TCT 通测检测
TESTING CENTRE TECHNOLOGY

SAR TEST REPORT

FCC ID. ..... :	2A3KR-KST103SDL	
Test Report No..... :	TCT220328E066	
Date of issue..... :	Apr. 19, 2022	
Testing laboratory ..... :	SHENZHEN TONGCE TESTING LAB	
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name..... :	SHENZHEN KINSTONE D&T DEVELOP CO. LTD.	
Address..... :	5th Floor, Building A2, Xinjianxing Technology Industrial Park, Fengxin Road, Guangming District, Shenzhen, China	
Manufacturer's name ... :	SHENZHEN KINSTONE D&T DEVELOP CO. LTD.	
Address..... :	5th Floor, Building A2, Xinjianxing Technology Industrial Park, Fengxin Road, Guangming District, Shenzhen, China	
Test item description ..... :	Android tablet	
Trade Mark ..... :	Kinstone	
Model/Type reference..... :	KST103SD-L	
SAR Max. Values.....:	**0.72 W/Kg (1g) for Body-worn; 0.75 W/Kg (1g) for Hotspot**	
Date of receipt of test item ..... :	Mar. 28, 2022	
Date (s) of performance of test..... :	Mar. 28, 2022 - Apr. 19, 2022	
Tested by (+signature) ... :	Karl WANG	Karl Wang
Check by (+signature).... :	Beryl Zhao	Beryl Zhao
Approved by (+signature):	Tomsin	Tomsin

SHENZHEN TONGCE TESTING LAB TCT

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1. General Product Information

1.1. EUT description

Test item description.....:	Android tablet
Model/Type reference.....:	KST103SD-L
Rating(s).....:	Rechargeable Li-ion Battery DC3.8V
2G	
Operation Band.....:	GSM850, GSM1900
Supported type.....:	GSM/GPRS/EGPRS
Power Class.....:	GSM850:Power Class 5; GSM1900:Power Class 0
Modulation Type.....:	GMSK for GSM/GPRS; 8QPSK for EGPRS
GSM Release Version.....:	R99
GPRS Multislot Class.....:	12
EGPRS Multislot Class.....:	12
3G	
Operation Band.....:	FDD Band II & FDD Band IV & FDD Band V
Power Class.....:	Power Class 3
Modulation Type.....:	QPSK for WCDMA/HSDPA/HSUPA
WCDMA Release Version.....:	R99
HSDPA Release Version.....:	Release 5
HSUPA Release Version.....:	Release 6
DC-HSUPA Release Version.....:	Not Supported
LTE	
Operation Band.....:	LTE Band 2 & LTE Band 4 & LTE Band 5 & LTE Band 7 & LTE Band 12 & LTE Band 17 & LTE Band 66
Power Class.....:	Power Class 3
Modulation Type.....:	QPSK &16-QAM for LTE
Wi-Fi 2.4G	
Supported type.....:	802.11b/802.11g/802.11n
Modulation Type.....:	802.11b: DSSS 802.11g/802.11n:OFDM
Operation Frequency.....:	802.11b/802.11g/802.11n(HT20):2412MHz~2462MHz; 802.11n(HT40):2422MHz~2452MHz
Channel number.....:	802.11b/802.11g/802.11n(HT20):11; 802.11n(HT40):7
Channel separation.....:	5MHz

BLE	
Bluetooth Version.....:	Supported 5.0
Modulation.....:	GFSK(1Mbps) , π/4-DQPSK(2Mbps) , 8-DPSK(3Mbps)
Operation Frequency.....:	2402MHz~2480MHz
Channel number.....:	79/40
Channel separation.....:	1MHz/2MHz
Wi-Fi 5G	
Operation Frequency:	Band 1: 5180 MHz -5240 MHz Band 2C: 5500 MHz -5700 MHz Band 3: 5745 MHz -5825 MHz
Channel Bandwidth:	802.11a: 20MHz 802.11n: 20MHz, 40MHz 802.11ac: 20MHz, 40MHz, 80MHz
Modulation Technology:	Orthogonal Frequency Division Multiplexing(OFDM)
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK

2. Test standard

The tests were performed according to following standards:
FCC 47 CFR §2.1093
BS IEC-IEEE 62209-1528-2020: Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices
KDB447498 D01:General RF Exposure Guidance v06
KDB865664 D01:SAR measurement 100MHz to 6GHz v01r04
KDB865664 D02:RF Exposure Reporting v01r02.
KDB941225 D01:3G SAR Procedures v03r01
KDB248227 D01:802.11 wi-fi SAR v02r02
KDB941225 D05:SAR for LTE devices v02r05
KDB941225 D06:Hotspot Mode v02r01
KDB941225 D07:UMPC Mini Tablet v01r02
KDB690783 D01:SAR Listings on Grant v01r03

3. Facilities and Accreditations

3.1. Facilities

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

- FCC - Registration No.: 645098
  SHENZHEN TONGCE TESTING LAB
  Designation Number: CN1205
  The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.
- IC - Registration No.: 10668A-1
  SHENZHEN TONGCE TESTING LAB
  CAB identifier: CN0031
  The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

3.2. Location

SHENZHEN TONGCE TESTING LAB.
Address: TCT Testing Industrial Park, Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China

3.3. Environment Condition:

Temperature:	18°C ~25°C
Humidity:	35%~75% RH
Atmospheric Pressure:	1011 mbar

4. Test Result Summary

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

Exposure Position	Frequency Band	Reported SAR (W/kg)	Equipment Class	Highest Reported SAR (W/kg)
Body-worn 1-g SAR (0 mm Gap)	GSM 850	0.68	PCE	**0.72**
	GSM 1900	0.58		
	WCDMA Band II	0.68		
	WCDMA Band IV	0.48		
	WCDMA Band V	0.26		
	LTE Band 2	0.68		
	LTE Band 4	**0.72**		
	LTE Band 5	0.62		
	LTE Band 7	0.57		
	LTE Band 12	0.25		
	LTE Band 17	0.34		
	LTE Band 66	0.47		
	WLAN 2.4 GHz	0.45	DTS	
	WLAN 5.2 GHz	0.25	NII	
	WLAN 5.6 GHz	0.31		
	WLAN 5.8 GHz	0.30		
Hotspot 1-g SAR (0 mm Gap)	GSM 850	0.69	PCE	**0.75**
	GSM 1900	0.60		
	WCDMA Band II	0.71		
	WCDMA Band IV	0.50		
	WCDMA Band V	0.29		
	LTE Band 2	0.70		
	LTE Band 4	**0.75**		
	LTE Band 5	0.64		
	LTE Band 7	0.61		
	LTE Band 12	0.30		
	LTE Band 17	0.35		
	LTE Band 66	0.48		
	WLAN 2.4 GHz	0.46	DTS	
	WLAN 5.2 GHz	0.27	NII	
	WLAN 5.6 GHz	0.35		
	WLAN 5.8 GHz	0.32		

<Highest Reported simultaneous SAR Summary>

Exposure Position	Frequency Band	Highest Reported Simultaneous Transmission SAR (W/kg)
Body 1-g SAR (0 mm Gap)	LTE Band 4 + WIFI 2.4G	**1.17**
Hotspot 1-g SAR (0 mm Gap)	LTE Band 4 + WIFI 2.4G	**1.21**

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 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. This EUT owns four cards, after we perform the pretest for these two SIM card; we found the SIM 1 is the worst case, so its result is recorded in this report.

5. RF Exposure Limit

Type Exposure	SAR (W/kg)
	Uncontrolled Exposure Limit
Spatial Peak SAR (averaged over any 1 g of tissue)	1.60
Spatial Peak SAR (hands/wrists/feet/ankles averaged over 10g)	4.00
Spatial Peak SAR (averaged over the whole body)	0.08

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.

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

6. SAR Measurement System Configuration

6.1. SAR Measurement Set-up

The OPENSAR system for performing compliance tests consist of the following items:

A standard high precision 6-axis robot (KUKA) with controller and software.

KUKA Control Panel (KCP)

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with a Video Positioning System (VPS).

The stress sensor is composed with mechanical and electronic when the electronic part detects a change on the electro-mechanical switch; it sends an “Emergency signal” to the robot controller that to stop robot’s moves A computer operating Windows XP.

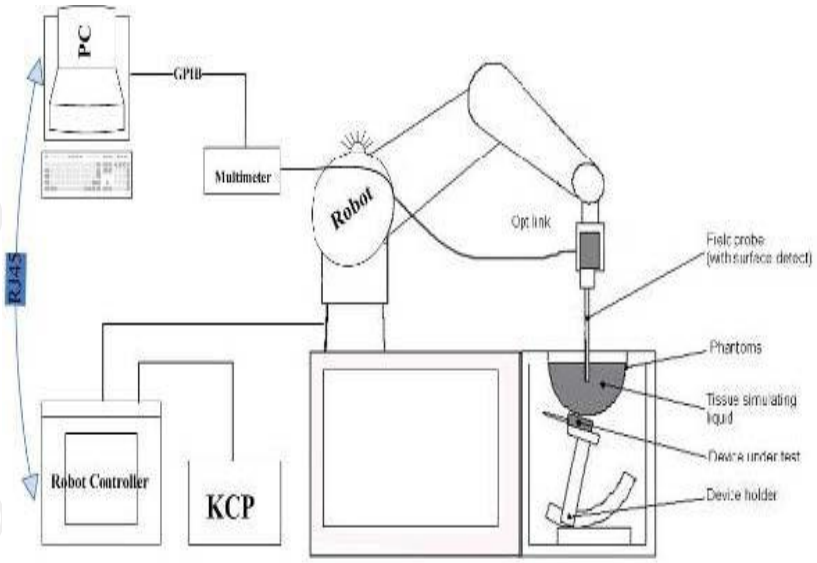
OPENSAR software Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.

The SAM phantom enabling testing left-hand right-hand and body usage.

The Position device for handheld EUT

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles to validate the proper functioning of the system.



KUKA SAR Test Sysytem Configuration

6.2. 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.

Probe Specification
Construction Symmetrical design with triangular core
Interleaved sensors
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration ISO/IEC 17025 calibration service available.

Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 41/18 EPGO331
Frequency Range of Probe	0.4 GHz- 6GHz
Resistance of Three Dipoles at Connector	Dipole 1:R1=0.184MΩ Dipole 2:R3=0.191MΩ Dipole 3:R3=0.192MΩ

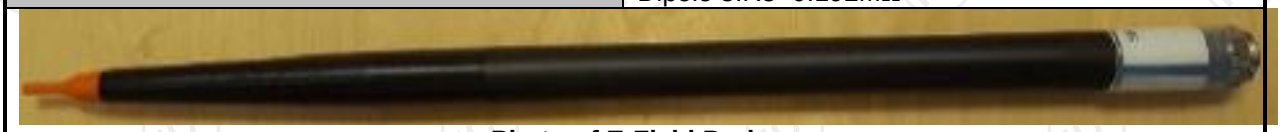
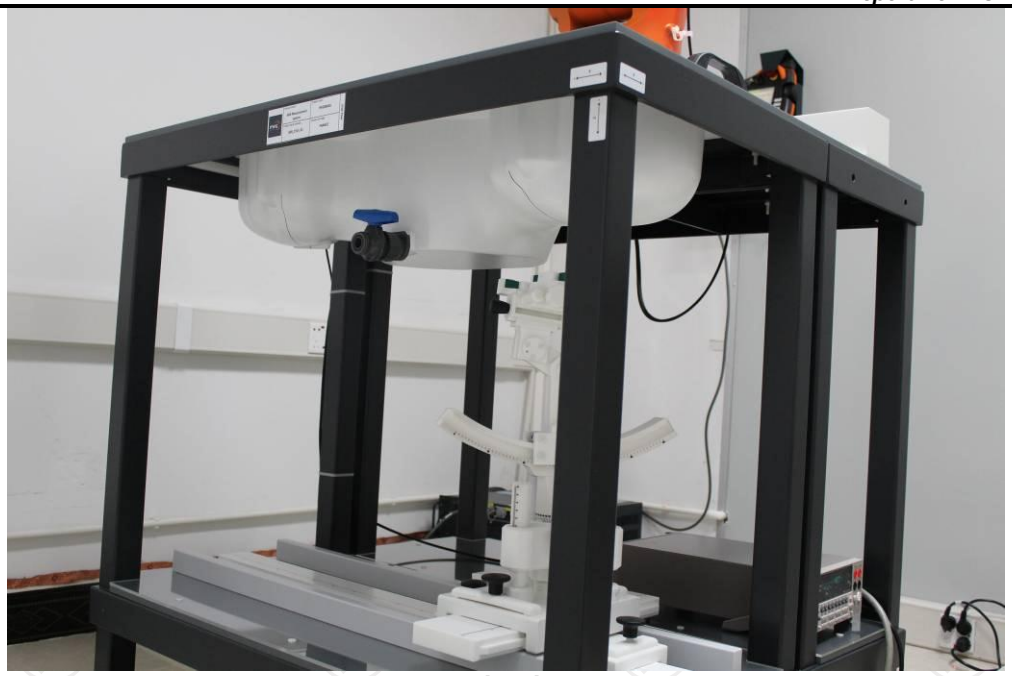


Photo of E-Field Probe

6.3. Phantom

The SAM Phantom SAM120 is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is in compliance with the specification set in IEEE P1528 and CENELEC IEC 62209-1, IEC 62209-2:2010.
The phantom enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region.
A cover prevents the evaporation of the liquid.
Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections.
Body SAR testing also used the flat section between the head profiles.

Name: COMOSAR IEEE SAM PHANTOM
S/N: SN 19/15 SAM 120
Manufacture: MVG

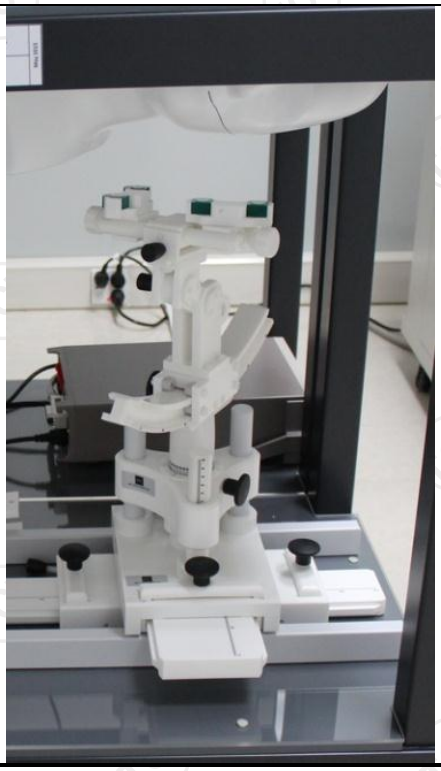


SAM Twin Phantom

6.4. Device Holder

In combination with the Generic Twin Phantom SAM120, the Mounting Device enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening.
The devices can be easily, accurately, and repeatedly positioned according to the FCC and CENELEC specifications.
The device holder can be locked at different phantom locations (left head, right head, flat phantom).

COMOSAR Mobile phone positioning system



6.5. Data Storage and Evaluation

Data Storage

The OPENSAR software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation

The OPENSAR software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the OPENSAR components. In the direct measuring mode of the millimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$Vi = Ui + Ui2 \cdot c\,f / d\,c\,pi$$

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (MVG parameter)
dcpi = diode compression point (MVG parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $Ei = (Vi / Normi \cdot ConvF)1/2$

H-field probes: $Hi = (Vi)1/2 \cdot (ai0 + ai1\,f + ai2f2) / f$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

Etot = (Ex2+ EY2+ Ez2)1/2

The primary field data are used to calculate the derived field units.

SAR = (Etot) 2 · σ / (ρ · 1000)

with SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm3

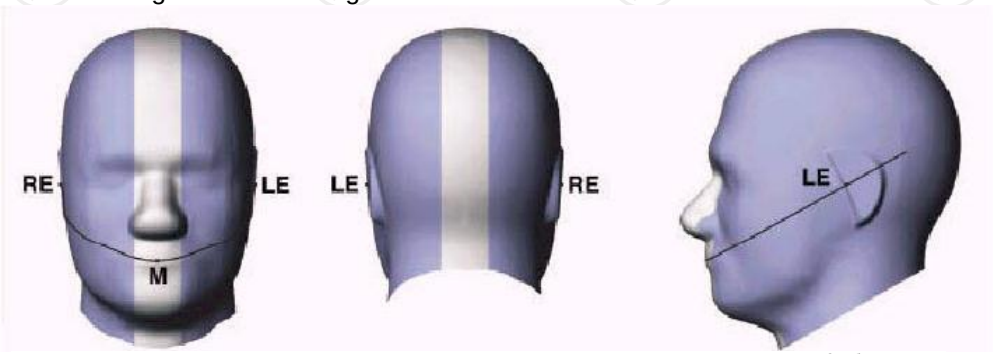
Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

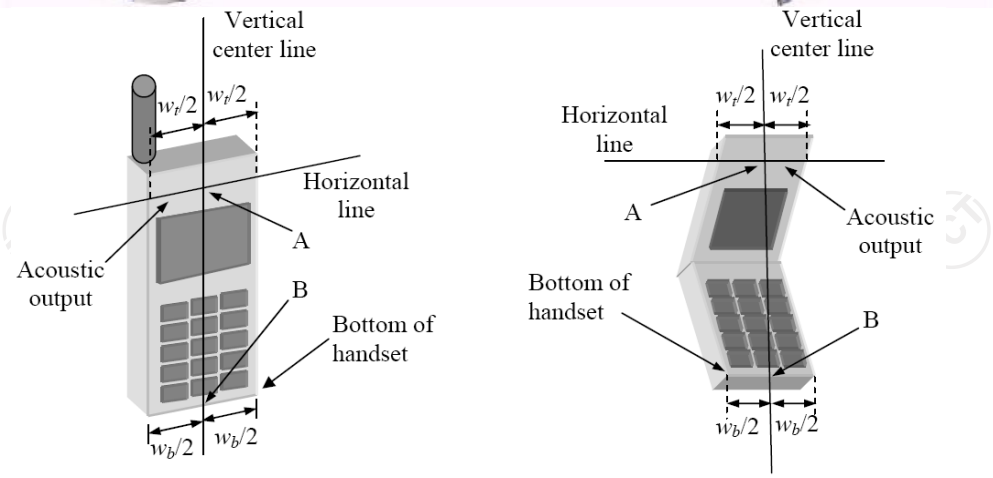
6.6. Position of the wireless device in relation to the phantom

Handset Reference Points

Ppwe = Etot2 / 3770 or Ppwe = Htot2 · 37.7

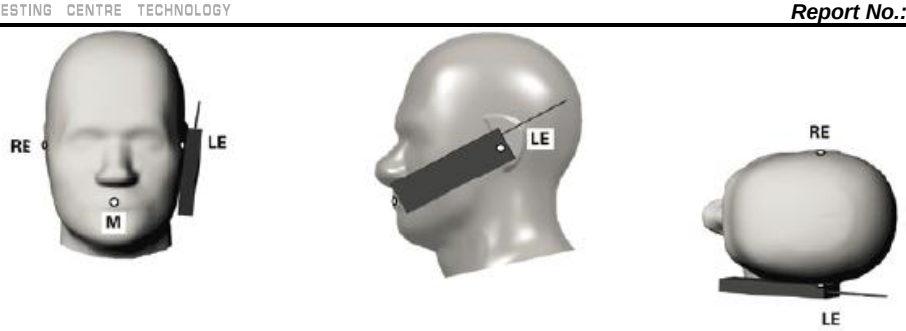
With Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = total magnetic field strength in A/m





Wt Width of the handset at the level of the acoustic
Wb Width of the bottom of the handset
A Midpoint of the width wt of the handset at the level of the acoustic output
B Midpoint of the width wb of the bottom of the handset

Positioning for Cheek / Touch



Positioning for Ear / 15º Tilt

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 15mm or holster surface and the flat phantom to 0 mm.

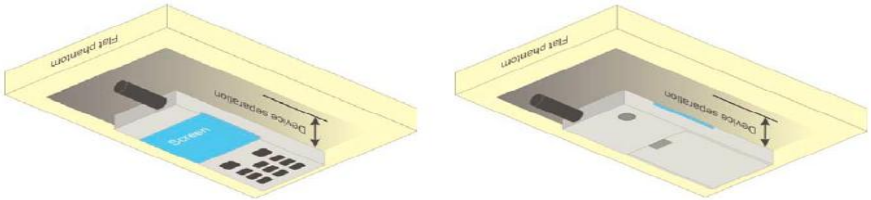


Illustration for Body Worn Position

Ireless 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.

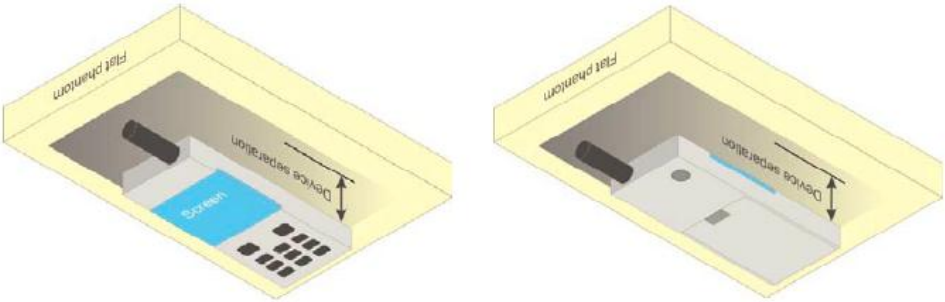
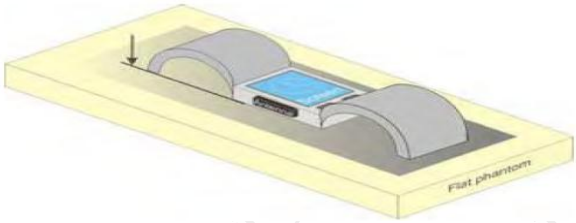


Illustration for Hotspot Position

Limb-worn device

A limb-worn device is a unit whose intended use includes being strapped to the arm or leg of the user while transmitting (except in idle mode). It is similar to a body-worn device. Therefore, the test positions of 6.1.4.4 also apply. The strap shall be opened so that it is divided into two parts as shown in Figure 9. The device shall be positioned directly against the phantom surface with the strap straightened as much as possible and the back of the device towards the phantom.

If the strap cannot normally be opened to allow placing in direct contact with the phantom surface, it may be necessary to break the strap of the device but ensuring to not damage the antenna.



Test position for limb-worn devices

6.7. Tissue Dielectric Parameters

The liquid used for the frequency range of 100MHz-6G consisted of water, sugar, salt and Cellulose. The liquid has been previously proven to be suited for worst-case. The following Table shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.
The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the determine of the dielectric parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ±5% of the target values.
The following materials are used for producing the tissue-equivalent materials

Targets for tissue simulating liquid

Frequency (MHz)	Liquid Type	Liquid Type (σ)	± 5% Range	Permittivity (ε)	± 5% Range
300	Head	0.87	0.83~0.91	45.3	43.04~47.57
450	Head	0.87	0.83~0.91	43.5	41.33~45.68
750	Head	0.89	0.83~0.93	41.9	39.40~41.94
835	Head	0.90	0.86~0.95	41.5	39.43~43.58
900	Head	0.97	0.92~1.02	41.5	39.43~43.58
1800-2000	Head	1.40	1.33~1.47	40.0	38.00~42.00
2450	Head	1.80	1.71~1.89	39.2	37.24~41.16
2600	Head	1.96	1.86~2.06	39.0	37.05~40.95
3000	Head	2.40	2.28~2.52	38.5	36.58~40.43
5200	Head	4.45	4.22~4.45	36.68	36.68~40.40
5600	Head	5.02	5.04~5.45	37.00	37.08~40.53
5800	Head	5.27	5.01~5.53	35.3	33.54~37.07
300	Body	0.92	0.87~0.97	58.2	55.29~61.11
450	Body	0.94	0.89~0.99	56.7	53.87~59.54
750	Body	0.98	0.98~1.01	56.7	53.87~59.54
835	Body	0.97	0.92~1.02	55.2	52.44~57.96
900	Body	1.05	1.00~1.10	55.0	52.25~57.75
1800-2000	Body	1.52	1.44~1.60	53.3	50.64~55.97
2450	Body	1.95	1.85~2.05	52.7	50.07~55.34
2600	Body	2.16	2.05~2.27	52.5	49.88~55.13
3000	Body	2.73	2.60~2.87	52.0	49.40~54.60
5200	Body	5.46	5.56~5.60	49.02	49.21~53.60
5600	Body	5.53	5.57~5.90	49.01	49.23~53.50
5800	Body	6.00	5.70~6.30	48.2	45.79~50.61

(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m3)

6.8. Tissue-equivalent Liquid Properties

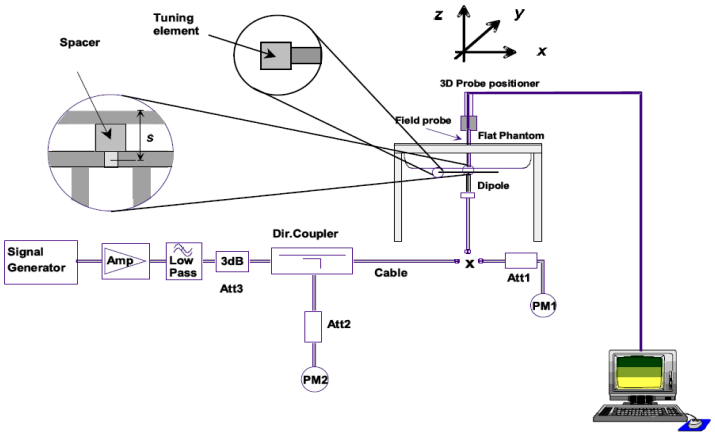
Test Date dd/mm/yy	Temp ℃	Tissue Type	Measured Frequency (MHz)	εr	σ(s/m)	Dev εr(%)	Dev σ(%)
03/30/2022	22℃	750B	690	56.77	0.92	1.80	-4.16
			700	56.94	0.93	2.17	-3.54
			710	56.78	0.93	1.96	-3.33
04/01/2022	22℃	835B	825	55.26	0.93	0.11	-4.12
			835	55.24	0.94	0.07	-3.09
			850	55.21	0.97	0.02	0.00
04/06/2022	22℃	1800B	1710	53.34	1.49	0.08	-1.97
			1720	53.32	1.50	0.04	-1.32
			1750	53.31	1.51	0.02	-0.66
			1800	53.29	1.53	-0.02	0.66
04/08/2022	22℃	1900B	1850	53.34	1.49	0.08	-1.97
			1880	53.32	1.50	0.04	-1.32
			1900	53.31	1.51	0.02	-0.66
			1910	53.29	1.53	-0.02	0.66
04/11/2022	22℃	2450B	2410	54.65	1.97	3.70	1.03
			2435	54.63	1.98	3.66	1.54
			2450	54.62	2.01	3.64	3.08
			2460	54.59	2.03	3.59	4.10
04/13/2022	22℃	2600B	20850	51.96	2.10	-1.02	-2.78
			21100	52.01	2.11	-0.93	-2.31
			21350	52.13	2.13	-0.70	-1.39
04/14/2022	22℃	5200B	5200	49.02	5.46	1.70	-4.21
04/15/2022	22℃	5600B	5600	49.76	5.97	0.91	2.52
04/18/2022	22℃	5800B	5800	47.39	6.27	1.54	2.77

6.9. System Check

The SAR system must be validated against its performance specifications before it is deployed. When SAR probe and system component or software are changed, upgraded or recalibrated, these must be validated with the SAR system(s) that operates with such component. Reference dipoles are used with the required tissue-equivalent media for system validation.

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).

System check is performed regularly on all frequency bands where tests are performed with the OPENSAR system.



System Check Set-up

Verification Results

Frequency (MHz)	Liquid Type	Measured Value in 100mW (W/kg)		Normalized to 1W (W/kg)		Target Value (W/kg)		Deviation (%)	
		1 g Average	10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average	10 g Average
750	Body	0.83	0.56	8.30	5.60	8.46	5.81	-1.89	-3.61
835	Body	0.95	0.63	9.50	6.30	9.62	6.44	-1.25	-2.17
1800	Body	3.78	2.05	37.79	20.46	37.69	20.57	0.27	-0.54
1900	Body	3.77	1.99	37.70	19.90	38.71	20.53	-2.61	-3.07
2450	Body	5.07	2.42	50.70	24.16	50.63	23.40	0.14	3.25
2600	Body	5.37	2.38	53.65	23.81	53.26	23.89	0.73	-0.33
5200	Body	16.35	5.62	163.50	56.20	158.49	55.40	3.16	1.44
5600	Body	18.07	5.99	180.70	59.90	175.65	59.48	2.88	0.71
5800	Body	18.37	6.38	183.70	63.80	183.06	61.62	0.35	3.53

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

7. Measurement Procedure

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 analyser, 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 MVG 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

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 MVG 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 (SEMCAD). 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.

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

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 D01v01r03 quoted below.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm ± 1 mm	½·δ·ln(2) mm ± 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·$\Delta z_{Zoom}(n-1)$ mm	
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 IEEE Std 1528-2013 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB Publication 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.

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, SEMCAD post-processor scan combine and subsequently superpose these measurement data to calculating the multiband SAR.

SAR Averaged Methods

In MVG, 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.

Power Drift Monitoring

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

Power Drift measurement

The drift job measures the field at the same location as the most recent reference job within the same procedure, and with the same settings. The drift measurement gives the field difference in dB from the reading conducted within the last reference measurement. Several drift measurements are possible for

Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100KHz to 6GHz ,when the highest measurement 1-g SAR within a frequency band is <1.5W/kg, the extensive SAR measurement uncertainty analysis described IEEE Std 1528-2013 is not required in SAR report submitted for equipment approval.

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8. Conducted Output Power

Band: GSM 850	Measured Power (dBm)			Calculation (dB)	Averaged Power (dBm)		
Channel	128	190	251		128	190	251
Frequency	824.2	836.6	848.8		824.2	836.6	848.8
GSM (GMSK, Voice)	32.78	32.88	32.65	-9.03	23.75	**23.85**	23.62
GPRS (GMSK, 1-slot)	32.73	32.77	32.53	-9.03	23.70	23.74	23.50
GPRS (GMSK, 2-slot)	30.49	30.67	30.44	-6.02	24.47	**24.65**	24.42
GPRS (GMSK, 3-slot)	28.63	28.80	28.58	-4.26	24.37	24.54	24.32
GPRS (GMSK, 4-slot)	26.46	26.62	26.40	-3.01	23.45	23.61	23.39
EGPRS (1-slot)	25.38	25.68	25.16	-9.03	16.35	16.65	16.13
EGPRS (2-slot)	25.17	25.72	25.15	-6.02	19.15	19.70	19.13
EGPRS (3-slot)	23.86	24.28	23.91	-4.26	19.60	20.02	19.65
EGPRS (4-slot)	21.40	22.06	21.46	-3.01	18.39	19.05	18.45

Note:
1. Division Factors
   To average the power, the division factor is as follows:
   1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB
   2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB
   3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB
   4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB
2. According to the conducted power as above, the body measurements are performed with 1Tx slots for 850MHz for GPRS.
3. The device do not support power reduction, so power of hotspot activated as the same as hotspot disabled

Band: GSM 1900	Measured Power (dBm)			Calculation (dB)	Averaged Power (dBm)		
Channel	512	661	810		512	661	810
Frequency	1850.2	1880.0	1909.8		1850.2	1880.0	1909.8
GSM (GMSK, Voice)	29.12	29.21	29.19	-9.03	20.09	**20.18**	20.16
GPRS (GMSK, 1-slot)	29.10	29.15	29.13	-9.03	20.07	20.12	20.10
GPRS (GMSK, 2-slot)	26.90	26.68	26.39	-6.02	**20.88**	20.66	20.37
GPRS (GMSK, 3-slot)	25.19	24.94	24.67	-4.26	20.93	20.68	20.41
GPRS (GMSK, 4-slot)	22.99	22.74	22.51	-3.01	19.98	19.73	19.50
EGPRS (1-slot)	26.98	27.50	27.19	-9.03	17.95	18.47	18.16
EGPRS (2-slot)	26.69	27.42	27.18	-6.02	20.67	21.40	21.16
EGPRS (3-slot)	25.00	25.81	25.57	-4.26	20.74	21.55	21.31
EGPRS (4-slot)	21.95	23.09	22.89	-3.01	18.94	20.08	19.88

Note:

1. Division Factors
   To average the power, the division factor is as follows:
   1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB
   2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB
   3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB
   4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB
2. According to the conducted power as above, the body measurements are performed with 1Tx slots for 1900MHz for GPRS.
3. The device do not support power reduction, so power of hotspot activated as the same as hotspot disabled

Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4182	4233
Frequency	1852.40	1880.00	1907.60	826.40	836.40	846.60
RMC 12.2Kbps	21.81	**22.03**	22.03	22.88	**22.93**	22.85
HSDPA Subtest-1	21.20	21.72	22.10	21.36	22.28	21.58
HSDPA Subtest-2	20.83	21.33	21.69	21.18	21.99	21.34
HSDPA Subtest-3	20.64	21.12	21.50	20.73	21.57	20.94
HSDPA Subtest-4	20.65	21.12	21.51	20.77	21.60	20.93
HSUPA Subtest-1	18.96	18.68	19.24	19.86	20.36	20.05
HSUPA Subtest-2	19.45	19.62	20.22	20.23	20.77	20.19
HSUPA Subtest-3	19.33	19.27	19.85	19.97	20.35	19.72
HSUPA Subtest-4	19.50	19.70	20.31	19.81	20.37	19.76
HSUPA Subtest-5	21.13	21.66	22.05	21.69	22.51	21.78
Band	WCDMA Band IV					
Channel	1312	1450	1513			
Frequency	1712.4	1740.0	1752.6			
RMC 12.2Kbps	22.45	22.44	**22.52**			
HSDPA Subtest-1	21.93	21.27	22.22			
HSDPA Subtest-2	21.89	21.29	22.18			
HSDPA Subtest-3	21.83	21.24	22.07			
HSDPA Subtest-4	21.85	21.27	22.08			
HSUPA Subtest-1	21.82	20.99	21.88			
HSUPA Subtest-2	21.75	20.99	21.80			
HSUPA Subtest-3	21.64	20.56	21.35			
HSUPA Subtest-4	21.79	21.06	21.80			
HSUPA Subtest-5	21.98	21.33	22.24			

Note:

1. According to the power listed above, the HSDPA and HSUPA were not determined for SAR testing.
2. The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2kbps RMC(reference measurement channel) configuration in test loop mode
3. The device do not support power reduction, so power of hotspot activated as the same as hotspot disabled

WLAN 2.4G						
Mode	802.11b			802.11g		
Channel	1	6	11	1	6	11
Frequency	2412	2437	2462	2412	2437	2462
Average Power (dBm)	16.603	15.987	**16.865**	14.64	15.209	15.097
Mode	802.11n(HT20)			802.11n(HT40)		
Channel	1	6	11	3	6	9
Frequency	2412	2437	2462	2422	2437	2452
Average Power (dBm)	15.04	15.658	15.462	14.134	13.768	14.267

WLAN 5.2G						
Mode	IEEE 802.11a			IEEE 802.11n HT20		
Channel	36	44	48	36	44	48
Frequency	5180	5220	5240	5180	5220	5240
Average Power (dBm)	17.51	17.13	17.51	**17.85**	16.25	15.37
Mode	IEEE 802.11n HT40			IEEE 802.11ac VHT20		
Channel	38	46		36	44	48
Frequency	5190	5230		5180	5220	5240
Average Power (dBm)	15.38	14.13		16.42	15.52	14.99
Mode	EEE 802.11ac VHT40			IEEE 802.11ac VHT80		
Channel	38	46		42		
Frequency	5190	5230		5210		
Average Power (dBm)	16.05	15.75		15.72		
WLAN 5.6G						
Mode	IEEE 802.11a			IEEE 802.11n HT20		
Channel	100	116	140	100	116	140
Frequency	5500	5580	5700	5500	5580	5700
Average Power (dBm)	15.71	15.54	15.97	15.55	15.97	**16.00**
Mode	IEEE 802.11n HT40			IEEE 802.11ac VHT20		
Channel	102	110	134	100	116	140
Frequency	5510	5550	5670	5500	5580	5700
Average Power (dBm)	13.48	13.64	13.86	14.87	14.24	14.00
Mode	EEE 802.11ac VHT40			IEEE 802.11ac VHT80		
Channel	102	110	134	106	122	
Frequency	5510	5550	5670	5530	5610	
Average Power (dBm)	14.47	14.19	13.95	15.00	14.37	

WLAN 5.8G						
Mode	IEEE 802.11a			IEEE 802.11n HT20		
Channel	149	157	165	149	157	165
Frequency	5745	5785	5825	5745	5785	5825
Average Power (dBm)	**16.94**	16.16	16.62	16.21	15.74	16.43
Mode	IEEE 802.11n HT40			IEEE 802.11ac VHT20		
Channel	151	159		149	157	165
Frequency	5755	5795		5745	5785	5825
Average Power (dBm)	15.76	14.69		15.53	15.35	15.39
Mode	EEE 802.11ac VHT40			IEEE 802.11ac VHT80		
Channel	151	159		155		
Frequency	5755	5795		5775		
Average Power (dBm)	15.87	15.08		16.02		

Note

1. Per KDB 248227 D01 v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
2. The output power of all data rate were prescan , just the worst case (the lowest data rate) of all mode were shown in report

Bluetooth						
Mode	GFSK			Pi/4DQPSK		
Channel	0	39	78	0	39	78
Frequency	2402	2441	2480	2402	2441	2480
Average Power (dBm)	/	/	/	/	/	/
Mode	8DPSK			BLE(1M)		
Channel	0	39	78	0	20	39
Frequency	2402	2441	2480	2402	2440	2480
Average Power (dBm)	/	/	/	5.263	**5.353**	4.217
Mode	BLE(2M)					
Channel	0	20	39			
Frequency	2402	2440	2480			
Average Power (dBm)	5.118	5.282	4.134			

Channel	Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Power (mW)	Test distance (mm)	Result	Exclusion thresholds for 1-g SAR	Exclusion thresholds for 10-g SAR
20	2.440	5.50	3.55	5	1.11	3.0	7.5

Note

1. Per KDB 447498 D01v06, the 1-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, where
   ·f(GHz) is the RF channel transmit frequency in GHz
   ·Power and distance are rounded to the nearest mW and mm before calculation
   ·The result is rounded to one decimal place for comparison
2. Base on the result of note1, RF exposure evaluation of BLE is not required.
3. Per KDB 248227 D01 v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
4. The output power of all data rate were prescan, just the worst case (the lowest data rate) of all mode were shown in report.

LTE Band 2

Conducted Power of LTE Band 2						
Bandwidth	Modulation	RB size	RB offset	Channel 18607	Channel 18900	Channel 19193
1.4MHz	QPSK	1	0.00	21.74	21.69	21.70
			3.00	21.64	21.65	21.69
			5.00	21.67	21.64	21.69
		3	0.00	21.83	21.75	21.78
			2.00	21.70	21.74	21.79
			3.00	21.77	21.77	21.77
		6	0.00	20.72	20.83	20.77
	16QAM	1	0.00	21.08	20.91	20.87
			3.00	21.46	20.71	21.18
			5.00	21.47	20.63	21.24
		3	0.00	20.46	20.66	20.81
			2.00	20.50	20.67	20.51
			3.00	20.58	20.61	20.47
		6	0.00	19.87	19.76	19.78
Bandwidth	Modulation	RB size	RB offset	Channel 18615	Channel 18900	Channel 19185
3MHz	QPSK	1	0.00	21.60	21.64	21.76
			7.00	21.66	21.66	21.75
			14.00	21.54	21.61	21.72
		8	0.00	20.72	20.63	20.69
			4.00	20.73	20.72	20.66
			7.00	20.65	20.78	20.66
		15	0.00	20.70	20.77	20.72
	16QAM	1	0.00	20.85	20.45	20.62
			7.00	20.78	20.44	20.60
			14.00	20.72	20.44	20.56
		8	0.00	20.00	20.02	19.79
			4.00	19.99	20.00	19.80
			7.00	19.90	19.90	19.74
		15	0.00	19.86	19.80	19.75

Conducted Power of LTE Band 2						
Bandwidth	Modulation	RB size	RB offset	Channel 18625	Channel 18900	Channel 19175
5MHz	QPSK	1	0.00	21.66	21.60	21.76
			12.00	21.63	21.64	21.85
			24.00	21.61	21.71	21.81
		12	0.00	20.72	20.75	20.61
			6.00	20.74	20.74	20.75
			13.00	20.72	20.74	20.66
		25	0.00	20.61	20.84	20.59
	16QAM	1	0.00	20.16	20.96	20.40
			12.00	20.09	20.95	20.49
			24.00	20.18	20.71	20.47
		12	0.00	19.83	19.82	19.56
			6.00	19.85	19.83	19.69
			13.00	19.77	19.78	19.66
		25	0.00	19.84	19.79	19.75
Bandwidth	Modulation	RB size	RB offset	Channel 18650	Channel 18900	Channel 19150
10MHz	QPSK	1	0.00	21.67	21.61	21.60
			24.00	21.55	21.51	21.69
			49.00	21.62	21.50	21.75
		25	0.00	20.77	20.73	20.64
			12.00	20.68	20.78	20.53
			25.00	20.72	20.80	20.83
		50	0.00	20.58	20.76	20.56
	16QAM	1	0.00	20.79	20.74	21.19
			2400	20.64	20.66	21.25
			49.00	20.63	20.57	21.30
		25	0.00	19.77	19.88	19.85
			2400	19.78	19.87	19.85
			49.00	19.75	19.89	19.86
		50	0.00	19.74	19.85	19.83

Conducted Power of LTE Band 2						
Bandwidth	Modulation	RB size	RB offset	Channel 18675	Channel 18900	Channel 19125
15MHz	QPSK	1	0.00	21.61	21.56	21.70
			38.00	21.67	21.73	21.69
			74.00	21.75	21.64	21.79
		37	0.00	20.69	20.65	20.59
			18.00	20.67	20.63	20.58
			37.00	20.66	20.63	20.58
		75	0.00	20.66	20.63	20.61
	16QAM	1	0.00	20.77	20.91	21.18
			38.00	20.66	21.06	21.06
			74.00	20.70	20.96	21.24
		37	0.00	20.67	20.63	20.61
			18.00	20.66	20.63	20.59
			37.00	20.66	20.63	20.60
		75	0.00	19.72	19.91	19.75
Bandwidth	Modulation	RB size	RB offset	Channel 18700	Channel 18900	Channel 19100
20MHz	QPSK	1	0.00	21.86	21.82	21.59
			49.00	21.82	**21.86**	21.62
			99.00	21.82	21.81	21.72
		50	0.00	20.62	**20.83**	20.72
			25.00	20.73	20.76	20.74
			50.00	20.72	20.61	20.71
		100	0.00	20.59	20.77	20.64
	16QAM	1	0.00	20.79	21.08	20.50
			49.00	20.77	21.17	20.52
			99.00	20.90	21.19	20.59
		50	0.00	19.83	19.89	19.73
			25.00	19.91	19.89	19.73
			50.00	19.93	19.84	19.78
		100	0.00	19.89	19.83	19.74

LTE Band 4

Conducted Power of LTE Band 4						
Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393
1.4MHz	QPSK	1	0.00	22.18	22.05	22.14
			2.00	22.08	22.08	22.15
			5.00	22.12	22.11	22.10
		3	0.00	22.29	22.13	22.27
			1.00	22.27	22.13	22.30
			3.00	22.28	22.23	22.23
		6	0.00	21.23	21.14	21.24
	16QAM	1	0.00	22.00	20.73	21.30
			2.00	22.04	21.02	21.63
			5.00	21.99	20.80	21.67
		3	0.00	20.96	20.86	21.14
			1.00	20.91	21.22	21.14
			3.00	20.96	21.13	20.88
		6	0.00	20.29	20.37	20.32
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385
3MHz	QPSK	1	0.00	22.05	22.12	22.13
			8.00	22.07	22.10	22.18
			14.00	22.05	21.99	22.17
		8	0.00	21.24	21.01	21.17
			4.00	21.25	21.02	21.18
			7.00	21.23	21.12	21.06
		15	0.00	21.25	21.03	21.15
	16QAM	1	0.00	20.99	20.74	21.30
			8.00	21.07	20.81	21.29
			14.00	20.94	21.07	21.27
		8	0.00	20.45	20.42	20.43
			4.00	20.33	20.43	20.43
			7.00	20.30	20.45	20.36
		15	0.00	20.30	20.12	20.31

Conducted Power of LTE Band 4						
Bandwidth	Modulation	RB size	RB offset	Channel 19975	Channel 20175	Channel 20375
5MHz	QPSK	1	0.00	22.08	21.96	22.26
			12.00	22.12	22.09	22.28
			24.00	22.04	22.09	22.25
		12	0.00	21.25	21.12	21.07
			6.00	21.26	21.10	21.16
			13.00	21.17	21.14	21.22
		25	0.00	21.04	21.04	21.06
	16QAM	1	0.00	20.63	21.02	20.75
			12.00	20.63	21.13	20.83
			24.00	20.63	21.12	21.14
		12	0.00	20.35	20.23	20.08
			6.00	20.35	20.21	20.09
			13.00	20.32	20.25	20.17
		25	0.00	20.34	20.05	20.23
Bandwidth	Modulation	RB size	RB offset	Channel 20000	Channel 20175	Channel 20350
10MHz	QPSK	1	0.00	22.08	22.03	22.22
			24.00	22.09	22.08	22.37
			49.00	22.17	21.94	22.24
		25	0.00	21.25	21.25	21.26
			12.00	21.20	21.13	21.14
			25.00	21.13	21.25	21.07
		50	0.00	21.17	21.22	21.20
	16QAM	1	0.00	21.25	21.16	21.87
			24.00	21.22	21.07	22.01
			49.00	21.21	21.00	21.85
		25	0.00	20.25	20.45	20.28
			12.00	20.21	20.45	20.29
			25.00	20.31	20.35	20.22
		50	0.00	20.20	20.31	20.50

Conducted Power of LTE Band 4						
Bandwidth	Modulation	RB size	RB offset	Channel 20025	Channel 20175	Channel 20325
15MHz	QPSK	1	0.00	22.56	22.44	22.68
			38.00	22.62	22.49	22.72
			74.00	22.63	22.46	22.74
		38	0.00	21.10	21.07	21.12
			18.00	21.23	21.17	21.14
			37.00	21.23	21.17	21.14
		75	0.00	21.23	21.17	21.15
	16QAM	1	0.00	21.75	21.79	22.33
			38.00	21.74	21.75	22.41
			74.00	21.67	21.77	22.46
		38	0.00	21.23	21.07	21.13
			18.00	21.23	21.17	21.14
			37.00	21.23	21.17	21.14
		75	0.00	20.32	20.34	20.26
Bandwidth	Modulation	RB size	RB offset	Channel 20050	Channel 20175	Channel 20300
20MHz	QPSK	1	0.00	**22.85**	22.81	22.79
			49.00	22.72	22.84	22.79
			99.00	22.71	22.79	22.77
		50	0.00	**21.10**	21.25	21.12
			25.00	21.08	21.27	21.10
			50.00	21.02	21.17	21.34
		100	0.00	21.36	21.23	21.28
	16QAM	1	0.00	21.86	22.16	21.46
			49.00	21.79	22.05	21.36
			99.00	21.84	22.09	21.35
		50	0.00	20.35	20.36	20.30
			25.00	20.35	20.36	20.19
			50.00	20.40	20.21	20.40
		100	0.00	20.34	20.28	20.31

LTE Band 5

Conducted Power of LTE Band 5						
Bandwidth	Modulation	RB size	RB offset	Channel 20407	Channel 20525	Channel 20643
1.4MHz	QPSK	1	0.00	22.38	22.53	22.31
			2.00	22.39	22.52	22.43
			5.00	22.41	22.50	22.40
		3	0.00	22.44	22.43	22.31
			1.00	22.45	22.42	22.31
			3.00	22.47	22.45	22.35
		6	0.00	21.38	21.43	21.34
	16QAM	1	0.00	22.09	21.08	21.91
			2.00	22.04	21.16	21.85
			5.00	22.02	21.23	21.85
		3	0.00	21.20	21.10	21.00
			1.00	21.12	21.06	21.12
			3.00	21.19	21.14	21.04
		6	0.00	20.50	21.11	20.45
Bandwidth	Modulation	RB size	RB offset	Channel 20415	Channel 20525	Channel 20635
3MHz	QPSK	1	0.00	22.38	22.58	22.38
			8.00	22.43	22.48	22.34
			14.00	22.36	22.50	22.42
		8	0.00	21.34	21.21	21.20
			4.00	21.48	21.21	21.21
			7.00	21.51	21.42	21.26
		15	0.00	21.38	21.36	21.27
	16QAM	1	0.00	21.05	21.12	21.73
			8.00	21.06	21.10	21.54
			14.00	21.06	21.17	21.57
		8	0.00	20.48	20.46	20.93
			4.00	20.51	20.46	21.00
			7.00	20.37	21.06	20.47
		15	0.00	20.45	20.85	20.85

Conducted Power of LTE Band 5						
Bandwidth	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625
5MHz	QPSK	1	0.00	22.29	22.39	22.42
			12.00	22.31	22.39	22.39
			24.00	22.31	22.35	22.44
		12	0.00	21.39	21.33	21.32
			6.00	21.42	21.38	21.31
			13.00	21.46	21.38	21.33
		25	0.00	21.50	21.34	21.36
	16QAM	1	0.00	20.81	21.48	21.10
			12.00	20.73	21.30	20.96
			24.00	20.77	21.31	21.31
		12	0.00	20.43	20.43	20.52
			6.00	20.45	20.42	20.73
			13.00	20.35	20.89	20.92
		25	0.00	20.41	20.85	20.91
Bandwidth	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600
10MHz	QPSK	1	0.00	22.38	22.32	22.35
			24.00	22.40	22.25	**22.42**
			49.00	22.44	22.50	22.38
		25	0.00	21.32	21.31	**21.38**
			12.00	21.33	21.30	21.31
			25.00	21.36	21.43	21.31
		50	0.00	21.33	21.37	21.39
	16QAM	1	0.00	21.43	21.22	21.87
			24.00	21.37	21.28	21.75
			49.00	21.30	21.19	21.74
		25	0.00	20.30	20.52	20.43
			12.00	20.31	20.46	20.44
			25.00	20.34	20.53	20.89
		50	0.00	20.34	20.92	20.91

LTE Band 7

Conducted Power of LTE Band 7						
Bandwidth	Modulation	RB size	RB offset	Channel 20775	Channel 21100	Channel 21425
5MHz	QPSK	1	0.00	21.25	21.43	22.03
			12.00	21.36	21.59	21.94
			24.00	21.48	21.48	22.00
		12	0.00	20.24	20.67	20.94
			6.00	20.23	20.55	20.86
			13.00	20.29	20.55	20.82
		25	0.00	20.34	20.64	20.86
	16QAM	1	0.00	19.72	20.50	20.94
			12.00	19.91	20.87	20.81
			24.00	19.88	20.91	20.86
		12	0.00	19.36	19.85	20.02
			6.00	19.40	19.77	19.99
			13.00	19.45	19.82	19.82
		25	0.00	19.50	19.79	19.90
Bandwidth	Modulation	RB size	RB offset	Channel 20800	Channel 21100	Channel 21400
10MHz	QPSK	1	0.00	21.19	21.56	21.61
			24.00	21.28	21.59	21.92
			49.00	21.26	21.58	21.90
		25	0.00	20.28	20.65	20.86
			12.00	20.27	20.68	20.91
			25.00	20.51	20.53	20.86
		50	0.00	20.40	20.53	20.87
	16QAM	1	0.00	20.28	20.50	21.42
			24.00	20.38	20.56	20.93
			49.00	20.23	20.54	20.83
		25	0.00	19.44	19.83	20.01
			12.00	19.44	19.84	20.09
			25.00	19.54	19.89	20.04
		50	0.00	19.54	19.82	20.16

Conducted Power of LTE Band 7						
Bandwidth	Modulation	RB size	RB offset	Channel 20825	Channel 21100	Channel 21375
15MHz	QPSK	1	0.00	21.16	21.41	21.68
			38.00	21.35	21.56	21.88
			74.00	21.41	21.58	21.87
		38	0.00	20.54	20.60	20.73
			18.00	20.50	20.60	20.77
			37.00	20.37	20.59	20.78
		75	0.00	20.38	20.60	20.78
	16QAM	1	0.00	20.28	20.82	20.90
			38.00	20.44	20.82	21.05
			74.00	20.55	20.70	21.11
		38	0.00	20.51	20.59	20.76
			18.00	20.38	20.59	20.81
			37.00	20.38	20.59	20.78
		75	0.00	19.58	19.87	19.97
Bandwidth	Modulation	RB size	RB offset	Channel 20850	Channel 21100	Channel 21350
20MHz	QPSK	1	0.00	21.37	21.59	21.87
			49.00	21.54	21.85	**21.98**
			99.00	21.62	21.85	22.03
		50	0.00	20.45	20.70	20.76
			25.00	20.42	20.62	**20.77**
			50.00	20.51	20.63	20.89
		100	0.00	20.32	20.70	20.81
	16QAM	1	0.00	19.89	20.79	20.88
			49.00	20.27	20.79	20.81
			99.00	20.39	20.90	20.93
		50	0.00	19.53	19.74	20.05
			25.00	19.52	19.76	19.92
			50.00	19.74	19.83	20.15
		100	0.00	19.55	19.81	19.98

LTE Band 12

Conducted Power of LTE Band 12						
Bandwidth	Modulation	RB size	RB offset	Channel 23017	Channel 23095	Channel 23173
1.4MHz	QPSK	1	0.00	22.48	22.68	22.55
			2.00	22.34	22.61	22.62
			5.00	22.40	22.71	22.50
		3	0.00	22.46	22.64	22.55
			1.00	22.47	22.64	22.57
			3.00	22.50	22.62	22.69
		6	0.00	21.35	21.51	21.66
	16QAM	1	0.00	21.89	21.18	21.86
			2.00	21.89	21.13	21.84
			5.00	21.96	21.25	21.70
		3	0.00	21.07	21.18	21.28
			1.00	20.87	21.43	21.25
			3.00	21.10	21.37	21.42
		6	0.00	21.04	21.14	21.20
Bandwidth	Modulation	RB size	RB offset	Channel 23025	Channel 23095	Channel 23165
3MHz	QPSK	1	0.00	22.38	22.71	22.56
			8.00	22.37	22.45	22.63
			14.00	22.38	22.52	22.57
		8	0.00	21.40	21.40	21.56
			4.00	21.40	21.58	21.62
			7.00	21.43	21.29	21.49
		15	0.00	21.22	21.44	21.80
	16QAM	1	0.00	21.04	21.29	22.24
			8.00	21.16	21.25	21.80
			14.00	21.02	21.30	21.85
		8	0.00	21.01	20.59	20.55
			4.00	21.01	20.58	20.56
			7.00	20.44	21.10	21.36
		15	0.00	20.98	20.87	20.55

Conducted Power of LTE Band 12						
Bandwidth	Modulation	RB size	RB offset	Channel 23035	Channel 23095	Channel 23155
5MHz	QPSK	1	0.00	22.26	22.43	22.78
			12.00	22.34	22.40	22.53
			24.00	22.29	22.47	22.63
		12	0.00	21.18	21.66	21.68
			6.00	21.34	21.47	21.68
			13.00	21.45	21.39	21.51
		25	0.00	21.35	21.47	21.56
	16QAM	1	0.00	20.79	21.61	21.31
			12.00	20.74	21.60	21.24
			24.00	20.77	21.68	21.34
		12	0.00	20.92	20.42	20.45
			6.00	20.91	20.52	20.53
			13.00	20.37	21.07	20.36
		25	0.00	20.41	21.10	20.63
Bandwidth	Modulation	RB size	RB offset	Channel 23060	Channel 23095	Channel 23130
10MHz	QPSK	1	0.00	22.31	22.38	22.55
			24.00	22.30	**22.65**	22.60
			49.00	22.60	22.68	22.64
		25	0.00	21.38	**21.44**	21.48
			12.00	21.50	21.43	21.50
			25.00	21.48	21.45	21.73
		50	0.00	21.32	21.46	21.56
	16QAM	1	0.00	21.26	21.15	21.98
			24.00	21.17	21.26	21.96
			49.00	21.29	21.31	22.18
		25	0.00	20.28	20.58	21.11
			12.00	20.28	20.58	21.12
			25.00	20.44	21.17	20.67
		50	0.00	21.03	21.04	21.10

LTE Band 17

Conducted Power of LTE Band 17						
Bandwidth	Modulation	RB size	RB offset	Channel 23755	Channel 23790	Channel 23825
5MHz	QPSK	1	0.00	22.41	22.40	22.90
			12.00	22.56	22.45	22.72
			24.00	22.50	22.52	22.66
		12	0.00	21.49	21.49	21.71
			6.00	21.68	21.55	21.60
			13.00	21.48	21.69	21.54
		25	0.00	21.43	21.55	21.59
	16QAM	1	0.00	20.79	21.58	21.34
			12.00	20.89	21.68	21.23
			24.00	20.93	21.72	21.37
		12	0.00	20.47	21.01	20.48
			6.00	20.47	20.92	20.49
			13.00	20.96	20.59	20.87
		25	0.00	20.56	20.90	20.66
Bandwidth	Modulation	RB size	RB offset	Channel 23780	Channel 23790	Channel 23800
10MHz	QPSK	1	0.00	22.37	**22.59**	22.54
			24.00	22.50	22.56	22.51
			49.00	22.56	22.67	22.60
		25	0.00	21.58	21.50	21.49
			12.00	21.58	**21.62**	21.43
			25.00	21.72	21.61	21.63
		50	0.00	21.41	21.52	21.58
	16QAM	1	0.00	21.04	21.29	21.93
			24.00	21.14	21.30	21.94
			49.00	21.32	21.30	22.07
		25	0.00	20.41	21.09	21.09
			12.00	20.42	21.09	21.09
			25.00	20.48	20.68	20.62
		50	0.00	20.95	21.12	21.10

LTE Band 66

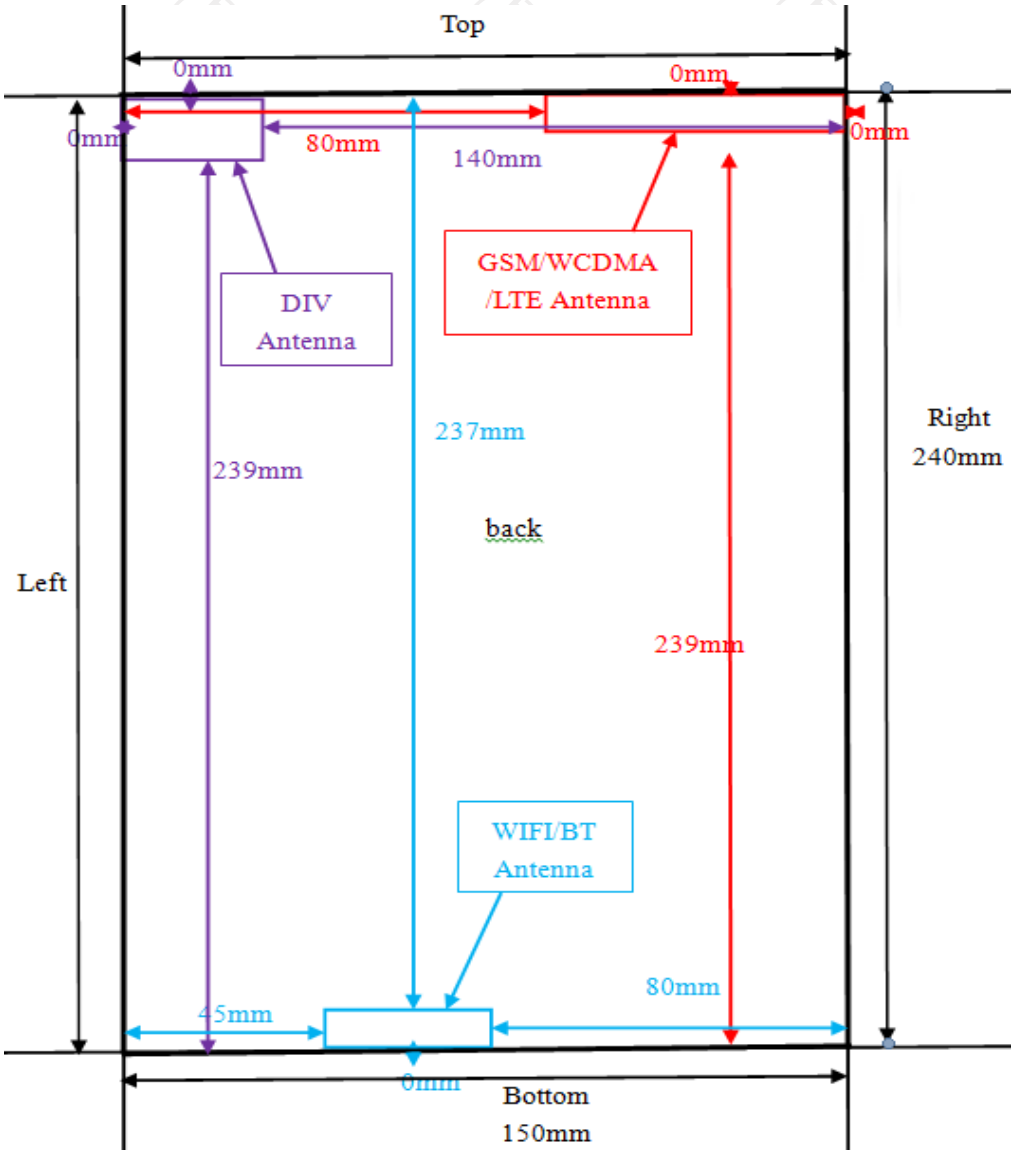
Conducted Power of LTE Band 66						
Bandwidth	Modulation	RB size	RB offset	Channel 131979	Channel 132322	Channel 132665
1.4MHz	QPSK	1	0.00	22.21	22.17	22.07
			2.00	22.10	22.26	22.04
			5.00	22.14	22.32	22.10
		3	0.00	22.27	22.22	22.06
			1.00	22.27	22.23	22.06
			3.00	22.24	22.23	22.08
		6	0.00	21.22	21.20	21.07
	16QAM	1	0.00	21.98	21.74	21.19
			2.00	21.99	21.95	21.18
			5.00	21.99	21.78	21.27
		3	0.00	20.93	21.02	21.11
			1.00	20.93	21.04	21.11
			3.00	20.90	21.07	21.24
		6	0.00	20.51	20.35	20.27
Bandwidth	Modulation	RB size	RB offset	Channel 131987	Channel 132322	Channel 132657
3MHz	QPSK	1	0.00	22.07	22.22	22.06
			8.00	22.05	22.23	22.06
			14.00	22.08	22.33	22.04
		8	0.00	21.20	21.20	21.07
			4.00	21.22	21.21	21.08
			7.00	21.21	21.16	21.03
		15	0.00	21.22	21.15	21.07
	16QAM	1	0.00	21.02	20.98	20.94
			8.00	20.96	21.05	20.97
			14.00	21.19	21.22	21.59
		8	0.00	20.48	20.46	20.34
			4.00	20.48	20.47	20.34
			7.00	20.44	20.46	20.27
		15	0.00	20.33	20.15	20.23

Conducted Power of LTE Band 66						
Bandwidth	Modulation	RB size	RB offset	Channel 131997	Channel 132322	Channel 132647
5MHz	QPSK	1	0.00	22.12	22.09	22.18
			12.00	22.10	22.14	22.10
			24.00	22.11	22.09	22.15
		12	0.00	21.12	21.12	21.05
			6.00	21.14	21.25	21.08
			13.00	21.12	21.08	21.00
		25	0.00	21.15	21.09	21.06
	16QAM	1	0.00	20.60	21.29	21.12
			12.00	20.58	21.34	21.25
			24.00	20.51	21.30	21.19
		12	0.00	20.35	20.25	20.09
			6.00	20.34	20.25	20.05
			13.00	20.31	20.13	20.03
		25	0.00	20.27	20.07	20.11
Bandwidth	Modulation	RB size	RB offset	Channel 132022	Channel 132322	Channel 132622
10MHz	QPSK	1	0.00	22.02	22.16	22.07
			24.00	22.11	22.23	21.98
			49.00	22.06	22.24	22.05
		25	0.00	21.15	21.24	21.17
			12.00	21.10	21.24	21.04
			25.00	21.18	21.17	21.12
		50	0.00	21.22	21.05	20.98
	16QAM	1	0.00	20.95	20.89	21.66
			24.00	20.95	21.06	21.62
			49.00	21.02	21.03	21.62
		25	0.00	20.25	20.36	20.24
			12.00	20.26	20.36	20.26
			25.00	20.22	20.29	20.23
		50	0.00	20.24	20.30	20.24

Conducted Power of LTE Band 66						
Bandwidth	Modulation	RB size	RB offset	Channel 132047	Channel 132322	Channel 132597
15MHz	QPSK	1	0.00	22.07	22.02	22.05
			38.00	22.13	22.34	22.04
			74.00	22.08	22.32	22.07
		38	0.00	21.19	21.27	21.13
			18.00	21.19	21.27	21.06
			37.00	21.19	21.26	21.06
		75	0.00	21.20	21.26	21.06
	16QAM	1	0.00	21.24	21.41	21.61
			38.00	21.20	21.54	21.64
			74.00	21.17	21.48	21.51
		38	0.00	21.18	21.27	21.05
			18.00	21.19	21.26	21.06
			37.00	21.19	21.26	21.07
		75	0.00	20.42	20.41	20.17
Bandwidth	Modulation	RB size	RB offset	Channel 132072	Channel 132322	Channel 132572
20MHz	QPSK	1	0.00	22.31	22.30	22.11
			49.00	22.28	**22.38**	22.10
			99.00	22.30	22.39	21.88
		50	0.00	21.07	**21.13**	21.23
			25.00	21.25	21.13	21.22
			50.00	21.25	21.22	20.93
		100	0.00	21.15	21.28	21.09
	16QAM	1	0.00	20.97	21.63	21.04
			49.00	20.97	21.63	20.96
			99.00	21.03	21.52	21.24
		50	0.00	20.35	20.28	20.32
			25.00	20.34	20.31	20.28
			50.00	20.37	20.37	20.20
		100	0.00	20.28	20.40	20.15

9. Exposure Position Consideration

9.1. EUT Antenna Location



9.2. Test Position Consideration

Test Positions						
Mode	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
GSM/WCDMA/CDMA /LTE	Yes	Yes	Yes	**No**	Yes	**No**
WIFI/BT	Yes	Yes	**No**	Yes	**No**	**No**

Note:

1. KDB 447498 D01v06, particular DUT edges were not required to be evaluated for SAR if the antenna-to-edge distance is greater than 2.5cm.

10. SAR Test Results Summary

10.1. Body-Worn 1g SAR Data

Band	Mode	Test Position with 0mm	CH.	Freq. (MHz)	Ave. Power (dBm)	Tune-Up Limit (dBm)	Power Drift (%)	Meas. SAR1g (W/kg)	Scaling Factor	Reported SAR1g (W/kg)	Limit (W/Kg)
GSM850	voice	Front	190	836.6	32.88	33.00	-0.61	0.26	1.028	0.27	1.60
		Back	190	836.6	32.88	33.00	-0.43	0.52	1.028	0.53	
	GPRS 2 slots	Front	190	836.6	30.67	31.00	1.25	0.33	1.079	0.36	
		Back	190	836.6	30.67	31.00	-3.19	0.63	1.079	**0.68**	
GSM1900	voice	Front	661	1880	29.21	29.50	-1.37	0.11	1.069	0.12	
		Back	661	1880	29.21	29.50	2.66	0.20	1.069	0.21	
	GPRS 3 slots	Front	512	1850.2	26.90	27.00	-2.13	0.34	1.023	0.35	
		Back	512	1850.2	26.90	27.00	1.38	0.57	1.023	**0.58**	
WCDMA Band II	RMC	Front	9400	1880	22.03	22.50	-0.12	0.30	1.114	0.33	
		Back	9400	1880	22.03	22.50	-0.16	0.61	1.114	**0.68**	
WCDMA Band IV	RMC	Front	1513	1752.6	22.52	23.00	0.21	0.17	1.117	0.19	
		Back	1513	1752.6	22.52	23.00	-0.08	0.43	1.117	**0.48**	
WCDMA Band V	RMC	Front	4182	836.4	22.93	23.00	-0.31	0.17	1.016	0.17	
		Back	4182	836.4	22.93	23.00	-1.15	0.26	1.016	**0.26**	
2.4G	802.11b	Front	11	2462	16.865	17.00	-2.16	0.15	1.032	0.15	
		Back	11	2462	16.865	17.00	1.25	0.44	1.032	**0.45**	
5.2G	802.11n (HT20)	Front	36	5180	17.85	18.00	1.01	0.12	1.035	0.12	
		Back	36	5180	17.85	18.00	-1.30	0.24	1.035	**0.25**	
5.6G	802.11n (HT20)	Front	140	5700	16.00	16.50	3.11	0.15	1.122	0.17	
		Back	140	5700	16.00	16.50	-2.13	0.28	1.122	**0.31**	
5.8G	802.11a	Front	149	5745	16.94	17.00	-1.42	0.14	1.014	0.14	
		Back	149	5745	16.94	17.00	-1.99	0.30	1.014	**0.30**	

Band	Mode	Test Position with 0mm	CH.	Freq. (MHz)	RB allocation	RB offset	Ave. Power (dBm)	Tune-Up Limit (dBm)	Power Drift (%)	Meas. SAR1g (W/kg)	Scaling Factor	Reported SAR1g (W/kg)
LTE Band 2	QPSK (20MHz)	Front	18900	1880	1	49	21.86	22.00	0.20	0.35	1.033	0.36
					50	0	20.83	21.00	0.12	0.30	1.040	0.31
		Back	18900	1880	1	49	21.86	22.00	0.30	0.66	1.033	**0.68**
					50	0	20.83	21.00	1.34	0.62	1.040	0.64
LTE Band 4	QPSK (20MHz)	Front	20050	1720	1	0	22.85	23.00	-0.39	0.44	1.035	0.46
					50	0	21.10	21.50	-0.08	0.40	1.096	0.44
		Back	20050	1720	1	0	22.85	23.00	-0.35	0.70	1.035	**0.72**
					50	0	21.10	21.50	2.14	0.65	1.096	0.71
LTE Band 5	QPSK (10MHz)	Front	20600	844	1	24	22.42	22.50	0.39	0.33	1.019	0.34
					25	0	21.38	21.50	0.68	0.27	1.028	0.28
		Back	20600	844	1	24	22.42	22.50	-0.40	0.61	1.019	**0.62**
					25	0	21.38	21.50	1.28	0.57	1.028	0.59
LTE Band 7	QPSK (20MHz)	Front	21350	2560	1	49	21.98	22.00	0.27	0.26	1.005	0.26
					50	25	20.77	21.00	-0.36	0.20	1.054	0.21
		Back	21350	2560	1	49	21.98	22.00	-0.50	0.57	1.005	**0.57**
					50	25	20.77	21.00	2.13	0.52	1.054	0.55
LTE Band 12	QPSK (10MHz)	Front	23095	707.5	1	24	22.65	23.00	1.16	0.15	1.084	0.16
					25	0	21.44	21.50	-0.50	0.10	1.014	0.10
		Back	23095	707.5	1	24	22.65	23.00	0.12	0.23	1.084	**0.25**
					25	0	21.44	21.50	-0.58	0.20	1.014	0.20
LTE Band 17	QPSK (10MHz)	Front	23790	710	1	0	22.59	23.00	-1.01	0.15	1.099	0.16
					25	12	21.62	22.00	0.14	0.10	1.091	0.11
		Back	23790	710	1	0	22.59	23.00	0.68	0.31	1.099	**0.34**
					25	12	21.62	22.00	0.61	0.27	1.091	0.29
LTE Band 66	QPSK (20MHz)	Front	132322	1745	1	49	22.38	22.50	-1.28	0.26	1.028	0.27
					50	0	21.13	21.50	-2.54	0.21	1.089	0.23
		Back	132322	1745	1	49	22.38	22.50	-0.36	0.46	1.028	**0.47**
					50	0	21.13	21.50	1.24	0.40	1.089	0.44

Note:

1. Per KDB 447498 D01 v06, 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 447498 D01 v06, body-worn use is evaluated with the device positioned at 10 mm from a flat phantom filled with head tissue-equivalent medium.
3. Per KDB 447498 D01 v06, the report SAR is measured SAR value adjusted for maximum tune-up tolerance. Scaling Factor=10^[(tune-up limit power(dBm) - Ave.power power (dBm))/10], where tune-up limit is the maximum rated power among all production units.
   Reported SAR(W/kg)=Measured SAR (W/kg)*Scaling Factor.
4. Per KDB865664D01 v01r04 perform a second repeated measurement only the ratio of largest to smallest SAR for the original and first repeated measurement is >1.20 or when the original or repeated measurement is ⩾ 1.45W/kg.
5. Perform a second measurement only if the original, first and second repeated measurement is ⩾1.5w/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurement is >1.20.

10.2. Hotspot 1g SAR Data

Band	Mode	Test Position with0mm	CH.	Freq. (MHz)	Ave. Power (dBm)	Tune-Up Limit (dBm)	Power Drift (%)	Meas. SAR1g (W/kg)	Scaling Factor	Reported SAR1g (W/kg)	Limit (W/Kg)
GSM850	GPRS 2 slots	Front	190	836.6	30.67	31.00	-1.24	0.34	1.079	0.37	
		Back	190	836.6	30.67	31.00	1.98	0.64	1.079	**0.69**	
		Right	190	836.6	30.67	31.00	-3.11	0.03	1.079	0.03	
		Top	190	836.6	30.67	31.00	0.36	0.01	1.079	0.01	
GSM1900	GPRS 2 slots	Front	512	1850.2	26.90	27.00	-0.20	0.34	1.023	0.35	
		Back	512	1850.2	26.90	27.00	-0.49	0.59	1.023	**0.60**	
		Right	512	1850.2	26.90	27.00	-3.31	0.03	1.023	0.03	
		Top	512	1850.2	26.90	27.00	0.29	0.01	1.023	0.01	
WCDMA Band II	RMC	Front	9400	1880	22.03	22.50	-2.29	0.34	1.114	0.38	
		Back	9400	1880	22.03	22.50	-0.58	0.64	1.114	**0.71**	
		Right	9400	1880	22.03	22.50	0.52	0.02	1.114	0.02	
		Top	9400	1880	22.03	22.50	-2.80	0.01	1.114	0.01	**1.60**
WCDMA Band IV	RMC	Front	1513	1752.6	22.52	23.00	0.73	0.25	1.117	0.28	
		Back	1513	1752.6	22.52	23.00	-0.59	0.45	1.117	**0.50**	
		Right	1513	1752.6	22.52	23.00	0.45	0.03	1.117	0.03	
		Top	1513	1752.6	22.52	23.00	0.59	0.01	1.117	0.01	
WCDMA Band V	RMC	Front	4182	836.4	22.93	23.00	-2.22	0.19	1.016	0.19	
		Back	4182	836.4	22.93	23.00	0.60	0.29	1.016	**0.29**	
		Right	4182	836.4	22.93	23.00	-0.03	0.02	1.016	0.02	
		Top	4182	836.4	22.93	23.00	-2.61	0.01	1.016	0.01	
2.4G	802.11n (HT20)	Front	11	2462	16.865	17.00	0.12	0.25	1.032	0.26	
		Back	11	2462	16.865	17.00	-3.11	0.45	1.032	**0.46**	
		Bottom	11	2462	16.865	17.00	0.01	0.03	1.032	0.03	

5.2G	802.11n (HT20)	Front	36	5180	17.85	18.00	0.10	0.16	1.035	0.17	
		Back	36	5180	17.85	18.00	-2.77	0.26	1.035	**0.27**	
		Bottom	36	5180	17.85	18.00	3.17	0.02	1.035	0.02	
5.6G	802.11n (HT20)	Front	140	5700	16.00	16.50	-2.17	0.19	1.122	0.21	
		Back	140	5700	16.00	16.50	-2.29	0.31	1.122	**0.35**	**1.60**
		Bottom	140	5700	16.00	16.50	-2.49	0.01	1.122	0.01	
5.8G	802.11a	Front	149	5745	16.94	17.00	-2.50	0.20	1.014	0.20	
		Back	149	5745	16.94	17.00	-2.80	0.32	1.014	**0.32**	
		Bottom	149	5745	16.94	17.00	1.44	0.01	1.014	0.01	

Band	Mode	Test Position with 0mm	CH.	Freq. (MHz)	RB allocation	RB offset	Ave. Power (dBm)	Tune-Up Limit (dBm)	Power Drift (%)	Meas. SAR1g (W/kg)	Scaling Factor	Reported SAR1g (W/kg)
LTE Band 2	QPSK (20MHz)	Front	18900	1880	1	49	21.86	22.00	3.46	0.38	1.033	0.39
					50	0	20.83	21.00	0.47	0.31	1.040	0.32
		Back	18900	1880	1	49	21.86	22.00	-1.17	0.68	1.033	**0.70**
					50	0	20.83	21.00	-3.39	0.63	1.040	0.66
		Right	18900	1880	1	49	21.86	22.00	2.14	0.03	1.033	0.03
					50	0	20.83	21.00	-1.11	0.02	1.040	0.02
		Top	18900	1880	1	49	21.86	22.00	1.04	0.02	1.033	0.02
					50	0	20.83	21.00	2.14	0.01	1.040	0.01
LTE Band 4	QPSK (20MHz)	Front	20050	1720	1	0	22.85	23.00	-0.15	0.34	1.035	0.35
					50	0	21.10	21.50	-0.02	0.30	1.096	0.33
		Back	20050	1720	1	0	22.85	23.00	-0.13	0.72	1.035	**0.75**
					50	0	21.10	21.50	0.20	0.68	1.096	0.75
		Right	20050	1720	1	0	22.85	23.00	-0.46	0.03	1.035	0.03
					50	0	21.10	21.50	1.34	0.02	1.096	0.02
		Top	20050	1720	1	0	22.85	23.00	2.47	0.02	1.035	0.02
					50	0	21.10	21.50	-1.69	0.01	1.096	0.01

LTE Band 5	QPSK (10MHz)	Front	20600	844	1	24	22.42	22.50	1.10	0.33	1.019	0.34
					25	0	21.38	21.50	0.31	0.30	1.028	0.31
		Back	20600	844	1	24	22.42	22.50	0.32	0.63	1.019	**0.64**
					25	0	21.38	21.50	-2.67	0.57	1.028	0.59
		Right	20600	844	1	24	22.42	22.50	-1.18	0.02	1.019	0.02
					25	0	21.38	21.50	-1.78	0.01	1.028	0.01
		Top	20600	844	1	24	22.42	22.50	-0.58	0.02	1.019	0.02
					25	0	21.38	21.50	0.37	0.01	1.028	0.01
LTE Band 7	QPSK (20MHz)	Front	21350	2560	1	49	21.98	22.00	-0.21	0.31	1.005	0.31
					50	25	20.77	21.00	-1.29	0.27	1.054	0.28
		Back	21350	2560	1	49	21.98	22.00	-0.17	0.61	1.005	**0.61**
					50	25	20.77	21.00	4.01	0.54	1.054	0.57
		Right	21350	2560	1	49	21.98	22.00	-4.82	0.03	1.005	0.03
					50	25	20.77	21.00	1.06	0.02	1.054	0.02
		Top	21350	2560	1	49	21.98	22.00	0.10	0.02	1.005	0.02
					50	25	20.77	21.00	-2.11	0.01	1.054	0.01
LTE Band 12	QPSK (10MHz)	Front	23095	707.5	1	24	22.65	23.00	-2.61	0.18	1.084	0.20
					25	0	21.44	21.50	1.01	0.14	1.014	0.14
		Back	23095	707.5	1	24	22.65	23.00	-2.77	0.28	1.084	**0.30**
					25	0	21.44	21.50	0.48	0.20	1.014	0.20
		Right	23095	707.5	1	24	22.65	23.00	2.37	0.03	1.084	0.03
					25	0	21.44	21.50	-2.06	0.02	1.014	0.02
		Top	23095	707.5	1	24	22.65	23.00	-2.69	0.02	1.084	0.02
					25	0	21.44	21.50	1.38	0.01	1.014	0.01

LTE Band 17	QPSK (10MHz)	Front	23790	710	1	0	22.59	23.00	0.71	0.18	1.099	0.20
					25	12	21.62	22.00	1.30	0.10	1.091	0.11
		Back	23790	710	1	0	22.59	23.00	-1.19	0.32	1.099	**0.35**
					25	12	21.62	22.00	-0.63	0.30	1.091	0.33
		Right	23790	710	1	0	22.59	23.00	0.42	0.02	1.099	0.02
					25	12	21.62	22.00	-2.60	0.01	1.091	0.01
		Top	23790	710	1	0	22.59	23.00	3.08	0.03	1.099	0.03
					25	12	21.62	22.00	4.21	0.02	1.091	0.02
LTE Band 66	QPSK (20MHz)	Front	132322	1745	1	49	22.38	22.50	-2.67	0.28	1.028	0.29
					50	0	21.13	21.50	0.60	0.20	1.089	0.22
		Back	132322	1745	1	49	22.38	22.50	-0.82	0.47	1.028	**0.48**
					50	0	21.13	21.50	-1.00	0.40	1.089	0.44
		Right	132322	1745	1	49	22.38	22.50	-1.21	0.02	1.028	0.02
					50	0	21.13	21.50	-3.11	0.01	1.089	0.01
		Top	132322	1745	1	49	22.38	22.50	-0.20	0.03	1.028	0.03
					50	0	21.13	21.50	-2.77	0.02	1.089	0.02

Note:

1. Per KDB 447498 D01 v06, 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 447498 D01 v06, body-worn with hotspot use is evaluated with the device positioned at 10 mm from a flat phantom filled with head tissue-equivalent medium.
3. Per KDB 447498 D01 v06, the report SAR is measured SAR value adjusted for maximum tune-up tolerance. Scaling Factor=10^[(tune-up limit power(dBm) - Ave. power (dBm))/10], where tune-up limit is the maximum rated power among all production units.
   Reported SAR(W/kg)=Measured SAR (W/kg)*Scaling Factor.
4. Per KDB865664D01 v01r04 perform a second repeated measurement only the ratio of largest to smallest SAR for the original and first repeated measurement is >1.20 or when the original or repeated measurement is ⩾ 1.45W/kg.
5. Perform a second measurement only if the original, first and second repeated measurement is ⩾1.5w/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurement is >1.20.

10.3. Simultaneous Transmission Conclusion

Multi-Band Simultaneous Transmission Considerations

According to FCC KDB Publication 447498 D01v05r02, 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.

Simultaneous Transmission Paths

Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05r02, 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 D01v05r02 4.3.2.2), the following equation must be used to estimate the standalone 1g SAR and 10g extremity SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{7.5(18.75)} \cdot \frac{\text{Max. power of channel, mW}}{\text{Min. Separation Distance, mm}}$$

Mode	Max. tune-up Power (dBm)	Exposure Position	Head	Body -worn
		Test Distance (mm)	5	5
BLE	5.50	Estimated SAR (W/kg)	/	0.15

Note:

1. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according is applied to determine estimated SAR.
2. (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 5 mm; where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
3. Next to the mouth exposure requires 1-g SAR, and the wrist-worn condition requires 10-g extremity SAR.

Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

NO.	Configuration	Head	Body-Worn	Hotspot
1	GSM850/1900(Voice)+WIFI(2.4/5G)	NO	YES	NO
2	GPRS 850/1900(DATA)+WIFI(2.4/5G)	NO	YES	YES
3	WCDMA+ WIFI(2.4/5G)	NO	YES	YES
4.	LTE+WIFI(2.4/5G)	NO	YES	YES
5.	GSM850/1900(Voice)+BT	NO	YES	NO
6	GPRS/EDGE 850/1900(DATA)+BT	NO	YES	NO
7.	WCDMA+ BT	NO	YES	NO
8.	LTE+BT	NO	YES	NO

10.4. SAR Simultaneous Transmission Analysis

Band	Test Position	Scaled SAR				Σ SAR (W/kg)	SPLSR	Remark
		Body-Worn	WIFI 2.4G	WIFI 5G	BT			
GSM850 (voice)	Front	0.27	0.15	0.17	0.15	0.44	N/A	N/A
	Back	0.53	0.45	0.31	0.15	0.98	N/A	N/A
GSM850 (GPRS 4slot)	Front	0.36	0.15	0.17	0.15	0.53	N/A	N/A
	Back	0.68	0.45	0.31	0.15	1.13	N/A	N/A
GSM1900 (voice)	Front	0.12	0.15	0.17	0.15	0.29	N/A	N/A
	Back	0.21	0.45	0.31	0.15	0.66	N/A	N/A
GSM1900 (GPRS 3slot)	Front	0.35	0.15	0.17	0.15	0.52	N/A	N/A
	Back	0.58	0.45	0.31	0.15	1.03	N/A	N/A
WCDMA Band II	Front	0.33	0.15	0.17	0.15	0.50	N/A	N/A
	Back	0.68	0.45	0.31	0.15	1.13	N/A	N/A
WCDMA Band IV	Front	0.19	0.15	0.17	0.15	0.36	N/A	N/A
	Back	0.48	0.45	0.31	0.15	0.93	N/A	N/A
WCDMA Band V	Front	0.17	0.15	0.17	0.15	0.34	N/A	N/A
	Back	0.26	0.45	0.31	0.15	0.71	N/A	N/A

Band	Test Position	RB allocation	Scaled				Σ SAR (W/kg)	SPLSR	Remark
			Body-Worn	WIFI 2.4G	WIFI 5G	Bluetooth			
LTE Band 2 QPSK (20MHz)	Front	1	0.36	0.15	0.17	0.15	0.53	N/A	N/A
		50	0.31	0.15	0.17	0.15	0.48	N/A	N/A
	Back	1	0.68	0.45	0.31	0.15	1.13	N/A	N/A
		50	0.64	0.45	0.31	0.15	1.09	N/A	N/A
LTE Band 4 QPSK (20MHz)	Front	1	0.46	0.15	0.17	0.15	0.63	N/A	N/A
		50	0.44	0.15	0.17	0.15	0.61	N/A	N/A
	Back	1	0.72	0.45	0.31	0.15	**1.17**	N/A	N/A
		50	0.71	0.45	0.31	0.15	1.16	N/A	N/A
LTE Band 5 QPSK (10MHz)	Front	1	0.34	0.15	0.17	0.15	0.51	N/A	N/A
		25	0.28	0.15	0.17	0.15	0.45	N/A	N/A
	Back	1	0.62	0.45	0.31	0.15	1.07	N/A	N/A
		25	0.59	0.45	0.31	0.15	1.04	N/A	N/A
LTE Band 7 QPSK (20MHz)	Front	1	0.26	0.15	0.17	0.15	0.43	N/A	N/A
		50	0.21	0.15	0.17	0.15	0.38	N/A	N/A
	Back	1	0.57	0.45	0.31	0.15	1.02	N/A	N/A
		50	0.55	0.45	0.31	0.15	1.00	N/A	N/A

LTE Band 12 QPSK (10MHz)	Front	1	0.16	0.15	0.17	0.15	0.33	N/A	N/A
		25	0.10	0.15	0.17	0.15	0.27	N/A	N/A
	Back	1	0.25	0.45	0.31	0.15	0.70	N/A	N/A
		25	0.20	0.45	0.31	0.15	0.65	N/A	N/A
LTE Band 17 QPSK (10MHz)	Front	1	0.16	0.15	0.17	0.15	0.33	N/A	N/A
		25	0.11	0.15	0.17	0.15	0.28	N/A	N/A
	Back	1	0.34	0.45	0.31	0.15	0.79	N/A	N/A
		25	0.29	0.45	0.31	0.15	0.74	N/A	N/A
LTE Band 66 QPSK (20MHz)	Front	1	0.27	0.15	0.17	0.15	0.44	N/A	N/A
		50	0.23	0.15	0.17	0.15	0.40	N/A	N/A
	Back	1	0.47	0.45	0.31	0.15	0.92	N/A	N/A
		50	0.44	0.45	0.31	0.15	0.89	N/A	N/A

Band	Test Position	Scaled SAR			Σ SAR (W/kg)	SPLSR	Remark
		Hotspot	WIFI 2.4G	WIFI 5G			
GSM850 (GPRS)	Front	0.37	0.26	0.21	0.63	N/A	N/A
	Back	0.69	0.46	0.35	1.15	N/A	N/A
	Right	0.03	/	/	0.03	N/A	N/A
	Top	0.01	/	/	0.01	N/A	N/A
	Bottom	/	0.03	0.01	0.03	N/A	N/A
GSM1900 (GPRS)	Front	0.35	0.26	0.21	0.61	N/A	N/A
	Back	0.60	0.48	0.35	1.08	N/A	N/A
	Right	0.03	/	/	0.03	N/A	N/A
	Top	0.01	/	/	0.01	N/A	N/A
	Bottom	/	0.03	0.01	0.03	N/A	N/A
WCDMA Band II	Front	0.38	0.26	0.21	0.64	N/A	N/A
	Back	0.71	0.46	0.35	1.17	N/A	N/A
	Right	0.02	/	/	0.02	N/A	N/A
	Top	0.01	/	/	0.01	N/A	N/A
	Bottom	/	0.03	0.01	0.03	N/A	N/A
WCDMA Band IV	Front	0.28	0.26	0.21	0.54	N/A	N/A
	Back	0.50	0.46	0.35	0.96	N/A	N/A
	Right	0.03	/	/	0.03	N/A	N/A
	Top	0.01	/	/	0.01	N/A	N/A
	Bottom	/	0.03	0.01	0.03	N/A	N/A
WCDMA Band V	Front	0.19	0.26	0.21	0.45	N/A	N/A
	Back	0.29	0.46	0.35	0.75	N/A	N/A
	Right	0.02	/	/	0.02	N/A	N/A
	Top	0.01	/	/	0.01	N/A	N/A
	Bottom	/	0.03	0.01	0.03	N/A	N/A

Band	Test Position	RB allocation	Scaled			Σ SAR (W/kg)	SPLSR	Remark
			Hotspot	WIFI2.4G	WIFI 5G			
LTE Band 2 QPSK (20MHz)	Front	1	0.39	0.26	0.21	0.65	N/A	N/A
		50	0.32	0.26	0.21	0.58	N/A	N/A
	Back	1	0.70	0.46	0.35	1.16	N/A	N/A
		50	0.66	0.46	0.35	1.12	N/A	N/A
	Right	1	0.03	/	/	0.03	N/A	N/A
		50	0.02	/	/	0.02	N/A	N/A
	Top	1	0.02	/	/	0.02	N/A	N/A
		50	0.01	/	/	0.01	N/A	N/A
	Bottom	1	/	0.03	0.01	0.03	N/A	N/A
		50	/	0.03	0.01	0.03	N/A	N/A
LTE Band 4 QPSK (20MHz)	Front	1	0.35	0.26	0.21	0.61	N/A	N/A
		50	0.33	0.26	0.21	0.59	N/A	N/A
	Back	1	0.75	0.46	0.35	**1.21**	N/A	N/A
		50	0.75	0.46	0.35	1.21	N/A	N/A
	Right	1	0.03	/	/	0.03	N/A	N/A
		50	0.02	/	/	0.02	N/A	N/A
	Top	1	0.02	/	/	0.02	N/A	N/A
		50	0.01	/	/	0.01	N/A	N/A
	Bottom	1	/	0.03	0.01	0.03	N/A	N/A
		50	/	0.03	0.01	0.03	N/A	N/A
LTE Band 5 QPSK (10MHz)	Front	1	0.34	0.26	0.21	0.6	N/A	N/A
		25	0.31	0.26	0.21	0.57	N/A	N/A
	Back	1	0.64	0.46	0.35	1.1	N/A	N/A
		25	0.59	0.46	0.35	1.05	N/A	N/A
	Right	1	0.02	/	/	0.02	N/A	N/A
		25	0.01	/	/	0.01	N/A	N/A
	Top	1	0.02	/	/	0.02	N/A	N/A
		25	0.01	/		0.01	N/A	N/A
	Bottom	1	/	0.03	0.01	0.03	N/A	N/A
		25	/	0.03	0.01	0.03	N/A	N/A

LTE Band 7 QPSK (20MHz)	Front	1	0.31	0.26	0.21	0.57	N/A	N/A
		50	0.28	0.26	0.21	0.54	N/A	N/A
	Back	1	0.61	0.46	0.35	1.07	N/A	N/A
		50	0.57	0.46	0.35	1.03	N/A	N/A
	Right	1	0.03	/	/	0.03	N/A	N/A
		50	0.02	/	/	0.02	N/A	N/A
	Top	1	0.02	/	/	0.02	N/A	N/A
		50	0.01	/	/	0.01	N/A	N/A
	Bottom	1	/	0.03	0.01	0.03	N/A	N/A
		50	/	0.03	0.01	0.03	N/A	N/A
LTE Band 12 QPSK (10MHz)	Front	1	0.20	0.26	0.21	0.46	N/A	N/A
		25	0.14	0.26	0.21	0.4	N/A	N/A
	Back	1	0.30	0.46	0.35	0.76	N/A	N/A
		25	0.20	0.46	0.35	0.66	N/A	N/A
	Right	1	0.03	/	/	0.03	N/A	N/A
		25	0.02	/	/	0.02	N/A	N/A
	Top	1	0.02	/	//	0.02	N/A	N/A
		25	0.01	/	/	0.01	N/A	N/A
	Bottom	1	/	0.03	0.01	0.03	N/A	N/A
		25	/	0.03	0.01	0.03	N/A	N/A
LTE Band 17 QPSK (10MHz)	Front	1	0.20	0.26	0.21	0.46	N/A	N/A
		25	0.11	0.26	0.21	0.37	N/A	N/A
	Back	1	0.35	0.46	0.35	0.81	N/A	N/A
		25	0.33	0.46	0.35	0.79	N/A	N/A
	Right	1	0.02	/	/	0.02	N/A	N/A
		25	0.01	/	/	0.01	N/A	N/A
	Top	1	0.03	/	/	0.03	N/A	N/A
		25	0.02	/	/	0.02	N/A	N/A
	Bottom	1	/	0.03	0.01	0.03	N/A	N/A
		25	/	0.03	0.01	0.03	N/A	N/A

LTE Band 66 QPSK (20MHz)	Front	1	0.29	0.26	0.21	0.55	N/A	N/A
		50	0.22	0.26	0.21	0.48	N/A	N/A
	Back	1	0.48	0.46	0.35	0.94	N/A	N/A
		50	0.44	0.46	0.35	0.90	N/A	N/A
	Right	1	0.02	/	/	0.02	N/A	N/A
		50	0.01	/	/	0.01	N/A	N/A
	Top	1	0.03	/	/	0.03	N/A	N/A
		50	0.02	/	/	0.02	N/A	N/A
	Bottom	1	/	0.03	0.01	0.03	N/A	N/A
		50	/	0.03	0.01	0.03	N/A	N/A

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 measured volumetric simultaneous SAR summation is not required per FCC KDB Publication 447498 D01v05r02.

10.5. Measurement Uncertainty (450MHz-3GHz)

UNCERTAINTY EVALUATION FOR HEADSET SAR									
Uncertainty Component	Description	Uncertainty Value(%)	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. 1g(%)	Std. Unc. 10g(%)	v
Measurement system									
Probe calibration	7.2.1	5.8	N	1	1	1	5.8	5.8	∞
Axial isotropy	7.2.1.1	3.5	R	$\sqrt{3}$	$(1-C_p)^{1/2}$	$(1-C_p)^{1/2}$	1.43	1.43	∞
Hemispherical isotropy	7.2.1.1	5.9	R	$\sqrt{3}$	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
Boundary Effects	7.2.1.4	1.00	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	7.2.1.2	4.70	R	$\sqrt{3}$	1	1	2.71	2.71	∞
System detection limits	7.2.1.2	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation Response	7.2.1.3	3	N	1	1	1	3.00	3.00	∞
Readout Electronics	7.2.1.5	0.5	N	1	1	1	0.50	0.50	∞
Response Time	7.2.1.6	0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
Integration Time	7.2.1.7	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
RF Ambient Conditions-Noise	7.2.3.7	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF Ambient Conditions-Reflection	7.2.3.7	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioned mechanical Tolerance	7.2.2.1	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	7.2.2.3	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Extrapolation interpolation and integration algorithms for Max.SAR evaluation	7.2.4	2.3	R	1	1	1	1.33	1.33	∞
Test sample related									
Test sample positioning	7.2.2.4.4	2.6	N	1	1	1	2.60	2.60	∞
Device holder uncertainty	7.2.2.4.2 7.2.2.4.3	3	N	1	1	1	3.00	3.00	∞
output power variation-SAR drift measurement	7.2.3.6	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
SAR scaling	7.2.5	2	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and tissue parameters									
Phantom uncertainty (shape and thickness tolerances)	7.2.2.2	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
uncertainty in SAR correction for deviation (in permittivity and conductivity)	7.2.6	2	N	1	1	0.84	2.00	1.68	∞
Liquid conductivity (temperature uncertainty)	7.2.3.5	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid conductivity -measurement uncertainty	7.2.3.3	4	N	1	0.23	0.26	0.92	1.04	∞
Liquid permittivity (temperature uncertainty)	7.2.3.5	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid permittivity measurement uncertainty	7.2.3.4	5	N	1	0.23	0.26	1.15	1.30	∞
Combined standard uncertainty			RSS				10.83	10.54	
Expanded uncertainty (95%CONFIDENCEINTERVAL			k				21.26	21.08	

UNCERTAINTY FOR PERFORMANCE CHECK									
Uncertainty Component	Description	Uncertainty Value(%)	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. 1g(%)	Std. Unc. 10g(%)	v
Measurement system									
Probe calibration	7.2.1	5.8	N	1	1	1	5.8	5.8	∞
Axial isotropy	7.2.1.1	3.5	R	$\sqrt{3}$	$(1-C_p)^{1/2}$	$(1-C_p)^{1/2}$	1.43	1.43	∞
Hemispherical isotropy	7.2.1.1	5.9	R	$\sqrt{3}$	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
Boundary Effects	7.2.1.4	1.00	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	7.2.1.2	4.70	R	$\sqrt{3}$	1	1	2.71	2.71	∞
System detection limits	7.2.1.2	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation Response	7.2.1.3	3	N	1	1	1	0.00	0.00	∞
Readout Electronics	7.2.1.5	0.5	N	1	1	1	0.50	0.50	∞
Response Time	7.2.1.6	0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
Integration Time	7.2.1.7	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
RF Ambient Conditions-Noise	7.2.3.7	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF Ambient Conditions-Reflection	7.2.3.7	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioned mechanical Tolerance	7.2.2.1	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	7.2.2.3	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Extrapolation interpolation and integration algorithms for Max.SAR evaluation	7.2.4	2.3	R	1	1	1	1.33	1.33	∞
Dipole									
Deviation of experimental source from numerical source		4	N	1	1	1	4.00	4.00	∞
Input power and SAR drift measurement	7.2.3.6	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Dipole axis to liquid distance		2	R	$\sqrt{3}$	1	1			∞
Phantom and tissue parameters									
Phantom uncertainty (shape and thickness tolerances)	7.2.2.2	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
uncertainty in SAR correction for deviation (in permittivity and conductivity)	7.2.6	2	N	1	1	0.84	2.00	1.68	∞
Liquid conductivity (temperature uncertainty)	7.2.3.5	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid conductivity -measurement uncertainty	7.2.3.3	4	N	1	0.23	0.26	0.92	1.04	∞
Liquid permittivity (temperature uncertainty)	7.2.3.5	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid permittivity measurement uncertainty	7.2.3.4	5	N	1	0.23	0.26	1.15	1.30	∞
Combined standard uncertainty			RSS				10.15	10.05	
Expanded uncertainty (95%CONFIDENCEINTERVAL			k				20.29	20.10	

10.6. Test Equipment List

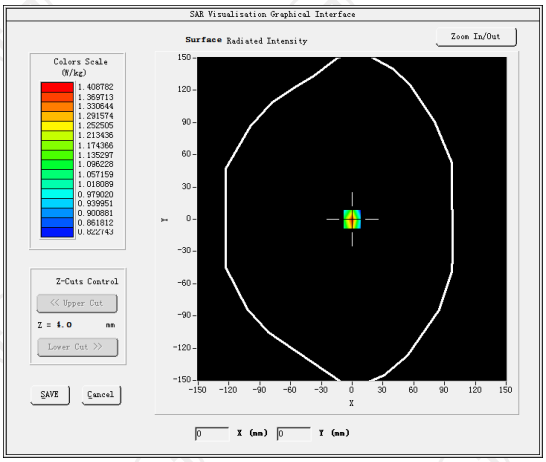
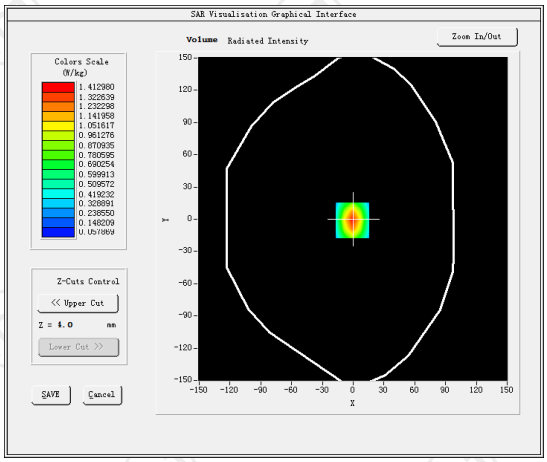
Test Equipment	Manufacturer	Model	Serial Number	Calibration	
				Calibration Date (D.M.Y)	Calibration Due (D.M.Y)
PC	Lenovo	H3050	N/A	N/A	N/A
Signal Generator	Angilent	N5182A	MY47070282	Jun. 08, 2021	Jun. 07, 2022
Multimeter	Keithley	Multimeter 2000	4078275	Jun. 08, 2021	Jun. 07, 2022
Network Analyzer	Agilent	8753E	US38432457	Jun. 08, 2021	Jun. 07, 2022
Wideband Radio Communication Tester	R&S	CMW500	114220	Jun. 08, 2021	Jun. 07, 2022
Power Meter	Agilent	E4418B	GB43312526	Jun. 08, 2021	Jun. 07, 2022
Power Meter	Agilent	E4416A	MY45101555	Jun. 08, 2021	Jun. 07, 2022
Power Meter	Agilent	N1912A	MY50001018	Jun. 08, 2021	Jun. 07, 2022
Power Sensor	Agilent	E9301A	MY41497725	Jun. 08, 2021	Jun. 07, 2022
Power Sensor	Agilent	E9327A	MY44421198	Jun. 08, 2021	Jun. 07, 2022
Power Sensor	Agilent	E9323A	MY53070005	Jun. 08, 2021	Jun. 07, 2022
Power Amplifier	PE	PE15A4019	112342	N/A	N/A
Directional Coupler	Agilent	722D	MY52180104	N/A	N/A
Attenuator	Chensheng	FF779	134251	N/A	N/A
E-Field PROBE	MVG	SSE2	SN 41/18 EPGO331	Aug. 02, 2021	Aug. 01, 2022
DIPOLE 750	MVG	SID750	SN 16/15 DIP 0G750-368	Jun. 05, 2021	Jun. 04, 2024
DIPOLE 835	MVG	SID835	SN 16/15 DIP 0G835-369	Jun. 05, 2021	Jun. 04, 2024
DIPOLE 1800	MVG	SID 1800	SN 16/15 DIP 1G800-371	Jun. 05, 2021	Jun. 04, 2024
DIPOLE 1900	MVG	SID1900	SN 16/15 DIP 1G900-372	Jun. 05, 2021	Jun. 04, 2024
DIPOLE 2450	MVG	SID 2450	SN 16/15 DIP 2G450-374	Jun. 05, 2021	Jun. 04, 2024
DIPOLE 2600	MVG	SID 2600	SN 16/15 DIP 2G600-375	Jun. 05, 2021	Jun. 04, 2024
DIPOLE 5G	MVG	SID 5G	SN 13/14 WGA32	May. 15, 2021	May. 14, 2024
Limesar Dielectric Probe	MVG	SCLMP	SN 19/15 OCPG71	Jun. 05, 2021	Jun. 04, 2024
Communication Antenna	MVG	ANTA59	SN 39/14 ANTA59	N/A	N/A
Mobile Phone Position Device	MVG	MSH101	SN 19/15 MSH101	N/A	N/A
Dummy Probe	MVG	DP66	SN 13/15 DP66	N/A	N/A
SAM PHANTOM	MVG	SAM120	SN 19/15 SAM120	N/A	N/A
PHANTOM TABLE	MVG	TABP101	SN 19/15 TABP101	N/A	N/A
Robot TABLE	MVG	TABP61	SN 19/15 TABP61	N/A	N/A
6 AXIS ROBOT	KUKA	KR6-R900	501822	N/A	N/A

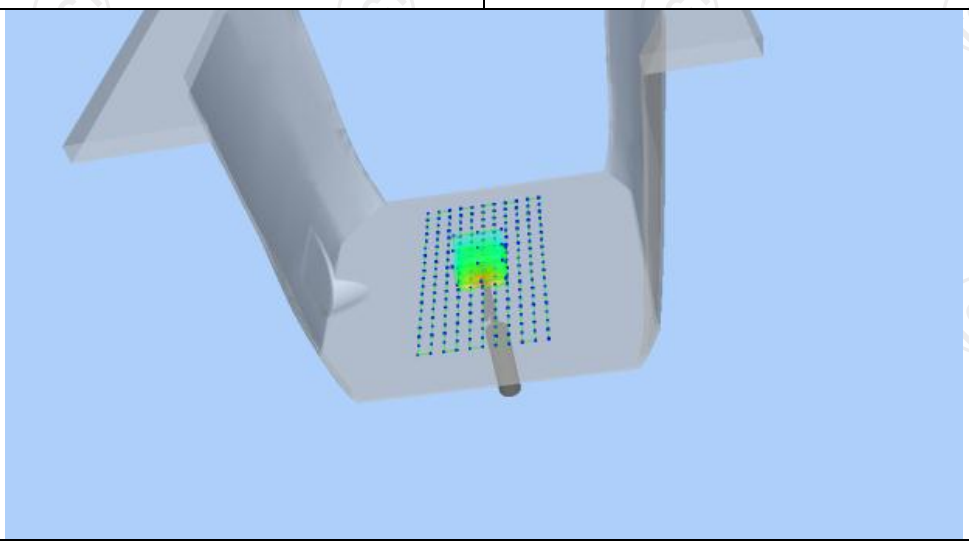
Note: *1.N/A means this equipment no need to calibrate*
2.Each Time means this device need to calibrate every use time
3. The dipole was not damaged properly repaired.
4. The measured SAR deviates from the calibrated SAR value by less than 10%
5. The most recent return-loss result meets the required 20 dB minimum return-loss requirement
6. The most recent measurement of the real or imaginary parts of the impedance deviates by less than 5 Ω from the previous measurement.

11. System Check Results

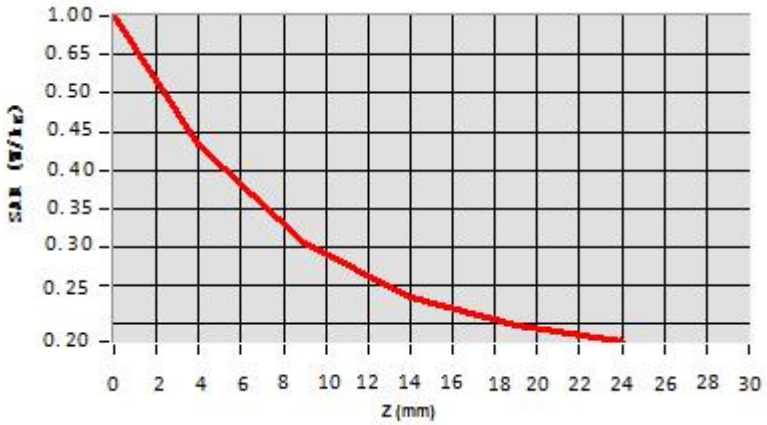
Date of measurement: 03/30/2022 Test mode: 750 (Body)
Product Description: Validation
Dipole Model: SID750
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	1.78
Frequency (MHz)	750.000000
Relative permittivity (real part)	56.701166
Relative permittivity (imaginary part)	20.148160
Conductivity (S/m)	0.981243
Variation (%)	-0.150000
SAR 10g (W/Kg)	**0.562014**
SAR 1g (W/Kg)	**0.832441**

SURFACE SAR	**VOLUME SAR**
	



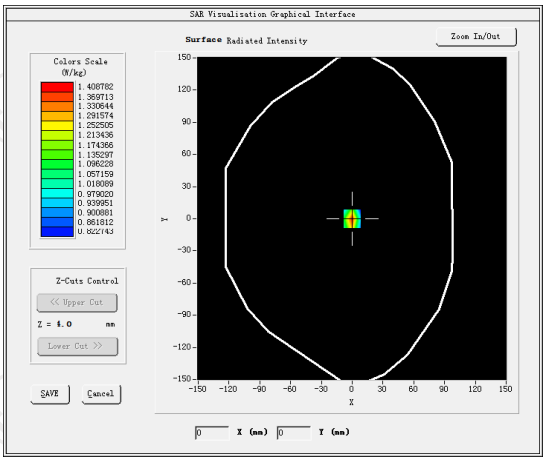
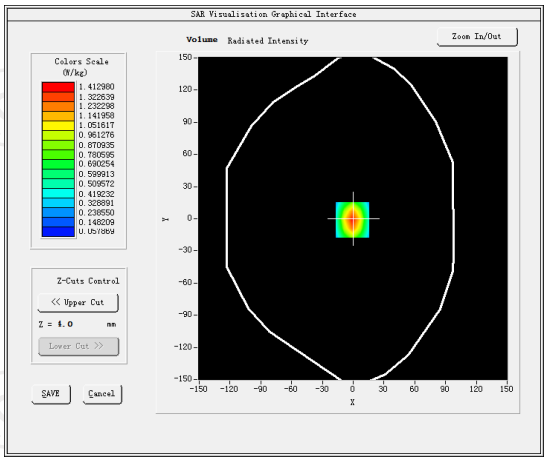
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.014	0.4420	0.3029	0.2419	0.2240

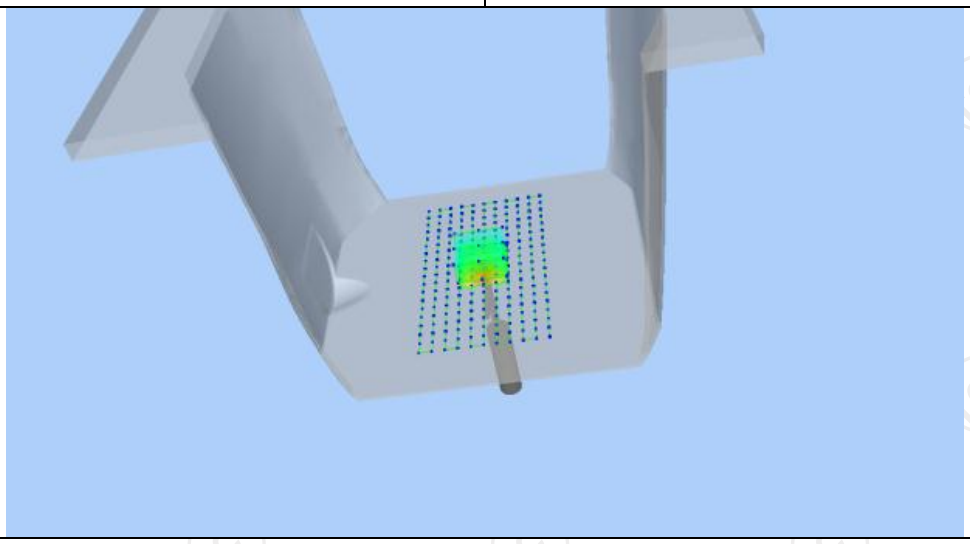


Hot spot position

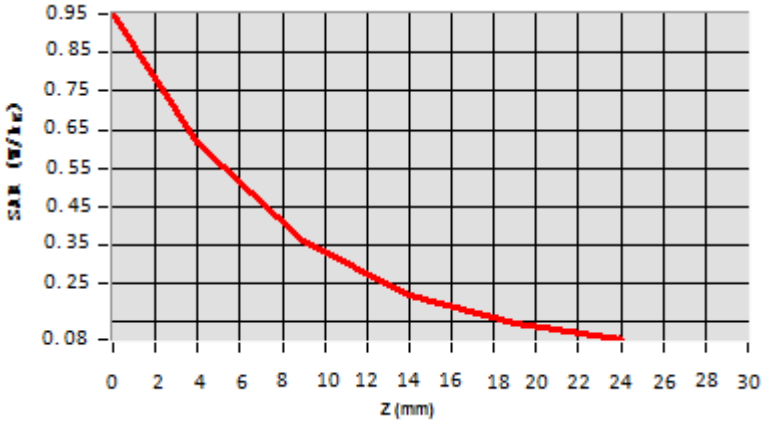
Date of measurement: 04/01/2022 Test mode: 835 (Body)
Product Description: Validation
Dipole Model: SID835
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	1.86
Frequency (MHz)	835.000000
Relative permittivity (real part)	56.352077
Relative permittivity (imaginary part)	21.378187
Conductivity (S/m)	0.988883
Variation (%)	-0.150000
SAR 10g (W/Kg)	**0.633123**
SAR 1g (W/Kg)	**0.949446**

SURFACE SAR	**VOLUME SAR**
	



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.9625	0.6022	0.3594	0.2202	0.0725

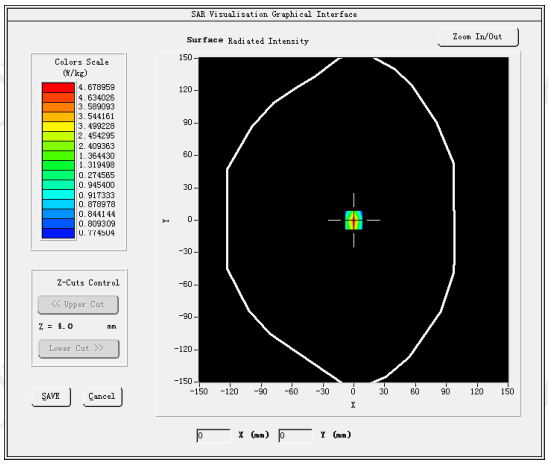
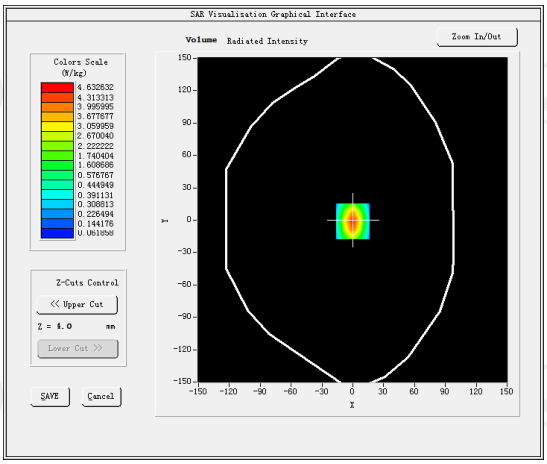


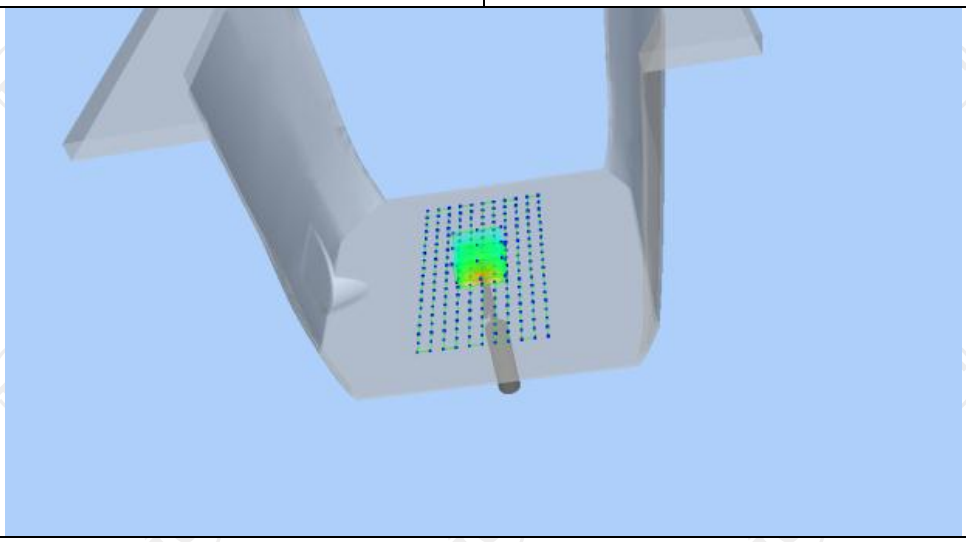
Hot spot position

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

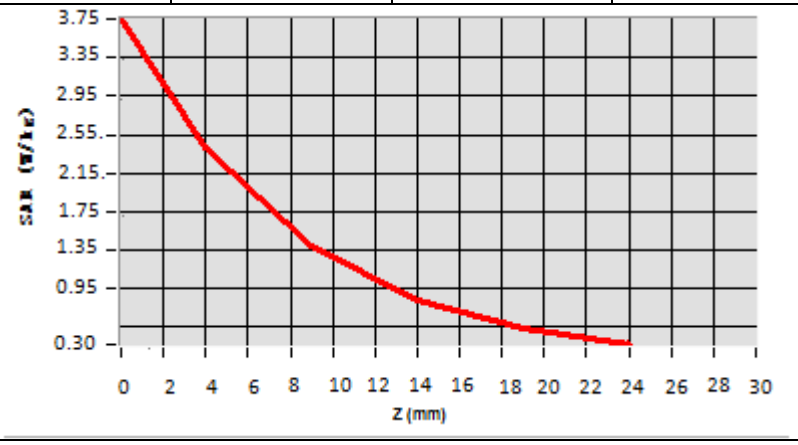
Date of measurement: 04/06/2022 Test mode: 1800MHz (Body)
Product Description: Validation
Dipole Model: SID1800
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	2.16
Frequency (MHz)	1800.000000
Relative permittivity (real part)	52.272699
Relative permittivity (imaginary part)	15.200000
Conductivity (S/m)	1.470000
Variation (%)	3.050000
SAR 10g (W/Kg)	**2.053687**
SAR 1g (W/Kg)	**3.782547**

SURFACE SAR	**VOLUME SAR**
	



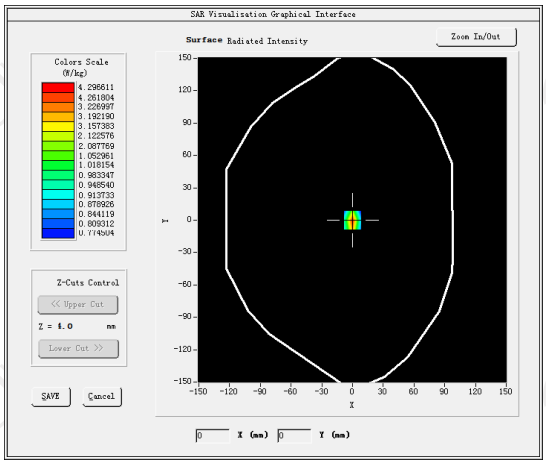
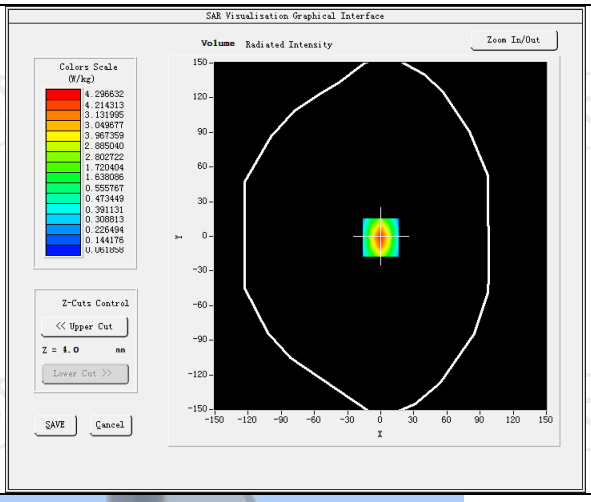
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	3.7545	2.4524	1.3520	0.8214	0.5525

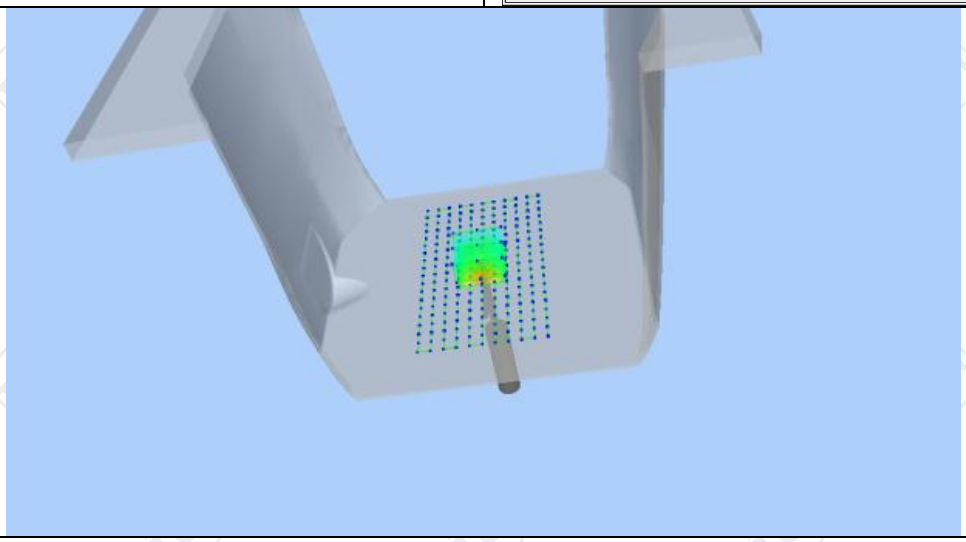


Hot spot position

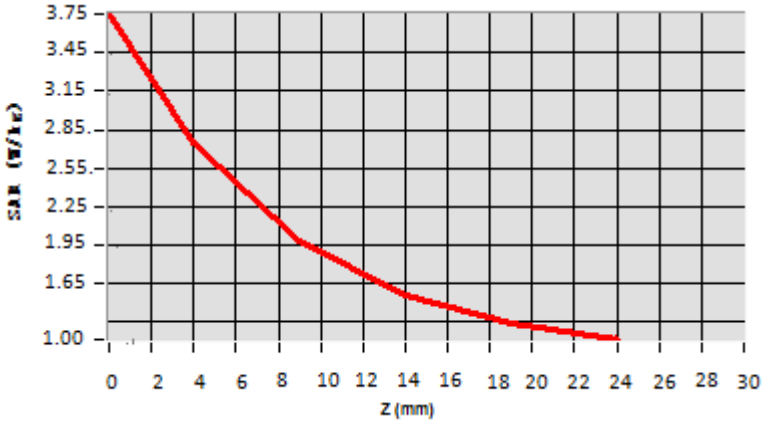
Date of measurement: 04/08/2022 Test mode: 1900MHz (Body)
Product Description: Validation
Dipole Model: SID1900
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	2.32
Frequency (MHz)	1900.000000
Relative permittivity (real part)	52.839999
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	1.590354
Variation (%)	1.250000
SAR 10g (W/Kg)	**1.994255**
SAR 1g (W/Kg)	**3.766112**

SURFACE SAR	**VOLUME SAR**
	



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	3.7752	2.7154	1.9525	1.5694	0.9014

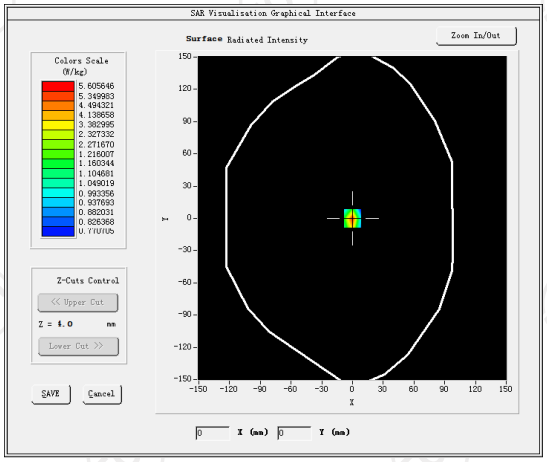
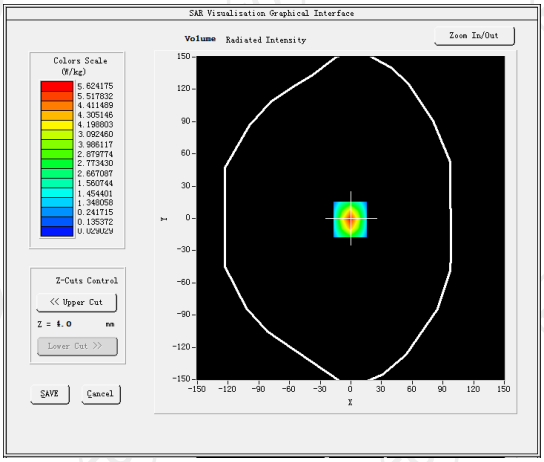


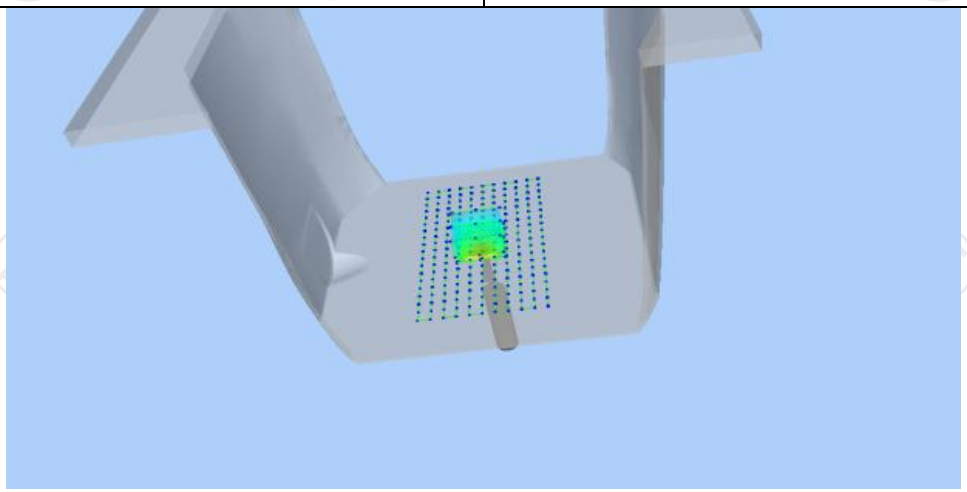
Hot spot position

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

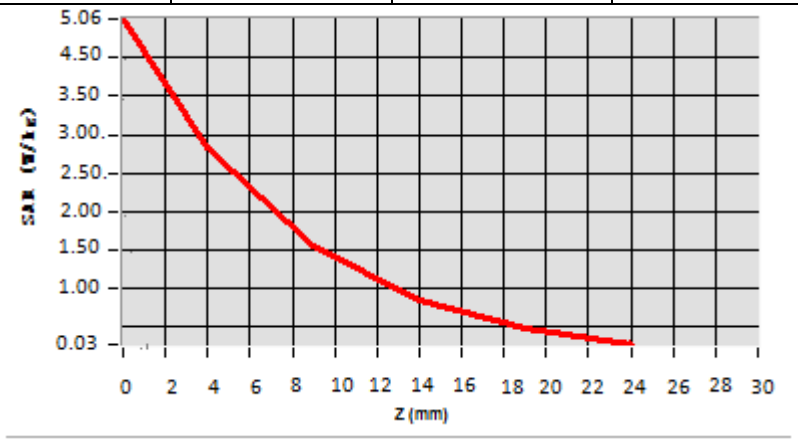
Date of measurement: 04/11/2022 Test mode: 2450MHz (Body)
Product Description: Validation
Dipole Model: SID2450
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	2.37
Frequency (MHz)	2450.000000
Relative permittivity (real part)	54.906199
Relative permittivity (imaginary part)	14.930150
Conductivity (S/m)	1.972159
Variation (%)	-0.230000
SAR 10g (W/Kg)	**2.416669**
SAR 1g (W/Kg)	**5.066368**

SURFACE SAR	**VOLUME SAR**
	



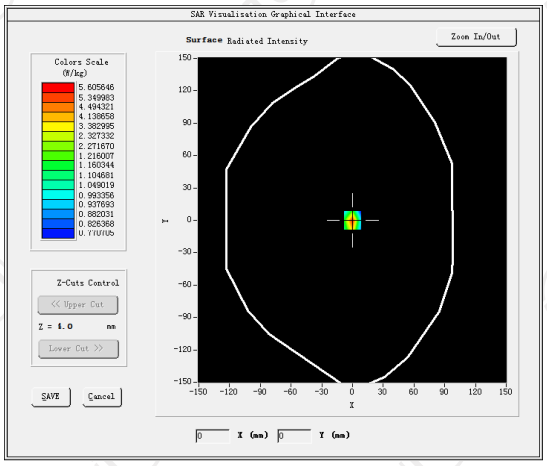
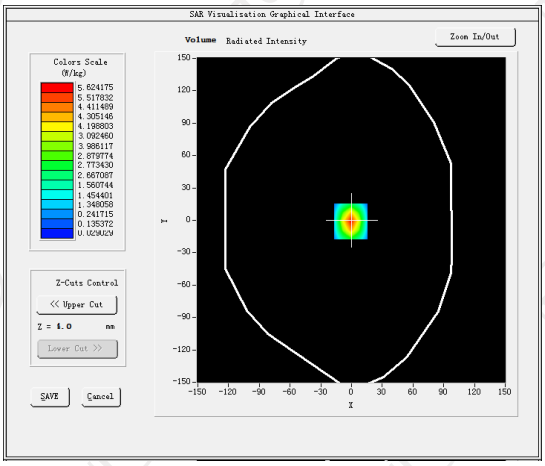
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	5.0622	2.7984	1.5251	0.8352	0.4200

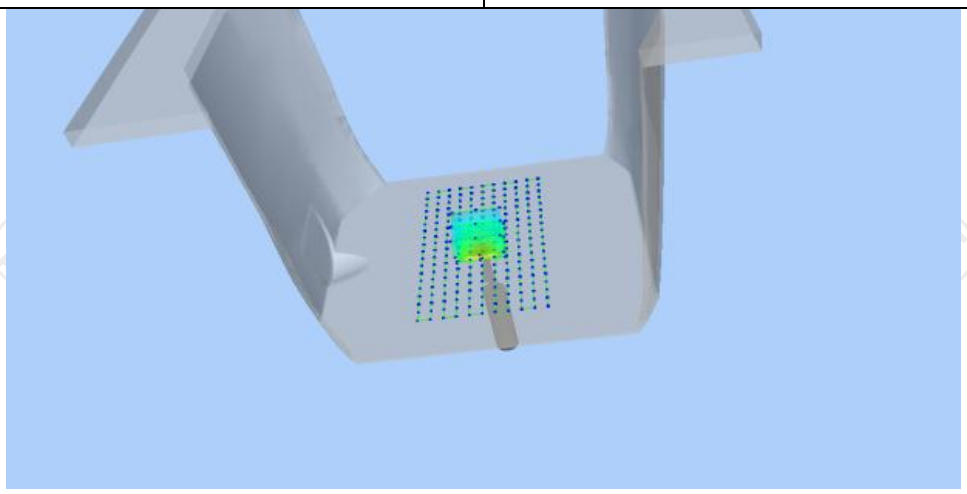


Hot spot position

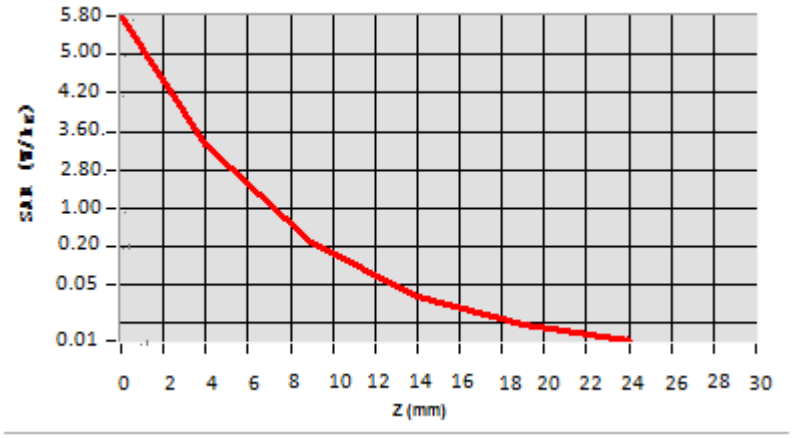
Date of measurement: 04/13/2022 Test mode: 2600MHz (Body)
Product Description: Validation
Dipole Model: SID2600
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	2.23
Frequency (MHz)	2535.000000
Relative permittivity (real part)	52.423887
Relative permittivity (imaginary part)	14.935214
Conductivity (S/m)	2.184821
Variation (%)	-1.800000
SAR 10g (W/Kg)	**2.382177**
SAR 1g (W/Kg)	**5.365098**

SURFACE SAR	**VOLUME SAR**
	



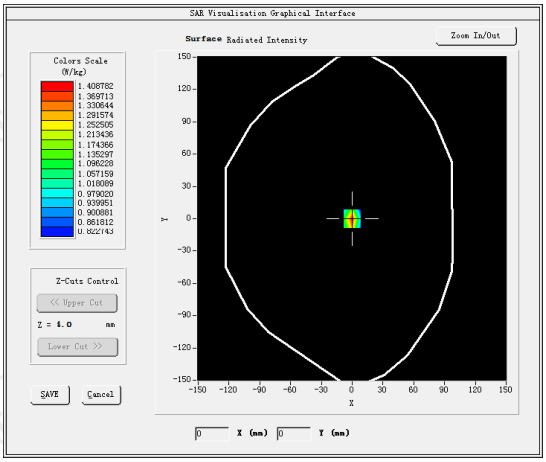
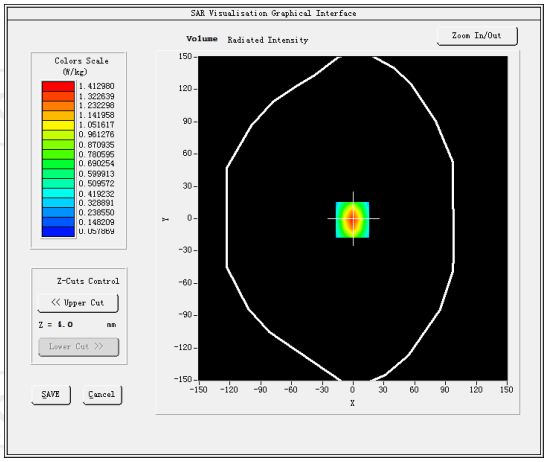
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	5.7721	3.2210	0.1937	0.0321	0.0203

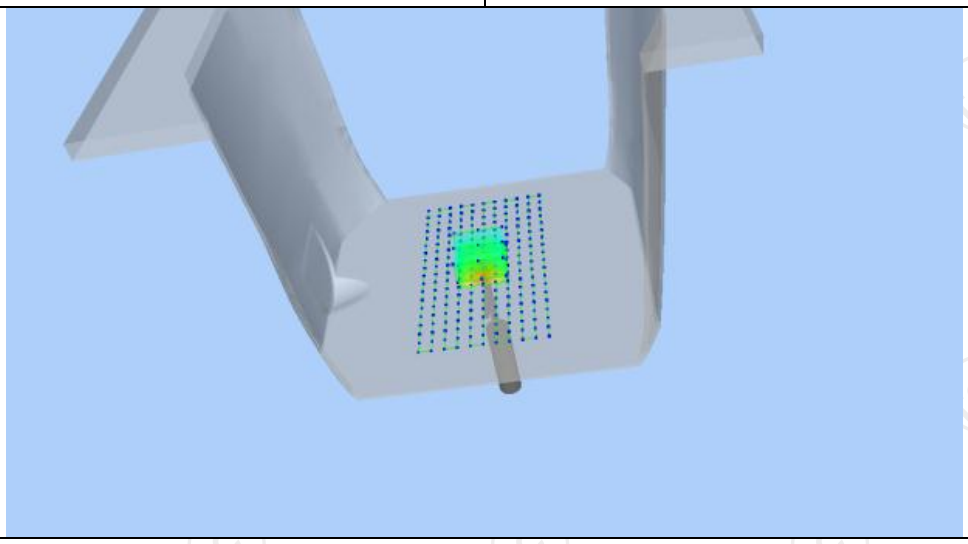


Hot spot position

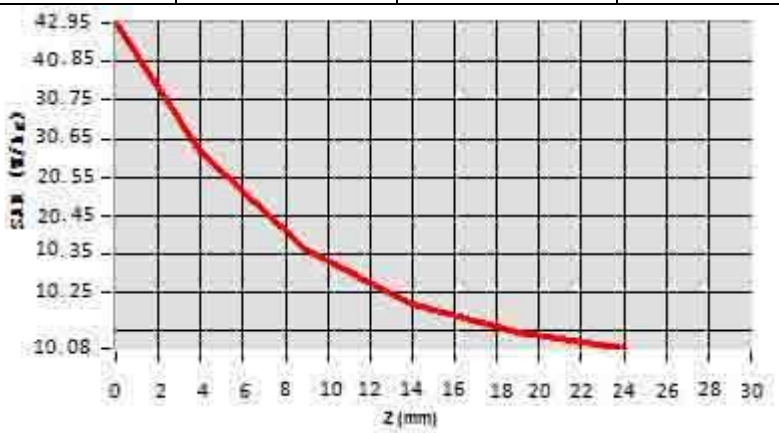
Date of measurement: 04/14/2022 Test mode: 5200 (Body)
Product Description: Validation
Dipole Model: SID5000
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	2.08
Frequency (MHz)	5200.000000
Relative permittivity (real part)	49.022077
Relative permittivity (imaginary part)	21.378187
Conductivity (S/m)	5.458883
Variation (%)	-3.140000
SAR 10g (W/Kg)	**5.623123**
SAR 1g (W/Kg)	**16.349446**

SURFACE SAR	**VOLUME SAR**
	



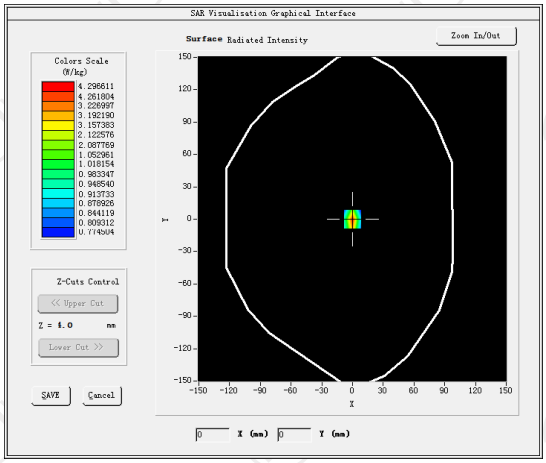
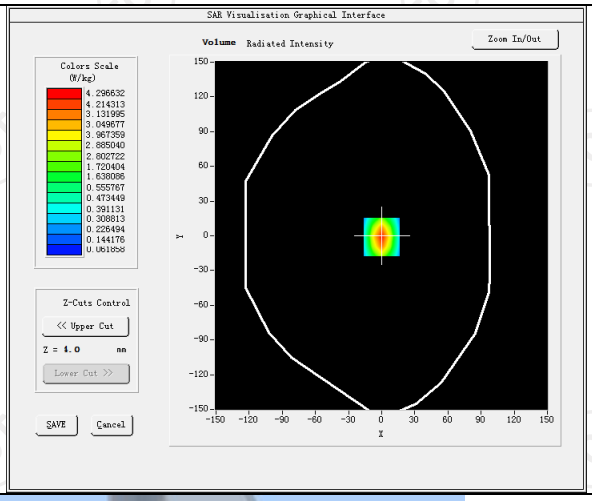
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	42.9525	27.6022	10.3594	10.2202	10.0725

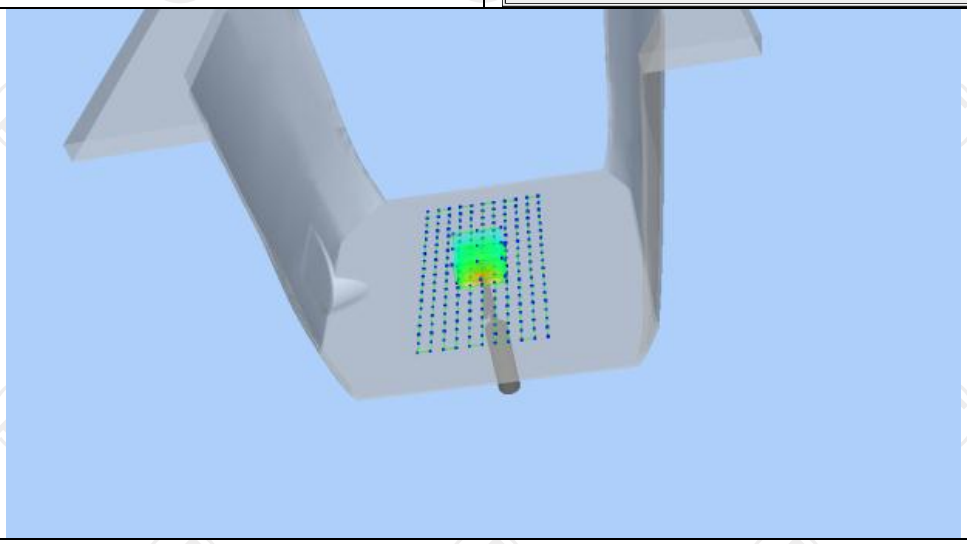


Hot spot position

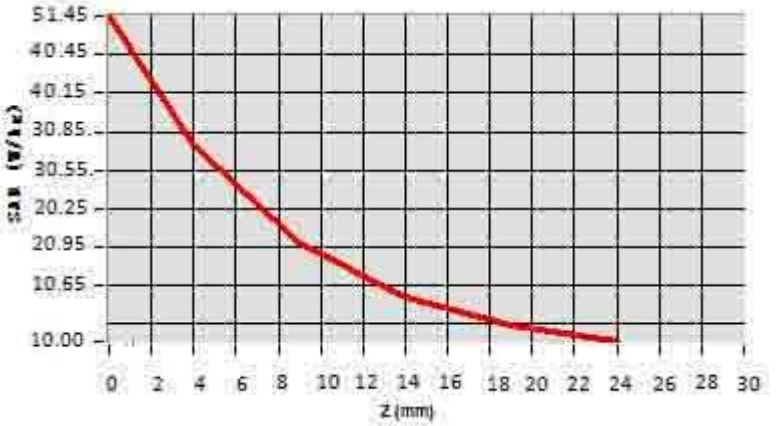
Date of measurement: 04/15/2022 Test mode: 5600MHz (Body)
Product Description: Validation
Dipole Model: SID5000
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	2.12
Frequency (MHz)	5600.000000
Relative permittivity (real part)	47.599999
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	5.770354
Variation (%)	1.410000
SAR 10g (W/Kg)	**5.994255**
SAR 1g (W/Kg)	**18.066112**

SURFACE SAR	**VOLUME SAR**
	



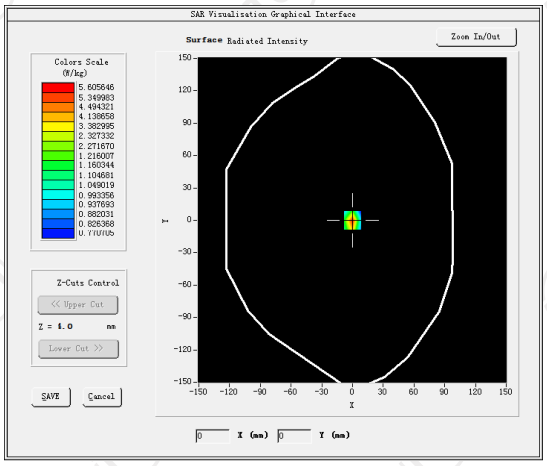
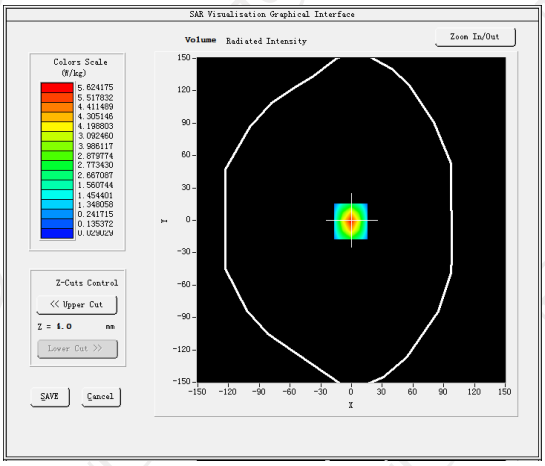
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	51.4532	30.7154	20.9525	10.5194	10.3514

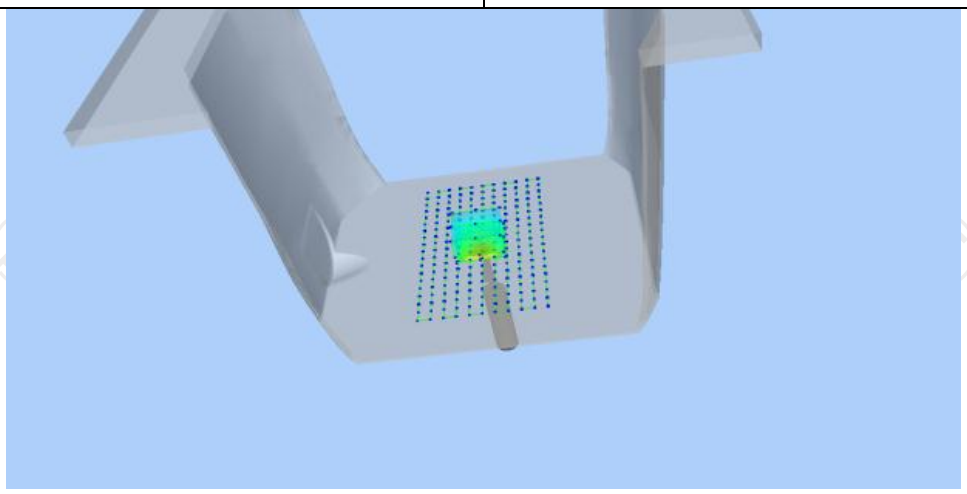


Hot spot position

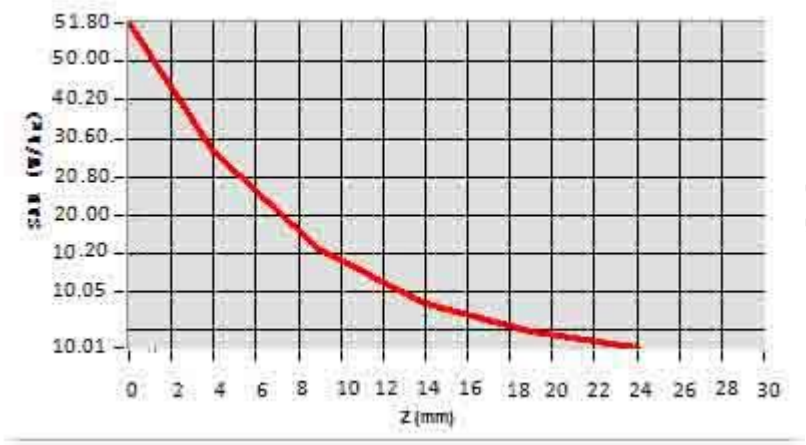
Date of measurement: 04/18/2022 Test mode: 5800MHz (Body)
Product Description: Validation
Dipole Model: SID5000
E-Field Probe: SSE2 (SN 41/18 EPGO331)

Phantom	Validation plane
Input Power	100mW
Crest Factor	1.0
Probe Conversion factor	2.13
Frequency (MHz)	5800.000000
Relative permittivity (real part)	47.813887
Relative permittivity (imaginary part)	14.935214
Conductivity (S/m)	6.124821
Variation (%)	-1.420000
SAR 10g (W/Kg)	**6.382177**
SAR 1g (W/Kg)	**18.365098**

SURFACE SAR	**VOLUME SAR**
	



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	51.8021	29.9510	10.2037	10.0321	10.0203

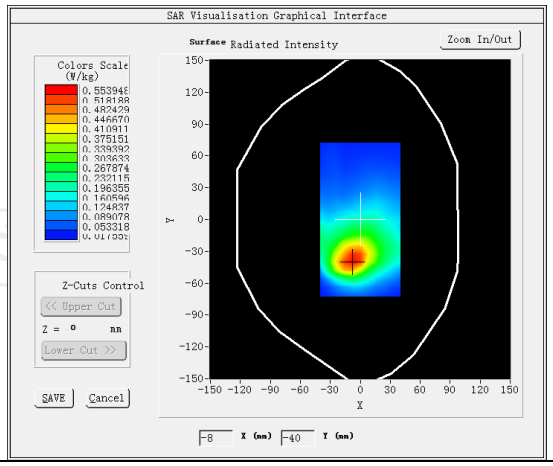


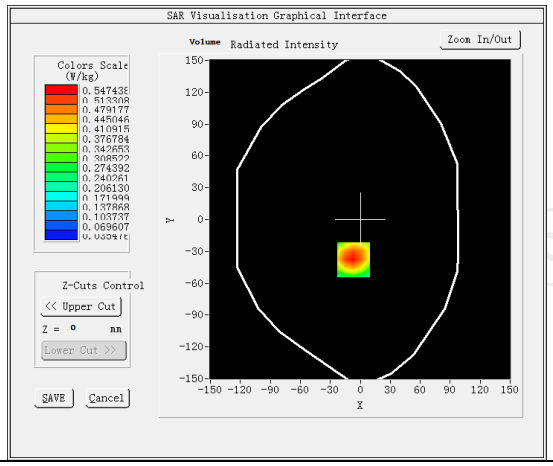
Hot spot position

12. SAR Test Data

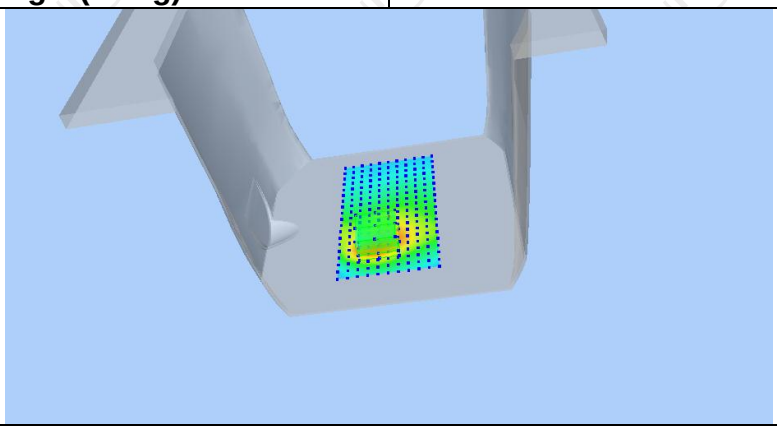
GSM850

MEASUREMENT 1	
Middle Band SAR (Channel 190):	Date: 04/01/2022
Frequency (MHz)	836.600000
Relative permittivity (real part)	55.212927
Relative permittivity (imaginary part)	21.368266
Conductivity (S/m)	0.971230
Variation (%)	-0.430000
Crest Factor:	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	GSM850(Voice)
SURFACE SAR	**VOLUME SAR**

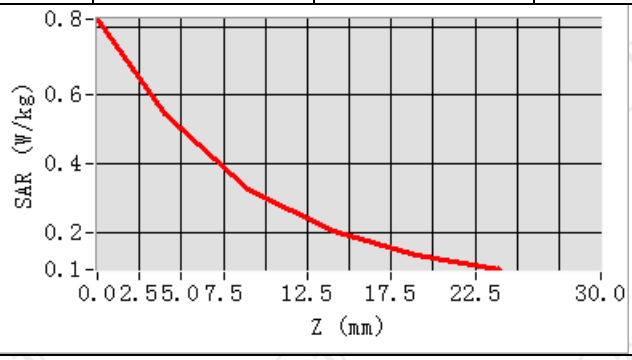




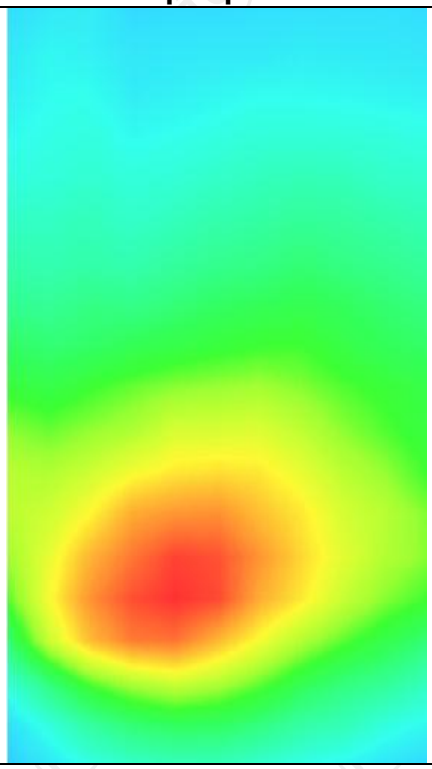
Maximum location: X=-7.00, Y=-38.00 SAR Peak: 0.83 W/kg	
SAR 10g (W/Kg)	0.315341
SAR 1g (W/Kg)	0.521422



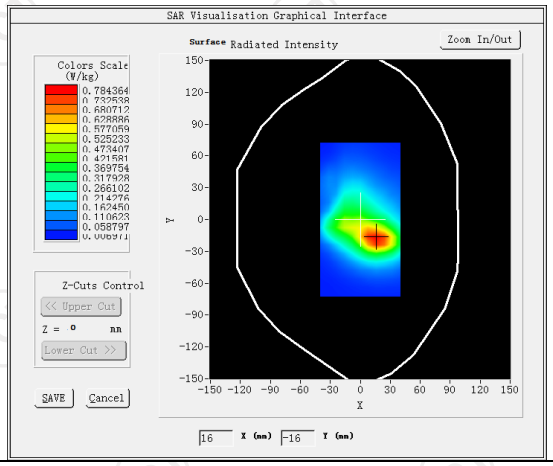
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8214	0.5474	0.3276	0.2028	0.1349

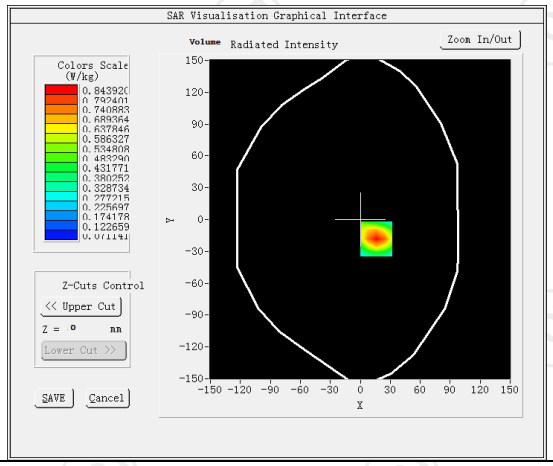


Hot spot position

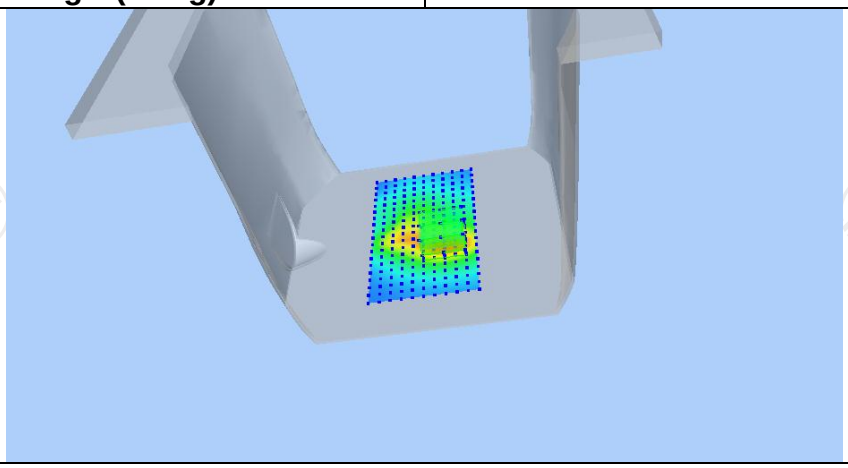


MEASUREMENT 2	
Middle Band SAR (Channel 190):	Date: 04/01/2022
Frequency (MHz)	836.600000
Relative permittivity (real part)	55.212927
Relative permittivity (imaginary part)	21.368266
Conductivity (S/m)	0.971230
Variation (%)	-3.190000
Crest Factor:	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	GSM850(GPRS 2slot)
SURFACE SAR	**VOLUME SAR**

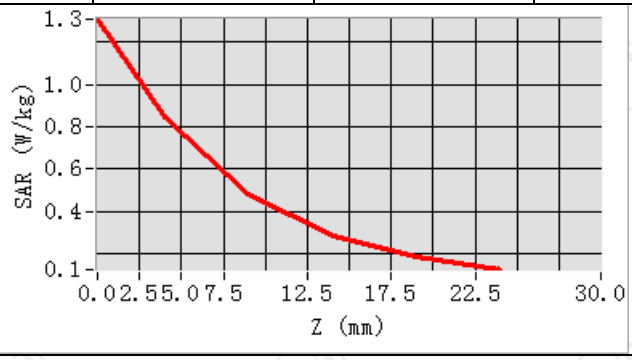




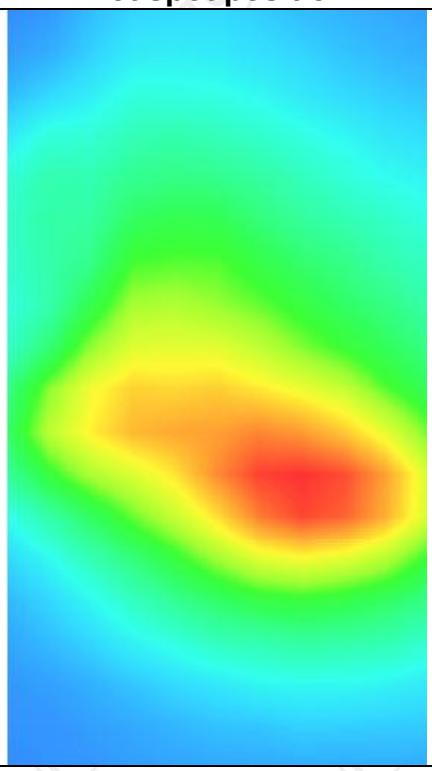
Maximum location: X=16.00, Y=-18.00 SAR Peak: 1.31 W/kg	
SAR 10g (W/Kg)	0.443765
SAR 1g (W/Kg)	0.627053

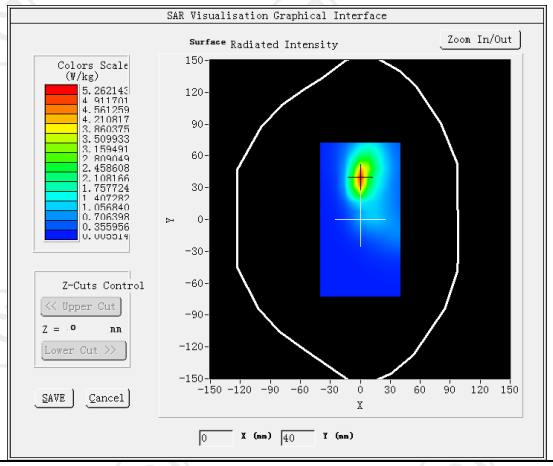
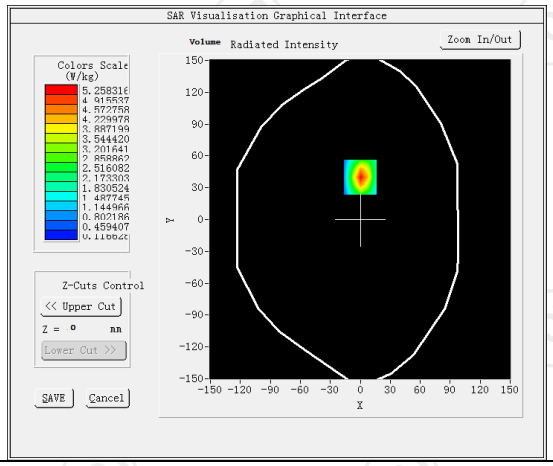
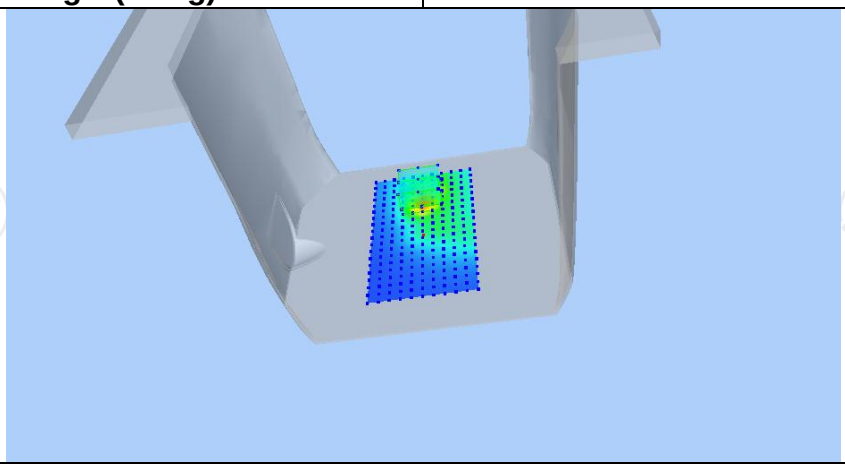


Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.3075	0.8439	0.4826	0.2858	0.1843

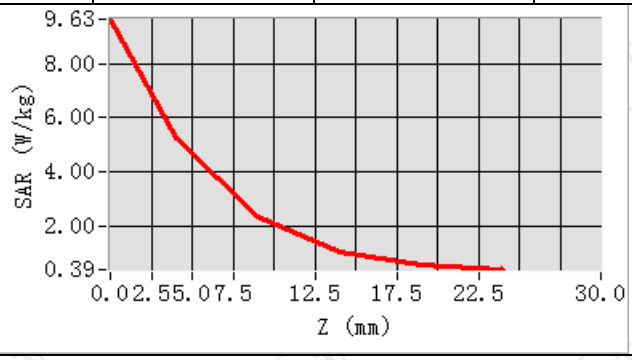


Hot spot position

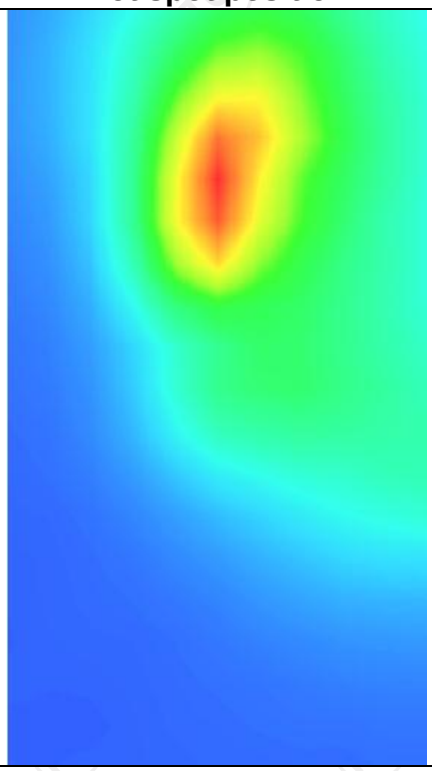


MEASUREMENT 3	
Middle Band SAR (Channel 190):	Date: 04/01/2022
Frequency (MHz)	836.600000
Relative permittivity (real part)	55.212927
Relative permittivity (imaginary part)	21.378266
Conductivity (S/m)	0.971230
Variation (%)	1.980000
Crest Factor:	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	GSM850(GPRS 2slot hotspot)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=0.00, Y=40.00 SAR Peak: 9.68 W/kg	
SAR 10g (W/Kg)	1.250846
SAR 1g (W/Kg)	0.641412
	

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	9.6338	5.2583	2.3168	1.0521	0.5848

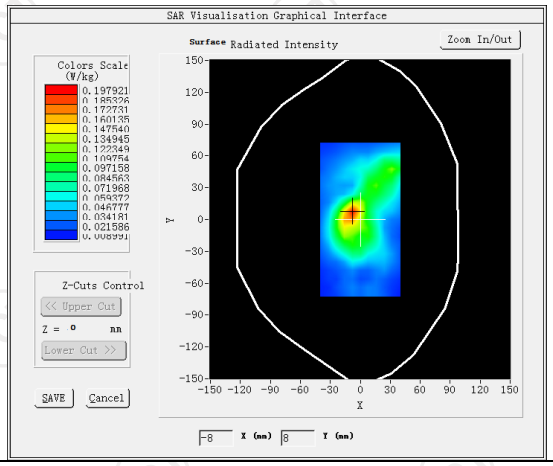


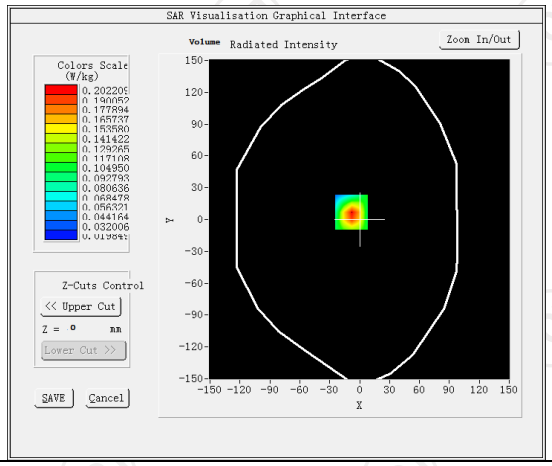
Hot spot position



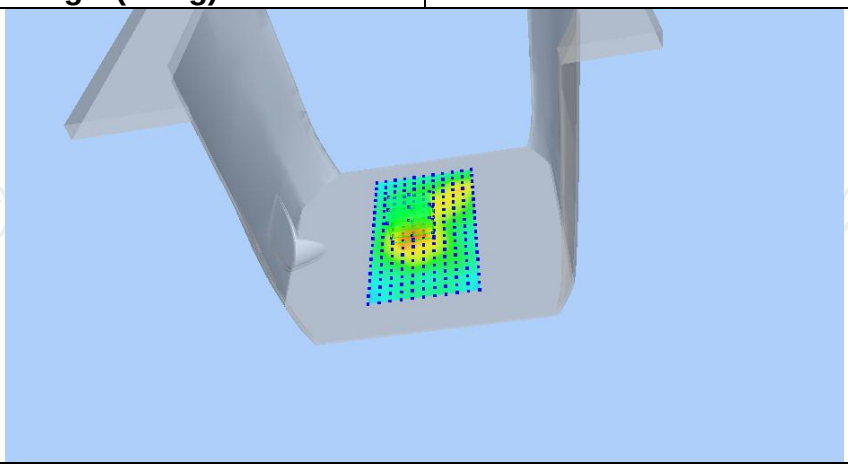
GSM1900

MEASUREMENT 1	
Middle Band SAR (Channel 661):	Date: 04/08/2022
Frequency (MHz)	1880.000000
Relative permittivity (real part)	53.291337
Relative permittivity (imaginary part)	14.322400
Conductivity (S/m)	1.531736
Variation (%)	2.660000
Crest Factor	1.0
Probe Conversion factor	2.32
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	GSM1900(voice)
SURFACE SAR	**VOLUME SAR**

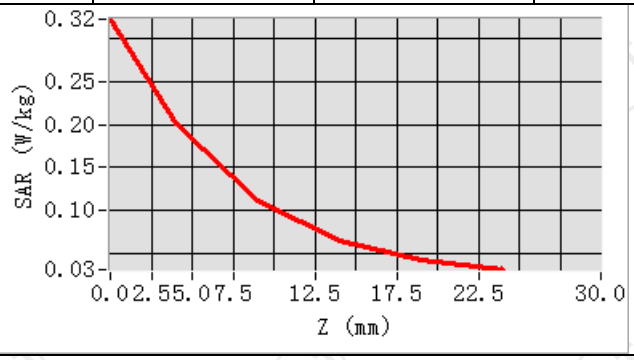




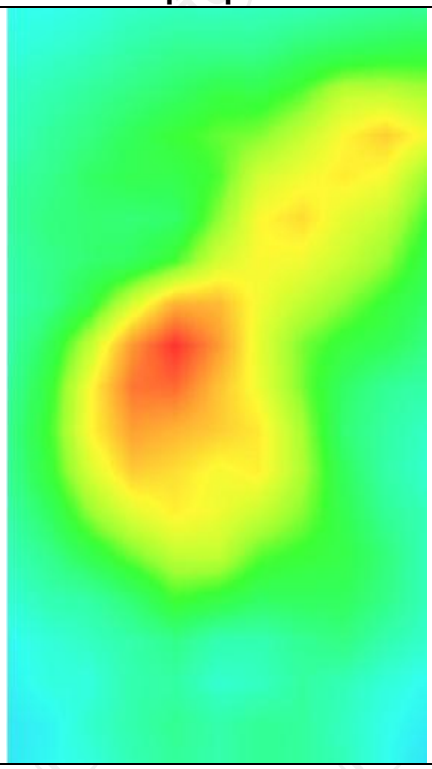
Maximum location: X=-8.00, Y=7.00 SAR Peak: 0.33 W/kg	
SAR 10g (W/Kg)	0.102803
SAR 1g (W/Kg)	0.200395



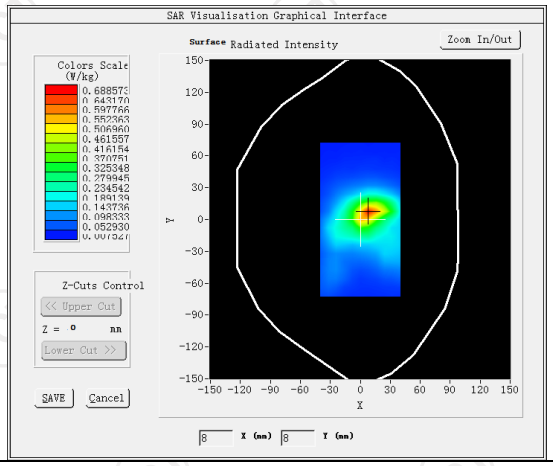
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3228	0.2022	0.1116	0.0652	0.0433

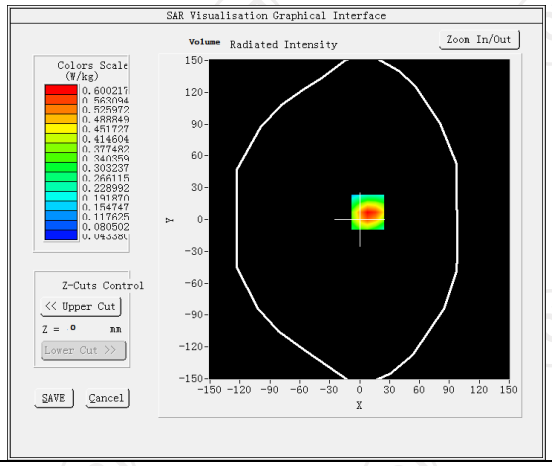


Hot spot position

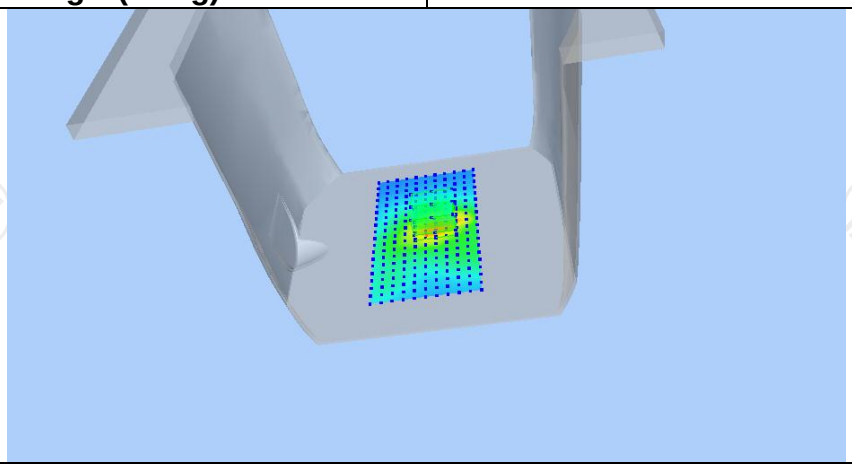


MEASUREMENT 2	
Lower Band SAR (Channel 512):	Date: 04/08/2022
Frequency (MHz)	1850.200000
Relative permittivity (real part)	53.291337
Relative permittivity (imaginary part)	14.322400
Conductivity (S/m)	1.531736
Variation (%)	1.380000
Crest Factor	1.0
Probe Conversion factor	2.32
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	GSM1900(GPRS 2slot)
SURFACE SAR	**VOLUME SAR**

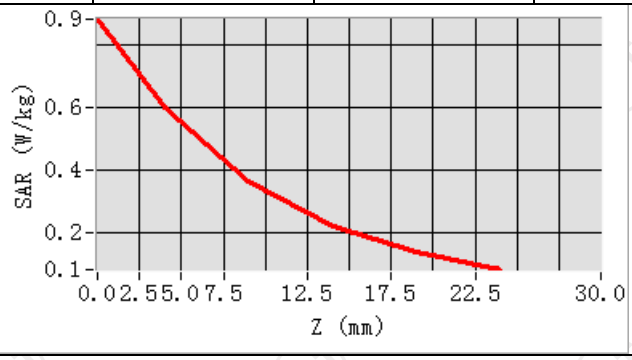




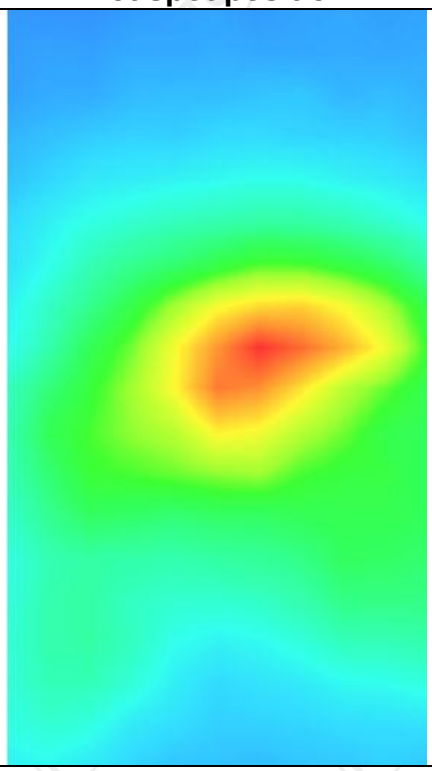
Maximum location: X=8.00, Y=7.00 SAR Peak: 0.91 W/kg	
SAR 10g (W/Kg)	0.318709
SAR 1g (W/Kg)	0.567915

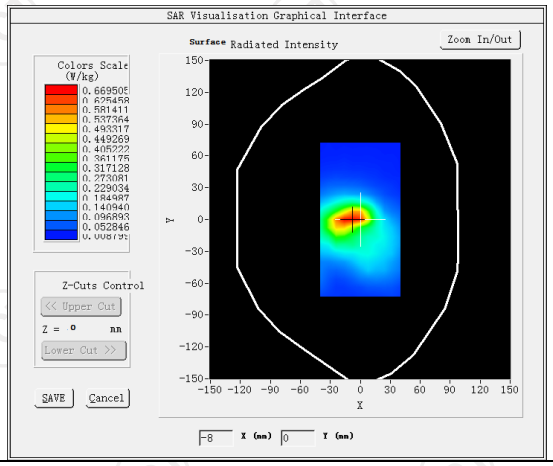
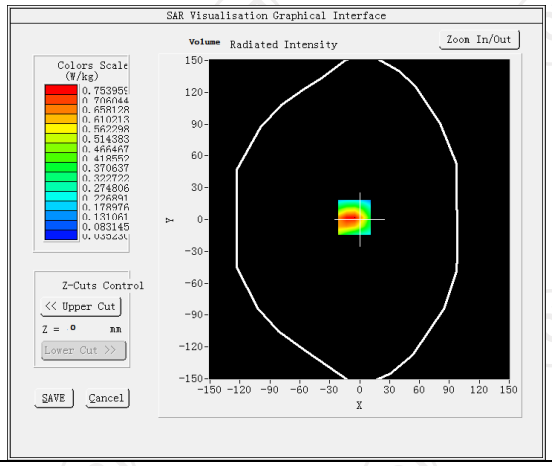


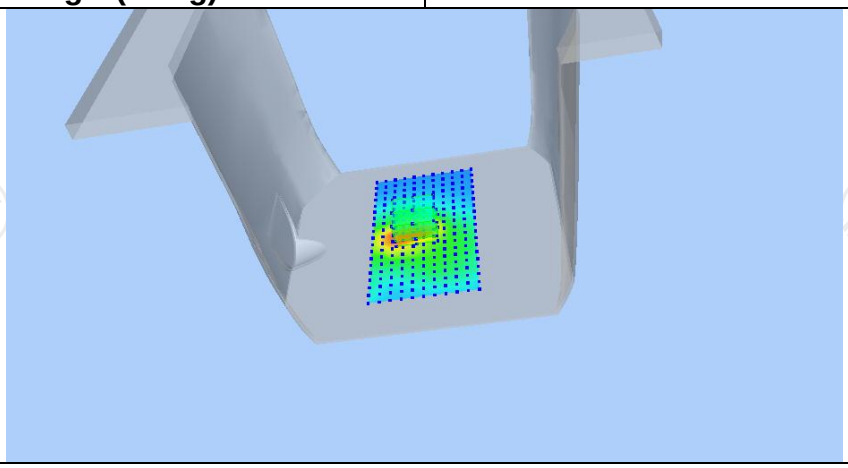
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8804	0.6002	0.3651	0.2219	0.1369



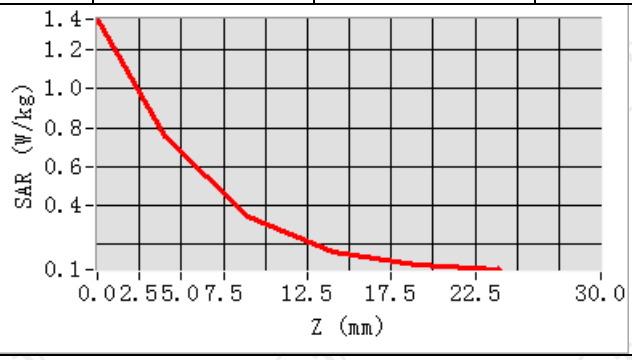
Hot spot position



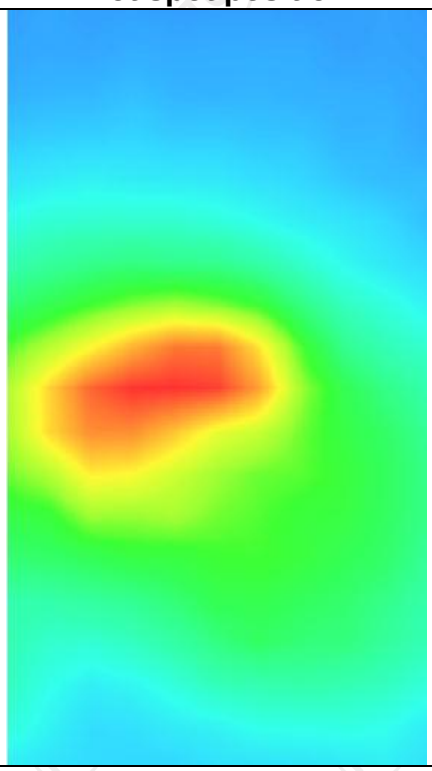
MEASUREMENT 3	
Lower Band SAR (Channel 512):	Date: 04/08/2022
Frequency (MHz)	1850.2.800000
Relative permittivity (real part)	53.341337
Relative permittivity (imaginary part)	14.322400
Conductivity (S/m)	1.491736
Variation (%)	-0.490000
Crest Factor	1.0
Probe Conversion factor	2.32
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	GSM1900(GPRS 2slot hotspot)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-5.00, Y=2.00 SAR Peak: 1.39 W/kg	
SAR 10g (W/Kg)	0.362005
SAR 1g (W/Kg)	0.593100



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.3574	0.7540	0.3445	0.1663	0.1001

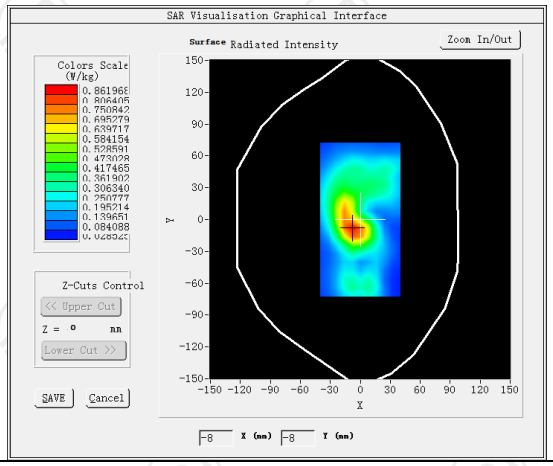


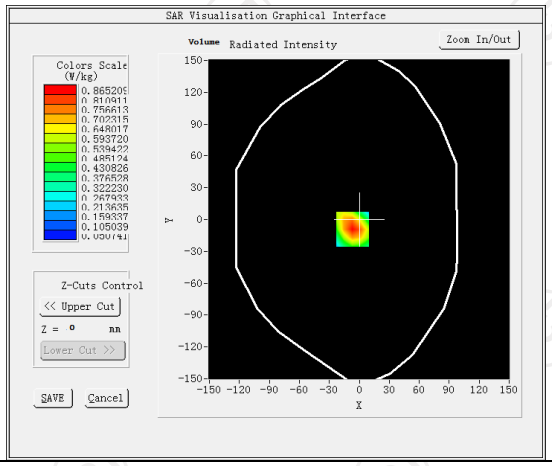
Hot spot position



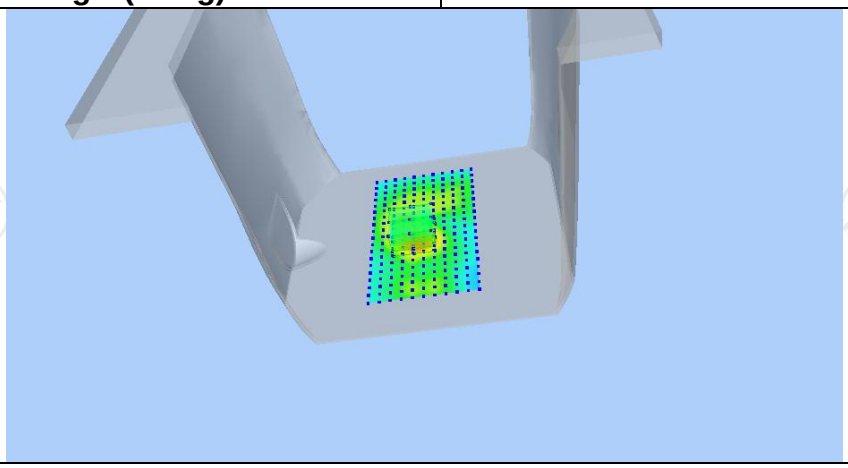
WCDMA Band II

MEASUREMENT 1	
Middle Band SAR (Channel 9400):	Date: 04/08/2022
Frequency (MHz)	1880.000000
Relative permittivity (real part)	53.291337
Relative permittivity (imaginary part)	14.232400
Conductivity (S/m)	1.526736
Variation (%)	-0.160000
Crest Factor	1.0
Probe Conversion factor	2.32
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	BAND2_WCDMA1900
SURFACE SAR	**VOLUME SAR**

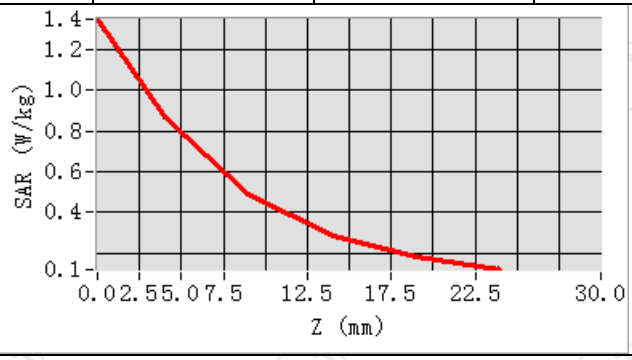




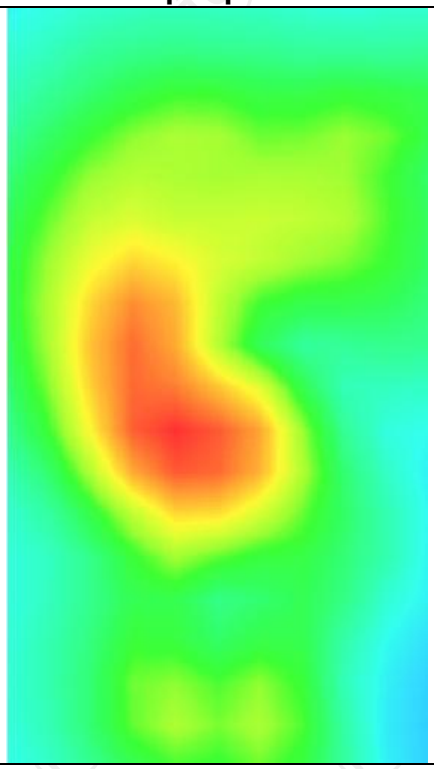
Maximum location: X=-7.00, Y=-9.00 SAR Peak: 1.36 W/kg	
SAR 10g (W/Kg)	0.456519
SAR 1g (W/Kg)	0.613048



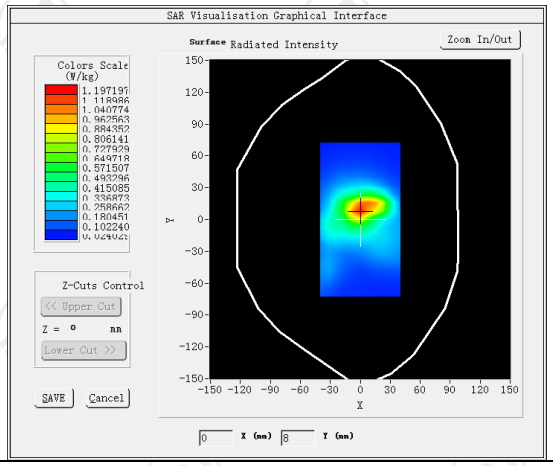
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.3502	0.8652	0.4891	0.2857	0.1817

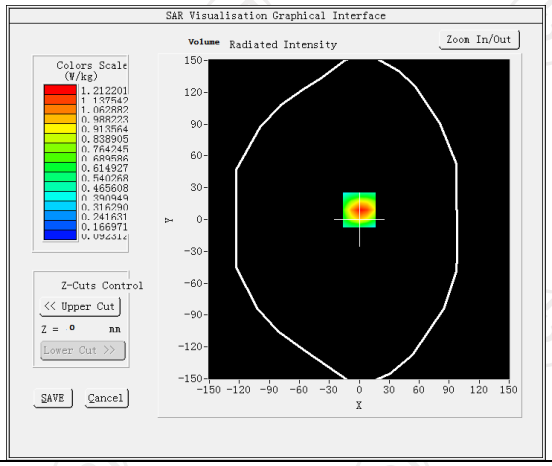


Hot spot position

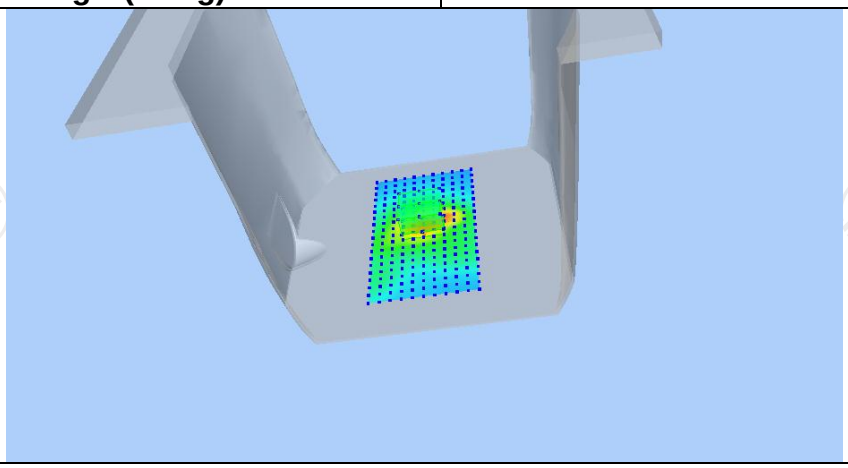


MEASUREMENT 2	
Middle Band SAR (Channel 9400):	Date: 04/08/2022
Frequency (MHz)	1880.000000
Relative permittivity (real part)	53.291337
Relative permittivity (imaginary part)	14.232400
Conductivity (S/m)	1.526736
Variation (%)	-0.580000
Crest Factor	1.0
Probe Conversion factor	2.32
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	BAND2_WCDMA1900(hotspot)
SURFACE SAR	**VOLUME SAR**

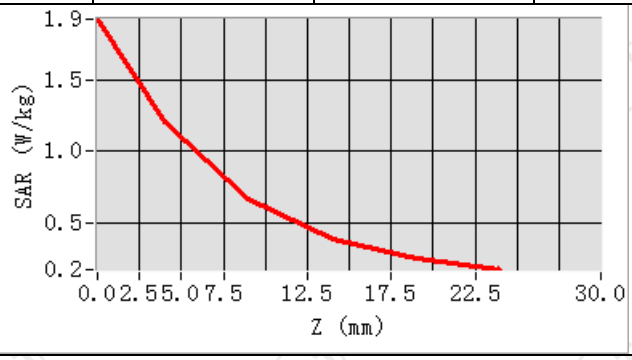




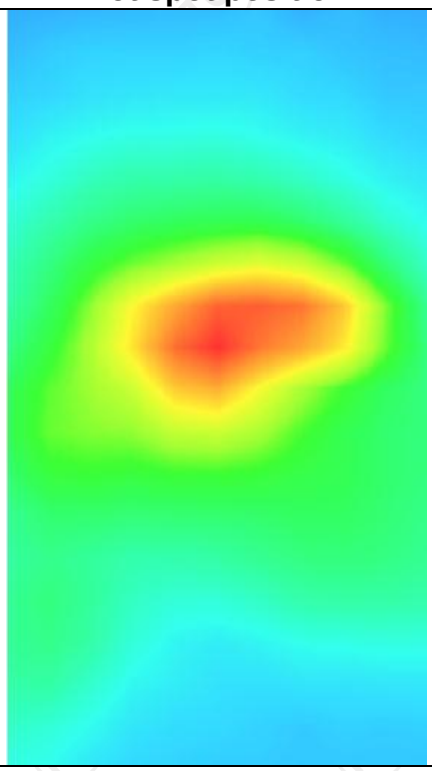
Maximum location: X=0.00, Y=9.00 SAR Peak: 1.94 W/kg	
SAR 10g (W/Kg)	0.914073
SAR 1g (W/Kg)	0.642176



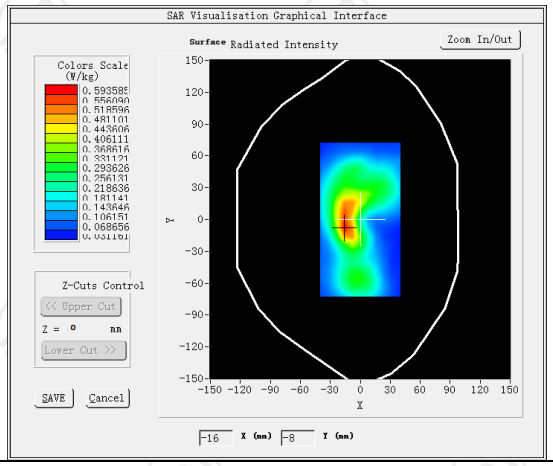
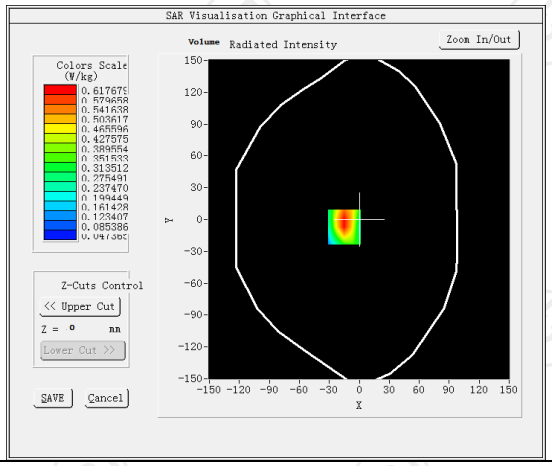
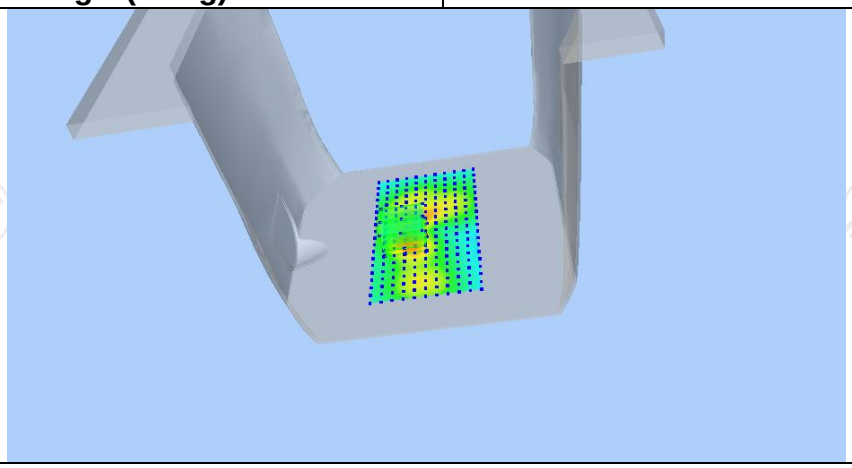
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.9325	1.2122	0.6666	0.3824	0.2445



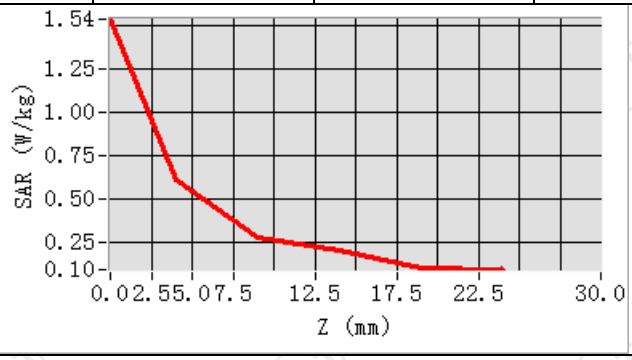
Hot spot position



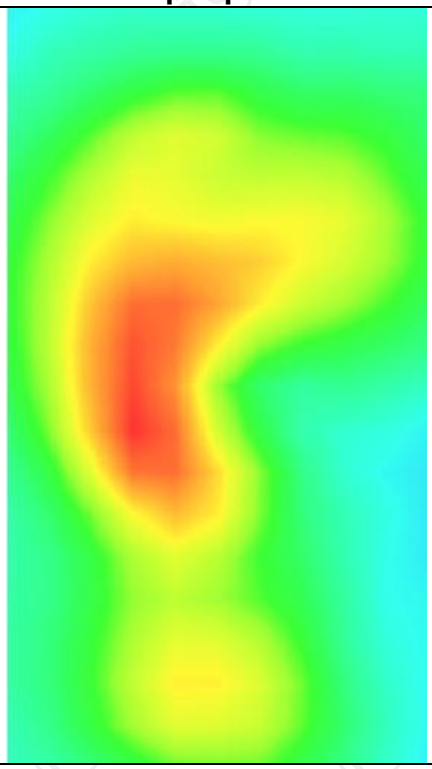
WCDMA Band IV

MEASUREMENT 1	
Hight Band SAR (Channel 1513):	Date: 04/06/2022
Frequency (MHz)	1752.600000
Relative permittivity (real part)	53.342521
Relative permittivity (imaginary part)	14.225400
Conductivity (S/m)	1.492530
Variation (%)	-0.080000
Crest Factor	1.0
Probe Conversion factor	2.16
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	BAND4 WCDMA1700
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-15.00, Y=-7.00 SAR Peak: 1.01 W/kg	
SAR 10g (W/Kg)	0.597183
SAR 1g (W/Kg)	0.427336
	

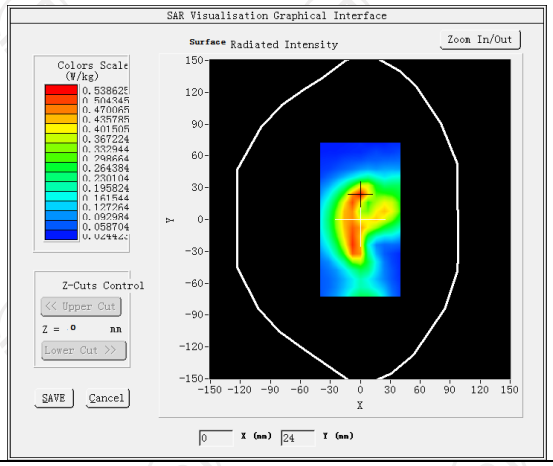
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.5385	0.6177	0.2788	0.2071	0.1088

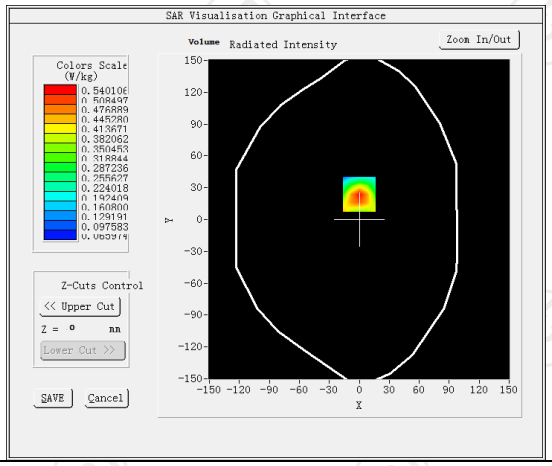


Hot spot position

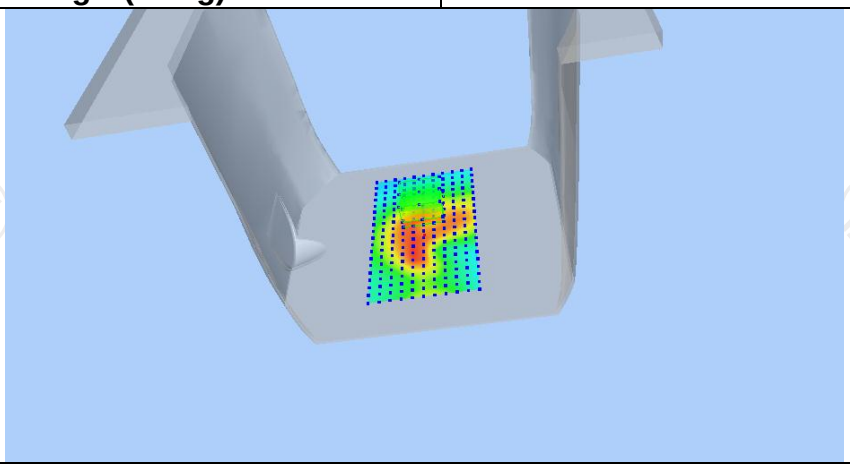


MEASUREMENT 2	
Hight Band SAR (Channel 1513):	Date: 04/06/2022
Frequency (MHz)	1752.600000
Relative permittivity (real part)	53.342521
Relative permittivity (imaginary part)	14.225400
Conductivity (S/m)	1.492530
Variation (%)	-0.590000
Crest Factor	1.0
Probe Conversion factor	2.16
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back (0mm)
Band	BAND4 WCDMA1700(hotspot)
SURFACE SAR	**VOLUME SAR**

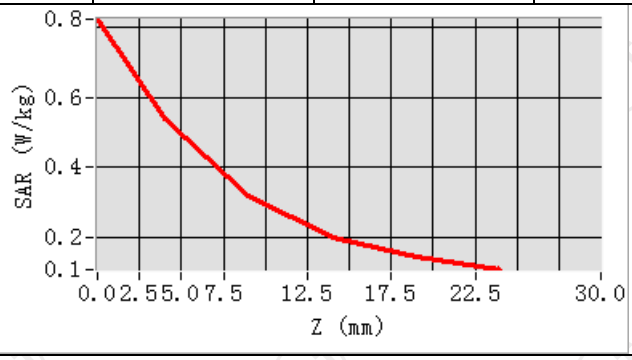




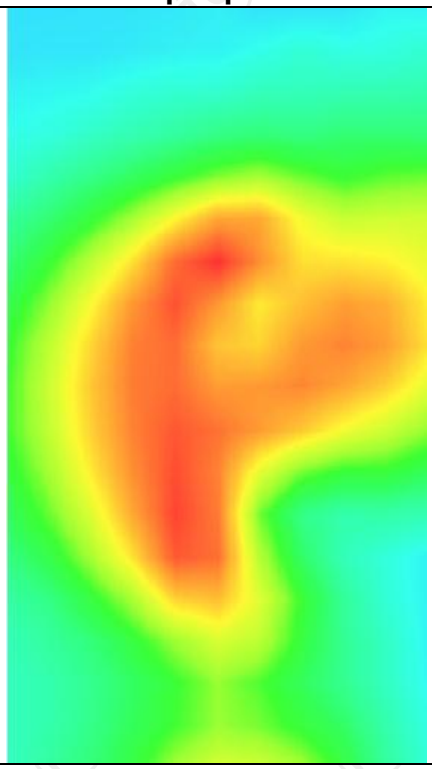
Maximum location: X=0.00, Y=24.00 SAR Peak: 0.83 W/kg	
SAR 10g (W/Kg)	0.505276
SAR 1g (W/Kg)	0.451904



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.8214	0.5401	0.3210	0.2031	0.1442

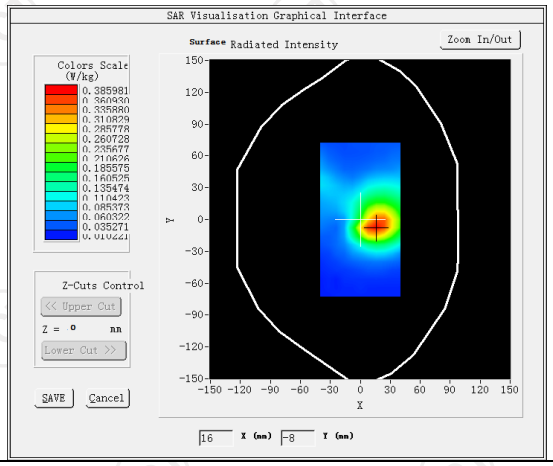


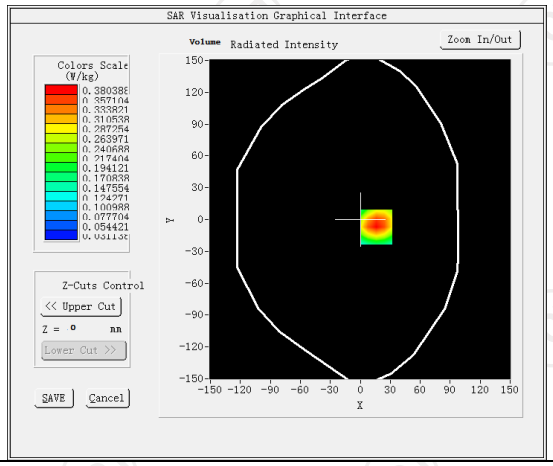
Hot spot position



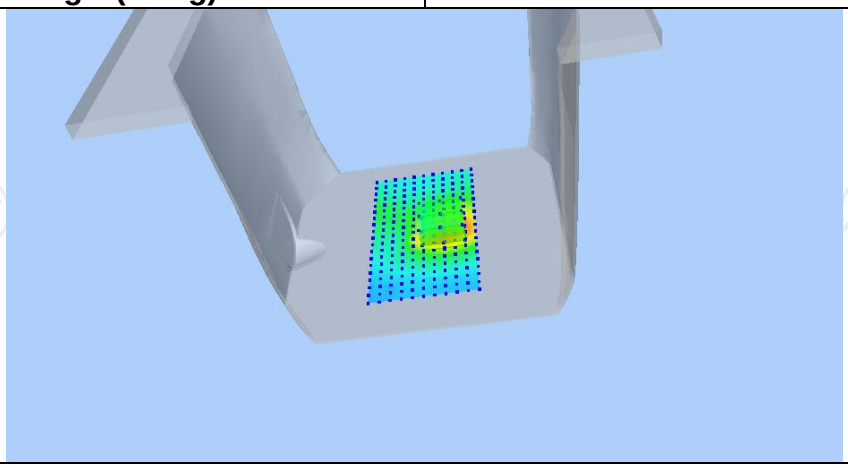
WCDMA Band V

MEASUREMENT 1	
Middle Band SAR (Channel 4182):	Date: 04/01/2022
Frequency (MHz)	836.400000
Relative permittivity (real part)	55.262927
Relative permittivity (imaginary part)	21.378266
Conductivity (S/m)	0.931230
Variation (%)	-1.150000
Crest Factor:	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(10mm)
Band	BAND5_WCDMA850
SURFACE SAR	**VOLUME SAR**

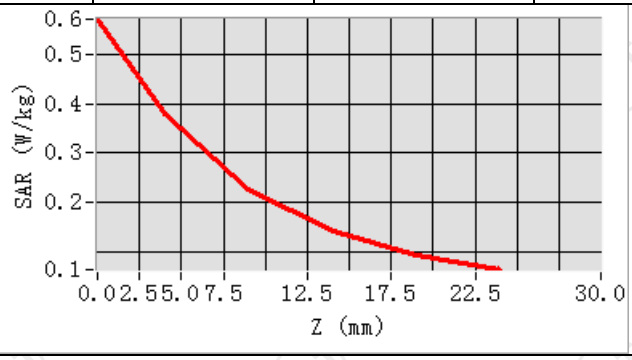




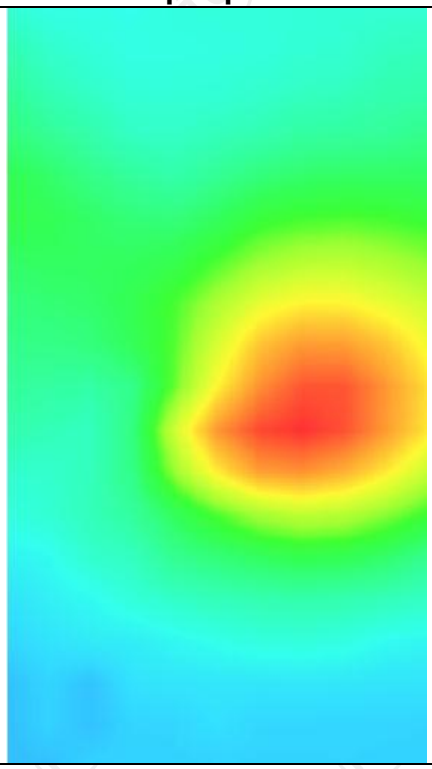
Maximum location: X=16.00, Y=-7.00 SAR Peak: 0.58 W/kg	
SAR 10g (W/Kg)	0.321624
SAR 1g (W/Kg)	0.263625



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.5699	0.3804	0.2283	0.1419	0.0950



Hot spot position

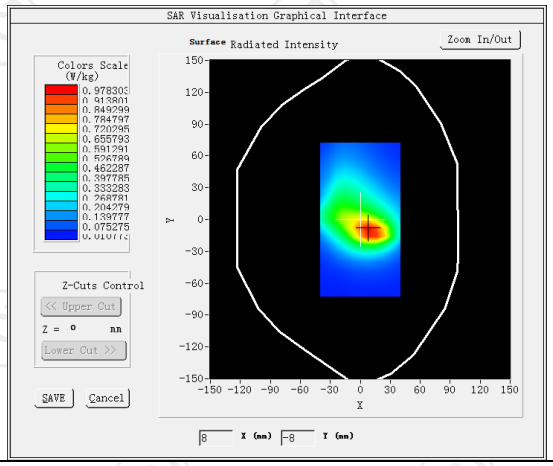


MEASUREMENT 2

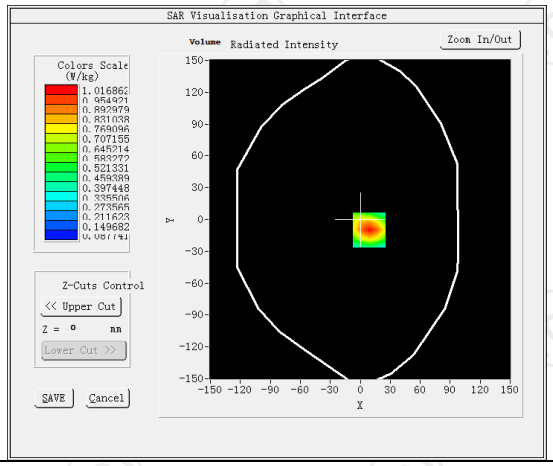
Middle Band SAR (Channel 4182): Date: 04/01/2022

Frequency (MHz)	836.400000
Relative permittivity (real part)	55.262927
Relative permittivity (imaginary part)	21.378266
Conductivity (S/m)	0.931230
Variation (%)	0.600000
Crest Factor:	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(10mm)
Band	BAND5_WCDMA850(hotspot)

SURFACE SAR

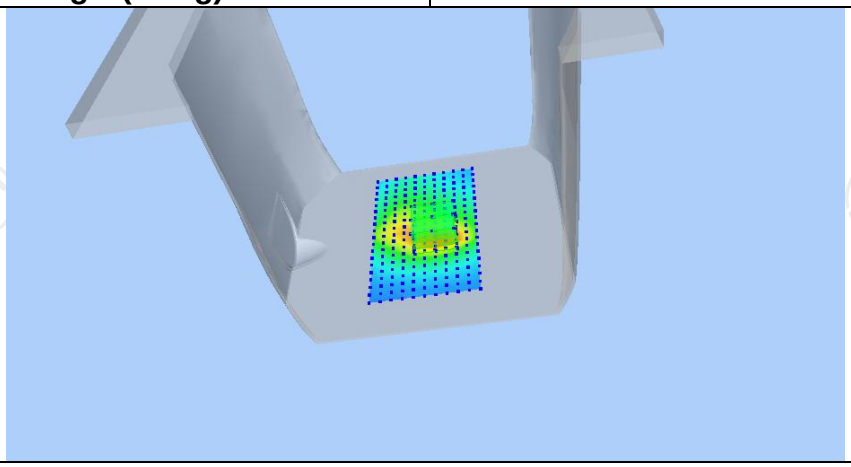


VOLUME SAR

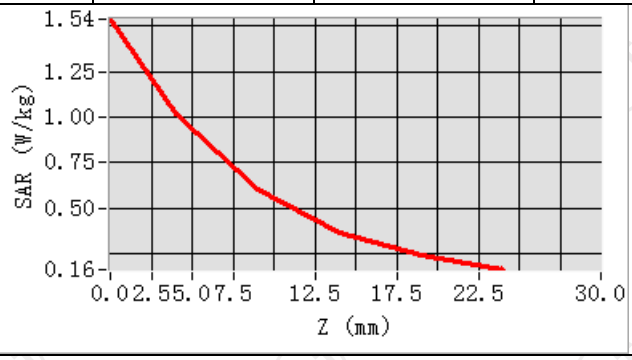


Maximum location: X=9.00, Y=-10.00 SAR Peak: 1.54 W/kg

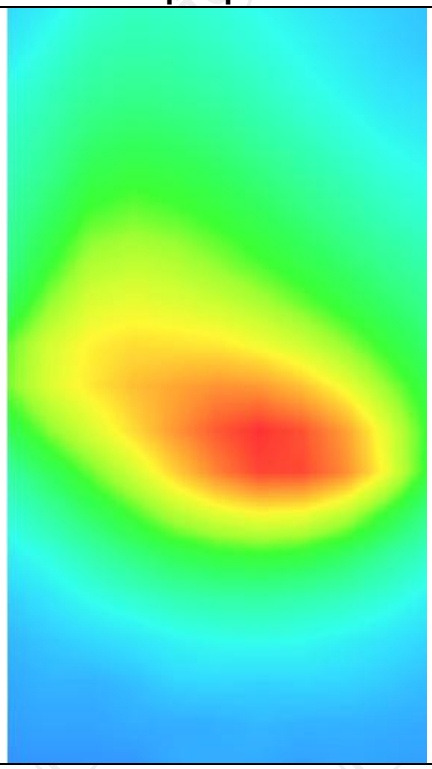
SAR 10g (W/Kg)	0.552040
SAR 1g (W/Kg)	0.291845



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.5364	1.0169	0.6023	0.3688	0.2429

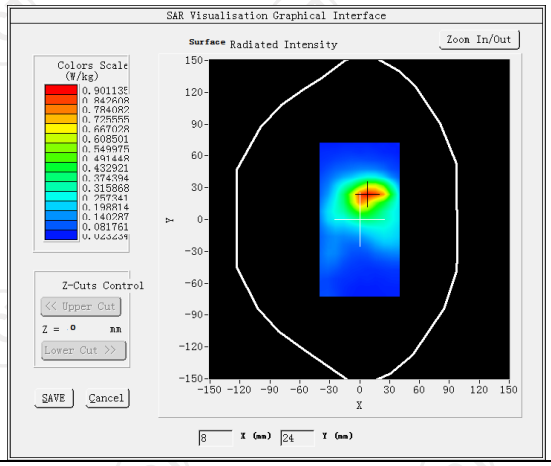


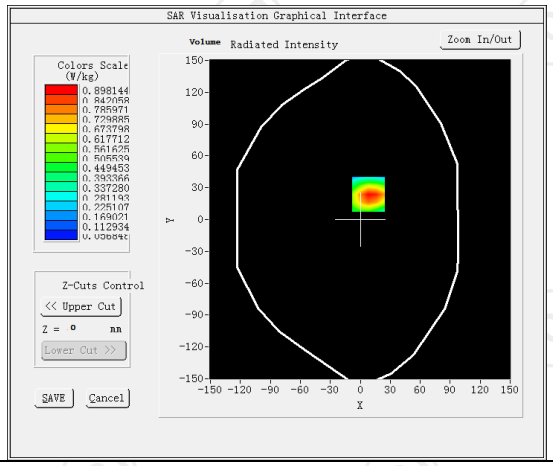
Hot spot position



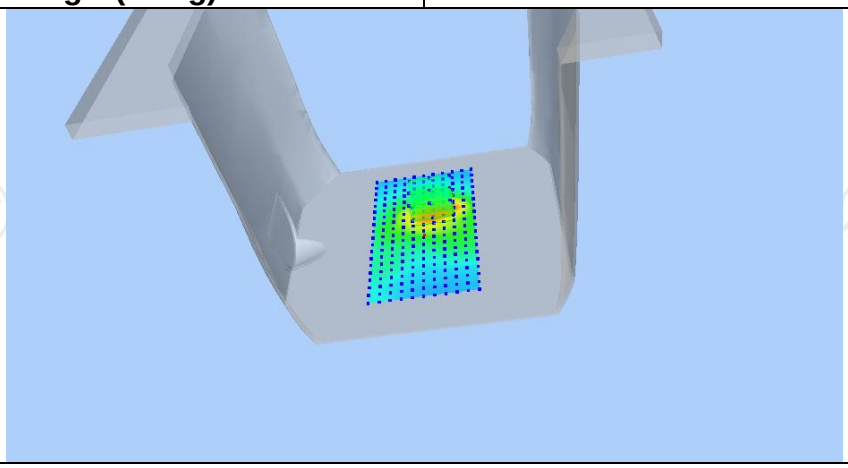
LTE Band 2

MEASUREMENT 1	
Middle Band SAR (Channel 18900):	Date: 04/08/2022
Frequency (MHz)	1880.000000
Relative permittivity (real part)	53.291337
Relative permittivity (imaginary part)	14.232400
Conductivity (S/m)	1.531736
Variation (%)	0.320000
Crest Factor	1.0
Probe Conversion factor	2.32
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	LTE band 2 (1 RB#49)
SURFACE SAR	**VOLUME SAR**

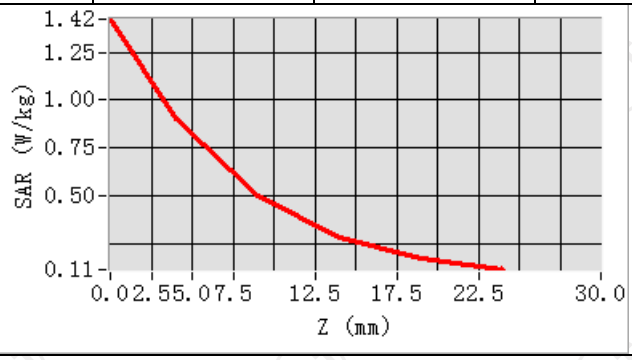




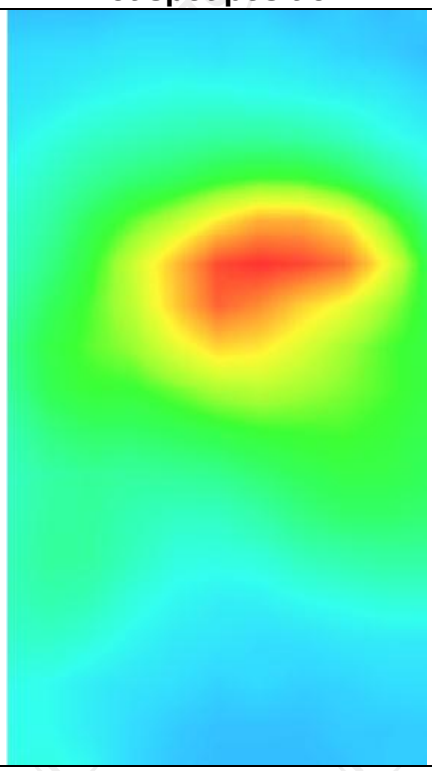
Maximum location: X=8.00, Y=24.00 SAR Peak: 1.47 W/kg	
SAR 10g (W/Kg)	0.864643
SAR 1g (W/Kg)	0.655096



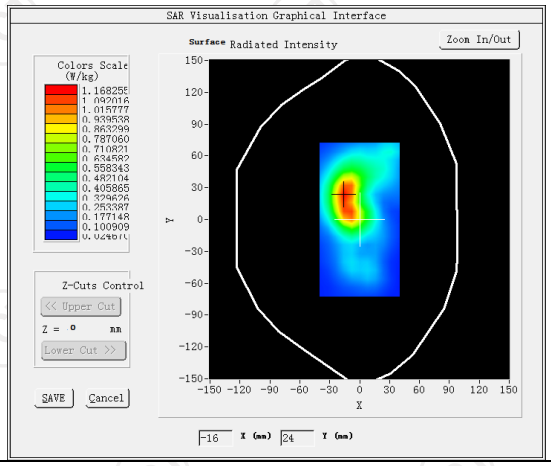
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.4219	0.8981	0.4967	0.2834	0.1766

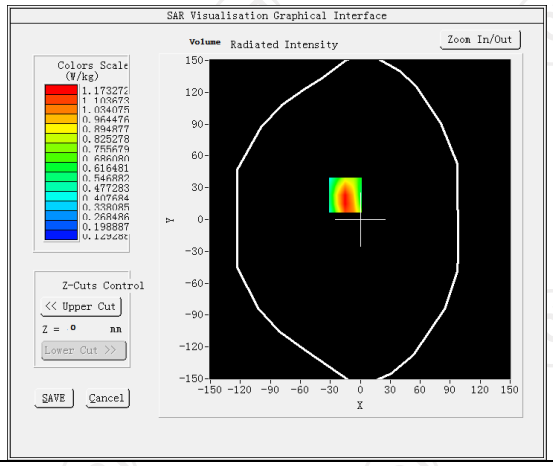


Hot spot position

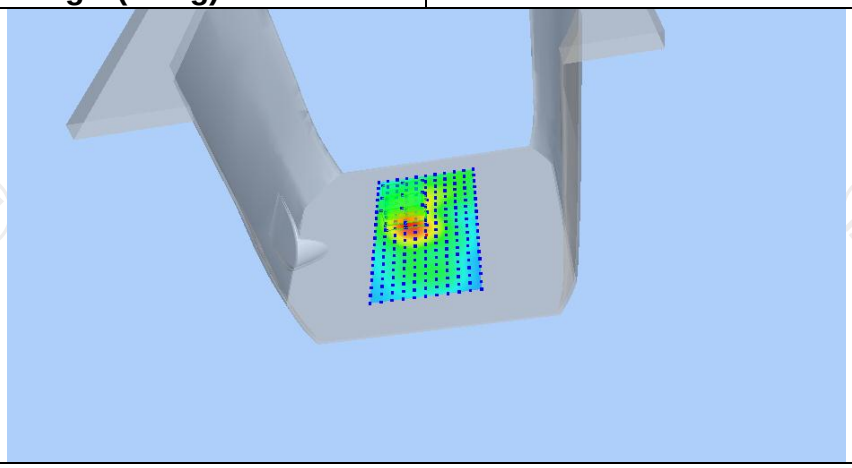


MEASUREMENT 2	
Middle Band SAR (Channel 18900):	Date: 04/08/2022
Frequency (MHz)	1880.000000
Relative permittivity (real part)	53.291337
Relative permittivity (imaginary part)	14.232400
Conductivity (S/m)	1.531736
Variation (%)	-1.170000
Crest Factor	1.0
Probe Conversion factor	2.32
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(hotspot 0mm)
Band	LTE band 2 (1 RB#49)
SURFACE SAR	**VOLUME SAR**

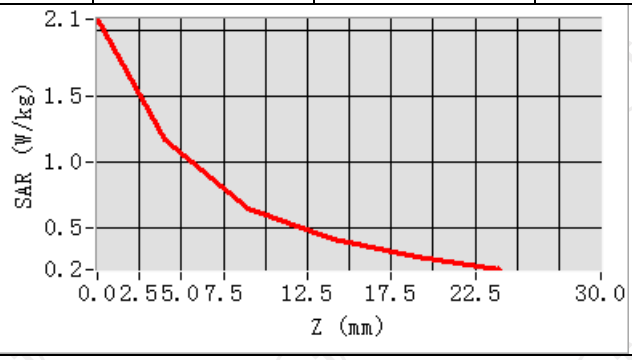




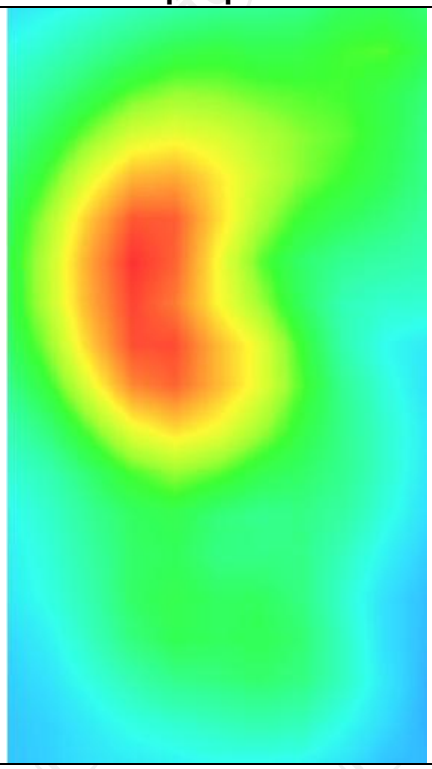
Maximum location: X=-15.00, Y=23.00 SAR Peak: 1.80 W/kg	
SAR 10g (W/Kg)	0.951296
SAR 1g (W/Kg)	0.682924



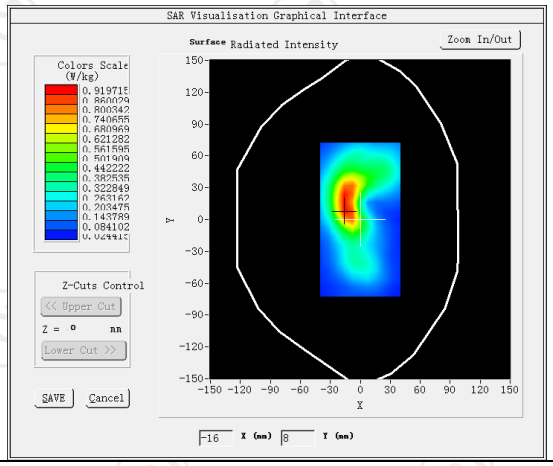
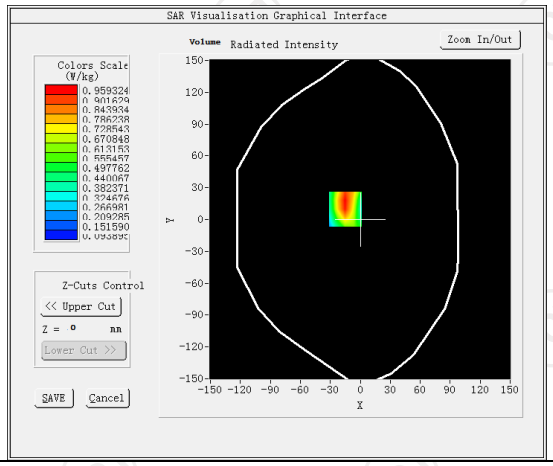
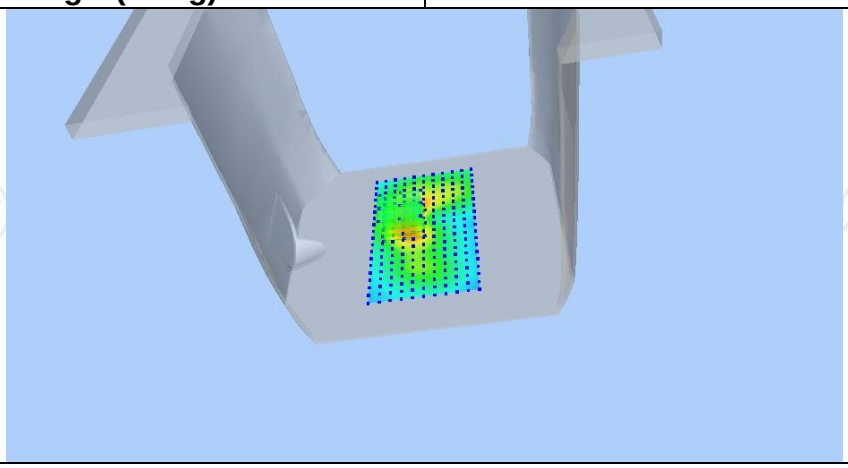
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	2.0809	1.1733	0.6436	0.4183	0.2774



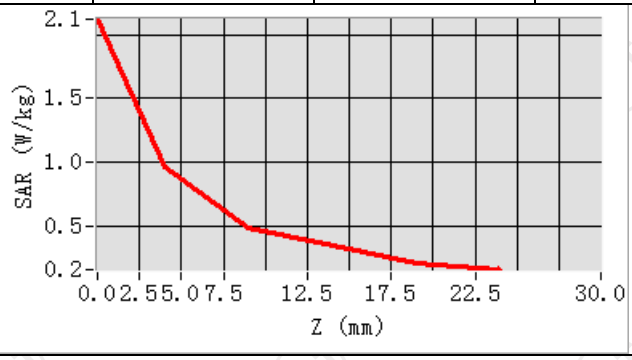
Hot spot position



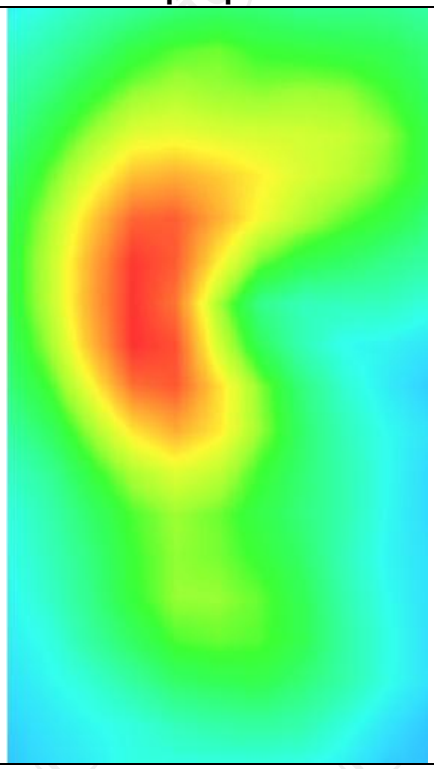
LTE Band 4

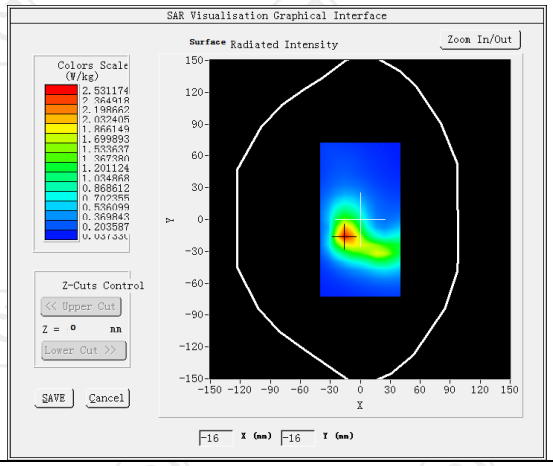
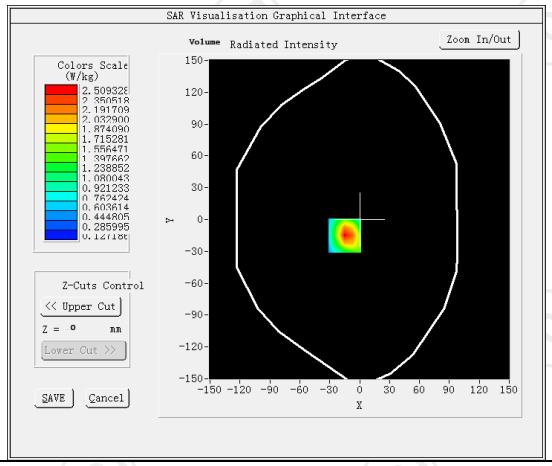
MEASUREMENT 1	
Lower Band SAR (Channel 20050):	Date: 04/06/2022
Frequency (MHz)	1720.000000
Relative permittivity (real part)	53.321249
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	1.502592
Variation (%)	-0.350000
Crest Factor	1.0
Probe Conversion factor	2.16
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	LTE band 4(1 RB#0)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-15.00, Y=10.00 SAR Peak: 1.46 W/kg	
SAR 10g (W/Kg)	0.922113
SAR 1g (W/Kg)	0.700539
	

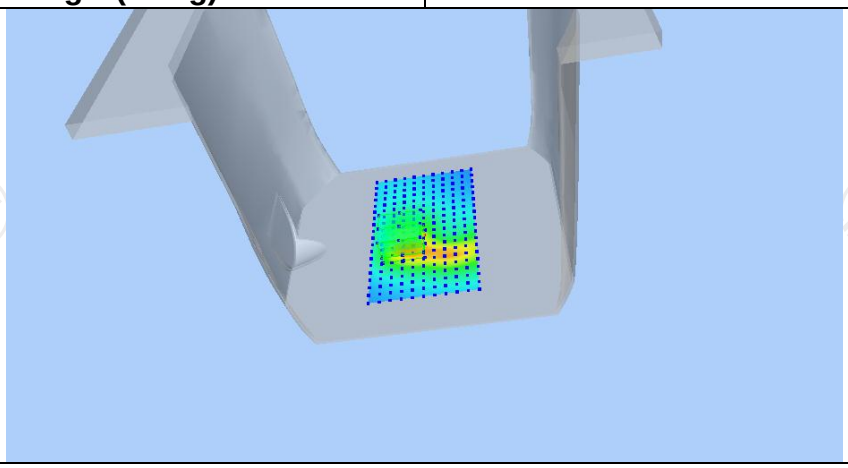
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	2.1227	0.9593	0.4855	0.3521	0.2042



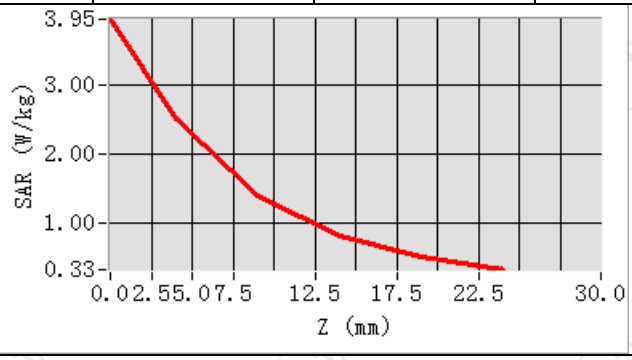
Hot spot position



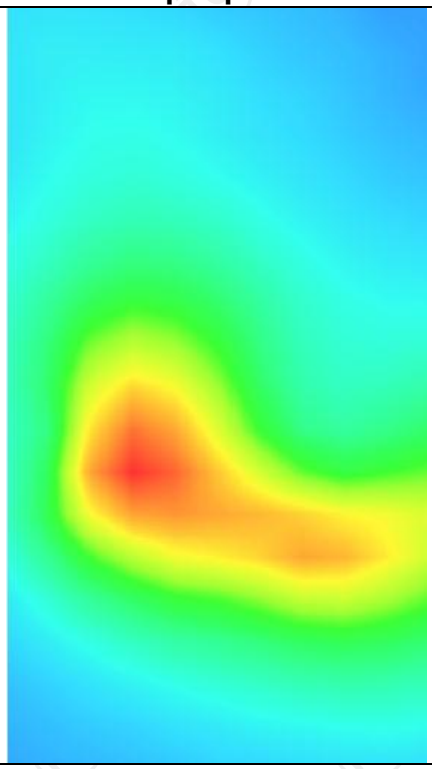
MEASUREMENT 2	
Lower Band SAR (Channel 20050):	Date: 04/06/2022
Frequency (MHz)	1720.000000
Relative permittivity (real part)	53.321249
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	1.502592
Variation (%)	-0.130000
Crest Factor	1.0
Probe Conversion factor	2.16
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(hotspot 0mm)
Band	LTE band 4(1 RB#0)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-15.00, Y=-15.00 SAR Peak: 4.02 W/kg	
SAR 10g (W/Kg)	1.260691
SAR 1g (W/Kg)	0.715670



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	3.9497	2.5093	1.3992	0.8041	0.5030



Hot spot position



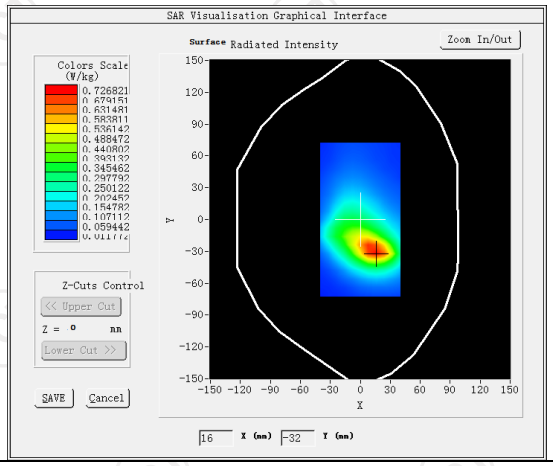
LTE Band 5

MEASUREMENT 1

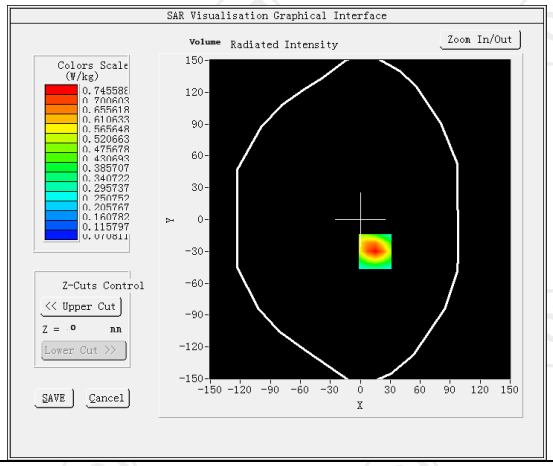
Hight Band SAR (Channel 20600): Date: 04/01/2022

Frequency (MHz)	844.000000
Relative permittivity (real part)	55.260832
Relative permittivity (imaginary part)	12.468860
Conductivity (S/m)	0.934272
Variation (%)	-0.400000
Crest Factor	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	LTE band 5(1 RB#24)

SURFACE SAR

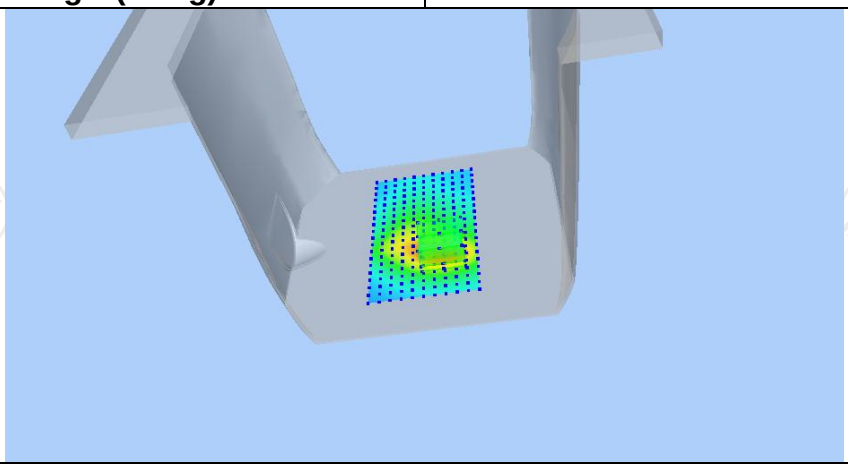


VOLUME SAR

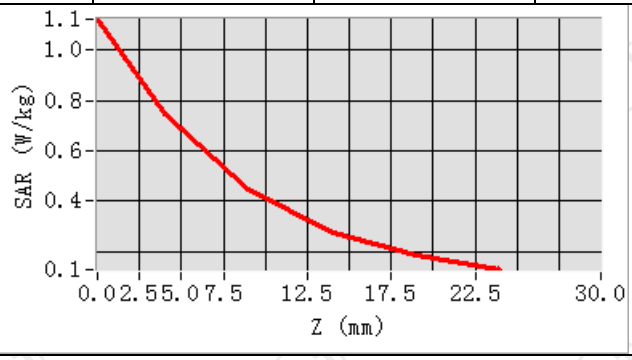


Maximum location: X=15.00, Y=-30.00 SAR Peak: 1.13 W/kg

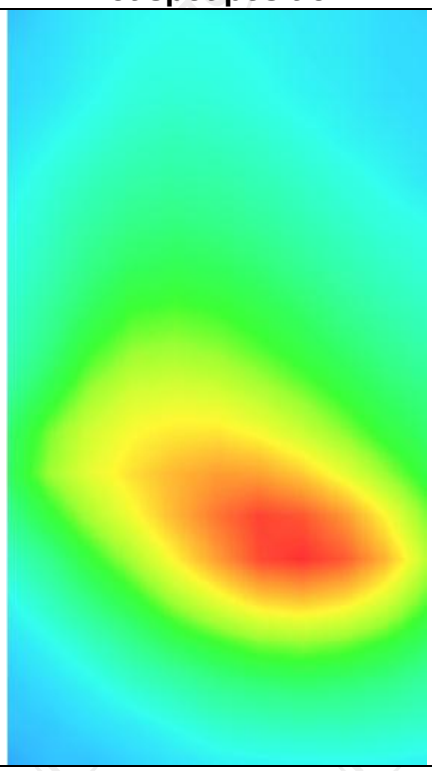
SAR 10g (W/Kg)	0.701850
SAR 1g (W/Kg)	0.611518



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.1217	0.7456	0.4454	0.2766	0.1859



Hot spot position

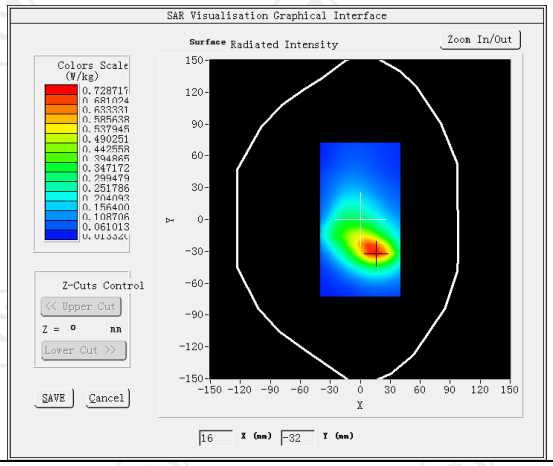


MEASUREMENT 2

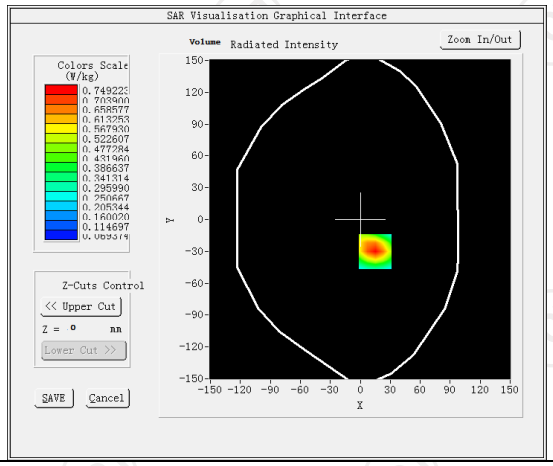
Hight Band SAR (Channel 20600): Date: 04/01/2022

Frequency (MHz)	844.000000
Relative permittivity (real part)	55.260832
Relative permittivity (imaginary part)	12.468860
Conductivity (S/m)	0.934272
Variation (%)	0.320000
Crest Factor	1.0
Probe Conversion factor	1.86
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back((hotspot 0mm)
Band	LTE band 5(1 RB#24)

SURFACE SAR

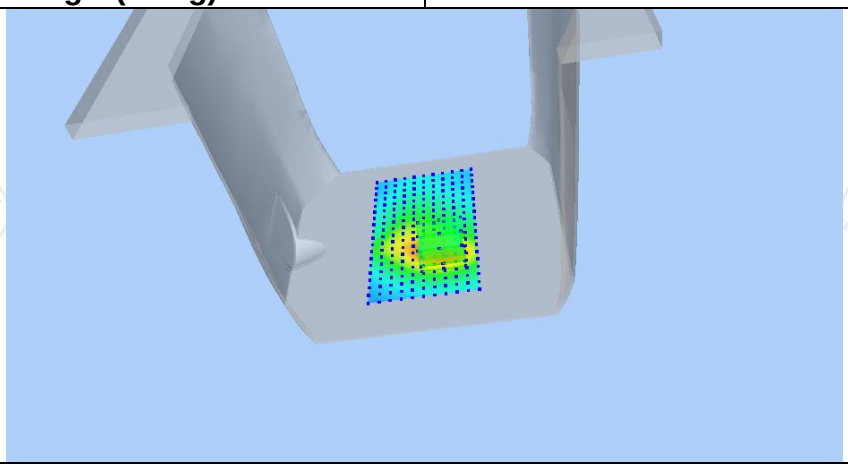


VOLUME SAR

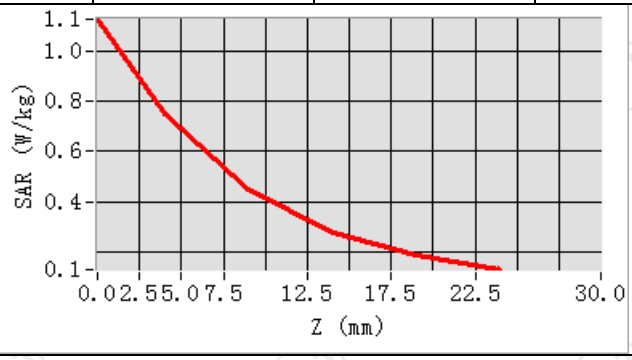


Maximum location: X=15.00, Y=-30.00 SAR Peak: 1.13 W/kg

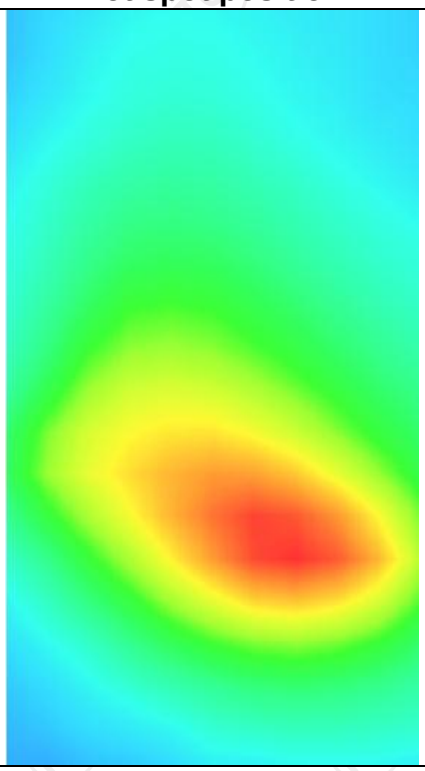
SAR 10g (W/Kg)	0.714223
SAR 1g (W/Kg)	0.625037



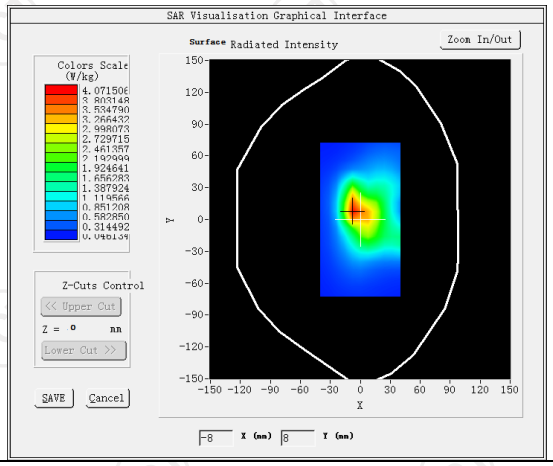
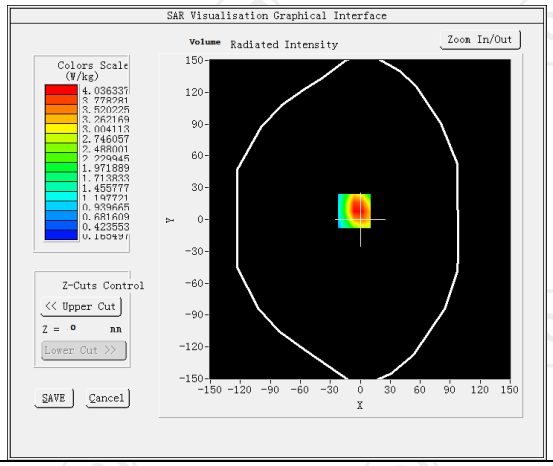
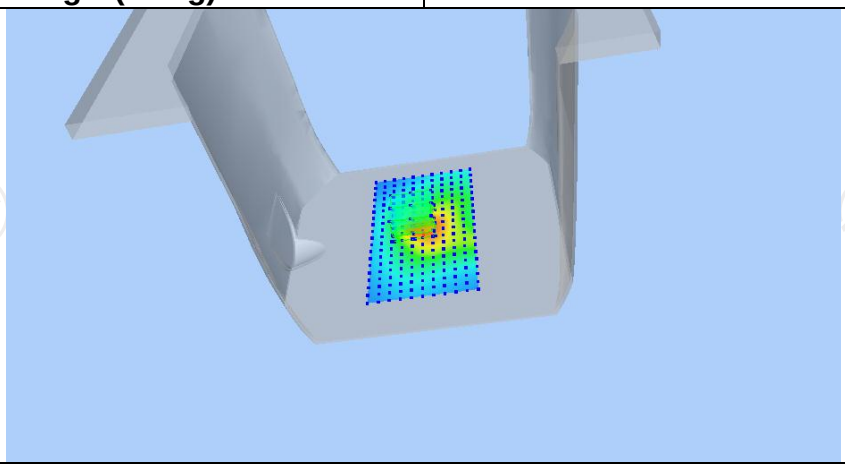
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.1263	0.7492	0.4481	0.2785	0.1872



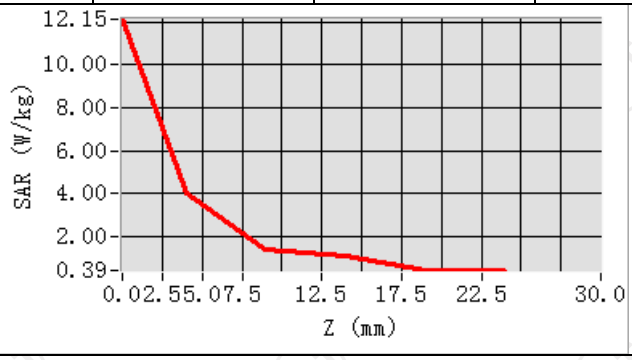
Hot spot position



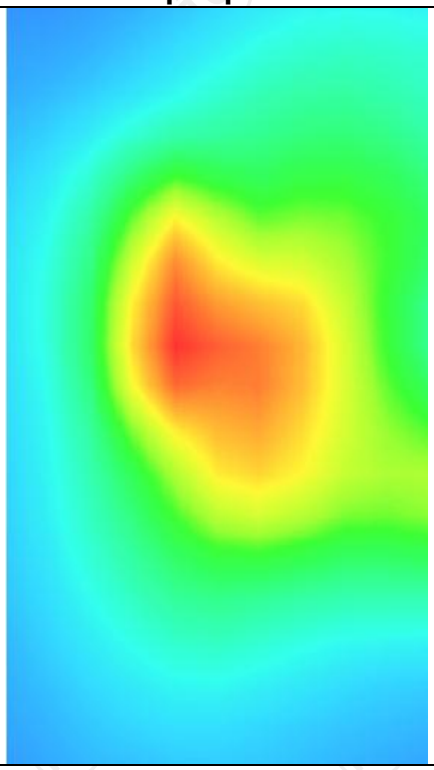
LTE Band 7

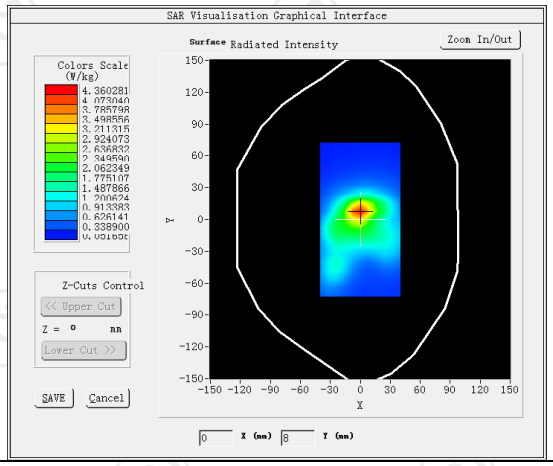
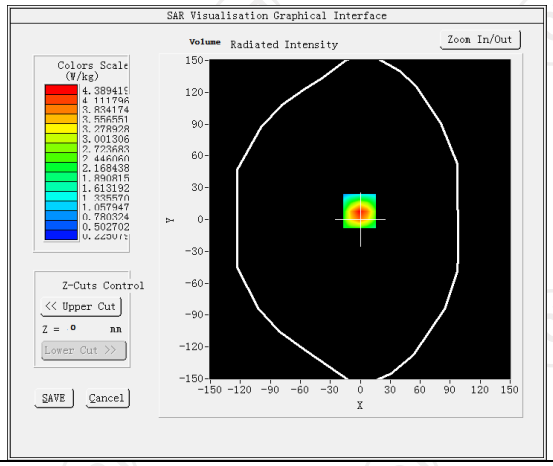
MEASUREMENT 1	
Hight Band SAR (Channel 21350):	Date: 04/13/2022
Frequency (MHz)	2560.000000
Relative permittivity (real part)	52.702754
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	1.902731
Variation (%)	-0.500000
Crest Factor	1.0
Probe Conversion factor	2.23
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	LTE band 7(1 RB#49)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-6.00, Y=8.00 SAR Peak: 7.39 W/kg	
SAR 10g (W/Kg)	0.976372
SAR 1g (W/Kg)	0.570271
	

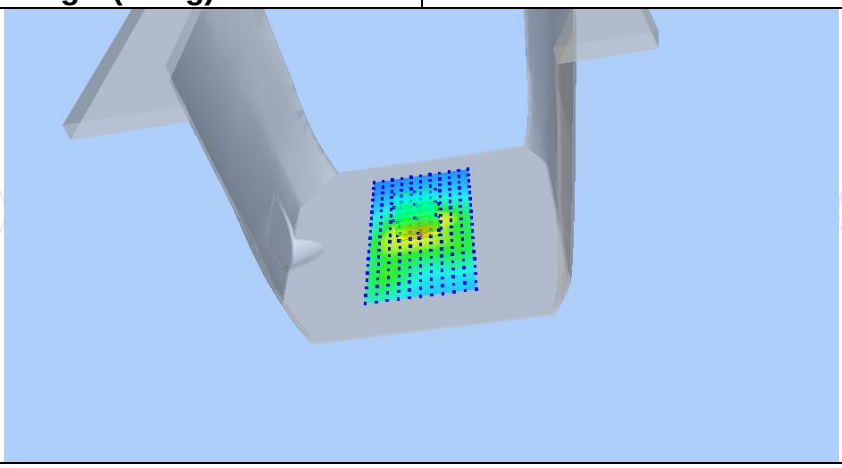
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	12.1463	4.0363	1.3465	1.0586	0.4174



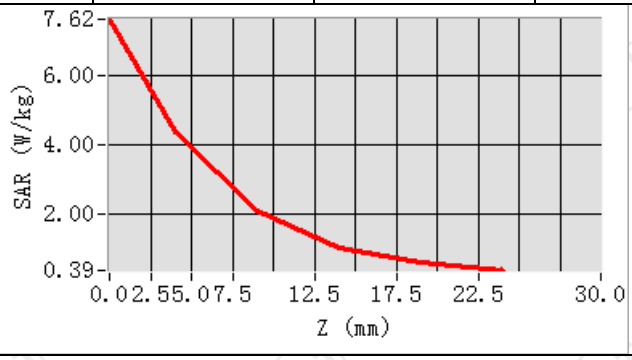
Hot spot position



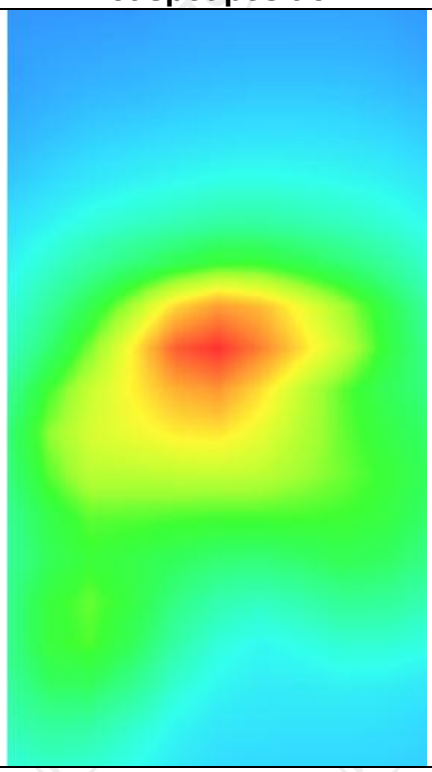
MEASUREMENT 2	
Hight Band SAR (Channel 21350):	Date: 04/13/2022
Frequency (MHz)	2560.000000
Relative permittivity (real part)	52.702754
Relative permittivity (imaginary part)	12.468850
Conductivity (S/m)	1.902731
Variation (%)	-0.170000
Crest Factor	1.0
Probe Conversion factor	2.23
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(hotspot 0mm)
Band	LTE band 7(1 RB#49)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-1.00, Y=8.00 SAR Peak: 7.72 W/kg	
SAR 10g (W/Kg)	0.986620
SAR 1g (W/Kg)	0.609683



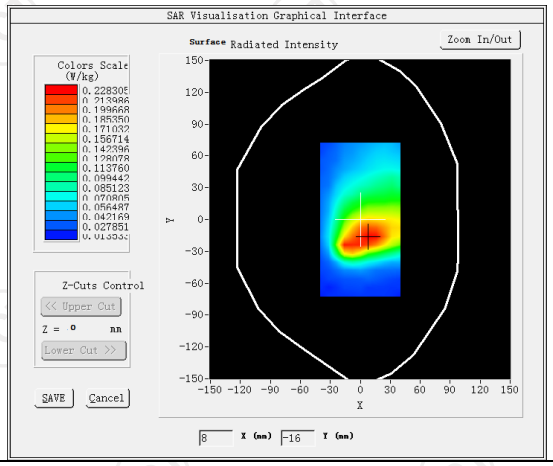
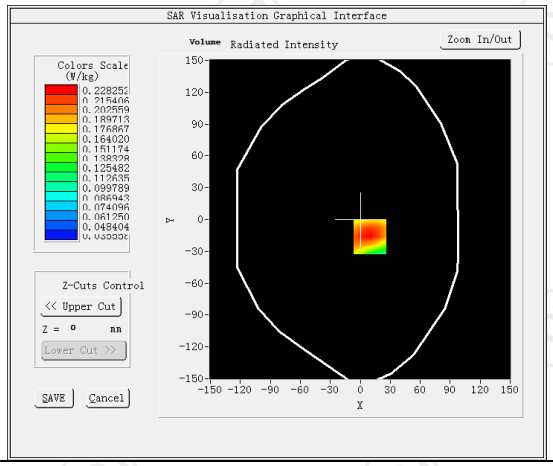
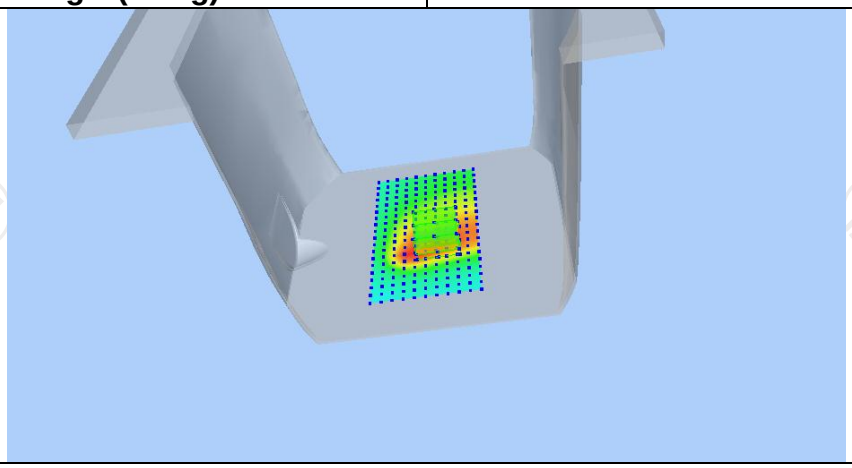
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	7.6230	4.3894	2.1097	1.0475	0.6046



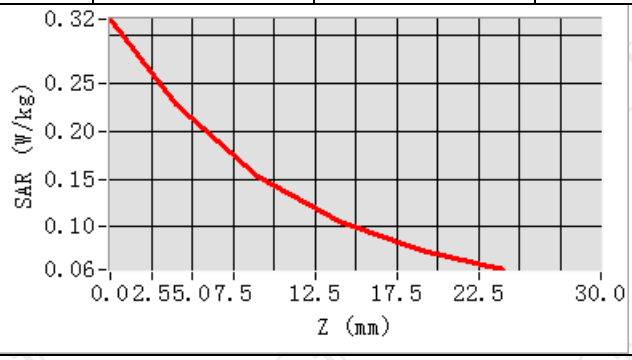
Hot spot position



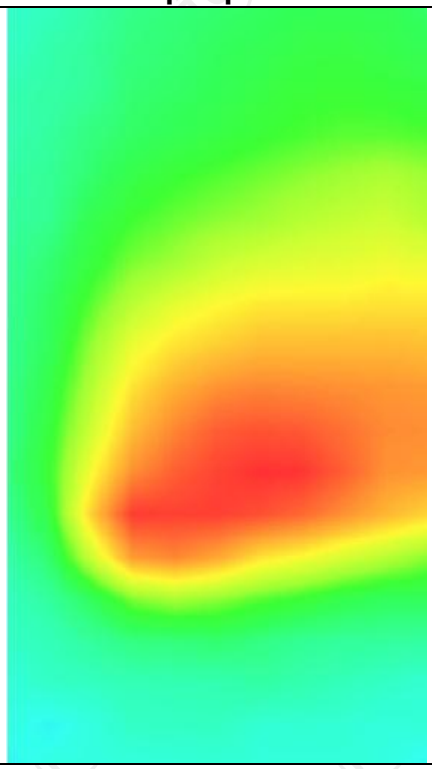
LTE Band 12

MEASUREMENT 1	
Middle Band SAR (Channel 23095):	Date: 03/30/2022
Frequency (MHz)	707.500000
Relative permittivity (real part)	55.260832
Relative permittivity (imaginary part)	12.468860
Conductivity (S/m)	0.934272
Variation (%)	0.120000
Crest Factor	1.0
Probe Conversion factor	1.78
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	LTE band 12(1 RB#24)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=10.00, Y=-16.00 SAR Peak: 0.32 W/kg	
SAR 10g (W/Kg)	0.155337
SAR 1g (W/Kg)	0.232458
	

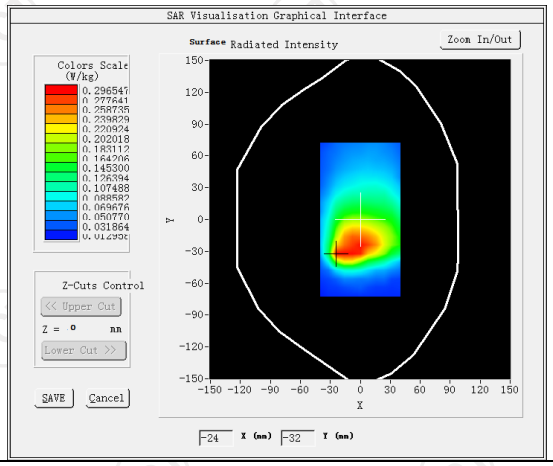
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3164	0.2283	0.1524	0.1049	0.0758

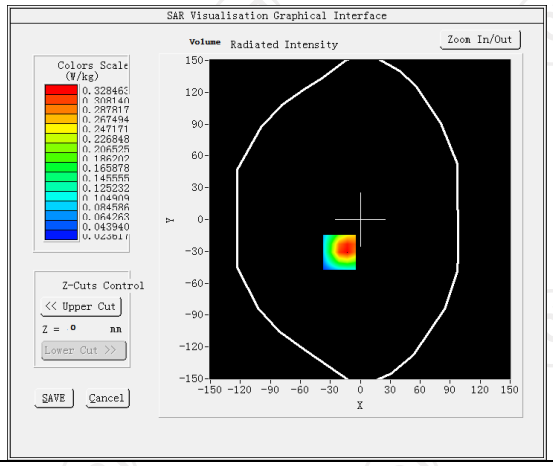


Hot spot position

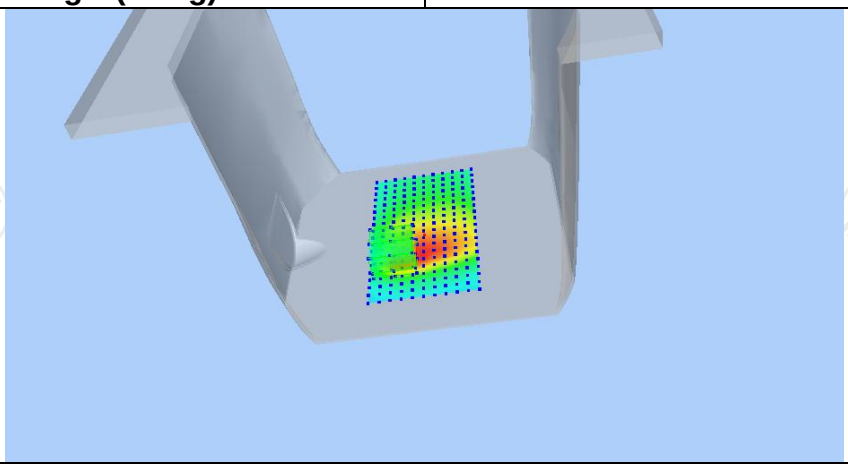


MEASUREMENT 2	
Middle Band SAR (Channel 23095):	Date: 03/30/2022
Frequency (MHz)	707.500000
Relative permittivity (real part)	55.260832
Relative permittivity (imaginary part)	12.468860
Conductivity (S/m)	0.934272
Variation (%)	-2.770000
Crest Factor	1.0
Probe Conversion factor	1.78
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(hotspot 0mm)
Band	LTE band 12(1 RB#24)
SURFACE SAR	**VOLUME SAR**

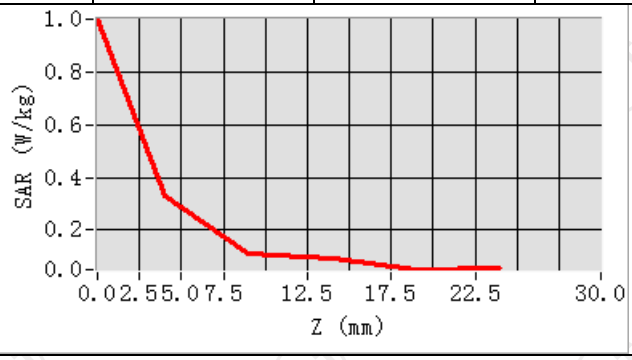




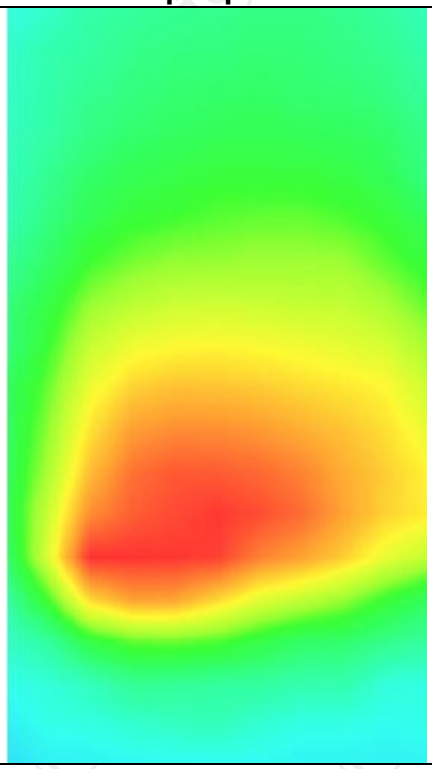
Maximum location: X=-21.00, Y=-31.00 SAR Peak: 0.59 W/kg	
SAR 10g (W/Kg)	0.184414
SAR 1g (W/Kg)	0.279977



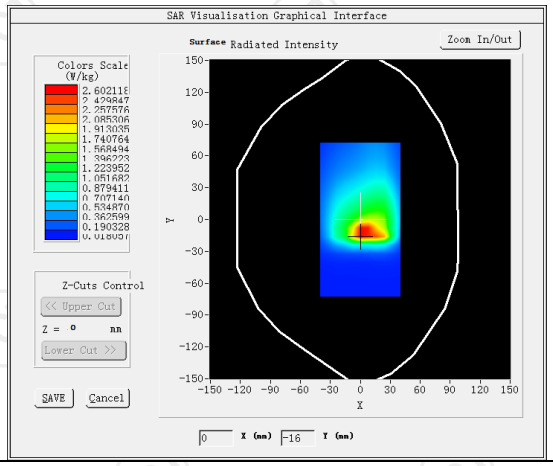
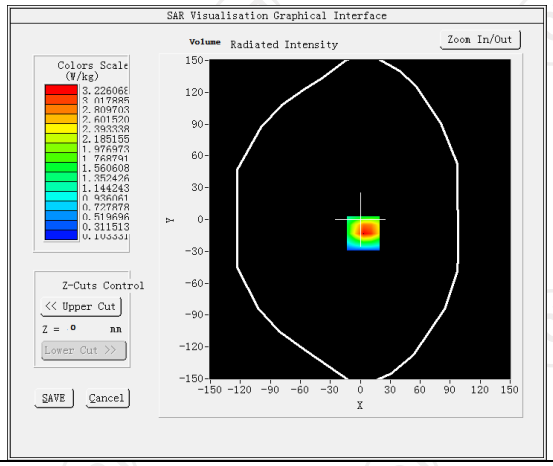
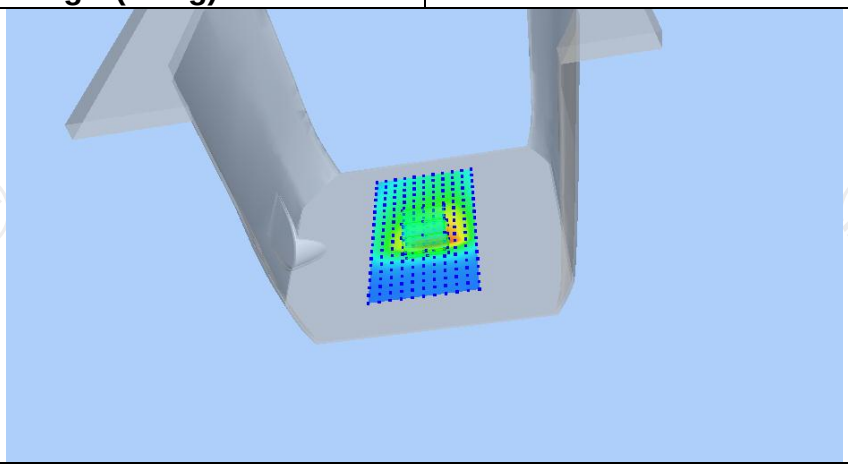
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.0019	0.3285	0.1087	0.0926	0.0490



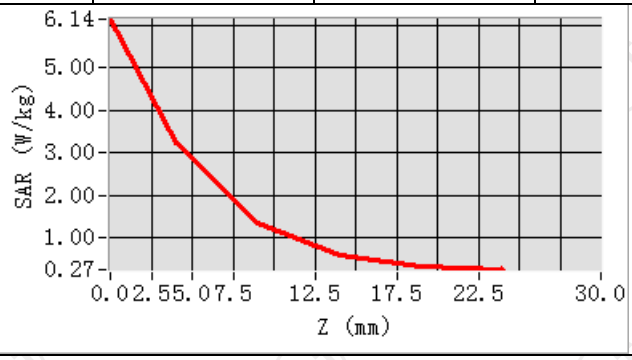
Hot spot position



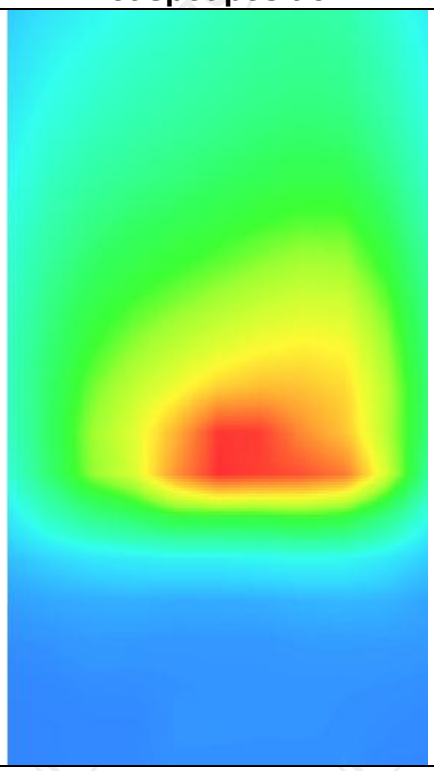
LTE Band 17

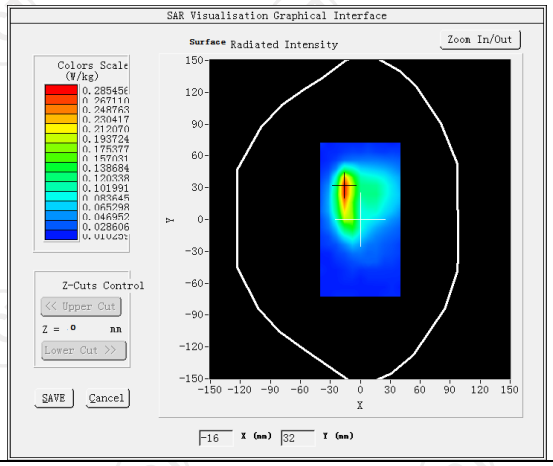
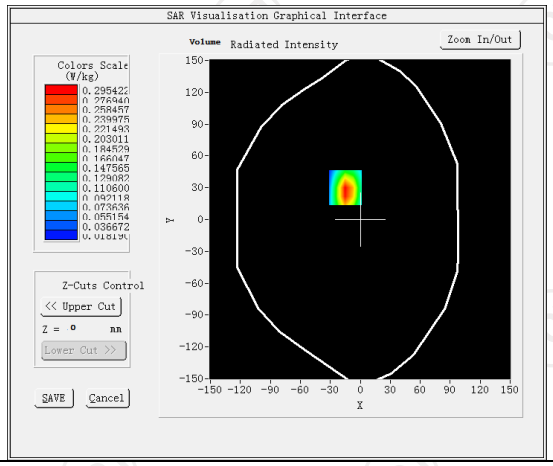
MEASUREMENT 1	
Middle Band SAR (Channel 23790):	Date: 03/30/2022
Frequency (MHz)	710.000000
Relative permittivity (real part)	55.263812
Relative permittivity (imaginary part)	12.468867
Conductivity (S/m)	0.930822
Variation (%)	0.680000
Crest Factor	1.0
Probe Conversion factor	1.78
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	LTE band 17(1 RB#0)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=3.00, Y=-13.00 SAR Peak: 6.40 W/kg	
SAR 10g (W/Kg)	1.568509
SAR 1g (W/Kg)	0.310691
	

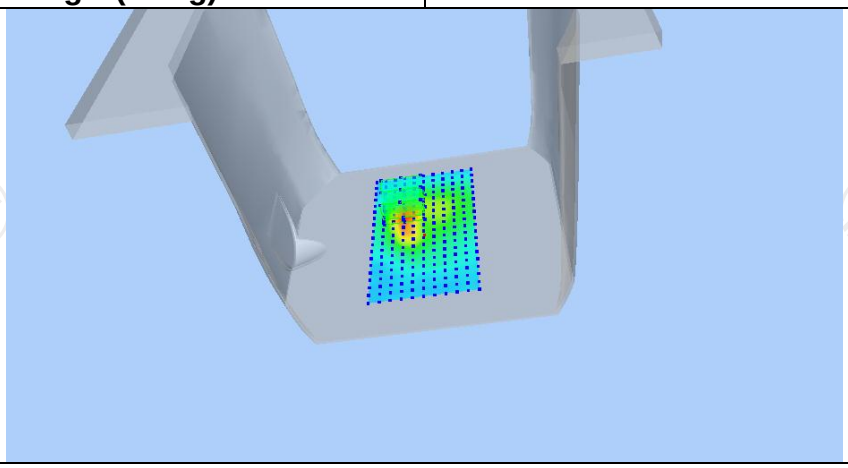
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	6.1435	3.2261	1.3409	0.5883	0.3457



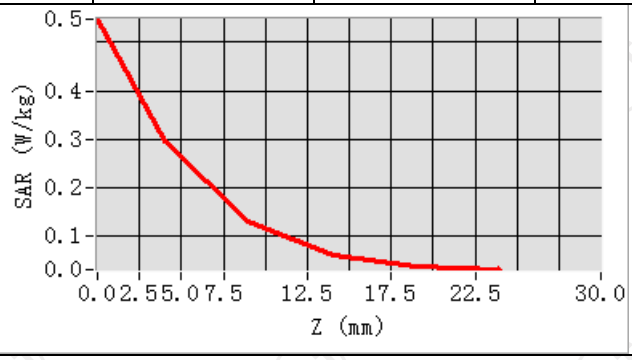
Hot spot position



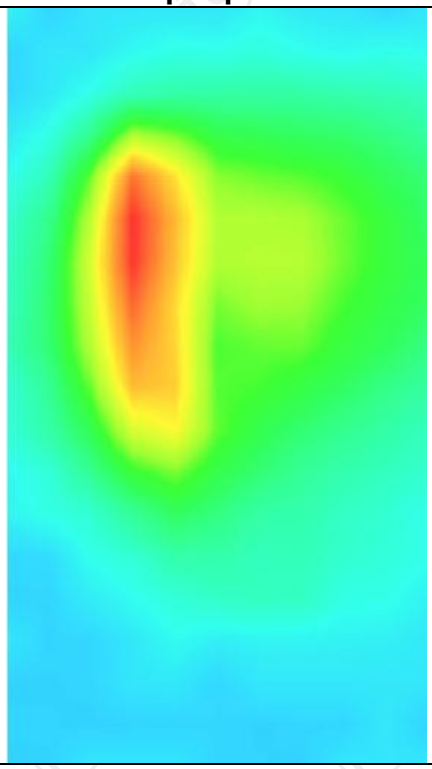
MEASUREMENT 2	
Middle Band SAR (Channel 23790):	Date: 03/30/2022
Frequency (MHz)	710.000000
Relative permittivity (real part)	55.263812
Relative permittivity (imaginary part)	12.468867
Conductivity (S/m)	0.881392
Variation (%)	-1.190000
Crest Factor	1.0
Probe Conversion factor	1.78
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(hotspot 0mm)
Band	LTE band 17(1 RB#0)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-15.00, Y=30.00 SAR Peak: 0.56 W/kg	
SAR 10g (W/Kg)	0.137658
SAR 1g (W/Kg)	0.322202



Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.5480	0.2954	0.1291	0.0605	0.0375

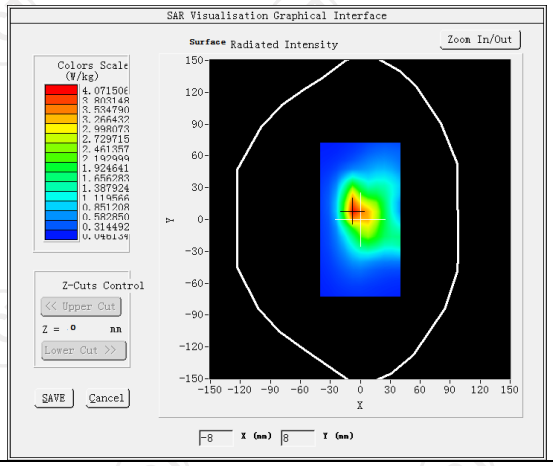


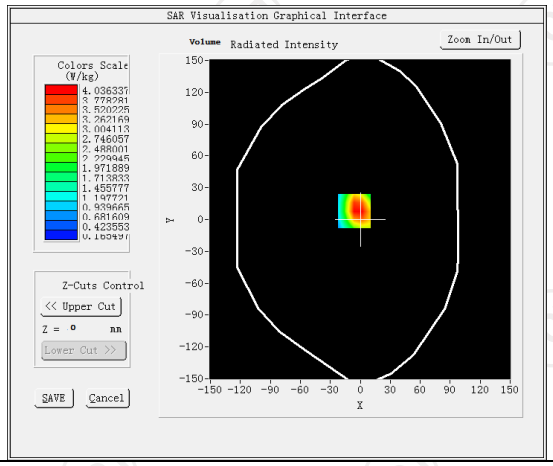
Hot spot position



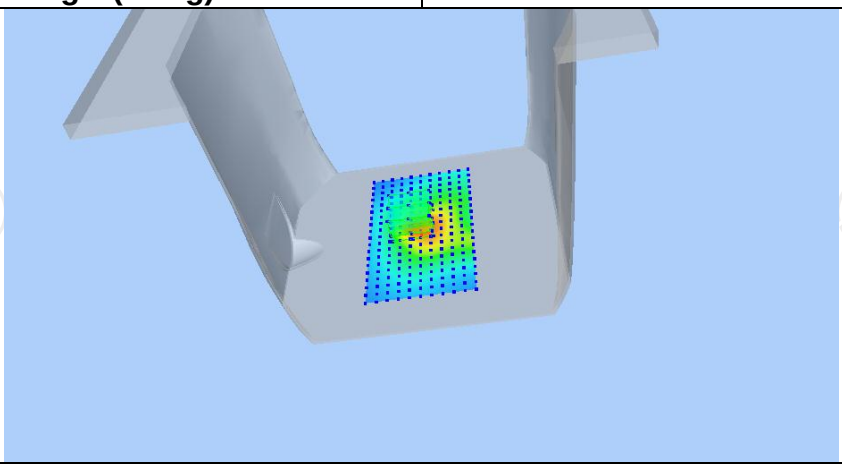
LTE Band 66

MEASUREMENT 1	
Middle Band SAR (Channel 132322):	Date: 04/06/2022
Frequency (MHz)	1745.000000
Relative permittivity (real part)	53.341249
Relative permittivity (imaginary part)	15.168850
Conductivity (S/m)	1.492592
Variation (%)	0.400000
Crest Factor	1.0
Probe Conversion factor	2.16
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	LTE band 66(1 RB#49)
SURFACE SAR	**VOLUME SAR**

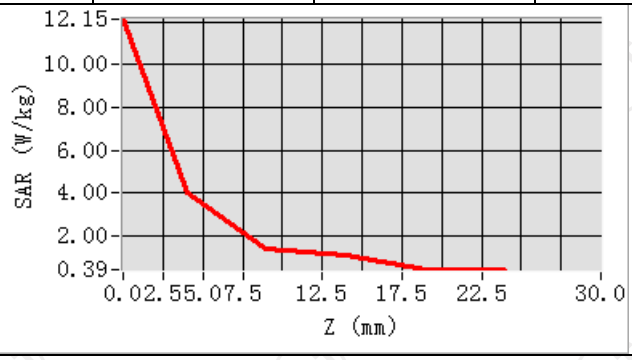




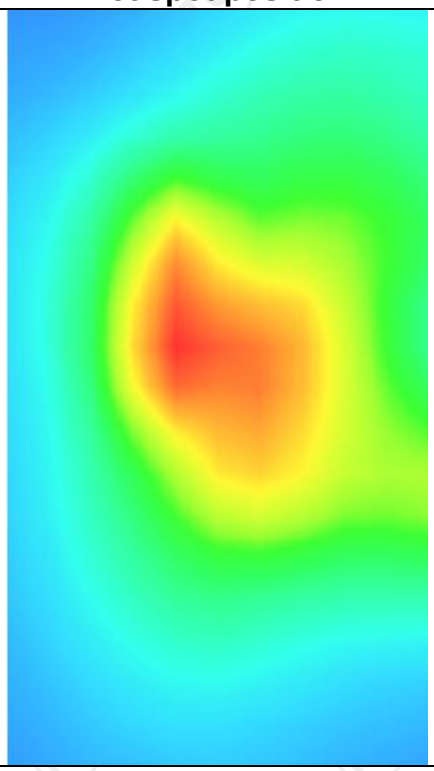
Maximum location: X=-6.00, Y=8.00 SAR Peak: 7.39 W/kg	
SAR 10g (W/Kg)	0.976372
SAR 1g (W/Kg)	0.460271



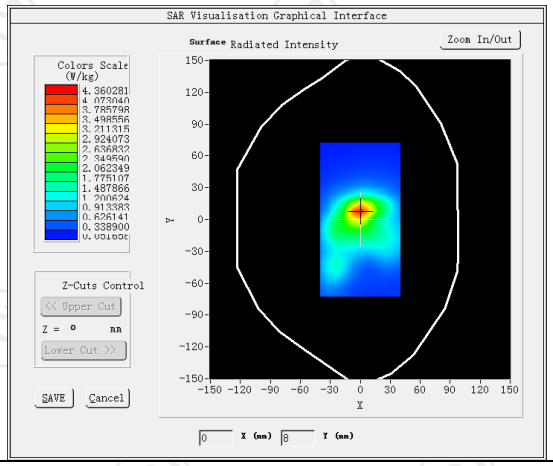
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	12.1463	4.0363	1.3465	1.0586	0.4174

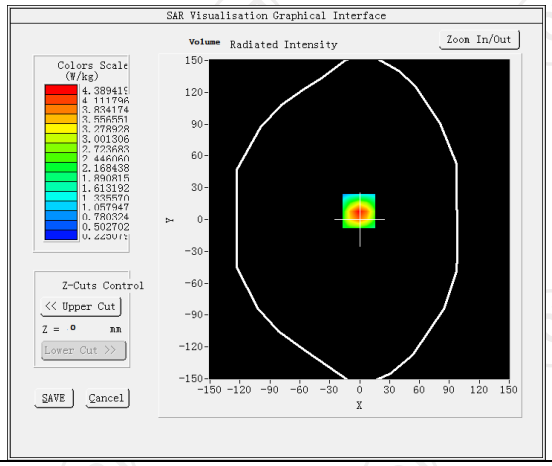


Hot spot position

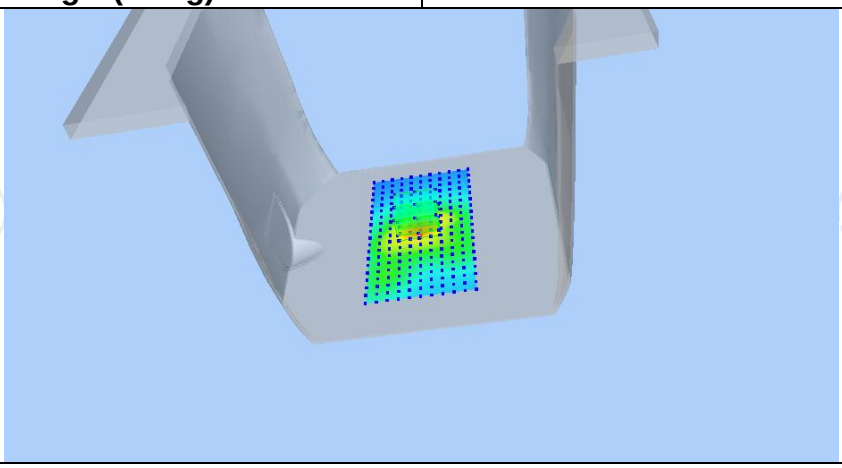


MEASUREMENT 2	
Middle Band SAR (Channel 132322):	Date: 04/06/2022
Frequency (MHz)	1745.000000
Relative permittivity (real part)	53.341249
Relative permittivity (imaginary part)	15.168850
Conductivity (S/m)	1.492592
Variation (%)	-0.820000
Crest Factor	1.0
Probe Conversion factor	2.16
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(hotspot 0mm)
Band	LTE band 66(1 RB#49)
SURFACE SAR	**VOLUME SAR**

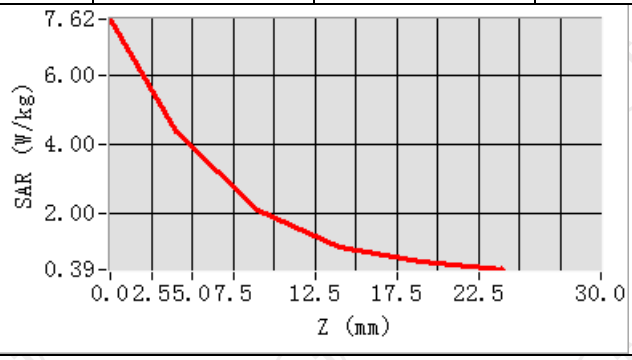




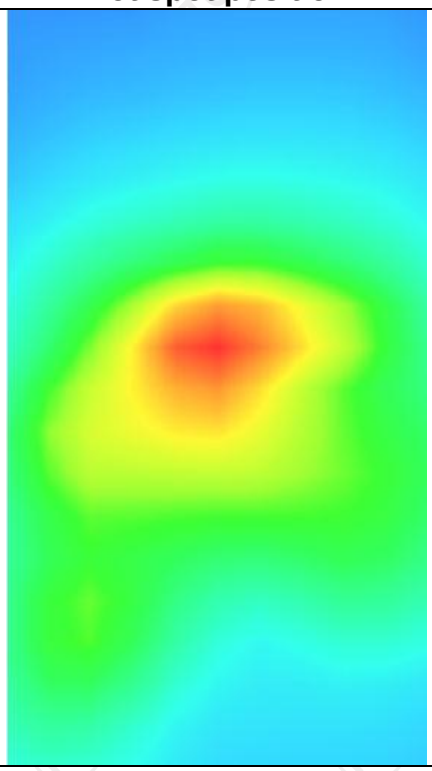
Maximum location: X=-1.00, Y=8.00 SAR Peak: 7.72 W/kg	
SAR 10g (W/Kg)	0.986620
SAR 1g (W/Kg)	0.469683



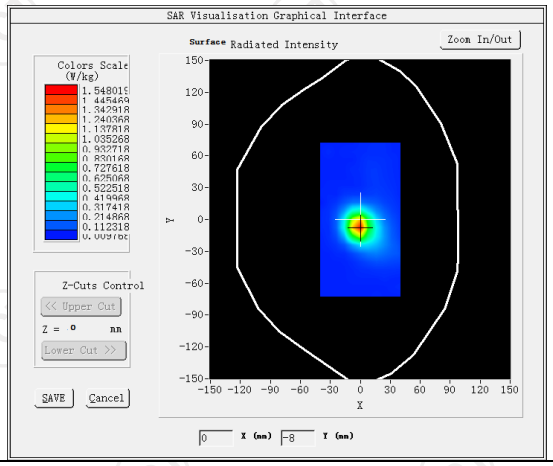
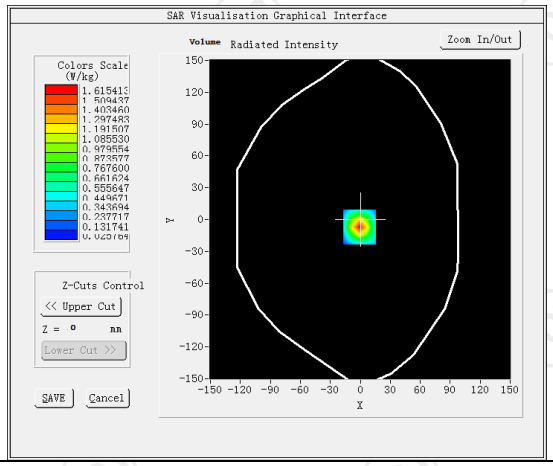
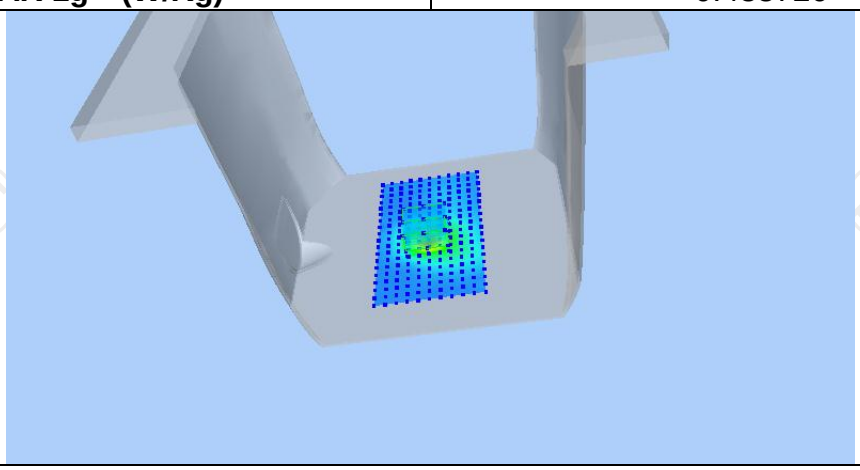
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	7.6230	4.3894	2.1097	1.0475	0.4046



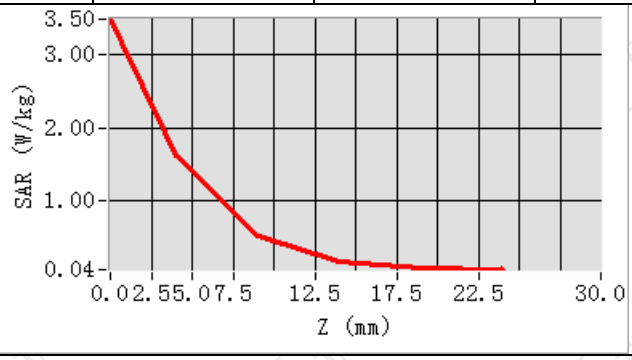
Hot spot position



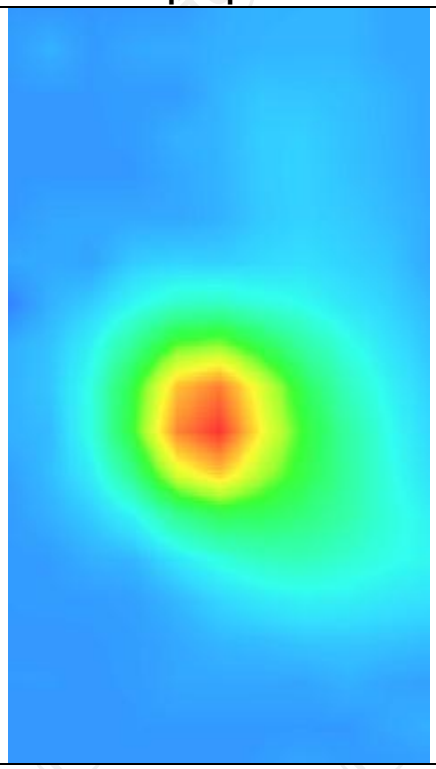
WLAN 2.4G

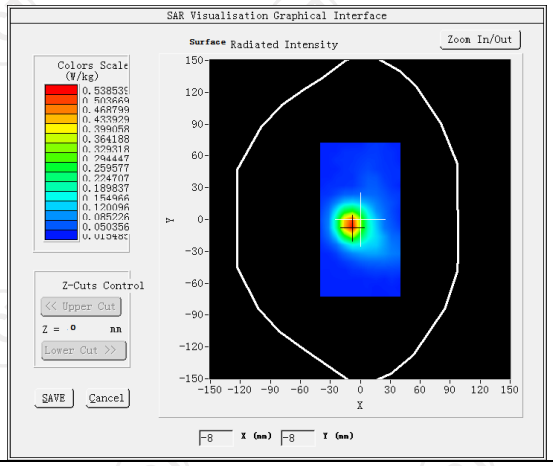
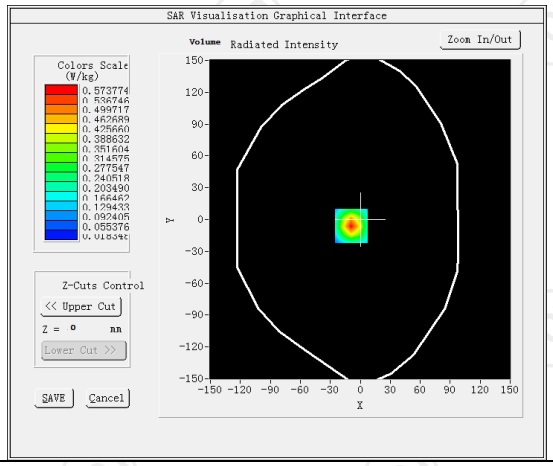
MEASUREMENT 1	
Hight Band SAR (Channel 11):	Date: 04/11/2022
Frequency (MHz)	2462.000000
Relative permittivity (real part)	54.630667
Relative permittivity (imaginary part)	14.318428
Conductivity (S/m)	1.982536
Variation (%)	1.250000
Crest Factor	1.0
Probe Conversion factor	2.37
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	IEEE 802.11n(HT20) ISM
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-1.00, Y=-7.00 SAR Peak: 3.48 W/kg	
SAR 10g (W/Kg)	0.182670
SAR 1g (W/Kg)	0.438726
	

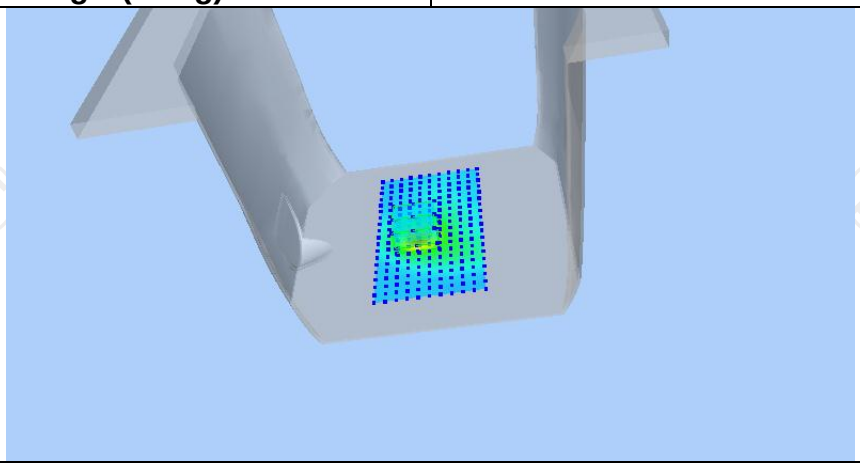
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	3.4980	1.6154	0.5133	0.1482	0.0600



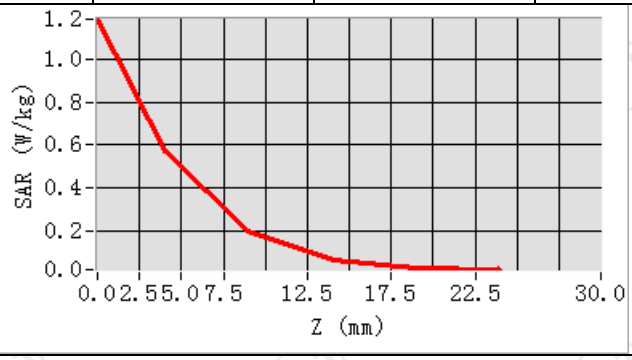
Hot spot position



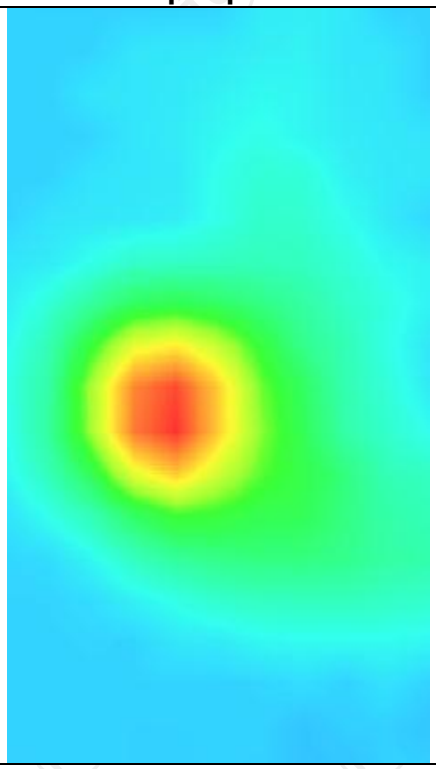
MEASUREMENT 2	
Hight Band SAR (Channel 11):	Date: 04/11/2022
Frequency (MHz)	2462.000000
Relative permittivity (real part)	54.630667
Relative permittivity (imaginary part)	14.318428
Conductivity (S/m)	1.982536
Variation (%)	-3.110000
Crest Factor	1.0
Probe Conversion factor	2.37
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	IEEE 802.11n(HT20) ISM(hotspot)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-14.00, Y=55.00 SAR Peak: 0.37 W/kg	
SAR 10g (W/Kg)	0.134240
SAR 1g (W/Kg)	0.445290



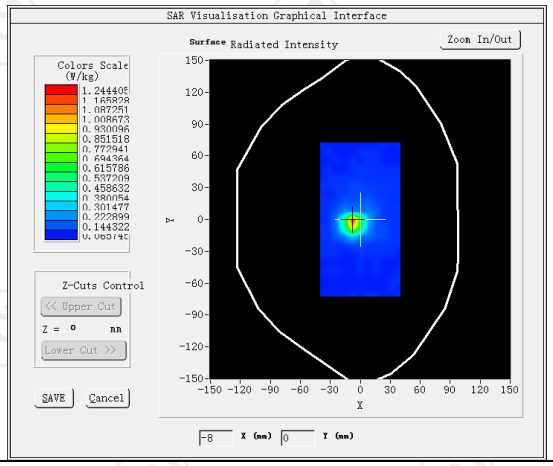
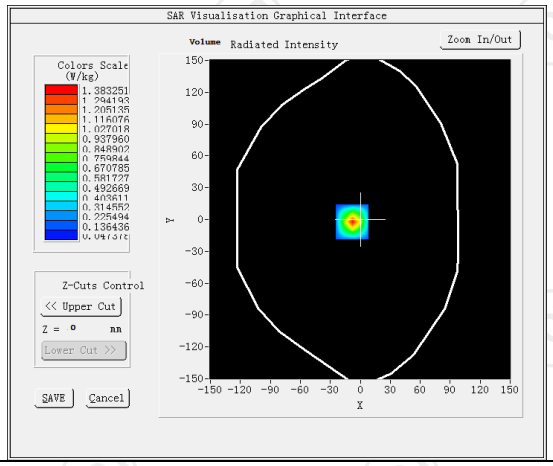
Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.1857	0.5738	0.2014	0.0679	0.0308

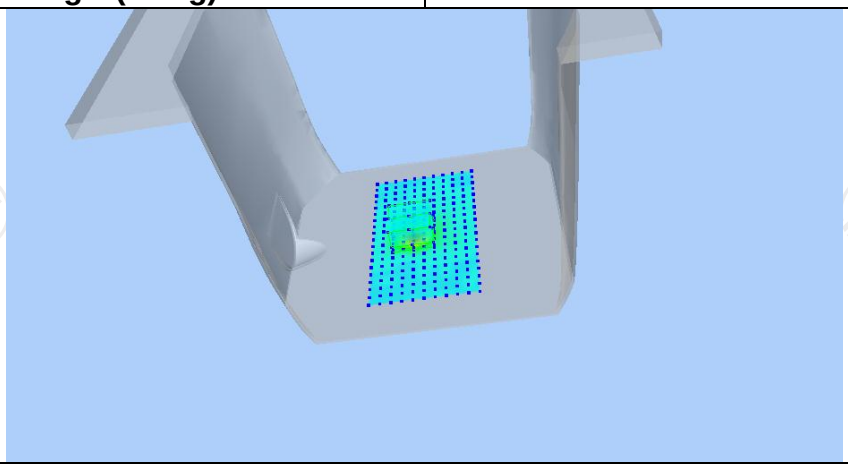


Hot spot position

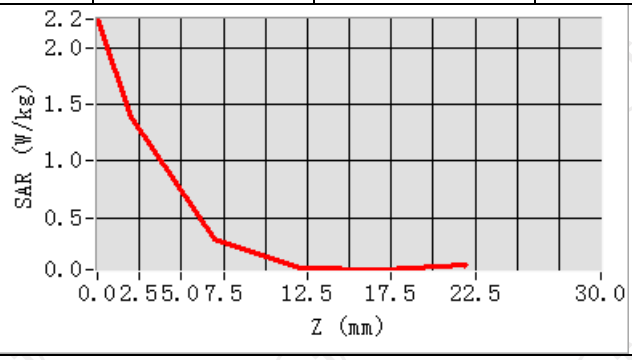


WLAN 5.2G

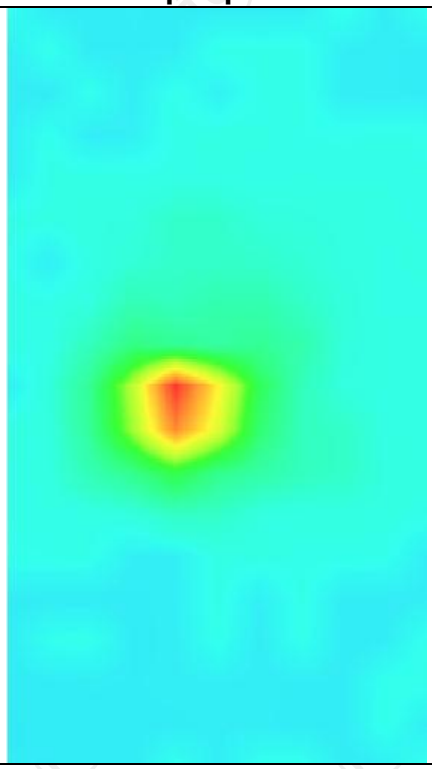
MEASUREMENT 1	
SAR (Channel 36):	Date: 04/14/2022
Frequency (MHz)	5180.000000
Relative permittivity (real part)	49.022077
Relative permittivity (imaginary part)	21.378187
Conductivity (S/m)	5.408883
Variation (%)	-1.300000
Crest Factor	1.0
Probe Conversion factor	2.08
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	IEEE 802.11n(HT20) ISM
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-8.00, Y=-2.00 SAR Peak: 2.32 W/kg	
SAR 10g (W/Kg)	0.304653
SAR 1g (W/Kg)	0.241245

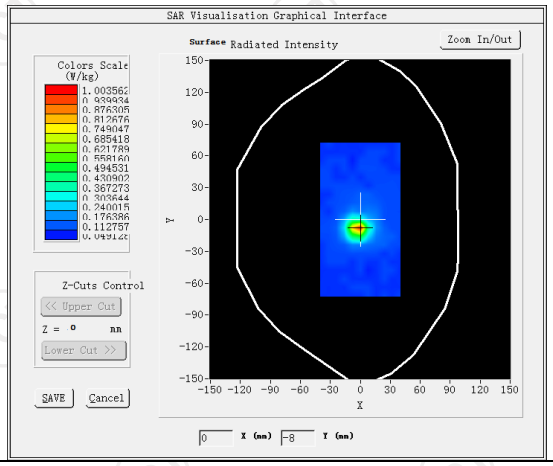
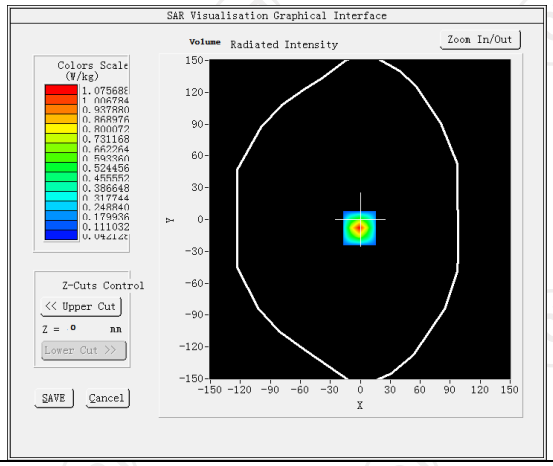
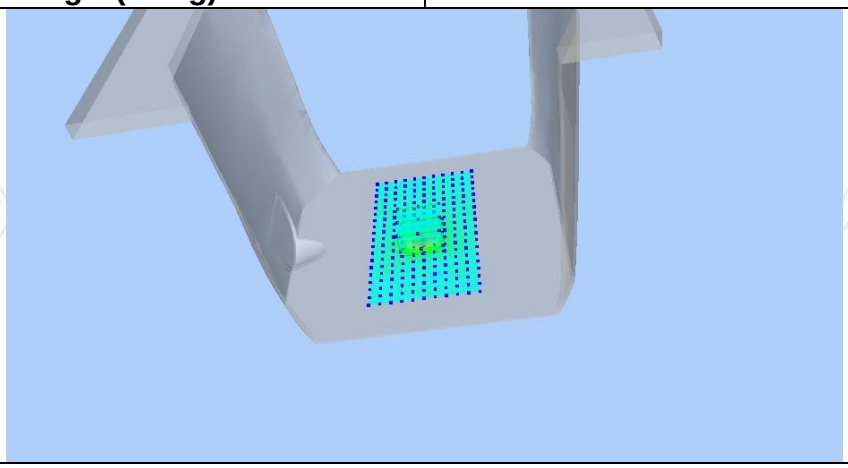


Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	2.2471	1.3833	0.3184	0.0673	0.0474

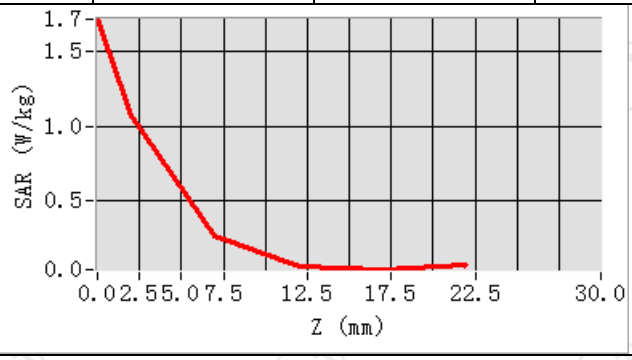


Hot spot position

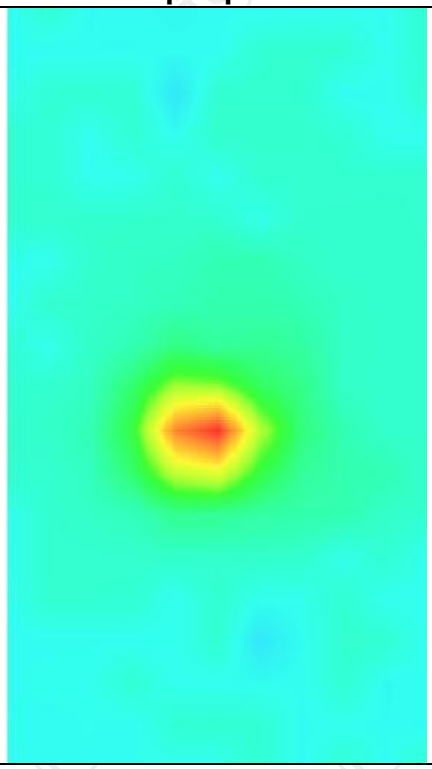


MEASUREMENT 2	
SAR (Channel 36):	Date: 04/14/2022
Frequency (MHz)	5180.000000
Relative permittivity (real part)	49.022077
Relative permittivity (imaginary part)	21.378187
Conductivity (S/m)	5.408883
Variation (%)	-2.770000
Crest Factor	1.0
Probe Conversion factor	2.08
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	IEEE 802.11n(HT20) ISM(hotspot)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-1.00, Y=-8.00 SAR Peak: 1.76 W/kg	
SAR 10g (W/Kg)	0.616528
SAR 1g (W/Kg)	0.256240
	

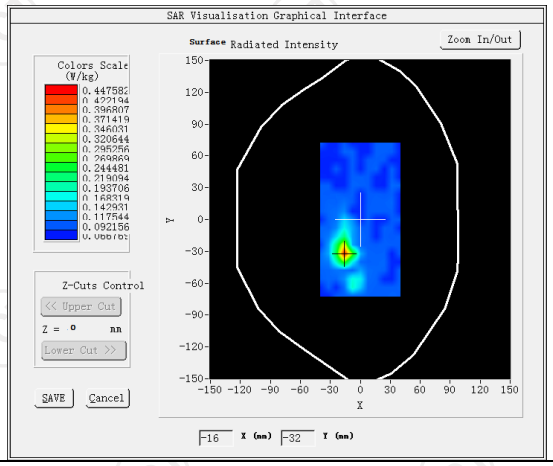
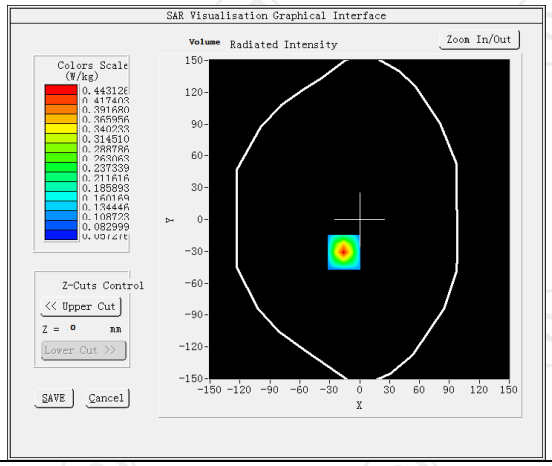
Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.7141	1.0757	0.2699	0.0646	0.0422

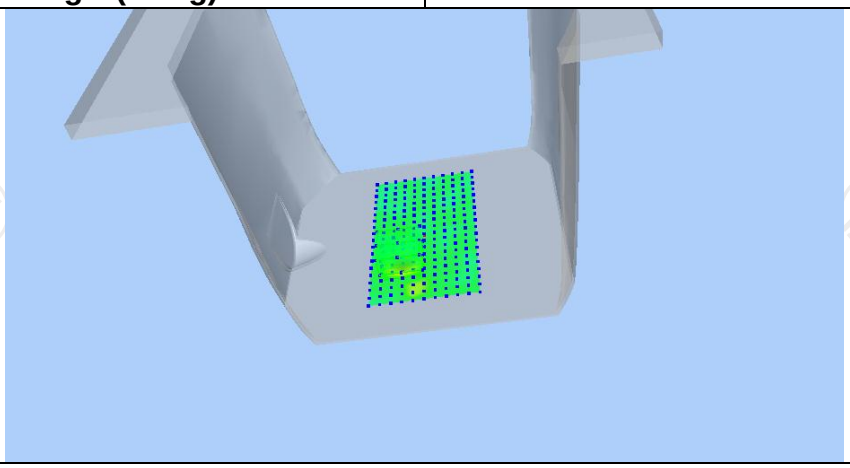


Hot spot position

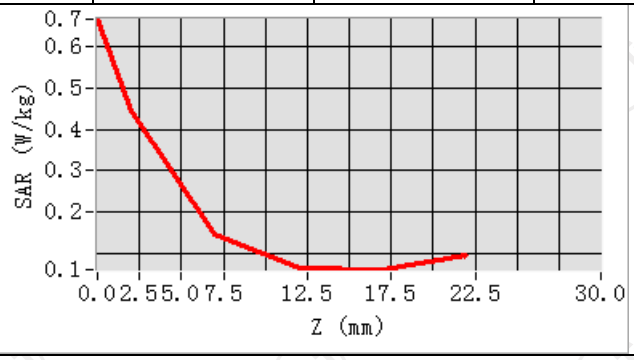


WLAN 5.6G

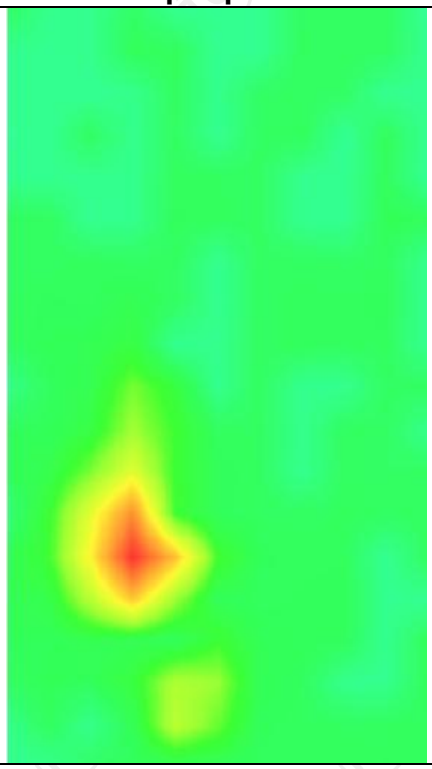
MEASUREMENT 1	
SAR (Channel 140):	Date: 04/15/2022
Frequency (MHz)	5700.000000
Relative permittivity (real part)	49.012699
Relative permittivity (imaginary part)	15.200000
Conductivity (S/m)	5.520000
Variation (%)	-2.130000
Crest Factor	1.0
Probe Conversion factor	2.12
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	IEEE 802.11n(HT20) ISM
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-16.00, Y=-31.00 SAR Peak: 0.69 W/kg	
SAR 10g (W/Kg)	0.145644
SAR 1g (W/Kg)	0.280391

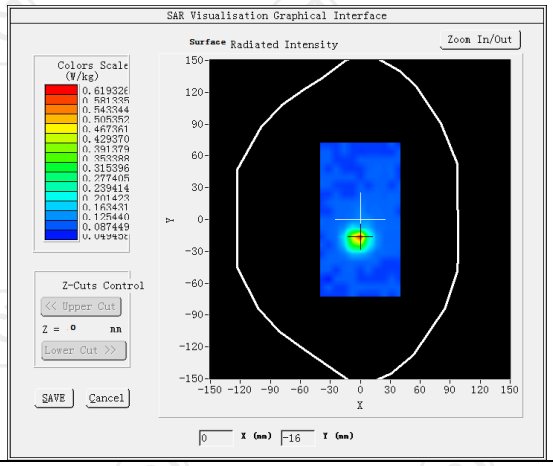
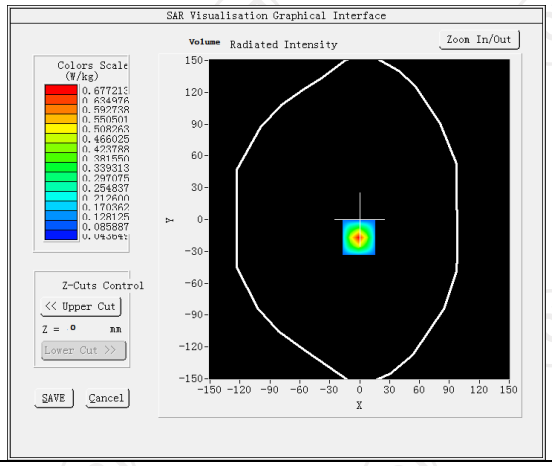


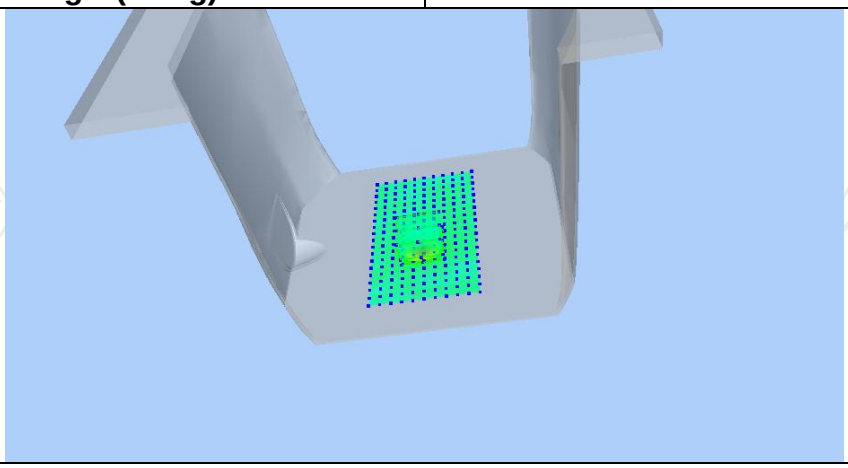
Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.6652	0.4431	0.1477	0.0636	0.0615



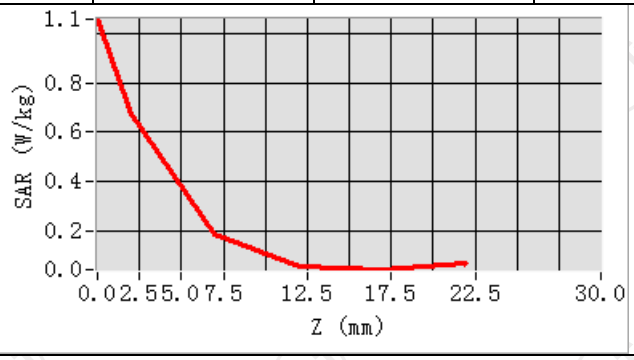
Hot spot position



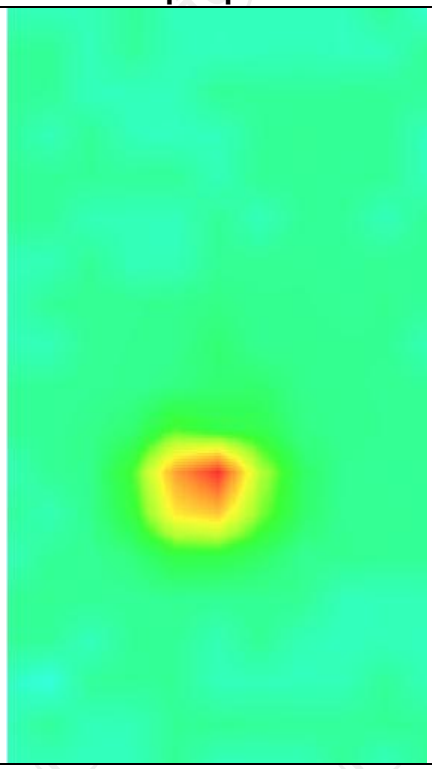
MEASUREMENT 2	
SAR (Channel 140):	Date: 04/15/2022
Frequency (MHz)	5700.000000
Relative permittivity (real part)	49.012699
Relative permittivity (imaginary part)	15.200000
Conductivity (S/m)	5.520000
Variation (%)	-2.290000
Crest Factor	1.0
Probe Conversion factor	2.12
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(0mm)
Band	IEEE 802.11n(HT20) ISM(hotspot)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-1.00, Y=-17.00 SAR Peak: 1.09 W/kg	
SAR 10g (W/Kg)	0.175534
SAR 1g (W/Kg)	0.309545



Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.0581	0.6772	0.1874	0.0564	0.0436

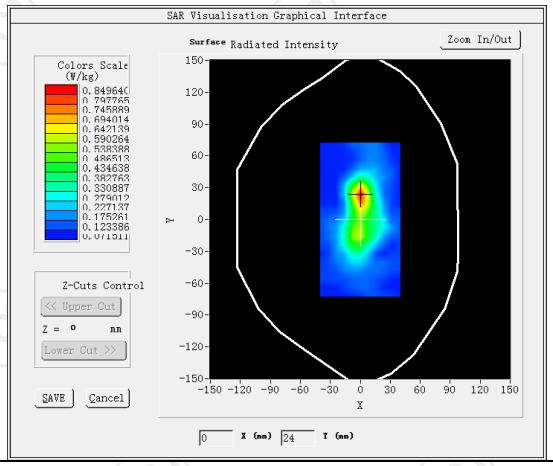


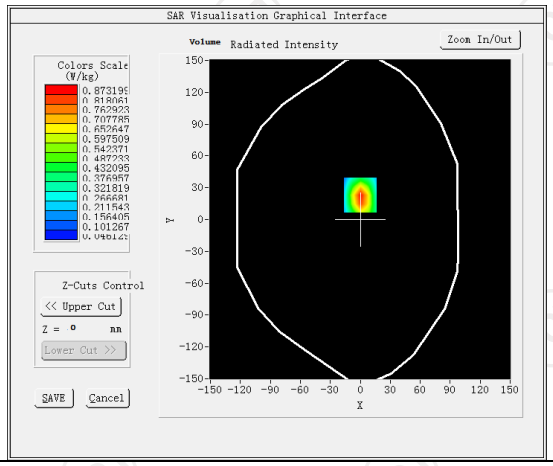
Hot spot position



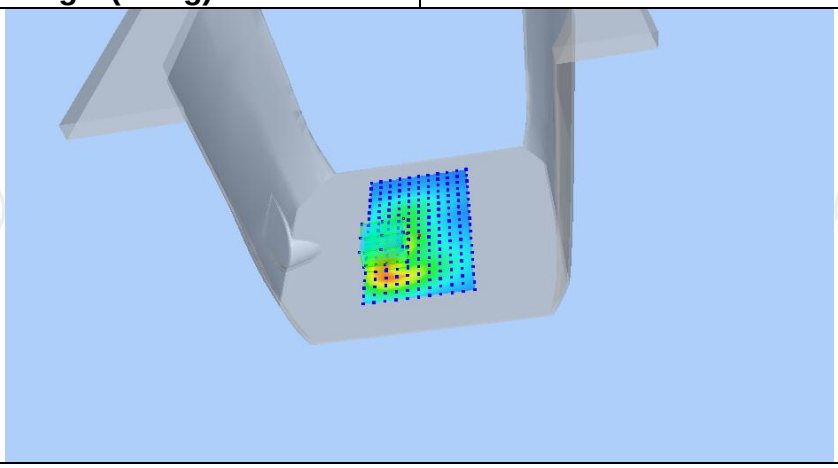
WLAN 5.8G

MEASUREMENT 1	
SAR (Channel 149):	Date: 04/18/2022
Frequency (MHz)	5745.000000
Relative permittivity (real part)	48.019999
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	5.970354
Variation (%)	-1.990000
Crest Factor	1.0
Probe Conversion factor	2.13
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(10mm)
Band	IEEE 802.11a ISM
SURFACE SAR	**VOLUME SAR**

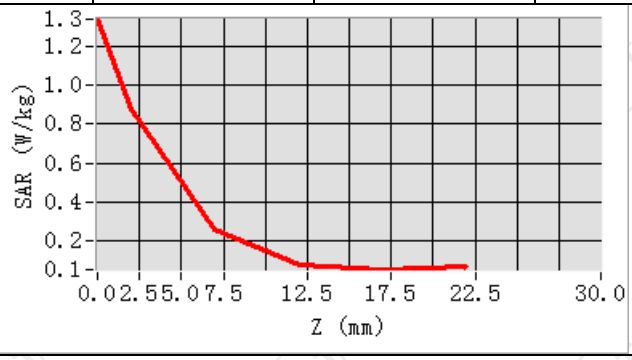




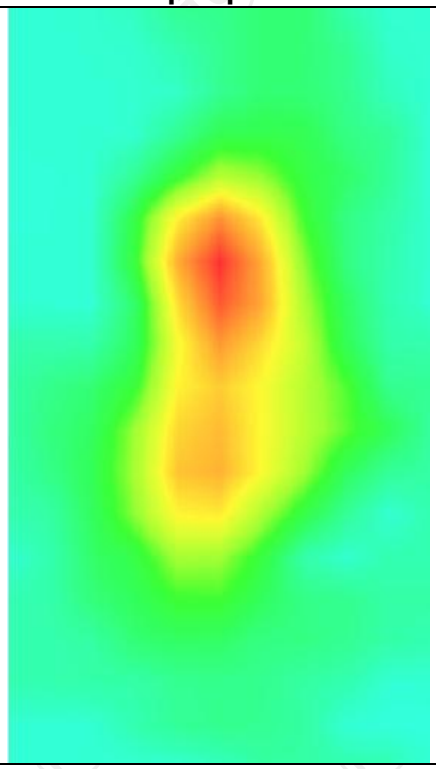
Maximum location: X=0.00, Y=23.00 SAR Peak: 1.39 W/kg	
SAR 10g (W/Kg)	0.245968
SAR 1g (W/Kg)	0.304770

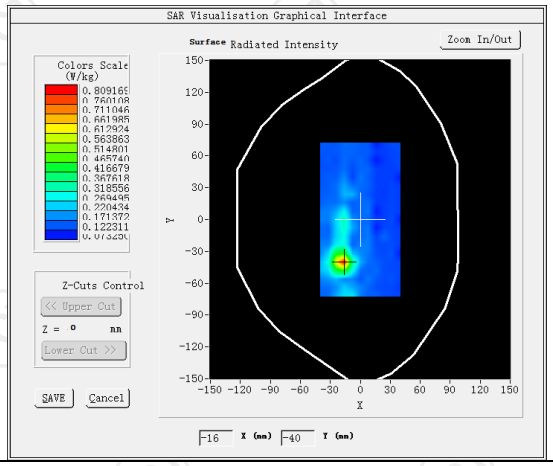
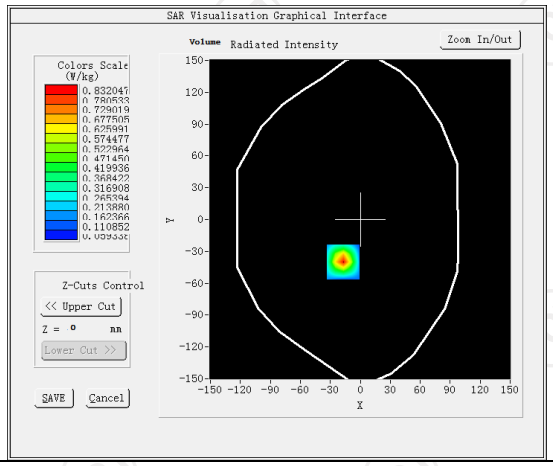


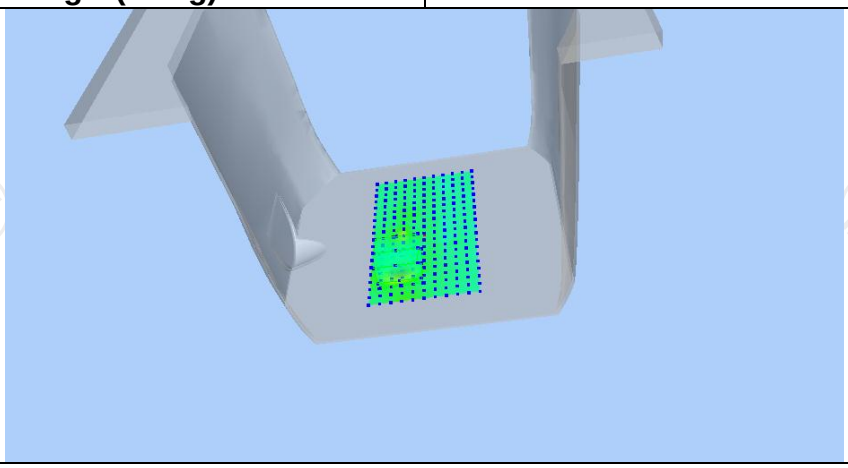
Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.3365	0.8732	0.2607	0.0823	0.0550



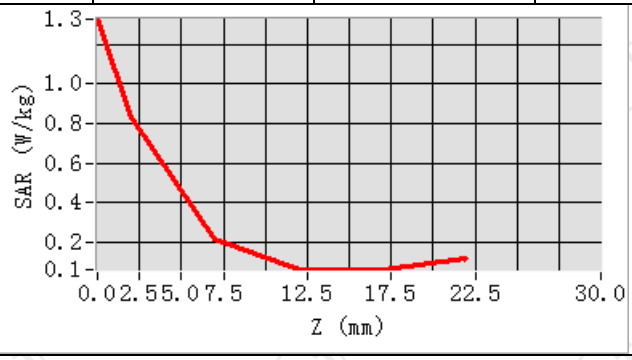
Hot spot position



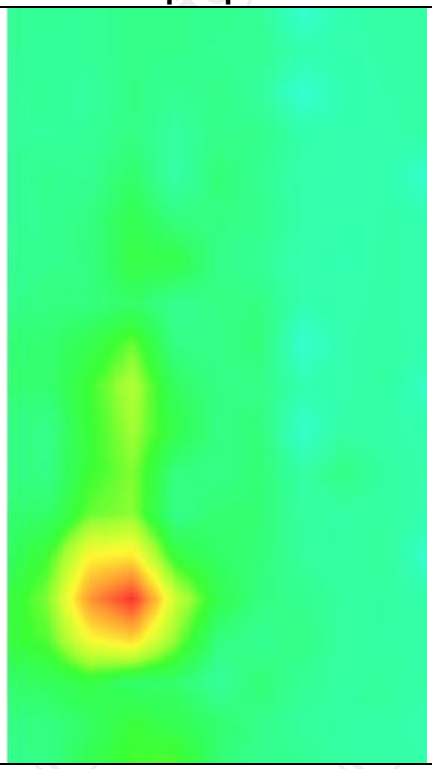
MEASUREMENT 2	
SAR (Channel 149):	Date: 04/18/2022
Frequency (MHz)	5745.000000
Relative permittivity (real part)	48.019999
Relative permittivity (imaginary part)	14.329440
Conductivity (S/m)	5.970354
Variation (%)	-2.800000
Crest Factor	1.0
Probe Conversion factor	2.13
E-Field Probe:	SSE2 (SN 41/18 EPGO331)
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back(10mm)
Band	IEEE 802.11a ISM(hotspot)
SURFACE SAR	**VOLUME SAR**
	
Maximum location: X=-17.00, Y=-40.00 SAR Peak: 1.39 W/kg	
SAR 10g (W/Kg)	0.225241
SAR 1g (W/Kg)	0.320450



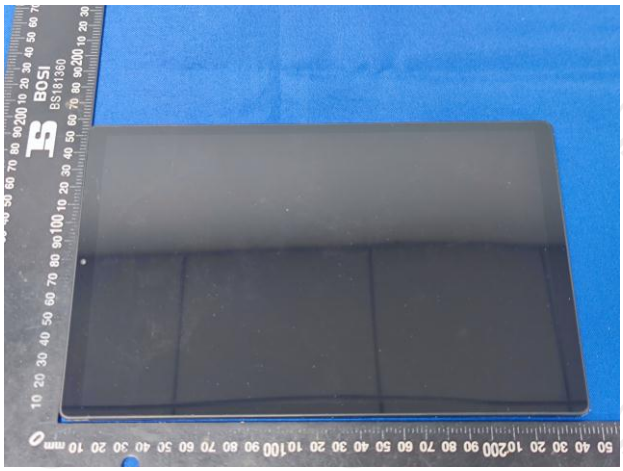
Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.3296	0.8320	0.2114	0.0617	0.0593

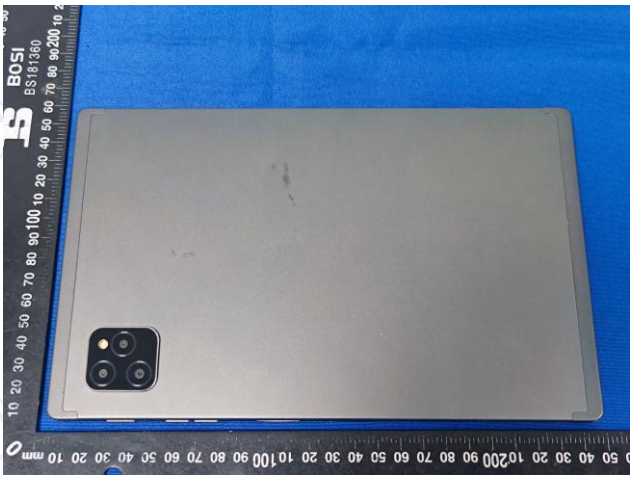


Hot spot position



Appendix A: EUT Photos

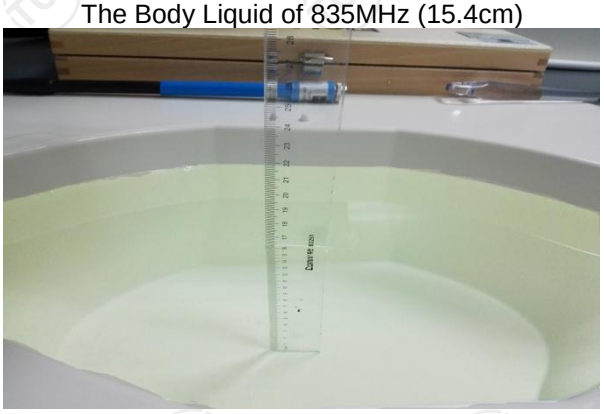




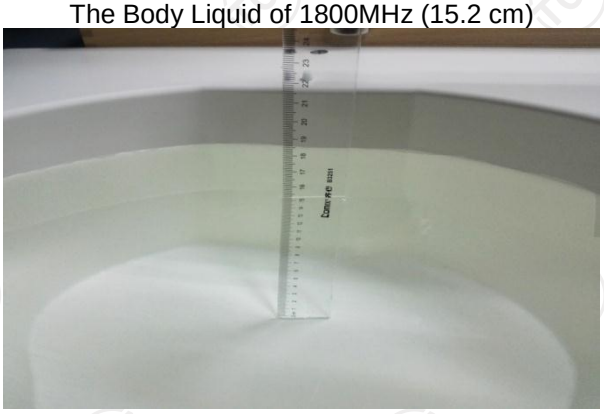
Liquid depth

The Body Liquid of 835MHz (15.4cm)

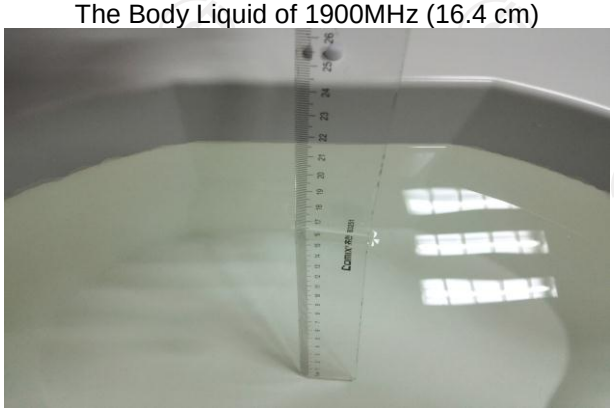
The Body Liquid of 1800MHz (15.2 cm)



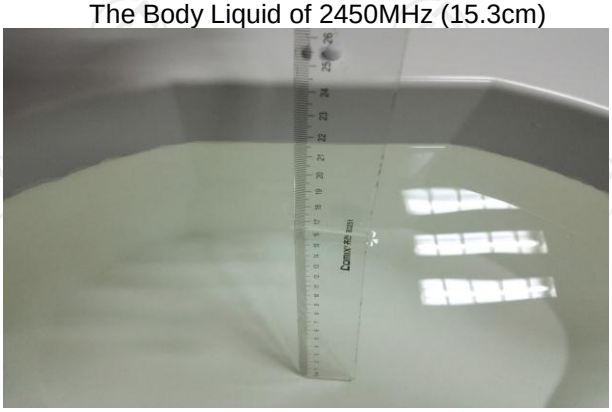
The Body Liquid of 1900MHz (16.4 cm)



The Body Liquid of 2450MHz (15.3cm)

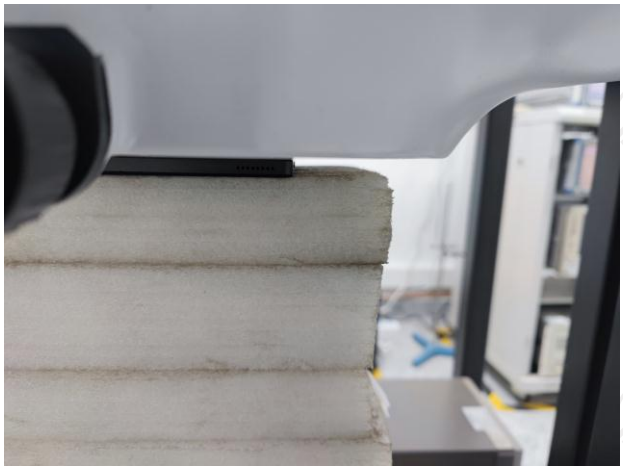


The Body Liquid of 2600MHz (16.5cm)

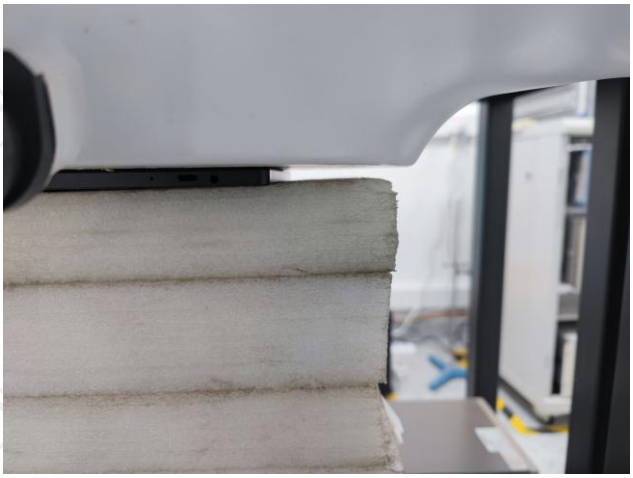


The Body Liquid of 5000-6000MHz (16.5cm)

Appendix B: Test Setup Photos

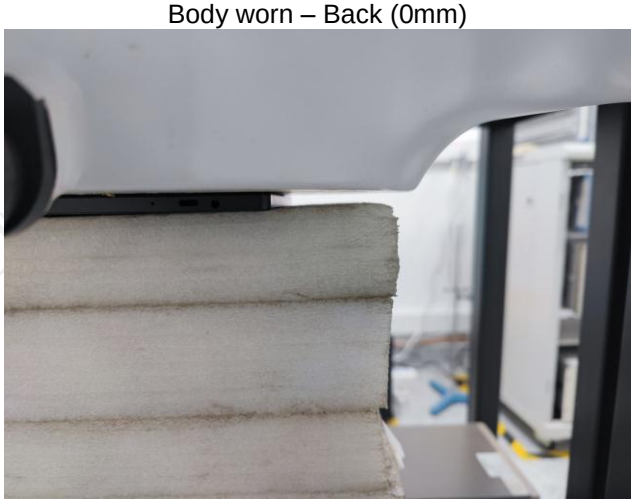


Body worn – Front (0mm)

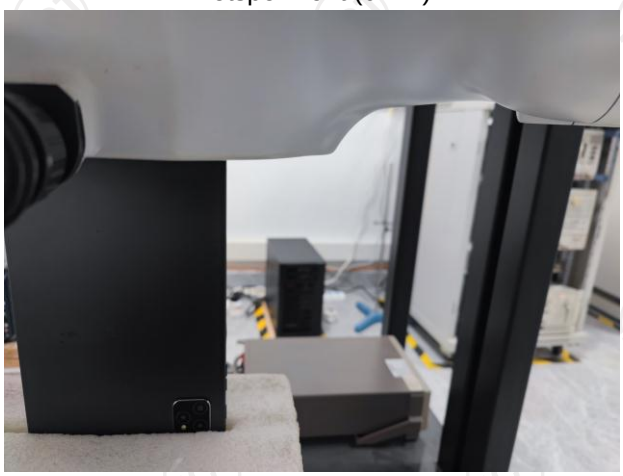


Body worn – Back (0mm)

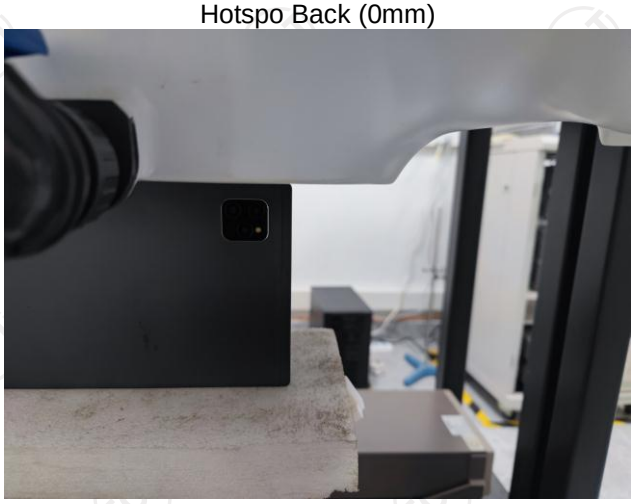
Hotspo Front (0mm)



Hotspo Back (0mm)



Hotspot Top (0mm)



Hotspot Right (0mm)

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

Hotspot Bottom (0mm)

Appendix C: Probe Calibration Certificate

COMOSAR E-FIELD Probe

COMOSAR E-Field Probe Calibration Report

Ref : ACR.241.1.19.SATU.A

SHENZHEN TONGCE TESTING LAB.

TCT TESTING INDUSTRIAL PARK, FUQIAO 5TH INDUSTRIAL ZONE, FUHAI STREET, BAOAN DISTRICT SHENZHEN, GUANGDONG, 518103, PEOPLES REPUBLIC OF CHINA

MVG COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: SN 41/18 EPGO331

Calibrated at MVG US

2105 Barrett Park Dr. - Kennesaw, GA 30144

Calibration Date: 08/02/2021

Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed in MVG USA using the CALISAR / CALIBAIR test bench, for use with a COMOSAR system only. All calibration results are traceable to national metrology institutions.

	Name	Function	Date	Signature
Prepared by :	Jérôme LUC	Product Manager	08/02/2021	
Checked by :	Jérôme LUC	Product Manager	08/02/2021	
Approved by :	Kim RUTKOWSKI	Quality Manager	08/02/2021	

	Customer Name
Distribution :	SHENZHEN TONGCE TESTING LAB.

Issue	Date	Modifications
A	08/02/2021	Initial release

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1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 41/18 EPGO331
Product Condition (new / used)	New
Frequency Range of Probe	0.4 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.184 MΩ Dipole 2: R2=0.191 MΩ Dipole 3: R3=0.192 MΩ

A yearly calibration interval is recommended.

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

MVG's COMOSAR E field Probes are built in accordance to the IEEE 1528, OET 65 Bulletin C and CEI/IEC 62209 standards.

Figure 1 – *MVG COMOSAR Dosimetric E field Dipole*

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

3 MEASUREMENT METHOD

The IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their affect. All calibrations / measurements performed meet the fore mentioned standards.

3.1 LINEARITY

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

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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 - 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°).

3.5 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.

4 MEASUREMENT UNCERTAINTY

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

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	**Uncertainty value (%)**	**Probability Distribution**	**Divisor**	**ci**	**Standard Uncertainty (%)**
Incident or forward power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Reflected power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Liquid conductivity	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Liquid permittivity	4.00%	Rectangular	$\sqrt{3}$	1	2.309%
Field homogeneity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Field probe positioning	5.00%	Rectangular	$\sqrt{3}$	1	2.887%

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Field probe linearity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Combined standard uncertainty					5.831%
Expanded uncertainty 95 % confidence level k = 2					12.0%

5 CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

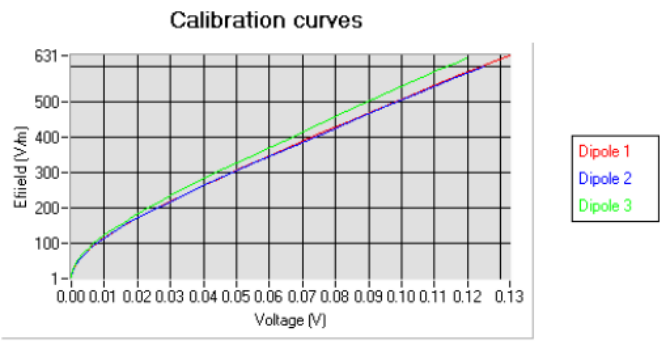
5.1 SENSITIVITY IN AIR

Normx dipole 1 (µV/(V/m)^2)	Normy dipole 2 (µV/(V/m)^2)	Normz dipole 3 (µV/(V/m)^2)
0.86	0.78	0.74

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
95	93	91

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

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



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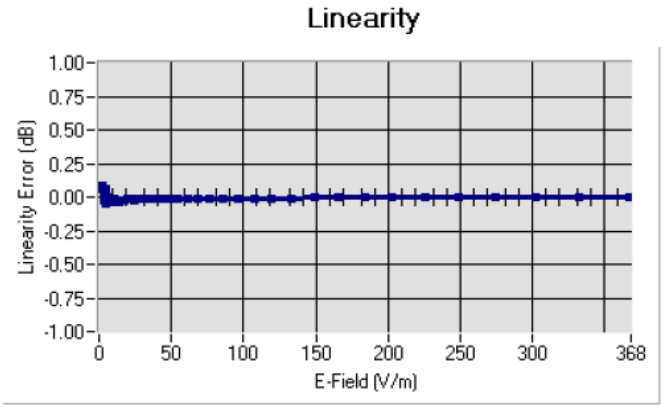
5.2 LINEARITY



Linearity: +/-1.92% (+/-0.08dB)

5.3 SENSITIVITY IN LIQUID

Liquid	Frequency (MHz +/- 100MHz)	Permittivity	Epsilon (S/m)	ConvF
HL450	450	45.43	0.86	1.85
BL450	450	58.80	0.90	1.92
HL750	750	40.76	0.93	1.71
BL750	750	56.70	0.98	1.78
HL850	835	40.86	0.92	1.80
BL850	835	56.35	0.99	1.86
HL900	900	41.94	0.93	1.91
BL900	900	54.62	0.98	1.96
HL1800	1800	40.86	1.29	2.08
BL1800	1800	52.27	1.47	2.16
HL1900	1900	39.67	1.38	2.23
BL1900	1900	52.84	1.59	2.32
HL2000	2000	38.71	1.42	2.03
BL2000	2000	52.03	1.52	2.10
HL2450	2450	38.72	1.80	2.31
BL2450	2450	54.91	1.97	2.37
HL2600	2600	39.98	1.89	2.16
BL2600	2600	54.42	2.18	2.23
HL3500	3500	37.96	2.87	2.21
BL3500	3500	53.40	3.28	2.28
HL5200	5200	36.68	4.45	2.01
BL5200	5200	49.02	5.46	2.08
HL5400	5400	36.08	4.69	1.94
BL5400	5400	49.55	5.53	1.99
HL5600	5600	35.34	4.95	2.07
BL5600	5600	47.60	5.77	2.12
HL5800	5800	34.81	5.08	2.06
BL5800	5800	47.81	6.12	2.13

LOWER DETECTION LIMIT: 9mW/kg

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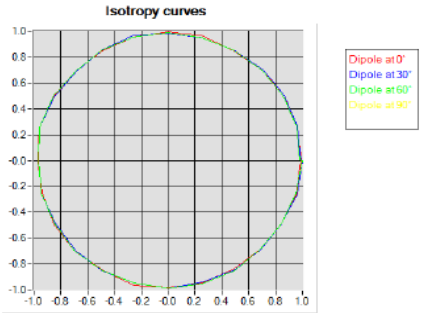
5.4 ISOTROPY

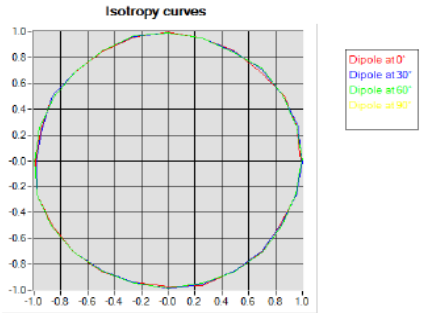
HL850 MHz

- Axial isotropy: 0.04 dB
- Hemispherical isotropy: 0.07 dB



HL1900 MHz

- Axial isotropy: 0.04 dB
- Hemispherical isotropy: 0.08 dB



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