FCC SAR REPORT

Applicant:	INFINIX MOBILITY LIMITED
Address of Applicant:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG

Equipment Under Test (EUT)

Product Name:	Mobile Phone
Model No.:	X6826C
Trade mark	Infinix
FCC ID:	2AIZN-X6826C
Applicable standards:	FCC 47 CFR Part 2.1093
Date of Test:	29 Sep., 2022 ~ 13 Oct., 2022
Test Result:	Maximum Reported 1-g SAR (W/kg) Head: 1.326 Body: 0.649 Hotspot: 0.762

Authorized Signature:

Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*28 Oct., 2022*	*Original*

Tested by: Zora Huang ***Date:*** *28 Oct., 2022*

Test Engineer

Reviewed by: Janet. Wei ***Date:*** *28 Oct., 2022*

Project Engineer

3 Contents

4 SAR Results Summary

The maximum results of Specific Absorption Rate (SAR) found during test as below:
<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	0.796	PCE	1.326
	PCS 1900	0.899		
	WCDMA Band II	0.691		
	WCDMA Band IV	0.586		
	WCDMA Band V	1.072		
	LTE Band 2	1.197		
	LTE Band 4	0.657		
	LTE Band 5	0.721		
	LTE Band 7	1.326		
	LTE Band 41&Band 38	0.552		
	WLAN 2.4 GHz	0.212	DTS	
	WLAN 5.2 GHz	0.227	NII	
	WLAN 5.8 GHz	0.203		
	Bluetooth	0.054	DSS	
Body (10 mm Gap)	GSM 850	0.388	PCE	0.649
	PCS 1900	0.649		
	WCDMA Band II	0.314		
	WCDMA Band IV	0.206		
	WCDMA Band V	0.379		
	LTE Band 2	0.540		
	LTE Band 4	0.206		
	LTE Band 5	0.289		
	LTE Band 7	0.526		
	LTE Band 41&Band 38	0.221		
	WLAN 2.4GHz	0.097	DTS	
	WLAN 5.2 GHz	0.109	NII	
	WLAN 5.8 GHz	0.122		
	Bluetooth	0.028	DSS	
Hotspot (10 mm Gap)	GSM 850	0.388	PCE	0.762
	PCS 1900	0.762		
	WCDMA Band II	0.365		
	WCDMA Band IV	0.223		
	WCDMA Band V	0.379		
	LTE Band 2	0.659		
	LTE Band 4	0.231		
	LTE Band 5	0.289		
	LTE Band 7	0.683		
	LTE Band 41&Band 38	0.245		
	WLAN 2.4 GHz	0.097	DTS	
	WLAN 5.2 GHz	0.116	NII	
	WLAN 5.8 GHz	0.152		
	Bluetooth	0.028	DSS	

<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)
Right Tilted	WWAN	1.326	PCE	1.433
	WLAN 5GHz	0.107	DTS	
	NFC	0.000	DXX	

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.
3. For TDD-LTE Band 38 is full covered by TDD-LTE Band 41, so only TDD-LTE Band 41 was tested.

5 General Information

5.1 Client Information

Applicant:	INFINIX MOBILITY LIMITED
Address of Applicant:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Manufacturer:	INFINIX MOBILITY LIMITED
Address of Manufacturer:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Factory:	SHENZHEN TECNO TECHNOLOGY CO.,LTD.
Address of Factory:	101,Building 24,Waijing Industrial Park,Fumin Community,Fucheng Street,Longhua District,Shenzhen City,P.R.China

5.2 General Description of EUT

Product Name:	Mobile Phone		
Model No.:	X6826C		
Category of device	Portable device		
Operation Frequency:	GSM :	GSM850: 824.2~848.8 MHz	PCS 1900: 1850.2~1909.8 MHz
	WCDMA :	Band II: 1852.4~1907.6 MHz	Band V: 826.4~846.6 MHz
		Band IV: 1712.4~1752.6 MHz	
	LTE :	Band 2 :1850MHz~1910MHz	Band 4 :1710MHz~1755MHz
		Band 5 :824MHz~849MHz	Band 7: 2500MHz~2570MHz
		Band 38: 2570MHz~2620MHz	Band 41: 2555MHz~2655MHz
	Wi-Fi:	2412MHz~2472MHz	5150MHz-5250MHz
		5725MHz-5850MHz	
	Bluetooth: 2402 MHz ~ 2480 MHz		
	NFC :13.56MHz		
Modulation technology:	2G:	☒Voice(GMSK)	☒GPRS(GMSK) ☒EGPRS(GMSK, 8PSK)
	3G:	☒RMC(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)
	NFC:	ASK	
Antenna Type:	Internal Antenna		
Antenna Gain:	GSM 850: -4.1 dBi; PCS 1900: -0.1 dBi WCDMA Band V: -4.1 dBi ;WCDMA Band II: -0.1 dBi; WCDMA Band IV: -0.8 dBi LTE Band 2: -0.1 dBi; LTE Band 4: -0.8 dBi LTE Band 5: -4.1 dBi; LTE Band 7: -0.8 dBi LTE Band 38: -0.8 dBi; LTE Band 41: -0.8 dBi Bluetooth: 0.8 dBi; 2.4G Wi-Fi: 0.8 dBi; 5G Wi-Fi: -0.4 dBi		
(E)GPRS Class:	(E)GPRS Class: 12		
Dimensions (L*W*H):	171 mm (L)× 77 mm (W)× 8 mm (H)		

Accessories information:	Adapter: Model:U180XSA Input:100-240V AC,50/60Hz 0.6A Output: DC 5.0V, 2.4A or 7.5V, 2.4A 18.0W Max	Battery: Rechargeable Li-ion Polymer Battery DC3.87V, 4900mAh Headset: Support headset

5.3 Maximum RF Output Power

Mode	Average Power (dBm)	
	GSM 850	GSM 1900
GSM (Voice)	33.22	29.56
GPRS (1 TX Slot)	33.21	29.70
GPRS (2 TX Slots)	32.23	28.75
GPRS (3 TX Slots)	30.19	26.81
GPRS (4 TX Slots)	29.06	25.73
EGPRS (1 TX Slot)	27.65	26.41
EGPRS (2 TX Slots)	26.30	25.53
EGPRS (3 TX Slots)	23.90	23.50
EGPRS (4 TX Slots)	22.59	22.46

Mode	Average Power (dBm)		
	WCDMA Band V	WCDMA Band IV	WCDMA Band II
AMR 12.2 kbps	23.49	22.74	23.07
RMC 12.2 kbps	23.55	22.82	23.05
HSDPA Sub-test 1	22.60	21.81	22.07
HSDPA Sub-test 2	22.04	21.39	21.48
HSDPA Sub-test 3	22.07	21.33	21.51
HSDPA Sub-test 4	22.04	21.31	21.47
HSUPA Sub-test 1	20.66	19.87	20.04
HSUPA Sub-test 2	21.13	20.35	20.50
HSUPA Sub-test 3	21.62	20.79	21.02
HSUPA Sub-test 4	20.67	19.89	20.09
HSUPA Sub-test 5	22.63	21.83	22.02

Mode	Average Power (dBm)				
	LTE Band 2	LTE Band 4	LTE Band 5	LTE Band 7	LTE Band 41
BW/1.4 MHz	23.00	22.91	23.46	/	/
BW/3.0 MHz	22.95	22.85	23.32	/	/
BW/5.0 MHz	23.03	22.89	23.42	22.37	22.89
BW/10 MHz	23.08	22.90	23.35	22.38	23.02
BW/15 MHz	22.97	22.85	/	22.31	22.86
BW/20 MHz	23.10	23.50	/	22.34	23.01

WLAN 2.4 GHz Band Average Power (dBm)				
Mode/Band	b	g	n (HT-20)	n (HT-40)
WLAN 2.4GHz	16.33	14.04	13.92	13.03

WLAN 5.2 GHz Band Average Power (dBm)						
Mode/Band	a	ac 20	ac 40	ac 80	n 20	n 40
WLAN 5.2GHz	11.52	10.92	11.31	11.31	11.40	10.80

WLAN 5.8 GHz Band Average Power (dBm)						
Mode/Band	a	ac 20	ac 40	ac 80	n 20	n 40
WLAN 5.8GHz	8.01	7.52	7.38	5.28	7.64	7.36

Bluetooth Average Power (dBm)							
Mode/Band	1 Mbps (GFSK)	2 Mbps (π/4DQPSK)	3 Mbps (8DPSK)	BLE PHY 1M	BLE PHY 2M	BLE Coded PHY S=2	BLE Coded PHY S=8
Bluetooth	4.67	3.83	3.88	-2.18	-2.32	-2.18	-2.16

NFC Band Average Power (dBm)	
Mode/Band	ASK
NFC	-45.71

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
2#	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:/jyt.lets.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

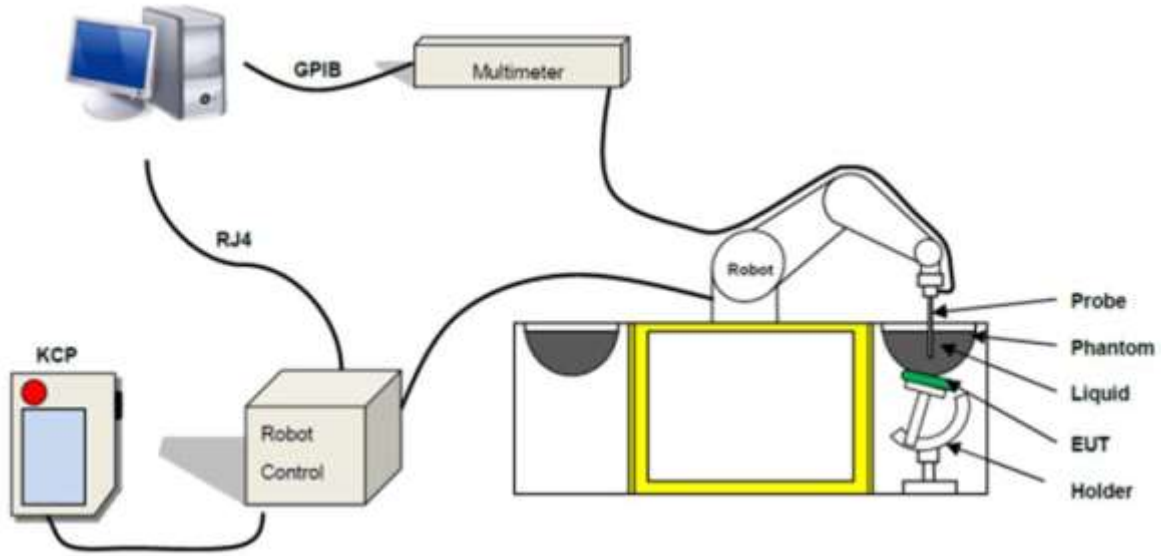


Fig. 8.1 MVG COMOSAR System Configurations

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.

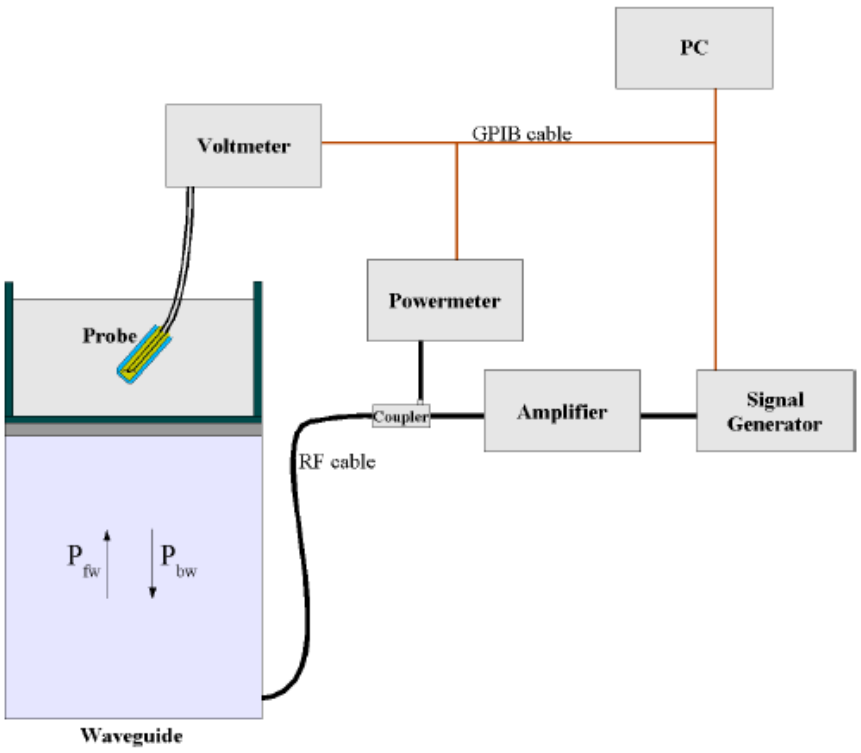
➢ **E-Field Probe Specification**

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	06.30.2022	06.29.2023
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	WXJ076-12	01.14.2021	01.13.2024
MVG	COMOSAR 2600 MHz REFERENCE DIPOLE	SID2600	WXJ076-13	01.14.2021	01.13.2024
MVG	COMOSAR 5200-5800 MHz REFERENCE DIPOLE	SID5000	WXJ076-21	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_01_09	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	03.02.2023
R&S	Universal Radio Communication Tester	CMU200	WXJ008-2	03.30.2022	03.29.2024
KEYSIGHT	Network Analyzer	E5071C	WXJ091	03.30.2022	03.29.2023
KEYSIGHT	EPM Series Power Meter	N1914A	WXJ075	06.29.2022	06.28.2023
KEYSIGHT	E-Series Power Sensor	E9300H	WXJ075-1	06.29.2022	06.28.2023
KEYSIGHT	E-Series Power Sensor	E9300H	WXJ075-2	06.29.2022	06.28.2023
KEYSIGHT	Signal Generator	N5173B	WXJ006-3	06.29.2022	06.28.2023
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.

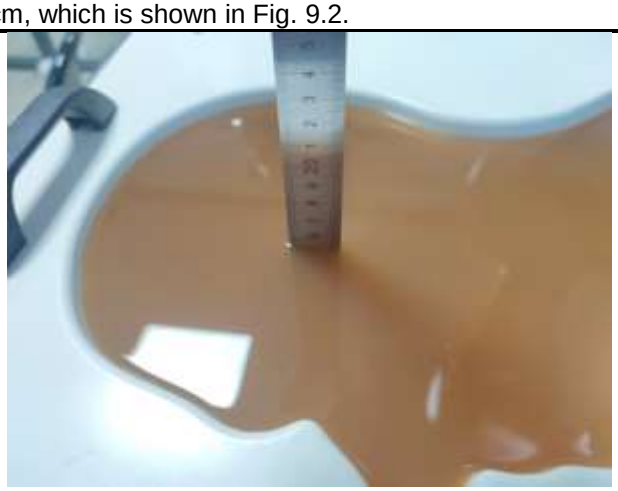


Fig. 9.1 Photo of Liquid Height for Head SAR (depth>15cm)

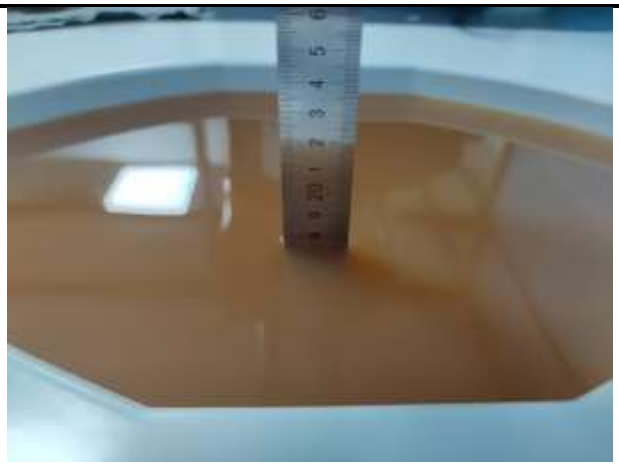


Fig. 9.2 Photo of Liquid Height for Body SAR (depth>15cm)

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 (dd/mm/yy)
835	21.6	0.86	40.34	0.90	41.50	-4.44	-2.80	±5	29.09.2022
1750	21.9	1.34	39.25	1.37	40.10	-2.19	-2.12	±5	09.10.2022
1900	21.9	1.38	38.97	1.40	40.00	-1.43	-2.58	±5	09.10.2022
2450	21.8	1.75	38.24	1.80	39.20	-2.78	-2.45	±5	10.10.2022
2600	21.8	1.93	38.10	1.96	39.00	-1.53	-2.31	±5	10.10.2022
5200	21.5	4.58	35.55	4.66	36.00	-1.72	-1.25	±5	13.10.2022
5800	21.5	5.19	34.97	5.27	35.30	-1.52	-0.93	±5	13.10.2022

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:

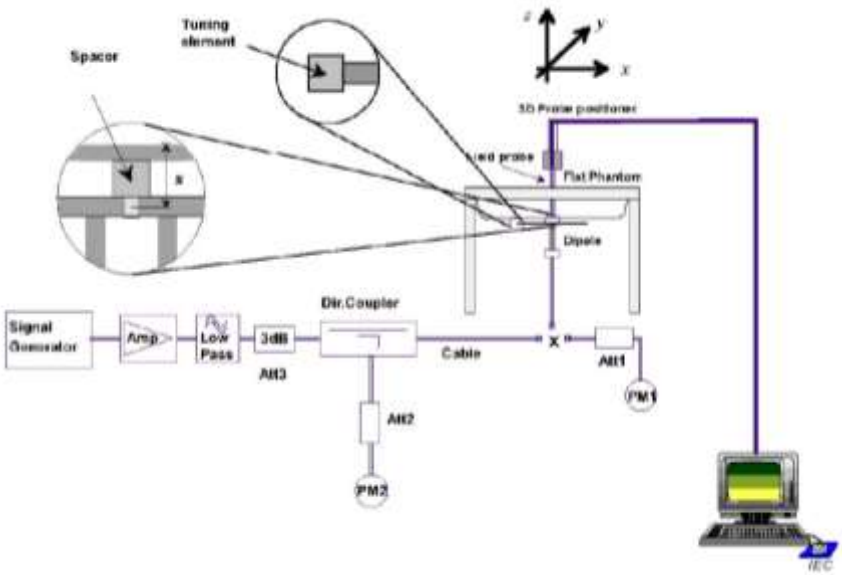


Fig.10.1 System Verification Setup Diagram

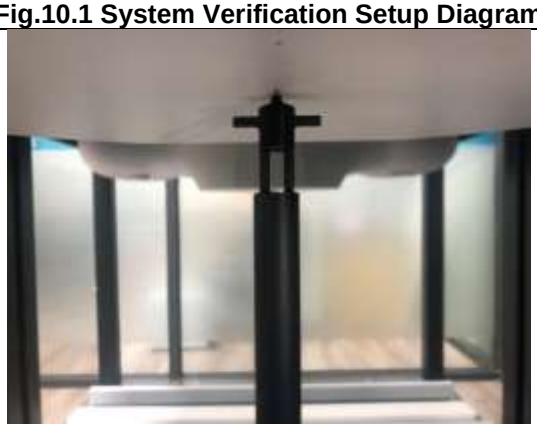


Fig.10.2 Photo of Dipole setup

➢ **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 (dd/mm/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 (%)
29.09.2022	835	100	0.586	5.86	6.04	-2.98
09.10.2022	1750	100	1.908	19.08	19.18	-0.52
09.10.2022	1900	100	2.010	20.10	20.33	-1.13
10.10.2022	2450	40	0.932	23.30	23.68	-1.60
10.10.2022	2600	40	0.944	23.60	24.11	-2.12
13.10.2022	5200	40	0.889	22.23	22.60	-1.66
13.10.2022	5800	40	0.896	22.40	22.93	-2.31

11 EUT Testing Position

This EUT was tested in nine different positions. They are right cheek/right tilted/left cheek/left tilted for head, Front/Back/ Left /Right /Top 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

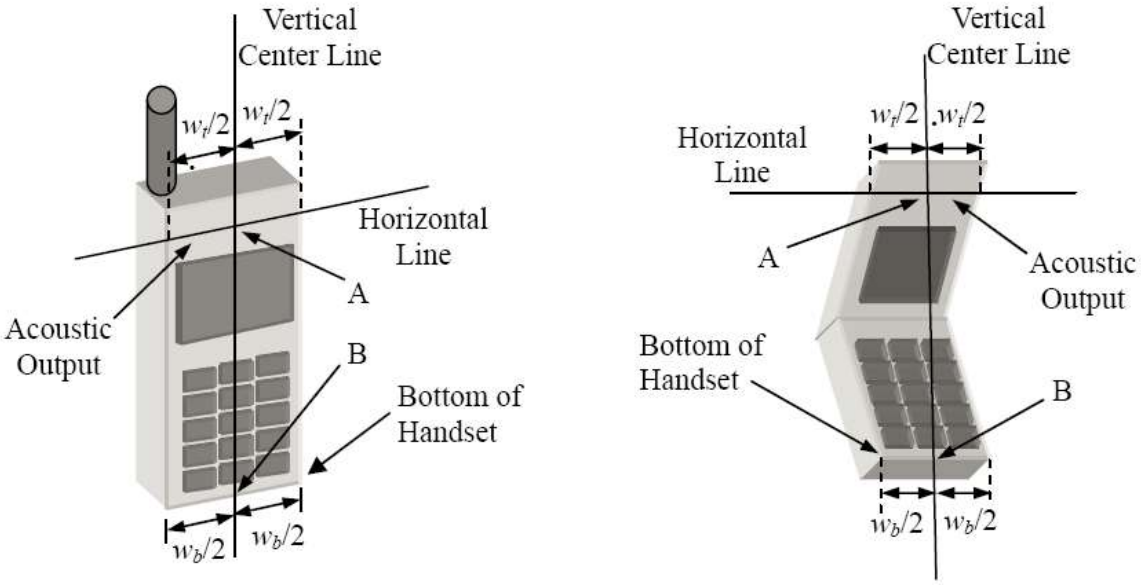


Fig. 11.2 Illustration for Handset Vertical and Horizontal Reference Lines

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.

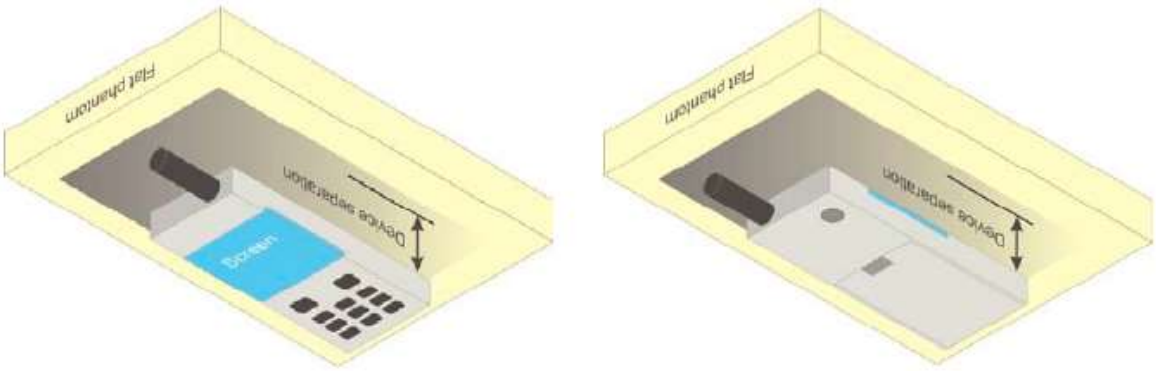


Fig.11.5 Illustration for Body Worn Position

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.

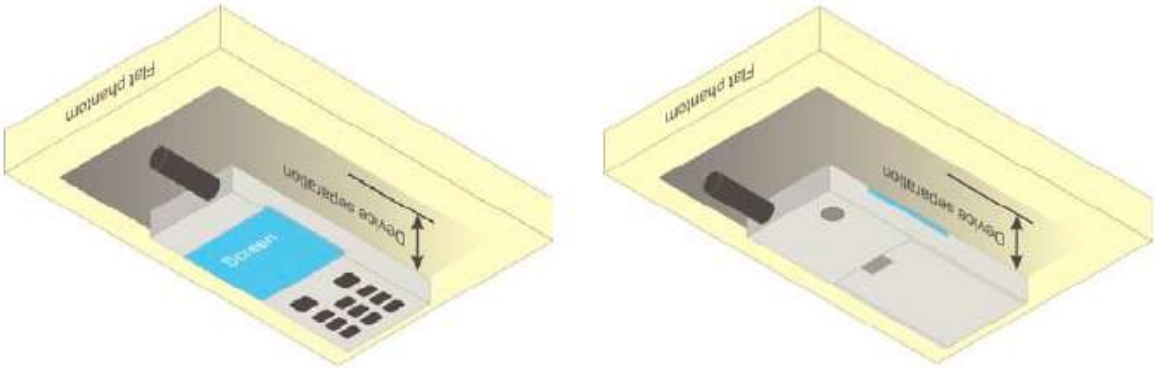


Fig.11.6 Illustration for Hotspot Position

12 Measurement Procedures

The measurement procedures are as below:

<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)	33.17	**33.22**	33.08	24.14	24.19	24.05
GPRS (GMSK, 1 TX slot)	33.14	33.21	33.07	24.11	24.18	24.04
GPRS (GMSK, 2 TX slots)	32.16	**32.23**	32.10	26.14	**26.21**	26.08
GPRS (GMSK, 3 TX slots)	30.15	30.19	30.05	25.89	25.93	25.79
GPRS (GMSK, 4 TX slots)	29.03	29.06	28.93	26.02	26.05	25.92
EGPRS (8PSK, 1 TX slot)	27.58	27.40	27.65	18.55	18.37	18.62
EGPRS (8PSK, 2 TX slots)	26.26	26.07	26.30	20.24	20.05	20.28
EGPRS (8PSK, 3 TX slots)	23.90	23.74	23.90	19.64	19.48	19.64
EGPRS (8PSK, 4 TX slots)	22.54	22.33	22.59	19.53	19.32	19.58

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. For GPRS multi time slots SAR measurement, when the measured maximum output power levels are within 0.25 dB of each other, test the configuration with the most number of time slots.
5. Per KDB447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
6. 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)	**29.56**	29.50	29.50	20.53	20.47	20.47
GPRS (GMSK, 1 TX slot)	29.70	29.68	29.68	20.67	20.65	20.65
GPRS (GMSK, 2 TX slots)	28.70	28.72	**28.75**	22.68	22.70	**22.73**
GPRS (GMSK, 3 TX slots)	26.69	26.70	26.81	22.43	22.44	22.55
GPRS (GMSK, 4 TX slots)	25.53	25.60	25.73	22.52	22.59	22.72
EGPRS (8PSK, 1 TX slot)	26.06	26.41	26.23	17.03	17.38	17.20
EGPRS (8PSK, 2 TX slots)	25.17	25.53	25.31	19.15	19.51	19.29
EGPRS (8PSK, 3 TX slots)	23.10	23.50	23.26	18.84	19.24	19.00
EGPRS (8PSK, 4 TX slots)	22.05	22.46	22.18	19.04	19.45	19.17

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 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.

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	23.49	23.49	23.37
RMC 12.2 kbps	23.41	**23.55**	23.39
HSDPA Sub-test 1	22.46	22.60	22.47
HSDPA Sub-test 2	21.91	22.04	21.95
HSDPA Sub-test 3	21.91	22.07	21.95
HSDPA Sub-test 4	21.89	22.04	21.81
HSUPA Sub-test 1	20.51	20.66	20.52
HSUPA Sub-test 2	20.98	21.13	20.99
HSUPA Sub-test 3	21.47	21.62	21.47
HSUPA Sub-test 4	20.52	20.67	20.54
HSUPA Sub-test 5	22.50	22.63	22.49

WCDMA Average power (dBm)			
Band	WCDMA Band IV		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
AMR 12.2 kbps	22.68	22.74	22.72
RMC 12.2 kbps	22.70	**22.82**	22.69
HSDPA Sub-test 1	21.63	21.81	21.67
HSDPA Sub-test 2	21.20	21.39	21.26
HSDPA Sub-test 3	21.16	21.33	21.19
HSDPA Sub-test 4	21.13	21.31	21.16
HSUPA Sub-test 1	19.71	19.87	19.72
HSUPA Sub-test 2	20.16	20.35	20.24
HSUPA Sub-test 3	20.64	20.79	20.67
HSUPA Sub-test 4	19.72	19.89	19.73
HSUPA Sub-test 5	21.26	21.83	21.69

WCDMA Average power (dBm)			
Band	WCDMA Band II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
AMR 12.2 kbps	22.76	23.07	22.94
RMC 12.2 kbps	22.76	**23.05**	22.97
HSDPA Sub-test 1	21.80	22.07	21.98
HSDPA Sub-test 2	21.25	21.48	21.39
HSDPA Sub-test 3	21.27	21.51	21.43
HSDPA Sub-test 4	21.21	21.47	21.44
HSUPA Sub-test 1	19.80	20.04	19.95
HSUPA Sub-test 2	20.26	20.50	20.45
HSUPA Sub-test 3	20.77	21.02	20.92
HSUPA Sub-test 4	19.80	20.09	19.93
HSUPA Sub-test 5	21.76	22.02	21.93

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.

13.3.3 TDD LTE configuration setup for SAR measurement

According to KDB 941225 D05v02r03 and April 2013 TCB workshop slides, SAR must be tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- see 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- “special subframe S” contains both uplink and downlink transmissions and must be taken into consideration to determine the transmission duty factor
  - according to the worst case uplink and downlink cyclic prefix requirements for UpPTS to determine the highest SAR test duty factor

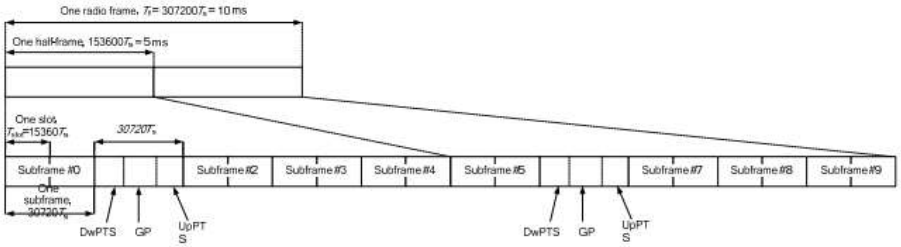


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity)

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

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Per 3GPP 36.211 section 4.2, each radio frame of length T_f=37200·*T*s = 10 ms consists of two half-frames of length 153600·Ts = 5ms each. Each half-frame consists of five subframes of length 30720 ·*T*s = 1ms. So, the uplink duty factor in special subframe as below:

Special Subframe configuration	Normal cyclic prefix in downlink		Extended cyclic prefix in downlink	
	Duty factor of Uplink		Duty factor of Uplink	
	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	7.14%	8.33%	7.14%	8.33%
1	7.14%	8.33%	7.14%	8.33%
2	7.14%	8.33%	7.14%	8.33%
3	7.14%	8.33%	7.14%	8.33%
4	7.14%	8.33%	14.27%	16.67%
5	14.27%	16.67%	14.27%	16.67%
6	14.27%	16.67%	14.27%	16.67%
7	14.27%	16.67%	14.27%	16.67%
8	14.27%	16.67%	/	/
9	14.27%	16.67%	/	/

Table 4.2-2: Uplink-downlink configurations

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

According to above table:

1. The highest duty factor is configuration 0;
2. The duty factor of uplink in one half-frame with normal cyclic prefix is: (3ms + 0.143ms)/5ms=62.86%;
3. The duty factor of uplink in one half-frame with extended cyclic prefix is: (3ms + 0.167ms)/5ms=63.34%;
4. For purpose to get the worst case SAR test duty factor, the duty factor of normal cyclic prefix in uplink scaled-up to the extended cyclic prefix in uplink, the scaling factor is 63.34%/62.86%=1.008, and the scaling factor will be taken into the final measured SAR.

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	22.65	22.91	22.80
			1	2	22.79	23.00	22.84
			1	5	22.65	22.89	22.82
			3	0	22.77	22.98	22.89
			3	1	22.74	22.98	22.86
			3	2	22.78	22.99	22.90
			6	0	21.74	22.00	21.96
		16QAM	1	0	21.82	22.04	21.74
			1	2	21.96	22.15	21.95
			1	5	21.80	22.01	21.75
			3	0	21.64	21.91	21.72
			3	1	21.68	21.89	21.77
			3	2	21.71	21.92	21.72
			6	0	20.77	20.88	20.93
		64QAM	1	0	21.03	21.18	21.08
			1	2	21.25	21.57	21.07
			1	5	21.26	21.50	20.96
			3	0	21.09	21.41	21.11
			3	1	21.16	20.99	21.26
			3	2	21.09	21.02	20.77
			6	0	19.94	20.36	20.18

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	22.66	22.95	22.92
			1	7	22.68	22.91	22.94
			1	14	22.66	22.92	22.90
			8	0	21.75	21.98	21.95
			8	4	21.73	21.96	21.99
			8	7	21.70	21.94	21.95
			15	0	21.68	21.95	21.91
		16QAM	1	0	21.89	22.16	21.76
			1	7	21.80	22.06	21.89
			1	14	21.84	22.07	21.87
			8	0	20.78	20.99	20.96
			8	4	20.76	20.98	20.95
			8	7	20.74	20.94	20.92
			15	0	20.72	20.90	20.83
		64QAM	1	0	21.12	21.22	21.24
			1	7	20.98	21.16	21.01
			1	14	21.09	21.18	21.35
			8	0	20.14	20.18	20.30
			8	4	19.87	20.40	20.03
			8	7	20.17	20.38	20.21
			15	0	20.00	19.97	20.25

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	22.66	22.94	22.86
			1	12	22.80	23.03	23.03
			1	24	22.63	22.96	22.92
			12	0	21.63	22.04	21.95
			12	6	21.65	22.02	21.88
			12	11	21.68	21.98	21.89
			25	0	21.66	22.03	21.96
		16QAM	1	0	21.63	22.14	21.89
			1	12	21.76	22.25	22.07
			1	24	21.62	22.19	21.95
			12	0	20.69	21.02	20.91
			12	6	20.68	20.97	20.90
			12	11	20.64	21.05	20.90
			25	0	20.70	21.04	20.97
		64QAM	1	0	21.10	21.33	20.98
			1	12	21.16	21.38	21.10
			1	24	20.71	21.46	20.96
			12	0	20.08	20.09	19.96
			12	6	19.73	20.46	20.01
			12	11	20.06	20.36	20.36
			25	0	19.92	20.32	19.99

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	22.64	22.87	22.77
			1	24	22.74	23.08	23.03
			1	49	22.62	22.93	22.95
			25	0	21.71	22.11	22.03
			25	12	21.73	22.05	22.04
			25	24	21.73	22.09	22.08
			50	0	21.73	22.03	21.95
		16QAM	1	0	21.85	22.16	21.75
			1	24	21.98	22.23	21.96
			1	49	21.83	22.10	21.81
			25	0	20.76	21.11	21.05
			25	12	20.72	21.09	21.06
			25	24	20.76	21.11	21.08
			50	0	20.71	21.06	20.96
		64QAM	1	0	20.87	21.42	20.85
			1	24	21.10	21.70	21.34
			1	49	21.17	21.44	21.07
			25	0	20.12	20.24	20.26
			25	12	20.15	20.17	20.49
			25	24	20.19	20.60	20.58
			50	0	20.09	20.08	20.45

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	22.65	22.83	22.78
			1	37	22.63	22.97	22.81
			1	74	22.59	22.78	22.86
			36	0	21.74	22.10	22.06
			36	16	21.74	22.04	22.01
			36	35	21.68	22.06	22.05
			75	0	21.74	22.06	22.01
		16QAM	1	0	21.75	22.09	21.69
			1	37	21.84	22.28	21.77
			1	74	21.75	22.12	21.78
			36	0	20.65	21.09	20.90
			36	16	20.67	21.09	20.93
			36	35	20.67	21.05	20.90
			75	0	20.70	21.03	20.95
		64QAM	1	0	21.17	21.38	21.10
			1	37	21.14	21.35	20.82
			1	74	21.04	21.13	20.99
			36	0	19.90	20.31	20.19
			36	16	19.71	20.34	20.20
			36	35	19.91	20.49	19.90
			75	0	20.06	20.46	20.12

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	22.53	22.70	22.54
			1	49	22.76	23.10	22.84
			1	99	22.65	22.70	22.61
			50	0	21.67	21.97	21.91
			50	24	21.67	21.99	21.86
			50	49	21.70	21.96	21.93
			100	0	21.66	22.03	21.87
		16QAM	1	0	21.60	21.90	21.71
			1	49	21.81	22.32	21.97
			1	99	21.71	21.88	21.80
			50	0	20.65	20.98	20.97
			50	24	20.69	21.01	20.98
			50	49	20.68	20.98	20.97
			100	0	20.63	21.02	20.90
		64QAM	1	0	21.07	21.05	21.12
			1	49	20.86	21.79	21.13
			1	99	20.71	21.32	21.29
			50	0	19.83	20.22	20.01
			50	24	20.03	20.10	20.24
			50	49	19.75	20.46	20.22
			100	0	19.66	20.26	20.34

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	22.71	22.80	22.70
			1	2	22.84	22.74	22.85
			1	5	22.64	22.83	22.71
			3	0	22.77	22.89	22.78
			3	1	22.74	22.90	22.77
			3	2	22.77	22.91	22.73
			6	0	21.79	21.93	21.78
		16QAM	1	0	21.85	21.68	21.79
			1	2	22.05	22.03	21.93
			1	5	21.85	21.75	21.78
			3	0	21.74	21.77	21.69
			3	1	21.73	21.77	21.65
			3	2	21.71	21.77	21.66
			6	0	20.65	20.91	20.82
		64QAM	1	0	21.30	20.70	21.21
			1	2	21.25	21.25	21.36
			1	5	21.33	21.02	21.01
			3	0	20.91	20.92	21.06
			3	1	20.92	20.80	20.88
			3	2	20.84	21.15	20.91
			6	0	19.68	20.23	19.87

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	22.60	22.79	22.68
			1	7	22.66	22.85	22.69
			1	14	22.63	22.81	22.69
			8	0	21.68	21.87	21.70
			8	4	21.71	21.87	21.72
			8	7	21.70	21.79	21.72
			15	0	21.66	21.80	21.67
		16QAM	1	0	21.89	22.05	21.56
			1	7	21.85	22.03	21.60
			1	14	21.79	21.97	21.59
			8	0	20.76	20.85	20.72
			8	4	20.78	20.90	20.75
			8	7	20.78	20.86	20.76
			15	0	20.70	20.76	20.57
		64QAM	1	0	21.12	21.15	21.03
			1	7	21.27	21.51	20.89
			1	14	20.81	21.04	20.66
			8	0	20.08	20.24	20.10
			8	4	20.07	20.14	19.92
			8	7	20.11	20.17	20.10
			15	0	20.05	20.07	20.02

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	22.60	22.77	22.60
			1	12	22.82	22.89	22.77
			1	24	22.64	22.78	22.70
			12	0	21.62	21.86	21.60
			12	6	21.61	21.87	21.62
			12	11	21.66	21.80	21.59
			25	0	21.70	21.89	21.65
		16QAM	1	0	21.68	21.94	21.66
			1	12	21.80	22.15	21.74
			1	24	21.69	22.00	21.68
			12	0	20.60	20.91	20.59
			12	6	20.65	20.88	20.63
			12	11	20.62	20.87	20.62
			25	0	20.74	20.83	20.71
		64QAM	1	0	21.10	21.41	20.92
			1	12	20.86	21.33	20.81
			1	24	21.05	21.06	21.00
			12	0	19.96	20.23	20.00
			12	6	19.85	19.91	19.92
			12	11	19.69	19.97	19.65
			25	0	20.09	20.22	19.80

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	22.60	22.81	22.65
			1	24	22.75	22.90	22.76
			1	49	22.69	22.74	22.69
			25	0	21.66	21.94	21.68
			25	12	21.66	21.96	21.69
			25	24	21.66	21.95	21.70
			50	0	21.73	21.89	21.67
		16QAM	1	0	21.83	22.01	21.64
			1	24	22.13	21.97	21.74
			1	49	21.90	21.99	21.58
			25	0	20.64	20.98	20.75
			25	12	20.64	20.95	20.73
			25	24	20.70	20.98	20.72
			50	0	20.74	20.93	20.67
		64QAM	1	0	20.96	21.44	20.83
			1	24	21.14	21.40	21.16
			1	49	21.22	21.02	20.69
			25	0	19.72	20.35	19.82
			25	12	19.65	20.04	19.97
			25	24	19.86	20.19	20.11
			50	0	19.87	20.43	20.01

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	22.56	22.68	22.67
			1	37	22.70	22.85	22.72
			1	74	22.73	22.63	22.59
			36	0	21.71	21.98	21.74
			36	16	21.72	22.01	21.79
			36	35	21.72	21.99	21.81
			75	0	21.81	21.96	21.77
		16QAM	1	0	21.76	22.10	21.56
			1	37	21.92	22.19	21.63
			1	74	21.80	21.94	21.52
			36	0	20.69	20.96	20.66
			36	16	20.61	20.97	20.65
			36	35	20.67	21.01	20.69
			75	0	20.75	20.89	20.74
		64QAM	1	0	21.16	21.41	20.92
			1	37	21.29	21.32	20.75
			1	74	20.84	21.05	20.72
			36	0	20.10	20.26	19.76
			36	16	19.81	20.09	19.71
			36	35	19.90	20.11	19.83
			75	0	20.13	20.15	20.23

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	22.50	22.63	22.46
			1	49	23.02	23.17	22.75
			1	99	22.69	22.51	22.38
			50	0	21.63	21.95	21.86
			50	24	21.67	21.96	21.82
			50	49	21.65	21.93	21.84
			100	0	21.78	21.87	21.76
		16QAM	1	0	21.55	21.79	21.61
			1	49	21.95	22.32	21.83
			1	99	21.76	21.78	21.53
			50	0	20.61	20.94	20.91
			50	24	20.64	20.97	20.93
			50	49	20.63	21.00	20.95
			100	0	20.78	20.86	20.80
		64QAM	1	0	20.66	20.96	20.67
			1	49	21.39	21.55	21.16
			1	99	20.84	21.11	20.65
			50	0	19.99	20.00	20.30
			50	24	20.06	20.41	19.98
			50	49	19.90	20.41	19.99
			100	0	20.01	20.12	19.94

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	23.19	23.31	23.11
			1	2	23.30	23.46	23.24
			1	5	23.16	23.30	23.07
			3	0	23.26	23.37	23.22
			3	1	23.25	23.35	23.19
			3	2	23.26	23.35	23.23
			6	0	22.33	22.38	22.22
		16QAM	1	0	22.40	22.24	22.31
			1	2	22.41	22.43	22.43
			1	5	22.38	22.26	22.28
			3	0	22.19	22.23	22.12
			3	1	22.22	22.26	22.10
			3	2	22.21	22.24	22.15
			6	0	21.22	21.43	21.23
		64QAM	1	0	21.85	21.59	21.35
			1	2	21.81	21.58	21.89
			1	5	21.49	21.52	21.61
			3	0	21.24	21.29	21.49
			3	1	21.57	21.30	21.26
			3	2	21.57	21.58	21.46
			6	0	20.32	20.57	20.29

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	23.26	23.32	23.24
			1	7	23.19	23.30	23.19
			1	14	23.22	23.32	23.15
			8	0	22.27	22.42	22.25
			8	4	22.27	22.35	22.26
			8	7	22.26	22.40	22.18
			15	0	22.24	22.37	22.19
		16QAM	1	0	22.47	22.55	22.20
			1	7	22.40	22.51	22.15
			1	14	22.39	22.50	22.13
			8	0	21.26	21.35	21.25
			8	4	21.28	21.36	21.24
			8	7	21.29	21.36	21.19
			15	0	21.27	21.28	21.14
		64QAM	1	0	21.70	21.81	21.69
			1	7	21.46	21.62	21.32
			1	14	21.73	21.71	21.14
			8	0	20.46	20.60	20.71
			8	4	20.70	20.69	20.56
			8	7	20.57	20.77	20.36
			15	0	20.71	20.64	20.54

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	23.21	23.28	23.31
			1	12	23.35	23.42	23.36
			1	24	23.25	23.29	23.17
			12	0	22.25	22.34	22.28
			12	6	22.27	22.34	22.27
			12	11	22.25	22.35	22.31
			25	0	22.27	22.41	22.26
		16QAM	1	0	22.28	22.56	22.32
			1	12	22.38	22.63	22.43
			1	24	22.29	22.58	22.20
			12	0	21.19	21.34	21.29
			12	6	21.20	21.38	21.30
			12	11	21.19	21.40	21.24
			25	0	21.25	21.39	21.27
		64QAM	1	0	21.54	21.87	21.77
			1	12	21.51	22.07	21.50
			1	24	21.72	21.93	21.58
			12	0	20.43	20.44	20.59
			12	6	20.52	20.40	20.52
			12	11	20.47	20.64	20.33
			25	0	20.67	20.53	20.36

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	23.14	23.29	23.32
			1	24	23.30	23.34	23.35
			1	49	23.26	23.32	23.17
			25	0	22.24	22.39	22.45
			25	12	22.23	22.39	22.45
			25	24	22.27	22.38	22.45
			50	0	22.22	22.38	22.31
		16QAM	1	0	22.33	22.50	22.25
			1	24	22.52	22.55	22.33
			1	49	22.50	22.51	22.12
			25	0	21.22	21.39	21.45
			25	12	21.22	21.43	21.47
			25	24	21.26	21.36	21.47
			50	0	21.25	21.36	21.32
		64QAM	1	0	21.54	21.89	21.38
			1	24	21.81	21.57	21.75
			1	49	21.98	21.97	21.61
			25	0	20.58	20.54	20.93
			25	12	20.47	20.86	20.95
			25	24	20.75	20.50	20.62
			50	0	20.52	20.66	20.62

LTE Band 7 part：

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20775	21100	21425
					2502.5MHz	2535MHz	2567.5MHz
Band 7	5	QPSK	1	0	22.06	22.11	22.26
			1	12	22.17	22.24	22.37
			1	24	22.05	22.13	22.31
			12	0	21.16	21.16	21.36
			12	6	21.14	21.16	21.37
			12	11	21.16	21.15	21.34
			25	0	21.19	21.18	21.30
		16QAM	1	0	21.15	21.38	21.35
			1	12	21.28	21.42	21.45
			1	24	21.15	21.35	21.36
			12	0	20.20	20.32	20.42
			12	6	20.20	20.32	20.42
			12	11	20.22	20.32	20.41
			25	0	20.29	20.25	20.44
		64QAM	1	0	20.28	20.57	20.73
			1	12	20.65	20.89	20.94
			1	24	20.63	20.61	20.86
			12	0	19.43	19.45	19.90
			12	6	19.43	19.38	19.42
			12	11	19.64	19.73	19.80
			25	0	19.61	19.39	19.47

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20800	21100	21400
					2505MHz	2535MHz	2565MHz
Band 7	10	QPSK	1	0	22.09	22.16	22.28
			1	24	22.18	22.26	22.38
			1	49	22.02	22.17	22.34
			25	0	21.16	21.24	21.39
			25	12	21.16	21.24	21.38
			25	24	21.16	21.19	21.41
			50	0	21.16	21.25	21.35
		16QAM	1	0	21.37	21.36	21.23
			1	24	21.37	21.49	21.28
			1	49	21.25	21.34	21.29
			25	0	20.23	20.41	20.51
			25	12	20.21	20.39	20.51
			25	24	20.21	20.38	20.47
			50	0	20.26	20.31	20.43
		64QAM	1	0	20.66	20.81	20.54
			1	24	20.50	20.71	20.69
			1	49	20.73	20.75	20.78
			25	0	19.36	19.55	19.63
			25	12	19.50	19.51	19.86
			25	24	19.62	19.42	19.96
			50	0	19.61	19.44	19.66

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20825	21100	21375
					2507.5MHz	2535MHz	2562.5MHz
Band 7	15	QPSK	1	0	22.04	22.02	22.22
			1	37	22.09	22.21	22.31
			1	74	21.93	22.08	22.28
			36	0	21.15	21.25	21.37
			36	16	21.13	21.22	21.36
			36	35	21.13	21.23	21.39
			75	0	21.15	21.30	21.39
		16QAM	1	0	21.20	21.38	21.14
			1	37	21.30	21.46	21.26
			1	74	21.12	21.35	21.14
			36	0	20.17	20.32	20.33
			36	16	20.18	20.33	20.32
			36	35	20.20	20.35	20.32
			75	0	20.14	20.33	20.39
		64QAM	1	0	20.29	20.60	20.60
			1	37	20.65	20.75	20.31
			1	74	20.44	20.38	20.50
			36	0	19.56	19.66	19.80
			36	16	19.45	19.73	19.67
			36	35	19.55	19.83	19.67
			75	0	19.59	19.48	19.52

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					20850	21100	21350
					2510MHz	2535MHz	2560MHz
Band 7	20	QPSK	1	0	21.92	21.93	21.91
			1	49	22.18	22.34	22.34
			1	99	21.93	22.01	21.99
			50	0	21.02	21.13	21.26
			50	24	20.98	21.12	21.32
			50	49	21.03	21.12	21.29
			100	0	21.07	21.20	21.29
		16QAM	1	0	21.03	21.11	21.07
			1	49	21.25	21.42	21.51
			1	99	20.93	21.21	21.13
			50	0	20.10	20.26	20.41
			50	24	20.10	20.26	20.39
			50	49	20.07	20.26	20.42
			100	0	20.11	20.27	20.39
		64QAM	1	0	20.11	20.18	20.16
			1	49	20.75	20.67	20.85
			1	99	20.11	20.36	20.20
			50	0	19.51	19.39	19.67
			50	24	19.11	19.64	19.44
			50	49	19.17	19.33	19.51
			100	0	19.60	19.51	19.53

LTE Band 41 part：

LTE Band	Band-width (MHz)	Modu-lation	RB Size	RB Offset	Average Power (dBm)				
					39675	40148	40620	41093	41565
					2498.5MHz	2545.5MHz	2593.0MHz	2640.3MHz	2687.5MHz
Band 41	5	QPSK	1	0	22.53	22.54	22.74	22.61	22.55
			1	12	22.77	22.72	22.89	22.78	22.67
			1	24	22.67	22.61	22.76	22.66	22.54
			12	0	21.68	21.67	21.75	21.70	21.66
			12	6	21.67	21.62	21.83	21.69	21.57
			12	11	21.68	21.67	21.84	21.72	21.65
			25	0	21.74	21.68	21.81	21.72	21.61
		16QAM	1	0	21.97	21.92	22.12	21.98	21.86
			1	12	22.15	22.10	22.24	22.14	22.04
			1	24	22.05	21.97	22.13	22.02	21.89
			12	0	20.70	20.66	20.73	20.68	20.61
			12	6	20.68	20.60	20.75	20.65	20.51
			12	11	20.73	20.67	20.78	20.71	20.61
			25	0	20.77	20.71	20.84	20.75	20.64
		64QAM	1	0	21.29	21.30	21.39	21.33	21.30
			1	12	21.21	21.16	21.39	21.23	21.10
			1	24	21.17	21.07	21.40	21.18	20.96
			12	0	20.11	20.07	19.95	20.03	20.03
			12	6	20.02	19.91	20.07	19.96	19.79
			12	11	19.85	19.84	19.85	19.84	19.82
			25	0	19.83	19.78	20.14	19.90	19.72

LTE Band	Band-width (MHz)	Modu-lation	RB Size	RB Offset	Average Power (dBm)				
					39700	40160	40620	41080	41540
					2501.0MHz	2547.0MHz	2593.0MHz	2639.0MHz	2685.0MHz
Band 41	10	QPSK	1	0	22.71	22.68	22.89	22.75	22.65
			1	24	22.90	22.87	23.02	22.92	22.84
			1	49	22.74	22.68	22.81	22.72	22.62
			25	0	21.72	21.72	21.88	21.77	21.71
			25	12	21.75	21.75	21.89	21.79	21.74
			25	24	21.75	21.76	21.91	21.81	21.76
			50	0	21.80	21.74	21.91	21.80	21.68
		16QAM	1	0	22.03	21.80	22.18	21.92	21.56
			1	24	22.30	22.02	22.40	22.15	21.74
			1	49	22.13	21.82	22.15	21.93	21.50
			25	0	20.83	20.78	20.95	20.83	20.72
			25	12	20.82	20.77	20.96	20.83	20.71
			25	24	20.84	20.78	20.99	20.85	20.71
			50	0	20.83	20.76	20.87	20.80	20.69
		64QAM	1	0	21.06	20.91	21.52	21.11	20.76
			1	24	21.35	21.10	21.41	21.20	20.84
			1	49	21.57	21.06	21.29	21.14	20.55
			25	0	20.30	20.04	20.27	20.11	19.77
			25	12	19.82	19.78	20.26	19.94	19.73
			25	24	19.87	19.97	20.28	20.07	20.07
			50	0	20.03	19.94	19.99	19.95	19.84

LTE Band	Band-width (MHz)	Modu-lation	RB Size	RB Offset	Average Power (dBm)				
					39725	40173	40620	41068	41515
					2503.5MHz	2548.5MHz	2593.0MHz	2637.8MHz	2682.5MHz
Band 41	15	QPSK	1	0	22.63	22.65	22.81	22.70	22.66
			1	37	22.78	22.77	22.86	22.80	22.75
			1	74	22.66	22.62	22.75	22.66	22.58
			36	0	21.72	21.74	21.89	21.79	21.75
			36	16	21.74	21.75	21.85	21.78	21.75
			36	35	21.74	21.75	21.88	21.79	21.75
			75	0	21.80	21.75	21.86	21.79	21.70
		16QAM	1	0	22.00	21.85	22.13	21.94	21.70
			1	37	22.11	21.94	22.22	22.03	21.77
			1	74	22.00	21.78	22.10	21.88	21.55
			36	0	20.72	20.71	20.84	20.75	20.70
			36	16	20.72	20.72	20.86	20.77	20.72
			36	35	20.73	20.72	20.88	20.77	20.71
			75	0	20.79	20.73	20.85	20.77	20.67
		64QAM	1	0	21.01	20.87	21.57	21.10	20.72
			1	37	21.30	21.10	21.55	21.25	20.89
			1	74	21.40	21.19	21.33	21.23	20.97
			36	0	19.97	19.88	20.32	20.03	19.79
			36	16	20.15	19.95	20.09	19.99	19.74
			36	35	19.76	19.79	19.94	19.84	19.82
			75	0	19.91	19.84	20.04	19.90	19.76

LTE Band	Band-width (MHz)	Modu-lation	RB Size	RB Offset	Average Power (dBm)				
					39750	40185	40620	41055	41490
					2506.0MHz	2549.5MHz	2593.0MHz	2636.5MHz	2680.0MHz
Band 41	20	QPSK	1	0	22.48	22.50	22.62	22.54	22.51
			1	49	22.95	22.88	23.01	22.92	22.80
			1	99	22.59	22.52	22.58	22.54	22.44
			50	0	21.68	21.67	21.83	21.72	21.65
			50	24	21.69	21.69	21.83	21.74	21.69
			50	49	21.73	21.73	21.84	21.76	21.72
			100	0	21.74	21.70	21.81	21.74	21.66
		16QAM	1	0	21.72	21.44	21.81	21.56	21.16
			1	49	22.18	21.80	22.20	21.93	21.41
			1	99	21.79	21.44	21.76	21.54	21.08
			50	0	20.70	20.73	20.81	20.76	20.76
			50	24	20.72	20.70	20.84	20.74	20.67
			50	49	20.74	20.71	20.83	20.75	20.67
			100	0	20.75	20.69	20.81	20.73	20.63
		64QAM	1	0	20.83	20.73	21.14	20.87	20.63
			1	49	21.63	21.07	21.69	21.28	20.51
			1	99	21.22	20.81	20.78	20.80	20.39
			50	0	20.01	20.14	19.85	20.04	20.26
			50	24	19.80	19.90	20.17	19.99	20.00
			50	49	20.14	20.04	20.07	20.05	19.94
			100	0	20.25	19.99	19.81	19.93	19.72

Note:

1. Per KDB 447498 D01v05r02 section 4.1, 6), the required test channels number is 5 for LTE Band 41.

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	**16.33**	14.04	13.92
CH 06	2437	16.15	13.80	13.65
CH 11	2462	15.87	13.55	13.46

Average Power (dBm)		
Channel	Frequency (MHz)	802.11n (HT40)
CH 03	2422	12.97
CH 06	2437	13.03
CH 09	2452	12.97

Note:

1. SAR test of WLAN 2.4GHz is performed.
2. Per KDB 248227 D01v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
3. 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.
4. 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.
5. Per KDB 248227 D01V02r02 section 2.2, when the EUT in continuously transmitting mode, the actual duty cycle is 100%, so the duty cycle factor is 1.

13.5 WLAN 5.2GHz Band Conducted Power

Average Power (dBm)				
Channel	Frequency (MHz)	802.11 a	802.11 ac20	802.11 n20
CH 36	5180	11.40	10.92	11.24
CH 40	5200	11.06	10.83	11.40
CH 48	5240	**11.52**	10.83	11.30

Average Power (dBm)			
Channel	Frequency (MHz)	802.11 ac40	802.11 n40
CH 38	5190	11.29	10.74
CH 46	5230	11.31	10.80

Average Power (dBm)		
Channel	Frequency (MHz)	802.11 ac80
CH 42	5210	11.31

Note:

6. SAR test of WLAN 5.2GHz is performed.
7. Per KDB 248227 D01v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
8. 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.
9. Per KDB 248227 D01V02r02 section 2.2, when the EUT in continuously transmitting mode, the actual duty cycle is 100%, so the duty cycle factor is 1.

13.6 WLAN 5.8GHz Band Conducted Power

Average Power (dBm)				
Channel	Frequency (MHz)	802.11 a	802.11 ac20	802.11 n20
CH 149	5745	6.70	6.57	6.67
CH 157	5785	7.48	7.35	7.37
CH 165	5825	**8.01**	7.52	7.64

Average Power (dBm)			
Channel	Frequency (MHz)	802.11 ac40	802.11 n40
CH 151	5755	6.74	6.63
CH 159	5795	7.38	7.36

Average Power (dBm)		
Channel	Frequency (MHz)	802.11 ac80
CH 155	5775	5.28

Note:

10. SAR test of WLAN 5.8GHz is performed.
11. Per KDB 248227 D01v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
12. 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.
13. Per KDB 248227 D01V02r02 section 2.2, when the EUT in continuously transmitting mode, the actual duty cycle is 100%, so the duty cycle factor is 1.

13.7 Bluetooth Conducted Power

Average Power (dBm)				
Channel	Frequency (MHz)	GFSK	π/4-DQPSK	8DPSK
CH 00	2402	3.59	2.85	2.82
CH 39	2441	**4.67**	3.83	3.88
CH 78	2480	3.59	2.80	2.81

Average Power (dBm)					
Channel	Frequency (MHz)	BLE PHY 1M	BLE PHY 2M	BLE Coded PHY S=2	BLE Coded PHY S=8
CH 00	2402	-3.16	-3.18	-3.16	-3.15
CH 20	2442	-2.18	-2.32	-2.18	-2.16
CH 39	2480	-3.21	-3.24	-3.20	-3.17

Note:
1. SAR test of Bluetooth is performed and the mode with highest average power is selected for SAR testing.
2. Per KDB 447498 D04v01 section 2.1.2: 1-mW Test Exemption, SAR test for BLE 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. Per KDB 248227 D01V02r02 section 2.2, when the EUT in continuously transmitting mode, the actual duty cycle is 100%, so the duty cycle factor is 1.

13.8 NFC Conducted Power

Average Power (dBm)	
Frequency (MHz)	ASK
13.56	-45.71

Note:
5. Per KDB 447498 D04v01 section 2.1.2: 1-mW Test Exemption, SAR test for NFC is not required.

dBm	mW
-45.71	0.000027

6. The output power of all data rate were pre-scan, just the worst case of all mode were shown in report.

14 Exposure Positions Consideration

14.1 EUT Antenna Locations

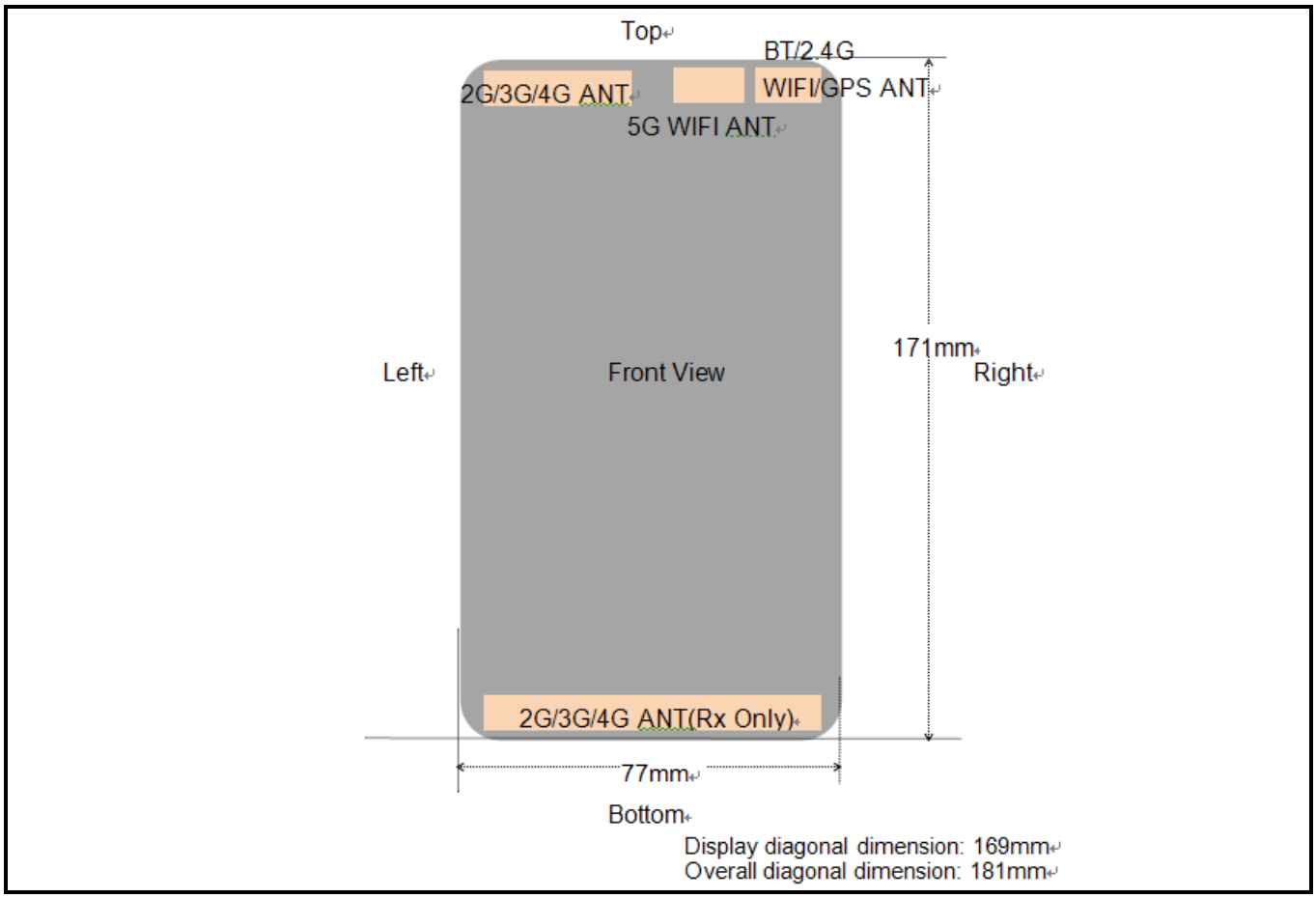


Fig.14.1 EUT Antenna Locations

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	<25mm	151mm	36mm	<25mm
2.4GWLAN & Bluetooth	<25mm	<25mm	<25mm	164mm	<25mm	55mm
5GWIFI	<25mm	<25mm	<25mm	164mm	<25mm	43mm

Test Positions Test distance: 10mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
2G/3G/4G	Yes	Yes	Yes	No	No	Yes
2.4GWLAN & Bluetooth	Yes	Yes	Yes	No	Yes	No
5GWIFI	Yes	Yes	Yes	No	Yes	No

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.
4. Per KDB 648474 D04 v01r03, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg

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)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
1	GSM850/Voice	Right Cheek	190	836.6	33.22	-4.52	33.5	**0.746**	1.067	0.796
	GSM850/Voice	Right Tilted	190	836.6	33.22	-2.71	33.5	0.675	1.067	0.720
	GSM850/Voice	Left Cheek	190	836.6	33.22	2.25	33.5	0.472	1.067	0.504
	GSM850/Voice	Left Tilted	190	836.6	33.22	1.03	33.5	0.427	1.067	0.456
	PCS1900/Voice	Right Cheek	512	1850.2	29.56	-2.84	30.0	0.520	1.107	0.576
2	PCS1900/Voice	Right Tilted	512	1850.2	29.56	-0.72	30.0	**0.812**	1.107	0.899
	PCS1900/Voice	Left Cheek	512	1850.2	29.56	1.12	30.0	0.316	1.107	0.350
	PCS1900/Voice	Left Tilted	512	1850.2	29.56	-1.74	30.0	0.442	1.107	0.489
	PCS1900/Voice	Right Tilted	661	1880	29.50	-4.26	30.0	0.726	1.122	0.815
	PCS1900/Voice	Right Tilted	810	1909.8	29.50	-0.19	30.0	0.641	1.122	0.719
	PCS1900/Voice	**Right Tilted**	**512**	**1850.2**	**29.56**	**-0.58**	**30.0**	**0.801**	**1.107**	**0.887**
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)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band II/RMC	Right Cheek	9400	1880	23.05	0.22	23.5	0.405	1.109	0.449
3	Band II/RMC	Right Tilted	9400	1880	23.05	-0.54	23.5	**0.623**	1.109	0.691
	Band II/RMC	Left Cheek	9400	1880	23.05	1.26	23.5	0.302	1.109	0.335
	Band II/RMC	Left Tilted	9400	1880	23.05	2.88	23.5	0.378	1.109	0.419
	Band IV/RMC	Right Cheek	1413	1732.6	22.82	-1.15	23.0	0.365	1.042	0.380
4	Band IV/RMC	Right Tilted	1413	1732.6	22.82	-4.05	23.0	**0.562**	1.042	0.586
	Band IV/RMC	Left Cheek	1413	1732.6	22.82	-1.44	23.0	0.268	1.042	0.279
	Band IV/RMC	Left Tilted	1413	1732.6	22.82	0.78	23.0	0.387	1.042	0.403
	Band V/RMC	Right Cheek	4183	836.6	23.55	-3.88	24.0	0.789	1.109	0.875
	Band V/RMC	Right Tilted	4183	836.6	23.55	-4.64	24.0	0.716	1.109	0.794
	Band V/RMC	Left Cheek	4183	836.6	23.55	1.44	24.0	0.499	1.109	0.553
	Band V/RMC	Left Tilted	4183	836.6	23.55	0.62	24.0	0.472	1.109	0.523
	Band V/RMC	Right Cheek	4132	826.4	23.41	-4.63	24.0	0.833	1.146	0.955
5	Band V/RMC	Right Cheek	4233	846.6	23.39	-4.30	24.0	**0.931**	1.151	1.072
	Band V/RMC	**Right Cheek**	**4233**	**846.6**	**23.39**	**1.66**	**24.0**	**0.919**	**1.151**	**1.058**
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 2(20MHz) QPSK Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band2/1RB#49	Right Cheek	18900	1880	23.10	-1.99	23.5	0.711	1.096	0.779
	Band2/1RB#49	Right Tilted	18900	1880	23.10	-4.76	23.5	0.946	1.096	1.037
	Band2/1RB#49	Left Cheek	18900	1880	23.10	-0.61	23.5	0.498	1.096	0.546
	Band2/1RB#49	Left Tilted	18900	1880	23.10	0.88	23.5	0.364	1.096	0.399
	Band2/50%RB#24	Right Cheek	18900	1880	21.99	1.18	22.0	0.623	1.002	0.624
	Band2/50%RB#24	Right Tilted	18900	1880	21.99	-3.42	22.0	0.805	1.002	0.807
	Band2/50%RB#24	Left Cheek	18900	1880	21.99	0.12	22.0	0.433	1.002	0.434
	Band2/50%RB#24	Left Tilted	18900	1880	21.99	1.72	22.0	0.319	1.002	0.320
	Band2/100%RB#0	Right Tilted	18900	1880	22.03	-0.49	22.5	0.704	1.114	0.784
6	Band2/1RB#49	Right Tilted	18700	1860	22.76	-0.42	23.5	**1.009**	1.186	1.197
	Band2/1RB#49	Right Tilted	19100	1900	22.84	-0.74	23.5	0.900	1.164	1.048
	Band2/50%RB#49	Right Tilted	18700	1860	21.70	-0.71	22.0	0.858	1.072	0.920
	Band2/50%RB#49	Right Tilted	19100	1900	21.93	-0.39	22.0	0.795	1.016	0.808

	Band2/1RB#49	**Right Tilted**	**18700**	**1860**	**22.76**	**-0.89**	**23.5**	**1.005**	**1.186**	**1.192**
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 4(20MHz) QPSK Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band4/1RB#49	Right Cheek	20175	1732.5	23.17	1.83	23.5	0.396	1.079	0.427
7	Band4/1RB#49	Right Tilted	20175	1732.5	23.17	-0.91	23.5	**0.609**	1.079	0.657
	Band4/1RB#49	Left Cheek	20175	1732.5	23.17	-0.25	23.5	0.290	1.079	0.313
	Band4/1RB#49	Left Tilted	20175	1732.5	23.17	1.21	23.5	0.419	1.079	0.452
	Band4/50%RB#24	Right Cheek	20175	1732.5	21.96	-0.51	22.0	0.328	1.009	0.331
	Band4/50%RB#24	Right Tilted	20175	1732.5	21.96	0.37	22.0	0.505	1.009	0.510
	Band4/50%RB#24	Left Cheek	20175	1732.5	21.96	1.95	22.0	0.241	1.009	0.243
	Band4/50%RB#24	Left Tilted	20175	1732.5	21.96	0.91	22.0	0.348	1.009	0.351
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 5(10MHz) QPSK Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
8	Band5/1RB#24	Right Cheek	20600	844	23.35	-1.30	23.5	**0.697**	1.035	0.721
	Band5/1RB#24	Right Tilted	20600	844	23.35	-2.24	23.5	0.661	1.035	0.684
	Band5/1RB#24	Left Cheek	20600	844	23.35	-2.39	23.5	0.559	1.035	0.579
	Band5/1RB#24	Left Tilted	20600	844	23.35	0.17	23.5	0.530	1.035	0.549
	Band5/50%RB#0	Right Cheek	20600	844	22.45	-1.76	22.5	0.566	1.012	0.573
	Band5/50%RB#0	Right Tilted	20600	844	22.45	1.09	22.5	0.531	1.012	0.537
	Band5/50%RB#0	Left Cheek	20600	844	22.45	0.49	22.5	0.452	1.012	0.457
	Band5/50%RB#0	Left Tilted	20600	844	22.45	-0.17	22.5	0.429	1.012	0.434
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 7(20MHz) QPSK Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band7/1RB#49	Right Cheek	21100	2535	22.34	0.63	22.5	0.694	1.038	0.720
	Band7/1RB#49	Right Tilted	21100	2535	22.34	-0.76	22.5	1.099	1.038	1.141
	Band7/1RB#49	Left Cheek	21100	2535	22.34	1.14	22.5	0.458	1.038	0.475
	Band7/1RB#49	Left Tilted	21100	2535	22.34	1.56	22.5	0.687	1.038	0.713
	Band7/50%RB#24	Right Cheek	21350	2560	21.32	21.50	21.5	0.590	1.042	0.615
	Band7/50%RB#24	Right Tilted	21350	2560	21.32	21.50	21.5	0.935	1.042	0.974
	Band7/50%RB#24	Left Cheek	21350	2560	21.32	21.50	21.5	0.389	1.042	0.405
	Band7/50%RB#24	Left Tilted	21350	2560	21.32	21.50	21.5	0.584	1.042	0.609
	Band7/100%RB#0	Right Tilted	21350	2560	21.29	21.50	21.5	0.744	1.050	0.781
9	Band7/1RB#49	Right Tilted	20850	2510	22.18	-4.27	22.5	**1.232**	1.076	1.326
	Band7/1RB#49	Right Tilted	21350	2560	22.34	-3.82	22.5	1.003	1.038	1.041
	Band7/50%RB#49	Right Tilted	20850	2510	21.03	21.50	21.5	0.865	1.114	0.964
	Band7/50%RB#0	Right Tilted	21100	21.13	21.32	21.50	21.5	0.887	1.042	0.924
	Band7/1RB#49	**Right Tilted**	**20850**	**2510**	**22.18**	**2.56**	**22.5**	**1.211**	**1.076**	**1.303**
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ TDD-LTE Band 41(20MHz) QPSK Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	Band41/1RB#49	Right Cheek	40640	2595	23.01	0.19	23.5	0.394	1.119	1.008	0.444
10	Band41/1RB#49	Right Tilted	40640	2595	23.01	-1.72	23.5	**0.489**	1.119	1.008	0.552
	Band41/1RB#49	Left Cheek	40640	2595	23.01	-2.54	23.5	0.249	1.119	1.008	0.281
	Band41/1RB#49	Left Tilted	40640	2595	23.01	0.77	23.5	0.309	1.119	1.008	0.349
	Band41/50%RB#49	Right Cheek	40640	2595	21.84	0.02	22.0	0.330	1.038	1.008	0.345
	Band41/50%RB#49	Right Tilted	40640	2595	21.84	-1.18	22.0	0.410	1.038	1.008	0.429
	Band41/50%RB#49	Left Cheek	40640	2595	21.84	-0.22	22.0	0.209	1.038	1.008	0.219
	Band41/50%RB#49	Left Tilted	40640	2595	21.84	0.32	22.0	0.259	1.038	1.008	0.271
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)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	2.4GHz/802.11b	Right Cheek	1	2412	16.33	0.16	16.5	0.104	1.04	1.000	0.108
	2.4GHz/802.11b	Right Tilted	1	2412	16.33	1.56	16.5	0.081	1.04	1.000	0.084
11	2.4GHz/802.11b	Left Cheek	1	2412	16.33	-2.42	16.5	**0.204**	1.04	1.000	0.212
	2.4GHz/802.11b	Left Tilted	1	2412	16.33	0.91	16.5	0.162	1.04	1.000	0.168
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ WLAN 5.2 GHz Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	5.2GHz/802.11a	Right Cheek	48	5240	11.52	-1.38	12.0	0.082	1.117	1.000	0.092
	5.2GHz/802.11a	Right Tilted	48	5240	11.52	-0.28	12.0	0.096	1.117	1.000	0.107
	5.2GHz/802.11a	Left Cheek	48	5240	11.52	1.17	12.0	0.138	1.117	1.000	0.154
12	5.2GHz/802.11a	Left Tilted	48	5240	11.52	-0.43	12.0	**0.203**	1.117	1.000	0.227
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ WLAN 5.8GHz Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	5.8GHz/802.11a	Right Cheek	165	5825	8.01	-0.05	8.5	0.074	1.119	1.000	0.083
	5.8GHz/802.11a	Right Tilted	165	5825	8.01	2.37	8.5	0.086	1.119	1.000	0.096
	5.8GHz/802.11a	Left Cheek	165	5825	8.01	1.22	8.5	0.123	1.119	1.000	0.138
13	5.8GHz/802.11a	Left Tilted	165	5825	8.01	-2.69	8.5	**0.181**	1.119	1.000	0.203
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ Bluetooth Head SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	BT/GFSK	Right Cheek	39	2441	4.67	1.32	5.0	0.022	1.079	1.000	0.024
	BT/GFSK	Right Tilted	39	2441	4.67	-0.14	5.0	0.018	1.079	1.000	0.019
14	BT/GFSK	Left Cheek	39	2441	4.67	-0.85	5.0	**0.050**	1.079	1.000	0.054
	BT/GFSK	Left Tilted	39	2441	4.67	-3.16	5.0	0.042	1.079	1.000	0.045
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak					**1.6 W/kg (mW/g) Averaged over 1g**						

Uncontrolled Exposure/General Population	

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 28.18mW(14.5dBm) and 44.67mW(0.179dBm), the scaled SAR would be 0.227×(28.18/44.67)=0.143W/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)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	GPRS850/2 slots	Front	190	836.6	32.23	-1.37	32.5	0.297	1.064	0.316
15	GPRS850/2 slots	Back	190	836.6	32.23	-2.41	32.5	**0.365**	1.064	0.388
	GPRS1900/2 slots	Front	810	1909.8	28.75	0.43	29.0	0.340	1.059	0.360
16	GPRS1900/2 slots	Back	810	1909.8	28.75	-2.22	29.0	**0.613**	1.059	0.649
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)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band II/RMC	Front	9400	1880	23.05	0.65	23.5	0.157	1.109	0.174
17	Band II/RMC	Back	9400	1880	23.05	-2.39	23.5	**0.283**	1.109	0.314
	Band IV/RMC	Front	1413	1732.6	22.82	-1.06	23.0	0.110	1.042	0.115
18	Band IV/RMC	Back	1413	1732.6	22.82	-0.51	23.0	**0.198**	1.042	0.206
	Band V/RMC	Front	4183	836.6	23.55	0.31	24.0	0.258	1.109	0.286
19	Band V/RMC	Back	4183	836.6	23.55	-1.94	24.0	**0.342**	1.109	0.379
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 2(20MHz) QPSK Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band2/1RB#49	Front	18900	1880	23.10	0.79	23.5	0.274	1.096	0.300
20	Band2/1RB#49	Back	18900	1880	23.10	-3.46	23.5	**0.493**	1.096	0.540
	Band2/50%RB#24	Front	18900	1880	21.99	1.46	22.0	0.227	1.002	0.227
	Band2/50%RB#24	Back	18900	1880	21.99	-0.05	22.0	0.409	1.002	0.410
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 4(20MHz) QPSK Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band4/1RB#49	Front	20175	1732.5	23.17	2.43	23.5	0.112	1.079	0.121
21	Band4/1RB#49	Back	20175	1732.5	23.17	-1.45	23.5	**0.191**	1.079	0.206
	Band4/50%RB#24	Front	20175	1732.5	21.96	4.61	22.0	0.088	1.009	0.089
	Band4/50%RB#24	Back	20175	1732.5	21.96	-1.23	22.0	0.152	1.009	0.153
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 5(10MHz) QPSK Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band5/1RB#24	Front	20600	844	23.35	2.68	23.5	0.182	1.035	0.188
22	Band5/1RB#24	Back	20600	844	23.35	-0.29	23.5	**0.279**	1.035	0.289
	Band5/50%RB#0	Front	20600	844	22.45	2.68	22.5	0.137	1.012	0.139
	Band5/50%RB#0	Back	20600	844	22.45	0.04	22.5	0.209	1.012	0.212
ANSI / IEEE C95.1 – SAFETY LIMIT					**1.6 W/kg (mW/g)**					

Spatial Peak Uncontrolled Exposure/General Population	Averaged over 1g

➢ FDD-LTE Band 7(20MHz) QPSK Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band7/1RB#49	Front	21100	2535	22.34	-1.45	22.5	0.273	1.038	0.283
23	Band7/1RB#49	Back	21100	2535	22.34	3.33	22.5	**0.507**	1.038	0.526
	Band7/50%RB#24	Front	21350	2560	21.32	0.21	21.5	0.207	1.042	0.216
	Band7/50%RB#24	Back	21350	2560	21.32	1.56	21.5	0.385	1.042	0.401
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ TDD-LTE Band 41(20MHz) QPSK Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	Band41/1RB#49	Front	40640	2595	23.01	1.53	23.5	0.099	1.119	1.008	0.112
24	Band41/1RB#49	Back	40640	2595	23.01	-3.58	23.5	**0.196**	1.119	1.008	0.221
	Band41/50%RB#49	Front	40640	2595	21.84	-1.28	22.0	0.078	1.038	1.008	0.082
	Band41/50%RB#49	Back	40640	2595	21.84	1.01	22.0	0.153	1.038	1.008	0.160
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)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
25	2.4GHz/802.11b	Front	1	2412	16.33	0.45	16.5	**0.093**	1.040	1.000	0.097
	2.4GHz/802.11b	Back	1	2412	16.33	3.26	16.5	0.076	1.040	1.000	0.079
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ WLAN 5.2 GHz Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	5.2GHz/802.11a	Front	48	5240	11.52	0.74	12.0	0.084	1.117	1.000	0.094
26	5.2GHz/802.11a	Back	48	5240	11.52	-0.59	12.0	**0.098**	1.117	1.000	0.109
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ WLAN 5.8 GHz Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	5.8GHz/802.11a	Front	165	5825	8.01	-0.04	8.5	0.096	1.119	1.000	0.107
27	5.8GHz/802.11a	Back	165	5825	8.01	-0.44	8.5	**0.109**	1.119	1.000	0.122
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ Bluetooth Body SAR

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
28	BT/GFSK	Front	39	2441	4.67	-5.00	5.0	**0.026**	1.079	1.000	0.028
	BT/GFSK	Back	39	2441	4.67	0.20	5.0	0.021	1.079	1.000	0.023
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.
10. Highlight part of test data means repeated test.

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)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	GPRS850/2 slots	Front	190	836.6	32.23	-1.37	32.5	0.297	1.064	0.316
15	GPRS850/2 slots	Back	190	836.6	32.23	-2.41	32.5	**0.365**	1.064	0.388
	GPRS850/2 slots	Left	190	836.6	32.23	-0.63	32.5	0.183	1.064	0.195
	GPRS850/2 slots	Top	190	836.6	32.23	-2.50	32.5	0.273	1.064	0.290
	GPRS1900/2 slots	Front	810	1909.8	28.75	0.43	29.0	0.340	1.059	0.360
	GPRS1900/2 slots	Back	810	1909.8	28.75	-2.22	29.0	0.613	1.059	0.649
	GPRS1900/2 slots	Left	810	1909.8	28.75	-0.12	29.0	0.126	1.059	0.133
29	GPRS1900/2 slots	Top	810	1909.8	28.75	-4.92	29.0	**0.720**	1.059	0.762
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)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band II/RMC	Front	9400	1880	23.05	0.65	23.5	0.157	1.109	0.174
	Band II/RMC	Back	9400	1880	23.05	-2.39	23.5	0.283	1.109	0.314
	Band II/RMC	Left	9400	1880	23.05	1.83	23.5	0.058	1.109	0.064
30	Band II/RMC	Top	9400	1880	23.05	-0.12	23.5	**0.329**	1.109	0.365
	Band IV/RMC	Front	1413	1732.6	22.82	-1.06	23.0	0.110	1.042	0.115
	Band IV/RMC	Back	1413	1732.6	22.82	-0.51	23.0	0.198	1.042	0.206
	Band IV/RMC	Left	1413	1732.6	22.82	0.77	23.0	0.042	1.042	0.044
31	Band IV/RMC	Top	1413	1732.6	22.82	0.03	23.0	**0.214**	1.042	0.223
	Band V/RMC	Front	4183	836.6	23.55	0.31	24.0	0.258	1.109	0.286
19	Band V/RMC	Back	4183	836.6	23.55	-1.94	24.0	**0.342**	1.109	0.379
	Band V/RMC	Left	4183	836.6	23.55	2.21	24.0	0.166	1.109	0.184
	Band V/RMC	Top	4183	836.6	23.55	-3.40	24.0	0.224	1.109	0.248
					Band V/RMC					

➢ FDD-LTE Band 2(20MHz) QPSK Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band2/1RB#49	Front	18900	1880	23.10	0.79	23.5	0.274	1.096	0.300
	Band2/1RB#49	Back	18900	1880	23.10	-3.46	23.5	0.493	1.096	0.540
	Band2/1RB#49	Left	18900	1880	23.10	-4.82	23.5	0.102	1.096	0.112
32	Band2/1RB#49	Top	18900	1880	23.10	0.50	23.5	**0.601**	1.096	0.659
	Band2/50%RB#24	Front	18900	1880	21.99	1.46	22.0	0.227	1.002	0.227
	Band2/50%RB#24	Back	18900	1880	21.99	-0.05	22.0	0.409	1.002	0.410
	Band2/50%RB#24	Left	18900	1880	21.99	0.34	22.0	0.085	1.002	0.085
	Band2/50%RB#24	Top	18900	1880	21.99	1.33	22.0	0.499	1.002	0.500
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 4(20MHz) QPSK Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band4/1RB#49	Front	20175	1732.5	23.17	2.43	23.5	0.112	1.079	0.121
	Band4/1RB#49	Back	20175	1732.5	23.17	-1.45	23.5	0.191	1.079	0.206
	Band4/1RB#49	Left	20175	1732.5	23.17	0.06	23.5	0.042	1.079	0.045
33	Band4/1RB#49	Top	20175	1732.5	23.17	0.02	23.5	**0.214**	1.079	0.231

	Band4/50%RB#24	Front	20175	1732.5	21.96	4.61	22.0	0.088	1.009	0.089
	Band4/50%RB#24	Back	20175	1732.5	21.96	-1.23	22.0	0.152	1.009	0.153
	Band4/50%RB#24	Left	20175	1732.5	21.96	0.18	22.0	0.033	1.009	0.033
	Band4/50%RB#24	Top	20175	1732.5	21.96	0.73	22.0	0.169	1.009	0.171
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 5(10MHz) QPSK Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band5/1RB#24	Front	20600	844	23.35	2.68	23.5	0.182	1.035	0.188
22	Band5/1RB#24	Back	20600	844	23.35	-0.29	23.5	**0.279**	1.035	0.289
	Band5/1RB#24	Left	20600	844	23.35	-1.17	23.5	0.116	1.035	0.120
	Band5/1RB#24	Top	20600	844	23.35	0.74	23.5	0.173	1.035	0.179
	Band5/50%RB#0	Front	20600	844	22.45	2.68	22.5	0.137	1.012	0.139
	Band5/50%RB#0	Back	20600	844	22.45	0.04	22.5	0.209	1.012	0.212
	Band5/50%RB#0	Left	20600	844	22.45	0.51	22.5	0.087	1.012	0.088
	Band5/50%RB#0	Top	20600	844	22.45	0.91	22.5	0.131	1.012	0.133
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ FDD-LTE Band 7(20MHz) QPSK Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)
	Band7/1RB#49	Front	21100	2535	22.34	-1.45	22.5	0.273	1.038	0.283
	Band7/1RB#49	Back	21100	2535	22.34	3.33	22.5	0.507	1.038	0.526
	Band7/1RB#49	Left	21100	2535	22.34	-4.04	22.5	0.197	1.038	0.204
34	Band7/1RB#49	Top	21100	2535	22.34	0.83	22.5	**0.658**	1.038	0.683
	Band7/50%RB#24	Front	21350	2560	21.32	0.21	21.5	0.207	1.042	0.216
	Band7/50%RB#24	Back	21350	2560	21.32	1.56	21.5	0.385	1.042	0.401
	Band7/50%RB#24	Left	21350	2560	21.32	1.91	21.5	0.151	1.042	0.157
	Band7/50%RB#24	Top	21350	2560	21.32	-0.40	21.5	0.504	1.042	0.525
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**					

➢ TDD-LTE Band 41(20MHz) QPSK Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	Band41/1RB#49	Front	40640	2595	23.01	1.53	23.5	0.099	1.119	1.008	0.112
	Band41/1RB#49	Back	40640	2595	23.01	-3.58	23.5	0.196	1.119	1.008	0.221
	Band41/1RB#49	Left	40640	2595	23.01	0.23	23.5	0.038	1.119	1.008	0.043
35	Band41/1RB#49	Top	40640	2595	23.01	-2.82	23.5	**0.217**	1.119	1.008	0.245
	Band41/50%RB#49	Front	40640	2595	21.84	-1.28	22.0	0.078	1.038	1.008	0.082
	Band41/50%RB#49	Back	40640	2595	21.84	1.01	22.0	0.153	1.038	1.008	0.160
	Band41/50%RB#49	Left	40640	2595	21.84	0.88	22.0	0.035	1.038	1.008	0.037
	Band41/50%RB#49	Top	40640	2595	21.84	-0.07	22.0	0.167	1.038	1.008	0.175
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 in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
25	2.4GHz/802.11b	Front	1	2412	16.33	0.45	16.5	**0.093**	1.040	1.000	0.097
	2.4GHz/802.11b	Back	1	2412	16.33	3.26	16.5	0.076	1.040	1.000	0.079
	2.4GHz/802.11b	Right	1	2412	16.33	-2.59	16.5	0.087	1.040	1.000	0.090
	2.4GHz/802.11b	Top	1	2412	16.33	-3.26	16.5	0.055	1.040	1.000	0.057
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ WLAN 5.2 GHz Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	5.2GHz/802.11a	Front	48	5240	11.52	0.74	12.0	0.084	1.117	1.000	0.094
	5.2GHz/802.11a	Back	48	5240	11.52	-0.59	12.0	0.098	1.117	1.000	0.109
	5.2GHz/802.11a	Right	48	5240	11.52	0.75	12.0	0.074	1.117	1.000	0.083
36	5.2GHz/802.11a	Top	48	5240	11.52	0.18	12.0	**0.104**	1.117	1.000	0.116
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ WLAN 5.8 GHz Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
	5.8GHz/802.11a	Front	165	5825	8.01	-0.04	8.5	0.096	1.119	1.000	0.107
	5.8GHz/802.11a	Back	165	5825	8.01	-0.44	8.5	0.109	1.119	1.000	0.122
	5.8GHz/802.11a	Right	165	5825	8.01	1.92	8.5	0.091	1.119	1.000	0.102
37	5.8GHz/802.11a	Top	165	5825	8.01	4.06	8.5	**0.136**	1.119	1.000	0.152
ANSI / IEEE C95.1 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**1.6 W/kg (mW/g) Averaged over 1g**						

➢ Bluetooth Body SAR in Hotspot mode

Plot No.	Band/Mode	Test Position	CH.	Freq. (MHz)	Ave. Power (dBm)	Variation (%)	Tune-Up Limit (dBm)	Meas. SAR_{1g} (W/kg)	Scaling Factor	D.C Factor	Reported SAR_{1g} (W/kg)
28	BT/GFSK	Front	39	2441	4.67	-5.00	5.0	**0.026**	1.079	1.000	0.028
	BT/GFSK	Back	39	2441	4.67	0.20	5.0	0.021	1.079	1.000	0.023
	BT/GFSK	Right	39	2441	4.67	1.16	5.0	0.018	1.079	1.000	0.019
	BT/GFSK	Top	39	2441	4.67	0.64	5.0	0.012	1.079	1.000	0.013
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
PCS1900/Voice	Right Tilted	512	1850.2	0.812	0.801	1.01	/	/
Band V/RMC	Right Cheek	4233	846.6	0.931	0.919	1.01	/	/
Band2/1RB#49	Right Tilted	18700	1860	1.009	1.005	1	/	/
Band7/1RB#49	Right Tilted	20850	2510	1.232	1.211	1.02	/	/
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 DUT holder perturbation uncertainty evaluation

1. According to TCB workshop, Oct 2016:
   When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required for each antenna, using the highest SAR configuration among all applicable frequency bands.
2. When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required for each antenna, using the highest SAR configuration among all applicable frequency bands.
3. According to IEEE 1528-2013 section E.4.1, When it is unknown if a device holder perturbs the fields of a test device, the SAR uncertainty shall be assessed with a flat phantom (see Clause 5) by comparing the SAR with and without the device holder according to the following tests:

a) With device holder: 1 g or 10 g peak spatial-average SAR is measured with the handset fixed in the holder in a manner similar to the way it was held when tested for the head SAR position. The handset horizontal and vertical centerlines (see Clause 6) are aligned parallel to the bottom of the flat phantom and the device is in direct contact with the phantom. The test shall be performed with the antenna position and device operational configuration corresponding to that where the highest head SAR was previously measured for each frequency band.

b) Without device holder: 1 g or 10 g peak spatial-average SAR is measured with the handset placed on a low-loss foam block or support in the position identical to that tested with the device holder. The relative permittivity and loss tangent of the foam material shall be less than 1.2 and 10–5, respectively.

Test result:

Plot	Band/ Mode	Test Position	CH.	Freq. (MHz)	Test configuration	Measured SAR (W/kg) Averaged over 1g
38	LTE Band 7	Front	20850	2510	With device holder	1.794
39	LTE Band 7	Front	20850	2510	Without device holder	1.872

The following equation is used to computed the SAR tolerance,

$$SAR_{\text{tolerance}}[\%] = 100 \times \left(\frac{SAR_{\text{w/ holder}} - SAR_{\text{w/o holder}}}{SAR_{\text{w/o holder}}} \right)$$

Therefore, the $SAR_{\text{tolerance}}$=100× [(1.794-1.872)/1.872] = -4.17%.

15.6 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.

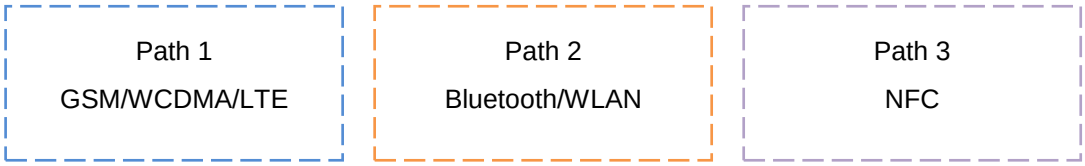


Fig.15.1 Simultaneous Transmission Paths

➢ **Simultaneous Transmission Procedures**

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D04v01, 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 D04v01 Appendix E, E.1), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$SAR_{est} = 1.6 \cdot P_{ant} / P_{th} \ [\mathrm{W/kg}].$$

Mode	Max. Power (dBm)	Max. Power (mW)	Exposure Position	Head	Body	Hotspot
NFC	-45.71	0.000027	Estimated SAR (W/kg)	0.000	0.000	0.000

Note:

1. Per KDB 447498 D04v01 section 2.1.2: 1-mW Test Exemption, P_{th} =1mW.

➢ **Multi-Band simultaneous Transmission Consideration**

	Position	Applicable Combination
Simultaneous Transmission Consideration	Head	WWAN (Voice) + WLAN 2.4 GHz/5.2GHz/5.8GHz+ NFC
		WWAN (Voice) + Bluetooth+ NFC
	Body	WWAN (Voice) + WLAN 2.4 GHz/5.2GHz/5.8GHz+ NFC
		WWAN (Voice) + Bluetooth+ NFC
	Hotspot	WWAN (Data) + WLAN 2.4 GHz/5.2GHz/5.8GH+ NFC
		WWAN (Data) + Bluetooth+ NFC

Note:

1. WLAN 2.4GHz Band and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. WLAN 5.2GHz Band and WLAN 5.8GHz share the same antenna, and cannot transmit simultaneously.
3. GSM/WCDMA/LTE shares the same antenna, and cannot transmit simultaneously.
4. The Report SAR summation is calculated based on the same configuration and test position.
5. Per KDB 447498 D04v01, 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

15.7 SAR Simultaneous Transmission Analysis

➢ **Simultaneous Transmission**

Position		Standalone SAR(W/kg)					Σ SAR_{1g} (W/kg)		
		1	2	3	4	5	1+2+5	1+3+5	1+4+5
		WWAN	2.4G WLAN	5G WLAN	BT	NFC			
Head	Right Cheek	1.072	0.108	0.092	0.024	0.000	1.180	1.164	1.096
	Right Tilted	1.326	0.084	0.107	0.019	0.000	1.410	**1.433**	1.345
	Left Cheek	0.579	0.212	0.154	0.054	0.000	0.791	0.733	0.633
	Left Tilted	0.713	0.168	0.227	0.045	0.000	0.881	0.940	0.758
Body-worn	Front	0.360	0.097	0.107	0.028	0.000	0.457	0.467	0.388
	Back	0.649	0.079	0.122	0.023	0.000	0.728	0.771	0.672
Hotspot	Front	0.360	0.097	0.107	0.028	0.000	0.457	0.467	0.388
	Back	0.649	0.079	0.122	0.023	0.000	0.728	0.771	0.672
	Left	0.204	/	/	/	0.000	0.204	0.204	0.204
	Right	/	0.090	0.102	0.019	0.000	0.090	0.102	0.019
	Top	0.762	0.057	0.152	0.013	0.000	0.819	0.914	0.775
	Bottom	/	/	/	/	0.000	0.000	0.000	0.000

➢ **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.

15.8 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 835 MHz

Date of measurement: 29/9/2022

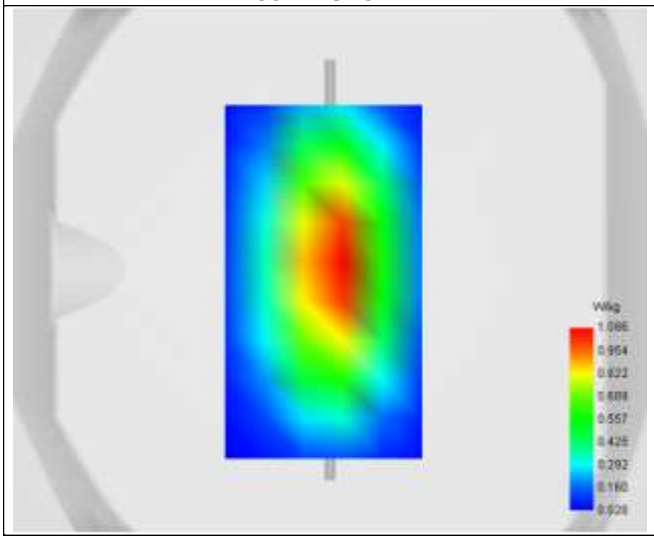
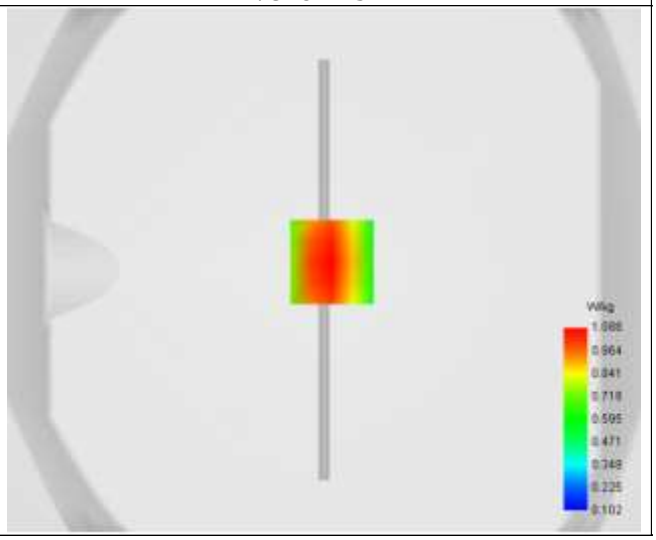
A. Experimental conditions.

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	CW835
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	835.000000
Relative permitivity (real part)	40.340000
Conductivity (S/m)	0.863908

C. SAR Surface and Volume

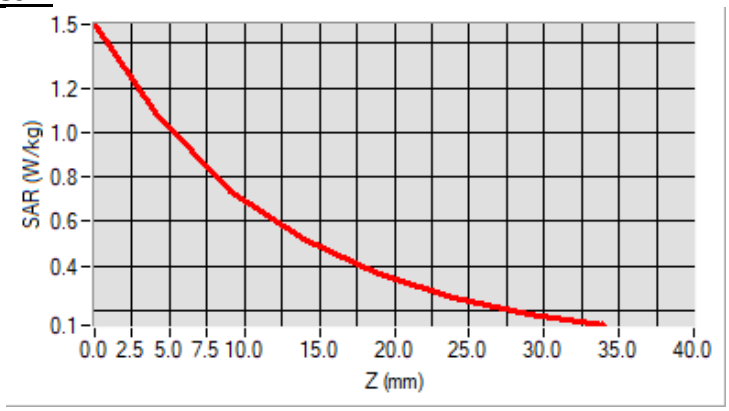
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=3.00 ; SAR Peak: 1.50 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.586127
SAR 1g (W/Kg)	0.949231
Variation (%)	2.790000

E. Z Axis Scan



System check at 1750 MHz

Date of measurement: 9/10/2022

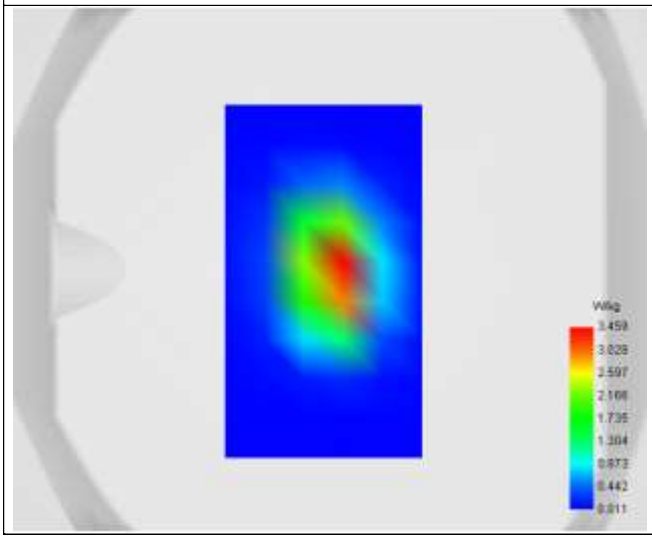
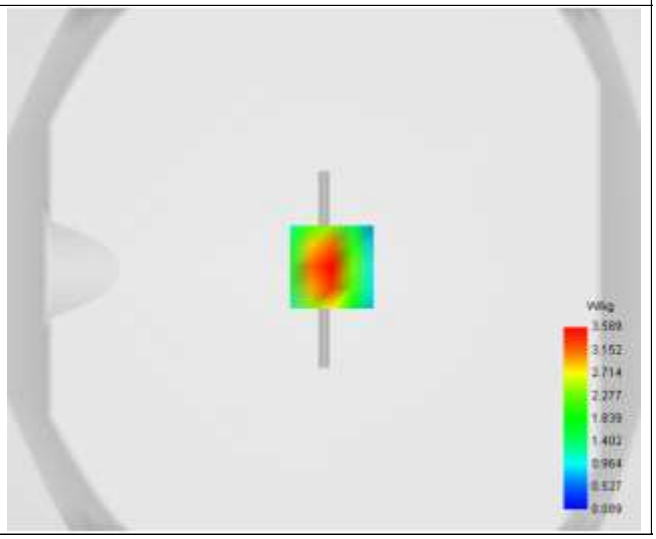
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.05
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)	39.253018
Conductivity (S/m)	1.344571

C. SAR Surface and Volume

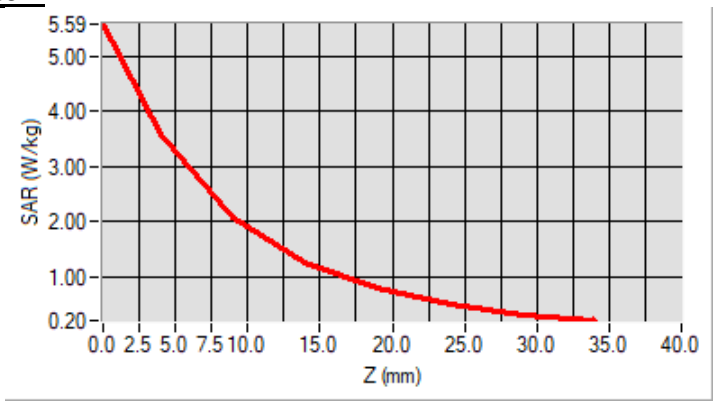
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=1.00 ; SAR Peak: 5.69 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	1.908000
SAR 1g (W/Kg)	3.625214
Variation (%)	1.680000

E. Z Axis Scan



System check at 1900 MHz

Date of measurement: 9/10/2022

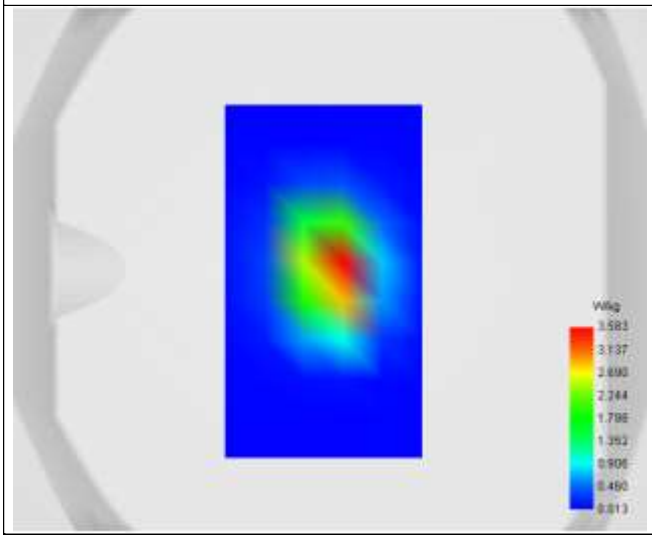
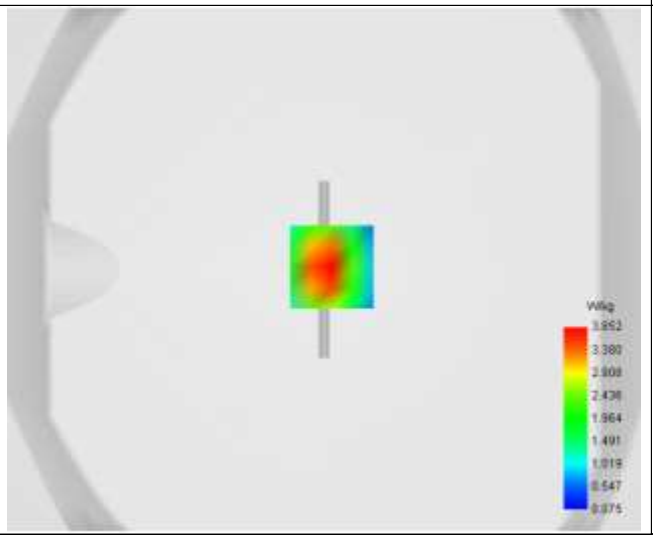
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
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)	38.970000
Conductivity (S/m)	1.381246

C. SAR Surface and Volume

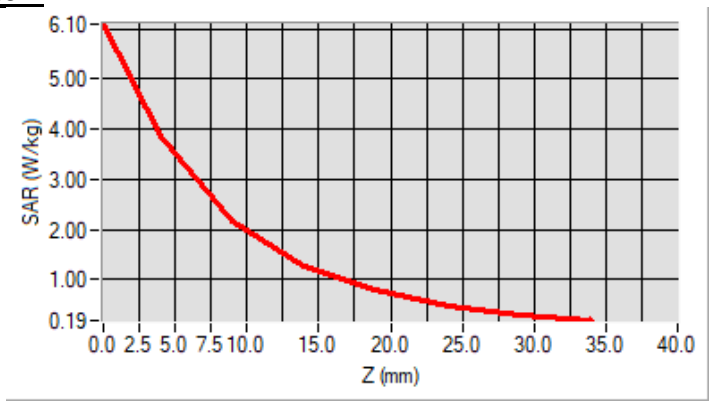
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=1.00 ; SAR Peak: 6.27 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	2.010224
SAR 1g (W/Kg)	3.928254
Variation (%)	1.470000

E. Z Axis Scan



System check at 2450 MHz

Date of measurement: 10/10/2022

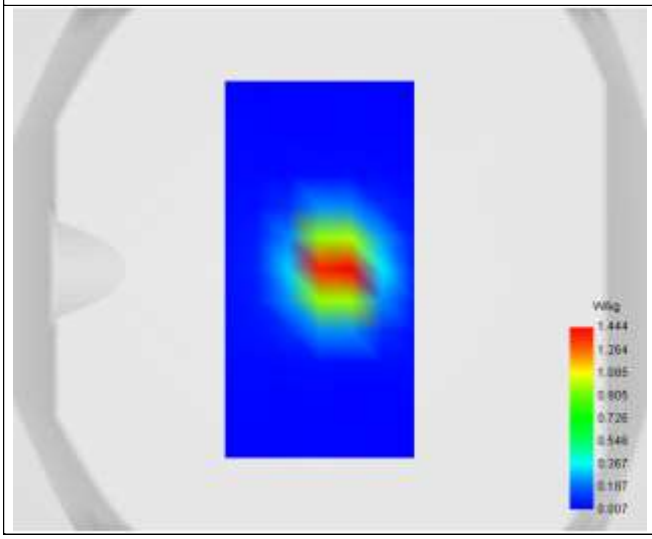
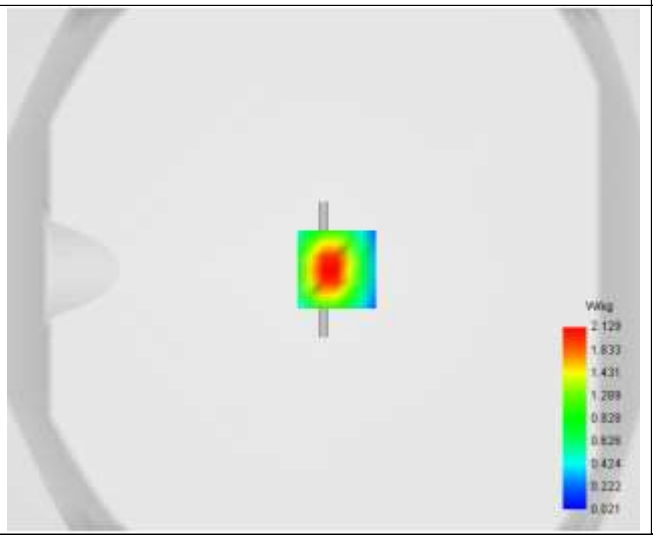
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.46
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)	38.240000
Conductivity (S/m)	1.751154

C. SAR Surface and Volume

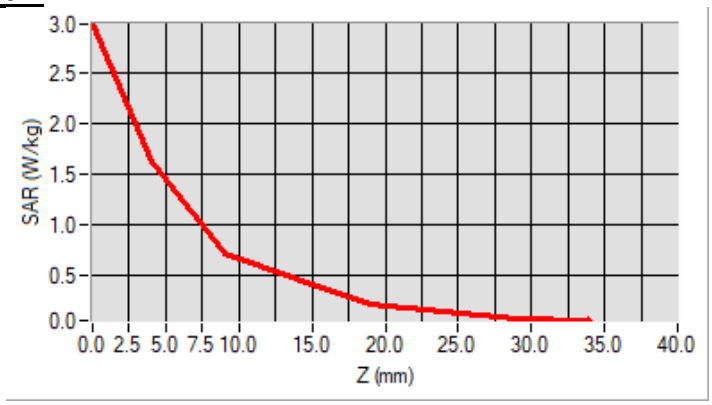
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=0.00 ; SAR Peak: 2.67 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.932214
SAR 1g (W/Kg)	2.057000
Variation (%)	1.070000

E. Z Axis Scan



System check at 2600 MHz

Date of measurement: 10/10/2022

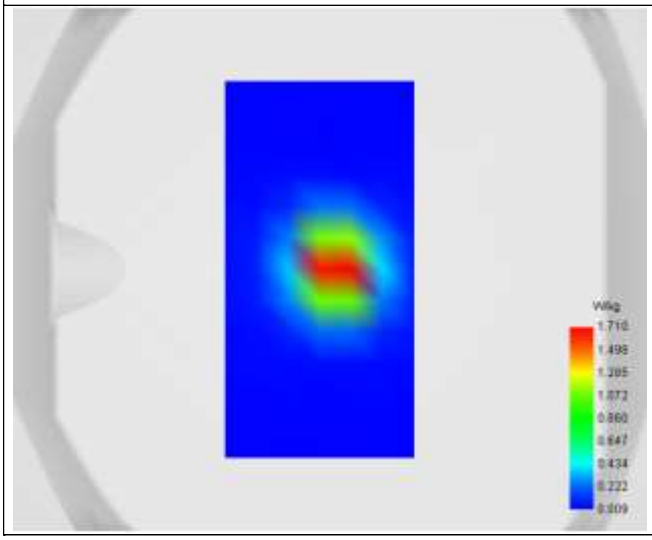
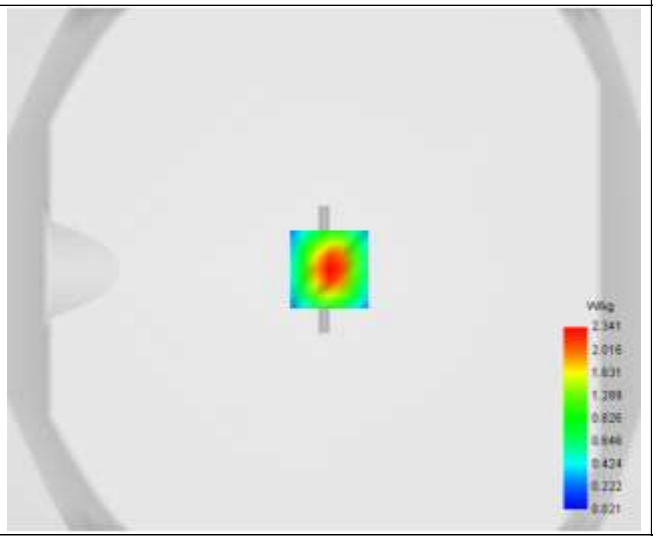
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
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)	38.100000
Conductivity (S/m)	1.930000

C. SAR Surface and Volume

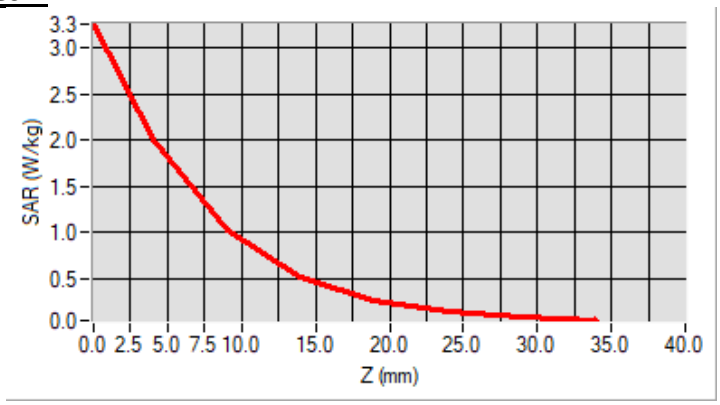
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=0.00 ; SAR Peak: 3.24 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.944247
SAR 1g (W/Kg)	2.168022
Variation (%)	-0.330000

E. Z Axis Scan



System check at 5200 MHz

Date of measurement: 13/10/2022

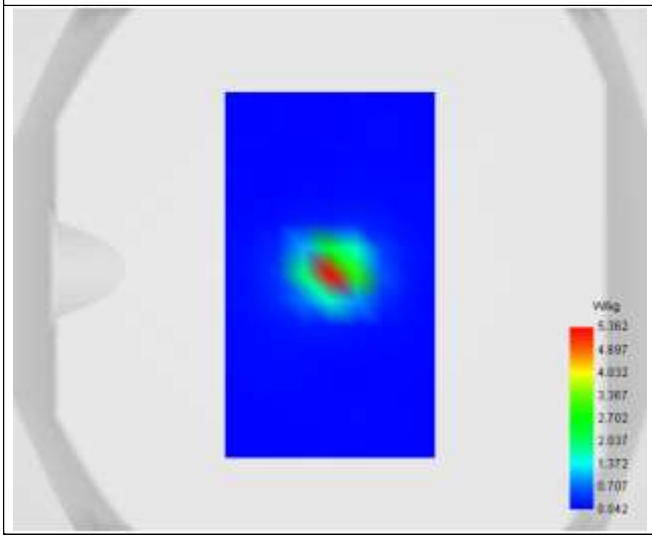
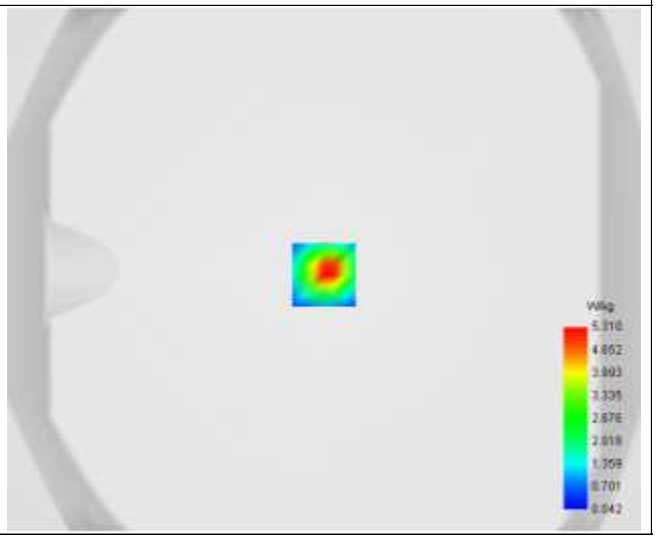
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.71
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW5200
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	5200.000000
Relative permitivity (real part)	35.550000
Conductivity (S/m)	4.583717

C. SAR Surface and Volume

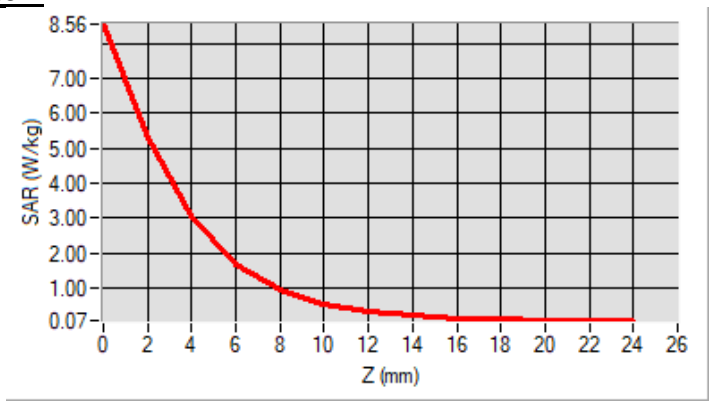
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=-2.00 ; SAR Peak: 9.16 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.889132
SAR 1g (W/Kg)	2.980113
Variation (%)	1.320000

E. Z Axis Scan



System check at 5800 MHz

Date of measurement: 13/10/2022

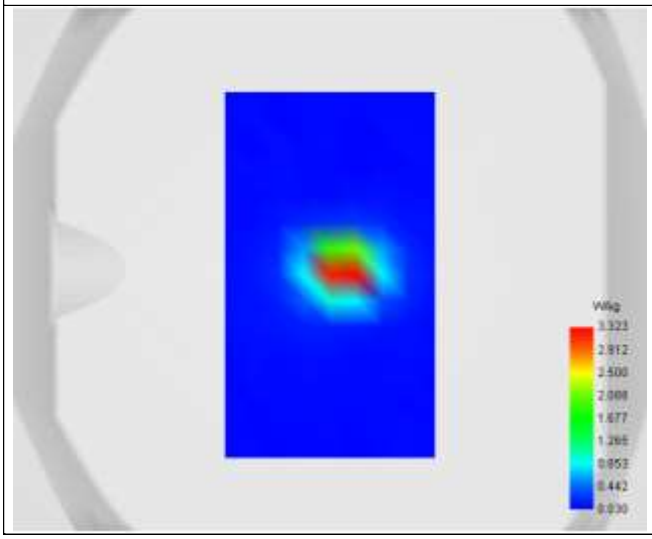
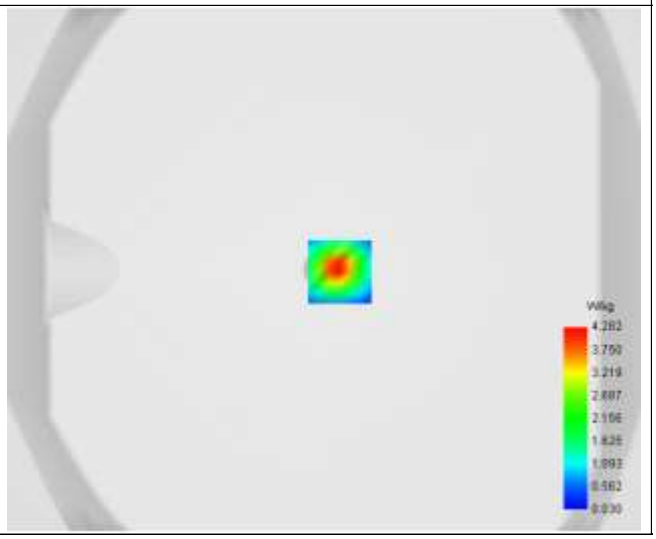
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.94
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW5800
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	5800.000000
Relative permitivity (real part)	34.966547
Conductivity (S/m)	5.191531

C. SAR Surface and Volume

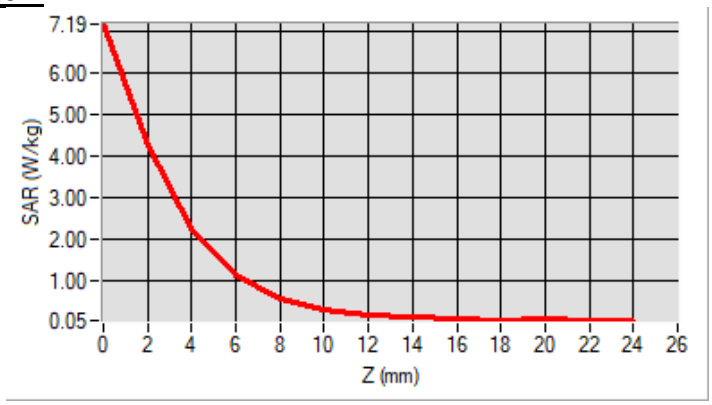
SURFACE SAR	VOLUME SAR
	

Maximum location: X=6.00, Y=-1.00 ; SAR Peak: 7.66 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.896001
SAR 1g (W/Kg)	3.258045
Variation (%)	0.120000

E. Z Axis Scan



Appendix B: Plots of SAR Test Data

SAR Measurement at GSM850 (Cheek, Right)

Date of measurement: 29/9/2022

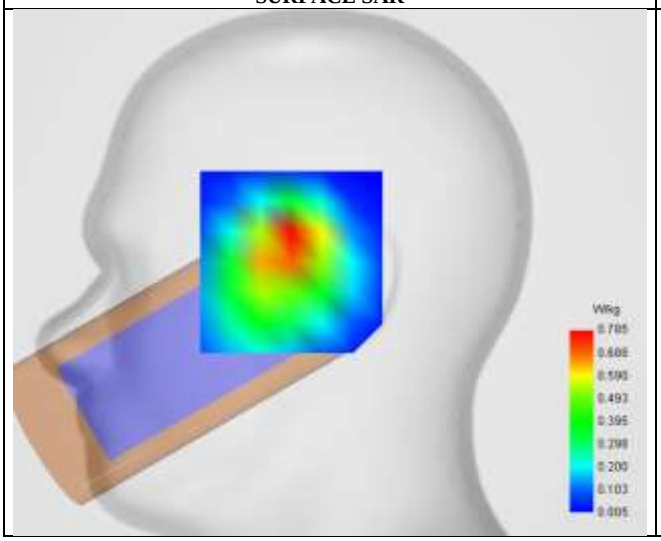
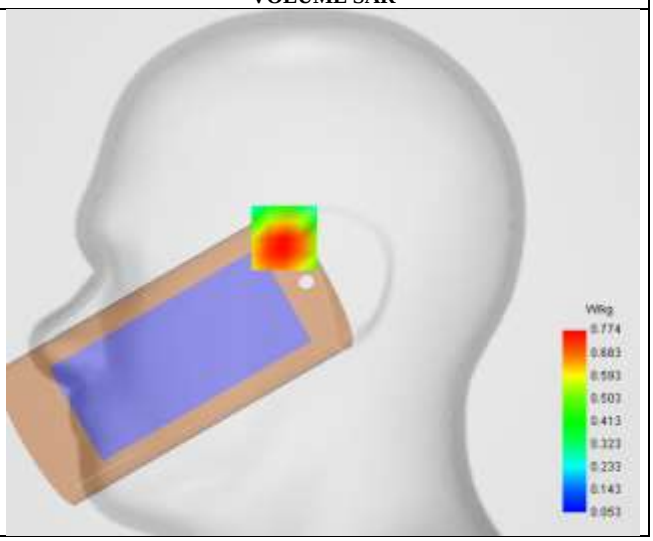
A. Experimental conditions.

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	GSM850
Channels	Middle
Signal	TDMA (Crest factor: 8.0)

B. Permitivity

Frequency (MHz)	836.599976
Relative permitivity (real part)	40.580000
Conductivity (S/m)	0.873457

C. SAR Surface and Volume

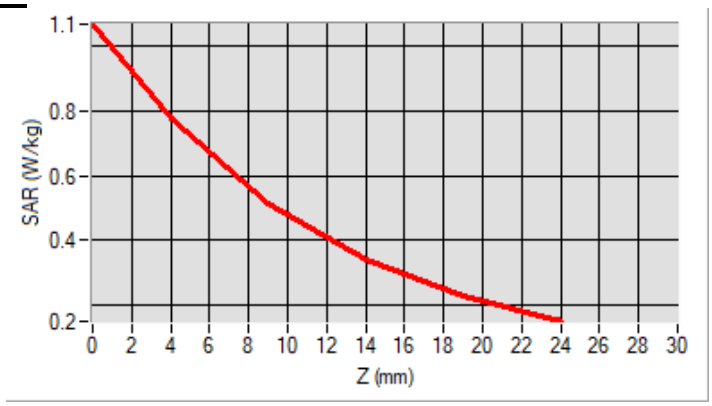
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-19.00, Y=17.00 ; SAR Peak: 1.08 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.477187
SAR 1g (W/Kg)	0.745888
Variation (%)	-4.520000

E. Z Axis Scan



SAR Measurement at GSM1900 (Tilt, Right)

Date of measurement: 9/10/2022

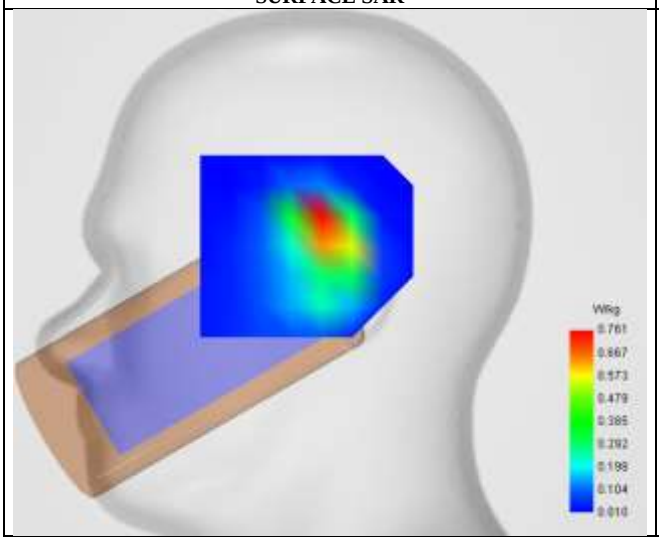
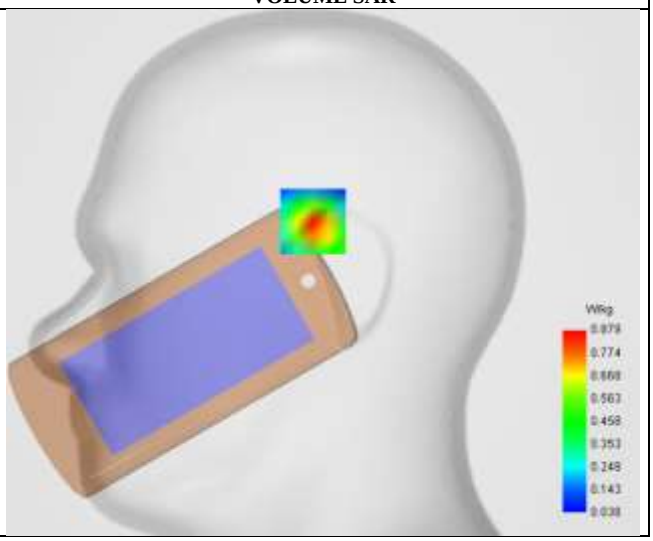
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Right head
Device Position	Tilt
Band	GSM1900
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. Permitivity

Frequency (MHz)	1850.199951
Relative permitivity (real part)	38.880000
Conductivity (S/m)	1.370260

C. SAR Surface and Volume

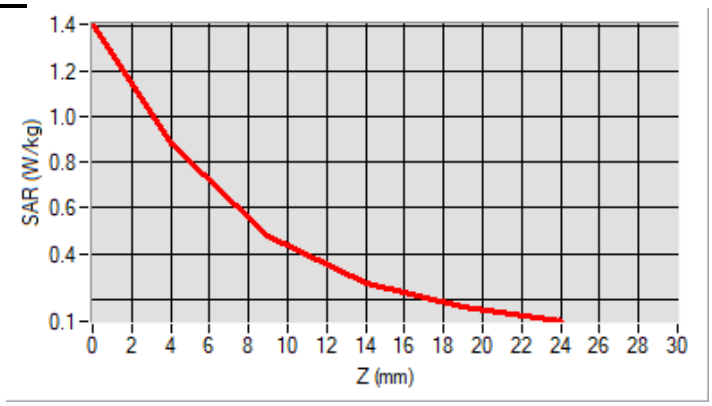
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-5.00, Y=25.00 ; SAR Peak: 1.42 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.417256
SAR 1g (W/Kg)	0.811843
Variation (%)	-0.720000

E. Z Axis Scan



SAR Measurement at Band2_WCDMA1900 (Tilt, Right)

Date of measurement: 9/10/2022

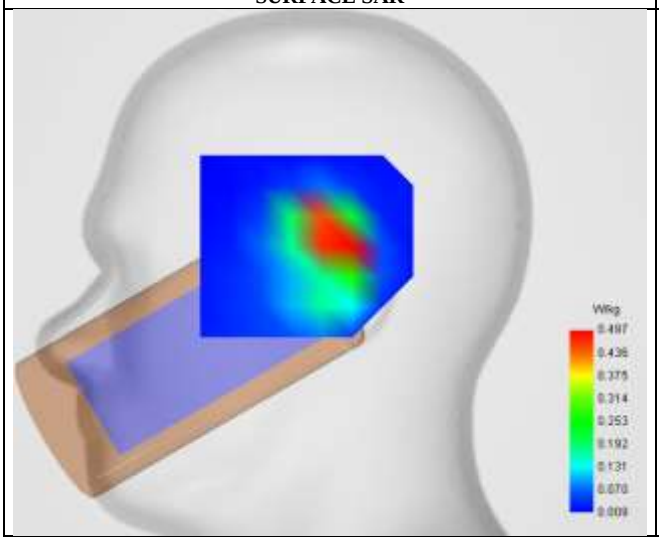
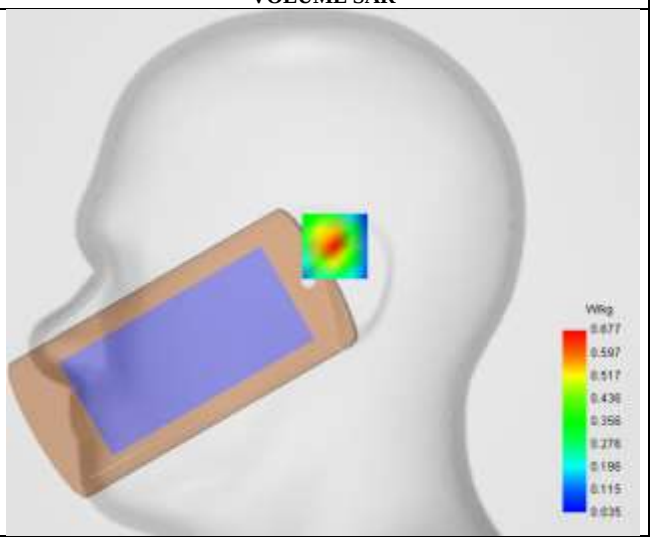
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Right head
Device Position	Tilt
Band	Band2_WCDMA1900
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1880.000000
Relative permitivity (real part)	40.002780
Conductivity (S/m)	1.400741

C. SAR Surface and Volume

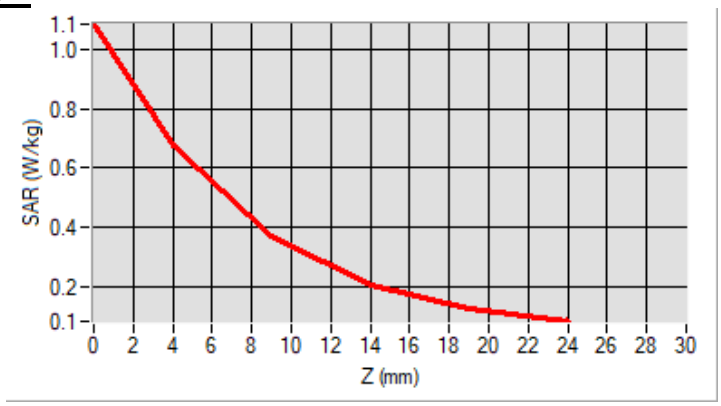
SURFACE SAR	VOLUME SAR
	

Maximum location: X=6.00, Y=13.00 ; SAR Peak: 1.10 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.316573
SAR 1g (W/Kg)	0.623147
Variation (%)	-0.540000

E. Z Axis Scan



SAR Measurement at CUSTOM (WCDMA_1700) (Tilt, Right)

Date of measurement: 9/10/2022

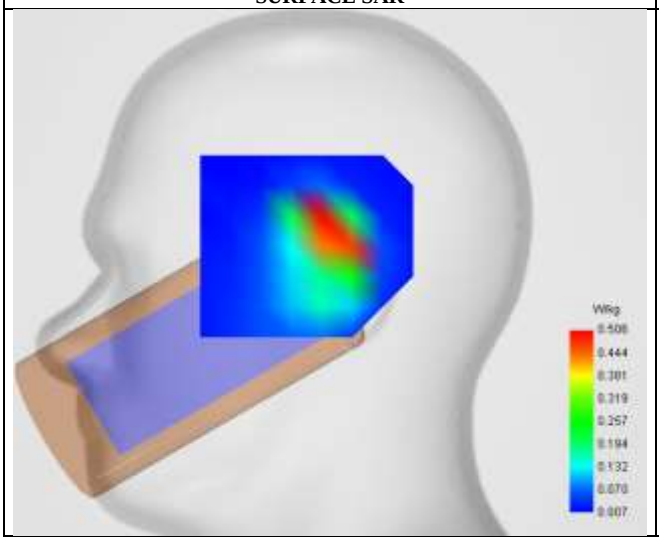
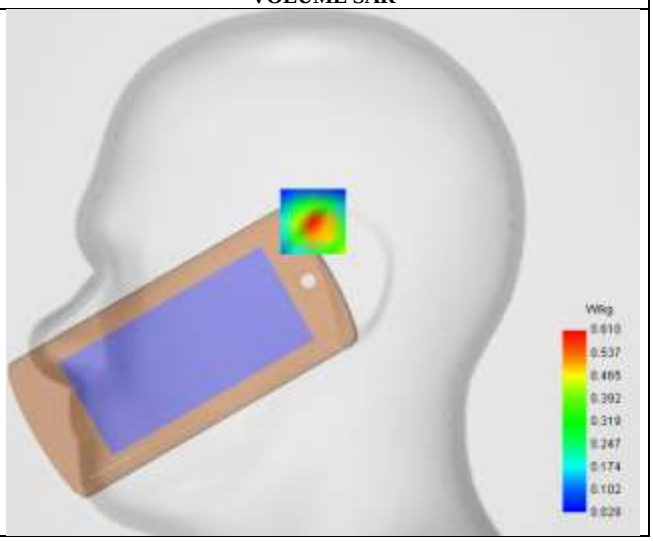
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.05
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Right head
Device Position	Tilt
Band	Band4_WCDMA1700
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1732.599976
Relative permitivity (real part)	39.815844
Conductivity (S/m)	1.336514

C. SAR Surface and Volume

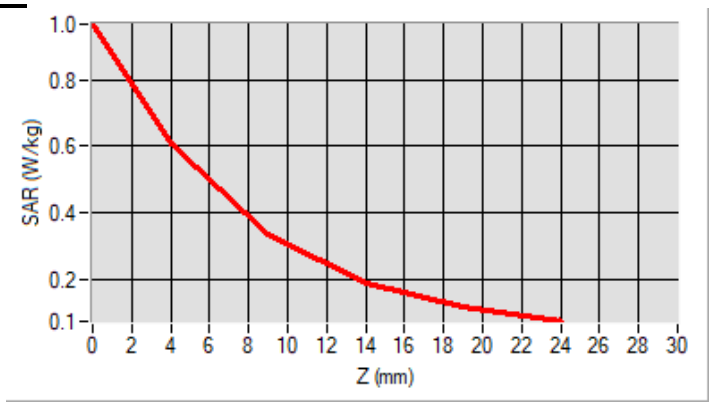
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-5.00, Y=25.00 ; SAR Peak: 0.98 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.291906
SAR 1g (W/Kg)	0.562064
Variation (%)	-4.050000

E. Z Axis Scan



SAR Measurement at Band5_WCDMA850 (Cheek, Right)

Date of measurement: 29/9/2022

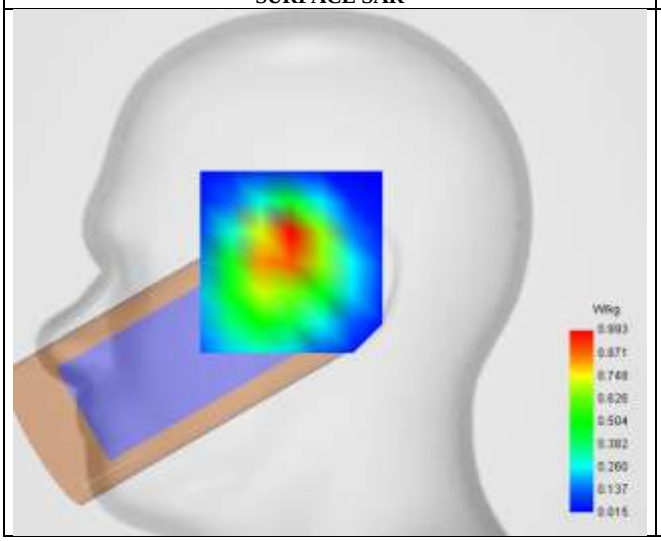
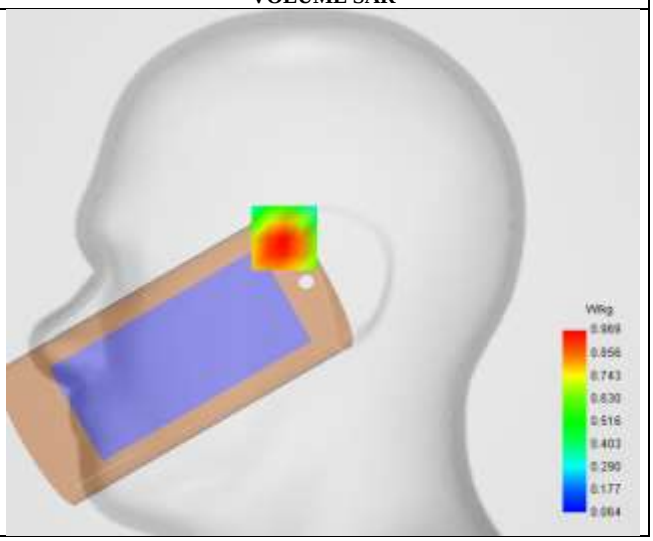
A. Experimental conditions.

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	Band5_WCDMA850
Channels	High
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	846.599976
Relative permitivity (real part)	41.160000
Conductivity (S/m)	0.882445

C. SAR Surface and Volume

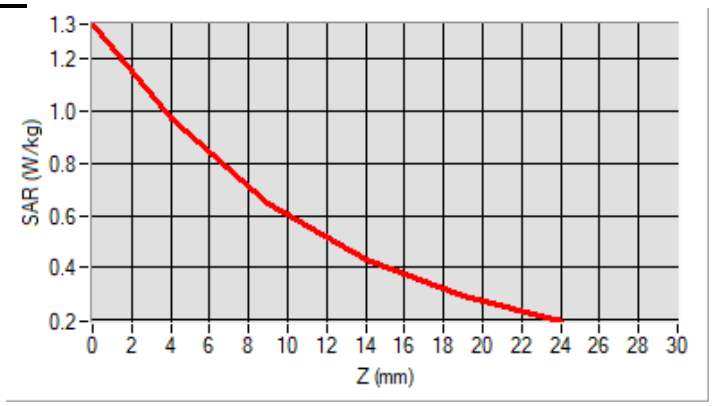
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-19.00, Y=17.00 ; SAR Peak: 1.34 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.606444
SAR 1g (W/Kg)	0.930860
Variation (%)	-4.300000

E. Z Axis Scan



SAR Measurement at LTE band 2 (Tilt, Right)

Date of measurement: 9/10/2022

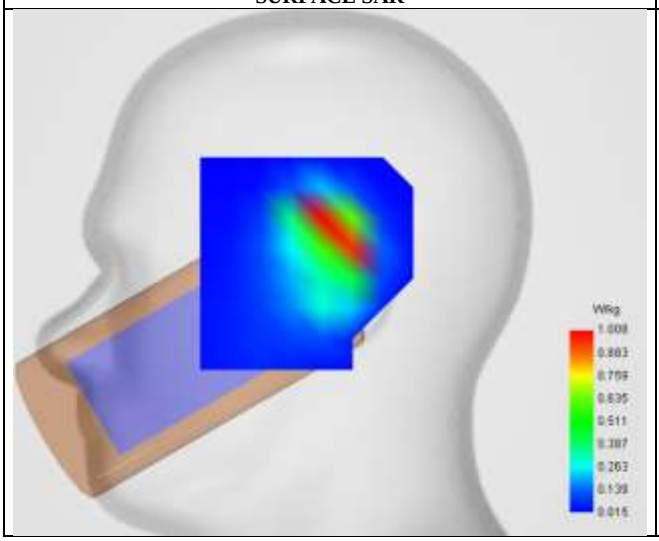
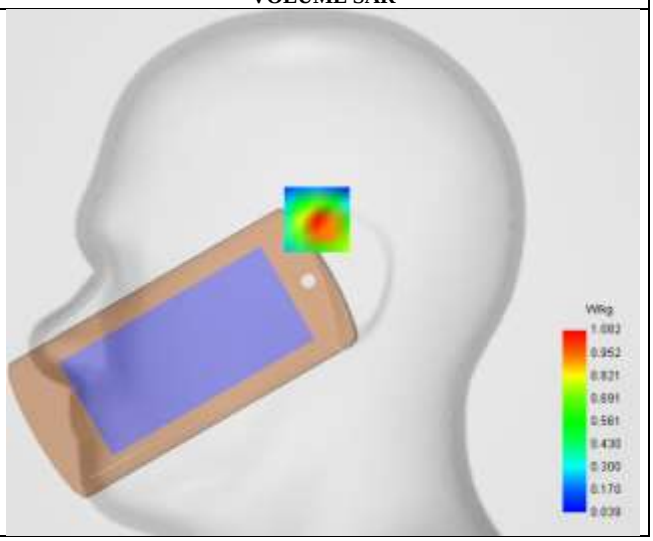
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Right head
Device Position	Tilt
Band	LTE band 2
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1860.000000
Relative permitivity (real part)	38.864500
Conductivity (S/m)	1.370155

C. SAR Surface and Volume

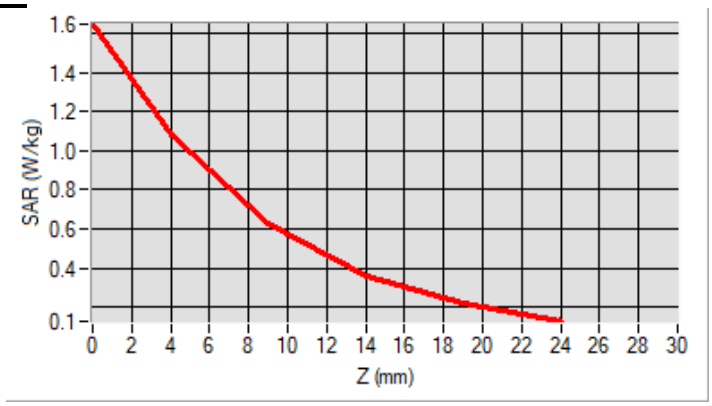
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-3.00, Y=26.00 ; SAR Peak: 1.68 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.540323
SAR 1g (W/Kg)	1.009029
Variation (%)	-0.420000

E. Z Axis Scan



SAR Measurement at CUSTOM (LTE_Band_4) (Tilt, Right)

Date of measurement: 9/10/2022

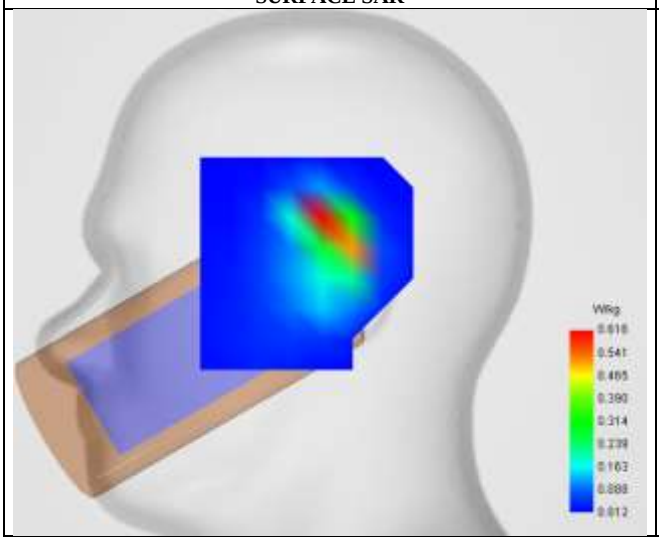
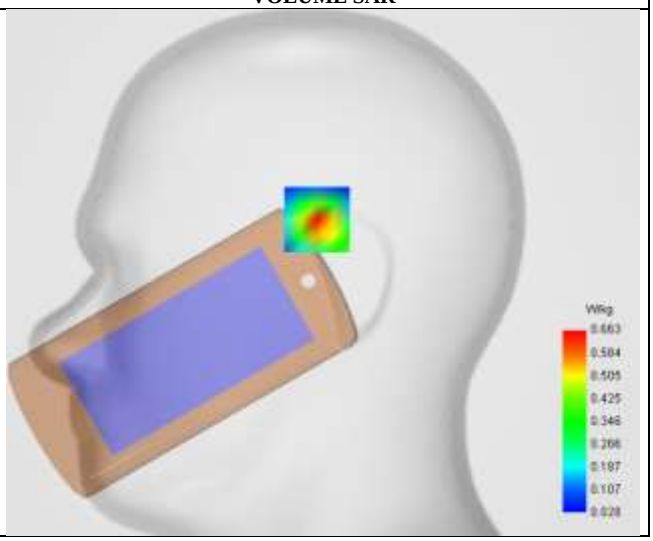
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.05
Area Scan	dx=15mm dy=15mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Right head
Device Position	Tilt
Band	LTE band 4
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1732.500000
Relative permitivity (real part)	39.215310
Conductivity (S/m)	1.331603

C. SAR Surface and Volume

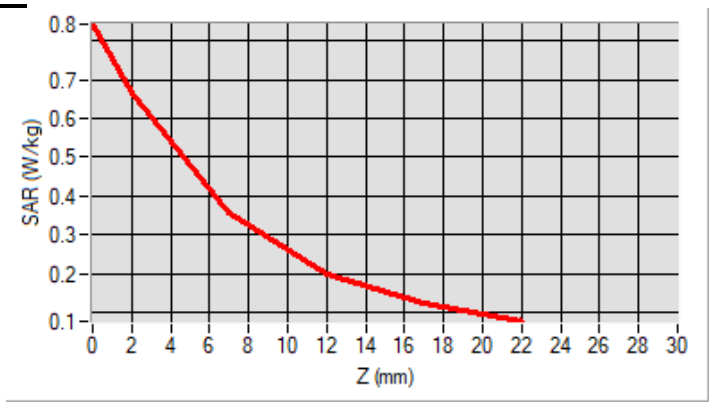
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-3.00, Y=26.00 ; SAR Peak: 1.07 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.309772
SAR 1g (W/Kg)	0.608597
Variation (%)	-0.910000

E. Z Axis Scan



SAR Measurement at LTE band 5 (Cheek, Right)

Date of measurement: 29/9/2022

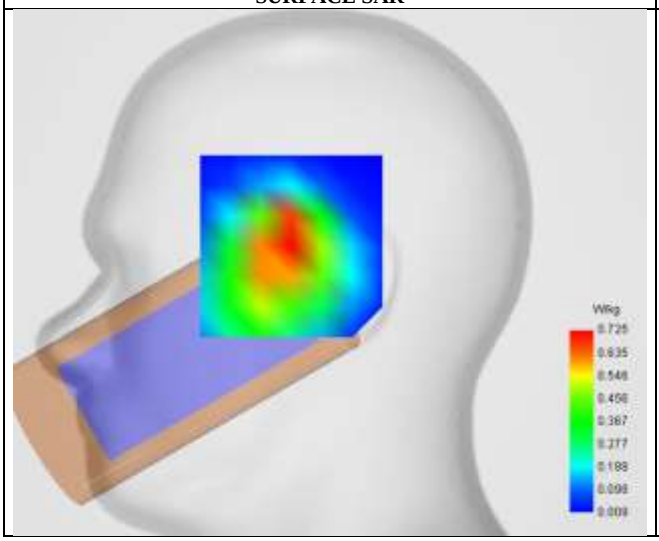
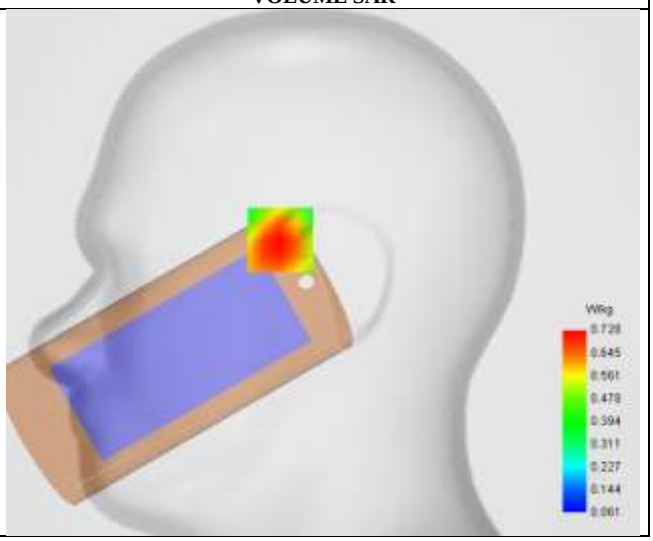
A. Experimental conditions.

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 5
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	844.000000
Relative permitivity (real part)	41.200000
Conductivity (S/m)	0.881501

C. SAR Surface and Volume

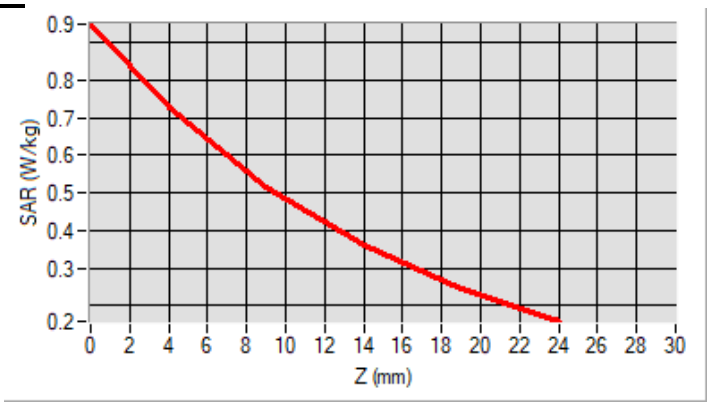
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-21.00, Y=16.00 ; SAR Peak: 0.95 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.472193
SAR 1g (W/Kg)	0.696727
Variation (%)	-1.300000

E. Z Axis Scan



SAR Measurement at LTE band 7 (Tilt, Right)

Date of measurement: 10/10/2022

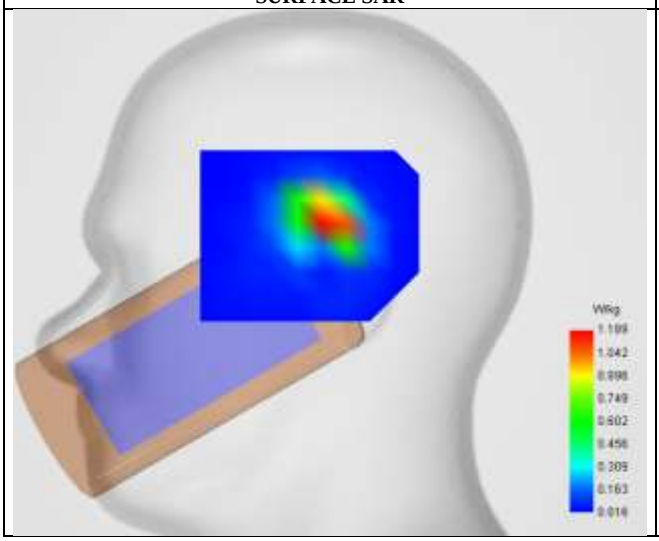
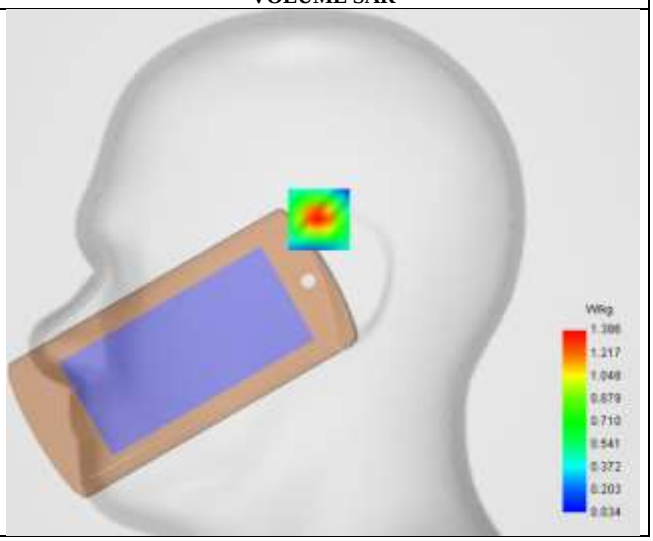
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Right head
Device Position	Tilt
Band	LTE band 7
Channels	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2510.000000
Relative permitivity (real part)	38.013428
Conductivity (S/m)	1.921786

C. SAR Surface and Volume

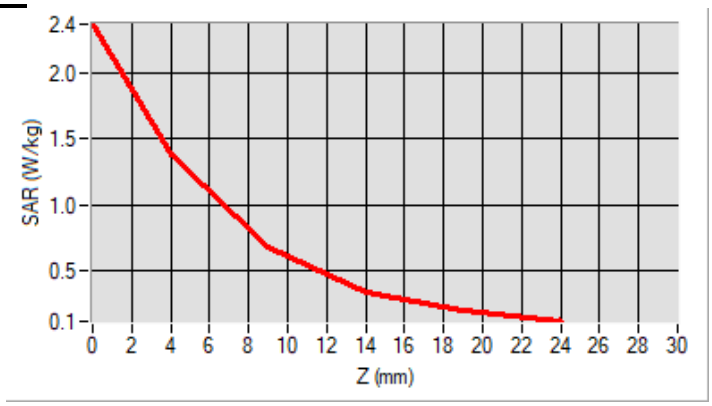
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-2.00, Y=26.00 ; SAR Peak: 2.37 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.577476
SAR 1g (W/Kg)	1.231658
Variation (%)	-4.270000

E. Z Axis Scan



SAR Measurement at LTE band 41 (Tilt, Right)

Date of measurement: 10/10/2022

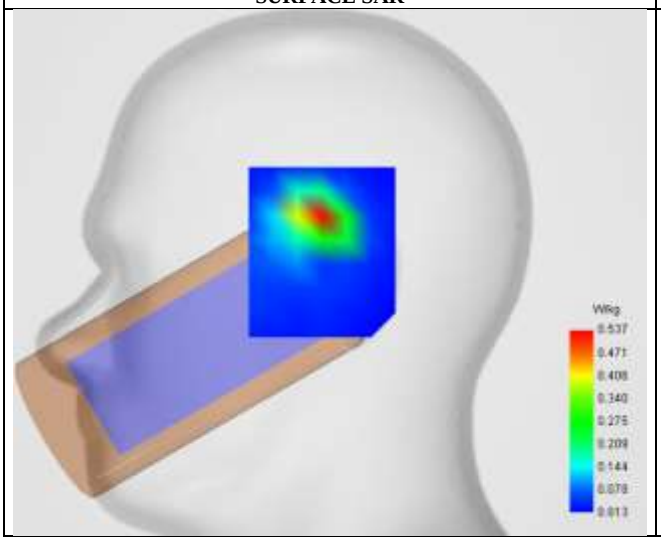
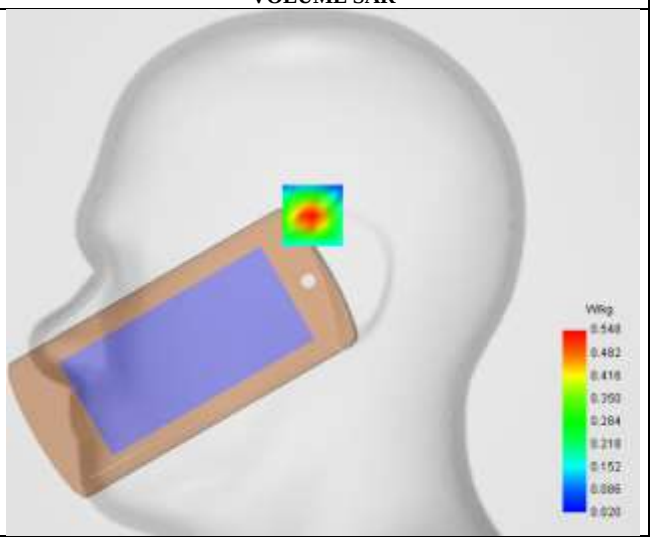
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Right head
Device Position	Tilt
Band	LTE band 41
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2595.000000
Relative permitivity (real part)	38.006648
Conductivity (S/m)	1.924660

C. SAR Surface and Volume

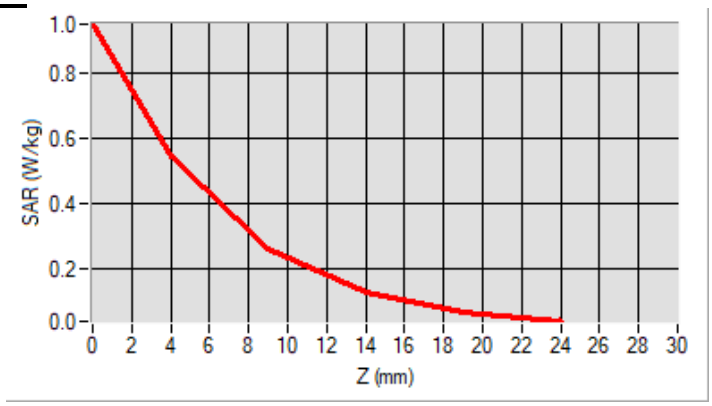
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-5.00, Y=28.00 ; SAR Peak: 0.96 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.229200
SAR 1g (W/Kg)	0.488630
Variation (%)	-1.720000

E. Z Axis Scan



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

Date of measurement: 10/10/2022

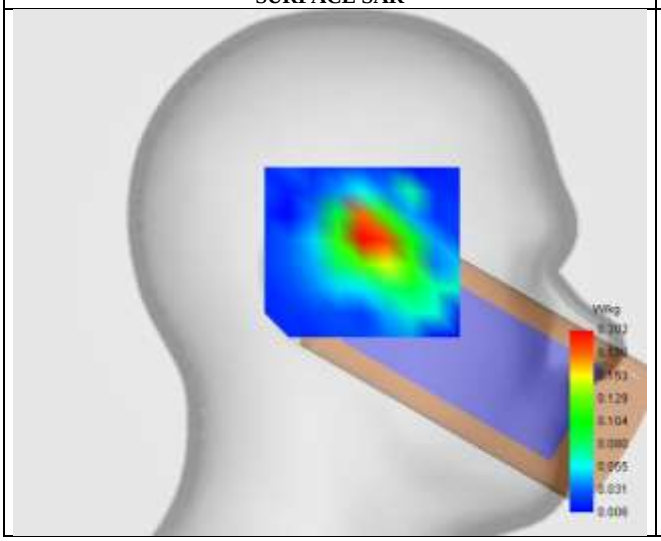
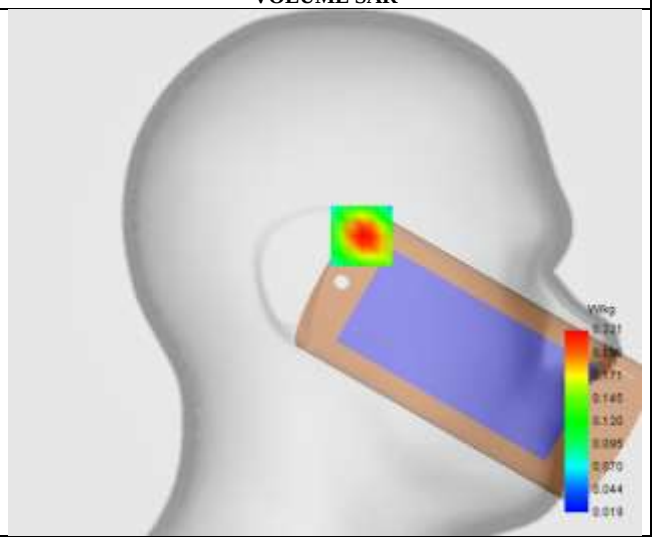
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.46
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Left head
Device Position	Cheek
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2412.000000
Relative permitivity (real part)	38.233000
Conductivity (S/m)	1.744028

C. SAR Surface and Volume

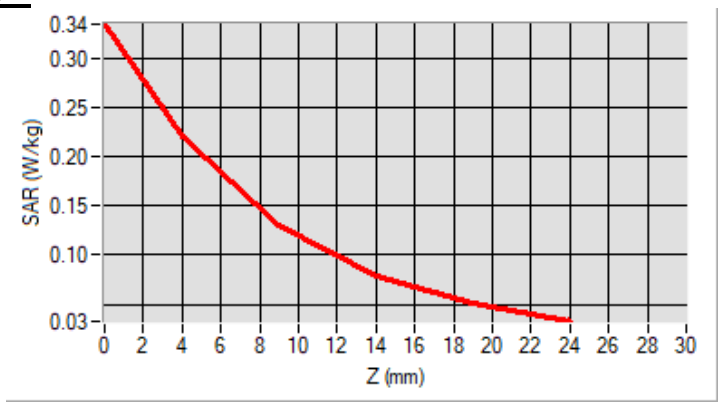
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-18.00, Y=18.00 ; SAR Peak: 0.34 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.115427
SAR 1g (W/Kg)	0.203636
Variation (%)	-2.420000

E. Z Axis Scan



SAR Measurement at CUSTOM (5.2GHz_802.11a) (Tilt, Left)

Date of measurement: 13/10/2022

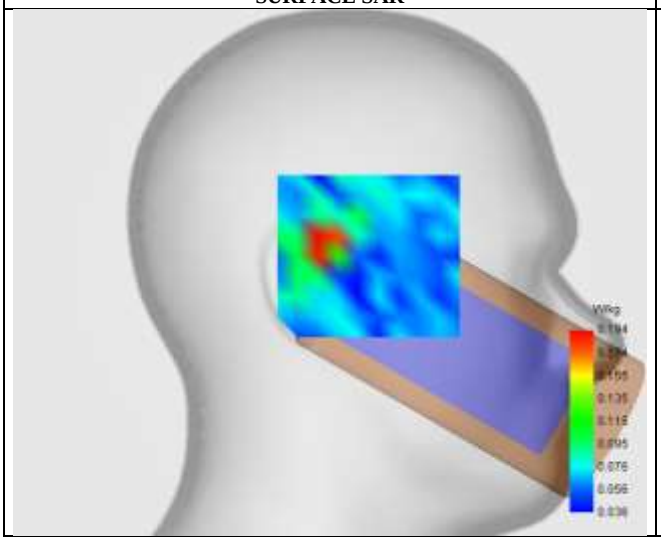
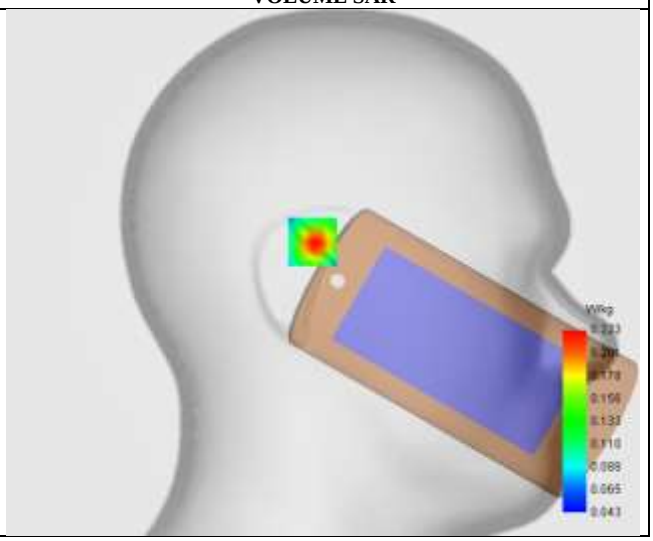
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.71
Area Scan	dx=10mm dy=10mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Left head
Device Position	Tilt
Band	IEEE802.a
Channels	High
Signal	IEEE802.a (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	5240.000000
Relative permitivity (real part)	35.959999
Conductivity (S/m)	4.601564

C. SAR Surface and Volume

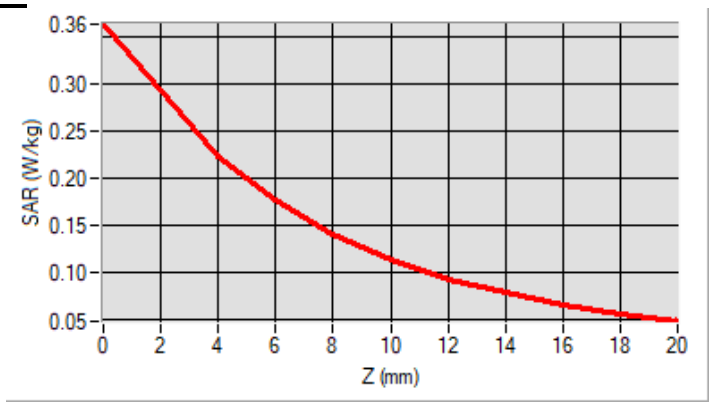
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=15.00 ; SAR Peak: 0.37 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.108978
SAR 1g (W/Kg)	0.202804
Variation (%)	-0.430000

E. Z Axis Scan



SAR Measurement at CUSTOM (5.8GHz_802.11a) (Tilt, Left)

Date of measurement: 13/10/2022

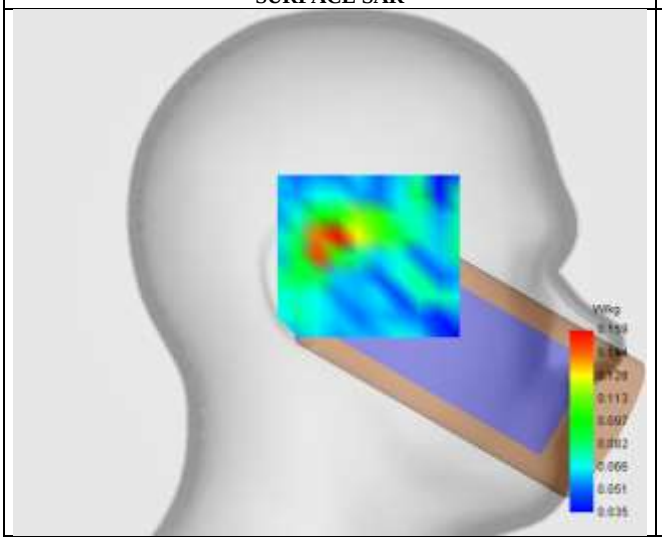
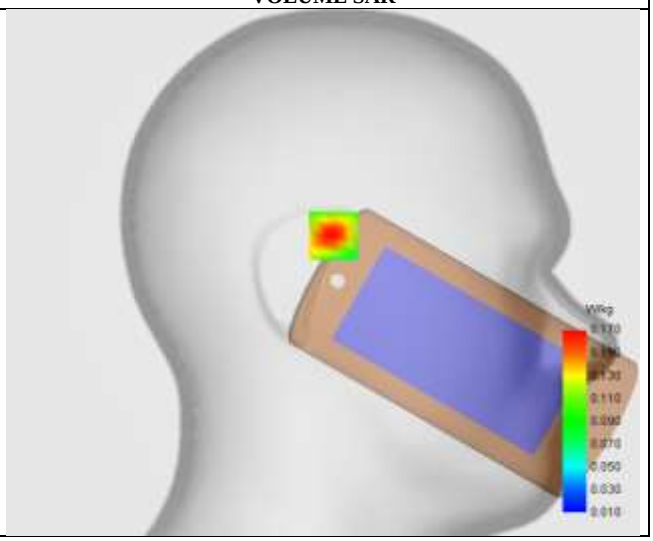
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.94
Area Scan	dx=10mm dy=10mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Left head
Device Position	Tilt
Band	IEEE802.a
Channels	High
Signal	IEEE802.a (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	5825.000000
Relative permitivity (real part)	35.106000
Conductivity (S/m)	5.196583

C. SAR Surface and Volume

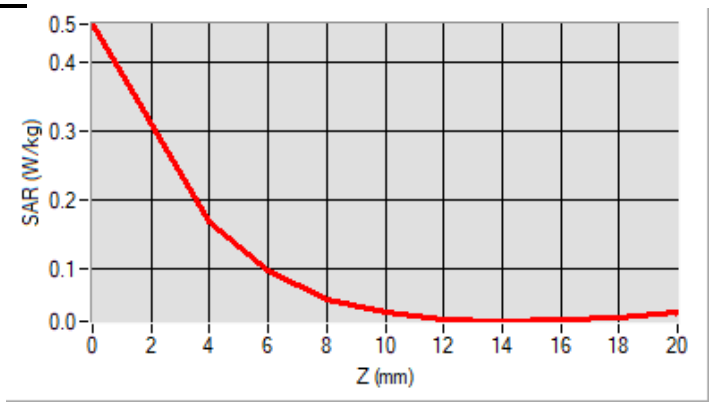
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-5.00, Y=18.00 ; SAR Peak: 0.47 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.088552
SAR 1g (W/Kg)	0.180976
Variation (%)	-2.690000

E. Z Axis Scan



SAR Measurement at Bluetooth (Cheek, Left)

Date of measurement: 10/10/2022

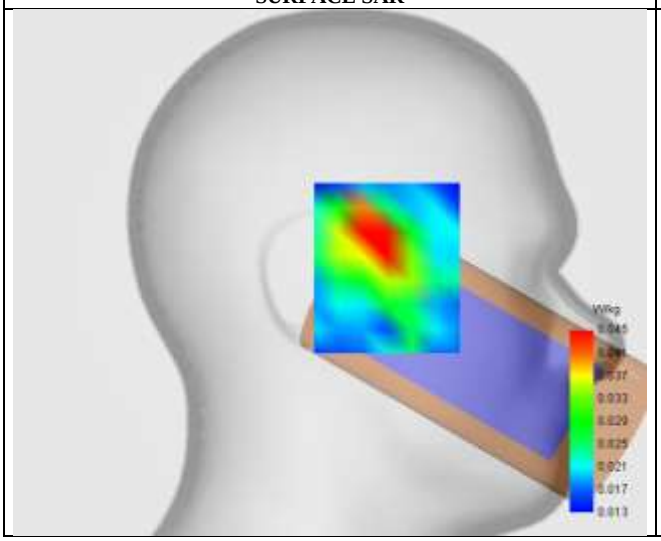
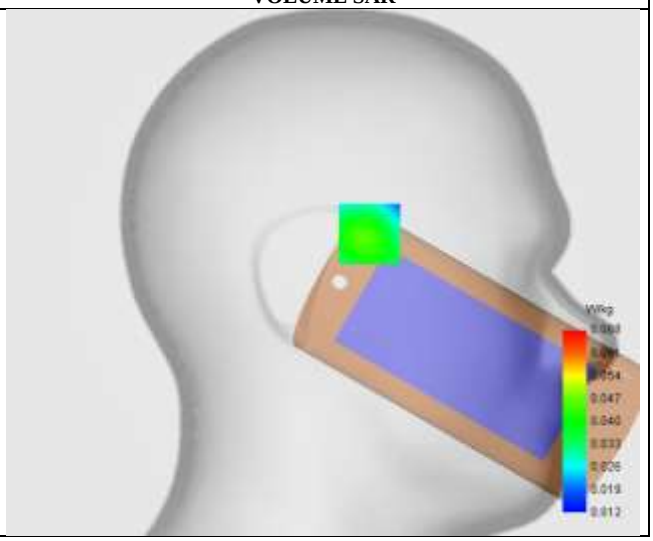
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.46
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Left head
Device Position	Cheek
Band	Bluetooth
Channels	Middle
Signal	Bluetooth (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2441.000000
Relative permitivity (real part)	38.237017
Conductivity (S/m)	1.750516

C. SAR Surface and Volume

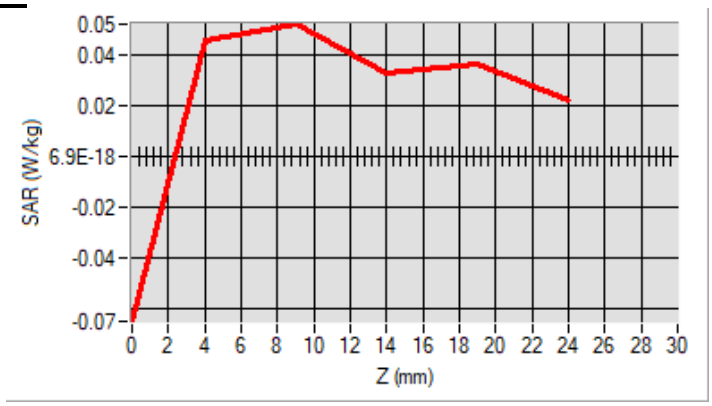
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-23.00, Y=19.00 ; SAR Peak: 0.06 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.041647
SAR 1g (W/Kg)	0.049783
Variation (%)	-0.850000

E. Z Axis Scan



SAR Measurement at CUSTOM (GPRS8502Txslot) (Body, Validation Plane)

Date of measurement: 29/9/2022

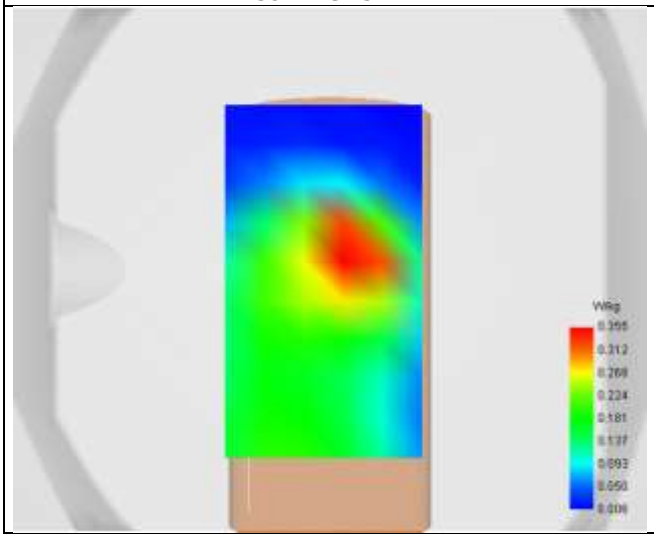
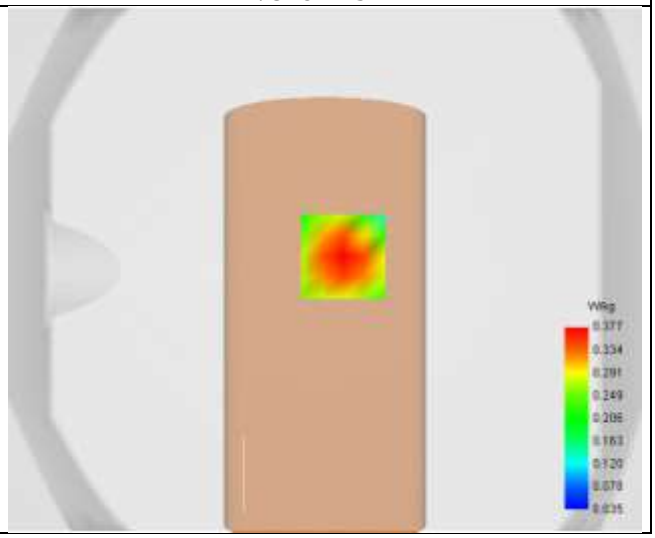
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.70
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	Middle
Signal	TDMA (Crest factor: 4.0)

B. Permitivity

Frequency (MHz)	836.599976
Relative permitivity (real part)	40.580000
Conductivity (S/m)	0.873457

C. SAR Surface and Volume

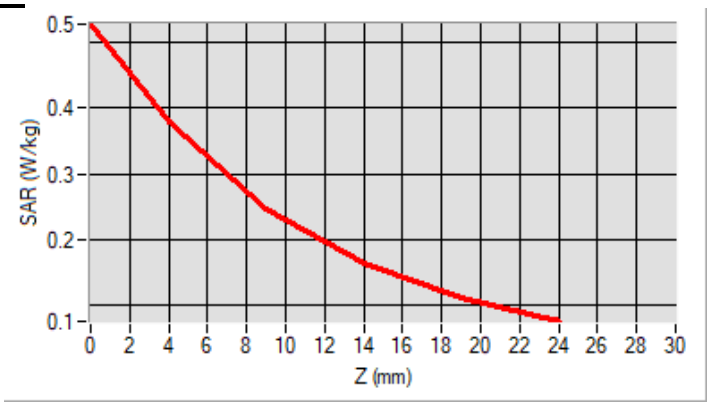
SURFACE SAR	VOLUME SAR
	

Maximum location: X=7.00, Y=5.00 ; SAR Peak: 0.53 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.229037
SAR 1g (W/Kg)	0.364595
Variation (%)	-2.410000

E. Z Axis Scan



SAR Measurement at CUSTOM (GPRS19002TXslot) (Body, Validation Plane)

Date of measurement: 9/10/2022

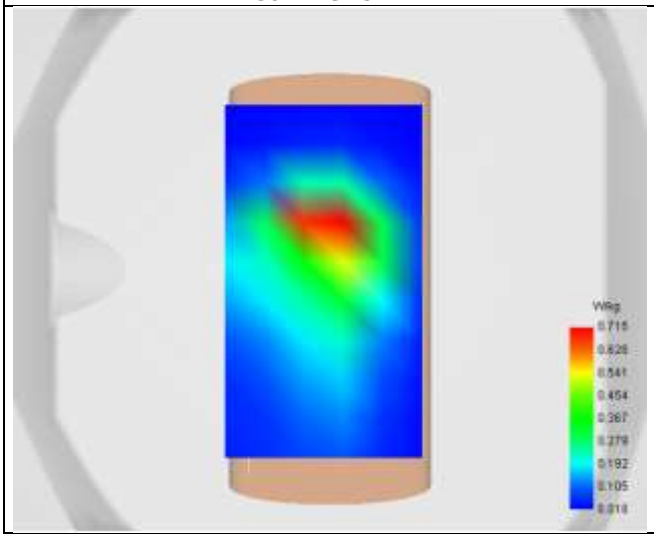
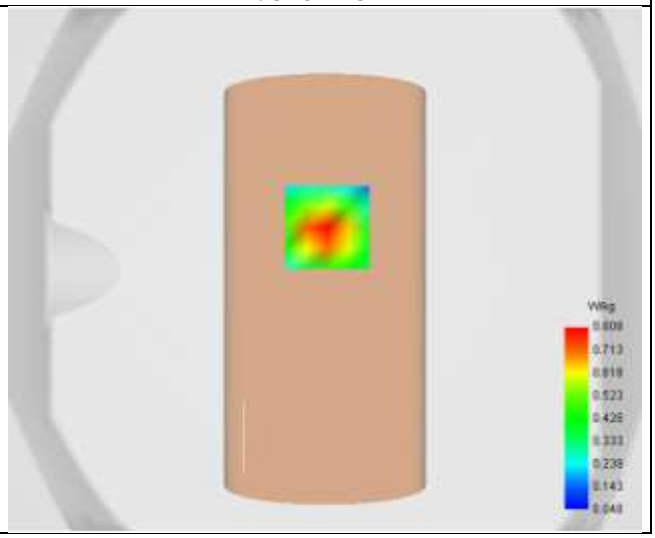
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	GSM 1900
Channels	High
Signal	TDMA (Crest factor: 4.0)

B. Permitivity

Frequency (MHz)	1909.800049
Relative permitivity (real part)	40.110000
Conductivity (S/m)	1.401223

C. SAR Surface and Volume

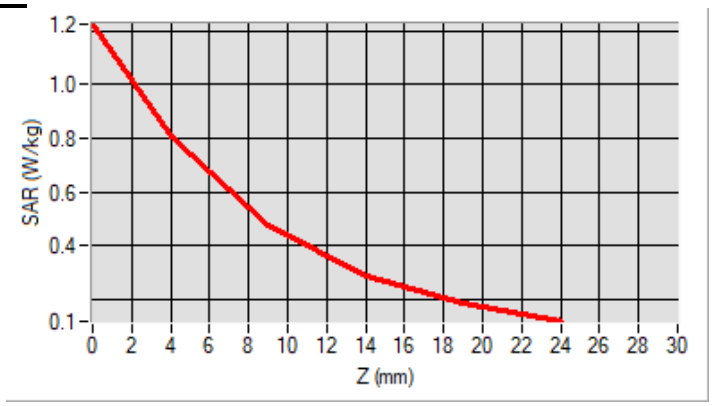
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=16.00 ; SAR Peak: 1.01 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.342264
SAR 1g (W/Kg)	0.613334
Variation (%)	-2.220000

E. Z Axis Scan



SAR Measurement at Band2_WCDMA1900 (Body, Validation Plane)

Date of measurement: 9/10/2022

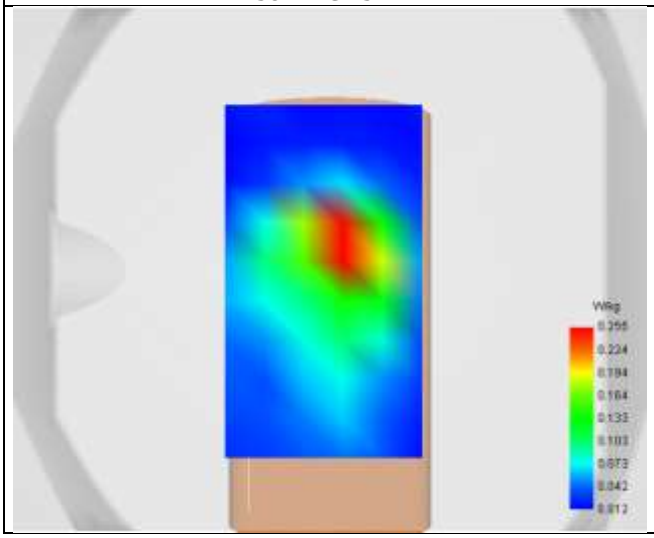
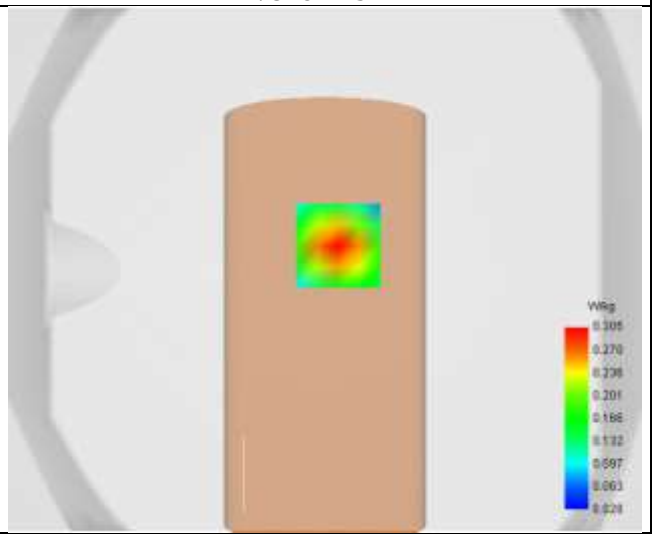
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
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	Middle
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1880.000000
Relative permitivity (real part)	40.002780
Conductivity (S/m)	1.400741

C. SAR Surface and Volume

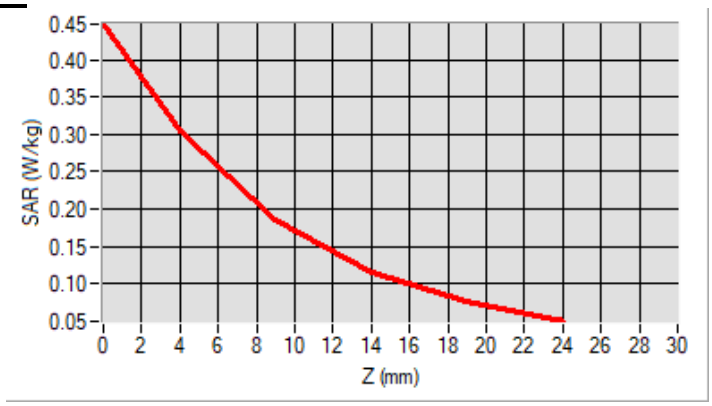
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=9.00 ; SAR Peak: 0.45 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.162187
SAR 1g (W/Kg)	0.283235
Variation (%)	-2.390000

E. Z Axis Scan



SAR Measurement at CUSTOM (WCDMA_1700) (Body, Validation Plane)

Date of measurement: 9/10/2022

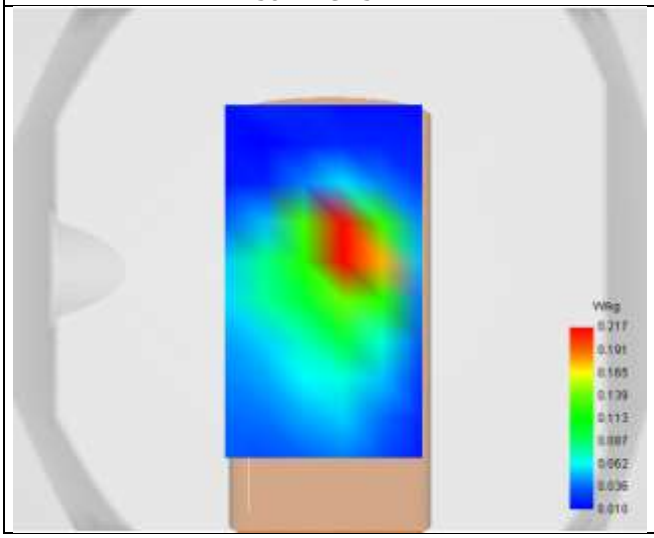
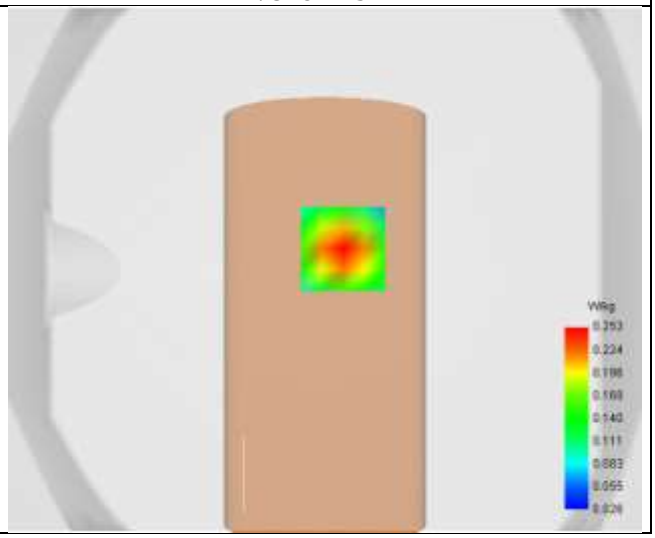
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.05
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)	1732.599976
Relative permitivity (real part)	39.815844
Conductivity (S/m)	1.336514

C. SAR Surface and Volume

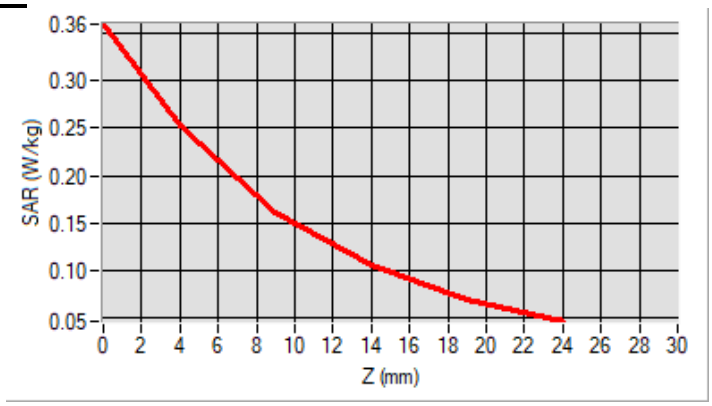
SURFACE SAR	VOLUME SAR
	

Maximum location: X=7.00, Y=8.00 ; SAR Peak: 0.30 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.118080
SAR 1g (W/Kg)	0.197833
Variation (%)	-0.510000

E. Z Axis Scan



SAR Measurement at Band5_WCDMA850 (Body, Validation Plane)

Date of measurement: 29/9/2022

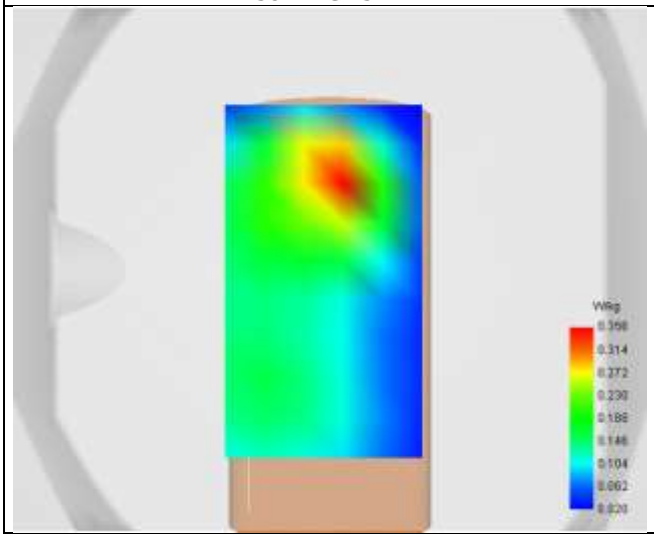
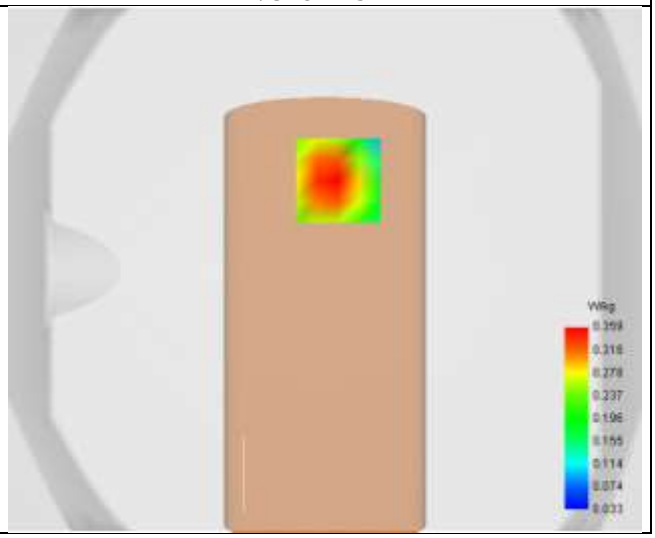
A. Experimental conditions.

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	Band5_WCDMA850
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	836.599976
Relative permitivity (real part)	41.160000
Conductivity (S/m)	0.882445

C. SAR Surface and Volume

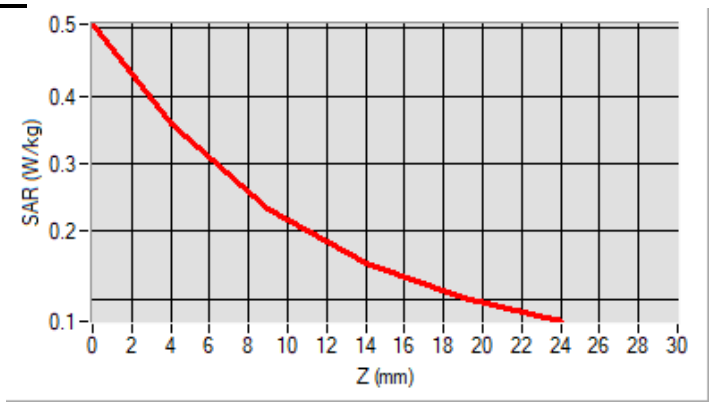
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=34.00 ; SAR Peak: 0.51 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.211947
SAR 1g (W/Kg)	0.342335
Variation (%)	-1.940000

E. Z Axis Scan



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

Date of measurement: 9/10/2022

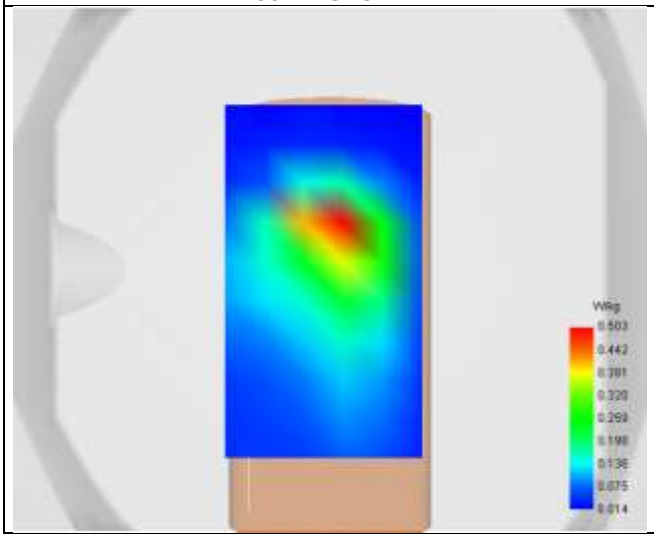
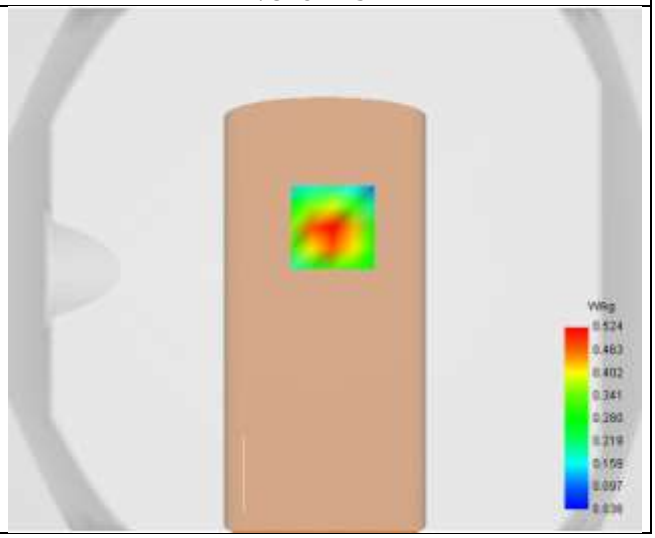
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
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	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1880.000000
Relative permitivity (real part)	38.936108
Conductivity (S/m)	1.333565

C. SAR Surface and Volume

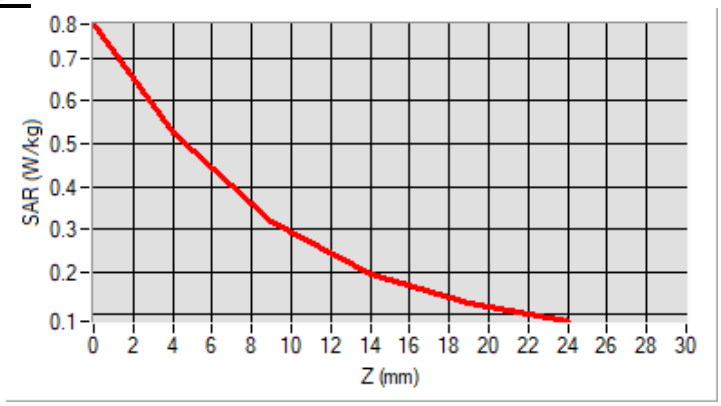
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=16.00 ; SAR Peak: 0.79 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.278477
SAR 1g (W/Kg)	0.492607
Variation (%)	-3.460000

E. Z Axis Scan



SAR Measurement at CUSTOM (LTE_Band_4) (Body, Validation Plane)

Date of measurement: 9/10/2022

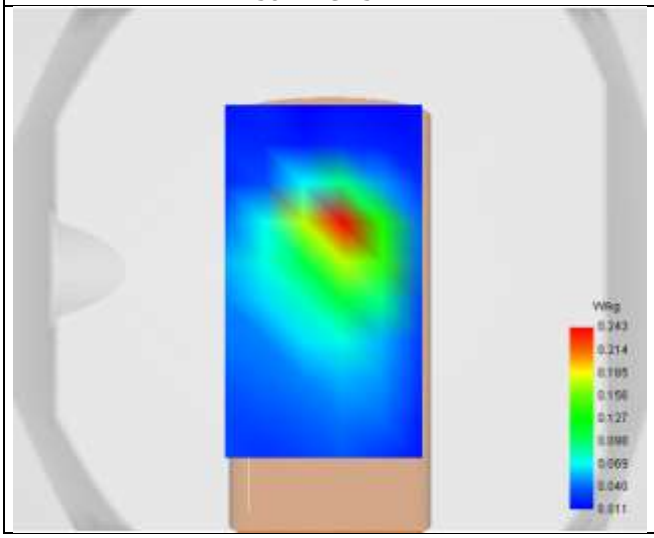
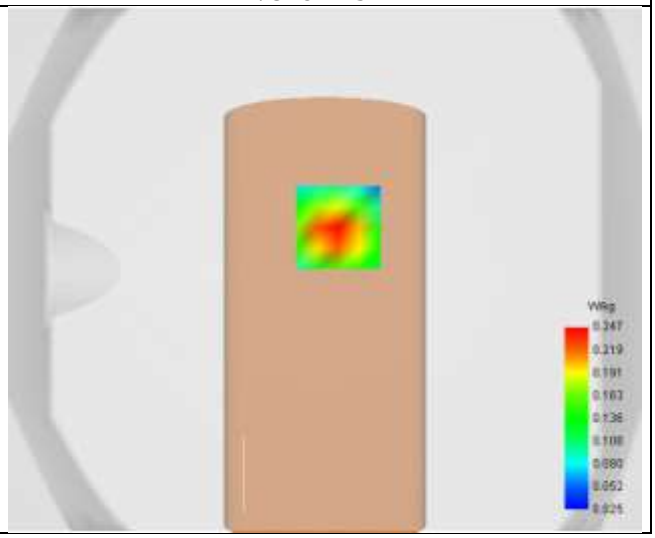
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.05
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)	39.215310
Conductivity (S/m)	1.331603

C. SAR Surface and Volume

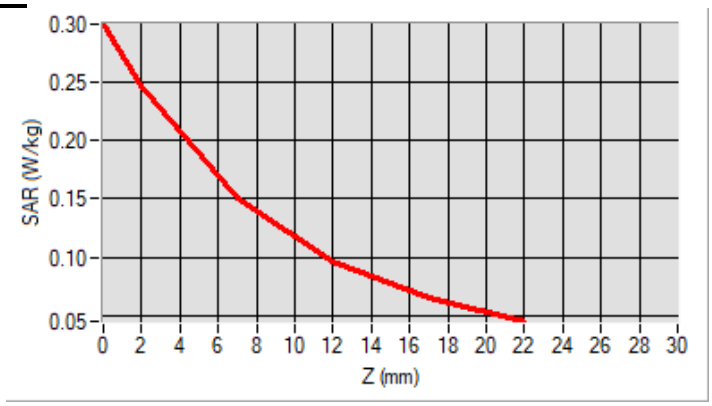
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=16.00 ; SAR Peak: 0.30 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.112852
SAR 1g (W/Kg)	0.191408
Variation (%)	-1.450000

E. Z Axis Scan



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

Date of measurement: 29/9/2022

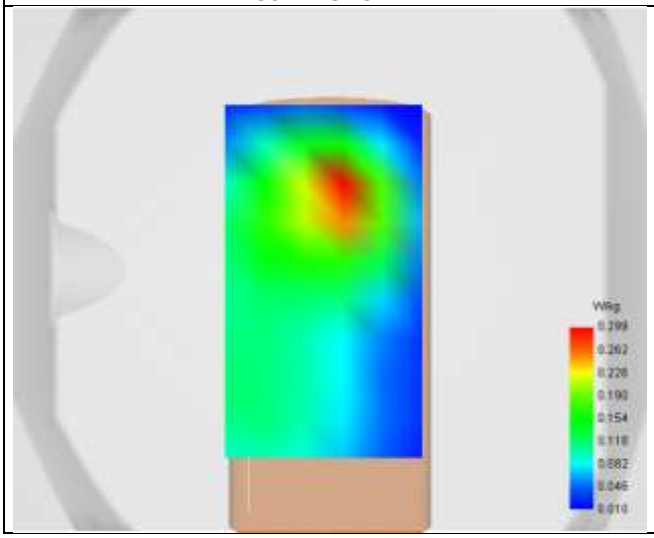
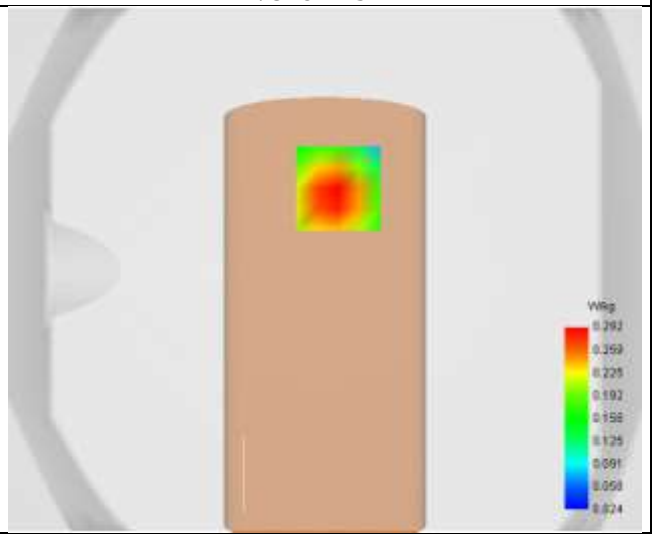
A. Experimental conditions.

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 5
Channels	High
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	844.000000
Relative permitivity (real part)	41.200000
Conductivity (S/m)	0.881501

C. SAR Surface and Volume

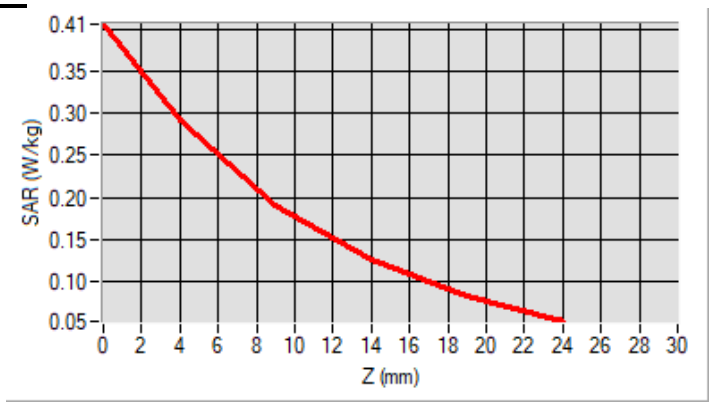
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=31.00 ; SAR Peak: 0.41 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.172877
SAR 1g (W/Kg)	0.279076
Variation (%)	-0.290000

E. Z Axis Scan



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

Date of measurement: 10/10/2022

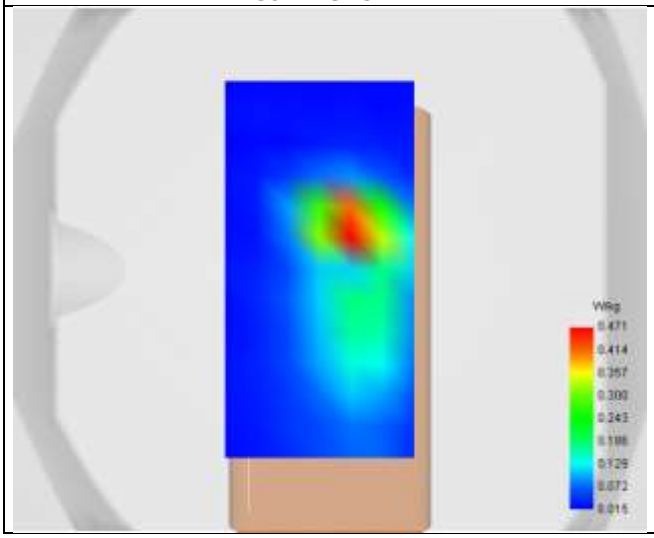
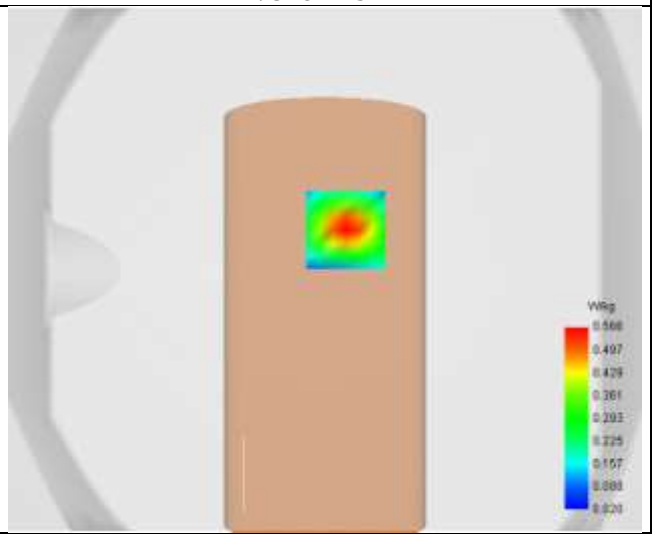
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
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	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2535.000000
Relative permitivity (real part)	38.062279
Conductivity (S/m)	1.919052

C. SAR Surface and Volume

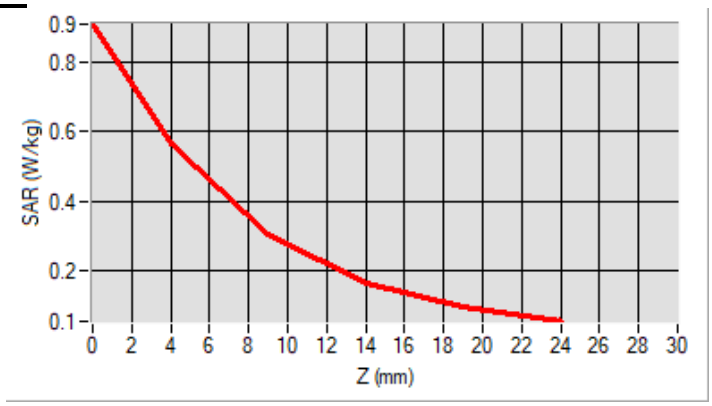
SURFACE SAR	VOLUME SAR
	

Maximum location: X=8.00, Y=15.00 ; SAR Peak: 0.91 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.249212
SAR 1g (W/Kg)	0.506740
Variation (%)	3.330000

E. Z Axis Scan



SAR Measurement at LTE band 41 (Body, Validation Plane)

Date of measurement: 10/10/2022

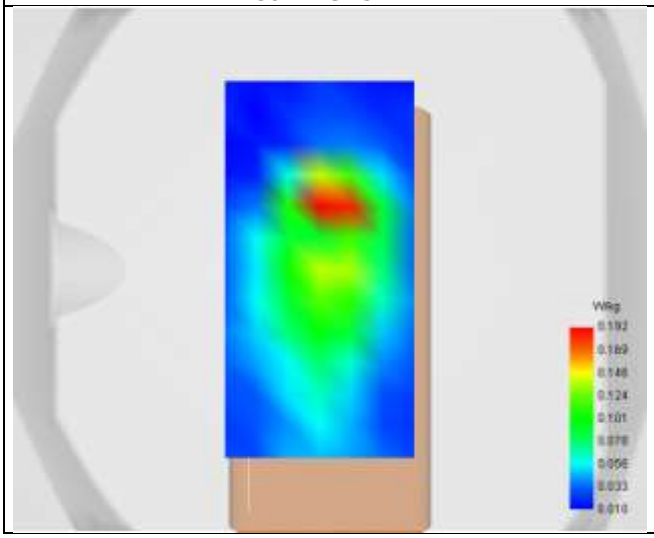
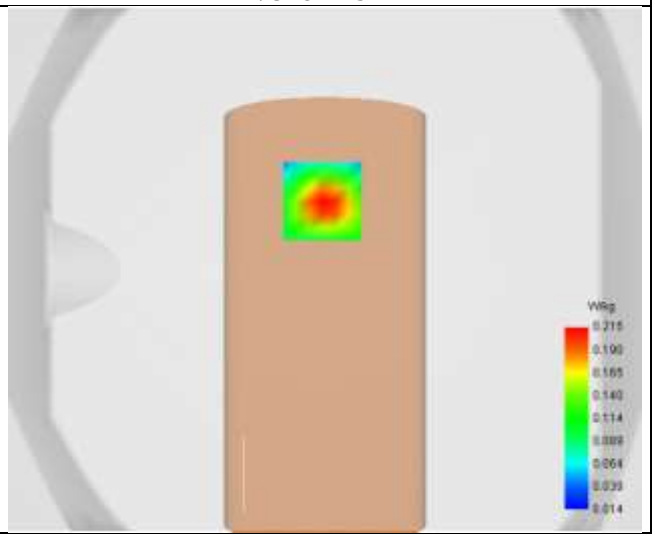
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
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 41
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2595.000000
Relative permitivity (real part)	38.006648
Conductivity (S/m)	1.924660

C. SAR Surface and Volume

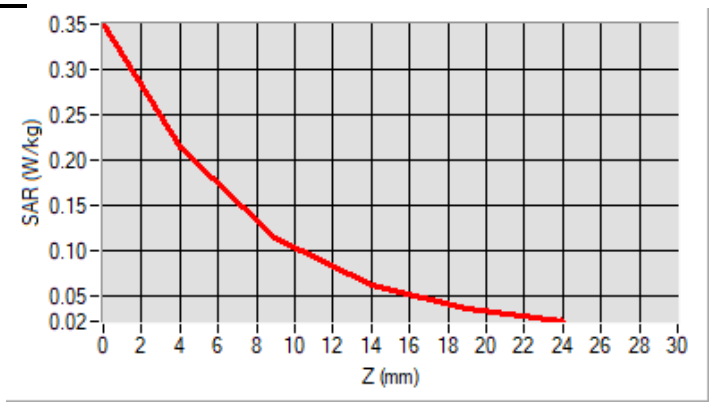
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-1.00, Y=26.00 ; SAR Peak: 0.35 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.102928
SAR 1g (W/Kg)	0.196163
Variation (%)	-3.580000

E. Z Axis Scan



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

Date of measurement: 10/10/2022

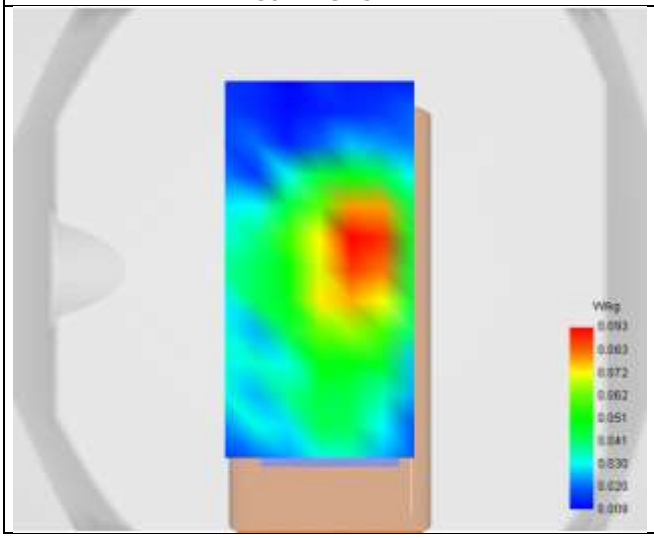
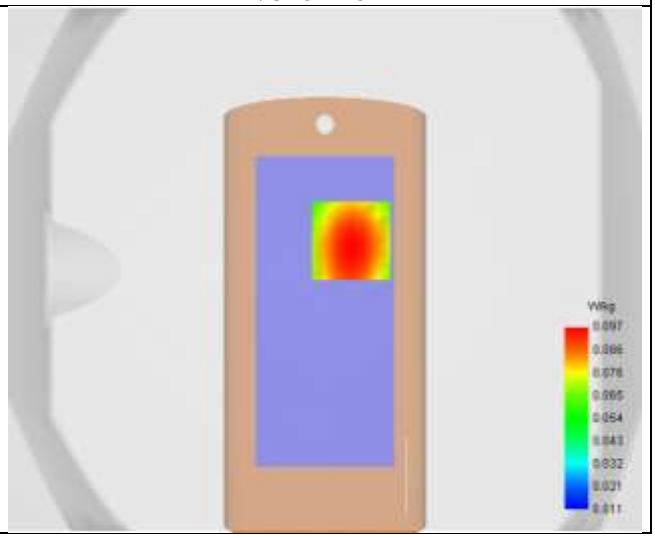
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.46
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	Low
Signal	IEEE802.b (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2412.000000
Relative permitivity (real part)	38.233000
Conductivity (S/m)	1.744028

C. SAR Surface and Volume

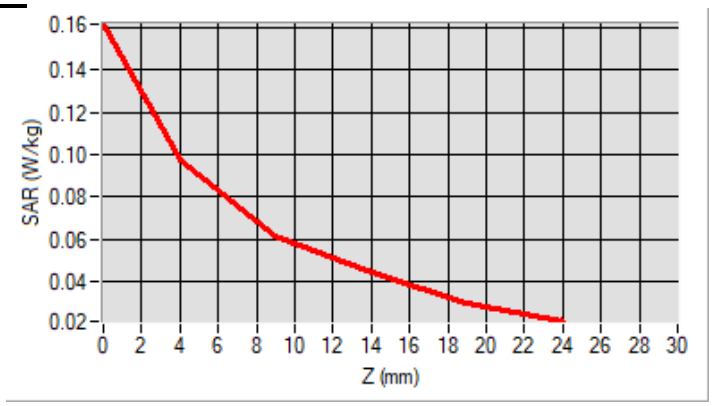
SURFACE SAR	VOLUME SAR
	

Maximum location: X=10.00, Y=11.00 ; SAR Peak: 0.13 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.060073
SAR 1g (W/Kg)	0.092511
Variation (%)	0.450000

E. Z Axis Scan



SAR Measurement at CUSTOM (5.2GHz_802.11a) (Body, Validation Plane)

Date of measurement: 13/10/2022

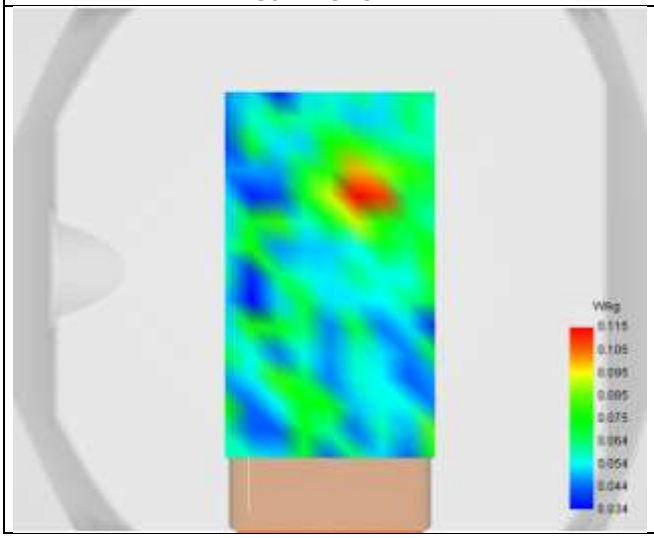
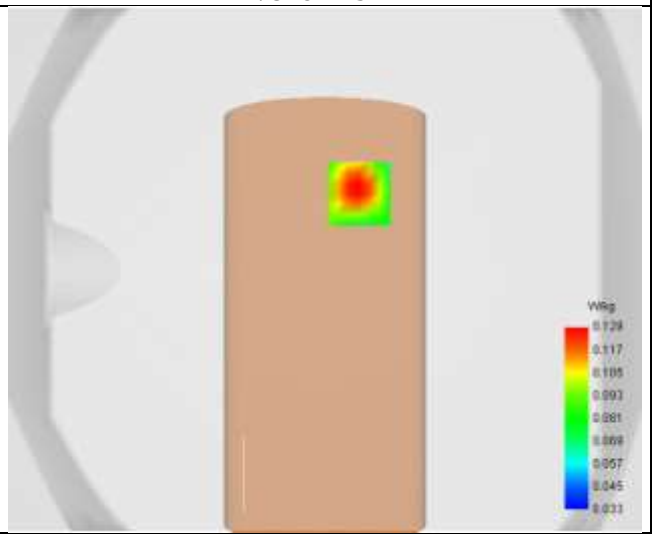
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.71
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE802.a
Channels	High
Signal	IEEE802.a (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	5240.000000
Relative permitivity (real part)	35.959999
Conductivity (S/m)	4.601564

C. SAR Surface and Volume

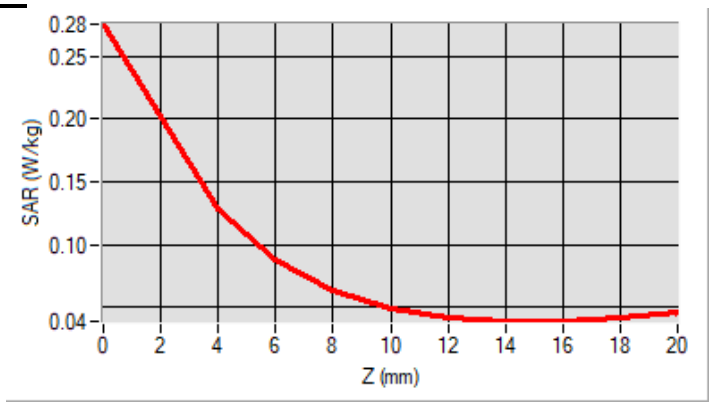
SURFACE SAR	VOLUME SAR
	

Maximum location: X=13.00, Y=29.00 ; SAR Peak: 0.20 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.063621
SAR 1g (W/Kg)	0.097958
Variation (%)	-0.590000

E. Z Axis Scan



SAR Measurement at CUSTOM (5.8GHz_802.11a) (Body, Validation Plane)

Date of measurement: 13/10/2022

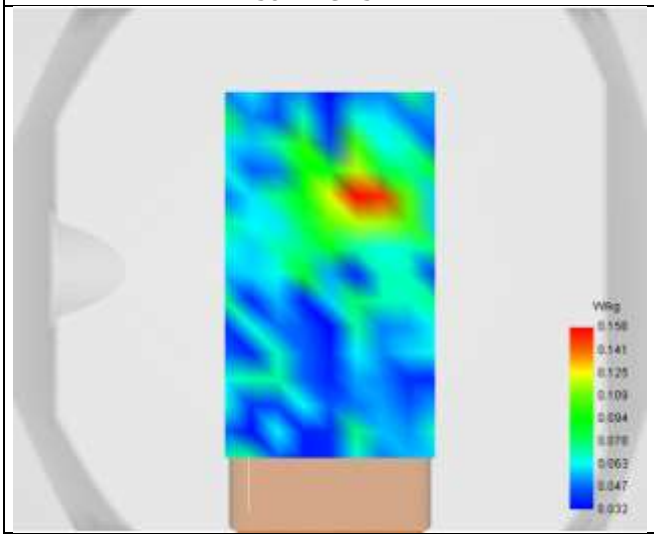
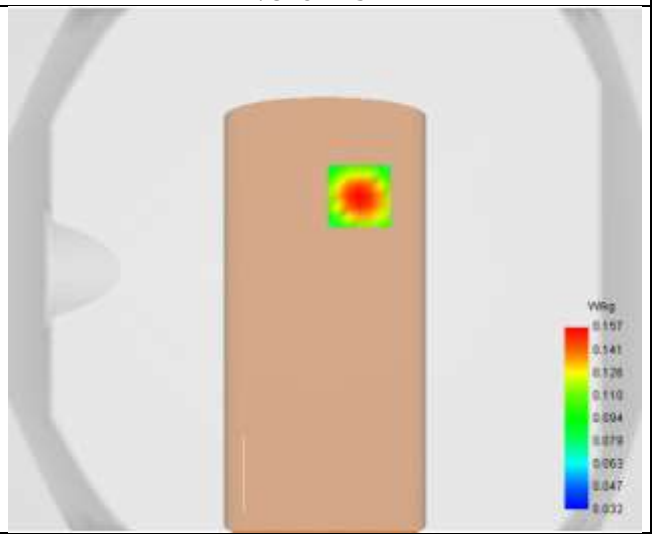
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.94
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE802.a
Channels	High
Signal	IEEE802.a (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	5825.000000
Relative permitivity (real part)	35.106000
Conductivity (S/m)	5.196583

C. SAR Surface and Volume

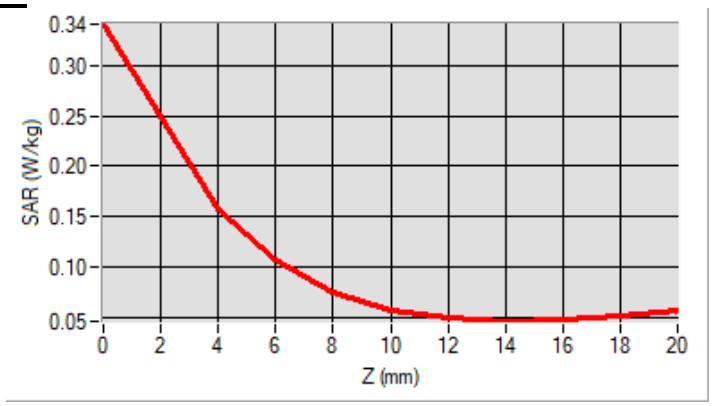
SURFACE SAR	VOLUME SAR
	

Maximum location: X=13.00, Y=28.00 ; SAR Peak: 0.24 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.073442
SAR 1g (W/Kg)	0.109197
Variation (%)	-0.440000

E. Z Axis Scan



SAR Measurement at Bluetooth (Body, Validation Plane)

Date of measurement: 10/10/2022

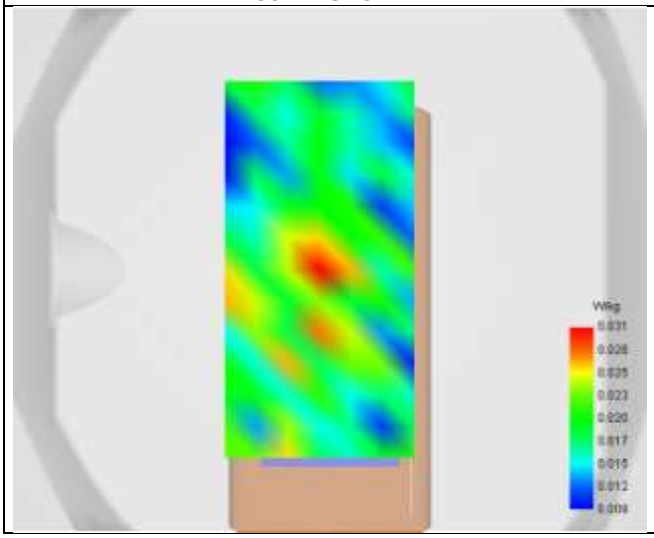
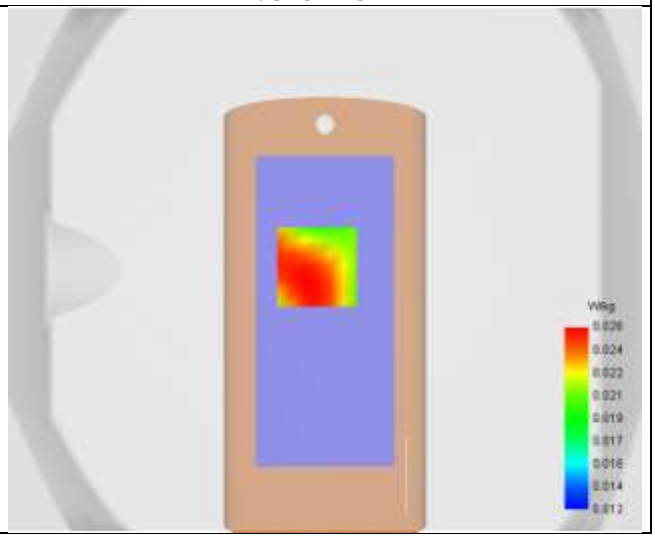
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.46
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	Bluetooth
Channels	Middle
Signal	Bluetooth (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2441.000000
Relative permitivity (real part)	38.237017
Conductivity (S/m)	1.750516

C. SAR Surface and Volume

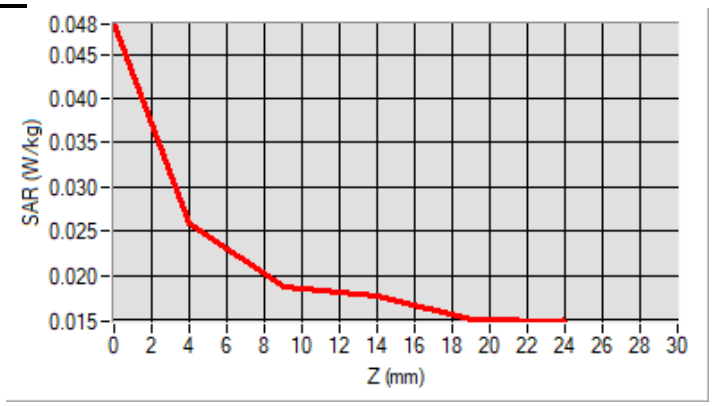
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-3.00, Y=1.00 ; SAR Peak: 0.03 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.020660
SAR 1g (W/Kg)	0.025688
Variation (%)	-5.000000

E. Z Axis Scan



SAR Measurement at CUSTOM (GPRS19002TXslot) (Body, Validation Plane)

Date of measurement: 9/10/2022

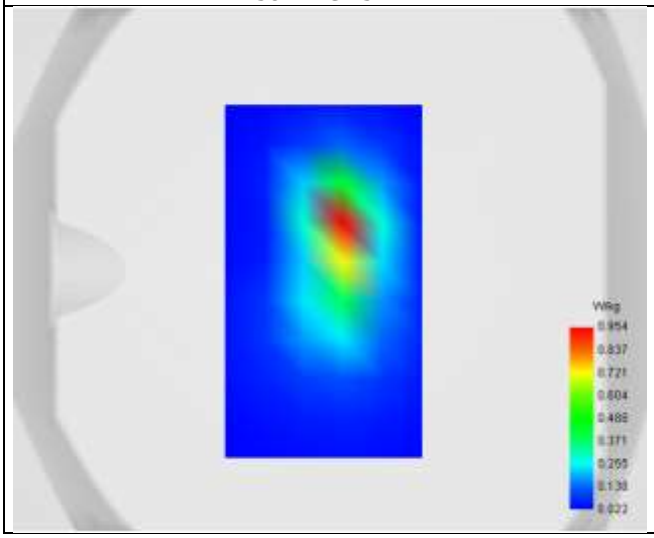
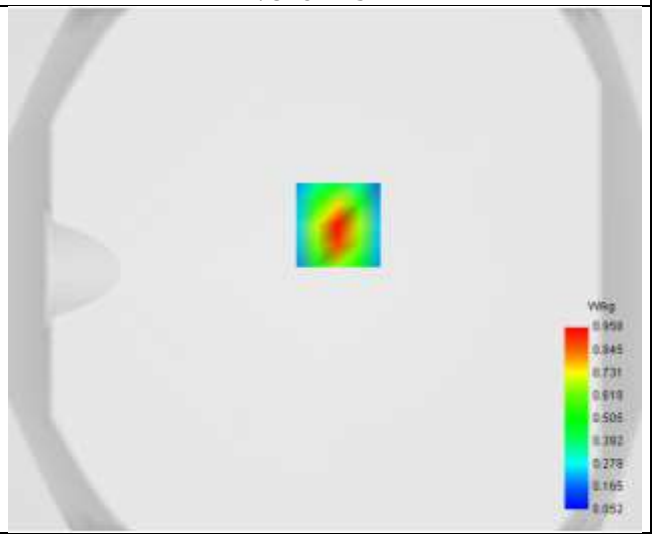
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	GSM 1900
Channels	High
Signal	TDMA (Crest factor: 4.0)

B. Permitivity

Frequency (MHz)	1909.800049
Relative permitivity (real part)	40.000000
Conductivity (S/m)	1.400023

C. SAR Surface and Volume

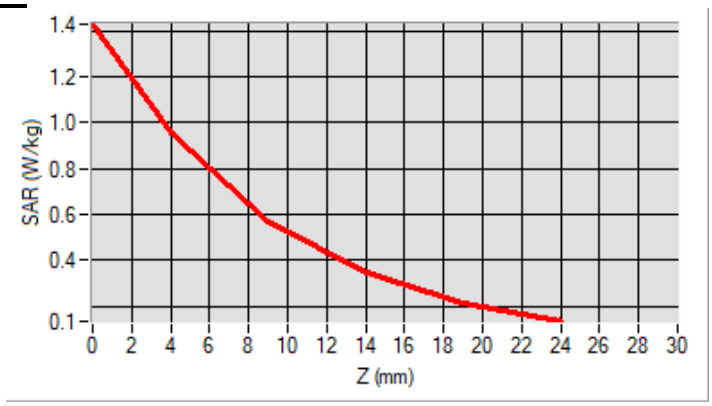
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=17.00 ; SAR Peak: 1.18 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.386189
SAR 1g (W/Kg)	0.719551
Variation (%)	-4.920000

E. Z Axis Scan



SAR Measurement at Band2_WCDMA1900 (Body, Validation Plane)

Date of measurement: 9/10/2022

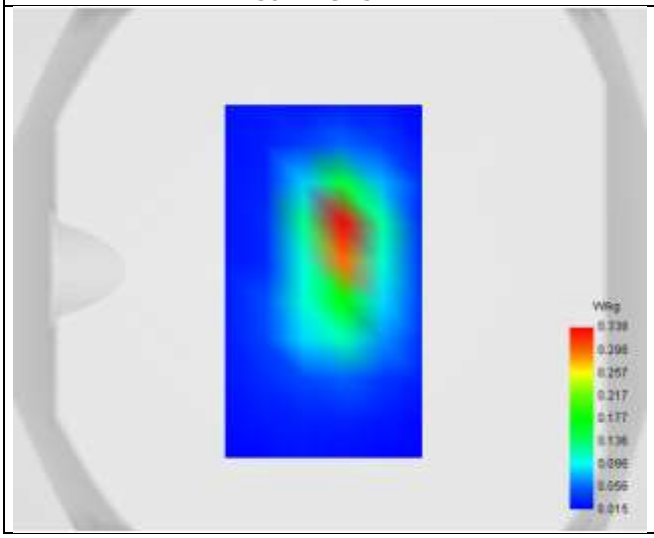
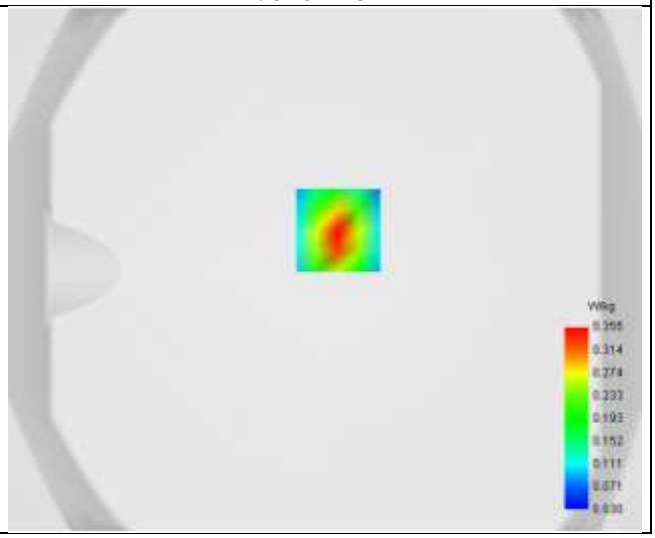
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
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	Middle
Signal	WCDMA (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1880.000000
Relative permitivity (real part)	40.002780
Conductivity (S/m)	1.400741

C. SAR Surface and Volume

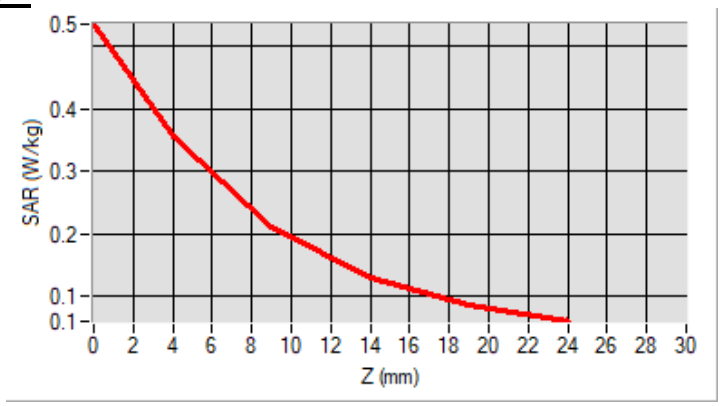
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=15.00 ; SAR Peak: 0.54 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.180846
SAR 1g (W/Kg)	0.328760
Variation (%)	-0.120000

E. Z Axis Scan



SAR Measurement at CUSTOM (WCDMA_1700) (Body, Validation Plane)

Date of measurement: 9/10/2022

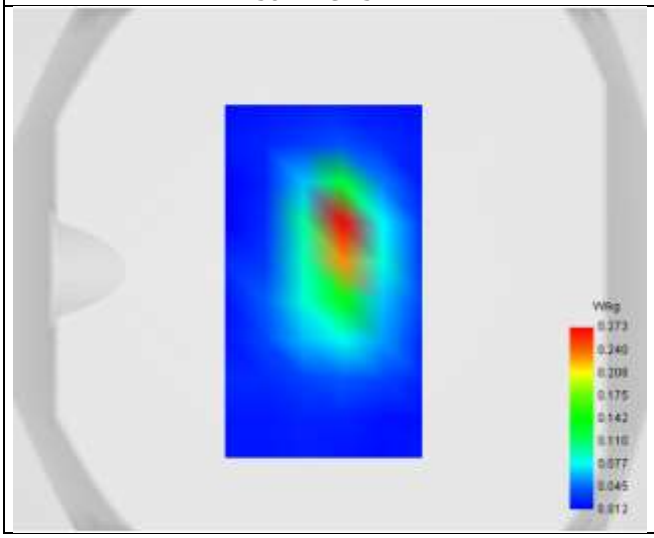
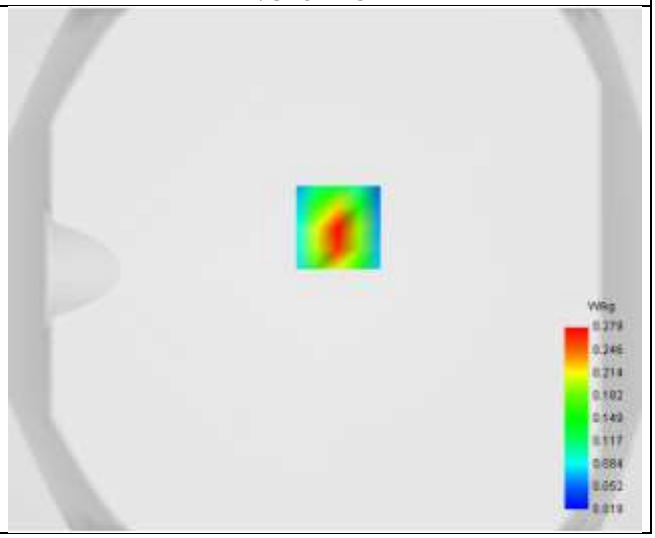
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.05
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)	1732.599976
Relative permitivity (real part)	39.815844
Conductivity (S/m)	1.336514

C. SAR Surface and Volume

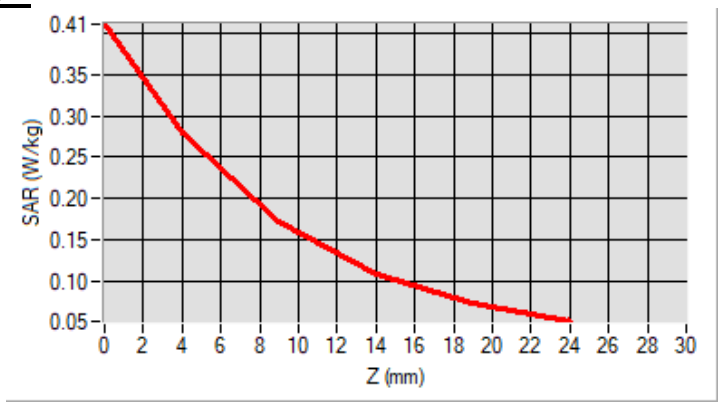
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=16.00 ; SAR Peak: 0.34 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.121249
SAR 1g (W/Kg)	0.213624
Variation (%)	0.030000

E. Z Axis Scan



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

Date of measurement: 9/10/2022

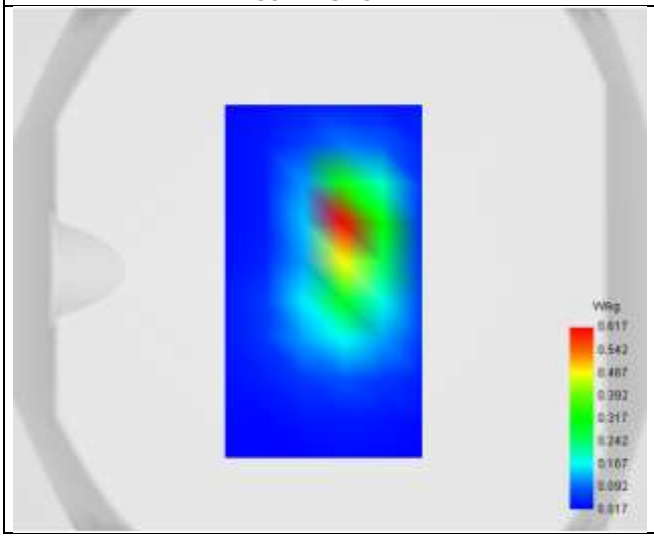
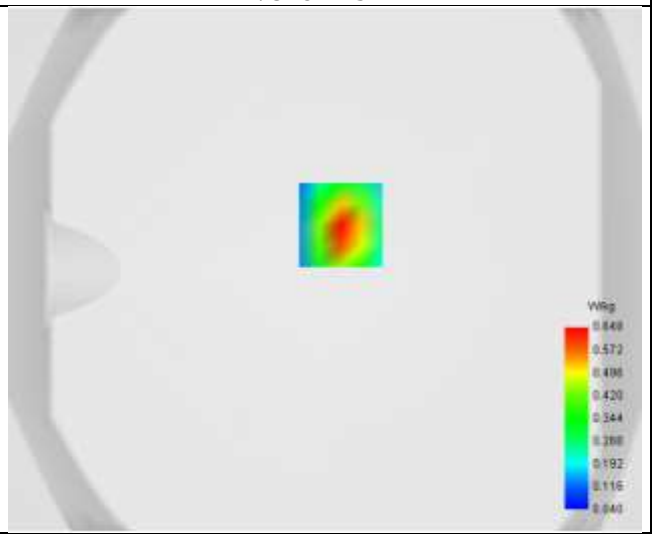
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.00
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	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	1880.000000
Relative permitivity (real part)	38.936108
Conductivity (S/m)	1.333565

C. SAR Surface and Volume

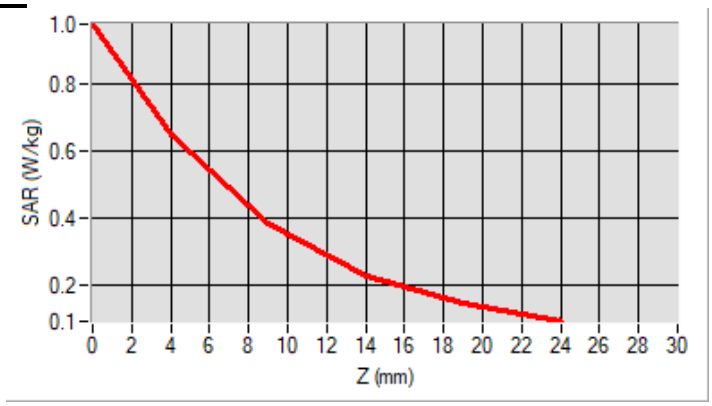
SURFACE SAR	VOLUME SAR
	

Maximum location: X=6.00, Y=17.00 ; SAR Peak: 0.99 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.323158
SAR 1g (W/Kg)	0.600909
Variation (%)	0.500000

E. Z Axis Scan



SAR Measurement at CUSTOM (LTE_Band_4) (Body, Validation Plane)

Date of measurement: 9/10/2022

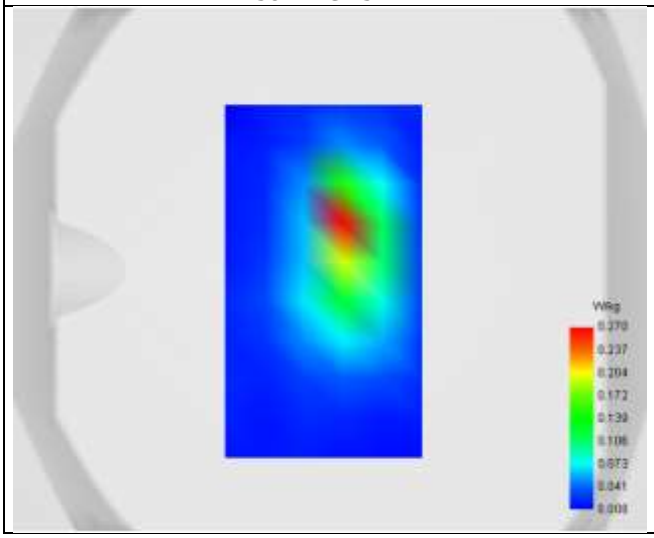
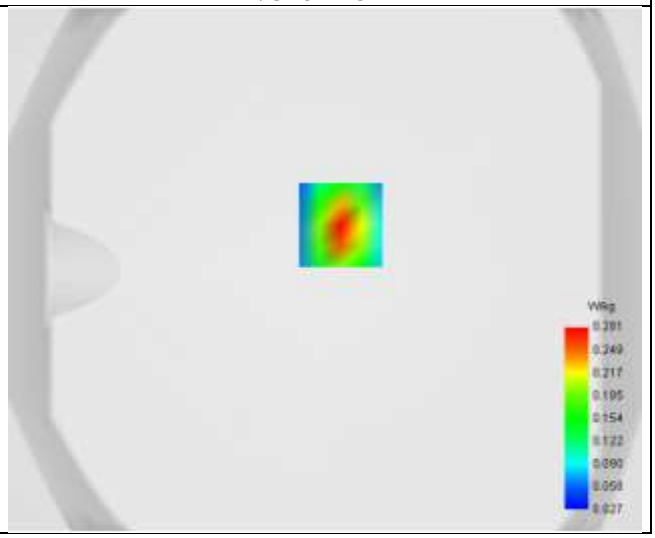
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.05
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)	39.215310
Conductivity (S/m)	1.331603

C. SAR Surface and Volume

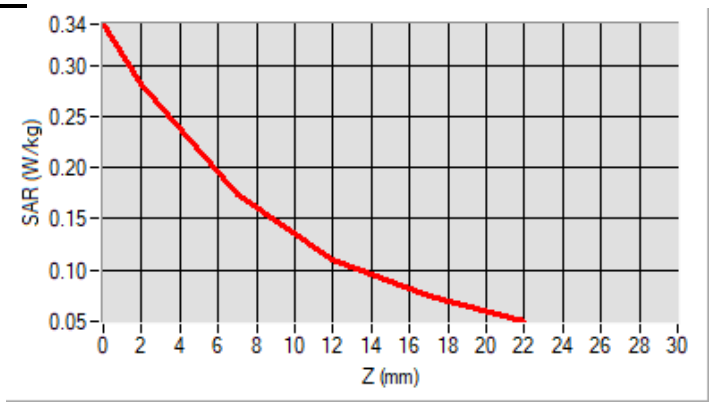
SURFACE SAR	VOLUME SAR
	

Maximum location: X=6.00, Y=17.00 ; SAR Peak: 0.34 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.121144
SAR 1g (W/Kg)	0.213938
Variation (%)	0.020000

E. Z Axis Scan



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

Date of measurement: 10/10/2022

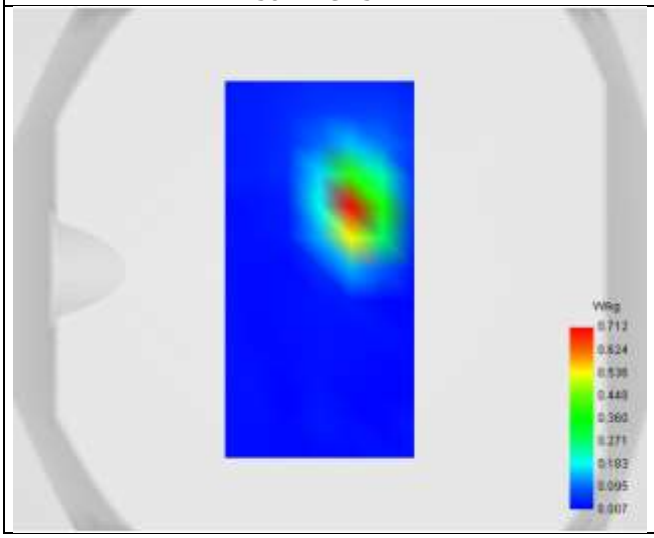
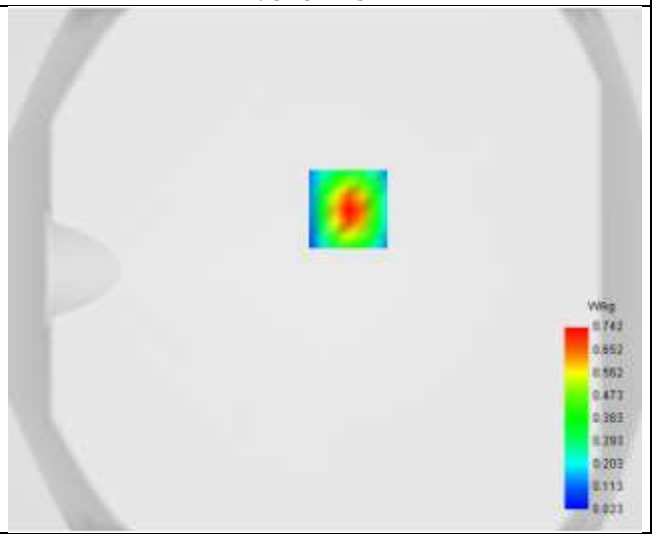
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
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	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2535.000000
Relative permitivity (real part)	38.062279
Conductivity (S/m)	1.919052

C. SAR Surface and Volume

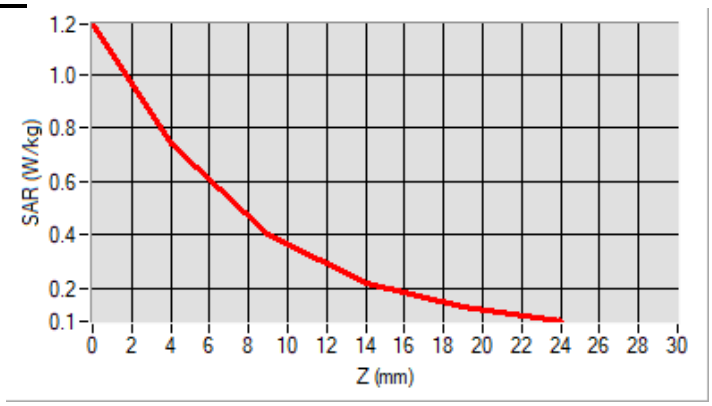
SURFACE SAR	VOLUME SAR
	

Maximum location: X=9.00, Y=23.00 ; SAR Peak: 1.19 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.320838
SAR 1g (W/Kg)	0.658195
Variation (%)	0.830000

E. Z Axis Scan



SAR Measurement at LTE band 41 (Body, Validation Plane)

Date of measurement: 10/10/2022

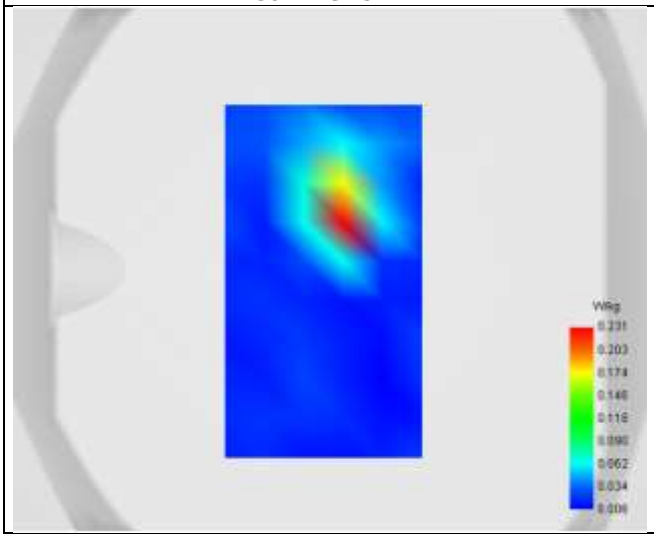
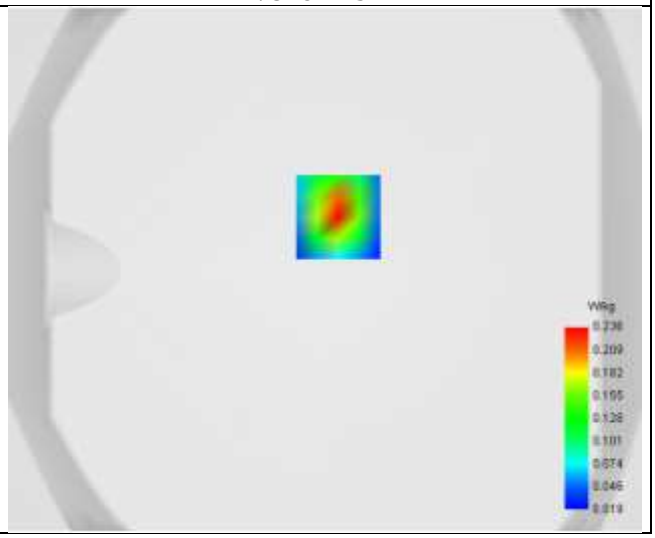
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=5mm dy=5mm dz=5mm,Complete
Phantom	Validation plane
Device Position	Body
Band	LTE band 41
Channels	Middle
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2595.000000
Relative permitivity (real part)	38.006648
Conductivity (S/m)	1.924660

C. SAR Surface and Volume

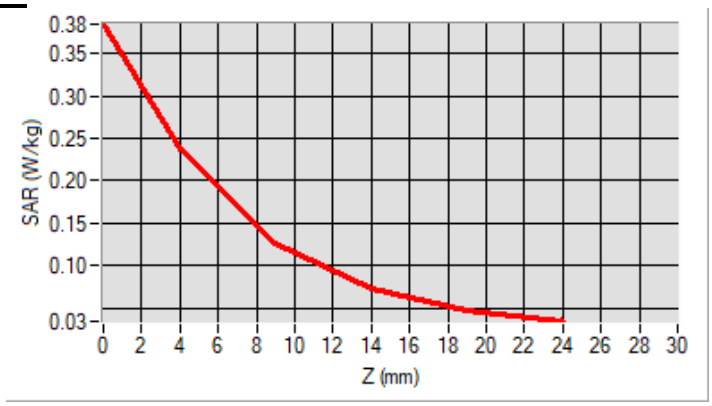
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=20.00 ; SAR Peak: 0.39 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.107448
SAR 1g (W/Kg)	0.216571
Variation (%)	-2.820000

E. Z Axis Scan



SAR Measurement at CUSTOM (5.2GHz_802.11a) (Body, Validation Plane)

Date of measurement: 13/10/2022

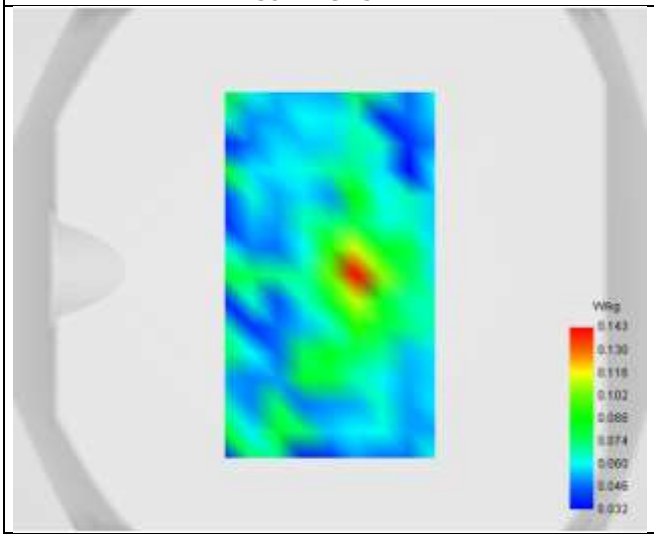
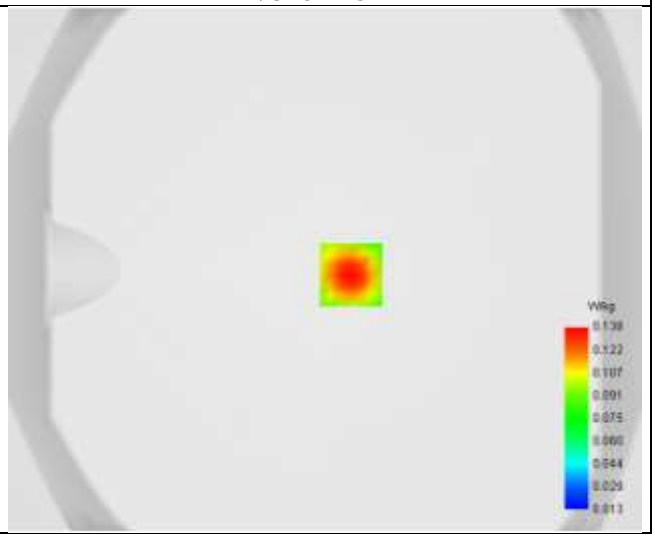
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.71
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE802.a
Channels	High
Signal	IEEE802.a (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	5240.000000
Relative permitivity (real part)	35.959999
Conductivity (S/m)	4.601564

C. SAR Surface and Volume

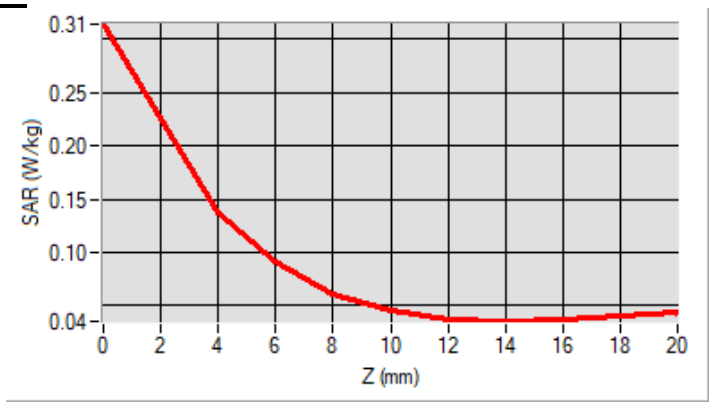
SURFACE SAR	VOLUME SAR
	

Maximum location: X=10.00, Y=-2.00 ; SAR Peak: 0.22 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.067655
SAR 1g (W/Kg)	0.104394
Variation (%)	0.180000

E. Z Axis Scan



SAR Measurement at CUSTOM (5.8GHz_802.11a) (Body, Validation Plane)

Date of measurement: 13/10/2022

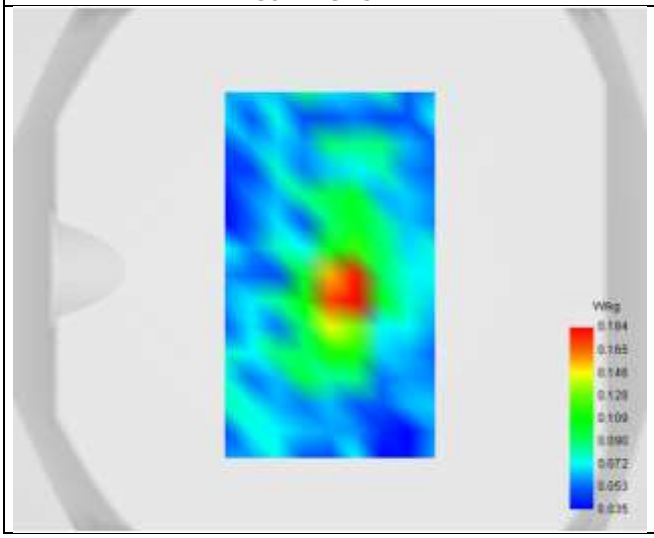
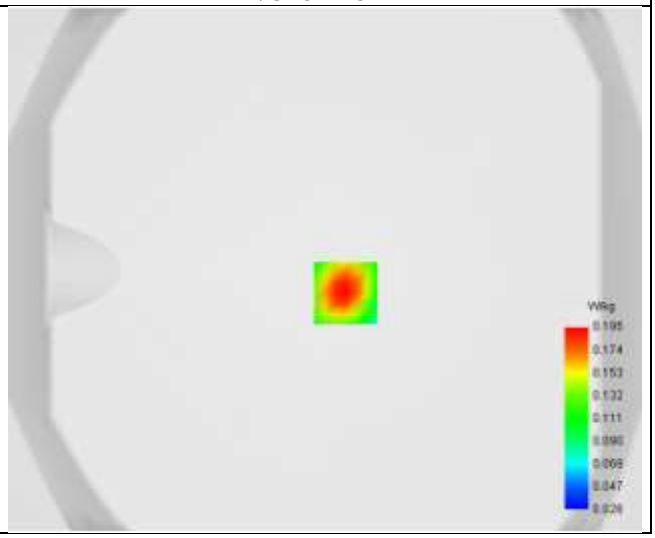
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	1.94
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm,Complete
Phantom	Validation plane
Device Position	Body
Band	IEEE802.a
Channels	High
Signal	IEEE802.a (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	5825.000000
Relative permitivity (real part)	35.106000
Conductivity (S/m)	5.196583

C. SAR Surface and Volume

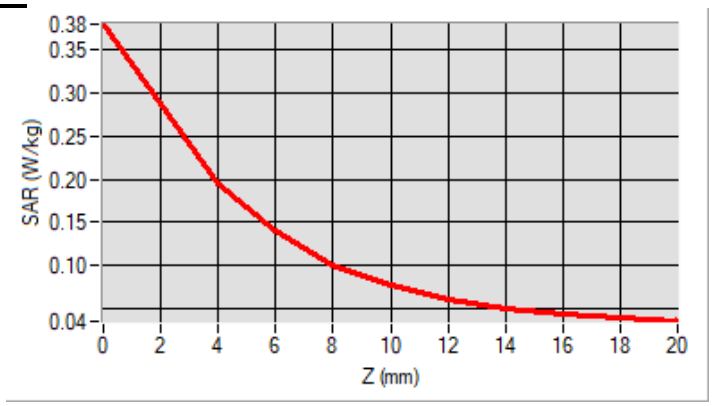
SURFACE SAR	VOLUME SAR
	

Maximum location: X=8.00, Y=-9.00 ; SAR Peak: 0.28 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.076995
SAR 1g (W/Kg)	0.136331
Variation (%)	4.060000

E. Z Axis Scan



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

Date of measurement: 10/10/2022

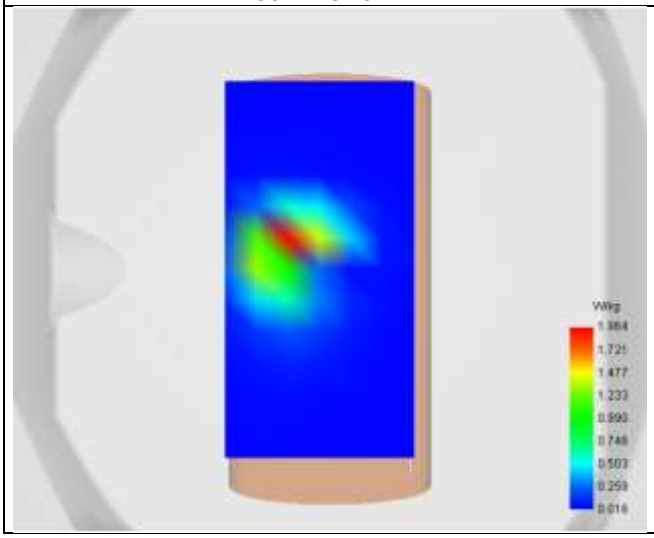
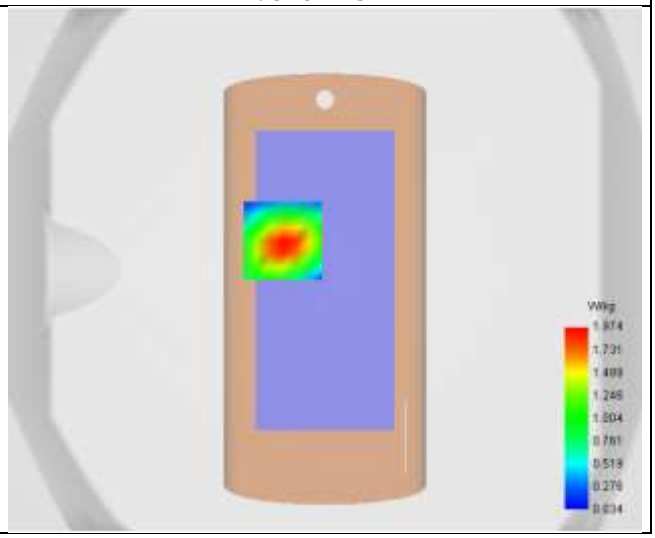
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
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	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2510.000000
Relative permitivity (real part)	38.013428
Conductivity (S/m)	1.921786

C. SAR Surface and Volume

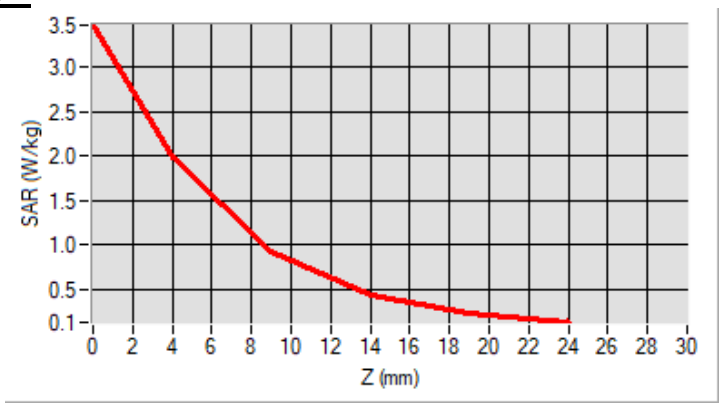
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-16.00, Y=11.00 ; SAR Peak: 3.52 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.841207
SAR 1g (W/Kg)	1.794174
Variation (%)	-1.110000

E. Z Axis Scan



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

Date of measurement: 10/10/2022

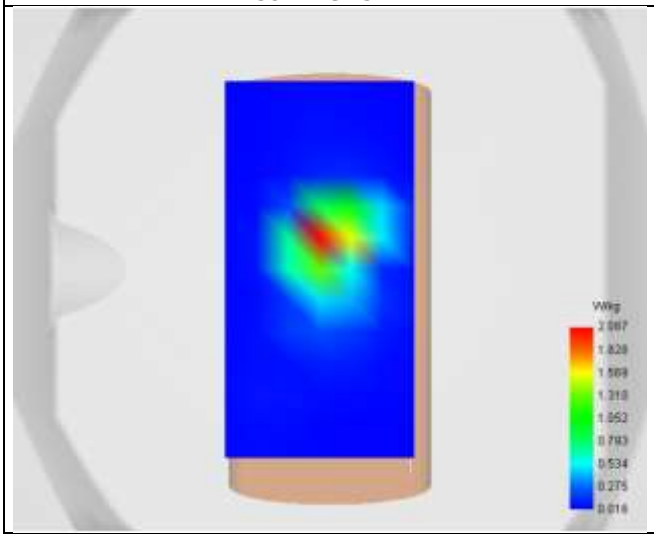
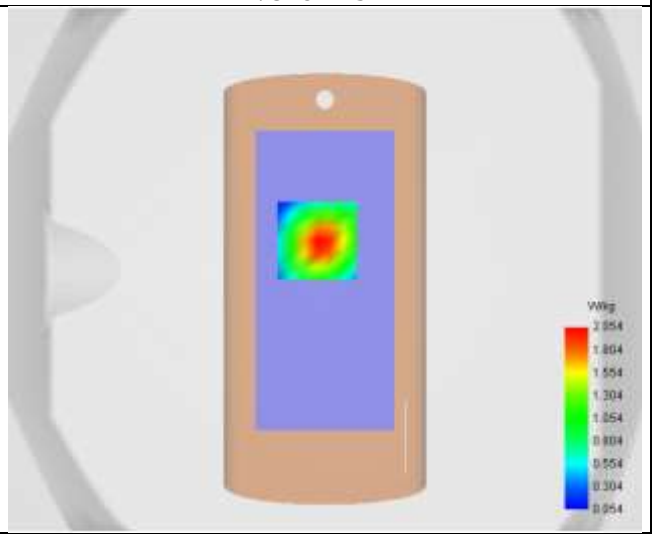
A. Experimental conditions.

Probe	SN 18/21 EPGO354
ConvF	2.27
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	Low
Signal	LTE (Crest factor: 1.0)

B. Permitivity

Frequency (MHz)	2510.000000
Relative permitivity (real part)	38.013428
Conductivity (S/m)	1.921786

C. SAR Surface and Volume

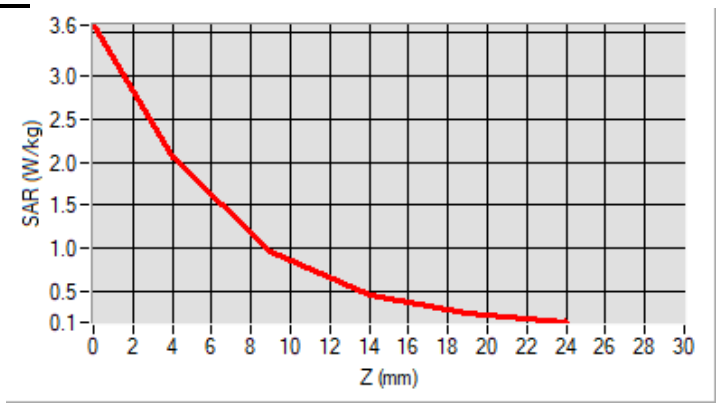
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-3.00, Y=11.00 ; SAR Peak: 3.65 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.868806
SAR 1g (W/Kg)	1.871851
Variation (%)	-1.550000

E. Z Axis Scan



Appendix C: System Calibration Certificate

Calibration information for E-field probes

COMOSAR E-Field Probe Calibration Report

Ref : ACR.181.10.22.BES.B

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

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: 06/30/2022

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

Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric 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.181.10.22.BES.B

	Name	Function	Date	Signature
Prepared by :	Jérôme Le Gall	Measurement Responsible	6/30/2022	
Checked & approved by:	Jérôme Luc	Technical Manager	6/30/2022	
Authorized by:	Yann Toutain	Laboratory Director	7/11/2022	

2022.07.11
10:36:00 +02'00'

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

Issue	Name	Date	Modifications
A	Jérôme Le Gall	6/30/2022	Initial release

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)	Used
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.202 MΩ Dipole 2: R2=0.216 MΩ Dipole 3: R3=0.224 MΩ

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

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

Figure 1 – *MVG COMOSAR Dosimetric E field Probe*

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 IEC/IEEE 62209-1528 and FCC KDB865664 D01 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:

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

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 SAR uncertainty[%] for scanning distances larger than 4mm is 1.0% Limit ,2%).

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 %

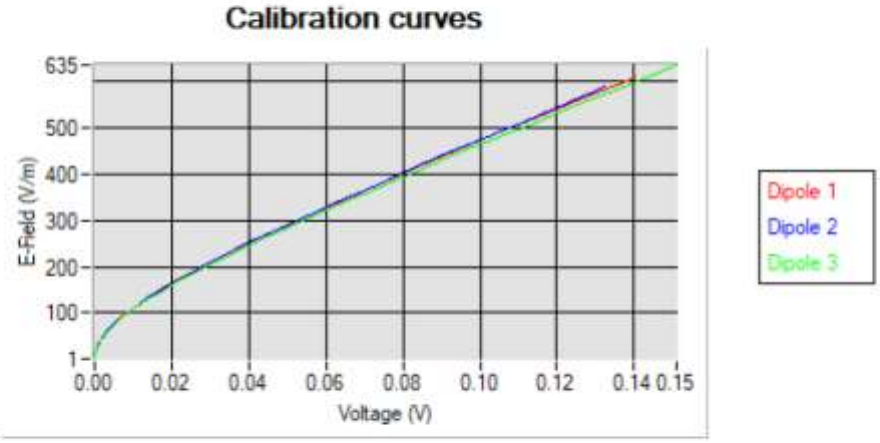
5.1 SENSITIVITY IN AIR

Normx dipole 1 (μV/(V/m)²)	Normy dipole 2 (μV/(V/m)²)	Normz dipole 3 (μV/(V/m)²)
0.88	0.89	0.91

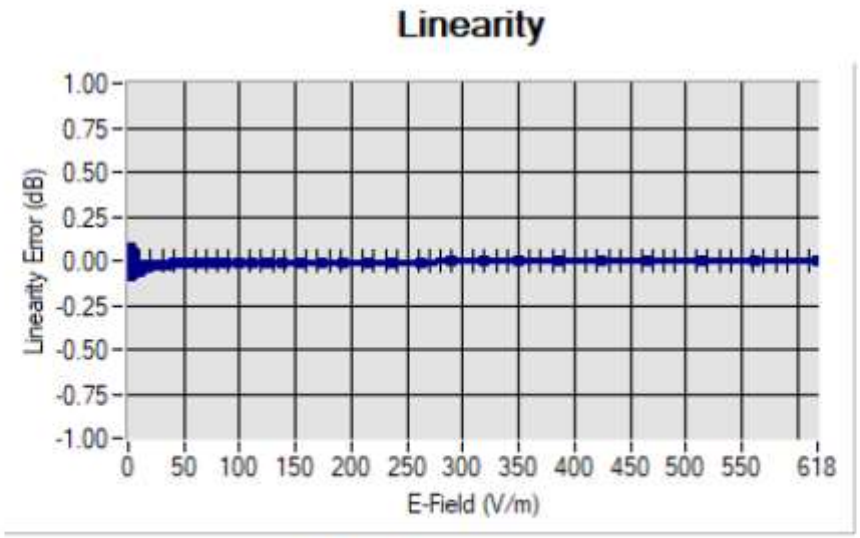
DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
107	101	106

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



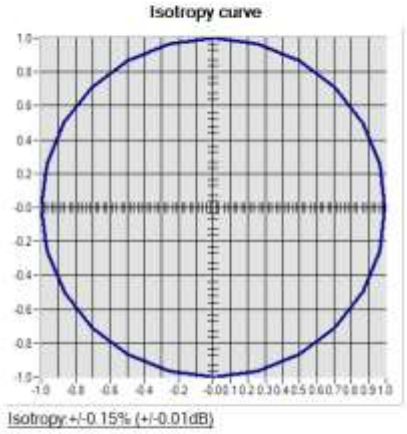
Linearity:+/-1.85% (+/-0.08dB)

5.3 SENSITIVITY IN LIQUID

Liquid	Frequency (MHz +/- 100MHz)	ConvF
HL750	750	1.70
HL850	835	1.73
HL900	900	1.78
HL1750	1750	2.05
HL1900	1900	2.00
HL2100	2100	2.34
HL2300	2300	2.40
HL2450	2450	2.46
HL2600	2600	2.27
HL3300	3300	2.07
HL3500	3500	2.10
HL3700	3700	2.15
HL3900	3900	2.41
HL4200	4200	2.33
HL5200	5200	1.71
HL5400	5400	1.91
HL5600	5600	2.04
HL5800	5800	1.94

LOWER DETECTION LIMIT: 7mW/kg

5.4 ISOTROPY



6 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	**Manufacturer / Model**	**Identification No.**	**Current Calibration Date**	**Next Calibration Date**
CALIPROBE Test Bench	Version 2	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer	Agilent 8753ES	MY40003210	10/2019	10/2022
Network Analyzer – Calibration kit	HP 85033D	3423A08186	06/2021	06/2027
Multimeter	Keithley 2000	1160271	02/2020	02/2023
Signal Generator	Rohde & Schwarz SMB	106589	03/2022	03/2025
Amplifier	MVG	MODU-023-C-0002	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	NI-USB 5680	170100013	06/2021	06/2024
Power Meter	Rohde & Schwarz NRVD	832839-056	11/2019	11/2022
Directional Coupler	Krytar 158020	131467	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Waveguide	MVG	SN 32/16 WG4_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G900_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG6_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG8_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800B_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800H_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG10_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_3G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG12_1	Validated. No cal required.	Validated. No cal required.

Liquid transition	MVG	SN 32/16 WGLIQ_5G000_1	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024

Calibration information for Dipole

SAR Reference Dipole Calibration Report

Ref : ACR.15.6.21.MVGB.B

Cancel and replace the report ACR.15.6.21.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: 835 MHZ
SERIAL NO.: SN 50/20 DIP 0G835-507

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.15.6.21.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 17:47:44 +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 835 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID835
Serial Number	SN 50/20 DIP 0G835-507
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

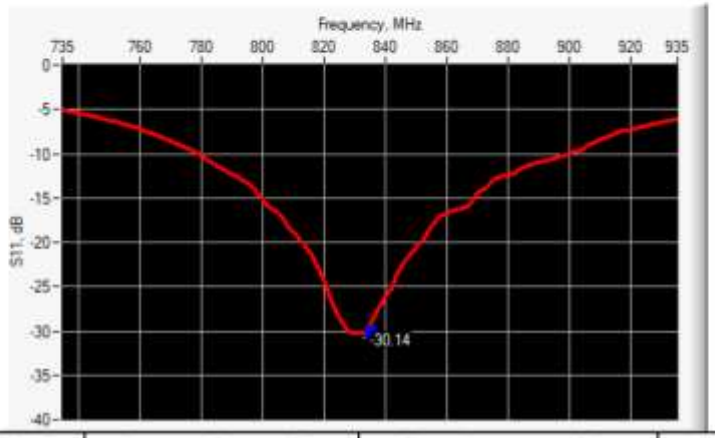
5.3 VALIDATION MEASUREMENT

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)

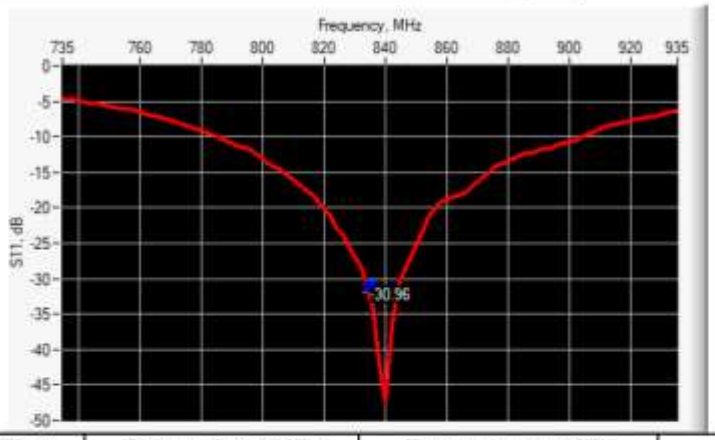
6 CALIBRATION MEASUREMENT RESULTS

6.1 RETURN LOSS AND IMPEDANCE IN HEAD LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
835	-30.14	-20	51.3 Ω - 2.8 jΩ

6.2 RETURN LOSS AND IMPEDANCE IN BODY LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
835	-30.96	-20	47.2 Ω - 0.4 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 %.		100.0 ±1 %.		6.35 ±1 %.	
835	161.0 ±1 %.	161.29	89.8 ±1 %.	89.25	3.6 ±1 %.	3.59
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 %		0.89 ±10 %	
835	41.5 ±10 %	40.6	0.90 ±10 %	0.89
900	41.5 ±10 %		0.97 ±10 %	
1450	40.5 ±10 %		1.20 ±10 %	
1500	40.4 ±10 %		1.23 ±10 %	
1640	40.2 ±10 %		1.31 ±10 %	
1750	40.1 ±10 %		1.37 ±10 %	
1800	40.0 ±10 %		1.40 ±10 %	
1900	40.0 ±10 %		1.40 ±10 %	
1950	40.0 ±10 %		1.40 ±10 %	
2000	40.0 ±10 %		1.40 ±10 %	
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

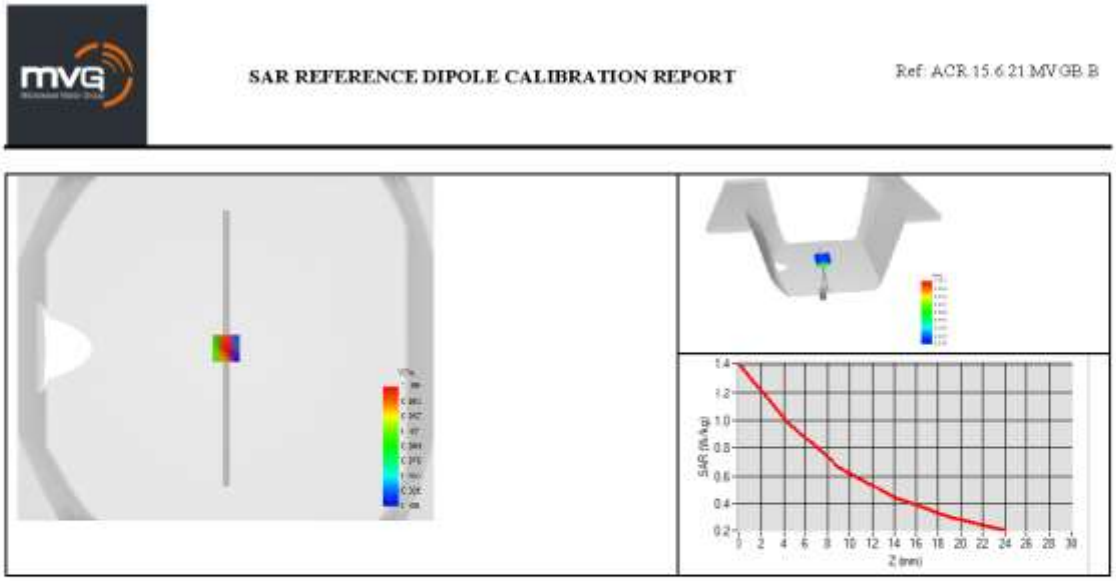
The IEEE Std. 1528 and CEI/IEC 62209 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is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

SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.15.6.21.MVGB.B

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	SN 41/18 EPGO333
Liquid	Head Liquid Values: eps' : 40.6 sigma : 0.89
Distance between dipole center and liquid	15.0 mm
Area scan resolution	dx=8mm/dy=8mm
Zoon Scan Resolution	dx=8mm/dy=8mm/dz=5mm
Frequency	835 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		5.55	
835	9.56	9.57 (0.96)	6.22	6.04 (0.60)
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	-		-	



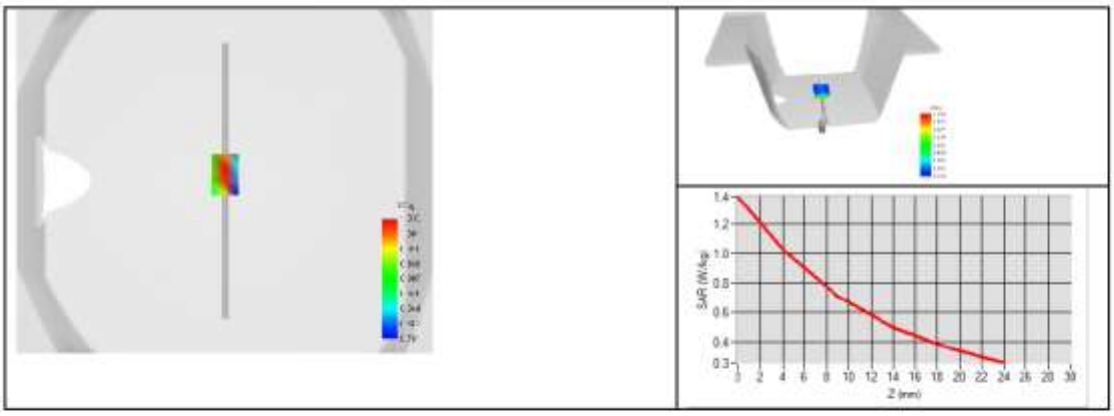
7.3 BODY LIQUID MEASUREMENT

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 %		0.96 ±10 %	
835	55.2 ±10 %	52.3	0.97 ±10 %	0.94
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' : 52.3 sigma : 0.94
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	835 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
835	9.77 (0.98)	6.36 (0.64)



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

Dipole Impedance and Return Loss calibration Report

Object: SID835 - SN 50/20 DIP 0G835-507

Calibration Date: January 14, 2022

Calibration reference: IEEE Std 1528:2013, IEC 62209-1:2006, FCC KDB 865664 D01

Calibrated By: Janet Wei (Janet Wei, SAR project engineer)

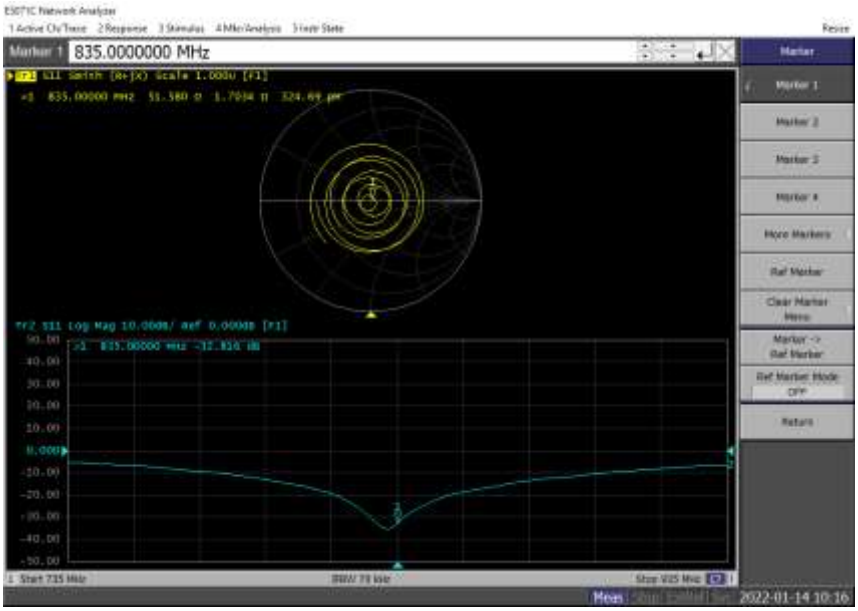
Reviewed By: Winner Zhang (Winner Zhang, Technical manager)

Environment of Test Site

Temperature:	18 ~ 25 C
Humidity:	50~60% RH
Atmospheric Pressure:	1011 mbar

Test Data

Measurement Plot for Head TSL In 2022



Comparison with Original report

Items	Calibrated By MVG	Calibrated By JYT In 2022	Deviation	Limit
Impendence for Head TSL	51.3Ω –2.8jΩ	51.58Ω +1.70jΩ	0.28Ω –4.50jΩ	±5Ω
Return Loss for Head TSL	-30.14	-32.82	8.89%	±20%(No less than 20 dB)

Result

Compliance