



## FCC SAR Compliance Test Report

**Product Name:** HUAWEI MediaPad T1 10

**Model:** T1-A22L

**Report No.:** SYBH(Z-SAR)017092015-2

**FCC ID:** QIST1-A22L

|      | APPROVED<br>(Lab Manager) | PREPARED<br>(Test Engineer) |
|------|---------------------------|-----------------------------|
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| DATE | 2015-11-10                | 2015-11-10                  |

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※ ※ **Modified History** ※ ※

| REV.    | DESCRIPTION                 | ISSUED<br>DATE | REMARK |
|---------|-----------------------------|----------------|--------|
| Rev.1.0 | Initial Test Report Release | 2015-11-10     | Li Wei |
|         |                             |                |        |
|         |                             |                |        |
|         |                             |                |        |
|         |                             |                |        |

# 1 General Information

## 1.1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for T1-A22L is as below Table 1.

| Band                                                                     | Position        | Max Reported 1-g SAR SAR(W/kg) |
|--------------------------------------------------------------------------|-----------------|--------------------------------|
| GSM850                                                                   | Top side(0mm)   | 1.11                           |
| GSM1900                                                                  | Back side(0mm)  | 1.10                           |
| UMTS Band II                                                             | Back side(0mm)  | 1.32                           |
| UMTS Band IV                                                             | Back side(0mm)  | 1.23                           |
| UMTS Band V                                                              | Top side(0mm)   | 0.69                           |
| LTE Band II                                                              | Back side(16mm) | 1.27                           |
| LTE Band IV                                                              | Back side(0mm)  | 1.36                           |
| LTE Band V                                                               | Top side(0mm)   | 1.14                           |
| LTE Band VII                                                             | Back side(0mm)  | 1.01                           |
| LTE Band XVII                                                            | Back side(0mm)  | <b>1.42</b>                    |
| LTE Band XXVI                                                            | Top side(0mm)   | 1.19                           |
| WiFi 2.4G                                                                | Back side(0mm)  | 1.20                           |
| WiFi 5G                                                                  | Back side(0mm)  | 1.20                           |
| <b>The highest simultaneous SAR value is 1.59 W/kg per KDB690783 D01</b> |                 |                                |

Table 1:Summary of test result

Note:

The device is in compliance with Specific Absorption Rate(SAR)for general population/uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI/IEEE C95.1:1992, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013

## 1.2 RF exposure limits

| Human Exposure                                         | Uncontrolled Environment<br>General Population | Controlled Environment<br>Occupational |
|--------------------------------------------------------|------------------------------------------------|----------------------------------------|
| <b>Spatial Peak SAR*</b><br>(Brain/Body/Arms/Legs)     | <b>1.60 W/kg</b>                               | 8.00 W/kg                              |
| <b>Spatial Average SAR**</b><br>(Whole Body)           | 0.08 W/kg                                      | 0.40 W/kg                              |
| <b>Spatial Peak SAR***</b><br>(Hands/Feet/Ankle/Wrist) | 4.00 W/kg                                      | 20.00 W/kg                             |

Table 2: RF exposure limits

The limit applied in this test report is shown in **bold** letters

### Notes:

- \* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
- \*\* The Spatial Average value of the SAR averaged over the whole body.
- \*\*\* The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

**Uncontrolled Environments** are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

**Controlled Environments** are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

### 1.3 EUT Description

| Device Information:              |                                                                                                     |                                                  |            |
|----------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|------------|
| Product Name:                    | HUAWEI MediaPad T1 10                                                                               |                                                  |            |
| Model:                           | T1-A22L                                                                                             |                                                  |            |
| FCC ID :                         | QIST1-A22L                                                                                          |                                                  |            |
| IMEI:                            | 868492020004073                                                                                     |                                                  |            |
| Device Type :                    | Portable device                                                                                     |                                                  |            |
| Device Phase:                    | Identical Prototype                                                                                 |                                                  |            |
| Exposure Category:               | Uncontrolled environment / general population                                                       |                                                  |            |
| Hardware Version :               | SH1T1A21LM                                                                                          |                                                  |            |
| Software Version :               | T1-A22LV100R001C001                                                                                 |                                                  |            |
| Antenna Type :                   | Internal antenna                                                                                    |                                                  |            |
| Device Operating Configurations: |                                                                                                     |                                                  |            |
| Supporting Mode(s)               | GSM850/1900, UMTS Band II/IV/V, LTE Band II/IV/V/VII/XVII/ XXVI, WiFi 2.4G/5G(Tested); BT(Untested) |                                                  |            |
| Test Modulation                  | GSM(GMSK/8PSK),UMTS(QPSK),CDMA(QPSK),LTE(QPSK/16QAM), WiFi(DSSS/OFDM),BT(GFSK)                      |                                                  |            |
| Device Class                     | B                                                                                                   |                                                  |            |
| Operating Frequency Range(s)     | Band                                                                                                | Tx (MHz)                                         | Rx (MHz)   |
|                                  | GSM850                                                                                              | 824-849                                          | 869-894    |
|                                  | GSM1900                                                                                             | 1850-1910                                        | 1930-1990  |
|                                  | UMTS Band II                                                                                        | 1850-1910                                        | 1930-1990  |
|                                  | UMTS Band IV                                                                                        | 1710-1755                                        | 2110-2155  |
|                                  | UMTS Band V                                                                                         | 824-849                                          | 869-894    |
|                                  | LTE Band II                                                                                         | 1850 -1910                                       | 1930 -1990 |
|                                  | LTE Band IV                                                                                         | 1710 -1755                                       | 2110 -2155 |
|                                  | LTE Band V                                                                                          | 824-849                                          | 869-894    |
|                                  | LTE Band VII                                                                                        | 2500-2570                                        | 2620-2690  |
|                                  | LTE Band XVII                                                                                       | 704-716                                          | 734-746    |
|                                  | LTE Band XXVI                                                                                       | 814-849                                          | 859-894    |
|                                  | BT                                                                                                  | 2402-2480                                        |            |
|                                  | WiFi 2.4G                                                                                           | 2412-2462                                        |            |
|                                  | WiFi 5G                                                                                             | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 |            |
| GPRS Multislot Class(12)         | Max Number of Timeslots in Uplink:                                                                  | 4                                                |            |
|                                  | Max Number of Timeslots in Downlink:                                                                | 4                                                |            |
|                                  | Max Total Timeslot:                                                                                 | 5                                                |            |
| EGPRS Multislot Class(12)        | Max Number of Timeslots in Uplink:                                                                  | 4                                                |            |
|                                  | Max Number of Timeslots in Downlink:                                                                | 4                                                |            |
|                                  | Max Total Timeslot:                                                                                 | 5                                                |            |
| HSDPA UE Category                | 14                                                                                                  |                                                  |            |
| HSUPA UE Category                | 6                                                                                                   |                                                  |            |
| DC-HSDPA UE Category             | 24                                                                                                  |                                                  |            |

|                               |                                                                                                             |
|-------------------------------|-------------------------------------------------------------------------------------------------------------|
| Power Class:                  | 4, tested with power level 5(GSM850)                                                                        |
|                               | 1, tested with power level 0(GSM1900)                                                                       |
|                               | 3, tested with power control "all 1"(UMTS Band II)                                                          |
|                               | 3, tested with power control "all 1"(UMTS Band IV)                                                          |
|                               | 3, tested with power control "all 1"(UMTS Band V)                                                           |
|                               | 3, tested with power control all Max.(LTE Band II)                                                          |
|                               | 3, tested with power control all Max.(LTE Band IV)                                                          |
|                               | 3, tested with power control all Max.(LTE Band V)                                                           |
|                               | 3, tested with power control all Max.(LTE Band VII)                                                         |
|                               | 3, tested with power control all Max.(LTE Band XVII)                                                        |
|                               | 3, tested with power control all Max.(LTE Band XXVI)                                                        |
| Test Channels (low-mid-high): | 128-190-251(GSM850)                                                                                         |
|                               | 512-661-810(GSM1900)                                                                                        |
|                               | 9262-9400-9538(UMTS Band II)                                                                                |
|                               | 1312-1413-1513(UMTS Band IV)                                                                                |
|                               | 4132-4182-4233(UMTS Band V)                                                                                 |
|                               | 18607-18900-19193(LTE Band II BW=1.4MHz)                                                                    |
|                               | 18615-18900-19185(LTE Band II BW=3MHz)                                                                      |
|                               | 18625-18900-19175(LTE Band II BW=5MHz)                                                                      |
|                               | 18650-18900-19150(LTE Band II BW=10MHz)                                                                     |
|                               | 18675-18900-19125(LTE Band II BW=15MHz)                                                                     |
|                               | 18700-18900-19100(LTE Band II BW=20MHz)                                                                     |
|                               | 19957-20175-20393(LTE Band IV BW=1.4MHz)                                                                    |
|                               | 19965-20175-20385(LTE Band IV BW=3MHz)                                                                      |
|                               | 19975-20175-20375(LTE Band IV BW=5MHz)                                                                      |
|                               | 20000-20175-20350(LTE Band IV BW=10MHz)                                                                     |
|                               | 20025-20175-20325(LTE Band IV BW=15MHz)                                                                     |
|                               | 20050-20175-20300(LTE Band IV BW=20MHz)                                                                     |
|                               | 20407-20525-20643(LTE Band V BW=1.4MHz)                                                                     |
|                               | 20415-20525-20635(LTE Band V BW=3MHz)                                                                       |
|                               | 20425-20525-20625(LTE Band V BW=5MHz)                                                                       |
|                               | 20450-20525-20600(LTE Band V BW=10MHz)                                                                      |
|                               | 20775-21100-21425(LTE Band VII BW=5MHz)                                                                     |
|                               | 20800-21100-21400(LTE Band VII BW=10MHz)                                                                    |
|                               | 20825-21100-21375(LTE Band VII BW=15MHz)                                                                    |
|                               | 20850-21100-21350(LTE Band VII BW=20MHz)                                                                    |
|                               | 23755-23790-23825(LTE Band XVII BW=5MHz)                                                                    |
|                               | 23780-23790-23800(LTE Band XVII BW=10MHz)                                                                   |
|                               | 26697-26865-27033(LTE Band XXVI BW=1.4MHz)                                                                  |
|                               | 26705-26865-27025(LTE Band XXVI BW=3MHz)                                                                    |
|                               | 26715-26865-27015(LTE Band XXVI BW=5MHz)                                                                    |
|                               | 26750-26865-26990(LTE Band XXVI BW=10MHz)                                                                   |
|                               | 26775-26865-26965(LTE Band XXVI BW=15MHz)                                                                   |
|                               | 802.11b/g/n 20M:1-6-11 (WiFi 2.4G)                                                                          |
|                               | 802.11a/n 20M: 36-40-44-48-52-56-60-64-100-104-108-112-116-120-124-128-132-136-140-149-153-157-161(WiFi 5G) |
|                               | 802.11 n 40M: 38-46-54-62-102-110-118-126-134-151-159(WiFi 5G)                                              |

Table 3: Device information and operating configuration

### 1.3.1 General Description

HUAWEI MediaPad T1 10 (MediaPad T1 10 for short) is a 9.6-inch tablet that incorporates a Qualcomm MSM8916 chip, and a 28 nm A53 quad-core at 1.2 GHz. With support for 4G and Wi-Fi data connections, MediaPad T1 10 provides users with unprecedented access to high-speed Internet services. With a light metal unibody and ultra-thin 8.3 mm design, MediaPad T1 10 weights about 433g grams.

#### Battery information:

| Name                   | Manufacture                      | Serials number | Description                                                                                                                                                                                                                                                                         |
|------------------------|----------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rechargeable<br>Li-ion | Huawei Technologies<br>Co., Ltd. | NA             | Battery Model: HB3080G1EBW<br>Rated capacity: 4800mAh<br>Nominal Voltage:  +3.8V<br>Charging Voltage:  +4.35V |

### 1.3.2 Power reduction specification

This device uses a proximity sensor that share the same metallic electrode as the transmitting antenna to facilitate triggering in typical user interactivity with the device.

Due to the operating configurations and exposure conditions required by the device, the proximity sensor is used to indicate when the tablet is held close to a user's body exposure condition. It utilizes the proximity sensor to reduce the output power in specific wireless and operating modes of main antenna to ensure SAR compliance. The procedures in KDB 616217D04 are applied (Refer to Section 6.1 for details).

The following tables summarize the key power reduction information:

| Band     | Sensor Trigger Distance             | Full Power Level (dBm) | Reduced power Level (dBm) | Power reduction (dB) |
|----------|-------------------------------------|------------------------|---------------------------|----------------------|
| GSM 850  | Back side: 17mm<br>Top side: 20mm   | 33.0                   | 30.5                      | 2.5                  |
| GSM 1900 | Back side: 17mm<br>Top side: 20mm   | 30.5                   | 21.5                      | 9.0                  |
| UMTS B2  | Back side: 17mm<br>Top side: 20mm   | 23.5                   | 14.0                      | 9.5                  |
| UMTS B4  | Back side: 17mm<br>Top side: 20mm   | 23.5                   | 14.0                      | 9.5                  |
| UMTS B5  | Back side: 17mm<br>Top side: 20mm   | 24.0                   | 21.0                      | 3.0                  |
| LTE B2   | Back side: 17mm<br>Top side: 20mm   | 23.0                   | 14.0                      | 9.0                  |
| LTE B4   | Back side: 17mm<br>Top side: 20mm   | 23.0                   | 14.5                      | 8.5                  |
| LTE B5   | b Back side: 17mm<br>Top side: 20mm | 23.5                   | 22.5                      | 1.0                  |
| LTE B7   | Back side: 17mm<br>Top side: 20mm   | 23.0                   | 14.5                      | 8.5                  |
| LTE B17  | Back side: 17mm<br>Top side: 20mm   | 24.0                   | 23.0                      | 1.0                  |

Note:

1) Since the capacitive proximity sensor triggering distance for the back side is 17mm , a conservative distance of 16mm was tested for SAR at maximum power level per KDB616217§6.2.

2) Since the capacitive proximity sensor triggering distance for the Top side is 20mm , a conservative distance of 19mm was tested for SAR at maximum power level per KDB616217§6.2.

The detailed full power and reduced tune-up specifications and conducted power measurement results are provided in Section 7 of this report.

3) The capacitive proximity sensor does not trigger power reduction for the other edges or frequency bands of the device.

#### 1.4 Test specification(s)

|                    |                                                                                                                                                                             |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANSI C95.1:1992    | Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.( IEEE Std C95.1-1991)                                              |
| IEEE Std 1528-2013 | Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques |
| RSS-102            | Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands (Issue 5 of March 2015)                                                            |
| KDB941225 D01      | 3G SAR Procedures v03r01                                                                                                                                                    |
| KDB941225 D05      | SAR for LTE Devices v02r04                                                                                                                                                  |
| KDB447498 D01      | General RF Exposure Guidance v06                                                                                                                                            |
| KDB616217 D04      | SAR for laptop and tablets v01r02                                                                                                                                           |
| KDB248227 D01      | SAR Guidance for IEEE 802.11 Wi-Fi SAR v02r02                                                                                                                               |
| KDB865664 D01      | SAR measurement 100 MHz to 6 GHz v01r04                                                                                                                                     |
| KDB865664 D02      | SAR Reporting v01r02                                                                                                                                                        |
| KDB690783 D01      | SAR Listings on Grants v01r03                                                                                                                                               |

#### 1.5 Testing laboratory

|                        |                                                                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site              | The Reliability Laboratory of Huawei Technologies Co., Ltd.                                                                                      |
| Test Location          | Zone G1,Huawei Industrial Base, Bantian Industry Area, Longgang District, Shenzhen, Guangdong, China                                             |
| Telephone              | +86 755 28780808                                                                                                                                 |
| Fax                    | +86 755 89652518                                                                                                                                 |
| State of accreditation | The Test laboratory (area of testing) is accredited according to ISO/IEC 17025.<br>CNAS Registration number: L0310<br>A2LA TESTING CERT #2174.01 |

#### 1.6 Applicant and Manufacturer

|              |                                                                                                                             |
|--------------|-----------------------------------------------------------------------------------------------------------------------------|
| Company Name | HUAWEI TECHNOLOGIES CO., LTD                                                                                                |
| Address      | Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C |

#### 1.7 Application details

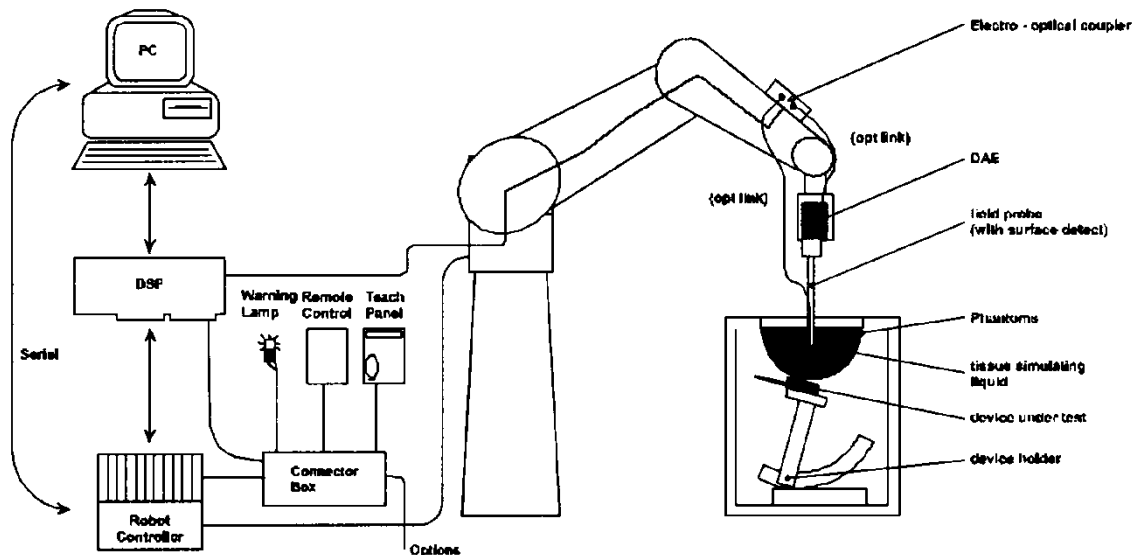
|                    |            |
|--------------------|------------|
| Start Date of test | 2015-09-16 |
| End Date of test   | 2015-10-22 |

#### 1.8 Ambient Condition

|                     |             |
|---------------------|-------------|
| Ambient temperature | 20°C – 24°C |
| Relative Humidity   | 30% – 70%   |

## 2 SAR Measurement System

### 2.1 SAR Measurement Set-up



The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
- The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 7.
- DASY5 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System check dipoles allowing to validate the proper functioning of the system.

## 2.2 Test environment

The DASY5 measurement system is placed at the head end of a room with dimensions: 5 x 2.5 x 3 m<sup>3</sup>, the SAM phantom is placed in a distance of 75 cm from the side walls and 1.1m from the rear wall. Above the test system a 1.5 x 1.5 m<sup>2</sup> array of pyramid absorbers is installed to reduce reflections from the ceiling.

Picture 1 of the photo documentation shows a complete view of the test environment.

The system allows the measurement of SAR values larger than 0.005 mW/g.

## 2.3 Data Acquisition Electronics description

The data acquisition electronics (DAE) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

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

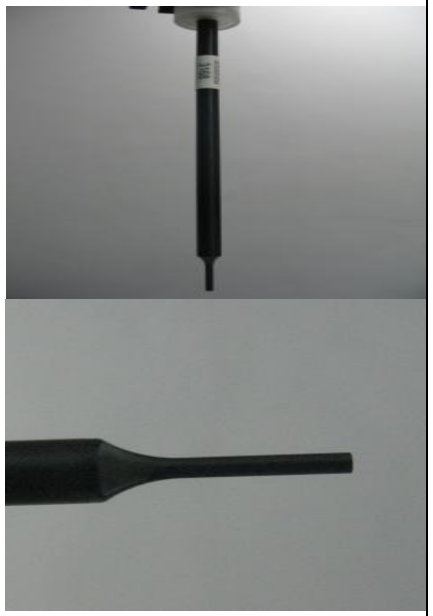
### DAE4

|                       |                          |                                                                                      |
|-----------------------|--------------------------|--------------------------------------------------------------------------------------|
| Input Impedance       | 200MOhm                  |  |
| The Inputs            | symmetrical and floating |                                                                                      |
| Common mode rejection | above 80 dB              |                                                                                      |

## 2.4 Probe description

These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor ( $\pm 2$  dB). The dosimetric probes have special calibrations in various liquids at different frequencies.

### Isotropic E-Field Probe ES3DV3 for Dosimetric Measurements

|               |                                                                                                                                                                                    |                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Construction  | Symmetrical design with triangular core<br>Interleaved sensors<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |  |
| Calibration   | ISO/IEC 17025 calibration service available.                                                                                                                                       |                                                                                      |
| Frequency     | 10 MHz to 4 GHz; Linearity: $\pm 0.2$ dB (30 MHz to 4 GHz)                                                                                                                         |                                                                                      |
| Directivity   | $\pm 0.2$ dB in HSL (rotation around probe axis)<br>$\pm 0.3$ dB in tissue material (rotation normal to probe axis)                                                                |                                                                                      |
| Dynamic range | 5 $\mu$ W/g to > 100 mW/g; Linearity: $\pm 0.2$ dB                                                                                                                                 |                                                                                      |
| Dimensions    | Overall length: 337 mm (Tip: 20 mm)<br>Tip diameter: 3.9 mm (Body: 12 mm)<br>Distance from probe tip to dipole centers: 2.0 mm                                                     |                                                                                      |
| Application   | General dosimetry up to 4 GHz<br>Dosimetry in strong gradient fields<br>Compliance tests of mobile phones                                                                          |                                                                                      |

### Isotropic E-Field Probe EX3DV4 for Dosimetric Measurements

|               |                                                                                                                                                                                                           |                                                                                       |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Construction  | Symmetrical design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE)                                               |  |
| Calibration   | ISO/IEC 17025 calibration service available.                                                                                                                                                              |                                                                                       |
| Frequency     | 10 MHz to >6 GHz; Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)                                                                                                                                               |                                                                                       |
| Directivity   | $\pm 0.3$ dB in HSL (rotation around probe axis)<br>$\pm 0.5$ dB in tissue material (rotation normal to probe axis)                                                                                       |                                                                                       |
| Dynamic range | 10 $\mu$ W/g to > 100 mW/g;<br>Linearity: $\pm 0.2$ dB (noise: typically < 1 $\mu$ W/g)                                                                                                                   |                                                                                       |
| 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                                                                      |                                                                                       |
| Application   | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30% |                                                                                       |

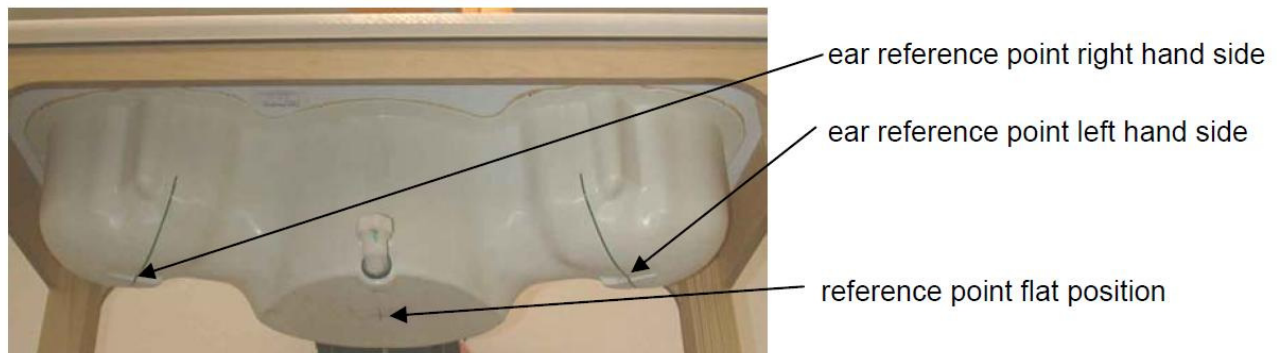
## 2.5 Phantom description

### SAM Twin Phantom

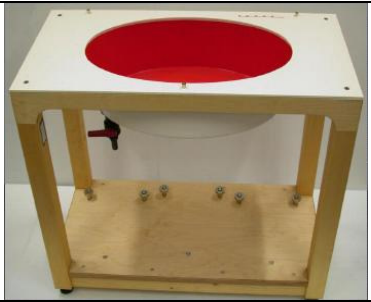
|                   |                                                        |                                                                                     |
|-------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|
| Shell Thickness   | 2mm±0.2mm;The ear region:6.0±0.2mm                     |  |
| Filling Volume    | Approximately 25 liters                                |                                                                                     |
| Dimensions        | Length:1000mm; Width:500mm;<br>Height: adjustable feet |                                                                                     |
| Measurement Areas | Left hand<br>Right hand<br>Flat phantom                |                                                                                     |

The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.  
A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on top of this phantom cover are possible. Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.

The following figure shows the definition of reference point:



### ELI4 Phantom

|                   |                                     |                                                                                       |
|-------------------|-------------------------------------|---------------------------------------------------------------------------------------|
| Shell Thickness   | 2mm±0.2mm                           |  |
| Filling Volume    | Approximately 30 liters             |                                                                                       |
| Dimensions        | Major axis:600mm; Minor axis:400mm; |                                                                                       |
| Measurement Areas | Flat phantom                        |                                                                                       |

The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209-2 and all known tissue simulating liquids.

The phantom shell material is resistant to all ingredients used in the tissue-equivalent liquid recipes. The shell of the phantom including ear spacers is constructed from low permittivity and low loss material, with a relative permittivity  $2 \leq \epsilon_r \leq 5$  at  $\leq 3$  GHz,  $3 \leq \epsilon_r \leq 4$  at  $> 3$  GHz and a loss tangent  $\leq 0.05$ .

## 2.6 Device holder description

The DASY5 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of  $65^\circ$ . The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA's only. If necessary an additional support of polystyrene material is used.



The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity  $\epsilon = 3$  and loss tangent  $\sigma = 0.02$ . The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

The device holder permits the device to be positioned with a tolerance of  $\pm 1^\circ$  in the tilt angle.

Larger DUT's (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values.

Therefore those devices are normally only tested at the flat part of the SAM.

## 2.7 Test Equipment List

This table gives a complete overview of the SAR measurement equipment.

Devices used during the test described are marked ☒

|                                     | Manufacturer  | Device                               | Type     | Serial number | Date of last calibration | Valid period |
|-------------------------------------|---------------|--------------------------------------|----------|---------------|--------------------------|--------------|
| <input checked="" type="checkbox"/> | SPEAG         | Dosimetric E-Field Probe             | EX3DV4   | 3744          | 2015-07-24               | One year     |
| <input checked="" type="checkbox"/> | SPEAG         | Dosimetric E-Field Probe             | EX3DV4   | 7350          | 2015-01-08               | One year     |
| <input checked="" type="checkbox"/> | SPEAG         | 750MHz Dipole                        | D750V3   | 1044          | 2015-09-14               | Three years  |
| <input checked="" type="checkbox"/> | SPEAG         | 835MHz Dipole                        | D835V2   | 4d059         | 2013-05-02               | Three years  |
| <input checked="" type="checkbox"/> | SPEAG         | 1750MHz Dipole                       | D1750V2  | 1123          | 2014-07-08               | Three years  |
| <input checked="" type="checkbox"/> | SPEAG         | 1900MHz Dipole                       | D1900V2  | 5d143         | 2014-09-23               | Three years  |
| <input type="checkbox"/>            | SPEAG         | 2300MHz Dipole                       | D2300V2  | 1016          | 2014-11-19               | Three years  |
| <input checked="" type="checkbox"/> | SPEAG         | 2450MHz Dipole                       | D2450V2  | 860           | 2014-11-19               | Three years  |
| <input checked="" type="checkbox"/> | SPEAG         | 2600MHz Dipole                       | D2600V2  | 1021          | 2015-07-24               | Three years  |
| <input checked="" type="checkbox"/> | SPEAG         | 5GHz Dipole                          | D5GHzV2  | 1155          | 2015-04-27               | Three years  |
| <input checked="" type="checkbox"/> | SPEAG         | Data acquisition electronics         | DAE4     | 1236          | 2014-11-13               | One year     |
| <input type="checkbox"/>            | SPEAG         | Data acquisition electronics         | DAE4     | 852           | 2015-04-27               | One year     |
| <input checked="" type="checkbox"/> | SPEAG         | Software                             | DASY 5   | N/A           | NCR                      | NCR          |
| <input type="checkbox"/>            | SPEAG         | Twin Phantom                         | SAM1     | TP-1475       | NCR                      | NCR          |
| <input type="checkbox"/>            | SPEAG         | Twin Phantom                         | SAM2     | TP-1474       | NCR                      | NCR          |
| <input type="checkbox"/>            | SPEAG         | Twin Phantom                         | SAM3     | TP-1597       | NCR                      | NCR          |
| <input type="checkbox"/>            | SPEAG         | Twin Phantom                         | SAM4     | TP-1620       | NCR                      | NCR          |
| <input type="checkbox"/>            | SPEAG         | Flat Phantom                         | ELI 4.0  | TP-1038       | NCR                      | NCR          |
| <input checked="" type="checkbox"/> | SPEAG         | Flat Phantom                         | ELI 4.0  | TP-1111       | NCR                      | NCR          |
| <input checked="" type="checkbox"/> | R & S         | Universal Radio Communication Tester | CMU 200  | 113989        | 2015-05-18               | One year     |
| <input checked="" type="checkbox"/> | R & S         | Universal Radio Communication Tester | CMW 500  | 126855        | 2015-07-02               | One year     |
| <input checked="" type="checkbox"/> | Agilent       | Network Analyser                     | E5071C   | MY46213349    | 2015-02-13               | One year     |
| <input checked="" type="checkbox"/> | Agilent       | Dielectric Probe Kit                 | 85070E   | 2484          | NCR                      | NCR          |
| <input checked="" type="checkbox"/> | Agilent       | Signal Generator                     | N5181A   | MY47420989    | 2015-01-07               | One year     |
| <input checked="" type="checkbox"/> | MINI-CIRCUITS | Amplifier                            | ZHL-42W  | QA1402001     | NCR                      | NCR          |
| <input checked="" type="checkbox"/> | MINI-CIRCUITS | Amplifier                            | ZVE-8G+  | N523101139    | NCR                      | NCR          |
| <input checked="" type="checkbox"/> | AR            | Directional Coupler                  | DC7144M1 | 0423264       | 2015-03-31               | One year     |
| <input checked="" type="checkbox"/> | Agilent       | Dual Directional Coupler             | 772D     | MY52180173    | 2015-01-08               | One year     |
| <input checked="" type="checkbox"/> | R & S         | Power Meter                          | NRP      | 100740        | 2015-07-02               | One year     |
| <input checked="" type="checkbox"/> | R & S         | Power Meter Sensor                   | NRP-Z11  | 106288        | 2015-07-02               | One year     |
| <input checked="" type="checkbox"/> | Agilent       | Power Meter                          | E4417A   | MY45101339    | 2015-01-07               | One year     |
| <input checked="" type="checkbox"/> | Agilent       | Power Meter Sensor                   | E9321A   | MY44420359    | 2015-01-07               | One year     |

Note:

1) Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

- There is no physical damage on the dipole;
- System check with specific dipole is within 10% of calibrated value;
- The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.
- The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

### 3 SAR Measurement Procedure

#### 3.1 Scanning procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and system check. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. +/- 5 %.
- The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above  $\pm 0.1\text{mm}$ ). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within  $\pm 30^\circ$ .)
- The “area scan” measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y- dimension ( $\leq 2\text{GHz}$ ), 12 mm in x- and y- dimension (2-4 GHz) and 10mm in x- and y- dimension (4-6GHz). If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation. Results of this coarse scan are shown in Appendix B.
- A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution:  $\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}} \leq 2\text{GHz} - \leq 8\text{mm}$ ,  $2-4\text{GHz} - \leq 5\text{ mm}$  and  $4-6\text{ GHz} - \leq 4\text{mm}$ ;  $\Delta z_{\text{zoom}} \leq 3\text{GHz} - \leq 5\text{ mm}$ ,  $3-4\text{ GHz} - \leq 4\text{mm}$  and  $4-6\text{GHz} - \leq 2\text{mm}$  where the robot additionally moves the probe along the z-axis away from the bottom of the Phantom. DASY is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in Appendix B. Test results relevant for the specified standard (see chapter 1.4.) are shown in table form in chapter 7.2.
- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2 mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth. A z-axis scan of the measurement with maximum SAR value is shown in Appendix B.

The following table summarizes the area scan and zoom scan resolutions per FCC KDB 865664D01:

| Frequency | Maximun Area Scan resolution<br>( $\Delta x_{\text{area}}, \Delta y_{\text{area}}$ ) | Maximun Zoom Scan spatial resolution<br>( $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$ ) | Maximun Zoom Scan spatial resolution |                               |                                     | Minimum zoom scan volume<br>(x,y,z) |
|-----------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------|-------------------------------------|-------------------------------------|
|           |                                                                                      |                                                                                              | Uniform Grid                         | Graded Grad                   |                                     |                                     |
|           |                                                                                      |                                                                                              | $\Delta z_{\text{Zoom}}(n)$          | $\Delta z_{\text{Zoom}}(1)^*$ | $\Delta z_{\text{Zoom}}(n>1)^*$     |                                     |
| ≤2GHz     | ≤15mm                                                                                | ≤8mm                                                                                         | ≤5mm                                 | ≤4mm                          | ≤1.5* $\Delta z_{\text{Zoom}}(n-1)$ | ≥30mm                               |
| 2-3GHz    | ≤12mm                                                                                | ≤5mm                                                                                         | ≤5mm                                 | ≤4mm                          | ≤1.5* $\Delta z_{\text{Zoom}}(n-1)$ | ≥30mm                               |
| 3-4GHz    | ≤12mm                                                                                | ≤5mm                                                                                         | ≤4mm                                 | ≤3mm                          | ≤1.5* $\Delta z_{\text{Zoom}}(n-1)$ | ≥28mm                               |
| 4-5GHz    | ≤10mm                                                                                | ≤4mm                                                                                         | ≤3mm                                 | ≤2.5mm                        | ≤1.5* $\Delta z_{\text{Zoom}}(n-1)$ | ≥25mm                               |
| 5-6GHz    | ≤10mm                                                                                | ≤4mm                                                                                         | ≤2mm                                 | ≤2mm                          | ≤1.5* $\Delta z_{\text{Zoom}}(n-1)$ | ≥22mm                               |

### 3.2 Spatial Peak SAR Evaluation

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 5 x 5 x 7 points( with 8mm horizontal resolution) or 7 x 7 x 7 points( with 5mm horizontal resolution) or 8 x 8 x 7 points( with 4mm horizontal resolution). The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting 'Graph Evaluated'.
- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.
- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

#### Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

#### Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff ].

#### Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

#### Advanced Extrapolation

DASY5 uses the advanced extrapolation option which is able to compensates boundary effects on E-field probes.

### 3.3 Data Storage and Evaluation

#### Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension "DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

#### Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

|                    |                           |                                         |
|--------------------|---------------------------|-----------------------------------------|
| Probe parameters:  | - Sensitivity             | $\text{Norm}_i, a_{i0}, a_{i1}, a_{i2}$ |
|                    | - Conversion factor       | $\text{ConvF}_i$                        |
|                    | - Diode compression point | $\text{Dcpi}$                           |
| Device parameters: | - Frequency               | $f$                                     |
|                    | - Crest factor            | $cf$                                    |
| Media parameters:  | - Conductivity            | $\sigma$                                |
|                    | - Density                 | $\rho$                                  |

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf/dcp_i$$

|      |         |                                                   |                  |
|------|---------|---------------------------------------------------|------------------|
| with | $V_i$   | = compensated signal of channel i                 | (i = x, y, z)    |
|      | $U_i$   | = input signal of channel i                       | (i = x, y, z)    |
|      | $cf$    | = crest factor of exciting field (DASY parameter) |                  |
|      | $dcp_i$ | = diode compression point                         | (DASY parameter) |

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:  $E_i = (V_i / \text{Norm}_i \cdot \text{ConvF})^{1/2}$   
H-field probes:  $H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2)/f$

with  $V_i$  = compensated signal of channel i (i = x, y, z)  
 $\text{Norm}_i$  = sensor sensitivity of channel i (i = x, y, z)  
[mV/(V/m)<sup>2</sup>] for E-field Probes  
ConvF = sensitivity enhancement in solution  
 $a_{ij}$  = sensor sensitivity factors for H-field probes  
f = carrier frequency [GHz]  
 $E_i$  = electric field strength of channel i in V/m  
 $H_i$  = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{\text{tot}} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$\text{SAR} = (E_{\text{tot}}^2 \cdot \sigma) / (\rho \cdot 1000)$$

with SAR = local specific absorption rate in mW/g  
 $E_{\text{tot}}$  = total field strength in V/m  
 $\sigma$  = conductivity in [mho/m] or [Siemens/m]  
 $\rho$  = equivalent tissue density in g/cm<sup>3</sup>

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{\text{pwe}} = E_{\text{tot}}^2 / 3770 \quad \text{or} \quad P_{\text{pwe}} = H_{\text{tot}}^2 \cdot 37.7$$

with  $P_{\text{pwe}}$  = equivalent power density of a plane wave in mW/cm<sup>2</sup>  
 $E_{\text{tot}}$  = total electric field strength in V/m  
 $H_{\text{tot}}$  = total magnetic field strength in A/m

## 4 System Verification Procedure

### 4.1 Tissue Verification

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within  $\pm 5\%$  of the target values.

The following materials are used for producing the tissue-equivalent materials.

| Ingredients (% of weight) | Head Tissue |       |       |        |       |      |        |
|---------------------------|-------------|-------|-------|--------|-------|------|--------|
| Frequency Band (MHz)      | 750         | 835   | 1750  | 1900   | 2300  | 2450 | 2600   |
| Water                     | 39.2        | 41.45 | 52.64 | 55.242 | 62.82 | 62.7 | 55.242 |
| Salt (NaCl)               | 2.7         | 1.45  | 0.36  | 0.306  | 0.51  | 0.5  | 0.306  |
| Sugar                     | 57.0        | 56.0  | 0.0   | 0.0    | 0.0   | 0.0  | 0.0    |
| HEC                       | 0.0         | 1.0   | 0.0   | 0.0    | 0.0   | 0.0  | 0.0    |
| Bactericide               | 0.0         | 0.1   | 0.0   | 0.0    | 0.0   | 0.0  | 0.0    |
| Triton X-100              | 0.0         | 0.0   | 0.0   | 0.0    | 0.0   | 0.0  | 0.0    |
| DGBE                      | 0.0         | 0.0   | 47.0  | 44.542 | 36.67 | 36.8 | 44.452 |
| Ingredients (% of weight) | Body Tissue |       |       |        |       |      |        |
| Frequency Band (MHz)      | 750         | 835   | 1750  | 1900   | 2300  | 2450 | 2600   |
| Water                     | 50.3        | 52.4  | 69.91 | 69.91  | 73.32 | 73.2 | 64.493 |
| Salt (NaCl)               | 1.60        | 1.40  | 0.13  | 0.13   | 0.06  | 0.04 | 0.024  |
| Sugar                     | 47.0        | 45.0  | 0.0   | 0.0    | 0.0   | 0.0  | 0.0    |
| HEC                       | 0.0         | 1.0   | 0.0   | 0.0    | 0.0   | 0.0  | 0.0    |
| Bactericide               | 0.0         | 0.1   | 0.0   | 0.0    | 0.0   | 0.0  | 0.0    |
| Triton X-100              | 0.0         | 0.0   | 0.0   | 0.0    | 0.0   | 0.0  | 0.0    |
| DGBE                      | 0.0         | 0.0   | 29.96 | 29.96  | 26.62 | 26.7 | 32.252 |

Table 4: Tissue Dielectric Properties

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16MΩ+ resistivity  
 HEC: Hydroxyethyl Cellulose; DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]  
 Triton X-100(ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

#### ☐ Simulating Head Liquid for 5G(HBBL3500-5800MHz), Manufactured by SPEAG:

| Ingredients | (% by weight) |
|-------------|---------------|
| Water       | 50-65%        |
| Mineral oil | 10-30%        |
| Emulsifiers | 8-25%         |
| Sodium salt | 0-1.5%        |

#### ☒ Simulating Body Liquid for 5G(MBBL3500-5800MHz), Manufactured by SPEAG:

| Ingredients                     | (% by weight) |
|---------------------------------|---------------|
| Water                           | 60-80%        |
| Esters, Emulsifiers, Inhibitors | 20-40%        |
| Sodium salt                     | 0-1.5%        |

| Tissue Type | Measured Frequency (MHz) | Target Tissue          |                        | Measured Tissue |                | Liquid Temp. | Test Date  |
|-------------|--------------------------|------------------------|------------------------|-----------------|----------------|--------------|------------|
|             |                          | $\epsilon_r$ (+/-5%)   | $\sigma$ (S/m) (+/-5%) | $\epsilon_r$    | $\sigma$ (S/m) |              |            |
| 750B        | 705                      | 55.70<br>(52.92~58.48) | 0.96<br>(0.92~1.008)   | 55.80           | 0.93           | 21.4°C       | 2015-09-24 |
|             | 710                      | 55.70<br>(52.92~58.48) | 0.96<br>(0.92~1.008)   | 55.67           | 0.93           |              |            |
|             | 750                      | 55.50<br>(52.73~58.27) | 0.96<br>(0.92~1.008)   | 55.42           | 0.97           |              |            |
| 835B        | 825                      | 55.20<br>(52.44~57.96) | 0.97<br>(0.92~1.02)    | 54.65           | 0.97           | 21.5°C       | 2015-09-18 |
|             | 835                      | 55.20<br>(52.44~57.96) | 0.97<br>(0.92~1.02)    | 54.59           | 0.98           |              |            |
|             | 850                      | 55.20<br>(52.44~57.96) | 0.99<br>(0.94~1.04)    | 54.47           | 1.00           |              |            |
| 835B        | 825                      | 55.20<br>(52.44~57.96) | 0.97<br>(0.92~1.02)    | 53.06           | 0.98           | 21.5°C       | 2015-10-09 |
|             | 835                      | 55.20<br>(52.44~57.96) | 0.97<br>(0.92~1.02)    | 52.87           | 0.99           |              |            |
|             | 850                      | 55.20<br>(52.44~57.96) | 0.99<br>(0.94~1.04)    | 52.79           | 1.01           |              |            |
| 1750B       | 1710                     | 53.5<br>(50.83~56.18)  | 1.46<br>(1.39~1.53)    | 52.26           | 1.39           | 21.8°C       | 2015-10-10 |
|             | 1730                     | 53.5<br>(50.83~56.18)  | 1.48<br>(1.41~1.55)    | 52.19           | 1.41           |              |            |
|             | 1750                     | 53.4<br>(50.73~56.07)  | 1.49<br>(1.42~1.56)    | 52.14           | 1.43           |              |            |
|             | 1800                     | 53.3<br>(50.64~55.97)  | 1.52<br>(1.44~1.60)    | 52.00           | 1.48           |              |            |
| 1750B       | 1710                     | 53.5<br>(50.83~56.18)  | 1.46<br>(1.39~1.53)    | 51.54           | 1.40           | 21.8°C       | 2015-10-16 |
|             | 1730                     | 53.5<br>(50.83~56.18)  | 1.48<br>(1.41~1.55)    | 51.47           | 1.42           |              |            |
|             | 1750                     | 53.4<br>(50.73~56.07)  | 1.49<br>(1.42~1.56)    | 51.40           | 1.44           |              |            |
|             | 1800                     | 53.3<br>(50.64~55.97)  | 1.52<br>(1.44~1.60)    | 51.23           | 1.49           |              |            |
| 1900B       | 1850                     | 53.30<br>(50.64~55.97) | 1.52<br>(1.44~1.60)    | 52.62           | 1.51           | 21.0°C       | 2015-09-21 |
|             | 1880                     | 53.30<br>(50.64~55.97) | 1.52<br>(1.44~1.60)    | 52.52           | 1.55           |              |            |
|             | 1900                     | 53.30<br>(50.64~55.97) | 1.52<br>(1.44~1.60)    | 52.43           | 1.57           |              |            |
|             | 1910                     | 53.30<br>(50.64~55.97) | 1.52<br>(1.44~1.60)    | 52.39           | 1.58           |              |            |
| 1900B       | 1850                     | 53.30<br>(50.64~55.97) | 1.52<br>(1.44~1.60)    | 52.05           | 1.52           | 21.0°C       | 2015-10-13 |
|             | 1880                     | 53.30<br>(50.64~55.97) | 1.52<br>(1.44~1.60)    | 51.95           | 1.55           |              |            |
|             | 1900                     | 53.30<br>(50.64~55.97) | 1.52<br>(1.44~1.60)    | 51.90           | 1.57           |              |            |
|             | 1910                     | 53.30<br>(50.64~55.97) | 1.52<br>(1.44~1.60)    | 51.87           | 1.59           |              |            |

|       |      |                        |                     |       |      |        |            |
|-------|------|------------------------|---------------------|-------|------|--------|------------|
| 2450B | 2410 | 52.80<br>(50.16~55.44) | 1.91<br>(1.81~2.00) | 52.06 | 1.93 | 21.0°C | 2015-10-17 |
|       | 2435 | 52.70<br>(50.07~55.34) | 1.94<br>(1.84~2.04) | 51.97 | 1.96 |        |            |
|       | 2450 | 52.70<br>(50.07~55.34) | 1.95<br>(1.85~2.05) | 51.92 | 1.98 |        |            |
|       | 2460 | 52.70<br>(50.07~55.34) | 1.96<br>(1.86~2.06) | 51.87 | 1.99 |        |            |
| 2600B | 2510 | 52.62<br>(49.99~55.25) | 2.03<br>(1.93~2.13) | 51.41 | 2.09 | 21.5°C | 2015-10-19 |
|       | 2535 | 52.59<br>(49.96~55.22) | 2.07<br>(1.97~2.17) | 51.32 | 2.13 |        |            |
|       | 2560 | 52.57<br>(49.94~55.20) | 2.09<br>(1.99~2.19) | 51.21 | 2.16 |        |            |
|       | 2600 | 52.5<br>(49.88~55.13)  | 2.16<br>(2.05~2.27) | 51.07 | 2.21 |        |            |
| 5G B  | 5200 | 49.0<br>(46.55~51.45)  | 5.30<br>(5.03~5.56) | 49.98 | 5.22 | 21.3°C | 2015-10-22 |
|       | 5600 | 48.50<br>(46.08~50.92) | 5.77<br>(5.48~6.05) | 47.79 | 5.92 |        |            |
|       | 5800 | 48.20<br>(45.79~50.61) | 6.00<br>(5.70~6.30) | 47.63 | 6.21 |        |            |

$\epsilon_r$ = Relative permittivity,  $\sigma$ = Conductivity

Table 5: Measured Tissue Parameter

Note: 1) The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2°C of the conditions expected during the SAR evaluation to satisfy protocol requirements.

2) KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.

3) The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

## 4.2 System Check

The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests(Graphic Plot(s) see Appendix A).

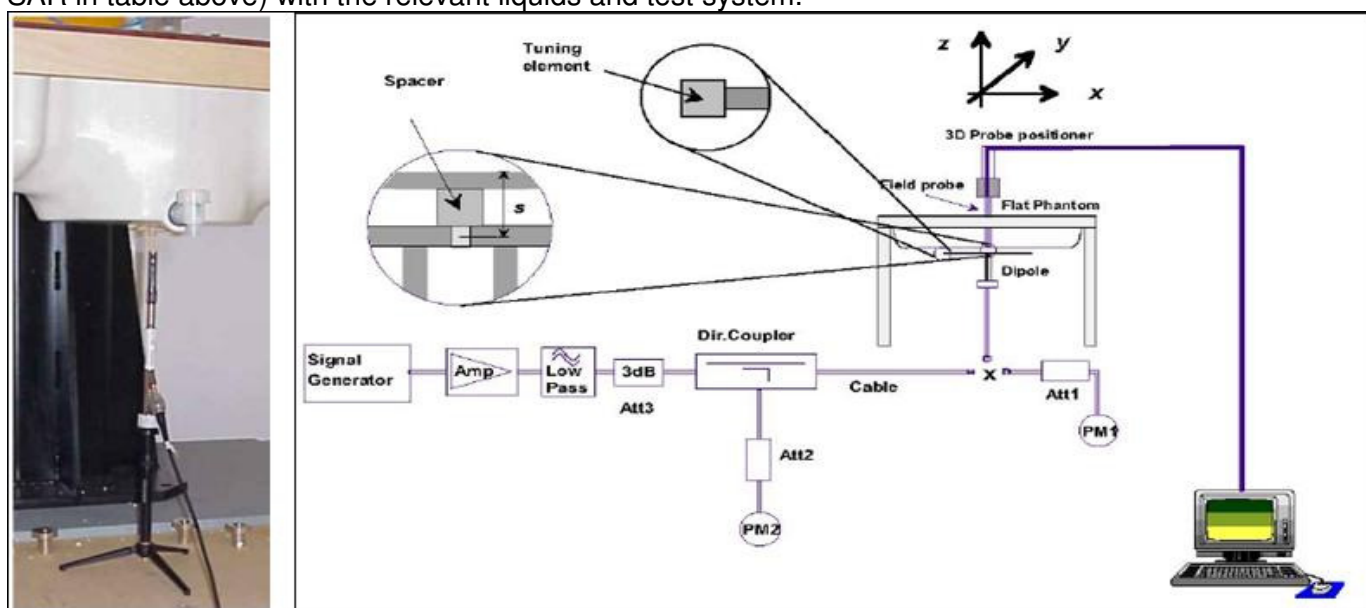
| System Check | Target SAR (1W)<br>(+/-10%) |                        | Measured SAR<br>(Normalized to 1W) |                | Liquid Temp. | Test Date  |
|--------------|-----------------------------|------------------------|------------------------------------|----------------|--------------|------------|
|              | 1-g<br>(mW/g)               | 10-g<br>(mW/g)         | 1-g<br>(mW/g)                      | 10-g<br>(mW/g) |              |            |
| 750MHz Body  | 8.76<br>(7.88~9.63)         | 5.78<br>(5.20~6.35)    | 8.96                               | 6.04           | 21.4°C       | 2015-09-24 |
| 835MHz Body  | 9.42<br>(8.48~10.36)        | 6.19<br>(5.57~6.80)    | 9.56                               | 6.28           | 21.5°C       | 2015-09-18 |
| 835MHz Body  | 9.42<br>(8.48~10.36)        | 6.19<br>(5.57~6.80)    | 9.72                               | 6.40           | 21.5°C       | 2015-10-09 |
| 1750MHz Body | 36.3<br>(32.67~39.93)       | 19.5<br>(17.55~21.45)  | 38.08                              | 20.40          | 21.8°C       | 2015-10-10 |
| 1750MHz Body | 36.3<br>(32.67~39.93)       | 19.5<br>(17.55~21.45)  | 38.28                              | 20.52          | 21.8°C       | 2015-10-16 |
| 1900MHz Body | 40.20<br>(36.18~44.22)      | 21.30<br>(19.17~23.43) | 41.20                              | 21.56          | 21.0°C       | 2015-09-21 |
| 1900MHz Body | 40.20<br>(36.18~44.22)      | 21.30<br>(19.17~23.43) | 41.20                              | 21.44          | 21.0°C       | 2015-10-13 |
| 2450MHz Body | 51.4<br>(46.26~56.54)       | 23.9<br>(21.51~26.29)  | 54.40                              | 25.32          | 21.0°C       | 2015-10-17 |
| 2600MHz Body | 57.5<br>(51.75~63.25)       | 25.9<br>(23.31~28.49)  | 59.20                              | 25.96          | 21.5°C       | 2015-10-19 |
| 5200MHz Body | 74.7<br>(67.23~82.17)       | 20.9<br>(18.81~22.99)  | 73.20                              | 22.00          | 21.3°C       | 2015-10-22 |
| 5600MHz Body | 77.8<br>(70.02~85.58)       | 21.6<br>(19.44~23.76)  | 76.70                              | 22.60          | 21.3°C       | 2015-10-22 |
| 5800MHz Body | 76.2<br>(68.58~83.82)       | 21.0<br>(18.9~23.10)   | 75.90                              | 22.40          | 21.3°C       | 2015-10-22 |

Table 6: System Check Results

### 4.3 System check Procedure

The system check is performed by using a system check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250 mW(below 5GHz) or 100mW(above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



## 5 SAR measurement variability and uncertainty

### 5.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, 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. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is  $< 0.80$  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  $> 1.20$ .

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

The detailed repeated measurement results are shown in Section 7.2.

### 5.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04, when the highest measured 1-g SAR within a frequency band is  $< 1.5$  W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

## 6 SAR Test Configuration

### 6.1 Test Positions Configuration

#### 6.1.1 Body Exposure Condition

The overall diagonal dimension of the tablet is > 20 cm. Per FCC KDB616217D04, the back side and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR Exclusion Threshold in FCC KDB 447498D01 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

#### 6.1.2 Proximity sensor triggering distances Assessment

The device uses a capacitance proximity sensor to reduce the maximum output power in selected wireless modes and operating configurations to ensure SAR compliance.

FCC KDB616217D04 section 6 was used as a test guideline for selecting SAR test distances for this device at these additional exposure conditions.

It was confirmed separately that the output power was altered according to the proximity sensor status indication. This was achieved by observing the proximity sensor status at the same time as monitoring the conducted power. Section 7 contains both the full and reduced conducted power measurements.



**Table: Summary of Trigger Distances**

| Band(MHz) | Trigger distance-Back Side |                          | Trigger distance-Top Side |                          |
|-----------|----------------------------|--------------------------|---------------------------|--------------------------|
|           | Moving toward phantom      | Moving away from phantom | Moving toward phantom     | Moving away from phantom |
| GSM850    | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| GSM1900   | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| UMTS B2   | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| UMTS B4   | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| UMTS B5   | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| LTE B2    | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| LTE B4    | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| LTE B5    | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| LTE B7    | 17mm                       | 17mm                     | 20mm                      | 20mm                     |
| LTE B17   | 17mm                       | 17mm                     | 20mm                      | 20mm                     |

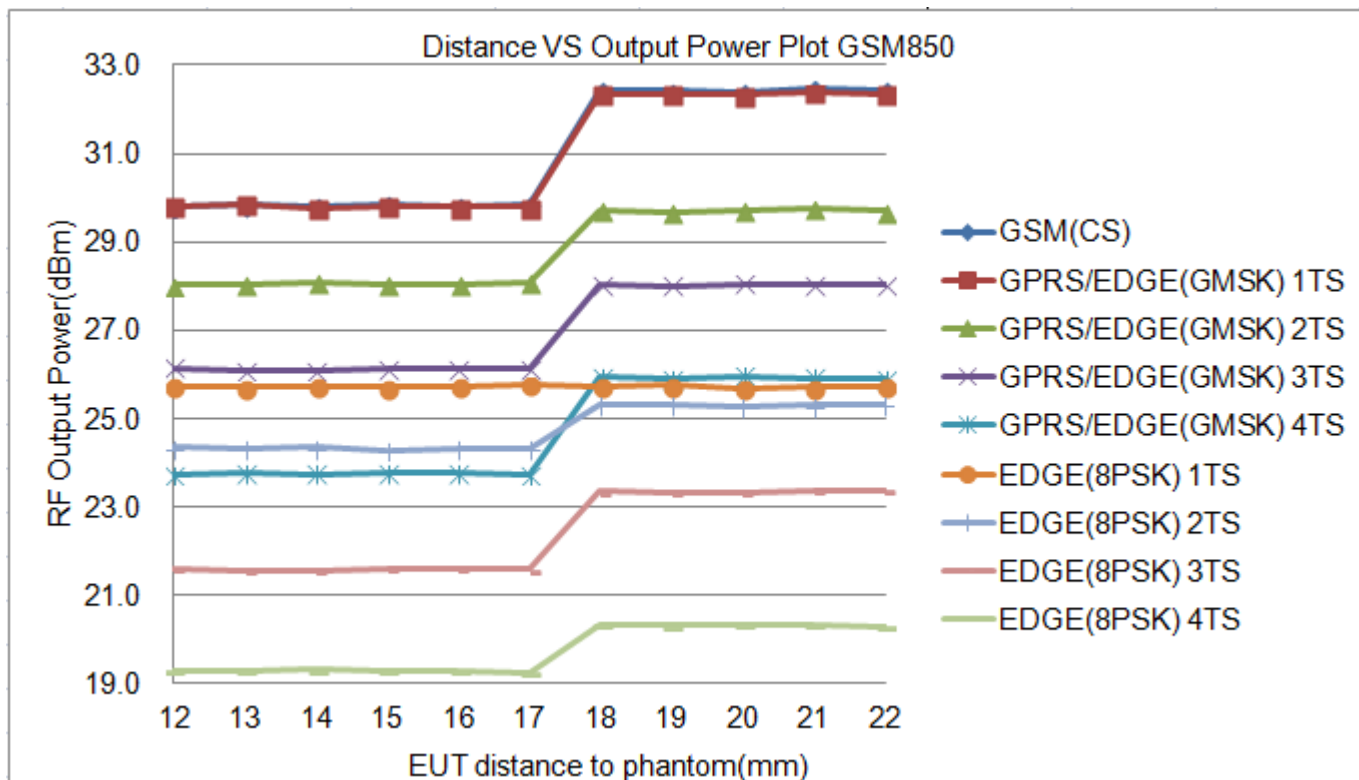
1) Since the capacitive proximity sensor triggering distance for the back side is 17mm , a conservative distance of 16mm was tested for SAR at maximum power level.

2) Since the capacitive proximity sensor triggering distance for the Top side is 20mm , a conservative distance of 19mm was tested for SAR at maximum power level.

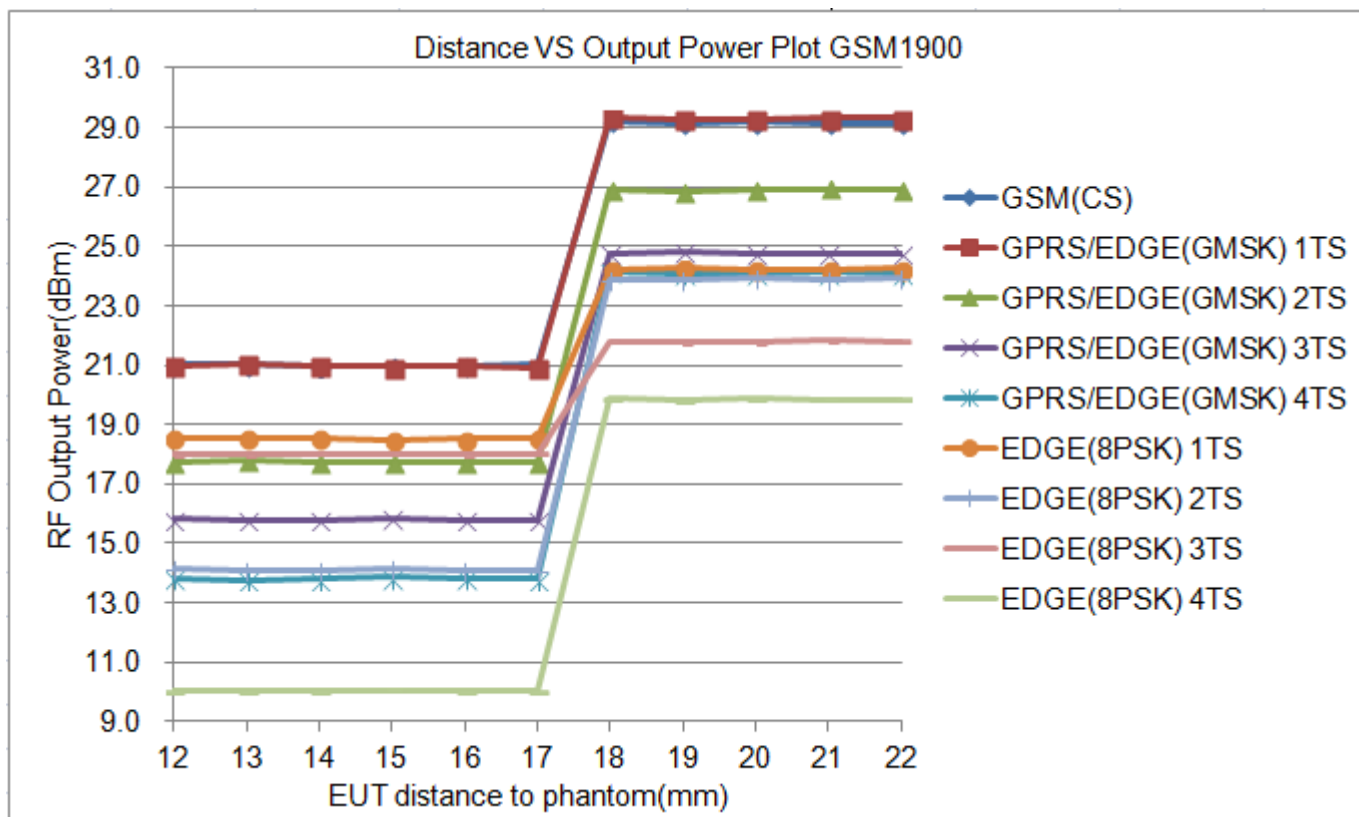
The detailed conducted power measurement data to determine the triggering distances is as below:

1) DUT is moved towards and away from the flat phantom-Back Side:

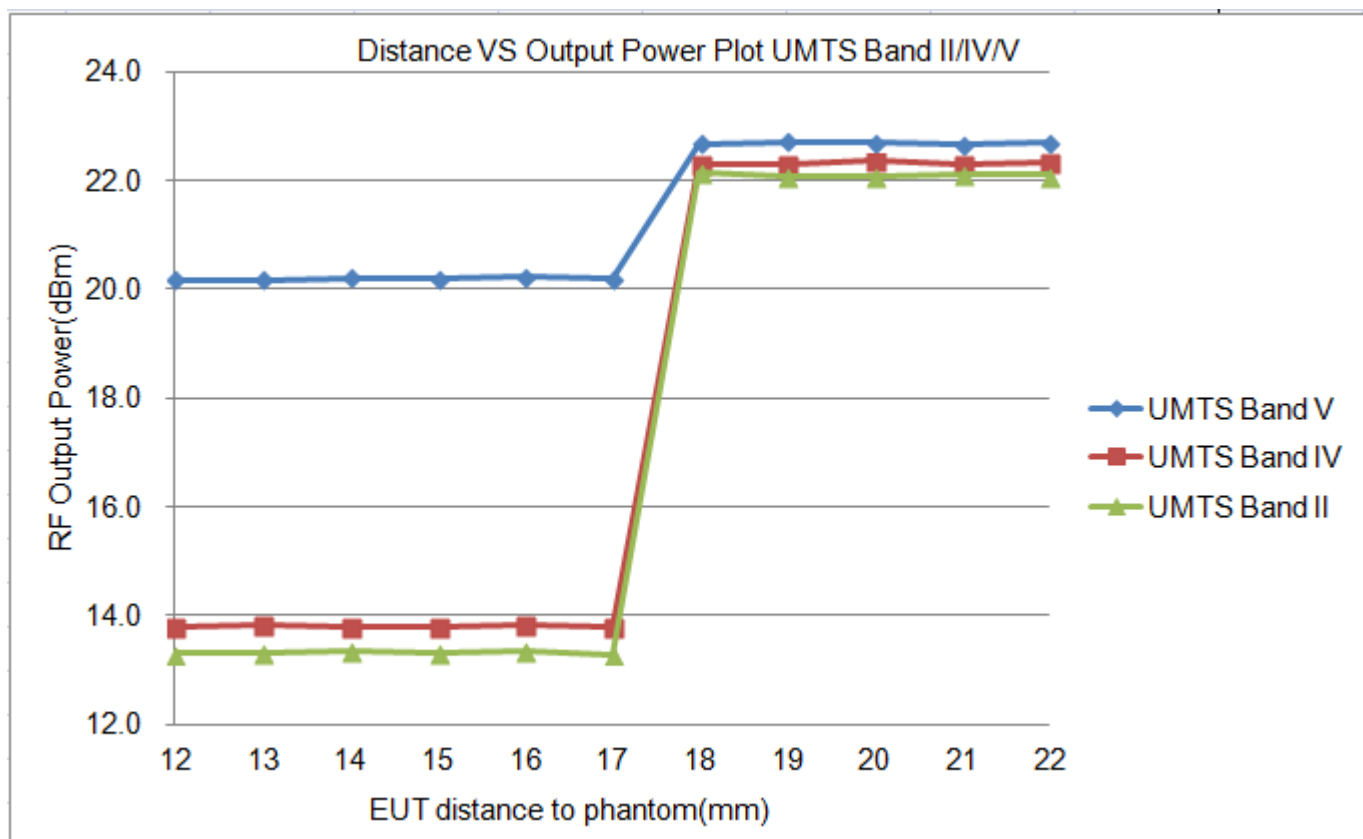
GSM850:



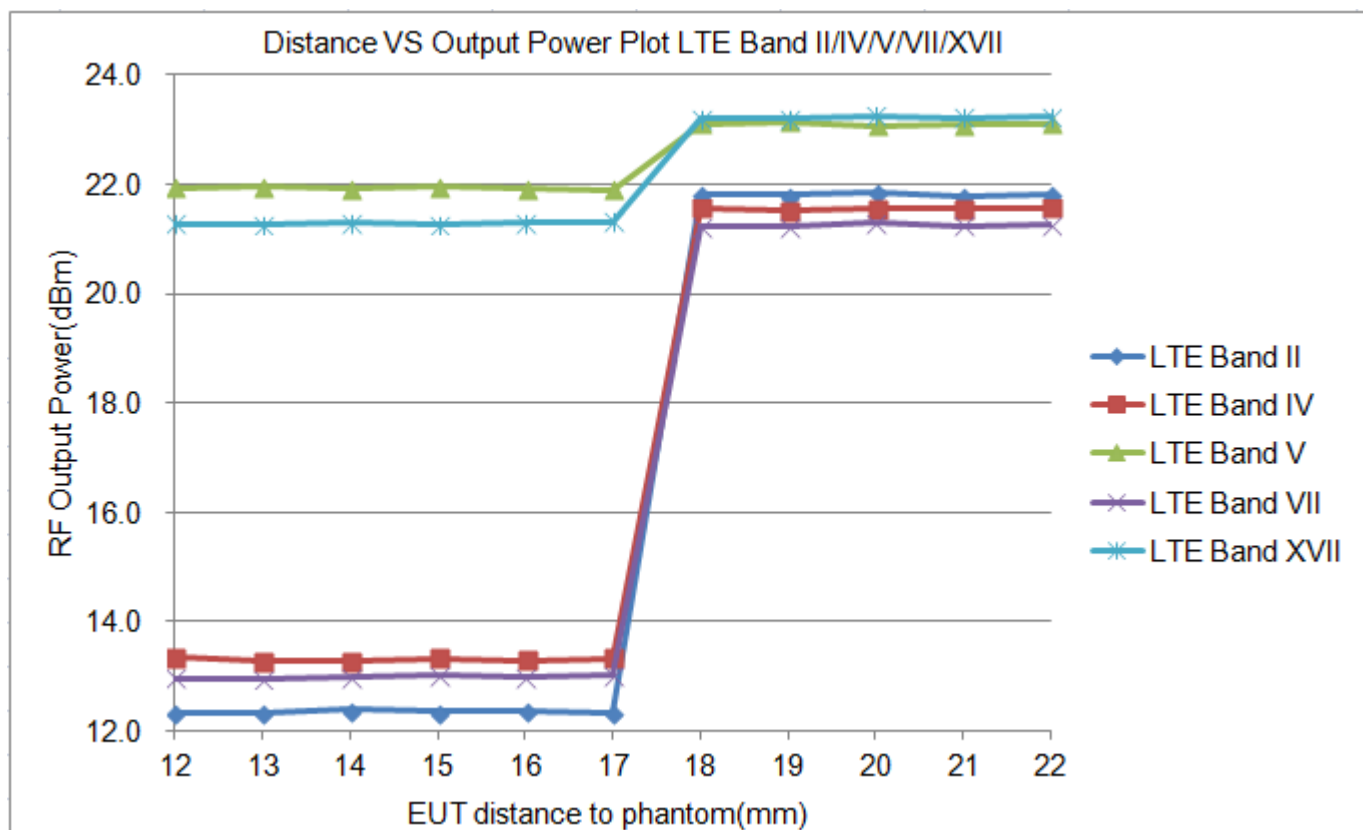
GSM1900:



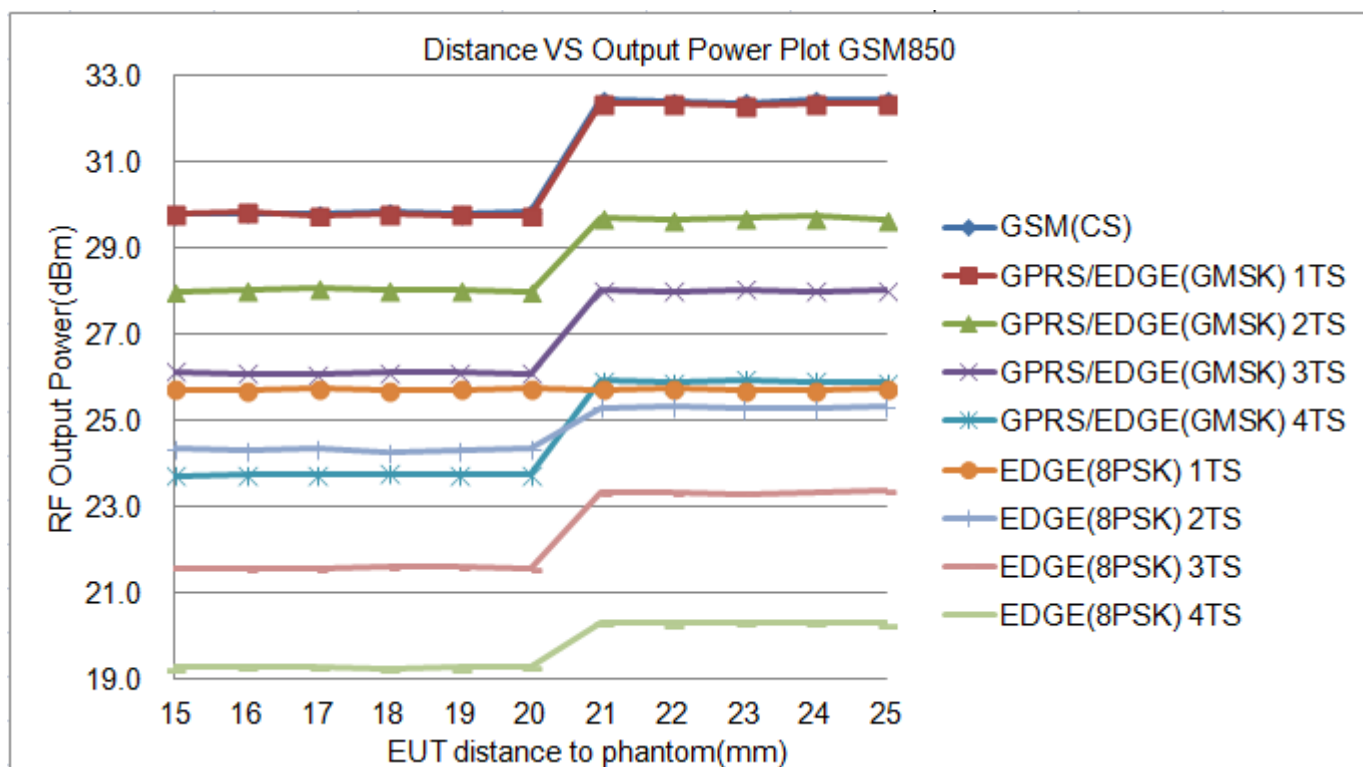
# UMTS Band II/IV/V:



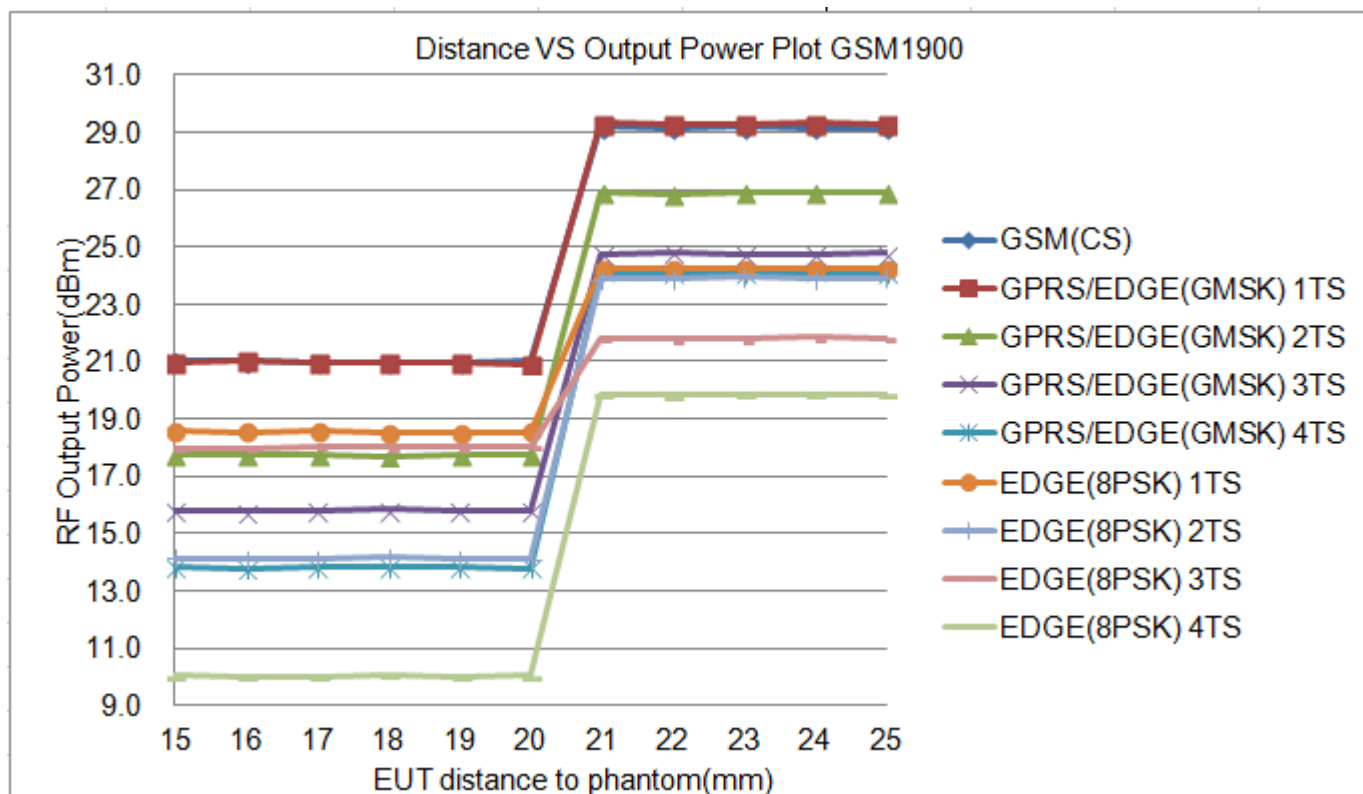
# LTE Band II/IV/V/VII/XVII:



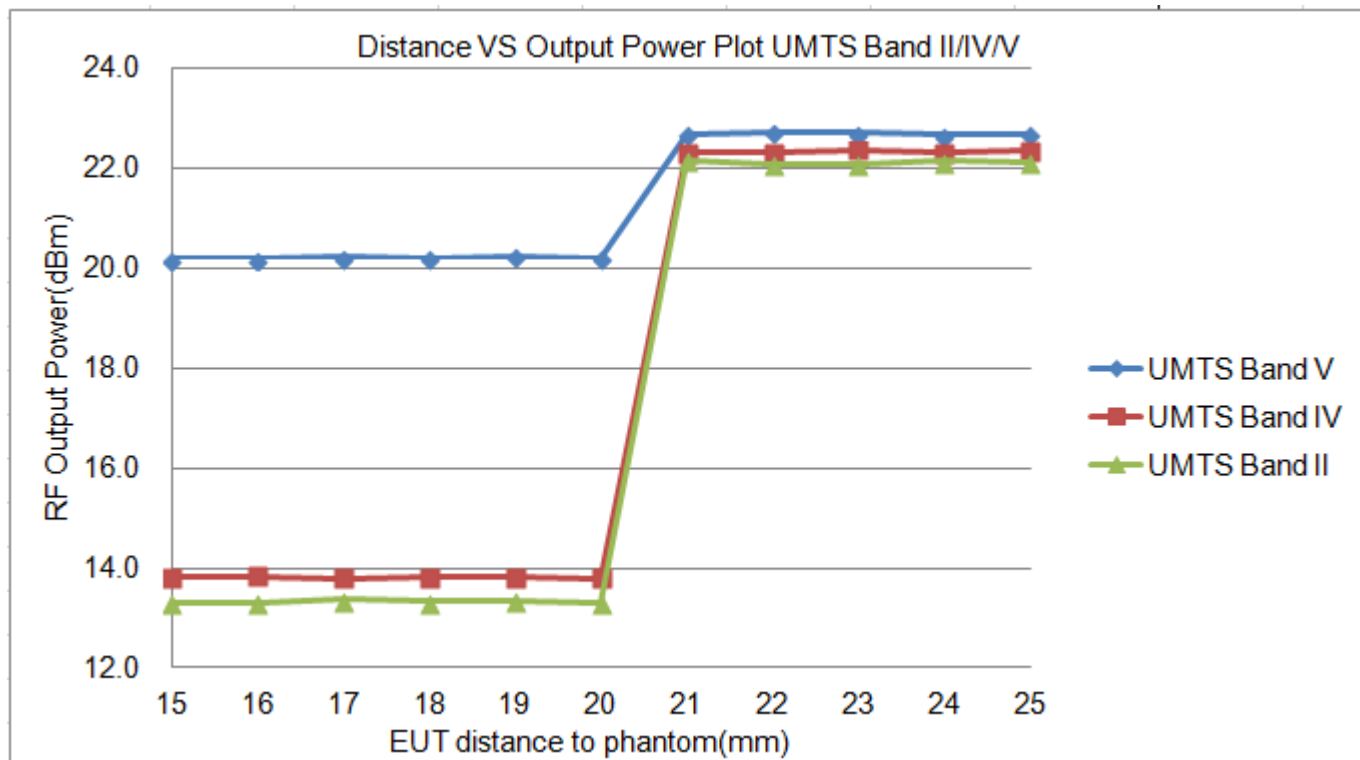
2) DUT is moved towards and away from the flat phantom-Top Side  
GSM850:



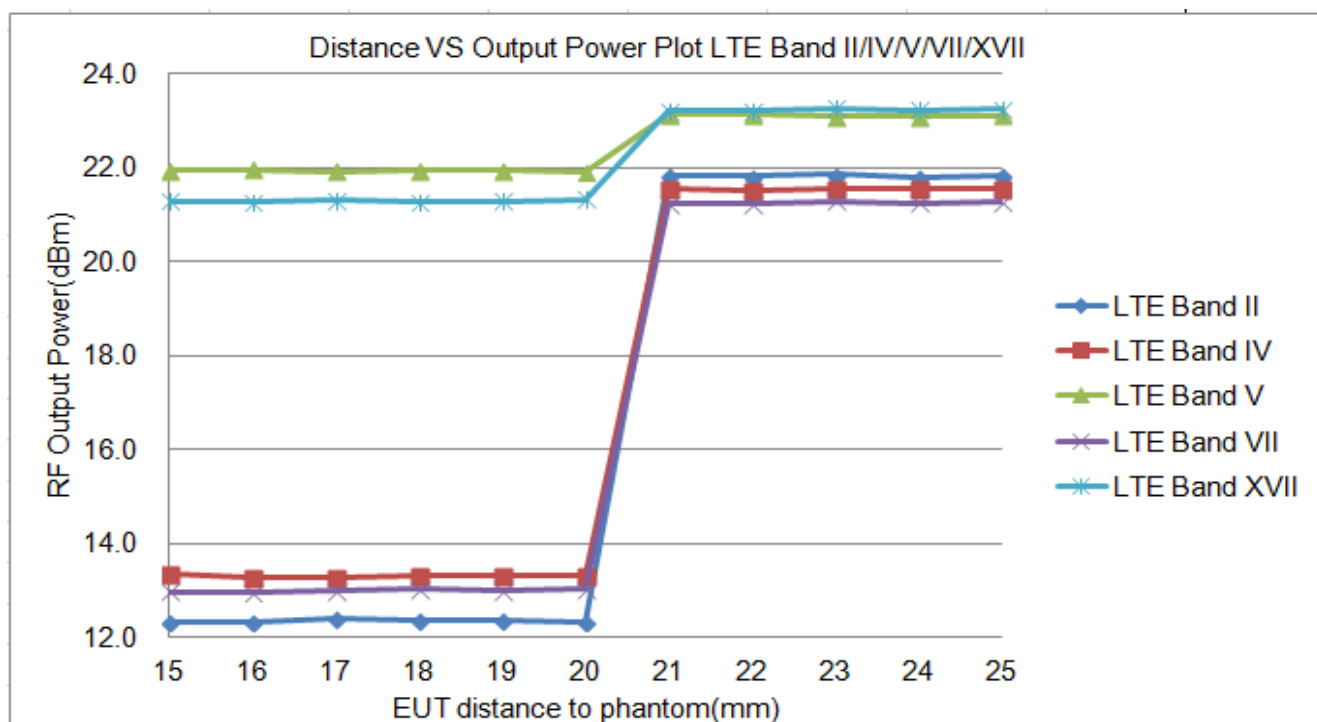
GSM1900:



# UMTS Band II/IV/V:



# LTE Band II/IV/V/VII/XVII:

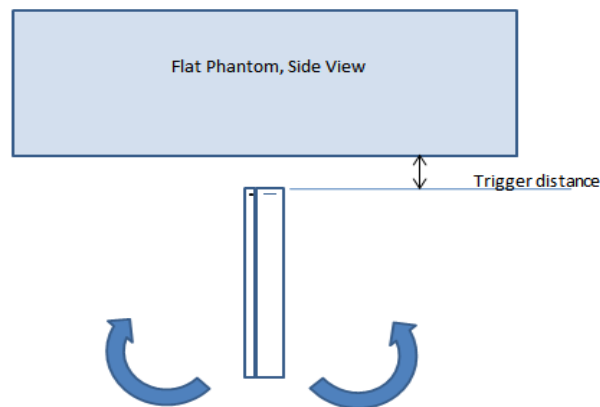


### 6.1.3 Proximity Sensor Coverage Assessment

As there is no spatial offset between the main antenna and the proximity sensor element(Refer to the antenna picture in Section 7.3), proximity sensor coverage per KDB 616217 §6.3 did not need to be assessed for this device.

### 6.1.4 Proximity Sensor Tilt Angle Assessment

Per KDB 616217 §6.4, the DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Top side parallel to the base of the flat phantom for each band. The EUT was rotated about Top side for angles up to  $\pm 45^\circ$ . If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to  $\pm 45^\circ$ .



Picture: Proximity sensor tilt angle assessment (Top side)

**Table: Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering(Top side)**

| Band (MHz) | Minimum trigger distance Per KDB616217§6.2 | Minimum trigger distance at which power reduction was maintained over $\pm 45^\circ$ | Power Reduction Status |      |      |      |     |    |    |     |     |     |     |
|------------|--------------------------------------------|--------------------------------------------------------------------------------------|------------------------|------|------|------|-----|----|----|-----|-----|-----|-----|
|            |                                            |                                                                                      | -45°                   | -35° | -25° | -15° | -5° | 0° | 5° | 15° | 25° | 35° | 45° |
| GSM850     | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| GSM1900    | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| UMTS B2    | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| UMTS B4    | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| UMTS B5    | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| LTE B2     | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| LTE B4     | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| LTE B5     | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| LTE B7     | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |
| LTE B17    | 20mm                                       | 20mm                                                                                 | On                     | On   | On   | On   | On  | On | On | On  | On  | On  | On  |

## 6.2 3G SAR Test Reduction Procedure

Per KDB941225 D01v03r01, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

## 6.3 GSM Test Configuration

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to “5” and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

## 6.4 UMTS Test Configuration

### 1) Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1’s” for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are required in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

### 2) WCDMA

#### a. Body SAR Measurements

SAR for body-worn accessory configurations is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode

### 3) HSDPA

SAR for body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

Per KDB941225 D01v03, the 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures for the highest reported SAR body exposure configuration in 12.2 kbps RMC.

HSDPA should be configured according to UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HAPRQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. The  $\beta_c$  and  $\beta_d$  gain factors for DPCCH and DPDCH were set according to the values in the below table,  $\beta_{hs}$  for HS-DPCCH is set automatically to the correct value when  $\Delta ACK, \Delta NACK, \Delta CQI = 8$ . The variation of the  $\beta_c / \beta_d$  ratio causes a power reduction at sub-tests 2 - 4.

| Sub-test <sup>4</sup> | $\beta_c$ <sup>4</sup> | $\beta_d$ <sup>4</sup> | $\beta_d$ (SF) <sup>4</sup> | $\beta_c/\beta_d$ <sup>4</sup> | $\beta_{hs}(1)$ <sup>4</sup> | CM(dB)(2) <sup>4</sup> | MPR (dB) <sup>4</sup> |
|-----------------------|------------------------|------------------------|-----------------------------|--------------------------------|------------------------------|------------------------|-----------------------|
| 1 <sup>4</sup>        | 2/15 <sup>4</sup>      | 15/15 <sup>4</sup>     | 64 <sup>4</sup>             | 2/15 <sup>4</sup>              | 4/15 <sup>4</sup>            | 0.0 <sup>4</sup>       | 0 <sup>4</sup>        |
| 2 <sup>4</sup>        | 12/15(3) <sup>4</sup>  | 15/15(3) <sup>4</sup>  | 64 <sup>4</sup>             | 12/15(3) <sup>4</sup>          | 24/15 <sup>4</sup>           | 1.0 <sup>4</sup>       | 0 <sup>4</sup>        |
| 3 <sup>4</sup>        | 15/15 <sup>4</sup>     | 8/15 <sup>4</sup>      | 64 <sup>4</sup>             | 15/8 <sup>4</sup>              | 30/15 <sup>4</sup>           | 1.5 <sup>4</sup>       | 0.5 <sup>4</sup>      |
| 4 <sup>4</sup>        | 15/15 <sup>4</sup>     | 4/15 <sup>4</sup>      | 64 <sup>4</sup>             | 15/4 <sup>4</sup>              | 30/15 <sup>4</sup>           | 1.5 <sup>4</sup>       | 0.5 <sup>4</sup>      |

Note 1:  $\Delta ACK$ ,  $\Delta NACK$  and  $\Delta CQI = 8$      $A_{hs} = \beta_{hs}/\beta_c = 30/15$      $\beta_{hs} = 30/15 * \beta_c$   
Note 2 : CM=1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.<sup>4</sup>  
Note 3 : For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ <sup>4</sup>

Table 7: Sub-tests for UMTS Release 5 HSDPA

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

| Parameter                        | Value       |
|----------------------------------|-------------|
| Nominal average inf. bit rate    | 534 kbit/s  |
| Inter-TTI Distance               | 3 TTI's     |
| Number of HARQ Processes         | 2 Processes |
| Information Bit Payload          | 3202 Bits   |
| MAC-d PDU size                   | 336 Bits    |
| Number Code Blocks               | 1 Block     |
| Binary Channel Bits Per TTI      | 4800 Bits   |
| Total Available SMLs in UE       | 19200 SMLs  |
| Number of SMLs per HARQ Process  | 9600 SMLs   |
| Coding Rate                      | 0.67        |
| Number of Physical Channel Codes | 5           |

Table 8: settings of required H-Set 1 QPSK acc. to 3GPP 34.121

| HS-DSCH Category | Maximum HS-DSCH Codes Received | Minimum Inter-TTI Interval | Maximum HS-DSCH Transport Block Bits/HS-DSCH TTI | Total Soft Channel Bits |
|------------------|--------------------------------|----------------------------|--------------------------------------------------|-------------------------|
| 1                | 5                              | 3                          | 7298                                             | 19200                   |
| 2                | 5                              | 3                          | 7298                                             | 28800                   |
| 3                | 5                              | 2                          | 7298                                             | 28800                   |
| 4                | 5                              | 2                          | 7298                                             | 38400                   |
| 5                | 5                              | 1                          | 7298                                             | 57600                   |
| 6                | 5                              | 1                          | 7298                                             | 67200                   |
| 7                | 10                             | 1                          | 14411                                            | 115200                  |
| 8                | 10                             | 1                          | 14411                                            | 134400                  |
| 9                | 15                             | 1                          | 25251                                            | 172800                  |
| 10               | 15                             | 1                          | 27952                                            | 172800                  |
| 11               | 5                              | 2                          | 3630                                             | 14400                   |
| 12               | 5                              | 1                          | 3630                                             | 28800                   |
| 13               | 15                             | 1                          | 34800                                            | 259200                  |
| 14               | 15                             | 1                          | 42196                                            | 259200                  |
| 15               | 15                             | 1                          | 23370                                            | 345600                  |
| 16               | 15                             | 1                          | 27952                                            | 345600                  |

Table 9: HSDPA UE category

#### 4) HSUPA

SAR for body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01v03, the 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures for the highest reported body exposure SAR configuration in 12.2 kbps RMC.

Due to inner loop power control requirements in HSDPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSDPA should be configured according to the values indicated below as well as other applicable procedures described in the ‘WCDMA Handset’ and ‘Release 5 HSDPA Data Device’ sections of 3G device.

| Sub-test <sup>1</sup> | $\beta_c$ <sup>2</sup>            | $\beta_d$ <sup>2</sup>            | $\beta_d$ (SF) <sup>2</sup> | $\beta_c/\beta_d$ <sup>2</sup>    | $\beta_{hs}^{(1)}$ <sup>2</sup> | $\beta_{ec}$ <sup>2</sup> | $\beta_{ed}$ <sup>2</sup>                                            | $\beta_e$ <sup>2</sup> (SF) <sup>2</sup> | $\beta_{ed}$ <sup>2</sup> (code) <sup>2</sup> | CM <sup>(2)</sup> <sup>2</sup> (dB) <sup>2</sup> | MP R <sup>2</sup> (dB) <sup>2</sup> | AG <sup>(4)</sup> <sup>2</sup> Inde <sup>2</sup> x <sup>2</sup> | E-TFC I <sup>2</sup> |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------|-----------------------------------|---------------------------------|---------------------------|----------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|--------------------------------------------------|-------------------------------------|-----------------------------------------------------------------|----------------------|
| 1 <sup>2</sup>        | 11/15 <sup>(3)</sup> <sup>2</sup> | 15/15 <sup>(3)</sup> <sup>2</sup> | 64 <sup>2</sup>             | 11/15 <sup>(3)</sup> <sup>2</sup> | 22/15 <sup>2</sup>              | 209/225 <sup>2</sup>      | 1039/225 <sup>2</sup>                                                | 4 <sup>2</sup>                           | 1 <sup>2</sup>                                | 1.0 <sup>2</sup>                                 | 0.0 <sup>2</sup>                    | 20 <sup>2</sup>                                                 | 75 <sup>2</sup>      |
| 2 <sup>2</sup>        | 6/15 <sup>2</sup>                 | 15/15 <sup>2</sup>                | 64 <sup>2</sup>             | 6/15 <sup>2</sup>                 | 12/15 <sup>2</sup>              | 12/15 <sup>2</sup>        | 94/75 <sup>2</sup>                                                   | 4 <sup>2</sup>                           | 1 <sup>2</sup>                                | 3.0 <sup>2</sup>                                 | 2.0 <sup>2</sup>                    | 12 <sup>2</sup>                                                 | 67 <sup>2</sup>      |
| 3 <sup>2</sup>        | 15/15 <sup>2</sup>                | 9/15 <sup>2</sup>                 | 64 <sup>2</sup>             | 15/9 <sup>2</sup>                 | 30/15 <sup>2</sup>              | 30/15 <sup>2</sup>        | $\beta_{ed1}:47/15$ <sup>2</sup><br>$\beta_{ed2}:47/15$ <sup>2</sup> | 4 <sup>2</sup>                           | 2 <sup>2</sup>                                | 2.0 <sup>2</sup>                                 | 1.0 <sup>2</sup>                    | 15 <sup>2</sup>                                                 | 92 <sup>2</sup>      |
| 4 <sup>2</sup>        | 2/15 <sup>2</sup>                 | 15/15 <sup>2</sup>                | 64 <sup>2</sup>             | 2/15 <sup>2</sup>                 | 4/15 <sup>2</sup>               | 2/15 <sup>2</sup>         | 56/75 <sup>2</sup>                                                   | 4 <sup>2</sup>                           | 1 <sup>2</sup>                                | 3.0 <sup>2</sup>                                 | 2.0 <sup>2</sup>                    | 17 <sup>2</sup>                                                 | 71 <sup>2</sup>      |
| 5 <sup>2</sup>        | 15/15 <sup>(4)</sup> <sup>2</sup> | 15/15 <sup>(4)</sup> <sup>2</sup> | 64 <sup>2</sup>             | 15/15 <sup>(4)</sup> <sup>2</sup> | 30/15 <sup>2</sup>              | 24/15 <sup>2</sup>        | 134/15 <sup>2</sup>                                                  | 4 <sup>2</sup>                           | 1 <sup>2</sup>                                | 1.0 <sup>2</sup>                                 | 0.0 <sup>2</sup>                    | 21 <sup>2</sup>                                                 | 81 <sup>2</sup>      |

Note 1:  $\Delta$  ACK,  $\Delta$  NACK and  $\Delta$  CQI=8  $A_{hs} = \beta_{hs}/\beta_c = 30/15$   $\beta_{hs} = 30/15 * \beta_c$

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

Note 3 : For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ <sup>2</sup>

Note 4 : 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 signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 14/15$  and  $\beta_d = 15/15$ <sup>2</sup>

Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g<sup>2</sup>

Note 6:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.<sup>2</sup>

Table 10:Subtests for UMTS Release 6 HSUPA

| UE E-DCH Category | Maximum E-DCH Codes Transmitted | Number of HARQ Processes | E-DCH TTI(ms) | Minimum Spreading Factor | Maximum E-DCH Transport Block Bits | Max Rate (Mbps) |
|-------------------|---------------------------------|--------------------------|---------------|--------------------------|------------------------------------|-----------------|
| 1                 | 1                               | 4                        | 10            | 4                        | 7110                               | 0.7296          |
| 2                 | 2                               | 8                        | 2             | 4                        | 2798                               | 1.4592          |
|                   | 2                               | 4                        | 10            | 4                        | 14484                              |                 |
| 3                 | 2                               | 4                        | 10            | 4                        | 14484                              | 1.4592          |
| 4                 | 2                               | 8                        | 2             | 2                        | 5772                               | 2.9185          |
|                   | 2                               | 4                        | 10            | 2                        | 20000                              | 2.00            |
| 5                 | 2                               | 4                        | 10            | 2                        | 20000                              | 2.00            |
| 6<br>(No DPDCH)   | 4                               | 8                        | 10            | 2SF2&2SF                 | 11484                              | 5.76            |
|                   | 4                               | 4                        | 2             | 4                        | 20000                              | 2.00            |
| 7<br>(No DPDCH)   | 4                               | 8                        | 2             | 2SF2&2SF                 | 22996                              | ?               |
|                   | 4                               | 4                        | 10            | 4                        | 20000                              | ?               |

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4. UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM.(TS25.306-7.3.0).

Table 11:HSUPA UE category

## 5) DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a Second serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0. A summary of these settings are illustrated below:

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

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

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

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

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

The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK

| Parameter                        | Value       |
|----------------------------------|-------------|
| Nominal average inf. bit rate    | 60 kbit/s   |
| Inter-TTI Distance               | 1 TTI's     |
| Number of HARQ Processes         | 6 Processes |
| Information Bit Payload          | 120 Bits    |
| Number Code Blocks               | 1 Block     |
| Binary Channel Bits Per TTI      | 960 Bits    |
| Total Available SMLs in UE       | 19200 SMLs  |
| Number of SMLs per HARQ Process  | 3200 SMLs   |
| Coding Rate                      | 0.15        |
| Number of Physical Channel Codes | 1           |

Table 12: settings of required H-Set 12 QPSK acc. to 3GPP 34.121

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 above.
- 2.Maximum number of transmission is limited to 1,i.e.,retransmission is not allowed. The redundancy and constellation version 0 shall be used.

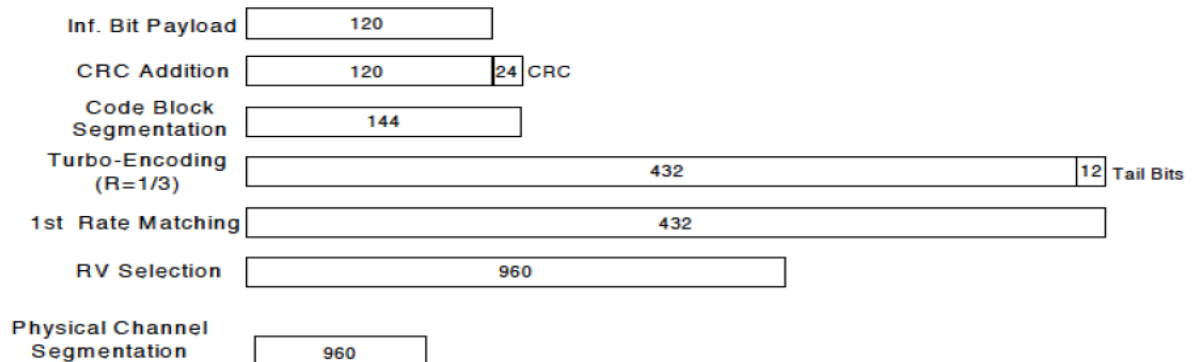


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 5 procedures. A summary of subtest settings are illustrated below:

| Sub-test <sup>o</sup> | $\beta_c$ <sup>o</sup> | $\beta_d$ <sup>o</sup> | $\beta_d$ (SF) <sup>o</sup> | $\beta_c/\beta_d$ <sup>o</sup> | $\beta_{hs}(1)$ <sup>o</sup> | CM(dB)(2) <sup>o</sup> | MPR (dB) <sup>o</sup> |
|-----------------------|------------------------|------------------------|-----------------------------|--------------------------------|------------------------------|------------------------|-----------------------|
| 1 <sup>o</sup>        | 2/15 <sup>o</sup>      | 15/15 <sup>o</sup>     | 64 <sup>o</sup>             | 2/15 <sup>o</sup>              | 4/15 <sup>o</sup>            | 0.0 <sup>o</sup>       | 0 <sup>o</sup>        |
| 2 <sup>o</sup>        | 12/15(3) <sup>o</sup>  | 15/15(3) <sup>o</sup>  | 64 <sup>o</sup>             | 12/15(3) <sup>o</sup>          | 24/15 <sup>o</sup>           | 1.0 <sup>o</sup>       | 0 <sup>o</sup>        |
| 3 <sup>o</sup>        | 15/15 <sup>o</sup>     | 8/15 <sup>o</sup>      | 64 <sup>o</sup>             | 15/8 <sup>o</sup>              | 30/15 <sup>o</sup>           | 1.5 <sup>o</sup>       | 0.5 <sup>o</sup>      |
| 4 <sup>o</sup>        | 15/15 <sup>o</sup>     | 4/15 <sup>o</sup>      | 64 <sup>o</sup>             | 15/4 <sup>o</sup>              | 30/15 <sup>o</sup>           | 1.5 <sup>o</sup>       | 0.5 <sup>o</sup>      |

Note 1:  $\Delta$  ACK,  $\Delta$  NACK and  $\Delta$  CQI=8  $A_{hs} = \beta_{hs}/\beta_c = 30/15$   $\beta_{hs} = 30/15 * \beta_c$   
Note 2: CM=1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.  
Note 3: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF0) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$

Up commands are set continuously to set the UE to Max power.

Note:

- 1.The Dual Carriers transmission only applies to HSDPA physical channels
- 2.The Dual Carriers belong to the same Node and are on adjacent carriers.
- 3.The Dual Carriers do not support MIMO to serve UEs configured for dual cell operation
- 4.The Dual Carriers operate in the same frequency band .
- 5.The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.
- 6.The device doesn't support carrier aggregation for it just can operate in Release 8.

## 6.5 LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02r04. The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames (Maximum TTI)

### 1) Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

### 2) MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.

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

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

| Modulation | Channel bandwidth / Transmission bandwidth (RB) |         |       |        |        |        | MPR (dB) |
|------------|-------------------------------------------------|---------|-------|--------|--------|--------|----------|
|            | 1.4 MHz                                         | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |          |
| QPSK       | > 5                                             | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 1      |
| 16 QAM     | ≤ 5                                             | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18   | ≤ 1      |
| 16 QAM     | > 5                                             | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 2      |

### 3) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by using Network Signalling Value of "NS\_01" on the base station simulator.

### 4) LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test requirements

i) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

ii) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in i) are applied to measure the SAR for QPSK with 50% RB allocation.

## iii) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in i) and ii) are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.

## iv) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is  $> \frac{1}{2}$  dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is  $> 1.45$  W/kg.

## B) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2}$  dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is  $> 1.45$  W/kg.

## 6.6 WiFi Test Configuration

For WiFi SAR testing, a communication link is set up with the testing software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test procedures in KDB 248227D01v02r02 are applied.

### 6.6.1 Initial Test Position Procedure

For exposure condition with multiple test position, such as handsets operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all position in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is  $\leq 0.4 \text{ W/kg}$ , no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is  $\leq 0.8 \text{ W/kg}$  or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the *reported* SAR is  $> 0.8 \text{ W/kg}$ , SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is  $\leq 1.2 \text{ W/kg}$  or all required channels are tested.

### 6.6.2 Initial Test Configuration Procedure

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required (see section 5.3.2 of KDB 248227D01v02). SAR test reduction of subsequent highest output test channels is based on the *reported* SAR of the initial test configuration.

For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the *reported* SAR of the initial test configuration is  $> 0.8 \text{ W/kg}$ , SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the *reported* SAR is  $\leq 1.2 \text{ W/kg}$  or all required channels are tested.

### 6.6.3 Sub Test Configuration Procedure

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units.

When the highest reported SAR for the initial test configuration, according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is  $\leq 1.2 \text{ W/kg}$ , SAR is not required for that subsequent test configuration.

### 6.6.4 WiFi 2.4G SAR Test Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.

#### A) 802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) When the *reported* SAR of the highest measured maximum output power channel (section 3.1 of of KDB 248227D01v02) for the exposure configuration is  $\leq 0.8$  W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) When the *reported* SAR is  $> 0.8$  W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any *reported* SAR is  $> 1.2$  W/kg, SAR is required for the third channel; i.e., all channels require testing.

#### B) 2.4GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3 of of KDB 248227D01v02r02). SAR is not required for the following 2.4 GHz OFDM conditions.

- 1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
- 2) When the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.

#### C) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

### 6.6.5 WiFi 5G SAR Test Procedures

#### A) U-NII-1 and U-NII-2A Bands

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following:

- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest *reported* SAR for a test configuration is  $\leq 1.2$  W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
- 2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest *reported* SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is  $\leq 1.2$  W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
- 3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest *reported* SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is  $> 1.2$  W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

#### B) U-NII-2C and U-NII-3 Bands

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

### C) OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

- 1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
- 2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
- 3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
- 4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.

After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.

- 1) The channel closest to mid-band frequency is selected for SAR measurement.
- 2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

### D) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

## 7 SAR Measurement Results

### 7.1 Conducted power measurements

For the measurements a Rohde & Schwarz Radio Communication Tester CMU 200&CMW500 was used. SAR drift measured at the same position in liquid before and after each SAR test as below 7.2 chapter.

Note: CMU200 measures GSM peak and average output power for active timeslots. For SAR the timebased average power is relevant. The difference in between depends on the duty cycle of the TDMA signal :

| No. of timeslots                                    | 1       | 2       | 3       | 4       |
|-----------------------------------------------------|---------|---------|---------|---------|
| Duty Cycle                                          | 1:8.3   | 1:4.1   | 1:2.77  | 1:2.08  |
| timebased avg. power compared to slotted avg. power | -9.19dB | -6.13dB | -4.42dB | -3.18dB |

The signalling modes differ as follows:

| mode | coding scheme | modulation |
|------|---------------|------------|
| GPRS | CS1 to CS4    | GMSK       |
| EDGE | MCS1 to MCS4  | GMSK       |
| EDGE | MCS5 to MCS9  | 8PSK       |

Apart from modulation change (GMSK/8PSK) coding schemes differ in code rate without influence on the RF signal. Therefore one coding scheme per mode was selected for conducted power measurements.

### 7.1.1 Conducted power measurements of GSM850

| GSM850           |            | Burst-Averaged output Power (dBm) |              |              |              | Division Factors | Frame-Averaged output Power (dBm) |              |              |              |
|------------------|------------|-----------------------------------|--------------|--------------|--------------|------------------|-----------------------------------|--------------|--------------|--------------|
|                  |            | Tune-up                           | 128CH        | 190CH        | 251CH        |                  | Tune-up                           | 128CH        | 190CH        | 251CH        |
| GSM (CS)         |            | 33.00                             | 32.37        | 32.44        | 32.41        | -9.19            | 23.81                             | 23.18        | 23.25        | 23.22        |
| GPRS/EDGE (GMSK) | 1 Tx Slot  | 33.00                             | 32.21        | 32.30        | 32.36        | -9.19            | 23.81                             | 23.02        | 23.11        | 23.17        |
|                  | 2 Tx Slots | <b>31.00</b>                      | <b>29.48</b> | <b>29.70</b> | <b>29.78</b> | <b>-6.13</b>     | <b>24.87</b>                      | <b>23.35</b> | <b>23.57</b> | <b>23.65</b> |
|                  | 3 Tx Slots | 29.00                             | 27.72        | 28.02        | 28.11        | -4.42            | 24.58                             | 23.30        | 23.60        | 23.69        |
|                  | 4 Tx Slots | 27.00                             | 25.68        | 25.94        | 25.91        | -3.18            | 23.82                             | 22.50        | 22.76        | 22.73        |
| EDGE (8PSK)      | 1 Tx Slot  | 26.50                             | 25.53        | 25.74        | 25.69        | -9.19            | 17.31                             | 16.34        | 16.55        | 16.50        |
|                  | 2 Tx Slots | 26.00                             | 25.11        | 25.31        | 25.37        | -6.13            | 19.87                             | 18.98        | 19.18        | 19.24        |
|                  | 3 Tx Slots | 24.00                             | 23.13        | 23.34        | 23.35        | -4.42            | 19.58                             | 18.71        | 18.92        | 18.93        |
|                  | 4 Tx Slots | 21.50                             | 20.01        | 20.33        | 20.40        | -3.18            | 18.32                             | 16.83        | 17.15        | 17.22        |

Table 13:Conducted power measurement results of GSM850 with Proximity sensor deactivated

| GSM850           |            | Burst-Averaged output Power (dBm) |              |              |              | Division Factors | Frame-Averaged output Power (dBm) |              |              |              |
|------------------|------------|-----------------------------------|--------------|--------------|--------------|------------------|-----------------------------------|--------------|--------------|--------------|
|                  |            | Tune-up                           | 128CH        | 190CH        | 251CH        |                  | Tune-up                           | 128CH        | 190CH        | 251CH        |
| GSM (CS)         |            | 30.50                             | 29.63        | 29.81        | 29.87        | -9.19            | 21.31                             | 20.44        | 20.62        | 20.68        |
| GPRS/EDGE (GMSK) | 1 Tx Slot  | 30.50                             | 29.62        | 29.78        | 29.83        | -9.19            | 21.31                             | 20.43        | 20.59        | 20.64        |
|                  | 2 Tx Slots | <b>28.50</b>                      | <b>27.74</b> | <b>28.05</b> | <b>28.12</b> | <b>-6.13</b>     | <b>22.37</b>                      | <b>21.61</b> | <b>21.92</b> | <b>21.99</b> |
|                  | 3 Tx Slots | 26.50                             | 25.78        | 26.11        | 26.02        | -4.42            | 22.08                             | 21.36        | 21.69        | 21.60        |
|                  | 4 Tx Slots | 24.50                             | 23.54        | 23.75        | 23.89        | -3.18            | 21.32                             | 20.36        | 20.57        | 20.71        |
| EDGE (8PSK)      | 1 Tx Slot  | 26.50                             | 25.49        | 25.72        | 25.74        | -9.19            | 17.31                             | 16.30        | 16.53        | 16.55        |
|                  | 2 Tx Slots | 25.00                             | 24.16        | 24.32        | 24.33        | -6.13            | 18.87                             | 18.03        | 18.19        | 18.20        |
|                  | 3 Tx Slots | 23.00                             | 21.30        | 21.59        | 21.62        | -4.42            | 18.58                             | 16.88        | 17.17        | 17.20        |
|                  | 4 Tx Slots | 20.50                             | 19.03        | 19.27        | 19.28        | -3.18            | 17.32                             | 15.85        | 16.09        | 16.10        |

Table 14:Conducted power measurement results of GSM850 with Proximity sensor activated

Note:

- 1) The conducted power of GSM850 is measured with RMS detector.
- 2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- 3) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

### 7.1.2 Conducted power measurements of GSM1900

| GSM1900          |            | Burst-Averaged output Power (dBm) |              |              |              | Division Factors | Frame-Averaged output Power (dBm) |              |              |              |
|------------------|------------|-----------------------------------|--------------|--------------|--------------|------------------|-----------------------------------|--------------|--------------|--------------|
|                  |            | Tune-up                           | 512CH        | 661CH        | 810CH        |                  | Tune-up                           | 512CH        | 661CH        | 810CH        |
| GSM (CS)         |            | 30.50                             | 29.18        | 29.17        | 29.31        | -9.19            | 21.31                             | 19.99        | 19.98        | 20.12        |
| GPRS/EDGE (GMSK) | 1 Tx Slot  | 30.50                             | 29.32        | 29.31        | 29.46        | -9.19            | 21.31                             | 20.13        | 20.12        | 20.27        |
|                  | 2 Tx Slots | <b>28.00</b>                      | <b>26.99</b> | <b>26.90</b> | <b>27.14</b> | <b>-6.13</b>     | <b>21.87</b>                      | <b>20.86</b> | <b>20.77</b> | <b>21.01</b> |
|                  | 3 Tx Slots | 25.50                             | 24.87        | 24.78        | 25.28        | -4.42            | 21.08                             | 20.45        | 20.36        | 20.86        |
|                  | 4 Tx Slots | 25.00                             | 24.08        | 24.01        | 24.40        | -3.18            | 21.82                             | 20.90        | 20.83        | 21.22        |
| EDGE (8PSK)      | 1 Tx Slot  | 25.50                             | 24.42        | 24.25        | 24.57        | -9.19            | 16.31                             | 15.23        | 15.06        | 15.38        |
|                  | 2 Tx Slots | 25.00                             | 24.06        | 23.92        | 24.28        | -6.13            | 18.87                             | 17.93        | 17.79        | 18.15        |
|                  | 3 Tx Slots | 23.00                             | 21.92        | 21.80        | 22.10        | -4.42            | 18.58                             | 17.50        | 17.38        | 17.68        |
|                  | 4 Tx Slots | 21.00                             | 19.92        | 19.85        | 20.04        | -3.18            | 17.82                             | 16.74        | 16.67        | 16.86        |

Table 15: Conducted power measurement results of GSM1900 with Proximity sensor deactivated

| GSM1900          |            | Burst-Averaged output Power (dBm) |              |              |              | Division Factors | Frame-Averaged output Power (dBm) |              |              |              |
|------------------|------------|-----------------------------------|--------------|--------------|--------------|------------------|-----------------------------------|--------------|--------------|--------------|
|                  |            | Tune-up                           | 512CH        | 661CH        | 810CH        |                  | Tune-up                           | 512CH        | 661CH        | 810CH        |
| GSM (CS)         |            | 21.50                             | 21.15        | 20.99        | 21.28        | -9.19            | 12.31                             | 11.96        | 11.80        | 12.09        |
| GPRS/EDGE (GMSK) | 1 Tx Slot  | 21.50                             | 21.02        | 20.97        | 21.21        | -9.19            | 12.31                             | 11.83        | 11.78        | 12.02        |
|                  | 2 Tx Slots | <b>19.50</b>                      | <b>17.87</b> | <b>17.72</b> | <b>18.12</b> | <b>-6.13</b>     | <b>13.37</b>                      | <b>11.74</b> | <b>11.59</b> | <b>11.99</b> |
|                  | 3 Tx Slots | 16.50                             | 15.79        | 15.80        | 15.92        | -4.42            | 12.08                             | 11.37        | 11.38        | 11.50        |
|                  | 4 Tx Slots | 14.50                             | 13.90        | 13.83        | 14.02        | -3.18            | 11.32                             | 10.72        | 10.65        | 10.84        |
| EDGE (8PSK)      | 1 Tx Slot  | 19.50                             | 18.70        | 18.53        | 18.82        | -9.19            | 10.31                             | 9.51         | 9.34         | 9.63         |
|                  | 2 Tx Slots | 15.00                             | 14.26        | 14.10        | 14.57        | -6.13            | 8.87                              | 8.13         | 7.97         | 8.44         |
|                  | 3 Tx Slots | 13.00                             | 12.22        | 12.18        | 12.49        | -4.42            | 8.58                              | 7.80         | 7.76         | 8.07         |
|                  | 4 Tx Slots | 11.00                             | 10.20        | 10.02        | 10.52        | -3.18            | 7.82                              | 7.02         | 6.84         | 7.34         |

Table 16: Conducted power measurement results of GSM1900 with Proximity sensor activated

Note:

- 1) The conducted power of GSM850 is measured with RMS detector.
- 2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- 3) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

### 7.1.3 Conducted power measurements of UMTS Band V

| UMTS Band V |              | Tune-up | Conducted Power (dBm) |              |              |
|-------------|--------------|---------|-----------------------|--------------|--------------|
|             |              |         | 4132CH                | 4182CH       | 4233CH       |
| WCDMA       | 12.2kbps RMC | 24.0    | <b>22.87</b>          | <b>22.69</b> | <b>22.67</b> |
|             | 64kbps RMC   | 24.0    | 22.86                 | 22.68        | 22.64        |
|             | 144kbps RMC  | 24.0    | 22.85                 | 22.70        | 22.65        |
|             | 384kbps RMC  | 24.0    | 22.84                 | 22.68        | 22.66        |
| HSDPA       | Subtest 1    | 23.0    | 21.78                 | 21.68        | 21.79        |
|             | Subtest 2    | 23.0    | 21.72                 | 21.44        | 21.53        |
|             | Subtest 3    | 22.5    | 21.14                 | 20.85        | 20.87        |
|             | Subtest 4    | 22.5    | 21.03                 | 20.89        | 20.91        |
| HSUPA       | Subtest 1    | 22.0    | 21.44                 | 21.18        | 21.61        |
|             | Subtest 2    | 21.5    | 20.37                 | 20.16        | 20.49        |
|             | Subtest 3    | 21.5    | 20.54                 | 20.19        | 20.26        |
|             | Subtest 4    | 22.0    | 20.53                 | 20.42        | 20.76        |
|             | Subtest 5    | 22.0    | 21.24                 | 20.99        | 21.31        |
| DC-HSDPA    | Subtest 1    | 23.0    | 21.74                 | 21.72        | 21.70        |
|             | Subtest 2    | 23.0    | 21.70                 | 21.49        | 21.50        |
|             | Subtest 3    | 22.5    | 21.21                 | 20.98        | 20.84        |
|             | Subtest 4    | 22.5    | 21.09                 | 20.94        | 20.90        |

Table 17: Conducted power measurement results of UMTS Band V with Proximity sensor deactivated

| UMTS Band V |              | Tune-up | Conducted Power (dBm) |              |              |
|-------------|--------------|---------|-----------------------|--------------|--------------|
|             |              |         | 4132CH                | 4182CH       | 4233CH       |
| WCDMA       | 12.2kbps RMC | 21.0    | <b>20.43</b>          | <b>20.23</b> | <b>20.24</b> |
|             | 64kbps RMC   | 21.0    | 20.46                 | 20.24        | 20.25        |
|             | 144kbps RMC  | 21.0    | 20.42                 | 20.22        | 20.23        |
|             | 384kbps RMC  | 21.0    | 20.44                 | 20.23        | 20.21        |
| HSDPA       | Subtest 1    | 20.0    | 19.42                 | 19.31        | 19.44        |
|             | Subtest 2    | 20.0    | 19.02                 | 19.07        | 19.27        |
|             | Subtest 3    | 19.5    | 18.62                 | 18.52        | 18.60        |
|             | Subtest 4    | 19.5    | 18.53                 | 18.43        | 18.62        |
| HSUPA       | Subtest 1    | 19.0    | 18.35                 | 18.44        | 18.52        |
|             | Subtest 2    | 18.5    | 18.15                 | 18.20        | 18.48        |
|             | Subtest 3    | 18.5    | 18.21                 | 17.91        | 18.23        |
|             | Subtest 4    | 19.0    | 18.93                 | 18.96        | 18.98        |
|             | Subtest 5    | 19.0    | 18.79                 | 18.55        | 18.44        |
| DC-HSDPA    | Subtest 1    | 20.0    | 19.40                 | 19.38        | 19.40        |
|             | Subtest 2    | 20.0    | 19.07                 | 19.11        | 19.29        |
|             | Subtest 3    | 19.5    | 18.69                 | 18.55        | 18.66        |
|             | Subtest 4    | 19.5    | 18.53                 | 18.46        | 18.60        |

Table 18: Conducted power measurement results of UMTS Band V with Proximity sensor activated  
Note:

- 1) The conducted power of UMTS Band V is measured with RMS detector.
- 2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).
- 3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the Second mode.

#### 7.1.4 Conducted power measurements of UMTS Band IV

| UMTS Band IV |              | Tune-up | Conducted Power (dBm) |              |              |
|--------------|--------------|---------|-----------------------|--------------|--------------|
|              |              |         | 1312CH                | 1413CH       | 1513CH       |
| WCDMA        | 12.2kbps RMC | 23.5    | <b>22.44</b>          | <b>22.34</b> | <b>22.37</b> |
|              | 64kbps RMC   | 23.5    | 22.42                 | 22.40        | 22.36        |
|              | 144kbps RMC  | 23.5    | 22.41                 | 22.41        | 22.35        |
|              | 384kbps RMC  | 23.5    | 22.43                 | 22.38        | 22.37        |
| HSDPA        | Subtest 1    | 22.5    | 21.47                 | 21.35        | 21.38        |
|              | Subtest 2    | 22.0    | 21.21                 | 21.10        | 20.94        |
|              | Subtest 3    | 22.0    | 20.72                 | 20.58        | 20.45        |
|              | Subtest 4    | 22.5    | 20.68                 | 20.56        | 20.52        |
| HSUPA        | Subtest 1    | 22.0    | 20.81                 | 20.74        | 20.97        |
|              | Subtest 2    | 21.0    | 19.66                 | 20.23        | 19.92        |
|              | Subtest 3    | 20.5    | 20.08                 | 20.21        | 19.84        |
|              | Subtest 4    | 21.5    | 20.68                 | 20.46        | 20.18        |
|              | Subtest 5    | 22.0    | 20.66                 | 20.55        | 20.25        |
| DC-HSDPA     | Subtest 1    | 22.5    | 21.48                 | 21.34        | 21.37        |
|              | Subtest 2    | 22.0    | 21.25                 | 21.11        | 21.03        |
|              | Subtest 3    | 22.0    | 20.70                 | 20.59        | 20.49        |
|              | Subtest 4    | 22.5    | 20.66                 | 20.54        | 20.58        |

Table 19: Conducted power measurement results of UMTS Band IV with Proximity sensor deactivated

| UMTS Band IV |              | Tune-up | Conducted Power (dBm) |              |              |
|--------------|--------------|---------|-----------------------|--------------|--------------|
|              |              |         | 1312CH                | 1413CH       | 1513CH       |
| WCDMA        | 12.2kbps RMC | 14.0    | <b>13.90</b>          | <b>13.82</b> | <b>13.93</b> |
|              | 64kbps RMC   | 14.0    | 13.89                 | 13.84        | 13.91        |
|              | 144kbps RMC  | 14.0    | 13.90                 | 13.81        | 13.90        |
|              | 384kbps RMC  | 14.0    | 13.91                 | 13.82        | 13.92        |
| HSDPA        | Subtest 1    | 13.0    | 11.92                 | 11.93        | 11.65        |
|              | Subtest 2    | 12.5    | 11.75                 | 11.73        | 11.45        |
|              | Subtest 3    | 12.5    | 11.19                 | 11.21        | 11.04        |
|              | Subtest 4    | 13.0    | 11.20                 | 11.12        | 11.05        |
| HSUPA        | Subtest 1    | 12.5    | 11.81                 | 11.94        | 11.93        |
|              | Subtest 2    | 11.5    | 10.01                 | 10.25        | 10.05        |
|              | Subtest 3    | 11.0    | 9.51                  | 9.61         | 9.55         |
|              | Subtest 4    | 12.0    | 11.66                 | 11.93        | 11.84        |
|              | Subtest 5    | 12.5    | 11.49                 | 11.60        | 11.31        |
| DC-HSDPA     | Subtest 1    | 13.0    | 11.90                 | 11.91        | 11.69        |
|              | Subtest 2    | 12.5    | 11.72                 | 11.70        | 11.52        |
|              | Subtest 3    | 12.5    | 11.25                 | 11.28        | 11.01        |
|              | Subtest 4    | 13.0    | 11.28                 | 11.21        | 11.04        |

Table 20: Conducted power measurement results of UMTS Band IV with Proximity sensor activated  
Note:

- 1) The conducted power of UMTS Band IV is measured with RMS detector.
- 2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).
- 3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the Second mode.

### 7.1.5 Conducted power measurements of UMTS Band II

| UMTS Band II |              | Tune-up | Conducted Power (dBm) |              |              |
|--------------|--------------|---------|-----------------------|--------------|--------------|
|              |              |         | 9262CH                | 9400CH       | 9538CH       |
| WCDMA        | 12.2kbps RMC | 23.5    | <b>22.07</b>          | <b>22.10</b> | <b>21.97</b> |
|              | 64kbps RMC   | 23.5    | 22.05                 | 22.06        | 21.98        |
|              | 144kbps RMC  | 23.5    | 22.04                 | 22.07        | 22.00        |
|              | 384kbps RMC  | 23.5    | 22.05                 | 22.08        | 21.98        |
| HSDPA        | Subtest 1    | 22.5    | 21.55                 | 21.58        | 21.69        |
|              | Subtest 2    | 22.5    | 21.43                 | 21.38        | 21.52        |
|              | Subtest 3    | 22.0    | 20.96                 | 20.84        | 20.91        |
|              | Subtest 4    | 22.0    | 20.89                 | 20.91        | 20.83        |
| HSUPA        | Subtest 1    | 22.0    | 21.40                 | 21.41        | 21.44        |
|              | Subtest 2    | 21.0    | 20.32                 | 20.62        | 20.61        |
|              | Subtest 3    | 21.0    | 20.57                 | 20.48        | 20.45        |
|              | Subtest 4    | 21.5    | 20.43                 | 20.46        | 20.41        |
|              | Subtest 5    | 22.0    | 21.16                 | 21.39        | 21.26        |
| DC-HSDPA     | Subtest 1    | 22.5    | 21.59                 | 21.61        | 21.65        |
|              | Subtest 2    | 22.5    | 21.49                 | 21.34        | 21.50        |
|              | Subtest 3    | 22.0    | 21.04                 | 20.88        | 20.90        |
|              | Subtest 4    | 22.0    | 20.95                 | 20.92        | 20.88        |

Table 21: Conducted power measurement results of UMTS Band II with Proximity sensor deactivated

| UMTS Band II |              | Tune-up | Conducted Power (dBm) |              |              |
|--------------|--------------|---------|-----------------------|--------------|--------------|
|              |              |         | 9262CH                | 9400CH       | 9538CH       |
| WCDMA        | 12.2kbps RMC | 14.0    | <b>13.40</b>          | <b>13.35</b> | <b>13.31</b> |
|              | 64kbps RMC   | 14.0    | 13.54                 | 13.35        | 13.33        |
|              | 144kbps RMC  | 14.0    | 13.44                 | 13.36        | 13.35        |
|              | 384kbps RMC  | 14.0    | 13.42                 | 13.32        | 13.34        |
| HSDPA        | Subtest 1    | 13.0    | 12.98                 | 12.92        | 12.87        |
|              | Subtest 2    | 13.0    | 12.94                 | 12.64        | 12.57        |
|              | Subtest 3    | 12.5    | 12.44                 | 12.24        | 12.17        |
|              | Subtest 4    | 12.5    | 12.46                 | 12.21        | 12.19        |
| HSUPA        | Subtest 1    | 14.0    | 13.12                 | 13.10        | 13.35        |
|              | Subtest 2    | 12.0    | 11.15                 | 11.33        | 11.34        |
|              | Subtest 3    | 12.0    | 10.66                 | 11.45        | 10.81        |
|              | Subtest 4    | 14.0    | 13.12                 | 13.11        | 13.08        |
|              | Subtest 5    | 13.0    | 12.32                 | 12.43        | 12.46        |
| DC-HSDPA     | Subtest 1    | 13.0    | 12.90                 | 12.90        | 12.83        |
|              | Subtest 2    | 13.0    | 12.91                 | 12.66        | 12.51        |
|              | Subtest 3    | 12.5    | 12.41                 | 12.28        | 12.24        |
|              | Subtest 4    | 12.5    | 12.38                 | 12.21        | 12.21        |

Table 22: Conducted power measurement results of UMTS Band II with Proximity sensor activated  
Note:

- 1) The conducted power of UMTS Band II is measured with RMS detector.
- 2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).
- 3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the Second mode.

### 7.1.6 Conducted power measurements of LTE Band II

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 18607CH | 18900CH | 19193CH |
| 1.4MHz    | QPSK       | 1       | 0         | 23      | 21.42   | 21.52   | 21.57   |
|           |            | 1       | 3         | 23      | 21.29   | 21.41   | 21.42   |
|           |            | 1       | 5         | 23      | 21.29   | 21.46   | 21.35   |
|           |            | 3       | 0         | 23      | 21.37   | 21.47   | 21.47   |
|           |            | 3       | 2         | 23      | 21.46   | 21.52   | 21.50   |
|           |            | 3       | 3         | 23      | 21.44   | 21.49   | 21.42   |
|           |            | 6       | 0         | 22      | 20.33   | 20.39   | 20.33   |
|           | 16QAM      | 1       | 0         | 22      | 20.89   | 20.31   | 20.94   |
|           |            | 1       | 3         | 22      | 20.96   | 20.11   | 20.12   |
|           |            | 1       | 5         | 22      | 20.97   | 20.08   | 20.06   |
|           |            | 3       | 0         | 22      | 20.23   | 20.05   | 20.11   |
|           |            | 3       | 2         | 22      | 20.21   | 20.11   | 20.03   |
|           |            | 3       | 3         | 22      | 20.22   | 20.08   | 20.07   |
|           |            | 6       | 0         | 21      | 19.58   | 19.21   | 19.16   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 18615CH | 18900CH | 19185CH |
| 3MHz      | QPSK       | 1       | 0         | 23      | 21.46   | 21.65   | 21.58   |
|           |            | 1       | 7         | 23      | 21.57   | 21.97   | 21.55   |
|           |            | 1       | 14        | 23      | 21.58   | 21.65   | 21.58   |
|           |            | 8       | 0         | 22      | 20.34   | 20.45   | 20.37   |
|           |            | 8       | 4         | 22      | 20.30   | 20.40   | 20.37   |
|           |            | 8       | 7         | 22      | 20.33   | 20.37   | 20.49   |
|           |            | 15      | 0         | 22      | 20.28   | 20.47   | 20.40   |
|           | 16QAM      | 1       | 0         | 22      | 21.26   | 20.31   | 21.03   |
|           |            | 1       | 7         | 22      | 21.32   | 20.43   | 20.80   |
|           |            | 1       | 14        | 22      | 21.21   | 20.39   | 20.85   |
|           |            | 8       | 0         | 21      | 19.55   | 19.43   | 19.54   |
|           |            | 8       | 4         | 21      | 19.62   | 19.55   | 19.37   |
|           |            | 8       | 7         | 21      | 19.65   | 19.45   | 19.07   |
|           |            | 15      | 0         | 21      | 19.31   | 19.29   | 19.55   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 18625CH | 18900CH | 19175CH |
| 5MHz      | QPSK       | 1       | 0         | 23      | 21.09   | 21.52   | 21.55   |
|           |            | 1       | 13        | 23      | 21.13   | 21.51   | 21.58   |
|           |            | 1       | 24        | 23      | 21.18   | 21.50   | 21.59   |
|           |            | 12      | 0         | 22      | 20.20   | 20.38   | 20.39   |
|           |            | 12      | 6         | 22      | 20.25   | 20.40   | 20.37   |
|           |            | 12      | 13        | 22      | 20.23   | 20.42   | 20.42   |
|           |            | 25      | 0         | 22      | 20.29   | 20.40   | 20.40   |
|           | 16QAM      | 1       | 0         | 22      | 20.14   | 20.02   | 20.69   |
|           |            | 1       | 13        | 22      | 20.12   | 20.06   | 20.58   |
|           |            | 1       | 24        | 22      | 20.01   | 20.03   | 20.66   |
|           |            | 12      | 0         | 21      | 19.43   | 19.34   | 19.16   |
|           |            | 12      | 6         | 21      | 19.42   | 19.49   | 19.14   |
|           |            | 12      | 13        | 21      | 19.29   | 19.48   | 19.20   |
|           |            | 25      | 0         | 21      | 19.54   | 19.40   | 19.60   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 18650CH | 18900CH | 19150CH |
| 10MHz     | QPSK       | 1       | 0         | 23      | 21.57   | 21.74   | 21.77   |
|           |            | 1       | 25        | 23      | 21.83   | 21.74   | 21.67   |
|           |            | 1       | 49        | 23      | 21.64   | 21.67   | 21.70   |
|           |            | 25      | 0         | 22      | 20.33   | 20.42   | 20.40   |
|           |            | 25      | 13        | 22      | 20.35   | 20.51   | 20.43   |
|           |            | 25      | 25        | 22      | 20.29   | 20.52   | 20.38   |
|           |            | 50      | 0         | 22      | 20.28   | 20.53   | 20.49   |
|           | 16QAM      | 1       | 0         | 22      | 21.12   | 20.70   | 20.62   |
|           |            | 1       | 25        | 22      | 20.94   | 20.79   | 20.76   |
|           |            | 1       | 49        | 22      | 21.13   | 20.51   | 20.52   |
|           |            | 25      | 0         | 21      | 19.48   | 19.49   | 19.38   |
|           |            | 25      | 13        | 21      | 19.44   | 19.41   | 19.43   |
|           |            | 25      | 25        | 21      | 19.45   | 19.53   | 19.39   |
|           |            | 50      | 0         | 21      | 19.35   | 19.42   | 19.29   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|--------------|--------------|--------------|
|           |            |         |           |         | 18675CH      | 18900CH      | 19125CH      |
| 15MHz     | QPSK       | 1       | 0         | 23      | 21.65        | 21.78        | 21.91        |
|           |            | 1       | 38        | 23      | 21.54        | 21.61        | 21.46        |
|           |            | 1       | 74        | 23      | 21.57        | 21.61        | 21.75        |
|           |            | 36      | 0         | 22      | 20.30        | 20.44        | 20.48        |
|           |            | 36      | 18        | 22      | 20.31        | 20.42        | 20.38        |
|           |            | 36      | 39        | 22      | 20.20        | 20.37        | 20.33        |
|           |            | 75      | 0         | 22      | 20.31        | 20.44        | 20.34        |
|           | 16QAM      | 1       | 0         | 22      | 21.18        | 20.29        | 20.42        |
|           |            | 1       | 38        | 22      | 20.89        | 20.24        | 20.49        |
|           |            | 1       | 74        | 22      | 20.97        | 20.22        | 20.73        |
|           |            | 36      | 0         | 21      | 19.45        | 19.30        | 19.30        |
|           |            | 36      | 18        | 21      | 19.38        | 19.30        | 19.21        |
|           |            | 36      | 39        | 21      | 19.11        | 19.23        | 19.25        |
|           |            | 75      | 0         | 21      | 19.59        | 19.63        | 19.36        |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|           |            |         |           |         | 18700CH      | 18900CH      | 19100CH      |
| 20MHz     | QPSK       | 1       | 0         | 23      | 21.52        | <b>21.82</b> | 21.56        |
|           |            | 1       | 50        | 23      | <b>21.53</b> | 21.74        | <b>21.61</b> |
|           |            | 1       | 99        | 23      | 21.27        | 21.58        | 21.42        |
|           |            | 50      | 0         | 22      | <b>20.46</b> | 20.49        | <b>20.43</b> |
|           |            | 50      | 25        | 22      | 20.26        | <b>20.51</b> | 20.32        |
|           |            | 50      | 50        | 22      | 20.30        | 20.42        | 20.29        |
|           |            | 100     | 0         | 22      | 20.39        | <b>20.48</b> | 20.39        |
|           | 16QAM      | 1       | 0         | 22      | 20.28        | 20.31        | 20.43        |
|           |            | 1       | 50        | 22      | 20.10        | 20.61        | 20.22        |
|           |            | 1       | 99        | 22      | 20.11        | 20.18        | 20.24        |
|           |            | 50      | 0         | 21      | 19.50        | 19.63        | 19.51        |
|           |            | 50      | 25        | 21      | 19.32        | 19.63        | 19.47        |
|           |            | 50      | 50        | 21      | 19.46        | 19.56        | 19.43        |
|           |            | 100     | 0         | 21      | 19.38        | 19.40        | 19.54        |

Table 23: Conducted power measurement results of LTE Band II with Proximity sensor deactivated

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 18607CH | 18900CH | 19193CH |
| 1.4MHz    | QPSK       | 1       | 0         | 14      | 12.55   | 12.52   | 12.54   |
|           |            | 1       | 3         | 14      | 12.54   | 12.62   | 12.61   |
|           |            | 1       | 5         | 14      | 12.67   | 12.5    | 12.63   |
|           |            | 3       | 0         | 14      | 12.50   | 12.53   | 12.44   |
|           |            | 3       | 2         | 14      | 12.48   | 12.63   | 12.46   |
|           |            | 3       | 3         | 14      | 12.55   | 12.49   | 12.58   |
|           |            | 6       | 0         | 13      | 11.79   | 11.97   | 11.84   |
|           | 16QAM      | 1       | 0         | 13      | 11.80   | 12.09   | 12.06   |
|           |            | 1       | 3         | 13      | 12.02   | 12.28   | 12.11   |
|           |            | 1       | 5         | 13      | 11.95   | 12.14   | 11.89   |
|           |            | 3       | 0         | 13      | 11.73   | 11.61   | 11.81   |
|           |            | 3       | 2         | 13      | 11.84   | 11.68   | 11.49   |
|           |            | 3       | 3         | 13      | 11.53   | 11.66   | 11.53   |
|           |            | 6       | 0         | 12      | 11.58   | 11.67   | 11.68   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 18615CH | 18900CH | 19185CH |
| 3MHz      | QPSK       | 1       | 0         | 14      | 12.47   | 12.16   | 12.11   |
|           |            | 1       | 7         | 14      | 12.56   | 12.55   | 12.55   |
|           |            | 1       | 14        | 14      | 12.19   | 12.28   | 11.98   |
|           |            | 8       | 0         | 13      | 11.89   | 12.04   | 12.04   |
|           |            | 8       | 4         | 13      | 11.88   | 11.98   | 11.94   |
|           |            | 8       | 7         | 13      | 11.91   | 11.98   | 11.96   |
|           |            | 15      | 0         | 13      | 11.87   | 12.07   | 11.93   |
|           | 16QAM      | 1       | 0         | 13      | 12.06   | 12.36   | 12.21   |
|           |            | 1       | 7         | 13      | 12.12   | 12.17   | 12.01   |
|           |            | 1       | 14        | 13      | 12.34   | 12.42   | 12.02   |
|           |            | 8       | 0         | 12      | 11.79   | 11.99   | 11.90   |
|           |            | 8       | 4         | 12      | 11.78   | 11.98   | 11.89   |
|           |            | 8       | 7         | 12      | 11.85   | 11.94   | 11.83   |
|           |            | 15      | 0         | 12      | 11.52   | 11.98   | 11.99   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 18625CH | 18900CH | 19175CH |
| 5MHz      | QPSK       | 1       | 0         | 14      | 12.13   | 12.43   | 12.41   |
|           |            | 1       | 13        | 14      | 12.04   | 12.06   | 12.02   |
|           |            | 1       | 24        | 14      | 12.32   | 12.52   | 12.28   |
|           |            | 12      | 0         | 13      | 11.83   | 12.03   | 11.87   |
|           |            | 12      | 6         | 13      | 11.78   | 11.98   | 11.93   |
|           |            | 12      | 13        | 13      | 11.83   | 11.98   | 11.85   |
|           |            | 25      | 0         | 13      | 11.89   | 11.97   | 11.93   |
|           | 16QAM      | 1       | 0         | 13      | 12.17   | 12.47   | 12.48   |
|           |            | 1       | 13        | 13      | 12.01   | 12.05   | 12.01   |
|           |            | 1       | 24        | 13      | 12.41   | 12.60   | 12.41   |
|           |            | 12      | 0         | 12      | 11.86   | 11.91   | 11.81   |
|           |            | 12      | 6         | 12      | 11.88   | 11.89   | 11.89   |
|           |            | 12      | 13        | 12      | 11.87   | 11.98   | 11.85   |
|           |            | 25      | 0         | 12      | 11.85   | 11.95   | 11.94   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 18650CH | 18900CH | 19150CH |
| 10MHz     | QPSK       | 1       | 0         | 14      | 12.37   | 12.55   | 12.29   |
|           |            | 1       | 25        | 14      | 12.41   | 12.34   | 12.46   |
|           |            | 1       | 49        | 14      | 12.51   | 12.70   | 12.51   |
|           |            | 25      | 0         | 13      | 11.97   | 12.04   | 11.94   |
|           |            | 25      | 13        | 13      | 11.88   | 12.02   | 11.92   |
|           |            | 25      | 25        | 13      | 11.92   | 11.96   | 11.98   |
|           |            | 50      | 0         | 13      | 11.93   | 11.94   | 11.89   |
|           | 16QAM      | 1       | 0         | 13      | 12.25   | 12.32   | 12.29   |
|           |            | 1       | 25        | 13      | 11.62   | 11.55   | 11.49   |
|           |            | 1       | 49        | 13      | 12.37   | 12.50   | 12.44   |
|           |            | 25      | 0         | 12      | 11.84   | 11.90   | 11.96   |
|           |            | 25      | 13        | 12      | 11.97   | 11.99   | 11.94   |
|           |            | 25      | 25        | 12      | 11.98   | 11.96   | 11.72   |
|           |            | 50      | 0         | 12      | 11.88   | 11.86   | 11.81   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|--------------|--------------|--------------|
|           |            |         |           |         | 18675CH      | 18900CH      | 19125CH      |
| 15MHz     | QPSK       | 1       | 0         | 14      | 12.48        | 12.60        | 12.58        |
|           |            | 1       | 38        | 14      | 12.11        | 12.45        | 12.71        |
|           |            | 1       | 74        | 14      | 12.41        | 12.95        | 12.58        |
|           |            | 36      | 0         | 13      | 11.88        | 12.07        | 12.05        |
|           |            | 36      | 18        | 13      | 11.86        | 11.97        | 11.92        |
|           |            | 36      | 39        | 13      | 11.81        | 11.89        | 11.98        |
|           |            | 75      | 0         | 13      | 11.87        | 12.00        | 11.91        |
|           | 16QAM      | 1       | 0         | 13      | 12.28        | 12.42        | 12.51        |
|           |            | 1       | 38        | 13      | 11.50        | 11.67        | 11.38        |
|           |            | 1       | 74        | 13      | 12.15        | 12.90        | 12.53        |
|           |            | 36      | 0         | 12      | 11.93        | 11.98        | 11.97        |
|           |            | 36      | 18        | 12      | 11.86        | 11.82        | 11.82        |
|           |            | 36      | 39        | 12      | 11.84        | 11.77        | 11.72        |
|           |            | 75      | 0         | 12      | 11.81        | 11.97        | 11.91        |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|           |            |         |           |         | 18700CH      | 18900CH      | 19100CH      |
| 20MHz     | QPSK       | 1       | 0         | 14      | <b>12.35</b> | 12.37        | <b>12.72</b> |
|           |            | 1       | 50        | 14      | 12.34        | 12.73        | 12.11        |
|           |            | 1       | 99        | 14      | 12.34        | <b>12.90</b> | 12.68        |
|           |            | 50      | 0         | 13      | <b>12.04</b> | <b>12.03</b> | <b>12.02</b> |
|           |            | 50      | 25        | 13      | 11.88        | 12.02        | 12.01        |
|           |            | 50      | 50        | 13      | 11.90        | 11.95        | 11.89        |
|           |            | 100     | 0         | 13      | 11.93        | 12.03        | <b>12.04</b> |
|           | 16QAM      | 1       | 0         | 13      | 12.78        | 12.76        | 12.75        |
|           |            | 1       | 50        | 13      | 12.44        | 12.41        | 12.50        |
|           |            | 1       | 99        | 13      | 12.72        | 12.89        | 12.65        |
|           |            | 50      | 0         | 12      | 11.87        | 11.98        | 11.97        |
|           |            | 50      | 25        | 12      | 11.70        | 11.98        | 11.96        |
|           |            | 50      | 50        | 12      | 11.70        | 11.97        | 11.94        |
|           |            | 100     | 0         | 12      | 11.98        | 11.95        | 11.89        |

Table 24: Conducted power measurement results of LTE Band II with Proximity sensor activated

### 7.1.7 Conducted power measurements of LTE Band IV

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 19957CH | 20175CH | 20393CH |
| 1.4MHz    | QPSK       | 1       | 0         | 23      | 21.56   | 21.60   | 21.77   |
|           |            | 1       | 3         | 23      | 21.63   | 22.28   | 22.32   |
|           |            | 1       | 5         | 23      | 21.59   | 21.64   | 21.84   |
|           |            | 3       | 0         | 23      | 21.65   | 21.50   | 21.55   |
|           |            | 3       | 2         | 23      | 21.69   | 21.53   | 21.57   |
|           |            | 3       | 3         | 23      | 21.67   | 21.51   | 21.54   |
|           |            | 6       | 0         | 22      | 20.59   | 20.48   | 20.51   |
|           | 16QAM      | 1       | 0         | 22      | 20.09   | 20.02   | 21.25   |
|           |            | 1       | 3         | 22      | 20.21   | 20.25   | 21.17   |
|           |            | 1       | 5         | 22      | 20.86   | 20.10   | 20.26   |
|           |            | 3       | 0         | 22      | 20.39   | 20.14   | 20.29   |
|           |            | 3       | 2         | 22      | 20.39   | 20.18   | 20.31   |
|           |            | 3       | 3         | 22      | 20.39   | 20.15   | 20.28   |
|           |            | 6       | 0         | 21      | 19.47   | 19.25   | 19.88   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 19965CH | 20175CH | 20385CH |
| 3MHz      | QPSK       | 1       | 0         | 23      | 21.77   | 21.77   | 21.66   |
|           |            | 1       | 7         | 23      | 21.88   | 21.74   | 21.82   |
|           |            | 1       | 14        | 23      | 21.90   | 21.82   | 21.88   |
|           |            | 8       | 0         | 22      | 20.53   | 20.46   | 20.34   |
|           |            | 8       | 4         | 22      | 20.63   | 20.44   | 20.45   |
|           |            | 8       | 7         | 22      | 20.61   | 20.43   | 20.49   |
|           |            | 15      | 0         | 22      | 20.61   | 20.51   | 20.43   |
|           | 16QAM      | 1       | 0         | 22      | 21.60   | 21.49   | 21.47   |
|           |            | 1       | 7         | 22      | 21.62   | 21.67   | 21.66   |
|           |            | 1       | 14        | 22      | 21.59   | 21.42   | 21.48   |
|           |            | 8       | 0         | 21      | 19.94   | 19.61   | 19.59   |
|           |            | 8       | 4         | 21      | 20.02   | 19.20   | 19.66   |
|           |            | 8       | 7         | 21      | 19.93   | 19.22   | 19.64   |
|           |            | 15      | 0         | 21      | 19.72   | 19.70   | 19.66   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 19975CH | 20175CH | 20375CH |
| 5MHz      | QPSK       | 1       | 0         | 23      | 21.70   | 21.67   | 21.68   |
|           |            | 1       | 13        | 23      | 21.84   | 21.65   | 21.65   |
|           |            | 1       | 24        | 23      | 21.74   | 21.63   | 21.73   |
|           |            | 12      | 0         | 22      | 20.57   | 20.48   | 20.34   |
|           |            | 12      | 6         | 22      | 20.56   | 20.46   | 20.41   |
|           |            | 12      | 13        | 22      | 20.56   | 20.52   | 20.48   |
|           |            | 25      | 0         | 22      | 20.55   | 20.55   | 20.51   |
|           | 16QAM      | 1       | 0         | 22      | 20.06   | 20.39   | 20.08   |
|           |            | 1       | 13        | 22      | 20.40   | 20.02   | 20.67   |
|           |            | 1       | 24        | 22      | 21.08   | 20.04   | 20.60   |
|           |            | 12      | 0         | 21      | 19.76   | 19.43   | 19.32   |
|           |            | 12      | 6         | 21      | 19.72   | 19.50   | 19.36   |
|           |            | 12      | 13        | 21      | 19.62   | 19.49   | 19.58   |
|           |            | 25      | 0         | 21      | 19.79   | 19.56   | 19.62   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 20000CH | 20175CH | 20350CH |
| 10MHz     | QPSK       | 1       | 0         | 23      | 21.93   | 21.84   | 21.81   |
|           |            | 1       | 25        | 23      | 22.00   | 21.51   | 21.55   |
|           |            | 1       | 49        | 23      | 21.85   | 21.66   | 21.67   |
|           |            | 25      | 0         | 22      | 20.64   | 20.47   | 20.48   |
|           |            | 25      | 13        | 22      | 20.62   | 20.37   | 20.49   |
|           |            | 25      | 25        | 22      | 20.58   | 20.39   | 20.54   |
|           |            | 50      | 0         | 22      | 20.60   | 20.44   | 20.46   |
|           | 16QAM      | 1       | 0         | 22      | 21.55   | 20.69   | 21.29   |
|           |            | 1       | 25        | 22      | 21.12   | 20.35   | 21.10   |
|           |            | 1       | 49        | 22      | 21.29   | 20.22   | 20.62   |
|           |            | 25      | 0         | 21      | 19.63   | 19.60   | 19.49   |
|           |            | 25      | 13        | 21      | 19.51   | 19.48   | 19.58   |
|           |            | 25      | 25        | 21      | 19.67   | 19.40   | 19.63   |
|           |            | 50      | 0         | 21      | 19.66   | 19.52   | 19.54   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|--------------|--------------|--------------|
|           |            |         |           |         | 20025CH      | 20175CH      | 20325CH      |
| 15MHz     | QPSK       | 1       | 0         | 23      | 21.95        | 22.13        | 21.93        |
|           |            | 1       | 38        | 23      | 21.84        | 21.69        | 21.60        |
|           |            | 1       | 74        | 23      | 21.83        | 21.76        | 21.62        |
|           |            | 36      | 0         | 22      | 20.64        | 20.50        | 20.53        |
|           |            | 36      | 18        | 22      | 20.67        | 20.46        | 20.46        |
|           |            | 36      | 39        | 22      | 20.48        | 20.39        | 20.45        |
|           |            | 75      | 0         | 22      | 20.49        | 20.43        | 20.47        |
|           | 16QAM      | 1       | 0         | 22      | 21.11        | 20.52        | 20.58        |
|           |            | 1       | 38        | 22      | 20.93        | 20.24        | 20.35        |
|           |            | 1       | 74        | 22      | 20.95        | 21.05        | 20.74        |
|           |            | 36      | 0         | 21      | 19.62        | 19.58        | 19.64        |
|           |            | 36      | 18        | 21      | 19.50        | 19.40        | 19.56        |
|           |            | 36      | 39        | 21      | 19.42        | 19.54        | 19.56        |
|           |            | 75      | 0         | 21      | 19.76        | 19.52        | 19.55        |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|           |            |         |           |         | 20050CH      | 20175CH      | 20300CH      |
| 20MHz     | QPSK       | 1       | 0         | 23      | <b>21.92</b> | <b>21.57</b> | 21.73        |
|           |            | 1       | 50        | 23      | 21.66        | 21.56        | <b>21.93</b> |
|           |            | 1       | 99        | 23      | 21.58        | 21.35        | 21.40        |
|           |            | 50      | 0         | 22      | 20.58        | <b>20.59</b> | 20.52        |
|           |            | 50      | 25        | 22      | 20.48        | 20.40        | 20.39        |
|           |            | 50      | 50        | 22      | 20.41        | 20.44        | 20.39        |
|           |            | 100     | 0         | 22      | 20.43        | 20.46        | <b>20.48</b> |
|           | 16QAM      | 1       | 0         | 22      | 20.50        | 20.52        | 20.62        |
|           |            | 1       | 50        | 22      | 20.21        | 20.32        | 20.39        |
|           |            | 1       | 99        | 22      | 20.07        | 20.33        | 20.49        |
|           |            | 50      | 0         | 21      | 19.69        | 19.70        | 19.68        |
|           |            | 50      | 25        | 21      | 19.53        | 19.55        | 19.56        |
|           |            | 50      | 50        | 21      | 19.48        | 19.59        | 19.66        |
|           |            | 100     | 0         | 21      | 19.57        | 19.65        | 19.61        |

Table 25: Conducted power measurement results of LTE Band IV with Proximity sensor deactivated

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 19957CH | 20175CH | 20393CH |
| 1.4MHz    | QPSK       | 1       | 0         | 14.5    | 13.25   | 13.02   | 13.06   |
|           |            | 1       | 3         | 14.5    | 13.14   | 13.12   | 13.16   |
|           |            | 1       | 5         | 14.5    | 13.20   | 13.12   | 13.27   |
|           |            | 3       | 0         | 14.5    | 13.25   | 13.05   | 13.09   |
|           |            | 3       | 2         | 14.5    | 13.29   | 13.08   | 13.13   |
|           |            | 3       | 3         | 14.5    | 13.27   | 13.15   | 13.19   |
|           |            | 6       | 0         | 13.5    | 13.25   | 13.04   | 13.15   |
|           | 16QAM      | 1       | 0         | 14.5    | 13.89   | 12.63   | 13.96   |
|           |            | 1       | 3         | 14.5    | 13.91   | 12.75   | 12.89   |
|           |            | 1       | 5         | 14.5    | 13.85   | 12.72   | 13.45   |
|           |            | 3       | 0         | 13.5    | 13.23   | 12.64   | 13.49   |
|           |            | 3       | 2         | 13.5    | 13.27   | 12.66   | 13.20   |
|           |            | 3       | 3         | 13.5    | 13.24   | 12.55   | 13.38   |
|           |            | 6       | 0         | 13.5    | 12.98   | 12.84   | 12.99   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 19965CH | 20175CH | 20385CH |
| 3MHz      | QPSK       | 1       | 0         | 14.5    | 13.42   | 13.19   | 13.22   |
|           |            | 1       | 7         | 14.5    | 13.43   | 13.27   | 13.33   |
|           |            | 1       | 14        | 14.5    | 13.43   | 13.26   | 13.30   |
|           |            | 8       | 0         | 13.5    | 13.15   | 13.14   | 13.05   |
|           |            | 8       | 4         | 13.5    | 13.24   | 13.12   | 13.14   |
|           |            | 8       | 7         | 13.5    | 13.24   | 13.10   | 13.13   |
|           |            | 15      | 0         | 13.5    | 13.25   | 13.14   | 13.15   |
|           | 16QAM      | 1       | 0         | 14.5    | 12.25   | 13.24   | 12.03   |
|           |            | 1       | 7         | 14.5    | 13.52   | 12.39   | 12.34   |
|           |            | 1       | 14        | 14.5    | 13.96   | 12.12   | 12.16   |
|           |            | 8       | 0         | 13.5    | 12.99   | 12.83   | 12.98   |
|           |            | 8       | 4         | 13.5    | 12.67   | 12.85   | 12.99   |
|           |            | 8       | 7         | 13.5    | 12.98   | 12.75   | 12.98   |
|           |            | 15      | 0         | 13.5    | 12.93   | 12.95   | 12.99   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 19975CH | 20175CH | 20375CH |
| 5MHz      | QPSK       | 1       | 0         | 14.5    | 13.35   | 13.01   | 13.21   |
|           |            | 1       | 13        | 14.5    | 13.28   | 13.02   | 13.09   |
|           |            | 1       | 24        | 14.5    | 13.04   | 13.07   | 13.22   |
|           |            | 12      | 0         | 13.5    | 13.15   | 13.14   | 12.94   |
|           |            | 12      | 6         | 13.5    | 13.17   | 13.10   | 12.93   |
|           |            | 12      | 13        | 13.5    | 13.19   | 13.07   | 13.10   |
|           |            | 25      | 0         | 13.5    | 13.15   | 13.11   | 13.12   |
|           | 16QAM      | 1       | 0         | 14.5    | 12.63   | 12.99   | 13.82   |
|           |            | 1       | 13        | 14.5    | 12.76   | 12.40   | 12.52   |
|           |            | 1       | 24        | 14.5    | 12.66   | 12.40   | 12.75   |
|           |            | 12      | 0         | 13.5    | 12.94   | 12.99   | 12.91   |
|           |            | 12      | 6         | 13.5    | 12.79   | 12.92   | 12.78   |
|           |            | 12      | 13        | 13.5    | 12.87   | 12.90   | 12.98   |
|           |            | 25      | 0         | 13.5    | 12.97   | 12.99   | 12.98   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 20000CH | 20175CH | 20350CH |
| 10MHz     | QPSK       | 1       | 0         | 14.5    | 13.45   | 13.43   | 13.52   |
|           |            | 1       | 25        | 14.5    | 13.51   | 13.52   | 13.51   |
|           |            | 1       | 49        | 14.5    | 13.53   | 13.32   | 13.44   |
|           |            | 25      | 0         | 13.5    | 13.29   | 13.16   | 13.12   |
|           |            | 25      | 13        | 13.5    | 13.15   | 13.10   | 13.12   |
|           |            | 25      | 25        | 13.5    | 13.20   | 13.14   | 13.20   |
|           |            | 50      | 0         | 13.5    | 13.24   | 13.19   | 13.21   |
|           | 16QAM      | 1       | 0         | 14.5    | 13.00   | 13.35   | 13.82   |
|           |            | 1       | 25        | 14.5    | 12.90   | 13.45   | 13.82   |
|           |            | 1       | 49        | 14.5    | 13.00   | 13.20   | 13.90   |
|           |            | 25      | 0         | 13.5    | 12.99   | 12.99   | 12.98   |
|           |            | 25      | 13        | 13.5    | 12.98   | 12.95   | 12.99   |
|           |            | 25      | 25        | 13.5    | 12.98   | 12.92   | 12.94   |
|           |            | 50      | 0         | 13.5    | 12.98   | 12.98   | 12.99   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|--------------|--------------|--------------|
|           |            |         |           |         | 20025CH      | 20175CH      | 20325CH      |
| 15MHz     | QPSK       | 1       | 0         | 14.5    | 13.64        | 13.56        | 13.47        |
|           |            | 1       | 38        | 14.5    | 13.47        | 13.15        | 13.19        |
|           |            | 1       | 74        | 14.5    | 13.43        | 13.28        | 13.27        |
|           |            | 36      | 0         | 13.5    | 13.24        | 13.18        | 13.19        |
|           |            | 36      | 18        | 13.5    | 13.27        | 13.12        | 13.09        |
|           |            | 36      | 39        | 13.5    | 13.16        | 13.15        | 13.20        |
|           |            | 75      | 0         | 13.5    | 13.11        | 13.10        | 13.13        |
|           | 16QAM      | 1       | 0         | 14.5    | 13.80        | 13.13        | 13.15        |
|           |            | 1       | 38        | 14.5    | 13.58        | 12.81        | 12.87        |
|           |            | 1       | 74        | 14.5    | 13.62        | 12.97        | 12.95        |
|           |            | 36      | 0         | 13.5    | 12.99        | 12.93        | 12.92        |
|           |            | 36      | 18        | 13.5    | 12.93        | 12.87        | 12.94        |
|           |            | 36      | 39        | 13.5    | 12.94        | 12.90        | 12.95        |
|           |            | 75      | 0         | 13.5    | 12.84        | 12.95        | 12.98        |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|           |            |         |           |         | 20050CH      | 20175CH      | 20300CH      |
| 20MHz     | QPSK       | 1       | 0         | 14.5    | <b>13.61</b> | <b>13.30</b> | <b>13.54</b> |
|           |            | 1       | 50        | 14.5    | 13.50        | 13.06        | 13.43        |
|           |            | 1       | 99        | 14.5    | 13.20        | 13.14        | 13.23        |
|           |            | 50      | 0         | 13.5    | <b>13.35</b> | <b>13.22</b> | <b>13.19</b> |
|           |            | 50      | 25        | 13.5    | 13.20        | 13.06        | 13.12        |
|           |            | 50      | 50        | 13.5    | 13.07        | 13.04        | 13.16        |
|           |            | 100     | 0         | 13.5    | 13.12        | 13.14        | <b>13.19</b> |
|           | 16QAM      | 1       | 0         | 14.5    | 13.44        | 13.23        | 13.11        |
|           |            | 1       | 50        | 14.5    | 13.13        | 13.03        | 12.88        |
|           |            | 1       | 99        | 14.5    | 13.10        | 13.02        | 12.91        |
|           |            | 50      | 0         | 13.5    | 12.98        | 12.88        | 12.84        |
|           |            | 50      | 25        | 13.5    | 12.93        | 12.81        | 12.92        |
|           |            | 50      | 50        | 13.5    | 12.83        | 12.83        | 12.92        |
|           |            | 100     | 0         | 13.5    | 12.93        | 12.90        | 12.86        |

Table 26: Conducted power measurement results of LTE Band IV with Proximity sensor activated

### 7.1.8 Conducted power measurements of LTE Band V

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 20407CH | 20525CH | 20643CH |
| 1.4MHz    | QPSK       | 1       | 0         | 23.5    | 22.93   | 22.79   | 22.89   |
|           |            | 1       | 3         | 23.5    | 22.78   | 22.82   | 22.91   |
|           |            | 1       | 5         | 23.5    | 22.83   | 22.73   | 22.76   |
|           |            | 3       | 0         | 23.5    | 22.88   | 22.63   | 22.96   |
|           |            | 3       | 2         | 23.5    | 22.77   | 22.70   | 22.88   |
|           |            | 3       | 3         | 23.5    | 22.88   | 22.61   | 22.92   |
|           |            | 6       | 0         | 22.5    | 21.89   | 21.79   | 21.81   |
|           | 16QAM      | 1       | 0         | 22.5    | 22.23   | 21.34   | 21.50   |
|           |            | 1       | 3         | 22.5    | 22.23   | 21.46   | 21.58   |
|           |            | 1       | 5         | 22.5    | 22.19   | 21.39   | 21.49   |
|           |            | 3       | 0         | 22.5    | 21.74   | 21.66   | 21.66   |
|           |            | 3       | 2         | 22.5    | 22.09   | 21.85   | 21.58   |
|           |            | 3       | 3         | 22.5    | 22.13   | 21.78   | 21.53   |
|           |            | 6       | 0         | 21.5    | 21.08   | 20.58   | 20.58   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 20415CH | 20525CH | 20635CH |
| 3MHz      | QPSK       | 1       | 0         | 23.5    | 23.02   | 22.99   | 22.99   |
|           |            | 1       | 7         | 23.5    | 23.15   | 22.82   | 23.02   |
|           |            | 1       | 14        | 23.5    | 22.95   | 22.90   | 23.05   |
|           |            | 8       | 0         | 22.5    | 21.79   | 21.80   | 21.84   |
|           |            | 8       | 4         | 22.5    | 21.73   | 21.75   | 21.88   |
|           |            | 8       | 7         | 22.5    | 21.75   | 21.63   | 21.89   |
|           |            | 15      | 0         | 22.5    | 21.88   | 21.76   | 21.96   |
|           | 16QAM      | 1       | 0         | 22.5    | 21.87   | 20.71   | 21.74   |
|           |            | 1       | 7         | 22.5    | 22.08   | 21.00   | 21.44   |
|           |            | 1       | 14        | 22.5    | 22.14   | 21.64   | 22.09   |
|           |            | 8       | 0         | 21.5    | 20.78   | 20.51   | 20.71   |
|           |            | 8       | 4         | 21.5    | 20.76   | 20.84   | 20.81   |
|           |            | 8       | 7         | 21.5    | 20.67   | 20.66   | 20.76   |
|           |            | 15      | 0         | 21.5    | 20.52   | 20.72   | 20.93   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|---------|--------------|--------------|
|           |            |         |           |         | 20425CH | 20525CH      | 20625CH      |
| 5MHz      | QPSK       | 1       | 0         | 23.5    | 22.95   | 22.74        | 22.82        |
|           |            | 1       | 13        | 23.5    | 22.96   | 22.77        | 22.82        |
|           |            | 1       | 24        | 23.5    | 22.36   | 22.64        | 22.87        |
|           |            | 12      | 0         | 22.5    | 21.79   | 21.81        | 21.79        |
|           |            | 12      | 6         | 22.5    | 21.85   | 21.70        | 21.70        |
|           |            | 12      | 13        | 22.5    | 21.78   | 21.69        | 21.85        |
|           |            | 25      | 0         | 22.5    | 21.91   | 21.79        | 21.81        |
|           | 16QAM      | 1       | 0         | 22.5    | 22.5    | 21.70        | 21.17        |
|           |            | 1       | 13        | 22.5    | 22.49   | 21.68        | 21.22        |
|           |            | 1       | 24        | 22.5    | 21.40   | 21.61        | 21.46        |
|           |            | 12      | 0         | 21.5    | 20.86   | 20.65        | 20.70        |
|           |            | 12      | 6         | 21.5    | 20.71   | 20.62        | 20.58        |
|           |            | 12      | 13        | 21.5    | 20.81   | 20.59        | 20.59        |
|           |            | 25      | 0         | 21.5    | 20.74   | 20.72        | 20.88        |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel      | Channel      |
|           |            |         |           |         | 20450CH | 20525CH      | 20600CH      |
| 10MHz     | QPSK       | 1       | 0         | 23.5    | 23.09   | 23.11        | 22.99        |
|           |            | 1       | 25        | 23.5    | 23.12   | 22.82        | <b>23.13</b> |
|           |            | 1       | 49        | 23.5    | 22.94   | 22.81        | 23.02        |
|           |            | 25      | 0         | 22.5    | 21.80   | 21.84        | 21.76        |
|           |            | 25      | 13        | 22.5    | 21.70   | 21.80        | 21.82        |
|           |            | 25      | 25        | 22.5    | 21.76   | <b>21.85</b> | 21.81        |
|           |            | 50      | 0         | 22.5    | 21.80   | 21.73        | 21.84        |
|           | 16QAM      | 1       | 0         | 22.5    | 22.06   | 22.42        | 22.00        |
|           |            | 1       | 25        | 22.5    | 22.08   | 22.29        | 22.48        |
|           |            | 1       | 49        | 22.5    | 21.81   | 22.22        | 22.00        |
|           |            | 25      | 0         | 21.5    | 20.67   | 20.87        | 20.77        |
|           |            | 25      | 13        | 21.5    | 20.76   | 20.81        | 20.72        |
|           |            | 25      | 25        | 21.5    | 20.77   | 20.49        | 20.83        |
|           |            | 50      | 0         | 21.5    | 20.64   | 20.64        | 20.68        |

Table 27: Conducted power measurement results of LTE Band V with Proximity sensor deactivated

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 20407CH | 20525CH | 20643CH |
| 1.4MHz    | QPSK       | 1       | 0         | 22.5    | 21.18   | 21.19   | 21.41   |
|           |            | 1       | 3         | 22.5    | 21.23   | 21.78   | 21.43   |
|           |            | 1       | 5         | 22.5    | 21.19   | 21.09   | 21.22   |
|           |            | 3       | 0         | 22.5    | 21.26   | 21.16   | 21.43   |
|           |            | 3       | 2         | 22.5    | 21.50   | 21.10   | 21.32   |
|           |            | 3       | 3         | 22.5    | 21.35   | 21.02   | 21.36   |
|           |            | 6       | 0         | 21.5    | 21.29   | 21.09   | 21.32   |
|           | 16QAM      | 1       | 0         | 21.5    | 20.76   | 20.81   | 20.72   |
|           |            | 1       | 3         | 21.5    | 21.02   | 20.81   | 20.57   |
|           |            | 1       | 5         | 21.5    | 20.78   | 20.83   | 20.70   |
|           |            | 3       | 0         | 21.5    | 21.25   | 20.98   | 21.25   |
|           |            | 3       | 2         | 21.5    | 21.49   | 21.04   | 21.48   |
|           |            | 3       | 3         | 21.5    | 21.47   | 21.31   | 21.19   |
|           |            | 6       | 0         | 20.5    | 20.45   | 20.46   | 20.49   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 20415CH | 20525CH | 20635CH |
| 3MHz      | QPSK       | 1       | 0         | 22.5    | 21.26   | 21.44   | 21.22   |
|           |            | 1       | 7         | 22.5    | 21.22   | 21.36   | 21.44   |
|           |            | 1       | 14        | 22.5    | 21.23   | 21.35   | 21.47   |
|           |            | 8       | 0         | 21.5    | 21.30   | 21.21   | 21.15   |
|           |            | 8       | 4         | 21.5    | 21.25   | 21.11   | 21.26   |
|           |            | 8       | 7         | 21.5    | 21.11   | 21.04   | 21.26   |
|           |            | 15      | 0         | 21.5    | 21.31   | 21.15   | 21.30   |
|           | 16QAM      | 1       | 0         | 21.5    | 21.33   | 20.13   | 21.35   |
|           |            | 1       | 7         | 21.5    | 21.26   | 20.38   | 21.25   |
|           |            | 1       | 14        | 21.5    | 21.02   | 20.18   | 20.31   |
|           |            | 8       | 0         | 20.5    | 20.32   | 20.43   | 20.48   |
|           |            | 8       | 4         | 20.5    | 20.49   | 20.49   | 20.49   |
|           |            | 8       | 7         | 20.5    | 20.36   | 20.35   | 20.45   |
|           |            | 15      | 0         | 20.5    | 20.44   | 20.49   | 20.49   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|--------------|--------------|--------------|
|           |            |         |           |         | 20425CH      | 20525CH      | 20625CH      |
| 5MHz      | QPSK       | 1       | 0         | 22.5    | 20.94        | 21.15        | 21.04        |
|           |            | 1       | 13        | 22.5    | 20.81        | 21.11        | 21.11        |
|           |            | 1       | 24        | 22.5    | 20.78        | 21.07        | 21.17        |
|           |            | 12      | 0         | 21.5    | 21.22        | 21.28        | 21.26        |
|           |            | 12      | 6         | 21.5    | 21.18        | 21.06        | 21.22        |
|           |            | 12      | 13        | 21.5    | 21.19        | 21.12        | 21.28        |
|           |            | 25      | 0         | 21.5    | 21.26        | 21.19        | 21.20        |
|           | 16QAM      | 1       | 0         | 21.5    | 21.18        | 20.65        | 20.98        |
|           |            | 1       | 13        | 21.5    | 21.06        | 20.48        | 21.04        |
|           |            | 1       | 24        | 21.5    | 20.98        | 20.49        | 20.60        |
|           |            | 12      | 0         | 20.5    | 20.48        | 20.47        | 20.49        |
|           |            | 12      | 6         | 20.5    | 20.49        | 20.49        | 20.43        |
|           |            | 12      | 13        | 20.5    | 20.49        | 20.42        | 20.49        |
|           |            | 25      | 0         | 20.5    | 20.49        | 20.48        | 20.47        |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|           |            |         |           |         | 20450CH      | 20525CH      | 20600CH      |
| 10MHz     | QPSK       | 1       | 0         | 22.5    | <b>21.50</b> | <b>21.93</b> | 21.41        |
|           |            | 1       | 25        | 22.5    | 21.20        | 21.45        | <b>21.45</b> |
|           |            | 1       | 49        | 22.5    | 21.30        | 21.34        | 21.44        |
|           |            | 25      | 0         | 21.5    | 21.22        | <b>21.25</b> | 21.07        |
|           |            | 25      | 13        | 21.5    | 21.17        | 21.08        | 21.14        |
|           |            | 25      | 25        | 21.5    | <b>21.23</b> | 21.00        | <b>21.27</b> |
|           |            | 50      | 0         | 21.5    | 21.22        | 21.11        | <b>21.23</b> |
|           | 16QAM      | 1       | 0         | 21.5    | 21.22        | 21.44        | 21.31        |
|           |            | 1       | 25        | 21.5    | 21.01        | 21.35        | 21.41        |
|           |            | 1       | 49        | 21.5    | 21.30        | 21.02        | 21.36        |
|           |            | 25      | 0         | 20.5    | 20.45        | 20.49        | 20.49        |
|           |            | 25      | 13        | 20.5    | 20.50        | 20.42        | 20.49        |
|           |            | 25      | 25        | 20.5    | 20.48        | 20.49        | 20.47        |
|           |            | 50      | 0         | 20.5    | 20.49        | 20.42        | 20.48        |

Table 28: Conducted power measurement results of LTE Band V with Proximity sensor activated

### 7.1.9 Conducted power measurements of LTE Band VII

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 20775CH | 21100CH | 21425CH |
| 5MHz      | QPSK       | 1       | 0         | 23      | 21.11   | 21.30   | 21.44   |
|           |            | 1       | 13        | 23      | 21.18   | 21.42   | 21.41   |
|           |            | 1       | 24        | 23      | 21.09   | 21.24   | 21.29   |
|           |            | 12      | 0         | 22      | 20.07   | 20.10   | 20.20   |
|           |            | 12      | 6         | 22      | 20.09   | 20.12   | 20.16   |
|           |            | 12      | 13        | 22      | 20.09   | 20.10   | 20.15   |
|           |            | 25      | 0         | 22      | 20.08   | 20.09   | 20.14   |
|           | 16QAM      | 1       | 0         | 22      | 20.12   | 20.77   | 20.52   |
|           |            | 1       | 13        | 22      | 20.05   | 20.87   | 20.35   |
|           |            | 1       | 24        | 22      | 20.28   | 20.91   | 20.26   |
|           |            | 12      | 0         | 21      | 19.04   | 19.23   | 19.10   |
|           |            | 12      | 6         | 21      | 19.07   | 20.25   | 19.15   |
|           |            | 12      | 13        | 21      | 19.09   | 20.24   | 19.27   |
|           |            | 25      | 0         | 21      | 19.03   | 19.32   | 19.41   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 20800CH | 21100CH | 21400CH |
| 10MHz     | QPSK       | 1       | 0         | 23      | 21.42   | 21.75   | 21.39   |
|           |            | 1       | 25        | 23      | 21.41   | 21.32   | 21.31   |
|           |            | 1       | 49        | 23      | 21.36   | 21.42   | 21.28   |
|           |            | 25      | 0         | 22      | 20.23   | 20.22   | 20.18   |
|           |            | 25      | 13        | 22      | 20.16   | 20.10   | 20.20   |
|           |            | 25      | 25        | 22      | 20.21   | 20.12   | 20.14   |
|           |            | 50      | 0         | 22      | 20.11   | 20.18   | 20.21   |
|           | 16QAM      | 1       | 0         | 22      | 20.33   | 20.90   | 20.33   |
|           |            | 1       | 25        | 22      | 20.94   | 20.80   | 20.45   |
|           |            | 1       | 49        | 22      | 20.25   | 20.15   | 20.02   |
|           |            | 25      | 0         | 21      | 19.10   | 19.15   | 19.21   |
|           |            | 25      | 13        | 21      | 19.04   | 19.11   | 19.28   |
|           |            | 25      | 25        | 21      | 19.25   | 19.03   | 19.22   |
|           |            | 50      | 0         | 21      | 19.03   | 19.16   | 19.19   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel      | Channel |
|-----------|------------|---------|-----------|---------|---------|--------------|---------|
|           |            |         |           |         | 20825CH | 21100CH      | 21375CH |
| 15MHz     | QPSK       | 1       | 0         | 23      | 21.44   | 21.46        | 21.41   |
|           |            | 1       | 38        | 23      | 21.25   | 21.28        | 21.23   |
|           |            | 1       | 74        | 23      | 21.27   | 21.27        | 21.22   |
|           |            | 36      | 0         | 22      | 20.19   | 20.17        | 20.20   |
|           |            | 36      | 18        | 22      | 20.20   | 20.12        | 20.11   |
|           |            | 36      | 39        | 22      | 20.15   | 20.07        | 20.13   |
|           |            | 75      | 0         | 22      | 20.18   | 20.15        | 20.15   |
|           | 16QAM      | 1       | 0         | 22      | 20.96   | 20.33        | 20.09   |
|           |            | 1       | 38        | 22      | 20.73   | 20.05        | 20.03   |
|           |            | 1       | 74        | 22      | 20.67   | 20.11        | 20.05   |
|           |            | 36      | 0         | 21      | 19.12   | 19.26        | 19.07   |
|           |            | 36      | 18        | 21      | 19.10   | 19.10        | 19.40   |
|           |            | 36      | 39        | 21      | 19.41   | 19.05        | 19.03   |
|           |            | 75      | 0         | 21      | 19.06   | 19.14        | 19.37   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel      | Channel |
|           |            |         |           |         | 20850CH | 21100CH      | 21350CH |
| 20MHz     | QPSK       | 1       | 0         | 23      | 21.15   | 21.26        | 21.27   |
|           |            | 1       | 50        | 23      | 21.16   | <b>21.28</b> | 21.26   |
|           |            | 1       | 99        | 23      | 21.14   | 21.25        | 21.05   |
|           |            | 50      | 0         | 22      | 20.23   | <b>20.24</b> | 20.18   |
|           |            | 50      | 25        | 22      | 20.16   | 20.13        | 20.10   |
|           |            | 50      | 50        | 22      | 20.11   | 20.06        | 20.18   |
|           |            | 100     | 0         | 22      | 20.22   | 20.11        | 20.23   |
|           | 16QAM      | 1       | 0         | 22      | 20.22   | 20.13        | 20.15   |
|           |            | 1       | 50        | 22      | 20.09   | 20.05        | 20.36   |
|           |            | 1       | 99        | 22      | 20.66   | 20.60        | 20.30   |
|           |            | 50      | 0         | 21      | 19.21   | 19.26        | 19.34   |
|           |            | 50      | 25        | 21      | 19.24   | 19.09        | 19.26   |
|           |            | 50      | 50        | 21      | 19.12   | 19.09        | 19.27   |
|           |            | 100     | 0         | 21      | 19.19   | 19.15        | 19.11   |

Table 29: Conducted power measurement results of LTE Band VII with Proximity sensor deactivated

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 20775CH | 21100CH | 21425CH |
| 5MHz      | QPSK       | 1       | 0         | 14.5    | 12.75   | 12.65   | 12.66   |
|           |            | 1       | 13        | 14.5    | 12.68   | 12.60   | 12.68   |
|           |            | 1       | 24        | 14.5    | 12.62   | 12.69   | 12.70   |
|           |            | 12      | 0         | 13.5    | 12.16   | 12.10   | 12.14   |
|           |            | 12      | 6         | 13.5    | 12.15   | 12.12   | 12.19   |
|           |            | 12      | 13        | 13.5    | 12.05   | 12.14   | 12.13   |
|           |            | 25      | 0         | 13.5    | 12.16   | 12.13   | 12.19   |
|           | 16QAM      | 1       | 0         | 13.5    | 12.59   | 12.86   | 12.76   |
|           |            | 1       | 13        | 13.5    | 11.99   | 12.01   | 11.96   |
|           |            | 1       | 24        | 13.5    | 12.48   | 12.61   | 12.54   |
|           |            | 12      | 0         | 12.5    | 12.02   | 11.98   | 12.14   |
|           |            | 12      | 6         | 12.5    | 12.07   | 11.92   | 12.08   |
|           |            | 12      | 13        | 12.5    | 12.11   | 11.97   | 12.11   |
|           |            | 25      | 0         | 12.5    | 12.24   | 12.26   | 12.21   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 20800CH | 21100CH | 21400CH |
| 10MHz     | QPSK       | 1       | 0         | 14.5    | 12.73   | 12.96   | 12.96   |
|           |            | 1       | 25        | 14.5    | 12.72   | 12.55   | 12.58   |
|           |            | 1       | 49        | 14.5    | 12.83   | 12.65   | 12.54   |
|           |            | 25      | 0         | 13.5    | 12.15   | 12.23   | 12.15   |
|           |            | 25      | 13        | 13.5    | 12.09   | 12.15   | 12.17   |
|           |            | 25      | 25        | 13.5    | 12.18   | 12.10   | 12.14   |
|           |            | 50      | 0         | 13.5    | 12.15   | 12.15   | 12.19   |
|           | 16QAM      | 1       | 0         | 13.5    | 12.50   | 12.83   | 12.84   |
|           |            | 1       | 25        | 13.5    | 11.61   | 11.55   | 11.58   |
|           |            | 1       | 49        | 13.5    | 12.70   | 12.46   | 12.37   |
|           |            | 25      | 0         | 12.5    | 12.24   | 12.11   | 12.20   |
|           |            | 25      | 13        | 12.5    | 12.14   | 12.07   | 12.22   |
|           |            | 25      | 25        | 12.5    | 12.13   | 12.10   | 12.08   |
|           |            | 50      | 0         | 12.5    | 12.10   | 12.04   | 12.11   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|--------------|--------------|--------------|
|           |            |         |           |         | 20825CH      | 21100CH      | 21375CH      |
| 15MHz     | QPSK       | 1       | 0         | 14.5    | 12.71        | 13.05        | 12.95        |
|           |            | 1       | 38        | 14.5    | 12.72        | 12.55        | 12.52        |
|           |            | 1       | 74        | 14.5    | 12.68        | 12.64        | 12.57        |
|           |            | 36      | 0         | 13.5    | 12.20        | 12.22        | 12.08        |
|           |            | 36      | 18        | 13.5    | 12.18        | 12.12        | 12.08        |
|           |            | 36      | 39        | 13.5    | 12.12        | 12.10        | 12.12        |
|           |            | 75      | 0         | 13.5    | 12.16        | 12.09        | 12.13        |
|           | 16QAM      | 1       | 0         | 13.5    | 12.51        | 12.83        | 12.72        |
|           |            | 1       | 38        | 13.5    | 11.68        | 11.52        | 11.51        |
|           |            | 1       | 74        | 13.5    | 12.79        | 12.51        | 12.23        |
|           |            | 36      | 0         | 12.5    | 12.17        | 12.13        | 12.01        |
|           |            | 36      | 18        | 12.5    | 12.25        | 11.97        | 11.94        |
|           |            | 36      | 39        | 12.5    | 12.16        | 11.92        | 11.95        |
|           |            | 75      | 0         | 12.5    | 12.09        | 12.11        | 12.27        |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|           |            |         |           |         | 20850CH      | 21100CH      | 21350CH      |
| 20MHz     | QPSK       | 1       | 0         | 14.5    | <b>12.94</b> | <b>12.99</b> | <b>12.86</b> |
|           |            | 1       | 50        | 14.5    | 12.90        | 12.69        | 12.77        |
|           |            | 1       | 99        | 14.5    | 12.76        | 12.53        | 12.76        |
|           |            | 50      | 0         | 13.5    | <b>12.14</b> | <b>12.23</b> | <b>12.18</b> |
|           |            | 50      | 25        | 13.5    | 12.13        | 12.06        | 12.05        |
|           |            | 50      | 50        | 13.5    | 11.98        | 12.11        | 12.13        |
|           |            | 100     | 0         | 13.5    | <b>12.21</b> | 12.17        | 12.11        |
|           | 16QAM      | 1       | 0         | 13.5    | 12.98        | 13.42        | 13.39        |
|           |            | 1       | 50        | 13.5    | 12.63        | 12.45        | 12.48        |
|           |            | 1       | 99        | 13.5    | 13.16        | 13.07        | 12.75        |
|           |            | 50      | 0         | 12.5    | 12.13        | 12.32        | 11.97        |
|           |            | 50      | 25        | 12.5    | 12.09        | 12.14        | 11.94        |
|           |            | 50      | 50        | 12.5    | 12.07        | 12.15        | 11.98        |
|           |            | 100     | 0         | 12.5    | 12.15        | 12.13        | 12.18        |

Table 30: Conducted power measurement results of LTE Band VII with Proximity sensor activated

### 7.1.10 Conducted power measurements of LTE Band XVII

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel |
|-----------|------------|---------|-----------|---------|--------------|--------------|---------|
|           |            |         |           |         | 23755CH      | 23790CH      | 23825CH |
| 5MHz      | QPSK       | 1       | 0         | 24      | 22.73        | 22.76        | 22.62   |
|           |            | 1       | 13        | 24      | 22.46        | 22.63        | 22.72   |
|           |            | 1       | 24        | 24      | 22.50        | 22.33        | 22.48   |
|           |            | 12      | 0         | 23      | 21.55        | 21.50        | 21.37   |
|           |            | 12      | 6         | 23      | 21.57        | 21.45        | 21.37   |
|           |            | 12      | 13        | 23      | 21.52        | 21.57        | 21.48   |
|           |            | 25      | 0         | 23      | 21.57        | 21.56        | 21.54   |
|           | 16QAM      | 1       | 0         | 23      | 21.32        | 21.02        | 21.17   |
|           |            | 1       | 13        | 23      | 21.21        | 21.21        | 21.13   |
|           |            | 1       | 24        | 23      | 21.17        | 21.01        | 21.02   |
|           |            | 12      | 0         | 22      | 20.56        | 20.45        | 20.28   |
|           |            | 12      | 6         | 22      | 20.61        | 20.41        | 20.37   |
|           |            | 12      | 13        | 22      | 20.34        | 20.35        | 20.32   |
|           |            | 25      | 0         | 22      | 20.65        | 20.47        | 20.33   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel |
|           |            |         |           |         | 23780CH      | 23790CH      | 23800CH |
| 10MHz     | QPSK       | 1       | 0         | 24      | 22.79        | <b>23.24</b> | 22.78   |
|           |            | 1       | 25        | 24      | 22.60        | 23.09        | 22.81   |
|           |            | 1       | 49        | 24      | 22.71        | 23.11        | 22.63   |
|           |            | 25      | 0         | 23      | <b>21.73</b> | 21.61        | 21.61   |
|           |            | 25      | 13        | 23      | 21.49        | 21.43        | 21.62   |
|           |            | 25      | 25        | 23      | 21.52        | 21.57        | 21.47   |
|           |            | 50      | 0         | 23      | 21.62        | 21.54        | 21.54   |
|           | 16QAM      | 1       | 0         | 23      | 22.35        | 21.42        | 22.33   |
|           |            | 1       | 25        | 23      | 21.93        | 21.39        | 22.01   |
|           |            | 1       | 49        | 23      | 22.19        | 21.15        | 22.18   |
|           |            | 25      | 0         | 22      | 20.71        | 20.41        | 20.69   |
|           |            | 25      | 13        | 22      | 20.59        | 20.63        | 20.62   |
|           |            | 25      | 25        | 22      | 20.65        | 20.47        | 20.47   |
|           |            | 50      | 0         | 22      | 20.53        | 20.51        | 20.54   |

Table 31: Conducted power measurement results of LTE Band XVII with Proximity sensor deactivated

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|--------------|--------------|--------------|
|           |            |         |           |         | 23755CH      | 23790CH      | 23825CH      |
| 5MHz      | QPSK       | 1       | 0         | 23      | 21.01        | 21.20        | 21.02        |
|           |            | 1       | 13        | 23      | 21.02        | 21.15        | 21.05        |
|           |            | 1       | 24        | 23      | 21.07        | 21.01        | 21.06        |
|           |            | 12      | 0         | 22      | 20.90        | 20.98        | 20.79        |
|           |            | 12      | 6         | 22      | 20.96        | 20.86        | 20.90        |
|           |            | 12      | 13        | 22      | 20.96        | 20.96        | 20.96        |
|           |            | 25      | 0         | 22      | 20.98        | 20.97        | 20.80        |
|           | 16QAM      | 1       | 0         | 22      | 20.37        | 20.51        | 20.38        |
|           |            | 1       | 13        | 22      | 20.39        | 20.29        | 20.21        |
|           |            | 1       | 24        | 22      | 20.46        | 20.20        | 20.14        |
|           |            | 12      | 0         | 22      | 20.52        | 20.45        | 20.25        |
|           |            | 12      | 6         | 22      | 20.45        | 20.38        | 20.37        |
|           |            | 12      | 13        | 22      | 20.49        | 20.41        | 20.40        |
|           |            | 25      | 0         | 22      | 20.59        | 20.47        | 20.37        |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|           |            |         |           |         | 23780CH      | 23790CH      | 23800CH      |
| 10MHz     | QPSK       | 1       | 0         | 23      | <b>21.20</b> | <b>21.29</b> | <b>21.36</b> |
|           |            | 1       | 25        | 23      | 21.05        | 21.13        | 21.26        |
|           |            | 1       | 49        | 23      | 21.18        | 21.09        | 21.21        |
|           |            | 25      | 0         | 22      | <b>20.99</b> | <b>20.98</b> | <b>20.99</b> |
|           |            | 25      | 13        | 22      | 20.96        | 20.91        | 20.88        |
|           |            | 25      | 25        | 22      | 20.94        | 20.95        | 20.96        |
|           |            | 50      | 0         | 22      | <b>20.98</b> | 20.97        | 20.95        |
|           | 16QAM      | 1       | 0         | 22      | 20.99        | 20.98        | 20.99        |
|           |            | 1       | 25        | 22      | 20.98        | 20.83        | 20.94        |
|           |            | 1       | 49        | 22      | 20.67        | 20.72        | 20.95        |
|           |            | 25      | 0         | 22      | 20.68        | 20.39        | 20.41        |
|           |            | 25      | 13        | 22      | 20.50        | 20.41        | 20.41        |
|           |            | 25      | 25        | 22      | 20.52        | 20.44        | 20.38        |
|           |            | 50      | 0         | 22      | 20.45        | 20.51        | 20.53        |

Table 32: Conducted power measurement results of LTE Band XVII with Proximity sensor activated

### 7.1.11 Conducted power measurements of LTE Band XXVI

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 26697CH | 26865CH | 27033CH |
| 1.4MHz    | QPSK       | 1       | 0         | 23.5    | 22.23   | 22.29   | 22.41   |
|           |            | 1       | 3         | 23.5    | 22.42   | 22.97   | 22.93   |
|           |            | 1       | 5         | 23.5    | 22.35   | 22.30   | 22.31   |
|           |            | 3       | 0         | 23.5    | 22.17   | 22.05   | 22.19   |
|           |            | 3       | 2         | 23.5    | 22.21   | 22.14   | 22.11   |
|           |            | 3       | 3         | 23.5    | 22.21   | 22.18   | 22.08   |
|           |            | 6       | 0         | 22.5    | 21.10   | 21.06   | 21.23   |
|           | 16QAM      | 1       | 0         | 22.5    | 21.88   | 20.81   | 20.97   |
|           |            | 1       | 3         | 22.5    | 21.33   | 20.92   | 21.13   |
|           |            | 1       | 5         | 22.5    | 21.43   | 20.83   | 21.43   |
|           |            | 3       | 0         | 22.5    | 21.42   | 20.92   | 21.48   |
|           |            | 3       | 2         | 22.5    | 21.06   | 20.93   | 21.36   |
|           |            | 3       | 3         | 22.5    | 21.01   | 21.00   | 21.37   |
|           |            | 6       | 0         | 21.5    | 20.02   | 20.06   | 20.68   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 26705CH | 26865CH | 27025CH |
| 3MHz      | QPSK       | 1       | 0         | 23.5    | 22.38   | 22.40   | 22.51   |
|           |            | 1       | 7         | 23.5    | 22.35   | 22.32   | 22.50   |
|           |            | 1       | 14        | 23.5    | 22.44   | 22.39   | 22.36   |
|           |            | 8       | 0         | 22.5    | 21.18   | 21.16   | 21.30   |
|           |            | 8       | 4         | 22.5    | 21.10   | 21.05   | 21.19   |
|           |            | 8       | 7         | 22.5    | 21.21   | 21.05   | 21.23   |
|           |            | 15      | 0         | 22.5    | 21.30   | 21.08   | 21.28   |
|           | 16QAM      | 1       | 0         | 22.5    | 21.56   | 21.11   | 21.29   |
|           |            | 1       | 7         | 22.5    | 21.59   | 21.55   | 22.04   |
|           |            | 1       | 14        | 22.5    | 21.11   | 21.79   | 21.62   |
|           |            | 8       | 0         | 21.5    | 19.96   | 20.18   | 20.57   |
|           |            | 8       | 4         | 21.5    | 19.91   | 20.43   | 20.50   |
|           |            | 8       | 7         | 21.5    | 19.96   | 20.27   | 20.27   |
|           |            | 15      | 0         | 21.5    | 20.16   | 20.29   | 20.07   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|-----------|------------|---------|-----------|---------|---------|---------|---------|
|           |            |         |           |         | 26715CH | 26865CH | 27015CH |
| 5MHz      | QPSK       | 1       | 0         | 23.5    | 21.95   | 22.31   | 22.29   |
|           |            | 1       | 13        | 23.5    | 22.25   | 22.39   | 22.41   |
|           |            | 1       | 24        | 23.5    | 22.40   | 21.84   | 22.21   |
|           |            | 12      | 0         | 22.5    | 21.15   | 21.12   | 21.25   |
|           |            | 12      | 6         | 22.5    | 21.18   | 21.04   | 21.34   |
|           |            | 12      | 13        | 22.5    | 21.33   | 21.26   | 21.20   |
|           |            | 25      | 0         | 22.5    | 21.21   | 21.20   | 21.26   |
|           | 16QAM      | 1       | 0         | 22.5    | 20.86   | 20.61   | 20.72   |
|           |            | 1       | 13        | 22.5    | 21.10   | 20.71   | 22.07   |
|           |            | 1       | 24        | 22.5    | 20.98   | 20.76   | 20.71   |
|           |            | 12      | 0         | 21.5    | 20.30   | 20.15   | 20.52   |
|           |            | 12      | 6         | 21.5    | 20.21   | 20.10   | 20.40   |
|           |            | 12      | 13        | 21.5    | 20.29   | 20.12   | 20.32   |
|           |            | 25      | 0         | 21.5    | 20.37   | 20.19   | 20.37   |
| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel | Channel | Channel |
|           |            |         |           |         | 26750CH | 26865CH | 26990CH |
| 10MHz     | QPSK       | 1       | 0         | 23.5    | 22.53   | 22.49   | 22.46   |
|           |            | 1       | 25        | 23.5    | 22.67   | 22.51   | 22.35   |
|           |            | 1       | 49        | 23.5    | 22.66   | 22.34   | 22.38   |
|           |            | 25      | 0         | 22.5    | 21.26   | 21.16   | 21.24   |
|           |            | 25      | 13        | 22.5    | 21.37   | 21.18   | 21.27   |
|           |            | 25      | 25        | 22.5    | 21.38   | 21.27   | 21.42   |
|           |            | 50      | 0         | 22.5    | 21.30   | 21.26   | 21.35   |
|           | 16QAM      | 1       | 0         | 22.5    | 20.94   | 21.95   | 21.02   |
|           |            | 1       | 25        | 22.5    | 20.96   | 21.88   | 21.81   |
|           |            | 1       | 49        | 22.5    | 21.15   | 21.92   | 21.96   |
|           |            | 25      | 0         | 21.5    | 20.43   | 20.26   | 20.20   |
|           |            | 25      | 13        | 21.5    | 20.29   | 20.15   | 20.25   |
|           |            | 25      | 25        | 21.5    | 20.29   | 20.18   | 20.32   |
|           |            | 50      | 0         | 21.5    | 20.37   | 20.27   | 20.25   |

| Bandwidth | Modulation | RB size | RB offset | Tune-up | Channel      | Channel      | Channel      |
|-----------|------------|---------|-----------|---------|--------------|--------------|--------------|
|           |            |         |           |         | 26775CH      | 26865CH      | 26965CH      |
| 15MHz     | QPSK       | 1       | 0         | 23.5    | <b>23.09</b> | <b>22.59</b> | 22.36        |
|           |            | 1       | 38        | 23.5    | 23.07        | 22.35        | 22.22        |
|           |            | 1       | 74        | 23.5    | 22.96        | 22.58        | <b>22.40</b> |
|           |            | 36      | 0         | 22.5    | <b>21.43</b> | <b>21.15</b> | 21.30        |
|           |            | 36      | 18        | 22.5    | 21.32        | 21.05        | 21.18        |
|           |            | 36      | 39        | 22.5    | 21.30        | 21.14        | <b>21.37</b> |
|           |            | 75      | 0         | 22.5    | 21.25        | 21.12        | <b>21.27</b> |
|           | 16QAM      | 1       | 0         | 22.5    | 21.31        | 21.30        | 21.02        |
|           |            | 1       | 38        | 22.5    | 21.39        | 21.09        | 21.04        |
|           |            | 1       | 74        | 22.5    | 21.24        | 22.05        | 21.25        |
|           |            | 36      | 0         | 21.5    | 20.50        | 20.33        | 20.35        |
|           |            | 36      | 18        | 21.5    | 20.32        | 20.30        | 20.35        |
|           |            | 36      | 39        | 21.5    | 20.39        | 20.16        | 20.37        |
|           |            | 75      | 0         | 21.5    | 20.38        | 20.17        | 20.29        |

Table 33: Conducted power measurement results of LTE Band XXVI

#### 7.1.12 Conducted power measurements of WiFi 2.4G

| Mode        | Channel | Frequency (MHz) | Data Rate (Mbps) | Tune-up | Average Power (dBm) | SAR Test (Yes/No) |
|-------------|---------|-----------------|------------------|---------|---------------------|-------------------|
| 802.11b     | 1       | 2412            | 1                | 12.00   | 10.79               | Yes               |
|             | 6       | 2437            |                  | 12.00   | 11.02               | Yes               |
|             | 11      | 2462            |                  | 12.00   | 10.91               | Yes               |
| 802.11g     | 1       | 2412            | 6                | 12.00   | Not Required        | No                |
|             | 6       | 2437            |                  | 12.00   | Not Required        | No                |
|             | 11      | 2462            |                  | 12.00   | Not Required        | No                |
| 802.11n-20M | 1       | 2412            | 6.5              | 11.50   | Not Required        | No                |
|             | 6       | 2437            |                  | 11.50   | Not Required        | No                |
|             | 11      | 2462            |                  | 11.50   | Not Required        | No                |

Table 34: Conducted power measurement results of WiFi 2.4G

Note: 1) The Average conducted power of WiFi is measured with RMS detector.

### 7.1.13 Conducted power measurements of WiFi 5G

| Band (GHz) | Mode        | Channel | Frequency (MHz) | Data Rate (Mbps) | Tune-up | Average Power (dBm) | SAR Test (Yes/No) |
|------------|-------------|---------|-----------------|------------------|---------|---------------------|-------------------|
| 5.2        | 802.11a     | CH 36   | 5180            | 6M               | 10.5    | Not Required        | NO                |
|            |             | CH 40   | 5200            |                  | 10.5    | Not Required        | NO                |
|            |             | CH 44   | 5220            |                  | 10.5    | Not Required        | NO                |
|            |             | CH 48   | 5240            |                  | 10.5    | Not Required        | NO                |
|            | 802.11n 20M | CH 36   | 5180            | 6.5M             | 10.5    | Not Required        | NO                |
|            |             | CH 40   | 5200            |                  | 10.5    | Not Required        | NO                |
|            |             | CH 44   | 5220            |                  | 10.5    | Not Required        | NO                |
|            |             | CH 48   | 5240            |                  | 10.5    | Not Required        | NO                |
|            | 802.11n 40M | CH 38   | 5190            | 13.5M            | 10.5    | 9.17                | Yes               |
|            |             | CH 46   | 5230            |                  | 10.5    | 8.85                | Yes               |
| Band (GHz) | Mode        | Channel | Frequency (MHz) | Data Rate (Mbps) | Tune-up | Average Power (dBm) | SAR Test (Yes/No) |
| 5.3        | 802.11a     | CH 52   | 5260            | 6M               | 10.0    | Not Required        | NO                |
|            |             | CH 56   | 5280            |                  | 10.0    | Not Required        | NO                |
|            |             | CH 60   | 5300            |                  | 10.0    | Not Required        | NO                |
|            |             | CH 64   | 5320            |                  | 10.0    | Not Required        | NO                |
|            | 802.11n 20M | CH 52   | 5260            | 6.5M             | 10.0    | Not Required        | NO                |
|            |             | CH 56   | 5280            |                  | 10.0    | Not Required        | NO                |
|            |             | CH 60   | 5300            |                  | 10.0    | Not Required        | NO                |
|            |             | CH 64   | 5320            |                  | 10.0    | Not Required        | NO                |
|            | 802.11n 40M | CH 54   | 5270            | 13.5M            | 10.0    | Not Required        | NO                |
|            |             | CH 62   | 5310            |                  | 10.0    | Not Required        | NO                |
| Band (GHz) | Mode        | Channel | Frequency (MHz) | Data Rate (Mbps) | Tune-up | Average Power (dBm) | SAR Test (Yes/No) |
| 5.5        | 802.11a     | CH 100  | 5500            | 6M               | 10.5    | Not Required        | No                |
|            |             | CH 104  | 5520            |                  | 10.5    | Not Required        | No                |
|            |             | CH 108  | 5540            |                  | 10.5    | Not Required        | No                |
|            |             | CH 112  | 5560            |                  | 10.5    | Not Required        | No                |
|            |             | CH 116  | 5580            |                  | 10.5    | Not Required        | No                |
|            |             | CH 120  | 5600            |                  | 10.5    | Not Required        | No                |
|            |             | CH 124  | 5620            |                  | 10.5    | Not Required        | No                |
|            |             | CH 128  | 5640            |                  | 10.5    | Not Required        | No                |
|            |             | CH 132  | 5660            |                  | 10.5    | Not Required        | No                |
|            |             | CH 136  | 5680            |                  | 10.5    | Not Required        | No                |
|            |             | CH 140  | 5700            |                  | 10.5    | Not Required        | No                |

| Band (GHz) | Mode        | Channel | Frequency (MHz) | Data Rate (Mbps) | Tune-up | Average Power (dBm) | SAR Test (Yes/No) |
|------------|-------------|---------|-----------------|------------------|---------|---------------------|-------------------|
| 5.5        | 802.11n 20M | CH 100  | 5500            | 6.5M             | 10.5    | Not Required        | No                |
|            |             | CH 104  | 5520            |                  | 10.5    | Not Required        | No                |
|            |             | CH 108  | 5540            |                  | 10.5    | Not Required        | No                |
|            |             | CH 112  | 5560            |                  | 10.5    | Not Required        | No                |
|            |             | CH 116  | 5580            |                  | 10.5    | Not Required        | No                |
|            |             | CH 120  | 5600            |                  | 10.5    | Not Required        | No                |
|            |             | CH 124  | 5620            |                  | 10.5    | Not Required        | No                |
|            |             | CH 128  | 5640            |                  | 10.5    | Not Required        | No                |
|            |             | CH 132  | 5660            |                  | 10.5    | Not Required        | No                |
|            |             | CH 136  | 5680            |                  | 10.5    | Not Required        | No                |
|            |             | CH 140  | 5700            |                  | 10.5    | Not Required        | No                |
|            | 802.11n 40M | CH 102  | 5510            | 13.5M            | 10.5    | 9.02                | Yes               |
|            |             | CH 110  | 5550            |                  | 10.5    | 9.03                | Yes               |
|            |             | CH 118  | 5590            |                  | 10.5    | 8.81                | Yes               |
|            |             | CH 126  | 5630            |                  | 10.5    | 8.74                | Yes               |
|            |             | CH 134  | 5670            |                  | 10.5    | 8.52                | Yes               |
| Band (GHz) | Mode        | Channel | Frequency (MHz) | Data Rate (Mbps) | Tune-up | Average Power (dBm) | SAR Test (Yes/No) |
| 5.8        | 802.11a     | CH 149  | 5745            | 6M               | 10.5    | Not Required        | No                |
|            |             | CH 153  | 5765            |                  | 10.5    | Not Required        | No                |
|            |             | CH 157  | 5785            |                  | 10.5    | Not Required        | No                |
|            |             | CH 161  | 5805            |                  | 10.5    | Not Required        | No                |
|            | 802.11n 20M | CH 149  | 5745            | 6.5M             | 10.5    | Not Required        | No                |
|            |             | CH 153  | 5765            |                  | 10.5    | Not Required        | No                |
|            |             | CH 157  | 5785            |                  | 10.5    | Not Required        | No                |
|            |             | CH 161  | 5805            |                  | 10.5    | Not Required        | No                |
|            | 802.11n 40M | CH 151  | 5755            | 13.5M            | 10.5    | 8.98                | Yes               |
|            |             | CH 159  | 5795            |                  | 10.5    | 9.27                | Yes               |

Table 35: Conducted power measurement results of WiFi 5G.

Note: 1) The Average conducted power of WiFi is measured with RMS detector.

### 7.1.14 Conducted power measurements of BT

The output power of BT antenna is as following:

| BT 2450 | Tune-up | Average Conducted Power (dBm) |      |      |
|---------|---------|-------------------------------|------|------|
|         |         | 0CH                           | 39CH | 78CH |
| DH5     | 5.0     | 2.70                          | 2.40 | 3.35 |
| 2DH5    | 5.0     | 0.97                          | 0.51 | 1.41 |
| 3DH5    | 5.0     | 1.01                          | 0.52 | 0.68 |

| BT 2450 | Tune-up | Average Conducted Power (dBm) |       |       |
|---------|---------|-------------------------------|-------|-------|
|         |         | 0CH                           | 19CH  | 39CH  |
| BT 4.0  | 0.0     | -3.24                         | -1.83 | -3.90 |

Table 36: Conducted power measurement results of BT.

Note: The conducted power of BT is measured with RMS detector.

## 7.2 SAR measurement Results

### General Notes:

- 1) Per KDB447498 D01v06, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.
- 2) Per KDB447498 D01v06, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - $\leq 0.8\text{W/kg}$  for 1-g or  $2.0\text{W/kg}$  for 10-g respectively, when the transmission band is  $\leq 100\text{MHz}$ .
  - $\leq 0.6\text{ W/kg}$  or  $1.5\text{ W/kg}$ , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
  - $\leq 0.4\text{ W/kg}$  or  $1.0\text{ W/kg}$ , for 1-g or 10-g respectively, when the transmission band is  $\geq 200\text{ MHz}$ .When the maximum output power variation across the required test channels is  $> \frac{1}{2}\text{ dB}$ , instead of the middle channel, the highest output power channel must be used.
- 3) Per KDB865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8\text{W/Kg}$ ; if the deviation among the repeated measurement is  $\leq 20\%$ , and the measured SAR  $< 1.45\text{W/Kg}$ , only one repeated measurement is required.
- 4) Per KDB865664 D02v01r01, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is  $> 1.5\text{ W/kg}$ , or  $> 7.0\text{ W/kg}$  for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing(Refer to the blue SAR test results in the tables of Section 7.3 and appendix B for detailed SAR plots).

### GSM Notes:

- 1) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
- 2) Per KDB648474 D04v01r03, the device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

### UMTS Notes:

- 1) Per KDB941225 D01v03r01, When the maximum output power and tune-up tolerance specified for production units in a Second mode is  $\leq \frac{1}{4}\text{ dB}$  higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is  $\leq 1.2\text{ W/kg}$ , SAR measurement is not required for the Second mode.

### LTE Notes:

- 1) The LTE test configurations are determined according to KDB941225 D05 SAR for LTE Devices v02r04. The general test procedures used for SAR testing can be found in Section 6.5.
- 2) A-MPR was disabled for all SAR test by setting NS\_01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames(maximum TTI)

**WiFi Notes:**

Per KDB248227D01v02r02:

- 1) When reported SAR for the initial test position is  $\leq 0.4\text{W/kg}$ , no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is  $\leq 0.8\text{W/kg}$  or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the *reported* SAR is  $> 0.8\text{ W/kg}$ , SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is  $\leq 1.2\text{ W/kg}$  or all required channels are tested.
- 2) The highest SAR measured for the initial test position or initial test configuration should be used to determine SAR test exclusion according to the sum of 1-g SAR and SAR peak to location ratio provisions in KDB 447498D01. In addition, a test lab may also choose to perform standalone SAR measurements for test positions and 802.11 configurations that are not required by the initial test position or initial test configuration procedures and apply the results to determine simultaneous transmission SAR test exclusion, according to sum of 1-g and SAR peak to location ratio requirements to reduce the number of simultaneous transmission SAR measurements.
- 3) For WiFi 2.4G , SAR is measured for 2.4 GHz 802.11b DSSS using the initial test position procedure. SAR is not required for the 2.4 GHz 802.11g/n OFDM conditions when KDB Publication 447498 SAR test exclusion applies to the OFDM configuration or when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2\text{ W/kg}$ .
- 4) For WiFi 5G U-NII-1 and U-NII-2A bands, as the different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest *reported* SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is  $\leq 1.2\text{ W/kg}$ , SAR is not required for the band with lower maximum output power in that test configuration.
- 5) For WiFi 5G, SAR is measured for 5 GHz 802.11n 40M OFDM using the initial test position and initial test configuration procedures. SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band.

### 7.2.1 SAR measurement Result of GSM850

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-----------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |           |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |           |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 190/836.6                | GPRS 2TS  | 0               | 0.660            | 0.354 | 0.180            | 28.05                  | 28.50               | 0.732                |
| Top Side                        | 190/836.6                | GPRS 2TS  | 0               | 0.877            | 0.465 | 0.180            | 28.05                  | 28.50               | 0.973                |
| Top Side                        | 251/848.8                | GPRS 2TS  | 0               | 1.010            | 0.529 | -0.030           | 28.12                  | 28.50               | 1.102                |
| Top Side-Repeated               | 251/848.8                | GPRS 2TS  | 0               | 1.020            | 0.535 | 0.020            | 28.12                  | 28.50               | <b>1.113</b>         |
| Top Side                        | 128/824.2                | GPRS 2TS  | 0               | 0.756            | 0.404 | 0.080            | 27.74                  | 28.50               | 0.901                |
| Back Side with Headset          | 251/848.8                | GSM       | 0               | 0.537            | 0.289 | 0.160            | 29.87                  | 30.50               | 0.621                |
| Proximity sensor is deactivated |                          |           |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 190/836.6                | GPRS 2TS  | 0               | 0.122            | 0.072 | 0.190            | 29.70                  | 31.00               | 0.165                |
| Back Side                       | 190/836.6                | GPRS 2TS  | 16              | 0.193            | 0.127 | -0.050           | 29.70                  | 31.00               | 0.260                |
| Top Side                        | 190/836.6                | GPRS 2TS  | 19              | 0.214            | 0.143 | 0.030            | 29.70                  | 31.00               | <b>0.289</b>         |
| Back Side with Headset          | 190/836.6                | GSM       | 16              | 0.195            | 0.129 | -0.050           | 32.44                  | 33.00               | 0.222                |

Table 37: Body SAR test results of GSM850

## 7.2.2 SAR measurement Result of GSM1900

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-----------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |           |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |           |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 661/1880                 | GPRS 2TS  | 0               | 0.727            | 0.309 | -0.040           | 17.72                  | 19.50               | <b>1.095</b>         |
| Back Side                       | 512/1850.2               | GPRS 2TS  | 0               | 0.726            | 0.309 | -0.070           | 17.87                  | 19.50               | 1.057                |
| Back Side                       | 810/1909.8               | GPRS 2TS  | 0               | 0.752            | 0.316 | 0.000            | 18.12                  | 19.50               | 1.033                |
| Back Side with Headset          | 810/1909.8               | GSM       | 0               | 0.823            | 0.349 | 0.000            | 21.28                  | 21.50               | 0.866                |
| Back Side with Headset-Repeated | 810/1909.8               | GSM       | 0               | 0.804            | 0.337 | 0.110            | 21.28                  | 21.50               | 0.846                |
| Top Side                        | 661/1880                 | GPRS 2TS  | 0               | 0.446            | 0.204 | 0.000            | 17.72                  | 19.50               | 0.672                |
| Proximity sensor is deactivated |                          |           |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 661/1880                 | GPRS 2TS  | 0               | 0.117            | 0.059 | 0.130            | 26.90                  | 28.00               | 0.151                |
| Back Side                       | 661/1880                 | GPRS 2TS  | 16              | 0.575            | 0.290 | -0.190           | 26.90                  | 28.00               | 0.741                |
| Back Side with Headset          | 661/1880                 | GSM       | 16              | 0.648            | 0.331 | -0.070           | 29.17                  | 30.50               | 0.880                |
| Back Side with Headset          | 512/1850.2               | GSM       | 16              | 0.628            | 0.321 | -0.030           | 29.17                  | 30.50               | 0.853                |
| Back Side with Headset          | 810/1909.8               | GSM       | 16              | 0.666            | 0.340 | -0.070           | 29.17                  | 30.50               | <b>0.905</b>         |
| Top Side                        | 661/1880                 | GPRS 2TS  | 19              | 0.246            | 0.144 | 0.180            | 26.90                  | 28.00               | 0.317                |

Table 38: Body SAR test results of GSM1900

### 7.2.3 SAR measurement Result of UMTS Band II

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-----------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |           |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |           |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 9400/1880                | RMC       | 0               | 1.140            | 0.473 | 0.000            | 13.35                  | 14.00               | <b>1.324</b>         |
| Back Side-Repeated              | 9400/1880                | RMC       | 0               | 1.040            | 0.434 | 0.130            | 13.35                  | 14.00               | 1.208                |
| Back Side                       | 9262/1852.4              | RMC       | 0               | 1.010            | 0.421 | 0.000            | 13.40                  | 14.00               | 1.160                |
| Back Side                       | 9538/1907.6              | RMC       | 0               | 1.040            | 0.429 | 0.000            | 13.31                  | 14.00               | 1.219                |
| Back Side with Headset          | 9400/1880                | RMC       | 0               | 1.130            | 0.460 | 0.000            | 13.35                  | 14.00               | 1.312                |
| Top Side                        | 9400/1880                | RMC       | 0               | 0.617            | 0.281 | 0.180            | 13.35                  | 14.00               | 0.717                |
| Proximity sensor is deactivated |                          |           |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 9400/1880                | RMC       | 0               | 0.302            | 0.149 | 0.080            | 22.10                  | 23.50               | 0.417                |
| Back Side                       | 9400/1880                | RMC       | 16              | 0.755            | 0.407 | 0.020            | 22.10                  | 23.50               | 1.042                |
| Back Side                       | 9262/1852.4              | RMC       | 16              | 0.783            | 0.423 | 0.160            | 22.07                  | 23.50               | <b>1.088</b>         |
| Back Side                       | 9538/1907.6              | RMC       | 16              | 0.713            | 0.384 | 0.110            | 21.97                  | 23.50               | 1.014                |
| Back Side with Headset          | 9262/1852.4              | RMC       | 16              | 0.722            | 0.392 | 0.040            | 22.07                  | 23.50               | 1.004                |
| Top Side                        | 9400/1880                | RMC       | 19              | 0.514            | 0.292 | 0.170            | 22.10                  | 23.50               | 0.710                |

Table 39: Body SAR test results of UMTS Band II

#### 7.2.4 SAR measurement Result of UMTS Band IV

| Test Position<br>of Body        | Test<br>channel<br>/Freq.(MHz) | Test<br>Mode | Test<br>Dist.<br>(mm) | SAR Value<br>(W/kg) |       | Power<br>Drift<br>(dB) | Conducte<br>d Power<br>(dBm) | Tune-up<br>Power<br>(dBm) | Scaled<br>SAR1-g<br>(W/kg) |
|---------------------------------|--------------------------------|--------------|-----------------------|---------------------|-------|------------------------|------------------------------|---------------------------|----------------------------|
|                                 |                                |              |                       | 1-g                 | 10-g  |                        |                              |                           |                            |
| Proximity sensor is activated   |                                |              |                       |                     |       |                        |                              |                           |                            |
| Back Side                       | 1413/1732.6                    | RMC          | 0                     | 1.170               | 0.517 | 0.000                  | 13.82                        | 14.00                     | 1.220                      |
| Back Side                       | 1312/1712.4                    | RMC          | 0                     | 1.130               | 0.499 | 0.000                  | 13.90                        | 14.00                     | 1.156                      |
| Back Side                       | 1513/1752.6                    | RMC          | 0                     | 1.140               | 0.500 | 0.000                  | 13.93                        | 14.00                     | 1.159                      |
| Back Side with<br>Headset       | 1413/1732.6                    | RMC          | 0                     | 1.180               | 0.519 | -0.150                 | 13.82                        | 14.00                     | <b>1.230</b>               |
| Back Side-<br>Repeated          | 1413/1732.6                    | RMC          | 0                     | 1.180               | 0.518 | 0.190                  | 13.82                        | 14.00                     | 1.230                      |
| Top Side                        | 1413/1732.6                    | RMC          | 0                     | 0.513               | 0.253 | 0.120                  | 13.82                        | 14.00                     | 0.535                      |
| Proximity sensor is deactivated |                                |              |                       |                     |       |                        |                              |                           |                            |
| Left Side                       | 1413/1732.6                    | RMC          | 0                     | 0.337               | 0.178 | 0.180                  | 22.34                        | 23.50                     | 0.440                      |
| Back Side                       | 1413/1732.6                    | RMC          | 16                    | 0.660               | 0.358 | 0.080                  | 22.34                        | 23.50                     | 0.862                      |
| Back Side                       | 1312/1712.4                    | RMC          | 16                    | 0.572               | 0.311 | 0.040                  | 22.44                        | 23.50                     | 0.730                      |
| Back Side                       | 1513/1752.6                    | RMC          | 16                    | 0.711               | 0.384 | -0.020                 | 22.37                        | 23.50                     | 0.922                      |
| Back Side with<br>Headset       | 1513/1752.6                    | RMC          | 16                    | 0.730               | 0.396 | 0.130                  | 22.37                        | 23.50                     | <b>0.947</b>               |
| Top Side                        | 1413/1732.6                    | RMC          | 19                    | 0.586               | 0.356 | 0.160                  | 22.34                        | 23.50                     | 0.765                      |

Table 40: Body SAR test results of UMTS Band IV

### 7.2.5 SAR measurement Result of UMTS Band V

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-----------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |           |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |           |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 4182/836.4               | RMC       | 0               | 0.352            | 0.189 | 0.020            | 20.23                  | 21.00               | 0.420                |
| Top Side                        | 4182/836.4               | RMC       | 0               | 0.580            | 0.310 | 0.080            | 20.23                  | 21.00               | <b>0.693</b>         |
| Back Side with Headset          | 4182/836.4               | RMC       | 0               | 0.338            | 0.205 | 0.030            | 20.23                  | 21.00               | 0.404                |
| Proximity sensor is deactivated |                          |           |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 4182/836.4               | RMC       | 0               | 0.090            | 0.055 | 0.060            | 22.69                  | 24.00               | 0.121                |
| Back Side                       | 4182/836.4               | RMC       | 16              | 0.103            | 0.069 | -0.120           | 22.69                  | 24.00               | 0.139                |
| Top Side                        | 4182/836.4               | RMC       | 19              | 0.096            | 0.066 | -0.040           | 22.69                  | 24.00               | 0.130                |
| Back Side with Headset          | 4182/836.4               | RMC       | 16              | 0.113            | 0.076 | -0.080           | 22.69                  | 24.00               | <b>0.153</b>         |

Table 41: Body SAR test results of UMTS Band V

**7.2.6 SAR measurement Result of LTE Band II**

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode         | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-------------------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |                   |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 18900/1880               | 20M QPSK 1RB#99   | 0               | 0.764            | 0.318 | 0.000            | 12.90                  | 14.00               | 0.984                |
| Back Side                       | 18700/1860               | 20M QPSK 1RB#0    | 0               | 0.851            | 0.357 | 0.000            | 12.35                  | 14.00               | <b>1.244</b>         |
| Back Side                       | 19100/1900               | 20M QPSK 1RB#0    | 0               | 0.865            | 0.361 | 0.000            | 12.72                  | 14.00               | 1.161                |
| Back Side-Repeated              | 19100/1900               | 20M QPSK 1RB#0    | 0               | 0.869            | 0.356 | 0.000            | 12.72                  | 14.00               | 1.167                |
| Top Side                        | 18900/1880               | 20M QPSK 1RB#99   | 0               | 0.518            | 0.236 | 0.180            | 12.90                  | 14.00               | 0.667                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 18700/1860               | 20M QPSK 50%RB#0  | 0               | 0.848            | 0.356 | 0.000            | 12.04                  | 13.00               | 1.058                |
| Back Side                       | 18900/1880               | 20M QPSK 50%RB#0  | 0               | 0.779            | 0.325 | 0.000            | 12.03                  | 13.00               | 0.974                |
| Back Side                       | 19100/1900               | 20M QPSK 50%RB#0  | 0               | 0.808            | 0.337 | 0.000            | 12.02                  | 13.00               | 1.013                |
| Top Side                        | 18700/1860               | 20M QPSK 50%RB#0  | 0               | 0.571            | 0.263 | 0.140            | 12.04                  | 13.00               | 0.712                |
| 100%RB                          |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 18700/1860               | 20M QPSK 100%RB#0 | 0               | 0.814            | 0.347 | 0.000            | 12.04                  | 13.00               | 1.015                |
| Proximity sensor is deactivated |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 18900/1880               | 20M QPSK 1RB#0    | 0               | 0.189            | 0.103 | 0.040            | 21.82                  | 23.00               | 0.248                |
| Back Side                       | 18900/1880               | 20M QPSK 1RB#0    | 16              | 0.966            | 0.496 | -0.050           | 21.82                  | 23.00               | <b>1.268</b>         |
| Back Side-Repeated              | 18900/1880               | 20M QPSK 1RB#0    | 16              | 0.865            | 0.459 | -0.010           | 21.82                  | 23.00               | 1.135                |
| Back Side                       | 18700/1860               | 20M QPSK 1RB#50   | 16              | 0.807            | 0.427 | -0.110           | 21.53                  | 23.00               | 1.132                |
| Back Side                       | 19100/1900               | 20M QPSK 1RB#50   | 16              | 0.761            | 0.395 | -0.140           | 21.61                  | 23.00               | 1.048                |
| Top Side                        | 18900/1880               | 20M QPSK 1RB#0    | 19              | 0.442            | 0.248 | 0.140            | 21.82                  | 23.00               | 0.580                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 18900/1880               | 20M QPSK 50%RB#25 | 0               | 0.136            | 0.073 | 0.160            | 20.51                  | 22.00               | 0.192                |
| Back Side                       | 18900/1880               | 20M QPSK 50%RB#25 | 16              | 0.631            | 0.327 | -0.160           | 20.51                  | 22.00               | 0.889                |
| Back Side                       | 18700/1860               | 20M QPSK 50%RB#0  | 16              | 0.669            | 0.346 | -0.140           | 20.46                  | 22.00               | 0.954                |
| Back Side                       | 19100/1900               | 20M QPSK 50%RB#0  | 16              | 0.623            | 0.322 | 0.190            | 20.43                  | 22.00               | 0.894                |
| Top Side                        | 18900/1880               | 20M QPSK 50%RB#25 | 19              | 0.325            | 0.182 | 0.050            | 20.51                  | 22.00               | 0.458                |



| 100%RB    |            |                      |    |       |       |        |       |       |       |
|-----------|------------|----------------------|----|-------|-------|--------|-------|-------|-------|
| Back Side | 18900/1880 | 20M QPSK<br>100%RB#0 | 16 | 0.683 | 0.354 | -0.140 | 20.48 | 22.00 | 0.969 |

Table 42: Body SAR test results of LTE Band II

### 7.2.7 SAR measurement Result of LTE Band IV

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode         | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-------------------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |                   |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 20050/1720               | 20M QPSK 1RB#0    | 0               | 1.050            | 0.460 | 0.180            | 13.61                  | 14.50               | 1.289                |
| Back Side                       | 20175/1732.5             | 20M QPSK 1RB#0    | 0               | 1.030            | 0.443 | 0.000            | 13.30                  | 14.50               | <b>1.358</b>         |
| Back Side                       | 20300/1745               | 20M QPSK 1RB#0    | 0               | 1.030            | 0.451 | 0.000            | 13.54                  | 14.50               | 1.285                |
| Top Side                        | 20050/1720               | 20M QPSK 1RB#0    | 0               | 0.324            | 0.156 | 0.090            | 13.61                  | 14.50               | 0.398                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 20050/1720               | 20M QPSK 50%RB#0  | 0               | 1.030            | 0.461 | 0.060            | 13.35                  | 13.50               | 1.066                |
| Back Side                       | 20175/1732.5             | 20M QPSK 50%RB#0  | 0               | 1.060            | 0.460 | 0.140            | 13.22                  | 13.50               | 1.131                |
| Back Side                       | 20300/1745               | 20M QPSK 50%RB#0  | 0               | 1.090            | 0.472 | -0.030           | 13.19                  | 13.50               | 1.171                |
| Back Side-Repeated              | 20300/1745               | 20M QPSK 50%RB#0  | 0               | 1.020            | 0.445 | 0.170            | 13.19                  | 13.50               | 1.095                |
| Top Side                        | 20050/1720               | 20M QPSK 50%RB#0  | 0               | 0.284            | 0.139 | 0.150            | 13.35                  | 13.50               | 0.294                |
| 100%RB                          |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 20300/1745               | 20M QPSK 100%RB#0 | 0               | 1.040            | 0.448 | 0.000            | 13.19                  | 13.50               | 1.117                |
| Proximity sensor is deactivated |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 20300/1745               | 20M QPSK 1RB#50   | 0               | 0.309            | 0.172 | 0.050            | 21.93                  | 23.00               | 0.395                |
| Back Side                       | 20300/1745               | 20M QPSK 1RB#50   | 16              | 0.751            | 0.407 | 0.060            | 21.93                  | 23.00               | <b>0.961</b>         |
| Back Side                       | 20050/1720               | 20M QPSK 1RB#0    | 16              | 0.582            | 0.326 | 0.160            | 21.92                  | 23.00               | 0.746                |
| Back Side                       | 20175/1732.5             | 20M QPSK 1RB#0    | 16              | 0.677            | 0.369 | 0.150            | 21.57                  | 23.00               | 0.941                |
| Top Side                        | 20300/1745               | 20M QPSK 1RB#50   | 19              | 0.429            | 0.251 | 0.170            | 21.93                  | 23.00               | 0.549                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 20175/1732.5             | 20M QPSK 50%RB#0  | 0               | 0.254            | 0.141 | 0.070            | 20.59                  | 22.00               | 0.351                |
| Back Side                       | 20175/1732.5             | 20M QPSK 50%RB#0  | 16              | 0.522            | 0.282 | 0.150            | 20.59                  | 22.00               | 0.722                |
| Top Side                        | 20175/1732.5             | 20M QPSK 50%RB#0  | 19              | 0.306            | 0.179 | 0.100            | 20.59                  | 22.00               | 0.423                |
| 100%RB                          |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 20300/1745               | 20M QPSK 100%RB#0 | 16              | 0.559            | 0.303 | 0.180            | 20.48                  | 22.00               | 0.793                |

Table 43: Body SAR test results of LTE Band IV

## 7.2.8 SAR measurement Result of LTE Band V

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode         | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-------------------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |                   |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 20525/836.5              | 10M QPSK 1RB#0    | 0               | 0.477            | 0.254 | 0.000            | 21.93                  | 22.50               | 0.544                |
| Top Side                        | 20525/836.5              | 10M QPSK 1RB#0    | 0               | 0.841            | 0.444 | -0.010           | 21.93                  | 22.50               | 0.959                |
| Top Side                        | 20450/829                | 10M QPSK 1RB#0    | 0               | 0.804            | 0.429 | 0.140            | 21.50                  | 22.50               | 1.012                |
| Top Side                        | 20600/844                | 10M QPSK 1RB#25   | 0               | 0.893            | 0.468 | 0.090            | 21.45                  | 22.50               | <b>1.137</b>         |
| Top Side-Repeated               | 20600/844                | 10M QPSK 1RB#25   | 0               | 0.871            | 0.457 | 0.110            | 21.45                  | 22.50               | 1.109                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 20600/844                | 10M QPSK 50%RB#25 | 0               | 0.466            | 0.248 | 0.170            | 21.27                  | 21.50               | 0.491                |
| Top Side                        | 20600/844                | 10M QPSK 50%RB#25 | 0               | 0.764            | 0.407 | 0.030            | 21.27                  | 21.50               | 0.806                |
| Top Side                        | 20525/836.5              | 10M QPSK 50%RB#0  | 0               | 0.881            | 0.468 | 0.020            | 21.25                  | 21.50               | 0.933                |
| Top Side                        | 20450/829                | 10M QPSK 50%RB#25 | 0               | 0.845            | 0.448 | 0.020            | 21.23                  | 21.50               | 0.899                |
| 100%RB                          |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Top Side                        | 20600/844                | 10M QPSK 100%RB#0 | 0               | 0.871            | 0.458 | 0.130            | 21.23                  | 21.50               | 0.927                |
| Proximity sensor is deactivated |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 20600/844                | 10M QPSK 1RB#25   | 0               | 0.170            | 0.104 | 0.120            | 23.13                  | 23.50               | 0.185                |
| Back Side                       | 20600/844                | 10M QPSK 1RB#25   | 16              | 0.267            | 0.174 | 0.140            | 23.13                  | 23.50               | <b>0.291</b>         |
| Top Side                        | 20600/844                | 10M QPSK 1RB#25   | 19              | 0.224            | 0.151 | 0.090            | 23.13                  | 23.50               | 0.244                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 20525/836.5              | 10M QPSK 50%RB#25 | 0               | 0.131            | 0.080 | 0.160            | 21.85                  | 22.50               | 0.152                |
| Back Side                       | 20525/836.5              | 10M QPSK 50%RB#25 | 16              | 0.184            | 0.122 | 0.030            | 21.85                  | 22.50               | 0.214                |
| Top Side                        | 20525/836.5              | 10M QPSK 50%RB#25 | 19              | 0.175            | 0.119 | 0.100            | 21.85                  | 22.50               | 0.203                |

Table 44: Body SAR test results of LTE Band V

## 7.2.9 SAR measurement Result of LTE Band VII

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode         | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-------------------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |                   |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 21100/2535               | 20M QPSK 1RB#0    | 0               | 0.618            | 0.217 | 0.000            | 12.99                  | 14.50               | 0.875                |
| Back Side                       | 20850/2510               | 20M QPSK 1RB#0    | 0               | 0.697            | 0.247 | 0.150            | 12.94                  | 14.50               | 0.998                |
| Back Side                       | 21350/2560               | 20M QPSK 1RB#0    | 0               | 0.612            | 0.215 | 0.150            | 12.86                  | 14.50               | 0.893                |
| Top Side                        | 21100/2535               | 20M QPSK 1RB#50   | 0               | 0.562            | 0.222 | 0.090            | 12.99                  | 14.50               | 0.314                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 21100/2535               | 20M QPSK 50%RB#0  | 0               | 0.752            | 0.259 | 0.000            | 12.23                  | 13.50               | <b>1.007</b>         |
| Back Side                       | 20850/2510               | 20M QPSK 50%RB#0  | 0               | 0.652            | 0.246 | 0.120            | 12.14                  | 13.50               | 0.892                |
| Back Side                       | 21350/2560               | 20M QPSK 50%RB#0  | 0               | 0.666            | 0.242 | 0.000            | 12.18                  | 13.50               | 0.903                |
| Top Side                        | 21100/2535               | 20M QPSK 50%RB#0  | 0               | 0.558            | 0.217 | 0.150            | 12.23                  | 13.50               | 0.748                |
| 100%RB                          |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 20850/2510               | 20M QPSK 100%RB#0 | 0               | 0.674            | 0.237 | 0.150            | 12.21                  | 13.50               | 0.907                |
| Proximity sensor is deactivated |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 21100/2535               | 20M QPSK 1RB#50   | 0               | 0.345            | 0.154 | 0.190            | 21.28                  | 23.00               | 0.513                |
| Back Side                       | 21100/2535               | 20M QPSK 1RB#50   | 16              | 0.508            | 0.251 | 0.140            | 21.28                  | 23.00               | <b>0.755</b>         |
| Top Side                        | 21100/2535               | 20M QPSK 1RB#50   | 19              | 0.417            | 0.225 | -0.160           | 21.28                  | 23.00               | 0.620                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 21100/2535               | 20M QPSK 50%RB#0  | 0               | 0.273            | 0.122 | 0.140            | 20.24                  | 22.00               | 0.409                |
| Back Side                       | 21100/2535               | 20M QPSK 50%RB#0  | 16              | 0.404            | 0.195 | -0.180           | 20.24                  | 22.00               | 0.606                |
| Top Side                        | 21100/2535               | 20M QPSK 50%RB#0  | 19              | 0.336            | 0.180 | 0.140            | 20.24                  | 22.00               | 0.504                |

Table 45: Body SAR test results of LTE Band VII

### 7.2.10 SAR measurement Result of LTE Band XVII

| Test Position of Body           | Test channel /Freq.(MHz) | Test Mode         | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|---------------------------------|--------------------------|-------------------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                                 |                          |                   |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| Proximity sensor is activated   |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 23800/711                | 10M QPSK 1RB#0    | 0               | 0.859            | 0.484 | 0.180            | 21.36                  | 23.00               | 1.253                |
| Back Side                       | 23780/709                | 10M QPSK 1RB#0    | 0               | 0.879            | 0.488 | 0.180            | 21.20                  | 23.00               | 1.330                |
| Back Side-Repeated              | 23780/709                | 10M QPSK 1RB#0    | 0               | 0.935            | 0.482 | 0.000            | 21.20                  | 23.00               | 1.415                |
| Back Side                       | 23790/710                | 10M QPSK 1RB#0    | 0               | 0.847            | 0.480 | 0.190            | 21.29                  | 23.00               | 1.256                |
| Top Side                        | 23800/711                | 10M QPSK 1RB#0    | 0               | 0.744            | 0.413 | 0.150            | 21.36                  | 23.00               | 1.085                |
| Top Side                        | 23780/709                | 10M QPSK 1RB#0    | 0               | 0.711            | 0.390 | 0.130            | 21.20                  | 23.00               | 1.076                |
| Top Side                        | 23790/710                | 10M QPSK 1RB#0    | 0               | 0.725            | 0.395 | 0.130            | 21.29                  | 23.00               | 1.075                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 23780/709                | 10M QPSK 50%RB#0  | 0               | 0.808            | 0.463 | 0.140            | 20.99                  | 22.00               | 1.020                |
| Back Side                       | 23790/710                | 10M QPSK 50%RB#0  | 0               | 0.811            | 0.465 | 0.120            | 20.98                  | 22.00               | 1.026                |
| Back Side                       | 23800/711                | 10M QPSK 50%RB#0  | 0               | 0.817            | 0.468 | 0.120            | 20.99                  | 22.00               | 1.031                |
| Top Side                        | 23780/709                | 10M QPSK 50%RB#0  | 0               | 0.733            | 0.407 | 0.150            | 20.99                  | 22.00               | 0.925                |
| Top Side                        | 23790/710                | 10M QPSK 50%RB#0  | 0               | 0.735            | 0.408 | 0.140            | 20.98                  | 22.00               | 0.930                |
| Top Side                        | 23800/711                | 10M QPSK 50%RB#0  | 0               | 0.734            | 0.408 | 0.150            | 20.99                  | 22.00               | 0.926                |
| 100%RB                          |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side                       | 23780/709                | 10M QPSK 100%RB#0 | 0               | 0.834            | 0.535 | 0.060            | 20.98                  | 22.00               | 1.055                |
| Top Side                        | 23780/709                | 10M QPSK 100%RB#0 | 0               | 0.724            | 0.395 | 0.120            | 20.98                  | 22.00               | 0.916                |
| Proximity sensor is deactivated |                          |                   |                 |                  |       |                  |                        |                     |                      |
| 1RB                             |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 23790/710                | 10M QPSK 1RB#0    | 0               | 0.173            | 0.103 | 0.180            | 23.24                  | 24.00               | 0.206                |
| Back Side                       | 23790/710                | 10M QPSK 1RB#0    | 16              | 0.262            | 0.181 | 0.020            | 23.24                  | 24.00               | 0.312                |
| Top Side                        | 23790/710                | 10M QPSK 1RB#0    | 19              | 0.112            | 0.080 | 0.160            | 23.24                  | 24.00               | 0.133                |
| 50%RB                           |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side                       | 23780/709                | 10M QPSK 50%RB#0  | 0               | 0.137            | 0.082 | 0.040            | 21.73                  | 23.00               | 0.184                |
| Back Side                       | 23780/709                | 10M QPSK 50%RB#0  | 16              | 0.212            | 0.146 | 0.180            | 21.73                  | 23.00               | 0.284                |
| Top Side                        | 23780/709                | 10M QPSK 50%RB#0  | 19              | 0.086            | 0.059 | 0.160            | 21.73                  | 23.00               | 0.115                |

Table 46: Body SAR test results of LTE Band XVII

### 7.2.11 SAR measurement Result of LTE Band XXVI

| Test Position of Body | Test channel /Freq.(MHz) | Test Mode         | Test Dist. (mm) | SAR Value (W/kg) |       | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|-----------------------|--------------------------|-------------------|-----------------|------------------|-------|------------------|------------------------|---------------------|----------------------|
|                       |                          |                   |                 | 1-g              | 10-g  |                  |                        |                     |                      |
| 1RB                   |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Back Side             | 26775/822.5              | 15M QPSK 1RB#0    | 0               | 0.660            | 0.352 | 0.140            | 23.09                  | 23.50               | 0.725                |
| Left Side             | 26775/822.5              | 15M QPSK 1RB#0    | 0               | 0.131            | 0.078 | 0.160            | 23.09                  | 23.50               | 0.144                |
| Top Side              | 26775/822.5              | 15M QPSK 1RB#0    | 0               | 0.885            | 0.472 | 0.130            | 23.09                  | 23.50               | 0.973                |
| Top Side              | 26965/841.5              | 15M QPSK 1RB#74   | 0               | 0.866            | 0.457 | -0.130           | 22.40                  | 23.50               | 1.116                |
| Top Side              | 26865/831.5              | 15M QPSK 1RB#0    | 0               | 0.859            | 0.454 | 0.160            | 22.59                  | 23.50               | 1.059                |
| 50%RB                 |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Left Side             | 26775/822.5              | 15M QPSK 50%RB#0  | 0               | 0.131            | 0.078 | 0.160            | 21.43                  | 22.50               | 0.168                |
| Back Side             | 26775/822.5              | 15M QPSK 50%RB#0  | 0               | 0.609            | 0.325 | 0.140            | 21.43                  | 22.50               | 0.779                |
| Top Side              | 26775/822.5              | 15M QPSK 50%RB#0  | 0               | 0.848            | 0.450 | 0.180            | 21.43                  | 22.50               | 1.085                |
| Top Side              | 26865/831.5              | 15M QPSK 50%RB#0  | 0               | 0.840            | 0.445 | 0.170            | 21.15                  | 22.50               | 1.146                |
| Top Side              | 26965/841.5              | 15M QPSK 50%RB#0  | 0               | 0.902            | 0.474 | 0.110            | 21.30                  | 22.50               | <b>1.189</b>         |
| Top Side-Repeated     | 26965/841.5              | 15M QPSK 50%RB#0  | 0               | 0.855            | 0.453 | 0.190            | 21.30                  | 22.50               | 1.127                |
| 100%RB                |                          |                   |                 |                  |       |                  |                        |                     |                      |
| Top Side              | 26965/841.5              | 15M QPSK 100%RB#0 | 0               | 0.877            | 0.460 | 0.100            | 21.27                  | 22.50               | 1.164                |

Table 47: Body SAR test results of LTE Band XXVI

### 7.2.12 SAR measurement Result of WiFi 2.4G

| Test Position of Body | Test channel /Freq.(MHz) | Test Mode | Test Dist. (mm) | SAR Value (W/kg) |               | Power Drift (dB) | Conducted Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|-----------------------|--------------------------|-----------|-----------------|------------------|---------------|------------------|-----------------------|---------------------|----------------------|
|                       |                          |           |                 | 1-g Area Scan    | 1-g Zoom Scan |                  |                       |                     |                      |
| Back Side             | 6/2437                   | 802.11 b  | 0               | 0.941            | 0.956         | 0.110            | 11.02                 | 12.00               | <b>1.198</b>         |
| Back Side-Repeated    | 6/2437                   | 802.11 b  | 0               | 0.825            | 0.830         | -0.150           | 11.02                 | 12.00               | 1.040                |
| Left Side             | 6/2437                   | 802.11 b  | 0               | 0.020            | 0.018         | -0.140           | 11.02                 | 12.00               | 0.023                |
| Right Side            | 6/2437                   | 802.11 b  | 0               | 0.254            | 0.275         | 0.180            | 11.02                 | 12.00               | 0.345                |
| Bottom Side           | 6/2437                   | 802.11 b  | 0               | 0.179            | 0.201         | 0.170            | 11.02                 | 12.00               | 0.252                |
| Back Side             | 1/2412                   | 802.11 b  | 0               | 0.801            | 0.805         | 0.000            | 10.79                 | 12.00               | 1.064                |
| Back Side             | 11/2462                  | 802.11 b  | 0               | 0.819            | 0.862         | 0.000            | 10.91                 | 12.00               | 1.108                |

Table 48: Body SAR test results of WiFi 2450MHz

### 7.2.13 SAR measurement Result of WiFi 5G

| Test Position of Body | Test channel /Freq.(MHz) | Test Mode   | Test Dist. (mm) | SAR Value (W/kg) |               | Power Drift (dB) | Conducte d Power (dBm) | Tune-up Power (dBm) | Scaled SAR1-g (W/kg) |
|-----------------------|--------------------------|-------------|-----------------|------------------|---------------|------------------|------------------------|---------------------|----------------------|
|                       |                          |             |                 | 1-g Area Scan    | 1-g Zoom Scan |                  |                        |                     |                      |
| 5.2G(U-NII-1 Band)    |                          |             |                 |                  |               |                  |                        |                     |                      |
| Back Side             | 38/5190                  | 802.11n 40M | 0               | 0.480            | 0.617         | 0.000            | 9.17                   | 10.50               | 0.838                |
| Back Side             | 46/5230                  | 802.11n 40M | 0               | 0.421            | 0.605         | 0.000            | 8.85                   | 10.50               | 0.885                |
| Right Side            | 38/5190                  | 802.11n 40M | 0               | 0.251            | /             | 0.000            | 9.17                   | 10.50               | /                    |
| Bottom Side           | 38/5190                  | 802.11n 40M | 0               | 0.378            | 0.434         | 0.010            | 9.17                   | 10.50               | 0.590                |
| 5.6G(U-NII-2C Band)   |                          |             |                 |                  |               |                  |                        |                     |                      |
| Back Side             | 110/5500                 | 802.11n 40M | 0               | 0.467            | 0.814         | 0.000            | 9.03                   | 10.50               | 1.142                |
| Back Side             | 102/5510                 | 802.11n 40M | 0               | 0.594            | 0.850         | 0.160            | 9.02                   | 10.50               | <b>1.195</b>         |
| Right Side            | 110/5500                 | 802.11n 40M | 0               | 0.320            | 0.342         | 0.160            | 9.03                   | 10.50               | 0.480                |
| Bottom Side           | 110/5500                 | 802.11n 40M | 0               | 0.508            | 0.651         | 0.000            | 9.03                   | 10.50               | 0.913                |
| Bottom Side           | 102/5510                 | 802.11n 40M | 0               | 0.551            | 0.650         | -0.020           | 8.95                   | 10.50               | 0.929                |
| 5.8G(U-NII-3 Band)    |                          |             |                 |                  |               |                  |                        |                     |                      |
| Back Side             | 159/5795                 | 802.11n 40M | 0               | 0.708            | 0.867         | 0.090            | 9.27                   | 10.50               | 1.151                |
| Back Side-Repeated    | 159/5795                 | 802.11n 40M | 0               | 0.789            | 0.894         | 0.070            | 9.27                   | 10.50               | 1.187                |
| Back Side             | 151/5755                 | 802.11n 40M | 0               | 0.629            | 0.836         | 0.140            | 8.98                   | 10.50               | 1.186                |
| Right Side            | 159/5795                 | 802.11n 40M | 0               | 0.254            | 0.266         | 0.000            | 9.27                   | 10.50               | 0.353                |
| Bottom Side           | 159/5795                 | 802.11n 40M | 0               | 0.675            | 0.802         | 0.000            | 9.27                   | 10.50               | 1.065                |
| Bottom Side           | 151/5755                 | 802.11n 40M | 0               | 0.551            | 0.682         | 0.190            | 8.98                   | 10.50               | 0.968                |

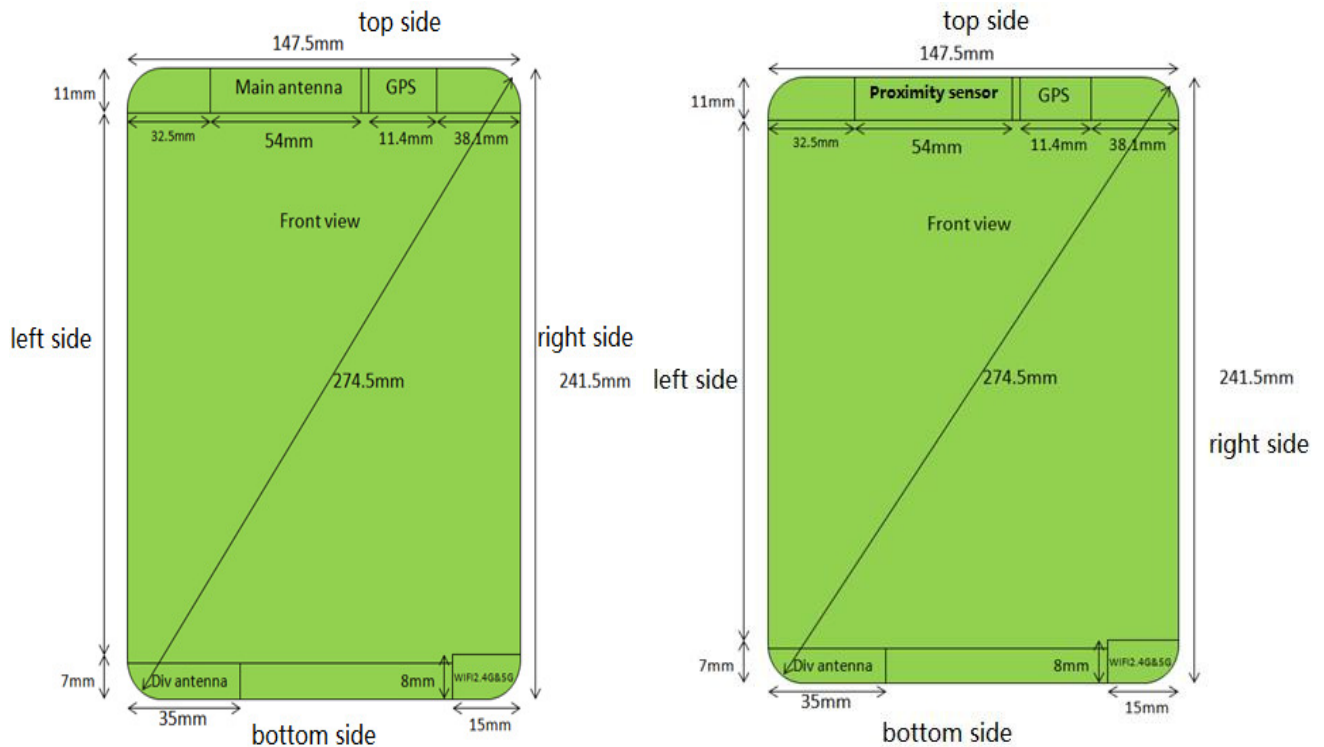
Table 49: Body SAR test results of WiFi 5G

Note: For WiFi 5G U-NII-1 and U-NII-2A bands, as the different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest *reported* SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is  $\leq 1.2$  W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

### 7.3 Multiple Transmitter Evaluation

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB 447498 D01 General RF Exposure Guidance v06.

The location of the antennas inside the device is shown as below picture:



Note:

- 1) The overall dimension of the device (Length\* Width) is 147.5mm\*241.5mm . Per KDB 616217, because the diagonal Length is about 274.5mm > 200mm, it is considered a “ tablet” device and need to test 0mm 1g Body SAR.
- 2) The Div antenna does not have transmit function.
- 3) There is no spatial offset between the main antenna and the proximity sensor element.

### 7.3.1 Standalone SAR exclusion calculation

Per FCC KDB 447498D01v06:

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

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity 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 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.

2) At 100 MHz to 6 GHz and for test separation distances  $> 50$  mm, the SAR test exclusion threshold is determined according to the following

a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · (f(MHz)/150)] mW, at 100 MHz to 1500 MHz

b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at  $> 1500$  MHz and  $\leq 6$  GHz

(Antennas  $< 50$  mm to adjacent sides)

| 1) Standalone SAR exclusion calculation(Antennas <50mm to adjacent sides) |                    |        |        |         |                         |           |            |          |             |                  |           |            |          |             |                     |           |            |          |             |
|---------------------------------------------------------------------------|--------------------|--------|--------|---------|-------------------------|-----------|------------|----------|-------------|------------------|-----------|------------|----------|-------------|---------------------|-----------|------------|----------|-------------|
| Band                                                                      | Exposure Condition | f(GHz) | Pmax   | Pmax    | Seperation Distance(mm) |           |            |          |             | Calculated Value |           |            |          |             | SAR Test(yes or no) |           |            |          |             |
|                                                                           |                    |        | (dBm)* | (mW)    | Back side               | Left side | Right side | Top side | Bottom side | Back side        | Left side | Right side | Top side | Bottom side | Back side           | Left side | Right side | Top side | Bottom side |
| GSM850                                                                    | Body 0mm           | 0.850  | 33.00  | 1995.26 | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 367.908          | 56.601    | >50mm      | 367.908  | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| GSM1900                                                                   | Body 0mm           | 1.900  | 30.50  | 1122.02 | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 309.319          | 47.588    | >50mm      | 309.319  | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| UMTS B2                                                                   | Body 0mm           | 1.900  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 61.717           | 9.495     | >50mm      | 61.717   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| UMTS B4                                                                   | Body 0mm           | 1.700  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 58.379           | 8.981     | >50mm      | 58.379   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| UMTS B5                                                                   | Body 0mm           | 0.850  | 24.00  | 251.19  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 46.317           | 7.126     | >50mm      | 46.317   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| LTE B2                                                                    | Body 0mm           | 1.900  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 55.006           | 8.462     | >50mm      | 55.006   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| LTE B4                                                                    | Body 0mm           | 1.700  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 52.030           | 8.005     | >50mm      | 52.030   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| LTE B5                                                                    | Body 0mm           | 0.850  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 41.280           | 6.351     | >50mm      | 41.280   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| LTE B7                                                                    | Body 0mm           | 2.600  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 64.345           | 9.899     | >50mm      | 64.345   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| LTE B17                                                                   | Body 0mm           | 0.750  | 24.00  | 251.19  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 43.507           | 6.693     | >50mm      | 43.507   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| LTE B26                                                                   | Body 0mm           | 0.850  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | 41.280           | 6.351     | >50mm      | 41.280   | >50mm       | Yes                 | Yes       | >50mm      | Yes      | >50mm       |
| WiFi 2.4G                                                                 | Body 0mm           | 2.450  | 12.00  | 15.85   | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | 4.962            | >50mm     | 4.962      | >50mm    | 4.962       | Yes                 | >50mm     | Yes        | >50mm    | Yes         |
| WiFi 5G                                                                   | Body 0mm           | 5.800  | 10.50  | 11.22   | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | 5.404            | >50mm     | 5.404      | >50mm    | 5.404       | Yes                 | >50mm     | Yes        | >50mm    | Yes         |
| BT                                                                        | Body 0mm           | 2.450  | 5.00   | 3.16    | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | 0.990            | >50mm     | 0.990      | >50mm    | 0.990       | No                  | >50mm     | No         | >50mm    | No          |

(Antennas  $> 50$  mm to adjacent sides)

| 2) Standalone SAR exclusion calculation(Antennas >50mm to adjacent sides) |                    |        |        |         |                         |           |            |          |             |                            |           |            |          |             |                     |           |            |          |             |
|---------------------------------------------------------------------------|--------------------|--------|--------|---------|-------------------------|-----------|------------|----------|-------------|----------------------------|-----------|------------|----------|-------------|---------------------|-----------|------------|----------|-------------|
| Band                                                                      | Exposure Condition | f(GHz) | Pmax   | Pmax    | Seperation Distance(mm) |           |            |          |             | Calculated Threshold Value |           |            |          |             | SAR Test(yes or no) |           |            |          |             |
|                                                                           |                    |        | (dBm)* | (mW)    | Back side               | Left side | Right side | Top side | Bottom side | Back side                  | Left side | Right side | Top side | Bottom side | Back side           | Left side | Right side | Top side | Bottom side |
| GSM850                                                                    | Body 0mm           | 0.850  | 33.00  | 1995.26 | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 226.33     | <50mm    | 2022.83     | <50mm               | <50mm     | No         | <50mm    | No          |
| GSM1900                                                                   | Body 0mm           | 1.900  | 30.50  | 1122.02 | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 219.00     | <50mm    | 2805.00     | <50mm               | <50mm     | No         | <50mm    | No          |
| UMTS B2                                                                   | Body 0mm           | 1.900  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1110.00    | <50mm    | 2805.00     | <50mm               | <50mm     | No         | <50mm    | No          |
| UMTS B4                                                                   | Body 0mm           | 1.700  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1110.00    | <50mm    | 2805.00     | <50mm               | <50mm     | No         | <50mm    | No          |
| UMTS B5                                                                   | Body 0mm           | 0.850  | 24.00  | 251.19  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1062.33    | <50mm    | 1122.83     | <50mm               | <50mm     | No         | <50mm    | No          |
| LTE B2                                                                    | Body 0mm           | 1.900  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1110.00    | <50mm    | 1905.00     | <50mm               | <50mm     | No         | <50mm    | No          |
| LTE B4                                                                    | Body 0mm           | 1.700  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1110.00    | <50mm    | 1905.00     | <50mm               | <50mm     | No         | <50mm    | No          |
| LTE B5                                                                    | Body 0mm           | 0.850  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1062.33    | <50mm    | 1122.83     | <50mm               | <50mm     | No         | <50mm    | No          |
| LTE B7                                                                    | Body 0mm           | 2.600  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1110.00    | <50mm    | 1905.00     | <50mm               | <50mm     | No         | <50mm    | No          |
| LTE B17                                                                   | Body 0mm           | 0.750  | 24.00  | 251.19  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1055.00    | <50mm    | 1002.50     | <50mm               | <50mm     | No         | <50mm    | No          |
| LTE B26                                                                   | Body 0mm           | 0.850  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | <50mm                      | <50mm     | 1062.33    | <50mm    | 1122.83     | <50mm               | <50mm     | No         | <50mm    | No          |
| WiFi 2.4G                                                                 | Body 0mm           | 2.450  | 12.00  | 15.85   | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | <50mm                      | 925.00    | <50mm      | 2831.00  | <50mm       | <50mm               | No        | <50mm      | No       | <50mm       |
| WiFi 5G                                                                   | Body 0mm           | 5.800  | 10.50  | 11.22   | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | <50mm                      | 925.00    | <50mm      | 2831.00  | <50mm       | <50mm               | No        | <50mm      | No       | <50mm       |
| BT                                                                        | Body 0mm           | 2.450  | 5.00   | 3.16    | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | <50mm                      | 925.00    | <50mm      | 2831.00  | <50mm       | <50mm               | No        | <50mm      | No       | <50mm       |

### 7.3.2 Estimated SAR for Simultaneous Transmission SAR Analysis

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

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] •  
[ √ f(GHz)/x] W/kg for test separation distances ≤ 50 mm, where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

When the minimum test separation distance is > 50 mm, the estimated SAR value is 0.4 W/kg

For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.

| Band      | Exposure Condition | f(GHz) | Pmax   | Pmax    | Seperation Distance(mm) |           |            |          |             | Estimated 1-g SAR Value (W/kg) |           |            |          |             |
|-----------|--------------------|--------|--------|---------|-------------------------|-----------|------------|----------|-------------|--------------------------------|-----------|------------|----------|-------------|
|           |                    |        | (dBm)* | (mW)    | Back side               | Left side | Right side | Top side | Bottom side | Back side                      | Left side | Right side | Top side | Bottom side |
| GSM850    | Body 0mm           | 0.850  | 33.00  | 1995.26 | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| GSM1900   | Body 0mm           | 1.900  | 30.50  | 1122.02 | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| UMTS B2   | Body 0mm           | 1.900  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| UMTS B4   | Body 0mm           | 1.700  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| UMTS B5   | Body 0mm           | 0.850  | 24.00  | 251.19  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| LTE B2    | Body 0mm           | 1.900  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| LTE B4    | Body 0mm           | 1.700  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| LTE B5    | Body 0mm           | 0.850  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| LTE B7    | Body 0mm           | 2.600  | 23.00  | 199.53  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| LTE B17   | Body 0mm           | 0.750  | 24.00  | 251.19  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| LTE B26   | Body 0mm           | 0.850  | 23.50  | 223.87  | 5.0                     | 32.5      | 61.0       | 5.0      | 230.5       | Measure                        | Measure   | 0.400      | Measure  | 0.400       |
| WiFi 2.4G | Body 0mm           | 2.450  | 12.00  | 15.85   | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | Measure                        | 0.400     | Measure    | 0.400    | Measure     |
| WiFi 5G   | Body 0mm           | 5.800  | 10.50  | 11.22   | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | Measure                        | 0.400     | Measure    | 0.400    | Measure     |
| BT        | Body 0mm           | 2.450  | 5.00   | 3.16    | 5.0                     | 132.5     | 5.0        | 233.1    | 5.0         | 0.132                          | 0.400     | 0.132      | 0.400    | 0.132       |

Note: \* - maximum possible output power(including tune-up tolerance) declared by manufacturer

### 7.3.3 Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

| No. | Configuration            | Body |
|-----|--------------------------|------|
| 1   | GSM/UMTS/LTE + WiFi 2.4G | Yes  |
| 2   | GSM/UMTS/LTE + WiFi 5G   | Yes  |
| 3   | GSM/UMTS/LTE + BT        | Yes  |

Table 50: Simultaneous Transmission Possibilities

Note:

- 1) WiFi 2.4G and WiFi 5G can't transmit simutanously.
- 2) WiFi 2.4G/5G and BT can't transmit simutanously.

### 7.3.4 SAR Summation Scenario

| Test Position   | Main antenna<br>SARMax |         |                 |                 |                |                |                |               |                 |                  |                  | WiFi/BT antenna<br>SARMax |            |        | Σ1-g SAR<br>(1.6W/kg<br>Limit) | SPLSR     |
|-----------------|------------------------|---------|-----------------|-----------------|----------------|----------------|----------------|---------------|-----------------|------------------|------------------|---------------------------|------------|--------|--------------------------------|-----------|
|                 | GSM850                 | GSM1900 | UMTS<br>Band II | UMTS<br>Band IV | UMTS<br>Band V | LTE<br>Band II | LTE<br>Band IV | LTE<br>Band V | LTE<br>Band VII | LTE<br>Band XVII | LTE<br>Band XXVI | WiFi 2.4G                 | WiFi<br>5G | BT     |                                |           |
| Sensor on       |                        |         |                 |                 |                |                |                |               |                 |                  |                  |                           |            |        |                                |           |
| Back Side 0mm   | 0.732                  | 1.095   | 1.324           | 1.230           | 0.420          | 1.244          | 1.358          | 0.544         | 1.007           | 1.415            | 0.779            | 1.198                     | 1.195      | 0.132  | 2.613                          | See 7.3.6 |
| Left Side 0mm   | 0.165                  | 0.151   | 0.417           | 0.440           | 0.121          | 0.248          | 0.395          | 0.185         | 0.513           | 0.206            | 0.168            | 0.400                     | 0.400      | 0.400  | 0.913                          | N/A       |
| Right Side 0mm  | 0.400                  | 0.400   | 0.400           | 0.400           | 0.400          | 0.400          | 0.400          | 0.400         | 0.400           | 0.400            | 0.400            | 0.347                     | 0.480      | 0.132  | 0.880                          | N/A       |
| Top Side 0mm    | 1.113                  | 0.672   | 0.717           | 0.535           | 0.693          | 0.712          | 0.398          | 1.137         | 0.748           | 1.085            | 1.189            | 0.400                     | 0.400      | 0.400  | 1.589                          | N/A       |
| Bottom Side 0mm | 0.400                  | 0.400   | 0.400           | 0.400           | 0.400          | 0.400          | 0.400          | 0.400         | 0.400           | 0.400            | 0.400            | 0.254                     | 1.065      | 0.132  | 1.465                          | N/A       |
| Sensor off      |                        |         |                 |                 |                |                |                |               |                 |                  |                  |                           |            |        |                                |           |
| Back Side 16mm  | 0.260                  | 0.905   | 1.088           | 0.947           | 0.153          | 1.268          | 0.961          | 0.291         | 0.755           | 0.312            | <0.779           | <1.198                    | <1.195     | <0.132 | <2.466                         | See 7.3.6 |
| Left Side 0mm   | 0.165                  | 0.151   | 0.417           | 0.440           | 0.121          | 0.248          | 0.395          | 0.185         | 0.513           | 0.206            | 0.168            | 0.400                     | 0.400      | 0.400  | 0.913                          | N/A       |
| Right Side 0mm  | 0.400                  | 0.400   | 0.400           | 0.400           | 0.400          | 0.400          | 0.400          | 0.400         | 0.400           | 0.400            | 0.400            | 0.347                     | 0.480      | 0.132  | 0.880                          | N/A       |
| Top Side 19mm   | 0.289                  | 0.317   | 0.710           | 0.765           | 0.130          | 0.580          | 0.549          | 0.244         | 0.620           | 0.133            | <1.189           | <0.400                    | <0.400     | <0.400 | <1.589                         | N/A       |
| Bottom Side 0mm | 0.400                  | 0.400   | 0.400           | 0.400           | 0.400          | 0.400          | 0.400          | 0.400         | 0.400           | 0.400            | 0.400            | 0.254                     | 1.065      | 0.132  | 1.465                          | N/A       |

Table 51: SAR Simultaneous Tx Combination of Main Antenna and WiFi/BT.

| Test Position | Main antenna SAR <sub>Max</sub> |         |              |              |             |             |             |            |              |               |               | WiFi antenna SAR <sub>Max</sub> | Σ1-g SAR (1.6W/kg Limit) | SPLSR | Volume scan  |
|---------------|---------------------------------|---------|--------------|--------------|-------------|-------------|-------------|------------|--------------|---------------|---------------|---------------------------------|--------------------------|-------|--------------|
|               | GSM850                          | GSM1900 | UMTS Band II | UMTS Band IV | UMTS Band V | LTE Band II | LTE Band IV | LTE Band V | LTE Band VII | LTE Band XVII | LTE Band XXVI | WiFi 2.4G                       |                          |       |              |
| Back Side 0mm | 0.732                           | /       | /            | /            | /           | /           | /           | /          | /            | /             | /             | 1.198                           | 1.930                    | 0.011 | Not required |
| Back Side 0mm | /                               | 1.095   | /            | /            | /           | /           | /           | /          | /            | /             | /             | 1.198                           | 2.293                    | 0.014 | Not required |
| Back Side 0mm | /                               | /       | 1.324        | /            | /           | /           | /           | /          | /            | /             | /             | 1.198                           | 2.522                    | 0.016 | Not required |
| Back Side 0mm | /                               | /       | /            | 1.230        | /           | /           | /           | /          | /            | /             | /             | 1.198                           | 2.428                    | 0.016 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | 0.420       | /           | /           | /          | /            | /             | /             | 1.198                           | 1.618                    | 0.008 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | 1.244       | /           | /          | /            | /             | /             | 1.198                           | 2.442                    | 0.015 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | 1.358       | /          | /            | /             | /             | 1.198                           | 2.556                    | 0.018 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | /           | 0.544      | /            | /             | /             | 1.198                           | 1.742                    | 0.009 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | /           | /          | 1.007        | /             | /             | 1.198                           | 2.205                    | 0.014 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | /           | /          | /            | 1.415         | /             | 1.198                           | 2.613                    | 0.018 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | /           | /          | /            | /             | 0.779         | 1.198                           | 1.977                    | 0.012 | Not required |

Table 52: SAR Simultaneous Tx Combination of Main Antenna(Back side, Sensor on) and WiFi 2.4G

| Test Position | Main antenna SAR <sub>Max</sub> |         |              |              |             |             |             |            |              |               |               | WiFi antenna SAR <sub>Max</sub> | Σ1-g SAR (1.6W/kg Limit) | SPLSR | Volume scan  |
|---------------|---------------------------------|---------|--------------|--------------|-------------|-------------|-------------|------------|--------------|---------------|---------------|---------------------------------|--------------------------|-------|--------------|
|               | GSM850                          | GSM1900 | UMTS Band II | UMTS Band IV | UMTS Band V | LTE Band II | LTE Band IV | LTE Band V | LTE Band VII | LTE Band XVII | LTE Band XXVI | WiFi 5G                         |                          |       |              |
| Back Side 0mm | 0.732                           | /       | /            | /            | /           | /           | /           | /          | /            | /             | /             | 1.195                           | 1.927                    | 0.011 | Not required |
| Back Side 0mm | /                               | 1.095   | /            | /            | /           | /           | /           | /          | /            | /             | /             | 1.195                           | 2.290                    | 0.014 | Not required |
| Back Side 0mm | /                               | /       | 1.324        | /            | /           | /           | /           | /          | /            | /             | /             | 1.195                           | 2.519                    | 0.016 | Not required |
| Back Side 0mm | /                               | /       | /            | 1.230        | /           | /           | /           | /          | /            | /             | /             | 1.195                           | 2.425                    | 0.015 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | 0.420       | /           | /           | /          | /            | /             | /             | 1.195                           | 1.615                    | 0.008 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | 1.244       | /           | /          | /            | /             | /             | 1.195                           | 2.439                    | 0.015 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | 1.358       | /          | /            | /             | /             | 1.195                           | 2.553                    | 0.018 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | /           | 0.544      | /            | /             | /             | 1.195                           | 1.739                    | 0.009 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | /           | /          | 1.007        | /             | /             | 1.195                           | 2.202                    | 0.018 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | /           | /          | /            | 1.415         | /             | 1.195                           | 2.610                    | 0.018 | Not required |
| Back Side 0mm | /                               | /       | /            | /            | /           | /           | /           | /          | /            | /             | 0.779         | 1.195                           | 1.974                    | 0.012 | Not required |

Table 53: SAR Simultaneous Tx Combination of Main Antenna(Back side,Sensor on) and WiFi 5G

| Test Position  | Main antenna SAR <sub>Max</sub> |         |              |              |             |             |             |            |              |               |               | WiFi antenna SAR <sub>Max</sub> | Σ1-g SAR (1.6W/kg Limit) | SPLSR  | Volume scan  |
|----------------|---------------------------------|---------|--------------|--------------|-------------|-------------|-------------|------------|--------------|---------------|---------------|---------------------------------|--------------------------|--------|--------------|
|                | GSM850                          | GSM1900 | UMTS Band II | UMTS Band IV | UMTS Band V | LTE Band II | LTE Band IV | LTE Band V | LTE Band VII | LTE Band XVII | LTE Band XXVI | WiFi 2.4G                       |                          |        |              |
| Back Side 16mm | 0.260                           | /       | /            | /            | /           | /           | /           | /          | /            | /             | /             | <1.198                          | <1.458                   | N/A    | Not required |
| Back Side 16mm | /                               | 0.905   | /            | /            | /           | /           | /           | /          | /            | /             | /             | <1.198                          | <2.103                   | <0.013 | Not required |
| Back Side 16mm | /                               | /       | 1.088        | /            | /           | /           | /           | /          | /            | /             | /             | <1.198                          | <2.286                   | <0.014 | Not required |
| Back Side 16mm | /                               | /       | /            | 0.947        | /           | /           | /           | /          | /            | /             | /             | <1.198                          | <2.145                   | <0.013 | Not required |
| Back Side 16mm | /                               | /       | /            | /            | 0.153       | /           | /           | /          | /            | /             | /             | <1.198                          | <1.351                   | N/A    | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | 1.268       | /           | /          | /            | /             | /             | <1.198                          | <2.466                   | <0.016 | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | 0.961       | /          | /            | /             | /             | <1.198                          | <2.159                   | <0.013 | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | /           | 0.291      | /            | /             | /             | <1.198                          | <1.489                   | N/A    | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | /           | /          | 0.755        | /             | /             | <1.198                          | <1.953                   | <0.011 | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | /           | /          | /            | 0.312         | /             | <1.198                          | <1.510                   | N/A    | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | /           | /          | /            | /             | <0.779        | <1.198                          | <1.977                   | <0.012 | Not required |

Table 54: SAR Simultaneous Tx Combination of Main Antenna(Back side,Sensor off) and WiFi 2.4G

| Test Position  | Main antenna SAR <sub>Max</sub> |         |              |              |             |             |             |            |              |               |               | WiFi antenna SAR <sub>Max</sub> | Σ1-g SAR (1.6W/kg Limit) | SPLSR  | Volume scan  |
|----------------|---------------------------------|---------|--------------|--------------|-------------|-------------|-------------|------------|--------------|---------------|---------------|---------------------------------|--------------------------|--------|--------------|
|                | GSM850                          | GSM1900 | UMTS Band II | UMTS Band IV | UMTS Band V | LTE Band II | LTE Band IV | LTE Band V | LTE Band VII | LTE Band XVII | LTE Band XXVI | WiFi 5G                         |                          |        |              |
| Back Side 16mm | 0.260                           | /       | /            | /            | /           | /           | /           | /          | /            | /             | /             | <1.195                          | <1.455                   | N/A    | Not required |
| Back Side 16mm | /                               | 0.905   | /            | /            | /           | /           | /           | /          | /            | /             | /             | <1.195                          | <2.100                   | <0.013 | Not required |
| Back Side 16mm | /                               | /       | 1.088        | /            | /           | /           | /           | /          | /            | /             | /             | <1.195                          | <2.283                   | <0.014 | Not required |
| Back Side 16mm | /                               | /       | /            | 0.947        | /           | /           | /           | /          | /            | /             | /             | <1.195                          | <2.142                   | <0.013 | Not required |
| Back Side 16mm | /                               | /       | /            | /            | 0.153       | /           | /           | /          | /            | /             | /             | <1.195                          | <1.348                   | N/A    | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | 1.268       | /           | /          | /            | /             | /             | <1.195                          | <2.463                   | <0.016 | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | 0.961       | /          | /            | /             | /             | <1.195                          | <2.156                   | <0.013 | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | /           | 0.291      | /            | /             | /             | <1.195                          | <1.486                   | N/A    | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | /           | /          | 0.755        | /             | /             | <1.195                          | <1.950                   | <0.011 | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | /           | /          | /            | 0.312         | /             | <1.195                          | <1.507                   | N/A    | Not required |
| Back Side 16mm | /                               | /       | /            | /            | /           | /           | /           | /          | /            | /             | <0.779        | <1.195                          | <1.974                   | <0.012 | Not required |

Table 55: SAR Simultaneous Tx Combination of Main Antenna(Back side,Sensor off) and WiFi 5G

### 7.3.5 SPLSR Evaluation Analysis

According to KDB447498 D01v06, When the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio(SPLSR).When the SAR to peak location ratio for each pair of antennas is  $\leq 1\text{-g } 0.04$  and  $10\text{-g } 0.10$ , simultaneous SAR evaluation is not required. When SAR is measured for both antennas in the pair, the peak location separation distance is computed by the following fomula:

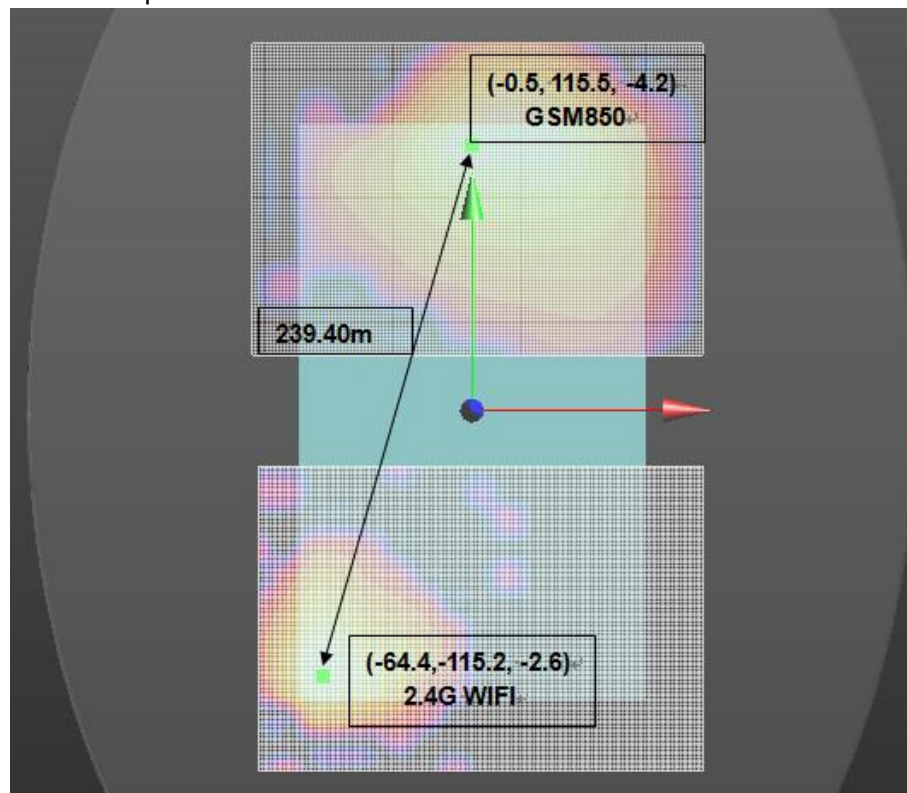
$$\text{Distance}_{\text{Tx1-Tx2}} = R_i = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

$$\text{SPLS Ratio} = (\text{SAR}_1 + \text{SAR}_2)^{1.5} / R_i$$

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna.

- 1) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM850(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

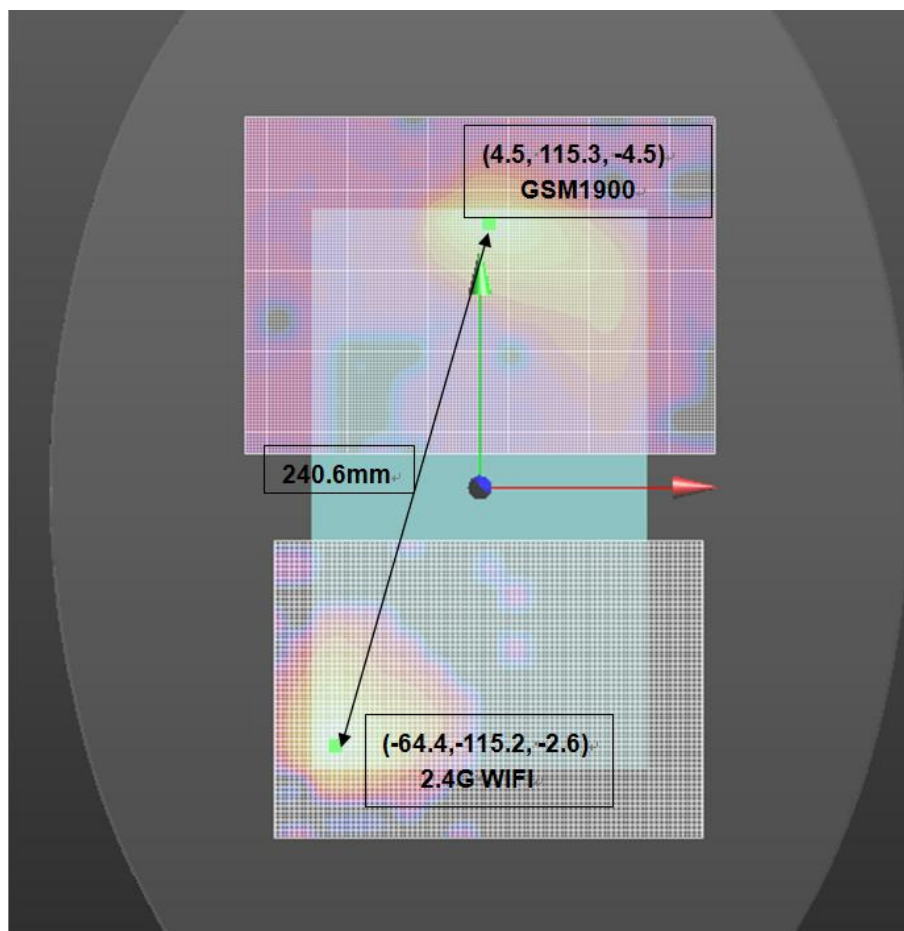


The SAR to peak location ratio calculation is as below:

| Test Position | GSM850 (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|---------------|------------------|--------|-------|-------------|------------------|
| Back Side 0mm | 0.732         | 1.198            | 239.4  | 0.011 | 0.04        | Not required     |

- 2) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM1900(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

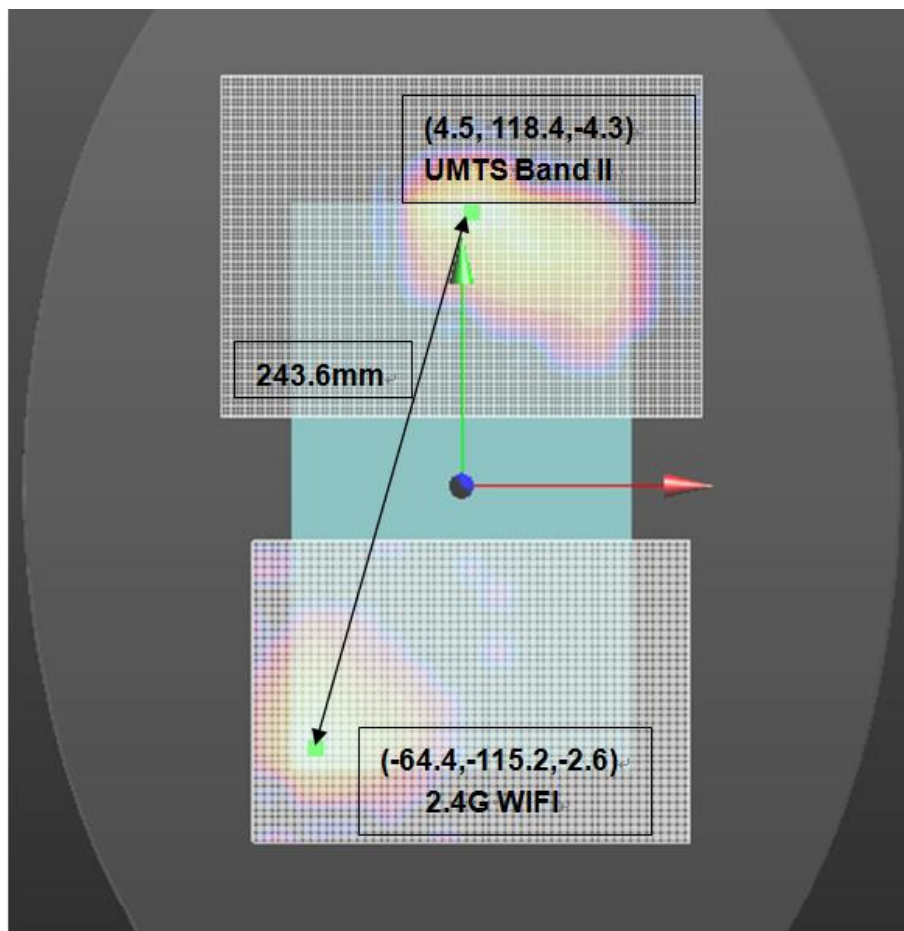


The SAR to peak location ratio calculation is as below:

| Test Position | GSM1900 (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|----------------|------------------|--------|-------|-------------|------------------|
| Back Side 0mm | 1.095          | 1.198            | 240.6  | 0.014 | 0.04        | Not required     |

- 3) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band II(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

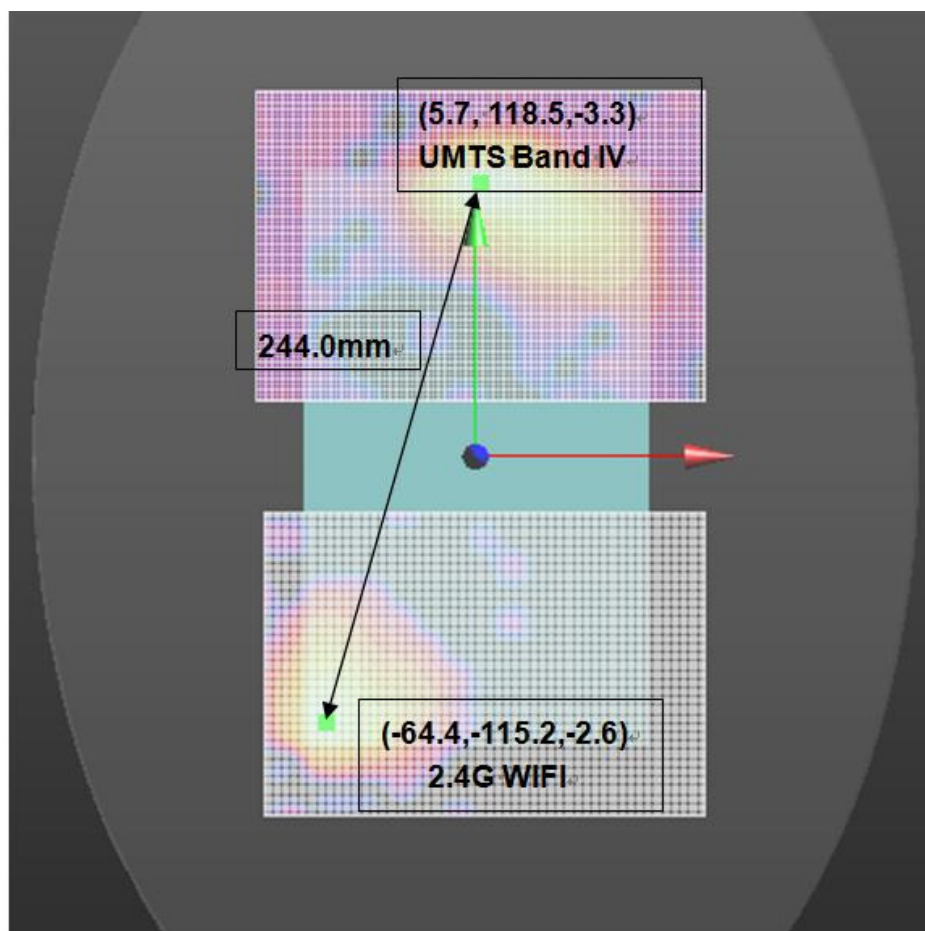


The SAR to peak location ratio calculation is as below:

| Test Position | UMTS Band II (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|---------------------|------------------|--------|-------|-------------|------------------|
| Back Side 0mm | 1.324               | 1.198            | 243.6  | 0.016 | 0.04        | Not required     |

- 4) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band IV(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

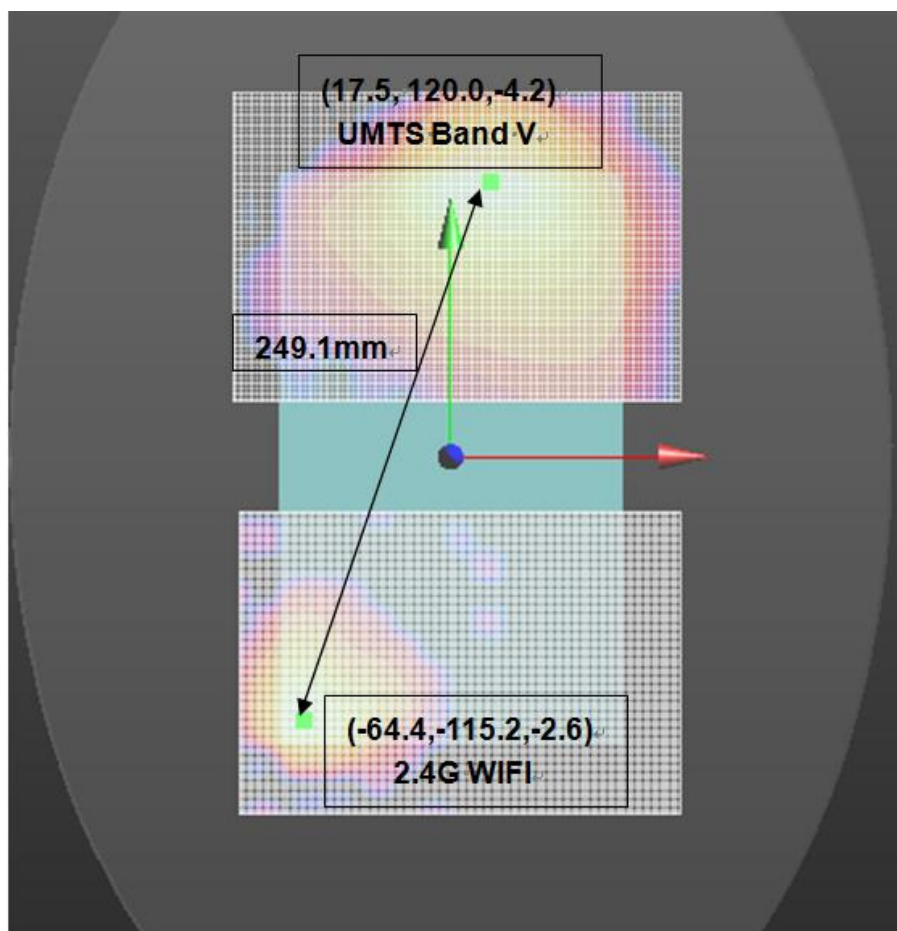


The SAR to peak location ratio calculation is as below:

| Test Position | MUTS<br>Band IV<br>(W/kg) | WIFI 2.4G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|---------------------------|---------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 1.230                     | 1.198               | 244.0  | 0.016 | 0.04           | Not required        |

- 5) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band V(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

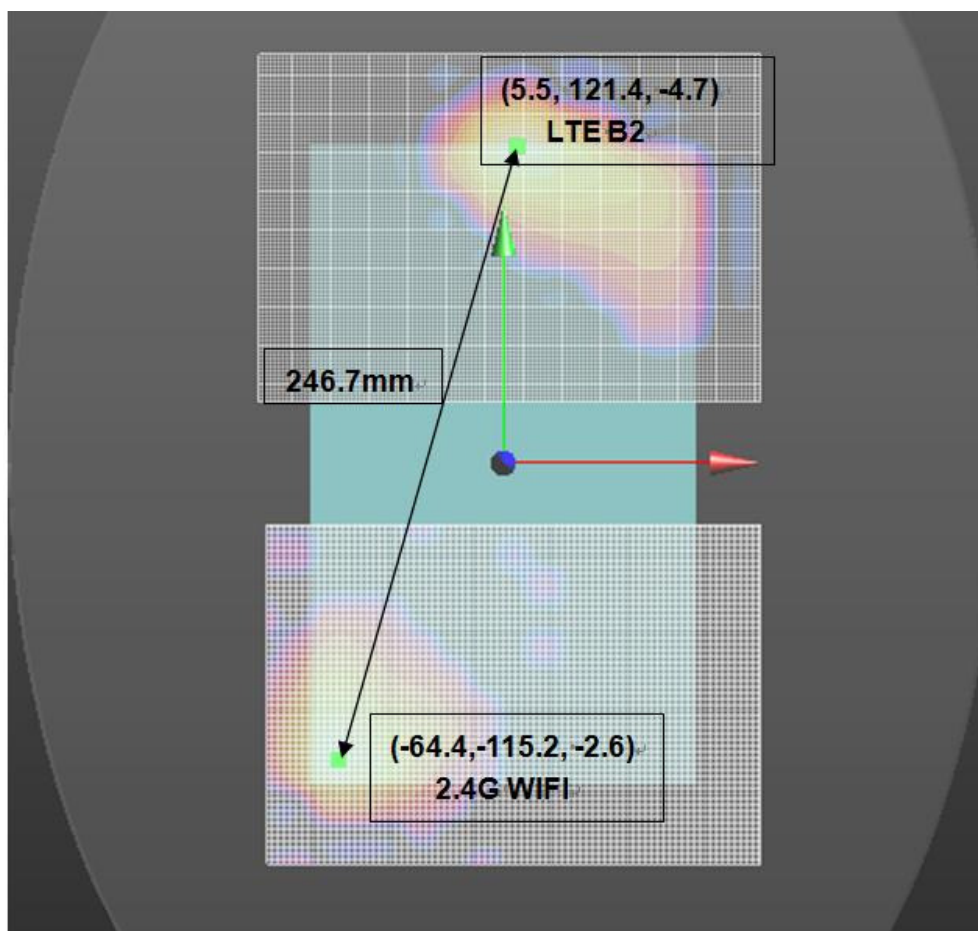


The SAR to peak location ratio calculation is as below:

| Test Position | UMTS Band V (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|--------------------|------------------|--------|-------|-------------|------------------|
| Back Side 0mm | 0.407              | 1.198            | 249.1  | 0.008 | 0.04        | Not required     |

- 6) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B2(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

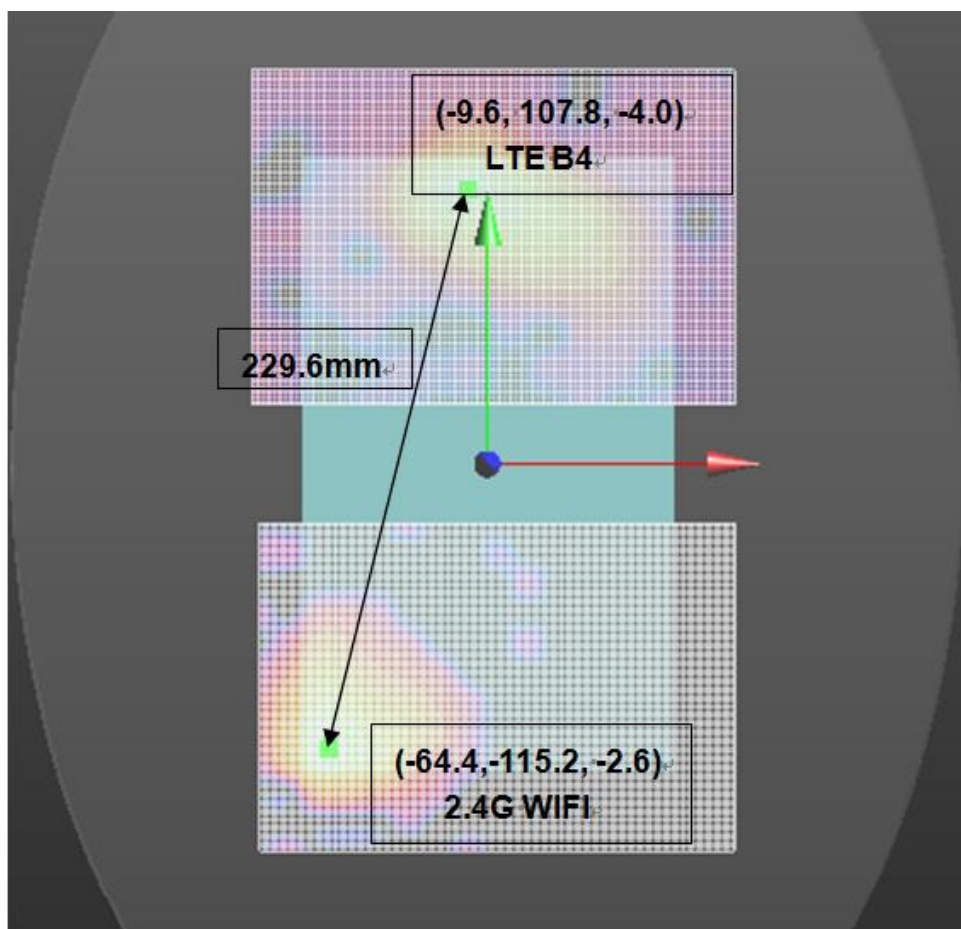


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B2<br>(W/kg) | WIFI 2.4G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|------------------|---------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 1.244            | 1.198               | 246.7  | 0.015 | 0.04           | Not required        |

- 7) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B4(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

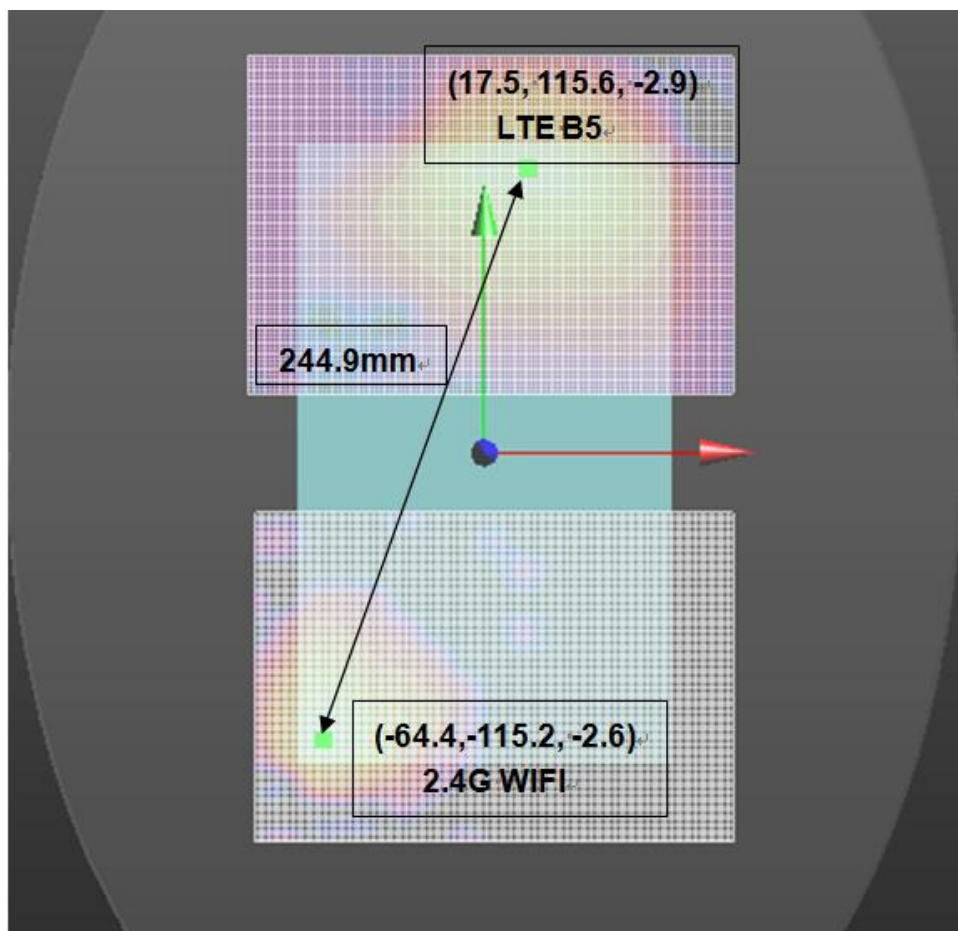


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B4<br>(W/kg) | WIFI 2.4G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|------------------|---------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 1.358            | 1.198               | 229.6  | 0.018 | 0.04           | Not required        |

- 8) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B5(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

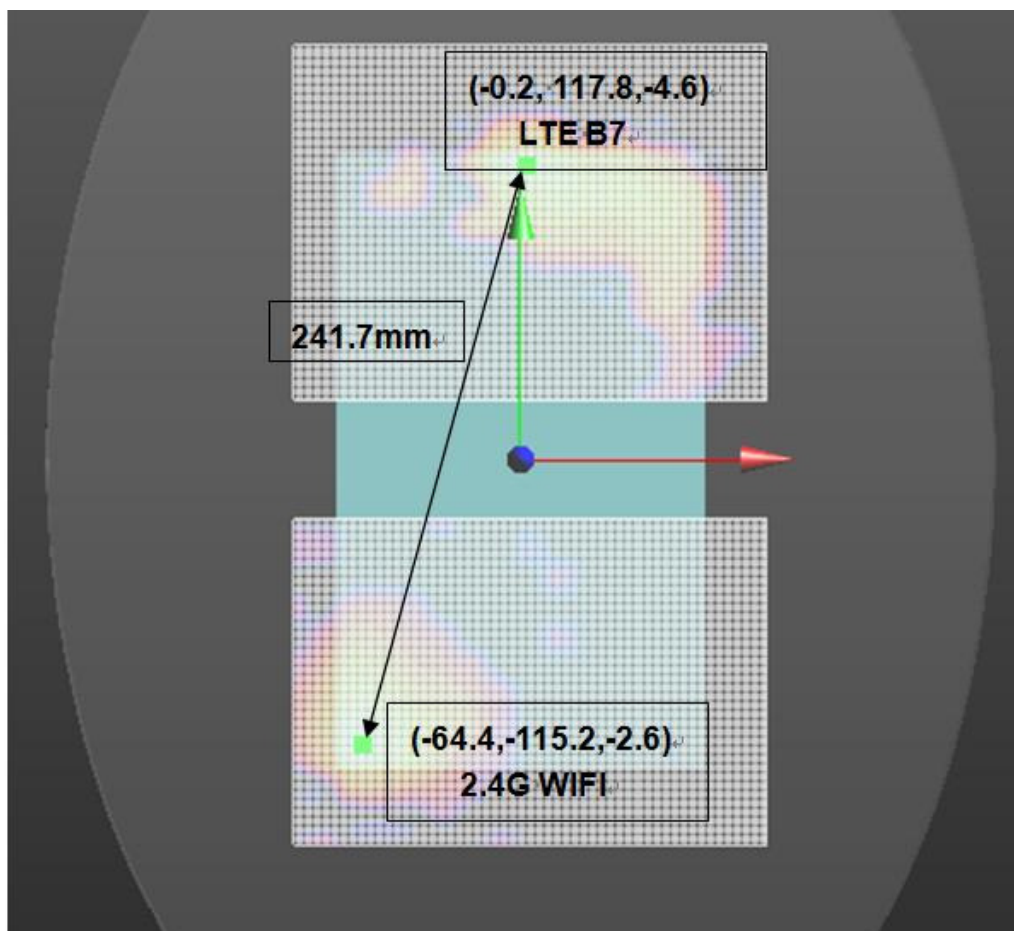


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B5<br>(W/kg) | WIFI 2.4G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|------------------|---------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 0.544            | 1.198               | 244.9  | 0.009 | 0.04           | Not required        |

- 9) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B7(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

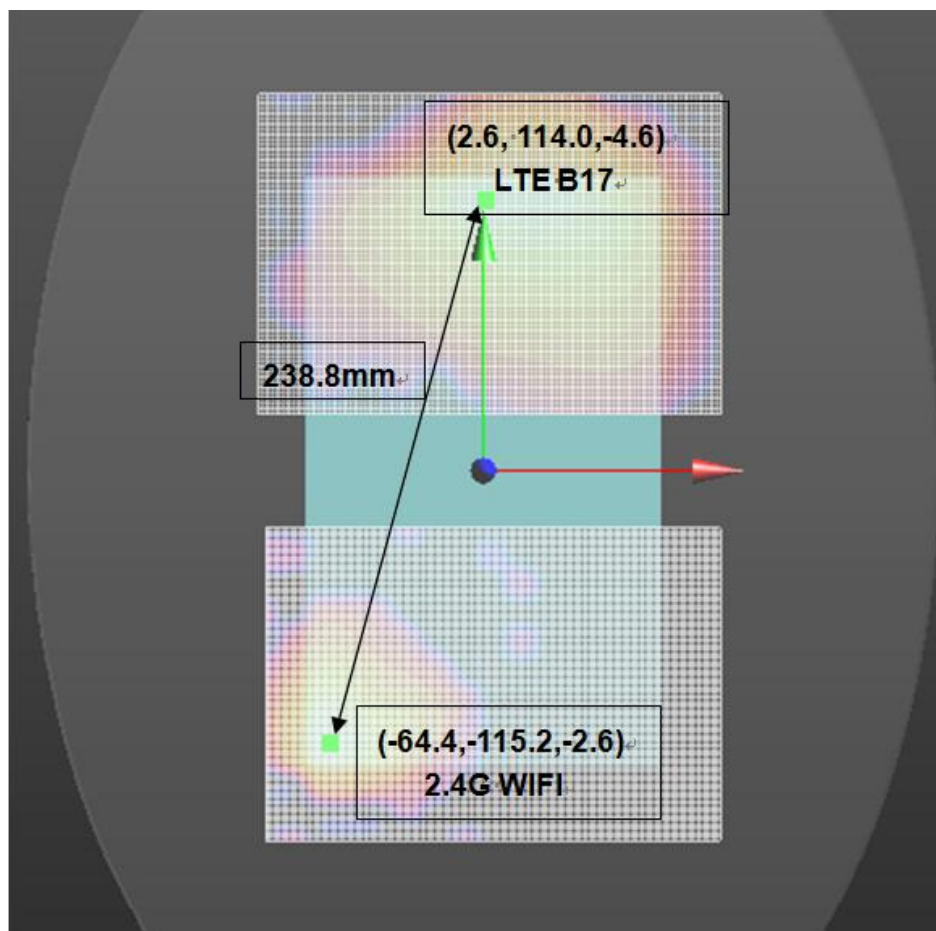


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B7<br>(W/kg) | WIFI 2.4G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|------------------|---------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 1.007            | 1.198               | 241.7  | 0.014 | 0.04           | Not required        |

- 10) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B17(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

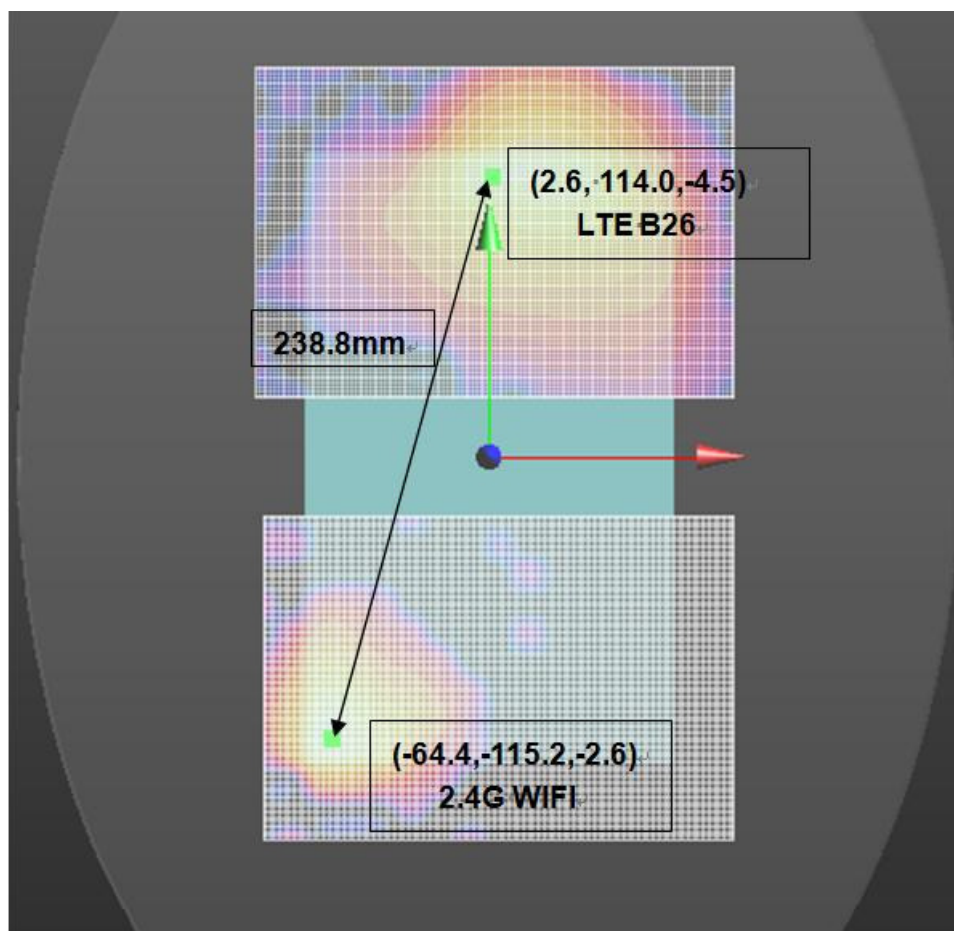


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B17<br>(W/kg) | WIFI 2.4G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|-------------------|---------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 1.415             | 1.198               | 238.8  | 0.018 | 0.04           | Not required        |

- 11) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B26(Sensor on) and WiFi 2.4G.

The Peak SAR location plot is as below:

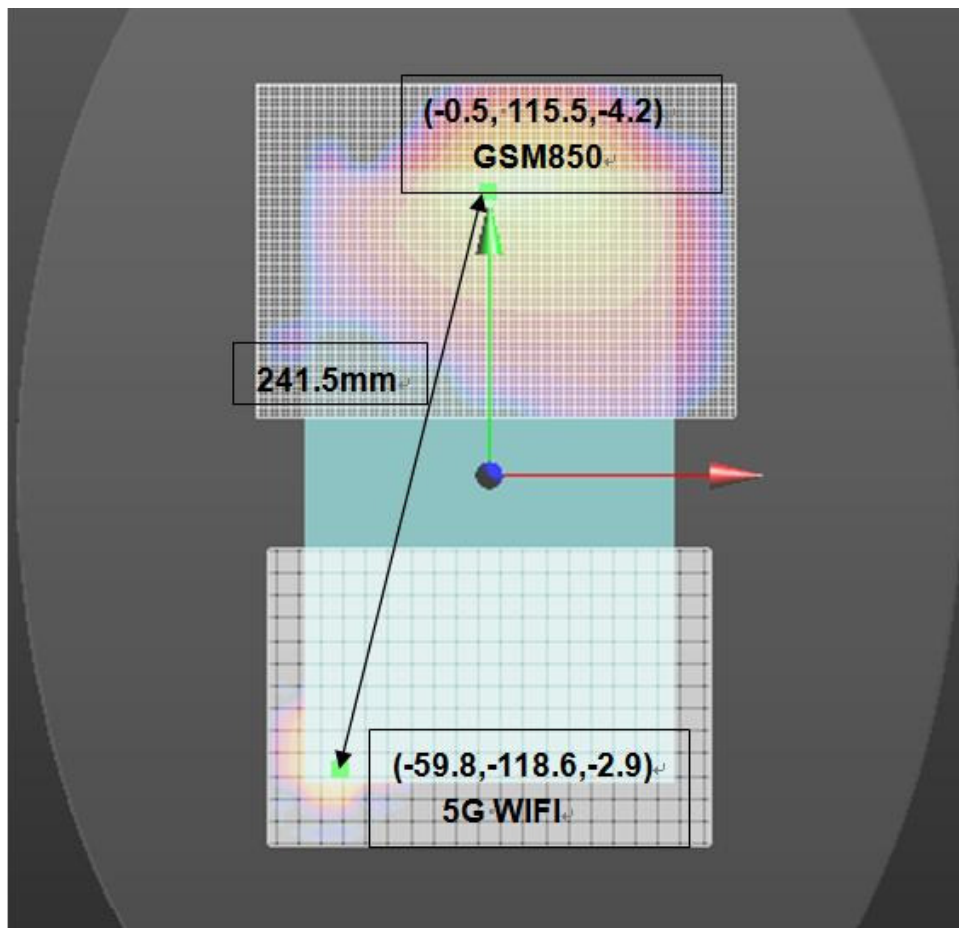


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B26 (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|----------------|------------------|--------|-------|-------------|------------------|
| Back Side 0mm | 0.779          | 1.198            | 238.8  | 0.012 | 0.04        | Not required     |

12) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM850(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

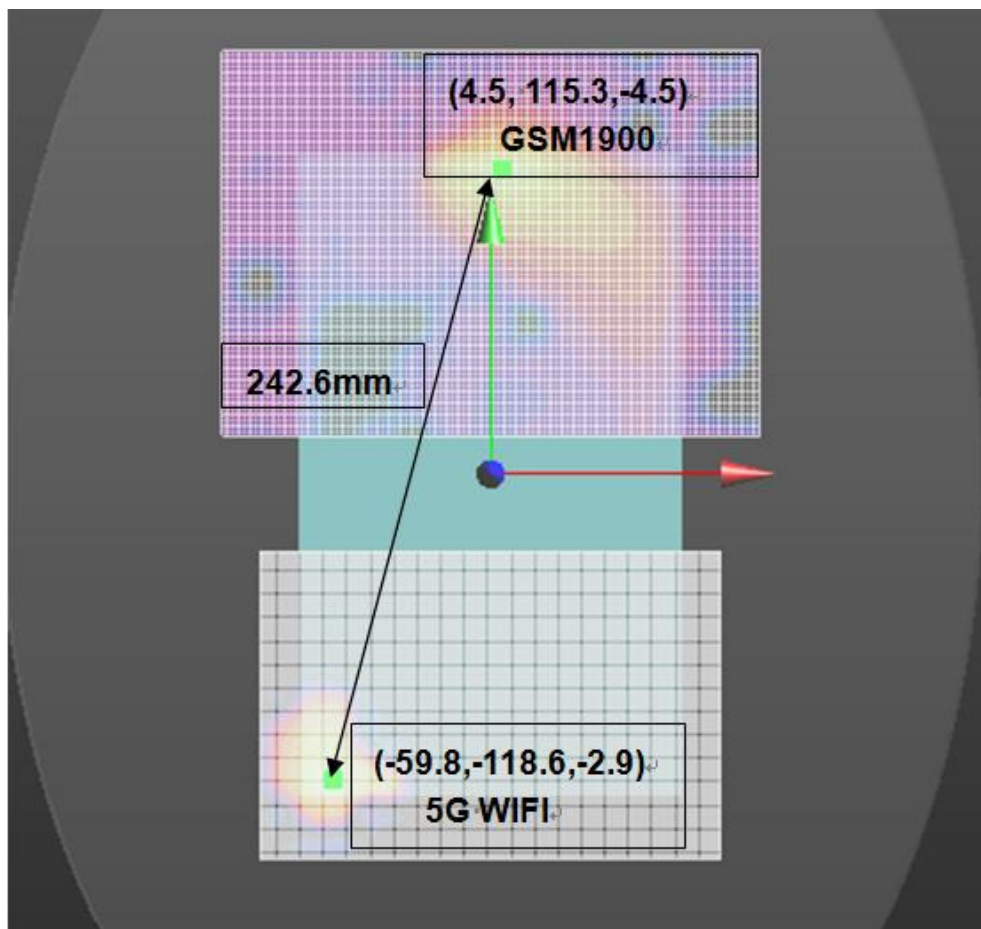


The SAR to peak location ratio calculation is as below:

| Test Position | GSM850 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|---------------|----------------|--------|-------|-------------|------------------|
| Back Side 0mm | 0.732         | 1.195          | 241.5  | 0.011 | 0.04        | Not required     |

- 13) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM1900(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

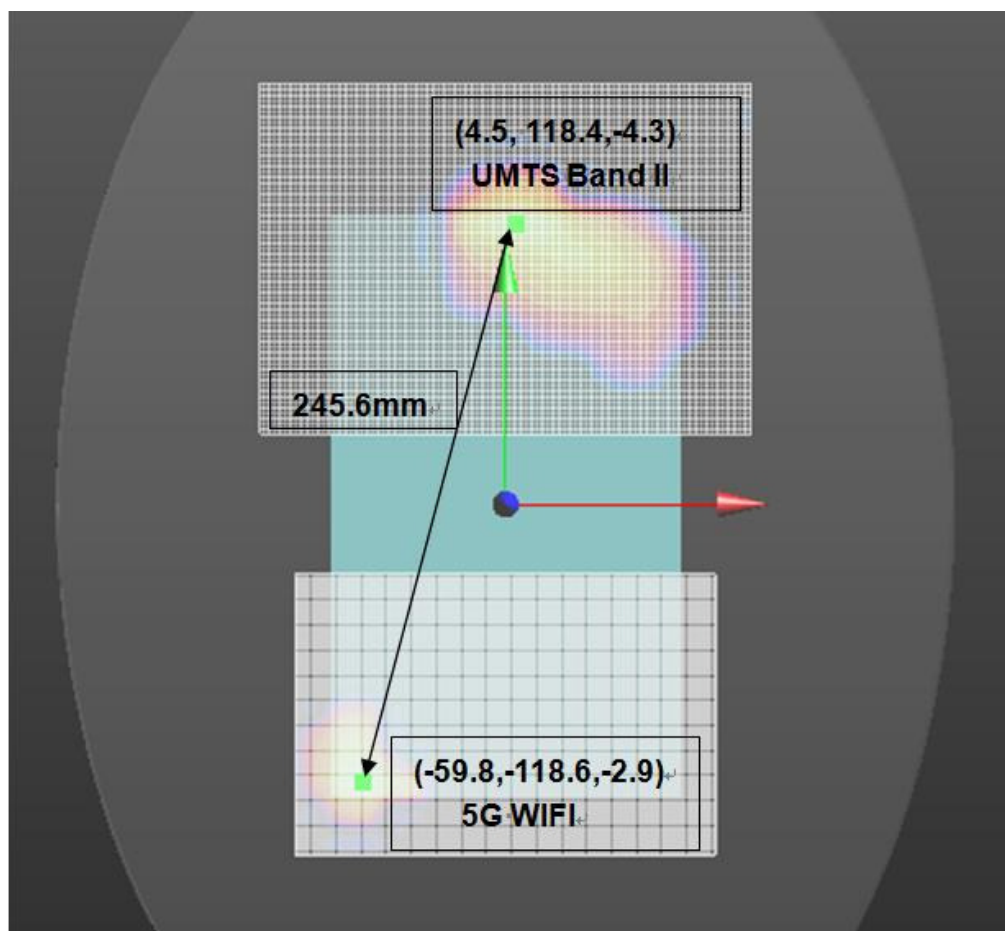


The SAR to peak location ratio calculation is as below:

| Test Position | GSM1900 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|----------------|----------------|--------|-------|-------------|------------------|
| Back Side 0mm | 1.095          | 1.195          | 242.6  | 0.014 | 0.04        | Not required     |

- 14) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band II(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

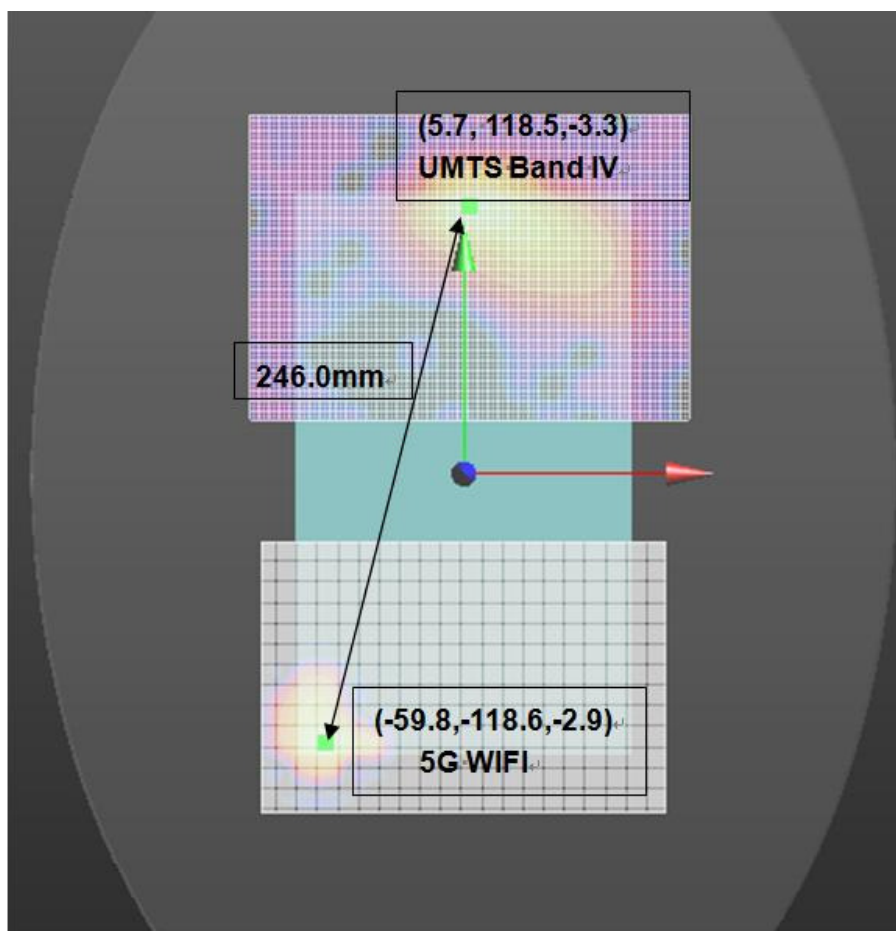


The SAR to peak location ratio calculation is as below:

| Test Position | UMTS Band II (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|---------------------|----------------|--------|-------|-------------|------------------|
| Back Side 0mm | 1.324               | 1.195          | 245.6  | 0.016 | 0.04        | Not required     |

- 15) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band IV(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

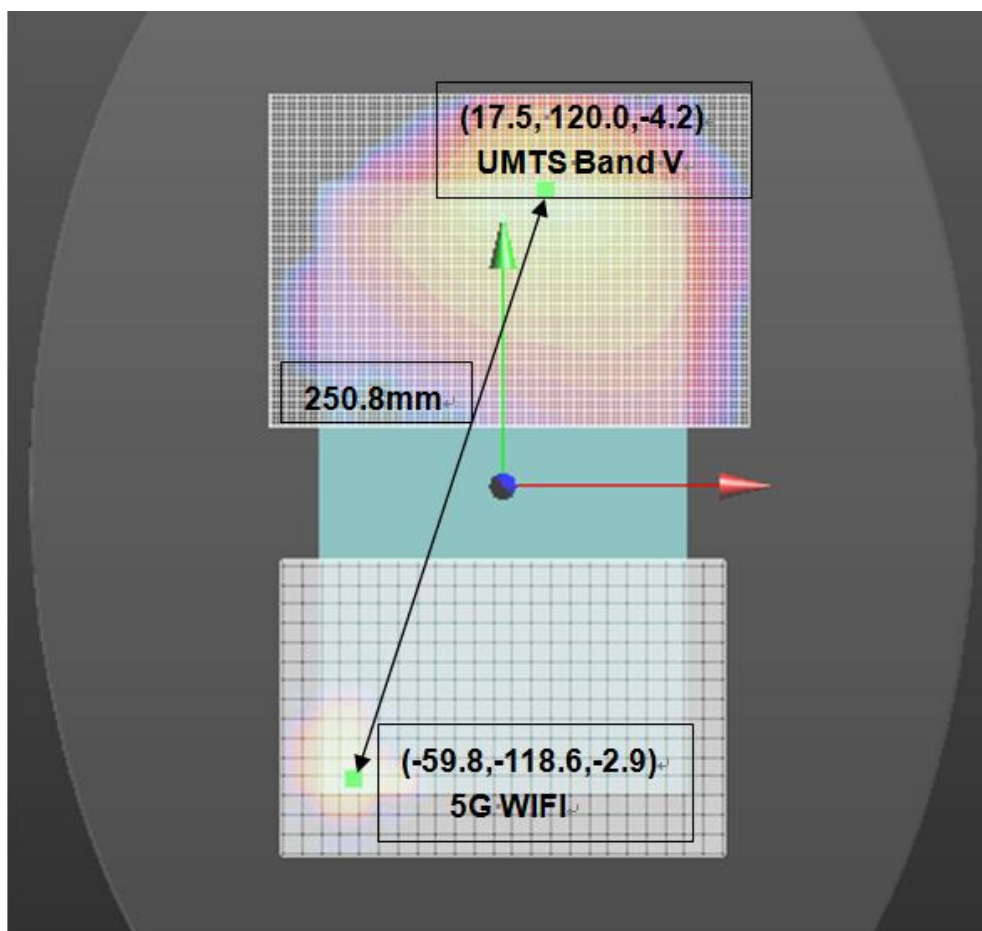


The SAR to peak location ratio calculation is as below:

| Test Position | UMTS Band IV (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|---------------------|----------------|--------|-------|-------------|------------------|
| Back Side 0mm | 1.230               | 1.195          | 246.0  | 0.015 | 0.04        | Not required     |

- 16) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band V(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

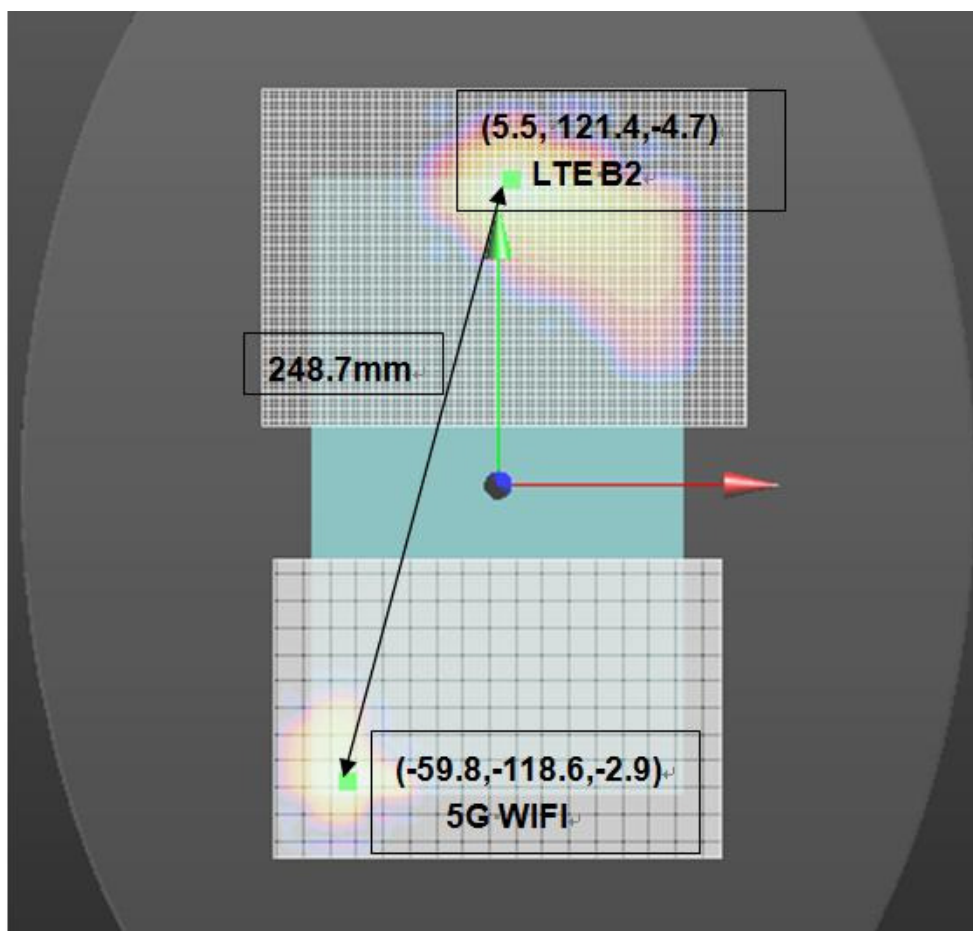


The SAR to peak location ratio calculation is as below:

| Test Position | UMTS Band V (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|--------------------|----------------|--------|-------|-------------|------------------|
| Back Side 0mm | 0.407              | 1.195          | 250.8  | 0.008 | 0.04        | Not required     |

- 17) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B2(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

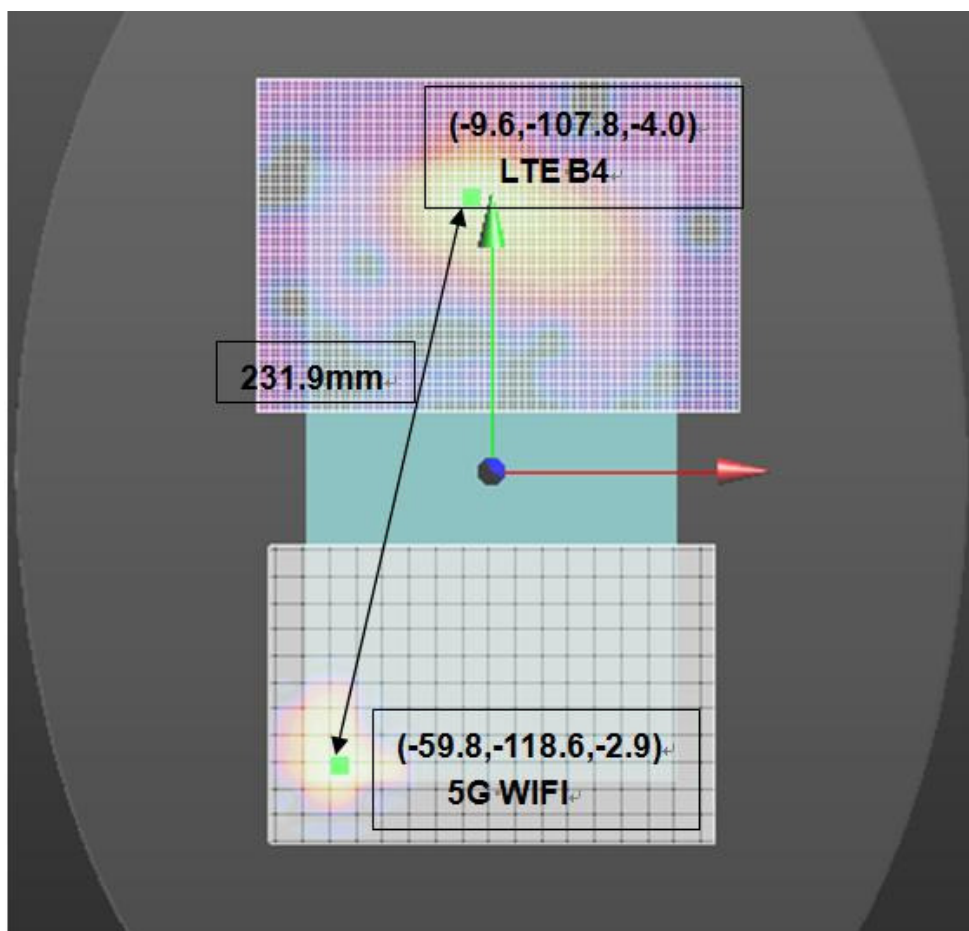


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B2 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|---------------|----------------|--------|-------|-------------|------------------|
| Back Side 0mm | 1.244         | 1.195          | 248.7  | 0.015 | 0.04        | Not required     |

- 18) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B4(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

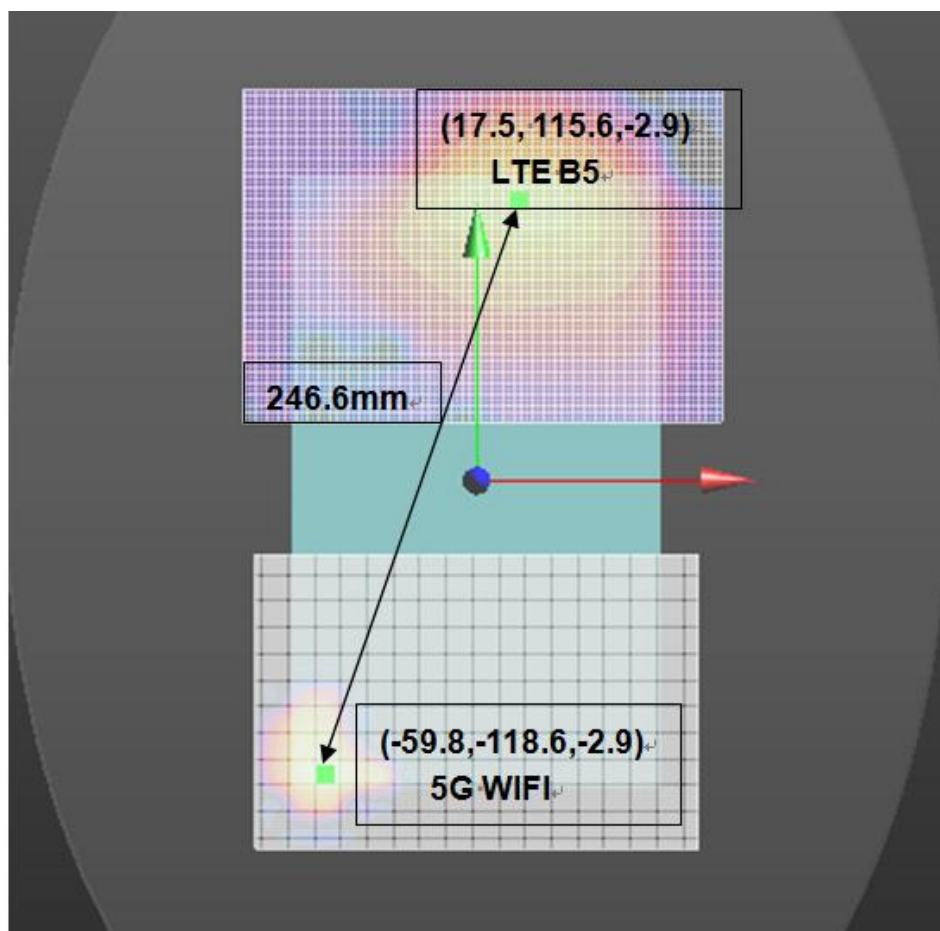


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B4<br>(W/kg) | WIFI 5G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|------------------|-------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 1.358            | 1.195             | 231.9  | 0.018 | 0.04           | Not required        |

- 19) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B5(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

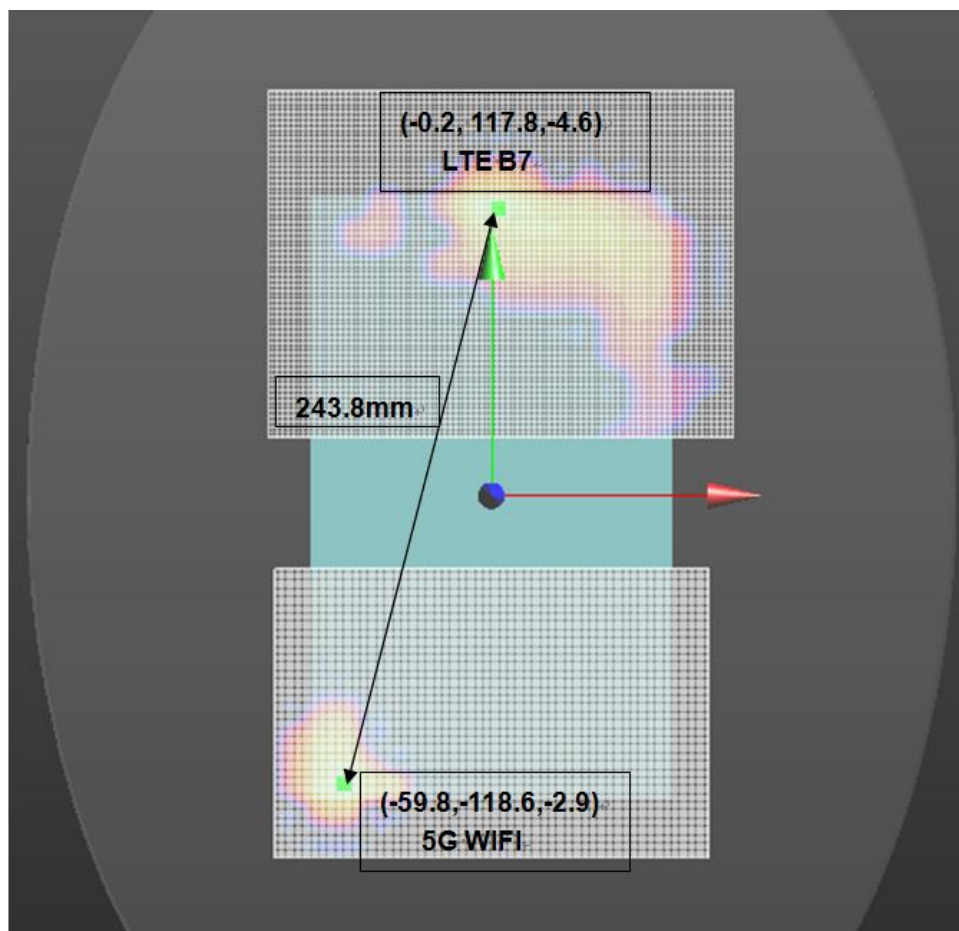


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B5 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|---------------|----------------|--------|-------|-------------|------------------|
| Back Side 0mm | 0.544         | 1.195          | 246.6  | 0.009 | 0.04        | Not required     |

20) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B7(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

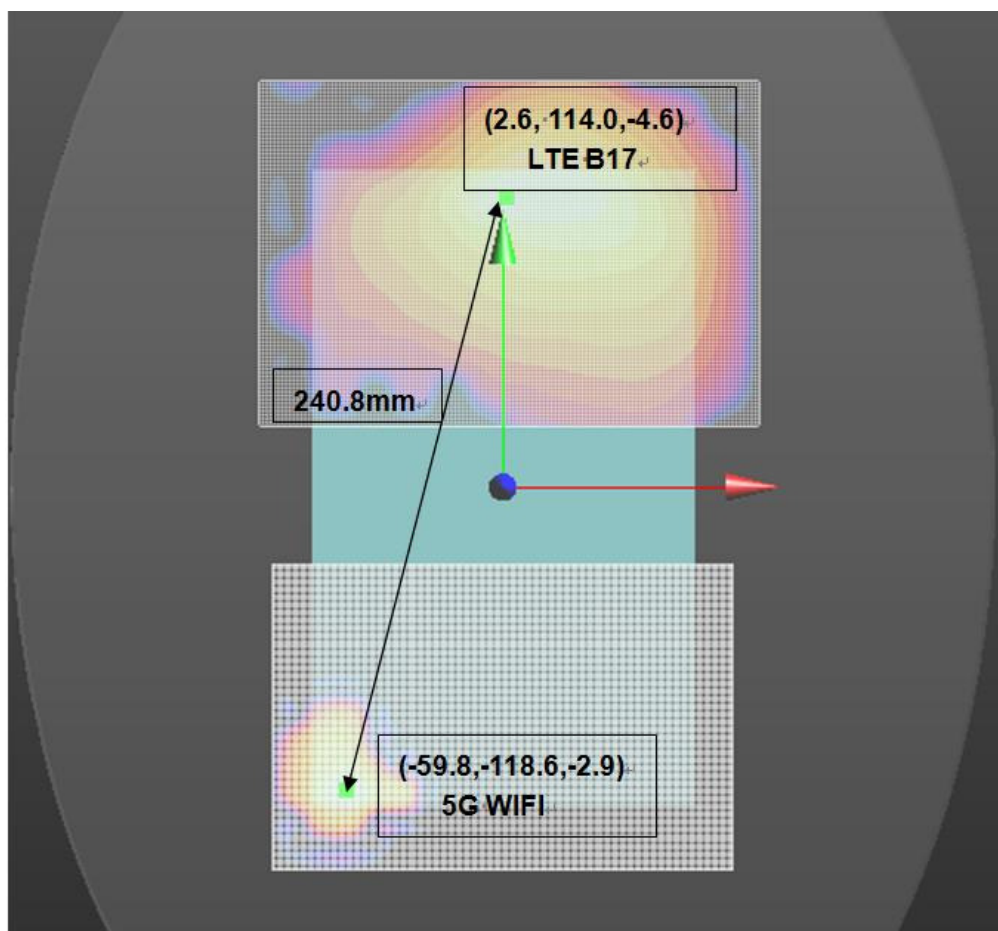


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B7<br>(W/kg) | WIFI 5G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|------------------|-------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 1.007            | 1.195             | 243.8  | 0.018 | 0.04           | Not required        |

21) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B17(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

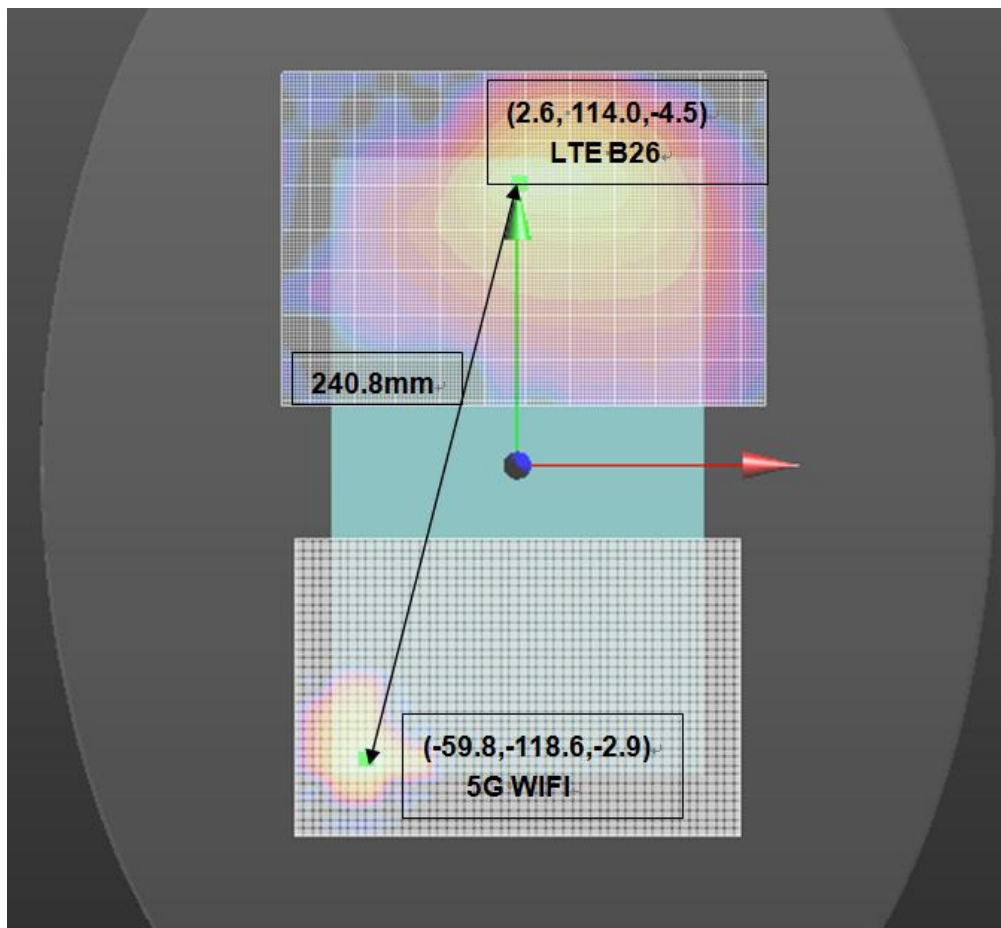


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B17<br>(W/kg) | WIFI 5G<br>(W/kg) | Ri(mm) | SPLSR | Ratio<br>Limit | Simultaneous<br>SAR |
|---------------|-------------------|-------------------|--------|-------|----------------|---------------------|
| Back Side 0mm | 1.415             | 1.195             | 240.8  | 0.018 | 0.04           | Not required        |

22) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B26(Sensor on) and WiFi 5G.

The Peak SAR location plot is as below:

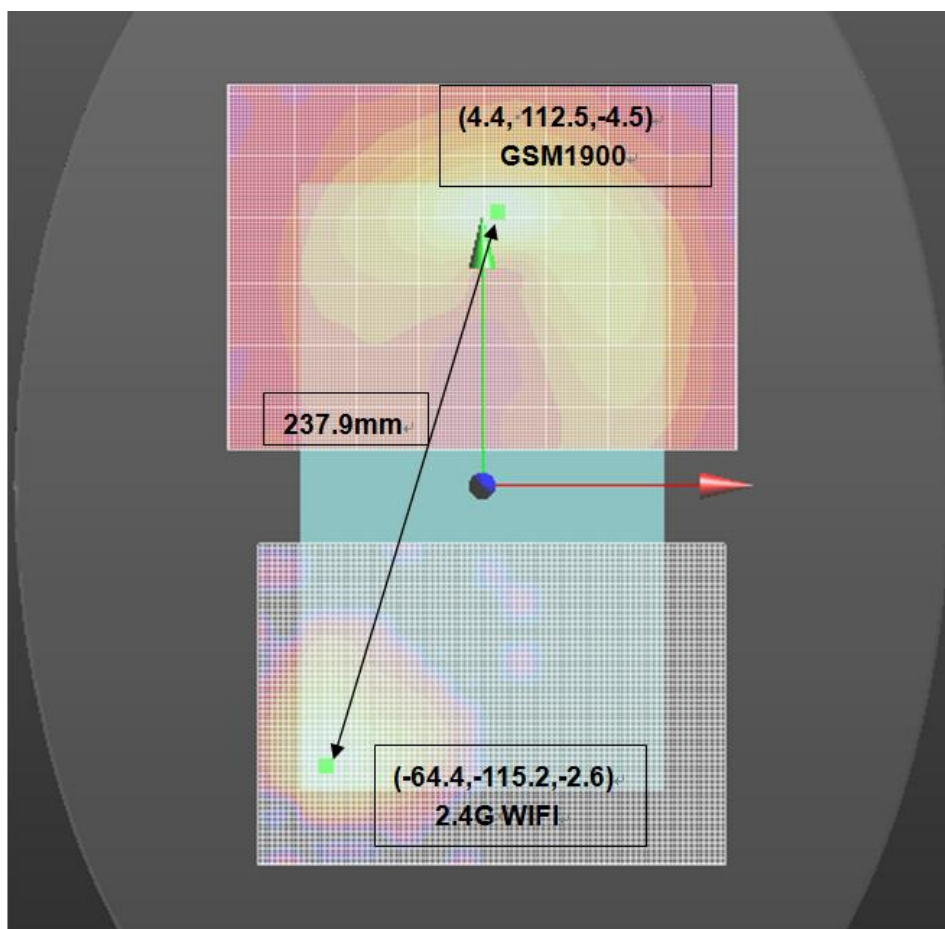


The SAR to peak location ratio calculation is as below:

| Test Position | LTE B26 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR | Ratio Limit | Simultaneous SAR |
|---------------|----------------|----------------|--------|-------|-------------|------------------|
| Back Side 0mm | 0.779          | 1.195          | 240.8  | 0.012 | 0.04        | Not required     |

23) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM1900(Sensor off) and WiFi 2.4G.

The Peak SAR location plot is as below:

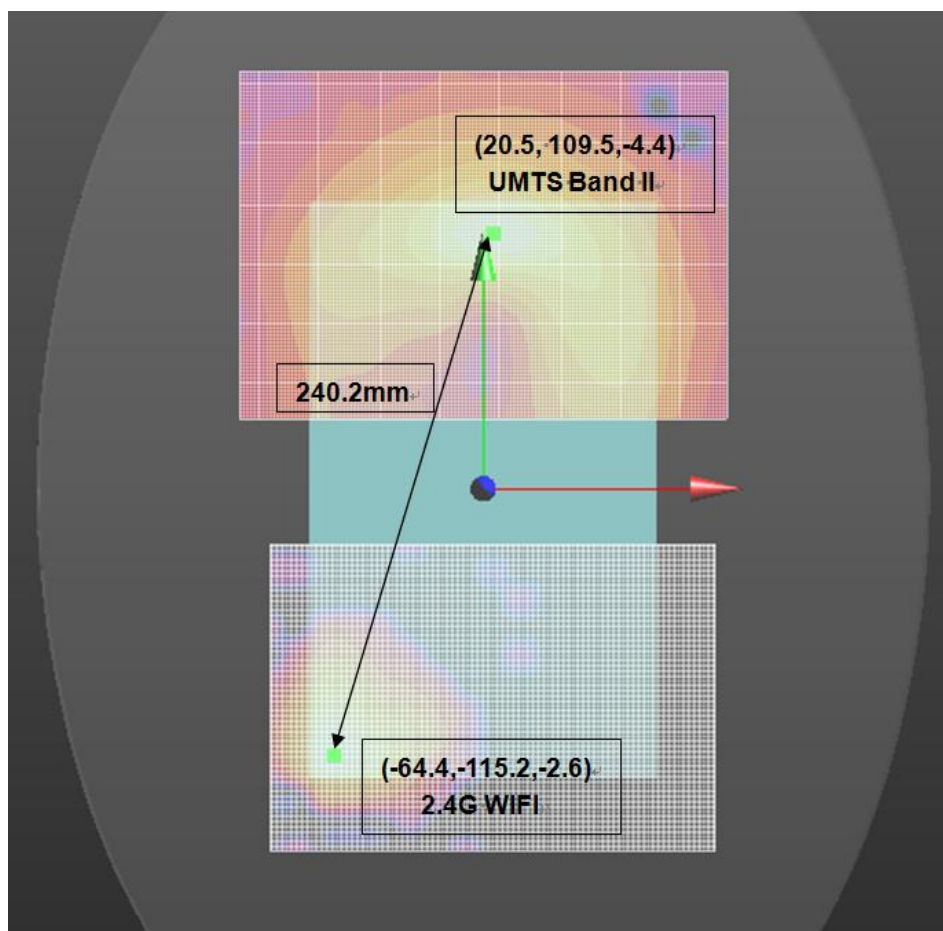


The SAR to peak location ratio calculation is as below:

| Test Position  | GSM1900 (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|----------------|------------------|--------|--------|-------------|------------------|
| Back Side 16mm | 0.905          | <1.198           | 237.9  | <0.013 | 0.04        | Not required     |

- 24) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band II(Sensor off) and WiFi 2.4G.

The Peak SAR location plot is as below:

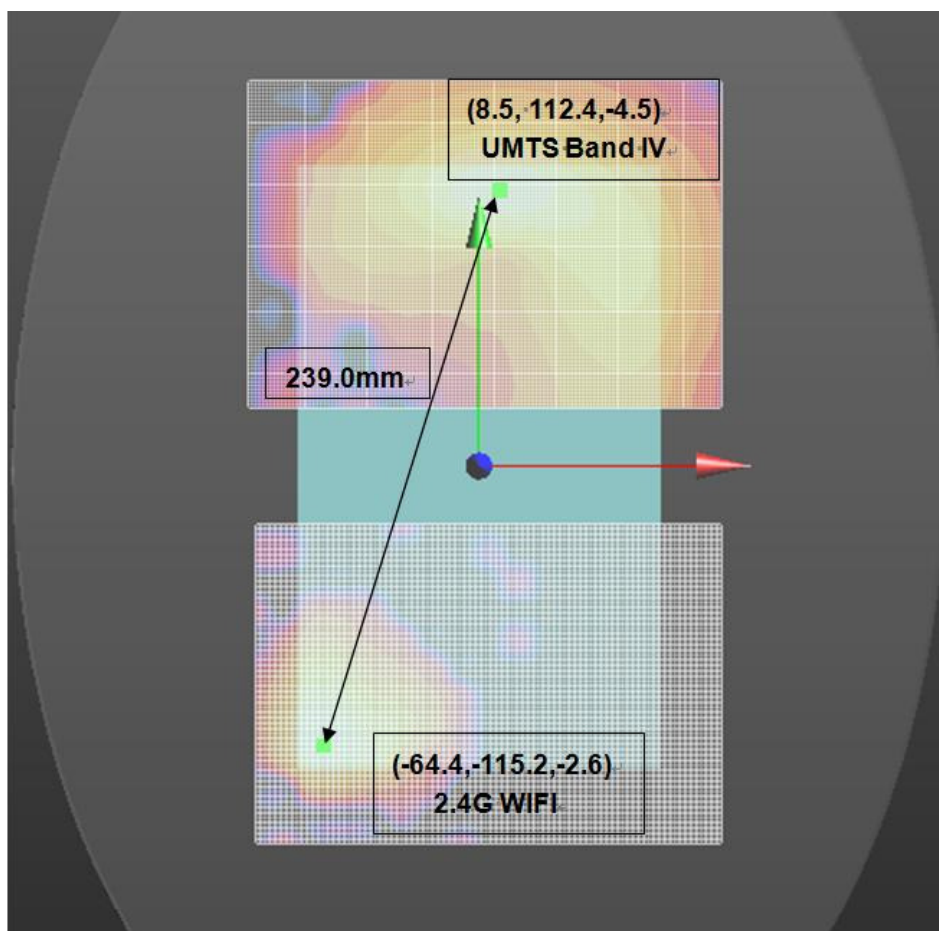


The SAR to peak location ratio calculation is as below:

| Test Position  | UMTS Band II (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------------|------------------|--------|--------|-------------|------------------|
| Back Side 16mm | 1.088               | <1.198           | 240.2  | <0.014 | 0.04        | Not required     |

25) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band IV(Sensor off) and WiFi 2.4G.

The Peak SAR location plot is as below:

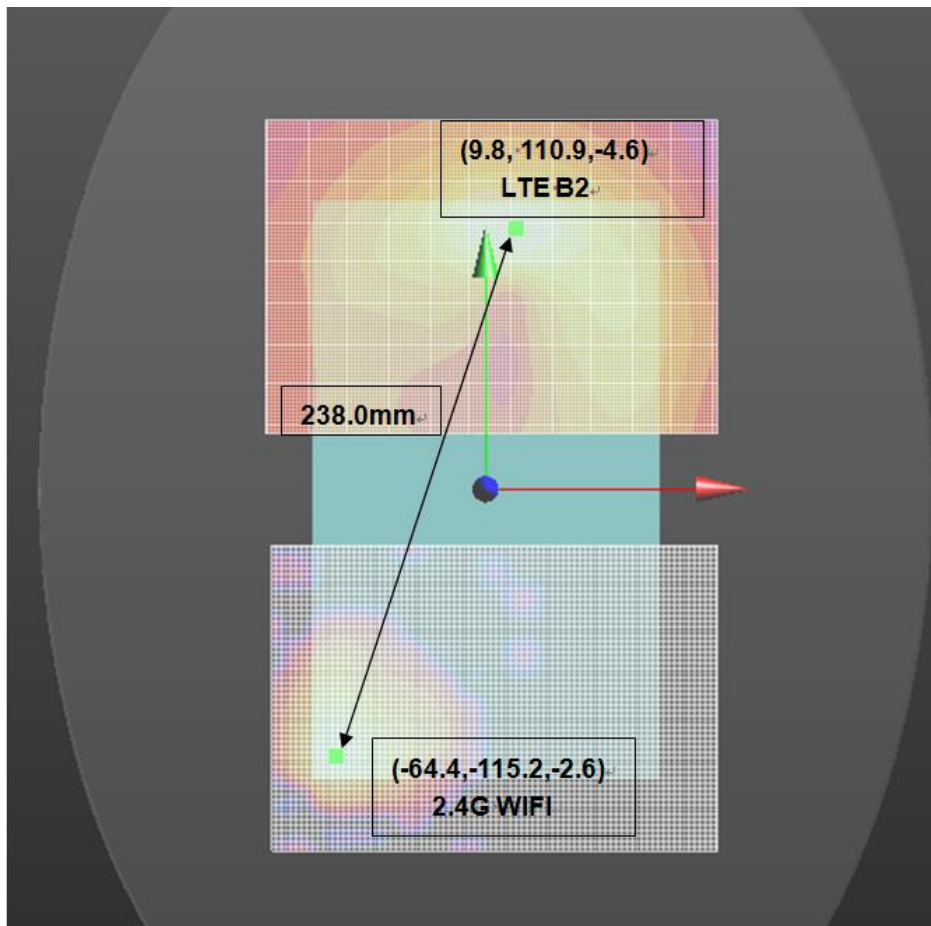


The SAR to peak location ratio calculation is as below:

| Test Position  | UMTS Band IV (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------------|------------------|--------|--------|-------------|------------------|
| Back Side 16mm | 0.947               | <1.198           | 239.0  | <0.013 | 0.04        | Not required     |

26) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B2(Sensor off) and WiFi 2.4G.

The Peak SAR location plot is as below:

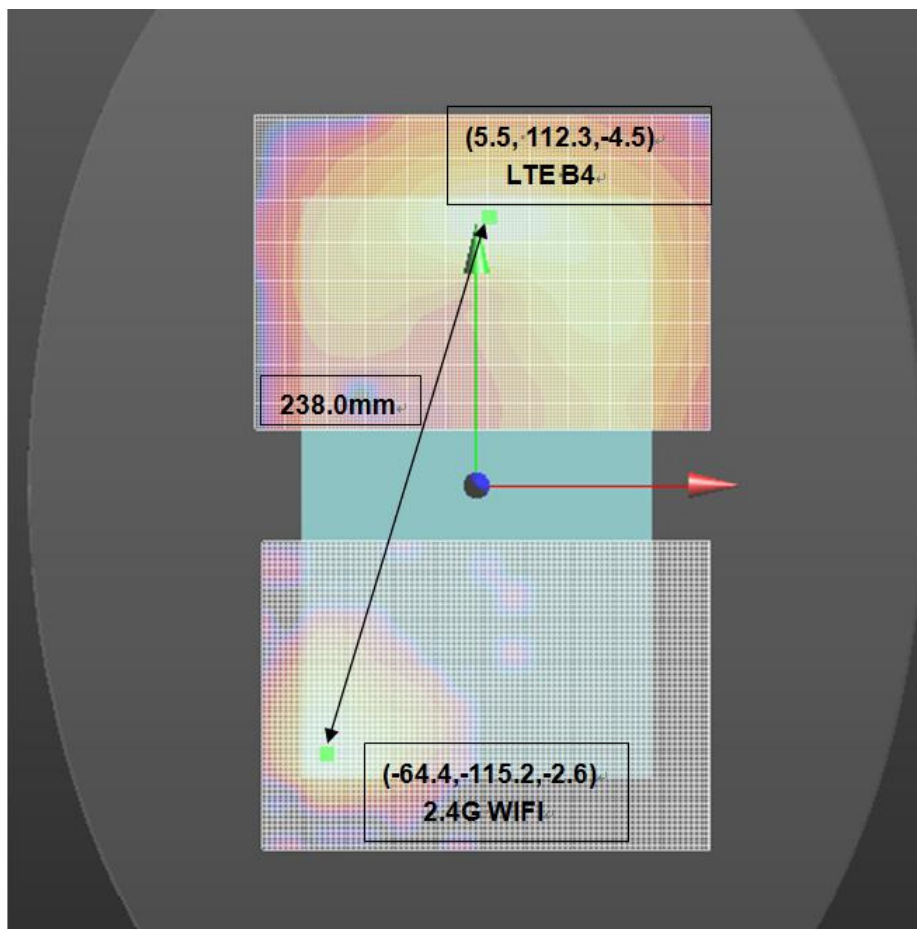


The SAR to peak location ratio calculation is as below:

| Test Position  | LTE B2 (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------|------------------|--------|--------|-------------|------------------|
| Back Side 16mm | 1.268         | <1.198           | 238.0  | <0.016 | 0.04        | Not required     |

27) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B4(Sensor off) and WiFi 2.4G.

The Peak SAR location plot is as below:

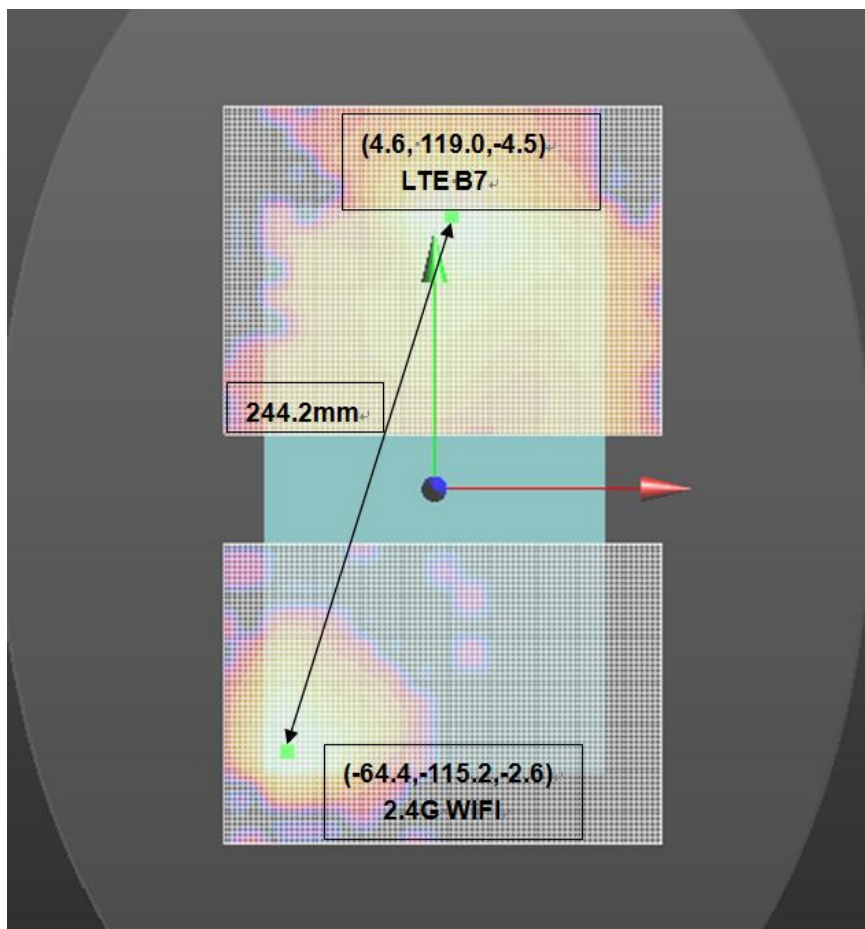


The SAR to peak location ratio calculation is as below:

| Test Position  | LTE B4<br>(W/kg) | WIFI 2.4G<br>(W/kg) | Ri(mm) | SPLSR  | Ratio<br>Limit | Simultaneous<br>SAR |
|----------------|------------------|---------------------|--------|--------|----------------|---------------------|
| Back Side 16mm | 0.961            | <1.198              | 238.0  | <0.013 | 0.04           | Not required        |

28) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B7(Sensor off) and WiFi 2.4G.

The Peak SAR location plot is as below:

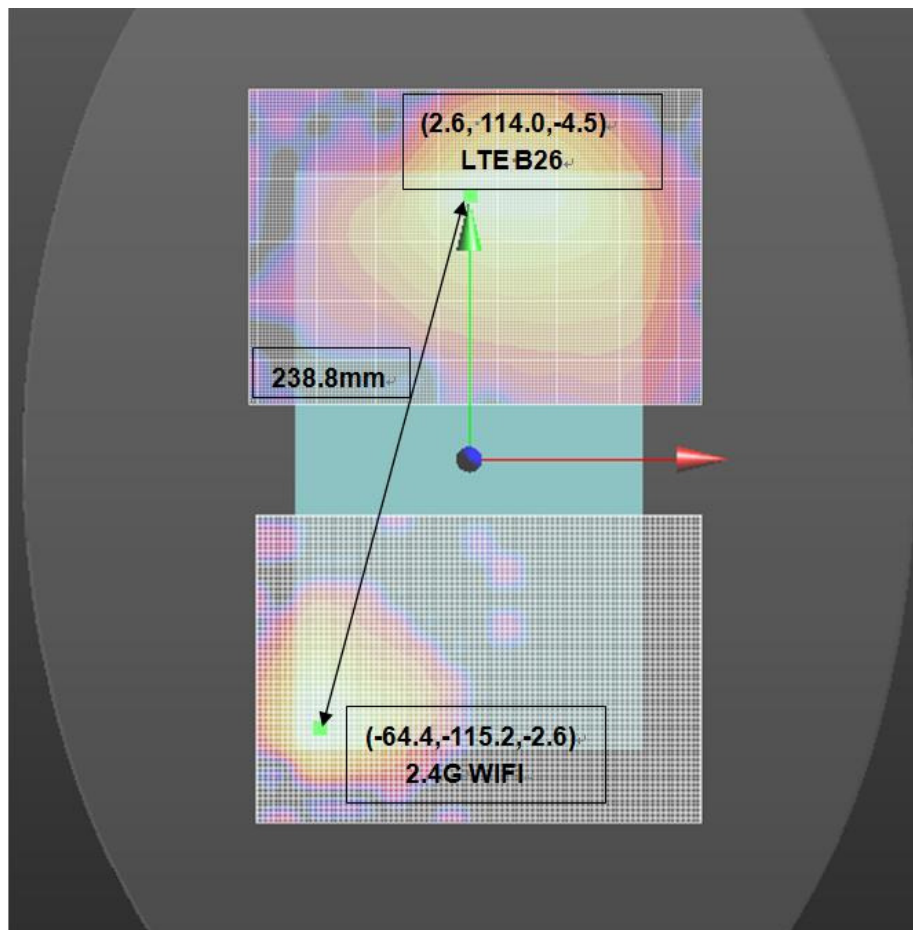


The SAR to peak location ratio calculation is as below:

| Test Position  | LTE B7 (W/kg) | WIFI 2.4G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------|------------------|--------|--------|-------------|------------------|
| Back Side 16mm | 0.755         | <1.198           | 244.2  | <0.011 | 0.04        | Not required     |

29) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B26(Sensor off) and WiFi 2.4G.

The Peak SAR location plot is as below:

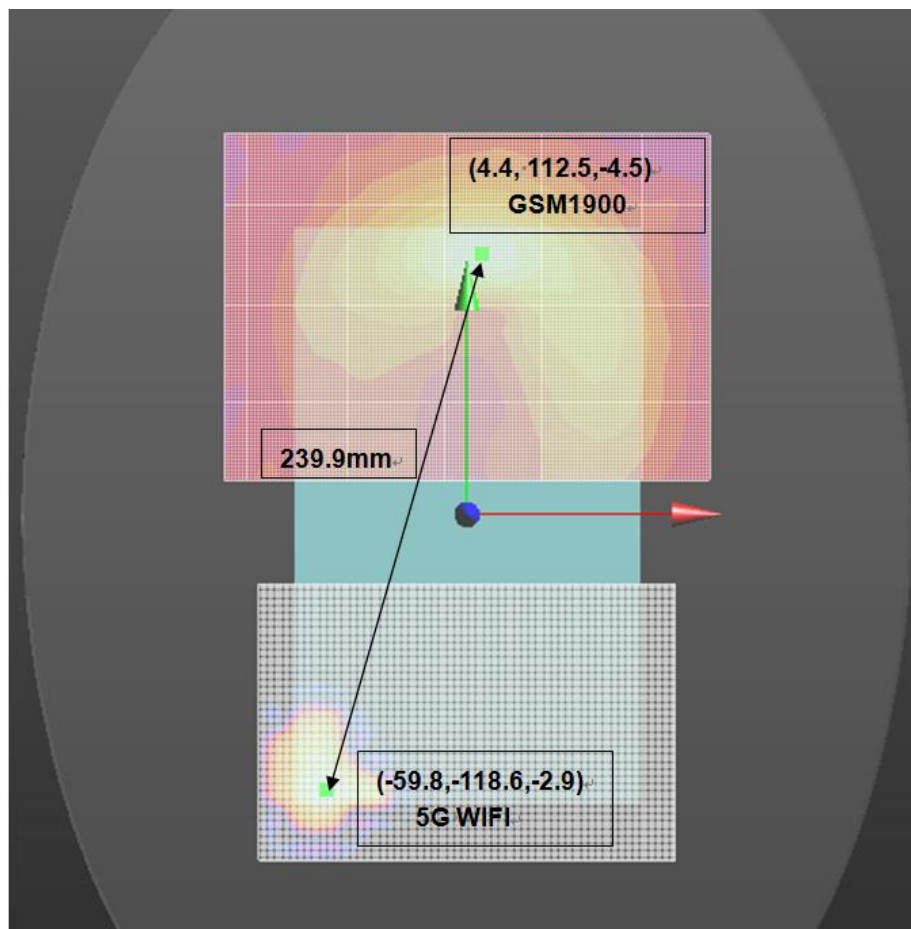


The SAR to peak location ratio calculation is as below:

| Test Position  | LTE B26<br>(W/kg) | WIFI 2.4G<br>(W/kg) | Ri(mm) | SPLSR  | Ratio<br>Limit | Simultaneous<br>SAR |
|----------------|-------------------|---------------------|--------|--------|----------------|---------------------|
| Back Side 16mm | <0.779            | <1.198              | 238.8  | <0.012 | 0.04           | Not required        |

30) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with GSM1900(Sensor off) and WiFi 5G.

The Peak SAR location plot is as below:

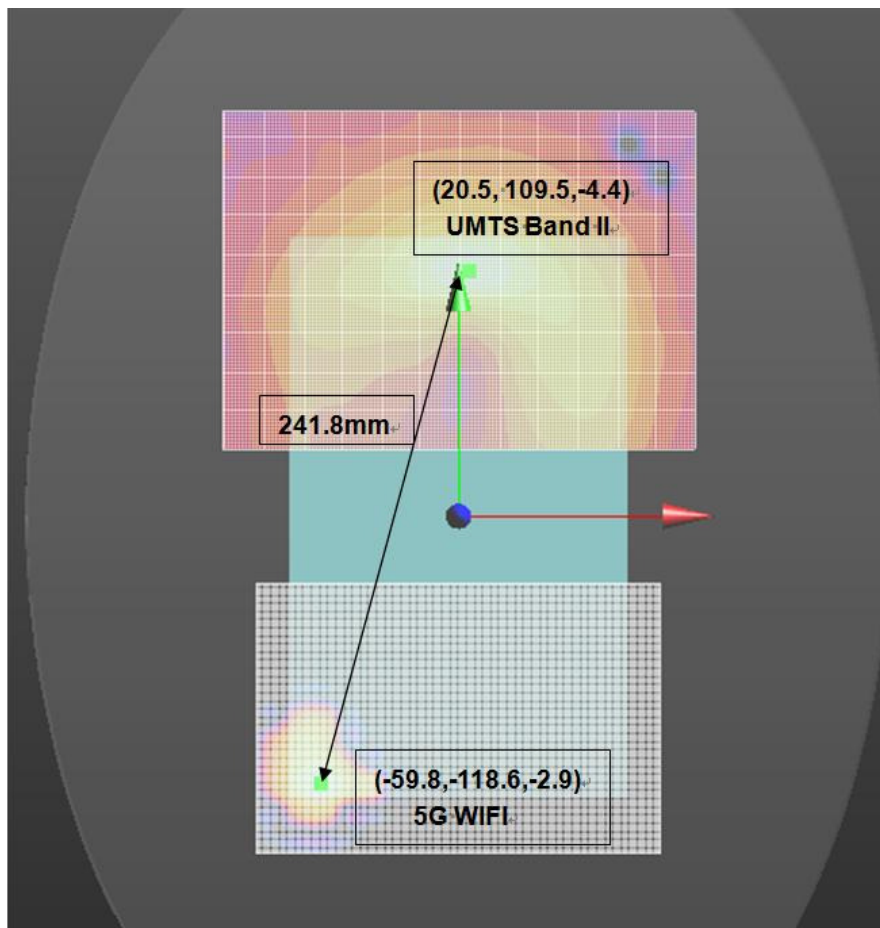


The SAR to peak location ratio calculation is as below:

| Test Position  | GSM1900 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|----------------|----------------|--------|--------|-------------|------------------|
| Back Side 16mm | 0.905          | <1.195         | 239.9  | <0.013 | 0.04        | Not required     |

31) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band II(Sensor off) and WiFi 5G.

The Peak SAR location plot is as below:

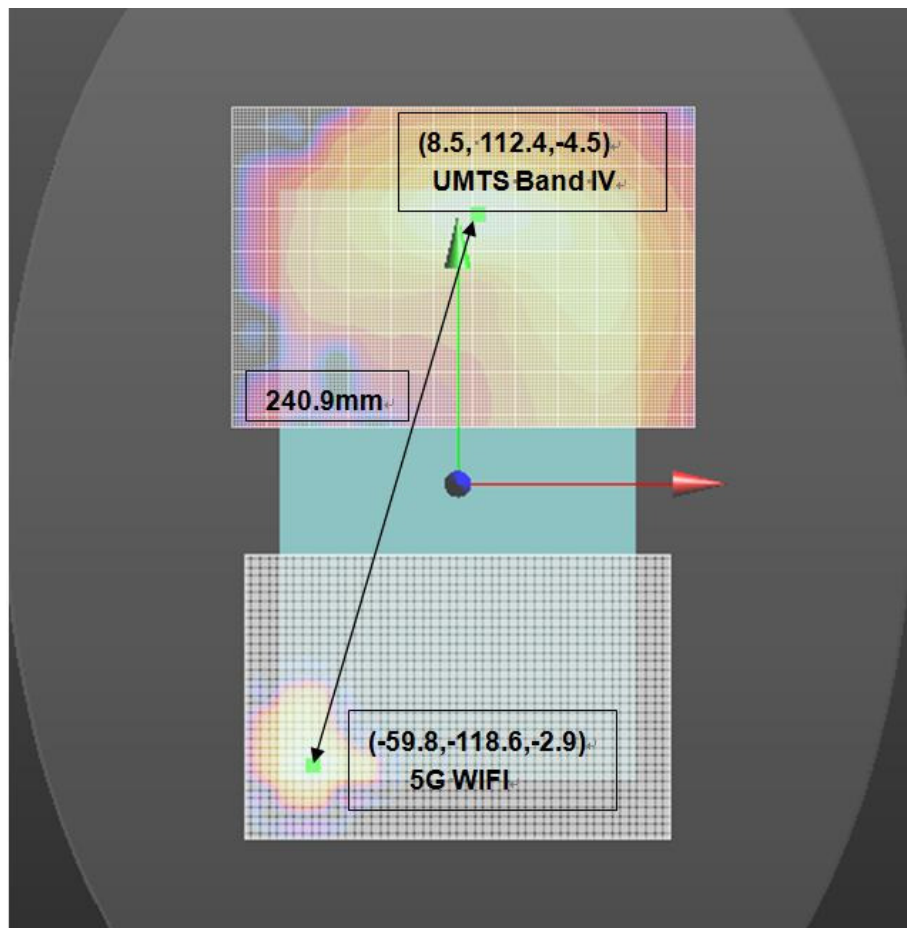


The SAR to peak location ratio calculation is as below:

| Test Position  | UMTS Band II (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------------|----------------|--------|--------|-------------|------------------|
| Back Side 16mm | 1.088               | <1.195         | 241.8  | <0.014 | 0.04        | Not required     |

32) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with UMTS Band IV(Sensor off) and WiFi 5G.

The Peak SAR location plot is as below:

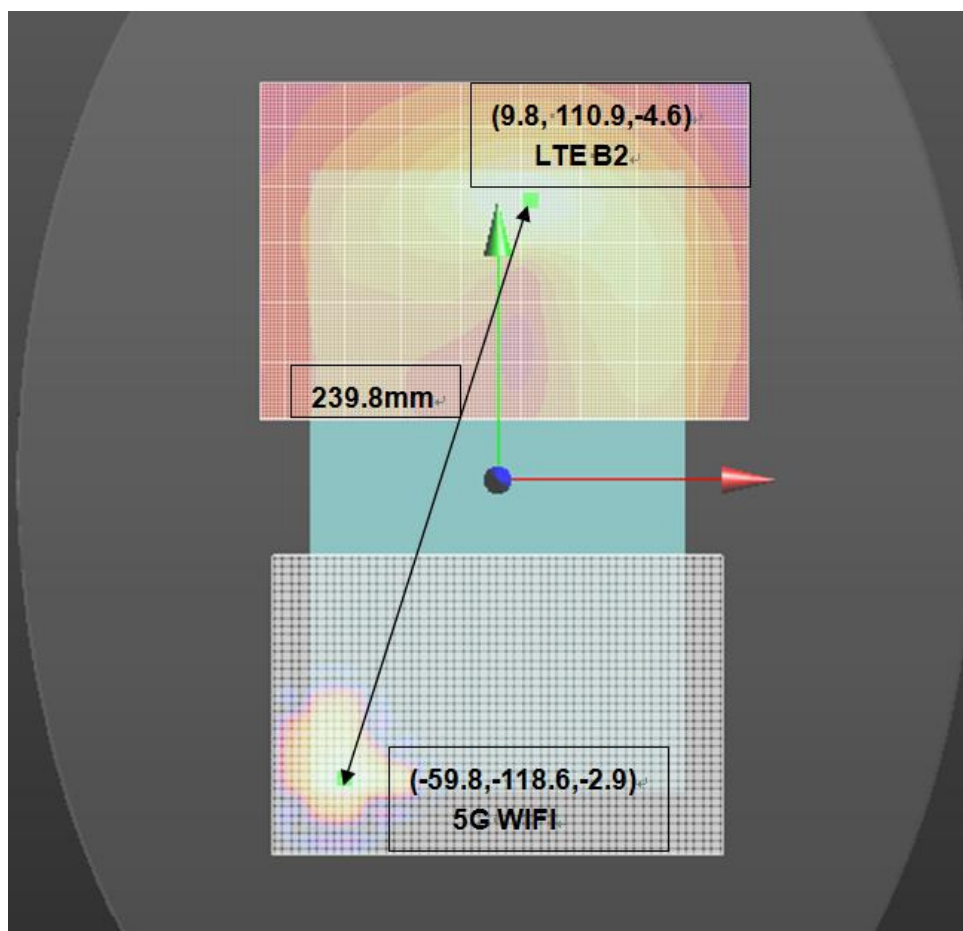


The SAR to peak location ratio calculation is as below:

| Test Position  | UMTS Band IV (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------------|----------------|--------|--------|-------------|------------------|
| Back Side 16mm | 0.947               | <1.195         | 240.9  | <0.013 | 0.04        | Not required     |

33) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B2(Sensor off) and WiFi 5G.

The Peak SAR location plot is as below:

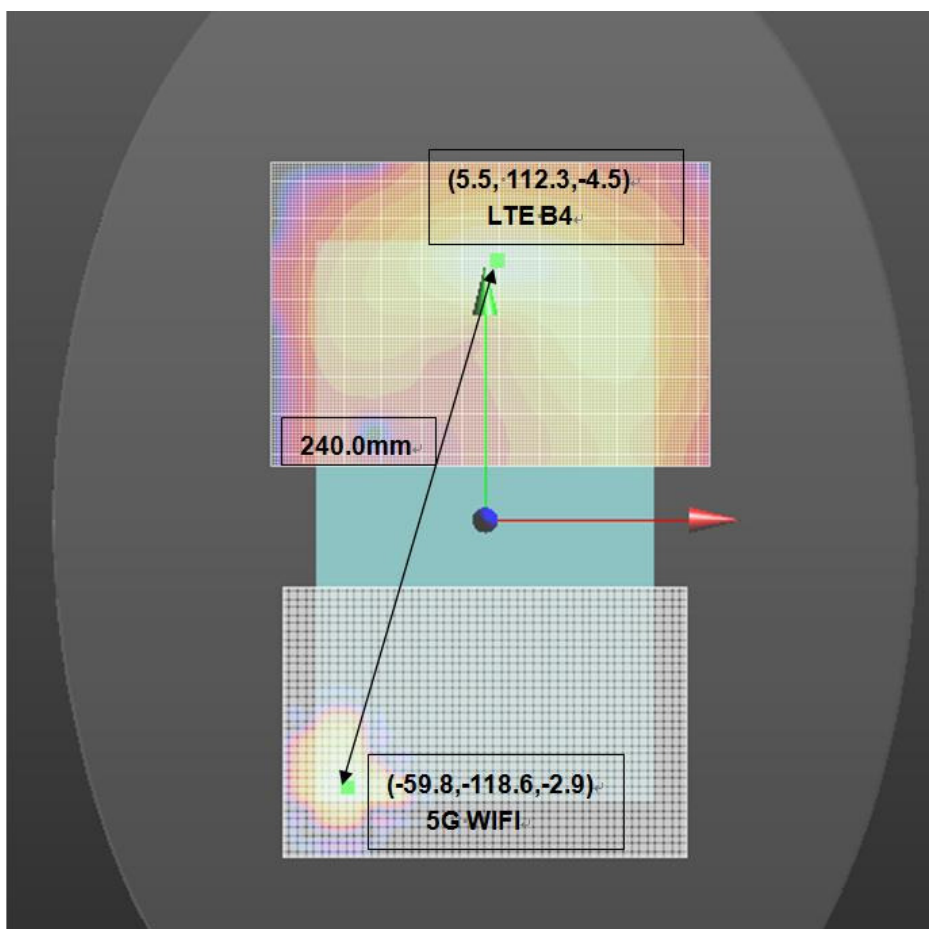


The SAR to peak location ratio calculation is as below:

| Test Position  | LTE B2 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------|----------------|--------|--------|-------------|------------------|
| Back Side 16mm | 1.268         | <1.195         | 239.8  | <0.016 | 0.04        | Not required     |

- 34) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B4(Sensor off) and WiFi 5G.

The Peak SAR location plot is as below:

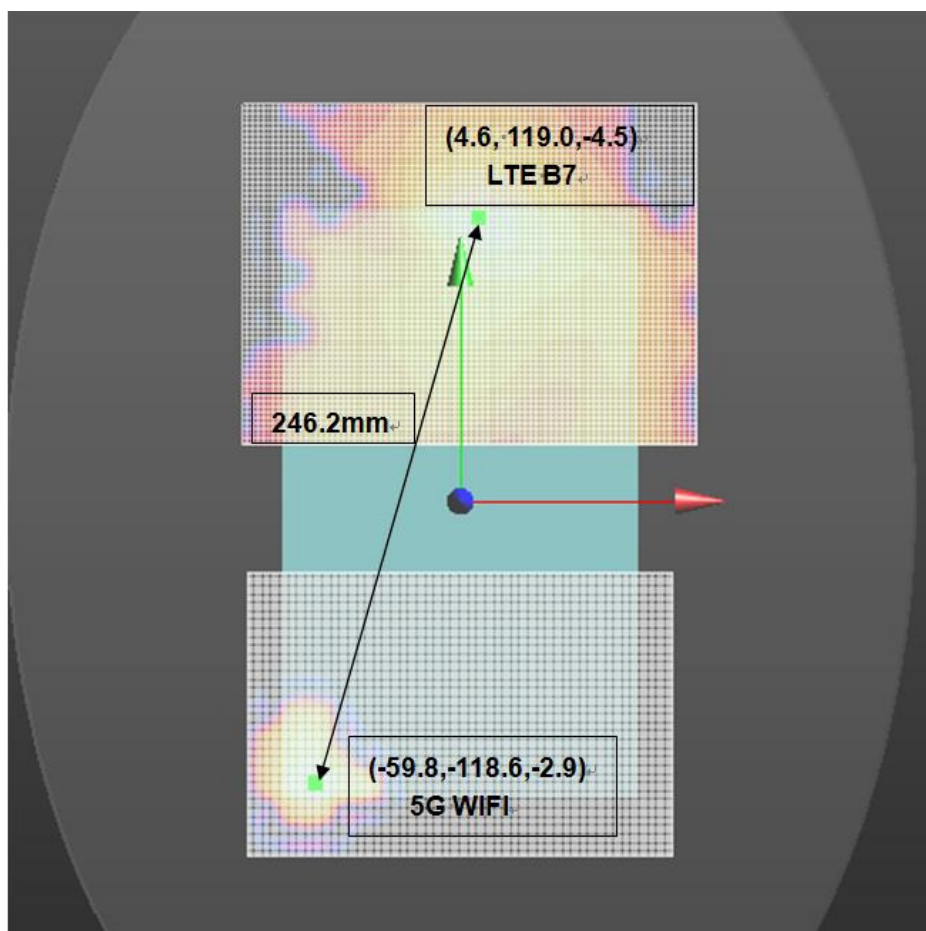


The SAR to peak location ratio calculation is as below:

| Test Position  | LTE B4 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------|----------------|--------|--------|-------------|------------------|
| Back Side 16mm | 0.961         | <1.195         | 240.0  | <0.013 | 0.04        | Not required     |

35) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B7(Sensor off) and WiFi 5G.

The Peak SAR location plot is as below:

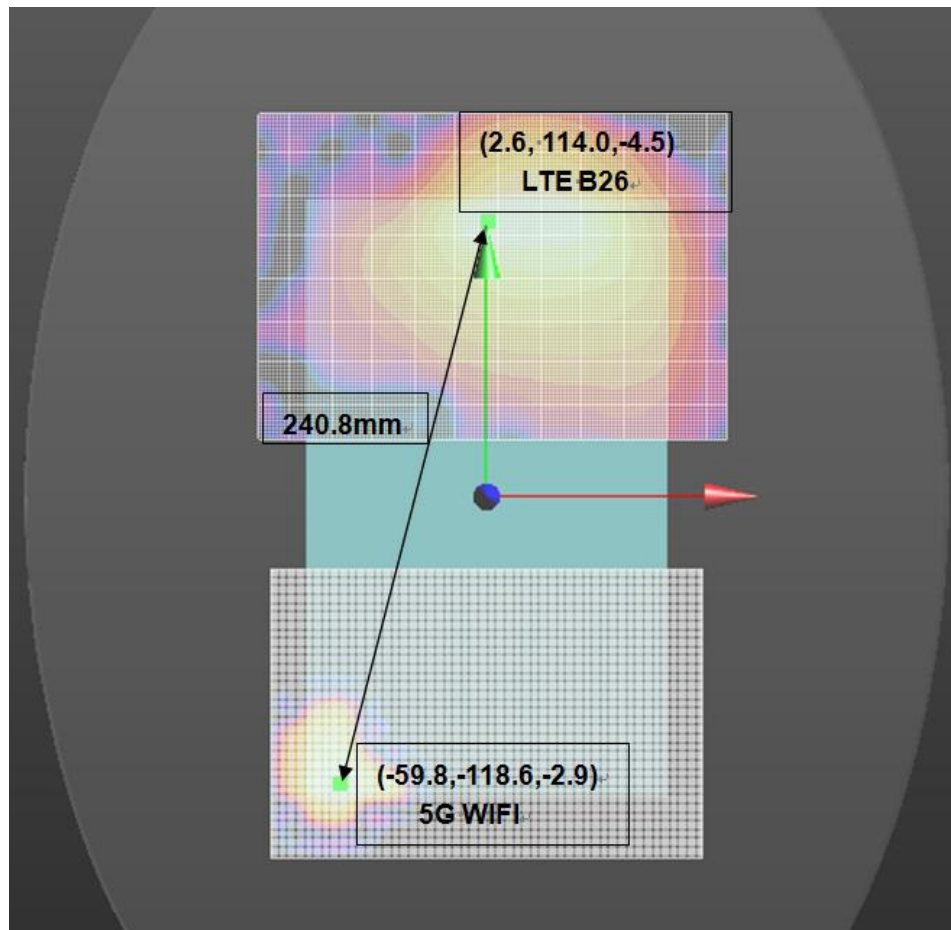


The SAR to peak location ratio calculation is as below:

| Test Position  | LTE B7 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|---------------|----------------|--------|--------|-------------|------------------|
| Back Side 16mm | 0.755         | <1.195         | 246.2  | <0.011 | 0.04        | Not required     |

- 36) The sum of aggregate 1-g SAR was above 1.6W/kg for Back Side configuration with LTE B26(Sensor off) and WiFi 5G.

The Peak SAR location plot is as below:



The SAR to peak location ratio calculation is as below:

| Test Position  | LTE B26 (W/kg) | WIFI 5G (W/kg) | Ri(mm) | SPLSR  | Ratio Limit | Simultaneous SAR |
|----------------|----------------|----------------|--------|--------|-------------|------------------|
| Back Side 16mm | <0.779         | <1.195         | 240.8  | <0.012 | 0.04        | Not required     |

### 7.3.6 Simultaneous Transmission Conclusion

The above numeral summed SAR results and/or SPLSR analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore simultaneous transmission SAR with Volume Scans is not required per KDB 447498 D01v06.

**Appendix A. System Check Plots**  
(Pls See Appendix A.)

**Appendix B. SAR Measurement Plots**  
(Pls See Appendix B.)

**Appendix C. Calibration Certificate**  
(Pls See Appendix C.)

**Appendix D. Photo documentation**  
(Pls See Appendix D.)

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**End**