FCC SAR TEST REPORT

Report No.: STS2203086H01

Issued for

Shenzhen Yibaifen Electronic Technology Co., Ltd.

Building e, Minle Science and Technology Park, Longhua district, Shenzhen, China

Product Name:	Smart phone
Brand Name:	Welcome
Model Name:	Note 10
Series Model:	MX4
FCC ID:	2A5MYNOTE10
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEEE 1528: 2013
Max. Report SAR (1g):	Head: 0.381 W/kg
	Body: 0.901 W/kg

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Test Report Certification

Applicant's name	:	Shenzhen Yibaifen Electronic Technology Co., Ltd.
Address	:	Building e, Minle Science and Technology Park, Longhua district, Shenzhen, China
Manufacturer's Name	:	Shenzhen encyclopedia Innovation Technology Co., Ltd
Address	:	Room 2718, block C, Huaqiang North Electronic Technology Building, Futian District, Shenzhen, China

Product description

Product name	:	Smart phone
Brand name	:	Welcome
Model name	:	Note 10
Series Model	:	MX4
Standards	:	ANSI/IEEE Std. C95.1-1992 FCC 47 CFR Part 2 (2.1093) IEEE 1528: 2013

The device was tested by Shenzhen STS Test Services Co., Ltd. in accordance with the measurement methods and procedures specified in KDB 865664 The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of Test	:	
Date (s) of performance of tests	:	26 Mar. 2022 ~ 28 Mar. 2022
Date of Issue	:	31 Mar. 2022
Test Result	:	**Pass**

Testing Engineer : Shi fan. long
(Shifan. Long)

Technical Manager : Sean She
(Sean she)

Authorized Signatory : Bovey Yang
(Bovey Yang)

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	31 Mar. 2022	STS2203086H01	ALL	Initial Issue

1. General Information

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

1.1 EUT Description

Product Name	Smart phone			
Brand Name	Welcome			
Model Name	Note 10			
Series Model	MX4			
Model Difference	Only different in model name.			
Battery	Rated Voltage:3.8V Charge Limit Voltage:4.35V Capacity:5000 MAH			
Device Category	Portable			
Product stage	Production unit			
RF Exposure Environment	General Population / Uncontrolled			
IMEI	355441061519390 355441061519408			
Hardware Version	V213IM-1.0			
Software Version	LRX21M test-keys			
Frequency Range	GSM 850: 824 MHz ~ 849 MHz PCS1900: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz WLAN802.11b/g/n20: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz to 2480 MHz			
Max. Reported SAR(1g): (Limit:1.6W/kg)	Band	Mode	Head (W/kg)	Body Worn and Hotspot(W/kg)
	PCE	GSM 850	0.381	0.494
	PCE	GSM 1900	0.043	0.901
	PCE	WCDMA Band V	0.099	0.160
	DTS	2.4G WLAN	0.108	0.052
	DSS	BT	0.036	0.035
1-g Sum SAR			0.489	0.953
FCC Equipment Class	Licensed Portable Transmitter Held to Ear (PCE) Part 15 Spread Spectrum Transmitter (DSS) Digital Transmission System (DTS)			
Operating Mode:	GSM: GSM Voice; GPRS Class 12 WCDMA: RMC, HSDPA, HSUPA Release 6 Bluetooth: GFSK +π/4DQPSK+8DPSK BLE: GFSK			
Antenna Specification:	GSM/WCDMA: PIFA Antenna Bluetooth: PIFA Antenna WLAN: PIFA Antenna			
SIM Card	Support dual-SIM, dual standby, the multiple SIM card with two lines cannot transmitting at the same time			

Hotspot Mode	Support
DTM Mode	Not Support

Note:
1. Bluetooth SAR was estimated
2. The dual SIM card mobile has 2 SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (Single active)
3. After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 card to perform all tests.
4. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power.

1.2 Test Environment

Ambient conditions in the SAR laboratory:

Items	Required
Temperature (℃)	18-25
Humidity (%RH)	30-70

1.3 Test Factory

ShenZhen STS Test Services Co.,Ltd.

A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration No.: 625569

IC Registration No.: 12108A

A2LA Certificate No.: 4338.01

2. Test Standards and Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D04 v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	FCC KDB 941225 D01 v03r01	SAR Measurement Procedures for 3G Devices
8	FCC KDB 941225 D06 v02r01	Hotspot Mode SAR
9	FCC KDB 648474 D04 v01r03	SAR Evaluation Considerations for Wireless Handsets
10	FCC KDB 248227 D01 Wi-Fi SAR v02r02	SAR Considerations for 802.11 Devices

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

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

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

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

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

Population/Uncontrolled Environments:
Are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

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

NOTE

GENERAL POPULATION/UNCONTROLLED EXPOSURE

PARTIAL BODY LIMIT

1.6 W/kg

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.
The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

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

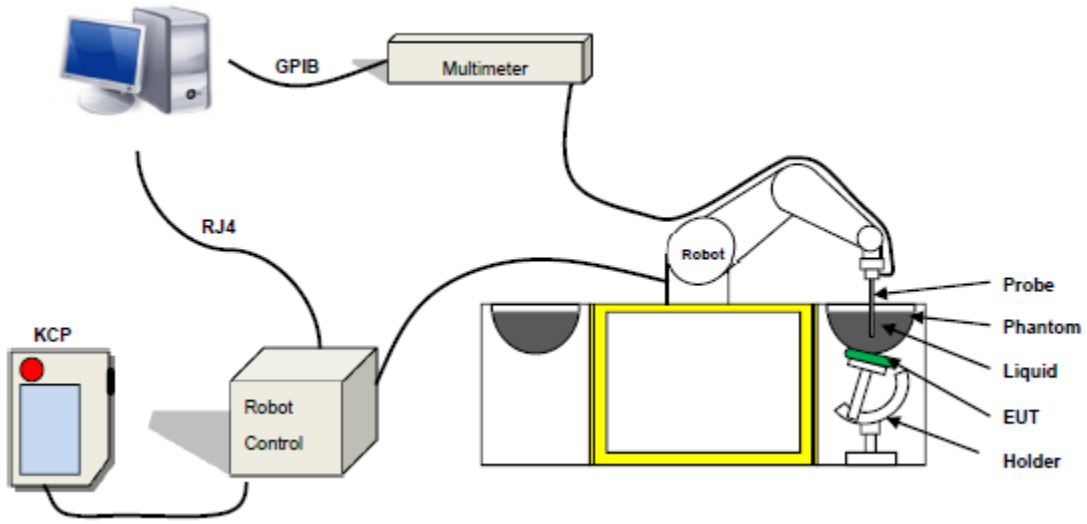
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue,
ρ is the mass density of the tissue and E is the RMS electrical field strength.

3.2 SAR System

MVG SAR System Diagram:



COMOSAR is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The COMOSAR system consists of the following items:

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

The following figure shows the system.

The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The Open SAR software computes the results to give a SAR value in a 1g or 10g mass.

3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 07/21 EPGO352 with following specifications is used

- Probe Length: 330 mm
- Length of Individual Dipoles: 2 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter: 2.5 mm
- Distance between dipole/probe extremity: 1 mm
- Dynamic range: 0.01-100 W/kg
- Probe linearity: 3%
- Axial Isotropy: < 0.10 dB
- Spherical Isotropy: < 0.10 dB
- Calibration range: 150 MHz to 6 GHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°

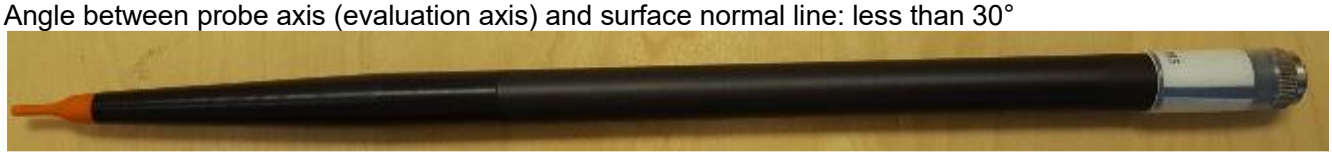


Figure 1-MVG COMOSAR Dosimetric E field Dipole

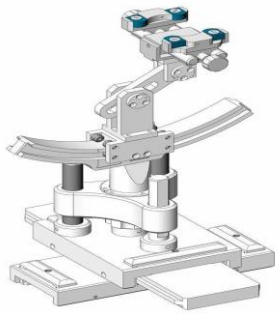
3.2.2 Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

SN 32/14 SAM115

SN 32/14 SAM116

3.2.3 Device Holder



The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ± 0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.4. Tissue Simulating Liquids

4. Tissue Simulating Liquids

4.1 Simulating Liquids Parameter Check

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Head Tissue

Frequency (MHz)	cellulose	DGBE	HEC	NaCl	Preventol	Sugar	X100	Water	Conductivity	Permittivity
	%	%	%	%	%	%	%	%	σ	εr
750	0.2	/	/	1.4	0.2	57.0	/	41.1	0.89	41.9
835	0.2	/	/	1.4	0.2	57.9	/	40.3	0.90	41.5
900	0.2	/	/	1.4	0.2	57.9	/	40.3	0.97	41.5
1800	/	44.5	/	0.3	/	/	30.45	55.2	1.4	40.0
1900	/	44.5	/	0.3	/	/	30.45	55.2	1.4	40.0
2000	/	44.5	/	0.3	/	/	/	55.2	1.4	40.0
2450	/	44.9	/	0.1	/	/	/	55.0	1.80	39.2
2600	/	45.0	/	0.1	/	/	/	54.9	1.96	39.0

Body Tissue

Frequency (MHz)	cellulose	DGBE	HEC	NaCl	Preventol	Sugar	X100	Water	Conductivity	Permittivity
	%	%	%	%	%	%	%	%	σ	εr
750	0.2	/	/	0.9	0.1	47.2	/	51.7	0.96	55.5
835	0.2	/	/	0.9	0.1	48.2	/	50.8	0.97	55.2
900	0.2	/	/	0.9	0.1	48.2	/	50.8	1.05	55.0
1800	/	29.4	/	0.4	/	/	30.45	70.2	1.52	53.3
1900	/	29.4	/	0.4	/	/	30.45	70.2	1.52	53.3
2000	/	29.4	/	0.4	/	/	/	70.2	1.52	53.3
2450	/	31.3	/	0.1	/	/	/	68.6	1.95	52.7
2600	/	31.7	/	0.1	/	/	/	68.2	2.16	52.3

Tissue dielectric parameters for head and body phantoms				
Frequency	εr		σ S/m	
	Head	Body	Head	Body
300	45.3	58.2	0.87	0.92
450	43.5	56.7	0.87	0.94
900	41.5	55.0	0.97	1.05
1450	40.5	54.0	1.20	1.30
1800	40.0	53.3	1.40	1.52
2450	39.2	52.7	1.80	1.95
3000	38.5	52.0	2.40	2.73
5800	35.3	48.2	5.27	6.00

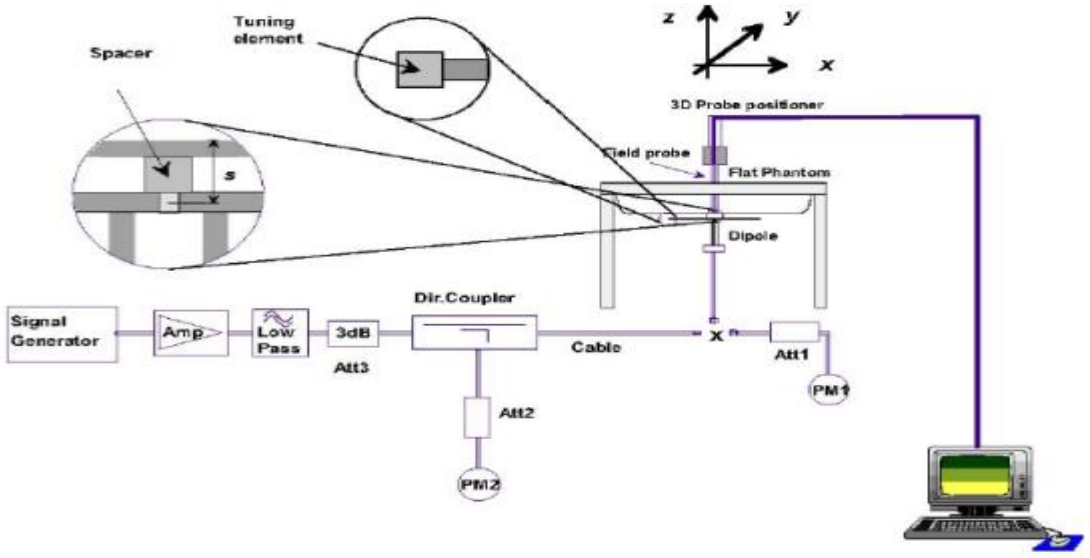
LIQUID MEASUREMENT RESULTS

Date	Ambient		Simulating Liquid		Parameters	Target	Measured	Deviation %	Limited %
	Temp. [°C]	Humidity %	Frequency	Temp. [°C]					
2022-03-26	20.9	51	824.2 MHz	20.5	Permittivity	41.55	40.48	-2.58	±5
					Conductivity	0.9	0.89	-1.11	±5
2022-03-26	20.8	57	826.4 MHz	20.5	Permittivity	41.54	41.43	-0.26	±5
					Conductivity	0.9	0.91	1.11	±5
2022-03-26	20.2	40	835 MHz	19.8	Permittivity	41.5	41.12	-0.92	±5
					Conductivity	0.9	0.91	1.11	±5
2022-03-26	20.3	52	836.6 MHz	20.0	Permittivity	41.5	42.28	1.88	±5
					Conductivity	0.9	0.87	-3.33	±5
2022-03-26	24.0	56	848.8 MHz	23.7	Permittivity	41.5	41.74	0.58	±5
					Conductivity	0.91	0.94	3.30	±5
2022-03-26	23.7	46	1850.2 MHz	23.3	Permittivity	40	39.65	-0.88	±5
					Conductivity	1.4	1.38	-1.43	±5
2022-03-26	23.3	50	1880 MHz	22.9	Permittivity	40	39.81	-0.47	±5
					Conductivity	1.4	1.35	-3.57	±5
2022-03-26	23.5	54	1882.5 MHz	23.2	Permittivity	40	40.39	0.98	±5
					Conductivity	1.4	1.34	-4.29	±5
2022-03-26	24.0	40	1900 MHz	23.7	Permittivity	40	39.95	-0.12	±5
					Conductivity	1.4	1.42	1.43	±5
2022-03-26	23.6	44	1909.8 MHz	23.3	Permittivity	40	38.84	-2.90	±5
					Conductivity	1.4	1.39	-0.71	±5
2022-03-28	22.6	47	2402 MHz	22.3	Permittivity	39.27	37.66	-4.10	±5
					Conductivity	1.77	1.79	1.13	±5
2022-03-28	20.6	48	2412 MHz	20.3	Permittivity	39.26	38.84	-1.07	±5
					Conductivity	1.77	1.83	3.39	±5
2022-03-28	22.1	54	2450 MHz	21.8	Permittivity	39.2	39.11	-0.23	±5
					Conductivity	1.8	1.81	0.56	±5

5. SAR System Validation

5.1 Validation System

Each MVG system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the MVG software, enable the user to conduct the system performance check and system validation. System kit includes a dipole, and dipole device holder.
The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system validation setup is shown as below.



5.2 Validation Result

Comparing to the original SAR value provided by MVG, the validation data should be within its specification of 10 %.

Date	Freq.	Power	Tested Value	Normalized SAR	Target SAR	Tolerance	Limit
	(MHz)	(mW)	(W/Kg)	(W/kg)	1g(W/kg)	(%)	(%)
2022-03-26	835	100	0.982	9.82	9.56	2.72	10
2022-03-26	1900	100	3.960	39.60	39.70	-0.25	10
2022-03-28	2450	100	5.263	52.63	52.40	0.44	10

Note:

1. The tolerance limit of System validation ±10%.
2. The dipole input power (forward power) was 100 mW.
3. The results are normalized to 1 W input power.

6. SAR Evaluation Procedures

The procedure for assessing the average SAR value consists of the following steps:
The following steps are used for each test position

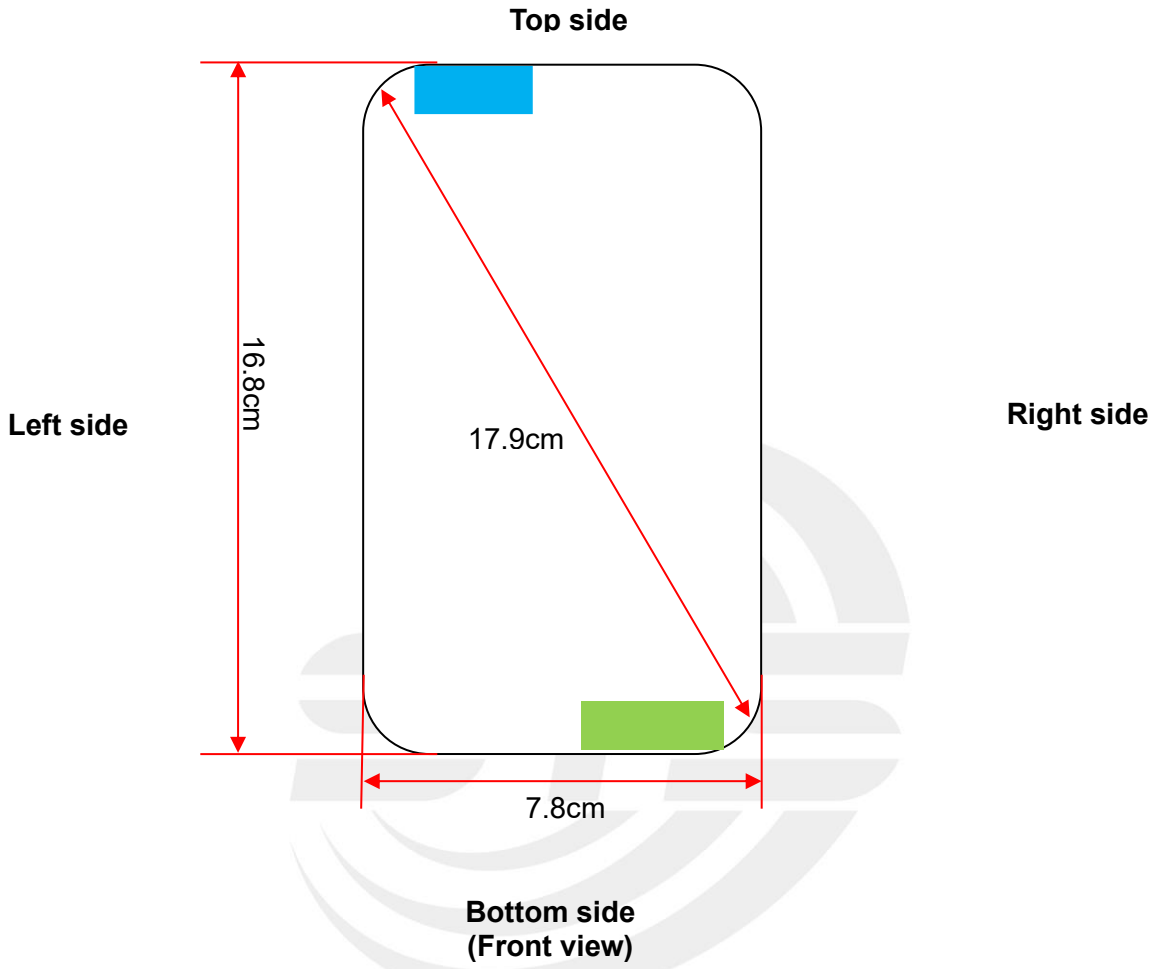
- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

➢ Area Scan& Zoom Scan

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 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01 quoted below. When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

7. EUT Antenna Location Sketch

It is a Smart phone, support GSM/WCDMA/WLAN/BT mode.



Antenna Separation Distance(cm)						
ANT	Back Side	Front Side	Left Side	Right Side	Top Side	Bottom Side
WLAN/BT	≤0.5	≤0.5	≤0.5	5.5	≤0.5	15.2
WWAN	≤0.5	≤0.5	4.3	≤0.5	12.3	≤0.5

WLAN/BT Antenna

WWAN Antenna

Note 1: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.

7.1 SAR test exclusion consider table

The WWAN/WLAN/BT SAR evaluation of Maximum power (dBm) summing tolerance.

Exposure Position	Wireless Interface	GSM850	PCS1900	WCDMA B5	BT	2.4G WLAN
	Calculated Frequency(GHz)	0.836	1.8502	0.8264	2.402	2.412
	Maximum Turn-up power	30	27	23	0.5	12
	Maximum rated power(mW)	1000.00	501.19	199.53	1.12	15.85
Back Side	Separation distance (cm)	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5
	exclusion threshold(mW)	9.23	3.44	9.38	2.79	2.78
	Testing required?	YES	YES	YES	NO	YES
Front Side	Separation distance (cm)	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5
	exclusion threshold(mW)	9.23	3.44	9.38	2.79	2.78
	Testing required?	YES	YES	YES	NO	YES
Left Side	Separation distance (cm)	4.3	4.3	4.3	≤0.5	≤0.5
	exclusion threshold(mW)	193.81	180.56	193.81	2.79	2.78
	Testing required?	YES	YES	YES	NO	YES
Right Side	Separation distance (cm)	≤0.5	≤0.5	≤0.5	5.5	5.5
	exclusion threshold(mW)	9.23	3.44	9.38	264.03	263.72
	Testing required?	YES	YES	YES	NO	NO
Top Side	Separation distance (cm)	12.3	12.3	12.3	≤0.5	≤0.5
	exclusion threshold(mW)	857.31	1250.27	850.57	2.79	2.78
	Testing required?	YES	NO	NO	NO	YES
Bottom Side	Separation distance (cm)	≤0.5	≤0.5	≤0.5	15.2	15.2
	exclusion threshold(mW)	9.23	3.44	9.38	1817.7	1817.25
	Testing required?	YES	YES	YES	NO	NO

Note：

1. maximum power is the source-based time-average power and represents the maximum RF output power among production units.
2. Per KDB 447498 D04, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. Per KDB 447498 D04, if the maximum time-averaged power available does not exceed 1 mW. This stand-alone SAR exemption test.

4. Per KDB 447498 D04, the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

5. Per KDB 447498 D04, An alternative to the SAR-based exemption is using below table and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in below table to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

RF Source frequency (MHz)	Threshold ERP(watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

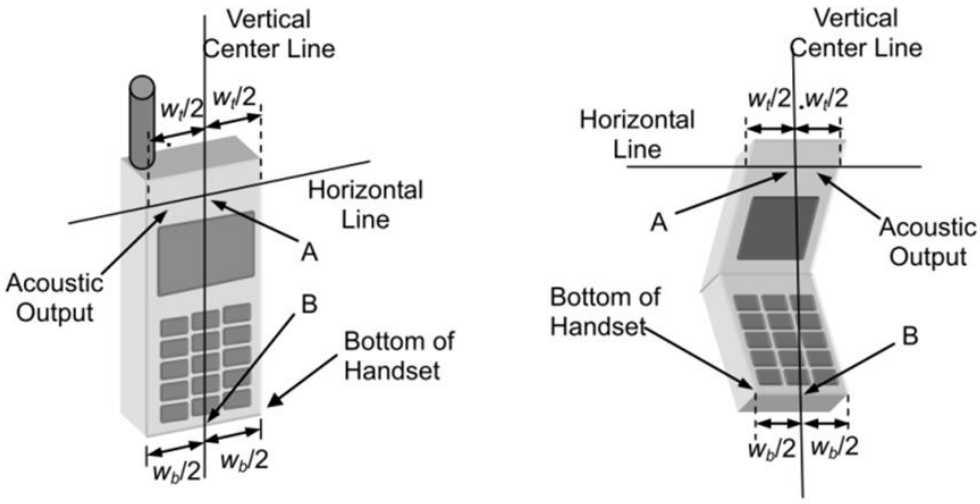
6. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine further SAR exclusion 8.for each frequency band ,testing at higher data rates and higher order modulations is not required when the maximum average output power for each of each of these configurations is less than 1/4db higher than those measured at the lower data rate than 11b mode ,thus the SAR can be excluded.
7. Per KDB 616217 D04, SAR evaluation for the front surface of tablet display screens are generally not necessary.
8. Per KDB 248227, as maximum rated power for U-NII-2A＞U-NII-1, U-NII-2A was chosen for SAR evaluation. Based on the measurements obtained, SAR measurements on U-NII-1 are not required as highest reported SAR from U-NII-2A band is≤1.2W/Kg.

8. EUT Test Position

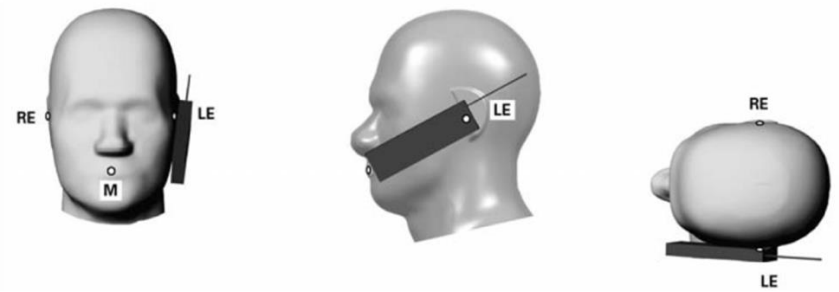
This EUT was tested in Right Cheek, Right Titled, Left Cheek, Left Titled, Front Face and Rear Face.

8.1 Define Two Imaginary Lines on the Handset

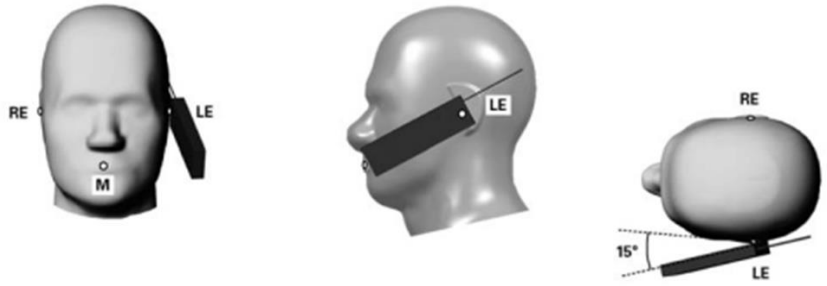
(1)The vertical centerline passes through two points on the front side of the handset the midpoint of the width wt of the handset at the level of the acoustic output, and the midpoint of the width wb of the handset.
(2)The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
(3)The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



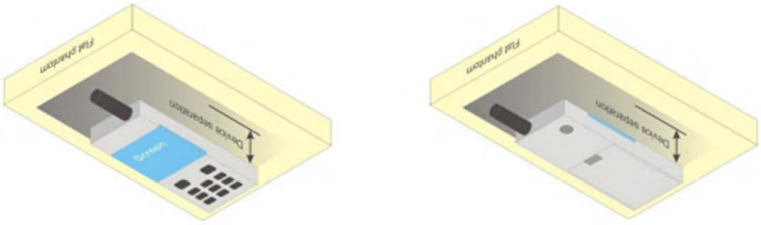
Cheek Position
1) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane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



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

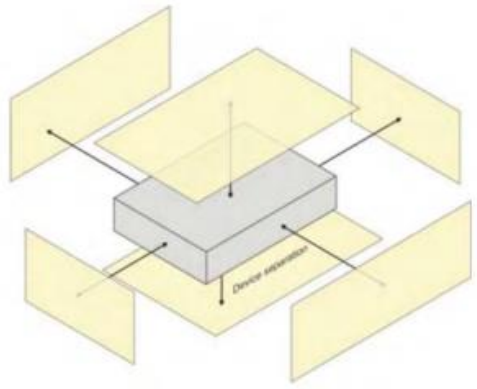


Body-worn Position Conditions:
Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative *test separation distance* configuration may be used to support both SAR conditions. When the *reported* SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest *reported* SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.



8.2 Hotspot mode exposure position condition

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing function, the relevant hand and body exposure condition are tested according to the hotspot SAR procedures in KDB 941225. A test separation distance of 10 mm is required between the phantom and all surface and edges with a transmitting antenna located within 25 mm form that surface or edge. When form factor of a handset is smaller than 9cm x 5cm, a test separation distance of 5mm (instead of 10mm) is required for testing hotspot mode. When the separate distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).



9. Uncertainty

9.1 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2013.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
Measurement System								
Probe calibration	5.86	N	1	1	1	5.86	5.86	∞
Axial Isotropy	0.16	R	√3	√0.5	√0.5	0.07	0.07	∞
Hemispherical Isotropy	1.06	R	√3	√0.5	√0.5	0.43	0.43	∞
Boundary effect	1	R	√3	1	1	0.58	0.58	∞
Linearity	1.27	R	√3	1	1	0.73	0.73	∞
System detection limits	1.23	R	√3	1	1	0.71	0.71	∞
Modulation response	3.6	R	√3	1	1	3.60	3.60	∞
Readout Electronics	0.28	N	1	1	1	0.28	0.28	∞
Response Time	0.19	R	√3	1	1	0.11	0.11	∞
Integration Time	1.47	R	√3	1	1	0.85	0.85	∞
RF ambient conditions-Noise	3.5	R	√3	1	1	2.02	2.02	∞
RF ambient conditions-reflections	3.2	R	√3	1	1	1.85	1.85	∞
Probe positioner mechanical tolerance	1.4	R	√3	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	∞
Post-processing	2.3	R	√3	1	1	1.33	1.33	∞
Test sample Related								
Test sample positioning	3.1	N	1	1	1	3.10	3.10	∞
Device holder uncertainty	3.8	N	1	1	1	3.80	3.80	∞
SAR drift measurement	4.8	R	√3	1	1	2.77	2.77	∞
SAR scaling	2	R	√3	1	1	1.15	1.15	∞
Phantom and tissue parameters								
Phantom uncertainty (shape and thickness uncertainty)	4	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	2	N	1	1	0.84	2.00	1.68	∞
Liquid conductivity (temperature uncertainty)	2.5	R	√3	0.78	0.71	1.95	1.78	∞
Liquid conductivity (measured)	4	N	1	0.78	0.71	0.92	1.04	M
Liquid permittivity (temperature uncertainty)	2.5	R	√3	0.23	0.26	1.95	1.78	∞
Liquid permittivity (measured)	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				10.60	10.51	
Expanded Uncertainty (95% Confidence interval)		K=2				21.21	21.03	

10. Conducted Power Measurement

10.1 Test Result

Burst Average Power (dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM(GMSK, 1-Slot)	31.08	31.27	31.15	28.14	28.39	28.25
GPRS (GMSK, 1-Slot)	30.84	31.07	31.02	28.12	27.81	27.63
GPRS (GMSK, 2-Slot)	30.36	30.63	30.56	27.67	27.38	27.16
GPRS (GMSK, 3-Slot)	29.90	30.22	30.09	27.21	26.92	26.73
GPRS (GMSK, 4-Slot)	29.47	29.72	29.65	26.71	26.44	26.25
Remark: GPRS, CS4 coding scheme. Multi-Slot Class 8, Support Max 4 downlink, 1 uplink, 5 working link Multi-Slot Class 10, Support Max 4 downlink, 2 uplink, 5 working link Multi-Slot Class 12, Support Max 4 downlink, 4 uplink, 5 working link						

Frame- Average Power(dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM(GMSK, 1-Slot)	22.05	22.24	22.12	19.11	19.36	19.22
GPRS (GMSK, 1-Slot)	21.81	22.04	21.99	19.09	18.78	18.60
GPRS (GMSK, 2-Slot)	24.34	24.61	24.54	21.65	21.36	21.14
GPRS (GMSK, 3-Slot)	25.64	25.96	25.83	22.95	22.66	22.47
GPRS (GMSK, 4-Slot)	26.46	26.71	26.64	23.70	23.43	23.24
Remark : 1. SAR testing was performed on the maximum frame-averaged power mode. 2. The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum Burst - averaged power based on time slots. The calculated method is shown as below: Frame-averaged power = Burst averaged power (1 TX Slot) – 9.03 dB Frame-averaged power = Burst averaged power (2 TX Slots) – 6.02 dB Frame-averaged power = Burst averaged power (3 TX Slots) - 4.26 dB Frame-averaged power = Burst averaged power (4 TX Slots) – 3.01 dB						

WCDMA

Band	WCDMA Band 5		
Channel	4132	4183	4233
Frequency (MHz)	826.4	836.6	846.6
AMR 12.2Kbps	22.74	22.48	21.97
RMC 12.2Kbps	22.80	22.48	22.03
HSDPA Subtest-1	21.74	22.35	22.60
HSDPA Subtest-2	21.30	21.86	22.19
HSDPA Subtest-3	20.94	21.40	21.83
HSDPA Subtest-4	20.48	21.00	21.46
HSUPA Subtest-1	21.68	22.41	22.36
HSUPA Subtest-2	20.73	21.50	21.37
HSUPA Subtest-3	20.59	21.01	20.99
HSUPA Subtest-4	20.24	20.51	20.64
HSUPA Subtest-5	18.78	19.01	19.19

According to 3GPP 25.101 sub-clause 6.2.2, the maximum output power is allowed to be reduced by following the table.

Table 6.1A: UE maximum output power with HS-DPCCH and E-DCH

UE Transmit Channel Configuration	CM(db)	MPR(db)
For all combinations of ,DPDCH,DPCCH HS-DPDCH,E-DPDCH and E-DPCCH	0≤ CM≤3.5	MAX(CM-1,0)
Note: CM=1 for βc/βd=12/15, βhs/ βc=24/15.For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (a function of the combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH).

When E-DPDCH channels are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

The SW currently recalculates the cubic metric every time the beta gains on the E-DPDCH are reduced. The cubic metric will likely get lower each time this is done .However, there is no reported reduction of maximum output power in the HSUPA mode since the device also provides a compensation for the power back-off by increasing the gain of TX_AGC in the transceiver (PA) device.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

2.4G WLAN

2.4GWIFI				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
802.11b	1	2412	11.95	15.67
	7	2437	11.87	15.39
	11	2462	11.54	14.26
802.11g	1	2412	4.80	3.02
	7	2437	4.64	2.91
	11	2462	4.38	2.74
802.11 n-HT20	1	2412	4.78	3.01
	7	2437	4.63	2.90
	11	2462	4.48	2.81
802.11 n-HT40	3	2422	4.39	2.75
	6	2437	4.45	2.79
	9	2452	4.22	2.64

Bluetooth

BT				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	0.21	1.05
	39	2441	-0.26	0.94
	78	2480	-0.79	0.83
π/4-QPSK(2Mbps)	0	2402	-2.03	0.63
	39	2441	-2.48	0.56
	78	2480	-3.10	0.49
8DPSK(3Mbps)	0	2402	-1.97	0.64
	39	2441	-2.23	0.60
	78	2480	-3.49	0.45

BLE

BLE				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	-5.83	0.26
	19	2440	-6.08	0.25
	39	2480	-6.99	0.20

11. EUT and Test Setup Photo

11.1 EUT Photo

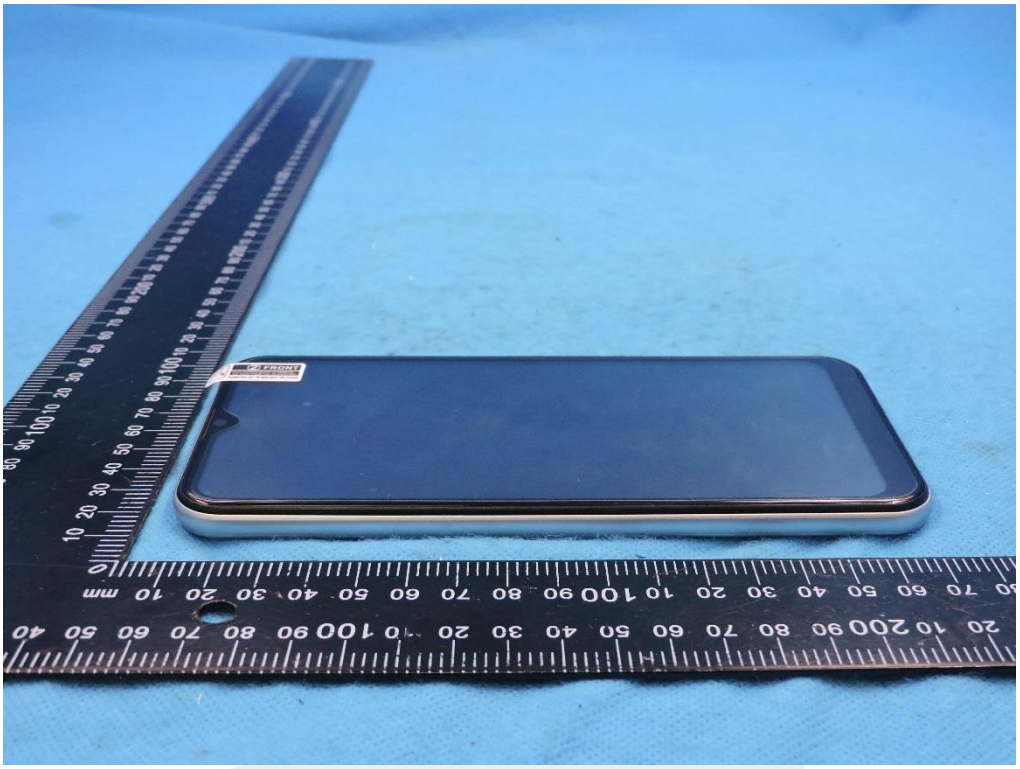
Front side

Back side

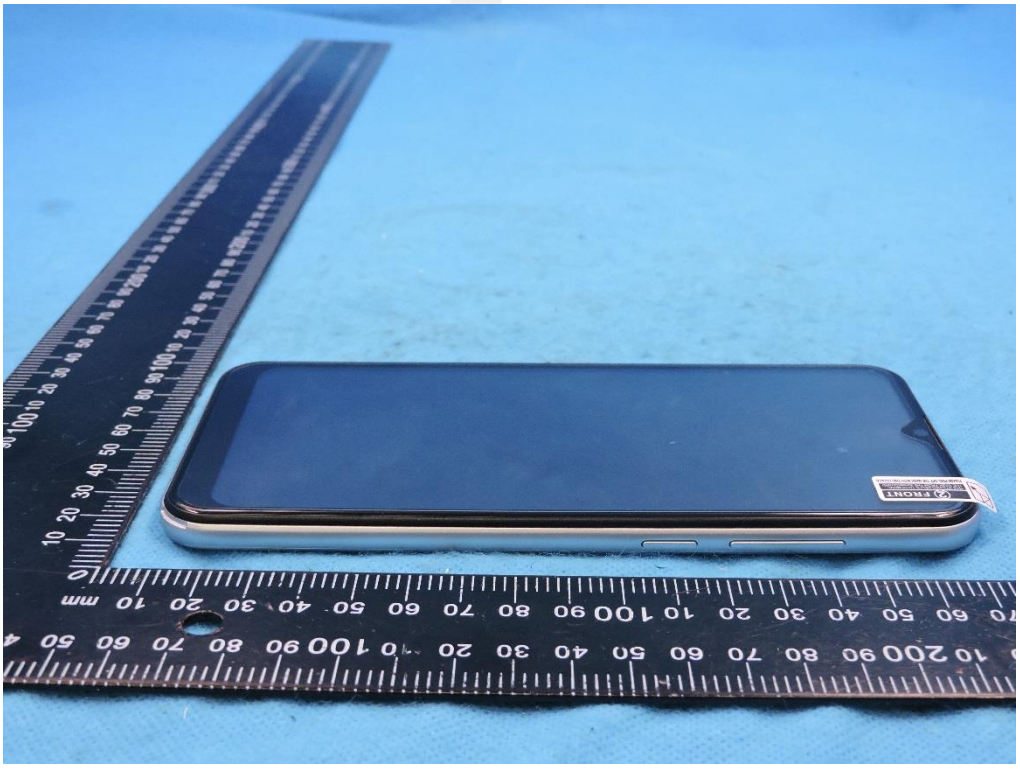
Top side

Bottom side

Left side

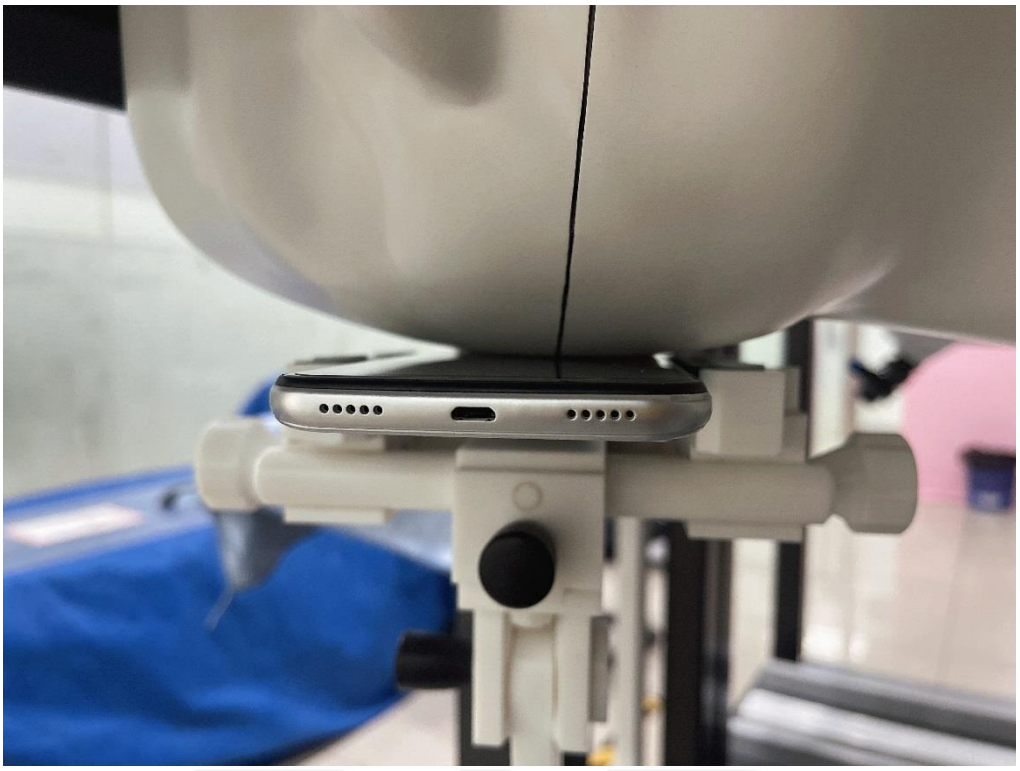


Right side

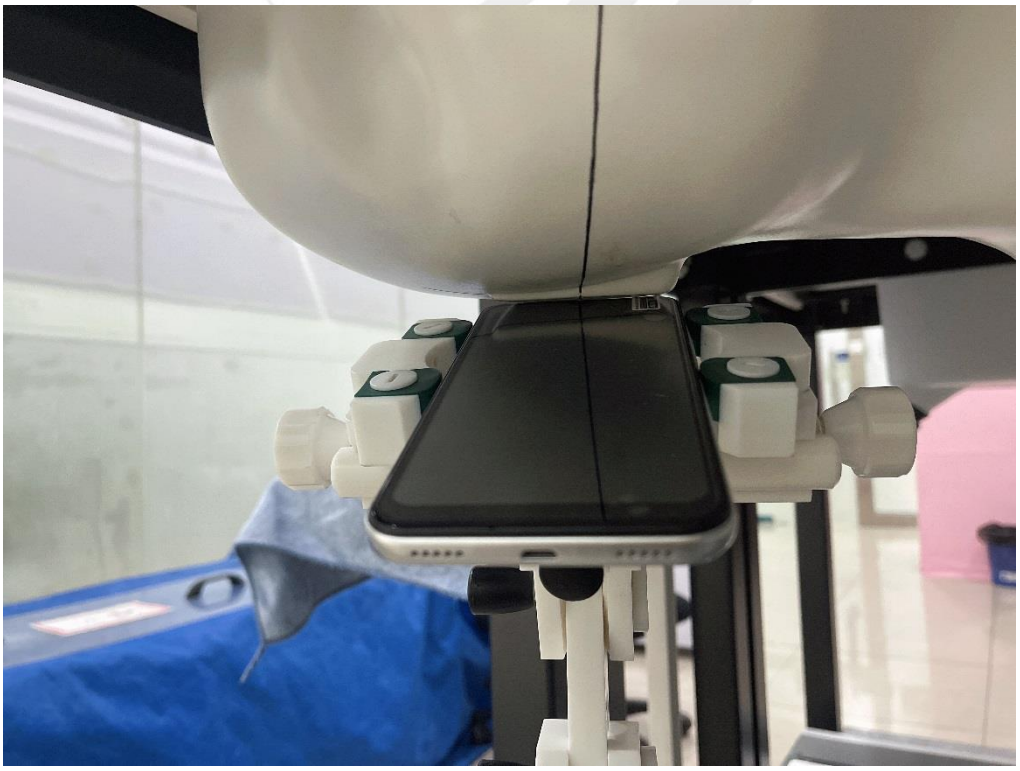


11.2 Setup Photo

Right Touch



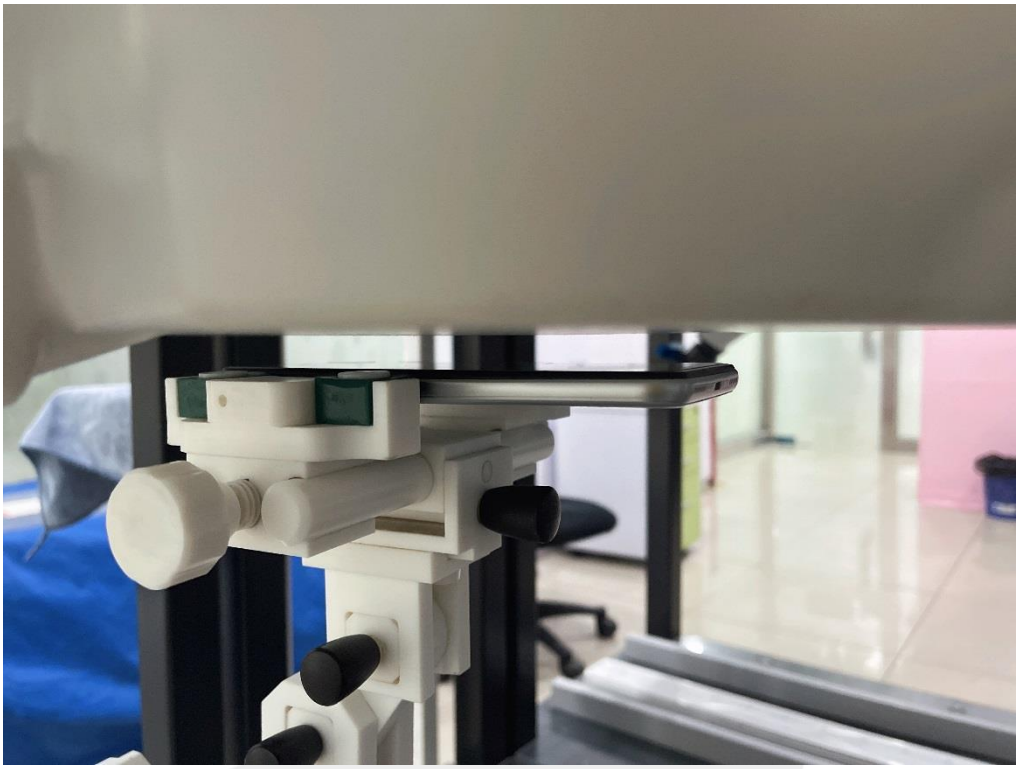
Right Tilt



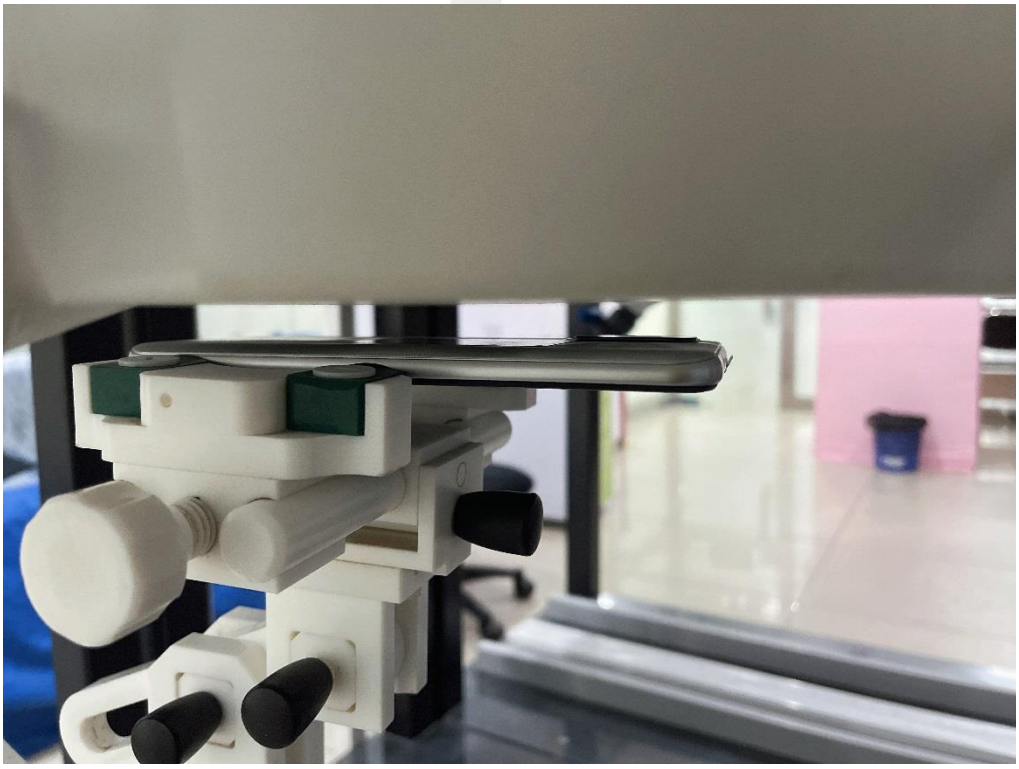
Left Touch

Left Tilt

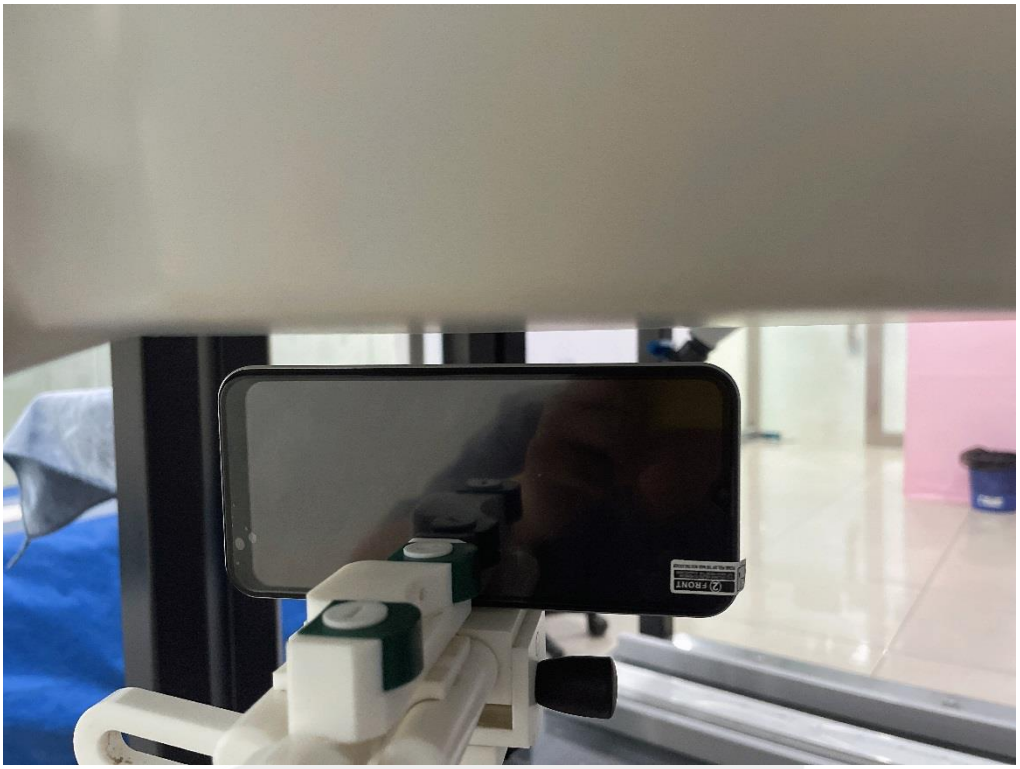
Body Front side(separation distance is 10mm)



Body Back side(separation distance is 10mm)



Body Left side(separation distance is 10mm)

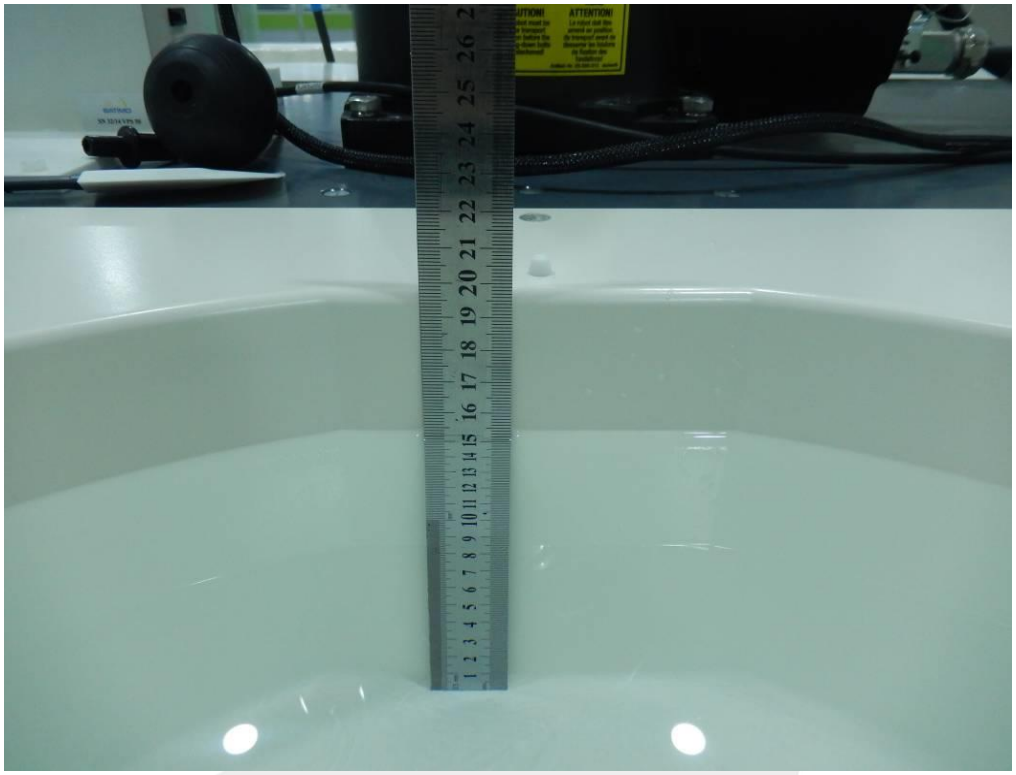


Body Right side(separation distance is 10mm)

Body Bottom side(separation distance is 10mm)

Body Top side(separation distance is 10mm)

Liquid depth (15 cm)



12. SAR Result Summary

12.1 Head SAR

Band	Model	Test Position	Freq.	SAR (1g) (W/kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
GSM850	GPRS Data-4 Slot	Right Cheek	836.6	0.331	0.64	30.00	29.72	0.353	/
		Right Tilt	836.6	0.154	3.88	30.00	29.72	0.164	/
		Left Cheek	824.2	0.322	-3.66	30.00	29.47	0.364	/
		Left Cheek	836.6	0.357	0.23	30.00	29.72	**0.381**	**1**
		Left Cheek	848.8	0.314	2.78	30.00	29.65	0.340	/
		Left Tilt	836.6	0.126	-0.69	30.00	29.72	0.134	/
GSM1900	GPRS Data-4 Slot	Right Cheek	1850.2	0.032	-0.32	27.00	26.71	0.034	/
		Right Tilt	1850.2	0.014	0.47	27.00	26.71	0.015	/
		Left Cheek	1850.2	0.04	2.50	27.00	26.71	**0.043**	**3**
		Left Tilt	1850.2	0.012	1.32	27.00	26.71	0.013	/
WCDMA Band V	RMC	Right Cheek	826.4	0.090	-0.59	23.00	22.80	0.094	/
		Right Tilt	826.4	0.045	2.64	23.00	22.80	0.047	/
		Left Cheek	826.4	0.095	-0.99	23.00	22.80	**0.099**	**5**
		Left Tilt	826.4	0.062	3.52	23.00	22.80	0.065	/
2.4G WLAN	802.11b	Right Cheek	2412	0.107	-1.71	12.00	11.95	**0.108**	**7**
		Right Tilt	2412	0.066	2.32	12.00	11.95	0.067	/
		Left Cheek	2412	0.05	-0.52	12.00	11.95	0.051	/
		Left Tilt	2412	0.021	-1.78	12.00	11.95	0.021	/
BT	GFSK	Right Cheek	2402	0.034	2.88	0.50	0.21	**0.036**	**9**
		Right Tilt	2402	0.023	0.17	0.50	0.21	0.025	/
		Left Cheek	2402	0.030	2.64	0.50	0.21	0.032	/
		Left Tilt	2402	0.020	0.50	0.50	0.21	0.021	/

Note:

1. Per KDB 447498 D04, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.

a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.

b. Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor

2. Per KDB 248227- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. (The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **0.021** W/Kg for Head)

3. Per KDB 865664 D01, Repeated measurement is not required when the original highest measured SAR is <0.80 W/kg

12.2 Body-worn and Hotspot SAR

Band	Model	Test Position	Freq.	SAR (1g) (W/kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
GSM850	GPRS Data-4 Slot	Front Side	836.6	0.305	3.02	30.00	29.72	0.325	/
		Back Side	836.6	0.463	0.53	30.00	29.72	**0.494**	**2**
		Left Edge	836.6	0.265	-0.78	30.00	29.72	0.283	/
		Right Edge	836.6	0.214	3.74	30.00	29.72	0.228	/
		Top Edge	836.6	0.025	-0.39	30.00	29.72	0.027	/
		Bottom Edge	836.6	0.332	2.96	30.00	29.72	0.354	/
GSM1900	GPRS Data-4 Slot	Front Side	1850.2	0.167	1.36	27.00	26.71	0.179	/
		Back Side	1850.2	0.843	-0.28	27.00	26.71	**0.901**	**4**
		Back Side	1880	0.754	1.64	27.00	26.44	0.858	/
		Back Side	1909.8	0.736	-2.38	27.00	26.25	0.875	/
		Left Edge	1850.2	0.665	-0.36	27.00	26.71	0.711	/
		Right Edge	1850.2	0.625	2.15	27.00	26.71	0.668	/
		Bottom Edge	1850.2	0.415	-1.27	27.00	26.71	0.444	**/**
WCDMA Band V	RMC	Front Side	826.4	0.093	0.68	23.00	22.80	0.097	/
		Back Side	826.4	0.153	3.97	23.00	22.80	**0.160**	**6**
		Left Edge	826.4	0.052	3.04	23.00	22.80	0.054	/
		Right Edge	826.4	0.045	-2.75	23.00	22.80	0.047	/
		Bottom Edge	826.4	0.051	-2.83	23.00	22.80	0.053	/
2.4GHz WLAN	802.11b	Front Side	2412	0.04	3.56	12.00	11.95	0.040	/
		Back Side	2412	0.051	-0.62	12.00	11.95	**0.052**	**8**
		Left Edge	2412	0.023	1.19	12.00	11.95	0.023	/
		Top Edge	2412	0.043	-2.76	12.00	11.95	0.043	**/**
BT	GFSK	Front Side	2402	0.025	1.68	0.50	0.21	0.027	/
		Back Side	2402	0.033	2.35	0.50	0.21	**0.035**	**10**
		Left Edge	2402	0.024	-0.93	0.50	0.21	0.026	/
		Top Edge	2402	0.030	2.21	0.50	0.21	0.032	**/**

Note:

1. The test separation of all above table is 10mm.
2. Per KDB 447498 D04, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
3. Per KDB 248227- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. (The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **0.010** W/Kg for Body)
4. When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the Wi-Fi transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The “Portable Hotspot” feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

Repeated SAR

Band	Mode	Test Position	Freq.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR(W/Kg)	Meas. No.
GSM 1900	GPRS Data-4 Slot	Back Side	1850.2	0.804	1.92	27.00	26.71	0.860	-
		Back Side	1880	0.742	-1.64	27.00	26.44	0.844	-
		Back Side	1909.8	0.716	-1.74	27.00	26.25	0.851	-

12.3 repeated SAR measurement

Band	Mode	Test Position	Freq.	Original Measured SAR 1g(W/kg)	1 st Repeated SAR 1g	Ratio	Original Measured SAR 1g(W/kg)	2nd Repeated SAR 1g	Ratio
GSM 1900	GPRS Data-4 Slot	Back Side	1850.2	0.843	0.804	1.049	-	-	-
		Back Side	1880	0.754	0.742	1.016	-	-	-
		Back Side	1909.8	0.736	0.716	1.028	-	-	-

Note:

1. Per KDB 865664 D01,for each frequency band ,repeated SAR measurement is required only when the measured SAR is≥0.8W/Kg.
2. Per KDB 865664 D01,if the ratio of largest to smallest SAR for the original and first repeated measurement is≤1.2 and the measured SAR＜1.45W/Kg, only one repeated measurement is required.
3. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is＞1.20 or when the original or repeated measurement is ≥ 1.45W/Kg.
4. The ratio is the difference in percentage between original and repeated measured SAR.

Simultaneous Multi-band Transmission Evaluation:

Application Simultaneous Transmission information:

Position	Simultaneous State
Head	1. GSM + 2.4GHz WLAN
	2. GSM + Bluetooth
	3. WCDMA + 2.4GHz WLAN
	4. WCDMA + Bluetooth
Body	1. GSM + 2.4GHz WLAN
	2. GSM + Bluetooth
	3. WCDMA + 2.4GHz WLAN
	4. WCDMA + Bluetooth

NOTE:

1. Bluetooth and WLAN can't simultaneous transmission at the same time.
2. For simultaneous transmission at head and body exposure position, 2 transmitters simultaneous transmission was the worst state.
3. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
4. KDB 447498 Appendix E, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
   SAR_{est} =1.6 · Pant / Pth [W/kg].
   P_{ant} is maximum time-averaged power or effective radiated power (ERP), whichever is greater, and P_{th} is defined in Formula KDB 447498 (B.2).

Simultaneous Mode	Position	Mode	Max. 1-g SAR (W/kg)	1-g Sum SAR (W/kg)
GSM + 2.4G WLAN	Head	GSM	0.381	0.489
		2.4G WLAN	0.108	
	Body	GSM	0.901	0.953
		2.4G WLAN	0.052	
GSM + Bluetooth	Head	GSM	0.381	0.417
		Bluetooth	0.036	
	Body	GSM	0.901	0.936
		Bluetooth	0.035	
WCDMA + 2.4G WLAN	Head	WCDMA	0.099	0.208
		2.4G WLAN	0.108	
	Body	WCDMA	0.160	0.212
		2.4G WLAN	0.052	
WCDMA + Bluetooth	Head	WCDMA	0.099	0.135
		Bluetooth	0.036	
	Body	WCDMA	0.160	0.195
		Bluetooth	0.035	

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna.

When the sum of SAR 1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR-1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR 1g is greater than the SAR limit (SAR-1g 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

13. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
835MHz Dipole	MVG	SID835	SN 30/14 DIP0G835-332	2020.07.14	2023.07.13
1900MHz Dipole	MVG	SID1900	SN 30/14 DIP1G900-333	2020.07.14	2023.07.13
2450MHzDipole	MVG	SID2450	SN 30/14 DIP2G450-335	2020.07.14	2023.07.13
E-Field Probe	MVG	SSE2	SN 07/21 EPGO352	2022.02.28	2023.02.27
Dielectric Probe Kit	MVG	SCLMP	SN 32/14 OCPG67	2021.11.23	2022.11.22
Antenna	MVG	ANTA3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	MVG	SAM	SN 32/14 SAM115	N/A	N/A
Phantom2	MVG	SAM	SN 32/14 SAM116	N/A	N/A
Phone holder	MVG	N/A	SN 32/14 MSH97	N/A	N/A
Laptop holder	MVG	N/A	SN 32/14 LSH29	N/A	N/A
Attenuator	Agilent	99899	DC-18GHz	N/A	N/A
Directional coupler	Narda	4226-20	3305	N/A	N/A
Network Analyzer	Agilent	8753ES	US38432810	2021.09.29	2022.09.28
Multi Meter	Keithley	Multi Meter 2000	4050073	2021.10.08	2022.10.07
Signal Generator	Agilent	N5182A	MY50140530	2021.09.30	2022.09.29
Wireless Communication Test Set	Agilent	8960-E5515C	MY48360751	2021.09.30	2022.09.29
Wireless Communication Test Set	R&S	CMW500	117239	2021.09.30	2022.09.29
Power Amplifier	DESAY	ZHL-42W	9638	2021.10.09	2022.10.08
Power Meter	R&S	NRP	100510	2021.09.29	2022.09.28
Power Sensor	R&S	NRP-Z11	101919	2021.09.29	2022.09.28
Temperature hygrometer	SuWei	SW-108	N/A	2021.10.09	2022.10.08
Thermograph	Elitech	RC-4	S/N EF7176501537	2021.10.09	2022.10.08

Appendix A. System Validation Plots

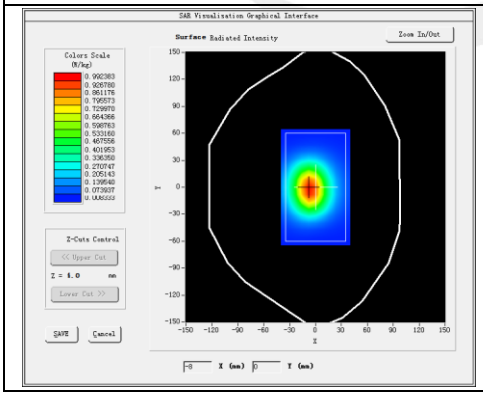
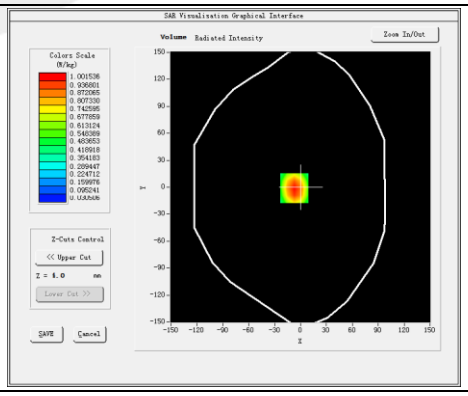
System Performance Check Data (835MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2022-03-26

Experimental conditions

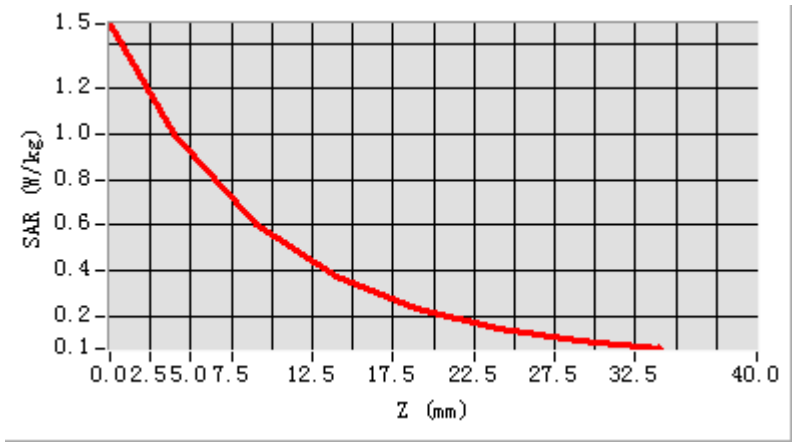
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	41.12
Conductivity (S/m)	0.91
Probe	SN 07/21 EPGO352
ConvF:	1.57
Crest factor:	1:1

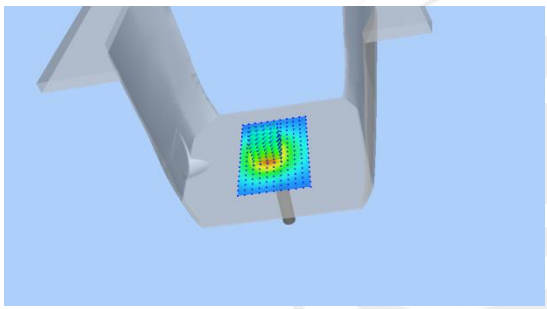
SURFACE SAR	VOLUME SAR
	

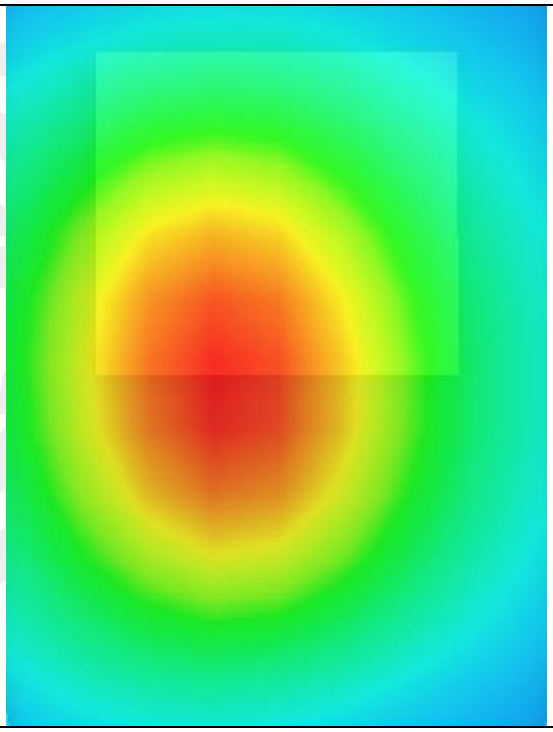
Maximum location: X=-7.00, Y=-1.00

SAR 10g (W/Kg)	0.626884
SAR 1g (W/Kg)	0.948621

Z Axis Scan


1.5
1.2
1.0
0.8
0.6
0.4
0.2
0.1
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)



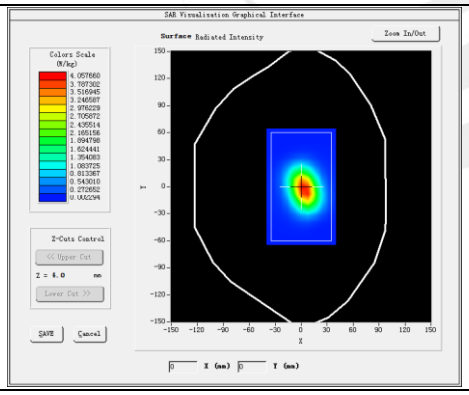
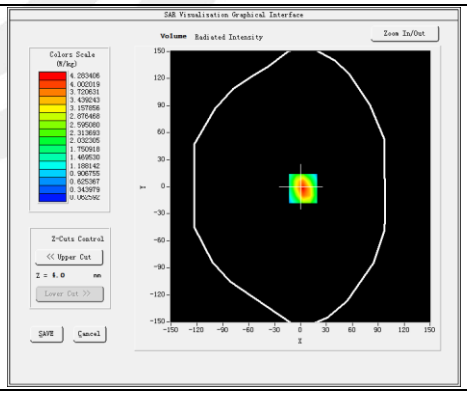


System Performance Check Data (1900MHz)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2022-03-26

Experimental conditions.

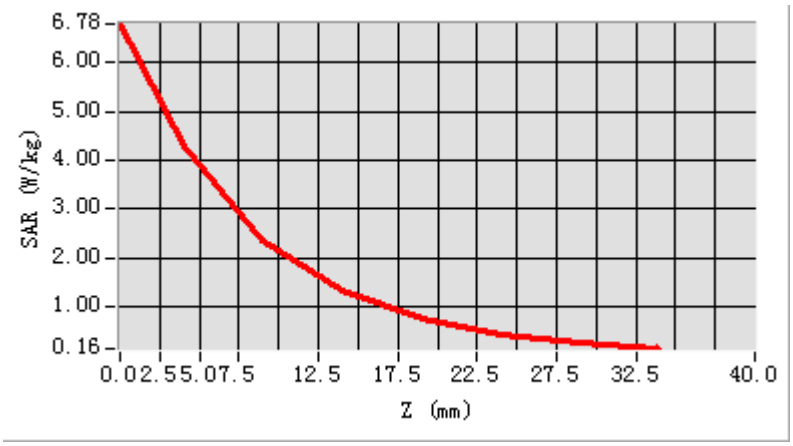
Phantom	Validation plane
Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900MHz
Relative permittivity	39.95
Conductivity (S/m)	1.42
Probe	SN 07/21 EPGO352
ConvF:	1.78
Crest factor:	1:1

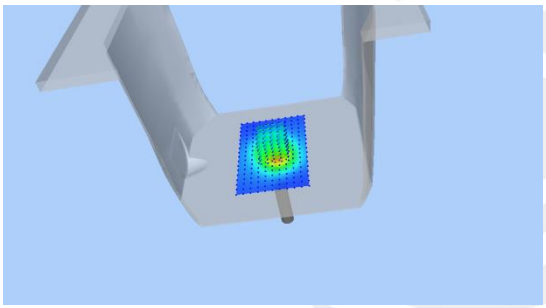
SURFACE SAR	VOLUME SAR
	

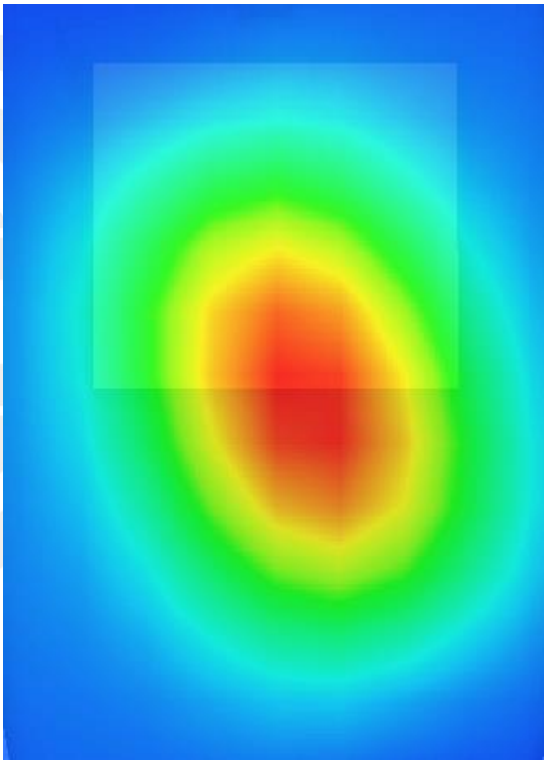
Maximum location: X=3.00, Y=-2.00

SAR 10g (W/Kg)	2.065450
SAR 1g (W/Kg)	3.950079

Z Axis Scan


6.78
6.00
5.00
4.00
3.00
2.00
1.00
0.16
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)



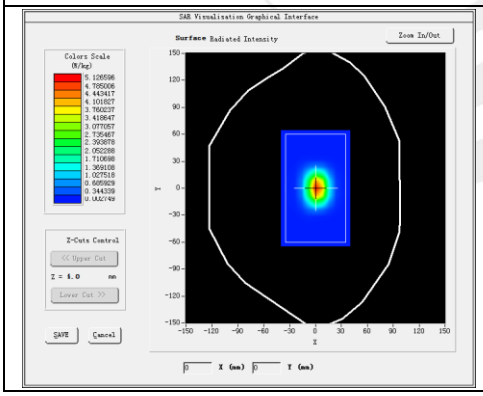
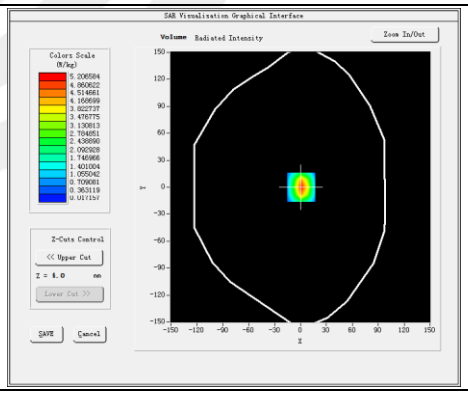


System Performance Check Data (2450MHz)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2022-03-28

Experimental conditions.

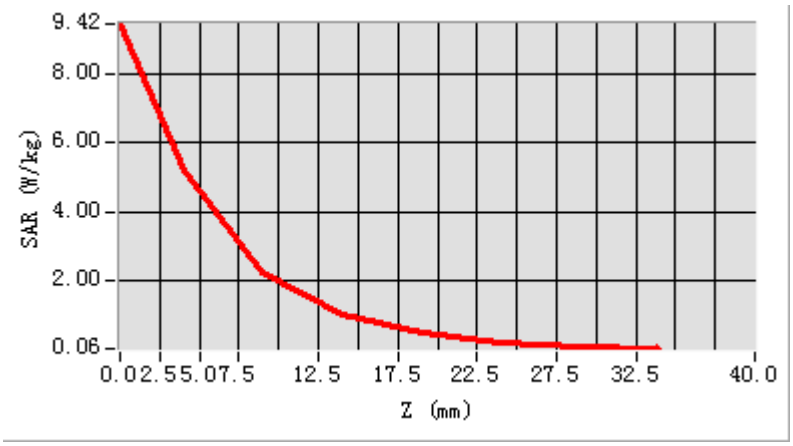
Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	39.11
Conductivity (S/m)	1.81
Probe	SN 07/21 EPGO352
ConvF	1.75
Crest factor:	1:1

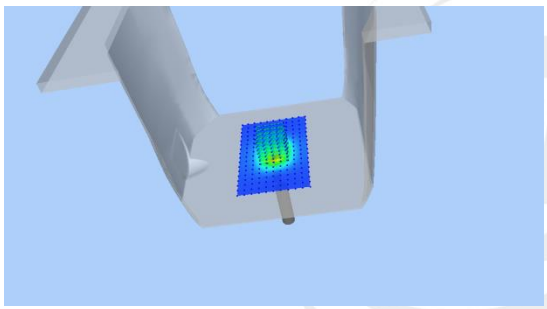
SURFACE SAR	VOLUME SAR
	

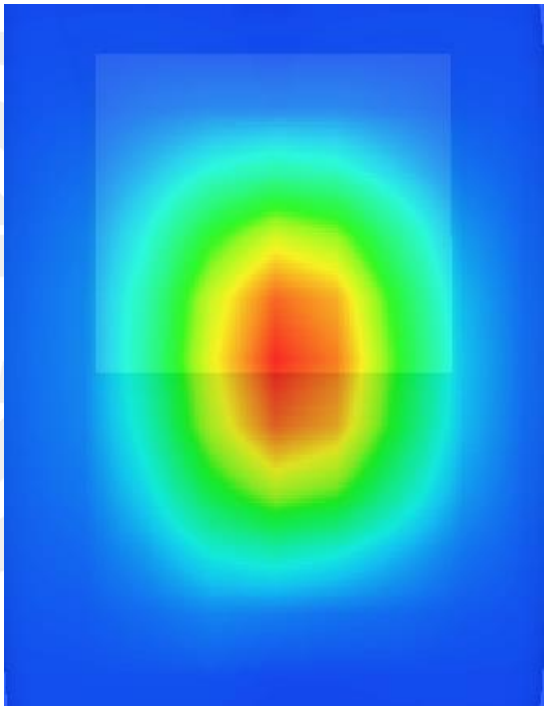
Maximum location: X=1.00, Y=0.00

SAR 10g (W/Kg)	2.414074
SAR 1g (W/Kg)	5.250046

Z Axis Scan


9.42
8.00
6.00
4.00
2.00
0.06
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)





Appendix B. SAR Test Plots

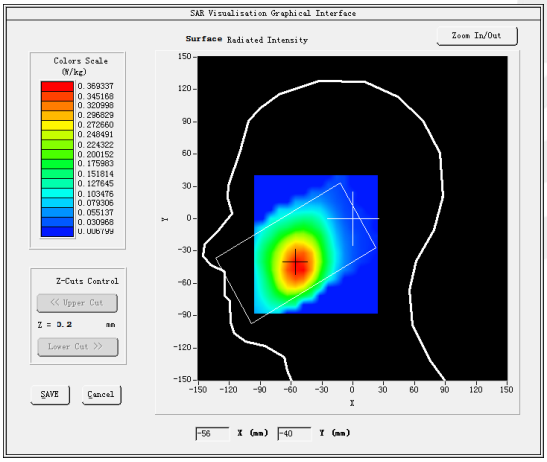
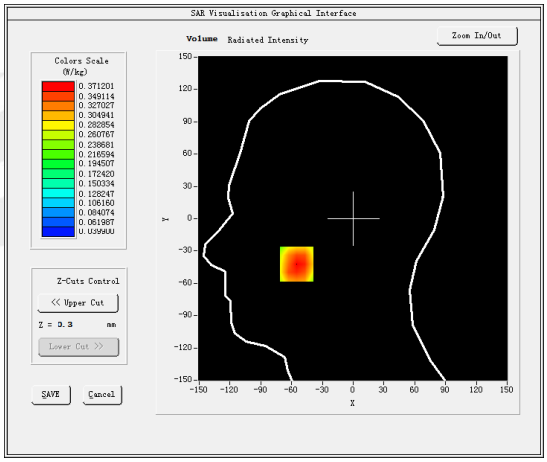
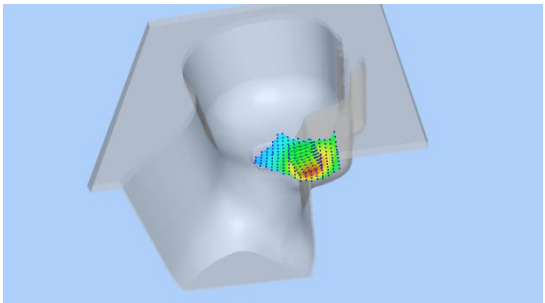
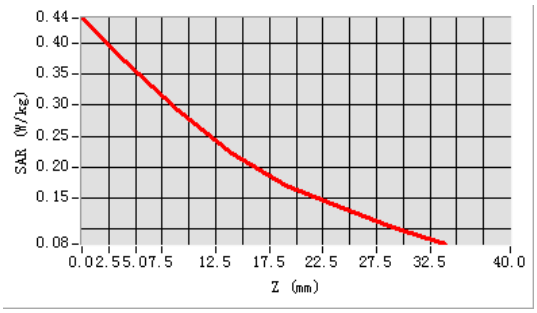
Plot 1: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-26
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Left Cheek
Device Position	Cheek
Band	GPRS 850
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	836.6
Relative permittivity (real part)	42.28
Conductivity (S/m)	0.87

Maximum location: X=-55.00, Y=-42.00

SAR Peak: 0.47 W/kg

SAR 10g (W/Kg)	0.259244
SAR 1g (W/Kg)	0.357497

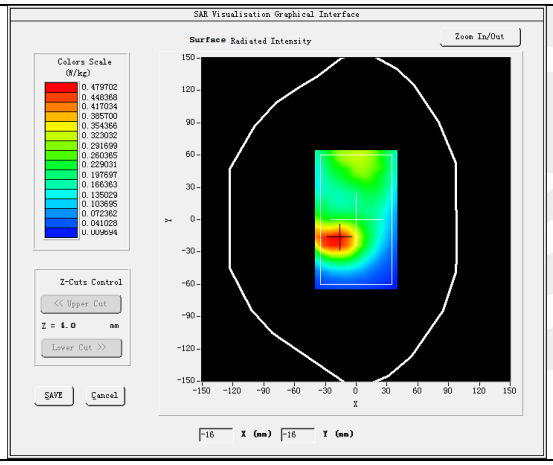
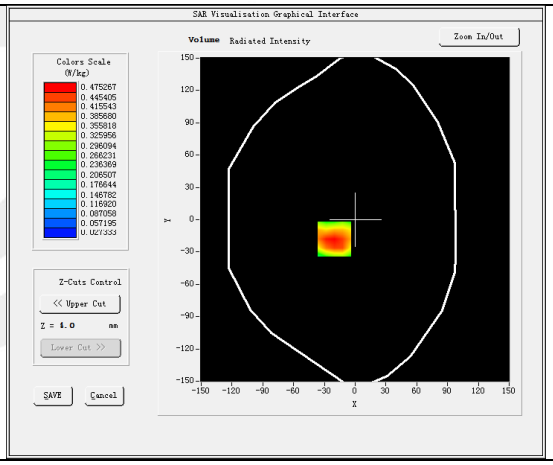
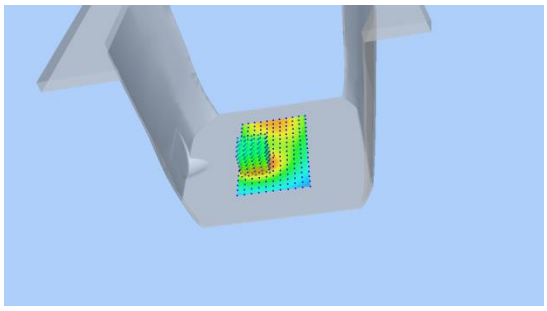
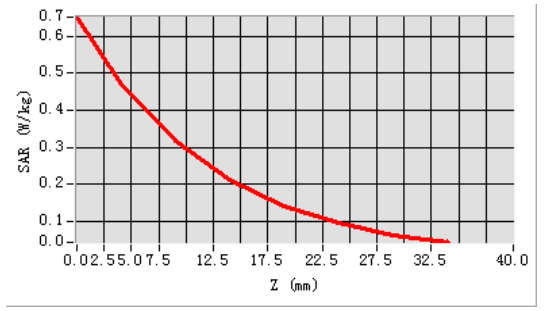
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 2: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-26
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	GPRS 850
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	836.6
Relative permittivity (real part)	42.28
Conductivity (S/m)	0.87

Maximum location: X=-20.00, Y=-18.00
SAR Peak: 0.70 W/kg

SAR 10g (W/Kg)	0.287605
SAR 1g (W/Kg)	0.462710

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

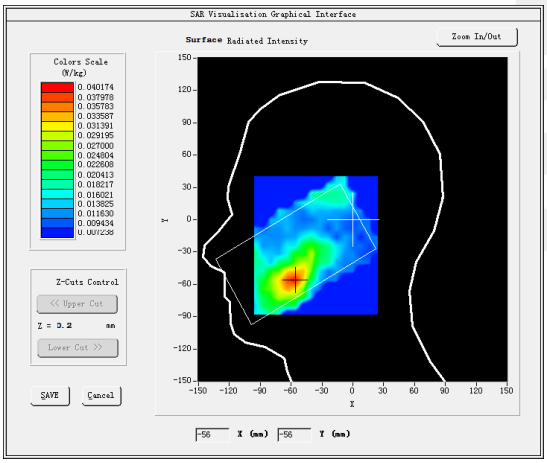
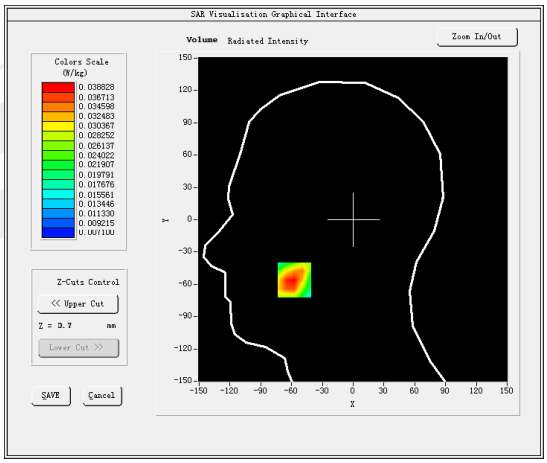
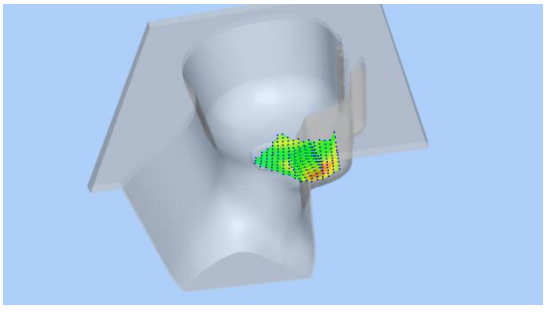
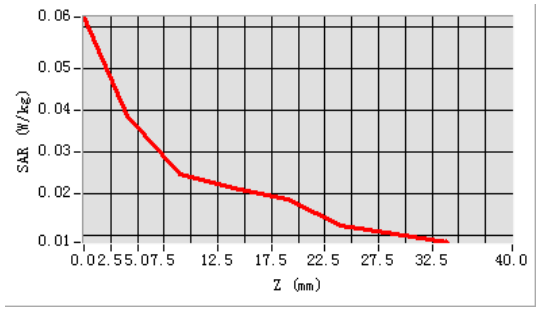
Plot 3: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-26
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Left head
Device Position	Cheek
Band	GPRS 1900
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	1850.2
Relative permittivity (real part)	39.65
Conductivity (S/m)	1.38

Maximum location: X=-57.00, Y=-56.00

SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.025295
SAR 1g (W/Kg)	0.039761

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

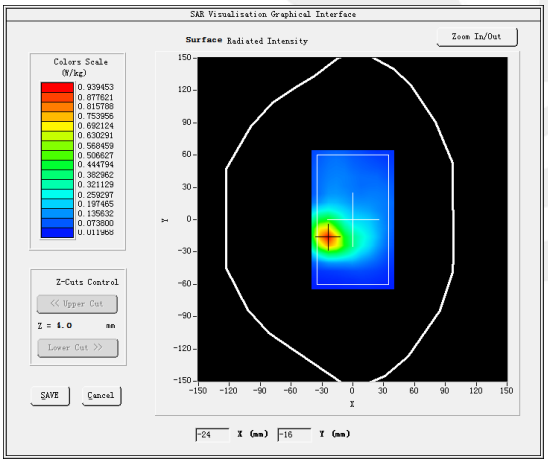
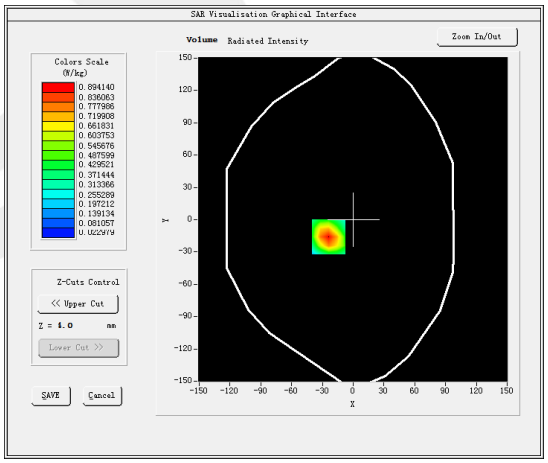
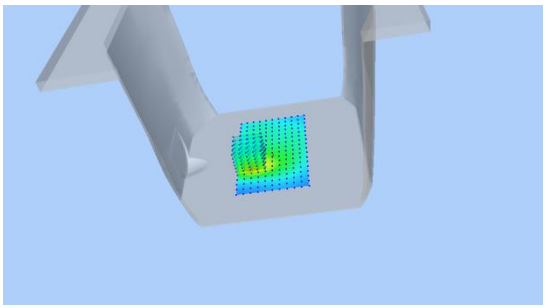
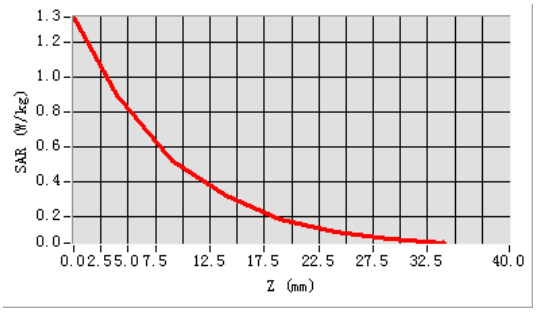
Plot 4: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-26
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	GPRS 1900
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	1850.2
Relative permittivity (real part)	39.65
Conductivity (S/m)	1.38

Maximum location: X=-24.00, Y=-16.00

SAR Peak: 1.35 W/kg

SAR 10g (W/Kg)	0.449660
SAR 1g (W/Kg)	0.842660

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

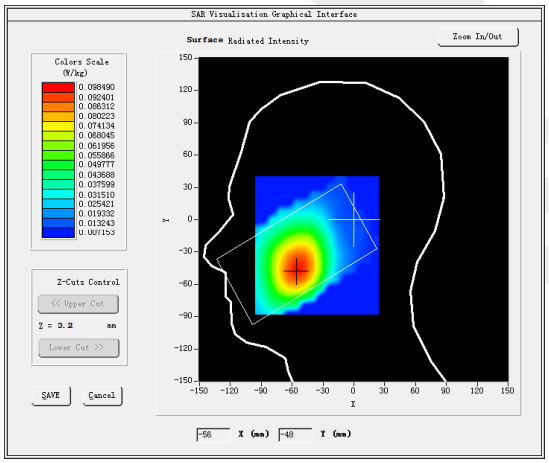
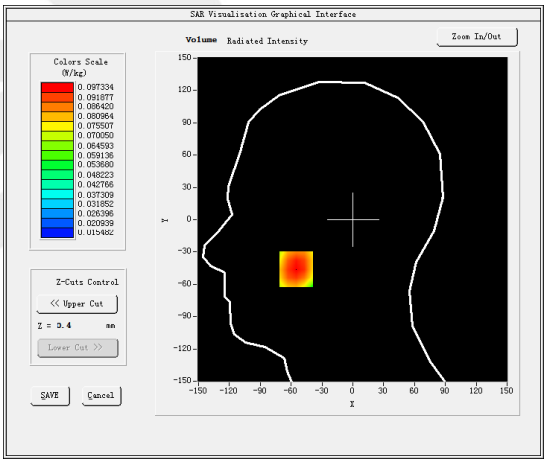
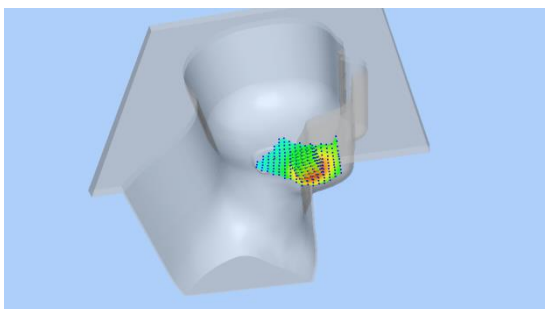
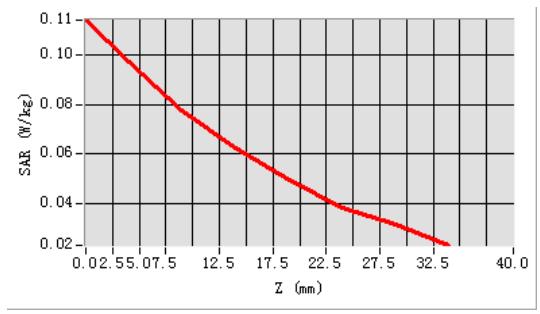
Plot 5: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-26
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Left Cheek
Device Position	Cheek
Band	WCDMA V
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	826.4
Relative permittivity (real part)	41.43
Conductivity (S/m)	0.91

Maximum location: X=-55.00, Y=-46.00

SAR Peak: 0.12 W/kg

SAR 10g (W/Kg)	0.071615
SAR 1g (W/Kg)	0.094734

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

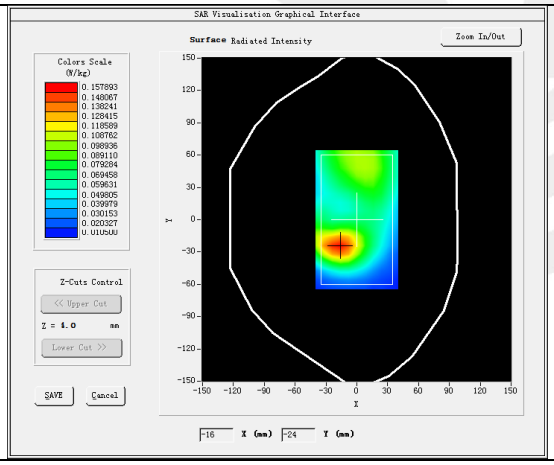
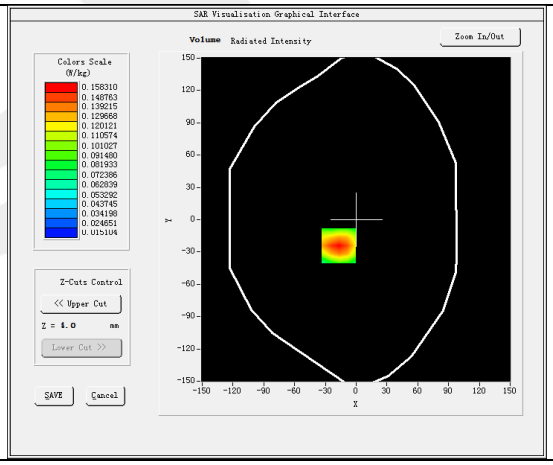
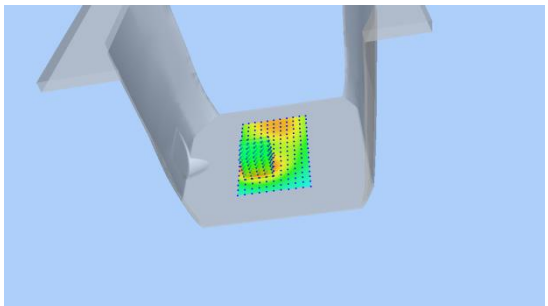
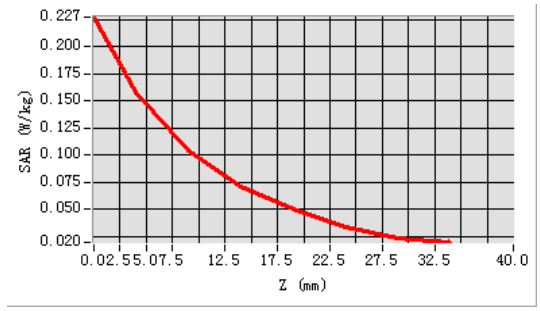
Plot 6: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-26
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	WCDMA V
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	826.4
Relative permittivity (real part)	41.43
Conductivity (S/m)	0.91

Maximum location: X=-17.00, Y=-24.00

SAR Peak: 0.23 W/kg

SAR 10g (W/Kg)	0.094931
SAR 1g (W/Kg)	0.152643

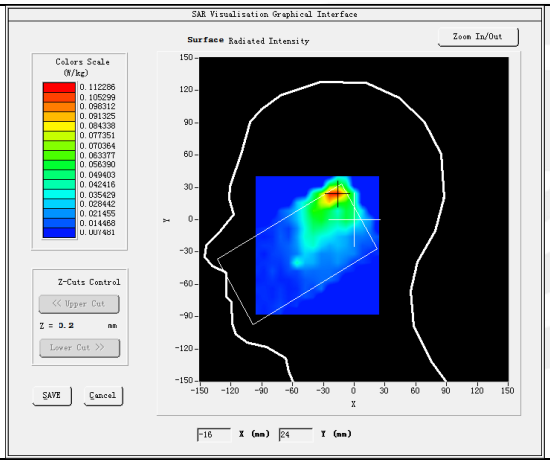
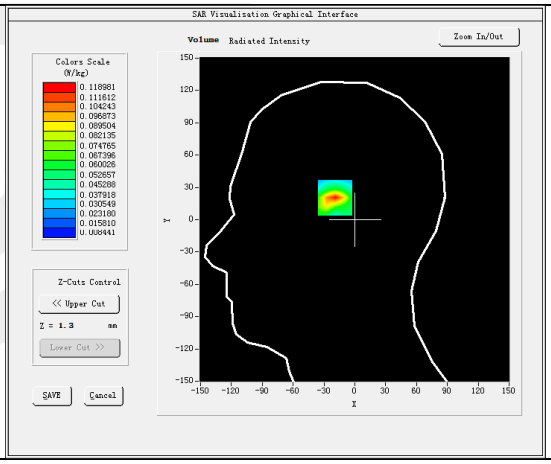
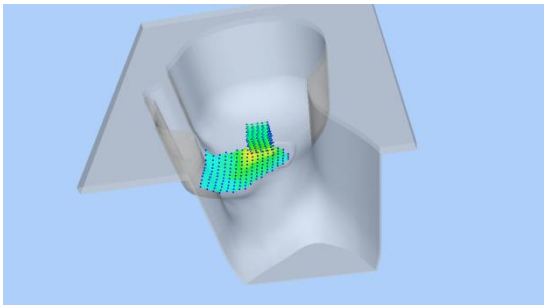
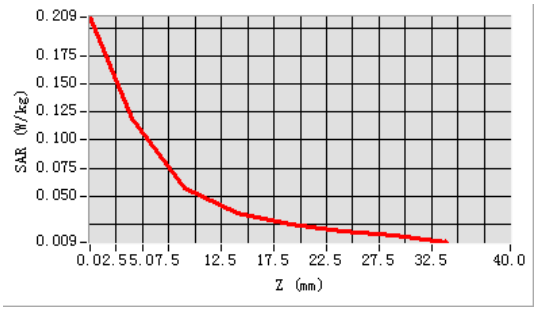
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 7: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-28
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right Cheek
Device Position	Cheek
Band	IEEE 802.11b ISM
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	38.84
Conductivity (S/m)	1.83

Maximum location: X=-18.00, Y=24.00
SAR Peak: 0.21 W/kg

SAR 10g (W/Kg)	0.053763
SAR 1g (W/Kg)	0.107362

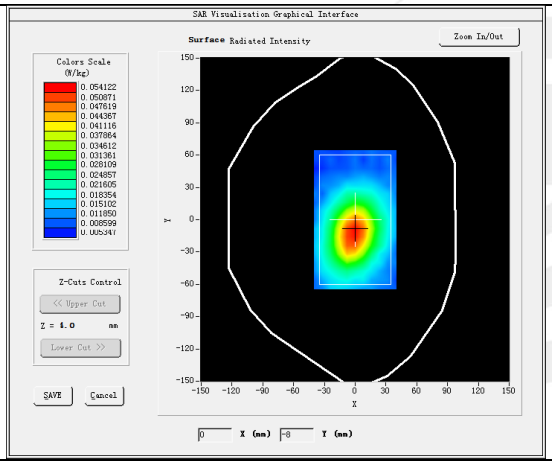
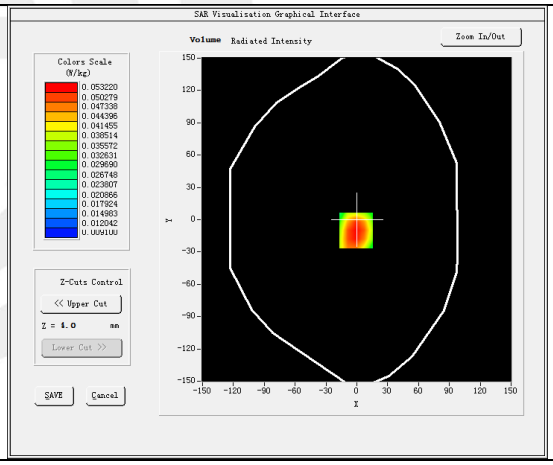
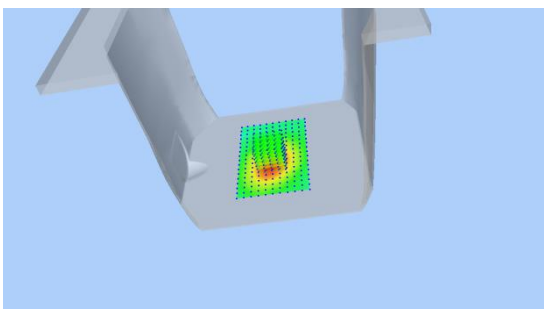
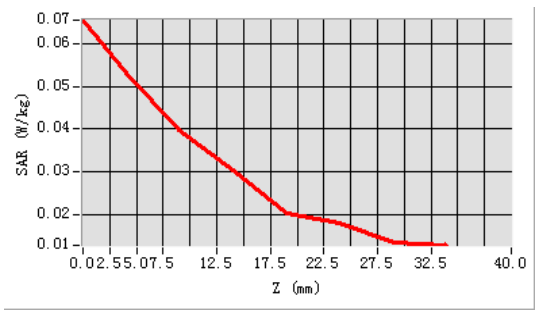
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 8: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-28
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	IEEE 802.11b ISM
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	38.84
Conductivity (S/m)	1.83

Maximum location: X=-1.00, Y=-10.00
SAR Peak: 0.07 W/kg

SAR 10g (W/Kg)	0.035187
SAR 1g (W/Kg)	0.051155

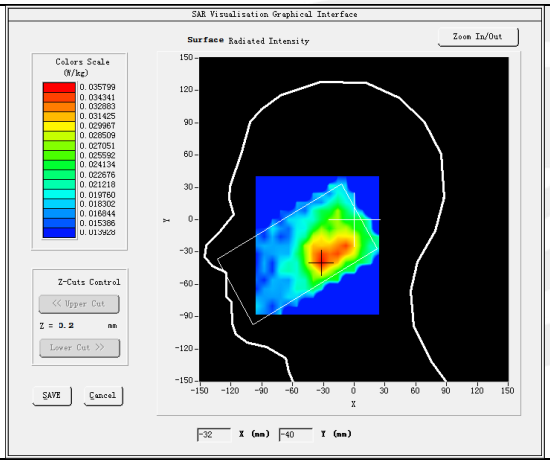
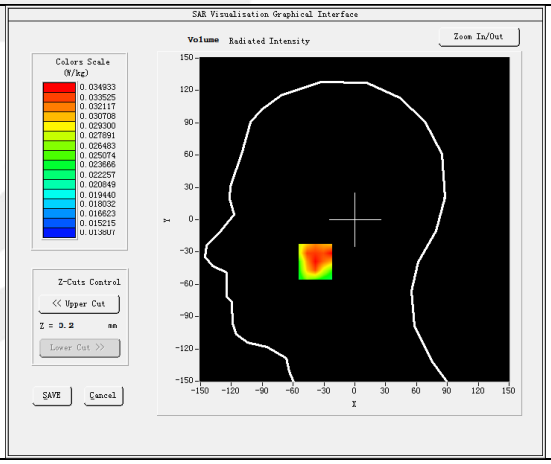
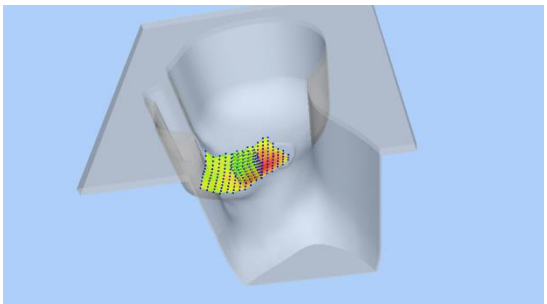
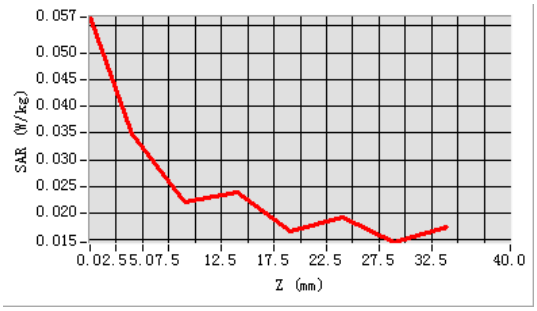
SURFACE SAR	VOLUME SAR
	
3D	**Z AZxis Scan**
	

Plot 9: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-28
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right Cheek
Device Position	Cheek
Band	BT
Signal	GFSK (Crest factor: 1.0)
Frequency (MHz)	2402
Relative permittivity (real part)	37.66
Conductivity (S/m)	1.79

Maximum location: X=-32.00, Y=-39.00
SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.027343
SAR 1g (W/Kg)	0.034236

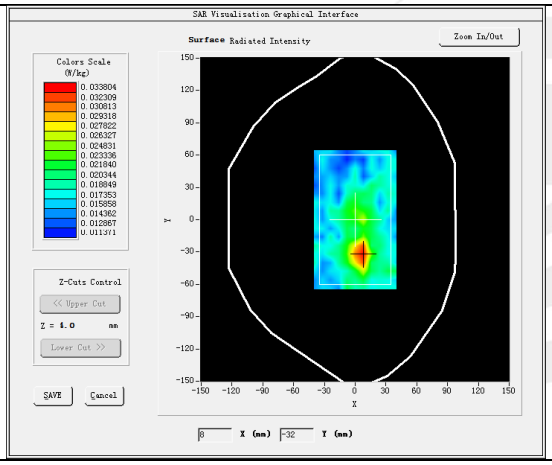
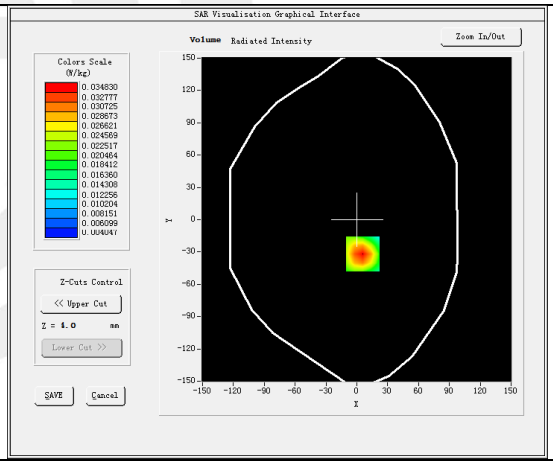
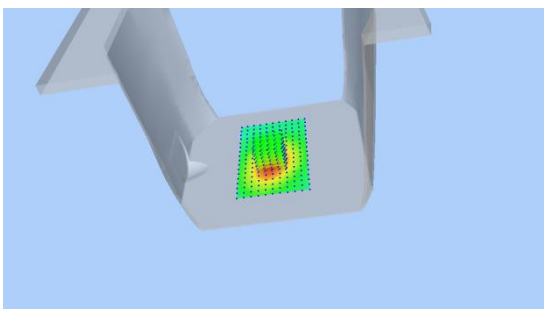
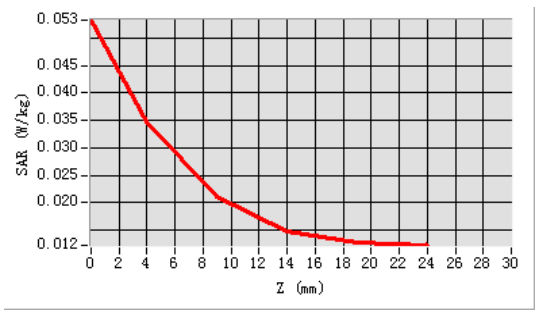
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 10: DUT: Smart phone; EUT Model: Note 10

Test Date	2022-03-28
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	BT
Signal	GFSK (Crest factor: 1.0)
Frequency (MHz)	2402
Relative permittivity (real part)	37.66
Conductivity (S/m)	1.79

Maximum location: X=6.00, Y=-32.00
SAR Peak: 0.05 W/kg

SAR 10g (W/Kg)	0.020959
SAR 1g (W/Kg)	0.033014

SURFACE SAR	VOLUME SAR
	
3D	**Z AZxis Scan**
	

Appendix C. Probe Calibration and Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※