FCC SAR Test Report

FCC ID: QISPIC-LX9

Project No.	:	1711C032
Equipment	:	Smart Phone
Model Name	:	HWV31
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. 09, 2017
Date of Test	:	Nov. 15, 2017~ Dec. 09, 2017
Issued Date	:	Dec. 19, 2017
Tested by	:	BTL Inc.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCC SAR-1-1711C032	Original Issue	Dec. 19, 2017

1. GENERAL SUMMARY

Equipment	Smart Phone
Brand Name	HUAWEI
Model Name	HWV31
Model difference	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-1-1711C032) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF 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.

2.2 MEASUREMENT UNCERTAINTY

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

3. GENERAL INFORMATION

3.1 STATEMENT OF COMPLIANCE

Equipment Class	Mode	Highest Head SAR-1g (W/kg)	Highest Body SAR-1g (W/kg)	Highest Hotspot SAR-1g (W/kg)
PCE(Main Ant)	GSM850	0.47	0.54	0.45
	GSM1900	0.32	0.21	0.68
	UMTS Band 5	0.47	0.44	0.58
	LTE Band 7	0.80	0.31	0.75
	LTE Band 26	0.35	0.34	0.47
	LTE Band 38	0.23	0.15	0.39
	LTE Band 41	0.50	0.19	0.38
PCE(Sub Ant)	GSM850	0.90	0.12	0.23
	GSM1900	1.03	0.05	0.11
	UMTS Band 5	1.06	0.24	0.27
	LTE Band 7	0.76	0.35	0.13
	LTE Band 26	0.74	0.18	0.19
	LTE Band 38	1.08	0.24	0.25
	LTE Band 41	0.99	0.14	0.21
DTS	2.4G WLAN	0.40	0.09	0.20
DSS	BT	N/A	N/A	N/A
Note: The highest reported SAR for head, body, hotspot and simultaneous transmission exposure conditions are 1.08W/kg, 0.54W/kg, 0.75W/kg and 1.45 W/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) According to TCB workshop October, 2014 RF Exposure Procedures Update (Overlapping LTE Bands): SAR for LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26(Frequency range: 814-849 MHz) due to similar frequency range, same maximum tune up limit and same channel bandwidth.

3.2 GENERAL DESCRIPTION OF EUT

Equipment	Smart Phone		
Model Name	HWV31		
IMEI Code	864801032944643		
S/N	NJSDU17930001575		
HW Version	HL1PICL01M		
SW Version	HWV31C791B100		
Modulation	GSM(GMSK/8PSK),UMTS(QPSK),LTE(QPSK/16QAM),WiFi(DSSS/OFDM),BT(GFSK/π/4-DQPSK/8-DPSK)		
Operation Frequency Range(s)	Band	TX (MHz)	RX (MHz)
	GSM850	824-849	869-894
	GSM1900	1850-1910	1930-1990
	UMTS Band 5	824-849	869-894
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	LTE Band 26	814-849	859-894
	LTE Band 38	2570-2620	2570-2620
	LTE Band 41	2545-2655	2545-2655
	Bluetooth	2400 ~2483.5	
	2.4GWIFI	2400 ~2483.5	
GPRS/EDGE Multislot Class(12)	Max Number of Timeslots in Uplink:	4	
	Max Number of Timeslots in Downlink:	4	
	Max Total Timeslot:	5	
GSM Device class	Class B		
HSDPA UE Category	14		
HSUPA UE Category	6		
DC-HSDPA Category	24		
Power Class:	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(UMTS Band 5)		
	3, tested with power control “all Max” (LTE Band 5/7/26/38/41)		
Test Channels (low-mid-high):	128-190-251 (GSM850)		
	512-661-810 (GSM1900)		
	4132-4182-4233 (UMTS Band 5)		
	20450-20525-20600 (LTE Band 5 BW=10MHz)		
	20850-21100-21350 (LTE Band 7 BW=20MHz)		
	26765-26865-26965 (LTE Band 26 BW=15MHz)		
	37850-38000-38150 (LTE Band 38 BW=20MHz)		
	40240-40690-41140 (LTE Band 41 BW=20MHz)		
	1-6-11 (2.4G WIFI 802.11b/g/n HT20)		
	3-6-9 (2.4G WIFI 802.11n HT40)		
	0-39-78 (BT)		

Other Information	
Battery	Huawei Technologies Co., Ltd. Battery Model: HB366179ECW Rated capacity: 2850mAh Nominal Voltage: ⎓ +3.82V Charging Voltage: ⎓ +4.40V Sunwoda Electronic Co., LTD
With Earphone(Yes/No)	Yes

3.3 HOTSPOT POWER REDUCTION SPECIFICATION FOR SAR

This device uses a single fixed level of power reduction through static table look-up for SAR compliance and it is triggered by a single event or operation. A fixed level power reduction is applied when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.

Item	Description
Supporting power reduction or not	Yes
Frequency Band(s) using power reduction	All bands of the Sub Ant
Power reduction feature	A fixed power reduction is applied when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.
Triggering conditions	Only hotspot mode (wireless routing) and nothing else is used to trigger this power reduction.
Full power and reduced power specifications	See Section 8.2.4
All simultaneous voice and data transmissions combinations and considerations	See Section 8.2.5

3.4 LABORATORY ENVIRONMENT

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

3.5 MAIN TEST INSTRUMENTS

Item	Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Interval
1	Data Acquisition Electronics	Speag	DAE4	1390	Sep. 15, 2017	1 Year
2	E-field Probe	Speag	EX3DV4	7396	May. 25, 2017	1 Year
3	Electro Optical Converter	Speag	ECO90	1151	N/A	N/A
4	System Validation Dipole	Speag	D835V2	4d160	Sep. 30, 2015	1 Year
5	System Validation Dipole	Speag	D1900V2	5d179	Sep. 29, 2015	1 Year
6	System Validation Dipole	Speag	D2450V2	919	Sep. 28, 2015	1 Year
7	System Validation Dipole	Speag	D2600V2	1067	Sep. 28, 2015	1 Year
8	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1784	N/A	N/A
9	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1896	N/A	N/A
10	8960 Series 10 Wireless Com Test set	Agilent	E5515E	MY52112163	Aug. 20, 2017	1 Year
11	CMU200-Universal Radio Communication Tester	RS	CMU200	115711	Mar. 26, 2017	1 Year
12	CMW500-Wideband Radio Communication Tester	RS	CMW500	152366	Mar. 26, 2017	1 Year
13	Power Amplifier	Mini-Circuits	ZHL-42W+	QA1333003	N/A	N/A
14	ENA Network Analyzer	Agilent	E5071C	MY46102965	Mar. 26, 2017	1 Year
15	MXG Analog Signal Generator	Agilent	N5181A	MY49060477	Jun. 30, 2017	1 Year
16	P-series power meter	Agilent	N1911A	MY45100473	Aug. 20, 2017	1 Year
17	wideband power sensor	Agilent	N1921A	MY51100041	Aug. 20, 2017	1 Year
18	power Meter	Anritsu	ML2495A	1128009	Mar. 26, 2017	1 Year
19	Pulse Power Sensor	Anritsu	MA 2411B	1027500	Mar. 26, 2017	1 Year
20	Dielectric Assessment Kit	Speag	DAK-3.5	1226	N/A	N/A
21	Dual directional coupler	Woken	TS-PCC0M-05	107090019	Mar. 09, 2017	1 Year

Remark: 1." N/A" denotes no model name, serial no. or calibration specified.

2.

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.

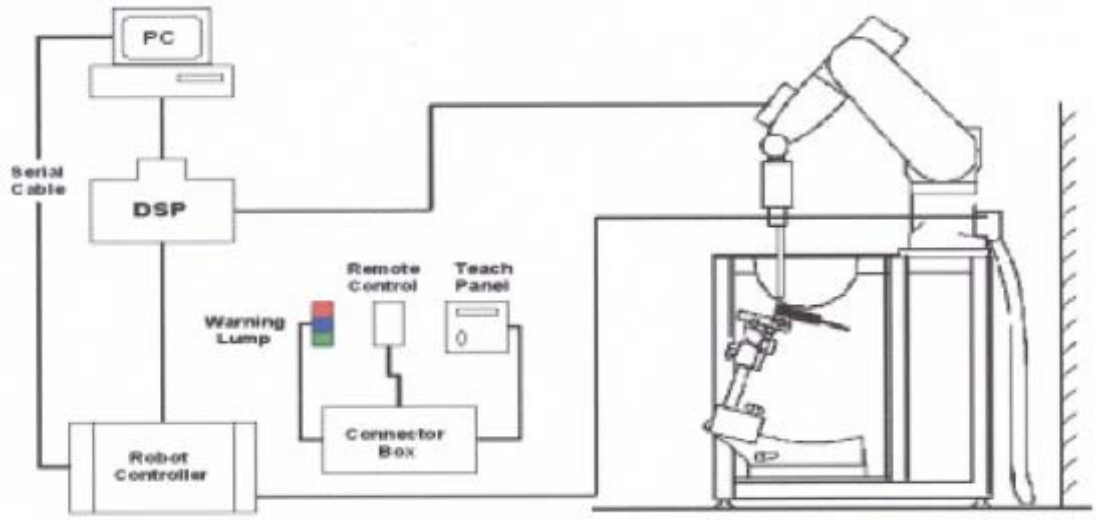
4. SAR MEASUREMENTS SYSTEM CONFIGURATION

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
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

4.1.1 Test Setup Layout



4.2 DASY5E-FIELDPROBESYSTEM

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

4.2.1 EX3DV4 PROBE SPECIFICATION

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to 6 GHz 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).

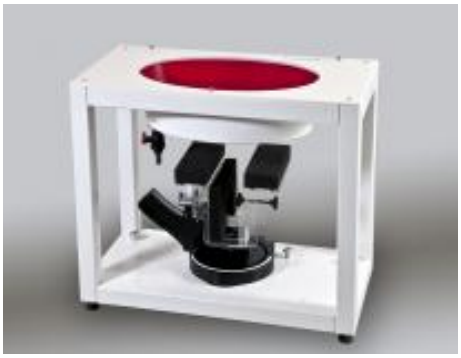
4.2.3 OTHER TEST EQUIPMENT

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 are the SAR values measured at the points of the fine cube grid consisting of 5 x 5 x 7 points(with 8mm horizontal resolution) or 7 x 7 x 7 points(with 5mm horizontal resolution) or 8 x 8 x 7 points(with 4mm horizontal resolution). The algorithm that finds the maximal averaged volume is separated into three different stages.

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

Extrapolation

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

Interpolation

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

Volume Averaging

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

Advanced Extrapolation

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

4.2.6 DATA STORAGE AND EVALUATION

4.2.6.1 Data Storage

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

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

4.2.7 Data Evaluation by SEMCAD

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

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

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

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

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

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

With V_i = compensated signal of channel i (i = x, y, z)

U_i = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcp_i = diode compression point (DASY parameter)

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

E-field probes: $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

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

With V_i = compensated signal of channel i (i = x, y, z)

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

ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

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

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

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

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

With SAR = local specific absorption rate in mW/g

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

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

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

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

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

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

5. SYSTEM VERIFICATION PROCEDURE

5.1 TISSUE VERIFICATION

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

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

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
Head 835	0.2	-	0.2	1.5	57.0	-	41.1	-
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 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	22.7	0.906	42.761	0.90	41.5	0.67	3.04	Nov. 15, 2017
Head	835	22.2	0.903	42.922	0.90	41.5	0.33	3.43	Dec. 09, 2017
Head	1900	22.7	1.442	38.942	1.40	40.0	3.00	-2.65	Nov. 15, 2017
Head	2450	22.1	1.815	39.084	1.80	39.2	0.83	-0.30	Nov. 20, 2017
Head	2600	22.4	2.024	38.631	1.96	39.0	3.27	-0.95	Nov. 19, 2017
Head	2600	22.1	2.027	38.946	1.96	39.0	3.42	-0.14	Nov. 20, 2017
Body	835	22.6	0.946	53.973	0.97	55.2	-2.47	-2.22	Nov. 22, 2017
Body	835	22.2	0.990	55.185	0.97	55.2	2.06	-0.03	Dec. 09, 2017
Body	1900	22.7	1.552	51.952	1.52	53.3	2.11	-2.53	Nov. 15, 2017
Body	2450	22.1	1.996	51.663	1.95	52.7	2.36	-1.97	Nov. 20, 2017
Body	2600	22.3	2.178	52.121	2.16	52.5	0.83	-0.72	Nov. 28, 2017
Body	2600	22.6	2.213	52.303	2.16	52.5	2.45	-0.38	Nov. 29, 2017

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

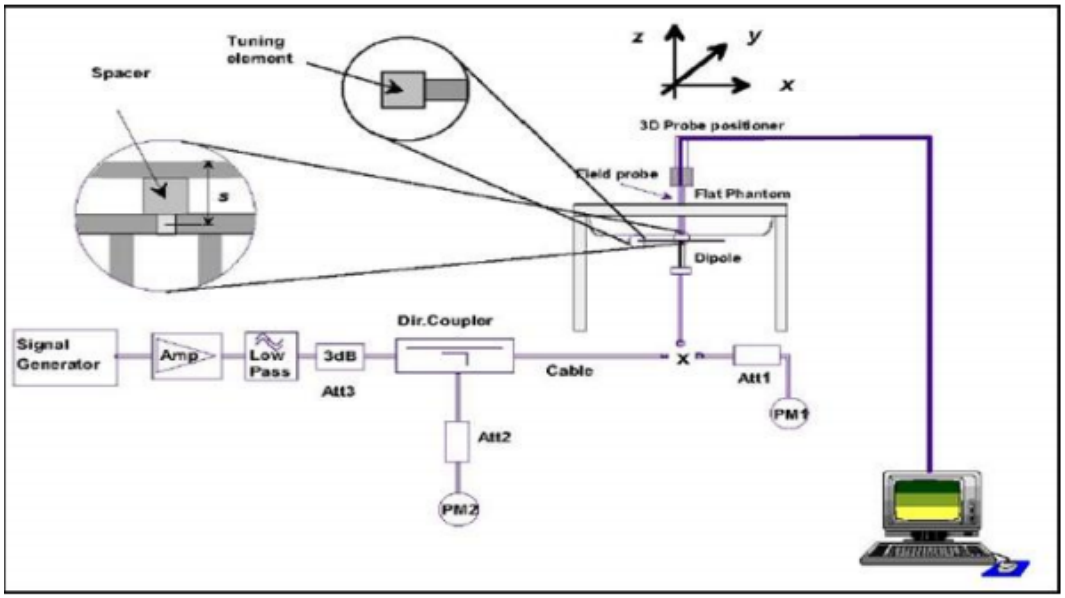
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands 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. 15, 2017	835	9.50	2.35	9.40	-1.05	4d160
Head	Dec. 09, 2017	835	9.50	2.38	9.52	0.21	4d160
Head	Nov. 15, 2017	1900	39.70	9.99	39.96	0.65	5d179
Head	Nov. 20, 2017	2450	52.00	13.20	52.80	1.54	919
Head	Nov. 19, 2017	2600	56.80	13.50	54.00	-4.93	1067
Head	Nov. 20, 2017	2600	56.80	13.60	54.40	-4.23	1067
Body	Nov. 22, 2017	835	9.52	2.28	9.12	-4.20	4d160
Body	Dec. 09, 2017	835	9.52	2.30	9.20	-3.36	4d160
Body	Nov. 15, 2017	1900	39.60	9.91	39.64	0.10	5d179
Body	Nov. 20, 2017	2450	51.10	12.80	51.20	0.20	919
Body	Nov. 28, 2017	2600	54.10	13.30	53.20	-1.66	1067
Body	Nov. 29, 2017	2600	54.10	13.50	54.00	-0.18	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 plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250 mW(below 5GHz) or 100mW(above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test.

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system (±10 %).



6. SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

6.1 SAR MEASUREMENT VARIABILITY

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

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

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

The detailed repeated measurement results are shown in Section 8.2.

7. OPERATIONAL CONDITIONS DURING TEST

7.1 SAR TEST CONFIGURATION

7.1.1 GSM TEST CONFIGURATION

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using 8960 Series the power lever is set to “5”and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

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

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 (Main full Power)	1 TX slot	0	0	6
	2 TX slots	3	3	8
	3 TX slots	5	5	10
	4 TX slots	6	6	12
GSM850 (Main Power)	1 TX slot	0	-	-
	2 TX slots	2.4	-	-
	3 TX slots	4	-	-
	4 TX slots	6	-	-
GSM850 (Sub Power receiver off)	1 TX slot	0	0	5
	2 TX slots	3	3	7
	3 TX slots	4.7	4.7	9
	4 TX slots	6	6	11
GSM850 (Sub Power receiver on or hotspot)	1 TX slot	0	-	-
	2 TX slots	3	-	-
	3 TX slots	4.7	-	-
	4 TX slots	6	-	-
GSM1900 (Main full Power)	1 TX slot	0	0	4
	2 TX slots	2.4	2.4	6
	3 TX slots	4	4	8
	4 TX slots	6	6	10
GSM1900 (Main Power sensor)	1 TX slot	0	-	-
	2 TX slots	2.4	-	-
	3 TX slots	4	-	-
	4 TX slots	6	-	-
GSM1900 (Sub Power receiver off)	1 TX slot	0	0	3
	2 TX slots	3	3	5
	3 TX slots	4.7	4.7	7
	4 TX slots	6	6	9
GSM1900 (Sub Power receiver on or hotspot)	1 TX slot	0	-	-
	2 TX slots	3	-	-
	3 TX slots	4.7	-	-
	4 TX slots	6	-	-

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 applying the required inner loop power control procedure 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 Head exposure configurations in voice mode is measured using a 12.2 kbps RMC with TPC bits configured to all “1s”. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than ¼ dB higher than that measured in 12.2 kbps RMC. Otherwise SAR is measured on the maximum output channel in 12.2 kbps AMR with 3.4kbps SRB(signalling radio bearer) using the exposure configuration that results in the highest SAR in12.2kbps RMC for that RF channel.

(2).Body SAR Measurements
SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits configured to all “1s”. SAR for other spreading codes and multiple DPDCHn, when supported by the EUT, are not required when the maximum average outputs of each RF channel, for each spreading code and DPDCHn configuration, are less than ¼ dB higher than those measured in 12.2 kbps RMC.

3. HSDPA

SAR for body exposure configurations is measured according to the “Body SAR Measurements”” procedures of 3G device. In addition, body SAR is also measured for HSDPA when the maximum average outputs of each RF channel with HSDPA active is at ¼ dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.
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 ΔACK, ΔNACK, ΔCQI = 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 ARQ 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 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

In DC-HSDPA implementation of this device, the uplink parameters are the same as HSDPA. No additional channels and modulations (16 QAM, and 64 QAM) are supported in uplink. The difference is only in the downlink parameters, where two carriers are supported. HSDPA settings were used on uplink.

For Rel. 8 DC-HSDPA apply the four subtests from HSDPA Release 5 except use fixed reference channel H-Set 12 for DC-HSDPA. And we can apply the same SAR test exclusion criteria used for Rel. 6 HSPA for Rel. 7 HSPA+ and Rel. 8 DC-HSDPA. That is, if the HSPA, HSPA+, or the DC-HSDPA maximum output is not more than 0.25 dB higher than WCDMA, SAR measurement for those modes is not required.
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.

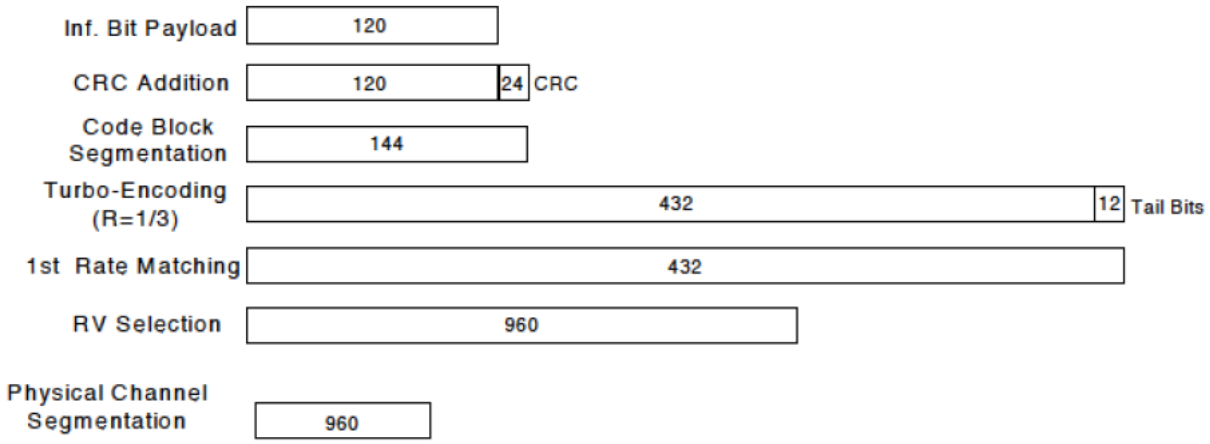


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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.

6. HSPA+

When the maximum average output power of each RF channel with (uplink) HSPA+ active is ≤¼ dB higher than that measured without HSPA+ using 12.2 kbps RMC, SAR evaluation for HSPA+ is not required.

Table Sub-test1 setup for release 7 HSPA+ with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

7.1.3 LTE TEST CONFIGURATION

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

1. Spectrum Plots for RB configurations

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

2. MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.
The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101:

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

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

3. A-MPR

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signalling Value of “NS_01”on the base station simulator.

4. LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test requirements

i) QPSK with 1 RB allocation

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

ii) QPSK with 50% RB allocation

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

iii) QPSK with 100% RB allocation

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

iv) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

B) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

LTE (TDD) Test Configuration

TDD LTE Band 38/41 supports 3GPP TS 36for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.
TDD LTE Band 38/41 supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special sub frame configurations.

Figure 4.2-1: Frame structure type 2

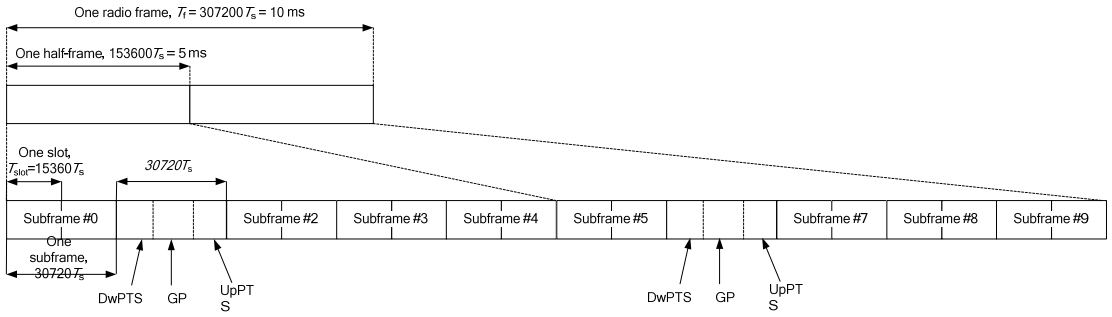


Table 4.2-1: Configuration of special sub frame (lengths of DwPTS/GP/UpPTS)

Special sub frame configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations

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

According to Figure 4.2-1, one radio frame is configured by 10 sub frames, which consist of Uplink-sub frame, Downlink-sub frame and Special sub frame. For TDD-LTE, the Duty Cycle should be calculated on Uplink-sub frames and Special sub frames, due to Special sub frame containing both Uplink transmissions. So for one radio frame, Duty Cycle can be calculated with formula as below. The count of Uplink sub frames are according to Table 4.2-2:

Duty cycle =(30720Ts*Ups+Uplink Component*Specials)/(307200Ts)

About the uplink component of Special sub frames, we can figure out by Table 4.2-1:

Uplink Component=UpPTS

In conclusion, for the TDD LTE Band 38/41, Duty Cycle can be calculated with formula as below .all these sets are ok when we test, or we can set as below.

Duty cycle =[(30720Ts*Ups)+UpPTS *Specials]/(307200Ts)

And we can get different Duty cycles under different configurations:

Uplink-downlink configuratin	Subframe number			Configuration of special subframe							
				Normal cyclic prefix in downlink				Extended cyclic prefix in downlink			
				Normal cyclic prefix in uplink		Extended cyclic prefix in uplink		Normal cyclic prefix in uplink		Extended cyclic prefix in uplink	
	D	S	U	configuration 0-4	configuration 5-9	configuration 0-4	configuration 5-9	configuration 0-3	configuration 4-7	configuration 0-3	configuration
0	2	2	6	61.43%	62.85%	61.67%	63.33%	61.43%	62.85%	61.67%	63.33%
1	4	2	4	41.43%	42.85%	41.67%	43.33%	41.43%	42.85%	41.67%	43.33%
2	6	2	2	21.43%	22.85%	21.67%	23.33%	21.43%	22.85%	21.67%	23.33%
3	6	1	3	30.71%	31.43%	30.83%	31.67%	30.71%	31.43%	30.83%	31.67%
4	7	1	2	20.71%	21.43%	20.83%	21.67%	20.71%	21.43%	20.83%	21.67%
5	8	1	1	10.71%	11.43%	10.83%	11.67%	10.71%	11.43%	10.83%	11.67%
6	3	2	5	51.43%	52.85%	51.67%	53.33%	51.43%	52.85%	51.67%	53.33%

For TDD LTE, SAR should be tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special sub frame configuration 7 for Frame structure type 2.

7.1.4 LTE CARRIER AGGREGATION POWER

LTE Rel.10 Carrier Aggregation

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

Table 1-1：Contiguous intra-band CA

E-UTRA CA configuration / Bandwidth combination set						
E-UTRA CA configuration	Uplink CA configurations (NOTE 3)	Component carriers in order of increasing carrier frequency			Maximum aggregated bandwidth [MHz]	Bandwidth combination set
		Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]		
CA_7C	NA	15	15		40	0
		20	20			
		10	20		40	1
		15	15, 20			
		20	10, 15, 20			
CA_38C	NA	15	15		40	0
		20	20			
CA_41C	NA	10	20		40	0
		15	15, 20			
		20	10, 15, 20			
		5, 10	20		40	1
		15	15, 20			
		20	5, 10, 15, 20			
		10	15, 20		40	2
		15	10, 15, 20			
		20	10, 15, 20			
		10	20		40	3
		20	20			
NOTE 1: The CA configuration refers to an operating band and a CA bandwidth class specified in Table 5.6A-1 (the indexing letter). Absence of a CA bandwidth class for an operating band implies support of all classes. NOTE 2: For the supported CC bandwidth combinations, the CC downlink and uplink bandwidths are equal. NOTE 3: Uplink CA configurations are the configurations supported by the present release of specifications.						

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

Table 4.3.1.1.1A-1: Test frequencies for CA_7C

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

Table 4.3.1.2.6A-1: Test frequencies for CA_38C

Range	CC-Combo / N_{RB_agg} [RB]	CC1 Note1			CC2 Note1		
		BW [RB]	$N_{UL/DL}$	$f_{UL/DL}$ [MHz]	BW [RB]	$N_{UL/DL}$	$f_{UL/DL}$ [MHz]
Low	75+75	75	37825	2577.5	75	37975	2592.5
	100+100	100	37850	2580	100	38048	2599.8
Mid	75+75	75	37925	2587.5	75	38075	2602.5
	100+100	100	37901	2585.1	100	38099	2604.9
High	75+75	75	38025	2597.5	75	38175	2612.5
	100+100	100	37952	2590.2	100	38150	2610
Note 1: Carriers in increasing frequency order.							

Table 4.3.1.2.9A-1: Test frequencies for CA_41C

Range	CC-Combo / N_{RB_agg} [RB]	CC1 Note1			CC2 Note1		
		BW [RB]	$N_{UL/DL}$	$f_{UL/DL}$ [MHz]	BW [RB]	$N_{UL/DL}$	$f_{UL/DL}$ [MHz]
Low	25+100	25	40165	2547.5	100	40282	2559.2
		100	40240	2555	25	40357	2566.7
	50+100	50	40190	2550	100	40334	2564.4
		100	40240	2555	50	40384	2569.4
	75+75	75	40215	2552.5	75	40365	2567.5
	75+100	75	40215	2552.5	100	40386	2569.6
		100	40240	2555	75	40411	2572.1
	100+100	100	40240	2555	100	40438	2574.8
Mid	25+100	25	40598	2590.8	100	40715	2602.5
		100	40665	2597.5	25	40782	2609.2
	50+100	50	40596	2590.6	100	40740	2565.0
		100	40641	2595.1	50	40785	2609.5
	75+75	75	40615	2592.5	75	40765	2607.5
	75+100	75	40593	2590.3	100	40764	2607.4
		100	40616	2592.6	75	40787	2609.7
	100+100	100	40591	2590.1	100	40789	2609.9
High	25+100	25	41023	2633.3	100	41140	2645
		100	41098	2640.8	25	41215	2652.5
	50+100	50	40996	2630.6	100	41140	2645
		100	41046	2635.6	50	41190	2650
	75+75	75	41014	2632.5	75	41165	2647.5
	75+100	75	40969	2627.9	100	41140	2645
		100	40994	2630.4	75	41165	2647.5
	100+100	100	40942	2625.2	100	41140	2645
Note 1: Carriers in increasing frequency order.							

1) Carrier Aggregation power test results (Main full Power)

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB Size	RB Offset	Channel (UL)	Fre. [MHZ]	Channel (DL)	Fre. [MHZ]	Band	BW [MHZ]	Channel (DL)	Fre. [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_7C	10M+20M	LTE B7	10	QPSK	1	50	20805	2505.5	2805	2625.5	LTE B7	20	2949	2639.9	21.33	21.44
		LTE B7	10	QPSK	1	50	21006	2525.6	3006	2645.6	LTE B7	20	3150	2660	21.53	21.63
		LTE B7	10	QPSK	1	50	21206	2545.6	3206	2665.6	LTE B7	20	3350	2680	21.44	21.46
	15M+15M	LTE B7	15	QPSK	1	50	20825	2507.5	2825	2627.5	LTE B7	15	2975	2642.5	21.24	21.26
		LTE B7	15	QPSK	1	50	21025	2527.5	3025	2647.5	LTE B7	15	3175	2662.5	21.65	21.68
		LTE B7	15	QPSK	1	50	21225	2547.5	3225	2667.5	LTE B7	15	3375	2682.5	21.49	21.68
	15M+20M	LTE B7	15	QPSK	1	50	20828	2507.8	2828	2627.8	LTE B7	20	2999	2644.9	21.28	21.26
		LTE B7	15	QPSK	1	50	21003	2525.3	3003	2645.3	LTE B7	20	3174	2662.4	21.62	21.68
		LTE B7	15	QPSK	1	50	21179	2542.9	3179	2662.9	LTE B7	20	3350	2680	21.45	21.40
	20M+10M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	10	2994	2644.4	22.12	22.17
		LTE B7	20	QPSK	1	50	21051	2530.1	3051	2650.1	LTE B7	10	3195	2664.5	22.5	22.43
		LTE B7	20	QPSK	1	50	21251	2550.1	3251	2670.1	LTE B7	10	3395	2684.5	22.41	22.44
	20M+15M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	15	3021	2647.1	21.93	21.97
		LTE B7	20	QPSK	1	50	21026	2527.6	3026	2647.6	LTE B7	15	3197	2664.7	22.49	22.49
		LTE B7	20	QPSK	1	50	21201	2545.1	3201	2665.1	LTE B7	15	3372	2682.2	22.39	22.44
	20M+20M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	20	3048	2649.8	21.82	21.97
		LTE B7	20	QPSK	1	50	21001	2525.1	3001	2645.1	LTE B7	20	3199	2664.9	22.61	22.62
		LTE B7	20	QPSK	1	50	21152	2540.2	3152	2660.2	LTE B7	20	3350	2680	22.44	22.46
CA_38C	15M+15M	LTE B38	15	QPSK	1	50	37825	2577.5	37825	2577.5	LTE B38	15	37975	2592.5	22.18	22.13
		LTE B38	15	QPSK	1	50	37925	2587.5	37925	2587.5	LTE B38	15	38075	2602.5	21.53	21.65
		LTE B38	15	QPSK	1	50	38025	2597.5	38025	2597.5	LTE B38	15	38175	2612.5	22.16	22.14
	20M+20M	LTE B38	20	QPSK	1	50	37850	2580	37850	2580	LTE B38	20	38048	2599.8	21.95	22.15
		LTE B38	20	QPSK	1	50	37901	2585.1	37901	2585.1	LTE B38	20	38099	2604.9	21.73	21.80
		LTE B38	20	QPSK	1	50	37952	2590.2	37952	2590.2	LTE B38	20	38150	2610	22.03	22.17

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB Size	RB Offset	Channel (UL)	Fre. [MHZ]	Channel (DL)	Fre. [MHZ]	Band	BW [MHZ]	Channel (DL)	Fre. [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_41C	5M+20M	LTE B41	5	QPSK	1	50	40165	2547.5	40165	2547.5	LTE B41	20	40282	2559.2	21.35	21.46
		LTE B41	5	QPSK	1	50	40598	2590.8	40598	2590.8	LTE B41	20	40715	2602.5	21.41	21.58
		LTE B41	5	QPSK	1	50	41023	2633.3	41023	2633.3	LTE B41	20	41140	2645	21.78	21.73
	10M+20M	LTE B41	10	QPSK	1	50	40190	2550	40190	2550	LTE B41	20	40334	2564.4	21.26	21.32
		LTE B41	10	QPSK	1	50	40596	2590.6	40596	2590.6	LTE B41	20	40740	2565	21.47	21.51
		LTE B41	10	QPSK	1	50	40996	2630.6	40996	2630.6	LTE B41	20	41140	2645	21.97	21.8
	15M+15M	LTE B41	15	QPSK	1	50	40215	2552.5	40215	2552.5	LTE B41	15	40365	2567.5	21.4	21.61
		LTE B41	15	QPSK	1	50	40615	2592.5	40615	2592.5	LTE B41	15	40765	2607.5	21.67	21.81
		LTE B41	15	QPSK	1	50	41014	2632.5	41014	2632.5	LTE B41	15	41165	2647.5	21.61	21.8
	15M+20M	LTE B41	15	QPSK	1	50	40215	2552.5	40215	2552.5	LTE B41	20	40386	2569.6	21.45	21.61
		LTE B41	15	QPSK	1	50	40593	2590.3	40593	2590.3	LTE B41	20	40764	2607.4	21.31	21.41
		LTE B41	15	QPSK	1	50	40969	2627.9	40969	2627.9	LTE B41	20	41140	2645	21.86	21.8
	20M+5M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	5	40357	2566.7	21.59	21.58
		LTE B41	20	QPSK	1	50	40665	2597.5	40665	2597.5	LTE B41	5	40782	2609.2	21.42	21.55
		LTE B41	20	QPSK	1	50	41098	2640.8	41098	2640.8	LTE B41	5	41215	2652.5	21.41	21.39
	20M+10M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	10	40384	2569.4	21.48	21.58
		LTE B41	20	QPSK	1	50	40641	2595.1	40641	2595.1	LTE B41	10	40785	2609.5	21.44	21.45
		LTE B41	20	QPSK	1	50	41046	2635.6	41046	2635.6	LTE B41	10	41190	2650	21.3	21.39
	20M+15M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	15	40411	2572.1	21.52	21.58
		LTE B41	20	QPSK	1	50	40616	2592.6	40616	2592.6	LTE B41	15	40787	2609.7	21.43	21.65
		LTE B41	20	QPSK	1	50	40994	2630.4	40994	2630.4	LTE B41	15	41165	2647.5	21.64	21.89
	20M+20M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	20	40438	2574.8	21.49	21.58
		LTE B41	20	QPSK	1	50	40591	2590.1	40591	2590.1	LTE B41	20	40789	2609.9	21.37	21.63
		LTE B41	20	QPSK	1	50	40942	2625.2	40942	2625.2	LTE B41	20	41140	2645	21.89	21.89

2) Carrier Aggregation power test results (Main Power sensor)

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB Size	RB Offset	Channel (UL)	Fre. [MHZ]	Channel (DL)	Fre. [MHZ]	Band	BW [MHZ]	Channel (DL)	Fre. [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_7C	10M+20M	LTE B7	10	QPSK	1	50	20805	2505.5	2805	2625.5	LTE B7	20	2949	2639.9	20.65	20.68
		LTE B7	10	QPSK	1	50	21006	2525.6	3006	2645.6	LTE B7	20	3150	2660	20.72	20.79
		LTE B7	10	QPSK	1	50	21206	2545.6	3206	2665.6	LTE B7	20	3350	2680	20.56	20.82
	15M+15M	LTE B7	15	QPSK	1	50	20825	2507.5	2825	2627.5	LTE B7	15	2975	2642.5	20.64	20.74
		LTE B7	15	QPSK	1	50	21025	2527.5	3025	2647.5	LTE B7	15	3175	2662.5	20.35	20.48
		LTE B7	15	QPSK	1	50	21225	2547.5	3225	2667.5	LTE B7	15	3375	2682.5	20.74	20.76
	15M+20M	LTE B7	15	QPSK	1	50	20828	2507.8	2828	2627.8	LTE B7	20	2999	2644.9	20.43	20.52
		LTE B7	15	QPSK	1	50	21003	2525.3	3003	2645.3	LTE B7	20	3174	2662.4	20.39	20.41
		LTE B7	15	QPSK	1	50	21179	2542.9	3179	2662.9	LTE B7	20	3350	2680	20.76	20.88
	20M+10M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	10	2994	2644.4	21.21	21.39
		LTE B7	20	QPSK	1	50	21051	2530.1	3051	2650.1	LTE B7	10	3195	2664.5	21.18	21.36
		LTE B7	20	QPSK	1	50	21251	2550.1	3251	2670.1	LTE B7	10	3395	2684.5	21.72	21.83
	20M+15M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	15	3021	2647.1	21.63	21.71
		LTE B7	20	QPSK	1	50	21026	2527.6	3026	2647.6	LTE B7	15	3197	2664.7	21.36	21.34
		LTE B7	20	QPSK	1	50	21201	2545.1	3201	2665.1	LTE B7	15	3372	2682.2	21.59	21.54
	20M+20M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	20	3048	2649.8	21.38	21.39
		LTE B7	20	QPSK	1	50	21001	2525.1	3001	2645.1	LTE B7	20	3199	2664.9	21.49	21.53
		LTE B7	20	QPSK	1	50	21152	2540.2	3152	2660.2	LTE B7	20	3350	2680	21.96	21.90

3) Carrier Aggregation power test results (Sub Power receiver off)

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB Size	RB Offset	Channel (UL)	Fre. [MHZ]	Channel (DL)	Fre. [MHZ]	Band	BW [MHZ]	Channel (DL)	Fre. [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_7C	10M+20M	LTE B7	10	QPSK	1	50	20805	2505.5	2805	2625.5	LTE B7	20	2949	2639.9	20.27	20.22
		LTE B7	10	QPSK	1	50	21006	2525.6	3006	2645.6	LTE B7	20	3150	2660	19.87	19.87
		LTE B7	10	QPSK	1	50	21206	2545.6	3206	2665.6	LTE B7	20	3350	2680	20.23	20.26
	15M+15M	LTE B7	15	QPSK	1	50	20825	2507.5	2825	2627.5	LTE B7	15	2975	2642.5	20.28	20.32
		LTE B7	15	QPSK	1	50	21025	2527.5	3025	2647.5	LTE B7	15	3175	2662.5	19.89	19.93
		LTE B7	15	QPSK	1	50	21225	2547.5	3225	2667.5	LTE B7	15	3375	2682.5	20.28	20.31
	15M+20M	LTE B7	15	QPSK	1	50	20828	2507.8	2828	2627.8	LTE B7	20	2999	2644.9	20.17	20.32
		LTE B7	15	QPSK	1	50	21003	2525.3	3003	2645.3	LTE B7	20	3174	2662.4	19.93	19.96
		LTE B7	15	QPSK	1	50	21179	2542.9	3179	2662.9	LTE B7	20	3350	2680	20.17	20.15
	20M+10M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	10	2994	2644.4	20.94	20.91
		LTE B7	20	QPSK	1	50	21051	2530.1	3051	2650.1	LTE B7	10	3195	2664.5	20.52	20.49
		LTE B7	20	QPSK	1	50	21251	2550.1	3251	2670.1	LTE B7	10	3395	2684.5	20.76	20.79
	20M+15M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	15	3021	2647.1	20.24	20.36
		LTE B7	20	QPSK	1	50	21026	2527.6	3026	2647.6	LTE B7	15	3197	2664.7	19.95	20.03
		LTE B7	20	QPSK	1	50	21201	2545.1	3201	2665.1	LTE B7	15	3372	2682.2	20.38	20.44
	20M+20M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	20	3048	2649.8	20.94	20.94
		LTE B7	20	QPSK	1	50	21001	2525.1	3001	2645.1	LTE B7	20	3199	2664.9	20.62	20.65
		LTE B7	20	QPSK	1	50	21152	2540.2	3152	2660.2	LTE B7	20	3350	2680	20.63	20.61
CA_38C	15M+15M	LTE B38	15	QPSK	1	50	37825	2577.5	37825	2577.5	LTE B38	15	37975	2592.5	22.03	22.19
		LTE B38	15	QPSK	1	50	37925	2587.5	37925	2587.5	LTE B38	15	38075	2602.5	21.96	21.91
		LTE B38	15	QPSK	1	50	38025	2597.5	38025	2597.5	LTE B38	15	38175	2612.5	22.36	22.57
	20M+20M	LTE B38	20	QPSK	1	50	37850	2580	37850	2580	LTE B38	20	38048	2599.8	21.88	22.15
		LTE B38	20	QPSK	1	50	37901	2585.1	37901	2585.1	LTE B38	20	38099	2604.9	22.13	22.36
		LTE B38	20	QPSK	1	50	37952	2590.2	37952	2590.2	LTE B38	20	38150	2610	22.51	22.64

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB Size	RB Offset	Channel (UL)	Fre. [MHZ]	Channel (DL)	Fre. [MHZ]	Band	BW [MHZ]	Channel (DL)	Fre. [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_41C	5M+20M	LTE B41	5	QPSK	1	50	40165	2547.5	40165	2547.5	LTE B41	20	40282	2559.2	20.83	20.81
		LTE B41	5	QPSK	1	50	40598	2590.8	40598	2590.8	LTE B41	20	40715	2602.5	21.36	21.42
		LTE B41	5	QPSK	1	50	41023	2633.3	41023	2633.3	LTE B41	20	41140	2645	21.45	21.51
	10M+20M	LTE B41	10	QPSK	1	50	40190	2550	40190	2550	LTE B41	20	40334	2564.4	21.03	21.06
		LTE B41	10	QPSK	1	50	40596	2590.6	40596	2590.6	LTE B41	20	40740	2565	21.53	21.55
		LTE B41	10	QPSK	1	50	40996	2630.6	40996	2630.6	LTE B41	20	41140	2645	21.94	22.01
	15M+15M	LTE B41	15	QPSK	1	50	40215	2552.5	40215	2552.5	LTE B41	15	40365	2567.5	21.16	21.11
		LTE B41	15	QPSK	1	50	40615	2592.5	40615	2592.5	LTE B41	15	40765	2607.5	21.64	21.53
		LTE B41	15	QPSK	1	50	41014	2632.5	41014	2632.5	LTE B41	15	41165	2647.5	22.06	21.96
	15M+20M	LTE B41	15	QPSK	1	50	40215	2552.5	40215	2552.5	LTE B41	20	40386	2569.6	21.11	21.16
		LTE B41	15	QPSK	1	50	40593	2590.3	40593	2590.3	LTE B41	20	40764	2607.4	21.32	21.65
		LTE B41	15	QPSK	1	50	40969	2627.9	40969	2627.9	LTE B41	20	41140	2645	21.85	21.73
	20M+5M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	5	40357	2566.7	21.34	21.28
		LTE B41	20	QPSK	1	50	40665	2597.5	40665	2597.5	LTE B41	5	40782	2609.2	21.42	21.57
		LTE B41	20	QPSK	1	50	41098	2640.8	41098	2640.8	LTE B41	5	41215	2652.5	21.96	22.03
	20M+10M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	10	40384	2569.4	21.14	21.22
		LTE B41	20	QPSK	1	50	40641	2595.1	40641	2595.1	LTE B41	10	40785	2609.5	21.22	21.36
		LTE B41	20	QPSK	1	50	41046	2635.6	41046	2635.6	LTE B41	10	41190	2650	21.83	21.86
	20M+15M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	15	40411	2572.1	21.15	21.13
		LTE B41	20	QPSK	1	50	40616	2592.6	40616	2592.6	LTE B41	15	40787	2609.7	21.58	21.76
		LTE B41	20	QPSK	1	50	40994	2630.4	40994	2630.4	LTE B41	15	41165	2647.5	22.03	22.06
	20M+20M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	20	40438	2574.8	21.1	21.28
		LTE B41	20	QPSK	1	50	40591	2590.1	40591	2590.1	LTE B41	20	40789	2609.9	21.57	21.64
		LTE B41	20	QPSK	1	50	40942	2625.2	40942	2625.2	LTE B41	20	41140	2645	22.08	22.22

4) Carrier Aggregation power test results (Sub Power receiver on or hotspot)

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB Size	RB Offset	Channel (UL)	Fre. [MHZ]	Channel (DL)	Fre. [MHZ]	Band	BW [MHZ]	Channel (DL)	Fre. [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_7C	10M+20M	LTE B7	10	QPSK	1	50	20805	2505.5	2805	2625.5	LTE B7	20	2949	2639.9	14.52	14.58
		LTE B7	10	QPSK	1	50	21006	2525.6	3006	2645.6	LTE B7	20	3150	2660	14.36	14.55
		LTE B7	10	QPSK	1	50	21206	2545.6	3206	2665.6	LTE B7	20	3350	2680	14.57	14.63
	15M+15M	LTE B7	15	QPSK	1	50	20825	2507.5	2825	2627.5	LTE B7	15	2975	2642.5	14.89	14.88
		LTE B7	15	QPSK	1	50	21025	2527.5	3025	2647.5	LTE B7	15	3175	2662.5	14.47	14.56
		LTE B7	15	QPSK	1	50	21225	2547.5	3225	2667.5	LTE B7	15	3375	2682.5	14.67	14.62
	15M+20M	LTE B7	15	QPSK	1	50	20828	2507.8	2828	2627.8	LTE B7	20	2999	2644.9	14.85	14.97
		LTE B7	15	QPSK	1	50	21003	2525.3	3003	2645.3	LTE B7	20	3174	2662.4	14.52	14.45
		LTE B7	15	QPSK	1	50	21179	2542.9	3179	2662.9	LTE B7	20	3350	2680	14.63	14.71
	20M+10M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	10	2994	2644.4	15.84	15.79
		LTE B7	20	QPSK	1	50	21051	2530.1	3051	2650.1	LTE B7	10	3195	2664.5	15.53	15.52
		LTE B7	20	QPSK	1	50	21251	2550.1	3251	2670.1	LTE B7	10	3395	2684.5	15.54	15.73
	20M+15M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	15	3021	2647.1	15.87	15.91
		LTE B7	20	QPSK	1	50	21026	2527.6	3026	2647.6	LTE B7	15	3197	2664.7	15.44	15.46
		LTE B7	20	QPSK	1	50	21201	2545.1	3201	2665.1	LTE B7	15	3372	2682.2	15.73	15.77
	20M+20M	LTE B7	20	QPSK	1	50	20850	2510	2850	2630	LTE B7	20	3048	2649.8	15.99	16.02
		LTE B7	20	QPSK	1	50	21001	2525.1	3001	2645.1	LTE B7	20	3199	2664.9	15.53	15.61
		LTE B7	20	QPSK	1	50	21152	2540.2	3152	2660.2	LTE B7	20	3350	2680	15.78	15.93
CA_38C	15M+15M	LTE B38	15	QPSK	1	50	37825	2577.5	37825	2577.5	LTE B38	15	37975	2592.5	19.87	19.92
		LTE B38	15	QPSK	1	50	37925	2587.5	37925	2587.5	LTE B38	15	38075	2602.5	19.95	19.91
		LTE B38	15	QPSK	1	50	38025	2597.5	38025	2597.5	LTE B38	15	38175	2612.5	20.15	20..26
	20M+20M	LTE B38	20	QPSK	1	50	37850	2580	37850	2580	LTE B38	20	38048	2599.8	20.11	20.05
		LTE B38	20	QPSK	1	50	37901	2585.1	37901	2585.1	LTE B38	20	38099	2604.9	20.31	20.29
		LTE B38	20	QPSK	1	50	37952	2590.2	37952	2590.2	LTE B38	20	38150	2610	20.54	20.59

E-UTRA CA configuration	CC-Combo	PCC									SCC				Power	
		Band	BW [MHZ]	Modulation	RB Size	RB Offset	Channel (UL)	Fre. [MHZ]	Channel (DL)	Fre. [MHZ]	Band	BW [MHZ]	Channel (DL)	Fre. [MHZ]	TX power with DL CA	TX Power Single Carrier
CA_41C	5M+20M	LTE B41	5	QPSK	1	50	40165	2547.5	40165	2547.5	LTE B41	20	40282	2559.2	16.94	17.04
		LTE B41	5	QPSK	1	50	40598	2590.8	40598	2590.8	LTE B41	20	40715	2602.5	17.58	17.62
		LTE B41	5	QPSK	1	50	41023	2633.3	41023	2633.3	LTE B41	20	41140	2645	17.84	17.89
	10M+20M	LTE B41	10	QPSK	1	50	40190	2550	40190	2550	LTE B41	20	40334	2564.4	17.94	17.56
		LTE B41	10	QPSK	1	50	40596	2590.6	40596	2590.6	LTE B41	20	40740	2565	17.35	17.68
		LTE B41	10	QPSK	1	50	40996	2630.6	40996	2630.6	LTE B41	20	41140	2645	17.86	17.92
	15M+15M	LTE B41	15	QPSK	1	50	40215	2552.5	40215	2552.5	LTE B41	15	40365	2567.5	17.85	17.81
		LTE B41	15	QPSK	1	50	40615	2592.5	40615	2592.5	LTE B41	15	40765	2607.5	17.42	17.46
		LTE B41	15	QPSK	1	50	41014	2632.5	41014	2632.5	LTE B41	15	41165	2647.5	17.95	17.99
	15M+20M	LTE B41	15	QPSK	1	50	40215	2552.5	40215	2552.5	LTE B41	20	40386	2569.6	18.05	18.12
		LTE B41	15	QPSK	1	50	40593	2590.3	40593	2590.3	LTE B41	20	40764	2607.4	17.56	17.62
		LTE B41	15	QPSK	1	50	40969	2627.9	40969	2627.9	LTE B41	20	41140	2645	18.03	19.96
	20M+5M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	5	40357	2566.7	18.24	18.25
		LTE B41	20	QPSK	1	50	40665	2597.5	40665	2597.5	LTE B41	5	40782	2609.2	18.15	18.19
		LTE B41	20	QPSK	1	50	41098	2640.8	41098	2640.8	LTE B41	5	41215	2652.5	18.16	18.19
	20M+10M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	10	40384	2569.4	18.05	18.09
		LTE B41	20	QPSK	1	50	40641	2595.1	40641	2595.1	LTE B41	10	40785	2609.5	18.06	18.12
		LTE B41	20	QPSK	1	50	41046	2635.6	41046	2635.6	LTE B41	10	41190	2650	18.89	18.93
	20M+15M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	15	40411	2572.1	18.02	18.15
		LTE B41	20	QPSK	1	50	40616	2592.6	40616	2592.6	LTE B41	15	40787	2609.7	18.03	18.11
		LTE B41	20	QPSK	1	50	40994	2630.4	40994	2630.4	LTE B41	15	41165	2647.5	18.14	18.20
	20M+20M	LTE B41	20	QPSK	1	50	40240	2555	40240	2555	LTE B41	20	40438	2574.8	18.22	18.28
		LTE B41	20	QPSK	1	50	40591	2590.1	40591	2590.1	LTE B41	20	40789	2609.9	18.19	18.21
		LTE B41	20	QPSK	1	50	40942	2625.2	40942	2625.2	LTE B41	20	41140	2645	18.17	18.23

7.1.5 WIFI TEST CONFIGURATION

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

2.4G

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

For WiFi SAR testing, a communication link is set up with the test mode software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test procedures in KDB 248227 D01 are applied.

7.1.5.1 2.4G SAR Test Requirements

802.11b DSSS SAR Test Requirements

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

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.

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

SAR Test Requirements for OFDM configurations

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, each standalone And frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

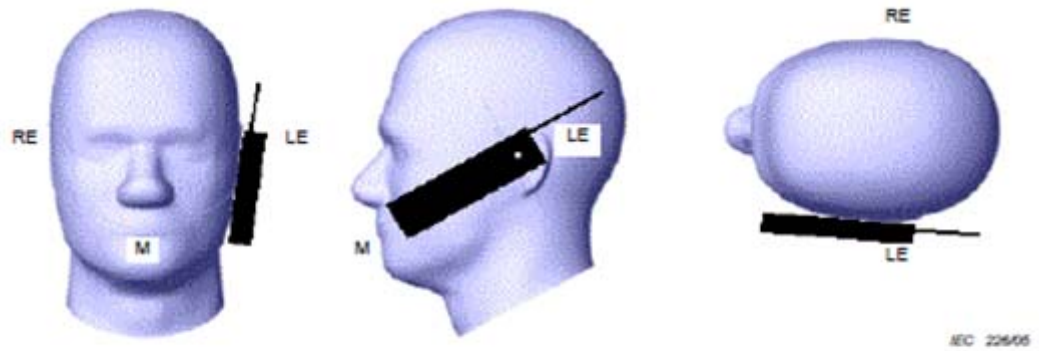
7.1.5.2 Initial test configuration procedure

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

7.2 TEST POSITION

7.2.1 Head test configuration

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

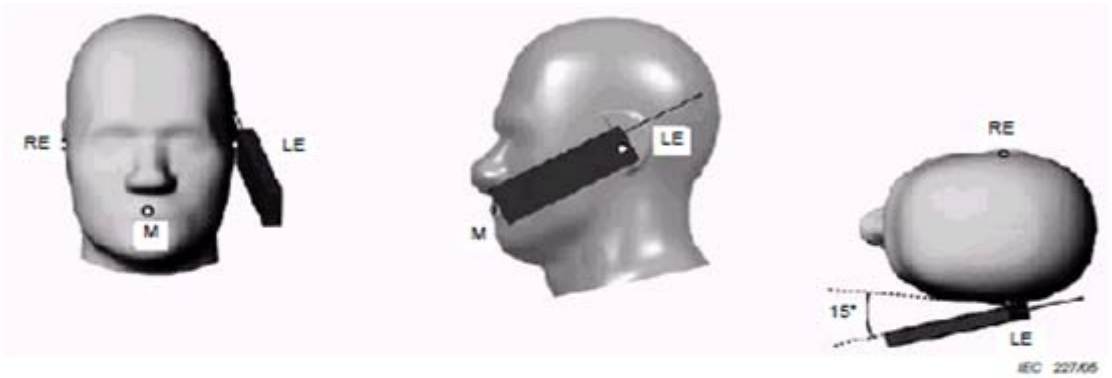


Key

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

Figure 1 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 2 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.

7.2.2 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.

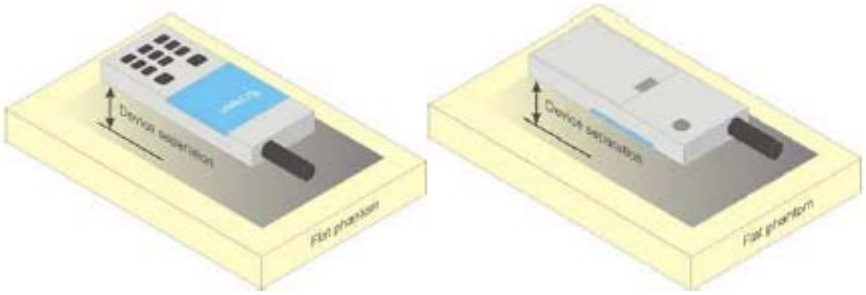


Figure 3 Test positions for body-worn device

7.2.3 Hotspot test configuration

Per FCC KDB 941225 D06, 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.

7.2.4 Product specific 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 mobile phone is 142.2mm (length) X 68.9mm (width), the length of the diagonal is 150.1mm.
The location of the antennas inside mobile phone is shown as below picture:

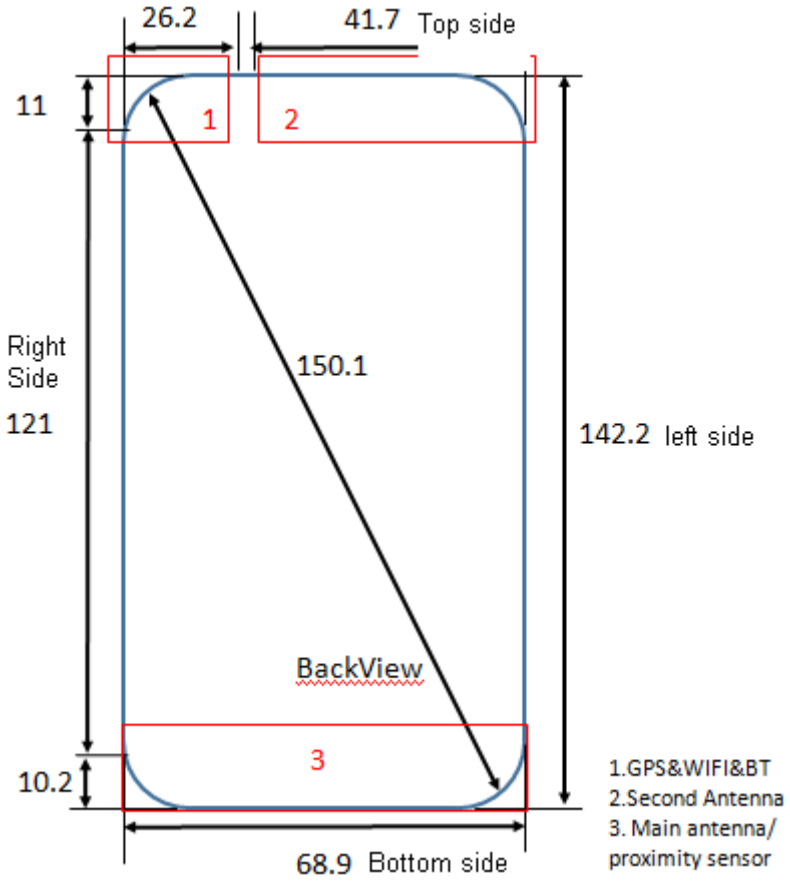


Table 7.2.2 Sides For Hotspot

ANT	Mode	Front Side	Rear Side	Left Side	Right Side	Top Side	Bottom Side
1	BT/WIFI	YES	YES	NO	YES	YES	NO
2	2G/3G/LTE (Sub)	YES	YES	YES	NO	YES	NO
3	2G/3G/LTE (Main)	YES	YES	YES	YES	NO	YES

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.

7.3 DYNAMIC ANTENNA TUNING DESCRIPTION

In this section, the following list is used to prepare an inquiry seeking SAR test guidance for dynamic antenna tuning according to KDB388624 D02. A summary SAR test plan is provided at the end of the inquiry to help expedite the process.

7.3.1 The specific device(s) covered by the KDB inquiry.

Model	HWV31
FCC bands	GSM 850/1900 WCDMA B5 FDD LTE: B5/7/26/38/41
FCC bands supporting dynamic antenna tuning	GSM1900, LTE B7, B41, only main Antenna supporting Dynamic antenna tuning

7.3.2 Summary test plan for Dynamic antenna tuning

For dynamic antenna tuning SAR test of each model device, all the tuning states will be considered for SAR compliance:

a) Firstly, some AT commands are used to fix the tuning state at state1 or state 2, so that only one antenna tuning state is chosen at a time for SAR test. The antenna is set to the MAX transmit output power level.

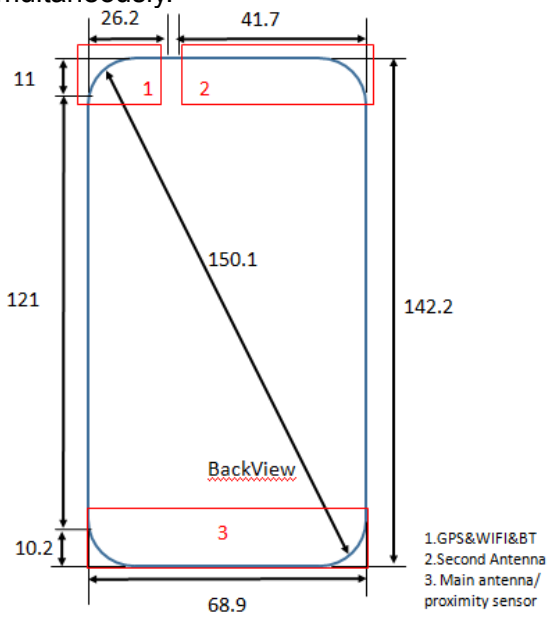
b) Secondly, per KDB648474D04 section 5, in order to reduce the number of SAR tests required to demonstrate compliance for the numerous tuning states, we plan to perform one single point zoom scan SAR measurement between state1 and state 2 for each antenna tuning band and applicable RF exposure condition to identify the higher SAR tuning state that need the full set of normally required SAR measurements and allow SAR test reduction for the lower SAR conditions.

c) Thirdly, full normally required SAR measurements are performed for the higher SAR tuning state. Moreover, the SAR worst case check will also be tested for the other tuning state in each antenna tuning band and applicable RF exposure condition. We think it is conservative enough to ensure the SAR compliance.

7.4 POWER REDUCTION INFORMATION AND FLOW CHART

In this section, the flow chart for dynamic antenna tuning and power reduction information are also provided to help expedite the KDB inquiry process.

Description of Tx antennas contained within the device:
The antennas inside the device are shown as below picture:
1) The device has two GSM/UMTS/LTE Tx antennas: Main Antenna (Ant 1) and Second Antenna (Ant 2).
2) **Only the Main Antenna(Ant 1) support dynamic antenna tuning.**
3) For the model HWV31 (single card), it can transmit from either Main Antenna or Second Antenna, but they can not transmit simultaneously.



During the SAR test, the Main Antenna (Ant 1) and Second Antenna (Ant 2) are set to the MAX transmit power level respectively and test the SAR respectively in all applicable RF exposure conditions. Some test scripts are supplied to fix the operation state and choose the antenna. We can ensure that all independent antennas and modems are completely covered by the appropriate SAR measurements and all simultaneous transmission possibilities are fully considered.

7.5 PROXIMITY SENSOR POWER REDUCTION INFORMATION

In this section, the following list is used to prepare an inquiry seeking SAR test guidance for proximity sensor power reduction. The procedures in KDB 616217 is applied for SAR testing.

7.5.1 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 or Product Specific 10-g(0mm)exposure condition. It utilizes the proximity sensor to reduce the output power in specific wireless and operating modes to ensure SAR compliance for the following scenarios: To reduce the output power of main antennas during body operating configurations.

Power Reduction operation table

Main antenna		
Band	Sensor Trigger Distance	Power reduction (dB)
GSM 1900	Front face:11mm Rear face:11mm Bottom side:14mm	1
LTE Band VII	Front face:11mm Rear face:11mm Bottom side:14mm	1

Note:

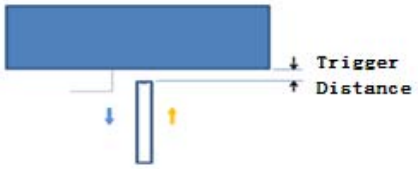
1) Since the capacitive proximity sensor triggering distance for GSM1900,LTE B7,the front side is 11mm , a conservative distance of 10mm was requried for addtional SAR test at maximum power level with sensor off.
2) Since the capacitive proximity sensor triggering distance for GSM1900,LTE B7,the back side is 11mm, a conservative distance of 10mm was requried for addtional SAR test at maximum power level with sensor off.
3) Since the capacitive proximity sensor triggering distance for GSM1900,LTE B7,the Bottom side is 14mm , a conservative distance of 13mm was requried for addtional SAR test at maximum power level with sensor off.
4) 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.

The following tables summarize the key power reduction information. The detailed full power and reduced tune-up specifications and conducted power measurement results are provided in the table.

7.5.2 Proximity sensor coverage, distance and angle

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

The device was tested by the test lab to determine the proximity sensor triggering distances for the front side, back side 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 are as below:



Proximity sensor triggering distances assessment Bottom Side

Proximity sensor triggering distances assessment Front Face and Rear Face

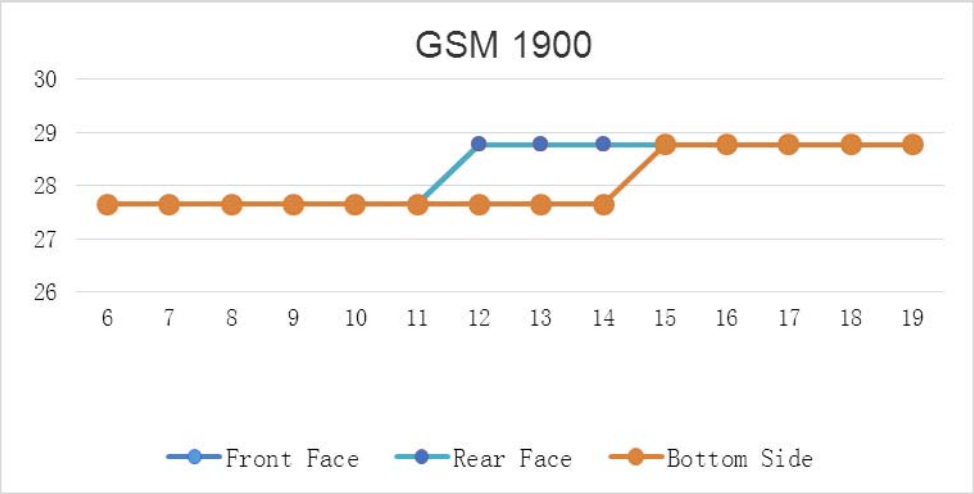
Table: Summary of Trigger Distances

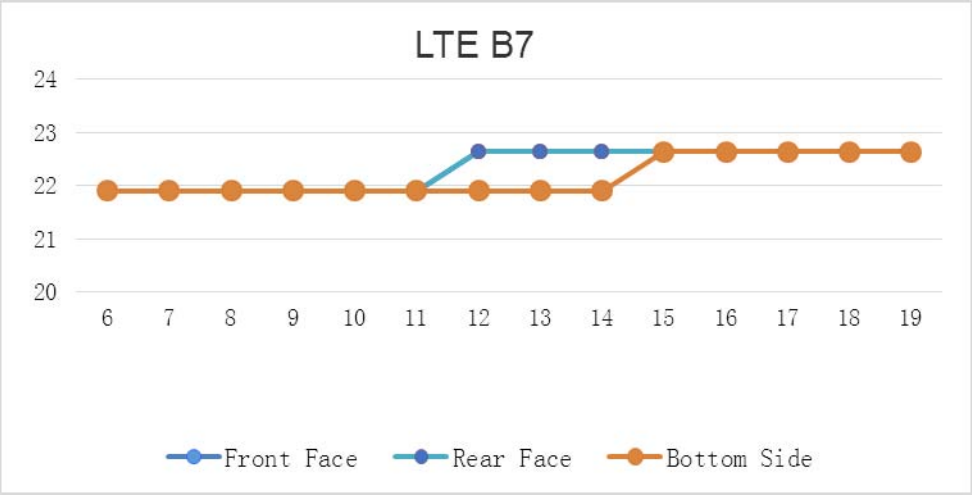
Band(MHz)	Trigger distance-Front/Rear Face		Trigger distance-Bottom Side	
	Moving toward phantom	Moving away from phantom	Moving toward phantom	Moving away from phantom
GSM 1900	11mm	11mm	14mm	14mm
LTE Band VII	11mm	11mm	14mm	14mm

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

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

mode		distance (mm)													
		6	7	8	9	10	11	12	13	14	15	16	17	18	19
GSM 1900	Front Face	27.65	27.65	27.65	27.65	27.65	27.65	28.77	28.77	28.77	28.77	28.77	28.77	28.77	28.77
	Rear Face	27.65	27.65	27.65	27.65	27.65	27.65	28.77	28.77	28.77	28.77	28.77	28.77	28.77	28.77
	Bottom Side	27.65	27.65	27.65	27.65	27.65	27.65	27.65	27.65	27.65	28.77	28.77	28.77	28.77	28.77
LTE B7	Front Face	21.9	21.9	21.9	21.9	21.9	21.9	22.64	22.64	22.64	22.64	22.64	22.64	22.64	22.64
	Rear Face	21.9	21.9	21.9	21.9	21.9	21.9	22.64	22.64	22.64	22.64	22.64	22.64	22.64	22.64
	Bottom Side	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	22.64	22.64	22.64	22.64	22.64





7.5.4.3 Procedures for determining device tilt angle influences to proximity sensor triggering(Per KDB616217 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with 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°.

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

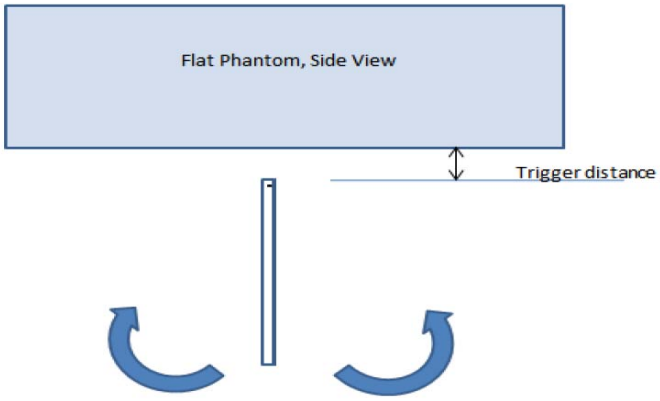


Table: Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering(Bottom side)

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	14mm	on	on	on	on	on	on	on	on	on	on	on
LTE Band VII	14mm	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,LTE B7with Main Antenna).

7.6 PROXIMITY SENSOR POWER REDUCTION INFORMATION

7.6.1 Power Reduction operation table

IR proximity sensor only works in voice mode and WIFI Simultaneous SAR , voice mode like GSM, CDMA 1X, VOLTE, WCDMA, and VOIP (VOLTE and VOIP based on the operation of different telecom carriers services and not includes other third party software applications). When head or body is in proximity and is detected by sensor as users take voice services and wifi on like above, SAR back off will be applied immediately（It's only reduce wifi power in this device）. 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. More details information followings:

Band	WiFi ant only Power Reduction (dB)	
	WiFi ant(Wi-Fi VOIP) + Sensor on/2G3G4G ant voice+ wifi station	WiFi + Sensor off
WiFi 2.4G	3	0

In user actual scenarios, while proximity sensor is triggered in voice mode, dynamical WiFi power reducing mechanism will set a lower WiFi Tx-power to make SAR back off immediately. Then if proximity sensor is away, WiFi proximity sensor power reducing mechanism will recover WiFi Tx-power that sets in NVs, now WiFi out power recovery to normal.

WiFi sensor power reducing mechanism need detect the WiFi connect state to make sure if it is necessary to set WiFi Tx-power back-off. In test lab environment, the Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools per KDB248227. As Wi-Fi works in non signaling mode, so the reducing mechanism can not detect WiFi connect state. In order to validate the power change before and after sensor power reduction in WiFi non signaling mode, a specific external test software and chipset based internal test modes are used in sensor triggering power measurement validation tests.

In the sensor triggering power measurement tests, chipset based internal test modes enable proximity sensor logic in WiFi non signaling mode by the following steps:

1) The first step, we execute the first script to install test tools, and the phone will reboot.
2) The second step, we execute the second script to send continuous non signaling frames from the test phone. Then we use the same test steps with normal mode(see the above user actual scenarios description) of the phone to verify WiFi power back-off and recovery.
3) The third step, after the sensor triggering power measurement validation test, we execute the third script to stop continuous none signal frames sending.
4) The fourth step, we execute the fourth script to uninstall test tools, and the phone will reboot.

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

7.6.2 Summary SAR test Plan for Proximity sensor power reduction

a) **For Head SAR compliance:** Head SAR for Wi-Fi antenna is evaluated at reduced power levels according to the real usage scenarios.

b) The detailed full power and reduced tune-up specifications and conducted power measurement results per KDB 616217D04 will be confirmed and provided in the final SAR report.

7.7 MAXIMUM OUTPUT POWER REDUCTION TRIGGERED BY SPECIFIC USE CONDITIONS MECHANISM

7.7.1 Summary SAR test Plan

Based on the power reduction triggered by specific use conditions information above, we provide a draft SAR test plan as below:

1) The Main Antenna and Second Antenna are set to the MAX transmit power level respectively and test the SAR respectively in all applicable RF exposure conditions per KDB 447498. Some AT commands or test scripts are supplied to fix the operation state and choose the antenna so that only one TX antenna is chosen and tested at a time.
2) For Head SAR test of 2G/3G/4G Second Antenna:
   Standalone Head SAR should be evaluated at power level A（Audio 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 LTE DATA, WCDMA RMC mode through triggering the audio receiver on by test scripts (bat files) in order to simulate the users' scene (LTE VOIP, WCDMA VOIP or data mode simultaneous Transmission with Vo Wifi) for Head SAR test of UMTS , LTE.
   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.
3) For Body/Product Specific 10-g SAR test of 2G/3G/4G Second Antenna:
   Standalone Body SAR should be evaluated at power level B（Audio Receiver off）

8. TEST RESULT

8.1 CONDUCTED POWER RESULTS

8.1.1 CONDUCTED POWER MEASUREMENTS OF GSM850

1) Conducted power measurement results of GSM850 (Main 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)		33.00	31.21	31.19	31.27	23.81	22.02	22.00	22.08
GPRS/ EDGE (GMSK)	1 Tx Slot	33.00	31.21	31.19	31.27	23.81	22.02	22.00	22.08
	2 Tx Slots	30.00	29.29	29.23	29.28	23.87	23.16	23.10	23.15
	3 Tx Slots	28.30	27.29	27.23	27.27	23.88	22.87	22.81	22.85
	4 Tx Slots	27.00	26.30	26.28	26.32	23.82	23.12	23.10	23.14
EDGE (8PSK)	1 Tx Slot	27.00	25.74	25.77	25.76	17.81	16.55	16.58	16.57
	2 Tx Slots	25.00	23.57	23.51	23.55	18.87	17.44	17.38	17.42
	3 Tx Slots	23.00	21.59	21.63	21.66	18.58	17.17	17.21	17.24
	4 Tx Slots	21.00	19.57	19.64	19.69	17.82	16.39	16.46	16.51

2) Conducted power measurement results of GSM850 (Sub Power receiver off)

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)		32.00	30.24	30.24	30.34	22.81	21.05	21.05	21.15
GPRS/ EDGE (GMSK)	1 Tx Slot	32.00	30.24	30.24	30.34	22.81	21.05	21.05	21.15
	2 Tx Slots	29.00	27.50	27.41	27.51	22.87	21.37	21.28	21.38
	3 Tx Slots	27.30	25.68	25.67	25.77	22.88	21.26	21.25	21.35
	4 Tx Slots	26.00	24.31	24.34	24.44	22.82	21.13	21.16	21.26
EDGE (8PSK)	1 Tx Slot	27.00	25.56	25.71	25.82	17.81	16.37	16.52	16.63
	2 Tx Slots	25.00	23.54	23.57	23.65	18.87	17.41	17.44	17.52
	3 Tx Slots	23.00	21.61	21.63	21.78	18.58	17.19	17.21	17.36
	4 Tx Slots	21.00	19.63	19.67	19.74	17.82	16.45	16.49	16.56

3) Conducted power measurement results of GSM850 (Sub Power receiver on or hotspot)

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)		28.00	26.87	26.87	26.96	18.81	17.68	17.68	17.77
GPRS (GMSK)	1 Tx Slot	28.00	26.87	26.87	26.96	18.81	17.68	17.68	17.77
	2 Tx Slots	25.00	23.93	23.96	24.05	18.87	17.80	17.83	17.92
	3 Tx Slots	23.30	22.20	22.19	22.28	18.88	17.78	17.77	17.86
	4 Tx Slots	22.00	20.94	20.91	21.01	18.82	17.76	17.73	17.83

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) Per KDB941225 D01, the bolded GPRS3Tx mode was selected for SAR testing with sensor off and the bolded GPRS4 Tx mode was selected for SAR testing with sensor on according to the highest frame –averaged output power table.
4) 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)
5) The 3 Tx Slots and 4 Tx Slot of EDGE(8PSK) mode don't support the sensor function, so the power is not reduced.

8.1.2 CONDUCTED POWER MEASUREMENTS OF GSM1900

1) Conducted power measurement results of GSM1900 (Main 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)		30.00	28.99	28.77	28.38	20.81	19.80	19.58	19.19
GPRS /EDGE (GMSK)	1 Tx Slot	30.00	28.99	28.77	28.38	20.81	19.80	19.58	19.19
	2 Tx Slots	27.60	26.91	26.63	26.32	21.47	20.78	20.50	20.19
	3 Tx Slots	26.00	24.98	24.79	24.37	21.58	20.56	20.37	19.95
	4 Tx Slots	24.00	22.96	22.65	22.32	20.82	19.78	19.47	19.14
EDGE (8PSK)	1 Tx Slot	26.00	24.82	24.56	24.35	16.81	15.63	15.37	15.16
	2 Tx Slots	24.00	22.38	22.16	22.02	17.87	16.25	16.03	15.89
	3 Tx Slots	22.00	20.80	20.64	20.46	17.58	16.38	16.22	16.04
	4 Tx Slots	20.00	18.72	18.57	18.38	16.82	15.54	15.39	15.20

2) Conducted power measurement results of GSM1900 (Main Power sensor)

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)		29.00	27.90	27.65	27.29	19.81	18.71	18.46	18.10
GPRS (GMSK)	1 Tx Slot	29.00	27.90	27.65	27.29	19.81	18.71	18.46	18.10
	2 Tx Slots	26.60	25.80	25.57	25.28	20.47	19.67	19.44	19.15
	3 Tx Slots	25.00	23.90	23.64	23.38	20.58	19.48	19.22	18.96
	4 Tx Slots	23.00	21.97	21.71	21.47	19.82	18.79	18.53	18.29

3) Conducted power measurement results of GSM1900 (Sub Power receiver off)

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)		29.00	28.13	28.00	27.90	19.81	18.94	18.81	18.71
GPRS /EDGE (GMSK)	1 Tx Slot	29.00	28.13	28.00	27.90	19.81	18.94	18.81	18.71
	2 Tx Slots	26.00	25.32	25.18	25.10	19.87	19.19	19.05	18.97
	3 Tx Slots	24.30	23.60	23.50	23.41	19.88	19.18	19.08	18.99
	4 Tx Slots	23.00	22.34	22.22	22.14	19.82	19.16	19.04	18.96
EDGE (8PSK)	1 Tx Slot	26.00	25.11	24.98	24.87	16.81	15.92	15.79	15.68
	2 Tx Slots	24.00	22.74	22.52	22.43	17.87	16.61	16.39	16.30
	3 Tx Slots	22.00	20.71	20.60	20.64	17.58	16.29	16.18	16.22
	4 Tx Slots	20.00	18.83	18.51	18.62	16.82	15.65	15.33	15.44

4) Conducted power measurement results of GSM1900 (Sub Power receiver on or hotspot)

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)		25.80	24.84	24.72	24.64	16.61	15.65	15.53	15.45
GPRS (GMSK)	1 Tx Slot	25.80	24.84	24.72	24.64	16.61	15.65	15.53	15.45
	2 Tx Slots	22.80	21.90	21.78	21.72	16.67	15.77	15.65	15.59
	3 Tx Slots	21.10	20.27	20.18	20.09	16.68	15.85	15.76	15.67
	4 Tx Slots	19.80	19.00	18.87	18.87	16.62	15.82	15.69	15.69

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) Per KDB941225 D01, the bolded GPRS 3Tx mode was selected for SAR testing with sensor off and the bolded GPRS 4Tx mode was selected for SAR testing with sensor on according to the highest frame –averaged output power table.
4) 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)

8.1.3 CONDUCTED POWER MEASUREMENTS OF UMTS Band 5

1) Conducted power measurement results of UMTS Band 5 (Main full Power)

UMTS Band 5		Tune-up	SAR Conducted Power (dBm)		
			4132CH	4182CH	4233CH
			826.4	836.4	846.6
WCDMA	AMR Voice	24.00	22.44	22.27	22.32
	12.2kbps RMC	24.00	22.44	22.27	22.32
	64kbps RMC	24.00	22.41	22.30	22.35
	144kbps RMC	24.00	22.42	22.30	22.36
	384kbps RMC	24.00	22.48	22.37	22.35
HSDPA	Subtest 1	23.00	22.09	21.87	22.05
	Subtest 2	22.70	21.76	21.56	21.74
	Subtest 3	22.00	20.92	20.81	20.83
	Subtest 4	22.00	20.95	20.86	20.86
HSUPA	Subtest 1	20.50	19.96	19.60	19.67
	Subtest 2	20.50	18.70	18.76	18.83
	Subtest 3	20.50	19.40	19.51	19.53
	Subtest 4	20.50	18.72	18.78	19.52
	Subtest 5	21.50	19.86	19.83	19.78
DC-HSDPA	Subtest 1	23.00	22.09	21.87	22.05
	Subtest 2	22.70	21.76	21.56	21.74
	Subtest 3	22.00	20.92	20.81	20.83
	Subtest 4	22.00	20.95	20.86	20.86

2) Conducted power measurement results of UMTS Band 5 (Sub Power receiver off)

UMTS Band 5		Tune-up	SAR Conducted Power (dBm)		
			4132CH	4182CH	4233CH
			826.4	836.4	846.6
WCDMA	AMR Voice	23.00	21.79	21.62	21.71
	12.2kbps RMC	23.00	21.79	21.62	21.71
	64kbps RMC	23.00	21.74	21.60	21.74
	144kbps RMC	23.00	21.82	21.67	21.74
	384kbps RMC	23.00	21.81	21.66	21.75
HSDPA	Subtest 1	22.50	20.98	20.78	20.89
	Subtest 2	21.70	20.66	20.53	20.64
	Subtest 3	21.00	19.91	19.88	19.95
	Subtest 4	21.00	19.99	19.89	19.95
HSUPA	Subtest 1	19.50	18.68	18.84	18.69
	Subtest 2	19.50	18.33	18.36	18.21
	Subtest 3	19.50	18.27	18.07	18.06
	Subtest 4	19.50	18.24	18.20	18.06
	Subtest 5	20.50	19.28	19.25	19.27
DC-HSDPA	Subtest 1	22.50	20.98	20.78	20.89
	Subtest 2	21.70	20.66	20.53	20.64
	Subtest 3	21.00	19.91	19.88	19.95
	Subtest 4	21.00	19.99	19.89	19.95

3) Conducted power measurement results of UMTS Band 5 (Sub Power receiver on or hotspot)

UMTS Band 5		Tune-up	SAR Conducted Power (dBm)		
			4132CH	4182CH	4233CH
			826.4	836.4	846.6
WCDMA	AMR Voice	19.00	17.79	17.71	17.80
	12.2kbps RMC	19.00	17.79	17.71	17.80
	64kbps RMC	19.00	17.85	17.77	17.76
	144kbps RMC	19.00	17.84	17.75	17.76
	384kbps RMC	19.00	17.84	17.77	17.75
HSDPA	Subtest 1	18.00	16.98	16.89	16.93
	Subtest 2	17.70	16.78	16.61	16.71
	Subtest 3	17.00	16.11	15.93	16.06
	Subtest 4	17.00	16.09	15.90	16.04
HSUPA	Subtest 1	15.00	14.07	14.35	14.23
	Subtest 2	14.50	13.73	13.85	13.73
	Subtest 3	14.50	13.61	13.46	13.37
	Subtest 4	15.50	14.31	14.48	14.37
	Subtest 5	16.00	14.67	14.95	14.99
DC-HSDPA	Subtest 1	18.00	16.98	16.89	16.93
	Subtest 2	17.70	16.78	16.61	16.71
	Subtest 3	17.00	16.11	15.93	16.06
	Subtest 4	17.00	16.09	15.90	16.04

Note:
1) The conducted power of UMTS Band 5 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.

8.1.4 CONDUCTED POWER MEASUREMENTS OF LTE Band 5

1) Conducted power measurement results of LTE Band 5 (Main full Power)

FDD LTE B5					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20407	20525	20643
					824.7	836.5	848.3
1.4MHz	QPSK	1	0	23.20	22.00	21.98	21.91
		1	2	23.20	22.13	22.08	21.94
		1	5	23.20	22.02	21.98	21.49
		3	0	23.20	22.06	21.97	22.01
		3	1	23.20	22.08	22.02	21.94
		3	3	23.20	22.12	22.01	21.81
		6	0	22.50	21.14	21.07	21.07
	16QAM	1	0	22.50	21.26	21.42	21.31
		1	2	22.50	21.39	21.51	21.30
		1	5	22.50	21.34	21.42	20.85
		3	0	22.50	21.07	21.16	21.24
		3	1	22.50	21.09	21.19	21.19
		3	3	22.50	21.14	21.20	21.08
		6	0	22.50	21.06	21.12	21.03
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20415	20525	20635
					825.5	836.5	847.5
3MHz	QPSK	1	0	23.20	21.80	21.71	21.89
		1	7	23.20	22.21	22.14	22.17
		1	14	23.20	21.77	21.96	21.37
		8	0	22.50	21.10	21.06	21.11
		8	3	22.50	21.15	21.09	21.11
		8	7	22.50	21.11	21.01	21.00
		15	0	22.50	21.07	21.02	20.99
	16QAM	1	0	22.50	21.14	21.18	21.13
		1	7	22.50	21.56	21.55	21.44
		1	14	22.50	21.23	21.25	20.68
		8	0	22.50	21.10	21.13	21.21
		8	3	22.50	21.13	21.14	21.19
		8	7	22.50	21.10	21.05	21.06
		15	0	22.50	21.00	21.05	21.01

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20425	20525	20625
					826.5	836.5	846.5
5MHz	QPSK	1	0	23.20	21.80	21.69	21.55
		1	12	23.20	22.14	22.10	22.01
		1	24	23.20	21.59	21.81	21.21
		12	0	22.50	21.14	20.96	20.97
		12	6	22.50	21.29	21.08	21.07
		12	13	22.50	21.13	21.01	20.99
		25	0	22.50	20.96	20.89	20.93
	16QAM	1	0	22.50	21.01	21.16	21.06
		1	12	22.50	21.40	21.63	21.52
		1	24	22.50	20.88	21.21	20.76
		12	0	22.50	21.08	21.01	20.95
		12	6	22.50	21.22	21.12	21.06
		12	13	22.50	21.06	21.05	20.98
		25	0	22.50	20.92	20.90	20.88
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20450	20525	20600
					829	836.5	844
10MHz	QPSK	1	0	23.20	21.62	21.48	21.79
		1	24	23.20	22.21	22.14	21.97
		1	49	23.20	21.34	21.55	21.29
		25	0	22.50	21.44	21.32	21.58
		25	12	22.50	21.48	21.42	21.53
		25	25	22.50	21.18	21.37	21.20
		50	0	22.50	21.25	21.26	21.43
	16QAM	1	0	22.50	21.03	20.91	21.05
		1	24	22.50	21.55	21.52	21.27
		1	49	22.50	20.70	20.94	20.59
		25	0	22.50	21.38	21.29	21.49
		25	12	22.50	21.48	21.40	21.44
		25	25	22.50	21.19	21.36	21.18
		50	0	22.50	21.23	21.21	21.39

2) Conducted power measurement results of LTE Band 5 (Sub Power receiver off)

FDD LTE B5					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20407	20525	20643
					824.7	836.5	848.3
1.4MHz	QPSK	1	0	22.40	21.53	21.96	21.68
		1	2	22.40	21.68	22.07	21.62
		1	5	22.40	21.63	21.90	21.16
		3	0	22.40	21.64	21.99	21.64
		3	1	22.40	21.66	22.00	21.58
		3	3	22.40	21.72	21.98	21.45
		6	0	22.20	20.68	20.97	20.71
	16QAM	1	0	22.60	20.72	21.25	21.01
		1	2	22.60	20.94	21.27	20.99
		1	5	22.60	20.80	21.16	20.66
		3	0	22.60	20.64	21.03	20.89
		3	1	22.60	20.68	21.08	20.81
		3	3	22.60	20.75	21.03	20.69
		6	0	22.20	20.66	20.95	20.76
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20415	20525	20635
					825.5	836.5	847.5
3MHz	QPSK	1	0	22.40	21.39	21.85	21.86
		1	7	22.40	21.80	22.08	21.88
		1	14	22.40	21.53	21.65	21.01
		8	0	22.00	20.63	21.01	21.06
		8	3	22.00	20.70	20.98	20.90
		8	7	22.00	20.71	20.78	20.70
		15	0	22.00	20.63	20.84	20.81
	16QAM	1	0	22.00	20.63	21.05	21.17
		1	7	22.00	21.12	21.32	21.27
		1	14	22.00	20.75	20.86	20.38
		8	0	21.20	20.67	20.97	21.10
		8	3	21.20	20.74	20.95	20.93
		8	7	21.20	20.73	20.77	20.73
		15	0	21.20	20.62	20.84	20.83

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20425	20525	20625
					826.5	836.5	846.5
5MHz	QPSK	1	0	22.40	21.35	21.81	21.65
		1	12	22.40	21.83	22.07	22.01
		1	24	22.40	21.40	21.45	20.90
		12	0	22.00	20.70	20.97	21.04
		12	6	22.00	20.87	21.00	21.07
		12	13	22.00	20.74	20.81	20.85
		25	0	22.00	20.59	20.71	20.87
	16QAM	1	0	22.00	20.55	21.07	21.10
		1	12	22.00	21.09	21.25	21.39
		1	24	22.00	20.59	20.66	20.41
		12	0	21.20	20.69	20.94	21.05
		12	6	21.20	20.90	20.95	21.08
		12	13	21.20	20.77	20.78	20.85
		25	0	21.20	20.57	20.72	20.84
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20450	20525	20600
					829	836.5	844
10MHz	QPSK	1	0	22.40	20.97	21.40	21.17
		1	24	22.40	21.75	21.83	21.80
		1	49	22.40	21.17	21.00	20.72
		25	0	22.00	20.57	20.77	20.83
		25	12	22.00	20.80	20.71	20.97
		25	25	22.00	20.61	20.49	20.65
		50	0	22.00	20.56	20.56	20.77
	16QAM	1	0	22.00	20.28	20.68	20.47
		1	24	22.00	21.04	21.00	21.08
		1	49	22.00	20.42	20.24	20.04
		25	0	21.20	20.56	20.78	20.76
		25	12	21.20	20.80	20.73	20.91
		25	25	21.20	20.61	20.47	20.58
		50	0	21.20	20.54	20.56	20.70

3) Conducted power measurement results of LTE Band 5 (Sub Power receiver on or hotspot)

FDD LTE B5					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20407	20525	20643
					824.7	836.5	848.3
1.4MHz	QPSK	1	0	18.80	17.77	17.80	17.78
		1	2	18.80	17.64	17.91	17.83
		1	5	18.80	17.56	17.79	17.42
		3	0	18.80	17.58	17.90	17.75
		3	1	18.80	17.61	17.93	17.72
		3	3	18.80	17.67	17.92	17.64
		6	0	18.80	17.61	17.88	17.63
	16QAM	1	0	18.80	18.06	18.07	17.98
		1	2	18.80	17.78	18.22	18.02
		1	5	18.80	17.69	18.04	17.62
		3	0	18.80	17.59	18.02	17.86
		3	1	18.80	17.61	18.05	17.83
		3	3	18.80	17.69	18.03	17.75
		6	0	18.80	17.73	17.89	17.64
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20415	20525	20635
					825.5	836.5	847.5
3MHz	QPSK	1	0	18.80	17.22	17.62	17.70
		1	7	18.80	17.77	17.99	17.93
		1	14	18.80	17.38	17.48	17.19
		8	0	18.80	17.62	17.80	17.79
		8	3	18.80	17.71	17.86	17.73
		8	7	18.80	17.64	17.69	17.58
		15	0	18.80	17.63	17.77	17.61
	16QAM	1	0	18.80	17.59	17.93	17.88
		1	7	18.80	18.12	18.30	18.14
		1	14	18.80	17.79	17.74	17.36
		8	0	18.80	17.61	17.85	17.75
		8	3	18.80	17.71	17.84	17.70
		8	7	18.80	17.70	17.68	17.56
		15	0	18.80	17.58	17.72	17.60

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20425	20525	20625
					826.5	836.5	846.5
5MHz	QPSK	1	0	18.80	17.28	17.55	17.55
		1	12	18.80	17.78	17.87	17.89
		1	24	18.80	17.31	17.28	17.04
		12	0	18.80	17.62	17.76	17.77
		12	6	18.80	17.76	17.87	17.81
		12	13	18.80	17.65	17.71	17.63
		25	0	18.80	17.60	17.65	17.63
	16QAM	1	0	18.80	17.56	18.05	17.84
		1	12	18.80	18.14	18.12	18.18
		1	24	18.80	17.62	17.72	17.36
		12	0	18.80	17.64	17.75	17.74
		12	6	18.80	17.85	17.79	17.78
		12	13	18.80	17.67	17.63	17.60
		25	0	18.80	17.51	17.58	17.56
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20450	20525	20600
					829	836.5	844
10MHz	QPSK	1	0	18.80	17.23	17.61	17.44
		1	24	18.80	18.09	18.12	18.06
		1	49	18.80	17.35	17.27	17.11
		25	0	18.80	17.45	17.60	17.60
		25	12	18.80	17.70	17.64	17.74
		25	25	18.80	17.51	17.44	17.41
		50	0	18.80	17.44	17.48	17.54
	16QAM	1	0	18.80	17.29	17.62	17.43
		1	24	18.80	18.17	18.13	18.04
		1	49	18.80	17.42	17.28	17.16
		25	0	18.80	17.49	17.62	17.56
		25	12	18.80	17.68	17.59	17.75
		25	25	18.80	17.48	17.38	17.42
		50	0	18.80	17.45	17.44	17.51

8.1.5 CONDUCTED POWER MEASUREMENTS OF LTE Band 7

1) Conducted power measurement results of LTE Band 7 (Main full Power)

FDD LTE B7					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20775	21100	21425
					2502.5	2535	2567.5
5MHz	QPSK	1	0	22.80	21.48	21.60	21.51
		1	12	22.80	21.63	21.68	21.56
		1	24	22.80	21.26	21.31	21.18
		12	0	21.80	20.78	20.86	20.75
		12	6	21.80	20.74	20.87	20.69
		12	13	21.80	20.66	20.71	20.55
		25	0	21.80	20.63	20.72	20.58
	16QAM	1	0	21.80	20.61	20.97	20.93
		1	12	21.80	20.69	21.03	21.00
		1	24	21.80	20.32	20.68	20.62
		12	0	21.80	20.73	20.84	20.70
		12	6	21.80	20.73	20.84	20.67
		12	13	21.80	20.66	20.68	20.52
		25	0	21.80	20.60	20.65	20.55
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20800	21100	21400
					2505	2535	2565
10MHz	QPSK	1	0	22.80	21.44	21.57	21.71
		1	24	22.80	21.74	21.73	21.67
		1	49	22.80	21.33	21.36	21.25
		25	0	21.80	20.77	20.80	20.72
		25	12	21.80	20.77	20.76	20.69
		25	25	21.80	20.61	20.65	20.52
		50	0	21.80	20.63	20.69	20.66
	16QAM	1	0	21.80	20.88	20.72	20.96
		1	24	21.80	21.13	20.83	20.99
		1	49	21.80	20.72	20.54	20.55
		25	0	21.80	20.70	20.75	20.66
		25	12	21.80	20.74	20.71	20.65
		25	25	21.80	20.58	20.61	20.49
		50	0	21.80	20.57	20.65	20.64

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20825	21100	21375
					2507.5	2535	2562.5
15MHz	QPSK	1	0	22.80	21.28	21.43	21.47
		1	37	22.80	21.66	21.68	21.70
		1	74	22.80	21.25	21.16	21.02
		36	0	21.80	20.63	20.72	20.81
		36	19	21.80	20.76	20.80	20.81
		36	39	21.80	20.64	20.56	20.53
		75	0	21.80	20.64	20.63	20.74
	16QAM	1	0	21.80	20.49	20.73	20.90
		1	37	21.80	20.84	21.03	21.12
		1	74	21.80	20.45	20.54	20.50
		36	0	21.80	20.61	20.70	20.76
		36	19	21.80	20.73	20.78	20.75
		36	39	21.80	20.57	20.53	20.49
		75	0	21.80	20.54	20.58	20.66
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20850	21100	21350
					2510	2535	2560
20MHz	QPSK	1	0	23.50	22.17	22.36	22.41
		1	50	23.50	22.37	22.43	22.64
		1	99	23.50	22.13	22.06	21.95
		50	0	21.80	20.74	20.75	21.02
		50	25	21.80	20.79	20.74	20.89
		50	50	21.80	20.70	20.62	20.57
		100	0	21.80	20.71	20.72	20.83
	16QAM	1	0	22.50	21.64	21.60	21.72
		1	50	22.50	21.90	21.69	21.89
		1	99	22.50	21.60	21.40	21.21
		50	0	21.80	20.66	20.70	20.96
		50	25	21.80	20.70	20.66	20.88
		50	50	21.80	20.61	20.54	20.57
		100	0	21.80	20.63	20.64	20.85

2) Conducted power measurement results of LTE Band 7 (Main Power sensor)

FDD LTE B7					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20775	21100	21425
					2502.5	2535	2567.5
5MHz	QPSK	1	0	22.20	20.46	20.69	20.64
		1	12	22.20	20.70	20.73	20.66
		1	24	22.20	20.24	20.25	20.46
		12	0	21.80	19.97	20.16	20.17
		12	6	21.80	20.08	20.17	20.11
		12	13	21.80	19.95	19.98	19.93
		25	0	21.80	19.96	20.00	19.99
	16QAM	1	0	21.80	19.94	20.35	20.31
		1	12	21.80	20.22	20.44	20.34
		1	24	21.80	20.05	19.95	19.87
		12	0	21.80	19.94	20.26	20.18
		12	6	21.80	19.99	20.25	20.13
		12	13	21.80	19.89	20.06	19.94
		25	0	21.80	19.89	19.97	20.01
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20800	21100	21400
					2505	2535	2565
10MHz	QPSK	1	0	22.20	20.40	20.66	20.85
		1	24	22.20	20.75	20.77	20.85
		1	49	22.20	20.36	20.30	20.32
		25	0	21.80	20.04	20.17	20.31
		25	12	21.80	20.06	20.08	20.22
		25	25	21.80	19.90	19.89	19.97
		50	0	21.80	19.91	20.02	20.17
	16QAM	1	0	21.80	20.02	20.22	20.53
		1	24	21.80	20.35	20.30	20.52
		1	49	21.80	20.00	19.86	19.91
		25	0	21.80	19.99	20.19	20.30
		25	12	21.80	20.05	20.09	20.22
		25	25	21.80	19.89	19.91	19.98
		50	0	21.80	19.88	20.02	20.15

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20825	21100	21375
					2507.5	2535	2562.5
15MHz	QPSK	1	0	22.20	20.21	20.56	20.74
		1	37	22.20	20.76	20.73	20.95
		1	74	22.20	20.68	20.43	20.41
		36	0	21.80	19.94	20.13	20.38
		36	19	21.80	20.10	20.15	20.37
		36	39	21.80	20.01	20.09	19.96
		75	0	21.80	19.93	19.98	20.25
	16QAM	1	0	21.80	20.07	20.11	20.40
		1	37	21.80	20.31	20.25	20.64
		1	74	21.80	19.96	19.90	20.05
		36	0	21.80	19.87	20.09	20.34
		36	19	21.80	20.06	20.13	20.32
		36	39	21.80	20.02	20.08	19.93
		75	0	21.80	19.90	19.92	20.21
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20850	21100	21350
					2510	2535	2560
20MHz	QPSK	1	0	22.50	21.06	21.47	21.69
		1	50	22.50	21.58	21.48	21.90
		1	99	22.50	21.56	21.15	21.08
		50	0	21.50	19.71	19.88	20.28
		50	25	21.50	19.86	19.79	20.24
		50	50	21.50	19.91	19.64	19.83
		100	0	21.50	19.78	19.79	20.16
	16QAM	1	0	21.90	20.58	20.97	20.99
		1	50	21.90	20.93	20.76	21.18
		1	99	21.90	20.89	20.46	20.38
		50	0	21.50	19.67	19.81	20.24
		50	25	21.50	19.85	19.76	20.17
		50	50	21.50	19.89	19.62	19.76
		100	0	21.50	19.77	19.75	20.06

3) Conducted power measurement results of LTE Band 7 (Sub Power receiver off)

FDD LTE B7					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20775	21100	21425
					2502.5	2535	2567.5
5MHz	QPSK	1	0	21.00	19.51	19.65	19.64
		1	12	21.00	20.02	19.86	19.79
		1	24	21.00	19.68	19.45	19.36
		12	0	21.00	19.81	19.82	19.80
		12	6	21.00	20.03	19.93	19.80
		12	13	21.00	19.95	19.79	19.70
		25	0	21.00	19.87	19.76	19.71
	16QAM	1	0	21.00	19.75	20.01	19.82
		1	12	21.00	20.19	20.21	19.98
		1	24	21.00	19.87	19.83	19.61
		12	0	21.00	19.81	19.88	19.78
		12	6	21.00	19.98	19.94	19.78
		12	13	21.00	19.90	19.80	19.63
		25	0	21.00	19.82	19.72	19.65
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20800	21100	21400
					2505	2535	2565
10MHz	QPSK	1	0	21.00	19.38	19.49	19.62
		1	24	21.00	20.22	19.91	19.86
		1	49	21.00	19.73	19.54	19.38
		25	0	21.00	19.95	19.74	19.78
		25	12	21.00	20.13	19.79	19.79
		25	25	21.00	20.00	19.69	19.62
		50	0	21.00	19.93	19.69	19.71
	16QAM	1	0	21.00	19.65	19.79	19.70
		1	24	21.00	20.38	20.22	19.90
		1	49	21.00	19.91	19.87	19.40
		25	0	21.00	19.91	19.76	19.72
		25	12	21.00	20.11	19.82	19.74
		25	25	21.00	19.98	19.73	19.57
		50	0	21.00	19.85	19.68	19.67

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20825	21100	21375
					2507.5	2535	2562.5
15MHz	QPSK	1	0	21.00	19.07	19.04	19.44
		1	37	21.00	20.32	19.85	19.92
		1	74	21.00	19.30	19.17	19.02
		36	0	21.00	19.86	19.57	19.78
		36	19	21.00	20.18	19.83	19.87
		36	39	21.00	19.95	19.61	19.52
		75	0	21.00	19.88	19.60	19.71
	16QAM	1	0	21.00	19.30	19.37	19.60
		1	37	21.00	20.46	20.16	20.08
		1	74	21.00	19.50	19.53	19.18
		36	0	21.00	19.80	19.53	19.74
		36	19	21.00	20.14	19.83	19.82
		36	39	21.00	19.89	19.62	19.48
		75	0	21.00	19.81	19.60	19.66
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20850	21100	21350
					2510	2535	2560
20MHz	QPSK	1	0	21.30	19.66	19.75	20.16
		1	50	21.30	20.94	20.62	20.79
		1	99	21.30	19.66	19.92	19.59
		50	0	21.30	19.92	19.52	19.95
		50	25	21.30	20.17	19.82	19.97
		50	50	21.30	19.81	19.73	19.51
		100	0	21.30	19.84	19.66	19.81
	16QAM	1	0	21.30	19.92	19.92	20.25
		1	50	21.30	20.12	20.75	20.85
		1	99	21.30	19.88	20.09	19.73
		50	0	21.30	19.90	19.45	19.90
		50	25	21.30	20.13	19.76	19.92
		50	50	21.30	19.73	19.68	19.47
		100	0	21.30	19.74	19.59	19.76

4) Conducted power measurement results of LTE Band 7 (Sub Power receiver on or hotspot)

FDD LTE B7					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20775	21100	21425
					2502.5	2535	2567.5
5MHz	QPSK	1	0	15.90	14.30	14.43	14.40
		1	12	15.90	14.22	14.56	14.47
		1	24	15.90	14.60	14.12	14.02
		12	0	15.90	14.10	14.20	14.15
		12	6	15.90	14.22	14.24	14.11
		12	13	15.90	14.14	14.08	13.95
		25	0	15.90	14.10	14.07	13.99
	16QAM	1	0	15.90	14.01	14.40	14.42
		1	12	15.90	14.45	14.52	14.46
		1	24	15.90	14.12	14.11	14.04
		12	0	15.90	14.08	14.19	14.14
		12	6	15.90	14.22	14.23	14.09
		12	13	15.90	14.14	14.07	13.94
		25	0	15.90	14.11	14.00	13.91
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20800	21100	21400
					2505	2535	2565
10MHz	QPSK	1	0	15.90	14.22	14.34	14.63
		1	24	15.90	14.84	14.59	14.66
		1	49	15.90	14.50	14.24	14.12
		25	0	15.90	14.58	14.52	14.63
		25	12	15.90	14.74	14.51	14.55
		25	25	15.90	14.63	14.39	14.33
		50	0	15.90	14.57	14.44	14.50
	16QAM	1	0	15.90	14.51	14.29	14.84
		1	24	15.90	15.13	14.56	14.82
		1	49	15.90	14.84	14.23	14.34
		25	0	15.90	14.60	14.45	14.56
		25	12	15.90	14.75	14.43	14.49
		25	25	15.90	14.64	14.32	14.27
		50	0	15.90	14.53	14.38	14.43

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20825	21100	21375
					2507.5	2535	2562.5
15MHz	QPSK	1	0	15.90	14.06	14.16	14.66
		1	37	15.90	14.98	14.53	14.74
		1	74	15.90	14.44	14.10	13.91
		36	0	15.90	14.60	14.44	14.76
		36	19	15.90	14.87	14.59	14.71
		36	39	15.90	14.74	14.36	14.33
		75	0	15.90	14.62	14.42	14.60
	16QAM	1	0	15.90	14.36	14.51	14.83
		1	37	15.90	15.26	14.86	14.89
		1	74	15.90	14.73	14.45	14.08
		36	0	15.90	14.58	14.36	14.71
		36	19	15.90	14.85	14.50	14.65
		36	39	15.90	14.72	14.28	14.27
		75	0	15.90	14.59	14.34	14.54
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20850	21100	21350
					2510	2535	2560
20MHz	QPSK	1	0	16.50	15.27	15.43	15.81
		1	50	16.50	16.10	15.66	15.93
		1	99	16.50	15.40	15.44	15.03
		50	0	16.50	14.84	14.56	15.56
		50	25	16.50	14.99	14.64	15.01
		50	50	16.50	14.87	14.64	14.58
		100	0	16.50	14.85	14.63	14.95
	16QAM	1	0	17.00	15.49	15.48	15.92
		1	50	17.00	16.09	15.69	16.00
		1	99	17.00	15.60	15.54	15.22
		50	0	16.50	14.78	14.58	15.18
		50	25	16.50	14.95	14.65	15.01
		50	50	16.50	14.82	14.66	14.59
		100	0	16.50	14.77	14.56	14.86

8.1.6 CONDUCTED POWER MEASUREMENTS OF LTE Band 26

1) Conducted power measurement results of LTE Band 26 (Main full Power)

FDD LTE B26					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26697	26865	27033
					814.7	831	848.3
1.4MHz	QPSK	1	0	23.20	21.86	22.03	22.06
		1	2	23.20	22.00	22.14	22.02
		1	5	23.20	21.87	21.97	21.57
		3	0	23.20	21.96	22.04	21.96
		3	1	23.20	21.99	22.07	21.90
		3	3	23.20	21.98	22.05	21.78
		6	0	22.50	20.92	20.99	21.04
	16QAM	1	0	22.50	21.10	21.35	21.42
		1	2	22.50	21.20	21.43	21.37
		1	5	22.50	21.09	21.27	20.89
		3	0	22.50	20.95	21.12	21.20
		3	1	22.50	21.00	21.15	21.14
		3	3	22.50	21.00	21.14	21.03
		6	0	22.50	20.94	20.98	21.03
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26705	26865	27025
					815.5	831	847.5
3MHz	QPSK	1	0	23.20	21.76	21.89	21.80
		1	7	23.20	22.08	22.12	22.19
		1	14	23.20	21.58	21.76	21.27
		8	0	22.50	20.94	21.01	21.14
		8	3	22.50	20.99	20.96	21.15
		8	7	22.50	20.81	20.85	20.96
		15	0	22.50	20.89	20.90	21.01
	16QAM	1	0	22.50	20.95	21.36	21.13
		1	7	22.50	21.32	21.60	21.51
		1	14	22.50	20.83	21.19	20.62
		8	0	22.50	20.91	21.00	21.19
		8	3	22.50	20.96	21.01	21.18
		8	7	22.50	20.86	20.91	20.99
		15	0	22.50	20.83	20.96	21.03

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26715	26865	27015
					816.5	831	846.5
5MHz	QPSK	1	0	23.20	21.65	21.80	21.58
		1	12	23.20	21.91	22.05	22.08
		1	24	23.20	21.48	21.57	21.39
		12	0	22.50	20.88	20.98	21.03
		12	6	22.50	20.98	21.03	21.08
		12	13	22.50	20.84	20.91	20.99
		25	0	22.50	20.85	20.85	20.92
	16QAM	1	0	22.50	21.01	20.98	20.96
		1	12	22.50	21.23	21.23	21.53
		1	24	22.50	20.83	20.81	20.68
		12	0	22.50	20.97	20.96	21.09
		12	6	22.50	20.99	21.01	21.15
		12	13	22.50	20.85	20.90	21.07
		25	0	22.50	20.82	20.81	20.93
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26750	26865	26990
					820	831	844
10MHz	QPSK	1	0	23.20	21.73	21.92	22.09
		1	24	23.20	22.27	22.37	22.22
		1	49	23.20	21.64	21.69	21.42
		25	0	22.50	21.06	21.09	21.28
		25	12	22.50	21.12	21.15	21.31
		25	25	22.50	20.94	20.95	20.99
		50	0	22.50	20.99	21.03	21.15
	16QAM	1	0	22.50	20.93	21.19	21.30
		1	24	22.50	21.52	21.60	21.57
		1	49	22.50	20.86	20.97	20.86
		25	0	22.50	21.00	21.09	21.24
		25	12	22.50	21.06	21.15	21.27
		25	25	22.50	20.89	20.90	20.98
		50	0	22.50	20.93	21.03	21.12

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26775	26865	26965
					822.5	831	841.5
15MHz	QPSK	1	0	23.20	21.72	21.93	21.87
		1	37	23.20	22.22	22.36	22.41
		1	74	23.20	22.12	22.34	22.12
		36	0	22.50	21.08	21.54	21.42
		36	19	22.50	21.29	21.35	21.51
		36	39	22.50	21.12	21.06	21.12
		75	0	22.50	21.11	21.24	21.30
	16QAM	1	0	22.50	20.87	21.21	20.84
		1	37	22.50	21.75	21.95	21.85
		1	74	22.50	21.68	22.06	21.56
		36	0	22.50	21.08	22.06	21.44
		36	19	22.50	21.32	21.35	21.50
		36	39	22.50	21.11	21.01	21.12
		75	0	22.50	21.08	21.16	21.31

2) Conducted power measurement results of LTE Band 26 (Sub Power receiver off)

FDD LTE B26					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26697	26865	27033
					814.7	831	848.3
1.4MHz	QPSK	1	0	22.40	20.94	21.40	21.26
		1	2	22.40	21.14	21.51	21.16
		1	5	22.40	21.07	21.37	20.87
		3	0	22.40	21.00	21.39	21.15
		3	1	22.40	21.08	21.42	21.08
		3	3	22.40	21.10	21.41	20.96
		6	0	22.20	21.05	21.41	21.01
	16QAM	1	0	22.60	21.03	21.60	21.29
		1	2	22.60	21.18	21.75	21.22
		1	5	22.60	21.11	21.63	20.77
		3	0	22.60	21.02	21.51	21.14
		3	1	22.60	21.12	21.55	21.08
		3	3	22.60	21.13	21.55	20.96
		6	0	22.20	20.21	20.54	20.21
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26705	26865	27025
					815.5	831	847.5
3MHz	QPSK	1	0	22.40	20.71	21.26	21.34
		1	7	22.40	21.22	21.48	21.44
		1	14	22.40	20.77	21.21	20.85
		8	0	22.00	21.00	21.35	21.41
		8	3	22.00	21.11	21.39	21.26
		8	7	22.00	21.03	21.31	20.97
		15	0	22.00	21.04	21.32	21.16
	16QAM	1	0	22.00	20.86	21.22	21.62
		1	7	22.00	21.40	21.55	21.68
		1	14	22.00	20.91	21.23	20.71
		8	0	21.20	20.18	20.55	20.51
		8	3	21.20	20.31	20.60	20.46
		8	7	21.20	20.18	20.52	20.17
		15	0	21.20	20.14	20.42	20.33

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26715	26865	27015
					816.5	831	846.5
5MHz	QPSK	1	0	22.40	20.63	21.04	21.11
		1	12	22.40	21.17	21.46	21.52
		1	24	22.40	20.69	20.98	20.64
		12	0	22.00	21.05	21.29	21.37
		12	6	22.00	21.16	21.40	21.42
		12	13	22.00	21.04	21.31	21.18
		25	0	22.00	21.00	21.18	21.19
	16QAM	1	0	22.00	20.89	21.34	21.54
		1	12	22.00	21.37	21.75	21.97
		1	24	22.00	20.92	21.30	20.76
		12	0	21.20	20.21	20.49	20.56
		12	6	21.20	20.34	20.60	20.56
		12	13	21.20	20.23	20.51	20.40
		25	0	21.20	20.13	20.31	20.28
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26750	26865	26990
					820	831	844
10MHz	QPSK	1	0	22.40	20.65	20.77	20.87
		1	24	22.40	21.21	21.43	21.48
		1	49	22.40	20.61	20.74	20.65
		25	0	22.00	20.91	21.01	21.06
		25	12	22.00	20.97	21.20	21.34
		25	25	22.00	20.66	20.95	21.00
		50	0	22.00	20.78	21.00	21.03
	16QAM	1	0	22.00	20.62	20.80	20.89
		1	24	22.00	21.42	21.69	21.74
		1	49	22.00	20.66	20.87	20.71
		25	0	21.20	20.03	20.08	20.23
		25	12	21.20	20.11	20.30	20.44
		25	25	21.20	19.79	20.04	20.11
		50	0	21.20	19.88	20.09	20.18

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26775	26865	26965
					822.5	831	841.5
15MHz	QPSK	1	0	22.40	20.80	20.74	20.74
		1	37	22.40	21.23	21.54	21.33
		1	74	22.40	20.79	20.76	20.61
		36	0	22.00	20.67	20.76	20.93
		36	19	22.00	20.83	21.13	21.10
		36	39	22.00	20.70	20.72	20.83
		75	0	22.00	20.60	20.78	20.92
	16QAM	1	0	22.00	20.60	20.64	20.96
		1	37	22.00	21.27	21.68	21.43
		1	74	22.00	20.98	21.09	20.75
		36	0	21.20	19.83	21.09	20.06
		36	19	21.20	19.98	20.36	20.25
		36	39	21.20	19.62	19.85	19.97
		75	0	21.20	19.71	19.91	20.01

3) Conducted power measurement results of LTE Band 26 (Sub Power receiver on or hotspot)

FDD LTE B26					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26697	26865	27033
					814.7	831	848.3
1.4MHz	QPSK	1	0	18.80	17.87	17.86	17.83
		1	2	18.80	17.98	17.99	17.82
		1	5	18.80	17.53	17.85	17.39
		3	0	18.80	17.41	17.88	17.76
		3	1	18.80	17.50	17.93	17.74
		3	3	18.80	17.53	17.92	17.66
		6	0	18.80	17.46	17.87	17.63
	16QAM	1	0	18.80	17.87	17.86	17.83
		1	2	18.80	17.98	17.99	17.82
		1	5	18.80	17.53	17.85	17.39
		3	0	18.80	17.41	17.88	17.76
		3	1	18.80	17.50	17.93	17.74
		3	3	18.80	17.53	17.92	17.66
		6	0	18.80	17.46	17.87	17.63
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26705	26865	27025
					815.5	831	847.5
3MHz	QPSK	1	0	18.80	17.25	17.54	17.76
		1	7	18.80	18.00	17.97	18.00
		1	14	18.80	17.48	17.55	17.13
		8	0	18.80	17.60	17.83	17.86
		8	3	18.80	17.78	17.89	17.80
		8	7	18.80	17.66	17.80	17.58
		15	0	18.80	17.65	17.81	17.68
	16QAM	1	0	18.80	17.25	17.54	17.76
		1	7	18.80	18.00	17.97	18.00
		1	14	18.80	17.48	17.55	17.13
		8	0	18.80	17.60	17.83	17.86
		8	3	18.80	17.78	17.89	17.80
		8	7	18.80	17.66	17.80	17.58
		15	0	18.80	17.65	17.81	17.68

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26715	26865	27015
					816.5	831	846.5
5MHz	QPSK	1	0	18.80	17.27	17.72	17.78
		1	12	18.80	17.90	18.13	18.15
		1	24	18.80	17.47	17.64	17.21
		12	0	18.80	17.71	17.98	18.11
		12	6	18.80	17.87	18.08	18.09
		12	13	18.80	17.79	17.99	17.91
		25	0	18.80	17.71	17.87	17.90
	16QAM	1	0	18.80	17.27	17.72	17.78
		1	12	18.80	17.90	18.13	18.15
		1	24	18.80	17.47	17.64	17.21
		12	0	18.80	17.51	17.78	17.91
		12	6	18.80	17.67	17.88	17.89
		12	13	18.80	17.59	17.79	17.71
		25	0	18.80	17.51	17.67	17.70
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26750	26865	26990
					820	831	844
10MHz	QPSK	1	0	18.80	17.12	17.44	17.47
		1	24	18.80	18.02	18.21	18.25
		1	49	18.80	17.13	17.36	17.20
		25	0	18.80	17.74	17.81	17.89
		25	12	18.80	17.84	17.99	18.11
		25	25	18.80	17.56	17.76	17.78
		50	0	18.80	17.64	17.80	17.83
	16QAM	1	0	18.80	17.12	17.44	17.47
		1	24	18.80	18.02	18.21	18.25
		1	49	18.80	17.13	17.36	17.20
		25	0	18.80	17.44	17.51	17.59
		25	12	18.80	17.54	17.69	17.81
		25	25	18.80	17.26	17.46	17.48
		50	0	18.80	17.34	17.50	17.53

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26775	26865	26965
					822.5	831	841.5
15MHz	QPSK	1	0	18.80	16.94	17.03	17.39
		1	37	18.80	17.89	18.27	18.13
		1	74	18.80	17.93	18.00	17.95
		36	0	18.80	17.56	18.00	17.75
		36	19	18.80	17.70	17.96	17.89
		36	39	18.80	17.39	17.59	17.67
		75	0	18.80	17.48	17.68	17.77
	16QAM	1	0	18.80	16.94	17.03	17.39
		1	37	18.80	17.59	17.90	17.83
		1	74	18.80	17.63	17.70	17.65
		36	0	18.80	17.26	17.70	17.45
		36	19	18.80	17.40	17.66	17.59
		36	39	18.80	17.09	17.29	17.37
		75	0	18.80	17.18	17.38	17.47

8.1.7 CONDUCTED POWER MEASUREMENTS OF LTE Band 38

1) Conducted power measurement results of LTE Band 38 (Main full Power)

FDD LTE B38					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37775	38000	38225
					2572.5	2595	2617.5
5MHz	QPSK	1	0	22.70	21.70	21.57	21.92
		1	12	22.70	21.97	21.68	22.07
		1	24	22.70	21.62	21.53	21.71
		12	0	22.10	20.87	20.82	21.16
		12	6	22.10	20.94	20.80	21.26
		12	13	22.10	20.91	20.69	21.13
		25	0	22.10	20.88	20.62	21.13
	16QAM	1	0	22.10	20.88	20.81	21.18
		1	12	22.10	20.94	20.90	21.37
		1	24	22.10	20.88	20.75	20.93
		12	0	22.10	20.87	20.73	21.22
		12	6	22.10	20.94	20.70	21.27
		12	13	22.10	20.90	20.88	21.13
		25	0	22.10	20.93	20.64	21.12
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37800	38000	38200
					2575	2595	2615
10MHz	QPSK	1	0	22.70	21.61	21.51	21.80
		1	24	22.70	22.11	21.72	22.11
		1	49	22.70	21.63	21.59	21.79
		25	0	22.10	20.94	20.68	21.07
		25	12	22.10	21.08	20.69	21.13
		25	25	22.10	20.89	20.87	21.06
		50	0	22.10	20.90	20.62	21.09
	16QAM	1	0	22.10	20.74	20.67	20.98
		1	24	22.10	21.12	20.77	21.43
		1	49	22.10	20.66	20.77	20.99
		25	0	22.10	20.95	20.63	21.00
		25	12	22.10	21.09	20.68	21.15
		25	25	22.10	20.96	20.83	21.07
		50	0	22.10	20.90	20.66	21.09

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37825	38000	38175
					2577.5	2595	2612.5
15MHz	QPSK	1	0	22.70	21.41	21.50	21.49
		1	37	22.70	22.13	21.75	22.14
		1	74	22.70	21.36	21.55	21.66
		36	0	22.10	20.95	20.73	20.93
		36	19	22.10	21.10	20.76	21.16
		36	39	22.10	20.91	20.86	21.01
		75	0	22.10	20.93	20.62	20.92
	16QAM	1	0	22.10	20.62	20.77	20.78
		1	37	22.10	20.94	20.83	21.33
		1	74	22.10	20.75	20.76	20.78
		36	0	22.10	20.91	20.65	20.83
		36	19	22.10	21.04	20.74	21.12
		36	39	22.10	20.85	20.78	21.04
		75	0	22.10	20.84	20.83	20.92
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37850	38000	38150
					2580	2595	2610
20MHz	QPSK	1	0	22.70	21.68	21.67	21.55
		1	50	22.70	22.15	21.80	22.17
		1	99	22.70	21.62	21.51	21.86
		50	0	22.10	21.12	20.86	20.92
		50	25	22.10	21.18	20.86	21.15
		50	50	22.10	20.99	20.68	21.14
		100	0	22.10	21.09	20.75	21.00
	16QAM	1	0	22.10	20.86	20.79	20.83
		1	50	22.10	20.94	20.70	21.18
		1	99	22.10	20.88	20.79	21.14
		50	0	22.10	21.06	20.87	20.90
		50	25	22.10	21.11	20.83	21.19
		50	50	22.10	20.91	20.68	21.16
		100	0	22.10	21.02	20.73	21.03

2) Conducted power measurement results of LTE Band 38 (Sub Power receiver off)

FDD LTE B38					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37775	38000	38225
					2572.5	2595	2617.5
5MHz	QPSK	1	0	23.50	21.86	21.94	22.45
		1	12	23.50	22.12	22.17	22.70
		1	24	23.50	21.79	21.74	22.21
		12	0	22.90	21.10	21.18	21.63
		12	6	22.90	21.15	21.17	21.72
		12	13	22.90	21.10	21.07	21.59
		25	0	22.90	21.08	21.05	21.59
	16QAM	1	0	22.90	20.91	21.09	21.59
		1	12	22.90	21.11	21.21	21.88
		1	24	22.90	20.90	20.95	21.38
		12	0	22.90	21.01	21.14	21.61
		12	6	22.90	21.06	21.12	21.69
		12	13	22.90	20.99	21.03	21.56
		25	0	22.90	21.05	21.06	21.55
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37800	38000	38200
					2575	2595	2615
10MHz	QPSK	1	0	23.50	21.79	21.93	22.32
		1	24	23.50	22.25	22.21	22.69
		1	49	23.50	21.76	21.83	22.28
		25	0	22.90	21.09	21.10	21.53
		25	12	22.90	21.20	21.18	21.63
		25	25	22.90	21.05	21.08	21.53
		50	0	22.90	21.03	21.09	21.54
	16QAM	1	0	22.90	21.05	20.91	21.23
		1	24	22.90	21.42	21.16	21.67
		1	49	22.90	21.04	20.95	21.24
		25	0	22.90	21.11	21.08	21.48
		25	12	22.90	21.20	21.13	21.63
		25	25	22.90	21.03	21.05	21.48
		50	0	22.90	21.02	21.06	21.56

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37825	38000	38175
					2577.5	2595	2612.5
15MHz	QPSK	1	0	23.50	21.56	21.68	21.83
		1	37	23.50	22.19	22.16	22.57
		1	74	23.50	21.53	21.61	22.08
		36	0	22.90	21.01	21.03	21.35
		36	19	22.90	21.20	21.14	21.55
		36	39	22.90	20.97	21.00	21.47
		75	0	22.90	20.98	20.98	21.38
	16QAM	1	0	22.90	20.95	20.94	20.90
		1	37	22.90	21.12	21.12	21.50
		1	74	22.90	20.95	20.93	21.16
		36	0	22.90	21.01	21.07	21.39
		36	19	22.90	21.14	21.22	21.55
		36	39	22.90	20.95	21.03	21.47
		75	0	22.90	21.03	21.01	21.37
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37850	38000	38150
					2580	2595	2610
20MHz	QPSK	1	0	23.50	22.16	21.92	22.05
		1	50	23.50	22.15	22.23	22.75
		1	99	23.50	21.64	22.00	22.17
		50	0	22.90	21.17	21.12	21.41
		50	25	22.90	21.09	21.23	21.62
		50	50	22.90	20.96	21.17	21.56
		100	0	22.90	21.02	21.15	21.47
	16QAM	1	0	22.90	21.17	21.03	21.08
		1	50	22.90	21.49	21.38	21.54
		1	99	22.90	21.09	21.11	21.24
		50	0	22.90	21.15	21.14	21.39
		50	25	22.90	21.26	21.22	21.59
		50	50	22.90	21.10	21.18	21.62
		100	0	22.90	21.15	21.14	21.45

3) Conducted power measurement results of LTE Band 38 (Sub Power receiver on or hotspot)

FDD LTE B38					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37775	38000	38225
					2572.5	2595	2617.5
5MHz	QPSK	1	0	20.70	19.71	20.04	20.39
		1	12	20.70	20.36	20.21	20.64
		1	24	20.70	19.18	19.78	20.16
		12	0	20.70	19.20	19.24	19.61
		12	6	20.70	19.12	19.23	19.70
		12	13	20.70	19.07	19.13	19.56
		25	0	20.70	19.06	19.05	19.57
	16QAM	1	0	20.70	19.70	19.03	19.56
		1	12	20.70	19.00	19.22	19.80
		1	24	20.70	19.59	18.80	19.34
		12	0	20.70	19.06	19.18	19.64
		12	6	20.70	19.12	19.17	19.73
		12	13	20.70	19.04	19.07	19.60
		25	0	20.70	19.02	19.06	19.55
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37800	38000	38200
					2575	2595	2615
10MHz	QPSK	1	0	20.70	19.78	19.88	20.29
		1	24	20.70	20.23	20.18	20.65
		1	49	20.70	19.76	19.79	20.24
		25	0	20.70	19.07	19.08	19.52
		25	12	20.70	19.18	19.15	19.62
		25	25	20.70	19.04	19.05	19.54
		50	0	20.70	19.01	19.06	19.59
	16QAM	1	0	20.70	19.57	18.76	19.45
		1	24	20.70	19.07	19.09	19.82
		1	49	20.70	19.58	19.06	19.41
		25	0	20.70	19.07	19.04	19.51
		25	12	20.70	19.13	19.16	19.56
		25	25	20.70	19.08	19.00	19.52
		50	0	20.70	19.02	19.04	19.56

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37825	38000	38175
					2577.5	2595	2612.5
15MHz	QPSK	1	0	20.70	19.64	19.81	19.90
		1	37	20.70	20.24	20.14	20.57
		1	74	20.70	19.55	19.73	20.18
		36	0	20.70	19.03	19.09	19.39
		36	19	20.70	19.23	19.20	19.59
		36	39	20.70	19.01	19.06	19.51
		75	0	20.70	19.01	19.04	19.37
	16QAM	1	0	20.70	19.43	18.83	19.04
		1	37	20.70	19.23	18.95	19.73
		1	74	20.70	19.41	18.79	19.23
		36	0	20.70	18.97	19.05	19.32
		36	19	20.70	19.23	19.14	19.52
		36	39	20.70	18.97	18.99	19.52
		75	0	20.70	18.98	18.99	19.38
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					37850	38000	38150
					2580	2595	2610
20MHz	QPSK	1	0	20.70	19.84	19.91	20.12
		1	50	20.70	20.29	20.23	20.67
		1	99	20.70	19.86	20.00	20.25
		50	0	19.70	19.21	19.19	19.47
		50	25	19.70	19.28	19.29	19.61
		50	50	19.70	19.15	19.23	19.56
		100	0	19.70	19.22	19.18	19.46
	16QAM	1	0	21.00	19.32	19.02	19.43
		1	50	21.00	19.79	19.16	19.89
		1	99	21.00	19.21	19.22	19.13
		50	0	20.70	19.15	19.12	19.44
		50	25	20.70	19.24	19.23	19.64
		50	50	20.70	19.11	19.20	19.53
		100	0	20.70	19.19	19.16	19.46

8.1.8 CONDUCTED POWER MEASUREMENTS OF LTE Band 41

1) Conducted power measurement results of LTE Band 41 (Main full Power)

FDD LTE B41					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40165	40690	41065
					2547.5	2600	2637.5
5MHz	QPSK	1	0	22.40	21.08	21.58	21.74
		1	12	22.40	21.46	21.78	21.73
		1	24	22.40	21.03	21.30	21.34
		12	0	21.80	20.37	20.81	20.92
		12	6	21.80	20.46	20.84	20.95
		12	13	21.80	20.32	20.58	20.71
		25	0	21.80	20.34	20.68	20.86
	16QAM	1	0	21.80	20.31	20.76	20.77
		1	12	21.80	20.67	21.03	20.95
		1	24	21.80	20.32	20.55	20.38
		12	0	21.80	20.38	20.83	20.96
		12	6	21.80	20.45	20.88	21.00
		12	13	21.80	20.32	20.69	20.83
		25	0	21.80	20.33	20.65	20.87
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40190	40690	41090
					2550	2600	2640
10MHz	QPSK	1	0	22.40	21.06	21.56	21.71
		1	24	22.40	21.52	21.81	21.80
		1	49	22.40	21.15	21.39	21.46
		25	0	21.80	20.38	20.81	20.89
		25	12	21.80	20.42	20.84	20.89
		25	25	21.80	20.47	20.65	20.79
		50	0	21.80	20.43	20.66	20.83
	16QAM	1	0	21.80	20.32	20.38	20.69
		1	24	21.80	20.66	20.85	20.88
		1	49	21.80	20.43	20.34	20.41
		25	0	21.80	20.37	20.77	20.89
		25	12	21.80	20.47	20.79	20.87
		25	25	21.80	20.42	20.58	20.77
		50	0	21.80	20.31	20.73	20.87

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40215	40690	41115
					2552.5	2600	2642.5
15MHz	QPSK	1	0	22.40	21.11	21.34	21.36
		1	37	22.40	21.61	21.81	21.80
		1	74	22.40	21.29	21.42	21.35
		36	0	21.80	20.47	20.80	20.92
		36	19	21.80	20.74	20.84	20.89
		36	39	21.80	20.96	20.78	20.77
		75	0	21.80	20.53	20.71	20.73
	16QAM	1	0	21.80	20.36	20.32	20.76
		1	37	21.80	20.79	20.88	21.18
		1	74	21.80	20.36	20.36	20.61
		36	0	21.80	20.39	20.65	20.75
		36	19	21.80	20.63	20.77	20.97
		36	39	21.80	20.53	20.63	20.81
		75	0	21.80	20.38	20.65	20.76
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40240	40690	41140
					2555	2600	2645
20MHz	QPSK	1	0	22.40	21.04	21.50	21.60
		1	50	22.40	21.58	21.75	21.89
		1	99	22.40	21.61	21.63	21.63
		50	0	21.80	20.61	20.77	20.89
		50	25	21.80	20.67	20.76	20.87
		50	50	21.80	20.66	20.78	20.99
		100	0	21.80	20.64	20.70	20.93
	16QAM	1	0	21.80	20.40	20.69	20.91
		1	50	21.80	20.83	20.82	20.98
		1	99	21.80	20.91	20.72	20.86
		50	0	21.80	20.49	20.73	20.93
		50	25	21.80	20.65	20.78	20.96
		50	50	21.80	20.70	20.66	20.93
		100	0	21.80	20.64	20.76	20.97

2) Conducted power measurement results of LTE Band 41 (Sub Power receiver off)

FDD LTE B41					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40165	40690	41065
					2547.5	2600	2637.5
5MHz	QPSK	1	0	22.20	20.51	21.13	21.51
		1	12	22.20	20.94	21.56	21.60
		1	24	22.20	20.53	21.17	20.97
		12	0	21.50	19.76	20.39	20.54
		12	6	21.50	19.90	20.41	20.54
		12	13	21.50	19.77	20.39	20.31
		25	0	21.50	19.78	20.34	20.43
	16QAM	1	0	21.50	19.91	20.51	20.61
		1	12	21.50	20.37	20.98	21.04
		1	24	21.50	19.92	20.56	20.63
		12	0	21.50	19.78	20.36	20.45
		12	6	21.50	19.87	20.41	20.59
		12	13	21.50	19.73	20.37	20.46
		25	0	21.50	19.70	20.31	20.43
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40190	40690	41090
					2550	2600	2640
10MHz	QPSK	1	0	22.20	20.45	21.03	21.40
		1	24	22.20	21.05	21.59	22.01
		1	49	22.20	20.70	21.35	21.65
		25	0	21.50	19.79	20.38	20.82
		25	12	21.50	20.01	20.56	21.01
		25	25	21.50	20.00	20.54	21.00
		50	0	21.50	19.88	20.31	20.84
	16QAM	1	0	21.50	19.83	20.39	20.72
		1	24	21.50	20.46	20.94	21.31
		1	49	21.50	20.14	20.68	21.12
		25	0	21.50	19.77	20.37	20.64
		25	12	21.50	19.99	20.43	20.93
		25	25	21.50	19.98	20.51	20.91
		50	0	21.50	19.85	20.41	20.71

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40215	40690	41115
					2552.5	2600	2642.5
15MHz	QPSK	1	0	22.20	20.24	20.71	21.16
		1	37	22.20	21.20	21.74	22.15
		1	74	22.20	20.74	21.32	21.82
		36	0	21.50	19.80	20.34	20.83
		36	19	21.50	20.15	20.65	21.08
		36	39	21.50	20.07	20.51	21.01
		75	0	21.50	20.91	21.43	21.09
	16QAM	1	0	21.50	19.54	20.05	20.54
		1	37	21.50	20.54	21.03	20.93
		1	74	21.50	20.12	20.37	21.08
		36	0	21.50	19.77	20.37	20.74
		36	19	21.50	20.11	20.62	21.01
		36	39	21.50	20.03	20.57	20.96
		75	0	21.50	19.92	20.41	20.89
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40240	40690	41140
					2555	2600	2645
20MHz	QPSK	1	0	22.20	20.51	21.05	21.46
		1	50	22.20	21.28	21.76	22.14
		1	99	22.20	21.14	21.68	22.08
		50	0	21.50	19.97	20.51	20.93
		50	25	21.50	20.21	20.76	21.24
		50	50	21.50	20.15	20.61	21.14
		100	0	21.50	20.19	20.72	21.27
	16QAM	1	0	21.50	19.87	20.37	20.86
		1	50	21.50	20.65	21.13	21.28
		1	99	21.50	20.45	20.94	21.38
		50	0	21.50	19.87	20.38	20.96
		50	25	21.50	20.18	20.69	21.12
		50	50	21.50	20.12	20.73	20.97
		100	0	21.50	20.14	20.68	21.05

3) Conducted power measurement results of LTE Band 41 (Sub Power receiver on or hotspot)

FDD LTE B41					Conducted Power (dBm)		
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40165	40690	41065
					2547.5	2600	2637.5
5MHz	QPSK	1	0	19.50	17.58	17.76	17.84
		1	12	19.50	17.86	18.02	18.13
		1	24	19.50	17.61	17.55	17.59
		12	0	19.50	17.58	17.74	18.02
		12	6	19.50	17.70	17.81	18.03
		12	13	19.50	17.58	17.63	17.83
		25	0	19.50	17.55	17.58	17.86
	16QAM	1	0	19.50	17.54	17.85	17.98
		1	12	19.50	17.88	18.09	18.14
		1	24	19.50	17.51	17.53	17.51
		12	0	19.50	17.59	17.81	17.98
		12	6	19.50	17.74	17.93	18.02
		12	13	19.50	17.70	17.71	17.85
		25	0	19.50	17.57	17.73	17.88
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40190	40690	41090
					2550	2600	2640
10MHz	QPSK	1	0	19.50	17.54	17.67	18.06
		1	24	19.50	18.03	17.88	18.16
		1	49	19.50	17.73	17.56	17.67
		25	0	19.50	17.81	17.74	18.06
		25	12	19.50	17.84	17.88	18.05
		25	25	19.50	17.90	17.73	17.92
		50	0	19.50	17.88	17.56	17.98
	16QAM	1	0	19.50	17.53	17.54	17.83
		1	24	19.50	17.97	17.86	17.95
		1	49	19.50	17.83	17.55	17.58
		25	0	19.50	17.61	17.68	17.93
		25	12	19.50	17.71	17.74	17.94
		25	25	19.50	17.74	17.63	17.84
		50	0	19.50	17.68	17.50	17.82

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40215	40690	41115
					2552.5	2600	2642.5
15MHz	QPSK	1	0	19.40	17.42	17.73	18.04
		1	37	19.40	18.18	17.46	18.14
		1	74	19.40	17.82	17.55	17.59
		36	0	19.40	17.58	17.54	17.84
		36	19	19.40	17.68	17.78	17.93
		36	39	19.40	17.88	17.59	17.81
		75	0	19.40	17.78	17.54	17.73
	16QAM	1	0	19.40	17.42	17.40	17.93
		1	37	19.40	17.73	17.92	18.11
		1	74	19.40	17.57	17.49	17.68
		36	0	19.40	17.61	17.49	17.77
		36	19	19.40	17.65	17.56	17.82
		36	39	19.40	17.42	17.52	17.66
		75	0	19.40	17.41	17.46	17.62
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					40240	40690	41140
					2555	2600	2645
20MHz	QPSK	1	0	19.50	17.81	17.94	18.14
		1	50	19.50	18.25	18.21	18.23
		1	99	19.50	18.22	18.06	17.82
		50	0	19.50	17.81	17.87	17.90
		50	25	19.50	17.92	17.91	17.82
		50	50	19.50	17.88	17.88	17.75
		100	0	19.50	17.85	17.84	17.83
	16QAM	1	0	19.50	17.74	17.88	17.83
		1	50	19.50	18.14	18.11	17.90
		1	99	19.50	18.12	18.02	17.70
		50	0	19.50	17.66	17.93	17.72
		50	25	19.50	17.54	17.65	17.82
		50	50	19.50	17.53	17.62	17.76
		100	0	19.50	17.52	17.60	17.88

8.1.9 CONDUCTED POWER MEASUREMENTS OF WiFi 2.4G

1) Conducted power measurement results of WiFi 2.4G (Full Power)

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Power Setting	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11b	1	2412	1	17.00	18.70	17.26	No
	6	2437		17.00	18.70	16.80	Yes
	11	2462		17.00	18.70	16.78	No
802.11g	1	2412	6	16.00	18.00	Not Required	No
	6	2437		16.00	18.00	Not Required	No
	11	2462		16.00	18.00	Not Required	No
802.11n HT20	1	2412	6.5	14.00	16.00	Not Required	No
	6	2437		14.00	16.00	Not Required	No
	11	2462		14.00	16.00	Not Required	No
802.11n HT40	3	2422	13.5	14.00	16.00	Not Required	No
	6	2437		14.00	16.00	Not Required	No
	9	2452		14.00	16.00	Not Required	No

2) Conducted power measurement results of WiFi 2.4G (Ruduce Power)

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Power Setting	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11b	1	2412	1	14.00	15.70	14.21	Yes
	6	2437		14.00	15.70	13.73	No
	11	2462		14.00	15.70	13.86	No
802.11g	1	2412	6	14.00	16.00	14.79	No
	6	2437		14.00	16.00	14.85	No
	11	2462		14.00	16.00	14.78	No
802.11n HT20	1	2412	6.5	14.00	15.70	Not Required	No
	6	2437		14.00	15.70	Not Required	No
	11	2462		14.00	15.70	Not Required	No
802.11n HT40	3	2422	13.5	14.00	15.70	Not Required	No
	6	2437		14.00	15.70	Not Required	No
	9	2452		14.00	15.70	Not Required	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.

8.1.10 CONDUCTED POWER MEASUREMENTS OF BT

BT	Tune Up	Average Conducted Power (dBm)		
		CH0	CH39	CH78
DH5	9.5	8.62	8.57	8.53
2DH5	9.5	2.16	2.26	2.37
3DH5	9.5	2.15	2.24	2.33

BT	Tune Up	Average Conducted Power (dBm)		
		CH0	CH19	CH39
BLE	9.5	-0.67	0.30	-0.58

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 Section7.1.4 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 for 5GHZ WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed power. Other transmission mode were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than1.2W/kg. See Section 7.1.4 for more information.

8.2.1 SAR MEASUREMENT RESULT

1. SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	Ant	State	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T01	GSM 850	GSM	190	Right Cheek	1	-	33	31.19	0.07	0.313	0.243	1.52	0.475
T02	GSM 850	GSM	190	Right Tilted	1	-	33	31.19	0.02	0.101	0.083	1.52	0.153
T03	GSM 850	GSM	190	Left Cheek	1	-	33	31.19	0.04	0.281	0.221	1.52	0.426
T04	GSM 850	GSM	190	Left Tilted	1	-	33	31.19	-0.03	0.244	0.196	1.52	0.370
T10	GSM 850	GSM	190	Right Cheek	2	-	28	26.87	-0.04	0.677	0.356	1.30	0.878
T11	GSM 850	GSM	190	Right Tilted	2	-	28	26.87	0.05	0.561	0.274	1.30	0.728
T12	GSM 850	GSM	190	Left Cheek	2	-	28	26.87	0.05	0.467	0.261	1.30	0.606
T13	GSM 850	GSM	190	Left Tilted	2	-	28	26.87	0.01	0.507	0.251	1.30	0.658
T14	GSM 850	GSM	128	Right Cheek	2	-	28	26.87	-0.02	0.692	0.357	1.30	0.898
T15	GSM 850	GSM	251	Right Cheek	2	-	28	26.96	-0.01	0.656	0.339	1.27	0.833
T21	GSM 1900	GSM	661	Right Cheek	1	1	30	28.77	-0.03	0.159	0.103	1.33	0.211
T22	GSM 1900	GSM	661	Right Cheek	1	2	30	28.77	0.09	0.241	0.15	1.33	0.320
T23	GSM 1900	GSM	661	Right Tilted	1	2	30	28.77	0.03	0.114	0.073	1.33	0.151
T24	GSM 1900	GSM	661	Left Cheek	1	2	30	28.77	0.07	0.167	0.106	1.33	0.222
T25	GSM 1900	GSM	661	Left Tilted	1	2	30	28.77	0.02	0.103	0.081	1.33	0.137
T26	GSM 1900	GSM	661	Right Cheek	1	1	30	28.77	-0.01	0.162	0.11	1.33	0.215
T30	GSM 1900	GSM	661	Right Cheek	2	-	25.8	24.72	0.02	0.704	0.389	1.28	0.903
T31	GSM 1900	GSM	661	Right Tilted	2	-	25.8	24.72	0.01	0.632	0.347	1.28	0.810
T32	GSM 1900	GSM	661	Left Cheek	2	-	25.8	24.72	0.05	0.331	0.197	1.28	0.424
T33	GSM 1900	GSM	661	Left Tilted	2	-	25.8	24.72	-0.03	0.376	0.205	1.28	0.482
T34	GSM 1900	GSM	512	Right Cheek	2	-	25.8	24.84	-0.06	0.624	0.346	1.25	0.778
T35	GSM 1900	GSM	810	Right Cheek	2	-	25.8	24.64	0.01	0.792	0.435	1.31	1.034
T36	GSM 1900	GSM	512	Right Tilted	2	-	25.8	24.84	0.06	0.594	0.329	1.25	0.741
T37	GSM 1900	GSM	810	Right Tilted	2	-	25.8	24.64	-0.05	0.736	0.413	1.31	0.961

2. SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Ant	State	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T41	UMTS B5	RMC12.2K	4182	Right Cheek	1	-	24	22.27	0.13	0.313	0.243	1.49	0.466
T42	UMTS B5	RMC12.2K	4182	Right Tilted	1	-	24	22.27	0.05	0.122	0.1	1.49	0.182
T43	UMTS B5	RMC12.2K	4182	Left Cheek	1	-	24	22.27	0.01	0.261	0.201	1.49	0.389
T44	UMTS B5	RMC12.2K	4182	Left Tilted	1	-	24	22.27	-0.03	0.166	0.133	1.49	0.247
T50	UMTS B5	RMC12.2K	4182	Right Cheek	2	-	19	17.71	0.06	0.786	0.409	1.35	1.058
T51	UMTS B5	RMC12.2K	4182	Right Tilted	2	-	19	17.71	0.05	0.673	0.352	1.35	0.906
T52	UMTS B5	RMC12.2K	4182	Left Cheek	2	-	19	17.71	-0.03	0.547	0.305	1.35	0.736
T53	UMTS B5	RMC12.2K	4182	Left Tilted	2	-	19	17.71	0.01	0.529	0.274	1.35	0.712
T54	UMTS B5	RMC12.2K	4132	Right Cheek	2	-	19	17.79	0.05	0.782	0.4	1.32	1.033
T55	UMTS B5	RMC12.2K	4233	Right Cheek	2	-	19	17.8	-0.02	0.784	0.405	1.32	1.034
T56	UMTS B5	RMC12.2K	4132	Right Tilted	2	-	19	17.79	0.05	0.668	0.342	1.32	0.883
T57	UMTS B5	RMC12.2K	4233	Right Tilted	2	-	19	17.8	0.05	0.679	0.346	1.32	0.895

3. SAR test results of LTE B7

Test No.	Band	Mode	Channel	RB	offset	Test Position	Ant	state	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T61	LTE B7	QPSK20M	21350	1	50	Right Cheek	1	1	23.5	22.64	-0.02	0.333	0.182	1.22	0.406
T62	LTE B7	QPSK20M	21350	1	50	Right Cheek	1	2	23.5	22.64	0.06	0.205	0.124	1.22	0.250
T63	LTE B7	QPSK20M	21350	1	50	Right Tilted	1	1	23.5	22.64	0.06	0.156	0.083	1.22	0.190
T64	LTE B7	QPSK20M	21350	1	50	Left Cheek	1	1	23.5	22.64	0.15	0.653	0.332	1.22	0.796
T65	LTE B7	QPSK20M	21350	1	50	Left Tilted	1	1	23.5	22.64	-0.13	0.285	0.131	1.22	0.347
T66	LTE B7	QPSK20M	21350	50	0	Right Cheek	1	1	21.8	21.02	0.03	0.206	0.111	1.20	0.246
T67	LTE B7	QPSK20M	21350	50	0	Right Tilted	1	1	21.8	21.02	-0.02	0.105	0.058	1.20	0.126
T68	LTE B7	QPSK20M	21350	50	0	Left Cheek	1	1	21.8	21.02	0.09	0.431	0.219	1.20	0.515
T69	LTE B7	QPSK20M	21350	50	0	Left Tilted	1	1	21.8	21.02	-0.03	0.165	0.087	1.20	0.197
T70	LTE B7	QPSK20M	21350	1	50	Left Cheek	1	2	23.5	21.90	0.04	0.438	0.226	1.44	0.632
T71	LTE B7	QPSK20M	20850	1	50	Right Cheek	2	-	16.5	16.10	0.09	0.691	0.327	1.10	0.758
T72	LTE B7	QPSK20M	20850	1	50	Right Tilted	2	-	16.5	16.10	0.01	0.577	0.252	1.10	0.633
T73	LTE B7	QPSK20M	20850	1	50	Left Cheek	2	-	16.5	16.10	0.06	0.268	0.136	1.10	0.294
T74	LTE B7	QPSK20M	20850	1	50	Left Tilted	2	-	16.5	16.10	-0.03	0.247	0.12	1.10	0.271
T75	LTE B7	QPSK20M	21350	50	0	Right Cheek	2	-	16.5	15.56	0.03	0.606	0.283	1.24	0.752
T76	LTE B7	QPSK20M	21350	50	0	Right Tilted	2	-	16.5	15.56	0.01	0.514	0.219	1.24	0.638
T77	LTE B7	QPSK20M	21350	50	0	Left Cheek	2	-	16.5	15.56	0.08	0.228	0.113	1.24	0.283
T78	LTE B7	QPSK20M	21350	50	0	Left Tilted	2	-	16.5	15.56	0.07	0.205	0.097	1.24	0.255

4. SAR test results of LTE B26

Test No.	Band	Mode	Channel	RB	offset	Test Position	Ant	state	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T81	LTE B26	QPSK15M	26965	1	37	Right Cheek	1	-	23.2	22.41	0.08	0.291	0.225	1.20	0.349
T82	LTE B26	QPSK15M	26965	1	37	Right Tilted	1	-	23.2	22.41	0.02	0.167	0.134	1.20	0.200
T83	LTE B26	QPSK15M	26965	1	37	Left Cheek	1	-	23.2	22.41	0.01	0.259	0.202	1.20	0.311
T84	LTE B26	QPSK15M	26965	1	37	Left Tilted	1	-	23.2	22.41	-0.06	0.106	0.085	1.20	0.127
T85	LTE B26	QPSK15M	26865	36	0	Right Cheek	1	-	22.5	21.54	0.05	0.183	0.141	1.25	0.228
T86	LTE B26	QPSK15M	26865	36	0	Right Tilted	1	-	22.5	21.54	0.07	0.072	0.059	1.25	0.090
T87	LTE B26	QPSK15M	26865	36	0	Left Cheek	1	-	22.5	21.54	0.01	0.163	0.125	1.25	0.204
T88	LTE B26	QPSK15M	26865	36	0	Left Tilted	1	-	22.5	21.54	0.02	0.098	0.075	1.25	0.122
T91	LTE B26	QPSK15M	26865	1	37	Right Cheek	2	-	18.8	18.27	-0.01	0.657	0.342	1.13	0.743
T92	LTE B26	QPSK15M	26865	1	37	Right Tilted	2	-	18.8	18.27	0.02	0.571	0.296	1.13	0.646
T93	LTE B26	QPSK15M	26865	1	37	Left Cheek	2	-	18.8	18.27	0.04	0.408	0.235	1.13	0.461
T94	LTE B26	QPSK15M	26865	1	37	Left Tilted	2	-	18.8	18.27	-0.06	0.411	0.218	1.13	0.465
T95	LTE B26	QPSK15M	26865	36	0	Right Cheek	2	-	18.8	18.00	0.01	0.502	0.282	1.20	0.603
T96	LTE B26	QPSK15M	26865	36	0	Right Tilted	2	-	18.8	18.00	-0.03	0.547	0.276	1.20	0.658
T97	LTE B26	QPSK15M	26865	36	0	Left Cheek	2	-	18.8	18.00	0.05	0.354	0.207	1.20	0.426
T98	LTE B26	QPSK15M	26865	36	0	Left Tilted	2	-	18.8	18.00	0.07	0.363	0.201	1.20	0.436

5. SAR test results of LTE B38

Test No.	Band	Mode	Channel	RB	offset	Test Position	Ant	state	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T101	LTE B38	QPSK20M	38150	1	50	Right Cheek	1	-	22.7	22.17	-0.05	0.199	0.102	1.13	0.225
T102	LTE B38	QPSK20M	38150	1	50	Right Tilted	1	-	22.7	22.17	0.02	0.065	0.035	1.13	0.074
T103	LTE B38	QPSK20M	38150	1	50	Left Cheek	1	-	22.7	22.17	0.01	0.11	0.061	1.13	0.124
T104	LTE B38	QPSK20M	38150	1	50	Left Tilted	1	-	22.7	22.17	-0.03	0.096	0.05	1.13	0.109
T105	LTE B38	QPSK20M	37850	50	25	Right Cheek	1	-	22.1	21.18	0.06	0.179	0.092	1.23	0.221
T106	LTE B38	QPSK20M	37850	50	25	Right Tilted	1	-	22.1	21.18	0.07	0.066	0.034	1.23	0.082
T107	LTE B38	QPSK20M	37850	50	25	Left Cheek	1	-	22.1	21.18	0.08	0.175	0.091	1.23	0.216
T108	LTE B38	QPSK20M	37850	50	25	Left Tilted	1	-	22.1	21.18	0.02	0.103	0.052	1.23	0.127
T111	LTE B38	QPSK20M	38150	1	50	Right Cheek	2	-	20.7	20.67	0.08	1.07	0.509	1.01	1.078
T112	LTE B38	QPSK20M	38150	1	50	Right Tilted	2	-	20.7	20.67	0.01	0.851	0.374	1.01	0.858
T113	LTE B38	QPSK20M	38150	1	50	Left Cheek	2	-	20.7	20.67	0.06	0.386	0.2	1.01	0.389
T114	LTE B38	QPSK20M	38150	1	50	Left Tilted	2	-	20.7	20.67	-0.03	0.31	0.155	1.01	0.312
T115	LTE B38	QPSK20M	38150	50	25	Right Cheek	2	-	19.7	19.61	0.02	0.857	0.395	1.02	0.875
T116	LTE B38	QPSK20M	38150	50	25	Right Tilted	2	-	19.7	19.61	0.05	0.825	0.357	1.02	0.843
T117	LTE B38	QPSK20M	38150	50	25	Left Cheek	2	-	19.7	19.61	0.01	0.384	0.19	1.02	0.392
T118	LTE B38	QPSK20M	38150	50	25	Left Tilted	2	-	19.7	19.61	0.03	0.311	0.158	1.02	0.318
T119	LTE B38	QPSK20M	37850	1	50	Right Cheek	2	-	20.7	20.29	0.02	0.822	0.393	1.10	0.904
T120	LTE B38	QPSK20M	38000	1	50	Right Cheek	2	-	20.7	20.23	0.09	0.848	0.404	1.11	0.945
T411	LTE B38	QPSK20M	37850	1	50	Right Tilted	2	-	20.7	20.29	0.06	0.782	0.366	1.10	0.860
T412	LTE B38	QPSK20M	38000	1	50	Right Tilted	2	-	20.7	20.23	0.01	0.763	0.351	1.11	0.850
T413	LTE B38	QPSK20M	37850	50	25	Right Cheek	2	-	19.7	19.28	0.05	0.793	0.349	1.10	0.874
T414	LTE B38	QPSK20M	38000	50	25	Right Cheek	2	-	19.7	19.29	-0.03	0.752	0.348	1.10	0.826
T415	LTE B38	QPSK20M	37850	50	25	Right Tilted	2	-	19.7	19.28	0.05	0.779	0.323	1.10	0.859
T416	LTE B38	QPSK20M	38000	50	25	Right Tilted	2	-	19.7	19.29	0.04	0.743	0.329	1.10	0.816
T417	LTE B38	QPSK20M	38150	100	0	Right Cheek	2	-	19.7	19.46	0.03	0.736	0.325	1.06	0.777
T418	LTE B38	QPSK20M	38150	100	0	Right Tilted	2	-	19.7	19.46	0.02	0.617	0.274	1.06	0.652
T419	LTE B38	QPSK20M	38150	1	50	Right Cheek（Retest）	2	-	20.7	20.67	0.01	1.02	0.501	1.01	1.028

6. SAR test results of LTE B41

Test No.	Band	Mode	Channel	RB	offset	Test Position	Ant	state	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T121	LTE B41	QPSK20M	41140	1	50	Right Cheek	1	1	22.4	21.89	-0.07	0.441	0.221	1.12	0.496
T122	LTE B41	QPSK20M	41140	1	50	Right Cheek	1	2	22.4	21.89	0.02	0.151	0.082	1.12	0.170
T123	LTE B41	QPSK20M	41140	1	50	Right Tilted	1	1	22.4	21.89	0.06	0.172	0.08	1.12	0.193
T124	LTE B41	QPSK20M	41140	1	50	Left Cheek	1	1	22.4	21.89	0.01	0.241	0.132	1.12	0.271
T125	LTE B41	QPSK20M	41140	1	50	Left Tilted	1	1	22.4	21.89	-0.03	0.236	0.11	1.12	0.265
T126	LTE B41	QPSK20M	41140	50	50	Right Cheek	1	1	21.8	20.99	0.05	0.341	0.171	1.21	0.411
T127	LTE B41	QPSK20M	41140	50	50	Right Tilted	1	1	21.8	20.99	0.07	0.13	0.066	1.21	0.157
T128	LTE B41	QPSK20M	41140	50	50	Left Cheek	1	1	21.8	20.99	0.01	0.148	0.081	1.21	0.178
T129	LTE B41	QPSK20M	41140	50	50	Left Tilted	1	1	21.8	20.99	-0.06	0.173	0.086	1.21	0.208
T130	LTE B41	QPSK20M	41140	1	50	Right Cheek	1	2	22.4	21.89	0.03	0.152	0.083	1.12	0.171
T131	LTE B41	QPSK20M	40240	1	50	Right Cheek	2	-	19.5	18.25	-0.02	0.74	0.364	1.33	0.987
T132	LTE B41	QPSK20M	40240	1	50	Right Tilted	2	-	19.5	18.25	0.04	0.571	0.261	1.33	0.761
T133	LTE B41	QPSK20M	40240	1	50	Left Cheek	2	-	19.5	18.25	0.03	0.267	0.14	1.33	0.356
T134	LTE B41	QPSK20M	40240	1	50	Left Tilted	2	-	19.5	18.25	-0.05	0.23	0.119	1.33	0.307
T135	LTE B41	QPSK20M	40240	50	25	Right Cheek	2	-	19.5	17.92	0.01	0.63	0.313	1.44	0.906
T136	LTE B41	QPSK20M	40240	50	25	Right Tilted	2	-	19.5	17.92	0.05	0.516	0.229	1.44	0.742
T137	LTE B41	QPSK20M	40240	50	25	Left Cheek	2	-	19.5	17.92	-0.02	0.243	0.13	1.44	0.350
T138	LTE B41	QPSK20M	40240	50	25	Left Tilted	2	-	19.5	17.92	0.05	0.216	0.11	1.44	0.311
T139	LTE B41	QPSK20M	40690	1	50	Right Cheek	2	-	19.5	18.21	0.03	0.667	0.323	1.35	0.898
T140	LTE B41	QPSK20M	41140	1	50	Right Cheek	2	-	19.5	18.23	0.01	0.702	0.336	1.34	0.940
T421	LTE B41	QPSK20M	40690	50	25	Right Cheek	2	-	19.5	17.91	0.03	0.601	0.311	1.44	0.867
T422	LTE B41	QPSK20M	41140	50	0	Right Cheek	2	-	19.5	17.90	0.04	0.615	0.305	1.45	0.889
T423	LTE B41	QPSK20M	40240	100	0	Right Cheek	2	-	19.5	17.85	0.01	0.601	0.296	1.46	0.879

7. SAR test results of WIFI

Test No.	Band	Mode	Channel	Test Position	Battery	Data Rate	Power Setting	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T141	802.11b	-	1	Right Cheek	-	1	14	15.7	14.21	0.02	0.090	0.046	1.41	0.127
T142	802.11b	-	1	Right Tilted	-	1	14	15.7	14.21	0.01	0.098	0.047	1.41	0.138
T143	802.11b	-	1	Left Cheek	-	1	14	15.7	14.21	-0.11	0.281	0.133	1.41	0.396
T144	802.11b	-	1	Left Tilted	-	1	14	15.7	14.21	-0.09	0.27	0.124	1.41	0.381

8.2.2 SAR MEASUREMENT RESULT OF BODY-WORN

1. Body-worn SAR test results of GSM850

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Ant	State	sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T151	GSM 850	GSM	190	Front Face	1.5	1	-	-	33	31.19	0.01	0.319	0.186	1.52	0.484
T152	GSM 850	GSM	190	Rear Face	1.5	1	-	-	33	31.19	-0.02	0.353	0.276	1.52	0.536
T155	GSM 850	GPRS 3TX	190	Front Face	1	1	-	-	28.3	27.23	-0.02	0.341	0.271	1.28	0.436
T156	GSM 850	GPRS 3TX	190	Rear Face	1	1	-	-	28.3	27.23	0.06	0.321	0.238	1.28	0.411
T157	GSM 850	GPRS 3TX	190	Left Side	1	1	-	-	28.3	27.23	0.01	0.248	0.167	1.28	0.317
T158	GSM 850	GPRS 3TX	190	Right Side	1	1	-	-	28.3	27.23	-0.01	0.352	0.243	1.28	0.450
T159	GSM 850	GPRS 3TX	190	Bottom Side	1	1	-	-	28.3	27.23	-0.03	0.071	0.038	1.28	0.091
T161	GSM 850	GSM	190	Front Face	1.5	2	-	-	32	30.24	0.06	0.078	0.046	1.50	0.117
T162	GSM 850	GSM	190	Rear Face	1.5	2	-	-	32	30.24	0	0.083	0.049	1.50	0.125
T163	GSM 850	GPRS 3TX	190	Front Face	1	2	-	-	23.3	22.19	0.06	0.175	0.097	1.29	0.226
T164	GSM 850	GPRS 3TX	190	Rear Face	1	2	-	-	23.3	22.19	-0.04	0.17	0.095	1.29	0.220
T165	GSM 850	GPRS 3TX	190	Left Side	1	2	-	-	23.3	22.19	0.03	0.121	0.056	1.29	0.156
T166	GSM 850	GPRS 3TX	190	Top Side	1	2	-	-	23.3	22.19	-0.03	0.129	0.061	1.29	0.167

2. Body-worn SAR test results of GSM1900

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Ant	State	sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T171	GSM 1900	GSM	661	Front Face	1.5	1	1	off	30	28.77	-0.01	0.161	0.086	1.33	0.214
T172	GSM 1900	GSM	661	Front Face	1.5	1	2	off	30	28.77	0.03	0.135	0.082	1.33	0.179
T173	GSM 1900	GSM	661	Rear Face	1.5	1	1	off	30	28.77	0.04	0.136	0.076	1.33	0.181
T174	GSM 1900	GSM	661	Front Face	1.5	1	2	off	30	28.77	0.05	0.134	0.081	1.33	0.178
T175	GSM 1900	GPRS 3TX	661	Front Face	1	1	1	on	25	23.64	0.05	0.429	0.216	1.37	0.587
T176	GSM 1900	GPRS 3TX	661	Front Face	1	1	2	on	25	23.64	0.02	0.171	0.107	1.37	0.234
T177	GSM 1900	GPRS 3TX	661	Rear Face	1	1	1	on	25	23.64	0.03	0.374	0.205	1.37	0.512
T178	GSM 1900	GPRS 3TX	661	Left Side	1	1	1	-	26	24.79	-0.03	0.068	0.039	1.32	0.090
T179	GSM 1900	GPRS 3TX	661	Right Side	1	1	1	-	26	24.79	0.05	0.275	0.158	1.32	0.363
T180	GSM 1900	GPRS 3TX	661	Bottom Side	1	1	1	on	25	23.64	0.01	0.321	0.157	1.37	0.439
T181	GSM 1900	GPRS 3TX	661	Front Face	1	1	2	on	25	23.64	0.08	0.17	0.106	1.37	0.233
T182	GSM 1900	GPRS 3TX	661	Bottom Side	1.3	1	1	off	26	24.79	0.01	0.305	0.156	1.32	0.403
T183	GSM 1900	GPRS 3TX	661	Bottom Side	1.3	1	2	off	26	24.79	0.03	0.131	0.06	1.32	0.173
T185	GSM 1900	GPRS 3TX	661	Front Face	1	1	1	off	26	24.79	0.09	0.432	0.22	1.32	0.571
T186	GSM 1900	GPRS 3TX	661	Rear Face	1	1	1	off	26	24.79	-0.08	0.514	0.255	1.32	0.679
T184	GSM 1900	GPRS 3TX	661	Front Face	1	1	2	off	26	24.79	-0.01	0.225	0.102	1.32	0.297
T191	GSM 1900	GSM	661	Front Face	1.5	2	-	-	29	28	-0.03	0.04	0.021	1.26	0.050
T192	GSM 1900	GSM	661	Rear Face	1.5	2	-	-	29	28	0.02	0.034	0.02	1.26	0.043
T194	GSM 1900	GPRS 3TX	661	Front Face	1	2	-	-	21.1	20.18	-0.02	0.091	0.048	1.24	0.112
T195	GSM 1900	GPRS 3TX	661	Rear Face	1	2	-	-	21.1	20.18	0.02	0.072	0.039	1.24	0.089
T196	GSM 1900	GPRS 3TX	661	Left Side	1	2	-	-	21.1	20.18	0.01	0.087	0.047	1.24	0.108
T197	GSM 1900	GPRS 3TX	661	Top Side	1	2	-	-	21.1	20.18	-0.03	0.088	0.041	1.24	0.109

3. Body-worn SAR test results of UMTS Band V

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Ant	State	sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T201	UMTS B5	RMC12.2K	4182	Front Face	1.5	1	-	-	24	22.27	0.02	0.284	0.203	1.49	0.423
T202	UMTS B5	RMC12.2K	4182	Rear Face	1.5	1	-	-	24	22.27	-0.09	0.293	0.23	1.49	0.436
T203	UMTS B5	RMC12.2K	4182	Front Face	1	1	-	-	24	22.27	0.05	0.371	0.288	1.49	0.553
T204	UMTS B5	RMC12.2K	4182	Rear Face	1	1	-	-	24	22.27	0.01	0.38	0.302	1.49	0.566
T205	UMTS B5	RMC12.2K	4182	Left Side	1	1	-	-	24	22.27	0.06	0.278	0.194	1.49	0.414
T206	UMTS B5	RMC12.2K	4182	Right Side	1	1	-	-	24	22.27	-0.07	0.392	0.272	1.49	0.584
T207	UMTS B5	RMC12.2K	4182	Bottom Side	1	1	-	-	24	22.27	0.02	0.104	0.055	1.49	0.155
T211	UMTS B5	RMC12.2K	4182	Front Face	1.5	2	-	-	23	22.27	0.05	0.196	0.121	1.18	0.232
T212	UMTS B5	RMC12.2K	4182	Rear Face	1.5	2	-	-	23	22.27	0.02	0.207	0.124	1.18	0.245
T213	UMTS B5	RMC12.2K	4182	Front Face	1	2	-	-	19	17.71	0.11	0.198	0.109	1.35	0.266
T214	UMTS B5	RMC12.2K	4182	Rear Face	1	2	-	-	19	17.71	0.06	0.187	0.107	1.35	0.252
T215	UMTS B5	RMC12.2K	4182	Left Side	1	2	-	-	19	17.71	0.03	0.075	0.048	1.35	0.101
T216	UMTS B5	RMC12.2K	4182	Top Side	1	2	-	-	19	17.71	0.02	0.15	0.074	1.35	0.202

4. Body-worn SAR test results of LTE B7

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	State	sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T221	LTE B7	QPKS20M	21350	1	50	Front Face	1.5	1	1	off	23.5	22.64	0.09	0.254	0.13	1.22	0.310
T222	LTE B7	QPKS20M	21350	1	50	Front Face	1.5	1	2	off	23.5	22.64	0.03	0.217	0.119	1.22	0.265
T223	LTE B7	QPKS20M	21350	1	50	Rear Face	1.5	1	1	off	23.5	22.64	-0.02	0.226	0.127	1.22	0.275
T224	LTE B7	QPKS20M	21350	50	0	Front Face	1.5	1	1	off	21.8	21.02	0.03	0.147	0.078	1.20	0.176
T225	LTE B7	QPKS20M	21350	50	0	Rear Face	1.5	1	1	off	21.8	21.02	-0.03	0.151	0.084	1.20	0.181
T226	LTE B7	QPKS20M	21350	1	50	Front Face	1.5	1	2	off	23.5	22.64	0.02	0.214	0.128	1.22	0.261
T231	LTE B7	QPSK20M	21350	1	50	Front Face	1	1	1	on	22.5	21.90	0.01	0.407	0.188	1.15	0.467
T232	LTE B7	QPSK20M	21350	1	50	Front Face	1	1	2	on	22.5	21.90	0.01	0.298	0.17	1.15	0.342
T233	LTE B7	QPSK20M	21350	1	50	Rear Face	1	1	1	on	22.5	21.90	0.01	0.212	0.112	1.15	0.243
T234	LTE B7	QPSK20M	21350	1	50	Left Side	1	1	1	-	23.5	22.64	0.06	0.311	0.163	1.22	0.379
T235	LTE B7	QPSK20M	21350	1	50	Right Side	1	1	1	-	23.5	22.64	-0.03	0.168	0.093	1.22	0.205
T236	LTE B7	QPSK20M	21350	1	50	Bottom Side	1	1	1	on	22.5	21.90	-0.02	0.203	0.096	1.15	0.233
T237	LTE B7	QPSK20M	21350	50	0	Front Face	1	1	1	on	21.5	20.28	0.01	0.233	0.115	1.32	0.308
T238	LTE B7	QPSK20M	21350	50	0	Rear Face	1	1	1	on	21.5	20.28	0.08	0.18	0.103	1.32	0.238
T239	LTE B7	QPSK20M	21350	50	0	Left Side	1	1	1	-	21.8	20.89	0	0.236	0.117	1.23	0.291
T240	LTE B7	QPSK20M	21350	50	0	Right Side	1	1	1	-	21.8	20.89	0.06	0.104	0.059	1.23	0.128
T241	LTE B7	QPSK20M	21350	50	0	Bottom Side	1	1	1	on	22.5	20.28	0.01	0.147	0.058	1.67	0.245
T242	LTE B7	QPSK20M	21350	1	50	Front Face	1	1	2	on	22.5	21.90	0.02	0.298	0.17	1.15	0.342
T243	LTE B7	QPKS20M	21350	1	50	Bottom Side	1.3	1	1	off	23.5	22.64	0.05	0.349	0.159	1.22	0.425
T244	LTE B7	QPKS20M	21350	1	50	Bottom Side	1.3	1	2	off	23.5	22.64	0.02	0.279	0.119	1.22	0.340
T247	LTE B7	QPKS20M	21350	1	50	Front Face	1	1	1	off	23.5	22.64	-0.1	0.619	0.302	1.22	0.755
T248	LTE B7	QPKS20M	21350	1	50	Rear Face	1	1	1	off	23.5	22.64	0.12	0.569	0.316	1.22	0.694
T245	LTE B7	QPKS20M	21350	50	0	Bottom Side	1.3	1	1	off	21.8	20.89	0.01	0.2	0.094	1.23	0.246
T249	LTE B7	QPKS20M	21350	50	0	Front Face	1	1	1	off	21.8	20.89	-0.06	0.385	0.198	1.23	0.474
T250	LTE B7	QPKS20M	21350	50	0	Rear Face	1	1	1	off	21.8	20.89	0.09	0.358	0.196	1.23	0.441
T246	LTE B7	QPKS20M	21350	1	50	Front Face	1	1	2	off	23.5	22.64	0.08	0.492	0.221	1.22	0.600
T251	LTE B7	QPKS20M	20850	1	50	Front Face	1.5	2	-	-	21.3	20.94	0.03	0.314	0.172	1.09	0.341
T252	LTE B7	QPKS20M	20850	1	50	Rear Face	1.5	2	-	-	21.3	20.94	-0.07	0.32	0.181	1.09	0.347
T253	LTE B7	QPKS20M	20850	50	25	Front Face	1.5	2	-	-	21.3	20.17	0.01	0.242	0.136	1.30	0.314
T254	LTE B7	QPKS20M	20850	50	25	Rear Face	1.5	2	-	-	21.3	20.17	0.06	0.259	0.145	1.30	0.336
T255	LTE B7	QPSK20M	20850	1	50	Front Face	1	2	-	-	16.5	16.10	0.02	0.093	0.053	1.10	0.102
T256	LTE B7	QPSK20M	20850	1	50	Rear Face	1	2	-	-	16.5	16.10	-0.12	0.096	0.052	1.10	0.105
T257	LTE B7	QPSK20M	20850	1	50	Left Side	1	2	-	-	16.5	16.10	-0.13	0.115	0.060	1.10	0.126
T258	LTE B7	QPSK20M	20850	1	50	Top Side	1	2	-	-	16.5	16.10	0.01	0.044	0.022	1.10	0.048
T259	LTE B7	QPSK20M	21350	50	25	Front Face	1	2	-	-	16.5	15.16	0.06	0.073	0.038	1.36	0.099
T260	LTE B7	QPSK20M	21350	50	25	Rear Face	1	2	-	-	16.5	15.16	-0.02	0.076	0.042	1.36	0.103
T261	LTE B7	QPSK20M	21350	50	25	Left Side	1	2	-	-	16.5	15.16	0.01	0.092	0.050	1.36	0.125
T262	LTE B7	QPSK20M	21350	50	25	Top Side	1	2	-	-	16.5	15.16	0.01	0.019	0.010	1.36	0.026

5. Body-worn SAR test results of LTE B26

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	State	sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T271	LTE B26	QPSK15M	26965	1	37	Front Face	1.5	1	-	-	23.2	22.41	0.02	0.256	0.206	1.20	0.307
T272	LTE B26	QPSK15M	26965	1	37	Rear Face	1.5	1	-	-	23.2	22.41	-0.03	0.281	0.22	1.20	0.337
T273	LTE B26	QPSK15M	26865	36	0	Front Face	1.5	1	-	-	22.5	21.54	0.01	0.157	0.123	1.25	0.196
T274	LTE B26	QPSK15M	26865	36	0	Rear Face	1.5	1	-	-	22.5	21.54	-0.02	0.172	0.136	1.25	0.215
T275	LTE B26	QPSK15M	26965	1	37	Front Face	1	1	-	-	23.2	22.41	0.06	0.372	0.283	1.20	0.446
T276	LTE B26	QPSK15M	26965	1	37	Rear Face	1	1	-	-	23.2	22.41	0.04	0.358	0.273	1.20	0.429
T277	LTE B26	QPSK15M	26965	1	37	Left Side	1	1	-	-	23.2	22.41	-0.03	0.267	0.176	1.20	0.320
T278	LTE B26	QPSK15M	26965	1	37	Right Side	1	1	-	-	23.2	22.41	-0.04	0.395	0.274	1.20	0.474
T279	LTE B26	QPSK15M	26965	1	37	Bottom Side	1	1	-	-	23.2	22.41	0.01	0.089	0.05	1.20	0.107
T280	LTE B26	QPSK15M	26865	36	0	Front Face	1	1	-	-	22.5	21.54	0.08	0.231	0.171	1.25	0.288
T281	LTE B26	QPSK15M	26865	36	0	Rear Face	1	1	-	-	22.5	21.54	0.06	0.233	0.139	1.25	0.291
T282	LTE B26	QPSK15M	26865	36	0	Left Side	1	1	-	-	22.5	21.54	0.07	0.131	0.089	1.25	0.164
T283	LTE B26	QPSK15M	26865	36	0	Right Side	1	1	-	-	22.5	21.54	0.02	0.227	0.162	1.25	0.283
T284	LTE B26	QPSK15M	26865	36	0	Bottom Side	1	1	-	-	22.5	21.54	0.01	0.066	0.035	1.25	0.082
T291	LTE B26	QPSK15M	26865	1	37	Front Face	1.5	2	-	-	22.4	21.54	0.02	0.139	0.085	1.22	0.169
T292	LTE B26	QPSK15M	26865	1	37	Rear Face	1.5	2	-	-	22.4	21.54	0.01	0.134	0.082	1.22	0.163
T293	LTE B26	QPSK15M	26865	36	19	Front Face	1.5	2	-	-	22	21.13	0.01	0.145	0.086	1.22	0.177
T294	LTE B26	QPSK15M	26865	36	19	Rear Face	1.5	2	-	-	22	21.13	-0.03	0.132	0.081	1.22	0.161
T295	LTE B26	QPSK15M	26865	1	37	Front Face	1	2	-	-	18.8	18.27	-0.03	0.172	0.093	1.13	0.195
T296	LTE B26	QPSK15M	26865	1	37	Rear Face	1	2	-	-	18.8	18.27	0.02	0.164	0.087	1.13	0.185
T297	LTE B26	QPSK15M	26865	1	37	Left Side	1	2	-	-	18.8	18.27	0.01	0.086	0.054	1.13	0.097
T298	LTE B26	QPSK15M	26865	1	37	Top Side	1	2	-	-	18.8	18.27	-0.02	0.117	0.054	1.13	0.132
T299	LTE B26	QPSK15M	26865	36	0	Front Face	1	2	-	-	18.8	18.00	0.01	0.154	0.081	1.20	0.185
T300	LTE B26	QPSK15M	26865	36	0	Rear Face	1	2	-	-	18.8	18.00	-0.08	0.156	0.082	1.20	0.188
T301	LTE B26	QPSK15M	26865	36	0	Left Side	1	2	-	-	18.8	18.00	0.09	0.084	0.052	1.20	0.101
T302	LTE B26	QPSK15M	26865	36	0	Top Side	1	2	-	-	18.8	18.00	0	0.129	0.057	1.20	0.155

6. Body-worn SAR test results of LTE B38

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	State	sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T311	LTE B38	QPSK20M	38150	1	50	Front Face	1.5	1	-	-	22.7	22.17	0.03	0.1	0.049	1.13	0.113
T312	LTE B38	QPSK20M	38150	1	50	Rear Face	1.5	1	-	-	22.7	22.17	0.01	0.085	0.047	1.13	0.096
T313	LTE B38	QPSK20M	37850	50	25	Front Face	1.5	1	-	-	22.1	21.18	0.09	0.121	0.06	1.23	0.149
T314	LTE B38	QPSK20M	37850	50	25	Rear Face	1.5	1	-	-	22.1	21.18	-0.05	0.093	0.052	1.23	0.115
T315	LTE B38	QPSK20M	38150	1	50	Front Face	1	1	-	-	22.7	22.17	0.02	0.233	0.116	1.13	0.264
T316	LTE B38	QPSK20M	38150	1	50	Rear Face	1	1	-	-	22.7	22.17	0.01	0.242	0.123	1.13	0.274
T317	LTE B38	QPSK20M	38150	1	50	Left Side	1	1	-	-	22.7	22.17	-0.06	0.097	0.046	1.13	0.110
T318	LTE B38	QPSK20M	38150	1	50	Right Side	1	1	-	-	22.7	22.17	-0.03	0.146	0.075	1.13	0.165
T319	LTE B38	QPSK20M	38150	1	50	Bottom Side	1	1	-	-	22.7	22.17	0.07	0.169	0.066	1.13	0.191
T320	LTE B38	QPSK20M	37850	50	25	Front Face	1	1	-	-	22.1	21.18	0.06	0.312	0.142	1.23	0.385
T321	LTE B38	QPSK20M	37850	50	25	Rear Face	1	1	-	-	22.1	21.18	0.07	0.243	0.122	1.23	0.300
T322	LTE B38	QPSK20M	37850	50	25	Left Side	1	1	-	-	22.1	21.18	0.06	0.191	0.097	1.23	0.236
T323	LTE B38	QPSK20M	37850	50	25	Right Side	1	1	-	-	22.1	21.18	0.01	0.15	0.082	1.23	0.185
T324	LTE B38	QPSK20M	37850	50	25	Bottom Side	1	1	-	-	22.1	21.18	0.01	0.237	0.096	1.23	0.293
T331	LTE B38	QPSK20M	38150	1	50	Front Face	1.5	2	-	-	23.5	22.75	0.07	0.206	0.114	1.19	0.245
T332	LTE B38	QPSK20M	38150	1	50	Rear Face	1.5	2	-	-	23.5	22.75	0.01	0.193	0.098	1.19	0.229
T333	LTE B38	QPSK20M	38150	50	25	Front Face	1.5	2	-	-	22.9	21.62	0.02	0.162	0.083	1.34	0.218
T334	LTE B38	QPSK20M	38150	50	25	Rear Face	1.5	2	-	-	22.9	21.62	-0.03	0.159	0.08	1.34	0.214
T336	LTE B38	QPSK20M	38150	1	50	Front Face	1	2	-	-	20.7	20.67	0.03	0.199	0.118	1.01	0.201
T337	LTE B38	QPSK20M	38150	1	50	Rear Face	1	2	-	-	20.7	20.67	0.01	0.197	0.123	1.01	0.199
T338	LTE B38	QPSK20M	38150	1	50	Left Side	1	2	-	-	20.7	20.67	0.02	0.25	0.128	1.01	0.252
T339	LTE B38	QPSK20M	38150	1	50	Top Side	1	2	-	-	20.7	20.67	-0.03	0.079	0.043	1.01	0.080
T340	LTE B38	QPSK20M	38150	50	25	Front Face	1	2	-	-	19.7	19.61	-0.05	0.181	0.117	1.02	0.185
T341	LTE B38	QPSK20M	38150	50	25	Rear Face	1	2	-	-	19.7	19.61	0.08	0.189	0.119	1.02	0.193
T342	LTE B38	QPSK20M	38150	50	25	Left Side	1	2	-	-	19.7	19.61	0.07	0.196	0.121	1.02	0.200
T343	LTE B38	QPSK20M	38150	50	25	Top Side	1	2	-	-	19.7	19.61	0.02	0.079	0.043	1.02	0.081

7. Body-worn SAR test results of LTE B41

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	State	sensor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T351	LTE B41	QPSK20M	41140	1	50	Front Face	1.5	1	1	-	22.4	21.89	0.05	0.17	0.087	1.12	0.191
T352	LTE B41	QPSK20M	41140	1	50	Front Face	1.5	1	2	-	22.4	21.89	0.03	0.144	0.079	1.12	0.162
T353	LTE B41	QPSK20M	41140	1	50	Rear Face	1.5	1	1	-	22.4	21.89	-0.07	0.169	0.085	1.12	0.190
T354	LTE B41	QPSK20M	41140	50	50	Front Face	1.5	1	1	-	21.8	20.99	0.04	0.112	0.059	1.21	0.135
T355	LTE B41	QPSK20M	41140	50	50	Rear Face	1.5	1	1	-	21.8	20.99	-0.02	0.131	0.069	1.21	0.158
T356	LTE B41	QPSK20M	41140	1	50	Rear Face	1.5	1	2	-	22.4	21.89	0.02	0.122	0.064	1.12	0.137
T357	LTE B41	QPSK20M	41140	1	50	Front Face	1	1	1	-	22.4	21.89	0.03	0.298	0.13	1.12	0.335
T358	LTE B41	QPSK20M	41140	1	50	Front Face	1	1	2	-	22.4	21.89	0.01	0.251	0.113	1.12	0.282
T359	LTE B41	QPSK20M	41140	1	50	Rear Face	1	1	1	-	22.4	21.89	-0.15	0.336	0.158	1.12	0.378
T360	LTE B41	QPSK20M	41140	1	50	Left Side	1	1	1	-	22.4	21.89	-0.03	0.092	0.043	1.12	0.103
T361	LTE B41	QPSK20M	41140	1	50	Right Side	1	1	1	-	22.4	21.89	0.01	0.243	0.099	1.12	0.273
T362	LTE B41	QPSK20M	41140	1	50	Bottom Side	1	1	1	-	22.4	21.89	0	0.233	0.085	1.12	0.262
T363	LTE B41	QPSK20M	41140	50	50	Front Face	1	1	1	-	21.8	20.99	0.08	0.221	0.098	1.21	0.266
T364	LTE B41	QPSK20M	41140	50	50	Rear Face	1	1	1	-	21.8	20.99	0.01	0.288	0.119	1.21	0.347
T365	LTE B41	QPSK20M	41140	50	50	Left Side	1	1	1	-	21.8	20.99	0.06	0.08	0.034	1.21	0.096
T366	LTE B41	QPSK20M	41140	50	50	Right Side	1	1	1	-	21.8	20.99	-0.03	0.218	0.091	1.21	0.263
T367	LTE B41	QPSK20M	41140	50	50	Bottom Side	1	1	1	-	21.8	20.99	-0.02	0.237	0.082	1.21	0.286
T368	LTE B41	QPSK20M	41140	1	50	Rear Face	1	1	2	-	22.4	21.89	0.07	0.216	0.087	1.12	0.243
T371	LTE B41	QPSK20M	41140	1	50	Front Face	1.5	2	-	-	22.2	22.40	0.02	0.13	0.076	0.95	0.124
T372	LTE B41	QPSK20M	41140	1	50	Rear Face	1.5	2	-	-	22.2	22.14	-0.04	0.14	0.076	1.01	0.142
T373	LTE B41	QPSK20M	41140	50	25	Front Face	1.5	2	-	-	21.5	21.24	0.01	0.101	0.058	1.06	0.107
T374	LTE B41	QPSK20M	41140	50	25	Rear Face	1.5	2	-	-	21.5	21.24	-0.03	0.109	0.059	1.06	0.116
T376	LTE B41	QPSK20M	40240	1	50	Front Face	1	2	-	-	19.5	18.25	0.06	0.128	0.075	1.33	0.171
T377	LTE B41	QPSK20M	40240	1	50	Rear Face	1	2	-	-	19.5	18.25	-0.11	0.114	0.063	1.33	0.152
T378	LTE B41	QPSK20M	40240	1	50	Left Side	1	2	-	-	19.5	18.25	0.15	0.161	0.083	1.33	0.215
T379	LTE B41	QPSK20M	40240	1	50	Top Side	1	2	-	-	19.5	18.25	0.01	0.138	0.075	1.33	0.184
T380	LTE B41	QPSK20M	40240	50	25	Front Face	1	2	-	-	19.5	17.92	0.05	0.132	0.074	1.44	0.190
T381	LTE B41	QPSK20M	40240	50	25	Rear Face	1	2	-	-	19.5	17.92	-0.03	0.137	0.077	1.44	0.197
T382	LTE B41	QPSK20M	40240	50	25	Left Side	1	2	-	-	19.5	17.92	-0.05	0.149	0.083	1.44	0.214
T383	LTE B41	QPSK20M	40240	50	25	Top Side	1	2	-	-	19.5	17.92	0.01	0.061	0.033	1.44	0.088

8. Body-worn SAR test results of WIFI

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Earphone	Data Rate	Power Setting	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift	SAR 1g	SAR 10g	Scaling Factor	Scaled 1g SAR
T391	802.11b	-	1	Front Face	1.5	v	1	17	18.7	17.26	0.03	0.056	0.031	1.39	0.078
T392	802.11b	-	1	Rear Face	1.5	v	1	17	18.7	17.26	0.02	0.066	0.035	1.39	0.092
T401	802.11b	-	1	Front Face	1	-	1	17	18.7	17.26	0.09	0.078	0.041	1.39	0.109
T402	802.11b	-	1	Rear Face	1	-	1	17	18.7	17.26	0.1	0.143	0.075	1.39	0.199
T403	802.11b	-	1	Right Side	1	-	1	17	18.7	17.26	0.06	0.118	0.063	1.39	0.164
T404	802.11b	-	1	Top Side	1	-	1	17	18.7	17.26	0.08	0.051	0.022	1.39	0.071

8.2.3 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	9.5	8.913	5	2.480	2.81	3	NO
BT	Body-Worn	9.5	8.913	15	2.480	0.94	3	NO
BT	Hotspot	9.5	8.913	10	2.480	1.40	3	NO

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	Head	9.5	8.913	5	2.480	7.5	0.374

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	X	Estimated SAR (W/kg)*
BT	Body-Worn	9.5	8.913	15	2.480	7.5	0.125

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	X	Estimated SAR (W/kg)*
BT	Hotspot	9.5	8.913	10	2.480	7.5	0.187

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

8.2.4 SIMULTANEOUS TRANSMISSION CONDITIONS

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

The Simultaneous Transmission Possibilities of this device are as below:

NO.	Simultaneous Tx Combination	Head	Body-worn	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	Yes	Yes
3	GSM Voice(Second ant) + BT	Yes	Yes	NA	Yes
4	GSM DATA(Second ant)+ BT	N/A	Yes	Yes	Yes
5	GSM Voice(Main ant) + WiFi	Yes	Yes	Yes	Yes
6	GSM DATA(Main ant) + WiFi	N/A	Yes	Yes	Yes
7	GSM Voice(Second ant) + WiFi	Yes	Yes	Yes	Yes
8	GSM DATA(Second ant) + WiFi	N/A	Yes	Yes	Yes
9	UMTS Voice(Main ant) + BT	Yes	Yes	NA	Yes
10	UMTS Data(Main ant) + BT	N/A	Yes	Yes	Yes
11	UMTS Voice(Second ant) + BT	Yes	Yes	NA	Yes
12	UMTS Data(Second ant) + BT	N/A	Yes	Yes	Yes
13	UMTS Voice(Main ant) + WiFi	Yes	Yes	Yes	Yes
14	UMTS Data (Main ant) + WiFi	Yes*	Yes	Yes	Yes
15	UMTS Voice (Second ant)+ WiFi	Yes	Yes	Yes	Yes
16	UMTS Data (Second ant)+ WiFi	Yes*	Yes	Yes	Yes
17	LTE(Main ant) + WiFi	Yes*	Yes*	Yes	Yes
18	LTE(Main ant) + BT	Yes*	Yes*	NA	Yes
19	LTE (Second ant)+ WiFi	Yes*	Yes*	Yes	Yes
20	LTE (Second ant) + BT	Yes*	Yes*	NA	Yes

Note:
1) Wi-Fiand 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 Main Antenna and Second Antenna can't transmit simultaneously.
5) The device supports VoWIFI function.
6) 2G&3G&4G share the same antenna and can't transmit simultaneously.

8.2.5 SAR SUMMATION SCENARIO

1) About BT/WiFi and GSM/UMTS/LTE Main antenna

Position	Head				Body-worn		Hotspot					
	Right Cheek	Right Tilted	Left Cheek	Left Tilted	Front Face（1.5cm）	Rear Face（1.5cm）	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
GSM 850	0.475	0.153	0.426	0.370	0.484	0.536	0.436	0.411	0.317	0.450	-	0.091
GSM 1900	0.320	0.151	0.222	0.137	0.214	0.181	0.571	0.679	0.090	0.363	-	0.439
UMTS B5	0.466	0.182	0.389	0.247	0.423	0.436	0.553	0.566	0.414	0.584	-	0.155
LTE B7	0.406	0.190	0.796	0.347	0.310	0.275	0.755	0.694	0.379	0.205	-	0.425
LTE B26	0.349	0.200	0.311	0.127	0.307	0.337	0.446	0.429	0.320	0.474	-	0.107
LTE B38	0.225	0.082	0.216	0.127	0.149	0.115	0.385	0.300	0.236	0.185	-	0.293
LTE B41	0.496	0.193	0.271	0.265	0.191	0.190	0.335	0.378	0.103	0.273	-	0.286
802.11b/g	0.127	0.138	0.396	0.381	0.078	0.092	0.109	0.199	-	0.164	0.071	-
Bluetooth	0.374	0.374	0.374	0.374	0.125	0.125	0.187	0.187	0.187	0.187	0.187	0.187
Max. SAR Summation	0.870	0.575	1.192	0.751	0.609	0.660	0.942	0.893	0.601	0.771	0.071	0.626
Hot Spot Separation	-	-	-	-	-	-	-	-	-	-	-	-
SPLSR	-	-	-	-	-	-	-	-	-	-	-	-

Note: The maximum SAR summation is calculated based on the same configuration and test position.

2) About BT/WiFi and GSM/UMTS/LTE Main antenna

Position	Head				Body-worn		Hotspot					
	Right Cheek	Right Tilted	Left Cheek	Left Tilted	Front Face（1.5cm）	Rear Face（1.5cm）	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
GSM 850	0.898	0.728	0.606	0.658	0.117	0.125	0.226	0.220	0.156	-	0.167	-
GSM 1900	1.034	0.961	0.424	0.482	0.050	0.043	0.112	0.089	0.108	-	0.109	-
UMTS B5	1.058	0.906	0.736	0.712	0.232	0.245	0.266	0.252	0.101	-	0.202	-
LTE B7	0.758	0.638	0.294	0.271	0.341	0.347	0.102	0.105	0.126	-	0.048	-
LTE B26	0.743	0.658	0.461	0.465	0.177	0.163	0.195	0.188	0.101	-	0.155	-
LTE B38	1.078	0.860	0.392	0.318	0.245	0.229	0.201	0.199	0.252	-	0.081	-
LTE B41	0.987	0.761	0.356	0.311	0.124	0.142	0.190	0.197	0.215	-	0.184	-
802.11b/g	0.127	0.138	0.396	0.381	0.078	0.092	0.109	0.199	-	0.164	0.071	-
Bluetooth	0.374	0.374	0.374	0.374	0.125	0.125	0.187	0.187	0.187	0.187	0.187	0.187
Max. SAR Summation	1.453	1.336	1.132	1.092	0.466	0.472	0.454	0.451	0.252	0.164	0.389	-
Hot Spot Separation	-	-	-	-	-	-	-	-	-	-	-	-
SPLSR	-	-	-	-	-	-	-	-	-	-	-	-

Note: The maximum SAR summation is calculated based on the same configuration and test position.

APPENDIX

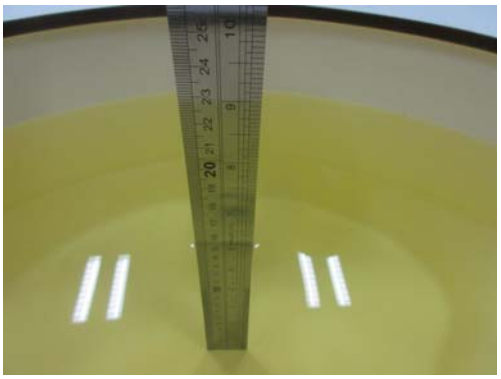
1. Test Layout

Specific Absorption Rate Test Layout

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

Body(835MHz)_15.6cm

Body(1900MHz~3800 MHz)_15.5cm



Head(835MHz))_15.9cm

Head (1900MHz~3800 MHz)_15.5cm

Appendix A. SAR Plots of System Verification

(Pls See Appendix A.)

Appendix B. SAR Plots of SAR Measurement

(Pls See Appendix B.)

Appendix C. Calibration Certificate for Probe and Dipole

(Pls See Appendix C.)

Appendix D. Photographs of the Test Set-Up

(Pls See Appendix D.)

End