FCC SAR TEST REPORT

Application No.:	XEWM2305000213RG
Applicant:	HONG KONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Manufacturer:	HONG KONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Product Name:	Revolutionary Intelligent KeyChain
Model No.(EUT):	GLMT23A01
Trade Mark:	GlocalMe
FCC ID:	2AC88-GLMT23A01
Standards:	FCC 47CFR §2.1093
Date of Receipt:	2023-05-09
Date of Test:	2023-06-23 to 2023-07-26
Date of Issue:	2023-07-27
Test Result:	**PASS ***

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

Authorized Signature:

Peter Tan

Regulatory Technical Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

REVISION HISTORY

Report Number	Revision	Description	Issue Date
XEWM2305000213RG06	01	Original	2023-07-27

Prepared By	Yuan Zhao **Yuan Zhao**
Reviewed by	Mark Liu **Mark Liu**

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TEST SUMMARY

Frequency Band	Test position	Max Report SAR1-g (W/kg)	SAR limit (W/kg)
LTE Band 2	Body	0.49	1.60
LTE Band 5	Body	0.45	1.60
LTE Band 12	Body	0.58	1.60
LTE Band 13	Body	0.40	1.60
LTE Band 17	Body	0.58	1.60
LTE Band 25	Body	0.49	1.60
LTE Band 26	Body	0.45	1.60
WI-FI (2.4GHz)	Body	0.86	1.60
BT	Body	0.20	1.60

Maximum Simultaneous Transmission SAR (W/kg)	
Scenario	Body
Sum SAR	1.59
SPLSR	/
SPLSR Limited	0.04

Note:

1) According to TCB workshop October,2014 RF Exposure Procedures Update (Overlapping Bands): SAR for LTE Band2(Frequency range:1850 - 1910 MHz)/LTE Band 5(Frequency range:824 - 849 MHz MHz)/LTE Band 17(Frequency range:704 - 716 MHz MHz) is respectively covered by LTE Band 25 (Frequency range:1850 - 1915 MHz)/LTE Band 26 (Frequency range:814 - 849 MHz)/LTE Band 12 (Frequency range: 699 - 716 MHz) due to similar frequency range, same maximum tune up limit and same channel bandwidth.
2) The Simultaneous transmission SAR is the same test position of the WIFI antenna + BT antenna.

CONTENTS

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1 General Information

1.1 Details of Client

Applicant:	HONG KONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Address:	Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong
Manufacturer:	HONG KONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Address:	Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong

1.2 Test Location

Company:	SGS-CSTC Standards Technical Services (XI 'AN) Co., Ltd.
Address:	1 / F, Unit D, Building 1, Kanghong Orange Science park, No.137 Keyuan 3rd Road, Fengdong New Town, Xi 'an, Shaanxi, China
Post code:	710086
Test Engineer：	Captain Zhou, Mark Liu

1.3 Test Facility

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

• **A2LA (Certificate No. 4854.01)**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

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

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0095

ISED#: 25613.

• **FCC –Designation Number: CN1337**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN1337.

Test Firm Registration Number: 917410

1.4 General Description of EUT

Product Name:	Revolutionary Intelligent KeyChain		
Model No.(EUT):	GLMT23A01		
Trade Mark:	GlocalMe		
Product Phase:	production unit		
Device Type:	portable device		
Exposure Category:	uncontrolled environment / general population		
IMEI:	353682680004460/353682680004486		
FCC ID:	2AC88-GLMT23A01		
Hardware Version:	P020_V3		
Software Version:	T10_HTSV1.0.001.002.230601		
Antenna Type:	PIFA		
Device Operating Configurations:			
Modulation Mode:	**LTE**: QPSK,16QAM **WIFI**: DSSS, OFDM; **BT**: GFSK, π/4DQPSK,8DPSK		
Power Class	3, tested with power control Max Power(LTE Band)		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	LTE Band 2	1850 - 1910	1930 - 1990
	LTE Band 5	824 - 849	869 - 894
	LTE Band 12	699 - 716	729 - 746
	LTE Band 13	777 - 787	746 - 756
	LTE Band 17	704 - 716	734 - 746
	LTE Band 25	1850 - 1915	1930 - 1995
	LTE Band 26	814 - 849	859 - 894
	WIFI(2.4GHz)	2412 - 2462	2412 - 2462
	BT	2402 - 2480	2402 - 2480
Battery Information:	Model:	T10	
	Normal Voltage:	3.85V	
	Rated capacity:	935mAh	
	Manufacturer	HUIZHOU GANFENG LIENERGY BATTERY TECHNOLOGY CO., LTD.	

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1.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE Std C95.1 – 1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 941225 D01	3G SAR Measurement Procedures v03r01
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB 941225 D06	Hotspot Mode SAR v02r01
KDB 248227 D01	SAR Guidance for IEEE 802 11 Wi-Fi SAR v02r02
KDB 616217 D04 v01r02	SAR for laptop and tablets
KDB 447498 D01	General RF Exposure Guidance v06
KDB 447498 D03 v01	Supplement C Cross-Reference
KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
KDB 865664 D02 v01r02	RF Exposure Reporting
KDB 648474 D04	SAR Evaluation Considerations for Wireless Handsets

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1.6 RF exposure limits

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

Notes:

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

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

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.)

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2 SAR Measurements System Configuration

2.1 The SAR Measurement System

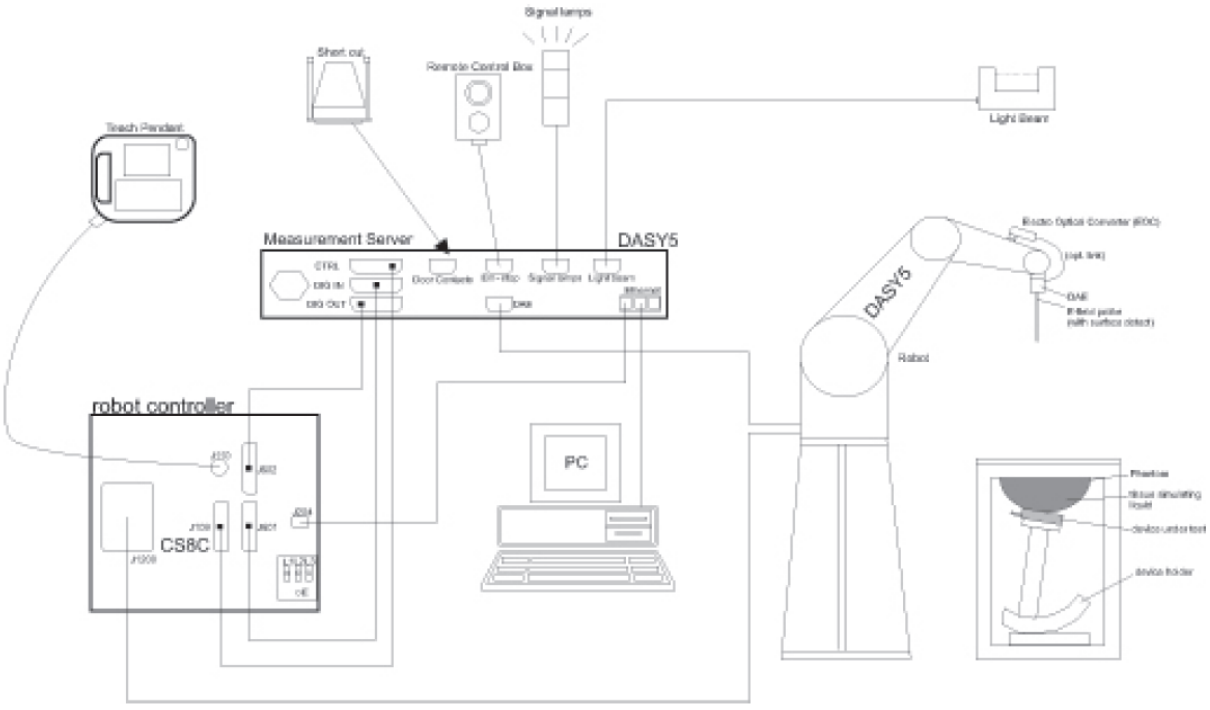
This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the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

2.2 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

2.3 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

2.4 SAM Twin Phantom

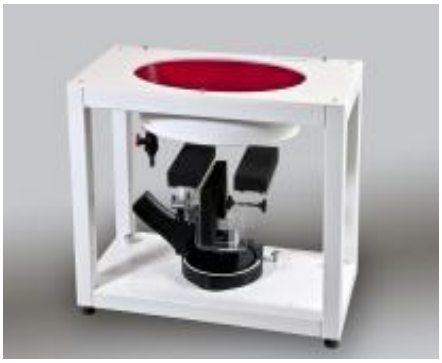
Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx.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

2.5 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.

2.6 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.

2.7 Measurement procedure

2.7.1 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.

			≤ 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 %

2.7.2 Data Storage

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

2.7.3 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.

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

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

3 Description of Test Position

3.1 The Body Test Position

The device is a Revolutionary Intelligent KeyChain, it is < 9cm x 5cm, Per FCC KDB 941225 D06, the declared 5mm distance is used to perform SAR testing with each side.

4 SAR System Verification Procedure

4.1 Tissue Simulate Liquid

4.1.1 Recipes for Tissue Simulate Liquid

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

Ingredients (% by weight)	Frequency (MHz)				
	450	700-900	1800-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
Salt: 99+% Pure Sodium Chloride Water: De-ionized, 16 MΩ+ resistivity Tween: Polyoxyethylene (20) sorbitan monolaurate			Sucrose: 98+% Pure Sucrose HEC: Hydroxyethyl Cellulose		
HSL5GHz is composed of the following ingredients： Water：50-65% Mineral oil：10-30% Emulsifiers：8-25% Sodium salt：0-1.5%					

Table 1： Recipe of Tissue Simulate Liquid

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4.1.2 Measurement for Tissue Simulate Liquid

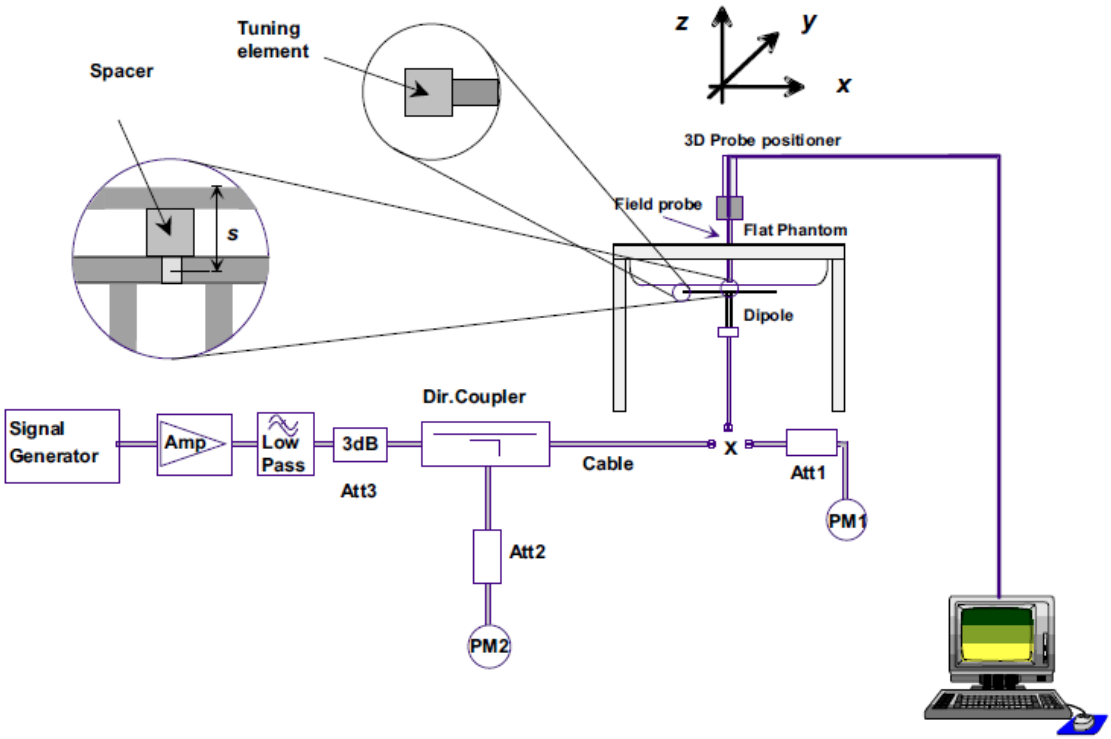
The Conductivity (σ) and Permittivity (ρ) are listed in Table 2. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2°C.

Tissue Type	Measured Frequency (MHz)	Target Tissue (±5%)		Measured Tissue		Deviation (Within ±5%)		Liquid Temp. (℃)	Test Date
		ε_r	σ(S/m)	ε_r	σ(S/m)	ε_r	σ(S/m)		
750 Head	750	41.90	0.89	43.711	0.857	4.32%	-3.71%	21.6	2023/7/22
835 Head	835	41.50	0.90	43.146	0.908	3.97%	0.89%	22.0	2023/7/24
1950 Head	1950	40.00	1.40	40.047	1.420	0.12%	1.43%	21.8	2023/7/24
2450 Head	2450	39.20	1.80	38.495	1.813	-1.80%	0.72%	22.4	2023/6/23

Table 2： Measurement result of Tissue electric parameters

4.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-3. 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 (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 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 check

4.2.1 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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4.2.2 Summary 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)		
D750V3	Head	1.97	1.29	7.88	5.16	8.40	5.52	-6.19%	-6.52%	21.6	2023/7/22
D835V2	Head	2.28	1.50	9.12	6.00	9.65	6.33	-5.49%	-5.21%	22.0	2023/7/24
D1950V3	Head	9.31	4.92	37.24	19.68	40.40	20.80	-7.82%	-5.38%	21.8	2023/7/24
D2450V2	Head	13.10	6.32	52.40	25.28	51.90	23.70	0.96%	6.67%	22.4	2023/6/23

Table 3： SAR System Check Result

4.2.3 Detailed System Check Results

Please see the Appendix A

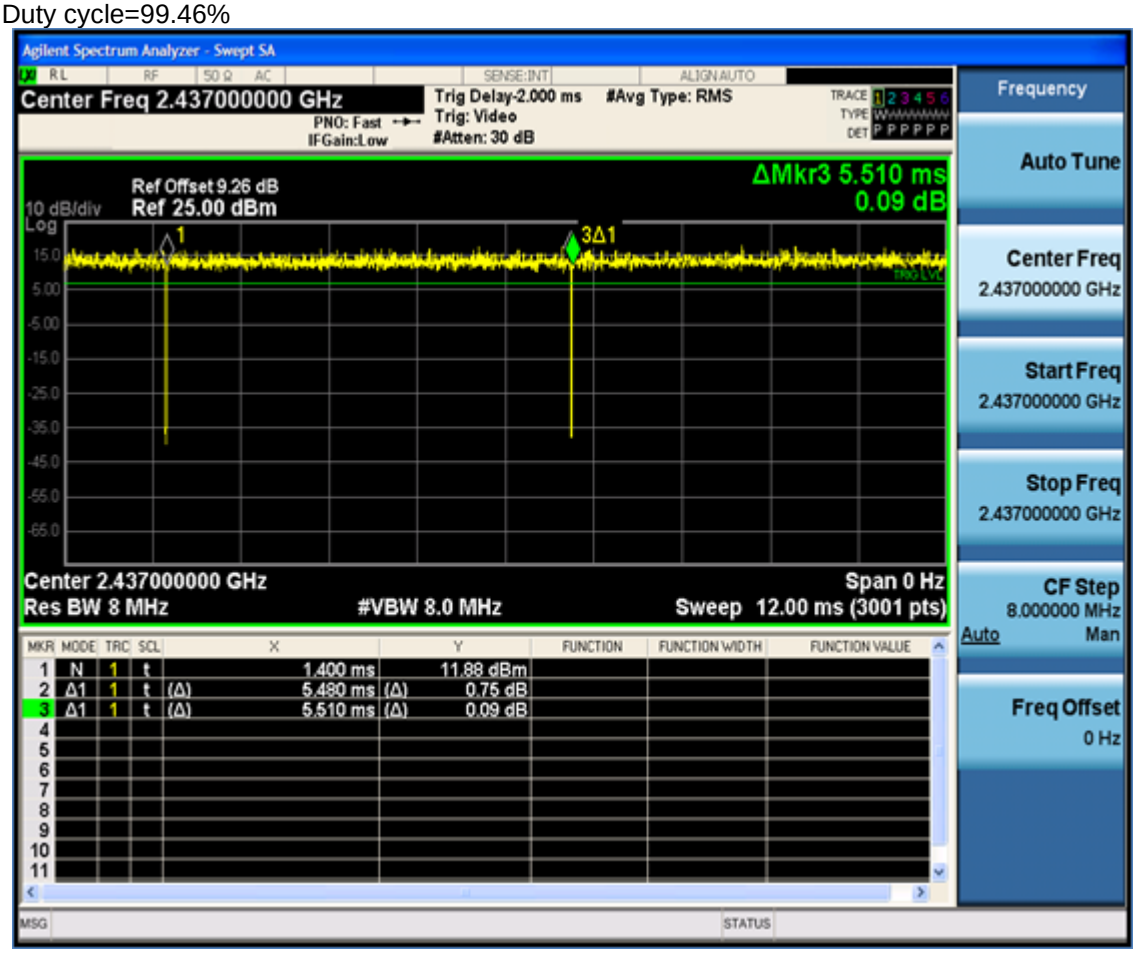
5 Test Configuration

5.1 Operation Configurations

5.1.1 WiFi Test Configuration

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

- 2.4G WIFI
  Duty cycle=99.46%



5.1.1.1 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.

5.1.1.2 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.

5.1.1.3 Subsequent Test Configuration Procedures

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

1）. When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.

2）. When the highest *reported* SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

3）. The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.

a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.

b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the *reported* SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.

4）. SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:

a) replace "subsequent test configuration" with "next subsequent test configuration" (i.e., subsequent next highest specified maximum output power configuration)

b) replace "initial test configuration" with "all tested higher output power configurations"

5.1.1.4 2.4 GHz SAR Procedures

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

- **802.11b DSSS SAR Test Requirements**

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

1）. When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

2）. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

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

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

1）. When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.

2）. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

5.1.2 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 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth / Transmission bandwidth configuration [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
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

C) A-MPR

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

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

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

2) QPSK with 50% RB allocation

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

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

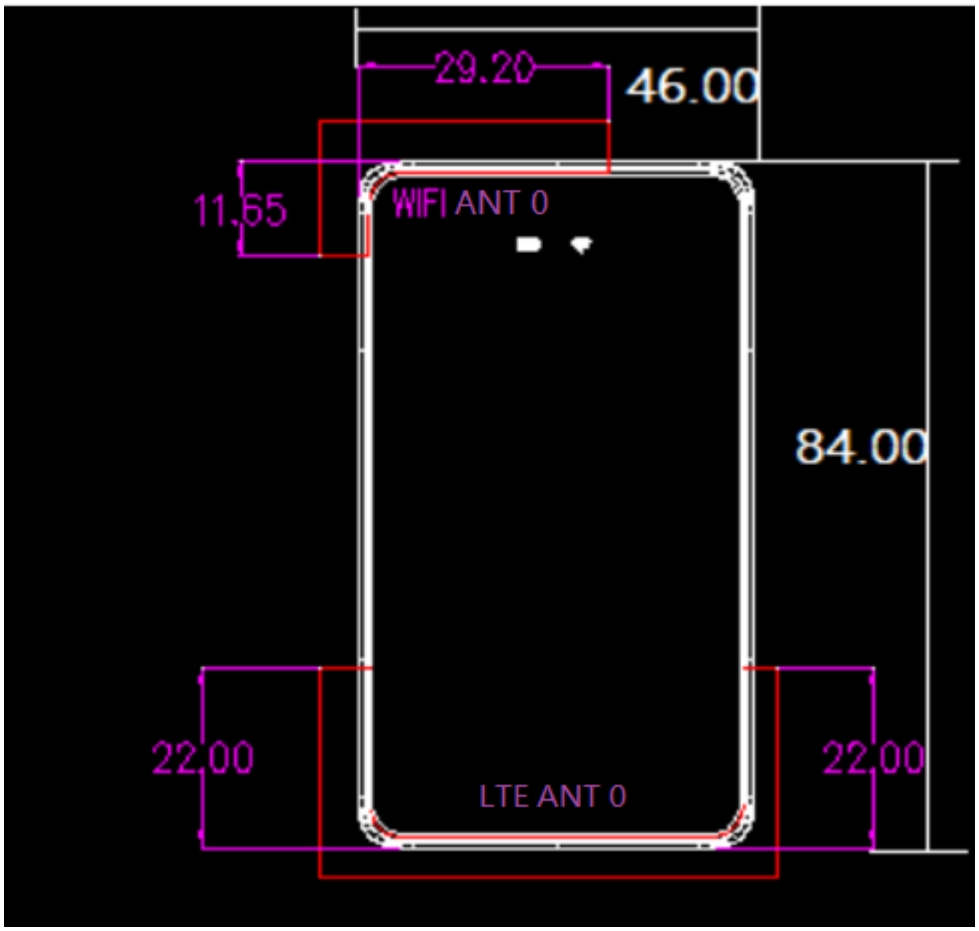
4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > 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.

5.1.3 DUT Antenna Locations



Note:

Mode	Front side	Back side	Left side	Right side	Top side	Bottom side
Main Ant	Yes	Yes	Yes	Yes	Yes	Yes
WIFI Ant	Yes	Yes	Yes	Yes	Yes	Yes

Table 4： EUT Sides for SAR Testing

5.2 Measurement of RF conducted Power

5.2.1 Conducted Power of LTE

LTE Band 2				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18607	18900	19193	
1.4MHz	QPSK	1	0	22.96	23.12	23.18	24.00
		1	2	23.12	22.63	22.76	24.00
		1	5	22.64	23.17	23.00	24.00
		3	0	23.15	23.37	23.19	24.00
		3	2	23.34	22.67	22.78	24.00
		3	3	22.70	22.57	22.50	24.00
		6	0	22.27	22.30	22.12	23.00
	16QAM	1	0	22.33	22.53	22.65	23.00
		1	2	22.54	22.09	22.12	23.00
		1	5	22.11	22.46	22.29	23.00
		3	0	22.47	22.63	22.51	23.00
		3	2	22.64	21.96	22.06	23.00
		3	3	21.98	21.44	21.60	23.00
		6	0	21.74	21.52	21.83	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18615	18900	19185	
3MHz	QPSK	1	0	23.11	23.05	22.67	24.00
		1	7	23.39	23.35	23.03	24.00
		1	14	23.06	22.64	22.94	24.00
		8	0	21.69	21.83	21.89	23.00
		8	4	21.92	22.12	21.56	23.00
		8	7	21.64	21.87	21.88	23.00
		15	0	21.86	22.08	21.64	23.00
	16QAM	1	0	22.23	22.19	21.78	23.00
		1	7	22.54	22.69	22.13	23.00
		1	14	21.58	21.81	21.83	23.00
		8	0	21.27	21.10	21.37	22.00
		8	4	21.55	21.21	21.36	22.00
		8	7	21.36	21.60	21.34	22.00
		15	0	21.29	21.19	21.43	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18625	18900	19175	
5MHz	QPSK	1	0	23.16	23.00	22.67	24.00
		1	13	**23.22**	23.19	22.70	24.00
		1	24	23.21	22.96	23.04	24.00
		12	0	22.07	22.07	21.60	23.00
		12	6	22.00	22.03	21.61	23.00
		12	13	22.13	22.00	21.68	23.00
		25	0	22.02	22.23	21.67	23.00
	16QAM	1	0	22.28	22.18	21.92	23.00
		1	13	22.27	22.34	21.95	23.00
		1	24	22.33	22.15	21.83	23.00
		12	0	21.34	21.13	21.44	22.00
		12	6	21.47	21.26	21.39	22.00
		12	13	21.35	21.58	21.32	22.00
		25	0	21.26	21.12	21.35	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up

				18650	18900	19150	
10MHz	QPSK	1	0	23.12	23.13	23.07	24.00
		1	25	23.16	**23.26**	23.03	24.00
		1	49	23.12	22.97	22.98	24.00
		25	0	22.16	22.01	21.80	23.00
		25	13	22.20	22.08	21.52	23.00
		25	25	22.30	22.31	21.90	23.00
		50	0	22.12	22.17	21.91	23.00
	16QAM	1	0	22.07	22.21	22.08	23.00
		1	25	22.07	22.17	21.94	23.00
		1	49	22.01	21.62	21.53	23.00
		25	0	20.78	20.87	20.82	22.00
		25	13	20.69	20.78	20.70	22.00
		25	25	20.66	20.86	20.71	22.00
		50	0	21.02	20.60	20.52	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18675	18900	19125	
15MHz	QPSK	1	0	23.33	**23.43**	23.13	24.00
		1	38	23.41	23.39	23.25	24.00
		1	74	23.40	23.26	22.98	24.00
		36	0	22.03	21.97	21.87	23.00
		36	18	22.14	21.84	21.72	23.00
		36	39	22.52	22.09	21.91	23.00
		75	0	22.15	21.92	21.72	23.00
	16QAM	1	0	22.05	22.19	21.89	23.00
		1	38	22.15	22.22	21.96	23.00
		1	74	22.19	21.98	21.75	23.00
		36	0	20.76	20.90	20.82	22.00
		36	18	20.69	20.80	20.71	22.00
		36	39	20.66	20.81	20.72	22.00
		75	0	20.71	20.81	20.73	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18700	18900	19100	
20MHz	QPSK	1	0	23.31	**23.43**	23.28	24.00
		1	50	23.21	23.23	23.16	24.00
		1	99	23.25	23.02	22.82	24.00
		50	0	22.27	22.48	22.32	23.00
		50	25	22.38	22.25	22.29	23.00
		50	50	22.08	22.72	22.14	23.00
		100	0	22.37	22.33	21.85	23.00
	16QAM	1	0	22.25	21.85	21.66	23.00
		1	50	22.12	22.19	22.06	23.00
		1	99	22.27	21.88	21.52	23.00
		50	0	20.79	20.91	20.78	22.00
		50	25	20.67	20.78	20.69	22.00
		50	50	20.66	20.84	20.72	22.00
		100	0	20.84	20.76	20.95	22.00

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LTE Band 5				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20407	20525	20643	
1.4MHz	QPSK	1	0	21.81	21.31	20.92	22.50
		1	2	**21.95**	21.06	21.79	22.50
		1	5	21.08	21.25	21.18	22.50
		3	0	21.80	21.32	20.97	22.50
		3	2	21.33	21.03	21.82	22.50
		3	3	21.03	21.26	21.08	22.50
		6	0	20.86	20.04	20.22	21.50
	16QAM	1	0	20.87	20.48	20.26	21.50
		1	2	21.34	20.15	20.90	21.50
		1	5	21.13	20.98	20.37	21.50
		3	0	21.01	20.86	21.12	21.50
		3	2	21.24	20.94	21.09	21.50
		3	3	21.06	21.32	21.08	21.50
		6	0	20.15	19.92	19.29	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20415	20525	20635	
3MHz	QPSK	1	0	21.89	21.29	21.02	22.50
		1	7	**21.97**	21.08	21.87	22.50
		1	14	21.10	21.26	21.13	22.50
		8	0	20.86	20.36	20.50	21.50
		8	4	20.93	20.07	20.73	21.50
		8	7	20.55	20.09	20.29	21.50
		15	0	20.79	20.13	20.23	21.50
	16QAM	1	0	20.93	20.53	20.27	21.50
		1	7	21.36	20.22	20.96	21.50
		1	14	21.08	20.99	20.37	21.50
		8	0	20.19	19.98	20.22	20.50
		8	4	20.36	20.12	20.16	20.50
		8	7	20.14	20.50	20.22	20.50
		15	0	20.12	19.97	19.31	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20425	20525	20625	
5MHz	QPSK	1	0	21.81	21.37	20.96	22.50
		1	13	**22.01**	21.06	21.90	22.50
		1	24	21.05	21.23	21.16	22.50
		12	0	20.94	20.25	20.57	21.50
		12	6	20.85	20.09	20.67	21.50
		12	13	20.63	20.01	20.26	21.50
		25	0	20.89	20.12	20.25	21.50
	16QAM	1	0	20.95	20.45	20.24	21.50
		1	13	21.32	20.22	20.87	21.50
		1	24	21.09	20.95	20.37	21.50
		12	0	20.19	20.03	20.27	20.50
		12	6	20.40	20.07	20.16	20.50
		12	13	20.16	20.48	20.23	20.50
		25	0	20.12	19.96	19.34	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20450	20525	20600	
10MHz	QPSK	1	0	21.87	21.37	21.06	22.50
		1	25	**22.02**	21.92	21.93	22.50

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		1	49	21.09	21.26	21.20	22.50
		25	0	20.99	20.33	20.59	21.50
		25	13	20.99	20.14	20.74	21.50
		25	25	20.66	20.08	20.36	21.50
		50	0	20.87	20.16	20.27	21.50
	16QAM	1	0	20.97	20.56	20.34	21.50
		1	25	20.99	19.87	20.56	21.50
		1	49	20.75	20.64	20.05	21.50
		25	0	20.30	19.94	19.71	20.50
		25	13	19.51	19.58	20.35	20.50
		25	25	19.56	20.39	19.75	20.50
		50	0	19.80	19.62	19.01	20.50

LTE FDD Band 12				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 23017	Channel 23095	Channel 23173	Tune up
1.4MHz	QPSK	1	0	**23.08**	23.05	23.03	23.50
		1	2	23.03	23.04	22.99	23.50
		1	5	23.04	22.80	22.58	23.50
		3	0	23.07	23.03	23.03	23.50
		3	2	23.07	22.96	22.88	23.50
		3	3	22.89	22.71	22.60	23.50
		6	0	22.16	22.10	21.64	22.50
	16QAM	1	0	22.39	22.12	21.93	22.50
		1	2	22.35	22.42	22.18	22.50
		1	5	22.22	21.76	21.42	22.50
		3	0	22.22	21.72	21.62	22.50
		3	2	22.00	22.12	21.87	22.50
		3	3	22.26	21.72	21.41	22.50
		6	0	21.08	20.99	21.10	21.50
Bandwidth	Modulation	RB size	RB offset	Channel 23025	Channel 23095	Channel 23165	Tune up
3MHz	QPSK	1	0	**23.17**	23.06	23.08	23.50
		1	7	23.05	23.13	22.99	23.50
		1	14	23.13	22.83	22.66	23.50
		8	0	21.87	22.03	21.83	22.50
		8	4	21.90	21.80	21.86	22.50
		8	7	21.63	22.26	21.61	22.50
		15	0	21.85	21.78	21.45	22.50
	16QAM	1	0	22.26	21.79	21.56	22.50
		1	7	22.03	22.07	21.93	22.50
		1	14	22.26	21.82	21.44	22.50
		8	0	20.86	20.88	20.85	21.50
		8	4	20.82	20.80	20.80	21.50
		8	7	20.93	21.17	21.05	21.50
		15	0	20.73	20.69	20.81	21.50
Bandwidth	Modulation	RB size	RB offset	Channel 23035	Channel 23095	Channel 23155	Tune up
5MHz	QPSK	1	0	23.08	**23.11**	23.01	23.50
		1	13	23.04	23.07	23.07	23.50
		1	24	22.98	22.78	22.68	23.50
		12	0	22.10	22.24	22.03	22.50
		12	6	22.19	21.95	21.95	22.50
		12	13	21.84	22.44	21.86	22.50
		25	0	22.02	22.04	21.58	22.50

	16QAM	1	0	22.41	21.96	21.84	22.50
		1	13	22.24	22.27	22.17	22.50
		1	24	22.41	22.03	21.65	22.50
		12	0	21.08	21.11	20.99	21.50
		12	6	21.12	20.90	21.05	21.50
		12	13	21.14	21.32	20.81	21.50
		25	0	20.94	20.92	21.06	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23060	23095	23130	
10MHz	QPSK	1	0	23.12	23.17	23.05	23.50
		1	25	23.18	**23.30**	23.06	23.50
		1	49	23.06	22.87	22.67	23.50
		25	0	21.97	22.22	22.04	22.50
		25	13	22.13	22.00	21.97	22.50
		25	25	21.82	22.45	21.77	22.50
		50	0	22.08	22.01	21.59	22.50
	16QAM	1	0	22.41	21.88	21.81	22.50
		1	25	22.23	22.25	22.12	22.50
		1	49	22.41	22.01	21.60	22.50
		25	0	21.21	20.62	20.52	21.50
		25	13	20.97	21.03	20.88	21.50
		25	25	21.14	20.71	20.39	21.50
		50	0	20.91	20.85	21.09	21.50

LTE FDD Band 13				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23205	23230	23255	
5MHz	QPSK	1	0	22.58	**22.61**	22.53	23.50
		1	13	22.57	22.43	22.33	23.50
		1	24	22.57	22.32	22.03	23.50
		12	0	22.05	22.09	22.01	22.50
		12	6	22.16	22.01	21.90	22.50
		12	13	21.80	22.35	21.80	22.50
		25	0	21.96	21.92	21.62	22.50
	16QAM	1	0	22.27	21.96	21.72	22.50
		1	13	22.11	22.27	22.25	22.50
		1	24	22.37	22.05	21.62	22.50
		12	0	21.32	21.31	21.17	21.50
		12	6	21.14	21.08	21.18	21.50
		12	13	21.42	21.02	21.02	21.50
		25	0	20.84	20.80	20.95	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				/	23230	/	
10MHz	QPSK	1	0	/	22.65	/	23.50
		1	25	/	**22.74**	/	23.50
		1	49	/	22.63	/	23.50
		25	0	/	22.11	/	22.50
		25	13	/	22.05	/	22.50
		25	25	/	22.44	/	22.50
		50	0	/	22.01	/	22.50
	16QAM	1	0	/	21.95	/	22.50
		1	25	/	22.25	/	22.50
		1	49	/	22.01	/	22.50
		25	0	/	21.05	/	21.50
		25	13	/	21.03	/	21.50

		25	25	/	21.06	/	21.50
		50	0	/	20.83	/	21.50

LTE FDD Band 17				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 23755	Channel 23790	Channel 23825	Tune up
5MHz	QPSK	1	0	**23.03**	23.02	23.01	23.50
		1	13	22.94	22.87	22.83	23.50
		1	24	22.98	22.73	22.52	23.50
		12	0	22.25	22.33	22.26	22.50
		12	6	22.38	22.25	22.20	22.50
		12	13	21.77	22.34	21.77	22.50
		25	0	21.94	21.92	21.52	22.50
	16QAM	1	0	22.27	21.93	21.67	22.50
		1	13	22.05	22.24	22.16	22.50
		1	24	22.35	21.95	21.53	22.50
		12	0	20.99	21.04	20.90	21.50
		12	6	20.87	20.88	20.89	21.50
		12	13	21.06	21.23	20.76	21.50
		25	0	20.76	20.79	20.95	21.50
Bandwidth	Modulation	RB size	RB offset	Channel 23780	Channel 23790	Channel 23800	Tune up
10MHz	QPSK	1	0	23.00	23.04	22.98	23.50
		1	25	**23.08**	23.05	23.00	23.50
		1	49	22.96	22.74	22.54	23.50
		25	0	22.17	22.35	22.25	22.50
		25	13	22.30	22.18	22.21	22.50
		25	25	21.62	22.28	21.74	22.50
		50	0	22.05	22.01	21.49	22.50
	16QAM	1	0	22.22	21.92	21.75	22.50
		1	25	22.11	22.12	22.14	22.50
		1	49	22.31	21.93	21.59	22.50
		25	0	20.91	21.04	20.95	21.50
		25	13	20.93	20.82	20.84	21.50
		25	25	21.06	21.28	21.36	21.50
		50	0	20.88	20.80	20.92	21.50

LTE Band 25				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 26047	Channel 26365	Channel 26683	Tune up
1.4MHz	QPSK	1	0	23.18	23.43	23.44	24.00
		1	2	23.38	22.86	23.03	24.00
		1	5	22.87	23.44	23.22	24.00
		3	0	23.44	23.57	23.46	24.00
		3	1	**23.58**	22.96	22.98	24.00
		3	3	22.89	22.46	22.48	24.00
		6	0	22.22	22.30	22.09	23.00
	16QAM	1	0	22.19	22.48	22.56	23.00
		1	2	22.51	22.03	22.16	23.00
		1	5	22.11	22.42	22.21	23.00
		3	0	22.37	22.53	22.47	23.00
		3	1	22.57	21.87	21.99	23.00

		3	3	21.99	21.72	21.47	23.00
		6	0	21.25	21.18	21.37	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26055	26365	26675	
3MHz	QPSK	1	0	22.95	22.89	22.52	24.00
		1	7	23.23	**23.39**	22.95	24.00
		1	14	23.00	22.54	22.86	24.00
		8	0	21.63	21.83	21.80	23.00
		8	4	21.90	22.05	21.54	23.00
		8	7	21.63	21.87	21.83	23.00
		15	0	21.78	22.04	21.61	23.00
	16QAM	1	0	22.15	22.16	21.74	23.00
		1	7	22.48	22.67	22.05	23.00
		1	14	21.57	21.76	21.79	23.00
		8	0	21.27	21.15	21.35	22.00
		8	4	21.53	21.22	21.32	22.00
		8	7	21.36	21.63	21.35	22.00
		15	0	21.30	21.11	21.38	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26065	26365	26665	
5MHz	QPSK	1	0	**23.45**	23.26	22.91	24.00
		1	13	23.44	23.37	22.90	24.00
		1	24	23.37	23.18	23.31	24.00
		12	0	22.02	22.02	21.54	23.00
		12	6	22.00	22.01	21.60	23.00
		12	13	22.12	21.94	21.66	23.00
		25	0	21.99	22.18	21.66	23.00
	16QAM	1	0	22.24	22.14	21.91	23.00
		1	13	22.25	22.24	21.92	23.00
		1	24	22.27	22.15	21.81	23.00
		12	0	21.31	21.11	21.39	22.00
		12	6	21.45	21.24	21.31	22.00
		12	13	21.28	21.56	21.35	22.00
		25	0	21.32	21.19	21.44	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26090	26365	26640	
10MHz	QPSK	1	0	**23.45**	23.24	22.92	24.00
		1	25	**23.45**	23.38	22.88	24.00
		1	49	23.40	23.17	23.31	24.00
		25	0	22.40	22.41	21.89	23.00
		25	13	22.39	22.41	21.97	23.00
		25	25	22.49	22.32	22.03	23.00
		50	0	22.39	22.53	22.04	23.00
	16QAM	1	0	22.64	22.54	22.26	23.00
		1	25	22.61	22.64	22.28	23.00
		1	49	22.64	22.54	22.20	23.00
		25	0	21.70	21.47	21.77	22.00
		25	13	21.82	21.61	21.70	22.00
		25	25	21.63	21.96	21.72	22.00
		50	0	21.70	21.58	21.84	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26115	26365	26615	
15MHz	QPSK	1	0	23.34	23.37	23.32	24.00
		1	38	23.42	23.37	23.28	24.00
		1	74	**23.43**	23.28	23.29	24.00
		36	0	22.50	22.30	22.06	23.00
		36	18	22.50	22.36	22.45	23.00

		36	39	22.68	22.61	22.26	23.00
		75	0	22.48	22.46	22.19	23.00
		1	0	22.43	22.53	22.42	23.00
		1	38	22.41	22.44	22.26	23.00
		1	74	22.39	21.97	21.93	23.00
	16QAM	36	0	21.14	21.27	21.15	22.00
		36	18	21.02	21.14	21.11	22.00
		36	39	21.01	21.22	21.07	22.00
		75	0	21.32	20.95	20.90	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26140	26365	26590	
20MHz		1	0	23.40	23.21	23.19	24.00
		1	50	**23.44**	23.41	23.28	24.00
		1	99	23.42	22.92	22.72	24.00
	QPSK	50	0	22.45	22.43	22.27	23.00
		50	25	22.31	22.22	22.20	23.00
		50	50	22.18	22.37	22.03	23.00
		100	0	22.26	22.25	21.80	23.00
		1	0	22.18	21.81	21.67	23.00
		1	50	22.06	22.13	21.98	23.00
		1	99	22.20	21.90	21.75	23.00
	16QAM	50	0	21.18	21.23	21.21	22.00
		50	25	21.10	21.22	21.07	22.00
		50	50	21.08	21.17	21.14	22.00
		100	0	21.34	21.24	21.20	22.00

LTE Band 26				**Conducted Power(dBm)**			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26697	26865	27033	
1.4MHz		1	0	21.92	21.62	21.49	22.50
		1	2	22.08	**22.09**	21.62	22.50
		1	5	21.35	21.45	21.25	22.50
	QPSK	3	0	21.34	21.44	21.25	22.50
		3	1	22.06	22.07	21.60	22.50
		3	3	21.35	21.46	21.26	22.50
		6	0	20.73	20.00	20.25	21.50
		1	0	20.90	20.48	20.20	21.50
		1	2	21.28	20.26	20.85	21.50
		1	5	20.93	20.05	20.67	21.50
	16QAM	3	0	20.44	20.06	20.07	21.50
		3	1	20.72	20.02	20.28	21.50
		3	3	20.70	20.02	20.25	21.50
		6	0	20.07	19.88	19.16	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26705	26865	27025	
3MHz		1	0	21.88	21.65	21.50	22.50
		1	7	22.03	**22.04**	21.62	22.50
		1	14	21.34	21.44	21.22	22.50
	QPSK	8	0	21.02	20.30	20.50	21.50
		8	4	20.91	20.03	20.60	21.50
		8	7	20.44	20.00	20.11	21.50
		15	0	20.73	20.02	20.25	21.50
		1	0	20.90	20.47	20.21	21.50
	16QAM	1	7	21.33	20.22	20.82	21.50
		1	14	20.97	20.98	20.22	21.50

		8	0	20.18	19.77	19.90	20.50
		8	4	20.11	19.51	20.03	20.50
		8	7	20.26	20.10	19.52	20.50
		15	0	20.15	19.86	19.16	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26715	26865	27015	
5MHz	QPSK	1	0	21.91	21.66	21.42	22.50
		1	13	22.05	**22.10**	21.63	22.50
		1	24	21.36	21.41	21.26	22.50
		12	0	20.95	20.35	20.48	21.50
		12	6	20.91	20.01	20.65	21.50
		12	13	20.40	20.02	20.12	21.50
		25	0	20.74	20.02	20.22	21.50
	16QAM	1	0	20.86	20.51	20.23	21.50
		1	13	21.35	20.22	20.84	21.50
		1	24	20.99	21.04	20.25	21.50
		12	0	20.18	19.82	19.89	20.50
		12	6	19.53	19.48	20.07	20.50
		12	13	20.20	20.05	19.54	20.50
		25	0	20.15	19.89	19.14	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26750	26865	26990	
10MHz	QPSK	1	0	21.95	21.68	21.45	22.50
		1	25	**22.04**	**22.04**	21.59	22.50
		1	49	21.38	21.46	21.26	22.50
		25	0	20.98	20.35	20.48	21.50
		25	13	20.93	20.02	20.67	21.50
		25	25	20.41	20.01	20.11	21.50
		50	0	20.74	20.03	20.25	21.50
	16QAM	1	0	20.90	20.52	20.20	21.50
		1	25	21.34	20.24	20.86	21.50
		1	49	20.94	20.98	20.15	21.50
		25	0	20.13	19.74	19.38	20.50
		25	13	19.30	19.43	20.02	20.50
		25	25	20.22	20.08	19.48	20.50
		50	0	20.13	19.88	19.12	20.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26775	26865	26965	
15MHz	QPSK	1	0	21.98	21.72	21.55	22.50
		1	38	22.11	**22.17**	21.70	22.50
		1	74	21.46	21.49	21.36	22.50
		36	0	20.89	21.00	20.55	21.50
		36	18	20.96	20.12	20.73	21.50
		36	39	20.53	20.11	20.21	21.50
		75	0	20.80	20.09	20.30	21.50
	16QAM	1	0	20.99	20.60	20.26	21.50
		1	38	20.46	20.27	20.89	21.50
		1	74	20.35	20.41	20.27	21.50
		36	0	20.26	19.86	19.45	20.50
		36	18	19.32	19.55	20.13	20.50
		36	39	20.32	20.13	19.57	20.50
		75	0	20.21	19.93	19.24	20.50

Table 5： Conducted Power of LTE.

5.2.2 Conducted Power of WIFI

WIFI 2.4G					
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11b	1	2412	1	15.46	16.00
	6	2437		15.73	16.00
	11	2462		15.43	16.00
802.11g	1	2412	6	15.28	16.00
	6	2437		15.30	16.00
	11	2462		15.20	16.00
802.11n HT20	1	2412	6.5	14.08	15.00
	6	2437		14.21	15.00
	11	2462		14.08	15.00
802.11n HT40	3	2422	13.5	13.24	15.00
	6	2437		13.84	15.00
	9	2452		13.50	15.00

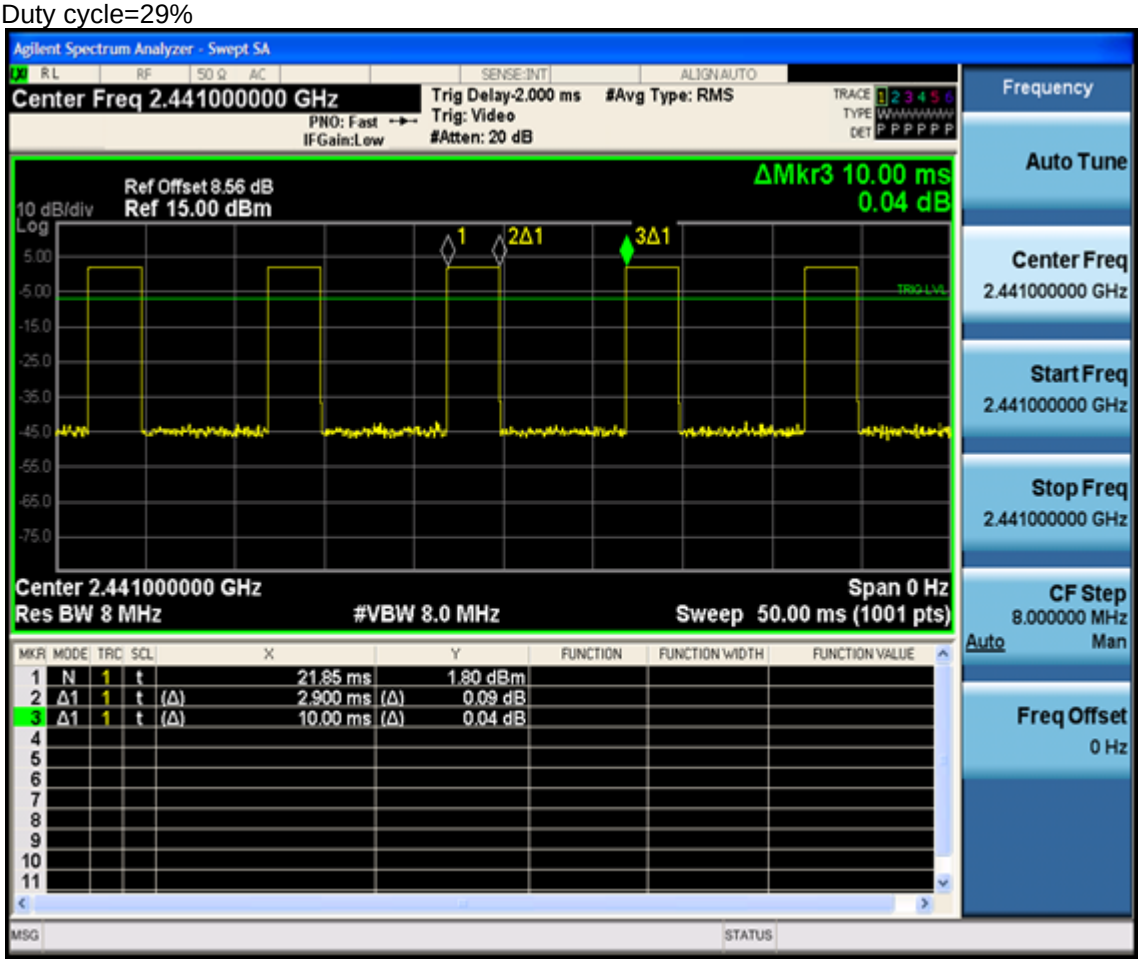
Table 6： Conducted Power of WIFI.

5.2.3 Conducted Power of BT

BT		Average Conducted Power(dBm)			
Band	Channel	0	39	78	Tune Up
BT	GFSK	4.28	2.72	4.21	4.50
	π/4DQPSK	0.75	-0.73	0.87	1.00
	8DPSK	0.76	-0.72	0.84	1.00
Band	Channel	0	19	39	Tune Up
BLE 1M	GFSK	4.19	2.51	4.05	4.50

Table 7： Conducted Power of BT.

BT DH5 Duty cycle=29%



5.3 Measurement of SAR Data

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.

2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.

WiFi 2.4G:

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

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5.3.1 SAR Result of LTE Band 12

LTE Band 12 SAR Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Body Test data(Separate 5mm 1RB)											
Front side	10	QPSK 1_25	23130/711	1:1	0.552	-0.07	23.30	23.50	1.047	**0.578**	21.6
Back side	10	QPSK 1_25	23130/711	1:1	0.501	0.05	23.30	23.50	1.047	0.525	21.6
Left side	10	QPSK 1_25	23130/711	1:1	0.270	0.02	23.30	23.50	1.047	0.283	21.6
Right side	10	QPSK 1_25	23130/711	1:1	0.431	-0.05	23.30	23.50	1.047	0.451	21.6
Top side	10	QPSK 1_25	23130/711	1:1	0.082	0.13	23.30	23.50	1.047	0.086	21.6
Bottom side	10	QPSK 1_25	23130/711	1:1	0.155	-0.02	23.30	23.50	1.047	0.162	21.6
Body Test data(Separate 5mm 50%RB)											
Front side	10	QPSK 25_0	23130/711	1:1	0.295	0.07	22.13	22.50	1.089	0.321	21.6
Back side	10	QPSK 25_0	23130/711	1:1	0.248	0.11	22.13	22.50	1.089	0.270	21.6
Left side	10	QPSK 25_0	23130/711	1:1	0.124	0.17	22.13	22.50	1.089	0.135	21.6
Right side	10	QPSK 25_0	23130/711	1:1	0.217	-0.01	22.13	22.50	1.089	0.236	21.6
Top side	10	QPSK 25_0	23130/711	1:1	0.044	0.05	22.13	22.50	1.089	0.048	21.6
Bottom side	10	QPSK 25_0	23130/711	1:1	0.090	0.03	22.13	22.50	1.089	0.098	21.6

Table 8： SAR of LTE Band 12 for Body.

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5.3.1 SAR Result of LTE Band 13

LTE Band 13 SAR Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Body Test data(Separate 5mm 1RB)											
Front side	10	QPSK 1_25	23230/782	1:1	0.336	0.10	22.74	23.50	1.191	**0.400**	21.6
Back side	10	QPSK 1_25	23230/782	1:1	0.268	0.03	22.74	23.50	1.191	0.319	21.6
Left side	10	QPSK 1_25	23230/782	1:1	0.167	0.14	22.74	23.50	1.191	0.199	21.6
Right side	10	QPSK 1_25	23230/782	1:1	0.225	0.11	22.74	23.50	1.191	0.268	21.6
Top side	10	QPSK 1_25	23230/782	1:1	0.053	0.08	22.74	23.50	1.191	0.064	21.6
Bottom side	10	QPSK 1_25	23230/782	1:1	0.083	0.18	22.74	23.50	1.191	0.099	21.6
Body Test data(Separate 5mm 50%RB)											
Front side	10	QPSK 25_0	23230/782	1:1	0.281	0.01	22.16	22.50	1.081	0.304	21.6
Back side	10	QPSK 25_0	23230/782	1:1	0.240	-0.13	22.16	22.50	1.081	0.260	21.6
Left side	10	QPSK 25_0	23230/782	1:1	0.140	0.06	22.16	22.50	1.081	0.151	21.6
Right side	10	QPSK 25_0	23230/782	1:1	0.186	-0.01	22.16	22.50	1.081	0.201	21.6
Top side	10	QPSK 25_0	23230/782	1:1	0.044	0.06	22.16	22.50	1.081	0.047	21.6
Bottom side	10	QPSK 25_0	23230/782	1:1	0.068	0.10	22.16	22.50	1.081	0.074	21.6

Table 9： SAR of LTE Band 13 for Body.

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5.3.2 SAR Result of LTE Band 25

LTE Band 25 SAR Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Body Test data(Separate 5mm 1RB)											
Front side	20	QPSK 1_50	26140/1860	1:1	0.429	0.05	23.44	24.00	1.138	**0.488**	21.8
Back side	20	QPSK 1_50	26140/1860	1:1	0.259	0.03	23.44	24.00	1.138	0.295	21.8
Left side	20	QPSK 1_50	26140/1860	1:1	0.060	0.07	23.44	24.00	1.138	0.069	21.8
Right side	20	QPSK 1_50	26140/1860	1:1	0.157	0.08	23.44	24.00	1.138	0.179	21.8
Top side	20	QPSK 1_50	26140/1860	1:1	0.041	-0.12	23.44	24.00	1.138	0.047	21.8
Bottom side	20	QPSK 1_50	26140/1860	1:1	0.179	-0.06	23.44	24.00	1.138	0.204	21.8
Body Test data(Separate 5mm 50%RB)											
Front side	20	QPSK 50_0	26140/1860	1:1	0.372	0.07	22.45	23.00	1.135	0.422	21.8
Back side	20	QPSK 50_0	26140/1860	1:1	0.220	-0.16	22.45	23.00	1.135	0.250	21.8
Left side	20	QPSK 50_0	26140/1860	1:1	0.048	0.03	22.45	23.00	1.135	0.055	21.8
Right side	20	QPSK 50_0	26140/1860	1:1	0.138	0.04	22.45	23.00	1.135	0.157	21.8
Top side	20	QPSK 50_0	26140/1860	1:1	0.038	-0.05	22.45	23.00	1.135	0.043	21.8
Bottom side	20	QPSK 50_0	26140/1860	1:1	0.125	-0.01	22.45	23.00	1.135	0.142	21.8

Table 10：SAR of LTE Band 25 for Body.

5.3.3 SAR Result of LTE Band 26

LTE Band 26 SAR Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Body Test data(Separate 5mm 1RB)											
Front side	15	QPSK 1_38	26865/831.5	1:1	0.414	-0.07	22.17	22.50	1.079	**0.447**	22
Back side	15	QPSK 1_38	26865/831.5	1:1	0.340	-0.02	22.17	22.50	1.079	0.367	22
Left side	15	QPSK 1_38	26865/831.5	1:1	0.172	-0.02	22.17	22.50	1.079	0.186	22
Right side	15	QPSK 1_38	26865/831.5	1:1	0.313	0.18	22.17	22.50	1.079	0.338	22
Top side	15	QPSK 1_38	26865/831.5	1:1	0.074	0.05	22.17	22.50	1.079	0.079	22
Bottom side	15	QPSK 1_38	26865/831.5	1:1	0.133	-0.16	22.17	22.50	1.079	0.143	22
Body Test data(Separate 5mm 50%RB)											
Front side	15	QPSK 36_0	26865/831.5	1:1	0.347	-0.03	21.00	21.50	1.122	0.389	22
Back side	15	QPSK 36_0	26865/831.5	1:1	0.280	0.06	21.00	21.50	1.122	0.314	22
Left side	15	QPSK 36_0	26865/831.5	1:1	0.147	0.04	21.00	21.50	1.122	0.165	22
Right side	15	QPSK 36_0	26865/831.5	1:1	0.287	-0.60	21.00	21.50	1.122	0.322	22
Top side	15	QPSK 36_0	26865/831.5	1:1	0.069	0.03	21.00	21.50	1.122	0.078	22
Bottom side	15	QPSK 36_0	26865/831.5	1:1	0.103	0.02	21.00	21.50	1.122	0.116	22

Table 11：SAR of LTE Band 26 for Body.

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5.3.4 SAR Result of WIFI 2.4G

Wi-Fi 2.4G SAR Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Body Test data(Separate 5mm)											
Front side	802.11b	6/2437	99.46%	1.005	0.527	0.06	15.73	16.00	1.064	0.564	22.4
Back side	802.11b	6/2437	99.46%	1.005	0.805	-0.03	15.73	16.00	1.064	**0.861**	22.4
Back side-Repeat	802.11b	6/2437	99.46%	1.005	0.794	0.05	15.73	16.00	1.064	0.850	22.4
Left side	802.11b	6/2437	99.46%	1.005	0.300	-0.05	15.73	16.00	1.064	0.321	22.4
Right side	802.11b	6/2437	99.46%	1.005	0.124	-0.19	15.73	16.00	1.064	0.133	22.4
Top side	802.11b	6/2437	99.46%	1.005	0.427	-0.07	15.73	16.00	1.064	0.457	22.4
Bottom side	802.11b	6/2437	99.46%	1.005	0.179	-0.14	15.73	16.00	1.064	0.192	22.4
Back side	802.11b	1/2412	99.46%	1.005	0.695	-0.07	15.73	16.00	1.064	0.744	22.4

Table 12：SAR of WIFI 2.4G for Body.

Note:

1)Per KDB 248227 D01, for Body SAR test of WiFi 2.4G, SAR is measured for 2.4 GHz 802.11b DSSS using the initial test position procedure. As the 802.11b highest reported SAR is smaller than 1.2 W/kg , and the tune-up of the other 802.11 modes are not higher than 802.11b,therefore the adjusted SAR is ≤ 1.2 W/kg for other 802.11 modes, SAR test for the other 802.11 modes are not required.

Test Position	Channel/ Frequency	Measured SAR (1g)	1st Repeated	Ratio	2nd Repeated	3rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Back side	6/2437	0.805	0.794	1.014	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was preformed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

5.3.1 SAR Result of BT

Bluetooth SAR Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp. (℃)
Body Test data (Separate 0mm)											
Front side	DH5	0/2402	29.00%	3.448	0.052	0.12	4.28	4.50	1.052	0.187	22.4
Back side	DH5	0/2402	29.00%	3.448	0.056	0.03	4.28	4.50	1.052	**0.202**	22.4
Left side	DH5	0/2402	29.00%	3.448	0.010	0.01	4.28	4.50	1.052	0.036	22.4
Right side	DH5	0/2402	29.00%	3.448	0.003	0.02	4.28	4.50	1.052	0.011	22.4
Top side	DH5	0/2402	29.00%	3.448	0.030	-0.05	4.28	4.50	1.052	0.108	22.4
Bottom side	DH5	0/2402	29.00%	3.448	0.001	0.07	4.28	4.50	1.052	0.004	22.4

Table 13：SAR of BT for Body.

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5.4 Multiple Transmitter Evaluation

5.4.1 Simultaneous SAR SAR test evaluation

- **Simultaneous Transmission Possibilities**

NO	Simultaneous TX Combination	Body
1	WIFI 2.4G+BT	Y
2	WWAN+WIFI 2.4G	Y
3	WWAN+BT	Y
4	WWAN+WIFI 2.4G+BT	Y

Note:

1) The device support DTM function.

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Test position		SARmax (W/kg)			Summed SAR			
		Main Ant0	WiFi 2.4G	BT				
		1	2	3	1+2	1+3	1+2+3	2+3
LTE B12	Front side	0.578	0.648	0.187	1.226	0.765	1.413	0.835
	Back side	0.525	0.861	0.202	1.386	0.727	1.588	1.063
	Left side	0.283	0.321	0.036	0.604	0.319	0.640	0.357
	Right side	0.451	0.133	0.011	0.584	0.462	0.595	0.144
	Top side	0.086	0.457	0.108	0.543	0.194	0.651	0.565
	Bottom side	0.162	0.192	0.004	0.354	0.166	0.358	0.196
LTE B13	Front side	0.400	0.648	0.187	1.048	0.587	1.235	
	Back side	0.319	0.861	0.202	1.180	0.521	1.382	
	Left side	0.199	0.321	0.036	0.520	0.235	0.556	
	Right side	0.268	0.133	0.011	0.401	0.279	0.412	
	Top side	0.064	0.457	0.108	0.521	0.172	0.629	
	Bottom side	0.099	0.192	0.004	0.291	0.103	0.295	
LTE B25	Front side	0.488	0.648	0.187	1.136	0.675	1.323	
	Back side	0.295	0.861	0.202	1.156	0.497	1.358	
	Left side	0.069	0.321	0.036	0.390	0.105	0.426	
	Right side	0.179	0.133	0.011	0.312	0.190	0.323	
	Top side	0.047	0.457	0.108	0.504	0.155	0.612	
	Bottom side	0.204	0.192	0.004	0.396	0.208	0.400	
LTE B26	Front side	0.447	0.648	0.187	1.095	0.634	1.282	
	Back side	0.367	0.861	0.202	1.228	0.569	1.430	
	Left side	0.186	0.321	0.036	0.507	0.222	0.543	
	Right side	0.338	0.133	0.011	0.471	0.349	0.482	
	Top side	0.079	0.457	0.108	0.536	0.187	0.644	
	Bottom side	0.143	0.192	0.004	0.335	0.147	0.339	

6 Equipment list

Test Platform	SPEAG DASY5 Professional
Description	SAR Test System (Frequency range 300MHz-6GHz)
Software Reference	DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)
Hardware Reference	

	Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	Twin Phantom	SPEAG	SAM 7	1702	NCR	NCR
☒	DAE	SPEAG	DAE4	1327	2022-11-18	2023-11-17
☒	E-Field Probe	SPEAG	EX3DV4	3923	2023-02-28	2024-02-27
☒	Validation Kits	SPEAG	D750V3	1214	2022-02-07	2025-02-06
☒	Validation Kits	SPEAG	D835V2	4d161	2020-08-28	2023-08-27
☒	Validation Kits	SPEAG	D1950V3	1218	2023-05-04	2026-05-03
☒	Validation Kits	SPEAG	D2450V2	922	2020-08-27	2023-08-26
☒	Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS-VNA R140	21460031	2023-03-20	2024-03-19
☒	Dielectric parameter probes	SPEAG	DAKS-3.5	1148	2023-03-20	2024-03-19
☒	Universal Radio Communication Tester	R&S	CMW500	124587	2023-02-16	2024-02-15
☒	Radio Communication Analyze	Anritsu	MT8821C	6201588568	2022-11-07	2023-11-06
☒	RF Bi-Directional Coupler	QIJI	QJOR31015001	6606_SMA-50-1	NCR	NCR
☒	Signal Generator	R&S	SMR20	1001189	2022-09-08	2023-09-07
☒	Radio Communication Analyzer	Anritsu	MT8820C	6200951859	2022-10-26	2023-10-25
☒	Preamplifier	QIJI	YX28982103	20211121063175	NCR	NCR
☒	Power Meter	Agilent	E4419B	GB43318103	2022-05-24 2023-05-15	2023-05-23 2024-05-14
☒	Power Sensor	Agilent	E9031H	MY41495605	2022-05-24 2023-05-15	2023-05-23 2024-05-14
☒	Power Sensor	Agilent	E9031A	MY41496508	2022-05-24 2023-05-15	2023-05-23 2024-05-14
☒	Coaxial low pass filter	Mini Circuits	VLF-3000+	15542	NCR	NCR
☒	Attenuator	Zhengchang Libo	3dB 8G	NA	NCR	NCR
☒	Temperature and humidity meter	MingGao	T809	NA	2022-09-18	2023-09-17

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

7 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.

8 Calibration certificate

Please see the Appendix C

9 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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