FCC SAR Test Report

FCC ID: 2AUYFRMX3263

Project No.	:	2108C082
Equipment	:	Mobile Phone
Brand Name	:	realme
Test Model	:	RMX3263
Series Model	:	N/A
Date of Receipt	:	Aug. 05, 2021
Date of Test	:	Aug. 13, 2021 ~ Aug. 19, 2021
Issued Date	:	Sep. 02, 2021
Report Version	:	R01
Test Sample	:	Engineering Sample No.: DG2021081285.
Standard(s)	:	Please refer to page 2.
Applicant	:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Address	:	No.178 Yulong Avenue,Yufengshan,Yubei District,Chongqing,China
Manufacturer	:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Address	:	No.178 Yulong Avenue,Yufengshan,Yubei District,Chongqing,China
Factory	:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Address	:	No.2 Building, No.24 Nichang Boulevard, Huixing Block, Yubei District, Chongqing,China

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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TESTING CERT #5123.02

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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

Declaration

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

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

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

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

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Limitation

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

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Aug. 31, 2021
R01	Modified the comments of TCB.	Sep. 02, 2021

1. GENERAL INFORMATION

1.1 STATEMENT OF COMPLIANCE

Mode	Highest Reported Head SAR-1g (W/kg)	Highest Reported Body-worn (15mm) SAR-1g (W/kg)	Highest Reported Hotspot (10mm) SAR-1g (W/kg)	Highest Reported Product Specific (0mm) SAR-10g (W/kg)	Highest Simultaneous Transmission SAR-1g (W/kg)
GSM850	0.225	0.234	0.384	/	1.416
GSM1900	0.108	0.296	0.790	/	
UMTS B2	0.126	0.309	0.666	/	
UMTS B4	0.161	0.300	0.703	/	
UMTS B5	0.265	0.217	0.465	/	
LTE B2	0.203	0.386	0.995	/	
LTE B4	0.184	0.380	0.900	/	
LTE B5	0.263	0.244	0.345	/	
LTE B7	0.305	0.450	0.971	/	
LTE B12	0.107	0.208	0.200	/	
LTE B17	0.111	0.202	0.208	/	
LTE B26	0.185	0.213	0.335	/	
LTE B38	0.277	0.351	1.172	/	
LTE B41	0.308	0.286	0.755	/	
LTE B66	0.185	0.374	0.794	/	
2.4G WLAN	1.108	0.282	0.559	/	
Bluetooth	0.122	0.027	/	0.185	

Note:
1) The device is in compliance with Specific Absorption Rate (SAR) for general population uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI C95.1:1992/IEEE C95.1:1991, the NCRP Report Number 86 for uncontrolled environment and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013.

1.2 LABORATORY ENVIRONMENT

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

1.3 GENERAL DESCRIPTION OF EUT

Equipment	Mobile Phone		
Test Model	RMX3263		
Series Model	N/A		
Model Difference(s)	N/A		
IMEI	860690050019873		
S/N	1723130210H1AA7		
Hardware Version	11		
Software Version	Android11		
DTM Function	Not Supported		
Modulation	GSM(GMSK/8PSK), UMTS(QPSK/16QAM), LTE(QPSK/16QAM/64QAM), WiFi(DSSS/OFDM), BT(GFSK/π/4-DQPSK/8-DPSK)		
Operation Frequency Range(s)	Band	TX (MHz)	RX (MHz)
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	UMTS B2	1850~1910	1930~1990
	UMTS B4	1710~1755	2110~2155
	UMTS B5	824~849	869~894
	LTE B2	1850~1910	1930~1990
	LTE B4	1710~1755	2110~2155
	LTE B5	824~849	869~894
	LTE B7	2500~2570	2620~2690
	LTE B12	699~716	729~746
	LTE B17	704~716	734~746
	LTE B26	814~849	859~894
	LTE B66	1710~1780	2110~2180
	LTE B38	2570~2620	
	LTE B41	2535~2655	
	Bluetooth	2400~2483.5	
	2.4G WLAN	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	10		
HSUPA UE Category	7		
DC-HSDPA Category	24		
HSPA+ Category	14		
Power Class	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all up bits” (UMTS B2/4/5)		
	3, tested with power control “all Max” (LTE B2/4/5/7/12/17/26/38/41/66)		

Test Channels (low-mid-high)	128-190-251 (GSM850)		
	512-661-810 (GSM1900)		
	9262-9400-9538 (UMTS B2)		
	1312-1413-1513 (UMTS B4)		
	4132-4182-4233 (UMTS B5)		
	18700-18900-19100 (LTE B2 BW=20MHz)		
	20050-20175-20300 (LTE B4 BW=20MHz)		
	20450-20525-20600 (LTE B5 BW=10MHz)		
	20850-21100-21350 (LTE B7 BW=20MHz)		
	23060-23095-23130 (LTE B12 BW=10MHz)		
	23780-23790-23800 (LTE B17 BW=10MHz)		
	26765-26865-26965 (LTE B26 BW=15MHz)		
	37850-38000-38150 (LTE B38 BW=20MHz)		
	40140-40440-40840-41140 (LTE B41 BW=20MHz)		
	132072-132322-132572 (LTE B66 BW=20MHz)		
	0-39-78 (BT)		
	0-19-39 (BLE)		
	1-6-11 (2.4G WiFi 802.11b/g/n HT20)		
	3-6-9 (2.4G WiFi 802.11n HT40)		
Antenna Gain (dBi)	Band	Ant 1 (Bottom Antenna)	Ant 3 (WiFi Antenna)
	GSM 850	0.5	/
	GSM 1900	1.1	/
	UMTS B2	1.1	/
	UMTS B4	1.1	/
	UMTS B5	0.5	/
	LTE B2	1.1	/
	LTE B4	1.1	/
	LTE B5	0.5	/
	LTE B7	1.1	/
	LTE B12	0.5	/
	LTE B17	0.5	/
	LTE B26	0.5	/
	LTE B38	1.1	/
	LTE B41	1.1	/
	LTE B66	1.1	/
	Bluetooth	/	-3.0
	WLAN 2.4G	/	-3.0
Other Information			
Battery	Model Name	BLP729	
	Power Rating	DC 3.87V/4880mAh	

1.4 MAIN TEST INSTRUMENTS

Item	Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Interval
1	Data Acquisition Electronics	Speag	DAE4	1390	Nov. 06, 2020	1 Year
2	Data Acquisition Electronics	Speag	DAE4	1423	Dec. 11, 2020	1 Year
3	Data Acquisition Electronics	Speag	DAE4	420	Dec. 09, 2020	1 Year
4	E-field Probe	Speag	EX3DV4	3974	Dec. 18, 2020	1 Year
5	E-field Probe	Speag	ES3DV3	3162	Jun. 15, 2021	1 Year
6	E-field Probe	Speag	EX3DV4	7544	Oct. 29, 2020	1 Year
7	System Validation Dipole	Speag	D750V3	1095	Jun. 01, 2021	3 Years
8	System Validation Dipole	Speag	D835V2	4d160	Jun. 01, 2021	3 Years
9	System Validation Dipole	Speag	D1750V2	1101	Jun. 01, 2021	3 Years
10	System Validation Dipole	Speag	D1900V2	5d179	May 31, 2021	3 Years
11	System Validation Dipole	Speag	D2450V2	919	May 28, 2021	3 Years
12	System Validation Dipole	Speag	D2600V2	1067	May 28, 2021	3 Years
13	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1811	N/A	N/A
14	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1812	N/A	N/A
15	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1784	N/A	N/A
16	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1896	N/A	N/A
17	Radio Communication Analver	Anritsu	MT8821C	6261915479	Jul. 24, 2021	1 Year
18	Wideband Radio Communication Tester	R&S	CMW500	104462	Jul. 27, 2021	1 Year
19	Power Amplifier	Mini-Circuits	ZHL-42W+	QA1333003	Dec. 29, 2020	1 Year
20	DC Source metter	Iteck	IT6154	006104126768201001	Jul. 24, 2021	1 Year
21	Signal Analyzer	R&S	FSV7	103120	Jul. 10, 2021	1 Year
22	Vector Network Analyzer	Agilent	E5071C	MY46102965	Feb. 28, 2021	1 Year
23	Signal Generator	Agilent	N5172B	MY53050758	Feb. 27, 2021	1 Year
24	Smart Power Sensor	R&S	NRP-Z21	102209	Feb. 28, 2021	1 Year
25	3.5mm Economy Calibration Kit	Agilent	85052D	MY43252246	Dec. 10, 2020	1 Year
26	Dielectric Assessment Kit	Speag	DAK-3.5	1226	N/A	N/A
27	Directional Coupler	Woken	TS-PCC0M-05	0107090019	Feb. 27, 2021	1 Year
28	Coupler	Woken	0110A05601O-10	COM5BNW1A2	Feb. 27, 2021	1 Year
29	Digital Themometer	LKM	DTM3000	3519	Jun. 24, 2021	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.

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 Room 108, Building 2, No.1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong, People's Republic of 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.

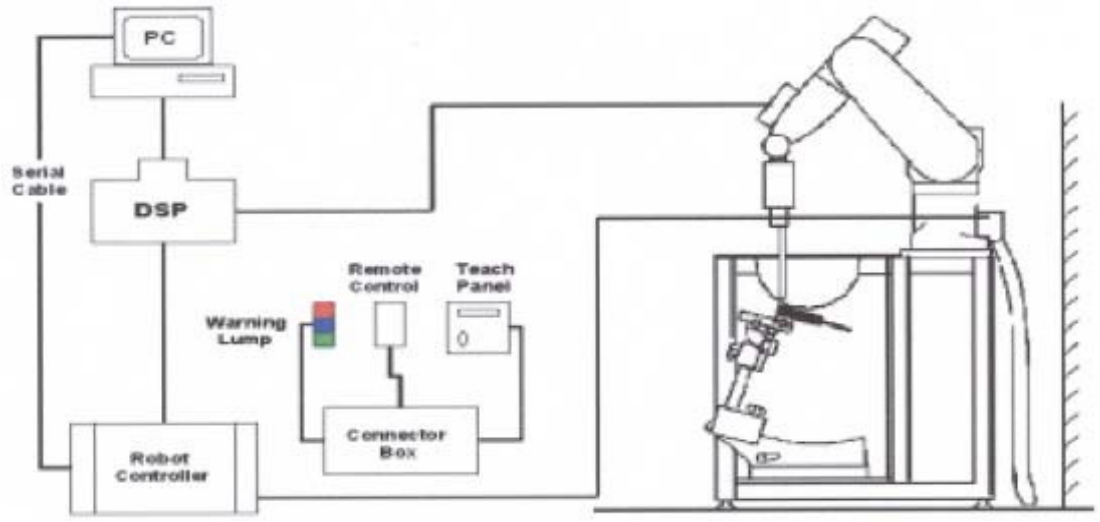
3. SAR MEASUREMENTS SYSTEM CONFIGURATION

3.1 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.

3.1.1 TEST SETUP LAYOUT



3.2 DASY5 E-FIELD PROBE SYSTEM

The SAR measurements were conducted with the dosimetric probe EX3DV4 and ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

3.2.1 PROBE SPECIFICATION

EX3DV4

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

ES3DV3

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 4 GHz Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g Linearity:± 0.2dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 4 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm

E-field Probe

3.2.2 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).

3.2.3 OTHER TEST EQUIPMENT

3.2.3.1. 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, ELI and SAM v6.0 Phantoms.
Material: POM, Acrylic glass, Foam

3.2.3.2 Phantom

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

3.2.4 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 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

3.2.5 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, Computer mathematic, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

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

Volume Averaging

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

Advanced Extrapolation

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

3.2.6 DATA STORAGE AND EVALUATION

3.2.6.1 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 “DAE”. 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.

3.2.7 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

4. SYSTEM VERIFICATION PROCEDURE

4.1 TISSUE VERIFICATION

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine 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 750	0.2	-	0.2	1.5	56.0	-	42.1	-
Head 835	0.2	-	0.2	1.5	57.0	-	41.1	-
Head 1750	-	47.0	-	0.4	-	-	52.6	-
Head 1900	-	44.5	-	0.2	-	-	55.3	-
Head 2450	-	45.0	-	0.1	-	-	54.9	-
Head 2600	-	45.1	-	0.1	-	-	54.8	-

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	750	22.5	0.886	42.790	0.89	41.9	-0.45	2.12	Aug. 13, 2021
Head	750	22.5	0.887	42.826	0.89	41.9	-0.34	2.21	Aug. 14, 2021
Head	835	22.5	0.913	42.116	0.90	41.5	1.44	1.48	Aug. 13, 2021
Head	835	22.5	0.914	42.151	0.90	41.5	1.56	1.57	Aug. 14, 2021
Head	835	22.3	0.903	42.142	0.90	41.5	0.33	1.55	Aug. 18, 2021
Head	1750	22.3	1.392	39.912	1.37	40.1	1.61	-0.47	Aug. 17, 2021
Head	1900	22.2	1.334	40.868	1.40	40.0	-4.71	2.17	Aug. 15, 2021
Head	1900	22.5	1.337	41.926	1.40	40.0	-4.50	4.82	Aug. 16, 2021
Head	2450	22.3	1.849	40.282	1.80	39.2	2.72	2.76	Aug. 18, 2021
Head	2600	22.5	1.979	39.404	1.96	39.0	0.97	1.04	Aug. 16, 2021
Head	2600	22.1	1.982	39.455	1.96	39.0	1.12	1.17	Aug. 19, 2021

Note:
1) The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.
2) KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.
3) The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

4.2 SYSTEM CHECK

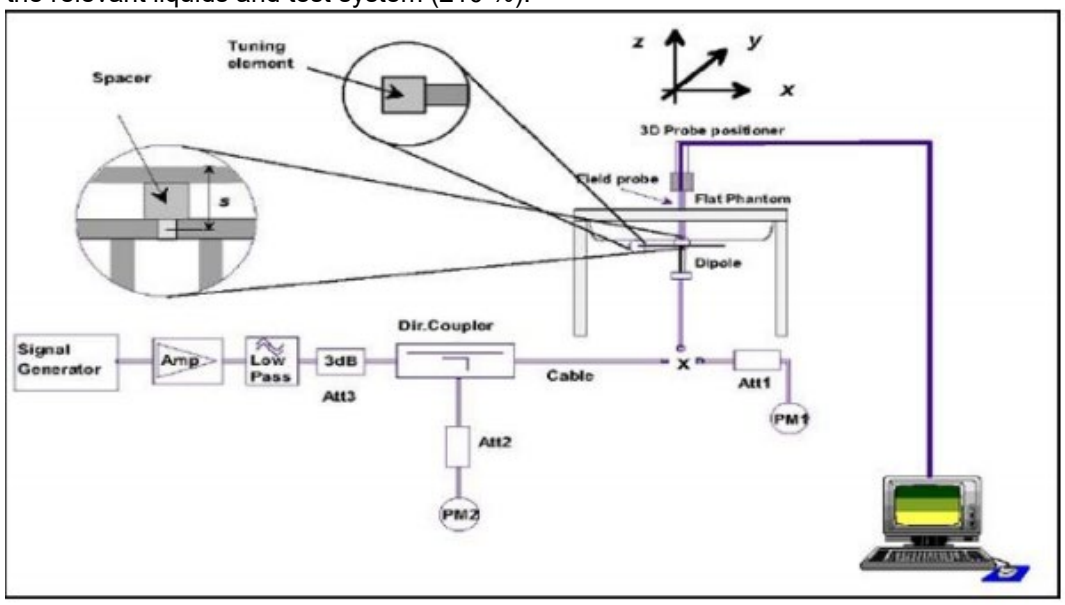
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE Std 1528 (described above). The following table shows system check results for all frequency bands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

System Check	Date	Frequency (MHz)	Targeted SAR-1g (W/kg)	Measured SAR-1g (W/kg)	normalized SAR-1g (W/kg)	Deviation (%)	Dipole S/N
Head	Aug. 13, 2021	750	8.59	2.20	8.80	2.44	1095
Head	Aug. 14, 2021	750	8.59	2.09	8.36	-2.68	1095
Head	Aug. 13, 2021	835	9.52	2.40	9.60	0.84	4d160
Head	Aug. 14, 2021	835	9.52	2.28	9.12	-4.20	4d160
Head	Aug. 18, 2021	835	9.52	2.44	9.76	2.52	4d160
Head	Aug. 17, 2021	1750	36.40	8.99	35.96	-1.21	1101
Head	Aug. 15, 2021	1900	39.60	10.30	41.20	4.04	5d179
Head	Aug. 16, 2021	1900	39.60	9.53	38.12	-3.74	5d179
Head	Aug. 18, 2021	2450	52.10	13.20	52.80	1.34	919
Head	Aug. 16, 2021	2600	56.90	13.70	54.80	-3.69	1067
Head	Aug. 19, 2021	2600	56.90	14.60	58.40	2.64	1067

4.3 SYSTEM CHECK PROCEDURE

The system check is performed by using a system check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250mW (below 3GHz) or 100mW (3-6GHz). To adjust this power a power meter is used.
The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test.

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



5. SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

5.1 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 7.2.

The mobile phone support the dual SIM, the SIM 1 and SIM 2 are use the same Transmit port and antenna.

6. OPERATIONAL CONDITIONS DURING TEST

6.1 SAR TEST CONFIGURATION

6.1.1 GSM TEST CONFIGURATION

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link.
Using MT8821C the power lever is set to “5” and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

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

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

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

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

6.1.2 UMTS TEST CONFIGURATION

1. Output Power Verification

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

2. WCDMA

(1) Head SAR Measurements

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

(2) Body SAR Measurements

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

3. HSDPA

SAR for body exposure configurations is measured according to the "Body SAR Measurements" procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as "otherwise" in the applicable procedures; SAR measurement is required for the secondary mode.

Per KDB941225 D01, the 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures for the highest reported SAR body exposure configuration in 12.2 kbps RMC.

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

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

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

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

HSDPA UE category

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

4. HSUPA

SAR for Body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01, the 3G SAR test reduction procedures is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures for the highest reported body exposure SAR configuration in 12.2 kbps RMC.

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

Subtests for WCDMA Release 6 HSUPA

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

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

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

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

Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$

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

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

HSUPA UE category

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Speading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF4	11484	5.76
	4	4	2		20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF4	22996	?
	4	4	10		20000	?

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

5. DC-HSDPA

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

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

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0
Levels for HSDPA connection setup

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

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13
The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.
The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK

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

Note:
1.The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table above.
2.Maximum number of transmission is limited to 1,i.e.,retransmission is not allowed. The redundancy and constellation version 0 shall be used.

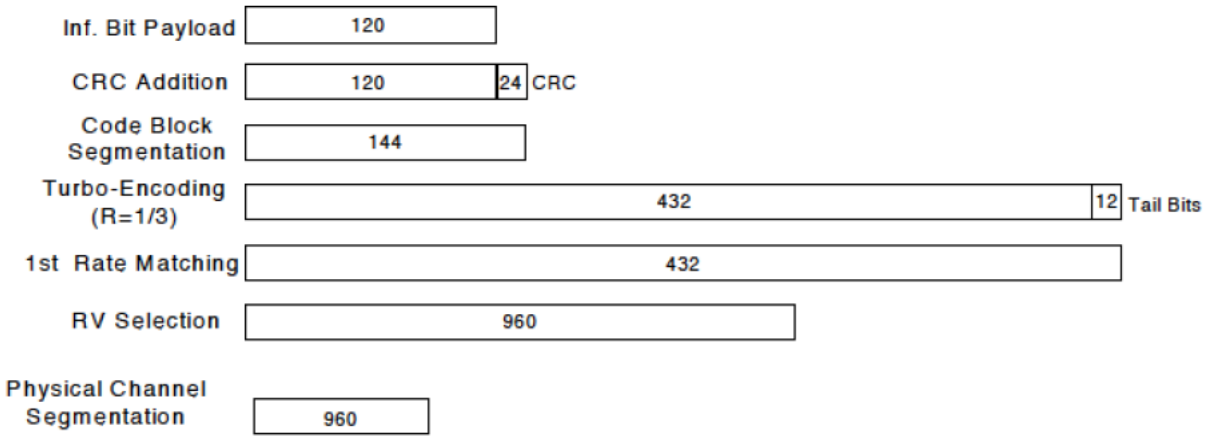


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM(dB)(2)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

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

6. HSPA+

An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5.A.1. Settings for the serving cell are defined in table 5.2E.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH 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	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 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 signaled to use the extrapolation algorithm.

Note:
1. The Dual Carriers transmission support HSDPA and HSUPA 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.

6.1.3 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

According to KDB 941225 D05 SAR for LTE Devices V02r05, for 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 B38/41 supports 3GPP TS 36 for 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 B38/41 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 subframe configurations.

Figure 4.2-1: Frame structure type 2

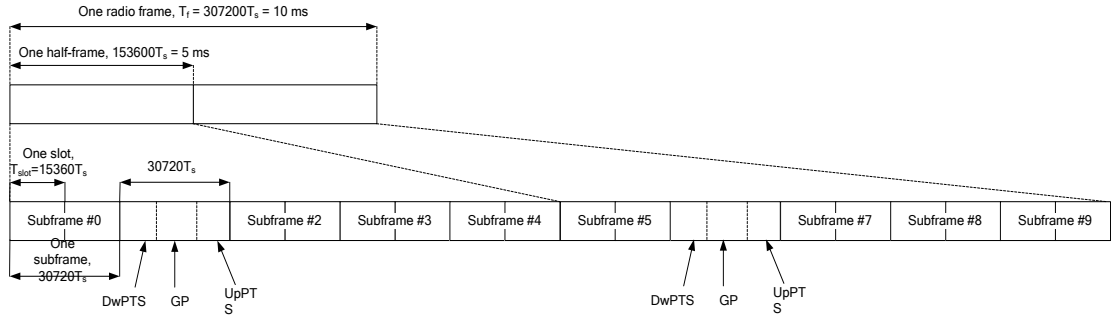


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
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 subframes, which consist of Uplink-subframe, Downlink-subframe and Special subframe. For TDD-LTE, the Duty Cycle should be calculated on Uplink-subframes and Special subframes, due to Special subframe containing both Uplink transmissions. So for one radio frame, Duty Cycle can be calculated with formula as below. The count of Uplink subframes are according to Table 4.2-2:

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

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

Uplink Component=UpPTS

In conclusion, for the TDD LTE B38/41, 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:

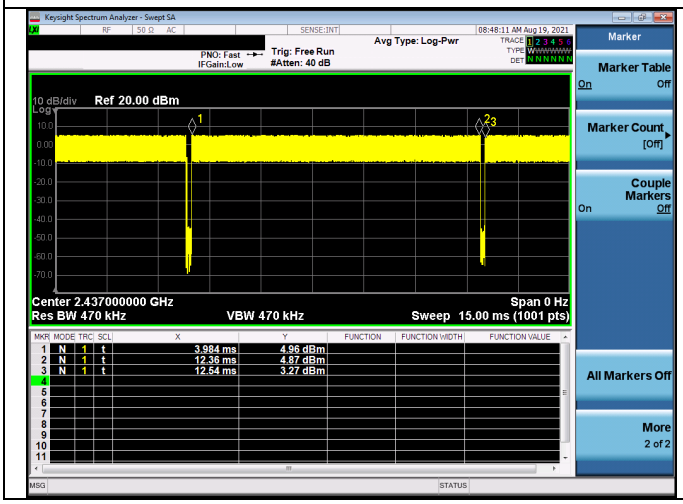
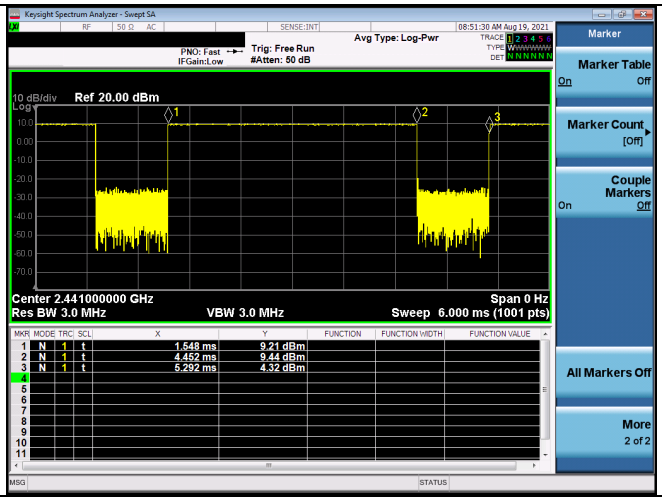
Uplink-downlink configuratin	Subframe number			Configuration of special subframe							
				Normal cyclic prefix in downlink				Extended cyclic prefix in downlink			
				Normal cyclic prefix in uplink		Extended cyclic prefix in uplink		Normal cyclic prefix in uplink		Extended cyclic prefix in uplink	
	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 subframe configuration 7 for Frame structure type 2.

6.1.4 WIFI TEST CONFIGURATION

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

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 test procedures in KDB 248227 D01 are applied.

Duty Cycle	Duty Cycle
WiFi 2.4G	BT
97.9%	77.6%
	

6.1.4.1 2.4G SAR Test Requirements

802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:
1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.
1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

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.

6.1.4.3 OFDM transmission mode and SAR test channel selection

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

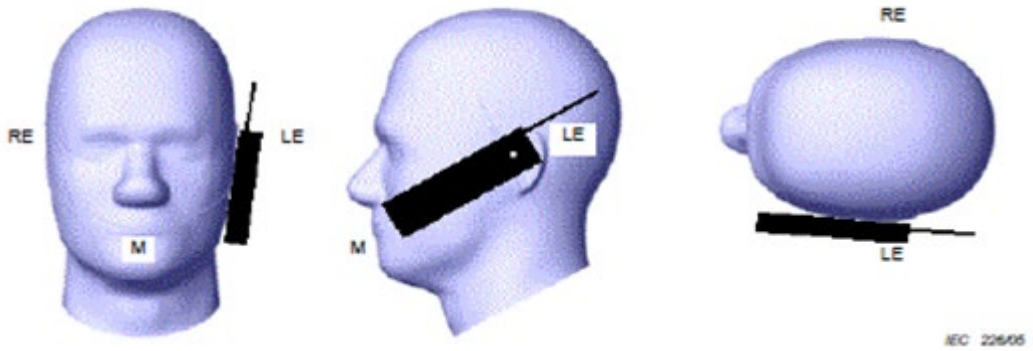
6.1.4.4 Initial test configuration procedure

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

6.2 TEST POSITION

6.2.1 HEAD TEST CONFIGURATION

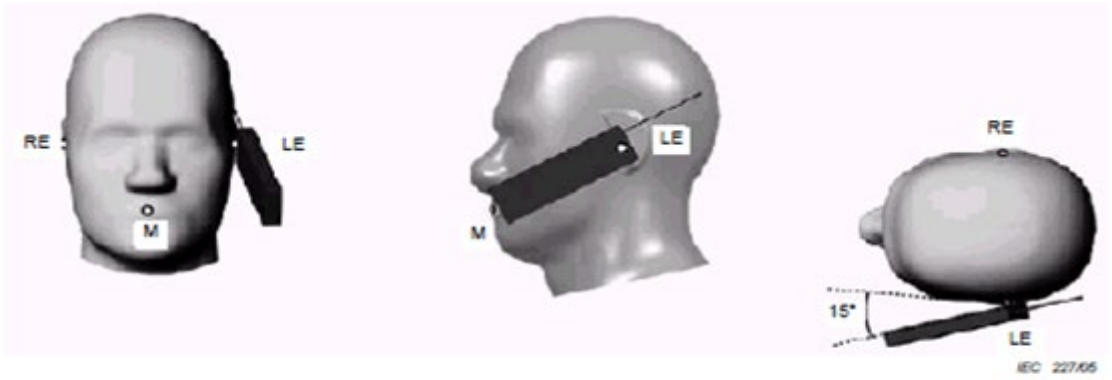
Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.



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.

6.2.2 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.

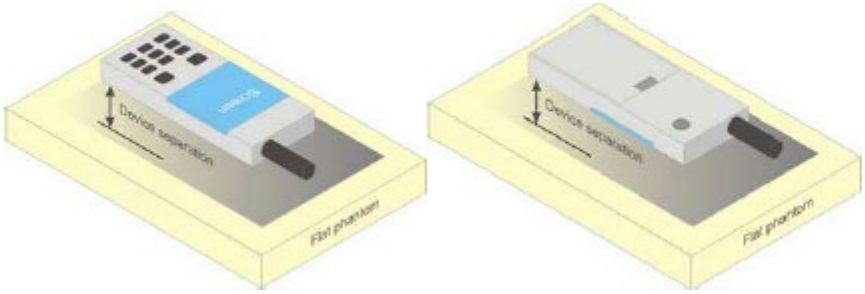


Figure 3 Test positions for body-worn device

6.2.3 HOTSPOT TEST CONFIGURATION

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

6.2.4 PRODUCT SPECIFIC 10-G SAR TEST CONFIGURATION

Per KDB 648474 D04, for smart phones with a display diagonal dimension > 15.0cm or an overall diagonal dimension > 16.0cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the device is marketed as “Phablet”.
The UMPC mini-tablets procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25mm from that surface or edge, in direct contact with a flat phantom, for product specific 10-g SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2W/kg; when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

The location of the antenna inside EUT and the test position judgment of Hotspot/Specific 10g SAR, please refer to Appendix E.

6.3 GENERAL DESCRIPTION OF TEST PROCEDURES

Connection to the EUT is established via air interface with Anritsu MT8820C & Anritsu MT8821C & R&S CMW500, and the EUT is set to maximum output power by Anritsu MT8820C & Anritsu MT8821C & R&S CMW500. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30dB.

6.4 RECEIVER DETECTION MECHANISM

6.4.1 GENERAL DESCRIPTION OF RECEIVER DETECTION MECHANISM

The device supports the receiver detection mechanism. The main purpose is to minimize triggering associated with power reduction scenarios by receiver detection mechanisms and provide enhanced user experience.
This device uses the receiver to indicate whether the user is making a call in head scenario or not. The selection between head and body power levels is based on the receiver detection mechanism. It can determine proximity to head or body and set the relevant power level for 2G&3G&4G antenna accordingly.
Users will be in full power when using WiFi alone. When WiFi+2G/3G/4G are used simultaneously, WiFi power reduction will be triggered, i.e. WiFi will be in power level B3 state.

Ant 1 (Bottom Antenna) Max Power (dBm)															
Power scenario	GSM 850	GSM 1900	UMTS B2	UMTS B4	UMTS B5	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B17	LTE B26	LTE B38	LTE B41	LTE B66
Receiver on (Head)	33.3	30.3	23.8	23.8	24.1	23.8	23.8	24.1	23.3	24.1	24.1	24.1	23.8	23.8	23.8
Receiver off (Body-worn)	33.3	30.3	23.8	23.8	24.1	22.8	21.8	24.1	23.3	24.1	24.1	24.1	23.8	23.8	23.8
Receiver off (Hotspot & Specific 10g SAR)	31.3	25.8	21.8	21.8	24.1	22.8	21.8	24.1	20.8	24.1	24.1	24.1	23.8	23.8	21.8

Ant 3 (WiFi Antenna) Max Power (dBm)						
Power scenario	2.4G					
	802.11b	802.11g	802.11n20	802.11n40	BT	BLE
Receiver on (Head)	19.5	17.5	16.5	16.5	12.5	8
Receiver off (Body-worn)	20.5	18.5	17.5	17.5	12.5	8
Receiver off (Hotspot & Specific 10g SAR)	-	-	-	-	-	-
Receiver off (Body-worn 0cm)	-	-	-	-	-	-

7. TEST RESULT

7.1 CONDUCTED POWER RESULTS

The conducted power measurement result please refer to Appendix F.

7.2 SAR TEST RESULTS

General Notes:

1) Per KDB447498 D01, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.
3) Per KDB865664 D01, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8W/kg; if the deviation among the repeated measurement is ≤ 20%, and the measured SAR < 1.45W/kg, only one repeated measurement is required.
4) Per KDB941225 D06, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
5) Per KDB648474 D04, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.
6) Per KDB865664 D02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing.

GSM Notes:

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

UMTS Notes:

Per KDB941225 D01, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

LTE notes:

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

WLAN Notes:

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

7.2.1 SAR MEASUREMENT RESULT OF HEAD

1. Head SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
G01	GSM 850	GSM	190	Right Cheek	Main	1	33.3	32.83	0.04	**0.202**	**0.153**	**0.225**
G02	GSM 850	GSM	190	Right Tilted	Main	1	33.3	32.83	0.01	0.074	0.078	0.082
G03	GSM 850	GSM	190	Left Cheek	Main	1	33.3	32.83	-0.07	0.190	0.143	0.212
G04	GSM 850	GSM	190	Left Tilted	Main	1	33.3	32.83	-0.02	0.066	0.076	0.073
G05	GSM 850	GSM	190	Right Cheek	Main	2	33.3	32.83	-0.06	0.195	0.149	0.217
G07	GSM 1900	GSM	661	Right Cheek	Main	1	30.3	30.15	0.07	**0.104**	**0.065**	**0.108**
G08	GSM 1900	GSM	661	Right Tilted	Main	1	30.3	30.15	0.05	0.084	0.049	0.087
G09	GSM 1900	GSM	661	Left Cheek	Main	1	30.3	30.15	0.01	0.100	0.063	0.103
G10	GSM 1900	GSM	661	Left Tilted	Main	1	30.3	30.15	-0.03	0.094	0.059	0.097
G11	GSM 1900	GSM	661	Right Cheek	Main	2	30.3	30.15	-0.09	0.099	0.061	0.102

Note: The value with boldface is the maximum SAR Value of each test band.

2. Head SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
U01	UMTS B2	RMC12.2K	9400	Right Cheek	Main	1	23.8	23.42	0.05	**0.115**	**0.069**	**0.126**
U02	UMTS B2	RMC12.2K	9400	Right Tilted	Main	1	23.8	23.42	0.01	0.083	0.047	0.090
U03	UMTS B2	RMC12.2K	9400	Left Cheek	Main	1	23.8	23.42	0.02	0.108	0.067	0.118
U04	UMTS B2	RMC12.2K	9400	Left Tilted	Main	1	23.8	23.42	0.09	0.093	0.057	0.102
U05	UMTS B2	RMC12.2K	9400	Right Cheek	Main	2	23.8	23.42	-0.13	0.109	0.062	0.119
U07	UMTS B4	RMC12.2K	1413	Right Cheek	Main	1	23.8	23.32	-0.18	**0.144**	**0.092**	**0.161**
U08	UMTS B4	RMC12.2K	1413	Right Tilted	Main	1	23.8	23.32	-0.03	0.081	0.050	0.091
U09	UMTS B4	RMC12.2K	1413	Left Cheek	Main	1	23.8	23.32	-0.05	0.113	0.073	0.126
U10	UMTS B4	RMC12.2K	1413	Left Tilted	Main	1	23.8	23.32	-0.06	0.062	0.041	0.069
U11	UMTS B4	RMC12.2K	1413	Right Cheek	Main	2	23.8	23.32	0.08	0.131	0.087	0.146
U13	UMTS B5	RMC12.2K	4182	Right Cheek	Main	1	24.1	23.85	0.08	0.243	0.185	0.257
U14	UMTS B5	RMC12.2K	4182	Right Tilted	Main	1	24.1	23.85	-0.11	0.172	0.142	0.182
U15	UMTS B5	RMC12.2K	4182	Left Cheek	Main	1	24.1	23.85	-0.05	**0.250**	**0.187**	**0.265**
U16	UMTS B5	RMC12.2K	4182	Left Tilted	Main	1	24.1	23.85	0.03	0.148	0.129	0.157
U17	UMTS B5	RMC12.2K	4182	Left Cheek	Main	2	24.1	23.85	0.12	0.243	0.181	0.257

Note: The value with boldface is the maximum SAR Value of each test band.

3. Head SAR test results of LTE

Test No.	Band	Mode	Channel	RB	offset	Test Position	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L01	LTE B2	QPSK20M	18700	1	50	Right Cheek	Main	1	23.8	23.32	0.09	**0.182**	**0.112**	**0.203**
L02	LTE B2	QPSK20M	18700	1	50	Right Tilted	Main	1	23.8	23.32	0.11	0.102	0.063	0.114
L03	LTE B2	QPSK20M	18700	1	50	Left Cheek	Main	1	23.8	23.32	0.05	0.124	0.079	0.138
L04	LTE B2	QPSK20M	18700	1	50	Left Tilted	Main	1	23.8	23.32	-0.02	0.093	0.061	0.104
L05	LTE B2	QPSK20M	19100	50	25	Right Cheek	Main	1	23.3	22.37	0.07	0.156	0.096	0.193
L06	LTE B2	QPSK20M	19100	50	25	Right Tilted	Main	1	23.3	22.37	0.15	0.073	0.044	0.090
L07	LTE B2	QPSK20M	19100	50	25	Left Cheek	Main	1	23.3	22.37	0.13	0.117	0.073	0.145
L08	LTE B2	QPSK20M	19100	50	25	Left Tilted	Main	1	23.3	22.37	0.02	0.079	0.053	0.098
L09	LTE B2	QPSK20M	18700	1	50	Right Cheek	Main	2	23.8	23.32	0.14	0.179	0.108	0.200
L11	LTE B4	QPSK20M	20050	1	0	Right Cheek	Main	1	23.8	23.73	-0.12	**0.181**	**0.115**	**0.184**
L12	LTE B4	QPSK20M	20050	1	0	Right Tilted	Main	1	23.8	23.73	-0.03	0.089	0.055	0.091
L13	LTE B4	QPSK20M	20050	1	0	Left Cheek	Main	1	23.8	23.73	0.1	0.105	0.069	0.107
L14	LTE B4	QPSK20M	20050	1	0	Left Tilted	Main	1	23.8	23.73	0.06	0.071	0.046	0.073
L15	LTE B4	QPSK20M	20175	50	25	Right Cheek	Main	1	23.3	21.92	0.1	0.125	0.079	0.172
L16	LTE B4	QPSK20M	20175	50	25	Right Tilted	Main	1	23.3	21.92	-0.18	0.063	0.039	0.087
L17	LTE B4	QPSK20M	20175	50	25	Left Cheek	Main	1	23.3	21.92	-0.03	0.088	0.057	0.121
L18	LTE B4	QPSK20M	20175	50	25	Left Tilted	Main	1	23.3	21.92	-0.07	0.054	0.035	0.074
L19	LTE B4	QPSK20M	20050	1	0	Right Cheek	Main	2	23.8	23.73	0.09	0.175	0.112	0.178
L21	LTE B5	QPSK10M	20450	1	0	Right Cheek	Main	1	24.1	23.93	0.02	0.225	0.173	0.234
L22	LTE B5	QPSK10M	20450	1	0	Right Tilted	Main	1	24.1	23.93	0.11	0.083	0.090	0.086
L23	LTE B5	QPSK10M	20450	1	0	Left Cheek	Main	1	24.1	23.93	-0.05	0.197	0.149	0.205
L24	LTE B5	QPSK10M	20450	1	0	Left Tilted	Main	1	24.1	23.93	0.17	0.075	0.091	0.078
L25	LTE B5	QPSK10M	20525	25	25	Right Cheek	Main	1	23.6	22.72	0.01	**0.215**	**0.164**	**0.263**
L26	LTE B5	QPSK10M	20525	25	25	Right Tilted	Main	1	23.6	22.72	-0.08	0.079	0.085	0.097
L27	LTE B5	QPSK10M	20525	25	25	Left Cheek	Main	1	23.6	22.72	0.1	0.184	0.139	0.225
L28	LTE B5	QPSK10M	20525	25	25	Left Tilted	Main	1	23.6	22.72	0.03	0.065	0.080	0.080
L29	LTE B5	QPSK10M	20525	25	25	Right Cheek	Main	2	23.6	22.72	0.08	0.201	0.159	0.246
L31	LTE B7	QPSK20M	20850	1	50	Right Cheek	Main	1	23.3	22.48	0.09	0.146	0.073	0.176
L32	LTE B7	QPSK20M	20850	1	50	Right Tilted	Main	1	23.3	22.48	0.04	0.117	0.061	0.141
L33	LTE B7	QPSK20M	20850	1	50	Left Cheek	Main	1	23.3	22.48	0.08	0.243	0.126	0.293
L34	LTE B7	QPSK20M	20850	1	50	Left Tilted	Main	1	23.3	22.48	-0.01	0.128	0.068	0.155
L35	LTE B7	QPSK20M	21100	50	50	Right Cheek	Main	1	22.3	21.42	0.06	0.120	0.061	0.147
L36	LTE B7	QPSK20M	21100	50	50	Right Tilted	Main	1	22.3	21.42	0.05	0.101	0.054	0.124
L37	LTE B7	QPSK20M	21100	50	50	Left Cheek	Main	1	22.3	21.42	0.01	**0.249**	**0.128**	**0.305**
L38	LTE B7	QPSK20M	21100	50	50	Left Tilted	Main	1	22.3	21.42	-0.07	0.078	0.041	0.096
L39	LTE B7	QPSK20M	21100	50	50	Left Cheek	Main	2	22.3	21.42	0.04	0.245	0.127	0.300
L41	LTE B12	QPSK10M	23060	1	49	Right Cheek	Main	1	24.1	24.00	-0.09	**0.104**	**0.082**	**0.107**
L42	LTE B12	QPSK10M	23060	1	49	Right Tilted	Main	1	24.1	24.00	0.11	0.033	0.042	0.034
L43	LTE B12	QPSK10M	23060	1	49	Left Cheek	Main	1	24.1	24.00	0.05	0.085	0.066	0.087
L44	LTE B12	QPSK10M	23060	1	49	Left Tilted	Main	1	24.1	24.00	-0.02	0.026	0.036	0.027
L45	LTE B12	QPSK10M	23095	25	25	Right Cheek	Main	1	23.6	22.72	-0.19	0.083	0.073	0.101
L46	LTE B12	QPSK10M	23095	25	25	Right Tilted	Main	1	23.6	22.72	0.13	0.031	0.038	0.038
L47	LTE B12	QPSK10M	23095	25	25	Left Cheek	Main	1	23.6	22.72	0.08	0.082	0.064	0.100
L48	LTE B12	QPSK10M	23095	25	25	Left Tilted	Main	1	23.6	22.72	0.02	0.029	0.040	0.036
L49	LTE B12	QPSK10M	23060	1	49	Right Cheek	Main	2	24.1	24.00	-0.01	0.100	0.079	0.102

Test No.	Band	Mode	Channel	RB	offset	Test Position	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L51	LTE B17	QPSK10M	23780	1	49	Right Cheek	Main	1	24.1	23.97	0.03	0.104	0.082	0.107
L52	LTE B17	QPSK10M	23780	1	49	Right Tilted	Main	1	24.1	23.97	0.11	0.018	0.044	0.019
L53	LTE B17	QPSK10M	23780	1	49	Left Cheek	Main	1	24.1	23.97	0.14	**0.108**	**0.084**	**0.111**
L54	LTE B17	QPSK10M	23780	1	49	Left Tilted	Main	1	24.1	23.97	-0.05	0.056	0.040	0.058
L55	LTE B17	QPSK10M	23790	25	12	Right Cheek	Main	1	23.1	22.71	0.07	0.080	0.063	0.087
L56	LTE B17	QPSK10M	23790	25	12	Right Tilted	Main	1	23.1	22.71	0.09	0.053	0.033	0.058
L57	LTE B17	QPSK10M	23790	25	12	Left Cheek	Main	1	23.1	22.71	0.15	0.082	0.064	0.090
L58	LTE B17	QPSK10M	23790	25	12	Left Tilted	Main	1	23.1	22.71	0.03	0.043	0.031	0.047
L59	LTE B17	QPSK10M	23780	1	49	Left Cheek	Main	2	24.1	23.97	-0.17	0.106	0.083	0.109
L61	LTE B26	QPSK15M	26765	1	0	Right Cheek	Main	1	24.1	24.03	0.05	0.181	0.138	0.184
L62	LTE B26	QPSK15M	26765	1	0	Right Tilted	Main	1	24.1	24.03	-0.07	0.069	0.076	0.070
L63	LTE B26	QPSK15M	26765	1	0	Left Cheek	Main	1	24.1	24.03	-0.02	**0.182**	**0.136**	**0.185**
L64	LTE B26	QPSK15M	26765	1	0	Left Tilted	Main	1	24.1	24.03	0.11	0.052	0.063	0.053
L65	LTE B26	QPSK15M	26865	36	0	Right Cheek	Main	1	23.1	23.07	0.01	0.177	0.134	0.178
L66	LTE B26	QPSK15M	26865	36	0	Right Tilted	Main	1	23.1	23.07	0.13	0.061	0.066	0.061
L67	LTE B26	QPSK15M	26865	36	0	Left Cheek	Main	1	23.1	23.07	0.18	0.177	0.132	0.178
L68	LTE B26	QPSK15M	26865	36	0	Left Tilted	Main	1	23.1	23.07	-0.09	0.051	0.062	0.051
L69	LTE B26	QPSK15M	26765	1	0	Left Cheek	Main	2	24.1	24.03	0.1	0.178	0.135	0.181
L71	LTE B38	QPSK20M	38000	1	0	Right Cheek	Main	1	23.8	23.16	-0.09	0.121	0.055	0.140
L72	LTE B38	QPSK20M	38000	1	0	Right Tilted	Main	1	23.8	23.16	0.05	0.093	0.049	0.108
L73	LTE B38	QPSK20M	38000	1	0	Left Cheek	Main	1	23.8	23.16	0.07	**0.239**	**0.122**	**0.277**
L74	LTE B38	QPSK20M	38000	1	0	Left Tilted	Main	1	23.8	23.16	0.12	0.115	0.060	0.133
L75	LTE B38	QPSK20M	38000	50	50	Right Cheek	Main	1	23.3	21.76	-0.04	0.096	0.045	0.137
L76	LTE B38	QPSK20M	38000	50	50	Right Tilted	Main	1	23.3	21.76	0.07	0.069	0.037	0.098
L77	LTE B38	QPSK20M	38000	50	50	Left Cheek	Main	1	23.3	21.76	0.08	0.183	0.093	0.261
L78	LTE B38	QPSK20M	38000	50	50	Left Tilted	Main	1	23.3	21.76	-0.03	0.103	0.052	0.147
L79	LTE B38	QPSK20M	38000	1	0	Left Cheek	Main	2	23.8	23.16	0.05	0.221	0.115	0.256
L81	LTE B41	QPSK20M	41140	1	99	Right Cheek	Main	1	23.8	23.28	0.04	0.146	0.066	0.165
L82	LTE B41	QPSK20M	41140	1	99	Right Tilted	Main	1	23.8	23.28	0.02	0.118	0.059	0.133
L83	LTE B41	QPSK20M	41140	1	99	Left Cheek	Main	1	23.8	23.28	0.07	**0.273**	**0.137**	**0.308**
L84	LTE B41	QPSK20M	41140	1	99	Left Tilted	Main	1	23.8	23.28	0.05	0.114	0.059	0.128
L85	LTE B41	QPSK20M	40140	50	25	Right Cheek	Main	1	23.3	22.39	-0.13	0.106	0.053	0.131
L86	LTE B41	QPSK20M	40140	50	25	Right Tilted	Main	1	23.3	22.39	0.03	0.079	0.039	0.097
L87	LTE B41	QPSK20M	40140	50	25	Left Cheek	Main	1	23.3	22.39	0.02	0.178	0.092	0.219
L88	LTE B41	QPSK20M	40140	50	25	Left Tilted	Main	1	23.3	22.39	-0.08	0.112	0.056	0.138
L89	LTE B41	QPSK20M	41140	1	99	Left Cheek	Main	2	23.8	23.28	0.03	0.264	0.121	0.298
L91	LTE B66	QPSK20M	132072	1	0	Right Cheek	Main	1	23.8	23.28	0.04	**0.164**	**0.102**	**0.185**
L92	LTE B66	QPSK20M	132072	1	0	Right Tilted	Main	1	23.8	23.28	-0.12	0.083	0.050	0.094
L93	LTE B66	QPSK20M	132072	1	0	Left Cheek	Main	1	23.8	23.28	0.04	0.093	0.060	0.104
L94	LTE B66	QPSK20M	132072	1	0	Left Tilted	Main	1	23.8	23.28	-0.05	0.071	0.046	0.080
L95	LTE B66	QPSK20M	132572	50	50	Right Cheek	Main	1	23.3	22.18	0.01	0.119	0.073	0.154
L96	LTE B66	QPSK20M	132572	50	50	Right Tilted	Main	1	23.3	22.18	0.13	0.075	0.046	0.097
L97	LTE B66	QPSK20M	132572	50	50	Left Cheek	Main	1	23.3	22.18	0.17	0.099	0.063	0.128
L98	LTE B66	QPSK20M	132572	50	50	Left Tilted	Main	1	23.3	22.18	0	0.058	0.037	0.075
L99	LTE B66	QPSK20M	132072	1	0	Right Cheek	Main	2	23.8	23.28	0.01	0.157	0.098	0.177

Note: The value with boldface is the maximum SAR Value of each test band.

4. Head SAR test results of 2.4G WiFi

Test No.	Band	Channel	Test Position	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W01	802.11b	6	Right Cheek	1	97.9	19.5	18.93	-0.1	0.497	0.262	0.579
W02	802.11b	6	Right Tilted	1	97.9	19.5	18.93	-0.14	0.475	0.239	0.553
W03	802.11b	6	Left Cheek	1	97.9	19.5	18.93	0.06	0.810	0.450	0.943
W04	802.11b	6	Left Tilted	1	97.9	19.5	18.93	0.01	0.775	0.376	0.903
W05	802.11b	1	Left Cheek	1	97.9	19.5	18.71	-0.05	**0.904**	**0.484**	**1.108**
W16	802.11b	1	Left Tilted	1	97.9	19.5	18.71	0.01	0.775	0.376	0.950
W07	802.11b	1	Left Cheek (Repeated)	1	97.9	19.5	18.71	0.03	0.871	0.405	1.067

Note: The value with boldface is the maximum SAR Value of each test band.

5. Head SAR test results of BT

Test No.	Band	Channel	Test Position	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
B01	BT DH5	39	Right Cheek	1	77.6	12.5	11.83	0.1	0.054	0.028	0.081
B02	BT DH5	39	Right Tilted	1	77.6	12.5	11.83	0.13	0.058	0.035	0.087
B03	BT DH5	39	Left Cheek	1	77.6	12.5	11.83	-0.08	**0.081**	**0.039**	**0.122**
B04	BT DH5	39	Left Tilted	1	77.6	12.5	11.83	-0.05	0.077	0.035	0.116

Note: The value with boldface is the maximum SAR Value of each test band.

7.2.2 SAR MEASUREMENT RESULT OF BODY-WORN

1. Body-worn SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
G12	GSM 850	GSM	190	Front Face	1.5	Main	1	33.3	32.83	-0.01	0.159	0.119	0.159
G13	GSM 850	GSM	190	Rear Face	1.5	Main	1	33.3	32.83	-0.05	**0.234**	**0.176**	**0.234**
G14	GSM 850	GSM	190	Rear Face	1.5	Main	2	33.3	32.83	0.09	0.216	0.165	0.216
G22	GSM 1900	GSM	661	Front Face	1.5	Main	1	30.3	30.15	-0.03	0.155	0.097	0.155
G23	GSM 1900	GSM	661	Rear Face	1.5	Main	1	30.3	30.15	0.09	**0.296**	**0.185**	**0.296**
G24	GSM 1900	GSM	661	Rear Face	1.5	Main	2	30.3	30.15	-0.05	0.287	0.179	0.287

Note: The value with boldface is the maximum SAR Value of each test band.

2. Body-worn SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
U19	UMTS B2	RMC12.2K	9400	Front Face	1.5	Main	1	23.8	23.42	0.09	0.151	0.119	0.151
U20	UMTS B2	RMC12.2K	9400	Rear Face	1.5	Main	1	23.8	23.42	0.02	**0.309**	**0.189**	**0.309**
U21	UMTS B2	RMC12.2K	9400	Rear Face	1.5	Main	2	23.8	23.42	-0.03	0.267	0.145	0.267
U30	UMTS B4	RMC12.2K	1413	Front Face	1.5	Main	1	23.8	23.32	0.04	0.125	0.087	0.125
U31	UMTS B4	RMC12.2K	1413	Rear Face	1.5	Main	1	23.8	23.32	0.18	**0.300**	**0.190**	**0.300**
U32	UMTS B4	RMC12.2K	1413	Rear Face	1.5	Main	2	23.8	23.32	-0.04	0.283	0.179	0.283
U41	UMTS B5	RMC12.2K	4182	Front Face	1.5	Main	1	24.1	23.85	0.05	0.207	0.157	0.207
U42	UMTS B5	RMC12.2K	4182	Rear Face	1.5	Main	1	24.1	23.85	0.01	**0.217**	**0.165**	**0.217**
U43	UMTS B5	RMC12.2K	4182	Rear Face	1.5	Main	2	24.1	23.85	0.02	0.209	0.157	0.209

Note: The value with boldface is the maximum SAR Value of each test band.

3. Body-worn SAR test results of LTE

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L101	LTE B2	QPSK20M	18900	1	0	Front Face	1.5	Main	1	22.8	22.02	0.13	0.156	0.103	0.187
L102	LTE B2	QPSK20M	18900	1	0	Rear Face	1.5	Main	1	22.8	22.02	-0.07	0.321	0.200	0.384
L103	LTE B2	QPSK20M	19100	50	25	Front Face	1.5	Main	1	21.8	20.77	-0.02	0.133	0.086	0.169
L104	LTE B2	QPSK20M	19100	50	25	Rear Face	1.5	Main	1	21.8	20.77	0.16	0.253	0.155	0.321
L105	LTE B2	QPSK20M	18900	1	0	Rear Face	1.5	Main	2	22.8	22.02	0.09	**0.323**	**0.201**	**0.386**
L119	LTE B4	QPSK20M	20175	1	0	Front Face	1.5	Main	1	21.8	21.36	0.15	0.143	0.097	0.158
L120	LTE B4	QPSK20M	20175	1	0	Rear Face	1.5	Main	1	21.8	21.36	0.1	0.332	0.216	0.368
L121	LTE B4	QPSK20M	20300	50	25	Front Face	1.5	Main	1	20.8	19.73	-0.18	0.090	0.062	0.116
L122	LTE B4	QPSK20M	20300	50	25	Rear Face	1.5	Main	1	20.8	19.73	0.11	0.221	0.139	0.283
L123	LTE B4	QPSK20M	20175	1	0	Rear Face	1.5	Main	2	21.8	21.36	0	**0.343**	**0.217**	**0.380**
L136	LTE B5	QPSK10M	20450	1	0	Front Face	1.5	Main	1	24.1	23.93	-0.07	0.176	0.132	0.183
L137	LTE B5	QPSK10M	20450	1	0	Rear Face	1.5	Main	1	24.1	23.93	-0.11	0.233	0.176	0.242
L138	LTE B5	QPSK10M	20525	25	25	Front Face	1.5	Main	1	23.6	22.72	0.03	0.169	0.128	0.207
L140	LTE B5	QPSK10M	20525	25	25	Rear Face	1.5	Main	1	23.6	22.72	-0.05	0.191	0.150	0.234
L141	LTE B5	QPSK10M	20450	1	0	Rear Face	1.5	Main	2	24.1	23.93	-0.05	**0.235**	**0.178**	**0.244**
L155	LTE B7	QPKS20M	20850	1	50	Front Face	1.5	Main	1	23.3	22.48	0.11	0.196	0.101	0.237
L156	LTE B7	QPKS20M	20850	1	50	Rear Face	1.5	Main	1	23.3	22.48	-0.07	**0.373**	**0.187**	**0.450**
L157	LTE B7	QPKS20M	21100	50	50	Front Face	1.5	Main	1	22.3	21.42	0.06	0.132	0.067	0.162
L158	LTE B7	QPKS20M	21100	50	50	Rear Face	1.5	Main	1	22.3	21.42	-0.13	0.258	0.129	0.316
L159	LTE B7	QPKS20M	20850	1	50	Rear Face	1.5	Main	2	23.3	22.48	-0.02	0.361	0.176	0.436
L173	LTE B12	QPSK10M	23060	1	49	Front Face	1.5	Main	1	24.1	24.00	0.03	0.114	0.088	0.117
L174	LTE B12	QPSK10M	23060	1	49	Rear Face	1.5	Main	1	24.1	24.00	-0.04	0.164	0.126	0.168
L175	LTE B12	QPSK10M	23095	25	25	Front Face	1.5	Main	1	23.6	22.72	0.11	0.122	0.095	0.149
L176	LTE B12	QPSK10M	23095	25	25	Rear Face	1.5	Main	1	23.6	22.72	0	**0.170**	**0.131**	**0.208**
L177	LTE B12	QPSK10M	23095	25	25	Rear Face	1.5	Main	2	23.6	22.72	-0.16	0.161	0.122	0.197
L191	LTE B17	QPSK10M	23780	1	49	Front Face	1.5	Mian	1	24.1	23.97	0.11	0.143	0.102	0.147
L192	LTE B17	QPSK10M	23780	1	49	Rear Face	1.5	Main	1	24.1	23.97	-0.02	**0.196**	**0.140**	**0.202**
L193	LTE B17	QPSK10M	23790	25	12	Front Face	1.5	Main	1	23.1	22.71	0.05	0.117	0.083	0.128
L194	LTE B17	QPSK10M	23790	25	12	Rear Face	1.5	Main	1	23.1	22.71	-0.01	0.153	0.118	0.167
L195	LTE B17	QPSK10M	23780	1	49	Rear Face	1.5	Main	2	24.1	23.97	0.09	0.186	0.132	0.192
L209	LTE B26	QPSK15M	26765	1	0	Front Face	1.5	Main	1	24.1	24.03	0.1	0.175	0.131	0.178
L210	LTE B26	QPSK15M	26765	1	0	Rear Face	1.5	Main	1	24.1	24.03	-0.07	**0.210**	**0.160**	**0.213**
L211	LTE B26	QPSK15M	26865	36	0	Front Face	1.5	Main	1	23.1	23.07	0.14	0.189	0.142	0.190
L212	LTE B26	QPSK15M	26865	36	0	Rear Face	1.5	Main	1	23.1	23.07	0.03	0.184	0.140	0.185
L213	LTE B26	QPSK15M	26765	1	0	Rear Face	1.5	Main	2	24.1	24.03	-0.06	0.198	0.151	0.201
L227	LTE B38	QPSK20M	38000	1	0	Front Face	1.5	Main	1	23.8	23.16	-0.12	0.103	0.060	0.119
L228	LTE B38	QPSK20M	38000	1	0	Rear Face	1.5	Main	1	23.8	23.16	0.02	**0.303**	**0.152**	**0.351**
L229	LTE B38	QPSK20M	37850	50	50	Front Face	1.5	Main	1	23.3	21.76	0.05	0.088	0.045	0.126
L230	LTE B38	QPSK20M	37850	50	50	Rear Face	1.5	Main	1	23.3	21.76	0.04	0.185	0.097	0.264
L231	LTE B38	QPSK20M	38000	1	0	Rear Face	1.5	Main	2	23.8	23.16	0.1	0.192	0.103	0.223

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L245	LTE B41	QPSK20M	41140	1	99	Front Face	1.5	Main	1	23.8	23.28	-0.11	0.120	0.066	0.135
L246	LTE B41	QPSK20M	41140	1	99	Rear Face	1.5	Main	1	23.8	23.28	-0.01	0.232	0.120	0.262
L247	LTE B41	QPSK20M	40140	50	25	Front Face	1.5	Main	1	23.3	22.39	0.07	0.124	0.063	0.153
L248	LTE B41	QPSK20M	40140	50	25	Rear Face	1.5	Main	1	23.3	22.39	0.03	**0.232**	**0.117**	**0.286**
L249	LTE B41	QPSK20M	40140	50	25	Rear Face	1.5	Main	2	23.3	22.39	0.15	0.230	0.112	0.283
L263	LTE B66	QPSK20M	132072	1	50	Front Face	1.5	Main	1	23.8	23.28	0.13	0.136	0.093	0.154
L264	LTE B66	QPSK20M	132072	1	50	Rear Face	1.5	Main	1	23.8	23.28	-0.12	**0.332**	**0.210**	**0.374**
L265	LTE B66	QPSK20M	132572	50	0	Front Face	1.5	Main	1	23.3	22.18	-0.18	0.101	0.069	0.131
L266	LTE B66	QPSK20M	132572	50	0	Rear Face	1.5	Main	1	23.3	22.18	0.06	0.257	0.162	0.332
L267	LTE B66	QPSK20M	132072	1	50	Rear Face	1.5	Main	1	23.8	23.28	0.01	0.328	0.208	0.369

Note: The value with boldface is the maximum SAR Value of each test band.

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

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W08	802.11b	1	Front Face	1.5	1	97.9	20.5	19.65	0.04	0.159	0.090	0.198
W09	802.11b	1	Rear Face	1.5	1	97.9	20.5	19.65	-0.11	**0.227**	**0.123**	**0.282**
W10	802.11b	1	Rear Face	1.5	1	97.9	20.5	19.65	0.07	0.219	0.117	0.272

Note: The value with boldface is the maximum SAR Value of each test band.

5. Body-worn SAR test results of BT

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
B07	BT DH5	39	Front Face	1.5	1	77.6	12.5	11.83	-0.09	0.012	0.005	0.017
B08	BT DH5	39	Rear Face	1.5	1	77.6	12.5	11.83	-0.06	0.017	0.008	0.025
B09	BT DH5	39	Rear Face	1.5	1	77.6	12.5	11.83	-0.03	**0.018**	**0.009**	**0.027**

Note: The value with boldface is the maximum SAR Value of each test band.

7.2.3 SAR MEASUREMENT RESULT OF HOTSPOT

1. Hotspot SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
G16	GSM 850	GPRS2TX	190	Front Face	1.0	Main	1	31.3	31	0.02	0.213	0.155	0.213
G17	GSM 850	GPRS2TX	190	Rear Face	1.0	Main	1	31.3	31	0.04	**0.384**	**0.227**	**0.384**
G18	GSM 850	GPRS2TX	190	Left Side	1.0	Main	1	31.3	31	-0.06	0.156	0.103	0.156
G19	GSM 850	GPRS2TX	190	Right Side	1.0	Main	1	31.3	31	0.13	0.221	0.144	0.221
G20	GSM 850	GPRS2TX	190	Bottom Side	1.0	Main	1	31.3	31	-0.01	0.266	0.142	0.266
G21	GSM 850	GPRS2TX	190	Rear Face	1.0	Main	2	31.3	31	0.07	0.362	0.218	0.362
G26	GSM 1900	GPRS4TX	661	Front Face	1.0	Main	1	25.8	24.39	0.03	0.314	0.197	0.314
G27	GSM 1900	GPRS4TX	661	Rear Face	1.0	Main	1	25.8	24.39	-0.11	0.128	0.066	0.128
G28	GSM 1900	GPRS4TX	661	Left Side	1.0	Main	1	25.8	24.39	0.05	0.157	0.068	0.157
G29	GSM 1900	GPRS4TX	661	Right Side	1.0	Main	1	25.8	24.39	0.01	0.109	0.060	0.109
G30	GSM 1900	GPRS4TX	661	Bottom Side	1.0	Main	1	25.8	24.39	-0.06	0.778	0.429	0.778
G31	GSM 1900	GPRS4TX	661	Bottom Side	1.0	Main	2	25.8	24.39	0.19	**0.790**	**0.432**	**0.790**

Note: The value with boldface is the maximum SAR Value of each test band.

2. Hotspot SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
U23	UMTS B2	RMC12.2K	9400	Front Face	1.0	Main	1	21.8	21.42	-0.09	0.223	0.147	0.223
U24	UMTS B2	RMC12.2K	9400	Rear Face	1.0	Main	1	21.8	21.42	0.19	0.528	0.307	0.528
U25	UMTS B2	RMC12.2K	9400	Left Side	1.0	Main	1	21.8	21.42	0.06	0.147	0.089	0.147
U26	UMTS B2	RMC12.2K	9400	Right Side	1.0	Main	1	21.8	21.42	-0.01	0.086	0.053	0.086
U27	UMTS B2	RMC12.2K	9400	Bottom Side	1.0	Main	1	21.8	21.42	0.03	**0.666**	**0.375**	**0.666**
U28	UMTS B2	RMC12.2K	9400	Bottom Side	1.0	Main	2	21.8	21.42	0.03	0.653	0.364	0.653
U34	UMTS B4	RMC12.2K	1413	Front Face	1.0	Main	1	21.8	21.33	0.09	0.238	0.161	0.238
U35	UMTS B4	RMC12.2K	1413	Rear Face	1.0	Main	1	21.8	21.33	-0.09	0.537	0.330	0.537
U36	UMTS B4	RMC12.2K	1413	Left Side	1.0	Main	1	21.8	21.33	0.01	0.107	0.064	0.107
U37	UMTS B4	RMC12.2K	1413	Right Side	1.0	Main	1	21.8	21.33	-0.03	0.068	0.045	0.068
U38	UMTS B4	RMC12.2K	1413	Bottom Side	1.0	Main	1	21.8	21.33	-0.04	**0.703**	**0.402**	**0.703**
U39	UMTS B4	RMC12.2K	1413	Bottom Side	1.0	Main	2	21.8	21.33	0.04	0.686	0.382	0.686
U45	UMTS B5	RMC12.2K	4182	Front Face	1.0	Main	1	24.1	23.85	0.07	0.257	0.189	0.257
U46	UMTS B5	RMC12.2K	4182	Rear Face	1.0	Main	1	24.1	23.85	-0.03	**0.465**	**0.275**	**0.465**
U47	UMTS B5	RMC12.2K	4182	Left Side	1.0	Main	1	24.1	23.85	0.02	0.221	0.145	0.221
U48	UMTS B5	RMC12.2K	4182	Right Side	1.0	Main	1	24.1	23.85	-0.11	0.327	0.212	0.327
U49	UMTS B5	RMC12.2K	4182	Bottom Side	1.0	Main	1	24.1	23.85	0.15	0.346	0.178	0.346
U50	UMTS B5	RMC12.2K	4182	Rear Face	1.0	Main	2	24.1	23.85	-0.05	0.458	0.271	0.458

Note: The value with boldface is the maximum SAR Value of each test band.

3. Hotspot SAR test results of LTE

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L107	LTE B2	QPSK20M	18900	1	50	Front Face	1.0	Main	1	22.8	22.02	0.05	0.274	0.170	0.328
L108	LTE B2	QPSK20M	18900	1	50	Rear Face	1.0	Main	1	22.8	22.02	-0.11	0.627	0.376	0.750
L109	LTE B2	QPSK20M	18900	1	50	Left Side	1.0	Main	1	22.8	22.02	0.07	0.136	0.075	0.163
L110	LTE B2	QPSK20M	18900	1	50	Right Side	1.0	Main	1	22.8	22.02	0.1	0.035	0.024	0.042
L111	LTE B2	QPSK20M	18900	1	50	Bottom Side	1.0	Main	1	22.8	22.02	0.03	**0.832**	**0.466**	**0.995**
L112	LTE B2	QPSK20M	19100	50	25	Front Face	1.0	Main	1	21.8	20.77	-0.09	0.224	0.135	0.284
L113	LTE B2	QPSK20M	19100	50	25	Rear Face	1.0	Main	1	21.8	20.77	0.19	0.518	0.310	0.656
L114	LTE B2	QPSK20M	19100	50	25	Left Side	1.0	Main	1	21.8	20.77	0.12	0.138	0.076	0.175
L115	LTE B2	QPSK20M	19100	50	25	Right Side	1.0	Main	1	21.8	20.77	0.04	0.037	0.023	0.047
L116	LTE B2	QPSK20M	19100	50	25	Bottom Side	1.0	Main	1	21.8	20.77	0.01	0.667	0.371	0.845
L280	LTE B2	QPSK20M	18700	1	99	Bottom Side	1.0	Main	1	22.8	21.76	0.17	0.753	0.412	0.957
L300	LTE B2	QPSK20M	19100	1	99	Bottom Side	1.0	Main	1	22.8	21.64	0.1	0.687	0.451	0.897
L290	LTE B2	QPSK20M	18900	50	0	Bottom Side	1.0	Main	1	21.8	20.77	0.03	0.614	0.326	0.779
L301	LTE B2	QPSK20M	18700	50	0	Bottom Side	1.0	Main	1	21.8	20.73	-50	0.581	0.325	0.743
L281	LTE B2	QPSK20M	19100	100	0	Bottom Side	1.0	Main	1	21.8	20.74	0.13	0.591	0.330	0.754
L117	LTE B2	QPSK20M	18900	1	50	Bottom Side	1.0	Main	2	22.8	22.02	-0.1	0.826	0.461	0.988
L282	LTE B2	QPSK20M	18900	1	50	Bottom Side (Repeated)	1.0	Main	1	22.8	22.02	0.16	0.815	0.458	0.975
L124	LTE B4	QPSK20M	20175	1	0	Front Face	1.0	Main	1	21.8	21.36	-0.01	0.258	0.178	0.286
L125	LTE B4	QPSK20M	20175	1	0	Rear Face	1.0	Main	1	21.8	21.36	-0.08	0.577	0.345	0.639
L126	LTE B4	QPSK20M	20175	1	0	Left Side	1.0	Main	1	21.8	21.36	0.15	0.109	0.070	0.121
L127	LTE B4	QPSK20M	20175	1	0	Right Side	1.0	Main	1	21.8	21.36	0	0.042	0.027	0.047
L128	LTE B4	QPSK20M	20175	1	0	Bottom Side	1.0	Main	1	21.8	21.36	0.01	**0.812**	**0.469**	**0.900**
L129	LTE B4	QPSK20M	20300	50	25	Front Face	1.0	Main	1	20.8	19.73	0.02	0.170	0.116	0.218
L130	LTE B4	QPSK20M	20300	50	25	Rear Face	1.0	Main	1	20.8	19.73	-0.01	0.432	0.277	0.553
L131	LTE B4	QPSK20M	20300	50	25	Left Side	1.0	Main	1	20.8	19.73	0.17	0.090	0.058	0.116
L132	LTE B4	QPSK20M	20300	50	25	Right Side	1.0	Main	1	20.8	19.73	-0.06	0.027	0.013	0.035
L133	LTE B4	QPSK20M	20300	50	25	Bottom Side	1.0	Main	1	20.8	19.73	-0.03	0.550	0.316	0.704
L283	LTE B4	QPSK20M	20050	1	0	Bottom Side	1.0	Main	1	21.8	21.33	0.05	0.719	0.460	0.802
L302	LTE B4	QPSK20M	20300	1	99	Bottom Side	1.0	Main	1	21.8	20.96	0.02	0.646	0.435	0.783
L284	LTE B4	QPSK20M	20050	100	0	Bottom Side	1.0	Main	1	20.8	19.69	-0.1	0.541	0.344	0.699
L134	LTE B4	QPSK20M	20175	1	0	Bottom Side	1.0	Main	2	21.8	21.36	0.04	0.800	0.508	0.886
L285	LTE B4	QPSK20M	20175	1	0	Bottom Side (Repeated)	1.0	Main	1	21.8	21.36	0.12	0.725	0.471	0.803
L143	LTE B5	QPSK10M	20450	1	0	Front Face	1.0	Main	1	24.1	23.93	0.19	0.219	0.159	0.228
L144	LTE B5	QPSK10M	20450	1	0	Rear Face	1.0	Main	1	24.1	23.93	0.09	0.330	0.195	0.343
L145	LTE B5	QPSK10M	20450	1	0	Left Side	1.0	Main	1	24.1	23.93	0	0.092	0.056	0.095
L146	LTE B5	QPSK10M	20450	1	0	Right Side	1.0	Main	1	24.1	23.93	-0.02	0.112	0.074	0.116
L147	LTE B5	QPSK10M	20450	1	0	Bottom Side	1.0	Main	1	24.1	23.93	0.03	0.270	0.135	0.281
L148	LTE B5	QPSK10M	20525	25	25	Front Face	1.0	Main	1	23.6	22.72	0.07	0.185	0.133	0.227
L149	LTE B5	QPSK10M	20525	25	25	Rear Face	1.0	Main	1	23.6	22.72	0.07	0.277	0.179	0.339
L150	LTE B5	QPSK10M	20525	25	25	Left Side	1.0	Main	1	23.6	22.72	-0.11	0.054	0.033	0.066
L151	LTE B5	QPSK10M	20525	25	25	Right Side	1.0	Main	1	23.6	22.72	-0.04	0.104	0.069	0.127
L152	LTE B5	QPSK10M	20525	25	25	Bottom Side	1.0	Main	1	23.6	22.72	0.1	0.241	0.129	0.295
L153	LTE B5	QPSK10M	20450	1	0	Rear Face	1.0	Main	2	24.1	23.93	0.03	**0.332**	**0.196**	**0.345**

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L161	LTE B7	QPSK20M	21100	1	0	Front Face	1.0	Main	1	20.8	20.47	0.11	0.259	0.121	0.279
L162	LTE B7	QPSK20M	21100	1	0	Rear Face	1.0	Main	1	20.8	20.47	-0.12	0.679	0.317	0.733
L163	LTE B7	QPSK20M	21100	1	0	Left Side	1.0	Main	1	20.8	20.47	-0.06	0.108	0.057	0.117
L164	LTE B7	QPSK20M	21100	1	0	Right Side	1.0	Main	1	20.8	20.47	0.07	0.083	0.043	0.089
L165	LTE B7	QPSK20M	21100	1	0	Bottom Side	1.0	Main	1	20.8	20.47	-0.05	**0.900**	**0.404**	**0.971**
L166	LTE B7	QPSK20M	21350	50	25	Front Face	1.0	Main	1	19.8	19.37	0.02	0.160	0.077	0.177
L167	LTE B7	QPSK20M	21350	50	25	Rear Face	1.0	Main	1	19.8	19.37	0.01	0.355	0.154	0.392
L168	LTE B7	QPSK20M	21350	50	25	Left Side	1.0	Main	1	19.8	19.37	-0.18	0.147	0.077	0.162
L169	LTE B7	QPSK20M	21350	50	25	Right Side	1.0	Main	1	19.8	19.37	-0.05	0.063	0.033	0.069
L170	LTE B7	QPSK20M	21350	50	25	Bottom Side	1.0	Main	1	19.8	19.37	0.04	0.705	0.322	0.778
L286	LTE B7	QPSK20M	20850	1	0	Bottom Side	1.0	Main	1	20.8	20.37	0.1	0.854	0.374	0.943
L303	LTE B7	QPSK20M	21350	1	99	Bottom Side	1.0	Main	1	20.8	20.20	0.12	0.841	0.354	0.965
L287	LTE B7	QPSK20M	21100	100	0	Bottom Side	1.0	Main	1	19.8	19.36	-0.16	0.739	0.321	0.818
L171	LTE B7	QPSK20M	21100	1	0	Bottom Side	1.0	Main	2	20.8	20.47	0.02	0.876	0.389	0.945
L288	LTE B7	QPSK20M	21100	1	0	Bottom Side (Repeated)	1.0	Main	1	20.8	20.47	0.1	0.759	0.318	0.819
L179	LTE B12	QPSK10M	23060	1	49	Front Face	1.0	Main	1	24.1	24.00	0.08	0.111	0.087	0.114
L180	LTE B12	QPSK10M	23060	1	49	Rear Face	1.0	Main	1	24.1	24.00	-0.06	**0.195**	**0.152**	**0.200**
L181	LTE B12	QPSK10M	23060	1	49	Left Side	1.0	Main	1	24.1	24.00	0.02	0.013	0.007	0.013
L182	LTE B12	QPSK10M	23060	1	49	Right Side	1.0	Main	1	24.1	24.00	-0.01	0.059	0.041	0.060
L183	LTE B12	QPSK10M	23060	1	49	Bottom Side	1.0	Main	1	24.1	24.00	-0.19	0.064	0.032	0.065
L184	LTE B12	QPSK10M	23095	25	25	Front Face	1.0	Main	1	23.6	22.72	0.07	0.121	0.094	0.149
L185	LTE B12	QPSK10M	23095	25	25	Rear Face	1.0	Main	1	23.6	22.72	0	0.161	0.137	0.197
L186	LTE B12	QPSK10M	23095	25	25	Left Side	1.0	Main	1	23.6	22.72	0.03	0.017	0.010	0.021
L187	LTE B12	QPSK10M	23095	25	25	Right Side	1.0	Main	1	23.6	22.72	0.14	0.056	0.041	0.069
L188	LTE B12	QPSK10M	23095	25	25	Bottom Side	1.0	Main	1	23.6	22.72	0.05	0.074	0.037	0.090
L189	LTE B12	QPSK10M	23060	1	49	Rear Face	1.0	Main	2	24.1	24.00	0	0.189	0.143	0.194
L197	LTE B17	QPSK10M	23780	1	49	Front Face	1.0	Main	1	24.1	23.97	0.11	0.125	0.098	0.129
L198	LTE B17	QPSK10M	23780	1	49	Rear Face	1.0	Main	1	24.1	23.97	-0.07	**0.202**	**0.157**	**0.208**
L199	LTE B17	QPSK10M	23780	1	49	Left Side	1.0	Main	1	24.1	23.97	-0.18	0.044	0.032	0.045
L200	LTE B17	QPSK10M	23780	1	49	Right Side	1.0	Main	1	24.1	23.97	0.15	0.058	0.041	0.060
L201	LTE B17	QPSK10M	23780	1	49	Bottom Side	1.0	Main	1	24.1	23.97	0.03	0.064	0.037	0.065
L202	LTE B17	QPSK10M	23790	25	12	Front Face	1.0	Main	1	23.1	22.71	0	0.099	0.077	0.108
L203	LTE B17	QPSK10M	23790	25	12	Rear Face	1.0	Main	1	23.1	22.71	-0.04	0.166	0.129	0.182
L204	LTE B17	QPSK10M	23790	25	12	Left Side	1.0	Main	1	23.1	22.71	0.09	0.051	0.037	0.056
L205	LTE B17	QPSK10M	23790	25	12	Right Side	1.0	Main	1	23.1	22.71	0.01	0.044	0.031	0.048
L206	LTE B17	QPSK10M	23790	25	12	Bottom Side	1.0	Main	1	23.1	22.71	-0.01	0.056	0.029	0.062
L207	LTE B17	QPSK10M	23780	1	49	Rear Face	1.0	Main	2	24.1	23.97	0.12	0.195	0.146	0.201
L215	LTE B26	QPSK15M	26765	1	0	Front Face	1.0	Main	1	24.1	24.03	0.09	0.192	0.141	0.195
L216	LTE B26	QPSK15M	26765	1	0	Rear Face	1.0	Main	1	24.1	24.03	0.02	0.326	0.193	0.331
L217	LTE B26	QPSK15M	26765	1	0	Left Side	1.0	Main	1	24.1	24.03	-0.01	0.026	0.016	0.026
L218	LTE B26	QPSK15M	26765	1	0	Right Side	1.0	Main	1	24.1	24.03	0.05	0.130	0.085	0.132
L219	LTE B26	QPSK15M	26765	1	0	Bottom Side	1.0	Main	1	24.1	24.03	-0.09	0.185	0.102	0.188
L220	LTE B26	QPSK15M	26865	36	0	Front Face	1.0	Main	1	23.1	23.07	-0.11	0.202	0.148	0.203
L221	LTE B26	QPSK15M	26865	36	0	Rear Face	1.0	Main	1	23.1	23.07	-0.02	**0.333**	**0.195**	**0.335**
L222	LTE B26	QPSK15M	26865	36	0	Left Side	1.0	Main	1	23.1	23.07	0.03	0.093	0.060	0.093
L223	LTE B26	QPSK15M	26865	36	0	Right Side	1.0	Main	1	23.1	23.07	0.15	0.110	0.071	0.110
L224	LTE B26	QPSK15M	26865	36	0	Bottom Side	1.0	Main	1	23.1	23.07	0.08	0.226	0.121	0.228
L225	LTE B26	QPSK15M	26865	36	19	Rear Face	1.0	Main	2	23.1	23.07	-0.01	0.325	0.189	0.327

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L233	LTE B38	QPSK20M	38000	1	0	Front Face	1.0	Main	1	23.8	23.16	-0.03	0.288	0.136	0.334
L234	LTE B38	QPSK20M	38000	1	0	Rear Face	1.0	Main	1	23.8	23.16	0.12	0.584	0.276	0.677
L235	LTE B38	QPSK20M	38000	1	0	Left Side	1.0	Main	1	23.8	23.16	-0.15	0.293	0.156	0.340
L236	LTE B38	QPSK20M	38000	1	0	Right Side	1.0	Main	1	23.8	23.16	-0.04	0.085	0.044	0.098
L237	LTE B38	QPSK20M	38000	1	0	Bottom Side	1.0	Main	1	23.8	23.16	0.07	**1.010**	**0.478**	**1.172**
L238	LTE B38	QPSK20M	38000	50	50	Front Face	1.0	Main	1	23.3	21.76	0	0.232	0.110	0.331
L239	LTE B38	QPSK20M	38000	50	50	Rear Face	1.0	Main	1	23.3	21.76	0.09	0.468	0.220	0.667
L240	LTE B38	QPSK20M	38000	50	50	Left Side	1.0	Main	1	23.3	21.76	0.1	0.214	0.116	0.305
L241	LTE B38	QPSK20M	38000	50	50	Right Side	1.0	Main	1	23.3	21.76	-0.07	0.075	0.040	0.107
L242	LTE B38	QPSK20M	38000	50	50	Bottom Side	1.0	Main	1	23.3	21.76	0.11	0.814	0.386	1.160
L291	LTE B38	QPSK20M	38150	1	99	Bottom Side	1.0	Main	1	23.8	22.86	0.01	0.900	0.478	1.118
L304	LTE B38	QPSK20M	37850	1	50	Bottom Side	1.0	Main	1	23.8	22.45	0.04	0.856	0.416	1.168
L292	LTE B38	QPSK20M	37850	50	0	Bottom Side	1.0	Main	1	23.3	21.69	-0.13	0.789	0.325	1.144
L305	LTE B38	QPSK20M	38150	50	0	Bottom Side	1.0	Main	1	23.3	21.60	-0.01	0.745	0.317	1.102
L244	LTE B38	QPSK20M	38000	100	0	Bottom Side	1.0	Main	1	23.3	21.83	0.05	0.763	0.346	1.069
L243	LTE B38	QPSK20M	38000	1	0	Bottom Side	1.0	Main	2	23.8	23.16	0.06	0.984	0.439	1.141
L245	LTE B38	QPSK20M	38000	1	0	Bottom Side (Repeated)	1.0	Main	1	23.8	23.16	-0.02	0.960	0.449	1.114
L251	LTE B41	QPSK20M	41140	1	99	Front Face	1.0	Main	1	23.8	23.28	0.08	0.257	0.138	0.290
L252	LTE B41	QPSK20M	41140	1	99	Rear Face	1.0	Main	1	23.8	23.28	0.13	0.427	0.197	0.481
L253	LTE B41	QPSK20M	41140	1	99	Left Side	1.0	Main	1	23.8	23.28	0.09	0.303	0.161	0.342
L254	LTE B41	QPSK20M	41140	1	99	Right Side	1.0	Main	1	23.8	23.28	-0.03	0.084	0.045	0.095
L255	LTE B41	QPSK20M	41140	1	99	Bottom Side	1.0	Main	1	23.8	23.28	0.05	**0.670**	**0.312**	**0.755**
L256	LTE B41	QPSK20M	40140	50	25	Front Face	1.0	Main	1	23.3	22.39	0.06	0.210	0.112	0.259
L257	LTE B41	QPSK20M	40140	50	25	Rear Face	1.0	Main	1	23.3	22.39	0.13	0.306	0.154	0.377
L258	LTE B41	QPSK20M	40140	50	25	Left Side	1.0	Main	1	23.3	22.39	-0.16	0.225	0.118	0.277
L259	LTE B41	QPSK20M	40140	50	25	Right Side	1.0	Main	1	23.3	22.39	0.04	0.044	0.023	0.054
L260	LTE B41	QPSK20M	40140	50	25	Bottom Side	1.0	Main	1	23.3	22.39	0.07	0.549	0.246	0.676
L261	LTE B41	QPSK20M	41140	1	99	Bottom Side	1.0	Main	2	23.8	23.28	0.13	0.572	0.265	0.645
L269	LTE B66	QPSK20M	132072	1	0	Front Face	1.0	Main	1	21.8	21.26	0.06	0.252	0.171	0.285
L270	LTE B66	QPSK20M	132072	1	0	Rear Face	1.0	Main	1	21.8	21.26	0.03	0.613	0.376	0.694
L271	LTE B66	QPSK20M	132072	1	0	Left Side	1.0	Main	1	21.8	21.26	0.09	0.075	0.045	0.085
L272	LTE B66	QPSK20M	132072	1	0	Right Side	1.0	Main	1	21.8	21.26	-0.13	0.088	0.053	0.100
L273	LTE B66	QPSK20M	132072	1	0	Bottom Side	1.0	Main	1	21.8	21.26	-0.03	**0.701**	**0.410**	**0.794**
L274	LTE B66	QPSK20M	132072	50	0	Front Face	1.0	Main	1	20.8	20.21	0.05	0.196	0.129	0.224
L275	LTE B66	QPSK20M	132072	50	0	Rear Face	1.0	Main	1	20.8	20.21	0.07	0.484	0.304	0.554
L276	LTE B66	QPSK20M	132072	50	0	Left Side	1.0	Main	1	20.8	20.21	-0.04	0.076	0.047	0.087
L277	LTE B66	QPSK20M	132072	50	0	Right Side	1.0	Main	1	20.8	20.21	0.03	0.076	0.046	0.087
L278	LTE B66	QPSK20M	132072	50	0	Bottom Side	1.0	Main	1	20.8	20.21	0.14	0.572	0.329	0.655
L279	LTE B66	QPSK20M	132072	50	0	Bottom Side	1.0	Main	2	20.8	20.21	0.07	0.564	0.318	0.646

Note: The value with boldface is the maximum SAR Value of each test band.

4. Hotspot SAR test results of 2.4G WiFi

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W11	802.11b	1	Front Face	1	1	97.9	20.5	19.65	-0.08	0.268	0.142	0.333
W12	802.11b	1	Rear Face	1	1	97.9	20.5	19.65	-0.09	**0.450**	**0.237**	**0.559**
W13	802.11b	1	Right Side	1	1	97.9	20.5	19.65	0.08	0.273	0.138	0.339
W14	802.11b	1	Top Side	1	1	97.9	20.5	19.65	0.02	0.406	0.203	0.504
W15	802.11b	1	Rear Face	1	1	97.9	20.5	19.65	0.02	0.436	0.232	0.542

Note: The value with boldface is the maximum SAR Value of each test band.

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

7.2.4 SAR MEASUREMENT RESULT OF PRODUCT SPECIFIC 10-G SAR

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

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 10g (W/kg)	Product Specific 10-g SAR Exclusion
G16	GSM 850	GPRS2TX	190	Front Face	1.0	Main	1	31.3	31	0.155	YES
G17	GSM 850	GPRS2TX	190	Rear Face	1.0	Main	1	31.3	31	**0.227**	YES
G18	GSM 850	GPRS2TX	190	Left Side	1.0	Main	1	31.3	31	0.103	YES
G19	GSM 850	GPRS2TX	190	Right Side	1.0	Main	1	31.3	31	0.144	YES
G20	GSM 850	GPRS2TX	190	Bottom Side	1.0	Main	1	31.3	31	0.142	YES
G21	GSM 850	GPRS2TX	190	Rear Face	1.0	Main	2	31.3	31	0.218	YES
G26	GSM 1900	GPRS4TX	661	Front Face	1.0	Main	1	25.8	24.39	0.197	YES
G27	GSM 1900	GPRS4TX	661	Rear Face	1.0	Main	1	25.8	24.39	0.066	YES
G28	GSM 1900	GPRS4TX	661	Left Side	1.0	Main	1	25.8	24.39	0.068	YES
G29	GSM 1900	GPRS4TX	661	Right Side	1.0	Main	1	25.8	24.39	0.060	YES
G30	GSM 1900	GPRS4TX	661	Bottom Side	1.0	Main	1	25.8	24.39	0.429	YES
G31	GSM 1900	GPRS4TX	661	Bottom Side	1.0	Main	2	25.8	24.39	**0.432**	YES
U23	UMTS B2	RMC12.2K	9400	Front Face	1.0	Main	1	23.8	23.42	0.147	YES
U24	UMTS B2	RMC12.2K	9400	Rear Face	1.0	Main	1	23.8	23.42	0.307	YES
U25	UMTS B2	RMC12.2K	9400	Left Side	1.0	Main	1	23.8	23.42	0.089	YES
U26	UMTS B2	RMC12.2K	9400	Right Side	1.0	Main	1	23.8	23.42	0.053	YES
U27	UMTS B2	RMC12.2K	9400	Bottom Side	1.0	Main	1	23.8	23.42	**0.375**	YES
U28	UMTS B2	RMC12.2K	9400	Bottom Side	1.0	Main	2	23.8	23.42	0.364	YES
U34	UMTS B4	RMC12.2K	1413	Front Face	1.0	Main	1	23.8	23.32	0.161	YES
U35	UMTS B4	RMC12.2K	1413	Rear Face	1.0	Main	1	23.8	23.32	0.330	YES
U36	UMTS B4	RMC12.2K	1413	Left Side	1.0	Main	1	23.8	23.32	0.064	YES
U37	UMTS B4	RMC12.2K	1413	Right Side	1.0	Main	1	23.8	23.32	0.045	YES
U38	UMTS B4	RMC12.2K	1413	Bottom Side	1.0	Main	1	23.8	23.32	**0.402**	YES
U39	UMTS B4	RMC12.2K	1413	Bottom Side	1.0	Main	2	23.8	23.32	0.382	YES
U45	UMTS B5	RMC12.2K	4182	Front Face	1.0	Main	1	24.1	23.85	0.189	YES
U46	UMTS B5	RMC12.2K	4182	Rear Face	1.0	Main	1	24.1	23.85	**0.275**	YES
U47	UMTS B5	RMC12.2K	4182	Left Side	1.0	Main	1	24.1	23.85	0.145	YES
U48	UMTS B5	RMC12.2K	4182	Right Side	1.0	Main	1	24.1	23.85	0.212	YES
U49	UMTS B5	RMC12.2K	4182	Bottom Side	1.0	Main	1	24.1	23.85	0.178	YES
U50	UMTS B5	RMC12.2K	4182	Rear Face	1.0	Main	2	24.1	23.85	0.271	YES

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 10g (W/kg)	Product Specific 10-g SAR Exclusion
L107	LTE B2	QPSK20M	18900	1	50	Front Face	1.0	Main	1	23.8	22.37	0.170	YES
L108	LTE B2	QPSK20M	18900	1	50	Rear Face	1.0	Main	1	23.8	22.37	0.376	YES
L109	LTE B2	QPSK20M	18900	1	50	Left Side	1.0	Main	1	23.8	22.37	0.075	YES
L110	LTE B2	QPSK20M	18900	1	50	Right Side	1.0	Main	1	23.8	22.37	0.024	YES
L111	LTE B2	QPSK20M	18900	1	50	Bottom Side	1.0	Main	1	23.8	22.37	**0.466**	YES
L112	LTE B2	QPSK20M	19100	50	25	Front Face	1.0	Main	1	23.3	22.37	0.135	YES
L113	LTE B2	QPSK20M	19100	50	25	Rear Face	1.0	Main	1	23.3	22.37	0.310	YES
L114	LTE B2	QPSK20M	19100	50	25	Left Side	1.0	Main	1	23.3	22.37	0.076	YES
L115	LTE B2	QPSK20M	19100	50	25	Right Side	1.0	Main	1	23.3	22.37	0.023	YES
L116	LTE B2	QPSK20M	19100	50	25	Bottom Side	1.0	Main	1	23.3	22.37	0.371	YES
L280	LTE B2	QPSK20M	18700	1	99	Bottom Side	1.0	Main	1	23.8	23.28	0.412	YES
L290	LTE B2	QPSK20M	18900	50	0	Bottom Side	1.0	Main	1	23.3	22.24	0.326	YES
L281	LTE B2	QPSK20M	19100	100	0	Bottom Side	1.0	Main	1	23.3	22.12	0.330	YES
L117	LTE B2	QPSK20M	18900	1	50	Bottom Side	1.0	Main	2	23.8	22.37	0.461	YES
L282	LTE B2	QPSK20M	18900	1	50	Bottom Side (Repeated)	1.0	Main	1	23.8	22.37	0.458	YES
L124	LTE B4	QPSK20M	20175	1	0	Front Face	1.0	Main	1	23.8	23.24	0.178	YES
L125	LTE B4	QPSK20M	20175	1	0	Rear Face	1.0	Main	1	23.8	23.24	0.345	YES
L126	LTE B4	QPSK20M	20175	1	0	Left Side	1.0	Main	1	23.8	23.24	0.070	YES
L127	LTE B4	QPSK20M	20175	1	0	Right Side	1.0	Main	1	23.8	23.24	0.027	YES
L128	LTE B4	QPSK20M	20175	1	0	Bottom Side	1.0	Main	1	23.8	23.24	**0.469**	YES
L129	LTE B4	QPSK20M	20300	50	25	Front Face	1.0	Main	1	23.3	21.82	0.116	YES
L130	LTE B4	QPSK20M	20300	50	25	Rear Face	1.0	Main	1	23.3	21.82	0.277	YES
L131	LTE B4	QPSK20M	20300	50	25	Left Side	1.0	Main	1	23.3	21.82	0.058	YES
L132	LTE B4	QPSK20M	20300	50	25	Right Side	1.0	Main	1	23.3	21.82	0.013	YES
L133	LTE B4	QPSK20M	20300	50	25	Bottom Side	1.0	Main	1	23.3	21.82	0.316	YES
L283	LTE B4	QPSK20M	20050	1	0	Bottom Side	1.0	Main	1	23.8	23.73	0.460	YES
L284	LTE B4	QPSK20M	20050	100	0	Bottom Side	1.0	Main	1	23.3	21.85	0.344	YES
L134	LTE B4	QPSK20M	20175	1	0	Bottom Side	1.0	Main	2	23.8	23.24	0.508	YES
L285	LTE B4	QPSK20M	20175	1	0	Bottom Side (Repeated)	1.0	Main	1	23.8	23.24	0.471	YES
L143	LTE B5	QPSK10M	20450	1	0	Front Face	1.0	Main	1	24.1	23.93	0.159	YES
L144	LTE B5	QPSK10M	20450	1	0	Rear Face	1.0	Main	1	24.1	23.93	0.195	YES
L145	LTE B5	QPSK10M	20450	1	0	Left Side	1.0	Main	1	24.1	23.93	0.056	YES
L146	LTE B5	QPSK10M	20450	1	0	Right Side	1.0	Main	1	24.1	23.93	0.074	YES
L147	LTE B5	QPSK10M	20450	1	0	Bottom Side	1.0	Main	1	24.1	23.93	0.135	YES
L148	LTE B5	QPSK10M	20525	25	25	Front Face	1.0	Main	1	23.6	22.72	0.133	YES
L149	LTE B5	QPSK10M	20525	25	25	Rear Face	1.0	Main	1	23.6	22.72	0.179	YES
L150	LTE B5	QPSK10M	20525	25	25	Left Side	1.0	Main	1	23.6	22.72	0.033	YES
L151	LTE B5	QPSK10M	20525	25	25	Right Side	1.0	Main	1	23.6	22.72	0.069	YES
L152	LTE B5	QPSK10M	20525	25	25	Bottom Side	1.0	Main	1	23.6	22.72	0.129	YES
L153	LTE B5	QPSK10M	20450	1	0	Rear Face	1.0	Main	2	24.1	23.93	**0.196**	YES

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 10g (W/kg)	Product Specific 10-g SAR Exclusion
L161	LTE B7	QPSK20M	21100	1	0	Front Face	1.0	Main	1	23.3	22.38	0.121	YES
L162	LTE B7	QPSK20M	21100	1	0	Rear Face	1.0	Main	1	23.3	22.38	0.317	YES
L163	LTE B7	QPSK20M	21100	1	0	Left Side	1.0	Main	1	23.3	22.38	0.057	YES
L164	LTE B7	QPSK20M	21100	1	0	Right Side	1.0	Main	1	23.3	22.38	0.043	YES
L165	LTE B7	QPSK20M	21100	1	0	Bottom Side	1.0	Main	1	23.3	22.38	**0.404**	YES
L166	LTE B7	QPSK20M	21350	50	25	Front Face	1.0	Main	1	22.3	21.27	0.077	YES
L167	LTE B7	QPSK20M	21350	50	25	Rear Face	1.0	Main	1	22.3	21.27	0.154	YES
L168	LTE B7	QPSK20M	21350	50	25	Left Side	1.0	Main	1	22.3	21.27	0.077	YES
L169	LTE B7	QPSK20M	21350	50	25	Right Side	1.0	Main	1	22.3	21.27	0.033	YES
L170	LTE B7	QPSK20M	21350	50	25	Bottom Side	1.0	Main	1	22.3	21.27	0.322	YES
L286	LTE B7	QPSK20M	20850	1	0	Bottom Side	1.0	Main	1	23.3	22.48	0.374	YES
L287	LTE B7	QPSK20M	21100	100	0	Bottom Side	1.0	Main	1	22.3	21.28	0.321	YES
L171	LTE B7	QPSK20M	21100	1	0	Bottom Side	1.0	Main	2	23.3	22.38	0.389	YES
L288	LTE B7	QPSK20M	21100	1	0	Bottom Side (Repeated)	1.0	Main	1	23.3	22.38	0.318	YES
L179	LTE B12	QPSK10M	23060	1	49	Front Face	1.0	Main	1	24.1	24.00	0.087	YES
L180	LTE B12	QPSK10M	23060	1	49	Rear Face	1.0	Main	1	24.1	24.00	**0.152**	YES
L181	LTE B12	QPSK10M	23060	1	49	Left Side	1.0	Main	1	24.1	24.00	0.007	YES
L182	LTE B12	QPSK10M	23060	1	49	Right Side	1.0	Main	1	24.1	24.00	0.041	YES
L183	LTE B12	QPSK10M	23060	1	49	Bottom Side	1.0	Main	1	24.1	24.00	0.032	YES
L184	LTE B12	QPSK10M	23095	25	25	Front Face	1.0	Main	1	23.6	22.72	0.094	YES
L185	LTE B12	QPSK10M	23095	25	25	Rear Face	1.0	Main	1	23.6	22.72	0.137	YES
L186	LTE B12	QPSK10M	23095	25	25	Left Side	1.0	Main	1	23.6	22.72	0.010	YES
L187	LTE B12	QPSK10M	23095	25	25	Right Side	1.0	Main	1	23.6	22.72	0.041	YES
L188	LTE B12	QPSK10M	23095	25	25	Bottom Side	1.0	Main	1	23.6	22.72	0.037	YES
L189	LTE B12	QPSK10M	23060	1	49	Rear Face	1.0	Main	2	24.1	24.00	0.143	YES
L197	LTE B17	QPSK10M	23780	1	49	Front Face	1.0	Main	1	24.1	23.97	0.098	YES
L198	LTE B17	QPSK10M	23780	1	49	Rear Face	1.0	Main	1	24.1	23.97	**0.157**	YES
L199	LTE B17	QPSK10M	23780	1	49	Left Side	1.0	Main	1	24.1	23.97	0.032	YES
L200	LTE B17	QPSK10M	23780	1	49	Right Side	1.0	Main	1	24.1	23.97	0.041	YES
L201	LTE B17	QPSK10M	23780	1	49	Bottom Side	1.0	Main	1	24.1	23.97	0.037	YES
L202	LTE B17	QPSK10M	23790	25	12	Front Face	1.0	Main	1	23.1	22.71	0.077	YES
L203	LTE B17	QPSK10M	23790	25	12	Rear Face	1.0	Main	1	23.1	22.71	0.129	YES
L204	LTE B17	QPSK10M	23790	25	12	Left Side	1.0	Main	1	23.1	22.71	0.037	YES
L205	LTE B17	QPSK10M	23790	25	12	Right Side	1.0	Main	1	23.1	22.71	0.031	YES
L206	LTE B17	QPSK10M	23790	25	12	Bottom Side	1.0	Main	1	23.1	22.71	0.029	YES
L207	LTE B17	QPSK10M	23780	1	49	Rear Face	1.0	Main	2	24.1	23.97	0.146	YES
L215	LTE B26	QPSK15M	26765	1	0	Front Face	1.0	Main	1	24.1	24.03	0.141	YES
L216	LTE B26	QPSK15M	26765	1	0	Rear Face	1.0	Main	1	24.1	24.03	0.193	YES
L217	LTE B26	QPSK15M	26765	1	0	Left Side	1.0	Main	1	24.1	24.03	0.016	YES
L218	LTE B26	QPSK15M	26765	1	0	Right Side	1.0	Main	1	24.1	24.03	0.085	YES
L219	LTE B26	QPSK15M	26765	1	0	Bottom Side	1.0	Main	1	24.1	24.03	0.102	YES
L220	LTE B26	QPSK15M	26865	36	0	Front Face	1.0	Main	1	23.1	23.07	0.148	YES
L221	LTE B26	QPSK15M	26865	36	0	Rear Face	1.0	Main	1	23.1	23.07	**0.195**	YES
L222	LTE B26	QPSK15M	26865	36	0	Left Side	1.0	Main	1	23.1	23.07	0.060	YES
L223	LTE B26	QPSK15M	26865	36	0	Right Side	1.0	Main	1	23.1	23.07	0.071	YES
L224	LTE B26	QPSK15M	26865	36	0	Bottom Side	1.0	Main	1	23.1	23.07	0.121	YES
L225	LTE B26	QPSK15M	26865	36	19	Rear Face	1.0	Main	2	23.1	23.07	0.189	YES

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	Ant	SIM	Maximum Tune-up (dBm)	Conducted Power (dBm)	SAR 10g (W/kg)	Product Specific 10-g SAR Exclusion
L233	LTE B38	QPSK20M	38000	1	0	Front Face	1.0	Main	1	23.8	23.16	0.136	YES
L234	LTE B38	QPSK20M	38000	1	0	Rear Face	1.0	Main	1	23.8	23.16	0.276	YES
L235	LTE B38	QPSK20M	38000	1	0	Left Side	1.0	Main	1	23.8	23.16	0.156	YES
L236	LTE B38	QPSK20M	38000	1	0	Right Side	1.0	Main	1	23.8	23.16	0.044	YES
L237	LTE B38	QPSK20M	38000	1	0	Bottom Side	1.0	Main	1	23.8	23.16	**0.478**	YES
L238	LTE B38	QPSK20M	38000	50	50	Front Face	1.0	Main	1	23.3	21.76	0.110	YES
L239	LTE B38	QPSK20M	38000	50	50	Rear Face	1.0	Main	1	23.3	21.76	0.220	YES
L240	LTE B38	QPSK20M	38000	50	50	Left Side	1.0	Main	1	23.3	21.76	0.116	YES
L241	LTE B38	QPSK20M	38000	50	50	Right Side	1.0	Main	1	23.3	21.76	0.040	YES
L242	LTE B38	QPSK20M	38000	50	50	Bottom Side	1.0	Main	1	23.3	21.76	0.386	YES
L291	LTE B38	QPSK20M	38150	1	99	Bottom Side	1.0	Main	1	23.8	22.86	0.478	YES
L292	LTE B38	QPSK20M	37850	50	0	Bottom Side	1.0	Main	1	23.3	21.69	0.325	YES
L244	LTE B38	QPSK20M	38000	100	0	Bottom Side	1.0	Main	1	23.3	21.83	0.346	YES
L243	LTE B38	QPSK20M	38000	1	0	Bottom Side	1.0	Main	2	23.8	23.16	0.439	YES
L245	LTE B38	QPSK20M	38000	1	0	Bottom Side (Repeated)	1.0	Main	1	23.8	23.16	0.449	YES
L251	LTE B41	QPSK20M	41140	1	99	Front Face	1.0	Main	1	23.8	23.28	0.138	YES
L252	LTE B41	QPSK20M	41140	1	99	Rear Face	1.0	Main	1	23.8	23.28	0.197	YES
L253	LTE B41	QPSK20M	41140	1	99	Left Side	1.0	Main	1	23.8	23.28	0.161	YES
L254	LTE B41	QPSK20M	41140	1	99	Right Side	1.0	Main	1	23.8	23.28	0.045	YES
L255	LTE B41	QPSK20M	41140	1	99	Bottom Side	1.0	Main	1	23.8	23.28	**0.312**	YES
L256	LTE B41	QPSK20M	40140	50	25	Front Face	1.0	Main	1	23.3	22.39	0.112	YES
L257	LTE B41	QPSK20M	40140	50	25	Rear Face	1.0	Main	1	23.3	22.39	0.154	YES
L258	LTE B41	QPSK20M	40140	50	25	Left Side	1.0	Main	1	23.3	22.39	0.118	YES
L259	LTE B41	QPSK20M	40140	50	25	Right Side	1.0	Main	1	23.3	22.39	0.023	YES
L260	LTE B41	QPSK20M	40140	50	25	Bottom Side	1.0	Main	1	23.3	22.39	0.246	YES
L261	LTE B41	QPSK20M	41140	1	99	Bottom Side	1.0	Main	2	23.8	23.28	0.265	YES
L269	LTE B66	QPSK20M	132072	1	0	Front Face	1.0	Main	1	23.8	23.28	0.171	YES
L270	LTE B66	QPSK20M	132072	1	0	Rear Face	1.0	Main	1	23.8	23.28	0.376	YES
L271	LTE B66	QPSK20M	132072	1	0	Left Side	1.0	Main	1	23.8	23.28	0.045	YES
L272	LTE B66	QPSK20M	132072	1	0	Right Side	1.0	Main	1	23.8	23.28	0.053	YES
L273	LTE B66	QPSK20M	132072	1	0	Bottom Side	1.0	Main	1	23.8	23.28	**0.410**	YES
L274	LTE B66	QPSK20M	132072	50	0	Front Face	1.0	Main	1	23.3	22.15	0.129	YES
L275	LTE B66	QPSK20M	132072	50	0	Rear Face	1.0	Main	1	23.3	22.15	0.304	YES
L276	LTE B66	QPSK20M	132072	50	0	Left Side	1.0	Main	1	23.3	22.15	0.047	YES
L277	LTE B66	QPSK20M	132072	50	0	Right Side	1.0	Main	1	23.3	22.15	0.046	YES
L278	LTE B66	QPSK20M	132072	50	0	Bottom Side	1.0	Main	1	23.3	22.15	0.329	YES
L279	LTE B66	QPSK20M	132072	50	0	Bottom Side	1.0	Main	2	23.3	22.15	0.318	YES

Product specific 10-g SAR test results

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Duty Cycle (%)	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
B11	BT DH5	39	Front Face	0	1	77.6	12.5	11.83	0	0.146	0.065	0.098
B12	BT DH5	39	Rear Face	0	1	77.6	12.5	11.83	-0.07	**0.274**	**0.123**	**0.185**
B13	BT DH5	39	Right Side	0	1	77.6	12.5	11.83	-0.03	0.084	0.036	0.054
B14	BT DH5	39	Top Side	0	1	77.6	12.5	11.83	0	0.222	0.071	0.107
B15	BT DH5	39	Rear Face	0	1	77.6	12.5	11.83	-0.09	0.269	0.121	0.182

Note: The value with boldface is the maximum SAR Value of each test band.

7.3 MULTIPLE TRANSMITTER EVALUATION

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

The location of the antenna inside EUT, please refer to Appendix E.

7.3.1 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 (15mm)	Hotspot (10mm)	Product specific 10-g (0mm)
1	LTE + 2.4G WiFi	Yes	Yes	Yes	Yes
2	UMTS + 2.4G WiFi	Yes	Yes	Yes	Yes
3	LTE + 2.4G WiFi	Yes	Yes	Yes	Yes
4	GSM + BT	Yes	Yes	No	Yes
5	UMTS + BT	Yes	Yes	Yes	Yes
6	LTE + BT	Yes	Yes	Yes	Yes

Note:
1) 2G&3G&4G share the same Tx antenna and can't transmit simultaneously.
2) WiFi and Bluetooth share the same Tx antenna and can't transmit simultaneously.

7.3.2 SAR SUMMATION SCENARIO

1. About BT/WIFI and GSM/UMTS/LTE Down Antenna

Position	Head				Body-worn		Hotspot					
	Right Cheek	Right Tilted	Left Cheek	Left Tilted	Front Face (1.5cm)	Rear Face (1.5cm)	Front Face (1cm)	Rear Face (1cm)	Left Side (1cm)	Right Side (1cm)	Top Side (1cm)	Bottom Side (1cm)
GSM 850	0.225	0.082	0.212	0.073	0.159	0.234	0.213	0.384	0.156	0.221	/	0.266
GSM 1900	0.108	0.087	0.103	0.097	0.155	0.296	0.314	0.128	0.157	0.109	/	0.790
UMTS B2	0.126	0.090	0.118	0.102	0.151	0.309	0.223	0.528	0.147	0.086	/	0.666
UMTS B4	0.161	0.091	0.126	0.069	0.125	0.300	0.238	0.537	0.107	0.068	/	0.703
UMTS B5	0.257	0.182	0.265	0.157	0.207	0.217	0.257	0.465	0.221	0.327	/	0.346
LTE B2	0.203	0.114	0.145	0.104	0.187	0.386	0.328	0.750	0.175	0.047	/	0.995
LTE B4	0.184	0.091	0.121	0.074	0.158	0.380	0.286	0.639	0.121	0.047	/	0.900
LTE B5	0.263	0.097	0.225	0.080	0.207	0.244	0.228	0.343	0.095	0.127	/	0.345
LTE B7	0.176	0.141	0.305	0.155	0.237	0.450	0.279	0.733	0.162	0.089	/	0.971
LTE B12	0.107	0.038	0.100	0.036	0.149	0.208	0.149	0.200	0.021	0.069	/	0.090
LTE B17	0.107	0.058	0.111	0.058	0.147	0.202	0.129	0.208	0.056	0.060	/	0.065
LTE B26	0.184	0.070	0.185	0.053	0.190	0.213	0.203	0.335	0.093	0.132	/	0.228
LTE B38	0.140	0.108	0.277	0.147	0.126	0.351	0.334	0.677	0.340	0.107	/	1.172
LTE B41	0.165	0.133	0.308	0.138	0.153	0.286	0.290	0.481	0.342	0.095	/	0.755
LTE B66	0.185	0.097	0.128	0.080	0.154	0.374	0.285	0.694	0.087	0.100	/	0.794
802.11b/g	0.579	0.553	1.108	0.950	0.198	0.282	0.333	0.559	/	0.339	0.504	/
Bluetooth	0.081	0.087	0.122	0.116	0.017	0.027	/	/	/	/	/	/
Max. SAR Summation	**0.842**	**0.735**	**1.416**	**1.107**	**0.435**	**0.732**	**0.667**	**1.309**	**0.342**	**0.666**	**0.504**	**1.172**

Note: MAX. $\sum SAR_{1g}$ = 1.416W/Kg <1.6W/Kg, so the SAR to peak location separation ratio should not be considered.

2. About product specific 10g SAR

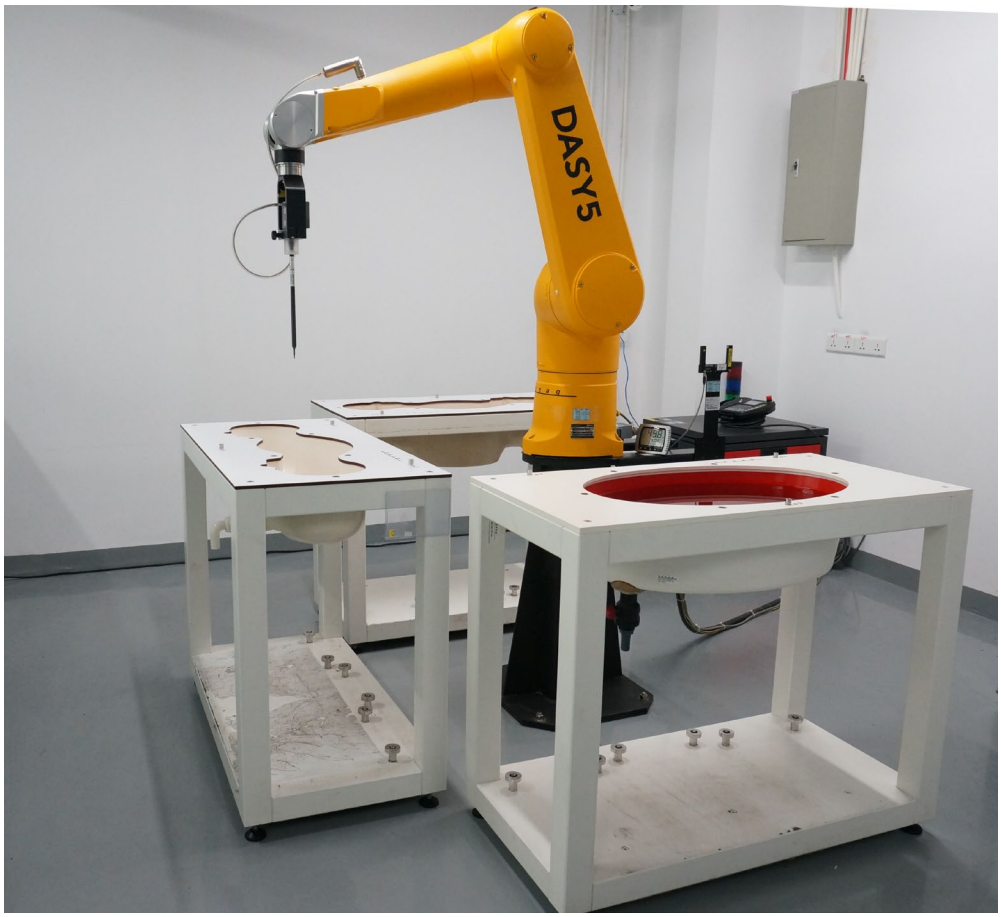
Position	Specific 10g SAR					
	Front Face (0cm)	Rear Face (0cm)	Left Side (0cm)	Right Side (0cm)	Top Side (0cm)	Bottom Side (0cm)
GSM 850	/	/	/	/	/	/
GSM 1900	/	/	/	/	/	/
UMTS B2	/	/	/	/	/	/
UMTS B4	/	/	/	/	/	/
UMTS B5	/	/	/	/	/	/
LTE B2	/	/	/	/	/	/
LTE B4	/	/	/	/	/	/
LTE B5	/	/	/	/	/	/
LTE B7	/	/	/	/	/	/
LTE B12	/	/	/	/	/	/
LTE B26	/	/	/	/	/	/
LTE B38	/	/	/	/	/	/
LTE B41	/	/	/	/	/	/
LTE B66	/	/	/	/	/	/
WiFi 2.4G	/	/	/	/	/	/
BT	0.098	0.185	0.054	0.107	/	/
Max. SAR Summation	0.098	0.185	0.054	0.107	0.000	0.000

Note:
The Simultaneous SAR of product Specific 10-g SAR is 0.185W/Kg which less than 4.0W/Kg, so the Simultaneous SAR is not required to calculate.

APPENDIX

1. TEST LAYOUT

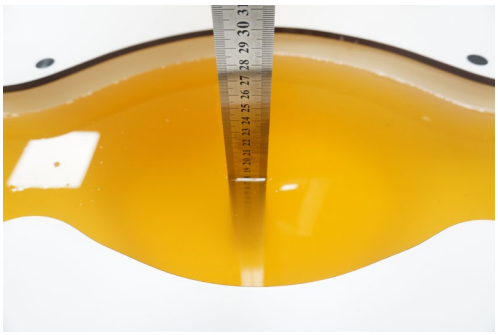
Specific Absorption Rate Test Layout



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

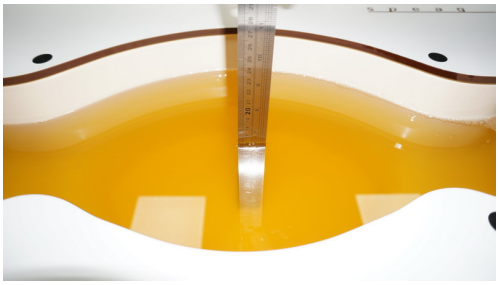
HSL_690MHz-925MHz_Head_15.3cm

HSL_690MHz-925MHz_Body_18.5cm

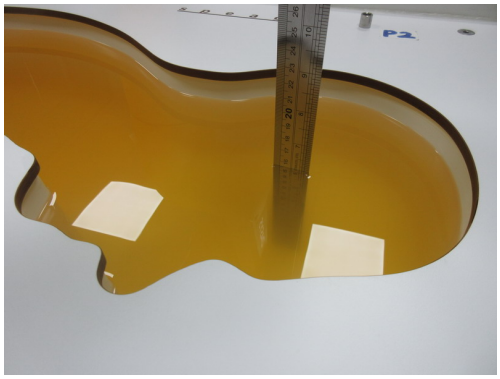


HSL_1700MHz-1900MHz_Head_15.5cm

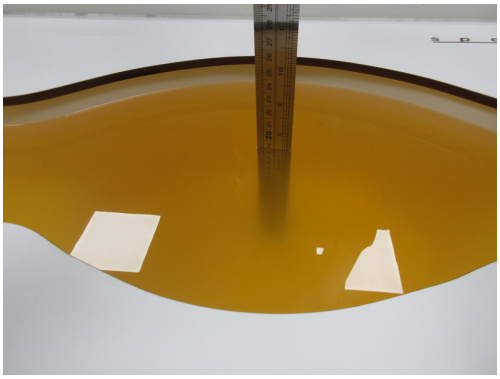
HSL_1700MHz-1900MHz_Body_16.2cm



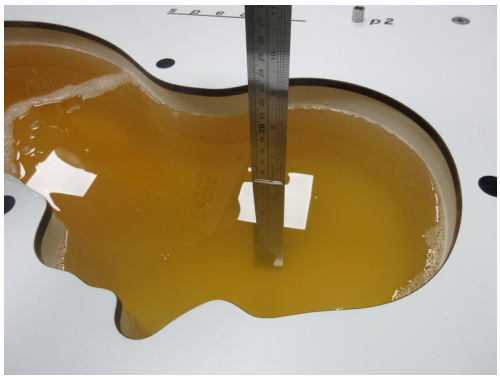
HSL_1900MHz-2300MHz_Head_15.5cm



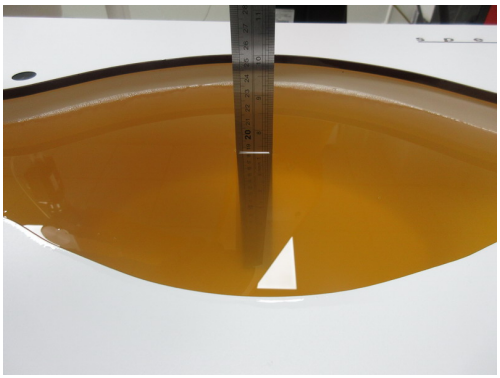
HSL_1900MHz-2300MHz_Body_18.8cm



HSL_2300MHz-2700MHz_Head_15.3cm



HSL_2300MHz-2700MHz_Body_18.5cm



Appendix A. SAR Plots of System Verification

(Pls See BTL-FCC SAR-1-2108C082_Appendix A.)

Appendix B. SAR Plots of SAR Measurement

(Pls See BTL-FCC SAR-1-2108C082_Appendix B.)

Appendix C. Calibration Certificate

(Pls See BTL-FCC SAR-1-2108C082_Appendix C.)

Appendix D. Photographs of the Test Set-Up

(Pls See BTL-FCC SAR-1-2108C082_Appendix D.)

Appendix E. Antenna location

(Pls See BTL-FCC SAR-1-2108C082_Appendix E.)

Appendix F. Conducted Power Measurement Result

(Pls See BTL-FCC SAR-1-2108C082_Appendix F.)

End of Test Report