FCC SAR Test Report

FCC ID: QISDUB-LX3

Project No.	:	1811C039
Equipment	:	Smart Phone
Model Name	:	DUB-LX3
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	:	Nov. 06, 2018
Date of Test	:	Nov. 06, 2018 ~ Nov. 22, 2018
Issued Date	:	Nov. 27, 2018
Tested by	:	BTL Inc.

PREPARED BY : Rot. Liang (Rot Liang)

APPROVED BY : Steven Lu (Steven Lu)

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Certificate #5123.02

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).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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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.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue	Nov. 27, 2018

1. GENERAL SUMMARY

Equipment	Smart Phone
Brand Name	HUAWEI
Model Name	DUB-LX3
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) **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 **KDB941225 D01** 3G SAR Procedures v03r01 **KDB941225 D05** SAR for LTE Devices v02r05 **KDB941225 D06** Hotspot Mode V02r01 **KDB447498 D01** General RF Exposure Guidance v06 **KDB648474 D04** Handset SAR v01r03 **KDB248227 D01** 802. 11 Wi-Fi SAR v02r02 **KDB865664 D01** SAR measurement 100 MHz to 6 GHz v01r04 **KDB865664 D02** SAR Reporting v01r02 **KDB690783 D01** SAR Listings on Grants v01r03 **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-1-1811C039) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA 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.523792

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

Mode	Highest Head Reported SAR-1g (W/kg)	Highest Body-worn Reported SAR-1g (W/kg)	Highest Hotspot Reported SAR-1g (W/kg)	Highest Product Specific 10-g SAR (W/kg)
GSM850	0.25	0.38	0.46	**/**
GSM1900	0.21	0.26	0.20	**/**
UMTS II	0.37	0.50	0.42	**1.17**
UMTS IV	0.23	0.54	0.46	**1.29**
UMTS V	0.24	0.37	0.40	**/**
LTE 2	0.32	0.39	0.33	**/**
LTE 4	0.16	0.58	0.48	**/**
LTE 5	0.22	0.31	0.32	**/**
LTE 7	0.14	0.59	0.37	**/**
2.4G WLAN	0.20	0.05	0.13	**/**
Note: The highest reported SAR for head, body-worn, hotspot, product specific 10-g SAR and simultaneous transmission exposure conditions are 0.37W/kg, 0.59W/kg, 0.48W/kg, 1.29W/kg and 0.64W/kg respectively.				

Note:

1)* For body-worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and that positions the handset a minimum of 15mm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

2)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 .

3.2 GENERAL DESCRIPTION OF EUT

Equipment	Smart Phone		
Brand Name	HUAWEI		
Model Name	DUB-LX3		
IMEI Code	Sample 1	IMEI 1: 863697040010885	
		IMEI 2: 863697040015124	
	Sample 2	IMEI 1: 863697040011149	
		IMEI 2: 863697040015389	
S/N	Sample 1: 35S0118A13000007		
	Sample 2: 35S0118A13000033		
HW Version	HL3DUBM		
SW Version	DUB-LX3 8.2.0.107(C900)		
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 B2	1850-1910	1930-1990
	UMTS B4	1710-1755	2110-2155
	UMTS B5	824-849	869-894
	LTE B2	1850-1910	1930-1990
	LTE B4	1710-1755	2110-2155
	LTE B5	824-849	869-894
	LTE B7	2500-2570	2620-2690
	Bluetooth	2400-2483.5	
	2.4GWIFI	2412-2462	
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 UE Category	24		
Power Class	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(UMTS B2/4/5)		
	3, tested with power control “all Max” (LTE B2/4/5/7)		
Test Channels (low-mid-high)	128-190-251 (GSM850)		
	512-661-810 (GSM1900)		
	9262-9400-9538(UMTS B2)		
	1312-1413-1513 (UMTS B4)		
	4132-4182-4233 (UMTS B5)		
	18700-18900-19100(LTE B2 BW=20MHz)		
	20050-20175-20300(LTE B4 BW=20MHz)		
	20450-20525-20600(LTE B5 BW=10MHz)		
	20850-21100-21350(LTE B7 BW=20MHz)		
	1-6-11 (2.4G WIFI 802.11b/g/n HT20)		
	3-6-9 (2.4G WIFI 802.11n HT40)		

Antenna Gain	Band	Main Antenna(dBi)	Wifi Antenna(dBi)
	GSM 850	-1.4	/
	GSM 1900	-0.3	/
	UMTS B2	-0.3	/
	UMTS B4	-2.2	/
	UMTS B5	-1.4	/
	LTE B2	-0.3	/
	LTE B4	-2.2	/
	LTE B5	-1.4	/
	LTE B7	0.2	/
	BT/2.4G WIFI	/	-1.3
Other Information			
Battery	Huawei Technologies Co., Ltd. Battery Model: HB406689ECW Rated capacity: 3900mAh Nominal Voltage: ⎓ + 3.82V Charging Voltage: ⎓ + 4.40V 1. Desay Battery Co., Ltd. 2. 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	< 0.5Ω
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	Electro Optical Converter	Speag	ECO90	1151	N/A	N/A
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	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1784	N/A	N/A
10	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1896	N/A	N/A
11	8960 Series 10 Wireless Com Test set	Agilent	E5515E	MY52112163	Aug. 11, 2018	1 Year
12	Radio Communication Analver	Anritsu	MT8820C	6201525877	Aug. 11, 2018	1Year
13	CMW500-Wideband Radio Communication Tester	RS	CMW500	152366	Mar. 11, 2018	1Year
14	CMW500-Wideband Radio Communication Tester	RS	CMW500	152372	Mar. 11, 2018	1Year
15	Power Amplifier	Mini-Circuits	ZHL-42W+	QA1333003	Mar. 09, 2018	1Year
16	DC Source metter	Iteck	OT6154	M00157	NA	NA
17	ENA Network Analyzer	Agilent	E5071C	MY46102965	Mar. 11, 2018	1 Year
18	MXG Analog Signal Generator	Agilent	N5181A	MY49060710	Aug. 11, 2018	1 Year
19	P-series power meter	Agilent	N1911A	MY45100473	Aug. 11, 2018	1 Year
20	wdeband power sensor	Agilent	N1921A	MY51100041	Aug. 11, 2018	1 Year

21	power Meter	Anritsu	ML2495A	1128009	Mar. 11, 2018	1 Year
22	Pulse Power Sensor	Anritsu	MA 2411B	1027500	Mar. 11, 2018	1 Year
23	Dielectric Assessment Kit	Speag	DAK-3.5	1226	N/A	N/A
24	Dual directional coupler	Woken	TS-PCC0M-05	107090019	Mar. 11, 2018	1 Year
25	coupler	Woken	0110A05601O-10	COM5BNW1A2	Mar. 11, 2018	1 Year
26	Bluetooth Test Set	Anritsu	Mt8852B-042	1132009	Aug. 11, 2018	1 Year
27	Digital Themometer	LKM	DTM3000	3519	Jul. 19, 2018	1 Year
28	Thermohygrometer	Parkoo	JR609	N/A	Aug. 23, 2018	1 Year

Note:

1: Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

2: “N/A” denotes no model name, serial No. or calibration specified.

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 5Ω from the previous measurement.

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

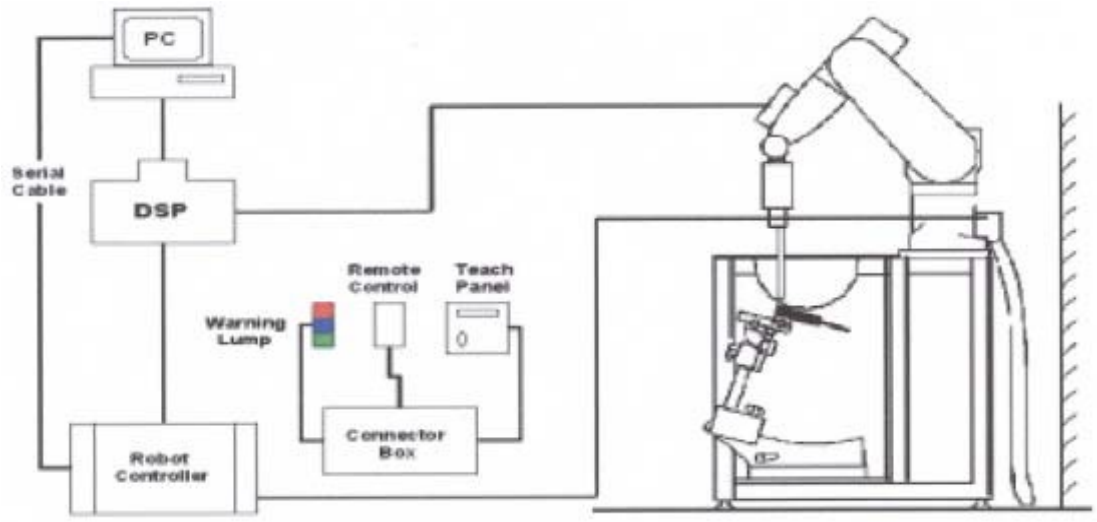
4. SAR MEASUREMENTS SYSTEM CONFIGURATION

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. 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 DASY5 E-FIELD PROBE SYSTEM

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 Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity:± 0.2dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) 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: Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where: σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m3).

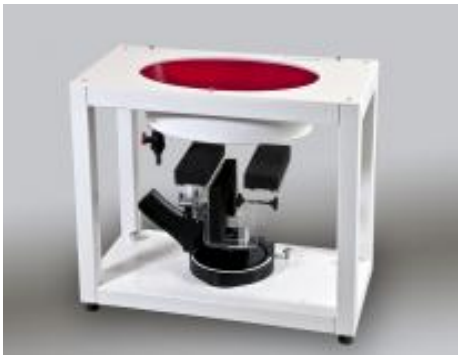
4.2.3 OTHER TEST EQUIPMENT

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 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 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: Δx_{zoom}, Δy_{zoom}≤ 2GHz -≤8mm, 2-4GHz -≤5 mm and 4-6 GHz-≤4mm; Δz_{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 (Δx_{area}, Δy_{area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom}, Δy_{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*Δz_{Zoom}(n-1)	≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5*Δz_{Zoom}(n-1)	≥30mm
3-4GHz	≤12mm	≤5mm	≤4mm	≤3mm	≤1.5*Δz_{Zoom}(n-1)	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5*Δz_{Zoom}(n-1)	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5*Δz_{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 is 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, Computer mathematic, 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 mathematic, 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 compensate boundary effects on E-field probes.

4.2.6 DATA STORAGE AND EVALUATION

4.2.5.1 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 dielectric 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
Head 835	0.2	-	0.2	1.5	57.0	-	41.1	-
Head 1750	-	47.0	-	0.4	-	-	52.6	-
Head 1900	-	44.5	-	0.2	-	-	55.3	-
Head 2450	-	45.0	-	0.1	-	-	54.9	-
Head 2600	-	45.1	-	0.1	-	-	54.8	-

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
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	-

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
Head	835	22.1	0.879	42.137	0.90	41.5	-2.33	1.53	Nov. 06, 2018
Head	1750	22.1	1.360	41.384	1.37	40.1	-0.73	3.20	Nov. 06, 2018
Head	1900	22.4	1.432	39.194	1.37	40.1	4.53	-2.26	Nov. 07, 2018
Head	2450	22.2	1.843	38.092	1.80	39.2	2.39	-2.83	Nov. 22, 2018
Head	2600	22.4	2.024	38.836	1.96	39.0	3.27	-0.42	Nov. 07, 2018
Body	835	22.2	0.981	54.448	0.97	55.2	1.13	-1.36	Nov. 08, 2018
Body	1750	22.3	1.530	53.773	1.49	53.4	2.68	0.70	Nov. 09, 2018
Body	1900	22.5	1.561	54.788	1.52	53.3	2.70	2.79	Nov. 10, 2018
Body	2450	22.3	1.985	54.284	1.95	52.7	1.79	3.01	Nov. 21, 2018
Body	2600	22.1	2.205	52.277	2.16	52.5	2.08	-0.42	Nov. 11, 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

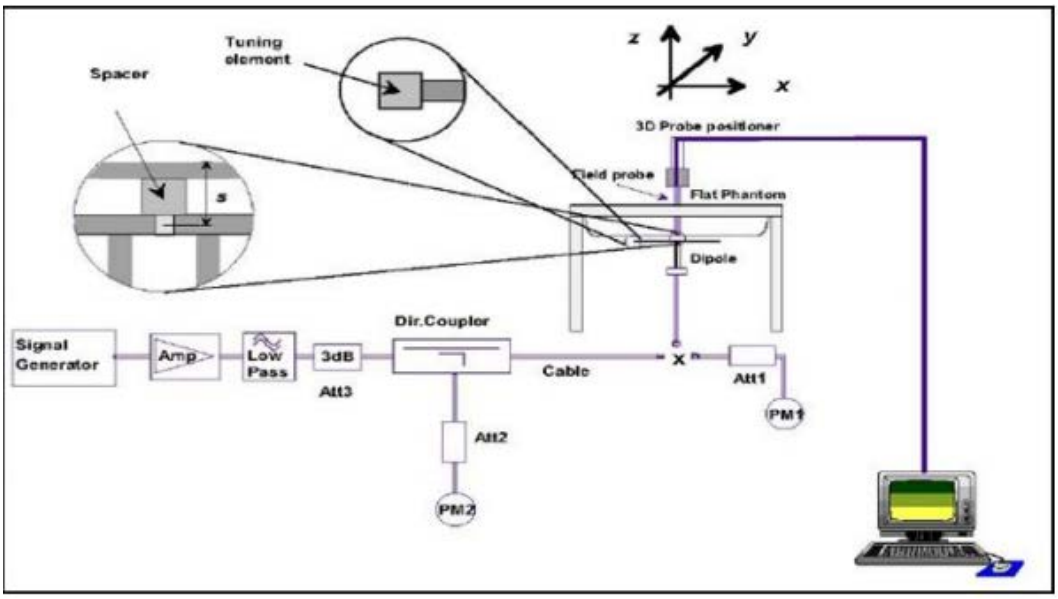
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE Std 1528 (described above). The following table shows system check results for all frequency bands 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
Head	Nov. 06, 2018	835	9.23	2.32	9.28	0.54	4d160
Head	Nov. 06, 2018	1750	37.00	8.89	35.56	-3.89	1101
Head	Nov. 07, 2018	1900	37.00	9.61	38.44	3.89	1101
Head	Nov. 22, 2018	2450	52.10	13.90	55.60	6.72	919
Head	Nov. 07, 2018	2600	56.10	13.40	53.60	-4.46	1067
Body	Nov. 08, 2018	835	9.53	2.48	9.92	4.09	4d160
Body	Nov. 09, 2018	1750	37.40	8.89	35.56	-4.92	1101
Body	Nov. 10, 2018	1900	39.80	10.40	41.60	4.52	5d179
Body	Nov. 21, 2018	2450	50.80	12.70	50.80	0.00	919
Body	Nov. 11, 2018	2600	55.20	13.60	54.40	-1.45	1067

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 Plexiglas's 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 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 β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the below table, β_{hs} for HS-DPCCH is set automatically to the correct value when Δ ACK, Δ NACK, Δ CQI = 8. The variation of the β_c /β_d ratio causes a power reduction at sub-tests 2 - 4.

Sub-test	β_c	β_d	β_d (SF)	β_c /β_d	β_{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 β_c/β_d= 12/15, β_{hs}/β_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 β_c/β_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 β_c = 11/15 and β_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	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{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	β_{ed1}:47/15 β_{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: Δ ACK, Δ NACK and Δ 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 β_c/β_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 β_c/β_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: β_{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.

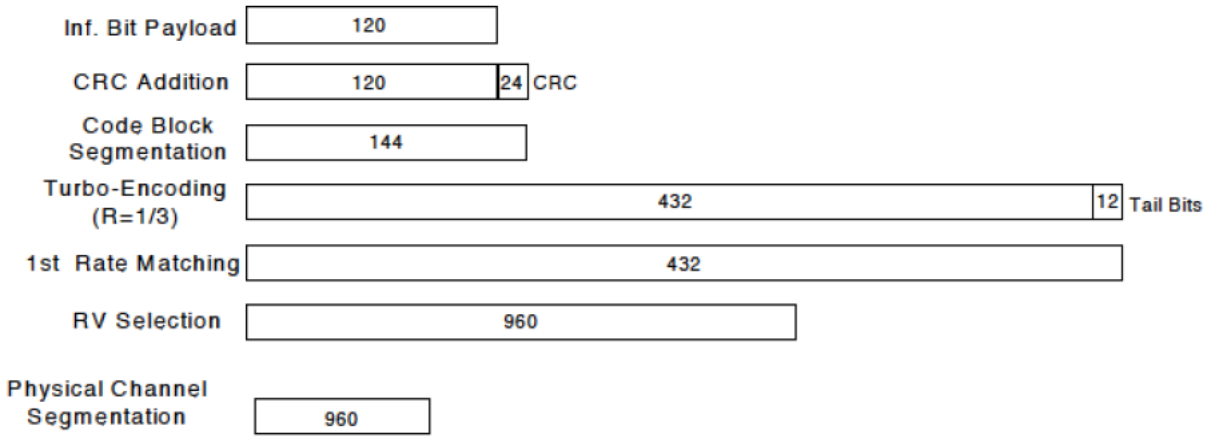


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{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: Δ ACK, Δ NACK and Δ CQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$
Note 2: CM=1 for β_c/β_d= 12/15, β_{hs}/β_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 β_c/β_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 β_c = 11/15 and β_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 Signaling 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 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			

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.

7.1.4.1 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.

7.2 GENERAL DESCRIPTION OF TEST PROCEDURES

Connection to the EUT is established via air interface with Agilent 8960 & RS CMW500 & Anritsu MT8820C, and the EUT is set to maximum output power by Agilent 8960 & RS CMW500 & Anritsu MT8820C. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30dB.

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.

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 device 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 antenna during body operating configurations.

7.3.2 ANTENNAS AND SENSOR PLACEMENT DETAILS

The device has one 2G&3G&4G Tx antenna and one 2.4G WiFi Tx antenna.

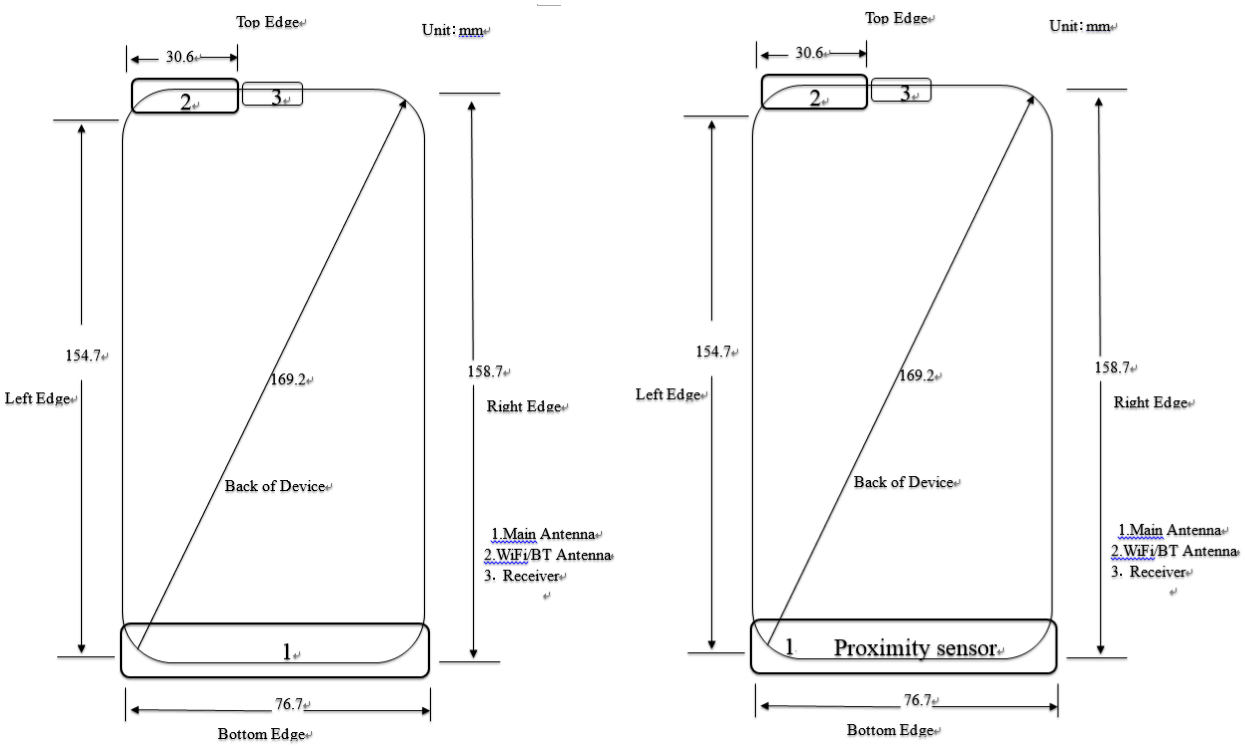


Figure1: The location of the antennas and the proximity sensor

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

Power Reduction operation table

The DUT which have some special NVs for SAR related max power back off, These NVs are used to set a new max power limit based proximity information and call configuration. When human body is in proximity and is detected by sensor, a new max power limit is set using the values stored in the NV. If Base station requests the higher output power above the limit, the power control algorithm inside modem chip will limit the power up to the preset power limit. If base station requests a lower output power less than the limit, the out power is controlled by base station.

Band	Sensor Trigger Distance	Power reduction (dB)
GSM 1900	Front face: 16mm Rear face: 16mm Bottom side: 16mm	4
UMTS B2	Front face: 16mm Rear face: 16mm Bottom side: 16mm	4.8
UMTS B4	Front face: 16mm Rear face: 16mm Bottom side: 16mm	4.8
LTE B2	Front face: 16mm Rear face: 16mm Bottom side: 16mm	4.5
LTE B4	Front face: 16mm Rear face: 16mm Bottom side: 16mm	4.5
LTE B7	Front face: 16mm Rear face: 16mm Bottom side: 16mm	5.2

Note: 1) Since the capacitive proximity sensor triggering distance for the Front Face, Rear Face and Bottom Side are N mm, a conservative distance of N-1 mm was requried for addtional SAR test at maximum power level with sensor off.

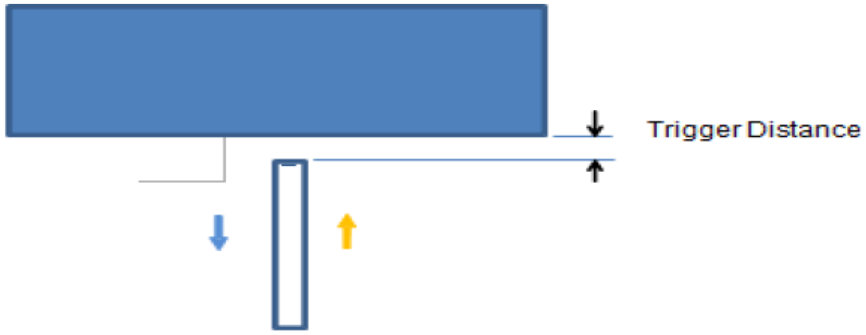
2) SAR tests with proximity sensor power reduction are only required for the sidesof frequency bands in the table above. For the other sides or other frequency bands of the device, SAR is still tested at the maximum power level with sensor off.

7.3.3 PROXIMITY SENSOR COVERAGE, DISTANCE AND ANGLE

7.3.3.1 Procedures for determining proximity sensor triggering distances

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

The proximity sensor triggering distance measurement method is as below:



Picture: Proximity sensor triggering distances assessment (Bottom side)

Picture: Proximity sensor triggering distances assessment (Front/Rear face)

Table: Summary of Trigger Distances

Band	Trigger distance –Bottom Side		Trigger distance –Rear Face		Trigger distance –Front Face	
	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving toward phantom
GSM1900	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**
UMTS B2	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**
UMTS B4	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**
LTE B2	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**
LTE B4	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**
LTE B7	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**	**16mm**

Note:

1) For Bottom Side, based on the most conservative measured triggering distance of N mm, additional SAR test is required at (N-1) mm.

2) For Rear Face, based on the most conservative measured triggering distance of N mm, additional SAR test is required at (N-1) mm.

3) For Front Face, based on the most conservative measured triggering distance of N mm, additional SAR test is required at (N-1) mm.

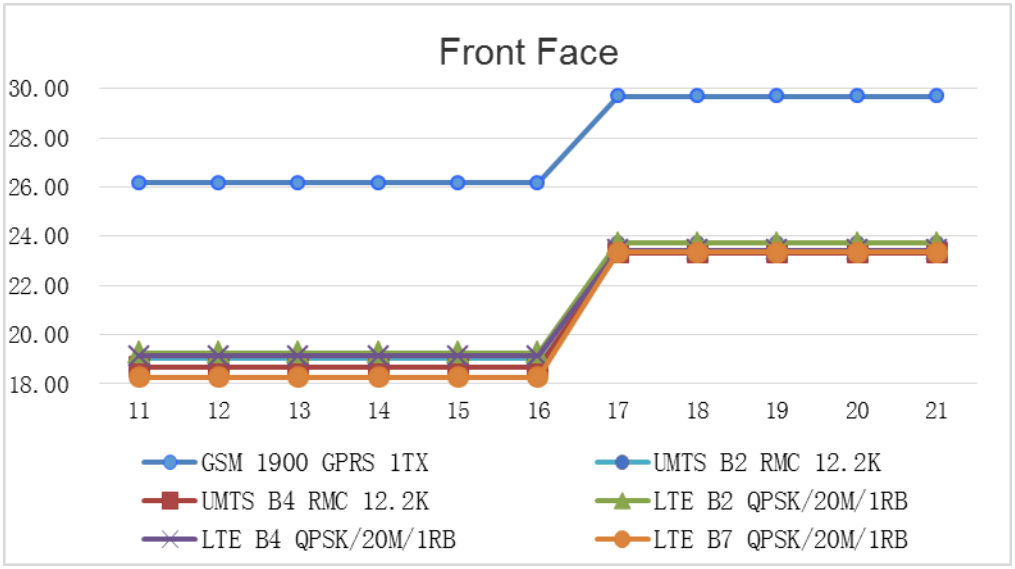
The proximity sensor is not triggered, when approaching from other sides. Therefore, the proximity sensor coverage is not evaluated on these orientations.

7.3.3.2 Procedures for determining antenna and proximity sensor coverage

The proximity sensor and main antenna use same metallic electrode, so there is no spatial offset.

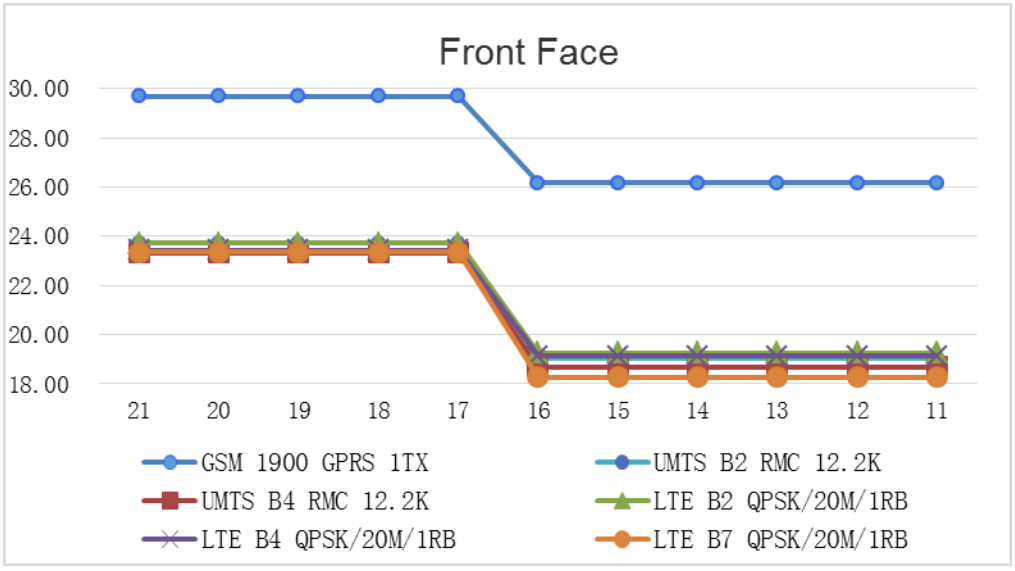
1) Front Face(moving away from the phantom)

mode		distance(mm)										
		Front Face										
		Sensor on						Sensor off				
		11	12	13	14	15	16	17	18	19	20	21
GSM 1900	GPRS 1TX	26.17	26.17	26.17	26.17	26.17	26.17	29.69	29.69	29.69	29.69	29.69
UMTS B2	RMC 12.2K	19.03	19.03	19.03	19.03	19.03	19.03	23.73	23.73	23.73	23.73	23.73
UMTS B4	RMC 12.2K	18.69	18.69	18.69	18.69	18.69	18.69	23.33	23.33	23.33	23.33	23.33
LTE B2	QPSK/20M/1RB	19.27	19.27	19.27	19.27	19.27	19.27	23.73	23.73	23.73	23.73	23.73
LTE B4	QPSK/20M/1RB	19.14	19.14	19.14	19.14	19.14	19.14	23.42	23.42	23.42	23.42	23.42
LTE B7	QPSK/20M/1RB	18.27	18.27	18.27	18.27	18.27	18.27	23.34	23.34	23.34	23.34	23.34



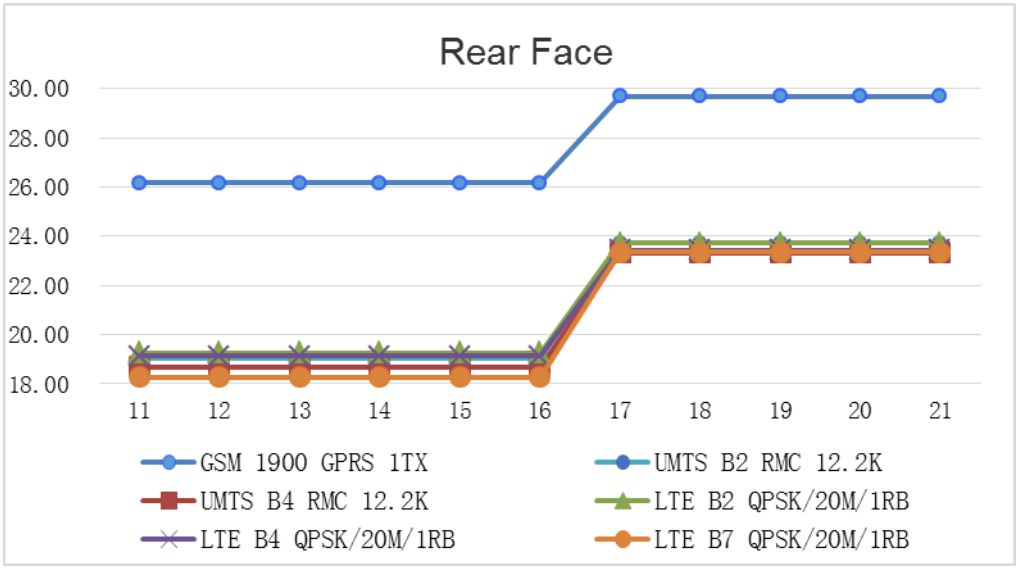
2) Front Face(moving toward the phantom)

mode		distance(mm)										
		Front Face										
		Sensor off					Sensor on					
		21	20	19	18	17	16	15	14	13	12	11
GSM 1900	GPRS 1TX	29.69	29.69	29.69	29.69	29.69	26.17	26.17	26.17	26.17	26.17	26.17
UMTS B2	RMC 12.2K	23.73	23.73	23.73	23.73	23.73	19.03	19.03	19.03	19.03	19.03	19.03
UMTS B4	RMC 12.2K	23.33	23.33	23.33	23.33	23.33	18.69	18.69	18.69	18.69	18.69	18.69
LTE B2	QPSK/20M/1RB	23.73	23.73	23.73	23.73	23.73	19.27	19.27	19.27	19.27	19.27	19.27
LTE B4	QPSK/20M/1RB	23.42	23.42	23.42	23.42	23.42	19.14	19.14	19.14	19.14	19.14	19.14
LTE B7	QPSK/20M/1RB	23.34	23.34	23.34	23.34	23.34	18.27	18.27	18.27	18.27	18.27	18.27



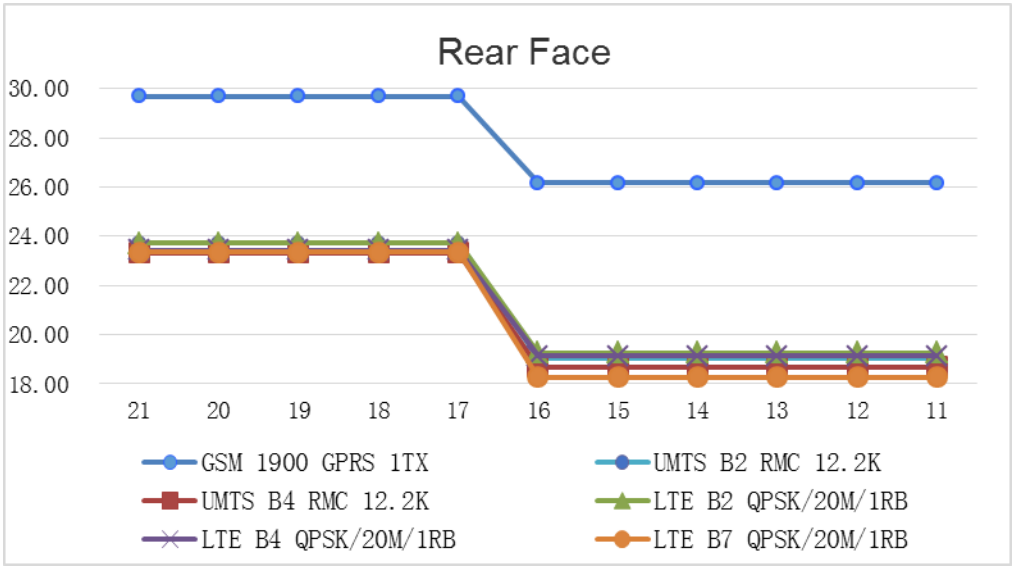
3) Rear Face(moving away from the phantom)

mode		distance(mm)										
		Rear Face										
		Sensor on						Sensor off				
		11	12	13	14	15	16	17	18	19	20	21
GSM 1900	GPRS 1TX	26.17	26.17	26.17	26.17	26.17	26.17	29.69	29.69	29.69	29.69	29.69
UMTS B2	RMC 12.2K	19.03	19.03	19.03	19.03	19.03	19.03	23.73	23.73	23.73	23.73	23.73
UMTS B4	RMC 12.2K	18.69	18.69	18.69	18.69	18.69	18.69	23.33	23.33	23.33	23.33	23.33
LTE B2	QPSK/20M/1RB	19.27	19.27	19.27	19.27	19.27	19.27	23.73	23.73	23.73	23.73	23.73
LTE B4	QPSK/20M/1RB	19.14	19.14	19.14	19.14	19.14	19.14	23.42	23.42	23.42	23.42	23.42
LTE B7	QPSK/20M/1RB	18.27	18.27	18.27	18.27	18.27	18.27	23.34	23.34	23.34	23.34	23.34



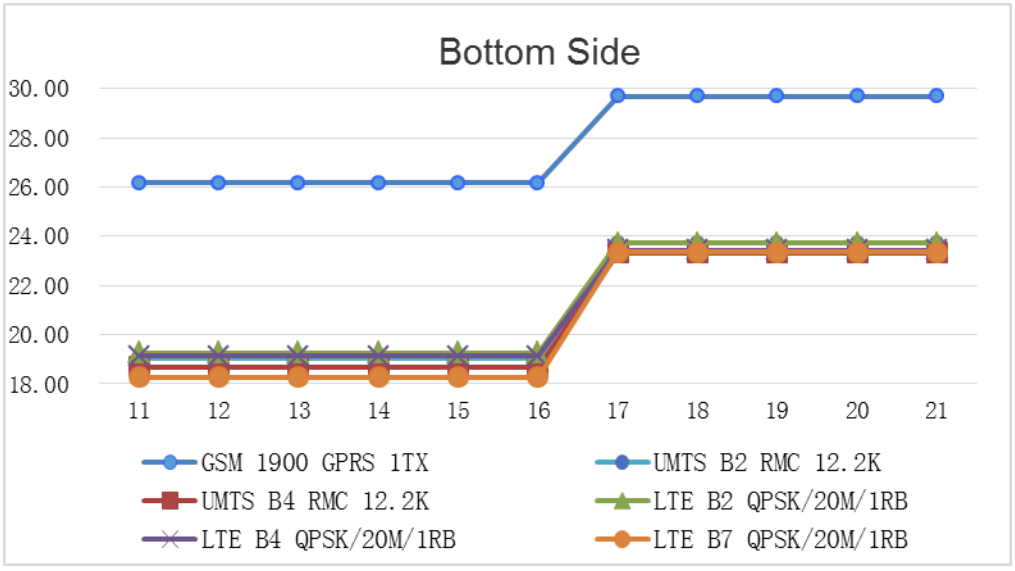
4) Rear Face(moving toward the phantom)

mode		distance(mm)										
		Rear Face										
		Sensor off					Sensor on					
		21	20	19	18	17	16	15	14	13	12	11
GSM 1900	GPRS 1TX	29.69	29.69	29.69	29.69	29.69	26.17	26.17	26.17	26.17	26.17	26.17
UMTS B2	RMC 12.2K	23.73	23.73	23.73	23.73	23.73	19.03	19.03	19.03	19.03	19.03	19.03
UMTS B4	RMC 12.2K	23.33	23.33	23.33	23.33	23.33	18.69	18.69	18.69	18.69	18.69	18.69
LTE B2	QPSK/20M/1RB	23.73	23.73	23.73	23.73	23.73	19.27	19.27	19.27	19.27	19.27	19.27
LTE B4	QPSK/20M/1RB	23.42	23.42	23.42	23.42	23.42	19.14	19.14	19.14	19.14	19.14	19.14
LTE B7	QPSK/20M/1RB	23.34	23.34	23.34	23.34	23.34	18.27	18.27	18.27	18.27	18.27	18.27



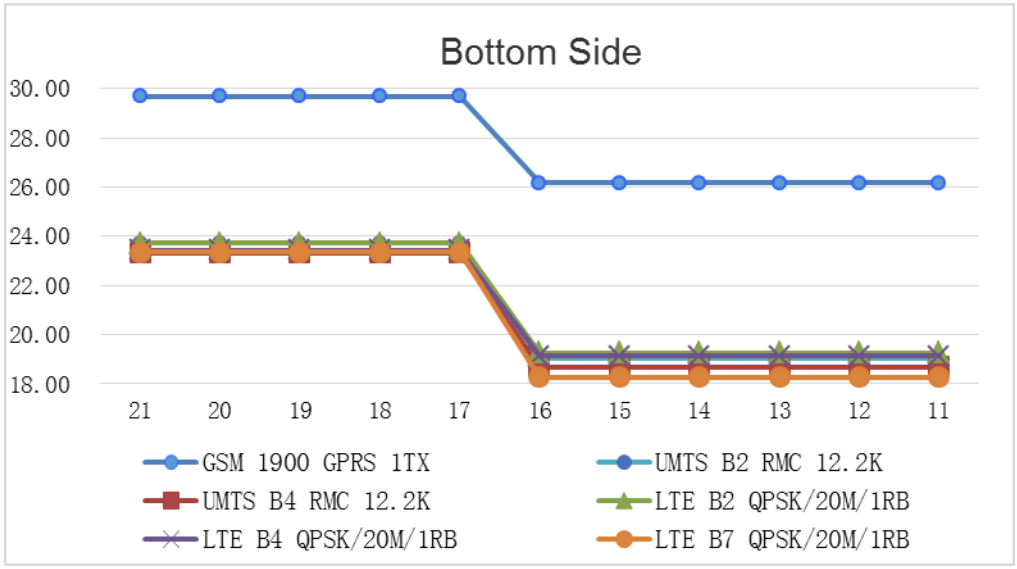
5) Bottom Side(moving away from the phantom)

mode		distance(mm)										
		Bottom Side										
		Sensor on						Sensor off				
		11	12	13	14	15	16	17	18	19	20	21
GSM 1900	GPRS 1TX	26.17	26.17	26.17	26.17	26.17	26.17	29.69	29.69	29.69	29.69	29.69
UMTS B2	RMC 12.2K	19.03	19.03	19.03	19.03	19.03	19.03	23.73	23.73	23.73	23.73	23.73
UMTS B4	RMC 12.2K	18.69	18.69	18.69	18.69	18.69	18.69	23.33	23.33	23.33	23.33	23.33
LTE B2	QPSK/20M/1RB	19.27	19.27	19.27	19.27	19.27	19.27	23.73	23.73	23.73	23.73	23.73
LTE B4	QPSK/20M/1RB	19.14	19.14	19.14	19.14	19.14	19.14	23.42	23.42	23.42	23.42	23.42
LTE B7	QPSK/20M/1RB	18.27	18.27	18.27	18.27	18.27	18.27	23.34	23.34	23.34	23.34	23.34



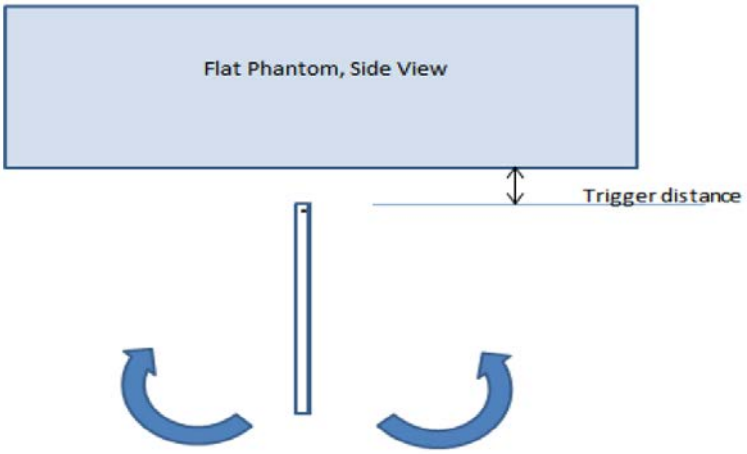
6) Bottom Side(moving toward the phantom)

mode		distance(mm)										
		Bottom Side										
		Sensor off					Sensor on					
		21	20	19	18	17	16	15	14	13	12	11
GSM 1900	GPRS 1TX	29.69	29.69	29.69	29.69	29.69	26.17	26.17	26.17	26.17	26.17	26.17
UMTS B2	RMC 12.2K	23.73	23.73	23.73	23.73	23.73	19.03	19.03	19.03	19.03	19.03	19.03
UMTS B4	RMC 12.2K	23.33	23.33	23.33	23.33	23.33	18.69	18.69	18.69	18.69	18.69	18.69
LTE B2	QPSK/20M/1RB	23.73	23.73	23.73	23.73	23.73	19.27	19.27	19.27	19.27	19.27	19.27
LTE B4	QPSK/20M/1RB	23.42	23.42	23.42	23.42	23.42	19.14	19.14	19.14	19.14	19.14	19.14
LTE B7	QPSK/20M/1RB	23.34	23.34	23.34	23.34	23.34	18.27	18.27	18.27	18.27	18.27	18.27



7.3.3.3 Procedures for determining device tilt angle influences to proximity sensor triggering

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Bottom side parallel to the base of the flat phantom for each band.
The EUT was rotated about Bottom 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°.



Picture: Proximity sensor tilts angle assessment

Table: Summary of EUT Tilt Angle Influence to Proximity Sensor Triggering (Bottom side)

Band(MHz)	Minimum trigger distance at which power reduction was maintained over ±45°	Power Reduction Status										
		-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°
GSM1900	16mm	on	on	on	on	on	on	on	on	on	on	on
UMTS B2	16mm	on	on	on	on	on	on	on	on	on	on	on
UMTS B4	16mm	on	on	on	on	on	on	on	on	on	on	on
LTE B2	16mm	on	on	on	on	on	on	on	on	on	on	on
LTE B4	16mm	on	on	on	on	on	on	on	on	on	on	on
LTE B7	16mm	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 (GSM1900, UMTS B2/4, LTE B2/4/7 with Main Antenna).

7.3.3.4 Summary SAR test Plan for Proximity sensor power reduction

The proximity sensor is used to indicate when the device is held close to a user's body exposure condition. SAR tests with proximity sensor power reduction are required for Front Face, Rear Face and Bottom Side of GSM1900, UMTS B2/4, LTE B2/4/7 with Main Antenna. For the other sides or other frequency bands of the device, SAR is still tested at the maximum power level with sensor off. Moreover, since the capacitive proximity sensor triggering distance is 16mm.

7.4 OPERATIONAL CONDITIONS DURING TEST

7.4.1 GENERAL DESCRIPTION OF RECEIVER DETECTION MECHANISM

The device supports the maximum output power reduction triggered by specific use conditions mechanism. The main purpose is to minimize triggering associated with power reduction scenarios by receiver detection mechanisms and provide enhanced user experience. This device uses the audio receiver to indicate whether the user is making a call in head scenario or not. The selection between head and body power levels is based on the receiver detection mechanism.

7.4.2 ANTENNAS AND RECEIVER PLACEMENT DETAILS

The device has one 2G&3G&4G Tx antenna and one 2.4G WiFi Tx antenna.

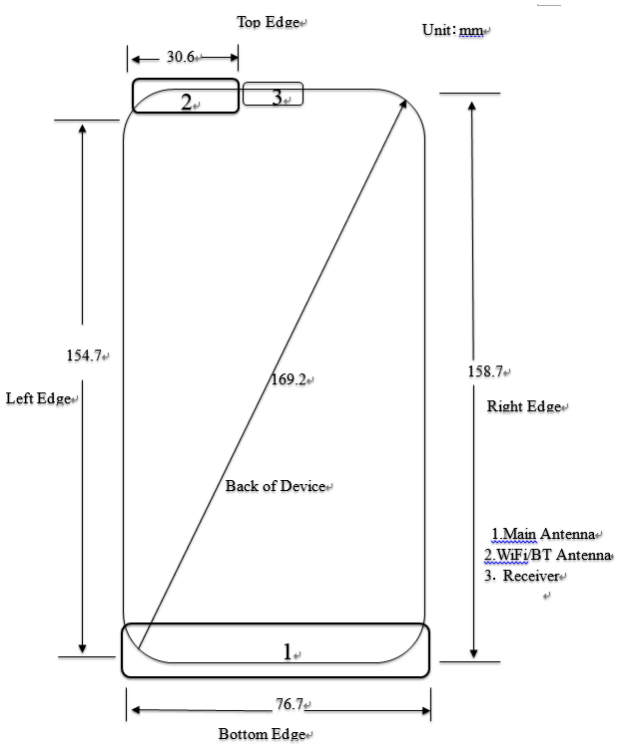


Figure 2: The location of the antennas and receiver

Note: Per KDB 648474 D04, because the diagonal distance of this device is >160mm, it is considered a “Phablet” device.

7.4.3 SUMMARY SAR TEST PLAN

Wifi Antenna Power Reduction							
Power scenario		2.4G 802.11b	2.4G 802.11g (CH3-9)	2.4G 802.11g (CH1)	2.4G 802.11g (CH2)	2.4G 802.11g (CH10)	2.4G 802.11g (CH11)
full power(dBm)		18	16	14	14.5	15	14
reduction level(dB)	Receiver on	4	2	0	0.5	1	0
	Receiver off	0	0	1.5	0	0	0

Wifi Antenna Power Reduction									
Power scenario		2.4G 802.11 n20 (CH3-9)	2.4G 802.11 n20 (CH1)	2.4G 802.11 n20 (CH2)	2.4G 802.11 n20 (CH10)	2.4G 802.11 n20 (CH11)	2.4G 802.11 n40 (CH3)	2.4G 802.11 n40 (CH4)	2.4G 802.11 n40 (CH5-7)	2.4G 802.11 n40 (CH8)
full power(dBm)		16	14	14.5	15	14	14	14	14	14
reduction level(dB)	Receiver on	2	0	0.5	1	0	0	0	0	0
	Receiver off	0	1.5	0	0	0	4	1.5	0.5	4

Based on the power reduction triggered by specific use conditions information above.

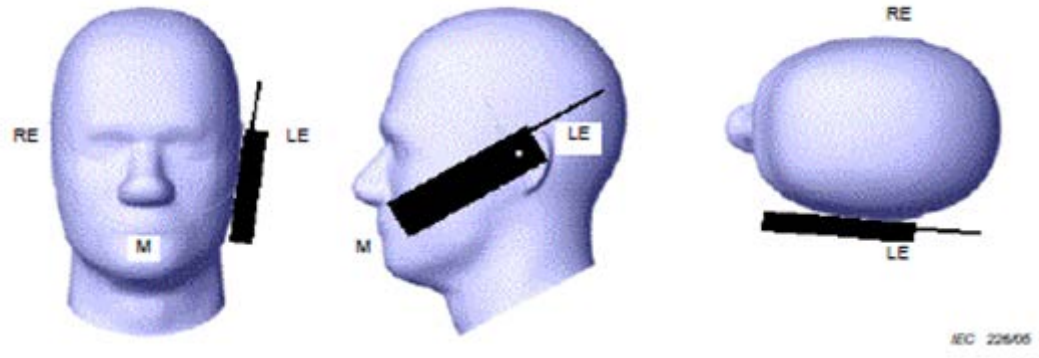
For Head SAR test of 2.4G WIFI Antenna：
Standalone Head SAR should be evaluated at receiver on.
As the audio receiver only works in voice mode when the user is making a call in head scenario, and the lack of the third-party VoIP server and the unstandardized VOIP operating characteristics, so we're planning to do the Head SAR test of 2.4G WIFI voice mode through triggering the audio receiver on by test scripts (bat files) in order to simulate the users' scene for Head SAR test.
The test scripts (bat files) function is only used to trigger audio receiver on and simulate voice and VOIP usage scene. 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. We can guarantee that the TX power and SAR value level during the test is the same as the actual user scenarios.

For Body / Product Specific 10-g SAR test of 2.4G WIFI Antenna：
Standalone Body SAR should be evaluated at receiver off.

7.5 TEST POSITION

7.5.1 HEAD TEST CONFIGURATION

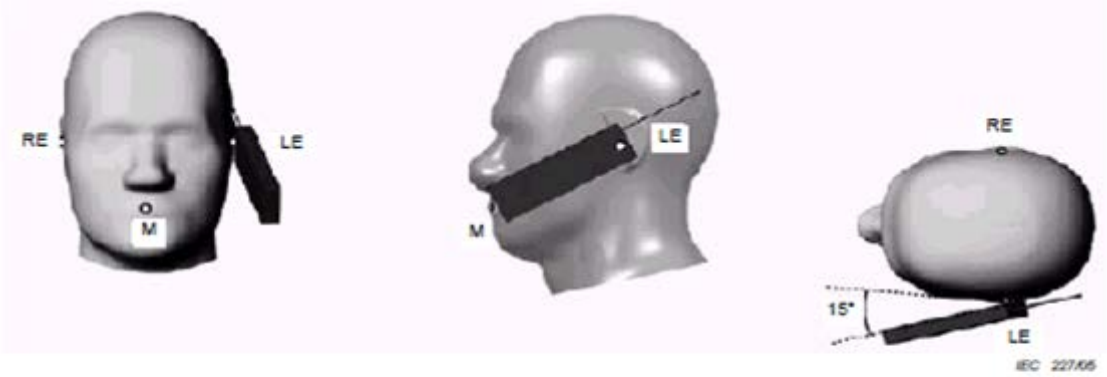
Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.



Key	
M	Mouth reference point
LE	Left ear reference point (ERP)
RE	Right ear reference point (ERP)

Figure 3 Cheek position of the wireless device on the left side of SAM

Note1: Cheek position of the wireless device on Right side of SAM also is similar to the left side represented above.



Key	
M	Mouth reference point
LE	Left ear reference point (ERP)
RE	Right ear reference point (ERP)

Figure 4 Tilt position of the wireless device on the left side of SAM

Note2: Tilt position of the wireless device on Right side of SAM also is similar to the left side represented above.

7.5.2 BODY-WORN TEST CONFIGURATION

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. The distance between the device and the phantom was kept 15mm.

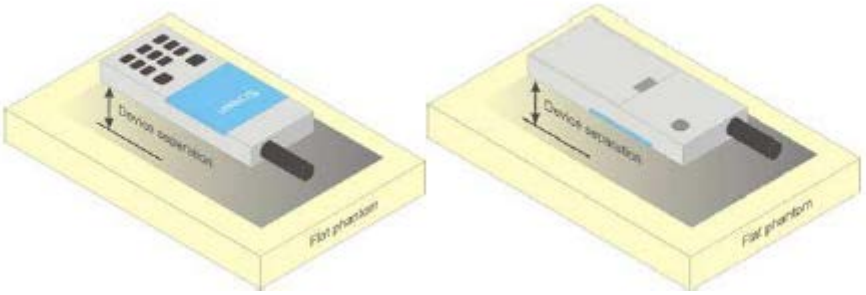


Figure 5 Test positions for body-worn device

7.5.3 HOTSPOT TEST CONFIGURATION

Per FCC KDB 941225D06, the SAR test separation distance for hotspot mode is determined according to device form factor. When the overall length and width of a device is>9cm×5cm, a test separation distance of 10mm is required for hotspot mode SAR measurements. A test separation distance of 5mm or less is required for smaller devices. Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25mm from that surface or edge; for the data modes, wireless technologies and frequency bands supporting hotspot mode. The SAR results are used to determine simultaneous transmission SAR test exclusion for hotspot mode; otherwise, simultaneous transmission SAR measurement is required.

7.5.4 PRODUCT SPECIFIC 10-G SAR TEST CONFIGURATION

Per KDB 648474 D04, for smart phones with a display diagonal dimension>15.0cm or an overall diagonal dimension>16.0cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the device is marketed as “Phablet”.

The UMPC mini-tablets procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at≤25mm from that surface or edge, in direct contact with a flat phantom, for product specific 10-g SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR>1.2W/kg; when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

The size of the EUT is 158.7mm (length)X 76.7mm (width), the length of the diagonal is 169.2 mm.
The location of the antennas inside EUT is shown as below picture:

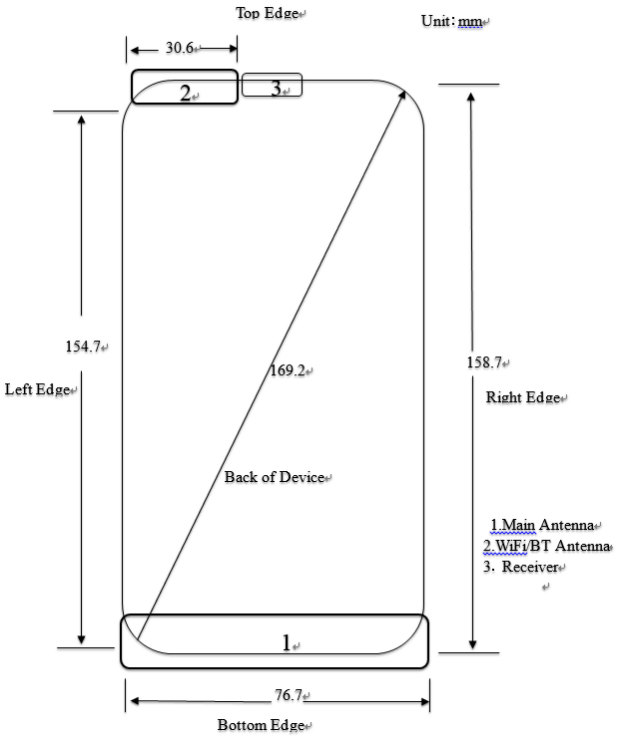


Figure 6: The location of the antennas

Sides For Hotspot and product specific 10-g SAR Testing

Ant	Mode	Front Side	Rear Side	Left Side	Right Side	Top Side	Bottom Side
Ant 1(Main)	GSM850/1900	YES	YES	YES	YES	NO	YES
	UMTS B2/4/5	YES	YES	YES	YES	NO	YES
	LTE B2/4/5/7	YES	YES	YES	YES	NO	YES
Ant 2	2.4GWiFi/BT	YES	YES	YES	NO	YES	NO

Note: Per KDB 941225 D06, particular DUT edges were not required to be evaluated for Hotspot SAR if the antenna-to-edge distance is greater than 2.5cm.

8. TEST RESULT

8.1 CONDUCTED POWER RESULTS

8.1.1 CONDUCTED POWER MEASUREMENTS OF GSM850

1) Full Power:

GSM850		Tune-up	Max Burst Average Power (dBm)			Tune-up	Max Frame Average Power (dBm)		
			128CH	190CH	251CH		128CH	190CH	251CH
			824.2MHz	836.6MHz	848.8MHz		824.2MHz	836.6MHz	848.8MHz
GSM (CS)		34.00	32.89	**32.67**	32.75	24.81	23.70	23.48	23.56
GPRS/EDGE (GMSK)	1 Tx Slot	34.00	32.75	32.55	32.62	24.81	23.56	23.36	23.43
	2 Tx Slot	31.00	29.58	**29.57**	29.62	24.87	23.45	23.44	23.49
	3 Tx Slot	29.20	27.40	27.46	27.43	24.78	22.98	23.04	23.01
	4 Tx Slot	28.00	26.16	26.08	26.10	24.82	22.98	22.90	22.92
EDGE (8PSK)	1 Tx Slot	28.00	26.17	26.13	26.03	18.81	16.98	16.94	16.84
	2 Tx Slot	25.00	23.67	23.54	23.50	18.87	17.54	17.41	17.37
	3 Tx Slot	23.20	22.05	22.47	22.34	18.78	17.63	18.05	17.92
	4 Tx Slot	22.00	21.02	20.83	21.06	18.82	17.84	17.65	17.88

Note:
1) The conducted power of GSM850 is measured with RMS detector.
2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 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 channel results are marks in bold.

8.1.2 CONDUCTED POWER MEASUREMENTS OF GSM1900

1) Full Power:

GSM1900		Tune-up	Max Burst Average Power (dBm)			Tune-up	Max Frame Average Power (dBm)		
			512CH	661CH	810CH		512CH	661CH	810CH
			1850.2MHz	1880MHz	1909.8MHz		1850.2MHz	1880MHz	1909.8MHz
GSM (CS)		31.20	29.94	**29.85**	29.68	22.01	20.75	20.66	20.49
GPRS/EDGE (GMSK)	1 Tx Slot	31.20	29.96	29.87	29.69	22.01	20.77	20.68	20.50
	2 Tx Slot	28.50	27.62	27.52	27.27	22.37	21.49	21.39	21.14
	3 Tx Slot	26.50	26.01	25.60	25.72	22.08	21.59	21.18	21.30
	4 Tx Slot	25.50	24.76	24.29	24.31	22.32	21.58	21.11	21.13
EDGE (8PSK)	1 Tx Slot	27.00	25.47	25.21	25.09	17.81	16.28	16.02	15.90
	2 Tx Slot	24.00	22.97	22.69	22.50	17.87	16.84	16.56	16.37
	3 Tx Slot	22.20	21.14	20.77	20.86	17.78	16.72	16.35	16.44
	4 Tx Slot	21.00	20.33	19.97	20.03	17.82	17.15	16.79	16.85

2) Sensor on or Hotspot power:

GSM1900		Tune-up	Max Burst Average Power (dBm)			Tune-up	Max Frame Average Power (dBm)		
			512CH	661CH	810CH		512CH	661CH	810CH
			1850.2MHz	1880MHz	1909.8MHz		1850.2MHz	1880MHz	1909.8MHz
GSM (CS)		27.20	26.30	26.51	26.22	18.01	17.11	17.32	17.03
GPRS/EDGE (GMSK)	1 Tx Slot	27.20	26.62	26.47	26.17	18.01	17.43	17.28	16.98
	2 Tx Slot	24.50	23.67	**23.23**	23.20	18.37	17.54	17.10	17.07
	3 Tx Slot	22.50	22.08	21.90	21.68	18.08	17.66	17.48	17.26
	4 Tx Slot	21.20	19.83	19.30	19.35	18.02	16.65	16.12	16.17
EDGE (8PSK)	1 Tx Slot	21.50	20.32	20.03	20.10	12.31	11.13	10.84	10.91
	2 Tx Slot	18.50	17.39	17.19	16.95	12.37	11.26	11.06	10.82
	3 Tx Slot	16.70	16.42	15.98	16.03	12.28	12.00	11.56	11.61
	4 Tx Slot	15.50	14.97	14.61	14.75	12.32	11.79	11.43	11.57

Note:
1) The conducted power of GSM1900 is measured with RMS detector.
2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 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 channel results are marks in bold.

8.1.3 CONDUCTED POWER MEASUREMENTS OF UMTS B2

1) Full Power:

Band	UMTS B2			
Tx Channel	Max. Tune-up Power	9262	9400	9538
Frequency		1852.4MHz	1880MHz	1907.6MHz
AMR Voice	24.80	23.77	23.73	23.58
RMC 12.2K	24.80	23.77	**23.73**	23.58
RMC 64K	24.80	23.72	23.75	23.38
RMC 144K	24.80	23.77	23.63	23.35
RMC 384K	24.80	23.89	23.77	23.67
HSDPA Subtest-1	23.80	22.78	22.76	22.62
HSDPA Subtest-2	23.80	22.81	22.71	22.58
HSDPA Subtest-3	23.30	22.32	22.26	22.12
HSDPA Subtest-4	23.30	22.38	22.27	22.14
HSUPA Subtest-1	23.80	22.25	22.32	22.16
HSUPA Subtest-2	21.80	20.82	20.76	20.58
HSUPA Subtest-3	22.80	21.50	21.58	21.37
HSUPA Subtest-4	21.80	20.81	20.80	20.56
HSUPA Subtest-5	23.30	22.78	22.70	22.56
DC-HSDPA Subtest-1	23.80	22.78	22.76	22.62
DC-HSDPA Subtest-2	23.80	22.81	22.71	22.58
DC-HSDPA Subtest-3	23.30	22.32	22.26	22.12
DC-HSDPA Subtest-4	23.30	22.38	22.27	22.14

2) Sensor on or Hotspot power:

Band	UMTS B2			
Tx Channel	Max. Tune-up Power	9262	9400	9538
Frequency		1852.4MHz	1880MHz	1907.6MHz
AMR Voice	20.00	18.94	19.03	18.85
RMC 12.2K	20.00	18.94	**19.03**	18.85
RMC 64K	20.00	19.02	19.04	18.94
RMC 144K	20.00	19.09	19.02	18.89
RMC 384K	20.00	19.08	19.03	18.83
HSDPA Subtest-1	19.00	17.98	17.95	17.85
HSDPA Subtest-2	19.00	17.96	17.99	17.89
HSDPA Subtest-3	18.50	17.51	17.53	17.32
HSDPA Subtest-4	18.50	17.59	17.53	17.44
HSUPA Subtest-1	19.00	18.05	17.95	17.81
HSUPA Subtest-2	17.00	16.10	16.03	16.00
HSUPA Subtest-3	18.00	17.15	17.11	17.09
HSUPA Subtest-4	17.00	16.11	16.12	15.88
HSUPA Subtest-5	18.50	18.00	17.94	17.82
DC-HSDPA Subtest-1	19.00	17.98	17.95	17.85
DC-HSDPA Subtest-2	19.00	17.96	17.99	17.89
DC-HSDPA Subtest-3	18.50	17.51	17.53	17.32
DC-HSDPA Subtest-4	18.50	17.59	17.53	17.44

Note:
1) The conducted power of UMTS B2 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 channel results are marks in bold.

8.1.4 CONDUCTED POWER MEASUREMENTS OF UMTS B4

1) Full Power:

Band	UMTS B4			
Tx Channel	Max. Tune-up Power	1312	1413	1513
Frequency		1712.4MHz	1732.6MHz	1752.6MHz
AMR Voice	24.80	23.33	23.50	23.51
RMC 12.2K	24.80	23.33	**23.50**	23.51
RMC 64K	24.80	23.45	23.48	23.58
RMC 144K	24.80	23.37	23.49	23.55
RMC 384K	24.80	23.42	23.58	23.44
HSDPA Subtest-1	23.80	22.31	22.39	22.44
HSDPA Subtest-2	23.80	22.35	22.42	22.50
HSDPA Subtest-3	23.30	21.83	21.90	21.96
HSDPA Subtest-4	23.30	21.88	21.95	21.94
HSUPA Subtest-1	23.80	21.97	22.12	21.85
HSUPA Subtest-2	21.80	20.35	20.42	20.46
HSUPA Subtest-3	22.80	20.85	21.23	21.14
HSUPA Subtest-4	21.80	20.44	20.53	20.45
HSUPA Subtest-5	23.30	22.34	22.44	22.48
DC-HSDPA Subtest-1	23.80	22.31	22.39	22.44
DC-HSDPA Subtest-2	23.80	22.35	22.42	22.50
DC-HSDPA Subtest-3	23.30	21.83	21.90	21.96
DC-HSDPA Subtest-4	23.30	21.88	21.95	21.94

2) Sensor on or Hotspot power:

Band	UMTS B4			
Tx Channel	Max. Tune-up Power	1312	1413	1513
Frequency		1712.4MHz	1732.6MHz	1752.6MHz
AMR Voice	20.00	18.69	18.74	18.70
RMC 12.2K	20.00	18.69	**18.74**	18.70
RMC 64K	20.00	18.62	18.68	18.72
RMC 144K	20.00	18.73	18.79	18.75
RMC 384K	20.00	18.68	18.71	18.73
HSDPA Subtest-1	19.00	17.63	17.66	17.66
HSDPA Subtest-2	19.00	17.57	17.69	17.72
HSDPA Subtest-3	18.50	17.20	17.19	17.22
HSDPA Subtest-4	18.50	17.09	17.23	17.26
HSUPA Subtest-1	19.00	17.65	17.70	17.69
HSUPA Subtest-2	17.00	15.66	15.71	15.73
HSUPA Subtest-3	18.00	16.63	16.75	16.83
HSUPA Subtest-4	17.00	15.70	15.74	15.78
HSUPA Subtest-5	18.50	17.58	17.72	17.74
DC-HSDPA Subtest-1	19.00	17.63	17.66	17.66
DC-HSDPA Subtest-2	19.00	17.57	17.69	17.72
DC-HSDPA Subtest-3	18.50	17.20	17.19	17.22
DC-HSDPA Subtest-4	18.50	17.09	17.23	17.26

Note:
1) The conducted power of UMTS B4 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 channel results are marks in bold.

8.1.5 CONDUCTED POWER MEASUREMENTS OF UMTS B5

1) Full Power:

Band	UMTS B5			
Tx Channel	Max. Tune-up Power	4132	4182	4233
Frequency		826.4MHz	836.4MHz	846.6MHz
AMR Voice	25.00	23.87	23.86	23.79
RMC 12.2K	25.00	23.87	**23.86**	23.79
RMC 64K	25.00	23.87	23.81	23.73
RMC 144K	25.00	23.82	23.77	23.82
RMC 384K	25.00	23.85	23.89	23.85
HSDPA Subtest-1	24.00	22.78	22.75	22.73
HSDPA Subtest-2	24.00	22.87	22.84	22.78
HSDPA Subtest-3	23.50	22.37	22.34	22.31
HSDPA Subtest-4	23.50	22.35	22.33	22.32
HSUPA Subtest-1	24.00	22.21	22.06	22.18
HSUPA Subtest-2	22.00	20.84	20.85	20.90
HSUPA Subtest-3	23.00	21.64	21.62	21.65
HSUPA Subtest-4	22.00	20.96	20.90	20.86
HSUPA Subtest-5	23.50	22.64	22.72	22.69
DC-HSDPA Subtest-1	24.00	22.78	22.75	22.73
DC-HSDPA Subtest-2	24.00	22.87	22.84	22.78
DC-HSDPA Subtest-3	23.50	22.37	22.34	22.31
DC-HSDPA Subtest-4	23.50	22.35	22.33	22.32

Note:
1) The conducted power of UMTS B5 is measured with RMS detector.
2) 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 channel results are marks in bold.

8.1.6 CONDUCTED POWER MEASUREMENTS OF LTE B2

1) Full Power:

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	24.50	23.28	23.55	23.23	2 / 3M	QPSK	1/0	24.50	23.23	23.55	23.31
		1/2	24.50	23.55	23.54	23.26			1/7	24.50	23.56	23.53	23.35
		1/5	24.50	23.25	23.49	23.20			1/14	24.50	23.19	23.48	23.04
		3/0	24.50	23.44	23.45	23.23			8/0	23.50	22.45	22.50	22.35
		3/1	24.50	23.40	23.60	23.24			8/3	23.50	22.34	22.56	22.30
		3/3	24.50	23.56	23.41	23.20			8/7	23.50	22.38	22.52	22.33
		6/0	23.50	22.39	22.53	22.27			15/0	23.50	22.48	22.50	22.34
	16QAM	1/0	23.50	22.12	22.22	22.17		16QAM	1/0	23.50	22.45	22.09	22.08
		1/2	23.50	22.29	22.43	21.95			1/7	23.50	22.64	22.59	22.41
		1/5	23.50	22.20	22.17	22.15			1/14	23.50	22.33	22.19	22.04
		3/0	23.50	22.54	22.47	21.98			8/0	22.50	21.48	21.30	21.31
		3/1	23.50	22.65	22.48	21.97			8/3	22.50	21.46	21.27	21.26
		3/3	23.50	22.62	22.50	21.93			8/7	22.50	21.48	21.41	21.15
		6/0	22.50	21.54	21.65	20.89			15/0	22.50	21.26	21.37	21.01
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	24.50	23.35	23.03	23.18	2 / 10M	QPSK	1/0	24.50	23.51	23.46	23.25
		1/12	24.50	23.54	23.27	23.43			1/24	24.50	23.67	23.67	23.42
		1/24	24.50	23.49	23.05	22.86			1/49	24.50	23.52	23.58	22.51
		12/0	23.50	22.46	22.50	22.39			25/0	23.50	22.53	22.51	22.37
		12/6	23.50	22.54	22.46	22.42			25/12	23.50	22.52	22.53	22.31
		12/13	23.50	22.51	22.50	22.38			25/25	23.50	22.56	22.50	22.29
		25/0	23.50	22.43	22.54	22.33			50/0	23.50	22.51	22.52	22.35
	16QAM	1/0	23.50	21.75	22.36	21.81		16QAM	1/0	23.50	22.25	22.18	22.29
		1/12	23.50	21.92	22.42	22.08			1/24	23.50	22.79	22.18	22.22
		1/24	23.50	21.87	21.94	21.51			1/49	23.50	22.34	22.21	21.70
		12/0	22.50	21.18	21.24	21.39			25/0	22.50	21.54	21.54	21.50
		12/6	22.50	21.46	21.28	21.34			25/12	22.50	21.42	21.44	21.50
		12/13	22.50	21.51	21.42	21.28			25/25	22.50	21.45	21.43	21.29
		25/0	22.50	21.52	21.50	21.08			50/0	22.50	21.38	21.43	21.15
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	24.50	23.13	23.43	23.26	2 / 20M	QPSK	1/0	24.50	23.47	**23.73**	23.47
		1/37	24.50	23.69	23.48	23.19			1/50	24.50	23.42	22.64	23.46
		1/74	24.50	23.69	23.38	22.51			1/99	24.50	23.14	23.48	22.59
		36/0	23.50	22.53	22.91	22.37			50/0	23.50	22.70	**22.76**	22.62
		36/19	23.50	22.58	22.54	22.37			50/25	23.50	22.65	22.72	22.57
		36/39	23.50	22.51	22.50	22.42			50/50	23.50	22.64	22.66	22.45
		75/0	23.50	22.55	22.51	22.36			100/0	23.50	22.72	22.67	22.59
	16QAM	1/0	23.50	22.21	22.23	22.89		16QAM	1/0	23.50	22.61	22.27	22.26
		1/37	23.50	22.83	22.26	22.74			1/50	23.50	22.56	21.63	22.35
		1/74	23.50	22.40	21.78	21.81			1/99	23.50	22.21	22.09	22.04
		36/0	22.50	21.48	21.78	21.36			50/0	22.50	21.79	21.59	21.41
		36/19	22.50	21.54	21.45	21.17			50/25	22.50	21.83	21.73	21.39
		36/39	22.50	21.38	21.40	21.13			50/50	22.50	21.63	21.55	21.13
		75/0	22.50	21.51	21.42	21.23			100/0	22.50	21.68	21.56	21.38

2) Sensor on or Hotspot power:

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	20.00	18.73	18.94	18.75	2 / 3M	QPSK	1/0	20.00	19.00	18.94	18.85
		1/2	20.00	18.72	19.00	18.62			1/7	20.00	19.12	19.03	18.81
		1/5	20.00	18.65	18.95	18.64			1/14	20.00	18.95	18.93	18.47
		3/0	20.00	18.81	18.94	18.84			8/0	20.00	18.94	18.92	18.83
		3/1	20.00	19.05	19.03	18.85			8/3	20.00	18.92	18.97	18.77
		3/3	20.00	18.95	18.99	18.70			8/7	20.00	18.97	18.92	18.77
		6/0	20.00	18.79	18.95	18.79			15/0	20.00	18.96	18.91	18.80
	16QAM	1/0	20.00	18.78	18.86	18.68		16QAM	1/0	20.00	18.90	18.64	18.58
		1/2	20.00	18.98	18.88	18.69			1/7	20.00	18.88	19.13	18.80
		1/5	20.00	18.64	18.84	18.66			1/14	20.00	18.58	18.82	18.49
		3/0	20.00	18.55	18.63	18.98			8/0	20.00	18.99	19.02	18.83
		3/1	20.00	18.87	18.67	18.91			8/3	20.00	18.98	19.08	18.79
		3/3	20.00	18.88	18.67	18.86			8/7	20.00	18.98	19.02	18.81
		6/0	20.00	18.94	18.67	18.95			15/0	20.00	18.95	19.06	18.63
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	20.00	18.88	18.72	18.63	2 / 10M	QPSK	1/0	20.00	18.94	18.70	18.57
		1/12	20.00	19.07	18.73	18.86			1/24	20.00	19.16	18.90	18.67
		1/24	20.00	19.00	18.40	18.66			1/49	20.00	18.96	18.73	18.55
		12/0	20.00	18.83	18.91	18.88			25/0	20.00	18.72	18.75	18.56
		12/6	20.00	18.91	19.05	18.77			25/12	20.00	18.84	18.74	18.61
		12/13	20.00	19.04	18.97	18.79			25/25	20.00	18.78	18.70	18.55
		25/0	20.00	18.88	18.92	18.79			50/0	20.00	18.83	18.73	18.64
	16QAM	1/0	20.00	18.32	18.92	18.39		16QAM	1/0	20.00	18.47	18.56	18.45
		1/12	20.00	18.47	18.93	18.52			1/24	20.00	19.17	18.36	18.34
		1/24	20.00	18.38	18.50	18.08			1/49	20.00	18.53	18.02	18.35
		12/0	20.00	18.87	18.78	18.68			25/0	20.00	18.68	18.70	18.55
		12/6	20.00	19.01	19.01	18.66			25/12	20.00	18.88	18.70	18.61
		12/13	20.00	18.89	18.99	18.65			25/25	20.00	18.81	18.66	18.58
		25/0	20.00	18.92	19.00	18.71			50/0	20.00	18.54	18.61	18.51
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	20.00	19.16	18.90	18.76	2 / 20M	QPSK	1/0	20.00	18.98	**19.27**	18.92
		1/37	20.00	19.24	18.95	18.69			1/50	20.00	18.92	19.05	18.86
		1/74	20.00	19.11	18.77	18.62			1/99	20.00	18.69	18.89	18.51
		36/0	20.00	18.99	18.77	18.82			50/0	20.00	19.03	**19.04**	18.86
		36/19	20.00	18.99	18.94	18.84			50/25	20.00	19.01	18.92	18.83
		36/39	20.00	18.95	18.90	18.76			50/50	20.00	18.95	18.94	18.76
		75/0	20.00	18.98	18.93	18.81			100/0	20.00	18.98	18.97	18.83
	16QAM	1/0	20.00	18.78	18.81	19.14		16QAM	1/0	20.00	18.94	18.45	18.41
		1/37	20.00	19.23	18.70	19.13			1/50	20.00	19.22	18.92	18.52
		1/74	20.00	18.81	18.45	19.21			1/99	20.00	18.34	18.28	18.05
		36/0	20.00	18.89	18.45	18.69			50/0	20.00	18.88	18.86	18.77
		36/19	20.00	18.91	18.92	18.72			50/25	20.00	19.08	19.07	18.73
		36/39	20.00	18.77	18.85	18.58			50/50	20.00	18.92	18.88	18.65
		75/0	20.00	18.90	18.77	18.64			100/0	20.00	18.93	18.91	18.65

Note: The tested channel results are marks in bold.

8.1.7 CONDUCTED POWER MEASUREMENTS OF LTE B4

1) Full Power:

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	24.50	23.26	23.18	23.26	4 / 3M	QPSK	1/0	24.50	23.32	23.16	23.00
		1/2	24.50	23.17	23.22	23.19			1/7	24.50	23.41	23.31	23.18
		1/5	24.50	23.24	23.26	23.28			1/14	24.50	23.36	23.26	23.01
		3/0	24.50	23.13	23.20	23.27			8/0	23.50	22.11	22.15	22.14
		3/1	24.50	23.28	23.25	23.30			8/3	23.50	22.18	22.11	22.12
		3/3	24.50	23.21	23.16	23.26			8/7	23.50	22.17	22.23	22.14
		6/0	23.50	22.17	22.12	22.23			15/0	23.50	22.26	22.14	22.25
	16QAM	1/0	23.50	22.03	22.04	21.95		16QAM	1/0	23.50	21.89	21.89	21.72
		1/2	23.50	22.06	22.40	22.00			1/7	23.50	21.95	22.24	22.25
		1/5	23.50	22.09	22.16	21.85			1/14	23.50	21.70	21.93	21.92
		3/0	23.50	21.96	22.19	22.12			8/0	22.50	21.28	21.02	20.92
		3/1	23.50	22.04	22.30	22.07			8/3	22.50	20.88	21.07	20.92
		3/3	23.50	22.15	21.87	22.14			8/7	22.50	20.98	20.81	20.96
		6/0	22.50	21.07	21.18	21.07			15/0	22.50	20.81	20.95	21.09
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	24.50	23.16	22.69	23.10	4 / 10M	QPSK	1/0	24.50	23.28	23.12	23.22
		1/12	24.50	23.08	22.99	23.27			1/24	24.50	23.33	23.30	23.38
		1/24	24.50	22.98	22.80	23.23			1/49	24.50	23.27	23.15	23.25
		12/0	23.50	22.17	22.11	22.25			25/0	23.50	22.09	22.11	22.23
		12/6	23.50	22.19	22.13	22.37			25/12	23.50	22.08	22.11	22.20
		12/13	23.50	22.21	22.22	22.31			25/25	23.50	22.09	22.04	22.31
		25/0	23.50	22.15	22.16	22.40			50/0	23.50	22.15	22.09	22.23
	16QAM	1/0	23.50	21.63	22.00	21.77		16QAM	1/0	23.50	22.12	21.84	22.30
		1/12	23.50	21.54	22.22	21.99			1/24	23.50	22.57	21.91	22.08
		1/24	23.50	21.57	21.57	21.58			1/49	23.50	21.95	21.87	22.30
		12/0	22.50	21.05	20.89	21.18			25/0	22.50	20.92	21.20	21.34
		12/6	22.50	20.98	20.88	21.31			25/12	22.50	20.91	21.25	21.31
		12/13	22.50	21.03	21.03	21.27			25/25	22.50	20.98	21.07	21.36
		25/0	22.50	21.14	21.03	21.06			50/0	22.50	21.10	21.08	21.10
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	24.50	23.32	22.95	23.27	4 / 20M	QPSK	1/0	24.50	23.04	23.34	23.04
		1/37	24.50	23.40	23.26	23.07			1/50	24.50	23.29	22.62	**23.42**
		1/74	24.50	23.16	23.15	23.23			1/99	24.50	23.05	23.36	23.09
		36/0	23.50	22.12	23.15	22.22			50/0	23.50	22.25	22.27	22.33
		36/19	23.50	22.13	22.12	22.23			50/25	23.50	22.33	22.29	**22.34**
		36/39	23.50	22.13	22.08	22.19			50/50	23.50	22.32	22.27	22.28
		75/0	23.50	22.12	22.08	22.23			100/0	23.50	22.22	22.15	22.32
	16QAM	1/0	23.50	22.03	21.90	22.75		16QAM	1/0	23.50	22.04	21.84	22.01
		1/37	23.50	22.70	22.07	22.66			1/50	23.50	22.23	21.57	21.92
		1/74	23.50	22.16	21.58	22.38			1/99	23.50	21.83	21.87	21.72
		36/0	22.50	21.08	21.48	21.10			50/0	22.50	21.14	20.99	21.06
		36/19	22.50	21.07	20.99	21.10			50/25	22.50	21.05	21.05	20.95
		36/39	22.50	20.98	21.00	21.07			50/50	22.50	21.20	20.97	20.95
		75/0	22.50	21.11	20.91	21.06			100/0	22.50	21.11	20.91	21.14

2) Sensor on or Hotspot power:

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	20.00	18.57	18.70	18.64	4 / 3M	QPSK	1/0	20.00	18.57	18.56	18.61
		1/2	20.00	18.91	18.69	18.61			1/7	20.00	18.76	18.73	18.88
		1/5	20.00	18.71	18.79	18.64			1/14	20.00	18.76	18.85	18.84
		3/0	20.00	18.71	18.70	18.65			8/0	20.00	18.74	18.58	18.78
		3/1	20.00	18.75	18.66	18.67			8/3	20.00	18.65	18.58	18.76
		3/3	20.00	18.69	18.86	18.67			8/7	20.00	18.57	18.76	18.72
		6/0	20.00	18.83	18.52	18.73			15/0	20.00	18.72	18.63	18.60
	16QAM	1/0	20.00	18.06	18.17	18.12		16QAM	1/0	20.00	18.51	18.10	18.20
		1/2	20.00	18.50	18.32	18.19			1/7	20.00	18.36	18.76	18.46
		1/5	20.00	18.45	18.39	18.15			1/14	20.00	18.11	18.43	18.28
		3/0	20.00	18.79	18.46	18.21			8/0	20.00	18.38	18.55	18.33
		3/1	20.00	18.66	18.41	18.33			8/3	20.00	18.54	18.65	18.45
		3/3	20.00	18.66	18.56	18.47			8/7	20.00	18.55	18.65	18.51
		6/0	20.00	18.53	18.63	18.23			15/0	20.00	18.48	18.47	18.28
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	20.00	18.63	18.30	18.71	4 / 10M	QPSK	1/0	20.00	18.64	18.50	18.71
		1/12	20.00	18.85	18.44	18.88			1/24	20.00	18.95	18.83	18.89
		1/24	20.00	18.58	18.27	18.92			1/49	20.00	18.71	18.55	18.64
		12/0	20.00	18.70	18.57	18.71			25/0	20.00	18.62	18.58	18.66
		12/6	20.00	18.67	18.61	18.89			25/12	20.00	18.59	18.60	18.73
		12/13	20.00	18.59	18.72	18.81			25/25	20.00	18.61	18.58	18.82
		25/0	20.00	18.62	18.65	18.88			50/0	20.00	18.60	18.58	18.69
	16QAM	1/0	20.00	18.23	18.55	18.23		16QAM	1/0	20.00	18.06	18.17	18.45
		1/12	20.00	18.10	18.57	18.39			1/24	20.00	19.00	18.31	18.70
		1/24	20.00	18.10	18.14	18.01			1/49	20.00	18.29	18.19	18.54
		12/0	20.00	18.59	18.36	18.41			25/0	20.00	18.48	18.50	18.61
		12/6	20.00	18.47	18.42	18.48			25/12	20.00	18.55	18.57	18.68
		12/13	20.00	18.50	18.48	18.53			25/25	20.00	18.43	18.55	18.84
		25/0	20.00	18.73	18.49	18.61			50/0	20.00	18.57	18.38	18.50
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	20.00	19.02	18.56	18.70	4 / 20M	QPSK	1/0	20.00	18.57	18.82	18.76
		1/37	20.00	18.75	18.66	18.62			1/50	20.00	18.86	18.85	**19.14**
		1/74	20.00	19.06	18.61	18.76			1/99	20.00	18.34	18.77	18.62
		36/0	20.00	18.63	18.61	18.74			50/0	20.00	18.64	18.65	18.73
		36/19	20.00	18.61	18.59	18.69			50/25	20.00	18.57	18.64	**18.74**
		36/39	20.00	18.61	18.62	18.68			50/50	20.00	18.65	18.64	18.66
		75/0	20.00	18.57	18.55	18.71			100/0	20.00	18.67	18.66	18.84
	16QAM	1/0	20.00	18.53	18.26	19.04		16QAM	1/0	20.00	18.69	18.30	18.37
		1/37	20.00	19.04	18.42	19.01			1/50	20.00	18.51	18.71	18.38
		1/74	20.00	18.52	18.06	19.05			1/99	20.00	18.19	18.22	18.39
		36/0	20.00	18.58	18.06	18.47			50/0	20.00	18.58	18.59	18.54
		36/19	20.00	18.51	18.69	18.63			50/25	20.00	18.61	18.67	18.48
		36/39	20.00	18.31	18.52	18.53			50/50	20.00	18.71	18.55	18.47
		75/0	20.00	18.57	18.32	18.59			100/0	20.00	18.66	18.51	18.60

Note: The tested channels are marks in bold.

8.1.8 CONDUCTED POWER MEASUREMENTS OF LTE B5

1) Full Power:

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	25.00	24.17	23.95	23.86	5 / 3M	QPSK	1/0	25.00	23.94	24.10	23.82
		1/2	25.00	24.18	24.06	24.20			1/7	25.00	24.23	24.15	23.93
		1/5	25.00	24.17	24.07	24.02			1/14	25.00	24.00	24.15	24.04
		3/0	25.00	24.02	23.94	24.04			8/0	24.00	22.93	22.91	22.97
		3/1	25.00	24.09	24.03	24.04			8/3	24.00	22.90	22.90	22.95
		3/3	25.00	24.18	24.08	24.09			8/7	24.00	22.90	22.88	22.91
		6/0	24.00	22.86	22.88	22.96			15/0	24.00	22.98	22.90	22.91
	16QAM	1/0	24.00	22.84	22.81	22.82		16QAM	1/0	24.00	23.10	22.74	22.83
		1/2	24.00	23.28	23.21	22.89			1/7	24.00	23.05	22.97	23.04
		1/5	24.00	23.04	23.02	22.90			1/14	24.00	22.93	22.82	22.72
		3/0	24.00	23.21	23.01	22.84			8/0	23.00	22.43	21.86	22.13
		3/1	24.00	23.12	22.87	22.66			8/3	23.00	22.09	22.07	22.19
		3/3	24.00	23.12	22.92	22.68			8/7	23.00	22.34	22.02	21.96
		6/0	23.00	22.13	22.12	21.74			15/0	23.00	22.16	22.01	21.71
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	25.00	24.08	23.57	23.91	5 / 10M	QPSK	1/0	25.00	24.16	23.99	24.04
		1/12	25.00	24.28	23.90	24.20			1/24	25.00	24.40	24.39	**24.40**
		1/24	25.00	24.14	23.49	23.92			1/49	25.00	23.94	24.02	23.93
		12/0	24.00	23.04	22.89	22.99			25/0	24.00	22.93	22.91	22.87
		12/6	24.00	22.97	22.94	22.95			25/12	24.00	22.95	22.93	**22.96**
		12/13	24.00	22.96	22.85	22.90			25/25	24.00	22.92	22.88	22.95
		25/0	24.00	22.94	22.93	22.95			50/0	24.00	22.92	22.88	22.97
	16QAM	1/0	24.00	22.41	22.71	22.63		16QAM	1/0	24.00	22.77	22.92	23.02
		1/12	24.00	22.48	22.98	22.72			1/24	24.00	23.42	22.80	22.90
		1/24	24.00	22.53	22.35	22.12			1/49	24.00	22.65	22.81	22.32
		12/0	23.00	22.10	21.79	21.94			25/0	23.00	22.12	22.06	22.07
		12/6	23.00	22.02	21.80	22.04			25/12	23.00	22.13	22.08	22.14
		12/13	23.00	22.07	21.86	22.07			25/25	23.00	22.05	22.00	22.00
		25/0	23.00	21.96	22.08	21.77			50/0	23.00	22.01	21.97	22.12

Note: The tested channel results are marks in bold.

8.1.9 CONDUCTED POWER MEASUREMENTS OF LTE B7

1) Full Power:

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	24.20	22.92	22.98	22.68	7 / 10M	QPSK	1/0	24.20	23.07	22.98	22.84
		1/12	24.20	23.19	23.25	22.70			1/24	24.20	23.26	23.15	23.08
		1/24	24.20	22.99	23.05	22.39			1/49	24.20	23.18	23.20	22.77
		12/0	23.20	22.11	22.10	21.88			25/0	23.20	22.19	22.15	22.05
		12/6	23.20	22.11	22.11	21.93			25/12	23.20	22.16	22.12	21.98
		12/13	23.20	22.11	22.11	21.91			25/25	23.20	22.16	22.14	21.97
		25/0	23.20	22.11	22.05	21.95			50/0	23.20	22.19	22.13	22.11
	16QAM	1/0	23.20	21.71	21.99	21.60		16QAM	1/0	23.20	21.91	21.81	21.91
		1/12	23.20	21.72	22.10	21.67			1/24	23.20	22.44	21.88	21.83
		1/24	23.20	21.71	21.42	21.65			1/49	23.20	21.89	21.40	21.69
		12/0	22.20	21.01	20.84	21.08			25/0	22.20	21.12	21.08	21.16
		12/6	22.20	21.03	21.12	20.96			25/12	22.20	21.09	21.35	21.08
		12/13	22.20	21.07	20.98	20.76			25/25	22.20	21.07	20.97	21.00
		25/0	22.20	21.25	21.07	21.01			50/0	22.20	21.04	20.99	21.04
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	24.20	23.09	22.86	22.96	7 / 20M	QPSK	1/0	24.20	22.75	22.86	22.73
		1/37	24.20	23.32	23.00	22.79			1/50	24.20	23.33	**23.34**	23.28
		1/74	24.20	23.06	22.91	22.67			1/99	24.20	22.61	22.89	22.51
		36/0	23.20	22.18	22.14	22.06			50/0	23.20	22.27	**22.28**	22.17
		36/19	23.20	22.19	22.14	22.04			50/25	23.20	22.24	22.21	22.08
		36/39	23.20	22.17	22.08	21.99			50/50	23.20	22.23	22.22	22.04
		75/0	23.20	22.16	22.09	21.96			100/0	23.20	22.16	22.17	22.00
	16QAM	1/0	23.20	21.99	21.80	22.57		16QAM	1/0	23.20	21.63	21.64	21.66
		1/37	23.20	22.68	21.90	22.41			1/50	23.20	22.47	21.91	21.82
		1/74	23.20	22.02	21.76	22.08			1/99	23.20	21.52	21.43	21.58
		36/0	22.20	21.12	21.25	21.05			50/0	22.20	20.96	20.96	20.95
		36/19	22.20	21.12	21.10	20.96			50/25	22.20	21.19	21.04	20.93
		36/39	22.20	21.09	21.12	20.83			50/50	22.20	21.08	21.12	20.85
		75/0	22.20	20.99	20.93	20.91			100/0	22.20	21.07	20.95	20.92

2) Sensor on or Hotspot power:

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	19.00	17.93	17.80	17.38	7 / 10M	QPSK	1/0	19.00	17.88	17.91	17.83
		1/12	19.00	17.93	18.07	17.60			1/24	19.00	18.22	18.00	17.92
		1/24	19.00	17.70	17.76	17.19			1/49	19.00	18.02	17.68	17.68
		12/0	19.00	17.81	17.87	17.69			25/0	19.00	17.86	17.83	17.80
		12/6	19.00	17.88	17.82	17.66			25/12	19.00	17.91	17.88	17.76
		12/13	19.00	17.84	17.86	17.71			25/25	19.00	17.87	17.85	17.75
		25/0	19.00	17.86	17.81	17.75			50/0	19.00	17.87	17.83	17.81
	16QAM	1/0	19.00	17.24	17.28	17.54		16QAM	1/0	19.00	17.46	17.41	17.55
		1/12	19.00	17.31	17.28	17.60			1/24	19.00	18.17	17.62	17.50
		1/24	19.00	17.23	17.08	17.09			1/49	19.00	17.51	17.42	17.49
		12/0	19.00	17.68	17.56	17.55			25/0	19.00	17.84	17.95	17.80
		12/6	19.00	17.74	17.51	17.66			25/12	19.00	17.85	18.04	17.87
		12/13	19.00	17.63	17.55	17.43			25/25	19.00	17.79	17.83	17.57
		25/0	19.00	17.64	17.88	17.59			50/0	19.00	17.72	17.84	17.66
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	19.00	18.25	17.68	17.70	7 / 20M	QPSK	1/0	19.00	17.68	17.81	17.54
		1/37	19.00	18.12	17.87	17.67			1/50	19.00	17.76	**18.27**	17.91
		1/74	19.00	18.16	17.73	17.71			1/99	19.00	17.55	17.83	17.53
		36/0	19.00	17.87	17.86	17.76			50/0	19.00	17.95	**17.97**	17.89
		36/19	19.00	17.83	17.89	17.73			50/25	19.00	17.92	17.88	17.87
		36/39	19.00	17.87	17.82	17.76			50/50	19.00	17.94	17.88	17.80
		75/0	19.00	17.82	17.85	17.74			100/0	19.00	17.88	17.88	17.77
	16QAM	1/0	19.00	17.70	17.41	18.21		16QAM	1/0	19.00	17.66	17.33	17.36
		1/37	19.00	18.08	17.51	18.15			1/50	19.00	18.00	17.70	17.43
		1/74	19.00	17.68	17.56	18.17			1/99	19.00	17.21	17.22	17.02
		36/0	19.00	17.69	17.93	17.69			50/0	19.00	17.73	17.76	17.56
		36/19	19.00	17.65	17.72	17.66			50/25	19.00	17.87	17.77	17.54
		36/39	19.00	17.66	17.74	17.60			50/50	19.00	17.79	17.73	17.52
		75/0	19.00	17.70	17.55	17.59			100/0	19.00	17.76	17.67	17.68

Note: The tested channel results are marks in bold.

8.1.10 CONDUCTED POWER MEASUREMENTS OF WIFI 2.4G

1) Full Power

Mode	Channel	Frequency (MHz)	Data Rate(Mbps)	Tune up	Average Power(dBm)	SAR Test(Yes/No)
802.11b	1	2412	1	18.00	17.36	No
	6	2437		18.00	17.42	No
	11	2462		18.00	**17.49**	Yes
802.11g	1	2412	6	12.50	Not Required	No
	6	2437		16.00	Not Required	No
	11	2462		14.00	Not Required	No
802.11n HT20	1	2412	6.5	12.50	Not Required	No
	6	2437		16.00	Not Required	No
	11	2462		14.00	Not Required	No
802.11n HT40	3	2422	13.5	10.00	Not Required	No
	6	2437		13.50	Not Required	No
	9	2452		10.00	Not Required	No

2) WiFi Antenna Simutanuous with 2G&3G&4G receiver on

Mode	Channel	Frequency (MHz)	Data Rate(Mbps)	Tune up	Average Power(dBm)	SAR Test(Yes/No)
802.11b	1	2412	1	14.00	13.53	No
	6	2437		14.00	13.71	No
	11	2462		14.00	**13.87**	Yes
802.11g	1	2412	6	14.00	12.64	No
	6	2437		14.00	12.82	No
	11	2462		14.00	13.19	No
802.11n HT20	1	2412	6.5	14.00	13.07	No
	6	2437		14.00	13.45	No
	11	2462		14.00	13.42	No
802.11n HT40	3	2422	13.5	14.00	12.51	No
	6	2437		14.00	12.21	No
	9	2452		14.00	12.71	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 channel results are marks in bold.

8.1.11 CONDUCTED POWER MEASUREMENTS OF BT

BT	Tune up	Average Conducted Power(dBm)		
		CH0	CH39	CH78
		2402MHz	2441MHz	2480MHz
DH5	9.70	7.12	7.73	5.55
2DH5	9.00	5.16	5.76	5.57
3DH5	9.00	5.14	5.74	5.53

BT	Tune up	Average Conducted Power(dBm)		
		CH0	CH19	CH39
		2402MHz	2441MHz	2480MHz
BLE(1M)	1.00	0.78	-0.12	-0.85

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

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 KDB941225 D06, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
5) Per KDB648474 D04, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.
6) 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.

GSM Notes:

1) Per KDB648474 D04, body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2) Per KDB941225 D01, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

UMTS Notes:

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.

LTE notes:

1) The LTE test configurations are determined according to KDB941225 D05 SAR for LTE Devices. The general test procedures used for SAR testing can be found in Section 7.1.3.
2) A-MPR was disabled for all SAR test by setting NS_01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames(maximum TTI)

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 7.1.4 for more information.

8.2.1 SAR MEASUREMENT RESULT OF HEAD

1. Head SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	SIM	Battery	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T01	GSM 850	GSM	190	Right Cheek	1	1	34	32.67	-0.05	**0.181**	**0.141**	**0.246**
T02	GSM 850	GSM	190	Right Tilted	1	1	34	32.67	-0.02	0.089	0.07	0.121
T03	GSM 850	GSM	190	Left Cheek	1	1	34	32.67	-0.06	0.172	0.131	0.234
T04	GSM 850	GSM	190	Left Tilted	1	1	34	32.67	0.15	0.09	0.071	0.122
T05	GSM 850	GSM	190	Right Cheek	2	1	34	32.67	0.06	0.174	0.131	0.236
T06	GSM 850	GSM	190	Right Cheek	1	2	34	32.67	0.02	0.177	0.133	0.240
T11	GSM 1900	GSM	661	Right Cheek	1	1	31.2	29.85	0.03	0.098	0.061	0.134
T12	GSM 1900	GSM	661	Right Tilted	1	1	31.2	29.85	0.05	0.07	0.045	0.096
T13	GSM 1900	GSM	661	Left Cheek	1	1	31.2	29.85	0.07	0.115	0.072	0.157
T14	GSM 1900	GSM	661	Left Tilted	1	1	31.2	29.85	0.06	0.077	0.049	0.105
T15	GSM 1900	GSM	661	Left Cheek	2	1	31.2	29.85	-0.01	0.12	0.074	0.164
T16	GSM 1900	GSM	661	Left Cheek	2	2	31.2	29.85	0.08	**0.156**	**0.101**	**0.213**

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

2. Head SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	SIM	Battery	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T21	UMTS B2	RMC12.2K	9400	Right Cheek	1	1	24.8	23.73	-0.06	0.251	0.162	0.321
T22	UMTS B2	RMC12.2K	9400	Right Tilted	1	1	24.8	23.73	0.02	0.152	0.102	0.194
T23	UMTS B2	RMC12.2K	9400	Left Cheek	1	1	24.8	23.73	0.15	0.266	0.173	0.340
T24	UMTS B2	RMC12.2K	9400	Left Tilted	1	1	24.8	23.73	0.01	0.16	0.108	0.205
T25	UMTS B2	RMC12.2K	9400	Left Cheek	2	1	24.8	23.73	0.09	**0.29**	**0.19**	**0.371**
T26	UMTS B2	RMC12.2K	9400	Left Cheek	2	2	24.8	23.73	0.02	0.282	0.182	0.361
T31	UMTS B4	RMC12.2K	1413	Right Cheek	1	1	24.8	23.5	0.03	0.16	0.104	0.216
T32	UMTS B4	RMC12.2K	1413	Right Tilted	1	1	24.8	23.5	0.01	0.117	0.076	0.158
T33	UMTS B4	RMC12.2K	1413	Left Cheek	1	1	24.8	23.5	0.05	0.106	0.073	0.143
T34	UMTS B4	RMC12.2K	1413	Left Tilted	1	1	24.8	23.5	0.04	0.137	0.087	0.185
T35	UMTS B4	RMC12.2K	1413	Right Cheek	2	1	24.8	23.5	0.01	**0.169**	**0.11**	**0.228**
T36	UMTS B4	RMC12.2K	1413	Right Cheek	2	2	24.8	23.5	0.02	0.165	0.107	0.223
T41	UMTS B5	RMC12.2K	4182	Right Cheek	1	1	25	23.86	0	**0.187**	**0.145**	**0.243**
T42	UMTS B5	RMC12.2K	4182	Right Tilted	1	1	25	23.86	0.06	0.104	0.084	0.135
T43	UMTS B5	RMC12.2K	4182	Left Cheek	1	1	25	23.86	0.08	0.164	0.13	0.213
T44	UMTS B5	RMC12.2K	4182	Left Tilted	1	1	25	23.86	0.02	0.099	0.079	0.129
T45	UMTS B5	RMC12.2K	4182	Right Cheek	2	1	25	23.86	0.04	0.185	0.144	0.241
T46	UMTS B5	RMC12.2K	4182	Right Cheek	1	2	25	23.86	-0.12	0.173	0.131	0.225

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

3. Head SAR test results of LTE

Test No.	Band	Mode	Channel	RB	offset	Test Position	SIM	Battery	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T51	LTE B2	QPSK20M	18900	1	0	Right Cheek	1	1	24.5	23.73	-0.05	0.177	0.116	0.211
T52	LTE B2	QPSK20M	18900	1	0	Right Tilted	1	1	24.5	23.73	0.06	0.149	0.097	0.178
T53	LTE B2	QPSK20M	18900	1	0	Left Cheek	1	1	24.5	23.73	0.01	0.231	0.152	0.276
T54	LTE B2	QPSK20M	18900	1	0	Left Tilted	1	1	24.5	23.73	0	0.14	0.096	0.167
T55	LTE B2	QPSK20M	18900	50	0	Right Cheek	1	1	23.5	22.76	0.01	0.153	0.101	0.181
T56	LTE B2	QPSK20M	18900	50	0	Right Tilted	1	1	23.5	22.76	0.03	0.113	0.075	0.134
T57	LTE B2	QPSK20M	18900	50	0	Left Cheek	1	1	23.5	22.76	0.04	0.17	0.113	0.201
T58	LTE B2	QPSK20M	18900	50	0	Left Tilted	1	1	23.5	22.76	-0.02	0.125	0.086	0.148
T59	LTE B2	QPSK20M	18900	1	0	Left Cheek	2	1	24.5	23.73	0.18	0.257	0.17	0.307
T60	LTE B2	QPSK20M	18900	1	0	Left Cheek	2	2	24.5	23.73	0.19	**0.268**	**0.174**	**0.320**
T71	LTE B4	QPSK20M	20300	1	50	Right Cheek	1	1	24.5	23.42	0.07	**0.127**	**0.082**	**0.163**
T72	LTE B4	QPSK20M	20300	1	50	Right Tilted	1	1	24.5	23.42	0.03	0.073	0.048	0.094
T73	LTE B4	QPSK20M	20300	1	50	Left Cheek	1	1	24.5	23.42	0.02	0.094	0.062	0.120
T74	LTE B4	QPSK20M	20300	1	50	Left Tilted	1	1	24.5	23.42	0.06	0.084	0.055	0.108
T75	LTE B4	QPSK20M	20300	50	25	Right Cheek	1	1	23.5	22.34	0.01	0.106	0.068	0.138
T76	LTE B4	QPSK20M	20300	50	25	Right Tilted	1	1	23.5	22.34	0.05	0.06	0.04	0.078
T77	LTE B4	QPSK20M	20300	50	25	Left Cheek	1	1	23.5	22.34	-0.12	0.077	0.049	0.100
T78	LTE B4	QPSK20M	20300	50	25	Left Tilted	1	1	23.5	22.34	-0.05	0.069	0.046	0.090
T79	LTE B4	QPSK20M	20300	1	50	Right Cheek	2	1	24.5	23.42	0.06	0.114	0.072	0.146
T80	LTE B4	QPSK20M	20300	1	50	Right Cheek	1	2	24.5	23.42	0.04	0.109	0.071	0.140
T91	LTE B5	QPSK10M	20600	1	24	Right Cheek	1	1	25	24.40	-0.07	0.177	0.133	0.203
T92	LTE B5	QPSK10M	20600	1	24	Right Tilted	1	1	25	24.40	0.05	0.091	0.073	0.104
T93	LTE B5	QPSK10M	20600	1	24	Left Cheek	1	1	25	24.40	0.12	0.152	0.117	0.174
T94	LTE B5	QPSK10M	20600	1	24	Left Tilted	1	1	25	24.40	0.15	0.092	0.073	0.106
T95	LTE B5	QPSK10M	20600	25	12	Right Cheek	1	1	24	22.96	0.02	0.128	0.096	0.162
T96	LTE B5	QPSK10M	20600	25	12	Right Tilted	1	1	24	22.96	0.03	0.071	0.056	0.090
T97	LTE B5	QPSK10M	20600	25	12	Left Cheek	1	1	24	22.96	0.05	0.115	0.09	0.146
T98	LTE B5	QPSK10M	20600	25	12	Left Tilted	1	1	24	22.96	-0.07	0.073	0.058	0.093
T99	LTE B5	QPSK10M	20600	1	24	Right Cheek	2	1	25	24.40	0.01	0.166	0.123	0.191
T100	LTE B5	QPSK10M	20600	1	24	Right Cheek	1	2	25	24.40	-0.07	**0.191**	**0.143**	**0.219**
T111	LTE B7	QPSK20M	21100	1	50	Right Cheek	1	1	24.2	23.34	0.05	**0.113**	**0.06**	**0.138**
T112	LTE B7	QPSK20M	21100	1	50	Right Tilted	1	1	24.2	23.34	0.03	0.033	0.015	0.040
T113	LTE B7	QPSK20M	21100	1	50	Left Cheek	1	1	24.2	23.34	0	0.041	0.022	0.050
T114	LTE B7	QPSK20M	21100	1	50	Left Tilted	1	1	24.2	23.34	0.12	0.049	0.026	0.060
T115	LTE B7	QPSK20M	21100	50	0	Right Cheek	1	1	23.2	22.28	0.05	0.092	0.048	0.114
T116	LTE B7	QPSK20M	21100	50	0	Right Tilted	1	1	23.2	22.28	0.02	0.021	0.009	0.026
T117	LTE B7	QPSK20M	21100	50	0	Left Cheek	1	1	23.2	22.28	0	0.032	0.016	0.040
T118	LTE B7	QPSK20M	21100	50	0	Left Tilted	1	1	23.2	22.28	0.07	0.039	0.021	0.048
T119	LTE B7	QPSK20M	21100	1	50	Right Cheek	2	1	24.2	23.34	0.04	0.11	0.058	0.134
T120	LTE B7	QPSK20M	21100	1	50	Right Cheek	1	2	24.2	23.34	0.01	0.111	0.058	0.135

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

4. Head SAR test results of 2.4G WIFI

Test No.	Band	Channel	Test Position	Battery	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T121	802.11b	11	Right Cheek	1	1	14	13.87	0.02	0.099	0.042	0.120
T122	802.11b	11	Right Tilted	1	1	14	13.87	-0.03	0.101	0.042	0.122
T123	802.11b	11	Left Cheek	1	1	14	13.87	0.01	0.157	0.062	0.190
T124	802.11b	11	Left Tilted	1	1	14	13.87	0.01	**0.164**	**0.067**	**0.198**
T125	802.11b	11	Left Tilted	2	1	14	13.87	-0.06	0.151	0.058	0.182

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

8.2.2 SAR MEASUREMENT RESULT OF BODY-WORN

1. Body-worn SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T01	GSM 850	GSM	190	Front Face	1.5	1	1	off	34	32.67	-0.01	0.16	0.102	0.217
T02	GSM 850	GSM	190	Rear Face	1.5	1	1	off	34	32.67	0.02	0.273	0.169	0.371
T03	GSM 850	GSM	190	Rear Face	1.5	2	1	off	34	32.67	-0.05	**0.282**	**0.223**	**0.383**
T04	GSM 850	GSM	190	Rear Face	1.5	2	2	off	34	32.67	0.06	0.269	0.171	0.365
T16	GSM 1900	GSM	661	Front Face	1.5	1	1	off	31.2	29.85	0.05	0.146	0.091	0.199
T17	GSM 1900	GSM	661	Rear Face	1.5	1	1	off	31.2	29.85	0.05	**0.187**	**0.103**	**0.255**
T18	GSM 1900	GSM	661	Rear Face	1.5	2	1	off	31.2	29.85	0.06	0.184	0.103	0.251
T19	GSM 1900	GSM	661	Rear Face	1.5	1	2	off	31.2	29.85	0.14	0.18	0.101	0.246

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

2. Body-worn SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T34	UMTS B2	RMC12.2K	9400	Front Face	1.5	1	1	off	24.8	23.73	0.02	0.303	0.184	0.388
T35	UMTS B2	RMC12.2K	9400	Rear Face	1.5	1	1	off	24.8	23.73	0.03	0.357	0.2	0.457
T36	UMTS B2	RMC12.2K	9400	Rear Face	1.5	2	1	off	24.8	23.73	-0.04	**0.39**	**0.217**	**0.499**
T37	UMTS B2	RMC12.2K	9400	Rear Face	1.5	2	2	off	24.8	23.73	0.07	0.386	0.211	0.494
T49	UMTS B4	RMC12.2K	1413	Front Face	1.5	1	1	off	24.8	23.5	0.16	0.21	0.119	0.283
T50	UMTS B4	RMC12.2K	1413	Rear Face	1.5	1	1	off	24.8	23.5	0.05	0.381	0.214	0.514
T51	UMTS B4	RMC12.2K	1413	Rear Face	1.5	2	1	off	24.8	23.5	0.01	**0.4**	**0.221**	**0.540**
T52	UMTS B4	RMC12.2K	1413	Rear Face	1.5	2	2	off	24.8	23.5	0.07	0.391	0.217	0.527
T67	UMTS B5	RMC12.2K	4182	Front Face	1.5	1	1	off	25	23.86	0.02	0.163	0.128	0.212
T68	UMTS B5	RMC12.2K	4182	Rear Face	1.5	1	1	off	25	23.86	0	**0.282**	**0.222**	**0.367**
T69	UMTS B5	RMC12.2K	4182	Rear Face	1.5	2	1	off	25	23.86	0.06	0.273	0.213	0.355
T70	UMTS B5	RMC12.2K	4182	Rear Face	1.5	1	2	off	25	23.86	0.04	0.264	0.205	0.343

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

3. Body-worn SAR test results of LTE

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T81	LTE B2	QPSK20M	18900	1	0	Front Face	1.5	1	1	off	24.5	23.73	0.01	0.235	0.146	0.280
T82	LTE B2	QPSK20M	18900	1	0	Rear Face	1.5	1	1	off	24.5	23.73	-0.06	0.3	0.169	0.358
T83	LTE B2	QPSK20M	18900	50	0	Front Face	1.5	1	1	off	23.5	22.76	0.05	0.193	0.121	0.229
T84	LTE B2	QPSK20M	18900	50	0	Rear Face	1.5	1	1	off	23.5	22.76	0.06	0.235	0.133	0.278
T85	LTE B2	QPSK20M	18900	1	0	Rear Face	1.5	2	1	off	24.5	23.73	0.01	**0.327**	**0.185**	**0.390**
T86	LTE B2	QPSK20M	18900	1	0	Rear Face	1.5	2	2	off	24.5	23.73	0.02	0.309	0.175	0.369
T105	LTE B4	QPSK20M	20300	1	50	Front Face	1.5	1	1	off	24.5	23.42	0.07	0.24	0.133	0.308
T106	LTE B4	QPSK20M	20300	1	50	Rear Face	1.5	1	1	off	24.5	23.42	0.17	0.437	0.233	0.560
T107	LTE B4	QPSK20M	20300	50	25	Front Face	1.5	1	1	off	23.5	22.34	-0.06	0.189	0.106	0.247
T108	LTE B4	QPSK20M	20300	50	25	Rear Face	1.5	1	1	off	23.5	22.34	0.02	0.347	0.185	0.453
T109	LTE B4	QPSK20M	20300	1	50	Rear Face	1.5	2	1	off	24.5	23.42	0.05	0.433	0.234	0.555
T110	LTE B4	QPSK20M	20300	1	50	Rear Face	1.5	1	2	off	24.5	23.42	0	**0.456**	**0.248**	**0.584**
T129	LTE B5	QPSK10M	20600	1	24	Front Face	1.5	1	1	off	25	24.40	0.05	0.161	0.127	0.185
T130	LTE B5	QPSK10M	20600	1	24	Rear Face	1.5	1	1	off	25	24.40	0.06	0.257	0.202	0.295
T131	LTE B5	QPSK10M	20600	25	12	Front Face	1.5	1	1	off	24	22.96	0.01	0.123	0.098	0.156
T132	LTE B5	QPSK10M	20600	25	12	Rear Face	1.5	1	1	off	24	22.96	0.12	0.204	0.161	0.259
T133	LTE B5	QPSK10M	20600	1	24	Rear Face	1.5	2	1	off	25	24.40	-0.08	0.248	0.196	0.285
T134	LTE B5	QPSK10M	20600	1	24	Rear Face	1.5	1	2	off	25	24.40	0.03	**0.273**	**0.214**	**0.313**
T148	LTE B7	QPKS20M	21100	1	50	Front Face	1.5	1	1	off	24.2	23.34	0.05	0.252	0.114	0.307
T149	LTE B7	QPKS20M	21100	1	50	Rear Face	1.5	1	1	off	24.2	23.34	0.06	0.484	0.225	0.590
T150	LTE B7	QPKS20M	21100	50	0	Front Face	1.5	1	1	off	23.2	22.28	0.12	0.211	0.093	0.261
T151	LTE B7	QPKS20M	21100	50	0	Rear Face	1.5	1	1	off	23.2	22.28	0.05	0.429	0.182	0.531
T152	LTE B7	QPKS20M	21100	1	50	Rear Face	1.5	2	1	off	24.2	23.34	0.05	**0.485**	**0.232**	**0.592**
T153	LTE B7	QPKS20M	21100	1	50	Rear Face	1.5	2	2	off	24.2	23.34	0.04	0.481	0.231	0.587

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

4. Body-worn SAR test results of 2.4G WIFI

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Battery	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T175	802.11b	11	Front Face	1.5	1	1	18	17.49	0.02	0.029	0.015	0.039
T176	802.11b	11	Rear Face	1.5	1	1	18	17.49	-0.06	**0.036**	**0.019**	**0.048**
T177	802.11b	11	Rear Face	1.5	2	1	18	17.49	-0.03	0.032	0.017	0.043

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

8.2.3 SAR MEASUREMENT RESULT OF HOTSPOT

1. Hotspot SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T06	GSM 850	GPRS 2TX	190	Front Face	1	1	1	off	31	29.57	0.1	0.159	0.127	0.221
T07	GSM 850	GPRS 2TX	190	Rear Face	1	1	1	off	31	29.57	-0.01	**0.327**	**0.259**	**0.455**
T08	GSM 850	GPRS 2TX	190	Left Side	1	1	1	off	31	29.57	-0.05	0.239	0.17	0.332
T09	GSM 850	GPRS 2TX	190	Right Side	1	1	1	off	31	29.57	0.12	0.163	0.12	0.227
T10	GSM 850	GPRS 2TX	190	Bottom Side	1	1	1	off	31	29.57	-0.1	0.023	0.013	0.032
T13	GSM 850	GPRS 2TX	190	Rear Face	1	2	1	off	31	29.57	0.06	0.317	0.251	0.441
T14	GSM 850	GPRS 2TX	190	Rear Face	1	1	2	off	31	29.57	0.04	0.312	0.248	0.434
T21	GSM 1900	GPRS 2TX	661	Front Face	1	1	1	on	24.5	23.23	0.05	0.07	0.046	0.094
T22	GSM 1900	GPRS 2TX	661	Rear Face	1	1	1	on	24.5	23.23	0.09	0.094	0.052	0.126
T23	GSM 1900	GPRS 2TX	661	Left Side	1	1	1	off	24.5	23.23	0.07	0.026	0.015	0.035
T24	GSM 1900	GPRS 2TX	661	Right Side	1	1	1	off	24.5	23.23	0.08	0.086	0.057	0.115
T25	GSM 1900	GPRS 2TX	661	Bottom Side	1	1	1	on	24.5	23.23	0.1	**0.149**	**0.08**	**0.200**
T26	GSM 1900	GPRS 2TX	661	Front Face	1.5	1	1	off	24.5	23.23	0.12	0.034	0.022	0.046
T27	GSM 1900	GPRS 2TX	661	Rear Face	1.5	1	1	off	24.5	23.23	0.03	0.039	0.023	0.052
T28	GSM 1900	GPRS 2TX	661	Bottom Side	1.5	1	1	off	24.5	23.23	0.05	0.062	0.037	0.083
T29	GSM 1900	GPRS 2TX	661	Bottom Side	1	2	1	on	24.5	23.23	0.01	0.133	0.072	0.178
T30	GSM 1900	GPRS 2TX	661	Bottom Side	1	1	2	on	24.5	23.23	0	0.132	0.714	0.177

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

2. Hotspot SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T39	UMTS B2	RMC12.2K	9400	Front Face	1	1	1	on	20	19.03	0.08	0.161	0.098	0.201
T40	UMTS B2	RMC12.2K	9400	Rear Face	1	1	1	on	20	19.03	0.12	0.219	0.117	0.274
T41	UMTS B2	RMC12.2K	9400	Left Side	1	1	1	off	20	19.03	0.03	0.056	0.033	0.070
T42	UMTS B2	RMC12.2K	9400	Right Side	1	1	1	off	20	19.03	0.05	0.077	0.047	0.096
T43	UMTS B2	RMC12.2K	9400	Bottom Side	1	1	1	on	20	19.03	0.04	0.305	0.161	0.381
T44	UMTS B2	RMC12.2K	9400	Bottom Side	1.5	1	1	off	20	19.03	-0.12	0.161	0.09	0.201
T45	UMTS B2	RMC12.2K	9400	Bottom Side	1	2	1	on	20	19.03	0.02	**0.337**	**0.178**	**0.421**
T46	UMTS B2	RMC12.2K	9400	Bottom Side	1	2	2	on	20	19.03	-0.06	0.332	0.176	0.415
T53	UMTS B4	RMC12.2K	1413	Front Face	1	1	1	on	20	18.74	-0.04	0.143	0.077	0.191
T54	UMTS B4	RMC12.2K	1413	Rear Face	1	1	1	on	20	18.74	-0.01	0.271	0.145	0.362
T55	UMTS B4	RMC12.2K	1413	Left Side	1	1	1	off	20	18.74	0.06	0.063	0.038	0.084
T56	UMTS B4	RMC12.2K	1413	Right Side	1	1	1	off	20	18.74	-0.09	0.082	0.05	0.110
T57	UMTS B4	RMC12.2K	1413	Bottom Side	1	1	1	on	20	18.74	0.08	0.309	0.159	0.413
T58	UMTS B4	RMC12.2K	1413	Bottom Side	1.5	1	1	off	20	18.74	0.06	0.155	0.088	0.207
T61	UMTS B4	RMC12.2K	1413	Bottom Side	1	2	1	on	20	18.74	0.12	**0.341**	**0.176**	**0.456**
T62	UMTS B4	RMC12.2K	1413	Bottom Side	1	2	2	on	20	18.74	0.04	0.331	0.172	0.442
T71	UMTS B5	RMC12.2K	4182	Front Face	1	1	1	off	25	23.86	0.03	0.128	0.069	0.166
T72	UMTS B5	RMC12.2K	4182	Rear Face	1	1	1	off	25	23.86	0.02	0.228	0.119	0.296
T73	UMTS B5	RMC12.2K	4182	Left Side	1	1	1	off	25	23.86	0.12	0.055	0.034	0.072
T74	UMTS B5	RMC12.2K	4182	Right Side	1	1	1	off	25	23.86	-0.09	0.128	0.069	0.166
T75	UMTS B5	RMC12.2K	4182	Bottom Side	1	1	1	off	25	23.86	0.02	0.264	0.128	0.343
T78	UMTS B5	RMC12.2K	4182	Rear Face	1	2	1	off	25	23.86	0	**0.307**	**0.241**	**0.399**
T79	UMTS B5	RMC12.2K	4182	Rear Face	1	2	2	off	25	23.86	0.04	0.3	0.234	0.390

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.
3) Since the test distance between bodyworn and additional SAR is the same and they are aslo at sensor off, the additional SAR with sensor off in front face / rear face at 15 mm are no longer added.

3. Hotspot SAR test results of LTE

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T88	LTE B2	QPSK20M	18900	1	0	Front Face	1	1	1	on	20	19.27	0.03	0.133	0.08	0.157
T89	LTE B2	QPSK20M	18900	1	0	Rear Face	1	1	1	on	20	19.27	0.07	0.196	0.101	0.232
T90	LTE B2	QPSK20M	18900	1	0	Left Side	1	1	1	off	20	19.27	0.05	0.049	0.029	0.058
T91	LTE B2	QPSK20M	18900	1	0	Right Side	1	1	1	off	20	19.27	-0.09	0.175	0.108	0.207
T92	LTE B2	QPSK20M	18900	1	0	Bottom Side	1	1	1	on	20	19.27	0.01	**0.275**	**0.146**	**0.325**
T93	LTE B2	QPSK20M	18900	1	0	Bottom Side	1.5	1	1	off	20	19.27	-0.14	0.126	0.072	0.149
T94	LTE B2	QPSK20M	18900	50	0	Front Face	1	1	1	on	20	19.04	0.16	0.126	0.076	0.157
T95	LTE B2	QPSK20M	18900	50	0	Rear Face	1	1	1	on	20	19.04	0.03	0.181	0.096	0.226
T96	LTE B2	QPSK20M	18900	50	0	Left Side	1	1	1	off	20	19.04	0.05	0.041	0.024	0.051
T97	LTE B2	QPSK20M	18900	50	0	Right Side	1	1	1	off	20	19.04	-0.04	0.06	0.037	0.075
T98	LTE B2	QPSK20M	18900	50	0	Bottom Side	1	1	1	on	20	19.04	0.12	0.245	0.127	0.305
T99	LTE B2	QPSK20M	18900	50	0	Bottom Side	1.5	1	1	off	20	19.04	0.06	0.117	0.067	0.146
T102	LTE B2	QPSK20M	18900	1	0	Bottom Side	1	2	1	on	20	19.27	0.06	0.219	0.112	0.259
T103	LTE B2	QPSK20M	18900	1	0	Bottom Side	1	1	2	on	20	19.27	0.03	0.231	0.12	0.273
T112	LTE B4	QPSK20M	20300	1	50	Front Face	1	1	1	on	20	19.14	0.01	0.177	0.094	0.216
T113	LTE B4	QPSK20M	20300	1	50	Rear Face	1	1	1	on	20	19.14	0.1	0.333	0.169	0.406
T114	LTE B4	QPSK20M	20300	1	50	Left Side	1	1	1	off	20	19.14	0	0.07	0.043	0.085
T115	LTE B4	QPSK20M	20300	1	50	Right Side	1	1	1	off	20	19.14	0.05	0.064	0.038	0.078
T116	LTE B4	QPSK20M	20300	1	50	Bottom Side	1	1	1	on	20	19.14	0.06	0.327	0.169	0.399
T117	LTE B4	QPSK20M	20300	1	50	Bottom Side	1.5	1	1	off	20	19.14	0.04	0.159	0.088	0.194
T118	LTE B4	QPSK20M	20300	50	25	Front Face	1	1	1	on	20	18.74	0.15	0.172	0.091	0.230
T119	LTE B4	QPSK20M	20300	50	25	Rear Face	1	1	1	on	20	18.74	0.08	0.323	0.166	0.432
T120	LTE B4	QPSK20M	20300	50	25	Left Side	1	1	1	off	20	18.74	0.07	0.071	0.044	0.095
T121	LTE B4	QPSK20M	20300	50	25	Right Side	1	1	1	off	20	18.74	0.05	0.046	0.028	0.061
T122	LTE B4	QPSK20M	20300	50	25	Bottom Side	1	1	1	on	20	18.74	0.16	0.36	0.182	0.481
T123	LTE B4	QPSK20M	20300	50	25	Bottom Side	1.5	1	1	off	20	18.74	0.02	0.176	0.097	0.235
T126	LTE B4	QPSK20M	20300	50	25	Bottom Side	1	2	1	on	20	19.14	0.05	0.392	0.198	0.478
T127	LTE B4	QPSK20M	20300	50	25	Bottom Side	1	1	2	on	20	19.14	0.03	**0.396**	**0.205**	**0.483**

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T136	LTE B5	QPSK10M	20600	1	24	Front Face	1	1	1	off	25	24.40	0.05	0.135	0.107	0.155
T137	LTE B5	QPSK10M	20600	1	24	Rear Face	1	1	1	off	25	24.40	0.06	0.258	0.2	0.296
T138	LTE B5	QPSK10M	20600	1	24	Left Side	1	1	1	off	25	24.40	0.02	0.151	0.106	0.173
T139	LTE B5	QPSK10M	20600	1	24	Right Side	1	1	1	off	25	24.40	0.04	0.15	0.105	0.172
T140	LTE B5	QPSK10M	20600	1	24	Bottom Side	1	1	1	off	25	24.40	0.05	0.256	0.213	0.294
T141	LTE B5	QPSK10M	20600	25	12	Front Face	1	1	1	off	24	22.96	0.12	0.108	0.085	0.137
T142	LTE B5	QPSK10M	20600	25	12	Rear Face	1	1	1	off	24	22.96	0.02	0.209	0.161	0.265
T143	LTE B5	QPSK10M	20600	25	12	Left Side	1	1	1	off	24	22.96	0.05	0.141	0.098	0.179
T144	LTE B5	QPSK10M	20600	25	12	Right Side	1	1	1	off	24	22.96	0.06	0.124	0.087	0.157
T145	LTE B5	QPSK10M	20600	25	12	Bottom Side	1	1	1	off	24	22.96	-0.01	0.226	0.178	0.287
T146	LTE B5	QPSK10M	20600	1	24	Rear Face	1	2	1	off	25	24.40	-0.02	**0.275**	**0.215**	**0.316**
T147	LTE B5	QPSK10M	20600	1	24	Rear Face	1	2	2	off	25	24.40	0.04	0.27	0.207	0.310
T154	LTE B7	QPSK20M	21100	1	50	Front Face	1	1	1	on	19	18.27	0.02	0.114	0.054	0.135
T155	LTE B7	QPSK20M	21100	1	50	Rear Face	1	1	1	on	19	18.27	0.09	0.275	0.117	0.326
T156	LTE B7	QPSK20M	21100	1	50	Left Side	1	1	1	off	19	18.27	0.02	0.036	0.021	0.043
T157	LTE B7	QPSK20M	21100	1	50	Right Side	1	1	1	off	19	18.27	0.13	0.095	0.051	0.112
T158	LTE B7	QPSK20M	21100	1	50	Bottom Side	1	1	1	on	19	18.27	0.04	0.227	0.101	0.269
T159	LTE B7	QPSK20M	21100	1	50	Bottom Side	1.5	1	1	off	19	18.27	0.06	0.122	0.059	0.144
T160	LTE B7	QPSK20M	21100	50	0	Front Face	1	1	1	on	19	17.97	0.12	0.117	0.058	0.148
T161	LTE B7	QPSK20M	21100	50	0	Rear Face	1	1	1	on	19	17.97	0.02	0.252	0.115	0.319
T162	LTE B7	QPSK20M	21100	50	0	Left Side	1	1	1	off	19	17.97	0.06	0.092	0.054	0.117
T163	LTE B7	QPSK20M	21100	50	0	Right Side	1	1	1	off	19	17.97	0.15	0.077	0.042	0.098
T164	LTE B7	QPSK20M	21100	50	0	Bottom Side	1	1	1	on	19	17.97	0.02	0.261	0.113	0.331
T165	LTE B7	QPSK20M	21100	50	0	Bottom Side	1.5	1	1	off	19	17.97	-0.05	0.132	0.064	0.167
T166	LTE B7	QPSK20M	21100	50	0	Rear Face	1	2	1	on	19	17.97	0.15	0.238	0.108	0.302
T167	LTE B7	QPSK20M	21100	50	0	Rear Face	1	1	2	on	19	17.97	0.02	**0.289**	**0.122**	**0.366**

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.
3) Since the test distance between bodyworn and additional SAR is the same and they are aslo at sensor off, the additional SAR with sensor off in front face / rear face at 15 mm are no longer added.

4. Hotspot SAR test results of 2.4G WIFI

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Battery	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 1g SAR
T179	802.11b	11	Front Face	1	1	1	18	17.49	0.05	0.067	0.034	0.089
T180	802.11b	11	Rear Face	1	1	1	18	17.49	0.08	**0.095**	**0.045**	**0.126**
T181	802.11b	11	Left Side	1	1	1	18	17.49	0.03	0.014	0.005	0.019
T182	802.11b	11	Top Side	1	1	1	18	17.49	-0.02	0.071	0.032	0.095
T183	802.11b	11	Rear Face	1	2	1	18	17.49	-0.04	0.091	0.042	0.121

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

Note: Per KDB248227 D01, the highest SAR measured for the initial test position or initial test configuration should be used to determine SAR test exclusion according to the sum of 1-g SAR and SAR peak to location ratio provisions in KDB 447498. In addition, a test lab may also choose to perform standalone SAR measurements for test positions and 802.11 configurations that are not required by the initial test position or initial test configuration procedures and apply the results to determine simultaneous transmission SAR test exclusion, according to sum of 1-g and SAR peak to location ratio requirements to reduce the number of simultaneous transmission SAR measurements.

8.2.4 SAR MEASUREMENT RESULT OF PRODUCT SPECIFIC 10-G SAR

Per KDB648474D04, when hotspot mode applies, product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold:

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 1g	Scaled 1g SAR	product specific 10-g SAR Exclusion
T06	GSM 850	GPRS 2TX	190	Front Face	1	1	1	off	31	29.57	0.159	0.221	Yes
T07	GSM 850	GPRS 2TX	190	Rear Face	1	1	1	off	31	29.57	0.327	0.455	Yes
T08	GSM 850	GPRS 2TX	190	Left Side	1	1	1	off	31	29.57	0.239	0.332	Yes
T09	GSM 850	GPRS 2TX	190	Right Side	1	1	1	off	31	29.57	0.163	0.227	Yes
T10	GSM 850	GPRS 2TX	190	Bottom Side	1	1	1	off	31	29.57	0.023	0.032	Yes
T13	GSM 850	GPRS 2TX	190	Rear Face	1	2	1	off	31	29.57	0.317	0.441	Yes
T14	GSM 850	GPRS 2TX	190	Rear Face	1	1	2	off	31	29.57	0.312	0.434	Yes
T21	GSM 1900	GPRS 2TX	661	Front Face	1	1	1	on	28.5	23.23	0.07	0.236	Yes
T22	GSM 1900	GPRS 2TX	661	Rear Face	1	1	1	on	28.5	23.23	0.094	0.316	Yes
T23	GSM 1900	GPRS 2TX	661	Left Side	1	1	1	off	28.5	23.23	0.026	0.087	Yes
T24	GSM 1900	GPRS 2TX	661	Right Side	1	1	1	off	28.5	23.23	0.086	0.289	Yes
T25	GSM 1900	GPRS 2TX	661	Bottom Side	1	1	1	on	28.5	23.23	0.149	0.501	Yes
T26	GSM 1900	GPRS 2TX	661	Front Face	1.5	1	1	off	28.5	23.23	0.034	0.114	Yes
T27	GSM 1900	GPRS 2TX	661	Rear Face	1.5	1	1	off	28.5	23.23	0.039	0.131	Yes
T28	GSM 1900	GPRS 2TX	661	Bottom Side	1.5	1	1	off	28.5	23.23	0.062	0.209	Yes
T29	GSM 1900	GPRS 2TX	661	Bottom Side	1	2	1	on	28.5	23.23	0.133	0.448	Yes
T30	GSM 1900	GPRS 2TX	661	Bottom Side	1	1	2	on	28.5	23.23	0.132	0.444	Yes

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 1g	Scaled 1g SAR	product specific 10-g SAR Exclusion
T39	UMTS B2	RMC12.2K	9400	Front Face	1	1	1	on	24.8	19.03	0.161	0.608	Yes
T40	UMTS B2	RMC12.2K	9400	Rear Face	1	1	1	on	24.8	19.03	0.219	0.827	Yes
T41	UMTS B2	RMC12.2K	9400	Left Side	1	1	1	off	24.8	19.03	0.056	0.211	Yes
T42	UMTS B2	RMC12.2K	9400	Right Side	1	1	1	off	24.8	19.03	0.077	0.291	Yes
T43	UMTS B2	RMC12.2K	9400	Bottom Side	1	1	1	on	24.8	19.03	0.305	1.152	Yes
T44	UMTS B2	RMC12.2K	9400	Bottom Side	1.5	1	1	off	24.8	19.03	0.161	0.608	Yes
T45	UMTS B2	RMC12.2K	9400	Bottom Side	1	2	1	on	24.8	19.03	**0.337**	**1.272**	**No**
T46	UMTS B2	RMC12.2K	9400	Bottom Side	1	2	2	on	24.8	19.03	**0.332**	**1.254**	**No**
T53	UMTS B4	RMC12.2K	1413	Front Face	1	1	1	on	24.8	18.74	0.143	0.577	Yes
T54	UMTS B4	RMC12.2K	1413	Rear Face	1	1	1	on	24.8	18.74	0.271	1.094	Yes
T55	UMTS B4	RMC12.2K	1413	Left Side	1	1	1	off	24.8	18.74	0.063	0.254	Yes
T56	UMTS B4	RMC12.2K	1413	Right Side	1	1	1	off	24.8	18.74	0.082	0.331	Yes
T57	UMTS B4	RMC12.2K	1413	Bottom Side	1	1	1	on	24.8	18.74	**0.309**	**1.247**	**No**
T58	UMTS B4	RMC12.2K	1413	Bottom Side	1.5	1	1	off	24.8	18.74	0.155	0.626	Yes
T61	UMTS B4	RMC12.2K	1413	Bottom Side	1	2	1	on	24.8	18.74	**0.341**	**1.376**	**No**
T62	UMTS B4	RMC12.2K	1413	Bottom Side	1	2	2	on	24.8	18.74	**0.331**	**1.336**	**No**
T71	UMTS B5	RMC12.2K	4182	Front Face	1	1	1	off	25	23.86	0.128	0.166	Yes
T72	UMTS B5	RMC12.2K	4182	Rear Face	1	1	1	off	25	23.86	0.228	0.296	Yes
T73	UMTS B5	RMC12.2K	4182	Left Side	1	1	1	off	25	23.86	0.055	0.072	Yes
T74	UMTS B5	RMC12.2K	4182	Right Side	1	1	1	off	25	23.86	0.128	0.166	Yes
T75	UMTS B5	RMC12.2K	4182	Bottom Side	1	1	1	off	25	23.86	0.264	0.343	Yes
T78	UMTS B5	RMC12.2K	4182	Rear Face	1	2	1	off	25	23.86	0.307	0.399	Yes
T79	UMTS B5	RMC12.2K	4182	Rear Face	1	2	2	off	25	23.86	0.3	0.390	Yes

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 1g	Scaled 1g SAR	product specific 10-g SAR Exclusion
T88	LTE B2	QPSK20M	18900	1	0	Front Face	1	1	1	on	24.5	19.27	0.133	0.443	Yes
T89	LTE B2	QPSK20M	18900	1	0	Rear Face	1	1	1	on	24.5	19.27	0.196	0.653	Yes
T90	LTE B2	QPSK20M	18900	1	0	Left Side	1	1	1	off	24.5	19.27	0.049	0.163	Yes
T91	LTE B2	QPSK20M	18900	1	0	Right Side	1	1	1	off	24.5	19.27	0.175	0.583	Yes
T92	LTE B2	QPSK20M	18900	1	0	Bottom Side	1	1	1	on	24.5	19.27	0.275	0.917	Yes
T93	LTE B2	QPSK20M	18900	1	0	Bottom Side	1.5	1	1	off	24.5	19.27	0.126	0.420	Yes
T94	LTE B2	QPSK20M	18900	50	0	Front Face	1	1	1	on	23.5	19.04	0.126	0.352	Yes
T95	LTE B2	QPSK20M	18900	50	0	Rear Face	1	1	1	on	23.5	19.04	0.181	0.505	Yes
T96	LTE B2	QPSK20M	18900	50	0	Left Side	1	1	1	off	23.5	19.04	0.041	0.114	Yes
T97	LTE B2	QPSK20M	18900	50	0	Right Side	1	1	1	off	23.5	19.04	0.06	0.167	Yes
T98	LTE B2	QPSK20M	18900	50	0	Bottom Side	1	1	1	on	23.5	19.04	0.245	0.684	Yes
T99	LTE B2	QPSK20M	18900	50	0	Bottom Side	1.5	1	1	off	23.5	19.04	0.117	0.327	Yes
T102	LTE B2	QPSK20M	18900	1	0	Bottom Side	1	2	1	on	24.5	19.27	0.219	0.730	Yes
T103	LTE B2	QPSK20M	18900	1	0	Bottom Side	1	1	2	on	24.5	19.27	0.231	0.770	Yes
T112	LTE B4	QPSK20M	20300	1	50	Front Face	1	1	1	on	24.5	19.14	0.177	0.608	Yes
T113	LTE B4	QPSK20M	20300	1	50	Rear Face	1	1	1	on	24.5	19.14	0.333	1.144	Yes
T114	LTE B4	QPSK20M	20300	1	50	Left Side	1	1	1	off	24.5	19.14	0.07	0.240	Yes
T115	LTE B4	QPSK20M	20300	1	50	Right Side	1	1	1	off	24.5	19.14	0.064	0.220	Yes
T116	LTE B4	QPSK20M	20300	1	50	Bottom Side	1	1	1	on	24.5	19.14	0.327	1.123	Yes
T117	LTE B4	QPSK20M	20300	1	50	Bottom Side	1.5	1	1	off	24.5	19.14	0.159	0.546	Yes
T118	LTE B4	QPSK20M	20300	50	25	Front Face	1	1	1	on	23.5	18.74	0.172	0.515	Yes
T119	LTE B4	QPSK20M	20300	50	25	Rear Face	1	1	1	on	23.5	18.74	0.323	0.967	Yes
T120	LTE B4	QPSK20M	20300	50	25	Left Side	1	1	1	off	23.5	18.74	0.071	0.212	Yes
T121	LTE B4	QPSK20M	20300	50	25	Right Side	1	1	1	off	23.5	18.74	0.046	0.138	Yes
T122	LTE B4	QPSK20M	20300	50	25	Bottom Side	1	1	1	on	23.5	18.74	0.36	1.077	Yes
T123	LTE B4	QPSK20M	20300	50	25	Bottom Side	1.5	1	1	off	23.5	18.74	0.176	0.527	Yes
T126	LTE B4	QPSK20M	20300	50	25	Bottom Side	1	2	1	on	23.5	19.14	0.392	1.070	Yes
T127	LTE B4	QPSK20M	20300	50	25	Bottom Side	1	1	2	on	23.5	19.14	0.396	1.081	Yes

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 1g	Scaled 1g SAR	product specific 10-g SAR Exclusion
T136	LTE B5	QPSK10M	20600	1	24	Front Face	1	1	1	off	25	24.40	0.135	0.155	Yes
T137	LTE B5	QPSK10M	20600	1	24	Rear Face	1	1	1	off	25	24.40	0.258	0.296	Yes
T138	LTE B5	QPSK10M	20600	1	24	Left Side	1	1	1	off	25	24.40	0.151	0.173	Yes
T139	LTE B5	QPSK10M	20600	1	24	Right Side	1	1	1	off	25	24.40	0.15	0.172	Yes
T140	LTE B5	QPSK10M	20600	1	24	Bottom Side	1	1	1	off	25	24.40	0.256	0.294	Yes
T141	LTE B5	QPSK10M	20600	25	12	Front Face	1	1	1	off	24	22.96	0.108	0.137	Yes
T142	LTE B5	QPSK10M	20600	25	12	Rear Face	1	1	1	off	24	22.96	0.209	0.265	Yes
T143	LTE B5	QPSK10M	20600	25	12	Left Side	1	1	1	off	24	22.96	0.141	0.179	Yes
T144	LTE B5	QPSK10M	20600	25	12	Right Side	1	1	1	off	24	22.96	0.124	0.157	Yes
T145	LTE B5	QPSK10M	20600	25	12	Bottom Side	1	1	1	off	24	22.96	0.226	0.287	Yes
T146	LTE B5	QPSK10M	20600	1	24	Rear Face	1	2	1	off	25	24.40	0.275	0.316	Yes
T147	LTE B5	QPSK10M	20600	1	24	Rear Face	1	2	2	off	25	24.40	0.27	0.310	Yes
T154	LTE B7	QPSK20M	21100	1	50	Front Face	1	1	1	on	24.2	18.27	0.114	0.447	Yes
T155	LTE B7	QPSK20M	21100	1	50	Rear Face	1	1	1	on	24.2	18.27	0.275	1.078	Yes
T156	LTE B7	QPSK20M	21100	1	50	Left Side	1	1	1	off	24.2	18.27	0.036	0.141	Yes
T157	LTE B7	QPSK20M	21100	1	50	Right Side	1	1	1	off	24.2	18.27	0.095	0.372	Yes
T158	LTE B7	QPSK20M	21100	1	50	Bottom Side	1	1	1	on	24.2	18.27	0.227	0.890	Yes
T159	LTE B7	QPSK20M	21100	1	50	Bottom Side	1.5	1	1	off	24.2	18.27	0.122	0.478	Yes
T160	LTE B7	QPSK20M	21100	50	0	Front Face	1	1	1	on	23.2	17.97	0.117	0.390	Yes
T161	LTE B7	QPSK20M	21100	50	0	Rear Face	1	1	1	on	23.2	17.97	0.252	0.840	Yes
T162	LTE B7	QPSK20M	21100	50	0	Left Side	1	1	1	off	23.2	17.97	0.092	0.307	Yes
T163	LTE B7	QPSK20M	21100	50	0	Right Side	1	1	1	off	23.2	17.97	0.077	0.257	Yes
T164	LTE B7	QPSK20M	21100	50	0	Bottom Side	1	1	1	on	23.2	17.97	0.261	0.870	Yes
T165	LTE B7	QPSK20M	21100	50	0	Bottom Side	1.5	1	1	off	23.2	17.97	0.132	0.440	Yes
T166	LTE B7	QPSK20M	21100	50	0	Rear Face	1	2	1	on	23.2	17.97	0.238	0.793	Yes
T167	LTE B7	QPSK20M	21100	50	0	Rear Face	1	1	2	on	23.2	17.97	0.289	0.963	Yes

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Battery	Data Rate	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 1g	Scaled 1g SAR	product specific 10-g SAR Exclusion
T179	802.11b	1	Front Face	1	1	1	18	17.49	0.067	0.089	Yes
T180	802.11b	1	Rear Face	1	1	1	18	17.49	0.095	0.126	Yes
T181	802.11b	1	Left Side	1	1	1	18	17.49	0.014	0.019	Yes
T182	802.11b	1	Top Side	1	1	1	18	17.49	0.071	0.095	Yes
T183	802.11b	1	Rear Face	1	2	1	18	17.49	0.091	0.121	Yes

Product specific 10-g SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Battery	Sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Reported 10g SAR
T47	UMTS B2	RMC12.2K	9400	Bottom Side	0	1	1	on	20	19.03	0.15	2.17	0.937	1.171
T48	UMTS B2	RMC12.2K	9400	Bottom Side	1.5	1	1	off	24.8	23.73	0.08	0.457	0.262	0.335
T185	UMTS B2	RMC12.2K	9400	Bottom Side	0	2	1	on	20	19.03	0.19	**2.21**	**0.939**	**1.174**
T186	UMTS B2	RMC12.2K	9400	Bottom Side	0	2	2	on	20	19.03	0.12	2.08	0.928	1.160
T63	UMTS B4	RMC12.2K	1413	Bottom Side	0	1	1	on	20	18.74	0.05	**2.3**	**0.964**	**1.288**
T64	UMTS B4	RMC12.2K	1413	Bottom Side	1.5	1	1	off	24.8	23.5	0.05	0.162	0.092	0.124
T65	UMTS B4	RMC12.2K	1413	Bottom Side	0	2	1	on	20	18.74	0.05	2.21	0.957	1.279
T66	UMTS B4	RMC12.2K	1413	Bottom Side	0	1	2	on	20	18.74	0.05	2.15	0.954	1.275

Note: 1) The value with boldface is the maximum SAR Value of each test band.
2) Battery: 1# Desay 2# SCUD.

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 447498 D01 General RF Exposure Guidance.

The length of the diagonal of the mobile phone is 169.2mm.

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

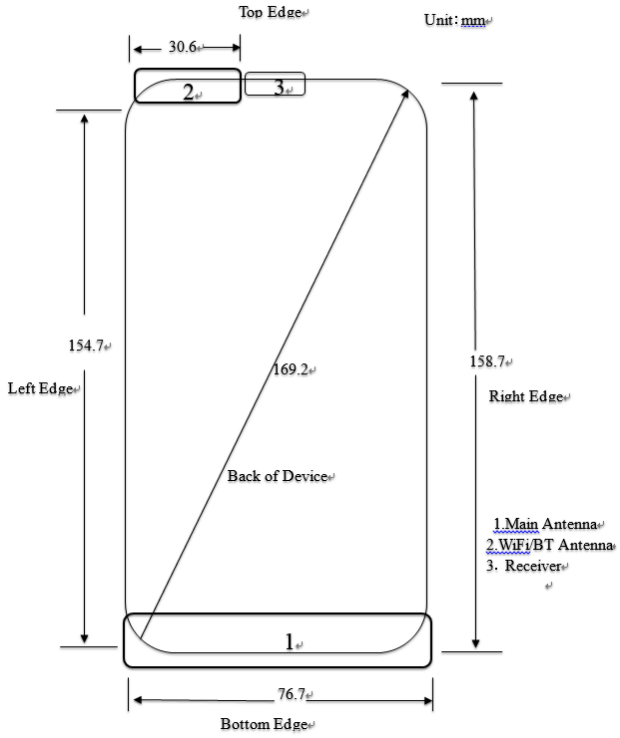


Figure 7: The location of the antennas

8.3.1 STAND-ALONE SAR TEST EXCLUSION

Per FCC KDB 447498 D01, the 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance,mm)][√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for product specific 10-g SAR, where:

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

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

Standalone SAR test exclusion for BT

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
BT	Head	9.7	9.33	5	2.48	2.94	3	Yes
BT	Body-Worn	9.7	9.33	15	2.48	0.98	3	Yes
BT	Hotspot	9.7	9.33	10	2.48	1.47	3	Yes
BT	product specific 10-g SAR	9.7	9.33	5	2.48	2.94	7.5	Yes

Note:

1)* - maximum possible output power declared by manufacturer

2) Held to ear configurations are not applicable to Bluetooth for this device.

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

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√ f(GHz)/x] W/kg for test separation distances≤50 mm, where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

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.

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

Estimated SAR calculation

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	X	Estimated SAR (W/kg)*
BT	Body-Worn	9.7	9.33	15	2.48	7.5	0.131
BT	Head	9.7	9.33	5	2.48	7.5	0.392
BT	Hotspot	9.7	9.33	10	2.48	7.5	0.196
BT	product specific 10-g SAR	9.7	9.33	5	2.48	18.75	0.157

Note: * - maximum possible output power declared by manufacturer

8.3.2 STAND-ALONE SAR TEST EXCLUSION

Per FCC KDB 447498D01, 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	Head	Body	Hotspot (10mm)	Product Specific 10-g (0mm)
1	GSM Voice(Main ant) + BT	Yes	Yes	NA	Yes
2	GSM DATA(Main ant) + BT	N/A	Yes	NA	Yes
3	GSM Voice(Main ant) + 2.4GWiFi	Yes	Yes	NA	Yes
4	GSM DATA(Main ant) + 2.4GWiFi	N/A	Yes	Yes	Yes
5	UMTS Voice(Main ant) + BT	Yes	Yes	NA	Yes
6	UMTS Data(Main ant) + BT	N/A	Yes	NA	Yes
7	UMTS Voice(Main ant) + 2.4GWiFi	Yes	Yes	NA	Yes
8	UMTS Data (Main ant) + 2.4GWiFi	Yes*	Yes	Yes	Yes
9	LTE(Main ant) + 2.4GWiFi	Yes*	Yes*	Yes	Yes
10	LTE(Main ant) + BT	Yes*	Yes*	NA	Yes

Note:
1) Wi-Fi and Bluetooth share the same Tx antenna and can't transmit simultaneously.
2) The device does not support DTM function.
3) * VoLTE or pre-installed VOIP applications are considered.
4) The device supports VoWIFI function.

8.3.3 SAR SUMMATION SCENARIO

Position	Head				Body-worn		Hotspot					
	Right Cheek	Right Tilted	Left Cheek	Left Tilted	Front Face	Rear Face	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
GSM 850	0.246	0.121	0.234	0.122	0.217	0.383	0.221	0.455	0.332	0.227	/	0.032
GSM 1900	0.134	0.096	0.213	0.105	0.199	0.255	0.094	0.126	0.035	0.115	/	0.200
UMTS B2	0.321	0.194	0.371	0.205	0.388	0.499	0.201	0.274	0.070	0.096	/	0.421
UMTS B4	0.228	0.158	0.143	0.185	0.283	0.540	0.191	0.362	0.084	0.110	/	0.456
UMTS B5	0.243	0.135	0.213	0.129	0.212	0.367	0.166	0.399	0.072	0.166	/	0.343
LTE B2	0.211	0.178	0.320	0.167	0.280	0.390	0.157	0.232	0.058	0.207	/	0.325
LTE B4	0.163	0.094	0.120	0.108	0.308	0.584	0.230	0.432	0.095	0.078	/	0.483
LTE B5	0.219	0.104	0.174	0.106	0.185	0.313	0.155	0.316	0.179	0.172	/	0.294
LTE B7	0.138	0.040	0.050	0.060	0.307	0.592	0.148	0.366	0.117	0.112	/	0.331
802.11b/g	0.120	0.122	0.190	0.198	0.039	0.048	0.089	0.126	0.019	/	0.095	/
Bluetooth	0.392	0.392	0.392	0.392	0.131	0.131	0.196	0.196	0.196	/	0.196	/
Max. SAR Summation For 2/3/4G and Wifi	**0.441**	**0.316**	**0.561**	**0.403**	**0.427**	**0.640**	**0.319**	**0.581**	**0.351**	**0.227**	**0.095**	**0.483**
Max. SAR Summation For 2/3/4G and BT	**0.713**	**0.586**	**0.763**	**0.597**	**0.518**	**0.722**	**0.426**	**0.650**	**0.528**	**0.227**	**0.196**	**0.483**

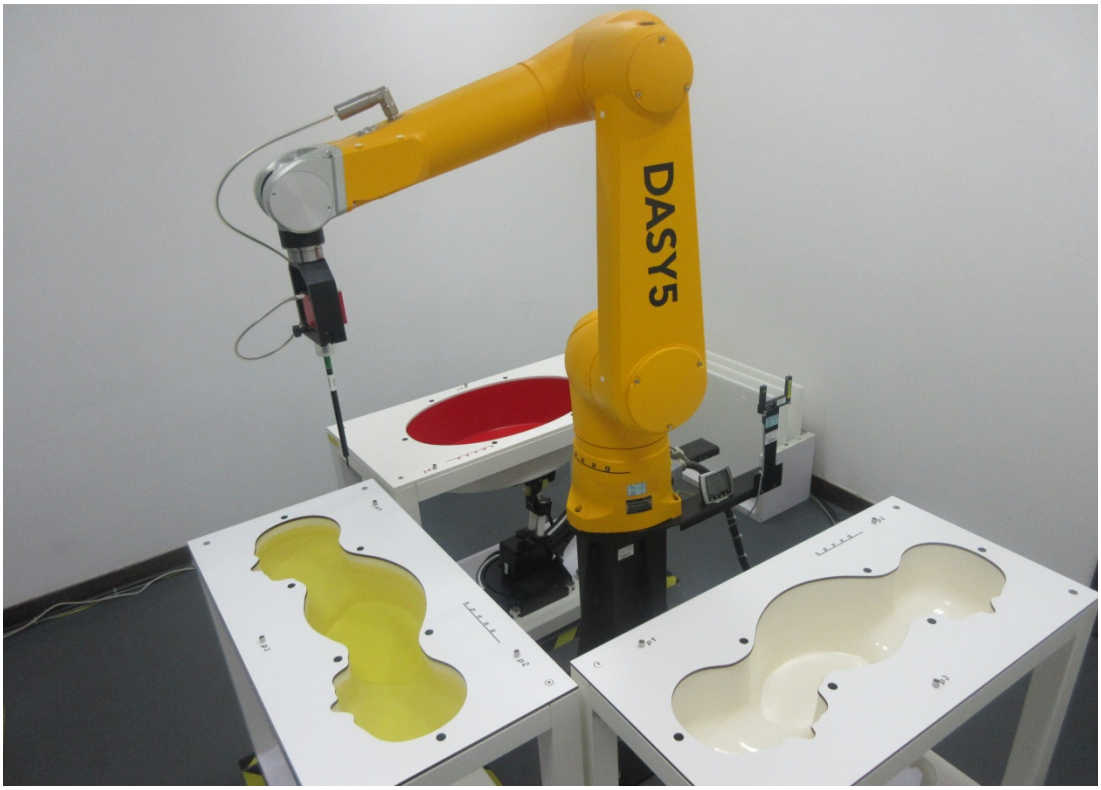
Position	Product Specific 10-g SAR					
	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
GSM 850	/	/	/	/	/	/
GSM 1900	/	/	/	/	/	/
UMTS B2	/	/	/	/	/	1.174
UMTS B4	/	/	/	/	/	1.288
UMTS B5	/	/	/	/	/	/
LTE B2	/	/	/	/	/	/
LTE B4	/	/	/	/	/	/
LTE B5	/	/	/	/	/	/
LTE B7	/	/	/	/	/	/
802.11b/g	/	/	/	/	/	/
Bluetooth	0.157	0.157	0.157	/	0.157	/
Max. SAR Summation	**0.157**	**0.157**	**0.157**	**/**	**0.157**	**1.288**

Note: 1. For main antenna and WiFi, MAX. $\sum SAR_{1g}$ =0.640W/Kg <1.6W/Kg, so the SAR to peak location separation ratio should not be considered.
2. For main antenna and BT, MAX. $\sum SAR_{1g}$ =0.763W/Kg <1.6W/Kg, so the SAR to peak location separation ratio should not be considered.
3. The Simultaneous SAR of product Specific 10-g SAR is 1.288W/Kg which less than 4.0W/Kg, so the Simultaneous SAR is not required to calculate.

APPENDIX

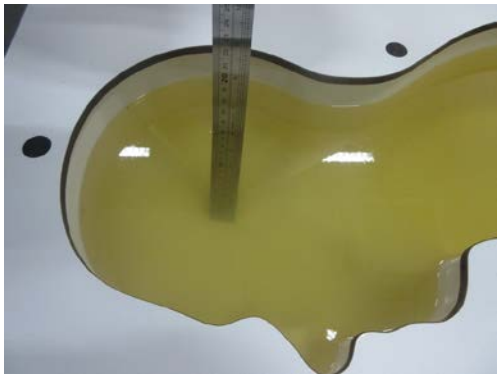
1. Test Layout

Specific Absorption Rate Test Layout

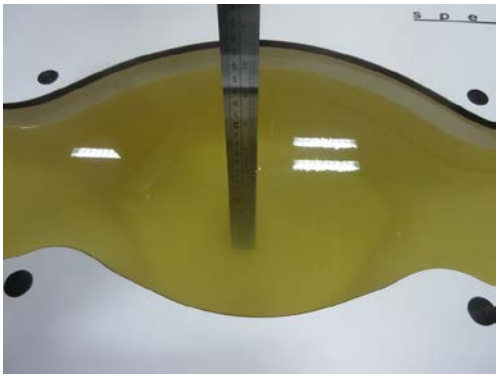


Liquid depth in the flat Phantom (≥15cm depth)

Head(835MHz~900MHz)_15.2cm

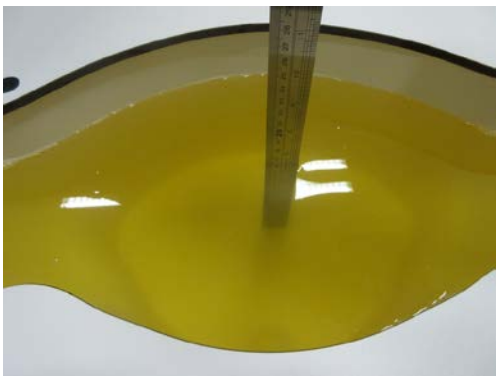


Body(835MHz~900MHz)_20.2cm



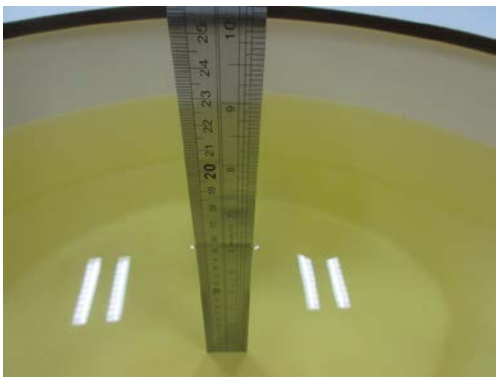
Head(1750MHz)_15.1cm

Body(1750MHz)_16.2cm



Head (1900MHz~2700MHz)_15.1cm

Body(1900MHz~2700MHz)_15.7cm



Appendix A. SAR Plots of System Verification

(Pls See BTL-FCC SAR-1-1811C039_Appendix A.)

Appendix B. SAR Plots of SAR Measurement

(Pls See BTL-FCC SAR-1-1811C039_Appendix B.)

Appendix C. Calibration Certificate for Probe and Dipole

(Pls See BTL-FCC SAR-1-1811C039_Appendix C.)

Appendix D. Photographs of the Test Set-Up

(Pls See BTL-FCC SAR-1-1811C039_Appendix D.)

End of Test Report