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: CellAllure

Model Name: CHIC X2

Family Model: N/A

Report No.: STR210302001006E

FCC ID: 2AAE9CAPHG66

Prepared for

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TEST RESULT CERTIFICATION

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Product description

Product name...... Mobile Phone

Brand Name CellAllure

Model and/or type reference CHIC X2

Family Model..... N/A

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..... Mar. 08, 2021 ~ Mar. 11, 2021

Date of Issue Mar.30, 2021

Test Result Pass

Prepared By (Test Engineer)

: Cheng Jiawen)

Approved By (Lab Manager)



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REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	Mar. 30, 2021	Cheng Jiawen

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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 CHIC X2 are as follows.

RF Exposure Conditions		Equipment Class -Highest Reported SAR (W/kg)				
		PCE	DTS	NII	DSS	
1-g Head		0.097	0.097 0.341		N/A	
1-g Body-Worn (Separation distance of 10mm)		0.723	0.099	N/A	N/A	
1-g Hotspot (Separation distance of 10mm)		0.723	0.099	N/A	N/A	
	Head	0.438	0.438	N/A	0.285	
Max Simultaneous Tx	Body-Worn	0.822	0.822	N/A	0.817	
	Hotspot	0.822	0.822	N/A	0.817	

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	Mobile Phone				
Brand Name	CellAllure					
Model Name	CHIC X2					
Family Model	N/A					
FCC ID	2AAE9CAPHG66					
Device Phase	Identical Prototype	Identical Prototype				
Exposure Category	General population / Uncontrolled environment					
Antenna Type	PIFA Antenna	PIFA Antenna				
Battery Information	DC 3.8V, 2000mAh	DC 3.8V, 2000mAh				
Device Operating Configurations						
Supporting Mode(s)	GSM 850/1900, WCDMA E	Band 2/4/5, WLAN 2	2.4G, Bluetooth			
Test Modulation	GSM(GMSK), WCDMA(QPSK), WLAN(DSSS/OFDM),					
Test Modulation	Bluetooth(GFSK, π/4-DQPSK, 8DPSK),					
Device Class	В					
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)			
Operating Frequency Range(s)	GSM 850	824-849	869-894			



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	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	
	WLAN 2.4G	2412-	2462	
	Bluetooth	2402-	2-2480	
	Max Number of Timeslots	in Uplink	4	
GPRS Multislot Class(12)	Max Number of Timeslots	4		
	Max Total Timeslot		5	
	4, tested with power level 5(GSM 850)			
	1, tested with power level 0(GSM 1900)			
Power Class	3, tested with power contro	and 2)		
	3, tested with power control "all 1"(WCDMA Band 4)			
	3, tested with power control "all 1"(WCDMA Band 5)			



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1.4. Test specification(s)

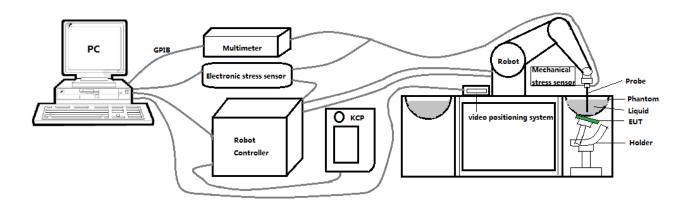
FCC 47 CFR Part 2(2.1093)
ANSI/IEEE C95.1-1992
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR
KDB 941225 D01 3G SAR Procedures
KDB 941225 D06 Hotspot SAR
KDB 648474 D04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

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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 dBAxial 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 ±10%. The spherical isotropy shall be evaluated and within ±0.25dB. 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

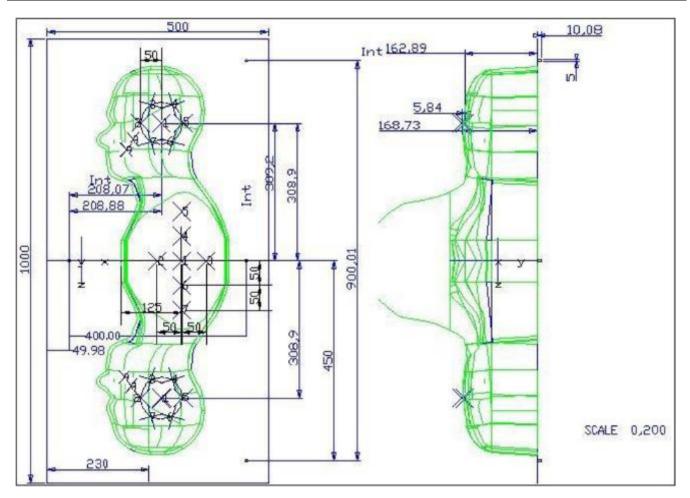


The SAM phantom is used to measure the SAR relative to people exposed to electro-magnetic field radiated by mobile phones.



2.4.1. Technical Data

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

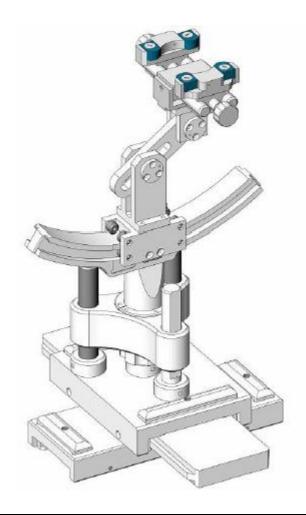


Serial Number	Left Head(mm)		Right Head(mm)		Flat Part(mm)	
	2	2.02	2	2.08	1	2.09
	3	2.05	3	2.06	2	2.06
	4	2.07	4	2.07	3	2.08
	5	2.08	5	2.08	4	2.10
SN 16/15 SAM119	6	2.05	6	2.07	5	2.10
	7	2.05	7	2.05	6	2.07
	8	2.07	8	2.06	7	2.07
	9	2.08	9	2.06	-	-

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

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 \boxtimes

	Manufacturer	Name of	Type/Model	Serial Number	Calib	ration
	Manufacturer	Equipment	Type/Model	Senai Number	Last Cal.	Due Date
	MVG	E FIELD PROBE	SSE2	SN 08/16 EPGO287	Mar. 01,	Feb. 28,
	WVO	ETIELDTROBE	JOLZ	3N 00/10 L1 0020/	2021	2022
	MVG	750 MHz Dipole	SID750	SN 03/15 DIP	Mar. 01,	Feb. 28,
	WVO	730 WI 12 DIPOIC	010700	0G750-355	2021	2024
	MVG	835 MHz Dipole	SID835	SN 03/15 DIP	Mar. 01,	Feb. 28,
	10100	000 Wil 12 Dipole	OIDOOO	0G835-347	2021	2024
	MVG	900 MHz Dipole	SID900	SN 03/15 DIP	Mar. 01,	Feb. 28,
	10100	300 Wil 12 Dipole	OIDOOO	0G900-348	2021	2024
	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP	Mar. 01,	Feb. 28,
	10100	1000 Wii 12 Bipolo	012 1000	1G800-349	2021	2024
	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP	Mar. 01,	Feb. 28,
	10100	1000 111112 211010	012 1000	1G900-350	2021	2024
	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP	Mar. 01,	Feb. 28,
	WV	2000 WIT IZ DIPOIC	OIDZ000	2G000-351	2021	2024
	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP	Mar. 01,	Feb. 28,
	WVO	2430 WI IZ DIPOIE	31D2 4 30	2G450-352	2021	2024
I_{\Box}	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP	Mar. 01,	Feb. 28,
	WVG	2000 IVII IZ DIPOIE	3102000	2G600-356	2021	2024
	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Mar. 01,	Feb. 28,
	WVG	3000 IVII IZ DIPOIE	34463300	3N 13/14 WGA 33	2021	2024
	MVG	Liquid measurement Kit	SCLMP	SN 21/15 OCPG 72	NCR	NCR
	MVG	Power Amplifier	N.A	AMPLISAR_28/14_003	NCR	NCR
\boxtimes	KEITHLEY	Millivoltmeter	2000	4072790	NCR	NCR
\boxtimes	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
\boxtimes	HP	Network Analyzer	8753D	3410J01136	Jul. 13, 2020	Jul. 12, 2021
	Agilent	PSG Analog Signal Generator	E8257D	MY51110112	Jul. 13, 2020	Jul. 12, 2021





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\boxtimes	Agilent	Power meter	E4419B	MY45102538	Jul. 13, 2020	Jul. 12, 2021				
\boxtimes	Agilent	Power sensor	E9301A	MY41495644	Jul. 13, 2020	Jul. 12, 2021				
\boxtimes	Agilent	Power sensor	E9301A	US39212148	Jul. 13, 2020	Jul. 12, 2021				
\boxtimes	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.

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- (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



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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 fro (geometric center of pr			5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$	
Maximum probe angle surface normal at the n			30° ± 1°	20° ± 1°	
			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm	
Maximum area scan sp	atial resolu	ntion: Δx_{Area} , Δy_{Area}	When the x or y dimension o measurement plane orientation the measurement resolution r x or y dimension of the test dimeasurement point on the test	on, is smaller than the above, must be \leq the corresponding evice with at least one	
Maximum zoom scan s	spatial reso	lution: Δx_{Zoom} , Δy_{Zoom}	\leq 2 GHz: \leq 8 mm 2 – 3 GHz: \leq 5 mm [*]	$3 - 4 \text{ GHz: } \le 5 \text{ mm}^*$ $4 - 6 \text{ GHz: } \le 4 \text{ mm}^*$	
	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm	
Maximum zoom scan spatial resolution, normal to phantom surface	graded	Δz _{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	
	grid $\Delta z_{Zoom}(n>1)$: between subsequer points		$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(\text{n-1})$		
Minimum zoom scan volume	x, y, z		≥ 30 mm	$3 - 4 \text{ GHz: } \ge 28 \text{ mm}$ $4 - 5 \text{ GHz: } \ge 25 \text{ mm}$ $5 - 6 \text{ GHz: } \ge 22 \text{ mm}$	

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 <u>reported</u> SAR from the <u>area scan based 1-g SAR estimation</u> procedures of KDB 447498 is $\leq 1.4 \text{ W/kg}$, $\leq 8 \text{ mm}$, $\leq 7 \text{ mm}$ and $\leq 5 \text{ mm}$ zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.



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 using to determinate 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 form 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 define 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 ±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								
Frequency Band (MHz)	750	835	900	1800	1900	2000	2450	2600	5200	5800
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.









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 ±5% of the target values.

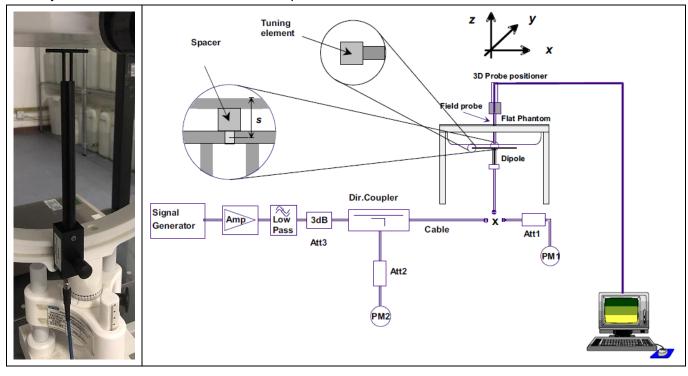
	measured conductivity and relative permitting chedic be within 2010 or the target value.							
 .	Measured	Target T	issue	Measured Tissue				
Tissue Type	Frequency (MHz)	εr (±5%)	σ (S/m) (±5%)	εr	σ (S/m)	Liquid Temp.	Test Date	
Head	835	41.50	0.90	44.02	0.87	21.3 °C	Mar. 08, 2021	
850	033	(39.43~43.58)	(0.86~0.95)	41.93	0.67	21.3 C	IVIAI. UO, 2UZ I	
Head	1800	40.00	1.40	39.71	1.35	21.3 °C	Mar. 09, 2021	
1800	1800	(38.00~42.00)	(1.33~1.47)	39.71	1.35	21.3 0	Mar. 09, 2021	
Head	1900	40.00	1.40	39.18	1.45	21.5 °C	Mar. 10, 2021	
1900	1900	(38.00~42.00)	(1.33~1.47)	39.10	1.43	21.5 C	IVIAI. 10, 2021	
Head	2450	39.20	1.80	39.51	1.77	21.2 °C	Mar. 11, 2021	
2450	2430	(37.24~41.16)	(1.71~1.89)	33.31	1.77	21.2 0	IVIAI. 11, 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 ±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.

	Target SA	Measured SAR					
System	(±10)%)	(Normalize	ed to 1W)	Liquid	Test Date	
Verification	1 ~ (\\//< ~)	40 ~ (\\//<~)	1-g	10-g	Temp.		
	1-g (W/Kg)	10-g (W/Kg)	(W/Kg)	(W/Kg)			
835MHz Head	9.84	6.22	9.34	5.90	21.3 °C	Mar. 08, 2021	
ossivinz nead	(8.86~10.82)	(5.60~6.84)	9.34	3.90	21.5 0	IVIAI. 00, 2021	
1800MHz Head	37.96	19.81	39.91	19.30	21.3 °C	Mar. 09, 2021	
1000IVITIZ Head	(34.17~41.75)	(17.83~21.79)	39.91	19.30	21.3 6	War. 09, 2021	
1000MH= Hood	40.37	20.48	27.04	20.74	21.5 °C	Mor 40 2024	
1900MHz Head	(36.34~44.40)	(18.44~22.52)	37.61	20.71	21.5 C	Mar. 10, 2021	
2450MHz Head	53.69	23.94	50.77	24.49	21.2 °C	Mar. 11, 2021	
2430WII IZ I IEau	(48.33~59.05)	(21.55~26.33)	30.77	24.43	21.2 0	IVIAI. 11, 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.

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- 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.

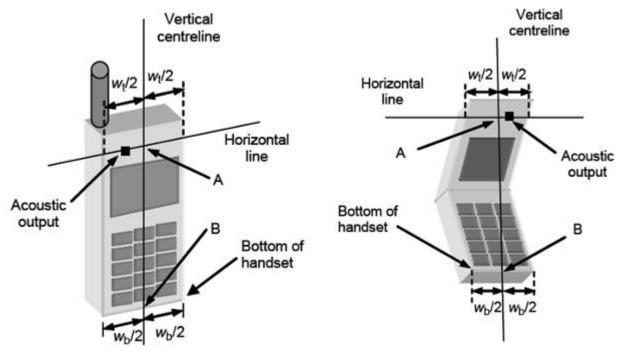


Fig 6.2.1 Handset vertical and horizontal reference lines—"fixed case

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

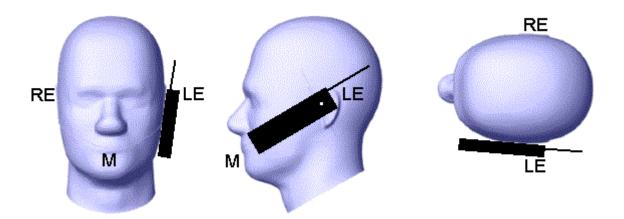


Fig 6.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

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.

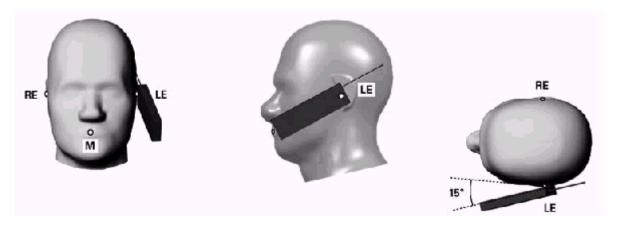


Figure 6.3.1 – Tilt position of the wireless device on the left side of SAM

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 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.</p>
- 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.

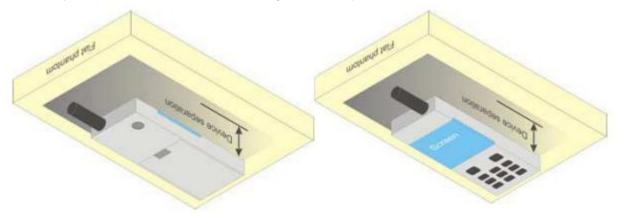


Figure 6.4.1 – Test positions for body-worn devices

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 x W \geq 9 cm x 5 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 form 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-Av	eraged ou	tput Powe	r (dBm)	Frame-A	eraged οι	utput Powe	er (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)	35.00	34.55	34.39	34.46	25.97	25.52	25.36	25.43
GPRS(GMSK, 1 TS)	35.00	34.60	34.45	34.51	25.97	25.57	25.42	25.48
GPRS(GMSK, 2 TS)	32.50	32.42	32.45	32.42	26.48	26.40	26.43	26.40
GPRS(GMSK, 3 TS)	31.00	30.62	30.67	30.57	26.74	26.36	26.41	26.31
GPRS(GMSK, 4 TS)	29.00	28.67	28.87	28.70	25.99	25.66	25.86	25.69
Band GSM1900	Burst-Av	eraged ou	tput Powe	r (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)	31.00	30.13	30.66	30.47	21.97	21.10	21.63	21.44
GPRS(GMSK, 1 TS)	31.00	30.12	30.70	30.52	21.97	21.09	21.67	21.49
GPRS(GMSK, 2 TS)	29.00	27.26	27.96	28.76	22.98	21.24	21.94	22.74
GPRS(GMSK, 3 TS)	27.50	25.72	26.43	27.31	23.24	21.46	22.17	23.05
GPRS(GMSK, 4 TS)	25.50	23.87	24.56	25.40	22.49	20.86	21.55	22.39

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	N Band 2	
Tx Channel	_	9262	9400	9538
Frequency (MHz)	Tune-up	1852.4	1880	1907.6
RMC 12.2Kbps	24.50	23.79	23.98	24.03
HSDPA Subtest-1	22.50	21.99	22.17	21.74
HSDPA Subtest-2	22.00	21.44	21.92	21.52
HSDPA Subtest-3	22.00	21.01	21.63	21.20
HSDPA Subtest-4	22.00	20.90	21.50	21.05
HSUPA Subtest-1	22.50	21.84	22.10	21.53
HSUPA Subtest-2	22.50	21.65	22.12	21.74
HSUPA Subtest-3	22.00	21.38	21.72	21.44
HSUPA Subtest-4	22.50	21.79	22.14	21.50
HSUPA Subtest-5	21.50	21.12	21.39	21.25
Band		WCDMA	Band 4	
Tx Channel	Tuna un	1312	1413	1513
Frequency (MHz)	Tune-up	1712.4	1732.6	1752.6
RMC 12.2Kbps	23.50	22.96	22.91	23.24
HSDPA Subtest-1	24.00	23.54	22.10	23.34
HSDPA Subtest-2	23.50	23.04	21.83	22.89
HSDPA Subtest-3	23.00	22.55	21.45	22.49
HSDPA Subtest-4	23.00	22.94	21.41	22.03
HSUPA Subtest-1	23.50	23.25	22.02	23.15
HSUPA Subtest-2	23.50	23.48	22.04	23.35
HSUPA Subtest-3	23.00	22.73	21.49	22.83
HSUPA Subtest-4	23.50	23.07	21.96	23.35
HSUPA Subtest-5	23.00	22.90	21.46	22.77
Band		WCDMA	Band 5	
Tx Channel	Tung up	4132	4182	4233
Frequency (MHz)	Tune-up	826.4	836.4	846.6
RMC 12.2Kbps	24.50	24.13	24.13	24.07
HSDPA Subtest-1	23.00	22.89	22.56	22.71
HSDPA Subtest-2	23.00	22.56	22.35	22.54
HSDPA Subtest-3	22.50	22.13	22.08	22.35
HSDPA Subtest-4	22.00	21.87	21.93	22.00
HSUPA Subtest-1	23.00	22.94	22.40	22.56
HSUPA Subtest-2	23.00	22.86	22.61	22.67
HSUPA Subtest-3	22.50	22.47	22.38	22.21





HSUPA Subtest-4	23.00	22.85	22.66	22.69
HSUPA Subtest-5	22.50	22.45	22.17	22.37

7.3. WLAN & Bluetooth Output Power

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
	1	2412	11.50	11.49
802.11b	6	2437	11.50	11.14
	11	2462	11.50	10.71
	1	2412	10.50	10.20
802.11g	6	2437	10.50	10.19
	11	2462	10.50	9.72
200.44	1	2412	9.50	8.96
802.11n	6	2437	9.50	9.26
HT20	11	2462	9.50	8.92

NOTE: Power measurement results of WLAN 2.4G.

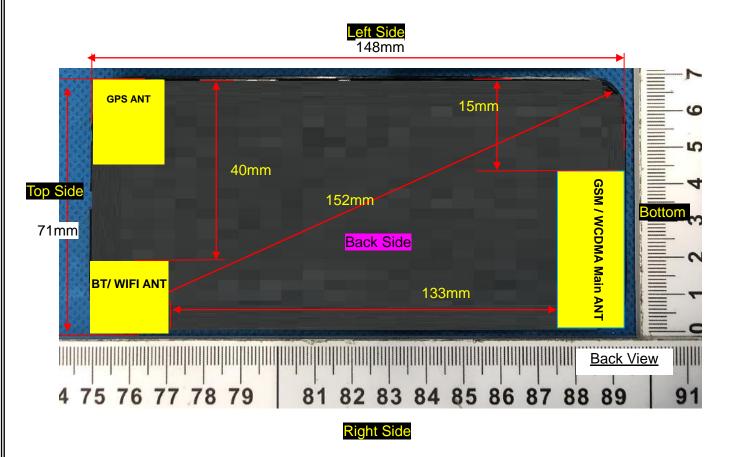
	Output Power (dBm)						
BR+EDR	Observat	T	Data Rates				
	Channel	Tune-up	1M	2M	3M		
	0CH	6.500	5.383	5.727	6.020		
	39CH	5.000	4.249	4.786	4.373		
	78CH	5.000	4.000	4.135	4.501		

	Channel	Tune-up	Output Power (dBm)
BLE	0CH	4.500	4.119
	19CH	3.500	3.193
	39CH	2.500	2.493

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											
		Positions	s for SAR te	sts							
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side					
WWAN Main	Yes	Yes	Yes	Yes	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:

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

- f_(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}	P _{max}	Distance	f	Calculation	SAR Exclusion	SAR test
ivioue	(dBm)	(mW)	(mm)	(GHz)	Result	threshold	exclusion
Bluetooth	6.50	4.47	5	2.48	1.41	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:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] * $[\sqrt{f_{(GHZ)}}/x]$ W/kg for test separation distances \leq 50mm, 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)	х	Estimated SAR (W/Kg)
Bluetooth	Head	6.50	4.47	5	2.48	7.5	0.188
Bluetooth	Body	6.50	4.47	10	2.48	7.5	0.094
Bluetooth	Hotspot	6.50	4.47	10	2.48	7.5	0.094

NOTE: Estimated SAR calculation for Bluetooth





10. SAR Results

10.1. SAR measurement Result

10.1.1. SAR measurement Result of GSM850

Test	Test			Value /kg)	Power	Conducted	Tune-up	Scaled SAR	
Position of Head	channel /Freq.	Test Mode	1g	10g	Drift (±5%)	power (dBm)	power (dBm)	1g (W/Kg)	Date
Left Cheek	189/836.4	GPRS(GMSK 3TS)	0.070	0.048	2.32	30.67	31.00	0.076	2021/3/08
Left Tilt 15 Degree	189/836.4	GPRS(GMSK 3TS)	0.053	0.035	3.19	30.67	31.00	0.057	2021/3/08
Right Cheek	189/836.4	GPRS(GMSK 3TS)	0.066	0.040	0.75	30.67	31.00	0.071	2021/3/08
Right Tilt 15 Degree	189/836.4	GPRS(GMSK 3TS)	0.044	0.028	-1.05	30.67	31.00	0.047	2021/3/08

NOTE: Head SAR test results of GSM850.

Test Position of	Test			Value /kg)	Power	Conducted	Tune-up	Scaled SAR	
Body-Worn with 10mm	channel /Freq.	Test Mode	1g	10g	Drift (±5%)	power (dBm)	power (dBm)	1g (W/Kg)	Date
Front Side	189/836.4	GPRS(GMSK 3TS)	0.078	0.051	-1.96	30.67	31.00	0.084	2021/3/08
Back Side	189/836.4	GPRS(GMSK 3TS)	0.096	0.064	-1.17	30.67	31.00	0.104	2021/3/08

NOTE: Body-Worn SAR test results of GSM850

Test Position of	Test channel	Test Mode	SAR (W/	Value /kg)	Power Drift	Conducted	Tune-up	Scaled SAR	Date
Hotspot with 10mm	/Freq.	Test Mode	1g	10g	(±5%)	(dBm)	(dBm)	1g (W/Kg)	Date
Front Side	189/836.4	GPRS(GMSK 3TS)	0.078	0.051	-1.96	30.67	31.00	0.084	2021/3/08
Back Side	189/836.4	GPRS(GMSK 3TS)	0.096	0.064	-1.17	30.67	31.00	0.104	2021/3/08
Left Side	189/836.4	GPRS(GMSK 3TS)	0.037	0.025	3.06	30.67	31.00	0.040	2021/3/08





Right Side	189/836.4	GPRS(GMSK 3TS)	0.046	0.033	-2.06	30.67	31.00	0.050	2021/3/08
Bottom Side	189/836.4	GPRS(GMSK 3TS)	0.069	0.051	3.32	30.67	31.00	0.074	2021/3/08

NOTE: Hotspot SAR test results of GSM850

10.1.2. SAR measurement Result of GSM1900

Test	Test			Value ′kg)	Power	Conducted	Tune-up	Scaled SAR	
Position of Head	channel /Freq.	Test Mode	1g	10g	Drift (±5%)	power (dBm)	power (dBm)	1g (W/Kg)	Date
Left Cheek	661/1880	GPRS(GMSK 3TS)	0.054	0.035	4.27	26.43	27.50	0.069	2021/3/10
Left Tilt 15 Degree	661/1880	GPRS(GMSK 3TS)	0.027	0.021	2.53	26.43	27.50	0.035	2021/3/10
Right Cheek	661/1880	GPRS(GMSK 3TS)	0.048	0.029	1.69	26.43	27.50	0.061	2021/3/10
Right Tilt 15 Degree	661/1880	GPRS(GMSK 3TS)	0.023	0.018	-2.65	26.43	27.50	0.029	2021/3/10

NOTE: Head SAR test results of GSM1900

Test Position of	Test channel	Test Mode		Value /kg)	Power Drift	Conducted	Tune-up	Scaled SAR	Date
Body-Worn with 10mm	/Freq.	Test Mode	1g	10g	(±5%)	power (dBm)	power (dBm)	1g (W/Kg)	Date
Front Side	661/1880	GPRS(GMSK 3TS)	0.476	0.267	4.65	26.43	27.50	0.609	2021/3/10
Back Side	661/1880	GPRS(GMSK 3TS)	0.565	0.313	-1.98	26.43	27.50	0.723	2021/3/10

NOTE: Body-Worn SAR test results of GSM1900

Test Position of	Test			Value /kg)	Power	Conducted	Tune-up	Scaled	
Hotspot with 10mm	channel /Freq.	Test Mode	1g	10g	Drift (±5%)	power (dBm)	power (dBm)	SAR 1g (W/Kg)	Date
Front Side	661/1880	GPRS(GMSK 3TS)	0.476	0.267	4.65	26.43	27.50	0.609	2021/3/10





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Back Side	661/1880	GPRS(GMSK 3TS)	0.565	0.313	-1.98	26.43	27.50	0.723	2021/3/10
Left Side	661/1880	GPRS(GMSK 3TS)	0.223	0.127	-4.99	26.43	27.50	0.285	2021/3/10
Right Side	661/1880	GPRS(GMSK 3TS)	0.254	0.144	-4.35	26.43	27.50	0.325	2021/3/10
Bottom Side	661/1880	GPRS(GMSK 3TS)	0.429	0.237	2.08	26.43	27.50	0.549	2021/3/10

NOTE: Hotspot SAR test results of GSM1900

10.1.3. SAR measurement Result of WCDMA Band 2

Test	Test	Taribbala		Value /kg)	Power	Conducted	Tune-up	Scaled SAR	Data
Position of Head	channel /Freq.	Test Mode	1g	10g	Drift (±5%)	power (dBm)	power (dBm)	1g	Date
rioda	71 1041		19	109	(=0 70)	(45.11)	(42.11)	(W/Kg)	
Left Cheek	9400/1880	RMC12.2K	0.086	0.058	-3.09	23.98	24.50	0.097	2021/3/10
Left Tilt 15	9400/1880	RMC12.2K	0.049	0.031	-1.95	23.98	24.50	0.055	2021/3/10
Degree	9400/1000	RIVIC 12.2K	0.049	0.031	-1.95	23.90	24.50	0.055	2021/3/10
Right	9400/1880	RMC12.2K	0.081	0.055	-0.42	23.98	24.50	0.091	2021/3/10
Cheek	9400/1000	NIVIC 12.2N	0.001	0.055	-0.42	23.90	24.50	0.091	2021/3/10
Right Tilt 15	9400/1880	RMC12.2K	0.041	0.030	2.59	23.98	24.50	0.046	2021/3/10
Degree	3400/1000	NIVIC 12.2N	0.041	0.030	2.09	23.90	24.50	0.046	2021/3/10

NOTE: Head SAR test results of WCDMA Band 2

Test Position of	Test channel	Test Mode		Value /kg)	Power Drift	Conducted	Tune-up	Scaled SAR	Date
Body-Worn with 10mm	/Freq.	rest wode	1g	10g	(±5%)	power (dBm)	(dBm)	1g (W/Kg)	Date
Front Side	9400/1880	RMC12.2K	0.324	0.163	3.85	23.98	24.50	0.365	2021/3/10
Back Side	9400/1880	RMC12.2K	0.401	0.203	-0.42	23.98	24.50	0.452	2021/3/10

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

Test			SAR	Value				Scaled	
Position of	Test		(W	/kg)	Power	Conducted	Tune-up	SAR	
Hotspot	channel	Test Mode			Drift	power	power		Date
with	/Freq.		1g	10g	(±5%)	(dBm)	(dBm)	1g (W/Kg)	
10mm								(vv/kg)	
Front Side	9400/1880	RMC12.2K	0.324	0.163	3.85	23.98	24.50	0.365	2021/3/10
Back Side	9400/1880	RMC12.2K	0.401	0.203	-0.42	23.98	24.50	0.452	2021/3/10
Left Side	9400/1880	RMC12.2K	0.158	0.082	3.38	23.98	24.50	0.178	2021/3/10

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Right Side	9400/1880	RMC12.2K	0.195	0.102	1.09	23.98	24.50	0.220	2021/3/10
Bottom	0400/4990	DMC12.2K	0.202	0.140	0.60	22.00	24.50	0.249	2024/2/40
Side	9400/1880	RMC12.2K	0.282	0.142	-0.63	23.98	24.50	0.318	2021/3/10

NOTE: Hotspot SAR test results of WCDMA Band 2

10.1.4. SAR measurement Result of WCDMA Band 4

Test	Test	Took Mode		Value /kg)	Power	Conducted	Tune-up	Scaled SAR	Data
Position of Head	channel /Freq.	Test Mode	1g	10g	Drift (±5%)	power (dBm)	(dBm)	1g (W/Kg)	Date
Left Cheek	1413/1732.6	HSDPA Sub 1	0.037	0.028	-0.15	22.10	24.00	0.057	2021/3/09
Left Tilt 15 Degree	1413/1732.6	HSDPA Sub 1	0.022	0.021	-1.38	22.10	24.00	0.034	2021/3/09
Right Cheek	1413/1732.6	HSDPA Sub 1	0.033	0.024	1.30	22.10	24.00	0.051	2021/3/09
Right Tilt 15 Degree	1413/1732.6	HSDPA Sub 1	0.018	0.013	-0.24	22.10	24.00	0.028	2021/3/09

NOTE: Head SAR test results of WCDMA Band 4

Test Position of	Test channel	Toot Mode		Value /kg)	Power	Conducted	Tune-up	Scaled SAR	Doto
Body-Worn with 10mm	/Freq.	Test Mode	1g	10g	Drift (±5%)	power (dBm)	(dBm)	1g (W/Kg)	Date
Front Side	1413/1732.6	HSDPA Sub 1	0.315	0.169	1.34	22.10	24.00	0.488	2021/3/09
Back Side	1413/1732.6	HSDPA Sub 1	0.393	0.213	-0.50	22.10	24.00	0.609	2021/3/09

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

Test Position of	Test channel	Test Mode		Value /kg)	Power Drift	Conducted	Tune-up	Scaled SAR	Date
Hotspot with 10mm	/Freq.	rest Mode	1g	10g	(±5%)	power (dBm)	(dBm)	1g (W/Kg)	Date
Front Side	1413/1732.6	HSDPA Sub 1	0.315	0.169	1.34	22.10	24.00	0.488	2021/3/09
Back Side	1413/1732.6	HSDPA Sub 1	0.393	0.213	-0.50	22.10	24.00	0.609	2021/3/09
Left Side	1413/1732.6	HSDPA Sub 1	0.149	0.085	-1.19	22.10	24.00	0.231	2021/3/09



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	Right Side	1413/1732.6	HSDPA Sub 1	0.184	0.099	2.62	22.10	24.00	0.285	2021/3/09	
	Bottom Side	1413/1732.6	HSDPA Sub 1	0.306	0.163	0.30	22.10	24.00	0.474	2021/3/09	

NOTE: Hotspot SAR test results of WCDMA Band 4

10.1.5. SAR measurement Result of WCDMA Band 5

Test	Test			Value /kg)	Power	Conducted	Tune-up	Scaled SAR	
Position of Head	channel /Freq.	Test Mode	1g	10g	Drift (±5%)	power (dBm)	power (dBm)	1g	Date
ricad	71 104.		19	109	(±070)	(dDIII)	(dBiii)	(W/Kg)	
Left Cheek	4182/836.4	RMC12.2K	0.078	0.067	-0.39	24.13	24.50	0.085	2021/3/08
Left Tilt 15	4182/836.4	RMC12.2K	0.041	0.032	0.99	24.13	24.50	0.045	2021/3/08
Degree	4102/030.4	KIVIC 12.2K	0.041	0.032	0.99	24.13	24.50	0.045	202 1/3/06
Right	4182/836.4	RMC12.2K	0.072	0.058	3.09	24.13	24.50	0.078	2021/3/08
Cheek	4102/030.4	KIVIC 12.2K	0.072	0.056	3.09	24.13	24.50	0.076	2021/3/00
Right Tilt 15	4182/836.4	RMC12.2K	0.033	0.030	1.62	24.13	24.50	0.036	2021/3/08
Degree	4102/030.4	IXIVIC 12.2K	0.033	0.030	1.02	24.13	24.50	0.030	202 1/3/00

NOTE: Head SAR test results of WCDMA Band 5

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode		Value /kg) 10g	Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date
Front Side	4182/836.4	RMC12.2K	0.089	0.062	-4.00	24.13	24.50	0.097	2021/3/08
Back Side	4182/836.4	RMC12.2K	0.199	0.100	1.32	24.13	24.50	0.217	2021/3/08

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

Test Position of	Test			Value /kg)	Power	Conducted power	Tune-up power	Scaled SAR	D :
Hotspot with 10mm	channel /Freq.	Test Mode	1g	10g	Drift (±5%)	(dBm)	(dBm)	1g (W/Kg)	Date
Front Side	4182/836.4	RMC12.2K	0.089	0.062	-4.00	24.13	24.50	0.097	2021/3/08
Back Side	4182/836.4	RMC12.2K	0.199	0.100	1.32	24.13	24.50	0.217	2021/3/08
Left Side	4182/836.4	RMC12.2K	0.040	0.030	1.82	24.13	24.50	0.044	2021/3/08
Right Side	4182/836.4	RMC12.2K	0.058	0.036	3.56	24.13	24.50	0.063	2021/3/08
Bottom Side	4182/836.4	RMC12.2K	0.088	0.057	0.11	24.13	24.50	0.096	2021/3/08

NOTE: Hotspot SAR test results of WCDMA Band 5



10.1.6. SAR measurement Result of WLAN 2.4G

Test Position	Test	Test		Value /kg)	Power Drift	Conducted	Tune-up	Scaled SAR	Date
of Head	/Freq.	Mode	1g	10g	(±5%)	(dBm)	(dBm)	1g (W/Kg)	Date
Left Cheek	6/2437	802.11 b	0.314	0.158	-0.54	11.14	11.50	0.341	2021/3/11
Left Tilt 15 Degree	6/2437	802.11 b	0.275	0.113	1.20	11.14	11.50	0.299	2021/3/11
Right Cheek	6/2437	802.11 b	0.288	0.140	1.56	11.14	11.50	0.313	2021/3/11
Right Tilt 15 Degree	6/2437	802.11 b	0.253	0.106	-2.66	11.14	11.50	0.275	2021/3/11

NOTE: Head SAR test results of WLAN 2.4G

Test Position of	Test	Toot Mode		Value ⁄kg)	Power Drift	Conducted	Tune-up	Scaled SAR	Doto
Body-Worn with 10mm	channel /Freq.	Test Mode	1g	10g	(±5%)	(dBm)	power power (dBm)	1g (W/Kg)	Date
Front Side	6/2437	802.11 b	0.059	0.034	0.49	11.14	11.50	0.064	2021/3/11
Back Side	6/2437	802.11 b	0.091	0.055	-0.07	11.14	11.50	0.099	2021/3/11

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

Test Position of	Test	Test Mode		Value /kg)	Power Drift	Conducted	Tune-up	Scaled SAR	Doto
Hotspot with 10mm	channel /Freq.	rest Mode	1g	10g	(±5%)	power (dBm)	(dBm)	1g (W/Kg)	Date
Front Side	6/2437	802.11 b	0.059	0.034	0.49	11.14	11.50	0.064	2021/3/11
Back Side	6/2437	802.11 b	0.091	0.055	-0.07	11.14	11.50	0.099	2021/3/11
Right Side	6/2437	802.11 b	0.030	0.018	2.59	11.14	11.50	0.033	2021/3/11
Top Side	6/2437	802.11 b	0.055	0.033	-0.38	11.14	11.50	0.060	2021/3/11

NOTE: Hotspot SAR test results of WLAN 2.4G



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

- 1) Scalar SAR summation < 1.6W/kg.
- 2) SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (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}		Σ1-g SAR	SPLSR	Remark
		PCE	DTS	(W/Kg)		
	Left Cheek	0.097	0.341	0.438	N/A	N/A
	Left Tilt 15	0.057	0.000	0.050	N1/A	N1/A
Heed	Degree	0.057	0.299	0.356	N/A	N/A
Head	Right Cheek	0.091	0.313	0.404	N/A	N/A
	Right Tilt 15	0.047	0.275	0.322	N/A	N/A
	Degree	0.047				
D 1 147	Front Side	0.609	0.064	0.673	N/A	N/A
Body-Worn	Back Side	0.723	0.099	0.822	N/A	N/A
	Front Side	0.609	0.064	0.673	N/A	N/A
	Back Side	0.723	0.099	0.822	N/A	N/A
Hatanat	Left Side	0.285	N/A	0.285	N/A	N/A
Hotspot	Right Side	0.325	0.033	0.358	N/A	N/A
	Top Side	N/A	0.060	0.060	N/A	N/A
	Bottom Side	0.549	N/A	0.549	N/A	N/A

Test Position		Scaled SAR _{MAX}		Σ1-g SAR	CDI CD	Damark
		PCE	DSS	(W/Kg)	SPLSR	Remark
	Left Cheek	0.097	0.188	0.285	N/A	N/A
	Left Tilt 15 Degree	0.057	0.188	0.245	N/A	N/A
Head	Right Cheek	0.091	0.188	0.279	N/A	N/A
	Right Tilt 15 Degree	0.047	0.188	0.235	N/A	N/A
Dark Man	Front Side	0.609	0.094	0.703	N/A	N/A
Body-Worn	Back Side	0.723	0.094	0.817	N/A	N/A
	Front Side	0.609	0.094	0.703	N/A	N/A
Hotspot	Back Side	0.723	0.094	0.817	N/A	N/A
	Left Side	0.285	N/A	0.285	N/A	N/A
	Right Side	0.325	0.094	0.419	N/A	N/A



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	Top Side	N/A	0.094	0.094	N/A	N/A
	Bottom Side	0.549	N/A	0.549	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 - 835MHz			
MEASUREMENT 2 System Performance Check - 1800MHz			
MEASUREMENT 3 System Performance Check - 1900MHz			
MEASUREMENT 4 System Performance Check - 2450MHz			



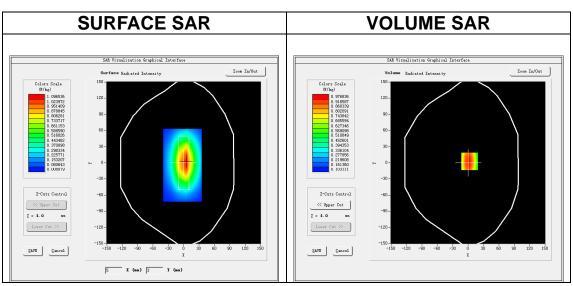
Date of measurement: 8/3/2021

A. Experimental conditions.

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

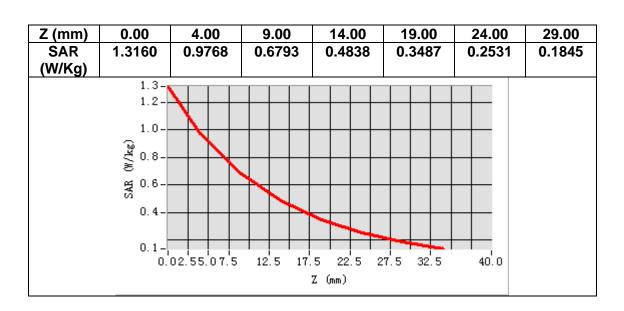
B. SAR Measurement Results

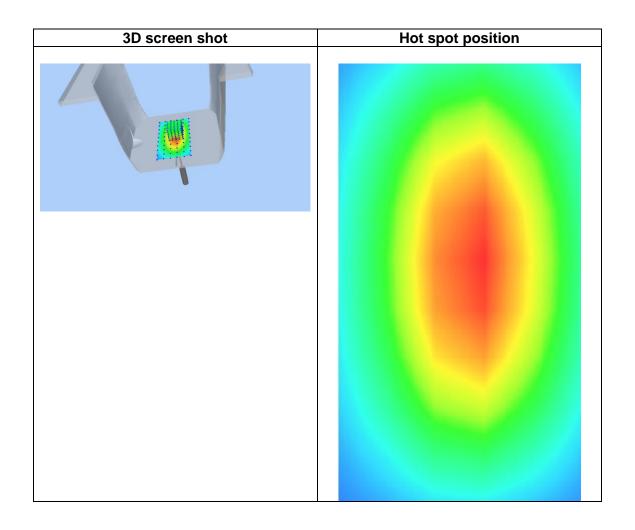
835.000000
41.932426
19.053465
0.872594
-0.200000



Maximum location: X=3.00, Y=3.00 SAR Peak: 1.32 W/kg

SAR 10g (W/Kg)	0.590257
SAR 1g (W/Kg)	0.934298







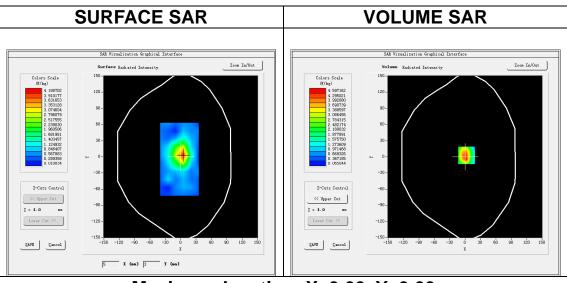
Date of measurement: 9/3/2021

A. Experimental conditions.

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

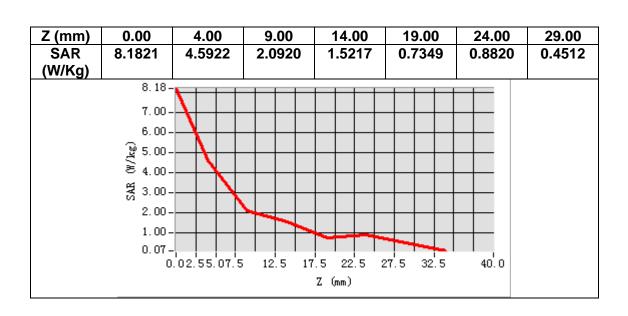
B. SAR Measurement Results

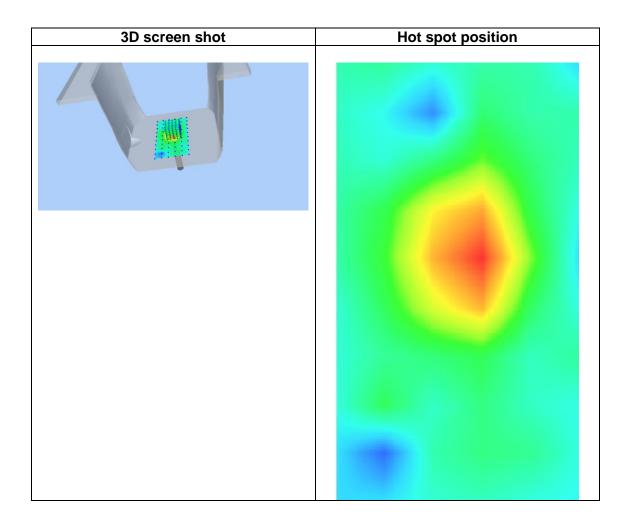
1800.00000
39.710120
13.540250
1.350000
-1.730000



Maximum location: X=3.00, Y=3.00 SAR Peak: 8.37 W/kg

SAR 10g (W/Kg)	1.930335
SAR 1g (W/Kg)	3.991410







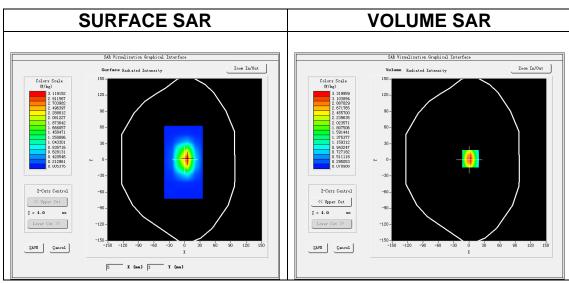
Date of measurement: 10/3/2021

A. Experimental conditions.

<u>Area Scan</u>	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<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>
Signal	CW (Crest factor: 1.0)

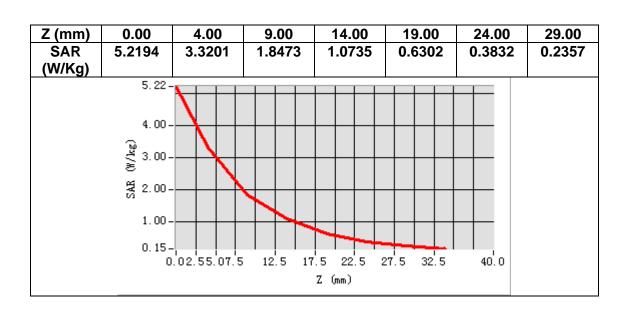
B. SAR Measurement Results

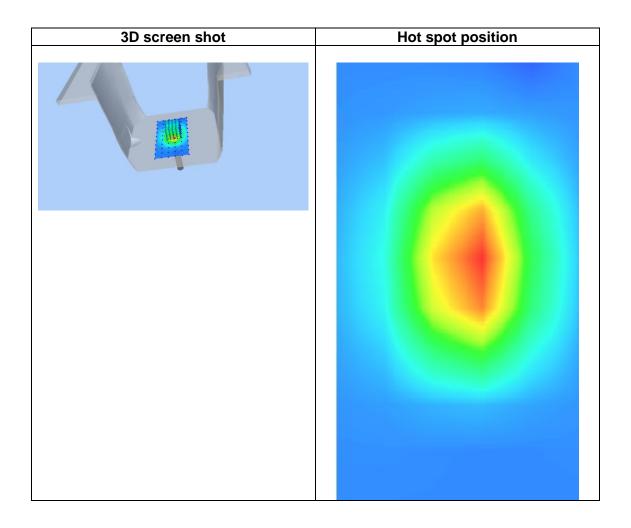
The mode and more recounts	
Frequency (MHz)	1900.000000
Relative permittivity (real part)	39.181789
Relative permittivity (imaginary part)	13.750310
Conductivity (S/m)	1.452587
Variation (%)	-0.200000



Maximum location: X=3.00, Y=2.00 SAR Peak: 5.24 W/kg

SAR 10g (W/Kg)	2.071256
SAR 1g (W/Kg)	3.761345







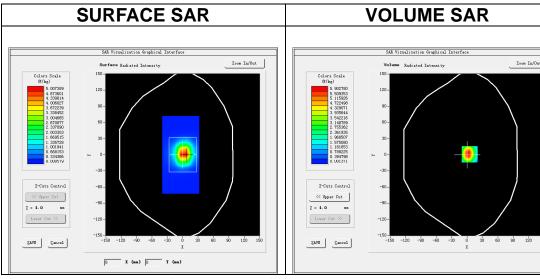
Date of measurement: 11/3/2021

A. Experimental conditions.

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

B. SAR Measurement Results

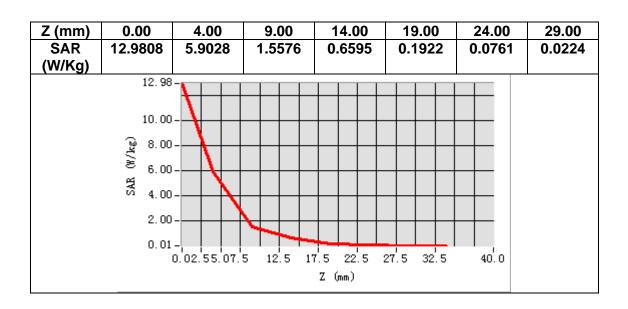
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2450.000000	
39.511099	
13.040900	
1.770598	
-0.100000	

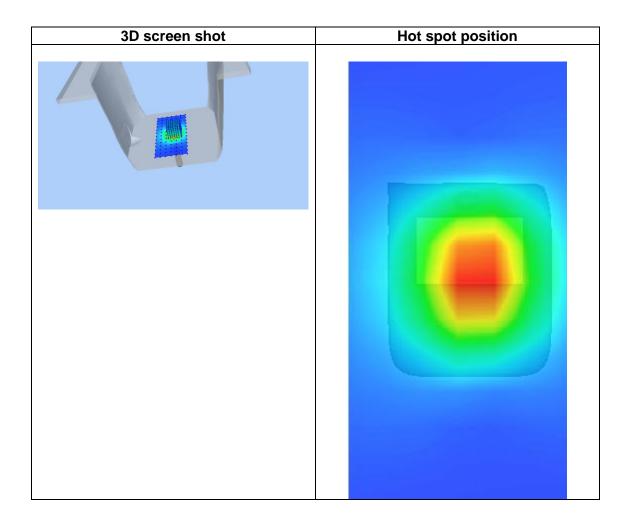


Maximum location: X=5.00, Y=1.00 SAR Peak: 12.07 W/kg

SAR 10g (W/Kg)	2.449002
SAR 1g (W/Kg)	5.077445







13. Appendix C. Plots of High SAR Measurement

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MEASUREMENT 1 GSM 850 Head	
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MEASUREMENT 6 WCDMA Band 2 Body	
MEASUREMENT 7 WCDMA Band 4 Head	
MEASUREMENT 8 WCDMA Band 4 Body	
MEASUREMENT 9 WCDMA Band 5 Head	
MEASUREMENT 10 WCDMA Band 5 Body	
MEASUREMENT 11 WLAN 2.4G Head	
MEASUREMENT 12 WLAN 2.4G Body	



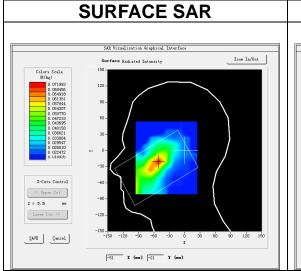
Date of measurement: 8/3/2021

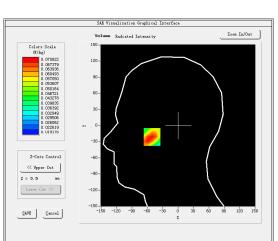
A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	<u>Left head</u>
Device Position	<u>Cheek</u>
<u>Band</u>	<u>GSM850</u>
<u>Channels</u>	<u>Middle</u>
Signal	TDMA (Crest factor: 2.7)

B. SAR Measurement Results

tit mododi omont i toodito	
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.845196
Relative permittivity (imaginary part)	19.080215
Conductivity (S/m)	0.886594
Variation (%)	2.320000



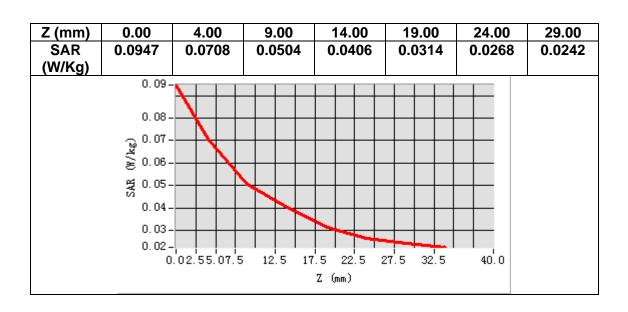


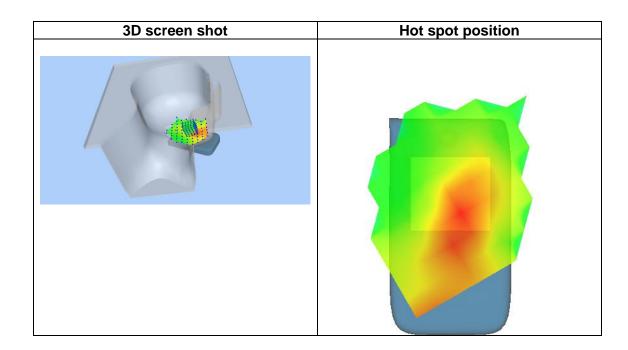
VOLUME SAR

Maximum location: X=-51.00, Y=-21.00 SAR Peak: 0.10 W/kg

SAR 10g (W/Kg) 0.048151 SAR 1g (W/Kg) 0.070353









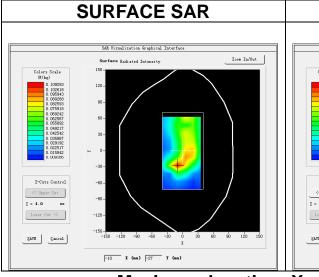
Date of measurement: 8/3/2021

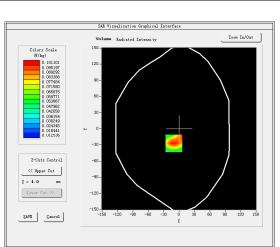
A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	Validation plane
Device Position	<u>Body</u>
<u>Band</u>	<u>GSM850</u>
<u>Channels</u>	<u>Middle</u>
Signal	TDMA (Crest factor: 2.7)

B. SAR Measurement Results

111 111000011 01110111 110001110	
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.845196
Relative permittivity (imaginary part)	19.080215
Conductivity (S/m)	0.886594
Variation (%)	-1.170000

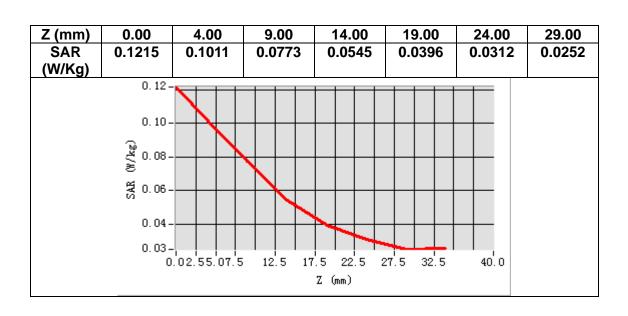


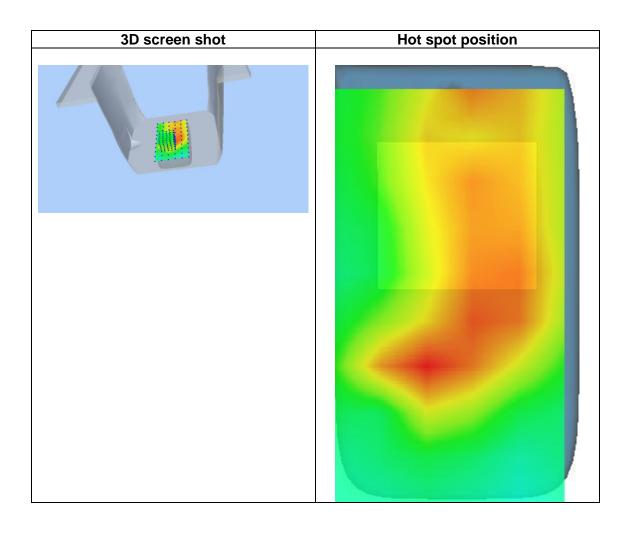


VOLUME SAR

Maximum location: X=-10.00, Y=-27.00 SAR Peak: 0.13 W/kg

SAR 10g (W/Kg) 0.064373 SAR 1g (W/Kg) 0.096078







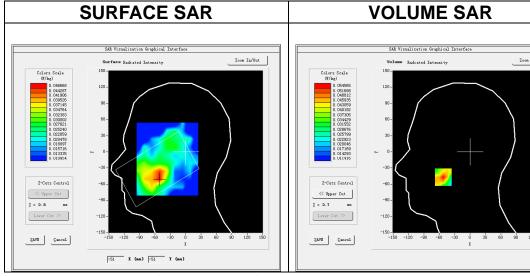
Date of measurement: 10/3/2021

A. Experimental conditions.

11 = 21 = 21 = 21 = 21 = 21 = 21 = 21 =	-
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<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>
Signal	TDMA (Crest factor: 2.7)

B. SAR Measurement Results

Frequency (MHz)	1880.00000
Relative permittivity (real part)	39.264702
Relative permittivity (imaginary part)	13.771500
Conductivity (S/m)	1.438357
Variation (%)	4.270000

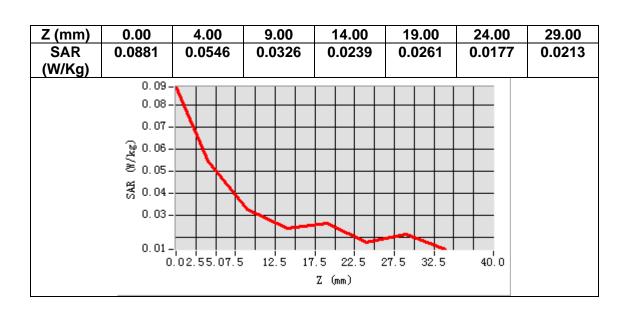


Maximum location: X=-52.00, Y=-47.00

SAR Peak: 0.09 W/kg

SAR 10g (W/Kg)	0.035133
SAR 1g (W/Kg)	0.053965









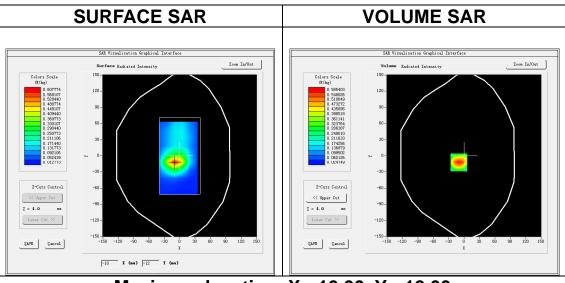
Date of measurement: 10/3/2021

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	Validation plane
Device Position	<u>Body</u>
<u>Band</u>	<u>GSM1900</u>
<u>Channels</u>	<u>Middle</u>
Signal	TDMA (Crest factor: 2.7)

B. SAR Measurement Results

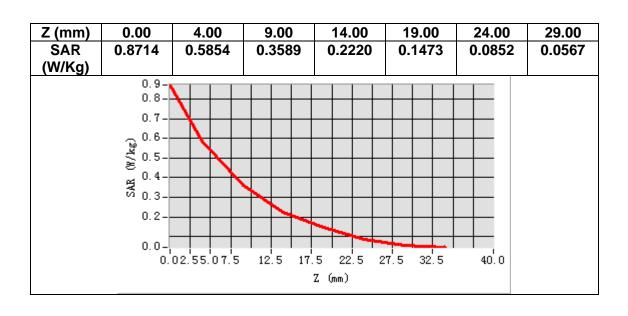
Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.264702
Relative permittivity (imaginary part)	13.771500
Conductivity (S/m)	1.438357
Variation (%)	-1.980000

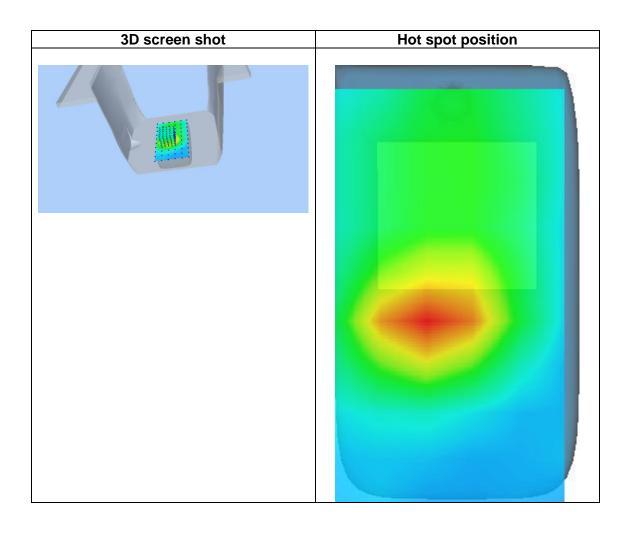


Maximum location: X=-10.00, Y=-12.00 SAR Peak: 0.88 W/kg

SAR 10g (W/Kg)	0.312719
SAR 1g (W/Kg)	0.565265









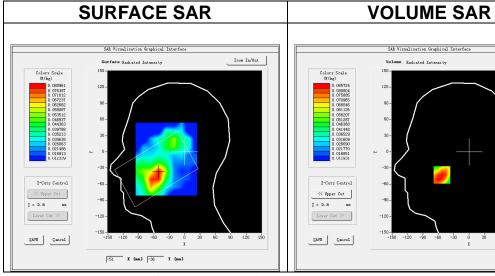
Date of measurement: 10/3/2021

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	<u>Left head</u>
Device Position	<u>Cheek</u>
<u>Band</u>	Band2_WCDMA1900
<u>Channels</u>	<u>Middle</u>
Signal	WCDMA (Crest factor: 1.0)

B. SAR Measurement Results

111 111000011 011101111 1110001110	
Frequency (MHz)	1880.00000
Relative permittivity (real part)	39.264702
Relative permittivity (imaginary part)	13.771500
Conductivity (S/m)	1.438357
Variation (%)	-3.090000

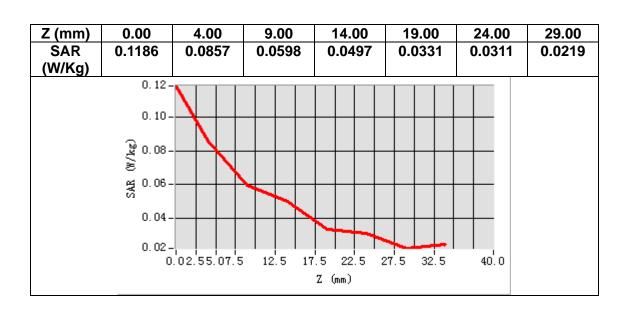


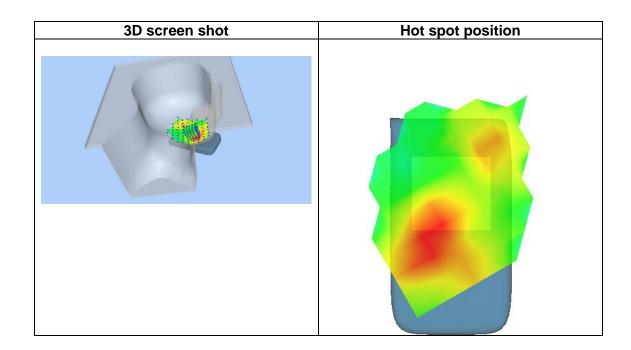
Maximum location: X=-53.00, Y=-43.00

SAR Peak: 0.12 W/kg

SAR 10g (W/Kg)	0.058110
SAR 1g (W/Kg)	0.086370









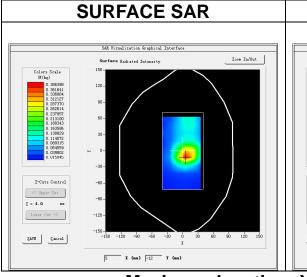
Date of measurement: 10/3/2021

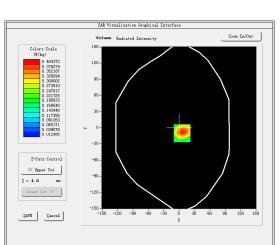
A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	Validation plane
Device Position	<u>Body</u>
<u>Band</u>	Band2_WCDMA1900
Channels	<u>Middle</u>
Signal	WCDMA (Crest factor: 1.0)

B. SAR Measurement Results

111 111000011 011101111 1110001110	
Frequency (MHz)	1880.00000
Relative permittivity (real part)	39.264702
Relative permittivity (imaginary part)	13.771500
Conductivity (S/m)	1.438357
Variation (%)	-0.420000

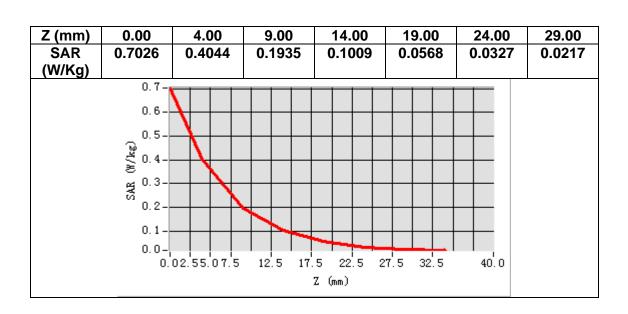


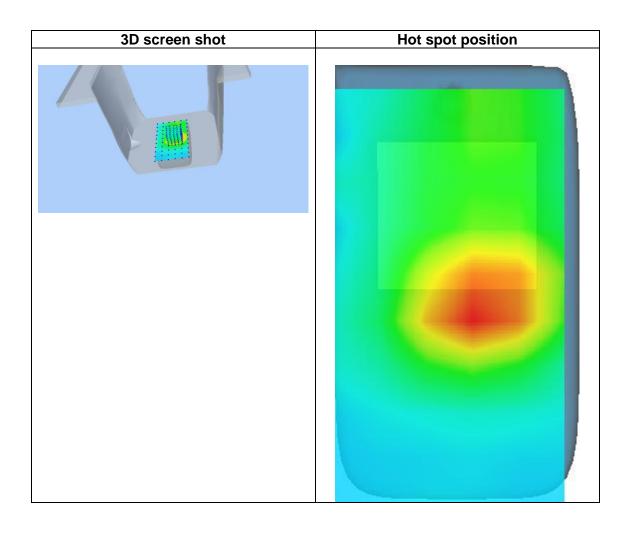


VOLUME SAR

Maximum location: X=6.00, Y=-10.00 SAR Peak: 0.71 W/kg

SAR 10g (W/Kg)	0.202961
SAR 1g (W/Kg)	0.401226







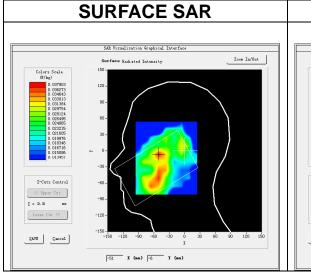
Date of measurement: 9/3/2021

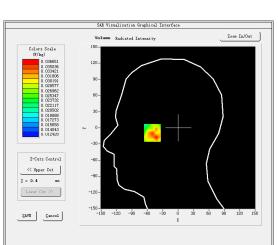
A. Experimental conditions.

<u>Area Scan</u>	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	<u>Left head</u>
Device Position	<u>Cheek</u>
<u>Band</u>	Band4_WCDMA1700
Channels	<u>Middle</u>
Signal	WCDMA (Crest factor: 1.0)

B. SAR Measurement Results

111 111000011 011101111 1110001110	
Frequency (MHz)	1732.600000
Relative permittivity (real part)	40.169395
Relative permittivity (imaginary part)	13.496682
Conductivity (S/m)	1.298681
Variation (%)	-0.150000



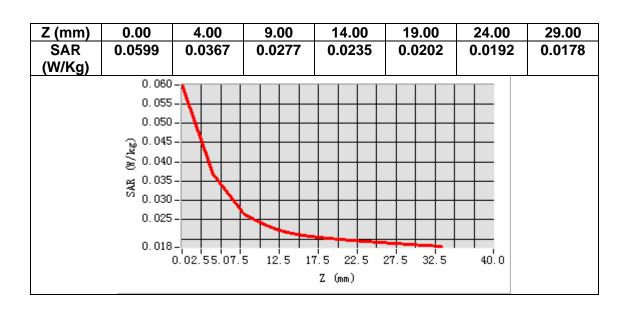


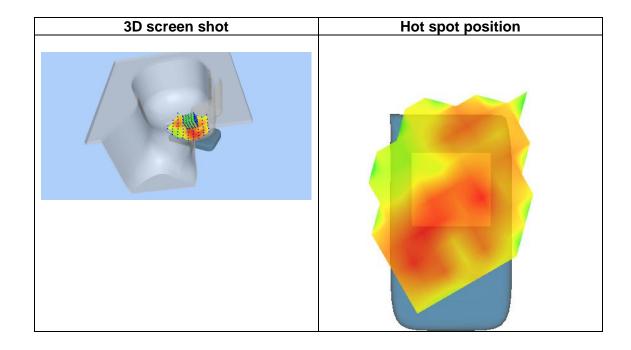
VOLUME SAR

Maximum location: X=-50.00, Y=-7.00 SAR Peak: 0.06 W/kg

SAR 10g (W/Kg) 0.027887 SAR 1g (W/Kg) 0.037219









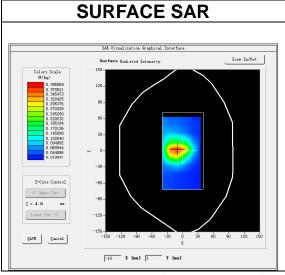
Date of measurement: 9/3/2021

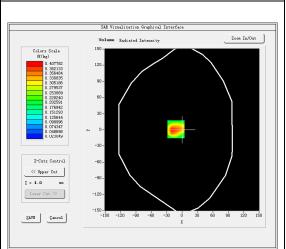
A. Experimental conditions.

- 11 = 21 O 11 11 11 11 11 11	
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
<u>Phantom</u>	Validation plane
Device Position	<u>Body</u>
<u>Band</u>	Band4_WCDMA1700
<u>Channels</u>	<u>Middle</u>
Signal	WCDMA (Crest factor: 1.0)

B. SAR Measurement Results

AIX Mododi ciliciti ixcodito	
Frequency (MHz)	1732.600000
Relative permittivity (real part)	40.169395
Relative permittivity (imaginary part)	13.496682
Conductivity (S/m)	1.298681
Variation (%)	-0.500000

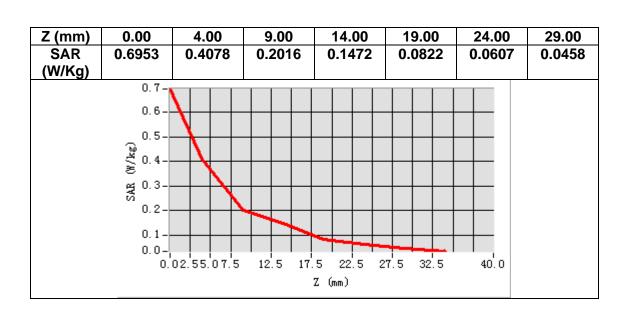


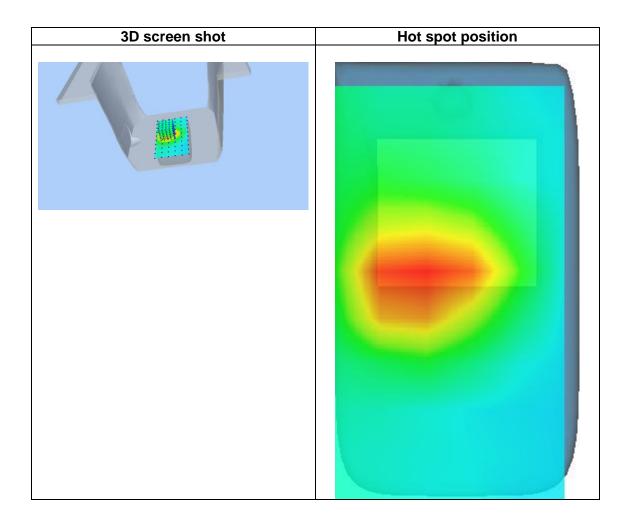


VOLUME SAR

Maximum location: X=-12.00, Y=1.00 SAR Peak: 0.65 W/kg

SAR 10g (W/Kg)	0.213183
SAR 1g (W/Kg)	0.393168







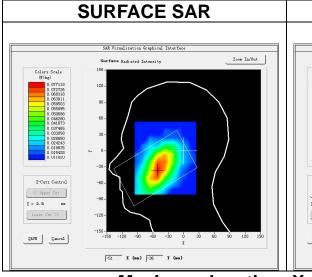
Date of measurement: 8/3/2021

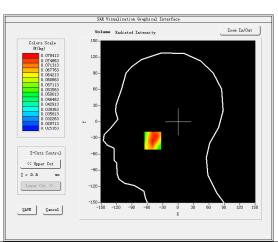
A. Experimental conditions.

- ti =2tp-011110111011	
Area Scan	dx=15mm dy=15mm, h= 5.00 mm
<u>ZoomScan</u>	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	Band5_WCDMA850
<u>Channels</u>	<u>Middle</u>
Signal	WCDMA (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.845196
Relative permittivity (imaginary part)	19.080215
Conductivity (S/m)	0.886594
Variation (%)	-0.390000



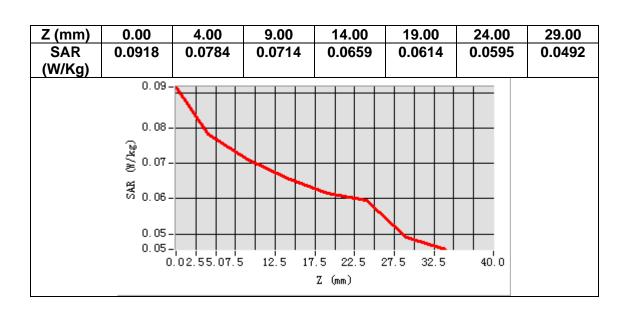


VOLUME SAR

Maximum location: X=-49.00, Y=-35.00

SAR Peak: 0.10 W/kg

SAR 10g (W/Kg)	0.066763
SAR 1g (W/Kg)	0.078306







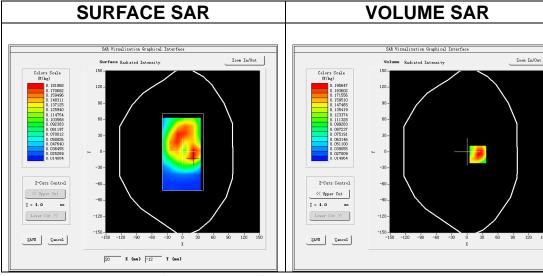
Date of measurement: 8/3/2021

A. Experimental conditions.

11 = 21 0 1111 0 1101 0 1101 11	
Area Scan	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>	<u>Body</u>
<u>Band</u>	Band5_WCDMA850
<u>Channels</u>	<u>Middle</u>
Signal	WCDMA (Crest factor: 1.0)

B. SAR Measurement Results

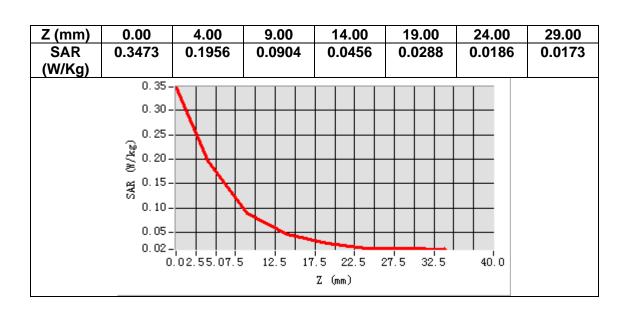
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.845196
Relative permittivity (imaginary part)	19.080215
Conductivity (S/m)	0.886594
Variation (%)	1.320000

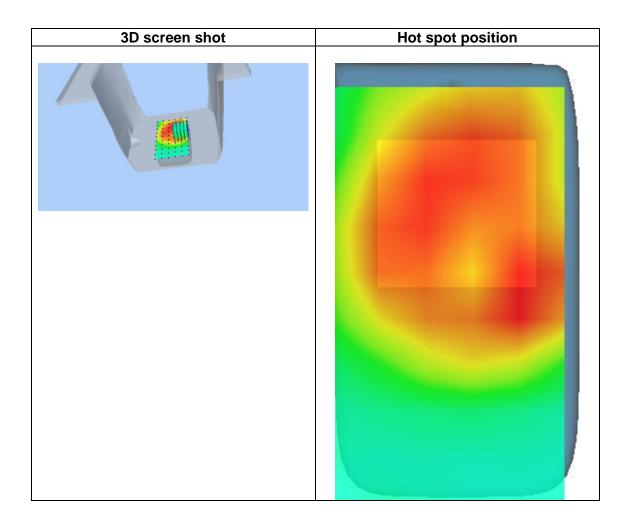


Maximum location: X=21.00, Y=-5.00 SAR Peak: 0.36 W/kg

SAR 10g (W/Kg)	0.100308
SAR 1g (W/Kg)	0.199436







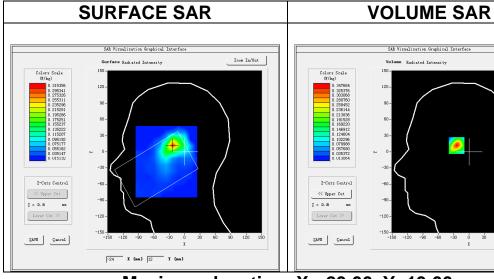
Date of measurement: 11/3/2021

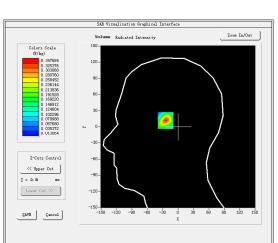
A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
<u>ZoomScan</u>	7x7x7,dx=5mm dy=5mm dz=5mm
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>IEEE 802.11b ISM</u>
Channels	<u>Middle</u>
Signal	IEEE802.11b (Crest factor: 1.0)

B. SAR Measurement Results

AIX MIGAGAI GITIGITE IX GOALLO	
Frequency (MHz)	2437.000000
Relative permittivity (real part)	39.561298
Relative permittivity (imaginary part)	12.956961
Conductivity (S/m)	1.754229
Variation (%)	-0.540000



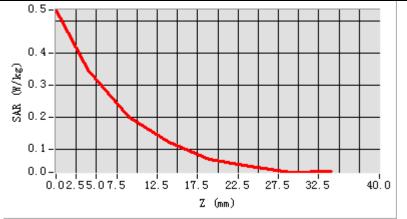


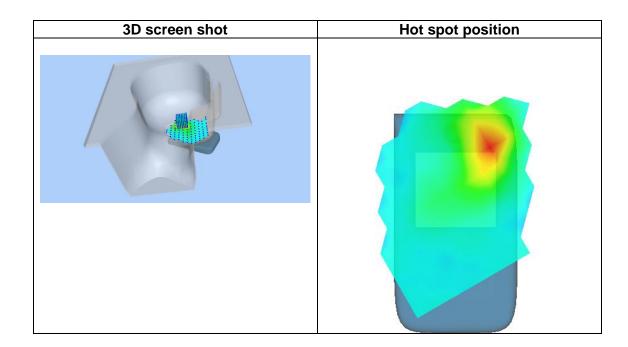
Maximum location: X=-23.00, Y=13.00

SAR Peak: 0.54 W/kg

SAR 10g (W/Kg)	0.158447
SAR 1g (W/Kg)	0.314106

Z (mm) 0.00 4.00 9.00 14.00 19.00 24.00 29.00 0.2005 SAR 0.5361 0.3477 0.1209 0.0683 0.0457 0.0265 (W/Kg) 0.5







MEASUREMENT 12

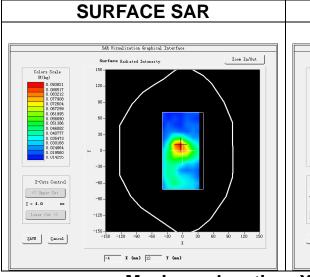
Date of measurement: 11/3/2021

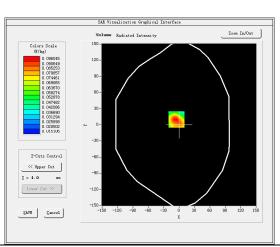
A. Experimental conditions.

- 11 = 21 p 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Area Scan	dx=12mm dy=12mm, h= 5.00 mm		
<u>ZoomScan</u>	7x7x7,dx=5mm dy=5mm dz=5mm		
Phantom	Validation plane		
<u>Device Position</u>	<u>Body</u>		
<u>Band</u>	<u>IEEE 802.11b ISM</u>		
<u>Channels</u>	<u>Middle</u>		
Signal	IEEE802.11b (Crest factor: 1.0)		

B. SAR Measurement Results

Air Meagarement Regard	
Frequency (MHz)	2437.000000
Relative permittivity (real part)	39.561298
Relative permittivity (imaginary part)	12.956961
Conductivity (S/m)	1.754229
Variation (%)	-0.070000

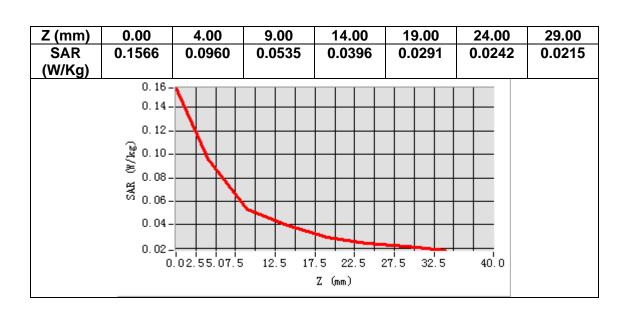


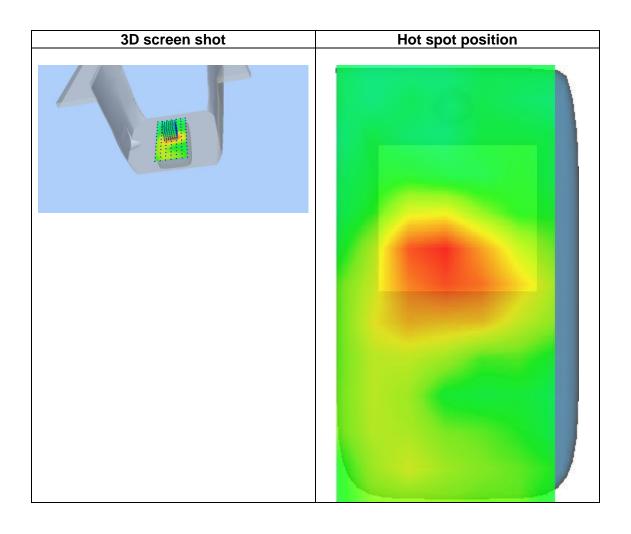


VOLUME SAR

Maximum location: X=-5.00, Y=10.00 SAR Peak: 0.16 W/kg

SAR 10g (W/Kg)	0.055060
SAR 1g (W/Kg)	0.090692





14. Appendix D. Calibration Certificate

Table of contents	
E Field Probe - SN 08/16 EPGO287	
835 MHz Dipole - SN 03/15 DIP 0G835-347	
1800 MHz Dipole - SN 03/15 DIP 1G800-349	
1900 MHz Dipole - SN 03/15 DIP 1G900-350	
2450 MHz Dipole - SN 03/15 DIP 2G450-352	

Report No.: STR210302001006E



COMOSAR E-Field Probe Calibration Report

Ref: ACR.60.1.21.MVGB.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI COMMUNITY, XIXIANG STREET, BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA MVG COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: SN 08/16 EPGO287

Calibrated at MVG Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon 29280 PLOUZANE - FRANCE

Calibration date: 03/01/2021



Accreditations #2-6789 and #2-6814 Scope available on www.cofrac.fr

Summary:

This document presents the method and results from an accredited COMOSAR E-Field Probe calibration performed at MVG, using the CALIPROBE test bench, for use with a MVG COMOSAR system only. The test results covered by accreditation are traceable to the International System of Units (SI).







Ref: ACR.60.1.21.MVGB.A

Report No.: STR210302001006E

	Name	Function	Date	Signature
Prepared by :	Jérôme Luc	Technical Manager	3/1/2021	Jes
Checked by:	Jérôme Luc	Technical Manager	3/1/2021	JS
Approved by:	Yann Toutain	Laboratory Director	3/1/2021	Gann Toutain

Mode d'emploi 2021.03.0 1 13:07:12 +01'00'

	Customer Name
	SHENZHEN NTEK
Distribution:	TESTING
Distribution:	TECHNOLOGY
	CO., LTD.

Issue	Name	Date	Modifications
A	Jérôme Luc	3/1/2021	Initial release





Ref: ACR.60.1.21.MVGB.A

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Ref: ACR.60.1.21.MVGB.A

Report No.: STR210302001006E

1 DEVICE UNDER TEST

Device Under Test		
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE	
Manufacturer	MVG	
Model	SSE2	
Serial Number	SN 08/16 EPGO287	
Product Condition (new / used)	Used	
Frequency Range of Probe	0.15 GHz-6GHz	
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.211 MΩ	
	Dipole 2: R2=0.199 MΩ	
	Dipole 3: R3=0.199 MΩ	

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

MVG's COMOSAR E field Probes are built in accordance to the IEEE 1528, FCC KDB865664 D01, CENELEC EN62209 and CEI/IEC 62209 standards.



Figure 1 - MVG COMOSAR Dosimetric E field Dipole

Probe Length	330 mm
Length of Individual Dipoles	2 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	2.5 mm
Distance between dipoles / probe extremity	1 mm

3 MEASUREMENT METHOD

The IEEE 1528, FCC KDB865664 D01, CENELEC EN62209 and CEI/IEC 62209 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their affect. All calibrations / measurements performed meet the fore mentioned standards.

3.1 LINEARITY

The evaluation of the linearity was done in free space using the waveguide, performing a power sweep to cover the SAR range 0.01W/kg to 100W/kg.



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

3.2 <u>SENSITIVITY</u>

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards.

3.3 LOWER DETECTION LIMIT

The lower detection limit was assessed using the same measurement set up as used for the linearity measurement. The required lower detection limit is 10 mW/kg.

3.4 ISOTROPY

The axial isotropy was evaluated by exposing the probe to a reference wave from a standard dipole with the dipole mounted under the flat phantom in the test configuration suggested for system validations and checks. The probe was rotated along its main axis from 0 to 360 degrees in 15-degree steps. The hemispherical isotropy is determined by inserting the probe in a thin plastic box filled with tissue-equivalent liquid, with the plastic box illuminated with the fields from a half wave dipole. The dipole is rotated about its axis $(0^{\circ}-180^{\circ})$ in 15° increments. At each step the probe is rotated about its axis $(0^{\circ}-360^{\circ})$.

3.1 BOUNDARY EFFECT

The boundary effect is defined as the deviation between the SAR measured data and the expected exponential decay in the liquid when the probe is oriented normal to the interface. To evaluate this effect, the liquid filled flat phantom is exposed to fields from either a reference dipole or waveguide. With the probe normal to the phantom surface, the peak spatial average SAR is measured and compared to the analytical value at the surface.

The boundary effect uncertainty can be estimated according to the following uncertainty approximation formula based on linear and exponential extrapolations between the surface and $d_{\rm be}$ + $d_{\rm step}$ along lines that are approximately normal to the surface:

$$\mathrm{SAR}_{\mathrm{uncertainty}} [\%] = \delta \mathrm{SAR}_{\mathrm{be}} \frac{\left(d_{\mathrm{be}} + d_{\mathrm{step}}\right)^2}{2d_{\mathrm{step}}} \frac{\left(e^{-d_{\mathrm{be}}/(\delta \beta)}\right)}{\delta/2} \quad \mathrm{for} \ \left(d_{\mathrm{be}} + d_{\mathrm{step}}\right) < 10 \ \mathrm{mm}$$

where

SAR_{uncertainty} is the uncertainty in percent of the probe boundary effect

dbe is the distance between the surface and the closest zoom-scan measurement

point, in millimetre

 $\Delta_{ ext{step}}$ is the separation distance between the first and second measurement points that

are closest to the phantom surface, in millimetre, assuming the boundary effect

at the second location is negligible

 δ is the minimum penetration depth in millimetres of the head tissue-equivalent

liquids defined in this standard, i.e., $\delta \approx 14$ mm at 3 GHz;

△SAR_{be} in percent of SAR is the deviation between the measured SAR value, at the

distance d_{be} from the boundary, and the analytical SAR value.





Ref: ACR.60.1.21.MVGB.A

The measured worst case boundary effect SARuncertainty[%] for scanning distances larger than 4mm is 1.0% Limit ,2%).

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards were followed to generate the measurement uncertainty associated with an E-field probe calibration using the waveguide technique. All uncertainties listed below represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2, traceable to the Internationally Accepted Guides to Measurement Uncertainty.

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	Uncertainty value (%)	Probability Distribution	Divisor	ci	Standard Uncertainty (%)
Expanded uncertainty 95 % confidence level k = 2					14 %

5 CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

5.1 SENSITIVITY IN AIR

Normx dipole		
$1 (\mu V/(V/m)^2)$	$2 (\mu V/(V/m)^2)$	$3 (\mu V/(V/m)^2)$
0.72	0.66	0.77

DCP dipole 1	DCP dipole 2	DCP dipole 3
(mV)	(mV)	(mV)
107	110	110

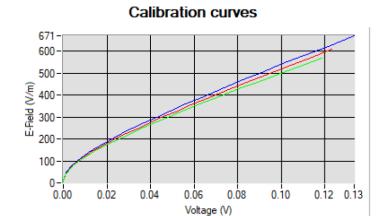
Calibration curves ei=f(V) (i=1,2,3) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



COMOSAR E-FIELD PROBE CALIBRATION REPORT

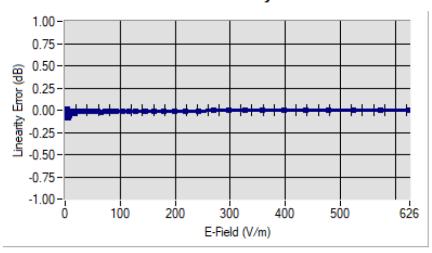
Ref: ACR.60.1.21.MVGB.A



Dipole 1 Dipole 2

LINEARITY

Linearity



Linearity:+/-1.90% (+/-0.08dB)





Ref: ACR.60.1.21.MVGB.A

Report No.: STR210302001006E

SENSITIVITY IN LIQUID

Liquid	Frequency	ConvF
	(MHz +/-	
	100MHz)	
HL750	750	1.49
HL850	835	1.50
HL900	900	1.61
HL1800	1800	1.73
HL1900	1900	1.91
HL2000	2000	1.97
HL2300	2300	1.92
HL2450	2450	1.98
HL2600	2600	1.87
HL3300	3300	1.79
HL3500	3500	1.85
HL3700	3700	1.79
HL3900	3900	2.07
HL4200	4200	2.21
HL4600	4600	2.25
HL4900	4900	2.05
HL5200	5200	1.80
HL5400	5400	2.05
HL5600	5600	2.16
HL5800	5800	2.07

LOWER DETECTION LIMIT: 8mW/kg

5 of 126 Report No.: STR210302001006E

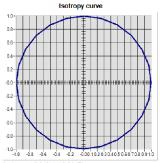


COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

5.4 <u>ISOTROPY</u>

HL1800 MHz



Isotropy:+/-0.24% (+/-0.01dB)







Ref: ACR.60.1.21.MVGB.A

6 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
Flat Phantom	MVG	SN-20/09-SAM71	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	05/2019	05/2022
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	05/2019	05/2022
Multimeter	Keithley 2000	1160271	02/2020	02/2023
Signal Generator	Rohde & Schwarz SMB	106589	04/2019	04/2022
Amplifier	Aethercomm	SN 046	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	NI-USB 5680	170100013	05/2019	05/2022
Directional Coupler	Narda 4216-20	01386	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Waveguide	Mega Industries	069Y7-158-13-712	Validated. No cal required.	Validated. No cal required.
Waveguide Transition	Mega Industries	069Y7-158-13-701	Validated. No cal required.	Validated. No cal required.
Waveguide Termination	Mega Industries	069Y7-158-13-701	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Testo 184 H1	44220687	05/2020	05/2023



SAR Reference Dipole Calibration Report

Ref: ACR.60.3.21.MVGB.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI COMMUNITY, XIXIANG STREET, BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA MVG COMOSAR REFERENCE DIPOLE

FREQUENCY: 835 MHZ

SERIAL NO.: SN 03/15 DIP0G835-347

Calibrated at MVG

Z.I. de la pointe du diable Technopôle Brest Iroise – 295 avenue Alexis de Rochon 29280 PLOUZANE - FRANCE

Calibration date: 03/01/2021



Accreditations #2-6789 and #2-6814 Scope available on www.cofrac.fr

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed at MVG, using the COMOSAR test bench. The test results covered by accreditation are traceable to the International System of Units (SI).





SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.60.3.21.MVGB.A

	Name	Function	Date	Signature
Prepared by :	Jérôme Luc	Technical Manager	3/1/2021	JES
Checked by :	Jérôme Luc	Technical Manager	3/1/2021	JE
Approved by :	Yann Toutain	Laboratory Director	3/1/2021	Gann Toutain

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	Customer Name
	SHENZHEN NTEK
Distribution:	TESTING
Distribution:	TECHNOLOGY
	CO., LTD.

Issue	Name	Date	Modifications
A	Jérôme Luc	3/1/2021	Initial release





SAR REFERENCE DIPOLE CALIBRATION REPORT

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.60.3.21.MVGB.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEEE 1528, FCC KDBs and CEI/IEC 62209 standards for reference dipoles used for SAR measurement system validations and the measurements that were performed to verify that the product complies with the fore mentioned standards.

2 DEVICE UNDER TEST

Device Under Test		
Device Type	COMOSAR 835 MHz REFERENCE DIPOLE	
Manufacturer	MVG	
Model	SID835	
Serial Number	SN 03/15 DIP0G835-347	
Product Condition (new / used)	Used	

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEEE 1528, FCC KDBs and CEI/IEC 62209 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



mvg



SAR REFERENCE DIPOLE CALIBRATION REPORT

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MEASUREMENT METHOD

The IEEE 1528, FCC KDBs and CEI/IEC 62209 standards provide requirements for reference dipoles used for system validation measurements. The following measurements were performed to verify that the product complies with the fore mentioned standards.

4.1 RETURN LOSS REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a return loss of -20 dB or better. The return loss measurement shall be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. A direct method is used with a network analyser and its calibration kit, both with a valid ISO17025 calibration.

MECHANICAL REQUIREMENTS

The IEEE Std. 1528 and CEI/IEC 62209 standards specify the mechanical components and dimensions of the validation dipoles, with the dimension's frequency and phantom shell thickness dependent. The COMOSAR test bench employs a 2 mm phantom shell thickness therefore the dipoles sold for use with the COMOSAR test bench comply with the requirements set forth for a 2 mm phantom shell thickness. A direct method is used with a ISO17025 calibrated caliper.

MEASUREMENT UNCERTAINTY

All uncertainties listed below represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2, traceable to the Internationally Accepted Guides to Measurement Uncertainty.

5.1 RETURN LOSS

The following uncertainties apply to the return loss measurement:

Frequency band	Expanded Uncertainty on Return Loss
400-6000MHz	0.08 LIN

5.2 DIMENSION MEASUREMENT

The following uncertainties apply to the dimension measurements:

Length (mm)	Expanded Uncertainty on Length
0 - 300	0.20 mm
300 - 450	0.44 mm

5.3 VALIDATION MEASUREMENT

The guidelines outlined in the IEEE 1528, FCC KDBs, CENELEC EN50361 and CEI/IEC 62209 standards were followed to generate the measurement uncertainty for validation measurements.

Scan Volume	Expanded Uncertainty
-------------	----------------------

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mvg



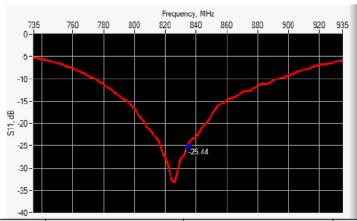
SAR REFERENCE DIPOLE CALIBRATION REPORT

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1 g	19 % (SAR)
10 g	19 % (SAR)

CALIBRATION MEASUREMENT RESULTS

RETURN LOSS AND IMPEDANCE



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
835	-25.44	-20	54.4 Ω - 2.9 jΩ

6.2 MECHANICAL DIMENSIONS

Frequency MHz	Lm	nm	h mm		d n	nm
	required	measured	required	measured	required	measured
300	420.0 ±1 %.		250.0 ±1 %.		6.35 ±1 %.	
450	290.0 ±1 %.		166.7 ±1 %.		6.35 ±1 %.	
750	176.0 ±1 %.		100.0 ±1 %.		6.35 ±1 %.	
835	161.0 ±1 %.	-	89.8 ±1 %.	-	3.6 ±1 %.	-
900	149.0 ±1 %.		83.3 ±1 %.		3.6 ±1 %.	
1450	89.1 ±1 %.		51.7 ±1 %.		3.6 ±1 %.	
1500	80.5 ±1 %.		50.0 ±1 %.		3.6 ±1 %.	
1640	79.0 ±1 %.		45.7 ±1 %.		3.6 ±1 %.	
1750	75.2 ±1 %.		42.9 ±1 %.		3.6 ±1 %.	
1800	72.0 ±1 %.		41.7 ±1 %.		3.6 ±1 %.	
1900	68.0 ±1 %.		39.5 ±1 %.		3.6 ±1 %.	
1950	66.3 ±1 %.		38.5 ±1 %.		3.6 ±1 %.	
2000	64.5 ±1 %.		37.5 ±1 %.		3.6 ±1 %.	
2100	61.0 ±1 %.		35.7 ±1 %.		3.6 ±1 %.	
2300	55.5 ±1 %.		32.6 ±1 %.		3.6 ±1 %.	
2450	51.5 ±1 %.		30.4 ±1 %.		3.6 ±1 %.	

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2600	48.5 ±1 %.	28.8 ±1 %.	3.6 ±1 %.	
3000	41.5 ±1 %.	25.0 ±1 %.	3.6 ±1 %.	
3500	37.0±1 %.	26.4 ±1 %.	3.6 ±1 %.	
3700	34.7±1 %.	26.4 ±1 %.	3.6 ±1 %.	

VALIDATION MEASUREMENT

The IEEE Std. 1528, FCC KDBs and CEI/IEC 62209 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

7.1 MEASUREMENT CONDITION

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	SN 41/18 EPGO333
Liquid	Head Liquid Values: eps': 40.6 sigma: 0.89
Distance between dipole center and liquid	15.0 mm
Area scan resolution	dx=8mm/dy=8mm
Zoon Scan Resolution	dx=8mm/dy=8mm/dz=5mm
Frequency	835835 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

7.2 HEAD LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ε,')		Conductivi	ity (σ) S/m
	required	measured	required	measured
300	45.3 ±10 %		0.87 ±10 %	
450	43.5 ±10 %		0.87 ±10 %	
750	41.9 ±10 %		0.89 ±10 %	
835	41.5 ±10 %	40.6	0.90 ±10 %	0.89
900	41.5 ±10 %		0.97 ±10 %	
1450	40.5 ±10 %		1.20 ±10 %	
1500	40.4 ±10 %		1.23 ±10 %	
1640	40.2 ±10 %		1.31 ±10 %	
1750	40.1 ±10 %		1.37 ±10 %	
1800	40.0 ±10 %		1.40 ±10 %	
1900	40.0 ±10 %		1.40 ±10 %	
1950	40.0 ±10 %		1.40 ±10 %	
2000	40.0 ±10 %		1.40 ±10 %	

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		_		
2100	39.8 ±10 %		1.49 ±10 %	
2300	39.5 ±10 %		1.67 ±10 %	
2450	39.2 ±10 %		1.80 ±10 %	
2600	39.0 ±10 %		1.96 ±10 %	
3000	38.5 ±10 %		2.40 ±10 %	
3500	37.9 ±10 %		2.91 ±10 %	

7.3 MEASUREMENT RESULT

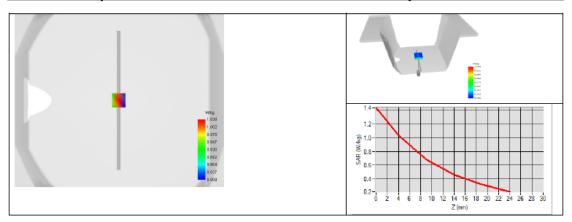
The IEEE Std. 1528 and CEI/IEC 62209 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

Frequency MHz	1 g SAR (W/kg/W)		10 g SAR	(W/kg/W)
	required	measured	required	measured
300	2.85		1.94	
450	4.58		3.06	
750	8.49		5.55	
835	9.56	9.84 (0.98)	6.22	6.22 (0.62)
900	10.9		6.99	
1450	29		16	
1500	30.5		16.8	
1640	34.2		18.4	
1750	36.4		19.3	
1800	38.4		20.1	
1900	39.7		20.5	
1950	40.5		20.9	
2000	41.1		21.1	
2100	43.6		21.9	
2300	48.7		23.3	
2450	52.4		24	
2600	55.3		24.6	
3000	63.8		25.7	
3500	67.1		25	



SAR REFERENCE DIPOLE CALIBRATION REPORT

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.60.3.21.MVGB.A

8 LIST OF EQUIPMENT

Equipment Summary Sheet						
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date		
SAM Phantom	MVG	SN-13/09-SAM68		Validated. No cal required.		
COMOSAR Test Bench	Version 3	NA		Validated. No cal required.		
Network Analyzer	Rohde & Schwarz ZVM	100203	05/2019	05/2022		
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	05/2019	05/2022		
Calipers	Mitutoyo	SN 0009732	10/2019	10/2022		
Reference Probe	MVG	EPGO333 SN 41/18	05/2020	05/2021		
Multimeter	Keithley 2000	1160271	02/2020	02/2023		
Signal Generator	Rohde & Schwarz SMB	106589	04/2019	04/2022		
Amplifier	Aethercomm	SN 046	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.		
Power Meter	NI-USB 5680	170100013	05/2019	05/2022		
Directional Coupler	Narda 4216-20	01386	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.		
Temperature / Humidity Sensor	Testo 184 H1	44220687	05/2020	05/2023		