

FCC SAR EVALUATION REPORT

**In accordance with the requirements of
FCC 47 CFR Part 2(2.1093), ANSI/IEEE C95.1-1992 and
IEEE Std 1528-2013**

Product Name : Mobile Phone
Brand Name : ulefone
Model Name : GQ3096
Family Model : Power Armor 13, Power Armor 13E,
Power Armor 13S
Report No. : STR210510003009E
FCC ID : 2AT9T-3096

Prepared for

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TEST RESULT CERTIFICATION

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Product description

Product name.....: Mobile Phone
Brand Name: ulefone
Model and/or type reference : GQ3096
Family Model.....: Power Armor 13, Power Armor 13E, Power Armor 13S
FCC 47 CFR Part 2(2.1093)
ANSI/IEEE C95.1-1992
Standards.....: IEEE Std 1528-2013
Published RF exposure KDB procedures

This device described above has been tested by Shenzhen NTEK. In accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 and KDB 865664 D01. Testing has shown that this device is capable of compliance with localized specific absorption rate (SAR) specified in FCC 47 CFR Part 2(2.1093) and ANSI/IEEE C95.1-1992. The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

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Date of Test

Date (s) of performance of tests.....: May 12, 2021 ~ May 18, 2021
Date of Issue: Jun. 02, 2021
Test Result: **Pass**

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※ ※ Revision History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
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1. General Information

1.1. RF exposure limits

(A).Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

(B).Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

NOTE: **Whole-Body SAR** is averaged over the entire body, **partial-body SAR** is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. **SAR for hands, wrists, feet and ankles** is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

Occupational/Controlled Environments:

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

General Population/Uncontrolled Environments:

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

NOTE

HEAD AND TRUNK LIMIT

1.6 W/kg

APPLIED TO THIS EUT

1.2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for GQ3096 are as follows.

RF Exposure Conditions		Equipment Class -Highest Reported SAR (W/kg)			
		PCE	DTS	NII	DSS
1-g Head		0.371	0.140	0.556	N/A
1-g Body-Worn (Separation distance of 10mm)		1.195	0.075	0.121	N/A
1-g Hotspot (Separation distance of 10mm)		1.195	0.075	0.121	N/A
Max Simultaneous Tx	Head	0.927	0.511	0.927	0.636
	Body-Worn	1.327	1.270	1.316	1.327
	Hotspot	1.327	1.270	1.316	1.327

Note: The Max Simultaneous Tx is calculated based on the same configuration and test position.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR Part 2(2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 & KDB 865664 D01.

1.3. EUT Description

Device Information			
Product Name	Mobile Phone		
Brand Name	ulefone		
Model Name	GQ3096		
Family Model	Power Armor 13, Power Armor 13E, Power Armor 13S		
FCC ID	2AT9T-3096		
Device Phase	Identical Prototype		
Exposure Category	General population / Uncontrolled environment		
Antenna Type	PIFA Antenna		
Battery Information	DC 3.85V, 13200mAh		
Device Operating Configurations			
Supporting Mode(s)	GSM 850/1900, WCDMA Band 2/4/5, LTE Band 2/4/5/7/12/17, WLAN 2.4G/5G, Bluetooth, NFC		
Test Modulation	GSM(GMSK/8PSK), WCDMA(QPSK), LTE(QPSK/16QAM), WLAN(DSSS/OFDM), Bluetooth(GFSK, $\pi/4$ -DQPSK, 8DPSK), NFC(ASK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)

	GSM 850	824-849	869-894
	GSM 1900	1850-1910	1930-1990
	WCDMA Band 2	1850-1910	1930-1990
	WCDMA Band 4	1710-1755	2110-2155
	WCDMA Band 5	824-849	869-894
	LTE Band 2	1850-1910	1930-1990
	LTE Band 4	1710-1755	2110-2155
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	LTE Band 12	699-716	729-746
	LTE Band 17	704-716	734-746
	WLAN 2.4G	2412-2462	
	WLAN 5.2G	5180-5240	
	WLAN 5.8G	5745-5825	
	NFC	13.56	
	Bluetooth	2402-2480	
GPRS Multislot Class(12)	Max Number of Timeslots in Uplink		4
	Max Number of Timeslots in Downlink		4
	Max Total Timeslot		5
EDGE Multislot Class(12)	Max Number of Timeslots in Uplink		4
	Max Number of Timeslots in Downlink		4
	Max Total Timeslot		5
Power Class	4, tested with power level 5(GSM 850)		
	1, tested with power level 0(GSM 1900)		
	3, tested with power control "all 1"(WCDMA Band 2)		
	3, tested with power control "all 1"(WCDMA Band 4)		
	3, tested with power control "all 1"(WCDMA Band 5)		
	3, tested with power control all Max.(LTE Band 2)		
	3, tested with power control all Max.(LTE Band 4)		
	3, tested with power control all Max.(LTE Band 5)		
	3, tested with power control all Max.(LTE Band 7)		
	3, tested with power control all Max.(LTE Band 12)		
	3, tested with power control all Max.(LTE Band 17)		

1.4. Test specification(s)

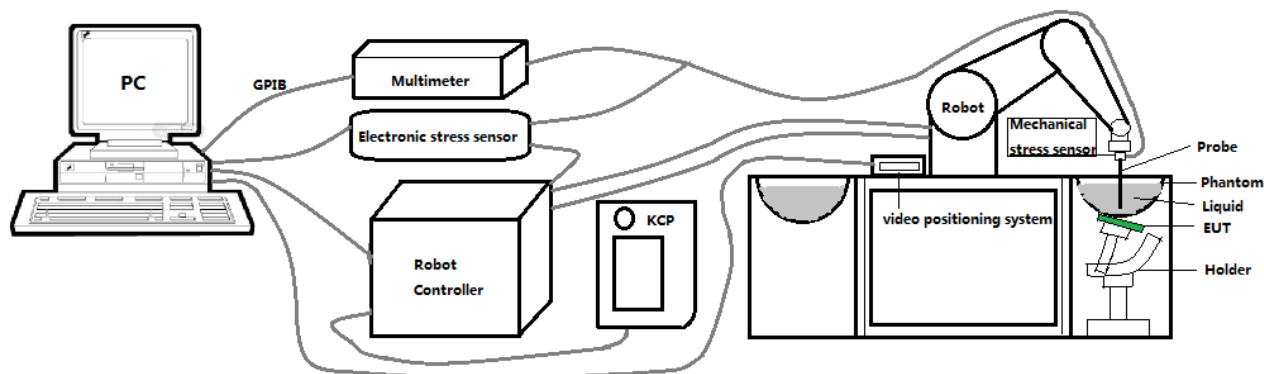
FCC 47 CFR Part 2(2.1093)
ANSI/IEEE C95.1-1992
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR
KDB 941225 D01 3G SAR Procedures
KDB 941225 D05 SAR for LTE Devices
KDB 941225 D06 Hotspot SAR
KDB 648474 D04 Handset SAR

1.5. Ambient Condition

Ambient temperature	20°C – 24°C
Relative Humidity	30% – 70%

2. SAR Measurement System

2.1. SATIMO SAR Measurement Set-up Diagram



These measurements were performed with the automated near-field scanning system OPENSAR from SATIMO. The system is based on a high precision robot (working range: 901 mm), which positions the probes with a positional repeatability of better than ± 0.03 mm. The SAR measurements were conducted with dosimetric probe (manufactured by SATIMO), designed in the classical triangular configuration and optimized for dosimetric evaluation.

The first step of the field measurement is the evaluation of the voltages induced on the probe by the device under test. Probe diode detectors are nonlinear. Below the diode compression point, the output voltage is proportional to the square of the applied E-field; above the diode compression point, it is linear to the applied E-field. The compression point depends on the diode, and a calibration procedure is necessary for each sensor of the probe.

The Keithley multimeter reads the voltage of each sensor and send these three values to the PC. The corresponding E field value is calculated using the probe calibration factors, which are stored in the working directory. This evaluation includes linearization of the diode characteristics. The field calculation is done separately for each sensor. Each component of the E field is displayed on the "Dipole Area Scan Interface" and the total E field is displayed on the "3D Interface"

2.2. Robot

The SATIMO SAR system uses the high precision robots from KUKA. For the 6-axis controller system, the robot controller version (KUKA) from KUKA is used. The KUKA robot series have many features that are important for our application:



- High precision (repeatability ± 0.03 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

2.3. E-Field Probe

This E-field detection probe is composed of three orthogonal dipoles linked to special Schottky diodes with low detection thresholds. The probe allows the measurement of electric fields in liquids such as the one defined in the IEEE and CENELEC standards.

For the measurements the Specific Dosimetric E-Field Probe SN 08/16 EPGO287 with following specifications is used



- Dynamic range: 0.01-100 W/kg
 - Tip Diameter : 2.5 mm
 - Distance between probe tip and sensor center: 1 mm
 - Distance between sensor center and the inner phantom surface: 2 mm (repeatability better than ± 1 mm).
 - Probe linearity: ± 0.08 dB
 - Axial isotropy: ± 0.01 dB
 - Hemispherical Isotropy: ± 0.01 dB
 - Calibration range: 650MHz to 5900MHz for head & body simulating liquid.
 - Lower detection limit: 8mW/kg
- Angle between probe axis (evaluation axis) and surface normal line: less than 30° .

2.3.1. E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy shall be evaluated and within ± 0.25 dB. The sensitivity parameters (Norm X, Norm Y, and Norm Z), the diode compression parameter (DCP) and the conversion factor (Conv F) of the probe are tested. The calibration data can be referred to appendix D of this report.

2.4. SAM phantoms

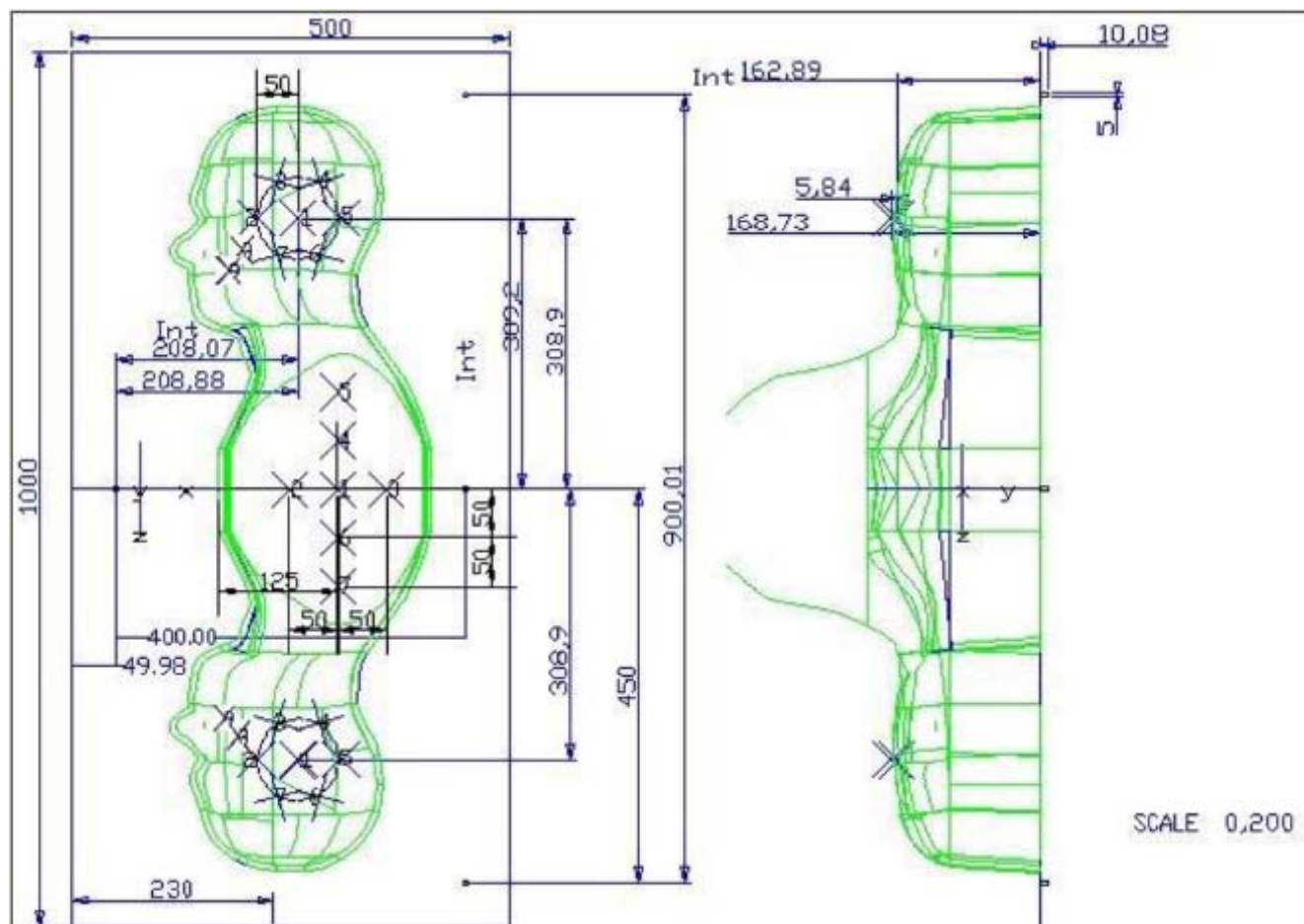
Photo of SAM phantom SN 16/15 SAM119



The SAM phantom is used to measure the SAR relative to people exposed to electro-magnetic field radiated by mobile phones.

2.4.1. Technical Data

Serial Number	Shell thickness	Filling volume	Dimensions	Positionner Material	Permittivity	Loss Tangent
SN 16/15 SAM119	2 mm $\pm$ 0.2 mm	27 liters	Length:1000 mm Width:500 mm Height:200 mm	Gelcoat with fiberglass	3.4	0.02

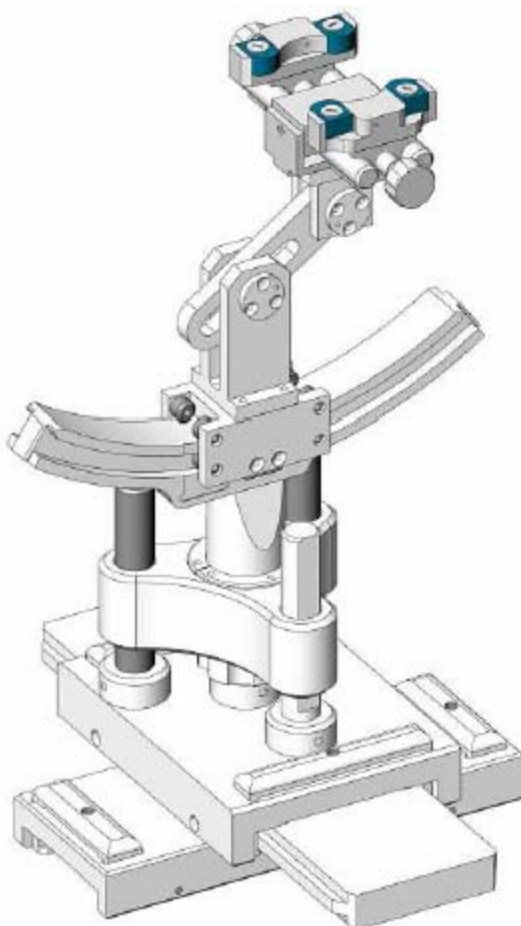


Serial Number	Left Head(mm)		Right Head(mm)		Flat Part(mm)	
SN 16/15 SAM119	2	2.02	2	2.08	1	2.09
	3	2.05	3	2.06	2	2.06
	4	2.07	4	2.07	3	2.08
	5	2.08	5	2.08	4	2.10
	6	2.05	6	2.07	5	2.10
	7	2.05	7	2.05	6	2.07
	8	2.07	8	2.06	7	2.07
	9	2.08	9	2.06	-	-

The test, based on ultrasonic system, allows measuring the thickness with an accuracy of 10 μ m.

2.5. Device Holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1 degree.



Serial Number	Holder Material	Permittivity	Loss Tangent
SN 16/15 MSH100	Delrin	3.7	0.005

2.6. Test Equipment List

This table gives a complete overview of the SAR measurement equipment.

Devices used during the test described are marked ☒

	Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
					Last Cal.	Due Date
☒	MVG	E FIELD PROBE	SSE2	SN 08/16 EPGO287	Mar. 01, 2021	Feb. 28, 2022
☒	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	900 MHz Dipole	SID900	SN 03/15 DIP 0G900-348	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	Liquid measurement Kit	SCLMP	SN 21/15 OCPG 72	NCR	NCR
☒	MVG	Power Amplifier	N.A	AMPLISAR_28/14_003	NCR	NCR
☒	KEITHLEY	Millivoltmeter	2000	4072790	NCR	NCR
☒	R&S	Universal radio communication tester	CMU200	117858	Jul. 13, 2020	Jul. 12, 2021
☒	R&S	Wideband radio communication tester	CMW500	103917	Jul. 13, 2020	Jul. 12, 2021
☒	HP	Network Analyzer	8753D	3410J01136	Jul. 13, 2020	Jul. 12, 2021
☒	Agilent	PSG Analog Signal Generator	E8257D	MY51110112	Jul. 13, 2020	Jul. 12, 2021

☒	Agilent	Power meter	E4419B	MY45102538	Jul. 13, 2020	Jul. 12, 2021
☒	Agilent	Power sensor	E9301A	MY41495644	Jul. 13, 2020	Jul. 12, 2021
☒	Agilent	Power sensor	E9301A	US39212148	Jul. 13, 2020	Jul. 12, 2021
☒	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Jul. 17, 2020	Jul. 16, 2023

3. SAR Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For Wi-Fi/BT power measurement, use engineering software to configure EUT Wi-Fi/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band.
- (d) Connect EUT RF port through RF cable to the power meter, and measure Wi-Fi/BT output power.

<SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT Wi-Fi/BT continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix A demonstrates.
- (c) Set scan area, grid size and other setting on the OPENSAR software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band.
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg.

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

3.1. Power Reference

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

3.2. Area scan & Zoom scan

The area scan is a 2D scan to find the hot spot location on the DUT. The zoom scan is a 3D scan

above the hot spot to calculate the 1g and 10g SAR value.

Measurement of the SAR distribution with a grid of 8 to 16 mm * 8 to 16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme. Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8 * 4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that will not be within the zoom scan of other peaks; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR compliance limit (e.g., 1 W/kg for 1,6 W/kg 1 g limit, or 1,26 W/kg for 2 W/kg, 10 g limit).

Area scan & Zoom scan scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$			≤ 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 $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 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: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
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.

3.3. Description of interpolation/extrapolation scheme

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimise measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is used to determine this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1 mm step.

The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10 grams and 1 gram requires a very fine resolution in the three dimensional scanned data array.

3.4. Volumetric Scan

The volumetric scan consists to a full 3D scan over a specific area. This 3D scan is useful for multi Tx SAR measurement. Indeed, it is possible with OpenSAR to add, point by point, several volumetric scan to calculate the SAR value of the combined measurement as it is defined in the standard IEEE1528 and IEC62209.

3.5. Power Drift

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In OpenSAR measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in V/m. If the power drifts more than $\pm 5\%$, the SAR will be retested.

4. System Verification Procedure

4.1. Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% of weight)	Head Tissue									
	750	835	900	1800	1900	2000	2450	2600	5200	5800
Frequency Band (MHz)										
Water	34.40	34.40	34.40	55.36	55.36	57.87	57.87	57.87	65.53	65.53
NaCl	0.79	0.79	0.79	0.35	0.35	0.16	0.16	0.16	0.00	0.00
1,2-Propanediol	64.81	64.81	64.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	30.45	30.45	19.97	19.97	19.97	24.24	24.24
DGBE	0.00	0.00	0.00	13.84	13.84	22.00	22.00	22.00	10.23	10.23

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid depth from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm.

Photo of Liquid depth for Head Position	Photo of Liquid depth for Body Position
	

4.1.1. Tissue Dielectric Parameter Check Results

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

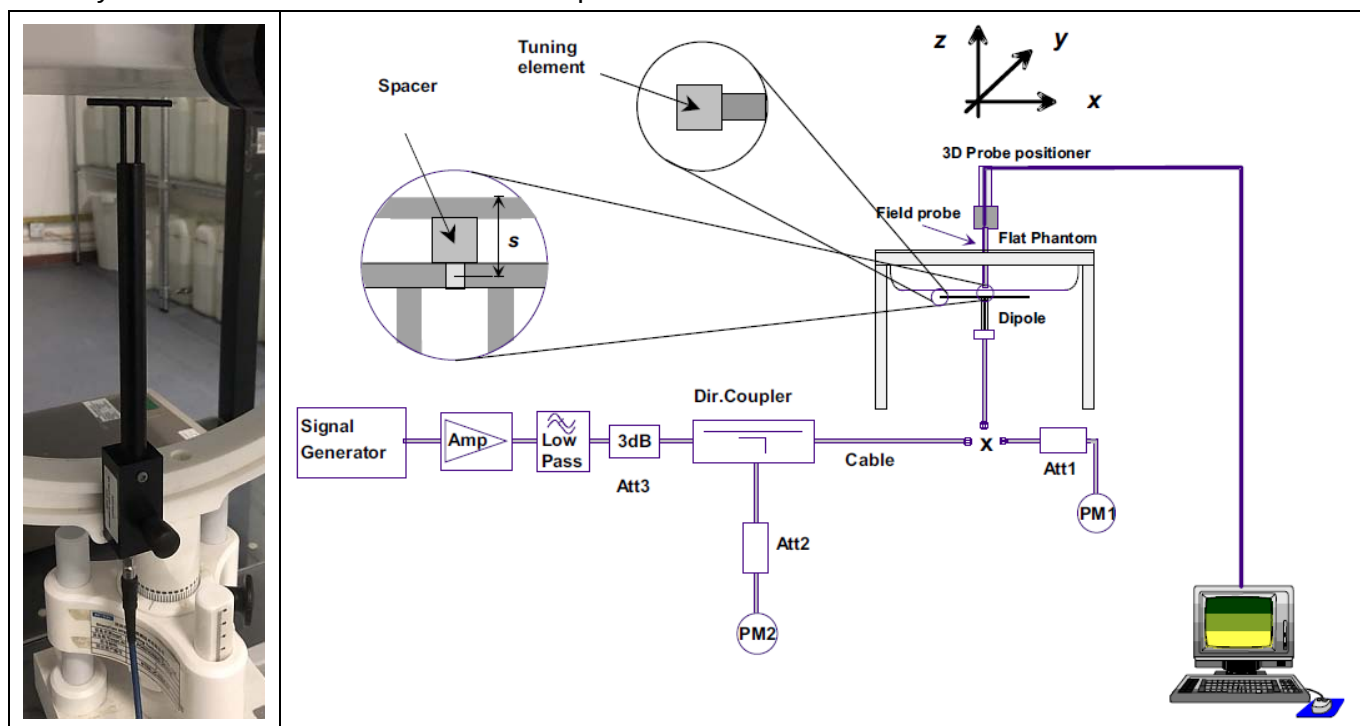
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		$\epsilon_r (\pm 5\%)$	σ (S/m) ($\pm 5\%$)	ϵ_r	σ (S/m)		
Head 750	750	41.96 (39.86~44.06)	0.89 (0.85~0.93)	41.05	0.89	21.5 °C	May 14, 2021
Head 850	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	42.35	0.91	21.5 °C	May 14, 2021
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	40.26	1.38	21.7 °C	May 14, 2021
Head 1900	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.50	1.41	21.5 °C	May 17, 2021
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	40.37	1.83	21.5 °C	May 12, 2021
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	40.10	1.91	21.4 °C	May 17, 2021
Head 5200	5200	36.00 (34.20~37.80)	4.66 (4.43~4.89)	36.89	4.59	21.5 °C	May 18, 2021
Head 5800	5800	35.30 (33.54~37.07)	5.27 (5.01~5.53)	35.84	5.14	21.9 °C	May 13, 2021

NOTE: The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.

4.2. System Verification Procedure

The system verification is performed for verifying the accuracy of the complete measurement system and performance of the software. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 100mW (below 5GHz) or 100mW (above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system verification to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system verification to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

The system verification is shown as below picture:



4.2.1. System Verification Results

Comparing to the original SAR value provided by SATIMO, the verification data should be within its specification of $\pm 10\%$. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance verification can meet the variation criterion and the plots can be referred to Appendix B of this report.

System Verification	Target SAR (1W) ($\pm 10\%$)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)		
750MHz	8.53 (7.68~9.38)	5.56 (5.01~6.11)	8.51	5.49	21.5 °C	May 14, 2021
835MHz	9.84 (8.86~10.82)	6.22 (5.60~6.84)	9.53	6.07	21.5 °C	May 14, 2021
1800MHz	37.96 (34.17~41.75)	19.81 (17.83~21.79)	38.09	20.01	21.7 °C	May 14, 2021
1900MHz	40.37 (36.34~44.40)	20.48 (18.44~22.52)	38.86	20.04	21.5 °C	May 17, 2021
2450MHz	53.69 (48.33~59.05)	23.94 (21.55~26.33)	53.74	23.98	21.5 °C	May 12, 2021
2600MHz	55.83 (50.25~61.41)	24.19 (21.78~26.60)	55.67	24.69	21.4 °C	May 17, 2021
5200MHz	162.34 (146.11~178.57)	55.42 (49.88~60.96)	154.97	56.87	21.5 °C	May 18, 2021
5800MHz	178.89 (161.01~196.77)	59.32 (53.39~65.25)	184.01	62.58	21.9 °C	May 13, 2021

5. SAR Measurement variability and uncertainty

5.1. SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

5.2. 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.

6. RF Exposure Positions

6.1. Ear and handset reference point

Figure 6.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M”, the left ear reference point (ERP) is marked “LE”, and the right ERP is marked “RE”.



Fig 6.1.1 Front, back, and side views of SAM phantom

6.2. Definition of the cheek position

1. Define two imaginary lines on the handset, the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset: the midpoint of the width w_t of the handset at the level of the acoustic output (point A in Figure 6.2.1 and Figure 6.2.2), and the midpoint of the width w_b of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 6.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 6.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
2. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
3. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP
4. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
5. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.

6. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 6.2.3. The actual rotation angles should be documented in the test report.

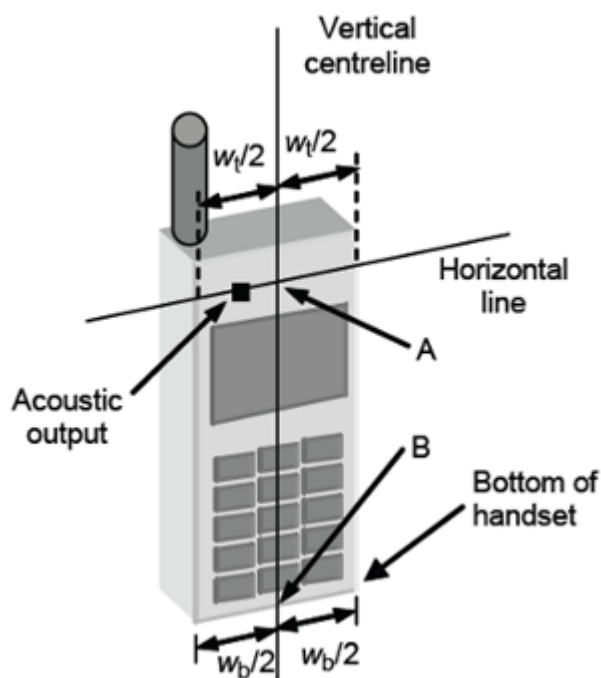


Fig 6.2.1 Handset vertical and horizontal reference lines—"fixed case"

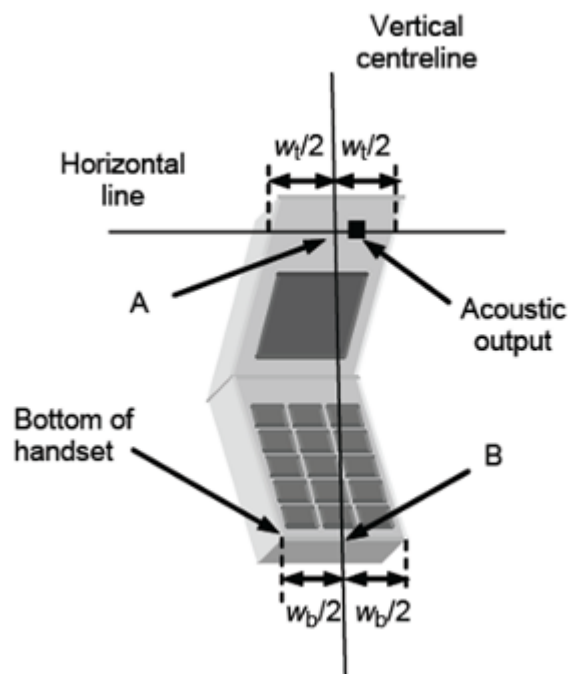


Fig 6.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

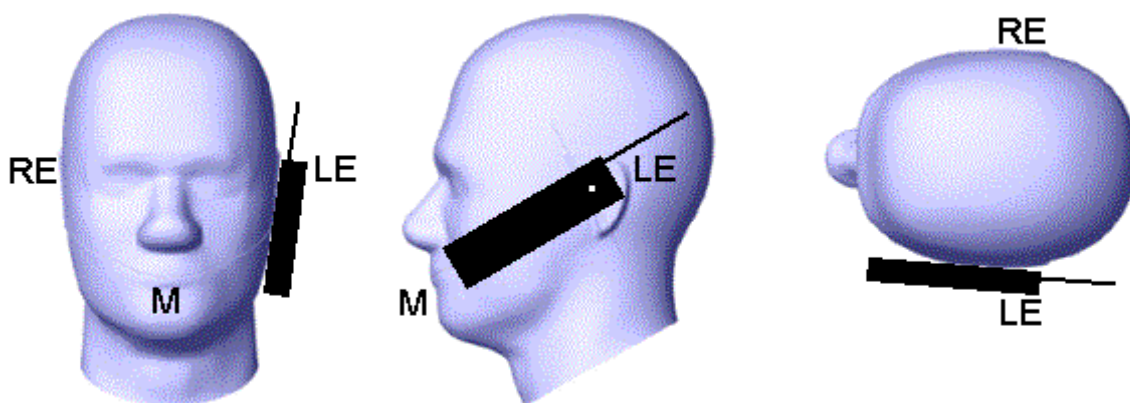


Fig 6.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

6.3. Definition of the tilt position

1. While maintaining the orientation of the handset, retract the handset parallel to the reference plane far enough away from the phantom to enable a rotation of the device by 15 degree.
2. Rotate the Handset around the horizontal line by 15 degree (see Figure 6.3.1).
3. While maintaining the orientation of the handset, move the handset towards the phantom on a line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact is on the pinna. If the contact is at any location other than the pinna, e.g., the antenna with the back of the phantom head, the angle of the handset shall be reduced. In this case, the tilt position is obtained if any part of the handset is in contact with the pinna as well as a second part of the handset is in contact with the phantom, e.g., the antenna with the back of the head.

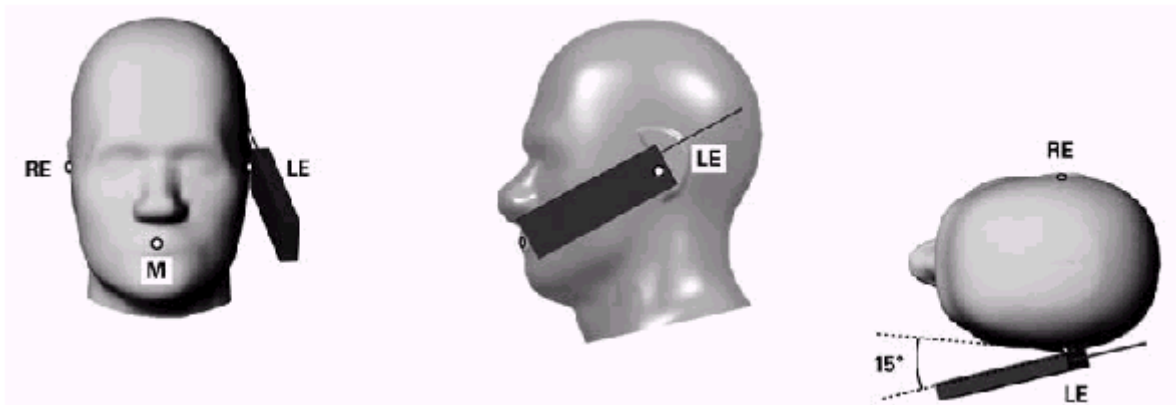


Figure 6.3.1 – Tilt position of the wireless device on the left side of SAM

6.4. Body Worn Accessory

1. Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6.4.1). Per KDB 648474 D04, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is $< 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.
2. Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest

spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

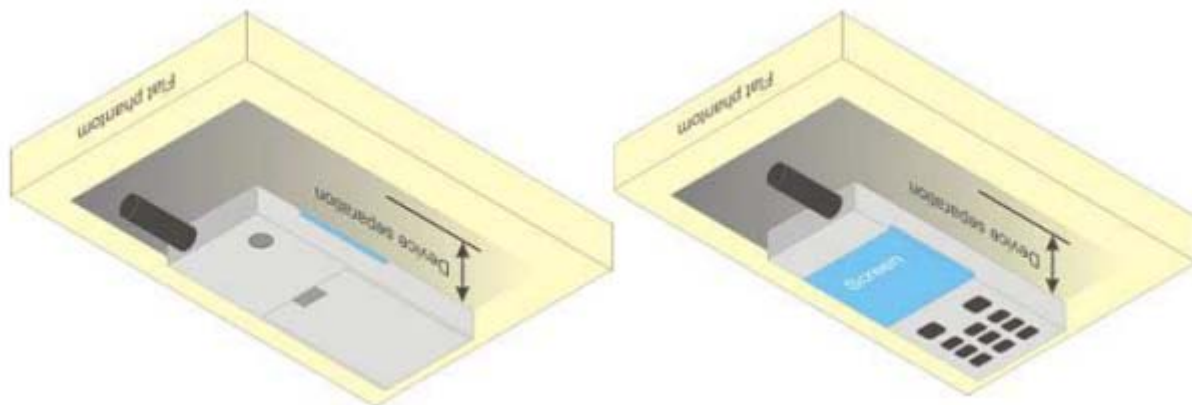


Figure 6.4.1 – Test positions for body-worn devices

6.5. Wireless Router Devices

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WLAN simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WLAN transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WLAN transmitter according to FCC KDB Publication 447498 D01 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

7. RF Output Power

7.1. GSM Conducted Power

Band GSM850	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up	128	189	251	Tune-up	128	189	251
Frequency (MHz)	(dBm)	824.2	836.4	848.8	(dBm)	824.2	836.4	848.8
GSM (GMSK)	33.50	33.09	33.01	33.06	24.47	24.06	23.98	24.03
GPRS(GMSK, 1 TS)	33.50	33.07	33.02	33.05	24.47	24.04	23.99	24.02
GPRS(GMSK, 2 TS)	32.50	32.31	32.20	32.25	26.48	26.29	26.18	26.23
GPRS(GMSK, 3 TS)	31.00	30.52	30.39	30.44	26.74	26.26	26.13	26.18
GPRS(GMSK, 4 TS)	29.50	29.36	29.24	29.25	26.49	26.35	26.23	26.24
EDGE(GMSK, 1 TS)	27.00	26.81	26.37	26.58	17.97	17.78	17.34	17.55
EDGE(GMSK, 2 TS)	26.50	26.04	24.83	25.79	20.48	20.02	18.81	19.77
EDGE(GMSK, 3 TS)	24.00	23.69	23.44	23.50	19.74	19.43	19.18	19.24
EDGE(GMSK, 4 TS)	23.00	22.93	22.06	22.97	19.99	19.92	19.05	19.96
Band GSM1900	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up	512	661	810	Tune-up	512	661	810
Frequency (MHz)	(dBm)	1850.2	1880.0	1909.8	(dBm)	1850.2	1880.0	1909.8
GSM (GMSK)	30.00	29.77	29.62	29.64	20.97	20.74	20.59	20.61
GPRS(GMSK, 1 TS)	30.00	29.77	29.61	29.65	20.97	20.74	20.58	20.62
GPRS(GMSK, 2 TS)	29.50	29.05	28.88	28.91	23.48	23.03	22.86	22.89
GPRS(GMSK, 3 TS)	27.50	27.29	27.13	27.18	23.24	23.03	22.87	22.92
GPRS(GMSK, 4 TS)	26.50	26.18	26.05	26.11	23.49	23.17	23.04	23.10
EDGE(GMSK, 1 TS)	28.50	28.21	27.85	27.58	19.47	19.18	18.82	18.55
EDGE(GMSK, 2 TS)	27.50	26.90	27.11	26.28	21.48	20.88	21.09	20.26
EDGE(GMSK, 3 TS)	25.50	25.47	25.24	24.52	21.24	21.21	20.98	20.26
EDGE(GMSK, 4 TS)	24.50	23.51	24.14	23.65	21.49	20.50	21.13	20.64

Note: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 TS) - 9.03 dB

Frame-averaged power = Maximum burst averaged power (2 TS) - 6.02 dB

Frame-averaged power = Maximum burst averaged power (3 TS) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 TS) - 3.01 dB

7.2. WCDMA Conducted Power

Band	WCDMA Band 2			
Tx Channel	Tune-up	9262	9400	9538
Frequency (MHz)		1852.4	1880	1907.6
RMC 12.2Kbps	24.00	23.68	23.57	23.45
HSDPA Subtest-1	23.00	22.73	22.59	22.49
HSDPA Subtest-2	22.50	22.34	22.05	21.86
HSDPA Subtest-3	21.50	21.28	20.72	20.67
HSDPA Subtest-4	21.50	21.09	20.98	20.71
HSUPA Subtest-1	22.50	21.50	22.46	22.19
HSUPA Subtest-2	23.00	22.57	22.49	22.35
HSUPA Subtest-3	21.50	20.96	21.09	21.14
HSUPA Subtest-4	23.00	22.71	22.58	22.48
HSUPA Subtest-5	22.00	21.29	21.82	21.50
Band	WCDMA Band 4			
Tx Channel	Tune-up	1312	1413	1513
Frequency (MHz)		1712.4	1732.6	1752.6
RMC 12.2Kbps	23.00	22.56	22.53	22.75
HSDPA Subtest-1	22.00	21.62	21.56	21.81
HSDPA Subtest-2	21.50	21.08	21.22	21.19
HSDPA Subtest-3	20.50	19.85	20.19	20.39
HSDPA Subtest-4	20.50	20.36	19.99	20.42
HSUPA Subtest-1	21.60	19.88	21.38	21.54
HSUPA Subtest-2	22.00	21.53	21.47	21.75
HSUPA Subtest-3	21.00	19.87	20.34	20.55
HSUPA Subtest-4	22.00	21.63	21.58	21.78
HSUPA Subtest-5	21.50	20.22	20.72	21.19
Band	WCDMA Band 5			
Tx Channel	Tune-up	4132	4182	4233
Frequency (MHz)		826.4	836.4	846.6
RMC 12.2Kbps	23.50	23.40	23.34	23.35
HSDPA Subtest-1	22.50	22.43	22.37	22.38
HSDPA Subtest-2	22.00	21.99	21.91	21.94
HSDPA Subtest-3	21.00	20.94	20.89	20.59
HSDPA Subtest-4	21.50	21.17	20.98	20.69
HSUPA Subtest-1	22.50	21.38	22.20	22.24
HSUPA Subtest-2	22.50	22.30	22.23	22.27
HSUPA Subtest-3	21.50	20.48	21.16	20.88
HSUPA Subtest-4	22.50	22.45	22.36	22.38

HSUPA Subtest-5	22.00	21.28	21.28	21.82
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7.3. LTE Conducted Power

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18607/1850.7	18900/1880	19193/1909.3
LTE Band 2	1.4MHz	QPSK	1	0	24.50	23.80	23.88	23.78
			1	2	24.50	24.10	23.93	23.88
			1	5	24.50	24.00	23.87	23.77
			3	0	24.00	23.94	23.92	23.84
			3	1	24.00	23.98	23.95	23.88
			3	2	24.00	23.87	23.87	23.83
			6	0	23.50	23.06	22.99	22.85
		16QAM	1	0	23.50	22.98	22.66	22.83
			1	2	23.50	23.05	22.73	22.90
			1	5	23.50	22.99	22.65	22.82
			3	0	23.50	23.15	23.05	22.97
			3	1	23.50	23.17	23.07	22.98
			3	2	23.50	23.15	23.05	22.92
			6	0	22.50	22.20	22.23	22.03
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18615/1851.5	18900/1880	19185/1908.5
LTE Band 2	3MHz	QPSK	1	0	24.50	23.85	23.68	23.59
			1	7	24.50	23.88	23.81	23.72
			1	14	24.50	23.80	23.71	23.66
			8	0	23.50	22.97	22.92	22.85
			8	4	23.50	23.05	22.99	22.85
			8	7	23.50	22.98	22.89	22.80
			15	0	23.00	22.93	22.98	22.79
		16QAM	1	0	23.50	23.05	22.83	22.43
			1	7	23.50	23.11	22.93	22.53
			1	14	23.50	23.08	22.85	22.41
			8	0	22.00	21.95	21.92	21.81
			8	4	22.00	21.99	21.94	21.85
			8	7	22.00	21.94	21.87	21.81
			15	0	22.00	21.90	21.85	21.90

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18625/1852.5	18900/1880	19175/1907.5
LTE Band 2	5MHz	QPSK	1	0	24.50	24.03	23.96	23.84
			1	12	24.50	24.12	24.02	23.94
			1	24	24.50	24.03	23.94	23.84
			12	0	23.50	23.00	22.97	22.89
			12	6	23.50	23.04	23.01	22.94
			12	11	23.50	23.00	22.98	22.79
			25	0	23.50	23.01	22.93	22.87
		16QAM	1	0	23.50	23.20	23.20	23.27
			1	12	23.50	23.30	23.25	23.38
			1	24	23.50	23.25	23.15	23.27
			12	0	22.50	21.90	21.97	21.91
			12	6	22.50	21.95	22.04	21.96
			12	11	22.50	21.94	21.94	21.80
			25	0	22.00	21.97	21.91	21.88
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18650/1855	18900/1880	19150/1905
LTE Band 2	10MHz	QPSK	1	0	24.50	24.13	24.01	23.91
			1	24	24.50	24.15	24.06	23.95
			1	49	24.50	24.10	24.01	23.91
			25	0	23.50	22.98	22.99	22.86
			25	12	23.50	23.06	23.02	22.92
			25	24	23.50	22.99	22.95	22.76
			50	0	23.50	23.01	22.97	22.84
		16QAM	1	0	23.50	22.82	23.37	23.06
			1	24	23.50	22.90	23.38	23.06
			1	49	23.50	22.95	23.36	23.01
			25	0	22.50	21.94	22.00	21.88
			25	12	22.50	22.06	22.05	21.91
			25	24	22.50	21.95	21.93	21.75
			50	0	22.00	21.95	21.96	21.85
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18675/1857.5	18900/1880	19125/1902.5

LTE Band 2	15MHz	QPSK	1	0	24.50	24.05	24.01	23.94
			1	37	24.50	24.06	24.03	23.96
			1	74	24.50	23.96	23.94	23.84
			36	0	23.50	23.13	23.08	22.91
			36	18	23.50	23.13	23.10	22.98
			36	37	23.50	23.09	23.00	22.84
			75	0	23.50	23.15	23.05	22.94
		16QAM	1	0	23.50	23.06	23.37	23.07
			1	37	23.50	23.22	23.37	23.05
			1	74	23.50	23.13	23.28	22.97
			36	0	22.50	22.03	22.05	21.99
			36	18	22.50	22.04	22.08	22.03
			36	37	22.50	22.03	22.01	21.90
			75	0	22.50	22.10	22.03	21.90
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18700/1860	18900/1880	19100/1900
LTE Band 2	20MHz	QPSK	1	0	24.50	23.95	23.95	23.89
			1	49	24.50	24.09	24.15	24.00
			1	99	24.50	23.94	23.94	23.80
			50	0	23.50	23.13	23.00	22.88
			50	24	23.50	23.13	23.09	23.00
			50	49	23.50	23.09	22.91	22.78
			100	0	23.50	23.11	22.94	22.80
		16QAM	1	0	23.50	23.08	23.19	23.18
			1	49	23.50	23.34	23.26	23.29
			1	99	23.50	23.20	23.13	23.07
			50	0	22.50	22.08	22.02	21.95
			50	24	22.50	22.10	22.07	22.08
			50	49	22.50	22.08	21.92	21.78
			100	0	22.50	22.12	21.90	21.87

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		19957/1710.7	20175/1732.5	20393/1754.3
LTE Band 4	1.4MHz	QPSK	1	0	23.50	22.15	23.12	23.30
			1	2	23.50	23.16	23.20	23.38
			1	5	23.50	23.02	23.07	23.29

			3	0	23.50	23.11	23.24	23.38
			3	1	23.50	23.09	23.29	23.42
			3	2	23.50	23.07	23.23	23.38
			6	0	22.50	22.18	22.25	22.45
		16QAM	1	0	22.50	21.80	22.29	22.39
			1	2	22.50	21.91	22.33	22.47
			1	5	22.50	21.86	22.29	22.39
			3	0	23.00	22.21	22.39	22.55
			3	1	23.00	22.22	22.41	22.59
			3	2	23.00	22.22	22.36	22.56
			6	0	22.00	21.30	21.43	21.58
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		19965/1711.5	20175/1732.5	20385/1753.5
LTE Band 4	3MHz	QPSK	1	0	23.50	22.88	22.94	23.19
			1	7	23.50	22.96	23.05	23.30
			1	14	23.50	22.88	22.98	23.22
			8	0	22.50	22.07	22.14	22.39
			8	4	22.50	22.12	22.23	22.45
			8	7	22.50	22.14	22.16	22.37
			15	0	22.50	22.10	22.19	22.39
		16QAM	1	0	22.50	22.29	22.15	21.96
			1	7	22.50	22.33	22.25	22.10
			1	14	22.50	22.25	22.14	21.93
			8	0	21.50	21.10	21.19	21.32
			8	4	21.50	21.16	21.22	21.38
			8	7	21.50	21.10	21.14	21.33
			15	0	21.50	21.14	21.14	21.43
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		19975/1712.5	20175/1732.5	20375/1752.5
LTE Band 4	5MHz	QPSK	1	0	23.50	23.13	23.17	23.37
			1	12	23.50	23.20	23.33	23.45
			1	24	23.50	23.15	23.28	23.39
			12	0	22.50	22.13	22.24	22.36
			12	6	22.50	22.20	22.32	22.47
			12	11	22.50	22.18	22.27	22.44
			25	0	22.50	22.16	22.26	22.41

		16QAM	1	0	23.00	22.59	22.52	22.64
			1	12	23.00	22.71	22.62	22.70
			1	24	23.00	22.67	22.58	22.62
			12	0	21.50	21.09	21.15	21.36
			12	6	21.50	21.20	21.25	21.48
			12	11	21.50	21.16	21.24	21.44
			25	0	21.50	21.14	21.30	21.37
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20000/1715	20175/1732.5	20350/1750
LTE Band 4	10MHz	QPSK	1	0	23.50	22.05	23.23	23.37
			1	24	23.50	23.31	23.35	23.48
			1	49	23.50	23.24	23.36	23.48
			25	0	22.50	22.03	22.21	22.32
			25	12	22.50	22.17	22.31	22.47
			25	24	22.50	22.09	22.30	22.46
			50	0	22.50	22.07	22.30	22.42
		16QAM	1	0	23.00	22.05	22.64	22.52
			1	24	23.00	22.06	22.71	22.63
			1	49	23.00	22.08	22.79	22.55
			25	0	21.50	21.07	21.24	21.37
			25	12	21.50	21.17	21.33	21.47
			25	24	21.50	21.16	21.31	21.46
			50	0	21.50	21.09	21.30	21.45
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20025/1717.5	20175/1732.5	20325/1747.5
LTE Band 4	15MHz	QPSK	1	0	23.50	23.17	23.12	23.34
			1	37	23.50	23.26	23.28	23.49
			1	74	23.50	23.23	23.30	23.47
			36	0	23.00	22.12	22.26	22.33
			36	18	23.00	22.24	22.31	22.51
			36	37	23.00	22.17	22.35	22.54
			75	0	22.50	22.21	22.33	22.49
		16QAM	1	0	23.00	22.30	22.28	22.76
			1	37	23.00	22.40	22.45	22.86
			1	74	23.00	22.38	22.48	22.77
			36	0	22.00	21.20	21.22	21.36

			36	18	22.00	21.25	21.27	21.50
			36	37	22.00	21.26	21.30	21.55
			75	0	21.50	21.14	21.33	21.46
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20050/1720	20175/1732.5	20300/1745
LTE Band 4	20MHz	QPSK	1	0	23.50	23.10	23.12	23.25
			1	49	23.50	23.30	23.39	23.49
			1	99	23.50	23.23	23.39	23.46
			50	0	23.00	22.11	22.31	22.34
			50	24	23.00	22.27	22.40	22.52
			50	49	23.00	22.15	22.39	22.65
			100	0	23.00	22.13	22.34	22.50
		16QAM	1	0	23.00	22.31	22.47	22.53
			1	49	23.00	22.49	22.70	22.77
			1	99	23.00	22.46	22.70	22.60
			50	0	22.00	21.15	21.38	21.31
			50	24	22.00	21.30	21.47	21.48
			50	49	22.00	21.19	21.48	21.60
			100	0	21.50	21.12	21.38	21.48

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20407/824.7	20525/836.5	20643/848.3
LTE Band 5	1.4MHz	QPSK	1	0	24.50	23.11	23.99	23.95
			1	2	24.50	24.10	24.05	24.01
			1	5	24.50	24.02	23.98	23.92
			3	0	24.50	24.11	24.08	24.06
			3	1	24.50	24.13	24.15	24.10
			3	2	24.50	24.08	24.08	24.06
			6	0	23.50	23.16	23.12	23.09
		16QAM	1	0	23.50	22.86	23.09	23.06
			1	2	23.50	22.93	23.16	23.10
			1	5	23.50	22.88	23.11	23.08
			3	0	23.50	23.22	23.20	23.23
			3	1	23.50	23.25	23.22	23.26
			3	2	23.50	23.25	23.16	23.21
			6	0	22.50	22.30	22.34	22.29

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20415/825.5	20525/836.5	20635/847.5
LTE Band 5	3MHz	QPSK	1	0	24.50	23.85	23.87	23.85
			1	7	24.50	23.96	23.93	23.88
			1	14	24.50	23.96	23.86	23.76
			8	0	23.50	23.03	23.03	23.01
			8	4	23.50	23.11	23.03	23.05
			8	7	23.50	23.10	23.01	22.99
			15	0	23.50	23.09	23.03	22.98
		16QAM	1	0	23.50	23.03	22.73	23.29
			1	7	23.50	23.13	22.78	23.26
			1	14	23.50	23.08	22.65	23.07
			8	0	22.50	22.07	22.01	22.05
			8	4	22.50	22.15	22.06	22.11
			8	7	22.50	22.07	22.06	21.98
			15	0	22.50	22.05	22.08	22.03
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20425/826.5	20525/836.5	20625/846.5
LTE Band 5	5MHz	QPSK	1	0	24.50	24.16	24.09	24.10
			1	12	24.50	24.14	24.14	24.16
			1	24	24.50	24.17	24.00	24.07
			12	0	23.50	23.14	23.10	23.00
			12	6	23.50	23.19	23.17	23.16
			12	11	23.50	23.15	23.02	22.95
			25	0	23.50	23.13	23.10	23.00
		16QAM	1	0	24.00	23.45	23.38	23.63
			1	12	24.00	23.47	23.43	23.65
			1	24	24.00	23.41	23.35	23.45
			12	0	22.50	22.05	22.16	22.02
			12	6	22.50	22.15	22.22	22.20
			12	11	22.50	22.14	22.04	21.96
			25	0	22.50	22.21	22.06	21.99
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20450/829	20525/836.5	20600/844

LTE Band 5	10MHz	QPSK	1	0	24.50	24.17	24.17	24.12
			1	24	24.50	24.21	24.19	24.20
			1	49	24.50	24.20	24.15	24.16
			25	0	23.50	23.14	23.08	23.18
			25	12	23.50	23.22	23.17	23.20
			25	24	23.50	23.27	22.89	23.21
			50	0	23.50	23.23	23.03	23.24
		16QAM	1	0	24.00	23.57	23.36	22.97
			1	24	24.00	23.61	23.36	23.08
			1	49	24.00	23.60	23.28	22.97
			25	0	22.50	22.18	22.09	22.23
			25	12	22.50	22.25	22.19	22.25
			25	24	22.50	22.34	21.93	22.23
			50	0	22.50	22.23	22.04	22.22

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20775/2502.5	21100/2535	21425/2567.5
LTE Band 7	5MHz	QPSK	1	0	23.50	22.91	22.96	23.03
			1	12	23.50	22.99	23.07	23.17
			1	24	23.50	22.93	23.00	23.10
			12	0	22.50	21.93	22.05	22.15
			12	6	22.50	22.02	22.11	22.18
			12	11	22.50	21.99	22.08	22.14
			25	0	22.50	22.00	22.04	22.17
		16QAM	1	0	22.50	22.41	22.35	22.34
			1	12	22.50	22.47	22.42	22.47
			1	24	22.50	22.41	22.34	22.39
			12	0	21.50	20.91	20.96	21.19
			12	6	21.50	21.04	21.06	21.24
			12	11	21.50	21.04	21.07	21.24
			25	0	21.50	21.00	21.12	21.17
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20800/2505	21100/2535	21400/2565
LTE Band 7	10MHz	QPSK	1	0	23.50	23.01	23.01	23.16
			1	24	23.50	23.06	23.07	23.17
			1	49	23.50	22.99	23.09	23.22

				25	0	22.50	21.87	22.02	22.23
				25	12	22.50	21.99	22.10	22.17
				25	24	22.50	22.00	22.14	22.16
				50	0	22.50	22.00	22.12	22.22
			16QAM	1	0	22.50	22.39	22.22	22.02
				1	24	22.50	22.37	22.30	22.06
				1	49	22.50	22.34	22.30	22.05
				25	0	21.50	20.95	21.05	21.23
				25	12	21.50	21.03	21.14	21.24
				25	24	21.50	21.06	21.20	21.20
				50	0	21.50	20.98	21.14	21.22
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)			
			RB Size	RB Offset		20825/2507.5	21100/2535	21375/2562.5	
LTE Band 7	15MHz	QPSK	1	0	23.50	22.93	22.97	23.09	
			1	37	23.50	22.98	23.09	23.18	
			1	74	23.50	22.98	23.06	23.17	
			36	0	22.50	21.91	21.97	22.20	
			36	18	22.50	22.01	22.03	22.21	
			36	37	22.50	21.96	22.13	22.11	
			75	0	22.50	21.97	22.09	22.24	
		16QAM	1	0	23.00	22.05	22.37	22.23	
			1	37	23.00	22.05	22.53	22.36	
			1	74	23.00	22.05	22.49	22.35	
			36	0	21.50	20.83	21.03	21.23	
			36	18	21.50	20.93	21.07	21.27	
			36	37	21.50	20.88	21.17	21.18	
			75	0	21.50	20.94	21.08	21.20	
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)			
			RB Size	RB Offset		20850/2510	21100/2535	21350/2560	
LTE Band 7	20MHz	QPSK	1	0	23.50	22.86	22.88	23.00	
			1	49	23.50	22.99	23.10	23.23	
			1	99	23.50	22.97	23.11	23.14	
			50	0	22.50	21.78	22.00	22.19	
			50	24	22.50	21.97	22.13	22.22	
			50	49	22.50	21.86	22.24	22.13	
			100	0	22.50	21.77	22.12	22.12	

16QAM	1	0	22.50	22.09	22.23	22.19
	1	49	22.50	22.21	22.45	22.43
	1	99	22.50	22.17	22.41	22.37
	50	0	21.50	20.81	21.07	21.18
	50	24	21.50	21.00	21.15	21.21
	50	49	21.50	20.89	21.28	21.13
	100	0	21.50	20.82	21.14	21.14

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23017/699.7	23095/707.5	23173/715.3
LTE Band 12	1.4MHz	QPSK	1	0	24.00	22.28	23.29	23.31
			1	2	24.00	23.19	23.34	23.41
			1	5	24.00	23.26	23.22	23.31
			3	0	24.00	23.24	23.40	23.53
			3	1	24.00	23.29	23.46	23.53
			3	2	24.00	23.29	23.37	23.52
			6	0	23.00	22.28	22.37	22.52
		16QAM	1	0	23.00	21.99	22.40	22.42
			1	2	23.00	22.10	22.48	22.55
			1	5	23.00	22.09	22.42	22.56
			3	0	23.00	22.35	22.54	22.65
			3	1	23.00	22.40	22.58	22.74
			3	2	23.00	22.46	22.50	22.70
			6	0	22.00	21.49	21.65	21.67
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23025/700.5	23095/707.5	23165/714.5
LTE Band 12	3MHz	QPSK	1	0	24.00	22.88	23.07	23.18
			1	7	24.00	23.20	23.16	23.30
			1	14	24.00	23.15	23.14	23.28
			8	0	22.50	22.20	22.29	22.42
			8	4	22.50	22.35	22.32	22.45
			8	7	22.50	22.37	22.34	22.39
			15	0	22.50	22.26	22.35	22.34
		16QAM	1	0	23.00	22.38	22.28	21.99
			1	7	23.00	22.59	22.42	22.09
			1	14	23.00	22.46	22.37	22.10

			8	0	21.50	21.29	21.31	21.36
			8	4	21.50	21.38	21.35	21.46
			8	7	21.50	21.38	21.33	21.44
			15	0	21.50	21.29	21.34	21.43
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23035/701.5	23095/707.5	23155/713.5
LTE Band 12	5MHz	QPSK	1	0	24.00	23.20	23.28	23.35
			1	12	24.00	23.42	23.41	23.45
			1	24	24.00	23.37	23.38	23.44
			12	0	23.00	22.24	22.42	22.38
			12	6	23.00	22.42	22.43	22.50
			12	11	23.00	22.31	22.48	22.31
			25	0	22.50	22.33	22.44	22.39
		16QAM	1	0	23.00	22.77	22.65	22.64
			1	12	23.00	22.88	22.78	22.69
			1	24	23.00	22.83	22.67	22.74
			12	0	22.00	21.30	21.40	21.45
			12	6	22.00	21.42	21.40	21.53
			12	11	22.00	21.35	21.41	21.36
			25	0	22.00	21.31	21.51	21.38
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23060/704	23095/707.5	23130/711
LTE Band 12	10MHz	QPSK	1	0	24.00	23.29	23.37	23.41
			1	24	24.00	23.47	23.46	23.53
			1	49	24.00	23.50	23.50	23.55
			25	0	23.00	22.25	22.47	22.27
			25	12	23.00	22.41	22.45	22.48
			25	24	23.00	22.30	22.63	22.33
			50	0	23.00	22.33	22.58	22.29
		16QAM	1	0	23.00	22.73	22.52	22.29
			1	24	23.00	22.84	22.67	22.35
			1	49	23.00	22.91	22.66	22.38
			25	0	22.00	21.32	21.50	21.28
			25	12	22.00	21.45	21.51	21.53
			25	24	22.00	21.35	21.66	21.29
			50	0	22.00	21.32	21.61	21.30

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23755/706.5	23790/710	23825/713.5
LTE Band 17	5MHz	QPSK	1	0	24.00	23.47	23.52	23.52
			1	12	24.00	23.55	23.59	23.66
			1	24	24.00	23.52	23.60	23.61
			12	0	23.00	22.56	22.45	22.63
			12	6	23.00	22.61	22.56	22.64
			12	11	23.00	22.57	22.70	22.45
			25	0	23.00	22.58	22.58	22.52
		16QAM	1	0	23.50	22.99	22.85	22.77
			1	12	23.50	23.08	22.94	22.84
			1	24	23.50	23.08	22.80	22.89
			12	0	22.00	21.58	21.47	21.60
			12	6	22.00	21.65	21.56	21.67
			12	11	22.00	21.61	21.61	21.45
			25	0	22.00	21.59	21.60	21.51
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23780/709	23790/710	23800/711
LTE Band 17	10MHz	QPSK	1	0	24.00	23.53	23.58	23.56
			1	24	24.00	23.64	23.63	23.65
			1	49	24.00	23.71	23.71	23.73
			25	0	23.00	22.56	22.49	22.46
			25	12	23.00	22.59	22.59	22.61
			25	24	23.00	22.63	22.55	22.39
			50	0	23.00	22.62	22.56	22.48
		16QAM	1	0	23.50	22.96	22.73	22.44
			1	24	23.50	23.06	22.82	22.47
			1	49	23.50	22.96	22.79	22.54
			25	0	22.00	21.64	21.52	21.44
			25	12	22.00	21.71	21.62	21.68
			25	24	22.00	21.73	21.58	21.45
			50	0	22.00	21.70	21.58	21.44

7.4. WLAN & Bluetooth Output Power

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11b	1	2412	14.50	14.31
	6	2437	14.50	14.38
	11	2462	14.50	14.22
802.11g	1	2412	14.00	13.74
	6	2437	14.00	13.94
	11	2462	14.00	13.27
802.11n HT20	1	2412	14.00	13.57
	6	2437	14.00	13.91
	11	2462	14.00	13.28
802.11n HT40	3	2422	13.50	13.26
	6	2437	13.50	12.88
	9	2452	13.50	13.36

NOTE: Power measurement results of WLAN 2.4G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11a	36	5180	10.500	10.262
	40	5200	10.500	9.614
	48	5240	10.500	9.214
802.11n HT20	36	5180	10.000	9.935
	40	5200	10.000	9.186
	48	5240	10.000	9.381
802.11n HT40	38	5190	10.000	9.508
	46	5230	10.000	9.330
802.11ac VHT20	36	5180	10.000	9.597
	40	5200	10.000	9.432
	48	5240	10.000	9.386
802.11ac VHT40	38	5190	9.500	9.201
	46	5230	9.500	9.051
802.11ac VHT80	42	5210	10.000	9.667

NOTE: Power measurement results of WLAN 5.2G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11a	149	5745	10.500	10.275
	157	5785	10.500	10.325

	165	5825	10.500	9.714
802.11n HT20	149	5745	10.500	9.978
	157	5785	10.500	10.145
	165	5825	10.500	9.603
802.11n HT40	151	5755	10.000	9.646
	159	5795	10.000	9.807
802.11ac VHT20	149	5745	10.500	10.224
	157	5785	10.500	10.239
	165	5825	10.500	9.660
802.11ac VHT40	151	5755	10.000	9.661
	159	5795	10.000	9.820
802.11ac VHT80	155	5775	9.500	9.448

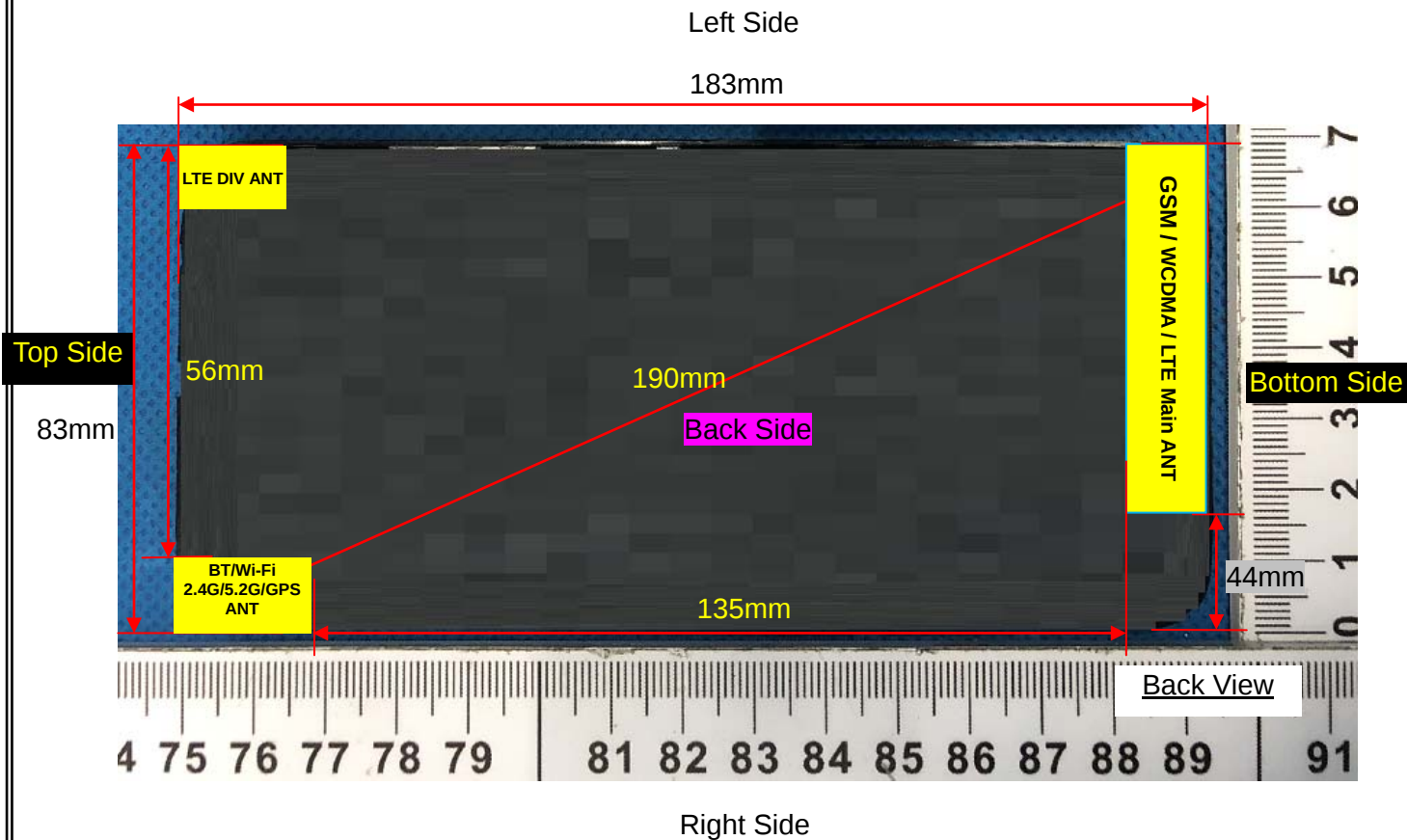
NOTE: Power measurement results of WLAN 5.8G.

BR+EDR	Output Power (dBm)				
	Channel	Tune-up	Data Rates		
			1M	2M	3M
	0CH	7.000	6.572	5.867	5.901
	39CH	8.000	7.008	6.316	6.289
	78CH	8.000	7.768	7.085	7.042

BLE	Channel	Data Rates		Data Rates	
		1M		2M	
		Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)
	0CH	-5.000	-5.756	-5.000	-5.757
	19CH	-4.000	-4.601	-4.000	-4.632
	39CH	-5.000	-5.033	-4.000	-4.987

NOTE: Power measurement results of Bluetooth.

8. Antenna Location



Note: Since the confidentiality request of EUT, the antenna location example diagram see as above.

Distance of the Antenna to the EUT surface/edge						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
WWAN Main	≤ 25mm	≤ 25mm	≤ 25mm	> 25mm	>25mm	≤ 25mm
WLAN & Bluetooth	≤ 25mm	≤ 25mm	>25mm	≤25mm	≤ 25mm	>25mm
Positions for SAR tests						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
WWAN Main	Yes	Yes	Yes	NO	NO	Yes
WLAN & Bluetooth	Yes	Yes	NO	Yes	Yes	NO

9. Stand-alone SAR test exclusion

Refer to FCC KDB 447498D01, the 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{(GHz)}}}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- $f_{\text{(GHz)}}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Mode	P_{max} (dBm)	P_{max} (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
Bluetooth	8.00	6.31	5	2.480	1.99	3	Yes

NOTE: Standalone SAR test exclusion for Bluetooth.

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{(GHz)}}}/x] \text{ W/kg}$ for test separation distances $\leq 50\text{mm}$, where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Mode	Position	P_{max} (dBm)	P_{max} (mW)	Distance (mm)	f (GHz)	x	Estimated SAR (W/Kg)
Bluetooth	Head	8.00	6.31	5	2.48	7.5	0.265
Bluetooth	Body	8.00	6.31	10	2.48	7.5	0.132
Bluetooth	Hotspot	8.00	6.31	10	2.48	7.5	0.132

NOTE: Estimated SAR calculation for Bluetooth

10. SAR Results

10.1. SAR measurement Result

10.1.1. SAR measurement Result of GSM850

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Left Cheek	189/836.4	GPRS(GMSK 4TS)	0.208	0.163	0.16	29.24	29.50	0.221	2021/5/14
Left Tilt 15 Degree	189/836.4	GPRS(GMSK 4TS)	0.105	0.078	-3.19	29.24	29.50	0.111	2021/5/14
Right Cheek	189/836.4	GPRS(GMSK 4TS)	0.181	0.143	2.15	29.24	29.50	0.192	2021/5/14
Right Tilt 15 Degree	189/836.4	GPRS(GMSK 4TS)	0.094	0.073	2.67	29.24	29.50	0.100	2021/5/14

NOTE: Head SAR test results of GSM850.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	189/836.4	GPRS(GMSK 4TS)	0.318	0.192	3.43	29.24	29.50	0.338	2021/5/14
Back Side	189/836.4	GPRS(GMSK 4TS)	0.522	0.332	-0.86	29.24	29.50	0.554	2021/5/14

NOTE: Body-Worn SAR test results of GSM850

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	189/836.4	GPRS(GMSK 4TS)	0.318	0.192	3.43	29.24	29.50	0.338	2021/5/14
Back Side	189/836.4	GPRS(GMSK 4TS)	0.522	0.332	-0.86	29.24	29.50	0.554	2021/5/14
Left Side	189/836.4	GPRS(GMSK 4TS)	0.172	0.106	-3.81	29.24	29.50	0.183	2021/5/14
Bottom Side	189/836.4	GPRS(GMSK 4TS)	0.177	0.110	0.84	29.24	29.50	0.188	2021/5/14

NOTE: Hotspot SAR test results of GSM850

10.1.2. SAR measurement Result of GSM1900

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Left Cheek	661/1880	GPRS(GMSK 4TS)	0.077	0.052	1.44	26.05	26.50	0.085	2021/5/17

Left Tilt 15 Degree	661/1880	GPRS(GMSK 4TS)	0.040	0.025	0.68	26.05	26.50	0.044	2021/5/17
Right Cheek	661/1880	GPRS(GMSK 4TS)	0.070	0.046	-0.94	26.05	26.50	0.078	2021/5/17
Right Tilt 15 Degree	661/1880	GPRS(GMSK 4TS)	0.034	0.023	-2.82	26.05	26.50	0.038	2021/5/17

NOTE: Head SAR test results of GSM1900

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	661/1880	GPRS(GMSK 4TS)	0.229	0.126	1.46	26.05	26.50	0.254	2021/5/17
Back Side	661/1880	GPRS(GMSK 4TS)	0.352	0.204	-2.00	26.05	26.50	0.390	2021/5/17

NOTE: Body-Worn SAR test results of GSM1900

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	661/1880	GPRS(GMSK 4TS)	0.229	0.126	1.46	26.05	26.50	0.254	2021/5/17
Back Side	661/1880	GPRS(GMSK 4TS)	0.352	0.204	-2.00	26.05	26.50	0.390	2021/5/17
Left Side	661/1880	GPRS(GMSK 4TS)	0.120	0.067	-2.52	26.05	26.50	0.133	2021/5/17
Bottom Side	661/1880	GPRS(GMSK 4TS)	0.109	0.061	3.13	26.05	26.50	0.121	2021/5/17

NOTE: Hotspot SAR test results of GSM1900

10.1.3. SAR measurement Result of WCDMA Band 2

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Left Cheek	9400/1880	RMC12.2K	0.081	0.055	-1.65	23.57	24.00	0.089	2021/5/17
Left Tilt 15 Degree	9400/1880	RMC12.2K	0.042	0.031	1.99	23.57	24.00	0.046	2021/5/17
Right	9400/1880	RMC12.2K	0.074	0.047	-3.66	23.57	24.00	0.082	2021/5/17

Cheek									
Right Tilt 15 Degree	9400/1880	RMC12.2K	0.034	0.018	1.34	23.57	24.00	0.038	2021/5/17

NOTE: Head SAR test results of WCDMA Band 2

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	9400/1880	RMC12.2K	0.286	0.157	-3.35	23.57	24.00	0.316	2021/5/17
Back Side	9400/1880	RMC12.2K	0.447	0.251	-0.43	23.57	24.00	0.494	2021/5/17

NOTE: Body-Worn SAR test results of WCDMA Band 2

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	9400/1880	RMC12.2K	0.286	0.157	-3.35	23.57	24.00	0.316	2021/5/17
Back Side	9400/1880	RMC12.2K	0.447	0.251	-0.43	23.57	24.00	0.494	2021/5/17
Left Side	9400/1880	RMC12.2K	0.152	0.084	2.69	23.57	24.00	0.168	2021/5/17
Bottom Side	9400/1880	RMC12.2K	0.148	0.079	-2.38	23.57	24.00	0.163	2021/5/17

NOTE: Hotspot SAR test results of WCDMA Band 2

10.1.4. SAR measurement Result of WCDMA Band 4

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Left Cheek	1413/1732.6	RMC12.2K	0.235	0.150	-1.86	22.53	23.00	0.262	2021/5/14
Left Tilt 15 Degree	1413/1732.6	RMC12.2K	0.123	0.078	1.76	22.53	23.00	0.137	2021/5/14
Right Cheek	1413/1732.6	RMC12.2K	0.207	0.130	4.86	22.53	23.00	0.231	2021/5/14
Right Tilt 15 Degree	1413/1732.6	RMC12.2K	0.104	0.066	-0.07	22.53	23.00	0.116	2021/5/14

NOTE: Head SAR test results of WCDMA Band 4

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	1413/1732.6	RMC12.2K	0.342	0.193	-2.21	22.53	23.00	0.381	2021/5/14
Back Side	1413/1732.6	RMC12.2K	0.534	0.318	-1.26	22.53	23.00	0.595	2021/5/14

NOTE: Body-Worn SAR test results of WCDMA Band 4

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	1413/1732.6	RMC12.2K	0.342	0.193	-2.21	22.53	23.00	0.381	2021/5/14
Back Side	1413/1732.6	RMC12.2K	0.534	0.318	-1.26	22.53	23.00	0.595	2021/5/14
Left Side	1413/1732.6	RMC12.2K	0.160	0.095	0.87	22.53	23.00	0.178	2021/5/14
Bottom Side	1413/1732.6	RMC12.2K	0.166	0.098	-2.06	22.53	23.00	0.185	2021/5/14

NOTE: Hotspot SAR test results of WCDMA Band 4

10.1.5. SAR measurement Result of WCDMA Band 5

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Left Cheek	4182/836.4	RMC12.2K	0.132	0.106	-0.63	23.34	23.50	0.137	2021/5/14
Left Tilt 15 Degree	4182/836.4	RMC12.2K	0.068	0.054	2.85	23.34	23.50	0.071	2021/5/14
Right Cheek	4182/836.4	RMC12.2K	0.122	0.094	-2.52	23.34	23.50	0.127	2021/5/14
Right Tilt 15 Degree	4182/836.4	RMC12.2K	0.067	0.056	-0.56	23.34	23.50	0.070	2021/5/14

NOTE: Head SAR test results of WCDMA Band 5

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	4182/836.4	RMC12.2K	0.212	0.131	-0.20	23.34	23.50	0.220	2021/5/14
Back Side	4182/836.4	RMC12.2K	0.337	0.215	-0.51	23.34	23.50	0.350	2021/5/14

NOTE: Body-Worn SAR test results of WCDMA Band 5

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	4182/836.4	RMC12.2K	0.212	0.131	-0.20	23.34	23.50	0.220	2021/5/14
Back Side	4182/836.4	RMC12.2K	0.337	0.215	-0.51	23.34	23.50	0.350	2021/5/14
Left Side	4182/836.4	RMC12.2K	0.115	0.071	-1.19	23.34	23.50	0.119	2021/5/14
Bottom Side	4182/836.4	RMC12.2K	0.111	0.069	-3.29	23.34	23.50	0.115	2021/5/14

NOTE: Hotspot SAR test results of WCDMA Band 5

10.1.6. SAR measurement Result of LTE Band 2

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Left Cheek	18900/1880	20M QPSK(1,49)	0.096	0.062	2.69	24.15	24.50	0.104	2021/5/17
Left Tilt 15 Degree	18900/1880	20M QPSK(1,49)	0.050	0.033	1.44	24.15	24.50	0.054	2021/5/17
Right Cheek	18900/1880	20M QPSK(1,49)	0.083	0.058	3.09	24.15	24.50	0.090	2021/5/17
Right Tilt 15 Degree	18900/1880	20M QPSK(1,49)	0.043	0.027	3.39	24.15	24.50	0.047	2021/5/17
50%RB									
Left Cheek	18900/1880	20M QPSK(50,24)	0.083	0.058	-1.67	23.09	23.50	0.091	2021/5/17
Left Tilt 15 Degree	18900/1880	20M QPSK(50,24)	0.047	0.030	0.37	23.09	23.50	0.052	2021/5/17
Right Cheek	18900/1880	20M QPSK(50,24)	0.074	0.051	-3.35	23.09	23.50	0.081	2021/5/17
Right Tilt 15 Degree	18900/1880	20M QPSK(50,24)	0.038	0.024	3.26	23.09	23.50	0.042	2021/5/17

NOTE: Head SAR test results of LTE Band 2.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	18900/1880	20M QPSK(1,49)	0.279	0.152	0.96	24.15	24.50	0.302	2021/5/17
Back Side	18900/1880	20M QPSK(1,49)	0.458	0.262	-0.10	24.15	24.50	0.496	2021/5/17
50%RB									
Front Side	18900/1880	20M QPSK(50,24)	0.262	0.143	2.79	23.09	23.50	0.288	2021/5/17
Back Side	18900/1880	20M QPSK(50,24)	0.431	0.247	-3.03	23.09	23.50	0.474	2021/5/17

NOTE: Body-Worn SAR test results of LTE Band 2.

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	18900/1880	20M QPSK(1,49)	0.279	0.152	0.96	24.15	24.50	0.302	2021/5/17
Back Side	18900/1880	20M QPSK(1,49)	0.458	0.262	-0.10	24.15	24.50	0.496	2021/5/17
Left Side	18900/1880	20M QPSK(1,49)	0.151	0.084	1.30	24.15	24.50	0.164	2021/5/17
Bottom Side	18900/1880	20M QPSK(1,49)	0.155	0.085	-3.15	24.15	24.50	0.168	2021/5/17
50%RB									
Front Side	18900/1880	20M QPSK(50,24)	0.262	0.143	2.79	23.09	23.50	0.288	2021/5/17
Back Side	18900/1880	20M QPSK(50,24)	0.431	0.247	-3.03	23.09	23.50	0.474	2021/5/17
Left Side	18900/1880	20M QPSK(50,24)	0.131	0.079	2.04	23.09	23.50	0.144	2021/5/17
Bottom Side	18900/1880	20M QPSK(50,24)	0.134	0.080	-4.13	23.09	23.50	0.147	2021/5/17

NOTE: Hotspot SAR test results of LTE Band 2.

10.1.7. SAR measurement Result of LTE Band 4

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Left Cheek	20175/1732.5	20M QPSK(1,49)	0.264	0.169	-4.49	23.39	23.50	0.271	2021/5/14
Left Tilt 15 Degree	20175/1732.5	20M QPSK(1,49)	0.147	0.093	-3.43	23.39	23.50	0.151	2021/5/14
Right Cheek	20175/1732.5	20M QPSK(1,49)	0.228	0.147	-2.85	23.39	23.50	0.234	2021/5/14
Right Tilt 15 Degree	20175/1732.5	20M QPSK(1,49)	0.118	0.073	-0.16	23.39	23.50	0.121	2021/5/14
50%RB									
Left Cheek	20175/1732.5	20M QPSK(50,49)	0.242	0.157	-4.04	22.39	23.00	0.278	2021/5/14
Left Tilt 15 Degree	20175/1732.5	20M QPSK(50,49)	0.138	0.088	-4.01	22.39	23.00	0.159	2021/5/14
Right Cheek	20175/1732.5	20M QPSK(50,49)	0.212	0.132	2.58	22.39	23.00	0.244	2021/5/14
Right Tilt 15 Degree	20175/1732.5	20M QPSK(50,49)	0.101	0.067	2.07	22.39	23.00	0.116	2021/5/14

NOTE: Head SAR test results of LTE Band 4.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	20175/1732.5	20M QPSK(1,49)	0.407	0.234	-2.59	23.39	23.50	0.417	2021/5/14
Back Side	20175/1732.5	20M QPSK(1,49)	0.679	0.403	-0.88	23.39	23.50	0.696	2021/5/14
50%RB									

Front Side	20175/1732.5	20M QPSK(50,49)	0.351	0.212	-4.75	22.39	23.00	0.404	2021/5/14
Back Side	20175/1732.5	20M QPSK(50,49)	0.590	0.352	-2.67	22.39	23.00	0.679	2021/5/14

NOTE: Body-Worn SAR test results of LTE Band 4.

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	20175/1732.5	20M QPSK(1,49)	0.407	0.234	-2.59	23.39	23.50	0.417	2021/5/14
Back Side	20175/1732.5	20M QPSK(1,49)	0.679	0.403	-0.88	23.39	23.50	0.696	2021/5/14
Left Side	20175/1732.5	20M QPSK(1,49)	0.210	0.123	3.77	23.39	23.50	0.215	2021/5/14
Bottom Side	20175/1732.5	20M QPSK(1,49)	0.238	0.137	1.26	23.39	23.50	0.244	2021/5/14
50%RB									
Front Side	20175/1732.5	20M QPSK(50,49)	0.351	0.212	-4.75	22.39	23.00	0.404	2021/5/14
Back Side	20175/1732.5	20M QPSK(50,49)	0.590	0.352	-2.67	22.39	23.00	0.679	2021/5/14
Left Side	20175/1732.5	20M QPSK(50,49)	0.195	0.109	-0.31	22.39	23.00	0.224	2021/5/14
Bottom Side	20175/1732.5	20M QPSK(50,49)	0.208	0.126	-2.68	22.39	23.00	0.239	2021/5/14

NOTE: Hotspot SAR test results of LTE Band 4.

10.1.8. SAR measurement Result of LTE Band 5

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Left Cheek	20525/836.5	10M QPSK(1,24)	0.143	0.115	1.79	24.19	24.50	0.154	2021/5/14
Left Tilt	20525/836.5	10M	0.073	0.063	-2.94	24.19	24.50	0.078	2021/5/14

15 Degree		QPSK(1,24)							
Right Cheek	20525/836.5	10M QPSK(1,24)	0.130	0.103	-0.62	24.19	24.50	0.140	2021/5/14
Right Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.071	0.055	-2.56	24.19	24.50	0.076	2021/5/14
50%RB									
Left Cheek	20525/836.5	10M QPSK(25,24)	0.131	0.100	-2.85	22.89	23.50	0.151	2021/5/14
Left Tilt 15 Degree	20525/836.5	10M QPSK(25,24)	0.065	0.056	-4.19	22.89	23.50	0.075	2021/5/14
Right Cheek	20525/836.5	10M QPSK(25,24)	0.121	0.092	0.14	22.89	23.50	0.139	2021/5/14
Right Tilt 15 Degree	20525/836.5	10M QPSK(25,24)	0.067	0.050	-0.43	22.89	23.50	0.077	2021/5/14

NOTE: Head SAR test results of LTE Band 5.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	20525/836.5	10M QPSK(1,24)	0.252	0.160	3.02	24.19	24.50	0.271	2021/5/14
Back Side	20525/836.5	10M QPSK(1,24)	0.407	0.258	0.29	24.19	24.50	0.437	2021/5/14
50%RB									
Front Side	20525/836.5	10M QPSK(25,24)	0.229	0.139	3.21	22.89	23.50	0.264	2021/5/14
Back Side	20525/836.5	10M QPSK(25,24)	0.369	0.244	3.41	22.89	23.50	0.425	2021/5/14

NOTE: Body-Worn SAR test results of LTE Band 5.

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front	20525/836.5	10M	0.252	0.160	3.02	24.19	24.50	0.271	2021/5/14

Side		QPSK(1,24)							
Back Side	20525/836.5	10M QPSK(1,24)	0.407	0.258	0.29	24.19	24.50	0.437	2021/5/14
Left Side	20525/836.5	10M QPSK(1,24)	0.142	0.086	-2.70	24.19	24.50	0.153	2021/5/14
Bottom Side	20525/836.5	10M QPSK(1,24)	0.134	0.082	1.60	24.19	24.50	0.144	2021/5/14
50%RB									
Front Side	20525/836.5	10M QPSK(25,24)	0.229	0.139	3.21	22.89	23.50	0.264	2021/5/14
Back Side	20525/836.5	10M QPSK(25,24)	0.369	0.244	3.41	22.89	23.50	0.425	2021/5/14
Left Side	20525/836.5	10M QPSK(25,24)	0.129	0.079	2.27	22.89	23.50	0.148	2021/5/14
Bottom Side	20525/836.5	10M QPSK(25,24)	0.115	0.071	3.52	22.89	23.50	0.132	2021/5/14

NOTE: Hotspot SAR test results of LTE Band 5.

10.1.9. SAR measurement Result of LTE Band 7

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Left Cheek	21100/2535	20M QPSK(1,49)	0.338	0.183	0.59	23.10	23.50	0.371	2021/5/17
Left Tilt 15 Degree	21100/2535	20M QPSK(1,49)	0.203	0.106	-1.76	23.10	23.50	0.223	2021/5/17
Right Cheek	21100/2535	20M QPSK(1,49)	0.289	0.154	4.25	23.10	23.50	0.317	2021/5/17
Right Tilt 15 Degree	21100/2535	20M QPSK(1,49)	0.133	0.070	-1.49	23.10	23.50	0.146	2021/5/17
50%RB									
Left Cheek	21100/2535	20M QPSK(50,49)	0.303	0.162	-0.05	22.24	22.50	0.322	2021/5/17
Left Tilt 15 Degree	21100/2535	20M QPSK(50,49)	0.189	0.097	4.88	22.24	22.50	0.201	2021/5/17
Right	21100/2535	20M	0.255	0.143	-4.27	22.24	22.50	0.271	2021/5/17

Cheek		QPSK(50,49)							
Right Tilt 15 Degree	21100/2535	20M QPSK(50,49)	0.117	0.063	-2.27	22.24	22.50	0.124	2021/5/17

NOTE: Head SAR test results of LTE Band 7.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	21100/2535	20M QPSK(1,49)	0.560	0.271	0.07	23.10	23.50	0.614	2021/5/17
Back Side	21100/2535	20M QPSK(1,49)	1.090	0.591	-0.36	23.10	23.50	1.195	2021/5/17
Back Side Repeated	21100/2535	20M QPSK(1,49)	1.085	0.588	-0.16	23.10	23.50	1.190	2021/5/17
Back Side	20850/2510	20M QPSK(1,49)	1.003	0.589	-0.38	22.99	23.50	1.128	2021/5/17
Back Side	21350/2560	20M QPSK(1,49)	0.862	0.425	-0.54	23.23	23.50	0.917	2021/5/17
50%RB									
Front Side	21100/2535	20M QPSK(50,49)	0.295	0.149	1.22	22.24	22.50	0.313	2021/5/17
Back Side	21100/2535	20M QPSK(50,49)	0.617	0.296	3.59	22.24	22.50	0.655	2021/5/17
100%RB									
Back Side	21100/2535	20M QPSK(100,0)	0.518	0.249	3.26	22.12	22.50	0.565	2021/5/17

NOTE: Body-Worn SAR test results of LTE Band 7

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	21100/2535	20M QPSK(1,49)	0.560	0.271	0.07	23.10	23.50	0.614	2021/5/17
Back Side	21100/2535	20M QPSK(1,49)	1.090	0.591	-0.36	23.10	23.50	1.195	2021/5/17

Back Side Repeated	21100/2535	20M QPSK(1,49)	1.085	0.588	-0.16	23.10	23.50	1.190	2021/5/17
Left Side	21100/2535	20M QPSK(1,49)	0.267	0.132	0.53	23.10	23.50	0.293	2021/5/17
Bottom Side	21100/2535	20M QPSK(1,49)	0.302	0.149	3.68	23.10	23.50	0.331	2021/5/17
Back Side	20850/2510	20M QPSK(1,49)	1.003	0.589	-0.38	22.99	23.50	1.128	2021/5/17
Back Side	21350/2560	20M QPSK(1,49)	0.862	0.425	-0.54	23.23	23.50	0.917	2021/5/17
50%RB									
Front Side	21100/2535	20M QPSK(50,49)	0.295	0.149	1.22	22.24	22.50	0.313	2021/5/17
Back Side	21100/2535	20M QPSK(50,49)	0.617	0.296	3.59	22.24	22.50	0.655	2021/5/17
Left Side	21100/2535	20M QPSK(50,49)	0.139	0.074	3.62	22.24	22.50	0.148	2021/5/17
Bottom Side	21100/2535	20M QPSK(50,49)	0.161	0.089	-4.16	22.24	22.50	0.171	2021/5/17
100%RB									
Back Side	21100/2535	20M QPSK(100,0)	0.518	0.249	3.26	22.12	22.50	0.565	2021/5/17

NOTE: Hotspot SAR test results of LTE Band 7

10.1.10. SAR measurement Result of LTE Band 12

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Left Cheek	23095/707.5	10M QPSK(1,49)	0.099	0.083	2.63	23.50	24.00	0.111	2021/5/14
Left Tilt 15 Degree	23095/707.5	10M QPSK(1,49)	0.051	0.044	2.66	23.50	24.00	0.057	2021/5/14
Right Cheek	23095/707.5	10M QPSK(1,49)	0.086	0.071	0.71	23.50	24.00	0.096	2021/5/14
Right Tilt 15 Degree	23095/707.5	10M QPSK(1,49)	0.039	0.028	-0.13	23.50	24.00	0.044	2021/5/14

50%RB									
Left Cheek	23095/707.5	10M QPSK(25,24)	0.089	0.077	-1.30	22.63	23.00	0.097	2021/5/14
Left Tilt 15 Degree	23095/707.5	10M QPSK(25,24)	0.046	0.039	1.79	22.63	23.00	0.050	2021/5/14
Right Cheek	23095/707.5	10M QPSK(25,24)	0.080	0.061	1.24	22.63	23.00	0.087	2021/5/14
Right Tilt 15 Degree	23095/707.5	10M QPSK(25,24)	0.037	0.026	1.38	22.63	23.00	0.040	2021/5/14

NOTE: Head SAR test results of LTE Band 12.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	23095/707.5	10M QPSK(1,49)	0.114	0.093	-3.80	23.50	24.00	0.128	2021/5/14
Back Side	23095/707.5	10M QPSK(1,49)	0.175	0.142	0.20	23.50	24.00	0.196	2021/5/14
50%RB									
Front Side	23095/707.5	10M QPSK(25,24)	0.104	0.082	-2.69	22.63	23.00	0.113	2021/5/14
Back Side	23095/707.5	10M QPSK(25,24)	0.161	0.133	-0.90	22.63	23.00	0.175	2021/5/14

NOTE: Body-Worn SAR test results of LTE Band 12.

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	23095/707.5	10M QPSK(1,49)	0.114	0.093	-3.80	23.50	24.00	0.128	2021/5/14
Back Side	23095/707.5	10M QPSK(1,49)	0.175	0.142	0.20	23.50	24.00	0.196	2021/5/14
Left Side	23095/707.5	10M QPSK(1,49)	0.060	0.046	1.37	23.50	24.00	0.067	2021/5/14
Bottom Side	23095/707.5	10M QPSK(1,49)	0.064	0.048	3.93	23.50	24.00	0.072	2021/5/14

50%RB									
Front Side	23095/707.5	10M QPSK(25,24)	0.104	0.082	-2.69	22.63	23.00	0.113	2021/5/14
Back Side	23095/707.5	10M QPSK(25,24)	0.161	0.133	-0.90	22.63	23.00	0.175	2021/5/14
Left Side	23095/707.5	10M QPSK(25,24)	0.054	0.041	-3.85	22.63	23.00	0.059	2021/5/14
Bottom Side	23095/707.5	10M QPSK(25,24)	0.059	0.044	-4.00	22.63	23.00	0.064	2021/5/14

NOTE: Hotspot SAR test results of LTE Band 12.

10.1.11. SAR measurement Result of LTE Band 17

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Left Cheek	23790/710	10M QPSK(1,49)	0.091	0.077	1.15	23.71	24.00	0.097	2021/5/14
Left Tilt 15 Degree	23790/710	10M QPSK(1,49)	0.047	0.041	-0.53	23.71	24.00	0.050	2021/5/14
Right Cheek	23790/710	10M QPSK(1,49)	0.081	0.072	4.17	23.71	24.00	0.087	2021/5/14
Right Tilt 15 Degree	23790/710	10M QPSK(1,49)	0.044	0.041	-0.92	23.71	24.00	0.047	2021/5/14
50%RB									
Left Cheek	23790/710	10M QPSK(25,24)	0.081	0.073	-0.43	22.55	23.00	0.090	2021/5/14
Left Tilt 15 Degree	23790/710	10M QPSK(25,24)	0.040	0.036	-0.28	22.55	23.00	0.044	2021/5/14
Right Cheek	23790/710	10M QPSK(25,24)	0.074	0.062	-3.98	22.55	23.00	0.082	2021/5/14
Right Tilt 15 Degree	23790/710	10M QPSK(25,24)	0.039	0.038	3.01	22.55	23.00	0.043	2021/5/14

NOTE: Head SAR test results of LTE Band17.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	23790/710	10M QPSK(1,49)	0.126	0.101	0.14	23.71	24.00	0.135	2021/5/14
Back Side	23790/710	10M QPSK(1,49)	0.194	0.155	-1.12	23.71	24.00	0.207	2021/5/14
50%RB									
Front Side	23790/710	10M QPSK(25,24)	0.119	0.094	0.70	22.55	23.00	0.132	2021/5/14
Back Side	23790/710	10M QPSK(25,24)	0.172	0.136	-3.45	22.55	23.00	0.191	2021/5/14

NOTE: Body-Worn SAR test results of LTE Band 17

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
1RB									
Front Side	23790/710	10M QPSK(1,49)	0.126	0.101	0.14	23.71	24.00	0.135	2021/5/14
Back Side	23790/710	10M QPSK(1,49)	0.194	0.155	-1.12	23.71	24.00	0.207	2021/5/14
Left Side	23790/710	10M QPSK(1,49)	0.062	0.048	0.12	23.71	24.00	0.066	2021/5/14
Bottom Side	23790/710	10M QPSK(1,49)	0.062	0.049	0.50	23.71	24.00	0.066	2021/5/14
50%RB									
Front Side	23790/710	10M QPSK(25,24)	0.119	0.094	0.70	22.55	23.00	0.132	2021/5/14
Back Side	23790/710	10M QPSK(25,24)	0.172	0.136	-3.45	22.55	23.00	0.191	2021/5/14
Left Side	23790/710	10M QPSK(25,24)	0.054	0.043	1.52	22.55	23.00	0.060	2021/5/14
Bottom Side	23790/710	10M QPSK(25,24)	0.053	0.044	-1.12	22.55	23.00	0.059	2021/5/14

NOTE: Hotspot SAR test results of LTE Band 17

10.1.12. SAR measurement Result of WLAN 2.4G

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Left Cheek	6/2437	802.11b	0.136	0.073	0.34	14.38	14.50	0.140	2021/5/12
Left Tilt 15 Degree	6/2437	802.11b	0.073	0.043	1.08	14.38	14.50	0.075	2021/5/12
Right Cheek	6/2437	802.11b	0.118	0.064	4.62	14.38	14.50	0.121	2021/5/12
Right Tilt 15 Degree	6/2437	802.11b	0.064	0.033	4.20	14.38	14.50	0.066	2021/5/12

NOTE: Head SAR test results of WLAN 2.4G

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	6/2437	802.11b	0.045	0.028	0.42	14.38	14.50	0.046	2021/5/12
Back Side	6/2437	802.11b	0.073	0.045	2.42	14.38	14.50	0.075	2021/5/12

NOTE: Body-Worn SAR test results of WLAN 2.4G

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	6/2437	802.11b	0.045	0.028	0.42	14.38	14.50	0.046	2021/5/12
Back Side	6/2437	802.11b	0.073	0.045	2.42	14.38	14.50	0.075	2021/5/12
Right Side	6/2437	802.11b	0.020	0.013	4.26	14.38	14.50	0.021	2021/5/12
Top Side	6/2437	802.11b	0.024	0.015	-1.65	14.38	14.50	0.025	2021/5/12

NOTE: Hotspot SAR test results of WLAN 2.4G

10.1.13. SAR measurement Result of WLAN 5.2G

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Left Cheek	40/5200	802.11a	0.453	0.188	-2.07	9.614	10.500	0.556	2021/5/18
Left Tilt 15 Degree	40/5200	802.11a	0.269	0.108	3.50	9.614	10.500	0.330	2021/5/18

Right Cheek	40/5200	802.11a	0.391	0.161	4.86	9.614	10.500	0.479	2021/5/18
Right Tilt 15 Degree	40/5200	802.11a	0.195	0.079	-4.86	9.614	10.500	0.239	2021/5/18

NOTE: Head SAR test results of WLAN 5.2G

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	40/5200	802.11a	0.062	0.035	-1.89	9.614	10.500	0.076	2021/5/18
Back Side	40/5200	802.11a	0.099	0.058	-1.78	9.614	10.500	0.121	2021/5/18

NOTE: Body-Worn SAR test results of WLAN 5.2G

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	40/5200	802.11a	0.062	0.035	-1.89	9.614	10.500	0.076	2021/5/18
Back Side	40/5200	802.11a	0.099	0.058	-1.78	9.614	10.500	0.121	2021/5/18
Right Side	40/5200	802.11a	0.034	0.019	1.05	9.614	10.500	0.042	2021/5/18
Top Side	40/5200	802.11a	0.034	0.019	2.12	9.614	10.500	0.042	2021/5/18

NOTE: Hotspot SAR test results of WLAN 5.2G

10.1.14. SAR measurement Result of WLAN 5.8G

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Left Cheek	157/5785	802.11a	0.168	0.086	4.85	10.325	10.500	0.175	2021/5/13
Left Tilt 15 Degree	157/5785	802.11a	0.091	0.046	5.42	10.325	10.500	0.095	2021/5/13
Right Cheek	157/5785	802.11a	0.152	0.077	0.03	10.325	10.500	0.158	2021/5/13
Right Tilt 15 Degree	157/5785	802.11a	0.079	0.039	2.60	10.325	10.500	0.082	2021/5/13

NOTE: Head SAR test results of WLAN 5.8G

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	157/5785	802.11a	0.056	0.034	2.51	10.325	10.500	0.058	2021/5/13

Back Side	157/5785	802.11a	0.087	0.054	-4.70	10.325	10.500	0.091	2021/5/13
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NOTE: Body-Worn SAR test results of WLAN 5.8G

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
			1g	10g					
Front Side	157/5785	802.11a	0.056	0.034	2.51	10.325	10.500	0.058	2021/5/13
Back Side	157/5785	802.11a	0.087	0.054	-4.70	10.325	10.500	0.091	2021/5/13
Right Side	157/5785	802.11a	0.029	0.017	-1.25	10.325	10.500	0.030	2021/5/13
Top Side	157/5785	802.11a	0.033	0.019	0.60	10.325	10.500	0.034	2021/5/13

NOTE: Hotspot SAR test results of WLAN 5.8G

10.2. Simultaneous Transmission Analysis

Per KDB 447498 D01, simultaneous transmission SAR is compliant if,

- Scalar SAR summation < 1.6W/kg.
- $SPLSR = (SAR_1 + SAR_2)^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan. If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	DTS			
Head	Left Cheek	0.371	0.140	0.511	N/A	N/A
	Left Tilt 15 Degree	0.223	0.075	0.298	N/A	N/A
	Right Cheek	0.317	0.121	0.438	N/A	N/A
	Right Tilt 15 Degree	0.146	0.066	0.212	N/A	N/A
Body-Worn	Front Side	0.614	0.046	0.660	N/A	N/A
	Back Side	1.195	0.075	1.270	N/A	N/A
Hotspot	Front Side	0.614	0.046	0.660	N/A	N/A
	Back Side	1.195	0.075	1.270	N/A	N/A
	Left Side	0.293	N/A	0.293	N/A	N/A
	Right Side	N/A	0.021	0.021	N/A	N/A
	Top Side	N/A	0.025	0.025	N/A	N/A
	Bottom Side	0.331	N/A	0.331	N/A	N/A

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	NII			
Head	Left Cheek	0.371	0.556	0.927	N/A	N/A
	Left Tilt 15 Degree	0.223	0.330	0.553	N/A	N/A
	Right Cheek	0.317	0.479	0.796	N/A	N/A
	Right Tilt 15 Degree	0.146	0.239	0.385	N/A	N/A
Body-Worn	Front Side	0.614	0.076	0.690	N/A	N/A
	Back Side	1.195	0.121	1.316	N/A	N/A
Hotspot	Front Side	0.614	0.076	0.690	N/A	N/A
	Back Side	1.195	0.121	1.316	N/A	N/A
	Left Side	0.293	N/A	0.293	N/A	N/A
	Right Side	N/A	0.042	0.042	N/A	N/A
	Top Side	N/A	0.042	0.042	N/A	N/A
	Bottom Side	0.331	N/A	0.331	N/A	N/A

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	DSS			
Head	Left Cheek	0.371	0.265	0.636	N/A	N/A
	Left Tilt 15 Degree	0.223	0.265	0.488	N/A	N/A
	Right Cheek	0.317	0.265	0.582	N/A	N/A
	Right Tilt 15 Degree	0.146	0.265	0.411	N/A	N/A
Body-Worn	Front Side	0.614	0.132	0.746	N/A	N/A
	Back Side	1.195	0.132	1.327	N/A	N/A
Hotspot	Front Side	0.614	0.132	0.746	N/A	N/A
	Back Side	1.195	0.132	1.327	N/A	N/A
	Left Side	0.293	N/A	0.293	N/A	N/A
	Right Side	N/A	0.132	0.132	N/A	N/A
	Top Side	N/A	0.132	0.132	N/A	N/A
	Bottom Side	0.331	N/A	0.331	N/A	N/A

11. Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

12. Appendix B. System Check Plots

Table of contents
MEASUREMENT 1 System Performance Check - 750MHz
MEASUREMENT 2 System Performance Check - 835MHz
MEASUREMENT 3 System Performance Check - 1800MHz
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MEASUREMENT 6 System Performance Check - 2600MHz
MEASUREMENT 7 System Performance Check - 5200MHz
MEASUREMENT 8 System Performance Check - 5800MHz

MEASUREMENT 1

Date of measurement: 14/5/2021

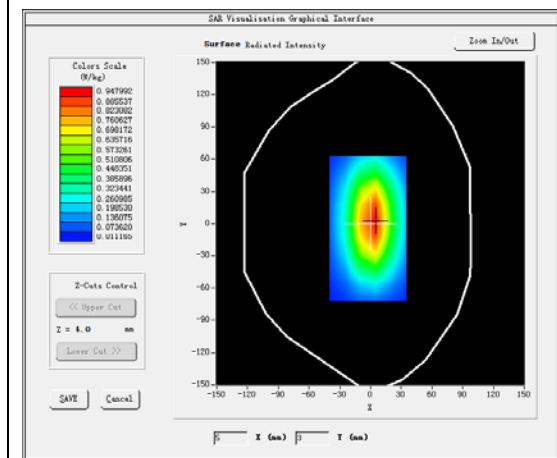
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW750</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

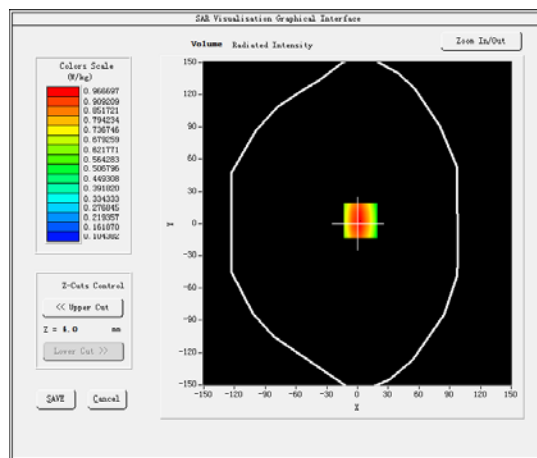
B. SAR Measurement Results

Frequency (MHz)	750.000000
Relative permittivity (real part)	41.047169
Relative permittivity (imaginary part)	21.275281
Conductivity (S/m)	0.886470
Variation (%)	-1.910000

SURFACE SAR



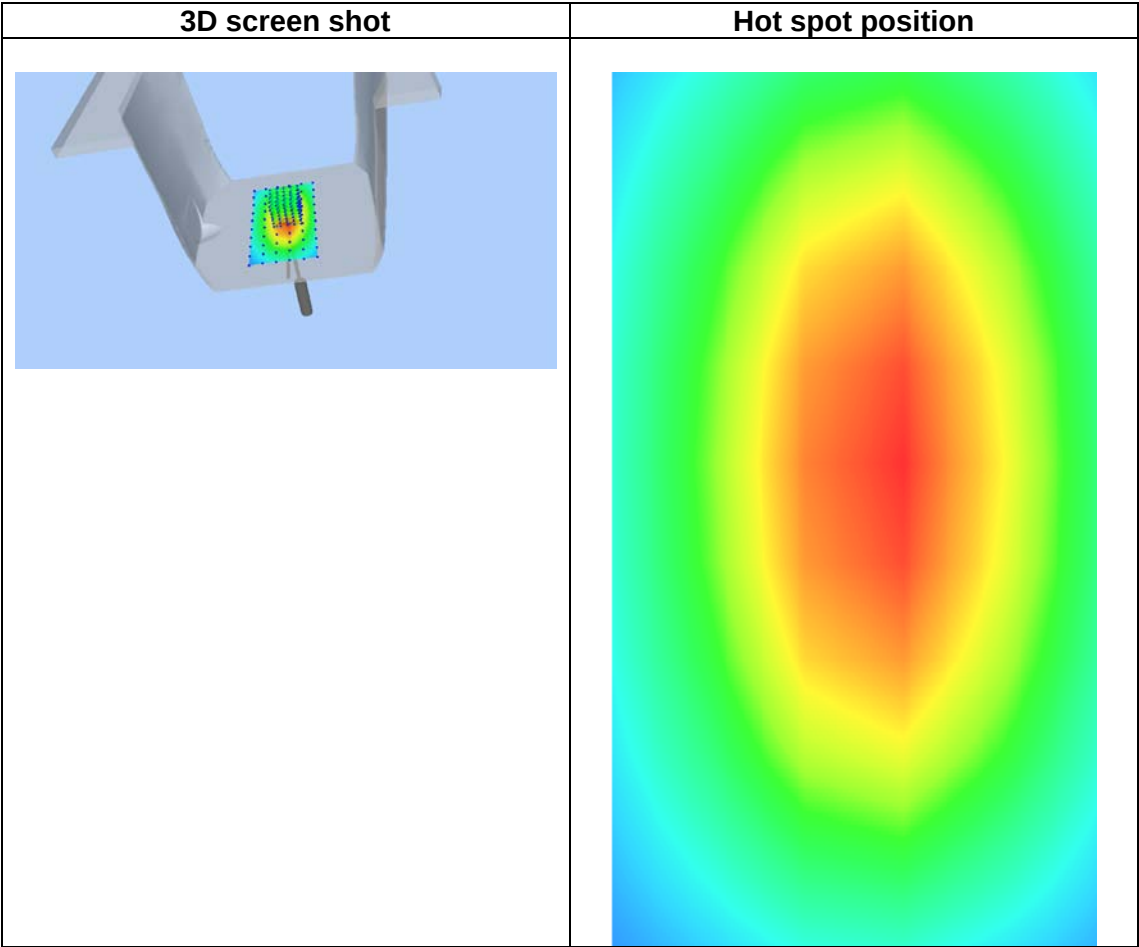
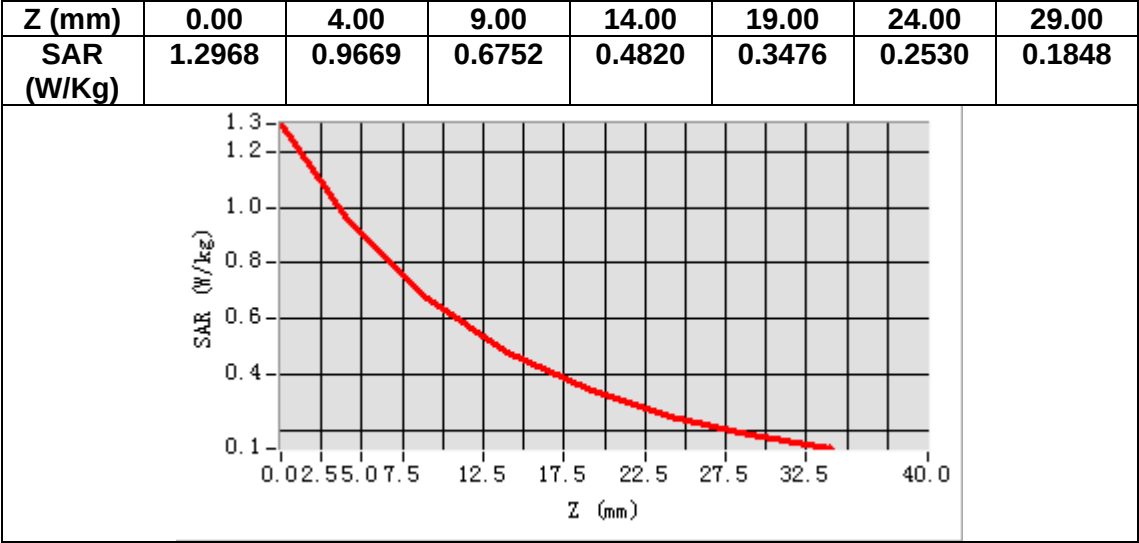
VOLUME SAR



Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.549238
SAR 1g (W/Kg)	0.851162



MEASUREMENT 2

Date of measurement: 14/5/2021

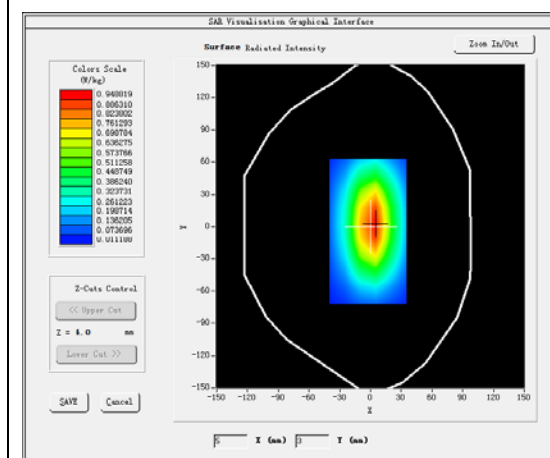
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW835</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

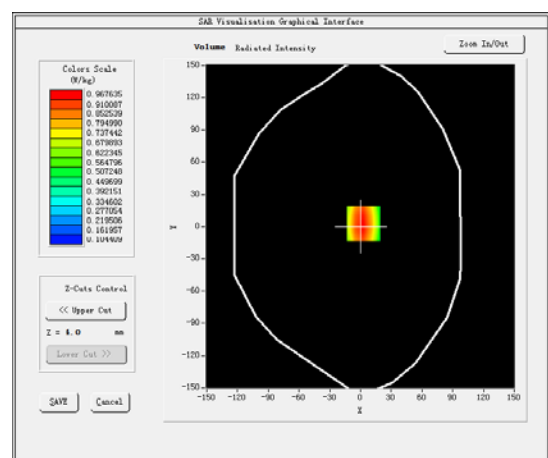
B. SAR Measurement Results

Frequency (MHz)	835.000000
Relative permittivity (real part)	42.351767
Relative permittivity (imaginary part)	19.706641
Conductivity (S/m)	0.914169
Variation (%)	1.120000

SURFACE SAR



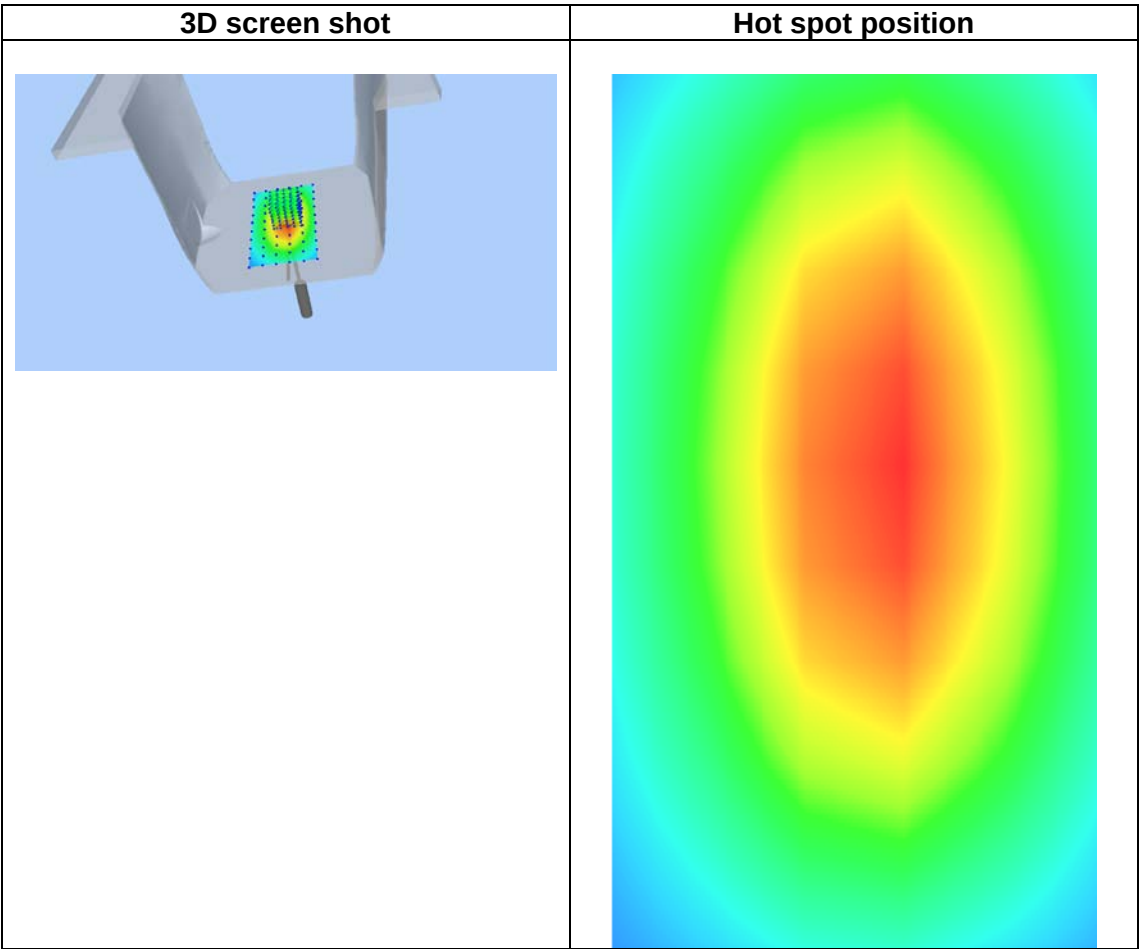
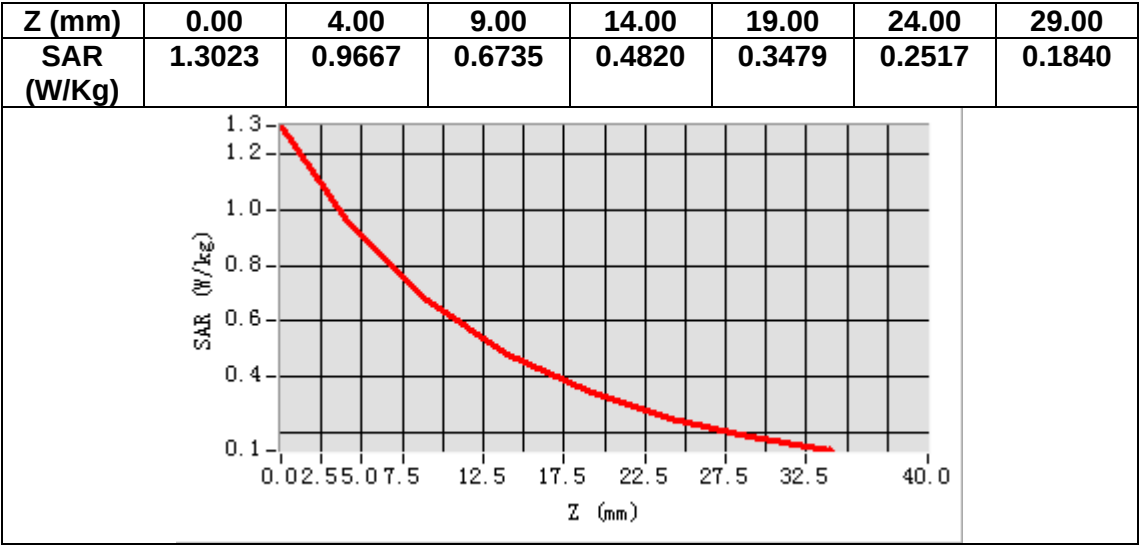
VOLUME SAR



Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.607376
SAR 1g (W/Kg)	0.953438



MEASUREMENT 3

Date of measurement: 14/5/2021

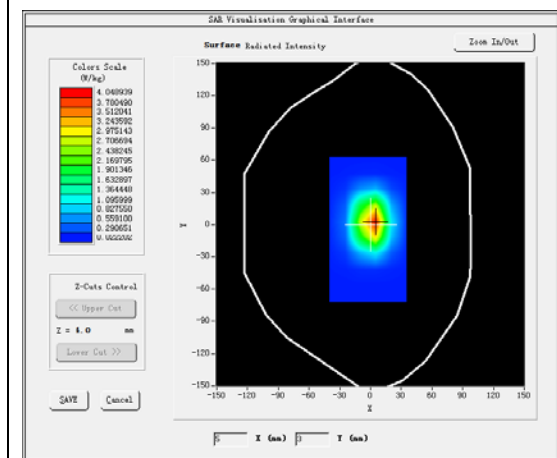
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW1800</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

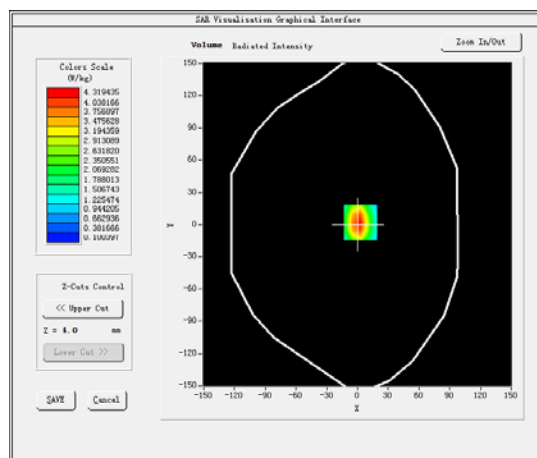
B. SAR Measurement Results

Frequency (MHz)	1800.000000
Relative permittivity (real part)	40.257245
Relative permittivity (imaginary part)	13.818027
Conductivity (S/m)	1.381803
Variation (%)	-0.17000

SURFACE SAR



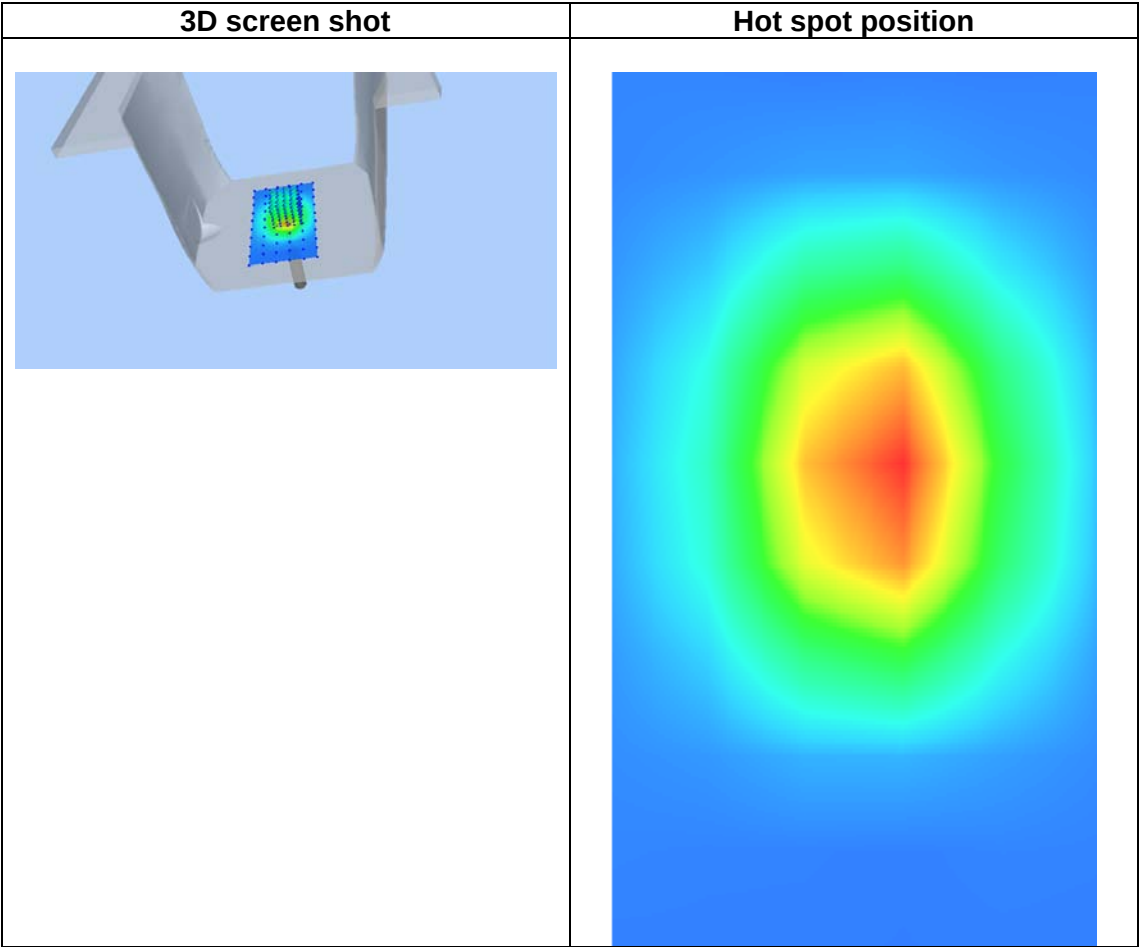
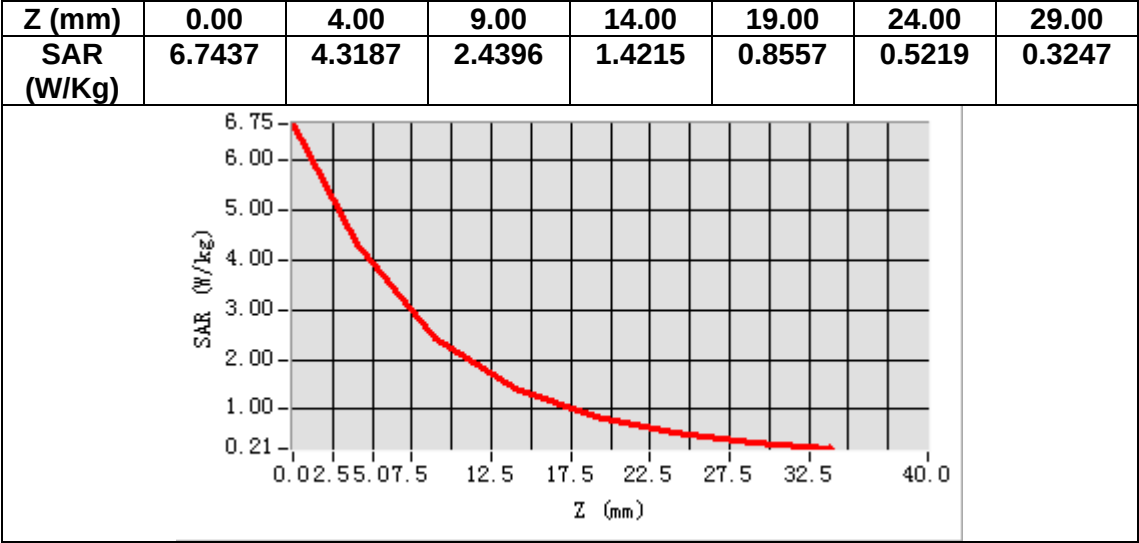
VOLUME SAR



Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

SAR 10g (W/Kg)	2.001367
SAR 1g (W/Kg)	3.809451



MEASUREMENT 4

Date of measurement: 17/5/2021

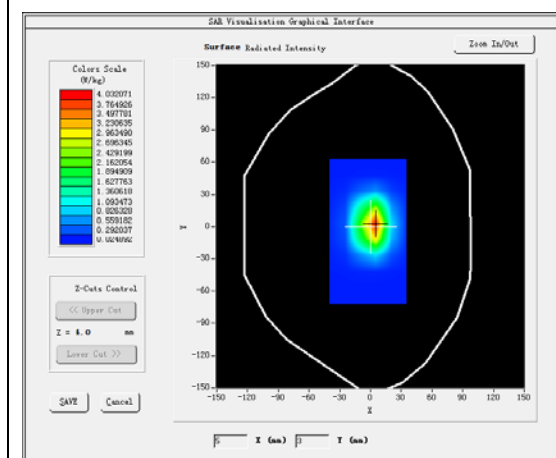
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

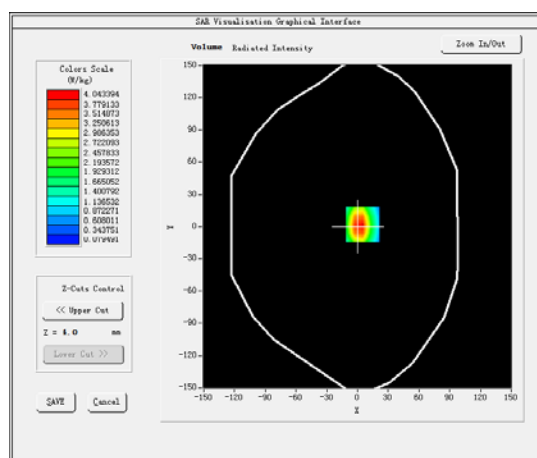
B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative permittivity (real part)	39.503660
Relative permittivity (imaginary part)	13.349589
Conductivity (S/m)	1.409123
Variation (%)	-0.430000

SURFACE SAR



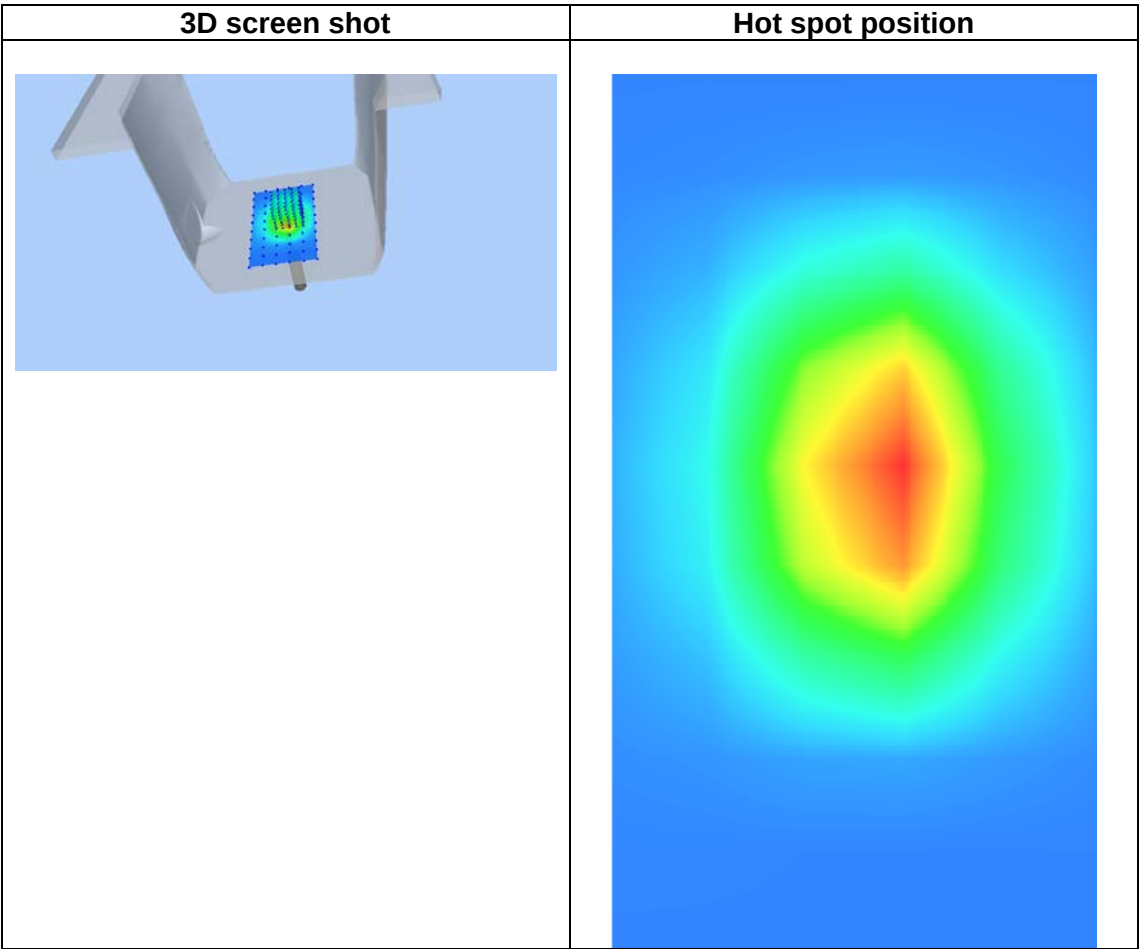
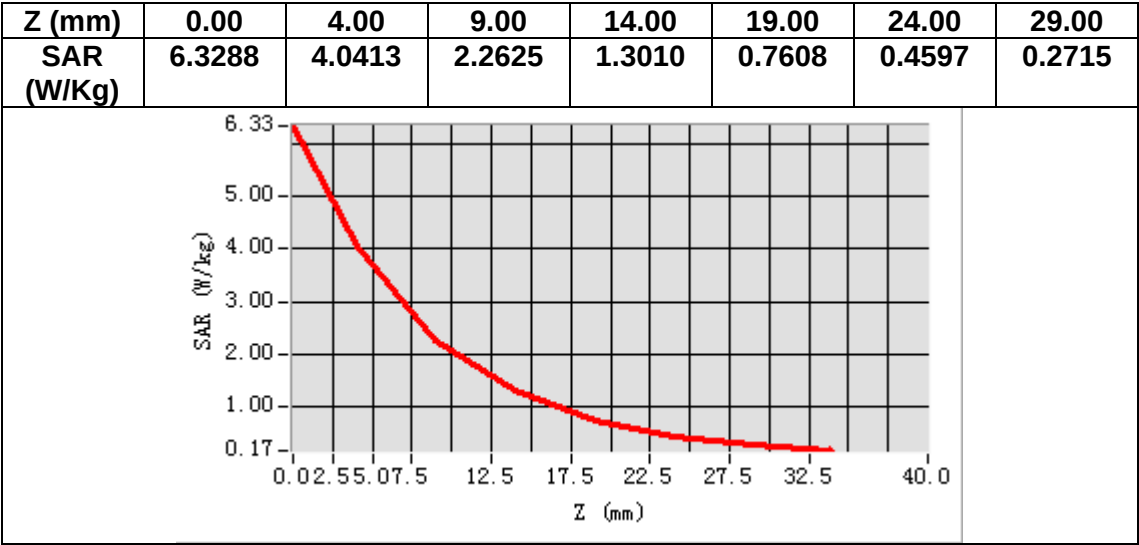
VOLUME SAR



Maximum location: X=5.00, Y=2.00

SAR Peak: 6.70 W/kg

SAR 10g (W/Kg)	2.004456
SAR 1g (W/Kg)	3.886165



MEASUREMENT 5

Date of measurement: 12/5/2021

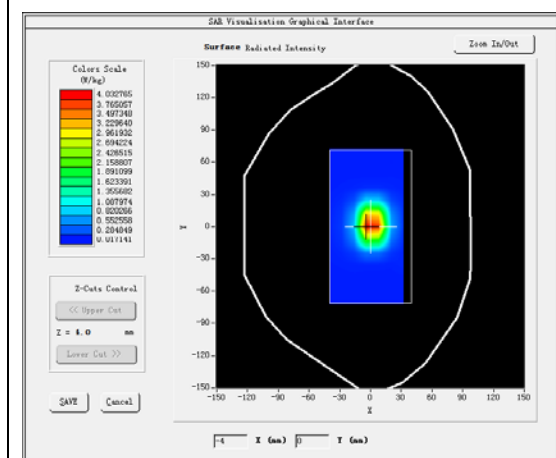
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2450</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

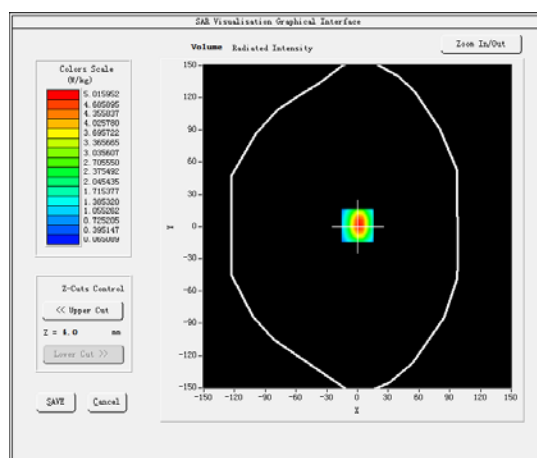
B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative permittivity (real part)	40.368072
Relative permittivity (imaginary part)	13.427488
Conductivity (S/m)	1.827630
Variation (%)	-0.310000

SURFACE SAR



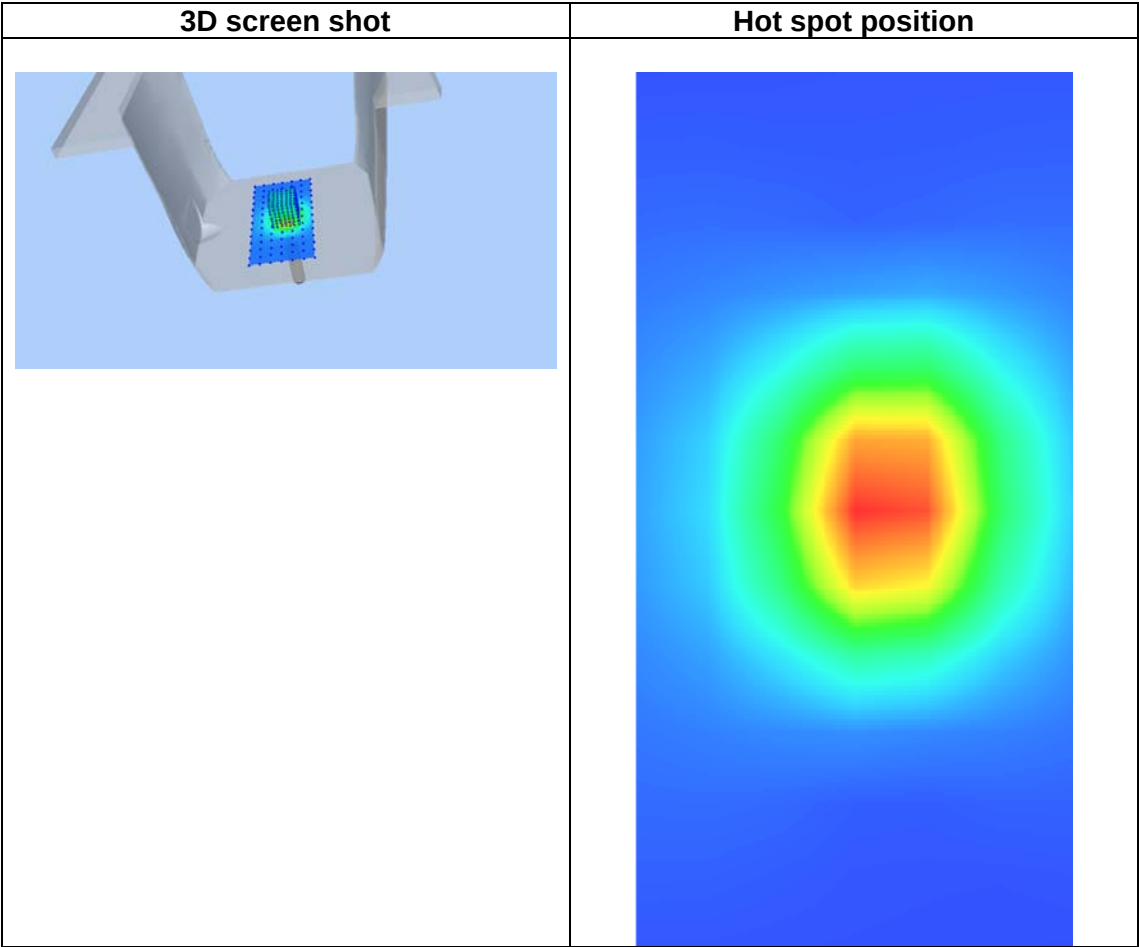
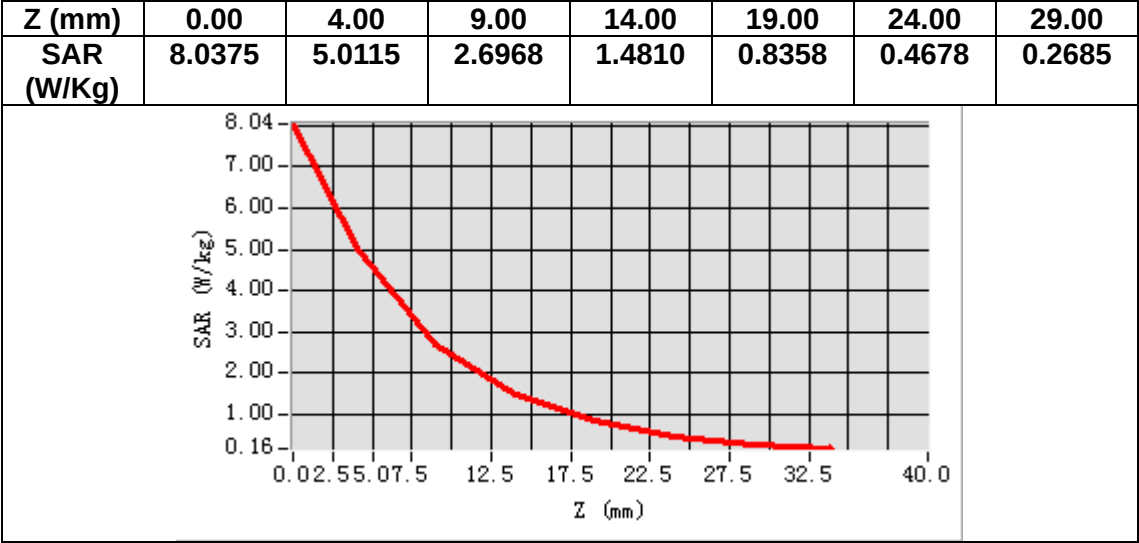
VOLUME SAR



Maximum location: X=0.00, Y=1.00

SAR Peak: 8.14 W/kg

SAR 10g (W/Kg)	2.398275
SAR 1g (W/Kg)	5.374415



MEASUREMENT 6

Date of measurement: 17/5/2021

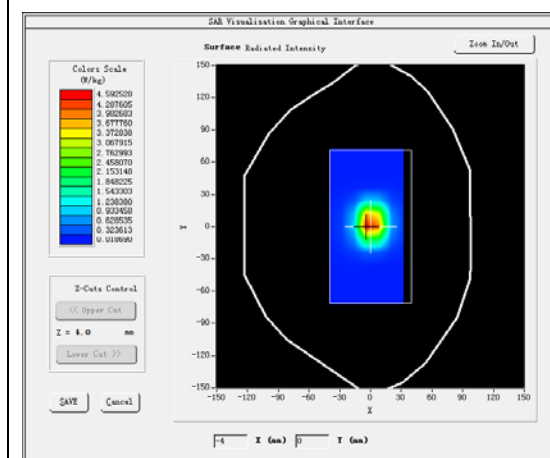
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2600</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

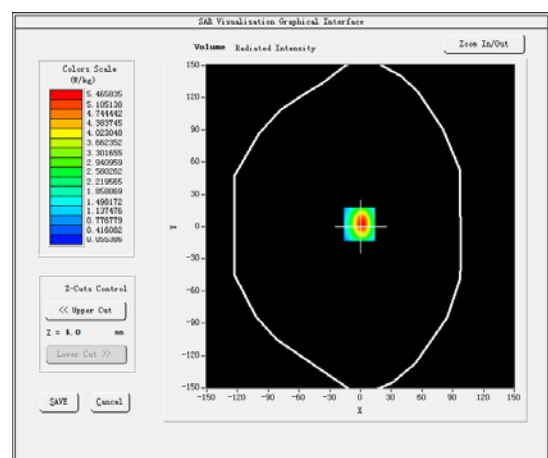
B. SAR Measurement Results

Frequency (MHz)	2600.000000
Relative permittivity (real part)	40.101958
Relative permittivity (imaginary part)	13.230880
Conductivity (S/m)	1.911127
Variation (%)	-4.240000

SURFACE SAR



VOLUME SAR

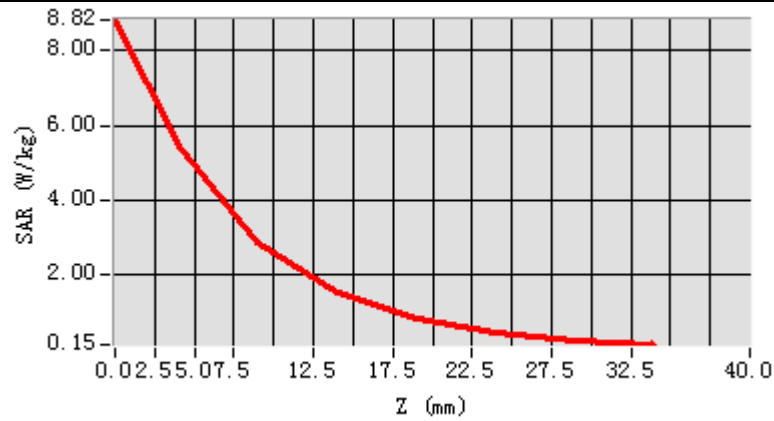


Maximum location: X=-1.00, Y=2.00

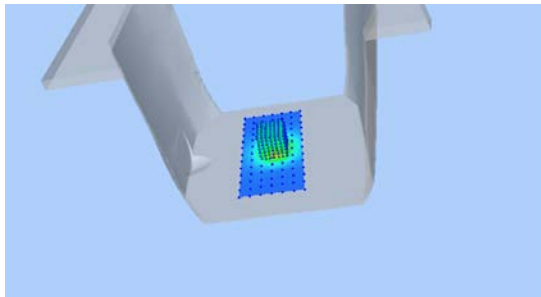
SAR Peak: 9.07 W/kg

SAR 10g (W/Kg)	2.469205
SAR 1g (W/Kg)	5.566867

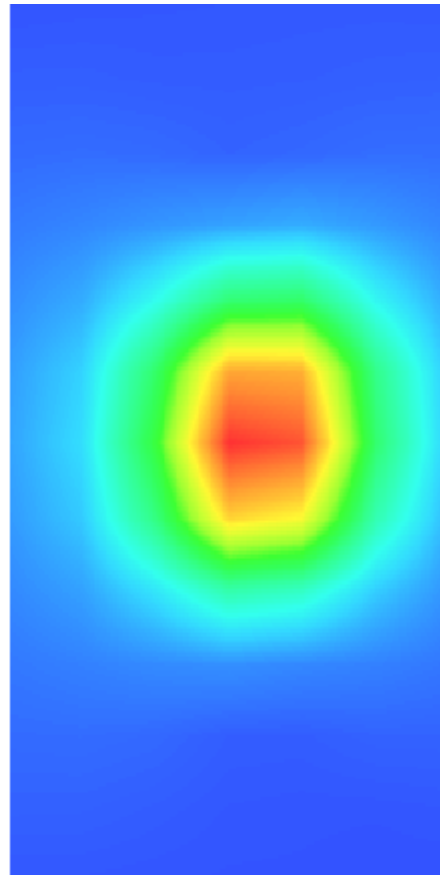
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	8.8101	5.4676	2.8985	1.5674	0.8512	0.4785	0.2697



3D screen shot



Hot spot position



MEASUREMENT 7

Date of measurement: 18/5/2021

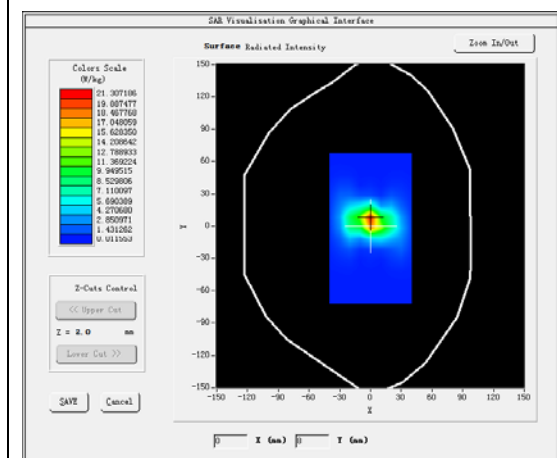
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW5200</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

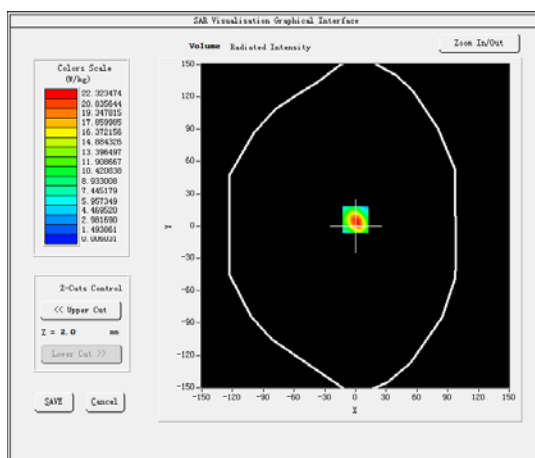
B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	36.891037
Relative permittivity (imaginary part)	15.892865
Conductivity (S/m)	4.591272
Variation (%)	4.160000

SURFACE SAR



VOLUME SAR

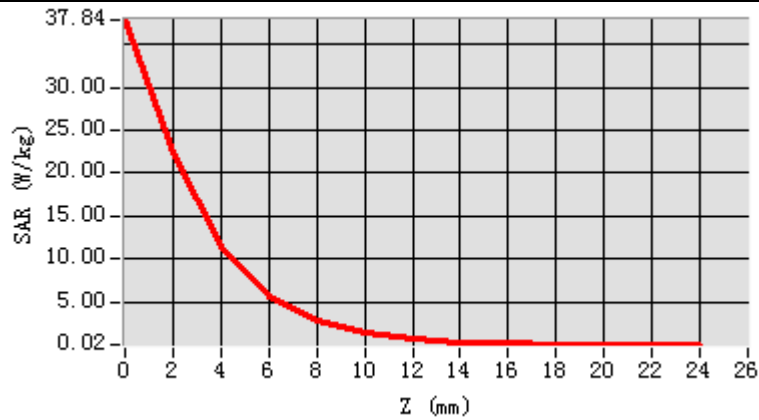


Maximum location: X=0.00, Y=6.00

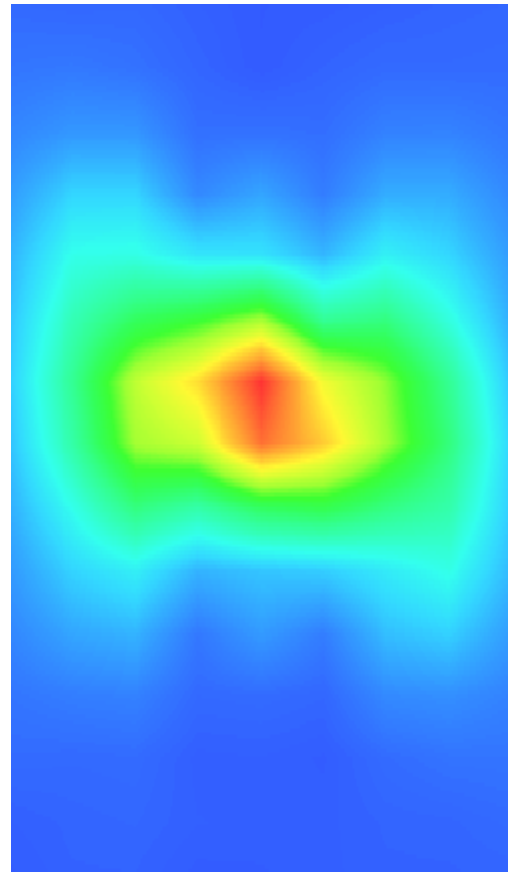
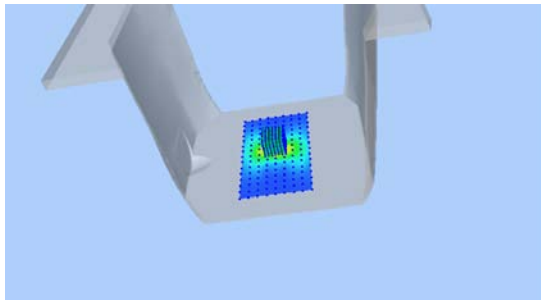
SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.687495
SAR 1g (W/Kg)	15.497221

Z (mm)	SAR (W/kg)
0	37.84
2	22.00
4	11.00
6	5.00
8	2.50
10	1.00
12	0.50
14	0.25
16	0.10
18	0.05
20	0.03
22	0.02
24	0.02



Hot spot position



MEASUREMENT 8

Date of measurement: 13/5/2021

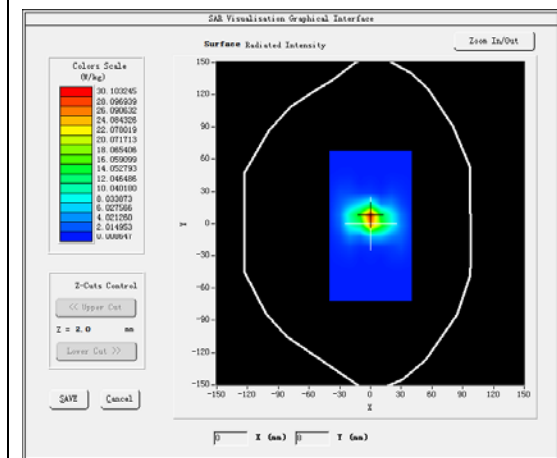
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW5800</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

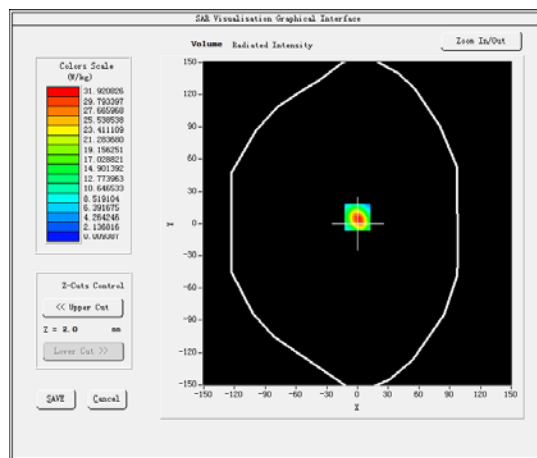
B. SAR Measurement Results

Frequency (MHz)	5800.000000
Relative permittivity (real part)	35.840304
Relative permittivity (imaginary part)	15.939593
Conductivity (S/m)	5.136091
Variation (%)	1.210000

SURFACE SAR



VOLUME SAR

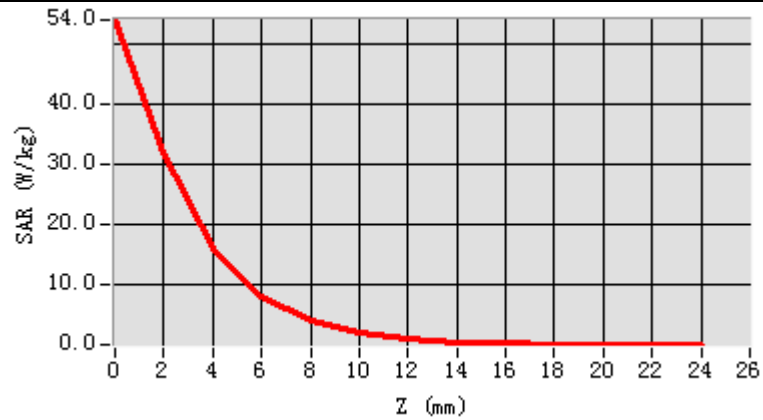


Maximum location: X=0.00, Y=6.00

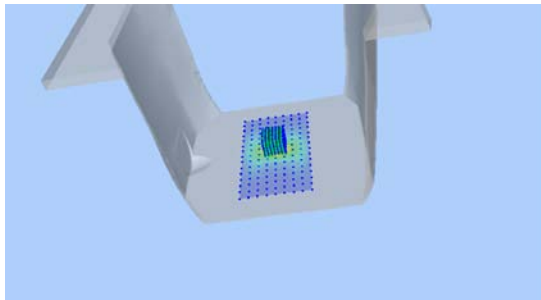
SAR Peak: 57.37 W/kg

SAR 10g (W/Kg)	6.258495
SAR 1g (W/Kg)	18.400863

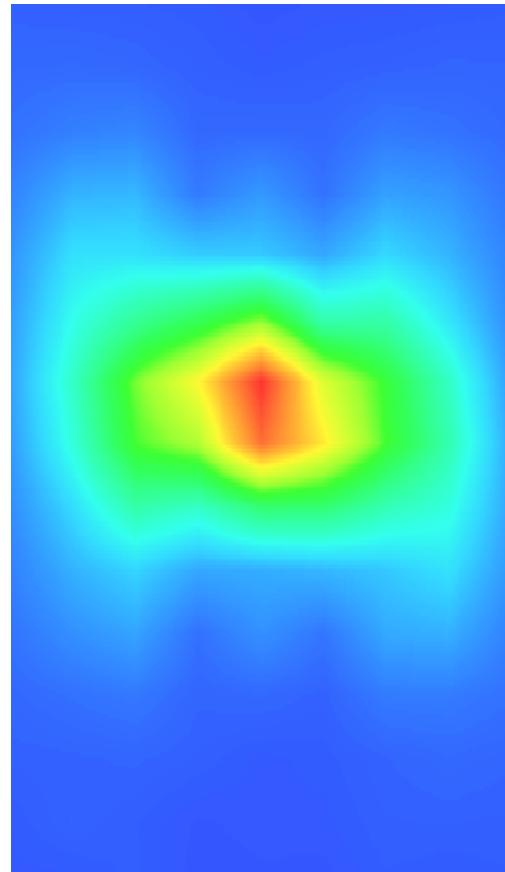
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SA R (W/ Kg)	54.0 382	31.9 201	16.1 706	8.17 22	4.08 58	2.05 51	1.03 43	0.51 50	0.27 58	0.15 61	0.07 91	0.04 72



3D screen shot



Hot spot position



13. Appendix C. Plots of High SAR Measurement

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MEASUREMENT 1

Date of measurement: 14/5/2021

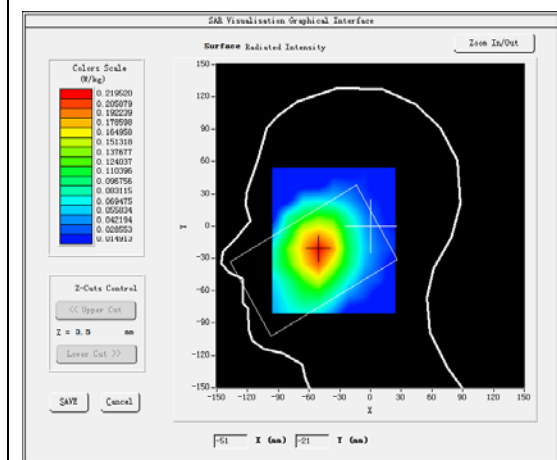
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>GSM850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.0)</u>

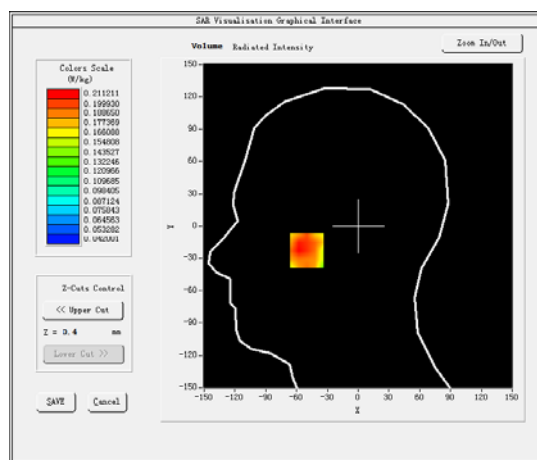
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	42.267426
Relative permittivity (imaginary part)	19.732481
Conductivity (S/m)	0.916903
Variation (%)	0.160000

SURFACE SAR



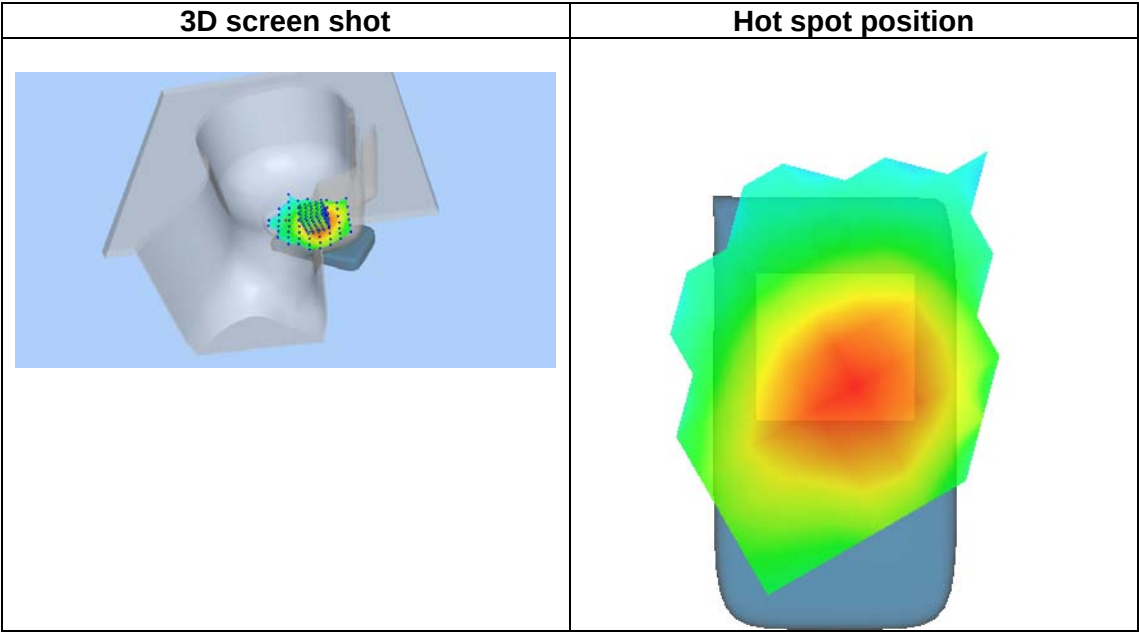
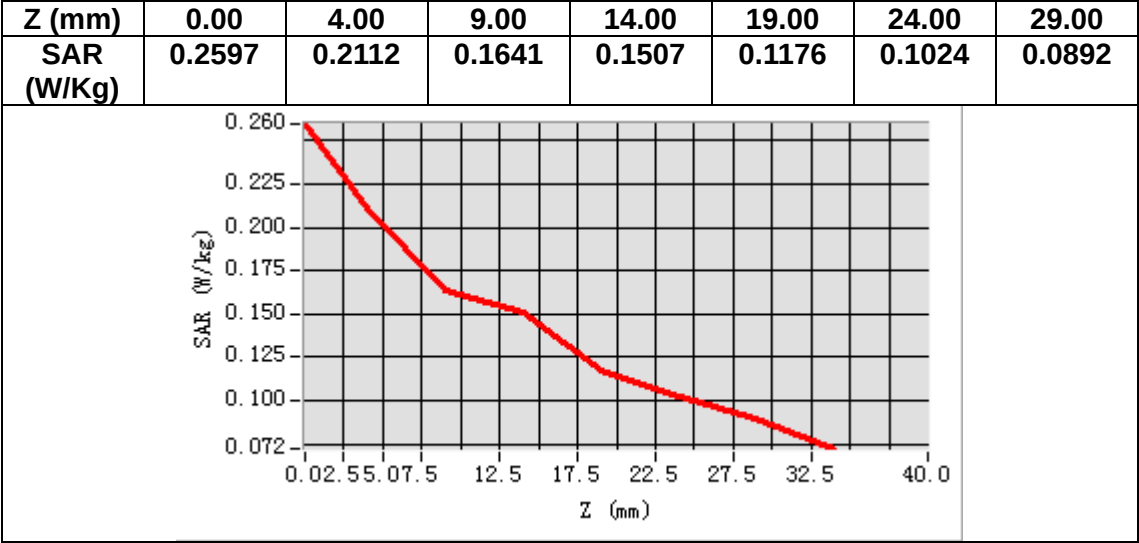
VOLUME SAR



Maximum location: X=-50.00, Y=-23.00

SAR Peak: 0.26 W/kg

SAR 10g (W/Kg)	0.163034
SAR 1g (W/Kg)	0.207529



MEASUREMENT 2

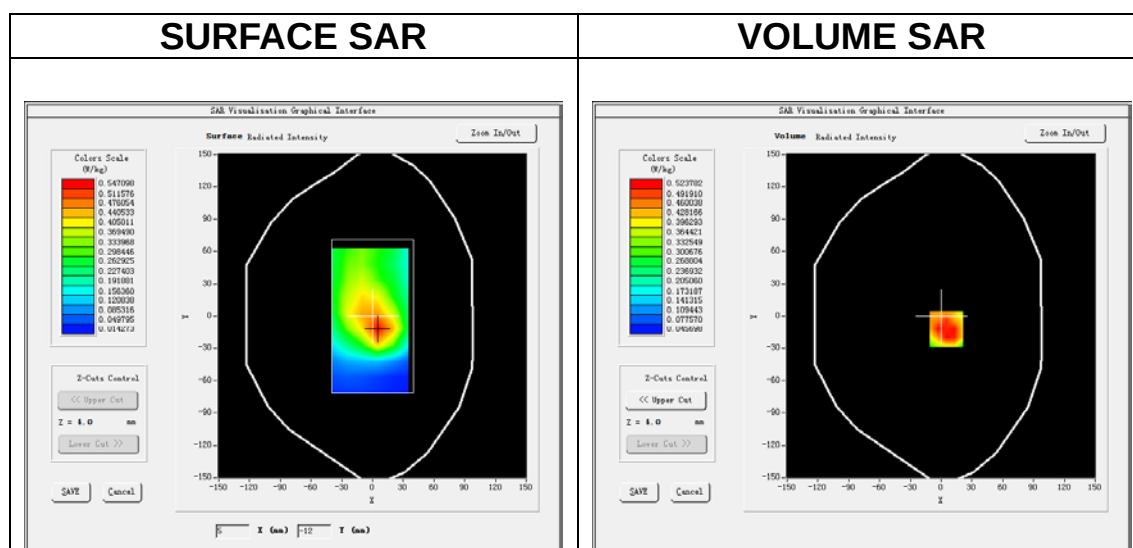
Date of measurement: 14/5/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.0)</u>

B. SAR Measurement Results

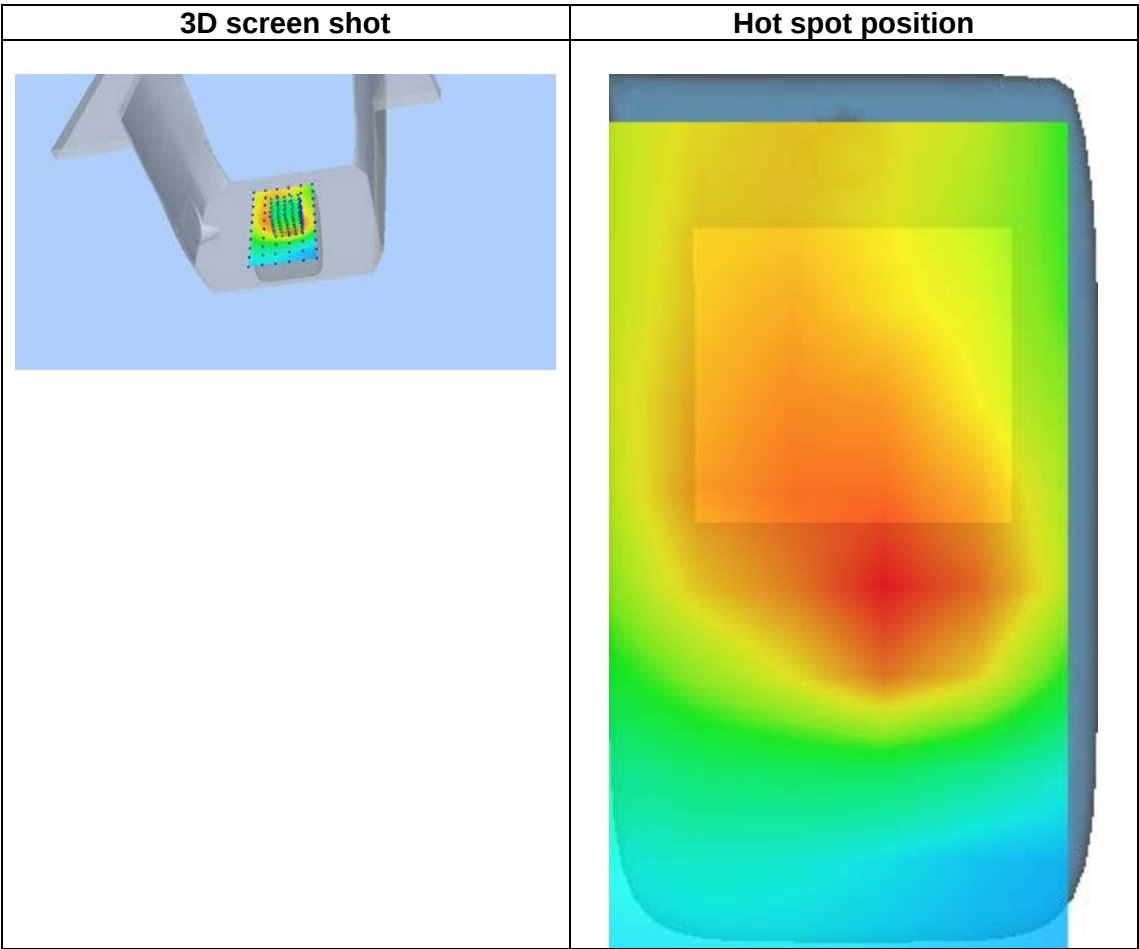
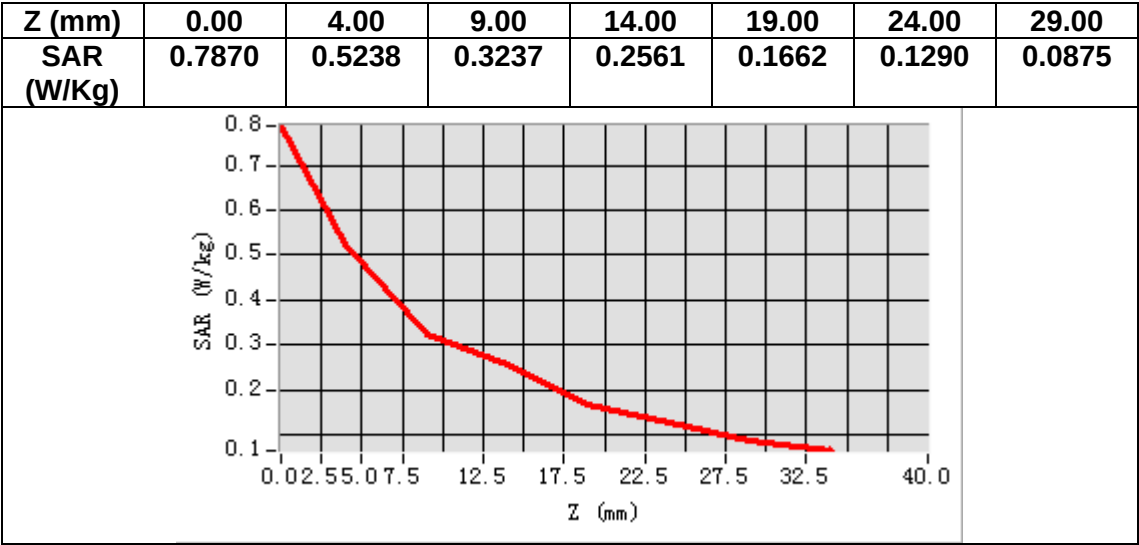
Frequency (MHz)	836.400000
Relative permittivity (real part)	42.267426
Relative permittivity (imaginary part)	19.732481
Conductivity (S/m)	0.916903
Variation (%)	-0.860000



Maximum location: X=5.00, Y=-12.00

SAR Peak: 0.79 W/kg

SAR 10g (W/Kg)	0.332264
SAR 1g (W/Kg)	0.521619



MEASUREMENT 3

Date of measurement: 17/5/2021

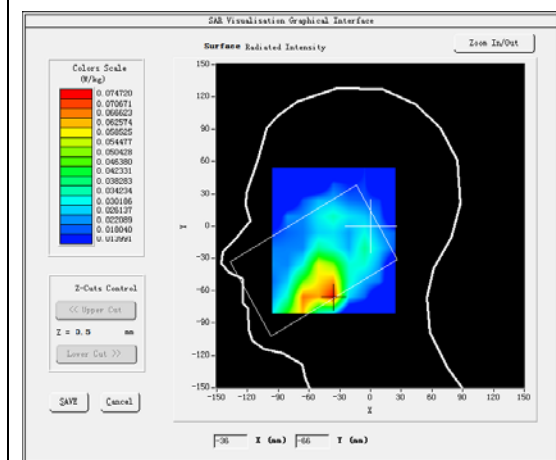
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>GSM1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.0)</u>

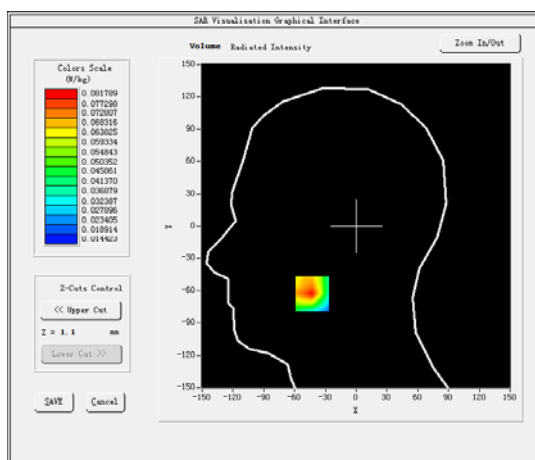
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.590061
Relative permittivity (imaginary part)	13.367389
Conductivity (S/m)	1.396150
Variation (%)	1.440000

SURFACE SAR



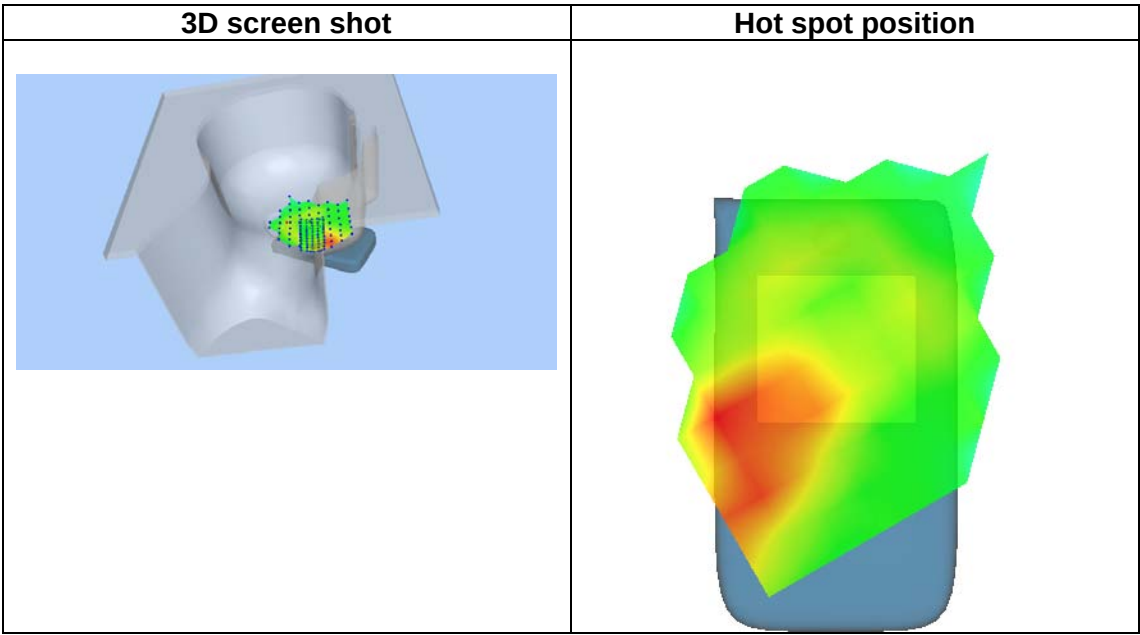
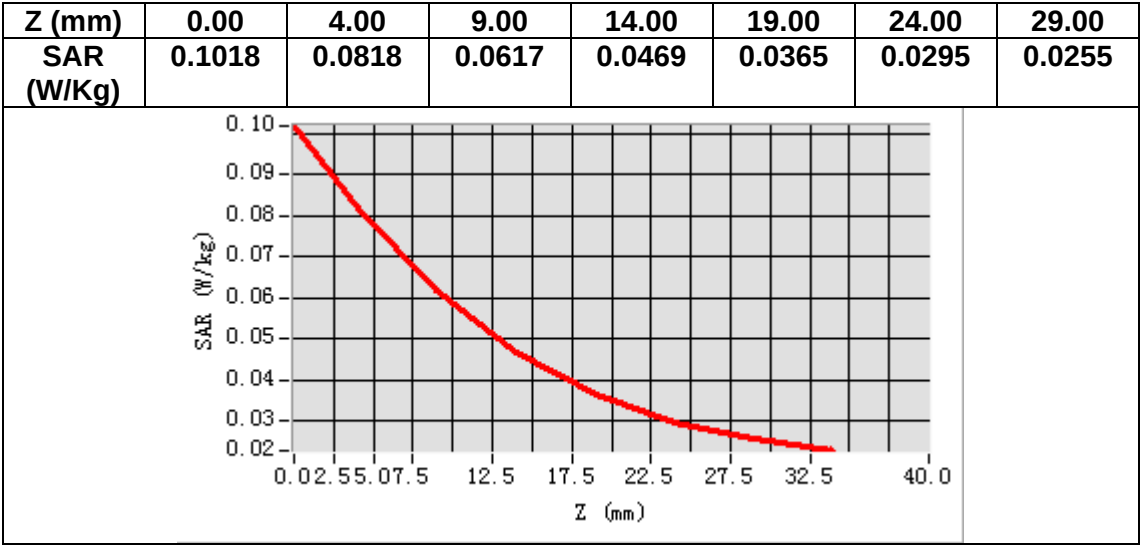
VOLUME SAR



Maximum location: X=-39.00, Y=-63.00

SAR Peak: 0.10 W/kg

SAR 10g (W/Kg)	0.052154
SAR 1g (W/Kg)	0.076633



MEASUREMENT 4

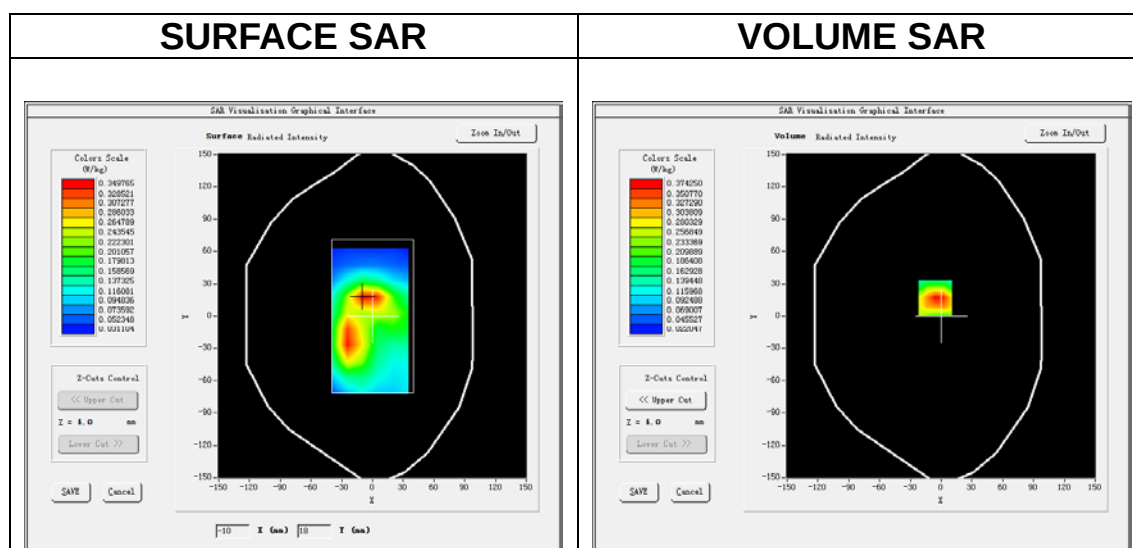
Date of measurement: 17/5/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.0)</u>

B. SAR Measurement Results

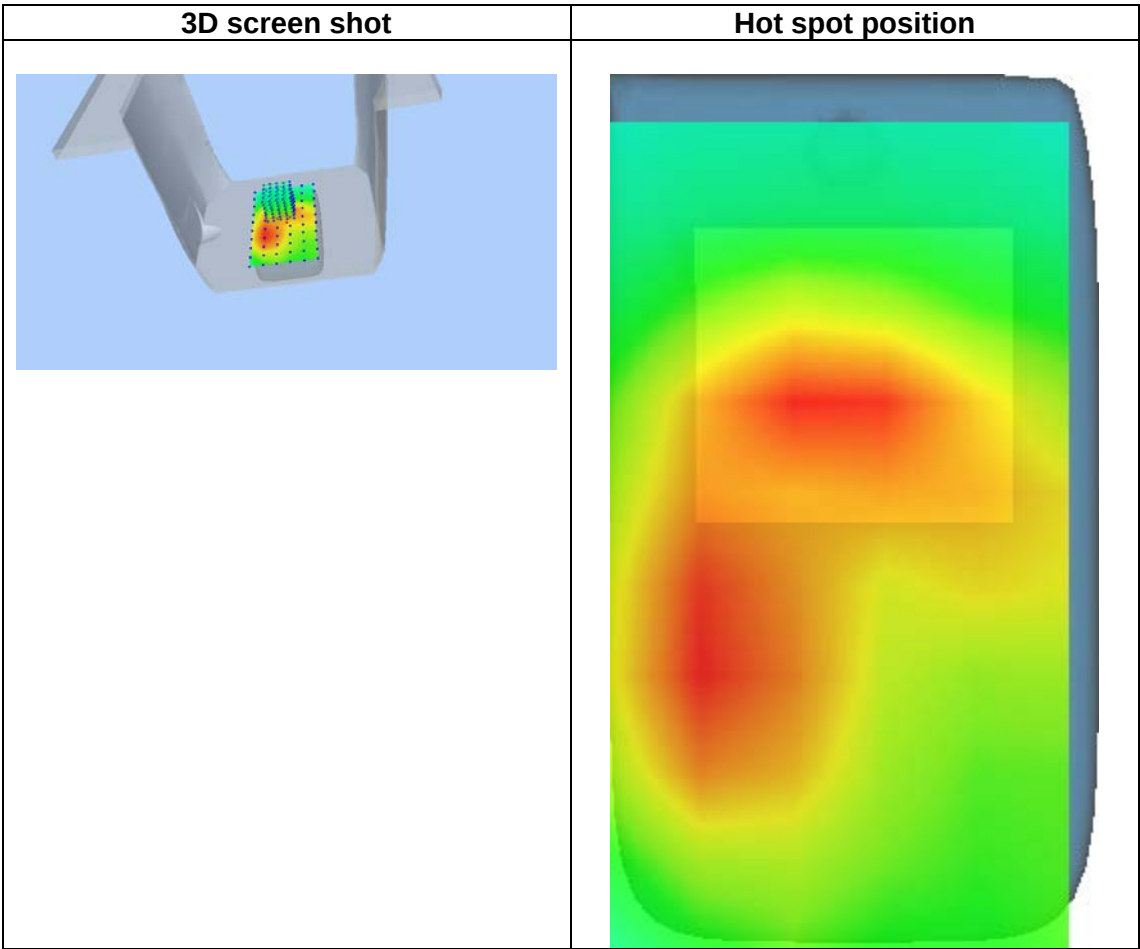
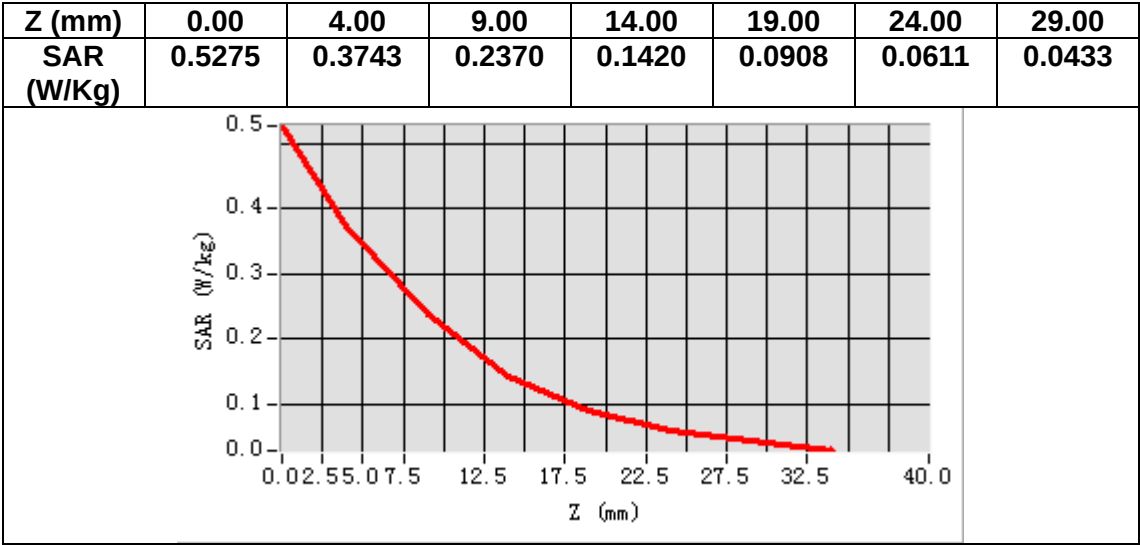
Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.590061
Relative permittivity (imaginary part)	13.367389
Conductivity (S/m)	1.396150
Variation (%)	-2.000000



Maximum location: X=-6.00, Y=17.00

SAR Peak: 0.55 W/kg

SAR 10g (W/Kg)	0.203674
SAR 1g (W/Kg)	0.352258



MEASUREMENT 5

Date of measurement: 17/5/2021

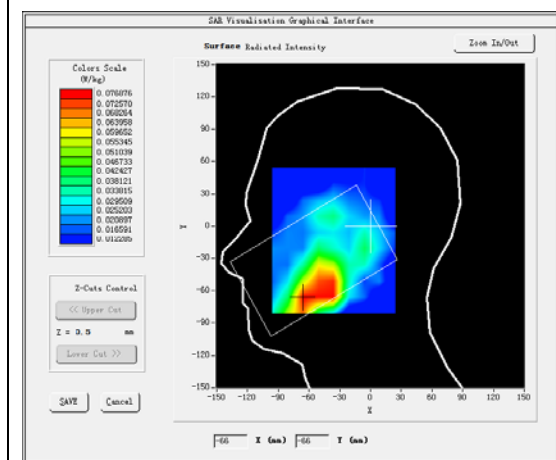
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>

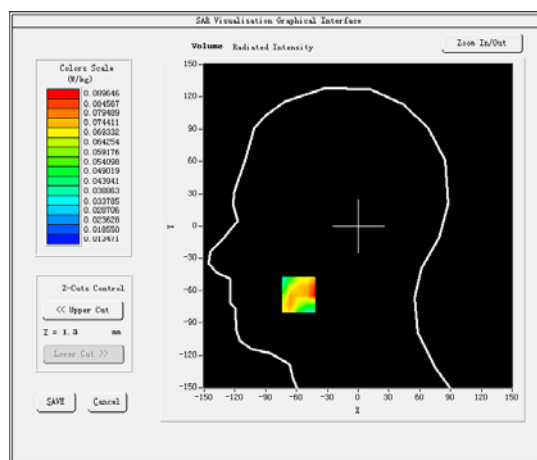
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.590061
Relative permittivity (imaginary part)	13.367389
Conductivity (S/m)	1.396150
Variation (%)	-1.650000

SURFACE SAR



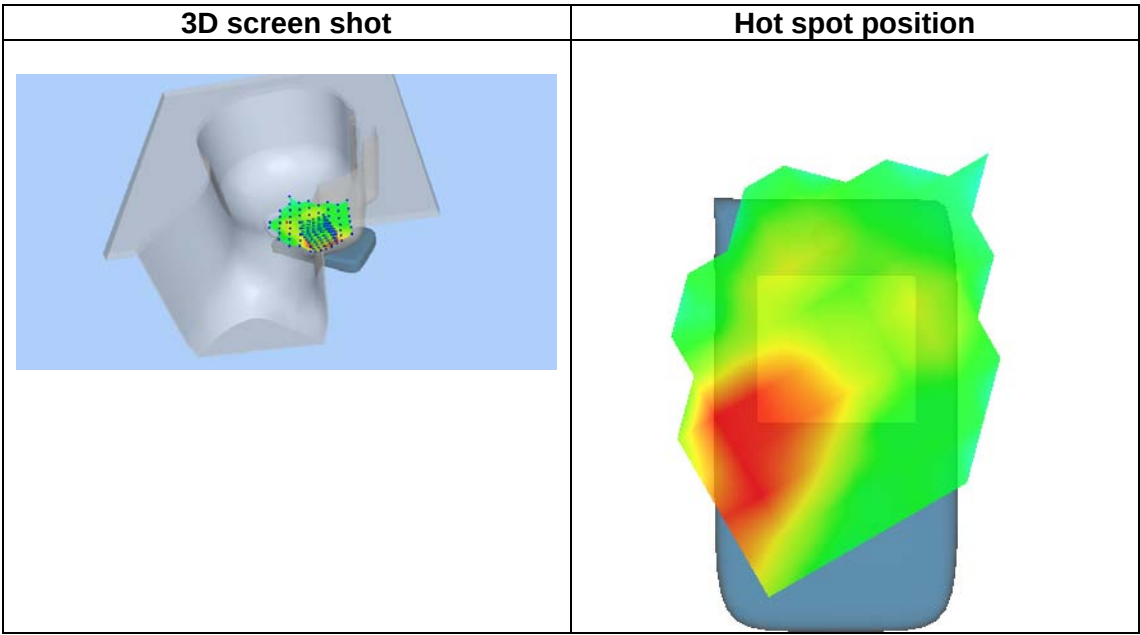
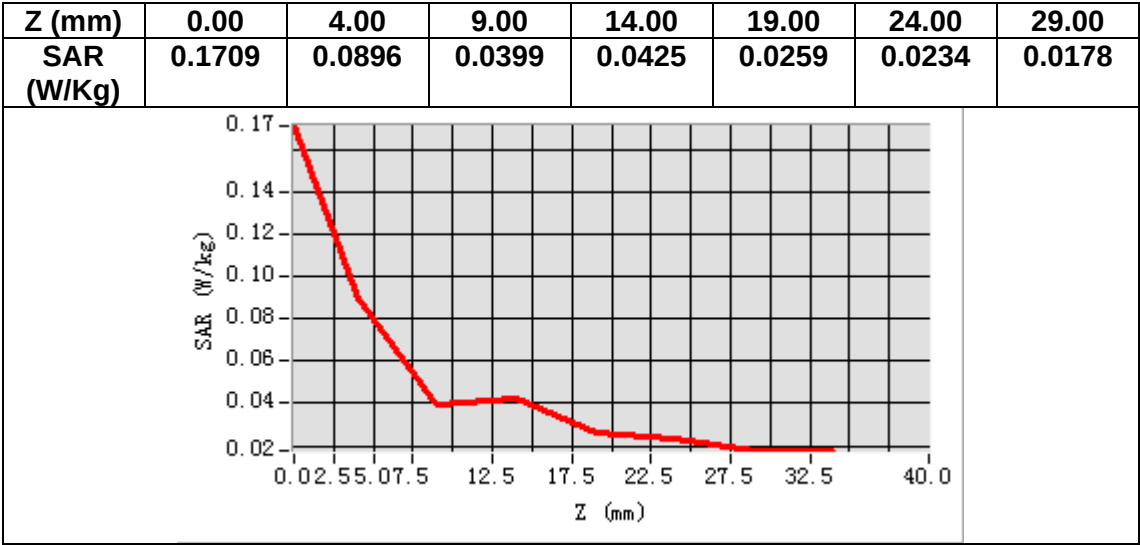
VOLUME SAR



Maximum location: X=-58.00, Y=-64.00

SAR Peak: 0.11 W/kg

SAR 10g (W/Kg)	0.055031
SAR 1g (W/Kg)	0.080735



MEASUREMENT 6

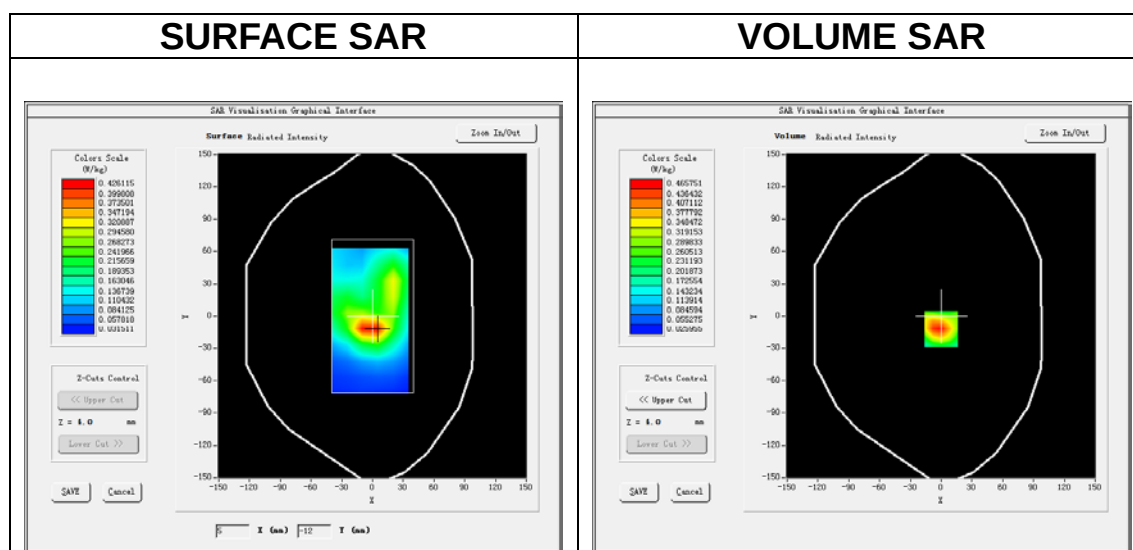
Date of measurement: 17/5/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.590061
Relative permittivity (imaginary part)	13.367389
Conductivity (S/m)	1.396150
Variation (%)	-0.430000

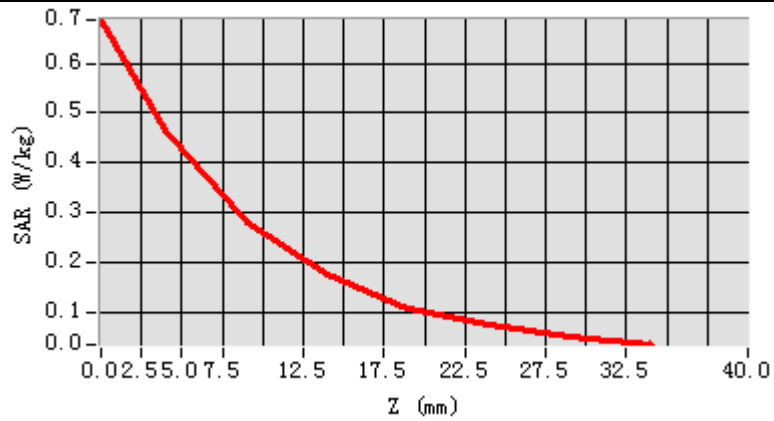


Maximum location: X=0.00, Y=-12.00

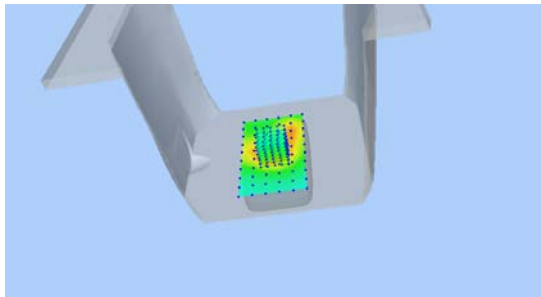
SAR Peak: 0.70 W/kg

SAR 10g (W/Kg)	0.250590
SAR 1g (W/Kg)	0.446697

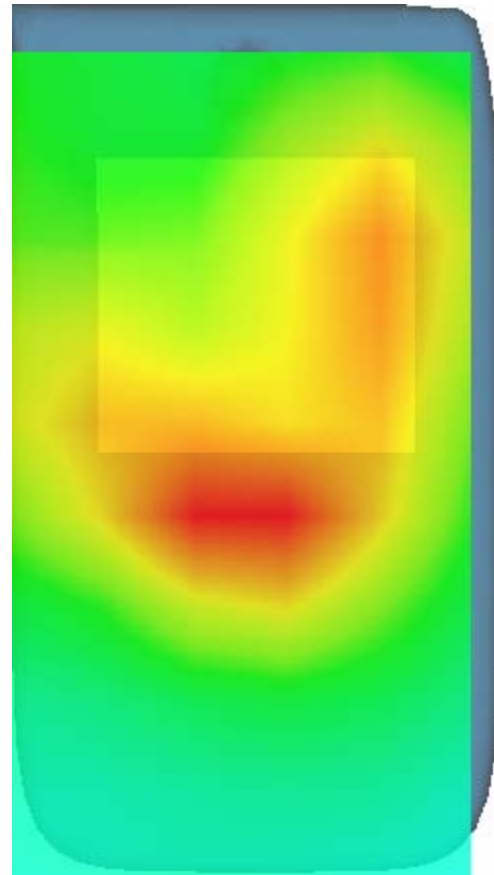
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.6868	0.4658	0.2817	0.1750	0.1085	0.0726	0.0497



3D screen shot



Hot spot position



MEASUREMENT 7

Date of measurement: 14/5/2021

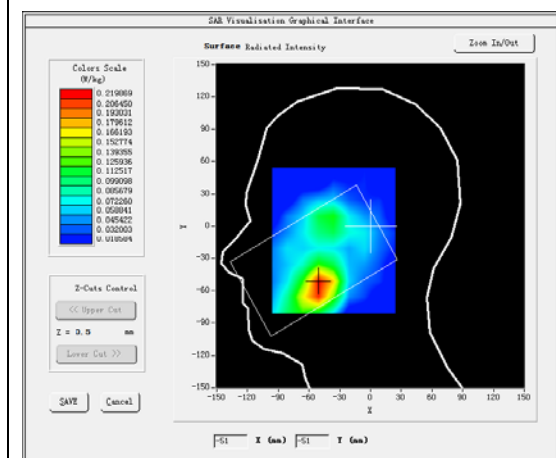
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band4 WCDMA1700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>

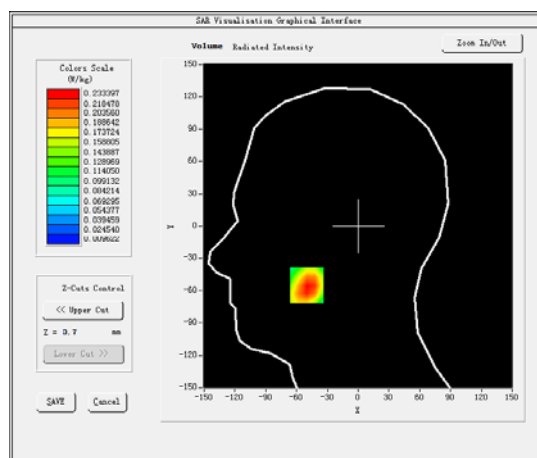
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	40.716946
Relative permittivity (imaginary part)	13.770327
Conductivity (S/m)	1.325011
Variation (%)	-1.860000

SURFACE SAR



VOLUME SAR

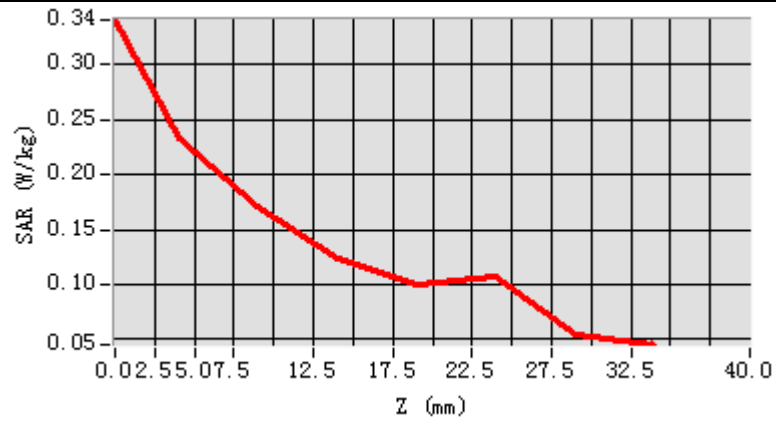


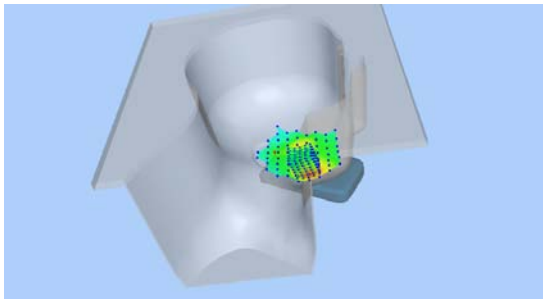
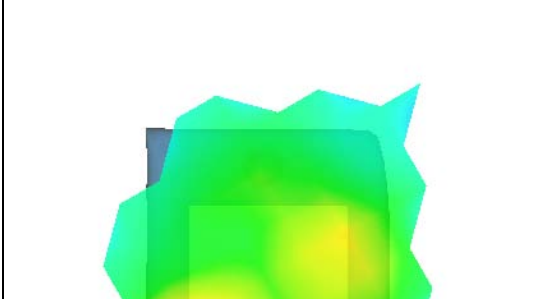
Maximum location: X=-50.00, Y=-55.00

SAR Peak: 0.35 W/kg

SAR 10g (W/Kg)	0.150114
SAR 1g (W/Kg)	0.234512

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.3406	0.2334	0.1705	0.1231	0.1004	0.1073	0.0539



3D screen shot	Hot spot position
 A 3D visualization of a knee joint model. The femur (thigh bone) is at the top, and the tibia (shin bone) is at the bottom. A cluster of colored dots (red, yellow, green, blue) is concentrated on the posterior surface of the tibia, representing the hot spot area.	 A 3D visualization of the hot spot position. The knee joint model is shown in a semi-transparent blue color. A large, irregularly shaped region is highlighted in green and yellow, indicating the area of high stress or strain. The hot spot is located on the posterior surface of the tibia, corresponding to the area shown in the 3D screen shot.

MEASUREMENT 8

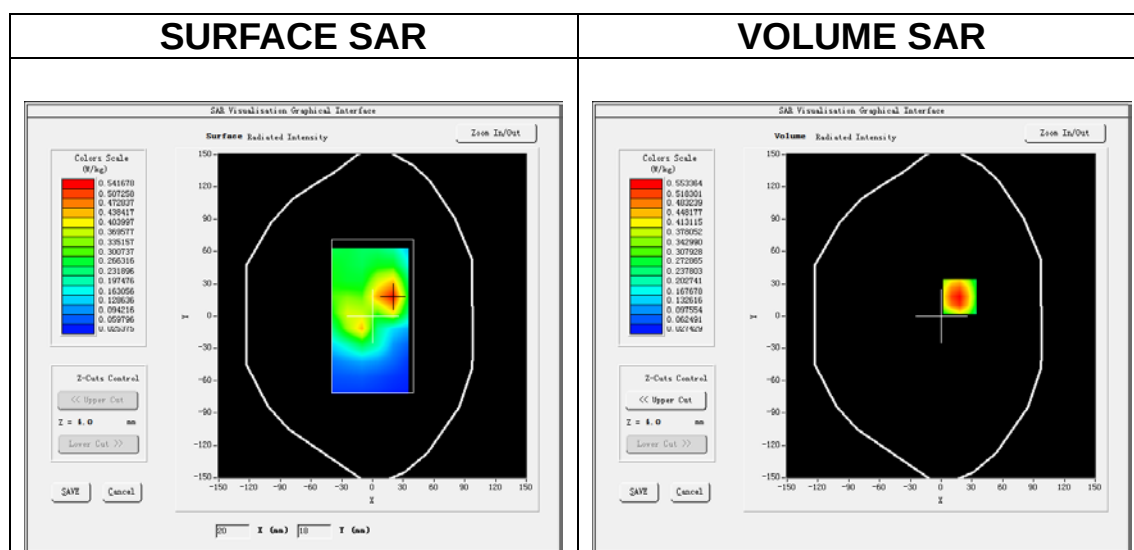
Date of measurement: 14/5/2021

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band4 WCDMA1700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	40.716946
Relative permittivity (imaginary part)	13.770327
Conductivity (S/m)	1.325011
Variation (%)	-1.260000



Maximum location: X=18.00, Y=18.00

SAR Peak: 0.82 W/kg

SAR 10g (W/Kg)	0.318497
SAR 1g (W/Kg)	0.533840

The graph shows the SAR distribution for a 1000 MHz plane wave. The SAR starts at approximately 0.8 W/kg at Z=0 and decreases exponentially, reaching 0 W/kg at Z=35 mm.

Z (mm)	SAR (W/kg)
0	0.8
2.5	0.6
5	0.45
7.5	0.35
10	0.28
12.5	0.22
15	0.18
17.5	0.14
20	0.11
22.5	0.08
25	0.06
27.5	0.04
30	0.02
32.5	0.01
35	0

Hot spot position

