# FCC SAR Test Report

## FCC ID: QISAGS2-L03

| | | |
|---|---|---|
| **Project No.** | : | 1808C216 |
| **Equipment** | : | HUAWEI MediaPad T5 |
| **Model Name** | : | AGS2-L03 |
| **Applicant** | : | Huawei Technologies Co., Ltd. |
| **Address** | : | Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C |

| | | |
|---|---|---|
| **Date of Receipt** | : | Aug. 24, 2018 |
| **Date of Test** | : | Aug. 27, 2018 ~ Sep. 10, 2018 |
| **Issued Date** | : | Sep. 21, 2018 |
| **Tested by** | : | BTL Inc. |

**PREPARED BY** : Rot. Liang (Rot Liang)

**APPROVED BY** : Herbort Liu (Herbort Liu)


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NVLAP® TESTING NVLAP LAB CODE 200788-0

## Declaration

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

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**BTL**'s laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

**BTL** is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements in all the possible configurations as representative of its intended use.

## Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

## Table of Contents Page

## Table of Contents Page

## REPORT ISSUED HISTORY

| Issued No. | Description | Issued Date |
|---|---|---|
| BTL-FCC SAR-1-1808C216 | Original Issue | Sep. 21, 2018 |

## 1. GENERAL SUMMARY

| | |
|---|---|
| Equipment | HUAWEI MediaPad T5 |
| Brand Name | HUAWEI |
| Model Name | AGS2-L03 |
| Model difference(s) | N/A |
| Manufacturer | Huawei Technologies Co., Ltd. |
| Address | Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C |
| Factory | Huawei Technologies Co., Ltd. |
| Address | Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C |
| Standard(s) | **ANSI Std C95.1-1992** Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz - 300 GHz.(IEEE Std C95.1-1991)<br><br>**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<br><br>**KDB941225 D01** 3G SAR Procedures v03r01<br>**KDB941225 D05** SAR for LTE Devices v02r05<br>**KDB941225 D05A** LTE Rel.10 KDB Inquiry Sheet v01r02<br>**KDB447498 D01** General RF Exposure Guidance v06<br>**KDB648474 D04** Handset SAR v01r03<br>**KDB248227 D01** 802. 11 Wi-Fi SAR v02r02<br>**KDB865664 D01** SAR measurement 100 MHz to 6 GHz v01r04<br>**KDB865664 D02** SAR Reporting v01r02<br>**KDB690783 D01** SAR Listings on Grants v01r03<br>**KDB616217 D04** SAR for laptop and tablets v01r02 |

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCC SAR-1-1808C216) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP according to the ISO-17025 quality assessment standard and technical standard(s).

# 2. RF EMISSIONS MEASUREMENT

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **SAR room** at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
BTL's test firm number for FCC: 854385
BTL's test designation number for FCC:CN5020

## 2.2 MEASUREMENT UNCERTAINTY

Note: Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, 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.

# 3. GENERAL INFORMATION

## 3.1 STATEMENT OF COMPLIANCE

| Equipment Class | Mode | Highest Body Reported SAR-1g (W/kg) Sensor on | Highest Body Reported SAR-1g (W/kg) Sensor off |
|---|---|---|---|
| PCE | GSM850 | 0.51 | 0.26 |
| | GSM1900 | 0.35 | 0.40 |
| | UMTS Band 2 | 0.20 | 0.46 |
| | UMTS Band 4 | 0.38 | 0.52 |
| | UMTS Band 5 | 0.19 | 0.25 |
| | LTE Band 2 | 0.29 | 0.43 |
| | LTE Band 4 | 0.21 | 0.43 |
| | LTE Band 5 | 0.15 | 0.24 |
| | LTE Band 7 | 0.35 | 0.31 |
| | LTE Band 12 | 0.12 | 0.09 |
| DTS | 2.4G WLAN | 0.63 | 0.12 |
| NII | 5.3G WLAN | 0.74 | 0.59 |
| | 5.6G WLAN | 0.44 | 0.37 |
| | 5.8G WLAN | 0.18 | 0.25 |
| **Note: The highest reported SAR for body and simultaneous transmission exposure conditions are 0.74W/kg and 0.97W/Kg respectively.** | | | |

Note:

1) 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 C95.1:1992/IEEE C95.1:1991, the NCRP Report Number 86 for uncontrolled environment and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 .
2) According to TCB workshop October, 2014 RF Exposure Procedures Update(Overlapping LTE Bands):SAR for LTE Band 17 (Frequency range:704-716 MHz) is covered by LTE Band 12 (Frequency range:699-716 MHz) due to similar frequency range, same maximum tune up limit and same channel bandwidth.

### 3.2 GENERAL DESCRIPTION OF EUT

| | | | |
|---|---|---|---|
| Equipment | HUAWEI MediaPad T5 | | |
| Brand Name | HUAWEI | | |
| Model Name | AGS2-L03 | | |
| IMEI Code | 004401721233423 | | |
| S/N | FQCBB18808150020 | | |
| HW Version | A6t6e | | |
| SW Version | AGS2-L03 8.0.0.20(C605) | | |
| Modulation | GSM(GMSK/8PSK),UMTS(QPSK),LTE(QPSK/16QAM),WiFi(DSSS/OFDM),BT(GFSK/ π /4-DQPSK/8-DPSK) | | |
| Operation Frequency Range(s) | Band | TX (MHz) | RX (MHz) |
| | GSM850 | 824-849 | 869-894 |
| | GSM1900 | 1850-1910 | 1930-1990 |
| | UMTS Band 2 | 1850-1910 | 1930-1990 |
| | UMTS Band 4 | 1710-1755 | 2110-2155 |
| | UMTS Band 5 | 824-849 | 869-894 |
| | LTE Band 2 | 1850-1910 | 1930-1990 |
| | LTE Band 4 | 1710-1755 | 2110-2155 |
| | LTE Band 5 | 824-849 | 869-894 |
| | LTE Band 7 | 2500-2570 | 2620-2690 |
| | LTE Band 12 | 699-716 | 729-746 |
| | LTE Band 17 | 704-716 | 734-746 |
| | Bluetooth | 2402-2480 | |
| | WIFI | 2412-2462 | |
| | | 5150-5250 | |
| | | 5250-5350 | |
| | | 5470-5725 | |
| | | 5725-5850 | |
| GPRS/EDGE Multislot Class(12) | Max Number of Timeslots in Uplink: | 4 | |
| | Max Number of Timeslots in Downlink: | 4 | |
| | Max Total Timeslot: | 5 | |
| GSM Device class | Class B | | |
| HSDPA UE Category | 14 | | |
| HSUPA UE Category | 6 | | |
| DC-HSDPA 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 2/4/5) | | |
| | 3, tested with power control “all Max” (LTE Band 2/4/5/7/12/17) | | |
| Test Channels (low-mid-high): | 128-190-251 (GSM850) | | |
| | 512-661-810 (GSM1900) | | |
| | 9262-9400-9538(UMTS Band 2) | | |
| | 1312-1413-1513 (UMTS Band 4) | | |
| | 4132-4182-4233 (UMTS Band 5) | | |
| | 18700-18900-19100(LTE Band 2 BW=20MHz) | | |
| | 20050-20175-20300(LTE Band 4 BW=20MHz) | | |
| | 20450-20525-20600(LTE Band 5 BW=10MHz) | | |
| | 20850-21100-21350(LTE Band 7 BW=20MHz) | | |
| | 23060-23095-23130(LTE Band 12 BW=10MHz) | | |
| | 23780-23790-23800(LTE Band 17 BW=10MHz) | | |
| | 0-39-78 (BT) | | |
| | 0-19-39 (BLE) | | |
| | 1-6-11 (2.4G WIFI 802.11b/g/n HT20) | | |
| | 3-6-9 (2.4G WIFI 802.11n HT40) | | |

| | | | | | |
|---|---|---|---|---|---|
| | 5G WIFI | 5.2G | 5.3G | 5.5G | 5.8G |
| | a/n HT20/ ac HT20 | 36-40-44-48 | 52-56-60-64 | 100-104-108-112-116-132-136-140 | 149-153-157-161-165 |
| | n HT40/ ac HT40 | 38-46 | 54-62 | 102-134 | 151-159 |
| | ac VH80 | 42 | 58 | 106-138 | 155 |
| Antenna Gain | Band | | ANT Main(dBi) | | |
| | GSM 850 | | -0.40 | | |
| | GSM 1900 | | 1.60 | | |
| | UMTS B2 | | 0.90 | | |
| | UMTS B4 | | 0.20 | | |
| | UMTS B5 | | -0.40 | | |
| | LTE B2 | | 0.90 | | |
| | LTE B4 | | 0.20 | | |
| | LTE B5 | | -0.40 | | |
| | LTE B7 | | 0.80 | | |
| | LTE B12 | | -0.10 | | |
| | LTE B17 | | -0.10 | | |
| | BT/LE | | 0.10 | | |
| | WLAN 2.4G | | 0.10 | | |
| | WLAN 5G | | 1.00 | | |
| **Other Information** | | | | | |
| Battery | Huawei Technologies Co.,Ltd.<br>Battery Model: HB2899C0ECW-C<br>Rated capacity: 4980mAh<br>Nominal Voltage: ⎓ + 3.82V<br>Charging Voltage: ⎓ + 4.40V<br>1. SCUD (FUJIAN) Electronics Co., Ltd. | | | | |
| With Earphone(Yes/No) | No | | | | |

### 3.3 LABORATORY ENVIRONMENT

| | |
|---|---|
| Temperature | Min. = 18ºC, Max. = 25ºC |
| Relative humidity | Min. = 30%, Max. = 70% |
| Ground system resistance | < 0.5 Ω |
| Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards. | |

### 3.4 MAIN TEST INSTRUMENTS

| Item | Equipment | Manufacturer | Model | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | Data Acquisition Electronics | Speag | DAE4 | 1390 | May 11, 2018 | 1 Year |
| 2 | E-field Probe | Speag | EX3DV4 | 7396 | May 29, 2018 | 1 Year |
| 3 | System Validation Dipole | Speag | D750V3 | 1095 | Jun. 05, 2018 | 3 Years |
| 4 | System Validation Dipole | Speag | D835V2 | 4d160 | Jun. 05, 2018 | 3 Years |
| 5 | System Validation Dipole | Speag | D1750V2 | 1101 | Jun. 07, 2018 | 3 Years |
| 6 | System Validation Dipole | Speag | D1900V2 | 5d179 | Jun. 07, 2018 | 3 Years |
| 7 | System Validation Dipole | Speag | D2450V2 | 919 | Jun. 11, 2018 | 3 Years |
| 8 | System Validation Dipole | Speag | D2600V2 | 1067 | Jun. 11, 2018 | 3 Years |
| 9 | System Validation Dipole | Speag | D5GHzV2 | 1160 | Jun. 20, 2018 | 3 Years |
| 10 | ELI4 Phantom | Speag | ELI4 Phantom V5.0 | 1222 | N/A | N/A |
| 11* | 8960 Series 10 Wireless Com Test set | Agilent | E5515E | MY52112163 | Aug. 11, 2018 | 1 Year |
| 12 | CMW500-Wideband Radio Communication Tester | RS | CMW500 | 152372 | Mar. 11, 2018 | 1Year |
| 13 | CMW500-Wideband Radio Communication Tester | RS | CMW500 | 153883 | Mar. 11, 2018 | 1Year |
| 14 | Power Amplifier | Mini-Circuits | ZHL-42W+ | QA1333003 | Mar. 09, 2018 | 1Year |
| 15 | Power Amplifier | Mini-Circuits | ZVE-8G+ | 520701341 | Mar. 09, 2018 | 1Year |
| 16 | ENA Network Analyzer | Agilent | E5071C | MY46102965 | Mar. 11, 2018 | 1 Year |
| 17* | MXG Analog Signal Generator | Agilent | N5181A | MY49060477 | Aug. 11, 2018 | 1 Year |
| 18* | P-series power meter | Agilent | N1911A | MY45100473 | Aug. 11, 2018 | 1 Year |
| 19* | wideband power sensor | Agilent | N1921A | MY51100041 | Aug. 11, 2018 | 1 Year |
| 20 | power Meter | Anritsu | ML2495A | 1128009 | Mar. 11, 2018 | 1 Year |
| 21 | Pulse Power Sensor | Anritsu | MA 2411B | 1027500 | Mar. 11, 2018 | 1 Year |
| 22 | Dielectric Assessment Kit | Speag | DAK-3.5 | 1226 | N/A | N/A |
| 23 | Dual directional coupler | Woken | TS-PCC0M-05 | 107090019 | Mar. 11, 2018 | 1 Year |
| 24 | coupler | Woken | 0110A05601O-10 | COM5BNW1A2 | Mar. 11, 2018 | 1 Year |
| 25* | Bluetooth Test Set | Anritsu | Mt8852B-042 | 1132009 | Aug. 11, 2018 | 1 Year |
| 26 | Digital Themometer | LKM | DTM3000 | 3519 | Jul. 19, 2018 | 1 Year |
| 27 | Thermohygrometer | TESTO | 608-H1 | 1341359457/304 | Oct. 12, 2017 | 1 Year |

Remark:
1. “N/A” denotes no model name, serial No. or calibration specified.
2. * These test equipments have been recalibrated between the test periods. All these test equipments were within the valid period when the tests were performed.
3. 1) Per KDB865664 D01 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.
a) There is no physical damage on the dipole;
b) System check with specific dipole is within 10% of calibrated value;
c) The most recent return-loss result , measured at least annually, deviates by no more than 20% from the previous measurement;
d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5 Ω from the previous measurement.
2) Network analyzer probe calibration against air, distilled water and a short block performed before measuring liquid parameters.

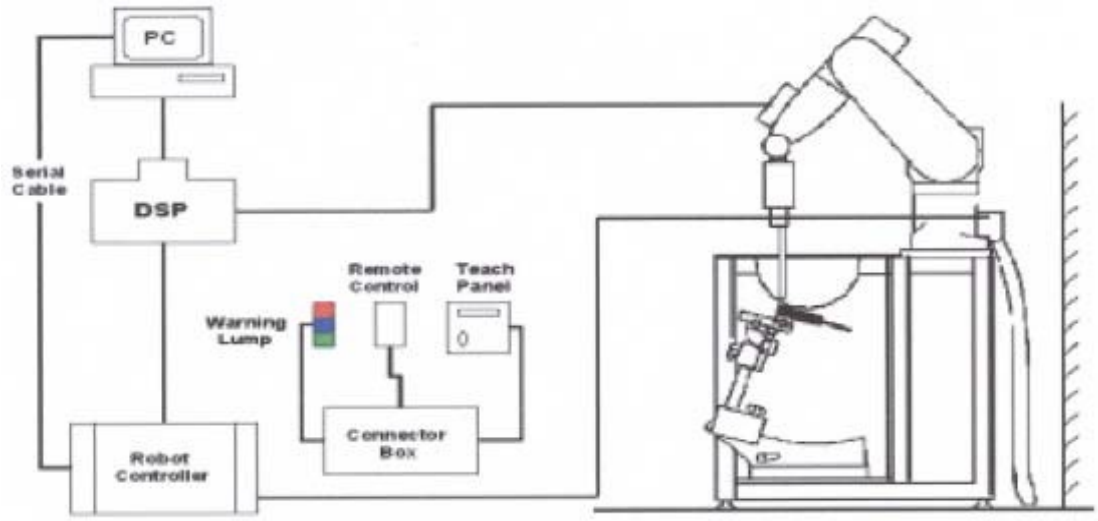
# 4. SAR MEASUREMENTS SYSTEM CONFIGURATION

## 4.1 SAR MEASUREMENT SET-UP

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

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. 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.
3. 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.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. 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.
6. TheDASY5 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
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

### 4.1.1 TEST SETUP LAYOUT



## 4.2 DASY5E-FIELDPROBESYSTEM

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG),designed in the classical triangular configuration and optimized for dosimetric evaluation.

### 4.2.1 EX3DV4 PROBE SPECIFICATION

| | |
|---|---|
| Construction | Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| Calibration | ISO/IEC 17025 calibration service available |
| Frequency | 10 MHz to 6 GHz<br>Linearity: ± 0.2 dB (30 MHz to 6 GHz) |
| Directivity | ± 0.3 dB in HSL (rotation around probe axis)<br>± 0.5 dB in tissue material (rotation normal to probe axis) |
| Dynamic Range | 10 µW/g to > 100 mW/g<br>Linearity:± 0.2dB |
| Dimensions | Overall length: 330 mm (Tip: 20 mm)<br>Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm |

**EX3DV4 E-field Probe**

### 4.2.2 E-FIELD PROBE CALIBRATION

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ±10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where: $\Delta t$ = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

$\Delta T$ = Temperature increase due to RF exposure.

Or $$SAR = \frac{|E|^2 \sigma}{\rho}$$

Where: σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m3).

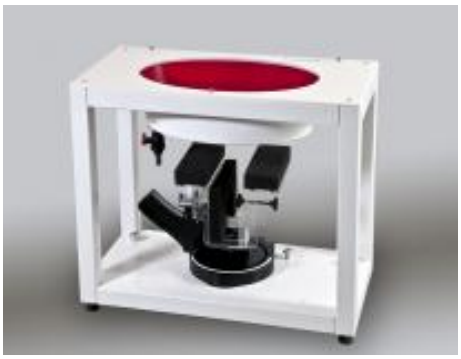
### 4.2.3 OTHER TEST EQUIPMENT

#### 4.2.3.1. Device Holder for Transmitters

**Construction:** Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices (e.g., laptops, cameras, etc.) It is light weight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI4and SAM v6.0Phantoms.
**Material:** POM, Acrylic glass, Foam

#### 4.2.3.2 Phantom

| | |
|---|---|
| Model | ELI4 Phantom |
| Construction | Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles. |
| Shell Thickness | 2±0.1 mm |
| Filling Volume | Approx. 30 liters |
| Dimensions | Length: 600 mm ; Width: 190mm<br>Height: adjustable feet |
| Aailable | Special |



| | |
|---|---|
| Model | Twin SAM |
| Construction | The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot. |
| Shell Thickness | 2 ± 0.2 mm |
| Filling Volume | Approx. 25 liters |
| Dimensions | Length:1000mm; Width: 500mm<br>Height: adjustable feet |
| Aailable | Special |

### 4.2.4 SCANNING PROCEDURE

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. 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 ± 0.1mm). 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 ± 30°.)

- Area Scan

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(≤2GHz)，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.

- Zoom Scan

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: $\Delta x_{zoom}$, $\Delta y_{zoom}$≤ 2GHz -≤8mm, 2-4GHz -≤5 mm and 4-6 GHz-≤4mm; $\Delta z_{zoom}$≤3GHz -≤5 mm, 3-4 GHz-≤4mm and 4-6GHz-≤2mm 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 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.

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

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

### 4.2.5 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, Computer mathematik, 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 compansate boundary effects on E-field probes.

### 4.2.6 DATA STORAGE AND EVALUATION

#### 4.2.6.1 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.

### 4.2.7 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 | Normi, $a_{i0}$, $a_{i1}$, $a_{i2}$ |
| | Conversion factor | $ConvF_i$ |
| | Diode compression point | $Dcp_i$ |
| Device parameters: | Frequency | f |
| | Crest factor | cf |
| Media parameters: | Conductivity | |
| | Density | |

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 multi meter 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: $E_i = ( V_i / Norm_i \cdot ConvF )^{1/2}$

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 )

$Norm_i$ = sensor sensitivity of channel i ( i = x, y, z )
[mV/(V/m)$^2$] for E-field Probes

ConvF = sensitivity enhancement in solution

aij = 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):

$$E_{tot} = (E_X^2 + E_Y^2 + E_Z^2)^{1/2}$$

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

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

With SAR = local specific absorption rate in mW/g

$E_{tot}$ = total field strength in V/m
= conductivity in [mho/m] or [Siemens/m]
= equivalent tissue density in g/cm$^3$

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.

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

With $P_{pwe}$ = equivalent power density of a plane wave in mW/cm$^2$

$E_{tot}$ = total field strength in V/m

$H_{tot}$ = total magnetic field strength in A/m

# 5. SYSTEM VERIFICATION PROCEDURE

## 5.1 TISSUE VERIFICATION

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectic parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ± 5% of the target values.

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

| Tissue Type | Bactericide | DGBE | HEC | NaCl | Sucrose | Triton X-100 | Water | Diethylene Glycol Mono-hexylether |
|---|---|---|---|---|---|---|---|---|
| Body 750 | 0.2 | - | 0.2 | 0.8 | 48.8 | - | 50.0 | - |
| Body 835 | 0.2 | - | 0.2 | 0.9 | 48.5 | - | 50.2 | - |
| Body 1750 | - | 31.0 | - | 0.2 | - | - | 68.8 | - |
| Body 1900 | - | 29.5 | - | 0.3 | - | - | 70.2 | - |
| Body 2450 | - | 31.4 | - | 0.1 | - | - | 68.5 | - |
| Body 2600 | - | 31.8 | - | 0.1 | - | - | 68.1 | - |
| Body 5G | - | - | - | - | - | 10.7 | 78.6 | 10.7 |

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16M + 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

| Tissue Verification | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Tissue Type | Frequency (MHz) | Liquid Temp. (℃) | Conductivity (σ) | Permittivity (εr) | Targeted Conductivity (σ) | Targeted Permittivity (εr) | Deviation Conductivity (σ) (%) | Deviation Permittivity (εr) (%) | Date |
| Body | 750 | 22.4 | 0.968 | 55.193 | 0.96 | 55.5 | 0.83 | -0.55 | Sep. 06, 2018 |
| Body | 835 | 22.4 | 0.991 | 55.289 | 0.97 | 55.2 | 2.16 | 0.16 | Sep. 06, 2018 |
| Body | 1750 | 22.3 | 1.498 | 52.487 | 1.49 | 53.4 | 0.54 | -1.71 | Sep. 07, 2018 |
| Body | 1900 | 22.5 | 1.554 | 53.591 | 1.52 | 53.3 | 2.24 | 0.55 | Sep. 07, 2018 |
| Body | 2450 | 22.5 | 1.982 | 51.386 | 1.95 | 52.7 | 1.64 | -2.49 | Sep. 06, 2018 |
| Body | 2600 | 22.5 | 2.206 | 52.282 | 2.16 | 52.5 | 2.13 | -0.42 | Sep. 06, 2018 |
| Body | 5300 | 22.6 | 5.487 | 47.447 | 5.42 | 48.9 | 1.24 | -2.97 | Sep. 09, 2018 |
| Body | 5300 | 22.5 | 5.480 | 47.297 | 5.42 | 48.9 | 1.11 | -3.28 | Sep. 19, 2018 |
| Body | 5500 | 22.6 | 5.772 | 47.087 | 5.65 | 48.6 | 2.16 | -3.11 | Sep. 09, 2018 |
| Body | 5500 | 22.5 | 5.752 | 46.872 | 5.65 | 48.6 | 1.81 | -3.56 | Sep. 19, 2018 |
| Body | 5600 | 22.6 | 5.920 | 46.900 | 5.77 | 48.5 | 2.60 | -3.30 | Sep. 09, 2018 |
| Body | 5600 | 22.5 | 5.885 | 46.679 | 5.77 | 48.5 | 1.99 | -3.75 | Sep. 19, 2018 |
| Body | 5800 | 22.6 | 6.209 | 46.515 | 6.00 | 48.2 | 3.48 | -3.50 | Sep. 09, 2018 |
| Body | 5800 | 22.5 | 6.163 | 46.344 | 6.00 | 48.2 | 2.72 | -3.85 | Sep. 19, 2018 |

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.

## 5.2 SYSTEM CHECK

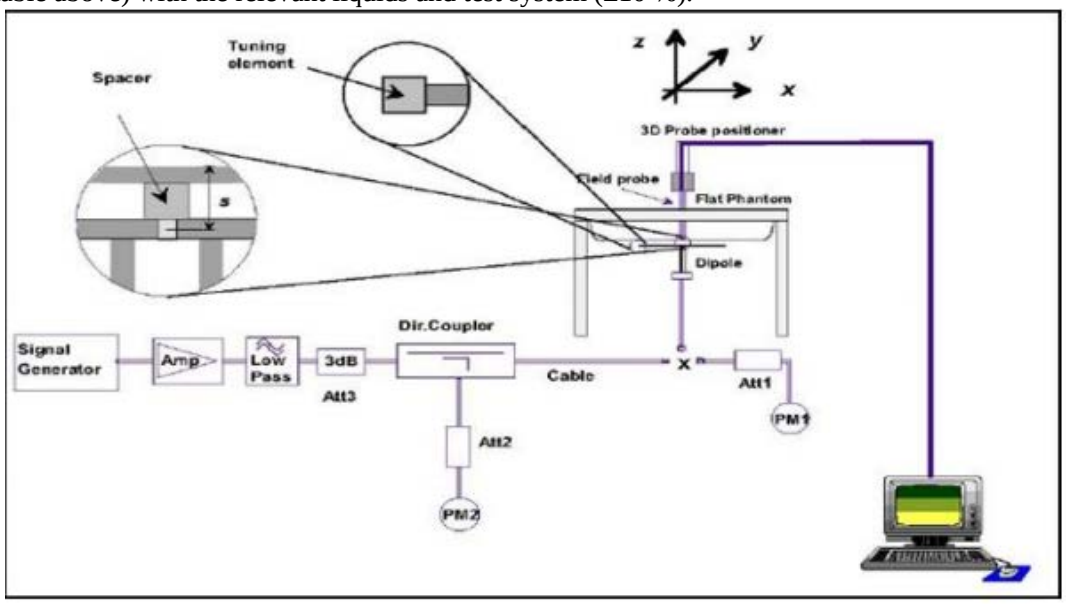
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE Std 1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests.

| System Check | Date | Frequency (MHz) | Targeted SAR-1g (W/kg) | Measured SAR-1g (W/kg) | normalized SAR-1g (W/kg) | Deviation (%) | Dipole S/N |
|---|---|---|---|---|---|---|---|
| Body | Sep. 06, 2018 | 750 | 8.51 | 2.09 | 8.36 | -1.76 | 1095 |
| Body | Sep. 06, 2018 | 835 | 9.53 | 2.46 | 9.84 | 3.25 | 4d160 |
| Body | Sep. 07, 2018 | 1750 | 37.40 | 8.95 | 35.80 | -4.28 | 1101 |
| Body | Sep. 07, 2018 | 1900 | 39.80 | 10.40 | 41.60 | 4.52 | 5d179 |
| Body | Sep. 06, 2018 | 2450 | 50.80 | 13.10 | 52.40 | 3.15 | 919 |
| Body | Sep. 06, 2018 | 2600 | 55.20 | 13.60 | 54.40 | -1.45 | 1067 |
| Body | Sep. 09, 2018 | 5300 | 72.30 | 7.04 | 70.40 | -2.63 | 1160 |
| Body | Sep. 09, 2018 | 5300 | 72.30 | 7.04 | 70.40 | -2.63 | 1160 |
| Body | Sep. 19, 2018 | 5300 | 72.30 | 7.03 | 70.30 | -2.77 | 1160 |
| Body | Sep. 09, 2018 | 5500 | 76.20 | 7.72 | 77.20 | 1.31 | 1160 |
| Body | Sep. 19, 2018 | 5500 | 76.20 | 7.69 | 76.90 | 0.92 | 1160 |
| Body | Sep. 09, 2018 | 5600 | 77.70 | 8.08 | 80.80 | 3.99 | 1160 |
| Body | Sep. 19, 2018 | 5600 | 77.70 | 8.13 | 81.30 | 4.63 | 1160 |
| Body | Sep. 09, 2018 | 5800 | 76.60 | 7.68 | 76.80 | 0.26 | 1160 |

## 5.3 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 3GHz) or 100mW(3-6GHz). 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.

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 (±10 %).



# 6. SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

## 6.1 SAR MEASUREMENT VARIABILITY

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz, 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 ≥ 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≥ 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 ≥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 8.2.

# 7. OPERATIONAL CONDITIONS DURING TEST

## 7.1 SAR TEST CONFIGURATION

### 7.1.1 GSM TEST CONFIGURATION

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using 8960 Series 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 8PSK.

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot.

The allowed power reduction in the multi-slot configuration is as following:

| Number of timeslots in uplink assignment | | Reduction of maximum output power (dB) | | |
|---|---|---|---|---|
| Band | Time Slots | GPRS (GMSK) | EGPRS (GMSK) | EGPRS (8PSK ) |
| GSM850 | 1 TX slot | 0.0 | 0.0 | 6.4 |
| | 2 TX slots | 3.0 | 3.0 | 9.4 |
| | 3 TX slots | 4.8 | 4.8 | 11.2 |
| | 4 TX slots | 6.0 | 6.0 | 12.4 |
| GSM1900 | 1 TX slot | 0.0 | 0.0 | 4.3 |
| | 2 TX slots | 3.0 | 3.0 | 7.3 |
| | 3 TX slots | 4.8 | 4.8 | 9.1 |
| | 4 TX slots | 6.0 | 6.0 | 10.3 |

### 7.1.2 UMTS TEST CONFIGURATION

1. Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the procedures description in section 5.2 of 3GPP TS 34.121,using the appropriate RMC or AMR with TPC(transmit power control) set to all "1s" for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Result for all applicable physical channel configurations(DPCCH,DPDCHn and spreading codes, HSDPA, HSPA)
Should be tabulated in the SAR report .All configuration that are not supported by the DUT or cannot be measured due to technical or equipment limitation should be clearly identified.

2. WCDMA

(1).Head SAR Measurements
SAR for next to ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1s". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR with 3.4kbps SRB(signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

(2).Body SAR Measurements
SAR for body-worn accessory is measured using the 12.2 kbps RMC with the TPC bits configured to all "1s". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by 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 ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2W/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 D01, 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 Δ ACK, Δ NACK, Δ CQI = 8. The variation of the $\beta_c$ /$\beta_d$ ratio causes a power reduction at sub-tests 2 - 4.

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

Note 1: ΔACK, ΔNACK and ΔCQI = 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,TF1) to $\beta_c$ = 11/15 and $\beta_d$ = 15/15

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

Settings of required H-Set 1 QPSK acc. to 3GPP 34.121

| 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 |

HSDPA UE category

| 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 |

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 ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01, the 3G SAR test reduction procedures 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 HSUPA, 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.

Subtests for WCDMA Release 6 HSUPA

| Sub-test | $\beta_c$ | $\beta_d$ | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{hs}$(1) | $\beta_{ec}$ | $\beta_{ed}$ | $\beta_{ec}$ (SF) | $\beta_{ed}$ (code) | CM(2) (dB) | MPR (dB) | AG(4) Index | E-TFCI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11/15(3) | 15/15(3) | 64 | 11/15(3) | 22/15 | 209/225 | 1039/225 | 4 | 1 | 1.0 | 0.0 | 20 | 75 |
| 2 | 6/15 | 15/15 | 64 | 6/15 | 12/15 | 12/15 | 94/75 | 4 | 1 | 3.0 | 2.0 | 12 | 67 |
| 3 | 15/15 | 9/15 | 64 | 15/9 | 30/15 | 30/15 | $\beta_{ed1}$:47/15 $\beta_{ed2}$:47/15 | 4 | 2 | 2.0 | 1.0 | 15 | 92 |
| 4 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 2/15 | 56/75 | 4 | 1 | 3.0 | 2.0 | 17 | 71 |
| 5 | 15/15(4) | 15/15(4) | 64 | 15/15(4) | 30/15 | 24/15 | 134/15 | 4 | 1 | 1.0 | 0.0 | 21 | 81 |

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

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

Note 4 : 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 $\beta_d = 15/15$

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

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

HSUPA UE category

| UE E-DCH Category | Maximum E-DCH Codes Transmitted | Number of HARQ Processes | E-DCH TTI(ms) | Minimum Speading 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 (No DPDCH) | 4 | 8 | 10 | 2SF2&2SF4 | 11484 | 5.76 |
| | 4 | 4 | 2 | | 20000 | 2.00 |
| 7 (No DPDCH) | 4 | 8 | 2 | 2SF2&2SF4 | 22996 | ? |
| | 4 | 4 | 10 | | 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).

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
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 |

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.

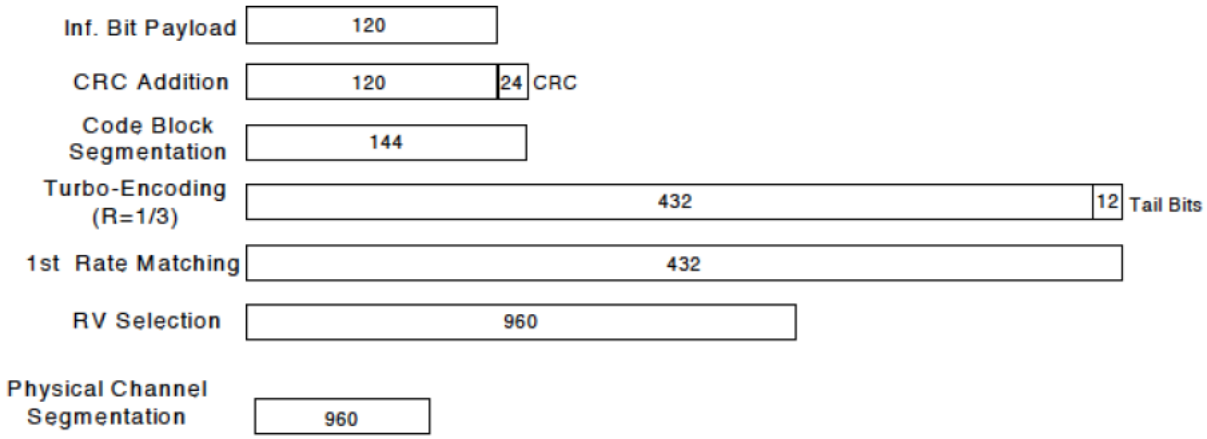



**Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)**

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

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

Note 1: $\Delta$ ACK, $\Delta$ NACK and $\Delta$ CQI = 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, TF1) 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.

### 7.1.3 LTE TEST CONFIGURATION

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices. The CMW500 Wide Band 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 ($N_{RB}$) | | | | | | MPR (dB) |
|---|---|---|---|---|---|---|---|
| | 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | |
| QPSK | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 |
| 16 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 |
| 16 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 |

### 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 ≤ 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 > ½ 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 > ½ 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.

### 7.1.4 LTE CARRIER AGGREGATION POWER

LTE Rel.10 Carrier Aggregation

As the KDB 941225 D05A, when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than 1/4dB higher than the maximum output power measured when downlink carrier aggregation is inactive, the CA test is not required.

Contiguous intra-band CA

| **Appendix：E-UTRA CA configuration / Bandwidth combination set** | | | | | |
|---|---|---|---|---|---|
| **E-UTRA CA configuration** | **Uplink CA configurations** | **Component carriers in order of increasing carrier frequency** | | **Maximum aggregated bandwidth [MHz]** | **Bandwidth combination set** |
| | | **Channel bandwidths for carrier [MHz]** | **Channel bandwidths for carrier [MHz]** | | |
| CA_2C | NA | 5 | 20 | 40 | 0 |
| | | 10 | 15,20 | | |
| | | 15 | 10,15,20 | | |
| | | 20 | 5,10,15,20 | | |
| CA_5B | NA | 5,10 | 10 | 20 | 0 |
| | | 10 | 5 | | |
| CA_7C | NA | 15 | 15 | 40 | 0 |
| | | 20 | 20 | | |
| | | 10 | 20 | 40 | 1 |
| | | 15 | 15, 20 | | |
| | | 20 | 10, 15, 20 | | |
| | | 15 | 10,15 | 40 | 2 |
| | | 20 | 15,20 | | |
| CA_12B | NA | 5 | 5,10 | 15 | 0 |
| NOTE 1: The CA configuration refers to an operating band and a CA bandwidth class specified in Table 5.6A-1 (the indexing letter). Absence of a CA bandwidth class for an operating band implies support of all classes.<br>NOTE 2: For the supported CC bandwidth combinations, the CC downlink and uplink bandwidths are equal.<br>NOTE 3: Uplink CA configurations are the configurations supported by the present release of specifications. | | | | | |

Note:
1）For the inter-band CA combinations, all the listed bands above can be used as PCC or SCC.
2) The channel spacing and aggregated channel bandwidth for CA are identical to the associated specification in 3GPP TS 36.101 V13.2.0.
3) The reference test frequencies for CA refers to3GPP TS 36.508 V13.1.0

Test frequencies for CA_2C

| Range | CC-Combo / $N_{RB\_agg}$ [RB] | CC1 Note1 | | | | | CC2 Note1 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BW [RB] | $N_{UL}$ | $f_{UL}$ [MHz] | $N_{DL}$ | $f_{DL}$ [MHz] | BW [RB] | $N_{UL}$ | $f_{UL}$ [MHz] | $N_{DL}$ | $f_{DL}$ [MHz] |
| Low | 25+100 | 25 | 18633 | 1853.3 | 633 | 1933.3 | 100 | 18750 | 1865 | 750 | 1945 |
| | | 100 | 18700 | 1860 | 700 | 1940 | 25 | 18817 | 1871.7 | 817 | 1951.7 |
| | 50+75 | 50 | 18653 | 1855.3 | 653 | 1935.3 | 75 | 18773 | 1867.3 | 773 | 1947.3 |
| | | 75 | 18675 | 1857.5 | 675 | 1937.5 | 50 | 18795 | 1869.5 | 795 | 1949.5 |
| | 50+100 | 50 | 18655 | 1855.5 | 655 | 1935.5 | 100 | 18799 | 1869.9 | 799 | 1949.9 |
| | | 100 | 18700 | 1860 | 700 | 1940 | 50 | 18844 | 1874.4 | 844 | 1954.4 |
| | 75+75 | 75 | 18675 | 1857.5 | 675 | 1937.5 | 75 | 18825 | 1872.5 | 825 | 1952.5 |
| | 75+100 | 75 | 18678 | 1857.8 | 678 | 1937.8 | 100 | 18849 | 1874.9 | 849 | 1954.9 |
| | | 100 | 18700 | 1860 | 700 | 1940 | 75 | 18871 | 1877.1 | 871 | 1957.1 |
| | 100+100 | 100 | 18700 | 1860 | 700 | 1940 | 100 | 18898 | 1879.8 | 898 | 1959.8 |
| Mid | 25+100 | 25 | 18808 | 1870.8 | 808 | 1950.8 | 100 | 18925 | 1882.5 | 925 | 1962.5 |
| | | 100 | 18875 | 1877.5 | 875 | 1957.5 | 25 | 18992 | 1889.2 | 992 | 1969.2 |
| | 50+75 | 50 | 18829 | 1872.9 | 829 | 1952.9 | 75 | 18949 | 1884.9 | 949 | 1964.9 |
| | | 75 | 18851 | 1875.1 | 851 | 1955.1 | 50 | 18971 | 1887.1 | 971 | 1967.1 |
| | 50+100 | 50 | 18806 | 1870.6 | 806 | 1950.6 | 100 | 18950 | 1885 | 950 | 1965 |
| | | 100 | 18851 | 1875.1 | 851 | 1955.1 | 50 | 18995 | 1889.5 | 995 | 1969.5 |
| | 75+75 | 75 | 18825 | 1872.5 | 825 | 1952.5 | 75 | 18975 | 1887.5 | 975 | 1967.5 |
| | 75+100 | 75 | 18803 | 1870.3 | 803 | 1950.3 | 100 | 18974 | 1887.4 | 974 | 1967.4 |
| | | 100 | 18826 | 1872.6 | 826 | 1952.6 | 75 | 18997 | 1889.7 | 997 | 1969.7 |
| | 100+100 | 100 | 18801 | 1870.1 | 801 | 1950.1 | 100 | 18999 | 1889.9 | 999 | 1969.9 |
| High | 25+100 | 25 | 18983 | 1888.3 | 983 | 1968.3 | 100 | 19100 | 1900 | 1100 | 1980 |
| | | 100 | 19050 | 1895 | 1050 | 1975 | 25 | 19167 | 1906.7 | 1167 | 1986.7 |
| | 50+75 | 50 | 19005 | 1890.5 | 1005 | 1970.5 | 75 | 19125 | 1902.5 | 1125 | 1982.5 |
| | | 75 | 19027 | 1892.7 | 1027 | 1972.7 | 50 | 19147 | 1904.7 | 1147 | 1984.7 |
| | 50+100 | 50 | 18956 | 1885.6 | 956 | 1965.6 | 100 | 19100 | 1900 | 1100 | 1980 |
| | | 100 | 19001 | 1890.1 | 1001 | 1970.1 | 50 | 19145 | 1904.5 | 1145 | 1984.5 |
| | 75+75 | 75 | 18975 | 1887.5 | 975 | 1967.5 | 75 | 19125 | 1902.5 | 1125 | 1982.5 |
| | 75+100 | 75 | 18929 | 1882.9 | 929 | 1962.9 | 100 | 19100 | 1900 | 1100 | 1980 |
| | | 100 | 18951 | 1885.1 | 951 | 1965.1 | 75 | 19122 | 1902.2 | 1122 | 1982.2 |
| | 100+100 | 100 | 18902 | 1880.2 | 902 | 1960.2 | 100 | 19100 | 1900 | 1100 | 1980 |

Note 1: Carriers in increasing frequency order.

Test frequencies for CA_5B

| Range | CC-Combo / $N_{RB\_agg}$ [RB] | CC1 Note1 | | | | | CC2 Note1 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BW [RB] | $N_{UL}$ | $f_{UL}$ [MHz] | $N_{DL}$ | $f_{DL}$ [MHz] | BW [RB] | $N_{UL}$ | $f_{UL}$ [MHz] | $N_{DL}$ | $f_{DL}$ [MHz] |
| Low | 25+50 | 25 | 20428 | 826.8 | 2428 | 871.8 | 50 | 20500 | 834 | 2500 | 879 |
| | 50+25 | 50 | 20450 | 829 | 2450 | 874 | 25 | 20522 | 836.2 | 2522 | 881.2 |
| | 50+50 | 50 | 20450 | 829 | 2450 | 874 | 50 | 20549 | 838.9 | 2549 | 883.9 |
| Mid | 25+50 | 25 | 20478 | 831.8 | 2478 | 876.8 | 50 | 20550 | 839 | 2550 | 884 |
| | 50+25 | 50 | 20500 | 834 | 2500 | 879 | 25 | 20572 | 841.2 | 2572 | 886.2 |
| | 50+50 | 50 | 20476 | 831.6 | 2476 | 876.6 | 50 | 20575 | 841.5 | 2575 | 886.5 |
| High | 25+50 | 25 | 20528 | 836.8 | 2528 | 881.8 | 50 | 20600 | 844 | 2600 | 889 |
| | 50+25 | 50 | 20550 | 839 | 2550 | 884 | 25 | 20622 | 846.2 | 2622 | 891.2 |
| | 50+50 | 50 | 20501 | 834.1 | 2501 | 879.1 | 50 | 20600 | 844 | 2600 | 889 |
| Note 1: Carriers in increasing frequency order. | | | | | | | | | | | |

Test frequencies for CA_7C

| Range | CC-Combo / $N_{RB\_agg}$ [RB] | CC1 Note1 | | | | | CC2 Note1 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BW [RB] | $N_{UL}$ | $f_{UL}$ [MHz] | $N_{DL}$ | $f_{DL}$ [MHz] | BW [RB] | $N_{UL}$ | $f_{UL}$ [MHz] | $N_{DL}$ | $f_{DL}$ [MHz] |
| Low | 50+100 | 50 | 20805 | 2505.5 | 2805 | 2625.5 | 100 | 20949 | 2519.9 | 2949 | 2639.9 |
| | | 100 | 20850 | 2510 | 2850 | 2630 | 50 | 20994 | 2524.4 | 2994 | 2644.4 |
| | 75+75 | 75 | 20825 | 2507.5 | 2825 | 2627.5 | 75 | 20975 | 2522.5 | 2975 | 2642.5 |
| | 75+100 | 75 | 20828 | 2507.8 | 2828 | 2627.8 | 100 | 20999 | 2524.9 | 2999 | 2644.9 |
| | | 100 | 20850 | 2510 | 2850 | 2630 | 75 | 21021 | 2527.1 | 3021 | 2647.1 |
| | 100+100 | 100 | 20850 | 2510 | 2850 | 2630 | 100 | 21048 | 2529.8 | 3048 | 2649.8 |
| Mid | 50+100 | 50 | 21006 | 2525.6 | 3006 | 2645.6 | 100 | 21150 | 2540 | 3150 | 2660 |
| | | 100 | 21051 | 2530.1 | 3051 | 2650.1 | 50 | 21195 | 2544.5 | 3195 | 2664.5 |
| | 75+75 | 75 | 21025 | 2527.5 | 3025 | 2647.5 | 75 | 21175 | 2542.5 | 3175 | 2662.5 |
| | 75+100 | 75 | 21003 | 2525.3 | 3003 | 2645.3 | 100 | 21174 | 2542.4 | 3174 | 2662.4 |
| | | 100 | 21026 | 2527.6 | 3026 | 2647.6 | 75 | 21197 | 2544.7 | 3197 | 2664.7 |
| | 100+100 | 100 | 21001 | 2525.1 | 3001 | 2645.1 | 100 | 21199 | 2544.9 | 3199 | 2664.9 |
| High | 50+100 | 50 | 21206 | 2545.6 | 3206 | 2665.6 | 100 | 21350 | 2560 | 3350 | 2680 |
| | | 100 | 21251 | 2550.1 | 3251 | 2670.1 | 50 | 21395 | 2564.5 | 3395 | 2684.5 |
| | 75+75 | 75 | 21225 | 2547.5 | 3225 | 2667.5 | 75 | 21375 | 2562.5 | 3375 | 2682.5 |
| | 75+100 | 75 | 21179 | 2542.9 | 3179 | 2662.9 | 100 | 21350 | 2560 | 3350 | 2680 |
| | | 100 | 21201 | 2545.1 | 3201 | 2665.1 | 75 | 21372 | 2562.2 | 3372 | 2682.2 |
| | 100+100 | 100 | 21152 | 2540.2 | 3152 | 2660.2 | 100 | 21350 | 2560 | 3350 | 2680 |
| Note 1: Carriers in increasing frequency order. | | | | | | | | | | | |

Test frequencies for CA_12B

| Range | CC-Combo / $N_{RB\_agg}$ [RB] | CC1 Note1 | | | | | CC2 Note1 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BW [RB] | $N_{UL}$ | $f_{UL}$ [MHz] | $N_{DL}$ | $f_{DL}$ [MHz] | BW [RB] | $N_{UL}$ | $f_{UL}$ [MHz] | $N_{DL}$ | $f_{DL}$ [MHz] |
| Low | 25+25 | 25 | 23035 | 701.5 | 5035 | 731.5 | 25 | 23083 | 706.3 | 5083 | 736.3 |
| | 25+50 | 25 | 23035 | 701.5 | 5035 | 731.5 | 50 | 23107 | 708.7 | 5107 | 738.7 |
| Mid | 25+25 | 25 | 23070 | 705 | 5070 | 735 | 25 | 23118 | 709.8 | 5118 | 739.8 |
| | 25+50 | 25 | 23045 | 702.5 | 5045 | 732.5 | 50 | 23117 | 709.7 | 5117 | 739.7 |
| High | 25+25 | 25 | 23107 | 708.7 | 5107 | 738.7 | 25 | 23155 | 713.5 | 5155 | 743.5 |
| | 25+50 | 25 | 23058 | 703.8 | 5058 | 733.8 | 50 | 23130 | 711 | 5130 | 741 |
| Note 1: Carriers in increasing frequency order. | | | | | | | | | | | |

1) Carrier Aggregation power test results (Full Power)

| E-UTRA CA configuration | | CC-Combo | PCC | | | | | | | | SCC | | | | Tune-up For TX Power With DL CA | Power | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Band | Bandwidth [MHZ] | Modulation | RB Size/Offset | Channel (UL) | Frequency [MHZ] | Channel (DL) | Frequency [MHZ] | Band | Bandwidth [MHZ] | Channel (DL) | Frequency [MHZ] | | TX Power With DL CA | TX Power Single Carrier |
| CA_2C | Low | 5M+20M | LTE B2 | 5 | QPSK | 1/0 | 18633 | 1853.3 | 633 | 1933.3 | LTE B2 | 20 | 750 | 1945 | 24 | 23.27 | 23.33 |
| | | 20M+5M | LTE B2 | 20 | QPSK | 1/0 | 18700 | 1860 | 700 | 1940 | LTE B2 | 5 | 817 | 1951.7 | 24 | 23.78 | 23.89 |
| | | 10M+15M | LTE B2 | 10 | QPSK | 1/0 | 18653 | 1855.3 | 653 | 1935.3 | LTE B2 | 15 | 773 | 1947.3 | 24 | 23.31 | 23.39 |
| | | 15M+10M | LTE B2 | 15 | QPSK | 1/0 | 18675 | 1857.5 | 675 | 1937.5 | LTE B2 | 10 | 795 | 1949.5 | 24 | 23.15 | 23.22 |
| | | 10M+20M | LTE B2 | 10 | QPSK | 1/0 | 18655 | 1855.5 | 655 | 1935.5 | LTE B2 | 20 | 799 | 1949.9 | 24 | 23.31 | 23.40 |
| | | 20M+10M | LTE B2 | 20 | QPSK | 1/0 | 18700 | 1860 | 700 | 1940 | LTE B2 | 10 | 844 | 1954.4 | 24 | 23.84 | 23.89 |
| | | 15M+15M | LTE B2 | 15 | QPSK | 1/0 | 18675 | 1857.5 | 675 | 1937.5 | LTE B2 | 15 | 825 | 1952.5 | 24 | 23.18 | 23.22 |
| | | 15M+20M | LTE B2 | 15 | QPSK | 1/0 | 18678 | 1857.8 | 678 | 1937.8 | LTE B2 | 20 | 849 | 1954.9 | 24 | 23.13 | 23.21 |
| | | 20M+15M | LTE B2 | 20 | QPSK | 1/0 | 18700 | 1860 | 700 | 1940 | LTE B2 | 15 | 871 | 1957.1 | 24 | 23.83 | 23.89 |
| | | 20M+20M | LTE B2 | 20 | QPSK | 1/0 | 18700 | 1860 | 700 | 1940 | LTE B2 | 20 | 898 | 1959.8 | 24 | 23.84 | 23.89 |
| | Mid | 5M+20M | LTE B2 | 5 | QPSK | 1/0 | 18808 | 1870.8 | 808 | 1950.8 | LTE B2 | 20 | 925 | 1962.5 | 24 | 23.41 | 23.47 |
| | | 20M+5M | LTE B2 | 20 | QPSK | 1/0 | 18875 | 1877.5 | 875 | 1957.5 | LTE B2 | 5 | 992 | 1969.2 | 24 | 22.72 | 22.76 |
| | | 10M+15M | LTE B2 | 10 | QPSK | 1/0 | 18829 | 1872.9 | 829 | 1952.9 | LTE B2 | 15 | 949 | 1964.9 | 24 | 22.52 | 22.63 |
| | | 15M+10M | LTE B2 | 15 | QPSK | 1/0 | 18851 | 1875.1 | 851 | 1955.1 | LTE B2 | 10 | 971 | 1967.1 | 24 | 22.45 | 22.51 |
| | | 10M+20M | LTE B2 | 10 | QPSK | 1/0 | 18806 | 1870.6 | 806 | 1950.6 | LTE B2 | 20 | 950 | 1965 | 24 | 22.49 | 22.59 |
| | | 20M+10M | LTE B2 | 20 | QPSK | 1/0 | 18851 | 1875.1 | 851 | 1955.1 | LTE B2 | 10 | 995 | 1969.5 | 24 | 22.67 | 22.72 |
| | | 15M+15M | LTE B2 | 15 | QPSK | 1/0 | 18825 | 1872.5 | 825 | 1952.5 | LTE B2 | 15 | 975 | 1967.5 | 24 | 22.41 | 22.55 |
| | | 15M+20M | LTE B2 | 15 | QPSK | 1/0 | 18803 | 1870.3 | 803 | 1950.3 | LTE B2 | 20 | 974 | 1967.4 | 24 | 22.38 | 22.47 |
| | | 20M+15M | LTE B2 | 20 | QPSK | 1/0 | 18826 | 1872.6 | 826 | 1952.6 | LTE B2 | 15 | 997 | 1969.7 | 24 | 22.67 | 22.78 |
| | | 20M+20M | LTE B2 | 20 | QPSK | 1/0 | 18801 | 1870.1 | 801 | 1950.1 | LTE B2 | 20 | 999 | 1969.9 | 24 | 22.61 | 22.69 |
| | High | 5M+20M | LTE B2 | 5 | QPSK | 1/0 | 18983 | 1888.3 | 983 | 1968.3 | LTE B2 | 20 | 1100 | 1980 | 24 | 22.63 | 22.71 |
| | | 20M+5M | LTE B2 | 20 | QPSK | 1/0 | 19050 | 1895 | 1050 | 1975 | LTE B2 | 5 | 1167 | 1986.7 | 24 | 22.59 | 23.75 |
| | | 10M+15M | LTE B2 | 10 | QPSK | 1/0 | 19005 | 1890.5 | 1005 | 1970.5 | LTE B2 | 15 | 1125 | 1982.5 | 24 | 22.73 | 22.81 |
| | | 15M+10M | LTE B2 | 15 | QPSK | 1/0 | 19027 | 1892.7 | 1027 | 1972.7 | LTE B2 | 10 | 1147 | 1984.7 | 24 | 22.86 | 22.97 |
| | | 10M+20M | LTE B2 | 10 | QPSK | 1/0 | 18956 | 1885.6 | 956 | 1965.6 | LTE B2 | 20 | 1100 | 1980 | 24 | 22.78 | 22.85 |
| | | 20M+10M | LTE B2 | 20 | QPSK | 1/0 | 19001 | 1890.1 | 1001 | 1970.1 | LTE B2 | 10 | 1145 | 1984.5 | 24 | 22.64 | 23.69 |
| | | 15M+15M | LTE B2 | 15 | QPSK | 1/0 | 18975 | 1887.5 | 975 | 1967.5 | LTE B2 | 15 | 1125 | 1982.5 | 24 | 22.8 | 22.88 |
| | | 15M+20M | LTE B2 | 15 | QPSK | 1/0 | 18929 | 1882.9 | 929 | 1962.9 | LTE B2 | 20 | 1100 | 1980 | 24 | 22.83 | 22.91 |
| | | 20M+15M | LTE B2 | 20 | QPSK | 1/0 | 18951 | 1885.1 | 951 | 1965.1 | LTE B2 | 15 | 1122 | 1982.2 | 24 | 23.04 | 23.11 |
| | | 20M+20M | LTE B2 | 20 | QPSK | 1/0 | 18902 | 1880.2 | 902 | 1960.2 | LTE B2 | 20 | 1100 | 1980 | 24 | 22.69 | 22.84 |
| CA_5B | Low | 5M+10M | LTE B5 | 5 | QPSK | 1/0 | 20428 | 826.8 | 2428 | 871.8 | LTE B5 | 10 | 2500 | 879 | 25.5 | 24.57 | 24.66 |
| | | 10M+5M | LTE B5 | 10 | QPSK | 1/0 | 20450 | 829 | 2450 | 874 | LTE B5 | 5 | 2522 | 881.2 | 25.5 | 24.62 | 24.68 |
| | | 10M+10M | LTE B5 | 10 | QPSK | 1/0 | 20450 | 829 | 2450 | 874 | LTE B5 | 10 | 2549 | 883.9 | 25.5 | 24.61 | 24.68 |
| | Mid | 5M+10M | LTE B5 | 5 | QPSK | 1/0 | 20478 | 831.8 | 2478 | 876.8 | LTE B5 | 10 | 2550 | 884 | 25.5 | 24.82 | 24.89 |
| | | 10M+5M | LTE B5 | 10 | QPSK | 1/0 | 20500 | 834 | 2500 | 879 | LTE B5 | 5 | 2572 | 886.2 | 25.5 | 24.94 | 25.01 |
| | | 10M+10M | LTE B5 | 10 | QPSK | 1/0 | 20476 | 831.6 | 2476 | 876.6 | LTE B5 | 10 | 2575 | 886.5 | 25.5 | 24.88 | 24.91 |
| | High | 5M+10M | LTE B5 | 5 | QPSK | 1/0 | 20528 | 836.8 | 2528 | 881.8 | LTE B5 | 10 | 2600 | 889 | 25.5 | 24.93 | 25.04 |
| | | 10M+5M | LTE B5 | 10 | QPSK | 1/0 | 20550 | 839 | 2550 | 884 | LTE B5 | 5 | 2622 | 891.2 | 25.5 | 24.97 | 25.11 |
| | | 10M+10M | LTE B5 | 10 | QPSK | 1/0 | 20501 | 834.1 | 2501 | 879.1 | LTE B5 | 10 | 2600 | 889 | 25.5 | 24.97 | 25.08 |

| E-UTRA CA configuration | | CC-Combo | PCC | | | | | | | | SCC | | | | Tune-up For TX Power With DL CA | Power | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Band | Bandwidth [MHZ] | Modulation | RB Size/Offset | Channel (UL) | Frequency [MHZ] | Channel (DL) | Frequency [MHZ] | Band | Bandwidth [MHZ] | Channel (DL) | Frequency [MHZ] | | TX Power With DL CA | TX Power Single Carrier |
| CA_7C | Low | 10M+20M | LTE B7 | 10 | QPSK | 1/0 | 20805 | 2505.5 | 2805 | 2625.5 | LTE B7 | 20 | 2949 | 2639.9 | 24 | 22.79 | 22.86 |
| | | 20M+10M | LTE B7 | 20 | QPSK | 1/0 | 20850 | 2510 | 2850 | 2630 | LTE B7 | 10 | 2994 | 2644.4 | 24 | 22.82 | 22.89 |
| | | 15M+15M | LTE B7 | 15 | QPSK | 1/0 | 20825 | 2507.5 | 2825 | 2627.5 | LTE B7 | 15 | 2975 | 2642.5 | 24 | 22.71 | 22.74 |
| | | 15M+20M | LTE B7 | 15 | QPSK | 1/0 | 20828 | 2507.8 | 2828 | 2627.8 | LTE B7 | 20 | 2999 | 2644.9 | 24 | 22.69 | 22.75 |
| | | 20M+15M | LTE B7 | 20 | QPSK | 1/0 | 20850 | 2510 | 2850 | 2630 | LTE B7 | 15 | 3021 | 2647.1 | 24 | 22.78 | 22.89 |
| | | 20M+20M | LTE B7 | 20 | QPSK | 1/0 | 20850 | 2510 | 2850 | 2630 | LTE B7 | 20 | 3048 | 2649.8 | 24 | 22.79 | 22.89 |
| | Mid | 10M+20M | LTE B7 | 10 | QPSK | 1/0 | 21006 | 2525.6 | 3006 | 2645.6 | LTE B7 | 20 | 3150 | 2660 | 24 | 22.66 | 22.75 |
| | | 20M+10M | LTE B7 | 20 | QPSK | 1/0 | 21051 | 2530.1 | 3051 | 2650.1 | LTE B7 | 10 | 3195 | 2664.5 | 24 | 22.6 | 22.67 |
| | | 15M+15M | LTE B7 | 15 | QPSK | 1/0 | 21025 | 2527.5 | 3025 | 2647.5 | LTE B7 | 15 | 3175 | 2662.5 | 24 | 22.58 | 22.64 |
| | | 15M+20M | LTE B7 | 15 | QPSK | 1/0 | 21003 | 2525.3 | 3003 | 2645.3 | LTE B7 | 20 | 3174 | 2662.4 | 24 | 22.53 | 22.61 |
| | | 20M+15M | LTE B7 | 20 | QPSK | 1/0 | 21026 | 2527.6 | 3026 | 2647.6 | LTE B7 | 15 | 3197 | 2664.7 | 24 | 22.52 | 22.59 |
| | | 20M+20M | LTE B7 | 20 | QPSK | 1/0 | 21001 | 2525.1 | 3001 | 2645.1 | LTE B7 | 20 | 3199 | 2664.9 | 24 | 22.63 | 22.73 |
| | High | 10M+20M | LTE B7 | 10 | QPSK | 1/0 | 21206 | 2545.6 | 3206 | 2665.6 | LTE B7 | 20 | 3350 | 2680 | 24 | 22.52 | 22.59 |
| | | 20M+10M | LTE B7 | 20 | QPSK | 1/0 | 21251 | 2550.1 | 3251 | 2670.1 | LTE B7 | 10 | 3395 | 2684.5 | 24 | 22.87 | 22.97 |
| | | 15M+15M | LTE B7 | 15 | QPSK | 1/0 | 21225 | 2547.5 | 3225 | 2667.5 | LTE B7 | 15 | 3375 | 2682.5 | 24 | 22.76 | 22.84 |
| | | 15M+20M | LTE B7 | 15 | QPSK | 1/0 | 21179 | 2542.9 | 3179 | 2662.9 | LTE B7 | 20 | 3350 | 2680 | 24 | 22.62 | 22.69 |
| | | 20M+15M | LTE B7 | 20 | QPSK | 1/0 | 21201 | 2545.1 | 3201 | 2665.1 | LTE B7 | 15 | 3372 | 2682.2 | 24 | 22.94 | 23.03 |
| | | 20M+20M | LTE B7 | 20 | QPSK | 1/0 | 21152 | 2540.2 | 3152 | 2660.2 | LTE B7 | 20 | 3350 | 2680 | 24 | 22.67 | 22.73 |
| CA_12B | Low | 5M+5M | LTE B12 | 5 | QPSK | 1/0 | 23035 | 701.5 | 5035 | 731.5 | LTE B12 | 5 | 5083 | 736.3 | 25.5 | 24.48 | 24.53 |
| | | 5M+10M | LTE B12 | 5 | QPSK | 1/0 | 23035 | 701.5 | 5035 | 731.5 | LTE B12 | 10 | 5107 | 738.7 | 25.5 | 24.44 | 24.53 |
| | Mid | 5M+5M | LTE B12 | 5 | QPSK | 1/0 | 23070 | 705 | 5070 | 735 | LTE B12 | 5 | 5118 | 739.8 | 25.5 | 24.42 | 24.47 |
| | | 5M+10M | LTE B12 | 5 | QPSK | 1/0 | 23045 | 702.5 | 5045 | 732.5 | LTE B12 | 10 | 5117 | 739.7 | 25.5 | 24.49 | 24.53 |
| | High | 5M+5M | LTE B12 | 5 | QPSK | 1/0 | 23107 | 708.7 | 5107 | 738.7 | LTE B12 | 5 | 5155 | 743.5 | 25.5 | 24.64 | 24.77 |
| | | 5M+10M | LTE B12 | 5 | QPSK | 1/0 | 23058 | 703.8 | 5058 | 733.8 | LTE B12 | 10 | 5130 | 741 | 25.5 | 24.55 | 24.68 |

2) Carrier Aggregation power test results (Sensor on power)

| E-UTRA CA configuration | | CC-Combo | PCC | | | | | | | | SCC | | | | Tune-up For TX Power With DL CA | Power | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Band | Bandwidth [MHZ] | Modulation | RB Size/Offset | Channel（UL) | Frequency [MHZ] | Channel（DL) | Frequency [MHZ] | Band | Bandwidth [MHZ] | Channel（DL) | Frequency [MHZ] | | TX power with DL CA | TX Power Single Carrier |
| CA_2C | Low | 5M+20M | LTE B2 | 5 | QPSK | 1/0 | 18633 | 1853.3 | 633 | 1933.3 | LTE B2 | 20 | 750 | 1945 | 9 | 8.22 | 8.27 |
| | | 20M+5M | LTE B2 | 5 | QPSK | 1/0 | 18700 | 1860 | 700 | 1940 | LTE B2 | 5 | 817 | 1951.7 | 9 | 8.17 | 8.22 |
| | | 10M+15M | LTE B2 | 10 | QPSK | 1/0 | 18653 | 1855.3 | 653 | 1935.3 | LTE B2 | 15 | 773 | 1947.3 | 9 | 7.96 | 8.03 |
| | | 15M+10M | LTE B2 | 10 | QPSK | 1/0 | 18675 | 1857.5 | 675 | 1937.5 | LTE B2 | 10 | 795 | 1949.5 | 9 | 7.76 | 7.79 |
| | | 10M+20M | LTE B2 | 10 | QPSK | 1/0 | 18655 | 1855.5 | 655 | 1935.5 | LTE B2 | 20 | 799 | 1949.9 | 9 | 8.01 | 8.04 |
| | | 20M+10M | LTE B2 | 10 | QPSK | 1/0 | 18700 | 1860 | 700 | 1940 | LTE B2 | 10 | 844 | 1954.4 | 9 | 8.18 | 8.22 |
| | | 15M+15M | LTE B2 | 15 | QPSK | 1/0 | 18675 | 1857.5 | 675 | 1937.5 | LTE B2 | 15 | 825 | 1952.5 | 9 | 7.74 | 7.79 |
| | | 15M+20M | LTE B2 | 15 | QPSK | 1/0 | 18678 | 1857.8 | 678 | 1937.8 | LTE B2 | 20 | 849 | 1954.9 | 9 | 7.73 | 7.78 |
| | | 20M+15M | LTE B2 | 15 | QPSK | 1/0 | 18700 | 1860 | 700 | 1940 | LTE B2 | 15 | 871 | 1957.1 | 9 | 8.14 | 8.22 |
| | | 20M+20M | LTE B2 | 20 | QPSK | 1/0 | 18700 | 1860 | 700 | 1940 | LTE B2 | 20 | 898 | 1959.8 | 9 | 8.15 | 8.22 |
| | Mid | 5M+20M | LTE B2 | 5 | QPSK | 1/0 | 18808 | 1870.8 | 808 | 1950.8 | LTE B2 | 20 | 925 | 1962.5 | 9 | 7.87 | 7.99 |
| | | 20M+5M | LTE B2 | 5 | QPSK | 1/0 | 18875 | 1877.5 | 875 | 1957.5 | LTE B2 | 5 | 992 | 1969.2 | 9 | 7.51 | 7.58 |
| | | 10M+15M | LTE B2 | 10 | QPSK | 1/0 | 18829 | 1872.9 | 829 | 1952.9 | LTE B2 | 15 | 949 | 1964.9 | 9 | 7.68 | 7.73 |
| | | 15M+10M | LTE B2 | 10 | QPSK | 1/0 | 18851 | 1875.1 | 851 | 1955.1 | LTE B2 | 10 | 971 | 1967.1 | 9 | 7.32 | 7.42 |
| | | 10M+20M | LTE B2 | 10 | QPSK | 1/0 | 18806 | 1870.6 | 806 | 1950.6 | LTE B2 | 20 | 950 | 1965 | 9 | 7.44 | 7.53 |
| | | 20M+10M | LTE B2 | 10 | QPSK | 1/0 | 18851 | 1875.1 | 851 | 1955.1 | LTE B2 | 10 | 995 | 1969.5 | 9 | 7.39 | 7.44 |
| | | 15M+15M | LTE B2 | 15 | QPSK | 1/0 | 18825 | 1872.5 | 825 | 1952.5 | LTE B2 | 15 | 975 | 1967.5 | 9 | 7.42 | 7.48 |
| | | 15M+20M | LTE B2 | 15 | QPSK | 1/0 | 18803 | 1870.3 | 803 | 1950.3 | LTE B2 | 20 | 974 | 1967.4 | 9 | 7.35 | 7.41 |
| | | 20M+15M | LTE B2 | 15 | QPSK | 1/0 | 18826 | 1872.6 | 826 | 1952.6 | LTE B2 | 15 | 997 | 1969.7 | 9 | 7.52 | 7.57 |
| | | 20M+20M | LTE B2 | 20 | QPSK | 1/0 | 18801 | 1870.1 | 801 | 1950.1 | LTE B2 | 20 | 999 | 1969.9 | 9 | 7.49 | 7.55 |
| | High | 5M+20M | LTE B2 | 5 | QPSK | 1/0 | 18983 | 1888.3 | 983 | 1968.3 | LTE B2 | 20 | 1100 | 1980 | 9 | 7.84 | 7.91 |
| | | 20M+5M | LTE B2 | 5 | QPSK | 1/0 | 19050 | 1895 | 1050 | 1975 | LTE B2 | 5 | 1167 | 1986.7 | 9 | 7.86 | 7.93 |
| | | 10M+15M | LTE B2 | 10 | QPSK | 1/0 | 19005 | 1890.5 | 1005 | 1970.5 | LTE B2 | 15 | 1125 | 1982.5 | 9 | 7.84 | 7.88 |
| | | 15M+10M | LTE B2 | 10 | QPSK | 1/0 | 19027 | 1892.7 | 1027 | 1972.7 | LTE B2 | 10 | 1147 | 1984.7 | 9 | 7.91 | 7.95 |
| | | 10M+20M | LTE B2 | 10 | QPSK | 1/0 | 18956 | 1885.6 | 956 | 1965.6 | LTE B2 | 20 | 1100 | 1980 | 9 | 7.79 | 7.91 |
| | | 20M+10M | LTE B2 | 10 | QPSK | 1/0 | 19001 | 1890.1 | 1001 | 1970.1 | LTE B2 | 10 | 1145 | 1984.5 | 9 | 7.75 | 7.88 |
| | | 15M+15M | LTE B2 | 15 | QPSK | 1/0 | 18975 | 1887.5 | 975 | 1967.5 | LTE B2 | 15 | 1125 | 1982.5 | 9 | 7.43 | 7.51 |
| | | 15M+20M | LTE B2 | 15 | QPSK | 1/0 | 18929 | 1882.9 | 929 | 1962.9 | LTE B2 | 20 | 1100 | 1980 | 9 | 7.39 | 7.44 |
| | | 20M+15M | LTE B2 | 15 | QPSK | 1/0 | 18951 | 1885.1 | 951 | 1965.1 | LTE B2 | 15 | 1122 | 1982.2 | 9 | 7.74 | 7.81 |
| | | 20M+20M | LTE B2 | 20 | QPSK | 1/0 | 18902 | 1880.2 | 902 | 1960.2 | LTE B2 | 20 | 1100 | 1980 | 9 | 7.66 | 7.72 |
| CA_5B | Low | 5M+10M | LTE B5 | 5 | QPSK | 1/0 | 20428 | 826.8 | 2428 | 871.8 | LTE B5 | 10 | 2500 | 879 | 15.5 | 14.32 | 14.40 |
| | | 10M+5M | LTE B5 | 10 | QPSK | 1/0 | 20450 | 829 | 2450 | 874 | LTE B5 | 5 | 2522 | 881.2 | 15.5 | 14.45 | 14.50 |
| | | 10M+10M | LTE B5 | 10 | QPSK | 1/0 | 20450 | 829 | 2450 | 874 | LTE B5 | 10 | 2549 | 883.9 | 15.5 | 14.43 | 14.50 |
| | Mid | 5M+10M | LTE B5 | 5 | QPSK | 1/0 | 20478 | 831.8 | 2478 | 876.8 | LTE B5 | 10 | 2550 | 884 | 15.5 | 14.54 | 14.61 |
| | | 10M+5M | LTE B5 | 10 | QPSK | 1/0 | 20500 | 834 | 2500 | 879 | LTE B5 | 5 | 2572 | 886.2 | 15.5 | 14.69 | 14.73 |
| | | 10M+10M | LTE B5 | 10 | QPSK | 1/0 | 20476 | 831.6 | 2476 | 876.6 | LTE B5 | 10 | 2575 | 886.5 | 15.5 | 14.57 | 14.65 |
| | High | 5M+10M | LTE B5 | 5 | QPSK | 1/0 | 20528 | 836.8 | 2528 | 881.8 | LTE B5 | 10 | 2600 | 889 | 15.5 | 14.76 | 14.82 |
| | | 10M+5M | LTE B5 | 10 | QPSK | 1/0 | 20550 | 839 | 2550 | 884 | LTE B5 | 5 | 2622 | 891.2 | 15.5 | 14.74 | 14.83 |
| | | 10M+10M | LTE B5 | 10 | QPSK | 1/0 | 20501 | 834.1 | 2501 | 879.1 | LTE B5 | 10 | 2600 | 889 | 15.5 | 14.63 | 14.69 |

| E-UTRA CA configuration | | CC-Combo | PCC | | | | | | | | SCC | | | | Tune-up For TX Power With DL CA | Power | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Band | Bandwidth [MHZ] | Modulation | RB Size/Offset | Channel （UL) | Frequency [MHZ] | Channel （DL) | Frequency [MHZ] | Band | Bandwidth [MHZ] | Channel （DL) | Frequency [MHZ] | | TX power with DL CA | TX Power Single Carrier |
| CA_7C | Low | 10M+20M | LTE B7 | 10 | QPSK | 1/0 | 20805 | 2505.5 | 2805 | 2625.5 | LTE B7 | 20 | 2949 | 2639.9 | 8 | 7.34 | 7.38 |
| | | 20M+10M | LTE B7 | 20 | QPSK | 1/0 | 20850 | 2510 | 2850 | 2630 | LTE B7 | 10 | 2994 | 2644.4 | 8 | 7.47 | 7.55 |
| | | 15M+15M | LTE B7 | 15 | QPSK | 1/0 | 20825 | 2507.5 | 2825 | 2627.5 | LTE B7 | 15 | 2975 | 2642.5 | 8 | 7.14 | 7.22 |
| | | 15M+20M | LTE B7 | 15 | QPSK | 1/0 | 20828 | 2507.8 | 2828 | 2627.8 | LTE B7 | 20 | 2999 | 2644.9 | 8 | 7.16 | 7.22 |
| | | 20M+15M | LTE B7 | 20 | QPSK | 1/0 | 20850 | 2510 | 2850 | 2630 | LTE B7 | 15 | 3021 | 2647.1 | 8 | 7.39 | 7.55 |
| | | 20M+20M | LTE B7 | 20 | QPSK | 1/0 | 20850 | 2510 | 2850 | 2630 | LTE B7 | 20 | 3048 | 2649.8 | 8 | 7.43 | 7.55 |
| | Mid | 10M+20M | LTE B7 | 10 | QPSK | 1/0 | 21006 | 2525.6 | 3006 | 2645.6 | LTE B7 | 20 | 3150 | 2660 | 8 | 7.26 | 7.31 |
| | | 20M+10M | LTE B7 | 20 | QPSK | 1/0 | 21051 | 2530.1 | 3051 | 2650.1 | LTE B7 | 10 | 3195 | 2664.5 | 8 | 7.29 | 7.35 |
| | | 15M+15M | LTE B7 | 15 | QPSK | 1/0 | 21025 | 2527.5 | 3025 | 2647.5 | LTE B7 | 15 | 3175 | 2662.5 | 8 | 6.93 | 7.02 |
| | | 15M+20M | LTE B7 | 15 | QPSK | 1/0 | 21003 | 2525.3 | 3003 | 2645.3 | LTE B7 | 20 | 3174 | 2662.4 | 8 | 6.97 | 7.07 |
| | | 20M+15M | LTE B7 | 20 | QPSK | 1/0 | 21026 | 2527.6 | 3026 | 2647.6 | LTE B7 | 15 | 3197 | 2664.7 | 8 | 7.21 | 7.29 |
| | | 20M+20M | LTE B7 | 20 | QPSK | 1/0 | 21001 | 2525.1 | 3001 | 2645.1 | LTE B7 | 20 | 3199 | 2664.9 | 8 | 7.14 | 7.17 |
| | High | 10M+20M | LTE B7 | 10 | QPSK | 1/0 | 21206 | 2545.6 | 3206 | 2665.6 | LTE B7 | 20 | 3350 | 2680 | 8 | 7.18 | 7.28 |
| | | 20M+10M | LTE B7 | 20 | QPSK | 1/0 | 21251 | 2550.1 | 3251 | 2670.1 | LTE B7 | 10 | 3395 | 2684.5 | 8 | 7.38 | 7.48 |
| | | 15M+15M | LTE B7 | 15 | QPSK | 1/0 | 21225 | 2547.5 | 3225 | 2667.5 | LTE B7 | 15 | 3375 | 2682.5 | 8 | 6.84 | 6.87 |
| | | 15M+20M | LTE B7 | 15 | QPSK | 1/0 | 21179 | 2542.9 | 3179 | 2662.9 | LTE B7 | 20 | 3350 | 2680 | 8 | 6.82 | 6.91 |
| | | 20M+15M | LTE B7 | 20 | QPSK | 1/0 | 21201 | 2545.1 | 3201 | 2665.1 | LTE B7 | 15 | 3372 | 2682.2 | 8 | 7.42 | 7.53 |
| | | 20M+20M | LTE B7 | 20 | QPSK | 1/0 | 21152 | 2540.2 | 3152 | 2660.2 | LTE B7 | 20 | 3350 | 2680 | 8 | 7.41 | 7.50 |
| CA_12B | Low | 5M+5M | LTE B12 | 5 | QPSK | 1/0 | 23035 | 701.5 | 5035 | 731.5 | LTE B12 | 5 | 5083 | 736.3 | 14 | 12.97 | 13.05 |
| | | 5M+10M | LTE B12 | 5 | QPSK | 1/0 | 23035 | 701.5 | 5035 | 731.5 | LTE B12 | 10 | 5107 | 738.7 | 14 | 12.95 | 13.05 |
| | Mid | 5M+5M | LTE B12 | 5 | QPSK | 1/0 | 23070 | 705 | 5070 | 735 | LTE B12 | 5 | 5118 | 739.8 | 14 | 13.38 | 13.47 |
| | | 5M+10M | LTE B12 | 5 | QPSK | 1/0 | 23045 | 702.5 | 5045 | 732.5 | LTE B12 | 10 | 5117 | 739.7 | 14 | 13.04 | 13.14 |
| | High | 5M+5M | LTE B12 | 5 | QPSK | 1/0 | 23107 | 708.7 | 5107 | 738.7 | LTE B12 | 5 | 5155 | 743.5 | 14 | 13.79 | 13.86 |
| | | 5M+10M | LTE B12 | 5 | QPSK | 1/0 | 23058 | 703.8 | 5058 | 733.8 | LTE B12 | 10 | 5130 | 741 | 14 | 13.15 | 13.26 |

### 7.1.5 WIFI TEST CONFIGURATION

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal.

2.4G

| Mode | 802.11b | 802.11g | 802.11n HT20 | 802.11n HT40 |
|---|---|---|---|---|
| Duty cycle | 100% | | | |
| Crest factor | 1 | | | |

5G

| Mode | 802.11a | 802.11n HT20 | 802.11n HT40 | 802.11ac HT20 | 802.11ac HT40 | 802.11ac VH80 |
|---|---|---|---|---|---|---|
| Duty cycle | 97.36% | 97.17% | 92.46% | 97.18% | 92.14% | 91.62% |
| Crest factor | 1.027 | 1.029 | 1.082 | 1.029 | 1.085 | 1.091 |

For WiFi SAR testing, a communication link is set up with the test mode 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 248227 D01 are applied.

#### 7.1.5.1 2.4G SAR Test Requirements

**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 for the exposure configuration is ≤ 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.

**2.4 GHz 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. 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 ≤ 1.2 W/kg.

**SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 2.4 GHz 802.11g/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.

### 7.1.5.2 5G SAR Test Requirements

✧ **U-NII-1 and U-NII-2A Band**

For devices that operate in both U-NII-1 and U-NII-2A bands, 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 ≤ 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. 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 ≤ 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.

✧ **U-NII-2C, 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, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.

Unless band gap channels are permanently disabled, they must be considered for SAR testing. 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.11 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.

### 7.1.5.3 OFDM transmission mode and SAR test channel selection

For the 2.4GHz and 5GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations(for example 802.11a,802.11n and 802.11ac,or 802.11g and 802.11n,with the same channel bandwidth, modulation, and data rate, etc.),the lower order 802.11 mode(i.e.802.11a then 802.11n and 802.11ac,or 802.11g then 802.11n) is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

#### 7.1.5.4 Initial test configuration procedure

For OFDM, in both 2.4GHz and 5GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output powers is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output power will be the initial test configuration.
When the reported SAR is≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurement.

## 7.2 TEST POSITION

### 7.2.1 BODY

The overall diagonal dimension of the display section of a tablet is 29.303cm>20cm, per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the Tablet touching the phantom.SAR evaluation for the front surface of tablet display screens are generally not necessary. The SAR Exclusion Threshold in KDB 447498 D01can 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 adjacent the phantom and the edge containing the antenna positioned perpendicular to the phantom.

**SAR test reduction and exclusion guidance**

(1)The SAR exclusion threshold for distances<50mm is defined by the following equation:

$$\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \sqrt{\text{Frequency (GHz)}} \leq 3.0$$

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

(2)The SAR exclusion threshold for distances>50mm is defined by the following equation, as illustrated in KDB 447498 D01 Appendix B:

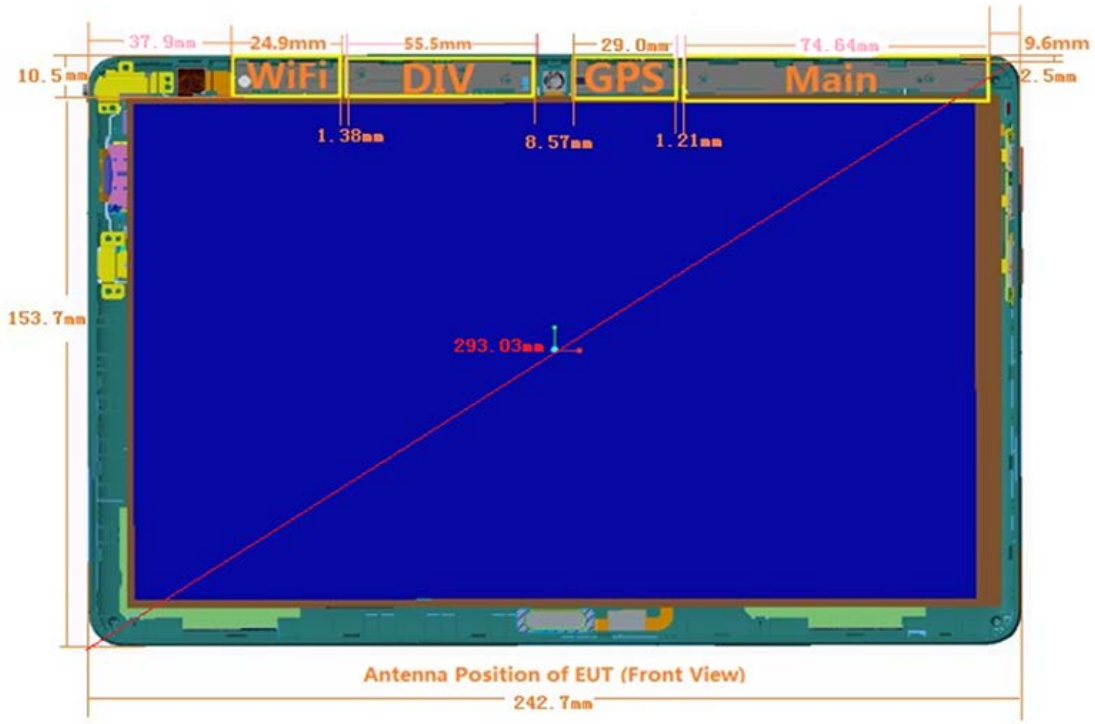
a) at 100 MHz to1500 MHz

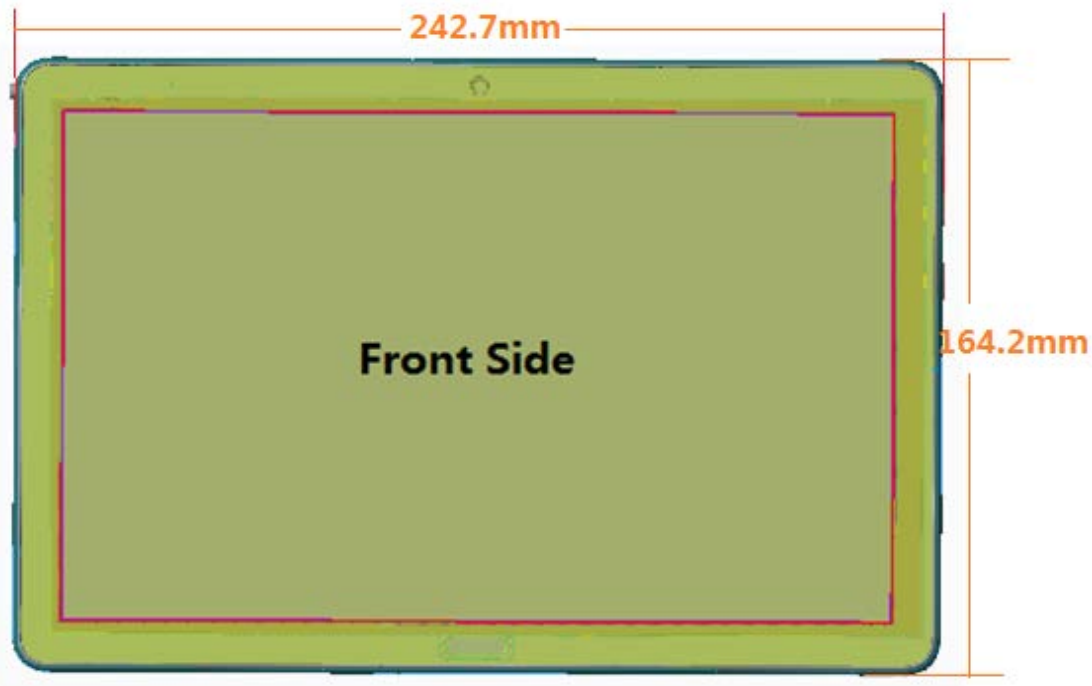
**[Power allowed at numeric Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · ($f_{(MHz)}$/150)] mW**

b) at >1500MHz and ≤6GHz

**[Power allowed at numeric Threshold at 50 mm in step 1) + (test separation distance - 50 mm) ·10] mW**

The location of the antenna inside EUT is as below.




Figue1: The location of the antennas & the SAR sensor

Note: The proximity sensor and Main antenna use same metallic electrode, so the location is same.

| | Antenna/Sensor-to- DUT sides separation distances | | | | | |
|---|---|---|---|---|---|---|
| **Tx Antenna** | **Front side** | **Back side** | **Left side** | **Right side** | **Top side** | **Bottom side** |
| Main Antenna | 1.98mm | 1.98mm | 158.46mm | 9.6mm | 2.5mm | 153.7mm |
| WiFi Antenna | 1.98mm | 1.98mm | 37.9mm | 179.9mm | 2.5mm | 153.7mm |
| DIV Ant & GPS Ant | Only receive signal, so it was not figured out in the following pictures | | | | | |

In the sensor triggering power measurement tests, Main power controlling logic for Main non signaling mode is the same as Main signaling mode. The Specific external test software and chipset based internal test modes only make sure that proximity sensor logic can be triggered in Main non signaling mode, and do not modify any settings in the phone. It can be ensured that the unmodified settings in production units, including maximum output power, amplifier gain and other RF performance or tuning parameters, are used for SAR measurement per KDB248227.

**The distance <50mm**

| Mode | Position | Distance (mm) | Pmax (dBm) | Pmax (mW) | f (GHz) | Calculation Result | SAR Exclusion threshold | Test Requirement (Yes/No) |
|---|---|---|---|---|---|---|---|---|
| GSM850 | Rear/Top | 5 | 32.5 | 1778.28 | 0.8488 | 327.67 | 3 | Yes |
| | Right | 9.6 | 32.5 | 1778.28 | 0.8488 | 170.66 | 3 | Yes |
| GSM1900 | Rear/Top | 5 | 29.5 | 891.25 | 1.9098 | 246.33 | 3 | Yes |
| | Right | 9.6 | 29.5 | 891.25 | 1.9098 | 128.30 | 3 | Yes |
| UMTS B2 | Rear/Top | 5 | 25 | 316.23 | 1.9076 | 87.35 | 3 | Yes |
| | Right | 9.6 | 25 | 316.23 | 1.9076 | 45.50 | 3 | Yes |
| UMTS B4 | Rear/Top | 5 | 25 | 316.23 | 1.7526 | 83.73 | 3 | Yes |
| | Right | 9.6 | 25 | 316.23 | 1.7526 | 43.61 | 3 | Yes |
| UMTS B5 | Rear/Top | 5 | 25.5 | 354.81 | 0.8466 | 65.29 | 3 | Yes |
| | Right | 9.6 | 25.5 | 354.81 | 0.8466 | 34.01 | 3 | Yes |
| LTE B2 | Rear/Top | 5 | 24 | 251.19 | 1.9 | 69.25 | 3 | Yes |
| | Right | 9.6 | 24 | 251.19 | 1.9 | 36.07 | 3 | Yes |
| LTE B4 | Rear/Top | 5 | 25 | 316.23 | 1.7450 | 83.55 | 3 | Yes |
| | Right | 9.6 | 25 | 316.23 | 1.7450 | 43.51 | 3 | Yes |
| LTE B5 | Rear/Top | 5 | 25.5 | 354.81 | 0.8440 | 65.19 | 3 | Yes |
| | Right | 9.6 | 25.5 | 354.81 | 0.8440 | 33.95 | 3 | Yes |
| LTE B7 | Rear/Top | 5 | 24 | 251.19 | 2.56 | 80.38 | 3 | Yes |
| | Right | 9.6 | 24 | 251.19 | 2.56 | 41.86 | 3 | Yes |
| LTE B12 | Rear/Top | 5 | 25.5 | 354.81 | 0.711 | 59.84 | 3 | Yes |
| | Right | 9.6 | 25.5 | 354.81 | 0.711 | 31.16 | 3 | Yes |
| LTE B17 | Rear/Top | 5 | 25.5 | 354.81 | 0.711 | 59.84 | 3 | Yes |
| | Right | 9.6 | 25.5 | 354.81 | 0.711 | 31.16 | 3 | Yes |
| BT | Rear/Top | 5 | 9.5 | 8.91 | 2.48 | 2.81 | 3 | No |
| | Left | 37.9 | 9.5 | 8.91 | 2.48 | 0.37 | 3 | No |
| 2.4G WiFi | Rear/Top | 5 | 17.5 | 56.23 | 2.462 | 17.65 | 3 | Yes |
| | Left | 37.9 | 17.5 | 56.23 | 2.462 | 2.33 | 3 | No |
| 5.2G WiFi | Rear/Top | 5 | 17 | 50.12 | 5.24 | 22.95 | 3 | Yes |
| | Left | 37.9 | 17 | 50.12 | 5.24 | 3.03 | 3 | Yes |
| 5.3G WiFi | Rear/Top | 5 | 17 | 50.12 | 5.32 | 23.12 | 3 | Yes |
| | Left | 37.9 | 17 | 50.12 | 5.32 | 3.05 | 3 | Yes |
| 5.5G WiFi | Rear/Top | 5 | 17 | 50.12 | 5.7 | 23.93 | 3 | Yes |
| | Left | 37.9 | 17 | 50.12 | 5.7 | 3.16 | 3 | Yes |
| 5.8G WiFi | Rear/Top | 5 | 17 | 50.12 | 5.825 | 24.19 | 3 | Yes |
| | Left | 37.9 | 17 | 50.12 | 5.825 | 3.19 | 3 | Yes |

**The distance >50mm**

| Mode | Position | Distance (mm) | Pmax (dBm) | Pmax (mW) | f (GHz) | Power allowed at numeric Threshold at 50mm | SAR Exclusion Result | Test Requirement (Yes/No) |
|---|---|---|---|---|---|---|---|---|
| GSM850 | Left | 158.46 | 32.5 | 1778.28 | 0.8488 | 162.81 | 776.55 | Yes |
| | Bottom | 153.7 | 32.5 | 1778.28 | 0.8488 | 162.81 | 749.62 | Yes |
| GSM1900 | Left | 158.46 | 29.5 | 891.25 | 1.9098 | 108.54 | 1193.14 | No |
| | Bottom | 153.7 | 29.5 | 891.25 | 1.9098 | 108.54 | 1145.54 | No |
| UMTS B2 | Left | 158.46 | 25 | 316.23 | 1.9076 | 108.60 | 1193.20 | No |
| | Bottom | 153.7 | 25 | 316.23 | 1.9076 | 108.60 | 1145.60 | No |
| UMTS B4 | Left | 158.46 | 25 | 316.23 | 1.7526 | 113.31 | 1197.91 | No |
| | Bottom | 153.7 | 25 | 316.23 | 1.7526 | 113.31 | 1150.31 | No |
| UMTS B5 | Left | 158.46 | 25.5 | 354.81 | 0.8466 | 163.02 | 775.17 | No |
| | Bottom | 153.7 | 25.5 | 354.81 | 0.8466 | 163.02 | 748.31 | No |
| LTE B2 | Left | 158.46 | 24 | 251.19 | 1.9 | 108.82 | 1193.42 | No |
| | Bottom | 153.7 | 24 | 251.19 | 1.9 | 108.82 | 1145.82 | No |
| LTE B4 | Left | 158.46 | 25 | 316.23 | 1.745 | 113.55 | 1198.15 | No |
| | Bottom | 153.7 | 25 | 316.23 | 1.745 | 113.55 | 1150.55 | No |
| LTE B5 | Left | 158.46 | 25.5 | 354.81 | 0.844 | 163.28 | 773.54 | No |
| | Bottom | 153.7 | 25.5 | 354.81 | 0.844 | 163.28 | 746.76 | No |
| LTE B7 | Left | 158.46 | 24 | 251.19 | 2.56 | 93.75 | 1178.35 | No |
| | Bottom | 153.7 | 24 | 251.19 | 2.56 | 93.75 | 1130.75 | No |
| LTE B12 | Left | 158.46 | 25.5 | 354.81 | 0.711 | 177.89 | 691.99 | No |
| | Bottom | 153.7 | 25.5 | 354.81 | 0.711 | 177.89 | 669.43 | No |
| LTE B17 | Left | 158.46 | 25.5 | 354.81 | 0.711 | 177.89 | 691.99 | No |
| | Bottom | 153.7 | 25.5 | 354.81 | 0.711 | 177.89 | 669.43 | No |
| BT | Right | 179.9 | 9.5 | 8.91 | 2.48 | 95.25 | 1394.25 | No |
| | Bottom | 153.7 | 9.5 | 8.91 | 2.48 | 95.25 | 1132.25 | No |
| 2.4G WiFi | Right | 179.9 | 17.5 | 56.23 | 2.462 | 95.60 | 1394.60 | No |
| | Bottom | 153.7 | 17.5 | 56.23 | 2.462 | 95.60 | 1132.60 | No |
| 5.2G WiFi | Right | 179.9 | 17 | 50.12 | 5.24 | 65.53 | 1364.53 | No |
| | Bottom | 153.7 | 17 | 50.12 | 5.24 | 65.53 | 1102.53 | No |
| 5.3G WiFi | Right | 179.9 | 17 | 50.12 | 5.32 | 65.03 | 1364.03 | No |
| | Bottom | 153.7 | 17 | 50.12 | 5.32 | 65.03 | 1102.03 | No |
| 5.5G WiFi | Right | 179.9 | 17 | 50.12 | 5.7 | 62.83 | 1361.83 | No |
| | Bottom | 153.7 | 17 | 50.12 | 5.7 | 62.83 | 1099.83 | No |
| 5.8G WiFi | Right | 179.9 | 17 | 50.12 | 5.825 | 62.15 | 1361.15 | No |
| | Bottom | 153.7 | 17 | 50.12 | 5.825 | 62.15 | 1099.15 | No |

### 7.3 PROXIMITY SENSOR POWER REDUCTION INFORMATION

In this section, the following list is used to prepare an inquiry seeking SAR test guidance for proximity sensor power reduction. The procedures in KDB616217 is applied for SAR testing.

#### 7.3.1 GENERAL PROXIMITY SENSOR IMPLEMENTATION DESCRIPTION

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 to ensure SAR compliance for the following scenarios: To reduce the output power of main antennas during body operating configurations.

**Power Reduction operation table**

| ANT | Test Position | Active distance（mm） |
|---|---|---|
| Main Antenna | Rear Face | 28mm |
| | Top Side | 38mm |
| WIFI | Rear Face | 12mm |
| | Top Side | 15mm |

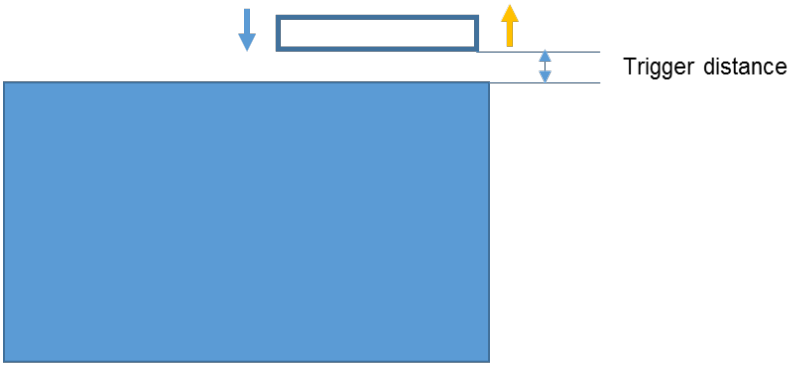
| Band | Full power level (dBm) | Reduced power level(dBm) |
|---|---|---|
| GSM 850 | 34.5 | 24.5 |
| GSM 1900 | 31.5 | 19.5 |
| UMTS Band 2 | 25 | 9.5 |
| UMTS Band 4 | 25 | 12.5 |
| UMTS Band 5 | 25.5 | 15.5 |
| LTE Band 2 | 24 | 11 |
| LTE Band 4 | 25 | 12.5 |
| LTE Band 5 | 25.5 | 15.5 |
| LTE Band 7 | 24 | 8 |
| LTE Band 12 | 25.5 | 14 |
| LTE Band 17 | 25.5 | 14 |
| 2.4G WIFI | 17.5 | 9.5 |
| 5G WIFI | 17 | 7 |

Note:
1) Since the capacitive proximity sensor triggering distance for the rear face and top side is N mm , a conservative distance of N-1 mm was requried for addtional SAR test at maximum power level with sensor off.
2) SAR tests with proximity sensor power reduction are only required for the sides of frequency bands in the table above. For the other sides or other frequency bands of the device, SAR is still tested at the maximum power level with sensor off.

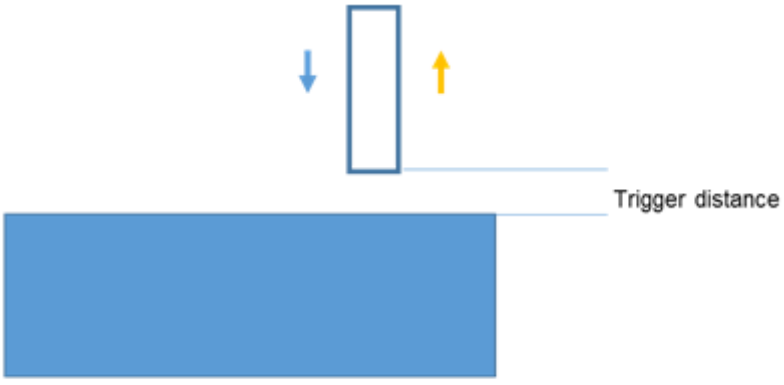
### 7.3.2 PROXIMITY SENSOR COVERAGE, DISTANCE AND ANGLE

#### 7.3.2.1 Procedures for determining proximity sensor triggering distances(Per KDB616217§6.2)

The device was tested by the test lab to determine the proximity sensor triggering distances for the back side and top side of the device. To ensure all production units are compliant, the smallest separation distance determined by the sensor triggering minus 1mm, must be used as the test separation distance for SAR testing.
the proximity sensor triggering distance measurement method are as below:




Picture:Proximity sensor tiggering distances assessment Back Side




Picture:Proximity sensor tiggering distances assessment Top Side

**Table: Summary of Trigger Distances**

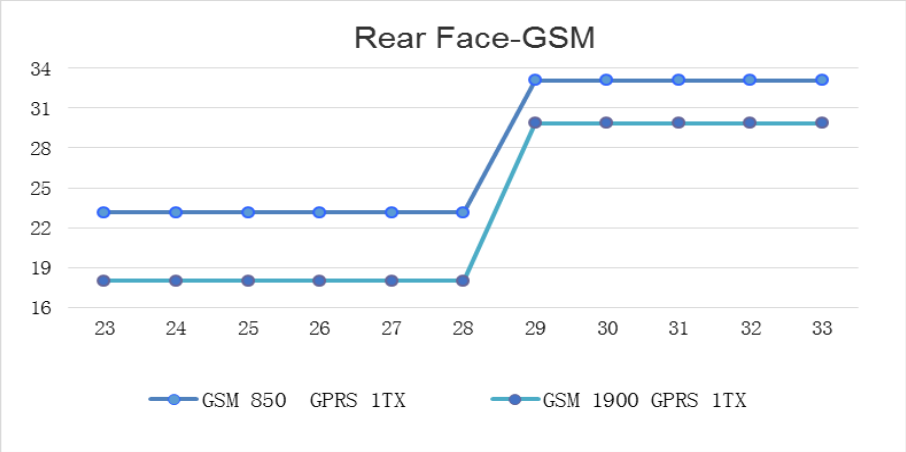
| Band(MHz) | Trigger distance-Back Side | | Trigger distance-Top Side | |
|---|---|---|---|---|
| | Moving toward phantom | Moving away from phantom | Moving toward phantom | Moving away from phantom |
| Main Antenna | 28mm | 28mm | 38mm | 38mm |
| WiFi Antenna | 12mm | 12mm | 15mm | 15mm |

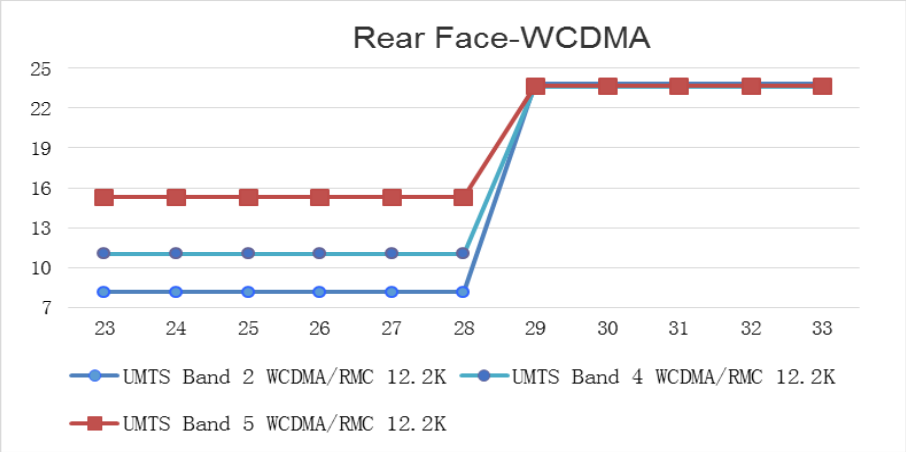
### 7.3.2.2 Procedures for determining antenna and proximity sensor coverage(Per KDB616217 §6.3)

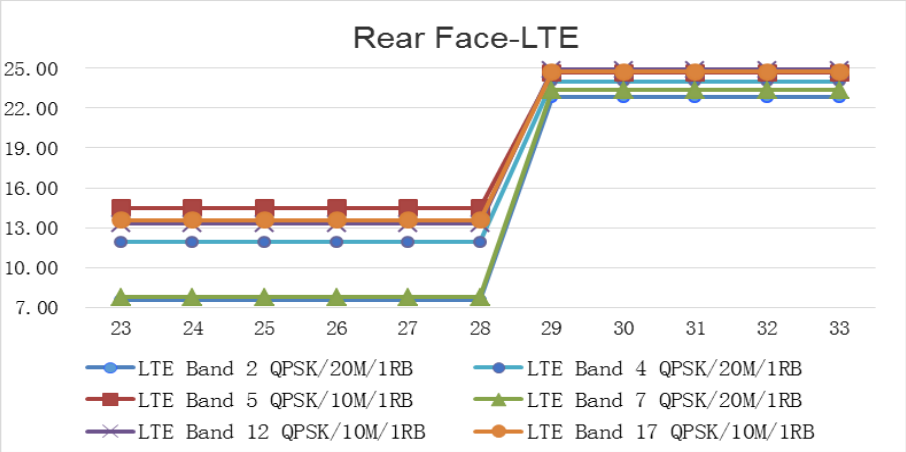
There is no spatial offset between the Main antenna and the proximity sensor element, so procedures for determining the proximity sensor coverage does not need to be assessed.

1) Rear Face of GSM & UMTS & LTE

| mode | | distance(mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rear Face | | | | | | | | | | |
| | | Sensor on | | | | | | Sensor off | | | | |
| | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
| GSM 850 | GPRS 1TX | 23.14 | 23.14 | 23.14 | 23.14 | 23.14 | 23.14 | 33.1 | 33.1 | 33.1 | 33.1 | 33.1 |
| GSM 1900 | GPRS 1TX | 17.98 | 17.98 | 17.98 | 17.98 | 17.98 | 17.98 | 29.88 | 29.88 | 29.88 | 29.88 | 29.88 |
| UMTS Band 2 | WCDMA/RMC 12.2K | 8.15 | 8.15 | 8.15 | 8.15 | 8.15 | 8.15 | 23.84 | 23.84 | 23.84 | 23.84 | 23.84 |
| UMTS Band 4 | WCDMA/RMC 12.2K | 11.03 | 11.03 | 11.03 | 11.03 | 11.03 | 11.03 | 23.65 | 23.65 | 23.65 | 23.65 | 23.65 |
| UMTS Band 5 | WCDMA/RMC 12.2K | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 23.68 | 23.68 | 23.68 | 23.68 | 23.68 |
| LTE Band 2 | QPSK/20M/1RB | 7.52 | 7.52 | 7.52 | 7.52 | 7.52 | 7.52 | 22.82 | 22.82 | 22.82 | 22.82 | 22.82 |
| LTE Band 4 | QPSK/20M/1RB | 11.89 | 11.89 | 11.89 | 11.89 | 11.89 | 11.89 | 24.02 | 24.02 | 24.02 | 24.02 | 24.02 |
| LTE Band 5 | QPSK/10M/1RB | 14.50 | 14.50 | 14.50 | 14.50 | 14.50 | 14.50 | 24.68 | 24.68 | 24.68 | 24.68 | 24.68 |
| LTE Band 7 | QPSK/20M/1RB | 7.76 | 7.76 | 7.76 | 7.76 | 7.76 | 7.76 | 23.36 | 23.36 | 23.36 | 23.36 | 23.36 |
| LTE Band 12 | QPSK/10M/1RB | 13.31 | 13.31 | 13.31 | 13.31 | 13.31 | 13.31 | 24.91 | 24.91 | 24.91 | 24.91 | 24.91 |
| LTE Band 17 | QPSK/10M/1RB | 13.57 | 13.57 | 13.57 | 13.57 | 13.57 | 13.57 | 24.75 | 24.75 | 24.75 | 24.75 | 24.75 |

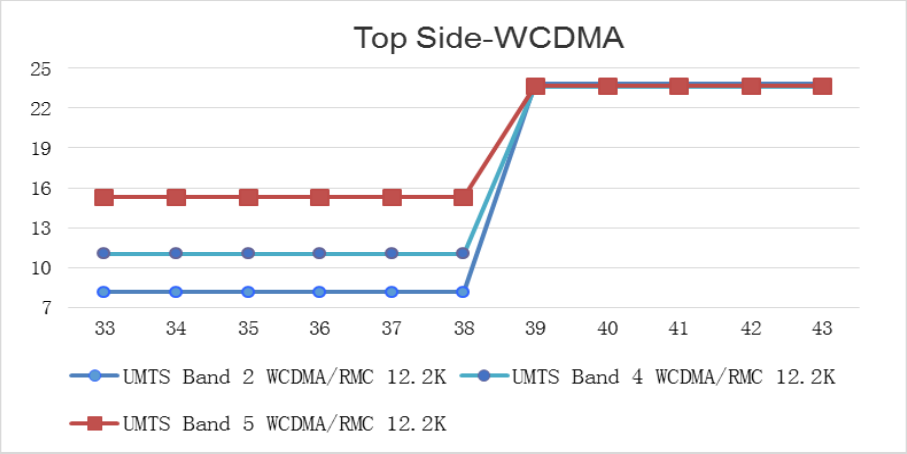


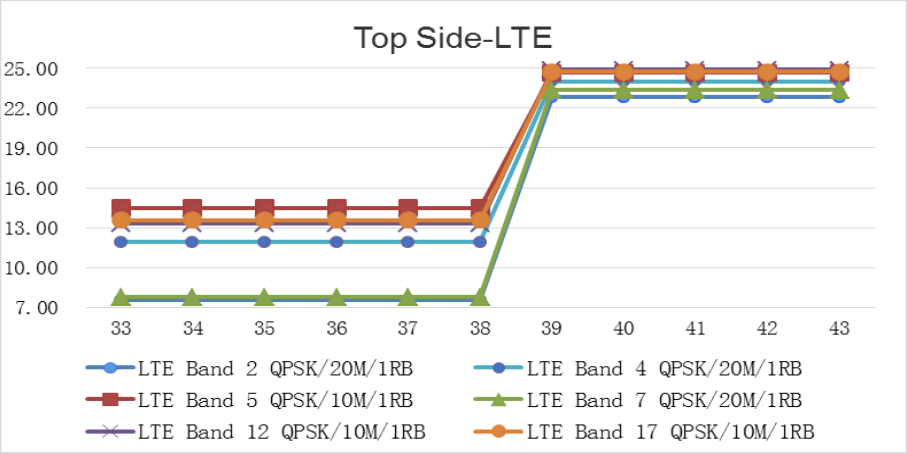






2) Top Side of GSM & UMTS & LTE

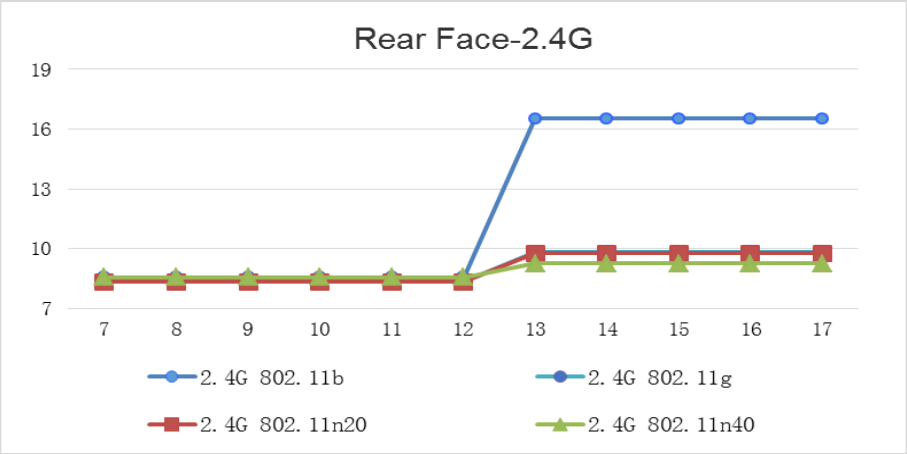
| mode | | distance(mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Top Side | | | | | | | | | | |
| | | Sensor on | | | | | | Sensor off | | | | |
| | | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
| GSM 850 | GPRS 1TX | 23.14 | 23.14 | 23.14 | 23.14 | 23.14 | 23.14 | 33.1 | 33.1 | 33.1 | 33.1 | 33.1 |
| GSM 1900 | GPRS 1TX | 17.98 | 17.98 | 17.98 | 17.98 | 17.98 | 17.98 | 29.88 | 29.88 | 29.88 | 29.88 | 29.88 |
| UMTS Band 2 | WCDMA/RMC 12.2K | 8.15 | 8.15 | 8.15 | 8.15 | 8.15 | 8.15 | 23.84 | 23.84 | 23.84 | 23.84 | 23.84 |
| UMTS Band 4 | WCDMA/RMC 12.2K | 11.03 | 11.03 | 11.03 | 11.03 | 11.03 | 11.03 | 23.65 | 23.65 | 23.65 | 23.65 | 23.65 |
| UMTS Band 5 | WCDMA/RMC 12.2K | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 23.68 | 23.68 | 23.68 | 23.68 | 23.68 |
| LTE Band 2 | QPSK/20M/1RB | 7.52 | 7.52 | 7.52 | 7.52 | 7.52 | 7.52 | 22.82 | 22.82 | 22.82 | 22.82 | 22.82 |
| LTE Band 4 | QPSK/20M/1RB | 11.89 | 11.89 | 11.89 | 11.89 | 11.89 | 11.89 | 24.02 | 24.02 | 24.02 | 24.02 | 24.02 |
| LTE Band 5 | QPSK/10M/1RB | 14.50 | 14.50 | 14.50 | 14.50 | 14.50 | 14.50 | 24.68 | 24.68 | 24.68 | 24.68 | 24.68 |
| LTE Band 7 | QPSK/20M/1RB | 7.76 | 7.76 | 7.76 | 7.76 | 7.76 | 7.76 | 23.36 | 23.36 | 23.36 | 23.36 | 23.36 |
| LTE Band 12 | QPSK/10M/1RB | 13.31 | 13.31 | 13.31 | 13.31 | 13.31 | 13.31 | 24.91 | 24.91 | 24.91 | 24.91 | 24.91 |
| LTE Band 17 | QPSK/10M/1RB | 13.57 | 13.57 | 13.57 | 13.57 | 13.57 | 13.57 | 24.75 | 24.75 | 24.75 | 24.75 | 24.75 |

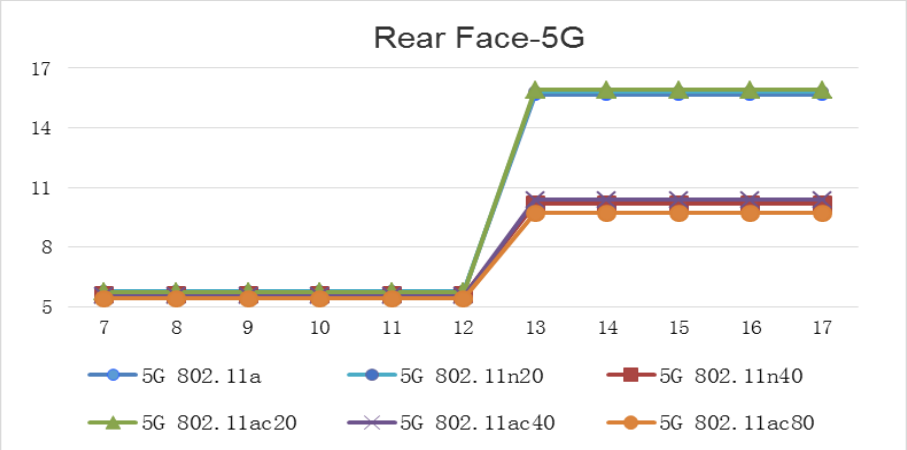

Top Side-WCDMA
25
22
19
16
13
10
7
33
34
35
36
37
38
39
40
41
42
43
UMTS Band 2 WCDMA/RMC 12.2K
UMTS Band 4 WCDMA/RMC 12.2K
UMTS Band 5 WCDMA/RMC 12.2K


Top Side-LTE
25.00
22.00
19.00
16.00
13.00
10.00
7.00
33
34
35
36
37
38
39
40
41
42
43
LTE Band 2 QPSK/20M/1RB
LTE Band 4 QPSK/20M/1RB
LTE Band 5 QPSK/10M/1RB
LTE Band 7 QPSK/20M/1RB
LTE Band 12 QPSK/10M/1RB
LTE Band 17 QPSK/10M/1RB

3) Rear Face of WIFI

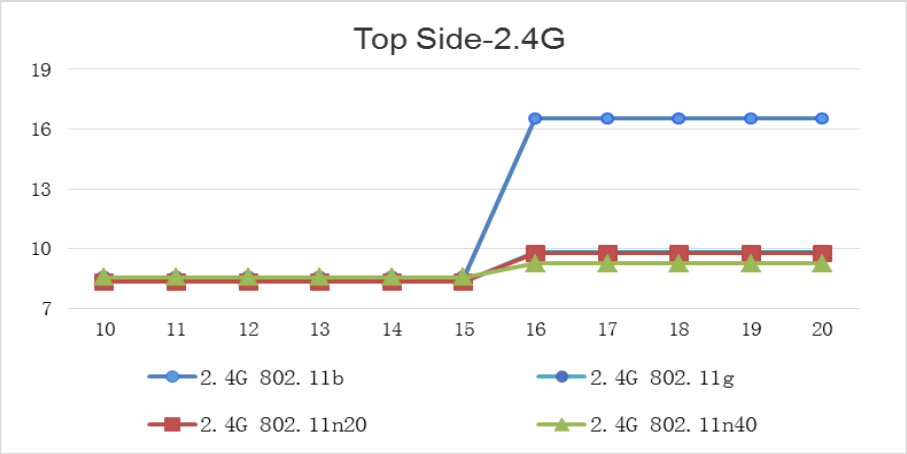
| mode | | distance(mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rear Face | | | | | | | | | | |
| | | Sensor on | | | | | | Sensor off | | | | |
| | | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 2.4G | 802.11b | 8.55 | 8.55 | 8.55 | 8.55 | 8.55 | 8.55 | 16.52 | 16.52 | 16.52 | 16.52 | 16.52 |
| | 802.11g | 8.32 | 8.32 | 8.32 | 8.32 | 8.32 | 8.32 | 9.84 | 9.84 | 9.84 | 9.84 | 9.84 |
| | 802.11n20 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 | 9.75 | 9.75 | 9.75 | 9.75 | 9.75 |
| | 802.11n40 | 8.55 | 8.55 | 8.55 | 8.55 | 8.55 | 8.55 | 9.26 | 9.26 | 9.26 | 9.26 | 9.26 |
| 5G | 802.11a | 5.76 | 5.76 | 5.76 | 5.76 | 5.76 | 5.76 | 15.65 | 15.65 | 15.65 | 15.65 | 15.65 |
| | 802.11n20 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 15.81 | 15.81 | 15.81 | 15.81 | 15.81 |
| | 802.11n40 | 5.57 | 5.57 | 5.57 | 5.57 | 5.57 | 5.57 | 10.18 | 10.18 | 10.18 | 10.18 | 10.18 |
| | 802.11ac20 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 15.92 | 15.92 | 15.92 | 15.92 | 15.92 |
| | 802.11ac40 | 5.52 | 5.52 | 5.52 | 5.52 | 5.52 | 5.52 | 10.37 | 10.37 | 10.37 | 10.37 | 10.37 |
| | 802.11ac80 | 5.39 | 5.39 | 5.39 | 5.39 | 5.39 | 5.39 | 9.72 | 9.72 | 9.72 | 9.72 | 9.72 |

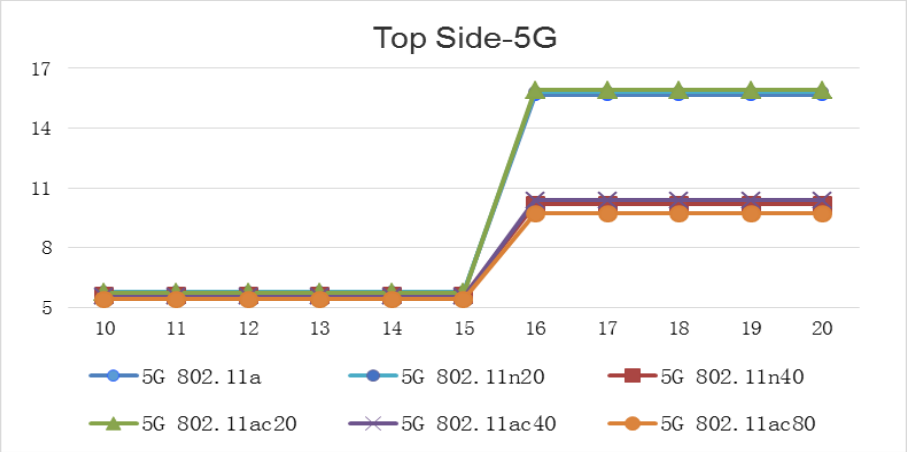


4) Top Side of WIFI

| mode | | distance(mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Top Side | | | | | | | | | | |
| | | Sensor on | | | | | | Sensor off | | | | |
| | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 2.4G | 802.11b | 8.55 | 8.55 | 8.55 | 8.55 | 8.55 | 8.55 | 16.52 | 16.52 | 16.52 | 16.52 | 16.52 |
| | 802.11g | 8.32 | 8.32 | 8.32 | 8.32 | 8.32 | 8.32 | 9.84 | 9.84 | 9.84 | 9.84 | 9.84 |
| | 802.11n20 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 | 9.75 | 9.75 | 9.75 | 9.75 | 9.75 |
| | 802.11n40 | 8.55 | 8.55 | 8.55 | 8.55 | 8.55 | 8.55 | 9.26 | 9.26 | 9.26 | 9.26 | 9.26 |
| 5G | 802.11a | 5.76 | 5.76 | 5.76 | 5.76 | 5.76 | 5.76 | 15.65 | 15.65 | 15.65 | 15.65 | 15.65 |
| | 802.11n20 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 15.81 | 15.81 | 15.81 | 15.81 | 15.81 |
| | 802.11n40 | 5.57 | 5.57 | 5.57 | 5.57 | 5.57 | 5.57 | 10.18 | 10.18 | 10.18 | 10.18 | 10.18 |
| | 802.11ac20 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 15.92 | 15.92 | 15.92 | 15.92 | 15.92 |
| | 802.11ac40 | 5.52 | 5.52 | 5.52 | 5.52 | 5.52 | 5.52 | 10.37 | 10.37 | 10.37 | 10.37 | 10.37 |
| | 802.11ac80 | 5.39 | 5.39 | 5.39 | 5.39 | 5.39 | 5.39 | 9.72 | 9.72 | 9.72 | 9.72 | 9.72 |



### 7.3.2.3 Procedures for determining device tilt angle influences to proximity sensor triggering(Per KDB616217 §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 +/- 45°. 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 +/- 45°.

The proximity sensor triggering tilt angle measurement method are as below:

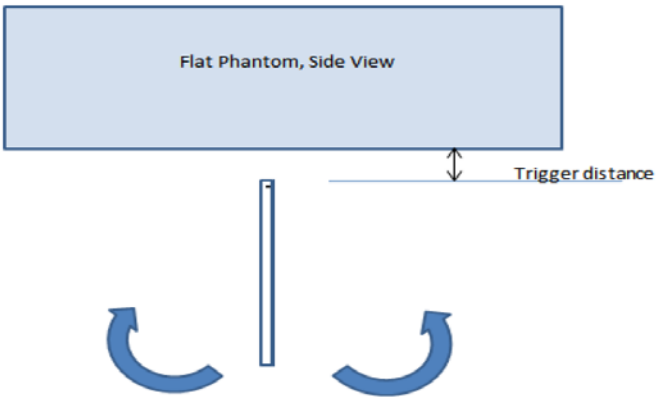



**Table: Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering**

| Mode | Minimum distance at which power reduction was maintained over +/-45° | | Power reduction status(ON/OFF) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rear Face | Top Side | -45° | -40° | -30° | -20° | -10° | -0° | 10° | 20° | 30° | 40° | 45° |
| GSM 850 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| GSM 1900 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| UMTS B2 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| UMTS B5 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| UMTS B8 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| LTE B2 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| LTE B4 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| LTE B5 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| LTE B7 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| LTE B12 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| LTE B17 | 28mm | 38mm | on | on | on | on | on | on | on | on | on | on | on |
| 2.4G WIFI | 12mm | 15mm | on | on | on | on | on | on | on | on | on | on | on |
| 5G WIFI | 12mm | 15mm | on | on | on | on | on | on | on | on | on | on | on |

**Conclusion:** It can be ensured that the proximity sensor can be valid triggered for the DUT tilt coverage exposure condition.

## 8. TEST RESULT

### 8.1 CONDUCTED POWER RESULTS

#### 8.1.1 CONDUCTED POWER MEASUREMENTS OF GSM850 AND GSM1900

1) Conducted power measurement results of GSM (Sensor off)

| GSM850 | | Tune-up | Max Burst Average Power (dBm) | | | Tune-up | Max Frame Average Power (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 128CH | 190CH | 251CH | | 128CH | 190CH | 251CH |
| | | | 824.2 MHz | 836.6 MHz | 848.8 MHz | | 824.2 MHz | 836.6 MHz | 848.8 MHz |
| GSM (CS) | | 34.50 | 33.07 | 33.10 | 33.13 | 25.31 | 23.88 | 23.91 | 23.94 |
| GPRS/EDGE (GMSK) | 1 Tx Slot | 34.50 | 33.07 | 33.10 | 33.13 | 25.31 | 23.88 | 23.91 | 23.94 |
| | 2 Tx Slot | **32.50** | 31.53 | **31.50** | 31.52 | **26.37** | 25.40 | **25.37** | 25.39 |
| | 3 Tx Slot | 30.50 | 29.28 | 29.28 | 29.29 | 26.08 | 24.86 | 24.86 | 24.87 |
| | 4 Tx Slot | 29.50 | 28.32 | 28.32 | 28.33 | 26.32 | 25.14 | 25.14 | 25.15 |
| EDGE (8PSK) | 1 Tx Slot | 27.50 | 26.82 | 26.61 | 26.58 | 18.31 | 17.63 | 17.42 | 17.39 |
| | 2 Tx Slot | 25.50 | 25.24 | 25.01 | 24.92 | 19.37 | 19.11 | 18.88 | 18.79 |
| | 3 Tx Slot | 23.50 | 22.98 | 23.01 | 23.05 | 19.08 | 18.56 | 18.59 | 18.63 |
| | 4 Tx Slot | 22.50 | 21.94 | 21.85 | 22.04 | 19.32 | 18.76 | 18.67 | 18.86 |
| GSM1900 | | Tune-up | Max Burst Average Power (dBm) | | | Tune-up | Max Frame Average Power (dBm) | | |
| | | | 512CH | 661CH | 810CH | | 512CH | 661CH | 810CH |
| | | | 1850.2 MHz | 1880 MHz | 1909.8 MHz | | 1850.2 MHz | 1880 MHz | 1909.8 MHz |
| GSM (CS) | | 31.50 | 29.89 | 29.89 | 29.73 | 22.31 | 20.70 | 20.70 | 20.54 |
| GPRS/EDGE (GMSK) | 1 Tx Slot | 31.50 | 29.89 | 29.88 | 29.72 | 22.31 | 20.70 | 20.69 | 20.53 |
| | 2 Tx Slot | **29.50** | 27.75 | **27.91** | 27.81 | **23.37** | 21.62 | **21.78** | 21.68 |
| | 3 Tx Slot | 27.50 | 25.72 | 25.86 | 25.80 | 23.08 | 21.30 | 21.44 | 21.38 |
| | 4 Tx Slot | 26.50 | 24.71 | 24.88 | 24.80 | 23.32 | 21.53 | 21.70 | 21.62 |
| EDGE (8PSK) | 1 Tx Slot | 27.00 | 25.50 | 25.55 | 25.70 | 17.81 | 16.31 | 16.36 | 16.51 |
| | 2 Tx Slot | 25.00 | 23.26 | 23.35 | 23.46 | 18.87 | 17.13 | 17.22 | 17.33 |
| | 3 Tx Slot | 23.00 | 21.56 | 21.62 | 21.46 | 18.58 | 17.14 | 17.20 | 17.04 |
| | 4 Tx Slot | 22.00 | 20.56 | 20.52 | 20.96 | 18.82 | 17.38 | 17.34 | 17.78 |

Note:
1) The conducted power of GSM850 and GSM1900 are 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 time slots.
3) The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:
Frame-averaged power=10 x log( Burst-averaged power mW x Slot used/8)
4) The tested channels are marks in bold.

2) Conducted power measurement results of GSM (Sensor on)

| GSM850 | | Tune-up | Max Burst Average Power (dBm) | | | Tune-up | Max Frame Average Power (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 128CH | 190CH | 251CH | | 128CH | 190CH | 251CH |
| | | | 824.2 MHz | 836.6 MHz | 848.8 MHz | | 824.2 MHz | 836.6 MHz | 848.8 MHz |
| GSM (CS) | | 24.50 | 23.14 | 23.14 | 23.15 | 15.31 | 13.95 | 13.95 | 13.96 |
| GPRS/EDGE (GMSK) | 1 Tx Slot | 24.50 | 23.14 | 23.14 | 23.15 | 15.31 | 13.95 | 13.95 | 13.96 |
| | 2 Tx Slot | **22.50** | 21.10 | **21.10** | 21.10 | **16.37** | 14.97 | **14.97** | 14.97 |
| | 3 Tx Slot | 20.50 | 19.13 | 19.13 | 19.16 | 16.08 | 14.71 | 14.71 | 14.74 |
| | 4 Tx Slot | 19.50 | 18.10 | 18.11 | 18.13 | 16.32 | 14.92 | 14.93 | 14.95 |
| EDGE (8PSK) | 1 Tx Slot | 16.00 | 14.58 | 14.71 | 14.72 | 6.81 | 5.39 | 5.52 | 5.53 |
| | 2 Tx Slot | 15.00 | 13.39 | 13.62 | 13.59 | 8.87 | 7.26 | 7.49 | 7.46 |
| | 3 Tx Slot | 13.00 | 12.22 | 12.11 | 12.31 | 8.58 | 7.80 | 7.69 | 7.89 |
| | 4 Tx Slot | 12.00 | 11.43 | 11.51 | 11.61 | 8.82 | 8.25 | 8.33 | 8.43 |
| GSM1900 | | Tune-up | Max Burst Average Power (dBm) | | | Tune-up | Max Frame Average Power (dBm) | | |
| | | | 512CH | 661CH | 810CH | | 512CH | 661CH | 810CH |
| | | | 1850.2 MHz | 1880 MHz | 1909.8 MHz | | 1850.2 MHz | 1880 MHz | 1909.8 MHz |
| GSM (CS) | | 19.50 | 17.87 | 17.98 | 18.22 | 10.31 | 8.68 | 8.79 | 9.03 |
| GPRS/EDGE (GMSK) | 1 Tx Slot | 19.50 | 17.87 | 17.98 | 18.22 | 10.31 | 8.68 | 8.79 | 9.03 |
| | 2 Tx Slot | **17.50** | 15.94 | **16.03** | 16.20 | **11.37** | 9.81 | **9.90** | 10.07 |
| | 3 Tx Slot | 15.50 | 14.18 | 14.20 | 14.35 | 11.08 | 9.76 | 9.78 | 9.93 |
| | 4 Tx Slot | 14.50 | 13.41 | 13.39 | 13.46 | 11.32 | 10.23 | 10.21 | 10.28 |
| EDGE (8PSK) | 1 Tx Slot | 13.00 | 12.52 | 12.43 | 12.61 | 3.81 | 3.33 | 3.24 | 3.42 |
| | 2 Tx Slot | 12.00 | 11.33 | 11.28 | 11.53 | 5.87 | 5.20 | 5.15 | 5.40 |
| | 3 Tx Slot | 11.00 | 10.25 | 10.32 | 10.36 | 6.58 | 5.83 | 5.90 | 5.94 |
| | 4 Tx Slot | 10.00 | 9.81 | 9.72 | 9.68 | 6.82 | 6.63 | 6.54 | 6.50 |

Note:
1) The conducted power of GSM850 and GSM1900 are 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 time slots.
3) The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:
Frame-averaged power=10 x log( Burst-averaged power mW x Slot used/8)
4) The tested channels are marks in bold.

### 8.1.2 CONDUCTED POWER MEASUREMENTS OF UMTS BAND 2

1) Conducted power measurement results of UMTS Band 2 (Sensor off)

| Band | UMTS II | | | |
|---|---|---|---|---|
| Tx Channel | Max. Tune-up Power | 9262 | 9400 | 9538 |
| Frequency | | 1852.4MHz | 1880MHz | 1907.6MHz |
| AMR Voice | 25.00 | 23.67 | 23.73 | 23.84 |
| RMC 12.2K | **25.00** | 23.67 | **23.73** | 23.84 |
| RMC 64K | 25.00 | 23.64 | 23.70 | 23.82 |
| RMC 144K | 25.00 | 23.62 | 23.71 | 23.72 |
| RMC 384K | 25.00 | 23.65 | 23.70 | 23.81 |
| HSDPA Subtest-1 | 25.00 | 23.59 | 23.61 | 23.72 |
| HSDPA Subtest-2 | 23.50 | 22.00 | 21.97 | 21.92 |
| HSDPA Subtest-3 | 23.50 | 21.98 | 21.87 | 21.98 |
| HSDPA Subtest-4 | 23.50 | 22.01 | 21.94 | 21.95 |
| HSUPA Subtest-1 | 22.50 | 21.25 | 20.84 | 20.95 |
| HSUPA Subtest-2 | 21.50 | 19.76 | 19.81 | 20.12 |
| HSUPA Subtest-3 | 22.50 | 21.18 | 21.23 | 21.24 |
| HSUPA Subtest-4 | 21.50 | 20.30 | 19.86 | 19.95 |
| HSUPA Subtest-5 | 24.50 | 23.15 | 23.11 | 23.20 |
| DC-HSDPA Subtest-1 | 25.00 | 23.59 | 23.61 | 23.72 |
| DC-HSDPA Subtest-2 | 23.50 | 22.00 | 21.97 | 21.92 |
| DC-HSDPA Subtest-3 | 23.50 | 21.98 | 21.87 | 21.98 |
| DC-HSDPA Subtest-4 | 23.50 | 22.01 | 21.94 | 21.95 |

Note:
1) The conducted power of UMTS Band 2 is measured with RMS detector.
2) Note: Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
3) The tested channels are marks in bold.

2) Conducted power measurement results of UMTS Band 2 (Sensor on)

| Band | UMTS II | | | |
|---|---|---|---|---|
| Tx Channel | Max. Tune-up Power | 9262 | 9400 | 9538 |
| Frequency | | 1852.4MHz | 1880MHz | 1907.6MHz |
| AMR Voice | 9.50 | 8.70 | 8.48 | 8.15 |
| RMC 12.2K | **9.50** | 8.70 | **8.48** | 8.15 |
| RMC 64K | 9.50 | 8.68 | 8.47 | 8.13 |
| RMC 144K | 9.50 | 8.69 | 8.45 | 8.13 |
| RMC 384K | 9.50 | 8.66 | 8.46 | 8.12 |
| HSDPA Subtest-1 | 9.50 | 8.44 | 8.18 | 7.87 |
| HSDPA Subtest-2 | 8.50 | 7.45 | 7.05 | 6.89 |
| HSDPA Subtest-3 | 8.50 | 7.40 | 6.89 | 6.71 |
| HSDPA Subtest-4 | 8.50 | 7.31 | 6.91 | 6.75 |
| HSUPA Subtest-1 | 8.00 | 7.47 | 7.54 | 7.32 |
| HSUPA Subtest-2 | 6.00 | 4.82 | 4.50 | 4.33 |
| HSUPA Subtest-3 | 7.00 | 5.92 | 6.05 | 5.85 |
| HSUPA Subtest-4 | 6.00 | 4.33 | 4.03 | 4.06 |
| HSUPA Subtest-5 | 9.00 | 8.68 | 8.31 | 8.11 |
| DC-HSDPA Subtest-1 | 9.50 | 8.44 | 8.18 | 7.87 |
| DC-HSDPA Subtest-2 | 8.50 | 7.45 | 7.05 | 6.89 |
| DC-HSDPA Subtest-3 | 8.50 | 7.40 | 6.89 | 6.71 |
| DC-HSDPA Subtest-4 | 8.50 | 7.31 | 6.91 | 6.75 |

Note:
1) The conducted power of UMTS Band 2 is measured with RMS detector.
2) Note: Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
3) The tested channels are marks in bold.

### 8.1.3 CONDUCTED POWER MEASUREMENTS OF UMTS BAND 4

1) Conducted power measurement results of UMTS Band 4 (Sensor off)

| Band | UMTS IV | | | |
|---|---|---|---|---|
| Tx Channel | Max. Tune-up Power | 1312 | 1413 | 1513 |
| Frequency | | 1712.4MHz | 1732.6MHz | 1752.6MHz |
| AMR Voice | 25.00 | 23.56 | 23.65 | 23.75 |
| RMC 12.2K | **25.00** | 23.56 | **23.65** | 23.75 |
| RMC 64K | 25.00 | 23.47 | 23.50 | 23.52 |
| RMC 144K | 25.00 | 23.48 | 23.54 | 23.53 |
| RMC 384K | 25.00 | 23.46 | 23.53 | 23.51 |
| HSDPA Subtest-1 | 25.00 | 23.48 | 23.58 | 23.65 |
| HSDPA Subtest-2 | 23.50 | 21.85 | 21.88 | 21.96 |
| HSDPA Subtest-3 | 23.50 | 21.88 | 21.93 | 22.02 |
| HSDPA Subtest-4 | 23.50 | 21.87 | 21.94 | 21.99 |
| HSUPA Subtest-1 | 22.50 | 21.40 | 20.96 | 20.94 |
| HSUPA Subtest-2 | 21.50 | 19.72 | 19.75 | 20.04 |
| HSUPA Subtest-3 | 22.50 | 21.10 | 21.12 | 20.83 |
| HSUPA Subtest-4 | 21.50 | 20.13 | 19.52 | 19.61 |
| HSUPA Subtest-5 | 24.50 | 22.97 | 23.05 | 23.13 |
| DC-HSDPA Subtest-1 | 25.00 | 23.48 | 23.58 | 23.65 |
| DC-HSDPA Subtest-2 | 23.50 | 21.85 | 21.88 | 21.96 |
| DC-HSDPA Subtest-3 | 23.50 | 21.88 | 21.93 | 22.02 |
| DC-HSDPA Subtest-4 | 23.50 | 21.87 | 21.94 | 21.99 |

Note:
1) The conducted power of UMTS Band 4 is measured with RMS detector.
2) Note: Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
3) The tested channels are marks in bold.

2) Conducted power measurement results of UMTS Band 4 (Sensor on)

| Band | UMTS IV | | | |
|---|---|---|---|---|
| Tx Channel | Max. Tune-up Power | 1312 | 1413 | 1513 |
| Frequency | | 1712.4MHz | 1732.6MHz | 1752.6MHz |
| AMR Voice | 12.50 | 11.15 | 11.03 | 11.62 |
| RMC 12.2K | **12.50** | 11.15 | **11.03** | 11.62 |
| RMC 64K | 12.50 | 11.13 | 11.01 | 11.61 |
| RMC 144K | 12.50 | 11.14 | 11.00 | 11.58 |
| RMC 384K | 12.50 | 11.11 | 11.02 | 11.60 |
| HSDPA Subtest-1 | 12.50 | 11.05 | 10.87 | 11.52 |
| HSDPA Subtest-2 | 11.50 | 9.88 | 9.63 | 10.34 |
| HSDPA Subtest-3 | 11.50 | 9.78 | 9.53 | 10.23 |
| HSDPA Subtest-4 | 11.50 | 9.80 | 9.64 | 10.32 |
| HSUPA Subtest-1 | 12.00 | 10.35 | 10.27 | 10.82 |
| HSUPA Subtest-2 | 9.00 | 7.33 | 7.17 | 7.77 |
| HSUPA Subtest-3 | 10.00 | 8.97 | 8.81 | 9.33 |
| HSUPA Subtest-4 | 9.00 | 7.05 | 7.02 | 7.28 |
| HSUPA Subtest-5 | 12.00 | 11.13 | 11.01 | 11.60 |
| DC-HSDPA Subtest-1 | 12.50 | 11.05 | 10.87 | 11.52 |
| DC-HSDPA Subtest-2 | 11.50 | 9.88 | 9.63 | 10.34 |
| DC-HSDPA Subtest-3 | 11.50 | 9.78 | 9.53 | 10.23 |
| DC-HSDPA Subtest-4 | 11.50 | 9.80 | 9.64 | 10.32 |

Note:
1) The conducted power of UMTS Band 4 is measured with RMS detector.
2) Note: Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
3) The tested channels are marks in bold.

### 8.1.4 CONDUCTED POWER MEASUREMENTS OF UMTS BAND 5

1) Conducted power measurement results of UMTS Band 5 (Sensor off)

| Band | UMTS V | | | |
|---|---|---|---|---|
| Tx Channel | Max. Tune-up Power | 4132 | 4182 | 4233 |
| Frequency | | 826.4MHz | 836.4MHz | 846.6MHz |
| AMR Voice | 25.50 | 23.68 | 23.78 | 23.89 |
| RMC 12.2K | **25.50** | 23.68 | **23.78** | 23.89 |
| RMC 64K | 25.50 | 23.64 | 23.75 | 23.76 |
| RMC 144K | 25.50 | 23.67 | 23.77 | 23.77 |
| RMC 384K | 25.50 | 23.64 | 23.73 | 23.75 |
| HSDPA Subtest-1 | 25.50 | 23.67 | 23.73 | 23.77 |
| HSDPA Subtest-2 | 23.50 | 21.78 | 21.77 | 21.88 |
| HSDPA Subtest-3 | 23.50 | 21.70 | 21.84 | 21.89 |
| HSDPA Subtest-4 | 23.50 | 21.81 | 21.79 | 21.84 |
| HSUPA Subtest-1 | 23.50 | 21.53 | 21.56 | 21.56 |
| HSUPA Subtest-2 | 22.00 | 21.01 | 20.95 | 21.03 |
| HSUPA Subtest-3 | 23.50 | 21.57 | 21.53 | 21.58 |
| HSUPA Subtest-4 | 22.00 | 20.74 | 20.88 | 20.97 |
| HSUPA Subtest-5 | 25.50 | 23.72 | 23.76 | 23.76 |
| DC-HSDPA Subtest-1 | 25.50 | 23.67 | 23.73 | 23.77 |
| DC-HSDPA Subtest-2 | 23.50 | 21.78 | 21.77 | 21.88 |
| DC-HSDPA Subtest-3 | 23.50 | 21.70 | 21.84 | 21.89 |
| DC-HSDPA Subtest-4 | 23.50 | 21.81 | 21.79 | 21.84 |

Note:
1) The conducted power of UMTS Band 5 is measured with RMS detector.
2) Note: Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
3) The tested channels are marks in bold.

2) Conducted power measurement results of UMTS Band 5 (Sensor on)

| Band | UMTS V | | | |
|---|---|---|---|---|
| Tx Channel | Max. Tune-up Power | 4132 | 4182 | 4233 |
| Frequency | | 826.4MHz | 836.4MHz | 846.6MHz |
| AMR Voice | 15.50 | 15.03 | 14.96 | 15.04 |
| RMC 12.2K | **15.50** | 15.03 | **14.96** | 15.04 |
| RMC 64K | 15.50 | 15.01 | 14.93 | 15.02 |
| RMC 144K | 15.50 | 14.98 | 14.95 | 15.03 |
| RMC 384K | 15.50 | 15.02 | 14.94 | 15.01 |
| HSDPA Subtest-1 | 15.50 | 14.89 | 14.82 | 14.97 |
| HSDPA Subtest-2 | 14.50 | 13.06 | 12.98 | 13.11 |
| HSDPA Subtest-3 | 14.50 | 13.08 | 13.10 | 13.26 |
| HSDPA Subtest-4 | 14.50 | 13.22 | 12.97 | 13.15 |
| HSUPA Subtest-1 | 14.50 | 14.00 | 14.07 | 14.08 |
| HSUPA Subtest-2 | 12.00 | 11.06 | 11.54 | 11.31 |
| HSUPA Subtest-3 | 13.50 | 12.47 | 13.03 | 12.66 |
| HSUPA Subtest-4 | 12.00 | 10.35 | 10.83 | 10.47 |
| HSUPA Subtest-5 | 15.50 | 14.87 | 14.91 | 15.02 |
| DC-HSDPA Subtest-1 | 15.50 | 14.89 | 14.82 | 14.97 |
| DC-HSDPA Subtest-2 | 14.50 | 13.06 | 12.98 | 13.11 |
| DC-HSDPA Subtest-3 | 14.50 | 13.08 | 13.10 | 13.26 |
| DC-HSDPA Subtest-4 | 14.50 | 13.22 | 12.97 | 13.15 |

Note:
1) The conducted power of UMTS Band 5 is measured with RMS detector.
2) Note: Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
3) The tested channels are marks in bold.

## 8.1.5 CONDUCTED POWER MEASUREMENTS OF LTE BAND 2

1) Conducted power measurement results of LTE Band 2 (Sensor off)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH18607 1850.7MHz | CH18900 1880MHz | CH19193 1909.3MHz | Band / BW | Modulation | RB Size/Offset | Tune-up | CH18615 1851.5MHz | CH18900 1880MHz | CH19185 1908.5MHz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 / 1.4M | QPSK | 1/0 | 24.00 | 23.26 | 22.69 | 22.48 | 2 / 3M | QPSK | 1/0 | 24.00 | 23.14 | 22.57 | 22.27 |
| | | 1/2 | 24.00 | 23.30 | 22.76 | 22.53 | | | 1/7 | 24.00 | 23.33 | 22.87 | 22.54 |
| | | 1/5 | 24.00 | 23.19 | 22.75 | 22.44 | | | 1/14 | 24.00 | 23.00 | 22.65 | 22.33 |
| | | 3/0 | 24.00 | 23.25 | 22.72 | 22.57 | | | 8/0 | 24.00 | 23.03 | 22.46 | 22.15 |
| | | 3/1 | 24.00 | 23.25 | 22.72 | 22.55 | | | 8/3 | 24.00 | 23.05 | 22.49 | 22.18 |
| | | 3/3 | 24.00 | 23.23 | 22.81 | 22.56 | | | 8/7 | 24.00 | 22.94 | 22.43 | 22.15 |
| | | 6/0 | 24.00 | 22.98 | 22.50 | 22.22 | | | 15/0 | 24.00 | 23.02 | 22.49 | 22.18 |
| | 16QAM | 1/0 | 24.00 | 22.96 | 22.58 | 22.11 | | 16QAM | 1/0 | 24.00 | 22.96 | 22.37 | 22.08 |
| | | 1/2 | 24.00 | 23.01 | 22.59 | 22.12 | | | 1/7 | 24.00 | 23.14 | 22.57 | 22.22 |
| | | 1/5 | 24.00 | 22.91 | 22.54 | 22.10 | | | 1/14 | 24.00 | 22.82 | 22.43 | 22.07 |
| | | 3/0 | 24.00 | 22.87 | 22.48 | 22.19 | | | 8/0 | 23.00 | 22.04 | 21.38 | 21.19 |
| | | 3/1 | 24.00 | 22.88 | 22.47 | 22.16 | | | 8/3 | 23.00 | 22.06 | 21.36 | 21.22 |
| | | 3/3 | 24.00 | 22.86 | 22.51 | 22.24 | | | 8/7 | 23.00 | 21.96 | 21.30 | 21.27 |
| | | 6/0 | 23.00 | 21.96 | 21.37 | 21.31 | | | 15/0 | 23.00 | 21.94 | 21.42 | 21.20 |
| **Band / BW** | **Modulation** | **RB Size/Offset** | **Tune-up** | **CH18625 1852.5MHz** | **CH18900 1880MHz** | **CH19175 1907.5MHz** | **Band / BW** | **Modulation** | **RB Size/Offset** | **Tune-up** | **CH18650 1855MHz** | **CH18900 1880MHz** | **CH19150 1905MHz** |
| 2 / 5M | QPSK | 1/0 | 24.00 | 23.29 | 22.66 | 22.30 | 2 / 10M | QPSK | 1/0 | 24.00 | 23.39 | 22.75 | 22.62 |
| | | 1/12 | 24.00 | 23.40 | 22.99 | 22.59 | | | 1/24 | 24.00 | 23.20 | 22.92 | 22.37 |
| | | 1/24 | 24.00 | 23.12 | 22.98 | 22.52 | | | 1/49 | 24.00 | 23.30 | 23.42 | 22.89 |
| | | 12/0 | 24.00 | 23.23 | 22.66 | 22.21 | | | 25/0 | 24.00 | 22.97 | 22.39 | 22.06 |
| | | 12/6 | 24.00 | 23.21 | 22.74 | 22.37 | | | 25/12 | 24.00 | 22.86 | 22.59 | 22.02 |
| | | 12/13 | 24.00 | 23.12 | 22.71 | 22.31 | | | 25/25 | 24.00 | 22.73 | 22.64 | 22.11 |
| | | 25/0 | 24.00 | 23.09 | 22.71 | 22.27 | | | 50/0 | 24.00 | 22.94 | 22.47 | 22.06 |
| | 16QAM | 1/0 | 24.00 | 23.02 | 22.60 | 22.11 | | 16QAM | 1/0 | 24.00 | 23.31 | 22.52 | 22.31 |
| | | 1/12 | 24.00 | 23.16 | 22.93 | 22.40 | | | 1/24 | 24.00 | 23.13 | 22.70 | 22.03 |
| | | 1/24 | 24.00 | 22.90 | 22.91 | 22.26 | | | 1/49 | 24.00 | 23.21 | 23.20 | 22.54 |
| | | 12/0 | 23.00 | 22.27 | 21.62 | 21.20 | | | 25/0 | 23.00 | 21.94 | 21.35 | 21.05 |
| | | 12/6 | 23.00 | 22.24 | 21.71 | 21.39 | | | 25/12 | 23.00 | 21.81 | 21.50 | 21.01 |
| | | 12/13 | 23.00 | 22.12 | 21.68 | 21.32 | | | 25/25 | 23.00 | 21.65 | 21.53 | 21.10 |
| | | 25/0 | 23.00 | 22.01 | 21.67 | 21.26 | | | 50/0 | 23.00 | 21.79 | 21.38 | 21.01 |
| **Band / BW** | **Modulation** | **RB Size/Offset** | **Tune-up** | **CH18675 1857.5MHz** | **CH18900 1880MHz** | **CH19125 1902.5MHz** | **Band / BW** | **Modulation** | **RB Size/Offset** | **Tune-up** | **CH18700 1860MHz** | **CH18900 1880MHz** | **CH19100 1900MHz** |
| 2 / 15M | QPSK | 1/0 | 24.00 | 23.22 | 22.41 | 23.04 | 2 / 20M | QPSK | 1/0 | **24.00** | **23.89** | 22.82 | 23.81 |
| | | 1/37 | 24.00 | 23.11 | 22.92 | 22.37 | | | 1/50 | 24.00 | 23.03 | 22.24 | 22.71 |
| | | 1/74 | 24.00 | 23.00 | 23.67 | 22.88 | | | 1/99 | 24.00 | 22.93 | 23.68 | 22.74 |
| | | 36/0 | 24.00 | 22.84 | 23.67 | 22.35 | | | 50/0 | **24.00** | **22.81** | 22.35 | 22.76 |
| | | 36/19 | 24.00 | 22.83 | 22.59 | 22.08 | | | 50/25 | 24.00 | 22.69 | 22.59 | 22.45 |
| | | 36/39 | 24.00 | 22.23 | 22.61 | 22.06 | | | 50/50 | 24.00 | 22.24 | 22.67 | 22.02 |
| | | 75/0 | 24.00 | 22.60 | 22.48 | 22.34 | | | 100/0 | 24.00 | 22.59 | 22.45 | 22.62 |
| | 16QAM | 1/0 | 24.00 | 23.02 | 22.27 | 22.83 | | 16QAM | 1/0 | 24.00 | 23.52 | 22.76 | 23.65 |
| | | 1/37 | 24.00 | 22.94 | 22.68 | 22.13 | | | 1/50 | 24.00 | 22.90 | 22.22 | 22.73 |
| | | 1/74 | 24.00 | 22.82 | 23.47 | 22.72 | | | 1/99 | 24.00 | 22.83 | 23.62 | 22.96 |
| | | 36/0 | 23.00 | 21.78 | 21.47 | 21.34 | | | 50/0 | 23.00 | 21.73 | 21.29 | 21.73 |
| | | 36/19 | 23.00 | 21.71 | 21.50 | 21.04 | | | 50/25 | 23.00 | 21.61 | 21.51 | 21.39 |
| | | 36/39 | 23.00 | 21.22 | 21.49 | 21.02 | | | 50/50 | 23.00 | 21.22 | 21.58 | 21.08 |
| | | 75/0 | 23.00 | 21.56 | 21.41 | 21.28 | | | 100/0 | 23.00 | 21.50 | 21.37 | 21.57 |

2) Conducted power measurement results of LTE Band 2 (Sensor on)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH18607 | CH18900 | CH19193 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH18615 | CH18900 | CH19185 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1850.7MHz | 1880MHz | 1909.3MHz | | | | | 1851.5MHz | 1880MHz | 1908.5MHz |
| 2 / 1.4M | QPSK | 1/0 | 9.00 | 8.02 | 7.74 | 8.21 | 2 / 3M | QPSK | 1/0 | 9.00 | 7.74 | 7.58 | 7.81 |
| | | 1/2 | 9.00 | 8.07 | 7.75 | 8.35 | | | 1/7 | 9.00 | 8.13 | 7.81 | 8.28 |
| | | 1/5 | 9.00 | 7.94 | 7.68 | 8.28 | | | 1/14 | 9.00 | 7.61 | 7.63 | 8.03 |
| | | 3/0 | 9.00 | 7.98 | 7.74 | 8.28 | | | 8/0 | 9.00 | 7.68 | 7.48 | 7.80 |
| | | 3/1 | 9.00 | 8.01 | 7.74 | 8.30 | | | 8/3 | 9.00 | 7.78 | 7.51 | 7.93 |
| | | 3/3 | 9.00 | 8.02 | 7.77 | 8.34 | | | 8/7 | 9.00 | 7.67 | 7.45 | 7.93 |
| | | 6/0 | 9.00 | 7.69 | 7.52 | 8.04 | | | 15/0 | 9.00 | 7.68 | 7.50 | 7.86 |
| | 16QAM | 1/0 | 9.00 | 7.87 | 7.70 | 8.14 | | 16QAM | 1/0 | 9.00 | 7.79 | 7.48 | 7.67 |
| | | 1/2 | 9.00 | 7.96 | 7.71 | 8.27 | | | 1/7 | 9.00 | 8.18 | 7.71 | 8.18 |
| | | 1/5 | 9.00 | 7.83 | 7.64 | 8.14 | | | 1/14 | 9.00 | 7.68 | 7.54 | 7.84 |
| | | 3/0 | 9.00 | 7.81 | 7.60 | 8.14 | | | 8/0 | 8.00 | 6.73 | 6.45 | 6.86 |
| | | 3/1 | 9.00 | 7.84 | 7.59 | 8.16 | | | 8/3 | 8.00 | 6.75 | 6.50 | 6.89 |
| | | 3/3 | 9.00 | 7.85 | 7.62 | 8.13 | | | 8/7 | 8.00 | 6.66 | 6.42 | 6.93 |
| | | 6/0 | 8.00 | 6.64 | 6.48 | 6.94 | | | 15/0 | 8.00 | 6.69 | 6.48 | 6.85 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH18625 | CH18900 | CH19175 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH18650 | CH18900 | CH19150 |
| | | | | 1852.5MHz | 1880MHz | 1907.5MHz | | | | | 1855MHz | 1880MHz | 1905MHz |
| 2 / 5M | QPSK | 1/0 | 9.00 | 8.22 | 7.72 | 8.01 | 2 / 10M | QPSK | 1/0 | 9.00 | 8.03 | 7.68 | 7.97 |
| | | 1/12 | 9.00 | 8.50 | 8.20 | 8.48 | | | 1/24 | 9.00 | 7.90 | 7.93 | 7.98 |
| | | 1/24 | 9.00 | 8.07 | 8.13 | 8.48 | | | 1/49 | 9.00 | 7.97 | 8.34 | 8.52 |
| | | 12/0 | 9.00 | 8.14 | 7.84 | 8.00 | | | 25/0 | 9.00 | 7.66 | 7.33 | 7.53 |
| | | 12/6 | 9.00 | 8.14 | 7.95 | 8.23 | | | 25/12 | 9.00 | 7.54 | 7.57 | 7.58 |
| | | 12/13 | 9.00 | 8.01 | 7.91 | 8.13 | | | 25/25 | 9.00 | 7.42 | 7.63 | 7.72 |
| | | 25/0 | 9.00 | 7.93 | 7.89 | 8.10 | | | 50/0 | 9.00 | 7.60 | 7.44 | 7.58 |
| | 16QAM | 1/0 | 9.00 | 8.23 | 7.87 | 8.11 | | 16QAM | 1/0 | 9.00 | 8.06 | 7.58 | 7.90 |
| | | 1/12 | 9.00 | 8.32 | 8.32 | 8.37 | | | 1/24 | 9.00 | 7.89 | 7.82 | 7.72 |
| | | 1/24 | 9.00 | 8.10 | 8.21 | 8.38 | | | 1/49 | 9.00 | 8.02 | 8.30 | 8.46 |
| | | 12/0 | 8.00 | 7.22 | 6.82 | 7.05 | | | 25/0 | 8.00 | 6.65 | 6.32 | 6.42 |
| | | 12/6 | 8.00 | 7.22 | 6.93 | 7.24 | | | 25/12 | 8.00 | 6.51 | 6.56 | 6.57 |
| | | 12/13 | 8.00 | 7.09 | 6.91 | 7.17 | | | 25/25 | 8.00 | 6.39 | 6.61 | 6.74 |
| | | 25/0 | 8.00 | 6.96 | 6.87 | 7.14 | | | 50/0 | 8.00 | 6.53 | 6.38 | 6.55 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH18675 | CH18900 | CH19125 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH18700 | CH18900 | CH19100 |
| | | | | 1857.5MHz | 1880MHz | 1902.5MHz | | | | | 1860MHz | 1880MHz | 1900MHz |
| 2 / 15M | QPSK | 1/0 | 9.00 | 7.79 | 7.39 | 8.22 | 2 / 20M | QPSK | 1/0 | **9.00** | 8.22 | 7.52 | **8.76** |
| | | 1/37 | 9.00 | 7.86 | 7.95 | 7.93 | | | 1/50 | 9.00 | 7.86 | 7.06 | 8.25 |
| | | 1/74 | 9.00 | 7.64 | 8.63 | 8.72 | | | 1/99 | 9.00 | 7.56 | 8.74 | 8.70 |
| | | 36/0 | 9.00 | 7.56 | 8.63 | 7.81 | | | 50/0 | **9.00** | 7.55 | 7.32 | **8.12** |
| | | 36/19 | 9.00 | 7.59 | 7.63 | 7.62 | | | 50/25 | 9.00 | 7.46 | 7.63 | 7.89 |
| | | 36/39 | 9.00 | 7.06 | 7.66 | 7.47 | | | 50/50 | 9.00 | 7.06 | 7.75 | 7.43 |
| | | 75/0 | 9.00 | 7.40 | 7.51 | 7.75 | | | 100/0 | 9.00 | 7.37 | 7.47 | 7.93 |
| | 16QAM | 1/0 | 9.00 | 7.73 | 7.26 | 8.20 | | 16QAM | 1/0 | 9.00 | 8.21 | 7.79 | 8.66 |
| | | 1/37 | 9.00 | 7.76 | 7.81 | 7.90 | | | 1/50 | 9.00 | 7.82 | 8.05 | 8.41 |
| | | 1/74 | 9.00 | 7.58 | 8.54 | 8.67 | | | 1/99 | 9.00 | 7.57 | 8.70 | 8.63 |
| | | 36/0 | 8.00 | 6.42 | 6.40 | 6.68 | | | 50/0 | 8.00 | 6.44 | 6.20 | 7.01 |
| | | 36/19 | 8.00 | 6.47 | 6.50 | 6.50 | | | 50/25 | 8.00 | 6.36 | 6.51 | 6.80 |
| | | 36/39 | 8.00 | 6.05 | 6.53 | 6.51 | | | 50/50 | 8.00 | 6.10 | 6.62 | 6.54 |
| | | 75/0 | 8.00 | 6.29 | 6.39 | 6.75 | | | 100/0 | 8.00 | 6.25 | 6.34 | 7.01 |

Note: The tested channels are marks in bold.

### 8.1.6 CONDUCTED POWER MEASUREMENTS OF LTE BAND 4

1) Conducted power measurement results of LTE Band 4 (Sensor off)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH19957 | CH20175 | CH20393 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH19965 | CH20175 | CH20385 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1710.7MHz | 1732.5MHz | 1754.3MHz | | | | | 1711.5MHz | 1732.5MHz | 1753.5MHz |
| 4 / 1.4M | QPSK | 1/0 | 25.00 | 23.64 | 23.34 | 24.02 | 4 / 3M | QPSK | 1/0 | 25.00 | 23.44 | 23.23 | 23.92 |
| | | 1/2 | 25.00 | 23.75 | 23.36 | 24.06 | | | 1/7 | 25.00 | 23.78 | 23.31 | 24.11 |
| | | 1/5 | 25.00 | 23.65 | 23.30 | 23.93 | | | 1/14 | 25.00 | 23.45 | 23.10 | 23.80 |
| | | 3/0 | 25.00 | 23.72 | 23.38 | 24.05 | | | 8/0 | 24.00 | 22.46 | 22.10 | 22.77 |
| | | 3/1 | 25.00 | 23.76 | 23.38 | 24.07 | | | 8/3 | 24.00 | 22.49 | 22.02 | 22.76 |
| | | 3/3 | 25.00 | 23.75 | 23.36 | 24.05 | | | 8/7 | 24.00 | 22.36 | 22.05 | 22.64 |
| | | 6/0 | 24.00 | 22.45 | 22.02 | 22.77 | | | 15/0 | 24.00 | 22.50 | 22.09 | 22.71 |
| | 16QAM | 1/0 | 24.00 | 22.99 | 22.85 | 23.13 | | 16QAM | 1/0 | 24.00 | 23.01 | 22.49 | 23.23 |
| | | 1/2 | 24.00 | 23.04 | 22.89 | 23.18 | | | 1/7 | 24.00 | 23.27 | 22.65 | 23.38 |
| | | 1/5 | 24.00 | 23.00 | 22.77 | 23.06 | | | 1/14 | 24.00 | 23.01 | 22.34 | 23.11 |
| | | 3/0 | 24.00 | 22.86 | 22.46 | 23.18 | | | 8/0 | 23.00 | 21.93 | 21.56 | 22.22 |
| | | 3/1 | 24.00 | 22.88 | 22.47 | 23.18 | | | 8/3 | 23.00 | 21.96 | 21.50 | 22.22 |
| | | 3/3 | 24.00 | 22.87 | 22.45 | 23.17 | | | 8/7 | 23.00 | 21.84 | 21.43 | 22.15 |
| | | 6/0 | 23.00 | 21.99 | 21.46 | 22.29 | | | 15/0 | 23.00 | 21.88 | 21.45 | 22.18 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH19975 | CH20175 | CH20375 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20000 | CH20175 | CH20350 |
| | | | | 1712.5MHz | 1732.5MHz | 1752.5MHz | | | | | 1715MHz | 1732.5MHz | 1750MHz |
| 4 / 5M | QPSK | 1/0 | 25.00 | 23.66 | 23.44 | 23.98 | 4 / 10M | QPSK | 1/0 | 25.00 | 23.56 | 23.32 | 23.57 |
| | | 1/12 | 25.00 | 23.93 | 23.58 | 24.10 | | | 1/24 | 25.00 | 23.90 | 23.48 | 24.03 |
| | | 1/24 | 25.00 | 23.53 | 23.22 | 23.81 | | | 1/49 | 25.00 | 23.90 | 23.70 | 24.18 |
| | | 12/0 | 24.00 | 22.65 | 22.28 | 22.93 | | | 25/0 | 24.00 | 22.63 | 22.19 | 22.73 |
| | | 12/6 | 24.00 | 22.72 | 22.26 | 22.99 | | | 25/12 | 24.00 | 22.62 | 22.22 | 22.86 |
| | | 12/13 | 24.00 | 22.63 | 22.18 | 22.89 | | | 25/25 | 24.00 | 22.46 | 22.16 | 22.77 |
| | | 25/0 | 24.00 | 22.60 | 22.16 | 22.88 | | | 50/0 | 24.00 | 22.50 | 22.15 | 22.73 |
| | 16QAM | 1/0 | 24.00 | 22.99 | 22.70 | 23.47 | | 16QAM | 1/0 | 24.00 | 22.99 | 22.78 | 22.88 |
| | | 1/12 | 24.00 | 23.26 | 22.78 | 23.68 | | | 1/24 | 24.00 | 23.32 | 22.90 | 23.35 |
| | | 1/24 | 24.00 | 22.88 | 22.42 | 23.29 | | | 1/49 | 24.00 | 23.30 | 23.13 | 23.54 |
| | | 12/0 | 23.00 | 22.08 | 21.74 | 22.36 | | | 25/0 | 23.00 | 22.02 | 21.60 | 22.15 |
| | | 12/6 | 23.00 | 22.09 | 21.72 | 22.42 | | | 25/12 | 23.00 | 22.02 | 21.63 | 22.26 |
| | | 12/13 | 23.00 | 22.00 | 21.64 | 22.32 | | | 25/25 | 23.00 | 21.87 | 21.57 | 22.17 |
| | | 25/0 | 23.00 | 21.98 | 21.55 | 22.26 | | | 50/0 | 23.00 | 21.94 | 21.53 | 22.09 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20025 | CH20175 | CH20325 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20050 | CH20175 | CH20300 |
| | | | | 1717.5MHz | 1732.5MHz | 1747.5MHz | | | | | 1720MHz | 1732.5MHz | 1745MHz |
| 4 / 15M | QPSK | 1/0 | 25.00 | 23.61 | 23.49 | 23.47 | 4 / 20M | QPSK | 1/0 | 25.00 | 24.00 | 23.85 | 23.69 |
| | | 1/37 | 25.00 | 23.80 | 23.45 | 23.94 | | | 1/50 | 25.00 | 24.02 | 23.19 | 24.07 |
| | | 1/74 | 25.00 | 23.81 | 23.65 | 24.18 | | | 1/99 | **25.00** | 23.61 | 23.70 | **24.19** |
| | | 36/0 | 24.00 | 22.61 | 23.75 | 22.57 | | | 50/0 | 24.00 | 22.77 | 22.42 | 22.55 |
| | | 36/19 | 24.00 | 22.59 | 22.23 | 22.74 | | | 50/25 | 24.00 | 22.71 | 22.41 | 22.80 |
| | | 36/39 | 24.00 | 22.48 | 22.19 | 22.83 | | | 50/50 | **24.00** | 22.49 | 22.38 | **22.91** |
| | | 75/0 | 24.00 | 22.53 | 22.19 | 22.68 | | | 100/0 | 24.00 | 22.64 | 22.39 | 22.77 |
| | 16QAM | 1/0 | 24.00 | 23.09 | 22.94 | 22.67 | | 16QAM | 1/0 | 24.00 | 23.46 | 23.11 | 23.25 |
| | | 1/37 | 24.00 | 23.32 | 22.92 | 23.20 | | | 1/50 | 24.00 | 23.50 | 22.25 | 23.62 |
| | | 1/74 | 24.00 | 23.29 | 23.15 | 23.46 | | | 1/99 | 24.00 | 23.11 | 22.98 | 23.72 |
| | | 36/0 | 23.00 | 22.03 | 22.85 | 22.02 | | | 50/0 | 23.00 | 22.22 | 21.89 | 22.01 |
| | | 36/19 | 23.00 | 22.02 | 21.63 | 22.12 | | | 50/25 | 23.00 | 22.16 | 21.87 | 22.26 |
| | | 36/39 | 23.00 | 21.86 | 21.59 | 22.22 | | | 50/50 | 23.00 | 21.95 | 21.83 | 22.36 |
| | | 75/0 | 23.00 | 21.92 | 21.59 | 22.07 | | | 100/0 | 23.00 | 22.08 | 21.84 | 22.18 |

2) Conducted power measurement results of LTE Band 4 (Sensor on)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH19957 | CH20175 | CH20393 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH19965 | CH20175 | CH20385 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1710.7MHz | 1732.5MHz | 1754.3MHz | | | | | 1711.5MHz | 1732.5MHz | 1753.5MHz |
| 4 / 1.4M | QPSK | 1/0 | 12.50 | 11.32 | 11.03 | 11.71 | 4 / 3M | QPSK | 1/0 | 12.50 | 11.17 | 10.98 | 11.49 |
| | | 1/2 | 12.50 | 11.45 | 11.12 | 11.79 | | | 1/7 | 12.50 | 11.68 | 11.20 | 11.79 |
| | | 1/5 | 12.50 | 11.38 | 10.96 | 11.63 | | | 1/14 | 12.50 | 11.30 | 10.80 | 11.38 |
| | | 3/0 | 12.50 | 11.37 | 11.09 | 11.70 | | | 8/0 | 11.50 | 9.87 | 9.52 | 10.04 |
| | | 3/1 | 12.50 | 11.41 | 11.11 | 11.73 | | | 8/3 | 11.50 | 9.98 | 9.72 | 10.08 |
| | | 3/3 | 12.50 | 11.43 | 11.08 | 11.71 | | | 8/7 | 11.50 | 9.86 | 9.61 | 9.98 |
| | | 6/0 | 11.50 | 9.79 | 9.59 | 10.08 | | | 15/0 | 11.50 | 9.89 | 9.64 | 10.00 |
| | 16QAM | 1/0 | 11.50 | 10.46 | 10.30 | 10.72 | | 16QAM | 1/0 | 11.50 | 10.38 | 10.13 | 10.43 |
| | | 1/2 | 11.50 | 10.66 | 10.38 | 10.80 | | | 1/7 | 11.50 | 10.89 | 10.38 | 10.74 |
| | | 1/5 | 11.50 | 10.57 | 10.20 | 10.65 | | | 1/14 | 11.50 | 10.52 | 9.96 | 10.36 |
| | | 3/0 | 11.50 | 10.45 | 10.06 | 10.67 | | | 8/0 | 10.50 | 9.36 | 8.95 | 9.55 |
| | | 3/1 | 11.50 | 10.50 | 10.06 | 10.70 | | | 8/3 | 10.50 | 9.48 | 8.92 | 9.60 |
| | | 3/3 | 11.50 | 10.51 | 10.04 | 10.68 | | | 8/7 | 10.50 | 9.35 | 8.81 | 9.50 |
| | | 6/0 | 10.50 | 9.36 | 8.97 | 9.58 | | | 15/0 | 10.50 | 9.33 | 8.84 | 9.44 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH19975 | CH20175 | CH20375 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20000 | CH20175 | CH20350 |
| | | | | 1712.5MHz | 1732.5MHz | 1752.5MHz | | | | | 1715MHz | 1732.5MHz | 1750MHz |
| 4 / 5M | QPSK | 1/0 | 12.50 | 11.31 | 11.04 | 11.53 | 4 / 10M | QPSK | 1/0 | 12.50 | 11.25 | 11.13 | 11.27 |
| | | 1/12 | 12.50 | 11.75 | 11.22 | 11.77 | | | 1/24 | 12.50 | 11.72 | 11.29 | 11.69 |
| | | 1/24 | 12.50 | 11.23 | 10.79 | 11.40 | | | 1/49 | 12.50 | 11.72 | 11.40 | 11.86 |
| | | 12/0 | 11.50 | 10.01 | 9.58 | 10.16 | | | 25/0 | 11.50 | 10.02 | 9.55 | 9.98 |
| | | 12/6 | 11.50 | 10.09 | 9.59 | 10.23 | | | 25/12 | 11.50 | 10.07 | 9.57 | 10.12 |
| | | 12/13 | 11.50 | 10.01 | 9.60 | 10.13 | | | 25/25 | 11.50 | 9.92 | 9.59 | 10.00 |
| | | 25/0 | 11.50 | 9.93 | 9.57 | 10.09 | | | 50/0 | 11.50 | 9.93 | 9.59 | 9.95 |
| | 16QAM | 1/0 | 11.50 | 10.57 | 10.27 | 10.70 | | 16QAM | 1/0 | 11.50 | 10.46 | 10.32 | 10.19 |
| | | 1/12 | 11.50 | 11.00 | 10.49 | 10.99 | | | 1/24 | 11.50 | 10.98 | 10.50 | 10.87 |
| | | 1/24 | 11.50 | 10.49 | 10.05 | 10.51 | | | 1/49 | 11.50 | 11.10 | 10.71 | 11.09 |
| | | 12/0 | 10.50 | 9.50 | 9.07 | 9.66 | | | 25/0 | 10.50 | 9.44 | 8.99 | 9.42 |
| | | 12/6 | 10.50 | 9.58 | 9.08 | 9.74 | | | 25/12 | 10.50 | 9.49 | 9.02 | 9.55 |
| | | 12/13 | 10.50 | 9.49 | 8.97 | 9.64 | | | 25/25 | 10.50 | 9.34 | 8.92 | 9.43 |
| | | 25/0 | 10.50 | 9.38 | 8.91 | 9.54 | | | 50/0 | 10.50 | 9.36 | 8.89 | 9.36 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20025 | CH20175 | CH20325 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20050 | CH20175 | CH20300 |
| | | | | 1717.5MHz | 1732.5MHz | 1747.5MHz | | | | | 1720MHz | 1732.5MHz | 1745MHz |
| 4 / 15M | QPSK | 1/0 | 12.50 | 11.38 | 11.33 | 11.10 | 4 / 20M | QPSK | 1/0 | 12.50 | 11.57 | 11.50 | 11.21 |
| | | 1/37 | 12.50 | 11.72 | 11.26 | 11.70 | | | 1/50 | **12.50** | **11.89** | 11.32 | 11.62 |
| | | 1/74 | 12.50 | 11.65 | 11.34 | 11.73 | | | 1/99 | 12.50 | 11.22 | 11.20 | 11.60 |
| | | 36/0 | 11.50 | 9.99 | 11.34 | 9.84 | | | 50/0 | **11.50** | **10.10** | 9.75 | 9.72 |
| | | 36/19 | 11.50 | 10.04 | 9.62 | 10.01 | | | 50/25 | 11.50 | 10.07 | 9.75 | 9.96 |
| | | 36/39 | 11.50 | 9.92 | 9.52 | 10.08 | | | 50/50 | 11.50 | 9.81 | 9.60 | 10.03 |
| | | 75/0 | 11.50 | 9.95 | 9.56 | 9.92 | | | 100/0 | 11.50 | 9.96 | 9.64 | 9.90 |
| | 16QAM | 1/0 | 11.50 | 10.54 | 10.59 | 10.05 | | 16QAM | 1/0 | 11.50 | 11.09 | 10.73 | 10.48 |
| | | 1/37 | 11.50 | 10.87 | 10.57 | 10.76 | | | 1/50 | 11.50 | 11.27 | 10.66 | 10.91 |
| | | 1/74 | 11.50 | 10.93 | 10.73 | 11.05 | | | 1/99 | 11.50 | 10.71 | 10.31 | 10.99 |
| | | 36/0 | 10.50 | 9.45 | 9.07 | 9.26 | | | 50/0 | 10.50 | 9.52 | 9.18 | 9.14 |
| | | 36/19 | 10.50 | 9.49 | 9.03 | 9.44 | | | 50/25 | 10.50 | 9.49 | 9.13 | 9.39 |
| | | 36/39 | 10.50 | 9.32 | 8.95 | 9.50 | | | 50/50 | 10.50 | 9.23 | 9.03 | 9.45 |
| | | 75/0 | 10.50 | 9.36 | 8.96 | 9.31 | | | 100/0 | 10.50 | 9.38 | 9.04 | 9.33 |

Note: The tested channels are marks in bold.

### 8.1.7 CONDUCTED POWER MEASUREMENTS OF LTE BAND 5

1) Conducted power measurement results of LTE Band 5 (Sensor off)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20407 | CH20525 | CH20643 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20415 | CH20525 | CH20635 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 824.7MHz | 836.5MHz | 848.3MHz | | | | | 825.5MHz | 836.5MHz | 847.5MHz |
| 5 / 1.4M | QPSK | 1/0 | 25.50 | 23.77 | 24.04 | 24.28 | 5 / 3M | QPSK | 1/0 | 25.50 | 23.60 | 23.96 | 23.83 |
| | | 1/2 | 25.50 | 23.87 | 24.12 | 24.39 | | | 1/7 | 25.50 | 23.85 | 24.08 | 24.23 |
| | | 1/5 | 25.50 | 23.70 | 23.94 | 24.29 | | | 1/14 | 25.50 | 23.60 | 23.71 | 24.04 |
| | | 3/0 | 25.50 | 23.77 | 24.07 | 24.31 | | | 8/0 | 24.50 | 22.66 | 23.14 | 23.19 |
| | | 3/1 | 25.50 | 23.79 | 24.09 | 24.35 | | | 8/3 | 24.50 | 22.69 | 23.05 | 23.29 |
| | | 3/3 | 25.50 | 23.78 | 24.03 | 24.35 | | | 8/7 | 24.50 | 22.52 | 22.93 | 23.24 |
| | | 6/0 | 24.50 | 22.73 | 23.09 | 23.34 | | | 15/0 | 24.50 | 22.62 | 22.98 | 23.24 |
| | 16QAM | 1/0 | 24.50 | 22.63 | 23.32 | 23.33 | | 16QAM | 1/0 | 24.50 | 22.73 | 23.35 | 22.96 |
| | | 1/2 | 24.50 | 22.70 | 23.41 | 23.46 | | | 1/7 | 24.50 | 23.03 | 23.52 | 23.38 |
| | | 1/5 | 24.50 | 22.56 | 23.29 | 23.39 | | | 1/14 | 24.50 | 22.54 | 23.05 | 23.15 |
| | | 3/0 | 24.50 | 22.71 | 23.20 | 23.25 | | | 8/0 | 23.50 | 21.62 | 22.15 | 22.12 |
| | | 3/1 | 24.50 | 22.74 | 23.23 | 23.30 | | | 8/3 | 23.50 | 21.66 | 22.07 | 22.24 |
| | | 3/3 | 24.50 | 22.72 | 23.17 | 23.30 | | | 8/7 | 23.50 | 21.53 | 21.94 | 22.17 |
| | | 6/0 | 23.50 | 21.56 | 22.01 | 22.20 | | | 15/0 | 23.50 | 21.52 | 21.97 | 22.12 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20425 | CH20525 | CH20625 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20450 | CH20525 | CH20600 |
| | | | | 826.5MHz | 836.5MHz | 846.5MHz | | | | | 829MHz | 836.5MHz | 844MHz |
| 5 / 5M | QPSK | 1/0 | 25.50 | 24.65 | 25.02 | 24.72 | 5 / 10M | QPSK | 1/0 | **25.50** | 24.68 | **25.16** | 24.76 |
| | | 1/12 | 25.50 | 23.67 | 23.97 | 24.19 | | | 1/24 | 25.50 | 24.50 | 24.84 | 24.56 |
| | | 1/24 | 25.50 | 24.61 | 24.84 | 25.15 | | | 1/49 | 25.50 | 24.84 | 24.49 | 25.13 |
| | | 12/0 | 24.50 | 22.61 | 23.09 | 22.95 | | | 25/0 | **24.50** | 23.36 | **23.76** | 23.30 |
| | | 12/6 | 24.50 | 22.60 | 23.14 | 23.14 | | | 25/12 | 24.50 | 23.48 | 23.75 | 23.68 |
| | | 12/13 | 24.50 | 22.57 | 22.91 | 23.16 | | | 25/25 | 24.50 | 23.46 | 23.46 | 23.60 |
| | | 25/0 | 24.50 | 22.50 | 22.89 | 22.99 | | | 50/0 | 24.50 | 23.42 | 23.58 | 23.59 |
| | 16QAM | 1/0 | 24.50 | 23.86 | 24.39 | 24.02 | | 16QAM | 1/0 | 24.50 | 23.85 | 24.43 | 23.77 |
| | | 1/12 | 24.50 | 22.78 | 23.35 | 23.54 | | | 1/24 | 24.50 | 23.81 | 24.32 | 23.68 |
| | | 1/24 | 24.50 | 23.80 | 24.19 | 24.13 | | | 1/49 | 24.50 | 24.09 | 23.87 | 24.16 |
| | | 12/0 | 23.50 | 21.58 | 22.12 | 21.90 | | | 25/0 | 23.50 | 22.27 | 22.78 | 22.23 |
| | | 12/6 | 23.50 | 21.52 | 22.11 | 22.11 | | | 25/12 | 23.50 | 22.42 | 22.71 | 22.61 |
| | | 12/13 | 23.50 | 21.51 | 21.90 | 22.11 | | | 25/25 | 23.50 | 22.40 | 22.38 | 22.62 |
| | | 25/0 | 23.50 | 21.51 | 21.83 | 21.86 | | | 50/0 | 23.50 | 22.27 | 22.48 | 22.53 |

2) Conducted power measurement results of LTE Band 5 (Sensor on)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20407 | CH20525 | CH20643 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20415 | CH20525 | CH20635 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 824.7MHz | 836.5MHz | 848.3MHz | | | | | 825.5MHz | 836.5MHz | 847.5MHz |
| 5 / 1.4M | QPSK | 1/0 | 15.50 | 13.70 | 13.87 | 13.96 | 5 / 3M | QPSK | 1/0 | 15.50 | 13.59 | 13.77 | 13.88 |
| | | 1/2 | 15.50 | 13.73 | 13.93 | 14.03 | | | 1/7 | 15.50 | 13.74 | 13.84 | 14.08 |
| | | 1/5 | 15.50 | 13.66 | 13.79 | 13.93 | | | 1/14 | 15.50 | 13.52 | 13.75 | 13.81 |
| | | 3/0 | 15.50 | 13.67 | 13.92 | 13.96 | | | 8/0 | 14.50 | 12.67 | 13.04 | 12.92 |
| | | 3/1 | 15.50 | 13.65 | 13.93 | 13.99 | | | 8/3 | 14.50 | 12.71 | 12.99 | 13.01 |
| | | 3/3 | 15.50 | 13.63 | 13.88 | 13.98 | | | 8/7 | 14.50 | 12.56 | 12.87 | 12.95 |
| | | 6/0 | 14.50 | 12.71 | 12.97 | 13.03 | | | 15/0 | 14.50 | 12.65 | 12.93 | 12.96 |
| | 16QAM | 1/0 | 14.50 | 12.74 | 13.22 | 13.07 | | 16QAM | 1/0 | 14.50 | 12.62 | 13.09 | 13.09 |
| | | 1/2 | 14.50 | 12.74 | 13.28 | 13.12 | | | 1/7 | 14.50 | 12.93 | 13.27 | 13.46 |
| | | 1/5 | 14.50 | 12.72 | 13.19 | 13.02 | | | 1/14 | 14.50 | 12.53 | 12.84 | 13.15 |
| | | 3/0 | 14.50 | 12.66 | 13.09 | 13.04 | | | 8/0 | 13.50 | 11.67 | 12.08 | 11.89 |
| | | 3/1 | 14.50 | 12.68 | 13.10 | 13.06 | | | 8/3 | 13.50 | 11.71 | 11.99 | 11.99 |
| | | 3/3 | 14.50 | 12.67 | 13.04 | 13.06 | | | 8/7 | 13.50 | 11.55 | 11.87 | 11.92 |
| | | 6/0 | 13.50 | 11.68 | 11.87 | 12.06 | | | 15/0 | 13.50 | 11.61 | 11.90 | 11.91 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20425 | CH20525 | CH20625 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20450 | CH20525 | CH20600 |
| | | | | 826.5MHz | 836.5MHz | 846.5MHz | | | | | 829MHz | 836.5MHz | 844MHz |
| 5 / 5M | QPSK | 1/0 | 15.50 | 14.39 | 14.81 | 14.53 | 5 / 10M | QPSK | 1/0 | 15.50 | 14.50 | 14.80 | 14.70 |
| | | 1/12 | 15.50 | 13.59 | 13.87 | 13.91 | | | 1/24 | 15.50 | 14.34 | 14.70 | 14.35 |
| | | 1/24 | 15.50 | 14.53 | 14.76 | 14.85 | | | 1/49 | **15.50** | 14.79 | 14.36 | **14.86** |
| | | 12/0 | 14.50 | 12.66 | 13.03 | 12.79 | | | 25/0 | **14.50** | 13.15 | **13.63** | 13.19 |
| | | 12/6 | 14.50 | 12.65 | 13.03 | 12.92 | | | 25/12 | 14.50 | 13.27 | 13.60 | 13.44 |
| | | 12/13 | 14.50 | 12.53 | 12.82 | 12.91 | | | 25/25 | 14.50 | 13.32 | 13.29 | 13.37 |
| | | 25/0 | 14.50 | 12.57 | 12.81 | 12.77 | | | 50/0 | 14.50 | 13.22 | 13.40 | 13.36 |
| | 16QAM | 1/0 | 14.50 | 13.58 | 14.03 | 13.78 | | 16QAM | 1/0 | 14.50 | 13.59 | 14.06 | 13.61 |
| | | 1/12 | 14.50 | 12.79 | 13.05 | 13.19 | | | 1/24 | 14.50 | 13.55 | 13.99 | 13.34 |
| | | 1/24 | 14.50 | 13.73 | 13.83 | 14.28 | | | 1/49 | 14.50 | 13.95 | 13.63 | 13.76 |
| | | 12/0 | 13.50 | 11.63 | 12.06 | 11.78 | | | 25/0 | 13.50 | 12.14 | 12.65 | 12.11 |
| | | 12/6 | 13.50 | 11.62 | 12.07 | 11.91 | | | 25/12 | 13.50 | 12.28 | 12.63 | 12.40 |
| | | 12/13 | 13.50 | 11.50 | 11.81 | 11.90 | | | 25/25 | 13.50 | 12.32 | 12.27 | 12.39 |
| | | 25/0 | 13.50 | 11.52 | 11.73 | 11.72 | | | 50/0 | 13.50 | 12.17 | 12.37 | 12.39 |

Note: The tested channels are marks in bold.

### 8.1.8 CONDUCTED POWER MEASUREMENTS OF LTE BAND 7

1) Conducted power measurement results of LTE Band 7 (Sensor off)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20775 | CH21100 | CH21425 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20800 | CH21100 | CH21400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2502.5MHz | 2535MHz | 2567.5MHz | | | | | 2505MHz | 2535MHz | 2565MHz |
| 7 / 5M | QPSK | 1/0 | 24.00 | 22.74 | 22.84 | 22.84 | 7 / 10M | QPSK | 1/0 | 24.00 | 22.86 | 22.84 | 22.75 |
| | | 1/12 | 24.00 | 23.10 | 23.11 | 22.96 | | | 1/24 | 24.00 | 22.54 | 22.22 | 22.10 |
| | | 1/24 | 24.00 | 23.23 | 23.08 | 22.85 | | | 1/49 | 24.00 | 23.32 | 23.25 | 22.86 |
| | | 12/0 | 23.00 | 22.27 | 22.33 | 22.26 | | | 25/0 | 23.00 | 21.28 | 21.19 | 21.15 |
| | | 12/6 | 23.00 | 22.38 | 22.43 | 22.23 | | | 25/12 | 23.00 | 21.51 | 21.35 | 21.12 |
| | | 12/13 | 23.00 | 22.34 | 22.38 | 22.14 | | | 25/25 | 23.00 | 21.45 | 21.27 | 21.15 |
| | | 25/0 | 23.00 | 22.26 | 22.35 | 22.16 | | | 50/0 | 23.00 | 21.45 | 21.29 | 21.22 |
| | 16QAM | 1/0 | 23.00 | 22.16 | 22.37 | 22.22 | | 16QAM | 1/0 | 23.00 | 22.19 | 22.18 | 21.95 |
| | | 1/12 | 23.00 | 22.53 | 22.62 | 22.31 | | | 1/24 | 23.00 | 21.68 | 21.53 | 21.27 |
| | | 1/24 | 23.00 | 22.62 | 22.60 | 22.21 | | | 1/49 | 23.00 | 22.88 | 22.63 | 22.09 |
| | | 12/0 | 23.00 | 22.17 | 22.24 | 22.15 | | | 25/0 | 23.00 | 21.16 | 21.10 | 21.07 |
| | | 12/6 | 23.00 | 22.31 | 22.33 | 22.11 | | | 25/12 | 23.00 | 21.40 | 21.25 | 21.04 |
| | | 12/13 | 23.00 | 22.27 | 22.24 | 21.96 | | | 25/25 | 23.00 | 21.31 | 21.18 | 21.07 |
| | | 25/0 | 23.00 | 22.19 | 22.22 | 22.02 | | | 50/0 | 23.00 | 21.33 | 21.20 | 21.10 |
| **Band / BW** | **Modulation** | **RB Size/Offset** | **Tune-up** | **CH20825** | **CH21100** | **CH21375** | **Band / BW** | **Modulation** | **RB Size/Offset** | **Tune-up** | **CH20850** | **CH21100** | **CH21350** |
| | | | | **2507.5MHz** | **2535MHz** | **2562.5MHz** | | | | | **2510MHz** | **2535MHz** | **2560MHz** |
| 7 / 15M | QPSK | 1/0 | 24.00 | 22.74 | 22.58 | 22.75 | 7 / 20M | QPSK | 1/0 | 24.00 | 22.89 | 22.68 | 23.11 |
| | | 1/37 | 24.00 | 23.31 | 23.19 | 23.03 | | | 1/50 | 24.00 | 22.69 | 22.23 | 22.19 |
| | | 1/74 | 24.00 | 23.25 | 23.19 | 22.72 | | | 1/99 | **24.00** | 23.00 | **23.36** | 23.04 |
| | | 36/0 | 23.00 | 22.54 | 22.21 | 22.11 | | | 50/0 | 23.00 | 21.29 | 21.25 | 21.10 |
| | | 36/19 | 23.00 | 22.75 | 22.48 | 22.19 | | | 50/25 | 23.00 | 21.41 | 21.28 | 21.07 |
| | | 36/39 | 23.00 | 22.66 | 22.47 | 22.14 | | | 50/50 | **23.00** | 21.33 | **21.41** | 21.03 |
| | | 75/0 | 23.00 | 22.76 | 22.31 | 22.31 | | | 100/0 | 23.00 | 21.45 | 21.18 | 21.14 |
| | 16QAM | 1/0 | 23.00 | 22.18 | 21.86 | 22.14 | | 16QAM | 1/0 | 23.00 | 22.27 | 21.99 | 22.44 |
| | | 1/37 | 23.00 | 22.87 | 22.50 | 22.50 | | | 1/50 | 23.00 | 21.88 | 21.52 | 21.30 |
| | | 1/74 | 23.00 | 22.74 | 22.48 | 22.20 | | | 1/99 | 23.00 | 22.32 | 22.65 | 22.26 |
| | | 36/0 | 23.00 | 22.38 | 22.10 | 22.02 | | | 50/0 | 23.00 | 21.17 | 21.16 | 21.09 |
| | | 36/19 | 23.00 | 22.64 | 22.36 | 22.12 | | | 50/25 | 23.00 | 21.41 | 21.20 | 21.11 |
| | | 36/39 | 23.00 | 22.54 | 22.34 | 22.04 | | | 50/50 | 23.00 | 21.33 | 21.11 | 21.01 |
| | | 75/0 | 23.00 | 22.66 | 22.21 | 22.17 | | | 100/0 | 23.00 | 21.34 | 21.05 | 21.03 |

2) Conducted power measurement results of LTE Band 7 (Sensor on)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20775 | CH21100 | CH21425 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20800 | CH21100 | CH21400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2502.5MHz | 2535MHz | 2567.5MHz | | | | | 2505MHz | 2535MHz | 2565MHz |
| 7 / 5M | QPSK | 1/0 | 8.00 | 7.13 | 7.37 | 7.28 | 7 / 10M | QPSK | 1/0 | 8.00 | 7.38 | 7.42 | 7.17 |
| | | 1/12 | 8.00 | 7.38 | 7.65 | 7.56 | | | 1/24 | 8.00 | 6.57 | 6.69 | 6.54 |
| | | 1/24 | 8.00 | 7.46 | 7.56 | 7.60 | | | 1/49 | 8.00 | 7.60 | 7.74 | 7.72 |
| | | 12/0 | 7.00 | 6.44 | 6.55 | 6.58 | | | 25/0 | 7.00 | 5.29 | 5.34 | 5.13 |
| | | 12/6 | 7.00 | 6.50 | 6.64 | 6.65 | | | 25/12 | 7.00 | 5.49 | 5.55 | 5.36 |
| | | 12/13 | 7.00 | 6.42 | 6.50 | 6.52 | | | 25/25 | 7.00 | 5.37 | 5.38 | 5.38 |
| | | 25/0 | 7.00 | 6.38 | 6.55 | 6.51 | | | 50/0 | 7.00 | 5.42 | 5.48 | 5.44 |
| | 16QAM | 1/0 | 7.00 | 6.43 | 6.72 | 6.54 | | 16QAM | 1/0 | 7.00 | 6.46 | 6.68 | 6.50 |
| | | 1/12 | 7.00 | 6.69 | 6.87 | 6.82 | | | 1/24 | 7.00 | 5.65 | 5.85 | 5.76 |
| | | 1/24 | 7.00 | 6.66 | 6.80 | 6.73 | | | 1/49 | 7.00 | 6.83 | 6.98 | 7.00 |
| | | 12/0 | 7.00 | 6.39 | 6.49 | 6.50 | | | 25/0 | 7.00 | 5.21 | 5.26 | 5.02 |
| | | 12/6 | 7.00 | 6.45 | 6.56 | 6.56 | | | 25/12 | 7.00 | 5.41 | 5.47 | 5.26 |
| | | 12/13 | 7.00 | 6.36 | 6.43 | 6.43 | | | 25/25 | 7.00 | 5.29 | 5.30 | 5.27 |
| | | 25/0 | 7.00 | 6.26 | 6.47 | 6.42 | | | 50/0 | 7.00 | 5.33 | 5.38 | 5.34 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH20825 | CH21100 | CH21375 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH20850 | CH21100 | CH21350 |
| | | | | 2507.5MHz | 2535MHz | 2562.5MHz | | | | | 2510MHz | 2535MHz | 2560MHz |
| 7 / 15M | QPSK | 1/0 | 8.00 | 7.22 | 6.89 | 6.76 | 7 / 20M | QPSK | 1/0 | 8.00 | 7.55 | 7.32 | 7.44 |
| | | 1/37 | 8.00 | 7.75 | 7.70 | 7.38 | | | 1/50 | 8.00 | 6.65 | 6.73 | 6.17 |
| | | 1/74 | 8.00 | 7.36 | 7.53 | 7.52 | | | 1/99 | **8.00** | 7.38 | **7.76** | 7.72 |
| | | 36/0 | 7.00 | 6.43 | 6.39 | 6.03 | | | 50/0 | 7.00 | 5.30 | 5.47 | 5.09 |
| | | 36/19 | 7.00 | 6.66 | 6.70 | 6.32 | | | 50/25 | **7.00** | 5.45 | **5.50** | 5.03 |
| | | 36/39 | 7.00 | 6.52 | 6.49 | 6.46 | | | 50/50 | 7.00 | 5.32 | 5.31 | 5.15 |
| | | 75/0 | 7.00 | 6.69 | 6.50 | 6.46 | | | 100/0 | 7.00 | 5.41 | 5.36 | 5.15 |
| | 16QAM | 1/0 | 7.00 | 6.35 | 6.22 | 5.92 | | 16QAM | 1/0 | 7.00 | 6.86 | 6.37 | 6.69 |
| | | 1/37 | 7.00 | 7.00 | 6.97 | 6.59 | | | 1/50 | 7.00 | 5.93 | 5.78 | 5.30 |
| | | 1/74 | 7.00 | 6.61 | 6.71 | 6.62 | | | 1/99 | 7.00 | 6.62 | 6.97 | 6.92 |
| | | 36/0 | 7.00 | 6.33 | 6.28 | 5.99 | | | 50/0 | 7.00 | 5.21 | 5.42 | 5.07 |
| | | 36/19 | 7.00 | 6.56 | 6.60 | 6.27 | | | 50/25 | 7.00 | 5.34 | 5.45 | 5.06 |
| | | 36/39 | 7.00 | 6.41 | 6.43 | 6.40 | | | 50/50 | 7.00 | 5.21 | 5.25 | 5.08 |
| | | 75/0 | 7.00 | 6.58 | 6.44 | 6.39 | | | 100/0 | 7.00 | 5.29 | 5.26 | 5.07 |

Note: The tested channels are marks in bold.

### 8.1.9 CONDUCTED POWER MEASUREMENTS OF LTE BAND 12

1) Conducted power measurement results of LTE Band 12 (Sensor off)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH23017 | CH23095 | CH23173 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH23025 | CH23095 | CH23165 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 699.7MHz | 707.5MHz | 715.3MHz | | | | | 700.5MHz | 707.5MHz | 714.5MHz |
| 12 / 1.4M | QPSK | 1/0 | 25.50 | 23.70 | 24.18 | 24.25 | 12 / 3M | QPSK | 1/0 | 25.50 | 23.60 | 24.29 | 23.83 |
| | | 1/2 | 25.50 | 23.71 | 24.15 | 24.31 | | | 1/7 | 25.50 | 23.77 | 24.18 | 24.30 |
| | | 1/5 | 25.50 | 23.57 | 23.83 | 24.08 | | | 1/14 | 25.50 | 23.74 | 23.67 | 24.00 |
| | | 3/0 | 25.50 | 23.60 | 24.18 | 24.26 | | | 8/0 | 23.00 | 21.76 | 22.56 | 22.07 |
| | | 3/1 | 25.50 | 23.61 | 24.15 | 24.29 | | | 8/3 | 23.00 | 21.80 | 22.36 | 22.23 |
| | | 3/3 | 25.50 | 23.61 | 24.08 | 24.24 | | | 8/7 | 23.00 | 21.83 | 22.13 | 22.21 |
| | | 6/0 | 23.00 | 21.77 | 22.35 | 22.30 | | | 15/0 | 23.00 | 21.82 | 22.30 | 22.13 |
| | 16QAM | 1/0 | 24.50 | 22.76 | 23.46 | 23.25 | | 16QAM | 1/0 | 24.50 | 22.89 | 23.48 | 22.76 |
| | | 1/2 | 24.50 | 22.76 | 23.46 | 23.33 | | | 1/7 | 24.50 | 23.10 | 23.41 | 23.24 |
| | | 1/5 | 24.50 | 22.63 | 23.15 | 23.11 | | | 1/14 | 24.50 | 22.84 | 22.75 | 22.97 |
| | | 3/0 | 24.50 | 22.71 | 23.24 | 23.19 | | | 8/0 | 23.50 | 21.63 | 22.39 | 21.92 |
| | | 3/1 | 24.50 | 22.79 | 23.21 | 23.24 | | | 8/3 | 23.50 | 21.67 | 22.14 | 22.07 |
| | | 3/3 | 24.50 | 22.78 | 23.16 | 23.24 | | | 8/7 | 23.50 | 21.72 | 21.97 | 22.05 |
| | | 6/0 | 23.50 | 21.65 | 22.22 | 22.26 | | | 15/0 | 23.50 | 21.65 | 22.06 | 21.96 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH23035 | CH23095 | CH23155 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH23060 | CH23095 | CH23130 |
| | | | | 701.5MHz | 707.5MHz | 713.5MHz | | | | | 704MHz | 707.5MHz | 711MHz |
| 12 / 5M | QPSK | 1/0 | 25.50 | 24.53 | 24.96 | 24.46 | 12 / 10M | QPSK | 1/0 | **25.50** | 24.43 | 24.91 | **24.97** |
| | | 1/12 | 25.50 | 23.94 | 23.99 | 24.03 | | | 1/24 | 25.50 | 24.56 | 24.15 | 23.69 |
| | | 1/24 | 25.50 | 24.91 | 24.67 | 24.87 | | | 1/49 | 25.50 | 24.70 | 24.37 | 24.87 |
| | | 12/0 | 23.00 | 21.74 | 22.53 | 21.68 | | | 25/0 | 23.00 | 21.69 | 22.40 | 21.88 |
| | | 12/6 | 23.00 | 21.84 | 22.40 | 21.93 | | | 25/12 | **23.00** | **22.37** | 22.23 | 21.66 |
| | | 12/13 | 23.00 | 21.93 | 22.06 | 22.03 | | | 25/25 | 23.00 | 22.21 | 21.58 | 21.57 |
| | | 25/0 | 23.00 | 21.68 | 22.20 | 21.87 | | | 50/0 | 23.00 | 21.83 | 22.00 | 21.70 |
| | 16QAM | 1/0 | 24.50 | 23.86 | 24.39 | 23.76 | | 16QAM | 1/0 | 24.50 | 23.64 | 24.49 | 24.34 |
| | | 1/12 | 24.50 | 23.06 | 23.27 | 23.09 | | | 1/24 | 24.50 | 23.62 | 23.38 | 22.72 |
| | | 1/24 | 24.50 | 24.41 | 24.04 | 24.35 | | | 1/49 | 24.50 | 24.14 | 23.93 | 24.34 |
| | | 12/0 | 23.50 | 21.67 | 22.30 | 21.55 | | | 25/0 | 23.50 | 21.56 | 22.31 | 21.81 |
| | | 12/6 | 23.50 | 21.76 | 22.18 | 21.87 | | | 25/12 | 23.50 | 22.24 | 22.15 | 21.57 |
| | | 12/13 | 23.50 | 21.84 | 21.95 | 21.97 | | | 25/25 | 23.50 | 22.13 | 21.56 | 21.50 |
| | | 25/0 | 23.50 | 21.53 | 22.06 | 21.72 | | | 50/0 | 23.50 | 21.68 | 21.84 | 21.54 |

2) Conducted power measurement results of LTE Band 12 (Sensor on)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH23017 | CH23095 | CH23173 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH23025 | CH23095 | CH23165 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 699.7MHz | 707.5MHz | 715.3MHz | | | | | 700.5MHz | 707.5MHz | 714.5MHz |
| 12 / 1.4M | QPSK | 1/0 | 14.00 | 12.07 | 12.77 | 12.72 | 12 / 3M | QPSK | 1/0 | 14.00 | 12.07 | 12.79 | 12.15 |
| | | 1/2 | 14.00 | 12.04 | 12.76 | 12.85 | | | 1/7 | 14.00 | 12.23 | 12.82 | 12.72 |
| | | 1/5 | 14.00 | 12.06 | 12.47 | 12.81 | | | 1/14 | 14.00 | 12.13 | 12.20 | 12.67 |
| | | 3/0 | 14.00 | 12.02 | 12.80 | 12.77 | | | 8/0 | 11.50 | 10.13 | 11.09 | 10.60 |
| | | 3/1 | 14.00 | 12.03 | 12.78 | 12.90 | | | 8/3 | 11.50 | 10.10 | 10.93 | 10.82 |
| | | 3/3 | 14.00 | 12.01 | 12.72 | 12.90 | | | 8/7 | 11.50 | 10.10 | 10.73 | 10.87 |
| | | 6/0 | 11.50 | 10.09 | 10.91 | 11.03 | | | 15/0 | 11.50 | 10.10 | 10.86 | 10.71 |
| | 16QAM | 1/0 | 13.00 | 11.14 | 11.89 | 12.01 | | 16QAM | 1/0 | 13.00 | 11.08 | 12.01 | 11.20 |
| | | 1/2 | 13.00 | 11.04 | 11.88 | 12.13 | | | 1/7 | 13.00 | 11.16 | 12.07 | 11.78 |
| | | 1/5 | 13.00 | 11.05 | 11.59 | 12.08 | | | 1/14 | 13.00 | 11.10 | 11.41 | 11.69 |
| | | 3/0 | 13.00 | 11.09 | 11.88 | 11.75 | | | 8/0 | 12.00 | 10.15 | 10.99 | 10.51 |
| | | 3/1 | 13.00 | 11.10 | 11.85 | 11.83 | | | 8/3 | 12.00 | 10.12 | 10.82 | 10.73 |
| | | 3/3 | 13.00 | 11.09 | 11.80 | 11.83 | | | 8/7 | 12.00 | 10.12 | 10.62 | 10.78 |
| | | 6/0 | 12.00 | 10.07 | 10.88 | 10.91 | | | 15/0 | 12.00 | 10.07 | 10.73 | 10.58 |
| Band / BW | Modulation | RB Size/Offset | Tune-up | CH23035 | CH23095 | CH23155 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH23060 | CH23095 | CH23130 |
| | | | | 701.5MHz | 707.5MHz | 713.5MHz | | | | | 704MHz | 707.5MHz | 711MHz |
| 12 / 5M | QPSK | 1/0 | 14.00 | 13.05 | 13.84 | 12.93 | 12 / 10M | QPSK | 1/0 | **14.00** | 12.87 | 13.31 | **13.88** |
| | | 1/12 | 14.00 | 12.07 | 12.73 | 12.36 | | | 1/24 | 14.00 | 12.85 | 12.80 | 12.24 |
| | | 1/24 | 14.00 | 13.68 | 13.30 | 13.78 | | | 1/49 | 14.00 | 13.49 | 13.03 | 13.88 |
| | | 12/0 | 11.50 | 10.11 | 11.03 | 10.25 | | | 25/0 | 11.50 | 10.05 | 10.72 | 10.51 |
| | | 12/6 | 11.50 | 10.17 | 10.96 | 10.47 | | | 25/12 | **11.50** | **10.79** | 10.77 | 10.31 |
| | | 12/13 | 11.50 | 10.33 | 10.72 | 10.60 | | | 25/25 | 11.50 | 10.72 | 10.22 | 10.19 |
| | | 25/0 | 11.50 | 10.03 | 10.78 | 10.45 | | | 50/0 | 11.50 | 10.35 | 10.53 | 10.33 |
| | 16QAM | 1/0 | 13.00 | 12.20 | 12.95 | 12.17 | | 16QAM | 1/0 | 13.00 | 11.93 | 12.69 | 12.89 |
| | | 1/12 | 13.00 | 11.29 | 11.94 | 11.55 | | | 1/24 | 13.00 | 11.95 | 12.08 | 11.24 |
| | | 1/24 | 13.00 | 12.88 | 12.48 | 12.98 | | | 1/49 | 13.00 | 12.72 | 12.34 | 13.00 |
| | | 12/0 | 12.00 | 10.02 | 10.96 | 10.14 | | | 25/0 | 12.00 | 10.09 | 10.71 | 10.40 |
| | | 12/6 | 12.00 | 10.13 | 10.90 | 10.37 | | | 25/12 | 12.00 | 10.61 | 10.67 | 10.19 |
| | | 12/13 | 12.00 | 10.29 | 10.65 | 10.49 | | | 25/25 | 12.00 | 10.57 | 10.11 | 10.07 |
| | | 25/0 | 12.00 | 10.02 | 10.68 | 10.33 | | | 50/0 | 12.00 | 10.20 | 10.40 | 10.20 |

Note: The tested channels are marks in bold.

## 8.1.10 CONDUCTED POWER MEASUREMENTS OF LTE BAND 17

1) Conducted power measurement results of LTE Band 17 (Sensor off)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH23755 | CH23790 | CH23825 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH23780 | CH23790 | CH23800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 706.5MHz | 710MHz | 713.5MHz | | | | | 709MHz | 710MHz | 711MHz |
| 17 / 5M | QPSK | 1/0 | 25.50 | 24.66 | 24.41 | 23.92 | 17 / 10M | QPSK | 1/0 | 25.50 | 24.75 | 24.55 | 24.57 |
| | | 1/12 | 25.50 | 23.11 | 22.48 | 22.77 | | | 1/24 | 25.50 | 23.73 | 23.52 | 23.48 |
| | | 1/24 | 25.50 | 24.09 | 24.00 | 24.41 | | | 1/49 | 25.50 | 24.47 | 24.60 | 24.73 |
| | | 12/0 | 23.00 | 22.42 | 21.80 | 21.61 | | | 25/0 | 23.00 | 22.94 | 22.82 | 22.62 |
| | | 12/6 | 23.00 | 22.51 | 21.72 | 21.86 | | | 25/12 | 23.00 | 22.59 | 22.52 | 22.39 |
| | | 12/13 | 23.00 | 22.26 | 21.51 | 21.96 | | | 25/25 | 23.00 | 22.15 | 22.23 | 22.39 |
| | | 25/0 | 23.00 | 22.31 | 21.67 | 21.80 | | | 50/0 | 23.00 | 22.55 | 22.43 | 22.42 |
| | 16QAM | 1/0 | 24.50 | 24.38 | 24.34 | 24.23 | | 16QAM | 1/0 | 24.50 | 24.35 | 24.37 | 24.40 |
| | | 1/12 | 24.50 | 23.30 | 22.71 | 23.10 | | | 1/24 | 24.50 | 23.80 | 23.75 | 23.44 |
| | | 1/24 | 24.50 | 24.21 | 24.22 | 24.35 | | | 1/49 | 24.50 | 24.34 | 24.32 | 24.36 |
| | | 12/0 | 23.50 | 22.35 | 21.76 | 21.51 | | | 25/0 | 23.50 | 22.90 | 22.82 | 22.57 |
| | | 12/6 | 23.50 | 22.44 | 21.68 | 21.76 | | | 25/12 | 23.50 | 22.56 | 22.43 | 22.40 |
| | | 12/13 | 23.50 | 22.20 | 21.58 | 21.86 | | | 25/25 | 23.50 | 22.12 | 22.23 | 22.37 |
| | | 25/0 | 23.50 | 22.23 | 21.60 | 21.70 | | | 50/0 | 23.50 | 22.49 | 22.38 | 22.37 |

2) Conducted power measurement results of LTE Band 17 (Sensor on)

| Band / BW | Modulation | RB Size/Offset | Tune-up | CH23755 | CH23790 | CH23825 | Band / BW | Modulation | RB Size/Offset | Tune-up | CH23780 | CH23790 | CH23800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 706.5MHz | 710MHz | 713.5MHz | | | | | 709MHz | 710MHz | 711MHz |
| 17 / 5M | QPSK | 1/0 | 14.00 | 13.77 | 13.80 | 13.48 | 17 / 10M | QPSK | 1/0 | 14.00 | 13.57 | 13.66 | 13.66 |
| | | 1/12 | 14.00 | 12.71 | 12.01 | 12.18 | | | 1/24 | 14.00 | 12.77 | 12.62 | 12.48 |
| | | 1/24 | 14.00 | 13.86 | 13.53 | 13.86 | | | 1/49 | 14.00 | 13.30 | 13.58 | 13.87 |
| | | 12/0 | 11.50 | 10.84 | 10.43 | 10.12 | | | 25/0 | 11.50 | 11.18 | 11.03 | 11.09 |
| | | 12/6 | 11.50 | 11.02 | 10.27 | 10.35 | | | 25/12 | 11.50 | 10.96 | 10.70 | 10.62 |
| | | 12/13 | 11.50 | 10.81 | 10.10 | 10.47 | | | 25/25 | 11.50 | 10.41 | 10.44 | 10.57 |
| | | 25/0 | 11.50 | 10.81 | 10.21 | 10.32 | | | 50/0 | 11.50 | 10.85 | 10.73 | 10.71 |
| | 16QAM | 1/0 | 13.00 | 12.83 | 12.82 | 12.76 | | 16QAM | 1/0 | 13.00 | 12.70 | 12.89 | 12.64 |
| | | 1/12 | 13.00 | 12.06 | 11.24 | 11.47 | | | 1/24 | 13.00 | 11.99 | 11.91 | 11.52 |
| | | 1/24 | 13.00 | 12.86 | 12.74 | 12.85 | | | 1/49 | 13.00 | 12.52 | 12.86 | 12.90 |
| | | 12/0 | 12.00 | 10.67 | 10.28 | 10.03 | | | 25/0 | 12.00 | 11.03 | 10.93 | 10.67 |
| | | 12/6 | 12.00 | 10.82 | 10.12 | 10.26 | | | 25/12 | 12.00 | 10.71 | 10.50 | 10.40 |
| | | 12/13 | 12.00 | 10.62 | 10.05 | 10.38 | | | 25/25 | 12.00 | 10.16 | 10.23 | 10.35 |
| | | 25/0 | 12.00 | 10.60 | 10.08 | 10.23 | | | 50/0 | 12.00 | 10.59 | 10.51 | 10.47 |

### 8.1.11 CONDUCTED POWER MEASUREMENTS OF BT

| BT | Tune up | Average Conducted Power(dBm) | | |
|---|---|---|---|---|
| | | CH0 | CH39 | CH78 |
| | | 2402MHz | 2441MHz | 2480MHz |
| DH5 | 9.50 | 7.13 | 7.22 | 7.11 |
| 2DH5 | 9.50 | 5.08 | 5.26 | 5.02 |
| 3DH5 | 9.50 | 5.18 | 5.10 | 5.25 |

| BT | Tune up | Average Conducted Power(dBm) | | |
|---|---|---|---|---|
| | | CH0 | CH19 | CH39 |
| | | 2402MHz | 2441MHz | 2480MHz |
| BLE | 9.50 | 5.50 | 5.37 | 4.71 |

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

### 8.1.12 CONDUCTED POWER MEASUREMENTS OF WIFI 2.4G

1) Conducted power measurement results of WiFi 2.4G (sensor off)

| | Mode | Channel | Frequency(MHz) | Data Rate(Mbps) | Tune up | Average Power(dBm) | SAR Test(Yes/No) |
|---|---|---|---|---|---|---|---|
| 2.4G | 802.11b | **1** | **2412** | **1** | **17.50** | **16.94** | Yes |
| | | **6** | **2437** | | 17.50 | 16.52 | No |
| | | 11 | **2462** | | 17.50 | 16.46 | No |
| | 802.11g | **1** | **2412** | **6** | 11.00 | Not Required | No |
| | | **6** | **2437** | | 11.00 | Not Required | No |
| | | 11 | **2462** | | 11.00 | Not Required | No |
| | 802.11n HT20 | **1** | **2412** | **6.5** | 11.00 | Not Required | No |
| | | **6** | **2437** | | 11.00 | Not Required | No |
| | | 11 | **2462** | | 11.00 | Not Required | No |
| | 802.11n HT40 | **3** | **2422** | **13.5** | 10.00 | Not Required | No |
| | | **6** | **2437** | | 10.00 | Not Required | No |
| | | 9 | **2452** | | 10.00 | Not Required | No |

2) Conducted power measurement results of WiFi 2.4G (wifi with sensor on)

| | Mode | Channel | Frequency(MHz) | Data Rate(Mbps) | Tune up | Average Power(dBm) | SAR Test(Yes/No) |
|---|---|---|---|---|---|---|---|
| 2.4G | 802.11b | **1** | **2412** | **1** | 9.50 | 8.46 | No |
| | | **6** | **2437** | | 9.50 | 8.55 | No |
| | | 11 | **2462** | | **9.50** | **9.19** | Yes |
| | 802.11g | **1** | **2412** | **6** | 9.50 | 8.25 | No |
| | | **6** | **2437** | | 9.50 | 8.32 | No |
| | | 11 | **2462** | | 9.50 | 8.78 | No |
| | 802.11n HT20 | **1** | **2412** | **6.5** | 9.50 | 8.26 | No |
| | | **6** | **2437** | | 9.50 | 8.33 | No |
| | | 11 | **2462** | | 9.50 | 8.74 | No |
| | 802.11n HT40 | **3** | **2422** | **13.5** | 9.50 | 8.55 | No |
| | | **6** | **2437** | | 9.50 | 9.04 | No |
| | | 9 | **2452** | | 9.50 | 8.98 | No |

Note:

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

2) Per KDB248227 D01, for WiFi 2.4GHz, the highest measured maximum output power Channel for DSSS modes(802.11b)was selected for SAR measurement. SAR for OFDM modes(2.4GHz 802.11g/n) was not required When the highest reported SAR for DSSS is adjusted by the ratio of OFDM modes(802.11g/n)to DSSS modes(802.11b)specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

3) The tested channels are marks in bold.

## 8.1.13 CONDUCTED POWER MEASUREMENTS OF WIFI 5G

1) Conducted power measurement results of WiFi 5G (sensor off)

| Band | Mode | Channel | Frequency(MHz) | Data Rate(Mbps) | Tune-up | Average Power(dBm) | SAR Test(Yes/No) |
|---|---|---|---|---|---|---|---|
| 5.2G | 802.11a | 36 | 5180 | 6 | 17.00 | 15.79 | No |
| | | 40 | 5200 | | 17.00 | 15.58 | No |
| | | 44 | 5220 | | 17.00 | 15.61 | No |
| | | 48 | 5240 | | 17.00 | 15.64 | No |
| | 802.11n HT20 | 36 | 5180 | 6.5 | 17.00 | 15.98 | No |
| | | 40 | 5200 | | 17.00 | 15.86 | No |
| | | 44 | 5220 | | 17.00 | 15.78 | No |
| | | 48 | 5240 | | 17.00 | 15.81 | No |
| | 802.11n HT40 | 38 | 5190 | 13.5 | 12.00 | Not Required | No |
| | | 46 | 5230 | | 12.00 | Not Required | No |
| | 802.11ac HT20 | 36 | 5180 | 6.5 | 17.00 | 15.93 | No |
| | | 40 | 5200 | | 17.00 | 15.88 | No |
| | | 44 | 5220 | | 17.00 | 15.87 | No |
| | | 48 | 5240 | | 17.00 | 15.92 | No |
| | 802.11ac HT40 | 38 | 5190 | 13.5 | 12.00 | Not Required | No |
| | | 46 | 5230 | | 12.00 | Not Required | No |
| | 802.11ac VH80 | 42 | 5210 | 29.3 | 11.00 | Not Required | No |
| 5.3G | 802.11a | 52 | 5260 | 6 | 17.00 | 15.36 | No |
| | | 56 | 5280 | | 17.00 | 15.51 | No |
| | | 60 | 5300 | | 17.00 | 15.57 | No |
| | | 64 | 5320 | | **17.00** | **15.61** | Yes |
| | 802.11n HT20 | 52 | 5260 | 6.5 | 17.00 | 15.76 | No |
| | | 56 | 5280 | | 17.00 | 15.75 | No |
| | | 60 | 5300 | | 17.00 | 15.84 | No |
| | | 64 | 5320 | | 17.00 | 15.62 | No |
| | 802.11n HT40 | 54 | 5270 | 13.5 | 12.00 | Not Required | No |
| | | 62 | 5310 | | 12.00 | Not Required | No |
| | 802.11ac HT20 | 52 | 5180 | 6.5 | 17.00 | 15.57 | No |
| | | 56 | 5200 | | 17.00 | 15.87 | No |
| | | 60 | 5220 | | 17.00 | 15.91 | No |
| | | 64 | 5240 | | 17.00 | 15.63 | No |
| | 802.11ac HT40 | 54 | 5270 | 13.5 | 12.00 | Not Required | No |
| | | 62 | 5310 | | 12.00 | Not Required | No |
| | 802.11ac VH80 | 58 | 5290 | 29.3 | 11.00 | Not Required | No |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5.5G | 802.11a | 100 | 5500 | 6 | 17.00 | 15.67 | No |
| | | 104 | 5520 | | 17.00 | 15.61 | No |
| | | 108 | 5540 | | 17.00 | 15.58 | No |
| | | 112 | 5560 | | 17.00 | 15.53 | No |
| | | 116 | 5580 | | 17.00 | 15.62 | No |
| | | 132 | 5660 | | 17.00 | 15.66 | No |
| | | 136 | 5680 | | 17.00 | 15.71 | No |
| | | 140 | 5700 | | **17.00** | **15.95** | Yes |
| | 802.11n HT20 | 100 | 5500 | 6.5 | 17.00 | 15.73 | No |
| | | 104 | 5520 | | 17.00 | 15.68 | No |
| | | 108 | 5540 | | 17.00 | 15.63 | No |
| | | 112 | 5560 | | 17.00 | 15.71 | No |
| | | 116 | 5580 | | 17.00 | 15.66 | No |
| | | 132 | 5660 | | 17.00 | 15.75 | No |
| | | 136 | 5680 | | 17.00 | 15.78 | No |
| | | 140 | 5700 | | 17.00 | 16.02 | No |
| | 802.11n HT40 | 102 | 5510 | 13.5 | 12.00 | Not Required | No |
| | | 134 | 5670 | | 12.00 | Not Required | No |
| | 802.11ac HT20 | 100 | 5500 | 6.5 | 17.00 | 15.76 | No |
| | | 104 | 5520 | | 17.00 | 15.65 | No |
| | | 108 | 5540 | | 17.00 | 15.63 | No |
| | | 112 | 5560 | | 17.00 | 15.71 | No |
| | | 116 | 5580 | | 17.00 | 15.66 | No |
| | | 132 | 5660 | | 17.00 | 15.74 | No |
| | | 136 | 5680 | | 17.00 | 15.59 | No |
| | | 140 | 5700 | | 17.00 | 15.44 | No |
| | 802.11ac HT40 | 102 | 5510 | 13.5 | 12.00 | Not Required | No |
| | | 134 | 5670 | | 12.00 | Not Required | No |
| | 802.11ac VH80 | 106 | 5530 | 29.3 | 11.00 | Not Required | No |
| | | 138 | 5690 | | 11.00 | Not Required | No |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5.8G | 802.11a | 149 | 5745 | 6 | 17.00 | 15.86 | No |
| | | 153 | 5765 | | 17.00 | 15.81 | No |
| | | 157 | 5785 | | **17.00** | **15.91** | Yes |
| | | 161 | 5805 | | 17.00 | 15.67 | No |
| | | 165 | 5825 | | 17.00 | 15.45 | No |
| | 802.11n HT20 | 149 | 5745 | 6.5 | 17.00 | 15.91 | No |
| | | 153 | 5765 | | 17.00 | 15.82 | No |
| | | 157 | 5785 | | 17.00 | 15.96 | No |
| | | 161 | 5805 | | 17.00 | 15.76 | No |
| | | 165 | 5825 | | 17.00 | 15.52 | No |
| | 802.11n HT40 | 151 | 5755 | 13.5 | 12.00 | Not Required | No |
| | | 159 | 5795 | | 12.00 | Not Required | No |
| | 802.11ac HT20 | 149 | 5745 | 6.5 | 17.00 | 15.36 | No |
| | | 153 | 5765 | | 17.00 | 15.32 | No |
| | | 157 | 5785 | | 17.00 | 15.41 | No |
| | | 161 | 5805 | | 17.00 | 15.45 | No |
| | | 165 | 5825 | | 17.00 | 15.55 | No |
| | 802.11ac HT40 | 151 | 5755 | 13.5 | 12.00 | Not Required | No |
| | | 159 | 5795 | | 12.00 | Not Required | No |
| | 802.11ac VH80 | 155 | 5775 | 29.3 | 11.00 | Not Required | No |

Note:
1) The Average conducted power of WiFi is measured with RMS detector.
2) The tested channels are marks in bold.

2) Conducted power measurement results of WiFi 5G (wifi with sensor on)

| Band | Mode | Channel | Frequency(MHz) | Data Rate(Mbps) | Tune-up | Average Power(dBm) | SAR Test(Yes/No) |
|---|---|---|---|---|---|---|---|
| 5.2G | 802.11a | 36 | 5180 | 6 | 7.00 | 5.95 | No |
| | | 40 | 5200 | | 7.00 | 5.84 | No |
| | | 44 | 5220 | | 7.00 | 5.76 | No |
| | | 48 | 5240 | | 7.00 | 5.71 | No |
| | 802.11n HT20 | 36 | 5180 | 6.5 | 7.00 | 5.91 | No |
| | | 40 | 5200 | | 7.00 | 5.90 | No |
| | | 44 | 5220 | | 7.00 | 5.93 | No |
| | | 48 | 5240 | | 7.00 | 5.75 | No |
| | 802.11n HT40 | 38 | 5190 | 13.5 | 7.00 | 5.76 | No |
| | | 46 | 5230 | | 7.00 | 5.57 | No |
| | 802.11ac HT20 | 36 | 5180 | 6.5 | 7.00 | 5.91 | No |
| | | 40 | 5200 | | 7.00 | 5.86 | No |
| | | 44 | 5220 | | 7.00 | 5.83 | No |
| | | 48 | 5240 | | 7.00 | 5.73 | No |
| | 802.11ac HT40 | 38 | 5190 | 13.5 | 7.00 | 5.73 | No |
| | | 46 | 5230 | | 7.00 | 5.52 | No |
| | 802.11ac VH80 | 42 | 5210 | 29.3 | 7.00 | 5.39 | No |
| 5.3G | 802.11a | 52 | 5260 | 6 | 7.00 | 5.93 | No |
| | | 56 | 5280 | | 7.00 | 6.01 | No |
| | | 60 | 5300 | | 7.00 | 6.22 | No |
| | | 64 | 5320 | | 7.00 | 6.43 | No |
| | 802.11n HT20 | 52 | 5260 | 6.5 | 7.00 | 5.83 | No |
| | | 56 | 5280 | | 7.00 | 5.94 | No |
| | | 60 | 5300 | | 7.00 | 6.15 | No |
| | | 64 | 5320 | | 7.00 | 6.39 | No |
| | 802.11n HT40 | 54 | 5270 | 13.5 | 7.00 | 5.48 | No |
| | | 62 | 5310 | | 7.00 | 5.75 | No |
| | 802.11ac HT20 | 52 | 5180 | 6.5 | 7.00 | 5.81 | No |
| | | 56 | 5200 | | 7.00 | 5.92 | No |
| | | 60 | 5220 | | 7.00 | 6.09 | No |
| | | 64 | 5240 | | 7.00 | 6.37 | No |
| | 802.11ac HT40 | 54 | 5270 | 13.5 | 7.00 | 5.46 | No |
| | | 62 | 5310 | | 7.00 | 5.77 | No |
| | 802.11ac VH80 | 58 | 5290 | 29.3 | **7.00** | **5.39** | Yes |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5.5G | 802.11a | 100 | 5500 | 6 | 7.00 | 6.08 | No |
| | | 104 | 5520 | | 7.00 | 6.18 | No |
| | | 108 | 5540 | | 7.00 | 6.29 | No |
| | | 112 | 5560 | | 7.00 | 6.46 | No |
| | | 116 | 5580 | | 7.00 | 5.71 | No |
| | | 132 | 5660 | | 7.00 | 5.51 | No |
| | | 136 | 5680 | | 7.00 | 5.87 | No |
| | | 140 | 5700 | | 7.00 | 6.19 | No |
| | 802.11n HT20 | 100 | 5500 | 6.5 | 7.00 | 5.96 | No |
| | | 104 | 5520 | | 7.00 | 6.08 | No |
| | | 108 | 5540 | | 7.00 | 6.21 | No |
| | | 112 | 5560 | | 7.00 | 6.39 | No |
| | | 116 | 5580 | | 7.00 | 5.64 | No |
| | | 132 | 5660 | | 7.00 | 5.43 | No |
| | | 136 | 5680 | | 7.00 | 5.83 | No |
| | | 140 | 5700 | | 7.00 | 6.14 | No |
| | 802.11n HT40 | 102 | 5510 | 13.5 | 7.00 | 6.02 | No |
| | | 134 | 5670 | | 7.00 | 5.74 | No |
| | 802.11ac HT20 | 100 | 5500 | 6.5 | 7.00 | 5.92 | No |
| | | 104 | 5520 | | 7.00 | 6.05 | No |
| | | 108 | 5540 | | 7.00 | 6.18 | No |
| | | 112 | 5560 | | 7.00 | 6.36 | No |
| | | 116 | 5580 | | 7.00 | 5.63 | No |
| | | 132 | 5660 | | 7.00 | 5.41 | No |
| | | 136 | 5680 | | 7.00 | 5.81 | No |
| | | 140 | 5700 | | 7.00 | 6.12 | No |
| | 802.11ac HT40 | 102 | 5510 | 13.5 | 7.00 | 6.01 | No |
| | | 134 | 5670 | | 7.00 | 5.72 | No |
| | 802.11ac VH80 | 106 | 5530 | 29.3 | **7.00** | **5.45** | Yes |
| | | 138 | 5690 | | 7.00 | 5.22 | No |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5.8G | 802.11a | 149 | 5745 | 6 | 7.00 | 5.87 | No |
| | | 153 | 5765 | | 7.00 | 5.38 | No |
| | | 157 | 5785 | | 7.00 | 5.82 | No |
| | | 161 | 5805 | | 7.00 | 6.18 | No |
| | | 165 | 5825 | | 7.00 | 6.37 | No |
| | 802.11n HT20 | 149 | 5745 | 6.5 | 7.00 | 5.84 | No |
| | | 153 | 5765 | | 7.00 | 5.37 | No |
| | | 157 | 5785 | | 7.00 | 5.78 | No |
| | | 161 | 5805 | | 7.00 | 6.15 | No |
| | | 165 | 5825 | | 7.00 | 6.34 | No |
| | 802.11n HT40 | 151 | 5755 | 13.5 | 7.00 | 5.51 | No |
| | | 159 | 5795 | | 7.00 | 5.75 | No |
| | 802.11ac HT20 | 149 | 5745 | 6.5 | 7.00 | 5.81 | No |
| | | 153 | 5765 | | 7.00 | 5.33 | No |
| | | 157 | 5785 | | 7.00 | 5.74 | No |
| | | 161 | 5805 | | 7.00 | 6.12 | No |
| | | 165 | 5825 | | 7.00 | 6.33 | No |
| | 802.11ac HT40 | 151 | 5755 | 13.5 | 7.00 | 5.48 | No |
| | | 159 | 5795 | | 7.00 | 5.73 | No |
| | 802.11ac VH80 | 155 | 5775 | 29.3 | **7.00** | **5.46** | Yes |

Note:
1) The Average conducted power of WiFi is measured with RMS detector.
2) The tested channels are marks in bold.

## 8.2 SAR TEST RESULTS

**General Notes:**

1) Per KDB447498 D01, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:≤0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is≤100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.
3) Per KDB865664 D01,for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg; if the deviation among the repeated measurement is ≤ 20%,and the measured SAR <1.45W/kg, only one repeated measurement is required.
4) Per KDB865664 D02, 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 W/kg, or > 7.0 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.

**WLAN Notes:**

1. For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode, 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 positions in an exposure condition. The test position with the highest extrapolated (peak)SAR is used as the initial test position. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 for 2.4GHz WIFI single transmission chain operations, the highest measured maximum output power Channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 7.1.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 for 5GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed power. Other transmission mode were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2W/kg. See Section 7.1.5 for more information.

### 8.2.1 SAR MEASUREMENT RESULT

1. Test results of GSM

| Test No. | Band | Mode | Channel | Test Position | Separation Distance (cm) | Sensor | Maximum Tune-up (dBm) | Conducted Power (dBm) | Power Drift | SAR 1g | SAR 10g | Reported 1g SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T100 | GSM 850 | GPRS 2TX | 190 | Rear Face | 0 | on | 22.5 | 21.1 | 0.17 | **0.367** | 0.173 | **0.507** |
| T101 | GSM 850 | GPRS 2TX | 190 | Top Side | 0 | on | 22.5 | 21.1 | 0.03 | 0.165 | 0.0737 | 0.228 |
| T103 | GSM 850 | GPRS 2TX | 190 | Rear Face | 2.7 | off | 32.5 | 31.5 | 0.06 | 0.102 | 0.069 | 0.128 |
| T104 | GSM 850 | GPRS 2TX | 190 | Left Side | 0 | off | 32.5 | 31.5 | 0.04 | 0.039 | 0.025 | 0.049 |
| T105 | GSM 850 | GPRS 2TX | 190 | Right Side | 0 | off | 32.5 | 31.5 | 0.1 | **0.205** | 0.130 | **0.258** |
| T106 | GSM 850 | GPRS 2TX | 190 | Top Side | 3.7 | off | 32.5 | 31.5 | -0.09 | 0.031 | 0.021 | 0.039 |
| T107 | GSM 850 | GPRS 2TX | 190 | Bottom Side | 0 | off | 32.5 | 31.5 | -0.09 | 0.061 | 0.037 | 0.076 |
| T109 | GSM 1900 | GPRS 2TX | 661 | Rear Face | 0 | on | 17.5 | 16.03 | 0 | **0.251** | 0.11 | **0.352** |
| T110 | GSM 1900 | GPRS 2TX | 661 | Top Side | 0 | on | 17.5 | 16.03 | 0.02 | 0.161 | 0.065 | 0.226 |
| T112 | GSM 1900 | GPRS 2TX | 661 | Rear Face | 2.7 | off | 29.5 | 27.91 | -0.09 | 0.079 | 0.048 | 0.114 |
| T113 | GSM 1900 | GPRS 2TX | 661 | Right Side | 0 | off | 29.5 | 27.91 | 0.18 | **0.279** | 0.149 | **0.402** |
| T114 | GSM 1900 | GPRS 2TX | 661 | Top Side | 3.7 | off | 29.5 | 27.91 | -0.03 | 0.033 | 0.021 | 0.048 |

Note: The maximum SAR Values are marks in bold.

2. Test results of UMTS

| Test No. | Band | Mode | Channel | Test Position | Separation Distance (cm) | Sensor | Maximum Tune-up (dBm) | Conducted Power (dBm) | Power Drift | SAR 1g | SAR 10g | Reported 1g SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T116 | UMTS B2 | RMC12.2K | 9400 | Rear Face | 0 | on | 9.5 | 8.48 | 0 | **0.155** | 0.066 | **0.196** |
| T117 | UMTS B2 | RMC12.2K | 9400 | Top Side | 0 | on | 9.5 | 8.48 | 0.16 | 0.047 | 0.018 | 0.059 |
| T119 | UMTS B2 | RMC12.2K | 9400 | Rear Face | 2.7 | off | 25 | 23.73 | -0.08 | 0.103 | 0.061 | 0.138 |
| T120 | UMTS B2 | RMC12.2K | 9400 | Right Side | 0 | off | 25 | 23.73 | 0.03 | **0.344** | 0.183 | **0.461** |
| T121 | UMTS B2 | RMC12.2K | 9400 | Top Side | 3.7 | off | 25 | 23.73 | 0 | 0.051 | 0.032 | 0.068 |
| T123 | UMTS B4 | RMC12.2K | 1413 | Rear Face | 0 | on | 12.5 | 11.03 | 0.09 | **0.273** | 0.123 | **0.383** |
| T124 | UMTS B4 | RMC12.2K | 1413 | Top Side | 0 | on | 12.5 | 11.03 | 0.08 | 0.102 | 0.041 | 0.143 |
| T126 | UMTS B4 | RMC12.2K | 1413 | Rear Face | 2.7 | off | 25 | 23.65 | 0.04 | 0.073 | 0.045 | 0.099 |
| T127 | UMTS B4 | RMC12.2K | 1413 | Right Side | 0 | off | 25 | 23.65 | 0.06 | **0.379** | 0.201 | **0.517** |
| T128 | UMTS B4 | RMC12.2K | 1413 | Top Side | 3.7 | off | 25 | 23.65 | 0.14 | 0.026 | 0.017 | 0.036 |
| T130 | UMTS B5 | RMC12.2K | 4182 | Rear Face | 0 | on | 15.5 | 14.96 | 0.03 | **0.167** | 0.075 | **0.189** |
| T131 | UMTS B5 | RMC12.2K | 4182 | Top Side | 0 | on | 15.5 | 14.96 | -0.02 | 0.141 | 0.069 | 0.160 |
| T133 | UMTS B5 | RMC12.2K | 4182 | Rear Face | 2.7 | off | 25.5 | 23.78 | -0.01 | 0.117 | 0.082 | 0.174 |
| T134 | UMTS B5 | RMC12.2K | 4182 | Right Side | 0 | off | 25.5 | 23.78 | 0.08 | **0.166** | 0.108 | **0.247** |
| T135 | UMTS B5 | RMC12.2K | 4182 | Top Side | 3.7 | off | 25.5 | 23.78 | 0 | 0.020 | 0.014 | 0.029 |

Note: The maximum SAR Values are marks in bold.

3. Test results of LTE B2

| Test No. | Band | Mode | Channel | RB | offset | Test Position | Separation Distance (cm) | Sensor | Maximum Tune-up (dBm) | Conducted Power (dBm) | Power Drift | SAR 1g | SAR 10g | Reported 1g SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T01 | LTE B2 | QPSK20M | 19100 | 1 | 0 | Rear Face | 0 | on | 9 | 8.76 | -0.09 | **0.276** | 0.115 | **0.292** |
| T02 | LTE B2 | QPSK20M | 19100 | 1 | 0 | Top Side | 0 | on | 9 | 8.76 | 0.04 | 0.088 | 0.032 | 0.092 |
| T03 | LTE B2 | QPSK20M | 19100 | 50 | 0 | Rear Face | 0 | on | 9 | 8.12 | -0.09 | 0.203 | 0.085 | 0.249 |
| T04 | LTE B2 | QPSK20M | 19100 | 50 | 0 | Top Side | 0 | on | 9 | 8.12 | 0.04 | 0.065 | 0.023 | 0.080 |
| T06 | LTE B2 | QPSK20M | 18700 | 1 | 0 | Rear Face | 2.7 | off | 24 | 23.89 | -0.05 | 0.117 | 0.071 | 0.120 |
| T07 | LTE B2 | QPSK20M | 18700 | 1 | 0 | Right Side | 0 | off | 24 | 23.89 | 0.08 | **0.416** | 0.227 | **0.426** |
| T08 | LTE B2 | QPSK20M | 18700 | 1 | 0 | Top Side | 3.7 | off | 24 | 23.89 | 0.02 | 0.051 | 0.032 | 0.052 |
| T09 | LTE B2 | QPSK20M | 18700 | 50 | 0 | Rear Face | 2.7 | off | 24 | 22.81 | 0.01 | 0.085 | 0.051 | 0.111 |
| T10 | LTE B2 | QPSK20M | 18700 | 50 | 0 | Right Side | 0 | off | 24 | 22.81 | -0.04 | 0.314 | 0.173 | 0.413 |
| T11 | LTE B2 | QPSK20M | 18700 | 50 | 0 | Top Side | 3.7 | off | 24 | 22.81 | 0.09 | 0.039 | 0.024 | 0.051 |

Note: The maximum SAR Values are marks in bold.

4. Test results of LTE B4

| Test No. | Band | Mode | Channel | RB | offset | Test Position | Separation Distance (cm) | Sensor | Maximum Tune-up (dBm) | Conducted Power (dBm) | Power Drift | SAR 1g | SAR 10g | Reported 1g SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T13 | LTE B4 | QPSK20M | 20050 | 1 | 50 | Rear Face | 0 | on | 12.5 | 11.89 | 0 | **0.184** | 0.084 | **0.212** |
| T14 | LTE B4 | QPSK20M | 20050 | 1 | 50 | Top Side | 0 | on | 12.5 | 11.89 | 0.04 | 0.065 | 0.030 | 0.075 |
| T15 | LTE B4 | QPSK20M | 20050 | 50 | 0 | Rear Face | 0 | on | 11.5 | 10.10 | 0 | 0.152 | 0.068 | 0.210 |
| T16 | LTE B4 | QPSK20M | 20050 | 50 | 0 | Top Side | 0 | on | 11.5 | 10.10 | -0.03 | 0.053 | 0.024 | 0.073 |
| T18 | LTE B4 | QPSK20M | 20300 | 1 | 99 | Rear Face | 2.7 | off | 25 | 24.19 | -0.01 | 0.090 | 0.056 | 0.108 |
| T19 | LTE B4 | QPSK20M | 20300 | 1 | 99 | Right Side | 0 | off | 25 | 24.19 | -0.17 | 0.327 | 0.175 | 0.394 |
| T20 | LTE B4 | QPSK20M | 20300 | 1 | 99 | Top Side | 3.7 | off | 25 | 24.19 | 0.04 | 0.031 | 0.020 | 0.037 |
| T21 | LTE B4 | QPSK20M | 20300 | 50 | 50 | Rear Face | 2.7 | off | 24 | 22.91 | 0.03 | 0.094 | 0.059 | 0.121 |
| T22 | LTE B4 | QPSK20M | 20300 | 50 | 50 | Right Side | 0 | off | 24 | 22.91 | -0.13 | **0.332** | 0.178 | **0.427** |
| T23 | LTE B4 | QPSK20M | 20300 | 50 | 50 | Top Side | 3.7 | off | 24 | 22.91 | 0.04 | 0.033 | 0.021 | 0.042 |

Note: The maximum SAR Values are marks in bold.

5. Test results of LTE B5

| Test No. | Band | Mode | Channel | RB | offset | Test Position | Separation Distance (cm) | Sensor | Maximum Tune-up (dBm) | Conducted Power (dBm) | Power Drift | SAR 1g | SAR 10g | Reported 1g SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T25 | LTE B5 | QPSK10M | 20600 | 1 | 49 | Rear Face | 0 | on | 15.5 | 14.86 | 0.01 | **0.133** | 0.069 | **0.154** |
| T26 | LTE B5 | QPSK10M | 20600 | 1 | 49 | Top Side | 0 | on | 15.5 | 14.86 | -0.06 | 0.061 | 0.039 | 0.070 |
| T27 | LTE B5 | QPSK10M | 20525 | 25 | 0 | Rear Face | 0 | on | 14.5 | 13.63 | 0.02 | 0.117 | 0.066 | 0.143 |
| T28 | LTE B5 | QPSK10M | 20525 | 25 | 0 | Top Side | 0 | on | 14.5 | 13.63 | 0.02 | 0.042 | 0.027 | 0.051 |
| T30 | LTE B5 | QPSK10M | 20525 | 1 | 0 | Rear Face | 2.7 | off | 25.5 | 25.16 | 0.12 | 0.082 | 0.055 | 0.088 |
| T31 | LTE B5 | QPSK10M | 20525 | 1 | 0 | Right Side | 0 | off | 25.5 | 25.16 | 0.14 | 0.199 | 0.127 | 0.215 |
| T32 | LTE B5 | QPSK10M | 20525 | 1 | 0 | Top Side | 3.7 | off | 25.5 | 25.16 | -0.12 | 0.020 | 0.013 | 0.022 |
| T33 | LTE B5 | QPSK10M | 20525 | 25 | 0 | Rear Face | 2.7 | off | 24.5 | 23.76 | 0.03 | 0.084 | 0.060 | 0.099 |
| T34 | LTE B5 | QPSK10M | 20525 | 25 | 0 | Right Side | 0 | off | 24.5 | 23.76 | 0.02 | **0.203** | 0.129 | **0.241** |
| T35 | LTE B5 | QPSK10M | 20525 | 25 | 0 | Top Side | 3.7 | off | 24.5 | 23.76 | -0.03 | 0.021 | 0.013 | 0.025 |

Note: The maximum SAR Values are marks in bold.

6. Test results of LTE B7

| Test No. | Band | Mode | Channel | RB | offset | Test Position | Separation Distance (cm) | Sensor | Maximum Tune-up (dBm) | Conducted Power (dBm) | Power Drift | SAR 1g | SAR 10g | Reported 1g SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T37 | LTE B7 | QPKS20M | 21100 | 1 | 99 | Rear Face | 0 | on | 8 | 7.76 | 0 | **0.332** | 0.109 | **0.351** |
| T38 | LTE B7 | QPKS20M | 21100 | 1 | 99 | Top Side | 0 | on | 8 | 7.76 | 0.09 | 0.219 | 0.064 | 0.231 |
| T39 | LTE B7 | QPKS20M | 21100 | 50 | 25 | Rear Face | 0 | on | 7 | 5.50 | 0 | 0.139 | 0.040 | 0.196 |
| T40 | LTE B7 | QPKS20M | 21100 | 50 | 25 | Top Side | 0 | on | 7 | 5.50 | 0.09 | 0.127 | 0.036 | 0.179 |
| T42 | LTE B7 | QPSK20M | 21100 | 1 | 99 | Rear Face | 2.7 | off | 24 | 23.36 | 0.04 | 0.137 | 0.076 | 0.159 |
| T43 | LTE B7 | QPSK20M | 21100 | 1 | 99 | Right Side | 0 | off | 24 | 23.36 | 0.09 | **0.267** | 0.125 | **0.309** |
| T44 | LTE B7 | QPSK20M | 21100 | 1 | 99 | Top Side | 3.7 | off | 24 | 23.36 | -0.07 | 0.178 | 0.100 | 0.206 |
| T45 | LTE B7 | QPSK20M | 21100 | 50 | 50 | Rear Face | 2.7 | off | 23 | 21.41 | -0.09 | 0.103 | 0.057 | 0.149 |
| T46 | LTE B7 | QPSK20M | 21100 | 50 | 50 | Right Side | 0 | off | 23 | 21.41 | 0.04 | 0.190 | 0.088 | 0.274 |
| T47 | LTE B7 | QPSK20M | 21100 | 50 | 50 | Top Side | 3.7 | off | 23 | 21.41 | 0.13 | 0.135 | 0.075 | 0.195 |

Note: The maximum SAR Values are marks in bold.

7. Test results of LTE B12

| Test No. | Band | Mode | Channel | RB | offset | Test Position | Separation Distance (cm) | Sensor | Maximum Tune-up (dBm) | Conducted Power (dBm) | Power Drift | SAR 1g | SAR 10g | Reported 1g SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T49 | LTE B12 | QPSK10M | 23130 | 1 | 0 | Rear Face | 0 | on | 14 | 13.88 | -0.05 | **0.121** | 0.058 | **0.124** |
| T50 | LTE B12 | QPSK10M | 23130 | 1 | 0 | Top Side | 0 | on | 14 | 13.88 | -0.04 | 0.055 | 0.026 | 0.057 |
| T51 | LTE B12 | QPSK10M | 23060 | 25 | 12 | Rear Face | 0 | on | 11.5 | 10.79 | 0.06 | 0.094 | 0.044 | 0.111 |
| T52 | LTE B12 | QPSK10M | 23060 | 25 | 12 | Top Side | 0 | on | 11.5 | 10.79 | -0.18 | 0.038 | 0.019 | 0.045 |
| T54 | LTE B12 | QPSK10M | 23130 | 1 | 0 | Rear Face | 2.7 | off | 25.5 | 24.97 | -0.15 | 0.036 | 0.025 | 0.040 |
| T55 | LTE B12 | QPSK10M | 23130 | 1 | 0 | Right Side | 0 | off | 25.5 | 24.97 | 0.14 | 0.067 | 0.042 | 0.076 |
| T56 | LTE B12 | QPSK10M | 23130 | 1 | 0 | Top Side | 3.7 | off | 25.5 | 24.97 | -0.1 | 0.009 | 0.006 | 0.010 |
| T57 | LTE B12 | QPSK10M | 23060 | 25 | 12 | Rear Face | 2.7 | off | 23 | 22.37 | -0.08 | 0.040 | 0.029 | 0.046 |
| T58 | LTE B12 | QPSK10M | 23060 | 25 | 12 | Right Side | 0 | off | 23 | 22.37 | 0.08 | **0.076** | 0.048 | **0.088** |
| T59 | LTE B12 | QPSK10M | 23060 | 25 | 12 | Top Side | 3.7 | off | 23 | 22.37 | 0.02 | 0.009 | 0.007 | 0.011 |

Note: The maximum SAR Values are marks in bold.

8. Test results of WIFI

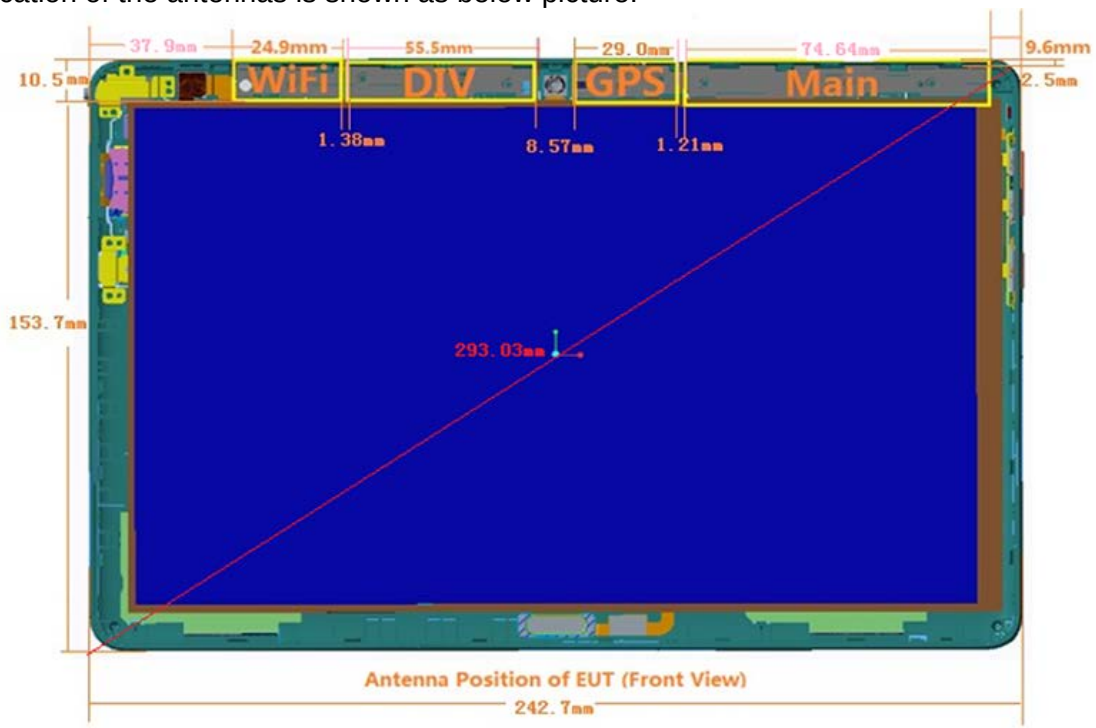
| Test No. | Band | Channel | Test Position | Separation Distance (cm) | Sensor | Data Rate | Duty Cycle | Maximum Tune-up (dBm) | Conducted Power (dBm) | Power Drift | SAR 1g | SAR 10g | Reported 1g SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T70 | 802.11b | 11 | Rear Face | 0 | on | 1 | 100% | 9.5 | 9.19 | 0 | 0.277 | 0.106 | 0.297 |
| T71 | 802.11b | 11 | Top Side | 0 | on | 1 | 100% | 9.5 | 9.19 | 0 | **0.59** | 0.281 | **0.634** |
| T73 | 802.11b | 1 | Rear Face | 1.1 | off | 1 | 100% | 17.5 | 16.94 | -0.05 | **0.109** | 0.055 | **0.124** |
| T74 | 802.11b | 1 | Top Side | 1.4 | off | 1 | 100% | 17.5 | 16.94 | 0.01 | 0.049 | 0.026 | 0.055 |
| T76 | 802.11ac80 | 58 | Rear Face | 0 | on | 6 | 92% | 7 | 5.39 | -0.03 | 0.207 | 0.068 | 0.327 |
| T77 | 802.11ac80 | 58 | Top Side | 0 | on | 6 | 92% | 7 | 5.39 | 0.05 | **0.468** | 0.115 | **0.740** |
| T79 | 802.11a | 64 | Rear Face | 1.1 | off | 6 | 97% | 17 | 15.61 | 0 | 0.206 | 0.078 | 0.291 |
| T80 | 802.11a | 64 | Left Side | 0 | off | 6 | 97% | 17 | 15.61 | 0.08 | 0.225 | 0.085 | 0.318 |
| T81 | 802.11a | 64 | Top Side | 1.4 | off | 6 | 97% | 17 | 15.61 | 0.05 | **0.419** | 0.165 | **0.593** |
| T83 | 802.11ac80 | 106 | Rear Face | 0 | on | 6 | 92% | 7 | 5.45 | 0.02 | 0.207 | 0.053 | 0.323 |
| T84 | 802.11ac80 | 106 | Top Side | 0 | on | 6 | 92% | 7 | 5.45 | 0.04 | **0.279** | 0.080 | **0.435** |
| T86 | 802.11a | 140 | Rear Face | 1.1 | off | 6 | 97% | 17 | 15.95 | 0 | 0.163 | 0.061 | 0.213 |
| T87 | 802.11a | 140 | Left Side | 0 | off | 6 | 97% | 17 | 15.95 | 0.03 | **0.279** | 0.086 | **0.365** |
| T88 | 802.11a | 140 | Top Side | 1.4 | off | 6 | 97% | 17 | 15.95 | -0.09 | 0.19 | 0.068 | 0.249 |
| T90 | 802.11ac80 | 155 | Rear Face | 0 | on | 6 | 92% | 7 | 5.46 | 0 | **0.118** | 0.027 | **0.184** |
| T91 | 802.11ac80 | 155 | Top Side | 0 | on | 6 | 92% | 7 | 5.46 | 0.01 | 0.112 | 0.024 | 0.174 |
| T93 | 802.11a | 157 | Rear Face | 1.1 | off | 6 | 97% | 17 | 15.91 | 0 | 0.134 | 0.050 | 0.177 |
| T94 | 802.11a | 157 | Left Side | 0 | off | 6 | 97% | 17 | 15.91 | 0.09 | **0.189** | 0.060 | **0.250** |
| T95 | 802.11a | 157 | Top Side | 1.4 | off | 6 | 97% | 17 | 15.91 | -0.06 | 0.165 | 0.069 | 0.218 |

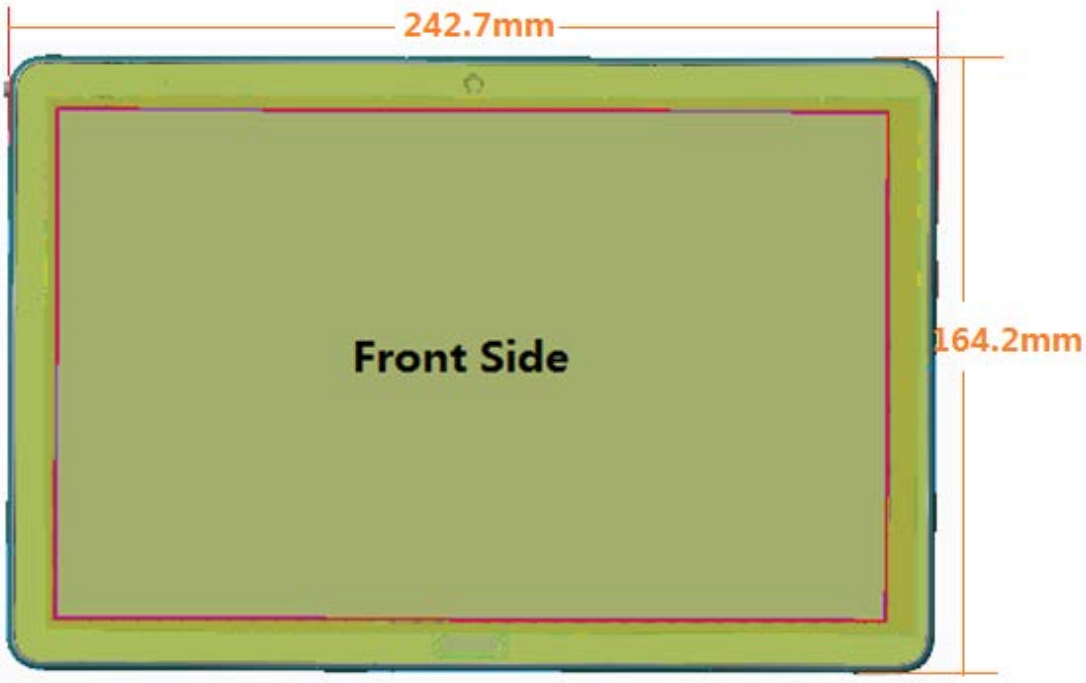
Note: The maximum SAR Values are marks in bold.

## 8.3 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 447498D01 General RF Exposure Guidance v06.

The location of the antennas is shown as below picture:




Figue1: The location of the antennas & the SAR sensor

Note: The proximity sensor and Main antenna use same metallic electrode, so the location is same.

### 8.3.1 STAND-ALONE SAR TEST EXCLUSION

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:

1) (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

According to KDB 447498 D01,when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standslone SAR was estimated according to following formula to result in substantially conservative SAR values of≤0.4W/kg to determine simultaneous transmission SAR test exclusion.

$$\text{Estimated SAR} = \frac{\text{Max. Tune up Power}_{(mW)}}{\text{Min. Test Separation Distance}_{(mm)}} \times \frac{\sqrt{f_{(GHz)}}}{7.5}$$

2) 0.4 W/kg for 1-g SAR, when the test separation distances is >50mm.

Estimated SAR calculation

| Mode | Position | $P_{max}$ (dBm)* | $P_{max}$ (mW) | Distance (mm) | f (GHz) | X | Estimated SAR (W/kg)* |
|---|---|---|---|---|---|---|---|
| BT | Rear/Top | 9.5 | 8.913 | 5 | 2.480 | 7.5 | 0.374 |

| Mode | Position | $P_{max}$ (dBm)* | $P_{max}$ (mW) | Distance (mm) | f (GHz) | X | Estimated SAR (W/kg)* |
|---|---|---|---|---|---|---|---|
| BT | Left | 9.5 | 8.913 | 37.9 | 2.480 | 7.5 | 0.049 |

| Mode | Position | $P_{max}$ (dBm)* | $P_{max}$ (mW) | Distance (mm) | f (GHz) | X | Estimated SAR (W/kg)* |
|---|---|---|---|---|---|---|---|
| 2.4G WiFi | Left | 17.5 | 56.234 | 37.9 | 2.462 | 7.5 | 0.310 |

Note: * - maximum possible output power declared by manufacturer.

### 8.3.2 SIMULTANEOUS TRANSMISSION CONDITIONS

Per FCC KDB 447498 D01, SAR compliance for simultaneous transmission must be considered when the maximum duration of overlapping transmissions, including network hand-offs, is greater than 30 seconds. This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis.

The Simultaneous Transmission Possibilities of this device are as below:

| NO. | Simultaneous Tx Combination | Body |
|---|---|---|
| 1 | GSM + BT | Yes |
| 2 | GSM + WiFi | Yes |
| 3 | UMTS + BT | Yes |
| 4 | UMTS + WiFi | Yes |
| 5 | LTE + BT | Yes |
| 6 | LTE + WiFi | Yes |
| 7 | GSM + LTE + BT+ WiFi | No |
| 8 | UMTS + LTE + BT+ WiFi | No |

Note:
1) Wi-Fiand Bluetooth share the same Tx antenna and can't transmit simultaneously.
2) The device does not support DTM function.

### 8.3.3 SAR SUMMATION SCENARIO

1) Summation scenario without Estimated SAR

| Position | Body | | | | | |
|---|---|---|---|---|---|---|
| | Front Face | Rear Face | Left Side | Right Side | Top Side | Bottom Side |
| GSM 850 | / | 0.507 | 0.049 | 0.258 | 0.228 | 0.076 |
| GSM 1900 | / | 0.352 | / | 0.402 | 0.226 | / |
| UMTS B2 | / | 0.196 | / | 0.461 | 0.068 | / |
| UMTS B4 | / | 0.383 | / | 0.517 | 0.143 | / |
| UMTS B5 | / | 0.189 | / | 0.247 | 0.160 | / |
| LTE B2 | / | 0.292 | / | 0.426 | 0.092 | / |
| LTE B4 | / | 0.212 | / | 0.427 | 0.075 | / |
| LTE B5 | / | 0.154 | / | 0.241 | 0.070 | / |
| LTE B7 | / | 0.351 | / | 0.309 | 0.231 | / |
| LTE B12 | / | 0.124 | / | 0.088 | 0.057 | / |
| 802.11b/g | / | 0.297 | / | / | 0.634 | / |
| 5.3G | / | 0.327 | 0.318 | / | 0.740 | / |
| 5.6G | / | 0.323 | 0.365 | / | 0.435 | / |
| 5.8G | / | 0.184 | 0.250 | / | 0.218 | / |
| Bluetooth | / | / | / | / | / | / |
| Max. SAR Summation | / | 0.834 | 0.414 | 0.517 | 0.971 | 0.076 |

Note: 1. For summation scenario without Estimated SAR, MAX. ∑SAR1g =0.971W/Kg<1.6 W/Kg, so the SAR to peak location separation ratio should not be considered.
2. The maximum SAR summation is calculated based on the same configuration and test position.

2) Summation scenario with Estimated SAR

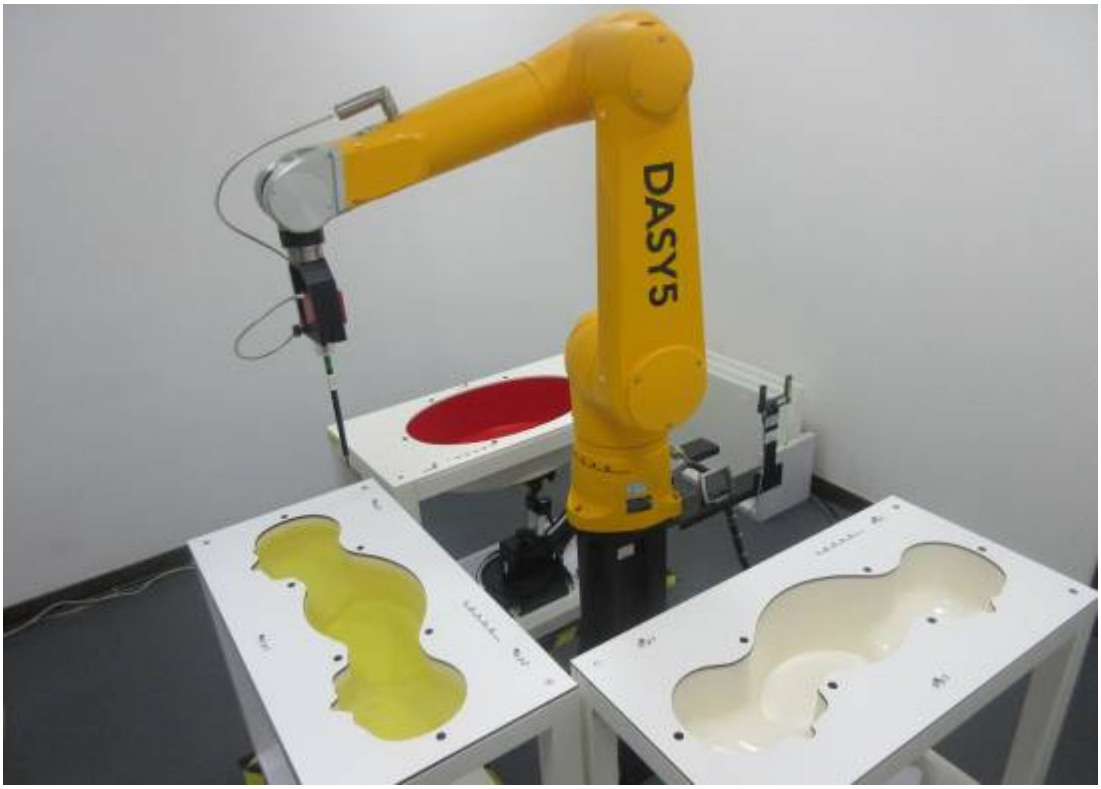
| Position | Body | | | | | |
|---|---|---|---|---|---|---|
| | Front Face | Rear Face | Left Side | Right Side | Top Side | Bottom Side |
| **GSM 850** | / | 0.507 | 0.049 | 0.258 | 0.228 | 0.076 |
| **GSM 1900** | / | 0.352 | 0.400 | 0.402 | 0.226 | 0.400 |
| **UMTS B2** | / | 0.196 | 0.400 | 0.461 | 0.068 | 0.400 |
| **UMTS B4** | / | 0.383 | 0.400 | 0.517 | 0.143 | 0.400 |
| **UMTS B5** | / | 0.189 | 0.400 | 0.247 | 0.160 | 0.400 |
| **LTE B2** | / | 0.292 | 0.400 | 0.426 | 0.092 | 0.400 |
| **LTE B4** | / | 0.212 | 0.400 | 0.427 | 0.075 | 0.400 |
| **LTE B5** | / | 0.154 | 0.400 | 0.241 | 0.070 | 0.400 |
| **LTE B7** | / | 0.351 | 0.400 | 0.309 | 0.231 | 0.400 |
| **LTE B12** | / | 0.124 | 0.400 | 0.088 | 0.057 | 0.400 |
| **802.11b/g** | / | 0.297 | 0.310 | 0.400 | 0.634 | 0.400 |
| **5.3G** | / | 0.327 | 0.318 | 0.400 | 0.740 | 0.400 |
| **5.6G** | / | 0.323 | 0.365 | 0.400 | 0.435 | 0.400 |
| **5.8G** | / | 0.184 | 0.250 | 0.400 | 0.218 | 0.400 |
| **Bluetooth** | / | 0.374 | 0.049 | 0.400 | 0.374 | 0.400 |
| **Max. SAR Summation** | **/** | 0.881 | 0.765 | 0.917 | 0.971 | 0.800 |

Note: 1. For summation scenario with Estimated SAR, MAX. ∑SAR1g =0.971W/Kg<1.6 W/Kg, so the SAR to peak location separation ratio should not be considered.
2. The maximum SAR summation is calculated based on the same configuration and test position.

# APPENDIX

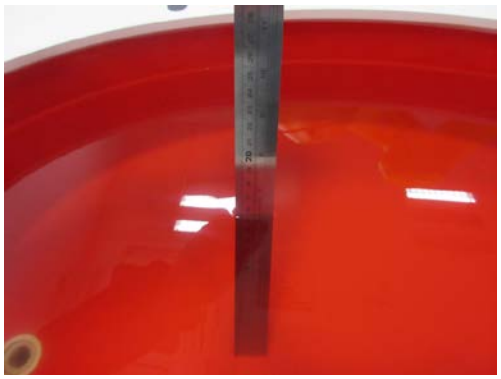
## 1. Test Layout

**Specific Absorption Rate Test Layout**

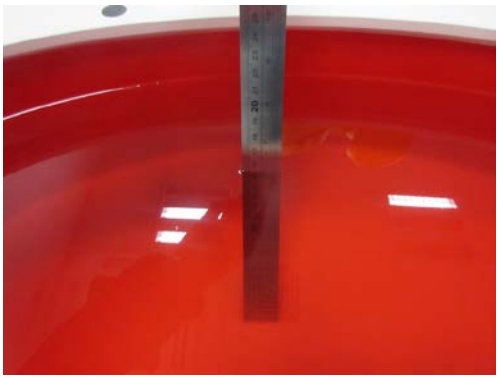


**Liquid depth in the flat Phantom (≥15cm depth)**

MSL750_15.7cm

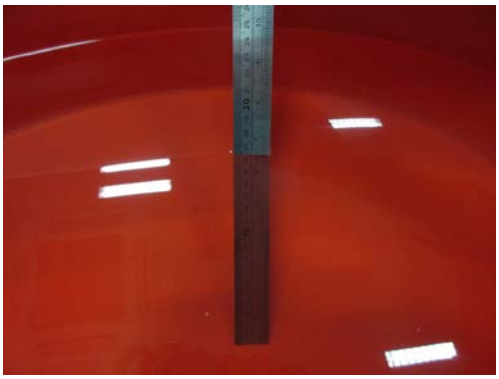


MSL835-900_15.6cm



MSL1750_15.5cm

MSL1900-3800_16.5cm



MSL5G_15.2cm

## Appendix A. SAR Plots of System Verification

**(Pls See Appendix A.)**

## Appendix B. SAR Plots of SAR Measurement

**(Pls See Appendix B.)**

## Appendix C. Calibration Certificate for Probe and Dipole

**(Pls See Appendix C.)**

## Appendix D. Photographs of the Test Set-Up

**(Pls See Appendix D.)**