FCC SAR TEST REPORT

Application No.:	KSCR2212002512AT(FYCR2211000473AT)
Applicant:	Vanstone Electronic (Beijing) Co., Ltd.
Address of Applicant:	3F No.2 Building, Aisino Corporation Park 18A, Xingshikou Road, Haidian District, Beijing, China 100195
Manufacturer:	Vanstone Electronic (Beijing) Co., Ltd.
Address of Manufacturer:	3F No.2 Building, Aisino Corporation Park 18A, Xingshikou Road, Haidian District, Beijing, China 100195
Product Name:	Android Cloud Terminal
Model No.(EUT):	A78
FCC ID:	OWL-A78-A
Standard(s) :	FCC 47CFR §2.1093
Date of Receipt:	2023-01-31
Date of Test:	2023-02-01 to 2023-02-08
Date of Issue:	2023-02-18
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Eric Lin
EMC Laboratory Manager

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REVISION HISTORY

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2023-02-18	/

Authorized for issue by:				
		Richard.Kong **Richard.Kong/ Project Engineer**		
		Eric Lin **Eric.Lin/Reviewer**		

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TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)
	Extremity
GSM850	0.68
GSM1900	1.66
WCDMA Band II	3.53
WCDMA Band V	0.69
LTE Band 2	2.67
LTE Band 4	1.91
LTE Band 5	0.61
LTE Band 7	2.73
LTE Band 38	1.65
LTE Band 40	1.55
LTE Band 41	1.68
WI-FI (2.4GHz)	0.58
BT	0.09
WI-FI (5GHz)	0.68
Sum SAR	3.65
SAR Limited(W/kg)	4.0

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1 General Information

1.1 General Description of EUT

Product Phase:	Production unit		
Device Type:	Portable device		
Exposure Category:	uncontrolled environment / general population		
SN:	00053000206		
Hardware Version:	V1.01		
Software Version:	V1.01		
Antenna Gain:	WIFI 2.4G/BT: 2.23dBi U-NII-1: 4.84dBi; U-NII-2A: 4.64dBi; U-NII-2C: 4.92 dBi; U-NII-3: 4.92 dBi GSM850: -5.96dBi PCS1900: -1.14dBi WCDMA B2: -1.14 dBi; B5: -5.96 dBi LTE B2: -1.14dBi; B4: -2.16dBi; B5: 5.96dBi; B7: 2.71dBi; B38:2.71dBi, B40: 2.69dBi, B41: 2.71dBi (Provided by Manufacturer)		
Antenna Type:	PIFA antenna		
Device Operating Configurations:			
Modulation Mode:	GSM: GMSK, 8PSK WCDMA: QPSK LTE: QPSK, 16QAM WIFI: DSSS, OFDM BT: GFSK, π/4DQPSK, 8DPSK		
GPRS Multi-slots Class:	12	EGPRS Multi-slots Class:	12
HSDPA UE Category:	14	HSUPA UE Category	6
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 II/V)		
	3, tested with power control Max Power (LTE Band 2/4/5/7/38/40/41)		
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 V	824-849	869-894
	LTE Band 2	1850-1910	1930-1990
	LTE Band 4	1710-1755	2110- 2155
	LTE Band 5	824-849	869-894

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	LTE Band 7	2500-2570	2620- 2690
	LTE Band 38	2570-2620	2570-2620
	LTE Band 40	2305-2315,2350-2360	2305-2315,2350-2360
	LTE Band 41	2496-2690	2496-2690
	WIFI2.4G	2412-2462	2412-2462
	BT/BLE	2402-2480	2402-2480
	WIFI(U-NII-1)	5150~5250	5150~5250
	WIFI(U-NII-2A)	5250~5350	5250~5350
	WIFI(U-NII-2C)	5470~5725	5470~5725
	WIFI(U-NII-3)	5725~5850	5725~5850
Battery Information1#:	Model:	BT-901	
	Normal Voltage:	DC3.60V	
	Rated capacity:	5200mAh	
	Battery Type:	Rechargeable Li-ion Battery	
	Manufacturer:	Zhuhai Greaton Electronic Technology Co.,Ltd.	
Battery Information2#:	Model:	BT-901	
	Normal Voltage:	DC3.60V	
	Rated capacity:	5200mAh	
	Battery Type:	Rechargeable Li-ion Battery	
	Manufacturer:	Shenzhen Rishengzhi Eletronics Technology Co.,Ltd.	

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1.1.1 DUT Antenna Locations

Please see the Appendix D

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1.2 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radio frequency Radiation Exposure Evaluation: Portable Devices
IEEE Std C95.1 – 1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 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 447498 D04	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
KDB 865664 D01 v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664 D02 v01r02	RF Exposure Compliance Reporting and Documentation Considerations
KDB 248227 D01 v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 941225 D01 v03r01	3G SAR Measurement Procedures
KDB 941225 D05 v02r05	SAR EVALUATION CONSIDERATIONS FOR LTE DEVICES
KDB 941225 D06 v02r01	SAR EVALUATION PROCEDURES FOR PORTABLE DEVICES WITH WIRELESS ROUTER CAPABILITIES

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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 W/kg	8.00 W/kg
Spatial Average SAR** (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

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:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

1.SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).
2.SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

1.5 Test Facility

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

• A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

• ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E; CAB identifier: CN0072

• VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

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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 Configuration

3.1 The SAR Measurement System

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

The DASY5 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.

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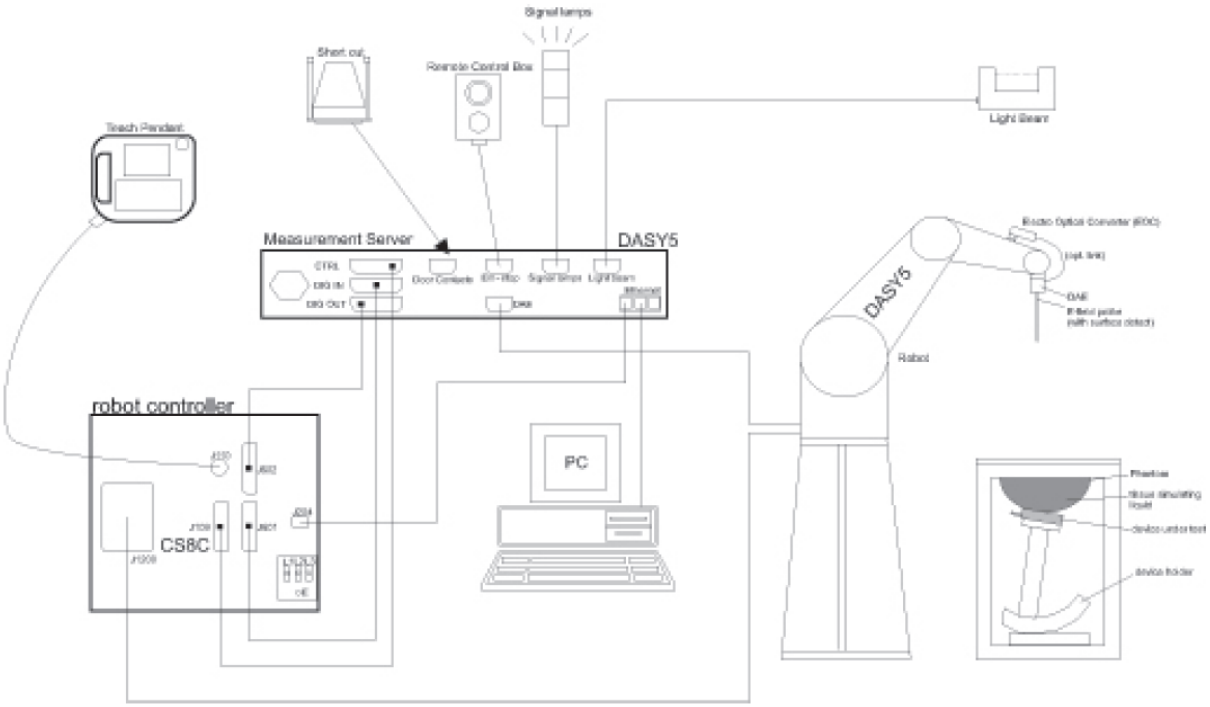

F-1. SAR Measurement System Configuration

- 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 7.
- DASY5 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 validat the proper functioning of the system.

3.2 Isotropic E-field Probe EX3DV4

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	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 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/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	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

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中国・江苏・昆山开发区伟业路10号 邮编：215300 t(86-512) 57355888 f(86-512) 57370818 sgs.china@sgs.com
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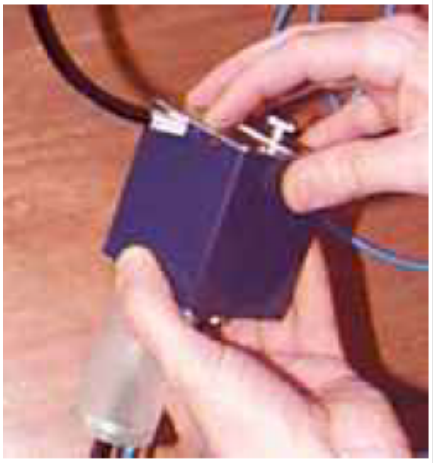
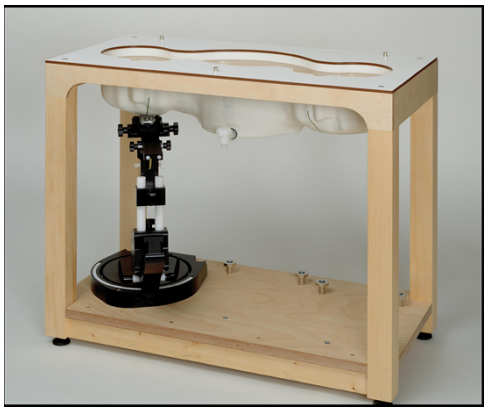
3.3 Data Acquisition Electronics (DAE)

Model	DAE4
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	approx. 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 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

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.

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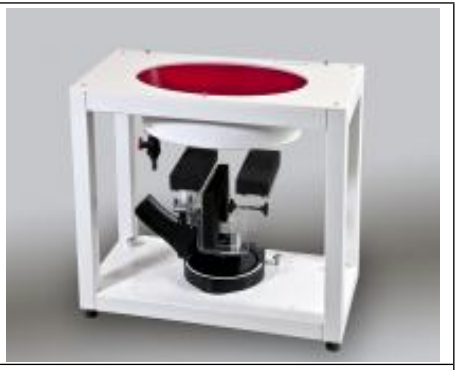
3.5 ELI Phantom

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	approx. 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 IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.

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

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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 ε=3 and loss tangent δ=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.

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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 30mm*30mm*30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5x5x7 points (≤2GHz) and 7x7x7 points (≥2GHz). 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.

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			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 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 ≤ 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: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

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. ± 5 %

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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 ".DAE3". 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 Vi = compensated signal of channel i (i = x, y, z)

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

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cf = crest factor of exciting field (DASY parameter)
dcp i = diode compression point (DASY parameter)

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

E-field probes:

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

H-field probes:

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

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel I (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

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

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

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

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

With SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ= conductivity in [mho/m] or [Siemens/m]
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.

$$P_{pwe} = E_{tot}{}^2{}_2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = total magnetic field strength in A/m

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4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB865664 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 (~ 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.

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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 (<3.75 W/kg for 10g), 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 Extremity exposure conditions

Devices that are designed or intended for use on extremities, or mainly operated in extremity only exposure conditions, i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user’s body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Test Exclusion Thresholds in 8.2 should be applied to determine SAR test requirements. When extremity SAR testing is required, a flat phantom must be used if the exposure condition is more conservative than the actual use conditions; otherwise, a KDB inquiry is required to determine the phantom and test requirements. Body SAR compliance is also tested with a flat phantom. For devices with irregular shapes or form factors that do not conform to a flat phantom, and/or unusual operating configurations and exposure conditions, a KDB inquiry is also required to determine the appropriate SAR measurement procedures. Unless it is specified differently in the published RF exposure KDB procedures, when simultaneous transmission applies to extremity exposure, the simultaneous transmission SAR test exclusion provisions should be applied. When simultaneous transmission SAR measurement is required, the enlarged zoom scan and volume scan post-processing procedures in KDB Publication 865664 D01 should be applied.

SAR can test the sides near the antenna, the surface of the device should be tested for SAR compliance with the device touching the phantom. The SAR Exclusion Threshold in KDB 447498 D04 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent device surface is used to determine if SAR testing is required for the adjacent surfaces, with the adjacent surface positioned against the phantom and the surface containing the antenna positioned perpendicular to the phantom.

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6 SAR System Verification 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		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

HSL5GHz is composed of the following ingredients：

Water：50-65%

Mineral oil：10-30%

Emulsifiers：8-25%

Sodium salt：0-1.5%

MSL5GHz is composed of the following ingredients：

Water：64-78%

Mineral oil：11-18%

Emulsifiers：9-15%

Sodium salt：2-3%

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6.1.2 Test Liquids Confirmation

Simulated tissue liquid parameter confirmation

The dielectric parameters were checked prior to assessment using the SPEAG DAK3.5 dielectric probe kit. The dielectric parameters measured are reported in each correspondent section.

IEEE SCC-34/SC-2 P1528 recommended tissue dielectric parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in P1528

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

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6.1.3 Measurement for Tissue Simulate Liquid

The dielectric properties for this Tissue Simulate Liquids were measured by using the SPEAG DAK3.5 dielectric probe kit in conjunction with Agilent E5071B Network Analyzer (300 KHz-8500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2°C.

Tissue Type	Measured Frequency（MHz）	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Liquid Temp. (℃)	Date
835 Head	835	0.89	40.97	0.90	41.50	-1.11	-1.27	±5	22.1	2023/2/1
1800 Head	1800	1.38	40.53	1.40	40.00	-1.14	1.32	±5	22.2	2023/2/2
1900 Head	1900	1.45	40.00	1.40	40.00	3.50	-0.01	±5	22.3	2023/2/3
2300 Head	2300	1.63	38.67	1.67	39.50	-2.22	-2.11	±5	22.1	2023/2/4
2450 Head	2450	1.80	38.23	1.80	39.20	0.11	-2.48	±5	22.2	2023/2/5
2600 Head	2600	1.97	37.77	1.96	39.00	0.41	-3.16	±5	22.1	2023/2/6
5200 Head	5200	4.78	37.01	4.66	36.01	2.62	2.79	±5	22.2	2023/2/7
5600 Head	5600	5.26	35.95	5.07	35.50	3.75	1.27	±5	22.2	2023/2/8
5800 Head	5800	5.38	34.50	5.28	35.24	1.89	-2.11	±5	22.2	2023/2/8

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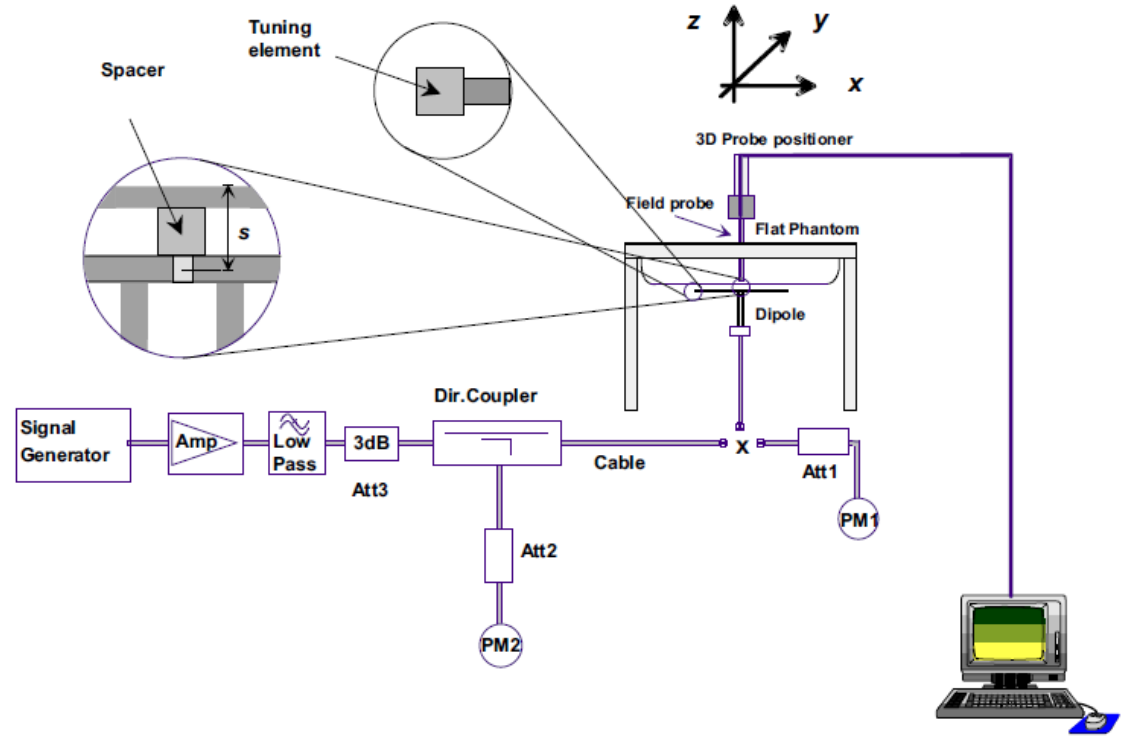
6.2 SAR System Check

The microwave circuit arrangement for system check is sketched in bellow figure. 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 +/- 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. During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15 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-3. the microwave circuit arrangement used for SAR system verification

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6.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, 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 10% 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)

Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1w)	Measured SAR (normalized to 1w)	Target SAR (normalized to 1w) (±10%)	Target SAR (normalized to 1w) (±10%)	Liquid Temp. (°C)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D835V2	Head	2.39	1.66	9.56	6.64	9.40 (8.46~10.34)	6.12 (5.51~6.73)	22.1	2023/2/1
D1800V2	Head	9.76	5.35	39.04	21.4	38.9 (35.01~42.79)	20.4 (18.36~22.44)	22.2	2023/2/2
D1900V2	Head	10.5	5.23	42	20.92	40.0 (36.00~44.00)	20.3 (18.72~22.88)	22.3	2023/2/3
D2300V2	Head	11.2	5.35	44.8	21.4	47.4 (42.66~52.14)	22.8 (20.52~25.08)	22.1	2023/2/4
D2450V2	Head	14	6.64	56	26.56	53 (47.70~58.30)	24.7 (22.23~27.17)	22.2	2023/2/5
D2600V2	Head	14.8	6.55	59.2	26.2	54.8 (49.32~60.28)	24.5 (22.05~26.95)	22.1	2023/2/6
Validation Kit		**Measured SAR 100mW**	**Measured SAR 100mW**	**Measured SAR (normalized to 1w)**	**Measured SAR (normalized to 1w)**	**Target SAR (normalized to 1w) (±10%)**	**Target SAR (normalized to 1w) (±10%)**	**Liquid Temp. (°C)**	**Measured Date**
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D5GHzV2	Head(5.20GHz)	7.86	2.15	78.6	21.5	77.6 (69.84~85.36)	22.1 (19.35~23.65)	22.2	2023/2/7
	Head(5.6GHz)	7.58	2.17	75.8	21.7	80.8 (72.72~88.88)	22.9 (20.61~25.19)	22.2	2023/2/8
	Head(5.8GHz)	7.18	2.05	71.8	20.5	76.7 (69.03~84.37)	21.5 (19.35~23.65)	22.2	2023/2/8

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

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 spreaing 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 / DC-HSDPA

According to KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher

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than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA

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(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) 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.

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Sub-test	βc	Bd	βd(SF)	βc/βd	βhs	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: △ACK, △NACK and △CQI= 8 Ahs = βhs/βc=30/15 βhs=30/15*βc

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, △ACK and △NACK= 8 (Ahs=30/15) with βhs=30/15*βc,and △CQI=
7 (Ahs=24/15) with βhs=24/15*βc.

Note3: CM=1 forβc/βd =12/15, βhs/βc=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.

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

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

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

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

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

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

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

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

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

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

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

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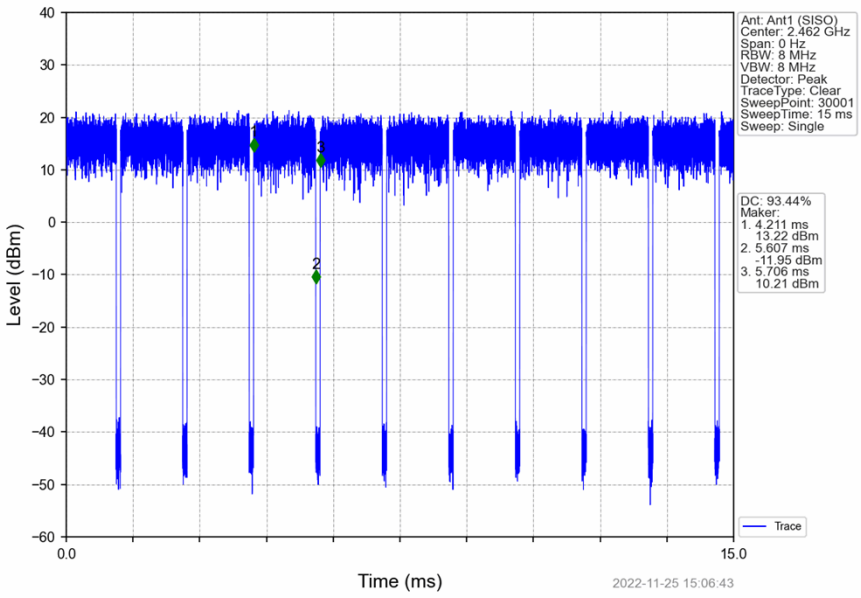
7.2.2 Wi-Fi Test Configuration

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.

7.2.2.1 Duty cycle

1) 2.4GHz Wi-Fi:

WI-FI 802.11b: Duty cycle= 93.44%



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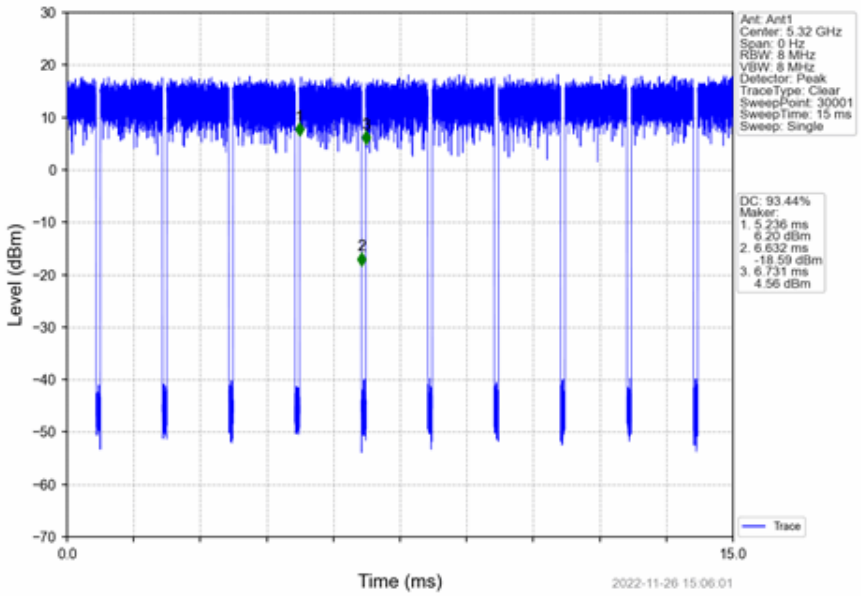
2) 5GHz Wi-Fi:

11a: Duty cycle= 93.44%



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7.2.2.2 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.

7.2.2.3 Initial Test Configuration Procedures

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required. SAR test reduction for subsequent highest output test channels is determined according to *reported* SAR of the initial test configuration.

For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the *reported* SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

7.2.2.4 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

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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”

7.2.2.5 2.4 GHz Wi-Fi 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:

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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.

7.2.2.6 5 GHz Wi-Fi SAR Procedures

- **U-NII-1 and U-NII-2A Bands**

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following：

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

- **U-NII-2C and U-NII-3 Bands**

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. when Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span

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across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

- **OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements**

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
    a) The channel closest to mid-band frequency is selected for SAR measurement.
    b) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. 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

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procedures.

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7.2.3 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 R&S CMW500 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.

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 V13.5.0 (201609) Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

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

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.

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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 > ½ 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 > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

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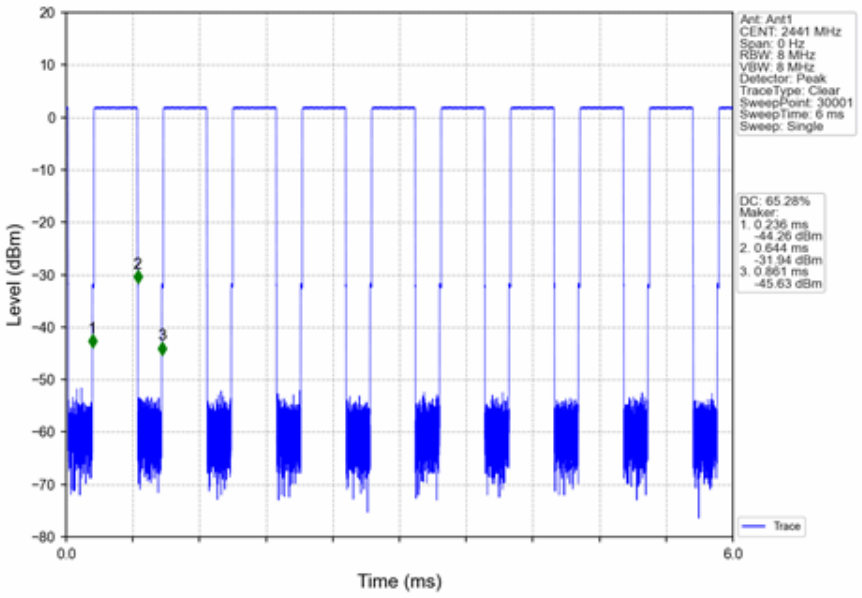
7.2.4 BluetoothTest Configuration

For the Bluetooth SAR tests, a communication link is set up with the test mode software for BT mode test. Bluetooth USES frequency hopping technology to divide the transmitted data into packets and transmit the packets respectively through 79 designated Bluetooth channels, 1MHz Bandwidth, frequency hops at 1600 hops/second per the Bluetooth standard. The Radio Frequency Channel Number (RFCN) is allocated to 0, 39 and 78 respectively in the case of 2402~2480 MHz during the test at each test frequency channel, the EUT is operated at the RF continuous emission mode.

7.2.4.1 Duty cycle

Bluetooth duty cycle: 65.28%



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8 Test Result

8.1 Measurement of RF Conducted Power

8.1.1 Conducted Power Of GSM

GSM 850										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		128	190	251			128	190	251	
GPRS/EGPRS (GMSK)	1 TX Slot	32.68	32.72	32.64	33.00	-9.03	23.65	23.69	23.61	23.97
	2 TX Slots	**31.08**	30.96	30.77	**32.00**	-6.02	25.06	24.94	24.75	**25.98**
	3 TX Slots	29.37	29.27	29.07	30.00	-4.26	25.11	25.01	24.81	25.74
	4 TX Slots	27.34	27.29	27.08	28.00	-3.01	24.33	24.28	24.07	24.99
EGPRS(8PSK)	1 TX Slot	25.44	25.16	25.09	26.00	-9.03	16.41	16.13	16.06	16.97
	2 TX Slots	24.27	24.38	**24.53**	25.00	-6.02	18.25	18.36	18.51	**18.98**
	3 TX Slots	22.31	22.21	22.06	23.00	-4.26	18.05	17.95	17.8	18.74
	4 TX Slots	20.32	20.33	20.12	21.00	-3.01	17.31	17.32	17.11	17.99
GSM 1900										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		512	661	810			512	661	810	
GPRS/EGPRS (GMSK)	1 TX Slot	30.02	29.90	29.97	31.00	-9.03	20.99	20.87	20.94	21.97
	2 TX Slots	27.72	27.67	27.57	28.00	-6.02	21.7	21.65	21.55	21.98
	3 TX Slots	**26.27**	26.18	26.09	**27.00**	-4.26	22.01	21.92	21.83	**22.74**
	4 TX Slots	24.24	24.18	24.03	25.00	-3.01	21.23	21.17	21.02	21.99
EGPRS(8PSK)	1 TX Slot	25.48	25.15	24.74	26.00	-9.03	16.45	16.12	15.71	16.97
	2 TX Slots	**24.18**	23.78	23.70	**25.00**	-6.02	18.16	17.76	17.68	**18.98**
	3 TX Slots	21.83	22.00	21.69	23.00	-4.26	17.57	17.74	17.43	18.74
	4 TX Slots	19.88	19.27	19.19	20.00	-3.01	16.87	16.26	16.18	16.99

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	-9.03	-6.02	-4.26	-3.01

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.

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8.1.2 Conducted Power Of WCDMA

WCDMA Band II					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	22.37	22.71	**22.75**	**24.00**
HSDPA	Subtest 1	21.62	22.30	22.21	23.00
	Subtest 2	21.63	22.31	22.21	23.00
	Subtest 3	21.63	22.32	22.22	23.00
	Subtest 4	21.57	22.27	22.16	23.00
HSUPA	Subtest 1	19.72	19.95	19.78	20.00
	Subtest 2	19.81	20.11	19.91	21.00
	Subtest 3	19.68	20.38	20.17	21.00
	Subtest 4	19.71	19.95	20.17	21.00
	Subtest 5	19.49	20.39	20.37	21.00

WCDMA Band V					
Average Conducted Power(dBm)					
Channel		1312	1412	1513	Tune up
WCDMA	12.2kbps RMC	23.04	**23.14**	23.14	**24.00**
HSDPA	Subtest 1	21.79	21.94	22.23	23.00
	Subtest 2	21.79	21.94	22.22	23.00
	Subtest 3	21.78	21.95	22.25	23.00
	Subtest 4	21.74	21.95	22.20	23.00
HSUPA	Subtest 1	19.99	20.03	20.17	21.00
	Subtest 2	19.61	20.21	20.02	21.00
	Subtest 3	20.01	20.11	19.87	21.00
	Subtest 4	19.46	20.21	20.46	21.00
	Subtest 5	19.88	20.10	20.29	21.00

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8.1.3 Conducted Power Of LTE

LTE Band 2				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 18607	Channel 18900	Channel 19193	Tune up
1.4MHz	QPSK	1	0	22.04	22.06	22.30	23.00
		1	2	22.04	22.04	22.34	23.00
		1	5	22.06	22.08	22.37	23.00
		3	0	22.16	22.21	22.41	23.00
		3	2	22.19	22.24	22.41	23.00
		3	3	22.21	22.16	22.43	23.00
		6	0	20.98	21.08	21.36	22.00
	16QAM	1	0	21.22	20.88	21.54	22.00
		1	2	21.25	20.85	21.48	22.00
		1	5	21.21	20.83	21.49	22.00
		3	0	21.1	21.06	21.31	22.00
		3	2	21.08	21.08	21.32	22.00
		3	3	21.1	21	21.36	22.00
		6	0	20.19	20.16	20.46	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 18615	Channel 18900	Channel 19185	Tune up
3MHz	QPSK	1	0	22.14	22.04	22.43	23.00
		1	7	22.07	22.07	22.43	23.00
		1	14	22.14	22.07	22.43	23.00
		8	0	21.13	21.18	21.33	22.00
		8	4	21.15	21.17	21.34	22.00
		8	7	21.08	21.08	21.47	22.00
		15	0	21.06	21.18	21.47	22.00
	16QAM	1	0	20.64	21.69	20.88	22.00
		1	7	20.64	21.74	20.88	22.00
		1	14	20.60	21.72	20.90	22.00
		8	0	20.44	20.35	20.75	22.00
		8	4	20.46	20.34	20.72	22.00
		8	7	20.48	20.4	20.76	22.00
		15	0	20.31	20.28	20.60	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 18625	Channel 18900	Channel 19175	Tune up
5MHz	QPSK	1	0	22.01	22.03	22.4	23.00
		1	13	22.02	21.98	22.39	23.00
		1	24	22.01	22.12	22.46	23.00
		12	0	21.1	21.14	21.47	22.00
		12	6	21.08	21.22	21.39	22.00
		12	13	21.07	21.1	21.43	22.00
		25	0	21.16	21.2	21.45	22.00
	16QAM	1	0	20.34	21.37	21.57	22.00
		1	13	20.34	21.35	21.55	22.00

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		1	24	20.4	21.4	21.63	22.00
		12	0	20.25	20.28	20.56	22.00
		12	6	20.24	20.3	20.53	22.00
		12	13	20.2	20.34	20.58	22.00
		25	0	20.27	20.34	20.54	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18650	18900	19150	
10MHz	QPSK	1	0	22.11	22.11	22.42	23.00
		1	25	21.95	22.07	22.45	23.00
		1	49	22.06	22.14	22.49	23.00
		25	0	21.12	21.19	21.34	22.00
		25	13	21.06	21.18	21.33	22.00
		25	25	21.08	21.13	21.44	22.00
		50	0	21.24	21.17	21.32	22.00
	16QAM	1	0	21.62	21.03	21.56	22.00
		1	25	21.65	21.03	21.65	22.00
		1	49	21.66	21.05	21.63	22.00
		25	0	20.29	20.54	20.66	22.00
		25	13	20.28	20.53	20.63	22.00
		25	25	20.34	20.48	20.61	22.00
		50	0	20.31	20.39	20.62	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18675	18900	19125	
15MHz	QPSK	1	0	22.05	22.12	22.42	23.00
		1	38	22.08	22.04	22.39	23.00
		1	74	22.06	22.13	22.49	23.00
		36	0	21.13	21.19	21.31	22.00
		36	18	21.06	21.26	21.28	22.00
		36	39	21.2	21.18	21.27	22.00
		75	0	21.19	21.1	21.39	22.00
	16QAM	1	0	21.64	21.58	21.54	22.00
		1	38	21.64	21.57	21.54	22.00
		1	74	21.61	21.65	21.6	22.00
		36	0	20.28	20.29	20.59	22.00
		36	18	20.33	20.28	20.68	22.00
		36	39	20.24	20.34	20.63	22.00
		75	0	20.34	20.35	20.59	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18700	18900	19100	
20MHz	QPSK	1	0	22.06	22.25	22.21	23.00
		1	50	22.23	22.29	22.2	23.00
		1	99	22.35	**22.49**	22.36	**23.00**
		50	0	21.23	21.19	21.34	22.00
		50	25	21.08	21.08	21.38	22.00

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中国・江苏・昆山开发区伟业路10号 邮编：215300 t(86-512) 57355888 f(86-512) 57370818 sgs.china@sgs.com
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		50	50	21.06	21.17	**21.39**	**22.00**
		100	0	21.09	21.11	21.43	22.00
		1	0	21.31	21.75	21.74	22.00
		1	50	21.36	21.71	21.7	22.00
		1	99	21.39	21.56	21.85	22.00
	16QAM	50	0	20.32	20.26	20.55	22.00
		50	25	20.4	20.33	20.56	22.00
		50	50	20.32	20.37	20.65	22.00
		100	0	20.32	20.36	20.49	21.00

LTE Band 4				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393	Tune up
1.4MHz	QPSK	1	0	21.67	21.85	21.91	23.00
		1	2	21.66	21.89	21.83	23.00
		1	5	21.68	21.89	21.79	23.00
		3	0	21.73	21.94	21.75	22.00
		3	2	21.68	21.98	21.74	22.00
		3	3	21.77	21.92	21.76	22.00
		6	0	20.56	20.88	20.75	22.00
	16QAM	1	0	20.8	21.19	20.55	22.00
		1	2	20.78	21.05	20.54	22.00
		1	5	20.81	21.03	20.54	22.00
		3	0	20.62	20.82	20.57	21.00
		3	2	20.6	20.87	20.56	21.00
		3	3	20.59	20.85	20.59	21.00
		6	0	19.82	20.04	20.03	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385	Tune up
3MHz	QPSK	1	0	21.62	21.8	21.85	23.00
		1	7	21.63	21.84	21.9	23.00
		1	14	21.65	21.87	21.94	23.00
		8	0	20.66	20.95	20.76	22.00
		8	4	20.64	20.87	20.67	22.00
		8	7	20.7	20.95	20.78	22.00
		15	0	20.74	20.95	20.73	22.00
	16QAM	1	0	20.53	21.81	20.85	22.00
		1	7	20.52	21.81	20.8	22.00
		1	14	20.49	21.71	20.8	22.00
		8	0	19.98	20.18	20.04	21.00
		8	4	20.01	20.17	20.1	21.00
		8	7	19.99	20.2	20.08	21.00
		15	0	19.9	20.1	19.89	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 19975	Channel 20175	Channel 20375	Tune up
5MHz	QPSK	1	0	21.72	21.82	21.66	23.00

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		1	13	21.68	21.74	21.65	23.00
		1	24	21.62	21.76	21.63	23.00
		12	0	20.74	20.82	20.72	22.00
		12	6	20.61	20.84	20.69	22.00
		12	13	20.59	20.85	20.69	22.00
		25	0	20.64	20.85	20.77	22.00
	16QAM	1	0	19.84	19.84	20.78	21.00
		1	13	19.77	19.77	20.73	21.00
		1	24	19.81	19.81	20.77	21.00
		12	0	19.9	19.9	19.84	21.00
		12	6	19.82	19.82	19.95	21.00
		12	13	19.81	19.81	19.90	21.00
		25	0	19.90	19.90	19.91	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20000	20175	20350	
10MHz	QPSK	1	0	21.58	22	21.78	23.00
		1	25	21.54	21.86	21.79	23.00
		1	49	21.86	21.78	21.79	23.00
		25	0	20.55	20.9	20.84	22.00
		25	13	20.75	20.93	20.72	22.00
		25	25	20.75	20.92	20.67	22.00
		50	0	20.72	21.02	20.75	22.00
	16QAM	1	0	20.94	20.5	21.32	22.00
		1	25	20.94	20.44	21.28	22.00
		1	49	21.21	20.42	21.31	22.00
		25	0	19.82	20.26	19.93	21.00
		25	13	19.76	20.23	19.93	21.00
		25	25	19.98	20.19	19.87	21.00
		50	0	19.83	20.05	19.94	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20025	20175	20325	
15MHz	QPSK	1	0	21.61	21.86	21.88	23.00
		1	38	21.66	21.79	21.82	23.00
		1	74	21.88	21.68	21.72	23.00
		36	0	20.69	21.03	20.70	22.00
		36	18	20.88	20.87	20.83	22.00
		36	39	21.09	20.85	20.61	22.00
		75	0	20.82	20.9	20.76	22.00
	16QAM	1	0	20.93	21.37	21.39	22.00
		1	38	21.04	21.29	21.34	22.00
		1	74	21.21	21.2	21.27	22.00
		36	0	19.88	20.18	20.01	21.00
		36	18	20.07	20.05	19.96	21.00
		36	39	20.28	20.06	19.94	21.00
		75	0	20.05	20.08	20.00	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20050	20175	20300	
20MHz	QPSK	1	0	21.81	22.1	21.85	22.00

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中国・江苏・昆山开发区伟业路10号 邮编：215300 t(86-512) 57355888 f(86-512) 57370818 sgs.china@sgs.com

		1	50	**22.11**	21.99	21.80	**22.00**
		1	99	21.99	21.85	21.80	22.00
		50	0	20.71	20.95	20.82	22.00
		50	25	20.94	20.87	20.82	22.00
		50	50	**21.05**	20.89	20.80	**22.00**
		100	0	20.96	20.94	20.76	22.00
	16QAM	1	0	20.66	21.9	21.38	21.00
		1	50	21.08	21.7	21.33	21.00
		1	99	20.99	21.59	21.21	21.00
		50	0	19.83	20.1	20.11	21.00
		50	25	20.15	20.06	20.06	21.00
		50	50	20.17	20	20.03	21.00
		100	0	20.1	20.1	19.95	21.00

LTE Band 5				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 20407	Channel 20525	Channel 20643	Tune up
1.4MHz	QPSK	1	0	22.53	22.70	22.60	24.00
		1	2	22.57	22.57	22.68	24.00
		1	5	22.58	22.59	22.69	24.00
		3	0	22.68	22.66	22.67	24.00
		3	2	22.72	22.65	22.62	24.00
		3	3	22.66	22.66	22.63	24.00
		6	0	21.58	21.63	21.59	23.00
	16QAM	1	0	21.79	22.02	21.69	23.00
		1	2	21.77	21.86	21.71	23.00
		1	5	21.73	21.88	21.72	23.00
		3	0	21.54	21.68	21.58	23.00
		3	2	21.58	21.75	21.63	23.00
		3	3	21.56	21.70	21.54	23.00
		6	0	20.74	20.89	20.76	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 20415	Channel 20525	Channel 20635	Tune up
3MHz	QPSK	1	0	22.72	22.78	22.45	24.00
		1	7	22.71	22.55	22.57	24.00
		1	14	22.69	22.53	22.54	24.00
		8	0	21.61	21.77	21.69	23.00
		8	4	21.63	21.59	21.61	23.00
		8	7	21.68	21.56	21.62	23.00
		15	0	21.57	21.66	21.62	23.00
	16QAM	1	0	21.14	22.71	21.94	23.00
		1	7	21.13	22.47	21.95	23.00
		1	14	21.23	22.42	21.94	23.00
		8	0	20.88	20.94	20.91	22.00
		8	4	20.90	20.74	20.91	22.00
		8	7	20.88	20.77	20.91	22.00
		15	0	20.74	20.76	20.68	22.00

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Bandwidth	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625	Tune up
5MHz	QPSK	1	0	22.52	22.80	22.54	24.00
		1	13	22.56	22.55	22.56	24.00
		1	24	22.58	22.49	22.59	24.00
		12	0	21.57	21.82	21.48	23.00
		12	6	21.68	21.65	21.56	23.00
		12	13	21.64	21.67	21.66	23.00
		25	0	21.63	21.61	21.58	23.00
	16QAM	1	0	20.84	21.96	21.61	22.00
		1	13	20.79	21.68	21.70	22.00
		1	24	20.83	21.76	21.76	22.00
		12	0	20.69	20.92	20.60	22.00
		12	6	20.66	20.71	20.64	22.00
		12	13	20.67	20.65	20.68	22.00
		25	0	20.74	20.80	20.61	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600	Tune up
10MHz	QPSK	1	0	22.63	22.67	22.69	24.00
		1	25	22.56	22.68	22.61	24.00
		1	49	22.71	22.60	**22.74**	**24.00**
		25	0	21.70	**21.85**	21.59	**23.00**
		25	13	21.70	21.55	21.50	23.00
		25	25	21.67	21.58	21.57	23.00
		50	0	21.68	21.61	21.48	23.00
	16QAM	1	0	22.06	21.20	21.86	23.00
		1	25	22.06	21.12	21.74	23.00
		1	49	22.23	21.10	21.86	23.00
		25	0	20.68	21.07	20.73	22.00
		25	13	20.77	20.82	20.72	22.00
		25	25	20.86	20.90	20.72	22.00
		50	0	20.70	20.66	20.73	22.00

LTE Band 7				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 20775	Channel 21100	Channel 21425	Tune up
5MHz	QPSK	1	0	21.83	21.86	22.26	23.00
		1	13	21.89	21.89	22.24	23.00
		1	24	21.84	21.94	22.41	23.00
		12	0	21.21	20.87	21.39	22.00
		12	6	21.05	20.87	21.32	22.00
		12	13	21.16	20.83	21.35	22.00
		25	0	21.01	20.74	21.29	22.00
	16QAM	1	0	21.17	20.64	20.52	22.00
		1	13	21.16	20.69	20.41	22.00
		1	24	21.24	20.65	20.44	22.00
		12	0	20.12	19.82	20.51	21.00

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		12	6	20.12	19.82	20.41	21.00
		12	13	20.14	19.85	20.43	21.00
		25	0	20.29	19.89	20.54	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 20800	Channel 21100	Channel 21400	Tune up
10MHz	QPSK	1	0	22.01	21.86	22.18	23.00
		1	25	22.02	21.85	22.20	23.00
		1	49	21.99	21.94	22.29	23.00
		25	0	21.09	20.85	21.16	22.00
		25	13	21.02	20.80	21.15	22.00
		25	25	20.99	20.78	21.28	22.00
		50	0	21.17	20.83	21.12	22.00
	16QAM	1	0	21.30	20.34	21.34	22.00
		1	25	21.28	20.38	21.42	22.00
		1	49	21.24	20.38	21.50	22.00
		25	0	20.31	20.09	20.44	21.00
		25	13	20.22	20.10	20.40	21.00
		25	25	20.29	20.11	20.54	21.00
		50	0	20.30	19.99	20.38	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 20825	Channel 21100	Channel 21375	Tune up
15MHz	QPSK	1	0	21.95	21.84	22.11	23.00
		1	38	21.96	21.87	22.19	23.00
		1	74	21.86	22.01	22.25	23.00
		36	0	21.09	20.82	21.19	22.00
		36	18	21.03	20.88	21.20	22.00
		36	39	21.19	20.91	21.23	22.00
		75	0	21.17	20.76	21.11	22.00
	16QAM	1	0	21.62	21.23	21.53	22.00
		1	38	21.55	21.30	21.61	22.00
		1	74	21.35	21.42	21.63	22.00
		36	0	20.28	19.99	20.35	21.00
		36	18	20.39	19.97	20.40	21.00
		36	39	20.22	20.01	20.59	21.00
		75	0	20.14	20.00	20.40	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 20850	Channel 21100	Channel 21350	Tune up
20MHz	QPSK	1	0	**22.28**	21.92	22.10	**23.00**
		1	50	22.00	22.03	22.13	23.00
		1	99	21.83	22.13	22.28	23.00
		50	0	21.08	20.97	21.20	22.00
		50	25	21.12	20.77	**21.25**	**22.00**
		50	50	20.85	20.92	21.13	22.00
		100	0	20.97	20.95	21.07	22.00
	16QAM	1	0	21.04	21.40	21.76	22.00
		1	50	21.00	21.36	21.75	22.00
		1	99	20.80	21.57	21.89	22.00
		50	0	20.38	19.99	20.43	21.00

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		50	25	20.26	19.95	20.39	21.00
		50	50	20.19	19.97	20.44	21.00
		100	0	20.15	20.06	20.32	21.00

LTE Band 38				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 37775	Channel 38000	Channel 38225	Tune up
5MHz	QPSK	1	0	21.97	22.18	22.29	23.00
		1	13	21.96	22.29	22.04	23.00
		1	24	21.94	22.30	22.29	23.00
		12	0	20.86	21.27	21.21	22.00
		12	6	20.96	21.33	21.24	22.00
		12	13	21.07	21.42	21.35	22.00
		25	0	20.96	21.37	21.19	22.00
	16QAM	1	0	20.91	22.03	21.28	22.50
		1	13	20.94	22.13	21.26	22.50
		1	24	20.78	22.19	21.13	22.50
		12	0	19.84	20.32	20.44	21.00
		12	6	20.04	20.34	20.37	21.00
		12	13	19.93	20.36	20.37	21.00
		25	0	19.98	20.74	20.42	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 37800	Channel 38000	Channel 38200	Tune up
10MHz	QPSK	1	0	21.96	22.16	22.35	23.00
		1	25	22.08	22.29	22.32	23.00
		1	49	22.20	22.26	21.77	23.00
		25	0	20.98	21.24	21.25	22.00
		25	13	21.04	21.41	21.23	22.00
		25	25	21.14	21.36	21.17	22.00
		50	0	20.96	21.27	21.27	22.00
	16QAM	1	0	20.85	21.19	21.22	22.00
		1	25	21.32	21.77	22.38	23.00
		1	49	21.09	21.39	22.41	23.00
		25	0	19.97	20.66	20.43	21.00
		25	13	20.17	20.74	20.53	21.00
		25	25	20.24	20.72	20.36	21.00
		50	0	20.11	20.48	20.67	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 37825	Channel 38000	Channel 38175	Tune up
15MHz	QPSK	1	0	21.56	22.51	22.43	23.00
		1	38	22.80	21.30	22.76	23.00
		1	74	22.48	22.50	22.22	23.00
		36	0	20.90	21.16	21.13	22.00
		36	18	21.08	22.55	21.25	23.00
		36	39	21.03	21.27	21.21	22.00
		75	0	21.19	20.98	21.17	22.00
	16QAM	1	0	21.36	22.38	22.08	23.00

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		1	38	21.69	21.87	22.40	23.00
		1	74	20.77	21.61	22.05	22.50
		36	0	20.11	19.98	20.42	21.00
		36	18	20.44	20.59	20.29	21.00
		36	39	20.08	20.61	20.40	21.00
		75	0	20.33	20.91	20.41	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 37850	Channel 38000	Channel 38150	Tune up
20MHz	QPSK	1	0	21.79	22.26	22.11	23.00
		1	50	22.00	**22.46**	22.21	**23.00**
		1	99	22.09	22.42	22.05	23.00
		50	0	20.96	21.17	21.36	22.00
		50	25	21.02	**21.37**	21.33	**22.00**
		50	50	21.16	21.36	21.08	22.00
		100	0	21.07	21.34	21.22	22.00
	16QAM	1	0	21.64	22.00	21.80	23.00
		1	50	21.62	22.16	21.67	23.00
		1	99	21.73	21.69	21.28	22.00
		50	0	20.33	20.47	20.46	22.00
		50	25	20.41	20.52	20.49	22.00
		50	50	20.48	20.59	20.37	22.00
		100	0	20.25	20.46	20.51	22.00

LTE Band 40a				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel 38725	Channel 38750	Channel 38785	Tune up
5MHz	QPSK	1	0	20.46	20.47	20.67	21.00
		1	13	20.53	20.49	20.55	21.00
		1	24	20.39	20.51	20.55	21.00
		12	0	19.45	19.56	19.42	21.00
		12	6	19.47	19.44	19.49	21.00
		12	13	19.57	19.50	19.51	21.00
		25	0	19.44	19.51	19.52	21.00
	16QAM	1	0	19.45	19.37	20.32	21.00
		1	13	20.27	19.35	19.43	21.00
		1	24	19.42	20.34	19.45	21.00
		12	0	18.49	18.45	18.54	20.00
		12	6	18.41	18.58	18.72	20.00
		12	13	18.55	18.48	18.52	20.00
		25	0	18.69	18.58	18.61	20.00
Bandwidth	Modulation	RB size	RB offset	Channel /	Channel 38750	Channel /	Tune up
10MHz	QPSK	1	0	/	20.40	/	21.00
		1	25	/	**20.57**	/	**21.00**
		1	49	/	20.47	/	21.00
		25	0	/	19.47	/	21.00
		25	13	/	**19.56**	/	**21.00**

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		25	25	/	19.44	/	21.00
		50	0	/	19.51	/	21.00
	16QAM	1	0	/	19.93	/	21.00
		1	25	/	19.39	/	21.00
		1	49	/	19.88	/	21.00
		25	0	/	18.68	/	20.00
		25	13	/	18.82	/	20.00
		25	25	/	18.62	/	20.00
		50	0	/	18.67	/	20.00

LTE Band 40b				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				39175	39200	39225	
5MHz	QPSK	1	0	20.79	20.90	20.81	21.00
		1	13	20.92	20.67	20.82	21.00
		1	24	20.77	20.98	20.94	21.00
		12	0	19.71	19.60	19.73	21.00
		12	6	19.64	19.72	19.71	21.00
		12	13	19.59	19.79	19.81	21.00
		25	0	19.64	19.76	19.74	21.00
	16QAM	1	0	19.33	20.84	20.21	21.00
		1	13	19.88	20.03	20.61	21.00
		1	24	20.82	20.21	19.53	21.00
		12	0	18.81	18.63	18.80	20.00
		12	6	18.68	19.00	18.78	20.00
		12	13	18.70	18.90	18.86	20.00
		25	0	18.85	18.84	18.96	20.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
					39200		
10MHz	QPSK	1	0		20.77		21.00
		1	25		20.99		21.00
		1	49		**21.08**		**22.00**
		25	0		19.74		21.00
		25	13		19.72		21.00
		25	25		**19.86**		**21.00**
		50	0		19.74		21.00
	16QAM	1	0		20.18		21.00
		1	25		20.61		21.00
		1	49		20.23		21.00
		25	0		18.74		20.00
		25	13		19.00		20.00
		25	25		19.13		20.00
		50	0		18.90		20.00

LTE Band 41	Conducted Power(dBm)	Tune up

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Bandwidth	Modulation	RB size	RB offset	Channel 39675	Channel 40620	Channel 41565	
5MHz	QPSK	1	0	21.22	22.21	21.52	23.00
		1	13	21.28	22.20	21.62	23.00
		1	24	21.23	22.21	21.77	23.00
		12	0	20.25	21.29	20.71	22.00
		12	6	20.34	21.35	20.70	22.00
		12	13	20.41	21.31	20.76	22.00
		25	0	20.20	21.29	20.73	22.00
	16QAM	1	0	19.75	21.57	20.69	22.00
		1	13	20.26	21.84	20.57	22.00
		1	24	20.11	21.52	20.94	22.00
		12	0	19.24	20.24	19.85	21.00
		12	6	19.28	20.36	19.83	21.00
		12	13	19.33	20.28	19.85	21.00
		25	0	19.37	20.62	19.77	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 39700	Channel 40620	Channel 41540	Tune up
10MHz	QPSK	1	0	21.32	22.02	21.83	23.00
		1	25	21.33	22.14	21.69	23.00
		1	49	21.21	22.23	21.63	23.00
		25	0	20.27	21.27	20.69	22.00
		25	13	20.36	21.32	20.59	22.00
		25	25	20.27	21.40	20.62	22.00
		50	0	20.36	21.24	20.66	22.00
	16QAM	1	0	20.50	21.22	21.79	22.00
		1	25	20.64	21.64	21.82	22.00
		1	49	20.37	21.55	21.84	22.00
		25	0	19.28	20.64	19.90	21.00
		25	13	19.39	20.61	20.01	21.00
		25	25	19.52	20.84	19.88	21.00
		50	0	19.54	20.33	19.94	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 39725	Channel 40620	Channel 41515	Tune up
15MHz	QPSK	1	0	21.27	22.32	21.84	23.00
		1	38	21.37	22.31	21.73	23.00
		1	74	21.34	22.43	21.68	23.00
		36	0	20.32	21.18	20.69	22.00
		36	18	20.23	21.24	20.75	22.00
		36	39	20.23	21.25	20.61	22.00
		75	0	20.34	21.25	20.78	22.00
	16QAM	1	0	20.37	21.37	21.86	22.00
		1	38	20.68	21.75	21.71	22.00
		1	74	20.21	21.43	21.60	22.00
		36	0	19.33	20.44	20.03	21.00
		36	18	19.41	20.48	20.01	21.00
		36	39	19.42	20.60	19.78	21.00
		75	0	19.41	20.36	19.88	21.00

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Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				39750	40620	41490	
20MHz	QPSK	1	0	21.05	22.16	21.66	23.00
		1	50	21.14	**22.36**	21.62	**23.00**
		1	99	21.26	22.26	21.67	23.00
		50	0	20.35	21.15	20.72	22.00
		50	25	20.30	21.17	20.69	22.00
		50	50	20.27	**21.36**	20.57	**22.00**
		100	0	20.26	21.19	20.85	22.00
	16QAM	1	0	20.90	21.61	20.88	22.00
		1	50	21.42	21.54	21.29	22.00
		1	99	20.97	21.59	20.76	22.00
		50	0	19.60	20.42	20.02	21.00
		50	25	19.71	20.41	20.01	21.00
		50	50	19.60	20.44	19.90	21.00
		100	0	19.54	20.44	20.02	21.00

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8.1.4 Conducted Power Of Wi-Fi

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Tune up
802.11b	1	2412	1	13.61	14.00
	6	2437		13.19	14.00
	11	2462		**13.99**	**14.00**
802.11g	1	2412	6	12.98	14.00
	6	2437		12.80	14.00
	11	2462		13.44	14.00
802.11n HT20 SISO	1	2412	6.5	13.00	14.00
	6	2437		12.88	14.00
	11	2462		13.51	14.00
802.11n HT40 SISO	3	2422	13.5	11.79	12.00
	6	2437		11.92	12.00
	9	2452		11.05	12.00

5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11a	U-NII-1	36	5180	6	10.22	11.00
		40	5200		10.09	11.00
		48	5240		10.93	11.00
	U-NII-2A	52	5260		12.18	13.00
		60	5300		12.10	13.00
		64	5320		**12.74**	**13.00**
	U-NII-2C	100	5500		13.50	14.00
		116	5580		**13.65**	**14.00**
		140	5700		13.33	14.00
	U-NII-3	149	5745		13.05	14.00
		157	5785		13.6	14.00
		165	5825		13.93	14.00
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11n-HT20	U-NII-1	36	5180	MCS0	10.21	11.00
		40	5200		10.01	11.00
		48	5240		10.93	11.00
	U-NII-2A	52	5260		12.5	13.00
		60	5300		12.09	13.00
		64	5320		12.52	13.00
	U-NII-2C	100	5500		12.49	13.00
		116	5580		12.35	13.00
		140	5700		12.17	13.00
	U-NII-3	149	5745		**12.96**	**13.00**
		157	5785		12.39	13.00

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		165	5825		12.77	13.00
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11n-HT40	U-NII-1	38	5190	MCS0	10.10	11.00
		46	5230		10.55	11.00
	U-NII-2A	54	5270		11.35	12.00
		62	5310		11.58	12.00
	U-NII-2C	102	5510		12.67	13.00
		110	5550		12.51	13.00
		134	5670		12.19	13.00
	U-NII-3	151	5755		12.85	13.00
		159	5795		12.81	13.00
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11ac 20M	U-NII-1	36	5180	MCS0	10.23	11.00
		40	5200		10.32	11.00
		48	5240		10.64	11.00
	U-NII-2A	52	5260		11.91	12.00
		60	5300		11.79	12.00
		64	5320		11.42	12.00
	U-NII-2C	100	5500		12.59	13.00
		116	5580		12.49	13.00
		140	5700		12.2	13.00
	U-NII-3	149	5745		12.90	13.00
		157	5785		12.46	13.00
		165	5825		12.86	13.00
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11ac 40M	U-NII-1	38	5190	MCS0	10.20	11.00
		46	5230		10.03	11.00
	U-NII-2A	54	5270		11.84	12.00
		62	5310		11.61	12.00
	U-NII-2C	102	5510		11.27	13.00
		110	5550		11.98	12.00
		134	5670		11.61	12.00
	U-NII-3	151	5755		11.64	12.00
		159	5795		11.95	12.00
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11ac 80M	U-NII-1	42	5210	MCS0	10.19	11.00
	U-NII-2A	58	5290		10.48	11.00
	U-NII-2C	106	5530		10.38	11.00
		122	5610		10.64	11.00
	U-NII-3	155	5775		10.94	11.00

Note:

a) Power must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band.

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b) 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.

c) 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.

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8.1.5 Conducted Power Of BT

BT			Average Conducted Power(dBm)	Tune up (dBm)
Modulation	Channel	Frequency (MHz)		
GFSK	0	2402	8.82	9.00
	39	2441	8.42	9.00
	78	2480	7.77	9.00
π/4DQPSK	0	2402	10.58	11.50
	39	2441	11.00	11.50
	78	2480	10.42	11.50
8DPSK	0	2402	10.81	12.00
	39	2441	**11.21**	**12.00**
	78	2480	10.64	12.00

BLE_1M			Average Conducted Power(dBm)	Tune up (dBm)
Modulation	Channel	Frequency (MHz)		
GFSK	0	2402	0.21	1.00
	19	2440	0.89	1.00
	39	2480	-0.24	1.00

BLE_2M			Average Conducted Power(dBm)	Tune up (dBm)
Modulation	Channel	Frequency (MHz)		
GFSK	0	2402	0.06	1.00
	19	2440	0.59	1.00
	39	2480	-0.02	1.00

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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 FCC KDB Publication 447498 D04, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg (2.0W/kg for 10g) then testing at the other channels is not required for such test configuration(s).

3) "*" is repeated measurement.

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 ≤ 3.0 W/kg, SAR test for the other 802.11 modes are not required.

WiFi 5G:

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. As the highest reported SAR for a test configuration is ≤ 3.0 W/kg, SAR is not required for U-NII-1 band for that configuration.

2) 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 ≤ 3.0 W/kg, SAR test for the other 802.11 modes are not required.

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8.2.1 SAR Result Of GSM 850

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 (W/kg) 10-g	Liquid Temp	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	GPRS 2TS	128/824.2	1:4.15	0.047	0.038	0.1	31.08	32.00	1.236	0.047	22.1	4.0
Back side	GPRS 2TS	128/824.2	1:4.15	0.901	0.551	0.01	31.08	32.00	1.236	**0.681**	22.1	4.0
Left side	GPRS 2TS	128/824.2	1:4.15	0.214	0.153	0.02	31.08	32.00	1.236	0.189	22.1	4.0
Right side	GPRS 2TS	128/824.2	1:4.15	0.110	0.079	-0.02	31.08	32.00	1.236	0.098	22.1	4.0
Top side	GPRS 2TS	128/824.2	1:4.15	0.129	0.097	-0.06	31.08	32.00	1.236	0.119	22.1	4.0
Bottom side	GPRS 2TS	128/824.2	1:4.15	0.003	0.002	-0.15	31.08	32.00	1.236	0.002	22.1	4.0
Back side	EGPRS 2TS	251/848.8	1:4.15	0.775	0.421	0.03	24.53	25.00	1.114	0.469	22.1	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	GPRS 2TS	128/824.2	1:4.15	0.875	0.523	0.04	31.08	32.00	1.236	0.646	22.1	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	GPRS 2TS	128/824.2	1:4.15	0.853	0.508	0.01	31.08	32.00	1.236	0.628	22.1	4.0

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8.2.2 SAR Result Of PCS 1900

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 (W/kg) 10-g	Liquid Temp	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	GPRS 3TS	512/1850.2	1:2.77	0.14	0.098	-0.02	26.27	27.00	1.183	0.116	22.3	4.0
Back side	GPRS 3TS	512/1850.2	1:2.77	2.75	1.42	0.01	26.27	27.00	1.183	**1.680**	22.3	4.0
Left side	GPRS 3TS	512/1850.2	1:2.77	0.631	0.384	0.1	26.27	27.00	1.183	0.455	22.3	4.0
Right side	GPRS 3TS	512/1850.2	1:2.77	0.32	0.20	-0.08	26.27	27.00	1.183	0.234	22.3	4.0
Top side	GPRS 3TS	512/1850.2	1:2.77	0.387	0.246	-0.16	26.27	27.00	1.183	0.290	22.3	4.0
Bottom side	GPRS 3TS	512/1850.2	1:2.77	0.01	0.01	0.06	26.27	27.00	1.183	0.006	22.3	4.0
Back side	EGPRS 2TS	512/1850.2	1:2.77	2.24	1.25	0.02	24.18	25.00	1.208	1.510	22.3	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	GPRS 3TS	512/1850.2	1:2.075	2.54	1.38	0.08	26.27	27.00	1.183	1.633	22.3	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	GPRS 3TS	512/1850.2	1:2.075	2.34	1.21	0.08	26.27	27.00	1.183	1.431	22.3	4.0

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8.2.3 SAR Result Of WCDMA Band II

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 (W/kg) 10-g	Liquid Temp	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	RMC	9538/1907.6	1:1	0.270	0.179	-0.06	22.75	24.00	1.334	0.238	22.3	4.0
Back side	RMC	9538/1907.6	1:1	5.08	2.65	-0.09	22.75	24.00	1.334	**3.534**	22.3	4.0
Left side	RMC	9538/1907.6	1:1	1.197	0.735	-0.03	22.75	24.00	1.334	0.980	22.3	4.0
Right side	RMC	9538/1907.6	1:1	0.616	0.373	0.12	22.75	24.00	1.334	0.498	22.3	4.0
Top side	RMC	9538/1907.6	1:1	0.726	0.459	-0.03	22.75	24.00	1.334	0.612	22.3	4.0
Bottom side	RMC	9538/1907.6	1:1	0.020	0.01	0.1	22.75	24.00	1.334	0.016	22.3	4.0
Back side	RMC	9262/1852.4	1:1	4.61	2.41	0.07	22.37	24.00	1.455	3.508	22.3	4.0
Back side	RMC	9400/1880	1:1	4.91	2.59	0.03	22.71	24.00	1.346	3.486	22.3	4.0
Back side-Repeated	RMC	9538/1907.6	1:1	4.93	2.56	0.07	22.75	24.00	1.334	3.414	22.3	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	RMC	9538/1907.6	1:1	4.89	2.53	0.07	22.75	24.00	1.334	3.374	22.3	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	RMC	9538/1907.6	1:1	4.96	2.58	-0.11	22.75	24.00	1.334	3.440	22.3	4.0

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8.2.4 SAR Result Of WCDMA Band V

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 (W/kg) 10-g	Liquid Temp	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	RMC	4182/836.4	1:1	0.050	0.039	-0.15	23.14	24.00	1.219	0.047	22.1	4.0
Back side	RMC	4182/836.4	1:1	0.932	0.563	0.02	23.14	24.00	1.219	**0.686**	22.1	4.0
Left side	RMC	4182/836.4	1:1	0.220	0.155	-0.17	23.14	24.00	1.219	0.189	22.1	4.0
Right side	RMC	4182/836.4	1:1	0.113	0.080	-0.05	23.14	24.00	1.219	0.098	22.1	4.0
Top side	RMC	4182/836.4	1:1	0.133	0.099	-0.08	23.14	24.00	1.219	0.120	22.1	4.0
Bottom side	RMC	4182/836.4	1:1	0.003	0.002	0.17	23.14	24.00	1.219	0.002	22.1	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	RMC	4182/836.4	1:1	0.878	0.514	0.04	23.14	24.00	1.219	0.627	22.1	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	RMC	4182/836.4	1:1	0.902	0.531	0.06	23.14	24.00	1.219	0.647	22.1	4.0

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8.2.5 SAR Result Of LTE Band 2

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	20M_QPSK 1RB_99	18900/1880	1:1	0.241	0.160	0.09	22.49	23.00	1.125	0.180	22.3	4.0
Back side	20M_QPSK 1RB_99	18900/1880	1:1	4.61	2.37	0.03	22.49	23.00	1.125	**2.665**	22.3	4.0
Left side	20M_QPSK 1RB_99	18900/1880	1:1	1.10	0.658	-0.09	22.49	23.00	1.125	0.740	22.3	4.0
Right side	20M_QPSK 1RB_99	18900/1880	1:1	0.562	0.336	-0.07	22.49	23.00	1.125	0.378	22.3	4.0
Top side	20M_QPSK 1RB_99	18900/1880	1:1	0.667	0.412	0.12	22.49	23.00	1.125	0.463	22.3	4.0
Bottom side	20M_QPSK 1RB_99	18900/1880	1:1	0.020	0.010	0.01	22.49	23.00	1.125	0.012	22.3	4.0
Back side	20M_QPSK 1RB_99	18700/1860	1:1	4.32	2.18	0.09	22.35	23.00	1.161	2.532	22.3	4.0
Back side	20M_QPSK 1RB_99	19100/1900	1:1	4.35	2.21	0.17	22.36	23.00	1.159	2.561	22.3	4.0
Front side	20M_QPSK 50RB_50	19100/1900	1:1	0.168	0.113	0.12	21.39	22.00	1.151	0.130	22.3	4.0
Back side	20M_QPSK 50RB_50	19100/1900	1:1	3.14	1.61	0.12	21.39	22.00	1.151	1.857	22.3	4.0
Left side	20M_QPSK 50RB_50	19100/1900	1:1	0.748	0.450	-0.15	21.39	22.00	1.151	0.518	22.3	4.0
Right side	20M_QPSK 50RB_50	19100/1900	1:1	0.383	0.232	0.13	21.39	22.00	1.151	0.267	22.3	4.0
Top side	20M_QPSK 50RB_50	19100/1900	1:1	0.456	0.284	-0.13	21.39	22.00	1.151	0.326	22.3	4.0
Bottom side	20M_QPSK 50RB_50	19100/1900	1:1	0.016	0.008	-0.01	21.39	22.00	1.151	0.009	22.3	4.0
Back side	20M_QPSK 50RB_50	18700/1860	1:1	2.94	1.49	0.13	21.06	22.00	1.242	1.845	22.3	4.0
Back side	20M_QPSK 50RB_50	18900/1880	1:1	2.96	1.50	0.04	21.17	22.00	1.211	1.820	22.3	4.0
Back side-Repeated	20M_QPSK 1RB_99	18900/1880	1:1	4.54	2.32	0.1	22.49	23.00	1.125	2.609	22.3	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	20M_QPSK 1RB_99	18900/1880	1:1	4.32	2.21	-0.1	22.49	23.00	1.125	2.485	22.3	4
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	20M_QPSK 1RB_99	18900/1880	1:1	4.43	2.33	0.09	22.49	23.00	1.125	2.620	22.3	4

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中国・江苏・昆山开发区伟业路10号 邮编：215300 t(86-512) 57355888 f(86-512) 57370818 sgs.china@sgs.com
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8.2.6 SAR Result Of LTE Band 4

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	20M_QPSK 1RB_50	20050/1720	1:1	0.193	0.132	-0.03	22.11	22.00	0.975	0.129	22.2	4.0
Back side	20M_QPSK 1RB_50	20050/1720	1:1	3.73	1.96	0.05	22.11	22.00	0.975	**1.911**	22.2	4.0
Left side	20M_QPSK 1RB_50	20050/1720	1:1	0.878	0.537	0.09	22.11	22.00	0.975	0.524	22.2	4.0
Right side	20M_QPSK 1RB_50	20050/1720	1:1	0.450	0.275	0.03	22.11	22.00	0.975	0.268	22.2	4.0
Top side	20M_QPSK 1RB_50	20050/1720	1:1	0.533	0.337	-0.03	22.11	22.00	0.975	0.329	22.2	4.0
Bottom side	20M_QPSK 1RB_50	20050/1720	1:1	0.011	0.006	0.01	22.11	22.00	0.975	0.006	22.2	4.0
Front side	20M_QPSK 50RB_50	20050/1720	1:1	0.138	0.096	0.07	21.05	22.00	1.245	0.120	22.2	4.0
Back side	20M_QPSK 50RB_50	20050/1720	1:1	2.61	1.38	-0.03	21.05	22.00	1.245	1.712	22.2	4.0
Left side	20M_QPSK 50RB_50	20050/1720	1:1	0.618	0.381	0.05	21.05	22.00	1.245	0.474	22.2	4.0
Right side	20M_QPSK 50RB_50	20050/1720	1:1	0.316	0.197	0.08	21.05	22.00	1.245	0.245	22.2	4.0
Top side	20M_QPSK 50RB_50	20050/1720	1:1	0.375	0.237	0.18	21.05	22.00	1.245	0.294	22.2	4.0
Bottom side	20M_QPSK 50RB_50	20050/1720	1:1	0.008	0.004	-0.17	21.05	22.00	1.245	0.005	22.2	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	20M_QPSK 1RB_50	20050/1720	1:1	3.61	1.81	0.01	22.11	22.00	0.975	1.765	22.2	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	20M_QPSK 1RB_50	20050/1720	1:1	3.49	1.75	-0.04	22.11	22.00	0.975	1.706	22.2	4.0

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8.2.7 SAR Result Of LTE Band 5

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	10M_QPSK 1RB_49	20600/844	1:1	0.040	0.031	-0.06	22.74	24.00	1.337	0.041	22.1	4.0
Back side	10M_QPSK 1RB_49	20600/844	1:1	0.750	0.453	0.08	22.74	24.00	1.337	**0.605**	22.1	4.0
Left side	10M_QPSK 1RB_49	20600/844	1:1	0.177	0.125	-0.1	22.74	24.00	1.337	0.168	22.1	4.0
Right side	10M_QPSK 1RB_49	20600/844	1:1	0.091	0.065	-0.14	22.74	24.00	1.337	0.086	22.1	4.0
Top side	10M_QPSK 1RB_49	20600/844	1:1	0.107	0.079	-0.02	22.74	24.00	1.337	0.105	22.1	4.0
Bottom side	10M_QPSK 1RB_49	20600/844	1:1	0.003	0.002	-0.08	22.74	24.00	1.337	0.002	22.1	4.0
Front side	10M_QPSK 25RB_0	20525/836.5	1:1	0.03	0.027	-0.18	21.85	23.00	1.303	0.036	22.1	4.0
Back side	10M_QPSK 25RB_0	20525/836.5	1:1	0.56	0.34	-0.16	21.85	23.00	1.303	0.449	22.1	4.0
Left side	10M_QPSK 25RB_0	20525/836.5	1:1	0.136	0.094	0.03	21.85	23.00	1.303	0.123	22.1	4.0
Right side	10M_QPSK 25RB_0	20525/836.5	1:1	0.070	0.052	0.03	21.85	23.00	1.303	0.067	22.1	4.0
Top side	10M_QPSK 25RB_0	20525/836.5	1:1	0.084	0.064	0.12	21.85	23.00	1.303	0.083	22.1	4.0
Bottom side	10M_QPSK 25RB_0	20525/836.5	1:1	0.003	0.001	-0.01	21.85	23.00	1.303	0.001	22.1	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	10M_QPSK 1RB_49	20600/844	1:1	0.721	0.435	0.09	22.74	24.00	1.337	0.581	22.1	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	10M_QPSK 1RB_49	20600/844	1:1	0.711	0.421	0.03	22.74	24.00	1.337	0.563	22.1	4.0

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8.2.8 SAR Result Of LTE Band 7

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	20M_QPSK 1RB_0	20850/2510	1:1	0.108	0.062	0.03	22.28	23.00	1.180	0.073	22.1	4.0
Back side	20M_QPSK 1RB_0	20850/2510	1:1	5.17	2.31	-0.06	22.28	23.00	1.180	**2.727**	22.1	4.0
Left side	20M_QPSK 1RB_0	20850/2510	1:1	0.665	0.345	0.09	22.28	23.00	1.180	0.407	22.1	4.0
Right side	20M_QPSK 1RB_0	20850/2510	1:1	1.01	0.525	0.06	22.28	23.00	1.180	0.620	22.1	4.0
Top side	20M_QPSK 1RB_0	20850/2510	1:1	0.797	0.445	-0.06	22.28	23.00	1.180	0.525	22.1	4.0
Bottom side	20M_QPSK 1RB_0	20850/2510	1:1	0.007	0.002	0.06	22.28	23.00	1.180	0.003	22.1	4.0
Back side	20M_QPSK 1RB_0	21100/2535.5	1:1	4.63	2.05	0.02	21.92	23.00	1.282	2.629	22.1	4.0
Back side	20M_QPSK 1RB_0	21350/2560	1:1	4.71	2.13	0.01	22.10	23.00	1.230	2.620	22.1	4.0
Front side	20M_QPSK 50RB_25	21350/2560	1:1	0.078	0.044	0.15	21.25	22.00	1.189	0.052	22.1	4.0
Back side	20M_QPSK 50RB_25	21350/2560	1:1	3.62	1.62	0.1	21.25	22.00	1.189	1.927	22.1	4.0
Left side	20M_QPSK 50RB_25	21350/2560	1:1	0.467	0.244	0.1	21.25	22.00	1.189	0.290	22.1	4.0
Right side	20M_QPSK 50RB_25	21350/2560	1:1	0.708	0.370	-0.07	21.25	22.00	1.189	0.440	22.1	4.0
Top side	20M_QPSK 50RB_25	21350/2560	1:1	0.560	0.315	-0.15	21.25	22.00	1.189	0.375	22.1	4.0
Bottom side	20M_QPSK 50RB_25	21350/2560	1:1	0.005	0.001	-0.14	21.25	22.00	1.189	0.001	22.1	4.0
Back side-Repeated	20M_QPSK 1RB_0	20850/2510	1:1	5.12	2.28	-0.17	22.28	23.00	1.180	2.691	22.1	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	20M_QPSK 1RB_0	20850/2510	1:1	5.08	2.27	0.06	22.28	23.00	1.180	2.679	22.1	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	20M_QPSK 1RB_0	20850/2510	1:1	4.85	2.11	-0.06	22.28	23.00	1.180	2.490	22.1	4.0

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8.2.9 SAR Result Of LTE Band 38

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	20M_QPSK 1RB_50	38000/2595	1:1	0.070	0.042	0.1	22.46	23.00	1.132	0.048	22.1	4.0
Back side	20M_QPSK 1RB_50	38000/2595	1:1	3.32	1.46	0.03	22.46	23.00	1.132	**1.653**	22.1	4.0
Left side	20M_QPSK 1RB_50	38000/2595	1:1	0.430	0.222	0.14	22.46	23.00	1.132	0.252	22.1	4.0
Right side	20M_QPSK 1RB_50	38000/2595	1:1	0.652	0.333	-0.16	22.46	23.00	1.132	0.377	22.1	4.0
Top side	20M_QPSK 1RB_50	38000/2595	1:1	0.514	0.283	-0.08	22.46	23.00	1.132	0.320	22.1	4.0
Bottom side	20M_QPSK 1RB_50	38000/2595	1:1	0.008	0.005	-0.04	22.46	23.00	1.132	0.005	22.1	4.0
Front side	20M_QPSK 50RB_25	38000/2595	1:1	0.054	0.036	-0.12	21.37	22.00	1.156	0.042	22.1	4.0
Back side	20M_QPSK 50RB_25	38000/2595	1:1	2.49	1.10	-0.16	21.37	22.00	1.156	1.272	22.1	4.0
Left side	20M_QPSK 50RB_25	38000/2595	1:1	0.325	0.170	-0.14	21.37	22.00	1.156	0.197	22.1	4.0
Right side	20M_QPSK 50RB_25	38000/2595	1:1	0.489	0.250	0.08	21.37	22.00	1.156	0.289	22.1	4.0
Top side	20M_QPSK 50RB_25	38000/2595	1:1	0.386	0.215	0.16	21.37	22.00	1.156	0.248	22.1	4.0
Bottom side	20M_QPSK 50RB_25	38000/2595	1:1	0.006	0.003	-0.11	21.37	22.00	1.156	0.003	22.1	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	20M_QPSK 1RB_50	38000/2595	1:1	3.15	1.31	0.08	22.46	23.00	1.132	1.483	22.1	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	20M_QPSK 1RB_50	38000/2595	1:1	3.23	1.35	-0.09	22.46	23.00	1.132	1.529	22.1	4.0

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8.2.10SAR Result Of LTE Band 40a

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	20M_QPSK 1RB_25	38750/2310	1:1	0.050	0.032	0.07	20.57	21.00	1.104	0.035	22.1	4.0
Back side	20M_QPSK 1RB_25	38750/2310	1:1	2.33	1.08	-0.13	20.57	21.00	1.104	1.192	22.1	4.0
Left side	20M_QPSK 1RB_25	38750/2310	1:1	0.301	0.161	-0.07	20.57	21.00	1.104	0.178	22.1	4.0
Right side	20M_QPSK 1RB_25	38750/2310	1:1	0.458	0.248	0.13	20.57	21.00	1.104	0.273	22.1	4.0
Top side	20M_QPSK 1RB_25	38750/2310	1:1	0.359	0.210	0.02	20.57	21.00	1.104	0.231	22.1	4.0
Bottom side	20M_QPSK 1RB_25	38750/2310	1:1	0.003	0.001	-0.17	20.57	21.00	1.104	0.001	22.1	4.0
Front side	20M_QPSK 25RB_13	38750/2310	1:1	0.038	0.022	0.03	19.56	21.00	1.393	0.031	22.1	4.0
Back side	20M_QPSK 25RB_13	38750/2310	1:1	1.75	0.81	-0.15	19.56	21.00	1.393	1.133	22.1	4.0
Left side	20M_QPSK 25RB_13	38750/2310	1:1	0.229	0.124	-0.09	19.56	21.00	1.393	0.172	22.1	4.0
Right side	20M_QPSK 25RB_13	38750/2310	1:1	0.347	0.189	0.18	19.56	21.00	1.393	0.263	22.1	4.0
Top side	20M_QPSK 25RB_13	38750/2310	1:1	0.274	0.162	-0.12	19.56	21.00	1.393	0.226	22.1	4.0
Bottom side	20M_QPSK 25RB_13	38750/2310	1:1	0.003	0.001	-0.01	19.56	21.00	1.393	0.001	22.1	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	20M_QPSK 1RB_25	38750/2310	1:1	2.15	1.01	0.08	20.57	21.00	1.104	1.115	22.1	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	20M_QPSK 1RB_25	38750/2310	1:1	1.93	0.965	0.03	20.57	21.00	1.104	1.065	22.1	4.0

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8.2.11SAR Result Of LTE Band 40b

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	20M_QPSK 1RB_49	39200/2355	1:1	0.059	0.035	0.05	21.08	22.00	1.236	0.043	22.1	4.0
Back side	20M_QPSK 1RB_49	39200/2355	1:1	2.68	1.25	0.06	21.08	22.00	1.236	**1.545**	22.1	4.0
Left side	20M_QPSK 1RB_49	39200/2355	1:1	0.346	0.189	0.02	21.08	22.00	1.236	0.234	22.1	4.0
Right side	20M_QPSK 1RB_49	39200/2355	1:1	0.525	0.288	-0.04	21.08	22.00	1.236	0.355	22.1	4.0
Top side	20M_QPSK 1RB_49	39200/2355	1:1	0.417	0.241	-0.04	21.08	22.00	1.236	0.298	22.1	4.0
Bottom side	20M_QPSK 1RB_49	39200/2355	1:1	0.007	0.003	-0.1	21.08	22.00	1.236	0.003	22.1	4.0
Front side	20M_QPSK 25RB_25	39200/2355	1:1	0.055	0.031	-0.17	19.86	21.00	1.300	0.040	22.1	4.0
Back side	20M_QPSK 25RB_25	39200/2355	1:1	2.41	1.13	0.19	19.86	21.00	1.300	1.467	22.1	4.0
Left side	20M_QPSK 25RB_25	39200/2355	1:1	0.313	0.173	-0.15	19.86	21.00	1.300	0.225	22.1	4.0
Right side	20M_QPSK 25RB_25	39200/2355	1:1	0.478	0.259	0.07	19.86	21.00	1.300	0.337	22.1	4.0
Top side	20M_QPSK 25RB_25	39200/2355	1:1	0.378	0.219	-0.15	19.86	21.00	1.300	0.285	22.1	4.0
Bottom side	20M_QPSK 25RB_25	39200/2355	1:1	0.004	0.001	-0.04	19.86	21.00	1.300	0.001	22.1	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	20M_QPSK 1RB_25	39200/2355	1:1	2.45	1.18	0.09	21.08	22.00	1.236	1.458	22.1	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	20M_QPSK 1RB_25	39200/2355	1:1	2.31	1.06	0.08	21.08	22.00	1.236	1.310	22.1	4.0

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8.2.12SAR Result Of LTE Band 41

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 (W/kg) 10-g	Liquid Temp	SAR limit (W/kg) 10-g
Extremity Test data with SIM1 (Separate 0mm)												
Front side	20M_QPSK 1RB_50	40620/2593	1:1	0.07	0.041	-0.04	22.36	23.00	1.159	0.048	22.1	4.0
Back side	20M_QPSK 1RB_50	40620/2593	1:1	3.36	1.45	-0.03	22.36	23.00	1.159	**1.680**	22.1	4.0
Left side	20M_QPSK 1RB_50	40620/2593	1:1	0.434	0.219	-0.09	22.36	23.00	1.159	0.254	22.1	4.0
Right side	20M_QPSK 1RB_50	40620/2593	1:1	0.660	0.331	0.12	22.36	23.00	1.159	0.384	22.1	4.0
Top side	20M_QPSK 1RB_50	40620/2593	1:1	0.520	0.282	-0.1	22.36	23.00	1.159	0.327	22.1	4.0
Bottom side	20M_QPSK 1RB_50	40620/2593	1:1	0.009	0.006	0.04	22.36	23.00	1.159	0.007	22.1	4.0
Front side	20M_QPSK 50RB_50	40620/2593	1:1	0.056	0.034	-0.15	21.36	22.00	1.159	0.040	22.1	4.0
Back side	20M_QPSK 50RB_50	40620/2593	1:1	2.420	1.045	0.02	21.36	22.00	1.159	1.211	22.1	4.0
Left side	20M_QPSK 50RB_50	40620/2593	1:1	0.315	0.162	0.14	21.36	22.00	1.159	0.187	22.1	4.0
Right side	20M_QPSK 50RB_50	40620/2593	1:1	0.478	0.242	-0.04	21.36	22.00	1.159	0.281	22.1	4.0
Top side	20M_QPSK 50RB_50	40620/2593	1:1	0.376	0.208	-0.05	21.36	22.00	1.159	0.241	22.1	4.0
Bottom side	20M_QPSK 50RB_50	40620/2593	1:1	0.007	0.004	0.09	21.36	22.00	1.159	0.005	22.1	4.0
Extremity Test data at the worst case with SIM2(Separate 0mm)												
Back side	20M_QPSK 1RB_50	40620/2593	1:1	3.13	1.25	0.06	22.36	23.00	1.159	1.448	22.1	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)												
Back side	20M_QPSK 1RB_50	40620/2593	1:1	3.25	1.33	0.08	22.36	23.00	1.159	1.541	22.1	4.0

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8.2.13 SAR Result Of 2.4GHz Wi-Fi

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg)
Extremity Test data(Separate 0mm)													
Front side	802.11b	11/2462	93.44	1.070	0.129	0.063	-0.17	13.99	14.00	1.002	0.068	22.2	4.0
Back side	802.11b	11/2462	93.44	1.070	0.075	0.021	0.07	13.99	14.00	1.002	0.023	22.2	4.0
Left side	802.11b	11/2462	93.44	1.070	0.113	0.059	0.06	13.99	14.00	1.002	0.063	22.2	4.0
Right side	802.11b	11/2462	93.44	1.070	1.20	0.540	0.03	13.99	14.00	1.002	**0.579**	22.2	4.0
Top side	802.11b	11/2462	93.44	1.070	0.156	0.087	-0.05	13.99	14.00	1.002	0.093	22.2	4.0
Bottom side	802.11b	11/2462	93.44	1.070	0.072	0.034	0.11	13.99	14.00	1.002	0.036	22.2	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)													
Right side	802.11b	11/2462	93.44	1.070	1.13	0.516	0.01	13.99	14.00	1.002	0.553	22.2	4.0

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8.2.14 SAR Result Of 5GHz Wi-Fi

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg)
Extremity Test data U-NII-1(Separate 0mm)													
Front side	802.11a	64/5320	93.44	1.070	0.032	0.011	-0.1	12.74	13.00	1.062	0.012	22.2	4.0
Back side	802.11a	64/5320	93.44	1.070	0.279	0.102	-0.09	12.74	13.00	1.062	0.116	22.2	4.0
Left side	802.11a	64/5320	93.44	1.070	0.011	0.004	0.03	12.74	13.00	1.062	0.005	22.2	4.0
Right side	802.11a	64/5320	93.44	1.070	1.86	0.600	0.01	12.74	13.00	1.062	**0.682**	22.2	4.0
Top side	802.11a	64/5320	93.44	1.070	0.331	0.124	0.09	12.74	13.00	1.062	0.141	22.2	4.0
Bottom side	802.11a	64/5320	93.44	1.070	0.085	0.023	-0.17	12.74	13.00	1.062	0.026	22.2	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)													
Right side	802.11a	64/5320	93.44	1.070	1.73	0.546	0.05	12.74	13.00	1.062	0.620	22.2	4.0
Extremity Test data U-NII-2C(Separate 0mm)													
Front side	802.11a	116/5580	93.44	1.070	0.027	0.010	-0.19	13.65	14.00	1.084	0.011	22.2	4.0
Back side	802.11a	116/5580	93.44	1.070	0.199	0.074	-0.01	13.65	14.00	1.084	0.086	22.2	4.0
Left side	802.11a	116/5580	93.44	1.070	0.011	0.004	0.12	13.65	14.00	1.084	0.004	22.2	4.0
Right side	802.11a	116/5580	93.44	1.070	1.32	0.421	0.03	13.65	14.00	1.084	0.488	22.2	4.0
Top side	802.11a	116/5580	93.44	1.070	0.236	0.089	0.13	13.65	14.00	1.084	0.103	22.2	4.0
Bottom side	802.11a	116/5580	93.44	1.070	0.062	0.020	0.14	13.65	14.00	1.084	0.023	22.2	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)													
Right side	802.11a	116/5580	93.44	1.070	1.23	0.409	0.01	13.65	14.00	1.084	0.474	22.2	4.0
Extremity Test data U-NII-3(Separate 0mm)													
Front side	802.11a	149/5745	93.44	1.070	0.022	0.012	0.15	12.96	13.00	1.009	0.012	22.2	4.0
Back side	802.11a	149/5745	93.44	1.070	0.177	0.069	0.17	12.96	13.00	1.009	0.074	22.2	4.0
Left side	802.11a	149/5745	93.44	1.070	0.011	0.006	-0.12	12.96	13.00	1.009	0.007	22.2	4.0
Right side	802.11a	149/5745	93.44	1.070	1.16	0.391	-0.09	12.96	13.00	1.009	0.422	22.2	4.0
Top side	802.11a	149/5745	93.44	1.070	0.207	0.081	-0.06	12.96	13.00	1.009	0.088	22.2	4.0
Bottom side	802.11a	149/5745	93.44	1.070	0.054	0.017	-0.04	12.96	13.00	1.009	0.019	22.2	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)													
Right side	802.11a	149/5745	93.44	1.070	1.05	0.374	0.03	12.96	13.00	1.009	0.404	22.2	4.0

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8.2.15 SAR Result Of Bluetooth

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 (W/kg) 10-g	Liquid Temp.	SAR limit (W/kg)
Extremity Test data(Separate 0mm)													
Front side	8DPSK	39/2441	65.28	1.532	0.013	0.007	-0.1	8.82	9.00	1.042	0.011	22.2	4.0
Back side	8DPSK	39/2441	65.28	1.532	0.007	0.002	-0.16	8.82	9.00	1.042	0.004	22.2	4.0
Left side	8DPSK	39/2441	65.28	1.532	0.011	0.007	-0.17	8.82	9.00	1.042	0.011	22.2	4.0
Right side	8DPSK	39/2441	65.28	1.532	0.117	0.058	-0.09	8.82	9.00	1.042	**0.093**	22.2	4.0
Top side	8DPSK	39/2441	65.28	1.532	0.016	0.010	0.14	8.82	9.00	1.042	0.015	22.2	4.0
Bottom side	8DPSK	39/2441	65.28	1.532	0.007	0.004	0.03	8.82	9.00	1.042	0.006	22.2	4.0
Extremity Test data at the worst case with Battery2(Separate 0mm)													
Right side	8DPSK	39/2441	65.28	1.532	0.105	0.051	0.07	8.82	9.00	1.042	0.081	22.2	4.0

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8.3 Multiple Transmitter Evaluation

8.3.1 Simultaneous SAR SAR test evaluation

Simultaneous Transmission

NO.	Simultaneous Transmission Configuration	Extremity
1	WWAN + WIFI 2.4GHz	Yes
2	WWAN + 5GHz	Yes
3	WWAN + BT	Yes
4	WIFI + BT (They share the same antenna and cannot transmit at the same time by design.)	No

Simultaneous Transmission SAR Summation Scenario for Extremity

WWAN Band	Exposure position	①MAX. WWAN SAR (W/kg)	②MAX. WLAN2.4G SAR (W/kg)	③MAX BT SAR (W/kg)	④MAX. WLAN5G SAR (W/kg)	Summed SAR ①+②	Summed SAR ①+③	Summed SAR ①+④	Volume scan
GSM850	Front	0.047	0.068	0.011	0.012	0.115	0.058	0.059	NO
	Back	0.681	0.023	0.004	0.116	0.704	0.685	0.797	NO
	Left	0.189	0.063	0.011	0.005	0.252	0.200	0.194	NO
	Right	0.098	0.579	0.093	0.682	0.677	0.191	0.780	NO
	Top	0.119	0.093	0.015	0.141	0.212	0.134	0.260	NO
	Bottom	0.002	0.036	0.006	0.026	0.038	0.008	0.028	NO
GSM1900	Front	0.116	0.068	0.011	0.012	0.184	0.127	0.128	NO
	Back	1.680	0.023	0.004	0.116	1.703	1.684	1.796	NO
	Left	0.455	0.063	0.011	0.005	0.518	0.466	0.460	NO
	Right	0.234	0.579	0.093	0.682	0.813	0.327	0.916	NO
	Top	0.29	0.093	0.015	0.141	0.383	0.305	0.431	NO
	Bottom	0.006	0.036	0.006	0.026	0.042	0.012	0.032	NO
WCDMA Band II	Front	0.238	0.068	0.011	0.012	0.306	0.249	0.250	NO
	Back	3.534	0.023	0.004	0.116	3.557	3.538	3.650	NO
	Left	0.98	0.063	0.011	0.005	1.043	0.991	0.985	NO
	Right	0.498	0.579	0.093	0.682	1.077	0.591	1.180	NO
	Top	0.612	0.093	0.015	0.141	0.705	0.627	0.753	NO
	Bottom	0.016	0.036	0.006	0.026	0.052	0.022	0.042	NO
WCDMA Band V	Front	0.047	0.068	0.011	0.012	0.115	0.058	0.059	NO
	Back	0.686	0.023	0.004	0.116	0.709	0.690	0.802	NO
	Left	0.189	0.063	0.011	0.005	0.252	0.200	0.194	NO
	Right	0.098	0.579	0.093	0.682	0.677	0.191	0.780	NO

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	Top	0.120	0.093	0.015	0.141	0.213	0.135	0.261	NO
	Bottom	0.002	0.036	0.006	0.026	0.038	0.008	0.028	NO
LTE Band 2	Front	0.18	0.068	0.011	0.012	0.248	0.191	0.192	NO
	Back	2.665	0.023	0.004	0.116	2.688	2.669	2.781	NO
	Left	0.74	0.063	0.011	0.005	0.803	0.751	0.745	NO
	Right	0.378	0.579	0.093	0.682	0.957	0.471	1.060	NO
	Top	0.463	0.093	0.015	0.141	0.556	0.478	0.604	NO
	Bottom	0.012	0.036	0.006	0.026	0.048	0.018	0.038	NO
LTE Band 4	Front	0.129	0.068	0.011	0.012	0.197	0.140	0.141	NO
	Back	1.911	0.023	0.004	0.116	1.934	1.915	2.027	NO
	Left	0.524	0.063	0.011	0.005	0.587	0.535	0.529	NO
	Right	0.268	0.579	0.093	0.682	0.847	0.361	0.950	NO
	Top	0.329	0.093	0.015	0.141	0.422	0.344	0.470	NO
	Bottom	0.006	0.036	0.006	0.026	0.042	0.012	0.032	NO
LTE Band 5	Front	0.041	0.068	0.011	0.012	0.109	0.052	0.053	NO
	Back	0.605	0.023	0.004	0.116	0.628	0.609	0.721	NO
	Left	0.168	0.063	0.011	0.005	0.231	0.179	0.173	NO
	Right	0.086	0.579	0.093	0.682	0.665	0.179	0.768	NO
	Top	0.105	0.093	0.015	0.141	0.198	0.120	0.246	NO
	Bottom	0.002	0.036	0.006	0.026	0.038	0.008	0.028	NO
LTE Band 7	Front	0.073	0.068	0.011	0.012	0.141	0.084	0.085	NO
	Back	2.727	0.023	0.004	0.116	2.750	2.731	2.843	NO
	Left	0.407	0.063	0.011	0.005	0.470	0.418	0.412	NO
	Right	0.62	0.579	0.093	0.682	1.199	0.713	1.302	NO
	Top	0.525	0.093	0.015	0.141	0.618	0.540	0.666	NO
	Bottom	0.003	0.036	0.006	0.026	0.039	0.009	0.029	NO
LTE Band 38	Front	0.048	0.068	0.011	0.012	0.116	0.059	0.060	NO
	Back	1.653	0.023	0.004	0.116	1.676	1.657	1.769	NO
	Left	0.252	0.063	0.011	0.005	0.315	0.263	0.257	NO
	Right	0.377	0.579	0.093	0.682	0.956	0.470	1.059	NO
	Top	0.32	0.093	0.015	0.141	0.413	0.335	0.461	NO
	Bottom	0.005	0.036	0.006	0.026	0.041	0.011	0.031	NO
LTE Band 40 a	Front	0.035	0.068	0.011	0.012	0.103	0.046	0.047	NO
	Back	1.192	0.023	0.004	0.116	1.215	1.196	1.308	NO
	Left	0.178	0.063	0.011	0.005	0.241	0.189	0.183	NO
	Right	0.273	0.579	0.093	0.682	0.852	0.366	0.955	NO
	Top	0.231	0.093	0.015	0.141	0.324	0.246	0.372	NO
	Bottom	0.001	0.036	0.006	0.026	0.037	0.007	0.027	NO
LTE Band 40 b	Front	0.043	0.068	0.011	0.012	0.111	0.054	0.055	NO
	Back	1.545	0.023	0.004	0.116	1.568	1.549	1.661	NO
	Left	0.234	0.063	0.011	0.005	0.297	0.245	0.239	NO
	Right	0.355	0.579	0.093	0.682	0.934	0.448	1.037	NO

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	Top	0.298	0.093	0.015	0.141	0.391	0.313	0.439	NO
	Bottom	0.003	0.036	0.006	0.026	0.039	0.009	0.029	NO
LTE Band 41	Front	0.048	0.068	0.011	0.012	0.116	0.059	0.060	NO
	Back	1.68	0.023	0.004	0.116	1.703	1.684	1.796	NO
	Left	0.254	0.063	0.011	0.005	0.317	0.265	0.259	NO
	Right	0.384	0.579	0.093	0.682	0.963	0.477	1.066	NO
	Top	0.327	0.093	0.015	0.141	0.420	0.342	0.468	NO
	Bottom	0.007	0.036	0.006	0.026	0.043	0.013	0.033	NO

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9 Equipment list

Test Platform	SPEAG DASY5 Professional
Location	Compliance Certification Services (Kunshan) Inc.
Software Reference	DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Hardware Reference

	Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	P C	HP	Core(rm)3.16G	CZCO48171H	N/A	N/A
☒	Signal Generator	Agilent	E5182A	MY50142015	2022/08/22	2023/08/21
☒	S-Parameter Network Analyzer	Agilent	E5071B	MY42301382	2022/02/20	2023/02/19
☒	DAK-3.5 probe	SPEAG	DAK-3.5	1102	N/A	N/A
☒	Wireless Communication Test Set	R&S	CMW500	159275	2022/08/22	2023/08/21
☒	Communication System	Anritsu	MT8820C	6201465349	2022/04/01	2023/03/31
☒	MXA Signal Analyzer	Keysight	N9020A	MY53420174	2022/08/22	2023/08/21
☒	DAE	SPEAG	DAE4	1245	2022/05/30	2023/05/29
☒	E-field PROBE	SPEAG	EX3DV4	7767	2022/10/28	2023/10/27
☒	Dipole	SPEAG	D835V2	4d114	2022/03/31	2025/03/30
☒	Dipole	SPEAG	D1800V2	2d170	2022/03/31	2025/03/30
☒	Dipole	SPEAG	D1900V2	5d136	2022/06/07	2025/06/06
☒	Dipole	SPEAG	D2300V2	1096	2022/03/31	2025/03/30
☒	Dipole	SPEAG	D2450V2	817	2022/04/01	2025/03/31
☒	Dipole	SPEAG	D2600V2	1158	2022/03/31	2025/03/30
☒	Dipole	SPEAG	D5GHzV2	1095	2022/06/01	2025/05/31
☒	Electro Thermometer	Renke	RS-WS-N01-6J	1032862	2022/04/01	2023/03/31
☒	Amplifier	Mini-circuits	ZVE-8G	110405	N/A	N/A
☒	Amplifier	Mini-circuits	ZHL-42	QA1331003	N/A	N/A
☒	3db ATTENUATOR	MINI	MCL BW-S3W5	0533	N/A	N/A
☒	DUMMY PROBE	SPEAG	DP_2	SPDP2001AA	N/A	N/A
☒	Dual Directional	Woken	20W couple	DOM2BHW1A1	N/A	N/A

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	Coupler					
☒	SAM PHANTOM (ELI4 v4.0)	SPEAG	QDOVA001BB	1102	N/A	N/A
☒	Twin SAM Phantom	SPEAG	QD000P40CD	1609	N/A	N/A
☒	ROBOT	SPEAG	TX60	F10/5E6AA1/A101	N/A	N/A
☒	ROBOT KRC	SPEAG	CS8C	F10/5E6AA1/C101	N/A	N/A
☒	LIQUID CALIBRATION KIT	ANTENNESSA	41/05 OCP9	00425167	N/A	N/A

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

All measurement facilities used to collect the measurement data are located at

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10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

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Appendix A: Detailed System Check Results

The plots are showing as followings.

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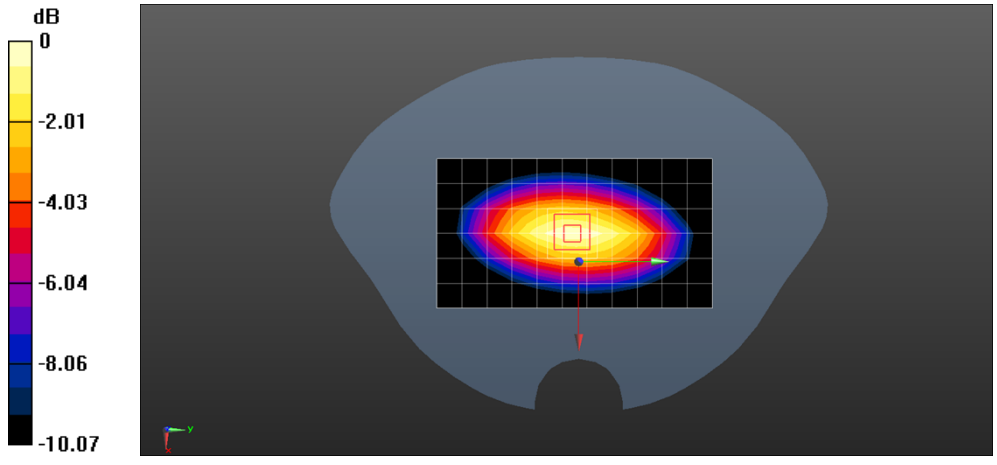
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
System Performance Check-D835
DUT: Dipole 835 MHz D835V2; Type: 4d114
Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.89 S/m; ε_r = 40.972; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(10, 10, 10); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check at Frequencies Low 1 GHz/d=15mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.41 W/kg

System Performance Check at Frequencies Low 1 GHz/d=15mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.61 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 4.09 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.66 W/kg
Maximum value of SAR (measured) = 3.51 W/kg



0 dB = 3.51 W/kg = 5.45 dBW/kg

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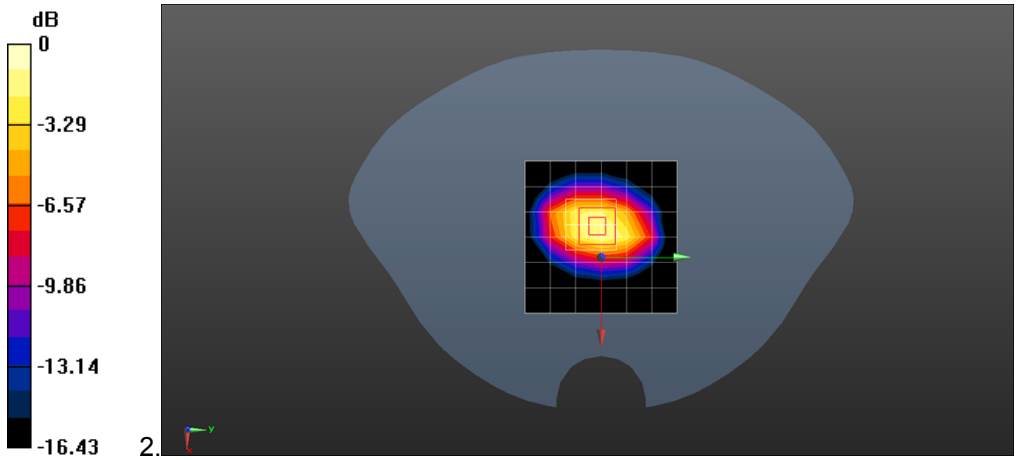
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
System Performance Check-D1800
DUT: Dipole 1800 MHz D1800V2; Type: 2d170
Communication System: UID 10000, CW; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.384 S/m; ε_r = 40.258; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(9.32, 9.32, 9.32); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (EX-Probe) (23.6 dBm)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 10.9 W/kg

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=3.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.1 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 17.3 W/kg
SAR(1 g) = 9.76 W/kg; SAR(10 g) = 5.35 W/kg
Maximum value of SAR (measured) = 13.6 W/kg



2.

0 dB = 13.6 W/kg = 11.34 dBW/kg

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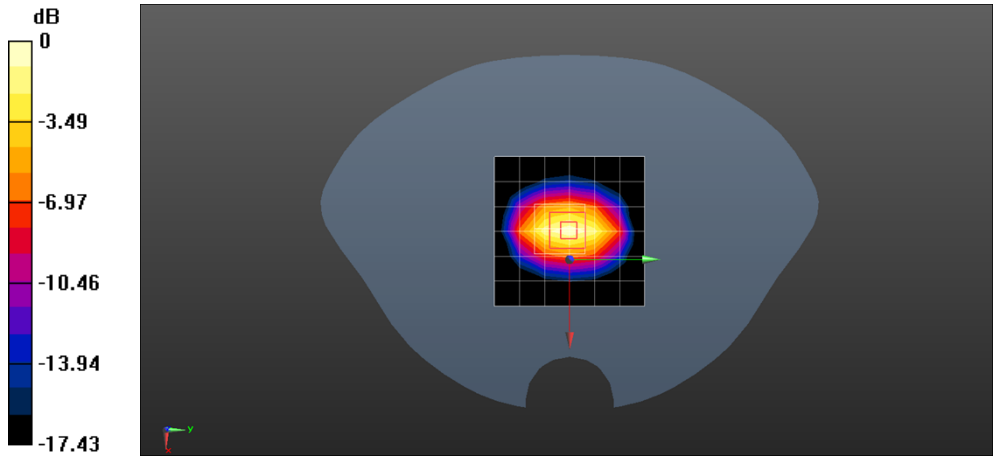
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
System Performance Check-D1900
DUT: Dipole 1900 MHz D1900V2; Type: 5d136
Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.449 S/m; ε_r = 39.955; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.91, 8.91, 8.91); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 15.1 W/kg

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.8 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 19.7 W/kg
SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.23 W/kg
Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 15.3 W/kg = 11.85 dBW/kg

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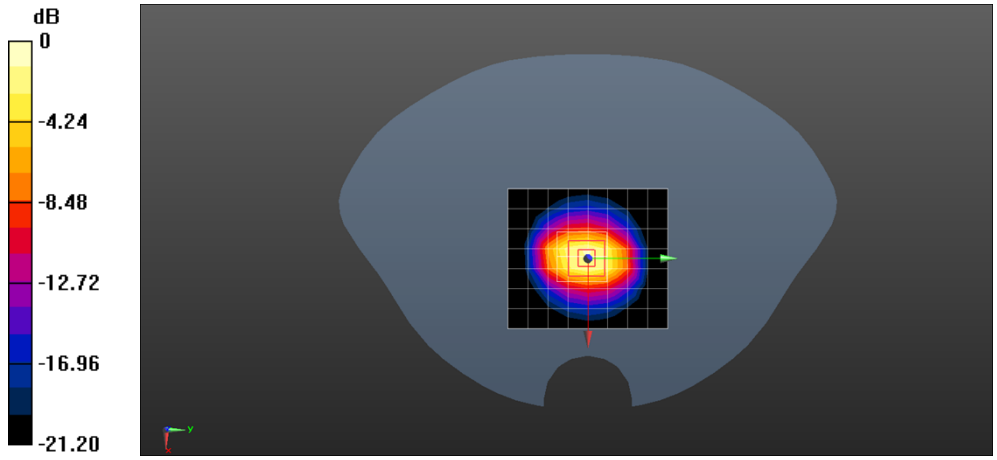
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
System Performance Check-D2300
DUT: Dipole 2300 MHz D230V2; Type: 1096
Communication System: UID 0, CW (0); Frequency: 2300 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2300 MHz; σ = 1.633 S/m; ε_r = 38.665; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.44, 8.44, 8.44); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 12.9 W/kg

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.06 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 22.1 W/kg
SAR(1 g) =11.2 W/kg; SAR(10 g) = 5.35 W/kg
Maximum value of SAR (measured) = 16.5 W/kg



0 dB = 16.5 W/kg = 12.17 dBW/kg

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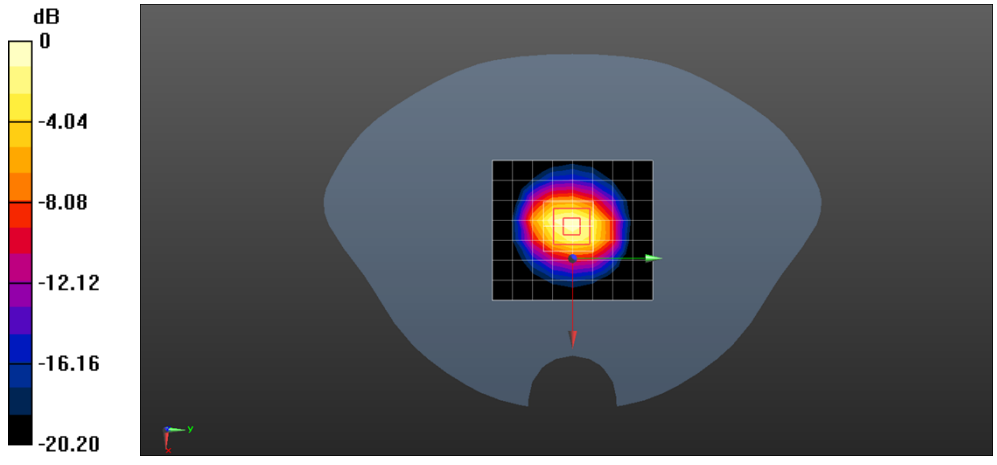
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
System Performance Check-D2450
DUT: Dipole 2450 MHz D2450V2; Type: 817
Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.802 S/m; ε_r = 38.226; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.24, 8.24, 8.24); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 19.4 W/kg

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.9 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 27.2 W/kg
SAR(1 g) = 14 W/kg; SAR(10 g) = 6.64 W/kg
Maximum value of SAR (measured) = 20.7 W/kg



0 dB = 20.7 W/kg = 13.16 dBW/kg

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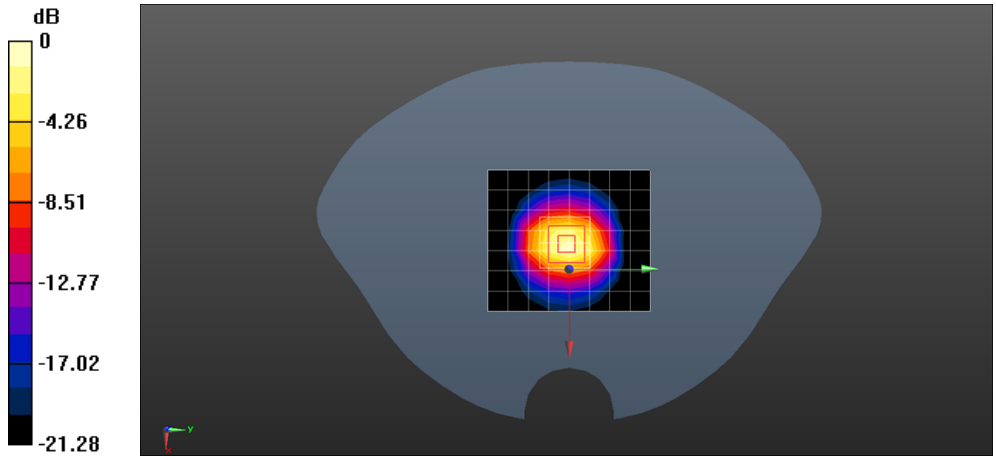
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
System Performance Check-D2600
DUT: Dipole 2600 MHz D2600V2; Type: 1158
Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 1.968 S/m; ε_r = 37.767; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(7.99, 7.99, 7.99); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 21.2 W/kg

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.4 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 32.1 W/kg
SAR(1 g) = 14.8 W/kg; SAR(10 g) = 6.55 W/kg
Maximum value of SAR (measured) = 23.8 W/kg



0 dB = 23.8 W/kg = 13.77 dBW/kg

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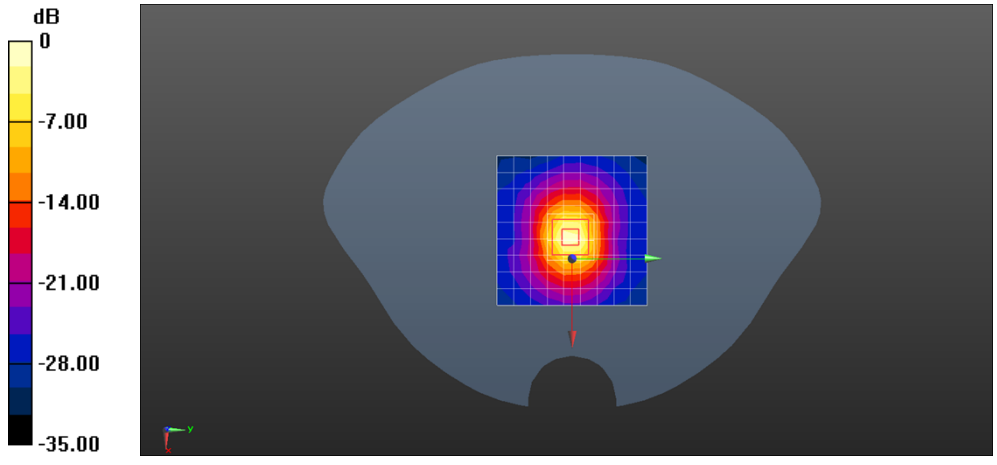
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
System Performance Check-D5200
DUT: Dipole D5GHzV2; Type: 1095
Communication System: UID 0, CW (0); Frequency: 5200 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; σ = 4.782 S/m; ε_r = 37.014; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(5.65, 5.65, 5.65); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5200 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 17.0 W/kg

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.97 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 29.4 W/kg
SAR(1 g) = 7.86 W/kg; SAR(10 g) = 2.15 W/kg
Maximum value of SAR (measured) = 18.6 W/kg



0 dB = 18.6 W/kg = 12.70 dBW/kg

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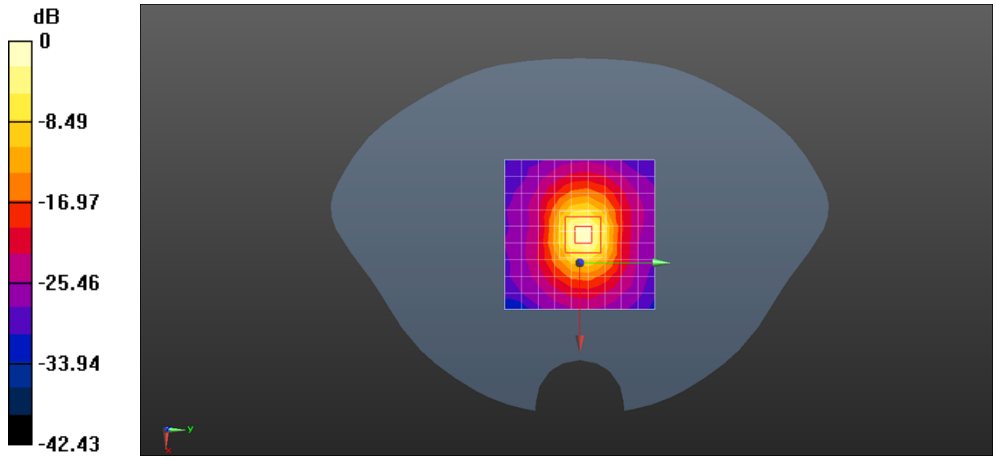
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
SystemPerformanceCheck-D5600
DUT: Dipole D5GHzV2; Type: 1095
Communication System: UID 0, CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.26 S/m; ε_r = 35.95; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(5.14, 5.14, 5.14); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5600 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 13.5 W/kg

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5600 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.81 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 32.5 W/kg
SAR(1 g) = 7.58 W/kg; SAR(10 g) = 2.17 W/kg
Maximum value of SAR (measured) = 18.1 W/kg



0 dB = 18.1 W/kg = 12.58 dBW/kg

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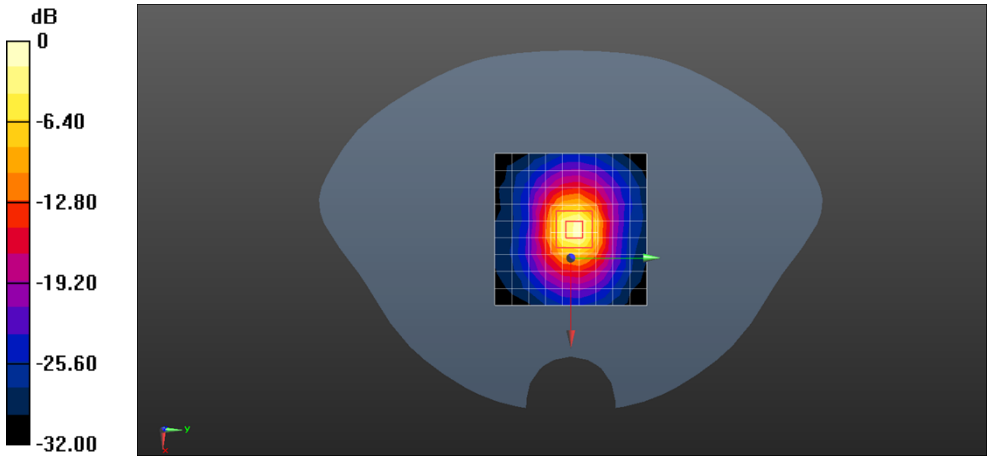
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
SystemPerformanceCheck-5800
DUT: Dipole D5GHzV2; Type: 1095
Communication System: UID 0, CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 5.38 S/m; ε_r = 34.496; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(5.1, 5.1, 5.1); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5800 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 12.8 W/kg

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.11 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 32.8 W/kg
SAR(1 g) = 7.18 W/kg; SAR(10 g) = 2.05 W/kg
Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg

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Appendix B: Detailed Test Results

The plots of worse case are showing as followings.

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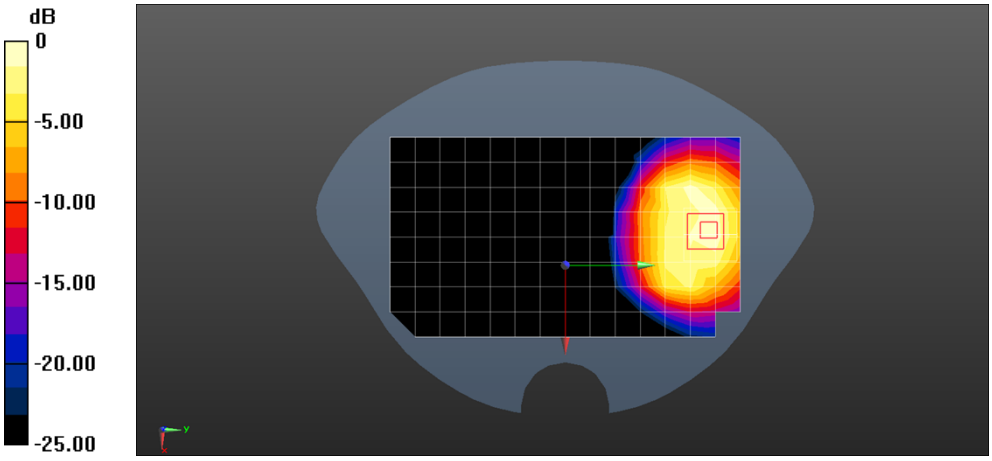
中国・江苏・昆山开发区伟业路10号 邮编：215300 t(86-512) 57355888 f(86-512) 57370818 sgs.china@sgs.com
Member of the SGS Group (SGS SA)

Test Laboratory: Compliance Certification Services (Kunshan) Inc.
GSM850 GPRS 2TS Back side Ch128 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, GPRS/EGPRS 2TX Slots (0); Frequency: 824.2 MHz;Duty Cycle: 1:2.07491
Medium parameters used: f = 824.2 MHz; σ = 0.883 S/m; ε_r = 41.042; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(10, 10, 10); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.14 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.55 W/kg
SAR(1 g) = 0.901 W/kg; SAR(10 g) = 0.551 W/kg
Maximum value of SAR (measured) = 1.30 W/kg



0 dB = 1.30 W/kg = 1.14 dBW/kg

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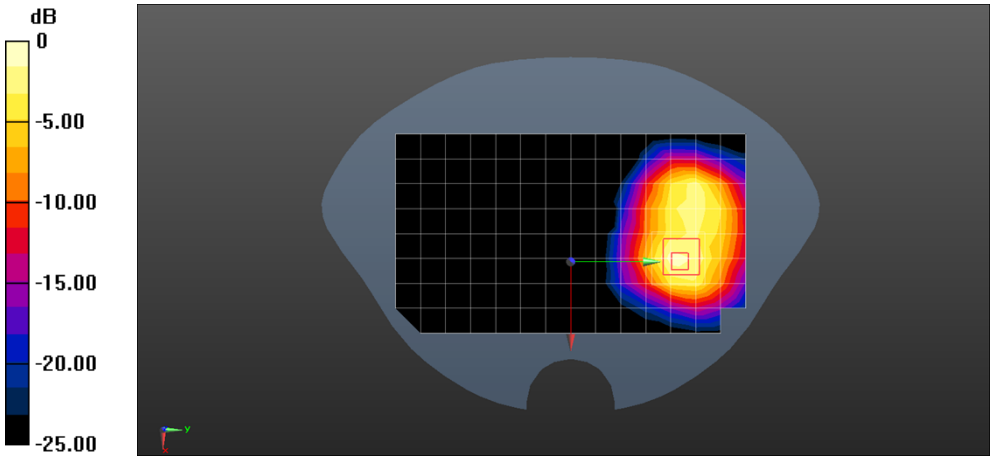
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
GSM1900 GPRS 3TS Back side Ch512 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, GPRS/EGPRS 3TX Slots (0); Frequency: 1850.2 MHz;Duty Cycle: 1:2.77013
Medium parameters used: f = 1850.2 MHz; σ = 1.437 S/m; ε_r = 40.209; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.91, 8.91, 8.91); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.41 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 5.01 W/kg
SAR(1 g) = 2.75 W/kg; SAR(10 g) = 1.42 W/kg
Maximum value of SAR (measured) = 4.02 W/kg



0 dB = 4.02 W/kg = 6.04 dBW/kg

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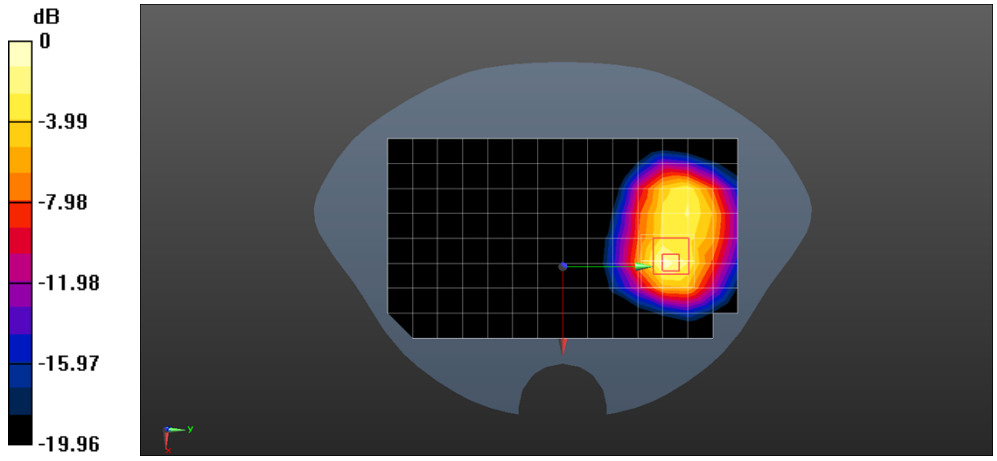
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
WCDMA Band 2 RMC Back side Ch9538 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, WCDMA / UMTS (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.485 S/m; ε_r = 39.921; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.91, 8.91, 8.91); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.93 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.1220 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 9.68 W/kg
SAR(1 g) = 5.08 W/kg; SAR(10 g) = 2.65 W/kg
Maximum value of SAR (measured) = 7.66 W/kg



0 dB = 7.66 W/kg = 8.84 dBW/kg

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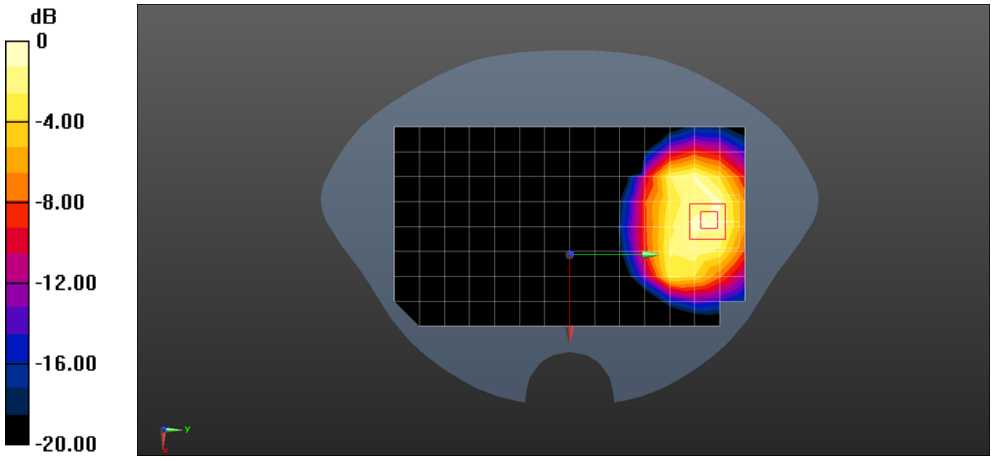
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
WCDMA Band 5 RMC Back side Ch4182 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, WCDMA / UMTS (0); Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium parameters used: f = 836.4 MHz; σ = 0.891 S/m; ε_r = 40.962; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(10, 10, 10); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.05 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 0.932 W/kg; SAR(10 g) = 0.563 W/kg
Maximum value of SAR (measured) = 1.32 W/kg



0 dB = 1.32 W/kg = 1.21 dBW/kg

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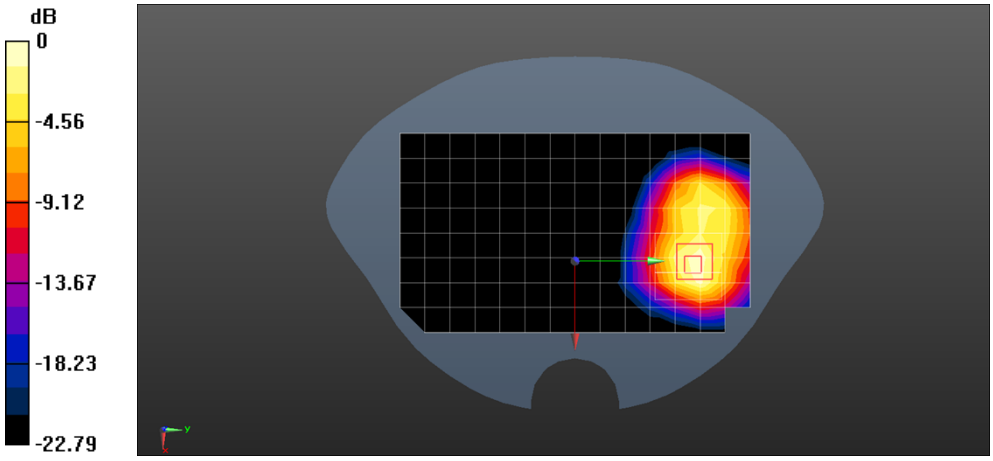
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
LTE Band 2 20M QPSK 1RB99 Back side Ch18900 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, FDD_LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.469 S/m; ε_r = 40.058; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.91, 8.91, 8.91); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 5.76 W/kg

Configuration/Head/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 8.28 W/kg
SAR(1 g) = 4.61 W/kg; SAR(10 g) = 2.37 W/kg
Maximum value of SAR (measured) = 6.53 W/kg



0 dB = 6.53 W/kg = 8.15 dBW/kg

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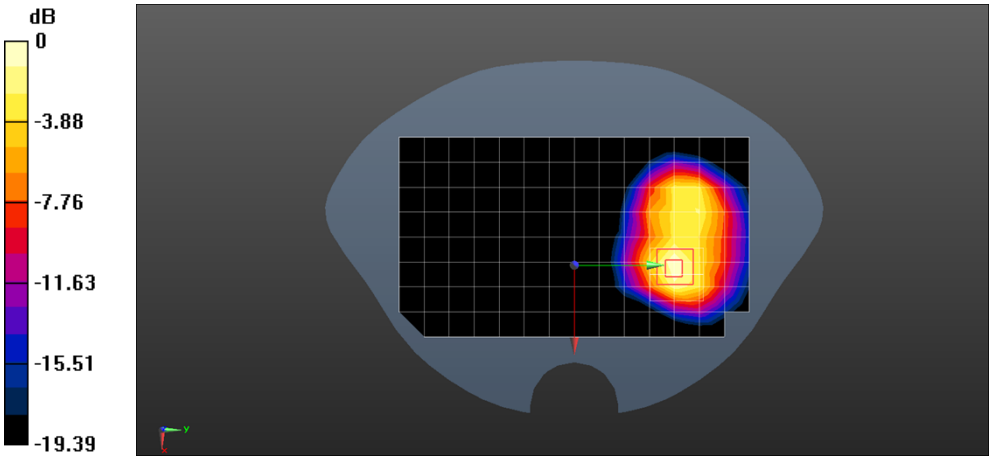
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
LTE Band 4 20M QPSK 1RB50 Back side Ch20050 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, FDD_LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.316 S/m; ε_r = 40.633; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(9.32, 9.32, 9.32); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 5.26 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 6.53 W/kg
SAR(1 g) = 3.73 W/kg; SAR(10 g) = 1.96 W/kg
Maximum value of SAR (measured) = 5.35 W/kg



0 dB = 5.35 W/kg = 7.28 dBW/kg

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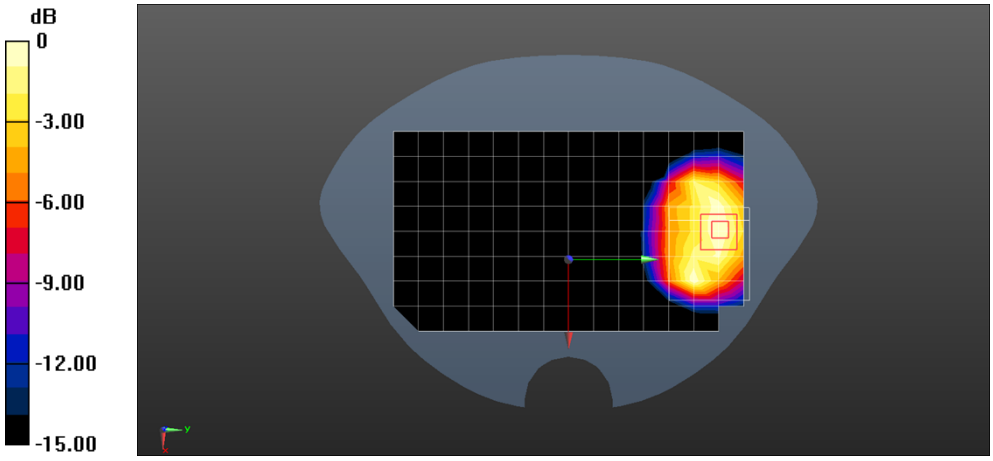
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
LTE Band 5 10M QPSK 1RB49 Back side Ch20600 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, FDD_LTE (0); Frequency: 844 MHz;Duty Cycle: 1:1
Medium parameters used: f = 844 MHz; σ = 0.896 S/m; ε_r = 40.914; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(10, 10, 10); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.13 W/kg

Configuration/Head/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.750 W/kg; SAR(10 g) = 0.453 W/kg
Maximum value of SAR (measured) = 1.06 W/kg



0 dB = 1.06 W/kg = 0.25 dBW/kg

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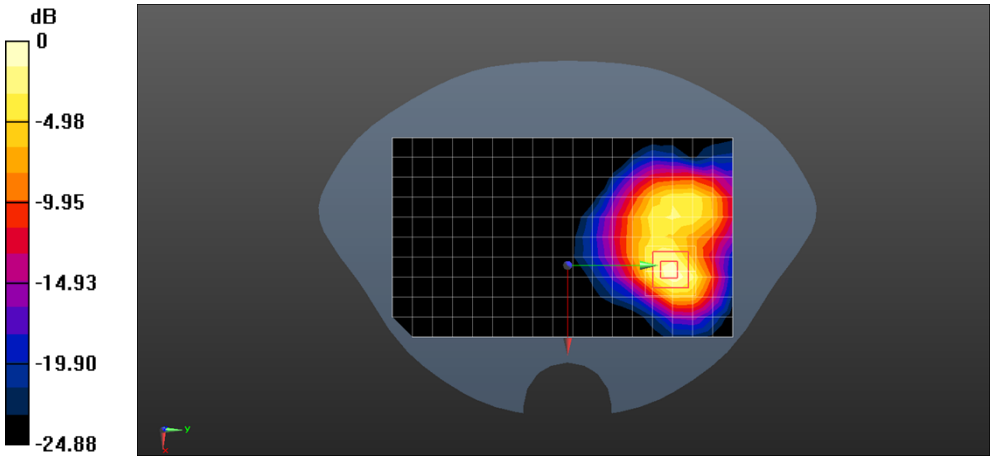
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
LTE Band 7 20M QPSK 1RB0 Back side Ch20850 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, FDD_LTE (0); Frequency: 2510 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2510 MHz; σ = 1.858 S/m; ε_r = 38.108; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(7.99, 7.99, 7.99); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 7.99 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.194 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 10.6 W/kg
SAR(1 g) = 5.17 W/kg; SAR(10 g) = 2.31 W/kg
Maximum value of SAR (measured) = 8.41 W/kg



0 dB = 8.41 W/kg = 9.25 dBW/kg

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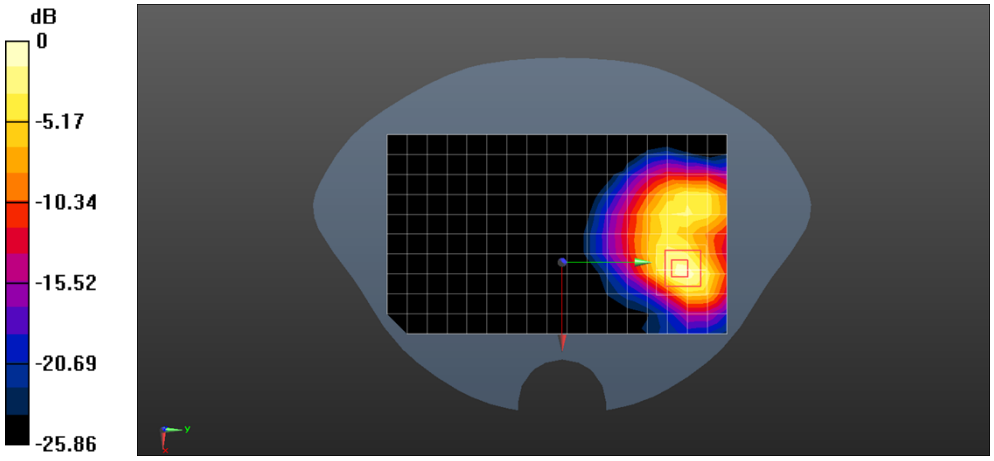
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
LTE Band 38 20M QPSK 1RB50 Back side Ch38000 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, TDD_LTE (0); Frequency: 2595 MHz;Duty Cycle: 1:1.57943
Medium parameters used: f = 2595 MHz; σ = 1.967 S/m; ε_r = 37.834; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(7.99, 7.99, 7.99); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 5.03 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.418 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 7.49 W/kg
SAR(1 g) = 3.32 W/kg; SAR(10 g) = 1.46 W/kg
Maximum value of SAR (measured) = 5.65 W/kg



0 dB = 5.65 W/kg = 7.52 dBW/kg

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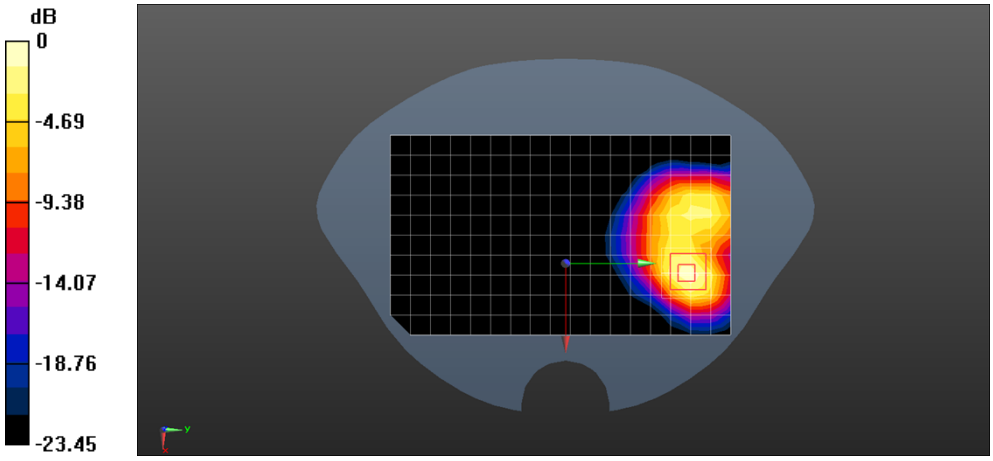
Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Test Laboratory: Compliance Certification Services (Kunshan) Inc.
LTE Band 40b 10M QPSK 1RB49 Back side Ch39200 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, TDD_LTE (0); Frequency: 2355 MHz;Duty Cycle: 1:1.57943
Medium parameters used: f = 2355 MHz; σ = 1.699 S/m; ε_r = 38.607; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.44, 8.44, 8.44); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 4.22 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.886 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 5.55 W/kg
SAR(1 g) = 2.68 W/kg; SAR(10 g) = 1.25 W/kg
Maximum value of SAR (measured) = 4.30 W/kg



0 dB = 4.30 W/kg = 6.33 dBW/kg

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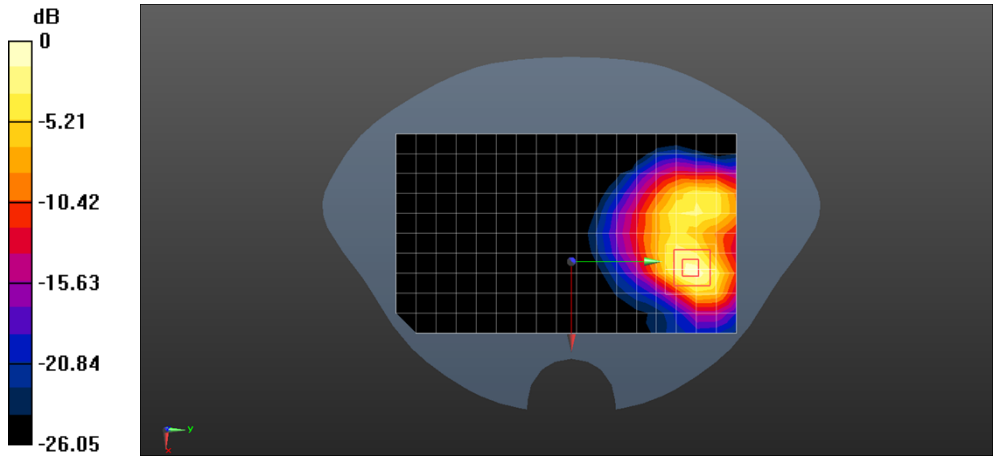
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
LTE Band 41 20M QPSK 1RB50 Back side Ch40620 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, TDD_LTE (0); Frequency: 2593 MHz;Duty Cycle: 1:1.57943
Medium parameters used: f = 2593 MHz; σ = 1.968 S/m; ε_r = 37.756; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(7.99, 7.99, 7.99); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 4.95 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.302 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 6.95 W/kg
SAR(1 g) = 3.36 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (measured) = 5.60 W/kg



0 dB = 5.60 W/kg = 7.48 dBW/kg

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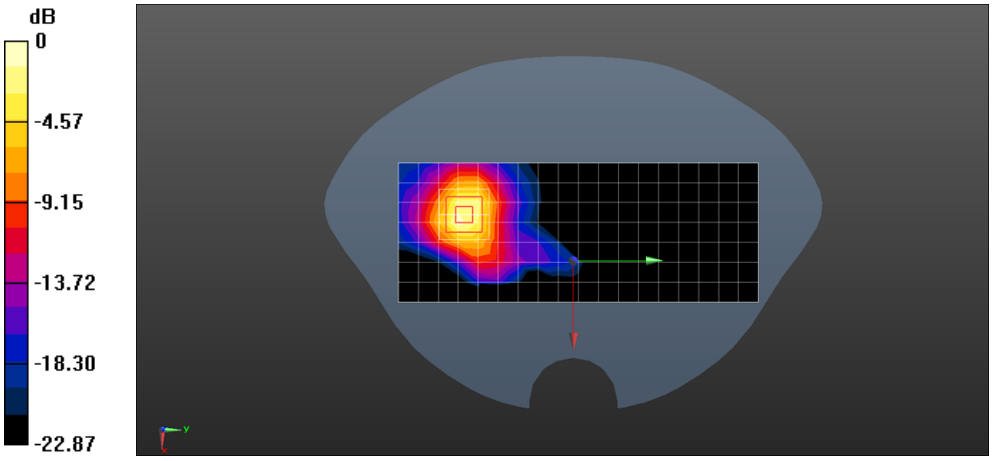
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
WLAN2.4Ghz 802.11b Right side Ch11 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, WiFi (0); Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.818 S/m; ε_r = 38.234; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.24, 8.24, 8.24); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (8x19x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 1.71 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.48 W/kg
SAR(1 g) = 1.2 W/kg; SAR(10 g) = 0.540 W/kg
Maximum value of SAR (measured) = 2.02 W/kg



0 dB = 2.02 W/kg = 3.05 dBW/kg

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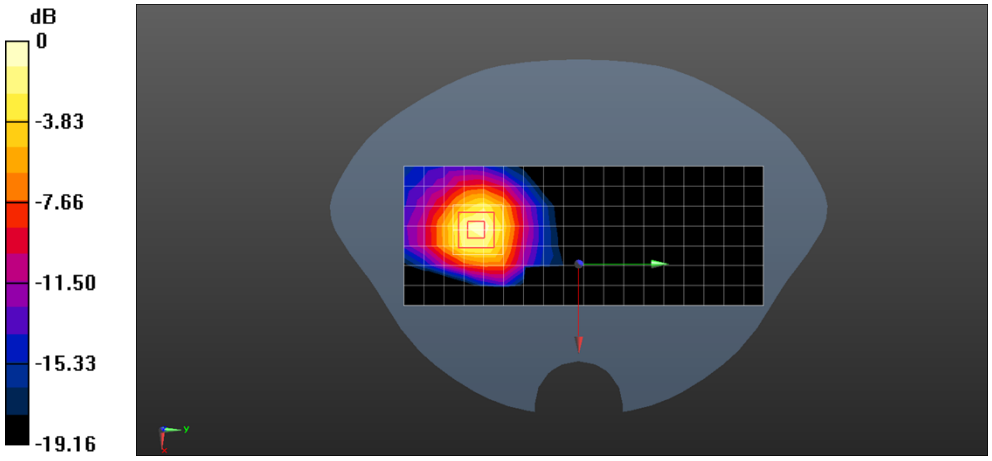
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
Bluetooth 3DH5 8DPSK Right side Ch39 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, Bluetooth (0); Frequency: 2441 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2441 MHz; σ = 1.787 S/m; ε_r = 38.363; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(8.24, 8.24, 8.24); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (8x19x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.176 W/kg

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.5020 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.227 W/kg
SAR(1 g) = 0.117 W/kg; SAR(10 g) = 0.058 W/kg
Maximum value of SAR (measured) = 0.186 W/kg



0 dB = 0.186 W/kg = -7.30 dBW/kg

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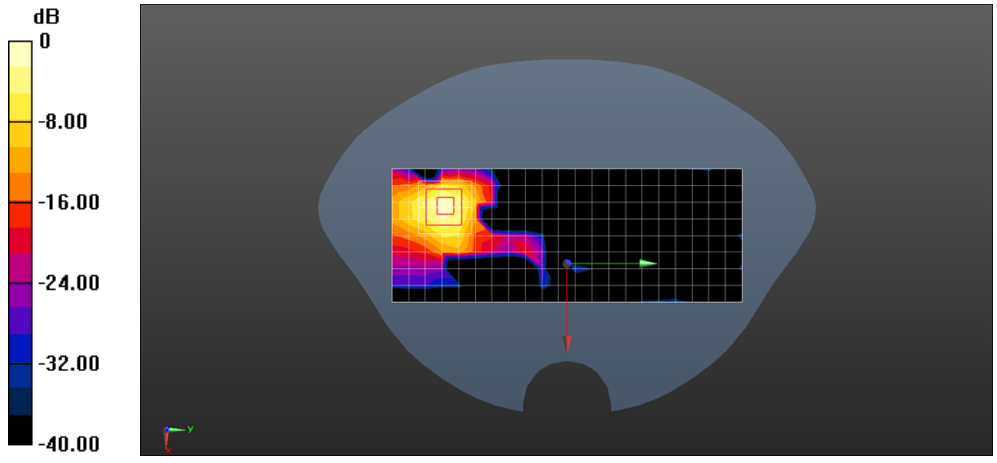
Test Laboratory: Compliance Certification Services (Kunshan) Inc.
WLAN5Ghz 802.11a Right side Ch64 0mm
DUT: Android Cloud Terminal; Type: A78;
Communication System: UID 0, WiFi (0); Frequency: 5320 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5320 MHz; σ = 4.936 S/m; ε_r = 36.667; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN7767; ConvF(5.48, 5.48, 5.48); Calibrated: 2022/10/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1245; Calibrated: 2022/05/30
- Phantom: Twin SAM Phantom; Type: QD 000 P40 CD; Serial: 1609
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/Head/Area Scan (9x22x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 3.86 W/kg

Configuration/Head/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 5.95 W/kg
SAR(1 g) = 1.86 W/kg; SAR(10 g) = 0.600 W/kg
Maximum value of SAR (measured) = 4.13 W/kg



0 dB = 4.13 W/kg = 6.16 dBW/kg

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Appendix C: Calibration certificate

Appendix D: Photographs

- End of the Report -

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中国・江苏・昆山开发区伟业路10号 邮编：215300 t(86-512) 57355888 f(86-512) 57370818 sgs.china@sgs.com
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