FCC SAR REPORT

Applicant:	SWAGTEK
Address of Applicant:	10205 NW 19th Street,STE 101, Miami, FL33172,USA
Equipment Under Test (EUT)	
Product Name:	6.8 inch 4G Smart Phone
Model No.:	L68, MATRIX, N68
Trade mark	LOGIC, iSWAG, UNONU
FCC ID:	O55681521
Applicable standards:	FCC 47 CFR Part 2.1093
Date of Test:	10 Jun., 2021 ~ 17 Jun., 2021
Test Result:	Maximum Reported 1-g SAR (W/kg) Head: 0.494 Body: 0.733 Hotspot: 1.038

Authorized Signature:

Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

2 Version

Version No.	Date	Description
00	*22 Jun., 2021*	*Original*
V01	*02 Jul., 2021*	*Changed the error message on page 55*

Tested by: Carl Wei ***Date:*** *02 Jul., 2021*

Test Engineer

Reviewed by: Janet Wei ***Date:*** *02 Jul., 2021*

Project Engineer

3 Contents

4 SAR Results Summary

The maximum results of Specific Absorption Rate (SAR) found during test as bellows:
<Highest Reported standalone SAR Summary>

Exposure Position	Frequency Band	Reported 1-g SAR (W/kg)	Equipment Class	Highest Reported 1-g SAR (W/kg)
Head	GSM 850	0.166	PCE	0.494
	GSM 1900	0.039		
	WCDMA Band V	0.082		
	WCDMA Band IV	0.053		
	WCDMA Band II	0.045		
	LTE Band 2	0.032		
	LTE Band 4	0.049		
	LTE Band 5	0.083		
	LTE Band 7	0.032		
	LTE Band 17	0.083		
	WLAN 2.4 GHz	0.494	DTS	
Body (10 mm Gap)	GSM 850	0.314	PCE	0.733
	GSM 1900	0.119		
	WCDMA Band V	0.165		
	WCDMA Band IV	0.555		
	WCDMA Band II	0.219		
	LTE Band 2	0.236		
	LTE Band 4	0.733		
	LTE Band 5	0.175		
	LTE Band 7	0.257		
	LTE Band 12	0.125		
	WLAN 2.4GHz	0.103	DTS	
Hotspot (10 mm Gap)	GSM 850	0.387	PCE	1.038
	GSM 1900	0.187		
	WCDMA Band V	0.165		
	WCDMA Band IV	1.030		
	WCDMA Band II	0.286		
	LTE Band 2	0.288		
	LTE Band 4	1.038		
	LTE Band 5	0.175		
	LTE Band 7	0.257		
	LTE Band 12	0.125		
	WLAN 2.4 GHz	0.103	DTS	

<Highest Reported simultaneous SAR Summary>

Exposure Position	Frequency Band	Reported 1-g SAR (W/kg)	Equipment Class	Highest Reported Simultaneous Transmission 1-g SAR (W/kg)
Bottom	LTE Band 4	1.038	PCE	1.038
	WLAN 2.4 GHz	/	DTS	

Note:

1. The highest simultaneous transmission is scalar summation of Reported standalone SAR per FCC KDB 690783 D01 v01r03, and scalar SAR summation of all possible simultaneous transmission scenarios are < 1.6W/kg.
2. This device is 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 C95.1-2005, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.

5 General Information

5.1 Client Information

Applicant:	SWAGTEK
Address of Applicant:	10205 NW 19th Street, STE 101, Miami, FL33172, USA
Manufacturer:	SWAGTEK
Address of Manufacturer:	10205 NW 19th Street, STE 101, Miami, FL33172, USA

5.2 General Description of EUT

Product Name:	6.8 inch 4G Smart Phone			
Model No.:	L68, MATRIX, N68			
Category of device	Portable device			
Operation Frequency:	2G :	GSM850: 824.2~848.8 MHz	PCS 1900: 1850.2~1909.8 MHz	
	3G :	Band II: 1852.4~1907.6 MHz	Band V: 826.4~846.6 MHz	
		Band IV: 1712.4~1752.6 MHz		
	4G :	Band 2 :1850MHz~1910MHz	Band 4 :1710MHz~1755MHz	
		Band 5 :824MHz~849MHz	Band 7: 2500MHz~2570MHz	
		Band 17: 704MHz~716MHz		
	Wi-Fi:	2412MHz~2462MHz		
	Bluetooth: 2402 MHz ~ 2480 MHz			
Modulation technology:	2G:	☒Voice(GMSK)	☒GPRS(GMSK)	☒EGPRS(GMSK, 8PSK)
	3G:	☒RCM(QPSK)	☒HSUPA(QPSK)	☒HSDPA(QPSK,16QAM)
	4G:	☒QPSK	☒16QAM	☒64QAM
	Wi-Fi:	☒802.11b(DSSS)	☒802.11a/g/n/ac (OFDM)	
	Bluetooth:	☒BDR(GFSK)	☒EDR(π /4-DQPSK, 8DPSK)	☒LE(GFSK)
Antenna Type:	Internal Antenna			
Antenna Gain:	GSM 850: -0.21 dBi; PCS 1900: 0.29 dBi WCDMA Band V: -0.21 dBi;WCDMA Band II: 0.29 dBi; WCDMA Band IV: 0.32 dBi LTE Band 2: 0.29 dBi; LTE Band 4: 0.32 dBi LTE Band 5: -0.21 dBi; LTE Band 7: 0.42 dBi LTE Band 17: -0.12 dBi; Bluetooth: 0.58 dBi; 2.4G Wi-Fi: 0.58 dBi;			
(E)GPRS Class:	(E)GPRS Class: 12			
Dimensions (L*W*H):	173 mm (L)× 79 mm (W)× 10 mm (H)			
Accessories information:	Adapter: Model: GLY-G43UA-050200-629A Input: AC100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2A		Battery: Rechargeable Li-ion Battery 3.85V/5000mAh	
			Headset: Support headset	
Remark:	Model No.: L68, MATRIX, N68 were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being trademark. LOGIC is for L68. iSWAG is for MATRIX, UNONU is for N68			

5.3 Maximum RF Output Power

Mode	Average Power (dBm)	
	GSM 850	GSM 1900
GSM (Voice)	33.98	30.26
GPRS (1 TX Slot)	33.91	30.19
GPRS (2 TX Slots)	31.85	27.86
GPRS (3 TX Slots)	29.91	26.31
GPRS (4 TX Slots)	27.83	24.15
EGPRS (1 TX Slot)	27.81	26.72
EGPRS (2 TX Slots)	27.86	25.76
EGPRS (3 TX Slots)	26.97	24.78
EGPRS (4 TX Slots)	24.75	22.47

Mode	Average Power (dBm)		
	WCDMA Band V	WCDMA Band IV	WCDMA Band II
AMR 12.2 kbps	22.93	22.71	23.80
RMC 12.2 kbps	22.97	22.73	23.81
HSDPA Sub-test 1	22.23	22.06	23.13
HSDPA Sub-test 2	21.98	22.10	22.81
HSDPA Sub-test 3	21.61	22.12	22.66
HSDPA Sub-test 4	21.60	22.09	22.64
HSUPA Sub-test 1	20.78	21.75	20.79
HSUPA Sub-test 2	20.97	21.98	21.29
HSUPA Sub-test 3	20.47	21.45	20.78
HSUPA Sub-test 4	20.49	21.75	21.12
HSUPA Sub-test 5	22.65	22.23	23.19

Mode	Average Power (dBm)				
	LTE Band 2	LTE Band 4	LTE Band 5	LTE Band 7	LTE Band 17
BW/1.4 MHz	23.61	24.03	23.67	/	/
BW/3.0 MHz	23.65	24.13	23.79	/	/
BW/5.0 MHz	23.78	24.25	23.79	22.90	23.56
BW/10 MHz	23.78	24.06	23.71	22.98	23.51
BW/15 MHz	23.68	24.35	/	23.11	/
BW/20 MHz	23.67	24.55	/	23.32	/

WLAN 2.4 GHz Band Average Power (dBm)				
Mode/Band	b	g	n (HT-20)	n (HT-40)
WLAN 2.4GHz	13.37	12.62	12.54	10.90

WLAN 5.2 GHz Band Average Power (dBm)						
Mode/Band	a	ac 20	ac 40	ac 80	n 20	n 40
WLAN 5.2GHz	6.45	6.89	6.69	7.18	6.79	6.86

Bluetooth Peak Power (dBm)				
Mode/Band	1 Mbps(GFSK)	2 Mbps(π/4DQPSK)	3 Mbps (8DPSK)	LE (BT 4.0)
Bluetooth	3.00	3.34	3.61	-0.22

5.4 Environment of Test Site

Temperature:	18°C ~25 °C
Humidity:	35%~75% RH
Atmospheric Pressure:	1010 mbar

5.5 Test Sample Plan

Sample Number	Used for Test Items
15#	SAR
***Remark**: JianYan Testing Group Shenzhen Co., Ltd. is only responsible for the test project data of the above samples, and will keep the above samples for a month.*	

5.6 Test Location

JianYan Testing Group Shenzhen Co., Ltd.
No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community,Xinqiao Street, Bao'an District, Shenzhen, Guangdong,People's Republic of China.
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info-JYTee@lets.com, Website: http://www.ccis-cb.com

6 Introduction

6.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

6.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho dv}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = C\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength. However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

7 RF Exposure Limits

7.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

7.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

7.3 RF Exposure Limits

SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT *Occupational* (W/kg) or (mW/g)
SPATIAL PEAK SAR Brain	1.6	8.0
SPATIAL AVERAGE SAR Whole Body	0.08	0.4
SPATIAL PEAK SAR Hands, Feet, Ankles, Wrists	4.0	20

Note:

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

8 SAR Measurement System

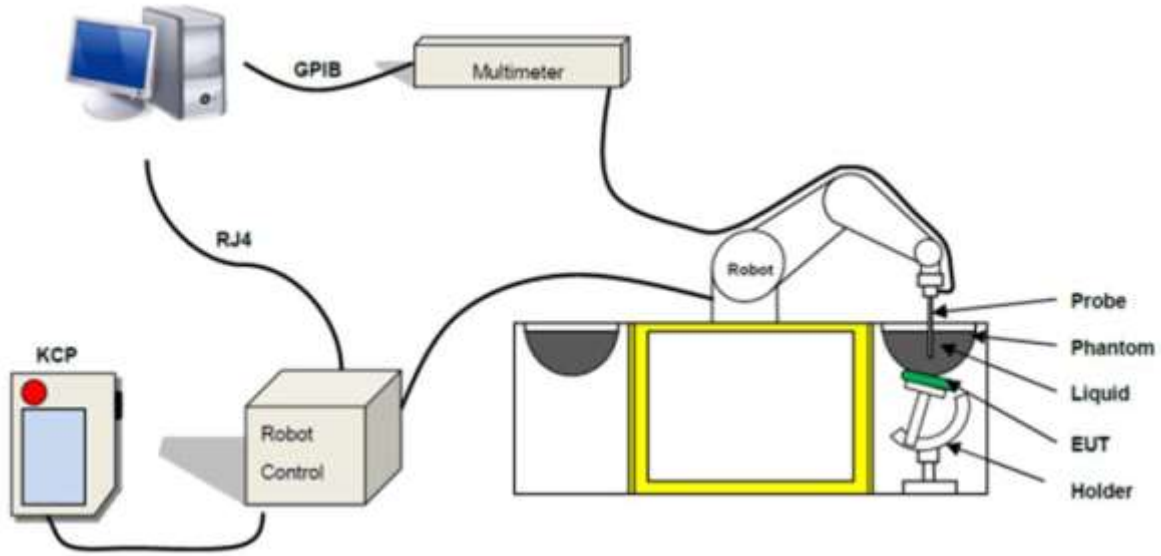


Fig. 8.1 MVG COMOSAR System Configurations

These measurements were performed with the automated near-field scanning system COMOSAR from MVG. The system is based on a high precision robot (working range: 850 mm), which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit.

The SAR measurements were conducted with dosimetric probe (manufactured by MVG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in SAR standard with accuracy of better than ±10%.The spherical isotropy was evaluated with the procedure described in SAR standard and found to be better than ±0.25 dB. The phantom used was the SAM Phantom as described in FCC supplement C, IEEE P1528.

The MVG COMOSAR system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

8.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by MVG). The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

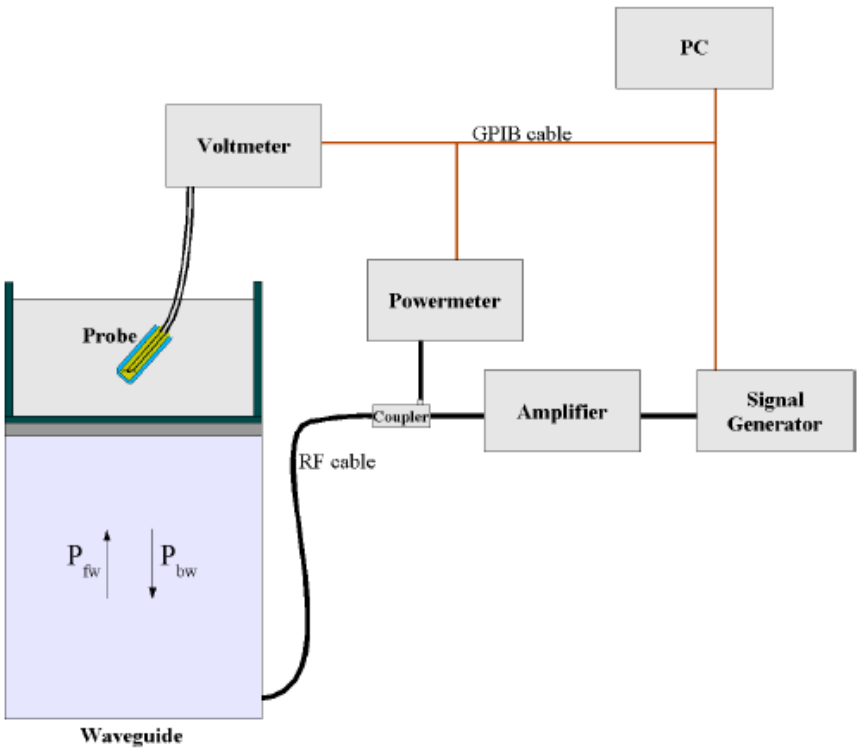
➢ **E-Field Probe Specification**

Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Model	SSE2
Frequency Range	150 MHz to 6 GHz
Dynamic Range	0.01W/kg to 100W/kg
Probe linearity	<0.25dB
Dimensions	Overall length: 330 mm Tip diameter: 2.5 mm Distance between dipoles / probe extremity: 1 mm

Fig. 8.2 Photo of E-Field Probe

➢ **E-Field Probe Calibration**

Probe calibration is realized, in compliance with EN/IEC 62209-1/-2 and IEEE 1528 std, with CALISAR, MVG proprietary calibration system. The calibration is performed with the technique using reference waveguide.



$$SAR = \frac{4(P_{fw} - P_{bw})}{ab\sigma}\cos^2\left(\pi\frac{y}{a}\right)c^{(2\pi/\sigma)}$$

Where :

Pfw	=	Forward Power
Pbw	=	Backward Power
a and b	=	Waveguide Dimensions
ı	=	Skin Depth

Keithley configuration

Rate=Medium; Filter=ON; RDGS=10; FILTER TYPE=MOVING AVERAGE; RANGE AUTO

After each calibration, a SAR measurement performed on a validation dipole and compared with a NPL calibrated probe, to verify it.

The Calibration factors, CF(N), for the 3 sensors corresponding to dipole 1, dipole 2 and dipole 3 are:

CF(N)=SAR(N)/Vlin(N) (N=1,2,3)

The linearized output voltage Vlin(N) is obtained from the displayed output voltage V(N) using

Vlin(N)=V(N)*(1+V(N)/DCP(N)) N=1,2,3

Where the DCP is the dipole compression point in mV

8.2 Robot

The COMOSAR system uses the high precision robots from KUKA. For the 6-axis controller system, the robot controller version (KUKA-KRC2sr) from KUKA is used. The KUKA robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Fig. 8.4 Photo of Robot

8.3 Phantom

<SAM Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume **Dimensions**	Approx. 27 liters Length: 1000mm; Width: 500mm; Height: 200mm
Material	Fiberglass based
Relative permittivity	3-4
Loss tangent	0.02
Measurement Areas	Left Head, Right Head, Flat phantom

Fig. 8.7 Photo of SAM Phantom

The phantom developed by MVG is produced in accordance with the specified in the standards. It has been designed to fit the COMOSAR phantom tables and is delivered with a plastic cover to prevent liquid evaporation.

8.4 Device Holder

The positioning system is made of an extremely stable material, which ensures easy handling and reproducible positioning. It also allows correct positioning of the dipoles referenced by the IEEE, ANSI and IEC.

<Device Holder for SAM Phantom>

Model	Handset Positioning System
Material properties	The positioning system is made of PETP. This material offers a low permittivity of 3.2 and low loss, with a loss tangent of 0.005 to minimize the influence of the DUT on measurement results.
Mechanical properties	The positioning system developed by MVG allows a positioning resolution better than 1 mm. The system is fixed on a bottom rail “x axis” so that the positioning system can be quickly moved from the right to the left part of the phantom. In addition, it can be moved on a perpendicular “y axis” and the height can be adapted. The system is also composed of three rotation points for accurate positioning of the device’s acoustical output.
Accuracy and precision	A curved rail on the top part allows the fast switch from the cheek to the tilt position. The required 15° angle for the tilt position can be easily checked thanks to a printed scale on the curved rail with a tolerance of ± 1°

Fig. 8.9 Photo of Device Holder

8.5 Test Equipment List

Manufacturer	Equipment Description	Model	Management Number	Cal. Information	
				Last Cal.	Due Date
MVG	COMOSAR DOSIMETRIC E FIELD PROBE	SSE2	WXJ076	05.20.2021	05.19.2022
MVG	COMOSAR 750 MHz REFERENCE DIPOLE	SID750	WXJ076-4	01.14.2021	01.13.2024
MVG	COMOSAR 835 MHz REFERENCE DIPOLE	SID835	WXJ076-5	01.14.2021	01.13.2024
MVG	COMOSAR 1750 MHz REFERENCE DIPOLE	SID1750	WXJ076-8	01.14.2021	01.13.2024
MVG	COMOSAR 1900 MHz REFERENCE DIPOLE	SID1900	WXJ076-9	01.14.2021	01.13.2024
MVG	COMOSAR 2450 MHz REFERENCE DIPOLE	SID2450	SN 50/20 DIP 2G450-514	01.14.2021	01.13.2024
MVG	COMOSAR 2600 MHz REFERENCE DIPOLE	SID2600	WXJ076-13	01.14.2021	01.13.2024
KEITHLEY	DIGIT MULTIMETER	DMM6500	WXJ076-1	12.17.2019	12.16.2022
MVG	MVG Measurement Software	OpenSAR	Version: V5	N.C.R	N.C.R
MVG	COMOSAR IEEE SAM PHANTOM	N/A	WXG009-2	N.C.R	N.C.R
MVG	COMOSAR IEEE SAM PHANTOM	N/A	WXG009-3	N.C.R	N.C.R
MVG	MOBILE PHONE POSITIONNING SYSTEM	N/A	WXG009-4	N.C.R	N.C.R
KUKA	Robot	KR 6 R900 sixx	WXG009-1	N.C.R	N.C.R
Anritsu	Universal Radio Communication Analyzer	MT8820C	WXJ008-5	03.03.2021	03.02.2022
R&S	Universal Radio Communication Tester	CMU200	WXJ008-2	06.18.2020	06.17.2021
HP	Network Analyzer	8753D	WXJ024	06.18.2020	06.17.2021
KEYSIGHT	EPM Series Power Meter	N1914A	WXJ075	11.12.2020	11.11.2021
KEYSIGHT	E-Series Power Sensor	E9300H	WXJ075-1	07.31.2020	07.30.2021
KEYSIGHT	E-Series Power Sensor	E9300H	WXJ075-2	08.21.2020	08.20.2021
KEYSIGHT	Signal Generator	N5173B	WXJ006-7	03.25.2021	03.24.2022
Huber Suhner	RF Cable	SUCOFLEX	WXG008-13	See Note 3	
Huber Suhner	RF Cable	SUCOFLEX	WXG008-14	See Note 3	
Huber Suhner	RF Cable	SUCOFLEX	WXG008-15	See Note 3	
Weinschel	Attenuator	23-3-34	WXG008-16	See Note 3	
Anritsu	Directional Coupler	MP654A	WXG008-17	See Note 3	
MVG	LIMESAR DIELECTRIC PROBE	SCLMP	WXG009-5	See Note 4	
TXC	Broadband Amplifier	BBA018000	WXG008-11	See Note 5	

Note:

1. The calibration certificate of MVG can be referred to appendix C of this report.
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The Insertion Loss calibration of Dual Directional Coupler and Attenuator were characterized via the network analyzer and compensated during system check.
4. The dielectric probe kit was calibrated via the network analyzer, with the specified procedure (calibrated in pure water) and calibration kit (standard) short circuit, before the dielectric measurement. The specific procedure and calibration kit are provided by MVG.
5. In system check we need to monitor the level on the spectrum analyzer, and adjust the power amplifier level to have precise power level to the dipole; the measured SAR will be normalized to 1 W input power according to the ratio of 1 W to the input power to the dipole. For system check, the calibration of the power amplifier is deemed not critically required for correct measurement; the spectrum analyzer is critical and we do have calibration for it
6. Attenuator insertion loss is calibrated by the network Analyzer, which the calibration is valid, before system check.
7. N.C.R means No Calibration Requirement.

9 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 9.1, for body SAR testing, the liquid height from the center of the flat phantom to liquid top surface is larger than 15 cm, which is shown in Fig. 9.2.

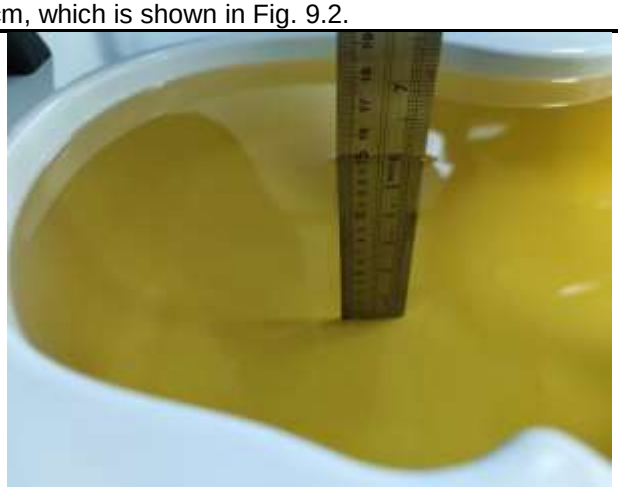


Fig. 9.1 Photo of Liquid Height for Head SAR (depth>15cm)

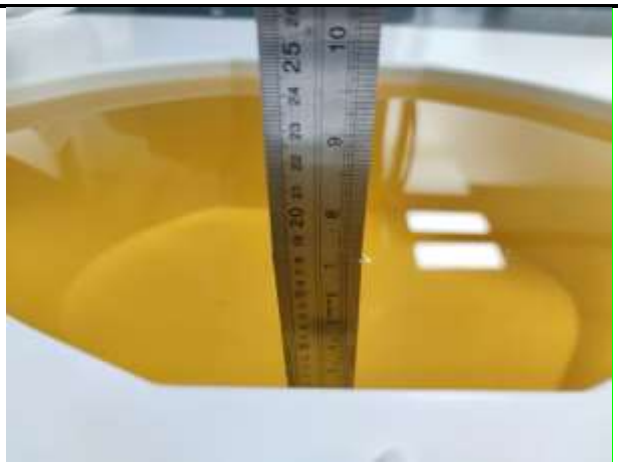


Fig. 9.2 Photo of Liquid Height for Body SAR (depth>15cm)

The relative permittivity and conductivity of the tissue material should be within ±5% of the values given in the table below recommended by the FCC OET 65 supplement C and RSS 102 Issue 5.

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

(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m

The dielectric parameters of liquids were verified prior to the SAR evaluation using a MVG Liquid measurement Kit and an Agilent Network Analyzer.
The following table shows the measuring results for simulating liquid.

Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (εr)	Conductivity Target(σ)	Permittivity Target(εr)	Delta (σ)%	Delta (εr)%	Limit (%)	Date (mm/dd/yy)
750	23.6	0.90	41.37	0.89	41.9	1.12	-1.26	±5	06.10.2021
835	23.6	0.93	40.97	0.90	41.5	3.33	-1.28	±5	06.10.2021
1750	24.0	1.39	39.79	1.37	40.1	1.46	-0.77	±5	06.16.2021
1900	24.0	1.43	39.11	1.40	40.0	2.14	-2.23	±5	06.16.2021
2450	23.3	1.78	39.81	1.80	39.2	-1.11	1.56	±5	06.15.2021
2600	23.3	1.99	39.12	1.96	39.0	1.53	0.31	±5	06.15.2021

10 SAR System Verification

Each ComoSAR system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the OpenSAR software, enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

- **Purpose of System Performance check**

  The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

- **System Setup**

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

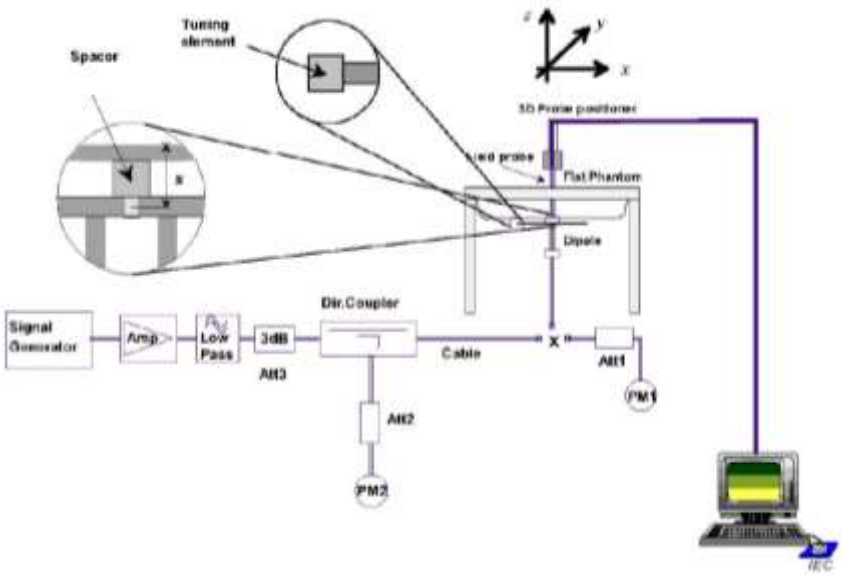


Fig.10.1 System Verification Setup Diagram

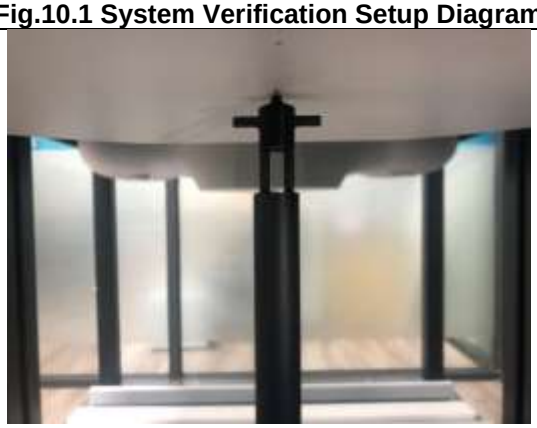


Fig.10.2 Photo of Dipole setup

➢ **System Verification Results**

Comparing to the original SAR value provided by MVG, the verification data should be within its specification of 10%. The table as below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix C of this report.

Date (mm/dd/yy)	Frequency (MHz)	Power fed onto dipole (mW)	Measured 1g SAR (W/kg)	Normalized to 1W 1g SAR (W/kg)	1W Target 1g SAR (W/kg)	Deviation (%)
06.10.2021	750	100	0.847	8.47	8.57	-1.17
06.10.2021	835	100	0.986	9.86	9.57	3.03
06.16.2021	1750	100	3.57	35.70	36.50	-2.19
06.16.2021	1900	100	3.89	38.90	39.60	-0.25
06.15.2021	2450	100	5.34	53.40	52.92	0.91
06.15.2021	2600	100	5.78	57.80	55.47	4.20

11 EUT Testing Position

This EUT was tested in ten different positions. They are right cheek/right tilted/left cheek/left tilted for head, Front/Back/Left Side/Right Side/Top Side/Bottom Side of the EUT with phantom 10 mm gap, as illustrated below, please refer to Appendix B for the test setup photos.

11.1 Handset Reference Points

- The vertical centreline 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, and the midpoint of the width w_b of the bottom of the handset.
- The horizontal line is perpendicular to the vertical centreline and passes the center of the acoustic output. The horizontal line is also tangential to the handset at point A.
- 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 centreline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

Fig.11.1 Illustration for Front, Back and Side of SAM Phantom

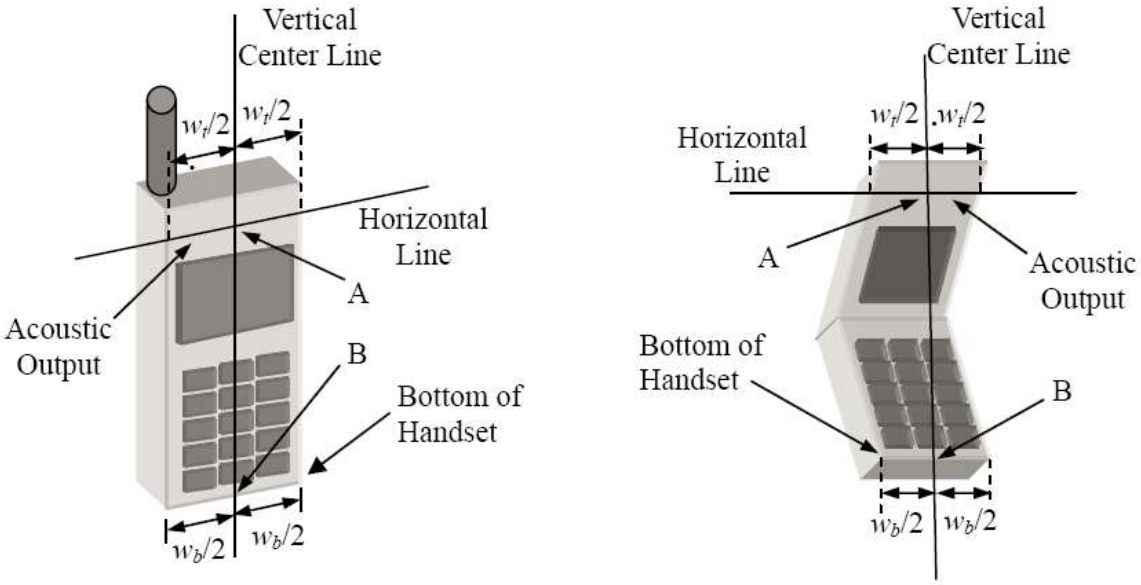


Fig. 11.2 Illustration for Handset Vertical and Horizontal Reference Lines

11.2 Positioning for Cheek / Touch

- To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see below figure)

Fig. 11.3 Illustration for Cheek Position

11.3 Positioning for Ear / 15º Tilt

- To position the device in the “cheek” position described above.
- While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see figure below).

Fig.11.4 Illustration for Tilted Position

11.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01r03. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR locations identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

11.5 Body Worn Accessory Configurations

- To position the device parallel to the phantom surface with either keypad up or down.
- To adjust the device parallel to the flat phantom.
- To adjust the distance between the device surface and the flat phantom to 10 mm or holster surface and the flat phantom to 0 mm.

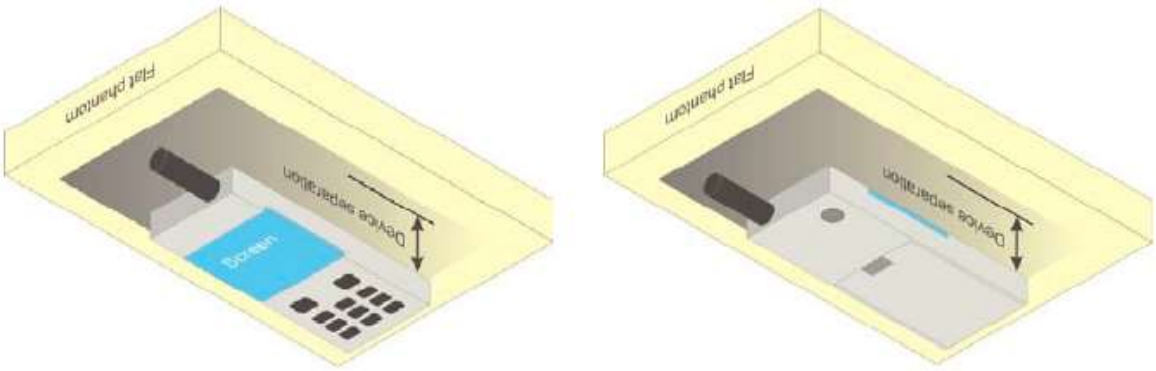


Fig.11.5 Illustration for Body Worn Position

11.6 Wireless Router (Hotspot) Configurations

Some battery-operated handsets have the capability to transmit and receive internet connectivity through simultaneous transmission of WIFI in conjunction with a separate licensed transmitter. The FCC has provided guidance in KDB Publication 941225 D06 where SAR test considerations for handsets (L x W ≥
9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device with antennas 2.5 cm or closer to the edge of the device, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI 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. Therefore, SAR must be evaluated for each frequency transmission and mode separately and summed with the WIFI transmitter according to KDB 648474 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

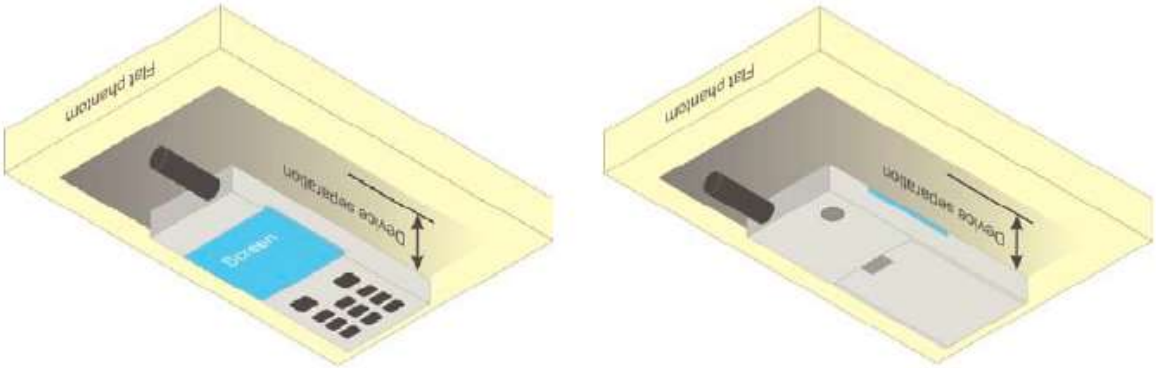


Fig.11.6 Illustration for Hotspot Position

12 Measurement Procedures

The measurement procedures are as bellows:

<Conducted power measurement>
- For WWAN power measurement, use base station simulator to configure EUT WWAN transition in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- Read the WWAN RF power level from the base station simulator.
- For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band.
- Connect EUT RF port through RF cable to the power meter or spectrum analyzer, and measure WLAN/BT output power.

<Conducted power measurement>
- Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
- Place the EUT in positions as Appendix B demonstrates.
- Set scan area, grid size and other setting on the OpenSAR software.
- Measure SAR results for the highest power channel on each testing position.
- Find out the largest SAR result on these testing positions of each band.
- Measure SAR results for other channels in worst SAR testing position if the Reported SAR or 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:

- Power reference measurement
- Area scan
- Zoom scan
- Power drift measurement

12.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The OpenSAR software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a “cube” measurement. The measured volume must include the 1g and 10 g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine. The system always gives the maximum values for 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:
- Extraction of the measured data (grid and values) from the Zoom Scan.
- Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
- Generation of a high-resolution mesh within the measured volume.
- Interpolation of all measured values form the measurement grid to the high-resolution grid
- Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- Calculation of the averaged SAR within masses of 1g and 10g.

12.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurement 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.

12.3 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r04 quoted below.

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

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

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

12.4 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software can combine and subsequently superpose these measurement data to calculating the multiband SAR.

12.5 SAR Averaged Methods

In COMOSAR system, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1g and 10g cubes, the extrapolation distance should not be larger than 5 mm.

12.6 Power Drift Monitoring

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. If the power drifts more than 5%, the SAR will be retested.

13 Conducted RF Output Power

13.1 GSM Conducted Power

Band: GSM 850	Burst Average Power (dBm)			Frame-Average Power(dBm)		
Channel	128	190	251	128	190	251
Frequency (MHz)	824.2	836.6	848.8	824.2	836.6	848.8
GSM (GMSK, Voice)	**33.98**	33.89	33.82	24.95	24.86	24.79
GPRS (GMSK, 1 TX slot)	33.91	33.87	33.81	24.88	24.84	24.78
GPRS (GMSK, 2 TX slots)	**31.85**	31.81	31.72	**25.83**	25.79	25.70
GPRS (GMSK, 3 TX slots)	29.91	29.90	29.81	25.65	25.64	25.55
GPRS (GMSK, 4 TX slots)	27.72	27.73	27.62	24.71	24.72	24.61
EGPRS (8PSK, 1 TX slot)	27.19	27.81	27.21	18.16	18.78	18.18
EGPRS (8PSK, 2 TX slots)	27.08	27.86	27.21	21.06	21.84	21.19
EGPRS (8PSK, 3 TX slots)	26.12	26.97	26.32	21.86	22.71	22.06
EGPRS (8PSK, 4 TX slots)	23.85	24.75	24.05	20.84	21.74	21.04

Remark:

1. The frame-averaged power is linearly reported the maximum burst averaged power over 8 time slots. The calculated method are shown as below:
   The duty cycle "x" of different time slots as below:
   1 TX slot is 1/8, 2 TX slots is 2/8, 3 TX slots is 3/8 and 4 TX slots is 4/8
   Based on the calculation formula:
   Frame-averaged power = Burst averaged power + 10 1og (x)
   So,
   Frame-averaged power (1 TX slot) = Burst averaged power (1 TX slot)– 9.03
   Frame-averaged power (2 TX slots) = Burst averaged power (2 TX slots)– 6.02
   Frame-averaged power (3 TX slots) = Burst averaged power (3 TX slots)– 4.26
   Frame-averaged power (4 TX slots) = Burst averaged power (4 TX slots) – 3.01
2. CS1 coding scheme was used in GPRS conducted power measurements and SAR testing, MCS5 coding scheme was used in EGPRS conducted power measurements and SAR testing (if necessary).

Note:

1. For Head SAR testing, GSM Voice mode should be evaluated, therefore the EUT was set in GSM 850 Voice mode.
2. For Body worn SAR testing, GSM Voice mode should be evaluated, therefore the EUT was set in GSM 850 Voice mode.
3. For Hotspot mode SAR testing, GPRS and EGPRS mode should be evaluated, therefore the EUT was set in GPRS 2 TX slots mode due to the highest frame-averaged power.
4. Per KDB447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
5. The EUT do not support DTM and VoIP function.

Band: PCS 1900	Burst Average Power (dBm)			Frame-Average Power(dBm)		
Channel	512	661	810	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8	1850.2	1880.0	1909.8
GSM (GMSK, Voice)	30.22	**30.26**	29.58	21.19	21.23	20.55
GPRS (GMSK, 1 TX slot)	30.15	30.19	29.42	21.19	21.26	20.39
GPRS (GMSK, 2 TX slots)	27.86	27.54	26.68	21.84	21.52	20.66
GPRS (GMSK, 3 TX slots)	**26.31**	25.93	25.07	**22.05**	21.67	20.81
GPRS (GMSK, 4 TX slots)	24.15	23.73	22.87	21.14	20.72	19.86
EGPRS (8PSK, 1 TX slot)	26.72	26.58	25.86	17.69	17.55	16.83
EGPRS (8PSK, 2 TX slots)	26.47	26.39	25.76	20.45	20.37	19.74
EGPRS (8PSK, 3 TX slots)	24.69	24.78	24.10	20.43	20.52	19.84
EGPRS (8PSK, 4 TX slots)	22.46	22.47	22.00	19.45	19.46	18.99

Remark:

3. The frame-averaged power is linearly reported the maximum burst averaged power over 8 time slots. The calculated method are shown as below:
   The duty cycle "x" of different time slots as below:
   1 TX slot is 1/8, 2 TX slots is 2/8, 3 TX slots is 3/8 and 4 TX slots is 4/8
   Based on the calculation formula:
   Frame-averaged power = Burst averaged power + 10 1og (x)
   So,
   Frame-averaged power (1 TX slot) = Burst averaged power (1 TX slot)– 9.03
   Frame-averaged power (2 TX slots) = Burst averaged power (2 TX slots)– 6.02
   Frame-averaged power (3 TX slots) = Burst averaged power (3 TX slots)– 4.26
   Frame-averaged power (4 TX slots) = Burst averaged power (4 TX slots) – 3.01
4. CS1 coding scheme was used in GPRS conducted power measurements and SAR testing, MCS5 coding scheme was used in EGPRS conducted power measurements and SAR testing (if necessary).

Note:

1. For Head SAR testing, GSM Voice mode should be evaluated, therefore the EUT was set in GSM 1900 Voice mode.
2. For Body worn SAR testing, GSM Voice mode should be evaluated, therefore the EUT was set in GSM Voice 1900 mode.
3. For Hotspot mode SAR testing, GPRS and EGPRS mode should be evaluated, therefore the EUT was set in GPRS 3 TX slots mode due to the highest frame-averaged power.
4. Per KDB447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
5. The EUT do not support DTM and VoIP function.

13.2 WCDMA Conducted Power

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Rohde & Schwarz CMU200 referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table 1

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{hs} (1)	CM (dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 (3)	15/15 (3)	64	12/15 (3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

HSDPA Sub-test setup configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Rohde & Schwarz CMU200 referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table 2

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

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} cannot be set directly; it is set by Absolute Grant Value.

HSUPA Sub-test setup configuration

WCDMA Conducted Power:

WCDMA Average power (dBm)			
Band	WCDMA Band V		
Channel	4132	4183	4233
Frequency (MHz)	826.4	836.6	846.6
AMR 12.2 kbps	22.93	22.85	22.81
RMC 12.2 kbps	**22.97**	22.89	22.88
HSDPA Sub-test 1	22.13	22.23	22.05
HSDPA Sub-test 2	21.98	21.93	21.87
HSDPA Sub-test 3	21.57	21.52	21.61
HSDPA Sub-test 4	21.60	21.58	21.60
HSUPA Sub-test 1	20.75	20.78	20.77
HSUPA Sub-test 2	20.97	20.90	20.95
HSUPA Sub-test 3	20.39	20.47	20.47
HSUPA Sub-test 4	20.49	20.17	20.37
HSUPA Sub-test 5	22.48	22.65	22.61

WCDMA Average power (dBm)			
Band	WCDMA Band IV		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
AMR 12.2 kbps	22.18	22.71	22.33
RMC 12.2 kbps	22.28	**22.73**	22.34
HSDPA Sub-test 1	21.72	22.06	21.95
HSDPA Sub-test 2	21.64	22.10	21.93
HSDPA Sub-test 3	21.62	22.12	21.88
HSDPA Sub-test 4	21.80	22.09	21.85
HSUPA Sub-test 1	21.29	21.75	21.67
HSUPA Sub-test 2	21.48	21.98	21.72
HSUPA Sub-test 3	21.05	21.45	21.23
HSUPA Sub-test 4	21.29	21.75	21.49
HSUPA Sub-test 5	21.77	22.23	22.01

WCDMA Average power (dBm)			
Band	WCDMA Band II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
AMR 12.2 kbps	23.80	23.72	23.52
RMC 12.2 kbps	**23.81**	23.74	23.55
HSDPA Sub-test 1	22.94	23.13	22.71
HSDPA Sub-test 2	22.77	22.81	22.56
HSDPA Sub-test 3	22.38	22.66	22.35
HSDPA Sub-test 4	22.58	22.64	22.39
HSUPA Sub-test 1	20.67	20.79	20.60
HSUPA Sub-test 2	21.21	21.29	21.02
HSUPA Sub-test 3	20.66	20.78	20.56
HSUPA Sub-test 4	21.02	21.12	20.82
HSUPA Sub-test 5	23.15	23.19	23.00

Note:

1. Applying the subtest setup in Table C.11.1.3 of 3GPP TS 34.121-1
2. Per KDB 941225 D01, RMC 12.2kbps mode is used to evaluate SAR due the highest output power. If AMR 12.2 kbps power is < 0.25dB higher than RMC 12.2kbps, SAR tests with AMR 12.2 kbps can be excluded.
3. AMR, HSDPA RF power will not be larger than RMC 12.2kbps, detailed information is included in Tune-up Procure exhibit.

13.3 LTE Conducted Power

13.3.1 Largest channel bandwidth standalone SAR test requirements

QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.8 When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

QPSK with 50% RB allocation

The procedures required for 1 RB allocation in section 4.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.9

QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in sections 4.2.1 and 4.2.2 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 4.2.1, 5.2.2 and 4.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

13.3.2 Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 4.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg. The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth. For example, 50 RB in 10 MHz channel bandwidth does not apply to 5 MHz channel bandwidth; therefore, this cannot be tested in the smaller channel bandwidth. However, 50% RB allocation in 10 MHz channel bandwidth is equivalent to 100% RB allocation in 5 MHz channel bandwidth; therefore, these are the equivalent configurations to be compared to determine the specific channel and configuration in the smaller channel bandwidth that need SAR testing.

LTE Band 2 part

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					18607	18900	19193
					1850.7MHz	1880.0MHz	1909.3MHz
Band 2	1.4	QPSK	1	0	23.57	23.41	23.42
			1	2	23.58	23.50	23.35
			1	5	23.61	23.40	23.20
			3	0	22.60	22.48	22.41
			3	1	22.71	22.46	22.48
			3	2	22.62	22.56	22.46
			6	0	22.47	22.51	22.31
		16QAM	1	0	22.81	22.79	22.64
			1	2	22.79	22.74	22.72
			1	5	22.70	22.80	22.56
			3	0	21.97	21.94	21.67
			3	1	21.82	21.82	21.71
			3	2	21.85	21.78	21.62
			6	0	21.79	21.85	21.57

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					18615	18900	19185
					1851.5MHz	1880.0MHz	1908.5MHz
Band 2	3	QPSK	1	0	23.65	23.50	23.45
			1	7	23.64	23.53	23.43
			1	14	23.64	23.53	23.41
			8	0	22.69	22.65	22.42
			8	4	22.71	22.66	22.46
			8	7	22.68	22.56	22.52
			15	0	22.78	22.59	22.44
		16QAM	1	0	22.78	22.58	22.54
			1	7	22.77	22.61	22.55
			1	14	22.70	22.55	22.59
			8	0	21.92	21.86	21.77
			8	4	21.96	21.86	21.80
			8	7	22.05	21.75	21.60
			15	0	21.82	21.69	21.52

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					18625	18900	19175
					1852.5MHz	1880.0MHz	1907.5MHz
Band 2	5	QPSK	1	0	23.78	23.56	23.44
			1	12	23.71	23.50	23.42
			1	24	23.70	23.58	23.38
			12	0	22.79	22.55	22.47
			12	6	22.72	22.60	22.58
			12	11	22.67	22.60	22.48
			25	0	22.67	22.50	22.42
		16QAM	1	0	22.80	22.48	22.48
			1	12	22.77	22.50	22.39
			1	24	22.85	22.52	22.30
			12	0	21.84	21.71	21.85
			12	6	21.85	21.72	21.84
			12	11	21.92	21.70	21.88
			25	0	21.77	21.59	21.74

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					18650	18900	19150
					1855.0MHz	1880.0MHz	1905.0MHz
Band 2	10	QPSK	1	0	23.78	23.60	23.53
			1	24	23.61	23.70	23.37
			1	49	23.66	23.76	23.41
			25	0	22.62	22.69	22.46
			25	12	22.64	22.64	22.59
			25	24	22.64	22.63	22.48
			50	0	22.63	22.55	22.48
		16QAM	1	0	22.79	22.60	22.65
			1	24	22.81	22.73	22.58
			1	49	22.70	22.78	22.53
			25	0	21.85	21.70	21.58
			25	12	21.86	21.81	21.50
			25	24	21.86	21.82	21.51
			50	0	21.77	21.76	21.46

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					18675	18900	19125
					1857.5MHz	1880.0MHz	1902.5MHz
Band 2	15	QPSK	1	0	23.55	23.50	23.72
			1	37	23.43	23.62	23.53
			1	74	23.35	23.68	23.49
			36	0	22.64	22.65	22.51
			36	16	22.57	22.45	22.60
			36	35	22.61	22.62	22.61
			75	0	22.56	22.68	22.46
		16QAM	1	0	22.59	22.73	22.53
			1	37	22.52	22.88	22.44
			1	74	22.46	23.02	22.60
			36	0	21.75	21.89	21.77
			36	16	21.65	21.81	21.61
			36	35	21.72	21.72	21.70
			75	0	21.53	21.69	21.64

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					18700	18900	19100
					1860.0MHz	1880.0MHz	1900.0MHz
Band 2	20	QPSK	1	0	23.67	23.39	23.64
			1	49	23.57	23.56	23.53
			1	99	23.52	23.61	23.34
			50	0	22.68	22.57	22.66
			50	24	22.64	22.47	22.64
			50	49	22.67	22.49	22.66
			100	0	22.65	22.73	22.57
		16QAM	1	0	22.75	22.65	22.51
			1	49	22.84	22.75	22.46
			1	99	22.88	22.82	22.41
			50	0	21.77	21.75	21.64
			50	24	21.76	21.66	21.59
			50	49	21.67	21.68	22.67
			100	0	21.77	21.72	21.54

LTE Band 4 part

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					19957	20175	20393
					1710.7MHz	1732.5MHz	1754.3MHz
Band 4	1.4	QPSK	1	0	23.67	23.91	23.81
			1	2	23.67	23.97	23.68
			1	5	23.65	24.03	23.78
			3	0	22.51	22.73	22.51
			3	1	22.52	22.84	22.50
			3	2	22.53	22.76	22.51
			6	0	22.45	22.71	22.45
		16QAM	1	0	23.38	23.33	23.33
			1	2	23.33	23.09	23.37
			1	5	23.23	23.12	23.28
			3	0	21.68	21.81	21.85
			3	1	21.75	21.79	21.75
			3	2	21.67	21.87	21.81
			6	0	21.52	21.71	21.68

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					19965	20175	20385
					1711.5MHz	1732.5MHz	1753.5MHz
Band 4	3	QPSK	1	0	23.80	24.01	23.84
			1	7	23.79	24.11	23.88
			1	14	23.77	24.13	23.83
			8	0	22.57	22.75	22.48
			8	4	22.48	22.75	22.49
			8	7	22.51	22.84	22.53
			15	0	22.48	22.78	22.53
		16QAM	1	0	23.08	23.22	23.08
			1	7	23.12	23.14	22.98
			1	14	23.01	23.27	23.03
			8	0	21.72	22.08	21.82
			8	4	21.72	22.13	21.76
			8	7	21.64	22.08	21.79
			15	0	21.44	21.91	21.52

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					19975	20175	20375
					1712.5MHz	1732.5MHz	1752.5MHz
Band 4	5	QPSK	1	0	23.76	24.13	23.83
			1	12	23.77	24.25	23.82
			1	24	23.80	24.21	23.94
			12	0	22.45	22.85	22.61
			12	6	22.49	22.82	22.54
			12	11	22.57	22.8	22.47
			25	0	22.45	22.88	22.57
		16QAM	1	0	23.01	22.91	22.91
			1	12	23.08	22.88	23.03
			1	24	22.92	22.85	22.83
			12	0	21.61	21.93	21.68
			12	6	21.67	21.92	21.72
			12	11	21.57	21.89	21.66
			25	0	21.67	22.01	21.68

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20000	20175	20350
					1715.0MHz	1732.5MHz	1750.0MHz
Band 4	10	QPSK	1	0	23.77	23.95	23.90
			1	24	23.80	24.06	23.79
			1	49	23.75	24.01	23.82
			25	0	22.42	22.83	22.54
			25	12	22.58	22.81	22.54
			25	24	22.47	22.90	22.56
			50	0	22.42	22.84	22.47
		16QAM	1	0	23.12	23.28	23.01
			1	24	23.07	23.27	22.94
			1	49	23.06	23.40	22.91
			25	0	21.63	21.91	21.68
			25	12	21.62	21.91	21.69
			25	24	21.66	21.89	21.66
			50	0	21.56	21.94	21.59

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20025	20175	20325
					1717.5MHz	1732.5MHz	1747.5MHz
Band 4	15	QPSK	1	0	24.04	24.14	24.35
			1	37	24.01	24.32	24.20
			1	74	24.07	24.28	24.18
			36	0	22.49	22.85	22.68
			36	16	22.58	22.84	22.64
			36	35	22.47	22.73	22.65
			75	0	22.64	22.87	22.67
		16QAM	1	0	23.07	23.02	23.46
			1	37	22.99	23.23	23.33
			1	74	23.15	23.24	23.32
			36	0	21.73	21.88	21.90
			36	16	21.76	21.87	21.89
			36	35	21.68	21.86	21.86
			75	0	21.64	21.84	21.74

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20050	20175	20300
					1720.0MHz	1732.5MHz	1745.0MHz
Band 4	20	QPSK	1	0	24.08	24.30	24.38
			1	49	24.14	24.55	24.27
			1	99	24.30	24.52	24.18
			50	0	22.49	22.75	22.81
			50	24	22.50	22.82	22.86
			50	49	22.54	22.83	22.88
			100	0	22.55	22.78	22.70
		16QAM	1	0	23.36	23.17	23.44
			1	49	23.48	23.29	23.48
			1	99	23.27	23.22	23.43
			50	0	21.60	21.90	21.91
			50	24	21.60	21.88	21.91
			50	49	21.56	21.97	21.84
			100	0	21.74	21.87	21.89

LTE Band 5 part:

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20407	20525	20643
					824.7MHz	836.5MHz	848.3MHz
Band 5	1.4	QPSK	1	0	23.59	23.53	23.57
			1	2	23.52	23.57	23.58
			1	5	23.48	23.52	23.67
			3	0	22.64	22.66	22.50
			3	1	22.66	22.67	22.54
			3	2	22.62	22.65	22.60
			6	0	22.60	22.61	22.57
		16QAM	1	0	22.44	22.46	22.62
			1	2	22.40	22.57	22.66
			1	5	22.43	22.61	22.56
			3	0	21.62	21.64	21.67
			3	1	21.54	21.55	21.74
			3	2	21.76	21.62	21.67
			6	0	21.60	21.51	21.59

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20415	20525	20635
					825.5MHz	836.5MHz	847.5MHz
Band 5	3	QPSK	1	0	23.79	23.55	23.53
			1	7	23.76	23.66	23.54
			1	14	23.67	23.60	23.64
			8	0	22.66	22.55	22.55
			8	4	22.67	22.55	22.59
			8	7	22.71	22.67	22.59
			15	0	22.61	22.68	22.54
		16QAM	1	0	22.41	22.61	22.52
			1	7	22.34	22.51	22.47
			1	14	22.42	22.53	22.65
			8	0	21.47	21.62	21.84
			8	4	21.49	21.77	21.81
			8	7	21.53	21.70	21.79
			15	0	21.50	21.66	21.54

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20425	20525	20625
					826.5MHz	836.5MHz	846.5MHz
Band 5	5	QPSK	1	0	23.79	23.56	23.54
			1	12	23.68	23.61	23.62
			1	24	23.75	23.68	23.60
			12	0	22.66	22.63	22.63
			12	6	22.70	22.59	22.52
			12	11	22.72	22.45	22.43
			25	0	22.61	22.63	22.57
		16QAM	1	0	22.76	22.53	22.39
			1	12	22.61	22.41	22.42
			1	24	22.71	22.57	22.52
			12	0	21.62	21.53	21.70
			12	6	21.66	21.51	21.52
			12	11	21.64	21.50	21.65
			25	0	21.58	21.41	21.56

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20450	20525	20600
					829MHz	836.5MHz	844MHz
Band 5	10	QPSK	1	0	23.70	23.69	23.71
			1	24	23.68	23.63	23.64
			1	49	23.63	23.68	23.63
			25	0	22.61	22.64	22.65
			25	12	22.65	22.63	22.53
			25	24	22.67	22.70	22.55
			50	0	22.72	22.68	22.58
		16QAM	1	0	22.59	22.62	22.61
			1	24	22.62	22.68	22.51
			1	49	22.51	22.57	22.53
			25	0	21.64	21.82	21.53
			25	12	21.66	21.69	21.49
			25	24	21.68	21.72	21.53
			50	0	21.57	21.64	21.48

LTE Band 7 part:

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20775	21100	21425
					2502.5MHz	2535.0MHz	2567.5MHz
Band 7	5	QPSK	1	0	22.75	22.51	22.50
			1	12	22.65	22.90	22.61
			1	24	22.75	22.46	22.58
			12	0	21.74	21.83	21.97
			12	6	21.70	21.85	21.98
			12	11	21.82	21.84	21.96
			25	0	21.67	21.84	21.86
		16QAM	1	0	22.22	22.23	22.43
			1	12	22.04	22.28	22.39
			1	24	22.17	22.24	22.44
			12	0	20.93	21.18	21.18
			12	6	21.01	21.17	21.16
			12	11	21.05	21.04	21.15
			25	0	20.89	21.03	21.07

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20800	21100	21400
					2505.0MHz	2535.0MHz	2565.0MHz
Band 7	10	QPSK	1	0	22.64	22.69	22.98
			1	24	22.46	22.65	22.76
			1	49	22.75	22.70	22.85
			25	0	21.71	21.84	21.80
			25	12	21.69	21.75	21.71
			25	24	21.69	21.76	21.73
			50	0	21.65	21.88	21.65
		16QAM	1	0	22.13	22.13	22.07
			1	24	22.16	21.99	22.10
			1	49	22.24	22.03	21.96
			25	0	21.03	21.04	21.22
			25	12	21.15	21.10	21.34
			25	24	21.03	21.12	21.24
			50	0	20.96	21.02	21.15

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20825	21100	21375
					2507.5MHz	2535.0MHz	2562.5MHz
Band 7	15	QPSK	1	0	22.90	22.94	23.11
			1	37	22.89	22.85	23.01
			1	74	23.05	22.82	22.66
			36	0	21.78	21.80	21.89
			36	16	21.77	21.84	21.94
			36	35	21.79	21.84	21.91
			75	0	21.76	21.77	21.83
		16QAM	1	0	22.18	22.12	22.31
			1	37	22.07	22.09	22.41
			1	74	22.22	22.05	22.39
			36	0	21.04	21.16	21.33
			36	16	21.09	21.17	21.29
			36	35	21.15	21.09	21.31
			75	0	20.96	21.07	21.32

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20850	21100	21350
					2510.0MHz	2535.0MHz	2560.0MHz
Band 7	20	QPSK	1	0	22.98	23.15	23.14
			1	49	22.89	22.97	23.32
			1	99	23.05	23.14	23.05
			50	0	21.65	21.87	21.92
			50	24	21.66	21.70	21.95
			50	49	21.64	21.81	21.78
			100	0	21.59	21.83	21.74
		16QAM	1	0	22.39	22.32	22.32
			1	49	22.41	22.34	22.46
			1	99	22.53	22.48	22.42
			50	0	21.46	21.35	21.32
			50	24	21.45	21.29	21.35
			50	49	21.53	21.21	21.38
			100	0	21.44	21.10	21.25

LTE Band 17 part:

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					23755	23790	23825
					706.5MHz	710.0MHz	713.5MHz
Band 17	5	QPSK	1	0	23.49	23.42	23.46
			1	12	23.50	23.39	23.47
			1	24	23.56	23.44	23.53
			12	0	22.42	22.46	22.46
			12	6	22.40	22.49	22.39
			12	11	22.32	22.50	22.36
			25	0	22.28	22.38	22.34
		16QAM	1	0	22.37	22.41	22.52
			1	12	22.27	22.43	22.61
			1	24	22.40	22.51	22.64
			12	0	21.30	21.40	21.32
			12	6	21.25	21.35	21.33
			12	11	21.06	21.39	21.32
			25	0	21.48	21.26	21.37

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					23780	23790	23800
					709.0MHz	710.0MHz	711.0MHz
Band 17	10	QPSK	1	0	23.33	23.26	23.44
			1	24	23.38	23.44	23.49
			1	49	23.31	23.36	23.51
			25	0	22.40	22.22	22.51
			25	12	22.42	22.25	22.55
			25	24	22.38	22.28	22.65
			50	0	22.39	22.11	22.48
		16QAM	1	0	22.54	22.47	22.42
			1	24	22.50	22.46	22.53
			1	49	22.44	22.42	22.23
			25	0	21.34	21.35	21.47
			25	12	21.33	21.37	21.44
			25	24	21.33	21.38	21.47
			50	0	21.43	21.31	21.39

13.4 WLAN 2.4 GHz Band Conducted Power

Average Power (dBm)				
Channel	Frequency (MHz)	802.11 b	802.11 g	802.11n (HT20)
CH 01	2412	12.99	**12.62**	11.77
CH 06	2437	10.81	10.48	10.55
CH 11	2462	**13.37**	12.06	12.54

Average Power (dBm)		
Channel	Frequency (MHz)	802.11n (HT40)
CH 03	2422	10.88
CH 06	2437	10.53
CH 09	2452	10.90

Note:

1. Per KDB 447498 D01v06, the 1-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*)] · [√f(GHz)] ≤ 3.0 for 1-g 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

Channel	Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Power (mW)	Test distance (mm)	Result	exclusion thresholds for 1-g SAR
b/CH 11	2.462	13.5	22.39	5	7.03	3.0
g/CH 01	2.412	13.0	19.95	5	6.26	3.0

2. Base on the result of note1, RF exposure evaluation of 802.11 b mode is required.
3. Per KDB 248227 D01v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
4. Per KDB 248227 D01v02r02, In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. SAR is not required for the following 2.4 GHz OFDM conditions:
   1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
   2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
5. The output power of all data rate were pre-scan, just the worst case (the lowest data rate) of all mode were shown in report.
6. Per KDB 248227 D01V02r02 section 2.2, when the EUT in continuously transmitting mode, the actual duty cycle is 98.72%, so the duty cycle factor is 1.01

13.5 WLAN 5.2GHz Band Conducted Power

Average Power (dBm)				
Channel	Frequency (MHz)	802.11 a	802.11 n20	802.11 ac20
CH 36	5180	5.95	6.41	6.39
CH 40	5200	6.45	6.79	6.89
CH 48	5240	5.14	5.73	5.62

Average Power (dBm)			
Channel	Frequency (MHz)	802.11n 40	802.11 ac40
CH 38	5190	6.86	6.69
CH 46	5230	5.78	5.75

Average Power (dBm)		
Channel	Frequency (MHz)	802.11ac 80
CH 42	5210	**7.18**

Note:

7. Per KDB 447498 D01v06, the 1-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*)] · [√f(GHz)] ≤ 3.0 for 1-g 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

Channel	Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Power (mW)	Test distance (mm)	Result	exclusion thresholds for 1-g SAR
a/CH 42	5.210	7.5	5.62	5	2.56	3.0

8. Base on the result of note1, RF exposure evaluation of 802.11 a mode is not required.
9. Per KDB 248227 D01v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
10. The output power of all data rate were pre-scan, just the worst case of all mode were shown in report.
11. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according is applied to determine SAR test exclusion.

13.6 Bluetooth Conducted Power

Peak Power (dBm) (Bluetooth)				
Channel	Frequency (MHz)	GFSK	π/4-DQPSK	8DPSK
CH 00	2402	1.16	2.57	2.94
CH 39	2441	0.56	1.39	1.73
CH 78	2480	3.00	3.34	**3.61**

Peak Power (dBm)		
Channel	Frequency (MHz)	BLE
CH 00	2402	-0.51
CH 20	2442	-0.98
CH 39	2480	-0.22

Note:

1. Per KDB 447498 D01v06, the 1-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*)] · [√f(GHz)] ≤ 3.0 for 1-g 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

Channel	Frequency (GHz)	Max. tune-up Power (dBm)	Max. Power (mW)	Test distance (mm)	Result	exclusion thresholds for 1-g SAR
CH 78	2.480	4	2.51	5	0.79	3.0

2. The max. tune-up power was provided by manufacturer, base on the result of note 1, RF exposure evaluation is not required.
3. The output power of all data rate were pre-scan, just the worst case of all mode were shown in report.
4. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according is applied to determine SAR test exclusion.

14 Exposure Positions Consideration

14.1 EUT Antenna Locations

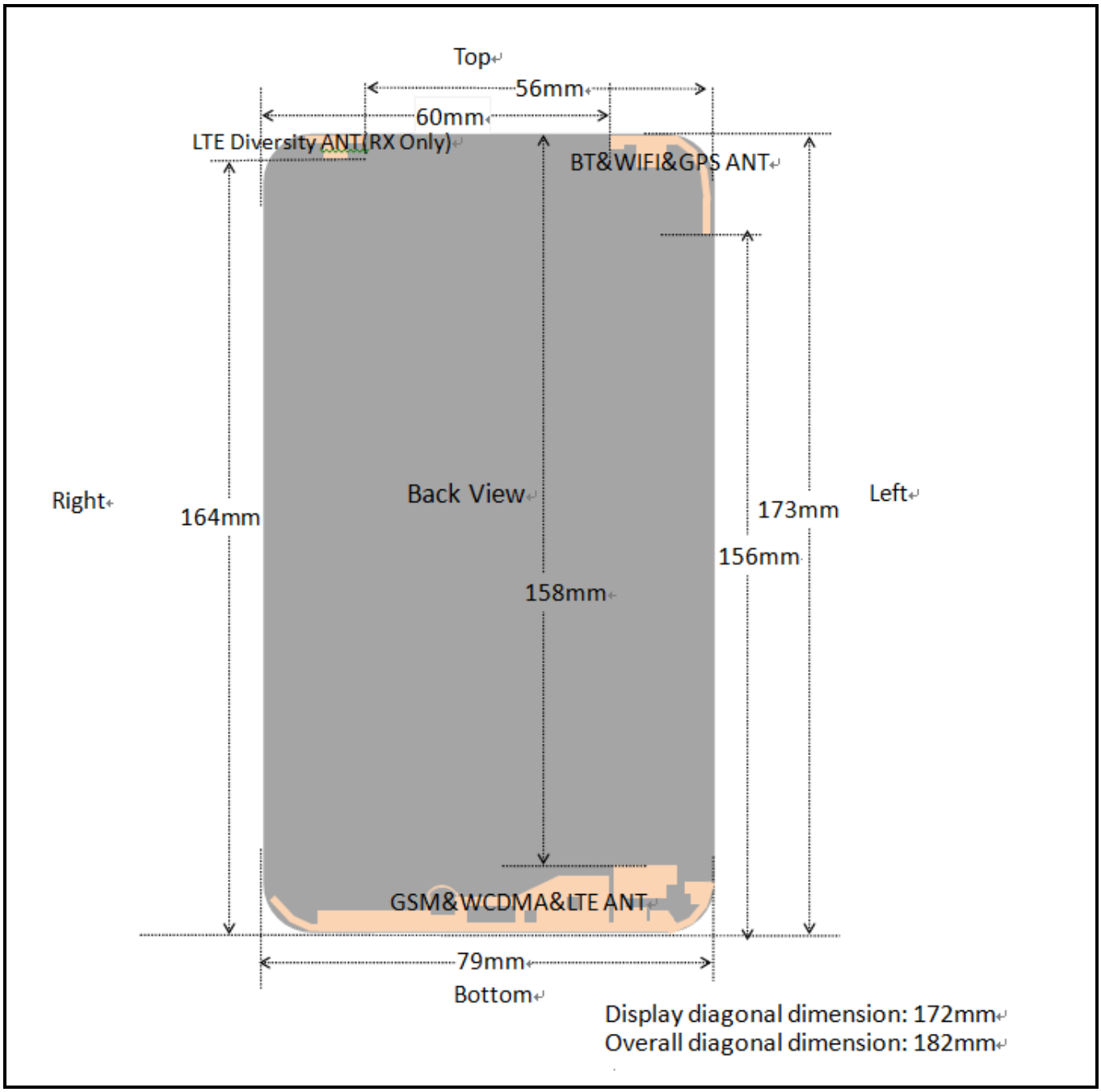


Fig.14.1 EUT Antenna Locations

Note: This antenna diagram is only used as a reference for the distance from the antenna to each edge. For the specific shape of the antenna, please refer to the physical photo.

14.2 Test Positions Consideration

Distance of Antennas to EUT edge/surface Test distance: 10mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
2G/3G/4G	<25mm	<25mm	158mm	<25mm	<25mm	<25mm
WLAN & Bluetooth	<25mm	<25mm	<25mm	156mm	60mm	<25mm

Test Positions Test distance: 10mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
2G/3G/4G	Yes	Yes	No	Yes	Yes	Yes
WLAN & Bluetooth	Yes	Yes	Yes	No	No	Yes

Note:

1. Head/Body-worn/Hotspot mode SAR assessments are required.
2. Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm * 5cm, the test distance is 10mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
3. Per KDB 447498 D01v06, for handsets the test separation distance is determined by the smallest distance between the outer surface of the device and the user, which is 0 mm for head SAR, 10 mm for hotspot SAR, and 10 mm for body-worn SAR.

15 SAR Test Results Summary

15.1 Standalone Head SAR Data

➢ GSM Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
1	GSM850/Voice	Right Cheek	128	824.2	33.98	0.87	34.0	**0.165**	1.005	0.166
	GSM850/Voice	Right Tilted	128	824.2	33.98	3.16	34.0	0.070	1.005	0.070
	GSM850/Voice	Left Cheek	128	824.2	33.98	-2.96	34.0	0.104	1.005	0.105
	GSM850/Voice	Left Tilted	128	824.2	33.98	3.06	34.0	0.044	1.005	0.044
	GSM1900/Voice	Right Cheek	661	1880.0	30.26	-3.81	30.5	0.024	1.057	0.025
	GSM1900/Voice	Right Tilted	661	1880.0	30.26	-2.16	30.5	0.011	1.057	0.012
2	GSM1900/Voice	Left Cheek	661	1880.0	30.26	-0.52	30.5	**0.037**	1.057	0.039
	GSM1900/Voice	Left Tilted	661	1880.0	30.26	-2.00	30.5	0.015	1.057	0.016
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ WCDMA Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
3	Band V/RMC	Right Cheek	4132	826.4	22.97	-1.02	23.0	**0.081**	1.007	0.082
	Band V/RMC	Right Tilted	4132	826.4	22.97	1.19	23.0	0.035	1.007	0.035
	Band V/RMC	Left Cheek	4132	826.4	22.97	-2.47	23.0	0.066	1.007	0.066
	Band V/RMC	Left Tilted	4132	826.4	22.97	2.97	23.0	0.027	1.007	0.027
	Band IV/RMC	Right Cheek	1413	1732.6	22.73	3.97	23.0	0.025	1.064	0.027
	Band IV/RMC	Right Tilted	1413	1732.6	22.73	0.29	23.0	0.011	1.064	0.012
4	Band IV/RMC	Left Cheek	1413	1732.6	22.73	1.84	23.0	**0.050**	1.064	0.053
	Band IV/RMC	Left Tilted	1413	1732.6	22.73	-2.62	23.0	0.022	1.064	0.023
	Band II/RMC	Right Cheek	9262	1852.4	23.81	3.24	24.0	0.026	1.045	0.027
	Band II/RMC	Right Tilted	9262	1852.4	23.81	2.24	24.0	0.012	1.045	0.013
5	Band II/RMC	Left Cheek	9262	1852.4	23.81	-1.41	24.0	**0.043**	1.045	0.045
	Band II/RMC	Left Tilted	9262	1852.4	23.81	-0.39	24.0	0.020	1.045	0.021
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 20MHz QPSK 1RB Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band2/RB#0	Right Cheek	18700	1860.0	23.67	-1.05	24.0	0.019	1.079	0.021
	Band2/RB#0	Right Tilted	18700	1860.0	23.67	-3.19	24.0	0.007	1.079	0.008
6	Band2/RB#0	Left Cheek	18700	1860.0	23.67	0.92	24.0	**0.022**	1.079	0.024
	Band2/RB#0	Left Tilted	18700	1860.0	23.67	-0.99	24.0	0.009	1.079	0.010
	Band4/RB#49	Right Cheek	20175	1732.5	24.55	1.71	25.0	0.034	1.109	0.038
	Band4/RB#49	Right Tilted	20175	1732.5	24.55	2.62	25.0	0.014	1.109	0.016
7	Band4/RB#49	Left Cheek	20175	1732.5	24.55	3.13	25.0	**0.044**	1.109	0.049
	Band4/RB#49	Left Tilted	20175	1732.5	24.55	-2.10	25.0	0.019	1.109	0.021
	Band7/RB#49	Right Cheek	21350	2560.0	23.32	-1.64	23.5	0.023	1.042	0.024
	Band7/RB#49	Right Tilted	21350	2560.0	23.32	-0.54	23.5	0.010	1.042	0.010
8	Band7/RB#49	Left Cheek	21350	2560.0	23.32	0.81	23.5	**0.031**	1.042	0.032
	Band7/RB#49	Left Tilted	21350	2560.0	23.32	-1.61	23.5	0.014	1.042	0.015
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 10MHz QPSK 1RB Head SAR

Plot	Band/Mode	Test	CH.	Freq.	Ave.	Power	Tune-Up	Meas.	Scaling	Reported

No.		Position		(MHz)	Power (dBm)	Drift (%)	Limit (dBm)	SAR_{1g} (W/kg)	Factor	SAR_{1g} (W/kg)
9	Band5/RB#0	Right Cheek	20600	844.0	23.71	-2.11	24.0	**0.078**	1.069	0.083
	Band5/RB#0	Right Tilted	20600	844.0	23.71	0.29	24.0	0.031	1.069	0.033
	Band5/RB#0	Left Cheek	20600	844.0	23.71	-0.97	24.0	0.051	1.069	0.055
	Band5/RB#0	Left Tilted	20600	844.0	23.71	3.17	24.0	0.021	1.069	0.022
10	Band17/RB#49	Right Cheek	23800	711.0	23.51	3.02	24.0	**0.074**	1.119	0.083
	Band17/RB#49	Right Tilted	23800	711.0	23.51	-1.60	24.0	0.030	1.119	0.034
	Band17/RB#49	Left Cheek	23800	711.0	23.51	-0.72	24.0	0.068	1.119	0.076
	Band17/RB#49	Left Tilted	23800	711.0	23.51	-1.46	24.0	0.026	1.119	0.029
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 20MHz QPSK 50%RB Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band2/RB#0	Right Cheek	18700	1860.0	22.68	0.52	23.0	0.021	1.076	0.023
	Band2/RB#0	Right Tilted	18700	1860.0	22.68	2.68	23.0	0.009	1.076	0.010
11	Band2/RB#0	Left Cheek	18700	1860.0	22.68	-2.45	23.0	**0.030**	1.076	0.032
	Band2/RB#0	Left Tilted	18700	1860.0	22.68	-1.84	23.0	0.012	1.076	0.013
	Band4/RB#49	Right Cheek	20300	1745.0	22.88	3.09	23.0	0.023	1.028	0.024
	Band4/RB#49	Right Tilted	20300	1745.0	22.88	-1.75	23.0	0.010	1.028	0.010
12	Band4/RB#49	Left Cheek	20300	1745.0	22.88	-3.50	23.0	**0.034**	1.028	0.035
	Band4/RB#49	Left Tilted	20300	1745.0	22.88	-1.17	23.0	0.015	1.028	0.015
	Band7/RB#24	Right Cheek	21350	2560.0	21.95	-2.09	22.0	0.013	1.012	0.013
	Band7/RB#24	Right Tilted	21350	2560.0	21.95	1.11	22.0	0.005	1.012	0.005
13	Band7/RB#24	Left Cheek	21350	2560.0	21.95	-3.92	22.0	**0.021**	1.012	0.021
	Band7/RB#24	Left Tilted	21350	2560.0	21.95	2.22	22.0	0.009	1.012	0.009
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 10MHz QPSK 50%RB Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
14	Band5/RB#24	Right Cheek	20525	836.5	22.70	-2.75	23.0	**0.049**	1.072	0.053
	Band5/RB#24	Right Tilted	20525	836.5	22.70	-1.99	23.0	0.023	1.072	0.025
	Band5/RB#24	Left Cheek	20525	836.5	22.70	-3.71	23.0	0.039	1.072	0.042
	Band5/RB#24	Left Tilted	20525	836.5	22.70	2.38	23.0	0.016	1.072	0.017
15	Band17/RB#24	Right Cheek	23800	711.0	22.65	1.56	23.0	**0.063**	1.084	0.068
	Band17/RB#24	Right Tilted	23800	711.0	22.65	0.69	23.0	0.026	1.084	0.028
	Band17/RB#24	Left Cheek	23800	711.0	22.65	-0.68	23.0	0.056	1.084	0.061
	Band17/RB#24	Left Tilted	23800	711.0	22.65	-0.05	23.0	0.022	1.084	0.024
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ WLAN 2.4 GHz Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
16	2.4GHz/802.11b	Right Cheek	11	2462	13.37	-0.35	13.5	**0.480**	1.030	1.01	0.494
	2.4GHz/802.11b	Right Tilted	11	2462	13.37	3.35	13.5	0.382	1.030	1.01	0.393
	2.4GHz/802.11b	Left Cheek	11	2462	13.37	-0.14	13.5	0.235	1.030	1.01	0.242
	2.4GHz/802.11b	Left Tilted	11	2462	13.37	2.90	13.5	0.191	1.030	1.01	0.197
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

Note:

1. Per KDB 447498 D01v06, for each exposure position, if the highest output power channel Reported SAR ≤ 0.8W/kg, other channels SAR testing is not necessary.
2. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg.
3. Per KDB 941225 D05v02r05, 100% RB allocation SAR measurement is not required when the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg.
4. Per KDB 248227 D01v02r02, for 802.11b DSSS , when the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required in that exposure configuration.
5. Per KDB 248227 D01v02r02, OFDM SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. Cuz the maximum output power specified for OFDM and DSSS are 19.95mW(13.0dBm) and 22.39mW(13.5dBm), the scaled SAR would be 0.306×(19.95/22.39)=0.273W/Kg<1.2 W/kg, therefore, SAR is not required for OFDM.
6. According to KDB 865664 D02v01r02, SAR plot is required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination.

15.2 Standalone Body SAR

➢ GSM Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	GSM850/Voice	Front	128	824.2	33.98	1.69	34.0	0.207	1.005	0.208
17	GSM850/Voice	Back	128	824.2	33.98	-3.50	34.0	**0.312**	1.005	0.314
	GSM1900/Voice	Front	661	1880.0	30.26	0.57	30.5	0.078	1.057	0.082
18	GSM1900/Voice	Back	661	1880.0	30.26	-0.33	30.5	**0.113**	1.057	0.119
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ WCDMA Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band V/RMC	Front	4132	826.4	22.97	-3.70	23.0	0.090	1.007	0.091
19	Band V/RMC	Back	4132	826.4	22.97	-2.83	23.0	**0.164**	1.007	0.165
	Band IV/RMC	Front	1413	1732.6	22.73	0.06	23.0	0.233	1.064	0.248
20	Band IV/RMC	Back	1413	1732.6	22.73	-0.64	23.0	**0.522**	1.064	0.555
	Band II/RMC	Front	9262	1852.4	23.81	1.01	24.0	0.124	1.045	0.130
21	Band II/RMC	Back	9262	1852.4	23.81	-2.24	24.0	**0.210**	1.045	0.219
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 20MHz QPSK 1RB Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band2/RB#0	Front	18700	1860.0	23.67	-1.33	24.0	0.153	1.079	0.165
22	Band2/RB#0	Back	18700	1860.0	23.67	3.31	24.0	**0.219**	1.079	0.236
	Band4/RB#49	Front	20175	1732.5	24.55	0.16	25.0	0.368	1.109	0.408
23	Band4/RB#49	Back	20175	1732.5	24.55	3.35	25.0	**0.661**	1.109	0.733
	Band7/RB#49	Front	21350	2560.0	23.32	-0.97	23.5	0.054	1.042	0.056
24	Band7/RB#49	Back	21350	2560.0	23.32	-0.70	23.5	**0.247**	1.042	0.257
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 10MHz QPSK 1RB Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band5/RB#0	Front	20600	844.0	23.71	-2.05	24.0	0.098	1.069	0.105
25	Band5/RB#0	Back	20600	844.0	23.71	-3.68	24.0	**0.164**	1.069	0.175
	Band17/RB#49	Front	23800	711.0	23.51	0.43	24.0	0.068	1.119	0.076
26	Band17/RB#49	Back	23800	711.0	23.51	-0.22	24.0	**0.112**	1.119	0.125
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 20MHz QPSK 50%RB Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band2/RB#0	Front	18700	1860.0	22.68	2.14	23.0	0.123	1.076	0.132
27	Band2/RB#0	Back	18700	1860.0	22.68	-2.89	23.0	**0.171**	1.076	0.184
	Band4/RB#49	Front	20300	1745.0	22.88	2.25	23.0	0.257	1.028	0.264
28	Band4/RB#49	Back	20300	1745.0	22.88	3.65	23.0	**0.434**	1.028	0.446
	Band7/RB#24	Front	21350	2560.0	21.95	1.06	22.0	0.032	1.012	0.032
29	Band7/RB#24	Back	21350	2560.0	21.95	0.37	22.0	**0.190**	1.012	0.192
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 10MHz QPSK 50%RB Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band5/RB#24	Front	20525	836.5	22.70	-1.47	23.0	0.077	1.072	0.083
30	Band5/RB#24	Back	20525	836.5	22.70	-3.60	23.0	**0.126**	1.072	0.135
	Band17/RB#24	Front	23800	711.0	22.65	1.09	23.0	0.058	1.084	0.063
31	Band17/RB#24	Back	23800	711.0	22.65	0.85	23.0	**0.101**	1.084	0.109
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ WLAN 2.4 GHz Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	2.4GHz/802.11b	Front	11	2462	13.37	-0.75	13.5	0.076	1.030	1.01	0.079
32	2.4GHz/802.11b	Back	11	2462	13.37	3.46	13.5	**0.099**	1.030	1.01	0.103
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

Note:

1. Body-worn SAR testing was performed at 10mm separation, and this distance is determined by the handset manufacturer that there will be body-worn accessories that users may acquire at the time of equipment certification, to enable users to purchase aftermarket body-worn accessories with the required minimum separation.
2. Per KDB 941225 D06v02r01, when the same wireless modes and device transmission configurations are required for testing body-worn accessories and hotspot mode, it is not necessary to test body-worn accessory SAR for the same device orientation if the test separation distance for hotspot mode is more conservative than that used for body-worn accessories.
3. Body-worn exposure conditions are intended to voice call operations, therefore GSM voice call is selected to be tested.
4. Per KDB 648474 D04v01r03, when the *Reported* SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
5. The WLAN SAR perform the front and back position, due considered the simultaneous SAR for body-worn.
6. Per KDB 447498 D01v06, for each exposure position, if the highest output channel Reported SAR ≤0.8W/kg, other channels SAR testing is not necessary.
7. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured

SAR is ≥0.8W/kg.

8. Per KDB 941225 D05v02r05, 100% RB allocation SAR measurement is not required when the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg.
9. According to KDB 865664 D02v01r02, SAR plot is required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination.

15.3 Body SAR in Hotspot Mode

➢ GSM Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	GPRS850/2 slots	Front	128	824.2	31.85	-3.04	32.0	0.224	1.035	0.232
33	GPRS850/2 slots	Back	128	824.2	31.85	2.14	32.0	**0.374**	1.035	0.387
	GPRS850/2 slots	Left	128	824.2	31.85	-3.87	32.0	0.111	1.035	0.115
	GPRS850/2 slots	Right	128	824.2	31.85	-2.98	32.0	0.096	1.035	0.099
	GPRS850/2 slots	Bottom	128	824.2	31.85	1.13	32.0	0.293	1.035	0.303
	GPRS1900/3 slots	Front	512	1850.2	26.31	-1.37	26.5	0.099	1.045	0.103
	GPRS1900/3 slots	Back	512	1850.2	26.31	3.45	26.5	0.176	1.045	0.184
	GPRS1900/3 slots	Left	512	1850.2	26.31	-0.33	26.5	0.069	1.045	0.072
	GPRS1900/3 slots	Right	512	1850.2	26.31	-3.59	26.5	0.051	1.045	0.053
34	GPRS1900/3 slots	Bottom	512	1850.2	26.31	-3.04	26.5	**0.179**	1.045	0.187
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ WCDMA Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band V/RMC	Front	4132	826.4	22.97	-3.70	23.0	0.090	1.007	0.091
19	Band V/RMC	Back	4132	826.4	22.97	-2.83	23.0	**0.164**	1.007	0.165
	Band V/RMC	Left	4233	846.6	22.97	-0.54	23.0	0.072	1.007	0.073
	Band V/RMC	Right	4233	846.6	22.97	-0.30	23.0	0.060	1.007	0.060
	Band V/RMC	Bottom	4233	846.6	22.97	1.47	23.0	0.125	1.007	0.126
	Band IV/RMC	Front	1413	1732.6	22.73	0.06	23.0	0.233	1.064	0.248
	Band IV/RMC	Back	1413	1732.6	22.73	-0.64	23.0	0.522	1.064	0.555
	Band IV/RMC	Left	1413	1732.6	22.73	-0.84	23.0	0.165	1.064	0.176
	Band IV/RMC	Right	1413	1732.6	22.73	-1.36	23.0	0.196	1.064	0.209
	Band IV/RMC	Bottom	1413	1732.6	22.73	-0.45	23.0	0.860	1.064	0.915
35	Band IV/RMC	Bottom	1312	1712.4	22.28	-1.70	23.0	**0.873**	1.180	1.030
	Band IV/RMC	**Bottom**	**1312**	**1712.4**	**22.28**	**-0.60**	**23.0**	**0.865**	**1.180**	**1.021**
	Band IV/RMC	Bottom	1513	1752.6	22.34	-0.14	23.0	0.797	1.164	0.928
	Band II/RMC	Front	9262	1852.4	23.81	1.01	24.0	0.124	1.045	0.130
	Band II/RMC	Back	9262	1852.4	23.81	-2.24	24.0	0.210	1.045	0.219
	Band II/RMC	Left	9262	1852.4	23.81	-0.19	24.0	0.052	1.045	0.054
	Band II/RMC	Right	9262	1852.4	23.81	-2.07	24.0	0.060	1.045	0.063
36	Band II/RMC	Bottom	9262	1852.4	23.81	3.17	24.0	**0.274**	1.045	0.286
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 20MHz QPSK 1RB Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)

	Band2/RB#0	Front	18700	1860.0	23.67	-1.33	24.0	0.153	1.079	0.165
	Band2/RB#0	Back	18700	1860.0	23.67	3.31	24.0	0.219	1.079	0.236
	Band2/RB#0	Left	18700	1860.0	23.67	1.07	24.0	0.043	1.079	0.046
	Band2/RB#0	Right	18700	1860.0	23.67	-1.67	24.0	0.050	1.079	0.054
37	Band2/RB#0	Bottom	18700	1860.0	23.67	-2.94	24.0	**0.267**	1.079	0.288
	Band4/RB#49	Front	20175	1732.5	24.55	0.16	25.0	0.368	1.109	0.408
	Band4/RB#49	Back	20175	1732.5	24.55	3.35	25.0	0.661	1.109	0.733
	Band4/RB#49	Left	20175	1732.5	24.55	-3.11	25.0	0.151	1.109	0.167
	Band4/RB#49	Right	20175	1732.5	24.55	2.69	25.0	0.161	1.109	0.179
	Band4/RB#49	Bottom	20175	1732.5	24.55	-3.94	25.0	0.936	1.109	1.038
38	Band4/RB#49	Bottom	20050	1720.0	24.30	-1.97	24.5	**0.975**	1.047	1.021
	Band4/RB#49	**Bottom**	**20050**	**1720.0**	**24.30**	**-2.61**	**24.5**	**0.972**	**1.047**	**1.018**
	Band4/RB#0	Bottom	20300	1745.0	24.38	-3.19	24.5	0.853	1.028	0.877
	Band7/RB#49	Front	21350	2560.0	23.32	-0.97	23.5	0.054	1.042	0.056
24	Band7/RB#49	Back	21350	2560.0	23.32	-0.70	23.5	**0.247**	1.042	0.257
	Band7/RB#49	Left	21350	2560.0	23.32	-0.46	23.5	0.035	1.042	0.036
	Band7/RB#49	Right	21350	2560.0	23.32	-1.18	23.5	0.025	1.042	0.026
	Band7/RB#49	Bottom	21350	2560.0	23.32	2.33	23.5	0.027	1.042	0.028
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 10MHz QPSK 1RB Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band5/RB#0	Front	20600	844.0	23.71	-2.05	24.0	0.098	1.069	0.105
25	Band5/RB#0	Back	20600	844.0	23.71	-3.68	24.0	**0.164**	1.069	0.175
	Band5/RB#0	Left	20600	844.0	23.71	-3.81	24.0	0.060	1.069	0.064
	Band5/RB#0	Right	20600	844.0	23.71	-2.42	24.0	0.078	1.069	0.083
	Band5/RB#0	Bottom	20600	844.0	23.71	2.54	24.0	0.107	1.069	0.114
	Band17/RB#49	Front	23800	711.0	23.51	0.43	24.0	0.068	1.119	0.076
26	Band17/RB#49	Back	23800	711.0	23.51	-0.22	24.0	**0.112**	1.119	0.125
	Band17/RB#49	Left	23800	711.0	23.51	1.95	24.0	0.026	1.119	0.029
	Band17/RB#49	Right	23800	711.0	23.51	1.81	24.0	0.020	1.119	0.022
	Band17/RB#49	Bottom	23800	711.0	23.51	-3.40	24.0	0.064	1.119	0.072
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 20MHz QPSK 50%RB Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band2/RB#0	Front	18700	1860.0	22.68	2.14	23.0	0.123	1.076	0.132
	Band2/RB#0	Back	18700	1860.0	22.68	-2.89	23.0	0.171	1.076	0.184
	Band2/RB#0	Left	18700	1860.0	22.68	0.77	23.0	0.031	1.076	0.033
	Band2/RB#0	Right	18700	1860.0	22.68	-0.18	23.0	0.037	1.076	0.040
39	Band2/RB#0	Bottom	18700	1860.0	22.68	-1.11	23.0	**0.193**	1.076	0.208
	Band4/RB#49	Front	20300	1745.0	22.88	2.25	23.0	0.257	1.028	0.264
	Band4/RB#49	Back	20300	1745.0	22.88	3.65	23.0	0.434	1.028	0.446
	Band4/RB#49	Left	20300	1745.0	22.88	-1.73	23.0	0.125	1.028	0.129
	Band4/RB#49	Right	20300	1745.0	22.88	-2.70	23.0	0.151	1.028	0.155
40	Band4/RB#49	Bottom	20300	1745.0	22.88	3.55	23.0	**0.599**	1.028	0.616
	Band7/RB#24	Front	21350	2560.0	21.95	1.06	22.0	0.032	1.012	0.032
29	Band7/RB#24	Back	21350	2560.0	21.95	0.37	22.0	**0.190**	1.012	0.192
	Band7/RB#24	Left	21350	2560.0	21.95	2.37	22.0	0.021	1.012	0.021
	Band7/RB#24	Right	21350	2560.0	21.95	-2.48	22.0	0.017	1.012	0.017
	Band7/RB#24	Bottom	21350	2560.0	21.95	2.35	22.0	0.018	1.012	0.018
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 10MHz QPSK 50%RB Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band5/RB#24	Front	20525	836.5	22.70	-1.47	23.0	0.077	1.072	0.083
30	Band5/RB#24	Back	20525	836.5	22.70	-3.60	23.0	**0.126**	1.072	0.135
	Band5/RB#24	Left	20525	836.5	22.70	-2.42	23.0	0.041	1.072	0.044
	Band5/RB#24	Right	20525	836.5	22.70	-1.54	23.0	0.058	1.072	0.062
	Band5/RB#24	Bottom	20525	836.5	22.70	-0.57	23.0	0.084	1.072	0.090
	Band17/RB#24	Front	23800	711.0	22.65	1.09	23.0	0.058	1.084	0.063
31	Band17/RB#24	Back	23800	711.0	22.65	0.85	23.0	**0.101**	1.084	0.109
	Band17/RB#24	Left	23800	711.0	22.65	-3.82	23.0	0.018	1.084	0.020
	Band17/RB#24	Right	23800	711.0	22.65	-3.53	23.0	0.013	1.084	0.014
	Band17/RB#24	Bottom	23800	711.0	22.65	-0.44	23.0	0.054	1.084	0.059
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ LTE 20MHz QPSK 100%RB Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band4/RB#0	Front	20175	1732.5	22.78	3.67	23.0	0.278	1.052	0.292
	Band4/RB#0	Back	20175	1732.5	22.78	-0.68	23.0	0.485	1.052	0.510
	Band4/RB#0	Left	20175	1732.5	22.78	-0.64	23.0	0.098	1.052	0.103
	Band4/RB#0	Right	20175	1732.5	22.78	-1.48	23.0	0.104	1.052	0.109
41	Band4/RB#0	Bottom	20175	1732.5	22.78	1.74	23.0	**0.642**	1.052	0.675
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ WLAN 2.4GHz Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Power Drift (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	2.4GHz/802.11b	Front	11	2462	13.37	-0.75	13.5	0.076	1.030	1.01	0.079
32	2.4GHz/802.11b	Back	11	2462	13.37	3.46	13.5	**0.099**	1.030	1.01	0.103
	2.4GHz/802.11b	Left	11	2462	13.37	0.31	13.5	0.035	1.030	1.01	0.036
	2.4GHz/802.11b	Top	11	2462	13.37	-1.53	13.5	0.056	1.030	1.01	0.058
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

Note:

1. Per KDB 447498 D01v06, for each exposure position, if the highest output channel Reported SAR ≤0.8W/kg, other channels SAR testing is not necessary.
2. Additional WLAN SAR testing was performed for simultaneous transmission analysis.
3. For Hotspot SAR testing, per KDB 941225 D06v02r01, for EUT dimension ≥ 9cm*5cm, the test distance is 10mm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
4. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA output power is < 0.25dB higher than RMC 12.2kbps, or Reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA SAR evaluation can be excluded.
5. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥0.8W/kg.
6. Per KDB 648474 D04v01r03, when the Reported SAR for a body-worn accessory measured without a headset connected to the handset is > 1.2 W/kg, SAR testing with a headset connected to the handset is required.
7. Per KDB 941225 D05v02r05, 100% RB allocation SAR measurement is not required when the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel.
8. According to KDB 865664 D02v01r02, SAR plot is required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination.
9. Highlight part of test data means repeated test.

15.4 Repeated SAR measurement

Band/ Mode	Test Position	CH.	Freq. (MHz)	Measured SAR (W/kg)				
				Original	1st Repeated		2nd Repeated	
					Value	Ratio	Value	Ratio
Band IV/RMC	Bottom	1312	1712.4	0.873	0.865	1.01	/	/
Band4/RB#49	Bottom	20050	1720.0	0.975	0.972	1.00	/	/
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population				**1.6 W/kg (mW/g) Averaged over 1g**				

Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8 W/kg
2. Per KDB 865664 D01v01r04, if the ratio of *original* and *repeated* is ≤ 1.2 and the measured SAR <1.45 W/kg, only one repeated measurement is required.

15.5 Multi-Band Simultaneous Transmission Considerations

➢ **Simultaneous Transmission Capabilities**

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the EUT are shown in below Figure and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

Fig.15.1 Simultaneous Transmission Paths

➢ **Simultaneous Transmission Procedures**

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v06, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤ 1.6 W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v06 4.3.2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{7.5} \cdot \frac{\text{Max. power of channel, mW}}{\text{Min. Separation Distance, mm}}$$

Mode	Max. tune-up Power (dBm)	Exposure Position	Head	Body	Hotspot
		Test Distance (mm)	0	10	10
Bluetooth	4	Estimated SAR (W/kg)	0.105	0.053	0.053
5.2GHz WIFI	7.5	Estimated SAR (W/kg)	0.342	0.171	0.171

Note:

1. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according is applied to determine estimated SAR.

➢ **Multi-Band simultaneous Transmission Consideration**

	Position	Applicable Combination
Simultaneous Transmission Consideration	Head	WWAN (Voice) + WLAN 2.4 GHz/5.2GHz
		WWAN (Voice) + Bluetooth
	Body	WWAN (Voice) + WLAN 2.4 GHz/5.2GHz
		WWAN (Voice) + Bluetooth
	Hotspot	WWAN (Data) + WLAN 2.4 GHz/5.2GHz
		WWAN (Data) + Bluetooth

Note:

1. WLAN 2.4GHz Band, WLAN 5.2GHz Band and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. GSM/WCDMA/LTE shares the same antenna, and cannot transmit simultaneously.
3. The Report SAR summation is calculated based on the same configuration and test position.
4. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i. Scalar SAR summation < 1.6 W/kg.
   ii. 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 ≤ 0.04, simultaneously transmission SAR measurement is not necessary
   iii. Simultaneously transmission SAR measurement, and the Reported multi-band SAR < 1.6 W/kg

15.6 SAR Simultaneous Transmission Analysis

➢ **Head Simultaneous Transmission**

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM 850	Right Cheek	0.166	0.494	0.660		GSM 850	Right Cheek	0.166	0.105	0.271
	Right Tilted	0.070	0.393	0.463			Right Tilted	0.070	0.105	0.175
	Left Cheek	0.105	0.242	0.347			Left Cheek	0.105	0.105	0.210
	Left Tilted	0.044	0.197	0.241			Left Tilted	0.044	0.105	0.149

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM 1900	Right Cheek	0.025	0.494	0.519		GSM 1900	Right Cheek	0.025	0.105	0.130
	Right Tilted	0.012	0.393	0.405			Right Tilted	0.012	0.105	0.117
	Left Cheek	0.039	0.242	0.281			Left Cheek	0.039	0.105	0.144
	Left Tilted	0.016	0.197	0.213			Left Tilted	0.016	0.105	0.121

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band V	Right Cheek	0.082	0.494	0.576		WCDMA Band V	Right Cheek	0.082	0.105	0.187
	Right Tilted	0.035	0.393	0.576			Right Tilted	0.035	0.105	0.140
	Left Cheek	0.066	0.242	0.428			Left Cheek	0.066	0.105	0.171
	Left Tilted	0.027	0.197	0.308			Left Tilted	0.027	0.105	0.132

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band IV	Right Cheek	0.027	0.494	0.521		WCDMA Band IV	Right Cheek	0.027	0.105	0.132
	Right Tilted	0.012	0.393	0.405			Right Tilted	0.012	0.105	0.117
	Left Cheek	0.053	0.242	0.295			Left Cheek	0.053	0.105	0.158
	Left Tilted	0.023	0.197	0.220			Left Tilted	0.023	0.105	0.128

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band II	Right Cheek	0.027	0.494	0.521		WCDMA Band II	Right Cheek	0.027	0.105	0.132
	Right Tilted	0.013	0.393	0.406			Right Tilted	0.013	0.105	0.118
	Left Cheek	0.045	0.242	0.287			Left Cheek	0.045	0.105	0.150
	Left Tilted	0.021	0.197	0.218			Left Tilted	0.021	0.105	0.126

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 2	Right Cheek	0.023	0.494	0.517		LTE Band 2	Right Cheek	0.023	0.105	0.128
	Right Tilted	0.010	0.393	0.403			Right Tilted	0.010	0.105	0.115
	Left Cheek	0.032	0.242	0.274			Left Cheek	0.032	0.105	0.137
	Left Tilted	0.013	0.197	0.210			Left Tilted	0.013	0.105	0.118

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 4	Right Cheek	0.038	0.494	0.532		LTE Band 4	Right Cheek	0.038	0.105	0.143
	Right Tilted	0.016	0.393	0.409			Right Tilted	0.016	0.105	0.121
	Left Cheek	0.049	0.242	0.291			Left Cheek	0.049	0.105	0.154
	Left Tilted	0.021	0.197	0.218			Left Tilted	0.021	0.105	0.126

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 5	Right Cheek	0.083	0.494	0.577		LTE Band 5	Right Cheek	0.083	0.105	0.188
	Right Tilted	0.033	0.393	0.426			Right Tilted	0.033	0.105	0.138
	Left Cheek	0.055	0.242	0.297			Left Cheek	0.055	0.105	0.160
	Left Tilted	0.022	0.197	0.219			Left Tilted	0.022	0.105	0.127

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 7	Right Cheek	0.024	0.494	0.518		LTE Band 7	Right Cheek	0.024	0.105	0.129
	Right Tilted	0.010	0.393	0.403			Right Tilted	0.010	0.105	0.115
	Left Cheek	0.032	0.242	0.274			Left Cheek	0.032	0.105	0.137
	Left Tilted	0.015	0.197	0.212			Left Tilted	0.015	0.105	0.120

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 17	Right Cheek	0.083	0.494	0.577		LTE Band 17	Right Cheek	0.083	0.105	0.188
	Right Tilted	0.034	0.393	0.427			Right Tilted	0.034	0.105	0.139
	Left Cheek	0.076	0.242	0.318			Left Cheek	0.076	0.105	0.181
	Left Tilted	0.029	0.197	0.226			Left Tilted	0.029	0.105	0.134

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM 850	Right Cheek	0.166	0.342	0.508		GSM 1900	Right Cheek	0.025	0.342	0.367
	Right Tilted	0.070	0.342	0.412			Right Tilted	0.012	0.342	0.354
	Left Cheek	0.105	0.342	0.447			Left Cheek	0.039	0.342	0.381
	Left Tilted	0.044	0.342	0.386			Left Tilted	0.016	0.342	0.358

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA V	Right Cheek	0.082	0.342	0.424		WCDMA IV	Right Cheek	0.027	0.342	0.369
	Right Tilted	0.035	0.342	0.377			Right Tilted	0.012	0.342	0.354
	Left Cheek	0.066	0.342	0.408			Left Cheek	0.053	0.342	0.395
	Left Tilted	0.027	0.342	0.369			Left Tilted	0.023	0.342	0.365

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA II	Right Cheek	0.027	0.342	0.369		LTE Band 2	Right Cheek	0.023	0.342	0.365
	Right Tilted	0.013	0.342	0.355			Right Tilted	0.010	0.342	0.352
	Left Cheek	0.045	0.342	0.387			Left Cheek	0.032	0.342	0.374
	Left Tilted	0.021	0.342	0.363			Left Tilted	0.013	0.342	0.355

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 4	Right Cheek	0.038	0.342	0.380		LTE Band 5	Right Cheek	0.083	0.342	0.425
	Right Tilted	0.016	0.342	0.358			Right Tilted	0.033	0.342	0.375
	Left Cheek	0.049	0.342	0.391			Left Cheek	0.055	0.342	0.397
	Left Tilted	0.021	0.342	0.363			Left Tilted	0.022	0.342	0.364

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 7	Right Cheek	0.024	0.342	0.366		LTE Band 17	Right Cheek	0.083	0.342	0.425
	Right Tilted	0.010	0.342	0.352			Right Tilted	0.034	0.342	0.376
	Left Cheek	0.032	0.342	0.374			Left Cheek	0.076	0.342	0.418
	Left Tilted	0.015	0.342	0.357			Left Tilted	0.029	0.342	0.371

➢ **Body worn Simultaneous Transmission**

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM 850	Front	0.208	0.079	0.287		GSM 850	Front	0.208	0.053	0.261
	Back	0.314	0.103	0.417			Back	0.314	0.053	0.367

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM 1900	Front	0.082	0.079	0.161		GSM 1900	Front	0.082	0.053	0.135
	Back	0.119	0.103	0.222			Back	0.119	0.053	0.172

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band V	Front	0.091	0.079	0.170		WCDMA Band V	Front	0.091	0.053	0.170
	Back	0.165	0.103	0.268			Back	0.165	0.053	0.268

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band IV	Front	0.248	0.079	0.327		WCDMA Band IV	Front	0.248	0.053	0.301
	Back	0.555	0.103	0.658			Back	0.555	0.053	0.608

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band II	Front	0.130	0.079	0.209		WCDMA Band II	Front	0.130	0.053	0.183
	Back	0.219	0.103	0.322			Back	0.219	0.053	0.272

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 2	Front	0.165	0.079	0.244		LTE Band 2	Front	0.165	0.053	0.218
	Back	0.236	0.103	0.339			Back	0.236	0.053	0.289

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 4	Front	0.408	0.079	0.487		LTE Band 4	Front	0.408	0.053	0.461
	Back	0.733	0.103	0.836			Back	0.733	0.053	0.786

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 5	Front	0.105	0.079	0.184		LTE Band 5	Front	0.105	0.053	0.158
	Back	0.175	0.103	0.278			Back	0.175	0.053	0.228

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 7	Front	0.056	0.079	0.135		LTE Band 7	Front	0.056	0.053	0.109
	Back	0.257	0.103	0.360			Back	0.257	0.053	0.310

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 17	Front	0.076	0.079	0.155		LTE Band 17	Front	0.076	0.053	0.129
	Back	0.125	0.103	0.228			Back	0.125	0.053	0.178

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM 850	Front	0.208	0.171	0.379		GSM 1900	Front	0.082	0.171	0.253
	Back	0.314	0.171	0.485			Back	0.119	0.171	0.290

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band V	Front	0.091	0.171	0.262		WCDMA Band IV	Front	0.248	0.171	0.419
	Back	0.165	0.171	0.336			Back	0.555	0.171	0.726

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band II	Front	0.130	0.171	0.301		LTE Band 2	Front	0.165	0.171	0.336
	Back	0.219	0.171	0.390			Back	0.236	0.171	0.407

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 4	Front	0.408	0.171	0.579		LTE Band 5	Front	0.105	0.171	0.276
	Back	0.733	0.171	0.904			Back	0.175	0.171	0.346

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 7	Front	0.056	0.171	0.227		LTE Band 17	Front	0.076	0.171	0.247
	Back	0.257	0.171	0.428			Back	0.125	0.171	0.296

➢ **Hotspot mode Simultaneous Transmission**

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)	WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM850	Front	0.232	0.079	0.311	GSM850	Front	0.232	0.053	0.285
	Back	0.387	0.103	0.490		Back	0.387	0.053	0.440
	Left	0.115	0.036	0.151		Left	0.115	0.053	0.168
	Right	0.099	/	0.099		Right	0.099	/	0.099
	Top	/	0.058	0.058		Top	/	0.053	0.053
	Bottom	0.303	/	0.303		Bottom	0.303	/	0.303

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)	WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM 1900	Front	0.103	0.079	0.182	GSM 1900	Front	0.103	0.053	0.182
	Back	0.184	0.103	0.287		Back	0.184	0.053	0.287
	Left	0.072	0.036	0.108		Left	0.072	0.053	0.108
	Right	0.053	/	0.053		Right	0.053	/	0.053
	Top	/	0.058	0.058		Top	/	0.053	0.058
	Bottom	0.187	/	0.187		Bottom	0.187	/	0.187

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)	WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band V	Front	0.091	0.079	0.170	WCDMA Band V	Front	0.091	0.053	0.144
	Back	0.165	0.103	0.268		Back	0.165	0.053	0.218
	Left	0.073	0.036	0.109		Left	0.073	0.053	0.126
	Right	0.060	/	0.060		Right	0.060	/	0.060
	Top	/	0.058	0.058		Top	/	0.053	0.053
	Bottom	0.126	/	0.126		Bottom	0.126	/	0.126

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)	WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band IV	Front	0.248	0.079	0.327	WCDMA Band IV	Front	0.248	0.053	0.301
	Back	0.555	0.103	0.658		Back	0.555	0.053	0.608
	Left	0.176	0.036	0.212		Left	0.176	0.053	0.229
	Right	0.209	/	0.209		Right	0.209	/	0.209
	Top	/	0.058	0.058		Top	/	0.053	0.053
	Bottom	1.030	/	1.030		Bottom	1.030	/	1.030

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band II	Front	0.130	0.079	0.209		WCDMA Band II	Front	0.130	0.053	0.183
	Back	0.219	0.103	0.322			Back	0.219	0.053	0.272
	Left	0.054	0.036	0.090			Left	0.054	0.053	0.107
	Right	0.063	/	0.063			Right	0.063	/	0.063
	Top	/	0.058	0.058			Top	/	0.053	0.053
	Bottom	0.286	/	0.286			Bottom	0.286	/	0.286

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 2	Front	0.165	0.079	0.244		LTE Band 2	Front	0.165	0.053	0.244
	Back	0.236	0.103	0.339			Back	0.236	0.053	0.339
	Left	0.046	0.036	0.082			Left	0.046	0.053	0.082
	Right	0.054	/	0.054			Right	0.054	/	0.054
	Top	/	0.058	0.058			Top	/	0.053	0.058
	Bottom	0.288	/	0.288			Bottom	0.288	/	0.288

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 4	Front	0.408	0.079	0.487		LTE Band 4	Front	0.408	0.053	0.461
	Back	0.733	0.103	0.836			Back	0.733	0.053	0.786
	Left	0.167	0.036	0.203			Left	0.167	0.053	0.220
	Right	0.179	/	0.179			Right	0.179	/	0.179
	Top	/	0.058	0.058			Top	/	0.053	0.053
	Bottom	1.038	/	1.038			Bottom	1.038	/	1.038

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 5	Front	0.105	0.079	0.461		LTE Band 5	Front	0.105	0.053	0.158
	Back	0.175	0.103	0.786			Back	0.175	0.053	0.228
	Left	0.064	0.036	0.220			Left	0.064	0.053	0.117
	Right	0.083	/	0.179			Right	0.083	/	0.083
	Top	/	0.058	0.053			Top	/	0.053	0.053
	Bottom	0.114	/	1.038			Bottom	0.114	/	0.114

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band7	Front	0.056	0.079	0.135		LTE Band 7	Front	0.056	0.053	0.109
	Back	0.257	0.103	0.360			Back	0.257	0.053	0.310
	Left	0.036	0.036	0.072			Left	0.036	0.053	0.089
	Right	0.026	/	0.026			Right	0.026	/	0.026
	Top	/	0.058	0.058			Top	/	0.053	0.053
	Bottom	0.028	/	0.028			Bottom	0.028	/	0.028

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	Bluetooth Estimated SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 17	Front	0.076	0.079	0.155		LTE Band 17	Front	0.076	0.053	0.155
	Back	0.125	0.103	0.228			Back	0.125	0.053	0.228
	Left	0.029	0.036	0.065			Left	0.029	0.053	0.065
	Right	0.022	/	0.022			Right	0.022	/	0.022
	Top	/	0.058	0.058			Top	/	0.053	0.058
	Bottom	0.072	/	0.072			Bottom	0.072	/	0.072

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
GSM 850	Front	0.232	0.171	0.403		GSM 1900	Front	0.103	0.171	0.274
	Back	0.387	0.171	0.558			Back	0.184	0.171	0.355
	Left	0.115	0.171	0.286			Left	0.072	0.171	0.243
	Right	0.099	/	0.099			Right	0.053	/	0.053
	Top	/	0.171	0.171			Top	/	0.171	0.171
	Bottom	0.303	/	0.303			Bottom	0.187	/	0.187

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)		WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band V	Front	0.091	0.171	0.262		WCDMA Band IV	Front	0.248	0.171	0.419
	Back	0.165	0.171	0.336			Back	0.555	0.171	0.726
	Left	0.073	0.171	0.244			Left	0.176	0.171	0.347
	Right	0.060	/	0.060			Right	0.209	/	0.209
	Top	/	0.171	0.171			Top	/	0.171	0.171
	Bottom	0.126	/	0.126			Bottom	1.030	/	1.030

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)	WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
WCDMA Band II	Front	0.130	0.171	0.301	LTE Band 2	Front	0.165	0.171	0.336
	Back	0.219	0.171	0.390		Back	0.236	0.171	0.407
	Left	0.054	0.171	0.225		Left	0.046	0.171	0.217
	Right	0.063	/	0.063		Right	0.054	/	0.054
	Top	/	0.171	0.171		Top	/	0.171	0.171
	Bottom	0.286	/	0.286		Bottom	0.288	/	0.288

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)	WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 4	Front	0.408	0.171	0.579	LTE Band 5	Front	0.105	0.171	0.276
	Back	0.733	0.171	0.904		Back	0.175	0.171	0.346
	Left	0.167	0.171	0.338		Left	0.064	0.171	0.235
	Right	0.179	/	0.179		Right	0.083	/	0.083
	Top	/	0.171	0.171		Top	/	0.171	0.171
	Bottom	1.038	/	1.038		Bottom	0.114	/	0.114

WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)	WWAN Mode	Position	WWAN SAR_{1g} (W/kg)	5.2GHz WLAN SAR_{1g} (W/kg)	Σ SAR (W/kg)
LTE Band 7	Front	0.056	0.171	0.227	LTE Band 17	Front	0.076	0.171	0.227
	Back	0.257	0.171	0.428		Back	0.125	0.171	0.428
	Left	0.036	0.171	0.207		Left	0.029	0.171	0.207
	Right	0.026	/	0.026		Right	0.022	/	0.026
	Top	/	0.171	0.171		Top	/	0.171	0.171
	Bottom	0.028	/	0.028		Bottom	0.072	/	0.028

➢ **Simultaneous Transmission Conclusion**

The above numerical summed SAR results for all the case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06.

15.7 Measurement Uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04, 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.

16 Reference

[1]. FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2]. ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3]. IEEE Std. 1528-2013, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, September2013

[4]. OpenSAR V5 Software User Manual

[5]. FCC KDB 248227 D01 v02r02, “SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS”, October 2015

[6]. FCC KDB 447498 D01 v06, “RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES”, October 2015

[7]. FCC KDB 648474 D04 v01r03, “SAR EVALUATION CONSIDERATIONS FOR WIRELESS HANDSETS”, October 2015

[8]. FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, October 2015

[9]. FCC KDB 941225 D05 v02r05, “SAR EVALUATION CONSIDERATIONS FOR LTE DEVICES”, Dec 2015

[10]. FCC KDB 941225 D03 v01, “Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE”, December 2008

[11]. FCC KDB 941225 D06 v02r01, " SAR EVALUATION PROCEDURES FOR PORTABLE DEVICES WITH WIRELESS ROUTER CAPABILITIES", October 2015

[12]. FCC KDB 865664 D01 v01r04, “SAR MEASUREMENT REQUIREMENTS FOR 100 MHz TO 6 GHz”, August 2015

Appendix A: Plots of SAR System Check

System check at 750 MHz

Date of measurement: 10/6/2021

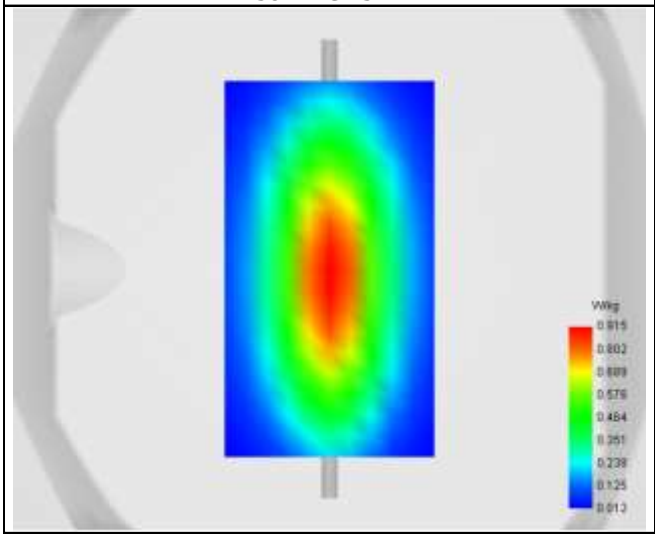
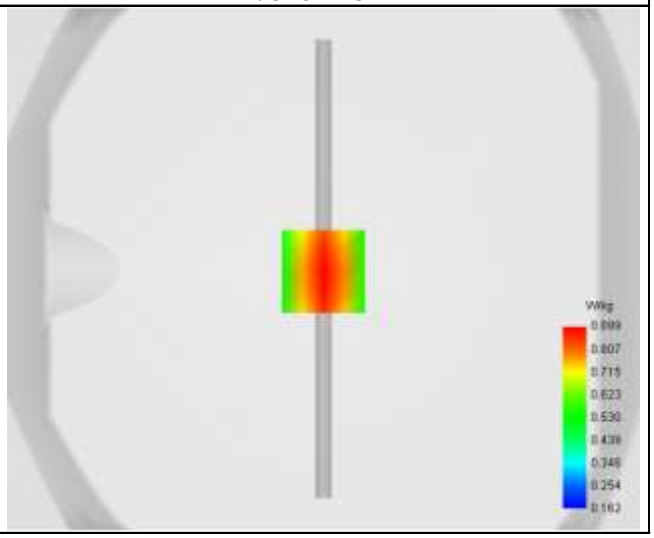
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.73
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW750
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	750.000000
Relative permitivity (real part)	41.367452
Conductivity (S/m)	0.897441

C. SAR Surface and Volume

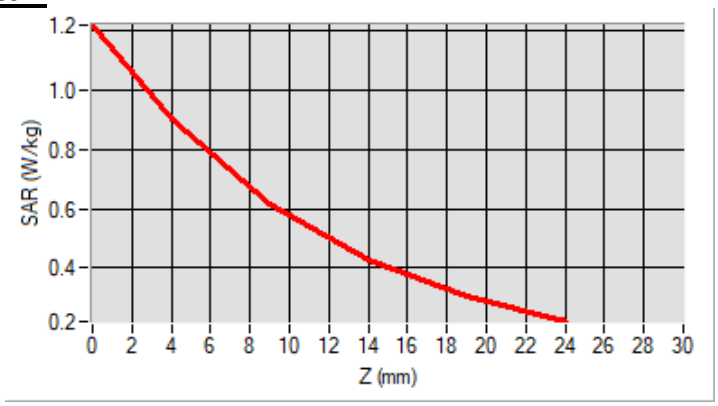
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00; SAR Peak: 1.12 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.571316
SAR 1g (W/Kg)	0.847164
Variation (%)	-2.150000

E. Z Axis Scan



System check at 835 MHz

Date of measurement: 10/6/2021

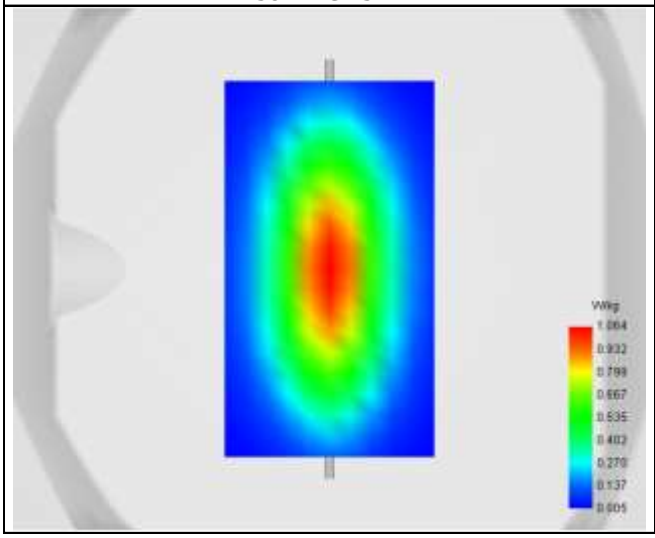
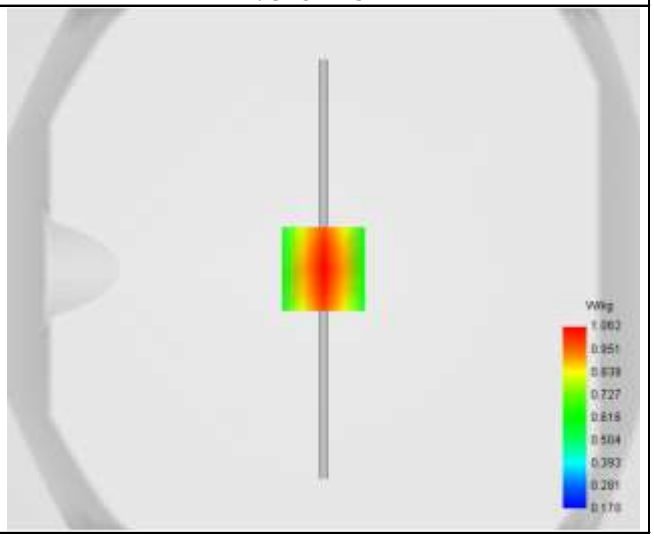
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW835
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	835.000000
Relative permitivity (real part)	40.9706082
Conductivity (S/m)	0.926435

C. SAR Surface and Volume

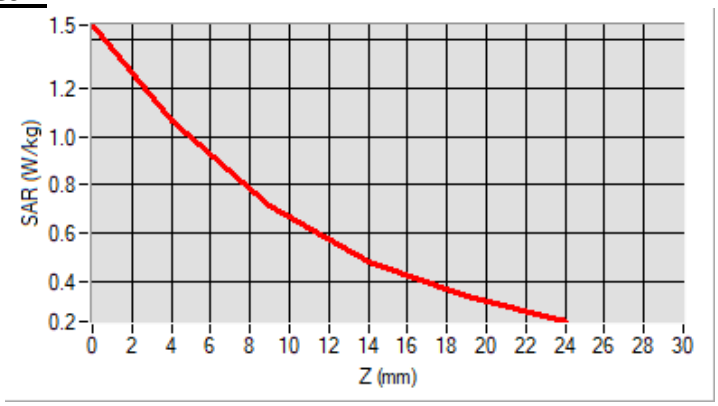
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00; SAR Peak: 1.54 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.632170
SAR 1g (W/Kg)	0.985675
Variation (%)	-1.060001

E. Z Axis Scan



System check at 1750 MHz

Date of measurement: 16/6/2021

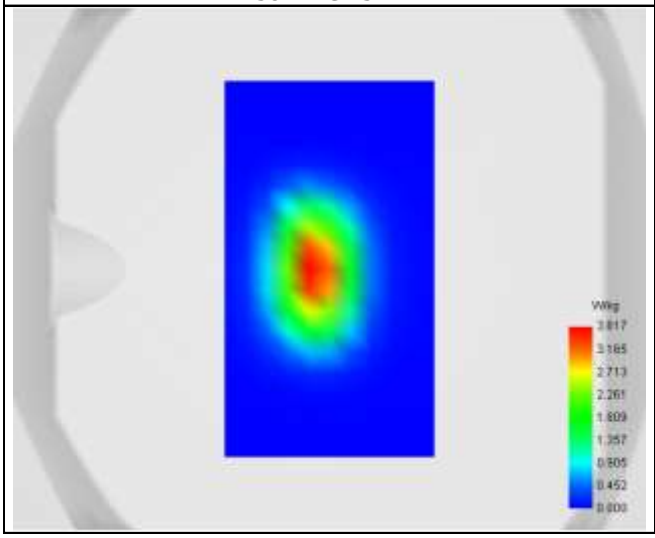
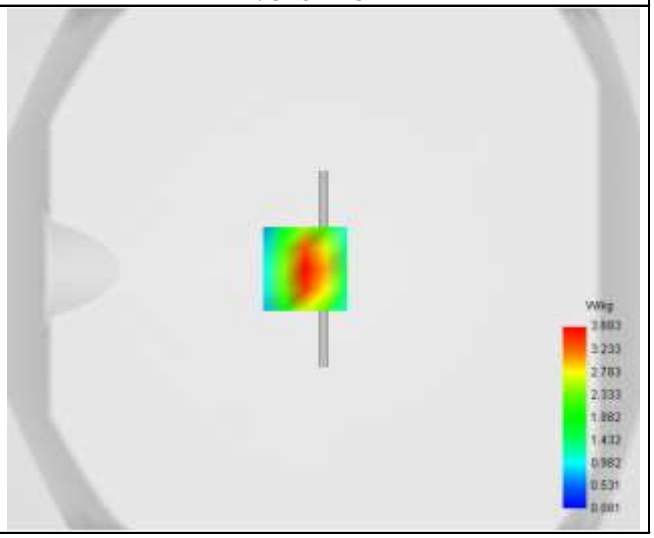
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW1750
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1750.000000
Relative permitivity (real part)	39.7912501
Conductivity (S/m)	1.389653

C. SAR Surface and Volume

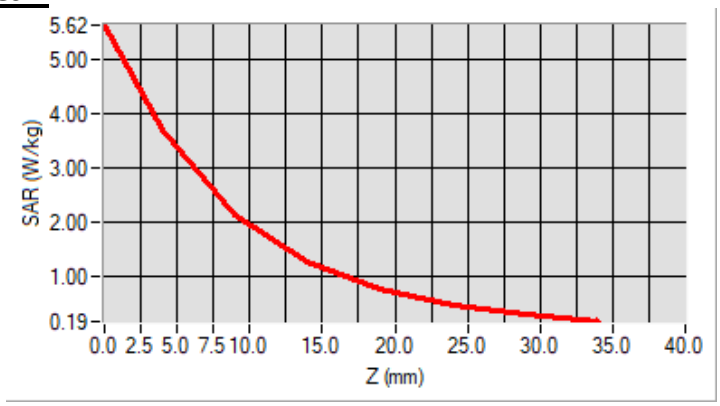
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00; SAR Peak: 5.66 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	1.922642
SAR 1g (W/Kg)	3.571310
Variation (%)	-0.250000

E. Z Axis Scan



System check at 1900 MHz

Date of measurement: 16/6/2021

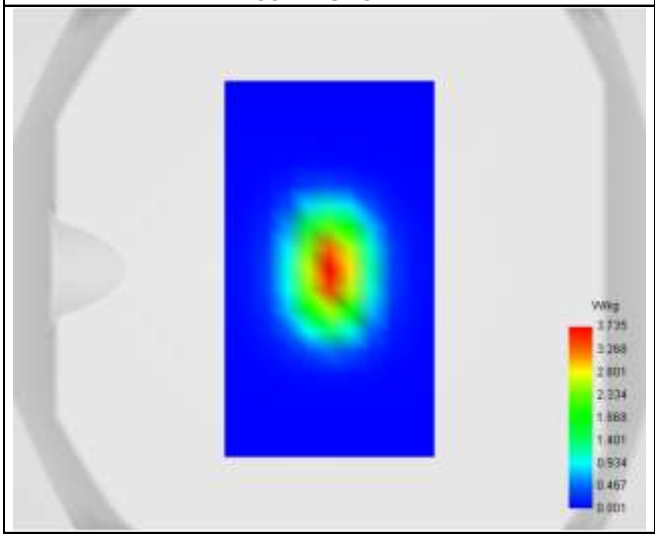
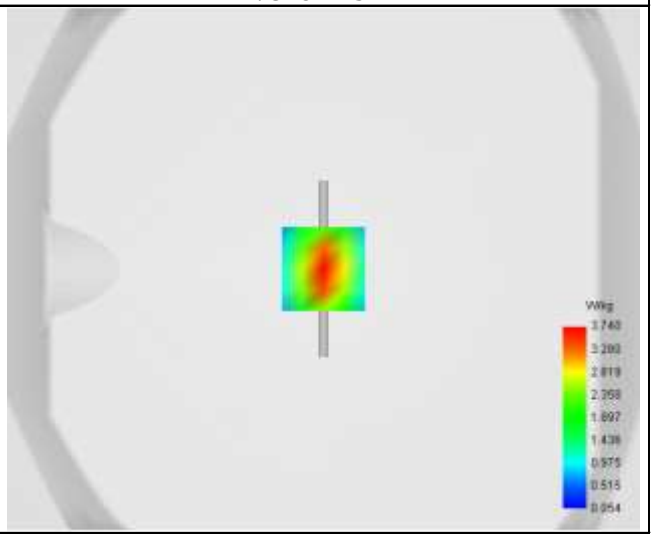
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW1900
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1900.000000
Relative permitivity (real part)	39.110458
Conductivity (S/m)	1.429354

C. SAR Surface and Volume

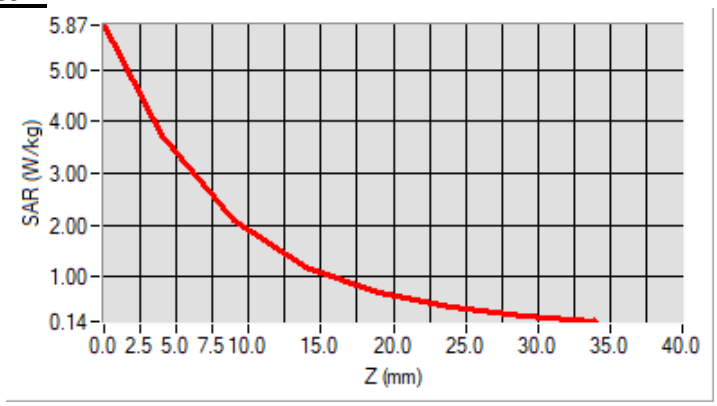
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00; SAR Peak: 6.15 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	1.961251
SAR 1g (W/Kg)	3.889526
Variation (%)	0.540001

E. Z Axis Scan



System check at 2450 MHz

Date of measurement: 15/6/2021

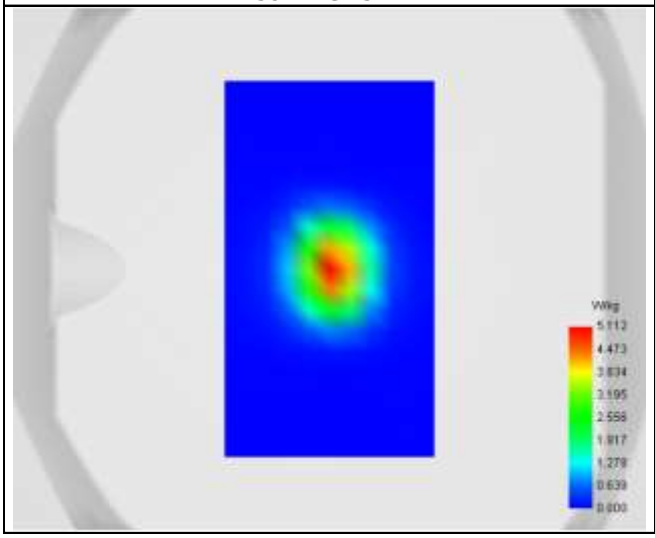
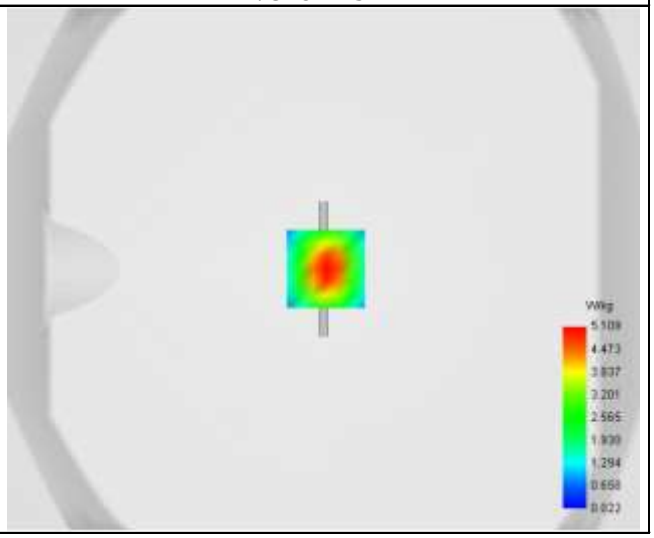
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.23
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2450.000000
Relative permitivity (real part)	39.812531
Conductivity (S/m)	1.781351

C. SAR Surface and Volume

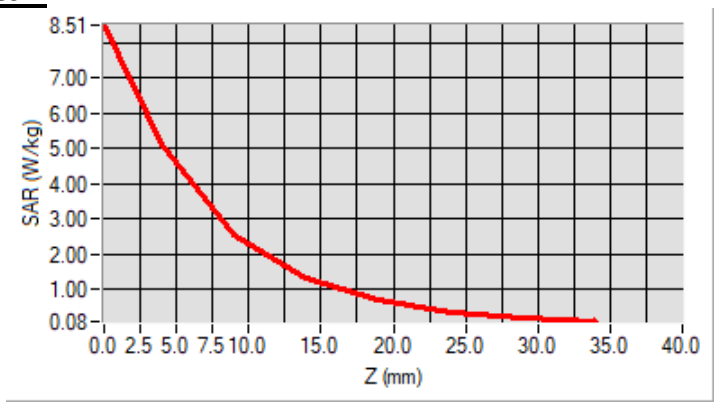
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=0.00; SAR Peak: 9.36 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	2.448032
SAR 1g (W/Kg)	5.344025
Variation (%)	-3.010004

E. Z Axis Scan



System check at 2600 MHz

Date of measurement: 15/06/2021

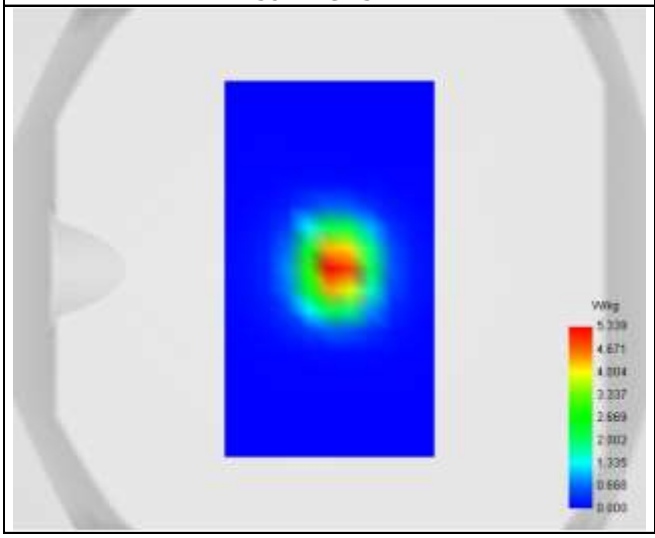
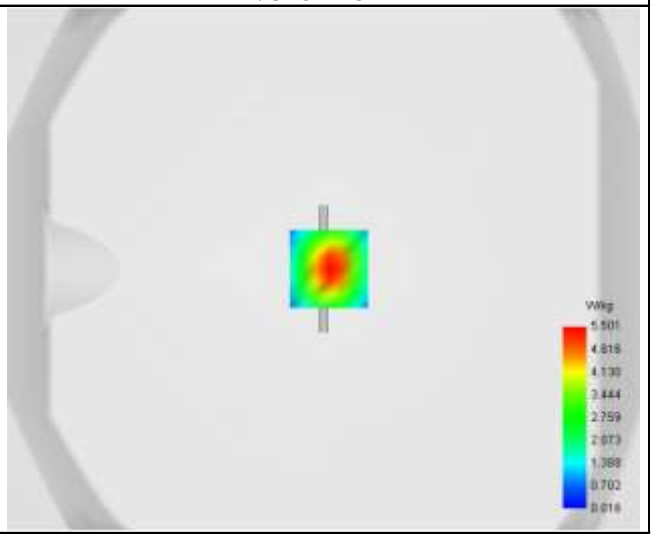
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.15
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW2600
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2600.000000
Relative permitivity (real part)	39.123528
Conductivity (S/m)	1.989452

C. SAR Surface and Volume

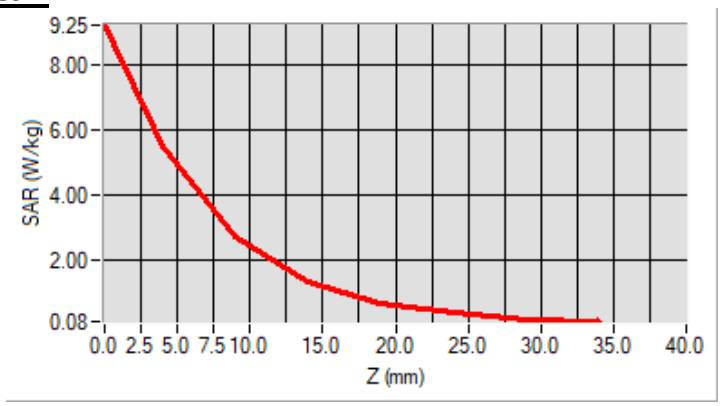
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=0.00; SAR Peak: 10.21 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	2.382531
SAR 1g (W/Kg)	5.784286
Variation (%)	1.250005

E. Z Axis Scan



Appendix B: Plots of SAR Test Data

SAR Measurement at GSM 850 (Cheek, Right)

Date of measurement: 10/6/2021

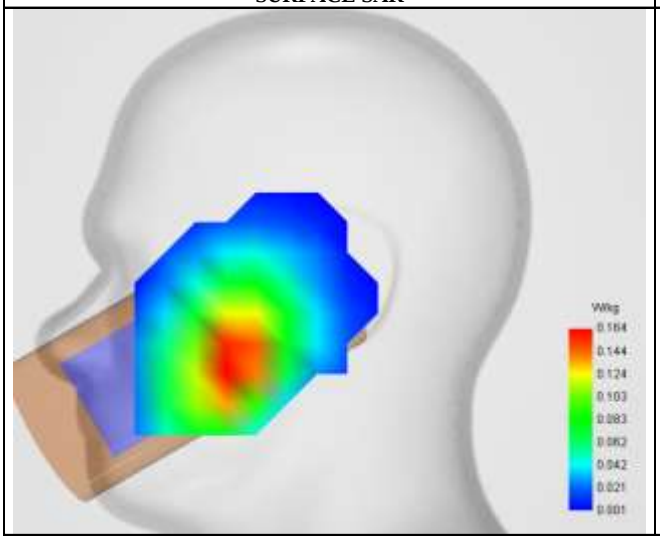
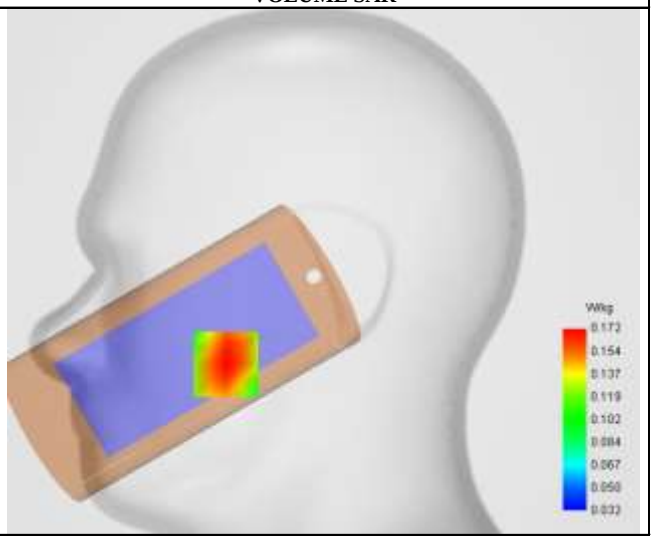
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Right head
Device Position	Cheek
Band	GSM850
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. Permitivity

Frequency (MHz)	824.200012
Relative permitivity (real part)	41.0165823
Conductivity (S/m)	0.919707

C. SAR Surface and Volume

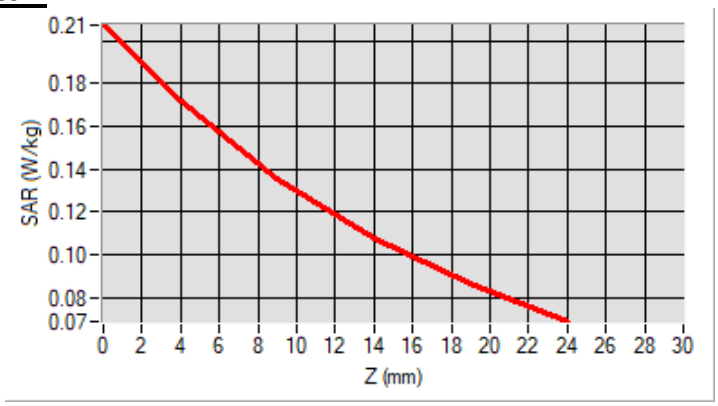
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-48.00, Y=-46.00 ; SAR Peak: 0.21 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.122028
SAR 1g (W/Kg)	0.164938
Variation (%)	0.870000

E. Z Axis Scan



SAR Measurement at GSM 1900 (Cheek, Left)

Date of measurement: 16/6/2021

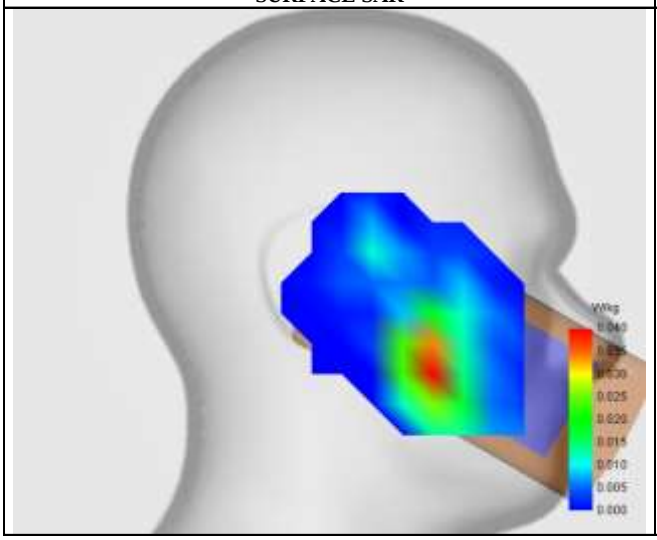
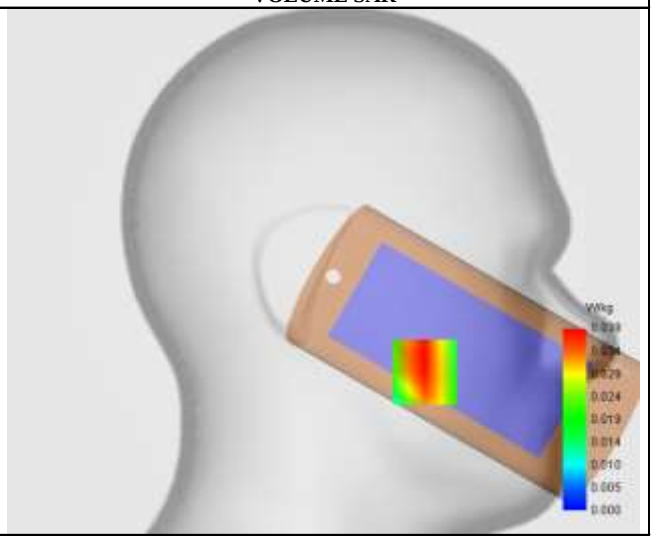
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Left head
Device Position	Cheek
Band	GSM1900
Channels	Middle
Signal	TDMA (Crest factor: 8.0)

B. Permitivity

Frequency (MHz)	1880.000000
Relative permitivity (real part)	39.1930241
Conductivity (S/m)	1.420391

C. SAR Surface and Volume

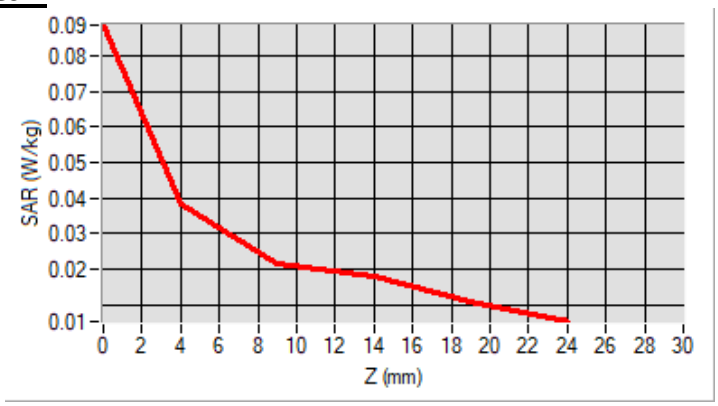
SURFACE SAR	VOLUME SAR
	

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

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.022429
SAR 1g (W/Kg)	0.037069
Variation (%)	-0.529999

E. Z Axis Scan



SAR Measurement at WCDMA 850 (Cheek, Right)

Date of measurement: 11/6/2021

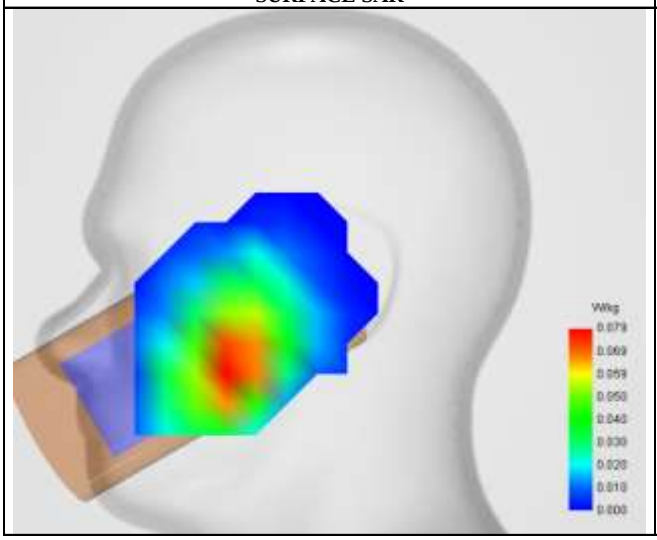
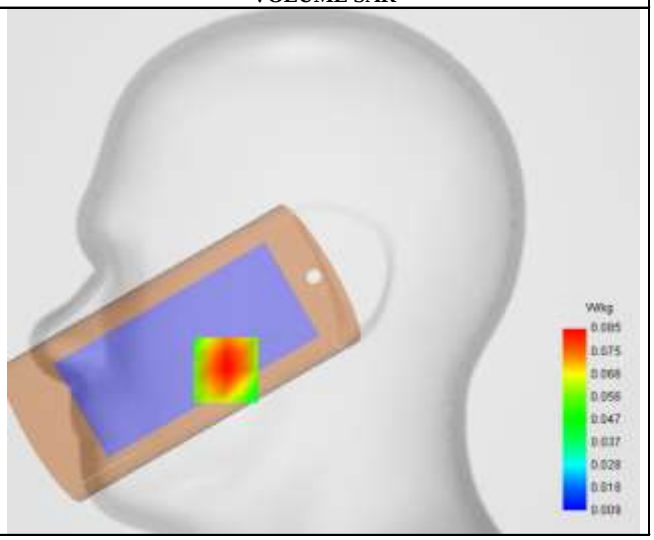
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Right head
Device Position	Cheek
Band	Band5_WCDMA850
Channels	Low
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	826.400024
Relative permitivity (real part)	40.994470
Conductivity (S/m)	0.920780

C. SAR Surface and Volume

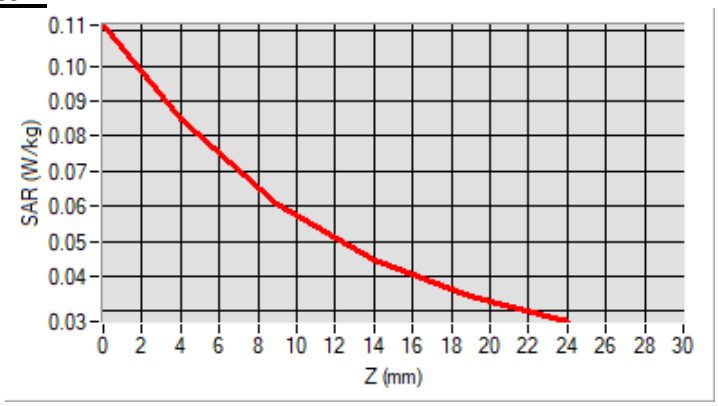
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-48.00, Y=-49.00 ; SAR Peak: 0.11 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.055980
SAR 1g (W/Kg)	0.080984
Variation (%)	-1.020000

E. Z Axis Scan



SAR Measurement at WCDMA 1700 (Cheek, Left)

Date of measurement: 16/6/2021

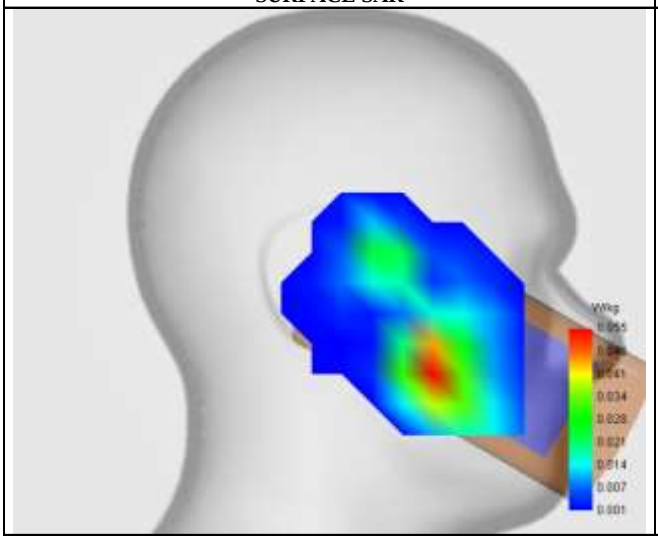
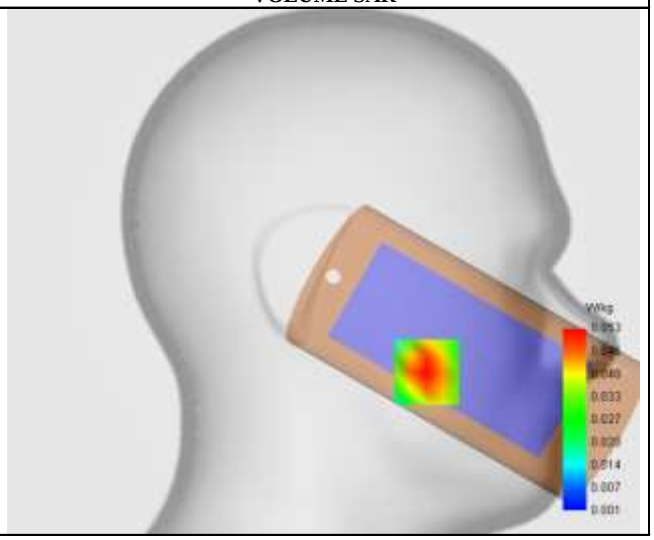
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Left head
Device Position	Cheek
Band	Band4_WCDMA1700
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1732.400024
Relative permitivity (real part)	39.916001
Conductivity (S/m)	1.367550

C. SAR Surface and Volume

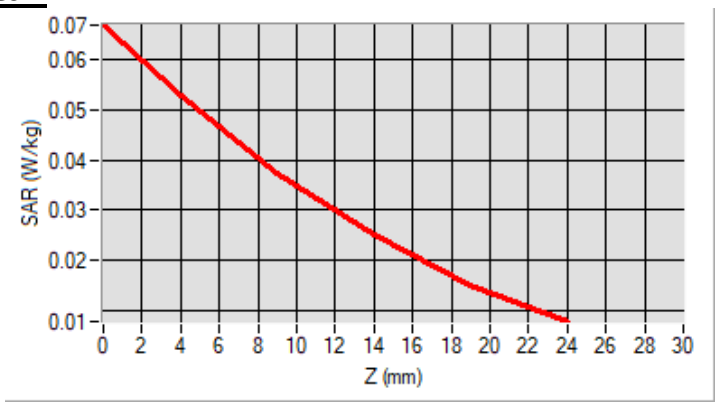
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-51.00, Y=-50.00 ; SAR Peak: 0.07 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.030201
SAR 1g (W/Kg)	0.049713
Variation (%)	1.840000

E. Z Axis Scan



SAR Measurement at WCDMA 1900 (Cheek, Left)

Date of measurement: 16/6/2021

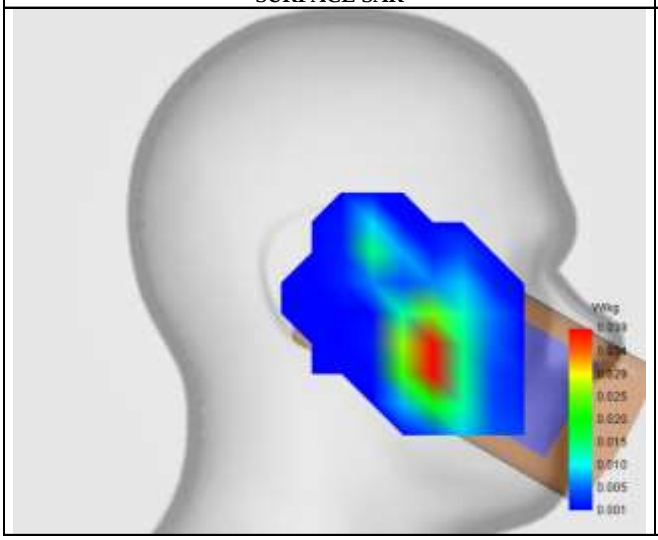
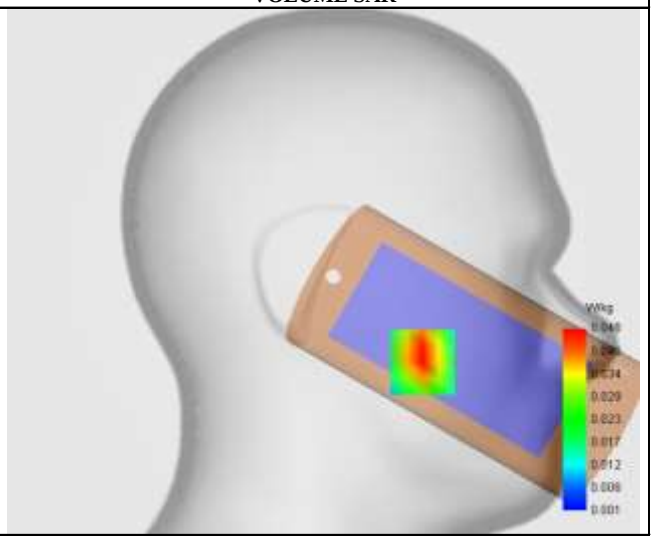
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Left head
Device Position	Cheek
Band	Band2_WCDMA1900
Channels	Low
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1852.400024
Relative permitivity (real part)	39.3123206
Conductivity (S/m)	1.408851

C. SAR Surface and Volume

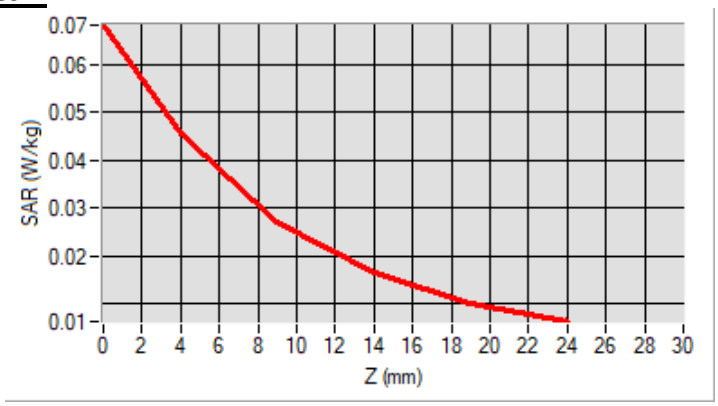
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-45.00 ; SAR Peak: 0.07 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.023722
SAR 1g (W/Kg)	0.043118
Variation (%)	-1.410001

E. Z Axis Scan



SAR Measurement at LTE band 2 (Cheek, Left)

Date of measurement: 16/6/2021

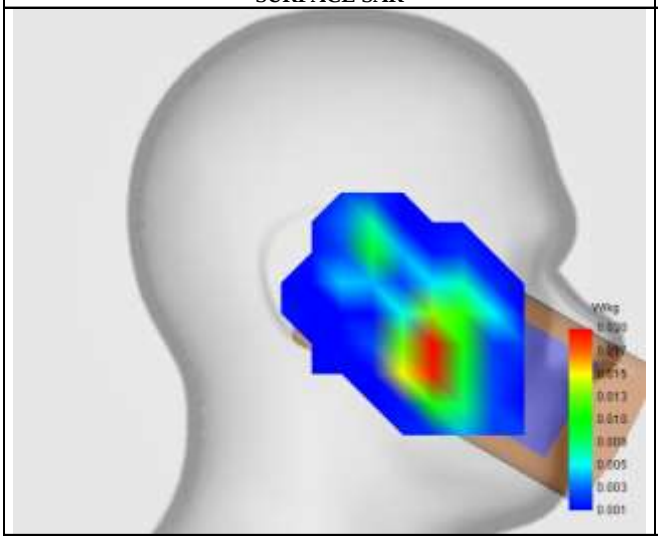
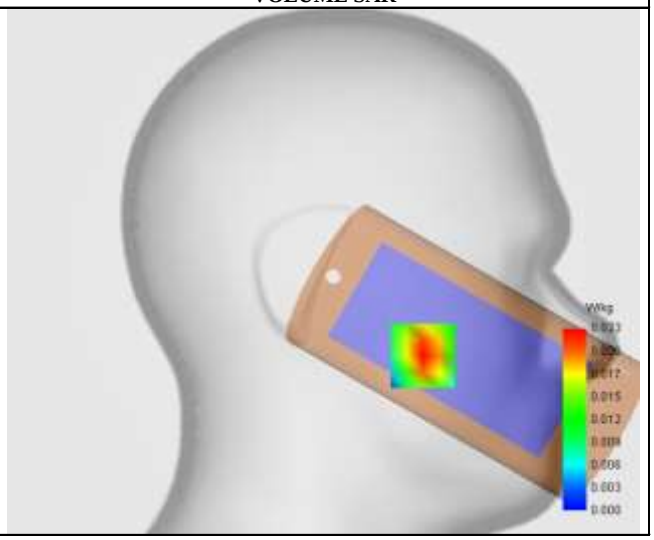
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Left head
Device Position	Body
Band	LTE band 2
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1860.000000
Relative permitivity (real part)	39.2910452
Conductivity (S/m)	1.410834

C. SAR Surface and Volume

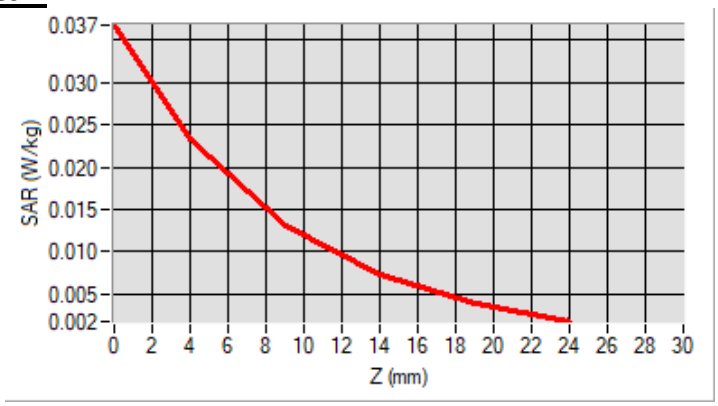
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-42.00 ; SAR Peak: 0.04 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.011645
SAR 1g (W/Kg)	0.021796
Variation (%)	0.920001

E. Z Axis Scan



SAR Measurement at LTE band 4 (Head, Left)

Date of measurement: 17/6/2021

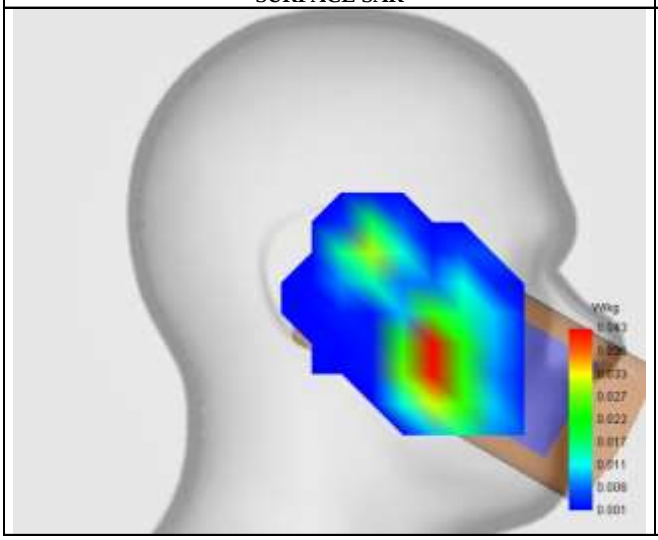
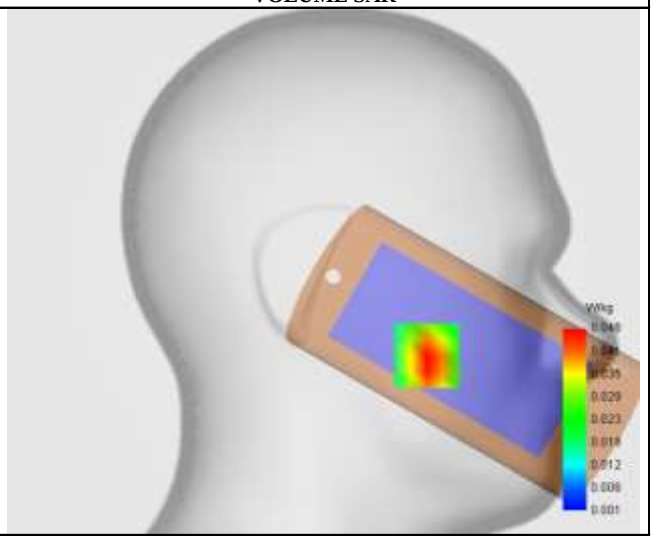
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Left head
Device Position	Body
Band	LTE band 4
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1732.500000
Relative permitivity (real part)	39.916001
Conductivity (S/m)	1.367550

C. SAR Surface and Volume

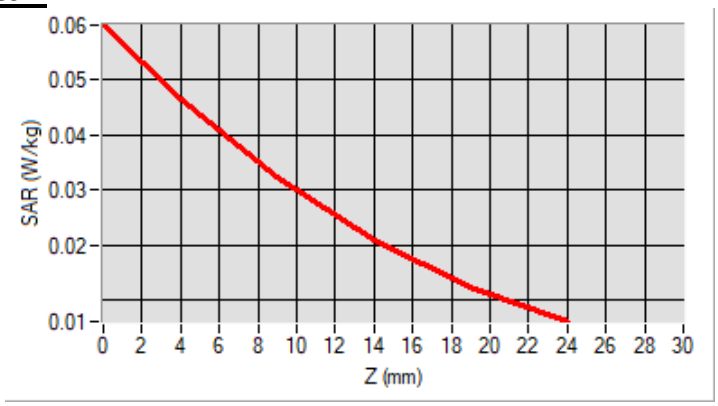
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-51.00, Y=-42.00 ; SAR Peak: 0.06 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.026439
SAR 1g (W/Kg)	0.043738
Variation (%)	3.130000

E. Z Axis Scan



SAR Measurement at LTE band 7 (Cheek, Left)

Date of measurement: 15/6/2021

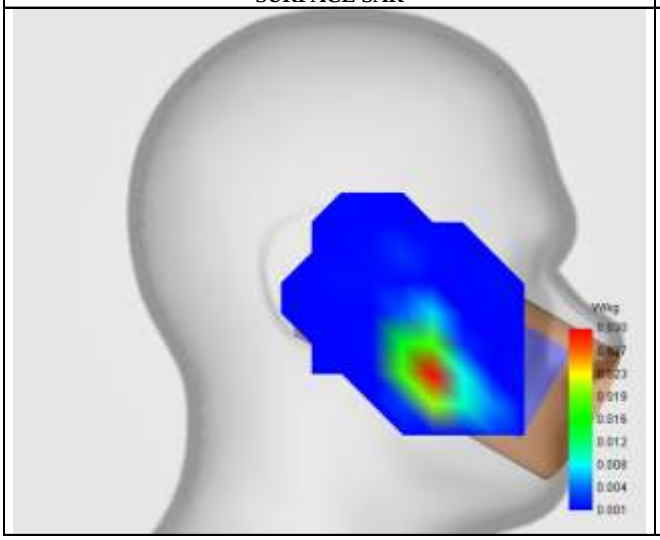
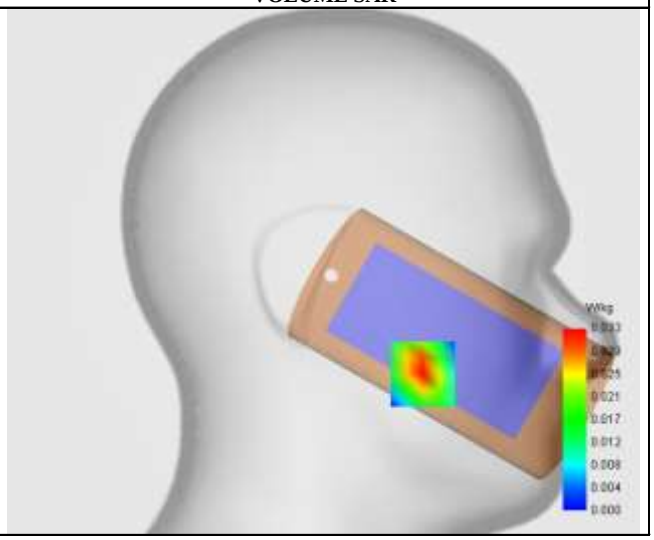
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.15
Area Scan	dx=15mm dy=15mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Left head
Device Position	Cheek
Band	LTE band 7
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2560.000000
Relative permitivity (real part)	39.343333
Conductivity (S/m)	1.968681

C. SAR Surface and Volume

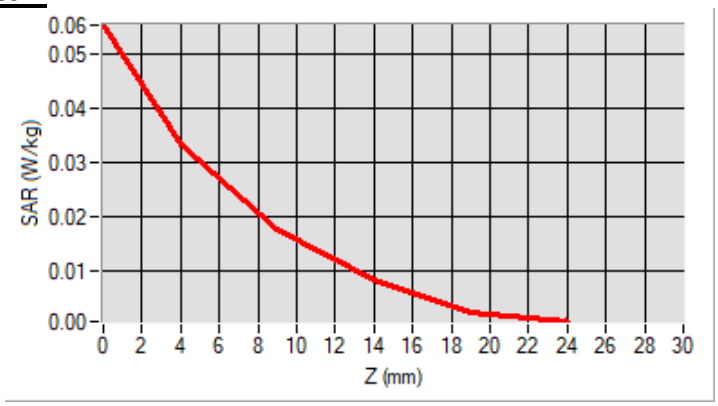
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-51.00 ; SAR Peak: 0.06 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.014556
SAR 1g (W/Kg)	0.031014
Variation (%)	0.810001

E. Z Axis Scan



SAR Measurement at LTE band 5 (Cheek, Right)

Date of measurement: 10/6/2021

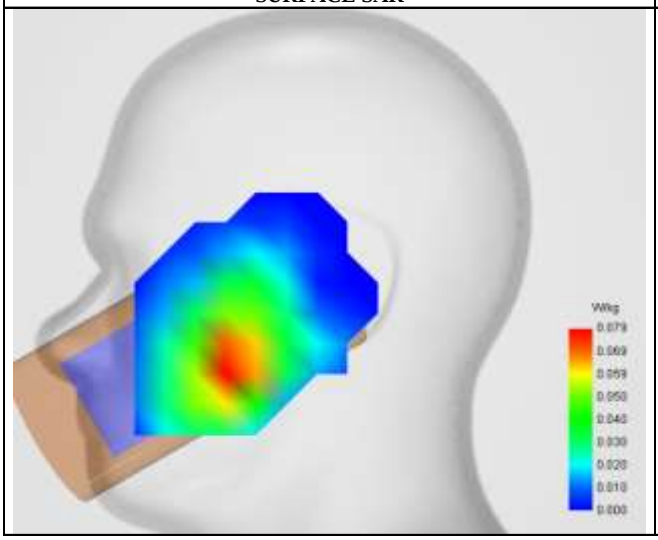
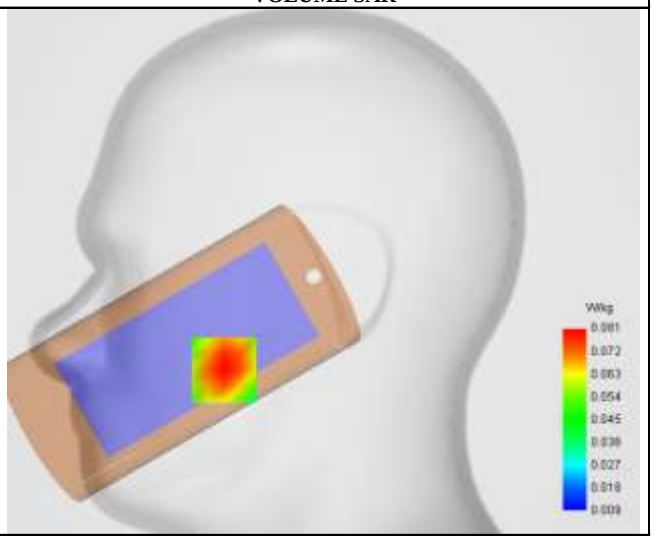
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Right head
Device Position	Cheek
Band	LTE band 5
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	844.000000
Relative permitivity (real part)	40.9114952
Conductivity (S/m)	0.939644

C. SAR Surface and Volume

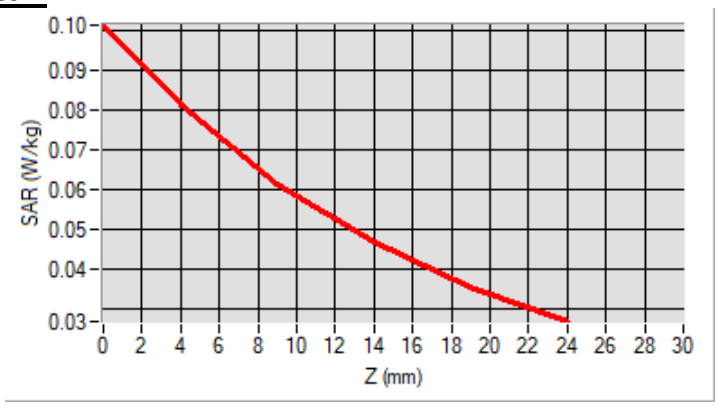
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-49.00 ; SAR Peak: 0.10 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.055212
SAR 1g (W/Kg)	0.077855
Variation (%)	-2.110000

E. Z Axis Scan



SAR Measurement at LTE band 17 (Cheek, Right)

Date of measurement: 10/6/2021

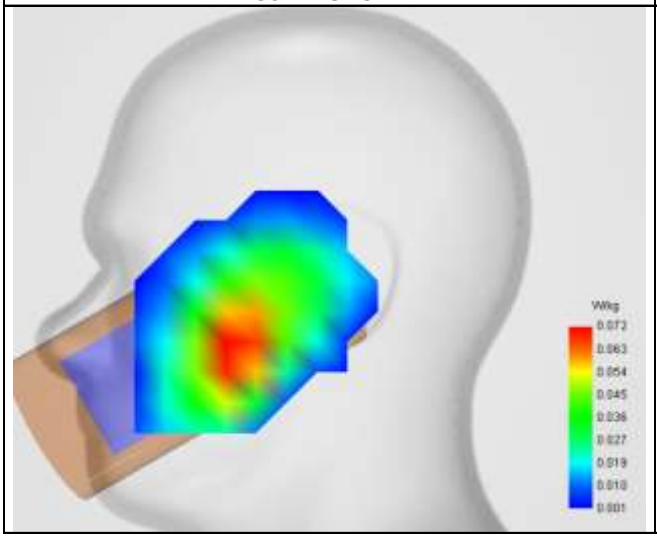
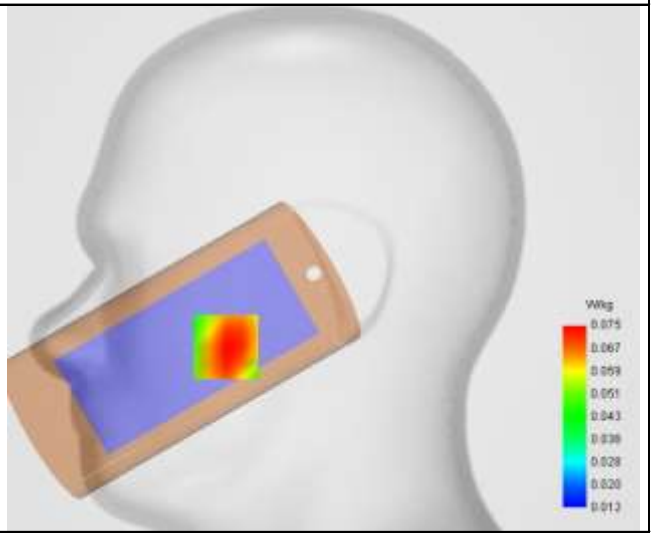
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.73
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Right head
Device Position	Cheek
Band	LTE band 17
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	711.000000
Relative permitivity (real part)	42.008002
Conductivity (S/m)	0.869734

C. SAR Surface and Volume

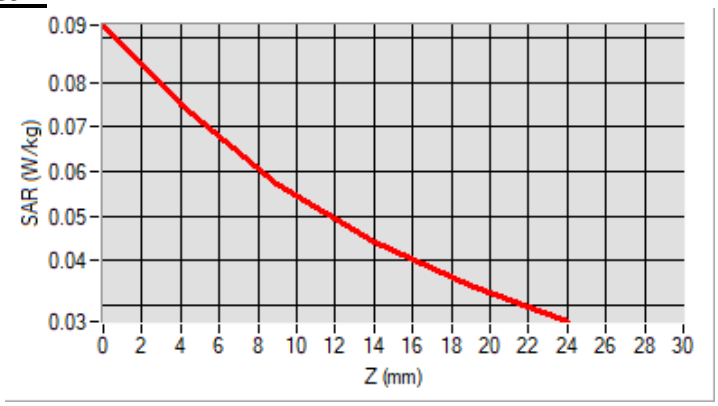
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-48.00, Y=-39.00 ; SAR Peak: 0.09 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.052827
SAR 1g (W/Kg)	0.073582
Variation (%)	3.020000

E. Z Axis Scan



SAR Measurement at LTE band 2 (Cheek, Left)

Date of measurement: 11/6/2021

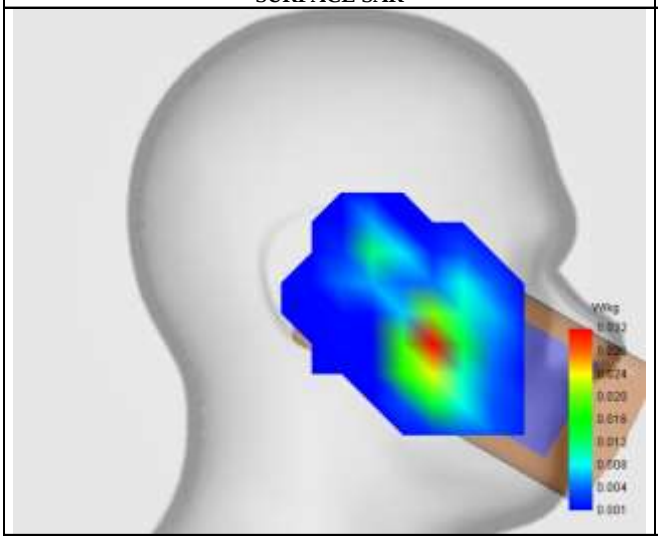
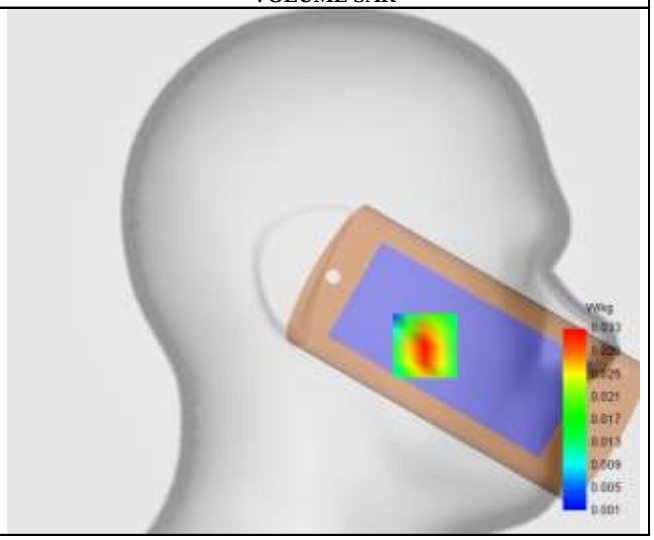
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Left head
Device Position	Body
Band	LTE band 2
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1860.000000
Relative permitivity (real part)	39.2910452
Conductivity (S/m)	1.410834

C. SAR Surface and Volume

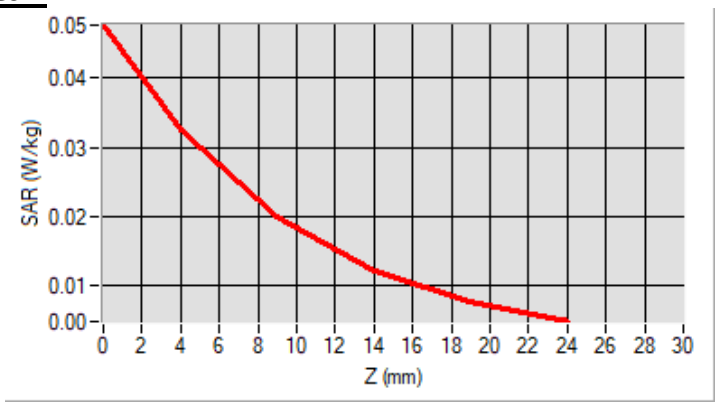
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-50.00, Y=-37.00 ; SAR Peak: 0.05 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.016626
SAR 1g (W/Kg)	0.030413
Variation (%)	-2.450000

E. Z Axis Scan



SAR Measurement at LTE band 4 (Cheek, Left)

Date of measurement: 17/6/2021

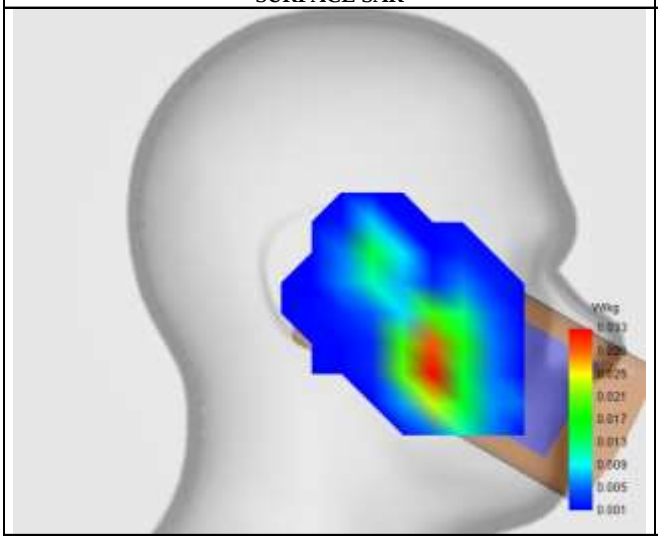
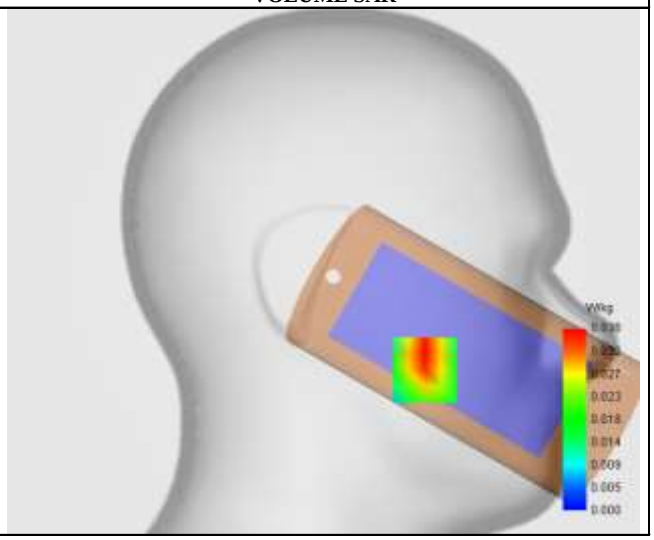
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Left head
Device Position	Body
Band	LTE band 4
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1745.000000
Relative permitivity (real part)	39.812998
Conductivity (S/m)	1.382861

C. SAR Surface and Volume

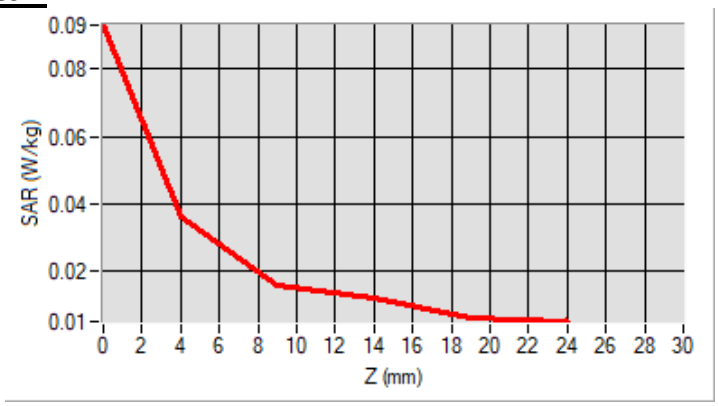
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-50.00, Y=-49.00 ; SAR Peak: 0.06 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.019052
SAR 1g (W/Kg)	0.034019
Variation (%)	-3.500000

E. Z Axis Scan



SAR Measurement at LTE band 7 (Cheek, Left)

Date of measurement: 15/6/2021

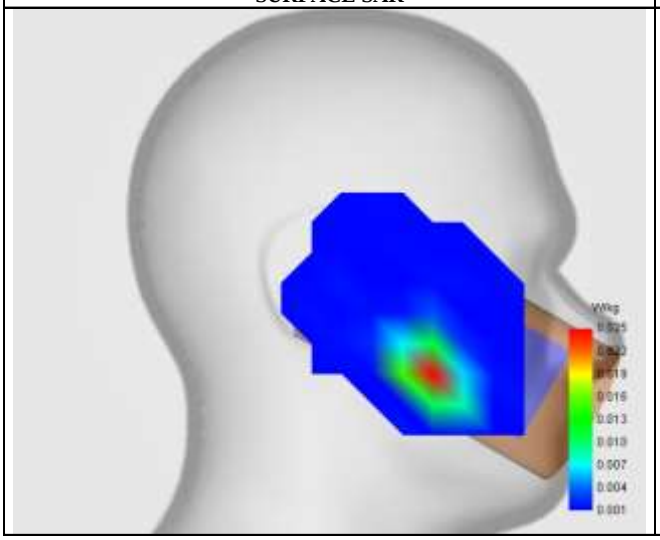
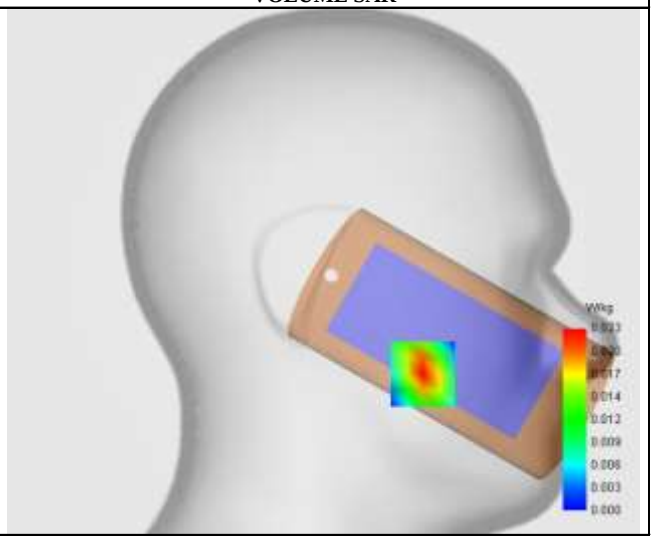
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.15
Area Scan	dx=15mm dy=15mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Left head
Device Position	Cheek
Band	LTE band 7
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2560.000000
Relative permitivity (real part)	39.343333
Conductivity (S/m)	1.968681

C. SAR Surface and Volume

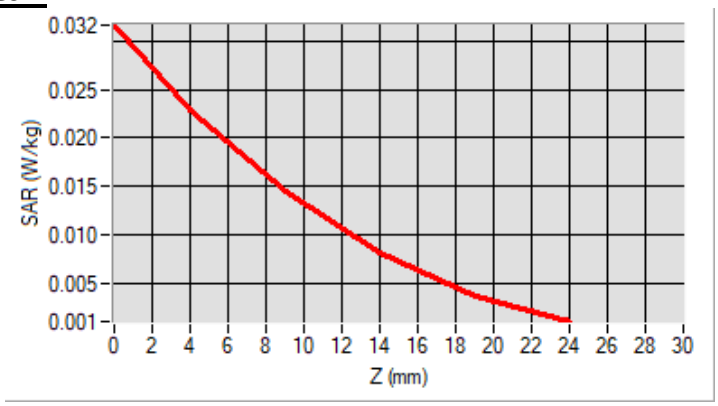
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-51.00 ; SAR Peak: 0.03 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.010355
SAR 1g (W/Kg)	0.021045
Variation (%)	-3.920000

E. Z Axis Scan



SAR Measurement at LTE band 5 (Cheek, Right)

Date of measurement: 11/6/2021

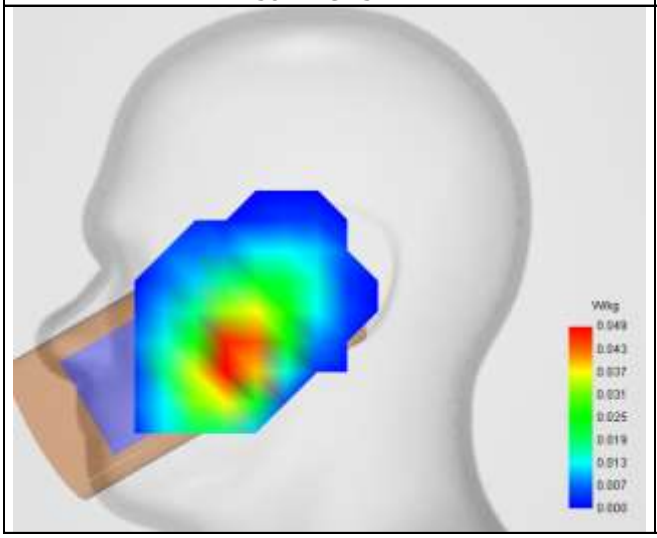
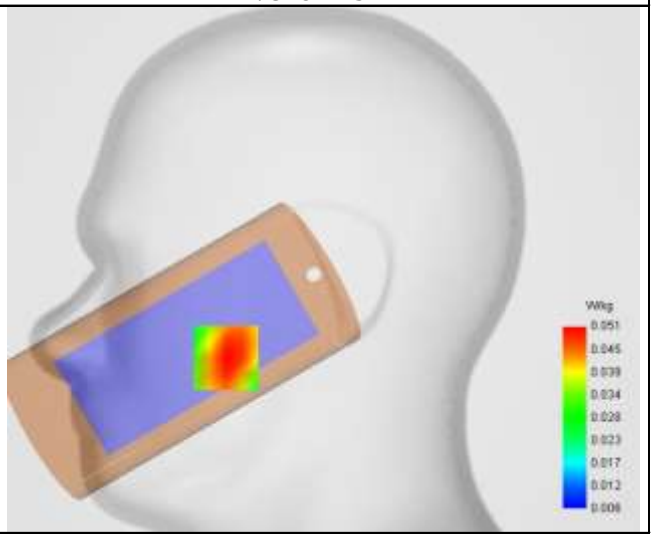
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Right head
Device Position	Cheek
Band	LTE band 5
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	836.500000
Relative permitivity (real part)	40.9661257
Conductivity (S/m)	0.927561

C. SAR Surface and Volume

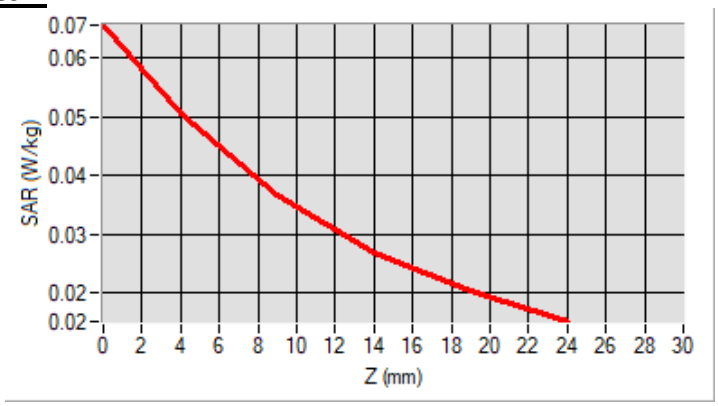
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-48.00, Y=-44.00 ; SAR Peak: 0.07 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.033602
SAR 1g (W/Kg)	0.048667
Variation (%)	-2.750000

E. Z Axis Scan



SAR Measurement at LTE band 17 (Cheek, Right)

Date of measurement: 10/6/2021

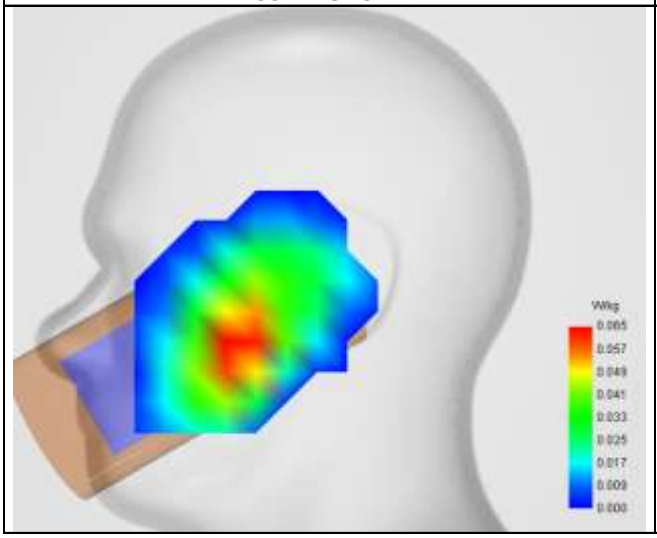
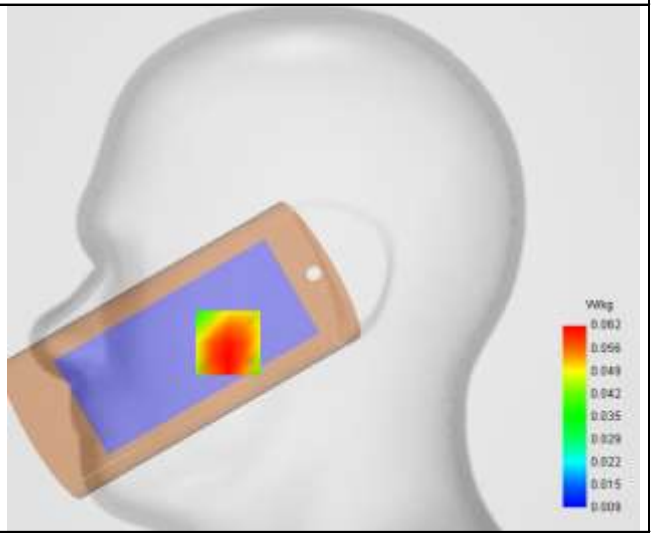
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.73
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Right head
Device Position	Cheek
Band	LTE band 17
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	711.000000
Relative permitivity (real part)	42.008002
Conductivity (S/m)	0.869734

C. SAR Surface and Volume

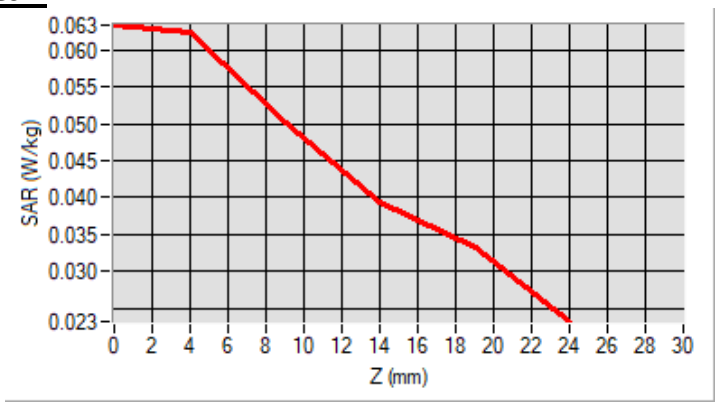
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-47.00, Y=-37.00 ; SAR Peak: 0.08 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.047379
SAR 1g (W/Kg)	0.062984
Variation (%)	1.560000

E. Z Axis Scan



SAR Measurement at IEEE 802.11b ISM (Cheek, Right)

Date of measurement: 15/6/2021

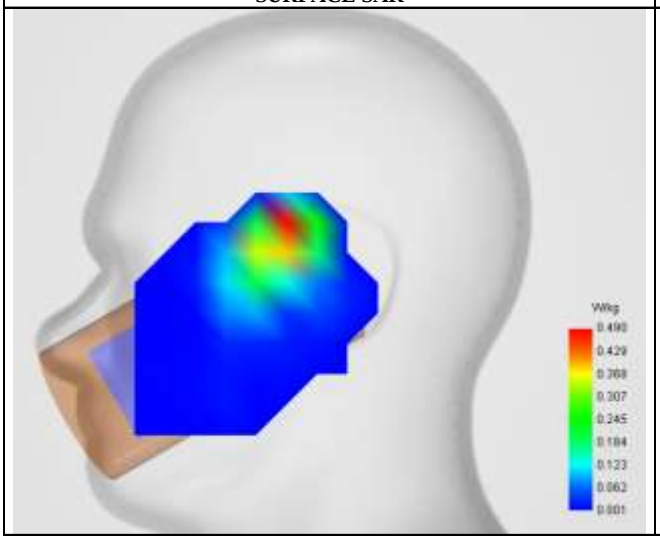
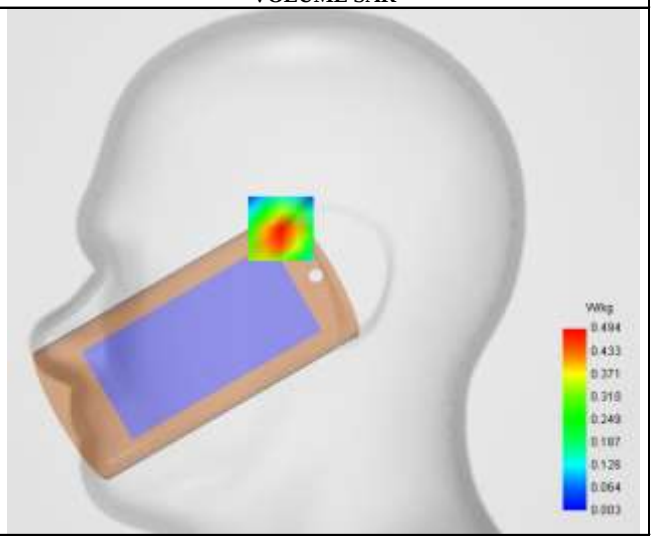
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.23
Area Scan	dx=15mm dy=15mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Right head
Device Position	Body
Band	IEEE 802.11b ISM
Channels	High
Signal	IEEE802.b (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2462.000000
Relative permitivity (real part)	39.760399
Conductivity (S/m)	1.814856

C. SAR Surface and Volume

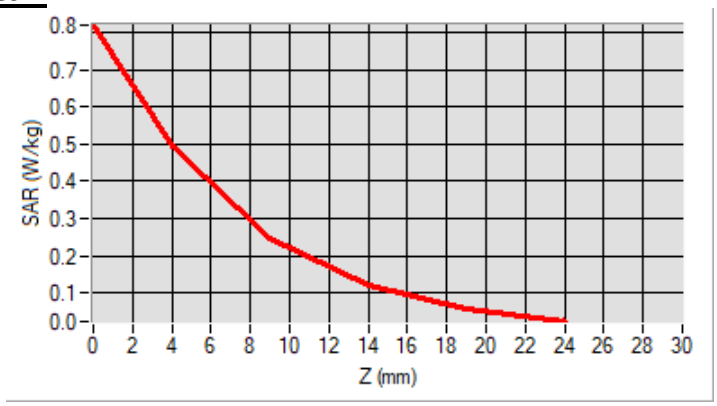
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-21.00, Y=21.00 ; SAR Peak: 0.83 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.234753
SAR 1g (W/Kg)	0.479917
Variation (%)	-0.350001

E. Z Axis Scan



SAR Measurement at GSM 850 (Body, Validation Plane)

Date of measurement: 11/6/2021

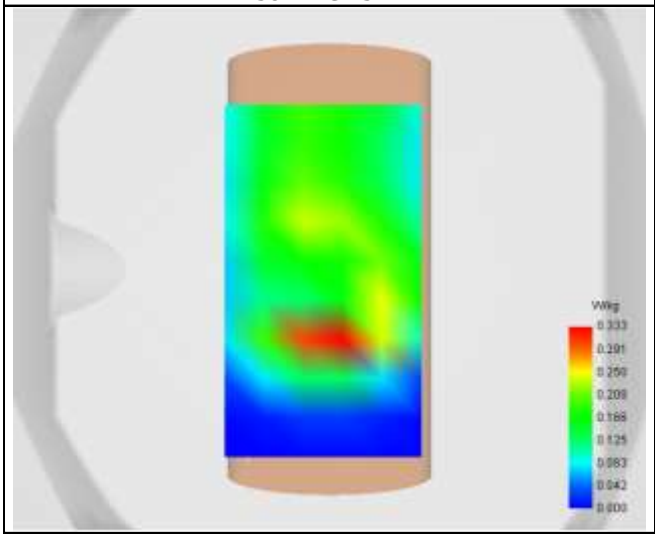
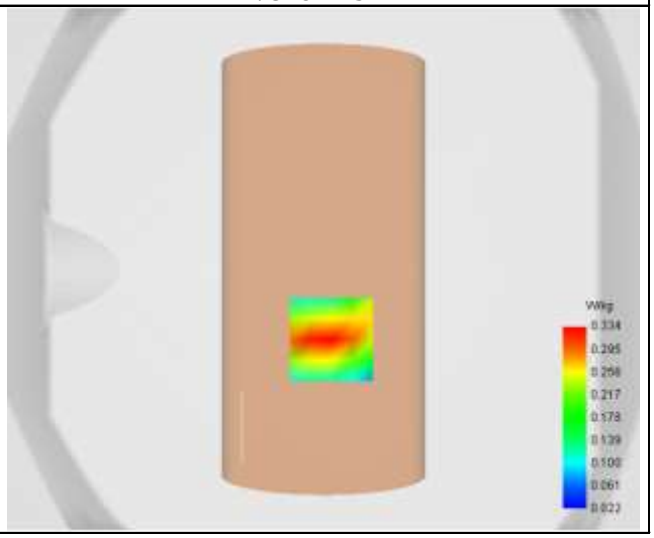
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. Permitivity

Frequency (MHz)	824.200012
Relative permitivity (real part)	41.0165823
Conductivity (S/m)	0.919707

C. SAR Surface and Volume

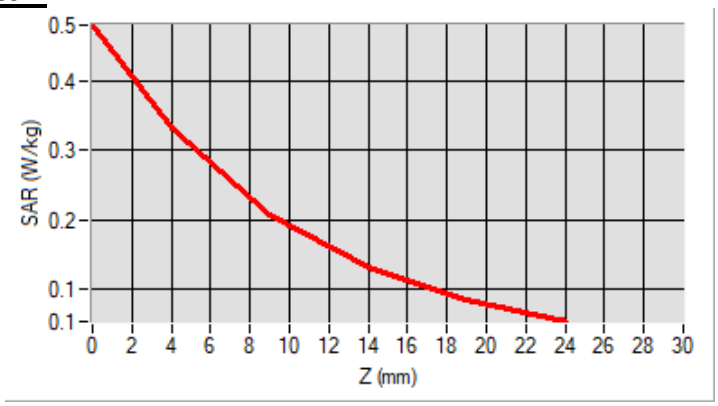
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=-27.00 ; SAR Peak: 0.49 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.181028
SAR 1g (W/Kg)	0.312414
Variation (%)	-3.500000

E. Z Axis Scan



SAR Measurement at GSM1900 (Body, Validation Plane)

Date of measurement: 16/6/2021

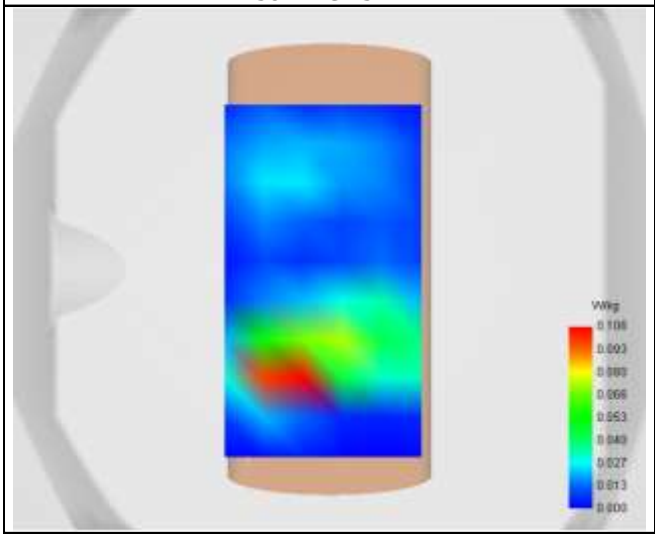
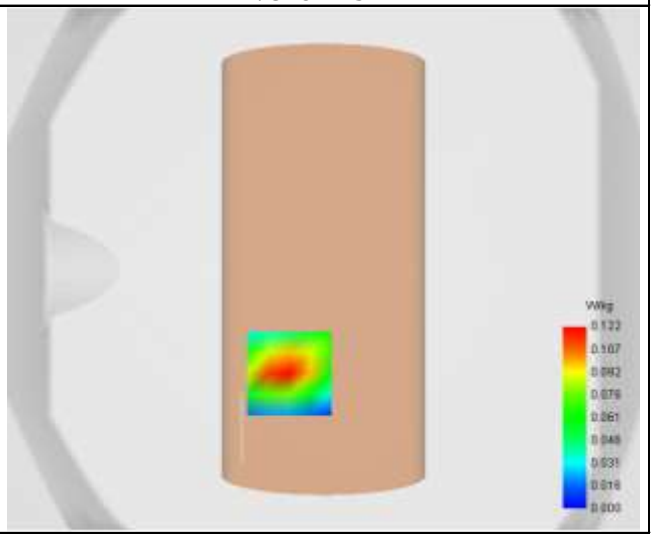
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	TDMA (Crest factor: 8.0)

B. Permitivity

Frequency (MHz)	1880.000000
Relative permitivity (real part)	39.1930241
Conductivity (S/m)	1.420391

C. SAR Surface and Volume

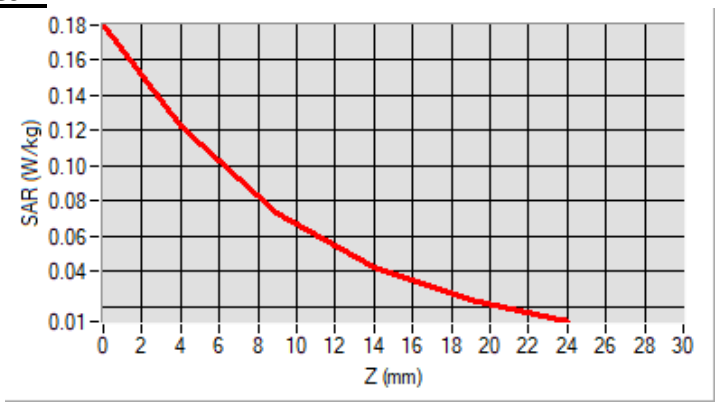
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-13.00, Y=-40.00 ; SAR Peak: 0.18 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.058056
SAR 1g (W/Kg)	0.112713
Variation (%)	-0.330000

E. Z Axis Scan



SAR Measurement at WCDMA 850 (Body, Validation Plane)

Date of measurement: 11/6/2021

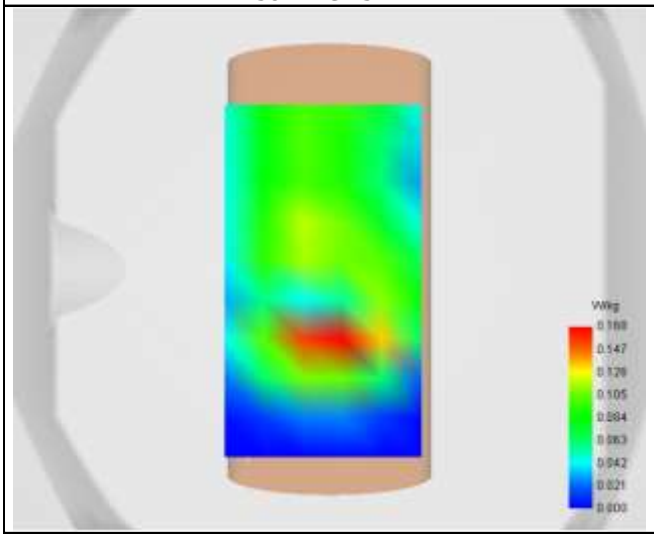
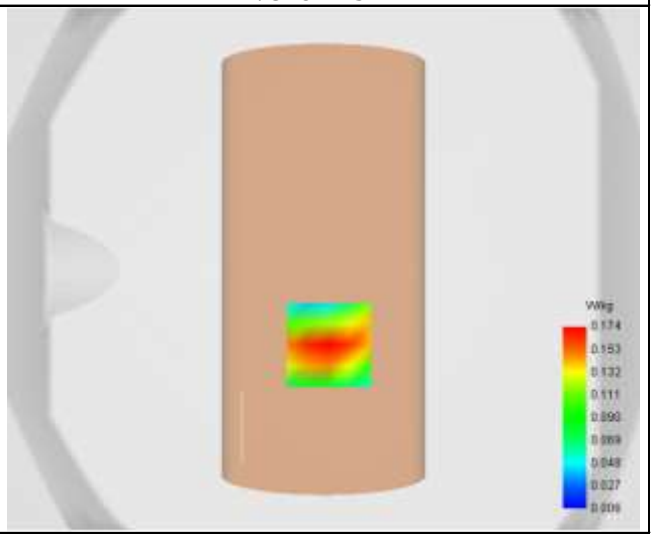
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Body
Band	Band5_WCDMA850
Channels	Low
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	826.400024
Relative permitivity (real part)	40.994470
Conductivity (S/m)	0.920780

C. SAR Surface and Volume

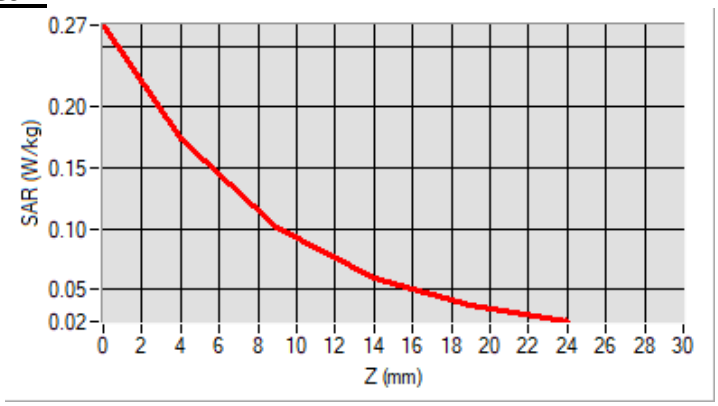
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=-29.00 ; SAR Peak: 0.27 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.092474
SAR 1g (W/Kg)	0.164052
Variation (%)	-2.830000

E. Z Axis Scan



SAR Measurement at WCDMA 1700 (Body, Validation Plane)

Date of measurement: 10/6/2021

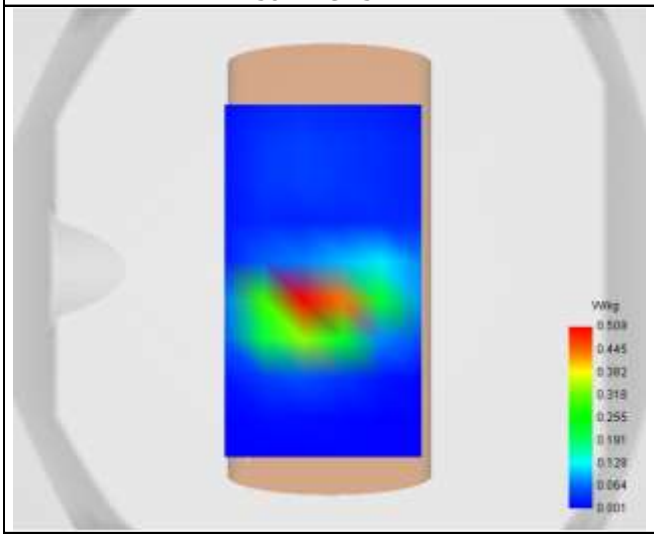
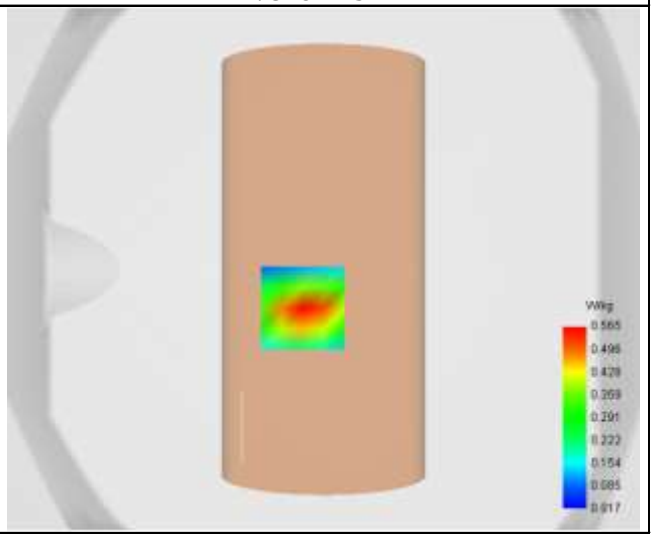
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band4_WCDMA1700
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1732.500000
Relative permitivity (real part)	39.916001
Conductivity (S/m)	1.367550

C. SAR Surface and Volume

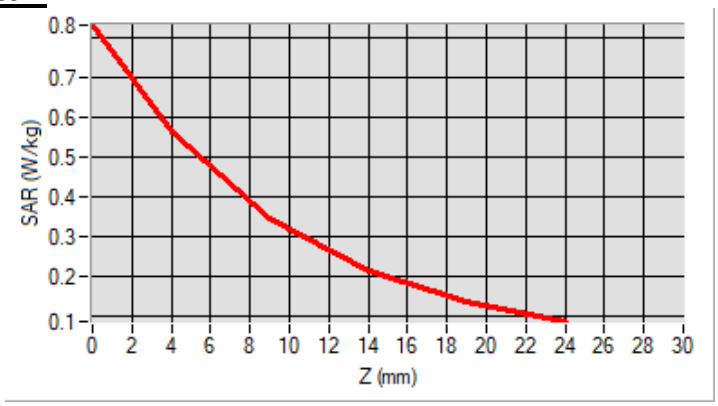
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-8.00, Y=-15.00 ; SAR Peak: 0.84 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.285588
SAR 1g (W/Kg)	0.522354
Variation (%)	-0.640000

E. Z Axis Scan



SAR Measurement at WCDMA 1900 (Body, Validation Plane)

Date of measurement: 16/6/2021

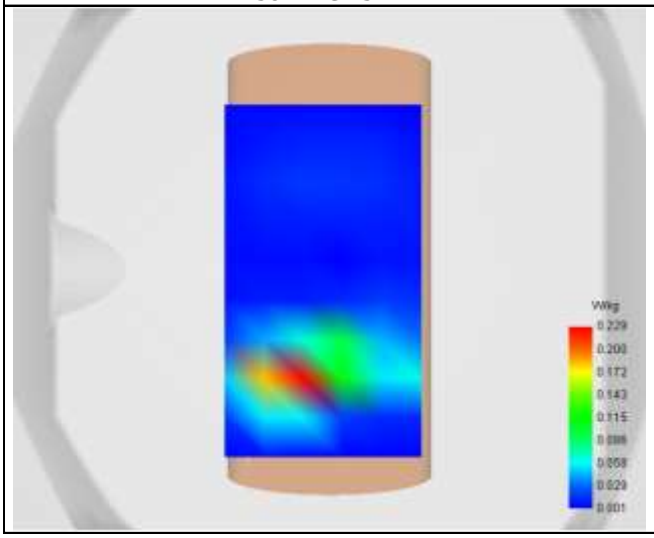
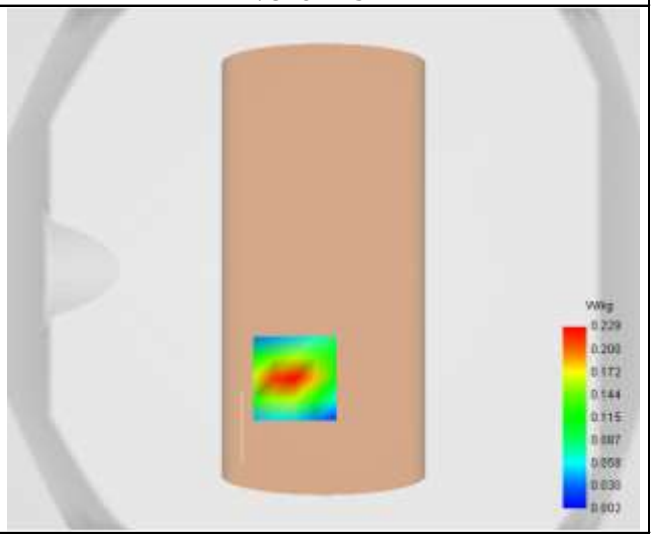
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band2_WCDMA1900
Channels	Low
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity:

Frequency (MHz)	1852.400024
Relative permitivity (real part)	39.3123206
Conductivity (S/m)	1.408851

C. SAR Surface and Volume

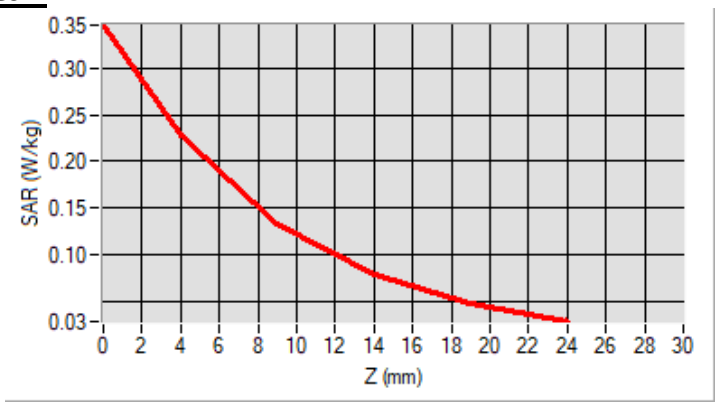
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-11.00, Y=-42.00 ; SAR Peak: 0.35 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.107148
SAR 1g (W/Kg)	0.209765
Variation (%)	-2.240000

E. Z Axis Scan



SAR Measurement at LTE band 2 (Body, Validation Plane)

Date of measurement: 17/6/2021

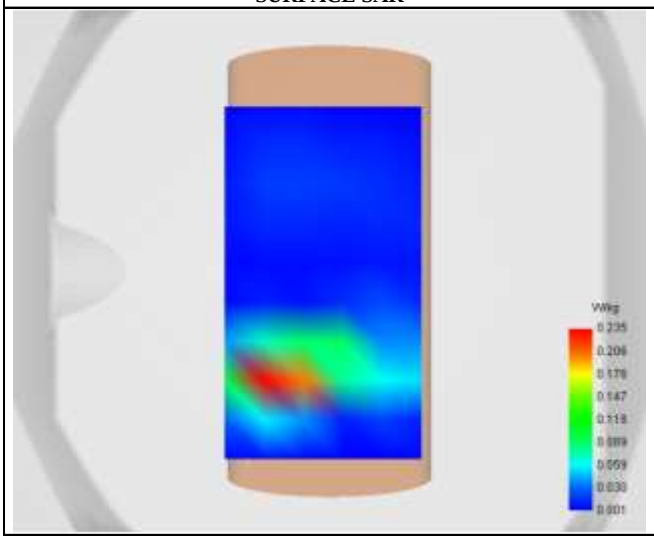
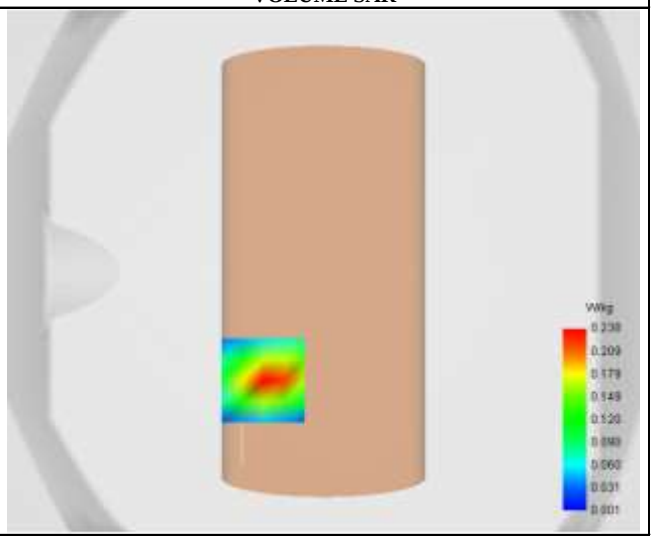
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1860.000000
Relative permitivity (real part)	39.2910452
Conductivity (S/m)	1.410834

C. SAR Surface and Volume

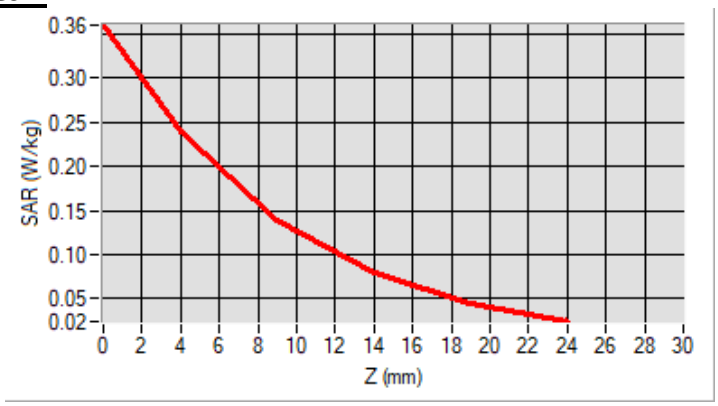
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-23.00, Y=-42.00 ; SAR Peak: 0.36 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.111078
SAR 1g (W/Kg)	0.218994
Variation (%)	3.310000

E. Z Axis Scan



SAR Measurement at LTE band 4 (Body, Validation Plane)

Date of measurement: 17/6/2021

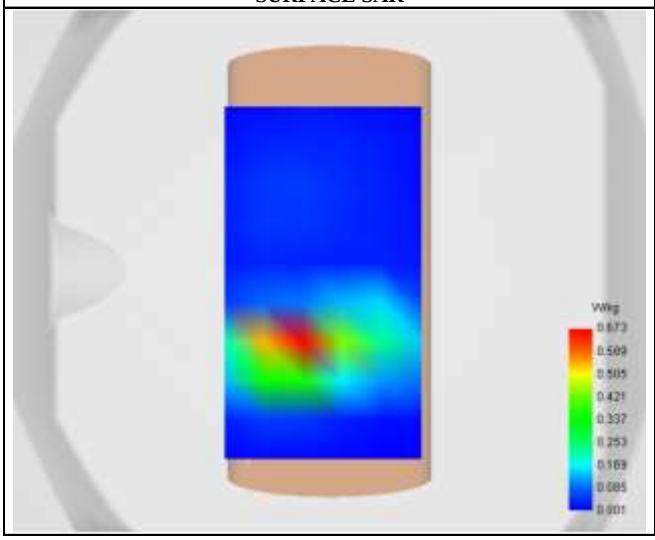
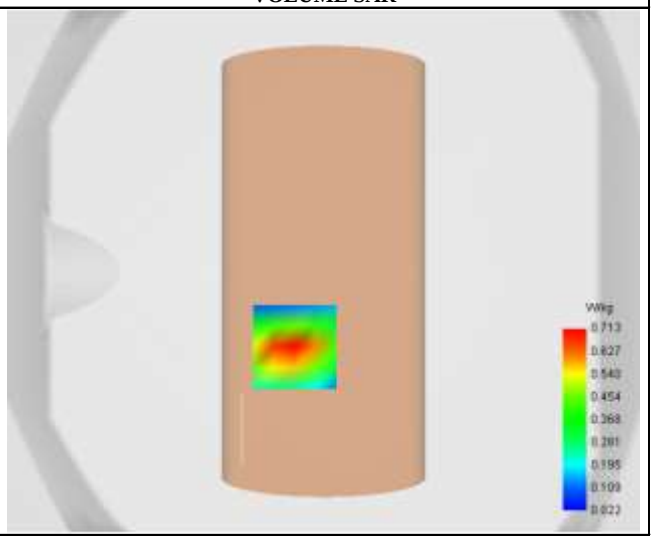
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1732.500000
Relative permitivity (real part)	40.115910
Conductivity (S/m)	1.360603

C. SAR Surface and Volume

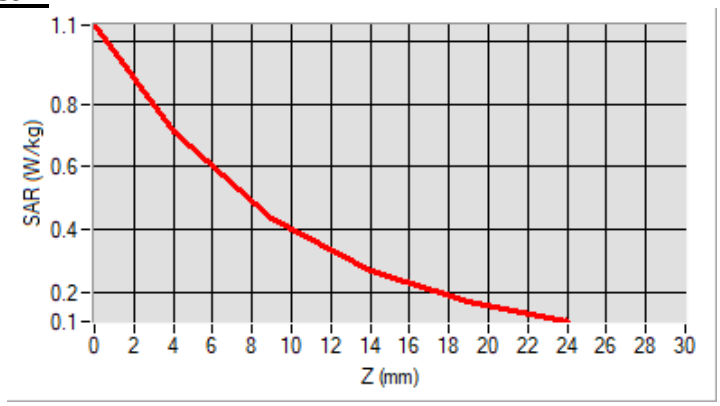
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-11.00, Y=-29.00 ; SAR Peak: 1.07 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.358475
SAR 1g (W/Kg)	0.661286
Variation (%)	3.350000

E. Z Axis Scan



SAR Measurement at LTE band 7 (Body, Validation Plane)

Date of measurement: 15/6/2021

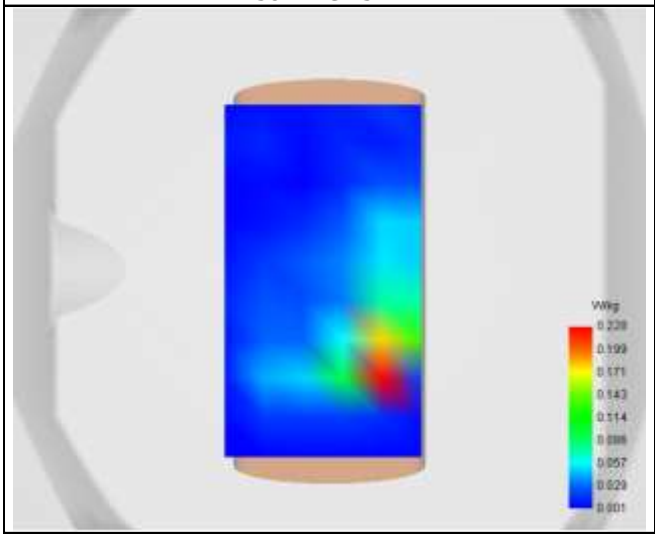
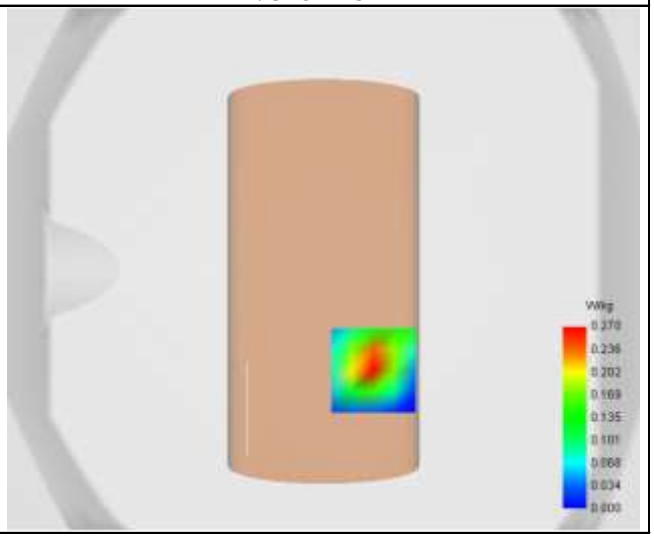
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.15
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 7
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2560.000000
Relative permitivity (real part)	39.343333
Conductivity (S/m)	1.968681

C. SAR Surface and Volume

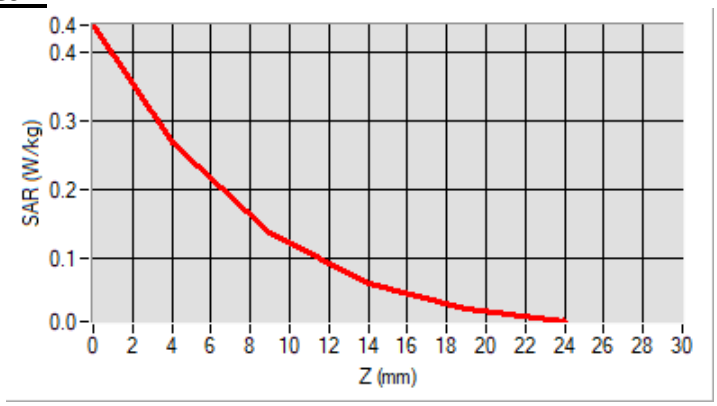
SURFACE SAR	VOLUME SAR
	

Maximum location: X=19.00, Y=-39.00 ; SAR Peak: 0.45 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.107484
SAR 1g (W/Kg)	0.247210
Variation (%)	-0.700000

E. Z Axis Scan



SAR Measurement at LTE band 5 (Body, Validation Plane)

Date of measurement: 10/6/2021

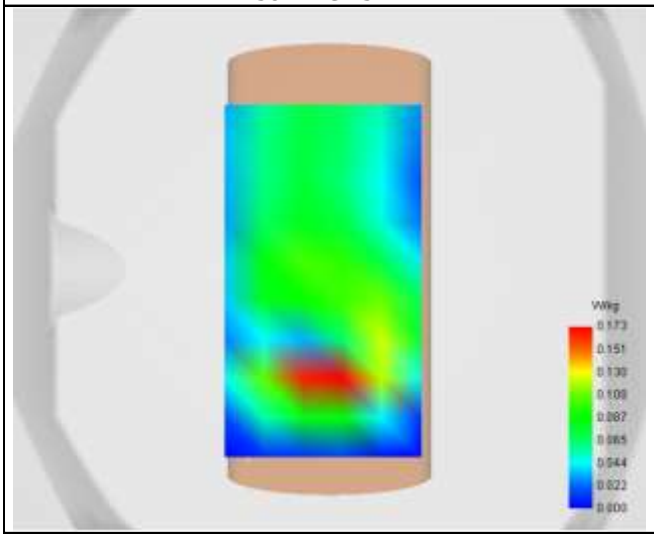
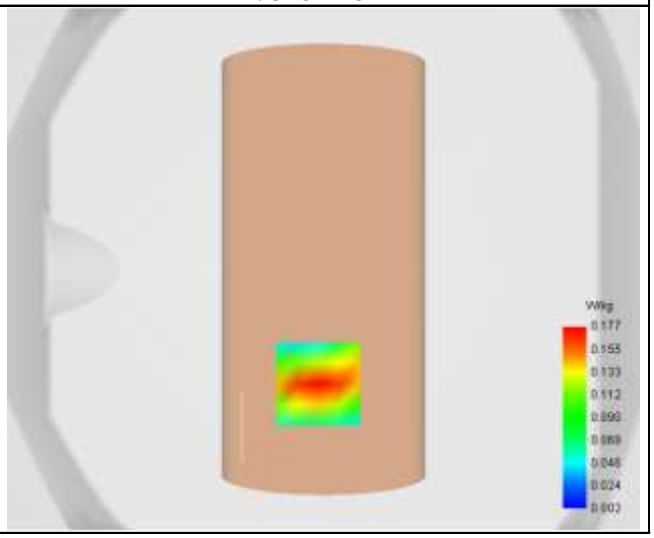
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 5
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	844.000000
Relative permitivity (real part)	40.9114952
Conductivity (S/m)	0.939644

C. SAR Surface and Volume

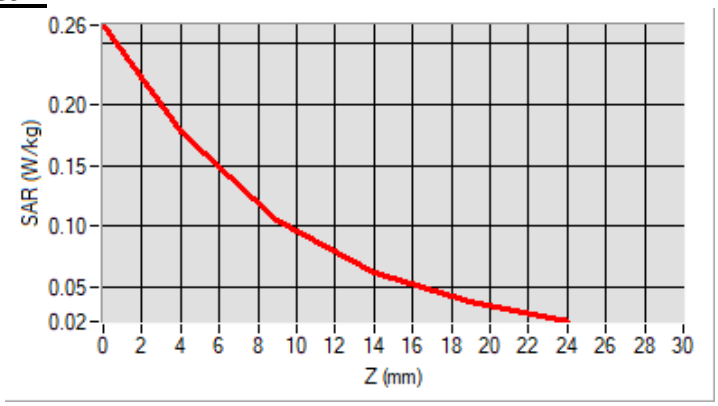
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-2.00, Y=-44.00 ; SAR Peak: 0.26 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.091324
SAR 1g (W/Kg)	0.164193
Variation (%)	-3.680000

E. Z Axis Scan



SAR Measurement at LTE band 17 (Body, Validation Plane)

Date of measurement: 10/6/2021

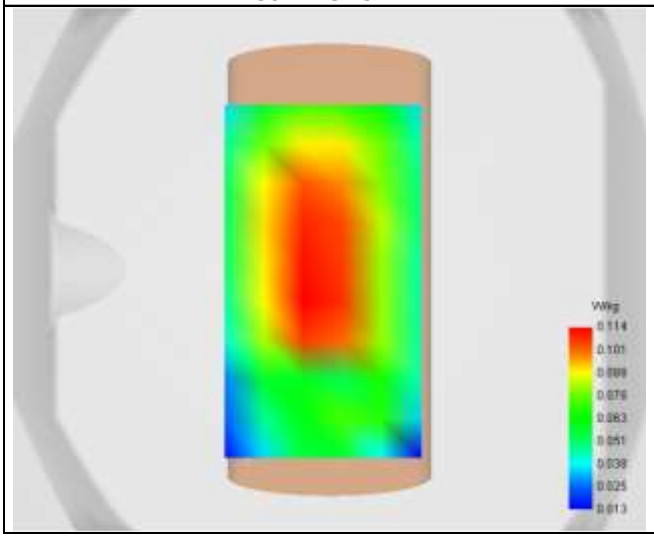
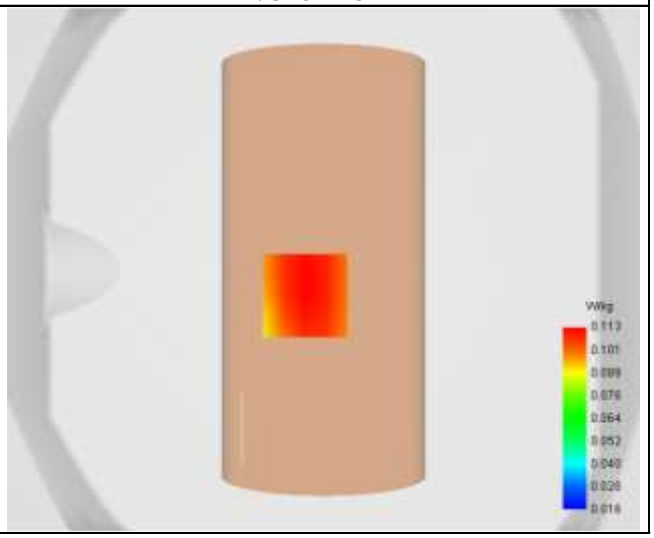
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.73
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 17
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	711.000000
Relative permitivity (real part)	42.008002
Conductivity (S/m)	0.869734

C. SAR Surface and Volume

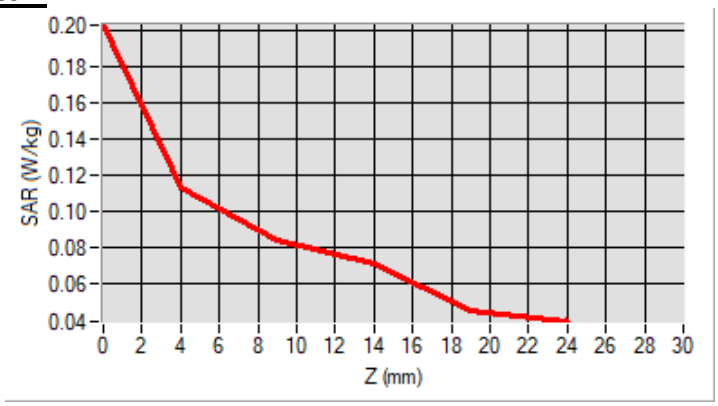
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-7.00, Y=-10.00 ; SAR Peak: 0.14 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.083912
SAR 1g (W/Kg)	0.112109
Variation (%)	-0.220000

E. Z Axis Scan



SAR Measurement at LTE band 2 (Body, Validation Plane)

Date of measurement: 17/6/2021

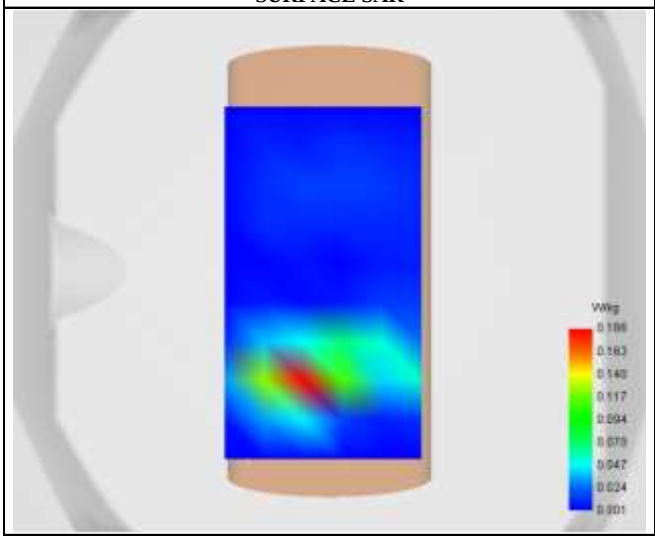
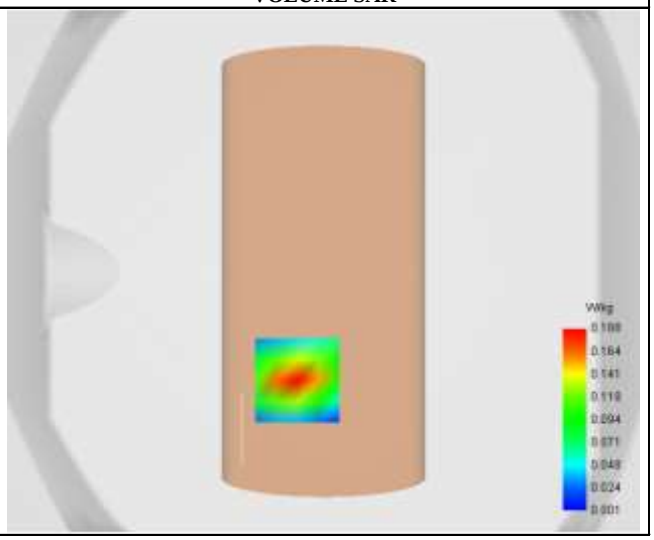
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1860.000000
Relative permitivity (real part)	39.2910452
Conductivity (S/m)	1.410834

C. SAR Surface and Volume

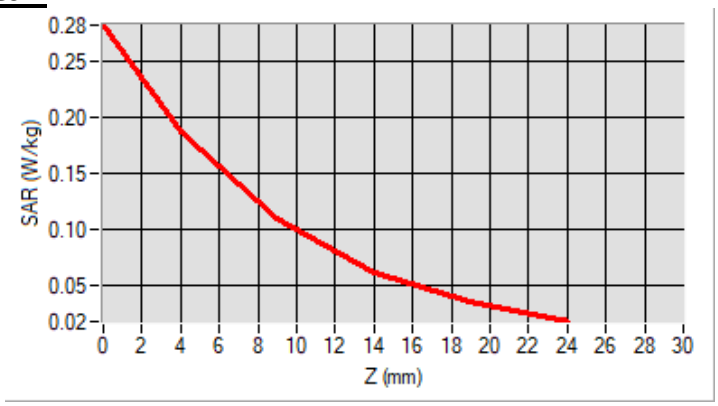
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-10.00, Y=-42.00 ; SAR Peak: 0.28 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.085573
SAR 1g (W/Kg)	0.170621
Variation (%)	-2.890000

E. Z Axis Scan



SAR Measurement at LTE band 4 (Body, Validation Plane)

Date of measurement: 17/6/2021

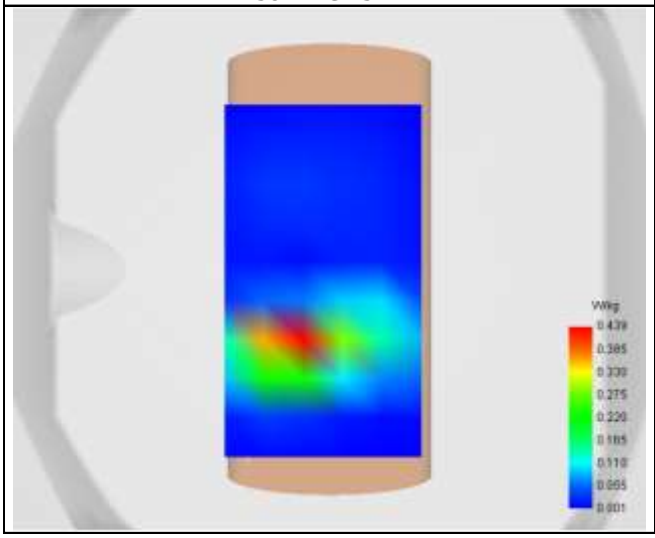
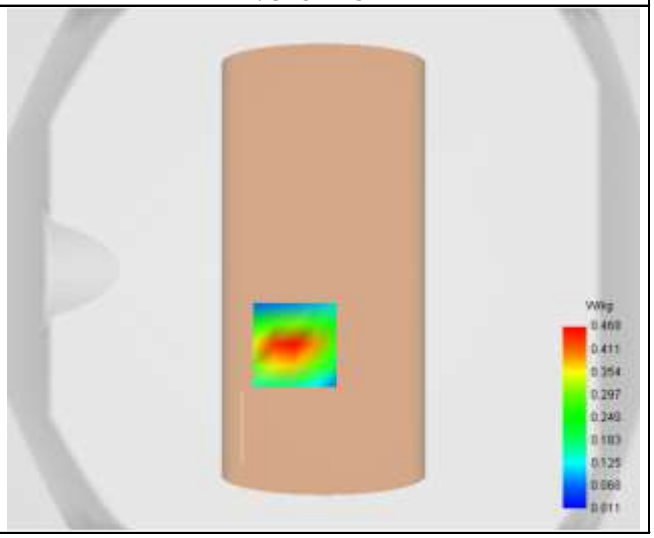
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1745.000000
Relative permitivity (real part)	39.812998
Conductivity (S/m)	1.382861

C. SAR Surface and Volume

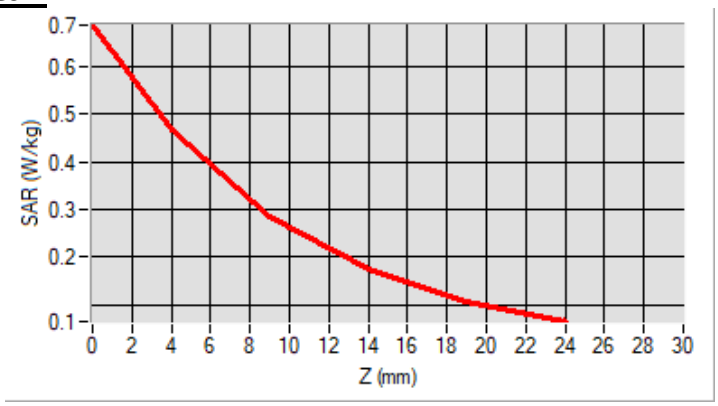
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-11.00, Y=-29.00 ; SAR Peak: 0.70 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.233806
SAR 1g (W/Kg)	0.434203
Variation (%)	3.650000

E. Z Axis Scan



SAR Measurement at LTE band 7 (Body, Validation Plane)

Date of measurement: 15/6/2021

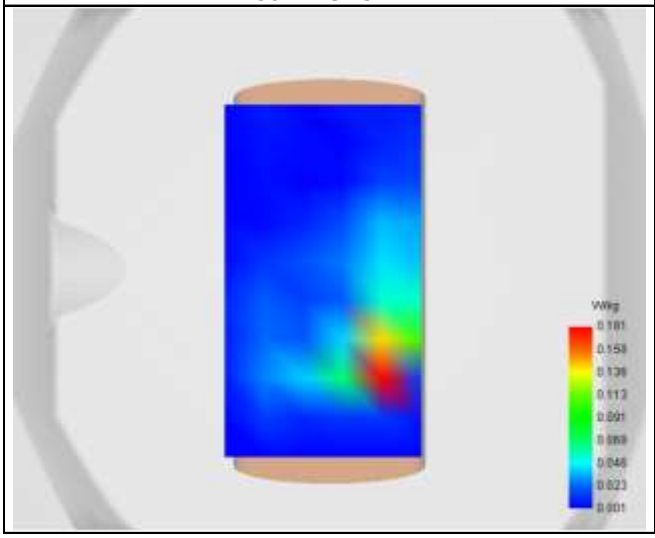
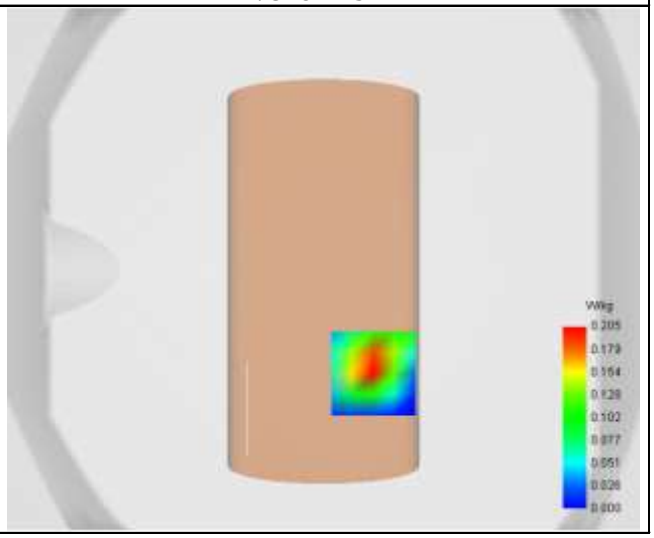
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.15
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 7
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2560.000000
Relative permitivity (real part)	39.343333
Conductivity (S/m)	1.968681

C. SAR Surface and Volume

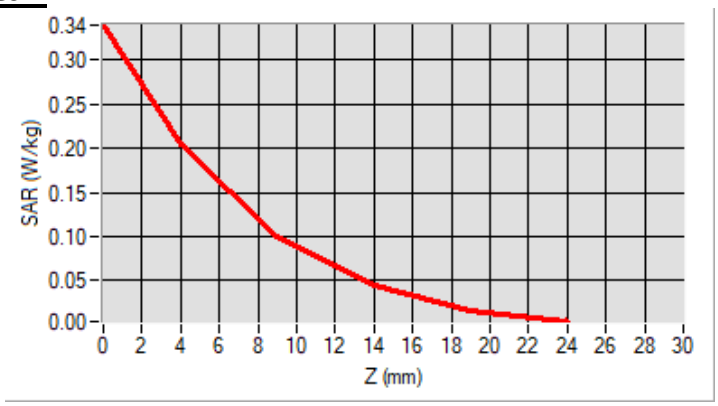
SURFACE SAR	VOLUME SAR
	

Maximum location: X=19.00, Y=-40.00 ; SAR Peak: 0.35 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.080544
SAR 1g (W/Kg)	0.189812
Variation (%)	0.370000

E. Z Axis Scan



SAR Measurement at LTE band 5 (Body, Validation Plane)

Date of measurement: 11/6/2021

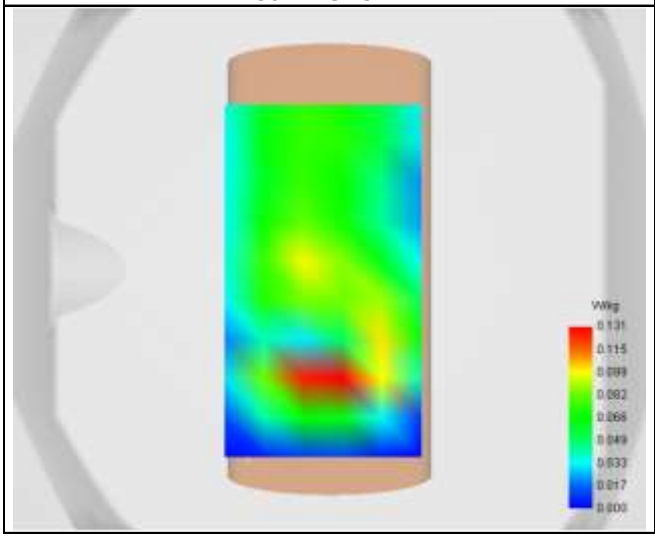
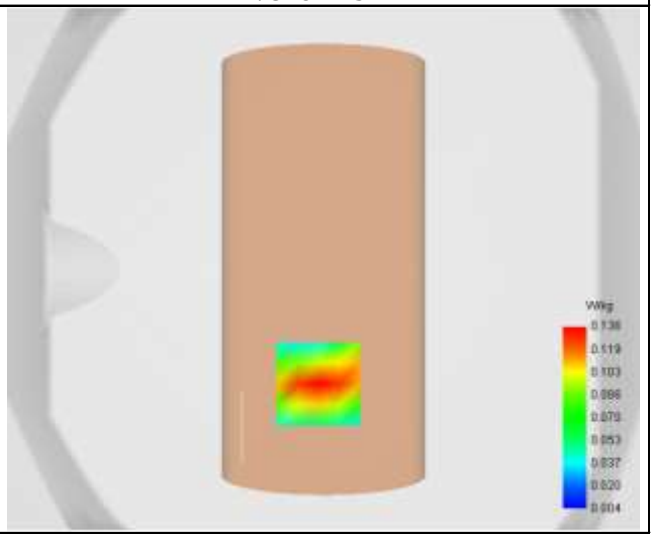
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.68
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 5
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	836.500000
Relative permitivity (real part)	40.9661257
Conductivity (S/m)	0.927561

C. SAR Surface and Volume

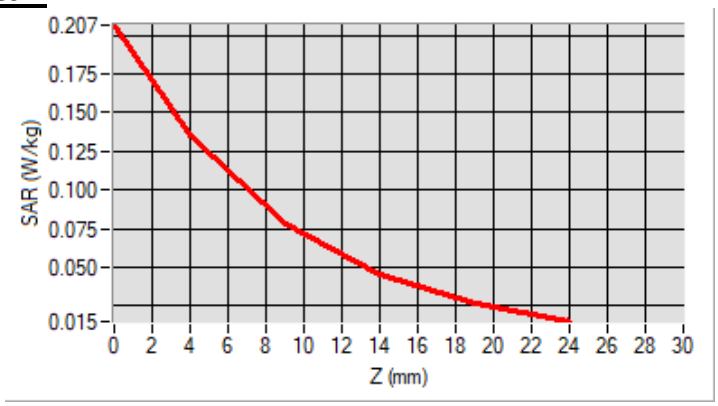
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-2.00, Y=-44.00 ; SAR Peak: 0.21 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.069485
SAR 1g (W/Kg)	0.126093
Variation (%)	-3.600000

E. Z Axis Scan



SAR Measurement at LTE band 17 (Body, Validation Plane)

Date of measurement: 10/6/2021

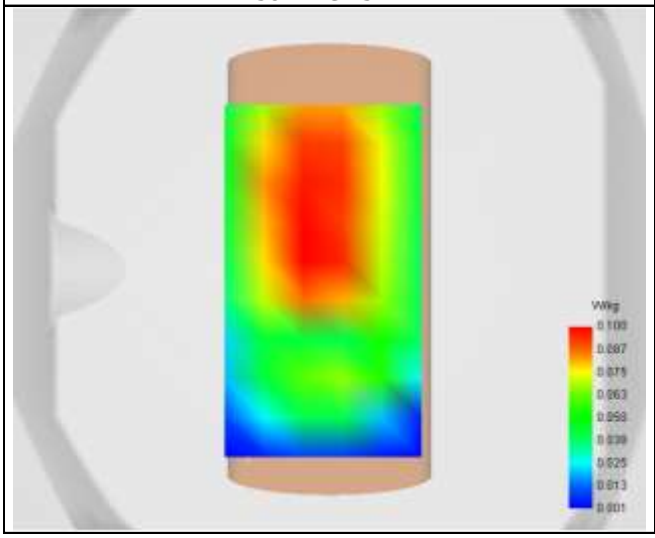
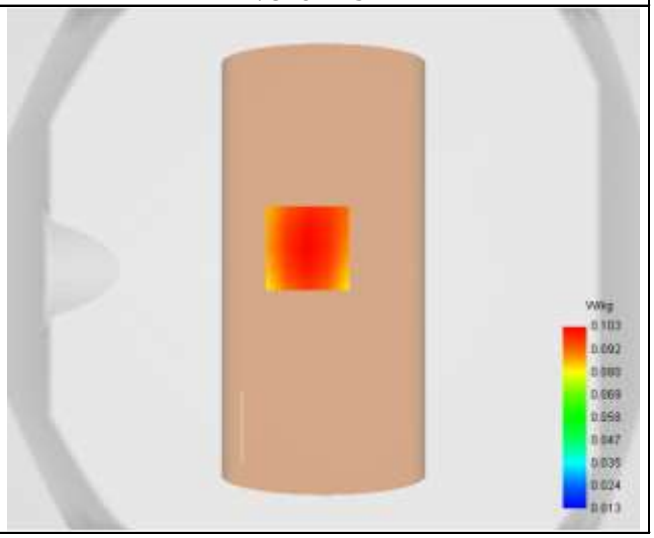
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.73
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 17
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	0.052827
Relative permitivity (real part)	0.073582
Conductivity (S/m)	-4.280000

C. SAR Surface and Volume

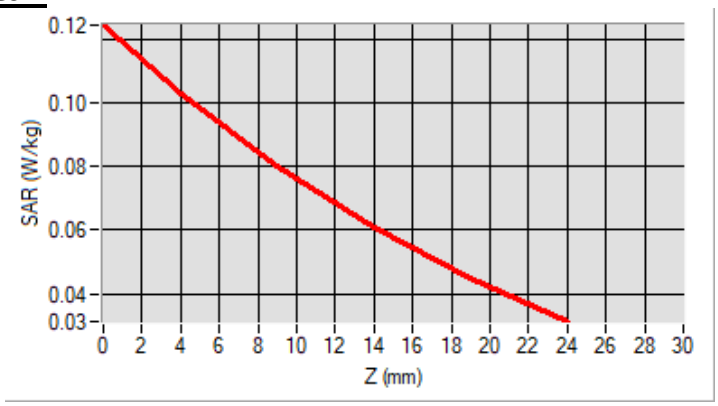
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-6.00, Y=8.00 ; SAR Peak: 0.13 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.074329
SAR 1g (W/Kg)	0.101438
Variation (%)	0.850000

E. Z Axis Scan



SAR Measurement at IEEE 802.11b ISM (Body, Validation Plane)

Date of measurement: 15/6/2021

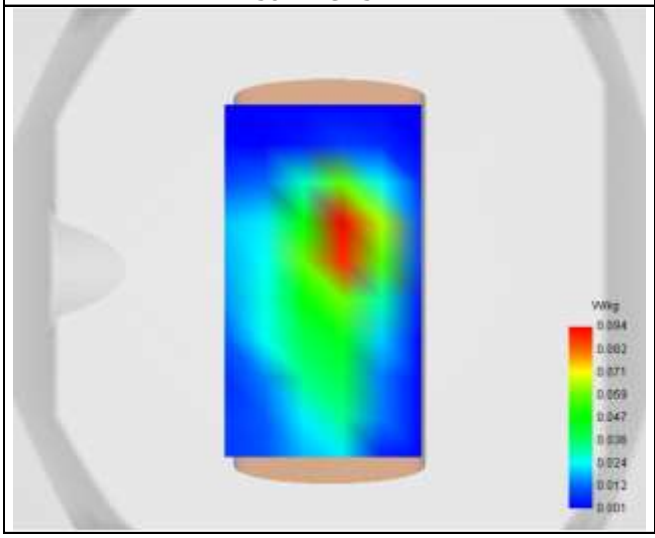
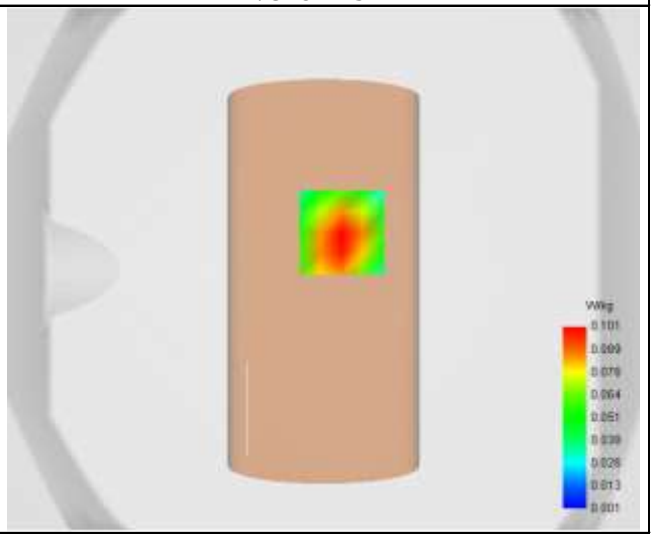
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.23
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11b ISM
Channels	High
Signal	IEEE802.b (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2462.000000
Relative permitivity (real part)	39.760399
Conductivity (S/m)	1.814856

C. SAR Surface and Volume

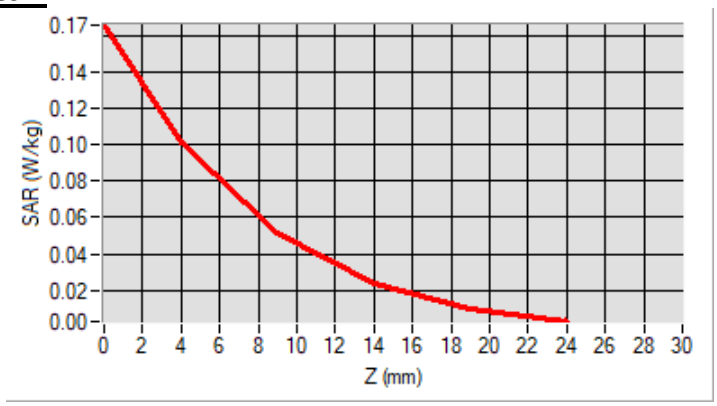
SURFACE SAR	VOLUME SAR
	

Maximum location: X=7.00, Y=14.00 ; SAR Peak: 0.17 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.049452
SAR 1g (W/Kg)	0.098966
Variation (%)	3.460000

E. Z Axis Scan



SAR Measurement at CUSTOM (GPRS850 2Tx Slot) (Body, Validation Plane)

Date of measurement: 11/6/2021

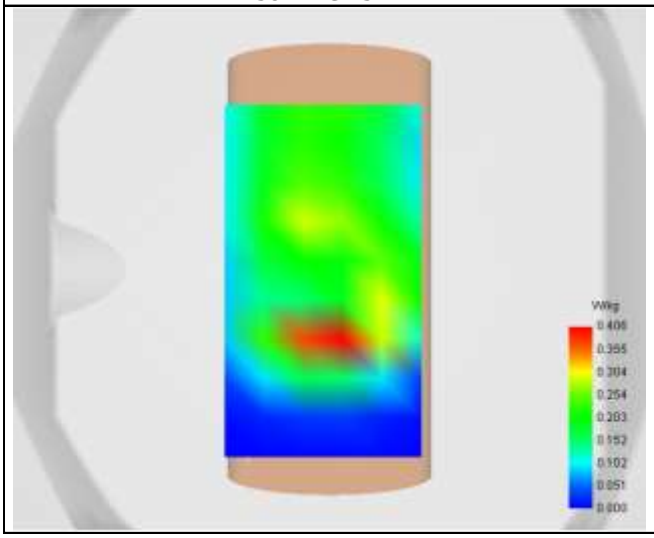
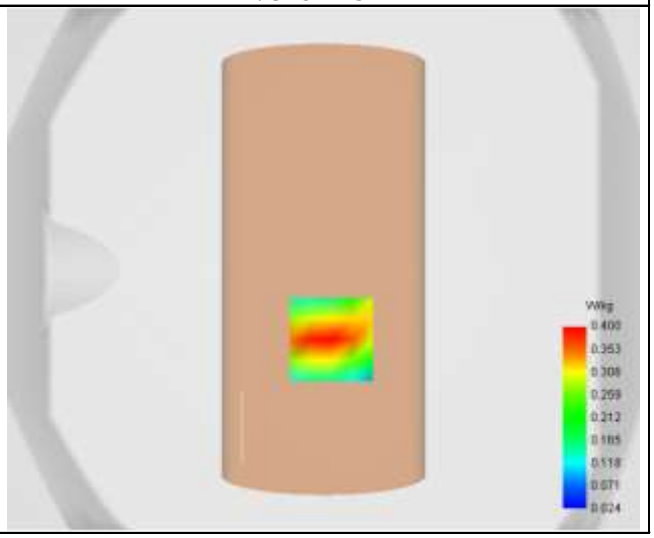
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.73
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete
Phantom	Validation plane
Device Position	Body
Band	GSM 850
Channels	Low
Signal	TDMA (Crest factor: 4.1)

B. Permitivity

Frequency (MHz)	824.200012
Relative permitivity (real part)	41.0165823
Conductivity (S/m)	0.919707

C. SAR Surface and Volume

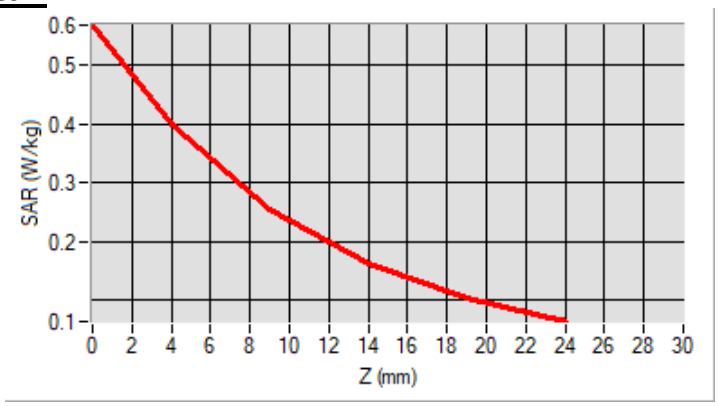
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=-27.00 ; SAR Peak: 0.57 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.217986
SAR 1g (W/Kg)	0.374260
Variation (%)	2.140000

E. Z Axis Scan



SAR Measurement at CUSTOM (GPRS 1900 3Tx Slot) (Body, Validation Plane)

Date of measurement: 10/6/2021

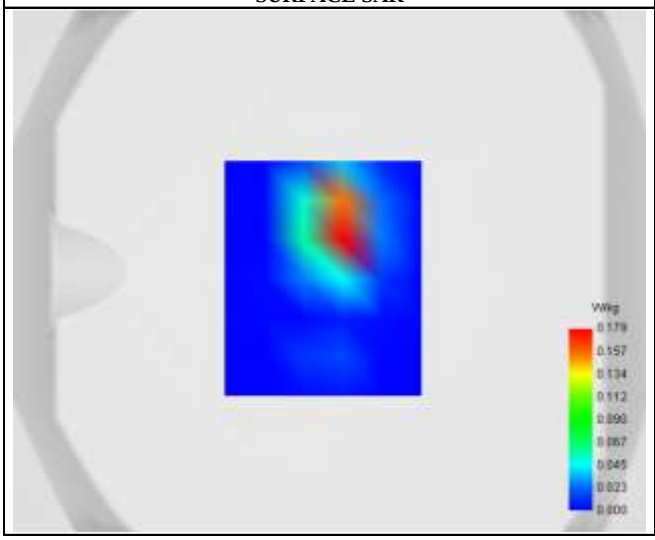
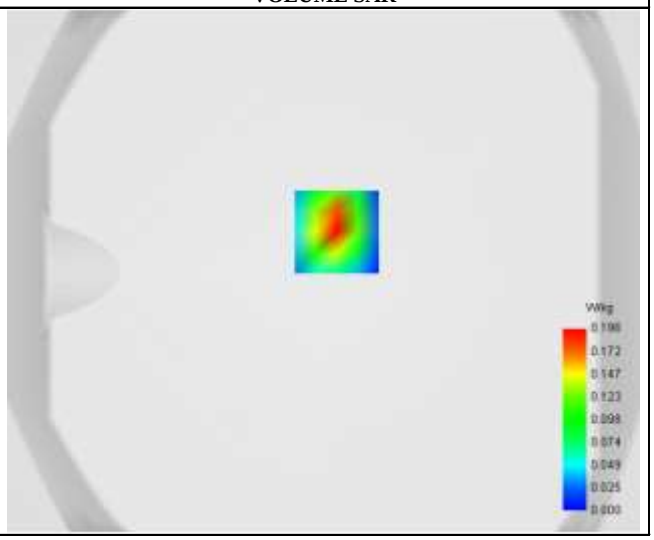
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	GSM 1900
Channels	Low
Signal	TDMA (Crest factor: 2.8)

B. Permitivity

Frequency (MHz)	1850.199951
Relative permitivity (real part)	39.3230054
Conductivity (S/m)	1.407860

C. SAR Surface and Volume

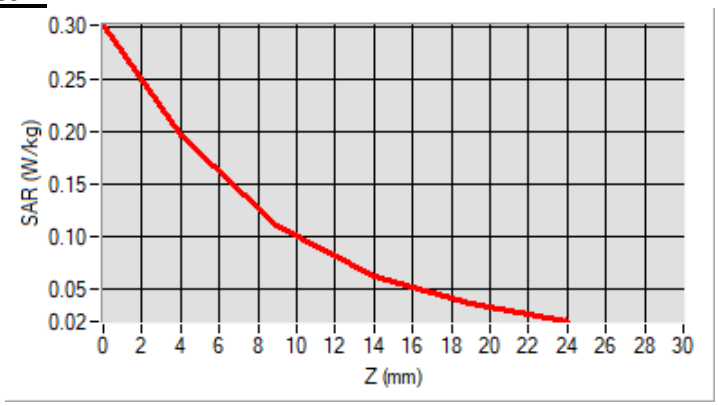
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=15.00 ; SAR Peak: 0.31 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.087114
SAR 1g (W/Kg)	0.179461
Variation (%)	-3.040000

E. Z Axis Scan



SAR Measurement at WCDMA 1700 (Body, Validation Plane)

Date of measurement: 16/6/2021

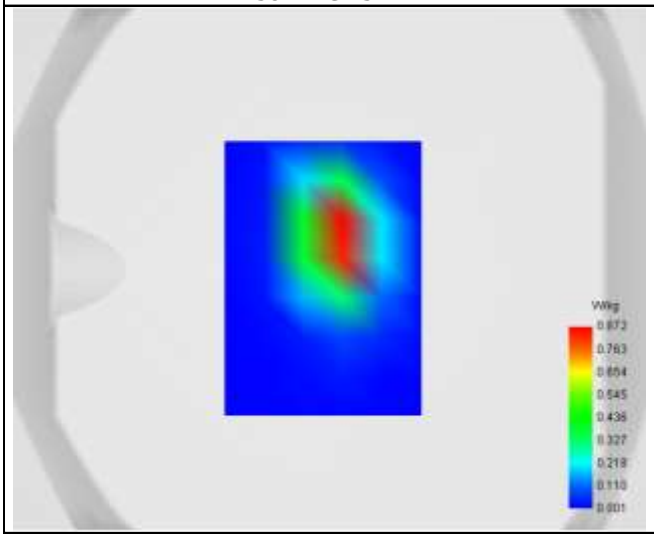
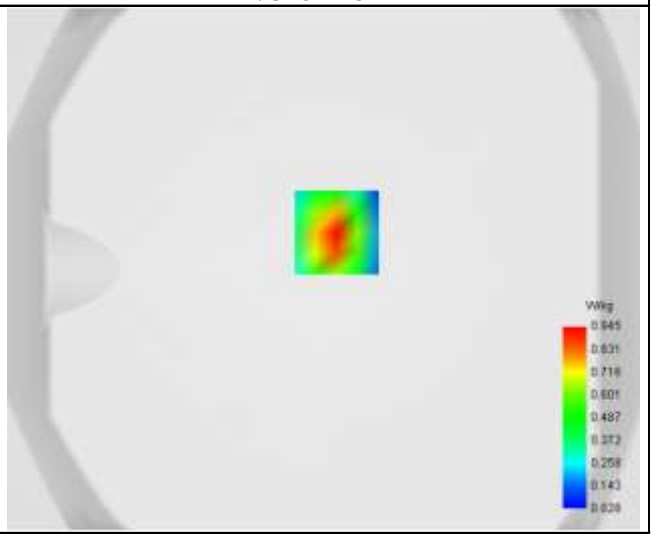
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band4_WCDMA1700
Channels	Low
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1712.400024
Relative permitivity (real part)	40.034182
Conductivity (S/m)	1.341859

C. SAR Surface and Volume

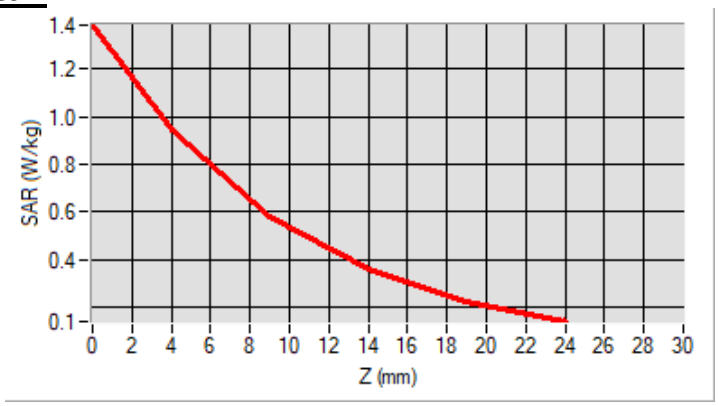
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=14.00 ; SAR Peak: 1.40 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.471052
SAR 1g (W/Kg)	0.872887
Variation (%)	-0.600000

E. Z Axis Scan



SAR Measurement at WCDMA 1900 (Body, Validation Plane)

Date of measurement: 16/6/2021

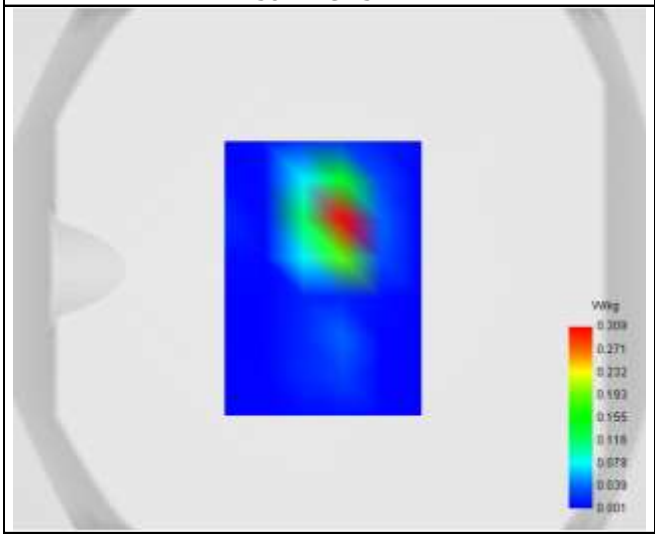
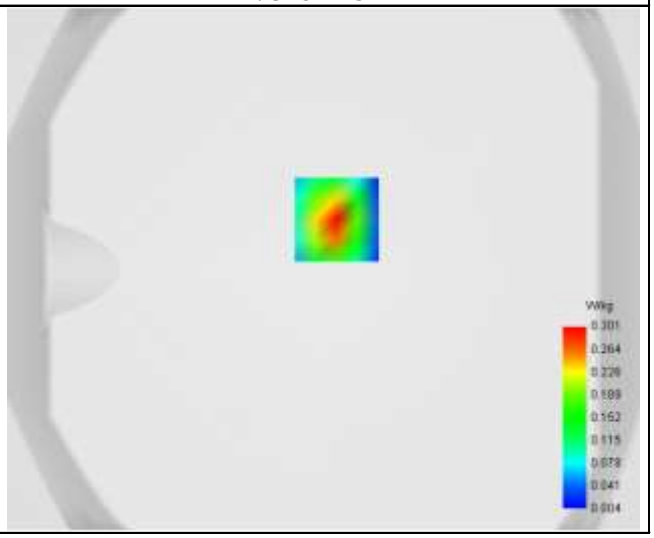
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Band2_WCDMA1900
Channels	Low
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1852.400024
Relative permitivity (real part)	39.3123206
Conductivity (S/m)	1.408851

C. SAR Surface and Volume

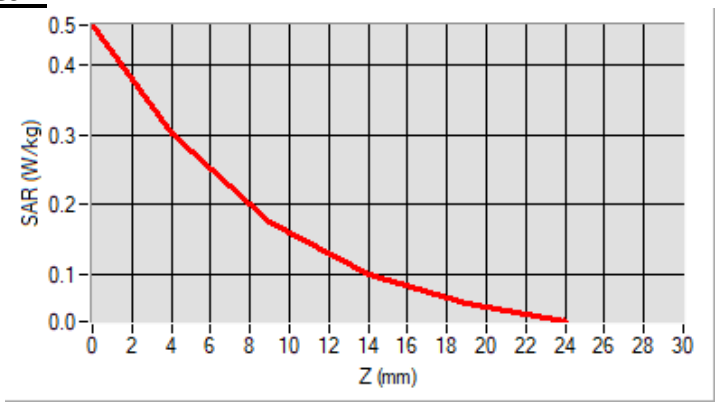
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=19.00 ; SAR Peak: 0.46 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.136414
SAR 1g (W/Kg)	0.274043
Variation (%)	3.170000

E. Z Axis Scan



SAR Measurement at LTE band 2 (Body, Validation Plane)

Date of measurement: 11/6/2021

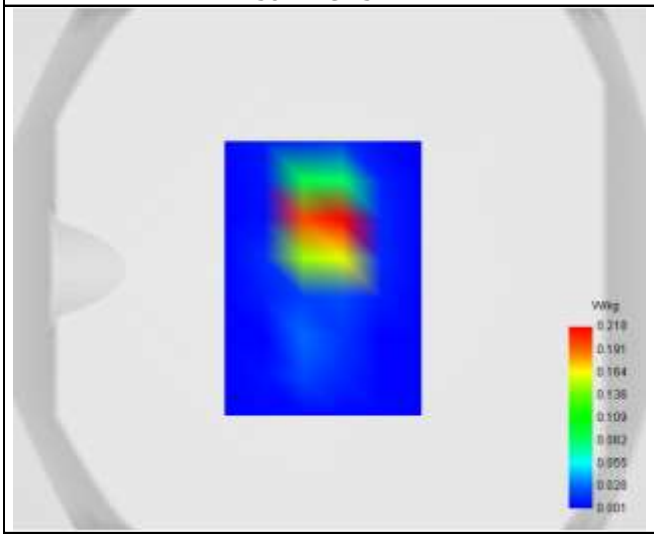
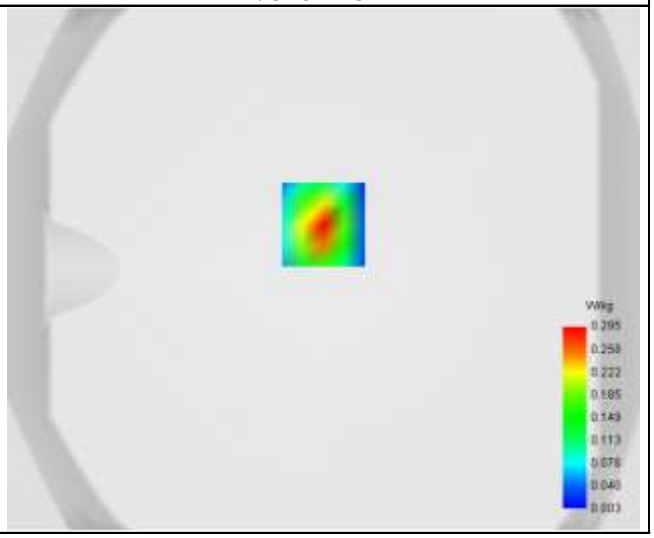
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1860.000000
Relative permitivity (real part)	39.2910452
Conductivity (S/m)	1.410834

C. SAR Surface and Volume

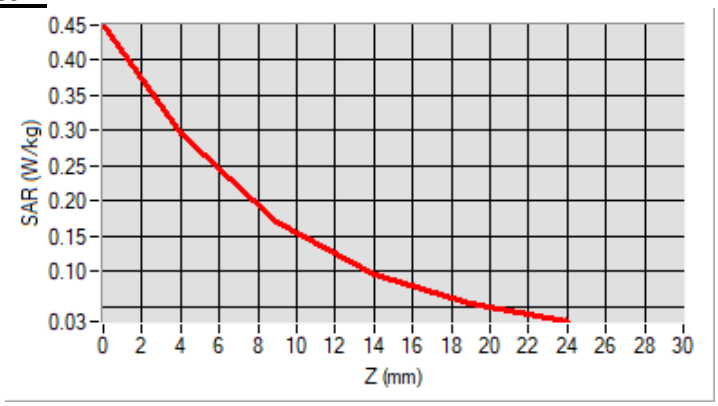
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=17.00 ; SAR Peak: 0.45 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.130822
SAR 1g (W/Kg)	0.267467
Variation (%)	-2.940000

E. Z Axis Scan



SAR Measurement at LTE band 4 (Body, Validation Plane)

Date of measurement: 17/6/2021

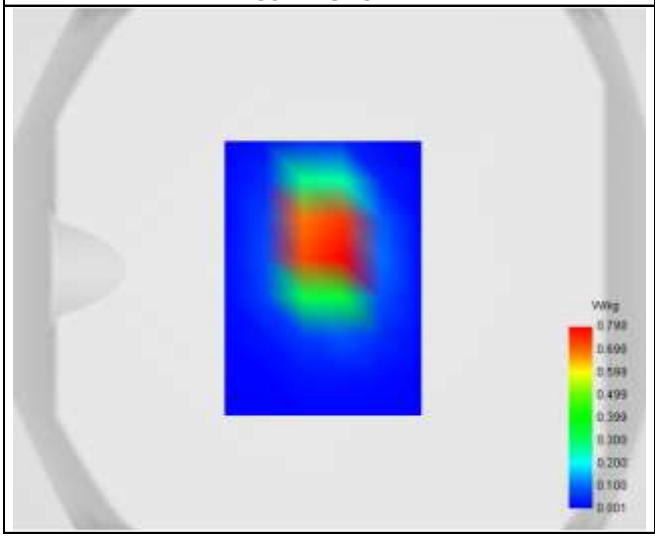
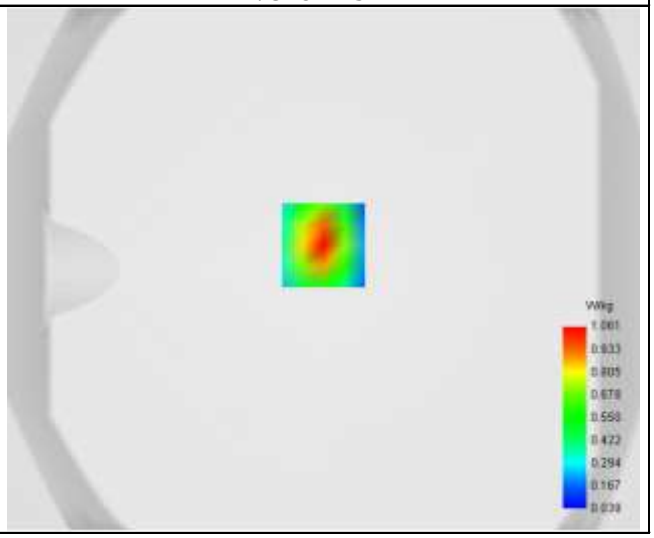
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1720.000000
Relative permitivity (real part)	40.002817
Conductivity (S/m)	1.351255

C. SAR Surface and Volume

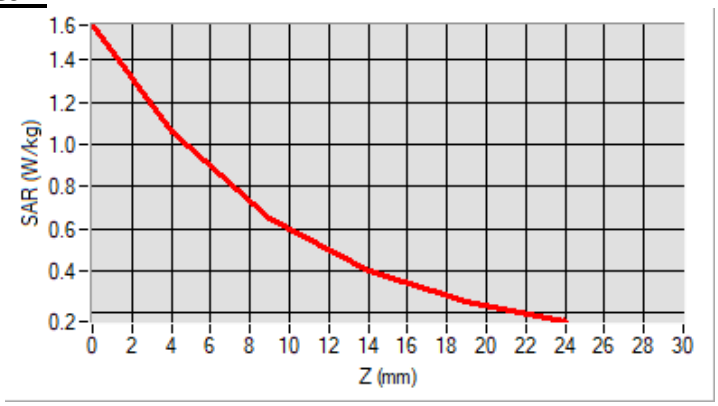
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=9.00 ; SAR Peak: 1.57 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.523896
SAR 1g (W/Kg)	0.974636
Variation (%)	-1.970000

E. Z Axis Scan



SAR Measurement at LTE band 2 (Body, Validation Plane)

Date of measurement: 16/6/2021

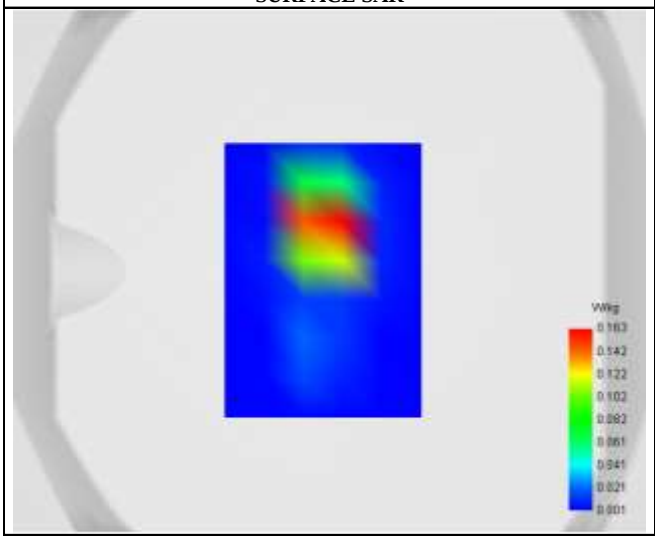
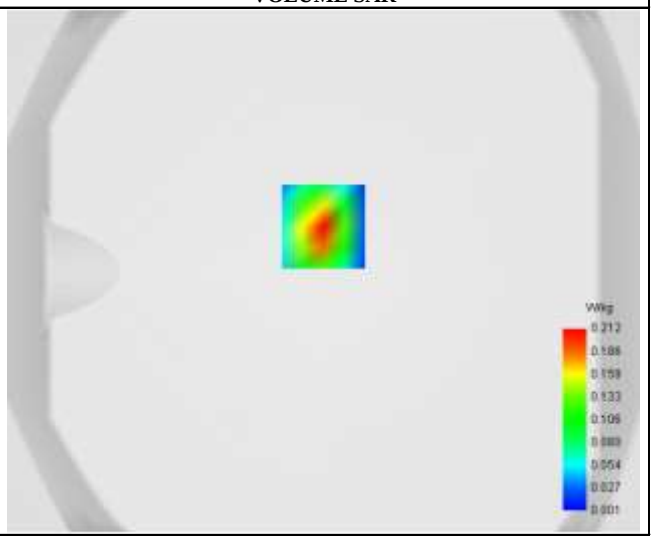
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.14
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1860.000000
Relative permitivity (real part)	39.2910452
Conductivity (S/m)	1.410834

C. SAR Surface and Volume

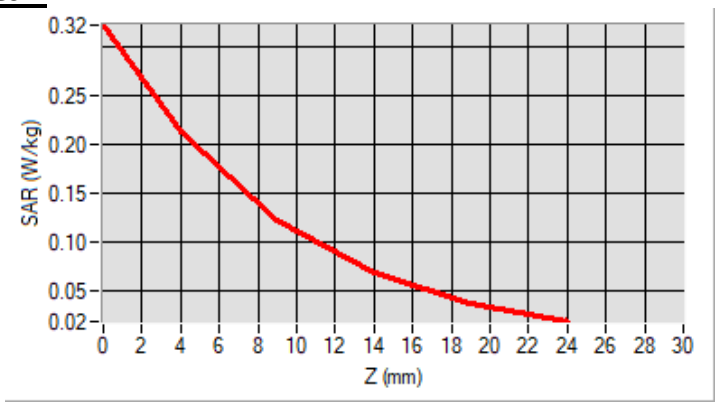
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=17.00 ; SAR Peak: 0.33 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.094293
SAR 1g (W/Kg)	0.192677
Variation (%)	-1.110000

E. Z Axis Scan



SAR Measurement at LTE band 4 (Body, Validation Plane)

Date of measurement: 17/6/2021

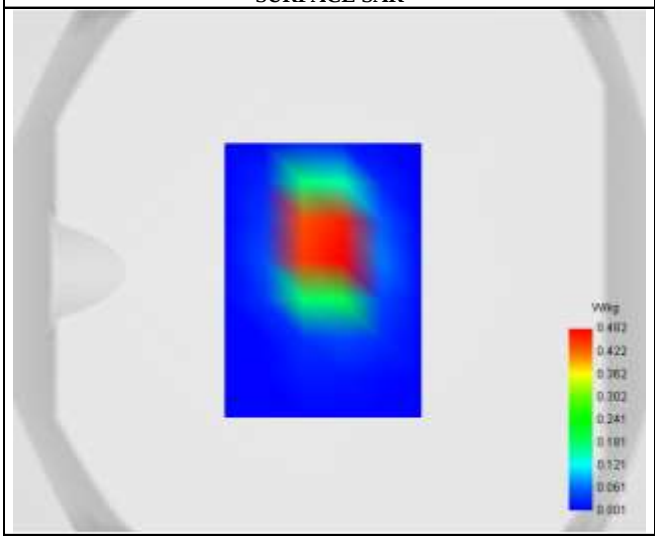
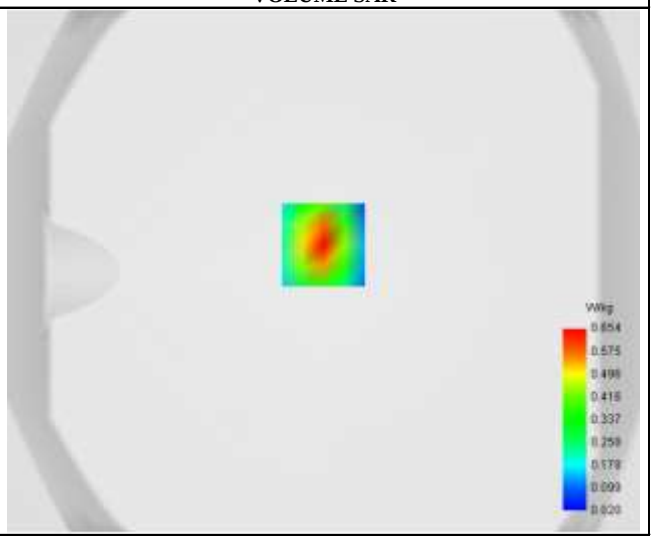
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1745.000000
Relative permitivity (real part)	39.812998
Conductivity (S/m)	1.382861

C. SAR Surface and Volume

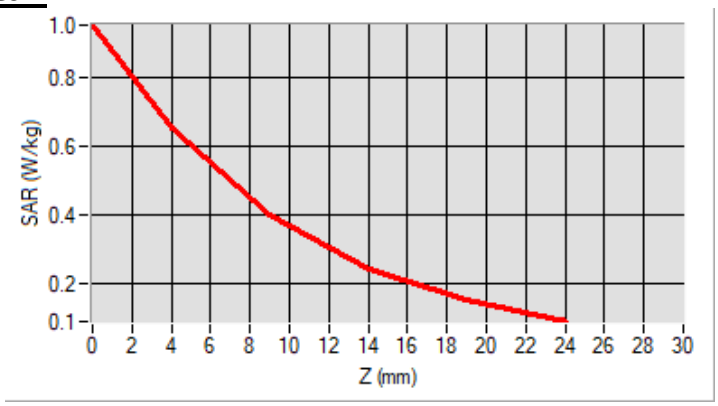
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=10.00 ; SAR Peak: 0.96 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.319447
SAR 1g (W/Kg)	0.599182
Variation (%)	-3.550000

E. Z Axis Scan



SAR Measurement at LTE band 4 (Body, Validation Plane)

Date of measurement: 17/6/2021

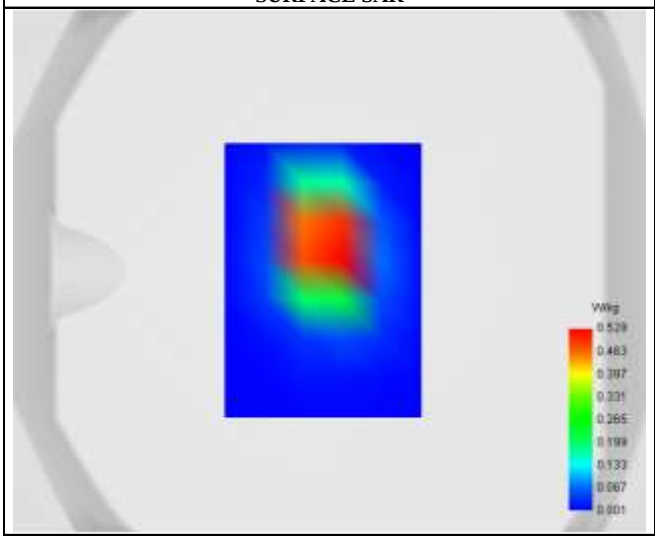
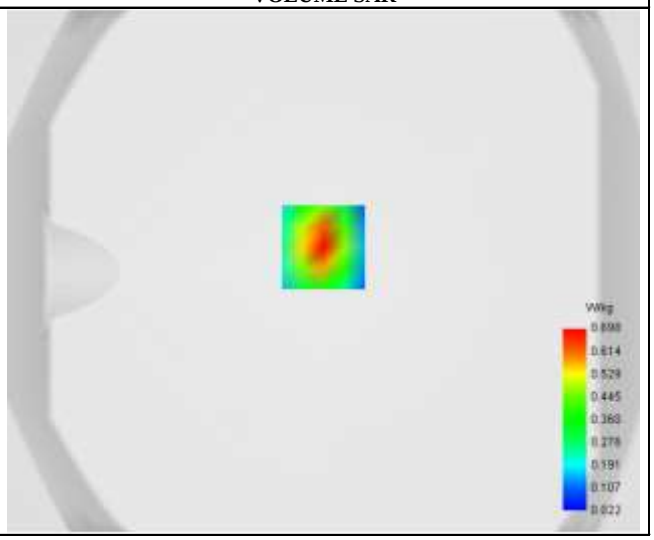
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.07
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1732.500000
Relative permitivity (real part)	40.115910
Conductivity (S/m)	1.360603

C. SAR Surface and Volume

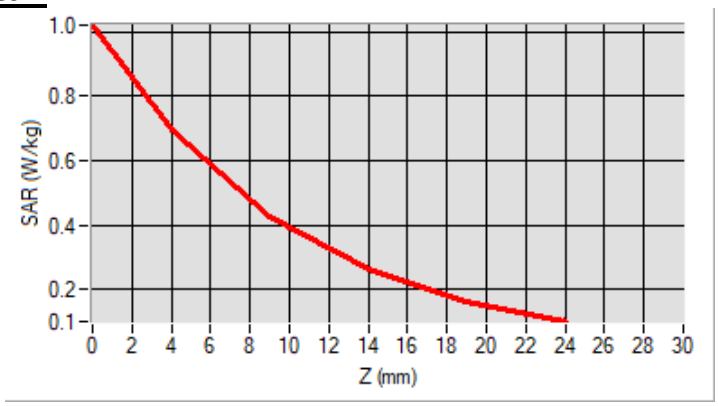
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=9.00 ; SAR Peak: 1.03 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.344211
SAR 1g (W/Kg)	0.642275
Variation (%)	1.740000

E. Z Axis Scan



Appendix C: System Calibration Certificate

Calibration information for E-field probes

COMOSAR E-Field Probe Calibration Report

Ref : ACR.140.1.21.BES.B

Cancel and replace the report ACR.140.1.21.BES.A

JIANYAN TESTING GROUP SHENZHEN CO.,LTD.

NO.101, BUILDING 8, INNOVATION WISDOM PORT, NO.155 HONGTIAN ROAD, HUANGPU COMMUNITY, XINQIAO STREET,

BAO'AN DISTRICT, SHENZHEN, GUANGDONG, CHINA

MVG COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: SN 18/21 EPGO354

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon

29280 PLOUZANE - FRANCE

Calibration date: 05/20/2021

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).

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.140.1.21.BES.B

	Name	Function	Date	Signature
Prepared by :	Jérôme Luc	Technical Manager	5/20/2021	
Checked by :	Jérôme Luc	Technical Manager	5/20/2021	
Approved by :	Yann Toutain	Laboratory Director	5/21/2021	Yann TOUTAIN

	Customer Name
Distribution :	JIANYAN TESTING GROUP SHENZHEN CO.,LTD.

Issue	Name	Date	Modifications
A	Jérôme Luc	5/20/2021	Initial release
B	Jérôme Luc	5/21/2021	Change customer address Add picture 1 Add 1450 MHz calibration

TABLE OF CONTENTS

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 18/21 EPGO354
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.202 MΩ Dipole 2: R2=0.217 MΩ Dipole 3: R3=0.225 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.

3.2 SENSITIVITY

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°–180°) in 15° increments. At each step the probe is rotated about its axis (0°–360°).

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 $d_{be} + d_{step}$ along lines that are approximately normal to the surface:

$$SAR_{uncertainty}[\%] = \delta SAR_{be} \frac{(d_{be} + d_{step})^2}{2 d_{step}} \left| e^{-4 \cdot \Delta(dB)} \right| \quad \text{for } (d_{be} - d_{step}) < 10 \text{ mm}$$

where

$SAR_{uncertainty}$	is the uncertainty in percent of the probe boundary effect
d_{be}	is the distance between the surface and the closest *zoom-scan* measurement point, in millimetre
Δ_{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;
ΔSAR_{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.

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 %

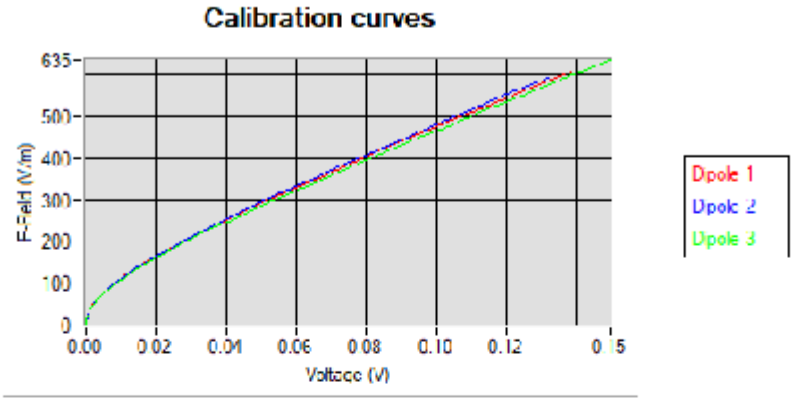
5.1 SENSITIVITY IN AIR

Normx dipole 1 (μV/(V/m)²)	Normy dipole 2 (μV/(V/m)²)	Normz dipole 3 (μV/(V/m)²)
0.86	0.87	0.90

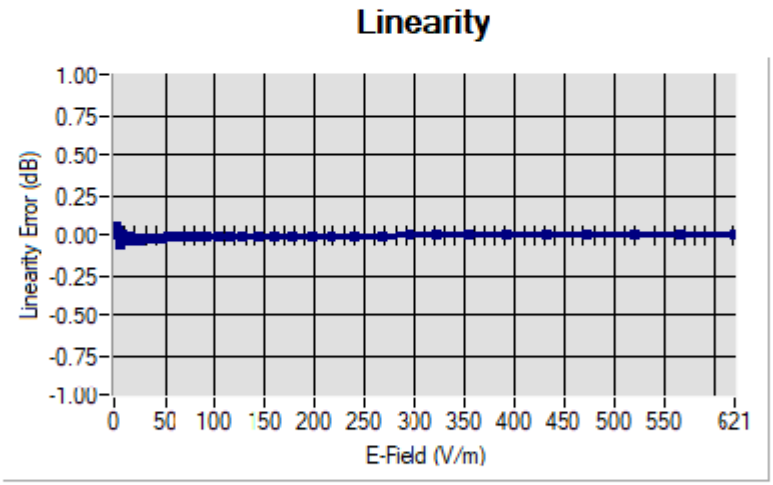
DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
107	101	105

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

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



5.2 LINEARITY



Linearity:+/-1.55% (+/-0.07dB)

5.3 SENSITIVITY IN LIQUID

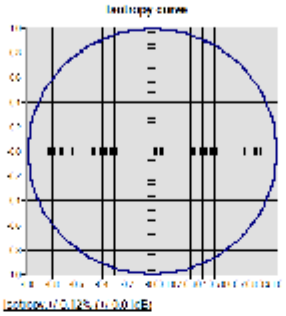
Liquid	Frequency (MHz +/- 100MHz)	ConvF
HL450*	450	1.92
BL450*	450	1.87
HL750	750	1.73
BL750	750	1.81
HL850	835	1.68
BL850	835	1.82
HL900	900	1.88
BL900	900	1.92
HL1450	1450	2.25
BL1450	1450	2.54
HL1750	1750	2.07
BL1750	1750	2.20
HL1900	1900	2.14
BL1900	1900	2.23
HL2100	2100	2.09
BL2100	2100	2.27
HL2300	2300	2.23
BL2300	2300	2.48
HL2450	2450	2.23
BL2450	2450	2.58
HL2600	2600	2.15
BL2600	2600	2.38
HL3300	3300	2.02
BL3300	3300	2.19
HL3500	3500	2.11
BL3500	3500	2.29
HL3700	3700	2.13
BL3700	3700	2.28
HL3900	3900	2.26
BL3900	3900	2.48
HL4200	4200	2.58
BL4200	4200	2.63
HL4600	4600	2.44
BL4600	4600	2.60
HL4900	4900	2.34
BL4900	4900	2.32
HL5200	5200	1.86
BL5200	5200	1.75
HL5400	5400	2.07
BL5400	5400	1.94
HL5600	5600	2.20
BL5600	5600	2.11
HL5800	5800	2.07
BL5800	5800	1.99

* Frequency not cover by COFRAC scope, calibration not accredited

LOWER DETECTION LIMIT: 8mW/kg

5.4 ISOTROPY

HL1900 MHz



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

Calibration information for Dipole

SAR Reference Dipole Calibration Report

Ref : ACR.15.5.21.MVGB.B

Cancel and replace the report ACR.15.5.21.MVGB.A

JIANYAN TESTING GROUP SHENZHEN CO.,LTD.
No.110~116, BUILDING B, JINYUAN BUSINESS BUILDING, XIXIANG ROAD, BAOAN DISTRICT, SHENZHEN, GUANGDONG, PR CHINA

MVG COMOSAR REFERENCE DIPOLE
FREQUENCY: 750 MHZ
SERIAL NO.: SN 50/20 DIP 0G750-506

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

Calibration date: 01/14/2021

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 in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.15.5.21.MVGB.B

	Name	Function	Date	Signature
Prepared by :	Jérôme LUC	Technical Manager	1/15/2021	
Checked by :	Jérôme LUC	Technical Manager	1/15/2021	
Approved by :	Yann Toutain	Laboratory Director	2/8/2021	Yann Toutain 2021.02.08 17:46:38 +01'00'

	Customer Name
Distribution :	JianYan Testing Group Shenzhen Co.,Ltd.

Issue	Name	Date	Modifications
A	Jérôme LUC	1/15/2021	Initial release
B	Jérôme LUC	2/8/2021	Change customer name/address

TABLE OF CONTENTS

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 750 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID750
Serial Number	SN 50/20 DIP 0G750-506
Product Condition (new / used)	New

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*

4 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.

4.2 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.

5 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

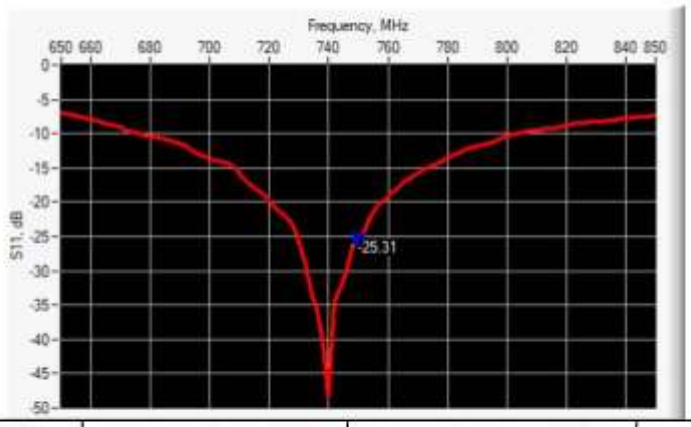
5.3 VALIDATION MEASUREMENT

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

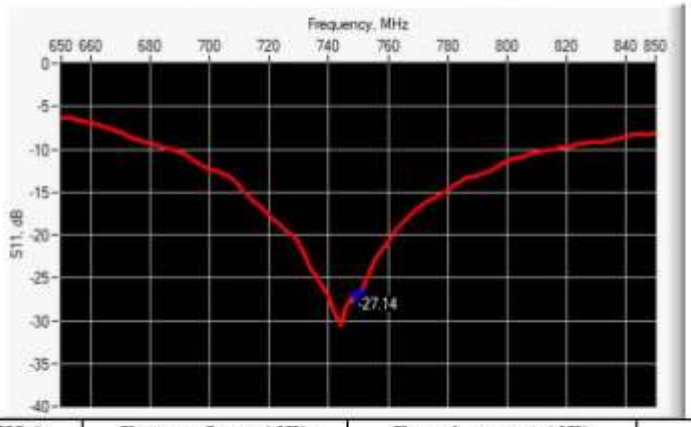
6 CALIBRATION MEASUREMENT RESULTS

6.1 RETURN LOSS AND IMPEDANCE IN HEAD LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
750	-25.31	-20	54.0 Ω - 3.7 jΩ

6.2 RETURN LOSS AND IMPEDANCE IN BODY LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
750	-27.14	-20	54.2 Ω + 1.4 jΩ

6.3 MECHANICAL DIMENSIONS

Frequency MHz	L mm		h mm		d mm	
	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 %.	177.03	100.0 ±1 %.	100.34	6.35 ±1 %.	6.35
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 %.	
2600	48.5 ±1 %.		28.8 ±1 %.		3.6 ±1 %.	
3000	41.5 ±1 %.		25.0 ±1 %.		3.6 ±1 %.	
3300	-		-		-	
3500	37.0±1 %.		26.4 ±1 %.		3.6 ±1 %.	
3700	34.7±1 %.		26.4 ±1 %.		3.6 ±1 %.	
3900	-		-		-	
4200	-		-		-	
4600	-		-		-	
4900	-		-		-	

7 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 HEAD LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ε')		Conductivity (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 %	41.8	0.89 ±10 %	0.82
835	41.5 ±10 %		0.90 ±10 %	
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 %	
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 %	
3300	38.2 ±10 %		2.71 ±10 %	
3500	37.9 ±10 %		2.91 ±10 %	
3700	37.7 ±10 %		3.12 ±10 %	
3900	37.5 ±10 %		3.32 ±10 %	
4200	37.1 ±10 %		3.63 ±10 %	
4600	36.7 ±10 %		4.04 ±10 %	
4900	36.3 ±10 %		4.35 ±10 %	

7.2 SAR MEASUREMENT RESULT WITH HEAD LIQUID

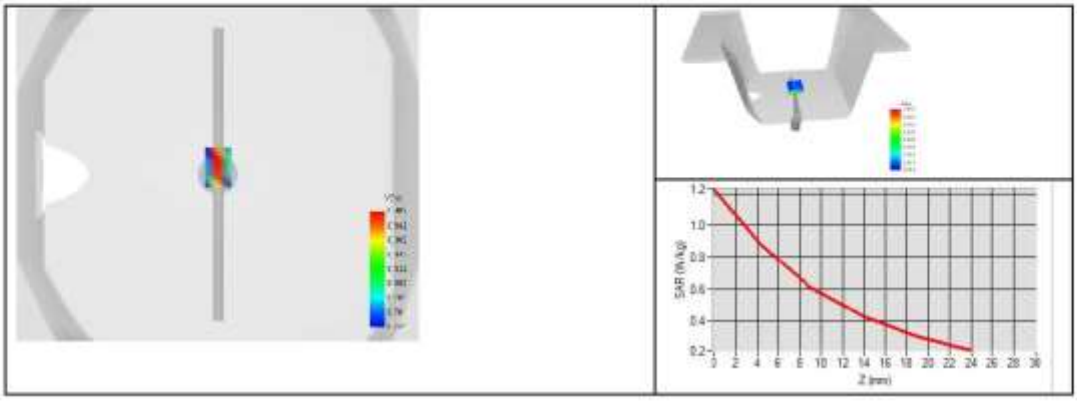
The IEEE Std. 1528 and CEI/IEC 62209 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is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

SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.15.5.21.MVGB.B

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	SN 41/18 EPGO333
Liquid	Head Liquid Values: eps' : 41.8 sigma : 0.82
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	750 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

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	8.57 (0.86)	5.55	5.56 (0.56)
835	9.56		6.22	
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	
3300	-		-	
3500	67.1		25	
3700	67.4		24.2	
3900	-		-	
4200	-		-	
4600	-		-	
4900	-		-	



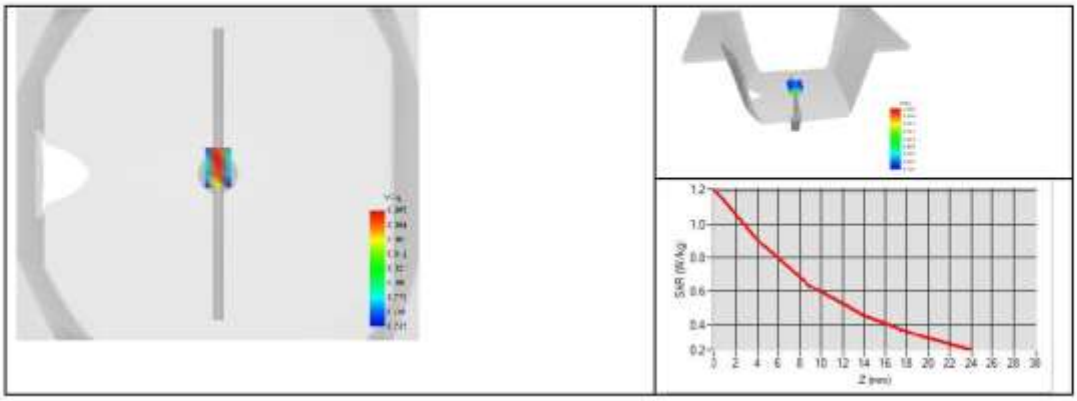
7.3 BODY LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ε')		Conductivity (σ) S/m	
	required	measured	required	measured
150	61.9 ±10 %		0.80 ±10 %	
300	58.2 ±10 %		0.92 ±10 %	
450	56.7 ±10 %		0.94 ±10 %	
750	55.5 ±10 %	52.9	0.96 ±10 %	0.89
835	55.2 ±10 %		0.97 ±10 %	
900	55.0 ±10 %		1.05 ±10 %	
915	55.0 ±10 %		1.06 ±10 %	
1450	54.0 ±10 %		1.30 ±10 %	
1610	53.8 ±10 %		1.40 ±10 %	
1800	53.3 ±10 %		1.52 ±10 %	
1900	53.3 ±10 %		1.52 ±10 %	
2000	53.3 ±10 %		1.52 ±10 %	
2100	53.2 ±10 %		1.62 ±10 %	
2300	52.9 ±10 %		1.81 ±10 %	
2450	52.7 ±10 %		1.95 ±10 %	
2600	52.5 ±10 %		2.16 ±10 %	
3000	52.0 ±10 %		2.73 ±10 %	
3300	51.6 ±10 %		3.08 ±10 %	
3500	51.3 ±10 %		3.31 ±10 %	
3700	51.0 ±10 %		3.55 ±10 %	
3900	50.8 ±10 %		3.78 ±10 %	
4200	50.4 ±10 %		4.13 ±10 %	
4600	49.8 ±10 %		4.60 ±10 %	
4900	49.4 ±10 %		4.95 ±10 %	
5200	49.0 ±10 %		5.30 ±10 %	
5300	48.9 ±10 %		5.42 ±10 %	
5400	48.7 ±10 %		5.53 ±10 %	
5500	48.6 ±10 %		5.65 ±10 %	
5600	48.5 ±10 %		5.77 ±10 %	
5800	48.2 ±10 %		6.00 ±10 %	

7.4 SAR MEASUREMENT RESULT WITH BODY LIQUID

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	SN 41/18 EPGO333
Liquid	Body Liquid Values: eps' : 52.9 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	750 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency MHz	1 g SAR (W/kg/W)	10 g SAR (W/kg/W)
	measured	measured
750	8.62 (0.86)	5.73 (0.57)



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.	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
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