S T S L A B

FCC SAR TEST REPORT

Report No: STS1707114H02

Issued for

Beijing ULINK Technology Co., Ltd.

East Area of 5F, No.16 Wangjing North Rd., Chaoyang District, Beijing, China

Product Name:	4G LTE Mobile Router
Brand Name:	macaroon
Model Name:	macaroon M1
Series Model:	N/A
FCC ID:	2AMIWM1
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEEE 1528: 2013
Max. Report SAR (1g):	Body:1.169 W/kg

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Test Report Certification

Applicant's name ..... : Beijing ULINK Technology Co., Ltd.

Address ..... : East Area of 5F, No.16 Wangjing North Rd., Chaoyang District, Beijing, China

Manufacture's Name..... : Beijing ULINK Technology Co., Ltd.

Address ..... : East Area of 5F, No.16 Wangjing North Rd., Chaoyang District, Beijing, China

Product description

Product name ..... : 4G LTE Mobile Router

Trademark ..... : macaroon

Model and/or type reference : macaroon M1

Series Model..... : N/A

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 .....: 19 Jun. 2017~22 Jun. 2017

Date of Issue.....: 23 Jun. 2017

Test Result.....: **Pass**

Testing Engineer **:**

(Aaron Bu)

Technical Manager **:**

(John Zou)

Authorized Signatory **:**

(Vita Li)

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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

Equipment	4G LTE Mobile Router		
Brand Name	Macaroon		
Model No.	macaroon M1		
Series Model	N/A		
FCC ID	2AMIWM1		
Model Difference	N/A		
Adapter	Input: AC 100-240V, 200mA, 50-60 Hz Output: DC 5V, 1000mA		
Battery	Rated Voltage: 3.8V; Charge Limit: 4.35V; Capacity: 3000mAh		
Device Category	Portable		
Product stage	Production unit		
RF Exposure Environment	General Population / Uncontrolled		
Hardware Version	1.0		
Software Version	V100		
Frequency Range	GSM 850:824.2~848.8MHz PCS1900:1850.2~1909.8MHz WCDMA Band II:1852.4~1907.6MHz WCDMA IV:1712.4~1752.6 MHz WCDMA Band V:826.4~846.6MHz LTE Band 2:1850.7~1909.3MHz LTE Band 4:1710.7~1754.3MHz LTE Band 5:824.7~848.3MHz LTE Band 7:2502.5~2567.5MHz LTE Band: 12:699.7~715.3MHz	LTE Band 17:706.5~713.5MHz LTE Band 41:2498.5~2687.5MHz WLAN802.11b/g/n(HT20):2412~2462MHz WLAN 802.11n(HT40):2422~2452MHz WLAN 802.11a/n/ac(HT20/40/80): 5150~5250 MHz; 5250~5350 MHz; 5470~5725 MHz; 5725~5875 MHz; Bluetooth:2402~ 2480MHz	
Max. Reported SAR(1g): (Limit:1.6W/kg)	Band	Mode	Body Worn and Hotspot(W/kg)
	PCE	GSM 850	0.157
	PCE	GSM 1900	0.797
	PCE	WCDMA Band II	1.074
	PCE	WCDMA Band IV	0.595
	PCE	WCDMA Band V	0.109
	PCE	LTE Band 2	0.302
	PCE	LTE Band 4	1.169
	PCE	LTE Band 5	0.131
	PCE	LTE Band 7	0.302
	PCE	LTE Band 12	0.429
	PCE	LTE Band 17	0.664
	PCE	LTE Band 41	0.103
	DTS	WLAN	0.180
	NII	WLAN(5.2 G)	0.135
	NII	WLAN(5.8 G)	0.100
	DSS	Bluetooth Note	0.265
1-g Sum SAR			1.434

FCC Equipment Class	Licensed Portable Transmitter Held to Ear (PCE) Part 15 Spread Spectrum Transmitter (DSS) Digital Transmission System (DTS)
Operating Mode:	GSM: GPRS Class 33; EGPRS Class 33; WCDMA: RMC, HSDPA Release 10, HSUPA Release 6; LTE:QPSK,16QAM; WLAN: 802.11 b/g/n(HT20) /n(HT40) /a/ac20/ac40/ac80; Bluetooth: V3.0 + EDR (GFSK, 8DPSK) ; BLE
Antenna Specification:	GSM,WCDMA,LTE: PIFA Antenna BT,WLAN: PIFA Antenna
SIM Card	Support single card
Hotspot Mode:	Support
DTM Mode:	Not Support
Note: 1. Bluetooth SAR was estimated 2. 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.
Add. : 1/F, Building B, Zhuoke Science Park,No.190, Chongqing Road, Fuyong, Baoan District, Shenzhen, Guangdong, China

CNAS Registration No.: L7649

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 D01 v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
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 D05 v02r05	SAR for LTE Devices
9	FCC KDB 941225 D06 v02r01	Hotspot Mode SAR
10	FCC KDB 248227 D01 WLAN 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:

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

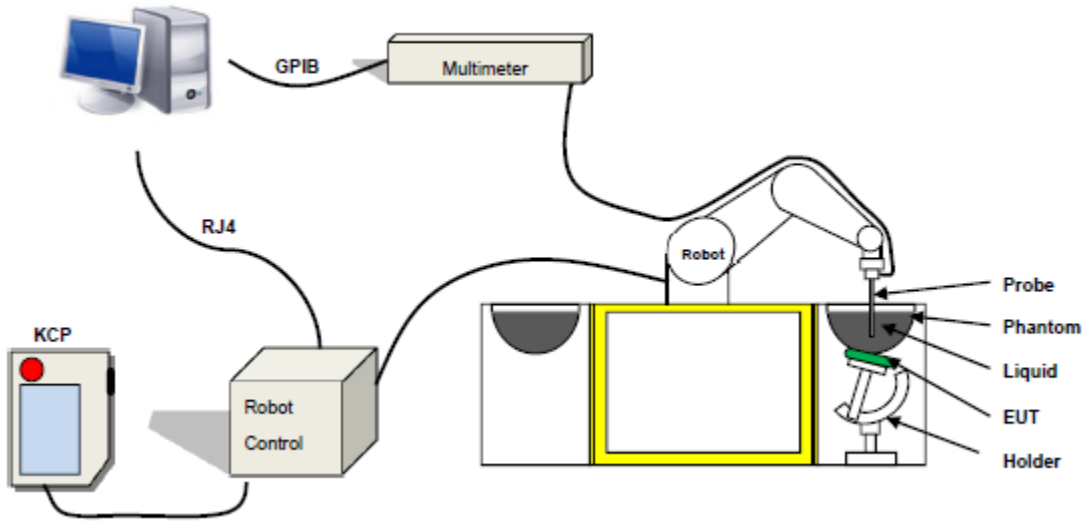
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

SATIMO 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 OpenSAR 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 45/15 EPGO281 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Tip Diameter: 2.5 mm
- Length of Individual Dipoles: 2 mm
- Maximum external diameter: 8 mm
- Distance between dipole/probe extremity: 8 mm (repeatability better than +/- 1mm)
- Probe linearity: 0±2.60%(0.11dB)
- Axial Isotropy: < 0.25 dB
- Spherical Isotropy: < 0.25 dB
- Calibration range: 450 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*

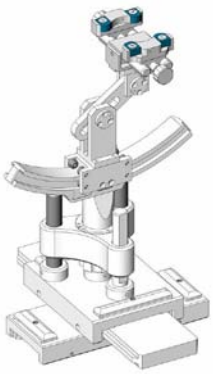
3.2.2 Phantom

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.

Frequency (MHz)	Bactericide	DGBE	HEC	NaCl	Sucrose	1,2-Propan ediol	X100	Water	Conductivity	Permittivity
	%	%	%	%	%	%	%	%	σ	εr
750	/	/	/	0.79	/	64.81	/	34.40	0.97	41.8
835	/	/	/	0.79	/	64.81	/	34.40	0.97	41.8
900	/	/	/	0.79	/	64.81	/	34.40	0.97	41.8
1800	/	13.84	/	0.35	/	/	30.45	55.36	1.38	41.0
1900	/	13.84	/	0.35	/	/	30.45	55.36	1.38	41.0
2000	/	7.99	/	0.16	/	/	19.97	71.88	1.55	41.1
2450	/	7.99	/	0.16	/	/	19.97	71.88	1.88	40.3
2600	/	7.99	/	0.16	/	/	19.97	71.88	1.88	40.3

Tissue dielectric parameters for head and body phantoms				
Frequency	ε_r		σ S/m	
	Head	Body	Head	Body
300	45.3	58.2	0.87	0.92
450	43.5	58.7	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

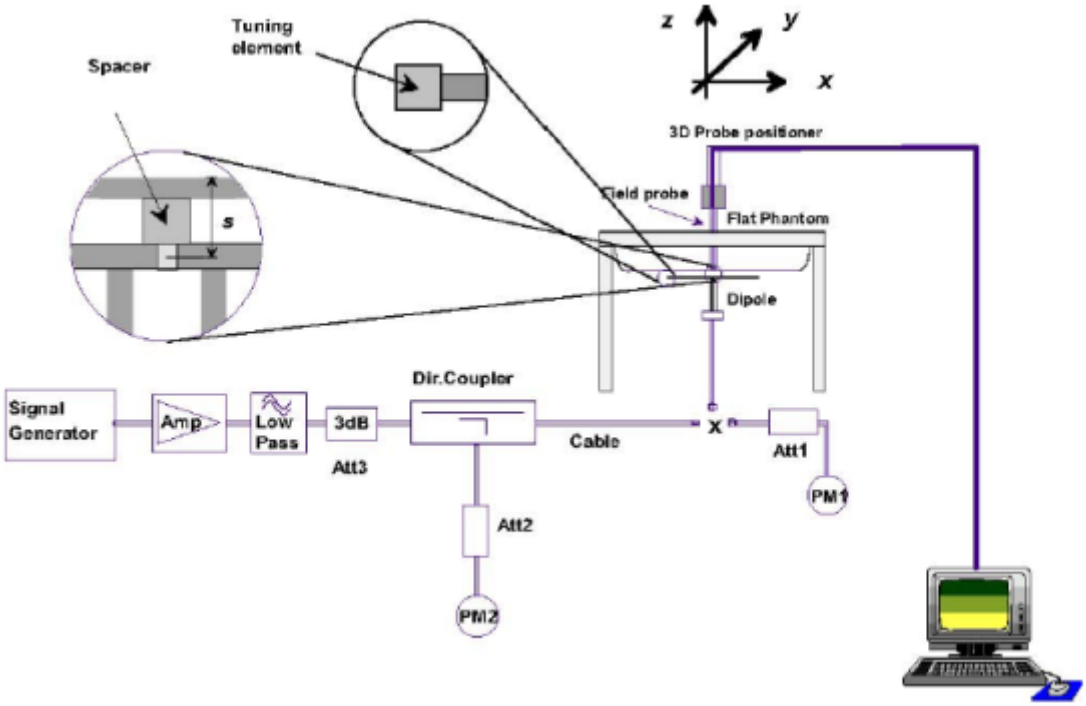
Date	Ambient condition		Body Simulating Liquid		Parameters	Target	Measured	Deviation [%]	Limited [%]
	Temp. [°C]	Humidity [%]	Frequency	Temp. [°C]					
2017-06-19	23.2	55	750 MHz	22.8	Permitivity:	55.5	54.24	-2.27	±5
					Conductivity:	0.96	0.94	-2.08	±5
2017-06-19	23.2	55	835 MHz	22.8	Permitivity:	55.2	54.7	-0.91	±5
					Conductivity:	0.97	0.96	-1.03	±5
2017-06-20	23.3	56	1800 MHz	23.0	Permitivity:	53.3	54.86	2.93	±5
					Conductivity:	1.52	1.52	0.00	±5
2017-06-20	23.3	56	1900 MHz	23.0	Permitivity:	53.3	54.1	1.50	±5
					Conductivity:	1.52	1.47	-3.29	±5
2017-06-21	22.8	58	2450 MHz	22.4	Permitivity:	52.7	50.88	-3.45	±5
					Conductivity:	1.95	1.98	1.54	±5
2017-06-21	22.8	58	2600 MHz	22.4	Permitivity:	52.5	53.44	1.79	±5
					Conductivity:	2.16	2.09	-3.24	±5
2017-06-22	23.1	58	5200 MHz	22.7	Permitivity:	49.0	49.33	0.67	±10
					Conductivity:	5.30	5.27	-0.57	±10
2017-06-22	23.1	58	5800 MHz	22.7	Permitivity:	48.2	47.38	-1.70	±10
					Conductivity:	6.00	5.97	-0.50	±10

5. SAR System Validation

5.1 Validation System

Each SATIMO system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the SATIMO 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 SATIMO, the validation data should be within its specification of 10 %.

Freq.(MHz)	Power(mW)	Tested Value (W/Kg)	Normalized SAR (W/kg/W)	Target (W/Kg/W)	Tolerance(%)	Date
750 Body	100	0.864	8.64	8.49	1.77	2017-06-19
835 Body	100	0.969	9.69	9.56	1.36	2017-06-19
1800 Body	100	3.694	36.94	38.4	-3.80	2017-06-20
1900 Body	100	4.074	40.74	39.7	2.62	2017-06-20
2450 Body	100	5.126	51.26	52.4	-2.18	2017-06-21
2600 Body	100	5.704	57.04	55.30	3.15	2017-06-21
5200 Body	100	15.849	158.49	159	-0.32	2017-06-22
5800 Body	100	17.964	179.640	181.2	-0.86	2017-06-22

Note: The tolerance limit of System validation ±10%.

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

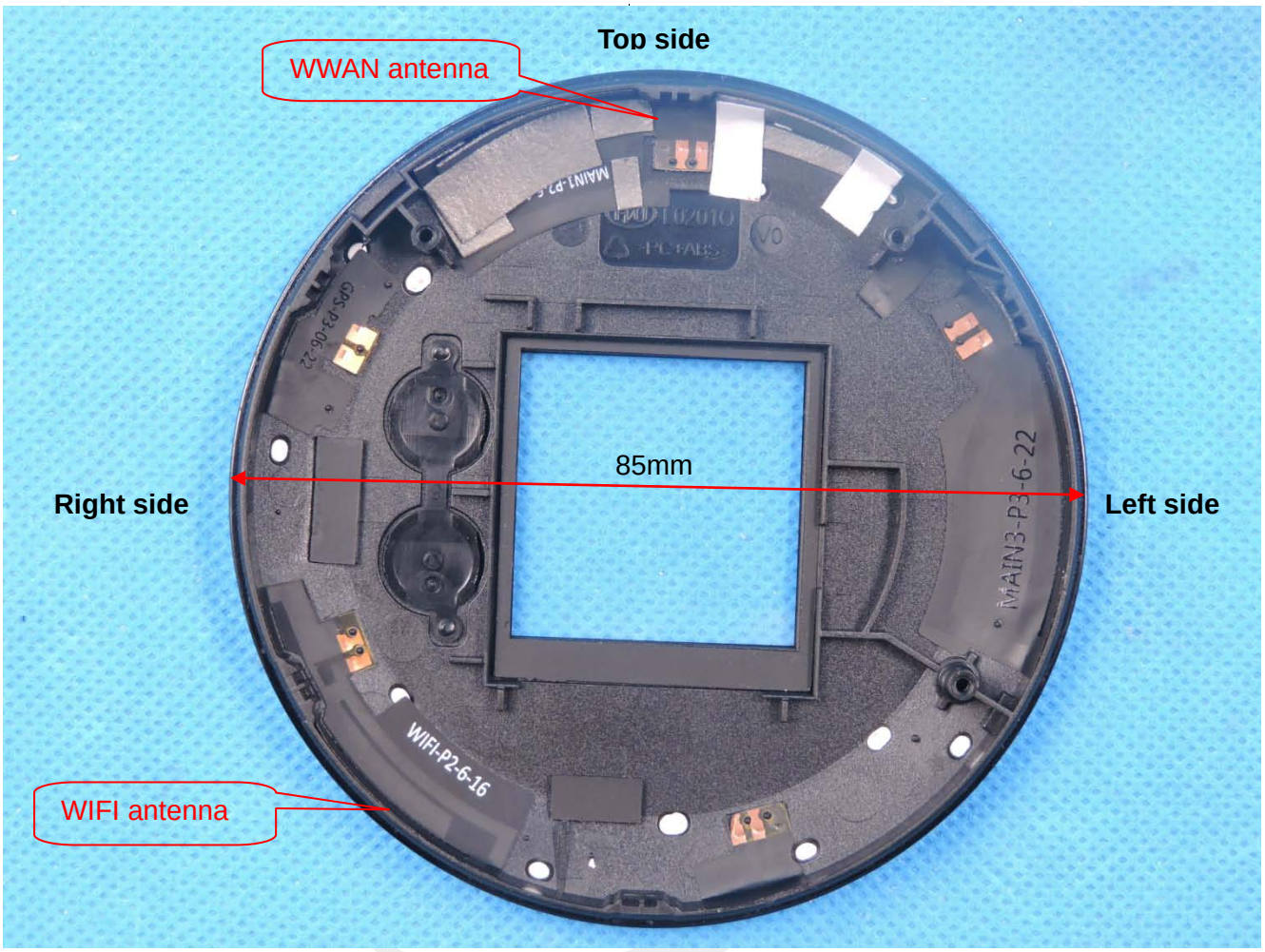
- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible 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 4G LTE Mobile Router, support GSM/WCDMA/LTE mode.



Bottom side
(Back view)

7.1 SAR test exclusion consider table

According with FCC KDB 447498 D01, appendix A, <SAR test exclusion thresholds for 100MHz ~6GHz and≤50mm＞table, this device SAR test configurations consider as following:

Band	Test position configurations					
	Front	Back	Right edge	Left edge	Top edge	Bottom edge
WWAN	＜5mm	＜5mm	＜5mm	＜5mm	＜5mm	75mm
	Yes	Yes	Yes	Yes	Yes	No
WLAN/BT	＜5mm	＜5mm	＜5mm	74mm	＜5mm	＜5mm
	Yes	Yes	Yes	No	Yes	Yes

Note：

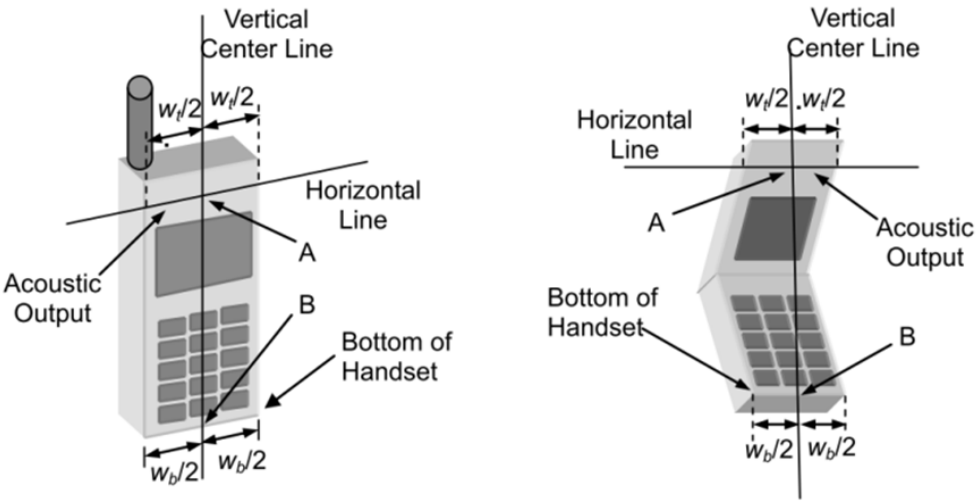
1. maximum power is the source-based time-average power and represents the maximum RF output power among production units.
2. per KDB 447498 D01, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. per KDB 447498 D01, standalone SAR test exclusion threshold is applied; if the distance of the antenna to the user is <5mm, 5mm is user to determine SAR exclusion threshold
4. per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distance ≤50mm 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 and≤7.5 for10-g extremity SAR ,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
   For <50mm distance, we just calculate mW of the exclusion threshold value(3.0)to do compare
5. per KDB 447498 D01, at 100 MHz to 6GHz and for test separation distances >50mm, the SAR test exclusion threshold is determined according to the following
   a)[threshold at 50mm in step 1]+(test separation distance -50mm)*(f (MHz)/150)]Mw, at 100 MHz to 1500 MHz
   b) [threshold at 50mm in step1]+(test separation distance -50mm) *10]mW at＞ 1500MHz and≤6GHz
6. Per KDB 447498 D02, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/ HSUPA/DC-HSDPA output power is<0.25db higher than RMC 12.2Kbps,or reported SAR with RMC 12.2kbps setting is ≤1.2W/Kg, HSDPA/HSUPA/DC-HSDPA SAR evaluation can be excluded.
7. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine futher 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.

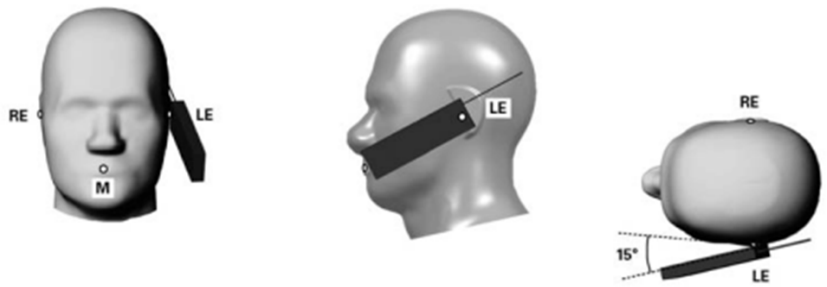
8. EUT Test Position

This EUT was tested in Front Face and Rear Face.

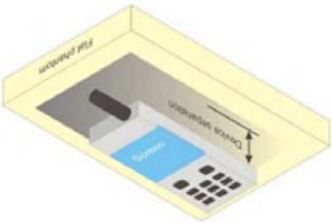
8.1 Define Two Imaginary Lines On The Handset

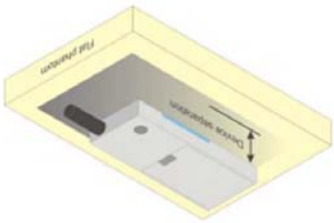
(1)The vertical centerline passes through two points on the front side of the handset the midpoint of the width wt of the handset at the level of the acoustic output, and the midpoint of the width wb of the handset.
(2)The horizontal line is perpendicular to the vertical centerline and passes through 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.





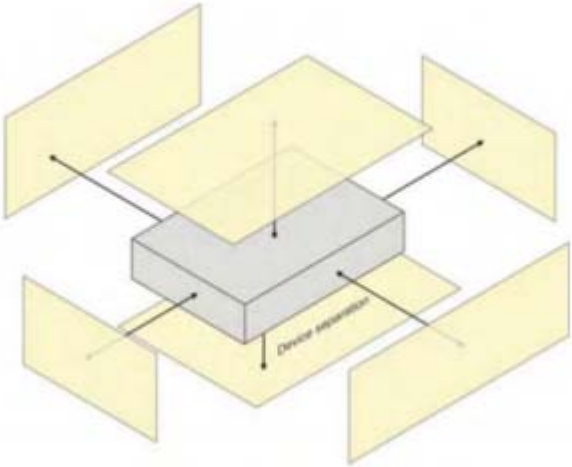
Body-worn Position Conditions:
Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset 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.

NO	Source	Tol(%)	Prob. Dist.	Div. k	ci (1g)	ci (10g)	1gUi	10gUi	Veff
Measurement System□									
1	Probe calibration	5.8	N	1	1	1	5.8	5.8	∞
2	Axial isotropy	3.5	R	√3	$(1-cp)^{1/2}$	$(1-cp)^{1/2}$	1.43	1.43	∞
3	Hemispherical isotropy	5.9	R	√3	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
4	Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
5	Linearity	4.7	R	√3	1	1	2.71	2.71	∞
6	System Detection limits	1.0	R	√3	1	1	0.58	0.58	∞
7	Readout electronics	0.5	N	1	1	1	0.50	0.50	∞
8	Response time	0	R	√3	1	1	0	0	∞
9	Integration time	1.4	R	√3	1	1	0.81	0.81	∞
10	Ambient noise	3.0	R	√3	1	1	1.73	1.73	∞
11	Ambient reflections	3.0	R	√3	1	1	1.73	1.73	∞
12	Probe positioner mech. restrictions	1.4	R	√3	1	1	0.81	0.81	∞
13	Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	∞
14	Max.SAR evaluation	1.0	R	√3	1	1	0.6	0.6	∞
Test sample related									

15	Device positioning	2.6	N	1	1	1	2.6	2.6	11
16	Device holder	3	N	1	1	1	3.0	3.0	7
17	Drift of output power	5.0	R	√3	1	1	2.89	2.89	∞
Phantom and set-up									
18	Phantom uncertainty	4.0	R	√3	1	1	2.31	2.31	∞
19	Liquid conductivity (target)	2.5	N	1	0.78	0.71	1.95	1.78	5
20	Liquid conductivity (meas)	4	N	1	0.23	0.26	0.92	1.04	5
21	Liquid Permittivity (target)	2.5	N	1	0.78	0.71	1.95	1.78	∞
22	Liquid Permittivity (meas)	5.0	N	1	0.23	0.26	1.15	1.30	∞
Combined standard			RSS	$U_C = \sqrt{\sum_{i=1}^{n} C_i^2 U_i^2}$			10.63%	10.54%	
Expanded uncertainty (P=95%)		$U = k\,U_C$,k=2					21.26%	21.08%	

9.2 System validation Uncertainty

NO	Source	Tol(%)	Prob. Dist.	Div. k	ci (1g)	ci (10g)	1gUi	10gUi	Veff
Measurement System□									
1	Probe calibration	5.8	N	1	1	1	5.8	5.8	∞
2	Axial isotropy	3.5	R	√3	$(1-cp)^{1/2}$	$(1-cp)^{1/2}$	1.43	1.43	∞
3	Hemispherical isotropy	5.9	R	√3	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
4	Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
5	Linearity	4.7	R	√3	1	1	2.71	2.71	∞
6	System Detection limits	1.0	R	√3	1	1	0.58	0.58	∞
7	Modulation response	0	N	1	1	1	0	0	∞
8	Readout electronics	0.5	N	1	1	1	0.50	0.50	∞
9	Response time	0	R	√3	1	1	0	0	∞
10	Integration time	1.4	R	√3	1	1	0.81	0.81	∞
11	Ambient noise	3.0	R	√3	1	1	1.73	1.73	∞
12	Ambient reflections	3.0	R	√3	1	1	1.73	1.73	∞
13	Probe positioner mech. restrictions	1.4	R	√3	1	1	0.81	0.81	∞
14	Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	∞
15	Max.SAR evaluation	1.0	R	√3	1	1	0.6	0.6	∞
Dipole									
16	Deviation of experimental source from	4	N	1	1	1	4.00	4.00	∞

17	Input power and SAR drit measurement	5	R	√3	1	1	2.89	2.89	∞
18	Dipole Axis to liquid Distance	2	R	√3	1	1			∞
Phantom and set-up									
19	Phantom uncertainty	4.0	R	√3	1	1	2.31	2.31	∞
20	Uncertainty in SAR correction for deviation(in	2.0	N	1	1	0.84	2	1.68	∞
21	Liquid conductivity (target)	2	N	1	1	0.84	2.00	1.68	∞
22	Liquid conductivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	5
23	Liquid conductivity (meas)	4	N	1	0.23	0.26	0.92	1.04	5
24	Liquid Permittivity (target)	2.5	N	1	0.78	0.71	1.95	1.78	∞
25	Liquid Permittivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	5
26	Liquid Permittivity (meas)	5.0	N	1	0.23	0.26	1.15	1.30	∞
Combined standard			RSS	$U_C = \sqrt{\sum_{i=1}^{n} C_i^2 U_i^2}$			10.15%	10.05%	
Expanded uncertainty (P=95%)		$U = k\ U_C$,k=2					20.29%	20.10%	

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
GPRS (Slot 1)	32.10	32.00	32.00	27.80	28.00	28.20
EGPRS (Slot 1)	32.00	32.00	32.00	27.80	28.00	28.10

Remark: GPRS, CS4 coding scheme. EGPRS, MCS9 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

Fram- 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
GPRS (Slot 1)	23.07	22.97	22.97	18.77	18.97	19.17
EGPRS (Slot 1)	22.97	22.97	22.97	18.77	18.97	19.07

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

WCDMA

Band	WCDMA Band V			WCDMA Band IV			WCDMA Band II		
Channel	4132	4183	4233	1312	1413	1513	9262	9400	9538
Frequency (MHz)	826.4	836.6	846.6	1712.6	1740	1752.4	1852.4	1880.0	1907.6
RMC 12.2Kbps	23.25	23.12	23.06	23.48	23.56	23.52	22.69	22.72	22.52
HSDPA Subtest	22.30	22.16	22.11	23.45	23.52	23.49	21.71	21.60	21.64
HSUPA Subtest	22.24	22.08	21.84	23.36	23.43	23.07	21.75	21.82	22.02

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.

WLAN (2.4Gband)

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
802.11b	1	2412	13.72
	6	2437	13.52
	11	2462	13.81
802.11g	1	2412	11.84
	6	2437	12.08
	11	2462	11.06
802.11n(HT 20)	1	2412	11.30
	6	2437	11.29
	11	2462	10.10
802.11n(HT 40)	3	2422	10.95
	6	2437	10.97
	9	2452	8.50

WLAN (5.2Gband)

Mode	Channel Number	Frequency (MHz)	Average EIRP Power (dBm)
802.11a	36	5180	13.68
	40	5200	13.97
	48	5240	13.95
802.11 n-HT20	36	5180	12.72
	40	5200	12.51
	48	5240	12.72
802.11 n-HT40	38	5190	12.75
	46	5230	12.37
802.11ac(HT20)	36	5180	11.69
	40	5200	11.46
	48	5240	11.66
802.11ac(HT40)	38	5190	11.71
	46	5230	11.47
802.11ac(HT80)	42	5210	11.81

WLAN (5.8Gband)

Mode	Channel Number	Frequency (MHz)	Average EIRP Power (dBm)
802.11a	149	5745	13.93
	157	5785	13.97
	165	5825	13.72
802.11 n-HT20	149	5745	12.64
	157	5785	12.63
	165	5825	12.87
802.11 n-HT40	151	5755	12.67
	159	5795	12.59
802.11ac(HT20)	149	5745	11.58
	157	5785	11.68
	165	5825	11.85
802.11ac(HT40)	151	5755	11.67
	159	5795	11.63
802.11ac(HT80)	155	5775	11.99

Bluetooth

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
GFSK(1Mbps)	0	2402	4.656
	39	2441	7.161
	78	2480	5.768
8DPSK(3Mbps)	0	2402	4.009
	39	2441	6.166
	78	2480	5.000

BLE

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
GFSK(1Mbps)	0	2402	-4.47
	19	2440	-2.63
	39	2480	-3.59

LTE Conducted Power

General Note:

1. Anritsu CMW500 base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05, smaller bandwidth SAR testing is not required.

LTE Band 2

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	23.38	23.59	23.62
1.4	1	2		23.15	23.36	23.41
1.4	1	5		22.94	23.12	23.12
1.4	3	0		22.67	22.88	22.91
1.4	3	1		22.43	22.68	22.62
1.4	3	2		22.22	22.42	22.39
1.4	6	0		22.00	22.14	22.18
1.4	1	0	16-QAM	23.15	23.32	23.35
1.4	1	2		22.89	23.06	23.08
1.4	1	5		22.69	22.82	22.84
1.4	3	0		22.46	22.61	22.62
1.4	3	1		22.19	22.36	22.39
1.4	3	2		21.96	22.16	22.18
1.4	6	0		21.67	21.92	21.96
3	1	0	QPSK	23.12	23.32	23.41
3	1	7		22.89	23.08	23.17
3	1	14		22.59	22.79	22.93
3	8	0		22.38	22.58	22.68
3	8	4		22.11	22.32	22.43
3	8	7		21.86	22.06	22.23
3	15	0		21.62	21.84	21.96
3	1	0	16-QAM	22.88	23.07	23.15
3	1	7		22.61	22.85	22.88
3	1	14		22.37	22.56	22.58
3	8	0		22.12	22.34	22.34
3	8	4		21.82	22.10	22.07
3	8	7		21.57	21.89	21.78
3	15	0		21.35	21.60	21.53

LTE BAND 2

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.19	23.12	23.16
5	1	12		22.98	22.87	22.96
5	1	24		22.68	22.57	22.71
5	12	0		22.41	22.35	22.49
5	12	6		22.19	22.10	22.22
5	12	11		21.96	21.81	21.97
5	25	0		21.68	21.51	21.73
5	1	0	16-QAM	22.93	22.84	22.90
5	1	12		22.70	22.64	22.60
5	1	24		22.42	22.41	22.40
5	12	0		22.19	22.16	22.13
5	12	6		21.92	21.94	21.93
5	12	11		21.68	21.66	21.65
5	25	0		21.42	21.36	21.37
10	1	0	QPSK	23.05	23.06	23.04
10	1	24		22.82	22.84	22.80
10	1	49		22.53	22.54	22.51
10	25	0		22.25	22.34	22.21
10	25	12		21.99	22.07	21.95
10	25	24		21.72	21.77	21.74
10	50	0		21.49	21.57	21.45
10	1	0	16-QAM	22.76	22.81	22.75
10	1	24		22.52	22.60	22.46
10	1	49		22.27	22.38	22.20
10	25	0		22.07	22.14	21.93
10	25	12		21.82	21.94	21.71
10	25	24		21.58	21.67	21.47
10	50	0		21.35	21.43	21.18

LTE BAND 2

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	23.23	23.26	23.32
15	1	37		23.02	23.05	23.02
15	1	74		22.81	22.78	22.79
15	36	0		22.51	22.49	22.53
15	36	18		22.29	22.26	22.26
15	36	39		22.00	22.03	22.05
15	75	0		21.75	21.77	21.83
15	1	0	16-QAM	23.02	23.06	23.07
15	1	38		22.81	22.84	22.86
15	1	75		22.53	22.62	22.60
15	36	0		22.27	22.37	22.31
15	36	18		22.06	22.14	22.04
15	36	39		21.85	21.93	21.77
15	75	0		21.59	21.71	21.52
20	1	0	QPSK	23.89	23.95	23.98
20	1	49		23.64	23.73	23.76
20	1	99		23.42	23.48	23.49
20	50	0		23.17	23.19	23.27
20	50	24		22.97	22.94	23.06
20	50	49		22.72	22.65	22.83
20	100	0		22.46	22.44	22.57
20	1	0	16-QAM	23.62	23.72	23.71
20	1	49		23.36	23.45	23.48
20	1	99		23.07	23.23	23.26
20	50	0		22.80	22.99	23.01
20	50	24		22.53	22.74	22.72
20	50	49		22.25	22.46	22.44
20	100	0		22.01	22.25	22.23

LTE BAND 4

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	23.76	23.79	23.82
1.4	1	2		23.55	23.59	23.54
1.4	1	5		23.29	23.32	23.25
1.4	3	0		23.03	23.03	23
1.4	3	1		22.77	22.81	22.78
1.4	3	2		22.55	22.52	22.49
1.4	6	0		22.31	22.3	22.24
1.4	1	0	16-QAM	23.53	23.53	23.52
1.4	1	2		23.31	23.26	23.27
1.4	1	5		23.05	22.99	22.98
1.4	3	0		22.81	22.75	22.77
1.4	3	1		22.54	22.54	22.5
1.4	3	2		22.29	22.27	22.22
1.4	6	0		22.09	22	21.94
3	1	0	QPSK	23.53	23.58	23.62
3	1	7		23.31	23.28	23.34
3	1	14		23.03	23.01	23.11
3	8	0		22.81	22.8	22.86
3	8	4		22.59	22.5	22.62
3	8	7		22.38	22.22	22.38
3	15	0		22.16	21.93	22.16
3	1	0	16-QAM	23.3	23.36	23.34
3	1	7		23.05	23.13	23.08
3	1	14		22.76	22.87	22.8
3	8	0		22.52	22.61	22.57
3	8	4		22.23	22.32	22.3
3	8	7		21.96	22.04	22.07
3	15	0		21.74	21.8	21.79

LTE BAND 4

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.65	23.68	23.72
5	1	12		23.35	23.44	23.46
5	1	24		23.09	23.24	23.23
5	12	0		22.86	23.02	22.94
5	12	6		22.58	22.76	22.66
5	12	11		22.38	22.53	22.43
5	25	0		22.16	22.31	22.18
5	1	0	16-QAM	23.41	23.45	23.48
5	1	12		23.14	23.2	23.22
5	1	24		22.88	22.93	22.96
5	12	0		22.66	22.71	22.69
5	12	6		22.38	22.46	22.47
5	12	11		22.11	22.19	22.27
5	25	0		21.82	21.98	21.97
10	1	0	QPSK	23.48	23.53	23.59
10	1	24		23.2	23.25	23.32
10	1	49		22.97	23.01	23.09
10	25	0		22.74	22.71	22.87
10	25	12		22.45	22.5	22.64
10	25	24		22.16	22.21	22.36
10	50	0		21.87	21.94	22.08
10	1	0	16-QAM	23.24	23.32	23.35
10	1	24		23	23.12	23.06
10	1	49		22.75	22.89	22.77
10	25	0		22.53	22.65	22.53
10	25	12		22.29	22.43	22.32
10	25	24		22.03	22.17	22.04
10	50	0		21.81	21.9	21.79

LTE BAND 4

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	23.73	23.76	23.79
15	1	37		23.53	23.55	23.52
15	1	74		23.24	23.26	23.25
15	36	0		23.01	23.01	23
15	36	18		22.81	22.72	22.75
15	36	39		22.52	22.44	22.51
15	75	0		22.23	22.18	22.27
15	1	0	16-QAM	23.51	23.56	23.52
15	1	38		23.28	23.26	23.26
15	1	75		23.08	22.97	22.98
15	36	0		22.86	22.76	22.68
15	36	18		22.57	22.52	22.46
15	36	39		22.29	22.23	22.2
15	75	0		22.07	21.97	21.97
20	1	0	QPSK	23.99	24.02	24.03
20	1	49		23.77	23.75	23.74
20	1	99		23.51	23.49	23.52
20	50	0		23.25	23.28	23.25
20	50	24		23.04	23	22.96
20	50	49		22.8	22.8	22.73
20	100	0		22.54	22.54	22.43
20	1	0	16-QAM	23.77	23.74	23.78
20	1	49		23.48	23.53	23.52
20	1	99		23.24	23.29	23.31
20	50	0		22.98	23.05	23.04
20	50	24		22.68	22.75	22.83
20	50	49		22.46	22.52	22.59
20	100	0		22.17	22.31	22.35

LTE BAND 5

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	23.39	23.43	23.45
1.4	1	2		23.19	23.22	23.24
1.4	1	5		22.99	22.96	22.97
1.4	3	0		22.75	22.74	22.73
1.4	3	1		22.53	22.44	22.45
1.4	3	2		22.32	22.21	22.17
1.4	6	0		22.05	21.97	21.9
1.4	1	0	16-QAM	23.14	23.18	23.21
1.4	1	2		22.87	22.90	23.00
1.4	1	5		22.64	22.66	22.79
1.4	3	0		22.42	22.4	22.5
1.4	3	1		22.19	22.2	22.22
1.4	3	2		21.90	21.99	21.97
1.4	6	0		21.64	21.76	21.75
3	1	0	QPSK	23.21	23.26	23.27
3	1	7		22.95	23.01	22.98
3	1	14		22.66	22.76	22.73
3	8	0		22.44	22.55	22.52
3	8	4		22.22	22.35	22.31
3	8	7		21.94	22.11	22.03
3	15	0		21.65	21.85	21.78
3	1	0	16-QAM	22.99	23.05	22.98
3	1	7		22.77	22.8	22.76
3	1	14		22.5	22.53	22.49
3	8	0		22.25	22.29	22.25
3	8	4		22.03	22.09	22.00
3	8	7		21.73	21.88	21.76
3	15	0		21.48	21.59	21.56

LTE BAND 5

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.38	23.35	23.42
5	1	12		23.1	23.08	23.15
5	1	24		22.82	22.81	22.92
5	12	0		22.62	22.6	22.63
5	12	6		22.37	22.4	22.42
5	12	11		22.11	22.17	22.19
5	25	0		21.87	21.9	21.92
5	1	0	16-QAM	23.12	23.13	23.18
5	1	12		22.88	22.86	22.97
5	1	24		22.6	22.65	22.71
5	12	0		22.32	22.41	22.46
5	12	6		22.09	22.12	22.23
5	12	11		21.84	21.91	21.99
5	25	0		21.57	21.64	21.7
10	1	0	QPSK	23.95	23.96	23.98
10	1	24		23.68	23.71	23.71
10	1	49		23.47	23.5	23.48
10	25	0		23.24	23.29	23.2
10	25	12		22.99	23.01	22.97
10	25	24		22.71	22.76	22.77
10	50	0		22.45	22.53	22.49
10	1	0	16-QAM	23.67	23.67	23.72
10	1	24		23.43	23.37	23.45
10	1	49		23.16	23.13	23.19
10	25	0		22.92	22.92	22.99
10	25	12		22.67	22.63	22.72
10	25	24		22.45	22.42	22.45
10	50	0		22.18	22.19	22.22

LTE BAND 7

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.68	23.65	23.59
5	1	12		23.48	23.37	23.37
5	1	24		23.19	23.11	23.16
5	12	0		22.93	22.88	22.93
5	12	6		22.67	22.61	22.65
5	12	11		22.47	22.35	22.36
5	25	0		22.27	22.11	22.13
5	1	0	16-QAM	23.45	23.37	23.31
5	1	12		23.25	23.11	23.09
5	1	24		22.96	22.88	22.85
5	12	0		22.7	22.64	22.59
5	12	6		22.47	22.34	22.33
5	12	11		22.22	22.05	22.06
5	25	0		21.97	21.79	21.82
10	1	0	QPSK	23.49	23.47	23.42
10	1	24		23.21	23.25	23.17
10	1	49		22.96	23.05	22.97
10	25	0		22.66	22.83	22.73
10	25	12		22.39	22.57	22.53
10	25	24		22.16	22.32	22.32
10	50	0		21.92	22.1	22.03
10	1	0	16-QAM	23.22	23.22	23.15
10	1	24		22.99	22.93	22.93
10	1	49		22.7	22.68	22.68
10	25	0		22.48	22.42	22.48
10	25	12		22.18	22.16	22.28
10	25	24		21.9	21.96	22.01
10	50	0		21.66	21.73	21.72

LTE BAND 7

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	23.67	23.72	23.71
15	1	37		23.39	23.44	23.48
15	1	74		23.13	23.17	23.24
15	36	0		22.84	22.95	22.97
15	36	18		22.55	22.68	22.71
15	36	39		22.27	22.46	22.42
15	75	0		22.01	22.22	22.16
15	1	0	16-QAM	23.37	23.46	23.42
15	1	38		23.16	23.24	23.21
15	1	75		22.9	22.97	22.99
15	36	0		22.62	22.69	22.71
15	36	18		22.42	22.39	22.43
15	36	39		22.13	22.12	22.21
15	75	0		21.87	21.84	21.97
20	1	0	QPSK	23.92	23.95	23.96
20	1	49		23.67	23.75	23.69
20	1	99		23.42	23.51	23.4
20	50	0		23.18	23.29	23.2
20	50	24		22.93	23.01	22.98
20	50	49		22.68	22.75	22.75
20	100	0		22.44	22.49	22.52
20	1	0	16-QAM	23.7	23.72	23.76
20	1	49		23.45	23.46	23.52
20	1	99		23.16	23.17	23.32
20	50	0		22.91	22.93	23.02
20	50	24		22.63	22.64	22.77
20	50	49		22.34	22.38	22.56
20	100	0		22.07	22.11	22.32

LTE BAND 12

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	23.43	23.52	23.59
1.4	1	2		23.18	23.22	23.35
1.4	1	5		22.93	23.01	23.09
1.4	3	0		22.63	22.78	22.85
1.4	3	1		22.42	22.56	22.61
1.4	3	2		22.17	22.27	22.38
1.4	6	0		21.9	22.03	22.13
1.4	1	0	16-QAM	23.21	23.26	23.33
1.4	1	2		22.99	23.03	23.12
1.4	1	5		22.69	22.81	22.88
1.4	12	0		22.46	22.56	22.67
1.4	12	1		22.18	22.36	22.45
1.4	12	2		21.93	22.15	22.18
1.4	25	0		21.65	21.88	21.91
3	1	0	QPSK	23.35	23.38	23.41
3	1	7		23.08	23.09	23.14
3	1	14		22.88	22.87	22.93
3	8	0		22.6	22.57	22.64
3	8	4		22.35	22.37	22.34
3	8	7		22.1	22.13	22.12
3	15	0		21.89	21.93	21.83
3	1	0	16-QAM	23.09	23.11	23.14
3	1	7		22.81	22.84	22.88
3	1	14		22.59	22.62	22.64
3	8	0		22.36	22.34	22.38
3	8	4		22.09	22.09	22.12
3	8	7		21.88	21.8	21.91
3	15	0		21.61	21.55	21.68

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.45	23.49	23.56
5	1	12		23.24	23.21	23.32
5	1	24		23	22.91	23.1
5	12	0		22.74	22.61	22.85
5	12	6		22.49	22.41	22.62
5	12	11		22.22	22.14	22.32
5	25	0		21.96	21.89	22.02
5	1	0	16-QAM	23.23	23.2	23.34
5	1	12		22.97	22.97	23.1
5	1	24		22.73	22.74	22.8
5	12	0		22.45	22.48	22.55
5	12	6		22.25	22.26	22.26
5	12	11		22.04	22.01	21.98
5	25	0		21.84	21.72	21.7
10	1	0	QPSK	23.79	23.85	23.89
10	1	24		23.49	23.59	23.67
10	1	49		23.22	23.36	23.45
10	25	0		22.94	23.12	23.25
10	25	12		22.73	22.9	23
10	25	24		22.49	22.69	22.73
10	50	0		22.26	22.45	22.44
10	1	0	16-QAM	23.52	23.6	23.68
10	1	24		23.28	23.31	23.4
10	1	49		23.05	23.09	23.12
10	25	0		22.77	22.82	22.87
10	25	12		22.5	22.58	22.65
10	25	24		22.21	22.32	22.41
10	50	0		21.98	22.09	22.16

LTE BAND 17

LTE Band 17 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22.89	22.95	22.96
5	1	12		22.61	22.72	22.72
5	1	24		22.39	22.48	22.51
5	12	0		22.16	22.19	22.21
5	12	6		21.87	21.91	21.97
5	12	11		21.57	21.64	21.71
5	25	0		21.28	21.34	21.49
5	1	0	16-QAM	22.68	22.74	22.75
5	1	12		22.42	22.5	22.49
5	1	24		22.17	22.24	22.2
5	12	0		21.96	21.97	21.98
5	12	6		21.71	21.71	21.76
5	12	11		21.47	21.46	21.55
5	25	0		21.18	21.22	21.33
10	1	0	QPSK	23.03	23.05	23.08
10	1	24		22.73	22.77	22.82
10	1	49		22.49	22.49	22.59
10	25	0		22.23	22.22	22.32
10	25	12		22	22.02	22.1
10	25	24		21.78	21.73	21.84
10	50	0		21.52	21.44	21.56
10	1	0	16-QAM	22.75	22.83	22.82
10	1	24		22.5	22.6	22.6
10	1	49		22.24	22.33	22.36
10	25	0		21.96	22.07	22.11
10	25	12		21.75	21.78	21.87
10	25	24		21.5	21.54	21.63
10	50	0		21.22	21.29	21.41

LTE BAND 41

LTE Band 41 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.43	23.21	23.26
5	1	12		23.18	22.92	22.98
5	1	24		22.94	22.7	22.71
5	12	0		22.74	22.49	22.48
5	12	6		22.51	22.21	22.2
5	12	11		22.28	21.95	21.96
5	25	0		22.07	21.73	21.71
5	1	0	16-QAM	23.21	22.97	23.01
5	1	12		22.99	22.72	22.76
5	1	24		22.72	22.45	22.49
5	12	0		22.44	22.22	22.21
5	12	6		22.15	21.94	21.97
5	12	11		21.87	21.72	21.73
5	25	0		21.59	21.5	21.51
10	1	0	QPSK	23.21	23.12	23.09
10	1	24		23	22.89	22.89
10	1	49		22.71	22.61	22.63
10	25	0		22.47	22.39	22.41
10	25	12		22.21	22.17	22.13
10	25	24		21.93	21.93	21.88
10	50	0		21.72	21.65	21.65
10	1	0	16-QAM	22.95	22.91	22.8
10	1	24		22.71	22.63	22.58
10	1	49		22.43	22.42	22.36
10	25	0		22.17	22.19	22.12
10	25	12		21.9	21.92	21.91
10	25	24		21.7	21.63	21.68
10	50	0		21.43	21.36	21.47

LTE Band 41 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	23.38	23.42	23.16
15	1	37		23.12	23.16	22.9
15	1	74		22.84	22.91	22.66
15	36	0		22.6	22.62	22.43
15	36	18		22.31	22.42	22.22
15	36	39		22.04	22.17	21.93
15	75	0		21.83	21.91	21.64
15	1	0	16-QAM	23.13	23.18	22.93
15	1	38		22.92	22.94	22.65
15	1	75		22.7	22.73	22.36
15	36	0		22.41	22.44	22.15
15	36	18		22.16	22.17	21.9
15	36	39		21.88	21.92	21.66
15	75	0		21.62	21.72	21.42
20	1	0	QPSK	23.89	23.92	23.97
20	1	49		23.63	23.72	23.67
20	1	99		23.41	23.42	23.38
20	50	0		23.18	23.19	23.12
20	50	24		22.89	22.93	22.83
20	50	49		22.66	22.71	22.54
20	100	0		22.46	22.5	22.3
20	1	0	16-QAM	23.61	23.72	23.68
20	1	49		23.39	23.44	23.45
20	1	99		23.12	23.17	23.15
20	50	0		22.83	22.92	22.91
20	50	24		22.57	22.67	22.69
20	50	49		22.37	22.39	22.43
20	100	0		22.09	22.1	22.14

10.2 Tune-up Power

Mode	GSM850(AVG)	GSM1900(AVG)
GPRS (1 Slot)	32±1dBm	28±1dBm
EDGE (1 Slot)	32±1dBm	28±1dBm

Mode	WCDMA Band V	WCDMA Band IV	WCDMA Band II
RMC	23±1dBm	23±1dBm	22±1dBm
HSDPA Subtest	22±1dBm	23±1dBm	22±1dBm
HSUPA Subtest	22±1dBm	23±1dBm	22±1dBm

Mode	WLAN(AVG)	
IEEE 802.11b	13±1dBm	
IEEE 802.11g	12±1dBm	
IEEE 802.11n(HT 20)	11±1dBm	
IEEE 802.11n(HT 40)	2412	10±1dBm
	2437	10±1dBm
	2462	8±1dBm

	Mode	WLAN(AVG)
5200 MHz	802.11a	13±1dBm
	802.11 n-HT20	12±1dBm
	802.11 n-HT40	12±1dBm
	802.11ac(HT20)	11±1dBm
	802.11ac(HT40)	11±1dBm
	802.11ac(HT80)	11±1dBm

	Mode	WLAN(AVG)
5800 MHz	802.11a	13±1dBm
	802.11 n-HT20	12±1dBm
	802.11 n-HT40	12±1dBm
	802.11ac(HT20)	11±1dBm
	802.11ac(HT40)	11±1dBm
	802.11ac(HT80)	11±1dBm

Mode	BT(AVG)	
GFSK	2402	4±1dBm
	2441	7±1dBm
	2408	5±1dBm
8DPSK	2402	4±1dBm
	2441	6±1dBm
	2408	5±1dBm

Mode	BT 4.0(AVG)
GFSK	-3.5±1dBm

LTE

BW[MHz]	RB Size	Mode	Band 2	Band 4	Band 5	Band 7
1.4	1	QPSK	23±1dBm	23±1dBm	23±1dBm	N/A
1.4	3		22±1dBm	23±1dBm	22±1dBm	N/A
1.4	6		22±1dBm	22±1dBm	22±1dBm	N/A
1.4	1	16- QAM	23±1dBm	23±1dBm	23±1dBm	N/A
1.4	3		22±1dBm	22±1dBm	22±1dBm	N/A
1.4	6		21±1dBm	22±1dBm	21±1dBm	N/A
3	1	QPSK	23±1dBm	23±1dBm	23±1dBm	N/A
3	8		22±1dBm	22±1dBm	22±1dBm	N/A
3	15		21±1dBm	22±1dBm	21±1dBm	N/A
3	1	16- QAM	23±1dBm	23±1dBm	23±1dBm	N/A
3	8		22±1dBm	22±1dBm	22±1dBm	N/A
3	15		21±1dBm	21±1dBm	21±1dBm	N/A
5	1	QPSK	23±1dBm	23±1dBm	23±1dBm	23±1dBm
5	12		22±1dBm	22±1dBm	22±1dBm	22±1dBm
5	25		21±1dBm	22±1dBm	21±1dBm	22±1dBm
5	1	16- QAM	22±1dBm	23±1dBm	23±1dBm	23±1dBm
5	12		22±1dBm	22±1dBm	22±1dBm	22±1dBm
5	25		21±1dBm	21±1dBm	21±1dBm	21±1dBm
10	1	QPSK	23±1dBm	23±1dBm	23±1dBm	23±1dBm
10	25		22±1dBm	22±1dBm	23±1dBm	22±1dBm
10	50		21±1dBm	22±1dBm	22±1dBm	22±1dBm
10	1	16- QAM	22±1dBm	23±1dBm	23±1dBm	23±1dBm
10	25		22±1dBm	22±1dBm	22±1dBm	22±1dBm
10	50		21±1dBm	21±1dBm	22±1dBm	21±1dBm
15	1	QPSK	23±1dBm	23±1dBm	N/A	23±1dBm
15	36		22±1dBm	23±1dBm	N/A	22±1dBm
15	75		21±1dBm	22±1dBm	N/A	22±1dBm
15	1	16- QAM	23±1dBm	23±1dBm	N/A	23±1dBm
15	36		22±1dBm	22±1dBm	N/A	22±1dBm
15	75		21±1dBm	22±1dBm	N/A	21±1dBm
20	1	QPSK	23±1dBm	24±1dBm	N/A	23±1dBm
20	50		23±1dBm	23±1dBm	N/A	23±1dBm
20	100		22±1dBm	22±1dBm	N/A	22±1dBm
20	1	16- QAM	23±1dBm	23±1dBm	N/A	23±1dBm
20	50		23±1dBm	23±1dBm	N/A	22±1dBm
20	100		22±1dBm	22±1dBm	N/A	22±1dBm

LTE

BW[MHz]	RB Size	Mode	Band 12	Band 17	Band 41
1.4	1	QPSK	23±1dBm	N/A	N/A
1.4	3		22±1dBm	N/A	N/A
1.4	6		22±1dBm	N/A	N/A
1.4	1	16- QAM	23±1dBm	N/A	N/A
1.4	3		22±1dBm	N/A	N/A
1.4	6		21±1dBm	N/A	N/A
3	1	QPSK	23±1dBm	N/A	N/A
3	8		22±1dBm	N/A	N/A
3	15		21±1dBm	N/A	N/A
3	1	16- QAM	23±1dBm	N/A	N/A
3	8		22±1dBm	N/A	N/A
3	15		21±1dBm	N/A	N/A
5	1	QPSK	23±1dBm	22±1dBm	23±1dBm
5	12		22±1dBm	22±1dBm	22±1dBm
5	25		22±1dBm	21±1dBm	22±1dBm
5	1	16- QAM	23±1dBm	22±1dBm	23±1dBm
5	12		22±1dBm	21±1dBm	22±1dBm
5	25		21±1dBm	21±1dBm	21±1dBm
10	1	QPSK	23±1dBm	23±1dBm	23±1dBm
10	25		23±1dBm	22±1dBm	22±1dBm
10	50		22±1dBm	21±1dBm	21±1dBm
10	1	16- QAM	23±1dBm	22±1dBm	22±1dBm
10	25		22±1dBm	22±1dBm	22±1dBm
10	50		22±1dBm	21±1dBm	21±1dBm
15	1	QPSK	N/A	N/A	23±1dBm
15	36		N/A	N/A	22±1dBm
15	75		N/A	N/A	21±1dBm
15	1	16- QAM	N/A	N/A	23±1dBm
15	36		N/A	N/A	22±1dBm
15	75		N/A	N/A	21±1dBm
20	1	QPSK	N/A	N/A	23±1dBm
20	50		N/A	N/A	23±1dBm
20	100		N/A	N/A	22±1dBm
20	1	16- QAM	N/A	N/A	23±1dBm
20	50		N/A	N/A	22±1dBm
20	100		N/A	N/A	22±1dBm

10.3 SAR Test Exclusions Applied

Per FCC KDB 447498D01, the 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHZ)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- f(GHZ) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

$$\frac{Max\ Power\ of\ Channel\ (mW)}{Test\ Separation\ Dist\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

Based on the maximum conducted power of **Bluetooth Body** (rounded to the nearest mW) and the antenna to user separation distance,

Bluetooth Body SAR was not required; [(6.310/5)* √2.480] = **1.99** < 3.0.

Based on the maximum conducted power of **2.4 GHz WLAN Body** (rounded to the nearest mW) and the antenna to user separation distance,

2.4 GHz WLAN SAR was required; [(25.119/5)* √2.462] = **7.88** > 3.0.

Based on the maximum conducted power of **5.2 GHz WLAN Body** (rounded to the nearest mW) and the antenna to user separation distance,

5.2 GHz WLAN SAR was required; [(25.119/5)* √5.200] = **11.46** > 3.0.

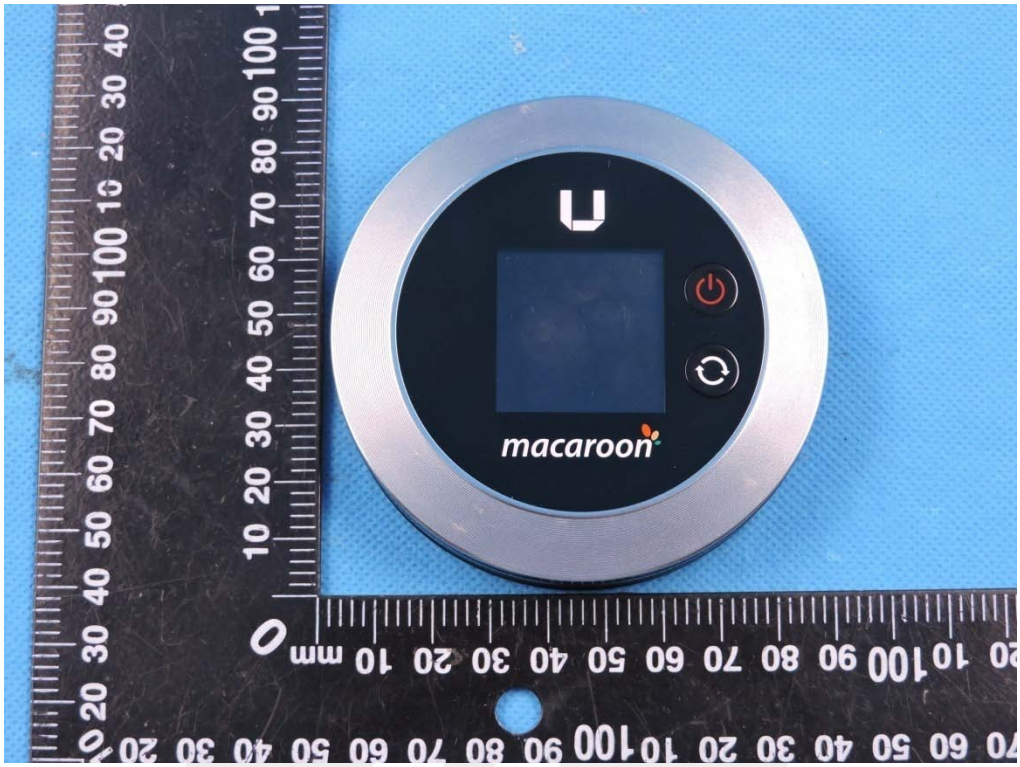
Based on the maximum conducted power of **5.8 GHz WLAN Body** (rounded to the nearest mW) and the antenna to user separation distance,

5.8 GHz WLAN SAR was required; [(25.119/5)* √5.800] = **12.10** > 3.0.

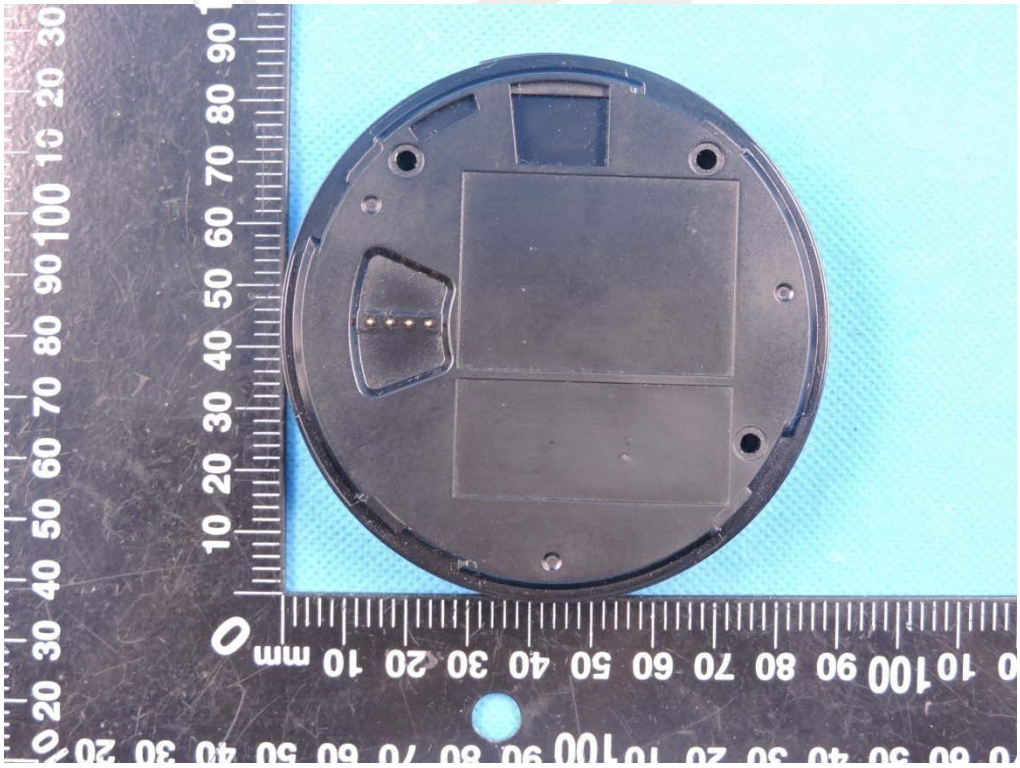
11. EUT And Test Setup Photo

11.1 EUT Photo

Front side



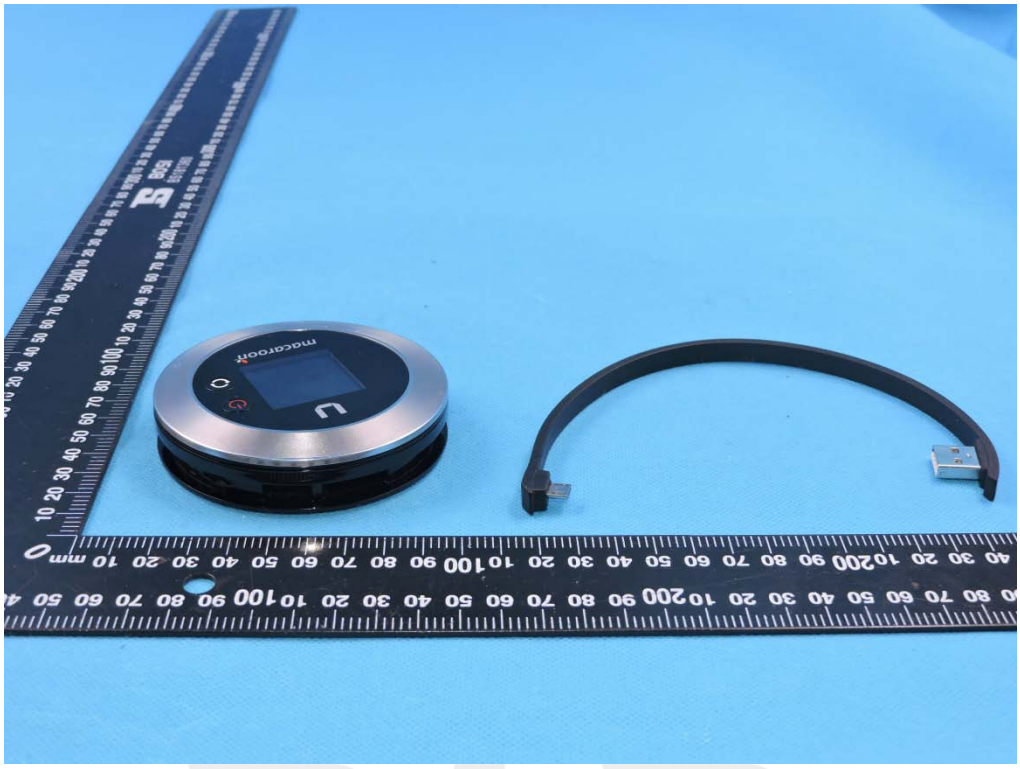
Back side



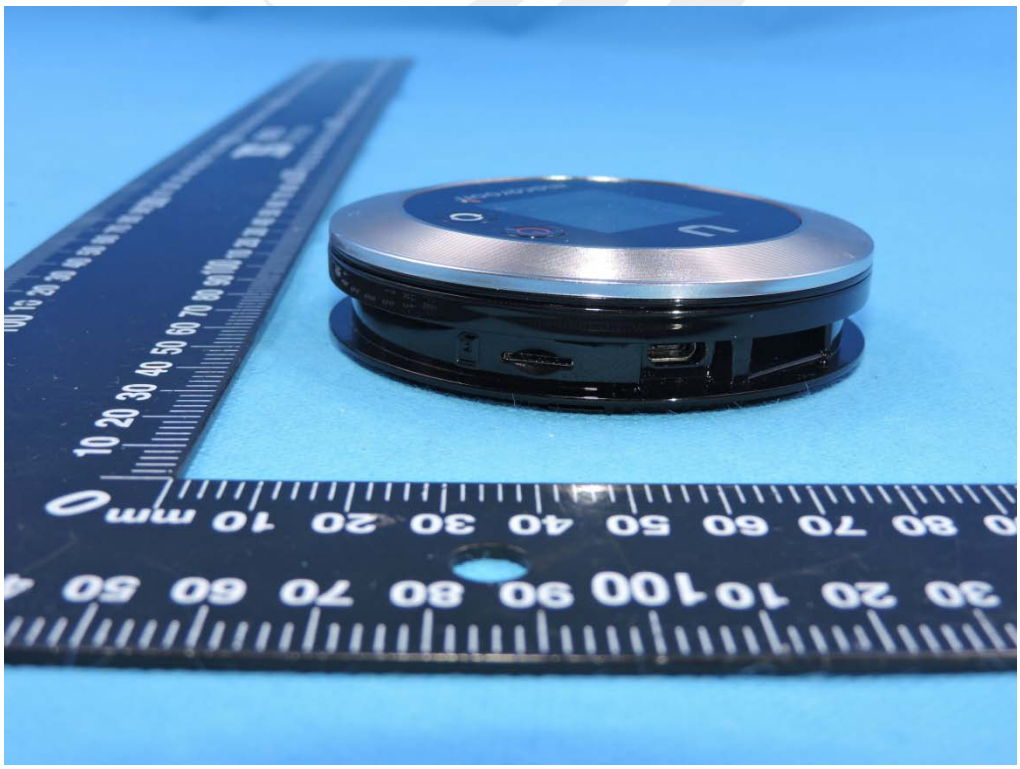
Top side

Bottom side

Left side

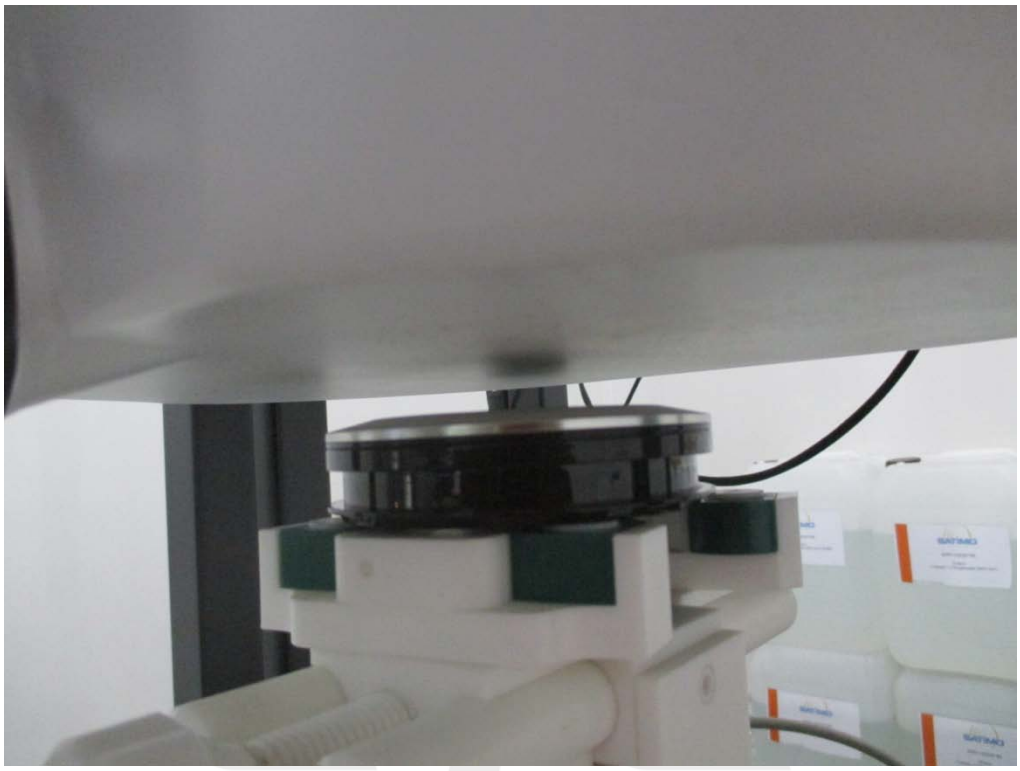


Right side



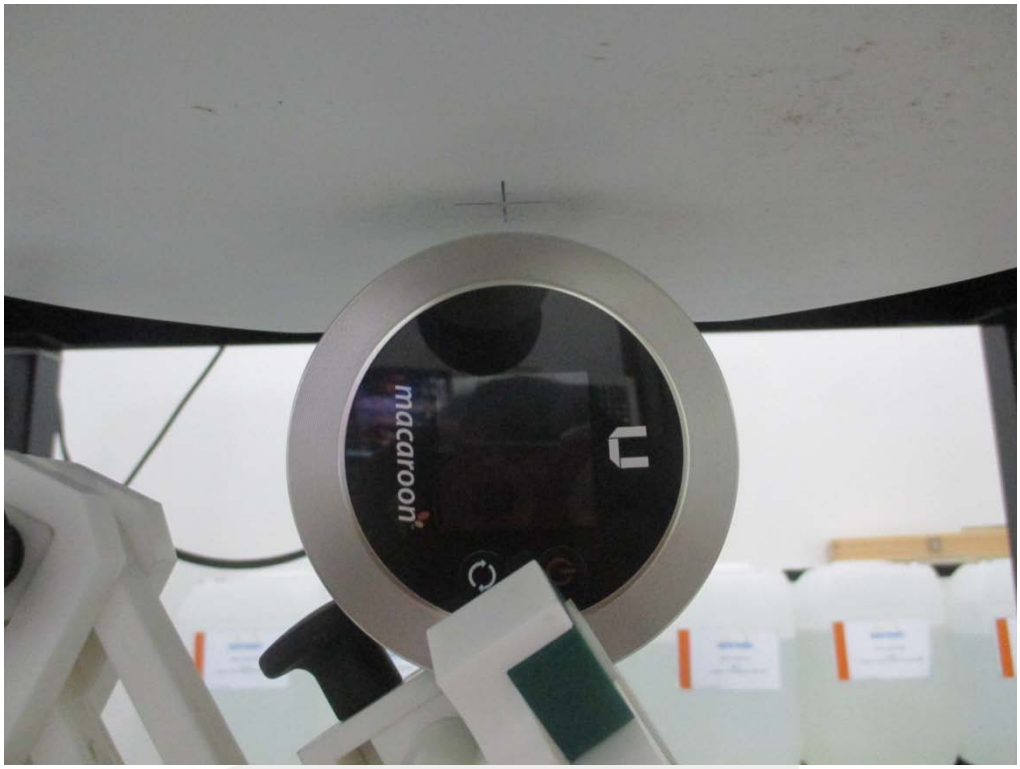
11.2 Setup Photo

Body Front side(separation distance is 5mm)



Body Back side(separation distance is 5mm)

Body left side(separation distance is 5mm)

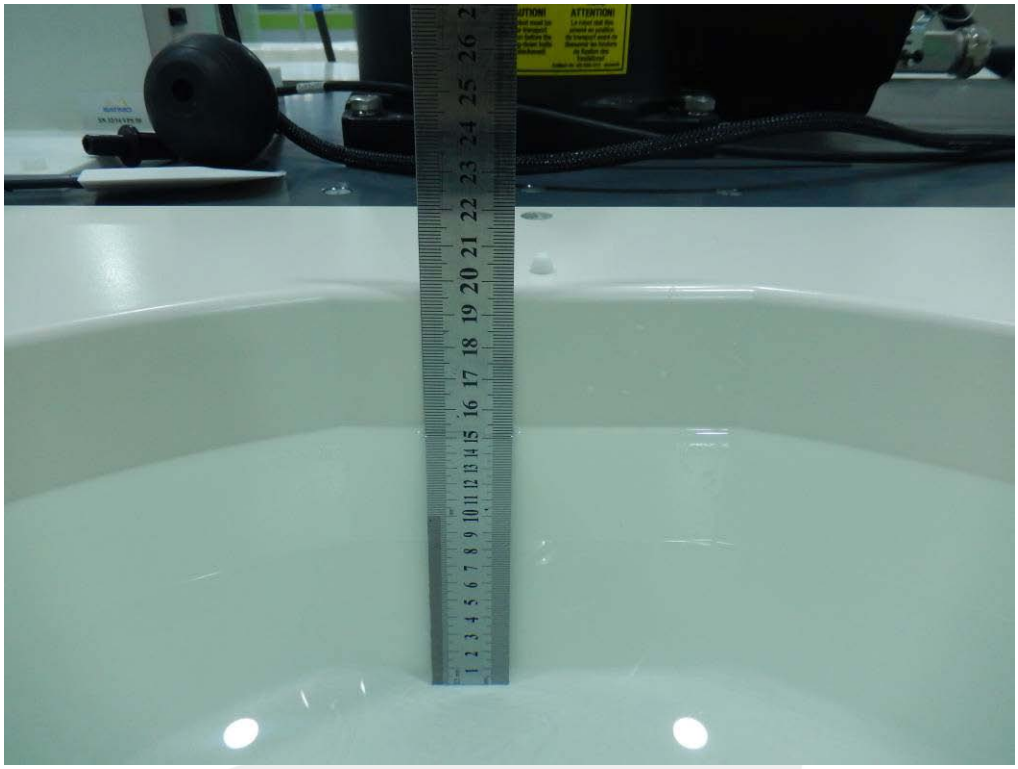


Body right side(separation distance is 5mm)

Body top side(separation distance is 5mm)

Body Bottom side(separation distance is 5mm)

Liquid depth (15 cm)



12. SAR Result Summary

12.2 Body-worn and Hotspot SAR

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
GSM 850	GPRS Data-4 Slot	Front side	128	0.128	-3.16	33	32.10	**0.157**	1
		Back side	128	0.053	0.39	33	32.10	0.065	/
		Left side	128	0.047	1.37	33	32.10	0.058	/
		Right side	128	0.061	-0.79	33	32.10	0.075	/
		Top side	128	0.072	-1.24	33	32.10	0.089	/
GSM1900	GPRS Data-4 Slot	Front side	810	0.663	-1.87	29	28.20	**0.797**	2
		Back side	810	0.218	3.98	29	28.20	0.262	/
		Left side	810	0.315	2.35	29	28.20	0.379	/
		Right side	810	0.336	-0.48	29	28.20	0.404	/
		Top side	810	0.407	1.93	29	28.20	0.489	/
WCDMA II	RMC	Front side	9262	0.819	1.58	23	22.69	0.880	/
		Front side	9400	1.007	-3.45	23	22.72	**1.074**	3
		Front side	9538	0.907	-1.17	23	22.52	1.013	/
		Back side	9400	0.401	-3.29	23	22.72	0.428	/
		Left side	9400	0.426	-2.33	23	22.72	0.454	/
		Right side	9400	0.473	0.82	23	22.72	0.504	/
		Top side	9400	0.512	1.44	23	22.72	0.546	/
WCDMA IV	RMC	Front side	1413	0.538	-0.54	24	23.56	**0.595**	4
		Back side	1413	0.426	1.35	24	23.56	0.471	/
		Left side	1413	0.211	2.10	24	23.56	0.233	/
		Right side	1413	0.225	-2.06	24	23.56	0.249	/
		Top side	1413	0.461	-1.34	24	23.56	0.510	/
WCDMA V	RMC	Front side	4132	0.092	-2.27	24	23.25	**0.109**	5
		Back side	4132	0.037	-0.67	24	23.25	0.044	/
		Left side	4132	0.041	0.53	24	23.25	0.049	/
		Right side	4132	0.044	3.61	24	23.25	0.052	/
		Top side	4132	0.056	1.39	24	23.25	0.067	/

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Duty cycle(%)	Scaled SAR (W/Kg)	Meas. No.
WLAN 2.4G	802.11b	Front side	11	0.172	3.24	14	13.81	98.8	**0.180**	6
		Back side	11	0.071	3.80	14	13.81	98.8	0.074	/
		Right side	11	0.132	-2.33	14	13.81	98.8	0.138	/
		Top side	11	0.107	1.37	14	13.81	98.8	0.112	/
		Bottom side	11	0.064	3.53	14	13.81	98.8	0.067	/
WLAN 5.2G	802.11a	Front side	40	0.134	-3.97	14	13.97	96	**0.135**	7
		Back side	40	0.057	1.78	14	13.97	96	0.057	/
		Right side	40	0.097	1.82	14	13.97	96	0.098	/
		Top side	40	0.062	-2.10	14	13.97	96	0.062	/
		Bottom side	40	0.053	-1.10	14	13.97	96	0.053	/
WLAN 5.8G	802.11a	Front side	157	0.099	3.98	14	13.97	96	**0.100**	8
		Back side	157	0.035	1.78	14	13.97	96	0.035	/
		Right side	157	0.058	-1.12	14	13.97	96	0.058	/
		Top side	157	0.047	0.79	14	13.97	96	0.047	/
		Bottom side	157	0.031	1.98	14	13.97	96	0.031	/

Note:

1. The test separation of all above table is 5mm.
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 **0.121** W/Kg for Body)
3. When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the WLAN 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.

Band	BW (MHz)	Mod.	RB Size	RB offset	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
LTE Band 2	20M	QPSK	1	0	Front side	19100	0.301	2.32	24	23.98	**0.302**	9
			50	0	Front side	19100	0.253	0.81	24	23.27	0.299	/
			1	0	Back Side	19100	0.114	2.03	24	23.98	0.115	/
			50	0	Back Side	19100	0.085	-2.85	24	23.27	0.101	/
			1	0	Left Side	19100	0.157	-3.98	24	23.98	0.158	/
			50	0	Left Side	19100	0.121	-1.95	24	23.27	0.143	/
			1	0	Right Side	19100	0.120	2.30	24	23.98	0.121	/
			50	0	Right Side	19100	0.101	-3.49	24	23.27	0.119	/
			1	0	Top side	19100	0.174	3.91	24	23.98	0.175	/
			50	0	Top side	19100	0.135	3.53	24	23.27	0.160	/
LTE Band 4	20M	QPSK	1	0	Front side	20050	0.794	2.92	25	23.99	1.002	/
			1	0	Front side	20175	0.862	0.50	25	24.02	1.080	/
			1	0	Front side	20300	0.935	2.74	25	24.03	**1.169**	10
			50	0	Front side	20175	0.723	-2.18	24	23.28	0.853	/
			1	0	Back Side	20300	0.411	1.43	25	24.03	0.514	/
			50	0	Back Side	20175	0.375	-1.17	24	23.28	0.443	/
			1	0	Left Side	20300	0.508	-3.13	25	24.03	0.635	/
			50	0	Left Side	20175	0.476	2.39	24	23.28	0.562	/
			1	0	Right Side	20300	0.382	-3.80	25	24.03	0.478	/
			50	0	Right Side	20175	0.349	1.37	24	23.28	0.412	/
			1	0	Top side	20300	0.533	-0.99	25	24.03	0.666	/
			50	0	Top side	20175	0.504	0.02	24	23.28	0.595	/
LTE Band 5	10M	QPSK	1	0	Front side	20600	0.130	3.44	24	23.98	**0.131**	11
			25	0	Front side	20525	0.094	3.10	24	23.29	0.111	/
			1	0	Back Side	20600	0.053	3.10	24	23.98	0.053	/
			25	0	Back Side	20525	0.037	2.25	24	23.29	0.044	/
			1	0	Left Side	20600	0.062	-3.06	24	23.98	0.062	/
			25	0	Left Side	20525	0.044	-1.22	24	23.29	0.052	/
			1	0	Right Side	20600	0.076	-3.34	24	23.98	0.076	/
			25	0	Right Side	20525	0.066	-2.17	24	23.29	0.078	/
			1	0	Top side	20600	0.092	1.36	24	23.98	0.092	/
			25	0	Top side	20525	0.078	-0.90	24	23.29	0.092	/
LTE Band 7	20M	QPSK	1	0	Front side	21350	0.299	-1.16	24	23.96	**0.302**	12
			50	0	Front side	21100	0.251	-2.44	24	23.29	0.296	/
			1	0	Back Side	21350	0.101	0.90	24	23.96	0.102	/
			50	0	Back Side	21100	0.082	-1.30	24	23.29	0.097	/
			1	0	Left Side	21350	0.114	0.68	24	23.96	0.115	/
			50	0	Left Side	21100	0.093	0.45	24	23.29	0.110	/
			1	0	Right Side	21350	0.125	3.02	24	23.96	0.126	/
			50	0	Right Side	21100	0.104	-2.89	24	23.29	0.122	/
			1	0	Top side	21350	0.168	0.67	24	23.96	0.170	/
			50	0	Top side	21100	0.132	-0.65	24	23.29	0.155	/

LTE Band 12	10M	QPSK	1	0	Front side	23130	0.418	1.13	24	23.89	**0.429**	13
			25	0	Front side	23130	0.360	-2.76	24	23.25	0.428	/
			1	0	Back Side	23130	0.134	-0.55	24	23.89	0.137	/
			25	0	Back Side	23130	0.085	-1.54	24	23.25	0.101	/
			1	0	Left Side	23130	0.165	0.63	24	23.89	0.169	/
			25	0	Left Side	23130	0.123	1.54	24	23.25	0.146	/
			1	0	Right Side	23130	0.207	0.79	24	23.89	0.212	/
			25	0	Right Side	23130	0.171	-1.96	24	23.25	0.203	/
			1	0	Top side	23130	0.240	-1.20	24	23.89	0.246	/
			25	0	Top side	23130	0.205	3.27	24	23.25	0.244	/
LTE Band 17	10M	QPSK	1	0	Front side	23800	0.537	-1.23	24	23.08	**0.664**	14
			25	0	Front side	23800	0.512	-1.59	23	22.32	0.599	/
			1	0	Back Side	23800	0.203	1.85	24	23.08	0.251	/
			25	0	Back Side	23800	0.196	-0.58	23	22.32	0.229	/
			1	0	Left Side	23800	0.223	-2.03	24	23.08	0.276	/
			25	0	Left Side	23800	0.214	-1.14	23	22.32	0.250	/
			1	0	Right Side	23800	0.257	0.51	24	23.08	0.318	/
			25	0	Right Side	23800	0.249	-2.05	23	22.32	0.291	/
			1	0	Top side	23800	0.305	-3.93	24	23.08	0.377	/
			25	0	Top side	23800	0.297	-0.16	23	22.32	0.347	/
LTE Band 41	20M	QPSK	1	0	Front side	41490	0.102	-2.31	24	23.97	**0.103**	15
			50	0	Front side	40620	0.083	-0.50	24	23.19	0.100	/
			1	0	Back Side	41490	0.042	-3.03	24	23.97	0.042	/
			50	0	Back Side	40620	0.037	-0.47	24	23.19	0.045	/
			1	0	Left Side	41490	0.053	3.26	24	23.97	0.053	/
			50	0	Left Side	40620	0.044	-3.46	24	23.19	0.053	/
			1	0	Right Side	41490	0.052	-2.64	24	23.97	0.052	/
			50	0	Right Side	40620	0.046	1.29	24	23.19	0.055	/
			1	0	Top side	41490	0.073	2.06	24	23.97	0.074	/
			50	0	Top side	40620	0.067	0.75	24	23.19	0.081	/

Repeated SAR

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
WCDMA II	RMC	Front side	9400	0.992	3.24	23	22.72	1.058	/
LTE Band 4	QPSK	Front side	20300	0.923	-4.07	25	24.03	1.154	/

12.3 repeated SAR measurement

Band	Mode	Test Position	Ch.	Original Measured SAR 1g(mW/g)	1 st Repeated SAR 1g	Ratio	Original Measured SAR 1g(mW/g)	2nd Repeated SAR 1g	Ratio
WCDMA II	RMC	Front side	9400	1.007	0.992	1.02	-	-	-
LTE Band 4	QPSK	Front side	20300	0.935	0.923	1.01	-	-	-

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⩽1.2and 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
Body	1. GSM + WLAN
	2. GSM + Bluetooth
	3. WCDMA + WLAN
	4. WCDMA + Bluetooth
	5. LTE + WLAN
	6. LTE + 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. Based upon KDB 447498 D01, BT SAR is excluded as below table.
4. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
5. For minimum test separation distance≦50mm,Bluetooth standalone SAR is excluded according to [(max. power of channel, including tune-up tolerance, mW)/ (min. test separation distance, mm) ·[√f (GHz) /x] ≦3.0 for 1-g SAR and ≦7.5 for 10-g extremity SAR
6. The reported SAR summation is calculated based on the same configuration and test position.
7. KDB 447498 / 4.3.2 (2) 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:
   a) (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f (GHz) /x] W/kg for test separation distances≤ 50 mm;
   Where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
   b) 0.4W/Kg for 1-g SAR and 1.0W/Kg for 10-g SAR, when the separation distance is >50mm.

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Simultaneous Mode	Position	Mode	Max. 1-g SAR (W/kg)	1-g Sum SAR (W/kg)
GSM + WLAN	Body	GSM Data	0.797	0.977
		WLAN	0.180	
GSM + Bluetooth	Body	GSM Data	0.797	1.062
		Bluetooth	0.265	
WCDMA + WLAN	Body	WCDMA RMC	1.016	1.196
		WLAN	0.180	
WCDMA + Bluetooth	Body	WCDMA RMC	1.016	1.281
		Bluetooth	0.265	
LTE + WLAN	Body	LTE RMC	1.169	1.349
		WLAN	0.180	
LTE + Bluetooth	Body	LTE RMC	1.169	**1.434**
		Bluetooth	0.265	

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
750MHz Dipole	SATIMO	SID750	SN 30/14 DIP0G750-331	2014.09.01	2017.08.31
835MHz Dipole	SATIMO	SID835	SN 30/14 DIP0G835-332	2014.09.01	2017.08.31
1800MHz Dipole	SATIMO	SID1800	SN 30/14 DIP1G800-329	2014.09.01	2017.08.31
1900MHz Dipole	SATIMO	SID1900	SN 30/14 DIP1G900-333	2014.09.01	2017.08.31
2450MHzDipole	SATIMO	SID2450	SN 30/14 DIP2G450-335	2014.09.01	2017.08.31
2600MHz Dipole	SATIMO	SID2600	SN 30/14 DIP2G600-336	2014.09.01	2017.08.31
Waveguide	SATIMO	SWG5500	SN 13/14 WGA32	2014.09.01	2017.08.31
E-Field Probe	MVG	SSE2	SN 45/15 EPGO281	2017.02.04	2018.02.03
Dielectric Probe Kit	SATIMO	SCLMP	SN 32/14 OCPG67	2016.12.05	2017.12.04
Antenna	SATIMO	Antenna3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	SATIMO	SAM	SN 32/14 SAM115	2014.09.01	N/A
Phantom2	SATIMO	SAM	SN 32/14 SAM116	2014.09.01	N/A
Phone holder	SATIMO	N/A	SN 32/14 MSH97	2014.09.01	N/A
Laptop holder	SATIMO	N/A	SN 32/14 LSH29	2014.09.01	N/A
Network Analyzer	Agilent	8753ES	US38432810	2017.03.16	2018.03.15
Multi Meter	Keithley	Multi Meter 2000	4050073	2016.10.23	2017.10.22
Signal Generator	Agilent	N5182A	MY50140530	2016.10.23	2017.10.22
Wireless Communication Test Set	Agilent	8960-E5515C	MY48360751	2016.10.23	2017.10.22
Power Amplifier	DESAY	ZHL-42W	9638	2016.10.23	2017.10.22
Power Meter	R&S	NRP	100510	2016.10.23	2017.10.22
Power Meter	Agilent	E4418B	GB43312526	2016.10.23	2017.10.22
Power Sensor	R&S	NRP-Z11	101919	2016.10.23	2017.10.22
Power Sensor	Agilent	E9301A	MY41497725	2016.10.23	2017.10.22
9dB Attenuator	Agilent	99899	DC-18GHz	2017.05.10	2018.05.09
11dB Attenuator	Agilent	8494B	DC-18GHz	2017.05.10	2018.05.09
110dB Attenuator	Agilent	8494B	DC-18GHz	2017.05.10	2018.05.09
Dual Directional Coupler	Agilent	SHWPDI-1080S	N/A	2017.05.09	2018.05.08
Temperature & Humitidy	MiEO	HH660	N/A	2016.10.25	2017.10.24

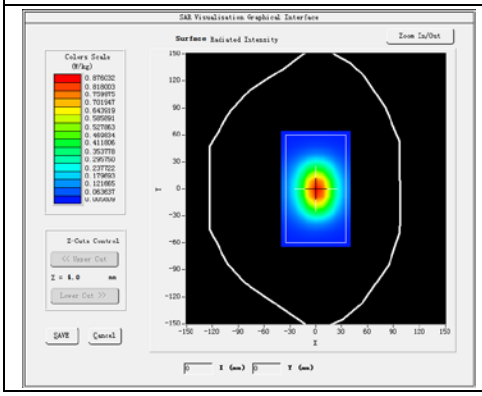
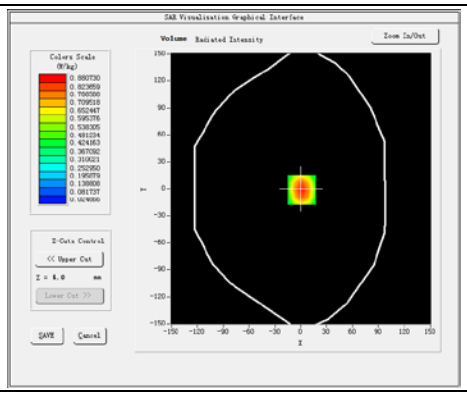
Appendix A. System Validation Plots

System Performance Check Data (750MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2017-06-19
Measurement duration: 14 minutes 12 seconds

Experimental conditions.

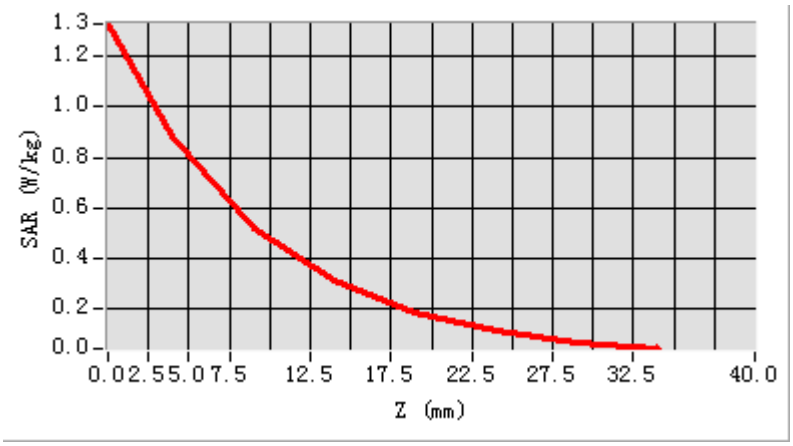
Probe	
Phantom	Validation plane
Device Position	-
Band	750MHz
Channels	-
Signal	CW
Frequency (MHz)	750MHz
Relative permittivity	54.24
Conductivity (S/m)	0.94
Power drift (%)	1.44
Probe	SN 45/15 EPGO281
ConvF:	1.59
Crest factor:	1:1

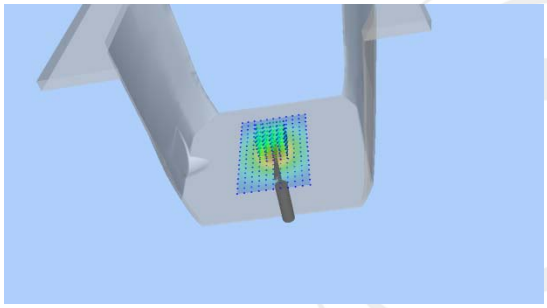
SURFACE SAR	VOLUME SAR
	

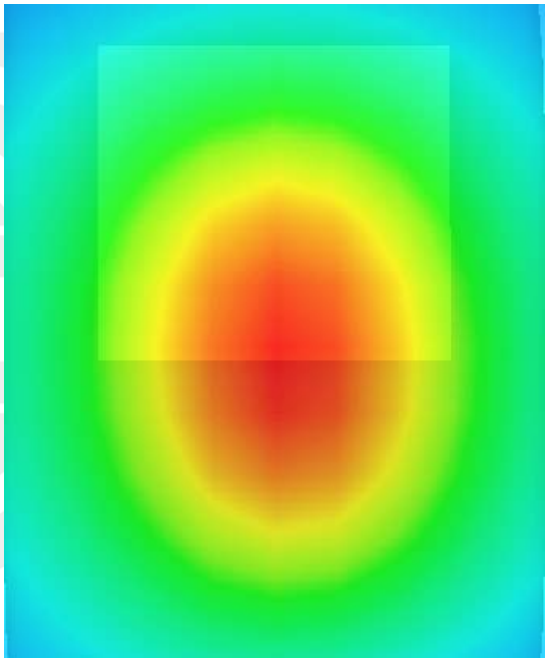
Maximum location: X=1.00, Y=-1.00

SAR 10g (W/Kg)	0.524586
SAR 1g (W/Kg)	0.863821

Z Axis Scan


1.3
1.2
1.0
0.8
0.6
0.4
0.2
0.0
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)



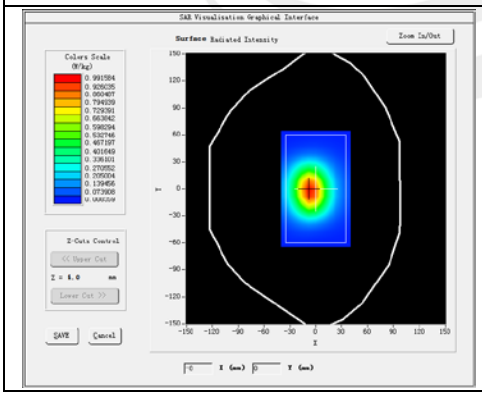
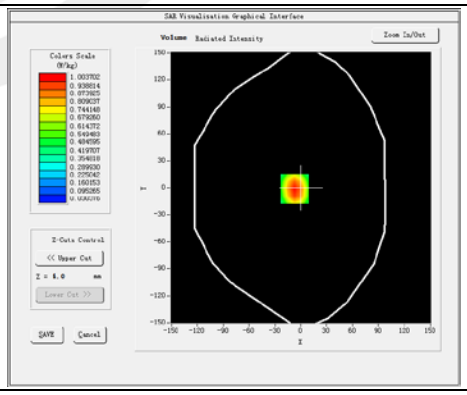


System Performance Check Data (835MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2017-06-19
Measurement duration: 14 minutes 13 seconds

Experimental conditions.

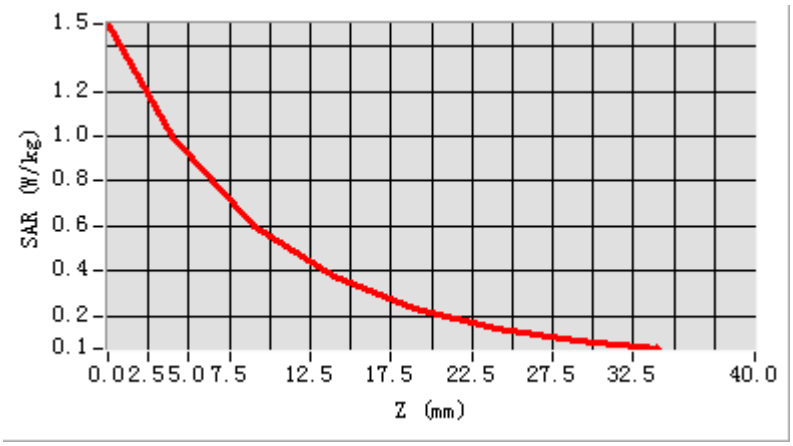
Probe	
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	54.7
Conductivity (S/m)	0.96
Power drift (%)	-0.37
Probe	SN 45/15 EPGO281
ConvF:	1.85
Crest factor:	1:1

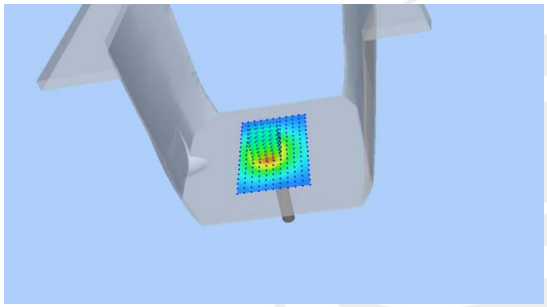
SURFACE SAR	VOLUME SAR
	

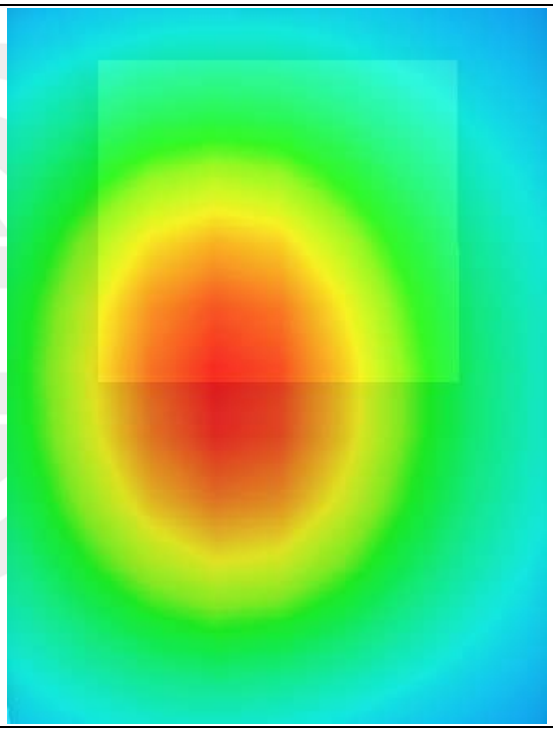
Maximum location: X=-7.00, Y=-1.00

SAR 10g (W/Kg)	0.610148
SAR 1g (W/Kg)	0.968924

Z Axis Scan


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



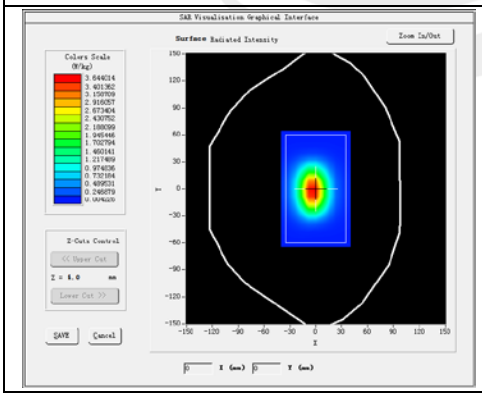
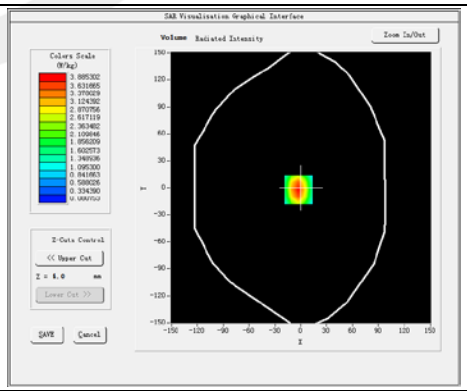


System Performance Check Data(1800MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2017-06-20

Experimental conditions.

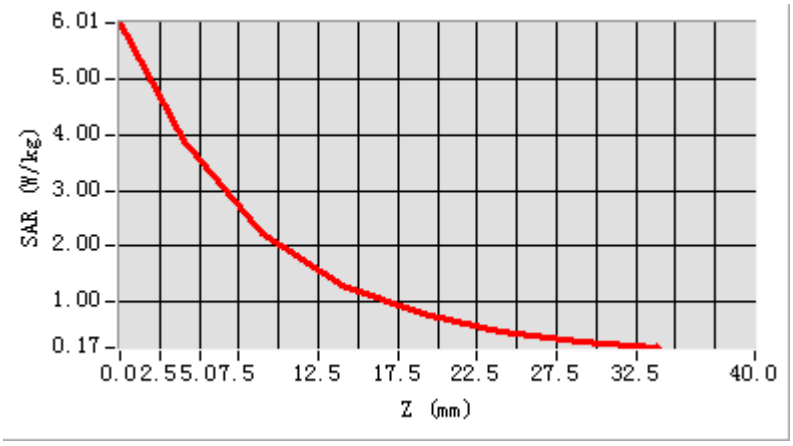
Phantom	Validation plane
Device Position	-
Band	1800MHz
Channels	-
Signal	CW
Frequency (MHz)	1800MHz
Relative permittivity	54.86
Conductivity (S/m)	1.52
Power drift (%)	-0.28
Probe	SN 45/15 EPGO281
ConvF	1.87
Crest factor:	1:1

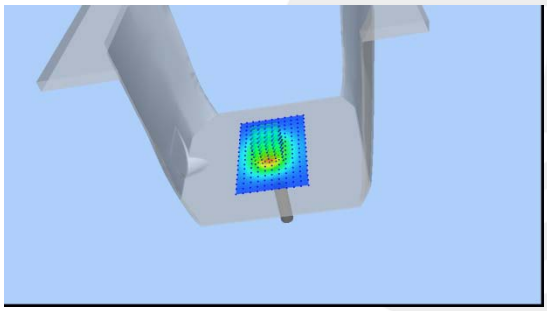
SURFACE SAR	VOLUME SAR
	

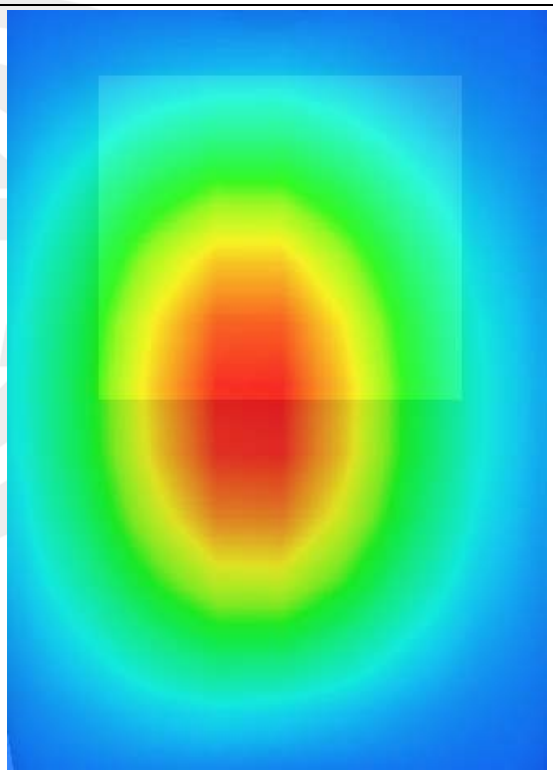
Maximum location: X=-3.00, Y=-2.00

SAR 10g (W/Kg)	2.095482
SAR 1g (W/Kg)	3.692145

Z Axis Scan


6.01
5.00
4.00
3.00
2.00
1.00
0.17
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)



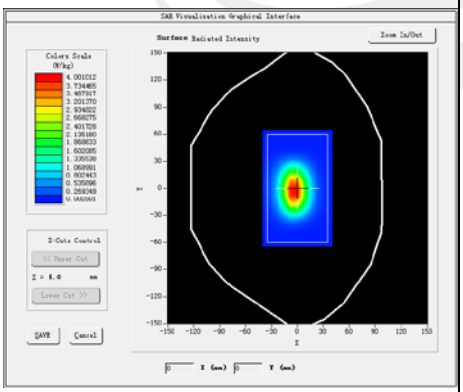
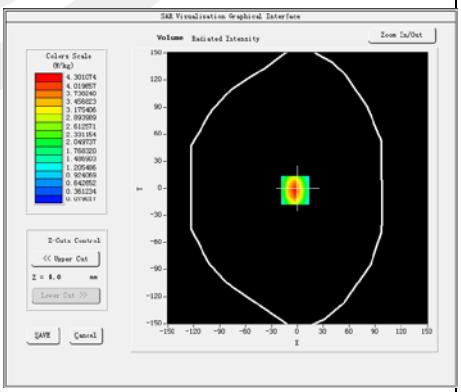


System Performance Check Data (1900MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2017-06-20
Measurement duration: 14 minutes 46 seconds

Experimental conditions.

Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900
Relative permittivity	54.10
Conductivity (S/m)	1.47
Power drift (%)	-0.31
Probe	SN 45/15 EPGO281
ConvF:	2.16
Crest factor:	1:1

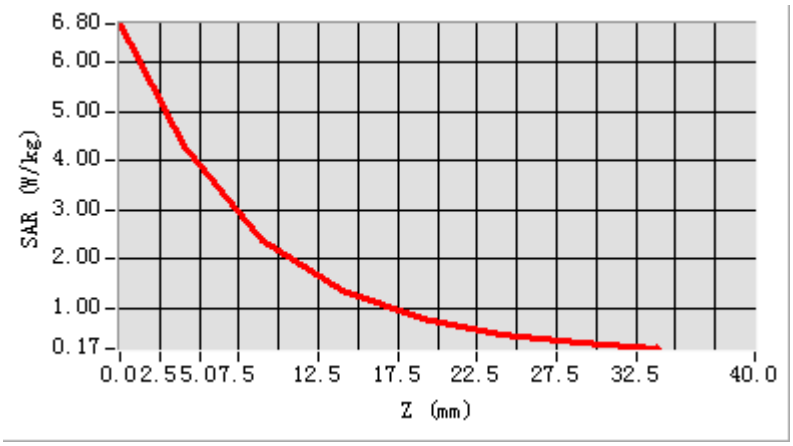
SURFACE SAR	VOLUME SAR
	

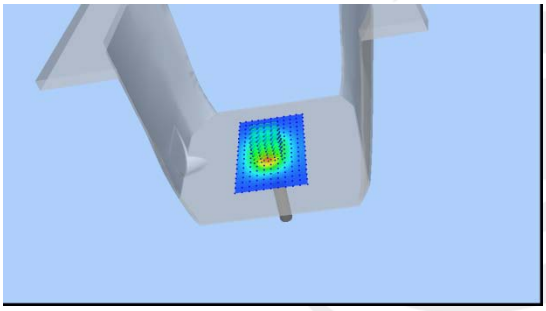
Maximum location: X=-3.00, Y=-2.00

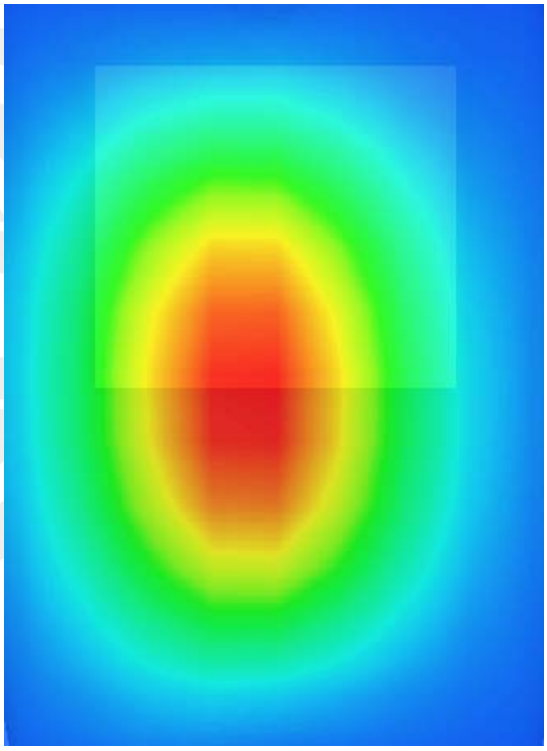
SAR Peak: 5.27 W/kg

SAR 10g (W/Kg)	2.065486
SAR 1g (W/Kg)	4.074158

Z Axis Scan


6.80
6.00
5.00
4.00
3.00
2.00
1.00
0.17
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)



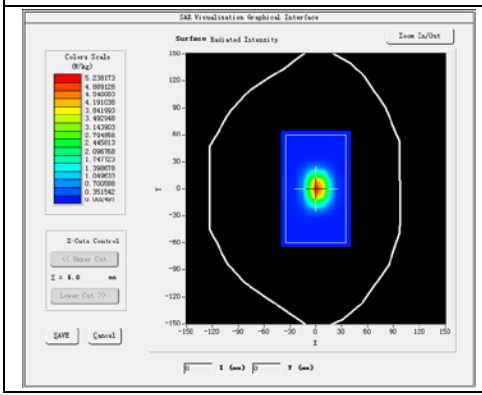
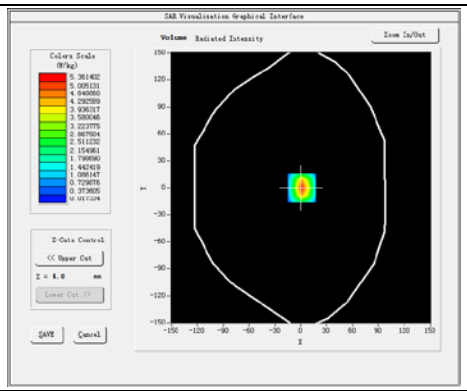


System Performance Check Data (2450MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2017-06-21
Measurement duration: 14 minutes 23 seconds

Experimental conditions.

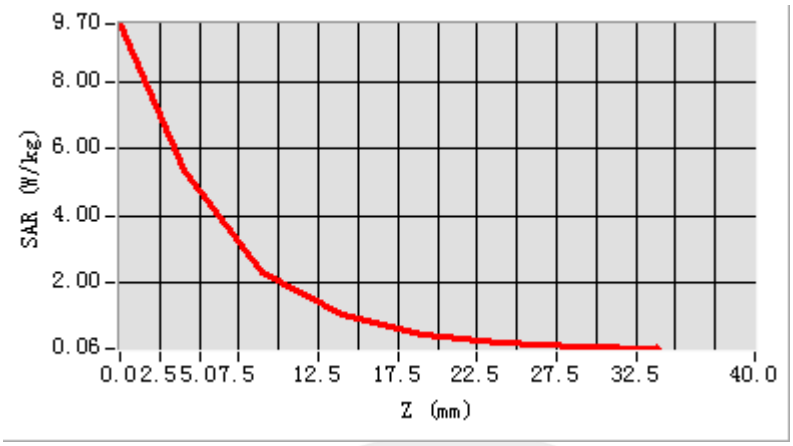
Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	50.88
Conductivity (S/m)	1.98
Power drift (%)	-0.30
Probe	SN 45/15 EPGO281
ConvF	2.28
Crest factor:	1:1

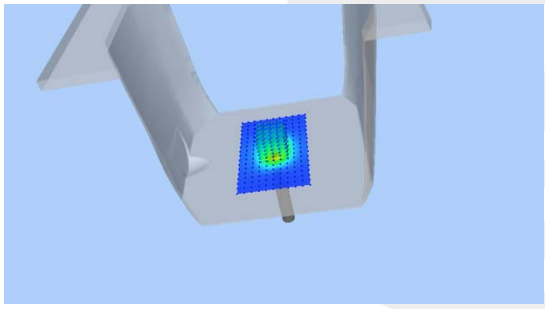
SURFACE SAR	VOLUME SAR
	

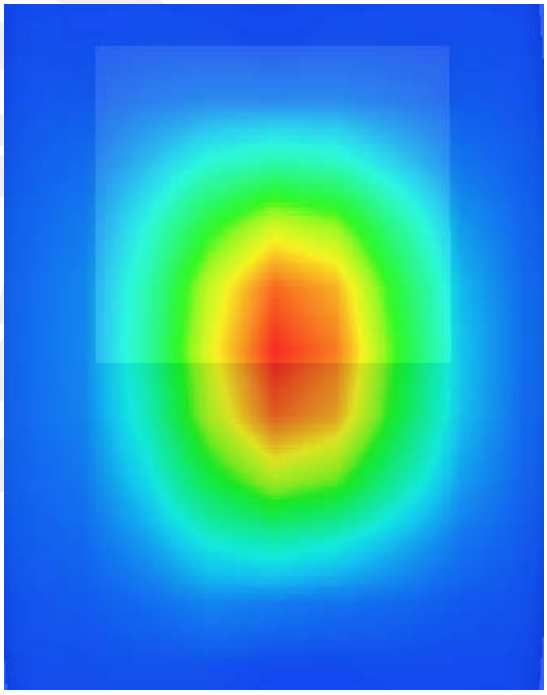
Maximum location: X=1.00, Y=0.00

SAR 10g (W/Kg)	2.401595
SAR 1g (W/Kg)	5.126315

Z Axis Scan


9.70
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)



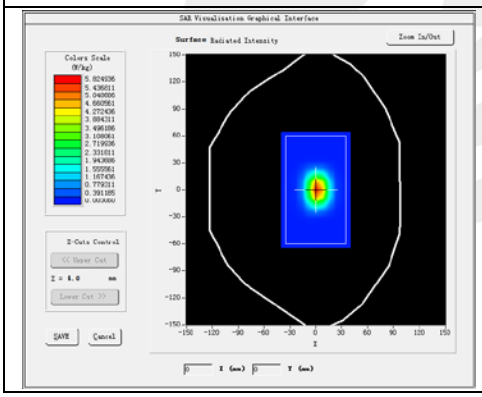
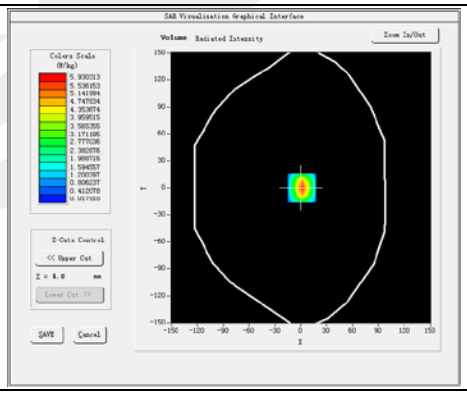


System Performance Check Data(2600MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2017-06-21

Experimental conditions.

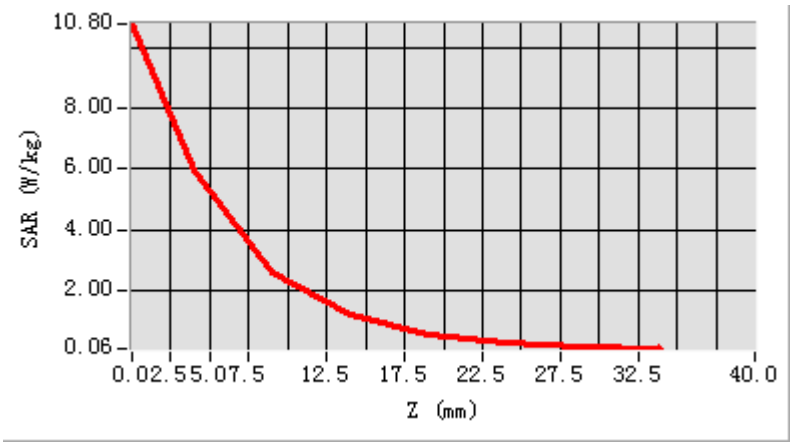
Device Position	Validation plane
Band	2600 MHz
Channels	-
Signal	CW
Frequency (MHz)	2600
Relative permittivity	53.44
Conductivity (S/m)	2.09
Power drift (%)	-0.30
Probe	SN 45/15 EPGO281
ConvF	2.38
Crest factor:	1:1

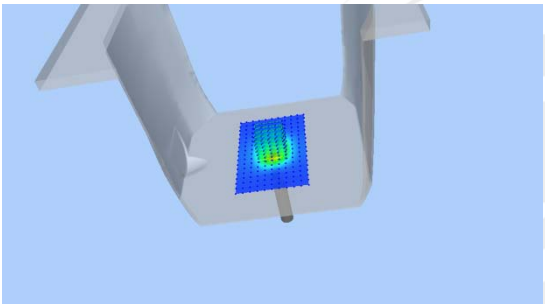
SURFACE SAR	VOLUME SAR
	

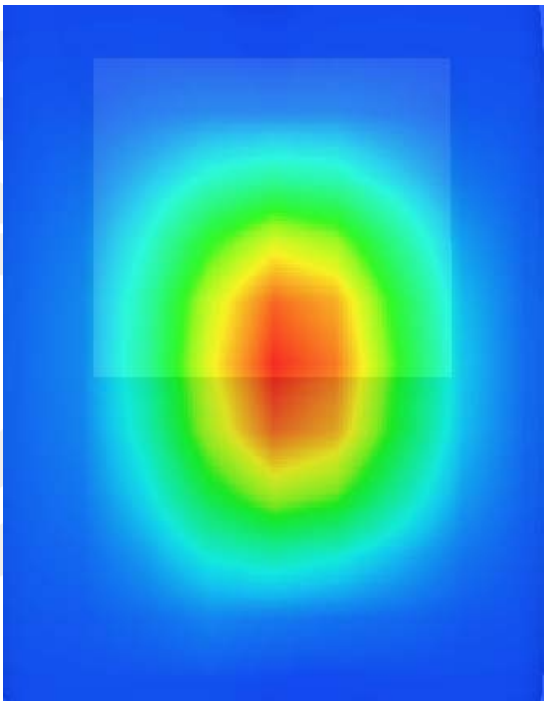
Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	2.542684
SAR 1g (W/Kg)	5.704156

Z Axis Scan


10.80
8.00
6.00
4.00
2.00
0.06
SAR (W/kg)
0.02.55.07.5
12.5
17.5
22.5
27.5
32.5
40.0
Z (mm)



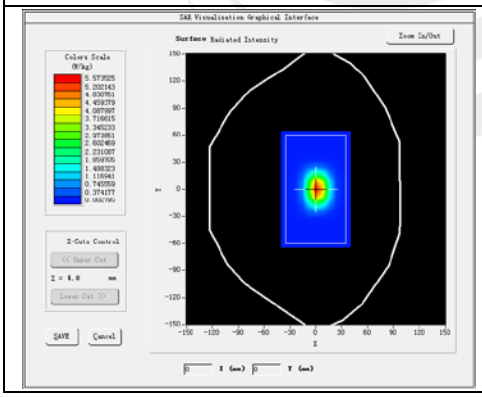
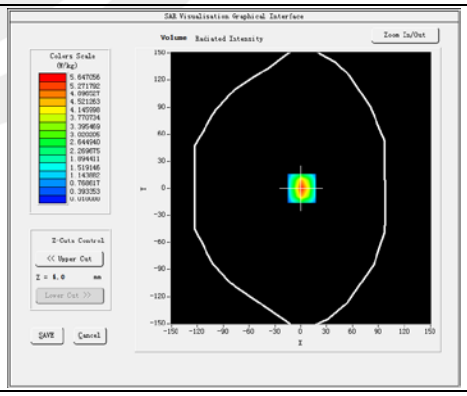


System Performance Check Data(5200MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2017-06-22

Experimental conditions.

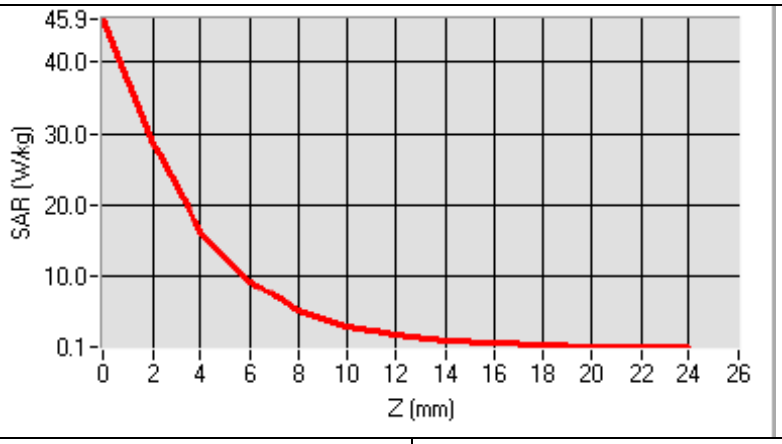
Device Position	Validation plane
Band	5200 MHz
Channels	-
Signal	CW
Frequency (MHz)	5200
Relative permittivity	49.33
Conductivity (S/m)	5.27
Power drift (%)	2.52
Probe	SN 45/15 EPGO281
ConvF	2.52
Crest factor:	1:1

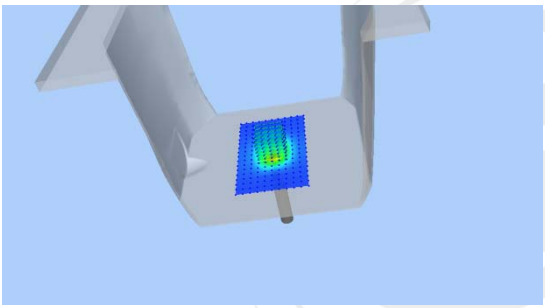
SURFACE SAR	VOLUME SAR
	

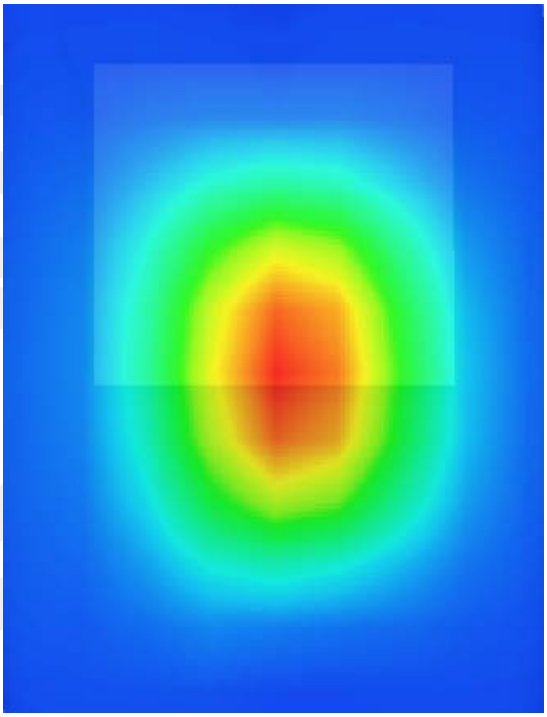
Maximum location: X=7.00, Y=2.00

SAR 10g (W/Kg)	5.433627
SAR 1g (W/Kg)	15.849223

Z Axis Scan





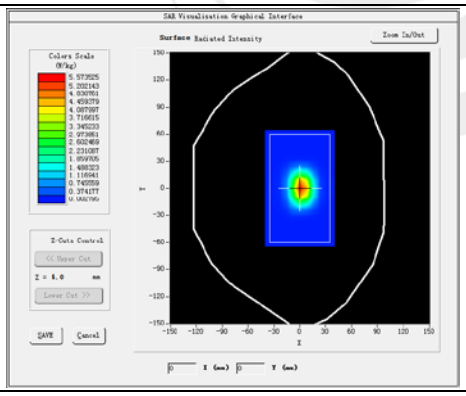
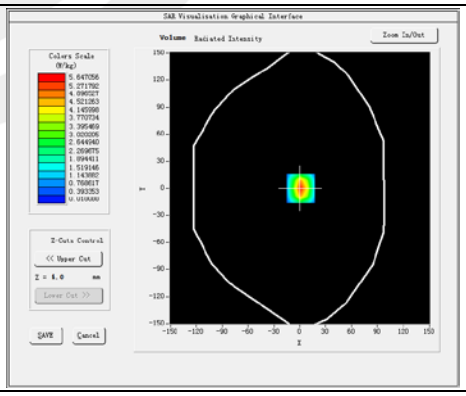


System Performance Check Data(5800MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2017-06-22

Experimental conditions.

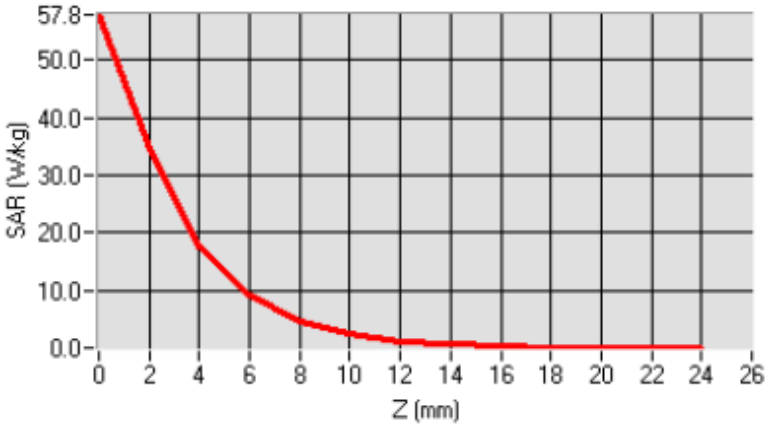
Device Position	Validation plane
Band	5800 MHz
Channels	-
Signal	CW
Frequency (MHz)	5800
Relative permittivity	47.38
Conductivity (S/m)	5.97
Power drift (%)	2.74
Probe	SN 45/15 EPGO281
ConvF	2.60
Crest factor:	1:1

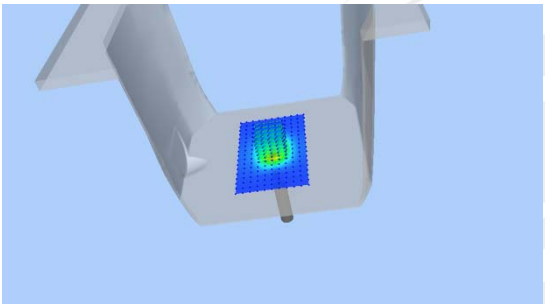
SURFACE SAR	VOLUME SAR
	

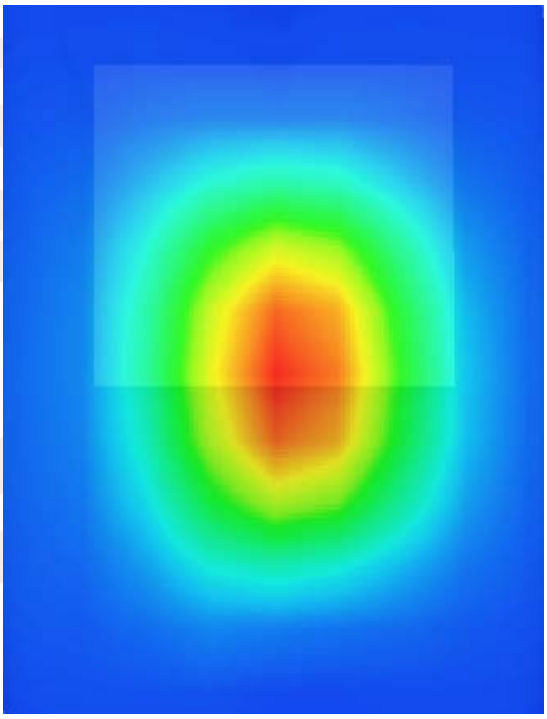
Maximum location: X=7.00, Y=2.00

SAR 10g (W/Kg)	6.032685
SAR 1g (W/Kg)	17.964072

Z Axis Scan


57.8
50.0
40.0
30.0
20.0
10.0
0.0
SAR (W/kg)
0 2 4 6 8 10 12 14 16 18 20 22 24 26
Z (mm)





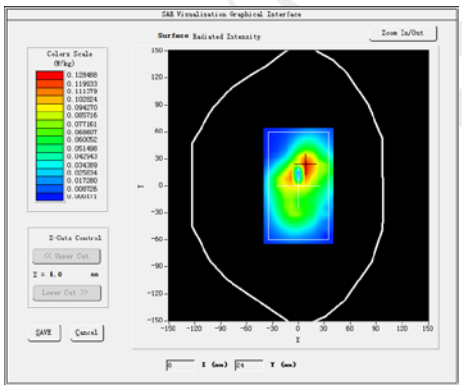
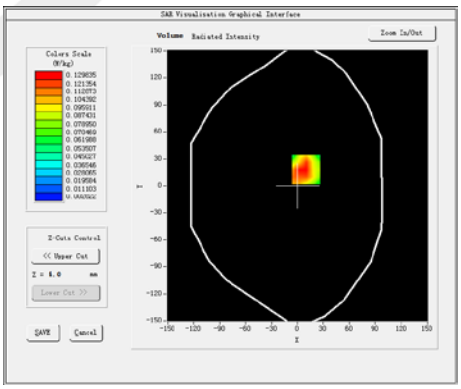
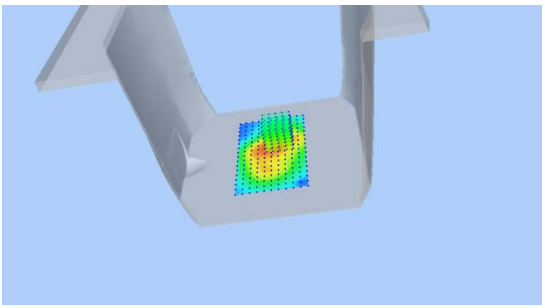
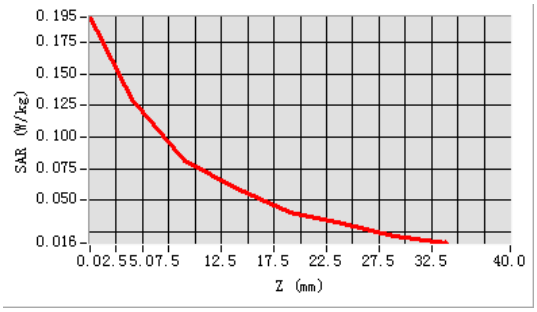
Appendix B. SAR Test Plots

Plot 1: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-19
Probe	SN 45/15 EPGO281
ConvF	1.85
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 front
Band	GPRS 850
Channels	Low
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	824.2
Relative permittivity (real part)	55.20
Conductivity (S/m)	0.97
Variation (%)	-3.16

Maximum location: X=10.00, Y=18.00
SAR Peak: 0.20 W/kg

SAR 10g (W/Kg)	0.079747
SAR 1g (W/Kg)	0.127831

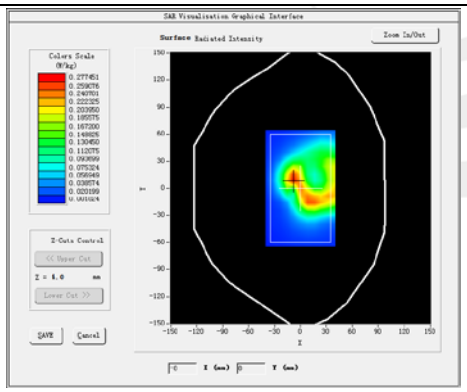
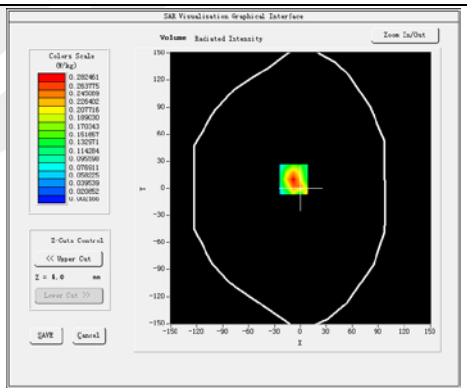
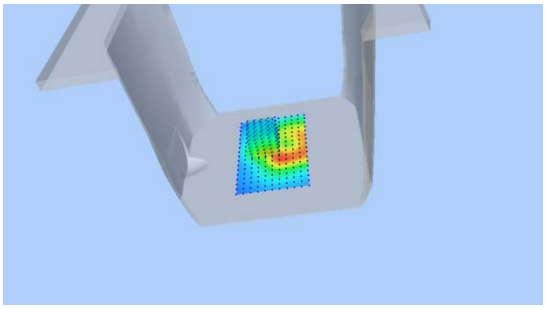
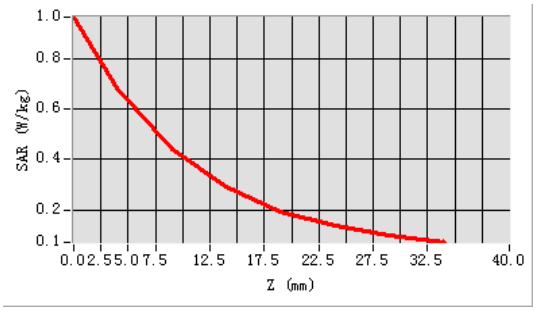
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 2: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-20
Probe	SN 45/15 EPGO281
ConvF	2.16
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 front side
Band	GPRS 1900
Channels	High
Signal	Duty Cycle: 1:2.00 (Crest factor: 2.0)
Frequency (MHz)	1909.8
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.52
Variation (%)	-1.87

Maximum location: X=-8.00, Y=10.00
SAR Peak: 0.96 W/kg

SAR 10g (W/Kg)	0.332520
SAR 1g (W/Kg)	0.662856

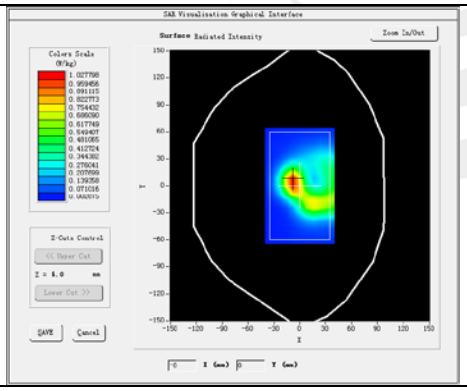
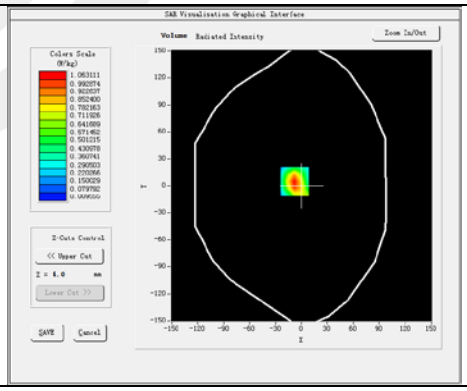
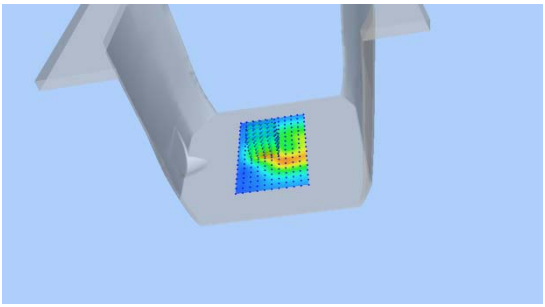
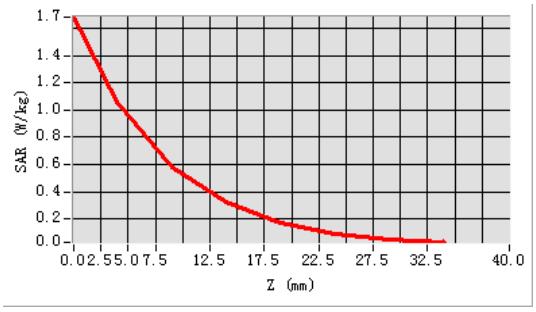
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 3: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-20
Probe	SN 45/15 EPGO281
ConvF	2.16
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 front side
Band	WCDMA II
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1880.0
Relative permittivity (real part)	53.3
Conductivity (S/m)	1.52
Variation (%)	-3.45

Maximum location: X=-8.00, Y=5.00
SAR Peak: 1.72 W/kg

SAR 10g (W/Kg)	0.497448
SAR 1g (W/Kg)	1.006614

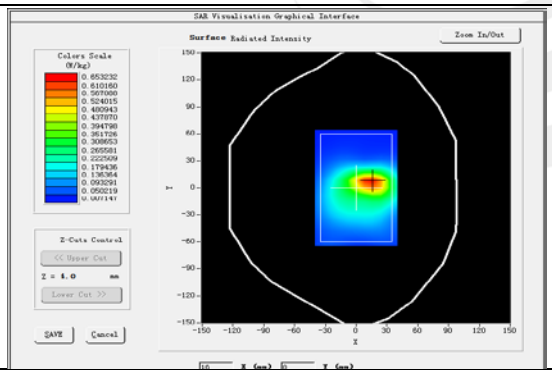
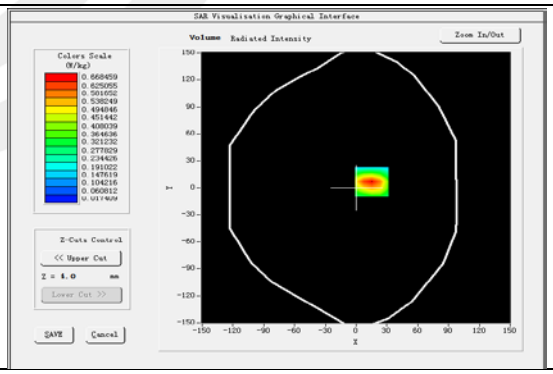
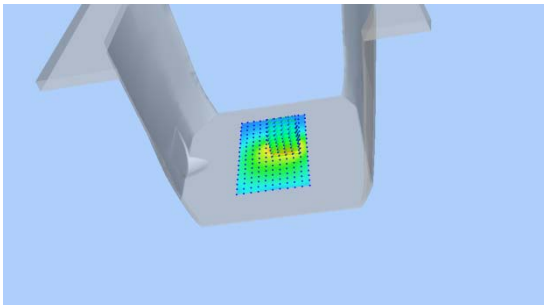
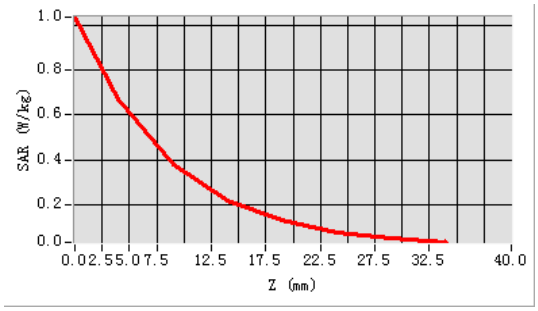
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 4: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Data	2017-06-19
Probe	SN 45/15 EPGO281
ConvF	1.87
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 front side
Band	WCDMA IV
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1740
Relative permittivity (real part)	53.53
Conductivity (S/m)	1.53
Variation (%)	-0.54

Maximum location: X=15.00, Y=7.00
SAR Peak: 0.97 W/kg

SAR 10g (W/Kg)	0.233209
SAR 1g (W/Kg)	0.538277

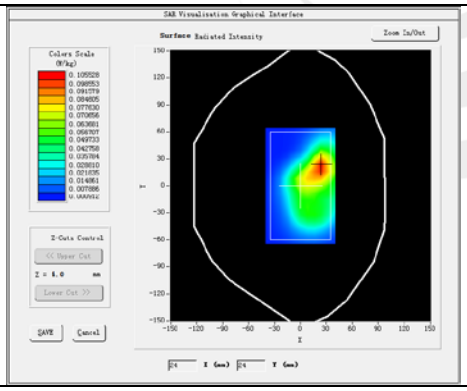
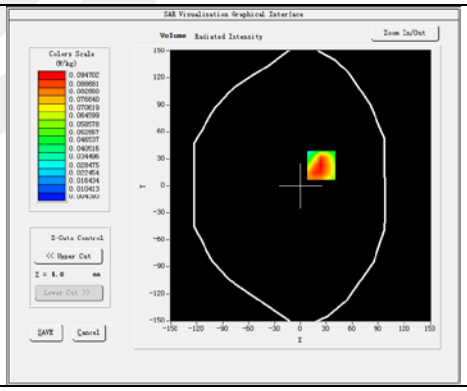
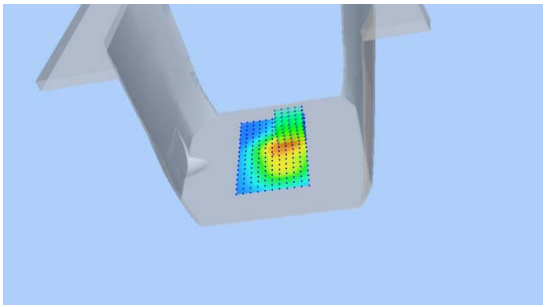
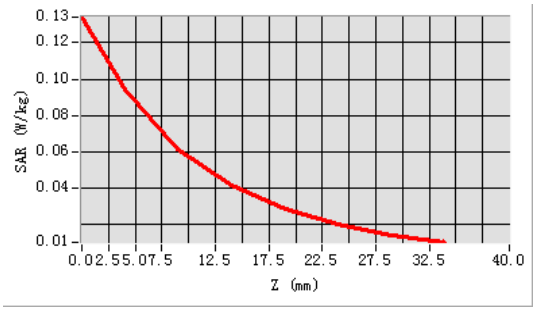
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 5: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-19
Probe	SN 45/15 EPGO281
ConvF	1.85
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 front
Band	WCDMA V
Channels	Low
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	826.4
Relative permittivity (real part)	55.2
Conductivity (S/m)	0.97
Variation (%)	-2.27

Maximum location: X=24.00, Y=23.00
SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.057296
SAR 1g (W/Kg)	0.092119

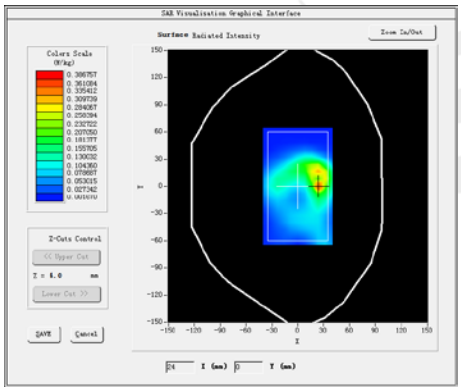
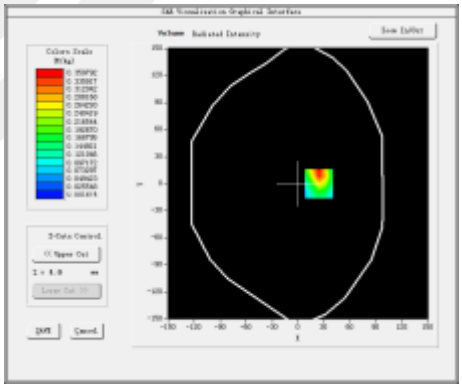
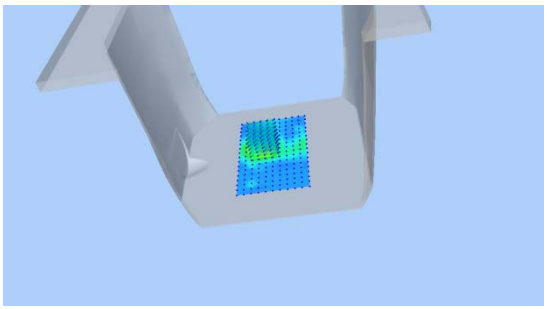
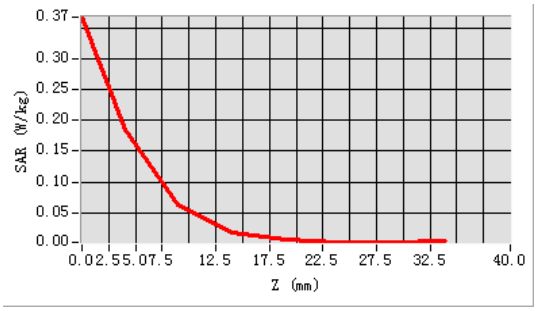
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 6: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-21
Probe	SN 45/15 EPGO281
ConvF	2.28
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 front
Band	IEEE 802.11b ISM
Channels	High
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2462
Relative permittivity (real part)	52.7
Conductivity (S/m)	1.95
Variation (%)	3.24

Maximum location: X=-9.00, Y=8.00
SAR Peak: 0.36 W/kg

SAR 10g (W/Kg)	0.066308
SAR 1g (W/Kg)	0.171583

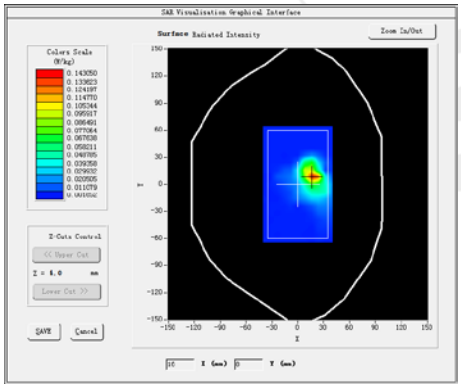
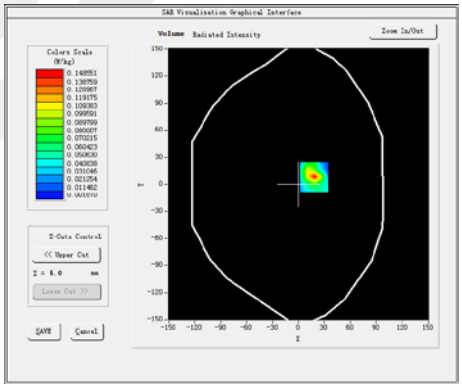
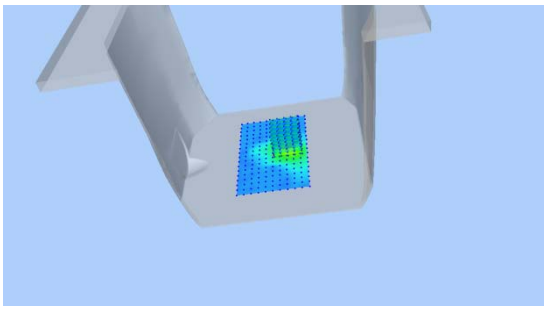
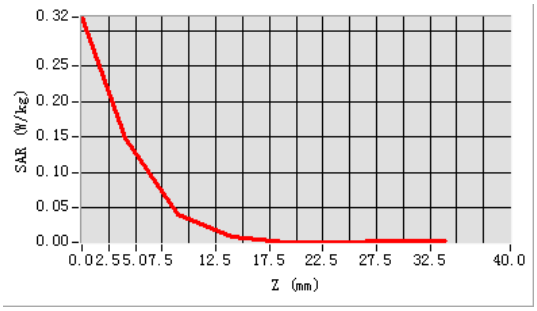
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 7: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-22
Probe	SN 45/15 EPGO281
ConvF	2.52
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 front side
Band	IEEE 802.11a ISM
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5200
Relative permittivity (real part)	49.0
Conductivity (S/m)	5.30
Variation (%)	-3.97

Maximum location: X=18.00, Y=8.00
SAR Peak: 0.31 W/kg

SAR 10g (W/Kg)	0.045457
SAR 1g (W/Kg)	0.134052

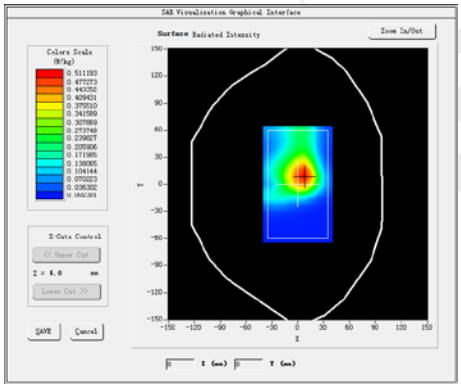
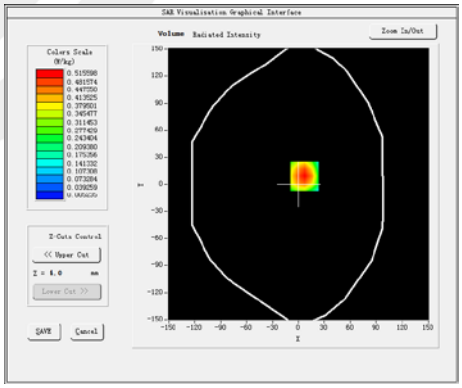
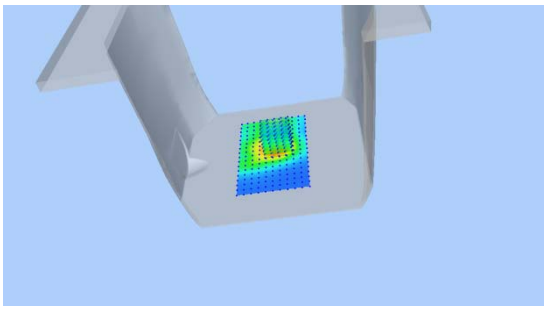
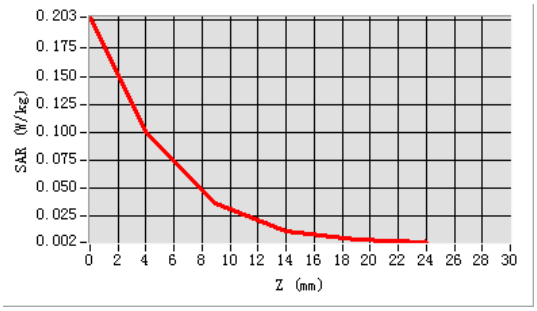
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 8: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-22
Probe	SN 45/15 EPGO281
ConvF	2.60
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 front side
Band	IEEE 802.11a ISM
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5785
Relative permittivity (real part)	48.2
Conductivity (S/m)	6.00
Variation (%)	3.98

Maximum location: X=-7.00, Y=18.00
SAR Peak: 0.22 W/kg

SAR 10g (W/Kg)	0.040011
SAR 1g (W/Kg)	0.099010

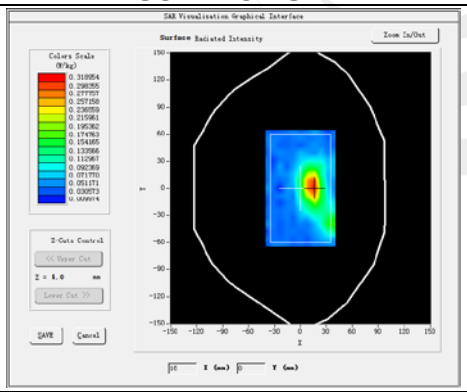
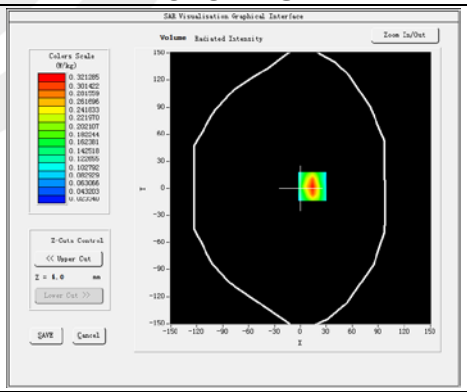
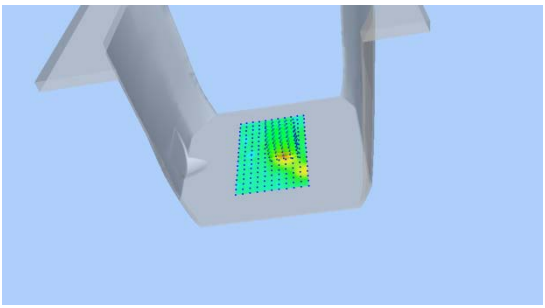
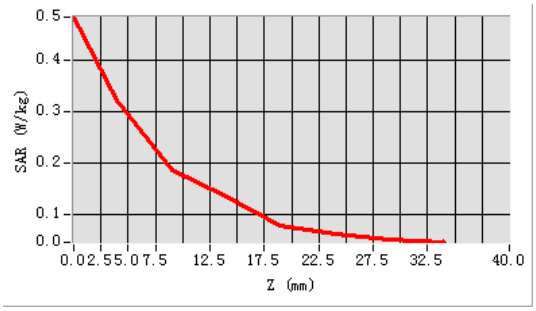
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 9: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-20
Probe	SN 45/15 EPGO281
ConvF	2.16
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 front
Band	LTE Band 2(RB 1)
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1900
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.52
Variation (%)	2.32

Maximum location: X=14.00, Y=2.00
SAR Peak: 0.50 W/kg

SAR 10g (W/Kg)	0.165859
SAR 1g (W/Kg)	0.300996

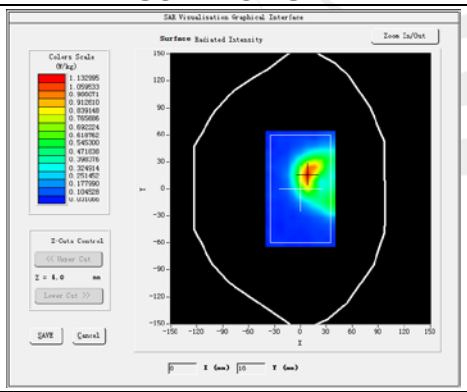
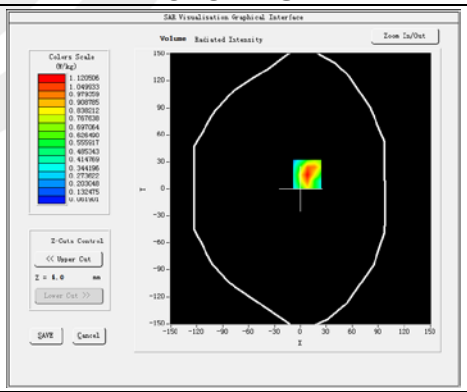
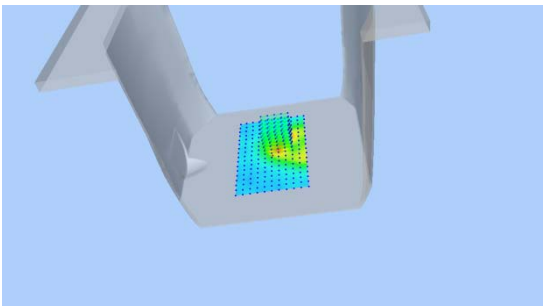
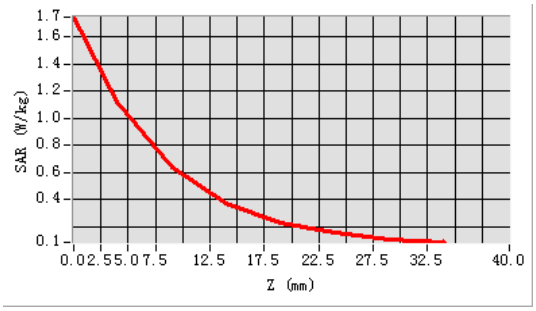
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 10: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-20
Probe	SN 45/15 EPGO281
ConvF	1.87
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 front
Band	LTE Band 4 (RB 1)
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1745
Relative permittivity (real part)	52.6
Conductivity (S/m)	1.38
Variation (%)	2.74

Maximum location: X=8.00, Y=16.00
SAR Peak: 1.75 W/kg

SAR 10g (W/Kg)	0.553912
SAR 1g (W/Kg)	0.935115

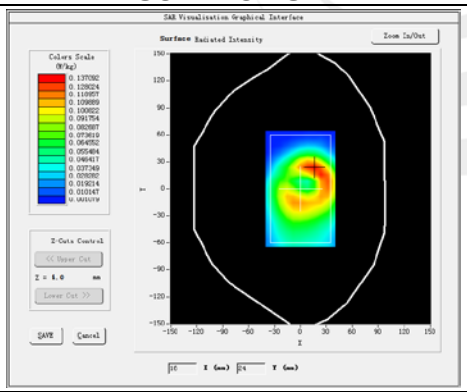
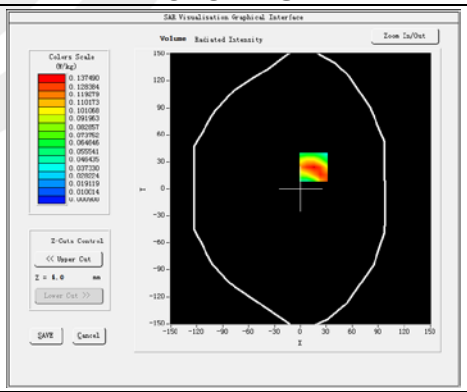
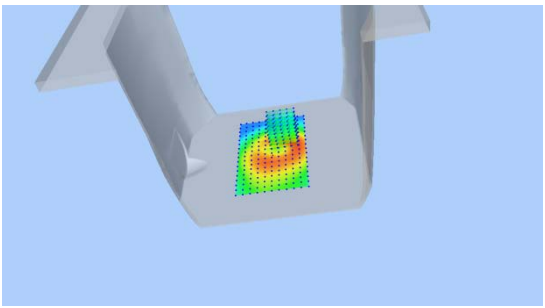
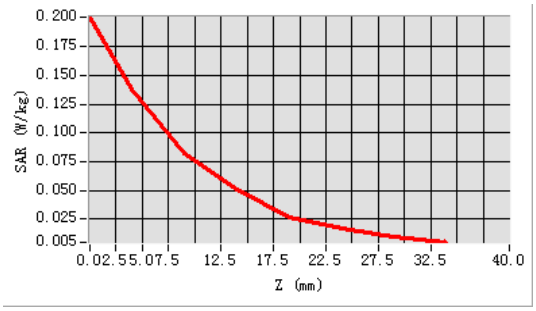
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 11: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-19
Probe	SN 45/15 EPGO281
ConvF	1.85
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 front
Band	LTE Band 5 (RB 1)
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	844.0
Relative permittivity (real part)	52.6
Conductivity (S/m)	1.38
Variation (%)	3.44

Maximum location: X=15.00, Y=24.00
SAR Peak: 0.21 W/kg

SAR 10g (W/Kg)	0.073443
SAR 1g (W/Kg)	0.130175

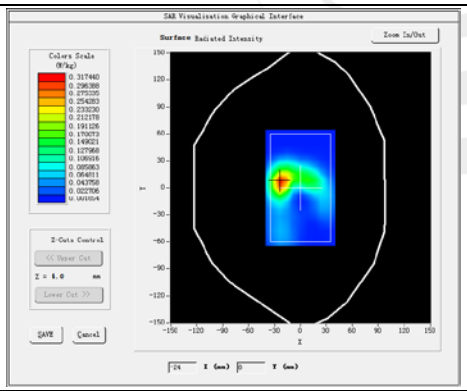
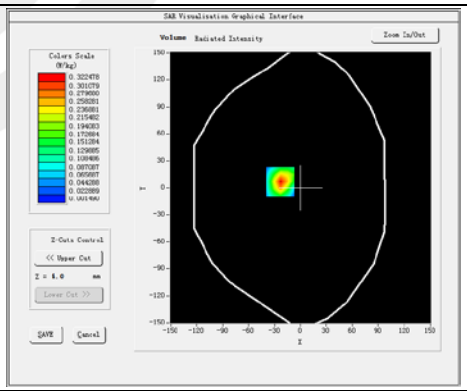
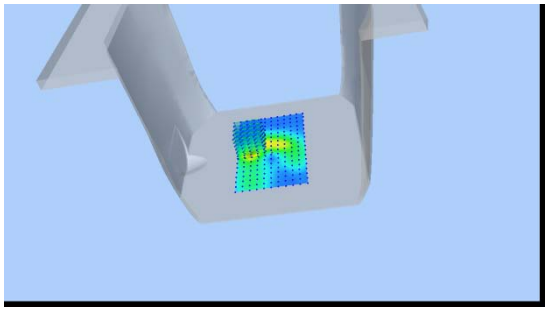
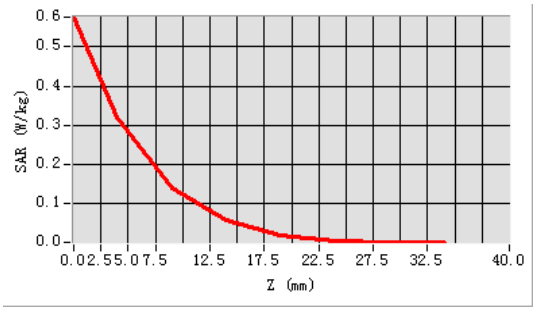
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 12: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-21
Probe	SN 45/15 EPGO281
ConvF	2.38
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 front
Band	LTE Band 7 (RB 1)
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2560
Relative permittivity (real part)	52.5
Conductivity (S/m)	2.16
Variation (%)	-1.16

Maximum location: X=-23.00, Y=7.00
SAR Peak: 0.57 W/kg

SAR 10g (W/Kg)	0.127850
SAR 1g (W/Kg)	0.299282

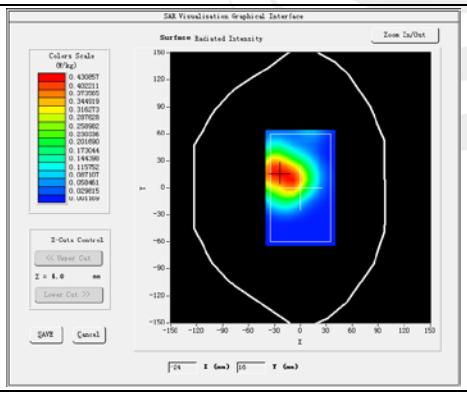
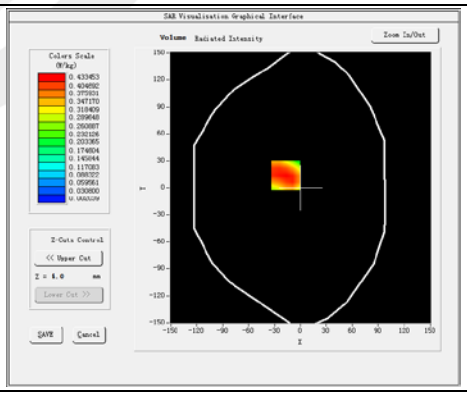
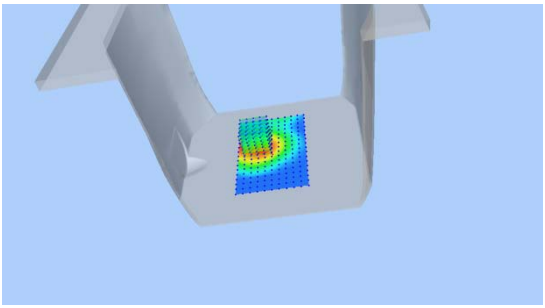
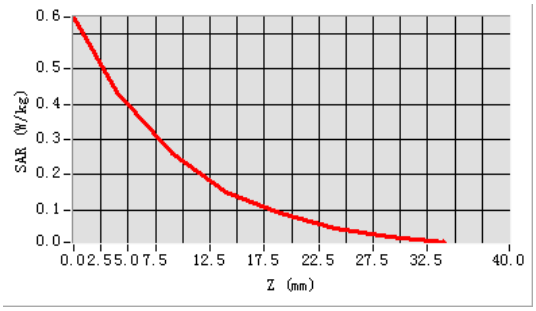
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 13: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-19
Probe	SN 45/15 EPGO281
ConvF	1.59
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 front
Band	LTE Band 12 (RB 1)
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	711
Relative permittivity (real part)	55.5
Conductivity (S/m)	0.96
Variation (%)	1.13

Maximum location: X=-17.00, Y=14.00
SAR Peak: 0.65 W/kg

SAR 10g (W/Kg)	0.242235
SAR 1g (W/Kg)	0.418348

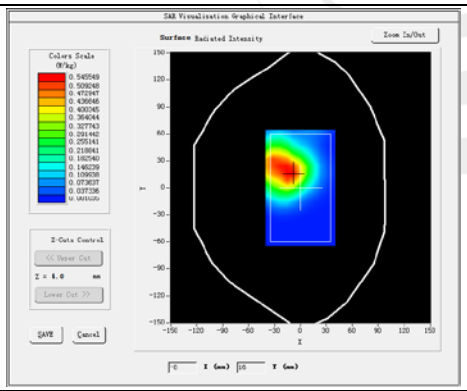
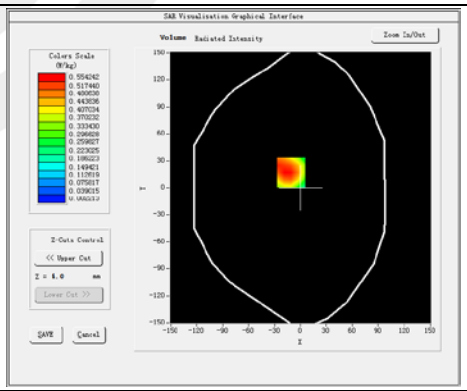
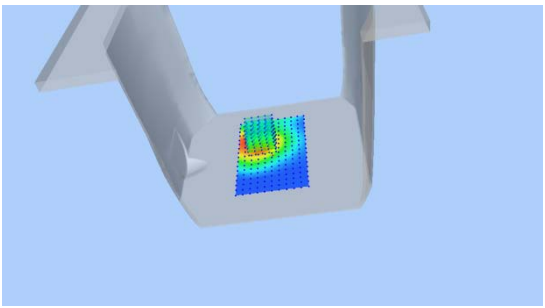
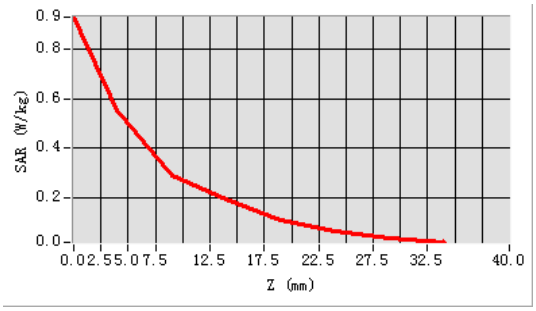
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 14: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-19
Probe	SN 45/15 EPGO281
ConvF	1.59
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 front
Band	LTE Band 17 (RB 1)
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	711
Relative permittivity (real part)	55.5
Conductivity (S/m)	0.96
Variation (%)	-1.23

Maximum location: X=-11.00, Y=17.00
SAR Peak: 0.84 W/kg

SAR 10g (W/Kg)	0.315685
SAR 1g (W/Kg)	0.536544

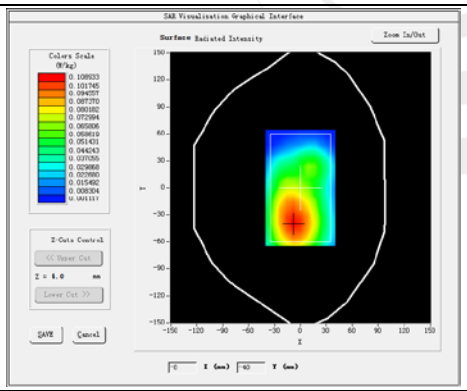
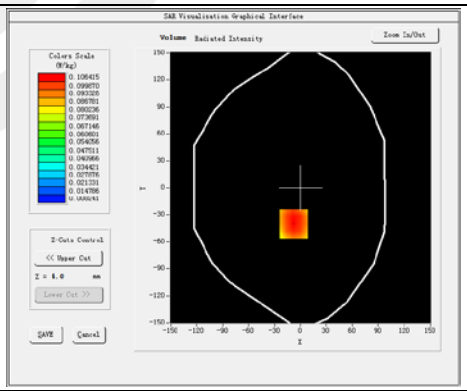
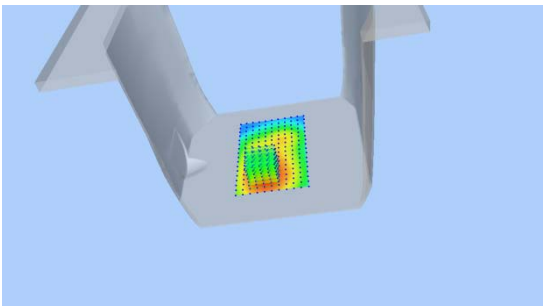
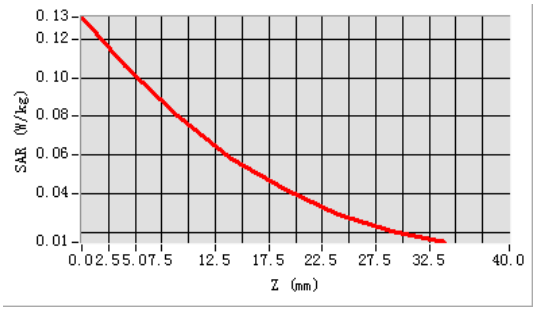
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 15: DUT: 4G LTE Mobile Router; EUT Model: macaroon M1

Test Date	2017-06-21
Probe	SN 45/15 EPGO281
ConvF	2.38
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 front
Band	LTE Band 41 (RB 1)
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2680
Relative permittivity (real part)	52.5
Conductivity (S/m)	2.16
Variation (%)	-2.31

Maximum location: X=-8.00, Y=-40.00
SAR Peak: 0.13 W/kg

SAR 10g (W/Kg)	0.072756
SAR 1g (W/Kg)	0.102426

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

Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※