

# TEST REPORT FOR SAR TESTING

Report No: SRTC2021-9004(F)-21082502(H)

Product Name: Mobile Phone

Applicant: Sharp Corporation

Manufacturer: Sharp Corporation

Specification: Part 2.1093

IEEE Std 1528

KDB Procedures

FCC ID: APYHRO00302

The State Radio\_monitoring\_center Testing Center (SRTC)

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## 1. GENERAL INFORMATION

### 1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio\_monitoring\_center Testing Center (SRTC).

The test results relate only to individual items of the samples which have been tested.

The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

### 1.2 Information about the testing laboratory

|                     |                                                                                  |
|---------------------|----------------------------------------------------------------------------------|
| Company:            | The State Radio_monitoring_center Testing Center (SRTC)                          |
| Address:            | 15th Building, No.30 Shixing Street, Shijingshan District, Beijing<br>P.R. China |
| City:               | Beijing                                                                          |
| Country or Region:  | P.R. China                                                                       |
| Contacted person:   | Liu Jia                                                                          |
| Tel:                | +86 10 57996183                                                                  |
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| Email:              | liujiaf@srtc.org.cn                                                              |
| Registration Number | 239125                                                                           |
| Designation Number  | CN1267                                                                           |

### 1.3 Applicant's details

|                    |                                                           |
|--------------------|-----------------------------------------------------------|
| Company:           | Sharp Corporation                                         |
| Address:           | 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan |
| City:              | Osaka                                                     |
| Country or Region: | Japan                                                     |
| Contacted person:  | Mr. Masaaki Nishikawa                                     |
| Telephone          | +81-50-5433-4157                                          |

### 1.4 Manufacturer's details

|                    |                                                           |
|--------------------|-----------------------------------------------------------|
| Company:           | Sharp Corporation                                         |
| Address:           | 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan |
| City:              | Osaka                                                     |
| Country or Region: | Japan                                                     |
| Contacted person:  | Mr. Masaaki Nishikawa                                     |
| Telephone          | +81-50-5433-4157                                          |

## 1.5 Test Environment

|                                         |            |
|-----------------------------------------|------------|
| Date of Receipt of test sample at SRTC: | 2021.08.30 |
| Testing Start Date:                     | 2021.08.31 |
| Testing End Date:                       | 2021.09.09 |

|                     |                  |              |
|---------------------|------------------|--------------|
| Environmental Data: | Temperature (°C) | Humidity (%) |
| Ambient             | 25               | 35           |

|                               |   |
|-------------------------------|---|
| Normal Supply Voltage (Vdc.): | 4 |
|-------------------------------|---|

## 2. DESCRIPTION OF THE DEVICE UNDER TEST

### 2.1 Final Equipent Build Status

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wireless Technology and Frequency Bands | <input checked="" type="checkbox"/> GSM Band: GSM850/1900<br><input checked="" type="checkbox"/> WCDMA Band: FDD V<br><input checked="" type="checkbox"/> LTE Band: 5/38/41<br><input checked="" type="checkbox"/> Wi-Fi Band: 2.4GHz/5GHz UNII-1 /UNII-2A /UNII-2C /UNII-3<br><input checked="" type="checkbox"/> BT/BLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Mode                                    | GSM<br><input checked="" type="checkbox"/> Voice (GMSK)<br><input checked="" type="checkbox"/> GPRS (GMSK)<br><input type="checkbox"/> EGPRS (GMSK/8PSK)<br>WCDMA<br><input checked="" type="checkbox"/> UMTS Rel. 99<br><input checked="" type="checkbox"/> HSDPA (Rel. 5)<br><input checked="" type="checkbox"/> HSUPA (Rel. 6)<br><input checked="" type="checkbox"/> HSPA+ (Rel. 7)(Downlink only)<br><input type="checkbox"/> DC-HSDPA (Rel. 8)<br>LTE<br><input checked="" type="checkbox"/> QPSK<br><input checked="" type="checkbox"/> 16QAM<br><input checked="" type="checkbox"/> 64QAM<br>Wi-Fi2.4GHz (802.11b/g/n/ax)<br><input checked="" type="checkbox"/> 802.11b<br><input checked="" type="checkbox"/> 802.11g<br><input checked="" type="checkbox"/> 802.11n (20MHz)<br><input type="checkbox"/> 802.11ax (20MHz)<br>Wi-Fi5GHz<br><input checked="" type="checkbox"/> 802.11a<br><input checked="" type="checkbox"/> 802.11n (20MHz/40MHz)<br><input checked="" type="checkbox"/> 802.11ac (20MHz/40MHz/80MHz)<br><input type="checkbox"/> 802.11ax (20MHz/40MHz/80MHz)<br>Bluetooth<br><input checked="" type="checkbox"/> BR(GFSK)<br><input checked="" type="checkbox"/> EDR( $\pi/4$ DQPSK , 8-DPSK)<br><input checked="" type="checkbox"/> BLE(GFSK)<br>NFC<br>Phones with built-in NFC functions do not require separate SAR testing and can generally be tested according to the SAR measurement procedures normally required for the phone. Influences of the hardware introduced by the built-in NFC functions are inherently considered through testing of the other transmitters that require SAR evaluation. |
| Duty Cycle*                             | GPRS/EDGE: 12.5% (1 Slot), 25% (2 Slots), 37.5% (3 Slots), 50% (4 Slots)<br>WCDMA: 100%<br>LTE(FDD): 100% LTE(TDD): 63.3% maximum<br>Bluetooth: 92.90% (DH5), 92.30% (2DH5), 91.60% (3DH5)<br>WIFI 2.4GHz:      11b    99.65%    11g 99.38%<br>11n20 99.40%    11n40 98.47%<br>WIFI 5GHz UNII-1: 11a    99.46%    11n20 99.46%    11n40 98.81%<br>11ac20 99.44%    11ac40 98.84%    11ac80 97.66%<br>WIFI 5GHz UNII-2A: 11a    99.43%    11n20 99.44%    11n40 98.87%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | <p>11ac20 99.42% 11ac40 99.00% 11ac80 97.81%</p> <p>WIFI 5GHz UNII-2C: 11a 99.47% 11n20 99.43% 11n40 98.99%</p> <p>11ac20 99.49% 11ac40 98.99% 11ac80 97.93%</p> <p>WIFI 5GHz UNII-3: 11a 99.51% 11n20 99.49% 11n40 99.00%</p> <p>11ac20 99.42% 11ac40 98.99% 11ac80 97.94%</p>                                                                                                                                              |
| Multi-Slot Class for GPRS/EDGE | <p><input type="checkbox"/> Class 8 - One Up</p> <p><input type="checkbox"/> Class 10 - Two Up</p> <p><input checked="" type="checkbox"/> Class 12 - Four Up</p> <p><input type="checkbox"/> Class 33- Four Up</p>                                                                                                                                                                                                           |
| Mobile Phone Capability        | <p><input type="checkbox"/> Class A - Mobile phones can be connected to both GPRS and GSM services simultaneously.</p> <p><input checked="" type="checkbox"/> Class B - Mobile phones can be attached to both GPRS and GSM services, using one service at a time.</p> <p><input type="checkbox"/> Class C - Mobile phones are attached to either GPRS or GSM voice service. You need to switch manually between services</p> |
| DTM                            | Not Supported                                                                                                                                                                                                                                                                                                                                                                                                                |
| Note                           | <p>For licensed cellular network duty cycle is inherent.</p> <p>For unlicensed network</p> <p>WLAN Duty cycle is depends on the data traffic, and the traffic allocation in operating mode could be the most conservative condition which with 100% duty cycle. SAR measurement also use non signalling mode, so the duty factor shall be taken into consideration.</p>                                                      |
| H/W Version                    | DVT(Remodeled to the equivalent of MP products)                                                                                                                                                                                                                                                                                                                                                                              |
| S/W Version                    | A806M                                                                                                                                                                                                                                                                                                                                                                                                                        |
| IMEI                           | <p>IMEI1:004401230421519</p> <p>IMEI2:004401230421154</p>                                                                                                                                                                                                                                                                                                                                                                    |

## 2.2 Support Equipment

|                 |                            |
|-----------------|----------------------------|
| Equipment       | Battery                    |
| Type            | Li-Lon                     |
| Manufacturer    | Amperex Technology Limited |
| Model Number    | UBATIA305AFN2              |
| Capacity        | Min4490mAh (Typ4570mAh)    |
| Nominal Voltage | 3.85                       |

### **3. REFERENCE SPECIFICATION**

| Specification  | Version | Title                                                                                                                                                                            |
|----------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part 2.1093    | 2021    | Radio frequency radiation exposure evaluation: portable devices.                                                                                                                 |
| IEEE Std 1528  | 2013    | IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques |
| KDB 447498 D01 | v06     | General RF Exposure Guidance                                                                                                                                                     |
| KDB 447498 D02 | v02r01  | SAR MEASUREMENT PROCEDURES FOR USB DONGLE TRANSMITTERS                                                                                                                           |
| KDB 648474 D04 | v01r03  | Handset SAR                                                                                                                                                                      |
| KDB 941225 D01 | v03r01  | 3G SAR Procedures                                                                                                                                                                |
| KDB 248227 D01 | v02r02  | SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS                                                                                                                                |
| KDB 865664 D01 | v01r04  | SAR Measurement from 100 MHz to 6 GHz                                                                                                                                            |
| KDB 865664 D02 | v01r02  | RF Exposure Reporting                                                                                                                                                            |
| KDB 941225 D05 | v02r05  | SAR for LTE Devices                                                                                                                                                              |

## **4. TEST CONDITIONS**

### **4.1 Picture to demonstrate the required liquid depth**

The liquid depth is large than 15cm in the used SAM phantoms in flat section, and the depth of the tissue simulant was  $15.0 \pm 0.5$  cm measured from the ear reference point during system checking and device measurements.



Liquid depth for SAR Measurement

### **4.2 Test Signal, Frequencies and Output Power**

The device was put into operation by using a call tester. Communication between the device and the call tester was established by air link.

The device output power was set to maximum power level for all tests; a fully charged battery was used for every test sequence.

In all operating bands the measurements were performed on middle channel, and few of them were also performed on lowest and highest channels.

### **4.3 SAR Measurement Set-up**

The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than  $\pm 0.02$ mm. Special E-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit. A cell controller system contains the power

supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors.

The PC consists of the Micron Pentium IV computer with Win7 system and SAR Measurement Software DASY5 Professional, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot.

A data acquisition electronic (DAE) circuit performs the signal amplification; signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines.

The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection

The robot uses its own controller with a built in VME-bus computer.

#### **4.4 Phantoms**

The phantom used for all tests i.e. for both system checks and device testing, was the twin headed "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528.

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

The SPEAG device holder was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

#### **4.5 Tissue Simulants**

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528. All tests were carried out using simulants whose dielectric parameters were within

$\pm 10\%$  below 3GHz and  $\pm 5\%$  above 3GHz of the recommended values when use DASY system according to KDB865664D01. All tests were carried out within 24 hours of measuring the dielectric parameters.

| Tissue Stimulant Recipes                                 |                                    |
|----------------------------------------------------------|------------------------------------|
| Name                                                     | Broadband tissue-equivalent liquid |
| Type                                                     | HBBL600-6000V6 Simulating Liquid   |
| Note: The stimulant could be the same for head and body. |                                    |

## 4.6 DESCRIPTION OF THE TEST PROCEDURE

### 4.6.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.



**Device holder supplied by SPEAG**

## **4.6.2 Test Exposure Conditions**

### **4.6.2.1 Head Configuration**

Measurements were made in “cheek” and “tilt” positions on both the left hand and right-hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

### **4.6.2.2 Body Worn Configuration**

The device was placed in the SPEAG holder below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance using a separate flat spacer that was removed before the start of the measurements. And the distance is normally determined according to the actual scene which might be the worst use condition for general exposure. The device's front and rear were oriented facing the phantom since these orientations give higher results for most regular portable devices.

### **4.6.2.3 Hotspot Configuration**

Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge; for the data modes, wireless technologies and frequency bands supporting hotspot mode.

## **4.6.3 Scan Procedure**

First, area scans were used for determination of the field distribution and the approximate location of the local peak SAR values. The SAR distribution is scanned along the inside surface, at least for an area larger than the projection of the handset and antenna. The angle between the probe axis and the surface normal line is recommended but not required to be less than 30°. The SAR distribution is first measured on a 2-D coarse grid. The scan region should cover all areas that are exposed and encompassed by the projection of the handset. There are 15 mm × 15 mm (equal or less than 2GHz), 12 mm × 12 mm (from 2GHz~4GHz) and 10mm x 10mm (from 4GHz~6GHz) measurement grid used when two staggered one-dimensional cubic splines are used to estimate the maximum SAR location.

When the reported 1g-SAR estimated by area scan is less than 1.40 w/kg.

Zoom scan was performed by using the configuration mentioned below or more conservative scan area and step to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

Below 3GHz: 32mmX32mmX30mm scan area with 8 mm X8 mm X5 mm steps

2GHz-3GHz: 32mmX32mmX30mm scan area with 8 mm X8 mm X5 mm steps

3GHz-4GHz: 28mmX28mmX28mm scan area with 7 mm X7 mm X4 mm steps

4GHz-5GHz: 25mmX25mmX24mm scan area with 5 mm X5 mm X3 mm steps

5GHz-6GHz: 25mmX25mmX22mm scan area with 5 mm X5 mm X2 mm steps

#### **4.6.4 SAR Averaging Methods**

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within DASY5 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation of Large Sets of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A triradiate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighboring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

## 5 RESULT SUMMARY

The maximum reported SAR values for Head/Body-Worn/Hotspot exposure conditions are given as follows. The device conforms to the requirements of the standard(s) when the maximum reported SAR value is less than or equal to the limit.

| Standalone Transmission Summary(1g- SAR) |                |                  |                          |             |        |
|------------------------------------------|----------------|------------------|--------------------------|-------------|--------|
| Exposure Position                        | Frequency Band | SAR Result(W/kg) | Highest SAR Result(W/kg) | Limit(W/kg) | Result |
| Head                                     | GSM850         | 0.08             | 0.11                     | 1.60        | Pass   |
|                                          | GSM1900        | 0.09             |                          |             |        |
|                                          | WCDMA Band V   | 0.09             |                          |             |        |
|                                          | LTE Band5      | 0.07             |                          |             |        |
|                                          | LTE Band38     | 0.11             |                          |             |        |
|                                          | LTE Band41     | 0.11             |                          |             |        |
| Body-Worn                                | GSM850         | 0.38             | 0.38                     | 1.60        | Pass   |
|                                          | GSM1900        | 0.33             |                          |             |        |
|                                          | WCDMA Band V   | 0.28             |                          |             |        |
|                                          | LTE Band5      | 0.24             |                          |             |        |
|                                          | LTE Band38     | 0.32             |                          |             |        |
|                                          | LTE Band41     | 0.31             |                          |             |        |
| Hotspot                                  | GSM850         | 0.38             | 0.55                     | 1.60        | Pass   |
|                                          | GSM1900        | 0.49             |                          |             |        |
|                                          | WCDMA Band V   | 0.28             |                          |             |        |
|                                          | LTE Band5      | 0.24             |                          |             |        |
|                                          | LTE Band38     | 0.55             |                          |             |        |
|                                          | LTE Band41     | 0.55             |                          |             |        |

| Standalone Transmission Summary |                  |                  |                          |             |        |
|---------------------------------|------------------|------------------|--------------------------|-------------|--------|
| Exposure Position               | Frequency Band   | SAR Result(W/kg) | Highest SAR Result(W/kg) | Limit(W/kg) | Result |
| Head                            | BT/BLE           | 0.10             | 0.56                     | 1.60        | Pass   |
|                                 | WLAN2.4GHz       | 0.56             |                          |             |        |
|                                 | WLAN5GHz UNII-1  | 0.33             |                          |             |        |
|                                 | WLAN5GHz UNII-2A | 0.26             |                          |             |        |
|                                 | WLAN5GHz UNII-2C | 0.15             |                          |             |        |
|                                 | WLAN5GHz UNII-3  | 0.07             |                          |             |        |
| Body-Worn                       | BT/BLE           | 0.08             | 0.12                     | 1.60        | Pass   |
|                                 | WLAN2.4GHz       | 0.12             |                          |             |        |
|                                 | WLAN5GHz UNII-1  | 0.00             |                          |             |        |
|                                 | WLAN5GHz UNII-2A | 0.11             |                          |             |        |
|                                 | WLAN5GHz UNII-2C | 0.01             |                          |             |        |
|                                 | WLAN5GHz UNII-3  | 0.00             |                          |             |        |
| Hotspot                         | BT/BLE           | 0.08             | 0.14                     | 1.60        | Pass   |
|                                 | WLAN2.4GHz       | 0.14             |                          |             |        |

## Simultaneous Transmission Summary

| Simultaneous Transmission Summary |                       |                          |             |         |
|-----------------------------------|-----------------------|--------------------------|-------------|---------|
| Exposure Position                 | Mode                  | Highest SAR Result(W/kg) | Limit(W/kg) | Verdict |
| Head                              | LTE Band41+WLAN2.4GHz | 0.67                     | 1.60        | Pass    |
| Body-Worn                         | GSM850+WLAN5GHz+BT    | 0.57                     | 1.60        | Pass    |
| Hotspot                           | LTE Band41            | 0.55                     | 1.60        | Pass    |

|                                                                 |                                         |
|-----------------------------------------------------------------|-----------------------------------------|
| <p>This Test Report Is Approved by:</p> <p>Mr. Peng Zhen 彭振</p> | <p>Review by:</p> <p>Mr. Li Bin 李彬</p>  |
| <p>Tested and issued by:</p> <p>Ms.Li Jin 李晋</p>                | <p>Approved date:</p> <p>2021/09/30</p> |

## 6 TEST RESULT

### 6.1 Measurement result

#### GSM Measurement result

#### Division Factors (for Measured Power and Frame Average Power):

To average the power, the division factor is as follows:

1TX-slot (1uplink) = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots(2uplink) = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots (3uplink) = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots (4uplink) = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

#### GSM850

GSM Measured Power:

| Carrier frequency (MHz) | Channel No. | Burst Power (dBm) | Tuneup Tolerance (dBm) | Frame power (dBm) |
|-------------------------|-------------|-------------------|------------------------|-------------------|
| 824.2                   | 128         | 32.41             | 33.2                   | 23.38             |
| 836.6                   | 190         | 32.41             |                        | 23.38             |
| 848.8                   | 251         | 32.32             |                        | 23.29             |

GPRS/EGPRS (GMSK) Measured Power:

| Carrier frequency (MHz) | Channel No. | TX Mode              | Burst Power (dBm) | Tuneup Tolerance (dBm) | Frame power (dBm) |
|-------------------------|-------------|----------------------|-------------------|------------------------|-------------------|
| 824.2                   | 128         | 4Downlink<br>1uplink | 32.67             | 33.2                   | 23.64             |
| 836.6                   | 190         |                      | 32.56             |                        | 23.53             |
| 848.8                   | 251         |                      | 32.35             |                        | 23.32             |
| 824.2                   | 128         | 3Downlink<br>2uplink | 30.23             | 30.5                   | 24.21             |
| 836.6                   | 190         |                      | 30.11             |                        | 24.09             |
| 848.8                   | 251         |                      | 30.14             |                        | 24.12             |
| 824.2                   | 128         | 2Downlink<br>3uplink | 28.36             | 28.7                   | 24.10             |
| 836.6                   | 190         |                      | 28.23             |                        | 23.97             |
| 848.8                   | 251         |                      | 28.34             |                        | 24.08             |
| 824.2                   | 128         | 1Downlink<br>4uplink | 27.11             | 27.5                   | 24.10             |
| 836.6                   | 190         |                      | 27.09             |                        | 24.08             |
| 848.8                   | 251         |                      | 27.19             |                        | 24.18             |

## PCS 1900

GSM Measured Power:

| Carrier frequency (MHz) | Channel No. | Burst Power (dBm) | Tuneup Tolerance (dBm) | Frame power (dBm) |
|-------------------------|-------------|-------------------|------------------------|-------------------|
| 824.2                   | 128         | 29.09             | 30.2                   | 20.06             |
| 836.6                   | 190         | 29.13             |                        | 20.10             |
| 848.8                   | 251         | 29.23             |                        | 20.20             |

GPRS/EGPRS (GMSK) Measured Power:

| Carrier frequency (MHz) | Channel No. | TX Mode              | Burst Power (dBm) | Tuneup Tolerance (dBm) | Frame power (dBm) |
|-------------------------|-------------|----------------------|-------------------|------------------------|-------------------|
| 824.2                   | 128         | 4Downlink<br>1uplink | 28.96             | 30.2                   | 19.93             |
| 836.6                   | 190         |                      | 29.13             |                        | 20.10             |
| 848.8                   | 251         |                      | 29.11             |                        | 20.08             |
| 824.2                   | 128         | 3Downlink<br>2uplink | 26.06             | 27.5                   | 20.04             |
| 836.6                   | 190         |                      | 26.18             |                        | 20.16             |
| 848.8                   | 251         |                      | 26.36             |                        | 20.34             |
| 824.2                   | 128         | 2Downlink<br>3uplink | 24.25             | 25.7                   | 19.99             |
| 836.6                   | 190         |                      | 24.59             |                        | 20.33             |
| 848.8                   | 251         |                      | 24.18             |                        | 19.92             |
| 824.2                   | 128         | 1Downlink<br>4uplink | 23.40             | 24.5                   | 20.39             |
| 836.6                   | 190         |                      | 23.05             |                        | 20.04             |
| 848.8                   | 251         |                      | 23.23             |                        | 20.22             |

## WCDMA Measurement result

### Release 99

The following procedures are according to FCC KDB Publication 941225 D01.

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 1                                     |
|                        | RMC mode<br>AMR mode    | 12.2kbps RMC<br>12.2kbps RMC in<br>3.4 kbps SRB |
|                        | Power Control Algorithm | Algorithm2                                      |
|                        | $\beta_c/\beta_d$       | 8/15                                            |

### Release 5

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121.

| Sub-test | $\beta_c$            | $\beta_d$            | $\beta_d$<br>(SF) | $\beta_c/\beta_d$    | $\beta_{hs}^{(1)}$ | CM(dB) <sup>(2)</sup> |
|----------|----------------------|----------------------|-------------------|----------------------|--------------------|-----------------------|
| 1        | 2/15                 | 15/15                | 64                | 2/15                 | 4/15               | 0.0                   |
| 2        | 12/15 <sup>(3)</sup> | 15/15 <sup>(3)</sup> | 64                | 12/15 <sup>(3)</sup> | 24/15              | 1.0                   |
| 3        | 15/15                | 8/15                 | 64                | 15/18                | 30/15              | 1.5                   |
| 4        | 15/15                | 4/15                 | 64                | 15/4                 | 30/15              | 1.5                   |

Note1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .

Note2: CM=1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ .

Note3: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

## Release 6

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

| Sub-test | $\beta_c$    | $\beta_d$    | $\beta_d$<br>(S F) | $\beta_c/\beta_d$ | $\beta_{hs}^{(1)}$ | $\beta_{ec}$ | $\beta_{ed}$                               | $\beta_{ed}$<br>(S F) | $\beta_{ed}$<br>(code s) | CM<br>( <sup>(2)</sup><br>dB ) | M<br>PR<br>(d B) | AG <sup>(4)</sup><br>Ind<br>ex | E-<br>TFCI |
|----------|--------------|--------------|--------------------|-------------------|--------------------|--------------|--------------------------------------------|-----------------------|--------------------------|--------------------------------|------------------|--------------------------------|------------|
| 1        | 11/15<br>(3) | 15/15<br>(3) | 64                 | 11/15<br>(3)      | 22/15              | 209/25       | 1039/25                                    | 4                     | 1                        | 1.0                            | 2.0              | 20                             | 75         |
| 2        | 6/15         | 15/15        | 64                 | 6/15              | 12/15              | 12/15        | 94/75                                      | 4                     | 1                        | 3.0                            | 2.0              | 12                             | 67         |
| 3        | 15/15        | 9/15         | 64                 | 15/9              | 30/15              | 30/15        | $\beta_{ed1}:47/15$<br>$\beta_{ed2}:47/15$ | 4                     | 2                        | 2.0                            | 2.0              | 15                             | 92         |
| 4        | 2/15         | 15/15        | 64                 | 2/15              | 4/15               | 2/15         | 56/75                                      | 4                     | 1                        | 3.0                            | 2.0              | 17                             | 71         |
| 5        | 15/15<br>(4) | 15/15<br>(4) | 64                 | 15/15<br>(4)      | 30/15              | 24/15        | 134/15                                     | 4                     | 1                        | 1.0                            | 2.0              | 21                             | 81         |

Note1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .

Note2: CM=1 for  $\beta_c/\beta_d = 12/15, \beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to  $\beta_c=10/15$  and  $\beta_d=15/15$ .

Note4: For subtest 5 the  $\beta_c/\beta_d$  ratio of 15/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to  $\beta_c=14/15$  and  $\beta_d=15/15$ .

NOTE5: Testing UE using E-DPDCH Physical layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

NOTE6:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

## Release 7

The following 1 Sub-test was completed according to Release 7 procedures in section 5.2 of 3GPP TS34.121.

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

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

## Release 8

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

| Parameter<br>During Connection setup | Unit | Value |
|--------------------------------------|------|-------|
| P-CPICH_Ec/lor                       | dB   | -10   |
| P-CCPCH and SCH_Ec/lor               | dB   | -12   |
| PICH_Ec/lor                          | dB   | -15   |
| HS-PDSCH                             | dB   | off   |
| HS-SCCH_1                            | dB   | off   |
| DPCH_Ec/lor                          | dB   | -5    |
| OCNS_Ec/lor                          | dB   | -3.1  |

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. |           |       |

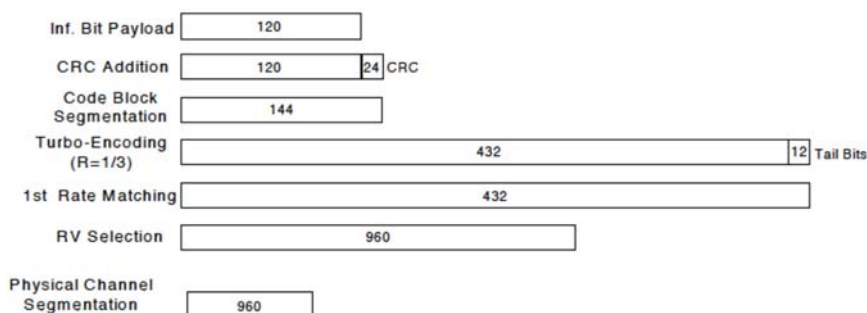


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121.

| Sub-test | $\beta_c$            | $\beta_d$            | $\beta_d$<br>(SF) | $\beta_c/\beta_d$    | $\beta_{hs}^{(1)}$ | CM(dB) <sup>(2)</sup> |
|----------|----------------------|----------------------|-------------------|----------------------|--------------------|-----------------------|
| 1        | 2/15                 | 15/15                | 64                | 2/15                 | 4/15               | 0.0                   |
| 2        | 12/15 <sup>(3)</sup> | 15/15 <sup>(3)</sup> | 64                | 12/15 <sup>(3)</sup> | 24/15              | 1.0                   |
| 3        | 15/15                | 8/15                 | 64                | 15/18                | 30/15              | 1.5                   |
| 4        | 15/15                | 4/15                 | 64                | 15/4                 | 30/15              | 1.5                   |

Note1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .

Note2: CM=1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ .

Note3: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

## WCDMA

### WCDMA band V

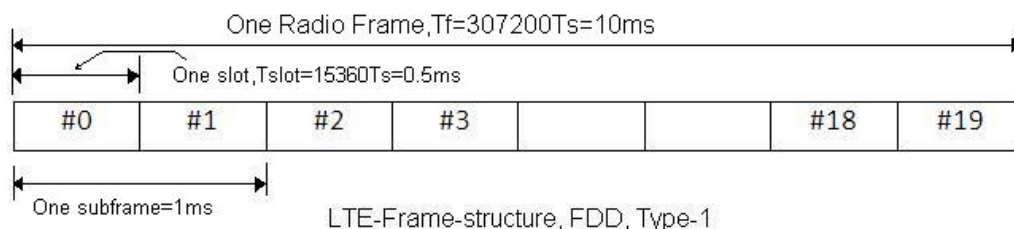
| Mode       |              | Carrier frequency (MHz) | Channel No. | RF Power Output (dBm) | Tuneup Tolerance (dBm) |
|------------|--------------|-------------------------|-------------|-----------------------|------------------------|
| Release 99 | RMC,12.2kbps | 826.4                   | 4132        | 22.86                 | 24.0                   |
|            |              | 836.6                   | 4183        | 23.00                 |                        |
|            |              | 846.6                   | 4233        | 23.04                 |                        |
| HSDPA      | Subtest1     | 826.4                   | 4132        | 21.93                 | 23.0                   |
|            |              | 836.6                   | 4183        | 21.97                 |                        |
|            |              | 846.6                   | 4233        | 22.07                 |                        |
|            | Subtest2     | 826.4                   | 4132        | 21.94                 | 23.0                   |
|            |              | 836.6                   | 4183        | 22.02                 |                        |
|            |              | 846.6                   | 4233        | 22.05                 |                        |
|            | Subtest3     | 826.4                   | 4132        | 21.43                 | 22.5                   |
|            |              | 836.6                   | 4183        | 21.52                 |                        |
|            |              | 846.6                   | 4233        | 21.54                 |                        |
|            | Subtest4     | 826.4                   | 4132        | 21.37                 | 22.5                   |
|            |              | 836.6                   | 4183        | 21.44                 |                        |
|            |              | 846.6                   | 4233        | 21.53                 |                        |
| HSUPA      | Subtest1     | 826.4                   | 4132        | 21.88                 | 23.0                   |
|            |              | 836.6                   | 4183        | 22.31                 |                        |
|            |              | 846.6                   | 4233        | 22.03                 |                        |
|            | Subtest2     | 826.4                   | 4132        | 19.90                 | 21.0                   |
|            |              | 836.6                   | 4183        | 20.28                 |                        |
|            |              | 846.6                   | 4233        | 20.36                 |                        |
|            | Subtest3     | 826.4                   | 4132        | 20.92                 | 22.0                   |
|            |              | 836.6                   | 4183        | 21.28                 |                        |
|            |              | 846.6                   | 4233        | 21.06                 |                        |
|            | Subtest4     | 826.4                   | 4132        | 19.72                 | 21.0                   |
|            |              | 836.6                   | 4183        | 19.94                 |                        |
|            |              | 846.6                   | 4233        | 19.81                 |                        |
|            | Subtest5     | 826.4                   | 4132        | 21.89                 | 23.0                   |
|            |              | 836.6                   | 4183        | 22.32                 |                        |
|            |              | 846.6                   | 4233        | 21.95                 |                        |

Note: UMTS SAR was tested under Rel.99 RMC 12.2kbps mode per KDB Publication 941225 D01.for other higher release configuration, SAR was not required since any average output power was not more than 0.25 dB higher than the RMC level.

## LTE Measurement result

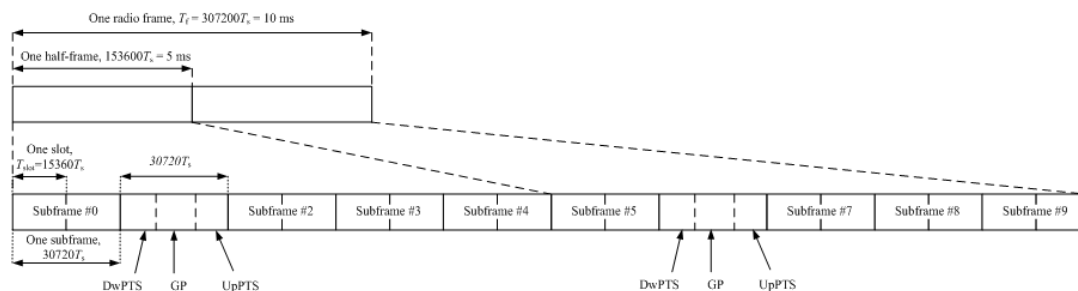
### General description:

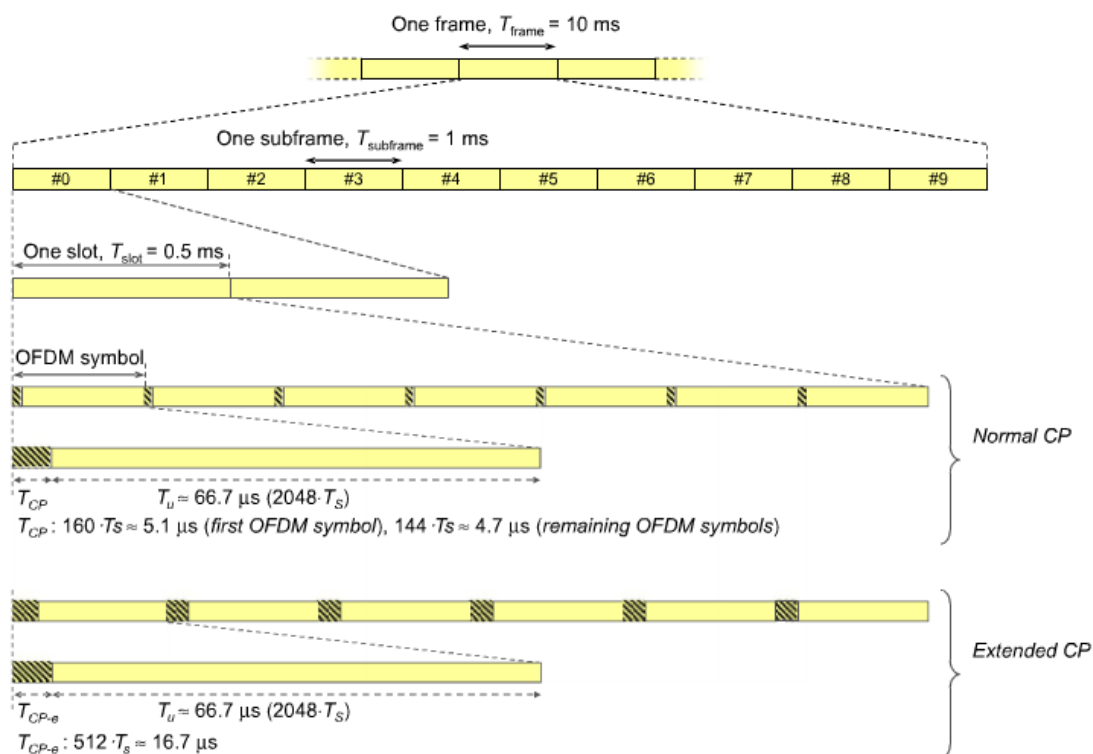
#### FDD-LTE frame structure



Type 1 is used as LTE FDD frame structure. As shown in the figure above, an LTE TDD frame is made of total 20 slots, each of 0.5ms. Two consecutive time slots will form one subframe. 10 such subframes form one radio frame. One subframe duration is about 1 ms. and the duty cycle is inherent as 100%

#### TDD-LTE frame structure





## Uplink-downlink configuration

| Uplink-downlink configuration | Downlink-to-Uplink Switch-point periodicity | Subframe number |   |   |   |   |   |   |   |   |   |
|-------------------------------|---------------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|
|                               |                                             | 0               | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0                             | 5 ms                                        | D               | S | U | U | U | D | S | U | U | U |
| 1                             | 5 ms                                        | D               | S | U | U | D | D | S | U | U | D |
| 2                             | 5 ms                                        | D               | S | U | D | D | D | S | U | D | D |
| 3                             | 10 ms                                       | D               | S | U | U | U | D | D | D | D | D |
| 4                             | 10 ms                                       | D               | S | U | U | D | D | D | D | D | D |
| 5                             | 10 ms                                       | D               | S | U | D | D | D | D | D | D | D |
| 6                             | 5 ms                                        | D               | S | U | U | U | D | S | U | U | D |

## Special sub-frame configuration

| 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                              | $26336 \cdot T_s$                | $4384 \cdot T_s$               | $5120 \cdot T_s$                 | $7680 \cdot T_s$                   | $4384 \cdot T_s$               | $5120 \cdot T_s$                 |
| 5                              | $6592 \cdot T_s$                 |                                |                                  | $20480 \cdot T_s$                  |                                |                                  |
| 6                              | $19760 \cdot T_s$                |                                |                                  | $23040 \cdot T_s$                  |                                |                                  |
| 7                              | $21952 \cdot T_s$                |                                |                                  | -                                  |                                |                                  |
| 8                              | $24144 \cdot T_s$                |                                |                                  | -                                  |                                |                                  |

### Special sub-frame with cyclic prefix uplink

| Special sub-frame configuration    |     | Duty factor with normal cyclic prefix in uplink | Duty factor with extended cyclic prefix in uplink |
|------------------------------------|-----|-------------------------------------------------|---------------------------------------------------|
| Normal cyclic prefix in downlink   | 0~4 | 7.13%                                           | 8.33%                                             |
|                                    | 5~9 | 14.3%                                           | 16.7%                                             |
| Extended cyclic prefix in downlink | 0~3 | 7.13%                                           | 8.33%                                             |
|                                    | 4~7 | 14.3%                                           | 16.7%                                             |

So we perform SAR test with maximum duty factor equal to 63.3% by using uplink-downlink configuration 0.

Note: One sub-frame is  $30720T_s=1\text{ms}$ , when UpPTS(uplink) in special sub-frame with extended cyclic prefix, duty factor =  $5120/30720=0.167$ . There are 5 sub-frames in half frame(3up link),so the final duty factor is  $(30720 \cdot 3 + 5120)/(30720 \cdot 5)=63.3\%$  which we used to evaluate the SAR compliance (worst case)

LTE Band 5

| BW  | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |       |                   |
|-----|------------|---------|-----------|----------------------|-------|-------|-------------------|
|     |            |         |           | 20407                | 20525 | 20643 | Tune-up Tolerance |
|     |            |         |           | 824.7                | 836.5 | 848.3 |                   |
| 1.4 | QPSK       | 1       | 0         | 22.70                | 22.80 | 23.05 | 24.0              |
|     |            | 1       | 3         | 22.76                | 22.91 | 23.08 | 24.0              |
|     |            | 1       | 5         | 22.73                | 22.89 | 22.97 | 24.0              |
|     |            | 3       | 0         | 22.71                | 22.92 | 22.98 | 24.0              |
|     |            | 3       | 1         | 22.77                | 22.83 | 23.04 | 24.0              |
|     |            | 3       | 3         | 22.68                | 22.85 | 22.96 | 24.0              |
|     |            | 6       | 0         | 21.81                | 21.90 | 22.07 | 23.0              |
|     | 16QAM      | 1       | 0         | 21.97                | 22.05 | 22.30 | 23.0              |
|     |            | 1       | 3         | 22.18                | 22.14 | 22.29 | 23.0              |
|     |            | 1       | 5         | 22.00                | 22.23 | 22.30 | 23.0              |
|     |            | 3       | 0         | 21.81                | 21.90 | 21.85 | 23.0              |
|     |            | 3       | 1         | 21.88                | 21.93 | 21.97 | 23.0              |
|     |            | 3       | 3         | 21.83                | 21.94 | 21.96 | 23.0              |
|     |            | 6       | 0         | 20.92                | 20.99 | 21.10 | 22.0              |
|     | 64QAM      | 1       | 0         | 21.09                | 20.73 | 20.96 | 22.0              |
|     |            | 1       | 3         | 21.33                | 20.86 | 20.99 | 22.0              |
|     |            | 1       | 5         | 21.26                | 20.76 | 20.90 | 22.0              |
|     |            | 3       | 0         | 20.96                | 20.97 | 21.11 | 22.0              |
|     |            | 3       | 1         | 21.05                | 21.09 | 21.16 | 22.0              |
|     |            | 3       | 3         | 20.99                | 21.12 | 21.15 | 22.0              |
|     |            | 6       | 0         | 19.86                | 20.02 | 19.99 | 21.0              |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |       |                   |
|----|------------|---------|-----------|----------------------|-------|-------|-------------------|
|    |            |         |           | 20415                | 20525 | 20635 | Tune-up Tolerance |
|    |            |         |           | 825.5                | 836.5 | 847.5 |                   |
| 3  | QPSK       | 1       | 0         | 22.91                | 22.98 | 23.13 | 24.0              |
|    |            | 1       | 8         | 22.86                | 23.12 | 23.19 | 24.0              |
|    |            | 1       | 14        | 22.90                | 23.03 | 23.16 | 24.0              |
|    |            | 8       | 0         | 22.05                | 22.05 | 22.18 | 24.0              |
|    |            | 8       | 4         | 22.08                | 22.13 | 22.20 | 24.0              |
|    |            | 8       | 7         | 22.03                | 22.09 | 22.17 | 24.0              |
|    |            | 15      | 0         | 21.91                | 22.00 | 22.09 | 23.0              |
|    | 16QAM      | 1       | 0         | 22.54                | 22.19 | 22.43 | 23.0              |
|    |            | 1       | 8         | 22.51                | 22.41 | 22.43 | 23.0              |
|    |            | 1       | 14        | 22.55                | 22.25 | 22.38 | 23.0              |
|    |            | 8       | 0         | 21.04                | 21.01 | 21.20 | 23.0              |
|    |            | 8       | 4         | 21.08                | 21.08 | 21.14 | 23.0              |
|    |            | 8       | 7         | 21.05                | 21.05 | 21.15 | 23.0              |
|    |            | 15      | 0         | 20.98                | 21.04 | 21.22 | 22.0              |
|    | 64QAM      | 1       | 0         | 21.26                | 20.82 | 21.10 | 22.0              |
|    |            | 1       | 8         | 21.18                | 20.95 | 21.04 | 22.0              |
|    |            | 1       | 14        | 21.24                | 20.91 | 20.98 | 22.0              |
|    |            | 8       | 0         | 20.19                | 20.07 | 20.13 | 22.0              |
|    |            | 8       | 4         | 20.14                | 20.10 | 20.19 | 22.0              |
|    |            | 8       | 7         | 20.17                | 20.07 | 20.17 | 22.0              |
|    |            | 15      | 0         | 19.97                | 20.13 | 20.28 | 21.0              |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |       |                   |
|----|------------|---------|-----------|----------------------|-------|-------|-------------------|
|    |            |         |           | 20425                | 20525 | 20625 | Tune-up Tolerance |
|    |            |         |           | 826.5                | 836.5 | 846.5 |                   |
| 5  | QPSK       | 1       | 0         | 22.70                | 22.79 | 22.89 | 24.0              |
|    |            | 1       | 12        | 22.51                | 22.82 | 22.99 | 24.0              |
|    |            | 1       | 24        | 22.72                | 23.00 | 22.96 | 24.0              |
|    |            | 12      | 0         | 21.78                | 21.88 | 21.99 | 23.0              |
|    |            | 12      | 7         | 21.80                | 21.96 | 22.04 | 23.0              |
|    |            | 12      | 13        | 21.78                | 22.01 | 22.11 | 23.0              |
|    |            | 25      | 0         | 21.79                | 21.90 | 21.99 | 23.0              |
|    | 16QAM      | 1       | 0         | 22.00                | 22.30 | 22.33 | 23.0              |
|    |            | 1       | 12        | 21.82                | 22.20 | 22.35 | 23.0              |
|    |            | 1       | 24        | 21.97                | 22.43 | 22.38 | 23.0              |
|    |            | 12      | 0         | 20.79                | 20.82 | 20.99 | 22.0              |
|    |            | 12      | 7         | 20.79                | 20.88 | 20.98 | 22.0              |
|    |            | 12      | 13        | 20.81                | 20.94 | 21.07 | 22.0              |
|    |            | 25      | 0         | 20.79                | 20.85 | 21.05 | 22.0              |
|    | 64QAM      | 1       | 0         | 20.74                | 21.19 | 21.27 | 22.0              |
|    |            | 1       | 12        | 20.63                | 21.20 | 21.22 | 22.0              |
|    |            | 1       | 24        | 20.80                | 21.28 | 21.34 | 22.0              |
|    |            | 12      | 0         | 19.78                | 19.98 | 20.11 | 21.0              |
|    |            | 12      | 7         | 19.72                | 19.97 | 20.13 | 21.0              |
|    |            | 12      | 13        | 19.77                | 20.14 | 20.20 | 21.0              |
|    |            | 25      | 0         | 19.75                | 19.98 | 20.07 | 21.0              |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |       |                   |
|----|------------|---------|-----------|----------------------|-------|-------|-------------------|
|    |            |         |           | 20450                | 20525 | 20600 | Tune-up Tolerance |
|    |            |         |           | 829                  | 836.5 | 844   |                   |
| 10 | QPSK       | 1       | 0         | 22.62                | 22.82 | 23.07 | 24.0              |
|    |            | 1       | 25        | 22.67                | 22.82 | 22.95 | 24.0              |
|    |            | 1       | 49        | 22.64                | 22.98 | 22.99 | 24.0              |
|    |            | 25      | 0         | 21.79                | 21.95 | 21.98 | 23.0              |
|    |            | 25      | 12        | 21.86                | 22.02 | 22.06 | 23.0              |
|    |            | 25      | 25        | 21.85                | 21.99 | 22.15 | 23.0              |
|    |            | 50      | 0         | 21.90                | 22.01 | 22.02 | 23.0              |
|    | 16QAM      | 1       | 0         | 22.55                | 22.48 | 22.16 | 23.0              |
|    |            | 1       | 25        | 22.37                | 22.95 | 22.26 | 23.0              |
|    |            | 1       | 49        | 22.79                | 22.99 | 22.45 | 23.0              |
|    |            | 25      | 0         | 20.71                | 20.98 | 21.12 | 22.0              |
|    |            | 25      | 12        | 20.91                | 20.98 | 21.04 | 22.0              |
|    |            | 25      | 25        | 20.91                | 21.05 | 21.13 | 22.0              |
|    |            | 50      | 0         | 20.89                | 20.84 | 21.01 | 22.0              |
|    | 64QAM      | 1       | 0         | 21.15                | 21.20 | 21.10 | 22.0              |
|    |            | 1       | 25        | 21.00                | 21.42 | 20.91 | 22.0              |
|    |            | 1       | 49        | 21.36                | 21.53 | 21.15 | 22.0              |
|    |            | 25      | 0         | 19.83                | 19.98 | 20.07 | 21.0              |
|    |            | 25      | 12        | 19.98                | 19.96 | 20.24 | 21.0              |
|    |            | 25      | 25        | 19.92                | 20.06 | 20.21 | 21.0              |
|    |            | 50      | 0         | 19.97                | 19.95 | 20.08 | 21.0              |

## LTE Band 38

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |        |           |
|----|------------|---------|-----------|----------------------|-------|--------|-----------|
|    |            |         |           | 37775                | 38000 | 38225  | Tune-up   |
|    |            |         |           | 2572.5               | 2595  | 2617.5 | Tolerance |
| 5  | QPSK       | 1       | 0         | 22.63                | 22.70 | 22.66  | 24.0      |
|    |            | 1       | 12        | 22.58                | 22.71 | 22.62  | 24.0      |
|    |            | 1       | 24        | 22.69                | 22.66 | 22.69  | 24.0      |
|    |            | 12      | 0         | 21.67                | 21.68 | 21.78  | 23.0      |
|    |            | 12      | 7         | 21.72                | 21.66 | 21.79  | 23.0      |
|    |            | 12      | 13        | 21.64                | 21.66 | 21.75  | 23.0      |
|    |            | 25      | 0         | 21.63                | 21.66 | 21.76  | 23.0      |
|    | 16QAM      | 1       | 0         | 22.07                | 22.05 | 21.95  | 23.0      |
|    |            | 1       | 12        | 22.10                | 22.11 | 21.99  | 23.0      |
|    |            | 1       | 24        | 22.11                | 22.00 | 22.06  | 23.0      |
|    |            | 12      | 0         | 20.68                | 20.73 | 20.75  | 22.0      |
|    |            | 12      | 7         | 20.75                | 20.69 | 20.76  | 22.0      |
|    |            | 12      | 13        | 20.71                | 20.73 | 20.73  | 22.0      |
|    |            | 25      | 0         | 20.68                | 20.73 | 20.81  | 22.0      |
|    | 64QAM      | 1       | 0         | 21.01                | 21.13 | 20.92  | 22.0      |
|    |            | 1       | 12        | 21.09                | 21.18 | 20.83  | 22.0      |
|    |            | 1       | 24        | 21.00                | 21.10 | 20.97  | 22.0      |
|    |            | 12      | 0         | 19.82                | 19.82 | 19.72  | 21.0      |
|    |            | 12      | 7         | 19.84                | 19.74 | 19.71  | 21.0      |
|    |            | 12      | 13        | 19.80                | 19.74 | 19.73  | 21.0      |
|    |            | 25      | 0         | 19.70                | 19.73 | 19.72  | 21.0      |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |       |           |
|----|------------|---------|-----------|----------------------|-------|-------|-----------|
|    |            |         |           | 37800                | 38000 | 38200 | Tune-up   |
|    |            |         |           | 2575                 | 2595  | 2615  | Tolerance |
| 10 | QPSK       | 1       | 0         | 22.53                | 22.39 | 22.63 | 24.0      |
|    |            | 1       | 25        | 22.57                | 22.51 | 22.65 | 24.0      |
|    |            | 1       | 49        | 22.55                | 22.50 | 22.71 | 24.0      |
|    |            | 25      | 0         | 21.65                | 21.68 | 21.75 | 23.0      |
|    |            | 25      | 12        | 21.65                | 21.77 | 21.79 | 23.0      |
|    |            | 25      | 25        | 21.58                | 21.62 | 21.76 | 23.0      |
|    |            | 50      | 0         | 21.57                | 21.60 | 21.77 | 23.0      |
|    | 16QAM      | 1       | 0         | 22.00                | 22.05 | 21.77 | 23.0      |
|    |            | 1       | 25        | 21.89                | 21.91 | 21.93 | 23.0      |
|    |            | 1       | 49        | 22.03                | 21.87 | 21.88 | 23.0      |
|    |            | 25      | 0         | 20.67                | 20.55 | 20.59 | 22.0      |
|    |            | 25      | 12        | 20.66                | 20.68 | 20.74 | 22.0      |
|    |            | 25      | 25        | 20.64                | 20.59 | 20.63 | 22.0      |
|    |            | 50      | 0         | 20.54                | 20.64 | 20.70 | 22.0      |
|    | 64QAM      | 1       | 0         | 20.91                | 21.00 | 20.39 | 22.0      |
|    |            | 1       | 25        | 20.89                | 20.98 | 20.40 | 22.0      |
|    |            | 1       | 49        | 20.66                | 20.93 | 20.27 | 22.0      |
|    |            | 25      | 0         | 19.65                | 19.72 | 19.54 | 21.0      |
|    |            | 25      | 12        | 19.60                | 19.78 | 19.67 | 21.0      |
|    |            | 25      | 25        | 19.66                | 19.63 | 19.68 | 21.0      |
|    |            | 50      | 0         | 19.64                | 19.60 | 19.75 | 21.0      |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |        |           |
|----|------------|---------|-----------|----------------------|-------|--------|-----------|
|    |            |         |           | 37825                | 38000 | 38175  | Tune-up   |
|    |            |         |           | 2577.5               | 2595  | 2612.5 | Tolerance |
| 15 | QPSK       | 1       | 0         | 22.45                | 22.29 | 22.44  | 24.0      |
|    |            | 1       | 37        | 22.51                | 22.29 | 22.48  | 24.0      |
|    |            | 1       | 74        | 22.56                | 22.35 | 22.57  | 24.0      |
|    |            | 36      | 0         | 21.53                | 21.45 | 21.53  | 23.0      |
|    |            | 36      | 29        | 21.46                | 21.41 | 21.49  | 23.0      |
|    |            | 36      | 30        | 21.46                | 21.48 | 21.39  | 23.0      |
|    |            | 75      | 0         | 21.42                | 21.38 | 21.48  | 23.0      |
|    | 16QAM      | 1       | 0         | 21.70                | 21.80 | 21.67  | 23.0      |
|    |            | 1       | 37        | 21.74                | 21.85 | 21.68  | 23.0      |
|    |            | 1       | 74        | 21.85                | 21.89 | 21.82  | 23.0      |
|    |            | 36      | 0         | 20.54                | 20.47 | 20.51  | 22.0      |
|    |            | 36      | 29        | 20.50                | 20.44 | 20.51  | 22.0      |
|    |            | 36      | 30        | 20.52                | 20.51 | 20.52  | 22.0      |
|    |            | 75      | 0         | 20.43                | 20.42 | 20.56  | 22.0      |
|    | 64QAM      | 1       | 0         | 20.81                | 20.61 | 20.75  | 22.0      |
|    |            | 1       | 37        | 20.78                | 20.82 | 20.76  | 22.0      |
|    |            | 1       | 74        | 20.77                | 20.83 | 20.81  | 22.0      |
|    |            | 36      | 0         | 19.54                | 19.48 | 19.54  | 21.0      |
|    |            | 36      | 29        | 19.52                | 19.51 | 19.54  | 21.0      |
|    |            | 36      | 30        | 19.55                | 19.45 | 19.57  | 21.0      |
|    |            | 75      | 0         | 19.51                | 19.38 | 19.57  | 21.0      |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |       |           |
|----|------------|---------|-----------|----------------------|-------|-------|-----------|
|    |            |         |           | 37850                | 38000 | 38150 | Tune-up   |
|    |            |         |           | 2580                 | 2595  | 2610  | Tolerance |
| 20 | QPSK       | 1       | 0         | 22.35                | 22.43 | 22.44 | 24.0      |
|    |            | 1       | 49        | 22.38                | 22.41 | 22.36 | 24.0      |
|    |            | 1       | 99        | 22.43                | 22.52 | 22.53 | 24.0      |
|    |            | 50      | 0         | 21.51                | 21.47 | 21.46 | 23.0      |
|    |            | 50      | 24        | 21.55                | 21.58 | 21.49 | 23.0      |
|    |            | 50      | 50        | 21.49                | 21.44 | 21.43 | 23.0      |
|    |            | 100     | 0         | 21.44                | 21.41 | 21.46 | 23.0      |
|    | 16QAM      | 1       | 0         | 21.73                | 21.76 | 21.33 | 23.0      |
|    |            | 1       | 49        | 21.72                | 21.78 | 21.28 | 23.0      |
|    |            | 1       | 99        | 21.81                | 21.90 | 21.35 | 23.0      |
|    |            | 50      | 0         | 20.53                | 20.47 | 20.50 | 22.0      |
|    |            | 50      | 24        | 20.58                | 20.56 | 20.59 | 22.0      |
|    |            | 50      | 50        | 20.53                | 20.49 | 20.53 | 22.0      |
|    |            | 100     | 0         | 20.42                | 20.41 | 20.55 | 22.0      |
|    | 64QAM      | 1       | 0         | 20.62                | 20.58 | 20.54 | 22.0      |
|    |            | 1       | 49        | 20.58                | 20.55 | 20.62 | 22.0      |
|    |            | 1       | 99        | 20.59                | 20.60 | 20.68 | 22.0      |
|    |            | 50      | 0         | 19.50                | 19.43 | 19.54 | 21.0      |
|    |            | 50      | 24        | 19.55                | 19.52 | 19.60 | 21.0      |
|    |            | 50      | 50        | 19.52                | 19.52 | 19.53 | 21.0      |
|    |            | 100     | 0         | 19.49                | 19.38 | 19.53 | 21.0      |

## LTE Band 41

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |        |                               |
|----|------------|---------|-----------|----------------------|-------|--------|-------------------------------|
|    |            |         |           | 39675                | 40620 | 41565  | Tune-up<br>Tolerance<br>L/M/H |
|    |            |         |           | 2498.5               | 2593  | 2687.5 |                               |
| 5  | QPSK       | 1       | 0         | 21.28                | 22.56 | 21.57  | 23.0/24.0/23.0                |
|    |            | 1       | 12        | 21.30                | 22.50 | 21.63  | 23.0/24.0/23.0                |
|    |            | 1       | 24        | 21.33                | 22.57 | 21.78  | 23.0/24.0/23.0                |
|    |            | 12      | 0         | 20.33                | 21.63 | 20.77  | 22.0/23.0/22.0                |
|    |            | 12      | 7         | 20.40                | 21.69 | 20.80  | 22.0/23.0/22.0                |
|    |            | 12      | 13        | 20.33                | 21.68 | 20.77  | 22.0/23.0/22.0                |
|    |            | 25      | 0         | 20.42                | 21.64 | 20.73  | 22.0/23.0/22.0                |
|    | 16QAM      | 1       | 0         | 20.75                | 21.88 | 21.12  | 22.0/23.0/22.0                |
|    |            | 1       | 12        | 20.73                | 21.85 | 21.14  | 22.0/23.0/22.0                |
|    |            | 1       | 24        | 20.74                | 21.94 | 21.18  | 22.0/23.0/22.0                |
|    |            | 12      | 0         | 19.39                | 20.72 | 19.81  | 21.0/22.0/21.0                |
|    |            | 12      | 7         | 19.41                | 20.61 | 19.85  | 21.0/22.0/21.0                |
|    |            | 12      | 13        | 19.40                | 20.67 | 19.85  | 21.0/22.0/21.0                |
|    |            | 25      | 0         | 19.40                | 20.67 | 19.80  | 21.0/22.0/21.0                |
|    | 64QAM      | 1       | 0         | 19.77                | 20.73 | 20.08  | 21.0/22.0/21.0                |
|    |            | 1       | 12        | 19.75                | 20.85 | 20.19  | 21.0/22.0/21.0                |
|    |            | 1       | 24        | 19.75                | 20.81 | 20.19  | 21.0/22.0/21.0                |
|    |            | 12      | 0         | 18.46                | 19.71 | 18.85  | 20.0/21.0/20.0                |
|    |            | 12      | 7         | 18.49                | 19.69 | 18.90  | 20.0/21.0/20.0                |
|    |            | 12      | 13        | 18.50                | 19.59 | 18.87  | 20.0/21.0/20.0                |
|    |            | 25      | 0         | 18.45                | 19.61 | 18.83  | 20.0/21.0/20.0                |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |       |                |
|----|------------|---------|-----------|----------------------|-------|-------|----------------|
|    |            |         |           | 39700                | 40620 | 41540 | Tune-up        |
|    |            |         |           | 2501                 | 2593  | 2685  | Tolerance      |
| 10 | QPSK       | 1       | 0         | 21.26                | 22.40 | 21.67 | 23.0/24.0/23.0 |
|    |            | 1       | 25        | 21.29                | 22.49 | 21.68 | 23.0/24.0/23.0 |
|    |            | 1       | 49        | 21.27                | 22.50 | 21.63 | 23.0/24.0/23.0 |
|    |            | 25      | 0         | 20.38                | 21.64 | 20.76 | 22.0/23.0/22.0 |
|    |            | 25      | 12        | 20.34                | 21.67 | 20.75 | 22.0/23.0/22.0 |
|    |            | 25      | 25        | 20.27                | 21.68 | 20.77 | 22.0/23.0/22.0 |
|    |            | 50      | 0         | 20.27                | 21.65 | 20.71 | 22.0/23.0/22.0 |
|    | 16QAM      | 1       | 0         | 20.70                | 21.97 | 20.84 | 22.0/23.0/22.0 |
|    |            | 1       | 25        | 20.76                | 21.85 | 20.85 | 22.0/23.0/22.0 |
|    |            | 1       | 49        | 20.56                | 21.95 | 20.98 | 22.0/23.0/22.0 |
|    |            | 25      | 0         | 19.43                | 20.58 | 19.66 | 21.0/22.0/21.0 |
|    |            | 25      | 12        | 19.39                | 20.62 | 19.70 | 21.0/22.0/21.0 |
|    |            | 25      | 25        | 19.34                | 20.67 | 19.73 | 21.0/22.0/21.0 |
|    |            | 50      | 0         | 19.29                | 20.63 | 19.77 | 21.0/22.0/21.0 |
|    | 64QAM      | 1       | 0         | 19.52                | 20.88 | 19.45 | 21.0/22.0/21.0 |
|    |            | 1       | 25        | 19.59                | 20.91 | 19.37 | 21.0/22.0/21.0 |
|    |            | 1       | 49        | 19.60                | 20.88 | 19.40 | 21.0/22.0/21.0 |
|    |            | 25      | 0         | 18.35                | 19.71 | 18.65 | 20.0/21.0/20.0 |
|    |            | 25      | 12        | 18.36                | 19.70 | 18.71 | 20.0/21.0/20.0 |
|    |            | 25      | 25        | 18.30                | 19.70 | 18.71 | 20.0/21.0/20.0 |
|    |            | 50      | 0         | 18.34                | 19.61 | 18.75 | 20.0/21.0/20.0 |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |        |                |
|----|------------|---------|-----------|----------------------|-------|--------|----------------|
|    |            |         |           | 39725                | 40620 | 41515  | Tune-up        |
|    |            |         |           | 2507.5               | 2593  | 2682.5 | Tolerance      |
| 15 | QPSK       | 1       | 0         | 21.09                | 22.25 | 21.48  | 23.0/24.0/23.0 |
|    |            | 1       | 37        | 21.15                | 22.23 | 21.44  | 23.0/24.0/23.0 |
|    |            | 1       | 74        | 21.17                | 22.32 | 21.56  | 23.0/24.0/23.0 |
|    |            | 36      | 0         | 20.18                | 21.47 | 20.60  | 22.0/23.0/22.0 |
|    |            | 36      | 29        | 20.20                | 21.45 | 20.59  | 22.0/23.0/22.0 |
|    |            | 36      | 30        | 20.13                | 21.40 | 20.59  | 22.0/23.0/22.0 |
|    |            | 75      | 0         | 20.17                | 21.37 | 20.62  | 22.0/23.0/22.0 |
|    | 16QAM      | 1       | 0         | 20.42                | 21.71 | 20.80  | 22.0/23.0/22.0 |
|    |            | 1       | 37        | 20.41                | 21.78 | 20.76  | 22.0/23.0/22.0 |
|    |            | 1       | 74        | 20.44                | 21.78 | 20.84  | 22.0/23.0/22.0 |
|    |            | 36      | 0         | 19.21                | 20.45 | 19.64  | 21.0/22.0/21.0 |
|    |            | 36      | 29        | 19.25                | 20.40 | 19.51  | 21.0/22.0/21.0 |
|    |            | 36      | 30        | 19.20                | 20.38 | 19.52  | 21.0/22.0/21.0 |
|    |            | 75      | 0         | 19.19                | 20.44 | 19.59  | 21.0/22.0/21.0 |
|    | 64QAM      | 1       | 0         | 19.32                | 20.71 | 19.85  | 21.0/22.0/21.0 |
|    |            | 1       | 37        | 19.32                | 20.66 | 19.74  | 21.0/22.0/21.0 |
|    |            | 1       | 74        | 19.36                | 20.74 | 19.71  | 21.0/22.0/21.0 |
|    |            | 36      | 0         | 18.22                | 19.48 | 18.65  | 20.0/21.0/20.0 |
|    |            | 36      | 29        | 18.23                | 19.46 | 18.61  | 20.0/21.0/20.0 |
|    |            | 36      | 30        | 18.25                | 19.46 | 18.62  | 20.0/21.0/20.0 |
|    |            | 75      | 0         | 18.18                | 19.50 | 18.61  | 20.0/21.0/20.0 |

| BW | Modulation | RB Size | RB Offset | Conducted power(dBm) |       |       |                |
|----|------------|---------|-----------|----------------------|-------|-------|----------------|
|    |            |         |           | 39750                | 40620 | 41490 | Tune-up        |
|    |            |         |           | 2506                 | 2593  | 2680  | Tolerance      |
| 20 | QPSK       | 1       | 0         | 21.14                | 22.35 | 21.53 | 23.0/24.0/23.0 |
|    |            | 1       | 49        | 21.11                | 22.28 | 21.49 | 23.0/24.0/23.0 |
|    |            | 1       | 99        | 21.22                | 22.59 | 21.54 | 23.0/24.0/23.0 |
|    |            | 50      | 0         | 20.27                | 21.50 | 20.65 | 22.0/23.0/22.0 |
|    |            | 50      | 24        | 20.20                | 21.37 | 20.67 | 22.0/23.0/22.0 |
|    |            | 50      | 50        | 20.22                | 21.46 | 20.55 | 22.0/23.0/22.0 |
|    |            | 100     | 0         | 20.17                | 21.42 | 20.63 | 22.0/23.0/22.0 |
|    | 16QAM      | 1       | 0         | 20.42                | 21.75 | 20.53 | 22.0/23.0/22.0 |
|    |            | 1       | 49        | 20.43                | 21.72 | 20.40 | 22.0/23.0/22.0 |
|    |            | 1       | 99        | 20.43                | 21.89 | 20.56 | 22.0/23.0/22.0 |
|    |            | 50      | 0         | 19.27                | 20.47 | 19.70 | 21.0/22.0/21.0 |
|    |            | 50      | 24        | 19.17                | 20.47 | 19.63 | 21.0/22.0/21.0 |
|    |            | 50      | 50        | 19.19                | 20.45 | 19.62 | 21.0/22.0/21.0 |
|    |            | 100     | 0         | 19.17                | 20.43 | 19.65 | 21.0/22.0/21.0 |
|    | 64QAM      | 1       | 0         | 19.28                | 20.46 | 19.68 | 21.0/22.0/21.0 |
|    |            | 1       | 49        | 19.24                | 20.49 | 19.67 | 21.0/22.0/21.0 |
|    |            | 1       | 99        | 19.28                | 20.62 | 19.63 | 21.0/22.0/21.0 |
|    |            | 50      | 0         | 18.31                | 19.43 | 18.69 | 20.0/21.0/20.0 |
|    |            | 50      | 24        | 18.23                | 19.37 | 18.77 | 20.0/21.0/20.0 |
|    |            | 50      | 50        | 18.20                | 19.50 | 18.57 | 20.0/21.0/20.0 |
|    |            | 100     | 0         | 18.24                | 19.42 | 18.72 | 20.0/21.0/20.0 |

## Bluetooth

### Bluetooth

| Modulation type | CConducted Average Power(dBm) |         |         | Tune-up Tolerance |
|-----------------|-------------------------------|---------|---------|-------------------|
|                 | 2402MHz                       | 2441MHz | 2480MHz |                   |
| GFSK            | 10.06                         | 10.30   | 10.09   | 12.0              |
| $\pi/4$ DQPSK   | 7.24                          | 7.44    | 7.68    | 9.0               |
| 8DPSK           | 7.28                          | 7.47    | 7.70    | 9.0               |

### BLE

| Modulation type | Conducted Average Power(dBm) |         |         | Tune-up Tolerance |
|-----------------|------------------------------|---------|---------|-------------------|
|                 | 2402MHz                      | 2440MHz | 2480MHz |                   |
| GFSK (LE 1Mbps) | 5.24                         | 5.50    | 5.78    | 7.0               |
| GFSK (LE 2Mbps) | 4.84                         | 5.12    | 5.34    | 7.0               |

## WiFi

### WIFI 2.4GHz

| Mode       | Tones/ RU Index | Freq(MHz) | Chain  | Peak power output (dBm) | Average power output (dBm) | Tune-up Tolerance |
|------------|-----------------|-----------|--------|-------------------------|----------------------------|-------------------|
| 802.11b    | NA              | 2412MHz   | Chain0 | 16.34                   | 13.31                      | 14.0              |
|            | NA              | 2437MHz   | Chain0 | 16.40                   | 13.39                      | 14.0              |
|            | NA              | 2462MHz   | Chain0 | 16.29                   | 13.26                      | 14.0              |
| 802.11g    | NA              | 2412MHz   | Chain0 | 20.47                   | 11.80                      | 12.0              |
|            | NA              | 2437MHz   | Chain0 | 20.43                   | 11.76                      | 12.0              |
|            | NA              | 2462MHz   | Chain0 | 19.96                   | 11.30                      | 12.0              |
| 802.11n20M | NA              | 2412MHz   | Chain0 | 20.31                   | 11.62                      | 12.0              |
|            | NA              | 2437MHz   | Chain0 | 20.29                   | 11.62                      | 12.0              |
|            | NA              | 2462MHz   | Chain0 | 19.84                   | 11.16                      | 12.0              |
| 802.11n40M | NA              | 2422MHz   | Chain0 | 20.47                   | 11.56                      | 12.0              |
|            | NA              | 2437MHz   | Chain0 | 20.26                   | 11.33                      | 12.0              |
|            | NA              | 2452MHz   | Chain0 | 20.62                   | 11.71                      | 12.0              |

WIFI 5GHz-NII1

| Mode        | Tones/<br>RUIndex | Freq<br>(MHz) | Chain  | Conducted average<br>power output(dBm) | Tune-up<br>Tolerance |
|-------------|-------------------|---------------|--------|----------------------------------------|----------------------|
| 802.11a     | NA                | 5180          | Chain0 | 11.67                                  | 12.0                 |
|             |                   | 5220          | Chain0 | 11.76                                  | 12.0                 |
|             |                   | 5240          | Chain0 | 11.84                                  | 12.0                 |
| 802.11n20M  |                   | 5180          | Chain0 | 11.54                                  | 12.0                 |
|             |                   | 5220          | Chain0 | 11.63                                  | 12.0                 |
|             |                   | 5240          | Chain0 | 11.70                                  | 12.0                 |
| 802.11n40M  |                   | 5190          | Chain0 | 11.61                                  | 12.0                 |
|             |                   | 5230          | Chain0 | 11.75                                  | 12.0                 |
| 802.11ac20M |                   | 5180          | Chain0 | 11.46                                  | 12.0                 |
|             |                   | 5220          | Chain0 | 11.64                                  | 12.0                 |
|             |                   | 5240          | Chain0 | 11.69                                  | 12.0                 |
| 802.11ac40M |                   | 5190          | Chain0 | 11.63                                  | 12.0                 |
|             |                   | 5230          | Chain0 | 11.75                                  | 12.0                 |
| 802.11ac80M |                   | 5210          | Chain0 | 11.96                                  | 12.0                 |

WIFI 5GHz-NII2A

| Mode        | Tones/<br>RUIndex | Freq<br>(MHz) | Chain  | Conducted average<br>power output(dBm) | Tune-up<br>Tolerance |
|-------------|-------------------|---------------|--------|----------------------------------------|----------------------|
| 802.11a     | NA                | 5260          | Chain0 | 11.73                                  | 12.0                 |
|             |                   | 5280          | Chain0 | 11.61                                  | 12.0                 |
|             |                   | 5320          | Chain0 | 11.61                                  | 12.0                 |
| 802.11n20M  |                   | 5260          | Chain0 | 11.58                                  | 12.0                 |
|             |                   | 5280          | Chain0 | 11.48                                  | 12.0                 |
|             |                   | 5320          | Chain0 | 11.46                                  | 12.0                 |
| 802.11n40M  |                   | 5270          | Chain0 | 11.63                                  | 12.0                 |
|             |                   | 5310          | Chain0 | 11.51                                  | 12.0                 |
| 802.11ac20M |                   | 5260          | Chain0 | 11.59                                  | 12.0                 |
|             |                   | 5280          | Chain0 | 11.49                                  | 12.0                 |
|             |                   | 5320          | Chain0 | 11.47                                  | 12.0                 |
| 802.11ac40M |                   | 5270          | Chain0 | 11.63                                  | 12.0                 |
|             |                   | 5310          | Chain0 | 11.53                                  | 12.0                 |
| 802.11ac80M |                   | 5290          | Chain0 | 11.77                                  | 12.0                 |

WIFI 5GHz-NII2C

| Mode        | Tones/<br>RUIndex | Freq<br>(MHz) | Chain  | Conductedaverage<br>power output(dBm) | Tune-up<br>Tolerance |
|-------------|-------------------|---------------|--------|---------------------------------------|----------------------|
| 802.11a     | NA                | 5500          | Chain0 | 11.43                                 | 12.0                 |
|             |                   | 5580          | Chain0 | 11.69                                 | 12.0                 |
|             |                   | 5700          | Chain0 | 11.81                                 | 12.0                 |
| 802.11n20M  |                   | 5500          | Chain0 | 11.40                                 | 12.0                 |
|             |                   | 5580          | Chain0 | 11.50                                 | 12.0                 |
|             |                   | 5700          | Chain0 | 11.62                                 | 12.0                 |
| 802.11n40M  |                   | 5510          | Chain0 | 11.51                                 | 12.0                 |
|             |                   | 5590          | Chain0 | 11.73                                 | 12.0                 |
|             |                   | 5670          | Chain0 | 11.57                                 | 12.0                 |
| 802.11ac20M |                   | 5500          | Chain0 | 11.48                                 | 12.0                 |
|             |                   | 5580          | Chain0 | 11.54                                 | 12.0                 |
|             |                   | 5700          | Chain0 | 11.59                                 | 12.0                 |
| 802.11ac40M |                   | 5510          | Chain0 | 11.63                                 | 12.0                 |
|             |                   | 5590          | Chain0 | 11.69                                 | 12.0                 |
|             |                   | 5670          | Chain0 | 11.56                                 | 12.0                 |
| 802.11ac80M |                   | 5530          | Chain0 | 11.60                                 | 12.0                 |
|             |                   | 5610          | Chain0 | 11.82                                 | 12.0                 |

WIFI 5GHz-NII3

| Mode        | Tones/<br>RUIndex | Freq<br>(MHz) | Chain  | Conducted average<br>power output(dBm) | Tune-up<br>Tolerance |
|-------------|-------------------|---------------|--------|----------------------------------------|----------------------|
| 802.11a     | NA                | 5745          | Chain0 | 11.98                                  | 12.0                 |
|             |                   | 5785          | Chain0 | 11.80                                  | 12.0                 |
|             |                   | 5825          | Chain0 | 11.42                                  | 12.0                 |
| 802.11n20M  |                   | 5745          | Chain0 | 11.80                                  | 12.0                 |
|             |                   | 5785          | Chain0 | 11.61                                  | 12.0                 |
|             |                   | 5825          | Chain0 | 11.24                                  | 12.0                 |
| 802.11n40M  |                   | 5755          | Chain0 | 11.69                                  | 12.0                 |
|             |                   | 5795          | Chain0 | 11.59                                  | 12.0                 |
| 802.11ac20M |                   | 5745          | Chain0 | 11.81                                  | 12.0                 |
|             |                   | 5785          | Chain0 | 11.65                                  | 12.0                 |
|             |                   | 5825          | Chain0 | 11.25                                  | 12.0                 |
| 802.11ac40M |                   | 5755          | Chain0 | 11.76                                  | 12.0                 |
|             |                   | 5795          | Chain0 | 11.66                                  | 12.0                 |
| 802.11ac80M |                   | 5775          | Chain0 | 11.85                                  | 12.0                 |

## 6.2 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

### SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and $\leq 50$ mm

#### Method1:

According to the KDB447498 4.3.1 (1)

For 100 MHz to 6 GHz and test separation distances  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f} \text{ (GHz)}] \leq 3.0$  for 1-g SAR, where

- $f(\text{GHz})$  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

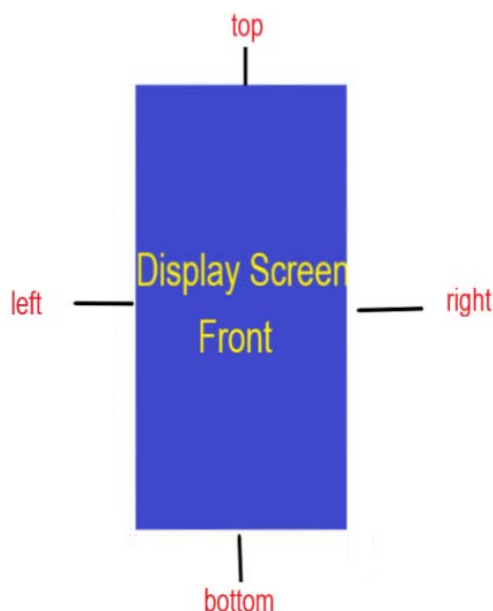
The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

This is equivalent to  $[(\text{max. power of channel, including tune-up tolerance, mW}) / (60 / \sqrt{f}(\text{GHz}) \text{ mW})] \cdot [20 \text{ mm} / (\text{min. test separation distance, mm})] \leq 1.0$  for 1-g SAR; also see Appendix A for approximate exclusion threshold values at selected frequencies and distances.

Note: Anyway, We evaluated SAR for BT/WIFI, so there is no need to consider this part.

### 6.3 RF exposure conditions

Refer to the follow picture “Antenna information” for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.



Note: Antenna Drawing as shown in the “SRTC2021-9004(F)-21082502(H)\_SAR\_Test Setup”.

All of Implementation antenna

Sub ANT:

WLAN/BT

Main ANT1:

GSM 1900      LTE Band 38/41

Main ANT2:

GSM 850      WCDMA Band V      LTE Band 5

Considered the separation distance between antennas to sides, Position listed as below shall be evaluated.

2/3/4G SAR Head test Position: Left Cheek, Left Tilt, Right Cheek, Right Tilt

Main ANT1      SAR Body test Position: back, front, Bottom, Left

Main ANT2      SAR Body test Position: back, front, Bottom, Right

WLAN/BT      SAR Head test Position: Left Cheek, Left Tilt, Right Cheek, Right Tilt

Sub ANT      SAR Body test Position: back, front, Top, Right

**Note\*:** For hotspot mode, it's not necessary test Rear and Front position for several bands which there is no “hotspot power reduction” scheme. Because we already test these positions without hotspot mode in Body Exposure conditions.

## 6.4 System Checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. For the measurement of the following parameters the SPEAG DAKS-3.5 dielectric parameter probe is used, representing the open-ended coaxial probe measurement procedure.

| Freq.(MHz) | Liquid parameters | measured | Target | Delta (%) | Tolerance (%) | Verdict |
|------------|-------------------|----------|--------|-----------|---------------|---------|
| 750        | $\epsilon_r$      | 42.2     | 41.9   | 0.72      | $\pm 10$      | Pass    |
|            | $\sigma$ [S/m]    | 0.85     | 0.89   | -4.49     | $\pm 10$      | Pass    |
| 835        | $\epsilon_r$      | 40.08    | 41.50  | -3.42     | $\pm 10$      | Pass    |
|            | $\sigma$ [S/m]    | 0.93     | 0.90   | 3.33      | $\pm 10$      | Pass    |
| 900        | $\epsilon_r$      | 40.24    | 41.50  | -3.04     | $\pm 10$      | Pass    |
|            | $\sigma$ [S/m]    | 1.02     | 0.97   | 5.15      | $\pm 10$      | Pass    |
| 1800       | $\epsilon_r$      | 41.1     | 40.00  | 2.75      | $\pm 10$      | Pass    |
|            | $\sigma$ [S/m]    | 1.35     | 1.40   | -3.57     | $\pm 10$      | Pass    |
| 2000       | $\epsilon_r$      | 39.8     | 40.00  | -0.50     | $\pm 10$      | Pass    |
|            | $\sigma$ [S/m]    | 1.34     | 1.40   | -4.29     | $\pm 10$      | Pass    |
| 2450       | $\epsilon_r$      | 38.7     | 39.20  | -1.28     | $\pm 10$      | Pass    |
|            | $\sigma$ [S/m]    | 1.75     | 1.80   | -2.78     | $\pm 10$      | Pass    |
| 2600       | $\epsilon_r$      | 38       | 39.00  | -2.56     | $\pm 10$      | Pass    |
|            | $\sigma$ [S/m]    | 2.01     | 1.96   | 2.55      | $\pm 10$      | Pass    |
| 5200       | $\epsilon_r$      | 35.8     | 36.00  | -0.56     | $\pm 5$       | Pass    |
|            | $\sigma$ [S/m]    | 4.5      | 4.66   | -3.43     | $\pm 5$       | Pass    |
| 5300       | $\epsilon_r$      | 36.4     | 35.90  | 1.39      | $\pm 5$       | Pass    |
|            | $\sigma$ [S/m]    | 4.88     | 4.76   | 2.52      | $\pm 5$       | Pass    |
| 5600       | $\epsilon_r$      | 36.2     | 35.50  | 1.97      | $\pm 5$       | Pass    |
|            | $\sigma$ [S/m]    | 4.86     | 5.07   | -4.14     | $\pm 5$       | Pass    |
| 5800       | $\epsilon_r$      | 35.6     | 35.30  | 0.85      | $\pm 5$       | Pass    |
|            | $\sigma$ [S/m]    | 5.11     | 5.27   | -3.04     | $\pm 5$       | Pass    |

Note: For DASY system, the conservative tolerance 5% could expand to 10% when the frequency under 3GHz

A system check measurement was made following once the determination of the dielectric parameters of the simulant, using the dipole validation kit. The system checking results (dielectric parameters and SAR values) are given in the table below.

| Date       | Freq. (MHz) | SAR<br>measured<br>(normalized to 1W) |       | Target<br>(Ref. Value) | Delta<br>(%) | Tolerance<br>(%) |
|------------|-------------|---------------------------------------|-------|------------------------|--------------|------------------|
| 2021.08.31 | 750         | 1g                                    | 8.52  | 8.40                   | 1.43         | ±10              |
| 2021.08.31 | 835         | 1g                                    | 9.40  | 9.38                   | 0.21         | ±10              |
| 2021.09.01 | 900         | 1g                                    | 10.32 | 10.9                   | -5.32        | ±10              |
| 2021.09.02 | 1800        | 1g                                    | 38.12 | 38.9                   | -2.01        | ±10              |
| 2021.09.03 | 2000        | 1g                                    | 41.08 | 41.0                   | 0.20         | ±10              |
| 2021.09.04 | 2450        | 1g                                    | 51.80 | 53.0                   | -2.26        | ±10              |
| 2021.09.05 | 2600        | 1g                                    | 53.60 | 56.5                   | -5.13        | ±10              |
| 2021.09.06 | 5200        | 1g                                    | 77.40 | 75.9                   | 1.98         | ±10              |
| 2021.09.07 | 5300        | 1g                                    | 81.00 | 78.0                   | 3.85         | ±10              |
| 2021.09.08 | 5600        | 1g                                    | 76.00 | 80.0                   | -5.00        | ±10              |
| 2021.09.09 | 5800        | 1g                                    | 82.00 | 78.5                   | 4.46         | ±10              |

## 6.5 SAR TEST RESULT

In order to determine the largest value of the peak spatial-average SAR of a handset, all device positions, configurations, and operational modes should be tested for each frequency band according to Steps 1 to 3 below.

Step 1: The tests should be performed at the channel that is closest to the center of the transmit frequency band.

- a) All device positions (cheek and tilt, for both left and right sides of the SAM phantom),
- b) All configurations for each device position in a), e.g., antenna extended and retracted, and
- c) All operational modes for each device position in item a) and configuration in item b) in each frequency band, e.g., analog and digital, If more than three frequencies need to be tested (i.e.,  $N_c > 3$ ), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing the highest peak spatial-average SAR determined in Step 1 for each frequency, perform all tests at all other test frequency channels, e.g., lowest and highest frequencies. In addition, for all other conditions (device position, configuration, and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies should be tested as well.

Step 3: Examine all data to determine the largest value of the peak.

Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.

Scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.

Duty Factor = 1 / Duty Cycle(%)

For cellular network:

Reported SAR (W/kg) = Measured SAR (W/kg) \* Scaling Factor

For WLAN

Reported SAR (W/kg) = Measured SAR (W/kg) \* Scaling Factor \* Duty factor

2. Per KDB 447498 D01v06, for each exposure position, if the highest output channel reported SAR  $\leq 0.8$ W/kg, other channels SAR testing are not necessary.

3. The distance between the EUT and the phantom bottom is 10mm.

The measured and reported Head/body SAR values for the test device are tabulated below:

Mode: GSM 850

fL(MHz)=824.2MHz

fM(MHz)=836.5MHz

fH(MHz)= 848.8MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

| Test case         |                    |                |         | Meas power(dBm) | Tune-up(dBm) | Scaling factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-------------------|--------------------|----------------|---------|-----------------|--------------|----------------|----------------|--------|------------------|--------|
| Mode              | Exposure condition | Position       | Channel |                 |              |                | First          | Second | First            | Second |
| GPRS/EDGE<br>GMSK | Head               | Left<br>Cheek  | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.068          | ---    | 0.075            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Left<br>tilt   | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.022          | ---    | 0.024            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Right<br>Cheek | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.074          | ---    | 0.081            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Right<br>tilt  | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.031          | ---    | 0.034            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
| GPRS/EDGE<br>GMSK | Body-<br>worn      | Back           | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.253          | ---    | 0.278            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Front          | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.342          | ---    | 0.376            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
| GPRS/EDGE<br>GMSK | Hotspot            | Back           | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.253          | ---    | 0.278            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Front          | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.342          | ---    | 0.376            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Top            | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | ---            | ---    | ---              | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Bottom         | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.178          | ---    | 0.196            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Left           | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | ---            | ---    | ---              | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |
|                   |                    | Right          | L       | 27.11           | 27.50        | 1.09           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 27.09           | 27.50        | 1.10           | 0.294          | ---    | 0.323            | ---    |
|                   |                    |                | H       | 27.19           | 27.50        | 1.07           | ---            | ---    | ---              | ---    |

**Mode: GSM 1900**

fL (MHz)=1850.2MHz      fM (MHz)=1880.0MHz      fH (MHz)=1909.8MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

| Test case         |                    |                |         | Meas power(dBm) | Tune-up(dBm) | Scaling factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-------------------|--------------------|----------------|---------|-----------------|--------------|----------------|----------------|--------|------------------|--------|
| Mode              | Exposure condition | Position       | Channel |                 |              |                | First          | Second | First            | Second |
| GPRS/EDGE<br>GMSK | Head               | Left<br>Cheek  | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.047          | ---    | 0.066            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           |                |        | ---              | ---    |
|                   |                    | Left<br>tilt   | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.018          | ---    | 0.025            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
|                   |                    | Right<br>Cheek | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.063          | ---    | 0.088            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
|                   |                    | Right<br>tilt  | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.022          | ---    | 0.031            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
| GPRS/EDGE<br>GMSK | Body-<br>worn      | Back           | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.213          | ---    | 0.298            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
|                   |                    | Front          | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.233          | ---    | 0.326            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
| GPRS/EDGE<br>GMSK | Hotspot            | Back           | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.213          | ---    | 0.298            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
|                   |                    | Front          | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.233          | ---    | 0.326            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
|                   |                    | Top            | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | ---            | ---    | ---              | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
|                   |                    | Bottom         | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.352          | ---    | 0.493            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
|                   |                    | Left           | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | 0.162          | ---    | 0.227            | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |
|                   |                    | Right          | L       | 23.40           | 24.50        | 1.29           | ---            | ---    | ---              | ---    |
|                   |                    |                | M       | 23.05           | 24.50        | 1.40           | ---            | ---    | ---              | ---    |
|                   |                    |                | H       | 23.23           | 24.50        | 1.34           | ---            | ---    | ---              | ---    |

**Mode: WCDMA BAND V**

fL (MHz)=826.4MHz      fM (MHz)=836.4MHz      fH (MHz)= 846.6MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

| Test case |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-----------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|--------|------------------|--------|
| Mode      | Exposure<br>condition | Position       | Channel |                    |              |                   | First          | Second | First            | Second |
| RMC       | Head                  | Left<br>Cheek  | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.058          | ---    | 0.073            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Left<br>tilt   | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.016          | ---    | 0.020            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Right<br>Cheek | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.071          | ---    | 0.089            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Right<br>tilt  | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.024          | ---    | 0.030            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
| RMC       | Body-<br>worn         | Back           | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.163          | ---    | 0.205            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.223          | ---    | 0.281            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
| RMC       | Hotspot               | Back           | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.163          | ---    | 0.205            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.223          | ---    | 0.281            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Top            | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Bottom         | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.149          | ---    | 0.188            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Left           | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       | Right          | L       | 22.86              | 24.00        | 1.30              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 23.00              | 24.00        | 1.26              | 0.200          | ---    | 0.252            | ---    |
|           |                       |                | H       | 23.04              | 24.00        | 1.25              | ---            | ---    | ---              | ---    |

**Mode: LTE Band 5**

fL (MHz)=829 MHz      fM (MHz)=836.5MHz      fH (MHz)= 844MHz

**Limit of SAR (W/kg) : <1.6W/kg (1g Average)**

| Test case   |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-------------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|--------|------------------|--------|
| Mode        | Exposure<br>condition | Position       | Channel |                    |              |                   | First          | Second | First            | Second |
| QPSK<br>1RB | Head                  | Left<br>Cheek  | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.043          | ---    | 0.056            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
|             |                       | Left<br>tilt   | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.013          | ---    | 0.017            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
|             |                       | Right<br>Cheek | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.054          | ---    | 0.071            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
|             |                       | Right<br>tilt  | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.022          | ---    | 0.029            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
| QPSK<br>1RB | Body-<br>worn         | Back           | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.138          | ---    | 0.181            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
|             |                       | Front          | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.186          | ---    | 0.244            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
| QPSK<br>1RB | Hotspot               | Back           | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.138          | ---    | 0.181            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
|             |                       | Front          | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.186          | ---    | 0.244            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
|             |                       | Top            | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | ---            | ---    | ---              | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
|             |                       | Bottom         | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | 0.114          | ---    | 0.149            | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |
|             |                       | Left           | L       | 22.62              | 24.00        | 1.37              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.82              | 24.00        | 1.31              | ---            | ---    | ---              | ---    |
|             |                       |                | H       | 23.07              | 24.00        | 1.24              | ---            | ---    | ---              | ---    |

|               |               |                |   |       |       |      |       |     |       |     |
|---------------|---------------|----------------|---|-------|-------|------|-------|-----|-------|-----|
|               |               | Right          | L | 22.62 | 24.00 | 1.37 | ---   | --- | ---   | --- |
|               |               |                | M | 22.82 | 24.00 | 1.31 | 0.178 | --- | 0.233 | --- |
|               |               |                | H | 23.07 | 24.00 | 1.24 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Head          | Left<br>Cheek  | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.031 | --- | 0.039 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Left<br>tilt   | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.007 | --- | 0.009 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Right<br>Cheek | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.045 | --- | 0.057 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Right<br>tilt  | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.016 | --- | 0.020 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Body-<br>worn | Back           | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.124 | --- | 0.156 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Front          | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.173 | --- | 0.218 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Hotspot       | Back           | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.124 | --- | 0.156 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Front          | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.173 | --- | 0.218 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Top            | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | ---   | --- | ---   | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Bottom         | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.089 | --- | 0.112 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Left           | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | ---   | --- | ---   | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Right          | L | 21.90 | 23.00 | 1.29 | ---   | --- | ---   | --- |
|               |               |                | M | 22.01 | 23.00 | 1.26 | 0.158 | --- | 0.199 | --- |
|               |               |                | H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |

**Mode: LTE Band 38**

fL (MHz)=2580 MHz

fM (MHz)=2595MHz

fH (MHz)= 2610MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

| Test case   |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-------------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|--------|------------------|--------|
| Mode        | Exposure<br>condition | Position       | Channel |                    |              |                   | First          | Second | First            | Second |
| QPSK<br>1RB | Head                  | Left<br>Cheek  | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.066          | ---    | 0.095            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
|             |                       | Left<br>tilt   | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.034          | ---    | 0.049            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
|             |                       | Right<br>Cheek | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.074          | ---    | 0.107            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
|             |                       | Right<br>tilt  | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.042          | ---    | 0.060            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
| QPSK<br>1RB | Body-<br>worn         | Back           | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.221          | ---    | 0.318            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
|             |                       | Front          | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.224          | ---    | 0.323            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
| QPSK<br>1RB | Hotspot               | Back           | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.221          | ---    | 0.318            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
|             |                       | Front          | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.224          | ---    | 0.323            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
|             |                       | Top            | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | ---            | ---    | ---              | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
|             |                       | Bottom         | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.382          | ---    | 0.550            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |
|             |                       | Left           | L       | 22.35              | 24.00        | 1.46              | ---            | ---    | ---              | ---    |
|             |                       |                | M       | 22.43              | 24.00        | 1.44              | 0.103          | ---    | 0.148            | ---    |
|             |                       |                | H       | 22.44              | 24.00        | 1.43              | ---            | ---    | ---              | ---    |

|               |               |                |   |       |       |      |       |     |       |     |
|---------------|---------------|----------------|---|-------|-------|------|-------|-----|-------|-----|
|               |               | Right          | L | 22.35 | 24.00 | 1.46 | ---   | --- | ---   | --- |
|               |               |                | M | 22.43 | 24.00 | 1.44 | ---   | --- | ---   | --- |
|               |               |                | H | 22.44 | 24.00 | 1.43 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Head          | Left<br>Cheek  | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.052 | --- | 0.072 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Left<br>tilt   | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.026 | --- | 0.036 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Right<br>Cheek | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.061 | --- | 0.085 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Right<br>tilt  | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.029 | --- | 0.040 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Body-<br>worn | Back           | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.187 | --- | 0.260 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Front          | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.190 | --- | 0.264 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Hotspot       | Back           | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.187 | --- | 0.260 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Front          | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.190 | --- | 0.264 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Top            | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | ---   | --- | ---   | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Bottom         | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.317 | --- | 0.441 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Left           | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | 0.087 | --- | 0.121 | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |
|               |               | Right          | L | 21.55 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | M | 21.58 | 23.00 | 1.39 | ---   | --- | ---   | --- |
|               |               |                | H | 21.49 | 23.00 | 1.42 | ---   | --- | ---   | --- |

**Mode: LTE Band 41**

fL (MHz)= 2506 MHz

fM (MHz)= 2593MHz

fH (MHz)= 2680MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

| Test case |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-----------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|--------|------------------|--------|
| Mode      | Exposure<br>condition | Position       | Channel |                    |              |                   | First          | Second | First            | Second |
| QPSK 1RB  | Head                  | Left<br>Cheek  | L       | 21.22              | 23.00        | 1.51              | ---            | ---    | ---              | ---    |
|           |                       |                | L-M     | 22.05              | 23.00        | 1.24              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 22.59              | 24.00        | 1.38              | 0.082          | ---    | 0.113            | ---    |
|           |                       |                | M-H     | 22.02              | 23.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 21.54              | 23.00        | 1.40              | ---            | ---    | ---              | ---    |
|           |                       | Left<br>tilt   | L       | 21.22              | 23.00        | 1.51              | ---            | ---    | ---              | ---    |
|           |                       |                | L-M     | 22.05              | 23.00        | 1.24              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 22.59              | 24.00        | 1.38              | 0.023          | ---    | 0.032            | ---    |
|           |                       |                | M-H     | 22.02              | 23.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 21.54              | 23.00        | 1.40              | ---            | ---    | ---              | ---    |
|           |                       | Right<br>Cheek | L       | 21.22              | 23.00        | 1.51              | ---            | ---    | ---              | ---    |
|           |                       |                | L-M     | 22.05              | 23.00        | 1.24              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 22.59              | 24.00        | 1.38              | 0.074          | ---    | 0.102            | ---    |
|           |                       |                | M-H     | 22.02              | 23.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 21.54              | 23.00        | 1.40              | ---            | ---    | ---              | ---    |
|           |                       | Right<br>tilt  | L       | 21.22              | 23.00        | 1.51              | ---            | ---    | ---              | ---    |
|           |                       |                | L-M     | 22.05              | 23.00        | 1.24              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 22.59              | 24.00        | 1.38              | 0.020          | ---    | 0.028            | ---    |
|           |                       |                | M-H     | 22.02              | 23.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 21.54              | 23.00        | 1.40              | ---            | ---    | ---              | ---    |
| QPSK 1RB  | Body-<br>worn         | Back           | L       | 21.22              | 23.00        | 1.51              | ---            | ---    | ---              | ---    |
|           |                       |                | L-M     | 22.05              | 23.00        | 1.24              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 22.59              | 24.00        | 1.38              | 0.210          | ---    | 0.290            | ---    |
|           |                       |                | M-H     | 22.02              | 23.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 21.54              | 23.00        | 1.40              | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 21.22              | 23.00        | 1.51              | ---            | ---    | ---              | ---    |
|           |                       |                | L-M     | 22.05              | 23.00        | 1.24              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 22.59              | 24.00        | 1.38              | 0.223          | ---    | 0.308            | ---    |
|           |                       |                | M-H     | 22.02              | 23.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 21.54              | 23.00        | 1.40              | ---            | ---    | ---              | ---    |
| QPSK 1RB  | Hotspot               | Back           | L       | 21.22              | 23.00        | 1.51              | ---            | ---    | ---              | ---    |
|           |                       |                | L-M     | 22.05              | 23.00        | 1.24              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 22.59              | 24.00        | 1.38              | 0.210          | ---    | 0.290            | ---    |
|           |                       |                | M-H     | 22.02              | 23.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 21.54              | 23.00        | 1.40              | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 21.22              | 23.00        | 1.51              | ---            | ---    | ---              | ---    |
|           |                       |                | L-M     | 22.05              | 23.00        | 1.24              | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 22.59              | 24.00        | 1.38              | 0.223          | ---    | 0.308            | ---    |
|           |                       |                | M-H     | 22.02              | 23.00        | 1.25              | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 21.54              | 23.00        | 1.40              | ---            | ---    | ---              | ---    |

|               |               |                |     |       |       |      |       |     |       |     |
|---------------|---------------|----------------|-----|-------|-------|------|-------|-----|-------|-----|
|               |               | Top            | H   | 21.54 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | L   | 21.22 | 23.00 | 1.51 | ---   | --- | ---   | --- |
|               |               |                | L-M | 22.05 | 23.00 | 1.24 | ---   | --- | ---   | --- |
|               |               |                | M   | 22.59 | 24.00 | 1.38 | ---   | --- | ---   | --- |
|               |               |                | M-H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               |                | H   | 21.54 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | L   | 21.22 | 23.00 | 1.51 | ---   | --- | ---   | --- |
|               |               |                | L-M | 22.05 | 23.00 | 1.24 | ---   | --- | ---   | --- |
|               |               |                | M   | 22.59 | 24.00 | 1.38 | 0.400 | --- | 0.552 | --- |
|               |               |                | M-H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Bottom         | H   | 21.54 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | L   | 21.22 | 23.00 | 1.51 | ---   | --- | ---   | --- |
|               |               |                | L-M | 22.05 | 23.00 | 1.24 | ---   | --- | ---   | --- |
|               |               |                | M   | 22.59 | 24.00 | 1.38 | 0.104 | --- | 0.144 | --- |
|               |               |                | M-H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Left           | H   | 21.54 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | L   | 21.22 | 23.00 | 1.51 | ---   | --- | ---   | --- |
|               |               |                | L-M | 22.05 | 23.00 | 1.24 | ---   | --- | ---   | --- |
|               |               |                | M   | 22.59 | 24.00 | 1.38 | ---   | --- | ---   | --- |
|               |               |                | M-H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
|               |               | Right          | H   | 21.54 | 23.00 | 1.40 | ---   | --- | ---   | --- |
|               |               |                | L   | 21.22 | 23.00 | 1.51 | ---   | --- | ---   | --- |
|               |               |                | L-M | 22.05 | 23.00 | 1.24 | ---   | --- | ---   | --- |
|               |               |                | M   | 22.59 | 24.00 | 1.38 | ---   | --- | ---   | --- |
|               |               |                | M-H | 22.02 | 23.00 | 1.25 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Head          | Left<br>Cheek  | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |               |                | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |               |                | M   | 21.50 | 23.00 | 1.41 | 0.067 | --- | 0.094 | --- |
|               |               |                | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |               |                | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
|               |               | Left<br>tilt   | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |               |                | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |               |                | M   | 21.50 | 23.00 | 1.41 | 0.015 | --- | 0.021 | --- |
|               |               |                | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |               |                | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
|               |               | Right<br>Cheek | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |               |                | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |               |                | M   | 21.50 | 23.00 | 1.41 | 0.058 | --- | 0.082 | --- |
|               |               |                | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |               |                | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
|               |               | Right<br>tilt  | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |               |                | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |               |                | M   | 21.50 | 23.00 | 1.41 | 0.010 | --- | 0.014 | --- |
|               |               |                | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |               |                | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Body-<br>worn | Back           | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |               |                | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |               |                | M   | 21.50 | 23.00 | 1.41 | 0.072 | --- | 0.102 | --- |
|               |               |                | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |               |                | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |

|               |         |        |     |       |       |      |       |     |       |     |
|---------------|---------|--------|-----|-------|-------|------|-------|-----|-------|-----|
|               |         | Front  | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |         |        | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |         |        | M   | 21.50 | 23.00 | 1.41 | 0.017 | --- | 0.024 | --- |
|               |         |        | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |         |        | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
| QPSK<br>50%RB | Hotspot | Back   | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |         |        | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |         |        | M   | 21.50 | 23.00 | 1.41 | 0.072 | --- | 0.102 | --- |
|               |         |        | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |         |        | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
|               |         | Front  | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |         |        | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |         |        | M   | 21.50 | 23.00 | 1.41 | 0.017 | --- | 0.024 | --- |
|               |         |        | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |         |        | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
|               |         | Top    | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |         |        | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |         |        | M   | 21.50 | 23.00 | 1.41 | ---   | --- | ---   | --- |
|               |         |        | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |         |        | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
|               |         | Bottom | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |         |        | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |         |        | M   | 21.50 | 23.00 | 1.41 | 0.301 | --- | 0.424 | --- |
|               |         |        | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |         |        | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
|               |         | Left   | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |         |        | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |         |        | M   | 21.50 | 23.00 | 1.41 | 0.067 | --- | 0.094 | --- |
|               |         |        | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |         |        | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |
|               |         | Right  | L   | 20.27 | 22.00 | 1.49 | ---   | --- | ---   | --- |
|               |         |        | L-M | 21.47 | 22.00 | 1.13 | ---   | --- | ---   | --- |
|               |         |        | M   | 21.50 | 23.00 | 1.41 | ---   | --- | ---   | --- |
|               |         |        | M-H | 21.40 | 22.00 | 1.15 | ---   | --- | ---   | --- |
|               |         |        | H   | 20.65 | 22.00 | 1.36 | ---   | --- | ---   | --- |

**Mode: Wi-Fi 2.4GHz**

fL (MHz)=2412MHz fM (MHz)=2437MHz

fH (MHz)= 2462MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

| Test case |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Duty<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-----------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|----------------|--------|------------------|--------|
| Mode      | Exposure<br>condition | Position       | Channel |                    |              |                   |                | First          | Second | First            | Second |
| 802.11b   | Head                  | Left<br>Cheek  | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.482          | ---    | 0.557            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Left<br>tilt   | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.203          | ---    | 0.235            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>Cheek | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.152          | ---    | 0.176            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>tilt  | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.109          | ---    | 0.126            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
| 802.11b   | Body-<br>worn         | Back           | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.045          | ---    | 0.052            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.101          | ---    | 0.117            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
| 802.11b   | Hotspot               | Back           | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.045          | ---    | 0.052            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.101          | ---    | 0.117            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Top            | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.010          | ---    | 0.012            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Bottom         | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Left           | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right          | L       | 13.31              | 14.00        | 1.17              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 13.39              | 14.00        | 1.15              | 1.01           | 0.122          | ---    | 0.141            | ---    |
|           |                       |                | H       | 13.26              | 14.00        | 1.19              | 1.01           | ---            | ---    | ---              | ---    |

**Mode: Wi-Fi5GHz UNII-1**

fL (MHz)=5180MHz fM (MHz)=5220MHz

fH (MHz)= 5240MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

| Test case |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Duty<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-----------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|----------------|--------|------------------|--------|
| Mode      | Exposure<br>condition | Position       | Channel |                    |              |                   |                | First          | Second | First            | Second |
| 802.11a   | Head                  | Left<br>Cheek  | L       | 11.67              | 12.00        | 1.08              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.76              | 12.00        | 1.06              | 1.01           | 0.308          | ---    | 0.328            | ---    |
|           |                       |                | H       | 11.84              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Left<br>tilt   | L       | 11.67              | 12.00        | 1.08              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.76              | 12.00        | 1.06              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.84              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>Cheek | L       | 11.67              | 12.00        | 1.08              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.76              | 12.00        | 1.06              | 1.01           | 0.194          | ---    | 0.207            | ---    |
|           |                       |                | H       | 11.84              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>tilt  | L       | 11.67              | 12.00        | 1.08              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.76              | 12.00        | 1.06              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.84              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
| 802.11a   | Body-<br>worn         | Back           | L       | 11.67              | 12.00        | 1.08              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.76              | 12.00        | 1.06              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.84              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 11.67              | 12.00        | 1.08              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.76              | 12.00        | 1.06              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.84              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |

**Mode: Wi-Fi5GHz UNII-2A**

fL (MHz)=5260MHz      fM (MHz)=5280MHz      fH (MHz)= 5320MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

| Test case |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Duty<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-----------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|----------------|--------|------------------|--------|
| Mode      | Exposure<br>condition | Position       | Channel |                    |              |                   |                | First          | Second | First            | Second |
| 802.11a   | Head                  | Left<br>Cheek  | L       | 11.73              | 12.00        | 1.06              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.61              | 12.00        | 1.09              | 1.01           | 0.239          | ---    | 0.262            | ---    |
|           |                       |                | H       | 11.61              | 12.00        | 1.09              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Left<br>tilt   | L       | 11.73              | 12.00        | 1.06              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.61              | 12.00        | 1.09              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.61              | 12.00        | 1.09              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>Cheek | L       | 11.73              | 12.00        | 1.06              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.61              | 12.00        | 1.09              | 1.01           | 0.157          | ---    | 0.172            | ---    |
|           |                       |                | H       | 11.61              | 12.00        | 1.09              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>tilt  | L       | 11.73              | 12.00        | 1.06              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.61              | 12.00        | 1.09              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.61              | 12.00        | 1.09              | 1.01           | ---            | ---    | ---              | ---    |
| 802.11a   | Body-<br>worn         | Back           | L       | 11.73              | 12.00        | 1.06              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.61              | 12.00        | 1.09              | 1.01           | 0.002          | ---    | 0.002            | ---    |
|           |                       |                | H       | 11.61              | 12.00        | 1.09              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 11.73              | 12.00        | 1.06              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.61              | 12.00        | 1.09              | 1.01           | 0.100          | ---    | 0.110            | ---    |
|           |                       |                | H       | 11.61              | 12.00        | 1.09              | 1.01           | ---            | ---    | ---              | ---    |

**Mode: Wi-Fi5GHz UNII-2C**

fL (MHz)=5500MHz fM (MHz)=5580MHz

fH (MHz)= 5700MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

| Test case |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Duty<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-----------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|----------------|--------|------------------|--------|
| Mode      | Exposure<br>condition | Position       | Channel |                    |              |                   |                | First          | Second | First            | Second |
| 802.11a   | Head                  | Left<br>Cheek  | L       | 11.43              | 12.00        | 1.14              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.69              | 12.00        | 1.07              | 1.01           | 0.142          | ---    | 0.153            | ---    |
|           |                       |                | H       | 11.81              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Left<br>tilt   | L       | 11.43              | 12.00        | 1.14              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.69              | 12.00        | 1.07              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.81              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>Cheek | L       | 11.43              | 12.00        | 1.14              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.69              | 12.00        | 1.07              | 1.01           | 0.034          | ---    | 0.037            | ---    |
|           |                       |                | H       | 11.81              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>tilt  | L       | 11.43              | 12.00        | 1.14              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.69              | 12.00        | 1.07              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.81              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
| 802.11a   | Body-<br>worn         | Back           | L       | 11.43              | 12.00        | 1.14              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.69              | 12.00        | 1.07              | 1.01           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.81              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 11.43              | 12.00        | 1.14              | 1.01           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.69              | 12.00        | 1.07              | 1.01           | 0.005          | ---    | 0.005            | ---    |
|           |                       |                | H       | 11.81              | 12.00        | 1.04              | 1.01           | ---            | ---    | ---              | ---    |

**Mode: Wi-Fi5GHz UNII-3**

fL (MHz)=5745MHz fM (MHz)=5785MHz

fH (MHz)= 5825MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

| Test case |                       |                |         | Meas<br>power(dBm) | Tune-up(dBm) | Scaling<br>factor | Duty<br>factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-----------|-----------------------|----------------|---------|--------------------|--------------|-------------------|----------------|----------------|--------|------------------|--------|
| Mode      | Exposure<br>condition | Position       | Channel |                    |              |                   |                | First          | Second | First            | Second |
| 802.11a   | Head                  | Left<br>Cheek  | L       | 11.98              | 12.00        | 1.00              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.80              | 12.00        | 1.05              | 1.00           | 0.069          | ---    | 0.073            | ---    |
|           |                       |                | H       | 11.42              | 12.00        | 1.14              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       | Left<br>tilt   | L       | 11.98              | 12.00        | 1.00              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.80              | 12.00        | 1.05              | 1.00           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.42              | 12.00        | 1.14              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>Cheek | L       | 11.98              | 12.00        | 1.00              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.80              | 12.00        | 1.05              | 1.00           | 0.024          | ---    | 0.025            | ---    |
|           |                       |                | H       | 11.42              | 12.00        | 1.14              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       | Right<br>tilt  | L       | 11.98              | 12.00        | 1.00              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.80              | 12.00        | 1.05              | 1.00           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.42              | 12.00        | 1.14              | 1.00           | ---            | ---    | ---              | ---    |
| 802.11a   | Body-<br>worn         | Back           | L       | 11.98              | 12.00        | 1.00              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.80              | 12.00        | 1.05              | 1.00           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.42              | 12.00        | 1.14              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       | Front          | L       | 11.98              | 12.00        | 1.00              | 1.00           | ---            | ---    | ---              | ---    |
|           |                       |                | M       | 11.80              | 12.00        | 1.05              | 1.00           | 0.001          | ---    | 0.001            | ---    |
|           |                       |                | H       | 11.42              | 12.00        | 1.14              | 1.00           | ---            | ---    | ---              | ---    |

**Mode: Bluetooth**

fL (MHz)=2402MHz fM (MHz)=2441MHz

fH (MHz)= 2480MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

| Test case |                                       |             |         | Meas power(dBm) | Tune-up (dBm) | Scaling factor | Duty factor | Meas SAR(w/kg) |        | Report SAR(w/kg) |        |
|-----------|---------------------------------------|-------------|---------|-----------------|---------------|----------------|-------------|----------------|--------|------------------|--------|
| Mode      | Exposure condition                    | Position    | Channel |                 |               |                |             | First          | Second | First            | Second |
| BR        | Head                                  | Left Cheek  | L       | 10.06           | 12.00         | 1.56           | 1.08        |                | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.064          | ---    | 0.102            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Left tilt   | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.058          | ---    | 0.092            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Right Cheek | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.059          | ---    | 0.094            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Right tilt  | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.054          | ---    | 0.086            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
| BR        | Body-worn                             | Back        | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.002          | ---    | 0.003            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Front       | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.051          | ---    | 0.081            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
| BR        | Hotspot (Support Bluetooth Thetering) | Back        | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.002          | ---    | 0.003            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Front       | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.051          | ---    | 0.081            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Top         | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.001          | ---    | 0.002            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Bottom      | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Left        | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       | Right       | L       | 10.06           | 12.00         | 1.56           | 1.08        | ---            | ---    | ---              | ---    |
|           |                                       |             | M       | 10.30           | 12.00         | 1.48           | 1.08        | 0.050          | ---    | 0.080            | ---    |
|           |                                       |             | H       | 10.09           | 12.00         | 1.55           | 1.08        | ---            | ---    | ---              | ---    |

## 6.6 SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is  $\geq 0.80$  W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is  $> 1.20$  or when the original or repeated measurement is  $\geq 1.45$  W/kg (~ 10% from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .

## 6.7 Simultaneous Transmission SAR Analysis

|    | WWAN                                     |   | WLAN / BT                    |
|----|------------------------------------------|---|------------------------------|
| 1) | one of the bands supported by the Device | + | WLAN (2.4GHz SISO)           |
| 2) |                                          | + | WLAN (5GHz SISO)             |
| 3) |                                          | + | Bluetooth                    |
| 4) |                                          | + | WLAN (5GHz SISO) + Bluetooth |

| Exposure condition | Position    | Simultaneous Transmission |       |
|--------------------|-------------|---------------------------|-------|
| Head               | Left cheek  | LTE Band41+WLAN2.4GHz     | 0.670 |
|                    | Left tilt   | LTE Band38+WLAN2.4GHz     | 0.284 |
|                    | Right cheek | LTE Band38+WLAN5GHz+BT    | 0.407 |
|                    | Right tilt  | LTE Band38+WLAN2.4GHz     | 0.187 |
| Body worn          | Back        | LTE Band38+WLAN2.4GHz     | 0.370 |
|                    | Front       | GSM850+WLAN5GHz+BT        | 0.567 |
| Hotspot            | Back        | LTE Band38+WLAN2.4GHz     | 0.370 |
|                    | Front       | GSM850+WLAN2.4GHz         | 0.493 |
|                    | Top         | WLAN2.4GHz                | 0.012 |
|                    | Bottom      | LTE Band41                | 0.552 |
|                    | Left        | GSM1900                   | 0.227 |
|                    | Right       | GSM850+WLAN2.4GHz         | 0.464 |

According to the above tables, SAR values < 1.6W/kg meet the compliance.

## 7 MEASUREMENT UNCERTAINTY

| (0.3 - 3 GHz range)                       |               |             |            |              |               |                |                 |                     |
|-------------------------------------------|---------------|-------------|------------|--------------|---------------|----------------|-----------------|---------------------|
| Error Description                         | Uncert. value | Prob. Dist. | Div.       | ( $c_i$ ) 1g | ( $c_i$ ) 10g | Std. Unc. (1g) | Std. Unc. (10g) | ( $v_i$ ) $v_{eff}$ |
| <b>Measurement System</b>                 |               |             |            |              |               |                |                 |                     |
| Probe Calibration                         | ±6.0 %        | N           | 1          | 1            | 1             | ±6.0 %         | ±6.0 %          | ∞                   |
| Axial Isotropy                            | ±4.7 %        | R           | $\sqrt{3}$ | 0.7          | 0.7           | ±1.9 %         | ±1.9 %          | ∞                   |
| Hemispherical Isotropy                    | ±9.6 %        | R           | $\sqrt{3}$ | 0.7          | 0.7           | ±3.9 %         | ±3.9 %          | ∞                   |
| Boundary Effects                          | ±1.0 %        | R           | $\sqrt{3}$ | 1            | 1             | ±0.6 %         | ±0.6 %          | ∞                   |
| Linearity                                 | ±4.7 %        | R           | $\sqrt{3}$ | 1            | 1             | ±2.7 %         | ±2.7 %          | ∞                   |
| System Detection Limits                   | ±1.0 %        | R           | $\sqrt{3}$ | 1            | 1             | ±0.6 %         | ±0.6 %          | ∞                   |
| Modulation Response <sup>m</sup>          | ±2.4 %        | R           | $\sqrt{3}$ | 1            | 1             | ±1.4 %         | ±1.4 %          | ∞                   |
| Readout Electronics                       | ±0.3 %        | N           | 1          | 1            | 1             | ±0.3 %         | ±0.3 %          | ∞                   |
| Response Time                             | ±0.8 %        | R           | $\sqrt{3}$ | 1            | 1             | ±0.5 %         | ±0.5 %          | ∞                   |
| Integration Time                          | ±2.6 %        | R           | $\sqrt{3}$ | 1            | 1             | ±1.5 %         | ±1.5 %          | ∞                   |
| RF Ambient Noise                          | ±3.0 %        | R           | $\sqrt{3}$ | 1            | 1             | ±1.7 %         | ±1.7 %          | ∞                   |
| RF Ambient Reflections                    | ±3.0 %        | R           | $\sqrt{3}$ | 1            | 1             | ±1.7 %         | ±1.7 %          | ∞                   |
| Probe Positioner                          | ±0.4 %        | R           | $\sqrt{3}$ | 1            | 1             | ±0.2 %         | ±0.2 %          | ∞                   |
| Probe Positioning                         | ±2.9 %        | R           | $\sqrt{3}$ | 1            | 1             | ±1.7 %         | ±1.7 %          | ∞                   |
| Max. SAR Eval.                            | ±2.0 %        | R           | $\sqrt{3}$ | 1            | 1             | ±1.2 %         | ±1.2 %          | ∞                   |
| <b>Test Sample Related</b>                |               |             |            |              |               |                |                 |                     |
| Device Positioning                        | ±2.9 %        | N           | 1          | 1            | 1             | ±2.9 %         | ±2.9 %          | 145                 |
| Device Holder                             | ±3.6 %        | N           | 1          | 1            | 1             | ±3.6 %         | ±3.6 %          | 5                   |
| Power Drift                               | ±5.0 %        | R           | $\sqrt{3}$ | 1            | 1             | ±2.9 %         | ±2.9 %          | ∞                   |
| Power Scaling <sup>P</sup>                | ±0 %          | R           | $\sqrt{3}$ | 1            | 1             | ±0.0 %         | ±0.0 %          | ∞                   |
| <b>Phantom and Setup</b>                  |               |             |            |              |               |                |                 |                     |
| Phantom Uncertainty                       | ±6.1 %        | R           | $\sqrt{3}$ | 1            | 1             | ±3.5 %         | ±3.5 %          | ∞                   |
| SAR correction                            | ±1.9 %        | R           | $\sqrt{3}$ | 1            | 0.84          | ±1.1 %         | ±0.9 %          | ∞                   |
| Liquid Conductivity (mea.) <sup>DAK</sup> | ±2.5 %        | R           | $\sqrt{3}$ | 0.78         | 0.71          | ±1.1 %         | ±1.0 %          | ∞                   |
| Liquid Permittivity (mea.) <sup>DAK</sup> | ±2.5 %        | R           | $\sqrt{3}$ | 0.26         | 0.26          | ±0.3 %         | ±0.4 %          | ∞                   |
| Temp. unc. - Conductivity <sup>BB</sup>   | ±3.4 %        | R           | $\sqrt{3}$ | 0.78         | 0.71          | ±1.5 %         | ±1.4 %          | ∞                   |
| Temp. unc. - Permittivity <sup>BB</sup>   | ±0.4 %        | R           | $\sqrt{3}$ | 0.23         | 0.26          | ±0.1 %         | ±0.1 %          | ∞                   |
| Combined Std. Uncertainty                 |               |             |            |              |               | ±11.2 %        | ±11.1 %         | 361                 |
| Expanded STD Uncertainty                  |               |             |            |              |               | ±22.3 %        | ±22.2 %         |                     |

| (3 - 6 GHz range)                         |               |             |      |                      |                       |                |                 |                                    |
|-------------------------------------------|---------------|-------------|------|----------------------|-----------------------|----------------|-----------------|------------------------------------|
| Error Description                         | Uncert. value | Prob. Dist. | Div. | (c <sub>i</sub> ) 1g | (c <sub>i</sub> ) 10g | Std. Unc. (1g) | Std. Unc. (10g) | (v <sub>i</sub> ) v <sub>eff</sub> |
| <b>Measurement System</b>                 |               |             |      |                      |                       |                |                 |                                    |
| Probe Calibration                         | ±6.55 %       | N           | 1    | 1                    | 1                     | ±6.55 %        | ±6.55 %         | ∞                                  |
| Axial Isotropy                            | ±4.7 %        | R           | √3   | 0.7                  | 0.7                   | ±1.9 %         | ±1.9 %          | ∞                                  |
| Hemispherical Isotropy                    | ±9.6 %        | R           | √3   | 0.7                  | 0.7                   | ±3.9 %         | ±3.9 %          | ∞                                  |
| Boundary Effects                          | ±2.0 %        | R           | √3   | 1                    | 1                     | ±1.2 %         | ±1.2 %          | ∞                                  |
| Linearity                                 | ±4.7 %        | R           | √3   | 1                    | 1                     | ±2.7 %         | ±2.7 %          | ∞                                  |
| System Detection Limits                   | ±1.0 %        | R           | √3   | 1                    | 1                     | ±0.6 %         | ±0.6 %          | ∞                                  |
| Modulation Response <sup>m</sup>          | ±2.4 %        | R           | √3   | 1                    | 1                     | ±1.4 %         | ±1.4 %          | ∞                                  |
| Readout Electronics                       | ±0.3 %        | N           | 1    | 1                    | 1                     | ±0.3 %         | ±0.3 %          | ∞                                  |
| Response Time                             | ±0.8 %        | R           | √3   | 1                    | 1                     | ±0.5 %         | ±0.5 %          | ∞                                  |
| Integration Time                          | ±2.6 %        | R           | √3   | 1                    | 1                     | ±1.5 %         | ±1.5 %          | ∞                                  |
| RF Ambient Noise                          | ±3.0 %        | R           | √3   | 1                    | 1                     | ±1.7 %         | ±1.7 %          | ∞                                  |
| RF Ambient Reflections                    | ±3.0 %        | R           | √3   | 1                    | 1                     | ±1.7 %         | ±1.7 %          | ∞                                  |
| Probe Positioner                          | ±0.8 %        | R           | √3   | 1                    | 1                     | ±0.5 %         | ±0.5 %          | ∞                                  |
| Probe Positioning                         | ±6.7 %        | R           | √3   | 1                    | 1                     | ±3.9 %         | ±3.9 %          | ∞                                  |
| Max. SAR Eval.                            | ±4.0 %        | R           | √3   | 1                    | 1                     | ±2.3 %         | ±2.3 %          | ∞                                  |
| <b>Test Sample Related</b>                |               |             |      |                      |                       |                |                 |                                    |
| Device Positioning                        | ±2.9 %        | N           | 1    | 1                    | 1                     | ±2.9 %         | ±2.9 %          | 145                                |
| Device Holder                             | ±3.6 %        | N           | 1    | 1                    | 1                     | ±3.6 %         | ±3.6 %          | 5                                  |
| Power Drift                               | ±5.0 %        | R           | √3   | 1                    | 1                     | ±2.9 %         | ±2.9 %          | ∞                                  |
| Power Scaling <sup>p</sup>                | ±0 %          | R           | √3   | 1                    | 1                     | ±0.0 %         | ±0.0 %          | ∞                                  |
| <b>Phantom and Setup</b>                  |               |             |      |                      |                       |                |                 |                                    |
| Phantom Uncertainty                       | ±6.6 %        | R           | √3   | 1                    | 1                     | ±3.8 %         | ±3.8 %          | ∞                                  |
| SAR correction                            | ±1.9 %        | R           | √3   | 1                    | 0.84                  | ±1.1 %         | ±0.9 %          | ∞                                  |
| Liquid Conductivity (mea.) <sup>DAK</sup> | ±2.5 %        | R           | √3   | 0.78                 | 0.71                  | ±1.1 %         | ±1.0 %          | ∞                                  |
| Liquid Permittivity (mea.) <sup>DAK</sup> | ±2.5 %        | R           | √3   | 0.26                 | 0.26                  | ±0.3 %         | ±0.4 %          | ∞                                  |
| Temp. unc. - Conductivity <sup>BB</sup>   | ±3.4 %        | R           | √3   | 0.78                 | 0.71                  | ±1.5 %         | ±1.4 %          | ∞                                  |
| Temp. unc. - Permittivity <sup>BB</sup>   | ±0.4 %        | R           | √3   | 0.23                 | 0.26                  | ±0.1 %         | ±0.1 %          | ∞                                  |
| Combined Std. Uncertainty                 |               |             |      |                      |                       | ±12.3 %        | ±12.2 %         | 748                                |
| Expanded STD Uncertainty                  |               |             |      |                      |                       | ±24.6 %        | ±24.5 %         |                                    |

## 8 TEST EQUIPMENTS

The measurements were performed using an automated near-field scanning system, DASY5, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements was the 'advanced extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

| Test Equipment           | Model   | Serial Number | Calibration date | Calibration Due data |
|--------------------------|---------|---------------|------------------|----------------------|
| DAE                      | DAE4    | 720           | 2020.09.30       | 2021.09.29           |
| Dosimetric E-field Probe | EX3DV4  | 3708          | 2020.10.30       | 2021.10.29           |
| Dipole Validation Kit    | D750V3  | 1101          | 2020.10.16       | 2021.10.15           |
| Dipole Validation Kit    | D835V2  | 4d023         | 2020.10.16       | 2021.10.15           |
| Dipole Validation Kit    | D900V2  | 171           | 2020.09.17       | 2023.09.16           |
| Dipole Validation Kit    | D1800V2 | 2d084         | 2020.09.18       | 2021.09.17           |
| Dipole Validation Kit    | D2000V2 | 1009          | 2020.10.14       | 2021.10.13           |
| Dipole Validation Kit    | D2450V2 | 738           | 2020.10.13       | 2021.10.12           |
| Dipole Validation Kit    | D2600V2 | 1166          | 2019.11.08       | 2022.11.07           |
| Dipole Validation Kit    | D5GHzV2 | 1079          | 2020.10.10       | 2023.10.09           |

Additional test equipment used in testing:

| Test Equipment             | Model    | Serial Number | Calibration date | Calibration Due data |
|----------------------------|----------|---------------|------------------|----------------------|
| Signal Generator           | E4428C   | MY45280865    | 2021.08.20       | 2022.08.19           |
| Signal Generator           | SML 03   | 103514        | 2021.08.20       | 2022.08.19           |
| Power meter                | E4417A   | MY45101182    | 2021.08.20       | 2022.08.19           |
| Power meter                | E4417A   | MY45101004    | 2021.08.20       | 2022.08.19           |
| Power Sensor               | E4412A   | MY41502214    | 2021.08.20       | 2022.08.19           |
| Power Sensor               | E4412A   | MY41502130    | 2021.08.20       | 2022.08.19           |
| Power Sensor               | E9300B   | MY41496001    | 2021.08.20       | 2022.08.19           |
| Power Sensor               | E9300B   | MY41496003    | 2021.08.20       | 2022.08.19           |
| Communication Tester       | E5515C   | MY48367401    | 2021.08.20       | 2022.08.19           |
| Communication Tester       | CMW500   | 161702        | 2021.08.20       | 2022.08.19           |
| Communication Tester       | MT8820C  | 6201300660    | 2021.08.20       | 2022.08.19           |
| Communication Tester       | MT8821C  | 6201547819    | 2021.08.20       | 2022.08.19           |
| Vector Network Analyzer    | VNA R140 | 0011213       | 2020.09.18       | 2021.09.17           |
| Dielectric Parameter Probe | DAKS-3.5 | 1042          | 2020.09.17       | 2021.09.16           |
| Vector Network Analyzer    | E5071C   | MY43030474    | 2021.08.20       | 2022.08.19           |
| Calibration Kit            | 85054D   | MY39200751    | 2021.08.20       | 2022.08.19           |

#### Detailed information of Isotropic E-field Probe Type EX3DV4

|                           |                                                                                                                                                                                                               |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction              | Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)                                                         |
| Calibration               | Calibration certificate in Appendix C                                                                                                                                                                         |
| Frequency                 | 10 MHz to > 6 GHz<br>Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)                                                                                                                                                |
| Optical Surface Detection | $\pm 0.3$ mm repeatability in air and clear liquids over diffuse reflecting surfaces                                                                                                                          |
| Dimensions                | Overall length: 337 mm (Tip: 20 mm)<br>Tip diameter: 2.5 mm (Body: 12 mm)<br>Typical distance from probe tip to dipole centers: 1 mm                                                                          |
| Dynamic Range             | 10 $\mu$ W/g to > 100 W/kg<br>Linearity: $\pm 0.2$ dB (noise: typically < 1 $\mu$ W/g)                                                                                                                        |
| Application               | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%. |

According to KDB 865664 D01 section 3.2.2, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the **SAR target, impedance and return loss** of a dipole have remain stable according to the following requirements.

- 1) The test laboratory must ensure that the required supporting information and documentation are included in the SAR report to qualify for the three-year extended calibration interval; otherwise, the IEEE Std 1528-2013 recommended annual calibration applies.
- 2) Immediate re-calibration is required for the following conditions.
  - a) After a dipole is damaged and properly repaired to meet required specifications.
  - b) When the measured SAR deviates from the calibrated SAR value by more than 10% due to changes in physical, mechanical, electrical or other relevant dipole conditions; i.e., the error is not introduced by incorrect measurement procedures or other issues relating to the SAR measurement system.
  - c) When the most recent return-loss result, measured at least annually, deviates by more than 20% from the previous measurement (i.e. value in dB $\times$ 0.2) or not meeting the required 20 dB minimum return-loss requirement.
  - d) When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by more than 5  $\Omega$  from the previous measurement

## Dipole

### SAR target

Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

### Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance deviates within 5  $\Omega$  from the previous measurement. (Data from the last calibration report)

The most recent return-loss result deviates within 20% from the previous measurement. (Data from the last calibration report)

| Dipole450 TSL Parameters |                               |                               |
|--------------------------|-------------------------------|-------------------------------|
| Parameters               | Measured data                 | Target (Ref. Value)           |
| Impedance                | 59.1 $\Omega$ +0.06j $\Omega$ | 55.5 $\Omega$ +6.40j $\Omega$ |
| Return loss              | -21.6 dB                      | -21.9 dB                      |

| Dipole750 TSL Parameters |                               |                               |
|--------------------------|-------------------------------|-------------------------------|
| Parameters               | Measured data                 | Target (Ref. Value)           |
| Impedance                | 53.8 $\Omega$ -4.02j $\Omega$ | 53.7 $\Omega$ -1.63j $\Omega$ |
| Return loss              | -25.5 dB                      | -28.2dB                       |

| Dipole835 TSL Parameters |                               |                               |
|--------------------------|-------------------------------|-------------------------------|
| Parameters               | Measured data                 | Target (Ref. Value)           |
| Impedance                | 54.5 $\Omega$ -6.16j $\Omega$ | 52.6 $\Omega$ -2.37j $\Omega$ |
| Return loss              | -34.1 dB                      | -29.3dB                       |

| Dipole900 TSL Parameters |                               |                               |
|--------------------------|-------------------------------|-------------------------------|
| Parameters               | Measured data                 | Target (Ref. Value)           |
| Impedance                | 53.0 $\Omega$ -5.24j $\Omega$ | 49.1 $\Omega$ -6.69j $\Omega$ |
| Return loss              | -23.2 dB                      | -23.4dB                       |

| Dipole1450 TSL Parameters |                               |                               |
|---------------------------|-------------------------------|-------------------------------|
| Parameters                | Measured data                 | Target (Ref. Value)           |
| Impedance                 | 54.7 $\Omega$ +3.95j $\Omega$ | 52.4 $\Omega$ -1.35j $\Omega$ |
| Return loss               | -33.1 dB                      | -31.5dB                       |

| Dipole1800 TSL Parameters |                               |                               |
|---------------------------|-------------------------------|-------------------------------|
| Parameters                | Measured data                 | Target (Ref. Value)           |
| Impedance                 | 44.2 $\Omega$ +5.06j $\Omega$ | 48.9 $\Omega$ -2.71j $\Omega$ |
| Return loss               | -31.8 dB                      | -30.6dB                       |

| Dipole2000 TSL Parameters |               |                     |
|---------------------------|---------------|---------------------|
| Parameters                | Measured data | Target (Ref. Value) |
| Impedance                 | 51.9Ω-3.37jΩ  | 49.4Ω-2.46jΩ        |
| Return loss               | -28.4 dB      | -31.9dB             |

| Dipole2450 TSL Parameters |               |                     |
|---------------------------|---------------|---------------------|
| Parameters                | Measured data | Target (Ref. Value) |
| Impedance                 | 53.2Ω-9.98jΩ  | 53.3Ω+6.38jΩ        |
| Return loss               | -19.9 dB      | -23.1dB             |

| Dipole2600 TSL Parameters |               |                     |
|---------------------------|---------------|---------------------|
| Parameters                | Measured data | Target (Ref. Value) |
| Impedance                 | 50.4Ω+6.71jΩ  | 47.9Ω-7.80jΩ        |
| Return loss               | -23.5 dB      | -21.7dB             |

| Dipole3500 TSL Parameters |               |                     |
|---------------------------|---------------|---------------------|
| Parameters                | Measured data | Target (Ref. Value) |
| Impedance                 | 53.3Ω-10.48jΩ | 52.6Ω+3.5jΩ         |
| Return loss               | -29.5 dB      | -27.4dB             |

| Dipole3700 TSL Parameters |               |                     |
|---------------------------|---------------|---------------------|
| Parameters                | Measured data | Target (Ref. Value) |
| Impedance                 | 46.0Ω+6.99jΩ  | 48.3Ω+1.1jΩ         |
| Return loss               | -34.5 dB      | -33.6dB             |

| Dipole3900 TSL Parameters (3900MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 51.8Ω-11.48jΩ | 48.3Ω-4.9jΩ         |
| Return loss                         | -28.7 dB      | -25.6dB             |

| Dipole3900 TSL Parameters (4100MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 51.6Ω+9.70jΩ  | 59.0Ω-0.8jΩ         |
| Return loss                         | -17.1 dB      | -21.6dB             |

| Dipole4200 TSL Parameters |               |                     |
|---------------------------|---------------|---------------------|
| Parameters                | Measured data | Target (Ref. Value) |
| Impedance                 | 43.9Ω+1.52jΩ  | 48.3Ω+1.10jΩ        |

|             |          |         |
|-------------|----------|---------|
| Return loss | -33.5 dB | -33.6dB |
|-------------|----------|---------|

| Dipole4600 TSL Parameters (4500MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 46.0Ω-1.14jΩ  | 46.4Ω-4.5jΩ         |
| Return loss                         | -27.2 dB      | -24.5dB             |

| Dipole4600 TSL Parameters (4600MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 49.0Ω-7.87jΩ  | 51.8Ω-6.35jΩ        |
| Return loss                         | -20.7 dB      | -23.8dB             |

| Dipole4600 TSL Parameters (4700MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 55.0Ω+0.91jΩ  | 55.9Ω-3.20jΩ        |
| Return loss                         | -26.2 dB      | -24.0dB             |

| Dipole4900 TSL Parameters |               |                     |
|---------------------------|---------------|---------------------|
| Parameters                | Measured data | Target (Ref. Value) |
| Impedance                 | 45.8Ω-1.40jΩ  | 50.6Ω-5.2jΩ         |
| Return loss               | -26.7 dB      | -25.7dB             |

| Dipole5GHz TSL Parameters (5200MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 51.2Ω+13.89jΩ | 50.2Ω-10.0jΩ        |
| Return loss                         | -17.0 dB      | -20.0dB             |

| Dipole5GHz TSL Parameters (5300MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 52.0Ω-11.40jΩ | 47.2Ω-7.33jΩ        |
| Return loss                         | -18.4 dB      | -21.9dB             |

| Dipole5GHz TSL Parameters (5500MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 51.6Ω+6.61jΩ  | 52.0Ω-7.96jΩ        |
| Return loss                         | -18.6 dB      | -21.9dB             |

| Dipole5GHz TSL Parameters (5600MHz) |  |  |
|-------------------------------------|--|--|
|-------------------------------------|--|--|

| Parameters  | Measured data | Target (Ref. Value) |
|-------------|---------------|---------------------|
| Impedance   | 53.6Ω+7.31jΩ  | 55.7Ω-3.78jΩ        |
| Return loss | -22.1 dB      | -23.8dB             |

| Dipole5GHz TSL Parameters (5800MHz) |               |                     |
|-------------------------------------|---------------|---------------------|
| Parameters                          | Measured data | Target (Ref. Value) |
| Impedance                           | 51.6Ω-5.96jΩ  | 53.7Ω-5.87jΩ        |
| Return loss                         | -19.0 dB      | -23.5dB             |