
| CA_46A-66A-66A          | QPSK     | 20       | 132322  | 1745       | 1.0       | 20       | 66786   | 2145       | 20       | 67086   | 2175       | 20       | 50690   | 5540       | 60            | 17.20             | 17.16           | -0.04 | 36    |
| CA_4A-12B               | QPSK     | 20       | 20175   | 1732.5     | 1.0       | 20       | 2175    | 2132.5     | 5        | 5048    | 732.8      | 10       | 5120    | 740        | 35            | 16.36             | 16.39           | 0.03  | 38    |
| CA_4A-46A-66A           | QPSK     | 20       | 20175   | 1732.5     | 1.0       | 20       | 2175    | 2132.5     | 20       | 50690   | 5540       | 20       | 53940   | 5865       | 60            | 16.71             | 16.72           | 0.01  | 39    |
| CA_4A-66C               | QPSK     | 20       | 20175   | 1732.5     | 1.0       | 20       | 2175    | 2132.5     | 20       | 50692   | 5540.2     | 20       | 50690   | 5560       | 60            | 16.70             | 16.75           | 0.05  | 40    |
| CA_4A-4A-12A            | QPSK     | 20       | 20050   | 1720       | 1.0       | 20       | 2050    | 2120       | 20       | 2300    | 2145       | 10       | 5060    | 734        | 50            | 17.27             | 17.29           | 0.02  | 41    |
| CA_4A-4A-13A            | QPSK     | 20       | 20175   | 1720       | 1.0       | 20       | 2050    | 2120       | 20       | 2300    | 2145       | 10       | 5230    | 751        | 50            | 17.28             | 17.27           | -0.01 | 42    |
| CA_5A-46A-66A           | QPSK     | 10       | 20525   | 836.5      | 1.25      | 10       | 2525    | 881.5      | 20       | 50690   | 5540       | 20       | 66886   | 2155       | 50            | 20.86             | 20.88           | 0.02  | 45    |
| CA_5B-46A               | QPSK     | 10       | 20476   | 831.6      | 1.25      | 10       | 2476    | 876.6      | 10       | 2575    | 886.5      | 20       | 50690   | 5540       | 40            | 18.94             | 18.97           | 0.03  | 51    |
| CA_66A-66B              | QPSK     | 20       | 132072  | 1720       | 1.0       | 20       | 66536   | 2120       | 10       | 67187   | 2185.1     | 10       | 67286   | 2195       | 40            | 17.42             | 17.37           | -0.05 | 54    |
| CA_66A-66C              | QPSK     | 20       | 132072  | 1720       | 1.0       | 20       | 66536   | 2120       | 20       | 67038   | 2170.2     | 20       | 67236   | 2190       | 60            | 17.46             | 17.43           | -0.03 | 55    |
| CA_66D                  | QPSK     | 20       | 132224  | 1735.2     | 1.0       | 20       | 66688   | 2135.2     | 20       | 66886   | 2155       | 20       | 67084   | 2174.8     | 60            | 16.82             | 16.79           | -0.03 | 56    |

## 4CC DL CA Measured Results

| E-UTRA CA configuration | Mode | CC1 (UL) |         |            |           |          | CC1 (DL) |            |          | CC2 (DL) |            |          | CC3 (DL) |            |          | CC4 (DL) |            |    | Aggregated BW | CA Inactive (dBm) | CA Active (dBm) | Delta | 4CC # |
|-------------------------|------|----------|---------|------------|-----------|----------|----------|------------|----------|----------|------------|----------|----------|------------|----------|----------|------------|----|---------------|-------------------|-----------------|-------|-------|
|                         |      | BW (MHz) | Channel | Freq (MHz) | RB Offset | BW (MHz) | Channel  | Freq (MHz) | BW (MHz) | Channel  | Freq (MHz) | BW (MHz) | Channel  | Freq (MHz) | BW (MHz) | Channel  | Freq (MHz) |    |               |                   |                 |       |       |
| CA_2A-12A-66C           | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 10       | 5060     | 734        | 20       | 66985    | 2164.9     | 20       | 67236    | 2190       | 70 | 19.07         | 19.04             | -0.03           | 2     |       |
| CA_2A-13A-46C           | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 10       | 5230     | 751        | 20       | 50692    | 5540.2     | 20       | 50890    | 5560       | 70 | 19.05         | 19.07             | 0.02            | 3     |       |
| CA_2A-13A-66B           | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 10       | 5230     | 751        | 10       | 66837    | 2150.1     | 10       | 66936    | 2160       | 50 | 19.11         | 19.08             | -0.03           | 5     |       |
| CA_2A-13A-66C           | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 10       | 5230     | 751        | 20       | 66787    | 2145.1     | 20       | 66985    | 2164.9     | 70 | 19.12         | 19.10             | -0.02           | 6     |       |
| CA_2A-2A-46C            | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 1100     | 1980       | 20       | 54142    | 5885.2     | 20       | 54340    | 5905       | 80 | 19.16         | 19.18             | 0.02            | 9     |       |
| CA_2A-2A-4A-4A          | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 1100     | 1980       | 20       | 2050     | 2120       | 20       | 2300     | 2145       | 80 | 19.18         | 19.21             | 0.03            | 10    |       |
| CA_2A-2A-4A-5A          | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 1100     | 1980       | 20       | 2175     | 2132.5     | 10       | 2575     | 886.5      | 70 | 19.19         | 19.22             | 0.03            | 11    |       |
| CA_2A-2A-66A-66A        | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 1100     | 1980       | 20       | 66786    | 2145       | 20       | 67086    | 2175       | 80 | 19.20         | 19.19             | -0.01           | 13    |       |
| CA_2A-2A-66B            | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 1100     | 1980       | 10       | 66837    | 2150.1     | 10       | 66936    | 2160       | 60 | 19.19         | 19.22             | 0.03            | 14    |       |
| CA_2A-2A-66C            | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 1100     | 1980       | 20       | 66787    | 2145.1     | 20       | 66985    | 2164.9     | 80 | 19.18         | 19.21             | 0.03            | 15    |       |
| CA_2A-46A-46A-66A       | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 50690    | 5540       | 20       | 53940    | 5865       | 20       | 66886    | 2155       | 80 | 19.20         | 19.21             | 0.01            | 16    |       |
| CA_2A-46C-66A           | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 50467    | 5517.7     | 20       | 50665    | 5537.5     | 20       | 66536    | 2120       | 80 | 19.20         | 19.23             | 0.03            | 18    |       |
| CA_2A-4A-4A-5A          | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 2050     | 2120       | 20       | 2300     | 2145       | 10       | 2525     | 881.5      | 70 | 19.22         | 19.24             | 0.02            | 20    |       |
| CA_2A-4A-5B             | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 2175     | 2132.5     | 10       | 2476     | 876.6      | 10       | 2575     | 886.5      | 60 | 19.23         | 19.22             | -0.01           | 21    |       |
| CA_2A-5A-46C            | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 10       | 2525     | 881.5      | 20       | 50467    | 5517.7     | 20       | 50665    | 5537.5     | 70 | 19.22         | 19.24             | 0.02            | 22    |       |
| CA_2A-66A-66A-66A       | QPSK | 20       | 18900   | 1880       | 50.0      | 20       | 900      | 1960       | 20       | 66536    | 2120       | 20       | 66886    | 2155       | 20       | 67236    | 2190       | 80 | 19.17         | 19.21             | 0.04            | 27    |       |
| CA_2C-66A-66A           | QPSK | 20       | 18801   | 1870.1     | 50.0      | 20       | 801      | 1950.1     | 20       | 999      | 1969.9     | 20       | 66536    | 2120       | 20       | 67236    | 2190       | 80 | 19.13         | 19.15             | 0.02            | 28    |       |
| CA_13A-46C-66A          | QPSK | 10       | 23230   | 782        | 1.0       | 10       | 5230     | 751        | 20       | 50467    | 5517.7     | 20       | 50665    | 5537.5     | 20       | 66536    | 2120       | 70 | 20.28         | 20.29             | 0.01            | 29    |       |
| CA_41A-46D              | QPSK | 20       | 39750   | 2506       | 50.24     | 20       | 39750    | 2506       | 20       | 50467    | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50663    | 5557.3     | 80 | 20.91         | 20.89             | -0.02           | 31    |       |
| CA_46C-66A-66A          | QPSK | 20       | 132322  | 1745       | 1.0       | 20       | 66786    | 2145       | 20       | 67086    | 2175       | 20       | 50692    | 5540.2     | 20       | 50890    | 5560       | 80 | 18.76         | 18.78             | 0.02            | 33    |       |
| CA_4A-46A-46C           | QPSK | 20       | 20175   | 1732.5     | 1.0       | 20       | 2175     | 2132.5     | 20       | 54340    | 5905       | 20       | 46890    | 5160       | 20       | 47088    | 5179.8     | 80 | 18.65         | 18.68             | 0.03            | 35    |       |
| CA_4A-46D               | QPSK | 20       | 20175   | 1732.5     | 1.0       | 20       | 2175     | 2132.5     | 20       | 50467    | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50663    | 5557.3     | 80 | 18.66         | 18.68             | 0.02            | 36    |       |
| CA_4A-4A-5B             | QPSK | 20       | 20050   | 1720       | 1.0       | 20       | 2050     | 2120       | 20       | 2300     | 2145       | 10       | 2476     | 876.6      | 10       | 2575     | 886.5      | 60 | 16.45         | 16.43             | -0.02           | 37    |       |
| CA_5A-46C-66A           | QPSK | 10       | 20525   | 836.5      | 1.25      | 10       | 2525     | 881.5      | 20       | 50467    | 5517.7     | 20       | 50665    | 5537.5     | 20       | 66536    | 2120       | 70 | 20.98         | 21.01             | 0.03            | 38    |       |
| CA_5A-5A-66A-66A        | QPSK | 10       | 20450   | 829        | 1.25      | 10       | 2450     | 874        | 10       | 2600     | 889        | 20       | 66536    | 2120       | 20       | 67236    | 2190       | 60 | 20.28         | 20.32             | 0.04            | 40    |       |
| CA_5A-5A-66B            | QPSK | 10       | 20450   | 829        | 1.25      | 10       | 2450     | 874        | 10       | 2600     | 889        | 10       | 66837    | 2150.1     | 10       | 66936    | 2160       | 40 | 20.28         | 20.29             | 0.01            | 41    |       |
| CA_5A-5A-66C            | QPSK | 10       | 20450   | 829        | 1.25      | 10       | 2450     | 874        | 10       | 2600     | 889        | 20       | 66787    | 2145.1     | 20       | 66985    | 2164.9     | 60 | 20.31         | 20.32             | 0.01            | 42    |       |
| CA_5B-46C               | QPSK | 10       | 20476   | 831.6      | 1.25      | 10       | 2476     | 876.6      | 10       | 2575     | 886.5      | 20       | 50692    | 5540.2     | 20       | 50890    | 5560       | 60 | 20.25         | 20.24             | -0.01           | 43    |       |

**5CC DL CA Measured Results**

| E-UTRA CA configuration | CC1 (UL) |          |         |            |           | CC1 (DL) |         |            |          |         | CC2 (DL)   |          |         |            |          | CC3 (DL) |            |          |         |            | CC4 (DL) |         |            |          |         | CC5 (DL)   |  |  |  |  | Aggregated BW | CA Inactive (dBm) | CA Active (dBm) | Delta | 5CC # |
|-------------------------|----------|----------|---------|------------|-----------|----------|---------|------------|----------|---------|------------|----------|---------|------------|----------|----------|------------|----------|---------|------------|----------|---------|------------|----------|---------|------------|--|--|--|--|---------------|-------------------|-----------------|-------|-------|
|                         | Mode     | BW (MHz) | Channel | Freq (MHz) | RB Offset | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel  | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) |  |  |  |  |               |                   |                 |       |       |
| CA_2A-13A-46D           | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 10       | 5230    | 751        | 20       | 50467   | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50863   | 5557.3     | 90       | 19.24   | 19.26      | 0.02     | 1       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-2A-12A-66A-66A    | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 1100    | 1980       | 10       | 5095    | 737.5      | 20       | 66536    | 2120       | 20       | 67036   | 2170       | 90       | 19.18   | 19.20      | 0.02     | 2       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-2A-13A-66A-66A    | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 1100    | 1980       | 10       | 5230    | 751        | 20       | 66536    | 2120       | 20       | 67036   | 2170       | 90       | 19.18   | 19.19      | 0.01     | 3       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-2A-46D            | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 1100    | 1980       | 20       | 50467   | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50863   | 5557.3     | 100      | 19.27   | 19.29      | 0.02     | 4       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-2A-5A-66A-66A     | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 1100    | 1980       | 10       | 2525    | 881.5      | 20       | 66536    | 2120       | 20       | 67236   | 2190       | 90       | 19.18   | 19.20      | 0.02     | 5       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-2A-5A-66B         | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 1100    | 1980       | 10       | 2525    | 881.5      | 10       | 66837    | 2150.1     | 10       | 66936   | 2160       | 70       | 19.19   | 19.20      | 0.01     | 6       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-2A-5A-66C         | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 1100    | 1980       | 10       | 2525    | 881.5      | 20       | 66787    | 2145.1     | 20       | 66985   | 2164.9     | 90       | 19.19   | 19.20      | 0.01     | 7       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-46A-46C-66A       | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 54340   | 5905       | 20       | 46890   | 5160       | 20       | 47088    | 5179.8     | 20       | 66536   | 2120       | 100      | 19.30   | 19.31      | 0.01     | 8       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-46A-46D           | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 54340   | 5905       | 20       | 50467   | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50863   | 5557.3     | 100      | 19.28   | 19.31      | 0.03     | 9       |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-46D-66A           | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 50665   | 5537.5     | 20       | 50863   | 5557.3     | 20       | 51061    | 5577.1     | 20       | 66536   | 2120       | 100      | 19.31   | 19.29      | -0.02    | 10      |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-5A-46D            | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 10       | 2525    | 881.5      | 20       | 50467   | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50863   | 5557.3     | 90       | 19.17   | 19.18      | 0.01     | 12      |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-5B-66A-66A        | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 10       | 2476    | 876.6      | 10       | 2575    | 886.5      | 20       | 66536    | 2120       | 20       | 67236   | 2190       | 80       | 19.20   | 19.21      | 0.01     | 13      |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-5B-66B            | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 10       | 2476    | 876.6      | 10       | 2575    | 886.5      | 10       | 66787    | 2145.1     | 10       | 66985   | 2164.9     | 60       | 19.21   | 19.20      | -0.01    | 14      |            |  |  |  |  |               |                   |                 |       |       |
| CA_2A-5B-66C            | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 10       | 2476    | 876.6      | 10       | 2575    | 886.5      | 20       | 66787    | 2145.1     | 20       | 66985   | 2164.9     | 80       | 19.22   | 19.24      | 0.02     | 15      |            |  |  |  |  |               |                   |                 |       |       |
| CA_13A-46D-66A          | QPSK     | 10       | 23230   | 782        | 1.0       | 10       | 5230    | 751        | 20       | 50467   | 5517.7     | 20       | 50665   | 5537.5     | 20       | 50863    | 5557.3     | 20       | 66536   | 2120       | 90       | 20.19   | 20.12      | -0.07    | 16      |            |  |  |  |  |               |                   |                 |       |       |
| CA_13A-46E              | QPSK     | 10       | 23230   | 782        | 1.0       | 10       | 5230    | 751        | 20       | 50467   | 5517.7     | 20       | 50665   | 5537.5     | 20       | 50863    | 5557.3     | 20       | 51061   | 5577.1     | 90       | 20.15   | 20.09      | -0.06    | 17      |            |  |  |  |  |               |                   |                 |       |       |
| CA_41A-46E              | QPSK     | 20       | 39750   | 2506       | 50.24     | 20       | 39750   | 2506       | 20       | 50467   | 5517.7     | 20       | 50665   | 5537.5     | 20       | 50863    | 5557.3     | 20       | 51061   | 5577.1     | 100      | 19.90   | 19.87      | -0.03    | 18      |            |  |  |  |  |               |                   |                 |       |       |
| CA_46A-46D-66A          | QPSK     | 20       | 132322  | 1745       | 1.0       | 20       | 66786   | 2145       | 20       | 54142   | 5885.2     | 20       | 50467   | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50863   | 5557.3     | 100      | 16.92   | 16.91      | -0.01    | 19      |            |  |  |  |  |               |                   |                 |       |       |
| CA_46D-66A-66A          | QPSK     | 20       | 132322  | 1745       | 1.0       | 20       | 66786   | 2145       | 20       | 67086   | 2175       | 20       | 50467   | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50863   | 5557.3     | 100      | 16.90   | 16.89      | -0.01    | 20      |            |  |  |  |  |               |                   |                 |       |       |
| CA_4A-46A-46D           | QPSK     | 20       | 20175   | 1732.5     | 1.0       | 20       | 2175    | 2132.5     | 20       | 54340   | 5905       | 20       | 50467   | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50863   | 5557.3     | 100      | 16.87   | 16.91      | 0.04     | 22      |            |  |  |  |  |               |                   |                 |       |       |
| CA_5A-46D-66A           | QPSK     | 10       | 20525   | 836.5      | 1.25      | 10       | 2525    | 881.5      | 20       | 50467   | 5517.7     | 20       | 50665   | 5537.5     | 20       | 50863    | 5557.3     | 20       | 66536   | 2120       | 90       | 20.74   | 20.76      | 0.02     | 23      |            |  |  |  |  |               |                   |                 |       |       |
| CA_5A-46E               | QPSK     | 10       | 20525   | 836.5      | 1.25      | 10       | 2525    | 881.5      | 20       | 50467   | 5517.7     | 20       | 50665   | 5537.5     | 20       | 50863    | 5557.3     | 20       | 51061   | 5577.1     | 90       | 20.75   | 20.80      | 0.05     | 24      |            |  |  |  |  |               |                   |                 |       |       |
| CA_5B-46D               | QPSK     | 10       | 20476   | 831.6      | 1.25      | 10       | 2476    | 876.6      | 10       | 2575    | 886.5      | 20       | 50467   | 5517.7     | 20       | 50665    | 5537.5     | 20       | 50863   | 5557.3     | 80       | 20.07   | 20.12      | 0.05     | 25      |            |  |  |  |  |               |                   |                 |       |       |

**6CC DL CA Measured Results**

| E-UTRA CA configuration | CC1 (UL) |          |         |            |           | CC1 (DL) |         |            |          |         | CC2 (DL)   |          |         |            |          | CC3 (DL) |            |          |         |            | CC4 (DL) |         |            |          |         | CC5 (DL)   |          |         |            |  | CC6 (DL) |  |  |  |  | Aggregated BW | CA Inactive (dBm) | CA Active (dBm) | Delta | 6CC # |
|-------------------------|----------|----------|---------|------------|-----------|----------|---------|------------|----------|---------|------------|----------|---------|------------|----------|----------|------------|----------|---------|------------|----------|---------|------------|----------|---------|------------|----------|---------|------------|--|----------|--|--|--|--|---------------|-------------------|-----------------|-------|-------|
|                         | Mode     | BW (MHz) | Channel | Freq (MHz) | RB Offset | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel  | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) | BW (MHz) | Channel | Freq (MHz) |  |          |  |  |  |  |               |                   |                 |       |       |
| CA_2A-46E-66A           | QPSK     | 20       | 18900   | 1880       | 50.0      | 20       | 900     | 1960       | 20       | 50467   | 5517.7     | 20       | 50665   | 5537.5     | 20       | 50863    | 5557.3     | 20       | 51061   | 5577.1     | 20       | 66536   | 2120       | 120      | 19.26   | 19.29      | 0.03     | 1       |            |  |          |  |  |  |  |               |                   |                 |       |       |

## 9.5. Wi-Fi 2.4GHz (DTS Band)

### Maximum Output Power (Tune-up Limit) for Wi-Fi 2.4 GHz

The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

For “Not required”, SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11b/g/n mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.

SAR testing is not required for OFDM mode(s) when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.

| Band         | Normal Tune-Up Power Limit (dBm) |                    |          |                    |
|--------------|----------------------------------|--------------------|----------|--------------------|
|              | WiFi Main                        |                    | WiFi Sub |                    |
|              | Normal                           | Simultaneous 2G_5G | Normal   | Simultaneous 2G_5G |
| DSSS 2.4 GHz | 14                               | 11                 | 12.5     | 11                 |
| OFDM 2.4 GHz | 14                               | 11                 | 14       | 11                 |

### Wi-Fi 2.4GHz Normal State Measured Results

| Band          | Mode                | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|---------------|---------------------|------|-------------|-------------------------------|---------|-------------------|------------------------------|---------|-------------------|
|               |                     |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| DSSS 2.4 GHz  | 802.11b             | 1    | 2412        | 13.8                          | 14.0    | Yes               | 12.1                         | 12.5    | Yes               |
|               |                     | 6    | 2437        | 13.1                          | 14.0    |                   | 12.0                         | 12.5    |                   |
|               |                     | 11   | 2462        | 13.4                          | 14.0    |                   | 11.7                         | 12.5    |                   |
| OFDM 2.4 GHz  | 802.11g             | 1    | 2412        | 12.6                          | 14.0    | No                | 13.3                         | 14.0    | Yes               |
|               |                     | 6    | 2437        | 13.2                          | 14.0    |                   | 14.0                         | 14.0    |                   |
|               |                     | 11   | 2462        | 13.4                          | 14.0    |                   | 13.8                         | 14.0    |                   |
|               | 802.11n (HT20)      | 1    | 2412        | 13.3                          | 14.0    | No                | 13.8                         | 14.0    | No                |
|               |                     | 6    | 2437        | 13.0                          | 14.0    |                   | 14.0                         | 14.0    |                   |
|               |                     | 11   | 2462        | 13.0                          | 14.0    |                   | 13.9                         | 14.0    |                   |
| OFDMA 2.4 GHz | 802.11ax (HE20, SU) | 1    | 2412        | 13.4                          | 14.0    | No                | 13.4                         | 14.0    | No                |
|               |                     | 6    | 2437        | 13.1                          | 14.0    |                   | 13.8                         | 14.0    |                   |
|               |                     | 11   | 2462        | 13.2                          | 14.0    |                   | 13.5                         | 14.0    |                   |

### Wi-Fi 2.4GHz Simultaneous State Measured Results

| Band         | Mode    | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|--------------|---------|------|-------------|-------------------------------|---------|-------------------|------------------------------|---------|-------------------|
|              |         |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| DSSS 2.4 GHz | 802.11b | 1    | 2412        | 10.5                          | 11.0    | Yes               | 10.6                         | 11.0    | Yes               |
|              |         | 6    | 2437        | 10.8                          | 11.0    |                   | 10.8                         | 11.0    |                   |
|              |         | 11   | 2462        | 11.0                          | 11.0    |                   | 11.0                         | 11.0    |                   |

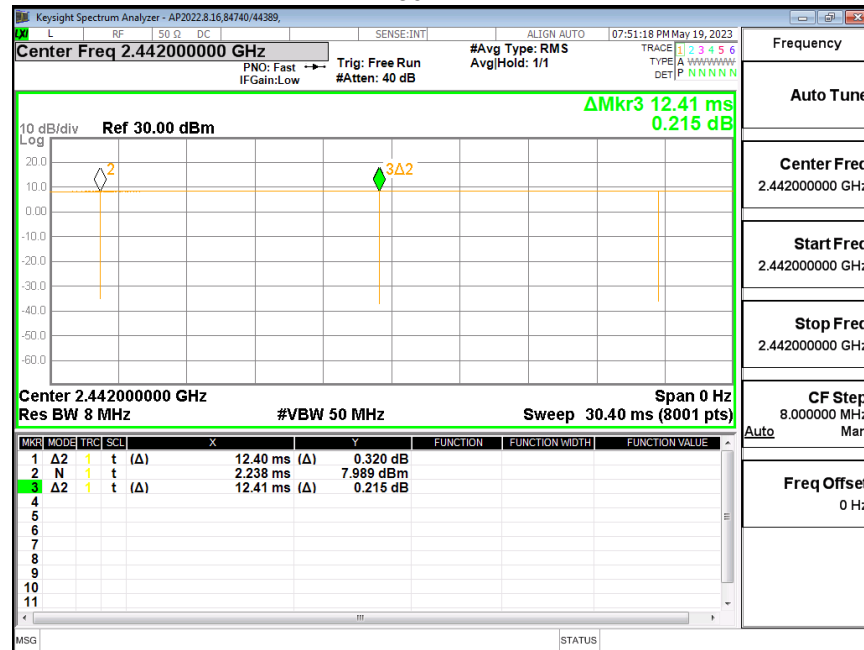


**Duty Factor Measured Results**

| Mode    | Type   | T on (ms) | Period (ms) | Duty Cycle | Crest Factor (1/duty cycle) |
|---------|--------|-----------|-------------|------------|-----------------------------|
| 802.11b | 1 Mbps | 12.40     | 12.41       | 99.9%      | 1.00                        |
| 802.11g | 6 Mbps | 2.096     | 2.114       | 99.1%      | 1.01                        |

**Note(s):**

Duty Cycle = (T on / period) \* 100%

**WLAN 2.4GHz Duty Cycle****802.11b****802.11g**

## 9.6. Wi-Fi 5GHz (U-NII Bands)

### Maximum Output Power (Tune-up Limit) for Wi-Fi 5 GHz

When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 transmission mode is selected.

The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

For “Not required”, SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac/ax mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.

When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is  $\leq 1.2$  W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.

| Band               | Max Tune-Up Power Limit (dBm) |                    |          |                    |
|--------------------|-------------------------------|--------------------|----------|--------------------|
|                    | WiFi Main                     |                    | WiFi Sub |                    |
|                    | Normal                        | Simultaneous 2G_5G | Normal   | Simultaneous 2G_5G |
| UNII-1<br>5.2 GHz  | 11.5                          | 9.5                | 11.5     | 9.5                |
| UNII-1 & 2A        | 11.5                          | 9.5                | 11.5     | 9.5                |
| UNII-2C<br>5.5 GHz | 11.5                          | 9.5                | 11.5     | 9.5                |
| UNII-3<br>5.8 GHz  | 11.5                          | 9.5                | 11.5     | 9.5                |

**Wi-Fi 5 GHz Normal State Measured Results**

| Band            | Mode                | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|-----------------|---------------------|------|-------------|-------------------------------|---------|-------------------|------------------------------|---------|-------------------|
|                 |                     |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| UNII-1 5.2GHz   | 802.11ac (VHT80)    | 42   | 5210        | 10.6                          | 11.5    | Yes               | 10.9                         | 11.5    | Yes               |
| Band            | Mode                | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|                 |                     |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| UNII-1 & 2A     | 802.11ac (VHT160)   | 50   | 5250        | 10.7                          | 11.5    | Yes               | 10.9                         | 11.5    | Yes               |
| Band            | Mode                | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|                 |                     |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| UNII-2C 5.5 GHz | 802.11ac (VHT160)   | 114  | 5570        | 10.6                          | 11.5    | Yes               | 10.8                         | 11.5    | Yes               |
| Band            | Mode                | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|                 |                     |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| UNII-3 5.8GHz   | 802.11n (HT40)      | 151  | 5755        | 10.6                          | 11.5    | Yes               | 11.0                         | 11.5    | Yes               |
|                 |                     | 159  | 5795        | 10.6                          | 11.5    |                   | 10.5                         | 11.5    |                   |
|                 | 802.11ax (HE40, SU) | 151  | 5755        | 10.6                          | 11.5    | Yes               | 11.0                         | 11.5    | Yes               |
|                 |                     | 159  | 5795        | 10.6                          | 11.5    |                   | 10.5                         | 11.5    |                   |

**Wi-Fi 5 GHz Simultaneous State Measured Results**

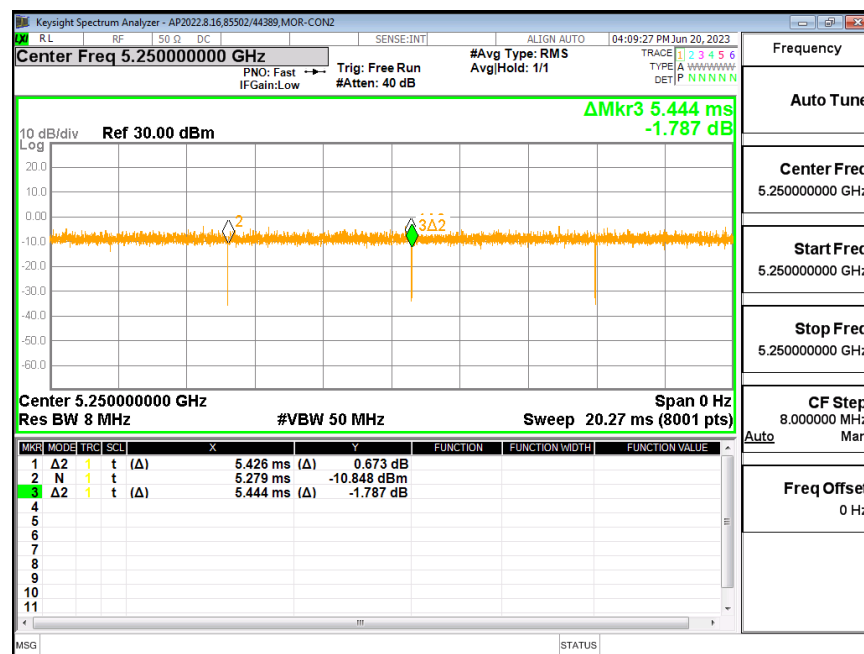
| Band            | Mode              | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|-----------------|-------------------|------|-------------|-------------------------------|---------|-------------------|------------------------------|---------|-------------------|
|                 |                   |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| UNII-1 5.2GHz   | 802.11ac (VHT80)  | 42   | 5210        | 8.9                           | 9.5     | Yes               | 9.5                          | 9.5     | Yes               |
| Band            | Mode              | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|                 |                   |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| UNII-1 & 2A     | 802.11ac (VHT160) | 50   | 5250        | 9.4                           | 9.5     | Yes               | 9.4                          | 9.5     | Yes               |
| Band            | Mode              | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|                 |                   |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| UNII-2C 5.5 GHz | 802.11ac (VHT160) | 114  | 5570        | 9.2                           | 9.5     | Yes               | 9.4                          | 9.5     | Yes               |
| Band            | Mode              | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|                 |                   |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| UNII-3 5.8GHz   | 802.11ac (VHT80)  | 155  | 5775        | 9.4                           | 9.5     | Yes               | 9.1                          | 9.5     | Yes               |

**Duty Factor Measured Results**

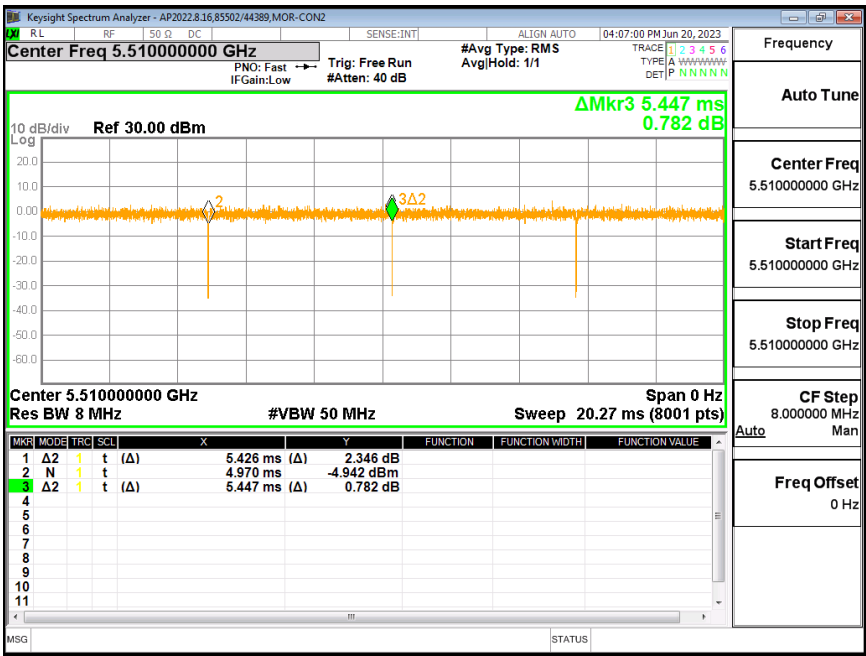
| Mode            | Type | T on (ms) | Period (ms) | Duty Cycle | Crest Factor (1/duty cycle) |
|-----------------|------|-----------|-------------|------------|-----------------------------|
| 802.11ac VHT80  | MCS0 | 5.39      | 5.445       | 99.0%      | 1.01                        |
| 802.11ac VHT160 | MCS0 | 5.426     | 5.444       | 99.7%      | 1.00                        |
| 802.11n HT40    | MCS0 | 5.426     | 5.447       | 99.6%      | 1.00                        |

**Note(s):**

Duty Cycle = (T on / period) \* 100%

**WLAN 5GHz Duty Cycle****802.11ac VHT80****802.11ac VHT160**

802.11n HT40



## 9.7. Bluetooth

### Maximum Output Power (Tune-up Limit) for Bluetooth

From October 2016 TCB workshop, Power and SAR were measured with the device connected to a call box with hopping disabled using DH5 modulation. The duty cycle value from the device is taken from the Duty Cycle plot below.

SAR measurement is not required for the EDR and LE. When the secondary mode is  $\leq 1/4$  dB higher than the primary mode.

| Band | Mode | Tune-Up Power Limit (dBm) |          |
|------|------|---------------------------|----------|
|      |      | WiFi Main                 | WiFi Sub |
|      |      | Normal                    | Normal   |
| 2.4  | BR   | 14.0                      | 14.0     |
|      | EDR  | 14.0                      | 14.0     |
|      | BLE  | 10.0                      | 10.02    |

### Bluetooth Measured Results

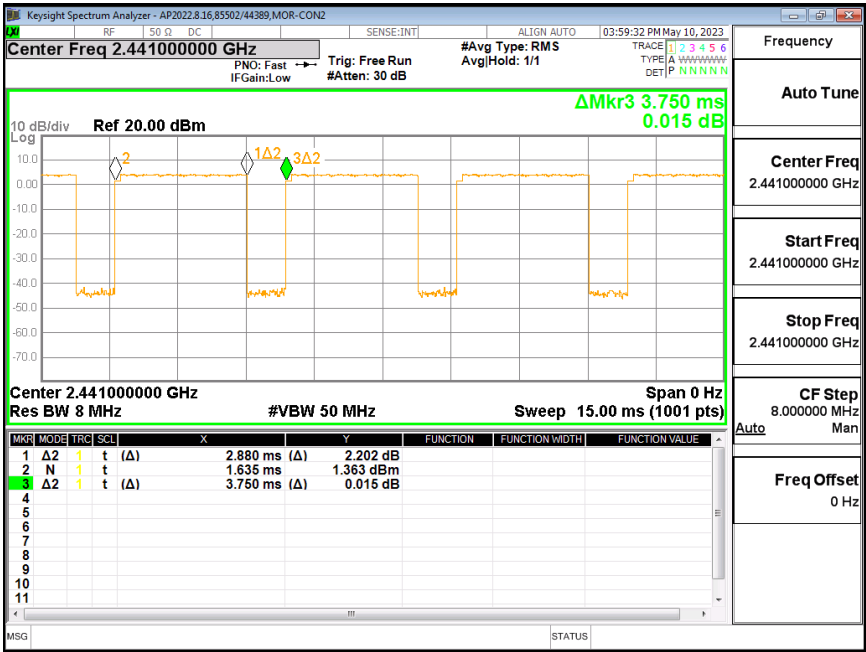
| Band | Mode               | Ch # | Freq. (MHz) | WiFi Main Average Power (dBm) |         |                   | WiFi Sub Average Power (dBm) |         |                   |
|------|--------------------|------|-------------|-------------------------------|---------|-------------------|------------------------------|---------|-------------------|
|      |                    |      |             | Meas Pwr                      | Tune-up | SAR Test (Yes/No) | Meas Pwr                     | Tune-up | SAR Test (Yes/No) |
| 2.4  | BR GFSK            | 0    | 2402        | 12.9                          | 14.0    | Yes               | 13.3                         | 14.0    | Yes               |
|      |                    | 39   | 2441        | 12.8                          | 14.0    |                   | 13.3                         | 14.0    |                   |
|      |                    | 78   | 2480        | 13.5                          | 14.0    |                   | 13.1                         | 14.0    |                   |
|      | EDR, $\pi/4$ DQPSK | 0    | 2402        | 12.8                          | 14.0    | No                | 13.1                         | 14.0    | No                |
|      |                    | 39   | 2441        | 12.6                          | 14.0    |                   | 13.1                         | 14.0    |                   |
|      |                    | 78   | 2480        | 13.3                          | 14.0    |                   | 13.1                         | 14.0    |                   |
|      | EDR, 8-DPSK        | 0    | 2402        | 12.5                          | 14.0    | No                | 13.0                         | 14.0    | No                |
|      |                    | 39   | 2441        | 12.7                          | 14.0    |                   | 13.1                         | 14.0    |                   |
|      |                    | 78   | 2480        | 13.2                          | 14.0    |                   | 13.1                         | 14.0    |                   |
|      | LE, GFSK           | 0    | 2402        | 9.8                           | 10.0    | No                | 10.0                         | 10.02   | No                |
|      |                    | 19   | 2440        | 9.7                           | 10.0    |                   | 10.0                         | 10.02   |                   |
|      |                    | 39   | 2480        | 9.9                           | 10.0    |                   | 9.7                          | 10.02   |                   |

Duty Factor Measured Results

| Mode    | T on (ms) | Period (ms) | Duty Cycle | Crest Factor (1/duty cycle) |
|---------|-----------|-------------|------------|-----------------------------|
| BR GFSK | 2.88      | 3.750       | 76.80%     | 1.30                        |

**Note(s):**  
Duty Cycle = (T on / period) \* 100%

WLAN 5GHz Duty Cycle  
BT BR GFSK



## 10. Measured and Reported (Scaled) SAR Results

### SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN and Bluetooth = Measured SAR \*Tune-up Scaling Factor
- Reported SAR(W/kg) for Wi-Fi = Measured SAR \* Tune-up scaling factor \* Duty Cycle scaling factor
- Duty Cycle scaling factor = 1 / Duty cycle (%)

### KDB 447498 D01 General RF Exposure Guidance:

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- $\leq 0.8$  W/kg or  $2.0$  W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
- $\leq 0.6$  W/kg or  $1.5$  W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- $\leq 0.4$  W/kg or  $1.0$  W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz

### KDB 648474 D04 Handset SAR:

With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is  $> 1.2$  W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

### KDB 648474 D04 Handset SAR (Phablet Only):

For smart phones, with a display diagonal dimension  $> 15.0$  cm or an overall diagonal dimension  $> 16.0$  cm.

When hotspot mode does not apply, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at  $\leq 25$  mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR  $> 1.2$  W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

### KDB 941225 D01 SAR test for 3G devices:

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the secondary mode.

### KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is  $> 0.8$  W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are  $> 0.8$  W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation  $< 1.45$  W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is  $< 1.45$  W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is  $< 1.45$  W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
- For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing; therefore, the requirement for H, M and L channels may not fully apply.



**KDB 248227 D01 SAR meas for 802.11:**

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the initial test position(s) by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The initial test position(s) is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the reported SAR for the initial test position is:

- $\leq 0.4$  W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- $> 0.4$  W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is  $\leq 0.8$  W/kg or all required test positions are tested.
  - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is  $> 0.8$  W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2$  W/kg or all required test channels are considered.
  - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is  $\leq 1.2$  W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is  $\leq 1.2$  W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

To determine the initial test position, Area Scans were performed to determine the position with the *Maximum Value of SAR (measured)*. The position that produced the highest *Maximum Value of SAR* is considered the worst case position; thus used as the initial test position.

**10.1. GSM850**

| RF Exposure Conditions | Mode             | Antenna    | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Power (dBm)   |       | 1-g SAR (W/kg) |              | Plot No. |
|------------------------|------------------|------------|------------|---------------|-------|-------------|---------------|-------|----------------|--------------|----------|
|                        |                  |            |            |               |       |             | Tune-up Limit | Meas. | Meas.          | Scaled       |          |
| Head                   | GPRS 4 Slots     | CELL Main1 | 0          | Left Cheek    | 190   | 836.6       | 26.9          | 25.7  | 0.066          | 0.087        | 1        |
|                        |                  |            |            | Left Tilt     | 190   | 836.6       | 26.9          | 25.7  | 0.035          | 0.046        |          |
|                        |                  |            |            | Right Cheek   | 190   | 836.6       | 26.9          | 25.7  | 0.082          | 0.108        |          |
|                        |                  |            |            | Right Tilt    | 190   | 836.6       | 26.9          | 25.7  | 0.030          | 0.040        |          |
| Body-Worn and Hotspot  | GPRS 4 Slots     | CELL Main1 | 10         | Rear          | 190   | 836.6       | 26.9          | 25.7  | 0.183          | 0.241        | 2        |
|                        |                  |            |            | Front         | 190   | 836.6       | 26.9          | 25.7  | 0.112          | 0.148        |          |
| Hotspot                | GPRS 4 Slots     | CELL Main1 | 10         | Edge Left     | 190   | 836.6       | 26.9          | 25.7  | 0.044          | 0.058        |          |
|                        |                  |            |            | Edge Bottom   | 190   | 836.6       | 26.9          | 25.7  | 0.064          | 0.084        |          |
| Body-Worn and Hotspot  | DTM GPRS 2 Slots | CELL Main1 | 10         | Rear          | 190   | 836.6       | 29.9          | 29.2  | 0.226          | <b>0.266</b> | 3        |

**10.2. GSM1900**

| RF Exposure Conditions | Mode             | Antenna    | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------------------|------------|------------|---------------|-------|-------------|---------------|-------|----------------|--------|----------|
|                        |                  |            |            |               |       |             | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | GPRS 4 Slots     | CELL Main2 | 0          | Left Cheek    | 810   | 1909.8      | 22.0          | 21.1  | 0.021          | 0.026  | 4        |
|                        |                  |            |            | Left Tilt     | 810   | 1909.8      | 22.0          | 21.1  | 0.013          | 0.016  |          |
|                        |                  |            |            | Right Cheek   | 810   | 1909.8      | 22.0          | 21.1  | 0.034          | 0.042  |          |
|                        |                  |            |            | Right Tilt    | 810   | 1909.8      | 22.0          | 21.1  | 0.010          | 0.012  |          |
| Body-Worn and Hotspot  | GPRS 4 Slots     | CELL Main2 | 10         | Rear          | 810   | 1909.8      | 22.0          | 21.1  | 0.120          | 0.148  | 5        |
|                        |                  |            |            | Front         | 810   | 1909.8      | 22.0          | 21.1  | 0.107          | 0.132  |          |
| Hotspot                | GPRS 4 Slots     | CELL Main2 | 10         | Edge Right    | 810   | 1909.8      | 22.0          | 21.1  | 0.111          | 0.137  | 6        |
|                        |                  |            |            | Edge Bottom   | 810   | 1909.8      | 22.0          | 21.1  | 0.162          | 0.199  |          |
| Body-Worn and Hotspot  | DTM GPRS 2 Slots | CELL Main2 | 10         | Edge Bottom   | 512   | 1850.2      | 25            | 24.2  | 0.102          | 0.123  | 7        |

**10.3. W-CDMA Band II**

| RF Exposure Conditions | Mode                  | Antenna    | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Power (dBm)   |       | 1-g SAR (W/kg) |              | Plot No. |
|------------------------|-----------------------|------------|------------|---------------|-------|-------------|---------------|-------|----------------|--------------|----------|
|                        |                       |            |            |               |       |             | Tune-up Limit | Meas. | Meas.          | Scaled       |          |
| Head                   | Rel. 99 RMC 12.2 kbps | CELL Main2 | 0          | Left Cheek    | 9538  | 1907.6      | 19.7          | 19.0  | 0.032          | 0.038        | 8        |
|                        |                       |            |            | Left Tilt     | 9538  | 1907.6      | 19.7          | 19.0  | 0.019          | 0.022        |          |
|                        |                       |            |            | Right Cheek   | 9538  | 1907.6      | 19.7          | 19.0  | 0.041          | 0.048        |          |
|                        |                       |            |            | Right Tilt    | 9538  | 1907.6      | 19.7          | 19.0  | 0.011          | 0.013        |          |
| Body-Worn and Hotspot  | Rel. 99 RMC 12.2 kbps | CELL Main2 | 10         | Rear          | 9538  | 1907.6      | 19.7          | 19.0  | 0.207          | 0.243        | 9        |
|                        |                       |            |            | Front         | 9538  | 1907.6      | 19.7          | 19.0  | 0.191          | 0.224        |          |
| Hotspot                | Rel. 99 RMC 12.2 kbps | CELL Main2 | 10         | Edge Right    | 9538  | 1907.6      | 19.7          | 19.0  | 0.143          | 0.168        | 10       |
|                        |                       |            |            | Edge Bottom   | 9538  | 1907.6      | 19.7          | 19.0  | 0.400          | <b>0.470</b> |          |

**10.4.W-CDMA Band IV**

| RF Exposure Conditions | Mode                     | Antenna    | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|--------------------------|------------|------------|---------------|-------|-------------|---------------|-------|----------------|--------|----------|
|                        |                          |            |            |               |       |             | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | Rel. 99 RMC<br>12.2 kbps | CELL Main2 | 0          | Left Cheek    | 1413  | 1732.6      | 18.7          | 18.0  | 0.030          | 0.035  | 11       |
|                        |                          |            |            | Left Tilt     | 1413  | 1732.6      | 18.7          | 18.0  | 0.019          | 0.022  |          |
|                        |                          |            |            | Right Cheek   | 1413  | 1732.6      | 18.7          | 18.0  | 0.053          | 0.062  |          |
|                        |                          |            |            | Right Tilt    | 1413  | 1732.6      | 18.7          | 18.0  | 0.020          | 0.023  |          |
| Body-Worn and Hotspot  | Rel. 99 RMC<br>12.2 kbps | CELL Main2 | 10         | Rear          | 1413  | 1732.6      | 18.7          | 18.0  | 0.137          | 0.161  | 12       |
|                        |                          |            |            | Front         | 1413  | 1732.6      | 18.7          | 18.0  | 0.105          | 0.123  |          |
| Hotspot                | Rel. 99 RMC<br>12.2 kbps | CELL Main2 | 10         | Edge Right    | 1413  | 1732.6      | 18.7          | 18.0  | 0.115          | 0.135  | 13       |
|                        |                          |            |            | Edge Bottom   | 1413  | 1732.6      | 18.7          | 18.0  | 0.149          | 0.175  |          |

**10.5.W-CDMA Band V**

| RF Exposure Conditions | Mode                     | Antenna    | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|--------------------------|------------|------------|---------------|-------|-------------|---------------|-------|----------------|--------|----------|
|                        |                          |            |            |               |       |             | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | Rel. 99 RMC<br>12.2 kbps | CELL Main1 | 0          | Left Cheek    | 4183  | 836.6       | 22.7          | 21.9  | 0.086          | 0.103  | 14       |
|                        |                          |            |            | Left Tilt     | 4183  | 836.6       | 22.7          | 21.9  | 0.051          | 0.061  |          |
|                        |                          |            |            | Right Cheek   | 4183  | 836.6       | 22.7          | 21.9  | 0.098          | 0.118  |          |
|                        |                          |            |            | Right Tilt    | 4183  | 836.6       | 22.7          | 21.9  | 0.052          | 0.063  |          |
| Body-Worn and Hotspot  | Rel. 99 RMC<br>12.2 kbps | CELL Main1 | 10         | Rear          | 4183  | 836.6       | 22.7          | 21.9  | 0.177          | 0.213  | 15       |
|                        |                          |            |            | Front         | 4183  | 836.6       | 22.7          | 21.9  | 0.118          | 0.142  |          |
| Hotspot                | Rel. 99 RMC<br>12.2 kbps | CELL Main1 | 10         | Edge Left     | 4183  | 836.6       | 22.7          | 21.9  | 0.075          | 0.090  |          |
|                        |                          |            |            | Edge Bottom   | 4183  | 836.6       | 22.7          | 21.9  | 0.060          | 0.072  |          |

**10.6.LTE Band 5 (10MHz Bandwidth)**

| RF Exposure Conditions | Mode | Antenna    | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB Offset | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------|------------|------------|---------------|-------|-------------|---------------|-----------|---------------|-------|----------------|--------|----------|
|                        |      |            |            |               |       |             |               |           | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | QPSK | CELL Main1 | 0          | Left Cheek    | 20525 | 836.5       | 1             | 25        | 22.0          | 20.9  | 0.059          | 0.076  | 16       |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.059          | 0.076  |          |
|                        |      |            |            | Left Tilt     | 20525 | 836.5       | 1             | 25        | 22.0          | 20.9  | 0.032          | 0.041  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.034          | 0.044  |          |
|                        |      |            |            | Right Cheek   | 20525 | 836.5       | 1             | 25        | 22.0          | 20.9  | 0.066          | 0.085  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.066          | 0.085  |          |
|                        |      |            |            | Right Tilt    | 20525 | 836.5       | 1             | 25        | 22.0          | 20.9  | 0.030          | 0.039  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.030          | 0.039  |          |
| Body-Worn and Hotspot  | QPSK | CELL Main1 | 10         | Rear          | 20525 | 836.5       | 1             | 25        | 22.0          | 20.9  | 0.150          | 0.193  | 17       |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.148          | 0.191  |          |
|                        |      |            |            | Front         | 20525 | 836.5       | 1             | 25        | 22.0          | 20.9  | 0.093          | 0.120  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.091          | 0.117  |          |
| Hotspot                | QPSK | CELL Main1 | 10         | Edge Left     | 20525 | 836.5       | 1             | 25        | 22.0          | 20.9  | 0.046          | 0.059  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.045          | 0.058  |          |
|                        |      |            |            | Edge Bottom   | 20525 | 836.5       | 1             | 25        | 22.0          | 20.9  | 0.048          | 0.062  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.047          | 0.061  |          |

**10.7. LTE Band 12 (10MHz Bandwidth)**

| RF Exposure Conditions | Mode | Antenna    | Dist. (mm) | Test Position | Ch #  | Freq. (MHz) | RB Allocation | RB Offset | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------|------------|------------|---------------|-------|-------------|---------------|-----------|---------------|-------|----------------|--------|----------|
|                        |      |            |            |               |       |             |               |           | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | QPSK | CELL Main1 | 0          | Left Cheek    | 23095 | 707.5       | 1             | 25        | 22.0          | 21.0  | 0.051          | 0.064  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 21.0  | 0.053          | 0.067  |          |
|                        |      |            |            | Left Tilt     | 23095 | 707.5       | 1             | 25        | 22.0          | 21.0  | 0.019          | 0.024  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 21.0  | 0.019          | 0.024  |          |
|                        |      |            |            | Right Cheek   | 23095 | 707.5       | 1             | 25        | 22.0          | 21.0  | 0.054          | 0.068  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 21.0  | 0.055          | 0.069  | 18       |
| Body-Worn and Hotspot  | QPSK | CELL Main1 | 10         | Rear          | 23095 | 707.5       | 1             | 25        | 22.0          | 21.0  | 0.090          | 0.113  | 19       |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 21.0  | 0.090          | 0.113  |          |
|                        |      |            |            | Front         | 23095 | 707.5       | 1             | 25        | 22.0          | 21.0  | 0.068          | 0.086  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 21.0  | 0.070          | 0.088  |          |
| Hotspot                | QPSK | CELL Main1 | 10         | Edge Left     | 23095 | 707.5       | 1             | 25        | 22.0          | 21.0  | 0.093          | 0.117  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 21.0  | 0.098          | 0.123  | 20       |
|                        |      |            |            | Edge Bottom   | 23095 | 707.5       | 1             | 25        | 22.0          | 21.0  | 0.026          | 0.033  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 21.0  | 0.026          | 0.033  |          |

**10.8. LTE Band 13 (10MHz Bandwidth)**

| RF Exposure Conditions | Mode | Antenna    | Dist. (mm) | Test Position | Ch #  | Freq. (MHz) | RB Allocation | RB Offset | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------|------------|------------|---------------|-------|-------------|---------------|-----------|---------------|-------|----------------|--------|----------|
|                        |      |            |            |               |       |             |               |           | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | QPSK | CELL Main1 | 0          | Left Cheek    | 23230 | 782.0       | 1             | 0         | 22.0          | 20.9  | 0.081          | 0.104  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.071          | 0.091  |          |
|                        |      |            |            | Left Tilt     | 23230 | 782.0       | 1             | 0         | 22.0          | 20.9  | 0.054          | 0.070  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.047          | 0.061  |          |
|                        |      |            |            | Right Cheek   | 23230 | 782.0       | 1             | 0         | 22.0          | 20.9  | 0.084          | 0.108  | 21       |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.072          | 0.093  |          |
| Body-Worn and Hotspot  | QPSK | CELL Main1 | 10         | Right Tilt    | 23230 | 782.0       | 1             | 0         | 22.0          | 20.9  | 0.048          | 0.062  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.041          | 0.053  |          |
|                        |      |            |            | Rear          | 23230 | 782.0       | 1             | 0         | 22.0          | 20.9  | 0.167          | 0.215  | 22       |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.142          | 0.183  |          |
|                        |      |            |            | Front         | 23230 | 782.0       | 1             | 0         | 22.0          | 20.9  | 0.131          | 0.169  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.111          | 0.143  |          |
| Hotspot                | QPSK | CELL Main1 | 10         | Edge Left     | 23230 | 782.0       | 1             | 0         | 22.0          | 20.9  | 0.126          | 0.162  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.118          | 0.152  |          |
|                        |      |            |            | Edge Bottom   | 23230 | 782.0       | 1             | 0         | 22.0          | 20.9  | 0.037          | 0.048  |          |
|                        |      |            |            |               |       |             | 25            | 0         | 22.0          | 20.9  | 0.030          | 0.039  |          |

**10.9. LTE Band 25 (20MHz Bandwidth)**

| RF Exposure Conditions | Mode | Antenna    | Dist. (mm) | Test Position | Ch #  | Freq. (MHz) | RB Allocation | RB Offset | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------|------------|------------|---------------|-------|-------------|---------------|-----------|---------------|-------|----------------|--------|----------|
|                        |      |            |            |               |       |             |               |           | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | QPSK | CELL Main2 | 0          | Left Cheek    | 26365 | 1882.5      | 1             | 0         | 20.0          | 18.8  | 0.033          | 0.044  | 23       |
|                        |      |            |            |               |       |             | 50            | 0         | 20.0          | 18.9  | 0.035          | 0.045  |          |
|                        |      |            |            | Left Tilt     | 26365 | 1882.5      | 1             | 0         | 20.0          | 18.8  | 0.018          | 0.024  |          |
|                        |      |            |            |               |       |             | 50            | 0         | 20.0          | 18.9  | 0.017          | 0.022  |          |
|                        |      |            |            | Right Cheek   | 26365 | 1882.5      | 1             | 0         | 20.0          | 18.8  | 0.062          | 0.082  |          |
|                        |      |            |            |               |       |             | 50            | 0         | 20.0          | 18.9  | 0.062          | 0.080  |          |
| Body-Worn and Hotspot  | QPSK | CELL Main2 | 10         | Rear          | 26365 | 1882.5      | 1             | 0         | 20.0          | 18.8  | 0.190          | 0.250  | 24       |
|                        |      |            |            |               |       |             | 50            | 0         | 20.0          | 18.9  | 0.196          | 0.252  |          |
|                        |      |            |            | Front         | 26365 | 1882.5      | 1             | 0         | 20.0          | 18.8  | 0.135          | 0.178  |          |
|                        |      |            |            |               |       |             | 50            | 0         | 20.0          | 18.9  | 0.140          | 0.180  |          |
| Hotspot                | QPSK | CELL Main2 | 10         | Edge Right    | 26365 | 1882.5      | 1             | 0         | 20.0          | 18.8  | 0.154          | 0.203  | 25       |
|                        |      |            |            |               |       |             | 50            | 0         | 20.0          | 18.9  | 0.160          | 0.206  |          |
|                        |      |            |            | Edge Bottom   | 26365 | 1882.5      | 1             | 0         | 20.0          | 18.8  | 0.209          | 0.276  |          |
|                        |      |            |            |               |       |             | 50            | 0         | 20.0          | 18.9  | 0.220          | 0.283  |          |

**10.10. LTE Band 41 (20MHz Bandwidth)**

| RF Exposure Conditions | Mode | Antenna    | Dist. (mm) | Test Position | Ch #  | Freq. (MHz) | RB Allocation | RB Offset | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------|------------|------------|---------------|-------|-------------|---------------|-----------|---------------|-------|----------------|--------|----------|
|                        |      |            |            |               |       |             |               |           | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | QPSK | CELL Main2 | 0          | Left Cheek    | 39750 | 2506.0      | 1             | 49        | 20.0          | 19.2  | 0.014          | 0.017  | 26       |
|                        |      |            |            |               |       |             | 50            | 24        | 20.0          | 19.2  | 0.013          | 0.016  |          |
|                        |      |            |            | Left Tilt     | 39750 | 2506.0      | 1             | 49        | 20.0          | 19.2  | 0.012          | 0.014  |          |
|                        |      |            |            |               |       |             | 50            | 24        | 20.0          | 19.2  | 0.011          | 0.013  |          |
|                        |      |            |            | Right Cheek   | 39750 | 2506.0      | 1             | 49        | 20.0          | 19.2  | 0.025          | 0.030  |          |
|                        |      |            |            |               |       |             | 50            | 24        | 20.0          | 19.2  | 0.025          | 0.030  |          |
| Body-Worn and Hotspot  | QPSK | CELL Main2 | 10         | Right Tilt    | 39750 | 2506.0      | 1             | 49        | 20            | 19.2  | 0.002          | 0.002  | 27       |
|                        |      |            |            |               |       |             | 50            | 24        | 20            | 19.2  | 0.005          | 0.006  |          |
|                        |      |            |            | Rear          | 39750 | 2506.0      | 1             | 49        | 20.0          | 19.2  | 0.104          | 0.125  |          |
|                        |      |            |            |               |       |             | 50            | 24        | 20.0          | 19.2  | 0.112          | 0.135  |          |
|                        |      |            |            | Front         | 39750 | 2506.0      | 1             | 49        | 20.0          | 19.2  | 0.099          | 0.119  |          |
|                        |      |            |            |               |       |             | 50            | 24        | 20.0          | 19.2  | 0.100          | 0.120  |          |
| Hotspot                | QPSK | CELL Main2 | 10         | Edge Right    | 39750 | 2506.0      | 1             | 49        | 20.0          | 19.2  | 0.034          | 0.041  | 28       |
|                        |      |            |            |               |       |             | 50            | 24        | 20.0          | 19.2  | 0.035          | 0.042  |          |
|                        |      |            |            | Edge Bottom   | 39750 | 2506.0      | 1             | 49        | 20.0          | 19.2  | 0.154          | 0.185  |          |
|                        |      |            |            |               |       |             | 50            | 24        | 20.0          | 19.2  | 0.157          | 0.189  |          |

**10.11. LTE Band 66 (20MHz Bandwidth)**

| RF Exposure Conditions | Mode | Antenna    | Dist. (mm) | Test Position | Ch #   | Freq. (MHz) | RB Allocation | RB Offset | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------|------------|------------|---------------|--------|-------------|---------------|-----------|---------------|-------|----------------|--------|----------|
|                        |      |            |            |               |        |             |               |           | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | QPSK | CELL Main2 | 0          | Left Cheek    | 132322 | 1720.0      | 1             | 0         | 19.0          | 18.1  | 0.029          | 0.036  |          |
|                        |      |            |            |               |        |             | 50            | 24        | 19.0          | 18.1  | 0.030          | 0.037  |          |
|                        |      |            |            | Left Tilt     | 132322 | 1720.0      | 1             | 0         | 19.0          | 18.1  | 0.015          | 0.018  |          |
|                        |      |            |            |               |        |             | 50            | 24        | 19.0          | 18.1  | 0.015          | 0.018  |          |
|                        |      |            |            | Right Cheek   | 132322 | 1720.0      | 1             | 0         | 19.0          | 18.1  | 0.049          | 0.060  |          |
|                        |      |            |            |               |        |             | 50            | 24        | 19.0          | 18.1  | 0.050          | 0.062  | 29       |
|                        |      |            |            | Right Tilt    | 132322 | 1720.0      | 1             | 0         | 19.0          | 18.1  | 0.015          | 0.018  |          |
|                        |      |            |            |               |        |             | 50            | 24        | 19.0          | 18.1  | 0.014          | 0.017  |          |
| Body-Worn and Hotspot  | QPSK | CELL Main2 | 10         | Rear          | 132322 | 1720.0      | 1             | 0         | 19.0          | 18.1  | 0.120          | 0.148  |          |
|                        |      |            |            |               |        |             | 50            | 24        | 19.0          | 18.1  | 0.121          | 0.149  | 30       |
|                        |      |            |            | Front         | 132322 | 1720.0      | 1             | 0         | 19.0          | 18.1  | 0.113          | 0.139  |          |
|                        |      |            |            |               |        |             | 50            | 24        | 19.0          | 18.1  | 0.113          | 0.139  |          |
| Hotspot                | QPSK | CELL Main2 | 10         | Edge Right    | 132322 | 1720.0      | 1             | 0         | 19.0          | 18.1  | 0.135          | 0.166  | 31       |
|                        |      |            |            |               |        |             | 50            | 24        | 19.0          | 18.1  | 0.134          | 0.165  |          |
|                        |      |            |            | Edge Bottom   | 132322 | 1720.0      | 1             | 0         | 19.0          | 18.1  | 0.102          | 0.125  |          |
|                        |      |            |            |               |        |             | 50            | 24        | 19.0          | 18.1  | 0.106          | 0.130  |          |

## 10.12. Wi-Fi (DTS Band)

When the 802.11b reported SAR of the highest measured maximum output power channel is  $\leq 0.8$  W/kg, no further SAR testing is required. If SAR is  $> 0.8$  W/kg and  $\leq 1.2$  W/kg, SAR is required for the next highest measured output power channel. Finally, if SAR is  $> 1.2$  W/kg, SAR is required for the third channel.

SAR testing is not required for OFDM mode(s) when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.

| RF Exposure Conditions | Mode    | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|---------|-----------|-----------------------|------------|---------------|------|-------------|--------------------------|------------|---------------|-------|----------------|--------|----------|
|                        |         |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | 802.11b | WiFi Main | Normal                | 0          | Left Cheek    | 1    | 2412        | 0.057                    | 99.9%      | 14.0          | 13.8  |                |        |          |
|                        |         |           |                       |            | Left Tilt     | 1    | 2412        | 0.023                    | 99.9%      | 14.0          | 13.8  |                |        |          |
|                        |         |           |                       |            | Right Cheek   | 1    | 2412        | 0.340                    | 99.9%      | 14.0          | 13.8  | 0.345          | 0.362  | 32       |
|                        |         |           |                       |            | Right Tilt    | 1    | 2412        | 0.086                    | 99.9%      | 14.0          | 13.8  |                |        |          |
| Body-Worn and Hotspot  | 802.11b | WiFi Main | Normal                | 10         | Rear          | 1    | 2412        | 0.037                    | 99.9%      | 14.0          | 13.8  | 0.041          | 0.043  | 33       |
|                        |         |           |                       |            | Front         | 1    | 2412        | 0.032                    | 99.9%      | 14.0          | 13.8  |                |        |          |
| Hotspot                | 802.11b | WiFi Main | Normal                | 10         | Edge Left     | 1    | 2412        | 0.067                    | 99.9%      | 14.0          | 13.8  | 0.070          | 0.073  | 34       |
|                        |         |           |                       |            | Edge Top      | 1    | 2412        | 0.003                    | 99.9%      | 14.0          | 13.8  |                |        |          |
| RF Exposure Conditions | Mode    | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|                        |         |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | 802.11b | WiFi Main | Simultaneous 2G_5G/6G | 0          | Left Cheek    | 11   | 2462        | 0.060                    | 99.9%      | 11.0          | 11.0  |                |        |          |
|                        |         |           |                       |            | Left Tilt     | 11   | 2462        | 0.016                    | 99.9%      | 11.0          | 11.0  |                |        |          |
|                        |         |           |                       |            | Right Cheek   | 11   | 2462        | 0.324                    | 99.9%      | 11.0          | 11.0  | 0.337          | 0.337  | 35       |
|                        |         |           |                       |            | Right Tilt    | 11   | 2462        | 0.080                    | 99.9%      | 11.0          | 11.0  |                |        |          |
| Body-Worn and Hotspot  | 802.11b | WiFi Main | Simultaneous 2G_5G/6G | 10         | Rear          | 11   | 2462        | 0.041                    | 99.9%      | 11.0          | 11.0  | 0.042          | 0.042  | 36       |
|                        |         |           |                       |            | Front         | 11   | 2462        | 0.027                    | 99.9%      | 11.0          | 11.0  |                |        |          |
| Hotspot                | 802.11b | WiFi Main | Simultaneous 2G_5G/6G | 10         | Edge Left     | 11   | 2462        | 0.074                    | 99.9%      | 11.0          | 11.0  | 0.077          | 0.077  | 37       |
|                        |         |           |                       |            | Edge Top      | 11   | 2462        | 0.002                    | 99.9%      | 11.0          | 11.0  |                |        |          |
| RF Exposure Conditions | Mode    | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|                        |         |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | 802.11g | WiFi Sub  | Normal                | 0          | Left Cheek    | 6    | 2437        | <.001                    | 99.1%      | 14.0          | 14.0  |                |        |          |
|                        |         |           |                       |            | Left Tilt     | 6    | 2437        | 0.001                    | 99.1%      | 14.0          | 14.0  |                |        | -        |
|                        |         |           |                       |            | Right Cheek   | 6    | 2437        | <.001                    | 99.1%      | 14.0          | 14.0  |                |        |          |
|                        |         |           |                       |            | Right Tilt    | 6    | 2437        | <.001                    | 99.1%      | 14.0          | 14.0  |                |        |          |
| Body-Worn and Hotspot  | 802.11g | WiFi Sub  | Normal                | 10         | Rear          | 6    | 2437        | 0.150                    | 99.1%      | 14.0          | 14.0  | 0.167          | 0.169  | 38       |
|                        |         |           |                       |            | Front         | 6    | 2437        | <.001                    | 99.1%      | 14.0          | 14.0  |                |        |          |
| Hotspot                | 802.11g | WiFi Sub  | Normal                | 10         | Edge Left     | 6    | 2437        | 0.003                    | 99.1%      | 14.0          | 14.0  |                |        |          |
|                        |         |           |                       |            | Edge Bottom   | 6    | 2437        | 0.012                    | 99.1%      | 14.0          | 14.0  |                |        |          |
| RF Exposure Conditions | Mode    | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|                        |         |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | 802.11b | WiFi Sub  | Simultaneous 2G_5G/6G | 0          | Left Cheek    | 11   | 2462        | 0.002                    | 99.9%      | 11.0          | 11.0  | <.001          | <.001  | -        |
|                        |         |           |                       |            | Left Tilt     | 11   | 2462        | <.001                    | 99.9%      | 11.0          | 11.0  |                |        |          |
|                        |         |           |                       |            | Right Cheek   | 11   | 2462        | <.001                    | 99.9%      | 11.0          | 11.0  |                |        |          |
|                        |         |           |                       |            | Right Tilt    | 11   | 2462        | <.001                    | 99.9%      | 11.0          | 11.0  |                |        |          |
| Body-Worn and Hotspot  | 802.11b | WiFi Sub  | Simultaneous 2G_5G/6G | 10         | Rear          | 11   | 2462        | 0.101                    | 99.9%      | 11.0          | 11.0  | 0.106          | 0.106  | 39       |
|                        |         |           |                       |            | Front         | 11   | 2462        | 0.002                    | 99.9%      | 11.0          | 11.0  |                |        |          |
| Hotspot                | 802.11b | WiFi Sub  | Simultaneous 2G_5G/6G | 10         | Edge Left     | 11   | 2462        | 0.002                    | 99.9%      | 11.0          | 11.0  |                |        |          |
|                        |         |           |                       |            | Edge Bottom   | 11   | 2462        | 0.005                    | 99.9%      | 11.0          | 11.0  |                |        |          |

### Notes:

- 10-g extremity SAR is not required since hotspot mode 1-g report SAR  $< 1.2$  W/kg

| Antenna   | 802.11b SAR (W/kg) | 802.11b pwr (dBm) | 802.11g/n pwr (dBm) | Adjusted SAR (W/kg) | Additional SAR Test |
|-----------|--------------------|-------------------|---------------------|---------------------|---------------------|
| WiFi Main | 0.362              | 14                | 14                  | 0.362               | Not Test            |

## 10.13. Wi-Fi (U-NII Band)

### UNII-1 &2A

When the specified maximum output power is the same for both UNII band 1 and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is

- $\leq 1.2$  W/kg, SAR is not required for UNII band 1
- $> 1.2$  W/kg, both bands should be tested independently for SAR.

#### UNII-1

| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------------------|-----------|-----------------------|------------|---------------|-------|-------------|--------------------------|------------|---------------|-------|----------------|--------|----------|
|                        |                  |           |                       |            |               |       |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Hotspot                | 802.11ac (VHT80) | WiFi Main | Normal                | 0          | Rear          | 42    | 5210        | 0.034                    | 99.0%      | 11.5          | 10.6  | 0.028          | 0.035  | 40       |
|                        |                  |           |                       |            | Front         | 42    | 5210        | 0.014                    | 99.0%      |               |       |                |        |          |
|                        |                  |           |                       |            | Edge Left     | 42    | 5210        | 0.033                    | 99.0%      |               |       |                |        |          |
|                        |                  |           |                       |            | Edge Top      | 42    | 5210        | 0.002                    | 99.0%      |               |       |                |        |          |
| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|                        |                  |           |                       |            |               |       |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Hotspot                | 802.11ac (VHT80) | WiFi Main | Simultaneous 2G_5G/6G | 0          | Rear          | 42    | 5210        | 0.022                    | 99.0%      | 9.5           | 8.9   | 0.013          | 0.015  | 41       |
|                        |                  |           |                       |            | Front         | 42    | 5210        | 0.009                    | 99.0%      |               |       |                |        |          |
|                        |                  |           |                       |            | Edge Left     | 42    | 5210        | 0.018                    | 99.0%      |               |       |                |        |          |
|                        |                  |           |                       |            | Edge Top      | 42    | 5210        | 0.005                    | 99.0%      |               |       |                |        |          |
| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|                        |                  |           |                       |            |               |       |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Hotspot                | 802.11ac (VHT80) | WiFi Sub  | Normal                | 0          | Rear          | 42    | 5210        | 0.032                    | 99.0%      | 11.5          | 10.9  | 0.024          | 0.028  | 42       |
|                        |                  |           |                       |            | Front         | 42    | 5210        | 0.006                    | 99.0%      |               |       |                |        |          |
|                        |                  |           |                       |            | Edge Left     | 42    | 5210        | 0.006                    | 99.0%      |               |       |                |        |          |
|                        |                  |           |                       |            | Edge Bottom   | 42    | 5210        | <0.001                   | 99.0%      |               |       |                |        |          |
| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|                        |                  |           |                       |            |               |       |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Hotspot                | 802.11ac (VHT80) | WiFi Sub  | Simultaneous 2G_5G/6G | 0          | Rear          | 42    | 5210        | 0.022                    | 99.0%      | 9.5           | 9.5   | 0.016          | 0.016  | 43       |
|                        |                  |           |                       |            | Front         | 42    | 5210        | 0.006                    | 99.0%      |               |       |                |        |          |
|                        |                  |           |                       |            | Edge Left     | 42    | 5210        | 0.005                    | 99.0%      |               |       |                |        |          |
|                        |                  |           |                       |            | Edge Bottom   | 42    | 5210        | 0.004                    | 99.0%      |               |       |                |        |          |



## UNII-2A

| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|------------------------|-------------------|-----------|-----------------------|------------|---------------|------|-------------|--------------------------|------------|---------------|-------|-----------------|--------|----------|
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT160) | WiFi Main | Normal                | 0          | Left Cheek    | 50   | 5250        | 0.023                    | 99.7%      | 11.5          | 10.7  |                 |        |          |
|                        |                   |           |                       |            | Left Tilt     | 50   | 5250        | 0.012                    | 99.7%      | 11.5          | 10.7  |                 |        |          |
|                        |                   |           |                       |            | Right Cheek   | 50   | 5250        | 0.106                    | 99.7%      | 11.5          | 10.7  | 0.151           | 0.182  | 44       |
|                        |                   |           |                       |            | Right Tilt    | 50   | 5250        | 0.035                    | 99.7%      | 11.5          | 10.7  |                 |        |          |
| Body-Worn              | 802.11ac (VHT160) | WiFi Main | Normal                | 10         | Rear          | 50   | 5250        | 0.030                    | 99.7%      | 11.5          | 10.7  | 0.023           | 0.028  | 45       |
|                        |                   |           |                       |            | Front         | 50   | 5250        | 0.016                    | 99.7%      | 11.5          | 10.7  |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 10-g SAR (W/kg) |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Extremity              | 802.11ac (VHT160) | WiFi Main | Normal                | 0          | Rear          | 50   | 5250        | 0.109                    | 99.7%      | 11.5          | 10.7  | 0.105           | 0.127  | 46       |
|                        |                   |           |                       |            | Front         | 50   | 5250        | 0.097                    | 99.7%      | 11.5          | 10.7  |                 |        |          |
|                        |                   |           |                       |            | Edge Left     | 50   | 5250        | 0.290                    | 99.7%      | 11.5          | 10.7  | 0.282           | 0.340  | 47       |
|                        |                   |           |                       |            | Edge Top      | 50   | 5250        | 0.011                    | 99.7%      | 11.5          | 10.7  |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT160) | WiFi Main | Simultaneous 2G_5G/6G | 0          | Left Cheek    | 50   | 5250        | 0.014                    | 99.7%      | 9.5           | 9.4   |                 |        |          |
|                        |                   |           |                       |            | Left Tilt     | 50   | 5250        | 0.013                    | 99.7%      | 9.5           | 9.4   |                 |        |          |
|                        |                   |           |                       |            | Right Cheek   | 50   | 5250        | 0.128                    | 99.7%      | 9.5           | 9.4   | 0.179           | 0.184  | 48       |
|                        |                   |           |                       |            | Right Tilt    | 50   | 5250        | 0.037                    | 99.7%      | 9.5           | 9.4   |                 |        |          |
| Body-Worn              | 802.11ac (VHT160) | WiFi Main | Simultaneous 2G_5G/6G | 10         | Rear          | 50   | 5250        | 0.032                    | 99.7%      | 9.5           | 9.4   | 0.024           | 0.025  | 49       |
|                        |                   |           |                       |            | Front         | 50   | 5250        | 0.013                    | 99.7%      | 9.5           | 9.4   |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT160) | WiFi Sub  | Normal                | 0          | Left Cheek    | 50   | 5250        | 0.004                    | 99.7%      | 11.5          | 10.9  | <0.001          | <0.001 | -        |
|                        |                   |           |                       |            | Left Tilt     | 50   | 5250        | <0.001                   | 99.7%      | 11.5          | 10.9  |                 |        |          |
|                        |                   |           |                       |            | Right Cheek   | 50   | 5250        | <0.001                   | 99.7%      | 11.5          | 10.9  |                 |        |          |
|                        |                   |           |                       |            | Right Tilt    | 50   | 5250        | <0.001                   | 99.7%      | 11.5          | 10.9  |                 |        |          |
| Body-Worn              | 802.11ac (VHT160) | WiFi Sub  | Normal                | 10         | Rear          | 50   | 5250        | 0.017                    | 99.7%      | 11.5          | 10.9  | 0.018           | 0.021  | 50       |
|                        |                   |           |                       |            | Front         | 50   | 5250        | <0.001                   | 99.7%      | 11.5          | 10.9  |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 10-g SAR (W/kg) |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Extremity              | 802.11ac (VHT160) | WiFi Sub  | Normal                | 0          | Rear          | 50   | 5250        | 0.138                    | 99.7%      | 11.5          | 10.9  | 0.157           | 0.181  | 51       |
|                        |                   |           |                       |            | Front         | 50   | 5250        | 0.003                    | 99.7%      | 11.5          | 10.9  |                 |        |          |
|                        |                   |           |                       |            | Edge Left     | 50   | 5250        | 0.005                    | 99.7%      | 11.5          | 10.9  | 0.001           | 0.001  | 52       |
|                        |                   |           |                       |            | Edge Top      | 50   | 5250        | 0.004                    | 99.7%      | 11.5          | 10.9  |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT160) | WiFi Main | Simultaneous 2G_5G/6G | 0          | Left Cheek    | 50   | 5250        | <0.001                   | 99.7%      | 9.5           | 9.4   | <0.001          | <0.001 | -        |
|                        |                   |           |                       |            | Left Tilt     | 50   | 5250        | <0.001                   | 99.7%      | 9.5           | 9.4   |                 |        |          |
|                        |                   |           |                       |            | Right Cheek   | 50   | 5250        | <0.001                   | 99.7%      | 9.5           | 9.4   |                 |        |          |
|                        |                   |           |                       |            | Right Tilt    | 50   | 5250        | <0.001                   | 99.7%      | 9.5           | 9.4   |                 |        |          |
| Body-Worn              | 802.11ac (VHT160) | WiFi Main | Simultaneous 2G_5G/6G | 10         | Rear          | 50   | 5250        | 0.018                    | 99.7%      | 9.5           | 9.4   | 0.011           | 0.011  | 53       |
|                        |                   |           |                       |            | Front         | 50   | 5250        | <0.001                   | 99.7%      | 9.5           | 9.4   |                 |        |          |

## Note(s):

- For results listed with "-", the SAR result is less than 0.01 W/kg.

**Wi-Fi UNII-2C**

| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|------------------------|-------------------|-----------|-----------------------|------------|---------------|------|-------------|--------------------------|------------|---------------|-------|-----------------|--------|----------|
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT160) | WiFi Main | Normal                | 0          | Left Cheek    | 114  | 5570        | 0.015                    | 99.7%      | 11.5          | 10.6  |                 |        |          |
|                        |                   |           |                       |            | Left Tilt     | 114  | 5570        | 0.013                    | 99.7%      | 11.5          | 10.6  |                 |        |          |
|                        |                   |           |                       |            | Right Cheek   | 114  | 5570        | 0.178                    | 99.7%      | 11.5          | 10.6  | 0.224           | 0.276  | 54       |
|                        |                   |           |                       |            | Right Tilt    | 114  | 5570        | 0.032                    | 99.7%      | 11.5          | 10.6  |                 |        |          |
| Body-Worn              | 802.11ac (VHT160) | WiFi Main | Normal                | 10         | Rear          | 114  | 5570        | 0.035                    | 99.7%      | 11.5          | 10.6  | 0.030           | 0.037  | 55       |
|                        |                   |           |                       |            | Front         | 114  | 5570        | 0.013                    | 99.7%      | 11.5          | 10.6  |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 10-g SAR (W/kg) |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Extremity              | 802.11ac (VHT160) | WiFi Main | Normal                | 0          | Rear          | 114  | 5570        | 0.075                    | 99.7%      | 11.5          | 10.6  |                 |        |          |
|                        |                   |           |                       |            | Front         | 114  | 5570        | 0.060                    | 99.7%      | 11.5          | 10.6  |                 |        |          |
|                        |                   |           |                       |            | Edge Left     | 114  | 5570        | 0.313                    | 99.7%      | 11.5          | 10.6  | 0.310           | 0.383  | 56       |
|                        |                   |           |                       |            | Edge Top      | 114  | 5570        | 0.018                    | 99.7%      | 11.5          | 10.6  |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT160) | WiFi Main | Simultaneous 2G_5G/6G | 0          | Left Cheek    | 114  | 5570        | 0.007                    | 99.7%      | 9.5           | 9.2   |                 |        |          |
|                        |                   |           |                       |            | Left Tilt     | 114  | 5570        | <.001                    | 99.7%      | 9.5           | 9.2   |                 |        |          |
|                        |                   |           |                       |            | Right Cheek   | 114  | 5570        | 0.098                    | 99.7%      | 9.5           | 9.2   | 0.122           | 0.131  | 57       |
|                        |                   |           |                       |            | Right Tilt    | 114  | 5570        | 0.005                    | 99.7%      | 9.5           | 9.2   |                 |        |          |
| Body-Worn              | 802.11ac (VHT160) | WiFi Main | Simultaneous 2G_5G/6G | 10         | Rear          | 114  | 5570        | 0.026                    | 99.7%      | 9.5           | 9.2   | 0.019           | 0.020  | 58       |
|                        |                   |           |                       |            | Front         | 114  | 5570        | 0.002                    | 99.7%      | 9.5           | 9.2   |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT160) | WiFi Sub  | Normal                | 0          | Left Cheek    | 114  | 5570        | <0.001                   | 99.7%      | 11.5          | 10.8  |                 |        |          |
|                        |                   |           |                       |            | Left Tilt     | 114  | 5570        | <0.001                   | 99.7%      | 11.5          | 10.8  |                 |        |          |
|                        |                   |           |                       |            | Right Cheek   | 114  | 5570        | <0.001                   | 99.7%      | 11.5          | 10.8  | <0.001          | <0.001 | -        |
|                        |                   |           |                       |            | Right Tilt    | 114  | 5570        | <0.001                   | 99.7%      | 11.5          | 10.8  |                 |        |          |
| Body-Worn              | 802.11ac (VHT160) | WiFi Sub  | Normal                | 10         | Rear          | 114  | 5570        | 0.028                    | 99.70%     | 11.5          | 10.8  | 0.028           | 0.033  | 59       |
|                        |                   |           |                       |            | Front         | 114  | 5570        | <.001                    | 99.7%      | 11.5          | 10.8  |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 10-g SAR (W/kg) |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Extremity              | 802.11ac (VHT160) | WiFi Sub  | Normal                | 0          | Rear          | 114  | 5570        | 0.243                    | 99.7%      | 11.5          | 10.8  | 0.316           | 0.372  | 60       |
|                        |                   |           |                       |            | Front         | 114  | 5570        | 0.011                    | 99.7%      | 11.5          | 10.8  |                 |        |          |
|                        |                   |           |                       |            | Edge Left     | 114  | 5570        | 0.035                    | 99.7%      | 11.5          | 10.8  |                 |        |          |
|                        |                   |           |                       |            | Edge Bottom   | 114  | 5570        | 0.025                    | 99.7%      | 11.5          | 10.8  |                 |        |          |
| RF Exposure Conditions | Mode              | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|                        |                   |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT160) | WiFi Sub  | Simultaneous 2G_5G/6G | 0          | Left Cheek    | 114  | 5570        | <0.001                   | 99.7%      | 9.5           | 9.4   |                 |        | -        |
|                        |                   |           |                       |            | Left Tilt     | 114  | 5570        | <0.001                   | 99.7%      | 9.5           | 9.4   |                 |        |          |
|                        |                   |           |                       |            | Right Cheek   | 114  | 5570        | <0.001                   | 99.7%      | 9.5           | 9.4   |                 |        |          |
|                        |                   |           |                       |            | Right Tilt    | 114  | 5570        | <0.001                   | 99.7%      | 9.5           | 9.4   |                 |        |          |
| Body-Worn              | 802.11ac (VHT160) | WiFi Sub  | Simultaneous 2G_5G/6G | 10         | Rear          | 114  | 5570        | 0.030                    | 99.7%      | 9.5           | 9.4   | 0.029           | 0.030  | 61       |
|                        |                   |           |                       |            | Front         | 114  | 5570        | 0.004                    | 99.7%      | 9.5           | 9.4   |                 |        |          |

**Note(s):**

- For results listed with “-”, the SAR result is less than 0.01 W/kg.

**Wi-Fi UNII-3**

| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|------------------------|------------------|-----------|-----------------------|------------|---------------|------|-------------|--------------------------|------------|---------------|-------|-----------------|--------|----------|
|                        |                  |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11n (HT40)   | WiFi Main | Normal                | 0          | Left Cheek    | 159  | 5795        | 0.016                    | 99.6%      | 11.5          | 10.6  |                 |        |          |
|                        |                  |           |                       |            | Left Tilt     | 159  | 5795        | 0.003                    | 99.6%      | 11.5          | 10.6  |                 |        |          |
|                        |                  |           |                       |            | Right Cheek   | 159  | 5795        | 0.098                    | 99.6%      | 11.5          | 10.6  | 0.211           | 0.261  | 62       |
|                        |                  |           |                       |            | Right Tilt    | 159  | 5795        | 0.028                    | 99.6%      | 11.5          | 10.6  |                 |        |          |
| Body-Worn / Hotspot    | 802.11n (HT40)   | WiFi Main | Normal                | 10         | Rear          | 159  | 5795        | 0.045                    | 99.6%      | 11.5          | 10.6  | 0.038           | 0.047  | 63       |
|                        |                  |           |                       |            | Front         | 159  | 5795        | 0.008                    | 99.6%      | 11.5          | 10.6  |                 |        |          |
| Hotspot                | 802.11n (HT40)   | WiFi Main | Normal                | 10         | Edge Left     | 159  | 5795        | 0.061                    | 99.6%      | 11.5          | 10.6  | 0.061           | 0.075  | 64       |
|                        |                  |           |                       |            | Edge Top      | 159  | 5795        | 0.012                    | 99.6%      | 11.5          | 10.6  |                 |        |          |
| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 10-g SAR (W/kg) |        | Plot No. |
|                        |                  |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Extremity              | 802.11n (HT40)   | WiFi Main | Normal                | 0          | Rear          | 159  | 5795        | 0.086                    | 99.6%      | 11.5          | 10.6  |                 |        |          |
|                        |                  |           |                       |            | Front         | 159  | 5795        | 0.080                    | 99.6%      | 11.5          | 10.6  |                 |        |          |
|                        |                  |           |                       |            | Edge Left     | 159  | 5795        | 0.337                    | 99.6%      | 11.5          | 10.6  | 0.340           | 0.420  | 65       |
|                        |                  |           |                       |            | Edge Top      | 159  | 5795        | 0.022                    | 99.6%      | 11.5          | 10.6  |                 |        |          |
| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|                        |                  |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11ac (VHT80) | WiFi Main | Simultaneous 2G_5G/6G | 0          | Left Cheek    | 155  | 5775        | 0.008                    | 99.0%      | 9.5           | 9.4   |                 |        |          |
|                        |                  |           |                       |            | Left Tilt     | 155  | 5775        | <0.001                   | 99.0%      | 9.5           | 9.4   |                 |        |          |
|                        |                  |           |                       |            | Right Cheek   | 155  | 5775        | 0.073                    | 99.0%      | 9.5           | 9.4   | 0.105           | 0.109  | 66       |
|                        |                  |           |                       |            | Right Tilt    | 155  | 5775        | 0.033                    | 99.0%      | 9.5           | 9.4   |                 |        |          |
| Body-Worn / Hotspot    | 802.11ac (VHT80) | WiFi Main | Simultaneous 2G_5G/6G | 10         | Rear          | 155  | 5775        | 0.03                     | 99.0%      | 9.5           | 9.4   | 0.019           | 0.020  | 67       |
|                        |                  |           |                       |            | Front         | 155  | 5775        | 0.003                    | 99.0%      | 9.5           | 9.4   |                 |        |          |
| Hotspot                | 802.11ac (VHT80) | WiFi Main | Simultaneous 2G_5G/6G | 10         | Edge Left     | 155  | 5775        | 0.046                    | 99.0%      | 9.5           | 9.4   | 0.043           | 0.044  | 68       |
|                        |                  |           |                       |            | Edge Top      | 155  | 5775        | 0.017                    | 99.0%      | 9.5           | 9.4   |                 |        |          |
| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg)  |        | Plot No. |
|                        |                  |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Head                   | 802.11n (HT40)   | WiFi Sub  | Normal                | 0          | Left Cheek    | 151  | 5755        | 0.008                    | 99.6%      | 11.5          | 11    |                 |        |          |
|                        |                  |           |                       |            | Left Tilt     | 151  | 5755        | 0.01                     | 99.6%      | 11.5          | 11    |                 |        |          |
|                        |                  |           |                       |            | Right Cheek   | 151  | 5755        | 0.005                    | 99.6%      | 11.5          | 11    |                 |        |          |
|                        |                  |           |                       |            | Right Tilt    | 151  | 5755        | 0.015                    | 99.6%      | 11.5          | 11    | <0.001          | <0.001 | -        |
| Body-Worn / Hotspot    | 802.11n (HT40)   | WiFi Sub  | Normal                | 10         | Rear          | 151  | 5755        | 0.06                     | 99.6%      | 11.5          | 11    | 0.060           | 0.068  | 69       |
|                        |                  |           |                       |            | Front         | 151  | 5755        | 0.008                    | 99.6%      | 11.5          | 11    |                 |        |          |
| Hotspot                | 802.11n (HT40)   | WiFi Sub  | Normal                | 10         | Edge Left     | 151  | 5755        | 0.013                    | 99.6%      | 11.5          | 11    | 0.008           | 0.009  |          |
|                        |                  |           |                       |            | Edge Bottom   | 151  | 5755        | 0.001                    | 99.6%      | 11.5          | 11    |                 |        |          |
| RF Exposure Conditions | Mode             | Antenna   | Power State           | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 10-g SAR (W/kg) |        | Plot No. |
|                        |                  |           |                       |            |               |      |             |                          |            | Tune-up Limit | Meas. | Meas.           | Scaled |          |
| Extremity              | 802.11n (HT40)   | WiFi Main | Normal                | 0          | Rear          | 151  | 5755        | 0.231                    | 99.6%      | 11.5          | 11.0  | 0.349           | 0.393  | 70       |
|                        |                  |           |                       |            | Front         | 151  | 5755        | 0.009                    | 99.6%      | 11.5          | 11.0  |                 |        |          |
|                        |                  |           |                       |            | Edge Left     | 151  | 5755        | 0.013                    | 99.6%      | 11.5          | 11.0  | 0.007           | 0.008  |          |
|                        |                  |           |                       |            | Edge Bottom   | 151  | 5755        | 0.005                    | 99.6%      | 11.5          | 11.0  |                 |        |          |

| RF Exposure Conditions | Mode             | Antenna  | Power State           | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Area Scan Max SAR (W/kg) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------------------|----------|-----------------------|------------|---------------|-------|-------------|--------------------------|------------|---------------|-------|----------------|--------|----------|
|                        |                  |          |                       |            |               |       |             |                          |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | 802.11ac (VHT80) | WiFi Sub | Simultaneous 2G_5G/6G | 0          | Left Cheek    | 155   | 5775        | 0.003                    | 99.0%      | 9.5           | 9.1   |                |        |          |
|                        |                  |          |                       |            | Left Tilt     | 155   | 5775        | 0.006                    | 99.0%      | 9.5           | 9.1   | <0.001         | <0.001 | -        |
|                        |                  |          |                       |            | Right Cheek   | 155   | 5775        | 0.004                    | 99.0%      | 9.5           | 9.1   |                |        |          |
|                        |                  |          |                       |            | Right Tilt    | 155   | 5775        | 0.004                    | 99.0%      | 9.5           | 9.1   |                |        |          |
| Body-Worn / Hotspot    | 802.11ac (VHT80) | WiFi Sub | Simultaneous 2G_5G/6G | 10         | Rear          | 155   | 5775        | 0.044                    | 99.0%      | 9.5           | 9.1   | 0.046          | 0.051  | 71       |
|                        |                  |          |                       |            | Front         | 155   | 5775        | <0.001                   | 99.0%      | 9.5           | 9.1   |                |        |          |
| Hotspot                | 802.11ac (VHT80) | WiFi Sub | Simultaneous 2G_5G/6G | 10         | Edge Left     | 155   | 5775        | 0.011                    | 99.0%      | 9.5           | 9.1   |                |        |          |
|                        |                  |          |                       |            | Edge Bottom   | 155   | 5775        | 0.001                    | 99.0%      | 9.5           | 9.1   |                |        |          |

**Note(s):**

- For results listed with "-", the SAR result is less than 0.001 W/kg.

**10.14. Bluetooth**

| RF Exposure Conditions | Mode | Antenna   | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|------------------------|------|-----------|------------|---------------|-------|-------------|------------|---------------|-------|----------------|--------|----------|
|                        |      |           |            |               |       |             |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | GFSK | WiFi Main | 0          | Left Cheek    | 78    | 2480        | 100.0%     | 14.0          | 13.5  | 0.058          | 0.065  |          |
|                        |      |           |            | Left Tilt     | 78    | 2480        | 100.0%     | 14.0          | 13.5  | 0.020          | 0.022  |          |
|                        |      |           |            | Right Cheek   | 78    | 2480        | 100.0%     | 14.0          | 13.5  | 0.272          | 0.305  | 72       |
|                        |      |           |            | Right Tilt    | 78    | 2480        | 100.0%     | 14.0          | 13.5  | 0.071          | 0.080  |          |
| Body-Worn and Hotspot  | GFSK | WiFi Main | 10         | Rear          | 78    | 2480        | 100.0%     | 14.0          | 13.5  | 0.046          | 0.052  | 73       |
|                        |      |           |            | Front         | 78    | 2480        | 100.0%     | 14.0          | 13.5  | 0.032          | 0.036  |          |
| Hotspot                | GFSK | WiFi Main | 10         | Edge Left     | 78    | 2480        | 100.0%     | 14.0          | 13.5  | 0.074          | 0.083  | 74       |
|                        |      |           |            | Edge Top      | 78    | 2480        | 100.0%     | 14.0          | 13.5  | 0.003          | 0.003  |          |
| RF Exposure Conditions | Mode | Antenna   | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Duty Cycle | Power (dBm)   |       | 1-g SAR (W/kg) |        | Plot No. |
|                        |      |           |            |               |       |             |            | Tune-up Limit | Meas. | Meas.          | Scaled |          |
| Head                   | GFSK | WiFi Sub  | 0          | Left Cheek    | 39    | 2441        | 100.0%     | 14.0          | 13.3  | <.001          | <.001  | -        |
|                        |      |           |            | Left Tilt     | 39    | 2441        | 100.0%     | 14.0          | 13.3  | <.001          | <.001  |          |
|                        |      |           |            | Right Cheek   | 39    | 2441        | 100.0%     | 14.0          | 13.3  | <.001          | <.001  |          |
|                        |      |           |            | Right Tilt    | 39    | 2441        | 100.0%     | 14.0          | 13.3  | <.001          | <.001  |          |
| Body-Worn and Hotspot  | GFSK | WiFi Sub  | 10         | Rear          | 39    | 2441        | 100.0%     | 14.0          | 13.3  | 0.075          | 0.088  | 75       |
|                        |      |           |            | Front         | 39    | 2441        | 100.0%     | 14.0          | 13.3  | <.001          | <.001  |          |
| Hotspot                | GFSK | WiFi Sub  | 10         | Edge Left     | 39    | 2441        | 100.0%     | 14.0          | 13.3  | 0.001          | 0.001  |          |
|                        |      |           |            | Edge Bottom   | 39    | 2441        | 100.0%     | 14.0          | 13.3  | 0.007          | 0.008  |          |

**Note(s):**

- For results listed with "-", the SAR result is less than 0.001 W/kg.
- TCB Workshop October 2016 was referenced to support utilizing a 100% Duty Cycle for Bluetooth.

## 11. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is  $< 0.8$  or  $2 \text{ W/kg}$  (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is  $\geq 0.8$  or  $2 \text{ W/kg}$  (1-g or 10-g respectively), repeat that measurement once.
- 3) Perform a second repeated measurement only if the **ratio of largest to smallest SAR** for the original and first repeated measurements is  $> 1.20$  or when the original or repeated measurement is  $\geq 1.45$  or  $3.6 \text{ W/kg}$  ( $\sim 10\%$  from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first, or second repeated measurement is  $\geq 1.5$  or  $3.75 \text{ W/kg}$  (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .

### Note(s):

Repeated measurement is not required since the original highest measured SAR is  $< 0.8 \text{ W/kg}$  (1-g) or  $2 \text{ W/kg}$  (10-g) .

## 12. Simultaneous Transmission Conditions

| RF Exposure Condition      | Tx Mode | WWAN       |            | WiFi Main     |             |           | Wi-Fi Sub     |             |           | NFC |
|----------------------------|---------|------------|------------|---------------|-------------|-----------|---------------|-------------|-----------|-----|
|                            |         | CELL Main1 | CELL Main2 | 2.4 GHz Wi-Fi | 5 GHz Wi-Fi | Bluetooth | 2.4 GHz Wi-Fi | 5 GHz Wi-Fi | Bluetooth |     |
| Head, Body-worn, & Hotspot | 1       | ✓          |            | ✓             |             |           | ✓             |             |           |     |
|                            | 2       | ✓          |            |               | ✓           |           |               | ✓           |           |     |
|                            | 3       | ✓          |            |               |             | ✓         |               |             |           |     |
|                            | 4       | ✓          |            |               |             |           |               |             | ✓         |     |
|                            | 5       | ✓          |            |               | ✓           | ✓         |               | ✓           |           |     |
|                            | 6       | ✓          |            |               | ✓           |           |               | ✓           | ✓         |     |
|                            | 7       | ✓          |            | ✓             | ✓           |           | ✓             | ✓           |           |     |
|                            | 8       |            | ✓          | ✓             |             |           | ✓             |             |           |     |
|                            | 9       |            | ✓          |               | ✓           |           |               | ✓           |           |     |
|                            | 10      |            | ✓          |               |             | ✓         |               |             |           |     |
|                            | 11      |            | ✓          |               |             |           |               |             | ✓         |     |
|                            | 12      |            | ✓          |               | ✓           | ✓         |               | ✓           |           |     |
|                            | 13      |            | ✓          |               | ✓           |           |               | ✓           | ✓         |     |
|                            | 14      |            | ✓          | ✓             | ✓           |           |               | ✓           |           |     |
| Extremity                  | 15      |            |            |               | ✓           |           |               | ✓           |           | ✓   |

### 12.1. Simultaneous transmission SAR test exclusion considerations

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

#### Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

### 12.2. Estimated SAR for Simultaneous Transmission SAR Analysis

#### Considerations for SAR estimation

- When standalone SAR test exclusion applies, standalone SAR must also be estimated to determine simultaneous transmission SAR test exclusion.
- Dedicated Host Approach criteria for SAR test exclusion is likewise applied to SAR estimation, with certain distinctions between test exclusion and SAR estimation:
  - When the separation distance from the antenna to an adjacent edge is  $\leq 5$  mm, a distance of 5 mm is applied for SAR estimation; this is the same between test exclusion and SAR estimation calculations.
  - When the separation distance from the antenna to an adjacent edge is  $> 5$  mm but  $\leq 50$  mm, the actual antenna-to-edge separation distance is applied for SAR estimation.
  - When the minimum test separation distance is  $> 50$  mm, the estimated SAR value is 0.4 W/kg
- Please refer to Estimated SAR Tables to see which test positions are inherently compliant as they consist of only estimated SAR values for all applicable transmitters and consequently will always have sum of SAR values  $< 1.2$  W/kg. Simultaneous transmission SAR analysis was therefore not performed for these test positions.

#### Estimated SAR for NFC

| Antenna | Tx Interface | Frequency (MHz) | Output Power | Separation Distances (mm) |  | Estimated 10-g SAR Value (W/kg) |
|---------|--------------|-----------------|--------------|---------------------------|--|---------------------------------|
|         |              |                 | mW           | Back                      |  | Back                            |
| NFC     | NFC          | 13.56           | 403          | 0                         |  | 0.501                           |

### 12.3. Sum of the SAR for WWAN CELL Main1 & Wi-Fi Normal State & BT

| RF Exposure Conditions | Standalone SAR (W/kg) |                |               |                |               |                |               | Σ 1-g SAR (W/kg)    |                   |                        |                        |           |           |
|------------------------|-----------------------|----------------|---------------|----------------|---------------|----------------|---------------|---------------------|-------------------|------------------------|------------------------|-----------|-----------|
|                        | WWAN                  | WLAN 2.4 GHz   |               | WLAN 5 GHz     |               | BT             |               | WWAN + WLAN 2.4 GHz | WWAN + WLAN 5 GHz | WWAN + WLAN 5 GHz + BT | WWAN + WLAN 5 GHz + BT | WWAN + BT | WWAN + BT |
|                        | CELL Main1<br>①       | WiFi Main<br>② | WiFi Sub<br>③ | WiFi Main<br>④ | WiFi Sub<br>⑤ | WiFi Main<br>⑥ | WiFi Sub<br>⑦ | ① + ② + ③           | ① + ④ + ⑤         | ① + ④ + ⑤ + ⑥          | ① + ④ + ⑤ + ⑦          | ① + ⑥     | ① + ⑦     |
| Head                   | 0.118                 | 0.362          | 0.169         | 0.276          | 0.068         | 0.305          | 0.088         | 0.649               | 0.462             | 0.767                  | 0.550                  | 0.423     | 0.206     |
| Body                   | 0.266                 | 0.043          | 0.169         | 0.047          | 0.068         | 0.052          | 0.088         | 0.478               | 0.381             | 0.433                  | 0.469                  | 0.318     | 0.354     |
| Hotspot                | 0.266                 | 0.073          | 0.169         | 0.075          | 0.068         | 0.083          | 0.088         | 0.508               | 0.409             | 0.492                  | 0.497                  | 0.349     | 0.354     |

#### Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

### 12.4. Sum of the SAR for WWAN CELL Main1 & Wi-Fi Simultaneous 2G\_5G State

| RF Exposure Conditions | Standalone SAR (W/kg) |                |               |                |               | Σ 1-g SAR (W/kg)                 |
|------------------------|-----------------------|----------------|---------------|----------------|---------------|----------------------------------|
|                        | WWAN                  | WLAN 2.4 GHz   |               | WLAN 5 GHz     |               | WWAN + WLAN 2.4 GHz + WLAN 5 GHz |
|                        | CELL Main1<br>①       | WiFi Main<br>② | WiFi Sub<br>③ | WiFi Main<br>④ | WiFi Sub<br>⑤ | ① + ② + ③ + ④ + ⑤                |
| Head                   | 0.118                 | 0.337          | 0.106         | 0.184          | 0.051         | 0.796                            |
| Body                   | 0.266                 | 0.042          | 0.106         | 0.025          | 0.051         | 0.490                            |
| Hotspot                | 0.266                 | 0.077          | 0.106         | 0.044          | 0.051         | 0.544                            |

#### Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

### 12.5. Sum of the SAR for WWAN CELL Main2 & Wi-Fi Normal State & BT

| RF Exposure Conditions | Standalone SAR (W/kg) |                |               |                |               |                |               | Σ 1-g SAR (W/kg)    |                   |                        |                        |           |           |
|------------------------|-----------------------|----------------|---------------|----------------|---------------|----------------|---------------|---------------------|-------------------|------------------------|------------------------|-----------|-----------|
|                        | WWAN                  | WLAN 2.4 GHz   |               | WLAN 5 GHz     |               | BT             |               | WWAN + WLAN 2.4 GHz | WWAN + WLAN 5 GHz | WWAN + WLAN 5 GHz + BT | WWAN + WLAN 5 GHz + BT | WWAN + BT | WWAN + BT |
|                        | CELL Main2<br>①       | WiFi Main<br>② | WiFi Sub<br>③ | WiFi Main<br>④ | WiFi Sub<br>⑤ | WiFi Main<br>⑥ | WiFi Sub<br>⑦ | ① + ② + ③           | ① + ④ + ⑤         | ① + ④ + ⑤ + ⑥          | ① + ④ + ⑤ + ⑦          | ① + ⑥     | ① + ⑦     |
| Head                   | 0.082                 | 0.362          | 0.169         | 0.276          | 0.068         | 0.305          | 0.088         | 0.613               | 0.426             | 0.731                  | 0.514                  | 0.387     | 0.170     |
| Body                   | 0.252                 | 0.043          | 0.169         | 0.047          | 0.068         | 0.052          | 0.088         | 0.464               | 0.367             | 0.419                  | 0.455                  | 0.304     | 0.340     |
| Hotspot                | 0.470                 | 0.073          | 0.169         | 0.075          | 0.068         | 0.083          | 0.088         | 0.712               | 0.613             | 0.696                  | 0.701                  | 0.553     | 0.558     |

#### Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

### 12.6. Sum of the SAR for WWAN CELL Main2 & Wi-Fi Simultaneous 2G\_5G State

| RF Exposure Conditions | Standalone SAR (W/kg) |                |               |                |               | Σ 1-g SAR (W/kg)                 |
|------------------------|-----------------------|----------------|---------------|----------------|---------------|----------------------------------|
|                        | WWAN                  | WLAN 2.4 GHz   |               | WLAN 5 GHz     |               | WWAN + WLAN 2.4 GHz + WLAN 5 GHz |
|                        | CELL Main2<br>①       | WiFi Main<br>② | WiFi Sub<br>③ | WiFi Main<br>④ | WiFi Sub<br>⑤ | ① + ② + ③ + ④ + ⑤                |
| Head                   | 0.082                 | 0.337          | 0.106         | 0.184          | 0.051         | 0.760                            |
| Body                   | 0.252                 | 0.042          | 0.106         | 0.025          | 0.051         | 0.476                            |
| Hotspot                | 0.470                 | 0.077          | 0.106         | 0.044          | 0.051         | 0.748                            |

#### Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

### 12.7. Sum of the SAR for Wi-Fi Normal State & NFC

| RF Exposure Conditions | Standalone SAR (W/kg) |               |          | Σ 10-g SAR (W/kg) |
|------------------------|-----------------------|---------------|----------|-------------------|
|                        | WLAN 5 GHz            |               | NFC      | WLAN 5 GHz + NFC  |
|                        | WiFi Main<br>①        | WiFi Sub<br>② | NFC<br>③ | ① + ② + ③         |
| Extremity              | 0.420                 | 0.372         | 0.501    | 1.293             |

#### Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 10-g SAR is < 4 W/kg or the SPLSR is < 0.1 for all circumstances that require SPLSR calculation.

## **Appendixes**

**Refer to separated files for the following appendixes.**

**Appendix A: SAR Setup Photos**

**Appendix B: SAR System Check Plots**

**Appendix C: SAR Highest Test Plots**

**Appendix D: SAR Tissue Ingredients**

**Appendix E: SAR Probe Certificates**

**Appendix F: SAR Dipole Certificates**

**END OF REPORT**