SAR TEST REPORT

For

Mobile Phone
Model Number: RMX3261
FCC ID: 2AUYFRMX3261

Report Number: WT218001266

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection National Digital Electronic Product Testing Center
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Test report declaration

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.
EUT Description	:	Mobile Phone
Model No	:	**RMX3261**
Trade mark	:	realme

FCC ID: 2AUYFRMX3261;

Test Standards:

IEEE Std 1528-2013, KDB941225 D01, KDB941225 D05, KDB941225 D06, KDB447498 D01,KDB648474 D04,KDB248227 D01,KDB 865664 D01,KDB865664 D02,KDB690783 D01

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the compliance of the applicable standards stated above. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results.

The results documented in this report only apply to the tested sample, under the conditions and modes of operation as described herein.

The test report shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	刘铮	Date:	May. 17, 2021
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Checked by:	施昌达	Date:	May. 17, 2021
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1. REPORTED SAR SUMMARY

1.1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing are as follows.

Band	Max Reported SAR(W/kg)	Max Reported SAR(W/kg)	Max Reported SAR(W/kg)	Max Reported SAR(W/kg)
	1-g head	1-g Hotspot Body(10mm)	10-g Extremity Hotspot Body(0mm)	1-g Body Worn(15mm)
GSM850	0.191	0.292	--	0.178
PCS1900	0.139	0.934	2.499	0.575
WCDMA Band 2	0.157	0.702	--	0.468
WCDMA Band 4	0.170	0.841	1.701	0.550
WCDMA Band 5	0.229	0.254	--	0.201
LTE Band 2	0.135	0.868	--	0.251
LTE Band 4	0.114	0.636	--	0.354
LTE Band 5	0.207	0.324	--	0.177
LTE Band 7	0.196	1.152	1.616	0.501
LTE Band 12	0.149	0.281	--	0.295
LTE Band 17	0.106	0.253	--	0.241
LTE Band 26	0.184	0.235	--	0.184
LTE Band 38	0.071	0.937	--	0.254
LTE Band 41	0.166	0.308	--	0.173
LTE Band 66	0.170	0.886	--	0.538
Wi-Fi 2.4G	0.870	0.390	2.505	0.241
BT	0.100	0.023	0.282	0.014

	Maximum Report SAR (W/kg)	Limit (W/kg)	Verdict
Head	0.870	1.6	Pass
Hotspot Body	1.152	1.6	Pass
Body Worn	0.575	1.6	Pass
Extremity Hotspot Body	2.505	4.0	Pass

Highest Simultaneous SAR				
Position	Simultaneous Configuration	Simultaneous SAR (W/kg)	Limit (W/kg)	Verdict
Head	WCDMA Band V+2.4G WLAN	1.083	1.6	Pass
Hotspot Body	LTE Band 66 +2.4G WLAN	1.169	1.6	Pass
Body Worn	PCS1900 +2.4G WLAN	0.714	1.6	Pass
Extremity Hotspot Body	WCDMA Band IV+2.4G WLAN	3.317	4.0	Pass

Table 1: Summary of test result

Note:

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

The device is in compliance with Specific Absorption Rate (SAR) for general population/ uncontrolled exposure limits according to the FCC rule 2.1093 , the ANSI/IEEE C95.1:1992, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/ Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013& IEEE Std 1528a-2005.

1.2. RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR*(Brain/Body)	**1.60mW/g**	8.00mW/g
Spatial Average SAR** (Whole Body)	0.08mW/g	0.40mW/g
Spatial Peak SAR***(Limbs)	4.00mW/g	20.00mW/g

Table 2: RF exposure limits

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

Notes:

* The Spatial Peak value of the SAR averaged over any 1 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 1 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time. Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result if employment or occupation.)

1.3 Ratings and System Details

Product Name:	Mobile Phone
Model No.(EUT):	**RMX3261**
Trade mark:	realme
EUT Supports Radios application:	BT5.0, 2.1+EDR: 2402MHz to 2480MHz Wi-Fi : IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz GPS: 1559MHz to 1610MHz GSM/GPRS/EDGE 850: Tx:824.20 -848.80MHz; Rx: 869.20 – 893.80MHz GSM/GPRS/EDGE 1900: Tx:1850.20 – 1909.80MHz; Rx:1930.20 – 1989.80MHz WCDMA/HSDPA/HSUPA/HSPA+(Down Link) Band V: Tx:826.40 -846.60MHz; Rx: 871.40 – 891.60MHz WCDMA/HSDPA/HSUPA/HSPA+(Down Link) Band II: Tx:1852.40 – 1907.60MHz; Rx:1932.40 – 1987.60MHz LTE Band 2:TX:1850MHz to 1910MHz RX:1930MHz to 1990MHz. LTE Band 4:TX:1710MHz to 1755MHz RX:2110MHz to 2155MHz. LTE Band 5:TX:824MHz to 849MHz RX:869MHz to 894MHz. LTE Band 7:TX:2500MHz to 2570MHz RX: 2620MHz to 2690MHz. LTE Band 12:TX:698MHz to 716MHz RX:729MHz to 746MHz. LTE Band 17:TX:704MHz to 716MHz RX:734MHz to 746MHz. LTE Band 26:TX:815MHz to 847MHz RX:860MHz to 892MHz. LTE Band 38: TX:2575MHz to 2620MHz RX: 2575MHz to 2620MHz LTE Band 41:TX:2555MHz to 2655 MHz RX: 2555MHz to 2655 MHz LTE Band 66:TX:1711MHz to 1770 MHz RX: 2111MHz to 2170 MHz
Battery Model	BLP729
Battery Specification	3.87Vdc, 4880mAh 18.89Wh Lithium Battery
Battery Applicant 1#	Huizhou Desay Battery Co., Ltd.
Battery Applicant 2#	Sunwoda Electronic Co., Ltd.
Battery 3#	TWS Technology (Guangzhou) Limited.
Hardware version:	11

Software version:	Android 11

1.4 Product Function and Intended Use

RMX3063 is subscriber equipment in the GSM/UMTS/LTE system.
The GSM frequency band is 850MHz, 900MHz,1800MHz and 1900MHz , only 850MHz and 1900MHz can be used in this report. The UMTS frequency band is Band1, Band2, Band4, Band5 and Band 8 , only Band2 and Band5 can be used in this report. The LTE frequency band is Band 1, Band 2, Band 3, Band 4, Band 5, Band 7, Band 8, Band 12, Band 17, Band 20,Band 26, Band 28,Band 38, Band 40,Band 41, Band 66, only Band 2,4,5,7,12,17,26,38,41,66 can be used in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSUPA/HSDPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video, MMS service, GPS, AGPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and Micro USIM card interface.

1.5 Power Reduction Description

This device uses the hotspot function status as indicator of power reduction.
When the hotspot indicator is set to on, which indicating the device is in hotspot mode and the software will trigger to reduced the power.
Body exposure conditions
Once the device is set to hotspot mode, Power reduction will be enabled for -GSM1900, WCDMA B2/4, LTE B2/4/7/38/41/66 and Wi-Fi 2.4G.

1.6 Test specification(s)

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 SAR test for 3G devices v03r01	3G SAR MEAUREMENT PROCEDURES
KDB941225 D05 SAR for LTE Devices v02r05	SAR Evaluation Considerations for LTE Devices
KDB941225 D06 Hotspot Mode v02r01	SAR Evaluation Procedures for portable Devices with Wireless Router Capabilities
KDB447498 D01 General RF Exposure Guidance v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
KDB 648474 D04 Handset SAR v01r03	SAR Evaluation Considerations for Wireless Handsets.
KDB 248227 D01 802 11 Wi-Fi SAR v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting v01r02	RF Exposure Compliance Reporting and Documentation Considerations
KDB 690783 D01 SAR Listings on Grants v01r03	SAR Listings on Equipment Authorization Grants

1.7 List of Test and Measurement Instruments

	Equipment	Model No.	Serial No.	Manufacturer	Last Calibration Date	Period
☒	SAR test system	TX60L	F08/5AY8A1/A/01+F08/	SPEAG	NCR	NCR
☒	Electronic Data Transmitter	DAE4	1637	SPEAG	2020.11.17	1year
☒	SAR Probe	EX3DV4	3881	SPEAG	2020.06.16	1year
☒	Software	85070	--	Agilent	--	--
☒	Software	DASY5	--	SPEAG	--	--
☒	System Validation Dipole,750MHz	D750V3	1103	SPEAG	2020.01.06	3year
☐	System Validation Dipole,835MHz	D835V2	4d141	SPEAG	2018.09.06	3year
☒	System Validation Dipole,900MHz	D900V2	1d077	SPEAG	2018.09.07	3year
☒	System Validation Dipole,1800MHz	D1800V2	2d171	SPEAG	2018.09.12	3year
☒	System Validation Dipole,1900MHz	D1900V2	5d162	SPEAG	2018.09.11	3year
☐	System Validation Dipole,2300MHz	D2300V2	1034	SPEAG	2020.01.02	3year
☒	System Validation Dipole,2450MHz	D2450V2	818	SPEAG	2018.08.31	3year
☒	System Validation Dipole,2600MHz	D2600V2	1074	SPEAG	2020.01.02	3year
☒	System Validation Dipole,1750MHz	D1750V2	1108	SPEAG	2020.01.03	3year
☒	System Validation Dipole,5GHz	D5GzV2	1185	SPEAG	2019.12.31	3year
☒	Dielectric Probe Kit	85070E	MY44300455	Agilent	NCR	NCR
☒	Dual-directional coupler,0.10-2.0GHz	778D	MY48220198	Agilent	NCR	NCR
☒	Dual-directional coupler,2.00-18GHz	772D	MY46151160	Agilent	NCR	NCR

☒	Power Amplifier	ZVE-8G	SC280800926	MINI-CIRCUITS	NCR	NCR
☒	Power Amplifier	ZHL42W	81709	MINI-CIRCUITS	NCR	NCR
☒	Signal Generator	SMR20	100047	R&S	2021.02.19	1year
☒	Power Sensor	NRP-Z21	102626	R&S	2020.06.04	1year
☒	Power Sensor	NRP-Z21	102627	R&S	2020.06.04	1year
☒	Call Tester	CMU 200	100110	R&S	2020.12.01	1year
☒	Network Analyzer	E5071C	MY46109550	Agilent	2021.02.19	1Year
☒	Flat Phantom	ELI4.0	TP-1904	SPEAG	NCR	NCR
☒	Twin Phantom	SAM	TP-1504	SPEAG	NCR	NCR
☒	Wideband Radio Communication Tester	CMW500	125469	R&S	2020.10.23	1Year
☒	Precision Thermometer	--	--	--	2020.08.07	1Year

Table 3: List of Test and Measurement Equipment

Note: All the test equipments are calibrated once a year, except the dipoles, which are calibrated every three years. Moreover, we have self-calibration every year to the dipoles.

2. GENERAL INFORMATION

2.1. Report information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

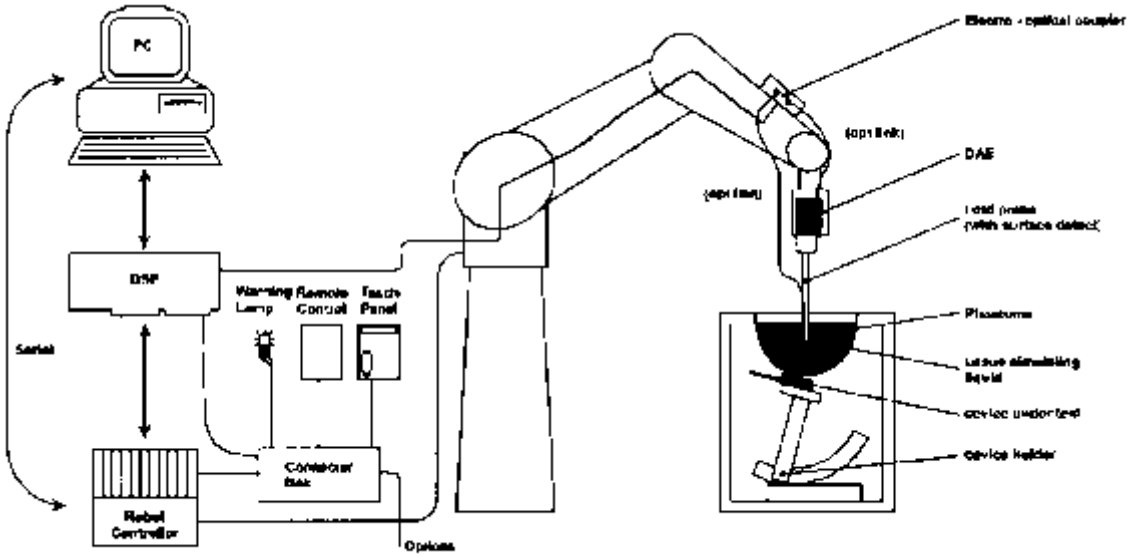
China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is 11177A.

3. SAR MEASUREMENT SYSTEM CONFIGURATION

3.1. SAR Measurement Set-up



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

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing,
- AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
- The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. • A computer operating Windows XP.
- DASY5 software and SEMCAD data evaluation software.

Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System checks dipoles allowing validating the proper functioning of the system.
- Test environment
- The DASY5 measurement system is placed at the head end of a room with dimensions:

4.5 x 4 x 3 m³, the SAM phantom is placed in a distance of 1.3 m from the side walls and 1.1m from the rear wall.

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

3.2. Probe description

Isotropic E-Field Probe EX3DV4 for Dosimetric Measurements

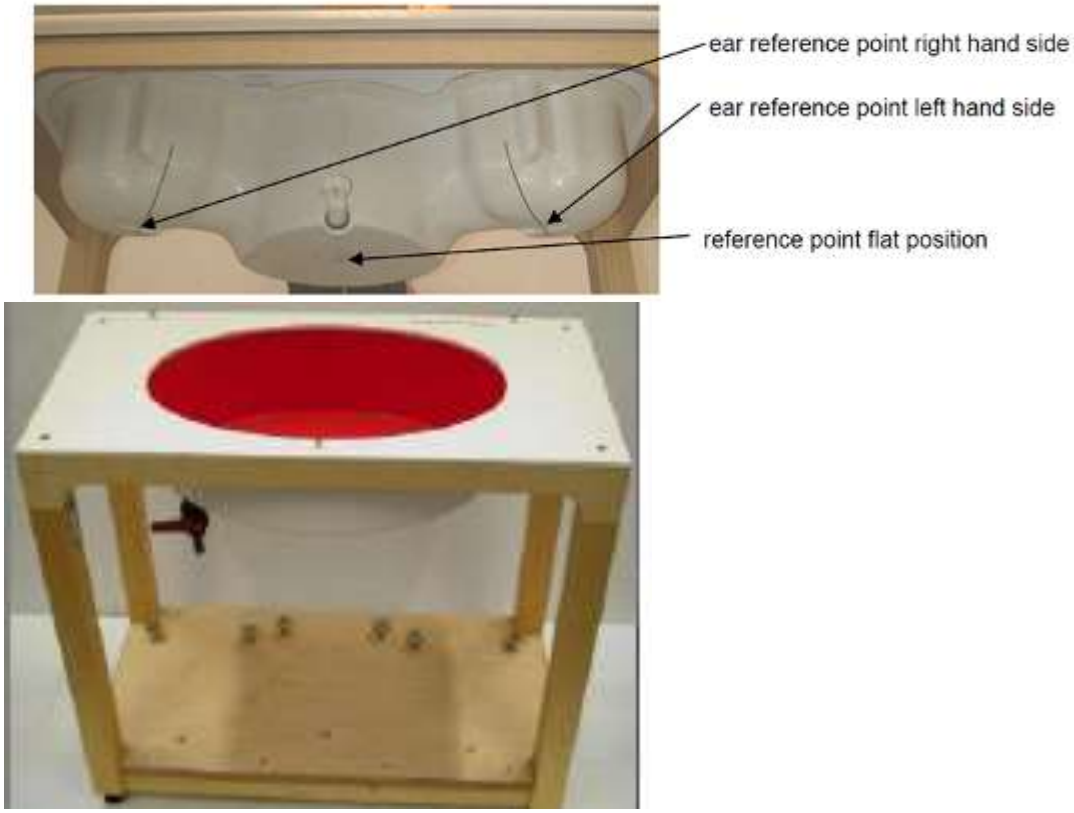
Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to >6 GHz (dosimetry); Linearity: ± 0.2 dB (30 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: ± 0.2 dB (noise: typically<1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20mm) Tip length: 2.5 mm (Body: 12mm) Typical distance from probe tip to dipole centers: 1mm

Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

3.3. Phantom description

The used SAM Phantom meets the requirements specified in Edition 01-01 of Supplement C to OET Bulletin 65 for Specific Absorption Rate (SAR) measurements.

The phantom consists of a fibreglass shell integrated in a wooden table. It allows left-hand and right-hand head as well as body-worn measurements with a maximum liquid depth of 18 cm in head position and 22 cm in planar position (body measurements). The thickness of the Phantom shell is 2 mm +/- 0.1 mm.



ELI4 Phantom

Shell Thickness	2mm+/- 0.2mm
Filling Volume	Approximately 30 liters
Measurement Areas	Flat phantom

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

The phantom shell material is resistant to all ingredients used in the tissue-equivalent liquid recipes. The shell of the phantom including ear spacers is constructed from low permittivity and low loss material, with a relative permittivity≤5 and a loss tangent ≤0.05.

3.4. Device holder description

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

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

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

4. SAR MEASUREMENT PROCEDURE

4.1. Scanning procedure

- The DASY5 installation includes predefined files with recommended procedures for measurements and system check. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.
- The reference and drift measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT's output power and should vary max. +/- 5 %.
- The surface check measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 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°.)
- 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 strenth 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.

Results of this coarse scan are shown in Appendix B.

- A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution: Δxzoom, Δyzoom ≤2GHZ≤ 8 mm, 2-4GHz - ≤ 5 mm and 4-6 GHz-≤ 4 mm; Δzzoom ≤ 3GHz - ≤ 5 mm, 3-4 GHz- ≤ 4 mm and 4-6GHz-≤2mm where the robot additionally moves the probe along the z-axis away from the bottom of the Phantom. DASY5 is also able to perform repeated zoom scans if more than 1 peak is found during area scan. Test results relevant for the specified standard (see chapter 1.5.) are shown in table form in chapter 3.2.
- 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 2mm steps. This measurement shows the continuity of the liquid and can – depending in the field strength- also show the liquid depth. A z-axis scan of the measurement with maximum SAR value is shown in Appendix B.

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

Frequency	Maximum Area Scan resolution (Δ xarea, Δ yarea)	Maximum Zoom Scan spatial resolution(Δ xzoomΔyzoom)	Maximum Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			Δ zzoom(n)	Δ zzoom(1)	Δzzoom(n>1)	
≤2GHz	≤15mm	≤8mm	≤5mm	≤4mm	≤1.5*Δzzoom(n-1)	≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5*Δzzoom(n-1)	≥30mm
3-4GHz	≤10mm	≤5mm	≤4mm	≤3mm	≤1.5*Δzzoom(n-1)	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5*Δzzoom(n-1)	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5*Δzzoom(n-1)	≥22mm

Spatial Peak SAR Evaluation

- The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The bases 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).

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

Interpolation

- The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].
- Volume Averaging
- At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.
- Advanced Extrapolation
- DASY5 uses the advanced extrapolation option which is able to compansate boundary effects on E-field probes.

4.1.1. Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters

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

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

Data Evaluation by SEMCAD

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

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

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

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input

signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

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

$$Vi = Ui + Ui2 \bullet cf/dcpi$$

with Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcpi = diode compression point (DASY parameter)

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

E-field probes: $Ei = (Vi / Normi \bullet ConvF)1/2$

H-field probes: $Hi = (Vi)1/2 \bullet (ai0 + ai1f + ai2f2)/f$

with Vi = compensated signal of channel i (i = x, y, z)
Normi = 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]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):
$Etot = (Ex2 + EY2 + Ez2)1/2$
The primary field data are used to calculate the derived field units.
$SAR = (Etot2 \bullet \sigma) / (\rho \bullet 1000)$

with SAR = local specific absorption rate in mW/g

Etot = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm3

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.

Ppwe = Etot2 / 3770 or Ppwe = Htot2 • 37.7

with Ppwe = equivalent power density of a plane wave in mW/cm2

Etot = total electric field strength in V/m

Htot = total magnetic field strength in A/m

5. SYSTEM VERIFICATION PROCEDURE

5.1. Tissue Verification

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

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

Ingredient (% by weight)	Head Tissue					
	835	1750	1900	2450	2600	5G
Water	41.45	52.64	55.24	62.7	55.242	56
Salt(NaCl)	1.45	0.36	0.306	0.5	0.306	0.0
Sugar	56.0	0.0	0.0	0.0	0.0	0.0
HEC	1.0	0.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	17.24
DGBE	0.0	47.0	44.54	36.8	44.452	0.0

Table 4 : Tissue Dielectric Properties

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

HEC: Hydroxyethyl Cellulose; DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100(ultra-pure): Polyethylene glycol mono[4-(1,1,3,3-tetramethylbutyl)phenyl]ether

Head & Body Tissue-equivalent liquid measurements:

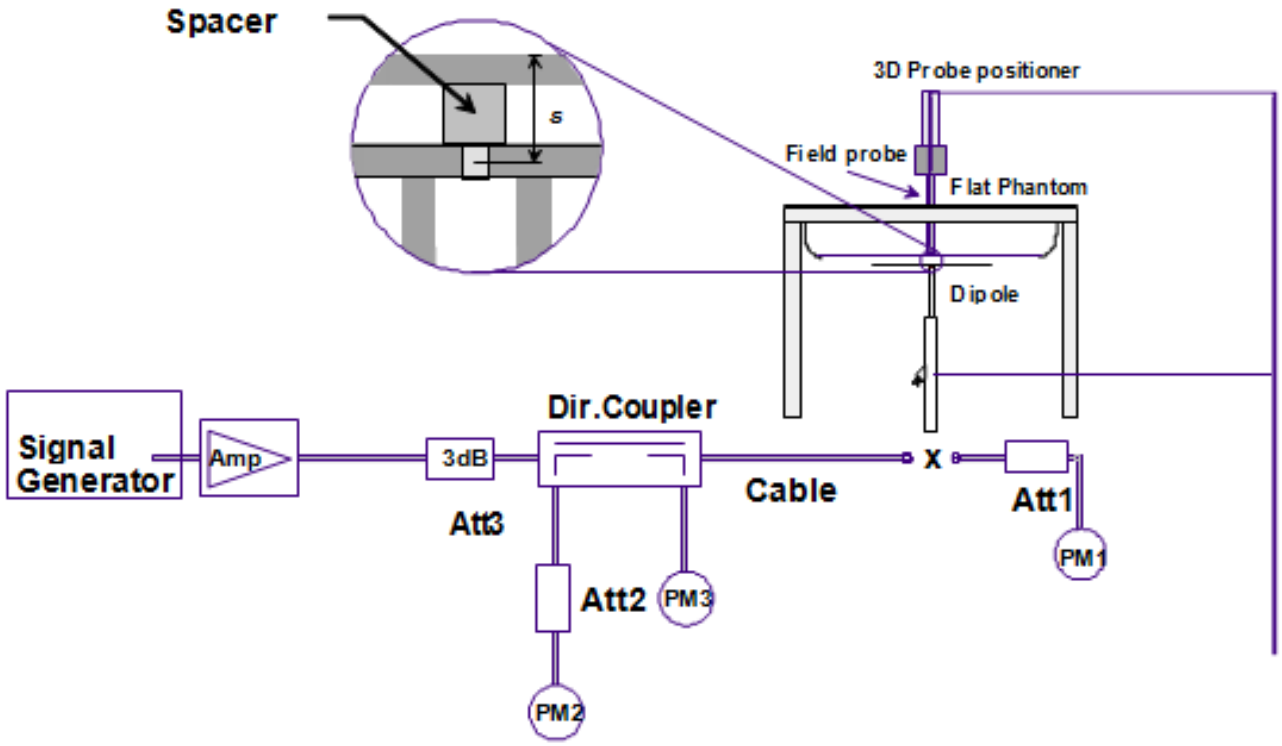
Used Target Frequency	Target Tissue		Measured Tissue		Liquid Temp	Test Date
	εr (+/-5%)	σ(S/m) (+/-5%)	εr	σ (S/m)		
750MHz Head	43.19 (41.03~45.35)	0.89 (0.85~0.93)	41.30	0.88	22°C	2021.05.06
835MHz Head	42.77 (40.63~44.91)	0.93 (0.88~0.98)	42.20	0.93	21°C	2021.05.07
1750MHz Head	39.31 (37.34~41.28)	1.35 (1.28~1.42)	39.72	1.40	21°C	2021.05.08
1900MHz Head	38.81 (36.87~40.75)	1.39 (1.32~1.46)	39.65	1.43	22°C	2021.05.09
2300MHz Head	38.91 (36.87~40.75)	1.62 (1.46~1.78)	38.45	1.48	22°C	2021.05.10
2450MHz Head	39.60 (37.62~41.58)	1.75 (1.66~1.84)	37.97	1.76	21°C	2021.05.11
2600MHz Head	40.40 (38.38~42.42)	2.04 (1.94~2.14)	37.70	1.88	21°C	2021.05.11
ε_r= Relative permittivity, σ= Conductivity						

System checking, Head & Body Tissue-equivalent liquid:

System Check	Target SAR (1W) (+/-10%)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (W/kg)	10-g (W/kg)	1-g (W/kg)	10-g (W/kg)		
D750V2 Head	8.66 (7.79~9.53)	5.83 (5.25~6.41)	8.16	5.36	22°C	2021.05.06
D835V2 Head	9.31 (8.38~10.24)	6.13 (5.52~6.74)	9.24	6.04	21°C	2021.05.07
D1750V2 Head	35.7 (33.13~39.27)	18.8 (16.92~20.68)	36.04	18.80	21°C	2021.05.08
D1900V2 Head	39.8 (35.82~43.78)	21.1 (18.99~23.21)	36.92	19.28	22°C	2021.05.09
D2300V2 Head	47.5 (42.75~52.25)	22.4 (20.16~24.64)	49.20	23.96	22°C	2021.05.10
D2450V2 Head	53.1 (47.79~58.41)	24.7 (22.23~27.17)	50.40	26.60	21°C	2021.05.11
D2600V3 Head	56.9 (51.21~62.59)	25.2 (22.68~27.72)	54.80	25.00	21°C	2021.05.11

System Checking

The manufacturer calibrates the probes annually. A system check measurement was made following the determination of the dielectric parameters of the tissue-equivalent liquid, using the dipole validation kit. A power level of 250mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom.



The system checking results (dielectric parameters and SAR values) are given in the table below.

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

6. SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

6.1. SAR measurement variability

Per KDB865664 D01 SAR measurement 100MHz to 6GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurement 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; step2) through 4) do not apply.
2) When the original highest measured SAR is ≥0.8 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 ≥1.5W/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.

6.2. SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100MHz to 6GHz v01r03, when the highest measured 1-g SAR within a frequency band is <1.5W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2003 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.

7. Test Configuration

The DUT is tested using a CMU 200 or E5515C communications tester as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted peak power.

Test positions as described in the tables above are in accordance with the specified test standard.

GSM Test Configuration

The tests for GSM850 and GSM1900, a communication link is set up with a System Simulator by air link. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 975, 37 and 124 respectively in the case of GSM900, to 512, 698 and 885 respectively in the case of GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 10 for this EUT, it has at most 2 timeslots in Up antenna and at most 4 timeslots in Down antenna, the maximum total timeslot is 5. The EGPRS class is 10 for this EUT, it has at most 2 timeslots in Up antenna, and at most 4 timeslots in Down antenna, the maximum total timeslot is 5. The device output power was set to maximum power level for all tests. Using CMU200 the power control level is set to “5”for GSM850, set to “0”for GSM1900.

WCDMA Test Configuration

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

	Mode	Rel99
	Subtest	---
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c / β_d	8/15

Handsets with Release 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the “Release 5 HSDPA Data Devices” section of this document, for the highest reported SAR body-worn accessory exposure configuration in 12.2 kbps RMC. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

HSDPA should be configured according to the UE category of a test device.The number of HSDSCH/HS-PDSCHs, HARQ 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 conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (note 1, note 2)	CM(dB) (note 3)	MPR(dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (note 4)	15/15 (note 4)	64	12/15 (note 4)	24/15	1.0	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

Note1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI}= 8 ⇔A_{hs} = β_{hs}/β_c=30/15 ⇔β_{hs}=30/15*β_c

Note2: CM=1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.

Note3: For subtest 2 the $\beta_c\beta_d$ ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC (TFC1,TF1) to β_c=11/15 and β_d=15/15.

HSUPA Test Configuration

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the “Release 6 HSPA Data Devices” section of this document, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn accessory

measurements is tested for next to the ear head exposure.

Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in Table 2 and other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of this document

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	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}, ΔNACK and Δ_{CQI} = 8 $\Leftrightarrow$ $A_{hs} = \beta_{hs}/\beta_c$ = 30/15 $\Leftrightarrow$ β_{hs}= 30/15 *β_c.
Note 2: CM = 1 for βc/βd =12/15, β_{hs}/β_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 βc/βd ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 10/15 and βd = 15/15.
Note 4: For subtest 5 the βc/βd ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 14/15 and βd = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Figure 5.1g.
Note 6: βed can not be set directly; it is set by Absolute Grant Value.

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI (ms)	Minimum Spreading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	2	2 SF2 & 2 SF4	11484	5.76
	4	4	10		20000	2.00
7 (No DPDCH)	4	8	2	2 SF2 & 2 SF4	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 supports QPSK only. UE Category 7 supports QPSK and 16QAM. (TS25.306-7.3.0)

HSPA, HSPA+ and DC-HSDPA Test Configuration

measurement is required for HSPA, HSPA+ or DC-HSDPA, a KDB inquiry is required to confirm that the wireless mode configurations in the test setup have remained stable throughout the SAR measurements.35 Without prior KDB confirmation to determine the SAR results are acceptable, a PBA is required for TCB approval. SAR test exclusion for HSPA, HSPA+ and DC-HSDPA is determined according to the following:

1) The HSPA procedures are applied to configure 3GPP Rel. 6 HSPA devices in the required Sub-test mode(s) to determine SAR test exclusion.

2) SAR is required for Rel. 7 HSPA+ when SAR is required for Rel. 6 HSPA; otherwise, the 3G SAR test reduction procedure is applied to (Up antenna) HSPA+ with 12.2 kbps RMC as the primary mode.36 Power is measured for HSPA+ that supports Up antenna 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

3) 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 secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

4) Regardless of whether a PBA is required, the following information must be verified and included in the SAR report for devices supporting HSPA, HSPA+ or DC-HSDPA: a) The output power measurement results and applicable release version(s) of 3GPP TS 34.121.

i) Power measurement difficulties due to test equipment setup or availability must be resolved between the grantee and its test lab.

b) The power measurement results are in agreement with the individual device implementation and specifications. When Enhanced MPR (E-MPR) applies, the normal MPR targets may be modified according to the Cubic Metric (CM) measured by the device, which must be taken into consideration.

c) The UE category, operating parameters, such as the β and Δ values used to configure the device for testing, power setback procedures described in 3GGPP TS 34.121 for the power measurements, and HSPA/HSPA+ channel conditions (active and stable) for the entire duration

of the measurement according to the required E-TFCI and AG index values.

5) When SAR measurement is required, the test configurations, procedures and power measurement results must be clearly described to confirm that the required test parameters are used, including E-TFCI and AG index stability and output power conditions.

<table>
<tr><th>HS-DSCH category</th><th>Maximum number of HS-DSCH codes received</th><th>Minimum inter-TTI interval</th><th>Maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI NOTE 1</th><th>Total number of soft channel bits</th><th>Supported modulations without MIMO operation or dual cell operation</th><th>Supported modulations with MIMO operation and without dual cell operation</th><th>Supported modulations with dual cell operation</th></tr>
<tr><td>Category 1</td><td>5</td><td>3</td><td>7298</td><td>19200</td><td rowspan="10">QPSK, 16QAM</td><td rowspan="14">Not applicable (MIMO not supported)</td><td rowspan="20">Not applicable (dual cell operation not supported)</td></tr>
<tr><td>Category 2</td><td>5</td><td>3</td><td>7298</td><td>28800</td></tr>
<tr><td>Category 3</td><td>5</td><td>2</td><td>7298</td><td>28800</td></tr>
<tr><td>Category 4</td><td>5</td><td>2</td><td>7298</td><td>38400</td></tr>
<tr><td>Category 5</td><td>5</td><td>1</td><td>7298</td><td>57600</td></tr>
<tr><td>Category 6</td><td>5</td><td>1</td><td>7298</td><td>67200</td></tr>
<tr><td>Category 7</td><td>10</td><td>1</td><td>14411</td><td>115200</td></tr>
<tr><td>Category 8</td><td>10</td><td>1</td><td>14411</td><td>134400</td></tr>
<tr><td>Category 9</td><td>15</td><td>1</td><td>20251</td><td>172800</td></tr>
<tr><td>Category 10</td><td>15</td><td>1</td><td>27952</td><td>172800</td></tr>
<tr><td>Category 11</td><td>5</td><td>2</td><td>3630</td><td>14400</td><td rowspan="2">QPSK</td></tr>
<tr><td>Category 12</td><td>5</td><td>1</td><td>3630</td><td>28800</td></tr>
<tr><td>Category 13</td><td>15</td><td>1</td><td>35280</td><td>259200</td><td rowspan="2">QPSK, 16QAM, 64QAM</td></tr>
<tr><td>Category 14</td><td>15</td><td>1</td><td>42192</td><td>259200</td></tr>
<tr><td>Category 15</td><td>15</td><td>1</td><td>23370</td><td>345600</td><td colspan="2" rowspan="2">QPSK, 16QAM</td></tr>
<tr><td>Category 16</td><td>15</td><td>1</td><td>27952</td><td>345600</td></tr>
<tr><td rowspan="2">Category 17 NOTE 2</td><td rowspan="2">15</td><td rowspan="2">1</td><td>35280</td><td>259200</td><td>QPSK, 16QAM, 64QAM</td><td>-</td></tr>
<tr><td>23370</td><td>345600</td><td>-</td><td>QPSK, 16QAM</td></tr>
<tr><td rowspan="2">Category 18 NOTE 3</td><td rowspan="2">15</td><td rowspan="2">1</td><td>42192</td><td>259200</td><td>QPSK, 16QAM, 64QAM</td><td>-</td></tr>
<tr><td>27952</td><td>345600</td><td>-</td><td>QPSK, 16QAM</td></tr>
<tr><td>Category 19</td><td>15</td><td>1</td><td>35280</td><td>518400</td><td colspan="2" rowspan="2">QPSK, 16QAM, 64QAM</td></tr>
<tr><td>Category 20</td><td>15</td><td>1</td><td>42192</td><td>518400</td></tr>
<tr><td>Category 21</td><td>15</td><td>1</td><td>23370</td><td>345600</td><td rowspan="4">-</td><td rowspan="4">-</td><td>QPSK, 16QAM</td></tr>
<tr><td>Category 22</td><td>15</td><td>1</td><td>27952</td><td>345600</td><td rowspan="2">QPSK, 16QAM, 64QAM</td></tr>
<tr><td>Category 23</td><td>15</td><td>1</td><td>35280</td><td>518400</td></tr>
<tr><td>Category 24</td><td>15</td><td>1</td><td>42192</td><td>518400</td></tr>
</table>

LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02r05. The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing.SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames (Maximum TTI)

1) Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power

measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

2) MPR

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

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

Maximun Power Reduction(MRP) 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

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	
		rmal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	6592 T_S	2192 T_S	2560 T_S	7680 T_S	2192 T_S	2560 T_S
1	19760 T_S			20480 T_S		
2	21952 T_S			23040 T_S		
3	24144 T_S			25600 T_S		
4	26336 T_S			7680 T_S	4384 T_S	5120 T_S

5	6592 T_S	4384 T_S	5120 T_S	20480 T_S		
6	19760 T_S			23040 T_S		
7	21952 T_S			12800 T_S		
8	24144 T_S			-	-	-
9	13168 T_S			-	-	-

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

Calculated Duty Cycle = Extended cyclic prefix in uplink x (Ts) x # of S + # of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = 5120 x [1/(15000 x 2048)] x 2 + 6 ms = 63.33%

Where Ts = 1/(15000 x 2048) seconds

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 ≤ 0.8W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1RB 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.

8. MEASUREMENT UNCERTAINTY

8.1. Uncertainty for Sar Test

DASY5

Uncertainty Component	Tol. (%)	Prob Dist.	Div	ci (10g)	ci.ui(%) (10g)	vi
Measurement System						
Probe Calibration	±5.9	N	1	1	±5.9	∞
Axial Isotropy	±4.7	R	$\sqrt{3}$	0.7	±1.9	∞
Hemispherical Isotropy	±9.6	R	$\sqrt{3}$	0.7	±3.9	∞
Boundary Effect	±1.0	R	$\sqrt{3}$	1	±0.6	∞
Linearity	±4.7	R	$\sqrt{3}$	1	±2.7	∞
System Detection Limits	±1.0	R	$\sqrt{3}$	1	±0.6	∞
Readout Electronics	±0.3	N	1	1	±0.3	∞
Response Time	±0.8	R	$\sqrt{3}$	1	±0.5	∞
Integration Time	±2.6	R	$\sqrt{3}$	1	±1.5	∞
RF Ambient Conditions - Noise	±3.0	R	$\sqrt{3}$	1	±1.7	∞
RF Ambient Conditions - Reflections	±3.0	R	$\sqrt{3}$	1	±1.7	∞
Probe Positioner Mechanical Tolerance	±0.4	R	$\sqrt{3}$	1	±0.2	∞
Probe Positioning with respect to Phantom Shell	±2.9	R	$\sqrt{3}$	1	±1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	±1.0	R	$\sqrt{3}$	1	±0.6	∞
Test Sample Related						
Test Sample Positioning	±2.9	N	1	1	±2.9	145
Device Holder Uncertainty	±3.6	N	1	1	±3.6	5
Output Power Variation - SAR drift measurement	±5.0	R	$\sqrt{3}$	1	±2.9	∞
Phantom and Tissue Parameters						
Phantom Uncertainty (shape and thickness tolerances)	±4.0	R	$\sqrt{3}$	1	±2.3	∞
Conductivity Target - tolerance	±5.0	R	$\sqrt{3}$	0.43	±1.2	∞
Conductivity - measurement uncertainty	±2.5	N	1	0.43	±1.1	∞
Permittivity Target - tolerance	±5.0	R	$\sqrt{3}$	0.49	±1.4	∞
Permittivity - measurement uncertainty	±2.5	N	1	0.49	±1.2	5
Combined Standard Uncertainty					**±10.7**	**387**
Expanded STD Uncertainty					**±21.4**	

8.2. SAR measurement Results

General Notes:

1) Per KDB447498 D01v06, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
2) Per KDB447498 D01v06, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is :≤0.8 W/kg or 2.0W/kg, for 1-g or 10-g respectively, when the transmission band is ≤100MHz. When the maximum output power variation across the required test channels is >1/2 dB, instead of the middle channel, the highest output power channel must be used.
3) Per KDB865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measure 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 KDB 941225 D06 Hotspot Mode SAR v02:r01, the DUT dimension is bigger than 9cm*5cm, 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 D04v01r03, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤1.2W/kg, no additional SAR evaluations using a headset are required.
6) Per KDB865664 D02v01r02, 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 >1.5W/kg, or >7.0W/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 plots-processing (refer to appendix B for details).

8.3. WLAN Notes

Per KDB 248227 D01v02r02, for all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are

tested.

Per KDB 248227 D01v02r02, for 802.11g/n SAR testing is required. 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.

Per KDB 248227 D01v02r02, for OFDM transmission configurations in the 2.4 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11g/n mode is used for SAR measurement, on the highest measured output power channel for each frequency band.

9. MEASUREMENT RESULTS

9.1. GSM850 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GSM(CS)	Left Cheek	190	836.6	32.57	33.5	1.239	0.12	0.149
GSM(CS)	Left Tilted	190	836.6	32.57	33.5	1.239	0.07	0.087
GSM(CS)	Right Cheek	190	836.6	32.57	33.5	1.239	0.154	0.191
GSM(CS)	Right Tilted	190	836.6	32.57	33.5	1.239	0.08	0.099
GSM(CS)(sim2)	Right Cheek	190	836.6	32.57	33.5	1.239	0.145	0.180

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GPRS (GMSK, 2 Tx slots)	Front Side	190	836.6	30.53	32	1.403	0.14	0.196
GPRS (GMSK, 2 Tx slots)	Back Side	190	836.6	30.53	32	1.403	0.208	0.292
GPRS (GMSK, 2 Tx slots)	Left Side	190	836.6	30.53	32	1.403	0.124	0.174
GPRS (GMSK, 2 Tx slots)	Right Side	190	836.6	30.53	32	1.403	0.166	0.233
GPRS (GMSK, 2 Tx slots)	Top Side	190	836.6	30.53	32	1.403	0.024	0.034
GPRS (GMSK, 2 Tx slots)	Bottom Side	190	836.6	30.53	32	1.403	0.193	0.271
GPRS	Back Side	190	836.6	30.53	32	1.403	0.201	0.282

(GMSK, 2 Tx slots)(battery 2#)								

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GSM(CS)	Front Side	190	836.6	32.57	33.5	1.239	0.14	0.173
GSM(CS)	Back Side	190	836.6	32.57	33.5	1.239	0.144	0.178
GSM(CS)	Back Side	190	836.6	32.57	33.5	1.239	0.141	0.175

9.2. PCS1900 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GSM(CS)	Left Cheek	661	1880	29.52	30.5	1.253	0.08	0.100
GSM(CS)	Left Tilted	661	1880	29.52	30.5	1.253	0.07	0.088
GSM(CS)	**Right Cheek**	**661**	**1880**	29.52	30.5	1.253	0.111	0.139
GSM(CS)	Right Tilted	661	1880	29.52	30.5	1.253	0.087	0.109
GSM(CS) (sim2)	Right Cheek	661	1880	29.52	30.5	1.253	0.099	0.124

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GPRS (GMSK, 2 Tx slots)	Front Side	661	1880	27.51	28.5	1.256	0.289	0.363
GPRS (GMSK, 2 Tx slots)	Back Side	661	1880	27.51	28.5	1.256	0.661	0.830
GPRS (GMSK, 2 Tx slots)	Left Side	661	1880	27.51	28.5	1.256	0.16	0.201
GPRS (GMSK, 2 Tx slots)	Right Side	661	1880	27.51	28.5	1.256	0.103	0.129
GPRS (GMSK, 2 Tx slots)	Top Side	661	1880	27.51	28.5	1.256	0.001	0.001
GPRS (GMSK, 2 Tx slots)	**Bottom Side**	**661**	**1880**	**27.51**	**28.5**	**1.256**	**0.744**	**0.934**
GPRS (GMSK, 2 Tx slots,SIM2)	Bottom Side	661	1880	27.51	28.5	1.256	0.712	0.894

Body Hotspot Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GPRS (GMSK, 2 Tx slots)	Front Side	661	1880	27.51	28.5	1.256	0.773	0.971
GPRS (GMSK, 2 Tx slots)	Back Side	661	1880	27.51	28.5	1.256	1.318	1.655
GPRS (GMSK, 2 Tx slots)	Left Side	661	1880	27.51	28.5	1.256	0.428	0.538
GPRS (GMSK, 2 Tx slots)	Right Side	661	1880	27.51	28.5	1.256	0.275	0.345
GPRS (GMSK, 2 Tx slots)	Top Side	661	1880	27.51	28.5	1.256	0.05	0.054
GPRS (GMSK, 2 Tx slots)	**Bottom Side**	**661**	**1880**	**27.51**	**28.5**	**1.256**	**1.990**	**2.499**
GPRS (GMSK, 2 Tx slots,SIM2)	Bottom Side	661	1880	27.51	28.5	1.256	1.904	2.391

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GSM(CS)	Front Side	661	1880	29.52	30.5	1.253	0.277	0.347
GSM(CS)	**Back Side**	**661**	**1880**	**29.52**	**30.5**	**1.253**	**0.459**	**0.575**
GSM(CS)	Back Side	661	1880	29.52	30.5	1.253	0.444	0.556

9.3. WCDMA II SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GSM(CS)	Left Cheek	661	1880	23.21	24	1.199	0.100	0.120
GSM(CS)	Left Tilted	661	1880	23.21	24	1.199	0.08	0.096
GSM(CS)	Right Cheek	661	1880	23.21	24	1.199	0.131	0.157
GSM(CS)	Right Tilted	661	1880	23.21	24	1.199	0.07	0.084
GSM(CS)(sim 2)	Right Cheek	661	1880	23.21	24	1.199	0.124	0.149

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
RMC	Front Side	661	1880	23.21	24	1.199	0.194	0.233
RMC	Back Side	661	1880	23.21	24	1.199	0.476	0.571
RMC	Left Side	661	1880	23.21	24	1.199	0.128	0.154
RMC	Right Side	661	1880	23.21	24	1.199	0.065	0.078
RMC	Top Side	661	1880	23.21	24	1.199	0.001	0.001
RMC	Bottom Side	661	1880	23.21	24	1.199	0.585	0.702
RMC	Bottom Side	661	1880	23.21	24	1.199	0.545	0.654

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)

				(dBm)				
RMC	Front Side	661	1880	23.21	24	1.199	0.165	0.198
RMC	Back Side	661	1880	23.21	24	1.199	0.39	0.468
RMC	Back Side	661	1880	23.21	24	1.199	0.384	0.461

9.4. WCDMA IV SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
RMC	Left Cheek	1412	1732.4	23.12	24	1.225	0.100	0.122
RMC	Left Tilted	1412	1732.4	23.12	24	1.225	0.07	0.086
RMC	Right Cheek	1412	1732.4	23.12	24	1.225	0.139	0.170
RMC	Right Tilted	1412	1732.4	23.12	24	1.225	0.06	0.073
RMC	Right Cheek	1412	1732.4	23.12	24	1.225	0.128	0.157

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
RMC	Front Side	1412	1732.4	21.22	22	1.197	0.231	0.276
RMC	**Back Side**	**1412**	**1732.4**	**21.22**	**22**	**1.197**	**0.703**	**0.841**
RMC	Left Side	1412	1732.4	21.22	22	1.197	0.099	0.118
RMC	Right Side	1412	1732.4	21.22	22	1.197	0.054	0.065
RMC	Top Side	1412	1732.4	21.22	22	1.197	0.001	0.001
RMC	Bottom Side	1412	1732.4	21.22	22	1.197	0.642	0.768
RMC	Back Side	1412	1732.4	21.22	22	1.197	0.655	0.784

Body Hotspot Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
RMC	Front Side	1412	1732.4	21.22	22	1.197	0.562	0.673
RMC	**Back Side**	**1412**	**1732.4**	**21.22**	**22**	**1.197**	1.420	1.701
RMC	Left Side	1412	1732.4	21.22	22	1.197	0.241	0.288
RMC	Right Side	1412	1732.4	21.22	22	1.197	0.131	0.157
RMC	Top Side	1412	1732.4	21.22	22	1.197	0.032	0.038
RMC	Bottom Side	1412	1732.4	21.22	22	1.197	1.412	1.690
RMC	Back Side	1412	1732.4	21.22	22	1.197	1.413	1.691

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
RMC	Front Side	1412	1732.4	23.12	24	1.225	0.201	0.246
RMC	Back Side	1412	1732.4	23.12	24	1.225	0.542	0.664
RMC	Back Side	1412	1732.4	23.12	24	1.225	0.529	0.648
RMC (Reduced)	Back Side	1412	1732.4	22.29	23	1.178	0.467	0.550

9.5. WCDMA V SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
RMC	Left Cheek	4182	836.4	23.33	24.3	1.250	0.17	0.213
RMC	Left Tilted	4182	836.4	23.33	24.3	1.250	0.09	0.113
RMC	Right Cheek	4182	836.4	23.33	24.3	1.250	0.183	0.229
RMC	Right Tilted	4182	836.4	23.33	24.3	1.250	0.1	0.125
RMC(sim2)	Right Cheek	4182	836.4	23.33	24.3	1.250	0.177	0.221

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
RMC	Front Side	4182	836.4	23.33	24.3	1.250	0.16	0.200
RMC	Back Side	4182	836.4	23.33	24.3	1.250	0.173	0.216
RMC	Left Side	4182	836.4	23.33	24.3	1.250	0.157	0.196
RMC	Right Side	4182	836.4	23.33	24.3	1.250	0.194	0.243
RMC	Top Side	4182	836.4	23.33	24.3	1.250	0.019	0.024
RMC	**Bottom Side**	**4182**	**836.4**	**23.33**	**24.3**	**1.250**	**0.203**	**0.254**
RMC	Bottom Side	4182	836.4	23.33	24.3	1.250	0.201	0.251

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
RMC	Front Side	4182	836.4	23.33	24.3	1.250	0.11	0.138
RMC	Back Side	4182	836.4	23.33	24.3	1.250	0.161	0.201
RMC	Back Side	4182	836.4	23.33	24.3	1.250	0.158	0.198

9.6. LTE Band 2 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Left Cheek	18900	1880	23.24	24	1.191	0.09	0.107
20M QPSK (1#25)	Left Tilted	18900	1880	23.24	24	1.191	0.06	0.071
20M QPSK (1#25)	Right Cheek	18900	1880	23.24	24	1.191	0.113	0.135
20M QPSK (1#25)	Right Tilted	18900	1880	23.24	24	1.191	0.06	0.071
20M QPSK (1#25)(50%)	Right Cheek	18900	1880	23.24	24	1.191	0.108	0.129

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	18900	1880	22.41	23	1.146	0.226	0.259
20M QPSK (1#25)	Back Side	18900	1880	22.41	23	1.146	0.549	0.629
20M QPSK (1#25)	Left Side	18900	1880	22.41	23	1.146	0.133	0.152
20M QPSK (1#25)	Right Side	18900	1880	22.41	23	1.146	0.074	0.085
20M QPSK (1#25)	Top Side	18900	1880	22.41	23	1.146	0.001	0.001
20M QPSK (1#25)	Bottom Side	18900	1880	22.41	23	1.146	0.758	0.868
20M QPSK (1#25)(50%)	Back Side	18900	1880	22.41	23	1.146	0.745	0.853

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	4182	836.4	22.34	23	1.164	0.125	0.146
20M QPSK (1#25)	Back Side	4182	836.4	22.34	23	1.164	0.3	0.349
20M QPSK (1#25)(50%)	Back Side	4182	836.4	22.34	23	1.164	0.284	0.331
20M QPSK (1#25) (Reduced)	Back Side	4182	836.4	21.24	22	1.191	0.211	0.251

9.7. LTE Band 4 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Left Cheek	20175	1732.5	23.73	24	1.064	0.099	0.105
20M QPSK (1#25)	Left Tilted	20175	1732.5	23.73	24	1.064	0.059	0.063
20M QPSK (1#25)	Right Cheek	20175	1732.5	23.73	24	1.064	0.107	0.114
20M QPSK (1#25)	Right Tilted	20175	1732.5	23.73	24	1.064	0.074	0.079
20M QPSK (1#25)(50%)	Right Cheek	20175	1732.5	23.73	24	1.064	0.098	0.104

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	20175	1732.5	21.27	22	1.183	0.257	0.304
20M QPSK (1#25)	Back Side	20175	1732.5	21.27	22	1.183	0.538	0.636
20M QPSK (1#25)	Left Side	20175	1732.5	21.27	22	1.183	0.108	0.128
20M QPSK (1#25)	Right Side	20175	1732.5	21.27	22	1.183	0.058	0.069
20M QPSK (1#25)	Top Side	20175	1732.5	21.27	22	1.183	0.001	0.001
20M QPSK (1#25)	Bottom Side	20175	1732.5	21.27	22	1.183	0.427	0.505
20M QPSK (1#25)(50%)	Back Side	20050	1720.0	21.27	22	1.183	0.524	0.620

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	20175	1732.5	21.22	22	1.197	0.158	0.189
20M QPSK (1#25)	Back Side	20175	1732.5	21.22	22	1.197	0.296	0.354
20M QPSK (1#25)(50%)	Back Side	20175	1732.5	21.22	22	1.197	0.288	0.345

9.8. LTE Band 5 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Left Cheek	20525	836.5	23.59	24.3	1.178	0.144	0.170
20M QPSK (1#25)	Left Tilted	20525	836.5	23.59	24.3	1.178	0.076	0.089
20M QPSK (1#25)	Right Cheek	20525	836.5	23.59	24.3	1.178	0.176	0.207
20M QPSK (1#25)	Right Tilted	20525	836.5	23.59	24.3	1.178	0.089	0.105
20M QPSK (1#25)(50%)	Right Cheek	20525	836.5	23.59	24.3	1.178	0.159	0.187

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	20525	836.5	23.59	24.3	1.178	0.147	0.173
20M QPSK (1#25)	Back Side	20525	836.5	23.59	24.3	1.178	0.275	0.324
20M QPSK (1#25)	Left Side	20525	836.5	23.59	24.3	1.178	0.114	0.134
20M QPSK (1#25)	Right Side	20525	836.5	23.59	24.3	1.178	0.194	0.228
20M QPSK (1#25)	Top Side	20525	836.5	23.59	24.3	1.178	0.001	0.001
20M QPSK (1#25)	Bottom Side	20525	836.5	23.59	24.3	1.178	0.17	0.200

20M QPSK (1#25)(50%)	Back Side	20525	836.5	23.59	24.3	1.178	0.269	0.317

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	20525	836.5	23.59	24.3	1.178	0.14	0.165
20M QPSK (1#25)	Back Side	20525	836.5	23.59	24.3	1.178	0.15	0.177
20M QPSK (1#25)(50%)	Back Side	20525	836.5	23.59	24.3	1.178	0.144	0.170

9.9. LTE Band 7 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Left Cheek	21100	2535	22.89	23.5	1.151	0.170	0.196
20M QPSK (1#25)	Left Tilted	21100	2535	22.89	23.5	1.151	0.120	0.138
20M QPSK (1#25)	Right Cheek	21100	2535	22.89	23.5	1.151	0.110	0.127
20M QPSK (1#25)	Right Tilted	21100	2535	22.89	23.5	1.151	0.080	0.092
20M QPSK (1#25)(50%)	Right Cheek	21100	2535	22.89	23.5	1.151	0.166	0.191

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	21100	2535	20.51	21	1.119	0.350	0.392
20M QPSK (1#25)	Back Side	21100	2535	20.51	21	1.119	0.600	0.672
20M QPSK (1#25)	Left Side	21100	2535	20.51	21	1.119	0.210	0.235
20M QPSK (1#25)	Right Side	21100	2535	20.51	21	1.119	0.200	0.224
20M QPSK (1#25)	Top Side	21100	2535	20.51	21	1.119	0.040	0.045
20M QPSK (1#25)	Bottom Side	21100	2535	20.51	21	1.119	1.000	1.119
20M QPSK (1#25)	**Bottom Side**	**20850**	**2510**	**20.47**	**21**	**1.130**	**1.020**	**1.152**

20M QPSK (1#25)	Bottom Side	21350	2560	20.51	21	1.119	0.864	0.967
20M QPSK (1#25)(50%)	Bottom Side	20850	2510	20.51	21	1.119	0.998	1.117

Body Hotspot Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	21100	2535	20.51	21	1.119	0.491	0.549
20M QPSK (1#25)	Back Side	21100	2535	20.51	21	1.119	0.841	0.941
20M QPSK (1#25)	Left Side	21100	2535	20.51	21	1.119	0.294	0.329
20M QPSK (1#25)	Right Side	21100	2535	20.51	21	1.119	0.280	0.313
20M QPSK (1#25)	Top Side	21100	2535	20.51	21	1.119	0.056	0.063
20M QPSK (1#25)	Bottom Side	21100	2535	20.51	21	1.119	1.402	1.569
20M QPSK (1#25)	**Bottom Side**	**20850**	**2510**	**20.47**	**21**	**1.130**	**1.430**	**1.616**
20M QPSK (1#25)	Bottom Side	21350	2560	20.51	21	1.119	1.211	1.355
20M QPSK (1#25)(50%)	Bottom Side	20850	2510	20.51	21	1.119	1.399	1.565

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	21100	2535	22.89	23.5	1.151	0.14	0.161
20M QPSK (1#25)	Back Side	21100	2535	22.89	23.5	1.151	0.435	0.501
20M QPSK (1#25)(50%)	Back Side	21100	2535	22.89	23.5	1.151	0.429	0.494

9.10. LTE Band12 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Left Cheek	23095	707.5	23.14	24.3	1.306	0.1	0.131
20M QPSK (1#25)	Left Tilted	23095	707.5	23.14	24.3	1.306	0.05	0.065
20M QPSK (1#25)	Right Cheek	23095	707.5	23.14	24.3	1.306	0.114	0.149
20M QPSK (1#25)	Right Tilted	23095	707.5	23.14	24.3	1.306	0.07	0.091
20M QPSK (1#25)(50%)	Right Cheek	23095	707.5	23.14	24.3	1.306	0.11	0.144

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	23095	707.5	23.14	24.3	1.306	0.12	0.157
20M QPSK (1#25)	Back Side	23095	707.5	23.14	24.3	1.306	0.215	0.281
20M QPSK (1#25)	Left Side	23095	707.5	23.14	24.3	1.306	0.098	0.128
20M QPSK (1#25)	Right Side	23095	707.5	23.14	24.3	1.306	0.157	0.205
20M QPSK (1#25)	Top Side	23095	707.5	23.14	24.3	1.306	0.001	0.001
20M QPSK (1#25)	Bottom Side	23095	707.5	23.14	24.3	1.306	0.052	0.068
20M QPSK (1#25)(50%)	Back Side	23095	707.5	23.14	24.3	1.306	0.211	0.276

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK (1#25)	Front Side	23095	707.5	23.14	24.3	1.306	0.119	0.155
20M QPSK (1#25)	Back Side	23095	707.5	23.14	24.3	1.306	0.226	0.295
20M QPSK (1#25)(50%)	Back Side	23095	707.5	23.14	24.3	1.306	0.214	0.280
20M QPSK (1#25)(battery 2#)	Back Side	23095	707.5	23.14	24.3	1.306	0.219	0.286

9.11. LTE Band17 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
10M QPSK (1#24)	**Left Cheek**	**23790**	**710**	**23.19**	**24.3**	1.291	0.082	0.106
10M QPSK (1#24)	Left Tilted	23790	710	23.19	24.3	1.291	0.005	0.006
10M QPSK (1#24)	Right Cheek	23790	710	23.19	24.3	1.291	0.074	0.096
10M QPSK (1#24)	Right Tilted	23790	710	23.19	24.3	1.291	0.005	0.006
10M QPSK (1#24)	Left Cheek	23790	710	23.19	24.3	1.291	0.078	0.101

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
10M QPSK (1#24)	Front Side	23790	710	23.19	24.3	1.291	0.126	0.163
10M QPSK (1#24)	Back Side	23790	710	23.19	24.3	1.291	0.196	0.253
10M QPSK (1#24)	Left Side	23790	710	23.19	24.3	1.291	0.131	0.169
10M QPSK (1#24)	Right Side	23790	710	23.19	24.3	1.291	0.185	0.239
10M QPSK (1#24)	Top Side	23790	710	23.19	24.3	1.291	0.001	0.001
10M QPSK (1#24)	Bottom Side	23790	710	23.19	24.3	1.291	0.072	0.093
10M QPSK (1#24) (50%)	Back Side	23790	710	23.19	24.3	1.291	0.188	0.243

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
10M QPSK (1#24)	Front Side	23790	710	23.19	24.3	1.291	0.089	0.115
10M QPSK (1#24)	Back Side	23790	710	23.19	24.3	1.291	0.187	0.241
10M QPSK (1#24) (50%)	Back Side	23790	710	23.19	24.3	1.291	0.177	0.229

9.12. LTE Band26 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
5M QPSK (1#12)	Left Cheek	26865	831.5	23.47	24.3	1.211	0.125	0.151
5M QPSK (1#12)	Left Tilted	26865	831.5	23.47	24.3	1.211	0.095	0.115
5M QPSK (1#12)	Right Cheek	26865	831.5	23.47	24.3	1.211	0.152	0.184
5M QPSK (1#12)	Right Tilted	26865	831.5	23.47	24.3	1.211	0.106	0.128
5M QPSK (1#12)(50%)	Right Cheek	26865	831.5	23.47	24.3	1.211	0.144	0.174

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
5M QPSK (1#12)	Front Side	26865	831.5	23.47	24.3	1.211	0.137	0.166
5M QPSK (1#12)	**Back Side**	**26865**	**831.5**	23.47	24.3	1.211	0.194	0.235
5M QPSK (1#12)	Left Side	26865	831.5	23.47	24.3	1.211	0.12	0.145
5M QPSK (1#12)	Right Side	26865	831.5	23.47	24.3	1.211	0.179	0.217
5M QPSK (1#12)	Top Side	26865	831.5	23.47	24.3	1.211	0.001	0.001
5M QPSK (1#12)	Bottom Side	26865	831.5	23.47	24.3	1.211	0.177	0.214
5M QPSK (1#12)(50%)	Back Side	26865	831.5	23.47	24.3	1.211	0.178	0.215

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
5M QPSK (1#12)	Front Side	26865	831.5	23.47	24.3	1.211	0.136	0.165
5M QPSK (1#12)	Back Side	26865	831.5	23.47	24.3	1.211	0.152	0.184
5M QPSK (1#12)(50%)	Back Side	26865	831.5	23.47	24.3	1.211	0.149	0.180

9.13. LTE Band 38 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Left Cheek	38000	2595	23.21	24	1.199	0.059	0.071
20M QPSK(1#50)	Left Tilted	38000	2595	23.21	24	1.199	0.01	0.012
20M QPSK(1#50)	Right Cheek	38000	2595	23.21	24	1.199	0.02	0.024
20M QPSK(1#50)	Right Tilted	38000	2595	23.21	24	1.199	0.03	0.036
20M QPSK(1#50)(50%)	Left Cheek	38000	2595	23.21	24	1.199	0.044	0.053

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Front Side	38000	2595	23.21	24	1.199	0.2	0.240
20M QPSK(1#50)	Back Side	38000	2595	23.21	24	1.199	0.28	0.336
20M QPSK(1#50)	Left Side	38000	2595	23.21	24	1.199	0.06	0.072
20M QPSK(1#50)	Right Side	38000	2595	23.21	24	1.199	0.04	0.048
20M QPSK(1#50)	Top Side	38000	2595	23.21	24	1.199	0.001	0.001
20M QPSK(1#50)	Bottom Side	38000	2595	23.21	24	1.199	0.781	0.937
20M QPSK(1#50) (50%)	Bottom Side	38000	2595	23.21	24	1.199	0.777	0.932

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Front Side	38000	2595	23.21	24	1.199	0.129	0.155
20M QPSK(1#50)	Back Side	38000	2595	23.21	24	1.199	0.212	0.254
20M QPSK(1#50) (50%)	Back Side	38000	2595	23.21	24	1.199	0.21	0.252

9.14. LTE Band 41 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Left Cheek	40620	2593.0	23.31	24	1.172	0.142	0.166
20M QPSK(1#50)	Left Tilted	40620	2593.0	23.31	24	1.172	0.06	0.070
20M QPSK(1#50)	Right Cheek	40620	2593.0	23.31	24	1.172	0.07	0.082
20M QPSK(1#50)	Right Tilted	40620	2593.0	23.31	24	1.172	0.05	0.059
20M QPSK(1#50)(50%)	Left Cheek	40620	2593.0	23.31	24	1.172	0.133	0.156

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Front Side	40620	2593.0	22.65	23	1.084	0.213	0.231
20M QPSK(1#50)	Back Side	40620	2593.0	22.65	23	1.084	0.284	0.308
20M QPSK(1#50)	Left Side	40620	2593.0	22.65	23	1.084	0.14	0.152
20M QPSK(1#50)	Right Side	40620	2593.0	22.65	23	1.084	0.09	0.098
20M QPSK(1#50)	Top Side	40620	2593.0	22.65	23	1.084	0.001	0.001
20M QPSK(1#50)	Bottom Side	40620	2593.0	22.65	23	1.084	0.15	0.163
20M QPSK(1#50) (50%)	Back Side	40620	2593.0	22.65	23	1.084	0.145	0.157

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Front Side	40620	2593.0	23.31	24	1.172	0.121	0.142
20M QPSK(1#50)	Back Side	40620	2593.0	23.31	24	1.172	0.148	0.173
20M QPSK(1#50) (50%)	Back Side	40620	2593.0	23.31	24	1.172	0.139	0.163

9.15. LTE Band66 SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Left Cheek	132322	1745	23.24	24	1.191	0.116	0.138
20M QPSK(1#50)	Left Tilted	132322	1745	23.24	24	1.191	0.056	0.067
20M QPSK(1#50)	Right Cheek	132322	1745	23.24	24	1.191	0.143	0.170
20M QPSK(1#50)	Right Tilted	132322	1745	23.24	24	1.191	0.074	0.088
20M QPSK(1#50)(50%)	Right Cheek	132322	1745	23.24	24	1.191	0.135	0.161

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Front Side	132322	1745	21.19	22	1.205	0.246	0.296
20M QPSK(1#50)	Back Side	132322	1745	21.19	22	1.205	0.735	0.886
20M QPSK(1#50)	Left Side	132322	1745	21.19	22	1.205	0.101	0.122
20M QPSK(1#50)	Right Side	132322	1745	21.19	22	1.205	0.053	0.064
20M QPSK(1#50)	Top Side	132322	1745	21.19	22	1.205	0.001	0.001
20M QPSK(1#50)	Bottom Side	132322	1745	21.19	22	1.205	0.677	0.816
20M QPSK(1#50) (50%)	Back Side	132322	1745	21.19	22	1.205	0.724	0.872

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
20M QPSK(1#50)	Front Side	132322	1745	23.24	24	1.191	0.238	0.284
20M QPSK(1#50)	Back Side	132322	1745	23.24	24	1.191	0.452	0.538
20M QPSK(1#50) (50%)	Back Side	132322	1745	23.24	24	1.191	0.433	0.516

9.16. Wi-Fi 2.4G SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
802.11b	Left Cheek	6	2437	18.24	20	1.500	0.58	0.870
802.11b	Left Tilted	6	2437	18.24	20	1.500	0.56	0.840
802.11b	Right Cheek	6	2437	18.24	20	1.500	0.391	0.586
802.11b	Right Tilted	6	2437	18.24	20	1.500	0.441	0.661

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
802.11b	Front Side	6	2437	18.24	20	1.500	0.174	0.261
802.11b	Back Side	6	2437	18.24	20	1.500	0.26	0.390
802.11b	Left Side	6	2437	18.24	20	1.500	0.052	0.078
802.11b	Right Side	6	2437	18.24	20	1.500	0.123	0.184
802.11b	Top Side	6	2437	18.24	20	1.500	0.182	0.273
802.11b	Bottom Side	6	2437	18.24	20	1.500	0.012	0.018
802.11b	Front Side	6	2437	17.29	18	1.178	0.125	0.147
802.11b	Back Side	6	2437	17.29	18	1.178	0.24	0.283
802.11b	Left Side	6	2437	17.29	18	1.178	0.032	0.038
802.11b	Right Side	6	2437	17.29	18	1.178	0.104	0.122
802.11b	Top Side	6	2437	17.29	18	1.178	0.154	0.181
802.11b	Bottom Side	6	2437	17.29	18	1.178	0.011	0.013

Body Hotspot Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
802.11b	Front Side	6	2437	18.24	20	1.500	1.121	1.681
802.11b	Back Side	6	2437	18.24	20	1.500	1.670	2.505
802.11b	Left Side	6	2437	18.24	20	1.500	0.544	0.816
802.11b	Right Side	6	2437	18.24	20	1.500	0.853	1.279
802.11b	Top Side	6	2437	18.24	20	1.500	1.331	1.996
802.11b	Bottom Side	6	2437	18.24	20	1.500	0.441	0.661
802.11b	Front Side	6	2437	17.29	18	1.178	0.818	0.963
802.11b	Back Side	6	2437	17.29	18	1.178	1.372	1.616
802.11b	Left Side	6	2437	17.29	18	1.178	0.397	0.468
802.11b	Right Side	6	2437	17.29	18	1.178	0.623	0.734
802.11b	Top Side	6	2437	17.29	18	1.178	0.972	1.145
802.11b	Bottom Side	6	2437	17.29	18	1.178	0.322	0.379

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
802.11b	Front Side	6	2437	18.24	20	1.500	0.101	0.151
802.11b	Back Side	6	2437	18.24	20	1.500	0.161	0.241
802.11b	Back Side	6	2437	18.24	20	1.500	0.151	0.226
802.11b	Front Side	6	2437	17.29	18	1.178	0.074	0.087
802.11b	Back Side	6	2437	17.29	18	1.178	0.118	0.139
802.11b	Back Side	6	2437	17.29	18	1.178	0.11	0.130

9.17. BT SAR results

Head Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GFSK	Left Cheek	39	2440	9.04	11.5	1.762	0.048	0.085
GFSK	Left Tilted	39	2440	9.04	11.5	1.762	0.057	0.100
GFSK	Right Cheek	39	2440	9.04	11.5	1.762	0.02	0.035
GFSK	Right Tilted	39	2440	9.04	11.5	1.762	0.021	0.037

Body Hotspot Exposure Condition (Separation Distance is 10 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GFSK	Front Side	39	2440	9.04	11.5	1.762	0.005	0.009
GFSK	Back Side	39	2440	9.04	11.5	1.762	0.013	0.023
GFSK	Left Side	39	2440	9.04	11.5	1.762	0.006	0.011
GFSK	Right Side	39	2440	9.04	11.5	1.762	0.002	0.004
GFSK	Top Side	39	2440	9.04	11.5	1.762	0.009	0.016
GFSK	Bottom Side	39	2440	9.04	11.5	1.762	0.004	0.007

Body Hotspot Exposure Condition (Separation Distance is 0 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GFSK	Front Side	39	2440	9.04	11.5	1.762	0.084	0.148
GFSK	Back Side	39	2440	9.04	11.5	1.762	0.16	0.282
GFSK	Left Side	39	2440	9.04	11.5	1.762	0.071	0.125
GFSK	Right Side	39	2440	9.04	11.5	1.762	0.054	0.095
GFSK	Top Side	39	2440	9.04	11.5	1.762	0.105	0.185
GFSK	Bottom Side	39	2440	9.04	11.5	1.762	0.023	0.041

Body worn Exposure Condition (Separation Distance is 15 mm)

Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
GFSK	Front Side	39	2440	9.04	11.5	1.762	0.002	0.004
GFSK	Back Side	39	2440	9.04	11.5	1.762	0.008	0.014

9.18. Repeated SAR results

Remark:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ⩾0.8W/kg.

2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ⩽ 1.2 and the measured SAR<1.45W/kg, only one repeated measurement is required.

3. The ratio is the difference in percentage between original and repeated measured SAR.

4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR (W/kg)	Reported SAR (W/kg)
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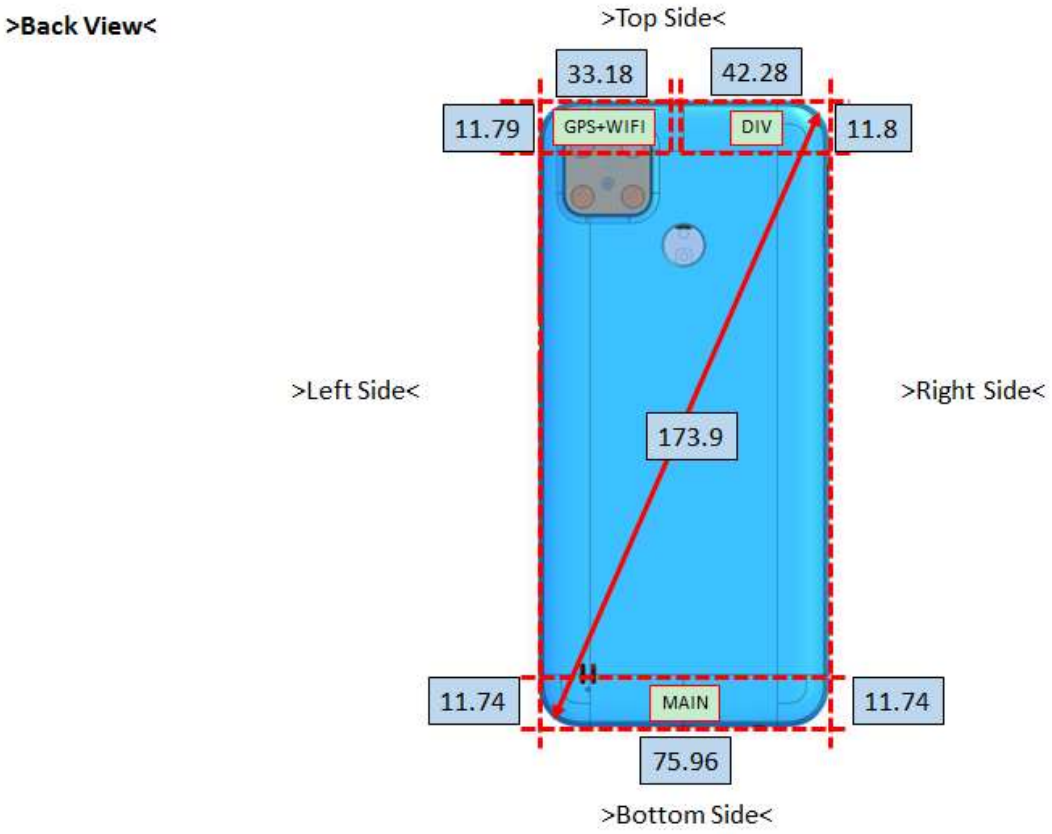
10. EXPOSURE POSITIONS CONSIDERATION

10.1. Multiple Transmitter Evaluation



Mode	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
TX Main Antenna	YES	YES	YES	YES	YES	YES
Wi-Fi Antenna	YES	YES	YES	YES	YES	YES

10.2. Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

No.	Configuration	
1	GSM(voice)+ WiFi2.4G	Yes
2	GPRS/EDGE(DATA)+ WiFi2.4G	Yes
3	GPRS/EDGE(DATA)+ BT	Yes
4	UMTS(Voice)+ WiFi2.4G	Yes

5	UMTS(DATA)+ WiFi2.4G	Yes
6	UMTS(DATA)+ BT	Yes
7	LTE(DATA)+WiFi2.4G	Yes
8	LTE(DATA)+BT	Yes

Table 5: Simultaneous Transmission Possibilities

Note:

1) Wi-Fi 2.4G and Bluetooth share the same Tx antenna and can't transmit simultaneously.
2) 2G&3G&4G can't transmit simultaneously.
3) Held to ear configurations are not applicable to Bluetooth and therefore were not considered for simultaneous transmission.

10.3. SAR Summation Scenario

Test Position		Left Cheek	Left Tilted	Right Cheek	Right Tilted
MAX 1-g SAR (W/kg)	GSM 850	0.149	0.087	0.191	0.099
	PCS 1900	0.100	0.088	0.139	0.109
	WCDMA Band II	0.120	0.096	0.157	0.084
	WCDMA Band IV	0.122	0.086	0.170	0.073
	WCDMA Band V	**0.213**	0.113	**0.229**	0.125
	LTE Band 2	0.107	0.071	0.135	0.071
	LTE Band 4	0.105	0.063	0.114	0.079
	LTE Band 5	0.170	0.089	0.207	0.105
	LTE Band 7	0.196	**0.138**	0.127	0.092
	LTE Band 12	0.131	0.065	0.149	0.091
	LTE Band 17	0.106	0.006	0.096	0.006
	LTE Band 26	0.151	0.115	0.184	**0.128**
	LTE Band 38	0.071	0.012	0.024	0.036
	LTE Band 41	0.166	0.070	0.082	0.059
	LTE Band 66	0.138	0.067	0.170	0.088
	2.4G Wi-Fi	**0.870**	**0.840**	**0.586**	**0.661**
	BT	0.085	0.100	0.035	0.037
Σ1-g SAR(W/kg)		1.083	0.978	0.815	0.789

Test Position		Front Side (10mm)	Back Side (10mm)	Left Side (10mm)	Right Side (10mm)	Top Side (10mm)	Bottom Side (10mm)
MAX 1-g SAR (W/kg)	GSM 850	0.196	0.292	0.174	0.233	0.034	0.271
	PCS 1900	0.363	0.830	0.201	0.129	0.001	0.934
	WCDMA Band II	0.233	0.571	0.154	0.078	0.001	0.702
	WCDMA Band IV	0.276	0.841	0.118	0.065	0.001	0.768
	WCDMA Band V	0.200	0.216	0.196	**0.243**	0.024	0.254
	LTE Band 2	0.259	0.629	0.152	0.085	0.001	0.868
	LTE Band 4	0.304	0.636	0.128	0.069	0.001	0.505
	LTE Band 5	0.173	0.324	0.134	0.228	0.001	0.200
	LTE Band 7	**0.392**	0.672	**0.235**	0.224	**0.045**	**1.152**
	LTE Band 12	0.157	0.281	0.128	0.205	0.001	0.068
	LTE Band 17	0.163	0.253	0.169	0.239	0.001	0.093
	LTE Band 26	0.166	0.235	0.145	0.217	0.001	0.214
	LTE Band 38	0.240	0.336	0.072	0.048	0.001	0.937
	LTE Band 41	0.231	0.308	0.152	0.098	0.001	0.163
	LTE Band 66	0.296	**0.886**	0.122	0.064	0.001	0.816
	2.4G Wi-Fi	**0.147**	**0.283**	**0.038**	**0.122**	**0.181**	**0.013**
	BT	0.009	0.023	0.011	0.004	0.016	0.007
Σ1-g SAR(W/kg)		0.539	1.169	0.273	0.365	0.226	1.165

Test Position		Front Side (0mm)	Back Side (0mm)	Left Side (0mm)	Right Side (0mm)	Top Side (0mm)	Bottom Side (0mm)
MAX 10-g SAR (W/kg)	PCS1900	**0.971**	1.655	**0.538**	**0.345**	0.054	**2.499**
	WCDMA Band IV	0.673	**1.701**	0.288	0.157	0.038	1.690
	LTE Band 7	0.549	0.941	0.329	0.313	**0.063**	1.616
	2.4G Wi-Fi	**0.963**	**1.616**	**0.468**	**0.734**	**1.145**	**0.379**
	BT	0.148	0.282	0.125	0.095	0.185	0.041
Σ1-g SAR(W/kg)		1.934	3.317	1.006	1.079	1.208	2.878

Test Position		Front Side (15mm)	Back Side (15mm)
MAX 1-g SAR (W/kg)	GSM 850	0.173	0.178
	PCS 1900	**0.347**	**0.575**
	WCDMA Band II	0.198	0.468
	WCDMA Band IV	0.246	0.550
	WCDMA Band V	0.138	0.201
	LTE Band 2	0.146	0.251
	LTE Band 4	0.189	0.354
	LTE Band 5	0.165	0.177
	LTE Band 7	0.161	0.501
	LTE Band 12	0.155	0.295
	LTE Band 17	0.115	0.241
	LTE Band 26	0.165	0.184
	LTE Band 38	0.155	0.254
	LTE Band 41	0.142	0.173
	LTE Band 66	0.284	0.538
	2.4G Wi-Fi	**0.087**	**0.139**
	BT	0.004	0.014
Σ1-g SAR(W/kg)		0.434	0.714

10.4. Simultaneous Transmission Conclusion

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

11. PHOTOGRAPHS OF THE TEST SET-UP

Photograph: Liquid depth

Photo 1: Body 750 Depth (15.0cm)	Photo 2: Body835 Depth (15.0cm)

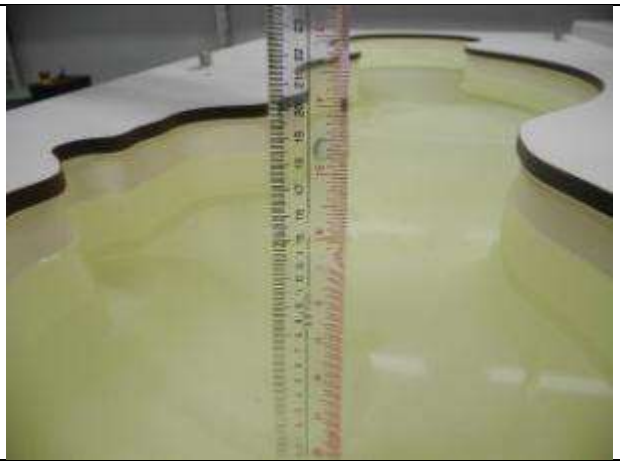
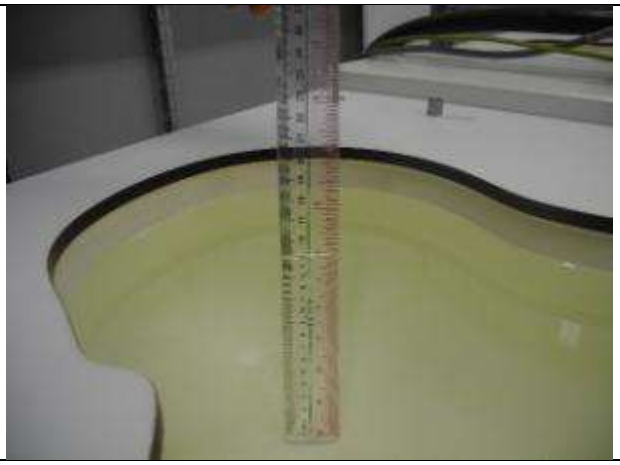

	

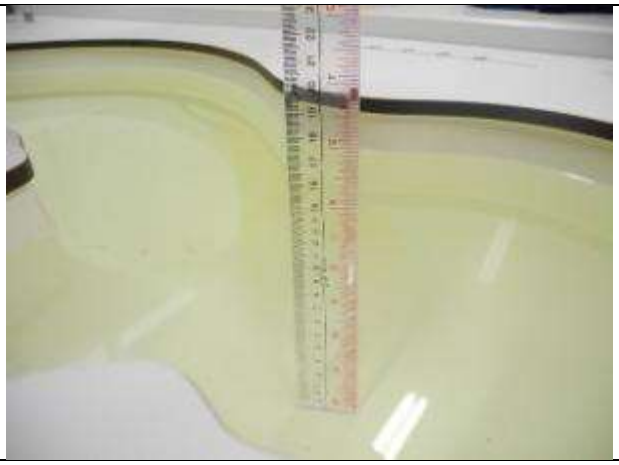
Photo 3: Body1750 Depth (15.0cm)	Photo 4: Body1900 Depth(15.0cm)
	

Photo 5: Body 2300 Depth (15.0cm)	Photo 6: Body 2450 Depth (15.0cm)

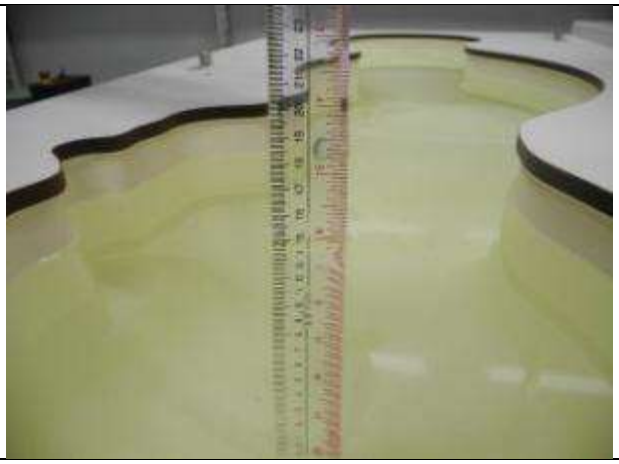
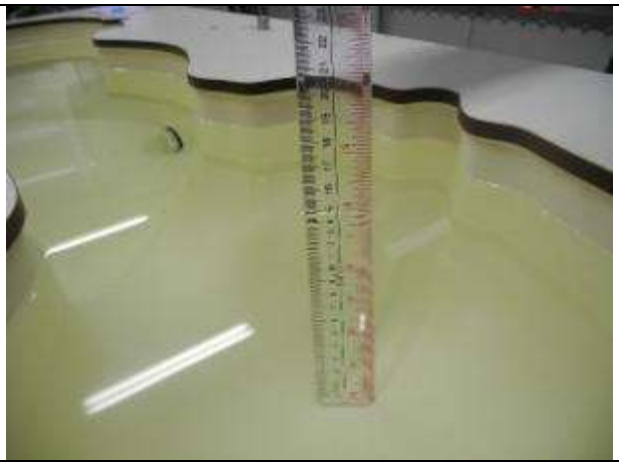



Photo 7: Body2600 Depth (15.0cm)	N/A
	N/A

Appendix A. System Check Plots

(Pls see Appendix A)

Appendix B. MEASUREMENT SCANS

(Pls see Appendix B)

AppendixC RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S)

(Pls see Appendix C)

Appendix D. RELEVANT PAGES FROM DAE&DIPOLE VALIDATION KIT REPORT(S)

(Pls see Appendix D)

Appendix E. CONDUCTED RF OUTPUT POWER TABLE

(Pls see Appendix E)

----------END Report----------