FCC SAR TEST REPORT

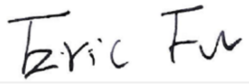
Application No.:	SZCR2311003545AT
Applicant:	Shenzhen Xinguodu Technology Co., Ltd.
Address of Applicant:	17B JinSong Mansion, Terra Industrial & Trade Park Chegongmiao, Futian District, Shenzhen, 518040 China
Manufacturer:	Shenzhen Xinguodu Technology Co., Ltd.
Address of Manufacturer:	17B JinSong Mansion, Terra Industrial & Trade Park Chegongmiao, Futian District, Shenzhen, 518040 China
Factory:	Shenzhen Xinguodu Technology Co., Ltd. Manufacture Branch.
Address of Factory:	Building C, Dagang Industrial Park, Changzhen Community, Gongming Office, Guangming New District, Shenzhen, Guangdong, China.
Product Name:	Countertop Base/Docking Station
Model No.(EUT):	T6
Trade mark:	NEXGO
FCC ID:	XDQT6-04
Standard(s) :	FCC 47CFR §2.1093
Date of Receipt:	2023-11-20
Date of Test:	2023-11-21 to 2023-11-23
Date of Issue:	2023-11-27
Test Result:	**Pass***

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

Keny Xu
EMC Laboratory Manager

检验检测专用章
Inspection & Testing Services
SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch Testing Center EEC Laboratory.

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2023-11-27	/

Authorized for issue by:				
				
		Roman Pan/Project Engineer		
				
		Eric Fu/Reviewer		

TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)
	Limbs
LTE Band 5	0.80
LTE Band 7	1.48
LTE Band 38	0.83
LTE Band 41	1.18
SAR Limited(W/kg)	4.0

CONTENTS

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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:	00062000087		
Hardware Version:	V1.00		
Software Version:	V1.00		
Antenna Gain:	LTE: B5: -2.2dBi, B7: 3.98dBi, B38: 3.99dBi, B41: 3.99dBi (Provided by Manufacturer)		
Antenna Type:	PIFA antenna		
Device Operating Configurations:			
Modulation Mode:	LTE: QPSK,16QAM		
Power Class:	1, tested with power control Max Power(LTE Band 5/7/38/41)		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620- 2690
	LTE Band 38	2570~2620	2570~2620
	LTE Band 41	2535-2675	2535-2675
Battery Information:	Model:	G2-18650	
	Normal Voltage:	DC 3.7V	
	Rated capacity:	2600mAh	
	Battery Type:	Rechargeable Li-ion Battery	
	Manufacturer:	Shenzhen Xinguodu Technology Co., Ltd.	

1.1.1 DUT Antenna Locations

Please see the Appendix D

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 Std 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 447498 D04v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
KDB 941225 D05 v02r05	SAR EVALUATION CONSIDERATIONS FOR LTE DEVICES
KDB 865664 D01 v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664 D01 v01r02	RF Exposure Compliance Reporting and Documentation Considerations

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.)

1.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

1.5 Test Facility

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

• A2LA (Certificate No. 3816.01)

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

• VCCI (Member No. 1937)

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

• FCC –Designation Number: CN1336

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

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

• Innovation, Science and Economic Development Canada

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

CAB identifier: CN0006.

IC#: 4620C.

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.	

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.

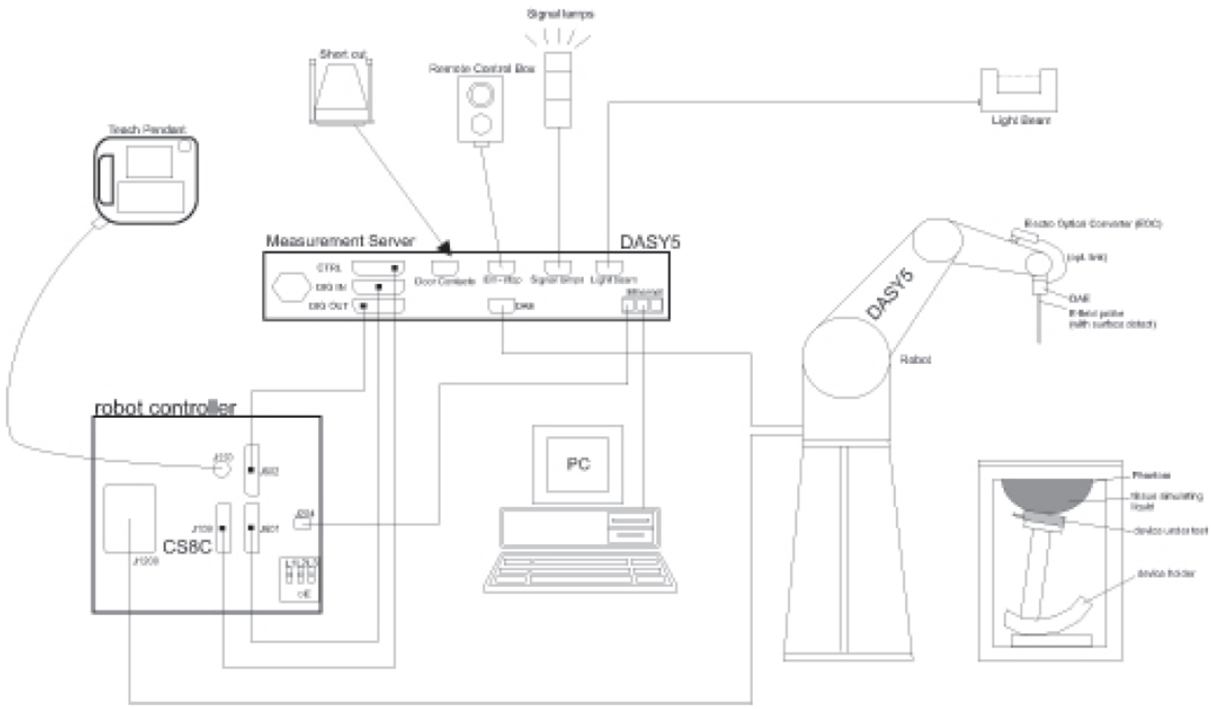
The DASY5 system for performing compliance tests consists of the following items:

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.



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.

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3.2 Isotropic E-field Probe EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 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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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

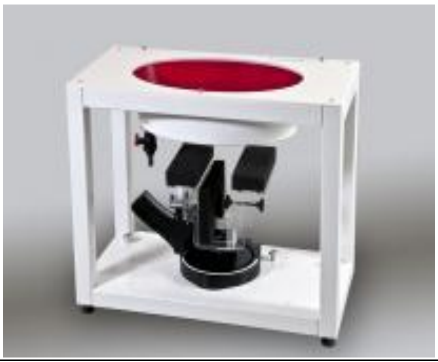
3.4 SAM Twin Phantom

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.

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.

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

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 %

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)

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

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.

4.2 SAR measurement uncertainty

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

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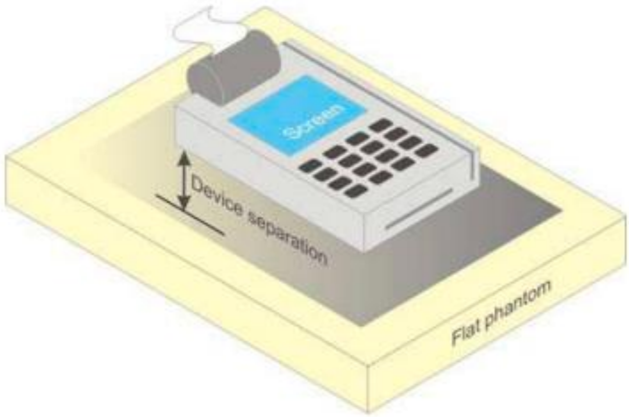
5 Description of Test Position

5.1 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.



F-1. Test positions for hand-held supported devices

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%

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 $\rho = 1000\ kg/m^3$)

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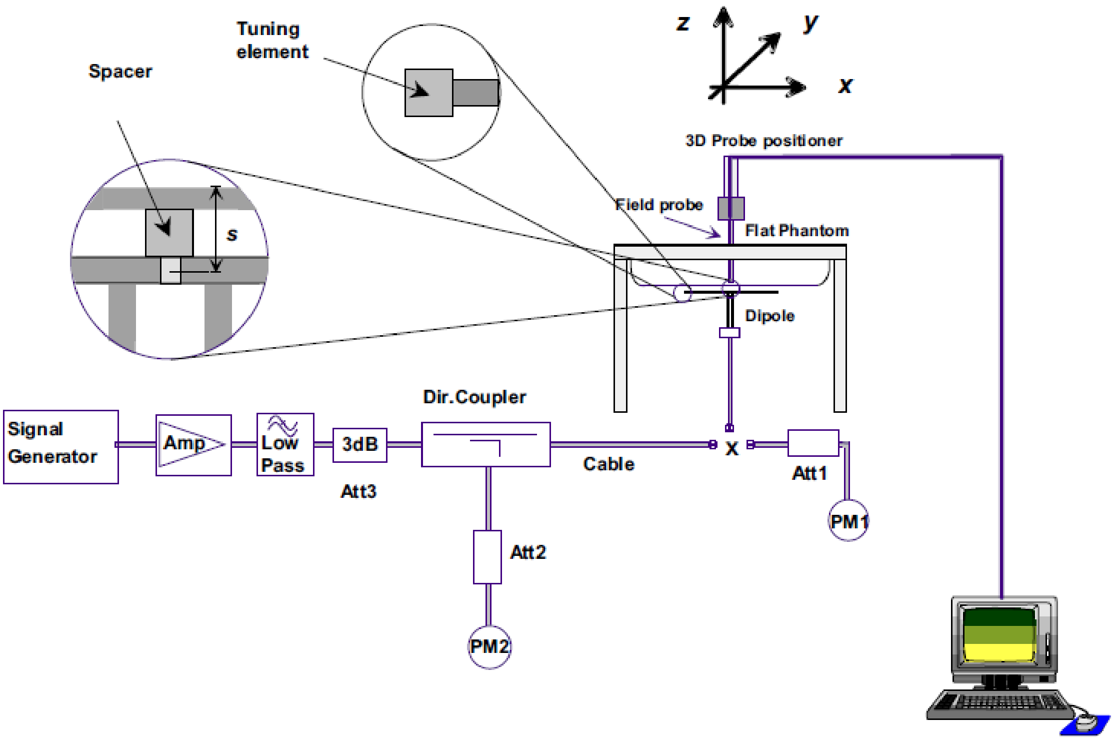
6.1.3 Measurement for Tissue Simulate Liquid

The dielectric properties for this Tissue Simulate Liquids were measured by using the SPEAG DAK3.5 dielectric probe kit in conjunction with Agilent 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.

Measurement for Tissue Simulate Liquid								
Tissue Type	Measured Frequency （MHz）	Measured Tissue		Target Tissue (±5%)		Deviation (Within ±5%)		Liquid Temp. (℃)	Test Date
		ε_r	σ(S/m)	ε_r	σ(S/m)	ε_r	σ(S/m)		
835 Head	835	43.300	0.893	41.50	0.90	4.34%	-0.78%	22.0	2023/11/23
2600 Head	2600	40.000	1.970	39.00	1.96	2.56%	0.51%	21.8	2023/11/22

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-2. the microwave circuit arrangement used for SAR system verification

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.

6.2.2 Summary System Check Result(s)

SAR System Validation Result(s)											
Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within ±10%)		Liquid Temp. (℃)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D835V2	Head	2.50	1.66	10.00	6.64	9.53	6.29	4.93%	5.56%	22.0	2023/11/23
D2600V2	Head	14.10	6.35	56.40	25.40	57.70	25.80	-2.25%	-1.55%	21.8	2023/11/22

6.2.3 Detailed System Check Results

Please see the Appendix A

7 Test Configuration

7.1 Operation Configurations

Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR. 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.

TDD LTE test consideration

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

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

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

Frame structure type 2:

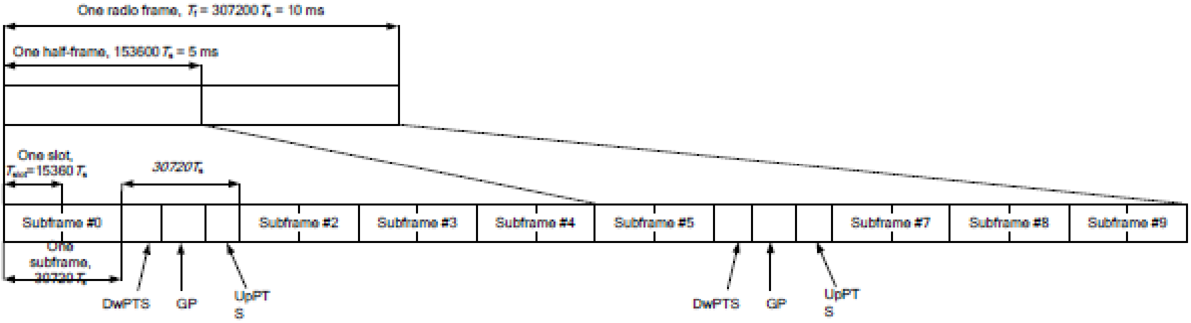


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

<table>
<tr><th rowspan="3">Special subframe configuration</th><th colspan="3">Normal cyclic prefix in downlink</th><th colspan="3">Extended cyclic prefix in downlink</th></tr>
<tr><th>DwPTS</th><th colspan="2">UpPTS</th><th>DwPTS</th><th colspan="2">UpPTS</th></tr>
<tr><th></th><th>Normal cyclic prefix in uplink</th><th>Extended cyclic prefix in uplink</th><th></th><th>Normal cyclic prefix in uplink</th><th>Extended cyclic prefix in uplink</th></tr>
<tr><td>0</td><td>6592.Ts</td><td rowspan="5">2192.Ts</td><td rowspan="5">2560.Ts</td><td>7680.Ts</td><td rowspan="4">2192.Ts</td><td rowspan="4">2560.Ts</td></tr>
<tr><td>1</td><td>19760.Ts</td><td>20480.Ts</td></tr>
<tr><td>2</td><td>21952.Ts</td><td>23040.Ts</td></tr>
<tr><td>3</td><td>24144.Ts</td><td>25600.Ts</td></tr>
<tr><td>4</td><td>26336.Ts</td><td>7680.Ts</td><td rowspan="3">4384.Ts</td><td rowspan="3">5120.Ts</td></tr>
<tr><td>5</td><td>6592.Ts</td><td rowspan="2">4384.Ts</td><td rowspan="2">5120.Ts</td><td>20480.Ts</td></tr>
<tr><td>6</td><td>19760.Ts</td><td>23040.Ts</td></tr>
</table>

7	21952.Ts			25600.Ts		
8	24144.Ts			-	-	-
9	13168.Ts			-	-	-

Table 4.2-2: Uplink-downlink configurations.

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

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

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

A) Spectrum Plots for RB Configurations

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

B) MPR

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

Modulation	Channel bandwidth / Transmission bandwidth (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 measured SAR is ≤ 1.0 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 measured SAR of a required test channel is > 1.80 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

For QPSK with 50% RB allocation, SAR is only required measure for the worst case of 1RB allocation used the highest maximum output power.

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 measured SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 1.0 W/kg. Otherwise, SAR is measured for the highest output power channel and if the measured SAR is > 1.80 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the measured SAR for the QPSK configuration is > 1.80 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 measured SAR of a configuration for the largest channel bandwidth is > 1.80 W/kg.

8 Measurement RF Conducted Power

8.1.1 Conducted Power Of LTE

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	23.67	24.29	24.05	25.50
		1	2	23.60	24.20	23.86	25.50
		1	5	23.74	24.21	23.93	25.50
		3	0	23.63	24.20	23.91	24.50
		3	2	23.64	24.17	23.89	24.50
		3	3	23.66	24.13	23.92	24.50
		6	0	22.84	23.29	22.94	24.50
	16QAM	1	0	23.04	23.37	23.04	24.50
		1	2	22.99	23.30	22.94	24.50
		1	5	23.03	23.39	22.94	24.50
		3	0	22.85	23.39	23.16	23.50
		3	2	22.86	23.37	23.19	23.50
		3	3	22.83	23.34	23.14	23.50
		6	0	21.82	22.27	22.03	23.50
Bandwidth	Modulation	RB size	RB offset	Channel 20415	Channel 20525	Channel 20635	Tune up
3MHz	QPSK	1	0	23.85	24.36	24.11	25.50
		1	7	23.84	24.36	24.10	25.50
		1	14	23.88	24.23	24.02	25.50
		8	0	23.03	23.52	23.13	24.50
		8	4	22.98	23.50	23.15	24.50
		8	7	23.04	23.44	23.05	24.50
		15	0	23.04	23.48	23.12	24.50
	16QAM	1	0	23.42	23.59	23.12	24.50
		1	7	23.46	23.64	23.14	24.50
		1	14	23.46	23.52	22.99	24.50
		8	0	22.19	22.53	22.22	23.50
		8	4	22.23	22.52	22.22	23.50
		8	7	22.23	22.46	22.15	23.50
		15	0	22.14	22.48	22.20	23.50
Bandwidth	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625	Tune up
5MHz	QPSK	1	0	23.93	24.32	24.19	25.50
		1	13	24.04	24.40	24.14	25.50
		1	24	24.03	24.25	23.97	25.50
		12	0	23.07	23.53	23.24	24.50
		12	6	23.17	23.61	23.28	24.50
		12	13	23.17	23.47	23.15	24.50

		25	0	23.12	23.53	23.18	24.50
	16QAM	1	0	22.86	23.62	23.31	24.50
		1	13	23.01	23.76	23.28	24.50
		1	24	23.04	23.60	23.06	24.50
		12	0	22.06	22.57	22.25	23.50
		12	6	22.16	22.64	22.31	23.50
		12	13	22.16	22.51	22.18	23.50
		25	0	22.15	22.52	22.31	23.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20450	20525	20600	
10MHz	QPSK	1	0	23.81	24.16	24.27	25.50
		1	25	24.13	24.36	24.17	25.50
		1	49	24.09	24.14	23.93	25.50
		25	0	22.97	23.30	23.23	24.50
		25	13	23.24	23.52	23.25	24.50
		25	25	23.24	23.31	23.08	24.50
		50	0	23.12	23.40	23.10	24.50
	16QAM	1	0	23.32	23.38	23.30	24.50
		1	25	23.73	23.62	23.27	24.50
		1	49	23.68	23.30	22.89	24.50
		25	0	22.06	22.40	22.28	23.50
		25	13	22.33	22.58	22.34	23.50
		25	25	22.25	22.37	22.17	23.50
		50	0	22.18	22.46	22.15	23.50

LTE Band 7				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20775	21100	21425	
5MHz	QPSK	1	0	23.68	23.64	23.64	24.50
		1	13	23.59	23.60	23.50	24.50
		1	24	23.51	23.73	23.48	24.50
		12	0	22.99	23.14	23.43	23.50
		12	6	22.84	22.82	22.86	23.50
		12	13	22.80	22.65	22.63	23.50
		25	0	22.67	22.60	22.81	23.50
	16QAM	1	0	22.89	22.78	22.69	23.50
		1	13	22.87	23.02	23.06	23.50
		1	24	22.44	22.16	22.09	23.50
		12	0	21.99	22.29	21.20	22.50
		12	6	21.73	21.90	21.79	22.50
		12	13	21.38	21.62	21.59	22.50
		25	0	21.03	21.82	21.54	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20800	21100	21400	
10MHz	QPSK	1	0	23.66	23.67	23.64	24.50

		1	25	23.62	23.61	23.51	24.50
		1	49	23.55	23.71	23.50	24.50
		25	0	23.03	23.11	23.44	23.50
		25	13	22.92	22.89	22.85	23.50
		25	25	22.80	22.70	22.65	23.50
		50	0	22.63	22.60	22.75	23.50
	16QAM	1	0	22.88	22.74	22.74	23.50
		1	25	22.84	22.95	23.09	23.50
		1	49	22.42	22.22	22.15	23.50
		25	0	21.95	22.25	21.28	22.50
		25	13	21.70	21.87	21.72	22.50
		25	25	21.31	21.62	21.61	22.50
		50	0	21.02	21.81	21.47	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20825	21100	21375	
15MHz	QPSK	1	0	23.61	23.67	23.66	24.50
		1	38	23.56	23.66	23.53	24.50
		1	74	23.53	23.73	23.48	24.50
		36	0	22.95	23.15	23.36	23.50
		36	18	22.93	22.87	22.79	23.50
		36	39	22.78	22.67	22.63	23.50
		75	0	22.71	22.62	22.82	23.50
	16QAM	1	0	22.82	22.69	22.72	23.50
		1	38	22.88	23.00	23.15	23.50
		1	74	22.42	22.17	22.11	23.50
		36	0	21.96	22.23	21.20	22.50
		36	18	21.69	21.94	21.73	22.50
		36	39	21.31	21.62	21.60	22.50
		75	0	21.02	21.78	21.48	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20850	21100	21350	
20MHz	QPSK	1	0	23.64	23.69	23.62	24.50
		1	50	23.59	23.62	23.51	24.50
		1	99	23.53	23.68	23.45	24.50
		50	0	22.98	23.13	22.94	23.50
		50	25	22.89	22.84	22.84	23.50
		50	50	22.78	22.68	22.64	23.50
		100	0	22.68	22.64	22.78	23.50
	16QAM	1	0	22.86	22.69	22.74	23.50
		1	50	22.85	22.97	23.11	23.50
		1	99	22.42	22.17	22.14	23.50
		50	0	21.98	22.27	21.24	22.50
		50	25	21.68	21.89	21.75	22.50
		50	50	21.36	21.60	21.62	22.50
		100	0	21.00	21.81	21.50	22.50

LTE Band 38				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 37775	Channel 38000	Channel 38225	Tune up
5MHz	QPSK	1	0	23.42	23.05	23.07	24.50
		1	13	23.27	23.52	23.49	24.50
		1	24	23.54	23.23	23.34	24.50
		12	0	22.54	22.32	23.14	23.50
		12	6	22.82	22.68	23.38	23.50
		12	13	22.72	22.93	22.92	23.50
		25	0	22.65	22.56	22.25	23.50
	16QAM	1	0	22.20	22.39	22.30	23.50
		1	13	22.87	22.92	23.45	23.50
		1	24	22.63	22.76	22.71	23.50
		12	0	21.81	21.45	21.63	22.50
		12	6	21.91	21.78	22.02	22.50
		12	13	21.91	22.09	22.12	22.50
		25	0	21.79	21.75	22.02	22.50
Bandwidth	Modulation	RB size	RB offset	Channel 37800	Channel 38000	Channel 38200	Tune up
10MHz	QPSK	1	0	23.48	22.95	23.00	24.50
		1	25	23.26	23.54	23.51	24.50
		1	49	23.42	23.23	23.32	24.50
		25	0	22.53	22.26	23.23	23.50
		25	13	22.79	22.62	23.33	23.50
		25	25	22.72	22.88	22.98	23.50
		50	0	22.63	22.60	22.25	23.50
	16QAM	1	0	22.19	22.41	22.35	23.50
		1	25	22.86	22.83	23.43	23.50
		1	49	22.69	22.73	22.78	23.50
		25	0	21.71	21.40	21.64	22.50
		25	13	21.90	21.85	22.08	22.50
		25	25	21.83	22.02	22.16	22.50
		50	0	21.80	21.68	22.01	22.50
Bandwidth	Modulation	RB size	RB offset	Channel 37825	Channel 38000	Channel 38175	Tune up
15MHz	QPSK	1	0	23.42	22.99	22.95	24.50
		1	38	23.17	23.53	23.50	24.50
		1	74	23.53	23.19	23.26	24.50
		36	0	22.56	22.33	23.17	23.50
		36	18	22.80	22.68	23.44	23.50
		36	39	22.67	22.94	22.87	23.50
		75	0	22.64	22.54	22.27	23.50
	16QAM	1	0	22.26	22.39	22.38	23.50
		1	38	22.85	22.88	23.40	23.50
		1	74	22.69	22.74	22.71	23.50
		36	0	21.76	21.33	21.66	22.50

		36	18	21.88	21.81	21.99	22.50
		36	39	21.90	22.00	22.21	22.50
		75	0	21.83	21.64	22.00	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				37850	38000	38150	
20MHz	QPSK	1	0	23.46	23.00	23.01	24.50
		1	50	23.21	23.57	23.61	24.50
		1	99	23.48	23.22	23.29	24.50
		50	0	22.58	22.27	23.17	23.50
		50	25	22.84	22.66	23.38	23.50
		50	50	22.72	22.89	22.93	23.50
		100	0	22.67	22.60	22.28	23.50
	16QAM	1	0	22.24	22.36	22.34	23.50
		1	50	22.91	22.89	23.41	23.50
		1	99	22.68	22.77	22.75	23.50
		50	0	21.77	21.39	21.68	22.50
		50	25	21.94	21.79	22.03	22.50
		50	50	21.88	22.06	22.17	22.50
		100	0	21.81	21.70	22.03	22.50

LTE Band 41 2535~2675				**Conducted Power(dBm)**				
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Tune up
				40065	40448	40832	41215	
5MHz	QPSK	1	0	23.43	23.49	22.99	22.91	24.50
		1	13	23.17	23.63	23.14	23.04	24.50
		1	24	23.33	23.56	23.29	23.51	24.50
		12	0	22.59	22.73	22.72	22.45	23.50
		12	6	22.59	23.03	22.36	23.08	23.50
		12	13	22.69	22.90	22.65	22.26	23.50
		25	0	22.49	22.81	22.36	22.28	23.50
	16QAM	1	0	22.68	22.46	22.25	22.40	23.50
		1	13	22.80	22.81	22.13	22.52	23.50
		1	24	22.16	22.78	22.62	22.37	23.50
		12	0	21.62	21.93	21.24	21.36	22.50
		12	6	21.85	22.15	21.48	21.47	22.50
		12	13	21.44	22.08	21.53	21.41	22.50
		25	0	21.49	22.09	21.32	21.82	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Channel	Tune up
				40090	40457	40823	41190	
10MHz	QPSK	1	0	23.54	23.69	22.84	22.86	24.50
		1	25	23.16	23.84	23.10	23.08	24.50
		1	49	23.33	23.69	23.11	23.35	24.50
		25	0	22.73	22.78	22.56	22.65	23.50
		25	13	22.80	22.98	22.39	23.21	23.50
		25	25	22.67	22.94	22.65	22.15	23.50
		50	0	22.69	22.84	22.18	22.42	23.50

	16QAM	1	0	22.66	22.42	22.06	22.37	23.50
		1	25	22.74	22.70	21.97	22.55	23.50
		1	49	22.19	22.92	22.67	22.43	23.50
		25	0	21.69	21.85	21.26	21.35	22.50
		25	13	21.87	22.13	21.52	22.40	22.50
		25	25	21.47	22.02	21.65	21.64	22.50
		50	0	21.69	21.96	21.41	21.78	22.50
Bandwidth	Modulation	RB size	RB offset	Channel 40115	Channel 40465	Channel 40815	Channel 41165	Tune up
15MHz	QPSK	1	0	23.31	23.59	22.96	22.79	24.50
		1	38	23.20	23.83	23.20	23.03	24.50
		1	74	23.26	23.78	23.32	23.37	24.50
		36	0	22.60	22.94	22.64	22.61	23.50
		36	18	22.65	22.96	22.40	23.08	23.50
		36	39	22.66	22.86	22.69	22.11	23.50
		75	0	22.70	22.86	22.18	22.42	23.50
	16QAM	1	0	22.85	22.57	22.17	22.32	23.50
		1	38	22.83	22.87	21.94	22.58	23.50
		1	74	22.17	22.84	22.67	22.32	23.50
		36	0	21.70	22.02	21.36	21.51	22.50
		36	18	21.76	22.11	21.47	22.44	22.50
		36	39	21.42	22.06	21.53	21.43	22.50
		75	0	21.53	21.91	21.32	21.74	22.50
Bandwidth	Modulation	RB size	RB offset	Channel 40140	Channel 40473	Channel 40807	Channel 41140	Tune up
20MHz	QPSK	1	0	23.46	23.63	22.99	22.87	24.50
		1	50	23.21	23.75	23.11	23.12	24.50
		1	99	23.37	23.69	23.23	23.43	24.50
		50	0	22.73	22.86	22.69	22.58	23.50
		50	25	22.74	23.08	22.47	23.15	23.50
		50	50	22.67	22.87	22.61	22.25	23.50
		100	0	22.61	22.92	22.31	22.43	23.50
	16QAM	1	0	22.81	22.51	22.17	22.45	23.50
		1	50	22.76	22.78	22.08	22.54	23.50
		1	99	22.15	22.93	22.73	22.41	23.50
		50	0	21.70	21.96	21.38	21.43	22.50
		50	25	21.78	22.14	21.50	22.42	22.50
		50	50	21.54	22.00	21.58	21.56	22.50
		100	0	21.63	22.04	21.42	21.85	22.50

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.

8.2.1 SAR Result Of LTE Band 5

LTE Band 5 SAR Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Limbs Test data (Separate 0mm 1RB)											
Front side	10	QPSK 1_25	20525/836.5	1:1	0.281	-0.02	24.36	25.50	1.300	0.365	21.8
Back side	10	QPSK 1_25	20525/836.5	1:1	0.596	-0.02	24.36	25.50	1.300	0.775	21.8
Left side	10	QPSK 1_25	20525/836.5	1:1	0.618	-0.10	24.36	25.50	1.300	**0.804**	21.8
Right side	10	QPSK 1_25	20525/836.5	1:1	0.190	0.04	24.36	25.50	1.300	0.247	21.8
Top side	10	QPSK 1_25	20525/836.5	1:1	0.020	0.01	24.36	25.50	1.300	0.026	21.8
Bottom side	10	QPSK 1_25	20525/836.5	1:1	0.602	0.02	24.36	25.50	1.300	0.783	21.8
Limbs Test data (Separate 0mm 50%RB)											
Front side	10	QPSK 25_13	20525/836.5	1:1	0.244	-0.07	23.52	24.50	1.253	0.306	21.8
Back side	10	QPSK 25_13	20525/836.5	1:1	0.490	-0.02	23.52	24.50	1.253	0.614	21.8
Left side	10	QPSK 25_13	20525/836.5	1:1	0.490	0.01	23.52	24.50	1.253	0.614	21.8
Right side	10	QPSK 25_13	20525/836.5	1:1	0.154	0.02	23.52	24.50	1.253	0.193	21.8
Top side	10	QPSK 25_13	20525/836.5	1:1	0.016	0.03	23.52	24.50	1.253	0.020	21.8
Bottom side	10	QPSK 25_13	20525/836.5	1:1	0.487	-0.01	23.52	24.50	1.253	0.610	21.8

8.2.2 SAR Result Of LTE Band 7

LTE Band 7 SAR Test Record											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs Test data (Separate 0mm 1RB)											
Front side	20	QPSK 1_0	21100/2535	1:1	0.126	-0.04	23.69	24.50	1.205	0.152	22
Back side	20	QPSK 1_0	21100/2535	1:1	0.915	-0.02	23.69	24.50	1.205	1.103	22
Left side	20	QPSK 1_0	21100/2535	1:1	1.230	-0.06	23.69	24.50	1.205	**1.482**	22
Right side	20	QPSK 1_0	21100/2535	1:1	0.084	0.01	23.69	24.50	1.205	0.101	22
Top side	20	QPSK 1_0	21100/2535	1:1	0.031	-0.04	23.69	24.50	1.205	0.037	22
Bottom side	20	QPSK 1_0	21100/2535	1:1	0.351	0.02	23.69	24.50	1.205	0.423	22
Limbs Test data (Separate 0mm 50%RB)											
Front side	20	QPSK 50_0	21100/2535	1:1	0.098	-0.07	23.13	23.50	1.089	0.107	22
Back side	20	QPSK 50_0	21100/2535	1:1	0.715	0.12	23.13	23.50	1.089	0.779	22
Left side	20	QPSK 50_0	21100/2535	1:1	0.945	-0.17	23.13	23.50	1.089	1.029	22
Right side	20	QPSK 50_0	21100/2535	1:1	0.062	0.01	23.13	23.50	1.089	0.068	22
Top side	20	QPSK 50_0	21100/2535	1:1	0.022	0.01	23.13	23.50	1.089	0.024	22
Bottom side	20	QPSK 50_0	21100/2535	1:1	0.254	0.03	23.13	23.50	1.089	0.277	22

8.2.3 SAR Result Of LTE Band 38

LTE Band 38 SAR Test Record												
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs Test data (Separate 0mm 1RB)											
Front side	20	QPSK 1_50	38150/2610	1:1.58	0.089	0.02	23.61	24.50	1.227	0.109	21.6
Back side	20	QPSK 1_50	38150/2610	1:1.58	0.628	-0.03	23.61	24.50	1.227	0.771	21.6
Left side	20	QPSK 1_50	38150/2610	1:1.58	0.677	-0.02	23.61	24.50	1.227	**0.831**	21.6
Right side	20	QPSK 1_50	38150/2610	1:1.58	0.043	0.02	23.61	24.50	1.227	0.053	21.6
Top side	20	QPSK 1_50	38150/2610	1:1.58	0.010	-0.03	23.61	24.50	1.227	0.012	21.6
Bottom side	20	QPSK 1_50	38150/2610	1:1.58	0.176	0.01	23.61	24.50	1.227	0.216	21.6
Limbs Test data (Separate 0mm 50%RB)											
Front side	20	QPSK 50_25	38150/2610	1:1.58	0.072	0.06	23.38	23.50	1.028	0.074	21.6
Back side	20	QPSK 50_25	38150/2610	1:1.58	0.464	0.02	23.38	23.50	1.028	0.477	21.6
Left side	20	QPSK 50_25	38150/2610	1:1.58	0.555	-0.02	23.38	23.50	1.028	0.571	21.6
Right side	20	QPSK 50_25	38150/2610	1:1.58	0.037	0.04	23.38	23.50	1.028	0.038	21.6
Top side	20	QPSK 50_25	38150/2610	1:1.58	0.008	0.02	23.38	23.50	1.028	0.008	21.6
Bottom side	20	QPSK 50_25	38150/2610	1:1.58	0.143	0.05	23.38	23.50	1.028	0.147	21.6

8.2.4 SAR Result Of LTE Band 41

LTE Band 41 SAR Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Limbs Test data (Separate 0mm 1RB)											
Front side	20	QPSK 1_50	40473/2578.3	1:1.58	0.100	-0.06	23.75	24.50	1.189	0.119	21.9
Back side	20	QPSK 1_50	40473/2578.3	1:1.58	0.725	0.01	23.75	24.50	1.189	0.862	21.9
Left side	20	QPSK 1_50	40473/2578.3	1:1.58	0.995	-0.06	23.75	24.50	1.189	**1.183**	21.9
Right side	20	QPSK 1_50	40473/2578.3	1:1.58	0.052	0.01	23.75	24.50	1.189	0.062	21.9
Top side	20	QPSK 1_50	40473/2578.3	1:1.58	0.016	0.07	23.75	24.50	1.189	0.019	21.9
Bottom side	20	QPSK 1_50	40473/2578.3	1:1.58	0.233	0.04	23.75	24.50	1.189	0.277	21.9
Limbs Test data (Separate 0mm 50%RB)											
Front side	20	QPSK 50_25	41140/2645	1:1.58	0.125	-0.12	23.15	23.50	1.084	0.135	21.9
Back side	20	QPSK 50_25	41140/2645	1:1.58	0.875	0.02	23.15	23.50	1.084	0.948	21.9
Left side	20	QPSK 50_25	41140/2645	1:1.58	1.010	0.09	23.15	23.50	1.084	1.095	21.9
Right side	20	QPSK 50_25	41140/2645	1:1.58	0.061	-0.04	23.15	23.50	1.084	0.066	21.9
Top side	20	QPSK 50_25	41140/2645	1:1.58	0.012	0.01	23.15	23.50	1.084	0.013	21.9
Bottom side	20	QPSK 50_25	41140/2645	1:1.58	0.254	0.03	23.15	23.50	1.084	0.275	21.9

9 Equipment list

Test Platform	SPEAG DASY Professional					
Description	SAR Test System (Frequency range 300MHz-6GHz)					
Software Reference	cDASY8 V16.2.4.2524					
Hardware Reference						
Equipment		Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	Twin Phantom	SPEAG	SAM V8.0	2256	NCR	NCR
☒	DAE	SPEAG	DAE4ip	1830	2023/09/12	2024/09/11
☒	E-Field Probe	SPEAG	EX3DV4	7838	2023/09/11	2024/09/10
☒	Validation Kits	SPEAG	D835V2	4d105	2022/11/02	2025/11/01
☒	Validation Kits	SPEAG	D2600V2	1125	2022/06/14	2025/06/13
☒	Dielectric parameter probes	SPEAG	DAKS-3.5	0005	2023/6/15	2024/6/14
☒	Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS_VNA R140	0140913	2023/6/7	2024/6/6
☒	Radio Communication Analyzer	Anritsu	MT8820C	6201381734	2023/05/25	2024/05/24
☒	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
☒	Signal Generator	Agilent	N5171B	MY53050736	2023/02/16	2024/02/15
☒	Preamplifier	Mini-Circuits	ZHL-42W	15542	NCR	NCR
☒	Preamplifier	Compliance Directions Systems Inc.	AMP28-3W	073501433	NCR	NCR
☒	Power Meter	Agilent	E4416A	GB41292095	2023/02/16	2024/02/15
☒	Power Sensor	Agilent	8481H	MY41091234	2023/02/16	2024/02/15
☒	Power Sensor	R&S	NRP-Z92	100025	2023/02/16	2024/02/15
☒	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
☒	Speed reading thermometer	MingGao	T809	NA	2023/05/26	2024/05/25

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
☒ No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

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