# SAR EVALUATION REPORT

**FCC 47 CFR § 2.1093**
**IEEE Std 1528-2013**

*For*
**GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC**

**FCC ID: PY7-21831A**

**Report Number: 12073310-S1V5**
**Issue Date: 2/1/2018**

*Prepared for*
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NVLAP LAB CODE 200065-0

**Revision History**

| Rev. | Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 1/9/2018 | Initial Issue | -- |
| V2 | 1/18/2018 | Sec.1: Corrected typo.<br>Sec. 6.1: Updated device dimensions<br>Sec. 6.2: Updated Table<br>Appendix A: Updated Antenna Dimensions exhibit | Kenneth Mak<br>Coltyce Sanders |
| V3 | 1/19/2018 | Sec.1 and 12: Corrected typo. | Devin Chang |
| V4 | 1/23/2018 | Sec. 10.19: Updated Max tune-up power<br>Sec. 12.1: Updated BT estimated SAR | Coltyce Sanders |
| V5 | 2/1/2018 | Sec. 6.1: Updated | Kenneth Mak |

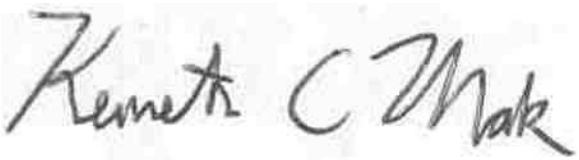
**Table of Contents**

# 1. Attestation of Test Results

| | | | | |
|---|---|---|---|---|
| Applicant Name | SONY MOBILE COMMUNICATIONS INC. | | | |
| FCC ID | PY7-21831A | | | |
| Applicable Standards | FCC 47 CFR § 2.1093<br>Published RF exposure KDB procedures<br>IEEE Std 1528-2013 | | | |
| Exposure Category | SAR Limits (W/Kg) | | | |
| | Peak spatial-average (1g of tissue) | | Product specific (10g of tissue) | |
| General population / Uncontrolled exposure | 1.6 | | 4 | |
| RF Exposure Conditions | Equipment Class - Highest Reported SAR (W/kg) | | | |
| | PCE | DTS | NII | DSS |
| Head | 0.356 | 0.328 | 0.598 | 0.204 |
| Body-worn | 0.307 | 0.024 | 0.061 | N/A |
| Hotspot/Wi-Fi Direct | 0.622 | 0.081 | N/A | N/A |
| Product specific 10g SAR | N/A | N/A | 0.302 | N/A |
| Simultaneous TX | 1.251 | 0.910 | 1.251 | 1.251 |
| Date Tested | 12/18/2017 to 12/29/2017 | | | |
| Test Results | Pass | | | |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

| Approved & Released By: | Prepared By: |
|---|---|
|  |  |
| Devin Chang<br>Senior Test Engineer<br>UL Verification Services Inc. | Kenneth C. Mak<br>Test Engineer<br>UL Verification Services Inc. |

# 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

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

- TCB workshop October, 2014; Page 36, RF Exposure Procedures Update (Overlapping LTE Bands)
- TCB workshop October, 2014; Page 37, RF Exposure Procedures Update (Other LTE Considerations)
- TCB workshop October, 2015; Page 6, RF Exposure Procedures (KDB 941225 D05A)
- TCB workshop April, 2016; Page 13, RF Exposure Procedures (LTE Carrier Aggregation for DL)
- TCB workshop October, 2016; Page 7, RF Exposure Procedures (Bluetooth Duty Factor)

# 3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

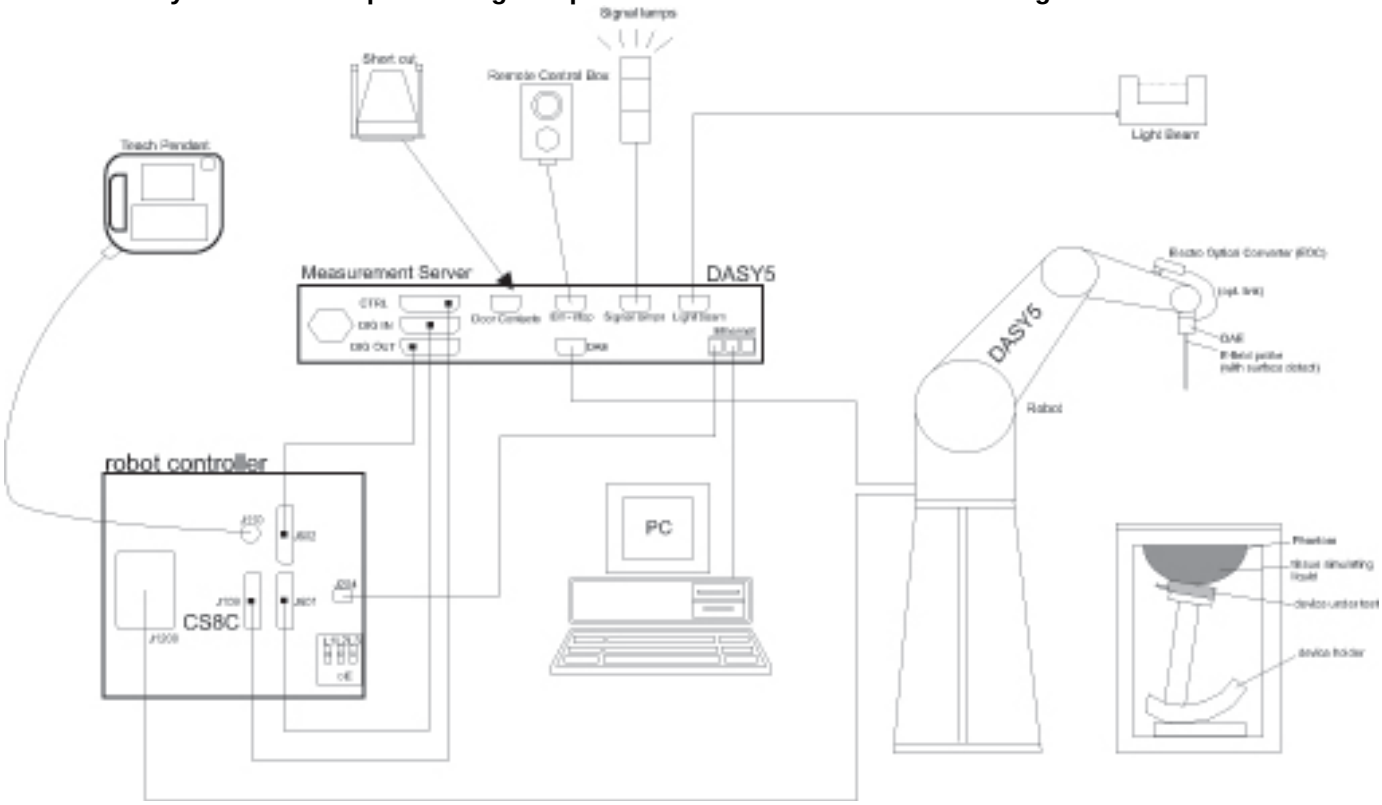
| 47173 Benicia Street | 47266 Benicia Street |
|---|---|
| SAR Lab A | SAR Lab 1 |
| SAR Lab B | SAR Lab 2 |
| SAR Lab C | SAR Lab 3 |
| SAR Lab D | SAR Lab 4 |
| SAR Lab E | |
| SAR Lab F | |
| SAR Lab G | |
| SAR Lab H | |

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

# 4. SAR Measurement System & Test Equipment

## 4.1. SAR Measurement System

**The DASY5 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 WinXP or Win7 and the DASY5 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.

## 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 IEEE Standard 1528 and IEC 62209 standards, 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

| | ≤ 3 GHz | > 3 GHz |
|---|---|---|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | 5 ± 1 mm | ½·δ·ln(2) ± 0.5 mm |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location | 30° ± 1° | 20° ± 1° |
| Maximum area scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$ | ≤ 2 GHz: ≤ 15 mm<br>2 – 3 GHz: ≤ 12 mm | 3 – 4 GHz: ≤ 12 mm<br>4 – 6 GHz: ≤ 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 ≤ 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

| | | | ≤ 3 GHz | > 3 GHz |
|---|---|---|---|---|
| Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$, $\Delta y_{Zoom}$ | | | ≤ 2 GHz: ≤ 8 mm<br>2 – 3 GHz: ≤ 5 mm* | 3 – 4 GHz: ≤ 5 mm*<br>4 – 6 GHz: ≤ 4 mm* |
| Maximum zoom scan spatial resolution, normal to phantom surface | uniform grid: $\Delta z_{Zoom}(n)$ | | ≤ 5 mm | 3 – 4 GHz: ≤ 4 mm<br>4 – 5 GHz: ≤ 3 mm<br>5 – 6 GHz: ≤ 2 mm |
| | graded grid | $\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface | ≤ 4 mm | 3 – 4 GHz: ≤ 3 mm<br>4 – 5 GHz: ≤ 2.5 mm<br>5 – 6 GHz: ≤ 2 mm |
| | | $\Delta z_{Zoom}(n>1)$: between subsequent points | ≤ 1.5·$\Delta z_{Zoom}(n-1)$ | |
| Minimum zoom scan volume | x, y, z | | ≥ 30 mm | 3 – 4 GHz: ≥ 28 mm<br>4 – 5 GHz: ≥ 25 mm<br>5 – 6 GHz: ≥ 22 mm |

Note: δ 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 *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 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.

**Step 5: Z-Scan (FCC only)**

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

## 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 | Agilent | 8753ES | MY40001647 | 9/15/2018 |
| Dielectric Probe kit | SPEAG | DAK-3.5 | 1103 | 2/16/2018 |
| Shorting block | SPEAG | DAK-3.5 Short | SM DAK 200 BA | 2/16/2018 |
| Thermometer | Traceable Calibration Control Co. | 4242 | 150378159 | 5/26/2018 |

**System Check**

| Name of Equipment | Manufacturer | Type/Model | Serial No. | Cal. Due Date |
|---|---|---|---|---|
| Synthesized Signal Generator | Agilent | N5181A | MY50140610 | 5/31/2018 |
| Power Meter | Keysight | N1912A | MY55196008 | 5/12/2018 |
| Power Sensor | Agilent | N1921A | MY52260009 | 1/5/2018 |
| Power Sensor | Agilent | N1921A | MY53020038 | 4/13/2018 |
| DC Power Supply | HP | 6296A | 2841A-05955 | N/A |
| Amplifier | MITEQ | AMF-4D-00400600-50-30P | 1795093 | N/A |
| Directional coupler | Werlatone | C8060-102 | 2149 | N/A |
| Synthesized Signal Generator | Agilent | N5181A | MY50140630 | 5/16/2018 |
| Power Meter | HP | 437B | 3125U12345 | 8/10/2018 |
| Power Meter | HP | 437B | 3125U11347 | 8/15/2018 |
| Power Sensor | HP | 8481A | 3318A92374 | 8/15/2018 |
| Power Sensor | HP | 8481A | 1926A27048 | 8/10/2018 |
| Amplifier | MITEQ | AMF-4D-00400600-50-30P | 1795092 | N/A |
| Directional coupler | Werlatone | C8060-102 | 2141 | N/A |
| DC Power Supply | BK Precision | 1611 | 215-02292 | N/A |

| Name of Equipment | Manufacturer | Type/Model | Serial No. | Cal. Due Date |
|---|---|---|---|---|
| E-Field Probe (SAR Lab A) | SPEAG | EX3DV4 | 7463 | 7/5/2018 |
| E-Field Probe (SAR Lab B) | SPEAG | EX3DV4 | 7335 | 3/15/2018 |
| E-Field Probe (SAR Lab C) | SPEAG | EX3DV4 | 3929 | 3/15/2018 |
| E-Field Probe (SAR Lab E) | SPEAG | EX3DV4 | 3772 | 2/16/2018 |
| E-Field Probe (SAR Lab F) | SPEAG | EX3DV4 | 3773 | 4/21/2018 |
| E-Field Probe (SAR Lab G) | SPEAG | EX3DV4 | 3989 | 2/16/2018 |
| Data Acquisition Electronics (SAR Lab A) | SPEAG | DAE4 | 1434 | 4/19/2018 |
| Data Acquisition Electronics (SAR Lab B) | SPEAG | DAE4 | 1380 | 7/24/2018 |
| Data Acquisition Electronics (SAR Lab C) | SPEAG | DAE4 | 1343 | 8/21/2018 |
| Data Acquisition Electronics (SAR Lab E) | SPEAG | DAE4 | 1357 | 2/13/2018 |
| Data Acquisition Electronics (SAR Lab F) | SPEAG | DAE4 | 1259 | 1/20/2018 |
| Data Acquisition Electronics (SAR Lab G) | SPEAG | DAE4 | 1472 | 3/10/2018 |
| System Validation Dipole | SPEAG | D750V3 | 1019 | 3/13/2018 |
| System Validation Dipole | SPEAG | D835V2 | 4d142 | 10/12/2018 |
| System Validation Dipole | SPEAG | D1750V2 | 1050 | 4/18/2018 |
| System Validation Dipole | SPEAG | D1900V2 | 5d043 | 11/22/2018 |
| System Validation Dipole | SPEAG | D1900V2 | 5d140 | 4/19/2018 |
| System Validation Dipole | SPEAG | D1900V2 | 5d163 | 10/5/2018 |
| System Validation Dipole | SPEAG | D2450V2 | 748 | 2/8/2018 |
| System Validation Dipole | SPEAG | D2450V2 | 899 | 3/10/2018 |
| System Validation Dipole | SPEAG | D2600V2 | 1036 | 3/10/2018 |
| System Validation Dipole | SPEAG | D5GHzV2 | 1168 | 11/23/2018 |
| System Validation Dipole | SPEAG | D5GHzV2 | 1138 | 10/26/2018 |

**Other**

| Name of Equipment | Manufacturer | Type/Model | T Number | Serial No. | Cal. Due Date |
|---|---|---|---|---|---|
| Power Meter | Keysight | N1912A | T1273 | MY55196007 | 7/17/2018 |
| Power Meter | Keysight | N1912A | T1263 | MY55196004 | 7/14/2018 |
| Power Meter | Agilent | N1912A | T733 | MY50001008 | 10/17/2018 |
| Power Sensor | Agilent | N1921A | T751 | MY53260010 | 10/17/2018 |
| Power Sensor | Agilent | N1921A | T748 | MY53020038 | 4/13/2018 |
| DC Power Supply | HP | 6296A | N/A | 2841A-05955 | N/A |
| Base station Simulator | R&S | CMW500 | T978 | 137877 | 9/1/2018 |
| Base station Simulator | R&S | CMW500 | T960 | 135384 | 6/30/2018 |
| Base station Simulator | R&S | CMW500 | T948 | 135393 | 5/15/2018 |
| Base station Simulator | R&S | CMW500 | T958 | 134855 | 6/12/2018 |
| Base station Simulator | R&S | CMW500 | T259 | 124594 | 10/24/2018 |
| Base station Simulator | R&S | CMW500 | T1526 | 147543 | 5/2/2018 |
| Base station Simulator | R&S | CMW500 | T964 | 134853 | 7/26/2018 |
| Base station Simulator | R&S | CMW500 | T268 | 124593 | 7/31/2018 |
| Base station Simulator | R&S | CMW500 | T953 | 135390 | 4/27/2018 |
| Base station Simulator | R&S | CMW500 | T376 | 132909 | 3/14/2018 |
| Base station Simulator | R&S | CMW500 | T959 | 137873 | 7/18/2018 |
| Base station Simulator | R&S | CMW500 | T232 | 104245 | 2/3/2018 |
| Base station Simulator | R&S | CMW500 | T919 | 125236 | 7/31/2018 |
| Base station Simulator | Agilent | E5515C | T213 | GB47050526 | 2/21/2018 |

# 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 ≤ 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 | Overall Diagonal: 165.695 mm<br>Display Diagonal: 145.0 mm |
| Back Cover | ☒ The Back Cover is not removable. |
| Battery Options | ☒ The rechargeable battery is not user accessible. |
| Accessory | Headset |
| Wireless Router (Hotspot) | Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices.<br>☒ Mobile Hotspot (Wi-Fi 2.4 GHz)<br>☐ Mobile Hotspot (Wi-Fi 5 GHz) |
| Wi-Fi Direct | Wi-Fi Direct enabled devices transfer data directly between each other<br>☒ Wi-Fi Direct (Wi-Fi 2.4 GHz)<br>☐ Wi-Fi Direct (Wi-Fi 5 GHz) |
| Test sample information | **S/N** / **Technology** / **Notes**<br>QV7000YT15 / GSM/UMTS / Conducted<br>QV70011G15 / GSM/UMTS / Conducted<br>QV7000YM15 / LTE (LB/MB) / Conducted<br>QV7000UW15 / LTE Band 26 / Conducted<br>QV7000T415 / LTE (HB) / Conducted<br>QV7000SD15 / WLAN - 2.4GHz #1 / Conducted<br>QV7000TQ15 / WLAN - 5GHz #1 / Conducted<br>QV70006W12 / GSM/UMTS (MB) #1 / Radiated<br>QV7000AQ12 / GSM/UMTS (MB) #2 / Radiated<br>QV70008F12 / GSM/UMTS (LB) #1 / Radiated<br>QV7000FN12 / GSM/UMTS (LB) #2 / Radiated<br>QV7000EA12 / LTE (LB) / Radiated<br>QV70004512 / LTE (LB) / Radiated<br>QV7000F512 / LTE (MB) / Radiated<br>QV7000E812 / LTE (MB) / Radiated<br>QV7000FP12 / LTE (HB) / Radiated<br>QV7000DN12 / LTE (HB) / Radiated<br>QV70003P12 / WLAN - 2.4GHz #1 / Radiated<br>QV70006212 / WLAN - 2.4GHz #4 / Radiated<br>QV7000GF12 / WLAN - 5GHz / Radiated<br>QV7000E012 / WLAN - 5GHz / Radiated<br>QV7000H412 / WLAN - 5GHz / Radiated |
| Hardware Version | A |
| Software Version | 0.202 |

## 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>EGPRS (8PSK) | Multi-Slot Class:<br>☐ Class 8 - 1 Up, 4 Down<br>☐ Class 10 - 2 Up, 4 Down<br>☐ Class 12 - 4 Up, 4 Down<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)? ☒ Yes ☐ 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)<br>HSPA+ (Rel. 9)<br>DC-HSDPA (Rel. 9) | | 100% |
| LTE | FDD Band 2<br>FDD Band 4<br>FDD Band 5<br>FDD Band 7<br>FDD Band 12<br>FDD Band 13<br>FDD Band 17<br>FDD Band 26<br>FDD Band 29 (Rx Only)<br>TDD Band 41<br>FDD Band 66 | QPSK<br>16QAM<br>64AQM<br>Rel. 12 Carrier Aggregation 4CC (1 Uplink and 4 Downlinks) Refer to §6.5. | | 100% (FDD)<br>63.3% (TDD) Refer to §6.6. |
| | Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No | | | |
| Wi-Fi | 2.4 GHz | 802.11b<br>802.11g<br>802.11n (HT20) | | 98.87% (802.11b)<br>98.26% (802.11g)<br>97.44% (802.11n) |
| | 5 GHz | 802.11a<br>802.11n (HT20)<br>802.11n (HT40)<br>802.11ac (VHT20)<br>802.11ac (VHT40)<br>802.11ac (VHT80) | | 98.1% (802.11a)<br>97.4% (802.11n HT20)<br>91.5% (802.11n HT40)<br>83.7% (802.11ac VHT80) |
| | Does this device support bands 5.60 ~ 5.65 GHz? ☒ Yes ☐ No | | | |
| | Does this device support Band gap channel(s)? ☒ Yes ☐ No | | | |
| Bluetooth | 2.4 GHz | Version 5.0 LE | | 76.8%(DH5) |

## 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 | | | | | |
| | | Channel Bandwidth | | | | | |
| | | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| | Low | 18700/ 1860 | 18675/ 1857.5 | 18650/ 1855 | 18625/ 1852.5 | 18615/ 1851.5 | 18607/ 1850.7 |
| | Mid | 18900/ 1880 | 18900/ 1880 | 18900/ 1880 | 18900/ 1880 | 18900/ 1880 | 18900/ 1880 |
| | High | 19100/ 1900 | 19125/ 1902.5 | 19150/ 1905 | 19175/ 1907.5 | 19185/ 1908.5 | 19193/ 1909.3 |
| | Band 4 | Frequency range: 1710 - 1755 MHz | | | | | |
| | | Channel Bandwidth | | | | | |
| | | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| | Low | 20050/ 1720 | 20025/ 1717.5 | 20000/ 1715 | 19975/ 1712.5 | 19965/ 1711.5 | 19957/ 1710.7 |
| | Mid | 20175/ 1732.5 | 20175/ 1732.5 | 20175/ 1732.5 | 20175/ 1732.5 | 20175/ 1732.5 | 20175/ 1732.5 |
| | High | 20300/ 1745 | 20325/ 1747.5 | 20350/ 1750 | 20375/ 1752.5 | 20385/ 1753.5 | 20393/ 1754.3 |
| | Band 5 | Frequency range: 824 - 849 MHz | | | | | |
| | | Channel Bandwidth | | | | | |
| | | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| | Low | | | 20450/ 829 | 20425/ 826.5 | 20415/ 825.5 | 20407/ 824.7 |
| | Mid | | | 20525/ 836.5 | 20525/ 836.5 | 20525/ 836.5 | 20525/ 836.5 |
| | High | | | 20600/ 844 | 20625/ 846.5 | 20635/ 847.5 | 20643/ 848.3 |
| | Band 7 | Frequency range: 2500 - 2570 MHz | | | | | |
| | | Channel Bandwidth | | | | | |
| | | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| | Low | 20850 2510 | 20825 2507.5 | 20800 2505 | 20775 2502.5 | | |
| | Mid | 21100 2535 | 21100 2535 | 21100 2535 | 21100 2535 | | |
| | High | 21350 2560 | 21375 2562.5 | 21400 2565 | 21425 2567.5 | | |
| | Band 12 | Frequency range: 699 – 716 MHz | | | | | |
| | | Channel Bandwidth | | | | | |
| | | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| | Low | | | 23060/ 704 | 23035/ 701.5 | 23025/ 700.5 | 23017/ 699.7 |
| | Mid | | | 23095/ 707.5 | 23095/ 707.5 | 23095/ 707.5 | 23095/ 707.5 |
| | High | | | 23130/ 711 | 23155/ 713.5 | 23165/ 714.5 | 23173/ 715.3 |
| | Band 13 | Frequency range: 777 - 787 MHz | | | | | |
| | | Channel Bandwidth | | | | | |
| | | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| | Low | | | | 23205/ 779.5 | | |
| | Mid | | | 23230/ 782 | 23230/ 782 | | |
| | High | | | | 23255/ 784.5 | | |

## General LTE SAR Test and Reporting Considerations (Continued)

**Frequency range, Channel Bandwidth, Numbers and Frequencies**

| Band 17 | Frequency range: 704 - 716 MHz | | | | | |
|---|---|---|---|---|---|---|
| | Channel Bandwidth | | | | | |
| | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| Low | | | 23780/ 709 | 23755/ 706.5 | | |
| Mid | | | 23790/ 710 | 23790/ 710 | | |
| High | | | 23800/ 711 | 23825/ 713.5 | | |

| Band 26 | Frequency range: 814 - 849 MHz | | | | | |
|---|---|---|---|---|---|---|
| | Channel Bandwidth | | | | | |
| | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| Low | | 26765/ 821.5 | 26740/ 819 | 26715/ 816.5 | 26705/ 815.5 | 26697/ 814.7 |
| Mid | | 26865/ 831.5 | 26865/ 831.5 | 26865/ 831.5 | 26865/ 831.5 | 26865/ 831.5 |
| High | | 26965/ 841.5 | 26990/ 844 | 27015/ 846.5 | 27025/ 847.5 | 27033/ 848.3 |

| Band 41 | Frequency range: 2496 - 2690 MHz | | | | | |
|---|---|---|---|---|---|---|
| | Channel Bandwidth | | | | | |
| | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| Low | 39750 / 2506.0 | | | | | |
| Low-Mid | 40185 / 2549.5 | | | | | |
| Mid | 40620 / 2593.0 | | | | | |
| Mid-High | 41055 / 2636.5 | | | | | |
| High | 41490 / 2680.0 | | | | | |

| Band 66 | Frequency range: 1710 - 1780 MHz | | | | | |
|---|---|---|---|---|---|---|
| | Channel Bandwidth | | | | | |
| | 20 MHz | 15 MHz | 10 MHz | 5 MHz | 3 MHz | 1.4 MHz |
| Low | 132072/ 1720 | 132047/ 1717.5 | 132022/ 1715 | 131997/ 1712.5 | 131987/ 1711.5 | 131979/ 1710.7 |
| Mid | 132322/ 1745 | 132322/ 1745 | 132322/ 1745 | 132322/ 1745 | 132322/ 1745 | 132322/ 1745 |
| High | 132572/ 1770 | 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)**

**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 |

MPR Built-in by design
The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values.
A-MPR (additional MPR) was disabled during SAR testing

**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:**

1. 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 Carrier Aggregation

| Combination | CA configuration | Bandwidth (MHz) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PCC | | | | | | SCC1 | | | | | |
| | | 20 | 15 | 10 | 5 | 3 | 1.4 | 20 | 15 | 10 | 5 | 3 | 1.4 |
| Intra-Band contiguous | 12B | | | | √ | | | | | √ | √ | | |
| | 7C | | | √ | | | | √ | | | | | |
| | | | √ | | | | | √ | √ | | | | |
| | | √ | | | | | | √ | √ | √ | | | |
| | 41C | | | | √ | | | √ | | | | | |
| | | | | √ | | | | √ | | | | | |
| | | | √ | | | | | √ | √ | | | | |
| | | √ | | | | | | √ | √ | √ | √ | | |
| | 66B | | | | √ | | | | √ | √ | √ | | |
| | | | | √ | | | | | | √ | √ | | |
| | | | √ | | | | | | | | √ | | |
| | 66C | | | | √ | | | √ | | | | | |
| | | | | √ | | | | √ | √ | | | | |
| | | | √ | | | | | √ | √ | √ | | | |
| | | √ | | | | | | √ | √ | √ | √ | | |
| Intra-Band non-contiguous | 2A-2A | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 4A-4A | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 7A-7A | | | | √ | | | | √ | | | | |
| | | | | √ | | | | | √ | √ | | | |
| | | | √ | | | | | √ | √ | | | | |
| | | √ | | | | | | √ | | | | | |
| | 66A-66A | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| Inter-Band non-contiguous | 2A-4A | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | |
| | 2A-5A | √ | √ | √ | √ | | | | | √ | √ | | |
| | 2A-7A | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 2A-12A | √ | √ | √ | √ | | | | | √ | √ | √ | |
| | 2A-13A | √ | √ | √ | √ | | | | | √ | | | |
| | 2A-17A | | | √ | √ | | | | | √ | √ | | |
| | 2A-29A | √ | √ | √ | √ | | | | | √ | √ | | |
| | 2A-66A | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | |
| | 4A-5A | √ | √ | √ | √ | | | | | √ | √ | | |
| | 4A-7A | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 4A-12A | √ | √ | √ | √ | √ | √ | | | √ | √ | √ | |
| | 4A-13A | √ | √ | √ | √ | | | | | √ | | | |
| | 4A-17A | | | √ | √ | | | | | √ | √ | | |
| | 4A-29A | √ | √ | √ | √ | | | | | √ | √ | | |
| | 5A-7A | | | √ | √ | √ | √ | √ | √ | √ | | | |
| | 5A-12A | | | √ | √ | | | | | √ | √ | | |
| | 5A-29A | | | √ | √ | | | | | √ | √ | | |
| | 12A-66A | | | √ | √ | | | √ | √ | √ | √ | √ | √ |

**Note(s):**

For supported channels, please refer to §6.4

| Combination | CA configuration | Bandwidth (MHz) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PCC | | | | | | SCC1 | | | | | | SCC2 | | | | | |
| | | 20 | 15 | 10 | 5 | 3 | 1.4 | 20 | 15 | 10 | 5 | 3 | 1.4 | 20 | 15 | 10 | 5 | 3 | 1.4 |
| Inter-Band non-contiguous | 2A-2A-4A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 2A-2A-12A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | √ | | |
| | 2A-2A-13A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | | | |
| | 2A-4A-4A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 2A-4A-5A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | √ | | |
| | 2A-4A-7A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 2A-4A-12A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | √ | | |
| | 2A-4A-13A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | | | |
| | 2A-4A-29A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | √ | | |
| | 2A-5A-29A | √ | √ | √ | √ | | | | | √ | √ | | | | | √ | √ | | |
| | 2A-7A-7A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 2A-12A-66A | √ | √ | √ | √ | | | | | √ | √ | | | √ | √ | √ | √ | | |
| | 2A-12B | √ | √ | √ | √ | | | | | | √ | | | | | √ | √ | | |
| | 2A-66A-66A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 4A-4A-5A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | √ | | |
| | 4A-4A-12A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | √ | | |
| | 4A-4A-13A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | | | |
| | 4A-4A-29A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | √ | | |
| | 4A-5A-29A | √ | √ | √ | √ | | | | | √ | √ | | | | | √ | √ | | |
| | 4A-7A-7A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 4A-7C | √ | √ | √ | √ | | | | | √ | | | | √ | | | | | |
| | | √ | √ | √ | √ | | | | √ | | | | | √ | √ | | | | |
| | | √ | √ | √ | √ | | | √ | | | | | | √ | √ | √ | | | |
| | 4A-12B | √ | √ | √ | √ | | | | | | √ | | | | | √ | √ | | |
| | 5A-7A-7A | | | √ | √ | | | √ | √ | √ | | | | √ | √ | √ | | | |
| | 12A-66A-66A | | | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | |

**Note(s):**

For supported channels, please refer to §6.4

| Combination | CA configuration | Bandwidth (MHz) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PCC | | | | | | SCC1 | | | | | | SCC2 | | | | | | SCC3 | | | | | |
| | | 20 | 15 | 10 | 5 | 3 | 1.4 | 20 | 15 | 10 | 5 | 3 | 1.4 | 20 | 15 | 10 | 5 | 3 | 1.4 | 20 | 15 | 10 | 5 | 3 | 1.4 |
| Inter-Band non-contiguous | 2A-4A-5A-29A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | √ | | | | | √ | √ | | |
| | 2A-4A-7A-7A | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | √ | √ | | |
| | 2A-4A-7C | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | | √ | | | | √ | | | | | |
| | | √ | √ | √ | √ | | | √ | √ | √ | √ | | | | √ | | | | | √ | √ | | | | |
| | | √ | √ | √ | √ | | | √ | √ | √ | √ | | | √ | | | | | | √ | √ | √ | | | |

**Note(s):**

For supported channels, please refer to §6.4

## 6.5. 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 | $6592 \cdot T_s$ | $2192 \cdot T_s$ | $2560 \cdot T_s$ | $7680 \cdot T_s$ | $2192 \cdot T_s$ | $2560 \cdot T_s$ |
| 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 | $26336 \cdot T_s$ | | | $7680 \cdot T_s$ | $4384 \cdot T_s$ | $5120 \cdot T_s$ |
| 5 | $6592 \cdot T_s$ | $4384 \cdot T_s$ | $5120 \cdot T_s$ | $20480 \cdot T_s$ | | |
| 6 | $19760 \cdot T_s$ | | | $23040 \cdot T_s$ | | |
| 7 | $21952 \cdot T_s$ | | | $12800 \cdot T_s$ | | |
| 8 | $24144 \cdot T_s$ | | | - | - | - |
| 9 | $13168 \cdot T_s$ | | | - | - | - |

**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 | 63.33 |
| 1 | 5 ms | D | S | U | U | D | D | S | U | U | D | 43.33 |
| 2 | 5 ms | D | S | U | D | D | D | S | U | D | D | 23.33 |
| 3 | 10 ms | D | S | U | U | U | D | D | D | D | D | 31.67 |
| 4 | 10 ms | D | S | U | U | D | D | D | D | D | D | 21.67 |
| 5 | 10 ms | D | S | U | D | D | D | D | D | D | D | 11.67 |
| 6 | 5 ms | D | S | U | U | U | D | S | U | U | D | 53.33 |

Calculated Duty Cycle = Extended cyclic prefix in uplink x ($T_s$) x # of S + # of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:
Calculated Duty Cycle = 5120 x [1/(15000 x 2048)] x 2 + 6 ms = 63.33%
where
$T_s$ = 1/(15000 x 2048) seconds

**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 and Special Subframe 7.

# 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.

| Wireless technologies | RF Exposure Conditions | DUT-to-User Separation | Test Position | Antenna-to-edge/surface | SAR Required |
|---|---|---|---|---|---|
| WWAN Main Ant. 1 | Head | 0 mm | Left Touch | N/A | Yes |
| | | | Left Tilt (15°) | N/A | Yes |
| | | | Right Touch | N/A | Yes |
| | | | Right Tilt (15°) | N/A | Yes |
| | Body | 15 mm | Rear | N/A | Yes |
| | | | Front | N/A | Yes |
| | Hotspot | 10 mm | Rear | < 25 mm | Yes |
| | | | Front | < 25 mm | Yes |
| | | | Edge 1 (Top) | > 25 mm | No |
| | | | Edge 2 (Right) | < 25 mm | Yes |
| | | | Edge 3 (Bottom) | < 25 mm | Yes |
| | | | Edge 4 (Left) | < 25 mm | Yes |
| WWAN Main Ant. 2 | Head | 0 mm | Left Touch | N/A | Yes |
| | | | Left Tilt (15°) | N/A | Yes |
| | | | Right Touch | N/A | Yes |
| | | | Right Tilt (15°) | N/A | Yes |
| | Body | 15 mm | Rear | N/A | Yes |
| | | | Front | N/A | Yes |
| | Hotspot | 10 mm | Rear | < 25 mm | Yes |
| | | | Front | < 25 mm | Yes |
| | | | Edge 1 (Top) | > 25 mm | No |
| | | | Edge 2 (Right) | < 25 mm | Yes |
| | | | Edge 3 (Bottom) | < 25 mm | Yes |
| | | | Edge 4 (Left) | < 25 mm | Yes |
| WLAN/BT (Chain 0) | Head | 0 mm | Left Touch | N/A | Yes |
| | | | Left Tilt (15°) | N/A | Yes |
| | | | Right Touch | N/A | Yes |
| | | | Right Tilt (15°) | N/A | Yes |
| | Body | 15 mm | Rear | N/A | Yes |
| | | | Front | N/A | Yes |
| | Hotspot / Wi-Fi Direct (2.4 GHz only) | 10 mm | Rear | < 25 mm | Yes |
| | | | Front | < 25 mm | Yes |
| | | | Edge 1 (Top) | < 25 mm | Yes |
| | | | Edge 2 (Right) | > 25 mm | No |
| | | | Edge 3 (Bottom) | > 25 mm | No |
| | | | Edge 4 (Left) | < 25 mm | Yes |
| | Product specific (5 GHz bands only) | 0 mm | Rear | < 25 mm | Yes |
| | | | Front | N/A | No |
| | | | Edge 1 (Top) | < 25 mm | Yes |
| | | | Edge 2 (Right) | > 25 mm | No |
| | | | Edge 3 (Bottom) | > 25 mm | No |
| | | | Edge 4 (Left) | < 25 mm | Yes |

**Notes:**

1. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
2. When Hotspot Mode is not supported, 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.
3. 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.
4. The WWAN Sub Antenna does not include the FCC band.

**RF Exposure Conditions (Test Configurations) continued:**

| Wireless technologies | RF Exposure Conditions | DUT-to-User Separation | Test Position | Antenna-to-edge/surface | SAR Required |
|---|---|---|---|---|---|
| WLAN (Chain 1) | Head | 0 mm | Left Touch | N/A | Yes |
| | | | Left Tilt (15°) | N/A | Yes |
| | | | Right Touch | N/A | Yes |
| | | | Right Tilt (15°) | N/A | Yes |
| | Body | 15 mm | Rear | N/A | Yes |
| | | | Front | N/A | Yes |
| | Hotspot / Wi-Fi Direct (2.4 GHz only) | 10 mm | Rear | < 25 mm | Yes |
| | | | Front | < 25 mm | Yes |
| | | | Edge 1 (Top) | > 25 mm | No |
| | | | Edge 2 (Right) | < 25 mm | Yes |
| | | | Edge 3 (Bottom) | > 25 mm | No |
| | | | Edge 4 (Left) | > 25 mm | No |
| | Product specific (5 GHz bands only) | 0 mm | Rear | < 25 mm | Yes |
| | | | Front | N/A | No |
| | | | Edge 1 (Top) | > 25 mm | No |
| | | | Edge 2 (Right) | < 25 mm | Yes |
| | | | Edge 3 (Bottom) | > 25 mm | No |
| | | | Edge 4 (Left) | > 25 mm | No |

**Notes:**

1. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
2. When Hotspot Mode is not supported, 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.
3. 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.

# 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 ± 2°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 (εr) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within ± 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 εr and σ may be relaxed to ± 10%. This is limited to frequencies ≤ 3 GHz.

### Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

| Target Frequency (MHz) | Head | | Body | |
|---|---|---|---|---|
| | $\varepsilon_r$ | σ (S/m) | $\varepsilon_r$ | σ (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 |
| 5800 | 35.3 | 5.27 | 48.2 | 6.00 |

**IEEE Std 1528-2013**

Refer to Table 3 within the IEEE Std 1528-2013

**Dielectric Property Measurements Results:**

| SAR Lab | Date | Band (MHz) | Tissue Type | Frequency (MHz) | Relative Permittivity (εr) | | | Conductivity (σ) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | Target | Delta (%) | Measured | Target | Delta (%) |
| A | 12/18/2017 | 835 | Body | 835 | 54.67 | 55.20 | -0.96 | 1.00 | 0.97 | 2.77 |
| | | | | 805 | 54.96 | 55.33 | -0.68 | 0.97 | 0.97 | -0.24 |
| | | | | 905 | 54.01 | 55.00 | -1.80 | 1.06 | 1.05 | 1.09 |
| A | 12/26/2017 | 835 | Head | 835 | 41.69 | 41.50 | 0.46 | 0.90 | 0.90 | 0.16 |
| | | | | 805 | 42.17 | 41.68 | 1.18 | 0.86 | 0.90 | -3.69 |
| | | | | 905 | 40.87 | 41.50 | -1.52 | 0.96 | 0.97 | -1.28 |
| A | 12/26/2017 | 835 | Body | 835 | 54.32 | 55.20 | -1.59 | 0.98 | 0.97 | 1.39 |
| | | | | 805 | 54.73 | 55.33 | -1.09 | 0.95 | 0.97 | -2.10 |
| | | | | 905 | 53.64 | 55.00 | -2.47 | 1.05 | 1.05 | -0.14 |
| B | 12/18/2017 | 1900 | Head | 1900 | 40.93 | 40.00 | 2.33 | 1.43 | 1.40 | 2.36 |
| | | | | 1850 | 41.21 | 40.00 | 3.03 | 1.38 | 1.40 | -1.21 |
| | | | | 1920 | 40.83 | 40.00 | 2.08 | 1.45 | 1.40 | 3.79 |
| B | 12/18/2017 | 1900 | Body | 1900 | 53.45 | 53.30 | 0.28 | 1.50 | 1.52 | -1.25 |
| | | | | 1850 | 53.68 | 53.30 | 0.71 | 1.45 | 1.52 | -4.54 |
| | | | | 1920 | 53.38 | 53.30 | 0.15 | 1.52 | 1.52 | 0.13 |
| B | 12/20/2017 | 1750 | Body | 1750 | 51.80 | 53.44 | -3.07 | 1.48 | 1.49 | -0.14 |
| | | | | 1710 | 51.86 | 53.54 | -3.14 | 1.44 | 1.46 | -1.34 |
| | | | | 1755 | 51.77 | 53.43 | -3.10 | 1.49 | 1.49 | -0.02 |
| B | 12/21/2017 | 1900 | Head | 1950 | 38.74 | 40.00 | -3.15 | 1.42 | 1.40 | 1.21 |
| | | | | 1900 | 38.93 | 40.00 | -2.67 | 1.37 | 1.40 | -2.14 |
| | | | | 1980 | 38.62 | 40.00 | -3.45 | 1.45 | 1.40 | 3.64 |

| SAR Lab | Date | Band (MHz) | Tissue Type | Frequency (MHz) | Relative Permittivity (εr) | | | Conductivity (σ) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | Target | Delta (%) | Measured | Target | Delta (%) |
| B | 12/26/2017 | 1750 | Body | 1750 | 53.58 | 53.44 | 0.26 | 1.49 | 1.49 | 0.39 |
| | | | | 1710 | 53.50 | 53.54 | -0.08 | 1.47 | 1.46 | 0.58 |
| | | | | 1755 | 53.61 | 53.43 | 0.34 | 1.49 | 1.49 | 0.19 |
| B | 12/26/2017 | 1900 | Head | 1900 | 41.35 | 40.00 | 3.38 | 1.39 | 1.40 | -0.64 |
| | | | | 1850 | 41.63 | 40.00 | 4.08 | 1.34 | 1.40 | -4.57 |
| | | | | 1920 | 41.19 | 40.00 | 2.97 | 1.42 | 1.40 | 1.50 |
| B | 12/27/2017 | 1750 | Head | 1750 | 38.24 | 40.08 | -4.60 | 1.37 | 1.37 | 0.07 |
| | | | | 1710 | 38.63 | 40.15 | -3.78 | 1.35 | 1.35 | 0.27 |
| | | | | 1800 | 38.01 | 40.00 | -4.98 | 1.43 | 1.40 | 2.21 |
| C | 12/18/2017 | 2600 | Head | 2600 | 38.10 | 39.01 | -2.33 | 2.04 | 1.96 | 4.07 |
| | | | | 2495 | 38.47 | 39.14 | -1.72 | 1.91 | 1.85 | 3.43 |
| | | | | 2690 | 37.72 | 38.90 | -3.03 | 2.15 | 2.06 | 4.54 |
| C | 12/21/2017 | 2600 | Body | 2600 | 51.41 | 52.51 | -2.10 | 2.19 | 2.16 | 1.54 |
| | | | | 2495 | 51.71 | 52.64 | -1.77 | 2.06 | 2.01 | 2.27 |
| | | | | 2690 | 51.05 | 52.40 | -2.57 | 2.31 | 2.29 | 0.77 |
| E | 12/19/2017 | 750 | Head | 750 | 40.28 | 41.96 | -4.01 | 0.91 | 0.89 | 1.73 |
| | | | | 695 | 41.05 | 42.24 | -2.83 | 0.86 | 0.89 | -3.47 |
| | | | | 790 | 39.78 | 41.76 | -4.73 | 0.94 | 0.90 | 5.39 |
| E | 12/20/2017 | 750 | Head | 750 | 40.69 | 41.96 | -3.03 | 0.91 | 0.89 | 1.35 |
| | | | | 695 | 41.45 | 42.24 | -1.88 | 0.86 | 0.89 | -3.74 |
| | | | | 790 | 40.15 | 41.76 | -3.85 | 0.94 | 0.90 | 5.06 |
| E | 12/21/2017 | 750 | Head | 750 | 40.99 | 41.96 | -2.32 | 0.93 | 0.89 | 4.27 |
| | | | | 695 | 41.71 | 42.24 | -1.26 | 0.88 | 0.89 | -0.88 |
| | | | | 790 | 40.42 | 41.76 | -3.20 | 0.97 | 0.90 | 8.16 |
| E | 12/21/2017 | 750 | Body | 750 | 56.55 | 55.55 | 1.81 | 0.97 | 0.96 | 0.21 |
| | | | | 695 | 57.04 | 55.76 | 2.30 | 0.91 | 0.96 | -4.71 |
| | | | | 790 | 56.18 | 55.39 | 1.42 | 1.00 | 0.97 | 3.92 |
| E | 12/22/2017 | 750 | Head | 750 | 39.50 | 41.96 | -5.87 | 0.89 | 0.89 | 0.11 |
| | | | | 695 | 40.22 | 42.24 | -4.79 | 0.84 | 0.89 | -5.14 |
| | | | | 790 | 39.06 | 41.76 | -6.46 | 0.93 | 0.90 | 3.72 |
| E | 12/26/2017 | 750 | Head | 750 | 41.22 | 41.96 | -1.77 | 0.88 | 0.89 | -1.40 |
| | | | | 695 | 41.88 | 42.24 | -0.86 | 0.83 | 0.89 | -6.47 |
| | | | | 790 | 40.67 | 41.76 | -2.60 | 0.92 | 0.90 | 2.42 |
| E | 12/26/2017 | 750 | Body | 750 | 56.17 | 55.55 | 1.12 | 0.92 | 0.96 | -4.71 |
| | | | | 695 | 56.61 | 55.76 | 1.53 | 0.87 | 0.96 | -9.54 |
| | | | | 790 | 55.84 | 55.39 | 0.81 | 0.96 | 0.97 | -0.96 |

| SAR Lab | Date | Band (MHz) | Tissue Type | Frequency (MHz) | Relative Permittivity (εr) | | | Conductivity (σ) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | Target | Delta (%) | Measured | Target | Delta (%) |
| E | 12/26/2017 | 835 | Body | 835 | 53.65 | 55.20 | -2.81 | 0.98 | 0.97 | 0.72 |
| | | | | 805 | 54.06 | 55.33 | -2.30 | 0.94 | 0.97 | -2.77 |
| | | | | 905 | 53.01 | 55.00 | -3.62 | 1.05 | 1.05 | -0.71 |
| E | 12/27/2017 | 750 | Head | 750 | 40.90 | 41.96 | -2.53 | 0.92 | 0.89 | 2.51 |
| | | | | 695 | 41.64 | 42.24 | -1.43 | 0.86 | 0.89 | -3.04 |
| | | | | 790 | 40.58 | 41.76 | -2.82 | 0.97 | 0.90 | 7.78 |
| E | 12/27/2017 | 750 | Body | 750 | 56.40 | 55.55 | 1.54 | 0.98 | 0.96 | 1.69 |
| | | | | 695 | 57.15 | 55.76 | 2.50 | 0.92 | 0.96 | -3.71 |
| | | | | 790 | 55.95 | 55.39 | 1.01 | 1.03 | 0.97 | 6.30 |
| F | 12/18/2017 | 2450 | Head | 2450 | 38.35 | 39.20 | -2.17 | 1.85 | 1.80 | 2.94 |
| | | | | 2400 | 38.55 | 39.30 | -1.90 | 1.80 | 1.75 | 2.65 |
| | | | | 2480 | 38.24 | 39.16 | -2.35 | 1.89 | 1.83 | 2.92 |
| F | 12/20/2017 | 2450 | Body | 2450 | 53.52 | 52.70 | 1.56 | 2.00 | 1.95 | 2.77 |
| | | | | 2400 | 53.67 | 52.77 | 1.70 | 1.94 | 1.90 | 2.21 |
| | | | | 2480 | 53.44 | 52.66 | 1.48 | 2.05 | 1.99 | 2.75 |
| F | 12/21/2017 | 2300 | Head | 2300 | 38.74 | 39.47 | -1.86 | 1.69 | 1.66 | 1.40 |
| | | | | 2350 | 38.52 | 39.38 | -2.20 | 1.74 | 1.71 | 1.95 |
| | | | | 2400 | 38.32 | 39.30 | -2.49 | 1.80 | 1.75 | 2.65 |
| F | 12/26/2017 | 2600 | Body | 2600 | 50.91 | 52.51 | -3.05 | 2.12 | 2.16 | -1.70 |
| | | | | 2495 | 51.36 | 52.64 | -2.44 | 1.98 | 2.01 | -1.45 |
| | | | | 2690 | 50.62 | 52.40 | -3.39 | 2.22 | 2.29 | -3.03 |
| F | 12/27/2017 | 2450 | Body | 2450 | 51.58 | 52.70 | -2.13 | 1.90 | 1.95 | -2.51 |
| | | | | 2400 | 51.74 | 52.77 | -1.96 | 1.84 | 1.90 | -3.16 |
| | | | | 2480 | 51.43 | 52.66 | -2.34 | 1.94 | 1.99 | -2.47 |
| F | 12/27/2017 | 2450 | Head | 2450 | 38.36 | 39.20 | -2.14 | 1.89 | 1.80 | 4.83 |
| | | | | 2400 | 38.54 | 39.30 | -1.93 | 1.84 | 1.75 | 4.93 |
| | | | | 2480 | 38.16 | 39.16 | -2.56 | 1.92 | 1.83 | 5.00 |
| F | 12/27/2017 | 5200 | Body | 5200 | 49.47 | 49.02 | 0.92 | 5.16 | 5.29 | -2.56 |
| | | | | 5150 | 49.55 | 49.09 | 0.94 | 5.07 | 5.24 | -3.22 |
| | | | | 5350 | 49.27 | 48.82 | 0.93 | 5.34 | 5.47 | -2.35 |
| F | 12/27/2017 | 5600 | Body | 5600 | 48.83 | 48.48 | 0.73 | 5.67 | 5.76 | -1.61 |
| | | | | 5500 | 49.03 | 48.61 | 0.86 | 5.53 | 5.64 | -1.97 |
| | | | | 5725 | 48.71 | 48.31 | 0.83 | 5.85 | 5.91 | -0.99 |
| F | 12/27/2017 | 5800 | Body | 5800 | 48.58 | 48.20 | 0.79 | 5.95 | 6.00 | -0.78 |
| | | | | 5700 | 48.72 | 48.34 | 0.78 | 5.81 | 5.88 | -1.08 |
| | | | | 5850 | 48.49 | 48.20 | 0.60 | 6.00 | 6.00 | 0.05 |
| F | 1/5/2018 | 2450 | Head | 2450 | 39.11 | 39.20 | -0.23 | 1.84 | 1.80 | 2.28 |
| | | | | 2400 | 39.37 | 39.30 | 0.19 | 1.80 | 1.75 | 2.65 |
| | | | | 2480 | 39.03 | 39.16 | -0.34 | 1.89 | 1.83 | 2.92 |

| SAR Lab | Date | Band (MHz) | Tissue Type | Frequency (MHz) | Relative Permittivity (εr) | | | Conductivity (σ) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | Target | Delta (%) | Measured | Target | Delta (%) |
| G | 12/20/2017 | 5200 | Head | 5200 | 37.03 | 35.99 | 2.89 | 4.52 | 4.65 | -2.82 |
| | | | | 5150 | 37.16 | 36.05 | 3.09 | 4.46 | 4.60 | -3.02 |
| | | | | 5350 | 37.08 | 35.82 | 3.52 | 4.76 | 4.80 | -1.01 |
| G | 12/20/2017 | 5600 | Head | 5600 | 36.77 | 35.53 | 3.48 | 4.98 | 5.06 | -1.66 |
| | | | | 5500 | 36.67 | 35.65 | 2.87 | 4.85 | 4.96 | -2.16 |
| | | | | 5725 | 36.54 | 35.39 | 3.25 | 5.13 | 5.19 | -1.16 |
| G | 12/20/2017 | 5800 | Head | 5800 | 36.34 | 35.30 | 2.95 | 5.03 | 5.27 | -4.63 |
| | | | | 5700 | 36.49 | 35.42 | 3.02 | 5.05 | 5.16 | -2.10 |
| | | | | 5850 | 36.48 | 35.30 | 3.34 | 5.31 | 5.27 | 0.70 |
| G | 12/26/2017 | 5200 | Head | 5200 | 37.03 | 35.99 | 2.89 | 4.52 | 4.65 | -2.82 |
| | | | | 5150 | 37.16 | 36.05 | 3.09 | 4.46 | 4.60 | -3.02 |
| | | | | 5350 | 37.08 | 35.82 | 3.52 | 4.76 | 4.80 | -1.01 |
| G | 12/26/2017 | 5600 | Head | 5600 | 36.77 | 35.53 | 3.48 | 4.98 | 5.06 | -1.66 |
| | | | | 5500 | 36.67 | 35.65 | 2.87 | 4.85 | 4.96 | -2.16 |
| | | | | 5725 | 36.54 | 35.39 | 3.25 | 5.13 | 5.19 | -1.16 |
| G | 12/26/2017 | 5800 | Head | 5800 | 36.34 | 35.30 | 2.95 | 5.03 | 5.27 | -4.63 |
| | | | | 5700 | 36.49 | 35.42 | 3.02 | 5.05 | 5.16 | -2.10 |
| | | | | 5850 | 36.48 | 35.30 | 3.34 | 5.31 | 5.27 | 0.70 |
| G | 12/28/2017 | 5600 | Body | 5600 | 47.01 | 48.48 | -3.03 | 5.91 | 5.76 | 2.62 |
| | | | | 5500 | 47.20 | 48.61 | -2.91 | 5.77 | 5.64 | 2.22 |
| | | | | 5725 | 46.85 | 48.31 | -3.02 | 6.10 | 5.91 | 3.25 |
| G | 12/28/2017 | 5600 | Body | 5800 | 46.70 | 48.20 | -3.11 | 6.19 | 6.00 | 3.17 |
| | | | | 5700 | 46.84 | 48.34 | -3.11 | 6.06 | 5.88 | 3.15 |
| | | | | 5850 | 46.62 | 48.20 | -3.28 | 6.27 | 6.00 | 4.57 |

## 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 ±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 ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 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 100 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 10% of the manufacturer calibrated dipole SAR target.

| SAR Lab | Date | Tissue Type | Dipole Type _Serial # | Dipole Cal. Due Data | Measured Results for 1g SAR | | | | Measured Results for 10g SAR | | | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Zoom Scan to 100 mW | Normalize to 1 W | Target (Ref. Value) | Delta ±10 % | Zoom Scan to 100 mW | Normalize to 1 W | Target (Ref. Value) | Delta ±10 % | |
| A | 12/18/2017 | Body | D835V2 SN:4d142 | 10/12/2018 | 0.936 | 9.36 | 9.63 | -2.80 | 0.618 | 6.18 | 6.27 | -1.44 | |
| A | 12/26/2017 | Head | D835V2 SN:4d142 | 10/12/2018 | 1.000 | 10.00 | 9.64 | 3.73 | 0.661 | 6.61 | 6.22 | 6.27 | 1,2 |
| A | 12/26/2017 | Body | D835V2 SN:4d142 | 10/12/2018 | 0.932 | 9.32 | 9.63 | -3.22 | 0.615 | 6.15 | 6.27 | -1.91 | |
| B | 12/18/2017 | Head | D1900V2 SN:5d043 | 11/22/2018 | 4.250 | 42.50 | 42.99 | -1.14 | 2.190 | 21.90 | 22.17 | -1.22 | |
| B | 12/18/2017 | Body | D1900V2 SN:5d043 | 11/22/2018 | 4.170 | 41.70 | 41.00 | 1.71 | 2.180 | 21.80 | 20.90 | 4.31 | 3,4 |
| B | 12/20/2017 | Body | D1750V2 SN:1050 | 4/18/2018 | 3.490 | 34.90 | 37.68 | -7.38 | 1.840 | 18.40 | 19.92 | -7.63 | 5,6 |
| B | 12/21/2017 | Head | D1900V2 SN:5d163 | 10/5/2018 | 3.650 | 36.50 | 38.77 | -5.86 | 1.880 | 18.80 | 20.10 | -6.47 | 7,8 |
| B | 12/26/2017 | Body | D1750V2 SN:1050 | 4/18/2018 | 3.560 | 35.60 | 37.68 | -5.52 | 1.880 | 18.80 | 19.92 | -5.62 | |
| B | 12/26/2017 | Head | D1900V2 SN:5d140 | 4/19/2018 | 4.090 | 40.90 | 40.80 | 0.25 | 2.130 | 21.30 | 21.16 | 0.66 | 9,10 |
| B | 12/27/2017 | Head | D1750V2 SN:1050 | 4/18/2018 | 3.610 | 36.10 | 36.76 | -1.80 | 1.920 | 19.20 | 19.60 | -2.04 | |
| C | 12/18/2017 | Head | D2600V2 SN:1036 | 3/10/2018 | 6.010 | 60.10 | 57.50 | 4.52 | 2.580 | 25.80 | 25.60 | 0.78 | 11,12 |
| C | 12/21/2017 | Body | D2600V2 SN:1036 | 3/10/2018 | 5.700 | 57.00 | 54.60 | 4.40 | 2.480 | 24.80 | 24.50 | 1.22 | |
| E | 12/19/2017 | Head | D750V3 SN:1019 | 3/13/2018 | 0.828 | 8.28 | 8.22 | 0.73 | 0.543 | 5.43 | 5.39 | 0.74 | |
| E | 12/21/2017 | Body | D750V3 SN:1019 | 3/13/2018 | 0.885 | 8.85 | 8.76 | 1.03 | 0.591 | 5.91 | 5.80 | 1.90 | |
| E | 12/26/2017 | Head | D750V3 SN:1019 | 3/13/2018 | 0.892 | 8.92 | 8.22 | 8.52 | 0.587 | 5.87 | 5.39 | 8.91 | 13,14 |
| E | 12/26/2017 | Body | D750V3 SN:1019 | 3/13/2018 | 0.841 | 8.41 | 8.76 | -4.00 | 0.562 | 5.62 | 5.80 | -3.10 | |
| E | 12/26/2017 | Body | D835V2 SN:4d142 | 10/12/2018 | 0.933 | 9.33 | 9.63 | -3.12 | 0.613 | 6.13 | 6.27 | -2.23 | 15,16 |
| F | 12/18/2017 | Head | D2450V2 SN:748 | 2/8/2018 | 5.590 | 55.90 | 52.10 | 7.29 | 2.500 | 25.00 | 24.20 | 3.31 | |
| F | 12/20/2017 | Body | D2450V2 SN:748 | 2/8/2018 | 5.020 | 50.20 | 51.30 | -2.14 | 2.290 | 22.90 | 23.90 | -4.18 | |
| F | 12/26/2017 | Body | D2600V2 SN:1036 | 3/10/2018 | 5.370 | 53.70 | 54.60 | -1.65 | 2.290 | 22.90 | 24.50 | -6.53 | 17,18 |
| F | 12/27/2017 | Body | D2450V2 SN:748 | 2/8/2018 | 4.850 | 48.50 | 51.30 | -5.46 | 2.190 | 21.90 | 23.90 | -8.37 | |
| F | 12/27/2017 | Head | D2450V2 SN:899 | 3/10/2018 | 5.770 | 57.70 | 52.60 | 9.70 | 2.580 | 25.80 | 24.60 | 4.88 | 19,20 |
| F | 12/28/2017 | Body | D5GHzV2 SN:1138 (5.2 GHz) | 10/26/2018 | 7.330 | 73.30 | 73.40 | -0.14 | 2.090 | 20.90 | 20.60 | 1.46 | |
| F | 12/28/2017 | Body | D5GHzV2 SN:1138 (5.6 GHz) | 10/26/2018 | 8.310 | 83.10 | 79.50 | 4.53 | 2.310 | 23.10 | 22.30 | 3.59 | 21,22 |
| F | 12/28/2017 | Body | D5GHzV2 SN:1138 (5.8 GHz) | 10/26/2018 | 7.380 | 73.80 | 76.80 | -3.91 | 2.069 | 20.69 | 21.30 | -2.86 | |
| F | 1/5/2018 | Head | D2450V2 SN:748 | 2/8/2018 | 5.710 | 57.10 | 52.10 | 9.60 | 2.550 | 25.50 | 24.20 | 5.37 | 23,24 |
| G | 12/20/2017 | Head | D5GHzV2 SN:1168 (5.2 GHz) | 11/23/2018 | 7.460 | 74.60 | 80.90 | -7.79 | 2.150 | 21.50 | 22.80 | -5.70 | |
| G | 12/20/2017 | Head | D5GHzV2 SN:1168 (5.6 GHz) | 11/23/2018 | 8.130 | 81.30 | 87.20 | -6.77 | 2.290 | 22.90 | 24.40 | -6.15 | |
| G | 12/20/2017 | Head | D5GHzV2 SN:1168 (5.8 GHz) | 11/23/2018 | 7.480 | 74.80 | 79.10 | -5.44 | 2.120 | 21.20 | 22.10 | -4.07 | |
| G | 12/26/2017 | Head | D5GHzV2 SN:1168 (5.2 GHz) | 11/23/2018 | 7.720 | 77.20 | 80.90 | -4.57 | 2.220 | 22.20 | 22.80 | -2.63 | |
| G | 12/26/2017 | Head | D5GHzV2 SN:1168 (5.6 GHz) | 11/23/2018 | 8.360 | 83.60 | 87.20 | -4.13 | 2.350 | 23.50 | 24.40 | -3.69 | |
| G | 12/26/2017 | Head | D5GHzV2 SN:1168 (5.8 GHz) | 11/23/2018 | 7.240 | 72.40 | 79.10 | -8.47 | 2.050 | 20.50 | 22.10 | -7.24 | 25,26 |
| G | 12/28/2017 | Body | D5GHzV2 SN:1138 (5.6 GHz) | 10/26/2018 | 8.140 | 81.40 | 79.50 | 2.39 | 2.250 | 22.50 | 22.30 | 0.90 | |
| G | 12/28/2017 | Body | D5GHzV2 SN:1138 (5.8 GHz) | 10/26/2018 | 8.260 | 82.60 | 76.80 | 7.55 | 2.310 | 23.10 | 21.30 | 8.45 | 27,28 |

# 9. Conducted Output Power Measurements

## 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.

**GSM850 Measured Results**

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Burst Pwr (dBm) | Frame Pwr (dBm) | Max. Output Pwr (dBm) | Max. Frame Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|
| GSM/ GPRS | CS1 | 1 | 128 | 824.4 | 32.4 | 23.4 | 33.2 | 24.2 |
| | | | 190 | 836.6 | 32.4 | 23.4 | | |
| | | | 251 | 848.8 | 32.5 | 23.5 | | |
| GPRS (GMSK) | | 2 | 128 | 824.4 | 30.3 | 24.3 | 31.2 | 25.2 |
| | | | 190 | 836.6 | 30.4 | 24.4 | | |
| | | | 251 | 848.8 | 30.4 | 24.4 | | |
| | | 3 | 128 | 824.4 | 28.5 | 24.2 | 29.2 | 24.9 |
| | | | 190 | 836.6 | 28.6 | 24.3 | | |
| | | | 251 | 848.8 | 28.6 | 24.3 | | |
| | | 4 | 128 | 824.4 | 27.6 | 24.6 | 28.2 | 25.2 |
| | | | 190 | 836.6 | 27.6 | 24.6 | | |
| | | | 251 | 848.8 | 27.6 | 24.6 | | |
| EGPRS (8PSK) | MCS5 | 1 | 128 | 824.4 | 27.1 | 18.1 | 28.0 | 19.0 |
| | | | 190 | 836.6 | 27.0 | 18.0 | | |
| | | | 251 | 848.8 | 27.0 | 18.0 | | |
| | | 2 | 128 | 824.4 | 25.4 | 19.4 | 26.5 | 20.5 |
| | | | 190 | 836.6 | 25.3 | 19.3 | | |
| | | | 251 | 848.8 | 25.3 | 19.3 | | |
| | | 3 | 128 | 824.4 | 23.6 | 19.3 | 24.5 | 20.2 |
| | | | 190 | 836.6 | 23.5 | 19.2 | | |
| | | | 251 | 848.8 | 23.5 | 19.2 | | |
| | | 4 | 128 | 824.4 | 22.4 | 19.4 | 23.5 | 20.5 |
| | | | 190 | 836.6 | 22.2 | 19.2 | | |
| | | | 251 | 848.8 | 22.3 | 19.3 | | |

**Notes:**

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 4 time slots for Max power based on the Tune-up Procedure.
- SAR is not required for EGPRS (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than GMSK GPRS or the adjusted SAR of the highest reported SAR of GMSK GPRS is ≤ 1.2W/kg.

**GSM1900 Measured Results**

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Burst Pwr (dBm) | Frame Pwr (dBm) | Max. Output Pwr (dBm) | Max. Frame Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|
| GSM/ GPRS | CS1 | 1 | 512 | 1850.2 | 28.2 | 19.2 | 28.7 | 19.7 |
| | | | 661 | 1880.0 | 28.2 | 19.2 | | |
| | | | 810 | 1909.8 | 28.2 | 19.2 | | |
| GPRS (GMSK) | | 2 | 512 | 1850.2 | 26.1 | 20.1 | 26.7 | 20.7 |
| | | | 661 | 1880.0 | 26.1 | 20.1 | | |
| | | | 810 | 1909.8 | 26.1 | 20.1 | | |
| | | 3 | 512 | 1850.2 | 24.1 | 19.8 | 24.7 | 20.4 |
| | | | 661 | 1880.0 | 24.1 | 19.8 | | |
| | | | 810 | 1909.8 | 24.1 | 19.8 | | |
| | | 4 | 512 | 1850.2 | 23.4 | 20.4 | 23.7 | 20.7 |
| | | | 661 | 1880.0 | 23.4 | 20.4 | | |
| | | | 810 | 1909.8 | 23.5 | 20.5 | | |
| EGPRS (8PSK) | MCS5 | 1 | 512 | 1850.2 | 26.0 | 17.0 | 27.0 | 18.0 |
| | | | 661 | 1880.0 | 25.9 | 16.9 | | |
| | | | 810 | 1909.8 | 25.9 | 16.9 | | |
| | | 2 | 512 | 1850.2 | 24.6 | 18.6 | 25.5 | 19.5 |
| | | | 661 | 1880.0 | 24.5 | 18.5 | | |
| | | | 810 | 1909.8 | 24.4 | 18.4 | | |
| | | 3 | 512 | 1850.2 | 22.4 | 18.1 | 23.5 | 19.2 |
| | | | 661 | 1880.0 | 22.3 | 18.0 | | |
| | | | 810 | 1909.8 | 22.3 | 18.0 | | |
| | | 4 | 512 | 1850.2 | 21.3 | 18.3 | 22.5 | 19.5 |
| | | | 661 | 1880.0 | 21.2 | 18.2 | | |
| | | | 810 | 1909.8 | 21.3 | 18.3 | | |

**Notes:**

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 4 time slots for Max power based on the Tune-up Procedure.
- SAR is not required for EGPRS (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than GMSK GPRS or the adjusted SAR of the highest reported SAR of GMSK GPRS is ≤ 1.2W/kg.

**GSM850 DTM Measured Results**

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Max Meas. Avg Pwr | | | | Max. Output Pwr (dBm) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CS | | PS | | | |
| | | | | | Burst (dBm) | Frame (dBm) | Burst (dBm) | Frame (dBm) | CS | PS |
| GSM(Voice) + GPRS(GMSK) | CS1 | 1 | 128 | 824.2 | 32.4 | 23.4 | | | 33.2 | |
| | | | 190 | 836.6 | 32.4 | 23.4 | | | | |
| | | | 251 | 848.8 | 32.5 | 23.5 | | | | |
| | | 2 | 128 | 824.2 | 30.7 | 24.7 | 30.8 | 24.8 | 31.2 | 31.2 |
| | | | 190 | 836.6 | 30.6 | 24.6 | 30.8 | 24.8 | | |
| | | | 251 | 848.8 | 30.6 | 24.6 | 30.8 | 24.8 | | |
| | | 3 | 128 | 824.2 | 28.7 | 24.4 | 28.9 | 24.6 | 29.2 | 29.2 |
| | | | 190 | 836.6 | 28.6 | 24.3 | 28.8 | 24.5 | | |
| | | | 251 | 848.8 | 28.5 | 24.2 | 28.9 | 24.6 | | |
| GSM(Voice) + EGPRS(8PSK) | MCS5 | 1 | 128 | 824.2 | 32.4 | 23.4 | | | 33.2 | |
| | | | 190 | 836.6 | 32.4 | 23.4 | | | | |
| | | | 251 | 848.8 | 32.5 | 23.5 | | | | |
| | | 2 | 128 | 824.2 | 30.8 | 24.8 | 25.6 | 19.6 | 31.2 | 26.5 |
| | | | 190 | 836.6 | 30.7 | 24.7 | 26.0 | 20.0 | | |
| | | | 251 | 848.8 | 30.7 | 24.7 | 26.0 | 20.0 | | |
| | | 3 | 128 | 824.2 | 28.3 | 24.0 | 23.4 | 19.1 | 29.2 | 24.5 |
| | | | 190 | 836.6 | 28.2 | 23.9 | 23.4 | 19.1 | | |
| | | | 251 | 848.8 | 28.2 | 23.9 | 23.8 | 19.5 | | |

**Notes:**

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GSM(Voice) + GMSK(GPRS) mode with 2 time slots for Max power based on the Tune-up Procedure.
- SAR is not required for GSM(Voice) + EGPRS (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than that of GSM(Voice) + GMSK (GPRS) mode or the adjusted SAR of the highest reported SAR of GSM(Voice) + GMSK (GPRS) is ≤ 1.2W/kg.

**GSM1900 DTM Measured Results**

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Max Meas. Avg Pwr | | | | Max. Output Pwr (dBm) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CS | | PS | | | |
| | | | | | Burst (dBm) | Frame (dBm) | Burst (dBm) | Frame (dBm) | CS | PS |
| GSM(Voice) + GPRS(GMSK) | CS1 | 1 | 512 | 1850.2 | 28.2 | 19.2 | | | 28.7 | |
| | | | 661 | 1880.0 | 28.2 | 19.2 | | | | |
| | | | 810 | 1909.8 | 28.2 | 19.2 | | | | |
| | | 2 | 512 | 1850.2 | 26.0 | 20.0 | 26.2 | 20.2 | 26.7 | 26.7 |
| | | | 661 | 1880.0 | 26.2 | 20.2 | 26.4 | 20.4 | | |
| | | | 810 | 1909.8 | 26.1 | 20.1 | 26.2 | 20.2 | | |
| | | 3 | 512 | 1850.2 | 24.1 | 19.8 | 24.2 | 19.9 | 24.7 | 24.7 |
| | | | 661 | 1880.0 | 24.1 | 19.8 | 24.2 | 19.9 | | |
| | | | 810 | 1909.8 | 24.0 | 19.7 | 24.2 | 19.9 | | |
| GSM(Voice) + EGPRS(8PSK) | MCS5 | 1 | 512 | 1850.2 | 28.2 | 19.2 | | | 28.7 | |
| | | | 661 | 1880.0 | 28.2 | 19.2 | | | | |
| | | | 810 | 1909.8 | 28.2 | 19.2 | | | | |
| | | 2 | 512 | 1850.2 | 26.1 | 20.1 | 22.5 | 16.5 | 26.7 | 25.5 |
| | | | 661 | 1880.0 | 26.3 | 20.3 | 22.5 | 16.5 | | |
| | | | 810 | 1909.8 | 26.2 | 20.2 | 22.7 | 16.7 | | |
| | | 3 | 512 | 1850.2 | 24.7 | 20.4 | 22.6 | 18.3 | 24.7 | 23.5 |
| | | | 661 | 1880.0 | 24.7 | 20.4 | 22.6 | 18.3 | | |
| | | | 810 | 1909.8 | 24.7 | 20.4 | 22.5 | 18.2 | | |

**Notes:**

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GSM(Voice) + GMSK(GPRS) mode with 2 time slots for Max power based on the Tune-up Procedure.
- SAR is not required for GSM(Voice) + EGPRS (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than that of GSM(Voice) + GMSK (GPRS) mode or the adjusted SAR of the highest reported SAR of GSM(Voice) + GMSK (GPRS) is ≤ 1.2W/kg.

## 9.2. W-CDMA

**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 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

| Mode | Subtest | Rel99 |
|---|---|---|
| WCDMA General Settings | Loopback Mode | Test Mode 2 |
| | Rel99 RMC | 12.2kbps RMC |
| | Power Control Algorithm | Algorithm2 |
| | βc/βd | 8/15 |

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

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

| | Mode | HSDPA | HSDPA | HSDPA | HSDPA |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| W-CDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set 1 | | | |
| | Power Control Algorithm | Algorithm 2 | | | |
| | βc | 2/15 | 11/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | Bd (SF) | 64 | | | |
| | βc/βd | 2/15 | 11/15 | 15/8 | 15/4 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | MPR (dB) | 0 | 0 | 0.5 | 0.5 |
| HSDPA Specific Settings | $D_{ACK}$ | 8 | | | |
| | $D_{NAK}$ | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack repetition factor | 3 | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | |
| | Ahs=βhs/βc | 30/15 | | | |

**HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals**

The following 5 Sub-tests were completed according to Release 6 procedures in table C,11.1.3 of 3GPP TS 34.121-1 v13.
A summary of these settings are illustrated below:

| | Mode | HSPA | | | | |
|---|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 | 5 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | Rel99 RMC | 12.2 kbps RMC | | | | |
| | HSDPA FRC | H-Set 1 | | | | |
| | HSUPA Test | HSPA | | | | |
| | Power Control Algorithm | Algorithm 2 | | | | Algorithm 1 |
| | βc | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | βd | 15/15 | 15/15 | 9/15 | 15/15 | 0 |
| | βec | 209/225 | 12/15 | 30/15 | 2/15 | 5/15 |
| | βc/βd | 11/15 | 6/15 | 15/9 | 2/15 | - |
| | βhs | 22/15 | 12/15 | 30/15 | 4/15 | 5/15 |
| | βed | 1309/225 | 94/75 | 47/15 | 56/75 | 47/15 |
| | CM (dB) | 1 | 3 | 2 | 3 | 1 |
| | MPR (dB) | 0 | 2 | 1 | 2 | 0 |
| HSDPA Specific Settings | DACK | 8 | | | | 0 |
| | DNAK | 8 | | | | 0 |
| | DCQI | 8 | | | | 0 |
| | Ack-Nack repetition factor | 3 | | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | | |
| | Ahs = βhs/βc | 30/15 | | | | |
| HSUPA Specific Settings | E-DPDCCH | 6 | 8 | 8 | 5 | 0 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 12 |
| | ETFCI (from 34.121 Table C.11.1.3) | 75 | 67 | 92 | 71 | 67 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E-TFCIs | 5 | 5 | 2 | 5 | 1 |
| | Reference E-TFCI | 11 | 11 | 11 | 11 | 67 |
| | Reference E-TFCI PO | 4 | 4 | 4 | 4 | 18 |
| | Reference E-TFCI | 67 | 67 | 92 | 67 | 67 |
| | Reference E-TFCI PO | 18 | 18 | 18 | 18 | 18 |
| | Reference E-TFCI | 71 | 71 | 71 | 71 | 71 |
| | Reference E-TFCI PO | 23 | 23 | 23 | 23 | 23 |
| | Reference E-TFCI | 75 | 75 | 75 | 75 | 75 |
| | Reference E-TFCI PO | 26 | 26 | 26 | 26 | 26 |
| | Reference E-TFCI | 81 | 81 | 81 | 81 | 81 |
| | Reference E-TFCI PO | 27 | 27 | 27 | 27 | 27 |
| | Maximum Channelization Codes | 2xSF2 | | | | SF4 |

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

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

**Table E.5.0: Levels for HSDPA connection setup**

| Parameter During Connection setup | Unit | Value |
|---|---|---|
| P-CPICH_Ec/Ior | dB | -10 |
| P-CCPCH and SCH_Ec/Ior | dB | -12 |
| PICH _Ec/Ior | dB | -15 |
| HS-PDSCH | dB | off |
| HS-SCCH_1 | dB | off |
| DPCH_Ec/Ior | dB | -5 |
| OCNS_Ec/Ior | dB | -3.1 |

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

**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. | | |

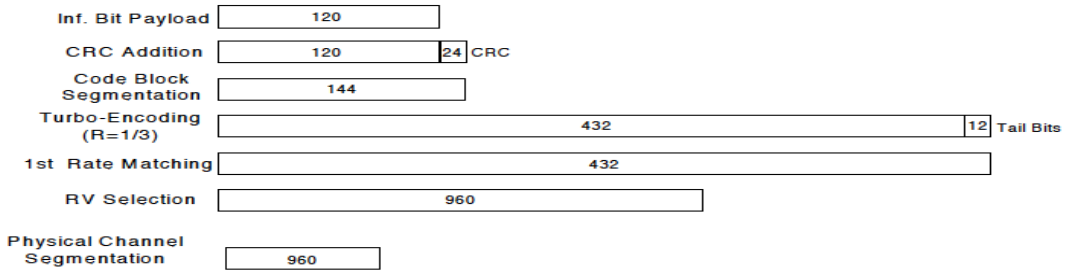



**Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)**

The following 4 Sub-tests for HSDPA were completed according to Release 9 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

| | Mode | HSDPA | HSDPA | HSDPA | HSDPA |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set 1 | | | |
| | Power Control Algorithm | Algorithm2 | | | |
| | βc | 2/15 | 11/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | βd (SF) | 64 | | | |
| | βc/βd | 2/15 | 12/15 | 15/8 | 15/4 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | MPR (dB) | 0 | 0 | 0.5 | 0.5 |
| HSDPA Specific Settings | DACK | 8 | | | |
| | DNAK | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack Repetition factor | 3 | | | |
| | CQI Feedback | 4ms | | | |
| | CQI Repetition Factor | 2 | | | |
| | Ahs = βhs/ βc | 30/15 | | | |

## HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., Rel. 9 Therefore, the RF conducted power is not measured.

**W-CDMA Band II Measured Results**

| Band | Mode | | UL Ch No. | Freq. (MHz) | MPR (dB) | Max. Meas. Avg Pwr (dBm) | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|
| W-CDMA Band II | Rel 99 | RMC, 12.2 kbps | 9262 | 1852.4 | N/A | 22.7 | 22.7 |
| | | | 9400 | 1880.0 | N/A | 22.6 | |
| | | | 9538 | 1907.6 | N/A | 22.5 | |
| | HSDPA | Subtest 1 | 9262 | 1852.4 | 0 | 22.0 | 22.0 |
| | | | 9400 | 1880.0 | 0 | 22.0 | |
| | | | 9538 | 1907.6 | 0 | 22.0 | |
| | | Subtest 2 | 9262 | 1852.4 | 0 | 22.0 | 22.0 |
| | | | 9400 | 1880.0 | 0 | 22.0 | |
| | | | 9538 | 1907.6 | 0 | 22.0 | |
| | | Subtest 3 | 9262 | 1852.4 | 0.5 | 21.0 | 21.5 |
| | | | 9400 | 1880.0 | 0.5 | 21.0 | |
| | | | 9538 | 1907.6 | 0.5 | 21.0 | |
| | | Subtest 4 | 9262 | 1852.4 | 0.5 | 21.0 | 21.5 |
| | | | 9400 | 1880.0 | 0.5 | 21.0 | |
| | | | 9538 | 1907.6 | 0.5 | 21.0 | |
| | HSUPA | Subtest 1 | 9262 | 1852.4 | 0 | 22.0 | 22.0 |
| | | | 9400 | 1880.0 | 0 | 22.0 | |
| | | | 9538 | 1907.6 | 0 | 22.0 | |
| | | Subtest 2 | 9262 | 1852.4 | 2 | 20.0 | 20.0 |
| | | | 9400 | 1880.0 | 2 | 20.0 | |
| | | | 9538 | 1907.6 | 2 | 20.0 | |
| | | Subtest 3 | 9262 | 1852.4 | 1 | 21.0 | 21.0 |
| | | | 9400 | 1880.0 | 1 | 21.0 | |
| | | | 9538 | 1907.6 | 1 | 21.0 | |
| | | Subtest 4 | 9262 | 1852.4 | 2 | 20.0 | 20.0 |
| | | | 9400 | 1880.0 | 2 | 20.0 | |
| | | | 9538 | 1907.6 | 2 | 20.0 | |
| | | Subtest 5 | 9262 | 1852.4 | 0 | 22.0 | 22.0 |
| | | | 9400 | 1880.0 | 0 | 22.0 | |
| | | | 9538 | 1907.6 | 0 | 22.0 | |
| | DC-HSDPA | Subtest 1 | 9262 | 1852.4 | 0 | 21.7 | 22.0 |
| | | | 9400 | 1880.0 | 0 | 21.8 | |
| | | | 9538 | 1907.6 | 0 | 21.6 | |
| | | Subtest 2 | 9262 | 1852.4 | 0 | 21.7 | 22.0 |
| | | | 9400 | 1880.0 | 0 | 21.8 | |
| | | | 9538 | 1907.6 | 0 | 21.7 | |
| | | Subtest 3 | 9262 | 1852.4 | 0.5 | 21.2 | 21.5 |
| | | | 9400 | 1880.0 | 0.5 | 21.3 | |
| | | | 9538 | 1907.6 | 0.5 | 21.1 | |
| | | Subtest 4 | 9262 | 1852.4 | 0.5 | 21.2 | 21.5 |
| | | | 9400 | 1880.0 | 0.5 | 21.3 | |
| | | | 9538 | 1907.6 | 0.5 | 21.1 | |

**W-CDMA Band IV Measured Results**

| Band | Mode | | UL Ch No. | Freq. (MHz) | MPR (dB) | Max. Meas. Avg Pwr (dBm) | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|
| W-CDMA Band IV | Rel 99 | RMC, 12.2 kbps | 1312 | 1712.4 | N/A | 22.5 | 22.7 |
| | | | 1413 | 1732.6 | N/A | 22.6 | |
| | | | 1513 | 1752.6 | N/A | 22.5 | |
| | HSDPA | Subtest 1 | 1312 | 1712.4 | 0 | 22.0 | 22.0 |
| | | | 1413 | 1732.6 | 0 | 22.0 | |
| | | | 1513 | 1752.6 | 0 | 22.0 | |
| | | Subtest 2 | 1312 | 1712.4 | 0 | 22.0 | 22.0 |
| | | | 1413 | 1732.6 | 0 | 22.0 | |
| | | | 1513 | 1752.6 | 0 | 22.0 | |
| | | Subtest 3 | 1312 | 1712.4 | 0.5 | 21.0 | 21.5 |
| | | | 1413 | 1732.6 | 0.5 | 21.0 | |
| | | | 1513 | 1752.6 | 0.5 | 21.0 | |
| | | Subtest 4 | 1312 | 1712.4 | 0.5 | 21.0 | 21.5 |
| | | | 1413 | 1732.6 | 0.5 | 21.0 | |
| | | | 1513 | 1752.6 | 0.5 | 21.0 | |
| | HSUPA | Subtest 1 | 1312 | 1712.4 | 0 | 22.0 | 22.0 |
| | | | 1413 | 1732.6 | 0 | 22.0 | |
| | | | 1513 | 1752.6 | 0 | 22.0 | |
| | | Subtest 2 | 1312 | 1712.4 | 2 | 19.5 | 20.0 |
| | | | 1413 | 1732.6 | 2 | 20.0 | |
| | | | 1513 | 1752.6 | 2 | 20.0 | |
| | | Subtest 3 | 1312 | 1712.4 | 1 | 21.0 | 21.0 |
| | | | 1413 | 1732.6 | 1 | 21.0 | |
| | | | 1513 | 1752.6 | 1 | 21.0 | |
| | | Subtest 4 | 1312 | 1712.4 | 2 | 20.0 | 20.0 |
| | | | 1413 | 1732.6 | 2 | 20.0 | |
| | | | 1513 | 1752.6 | 2 | 20.0 | |
| | | Subtest 5 | 1312 | 1712.4 | 0 | 21.7 | 22.0 |
| | | | 1413 | 1732.6 | 0 | 21.7 | |
| | | | 1513 | 1752.6 | 0 | 21.6 | |
| | DC-HSDPA | Subtest 1 | 1312 | 1712.4 | 0 | 21.7 | 22.0 |
| | | | 1413 | 1732.6 | 0 | 21.8 | |
| | | | 1513 | 1752.6 | 0 | 21.7 | |
| | | Subtest 2 | 1312 | 1712.4 | 0 | 21.7 | 22.0 |
| | | | 1413 | 1732.6 | 0 | 21.8 | |
| | | | 1513 | 1752.6 | 0 | 21.7 | |
| | | Subtest 3 | 1312 | 1712.4 | 0.5 | 21.3 | 21.5 |
| | | | 1413 | 1732.6 | 0.5 | 21.3 | |
| | | | 1513 | 1752.6 | 0.5 | 21.2 | |
| | | Subtest 4 | 1312 | 1712.4 | 0.5 | 21.2 | 21.5 |
| | | | 1413 | 1732.6 | 0.5 | 21.3 | |
| | | | 1513 | 1752.6 | 0.5 | 21.2 | |

**W-CDMA Band V Measured Results**

| Band | Mode | | UL Ch No. | Freq. (MHz) | MPR (dB) | Max. Meas. Avg Pwr (dBm) | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|
| W-CDMA Band V | Rel 99 | RMC, 12.2 kbps | 4132 | 826.4 | N/A | 24.8 | 24.9 |
| | | | 4183 | 836.6 | N/A | 24.7 | |
| | | | 4233 | 846.6 | N/A | 24.7 | |
| | HSDPA | Subtest 1 | 4132 | 826.4 | 0 | 23.8 | 24.2 |
| | | | 4183 | 836.6 | 0 | 23.7 | |
| | | | 4233 | 846.6 | 0 | 23.7 | |
| | | Subtest 2 | 4132 | 826.4 | 0 | 23.8 | 24.2 |
| | | | 4183 | 836.6 | 0 | 23.7 | |
| | | | 4233 | 846.6 | 0 | 23.7 | |
| | | Subtest 3 | 4132 | 826.4 | 0.5 | 23.3 | 23.7 |
| | | | 4183 | 836.6 | 0.5 | 23.2 | |
| | | | 4233 | 846.6 | 0.5 | 23.2 | |
| | | Subtest 4 | 4132 | 826.4 | 0.5 | 23.3 | 23.7 |
| | | | 4183 | 836.6 | 0.5 | 23.2 | |
| | | | 4233 | 846.6 | 0.5 | 23.3 | |
| | HSUPA | Subtest 1 | 4132 | 826.4 | 0 | 23.9 | 24.2 |
| | | | 4183 | 836.6 | 0 | 23.8 | |
| | | | 4233 | 846.6 | 0 | 23.8 | |
| | | Subtest 2 | 4132 | 826.4 | 2 | 22.0 | 22.2 |
| | | | 4183 | 836.6 | 2 | 21.9 | |
| | | | 4233 | 846.6 | 2 | 21.9 | |
| | | Subtest 3 | 4132 | 826.4 | 1 | 23.0 | 23.2 |
| | | | 4183 | 836.6 | 1 | 22.9 | |
| | | | 4233 | 846.6 | 1 | 22.9 | |
| | | Subtest 4 | 4132 | 826.4 | 2 | 21.9 | 22.2 |
| | | | 4183 | 836.6 | 2 | 21.9 | |
| | | | 4233 | 846.6 | 2 | 22.0 | |
| | | Subtest 5 | 4132 | 826.4 | 0 | 23.9 | 24.2 |
| | | | 4183 | 836.6 | 0 | 23.9 | |
| | | | 4233 | 846.6 | 0 | 23.9 | |
| | DC-HSDPA | Subtest 1 | 4132 | 826.4 | 0 | 23.9 | 24.2 |
| | | | 4183 | 836.6 | 0 | 23.8 | |
| | | | 4233 | 846.6 | 0 | 23.8 | |
| | | Subtest 2 | 4132 | 826.4 | 0 | 24.0 | 24.2 |
| | | | 4183 | 836.6 | 0 | 23.9 | |
| | | | 4233 | 846.6 | 0 | 23.9 | |
| | | Subtest 3 | 4132 | 826.4 | 0.5 | 23.4 | 23.7 |
| | | | 4183 | 836.6 | 0.5 | 23.4 | |
| | | | 4233 | 846.6 | 0.5 | 23.4 | |
| | | Subtest 4 | 4132 | 826.4 | 0.5 | 23.5 | 23.7 |
| | | | 4183 | 836.6 | 0.5 | 23.4 | |
| | | | 4233 | 846.6 | 0.5 | 23.4 | |

## 9.4. 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 |
| NS_03 | 6.6.2.2.1 | 2, 4,10, 23, 25, 35, 36, 66, 70 | 3 | >5 | ≤ 1 |
| | | | 5 | >6 | ≤ 1 |
| | | | 10 | >6 | ≤ 1 |
| | | | 15 | >8 | ≤ 1 |
| | | | 20 | >10 | ≤ 1 |
| NS_04 | 6.6.2.2.2, 6.6.3.3.19 | 41 | 5, 10, 15, 20 | Table 6.2.4-4, Table 6.2.4-4a | |
| NS_05 | 6.6.3.3.1 | 1 | 10,15,20 | ≥ 50 (NOTE1) | ≤ 1 (NOTE1) |
| | | | 15, 20 | Table 6.2.4-18 (NOTE2) | |
| | | 65 (NOTE 3) | 10,15,20 | ≥ 50 | ≤ 1 (NOTE 1) |
| | | | 15,20 | Table 6.2.4-18 (NOTE 2) | |
| NS_06 | 6.6.2.2.3 | 12, 13, 14, 17 | 1.4, 3, 5, 10 | Table 5.6-1 | N/A |
| NS_07 | 6.6.2.2.3 6.6.3.3.2 | 13 | 10 | Table 6.2.4-2 | |
| NS_08 | 6.6.3.3.3 | 19 | 10, 15 | > 44 | ≤ 3 |
| NS_09 | 6.6.3.3.4 | 21 | 10, 15 | > 40 | ≤ 1 |
| | | | | > 55 | ≤ 2 |
| NS_10 | | 20 | 15, 20 | Table 6.2.4-3 | |
| NS_11 | 6.6.2.2.1 6.6.3.3.13 | 23 | 1.4, 3, 5, 10, 15, 20 | Table 6.2.4-5 | |
| NS_12 | 6.6.3.3.5 | 26 | 1.4, 3, 5, 10, 15 | Table 6.2.4-6 | |
| NS_13 | 6.6.3.3.6 | 26 | 5 | Table 6.2.4-7 | |
| NS_14 | 6.6.3.3.7 | 26 | 10, 15 | Table 6.2.4-8 | |
| NS_15 | 6.6.3.3.8 | 26 | 1.4, 3, 5, 10, 15 | Table 6.2.4-9 Table 6.2.4-10 | |
| NS_16 | 6.6.3.3.9 | 27 | 3, 5, 10 | Table 6.2.4-11, Table 6.2.4-12, Table 6.2.4-13 | |
| NS_17 | 6.6.3.3.10 | 28 | 5, 10 | Table 5.6-1 | N/A |
| NS_18 | 6.6.3.3.11 | 28 | 5 | ≥ 2 | ≤ 1 |
| | | | 10, 15, 20 | ≥ 1 | ≤ 4 |
| NS_19 | 6.6.3.3.12 | 44 | 10, 15, 20 | Table 6.2.4-14 | |
| NS_20 | 6.2.2 6.6.2.2.1 6.6.3.3.14 | 23 | 5, 10, 15, 20 | Table 6.2.4-15 | |
| NS_21 | 6.6.2.2.1 6.6.3.3.15 | 30 | 5, 10 | Table 6.2.4-16 | |
| NS_22 | 6.6.3.3.16 | 42, 43 | 5, 10, 15, 20 | Table 6.2.4-17 | |
| NS_23 | 6.6.3.3.17 | 42, 43 | 5, 10, 15, 20 | N/A | |
| NS_24 | 6.6.3.3.20 | 65 (NOTE 4) | 5, 10, 15, 20 | Table 6.2.4-19 | |
| NS_25 | 6.6.3.3.21 | 65 (NOTE 4) | 5, 10, 15, 20 | Table 6.2.4-20 | |
| NS_26 | 6.6.3.3.22 | 68 | 10, 15 | Table 6.2.4-21 | |
| NS_27 | 6.6.2.2.5, 6.6.3.3.23 | 48 | 5, 10, 15, 20 | Table 6.2.4-22 | |
| NS_28 | 6.2.2A, 6.6.3.3.24 | 46 (NOTE 5) | 20 | Table 6.2.4-23 | |
| NS_29 | 6.2.2A, 6.6.2.3.1a, 6.6.3.3.25 | 46 (NOTE 5) | 20 | Table 6.2.4-24 | |
| NS_30 | 6.2.2A, 6.6.3.3.26 | 46 (NOTE 5) | 20 | Table 6.2.4-25 | |
| NS_31 | 6.2.2A, 6.6.3.3.27 | 46 (NOTE 5) | 20 | Table 6.2.4-26 | |
| | | | | | |
| NS_32 | - | - | - | - | - |

NOTE 1: Applicable when the lower edge of the assigned E-UTRA UL channel bandwidth frequency is larger than or equal to the upper edge of PHS band (1915.7 MHz) + 4 MHz + the channel BW assigned, where channel BW is as defined in subclause 5.6. A-MPR for

**LTE Band 2 Measured Results**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1860 MHz | 1880 MHz | 1900 MHz | |
| LTE Band 2 | 20 | QPSK | 1 | 0 | 0 | 22.9 | 23.0 | 23.0 | 23.0 |
| | | | 1 | 49 | 0 | 22.7 | 22.7 | 22.9 | |
| | | | 1 | 99 | 0 | 22.7 | 22.9 | 22.8 | |
| | | | 50 | 0 | 0 | 22.8 | 22.9 | 22.9 | |
| | | | 50 | 24 | 0 | 22.8 | 22.9 | 22.9 | |
| | | | 50 | 50 | 0 | 22.6 | 22.8 | 22.9 | |
| | | | 100 | 0 | 0 | 22.7 | 22.8 | 22.9 | |
| | | 16QAM | 1 | 0 | 0 | 22.9 | 23.0 | 23.0 | 23.0 |
| | | | 1 | 49 | 0 | 22.7 | 22.8 | 22.9 | |
| | | | 1 | 99 | 0 | 22.7 | 23.0 | 22.8 | |
| | | | 50 | 0 | 0 | 22.5 | 22.5 | 22.5 | |
| | | | 50 | 24 | 0 | 22.4 | 22.4 | 22.5 | |
| | | | 50 | 50 | 0 | 22.2 | 22.4 | 22.5 | |
| | | | 100 | 0 | 0 | 22.3 | 22.5 | 22.5 | |
| | | 64QAM | 1 | 0 | 0 | 22.9 | 22.7 | 22.6 | 23.0 |
| | | | 1 | 49 | 0 | 22.8 | 22.5 | 22.5 | |
| | | | 1 | 99 | 0 | 22.8 | 22.6 | 22.4 | |
| | | | 50 | 0 | 1 | 21.8 | 21.9 | 21.9 | 22.0 |
| | | | 50 | 24 | 1 | 21.8 | 21.8 | 21.9 | |
| | | | 50 | 50 | 1 | 21.6 | 21.8 | 21.9 | |
| | | | 100 | 0 | 1 | 21.7 | 21.8 | 21.9 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1857.5 MHz | 1880 MHz | 1902.5 MHz | |
| LTE Band 2 | 15 | QPSK | 1 | 0 | 0 | 22.8 | 22.8 | 22.6 | 23.0 |
| | | | 1 | 37 | 0 | 22.6 | 22.6 | 22.5 | |
| | | | 1 | 74 | 0 | 22.6 | 22.6 | 22.6 | |
| | | | 36 | 0 | 0 | 22.7 | 22.6 | 22.5 | |
| | | | 36 | 20 | 0 | 22.8 | 22.7 | 22.6 | |
| | | | 36 | 39 | 0 | 22.8 | 22.7 | 22.6 | |
| | | | 75 | 0 | 0 | 22.8 | 22.7 | 22.6 | |
| | | 16QAM | 1 | 0 | 0 | 22.8 | 22.9 | 22.9 | 23.0 |
| | | | 1 | 37 | 0 | 22.6 | 22.7 | 22.7 | |
| | | | 1 | 74 | 0 | 22.5 | 22.7 | 22.7 | |
| | | | 36 | 0 | 0 | 22.4 | 22.2 | 22.3 | |
| | | | 36 | 20 | 0 | 22.5 | 22.3 | 22.3 | |
| | | | 36 | 39 | 0 | 22.4 | 22.3 | 22.3 | |
| | | | 75 | 0 | 0 | 22.5 | 22.3 | 22.3 | |
| | | 64QAM | 1 | 0 | 0 | 22.8 | 22.4 | 22.7 | 23.0 |
| | | | 1 | 37 | 0 | 22.7 | 22.3 | 22.6 | |
| | | | 1 | 74 | 0 | 22.6 | 22.3 | 22.6 | |
| | | | 36 | 0 | 1 | 21.7 | 21.8 | 21.9 | 22.0 |
| | | | 36 | 20 | 1 | 21.8 | 21.8 | 21.9 | |
| | | | 36 | 39 | 1 | 21.8 | 21.8 | 21.9 | |
| | | | 75 | 0 | 1 | 21.8 | 21.7 | 21.9 | |

**LTE Band 2 Measured Results (continued)**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1855 MHz | 1880 MHz | 1905 MHz | |
| LTE Band 2 | 10 | QPSK | 1 | 0 | 0 | 22.7 | 22.7 | 22.8 | 23.0 |
| | | | 1 | 25 | 0 | 22.4 | 22.5 | 22.6 | |
| | | | 1 | 49 | 0 | 22.7 | 22.7 | 22.6 | |
| | | | 25 | 0 | 0 | 22.5 | 22.6 | 22.7 | |
| | | | 25 | 12 | 0 | 22.5 | 22.6 | 22.7 | |
| | | | 25 | 25 | 0 | 22.5 | 22.5 | 22.7 | |
| | | | 50 | 0 | 0 | 22.6 | 22.6 | 22.7 | |
| | | 16QAM | 1 | 0 | 0 | 22.4 | 22.6 | 22.3 | 23.0 |
| | | | 1 | 25 | 0 | 22.1 | 22.5 | 22.1 | |
| | | | 1 | 49 | 0 | 22.3 | 22.7 | 22.1 | |
| | | | 25 | 0 | 0 | 22.2 | 22.2 | 22.3 | |
| | | | 25 | 12 | 0 | 22.2 | 22.2 | 22.3 | |
| | | | 25 | 25 | 0 | 22.2 | 22.2 | 22.3 | |
| | | | 50 | 0 | 0 | 22.2 | 22.2 | 22.3 | |
| | | 64QAM | 1 | 0 | 0 | 22.5 | 22.6 | 22.6 | 23.0 |
| | | | 1 | 25 | 0 | 22.3 | 22.4 | 22.4 | |
| | | | 1 | 49 | 0 | 22.5 | 22.6 | 22.4 | |
| | | | 25 | 0 | 1 | 21.8 | 21.8 | 21.9 | 22.0 |
| | | | 25 | 12 | 1 | 21.8 | 21.8 | 21.9 | |
| | | | 25 | 25 | 1 | 21.8 | 21.7 | 21.9 | |
| | | | 50 | 0 | 1 | 21.8 | 21.7 | 21.8 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1852.5 MHz | 1880 MHz | 1907.5 MHz | |
| LTE Band 2 | 5 | QPSK | 1 | 0 | 0 | 22.6 | 22.5 | 22.5 | 23.0 |
| | | | 1 | 12 | 0 | 22.5 | 22.6 | 22.5 | |
| | | | 1 | 24 | 0 | 22.5 | 22.6 | 22.5 | |
| | | | 12 | 0 | 0 | 22.4 | 22.5 | 22.5 | |
| | | | 12 | 7 | 0 | 22.5 | 22.5 | 22.6 | |
| | | | 12 | 13 | 0 | 22.4 | 22.5 | 22.6 | |
| | | | 25 | 0 | 0 | 22.5 | 22.5 | 22.6 | |
| | | 16QAM | 1 | 0 | 0 | 22.2 | 22.1 | 22.6 | 23.0 |
| | | | 1 | 12 | 0 | 22.2 | 22.2 | 22.6 | |
| | | | 1 | 24 | 0 | 22.2 | 22.2 | 22.6 | |
| | | | 12 | 0 | 0 | 22.1 | 22.2 | 22.4 | |
| | | | 12 | 7 | 0 | 22.1 | 22.2 | 22.4 | |
| | | | 12 | 13 | 0 | 22.1 | 22.2 | 22.4 | |
| | | | 25 | 0 | 0 | 22.1 | 22.1 | 22.3 | |
| | | 64QAM | 1 | 0 | 0 | 22.5 | 22.0 | 22.5 | 23.0 |
| | | | 1 | 12 | 0 | 22.4 | 22.1 | 22.4 | |
| | | | 1 | 24 | 0 | 22.4 | 22.1 | 22.4 | |
| | | | 12 | 0 | 1 | 21.6 | 21.7 | 21.8 | 22.0 |
| | | | 12 | 7 | 1 | 21.6 | 21.7 | 21.8 | |
| | | | 12 | 13 | 1 | 21.6 | 21.7 | 21.8 | |
| | | | 25 | 0 | 1 | 21.6 | 21.7 | 21.8 | |

**LTE Band 2 Measured Results (continued)**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1851.5 MHz | 1880 MHz | 1908.5 MHz | |
| LTE Band 2 | 3 | QPSK | 1 | 0 | 0 | 22.4 | 22.6 | 22.7 | 23.0 |
| | | | 1 | 8 | 0 | 22.5 | 22.6 | 22.7 | |
| | | | 1 | 14 | 0 | 22.4 | 22.5 | 22.6 | |
| | | | 8 | 0 | 0 | 22.5 | 22.5 | 22.6 | |
| | | | 8 | 4 | 0 | 22.5 | 22.6 | 22.7 | |
| | | | 8 | 7 | 0 | 22.5 | 22.5 | 22.7 | |
| | | | 15 | 0 | 0 | 22.5 | 22.5 | 22.7 | |
| | | 16QAM | 1 | 0 | 0 | 22.1 | 22.5 | 22.1 | 23.0 |
| | | | 1 | 8 | 0 | 22.2 | 22.6 | 22.2 | |
| | | | 1 | 14 | 0 | 22.0 | 22.5 | 22.1 | |
| | | | 8 | 0 | 0 | 22.1 | 22.2 | 22.3 | |
| | | | 8 | 4 | 0 | 22.1 | 22.2 | 22.3 | |
| | | | 8 | 7 | 0 | 22.1 | 22.2 | 22.3 | |
| | | | 15 | 0 | 0 | 22.0 | 22.2 | 22.3 | |
| | | 64QAM | 1 | 0 | 0 | 22.2 | 22.4 | 22.3 | 23.0 |
| | | | 1 | 8 | 0 | 22.3 | 22.4 | 22.3 | |
| | | | 1 | 14 | 0 | 22.2 | 22.3 | 22.2 | |
| | | | 8 | 0 | 1 | 21.6 | 21.7 | 21.5 | 22.0 |
| | | | 8 | 4 | 1 | 21.6 | 21.7 | 21.6 | |
| | | | 8 | 7 | 1 | 21.6 | 21.7 | 21.7 | |
| | | | 15 | 0 | 1 | 21.6 | 21.6 | 21.7 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1850.7 MHz | 1880 MHz | 1909.3 MHz | |
| LTE Band 2 | 1.4 | QPSK | 1 | 0 | 0 | 22.4 | 22.4 | 22.5 | 23.0 |
| | | | 1 | 3 | 0 | 22.5 | 22.4 | 22.5 | |
| | | | 1 | 5 | 0 | 22.4 | 22.4 | 22.5 | |
| | | | 3 | 0 | 0 | 22.4 | 22.4 | 22.5 | |
| | | | 3 | 1 | 0 | 22.4 | 22.5 | 22.6 | |
| | | | 3 | 3 | 0 | 22.4 | 22.4 | 22.6 | |
| | | | 6 | 0 | 0 | 22.4 | 22.4 | 22.5 | |
| | | 16QAM | 1 | 0 | 0 | 22.1 | 22.0 | 22.4 | 23.0 |
| | | | 1 | 3 | 0 | 22.1 | 22.1 | 22.5 | |
| | | | 1 | 5 | 0 | 22.1 | 22.1 | 22.4 | |
| | | | 3 | 0 | 0 | 22.1 | 22.2 | 22.3 | |
| | | | 3 | 1 | 0 | 22.1 | 22.3 | 22.3 | |
| | | | 3 | 3 | 0 | 22.1 | 22.3 | 22.4 | |
| | | | 6 | 0 | 0 | 22.1 | 22.2 | 22.0 | |
| | | 64QAM | 1 | 0 | 0 | 22.4 | 22.1 | 22.0 | 23.0 |
| | | | 1 | 3 | 0 | 22.5 | 22.2 | 22.2 | |
| | | | 1 | 5 | 0 | 22.4 | 22.2 | 22.1 | |
| | | | 3 | 0 | 0 | 22.4 | 22.0 | 22.1 | |
| | | | 3 | 1 | 0 | 22.4 | 22.0 | 22.3 | |
| | | | 3 | 3 | 0 | 22.4 | 22.0 | 22.3 | |
| | | | 6 | 0 | 1 | 21.5 | 21.6 | 21.9 | 22.0 |

**LTE Band 4 Measured Results**

SAR for LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 5 Measured Results**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 829 MHz | 836.5 MHz | 844 MHz | |
| LTE Band 5 | 10 | QPSK | 1 | 0 | 0 | | 24.3 | | 25.0 |
| | | | 1 | 25 | 0 | | 24.5 | | |
| | | | 1 | 49 | 0 | | 24.4 | | |
| | | | 25 | 0 | 1 | | 23.6 | | 24.0 |
| | | | 25 | 12 | 1 | | 23.5 | | |
| | | | 25 | 25 | 1 | | 23.5 | | |
| | | | 50 | 0 | 1 | | 23.5 | | |
| | | 16QAM | 1 | 0 | 1 | | 23.8 | | 24.0 |
| | | | 1 | 25 | 1 | | 23.9 | | |
| | | | 1 | 49 | 1 | | 23.8 | | |
| | | | 25 | 0 | 2 | | 22.7 | | 23.0 |
| | | | 25 | 12 | 2 | | 22.7 | | |
| | | | 25 | 25 | 2 | | 22.6 | | |
| | | | 50 | 0 | 2 | | 22.6 | | |
| | | 64QAM | 1 | 0 | 2 | | 21.9 | | 23.0 |
| | | | 1 | 25 | 2 | | 22.1 | | |
| | | | 1 | 49 | 2 | | 22.0 | | |
| | | | 25 | 0 | 3 | | 21.7 | | 22.0 |
| | | | 25 | 12 | 3 | | 21.7 | | |
| | | | 25 | 25 | 3 | | 21.6 | | |
| | | | 50 | 0 | 3 | | 21.6 | | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 826.5 MHz | 836.5 MHz | 846.5 MHz | |
| LTE Band 5 | 5 | QPSK | 1 | 0 | 0 | 24.7 | 24.4 | 24.6 | 25.0 |
| | | | 1 | 12 | 0 | 24.7 | 24.4 | 24.5 | |
| | | | 1 | 24 | 0 | 24.7 | 24.4 | 24.5 | |
| | | | 12 | 0 | 1 | 23.6 | 23.5 | 23.6 | 24.0 |
| | | | 12 | 7 | 1 | 23.6 | 23.5 | 23.6 | |
| | | | 12 | 13 | 1 | 23.6 | 23.5 | 23.6 | |
| | | | 25 | 0 | 1 | 23.7 | 23.5 | 23.6 | |
| | | 16QAM | 1 | 0 | 1 | 23.4 | 23.5 | 23.7 | 24.0 |
| | | | 1 | 12 | 1 | 23.4 | 23.5 | 23.6 | |
| | | | 1 | 24 | 1 | 23.4 | 23.5 | 23.6 | |
| | | | 12 | 0 | 2 | 22.8 | 22.7 | 22.9 | 23.0 |
| | | | 12 | 7 | 2 | 22.8 | 22.7 | 22.8 | |
| | | | 12 | 13 | 2 | 22.8 | 22.7 | 22.8 | |
| | | | 25 | 0 | 2 | 22.7 | 22.7 | 22.8 | |
| | | 64QAM | 1 | 0 | 2 | 21.5 | 21.7 | 22.2 | 23.0 |
| | | | 1 | 12 | 2 | 21.9 | 21.7 | 22.2 | |
| | | | 1 | 24 | 2 | 21.8 | 21.7 | 22.1 | |
| | | | 12 | 0 | 3 | 21.8 | 21.7 | 21.7 | 22.0 |
| | | | 12 | 7 | 3 | 21.8 | 21.7 | 21.7 | |
| | | | 12 | 13 | 3 | 21.8 | 21.7 | 21.7 | |
| | | | 25 | 0 | 3 | 21.7 | 21.6 | 21.7 | |

**Note(s):**

10 MHz Bandwidths 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 5 Measured Results (continued)**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 825.5 MHz | 836.5 MHz | 847.5 MHz | |
| LTE Band 5 | 3 | QPSK | 1 | 0 | 0 | 24.6 | 24.5 | 24.6 | 25.0 |
| | | | 1 | 8 | 0 | 24.7 | 24.5 | 24.7 | |
| | | | 1 | 14 | 0 | 24.6 | 24.4 | 24.6 | |
| | | | 8 | 0 | 1 | 23.6 | 23.5 | 23.6 | 24.0 |
| | | | 8 | 4 | 1 | 23.7 | 23.5 | 23.6 | |
| | | | 8 | 7 | 1 | 23.7 | 23.5 | 23.6 | |
| | | | 15 | 0 | 1 | 23.7 | 23.5 | 23.6 | |
| | | 16QAM | 1 | 0 | 1 | 23.1 | 23.4 | 23.5 | 24.0 |
| | | | 1 | 8 | 1 | 23.2 | 23.5 | 23.6 | |
| | | | 1 | 14 | 1 | 23.1 | 23.4 | 23.5 | |
| | | | 8 | 0 | 2 | 22.8 | 22.6 | 22.7 | 23.0 |
| | | | 8 | 4 | 2 | 22.9 | 22.6 | 22.8 | |
| | | | 8 | 7 | 2 | 22.9 | 22.6 | 22.8 | |
| | | | 15 | 0 | 2 | 22.8 | 22.6 | 22.7 | |
| | | 64QAM | 1 | 0 | 2 | 22.2 | 21.5 | 21.7 | 23.0 |
| | | | 1 | 8 | 2 | 22.3 | 22.2 | 22.3 | |
| | | | 1 | 14 | 2 | 22.2 | 22.0 | 22.2 | |
| | | | 8 | 0 | 3 | 21.7 | 21.6 | 21.8 | 22.0 |
| | | | 8 | 4 | 3 | 21.9 | 21.7 | 21.8 | |
| | | | 8 | 7 | 3 | 21.9 | 21.7 | 21.8 | |
| | | | 15 | 0 | 3 | 21.7 | 21.6 | 21.7 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 824.7 MHz | 836.5 MHz | 848.3 MHz | |
| LTE Band 5 | 1.4 | QPSK | 1 | 0 | 0 | 24.6 | 24.3 | 24.4 | 25.0 |
| | | | 1 | 3 | 0 | 24.6 | 24.4 | 24.5 | |
| | | | 1 | 5 | 0 | 24.6 | 24.3 | 24.4 | |
| | | | 3 | 0 | 0 | 24.5 | 24.3 | 24.5 | |
| | | | 3 | 1 | 0 | 24.6 | 24.4 | 24.6 | |
| | | | 3 | 3 | 0 | 24.6 | 24.4 | 24.5 | |
| | | | 6 | 0 | 1 | 23.6 | 23.4 | 23.5 | 24.0 |
| | | 16QAM | 1 | 0 | 1 | 23.7 | 23.4 | 23.6 | 24.0 |
| | | | 1 | 3 | 1 | 23.7 | 23.5 | 23.7 | |
| | | | 1 | 5 | 1 | 23.6 | 23.5 | 23.6 | |
| | | | 3 | 0 | 1 | 23.7 | 23.6 | 23.8 | |
| | | | 3 | 1 | 1 | 23.7 | 23.7 | 23.8 | |
| | | | 3 | 3 | 1 | 23.7 | 23.7 | 23.8 | |
| | | | 6 | 0 | 2 | 22.8 | 22.6 | 22.8 | 23.0 |
| | | 64QAM | 1 | 0 | 2 | 23.0 | 22.3 | 22.5 | 23.0 |
| | | | 1 | 3 | 2 | 22.8 | 22.7 | 23.0 | |
| | | | 1 | 5 | 2 | 22.7 | 22.5 | 22.9 | |
| | | | 3 | 0 | 2 | 22.8 | 22.6 | 22.9 | |
| | | | 3 | 1 | 2 | 22.9 | 22.7 | 23.0 | |
| | | | 3 | 3 | 2 | 22.9 | 22.7 | 23.0 | |
| | | | 6 | 0 | 3 | 22.0 | 21.8 | 21.6 | 22.0 |

**LTE Band 7 Measured Results**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2510 MHz | 2535 MHz | 2560 MHz | |
| LTE Band 7 | 20 | QPSK | 1 | 0 | 0 | 22.6 | 22.7 | 22.6 | 23.0 |
| | | | 1 | 49 | 0 | 22.3 | 22.7 | 22.3 | |
| | | | 1 | 99 | 0 | 22.3 | 22.6 | 22.2 | |
| | | | 50 | 0 | 0 | 22.5 | 22.8 | 22.5 | |
| | | | 50 | 24 | 0 | 22.5 | 22.8 | 22.4 | |
| | | | 50 | 50 | 0 | 22.4 | 22.7 | 22.3 | |
| | | | 100 | 0 | 0 | 22.5 | 22.8 | 22.4 | |
| | | 16QAM | 1 | 0 | 0 | 22.7 | 22.7 | 22.6 | 23.0 |
| | | | 1 | 49 | 0 | 22.3 | 22.7 | 22.4 | |
| | | | 1 | 99 | 0 | 22.3 | 22.6 | 22.3 | |
| | | | 50 | 0 | 0 | 22.1 | 22.4 | 22.1 | |
| | | | 50 | 24 | 0 | 22.0 | 22.4 | 22.0 | |
| | | | 50 | 50 | 0 | 21.9 | 22.3 | 21.9 | |
| | | | 100 | 0 | 0 | 22.0 | 22.4 | 22.0 | |
| | | 64QAM | 1 | 0 | 0 | 22.5 | 23.0 | 22.4 | 23.0 |
| | | | 1 | 49 | 0 | 22.2 | 23.0 | 22.2 | |
| | | | 1 | 99 | 0 | 22.3 | 23.0 | 22.2 | |
| | | | 50 | 0 | 1 | 21.8 | 22.0 | 21.6 | 22.0 |
| | | | 50 | 24 | 1 | 21.7 | 22.0 | 21.5 | |
| | | | 50 | 50 | 1 | 21.7 | 22.0 | 21.5 | |
| | | | 100 | 0 | 1 | 21.7 | 22.0 | 21.5 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2507.5 MHz | 2535 MHz | 2562.5 MHz | |
| LTE Band 7 | 15 | QPSK | 1 | 0 | 0 | 22.5 | 22.7 | 22.7 | 23.0 |
| | | | 1 | 37 | 0 | 22.3 | 22.7 | 22.5 | |
| | | | 1 | 74 | 0 | 22.2 | 22.6 | 22.4 | |
| | | | 36 | 0 | 0 | 22.4 | 22.7 | 22.6 | |
| | | | 36 | 20 | 0 | 22.4 | 22.8 | 22.6 | |
| | | | 36 | 39 | 0 | 22.2 | 22.7 | 22.5 | |
| | | | 75 | 0 | 0 | 22.4 | 22.8 | 22.5 | |
| | | 16QAM | 1 | 0 | 0 | 22.5 | 22.6 | 22.2 | 23.0 |
| | | | 1 | 37 | 0 | 22.2 | 22.7 | 22.0 | |
| | | | 1 | 74 | 0 | 22.0 | 22.5 | 21.8 | |
| | | | 36 | 0 | 0 | 22.0 | 22.4 | 22.2 | |
| | | | 36 | 20 | 0 | 22.0 | 22.4 | 22.2 | |
| | | | 36 | 39 | 0 | 21.8 | 22.3 | 22.1 | |
| | | | 75 | 0 | 0 | 22.0 | 22.3 | 22.2 | |
| | | 64QAM | 1 | 0 | 0 | 22.7 | 22.5 | 22.5 | 23.0 |
| | | | 1 | 37 | 0 | 22.5 | 22.5 | 22.4 | |
| | | | 1 | 74 | 0 | 22.5 | 22.5 | 22.3 | |
| | | | 36 | 0 | 1 | 21.6 | 22.0 | 21.7 | 22.0 |
| | | | 36 | 20 | 1 | 21.6 | 22.0 | 21.7 | |
| | | | 36 | 39 | 1 | 21.5 | 22.0 | 21.6 | |
| | | | 75 | 0 | 1 | 21.6 | 22.0 | 21.7 | |

**LTE Band 7 Measured Results (continued)**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2505 MHz | 2535 MHz | 2565 MHz | |
| LTE Band 7 | 10 | QPSK | 1 | 0 | 0 | 22.4 | 22.6 | 22.5 | 23.0 |
| | | | 1 | 25 | 0 | 22.3 | 22.7 | 22.5 | |
| | | | 1 | 49 | 0 | 22.1 | 22.6 | 22.4 | |
| | | | 25 | 0 | 0 | 22.4 | 22.6 | 22.6 | |
| | | | 25 | 12 | 0 | 22.4 | 22.8 | 22.6 | |
| | | | 25 | 25 | 0 | 22.3 | 22.7 | 22.5 | |
| | | | 50 | 0 | 0 | 22.4 | 22.7 | 22.6 | |
| | | 16QAM | 1 | 0 | 0 | 22.0 | 22.5 | 22.1 | 23.0 |
| | | | 1 | 25 | 0 | 21.9 | 22.6 | 21.9 | |
| | | | 1 | 49 | 0 | 21.8 | 22.6 | 21.8 | |
| | | | 25 | 0 | 0 | 22.1 | 22.3 | 22.2 | |
| | | | 25 | 12 | 0 | 22.1 | 22.4 | 22.1 | |
| | | | 25 | 25 | 0 | 22.0 | 22.3 | 22.1 | |
| | | | 50 | 0 | 0 | 22.0 | 22.4 | 22.1 | |
| | | 64QAM | 1 | 0 | 0 | 22.3 | 22.4 | 22.5 | 23.0 |
| | | | 1 | 25 | 0 | 22.2 | 22.5 | 22.4 | |
| | | | 1 | 49 | 0 | 22.1 | 22.5 | 22.3 | |
| | | | 25 | 0 | 1 | 21.7 | 21.9 | 21.7 | 22.0 |
| | | | 25 | 12 | 1 | 21.7 | 22.0 | 21.7 | |
| | | | 25 | 25 | 1 | 21.6 | 22.0 | 21.7 | |
| | | | 50 | 0 | 1 | 21.6 | 22.0 | 21.6 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2502.5 MHz | 2535 MHz | 2567.5 MHz | |
| LTE Band 7 | 5 | QPSK | 1 | 0 | 0 | 22.5 | 22.6 | 22.6 | 23.0 |
| | | | 1 | 12 | 0 | 22.5 | 22.7 | 22.6 | |
| | | | 1 | 24 | 0 | 22.4 | 22.7 | 22.5 | |
| | | | 12 | 0 | 0 | 22.5 | 22.7 | 22.5 | |
| | | | 12 | 7 | 0 | 22.5 | 22.7 | 22.5 | |
| | | | 12 | 13 | 0 | 22.5 | 22.7 | 22.5 | |
| | | | 25 | 0 | 0 | 22.5 | 22.7 | 22.5 | |
| | | 16QAM | 1 | 0 | 0 | 22.2 | 22.7 | 22.2 | 23.0 |
| | | | 1 | 12 | 0 | 22.1 | 22.8 | 22.2 | |
| | | | 1 | 24 | 0 | 22.1 | 22.7 | 22.1 | |
| | | | 12 | 0 | 0 | 22.1 | 22.4 | 22.2 | |
| | | | 12 | 7 | 0 | 22.1 | 22.4 | 22.2 | |
| | | | 12 | 13 | 0 | 22.1 | 22.4 | 22.2 | |
| | | | 25 | 0 | 0 | 22.0 | 22.3 | 22.1 | |
| | | 64QAM | 1 | 0 | 0 | 22.4 | 22.6 | 22.0 | 23.0 |
| | | | 1 | 12 | 0 | 22.4 | 22.7 | 22.0 | |
| | | | 1 | 24 | 0 | 22.4 | 22.6 | 22.0 | |
| | | | 12 | 0 | 1 | 21.8 | 21.9 | 21.6 | 22.0 |
| | | | 12 | 7 | 1 | 21.8 | 21.9 | 21.6 | |
| | | | 12 | 13 | 1 | 21.7 | 21.9 | 21.6 | |
| | | | 25 | 0 | 1 | 21.7 | 21.9 | 21.6 | |

**LTE Band 12 Measured Results**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 704 MHz | 707.5 MHz | 711 MHz | |
| LTE Band 12 | 10 | QPSK | 1 | 0 | 0 | | 24.3 | | 25.0 |
| | | | 1 | 25 | 0 | | 24.4 | | |
| | | | 1 | 49 | 0 | | 24.5 | | |
| | | | 25 | 0 | 1 | | 23.5 | | 24.0 |
| | | | 25 | 12 | 1 | | 23.4 | | |
| | | | 25 | 25 | 1 | | 23.4 | | |
| | | | 50 | 0 | 1 | | 23.4 | | |
| | | 16QAM | 1 | 0 | 1 | | 23.7 | | 24.0 |
| | | | 1 | 25 | 1 | | 23.8 | | |
| | | | 1 | 49 | 1 | | 23.9 | | |
| | | | 25 | 0 | 2 | | 22.6 | | 23.0 |
| | | | 25 | 12 | 2 | | 22.6 | | |
| | | | 25 | 25 | 2 | | 22.5 | | |
| | | | 50 | 0 | 2 | | 22.5 | | |
| | | 64QAM | 1 | 0 | 2 | | 21.8 | | 23.0 |
| | | | 1 | 25 | 2 | | 22.0 | | |
| | | | 1 | 49 | 2 | | 22.1 | | |
| | | | 25 | 0 | 3 | | 21.6 | | 22.0 |
| | | | 25 | 12 | 3 | | 21.6 | | |
| | | | 25 | 25 | 3 | | 21.6 | | |
| | | | 50 | 0 | 3 | | 21.6 | | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 701.5 MHz | 707.5 MHz | 713.5 MHz | |
| LTE Band 12 | 5 | QPSK | 1 | 0 | 0 | 24.4 | 24.3 | 24.6 | 25.0 |
| | | | 1 | 12 | 0 | 24.5 | 24.3 | 24.6 | |
| | | | 1 | 24 | 0 | 24.5 | 24.4 | 24.6 | |
| | | | 12 | 0 | 1 | 23.6 | 23.4 | 23.5 | 24.0 |
| | | | 12 | 7 | 1 | 23.5 | 23.4 | 23.5 | |
| | | | 12 | 13 | 1 | 23.5 | 23.4 | 23.5 | |
| | | | 25 | 0 | 1 | 23.6 | 23.4 | 23.6 | |
| | | 16QAM | 1 | 0 | 1 | 23.5 | 23.4 | 23.3 | 24.0 |
| | | | 1 | 12 | 1 | 23.6 | 23.4 | 23.2 | |
| | | | 1 | 24 | 1 | 23.5 | 23.5 | 23.3 | |
| | | | 12 | 0 | 2 | 22.7 | 22.6 | 22.7 | 23.0 |
| | | | 12 | 7 | 2 | 22.7 | 22.6 | 22.7 | |
| | | | 12 | 13 | 2 | 22.7 | 22.6 | 22.7 | |
| | | | 25 | 0 | 2 | 22.7 | 22.5 | 22.7 | |
| | | 64QAM | 1 | 0 | 2 | 21.7 | 21.5 | 21.7 | 23.0 |
| | | | 1 | 12 | 2 | 21.7 | 21.6 | 21.7 | |
| | | | 1 | 24 | 2 | 21.7 | 21.7 | 21.8 | |
| | | | 12 | 0 | 3 | 21.7 | 21.6 | 21.7 | 22.0 |
| | | | 12 | 7 | 3 | 21.7 | 21.6 | 21.7 | |
| | | | 12 | 13 | 3 | 21.6 | 21.6 | 21.7 | |
| | | | 25 | 0 | 3 | 21.6 | 21.5 | 21.6 | |

**Note(s):**

10 MHz Bandwidths 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 12 Measured Results (continued)**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 700.5 MHz | 707.5 MHz | 714.5 MHz | |
| LTE Band 12 | 3 | QPSK | 1 | 0 | 0 | 24.5 | 24.3 | 24.5 | 25.0 |
| | | | 1 | 8 | 0 | 24.5 | 24.5 | 24.6 | |
| | | | 1 | 14 | 0 | 24.5 | 24.5 | 24.6 | |
| | | | 8 | 0 | 1 | 23.4 | 23.4 | 23.5 | 24.0 |
| | | | 8 | 4 | 1 | 23.4 | 23.4 | 23.6 | |
| | | | 8 | 7 | 1 | 23.5 | 23.4 | 23.6 | |
| | | | 15 | 0 | 1 | 23.5 | 23.4 | 23.5 | |
| | | 16QAM | 1 | 0 | 1 | 23.4 | 22.8 | 23.0 | 24.0 |
| | | | 1 | 8 | 1 | 23.4 | 22.9 | 23.2 | |
| | | | 1 | 14 | 1 | 23.4 | 22.9 | 23.0 | |
| | | | 8 | 0 | 2 | 22.6 | 22.6 | 22.7 | 23.0 |
| | | | 8 | 4 | 2 | 22.6 | 22.6 | 22.8 | |
| | | | 8 | 7 | 2 | 22.7 | 22.6 | 22.8 | |
| | | | 15 | 0 | 2 | 22.6 | 22.5 | 22.6 | |
| | | 64QAM | 1 | 0 | 2 | 21.5 | 21.9 | 22.1 | 23.0 |
| | | | 1 | 8 | 2 | 22.1 | 22.1 | 22.1 | |
| | | | 1 | 14 | 2 | 22.0 | 22.0 | 22.0 | |
| | | | 8 | 0 | 3 | 21.6 | 21.6 | 21.6 | 22.0 |
| | | | 8 | 4 | 3 | 21.6 | 21.6 | 21.7 | |
| | | | 8 | 7 | 3 | 21.7 | 21.6 | 21.7 | |
| | | | 15 | 0 | 3 | 21.6 | 21.5 | 21.7 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 699.7 MHz | 707.5 MHz | 715.3 MHz | |
| LTE Band 12 | 1.4 | QPSK | 1 | 0 | 0 | 24.3 | 24.3 | 24.5 | 25.0 |
| | | | 1 | 3 | 0 | 24.4 | 24.3 | 24.6 | |
| | | | 1 | 5 | 0 | 24.3 | 24.3 | 24.5 | |
| | | | 3 | 0 | 0 | 24.3 | 24.3 | 24.5 | |
| | | | 3 | 1 | 0 | 24.4 | 24.4 | 24.6 | |
| | | | 3 | 3 | 0 | 24.3 | 24.3 | 24.6 | |
| | | | 6 | 0 | 1 | 23.3 | 23.3 | 23.5 | 24.0 |
| | | 16QAM | 1 | 0 | 1 | 23.4 | 23.4 | 23.9 | 24.0 |
| | | | 1 | 3 | 1 | 23.5 | 23.5 | 23.9 | |
| | | | 1 | 5 | 1 | 23.4 | 23.4 | 23.9 | |
| | | | 3 | 0 | 1 | 23.6 | 23.6 | 23.7 | |
| | | | 3 | 1 | 1 | 23.6 | 23.6 | 23.8 | |
| | | | 3 | 3 | 1 | 23.6 | 23.6 | 23.8 | |
| | | | 6 | 0 | 2 | 22.6 | 22.6 | 22.5 | 23.0 |
| | | 64QAM | 1 | 0 | 2 | 21.5 | 21.5 | 21.9 | 23.0 |
| | | | 1 | 3 | 2 | 22.1 | 21.8 | 22.0 | |
| | | | 1 | 5 | 2 | 22.0 | 21.7 | 21.8 | |
| | | | 3 | 0 | 2 | 22.7 | 22.5 | 22.7 | |
| | | | 3 | 1 | 2 | 22.8 | 22.7 | 22.8 | |
| | | | 3 | 3 | 2 | 22.8 | 22.6 | 22.8 | |
| | | | 6 | 0 | 3 | 21.4 | 21.7 | 21.9 | 22.0 |

**LTE Band 13 Measured Results**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) 782 MHz | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|
| LTE Band 13 | 10 | QPSK | 1 | 0 | 0 | 24.2 | 25.0 |
| | | | 1 | 25 | 0 | 24.9 | |
| | | | 1 | 49 | 0 | 24.2 | |
| | | | 25 | 0 | 1 | 23.9 | 24.0 |
| | | | 25 | 12 | 1 | 24.0 | |
| | | | 25 | 25 | 1 | 23.8 | |
| | | | 50 | 0 | 1 | 24.0 | |
| | | 16QAM | 1 | 0 | 1 | 23.2 | 24.0 |
| | | | 1 | 25 | 1 | 23.9 | |
| | | | 1 | 49 | 1 | 23.1 | |
| | | | 25 | 0 | 2 | 23.0 | 23.0 |
| | | | 25 | 12 | 2 | 23.0 | |
| | | | 25 | 25 | 2 | 23.0 | |
| | | | 50 | 0 | 2 | 23.0 | |
| | | 64QAM | 1 | 0 | 2 | 22.6 | 23.0 |
| | | | 1 | 25 | 2 | 23.0 | |
| | | | 1 | 49 | 2 | 22.6 | |
| | | | 25 | 0 | 3 | 22.0 | 22.0 |
| | | | 25 | 12 | 3 | 22.0 | |
| | | | 25 | 25 | 3 | 22.0 | |
| | | | 50 | 0 | 3 | 22.0 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) 782 MHz | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|
| LTE Band 13 | 5 | QPSK | 1 | 0 | 0 | 24.8 | 25.0 |
| | | | 1 | 12 | 0 | 24.9 | |
| | | | 1 | 24 | 0 | 24.9 | |
| | | | 12 | 0 | 1 | 23.9 | 24.0 |
| | | | 12 | 7 | 1 | 23.9 | |
| | | | 12 | 13 | 1 | 24.0 | |
| | | | 25 | 0 | 1 | 23.9 | |
| | | 16QAM | 1 | 0 | 1 | 24.0 | 24.0 |
| | | | 1 | 12 | 1 | 24.0 | |
| | | | 1 | 24 | 1 | 24.0 | |
| | | | 12 | 0 | 2 | 23.0 | 23.0 |
| | | | 12 | 7 | 2 | 23.0 | |
| | | | 12 | 13 | 2 | 23.0 | |
| | | | 25 | 0 | 2 | 23.0 | |
| | | 64QAM | 1 | 0 | 2 | 22.9 | 23.0 |
| | | | 1 | 12 | 2 | 22.9 | |
| | | | 1 | 24 | 2 | 23.0 | |
| | | | 12 | 0 | 3 | 22.0 | 22.0 |
| | | | 12 | 7 | 3 | 22.0 | |
| | | | 12 | 13 | 3 | 22.0 | |
| | | | 25 | 0 | 3 | 22.0 | |

**Note(s):**

10/5 MHz Bandwidths 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 17 Measured Results**

SAR for LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 26 Measured Results**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 821.5 MHz | 831.5 MHz | 841.5 MHz | |
| LTE Band 26 | 15 | QPSK | 1 | 0 | 0 | | 24.0 | | 24.0 |
| | | | 1 | 37 | 0 | | 24.0 | | |
| | | | 1 | 74 | 0 | | 23.9 | | |
| | | | 36 | 0 | 0 | | 23.1 | | |
| | | | 36 | 20 | 0 | | 23.1 | | |
| | | | 36 | 39 | 0 | | 23.0 | | |
| | | | 75 | 0 | 0 | | 23.0 | | |
| | | 16QAM | 1 | 0 | 0 | | 23.5 | | 24.0 |
| | | | 1 | 37 | 0 | | 23.4 | | |
| | | | 1 | 74 | 0 | | 23.3 | | |
| | | | 36 | 0 | 1 | | 22.2 | | 23.0 |
| | | | 36 | 20 | 1 | | 22.2 | | |
| | | | 36 | 39 | 1 | | 22.1 | | |
| | | | 75 | 0 | 1 | | 22.1 | | |
| | | 64QAM | 1 | 0 | 1 | | 22.3 | | 23.0 |
| | | | 1 | 37 | 1 | | 22.2 | | |
| | | | 1 | 74 | 1 | | 22.1 | | |
| | | | 36 | 0 | 2 | | 21.3 | | 22.0 |
| | | | 36 | 20 | 2 | | 21.2 | | |
| | | | 36 | 39 | 2 | | 21.1 | | |
| | | | 75 | 0 | 2 | | 21.1 | | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 819 MHz | 831.5 MHz | 844 MHz | |
| LTE Band 26 | 10 | QPSK | 1 | 0 | 0 | 24.0 | 24.0 | 24.0 | 24.0 |
| | | | 1 | 25 | 0 | 24.0 | 24.0 | 23.8 | |
| | | | 1 | 49 | 0 | 24.0 | 23.9 | 24.0 | |
| | | | 25 | 0 | 0 | 23.3 | 23.0 | 23.0 | |
| | | | 25 | 12 | 0 | 23.3 | 23.0 | 22.9 | |
| | | | 25 | 25 | 0 | 23.2 | 23.0 | 22.9 | |
| | | | 50 | 0 | 0 | 23.2 | 23.0 | 22.9 | |
| | | 16QAM | 1 | 0 | 0 | 23.3 | 23.5 | 23.0 | 24.0 |
| | | | 1 | 25 | 0 | 23.2 | 23.3 | 22.8 | |
| | | | 1 | 49 | 0 | 23.2 | 23.4 | 22.9 | |
| | | | 25 | 0 | 1 | 22.4 | 22.1 | 22.0 | 23.0 |
| | | | 25 | 12 | 1 | 22.3 | 22.1 | 22.0 | |
| | | | 25 | 25 | 1 | 22.3 | 22.1 | 22.0 | |
| | | | 50 | 0 | 1 | 22.2 | 22.0 | 21.9 | |
| | | 64QAM | 1 | 0 | 1 | 22.4 | 22.2 | 22.3 | 23.0 |
| | | | 1 | 25 | 1 | 22.4 | 22.1 | 22.2 | |
| | | | 1 | 49 | 1 | 22.3 | 22.1 | 22.3 | |
| | | | 25 | 0 | 2 | 21.3 | 21.1 | 21.0 | 22.0 |
| | | | 25 | 12 | 2 | 21.3 | 21.1 | 21.0 | |
| | | | 25 | 25 | 2 | 21.3 | 21.1 | 21.0 | |
| | | | 50 | 0 | 2 | 21.2 | 21.0 | 21.0 | |

**Note(s):**

15 MHz Bandwidths 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 26 Measured Results (continued)**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 816.5 MHz | 831.5 MHz | 846.5 MHz | |
| LTE Band 26 | 5 | QPSK | 1 | 0 | 0 | 24.0 | 24.0 | 24.0 | 24.0 |
| | | | 1 | 12 | 0 | 24.0 | 24.0 | 24.0 | |
| | | | 1 | 24 | 0 | 24.0 | 23.9 | 24.0 | |
| | | | 12 | 0 | 0 | 23.2 | 23.0 | 22.8 | |
| | | | 12 | 7 | 0 | 23.2 | 23.0 | 22.8 | |
| | | | 12 | 13 | 0 | 23.2 | 23.0 | 22.9 | |
| | | | 25 | 0 | 0 | 23.2 | 23.0 | 23.0 | |
| | | 16QAM | 1 | 0 | 0 | 23.4 | 23.5 | 23.1 | 24.0 |
| | | | 1 | 12 | 0 | 23.3 | 23.6 | 23.1 | |
| | | | 1 | 24 | 0 | 23.3 | 23.5 | 23.2 | |
| | | | 12 | 0 | 1 | 22.3 | 22.2 | 22.0 | 23.0 |
| | | | 12 | 7 | 1 | 22.3 | 22.2 | 22.0 | |
| | | | 12 | 13 | 1 | 22.3 | 22.2 | 22.1 | |
| | | | 25 | 0 | 1 | 22.2 | 22.1 | 22.0 | |
| | | 64QAM | 1 | 0 | 1 | 22.5 | 22.3 | 21.9 | 23.0 |
| | | | 1 | 12 | 1 | 22.5 | 22.3 | 21.9 | |
| | | | 1 | 24 | 1 | 22.5 | 22.3 | 22.0 | |
| | | | 12 | 0 | 2 | 21.4 | 21.1 | 21.0 | 22.0 |
| | | | 12 | 7 | 2 | 21.4 | 21.0 | 20.9 | |
| | | | 12 | 13 | 2 | 21.3 | 21.0 | 21.1 | |
| | | | 25 | 0 | 2 | 21.3 | 21.1 | 21.0 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 815.5 MHz | 831.5 MHz | 847.5 MHz | |
| LTE Band 26 | 3 | QPSK | 1 | 0 | 0 | 24.0 | 23.9 | 23.9 | 24.0 |
| | | | 1 | 8 | 0 | 24.0 | 24.0 | 24.0 | |
| | | | 1 | 14 | 0 | 24.0 | 24.0 | 24.0 | |
| | | | 8 | 0 | 0 | 23.2 | 23.0 | 22.9 | |
| | | | 8 | 4 | 0 | 23.2 | 23.0 | 23.0 | |
| | | | 8 | 7 | 0 | 23.2 | 23.0 | 23.0 | |
| | | | 15 | 0 | 0 | 23.1 | 22.9 | 22.9 | |
| | | 16QAM | 1 | 0 | 0 | 23.3 | 23.4 | 22.9 | 24.0 |
| | | | 1 | 8 | 0 | 23.3 | 23.5 | 23.0 | |
| | | | 1 | 14 | 0 | 23.2 | 23.4 | 22.9 | |
| | | | 8 | 0 | 1 | 22.3 | 22.1 | 22.1 | 23.0 |
| | | | 8 | 4 | 1 | 22.3 | 22.2 | 22.1 | |
| | | | 8 | 7 | 1 | 22.3 | 22.2 | 22.2 | |
| | | | 15 | 0 | 1 | 22.2 | 22.1 | 22.1 | |
| | | 64QAM | 1 | 0 | 1 | 22.5 | 22.1 | 22.3 | 23.0 |
| | | | 1 | 8 | 1 | 22.5 | 22.3 | 22.4 | |
| | | | 1 | 14 | 1 | 22.4 | 22.2 | 22.3 | |
| | | | 8 | 0 | 2 | 21.2 | 21.1 | 21.1 | 22.0 |
| | | | 8 | 4 | 2 | 21.2 | 21.1 | 21.1 | |
| | | | 8 | 7 | 2 | 21.3 | 21.1 | 21.1 | |
| | | | 15 | 0 | 2 | 21.3 | 21.1 | 21.0 | |

**LTE Band 26 Measured Results (continued)**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 814.7 MHz | 831.5 MHz | 848.3 MHz | |
| LTE Band 26 | 1.4 | QPSK | 1 | 0 | 0 | 24.0 | 23.9 | 23.9 | 24.0 |
| | | | 1 | 3 | 0 | 24.0 | 24.0 | 23.9 | |
| | | | 1 | 5 | 0 | 24.0 | 23.9 | 23.9 | |
| | | | 3 | 0 | 0 | 23.8 | 23.9 | 23.9 | |
| | | | 3 | 1 | 0 | 23.9 | 23.9 | 24.0 | |
| | | | 3 | 3 | 0 | 23.8 | 24.0 | 24.0 | |
| | | | 6 | 0 | 0 | 23.1 | 22.9 | 23.0 | |
| | | 16QAM | 1 | 0 | 0 | 23.5 | 23.1 | 23.0 | 24.0 |
| | | | 1 | 3 | 0 | 23.6 | 23.1 | 23.0 | |
| | | | 1 | 5 | 0 | 23.5 | 23.1 | 23.0 | |
| | | | 3 | 0 | 0 | 23.4 | 23.0 | 23.1 | |
| | | | 3 | 1 | 0 | 23.4 | 23.1 | 23.2 | |
| | | | 3 | 3 | 0 | 23.4 | 23.1 | 23.2 | |
| | | | 6 | 0 | 1 | 22.1 | 22.1 | 22.2 | 23.0 |
| | | 64QAM | 1 | 0 | 1 | 22.3 | 22.1 | 22.4 | 23.0 |
| | | | 1 | 3 | 1 | 22.4 | 22.2 | 22.5 | |
| | | | 1 | 5 | 1 | 22.4 | 22.1 | 22.3 | |
| | | | 3 | 0 | 1 | 22.1 | 22.1 | 22.3 | |
| | | | 3 | 1 | 1 | 22.2 | 22.2 | 22.4 | |
| | | | 3 | 3 | 1 | 22.2 | 22.2 | 22.3 | |
| | | | 6 | 0 | 2 | 21.3 | 21.3 | 21.0 | 22.0 |

**LTE Band 41 Measured Results**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2506 MHz | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz | |
| LTE Band 41 | 20 | QPSK | 1 | 0 | 0 | 22.4 | 22.6 | 22.6 | 22.6 | 22.4 | 23.0 |
| | | | 1 | 49 | 0 | 22.1 | 22.3 | 22.4 | 22.3 | 22.2 | |
| | | | 1 | 99 | 0 | 22.1 | 22.1 | 22.3 | 22.0 | 22.2 | |
| | | | 50 | 0 | 0 | 22.2 | 22.5 | 22.6 | 22.4 | 22.3 | |
| | | | 50 | 24 | 0 | 22.2 | 22.4 | 22.5 | 22.3 | 22.1 | |
| | | | 50 | 50 | 0 | 22.1 | 22.3 | 22.4 | 22.1 | 22.1 | |
| | | | 100 | 0 | 0 | 22.1 | 22.3 | 22.5 | 22.2 | 22.1 | |
| | | 16QAM | 1 | 0 | 0 | 21.7 | 22.2 | 22.1 | 22.0 | 22.1 | 23.0 |
| | | | 1 | 49 | 0 | 21.5 | 22.0 | 22.0 | 21.7 | 21.9 | |
| | | | 1 | 99 | 0 | 21.4 | 21.8 | 21.9 | 21.4 | 21.8 | |
| | | | 50 | 0 | 0 | 21.8 | 22.1 | 22.2 | 22.0 | 21.9 | |
| | | | 50 | 24 | 0 | 21.8 | 22.0 | 22.1 | 21.9 | 21.8 | |
| | | | 50 | 50 | 0 | 21.7 | 21.9 | 21.9 | 21.7 | 21.8 | |
| | | | 100 | 0 | 0 | 21.7 | 21.9 | 22.1 | 21.8 | 21.7 | |
| | | 64QAM | 1 | 0 | 0 | 22.1 | 22.5 | 22.8 | 22.3 | 22.4 | 23.0 |
| | | | 1 | 49 | 0 | 22.0 | 22.2 | 22.7 | 22.3 | 22.3 | |
| | | | 1 | 99 | 0 | 22.1 | 22.3 | 22.8 | 22.3 | 22.3 | |
| | | | 50 | 0 | 1 | 21.7 | 21.9 | 22.0 | 22.0 | 21.8 | 22.0 |
| | | | 50 | 24 | 1 | 21.8 | 21.8 | 22.0 | 21.9 | 21.8 | |
| | | | 50 | 50 | 1 | 21.7 | 21.8 | 21.9 | 22.0 | 21.8 | |
| | | | 100 | 0 | 1 | 21.8 | 21.9 | 21.9 | 21.9 | 21.8 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2506 MHz | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz | |
| LTE Band 41 | 15 | QPSK | 1 | 0 | 0 | 22.2 | 22.4 | 22.4 | 22.5 | 22.3 | 23.0 |
| | | | 1 | 37 | 0 | 22.1 | 22.3 | 22.4 | 22.2 | 22.1 | |
| | | | 1 | 74 | 0 | 22.0 | 22.1 | 22.3 | 22.1 | 22.1 | |
| | | | 36 | 0 | 0 | 22.2 | 22.4 | 22.5 | 22.4 | 22.2 | |
| | | | 36 | 20 | 0 | 22.1 | 22.3 | 22.5 | 22.3 | 22.1 | |
| | | | 36 | 39 | 0 | 22.1 | 22.2 | 22.4 | 22.2 | 22.1 | |
| | | | 75 | 0 | 0 | 22.1 | 22.3 | 22.4 | 22.3 | 22.1 | |
| | | 16QAM | 1 | 0 | 0 | 21.7 | 22.1 | 22.0 | 22.0 | 21.9 | 23.0 |
| | | | 1 | 37 | 0 | 21.6 | 21.9 | 21.9 | 21.8 | 21.8 | |
| | | | 1 | 74 | 0 | 21.5 | 21.7 | 21.8 | 21.7 | 21.7 | |
| | | | 36 | 0 | 0 | 21.7 | 22.0 | 22.1 | 21.9 | 21.8 | |
| | | | 36 | 20 | 0 | 21.7 | 22.0 | 22.0 | 21.9 | 21.7 | |
| | | | 36 | 39 | 0 | 21.6 | 21.9 | 22.0 | 21.8 | 21.7 | |
| | | | 75 | 0 | 0 | 21.7 | 21.9 | 22.0 | 21.9 | 21.7 | |
| | | 64QAM | 1 | 0 | 0 | 22.4 | 22.2 | 22.0 | 22.7 | 22.2 | 23.0 |
| | | | 1 | 37 | 0 | 22.3 | 22.2 | 21.9 | 22.6 | 22.1 | |
| | | | 1 | 74 | 0 | 22.4 | 22.1 | 22.0 | 22.6 | 22.1 | |
| | | | 36 | 0 | 1 | 21.7 | 21.7 | 22.0 | 22.0 | 21.7 | 22.0 |
| | | | 36 | 20 | 1 | 21.8 | 21.7 | 22.0 | 21.9 | 21.7 | |
| | | | 36 | 39 | 1 | 21.7 | 21.8 | 22.0 | 21.9 | 21.7 | |
| | | | 75 | 0 | 1 | 21.8 | 21.9 | 21.9 | 21.9 | 21.7 | |

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

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2506 MHz | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz | |
| LTE Band 41 | 10 | QPSK | 1 | 0 | 0 | 22.2 | 22.4 | 22.4 | 22.4 | 22.2 | 23.0 |
| | | | 1 | 25 | 0 | 22.1 | 22.3 | 22.4 | 22.2 | 22.1 | |
| | | | 1 | 49 | 0 | 22.0 | 22.2 | 22.3 | 22.2 | 22.1 | |
| | | | 25 | 0 | 0 | 22.2 | 22.4 | 22.5 | 22.3 | 22.1 | |
| | | | 25 | 12 | 0 | 22.2 | 22.3 | 22.5 | 22.3 | 22.1 | |
| | | | 25 | 25 | 0 | 22.1 | 22.3 | 22.4 | 22.3 | 22.2 | |
| | | | 50 | 0 | 0 | 22.1 | 22.3 | 22.5 | 22.3 | 22.1 | |
| | | 16QAM | 1 | 0 | 0 | 21.7 | 22.1 | 21.9 | 21.9 | 21.9 | 23.0 |
| | | | 1 | 25 | 0 | 21.6 | 22.0 | 21.9 | 21.8 | 21.8 | |
| | | | 1 | 49 | 0 | 21.5 | 21.9 | 21.9 | 21.7 | 21.8 | |
| | | | 25 | 0 | 0 | 21.7 | 21.9 | 22.0 | 21.9 | 21.7 | |
| | | | 25 | 12 | 0 | 21.7 | 22.0 | 22.0 | 21.9 | 21.7 | |
| | | | 25 | 25 | 0 | 21.7 | 21.9 | 22.0 | 21.8 | 21.7 | |
| | | | 50 | 0 | 0 | 21.7 | 22.0 | 22.0 | 21.9 | 21.7 | |
| | | 64QAM | 1 | 0 | 0 | 22.4 | 22.4 | 21.9 | 22.7 | 22.4 | 23.0 |
| | | | 1 | 25 | 0 | 22.4 | 22.4 | 22.0 | 22.7 | 22.3 | |
| | | | 1 | 49 | 0 | 22.4 | 22.3 | 21.9 | 22.6 | 22.3 | |
| | | | 25 | 0 | 1 | 21.6 | 21.8 | 22.0 | 21.8 | 21.7 | 22.0 |
| | | | 25 | 12 | 1 | 21.7 | 21.8 | 22.0 | 21.8 | 21.6 | |
| | | | 25 | 25 | 1 | 21.7 | 21.8 | 21.9 | 21.9 | 21.7 | |
| | | | 50 | 0 | 1 | 21.7 | 21.8 | 21.9 | 21.9 | 21.7 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2506 MHz | 2549.5 MHz | 2593 MHz | 2636.5 MHz | 2680 MHz | |
| LTE Band 41 | 5 | QPSK | 1 | 0 | 0 | 22.1 | 22.3 | 22.5 | 22.3 | 22.0 | 23.0 |
| | | | 1 | 12 | 0 | 22.1 | 22.3 | 22.5 | 22.3 | 22.1 | |
| | | | 1 | 24 | 0 | 22.1 | 22.2 | 22.4 | 22.2 | 22.0 | |
| | | | 12 | 0 | 0 | 22.2 | 22.4 | 22.5 | 22.3 | 22.1 | |
| | | | 12 | 7 | 0 | 22.2 | 22.4 | 22.5 | 22.3 | 22.1 | |
| | | | 12 | 13 | 0 | 22.2 | 22.4 | 22.5 | 22.3 | 22.2 | |
| | | | 25 | 0 | 0 | 22.2 | 22.4 | 22.5 | 22.3 | 22.1 | |
| | | 16QAM | 1 | 0 | 0 | 21.8 | 21.9 | 22.0 | 21.9 | 21.6 | 23.0 |
| | | | 1 | 12 | 0 | 21.8 | 21.8 | 22.0 | 21.9 | 21.6 | |
| | | | 1 | 24 | 0 | 21.7 | 21.8 | 21.9 | 21.9 | 21.6 | |
| | | | 12 | 0 | 0 | 21.8 | 22.0 | 22.1 | 21.9 | 21.7 | |
| | | | 12 | 7 | 0 | 21.8 | 22.0 | 22.0 | 21.9 | 21.7 | |
| | | | 12 | 13 | 0 | 21.8 | 21.9 | 22.0 | 21.9 | 21.7 | |
| | | | 25 | 0 | 0 | 21.8 | 22.0 | 22.1 | 21.9 | 21.7 | |
| | | 64QAM | 1 | 0 | 0 | 21.8 | 22.7 | 22.6 | 22.1 | 22.6 | 23.0 |
| | | | 1 | 12 | 0 | 21.8 | 22.7 | 22.5 | 22.2 | 22.7 | |
| | | | 1 | 24 | 0 | 21.8 | 22.7 | 22.5 | 22.1 | 22.7 | |
| | | | 12 | 0 | 1 | 21.6 | 21.9 | 21.9 | 21.9 | 21.8 | 22.0 |
| | | | 12 | 7 | 1 | 21.7 | 21.9 | 21.9 | 22.0 | 21.8 | |
| | | | 12 | 13 | 1 | 21.7 | 21.9 | 21.9 | 22.0 | 21.9 | |
| | | | 25 | 0 | 1 | 21.7 | 21.8 | 21.8 | 21.9 | 21.7 | |

**LTE Band 66 Measured Results**

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1720 MHz | 1745 MHz | 1770 MHz | |
| LTE Band 66 | 20 | QPSK | 1 | 0 | 0 | 22.6 | 22.5 | 22.7 | 23.0 |
| | | | 1 | 49 | 0 | 22.4 | 22.4 | 22.5 | |
| | | | 1 | 99 | 0 | 22.4 | 22.5 | 22.6 | |
| | | | 50 | 0 | 0 | 22.6 | 22.6 | 22.6 | |
| | | | 50 | 24 | 0 | 22.6 | 22.6 | 22.6 | |
| | | | 50 | 50 | 0 | 22.5 | 22.6 | 22.6 | |
| | | | 100 | 0 | 0 | 22.6 | 22.6 | 22.6 | |
| | | 16QAM | 1 | 0 | 0 | 22.6 | 22.5 | 22.8 | 23.0 |
| | | | 1 | 49 | 0 | 22.5 | 22.4 | 22.5 | |
| | | | 1 | 99 | 0 | 22.5 | 22.6 | 22.6 | |
| | | | 50 | 0 | 0 | 22.2 | 22.2 | 22.2 | |
| | | | 50 | 24 | 0 | 22.2 | 22.3 | 22.2 | |
| | | | 50 | 50 | 0 | 22.1 | 22.2 | 22.1 | |
| | | | 100 | 0 | 0 | 22.2 | 22.2 | 22.1 | |
| | | 64QAM | 1 | 0 | 0 | 22.6 | 22.4 | 22.7 | 23.0 |
| | | | 1 | 49 | 0 | 22.4 | 22.4 | 22.4 | |
| | | | 1 | 99 | 0 | 22.4 | 22.5 | 22.6 | |
| | | | 50 | 0 | 1 | 21.8 | 21.8 | 21.9 | 22.0 |
| | | | 50 | 24 | 1 | 21.8 | 21.9 | 21.8 | |
| | | | 50 | 50 | 1 | 21.7 | 21.8 | 21.7 | |
| | | | 100 | 0 | 1 | 21.7 | 21.8 | 21.7 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1717.5 MHz | 1745 MHz | 1772.5 MHz | |
| LTE Band 66 | 15 | QPSK | 1 | 0 | 0 | 22.7 | 22.6 | 22.6 | 23.0 |
| | | | 1 | 37 | 0 | 22.6 | 22.4 | 22.5 | |
| | | | 1 | 74 | 0 | 22.6 | 22.5 | 22.5 | |
| | | | 36 | 0 | 0 | 22.7 | 22.5 | 22.6 | |
| | | | 36 | 20 | 0 | 22.6 | 22.6 | 22.6 | |
| | | | 36 | 39 | 0 | 22.6 | 22.5 | 22.4 | |
| | | | 75 | 0 | 0 | 22.6 | 22.6 | 22.5 | |
| | | 16QAM | 1 | 0 | 0 | 22.7 | 22.1 | 22.1 | 23.0 |
| | | | 1 | 37 | 0 | 22.5 | 21.9 | 21.9 | |
| | | | 1 | 74 | 0 | 22.5 | 22.1 | 22.0 | |
| | | | 36 | 0 | 0 | 22.3 | 22.1 | 22.1 | |
| | | | 36 | 20 | 0 | 22.2 | 22.2 | 22.1 | |
| | | | 36 | 39 | 0 | 22.2 | 22.2 | 22.0 | |
| | | | 75 | 0 | 0 | 22.2 | 22.2 | 22.1 | |
| | | 64QAM | 1 | 0 | 0 | 22.6 | 22.5 | 22.6 | 23.0 |
| | | | 1 | 37 | 0 | 22.5 | 22.4 | 22.4 | |
| | | | 1 | 74 | 0 | 22.5 | 22.5 | 22.5 | |
| | | | 36 | 0 | 1 | 21.8 | 21.6 | 21.7 | 22.0 |
| | | | 36 | 20 | 1 | 21.8 | 21.7 | 21.7 | |
| | | | 36 | 39 | 1 | 21.8 | 21.7 | 21.7 | |
| | | | 75 | 0 | 1 | 21.7 | 21.7 | 21.7 | |

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

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1715 MHz | 1745 MHz | 1775 MHz | |
| LTE Band 66 | 10 | QPSK | 1 | 0 | 0 | 22.5 | 22.4 | 22.4 | 23.0 |
| | | | 1 | 25 | 0 | 22.4 | 22.4 | 22.4 | |
| | | | 1 | 49 | 0 | 22.4 | 22.5 | 22.4 | |
| | | | 25 | 0 | 0 | 22.5 | 22.5 | 22.4 | |
| | | | 25 | 12 | 0 | 22.4 | 22.6 | 22.4 | |
| | | | 25 | 25 | 0 | 22.4 | 22.5 | 22.5 | |
| | | | 50 | 0 | 0 | 22.5 | 22.6 | 22.4 | |
| | | 16QAM | 1 | 0 | 0 | 22.4 | 22.4 | 21.9 | 23.0 |
| | | | 1 | 25 | 0 | 22.3 | 22.3 | 21.9 | |
| | | | 1 | 49 | 0 | 22.3 | 22.4 | 21.9 | |
| | | | 25 | 0 | 0 | 22.1 | 22.0 | 22.0 | |
| | | | 25 | 12 | 0 | 22.1 | 22.1 | 22.0 | |
| | | | 25 | 25 | 0 | 22.1 | 22.1 | 22.1 | |
| | | | 50 | 0 | 0 | 22.1 | 22.1 | 22.0 | |
| | | 64QAM | 1 | 0 | 0 | 22.3 | 22.3 | 22.4 | 23.0 |
| | | | 1 | 25 | 0 | 22.3 | 22.2 | 22.4 | |
| | | | 1 | 49 | 0 | 22.3 | 22.4 | 22.4 | |
| | | | 25 | 0 | 1 | 21.7 | 21.6 | 21.6 | 22.0 |
| | | | 25 | 12 | 1 | 21.7 | 21.7 | 21.6 | |
| | | | 25 | 25 | 1 | 21.6 | 21.7 | 21.6 | |
| | | | 50 | 0 | 1 | 21.6 | 21.7 | 21.6 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1712.5 MHz | 1745 MHz | 1777.5 MHz | |
| LTE Band 66 | 5 | QPSK | 1 | 0 | 0 | 22.2 | 22.4 | 22.6 | 23.0 |
| | | | 1 | 12 | 0 | 22.2 | 22.3 | 22.5 | |
| | | | 1 | 24 | 0 | 22.2 | 22.5 | 22.5 | |
| | | | 12 | 0 | 0 | 22.3 | 22.4 | 22.5 | |
| | | | 12 | 7 | 0 | 22.3 | 22.4 | 22.5 | |
| | | | 12 | 13 | 0 | 22.2 | 22.5 | 22.4 | |
| | | | 25 | 0 | 0 | 22.3 | 22.5 | 22.5 | |
| | | 16QAM | 1 | 0 | 0 | 22.3 | 22.5 | 22.2 | 23.0 |
| | | | 1 | 12 | 0 | 22.3 | 22.5 | 22.2 | |
| | | | 1 | 24 | 0 | 22.3 | 22.6 | 22.2 | |
| | | | 12 | 0 | 0 | 22.0 | 22.1 | 22.1 | |
| | | | 12 | 7 | 0 | 22.0 | 22.1 | 22.1 | |
| | | | 12 | 13 | 0 | 21.9 | 22.2 | 22.1 | |
| | | | 25 | 0 | 0 | 21.9 | 22.2 | 22.1 | |
| | | 64QAM | 1 | 0 | 0 | 21.8 | 22.0 | 22.1 | 23.0 |
| | | | 1 | 12 | 0 | 21.8 | 21.9 | 22.0 | |
| | | | 1 | 24 | 0 | 21.8 | 22.0 | 22.0 | |
| | | | 12 | 0 | 1 | 21.4 | 21.6 | 21.6 | 22.0 |
| | | | 12 | 7 | 1 | 21.4 | 21.6 | 21.6 | |
| | | | 12 | 13 | 1 | 21.4 | 21.7 | 21.6 | |
| | | | 25 | 0 | 1 | 21.3 | 21.6 | 21.6 | |

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

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1711.5 MHz | 1745 MHz | 1778.5 MHz | |
| LTE Band 66 | 3 | QPSK | 1 | 0 | 0 | 22.3 | 22.4 | 22.4 | 23.0 |
| | | | 1 | 8 | 0 | 22.3 | 22.5 | 22.5 | |
| | | | 1 | 14 | 0 | 22.2 | 22.4 | 22.4 | |
| | | | 8 | 0 | 0 | 22.2 | 22.4 | 22.4 | |
| | | | 8 | 4 | 0 | 22.2 | 22.4 | 22.4 | |
| | | | 8 | 7 | 0 | 22.2 | 22.4 | 22.4 | |
| | | | 15 | 0 | 0 | 22.3 | 22.4 | 22.4 | |
| | | 16QAM | 1 | 0 | 0 | 22.2 | 22.3 | 21.9 | 23.0 |
| | | | 1 | 8 | 0 | 22.3 | 22.4 | 22.0 | |
| | | | 1 | 14 | 0 | 22.1 | 22.3 | 21.8 | |
| | | | 8 | 0 | 0 | 21.9 | 22.0 | 22.1 | |
| | | | 8 | 4 | 0 | 21.9 | 22.1 | 22.1 | |
| | | | 8 | 7 | 0 | 21.9 | 22.1 | 22.1 | |
| | | | 15 | 0 | 0 | 21.9 | 22.0 | 22.0 | |
| | | 64QAM | 1 | 0 | 0 | 21.7 | 21.9 | 22.3 | 23.0 |
| | | | 1 | 8 | 0 | 22.2 | 22.4 | 22.4 | |
| | | | 1 | 14 | 0 | 22.1 | 22.3 | 22.3 | |
| | | | 8 | 0 | 1 | 21.4 | 21.6 | 21.6 | 22.0 |
| | | | 8 | 4 | 1 | 21.4 | 21.6 | 21.7 | |
| | | | 8 | 7 | 1 | 21.4 | 21.6 | 21.6 | |
| | | | 15 | 0 | 1 | 21.3 | 21.5 | 21.6 | |

| Band | BW (MHz) | Mode | RB Allocation | RB offset | MPR | Max. Meas. Avg Pwr (dBm) | | | Max. Output Pwr (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1710.7 MHz | 1745 MHz | 1779.3 MHz | |
| LTE Band 66 | 1.4 | QPSK | 1 | 0 | 0 | 22.1 | 22.3 | 22.4 | 23.0 |
| | | | 1 | 3 | 0 | 22.2 | 22.3 | 22.4 | |
| | | | 1 | 5 | 0 | 22.1 | 22.3 | 22.3 | |
| | | | 3 | 0 | 0 | 22.2 | 22.3 | 22.3 | |
| | | | 3 | 1 | 0 | 22.2 | 22.4 | 22.4 | |
| | | | 3 | 3 | 0 | 22.2 | 22.4 | 22.4 | |
| | | | 6 | 0 | 0 | 22.1 | 22.3 | 22.4 | |
| | | 16QAM | 1 | 0 | 0 | 22.1 | 22.2 | 22.0 | 23.0 |
| | | | 1 | 3 | 0 | 22.1 | 22.3 | 22.0 | |
| | | | 1 | 5 | 0 | 22.1 | 22.2 | 22.0 | |
| | | | 3 | 0 | 0 | 21.9 | 22.1 | 22.1 | |
| | | | 3 | 1 | 0 | 22.0 | 22.1 | 22.2 | |
| | | | 3 | 3 | 0 | 22.0 | 22.1 | 22.2 | |
| | | | 6 | 0 | 0 | 21.6 | 21.8 | 22.1 | |
| | | 64QAM | 1 | 0 | 0 | 21.7 | 21.8 | 21.5 | 23.0 |
| | | | 1 | 3 | 0 | 22.0 | 22.4 | 22.4 | |
| | | | 1 | 5 | 0 | 21.9 | 22.2 | 22.3 | |
| | | | 3 | 0 | 0 | 21.7 | 22.2 | 22.3 | |
| | | | 3 | 1 | 0 | 21.8 | 22.3 | 22.4 | |
| | | | 3 | 3 | 0 | 21.8 | 22.3 | 22.3 | |
| | | | 6 | 0 | 1 | 21.3 | 21.4 | 21.5 | 22.0 |

## 9.5. LTE Carrier Aggregation

The following power measurements were performed with a single carrier uplink; CA for this particular project is only supported in the downlinks. The CA combination is one (1) Uplink and to four (4) Downlinks.

| Type | LTE CA combinations | | | PCC (UL) | | | | | SCC (DL) | | | LTE Rel 8 Tx. Power [dBm] | LTE Rel 12 Tx. Power [dBm] | Delta |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PCC | + | SCC | Mode | BW (MHz) | Channel | Freq. (MHz) | RB/Offset | BW (MHz) | Channel | Freq. (MHz) | | | |
| Intra-Band Contiguous | 12B | | | QPSK | 5 | 23035 | 701.5 | 1,0 | 10 | 5107 | 738.7 | 24.86 | 24.03 | -3.3% |
| | 7C | | | QPSK | 20 | 21001 | 2525.1 | 1,0 | 20 | 3199 | 2664.9 | 22.73 | 22.73 | 0.0% |
| | 41C | | | QPSK | 20 | 39750 | 2506.0 | 1,0 | 20 | 39948 | 2525.8 | 22.36 | 22.56 | 0.9% |
| | 66B | | | QPSK | 15 | 132597 | 1772.5 | 75,0 | 5 | 67154 | 2181.8 | 22.95 | 22.96 | 0.0% |
| | 66C | | | QPSK | 20 | 132072 | 1720.0 | 100,0 | 20 | 66734 | 2139.8 | 23.00 | 22.99 | 0.0% |
| Intra-Band Non-Contiguous | 2A | + | 2A | QPSK | 20 | 18700 | 1860.0 | 1,0 | 20 | 1100 | 1980.0 | 22.90 | 22.77 | -0.6% |
| | 4A | + | 4A | QPSK | 20 | 20050 | 1720.0 | 1,0 | 20 | 2300 | 2145.0 | 22.70 | 22.71 | 0.0% |
| | 7A | + | 7A | QPSK | 20 | 20850 | 2510.0 | 1,0 | 20 | 3350 | 2680.0 | 22.73 | 22.90 | 0.7% |
| | 66A | + | 66A | QPSK | 20 | 132572 | 1770.0 | 1,0 | 20 | 66536 | 2120.0 | 22.92 | 22.90 | -0.1% |
| Inter-Band Non-Contiguous | 2A | + | 4A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2300 | 2145.0 | 22.97 | 23.00 | 0.1% |
| | 2A | + | 5A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 10 | 2450 | 874.0 | 22.97 | 23.00 | 0.1% |
| | 2A | + | 7A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 3350 | 2680.0 | 22.97 | 22.86 | -0.5% |
| | 2A | + | 12A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 10 | 5095 | 737.5 | 22.97 | 23.00 | 0.1% |
| | 2A | + | 13A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 10 | 5230 | 751.0 | 22.97 | 23.00 | 0.1% |
| | 2A | + | 17A | QPSK | 10 | 19150 | 1905.0 | 1,0 | 10 | 5790 | 740.0 | 22.97 | 23.00 | 0.1% |
| | 2A | + | 29A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 10 | 9715 | 722.5 | 22.97 | 22.96 | 0.0% |
| | 2A | + | 66A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 66886 | 2155.0 | 22.97 | 23.00 | 0.1% |
| | 4A | + | 5A | QPSK | 20 | 20175 | 1732.5 | 1,0 | 10 | 2525 | 881.5 | 22.74 | 22.93 | 0.8% |
| | 4A | + | 7A | QPSK | 20 | 20175 | 1732.5 | 1,0 | 20 | 3100 | 2655.0 | 22.74 | 22.92 | 0.8% |
| | 4A | + | 12A | QPSK | 20 | 20175 | 1732.5 | 1,0 | 10 | 5095 | 737.5 | 22.74 | 22.96 | 1.0% |
| | 4A | + | 13A | QPSK | 20 | 20175 | 1732.5 | 1,0 | 10 | 5230 | 751.0 | 22.74 | 22.96 | 1.0% |
| | 4A | + | 17A | QPSK | 10 | 20000 | 1715.0 | 1,0 | 10 | 5790 | 740.0 | 22.71 | 22.80 | 0.4% |
| | 4A | + | 29A | QPSK | 20 | 20175 | 1732.5 | 1,0 | 10 | 9715 | 722.5 | 22.74 | 22.98 | 1.1% |
| | 5A | + | 7A | QPSK | 10 | 20525 | 836.5 | 1,0 | 20 | 3350 | 2680.0 | 24.85 | 25.00 | 0.6% |
| | 5A | + | 12A | QPSK | 10 | 20525 | 836.5 | 1,0 | 10 | 5095 | 737.5 | 24.85 | 24.97 | 0.5% |
| | 5A | + | 29A | QPSK | 10 | 20600 | 844.0 | 1,0 | 10 | 9720 | 723.0 | 24.85 | 25.00 | 0.6% |
| | 12A | + | 66A | QPSK | 10 | 23095 | 707.5 | 1,0 | 20 | 66886 | 2155.0 | 24.77 | 24.80 | 0.1% |

**Note:**

Per KDB 941225 D05A LTE Rel. 10 KDB Inquiry Sheet: SAR is excluded for Carrier Aggregation when measured power does not exceed LTE Release 8 by more than a $^1/_4$ dBm.

| Type | LTE CA combinations | | | | | PCC (UL) | | | | | SCC1 (DL) | | | SCC2 (DL) | | | LTE Rel 8 Tx. Power [dBm] | LTE Rel 12 Tx. Power [dBm] | Delta |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PCC | + | SCC1 | + | SCC2 | Mode | BW (MHz) | Channel | Freq. (MHz) | RB/ Offset | BW (MHz) | Channel | Freq. (MHz) | BW (MHz) | Channel | Freq. (MHz) | | | |
| Inter-Band Non-Contiguous | 2A | + | 2A | + | 4A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 1100 | 1980.0 | 20 | 2175 | 2132.5 | 22.97 | 23.09 | 0.5% |
| | 2A | + | 2A | + | 12A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 1100 | 1980.0 | 10 | 5095 | 737.5 | 22.97 | 22.97 | 0.0% |
| | 2A | + | 2A | + | 13A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 1100 | 1980.0 | 10 | 5230 | 751.0 | 22.97 | 23.00 | 0.1% |
| | 2A | + | 4A | + | 4A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2300 | 2145.0 | 20 | 2050 | 2120.0 | 22.97 | 23.20 | 1.0% |
| | 2A | + | 4A | + | 5A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2300 | 2145.0 | 10 | 2525 | 881.5 | 22.97 | 23.02 | 0.2% |
| | 2A | + | 4A | + | 7A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2300 | 2145.0 | 20 | 3100 | 2655.0 | 22.97 | 23.07 | 0.4% |
| | 2A | + | 4A | + | 12A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2300 | 2145.0 | 10 | 5095 | 737.5 | 22.97 | 23.06 | 0.4% |
| | 2A | + | 4A | + | 13A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2300 | 2145.0 | 10 | 5230 | 751.0 | 22.97 | 23.05 | 0.3% |
| | 2A | + | 4A | + | 29A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2300 | 2145.0 | 10 | 9715 | 722.5 | 22.97 | 23.04 | 0.3% |
| | 2A | + | 5A | + | 29A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 10 | 2525 | 881.5 | 10 | 9715 | 722.5 | 22.97 | 23.01 | 0.2% |
| | 2A | + | 7A | + | 7A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2850 | 2630.0 | 20 | 3350 | 2680.0 | 22.97 | 22.83 | -0.6% |
| | 2A | + | 12A | + | 66A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 10 | 5095 | 737.5 | 20 | 66886 | 2155.0 | 22.97 | 23.03 | 0.3% |
| | 2A | + | 12B | | | QPSK | 20 | 18900 | 1880.0 | 1,0 | 5 | 5035 | 731.5 | 10 | 5107 | 738.7 | 22.97 | 23.10 | 0.6% |
| | 2A | + | 66A | + | 66A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 66536 | 2120.0 | 20 | 66886 | 2155.0 | 22.97 | 23.20 | 1.0% |
| | 4A | + | 4A | + | 5A | QPSK | 20 | 20050 | 1720.0 | 1,0 | 20 | 2300 | 2145.0 | 10 | 2525 | 881.5 | 22.74 | 22.76 | 0.1% |
| | 4A | + | 4A | + | 12A | QPSK | 20 | 20050 | 1720.0 | 1,0 | 20 | 2300 | 2145.0 | 10 | 5095 | 737.5 | 22.74 | 22.84 | 0.4% |
| | 4A | + | 4A | + | 13A | QPSK | 20 | 20050 | 1720.0 | 1,0 | 20 | 2300 | 2145.0 | 10 | 5230 | 751.0 | 22.74 | 22.79 | 0.2% |
| | 4A | + | 4A | + | 29A | QPSK | 20 | 20050 | 1720.0 | 1,0 | 20 | 2300 | 2145.0 | 10 | 9715 | 722.5 | 22.74 | 22.79 | 0.2% |
| | 4A | + | 5A | + | 29A | QPSK | 20 | 20175 | 1732.5 | 1,0 | 10 | 2525 | 881.5 | 10 | 9715 | 722.5 | 22.74 | 22.87 | 0.6% |
| | 4A | + | 7A | + | 7A | QPSK | 20 | 20175 | 1732.5 | 1,0 | 20 | 2850 | 2630.0 | 20 | 3350 | 2680.0 | 22.74 | 22.97 | 1.0% |
| | 4A | + | 7C | | | QPSK | 20 | 20175 | 1732.5 | 1,0 | 20 | 3001 | 2645.1 | 20 | 3199 | 2664.9 | 22.74 | 22.97 | 1.0% |
| | 4A | + | 12B | | | QPSK | 20 | 20175 | 1732.5 | 1,0 | 5 | 5035 | 731.5 | 10 | 5107 | 738.7 | 22.74 | 22.77 | 0.1% |
| | 5A | + | 7A | + | 7A | QPSK | 10 | 20525 | 836.5 | 25,0 | 20 | 2850 | 2630.0 | 20 | 3350 | 2680.0 | 24.10 | 24.07 | -0.1% |
| | 12A | + | 66A | + | 66A | QPSK | 10 | 23095 | 707.5 | 25,0 | 20 | 66536 | 2120.0 | 20 | 67236 | 2190.0 | 23.96 | 23.97 | 0.0% |

| Type | LTE CA combinations | | | | | | | PCC (UL) | | | | | SCC1 (DL) | | | SCC2 (DL) | | | SCC3 (DL) | | | LTE Rel 8 Tx. Power [dBm] | LTE Rel 12 Tx. Power [dBm] | Delta |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PCC | + | SCC1 | + | SCC2 | + | SCC3 | Mode | BW (MHz) | Channel | Freq. (MHz) | RB/Offset | BW (MHz) | Channel | Freq. (MHz) | BW (MHz) | Channel | Freq. (MHz) | BW (MHz) | Channel | Freq. (MHz) | | | |
| Inter-Band Non-Contiguous | 2A | + | 4A | + | 5A | + | 29A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2175 | 2132.5 | 10 | 2525 | 881.5 | 10 | 9715 | 722.5 | 22.97 | 23.10 | 0.6% |
| | 2A | + | 4A | + | 7A | + | 7A | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2175 | 2132.5 | 20 | 3100 | 2655.0 | 20 | 3350 | 2680.0 | 22.97 | 23.08 | 0.5% |
| | 2A | + | 4A | + | 7C | | | QPSK | 20 | 18900 | 1880.0 | 1,0 | 20 | 2175 | 2132.5 | 20 | 3001 | 2645.1 | 20 | 3199 | 2664.9 | 22.97 | 23.01 | 0.2% |

**Note:**

Per KDB 941225 D05A LTE Rel. 10 KDB Inquiry Sheet: SAR is excluded for Carrier Aggregation when measured power does not exceed LTE Release 8 by more than a $^{1}/_{4}$ dBm.

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

**Measured Results**

| Band (GHz) | Mode | Data Rate | Ch # | Freq. (MHz) | Meas. Avg Pwr (dBm) | | Max Output Power (dBm) | | SAR Test (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Chain 0 | Chain 1 | Chain 0 | Chain 1 | |
| 2.4 (DSSS) | 802.11b | 1 Mbps | 1 | 2412 | 13.2 | 12.7 | 13.5 | 13.3 | Yes |
| | | | 6 | 2437 | 13.1 | 13.0 | | | |
| | | | 11 | 2462 | 12.7 | 12.8 | | | |
| 2.4 (OFDM) | 802.11g | 6 Mbps | 1 | 2412 | Not Required | Not Required | 13.8 | 13.3 | No |
| | | | 6 | 2437 | | | | | |
| | | | 11 | 2462 | | | | | |
| | 802.11n (HT20) | 6.5 Mbps | 1 | 2412 | | | 13.9 | 13.3 | No |
| | | | 6 | 2437 | | | | | |
| | | | 11 | 2462 | | | | | |

**Note(s):**

1. SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
2. 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 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.
3. Additionally, SAR is not required for Channels 12 and 13 because the tune-up limit and the measured output power for these two channels are no greater than those for the default test channels.

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

**Measured Results**

| Band (GHz) | Mode | Data Rate | Ch # | Freq. (MHz) | Meas. Avg Pwr (dBm) | | Max Output Power (dBm) | | SAR Test (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Chain 0 | Chain 1 | Chain 0 | Chain 1 | |
| 5.2 U-NII 1 | 802.11a | 6 Mbps | 36 | 5180 | 11.0 | Not Required | 12.5 | 12.5 | Yes |
| | | | 40 | 5200 | 10.9 | | | | |
| | | | 44 | 5220 | 11.4 | | | | |
| | | | 48 | 5240 | 11.6 | | | | |
| | 802.11n (HT20) | 6.5 Mbps | 36 | 5180 | Not Required | | 12.4 | 12.4 | No |
| | | | 40 | 5200 | | | | | |
| | | | 44 | 5220 | | | | | |
| | | | 48 | 5240 | | | | | |
| | 802.11n (HT40) | 13.5 Mbps | 38 | 5190 | | | 12.4 | 12.4 | No |
| | | | 46 | 5230 | | | | | |
| | 802.11ac (VHT20) | 6.5 Mbps | 36 | 5180 | | | 12.4 | 12.5 | No |
| | | | 40 | 5200 | | | | | |
| | | | 44 | 5220 | | | | | |
| | | | 48 | 5240 | | | | | |
| | 802.11ac (VHT40) | 13.5 Mbps | 38 | 5190 | | | 12.4 | 11.6 | No |
| | | | 46 | 5230 | | | | 12.4 | |
| | 802.11ac (VHT80) | 29.3 Mbps | 42 | 5210 | | | 12.4 | 12.5 | No |
| 5.3 U-NII-2A | 802.11a | 6 Mbps | 52 | 5260 | Not Required | 11.0 | 12.3 | 12.7 | Yes |
| | | | 56 | 5280 | | 11.2 | | | |
| | | | 60 | 5300 | | 11.6 | | | |
| | | | 64 | 5320 | | 11.4 | | | |
| | 802.11n (HT20) | 6.5 Mbps | 52 | 5260 | | Not Required | 12.2 | 12.6 | No |
| | | | 56 | 5280 | | | | | |
| | | | 60 | 5300 | | | | | |
| | | | 64 | 5320 | | | | | |
| | 802.11n (HT40) | 13.5 Mbps | 54 | 5270 | | | 12.2 | 12.6 | No |
| | | | 62 | 5310 | | | | | |
| | 802.11ac (VHT20) | 6.5 Mbps | 52 | 5260 | | | 12.3 | 12.6 | No |
| | | | 56 | 5280 | | | | | |
| | | | 60 | 5300 | | | | | |
| | | | 64 | 5320 | | | | | |
| | 802.11ac (VHT40) | 13.5 Mbps | 54 | 5270 | | | 12.3 | 12.6 | No |
| | | | 62 | 5310 | | | | 12.1 | |
| | 802.11ac (VHT80) | 29.3 Mbps | 58 | 5290 | | | 12.3 | 12.6 | No |

**Note(s):**

1. 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 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.
2. When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.
3. When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest *reported* SAR for UNII band 2A is
   - ≤ 1.2 W/kg, SAR is not required for UNII band I
   - > 1.2 W/kg, both bands should be tested independently for SAR.

| Band (GHz) | Mode | Data Rate | Ch # | Freq. (MHz) | Meas. Avg Pwr (dBm) | | Max Output Power (dBm) | | SAR Test (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Chain 0 | Chain 1 | Chain 0 | Chain 1 | |
| 5.5 U-NII-2C | 802.11a | 6 Mbps | 100 | 5500 | Not Required | Not Required | 12.0 | 11.6 | No |
| | | | 120 | 5600 | | | | | |
| | | | 124 | 5620 | | | | | |
| | | | 144 | 5720 | | | | | |
| | 802.11n (HT20) | 6.5 Mbps | 100 | 5500 | | | 12.0 | 11.6 | No |
| | | | 120 | 5600 | | | | | |
| | | | 124 | 5620 | | | | | |
| | | | 144 | 5720 | | | | | |
| | 802.11n (HT40) | 13.5 Mbps | 102 | 5510 | | | 12.0 | 11.6 | No |
| | | | 118 | 5590 | | | | | |
| | | | 126 | 5630 | | | | | |
| | | | 142 | 5710 | | | | | |
| | 802.11ac (VHT20) | 6.5 Mbps | 100 | 5500 | | | 12.0 | 11.8 | No |
| | | | 120 | 5600 | | | | | |
| | | | 124 | 5620 | | | | | |
| | | | 144 | 5720 | | | | | |
| | 802.11ac (VHT40) | 13.5 Mbps | 102 | 5510 | | | 12.0 | 11.8 | No |
| | | | 118 | 5590 | | | | | |
| | | | 126 | 5630 | | | | | |
| | | | 142 | 5710 | | | | | |
| | 802.11ac (VHT80) | 29.3 Mbps | 106 | 5530 | 10.6 | 10.9 | 12.0 | 11.8 | Yes |
| | | | 122 | 5610 | 10.8 | 10.6 | | | |
| | | | 138 | 5690 | 10.7 | 10.6 | | | |
| 5.8 U-NII-3 | 802.11a | 6 Mbps | 149 | 5745 | Not Required | 8.3 | 10.1 | 9.7 | Yes |
| | | | 157 | 5785 | | 8.3 | | | |
| | | | 165 | 5825 | | 8.4 | | | |
| | 802.11n (HT20) | 6.5 Mbps | 149 | 5745 | | Not Required | 10.1 | 9.5 | No |
| | | | 157 | 5785 | | | | | |
| | | | 165 | 5825 | | | | | |
| | 802.11n (HT40) | 13.5 Mbps | 151 | 5755 | | | 10.1 | 9.5 | No |
| | | | 159 | 5795 | | | | | |
| | 802.11ac (VHT20) | 6.5 Mbps | 149 | 5745 | | | 10.1 | 9.5 | No |
| | | | 157 | 5785 | | | | | |
| | | | 165 | 5825 | | | | | |
| | 802.11ac (VHT40) | 13.5 Mbps | 151 | 5755 | | | 10.1 | 9.5 | No |
| | | | 159 | 5795 | | | | | |
| | 802.11ac (VHT80) | 29.3 Mbps | 155 | 5775 | 8.9 | | 10.1 | 9.5 | Yes |

**Note(s):**

1. 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 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.
2. When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.

## 9.8. Bluetooth

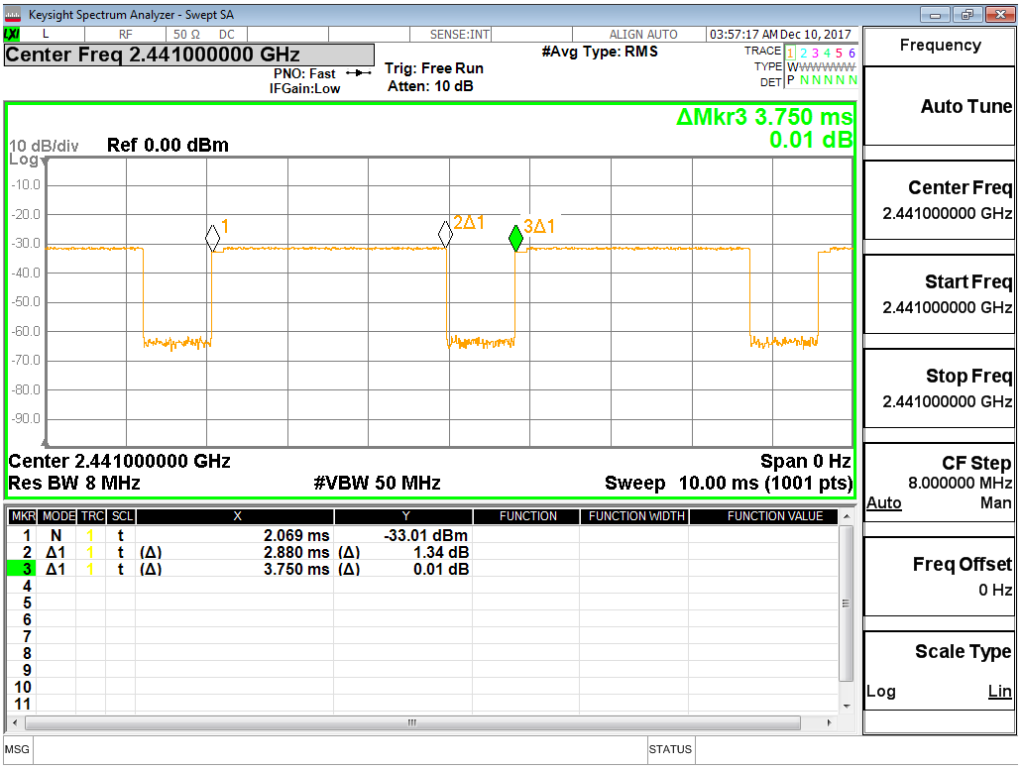
| Band (MHz) | Mode | Ch # | Freq. (MHz) | Conducted Avg Power | | Max Output Power (dBm) | SAR Test (Yes/No) |
|---|---|---|---|---|---|---|---|
| | | | | (dBm) | (mW) | | |
| 2.4 | GFSK | 0 | 2402 | 9.84 | 9.64 | 10.3 | Yes |
| | | 39 | 2441 | 10.88 | 12.25 | 10.9 | |
| | | 78 | 2480 | 9.24 | 8.39 | 10.0 | |
| | EDR, π/4 DQPSK | 0 | 2402 | 7.04 | 5.06 | 7.4 | No |
| | | 39 | 2441 | 8.15 | 6.53 | 8.2 | |
| | | 78 | 2480 | 7.24 | 5.30 | 7.3 | |
| | EDR, 8-DPSK | 0 | 2402 | 7.31 | 5.38 | 7.4 | No |
| | | 39 | 2441 | 8.15 | 6.53 | 8.2 | |
| | | 78 | 2480 | 7.27 | 5.33 | 7.3 | |
| | LE, GFSK | 0 | 2402 | 3.58 | 2.28 | 4.0 | No |
| | | 19 | 2440 | 5.36 | 3.44 | 5.4 | |
| | | 39 | 2480 | 4.22 | 2.64 | 4.9 | |

**Duty Factor Measured Results**

| Mode | Type | T on (ms) | Period (ms) | Duty Cycle | Crest Factor (1/duty cycle) |
|---|---|---|---|---|---|
| GFSK | DH5 | 2.88 | 3.75 | 76.80% | 1.30 |

## Duty Cycle plots

GFSK



# 10. Measured and Reported (Scaled) SAR Results

**SAR Test Reduction criteria are as follows:**

Reported SAR(W/kg) for WWAN= Measured SAR *Tune-up Scaling Factor

Reported SAR(W/kg) for Wi-Fi and Bluetooth= Measured SAR * Tune-up scaling factor * Duty Cycle scaling factor

**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:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 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
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 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):**

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. 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 .

Additional 1-g SAR testing at 5 mm is not required when hotspot mode 10-g extremity SAR is not required for the surfaces and edges; since all 1-g reported SAR < 1.2 W/kg.

**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 ≤ ¼ 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 ≤ 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:

- ≤ 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 ≤ 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 ≤ 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 ≤ 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 ≤ 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 | Pwr Back-off | 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 | OFF | 0 | Left Touch | 190 | 836.6 | 28.2 | 27.6 | 0.161 | 0.185 | 1 |
| | | | | Left Tilt | 190 | 836.6 | 28.2 | 27.6 | 0.057 | 0.065 | |
| | | | | Right Touch | 190 | 836.6 | 28.2 | 27.6 | 0.018 | 0.021 | |
| | | | | Right Tilt | 190 | 836.6 | 28.2 | 27.6 | 0.002 | 0.002 | |
| Body-worn | GPRS 4 Slots | OFF | 15 | Rear | 190 | 836.6 | 28.2 | 27.6 | 0.147 | 0.169 | |
| | | | | Front | 190 | 836.6 | 28.2 | 27.6 | 0.160 | 0.184 | 2 |
| Hotspot | GPRS 4 Slots | OFF | 10 | Rear | 190 | 836.6 | 28.2 | 27.6 | 0.257 | 0.295 | |
| | | | | Front | 190 | 836.6 | 28.2 | 27.6 | 0.303 | 0.348 | 3 |
| | | | | Edge 2 | 190 | 836.6 | 28.2 | 27.6 | 0.205 | 0.235 | |
| | | | | Edge 3 | 190 | 836.6 | 28.2 | 27.6 | 0.141 | 0.162 | |
| | | | | Edge 4 | 190 | 836.6 | 28.2 | 27.6 | 0.171 | 0.196 | |
| Hotspot | DTM 2 slots | OFF | 10 | Front | 190 | 836.6 | 31.2 | 30.8 | 0.305 | 0.334 | |

## 10.2. GSM1900

| RF Exposure Conditions | Mode | Pwr Back-off | 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 | OFF | 0 | Left Touch | 661 | 1880.0 | 23.7 | 23.4 | 0.088 | 0.094 | |
| | | | | Left Tilt | 661 | 1880.0 | 23.7 | 23.4 | 0.046 | 0.049 | |
| | | | | Right Touch | 661 | 1880.0 | 23.7 | 23.4 | 0.093 | 0.100 | 4 |
| | | | | Right Tilt | 661 | 1880.0 | 23.7 | 23.4 | 0.050 | 0.053 | |
| Body-worn | GPRS 4 Slots | OFF | 15 | Rear | 661 | 1880.0 | 23.7 | 23.4 | 0.083 | 0.089 | |
| | | | | Front | 661 | 1880.0 | 23.7 | 23.4 | 0.125 | 0.134 | 5 |
| Hotspot | GPRS 4 Slots | OFF | 10 | Rear | 661 | 1880.0 | 23.7 | 23.4 | 0.133 | 0.143 | |
| | | | | Front | 661 | 1880.0 | 23.7 | 23.4 | 0.202 | 0.216 | |
| | | | | Edge 2 | 661 | 1880.0 | 23.7 | 23.4 | 0.061 | 0.065 | |
| | | | | Edge 3 | 661 | 1880.0 | 23.7 | 23.4 | 0.298 | 0.319 | 6 |
| | | | | Edge 4 | 661 | 1880.0 | 23.7 | 23.4 | 0.242 | 0.259 | |
| Hotspot | DTM 2 slots | OFF | 10 | Edge 3 | 661 | 1880.0 | 26.7 | 26.4 | 0.276 | 0.296 | |

## 10.3. W-CDMA Band II

| RF Exposure Conditions | Mode | Pwr Back-off | 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 | OFF | 0 | Left Touch | 9400 | 1880.0 | 22.7 | 22.6 | 0.216 | 0.221 | 7 |
| | | | | Left Tilt | 9400 | 1880.0 | 22.7 | 22.6 | 0.100 | 0.102 | |
| | | | | Right Touch | 9400 | 1880.0 | 22.7 | 22.6 | 0.192 | 0.196 | |
| | | | | Right Tilt | 9400 | 1880.0 | 22.7 | 22.6 | 0.090 | 0.092 | |
| Body-worn | Rel 99 RMC 12.2 kbps | OFF | 15 | Rear | 9400 | 1880.0 | 22.7 | 22.6 | 0.200 | 0.205 | |
| | | | | Front | 9400 | 1880.0 | 22.7 | 22.6 | 0.246 | 0.252 | 8 |
| Hotspot | Rel 99 RMC 12.2 kbps | OFF | 10 | Rear | 9400 | 1880.0 | 22.7 | 22.6 | 0.292 | 0.299 | |
| | | | | Front | 9400 | 1880.0 | 22.7 | 22.6 | 0.493 | 0.504 | 9 |
| | | | | Edge 2 | 9400 | 1880.0 | 22.7 | 22.6 | 0.127 | 0.130 | |
| | | | | Edge 3 | 9400 | 1880.0 | 22.7 | 22.6 | 0.433 | 0.443 | |
| | | | | Edge 4 | 9400 | 1880.0 | 22.7 | 22.6 | 0.335 | 0.343 | |

## 10.4. W-CDMA Band IV

| RF Exposure Conditions | Mode | Pwr Back-off | 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 | OFF | 0 | Left Touch | 1413 | 1732.6 | 22.7 | 22.6 | 0.269 | 0.275 | 10 |
| | | | | Left Tilt | 1413 | 1732.6 | 22.7 | 22.6 | 0.113 | 0.116 | |
| | | | | Right Touch | 1413 | 1732.6 | 22.7 | 22.6 | 0.181 | 0.185 | |
| | | | | Right Tilt | 1413 | 1732.6 | 22.7 | 22.6 | 0.121 | 0.124 | |
| Body-worn | Rel 99 RMC 12.2 kbps | OFF | 15 | Rear | 1413 | 1732.6 | 22.7 | 22.6 | 0.196 | 0.201 | |
| | | | | Front | 1413 | 1732.6 | 22.7 | 22.6 | 0.262 | 0.268 | 11 |
| Hotspot | Rel 99 RMC 12.2 kbps | OFF | 10 | Rear | 1413 | 1732.6 | 22.7 | 22.6 | 0.303 | 0.310 | |
| | | | | Front | 1413 | 1732.6 | 22.7 | 22.6 | 0.455 | 0.466 | |
| | | | | Edge 2 | 1413 | 1732.6 | 22.7 | 22.6 | 0.051 | 0.052 | |
| | | | | Edge 3 | 1413 | 1732.6 | 22.7 | 22.6 | 0.490 | 0.501 | |
| | | | | Edge 4 | 1413 | 1732.6 | 22.7 | 22.6 | 0.522 | 0.534 | 12 |

## 10.5. W-CDMA Band V

| RF Exposure Conditions | Mode | Pwr Back-off | 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 | OFF | 0 | Left Touch | 4183 | 836.6 | 24.9 | 24.7 | 0.224 | 0.235 | 13 |
| | | | | Left Tilt | 4183 | 836.6 | 24.9 | 24.7 | 0.071 | 0.074 | |
| | | | | Right Touch | 4183 | 836.6 | 24.9 | 24.7 | 0.132 | 0.138 | |
| | | | | Right Tilt | 4183 | 836.6 | 24.9 | 24.7 | 0.051 | 0.053 | |
| Body-worn | Rel 99 RMC 12.2 kbps | OFF | 15 | Rear | 4183 | 836.6 | 24.9 | 24.7 | 0.187 | 0.196 | |
| | | | | Front | 4183 | 836.6 | 24.9 | 24.7 | 0.199 | 0.208 | 14 |
| Hotspot | Rel 99 RMC 12.2 kbps | OFF | 10 | Rear | 4183 | 836.6 | 24.9 | 24.7 | 0.364 | 0.381 | |
| | | | | Front | 4183 | 836.6 | 24.9 | 24.7 | 0.364 | 0.381 | 15 |
| | | | | Edge 2 | 4183 | 836.6 | 24.9 | 24.7 | 0.248 | 0.260 | |
| | | | | Edge 3 | 4183 | 836.6 | 24.9 | 24.7 | 0.188 | 0.197 | |
| | | | | Edge 4 | 4183 | 836.6 | 24.9 | 24.7 | 0.217 | 0.227 | |

## 10.6. LTE Band 2 (20MHz Bandwidth)

| RF Exposure Conditions | Mode | Pwr Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB offest | Power (dBm) | | 1-g SAR (W/kg) | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | |
| Head | QPSK | OFF | 0 | Left Touch | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.184 | 0.185 | 16 |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.174 | 0.178 | |
| | | | | Left Tilt | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.122 | 0.123 | |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.110 | 0.112 | |
| | | | | Right Touch | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.134 | 0.135 | |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.108 | 0.110 | |
| | | | | Right Tilt | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.076 | 0.077 | |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.066 | 0.067 | |
| Body-worn | QPSK | OFF | 15 | Rear | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.207 | 0.208 | |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.199 | 0.203 | |
| | | | | Front | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.304 | 0.306 | 17 |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.294 | 0.300 | |
| Hotspot | QPSK | OFF | 10 | Rear | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.339 | 0.341 | |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.324 | 0.331 | |
| | | | | Front | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.458 | 0.461 | |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.439 | 0.448 | |
| | | | | Edge 2 | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.123 | 0.124 | |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.122 | 0.125 | |
| | | | | Edge 3 | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.416 | 0.419 | |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.406 | 0.415 | |
| | | | | Edge 4 | 18900 | 1880.0 | 1 | 0 | 23.0 | 23.0 | 0.496 | 0.499 | 18 |
| | | | | | | | 50 | 0 | 23.0 | 22.9 | 0.477 | 0.487 | |

## 10.7. LTE Band 4 (20MHz Bandwidth)

SAR for LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

## 10.8. LTE Band 5 (10MHz Bandwidth)

| RF Exposure Conditions | Mode | Pwr Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB offest | Power (dBm) | | 1-g SAR (W/kg) | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | |
| Head | QPSK | OFF | 0 | Left Touch | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.157 | 0.178 | 19 |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.135 | 0.149 | |
| | | | | Left Tilt | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.080 | 0.091 | |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.067 | 0.074 | |
| | | | | Right Touch | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.157 | 0.178 | |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.126 | 0.139 | |
| | | | | Right Tilt | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.060 | 0.068 | |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.050 | 0.055 | |
| Body-worn | QPSK | OFF | 15 | Rear | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.131 | 0.149 | 20 |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.102 | 0.113 | |
| | | | | Front | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.110 | 0.125 | |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.083 | 0.092 | |
| Hotspot | QPSK | OFF | 10 | Rear | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.260 | 0.295 | 21 |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.202 | 0.223 | |
| | | | | Front | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.247 | 0.280 | |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.192 | 0.212 | |
| | | | | Edge 2 | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.241 | 0.274 | |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.186 | 0.205 | |
| | | | | Edge 3 | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.164 | 0.186 | |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.130 | 0.144 | |
| | | | | Edge 4 | 20525 | 836.5 | 1 | 25 | 25.0 | 24.5 | 0.126 | 0.143 | |
| | | | | | | | 25 | 0 | 24.0 | 23.6 | 0.119 | 0.131 | |

## 10.9. LTE Band 7 (20MHz Bandwidth)

| RF Exposure Conditions | Mode | Pwr Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB offest | Power (dBm) | | 1-g SAR (W/kg) | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | |
| Head | QPSK | OFF | 0 | Left Touch | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.084 | 0.089 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.081 | 0.085 | |
| | | | | Left Tilt (15°) | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.085 | 0.090 | 22 |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.064 | 0.067 | |
| | | | | Right Touch | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.075 | 0.080 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.066 | 0.069 | |
| | | | | Right Tilt (15°) | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.043 | 0.046 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.043 | 0.045 | |
| Body-worn | QPSK | OFF | 15 | Rear | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.115 | 0.122 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.124 | 0.130 | |
| | | | | Front | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.143 | 0.152 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.150 | 0.157 | 23 |
| Hotspot | QPSK | OFF | 10 | Rear | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.252 | 0.268 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.279 | 0.292 | |
| | | | | Front | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.246 | 0.262 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.261 | 0.274 | |
| | | | | Edge 2 | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.152 | 0.162 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.152 | 0.159 | |
| | | | | Edge 3 | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.504 | 0.536 | 24 |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.481 | 0.504 | |
| | | | | Edge 4 | 21100 | 2535.0 | 1 | 0 | 23.0 | 22.7 | 0.048 | 0.051 | |
| | | | | | | | 50 | 24 | 23.0 | 22.8 | 0.047 | 0.049 | |

## 10.10. LTE Band 12 (10MHz Bandwidth)

| RF Exposure Conditions | Mode | Pwr Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB offest | Power (dBm) | | 1-g SAR (W/kg) | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | |
| Head | QPSK | OFF | 0 | Left Touch | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.073 | 0.081 | 25 |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.069 | 0.078 | |
| | | | | Left Tilt (15°) | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.024 | 0.027 | |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.023 | 0.026 | |
| | | | | Right Touch | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.068 | 0.075 | |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.063 | 0.071 | |
| | | | | Right Tilt (15°) | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.023 | 0.025 | |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.025 | 0.029 | |
| Body-worn | QPSK | OFF | 15 | Rear | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.067 | 0.075 | 26 |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.060 | 0.068 | |
| | | | | Front | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.067 | 0.074 | |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.062 | 0.070 | |
| Hotspot | QPSK | OFF | 10 | Rear | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.083 | 0.093 | |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.078 | 0.088 | |
| | | | | Front | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.087 | 0.097 | 27 |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.082 | 0.092 | |
| | | | | Edge 2 | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.063 | 0.070 | |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.053 | 0.060 | |
| | | | | Edge 3 | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.015 | 0.016 | |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.013 | 0.015 | |
| | | | | Edge 4 | 23095 | 707.5 | 1 | 49 | 25.0 | 24.5 | 0.086 | 0.096 | |
| | | | | | | | 25 | 0 | 24.0 | 23.5 | 0.082 | 0.093 | |

## 10.11. LTE Band 13 (10MHz Bandwidth)

| RF Exposure Conditions | Mode | Pwr Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB offest | Power (dBm) | | 1-g SAR (W/kg) | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | |
| Head | QPSK | OFF | 0 | Left Touch | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.349 | 0.356 | 28 |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.351 | 0.352 | |
| | | | | Left Tilt (15°) | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.058 | 0.059 | |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.047 | 0.047 | |
| | | | | Right Touch | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.200 | 0.204 | |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.139 | 0.139 | |
| | | | | Right Tilt (15°) | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.063 | 0.064 | |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.052 | 0.052 | |
| Body-worn | QPSK | OFF | 15 | Rear | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.236 | 0.241 | |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.191 | 0.191 | |
| | | | | Front | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.273 | 0.279 | 29 |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.199 | 0.199 | |
| Hotspot | QPSK | OFF | 10 | Rear | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.292 | 0.298 | |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.236 | 0.237 | |
| | | | | Front | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.318 | 0.325 | 30 |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.257 | 0.258 | |
| | | | | Edge 2 | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.262 | 0.267 | |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.213 | 0.213 | |
| | | | | Edge 3 | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.112 | 0.114 | |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.089 | 0.090 | |
| | | | | Edge 4 | 23230 | 782.0 | 1 | 25 | 25.0 | 24.9 | 0.209 | 0.213 | |
| | | | | | | | 25 | 12 | 24.0 | 24.0 | 0.167 | 0.167 | |

## 10.12. LTE Band 17 (10MHz Bandwidth)

SAR for LTE Band 17 (Frequency Range: 704-716 MHz) is covered by LTE Band 12 (Frequency Range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

## 10.13. LTE Band 26 (15MHz Bandwidth)

| RF Exposure Conditions | Mode | Pwr Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB offest | Power (dBm) | | 1-g SAR (W/kg) | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | |
| Head | QPSK | OFF | 0 | Left Touch | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.204 | 0.204 | 31 |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.146 | 0.180 | |
| | | | | Left Tilt (15°) | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.032 | 0.032 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.035 | 0.043 | |
| | | | | Right Touch | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.116 | 0.116 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.088 | 0.108 | |
| | | | | Right Tilt (15°) | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.030 | 0.030 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.050 | 0.062 | |
| Body-worn | QPSK | OFF | 15 | Rear | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.145 | 0.145 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.151 | 0.186 | |
| | | | | Front | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.162 | 0.162 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.169 | 0.208 | 32 |
| Hotspot | QPSK | OFF | 10 | Rear | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.253 | 0.253 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.262 | 0.322 | |
| | | | | Front | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.291 | 0.291 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.299 | 0.368 | 33 |
| | | | | Edge 2 | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.187 | 0.187 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.213 | 0.262 | |
| | | | | Edge 3 | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.155 | 0.155 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.152 | 0.187 | |
| | | | | Edge 4 | 26865 | 831.5 | 1 | 0 | 24.0 | 24.0 | 0.235 | 0.235 | |
| | | | | | | | 36 | 20 | 24.0 | 23.1 | 0.192 | 0.236 | |

## 10.14. LTE Band 41 (20MHz Bandwidth)

| RF Exposure Conditions | Mode | Pwr Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB offest | Power (dBm) | | 1-g SAR (W/kg) | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | |
| Head | QPSK | OFF | 0 | Left Touch | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.049 | 0.054 | 34 |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.046 | 0.051 | |
| | | | | Left Tilt (15°) | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.025 | 0.028 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.021 | 0.023 | |
| | | | | Right Touch | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.044 | 0.049 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.042 | 0.046 | |
| | | | | Right Tilt (15°) | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.014 | 0.016 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.017 | 0.019 | |
| Body-worn | QPSK | OFF | 15 | Rear | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.083 | 0.092 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.084 | 0.093 | |
| | | | | Front | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.178 | 0.197 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.183 | 0.202 | 35 |
| Hotspot | QPSK | OFF | 10 | Rear | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.182 | 0.202 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.182 | 0.201 | |
| | | | | Front | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.244 | 0.271 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.237 | 0.262 | |
| | | | | Edge 2 | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.109 | 0.121 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.115 | 0.127 | |
| | | | | Edge 3 | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.274 | 0.304 | 36 |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.268 | 0.296 | |
| | | | | Edge 4 | 40620 | 2593.0 | 1 | 0 | 23.0 | 22.6 | 0.026 | 0.029 | |
| | | | | | | | 50 | 0 | 23.0 | 22.6 | 0.024 | 0.026 | |

## 10.15. LTE Band 66 (20MHz Bandwidth)

| RF Exposure Conditions | Mode | Pwr Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | RB Allocation | RB offest | Power (dBm) | | 1-g SAR (W/kg) | | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | |
| Head | QPSK | OFF | 0 | Left Touch | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.183 | 0.204 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.190 | 0.206 | 37 |
| | | | | Left Tilt (15°) | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.077 | 0.086 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.074 | 0.080 | |
| | | | | Right Touch | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.100 | 0.112 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.105 | 0.114 | |
| | | | | Right Tilt (15°) | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.080 | 0.089 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.083 | 0.089 | |
| Body-worn | QPSK | OFF | 15 | Rear | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.130 | 0.145 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.133 | 0.144 | |
| | | | | Front | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.269 | 0.300 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.283 | 0.307 | 38 |
| Hotspot | QPSK | OFF | 10 | Rear | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.220 | 0.246 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.236 | 0.256 | |
| | | | | Front | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.557 | 0.622 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.574 | 0.622 | 39 |
| | | | | Edge 2 | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.050 | 0.056 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.054 | 0.059 | |
| | | | | Edge 3 | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.482 | 0.538 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.525 | 0.569 | |
| | | | | Edge 4 | 132322 | 1745.0 | 1 | 99 | 23.0 | 22.5 | 0.528 | 0.590 | |
| | | | | | | | 50 | 24 | 23.0 | 22.7 | 0.539 | 0.584 | |

## 10.16. Wi-Fi (DTS Band)

| RF Exposure Conditions | Mode | Antenna | 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 1 Mbps | Chain 0 | 0 | Left Touch | 1 | 2412 | 0.181 | 98.87% | 13.5 | 13.2 | | | |
| | | | | Left Tilt | 1 | 2412 | 0.242 | 98.87% | 13.5 | 13.2 | | | |
| | | | | Right Touch | 1 | 2412 | 0.556 | 98.87% | 13.5 | 13.2 | | | |
| | | | | Right Tilt | 1 | 2412 | 0.598 | 98.87% | 13.5 | 13.2 | 0.303 | 0.328 | 40 |
| Body-worn | 802.11b 1 Mbps | Chain 0 | 15 | Rear | 1 | 2412 | 0.025 | 98.87% | 13.5 | 13.2 | | | |
| | | | | Front | 1 | 2412 | 0.027 | 98.87% | 13.5 | 13.2 | 0.022 | 0.024 | 41 |
| Hotspot | 802.11b 1 Mbps | Chain 0 | 10 | Rear | 1 | 2412 | 0.060 | 98.87% | 13.5 | 13.2 | | | |
| | | | | Front | 1 | 2412 | 0.064 | 98.87% | 13.5 | 13.2 | | | |
| | | | | Edge 1 | 1 | 2412 | 0.027 | 98.87% | 13.5 | 13.2 | | | |
| | | | | Edge 2 | 1 | 2412 | 0.007 | 98.87% | 13.5 | 13.2 | | | |
| | | | | Edge 4 | 1 | 2412 | 0.125 | 98.87% | 13.5 | 13.2 | 0.074 | 0.081 | 42 |
| Head | 802.11b 1 Mbps | Chain 1 | 0 | Left Touch | 6 | 2437 | 0.224 | 98.87% | 13.3 | 13.0 | | | |
| | | | | Left Tilt | 6 | 2437 | 0.059 | 98.87% | 13.3 | 13.0 | | | |
| | | | | Right Touch | 6 | 2437 | 0.245 | 98.87% | 13.3 | 13.0 | 0.154 | 0.167 | 43 |
| | | | | Right Tilt | 6 | 2437 | 0.030 | 98.87% | 13.3 | 13.0 | | | |
| Body-worn | 802.11b 1 Mbps | Chain 1 | 15 | Rear | 6 | 2437 | 0.003 | 98.87% | 13.3 | 13.0 | | | |
| | | | | Front | 6 | 2437 | 0.005 | 98.87% | 13.3 | 13.0 | 0.005 | 0.005 | 44 |
| Hotspot | 802.11b 1 Mbps | Chain 1 | 10 | Rear | 6 | 2437 | 0.012 | 98.87% | 13.3 | 13.0 | 0.007 | 0.008 | 45 |
| | | | | Front | 6 | 2437 | 0.007 | 98.87% | 13.3 | 13.0 | | | |
| | | | | Edge 1 | 6 | 2437 | 0.002 | 98.87% | 13.3 | 13.0 | | | |
| | | | | Edge 2 | 6 | 2437 | 0.007 | 98.87% | 13.3 | 13.0 | | | |
| | | | | Edge 4 | 6 | 2437 | 0.003 | 98.87% | 13.3 | 13.0 | | | |

**Notes:**

1. For results listed with "-", the SAR result is less than 0.001 W/kg.
2. When the 802.11b reported SAR of the highest measured maximum output power channel is ≤ 0.8 W/kg, no further SAR testing is required. If SAR is > 0.8 W/kg and ≤ 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.
3. 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 ≤ 1.2 W/kg.

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

## U-NII-1 & U-NII-2A

| RF Exposure Conditions | Mode | Antenna | 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 | 802.11a 6 Mbps | Chain 0 | 0 | Left Touch | 48 | 5240 | 0.138 | 98.1% | 12.5 | 11.6 | | | |
| | | | | Left Tilt | 48 | 5240 | 0.110 | 98.1% | 12.5 | 11.6 | | | |
| | | | | Right Touch | 48 | 5240 | 1.040 | 98.1% | 12.5 | 11.6 | 0.430 | 0.539 | 46 |
| | | | | Right Tilt | 48 | 5240 | 0.432 | 98.1% | 12.5 | 11.6 | 0.205 | 0.257 | |
| Body-worn | 802.11a 6 Mbps | Chain 0 | 15mm | Rear | 48 | 5240 | 0.039 | 98.1% | 12.5 | 11.6 | 0.014 | 0.018 | 47 |
| | | | | Front | 48 | 5240 | 0.023 | 98.1% | 12.5 | 11.6 | | | |
| Head | 802.11a 6 Mbps | Chain 1 | 0 | Left Touch | 60 | 5300 | 0.407 | 98.1% | 12.7 | 11.6 | 0.086 | 0.113 | 48 |
| | | | | Left Tilt | 60 | 5300 | 0.191 | 98.1% | 12.7 | 11.6 | | | |
| | | | | Right Touch | 60 | 5300 | 0.169 | 98.1% | 12.7 | 11.6 | | | |
| | | | | Right Tilt | 60 | 5300 | 0.136 | 98.1% | 12.7 | 11.6 | | | |
| Body-worn | 802.11a 6 Mbps | Chain 1 | 15mm | Rear | 60 | 5300 | 0.011 | 98.1% | 12.7 | 11.6 | | | |
| | | | | Front | 60 | 5300 | 0.012 | 98.1% | 12.7 | 11.6 | 0.001 | 0.001 | 49 |
| RF Exposure Conditions | Mode | Antenna | 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 | |
| Product specific | 802.11a 6 Mbps | Chain 0 | 0mm | Rear | 48 | 5240 | 0.828 | 98.1% | 12.5 | 11.6 | | | |
| | | | | Front | 48 | 5240 | 1.040 | 98.1% | 12.5 | 11.6 | 0.114 | 0.143 | 50 |
| | | | | Edge 1 | 48 | 5240 | 0.617 | 98.1% | 12.5 | 11.6 | | | |
| | | | | Edge 2 | 48 | 5240 | 0.010 | 98.1% | 12.5 | 11.6 | | | |
| Product specific | 802.11a 6 Mbps | Chain 1 | 0mm | Rear | 60 | 5300 | 0.371 | 98.1% | 12.7 | 11.6 | | | |
| | | | | Front | 60 | 5300 | 0.800 | 98.1% | 12.7 | 11.6 | 0.064 | 0.084 | 51 |
| | | | | Edge 4 | 60 | 5300 | 0.002 | 98.1% | 12.7 | 11.6 | | | |

## U-NII-2C

| RF Exposure Conditions | Mode | Antenna | 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) 29.3 Mbps | Chain 0 | 0 | Left Touch | 122 | 5610 | 0.273 | 83.7% | 12.0 | 10.8 | | | |
| | | | | Left Tilt | 122 | 5610 | 0.336 | 83.7% | 12.0 | 10.8 | | | |
| | | | | Right Touch | 122 | 5610 | 1.030 | 83.7% | 12.0 | 10.8 | 0.380 | 0.598 | 52 |
| | | | | Rightt Tilt | 122 | 5610 | 0.443 | 83.7% | 12.0 | 10.8 | 0.218 | 0.343 | |
| Body-worn | 802.11ac (VHT80) 29.3 Mbps | Chain 0 | 15mm | Rear | 122 | 5610 | 0.074 | 83.7% | 12.0 | 10.8 | 0.029 | 0.046 | 53 |
| | | | | Front | 122 | 5610 | 0.064 | 83.7% | 12.0 | 10.8 | | | |
| Head | 802.11ac (VHT80) 29.3 Mbps | Chain 1 | 0 | Left Touch | 106 | 5530 | 0.498 | 83.7% | 11.8 | 10.9 | 0.154 | 0.226 | 54 |
| | | | | Left Tilt | 106 | 5530 | 0.134 | 83.7% | 11.8 | 10.9 | | | |
| | | | | Right Touch | 106 | 5530 | 0.160 | 83.7% | 11.8 | 10.9 | | | |
| | | | | Rightt Tilt | 106 | 5530 | 0.062 | 83.7% | 11.8 | 10.9 | | | |
| Body-worn | 802.11ac (VHT80) 29.3 Mbps | Chain 1 | 15mm | Rear | 106 | 5530 | 0.020 | 83.7% | 11.8 | 10.9 | | | |
| | | | | Front | 106 | 5530 | 0.027 | 83.7% | 11.8 | 10.9 | 0.006 | 0.009 | 55 |
| RF Exposure Conditions | Mode | Antenna | 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 | |
| Product specific | 802.11ac (VHT80) 29.3 Mbps | Chain 0 | 0mm | Rear | 122 | 5610 | 0.741 | 83.7% | 12.0 | 10.8 | | | |
| | | | | Front | 122 | 5610 | 1.760 | 83.7% | 12.0 | 10.8 | 0.192 | 0.302 | 56 |
| | | | | Edge 1 | 122 | 5610 | 0.329 | 83.7% | 12.0 | 10.8 | | | |
| | | | | Edge 2 | 122 | 5610 | 0.022 | 83.7% | 12.0 | 10.8 | | | |
| Product specific | 802.11ac (VHT80) 29.3 Mbps | Chain 1 | 0mm | Rear | 106 | 5530 | 0.492 | 83.7% | 11.8 | 10.9 | | | |
| | | | | Front | 106 | 5530 | 0.889 | 83.7% | 11.8 | 10.9 | 0.086 | 0.126 | 57 |
| | | | | Edge 4 | 106 | 5530 | 0.021 | 83.7% | 11.8 | 10.9 | | | |

U-NII-3

| RF Exposure Conditions | Mode | Antenna | 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) 29.3 Mbps | Chain 0 | 0 | Left Touch | 155 | 5775 | 0.208 | 83.7% | 10.1 | 8.9 | | | |
| | | | | Left Tilt | 155 | 5775 | 0.299 | 83.7% | 10.1 | 8.9 | | | |
| | | | | Right Touch | 155 | 5775 | 0.520 | 83.7% | 10.1 | 8.9 | 0.183 | 0.288 | 58 |
| | | | | Rightt Tilt | 155 | 5775 | 0.308 | 83.7% | 10.1 | 8.9 | | | |
| Body-worn | 802.11ac (VHT80) 29.3 Mbps | Chain 0 | 15mm | Rear | 155 | 5775 | 0.096 | 83.7% | 10.1 | 8.9 | 0.039 | 0.061 | 59 |
| | | | | Front | 155 | 5775 | 0.028 | 83.7% | 10.1 | 8.9 | | | |
| Head | 802.11a 6 Mbps | Chain 1 | 0 | Left Touch | 165 | 5825 | 0.117 | 98.1% | 9.7 | 8.4 | 0.039 | 0.054 | 60 |
| | | | | Left Tilt | 165 | 5825 | 0.077 | 98.1% | 9.7 | 8.4 | | | |
| | | | | Right Touch | 165 | 5825 | 0.094 | 98.1% | 9.7 | 8.4 | | | |
| | | | | Rightt Tilt | 165 | 5825 | 0.011 | 98.1% | 9.7 | 8.4 | | | |
| Body-worn | 802.11a 6 Mbps | Chain 1 | 15mm | Rear | 165 | 5825 | 0.010 | 98.1% | 9.7 | 8.4 | | | |
| | | | | Front | 165 | 5825 | 0.019 | 98.1% | 9.7 | 8.4 | 0.001 | 0.001 | 61 |
| RF Exposure Conditions | Mode | Antenna | 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 | |
| Product specific | 802.11ac (VHT80) 29.3 Mbps | Chain 0 | 0mm | Rear | 155 | 5775 | 0.443 | 83.7% | 10.1 | 8.9 | 0.046 | 0.073 | |
| | | | | Front | 155 | 5775 | 1.300 | 83.7% | 10.1 | 8.9 | 0.137 | 0.216 | 62 |
| | | | | Edge 1 | 155 | 5775 | 0.241 | 83.7% | 10.1 | 8.9 | | | |
| | | | | Edge 2 | 155 | 5775 | 0.014 | 83.7% | 10.1 | 8.9 | | | |
| Product specific | 802.11a 6 Mbps | Chain 1 | 0mm | Rear | 165 | 5825 | 0.130 | 98.1% | 9.7 | 8.4 | | | |
| | | | | Front | 165 | 5825 | 0.689 | 98.1% | 9.7 | 8.4 | 0.058 | 0.079 | 63 |
| | | | | Edge 4 | 165 | 5825 | 0.013 | 98.1% | 9.7 | 8.4 | | | |

## 10.18. Bluetooth

| RF Exposure Conditions | Mode | 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 | 0 | Left Touch | 39 | 2441 | 76.8% | 10.90 | 10.88 | 0.054 | 0.071 | |
| | | | Left Tilt | 39 | 2441 | 76.8% | 10.90 | 10.88 | 0.068 | 0.089 | |
| | | | Right Touch | 39 | 2441 | 76.8% | 10.90 | 10.88 | 0.156 | 0.204 | 64 |
| | | | Right Tilt | 39 | 2441 | 76.8% | 10.90 | 10.88 | 0.126 | 0.165 | |

## 10.19. Standalone SAR Test Exclusion Considerations & Estimated SAR

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

*[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)]* ≤ 3.0, for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f_{(GHz)}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

- *(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√$f_{(GHz)}$/x]* W/kg for test separation distances ≤ 50 mm;
  where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
- 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.

**Body-worn and Hotspot:**

| RF Air interface | RF Exposure Conditions | Frequency (GHz) | Max. tune-up tolerance Power | | Min. test separation distance (mm) | SAR test exclusion Result* | Estimated 1-g SAR (W/kg) |
|---|---|---|---|---|---|---|---|
| | | | (dBm) | (mW) | | | |
| Bluetooth | Body-worn | 2.480 | 10.9 | 12 | 15 | 1.3 | 0.168 |
| Bluetooth | Hotspot | 2.480 | 10.9 | 12 | 10 | 1.9 | 0.252 |

**Conclusion:**

*: The computed value is ≤ 3; therefore, this qualifies for Standalone SAR test exclusion.

# 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 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.8 or 2 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 ≥ 1.45 or 3.6 W/kg (~ 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 ≥ 1.5 or 3.75 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.

| Frequency Band (MHz) | Air Interface | RF Exposure Conditions | Test Position | Repeated SAR (Yes/No) | Highest Measured SAR (W/kg) |
|---|---|---|---|---|---|
| 700 | LTE Band 12 | Hotspot | Front | No | 0.087 |
| | LTE Band 13 | Head | Left Touch | No | 0.351 |
| 850 | GSM 850 | Hotspot | Front | No | 0.305 |
| | WCDMA Band V | Hotspot | Front | No | 0.364 |
| | LTE Band 5 | Hotspot | Rear | No | 0.260 |
| | LTE Band 26 | Hotspot | Front | No | 0.299 |
| 1700 | WCDMA Band IV | Hotspot | Edge 4 | No | 0.522 |
| | LTE Band 66 | Hotspot | Front | No | 0.574 |
| 1900 | GSM 1900 | Hotspot | Edge 3 | No | 0.298 |
| | WCDMA Band II | Hotspot | Front | No | 0.493 |
| | LTE Band 2 | Hotspot | Edge 4 | No | 0.496 |
| 2400 | Wi-Fi 802.11b/g/n | Head | Right Tilt | No | 0.303 |
| 2400 | BT | Head | Right Touch | No | 0.156 |
| 2500 | LTE Band 7 | Hotspot | Edge 3 | No | 0.504 |
| 2600 | LTE Band 41 | Hotspot | Edge 3 | No | 0.274 |
| 5200 | Wi-Fi 802.11a/n/ac | Head | Right Touch | No | 0.430 |
| 5300 | Wi-Fi 802.11a/n/ac | Head | Left Touch | No | 0.086 |
| 5500 | Wi-Fi 802.11a/n/ac | Head | Right Touch | No | 0.380 |
| 5800 | Wi-Fi 802.11a/n/ac | Head | Right Touch | No | 0.183 |

**Note(s):**

Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is < 1.20.

| Frequency Band (MHz) | Air Interface | RF Exposure Conditions | Test Position | Repeated SAR (Yes/No) | Highest Measured SAR (W/kg) |
|---|---|---|---|---|---|
| 5200 | Wi-Fi 802.11a/n/ac | Product specific | Front | No | 0.014 |
| 5300 | Wi-Fi 802.11a/n/ac | Product specific | Front | No | 0.064 |
| 5500 | Wi-Fi 802.11a/n/ac | Product specific | Front | No | 0.192 |
| 5800 | Wi-Fi 802.11a/n/ac | Product specific | Front | No | 0.137 |

**Note(s):**

Repeated Measurement is not required since measured SAR is < 2 W/kg.

# 12. Simultaneous Transmission SAR Analysis

KDB 447498 D01 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / Ri$$

Where:

$SAR_1$ is the highest reported or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

$SAR_2$ is the highest reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

***Ri*** is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$(SAR_1 + SAR_2)^{1.5} / Ri \leq 0.04$$

### Simultaneous Transmission Condition

| Case | Cellular | WLAN Chain 0 / BT | WLAN Chain 1 |
|---|---|---|---|
| 1 | GSM/GPRS/Edge | BT/BLE | (None) |
| 2 | GSM/GPRS/Edge | WLAN 2.4G | (None) |
| 3 | GSM/GPRS/Edge | WLAN 2.4G | WLAN 2.4G |
| 4 | GSM/GPRS/Edge | WLAN 2.4G | WLAN 5G |
| 5 | GSM/GPRS/Edge | WLAN 5G | WLAN 5G |
| 6 | GSM/GPRS/Edge | BT<br>WLAN 5G | WLAN 5G |
| 7 | UMTS/HSPA | BT/BLE | (None) |
| 8 | UMTS/HSPA | WLAN 2.4G | (None) |
| 9 | UMTS/HSPA | WLAN 2.4G | WLAN 2.4G |
| 10 | UMTS/HSPA | WLAN 2.4G | WLAN 5G |
| 11 | UMTS/HSPA | WLAN 5G | WLAN 5G |
| 12 | UMTS/HSPA | BT<br>WLAN 5G | WLAN 5G |
| 13 | LTE | BT/BLE | (None) |
| 14 | LTE | WLAN 2.4G | (None) |
| 15 | LTE | WLAN 2.4G | WLAN 2.4G |
| 16 | LTE | WLAN 2.4G | WLAN 5G |
| 17 | LTE | WLAN 5G | WLAN 5G |
| 18 | LTE | BT<br>WLAN 5G | WLAN 5G |
| 19 | (None) | BT<br>WLAN 5G | WLAN 5G |

## 12.1. Sum of the SAR for WWAN & Wi-Fi & BT

| RF Exposure conditions | Test Position | Standalone SAR (W/kg) | | | | | | ∑ 1-g SAR (W/kg) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | WWAN | DTS | | U-NII | | BT | WWAN + BT | WWAN + DTS | WWAN + DTS | WWAN + DTS + U-NII | WWAN + U-NII | WWAN+U-NII+BT | U-NII+BT |
| | | ① | Chain 0 ② | Chain 1 ③ | Chain 0 ④ | Chain 1 ⑤ | Chain 0 ⑥ | ① + ⑥ | ① + ② | ① + ② + ③ | ① + ② + ⑤ | ① + ④ + ⑤ | ① + ④ + ⑤ + ⑥ | ④ + ⑤ + ⑥ |
| Head | Left Touch | 0.356 | 0.328 | 0.167 | 0.598 | 0.226 | 0.071 | 0.427 | 0.684 | 0.851 | 0.910 | 1.180 | 1.251 | 0.895 |
| | Left Tilt | 0.123 | 0.328 | 0.167 | 0.598 | 0.226 | 0.089 | 0.212 | 0.451 | 0.618 | 0.677 | 0.947 | 1.036 | 0.913 |
| | Right Touch | 0.204 | 0.328 | 0.167 | 0.598 | 0.226 | 0.204 | 0.408 | 0.532 | 0.699 | 0.758 | 1.028 | 1.232 | 1.028 |
| | Right Tilt | 0.124 | 0.328 | 0.167 | 0.343 | 0.226 | 0.165 | 0.289 | 0.452 | 0.619 | 0.678 | 0.693 | 0.858 | 0.734 |
| Body-worn | Rear | 0.241 | 0.024 | 0.005 | 0.061 | 0.009 | 0.168 | 0.409 | 0.265 | 0.270 | 0.274 | 0.311 | 0.479 | 0.238 |
| | Front | 0.307 | 0.024 | 0.005 | 0.061 | 0.009 | 0.168 | 0.475 | 0.331 | 0.336 | 0.340 | 0.377 | 0.545 | 0.238 |
| Hotspot | Rear | 0.341 | 0.081 | 0.008 | | | 0.252 | 0.593 | 0.422 | 0.430 | | | | |
| | Front | 0.622 | 0.081 | 0.008 | | | 0.252 | 0.874 | 0.703 | 0.711 | | | | |
| | Edge 2 | 0.274 | 0.081 | 0.008 | | | 0.252 | 0.526 | 0.355 | 0.363 | | | | |
| | Edge 3 | 0.569 | 0.081 | 0.008 | | | 0.252 | 0.821 | 0.650 | 0.658 | | | | |
| | Edge 4 | 0.590 | 0.081 | 0.008 | | | 0.252 | 0.842 | 0.671 | 0.679 | | | | |

**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.

# Appendixes

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

**12073310-S1V2 Appendix A: SAR Setup Photos**

**12073310-S1V1 Appendix B: SAR System Check Plots**

**12073310-S1V1 Appendix C: Highest SAR Test Plots**

**12073310-S1V1 Appendix D: SAR Liquid Tissue Ingredients**

**12073310-S1V2 Appendix E: SAR Probe Calibration Certificates**

**12073310-S1V1 Appendix F: SAR Dipole Calibration Certificates**

**END OF REPORT**