

FCC SAR TEST REPORT

Application No.: SZCR2501000207WM
Applicant: TCL Communication Ltd.
Address of Applicant: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Manufacturer: TCL Communication Ltd.
Address of Manufacturer: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
EUT Description: Mobile Phone
Model No.: T451A
Trade Mark: Alcatel
FCC ID: 2ACCB235
Standards: FCC 47CFR §2.1093
Date of Receipt: 2025-01-15
Date of Test: 2025-01-18 to 2025-02-07
Date of Issue: 2025-02-10

Test Result :	PASS *
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* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager



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SZSAR-TRF-01 Rev. A/0 May15,2023

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2025-02-10		Original

Authorized for issue by:				
		Kevin Lan		
		Kevin Lan/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



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TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)		
	Head	Body-worn&Hotspot	Product specific 10g SAR
GSM850	0.98	0.41	/
GSM1900	<0.10	0.64	/
WCDMA Band II	0.21	1.24	2.95
WCDMA Band IV	0.15	1.09	/
WCDMA Band V	0.80	0.33	/
LTE Band 2	0.17	1.23	2.79
LTE Band 7	<0.10	1.26	1.97
LTE Band 12/17	0.54	0.26	/
LTE Band 13	0.62	0.33	/
LTE Band 26/5	1.01	0.39	/
LTE Band 41/38	<0.10	1.24	0.75
LTE Band 66/4	<0.10	1.18	/
WI-FI (2.4GHz)	0.19	0.11	/
BT	<0.10	<0.10	/
SAR Limited(W/kg)	1.6		4.0
Maximum Simultaneous Transmission SAR (W/kg)			
Scenario	Head	Body-worn&Hotspot	Product specific 10g SAR
Sum SAR	1.14	1.32	2.95
SPLSR	/	/	/
SPLSR Limited	0.04		0.1

Note: The Simultaneous transmission SAR is the same test position of the WWAN Antenna + WiFi/BT Antenna.

According to TCB workshop (Overlapping LTE Bands): SAR in LTE band 4 (frequency range: 1710-1755) is covered by LTE band 66 (frequency range: 2110-2155). SAR in LTE band 5 (frequency range: 824-849 MHz) is covered by LTE band 26 (frequency range: 814-849 MHz). SAR in LTE band 17 (frequency range: 704-716 MHz) is covered by LTE band 12 (frequency range: 699-716 MHz). SAR in LTE band 38 (frequency range: 2570-2620 MHz) is covered by LTE band 41 (frequency range: 2496-2690 MHz).

Because the frequency range is similar, the maximum tuning limit is the same, and the channel bandwidth and other operating parameters for the smaller band is fully supported by the larger band.



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1 General Information

1.1 General Description of EUT

Product Name:	Mobile Phone		
Model No.:	T451A		
Trade Mark:	Alcatel		
Product Phase:	production unit		
Device Type:	portable device		
Exposure Category:	uncontrolled environment / general population		
IMEI:	358612600000202; 358612600000442; 358612600000681; 358612600000509; 358612600000129; 358612600003370; 358612600003354		
Hardware Version:	V00		
Software Version:	T451DA11		
Antenna Type:	PIFA Antenna		
Device Operating Configurations:			
Modulation Mode:	GSM: GMSK,8PSK; WCDMA: QPSK,16QAM LTE: QPSK,16QAM,64QAM WIFI: DSSS,OFDM; BT: GFSK, $\pi/4$ DQPSK,8DPSK		
Device Class:	B		
GPRS Multi-slots Class:	12	EGPRS Multi-slots Class:	12
HSDPA UE Category:	24	HSUPA UE Category:	7
DC-HSDPA UE Category:	24		
Power Class:	4, tested with power level 5(GSM850)		
	1, tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(WCDMA Band)		
	3, tested with power control “max power”(LTE Band)		
Frequency Bands:	Band	Tx(MHz)	Rx(MHz)
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	WCDMA Band II	1850~1910	1930~1990
	WCDMA Band IV	1710~1755	2110~2155
	WCDMA Band V	824~849	869~894
	LTE Band 2	1850 ~1910	1930 ~1990
	LTE Band 4	1710~1755	2110~2155



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	LTE Band 5	824~849	869-894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 12	699~716	729~746
	LTE Band 13	777~787	746~756
	LTE Band 17	704~716	734~746
	LTE Band 26	814~849	859~894
	LTE Band 38	2570~2620	2570~2620
	LTE Band 41	2496~2690	2496~2690
	LTE Band 66	1710~1780	2110~2200
	WIFI 2.4G	2412~2462	2412~2462
	BT	2402~2480	2402~2480
RF Cable:	☒ Provided by applicant ☐ Provided by the laboratory		
Battery1 Information:	Model:	TLp049LB	
	Normal Voltage:	3.87V	
	Typical Capacity:	5010mAh	
	Brand Name:	TCL	
Battery2 Information:	Model:	TLp049L9	
	Normal Voltage:	3.87V	
	Typical Capacity:	5010mAh	
	Brand Name:	TCL	
Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion. Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.			



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1.1.1 DUT Antenna Locations (Back View)

The DUT Antenna Locations can be referred to Appendix D

Note:

- 1) The test device is a smart phone. The overall diagonal dimension of this device is 175mm. Per KDB 648474 D04, because the diagonal distance of this device is $\geq 160\text{mm}$, so it is a phablet.

According to the distance between WWAN/WIFI/BT antennas and the sides of the EUT we can draw the conclusion that:

Distance of the Antenna to the EUT surface/edge						
Mode	Front	Back	Left	Right	Top	Bottom
Ant1	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$> 25\text{mm}$	$\leq 25\text{mm}$
Ant2	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$> 25\text{mm}$
Ant3	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$> 25\text{mm}$	$\leq 25\text{mm}$	$\leq 25\text{mm}$	$> 25\text{mm}$

Table 1 : Distance of the Antenna to the EUT surface/edge

Note:

- 1) When the antenna-to-edge distance is greater than 25mm, such position does not need to be tested.

1.1.2 Power reduction specification

This device uses a single fixed level of power reduction through static table look-up for SAR compliance and it is triggered by a single event or operation:

1) This device uses the receiver to indicate whether the user is making a voice call in head scenario or not. The selection between head and body power levels is based on the receiver detection mechanism. A fixed level power reduction is applied for some frequency bands when the audio receiver is on.

The detailed power reduction information can be referred to Appendix E Conducted RF Output Power.



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1.2 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 941225 D01	3G SAR Measurement Procedures v03r01
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB 941225 D06	Hotspot Mode SAR v02r01
KDB 248227 D01	SAR Guidance for IEEE 802.11 Wi-Fi SAR v02r02
KDB 648474 D04	Handset SAR v01r03
KDB 447498 D04	Interim General RF Exposure Guidance v01
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 690783 D01	SAR Listings on Grants v01r03



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1.3 RF exposure limits

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

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram 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 10 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 of employment or occupation.)



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1.4 Test Location

All tests were performed at:

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No tests were sub-contracted.

1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

- **Innovation, Science and Economic Development Canada**

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CAB identifier: CN0006.

IC#: 4620C.



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2 Laboratory Environment

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



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3 SAR Measurements System Configuraion

3.1 The SAR Measurement System

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

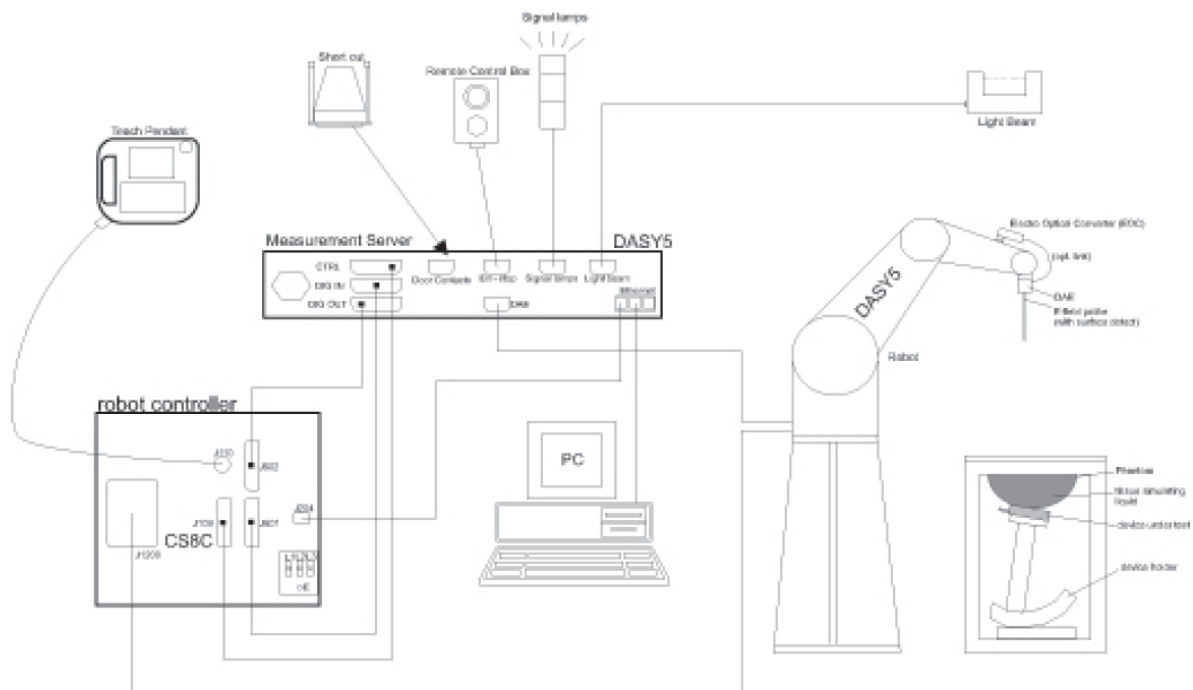
The DASY system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software. An arm extension for accommodation 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 electronics (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.

The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration

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- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows system.
- DASY software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.



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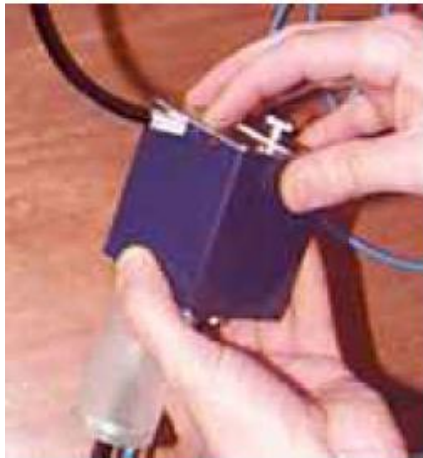
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3.2 Isotropic E-field Probe EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY52 SAR and higher, EASY4/MRI

3.3 Data Acquisition Electronics (DAE)

Model	DAE	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)	
Input Offset Voltage	< 5μV (with auto zero)	
Input Bias Current	< 50 f A	
Dimensions	60 x 60 x 68 mm	

3.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	pprox.. 25 liters	
Wooden Support	SPEAG standard phantom table	

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

3.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm(bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	pprox.. 30 liters	
Wooden Support	SPEAG standard phantom table	

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEEE 1528 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.

ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4 but has reinforced top structure.

3.6 Device Holder for Transmitters



F-2. Device Holder for Transmitters

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon=3$ and loss tangent $\delta=0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

3.7 Measurement Procedure

3.7.1 Scanning procedure

Step 1: Power reference measurement

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.

Step 2: Area scan

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Zoom scan

Around this point, a volume of 32mm*32mm*30mm ($f \leq 2\text{GHz}$), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points ($f \leq 2\text{GHz}$), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification). The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.



		$\leq 3 \text{ GHz}$	$> 3 \text{ GHz}$
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		$5 \pm 1 \text{ mm}$	$\frac{1}{4} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location		$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$		$\leq 2 \text{ GHz}: \leq 15 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 12 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 12 \text{ mm}$ $4 - 6 \text{ GHz}: \leq 10 \text{ mm}$
		When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$		$\leq 2 \text{ GHz}: \leq 8 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz}: \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz}: \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$	$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 4 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 3 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
	graded grid $\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 3 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
	$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z	$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz}: \geq 28 \text{ mm}$ $4 - 5 \text{ GHz}: \geq 25 \text{ mm}$ $5 - 6 \text{ GHz}: \geq 22 \text{ mm}$

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. $\pm 5 \%$

3.7.2 Data storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension "DAE". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.7.3 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	ε
- 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 DASY 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:

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

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

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

cf = crest factor of exciting field (DASY parameter)

dcp I = diode compression point (DASY parameter)

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



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

H-field probes:

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

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

$Norm_i$ = sensor sensitivity of channel i ($i = x, y, z$)

[mV/(V/m)²] for E-field Probes

$ConvF$ = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

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

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

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

$$E_{tot} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

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

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

with SAR = local specific absorption rate in mW/g

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

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

ϵ = 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.

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

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

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

4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz 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 measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

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

4.2 SAR measurement uncertainty

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



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5 Description of Test Position

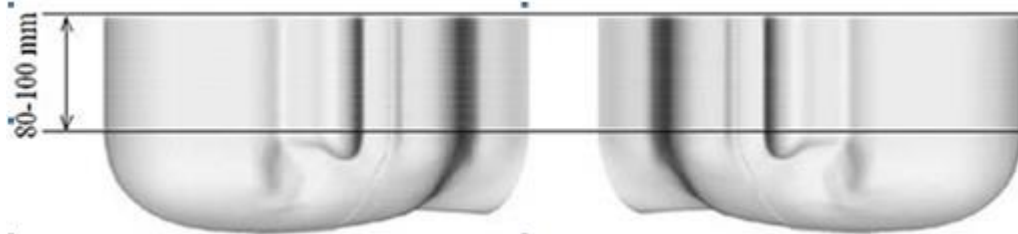
5.1 The Head Test Position

5.1.1 SAM Phantom Shape

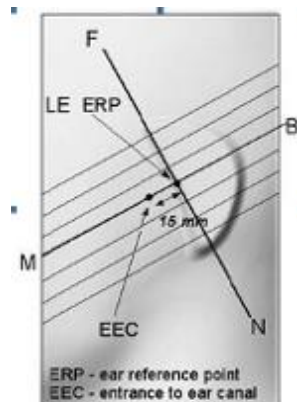


F-3. Front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only-procedures in this recommended practice are intended primarily for the phantom setup.

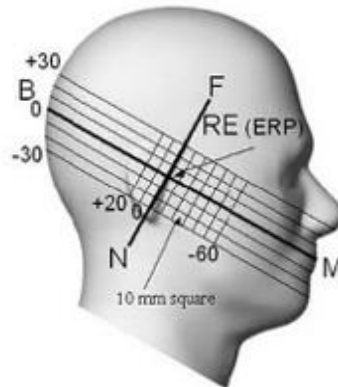
Note: The centre strip including the nose region has a different thickness tolerance.



F-4. Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)

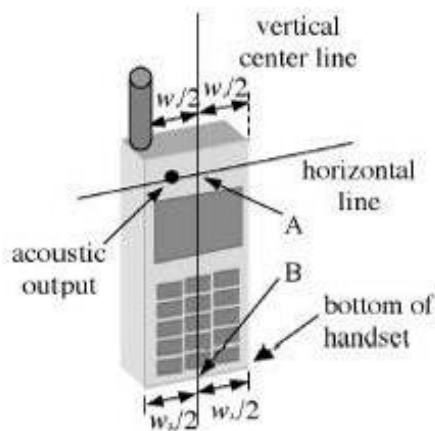


F-5. Close-up side view of phantom, showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

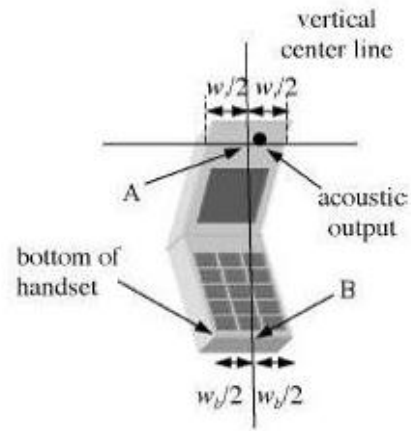


F-6.Side view of the phantom showing relevant markings and seven cross-sectional plane locations

5.1.2 EUT constructions



F-7. Handset vertical and horizontal reference lines-
“fixed case”



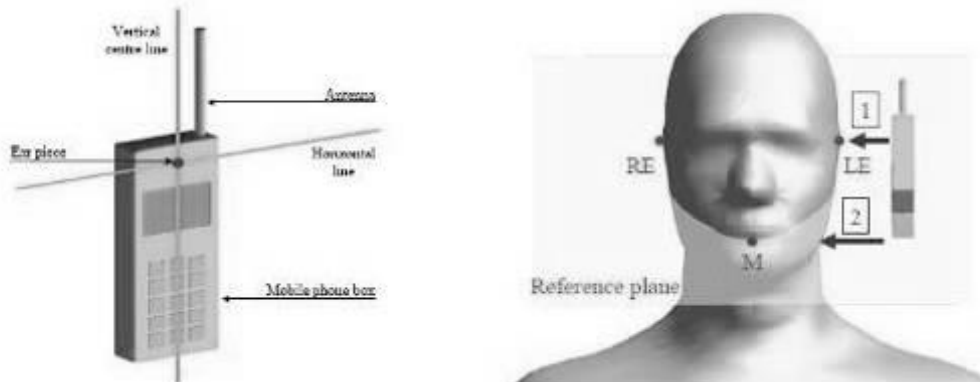
F-8.Handset vertical and horizontal reference lines-
“clam-shell case”

5.1.3 Definition of the “check” position

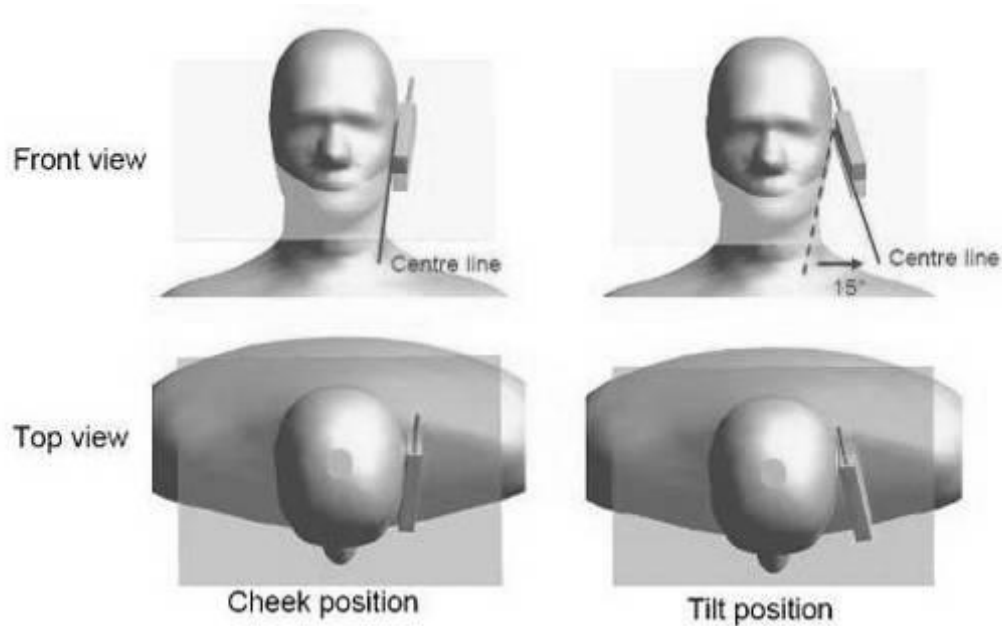
- a) Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom (“initial position”). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE.
- b) Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until telephone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.

5.1.4 Definition of the “tilted” position

- a) Position the device in the “cheek” position described above.
- b) While maintaining the device in the reference plane described above and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.



F-9. Definition of the reference lines and points, on the phone and on the phantom and initial position



F-10. "Cheek" and "tilt" positions of the mobile phone on the left side

5.2 The Body Test Position

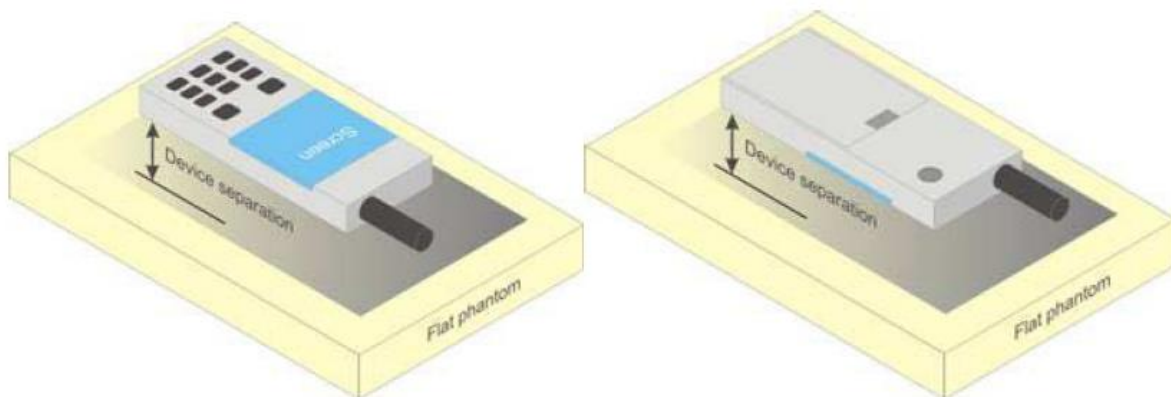
5.2.1 Body-worn accessory exposure conditions

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D04 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.



F-11. Test positions for body-worn devices

5.2.2 Wireless Router exposure conditions

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed-use conditions for this type of devices. For devices with form factors smaller than 9 cm x 5 cm, a test separation distance of 5 mm is required.

5.3 Extremity exposure conditions

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

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

Due to the SAR result, only the following frequency bands need to test with 0mm for the Product Specific 10-g SAR, the others are not required.

WB2 SAR Test Record											
Ant 1 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Product Specific 10-g SAR Exclusion
Hotspot&Body worn Test data(Separate 10mm) State1											
Front side	RMC	9400/1880	1:1	0.317	0.191	0.04	20.42	22.00	1.439	0.456	Yes
Back side	RMC	9400/1880	1:1	0.527	0.299	-0.09	20.42	22.00	1.439	0.758	Yes
Left side	RMC	9400/1880	1:1	0.185	0.106	0.15	20.42	22.00	1.439	0.266	Yes
Right side	RMC	9400/1880	1:1	0.057	0.033	0.02	20.42	22.00	1.439	0.082	Yes
Bottom side	RMC	9400/1880	1:1	0.711	0.379	0.02	20.42	22.00	1.439	1.023	Yes
Bottom side	RMC	9262/1852.4	1:1	0.851	0.474	-0.18	20.35	22.00	1.462	1.244	No
Bottom side-repeated	RMC	9262/1852.4	1:1	0.834	0.459	0.09	20.35	22.00	1.462	1.219	No
Bottom side	RMC	9538/1907.6	1:1	0.628	0.339	-0.02	20.54	22.00	1.400	0.879	Yes
Bottom side with Battery 2	RMC	9262/1852.4	1:1	0.773	0.411	0.03	20.35	22.00	1.462	1.130	Yes

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LTE Band 2 SAR Test Record												
Ant 1 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Product Specific 10-g SAR Exclusion
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	20	QPSK 1_99	19100/1900	1:1	0.342	0.204	-0.17	21.97	23.00	1.268	0.434	Yes
Back side	20	QPSK 1_99	19100/1900	1:1	0.566	0.320	-0.09	21.97	23.00	1.268	0.717	Yes
Left side	20	QPSK 1_99	19100/1900	1:1	0.198	0.113	-0.08	21.97	23.00	1.268	0.251	Yes
Right side	20	QPSK 1_99	19100/1900	1:1	0.059	0.034	0.01	21.97	23.00	1.268	0.075	Yes
Bottom side	20	QPSK 1_99	19100/1900	1:1	0.726	0.383	0.13	21.97	23.00	1.268	0.920	Yes
Bottom side	20	QPSK 1_99	18700/1860	1:1	0.871	0.488	-0.03	21.49	23.00	1.416	1.233	No
Bottom side-repeated	20	QPSK 1_99	18700/1860	1:1	0.863	0.472	0.19	21.49	23.00	1.416	1.222	No
Bottom side	20	QPSK 1_99	18900/1880	1:1	0.809	0.429	-0.14	21.68	23.00	1.355	1.096	Yes
Bottom side with Battery 2	20	QPSK 1_99	18700/1860	1:1	0.715	0.388	0.05	21.49	23.00	1.416	1.012	Yes
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	20	QPSK 50_50	18700/1860	1:1	0.295	0.177	0.16	20.84	22.00	1.306	0.385	Yes
Back side	20	QPSK 50_50	18700/1860	1:1	0.440	0.257	-0.07	20.84	22.00	1.306	0.575	Yes
Left side	20	QPSK 50_50	18700/1860	1:1	0.160	0.092	-0.02	20.84	22.00	1.306	0.209	Yes
Right side	20	QPSK 50_50	18700/1860	1:1	0.053	0.031	-0.19	20.84	22.00	1.306	0.069	Yes
Bottom side	20	QPSK 50_50	18700/1860	1:1	0.681	0.362	-0.06	20.84	22.00	1.306	0.890	Yes
Bottom side	20	QPSK 50_0	18900/1880	1:1	0.643	0.341	-0.10	20.50	22.00	1.413	0.908	Yes
Bottom side	20	QPSK 50_25	19100/1900	1:1	0.589	0.312	0.03	20.50	22.00	1.413	0.832	Yes
Hotspot&Body worn Test data (Separate 10mm 100%RB) State 1												
Bottom side	20	QPSK 100_0	19100/1900	1:1	0.594	0.316	-0.11	20.44	22.00	1.432	0.851	Yes

LTE Band 7 SAR Test Record												
Ant 1 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Product Specific 10-g SAR Exclusion
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	20	QPSK 1_50	20850/2510	1:1	0.378	0.177	-0.10	19.18	19.50	1.076	0.407	Yes
Back side	20	QPSK 1_50	20850/2510	1:1	0.836	0.376	-0.13	19.18	19.50	1.076	0.900	Yes
Left side	20	QPSK 1_50	20850/2510	1:1	0.103	0.054	-0.01	19.18	19.50	1.076	0.111	Yes
Right side	20	QPSK 1_50	20850/2510	1:1	0.011	0.006	-0.19	19.18	19.50	1.076	0.012	Yes
Bottom side	20	QPSK 1_50	20850/2510	1:1	1.070	0.470	-0.06	19.18	19.50	1.076	1.152	Yes
Back side	20	QPSK 1_0	21100/2535	1:1	0.960	0.426	-0.16	19.12	19.50	1.091	1.048	Yes
Back side	20	QPSK 1_0	21350/2560	1:1	1.120	0.197	-0.05	19.15	19.50	1.084	1.214	No
Bottom side	20	QPSK 1_0	21100/2535	1:1	1.150	0.521	0.04	19.12	19.50	1.091	1.255	No
Bottom side-repeated	20	QPSK 1_0	21100/2535	1:1	1.100	0.513	-0.11	19.12	19.50	1.091	1.201	No
Bottom side	20	QPSK 1_0	21350/2560	1:1	1.140	0.510	0.14	19.15	19.50	1.084	1.236	No



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Bottom side with Battery 2	20	QPSK 1_0	21100/2535	1:1	1.100	0.493	0.04	19.12	19.50	1.091	1.201	No
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	20	QPSK 50_0	21350/2560	1:1	0.261	0.125	-0.04	17.92	18.50	1.143	0.298	Yes
Back side	20	QPSK 50_0	21350/2560	1:1	0.668	0.298	-0.05	17.92	18.50	1.143	0.763	Yes
Left side	20	QPSK 50_0	21350/2560	1:1	0.036	0.019	-0.03	17.92	18.50	1.143	0.041	Yes
Right side	20	QPSK 50_0	21350/2560	1:1	0.065	0.037	-0.07	17.92	18.50	1.143	0.074	Yes
Bottom side	20	QPSK 50_0	21350/2560	1:1	0.685	0.308	-0.04	17.92	18.50	1.143	0.783	Yes
Hotspot&Body worn Test data (Separate 10mm 100%RB) State 1												
Back side	20	QPSK 100_0	21350/2560	1:1	0.742	0.327	0.10	17.83	18.50	1.167	0.866	Yes
Bottom side	20	QPSK 100_0	21350/2560	1:1	0.703	0.307	-0.10	17.83	18.50	1.167	0.820	Yes

LTE Band 41 SAR Test Record												
Ant 1 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Product Specific 10-g SAR Exclusion
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	20	QPSK 1_0	39750/2506	1:1.58	0.279	0.131	-0.02	19.91	21.00	1.285	0.359	Yes
Back side	20	QPSK 1_0	39750/2506	1:1.58	0.583	0.251	0.17	19.91	21.00	1.285	0.749	Yes
Left side	20	QPSK 1_0	39750/2506	1:1.58	0.088	0.047	0.17	19.91	21.00	1.285	0.113	Yes
Right side	20	QPSK 1_0	39750/2506	1:1.58	0.012	0.006	-0.10	19.91	21.00	1.285	0.015	Yes
Bottom side	20	QPSK 1_0	39750/2506	1:1.58	0.858	0.373	0.08	19.91	21.00	1.285	1.103	Yes
Back side	20	QPSK 1_0	40185/2549.5	1:1.58	0.708	0.316	0.04	19.48	21.00	1.419	1.005	Yes
Back side	20	QPSK 1_0	40620/2593	1:1.58	0.605	0.271	-0.14	19.75	21.00	1.334	0.807	Yes
Back side	20	QPSK 1_0	41055/2636.5	1:1.58	0.294	0.133	0.11	19.49	21.00	1.416	0.416	Yes
Back side	20	QPSK 1_50	41490/2680	1:1.58	0.155	0.071	0.08	19.59	21.00	1.384	0.214	Yes
Bottom side	20	QPSK 1_0	40185/2549.5	1:1.58	0.875	0.398	0.16	19.48	21.00	1.419	1.242	No
Bottom side-repeated	20	QPSK 1_0	40185/2549.5	1:1.58	0.862	0.381	0.09	19.48	21.00	1.419	1.223	No
Bottom side	20	QPSK 1_0	40620/2593	1:1.58	0.435	0.195	0.09	19.75	21.00	1.334	0.580	Yes
Bottom side	20	QPSK 1_0	41055/2636.5	1:1.58	0.222	0.102	0.19	19.49	21.00	1.416	0.314	Yes
Bottom side	20	QPSK 1_50	41490/2680	1:1.58	0.132	0.061	0.02	19.59	21.00	1.384	0.183	Yes
Bottom side with Battery 2	20	QPSK 1_0	40185/2549.5	1:1.58	0.725	0.332	0.06	19.48	21.00	1.419	1.029	Yes
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	20	QPSK 50_0	39750/2506	1:1.58	0.219	0.105	-0.17	18.86	20.00	1.300	0.285	Yes
Back side	20	QPSK 50_0	39750/2506	1:1.58	0.490	0.209	0.18	18.86	20.00	1.300	0.637	Yes
Left side	20	QPSK 50_0	39750/2506	1:1.58	0.075	0.039	-0.12	18.86	20.00	1.300	0.098	Yes
Right side	20	QPSK 50_0	39750/2506	1:1.58	0.011	0.005	-0.16	18.86	20.00	1.300	0.014	Yes
Bottom side	20	QPSK 50_0	39750/2506	1:1.58	0.701	0.306	-0.12	18.86	20.00	1.300	0.911	Yes
Back side	20	QPSK 50_50	40185/2549.5	1:1.58	0.585	0.263	0.05	18.49	20.00	1.416	0.828	Yes
Back side	20	QPSK 50_0	40620/2593	1:1.58	0.464	0.208	0.16	18.56	20.00	1.393	0.646	Yes
Back side	20	QPSK 50_25	41055/2636.5	1:1.58	0.213	0.095	0.19	18.30	20.00	1.479	0.315	Yes
Back side	20	QPSK 50_0	41490/2680	1:1.58	0.121	0.054	0.05	18.60	20.00	1.380	0.167	Yes



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Bottom side	20	QPSK 50_50	40185/2549.5	1:1.58	0.547	0.239	0.07	18.49	20.00	1.416	0.774	Yes
Bottom side	20	QPSK 50_0	40620/2593	1:1.58	0.336	0.152	-0.19	18.56	20.00	1.393	0.468	Yes
Bottom side	20	QPSK 50_25	41055/2636.5	1:1.58	0.177	0.080	0.02	18.30	20.00	1.479	0.262	Yes
Bottom side	20	QPSK 50_0	41490/2680	1:1.58	0.111	0.051	-0.02	18.60	20.00	1.380	0.153	Yes
Hotspot&Body worn Test data (Separate 10mm 100%RB) State 1												
Back side	20	QPSK 100_0	39750/2506	1:1.58	0.451	0.188	0.02	18.70	20.00	1.349	0.608	Yes
Bottom side	20	QPSK 100_0	39750/2506	1:1.58	0.693	0.304	0.05	18.70	20.00	1.349	0.935	Yes



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6 SAR System Verificaion Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

The bellowing tables give the recipes for tissue simulating liquids to be used in different frequency bands:

Ingredients (% by weight)	Frequency (MHz)				
	450	700-1000	1700-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
Salt: 99+% Pure Sodium Chloride Water: De-ionized, 16 MΩ+ resistivity Tween: Polyoxyethylene (20) sorbitan monolaurate Sucrose: 98+% Pure Sucrose HEC: Hydroxyethyl Cellulose					
HSL5GHz is composed of the following ingredients: (Manufactured by SPEAG) Water: 50-65% Mineral oil: 10-30% Emulsifiers: 8-25% Sodium salt: 0-1.5%					

Table 2 : Recipe of Tissue Simulate Liquid

6.1.2 Measurement for Tissue Simulate Liquid

The Conductivity (σ) and Permittivity (ϵ_r) are listed in Table 2. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was $22 \pm 2^\circ\text{C}$.

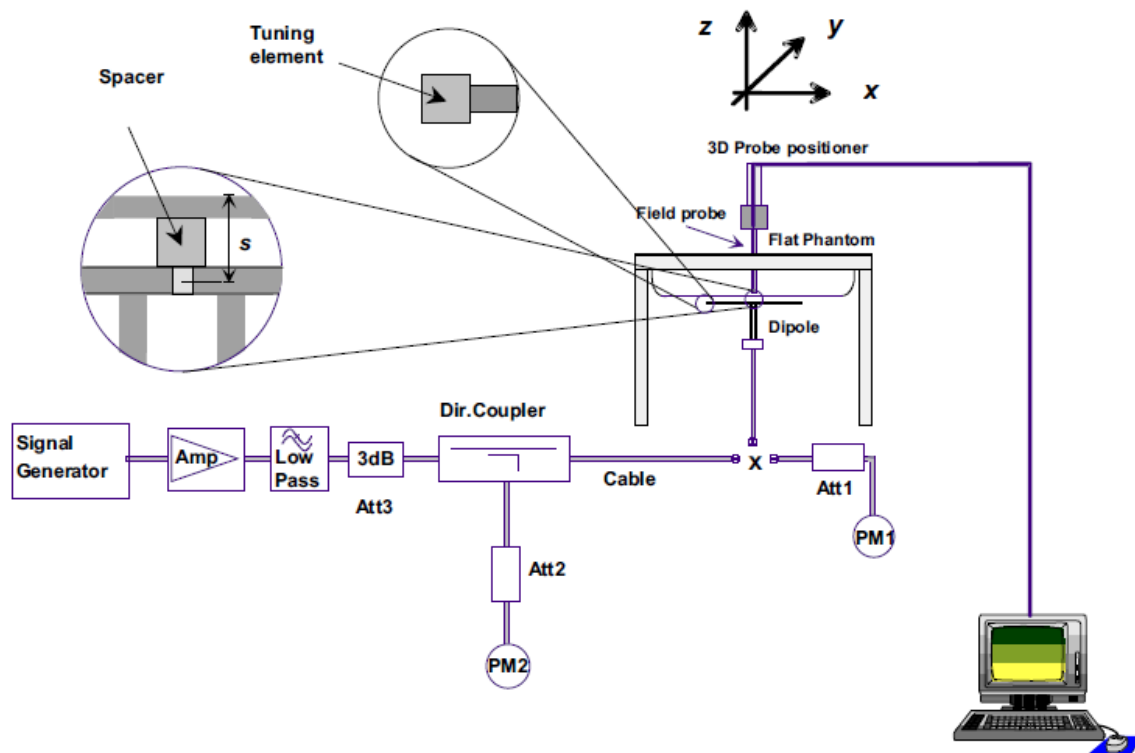
Measurement for Tissue Simulate Liquid									
Tissue Type	Measured Frequency (MHz)	Measured Tissue		Target Tissue ($\pm 5\%$)		Deviation (Within $\pm 5\%$)		Liquid Temp. ($^\circ\text{C}$)	Test Date
		ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$		
750 Head	750	41.067	0.893	41.90	0.89	-1.99%	0.31%	22.1	2025/1/19
835 Head	835	40.779	0.914	41.50	0.90	-1.74%	1.58%	22.1	2025/1/20
835 Head	835	40.557	0.905	41.50	0.90	-2.27%	0.52%	22.1	2025/1/21
1750 Head	1750	39.282	1.381	40.10	1.37	-2.04%	0.80%	22.1	2025/2/5
1950 Head	1950	39.951	1.382	40.00	1.40	-0.12%	-1.30%	22.3	2025/1/18
2450 Head	2450	40.113	1.790	39.20	1.80	2.33%	-0.56%	22.2	2025/1/20
2600 Head	2600	38.317	2.043	39.00	1.96	-1.75%	4.23%	22.3	2025/2/6
2600 Head	2600	38.071	2.013	39.00	1.96	-2.38%	2.70%	22.4	2025/2/7

Table 3 : Measurement result of Tissue electric parameters



6.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-12. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 10\%$ from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range $22\pm 2^{\circ}\text{C}$, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above $15\pm 0.5\text{ cm}$ in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-12.The microwave circuit arrangement used for SAR system Check

6.2.1 Justification for Extended SAR Dipole Calibrations

1) Instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

- a) There is no physical damage on the dipole;
- b) System check with specific dipole is within 10% of calibrated value;
- c) Return-loss is within 20% of calibrated measurement;
- d) Impedance is within 5Ω from the previous measurement.

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



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6.2.2 Summary System Check Result(s)

SAR System Validation Result(s)											
Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within ±10%)		Liquid Temp. (°C)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D750V3	Head	2.02	1.35	8.08	5.40	8.37	5.53	-3.46%	-2.35%	22.1	2025/1/19
D835V2	Head	2.48	1.64	9.92	6.56	9.53	6.29	4.09%	4.29%	22.1	2025/1/20
D835V2	Head	2.33	1.53	9.32	6.12	9.53	6.29	-2.20%	-2.70%	22.1	2025/1/21
D1750V2	Head	9.47	5.09	37.88	20.36	36.60	19.30	3.50%	5.49%	22.1	2025/2/5
D1950V3	Head	10.90	5.66	43.60	22.64	40.50	20.80	7.65%	8.85%	22.3	2025/1/18
D2450V2	Head	13.30	6.28	53.20	25.12	52.20	24.30	1.92%	3.37%	22.2	2025/1/20
D2600V2	Head	14.20	6.48	56.80	25.92	57.70	25.80	-1.56%	0.47%	22.3	2025/2/6
D2600V2	Head	15.10	6.89	60.40	27.56	57.70	25.80	4.68%	6.82%	22.4	2025/2/7

Table 4 : SAR System Check Result

6.2.3 Detailed System Check Results

Please see the Appendix A



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7 Test Configuration

7.1 3G SAR Test Reduction Procedure

According to KDB 941225D01, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

7.2 Operation Configurations

7.2.1 GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a base station by air link. Using Radio Communication Analyzer, the power lever is set to “5” and “0” in SAR of GSM 850 and GSM 1900. The tests in the band of GSM 850 and GSM 1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 or this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 5 timeslots in downlink, the maximum total timeslot is 6.

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power, the higher number time-slot configuration should be tested.

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

The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode.

7.2.2 WCDMA Test Configuration

1) . Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1’s” for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are required in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.



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2) . Head SAR

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

3) . Body SAR

SAR for body configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

4) . HSDPA / HSUPA

RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power for production units in HSDPA / HSUPA is $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest measured SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power of HSDPA / HSUPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.5 W/kg, SAR measurement is not required for HSDPA / HSUPA.

a) HSDPA

HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH/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 and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors (β_c , β_d), and HS-DPCCH power offset parameters (Δ_{ACK} , Δ_{NACK} , Δ_{CQI}) are set according to values indicated in the following table. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

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

Note1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8$ Ahs = $\beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$

Note2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude(EVM) with HS-DPCCH test in clause 5.13.1.A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 8$ (Ahs=30/15) with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 7$ (Ahs=24/15) with $\beta_{hs} = 24/15 * \beta_c$.

Note3: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

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

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

Table 5 : settings of required H-Set 1 QPSK acc. to 3GPP 34.121

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

Table 6 : HSDPA UE category

b) HSUPA

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



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Sub-test ¹⁾	β_c ²⁾	β_d ³⁾	β_d (SF) ⁴⁾	β_c/β_d ⁵⁾	$\beta_{hs}(1)$ ⁶⁾	β_{ac} ⁷⁾	β_{ad} ⁸⁾	β_c (SF) ⁹⁾	β_{ad} (code) ¹⁰⁾	CM ¹¹⁾ (dB) ¹²⁾	MP R ¹³⁾ (dB) ¹⁴⁾	AG ¹⁵⁾ Index ¹⁶⁾	E-TFC I ¹⁷⁾
1 ¹⁾	11/15 ⁽³⁾ ²⁾	15/15 ⁽³⁾ ³⁾	64 ⁴⁾	11/15 ⁽³⁾ ⁵⁾	22/15 ⁶⁾	209/225 ⁷⁾	1039/225 ⁸⁾	4 ⁹⁾	1 ¹⁰⁾	1.0 ¹¹⁾	0.0 ¹²⁾	20 ¹³⁾	75 ¹⁴⁾
2 ¹⁾	6/15 ²⁾	15/15 ³⁾	64 ⁴⁾	6/15 ⁵⁾	12/15 ⁶⁾	12/15 ⁷⁾	94/75 ⁸⁾	4 ⁹⁾	1 ¹⁰⁾	3.0 ¹¹⁾	2.0 ¹²⁾	12 ¹³⁾	67 ¹⁴⁾
3 ¹⁾	15/15 ²⁾	9/15 ³⁾	64 ⁴⁾	15/9 ⁵⁾	30/15 ⁶⁾	30/15 ⁷⁾	$\beta_{ad1}:47/15$ $\beta_{ad2}:47/15$ ⁸⁾	4 ⁹⁾	2 ¹⁰⁾	2.0 ¹¹⁾	1.0 ¹²⁾	15 ¹³⁾	92 ¹⁴⁾
4 ¹⁾	2/15 ²⁾	15/15 ³⁾	64 ⁴⁾	2/15 ⁵⁾	4/15 ⁶⁾	2/15 ⁷⁾	56/75 ⁸⁾	4 ⁹⁾	1 ¹⁰⁾	3.0 ¹¹⁾	2.0 ¹²⁾	17 ¹³⁾	71 ¹⁴⁾
5 ¹⁾	15/15 ⁽⁴⁾ ²⁾	15/15 ⁽⁴⁾ ³⁾	64 ⁴⁾	15/15 ⁽⁴⁾ ⁵⁾	30/15 ⁶⁾	24/15 ⁷⁾	134/15 ⁸⁾	4 ⁹⁾	1 ¹⁰⁾	1.0 ¹¹⁾	0.0 ¹²⁾	21 ¹³⁾	81 ¹⁴⁾
Note 1: ΔACK , $\Delta NACK$ and $\Delta CQI=8$ $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$ Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference ¹⁾ Note 3 : For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$ ²⁾ Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$ ³⁾ Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g ⁴⁾ Note 6: β_{ad} can not be set directly; it is set by Absolute Grant Value. ⁵⁾													

Table 7 : Subtests for UMTS Release 6 HSUPA

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	10	2SF2&2SF	11484	5.76
	4	4	2	4	20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF	22996	?
	4	4	10	4	20000	?
NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4. UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM. (TS25.306-7.3.0).						

Table 8 : HSUPA UE category

c) DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS



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34.121-1 to determine SAR test reduction. A primary and a Second serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

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

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

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

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13.

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK.

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

Table 9 : settings of required H-Set 12 QPSK acc. To 3GPP 34.121

Note:

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



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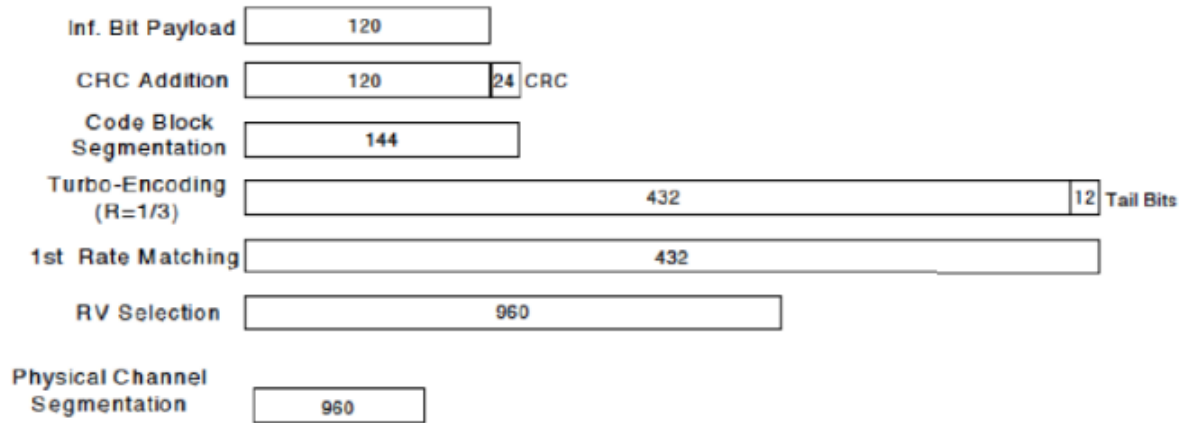


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

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

Note 1: ΔACK , $\Delta NACK$ and $\Delta CQI=8$ $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$ ^o

Note 2: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.^o

Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$ ^o

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

Note:

1. The Dual Carriers transmission only applies to HSDPA physical channels
2. The Dual Carriers belong to the same Node and are on adjacent carriers.
3. The Dual Carriers do not support MIMO to serve Ues configured for dual cell operation
4. The Dual Carriers operate in the same frequency band.
5. The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.
6. The device doesn't support carrier aggregation for it just can operate in Release 8.

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d) HSPA+

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 (uplink) HSPA+ with 12.2 kbps RMC as the primary mode. Power is measured for HSPA+ that supports uplink 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	β_{EC}	β_{ed1} (2xSF2) (Note 4)	β_{ed3} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105
Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$ Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0) Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm											

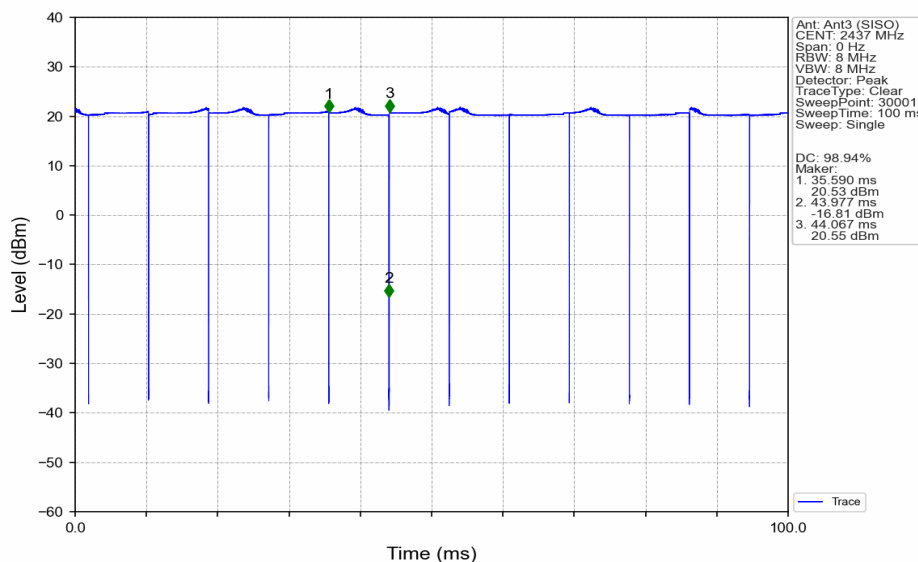
7.2.3 WIFI Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

7.2.3.1 Duty cycle

1) Wi-Fi 2.4GHz 802.11b:

Duty cycle=98.94%



7.2.3.2 Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

- 1) . When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
- 2) . When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
- 3) . 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. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.



7.2.3.3 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

- 1) . When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.
- 2) . When the highest reported SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
- 3) . The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.
 - a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.
 - b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the reported SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.
- 4) . SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:
 - a) replace “subsequent test configuration” with “next subsequent test configuration” (i.e., subsequent next highest specified maximum output power configuration)
 - b) replace “initial test configuration” with “all tested higher output power configurations”



7.2.3.4 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

- **802.11b DSSS SAR Test Requirements**

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

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

- **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). SAR is not required for the following 2.4 GHz OFDM conditions.

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

- **SAR Test Requirements for OFDM configurations**

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



7.2.4 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The Radio Communication Analyzer was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

TDD LTE test consideration

For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Frame structure type 2:

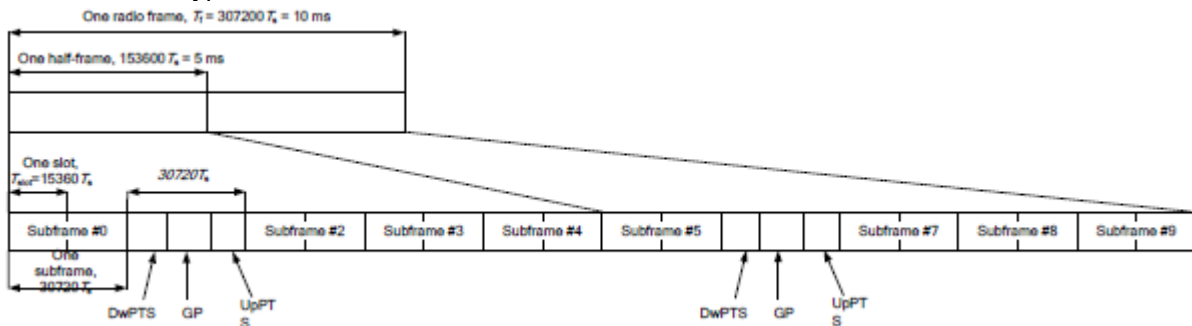


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	6592.Ts	2192.Ts	2560.Ts	7680.Ts	2192.Ts	2560.Ts
1	19760.Ts			20480.Ts		
2	21952.Ts			23040.Ts		
3	24144.Ts			25600.Ts		
4	26336.Ts			7680.Ts	4384.Ts	5120.Ts
5	6592.Ts	4384.Ts	5120.Ts	20480.Ts		

6	19760.Ts		23040.Ts		
7	21952.Ts		25600.Ts		
8	24144.Ts		-	-	-
9	13168.Ts		-	-	-

Table 4.2-2: Uplink-downlink configurations.

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

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

A) Spectrum Plots for RB Configurations

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

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth/Transmission bandwidth						MPR (dB)
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	



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QPSK	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	0
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	2
64QAM	> 5	> 4	> 8	> 12	> 16	> 18	3
256QAM	≥ 1						5

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

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

2) QPSK with 50% RB allocation

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

3) 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 1) and 2) 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.

4) 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 $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

E) 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 $> \frac{1}{2}$ 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.



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8 Test Result

8.1 Measurement of RF Conducted Power

The detailed conducted power can be referred to Appendix E.

Note:

- 1) . For SAR the time based average power is relevant. The difference in between depends on the duty cycle of the TDMA signal:

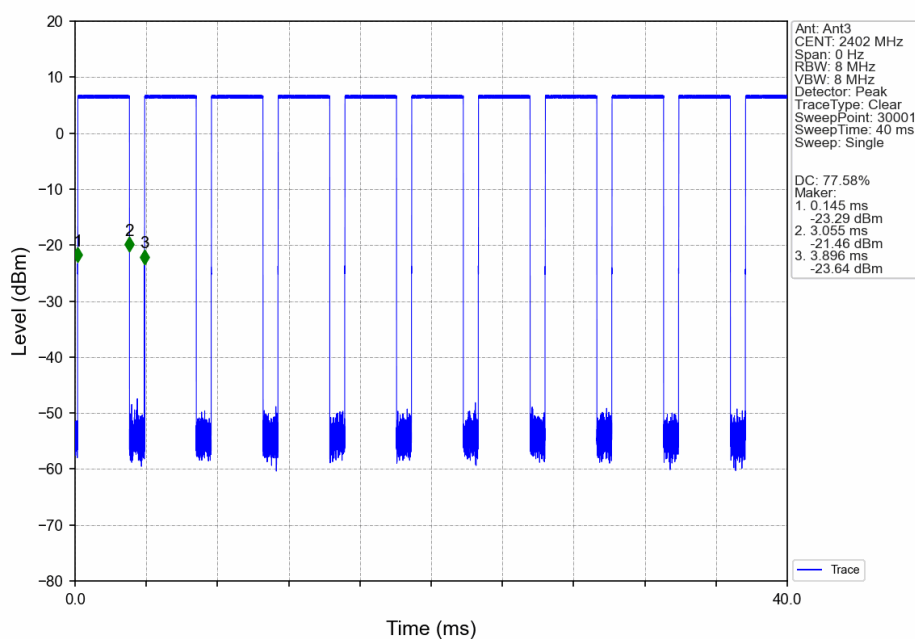
No. of timeslots	1	2	3	4
Duty Cycle	1:8.3	1:4.15	1:2.77	1:2.075
Time based avg. power compared to slotted avg. power	-9.19	-6.18	-4.42	-3.17

- 2) . The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:

Frame-averaged power = $10 \times \log (\text{Burst-averaged power mW} \times \text{Slot used} / 8)$.

- 3) . When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel must be used.
- 4) . For conducted power of WIFI must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band. For each transmission mode configuration, power must be measured for the highest and lowest channels; and at the mid-band channel(s) when there are at least 3 channels. For configurations with multiple mid-band channels, due to an even number of channels, both channels should be measured. Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units.
- 1) When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.
- 2) When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.

- 5) . The conducted power of BT is measured with RMS detector.
BT DH5 Duty Cycle=77.58%



8.2 Measurement of SAR Data

Note:

- 1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per KDB447498 D04, 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:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.

WiFi 2.4G:

- 1) When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is $\leq 1.2\text{ W/kg}$, SAR test for the other 802.11 modes are not required.

When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is $\leq 1.2\text{ W/kg}$, SAR test for the other 802.11 modes are not required.

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8.2.1 SAR Result of GSM850

GSM850 SAR Test Record											
Ant 2 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data State 2											
Left cheek	GPRS 2TS	190/836.6	1:4.15	0.533	0.378	-0.08	29.72	31.00	1.343	0.716	22.1
Left tilted	GPRS 2TS	190/836.6	1:4.15	0.362	0.235	-0.18	29.72	31.00	1.343	0.486	22.1
Right cheek	GPRS 2TS	190/836.6	1:4.15	0.725	0.466	0.01	29.72	31.00	1.343	0.974	22.1
Right tilted	GPRS 2TS	190/836.6	1:4.15	0.592	0.318	-0.14	29.72	31.00	1.343	0.795	22.1
Right cheek	GPRS 2TS	128/824.2	1:4.15	0.611	0.393	0.12	29.72	31.00	1.343	0.820	22.1
Right cheek	GPRS 2TS	251/848.8	1:4.15	0.729	0.481	0.04	29.73	31.00	1.340	0.977	22.1
Right cheek with Battery 2	GPRS 2TS	251/848.8	1:4.15	0.702	0.455	-0.16	29.73	31.00	1.340	0.940	22.1
Hotspot&Body worn Test data(Separate 10mm) State 1											
Front side	GPRS 2TS	190/836.6	1:4.15	0.140	0.101	0.15	29.72	31.00	1.343	0.188	22.1
Back side	GPRS 2TS	190/836.6	1:4.15	0.306	0.181	-0.04	29.72	31.00	1.343	0.411	22.1
Left side	GPRS 2TS	190/836.6	1:4.15	0.155	0.103	-0.13	29.72	31.00	1.343	0.208	22.1
Right side	GPRS 2TS	190/836.6	1:4.15	0.078	0.051	0.11	29.72	31.00	1.343	0.105	22.1
Top side	GPRS 2TS	190/836.6	1:4.15	0.146	0.076	0.05	29.72	31.00	1.343	0.196	22.1
Back side with Battery 2	GPRS 2TS	190/836.6	1:4.15	0.256	0.157	0.06	29.72	31.00	1.343	0.344	22.1



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8.2.2 SAR Result of GSM1900

GSM1900 SAR Test Record											
Ant 1 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data State 2											
Left cheek	GPRS 2TS	661/1880	1:4.15	0.068	0.045	0.03	26.12	27.00	1.225	0.083	22.3
Left tilted	GPRS 2TS	661/1880	1:4.15	0.043	0.025	-0.17	26.12	27.00	1.225	0.053	22.3
Right cheek	GPRS 2TS	661/1880	1:4.15	0.043	0.027	0.05	26.12	27.00	1.225	0.053	22.3
Right tilted	GPRS 2TS	661/1880	1:4.15	0.011	0.003	0.09	26.12	27.00	1.225	0.013	22.3
Left cheek with Battery 2	GPRS 2TS	661/1880	1:4.15	0.059	0.037	0.06	26.12	27.00	1.225	0.072	22.1
Hotspot&Body worn Test data(Separate 10mm) State 1											
Front side	GPRS 2TS	661/1880	1:4.15	0.195	0.117	-0.02	26.12	27.00	1.225	0.239	22.3
Back side	GPRS 2TS	661/1880	1:4.15	0.304	0.180	0.03	26.12	27.00	1.225	0.372	22.3
Left side	GPRS 2TS	661/1880	1:4.15	0.121	0.070	-0.13	26.12	27.00	1.225	0.148	22.3
Right side	GPRS 2TS	661/1880	1:4.15	0.047	0.027	-0.02	26.12	27.00	1.225	0.058	22.3
Bottom side	GPRS 2TS	661/1880	1:4.15	0.521	0.293	-0.07	26.12	27.00	1.225	0.638	22.3
Bottom side with Battery 2	GPRS 2TS	661/1880	1:4.15	0.460	0.248	0.02	26.12	27.00	1.225	0.563	22.1



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8.2.3 SAR Result of WCDMA Band II

WB2 SAR Test Record											
Ant 1 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data State 2											
Left cheek	RMC	9400/1880	1:1	0.121	0.077	-0.14	21.43	23.00	1.435	0.174	22.3
Left tilted	RMC	9400/1880	1:1	0.122	0.074	-0.04	21.43	23.00	1.435	0.175	22.3
Right cheek	RMC	9400/1880	1:1	0.143	0.091	0.05	21.43	23.00	1.435	0.205	22.3
Right tilted	RMC	9400/1880	1:1	0.090	0.056	-0.01	21.43	23.00	1.435	0.129	22.3
Right cheek with Battery 2	RMC	9400/1880	1:1	0.135	0.082	0.03	21.43	23.00	1.435	0.194	22.1
Hotspot&Body worn Test data(Separate 10mm) State1											
Front side	RMC	9400/1880	1:1	0.317	0.191	0.04	20.42	22.00	1.439	0.456	22.3
Back side	RMC	9400/1880	1:1	0.527	0.299	-0.09	20.42	22.00	1.439	0.758	22.3
Left side	RMC	9400/1880	1:1	0.185	0.106	0.15	20.42	22.00	1.439	0.266	22.3
Right side	RMC	9400/1880	1:1	0.057	0.033	0.02	20.42	22.00	1.439	0.082	22.3
Bottom side	RMC	9400/1880	1:1	0.711	0.379	0.02	20.42	22.00	1.439	1.023	22.3
Bottom side	RMC	9262/1852.4	1:1	0.851	0.474	-0.18	20.35	22.00	1.462	1.244	22.3
Bottom side-repeated	RMC	9262/1852.4	1:1	0.834	0.459	0.09	20.35	22.00	1.462	1.219	22.3
Bottom side	RMC	9538/1907.6	1:1	0.628	0.339	-0.02	20.54	22.00	1.400	0.879	22.3
Bottom side with Battery 2	RMC	9262/1852.4	1:1	0.773	0.411	0.03	20.35	22.00	1.462	1.130	22.1
Test position	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	SAR (W/kg)10-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled 10-g SAR(W/kg)	Liquid Temp.
Product specific 10g SAR Test data (Separate 0mm) State1											
Bottom side	RMC	9400/1880	1:1	3.840	1.820	-0.13	20.42	22.00	1.439	2.619	22.3
Bottom side	RMC	9262/1852.4	1:1	4.380	2.020	0.04	20.35	22.00	1.462	2.954	22.3
Bottom side-repeated	RMC	9262/1852.4	1:1	4.190	1.950	0.04	20.35	22.00	1.462	2.851	22.1
Bottom side	RMC	9538/1907.6	1:1	3.590	1.700	0.10	20.54	22.00	1.400	2.379	22.3
Bottom side with Battery 2	RMC	9262/1852.4	1:1	3.830	1.780	-0.02	20.35	22.00	1.462	2.603	22.1

Test Position	Channel/ Frequency	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Bottom side	9262/1852.4	0.851	0.834	1.020	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.

2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

3) A third repeated measurement was preformed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.



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Test Position	Channel/ Frequency	Measured SAR (10g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
	(MHz)		SAR (10g)		SAR (10g)	SAR (10g)
Bottom side	9262/1852.4	2.02	1.95	1.036	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.

2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.



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8.2.4 SAR Result of WCDMA Band IV

WB4 SAR Test Record											
Ant 1 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data State 2											
Left cheek	RMC	1412/1732.4	1:1	0.095	0.058	0.01	21.72	23.00	1.343	0.128	22.1
Left tilted	RMC	1412/1732.4	1:1	0.096	0.060	-0.07	21.72	23.00	1.343	0.129	22.1
Right cheek	RMC	1412/1732.4	1:1	0.112	0.074	0.06	21.72	23.00	1.343	0.150	22.1
Right tilted	RMC	1412/1732.4	1:1	0.081	0.052	-0.03	21.72	23.00	1.343	0.109	22.1
Right cheek with Battery 2	RMC	1412/1732.4	1:1	0.101	0.066	-0.05	21.72	23.00	1.343	0.136	22.1
Hotspot&Body worn Test data(Separate 10mm) State 1											
Front side	RMC	1412/1732.4	1:1	0.300	0.170	-0.18	21.10	22.50	1.380	0.414	22.1
Back side	RMC	1412/1732.4	1:1	0.545	0.297	-0.15	21.10	22.50	1.380	0.752	22.1
Left side	RMC	1412/1732.4	1:1	0.117	0.071	0.18	21.10	22.50	1.380	0.162	22.1
Right side	RMC	1412/1732.4	1:1	0.071	0.041	0.08	21.10	22.50	1.380	0.098	22.1
Bottom side	RMC	1412/1732.4	1:1	0.729	0.384	0.00	21.10	22.50	1.380	1.006	22.1
Bottom side	RMC	1312/1712.4	1:1	0.675	0.356	0.18	21.17	22.50	1.358	0.917	22.1
Bottom side	RMC	1513/1752.6	1:1	0.785	0.437	-0.08	21.07	22.50	1.390	1.091	22.1
Bottom side with Battery 2	RMC	1513/1752.6	1:1	0.776	0.417	0.09	21.07	22.50	1.390	1.079	22.1

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8.2.5 SAR Result of WCDMA Band V

WB5 SAR Test Record											
Ant 2 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data State 2											
Left cheek	RMC	4182/836.4	1:1	0.436	0.313	0.01	23.04	24.00	1.247	0.544	22.1
Left tilted	RMC	4182/836.4	1:1	0.365	0.222	-0.11	23.04	24.00	1.247	0.455	22.1
Right cheek	RMC	4182/836.4	1:1	0.638	0.413	0.02	23.04	24.00	1.247	0.796	22.1
Right tilted	RMC	4182/836.4	1:1	0.530	0.295	0.04	23.04	24.00	1.247	0.661	22.1
Right cheek with Battery 2	RMC	4182/836.4	1:1	0.622	0.398	0.05	23.04	24.00	1.247	0.776	22.1
Hotspot&Body worn Test data(Separate 10mm) State 1											
Front side	RMC	4182/836.4	1:1	0.138	0.099	-0.11	23.04	24.00	1.247	0.172	22.1
Back side	RMC	4182/836.4	1:1	0.263	0.151	-0.05	23.04	24.00	1.247	0.328	22.1
Left side	RMC	4182/836.4	1:1	0.188	0.125	-0.18	23.04	24.00	1.247	0.235	22.1
Right side	RMC	4182/836.4	1:1	0.085	0.056	-0.02	23.04	24.00	1.247	0.106	22.1
Top side	RMC	4182/836.4	1:1	0.155	0.077	-0.19	23.04	24.00	1.247	0.193	22.1
Back side with Battery 2	RMC	4182/836.4	1:1	0.224	0.141	0.06	23.04	24.00	1.247	0.279	22.1



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8.2.6 SAR Result of LTE Band 2

LTE Band 2 SAR Test Record												
Ant 1 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) State 2												
Left cheek	20	QPSK 1_99	19100/1900	1:1	0.126	0.081	0.04	22.85	24.00	1.303	0.164	22.3
Left tilted	20	QPSK 1_99	19100/1900	1:1	0.128	0.076	-0.02	22.85	24.00	1.303	0.166	22.3
Right cheek	20	QPSK 1_99	19100/1900	1:1	0.130	0.082	-0.09	22.85	24.00	1.303	0.169	22.3
Right tilted	20	QPSK 1_99	19100/1900	1:1	0.091	0.058	0.11	22.85	24.00	1.303	0.119	22.3
Head Test Data (50%RB) State 2												
Left cheek	20	QPSK 50_50	19100/1900	1:1	0.107	0.068	0.15	21.47	23.00	1.422	0.152	22.3
Left tilted	20	QPSK 50_50	19100/1900	1:1	0.109	0.065	-0.14	21.47	23.00	1.422	0.155	22.3
Right cheek	20	QPSK 50_50	19100/1900	1:1	0.120	0.076	0.09	21.47	23.00	1.422	0.171	22.3
Right tilted	20	QPSK 50_50	19100/1900	1:1	0.082	0.051	-0.18	21.47	23.00	1.422	0.117	22.3
Right cheek with Battery 2	20	QPSK 50_50	19100/1900	1:1	0.103	0.062	-0.01	21.47	23.00	1.422	0.146	22.1
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	20	QPSK 1_99	19100/1900	1:1	0.342	0.204	-0.17	21.97	23.00	1.268	0.434	22.3
Back side	20	QPSK 1_99	19100/1900	1:1	0.566	0.320	-0.09	21.97	23.00	1.268	0.717	22.3
Left side	20	QPSK 1_99	19100/1900	1:1	0.198	0.113	-0.08	21.97	23.00	1.268	0.251	22.3
Right side	20	QPSK 1_99	19100/1900	1:1	0.059	0.034	0.01	21.97	23.00	1.268	0.075	22.3
Bottom side	20	QPSK 1_99	19100/1900	1:1	0.726	0.383	0.13	21.97	23.00	1.268	0.920	22.3
Bottom side	20	QPSK 1_99	18700/1860	1:1	0.871	0.488	-0.03	21.49	23.00	1.416	1.233	22.3
Bottom side-repeated	20	QPSK 1_99	18700/1860	1:1	0.863	0.472	0.19	21.49	23.00	1.416	1.222	22.3
Bottom side	20	QPSK 1_99	18900/1880	1:1	0.809	0.429	-0.14	21.68	23.00	1.355	1.096	22.3
Bottom side with Battery 2	20	QPSK 1_99	18700/1860	1:1	0.715	0.388	0.05	21.49	23.00	1.416	1.012	22.1
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	20	QPSK 50_50	18700/1860	1:1	0.295	0.177	0.16	20.84	22.00	1.306	0.385	22.3
Back side	20	QPSK 50_50	18700/1860	1:1	0.440	0.257	-0.07	20.84	22.00	1.306	0.575	22.3
Left side	20	QPSK 50_50	18700/1860	1:1	0.160	0.092	-0.02	20.84	22.00	1.306	0.209	22.3
Right side	20	QPSK 50_50	18700/1860	1:1	0.053	0.031	-0.19	20.84	22.00	1.306	0.069	22.3
Bottom side	20	QPSK 50_50	18700/1860	1:1	0.681	0.362	-0.06	20.84	22.00	1.306	0.890	22.3
Bottom side	20	QPSK 50_0	18900/1880	1:1	0.643	0.341	-0.10	20.50	22.00	1.413	0.908	22.3
Bottom side	20	QPSK 50_25	19100/1900	1:1	0.589	0.312	0.03	20.50	22.00	1.413	0.832	22.3
Hotspot&Body worn Test data (Separate 10mm 100%RB) State 1												
Bottom side	20	QPSK 100_0	19100/1900	1:1	0.594	0.316	-0.11	20.44	22.00	1.432	0.851	22.3
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	SAR (W/kg)10-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled 10-g SAR(W/kg)	Liquid Temp.
Product specific 10g SAR Test data (Separate 0mm 1RB) State 1												
Bottom side	20	QPSK 1_99	19100/1900	1:1	3.950	1.850	0.07	21.97	23.00	1.268	2.345	22.3
Bottom side	20	QPSK 1_99	18700/1860	1:1	4.110	1.970	-0.02	21.49	23.00	1.416	2.789	22.3
Bottom side	20	QPSK 1_99	18900/1880	1:1	4.120	1.940	0.06	21.68	23.00	1.355	2.629	22.3
Bottom side with Battery 2	20	QPSK 1_99	18700/1860	1:1	4.150	1.940	0.03	21.49	23.00	1.416	2.747	22.1



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Product specific 10g SAR Test data (Separate 0mm 50%RB) State 1												
Bottom side	20	QPSK 1_99	18900/1880	1:1	3.490	1.630	0.03	20.50	22.00	1.413	2.302	22.3
Bottom side	20	QPSK 1_99	18700/1860	1:1	3.540	1.660	0.09	20.84	22.00	1.306	2.168	22.3
Bottom side	20	QPSK 1_99	19100/1900	1:1	3.360	1.560	-0.12	20.50	22.00	1.413	2.204	22.3
Product specific 10g SAR Test data (Separate 0mm 100%RB) State 1												
Bottom side	20	QPSK 100_0	19100/1900	1:1	3.350	1.560	-0.05	20.44	22.00	1.432	2.234	22.3

Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
			SAR (1g)		SAR (1g)	SAR (1g)
Bottom side	18700/1860	0.871	0.863	1.009	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.

2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.



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8.2.7 SAR Result of LTE Band 7

LTE Band 7 SAR Test Record												
Ant 1 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) State 2												
Left cheek	20	QPSK 1_99	20850/2510	1:1	0.053	0.031	0.06	22.93	24.00	1.279	0.068	22.3
Left tilted	20	QPSK 1_99	20850/2510	1:1	0.043	0.023	0.18	22.93	24.00	1.279	0.055	22.3
Right cheek	20	QPSK 1_99	20850/2510	1:1	0.037	0.021	0.05	22.93	24.00	1.279	0.047	22.3
Right tilted	20	QPSK 1_99	20850/2510	1:1	0.029	0.016	0.11	22.93	24.00	1.279	0.037	22.3
Left cheek with Battery 2	20	QPSK 1_99	20850/2510	1:1	0.047	0.025	-0.06	22.93	24.00	1.279	0.060	22.1
Head Test Data (50%RB) State 2												
Left cheek	20	QPSK 50_25	20850/2510	1:1	0.048	0.028	-0.01	21.85	23.00	1.303	0.063	22.3
Left tilted	20	QPSK 50_25	20850/2510	1:1	0.041	0.022	-0.16	21.85	23.00	1.303	0.053	22.3
Right cheek	20	QPSK 50_25	20850/2510	1:1	0.030	0.017	0.02	21.85	23.00	1.303	0.039	22.3
Right tilted	20	QPSK 50_25	20850/2510	1:1	0.028	0.015	-0.19	21.85	23.00	1.303	0.036	22.3
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	20	QPSK 1_50	20850/2510	1:1	0.378	0.177	-0.10	19.18	19.50	1.076	0.407	22.3
Back side	20	QPSK 1_50	20850/2510	1:1	0.836	0.376	-0.13	19.18	19.50	1.076	0.900	22.3
Left side	20	QPSK 1_50	20850/2510	1:1	0.103	0.054	-0.01	19.18	19.50	1.076	0.111	22.3
Right side	20	QPSK 1_50	20850/2510	1:1	0.011	0.006	-0.19	19.18	19.50	1.076	0.012	22.3
Bottom side	20	QPSK 1_50	20850/2510	1:1	1.070	0.470	-0.06	19.18	19.50	1.076	1.152	22.3
Back side	20	QPSK 1_0	21100/2535	1:1	0.960	0.426	-0.16	19.12	19.50	1.091	1.048	22.3
Back side	20	QPSK 1_0	21350/2560	1:1	1.120	0.197	-0.05	19.15	19.50	1.084	1.214	22.3
Bottom side	20	QPSK 1_0	21100/2535	1:1	1.150	0.521	0.04	19.12	19.50	1.091	1.255	22.3
Bottom side-repeated	20	QPSK 1_0	21100/2535	1:1	1.100	0.513	-0.11	19.12	19.50	1.091	1.201	22.3
Bottom side	20	QPSK 1_0	21350/2560	1:1	1.140	0.510	0.14	19.15	19.50	1.084	1.236	22.3
Bottom side with Battery 2	20	QPSK 1_0	21100/2535	1:1	1.100	0.493	0.04	19.12	19.50	1.091	1.201	22.1
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	20	QPSK 50_0	21350/2560	1:1	0.261	0.125	-0.04	17.92	18.50	1.143	0.298	22.3
Back side	20	QPSK 50_0	21350/2560	1:1	0.668	0.298	-0.05	17.92	18.50	1.143	0.763	22.3
Left side	20	QPSK 50_0	21350/2560	1:1	0.036	0.019	-0.03	17.92	18.50	1.143	0.041	22.3
Right side	20	QPSK 50_0	21350/2560	1:1	0.065	0.037	-0.07	17.92	18.50	1.143	0.074	22.3
Bottom side	20	QPSK 50_0	21350/2560	1:1	0.685	0.308	-0.04	17.92	18.50	1.143	0.783	22.3
Hotspot&Body worn Test data (Separate 10mm 100%RB) State 1												
Back side	20	QPSK 100_0	21350/2560	1:1	0.742	0.327	0.10	17.83	18.50	1.167	0.866	22.3
Bottom side	20	QPSK 100_0	21350/2560	1:1	0.703	0.307	-0.10	17.83	18.50	1.167	0.820	22.3
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	SAR (W/kg)10-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled 10-g SAR(W/kg)	Liquid Temp.
Product specific 10g SAR Test data (Separate 0mm 1RB) State 1												
Back side	20	QPSK 1_50	20850/2510	1:1	5.150	1.830	0.00	19.18	19.50	1.076	1.970	22.3
Bottom side	20	QPSK 1_50	20850/2510	1:1	2.790	0.971	-0.07	19.18	19.50	1.076	1.045	22.3
Back side with Battery 2	20	QPSK 1_50	20850/2510	1:1	4.300	1.630	-0.09	19.18	19.50	1.076	1.755	22.1



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Product specific 10g SAR Test data (Separate 0mm 50%RB) State 1												
Back side	20	QPSK 50_0	21350/2560	1:1	3.260	1.330	-0.19	17.92	18.00	1.019	1.355	22.3
Bottom side	20	QPSK 50_0	21350/2560	1:1	1.820	0.612	0.08	17.92	18.00	1.019	0.623	22.3

Test Position	Channel/ Frequency	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Bottom side	21100/2535	1.15	1.1	1.045	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.

2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.



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8.2.8 SAR Result of LTE Band 12

LTE Band 12 SAR Test Record												
Ant 2 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) State 2												
Left cheek	10	QPSK 1_0	23060/704	1:1	0.283	0.200	-0.10	24.30	25.00	1.175	0.332	22.1
Left tilted	10	QPSK 1_0	23060/704	1:1	0.214	0.138	0.15	24.30	25.00	1.175	0.251	22.1
Right cheek	10	QPSK 1_0	23060/704	1:1	0.370	0.235	-0.19	24.30	25.00	1.175	0.435	22.1
Right tilted	10	QPSK 1_0	23060/704	1:1	0.321	0.176	0.16	24.30	25.00	1.175	0.377	22.1
Head Test Data (50%RB) State 2												
Left cheek	10	QPSK 25_25	23130/711	1:1	0.314	0.221	0.16	23.07	24.00	1.239	0.389	22.1
Left tilted	10	QPSK 25_25	23130/711	1:1	0.251	0.164	-0.16	23.07	24.00	1.239	0.311	22.1
Right cheek	10	QPSK 25_25	23130/711	1:1	0.436	0.303	0.03	23.07	24.00	1.239	0.540	22.1
Right tilted	10	QPSK 25_25	23130/711	1:1	0.377	0.204	0.06	23.07	24.00	1.239	0.467	22.1
Right cheek with Battery 2	10	QPSK 25_25	23130/711	1:1	0.415	0.288	-0.12	23.07	24.00	1.239	0.514	22.1
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	10	QPSK 1_0	23060/704	1:1	0.106	0.076	-0.06	24.30	25.00	1.175	0.125	22.1
Back side	10	QPSK 1_0	23060/704	1:1	0.157	0.112	0.12	24.30	25.00	1.175	0.184	22.1
Left side	10	QPSK 1_0	23060/704	1:1	0.096	0.065	-0.13	24.30	25.00	1.175	0.113	22.1
Right side	10	QPSK 1_0	23060/704	1:1	0.047	0.032	-0.11	24.30	25.00	1.175	0.055	22.1
Top side	10	QPSK 1_0	23060/704	1:1	0.049	0.025	0.00	24.30	25.00	1.175	0.058	22.1
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	10	QPSK 25_25	23130/711	1:1	0.137	0.100	0.05	23.07	24.00	1.239	0.170	22.1
Back side	10	QPSK 25_25	23130/711	1:1	0.210	0.166	0.03	23.07	24.00	1.239	0.260	22.1
Left side	10	QPSK 25_25	23130/711	1:1	0.174	0.116	-0.07	23.07	24.00	1.239	0.216	22.1
Right side	10	QPSK 25_25	23130/711	1:1	0.069	0.045	-0.02	23.07	24.00	1.239	0.085	22.1
Top side	10	QPSK 25_25	23130/711	1:1	0.078	0.035	-0.08	23.07	24.00	1.239	0.097	22.1
Back side with Battery 2	10	QPSK 25_25	23130/711	1:1	0.201	0.145	0.02	23.07	24.00	1.239	0.249	22.1

8.2.9 SAR Result of LTE Band 13

LTE Band 13 SAR Test Record												
Ant 2 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) State 2												
Left cheek	10	QPSK 1_49	23230/782	1:1	0.382	0.271	-0.09	24.07	25.00	1.239	0.473	22.1
Left tilted	10	QPSK 1_49	23230/782	1:1	0.272	0.176	-0.02	24.07	25.00	1.239	0.337	22.1
Right cheek	10	QPSK 1_49	23230/782	1:1	0.500	0.334	0.07	24.07	25.00	1.239	0.619	22.1
Right tilted	10	QPSK 1_49	23230/782	1:1	0.395	0.213	-0.01	24.07	25.00	1.239	0.489	22.1
Right cheek with Battery 2	10	QPSK 1_49	23230/782	1:1	0.470	0.322	-0.18	24.07	25.00	1.239	0.582	22.1
Head Test Data (50%RB) State 2												
Left cheek	10	QPSK 25_0	23230/782	1:1	0.318	0.226	-0.16	23.08	24.00	1.236	0.393	22.1
Left tilted	10	QPSK 25_0	23230/782	1:1	0.231	0.149	-0.18	23.08	24.00	1.236	0.286	22.1
Right cheek	10	QPSK 25_0	23230/782	1:1	0.408	0.261	-0.13	23.08	24.00	1.236	0.504	22.1
Right tilted	10	QPSK 25_0	23230/782	1:1	0.334	0.181	0.03	23.08	24.00	1.236	0.413	22.1
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	10	QPSK 1_49	23230/782	1:1	0.159	0.116	-0.14	24.07	25.00	1.239	0.197	22.1
Back side	10	QPSK 1_49	23230/782	1:1	0.224	0.161	0.05	24.07	25.00	1.239	0.277	22.1
Left side	10	QPSK 1_49	23230/782	1:1	0.268	0.187	-0.04	24.07	25.00	1.239	0.332	22.1
Right side	10	QPSK 1_49	23230/782	1:1	0.096	0.064	-0.03	24.07	25.00	1.239	0.119	22.1
Top side	10	QPSK 1_49	23230/782	1:1	0.086	0.045	0.08	24.07	25.00	1.239	0.107	22.1
Left side with Battery 2	10	QPSK 1_49	23230/782	1:1	0.229	0.147	0.06	24.07	25.00	1.239	0.284	22.1
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	10	QPSK 25_0	23230/782	1:1	0.137	0.097	-0.11	23.08	24.00	1.236	0.169	22.1
Back side	10	QPSK 25_0	23230/782	1:1	0.187	0.135	0.02	23.08	24.00	1.236	0.231	22.1
Left side	10	QPSK 25_0	23230/782	1:1	0.199	0.132	0.04	23.08	24.00	1.236	0.246	22.1
Right side	10	QPSK 25_0	23230/782	1:1	0.052	0.035	-0.14	23.08	24.00	1.236	0.064	22.1
Top side	10	QPSK 25_0	23230/782	1:1	0.089	0.044	0.14	23.08	24.00	1.236	0.110	22.1

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8.2.10 SAR Result of LTE Band 26

LTE Band 26 SAR Test Record												
Ant 2 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) State 2												
Left cheek	15	QPSK 1_38	26865/831.5	1:1	0.599	0.426	-0.03	24.16	25.00	1.213	0.727	22.1
Left tilted	15	QPSK 1_38	26865/831.5	1:1	0.512	0.315	0.09	24.16	25.00	1.213	0.621	22.1
Right cheek	15	QPSK 1_38	26865/831.5	1:1	0.835	0.560	0.12	24.16	25.00	1.213	1.013	22.1
Right cheek-repeated	15	QPSK 1_38	26865/831.5	1:1	0.824	0.544	-0.12	24.16	25.00	1.213	1.000	22.1
Right tilted	15	QPSK 1_38	26865/831.5	1:1	0.670	0.376	-0.19	24.16	25.00	1.213	0.813	22.1
Right cheek	15	QPSK 1_38	26765/821.5	1:1	0.799	0.510	0.05	24.05	25.00	1.245	0.994	22.1
Right cheek	15	QPSK 1_0	26965/841.5	1:1	0.811	0.518	-0.18	24.16	25.00	1.213	0.984	22.1
Right tilted	15	QPSK 1_38	26765/821.5	1:1	0.651	0.364	-0.14	24.05	25.00	1.245	0.810	22.1
Right tilted	15	QPSK 1_0	26965/841.5	1:1	0.651	0.366	-0.07	24.16	25.00	1.213	0.790	22.1
Right cheek with Battery 2	15	QPSK 1_38	26865/831.5	1:1	0.810	0.540	0.06	24.16	25.00	1.213	0.983	22.1
Head Test Data (50%RB) State 2												
Left cheek	15	QPSK 36_0	26865/831.5	1:1	0.471	0.334	-0.12	23.10	24.00	1.230	0.579	22.1
Left tilted	15	QPSK 36_0	26865/831.5	1:1	0.405	0.251	0.18	23.10	24.00	1.230	0.498	22.1
Right cheek	15	QPSK 36_0	26865/831.5	1:1	0.671	0.426	0.01	23.10	24.00	1.230	0.826	22.1
Right tilted	15	QPSK 36_0	26865/831.5	1:1	0.537	0.300	-0.09	23.10	24.00	1.230	0.661	22.1
Right cheek	15	QPSK 36_39	26765/821.5	1:1	0.655	0.418	0.13	23.04	24.00	1.247	0.817	22.1
Right cheek	15	QPSK 36_18	26965/841.5	1:1	0.666	0.428	-0.17	22.96	24.00	1.271	0.846	22.1
Head Test Data (100%RB) State 2												
Right cheek	15	QPSK 75_0	26865/831.5	1:1	0.669	0.424	-0.14	22.98	24.00	1.265	0.846	22.1
Right tilted	15	QPSK 75_0	26865/831.5	1:1	0.532	0.296	-0.03	22.98	24.00	1.265	0.673	22.1
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	15	QPSK 1_38	26865/831.5	1:1	0.184	0.133	0.19	24.16	25.00	1.213	0.223	22.1
Back side	15	QPSK 1_38	26865/831.5	1:1	0.324	0.189	0.02	24.16	25.00	1.213	0.393	22.1
Left side	15	QPSK 1_38	26865/831.5	1:1	0.253	0.168	0.19	24.16	25.00	1.213	0.307	22.1
Right side	15	QPSK 1_38	26865/831.5	1:1	0.083	0.055	-0.06	24.16	25.00	1.213	0.101	22.1
Top side	15	QPSK 1_38	26865/831.5	1:1	0.226	0.117	0.12	24.16	25.00	1.213	0.274	22.1
Back side with Battery 2	15	QPSK 1_38	26865/831.5	1:1	0.261	0.154	0.08	24.16	25.00	1.213	0.317	22.1
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	15	QPSK 36_0	26865/831.5	1:1	0.146	0.106	-0.17	23.10	24.00	1.230	0.180	22.1
Back side	15	QPSK 36_0	26865/831.5	1:1	0.235	0.137	0.00	23.10	24.00	1.230	0.289	22.1
Left side	15	QPSK 36_0	26865/831.5	1:1	0.204	0.135	0.03	23.10	24.00	1.230	0.251	22.1
Right side	15	QPSK 36_0	26865/831.5	1:1	0.070	0.046	0.02	23.10	24.00	1.230	0.086	22.1
Top side	15	QPSK 36_0	26865/831.5	1:1	0.173	0.089	0.15	23.10	24.00	1.230	0.213	22.1



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Test Position	Channel/ Frequency	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Right cheek	26865/831.5	0.835	0.824	1.013	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.

2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.



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8.2.11 SAR Result of LTE Band 41

LTE Band 41 SAR Test Record												
Ant 1 Test Record												
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) State 2												
Left cheek	20	QPSK 1_50	39750/2506	1:1.58	0.043	0.025	0.03	22.68	24.00	1.355	0.058	22.4
Left tilted	20	QPSK 1_50	39750/2506	1:1.58	0.036	0.018	-0.05	22.68	24.00	1.355	0.049	22.4
Right cheek	20	QPSK 1_50	39750/2506	1:1.58	0.023	0.013	0.19	22.68	24.00	1.355	0.031	22.4
Right tilted	20	QPSK 1_50	39750/2506	1:1.58	0.020	0.011	0.16	22.68	24.00	1.355	0.027	22.4
Left cheek with Battery 2	20	QPSK 1_50	39750/2506	1:1.58	0.039	0.021	-0.04	22.68	24.00	1.355	0.053	22.4
Head Test Data (50%RB) State 2												
Left cheek	20	QPSK 50_0	39750/2506	1:1.58	0.038	0.021	-0.09	21.88	23.00	1.294	0.049	22.4
Left tilted	20	QPSK 50_0	39750/2506	1:1.58	0.029	0.016	0.10	21.88	23.00	1.294	0.038	22.4
Right cheek	20	QPSK 50_0	39750/2506	1:1.58	0.019	0.010	0.01	21.88	23.00	1.294	0.025	22.4
Right tilted	20	QPSK 50_0	39750/2506	1:1.58	0.017	0.009	0.14	21.88	23.00	1.294	0.022	22.4
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	20	QPSK 1_0	39750/2506	1:1.58	0.279	0.131	-0.02	19.91	21.00	1.285	0.359	22.4
Back side	20	QPSK 1_0	39750/2506	1:1.58	0.583	0.251	0.17	19.91	21.00	1.285	0.749	22.4
Left side	20	QPSK 1_0	39750/2506	1:1.58	0.088	0.047	0.17	19.91	21.00	1.285	0.113	22.4
Right side	20	QPSK 1_0	39750/2506	1:1.58	0.012	0.006	-0.10	19.91	21.00	1.285	0.015	22.4
Bottom side	20	QPSK 1_0	39750/2506	1:1.58	0.858	0.373	0.08	19.91	21.00	1.285	1.103	22.4
Back side	20	QPSK 1_0	40185/2549.5	1:1.58	0.708	0.316	0.04	19.48	21.00	1.419	1.005	22.4
Back side	20	QPSK 1_0	40620/2593	1:1.58	0.605	0.271	-0.14	19.75	21.00	1.334	0.807	22.4
Back side	20	QPSK 1_0	41055/2636.5	1:1.58	0.294	0.133	0.11	19.49	21.00	1.416	0.416	22.4
Back side	20	QPSK 1_50	41490/2680	1:1.58	0.155	0.071	0.08	19.59	21.00	1.384	0.214	22.4
Bottom side	20	QPSK 1_0	40185/2549.5	1:1.58	0.875	0.398	0.16	19.48	21.00	1.419	1.242	22.4
Bottom side-repeated	20	QPSK 1_0	40185/2549.5	1:1.58	0.862	0.381	0.09	19.48	21.00	1.419	1.223	22.4
Bottom side	20	QPSK 1_0	40620/2593	1:1.58	0.435	0.195	0.09	19.75	21.00	1.334	0.580	22.4
Bottom side	20	QPSK 1_0	41055/2636.5	1:1.58	0.222	0.102	0.19	19.49	21.00	1.416	0.314	22.4
Bottom side	20	QPSK 1_50	41490/2680	1:1.58	0.132	0.061	0.02	19.59	21.00	1.384	0.183	22.4
Bottom side with Battery 2	20	QPSK 1_0	40185/2549.5	1:1.58	0.725	0.332	0.06	19.48	21.00	1.419	1.029	22.4
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	20	QPSK 50_0	39750/2506	1:1.58	0.219	0.105	-0.17	18.86	20.00	1.300	0.285	22.4
Back side	20	QPSK 50_0	39750/2506	1:1.58	0.490	0.209	0.18	18.86	20.00	1.300	0.637	22.4
Left side	20	QPSK 50_0	39750/2506	1:1.58	0.075	0.039	-0.12	18.86	20.00	1.300	0.098	22.4
Right side	20	QPSK 50_0	39750/2506	1:1.58	0.011	0.005	-0.16	18.86	20.00	1.300	0.014	22.4
Bottom side	20	QPSK 50_0	39750/2506	1:1.58	0.701	0.306	-0.12	18.86	20.00	1.300	0.911	22.4
Back side	20	QPSK 50_50	40185/2549.5	1:1.58	0.585	0.263	0.05	18.49	20.00	1.416	0.828	22.4
Back side	20	QPSK 50_0	40620/2593	1:1.58	0.464	0.208	0.16	18.56	20.00	1.393	0.646	22.4
Back side	20	QPSK 50_25	41055/2636.5	1:1.58	0.213	0.095	0.19	18.30	20.00	1.479	0.315	22.4
Back side	20	QPSK 50_0	41490/2680	1:1.58	0.121	0.054	0.05	18.60	20.00	1.380	0.167	22.4
Bottom side	20	QPSK 50_50	40185/2549.5	1:1.58	0.547	0.239	0.07	18.49	20.00	1.416	0.774	22.4



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Bottom side	20	QPSK 50_0	40620/2593	1:1.58	0.336	0.152	-0.19	18.56	20.00	1.393	0.468	22.4
Bottom side	20	QPSK 50_25	41055/2636.5	1:1.58	0.177	0.080	0.02	18.30	20.00	1.479	0.262	22.4
Bottom side	20	QPSK 50_0	41490/2680	1:1.58	0.111	0.051	-0.02	18.60	20.00	1.380	0.153	22.4
Hotspot&Body worn Test data (Separate 10mm 100%RB) State 1												
Back side	20	QPSK 100_0	39750/2506	1:1.58	0.451	0.188	0.02	18.70	20.00	1.349	0.608	22.4
Bottom side	20	QPSK 100_0	39750/2506	1:1.58	0.693	0.304	0.05	18.70	20.00	1.349	0.935	22.4
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)1-g	SAR (W/kg)10-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled 10-g SAR(W/kg)	Liquid Temp.
Product specific 10g SAR Test data (Separate 0mm 1RB) State 1												
Bottom side	20	QPSK 1_0	39750/2506	1:1.58	1.680	0.583	-0.03	19.91	21.00	1.285	0.749	22.4
Bottom side with Battery 2	20	QPSK 1_0	39750/2506	1:1	1.200	0.473	0.06	19.91	21.00	1.285	0.608	22.4
Product specific 10g SAR Test data (Separate 0mm 50%RB) State 1												
Bottom side	20	QPSK 50_0	39750/2506	1:1.58	1.150	0.455	0.05	18.86	20.00	1.300	0.592	22.4

Test Position	Channel/ Frequency	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Bottom side	40185/2549.5	0.875	0.862	1.015	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
 2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
 3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
 4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg
 5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.



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8.2.12 SAR Result of LTE Band 66

LTE Band 66 SAR Test Record												
Ant 1 Test Record												
Test position	BW	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data (1RB) State 2												
Left cheek	20	QPSK 1 50	132072/1720	1:1	0.059	0.040	-0.03	22.83	23.50	1.167	0.069	22.1
Left tilted	20	QPSK 1 50	132072/1720	1:1	0.061	0.037	-0.15	22.83	23.50	1.167	0.071	22.1
Right cheek	20	QPSK 1 50	132072/1720	1:1	0.063	0.041	0.08	22.83	23.50	1.167	0.074	22.1
Right tilted	20	QPSK 1 50	132072/1720	1:1	0.054	0.034	0.18	22.83	23.50	1.167	0.063	22.1
Head Test Data (50%RB) State 2												
Left cheek	20	QPSK 50 25	132322/1745	1:1	0.068	0.044	-0.04	21.38	22.50	1.294	0.088	22.1
Left tilted	20	QPSK 50 25	132322/1745	1:1	0.069	0.044	0.00	21.38	22.50	1.294	0.089	22.1
Right cheek	20	QPSK 50 25	132322/1745	1:1	0.072	0.047	0.08	21.38	22.50	1.294	0.093	22.1
Right tilted	20	QPSK 50 25	132322/1745	1:1	0.053	0.035	-0.06	21.38	22.50	1.294	0.069	22.1
Right cheek with Battery 2	20	QPSK 50 25	132322/1745	1:1	0.065	0.042	-0.13	21.38	22.50	1.294	0.084	22.1
Hotspot&Body worn Test data (Separate 10mm 1RB) State 1												
Front side	20	QPSK 1 50	132072/1720	1:1	0.334	0.185	0.02	21.59	22.50	1.233	0.412	22.1
Back side	20	QPSK 1 50	132072/1720	1:1	0.597	0.324	-0.03	21.59	22.50	1.233	0.736	22.1
Left side	20	QPSK 1 50	132072/1720	1:1	0.114	0.067	0.02	21.59	22.50	1.233	0.141	22.1
Right side	20	QPSK 1 50	132072/1720	1:1	0.071	0.042	0.10	21.59	22.50	1.233	0.088	22.1
Bottom side	20	QPSK 1 50	132072/1720	1:1	0.810	0.419	-0.09	21.59	22.50	1.233	0.999	22.1
Bottom side	20	QPSK 1 50	132322/1745	1:1	0.903	0.466	0.08	21.44	22.50	1.276	1.153	22.1
Bottom side	20	QPSK 1 50	132572/1770	1:1	0.938	0.519	0.01	21.52	22.50	1.253	1.175	22.1
Bottom side-repeated	20	QPSK 1 50	132572/1770	1:1	0.916	0.502	-0.16	21.52	22.50	1.253	1.148	22.1
Bottom side with Battery 2	20	QPSK 1 50	132572/1770	1:1	0.803	0.434	0.05	21.52	22.50	1.253	1.006	22.1
Hotspot&Body worn Test data (Separate 10mm 50%RB) State 1												
Front side	20	QPSK 50 50	132322/1745	1:1	0.291	0.171	0.03	20.37	21.50	1.297	0.377	22.1
Back side	20	QPSK 50 50	132322/1745	1:1	0.528	0.287	0.15	20.37	21.50	1.297	0.685	22.1
Left side	20	QPSK 50 50	132322/1745	1:1	0.127	0.076	-0.07	20.37	21.50	1.297	0.165	22.1
Right side	20	QPSK 50 50	132322/1745	1:1	0.069	0.036	-0.07	20.37	21.50	1.297	0.090	22.1
Bottom side	20	QPSK 50 50	132322/1745	1:1	0.728	0.377	0.16	20.37	21.50	1.297	0.944	22.1
Bottom side	20	QPSK 50 50	132072/1720	1:1	0.673	0.347	0.14	20.30	21.50	1.318	0.887	22.1
Bottom side	20	QPSK 50 25	132572/1770	1:1	0.730	0.381	-0.14	20.17	21.50	1.358	0.992	22.1
Hotspot&Body worn Test data (Separate 10mm 100%RB) State 1												
Bottom side	20	QPSK 100 0	132322/1745	1:1	0.728	0.376	-0.11	20.28	21.50	1.324	0.964	22.1

Test Position	Channel/ Frequency	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Bottom side	132572/1770	0.938	0.916	1.024	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.

2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).

3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

5) The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds. The repeated measurement results must be clearly identified in the SAR report.

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8.2.13 SAR Result of WIFI 2.4G

Wi-Fi 2.4G SAR Test Record												
Ant 3 Test Record chain0												
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data												
Left cheek	802.11b	6/2437	98.94%	1.011	0.155	0.059	0.00	16.67	17.50	1.211	0.190	22.2
Left tilted	802.11b	6/2437	98.94%	1.011	0.141	0.069	-0.16	16.67	17.50	1.211	0.173	22.2
Right cheek	802.11b	6/2437	98.94%	1.011	0.104	0.063	0.14	16.67	17.50	1.211	0.127	22.2
Right tilted	802.11b	6/2437	98.94%	1.011	0.073	0.042	0.06	16.67	17.50	1.211	0.089	22.2
Left cheek with Battery 2	802.11b	6/2437	98.94%	1.011	0.146	0.052	0.09	16.67	17.50	1.211	0.179	22.2
Hotspot&Body worn Test data (Separate 10mm)												
Front side	802.11b	6/2437	98.94%	1.011	0.037	0.021	0.01	16.67	17.50	1.211	0.045	22.2
Back side	802.11b	6/2437	98.94%	1.011	0.088	0.049	0.04	16.67	17.50	1.211	0.108	22.2
Right side	802.11b	6/2437	98.94%	1.011	0.064	0.033	0.10	16.67	17.50	1.211	0.078	22.2
Top side	802.11b	6/2437	98.94%	1.011	0.027	0.014	0.03	16.67	17.50	1.211	0.033	22.2
Back side with Battery 2	802.11b	6/2437	98.94%	1.011	0.079	0.042	-0.15	16.67	17.50	1.211	0.097	22.2



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8.2.14 SAR Result of BT

Bluetooth SAR Test Record												
Ant 3 Test Record												
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data												
Left cheek	DH5	0/2402	77.58%	1.289	0.014	0.007	0.07	6.47	7.00	1.130	0.021	22.2
Left tilted	DH5	0/2402	77.58%	1.289	0.010	0.005	-0.11	6.47	7.00	1.130	0.015	22.2
Right cheek	DH5	0/2402	77.58%	1.289	0.011	0.006	0.03	6.47	7.00	1.130	0.016	22.2
Right tilted	DH5	0/2402	77.58%	1.289	0.007	0.003	-0.10	6.47	7.00	1.130	0.010	22.2
Left cheek with Battery 2	DH5	0/2402	77.58%	1.289	0.013	0.006	-0.12	6.47	7.00	1.130	0.019	22.2
Hotspot&Body worn Test data (Separate 10mm)												
Front side	DH5	0/2402	77.58%	1.289	0.005	0.002	0.11	6.47	7.00	1.130	0.007	22.2
Back side	DH5	0/2402	77.58%	1.289	0.009	0.005	0.07	6.47	7.00	1.130	0.013	22.2
Right side	DH5	0/2402	77.58%	1.289	0.008	0.004	0.18	6.47	7.00	1.130	0.012	22.2
Top side	DH5	0/2402	77.58%	1.289	0.007	0.003	-0.10	6.47	7.00	1.130	0.010	22.2
Back side with Battery 2	DH5	0/2402	77.58%	1.289	0.006	0.004	0.05	6.47	7.00	1.130	0.009	22.2



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8.3 Multiple Transmitter Evaluation

8.3.1 Simultaneous SAR test evaluation

No.	Simultaneous Tx Combination	Head	Body	Hotspot	Product Specific 10-g (0mm)
1	WWAN + WLAN 2.4GHz	Yes	Yes	Yes	Yes
2	WWAN + BT	Yes	Yes	Yes	Yes

Note:

- 1) The device does not support DTM function.



8.3.2 Simultaneous Transmission SAR Summation Scenario

Head:

Test position		SARmax (W/kg)			Summed SAR	
		WWAN Max SAR	WiFi 2.4G Max SAR	BT Max SAR		
		1	2	3	1+2	1+3
GSM850	Left cheek	0.716	0.190	0.021	0.906	0.737
	Left tilted	0.486	0.173	0.015	0.659	0.501
	Right cheek	0.977	0.127	0.016	1.104	0.993
	Right tilted	0.795	0.089	0.010	0.884	0.805
GSM1900	Left cheek	0.083	0.190	0.021	0.273	0.104
	Left tilted	0.053	0.173	0.015	0.226	0.068
	Right cheek	0.053	0.127	0.016	0.180	0.069
	Right tilted	0.013	0.089	0.010	0.102	0.023
WCDMA B2	Left cheek	0.174	0.190	0.021	0.364	0.195
	Left tilted	0.175	0.173	0.015	0.348	0.190
	Right cheek	0.205	0.127	0.016	0.332	0.221
	Right tilted	0.129	0.089	0.010	0.218	0.139
WCDMA B4	Left cheek	0.128	0.190	0.021	0.318	0.149
	Left tilted	0.129	0.173	0.015	0.302	0.144
	Right cheek	0.150	0.127	0.016	0.277	0.166
	Right tilted	0.109	0.089	0.010	0.198	0.119
WCDMA B5	Left cheek	0.544	0.190	0.021	0.734	0.565
	Left tilted	0.455	0.173	0.015	0.628	0.470
	Right cheek	0.796	0.127	0.016	0.923	0.812
	Right tilted	0.661	0.089	0.010	0.750	0.671
LTE B2	Left cheek	0.164	0.190	0.021	0.354	0.185
	Left tilted	0.166	0.173	0.015	0.339	0.181
	Right cheek	0.171	0.127	0.016	0.298	0.187
	Right tilted	0.119	0.089	0.010	0.208	0.129
LTE B7	Left cheek	0.068	0.190	0.021	0.258	0.089
	Left tilted	0.055	0.173	0.015	0.228	0.070
	Right cheek	0.047	0.127	0.016	0.174	0.063
	Right tilted	0.037	0.089	0.010	0.126	0.047
LTE B12	Left cheek	0.389	0.190	0.021	0.579	0.410
	Left tilted	0.311	0.173	0.015	0.484	0.326
	Right cheek	0.540	0.127	0.016	0.667	0.556
	Right tilted	0.467	0.089	0.010	0.556	0.477
LTE B13	Left cheek	0.473	0.190	0.021	0.663	0.494
	Left tilted	0.337	0.173	0.015	0.510	0.352
	Right cheek	0.619	0.127	0.016	0.746	0.635
	Right tilted	0.489	0.089	0.010	0.578	0.499
LTE B26	Left cheek	0.727	0.190	0.021	0.917	0.748
	Left tilted	0.621	0.173	0.015	0.794	0.636
	Right cheek	1.013	0.127	0.016	1.140	1.029
	Right tilted	0.813	0.089	0.010	0.902	0.823
LTE B41	Left cheek	0.058	0.190	0.021	0.248	0.079



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	Left tilted	0.049	0.173	0.015	0.222	0.064
	Right cheek	0.031	0.127	0.016	0.158	0.047
	Right tilted	0.027	0.089	0.010	0.116	0.037
LTE B66	Left cheek	0.088	0.190	0.021	0.278	0.109
	Left tilted	0.089	0.173	0.015	0.262	0.104
	Right cheek	0.093	0.127	0.016	0.220	0.109
	Right tilted	0.069	0.089	0.010	0.158	0.079



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Body_Worn&Hotspot:

Test position		SARmax (W/kg)			Summed SAR	
		WWAN Max SAR	WiFi 2.4G Max SAR	BT Max SAR		
		1	2	3	1+2	1+3
GSM850	Front side	0.188	0.045	0.007	0.233	0.195
	Back side	0.411	0.108	0.013	0.519	0.424
	Left side	0.208	/	/	0.208	0.208
	Right side	0.105	0.078	0.012	0.183	0.117
	Top side	0.196	0.033	0.010	0.229	0.206
	Bottom side	/	/	/	/	/
GSM1900	Front side	0.239	0.045	0.007	0.284	0.246
	Back side	0.372	0.108	0.013	0.480	0.385
	Left side	0.148	/	/	0.148	0.148
	Right side	0.058	0.078	0.012	0.136	0.070
	Top side	/	0.033	0.010	0.033	0.010
	Bottom side	0.638	/	/	0.638	0.638
WCDMA B2	Front side	0.456	0.045	0.007	0.501	0.463
	Back side	0.758	0.108	0.013	0.866	0.771
	Left side	0.266	/	/	0.266	0.266
	Right side	0.082	0.078	0.012	0.160	0.094
	Top side	/	0.033	0.010	0.033	0.010
	Bottom side	1.244	/	/	1.244	1.244
WCDMA B4	Front side	0.414	0.045	0.007	0.459	0.421
	Back side	0.752	0.108	0.013	0.860	0.765
	Left side	0.162	/	/	0.162	0.162
	Right side	0.098	0.078	0.012	0.176	0.110
	Top side	/	0.033	0.010	0.033	0.010
	Bottom side	1.091	/	/	1.091	1.091
WCDMA B5	Front side	0.172	0.045	0.007	0.217	0.179
	Back side	0.328	0.108	0.013	0.436	0.341
	Left side	0.235	/	/	0.235	0.235
	Right side	0.106	0.078	0.012	0.184	0.118
	Top side	0.193	0.033	0.010	0.226	0.203
	Bottom side	/	/	/	/	/
LTE B2	Front side	0.434	0.045	0.007	0.479	0.441
	Back side	0.717	0.108	0.013	0.825	0.730
	Left side	0.251	/	/	0.251	0.251
	Right side	0.075	0.078	0.012	0.153	0.087
	Top side	/	0.033	0.010	0.033	0.010
	Bottom side	1.233	/	/	1.233	1.233
LTE B7	Front side	0.407	0.045	0.007	0.452	0.414
	Back side	1.214	0.108	0.013	1.322	1.227
	Left side	0.111	/	/	0.111	0.111
	Right side	0.074	0.078	0.012	0.152	0.086
	Top side	/	0.033	0.010	0.033	0.010
	Bottom side	1.255	/	/	1.255	1.255
LTE B12	Front side	0.170	0.045	0.007	0.215	0.177



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	Back side	0.260	0.108	0.013	0.368	0.273
	Left side	0.216	/	/	0.216	0.216
	Right side	0.085	0.078	0.012	0.163	0.097
	Top side	0.097	0.033	0.010	0.130	0.107
	Bottom side	/	/	/	/	/
LTE B13	Front side	0.197	0.045	0.007	0.242	0.204
	Back side	0.277	0.108	0.013	0.385	0.290
	Left side	0.332	/	/	0.332	0.332
	Right side	0.119	0.078	0.012	0.197	0.131
	Top side	0.110	0.033	0.010	0.143	0.120
	Bottom side	/	/	/	/	/
LTE B26	Front side	0.223	0.045	0.007	0.268	0.230
	Back side	0.393	0.108	0.013	0.501	0.406
	Left side	0.307	/	/	0.307	0.307
	Right side	0.101	0.078	0.012	0.179	0.113
	Top side	0.274	0.033	0.010	0.307	0.284
	Bottom side	/	/	/	/	/
LTE B41	Front side	0.359	0.045	0.007	0.404	0.366
	Back side	1.005	0.108	0.013	1.113	1.018
	Left side	0.113	/	/	0.113	0.113
	Right side	0.015	0.078	0.012	0.093	0.027
	Top side	/	0.033	0.010	0.033	0.010
	Bottom side	1.242	/	/	1.242	1.242
LTE B66	Front side	0.412	0.045	0.007	0.457	0.419
	Back side	0.736	0.108	0.013	0.844	0.749
	Left side	0.165	/	/	0.165	0.165
	Right side	0.090	0.078	0.012	0.168	0.102
	Top side	/	0.033	0.010	0.033	0.010
	Bottom side	1.175	/	/	1.175	1.175



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Product specific 10g SAR:

Test position		SARmax (W/kg)			Summed SAR	
		WWAN Max SAR	WiFi 2.4G	BT		
		1	2	3	1+2	1+3
WCDMA B2	Front side	/	/	/	/	/
	Back side	/	/	/	/	/
	Left side	/	/	/	/	/
	Right side	/	/	/	/	/
	Top side	/	/	/	/	/
	Bottom side	2.954	/	/	2.954	2.954
LTE B2	Front side	/	/	/	/	/
	Back side	/	/	/	/	/
	Left side	/	/	/	/	/
	Right side	/	/	/	/	/
	Top side	/	/	/	/	/
	Bottom side	2.789	/	/	2.789	2.789
LTE B7	Front side	/	/	/	/	/
	Back side	1.970	/	/	1.970	1.970
	Left side	/	/	/	/	/
	Right side	/	/	/	/	/
	Top side	/	/	/	/	/
	Bottom side	1.045	/	/	1.045	1.045
LTE B41	Front side	/	/	/	/	/
	Back side	/	/	/	/	/
	Left side	/	/	/	/	/
	Right side	/	/	/	/	/
	Top side	/	/	/	/	/
	Bottom side	0.749	/	/	0.749	0.749



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9 Equipment list

Test Platform		SPEAG DASY Professional				
Description		SAR Test System				
Software Reference		DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)				
Hardware Reference						
Equipment		Manufacturer	Model	Inventory No.	Calibration Date	Due date of calibration
☒	Test Phantom	SPEAG	SAM Twin	SZ-WSR-A-025	NCR	NCR
☒	Test Phantom	SPEAG	SAM Twin	SZ-WSR-A-023	NCR	NCR
☒	DAE	SPEAG	DAE4	SZ-WSR-M-031	2024/03/18	2025/03/17
☒	DAE	SPEAG	DAE4	SZ-WSR-M-028	2024/04/16	2025/04/15
☒	E-Field Probe	SPEAG	EX3DV4	SZ-WSR-M-068	2025/01/15	2026/01/14
☒	E-Field Probe	SPEAG	EX3DV4	SZ-WSR-M-027	2024/07/17	2025/07/16
☒	Validation Kits	SPEAG	D750V3	SZ-WSR-M-032	2022/06/06	2025/06/05
☒	Validation Kits	SPEAG	D835V2	SZ-WSR-M-033	2022/11/02	2025/11/01
☒	Validation Kits	SPEAG	D1750V2	SZ-WSR-M-035	2022/06/17	2025/06/16
☒	Validation Kits	SPEAG	D1950V3	SZ-WSR-M-037	2022/10/31	2025/10/30
☒	Validation Kits	SPEAG	D2450V2	SZ-WSR-M-039	2022/11/02	2025/11/01
☒	Validation Kits	SPEAG	D2600V2	SZ-WSR-M-040	2022/06/14	2025/06/13
☒	Dielectric parameter probes	SPEAG	DAKS-3.5	SZ-WSR-M-053	2024/06/26	2025/06/25
☒	Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS_VNA R140	SZ-WSR-M-054	2024/06/26	2025/06/25
☒	Radio Communication Analyzer	Anritsu	MT8820C	SZ-WSR-M-005	2025/01/08	2026/01/07
☒	Radio Communication Analyzer	Anritsu	MT8820C	SZ-WSR-M-018	2024/05/24	2025/05/23
☒	Radio Communication Analyzer	Anritsu	MT8820C	SZ-WSR-M-020	2024/08/19	2025/08/18
☒	RF Bi-Directional Coupler	Agilent	86205-60001	SZ-WSR-A-004	NCR	NCR
☒	Signal Generator	Agilent	N5171B	SZ-WSR-M-006	2025/01/07	2026/01/06
☒	Preamplifier	Mini-Circuits	ZHL-42W	SZ-WSR-A-001	NCR	NCR
☒	Preamplifier	Compliance Directions Systems Inc.	AMP28-3W	SZ-WSR-A-002	NCR	NCR
☒	Power Meter	Agilent	E4416A	SZ-WSR-M-007	2025/01/07	2026/01/06
☒	Power Sensor	Agilent	8481H	SZ-WSR-M-008	2025/01/07	2026/01/06
☒	Power Sensor	R&S	NRP-Z92	SZ-WSR-M-009	2025/01/08	2026/01/07
☒	Attenuator	SHX	TS2-3dB	SZ-WSR-A-012	NCR	NCR
☒	Speed reading thermometer	Zhengzhou Bovang	TP3001	SZ-WSR-M-014	2024/05/30	2025/05/29



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SZSAR-TRF-01 Rev. A/0 May15,2023

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		Instrument				
☒	Temperature	MingGao	T809	SZ-WSR-M-015	2024/05/30	2025/05/29
☒	Temperature	MingGao	T809	SZ-WSR-M-016	2024/05/30	2025/05/29
☒	Humidity and Temperature Indicator	CHIGAO	HTC-1	SZ-WSR-M-013	2024/05/28	2025/05/27
☒	Humidity and Temperature Indicator	CHIGAO	HTC-1	SZ-WSR-M-012	2024/05/28	2025/05/27
☒	Humidity and Temperature Indicator	CHIGAO	HTC-1	SZ-WSR-M-011	2024/05/28	2025/05/27

Note: All the equipment are within the valid period when the tests are performed.



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10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

Appendix E: Conducted RF Output Power

--- End of report ---



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Shenzhen Branch (SZSAR-TRF-01) Laboratory

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中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com