FCC SAR TEST REPORT

Report No.: STS1903253H01

Issued for

Winmate Inc.

9F,No.111-6,shing-De Rd., San-Chung District, New Taipei City 241, Taiwan

Product Name:	Rugged Tablet PC
Brand Name:	Winmate
Model Name:	M101S
Series Model:	M101XXXXXXXXXX (where x can be A-Z,a-z,0-9,"-",Blank or Slash)
FCC ID:	PX9M101S
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEEE 1528: 2013
Max. Report SAR (1g):	Body:1.432 W/kg

Shenzhen STS Test Services Co., Ltd.
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Fuyong Street, Bao'an District, Shenzhen, Guangdong,China
TEL: +86-755 3688 6288 FAX: +86-755 3688 6277 E-mail:sts@stsapp.com

Test Report Certification

Applicant's name ..... :	Winmate Inc.
Address ..... :	9F,No.111-6,shing-De Rd., San-Chung District, New Taipei City 241, Taiwan
Manufacture's Name ..... :	Winmate Inc.
Address ..... :	9F,No.111-6,shing-De Rd., San-Chung District, New Taipei City 241, Taiwan

Product description

Product name ..... :	Rugged Tablet PC
Brand name ..... :	Winmate
Model name ..... :	M101S
Series Model..... :	M101XXXXXXXXXX (where x can be A-Z,a-z,0-9,"-",Blank or Slash)
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..... :	13 Nov. 2018~09 Dec. 2018
Date of Issue..... :	01 Apr. 2019
Test Result..... :	**Pass**

Testing Engineer **:** Aaron Bu

(Aaron Bu)

Technical Manager **:** Jason Lu

(Jason Lu)

Authorized Signatory **:** Vita Li

(Vita Li)

Table of Contents

Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	03 Dec. 2018	STS1811022H01	ALL	Initial Issue
00	01 Apr. 2019	STS1903253H01	ALL	Updated model name and appearance, FCC ID,naming of hardware and software version numbers
Note: **Format version** of the report -V01				

1.General Information

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

1.1 EUT Description

Product Name	Rugged Tablet PC		
Brand Name	Winmate		
Model Name	M101S		
Series Model	M101XXXXXXXXXX (where x can be A-Z,a-z,0-9, “-” ,Blank or Slash)		
FCC ID	PX9M101S		
Model Difference	Only for marketing purpose		
Adapter	Input: AC 100-240V,2000mA, 50-60 Hz Output: DC 19V,3420mA		
Battery	Rated Voltage: 7.4V; Charge Limit: 8.4V; Capacity: 5140mAh		
Device Category	Portable		
Product stage	Production unit		
RF Exposure Environment	General Population / Uncontrolled		
Hardware Version	M101S-300		
Software Version	M101S_M6E_50.1.17		
Frequency Range	WCDMA Band II:1852.4~1907.6MHz WCDMA Band 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 LTE Band 13:779.5~784.5MHz LTE Band 25:1850.7~1914.3MHz	LTE Band 26:814.7~848.3MHz LTE Band 30:2307.5~2312.5MHz LTE Band 41:2498.5~2687.5MHz WLAN802.11b/g/n(HT20):2412~2462MHz WLAN 802.11a/n/ac(HT20/40/80): 5150~5250 MHz; Bluetooth:2402~ 2480MHz GPS: 1575.42MHz NFC: 13.56 MHz	
Max. Reported SAR(1g): (Limit:1.6W/kg)	Band	Mode	Body Worn and Hotspot(W/kg)
	PCB	WCDMA Band II	0.678
	PCB	WCDMA Band IV	0.578
	PCB	WCDMA Band V	0.041
	PCB	LTE Band 4	1.432
	PCB	LTE Band 7	0.474
	PCB	LTE Band 12	0.232
	PCB	LTE Band 13	0.139
	PCB	LTE Band 25	0.207
	PCB	LTE Band 26	0.024
	PCB	LTE Band 30	0.254
	PCB	LTE Band 41	1.086
	DTS	2.4G WLAN ANT A	0.278
	DTS	2.4G WLAN ANT B	0.062
	DTS	2.4G WLAN ANT A+B	0.295
	NII	5.2G WLAN ANT A	0.088
	NII	5.2G WLAN ANT B	0.193
	NII	5.2G WLAN ANT A+B	0.080
	DSS	Bluetooth	0.046
1-g Sum SAR			1.578

FCC Equipment Class	Licensed Portable Transmitter (PCE) Part 15 Spread Spectrum Transmitter (DSS) Digital Transmission System (DTS) Unlicensed National Information Infrastructure TX (NII)
Operating Mode:	WCDMA:RMC,HSDPA,HSUPA Release 6; LTE:QPSK,16QAM; WLAN: 802.11 b/g/n(HT20) WLAN: 802.11 n(HT20/40) /a/ac80/ac160 BLE NFC:ASK
Antenna Specification:	WCDMA,LTE: PIFA Antenna BT,WLAN: PIFA Antenna
SIM Card	Only single card
Hotspot Mode:	Support
DTM Mode:	Not Support

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 Street, Bao'an District, Shenzhen, Guangdong, China
CNAS Registration No.: L7649
FCC Registration No.: 625569
IC Registration No.: 12108A
A2LA Certificate No.: 4338.01

2.Test Standards

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 648474 D04 v01r03	SAR Evaluation Considerations for Wireless Handsets
11	FCC KDB 248227 D01 Wi-Fi SAR v02r02	SAR Considerations for 802.11 Devices
12	FCC KDB 616217 D04 v01r02	SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers

In addition to the above, the following information was used:

TCB workshop October, 2014; Page 36, RF Exposure Procedures Update (Overlapping LTE Bands)

TCB workshop October, 2014; Page 37, LTE Considerations (LTE Band 41 Test Channels)

And Limits:

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

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

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

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

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

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

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

NOTE
GENERAL POPULATION/UNCONTROLLED EXPOSURE
PARTIAL BODY LIMIT
1.6 W/kg

3. SAR Measurement System

3.1 Definition Of Specific Absorption Rate (SAR)

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

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

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

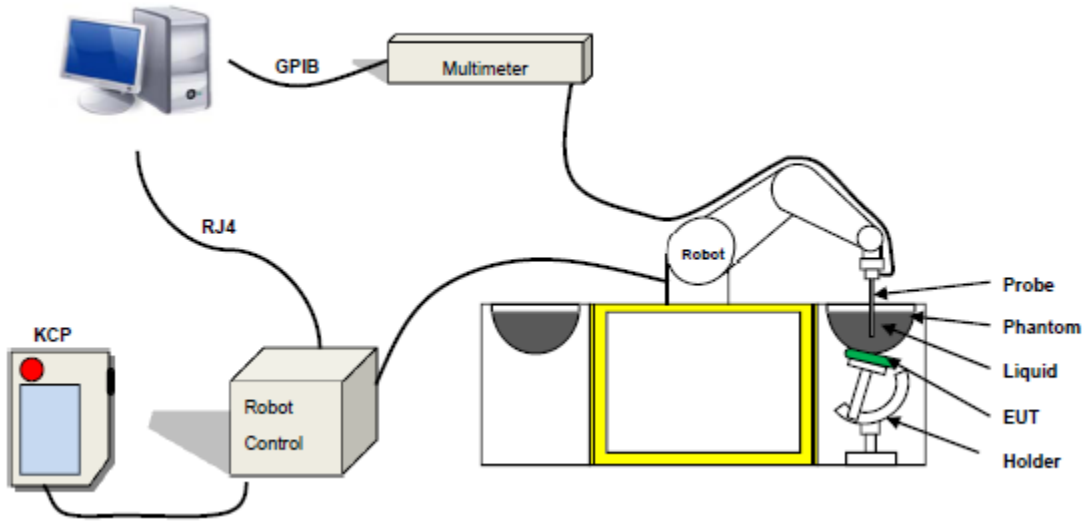
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SAR System

MVG SAR System Diagram:



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

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

The following figure shows the system.

The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The 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*

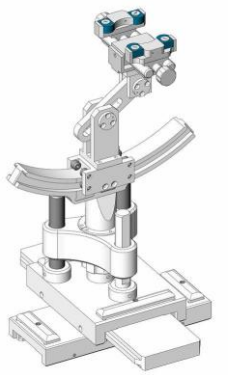
3.2.2 Phantom

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.

Head Tissue

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

Body Tissue

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

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

LIQUID MEASUREMENT RESULTS

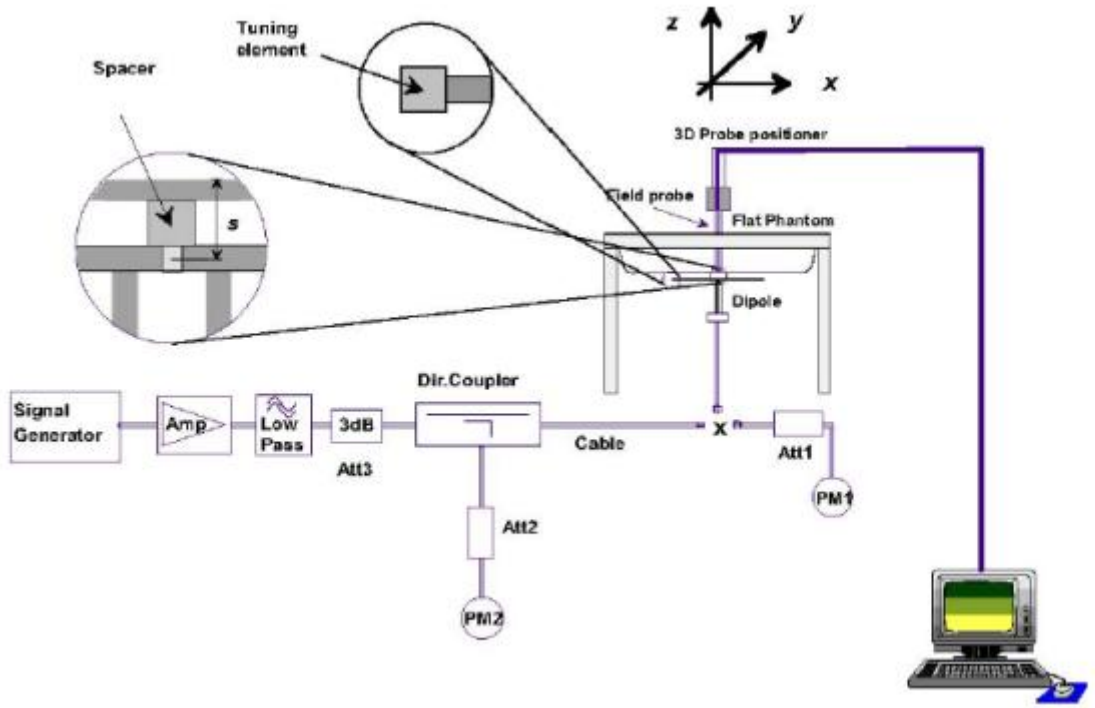
Date	Ambient condition		Body Simulating Liquid		Parameters	Target	Measured	Deviation [%]	Limited [%]
	Temp. [°C]	Humidity [%]	Frequency	Temp. [°C]					
2018-11-30	23.1	51	750 MHz	22.7	Permittivity:	55.5	55.13	-0.67	±5
					Conductivity:	0.96	0.96	0.06	±5
2018-11-13	22.7	48	835 MHz	22.4	Permittivity:	55.2	55.95	1.35	±5
					Conductivity:	0.97	0.95	-2.11	±5
2018-12-01	22.6	49	835 MHz	22.3	Permittivity:	55.2	54.50	-1.28	±5
					Conductivity:	0.97	0.95	-2.35	±5
2018-11-15	22.9	50	1800 MHz	22.6	Permittivity:	53.3	53.96	1.24	±5
					Conductivity:	1.52	1.52	-0.03	±5
2018-12-02	22.8	50	1800 MHz	22.4	Permittivity:	53.3	53.22	-0.15	±5
					Conductivity:	1.52	1.52	0.02	±5
2018-11-17	22.3	47	1900 MHz	22.0	Permittivity:	53.3	53.76	0.86	±5
					Conductivity:	1.52	1.50	-1.40	±5
2018-12-04	22.6	48	1900 MHz	22.4	Permittivity:	53.3	53.05	-0.47	±5
					Conductivity:	1.52	1.53	0.91	±5
2018-12-06	22.8	45	2450 MHz	22.5	Permittivity:	52.7	51.57	-2.15	±5
					Conductivity:	1.95	1.92	-1.44	±5
2018-12-08	23.0	48	2600 MHz	22.7	Permittivity:	52.5	51.69	-1.54	±5
					Conductivity:	2.16	2.15	-0.42	±5
2018-12-09	23.2	50	5200 MH	22.8	Permittivity:	49.0	48.61	-0.80	±5
					Conductivity	5.30	5.27	-0.57	±5

5. SAR System Validation

5.1 Validation System

Each MVG system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the MVG software, enable the user to conduct the system performance check and system validation. System kit includes a dipole, and dipole device holder.

The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system validation setup is shown as below.



5.2 Validation Result

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

Freq.(MHz)	Power(mW)	Tested Value (W/Kg)	Normalized SAR (W/kg/W)	Target (W/Kg/W)	Tolerance(%)	Date
750 Body	100	0.868	8.68	8.49	2.27	2018-11-30
835 Body	100	1.011	10.11	9.56	4.77	2018-11-13
835 Body	100	0.962	9.62	9.56	0.59	2018-12-01
1800 Body	100	3.922	39.22	38.4	2.14	2018-11-15
1800 Body	100	3.825	38.25	38.4	-0.38	2018-12-02
1900 Body	100	3.758	37.58	39.7	-3.35	2018-11-17
1900 Body	100	4.111	41.11	39.7	3.55	2018-12-04
2450 Body	100	5.321	53.21	52.4	1.55	2018-12-06
2600 Body	100	5.988	59.88	55.3	1.29	2018-12-08
5200 Body	100	15.849	158.49	159	-0.32	2018-12-09

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

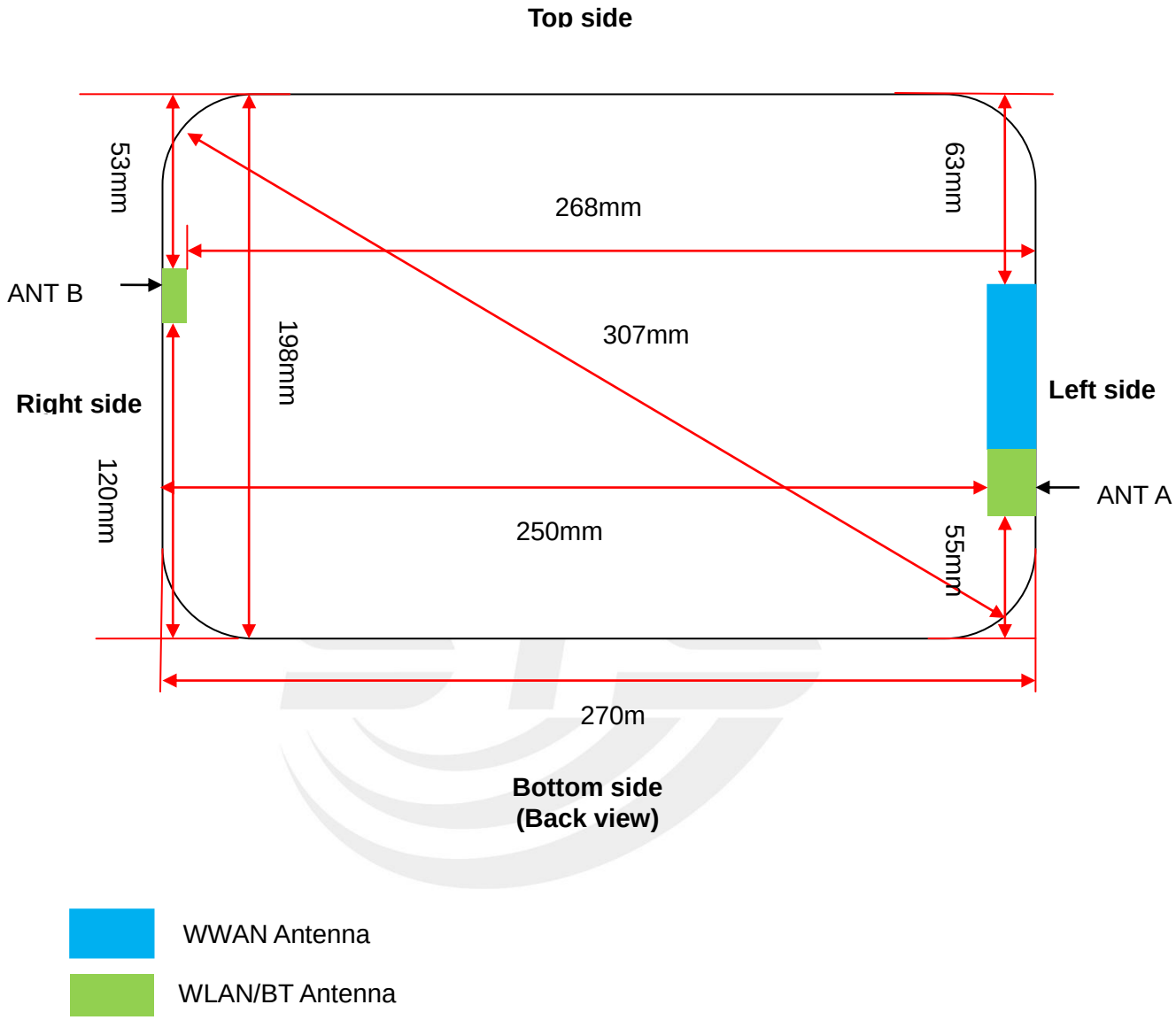
- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible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



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	Mode	Max. Peak Power		Test Position Configurations				
		dBm	mW	Back Side	Left Edge	Right Edge	Top Edge	Bottom Edge
WCDMA Band II	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2158	268	208
	QPSK	23.52	224.91	Yes	Yes	No	No	Yes
WCDMA Band IV	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2158	268	208
	QPSK	23.45	221.31	Yes	Yes	No	No	Yes
WCDMA Band V	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	1364	242	194
	QPSK	23.51	224.39	Yes	Yes	No	No	Yes
LTE Band 4	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2158	268	208
	QPSK	23.97	249.46	Yes	Yes	No	No	Yes
LTE Band 7	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2096	226	146
	QPSK	22.93	196.34	Yes	Yes	No	No	Yes
LTE Band 12	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	1364	242	194
	QPSK	23.99	250.6	Yes	Yes	No	Yes	Yes
LTE Band 13	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	1364	242	194
	QPSK	23.93	250.78	Yes	Yes	No	Yes	Yes
LTE Band 25	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2158	268	208
	QPSK	23.99	250.6	Yes	Yes	No	No	Yes
LTE Band 26	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	1364	242	194
	QPSK	23.98	250.03	Yes	Yes	No	Yes	Yes
LTE Band 30	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2096	226	146
	QPSK	22.95	197.24	Yes	Yes	No	No	Yes
LTE Band 41	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2096	226	146
	QPSK	21.53	142.23	Yes	Yes	No	No	No

WLAN 2.4 G ANT A	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2096	226	146
	802.11b	21.06	127.64	Yes	Yes	No	No	No
WLAN 2.4 G ANT B	Distance to User			<5mm	268mm	<5mm	53m	120m
	exclusion threshold			3	2276	3	126	796
	802.11b	21.15	130.32	Yes	No	Yes	Yes	No
WLAN 2.4 G ANT A	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2096	226	146
	802.11n	20.67	116.68	Yes	Yes	No	No	No
WLAN 2.4 G ANT B	Distance to User			<5mm	268mm	<5mm	53m	120m
	exclusion threshold			3	2276	3	126	796
	802.11n	21.10	128.82	Yes	No	Yes	Yes	No
WLAN 5.2 G ANT A	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2066	176	116
	802.11a	21.06	127.64	Yes	Yes	No	No	Yes
WLAN 5.2 G ANT B	Distance to User			<5mm	268mm	<5mm	53m	120m
	exclusion threshold			3	2246	3	96	766
	802.11a	21.23	132.74	Yes	No	Yes	Yes	No
WLAN 5.2 G ANT A	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2066	176	116
	802.11n	21.18	131.22	Yes	Yes	No	No	Yes
WLAN 5.2 G ANT B	Distance to User			<5mm	268mm	<5mm	53m	120m
	exclusion threshold			3	2246	3	96	766
	802.11n	21.05	127.35	Yes	No	Yes	Yes	No
Bluetooth	Distance to User			<5mm	<5mm	250mm	63m	55m
	exclusion threshold			3	3	2096	226	146
	GFSK	9.95	9.89	Yes	Yes	No	No	No

Note：

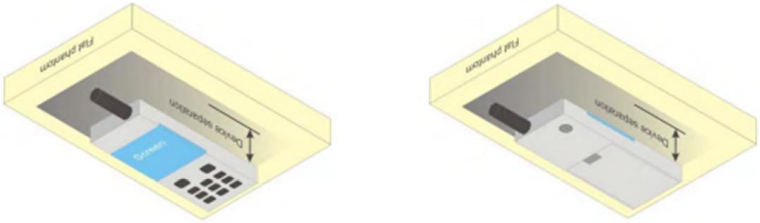
1. maximum power is the source-based time-average power and represents the maximum RF output power among production units.
2. per KDB 447498 D01, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. 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. Per KDB 616217 D04 Exposures from antennas through the front (top) surface of the display section of a full-size tablet, away from the edges, are generally limited to the user's hands. Exposures to hands for typical consumer transmitters used in tablets are not expected to exceed the extremity SAR limit; therefore, SAR evaluation for the front surface of tablet display screens are generally not necessary.

8. EUT Test Position

This EUT was tested in Front Face and Rear Face.

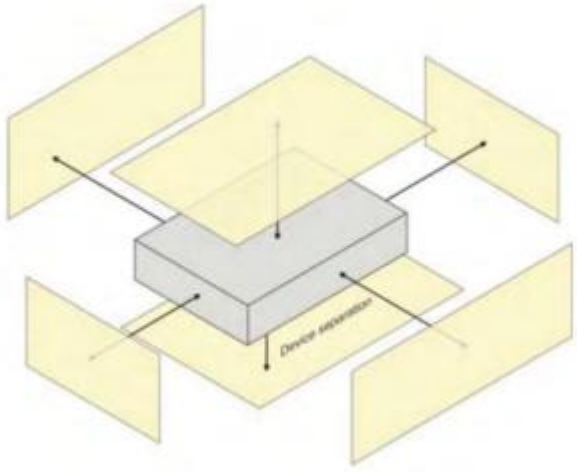
8.1 Define Two Imaginary Lines On The Handset

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	$(1\text{-cp})^{1/2}$	$(1\text{-cp})^{1/2}$	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	$(1\text{-cp})^{1/2}$	$(1\text{-cp})^{1/2}$	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 permittivity and conductivity)	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

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
AMR 12.2Kbps	23.17	23.26	23.43	23.41	23.41	23.22	23.47	22.87	22.86
RMC 12.2Kbps	23.27	23.32	23.51	23.45	23.45	23.24	23.52	22.98	23.01
HSDPA Subtest-1	22.47	22.32	22.40	22.38	22.39	22.22	22.09	22.08	22.11
HSDPA Subtest-2	22.04	22.16	22.46	22.25	22.67	22.34	22.04	22.01	22.19
HSDPA Subtest-3	21.37	21.32	21.25	21.25	21.40	21.37	22.03	21.11	20.98
HSDPA Subtest-4	20.78	20.66	20.73	20.88	21.11	21.21	22.15	21.00	20.53
HSUPA Subtest-1	21.24	21.20	21.40	21.59	22.19	21.33	21.25	21.10	21.38
HSUPA Subtest-2	21.28	21.68	21.18	21.42	21.80	21.34	21.20	21.12	21.18
HSUPA Subtest-3	21.26	21.47	21.79	21.64	21.24	21.31	21.29	21.09	21.05
HSUPA Subtest-4	21.21	21.13	21.36	21.65	21.47	21.14	21.21	21.08	21.24
HSUPA Subtest-5	21.66	21.49	21.78	21.42	21.37	21.43	21.20	21.11	21.19

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

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

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

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

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

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

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

WLAN (2.4Gband)

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)		
			Antenna A	Antenna B	Antenna A+B
802.11b	1	2412	19.41	20.02	N/A
	7	2442	21.06	21.15	N/A
	11	2462	19.99	20.82	N/A
	12	2467	17.74	17.92	N/A
	13	2472	14.93	14.42	N/A
802.11g	1	2412	16.56	17.10	N/A
	7	2442	20.76	21.04	N/A
	11	2462	16.81	16.73	N/A
	12	2467	13.72	13.62	N/A
	13	2472	-5.65	-5.66	N/A
802.11n20(HT0)	1	2412	15.96	16.70	N/A
	7	2442	20.67	21.10	N/A
	11	2462	16.12	16.31	N/A
	12	2467	13.48	13.56	N/A
	13	2472	-5.79	-5.86	N/A
802.11n20(HT8)	1	2412	14.85	14.15	17.53
	7	2442	17.66	17.46	20.58
	11	2462	14.79	14.34	17.59
	12	2467	12.35	11.86	15.13
	13	2472	-8.53	-8.52	-5.51
802.11n40(HT0)	3	2422	13.78	13.37	N/A
	7	2442	15.82	15.88	N/A
	9	2452	14.52	14.37	N/A
	10	2457	11.11	11.01	N/A
	11	2462	3.43	2.92	N/A
802.11n40(HT8)	3	2422	11.80	11.61	14.72
	7	2442	14.48	14.41	17.46
	9	2452	13.69	12.79	16.28
	10	2457	10.63	10.30	13.48
	11	2462	1.81	2.70	5.29

WLAN (5.2Gband)

Mode	Rate	Channel	Freq. (MHz)	Antenna	Average Power (dBm)
802.11a	6Mbps	36	5180	SISO CHAIN A	17.42
				SISO CHAIN B	17.72
		40	5200	SISO CHAIN A	20.62
				SISO CHAIN B	20.54
		48	5240	SISO CHAIN A	21.06
				SISO CHAIN B	21.23
802.11n20	HT0	36	5180	SISO CHAIN A	17.13
				SISO CHAIN B	17.40
		40	5200	SISO CHAIN A	19.95
				SISO CHAIN B	20.47
		48	5240	SISO CHAIN A	21.18
				SISO CHAIN B	21.05
	HT8	36	5180	MIMO CHAIN A	17.15
				MIMO CHAIN B	17.48
				Combined A+B	20.33
		40	5200	MIMO CHAIN A	19.24
				MIMO CHAIN B	19.05
				Combined A+B	22.15
		48	5240	MIMO CHAIN A	19.87
				MIMO CHAIN B	19.74
				Combined A+B	22.81

Mode	Rate	Channel	Freq. (MHz)	Antenna	Average Power (dBm)
802.11n40	HT0	38	5190	SISO CHAIN A	17.89
				SISO CHAIN B	17.74
		46	5230	SISO CHAIN A	19.26
				SISO CHAIN B	18.65
	HT8	38	5190	MIMO CHAIN A	14.69
				MIMO CHAIN B	14.73
				Combined A+B	17.72
		46	5230	MIMO CHAIN A	18.43
				MIMO CHAIN B	18.10
				Combined A+B	21.28
802.11ac80	VHT0	42ac80	5210	SISO CHAIN A	17.88
				SISO CHAIN B	17.89
				MIMO CHAIN A	15.00
				MIMO CHAIN B	13.86
				Combined A+B	17.48
802.11ac160	VHT0	50ac160	5250	SISO CHAIN A	12.85
				SISO CHAIN B	13.28
				MIMO CHAIN A	10.96
				MIMO CHAIN B	10.02
				Combined A+B	13.52

BLE

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
GFSK(1Mbps)	0	2402	8.41
	19	2440	8.89
	39	2480	9.95

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 $\leqslant$ 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 $\leqslant$ 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 $\leqslant$ 1.45 W/kg; Per KDB 941225 D05, smaller bandwidth SAR testing is not required.

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	23.24	23.09	22.97
1.4	1	2		23.45	23.28	23.02
1.4	1	5		23.55	23.09	22.94
1.4	6	0		22.28	22.00	21.74
1.4	1	0	16-QAM	22.43	22.19	21.93
1.4	1	2		22.56	22.17	22.06
1.4	1	5		22.27	22.19	21.92
1.4	6	0		21.31	21.07	20.90
3	1	0	QPSK	23.50	23.28	23.07
3	1	8		23.34	23.48	22.94
3	1	15		23.29	22.91	22.88
3	15	0		22.30	22.02	21.91
3	1	8	16-QAM	22.56	22.39	22.58
3	1	15		22.51	22.14	22.32
3	1	0		22.45	22.24	22.35
3	15	0		21.28	21.07	20.86
5	1	0	QPSK	23.59	23.41	23.27
5	1	13		23.55	23.24	23.23
5	1	24		23.52	23.20	23.02
5	25	0		22.26	22.03	22.01
5	1	0	16-QAM	23.02	23.39	22.25
5	1	13		22.81	23.22	22.09
5	1	24		22.75	23.21	22.12
5	25	0		21.26	22.01	21.14
10	1	0	QPSK	23.68	23.48	23.68
10	1	25		23.30	23.15	23.30
10	1	49		23.32	23.27	23.32
10	50	0		22.38	22.19	22.38
10	1	0	16-QAM	22.84	22.42	22.84
10	1	25		22.70	22.09	22.70
10	1	49		22.76	22.16	22.76
10	50	0		21.38	21.7	21.38

LTE BAND 4

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	23.88	23.80	23.77
15	1	38		23.25	23.26	23.08
15	1	74		23.42	23.60	23.13
15	75	0		22.43	22.32	22.16
15	1	0	16-QAM	22.95	23.11	23.23
15	1	38		22.45	22.50	22.59
15	1	75		22.68	22.83	22.70
15	75	0		22.38	21.44	21.18
20	1	0	QPSK	23.40	23.97	23.71
20	1	50		23.39	23.27	23.13
20	1	99		23.64	23.61	23.26
20	100	0		22.56	22.48	22.32
20	1	0	16-QAM	23.31	23.19	23.37
20	1	50		22.61	22.42	22.64
20	1	99		22.93	22.76	22.85
20	100	0		21.46	21.50	21.34

LTE BAND 7

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22.93	22.57	22.27
5	1	13		22.81	22.31	22.02
5	1	24		22.68	22.40	21.13
5	25	0		21.27	21.18	20.93
5	1	0	16-QAM	21.87	21.52	21.06
5	1	13		21.73	21.47	20.85
5	1	24		21.60	21.37	20.01
5	25	0		20.18	20.29	20.03
10	1	0	QPSK	22.72	22.93	22.55
10	1	25		22.57	22.77	22.33
10	1	49		22.33	22.72	21.19
10	50	0		21.34	21.28	21.17
10	1	0	16-QAM	22.23	21.33	22.03
10	1	25		22.09	21.44	21.84
10	1	49		21.93	21.14	20.56
10	50	0		20.41	20.25	20.36
15	1	0	QPSK	22.57	22.88	22.07
15	1	38		22.46	22.59	22.04
15	1	74		22.04	22.42	21.22
15	75	0		21.19	21.16	20.93
15	1	0	16-QAM	22.14	21.89	21.68
15	1	38		21.86	21.66	21.44
15	1	75		21.54	21.25	20.98
15	75	0		20.26	20.15	20.03
20	1	0	QPSK	22.67	22.22	21.80
20	1	50		22.40	22.51	21.00
20	1	99		21.97	21.73	21.28
20	100	0		21.15	21.24	20.89
20	1	0	16-QAM	21.54	22.02	21.62
20	1	50		21.46	21.43	21.73
20	1	99		20.91	21.06	21.10
20	100	0		20.16	20.22	19.90

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	23.84	23.78	23.71
1.4	1	2		23.76	23.67	23.54
1.4	1	5		23.99	23.77	23.74
1.4	6	0		22.28	22.31	22.26
1.4	1	0	16-QAM	22.56	23.05	22.06
1.4	1	2		22.71	23.08	22.06
1.4	1	5		22.50	22.87	21.93
1.4	6	0		21.29	21.17	21.36
3	1	0	QPSK	23.30	23.43	23.91
3	1	8		23.55	23.28	23.86
3	1	15		23.24	23.52	23.61
3	15	0		22.14	22.28	22.31
3	1	0	16-QAM	22.99	22.77	23.01
3	1	8		22.82	22.62	22.55
3	1	15		22.95	22.70	22.79
3	15	0		21.30	21.38	21.36
5	1	0	QPSK	23.43	23.80	23.61
5	1	13		23.30	23.90	23.52
5	1	24		23.50	23.65	23.59
5	25	0		22.12	22.36	22.20
5	1	0	16-QAM	22.26	22.94	22.62
5	1	13		22.40	22.66	22.55
5	1	24		22.51	22.79	22.62
5	25	0		21.30	21.37	21.34
10	1	0	QPSK	23.65	23.95	23.67
10	1	25		23.61	23.91	23.84
10	1	49		23.44	23.85	23.74
10	50	0		22.36	22.53	22.45
10	1	0	16-QAM	23.11	22.61	23.17
10	1	25		22.86	22.68	23.32
10	1	49		22.99	22.54	23.25
10	50	0		21.39	21.43	21.50

LTE BAND 13

LTE Band 13 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22.11	23.72	23.70
5	1	13		23.89	23.55	23.52
5	1	24		23.88	23.65	23.23
5	25	0		22.71	22.35	22.28
5	1	0	16-QAM	20.93	22.78	22.43
5	1	13		22.88	22.61	22.72
5	1	24		22.96	22.65	22.25
5	25	0		21.73	21.47	21.56
10	1	0	QPSK	-	22.30	-
10	1	25		-	23.93	-
10	1	49		-	23.47	-
10	50	0		-	22.73	-
10	1	0	16-QAM	-	21.91	-
10	1	25		-	23.56	-
10	1	49		-	23.07	-
10	50	0		-	21.73	-

LTE BAND 25

LTE Band 25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	23.79	23.66	23.63
1.4	1	2		23.59	23.60	23.54
1.4	1	5		23.66	23.59	23.60
1.4	6	0		22.26	22.06	22.20
1.4	1	0	16-QAM	22.71	22.47	22.59
1.4	1	2		22.74	22.57	23.09
1.4	1	5		22.59	22.45	22.63
1.4	6	0		21.37	21.08	21.00
3	1	0	QPSK	23.76	23.31	23.49
3	1	8		23.67	23.21	23.52
3	1	15		23.56	23.34	23.35
3	15	0		22.47	22.15	22.26
3	1	0	16-QAM	23.31	22.43	23.04
3	1	8		23.02	22.42	22.92
3	1	15		23.17	22.62	23.18
3	15	0		21.54	21.12	21.02
5	1	0	QPSK	23.78	23.75	23.58
5	1	13		23.51	22.36	23.36
5	1	24		23.39	22.23	23.55
5	25	0		22.32	21.42	22.24
5	1	0	16-QAM	22.55	22.68	22.68
5	1	13		22.36	22.45	22.44
5	1	24		22.23	22.49	22.43
5	25	0		21.42	21.19	21.02
10	1	0	QPSK	23.99	23.93	23.84
10	1	25		22.63	23.82	23.64
10	1	49		23.70	23.88	23.52
10	50	0		22.52	22.39	22.32
10	1	0	16-QAM	23.42	22.56	23.27
10	1	25		22.97	22.39	23.27
10	1	49		23.21	22.32	23.22
10	50	0		21.53	21.31	21.31

LTE BAND 25

LTE Band 25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	23.90	23.61	23.99
15	1	38		23.31	23.06	23.10
15	1	74		23.67	23.09	23.32
15	75	0		22.40	22.14	22.12
15	1	0	16-QAM	23.52	22.84	23.03
15	1	38		22.84	22.29	22.35
15	1	74		23.43	22.67	22.58
15	75	0		21.36	21.21	20.81
20	1	0	QPSK	23.85	23.94	23.85
20	1	50		23.55	23.30	23.05
20	1	99		23.81	23.31	23.29
20	100	0		22.52	22.06	22.24
20	1	0	16-QAM	23.33	23.12	23.56
20	1	50		22.54	22.27	22.46
20	1	99		22.66	23.01	23.03
20	100	0		21.46	21.14	21.02

LTE BAND 26

LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	23.83	23.84	23.53
1.4	1	2		23.63	23.80	23.72
1.4	1	5		23.67	23.72	23.48
1.4	6	0		22.26	22.08	22.49
1.4	1	0	16-QAM	22.58	22.80	22.54
1.4	1	2		22.74	22.79	22.93
1.4	1	5		22.39	22.66	22.54
1.4	6	0		21.24	21.60	21.17
3	1	0	QPSK	23.45	23.49	23.87
3	1	8		23.57	23.33	23.96
3	1	15		23.34	23.29	22.98
3	15	0		22.22	22.46	22.52
3	1	0	16-QAM	23.26	23.12	22.93
3	1	8		22.60	23.05	22.72
3	1	15		22.81	22.93	22.29
3	15	0		21.08	21.42	21.70
5	1	0	QPSK	23.50	23.68	23.81
5	1	13		23.31	23.92	23.29
5	1	24		23.33	23.67	23.38
5	25	0		22.10	22.16	22.08
5	1	0	16-QAM	22.37	22.98	22.59
5	1	13		22.43	22.61	22.55
5	1	24		22.27	22.71	22.59
5	25	0		21.21	21.15	21.13
10	1	0	QPSK	23.70	23.98	23.96
10	1	25		23.51	23.94	23.83
10	1	49		23.43	23.82	23.66
10	50	0		22.41	22.66	22.57
10	1	0	16-QAM	23.06	22.66	23.02
10	1	25		22.97	22.72	23.15
10	1	49		23.05	22.60	22.47
10	50	0		22.02	21.57	21.92

LTE BAND 26

LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	23.83	23.50	23.96
15	1	38		23.25	23.57	23.84
15	1	74		23.20	23.35	23.78
15	75	0		22.29	22.75	22.58
15	1	0	16-QAM	22.98	22.81	23.12
15	1	38		22.90	22.78	22.99
15	1	74		22.84	22.70	22.84
15	75	0		21.78	21.53	21.57

LTE BAND 30

LTE Band 30 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22.57	22.88	22.70
5	1	13		22.60	22.95	22.52
5	1	24		20.47	22.58	22.50
5	25	0		21.28	21.30	21.22
5	1	0	16-QAM	21.54	21.65	21.68
5	1	13		21.43	21.67	21.58
5	1	24		21.44	21.61	21.47
5	25	0		20.45	20.27	19.92
10	1	0	QPSK	-	22.81	-
10	1	25		-	22.74	-
10	1	49		-	22.66	-
10	50	0		-	21.46	-
10	1	0	16-QAM	-	22.15	-
10	1	25		-	22.43	-
10	1	49		-	22.12	-
10	50	0		-	20.46	-

LTE BAND 41

LTE Band 41 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	21.26	21.22	21.01
5	1	13		21.28	21.11	20.87
5	1	24		21.23	21.06	20.76
5	25	0		20.15	19.97	20.12
5	1	0	16-QAM	20.07	19.91	20.18
5	1	13		20.47	20.06	20.19
5	1	24		20.44	19.95	19.77
5	25	0		19.19	19.99	19.20
10	1	0	QPSK	21.21	21.09	21.05
10	1	25		21.32	21.00	20.81
10	1	49		21.20	20.77	20.53
10	50	0		20.17	19.95	20.12
10	1	0	16-QAM	20.56	20.07	20.24
10	1	25		21.16	20.18	20.18
10	1	49		20.78	19.73	19.70
10	50	0		19.18	18.94	19.20
15	1	0	QPSK	21.08	21.03	21.29
15	1	38		19.51	20.02	19.97
15	1	74		19.89	20.77	20.74
15	75	0		19.45	19.89	20.33
15	1	0	16-QAM	20.03	20.30	20.42
15	1	38		18.96	19.32	20.28
15	1	74		19.52	19.94	20.11
15	75	0		18.50	18.93	19.42
20	1	0	QPSK	21.09	21.20	21.37
20	1	50		19.94	21.30	21.53
20	1	99		19.46	20.79	21.29
20	100	0		18.72	19.87	20.39
20	1	0	16-QAM	19.62	20.17	20.65
20	1	50		19.63	20.12	20.21
20	1	99		19.21	19.87	20.07
20	100	0		18.69	18.89	19.28

10.2 Tune-up Power

Mode	WCDMA Band V(AVG)	WCDMA Band IV(AVG)	WCDMA Band II(AVG)
AMR	23±1dBm	23±1dBm	22.5±1dBm
RMC	23±1dBm	23±1dBm	22.6±1dBm
HSDPA Subtest-1	22±1dBm	22±1dBm	22±1dBm
HSDPA Subtest-2	22±1dBm	22±1dBm	22±1dBm
HSDPA Subtest-3	21±1dBm	21±1dBm	21.1±1dBm
HSDPA Subtest-4	20±1dBm	20.5±1dBm	21.5±1dBm
HSUPA Subtest-1	21±1dBm	21.3±1dBm	21±1dBm
HSUPA Subtest-2	21±1dBm	21±1dBm	21±1dBm
HSUPA Subtest-3	21±1dBm	21±1dBm	21±1dBm
HSUPA Subtest-4	21±1dBm	21±1dBm	21±1dBm
HSUPA Subtest-5	21±1dBm	21±1dBm	21±1dBm

Mode		WLAN(AVG)		
		ANT A	ANT B	ANT A+B
IEEE 802.11b		20.4±1dBm	21±1dBm	N/A
IEEE 802.11g	Low	16±1dBm	17±1dBm	N/A
	Middle	20±1dBm	21±1dBm	N/A
	High	16±1dBm	16±1dBm	N/A
IEEE 802.11n20(HT0)	Low	15±1dBm	16±1dBm	N/A
	Middle	20±1dBm	21±1dBm	N/A
	High	16±1dBm	16±1dBm	N/A
IEEE 802.11n20(HT8)	Low	14±1dBm	14±1dBm	17±1dBm
	Middle	17±1dBm	17±1dBm	20±1dBm
	High	14±1dBm	14±1dBm	17±1dBm
IEEE 802.11n40(HT0)	Low	13±1dBm	13±1dBm	N/A
	Middle	15±1dBm	15±1dBm	N/A
	High	14±1dBm	14±1dBm	N/A
IEEE 802.11n40(HT8)	Low	11±1dBm	11±1dBm	14±1dBm
	Middle	14±1dBm	14±1dBm	17±1dBm
	High	13±1dBm	12±1dBm	16±1dBm

Mode	Rate	Channel	Freq. (MHz)	Antenna	Average Power (dBm)
802.11a	6Mbps	36	5180	SISO CHAIN A	17±1dBm
				SISO CHAIN B	17±1dBm
		40	5200	SISO CHAIN A	20±1dBm
				SISO CHAIN B	20±1dBm
		48	5240	SISO CHAIN A	21±1dBm
				SISO CHAIN B	21±1dBm
802.11n20	HT0	36	5180	SISO CHAIN A	17±1dBm
				SISO CHAIN B	17±1dBm
		40	5200	SISO CHAIN A	19±1dBm
				SISO CHAIN B	20±1dBm
		48	5240	SISO CHAIN A	21±1dBm
				SISO CHAIN B	21±1dBm
	HT8	36	5180	MIMO CHAIN A	17±1dBm
				MIMO CHAIN B	17±1dBm
				Combined A+B	20±1dBm
		40	5200	MIMO CHAIN A	19±1dBm
				MIMO CHAIN B	19±1dBm
				Combined A+B	22±1dBm
		48	5240	MIMO CHAIN A	19±1dBm
				MIMO CHAIN B	19±1dBm
				Combined A+B	22±1dBm
802.11n40	HT0	38	5190	SISO CHAIN A	17±1dBm
				SISO CHAIN B	17±1dBm
		46	5230	SISO CHAIN A	19±1dBm
				SISO CHAIN B	18±1dBm
	HT8	38	5190	MIMO CHAIN A	14±1dBm
				MIMO CHAIN B	14±1dBm
				Combined A+B	17±1dBm
		46	5230	MIMO CHAIN A	18±1dBm
				MIMO CHAIN B	18±1dBm
				Combined A+B	21±1dBm

802.11ac80	VHT0	42ac80	5210	SISO CHAIN A	17±1dBm
				SISO CHAIN B	17±1dBm
				MIMO CHAIN A	15±1dBm
				MIMO CHAIN B	13±1dBm
				Combined A+B	17±1dBm
802.11ac160	VHT0	50ac160	5250	SISO CHAIN A	12±1dBm
				SISO CHAIN B	13±1dBm
				MIMO CHAIN A	10±1dBm
				MIMO CHAIN B	10±1dBm
				Combined A+B	13±1dBm

Mode	BLE(AVG)
GFSK	9±1dBm

LTE

BW[MHz]	RB Size	Mode	Band 4	Band 7	Band 12	Band 25	Band 26
1.4	1	QPSK	23±1dBm	N/A	23±1dBm	23±1dBm	23±1dBm
1.4	6		22±1dBm	N/A	22±1dBm	22±1dBm	22±1dBm
1.4	1	16- QAM	22±1dBm	N/A	22.1±1dBm	23±1dBm	22±1dBm
1.4	6		21±1dBm	N/A	21±1dBm	21±1dBm	21±1dBm
3	1	QPSK	23±1dBm	N/A	23±1dBm	23±1dBm	23±1dBm
3	15		22±1dBm	N/A	22±1dBm	22±1dBm	22±1dBm
3	1	16- QAM	22±1dBm	N/A	23±1dBm	23±1dBm	23±1dBm
3	15		21±1dBm	N/A	21±1dBm	21±1dBm	21±1dBm
5	1	QPSK	23±1dBm	22±1dBm	23±1dBm	23±1dBm	23±1dBm
5	25		22±1dBm	21±1dBm	22±1dBm	22±1dBm	22±1dBm
5	1	16- QAM	23±1dBm	21±1dBm	22±1dBm	22±1dBm	22±1dBm
5	25		22±1dBm	20±1dBm	21±1dBm	21±1dBm	21±1dBm
10	1	QPSK	23±1dBm	22±1dBm	23±1dBm	23±1dBm	23±1dBm
10	50		22±1dBm	21±1dBm	22±1dBm	22±1dBm	22±1dBm
10	1	16- QAM	22±1dBm	22±1dBm	23±1dBm	23±1dBm	23±1dBm
10	50		21±1dBm	20±1dBm	21±1dBm	21±1dBm	22±1dBm
15	1	QPSK	23±1dBm	22±1dBm	N/A	23±1dBm	23±1dBm
15	75		22±1dBm	21±1dBm	N/A	22±1dBm	22±1dBm
15	1	16- QAM	23±1dBm	21.2±1dBm	N/A	23±1dBm	23±1dBm
15	75		22±1dBm	20±1dBm	N/A	21±1dBm	21±1dBm
20	1	QPSK	23±1dBm	22±1dBm	N/A	23±1dBm	N/A
20	100		22±1dBm	21±1dBm	N/A	22±1dBm	N/A
20	1	16- QAM	23±1dBm	22±1dBm	N/A	23±1dBm	N/A
20	100		21±1dBm	20±1dBm	N/A	21±1dBm	N/A

LTE Band 13						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22±1dBm	23±1dBm	23±1dBm
5	1	13		23±1dBm	23±1dBm	23±1dBm
5	1	24		23±1dBm	23±1dBm	23±1dBm
5	25	0		22±1dBm	22±1dBm	22±1dBm
5	1	0	16-QAM	20±1dBm	22±1dBm	22±1dBm
5	1	13		22±1dBm	22±1dBm	22±1dBm
5	1	24		22±1dBm	22±1dBm	22±1dBm
5	25	0		21±1dBm	21±1dBm	21±1dBm
10	1	0	QPSK	-	22±1dBm	-
10	1	25		-	23±1dBm	-
10	1	49		-	23±1dBm	-
10	50	0		-	22±1dBm	-
10	1	0	16-QAM	-	21±1dBm	-
10	1	25		-	23±1dBm	-
10	1	49		-	23±1dBm	-
10	50	0		-	21±1dBm	-

LTE Band 30						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22±1dBm	22±1dBm	22±1dBm
5	1	13		22±1dBm	22±1dBm	22±1dBm
5	1	24		20±1dBm	22±1dBm	22±1dBm
5	25	0		21±1dBm	21±1dBm	21±1dBm
5	1	0	16-QAM	21±1dBm	21±1dBm	21±1dBm
5	1	13		21±1dBm	21±1dBm	21±1dBm
5	1	24		21±1dBm	21±1dBm	21±1dBm
5	25	0		20±1dBm	20±1dBm	19±1dBm
10	1	0	QPSK	-	22±1dBm	-
10	1	25		-	22±1dBm	-
10	1	49		-	22±1dBm	-
10	50	0		-	21±1dBm	-
10	1	0	16-QAM	-	22±1dBm	-
10	1	25		-	22±1dBm	-
10	1	49		-	22±1dBm	-
10	50	0		-	20±1dBm	-

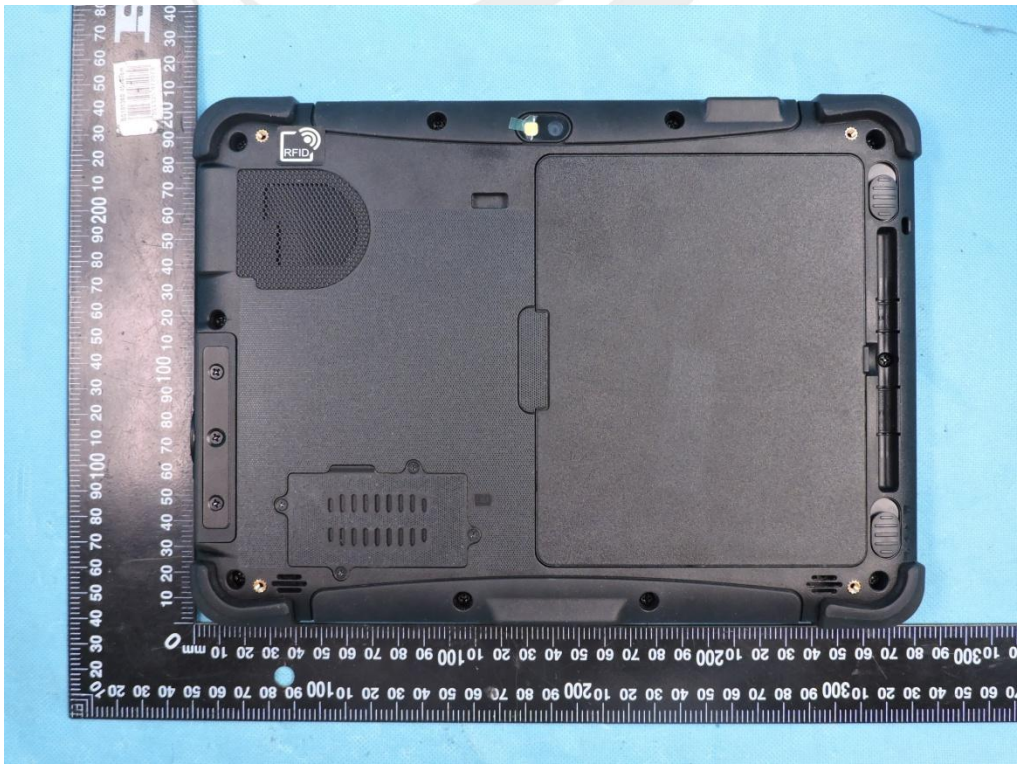
LTE Band 41						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	21±1dBm	21±1dBm	21±1dBm
5	1	13		21±1dBm	21±1dBm	20±1dBm
5	1	24		21±1dBm	21±1dBm	20±1dBm
5	25	0		20±1dBm	19±1dBm	20±1dBm
5	1	0	16-QAM	20±1dBm	19±1dBm	20±1dBm
5	1	13		20±1dBm	20±1dBm	20±1dBm
5	1	24		20±1dBm	19±1dBm	19±1dBm
5	25	0		19±1dBm	19±1dBm	19±1dBm
10	1	0	QPSK	21±1dBm	21±1dBm	21±1dBm
10	1	25		21±1dBm	21±1dBm	20±1dBm
10	1	49		21±1dBm	20±1dBm	20±1dBm
10	50	0		20±1dBm	19±1dBm	20±1dBm
10	1	0	16-QAM	20±1dBm	20±1dBm	20±1dBm
10	1	25		21±1dBm	20±1dBm	20±1dBm
10	1	49		20±1dBm	19±1dBm	19±1dBm
10	50	0		19±1dBm	18±1dBm	19±1dBm
15	1	0	QPSK	21±1dBm	21±1dBm	21±1dBm
15	1	38		19±1dBm	20±1dBm	19±1dBm
15	1	74		19±1dBm	20±1dBm	20±1dBm
15	75	0		19±1dBm	19±1dBm	20±1dBm
15	1	0	16-QAM	20±1dBm	20±1dBm	20±1dBm
15	1	38		18±1dBm	19±1dBm	20±1dBm
15	1	74		19±1dBm	19±1dBm	20±1dBm
15	75	0		18±1dBm	18±1dBm	19±1dBm
20	1	0	QPSK	21±1dBm	21±1dBm	21±1dBm
20	1	50		19±1dBm	21±1dBm	21±1dBm
20	1	99		19±1dBm	20±1dBm	21±1dBm
20	100	0		18±1dBm	19±1dBm	20±1dBm
20	1	0	16-QAM	19±1dBm	20±1dBm	20±1dBm
20	1	50		19±1dBm	20±1dBm	20±1dBm
20	1	99		19±1dBm	19±1dBm	20±1dBm
20	100	0		18±1dBm	18±1dBm	19±1dBm

11. EUT And Test Setup Photo

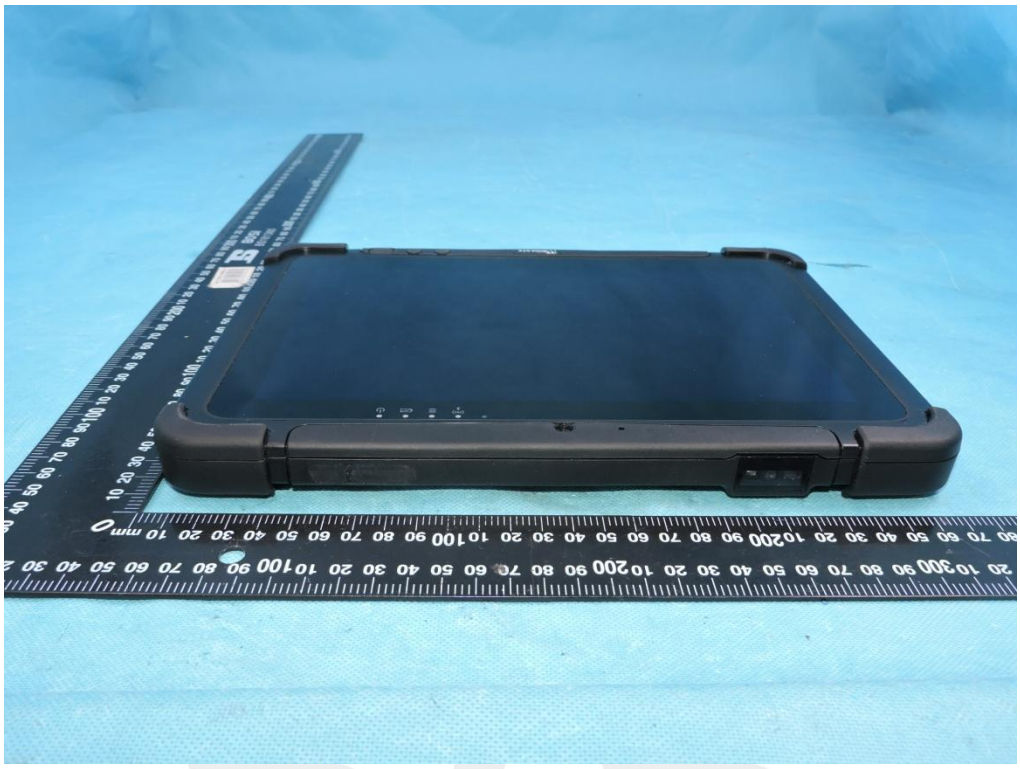
11.1 EUT Photo

Front side

Back side

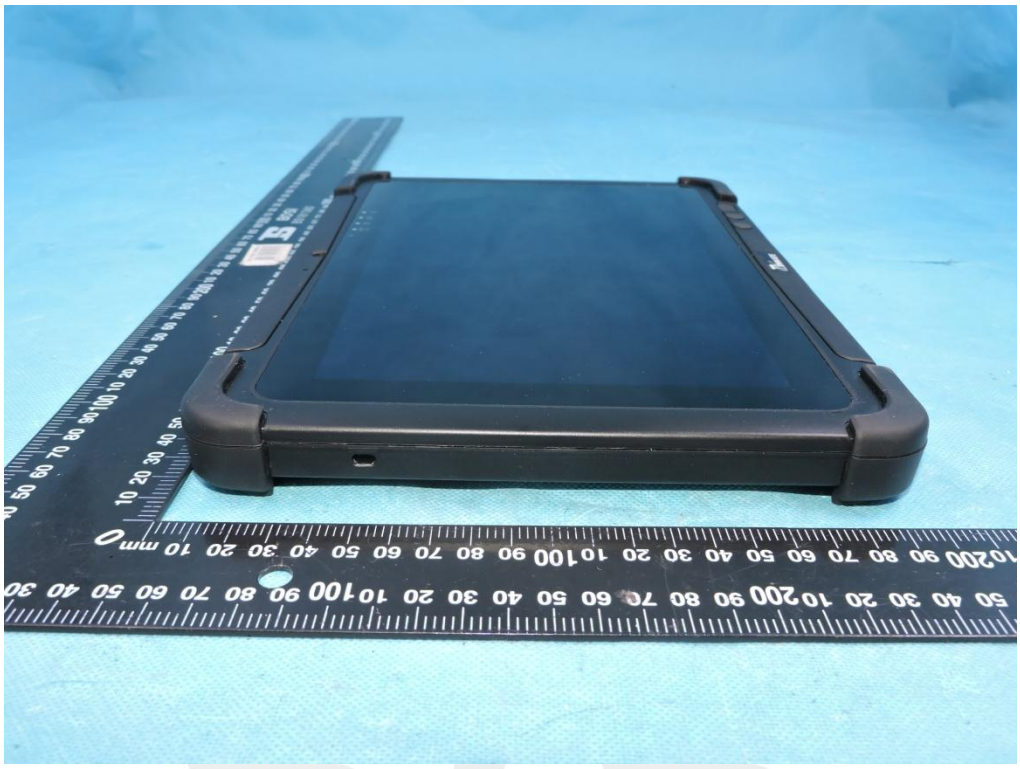


Top side



Bottom side

Left side



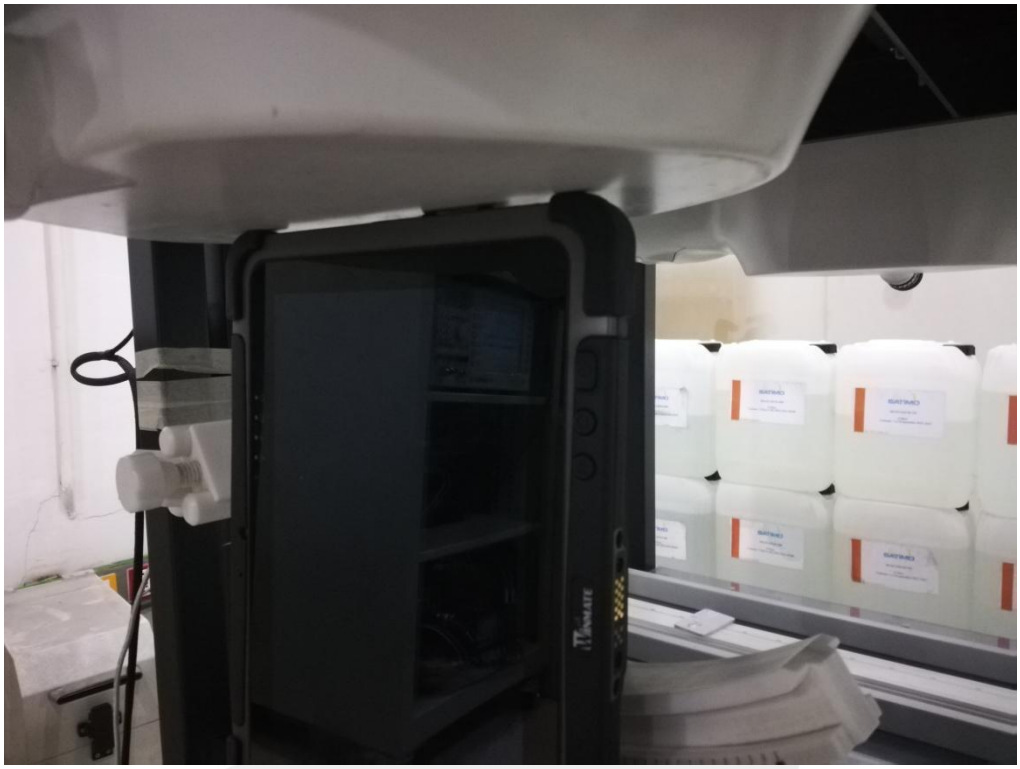
Right side

11.2 Setup Photo

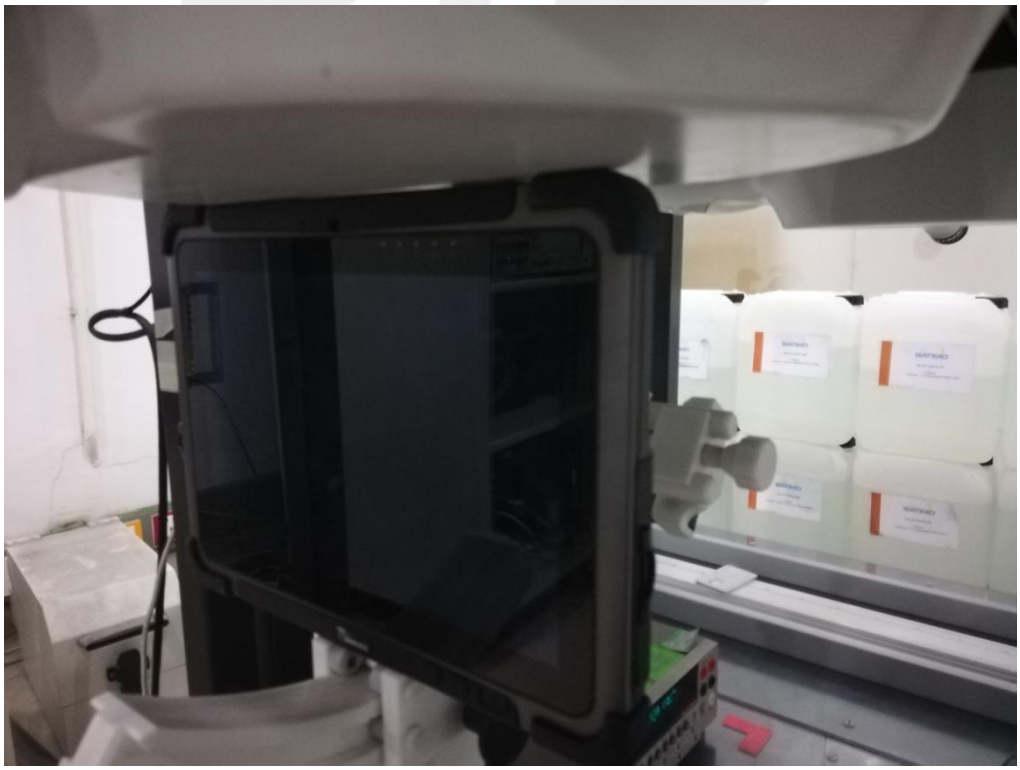
Body Back side(separation distance is 0mm)

Body left side(separation distance is 0mm)

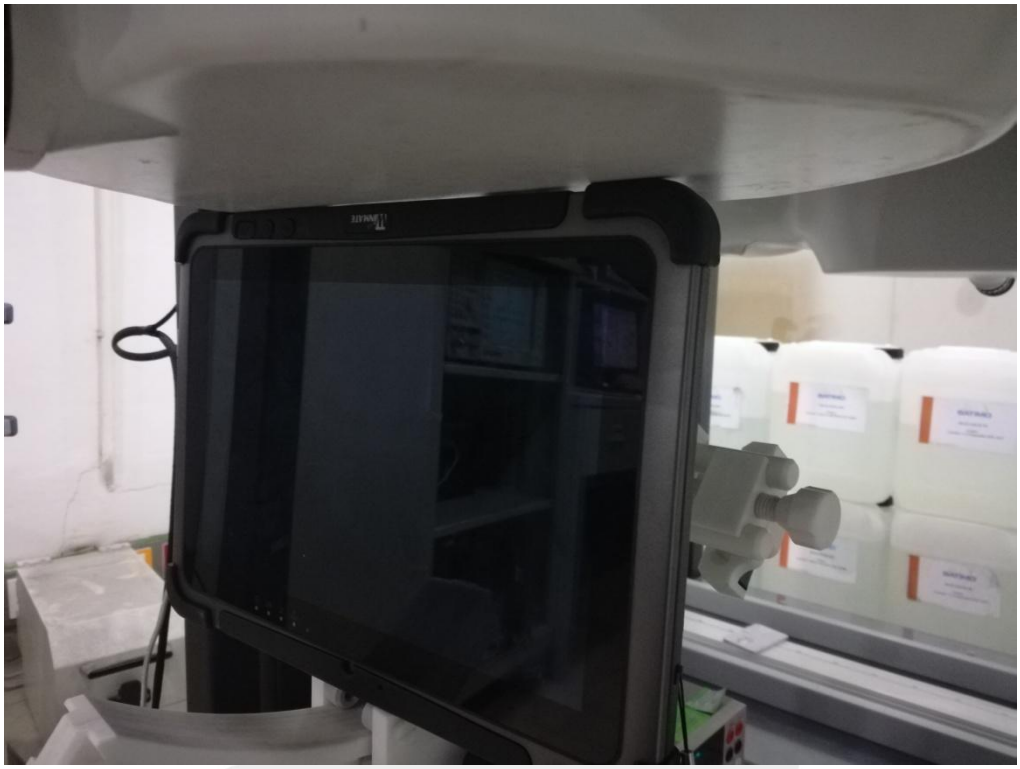
Body right side(separation distance is 0mm)



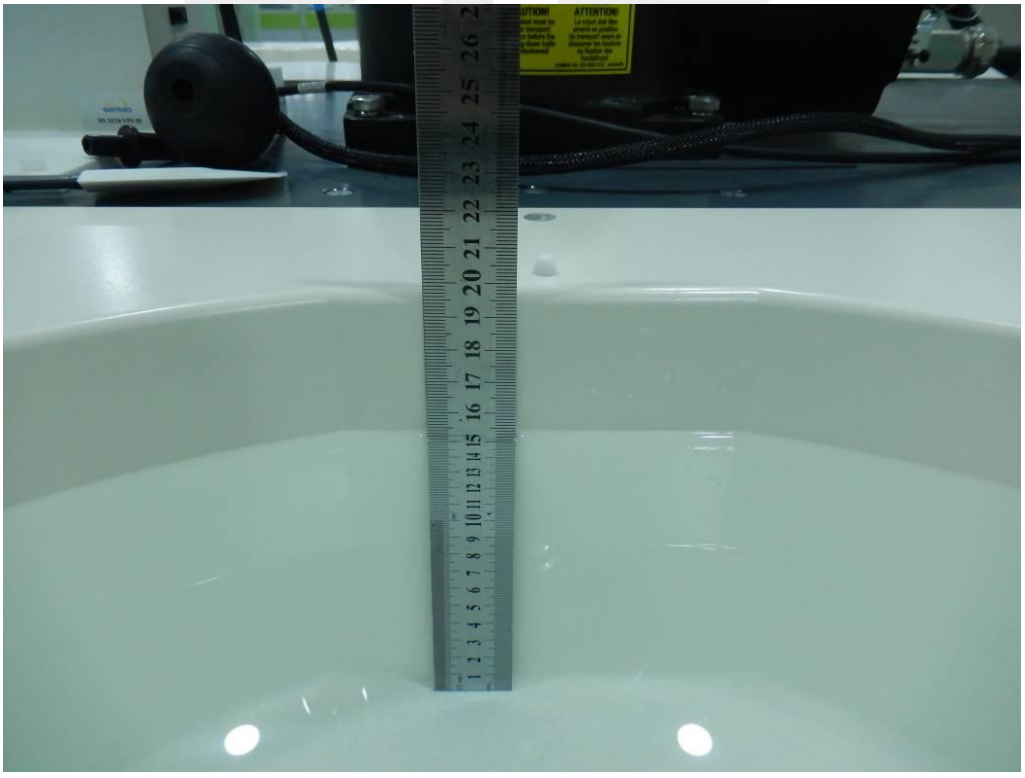
Body top side(separation distance is 0mm)



Body Bottom side(separation distance is 0mm)



Liquid depth (15 cm)



12. SAR Result Summary

12.1 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.
WCDMA II	RMC	Back side	9262	0.607	-1.95	24	23.52	**0.678**	1
		Left side	9262	0.411	-1.49	24	23.52	0.459	/
		Bottom side	9262	0.109	1.01	24	23.52	0.122	/
WCDMA IV	RMC	Back side	1413	0.509	-1.10	24	23.45	**0.578**	2
		Left side	1413	0.397	-3.37	24	23.45	0.451	/
		Bottom side	1413	0.116	2.27	24	23.45	0.132	/
WCDMA V	RMC	Back side	4233	0.037	-1.21	24	23.51	**0.041**	3
		Left side	4233	0.025	-3.76	24	23.51	0.028	/
		Bottom side	4233	0.009	-3.37	24	23.51	0.010	/

Band	Mode	Antenna	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.
2.4G WLAN	802.11b	A	Back side	7	0.257	-1.88	21.4	21.06	100	**0.278**	4
			Left side	7	0.135	-1.08	21.4	21.06	100	0.146	/
		B	Back side	7	0.051	-2.39	22	21.15	100	**0.062**	5
			Right side	7	0.028	2.54	22	21.15	100	0.034	/
			Top side	7	0.015	3.95	22	21.15	100	0.018	/
	802.11n	A	Back side	7	0.246	3.22	21	20.67	100	**0.265**	6
			Left side	7	0.109	1.04	21	20.67	100	0.118	/
		B	Back side	7	0.024	-3.19	22	21.10	100	**0.030**	7
			Right side	7	0.012	-0.01	22	21.10	100	0.015	/
			Top side	7	0.008	2.77	22	21.10	100	0.010	/

Note:

1. The test separation of all above table is 0mm.
2. Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
3. Per KDB 248227- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤1.2 W/kg. (The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was 0.271 W/Kg for Body)
4. When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the Wi-Fi transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The “Portable Hotspot” feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

Band	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 4	QPSK	1	0	Back Side	20175	0.574	-3.31	24	23.97	0.578	/
		1	0	Left Side	20050	1.124	1.24	24	23.40	1.291	/
		1	0	Left Side	20175	1.422	-0.16	24	23.97	**1.432**	8
		1	0	Left Side	20300	1.296	2.96	24	23.71	1.385	/
		100	0	Left Side	20050	1.159	1.96	23	22.56	1.283	/
		1	0	Bottom Side	20175	0.105	1.68	24	23.97	0.106	/
LTE Band 7	QPSK	1	0	Back Side	21100	0.466	0.54	23	22.93	**0.474**	9
		1	0	Left Side	21100	0.411	2.88	23	22.93	0.418	/
		1	0	Bottom Side	21100	0.206	1.84	23	22.93	0.209	/
LTE Band 12	QPSK	1	0	Back Side	23017	0.231	-3.18	24	23.99	**0.232**	10
		1	0	Left Side	23017	0.143	-1.22	24	23.99	0.143	/
		1	0	Top Side	23017	0.072	1.00	24	23.99	0.072	/
		1	0	Bottom Side	23017	0.103	-0.49	24	23.99	0.103	/
LTE Band 13	QPSK	1	25	Back Side	23230	0.137	-2.35	24	23.93	**0.139**	11
		1	25	Left Side	23230	0.109	-2.44	24	23.93	0.111	/
		1	25	Top Side	23230	0.048	-1.45	24	23.93	0.049	/
		1	25	Bottom Side	23230	0.057	-0.74	24	23.93	0.058	/
LTE Band 25	QPSK	1	0	Back Side	26590	0.207	-0.81	24	23.99	**0.207**	12
		1	0	Left Side	26590	0.175	2.09	24	23.99	0.175	/
		1	0	Bottom Side	26590	0.083	-2.85	24	23.99	0.083	/
LTE Band 26	QPSK	1	0	Back Side	26865	0.024	-0.85	24	23.98	**0.024**	13
		1	0	Left Side	26865	0.018	3.96	24	23.98	0.018	/
		1	0	Top Side	26865	0.006	1.58	24	23.98	0.006	/
		1	0	Bottom Side	26865	0.009	-0.40	24	23.98	0.009	/
LTE Band 30	QPSK	1	13	Back Side	27710	0.251	1.69	23	22.95	**0.254**	14
		1	13	Left Side	27710	0.207	-1.34	23	22.95	0.209	/
		1	13	Bottom Side	27710	0.111	3.40	23	22.95	0.112	/
LTE Band 41	QPSK	1	50	Back Side	41690	0.912	-1.03	20	19.94	0.925	/
		1	50	Back Side	42590	0.803	2.19	22	21.30	0.943	/
		1	50	Back Side	43490	0.975	-0.03	22	21.53	**1.086**	15
		100	0	Back Side	43490	0.868	3.97	21	20.39	0.999	/
		1	50	Left Side	43490	0.158	-3.42	22	21.53	0.176	/

LTE BAND 2

SAR for LTE Band 2 (Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth

LTE BAND 5

SAR for LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth

Band	Mode	Antenna	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
5.2G WLAN	802.11a	A	Back side	48	0.071	0.42	22	21.06	**0.088**	16
			Left side	48	0.036	-3.37	22	21.06	0.045	/
		B	Back side	48	0.162	-2.11	22	21.23	**0.193**	17
			Right side	48	0.082	-0.95	22	21.23	0.098	
			Top side	48	0.037	-1.45	22	21.23	0.044	
	802.11n	A	Back side	48	0.034	3.39	22	21.18	**0.041**	18
			Left side	48	0.019	-3.46	22	21.18	0.023	
		B	Back side	48	0.031	2.37	22	21.05	**0.039**	19
			Right side	48	0.023	1.98	22	21.05	0.029	
			Top side	48	0.012	2.58	22	21.05	0.015	

Band	Mode	Test Position	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
Bluetooth	GFSK	Back side	0.045	2.01	10	9.95	**0.046**	20
		Left side	0.024	1.16	10	9.95	0.024	/

Band	Mode	Scaled SAR (W/Kg)		A+B
WLAN 2.4G	802.11n	Antenna A	0.265	**0.295**
	802.11n	Antenna B	0.030	
WLAN 5.2G	802.11n	Antenna A	0.041	0.080
	802.11n	Antenna B	0.039	

Note:

1. The test separation of all above table is 0mm.
2. Per KDB 447498 D01v05r01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
3. When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the Wi-Fi transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The “Portable Hotspot” feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

Repeated SAR

Band	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 41	Back Side	43490	0.951	-1.62	22	21.53	1.060	/
LTE Band 4	Left Side	20175	1.407	3.01	24	23.97	1.417	/

12.2 repeated SAR measurement

Band	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
LTE Band 41	Back Side	43490	0.975	0.951	1.03	-	-	-
LTE Band 4	Left Side	20175	1.422	1.407	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:

RF Exposure Condition	Item	Capable Transmit Configurations		
Standalone	1	WWAN OFF	+ Antenna B Wi-Fi 2.4 GHz	+Bluetooth
	2		+ Antenna B Wi-Fi 5.2 GHz	+Bluetooth
	3	WCDMA WWAN ON	+ Antenna A Wi-Fi 2.4 GHz	
	4		+ Antenna B Wi-Fi 2.4 GHz	
	5		+ Antenna A+B Wi-Fi 2.4 GHz	
	6		+ Antenna B Wi-Fi 2.4 GHz	+Bluetooth
	7			+Bluetooth
	8		+ Antenna A Wi-Fi 5.2 GHz	
	9		+ Antenna B Wi-Fi 5.2 GHz	
	10		+ Antenna A+B Wi-Fi 5.2 GHz	
	11		+ Antenna B Wi-Fi 5.2 GHz	+ Bluetooth
	12	LTE WWAN ON	+ Antenna B Wi-Fi 2.4 GHz	+Bluetooth
	13		+ Antenna B Wi-Fi 5.2 GHz	+Bluetooth
	14		+ Antenna A Wi-Fi 2.4 GHz	
	15		+ Antenna B Wi-Fi 2.4 GHz	
	16		+ Antenna A+B Wi-Fi 2.4 GHz	
	17		+ Antenna B Wi-Fi 2.4 GHz	+Bluetooth
	18			+Bluetooth
	19		+ Antenna A Wi-Fi 5.2 GHz	
	20		+ Antenna B Wi-Fi 5.2 GHz	

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.

Sum of the SAR for Wi-Fi and BT

Test Position	Standalone SAR (W/ kg)		
	A	B	C
	2.4G WLAN Ant B	5.2G WLAN Ant B	Bluetooth
Back side	0.062	0.039	0.046
Left side	0	0	0.024
Right side	0.034	0.029	0
Top side	0.018	0.015	0
Bottom side	0	0	0

Test Position	Σ 1-g SAR (W/ kg)	
	A+C	B+C
Back side	0.108	0.085
Left side	0.024	0.024
Right side	0.034	0.029
Top side	0.018	0.015
Bottom side	0	0

Sum of the SAR for WCDMA,WIFI and BT

Test Position	Standalone SAR (W/ kg)							
	A	B	C	D	E	F	G	H
	WCDMA	2.4G WLAN Ant A	2.4G WLAN Ant B	2.4G WLAN Ant A+B	5.2G WLAN Ant A	5.2G WLAN Ant B	5.2G WLAN Ant A+B	Bluetooth
Back side	0.678	0.278	0.062	0.295	0.088	0.039	0.080	0.046
Left side	0.459	0.146	0	0.118	0.045	0	0.023	0.024
Right side	0	0	0.034	0.015	0	0.029	0.029	0
Top side	0	0	0.018	0.010	0	0.015	0.015	0
Bottom side	0.132	0	0	0	0	0	0	0

Test Position	Σ 1-g SAR (W/ kg)								
	A+B	A+C	A+D	A+C+H	A+H	A+E	A+F	A+G	A+F+H
Back side	0.956	0.740	0.973	0.786	0.724	0.766	0.717	0.758	0.763
Left side	0.605	0.459	0.577	0.483	0.483	0.504	0.459	0.482	0.483
Right side	0	0.034	0.015	0.034	0	0	0.029	0.029	0.029
Top side	0	0.018	0.010	0.018	0	0	0.015	0.015	0.015
Bottom side	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132

Sum of the SAR for LTE,WIFI and BT

Test Position	Standalone SAR (W/ kg)							
	A	B	C	D	E	F	G	H
	LTE	2.4G WLAN Ant A	2.4G WLAN Ant B	2.4G WLAN Ant A+B	5.2G WLAN Ant A	5.2G WLAN Ant B	5.2G WLAN Ant A+B	Bluetooth
Back side	1.086	0.278	0.062	0.295	0.088	0.039	0.080	0.046
Left side	1.432	0.146	0	0.118	0.045	0	0.023	0.024
Right side	0	0	0.034	0.015	0	0.029	0.029	0
Top side	0.072	0	0.018	0.010	0	0.015	0.015	0
Bottom side	0.209	0	0	0	0	0	0	0

Test Position	∑ 1-g SAR (W/ kg)								
	A+B	A+C	A+D	A+C+H	A+H	A+E	A+F	A+G	A+F+H
Back side	1.364	1.148	1.381	1.194	1.132	1.174	1.125	1.166	1.171
Left side	**1.578**	1.432	1.550	1.456	1.456	1.477	1.432	1.455	1.456
Right side	0	0.034	0.015	0.034	0	0	0.029	0.029	0.029
Top side	0.072	0.09	0.082	0.09	0.072	0.072	0.087	0.087	0.087
Bottom side	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209

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	MVG	SID750	SN 30/14 DIP0G750-331	2017.08.15	2020.08.14
835MHz Dipole	MVG	SID835	SN 30/14 DIP0G835-332	2017.08.15	2020.08.14
1800MHz Dipole	MVG	SID1800	SN 30/14 DIP1G800-329	2017.08.15	2020.08.14
1900MHz Dipole	MVG	SID1900	SN 30/14 DIP1G900-333	2017.08.15	2020.08.14
2450MHzDipole	MVG	SID2450	SN 30/14 DIP2G450-335	2017.08.15	2020.08.14
2600MHz Dipole	MVG	SID2600	SN 30/14 DIP2G600-336	2017.08.15	2020.08.14
Waveguide	SATIMO	SWG5500	SN 13/14 WGA32	2017.08.15	2020.08.14
E-Field Probe	MVG	SSE2	SN 45/15 EPGO281	2018.04.10	2019.04.09
Dielectric Probe Kit	MVG	SCLMP	SN 32/14 OCPG67	2018.04.10	2019.04.09
Antenna	MVG	ANTA3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	MVG	SAM	SN 32/14 SAM115	2014.09.01	N/A
Phantom2	MVG	SAM	SN 32/14 SAM116	2014.09.01	N/A
Phone holder	MVG	N/A	SN 32/14 MSH97	2014.09.01	N/A
Laptop holder	MVG	N/A	SN 32/14 LSH29	2014.09.01	N/A
Network Analyzer	Agilent	8753ES	US38432810	2018.03.08	2019.03.07
Multi Meter	Keithley	Multi Meter 2000	4050073	2018.10.13	2019.10.12
Signal Generator	Agilent	N5182A	MY50140530	2018.10.16	2019.10.15
Wireless Communication Test Set	Agilent	8960-E5515C	MY48360751	2018.10.16	2019.10.15
Wireless Communication Test Set	R&S	CMW500	117239	2018.10.13	2019.10.12
Power Amplifier	DESAY	ZHL-42W	9638	2018.10.13	2019.10.12
Power Meter	R&S	NRP	100510	2018.10.26	2019.10.25
Power Meter	Agilent	E4418B	GB43312526	2018.10.26	2019.10.25
Power Sensor	R&S	NRP-Z11	101919	2018.10.13	2019.10.12
Power Sensor	Agilent	E9301A	MY41497725	2018.10.13	2019.10.12
9dB Attenuator	Agilent	99899	DC-18GHz	2018.05.09	2019.05.08
11dB Attenuator	Agilent	8494B	DC-18GHz	2018.05.09	2019.05.08
110dB Attenuator	Agilent	8494B	DC-18GHz	2018.05.09	2019.05.08
Directional coupler	Narda	4226-20	3305	2018.05.09	2019.05.08
hygrothermograph	MiEO	HH660	N/A	2018.10.11	2019.10.10
Thermograph	Elitech	RC-4	S/N EF7176501537	2018.10.15	2019.10.14

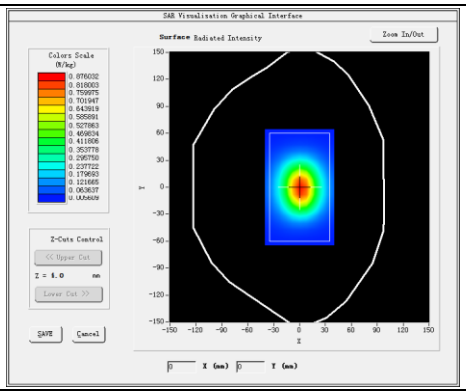
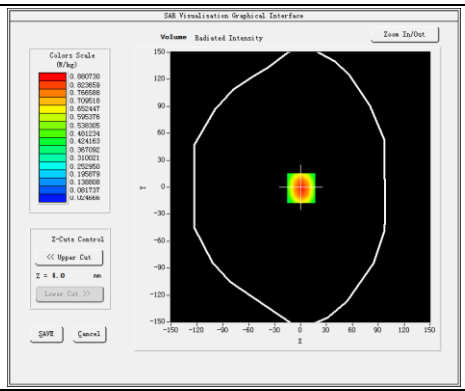
Appendix A. System Validation Plots

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: 2018-11-30
Measurement duration: 14 minutes 12 seconds

Experimental conditions.

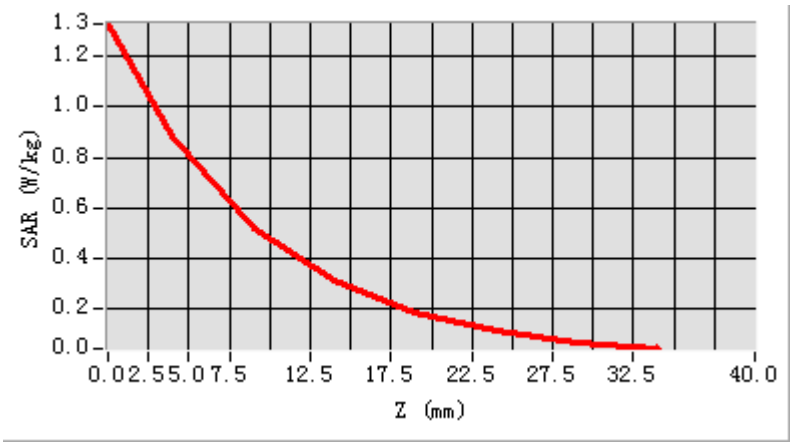
Probe	
Phantom	Validation plane
Device Position	-
Band	750MHz
Channels	-
Signal	CW
Frequency (MHz)	750MHz
Relative permittivity	55.13
Conductivity (S/m)	0.96
Power drift (%)	1.44
Probe	SN 45/15 EPGO281
ConvF:	1.59
Crest factor:	1:1

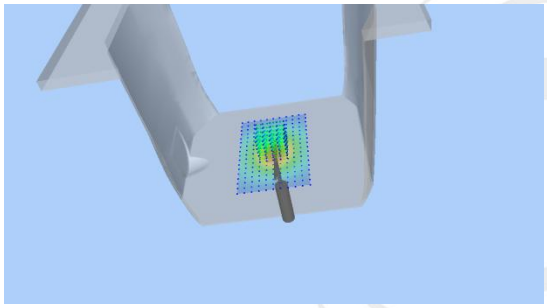
SURFACE SAR	VOLUME SAR
	

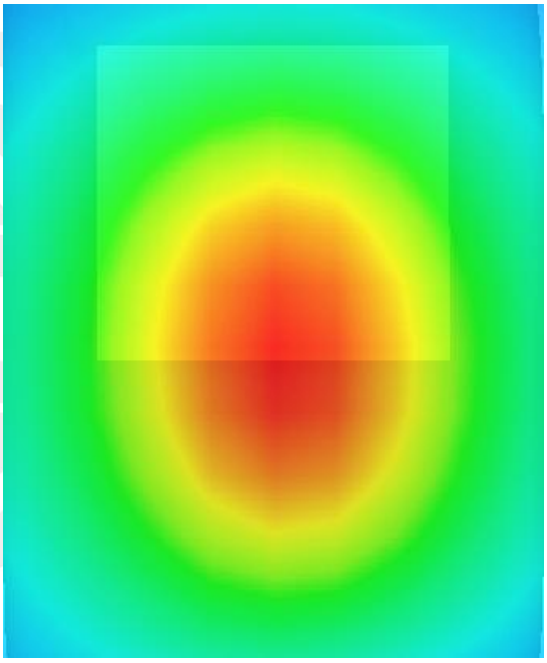
Maximum location: X=1.00, Y=-1.00

SAR 10g (W/Kg)	0.518932
SAR 1g (W/Kg)	0.868120

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)



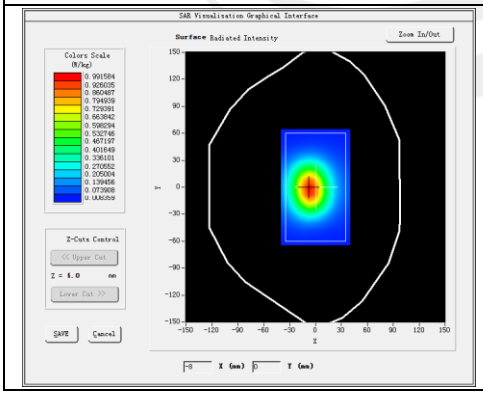
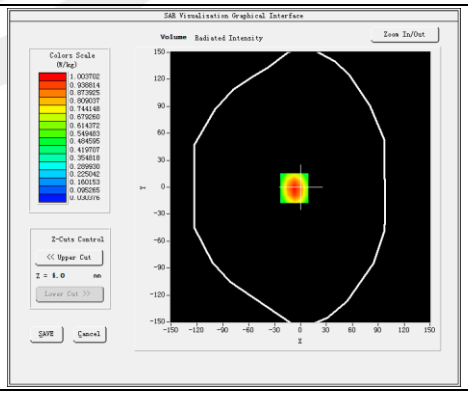


System Performance Check Data (835MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018-11-13
Measurement duration: 14 minutes 13 seconds

Experimental conditions.

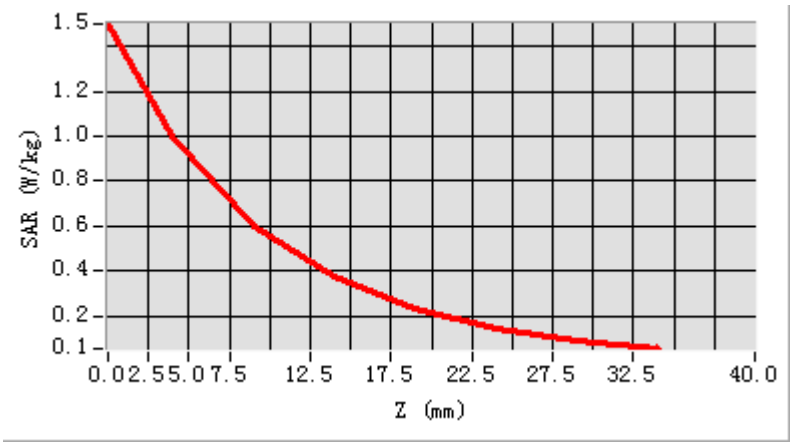
Probe	
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	55.95
Conductivity (S/m)	0.95
Power drift (%)	-0.37
Probe	SN 45/15 EPGO281
ConvF:	1.85
Crest factor:	1:1

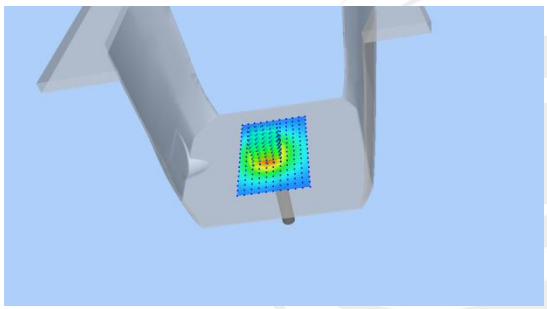
SURFACE SAR	VOLUME SAR
	

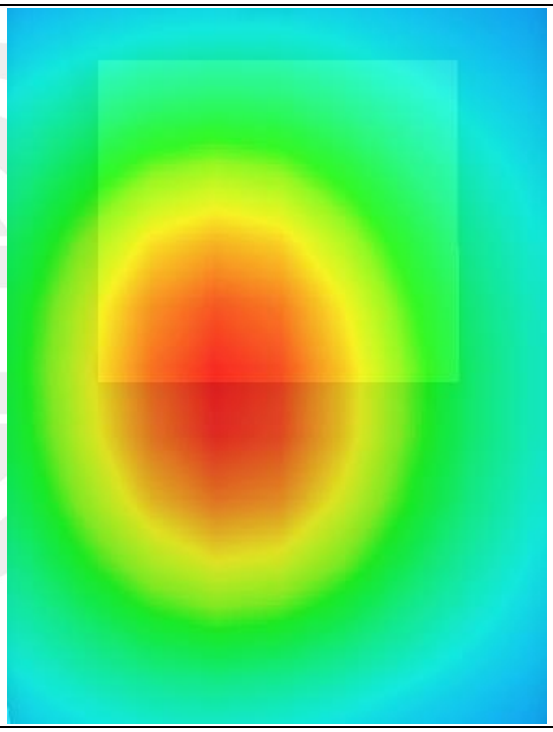
Maximum location: X=-7.00, Y=-1.00

SAR 10g (W/Kg)	0.535701
SAR 1g (W/Kg)	1.011291

Z Axis Scan


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



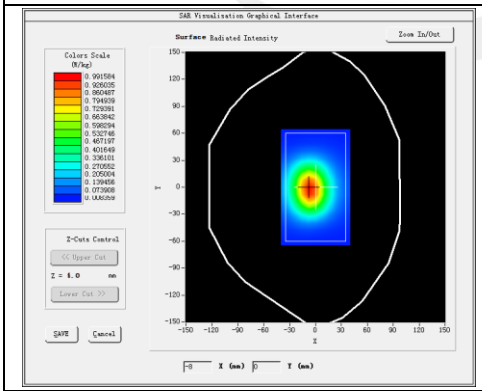
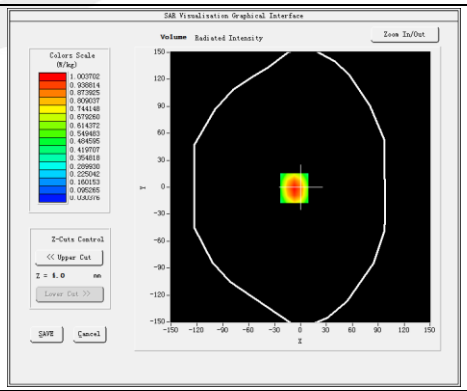


System Performance Check Data (835MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018-12-01
Measurement duration: 14 minutes 13 seconds

Experimental conditions.

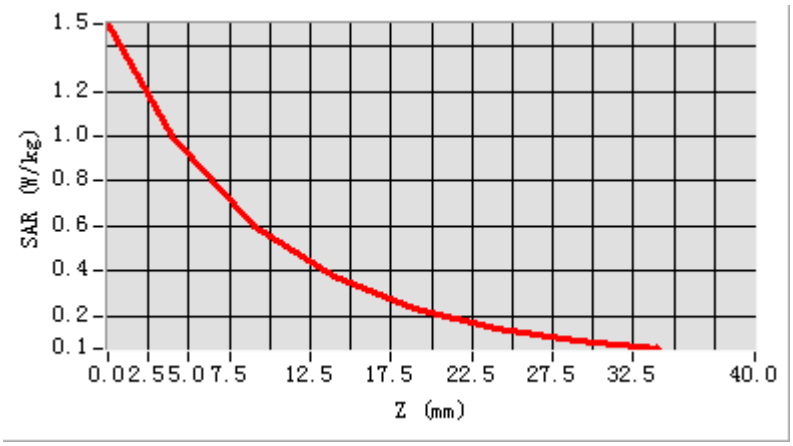
Probe	
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	54.50
Conductivity (S/m)	0.95
Power drift (%)	-0.44
Probe	SN 45/15 EPGO281
ConvF:	1.85
Crest factor:	1:1

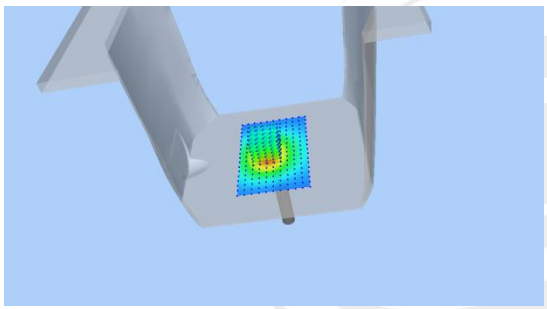
SURFACE SAR	VOLUME SAR
	

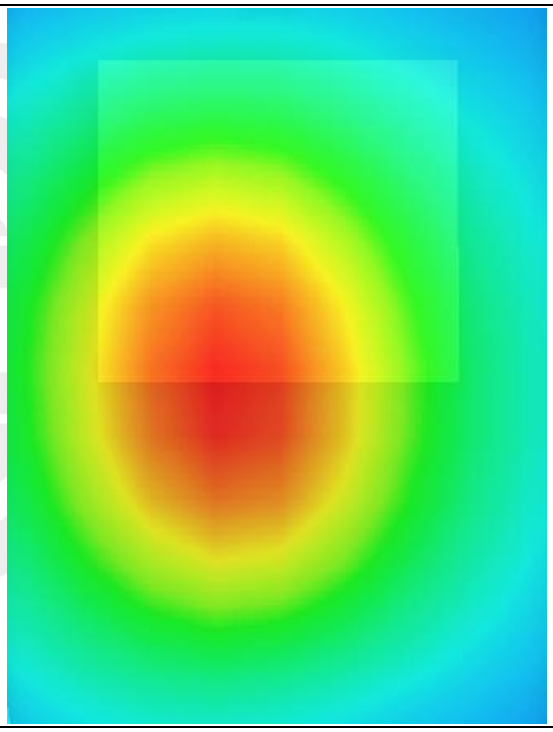
Maximum location: X=-7.00, Y=-1.00

SAR 10g (W/Kg)	0.521548
SAR 1g (W/Kg)	0.962429

Z Axis Scan


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



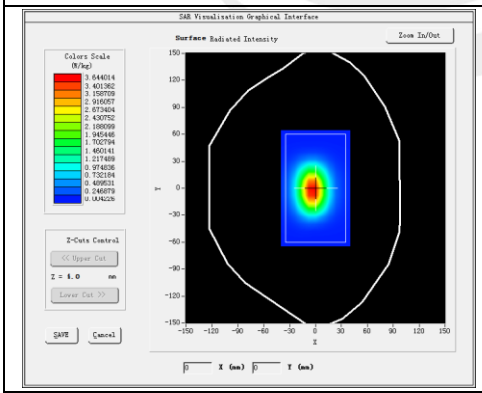
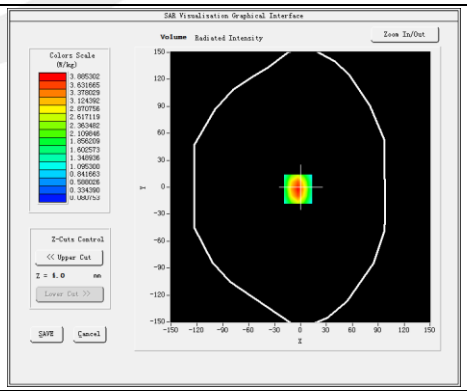


System Performance Check Data(1800MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018-11-15

Experimental conditions.

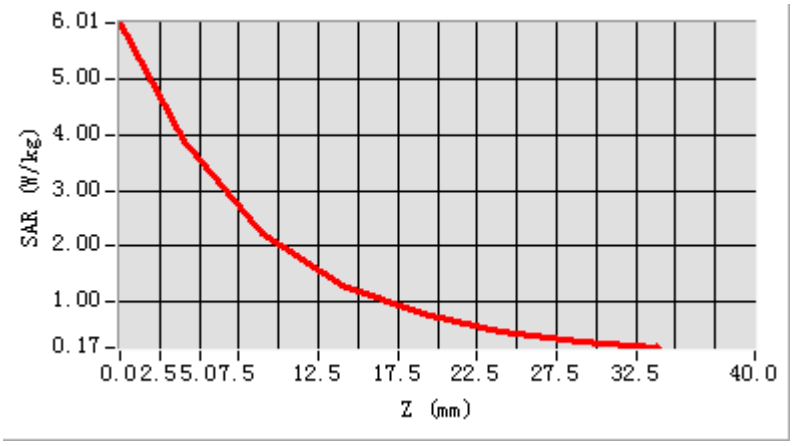
Phantom	Validation plane
Device Position	-
Band	1800MHz
Channels	-
Signal	CW
Frequency (MHz)	1800MHz
Relative permittivity	53.96
Conductivity (S/m)	1.50
Power drift (%)	-0.28
Probe	SN 45/15 EPGO281
ConvF	1.87
Crest factor:	1:1

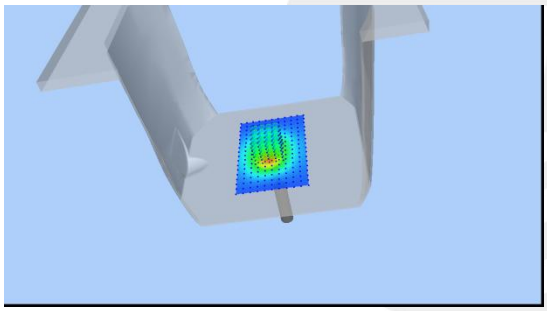
SURFACE SAR	VOLUME SAR
	

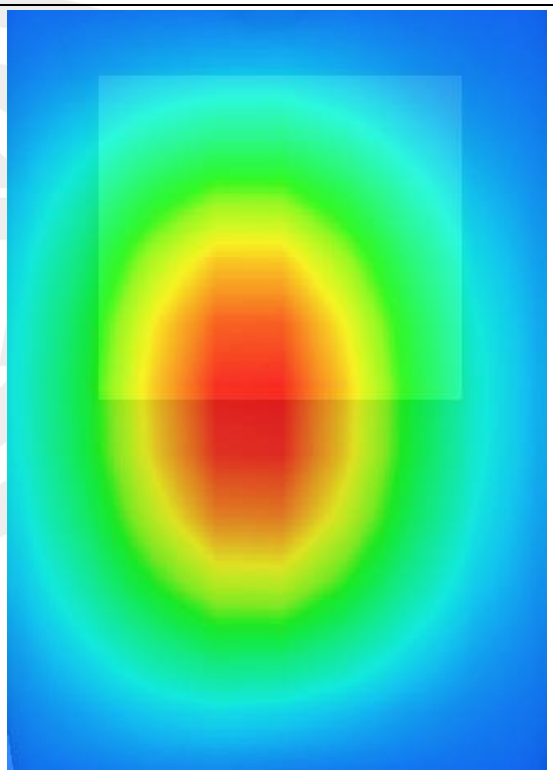
Maximum location: X=-3.00, Y=-2.00

SAR 10g (W/Kg)	2.158147
SAR 1g (W/Kg)	3.758104

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)



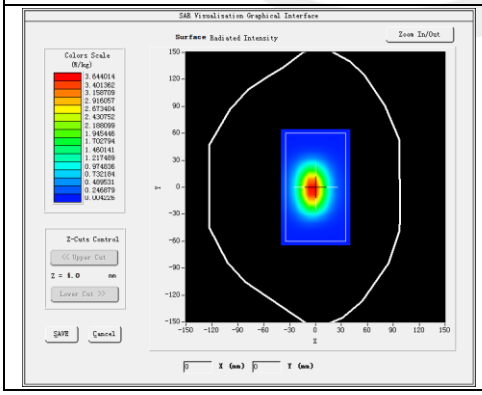
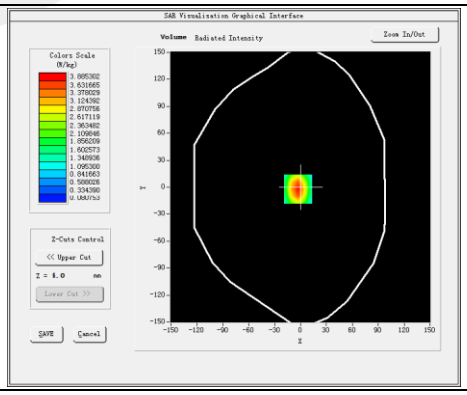


System Performance Check Data(1800MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018-12-02

Experimental conditions.

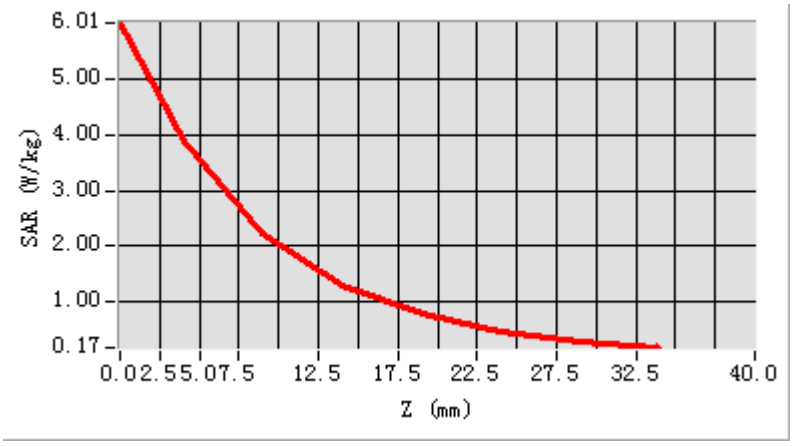
Phantom	Validation plane
Device Position	-
Band	1800MHz
Channels	-
Signal	CW
Frequency (MHz)	1800MHz
Relative permittivity	53.22
Conductivity (S/m)	1.52
Power drift (%)	-1.08
Probe	SN 45/15 EPGO281
ConvF	1.87
Crest factor:	1:1

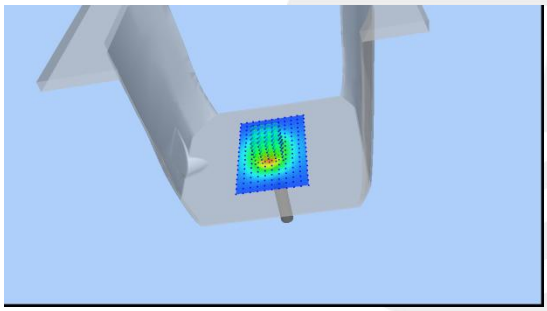
SURFACE SAR	VOLUME SAR
	

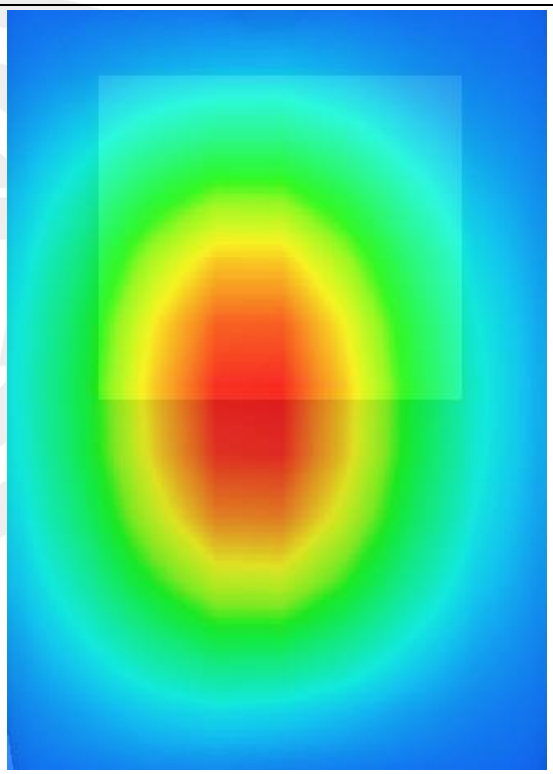
Maximum location: X=-3.00, Y=-2.00

SAR 10g (W/Kg)	2.125486
SAR 1g (W/Kg)	3.824932

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)



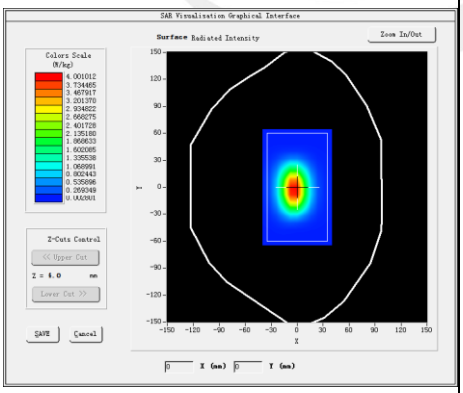
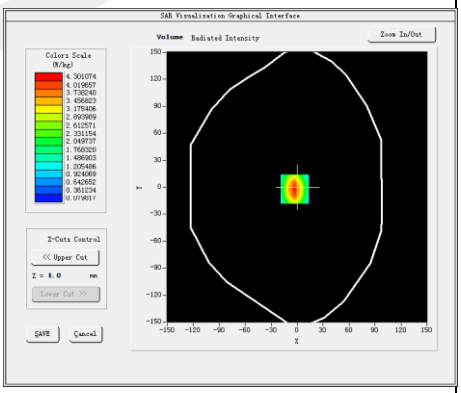


System Performance Check Data (1900MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018-11-17
Measurement duration: 14 minutes 46 seconds

Experimental conditions.

Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900
Relative permittivity	53.76
Conductivity (S/m)	1.50
Power drift (%)	-0.31
Probe	SN 45/15 EPGO281
ConvF:	1.57
Crest factor:	1:1

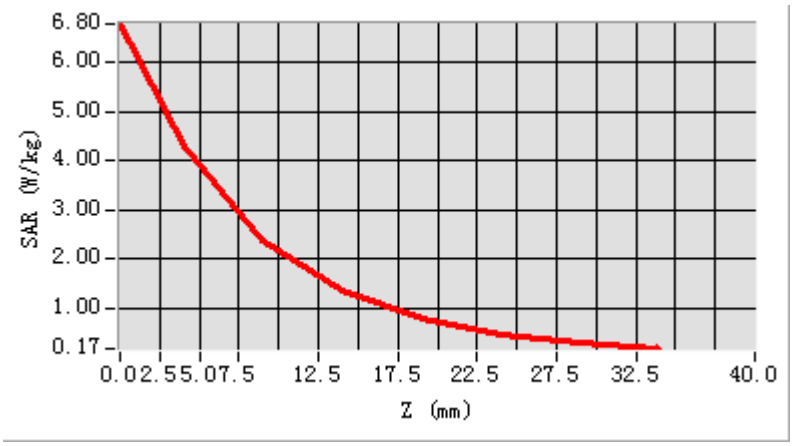
SURFACE SAR	VOLUME SAR
	

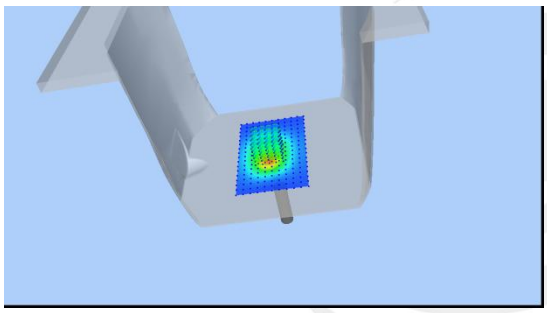
Maximum location: X=-3.00, Y=-2.00

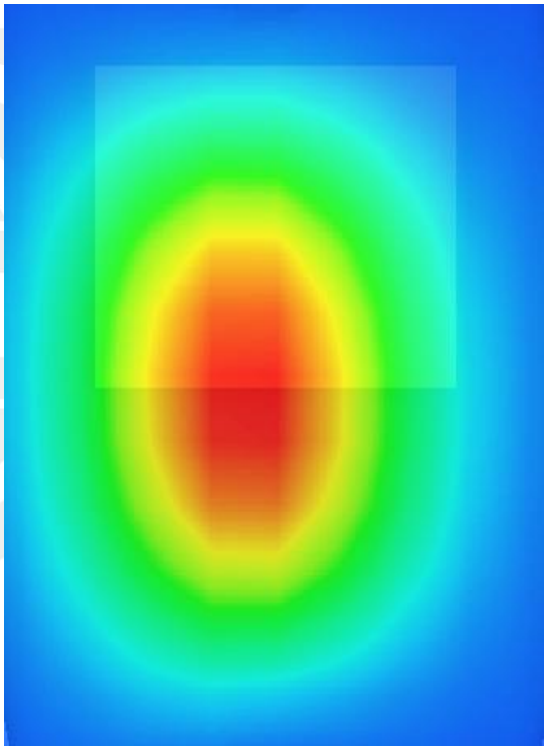
SAR Peak: 5.27 W/kg

SAR 10g (W/Kg)	2.158147
SAR 1g (W/Kg)	3.758104

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)



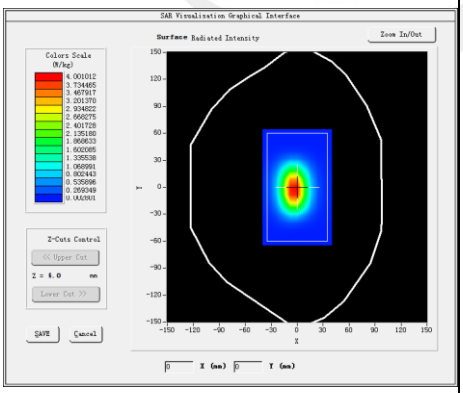
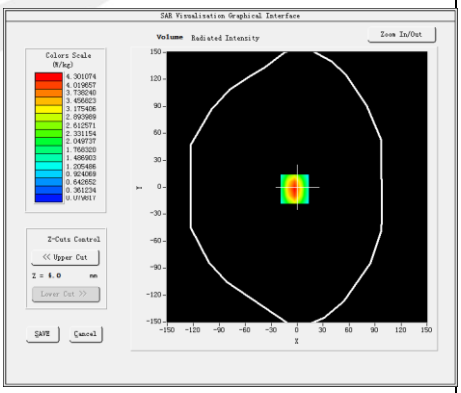


System Performance Check Data (1900MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018-12-04
Measurement duration: 14 minutes 46 seconds

Experimental conditions.

Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900
Relative permittivity	53.05
Conductivity (S/m)	1.53
Power drift (%)	0.82
Probe	SN 45/15 EPGO281
ConvF:	1.57
Crest factor:	1:1

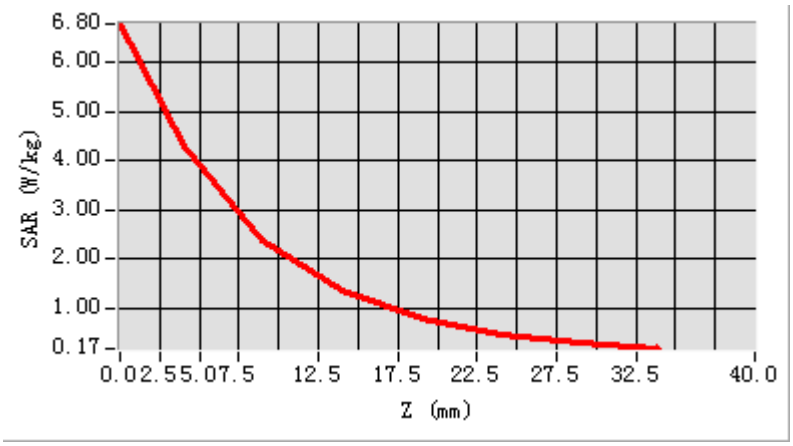
SURFACE SAR	VOLUME SAR
	

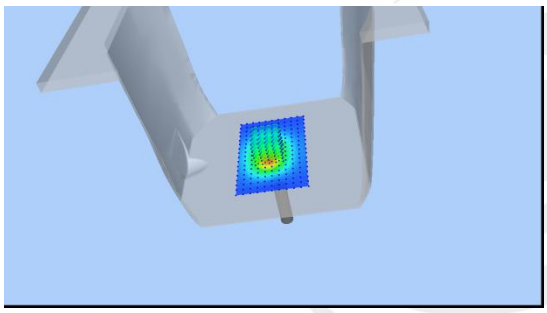
Maximum location: X=-3.00, Y=-2.00

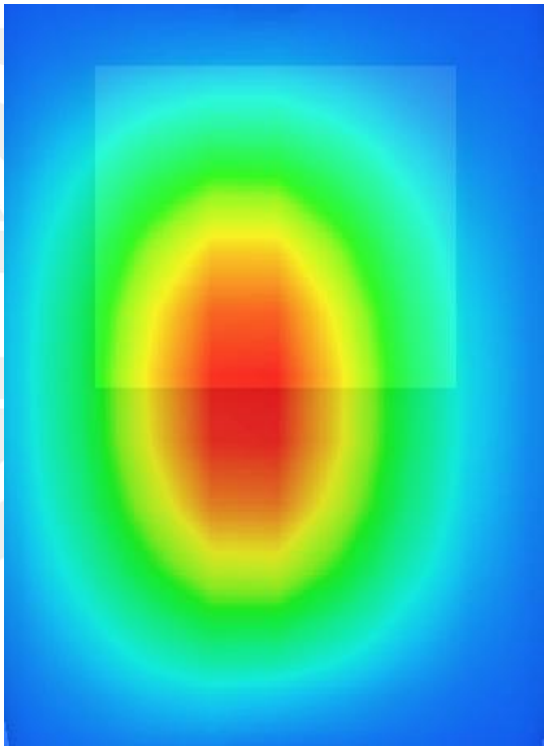
SAR Peak: 5.27 W/kg

SAR 10g (W/Kg)	2.254856
SAR 1g (W/Kg)	4.111457

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)



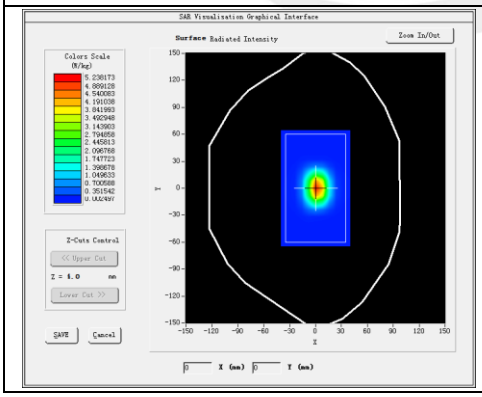
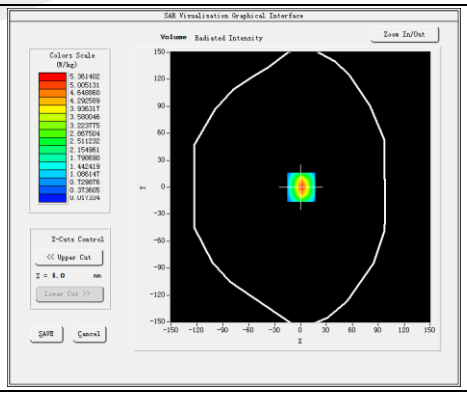


System Performance Check Data (2450MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018-12-06
Measurement duration: 14 minutes 23 seconds

Experimental conditions.

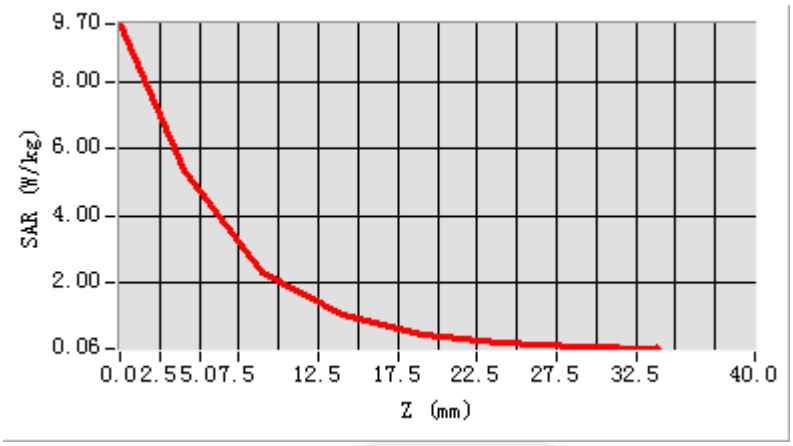
Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	51.57
Conductivity (S/m)	1.92
Power drift (%)	-0.30
Probe	SN 45/15 EPGO281
ConvF	2.28
Crest factor:	1:1

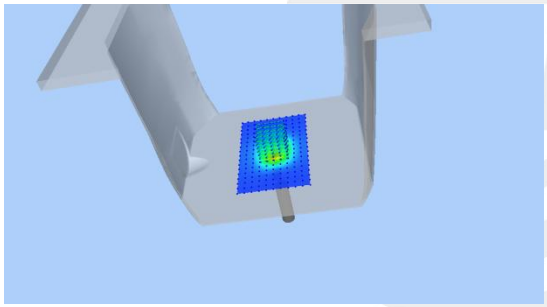
SURFACE SAR	VOLUME SAR
	

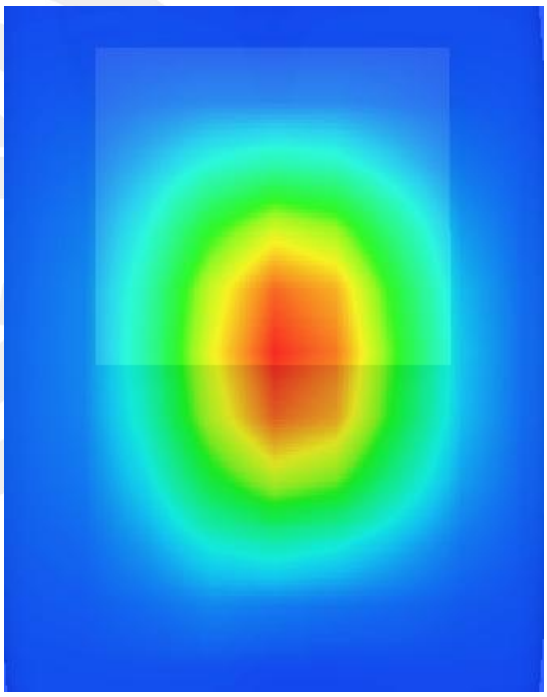
Maximum location: X=1.00, Y=0.00

SAR 10g (W/Kg)	2.410178
SAR 1g (W/Kg)	5.320687

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)



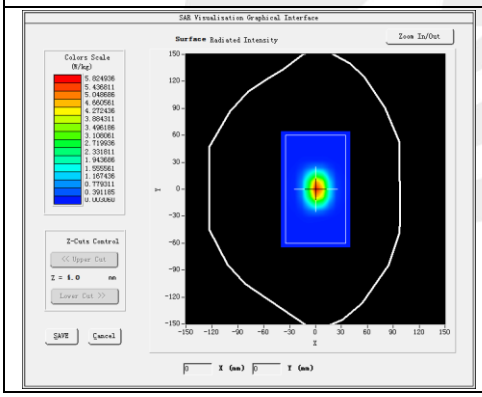
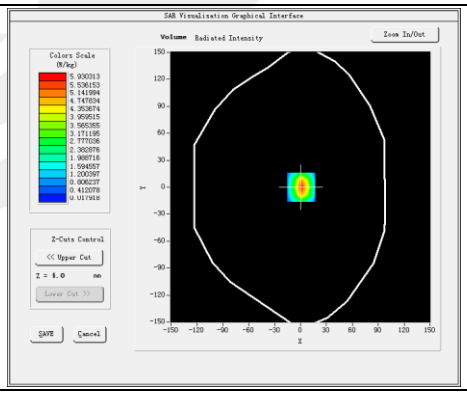


System Performance Check Data(2600MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018-12-08

Experimental conditions.

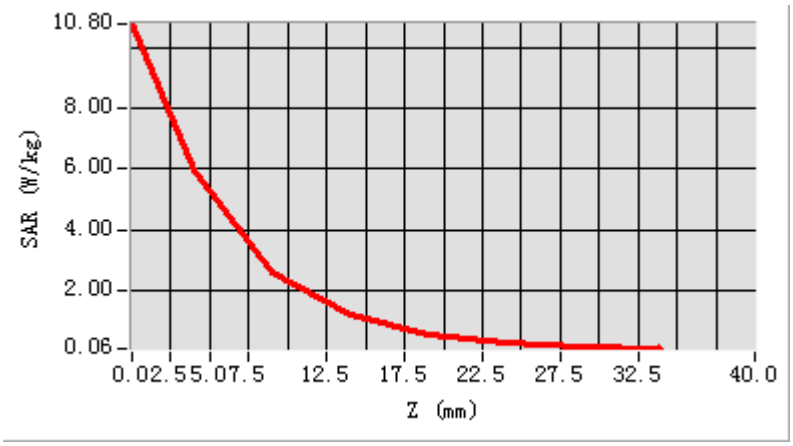
Device Position	Validation plane
Band	2600 MHz
Channels	-
Signal	CW
Frequency (MHz)	2600
Relative permittivity	51.69
Conductivity (S/m)	2.15
Power drift (%)	-0.30
Probe	SN 45/15 EPGO281
ConvF	2.38
Crest factor:	1:1

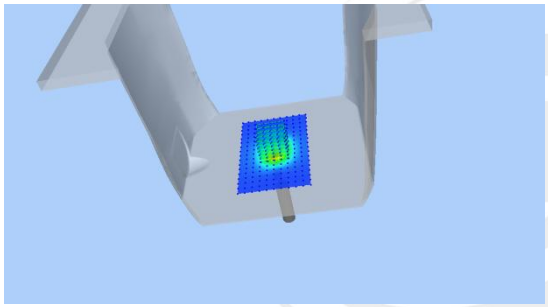
SURFACE SAR	VOLUME SAR
	

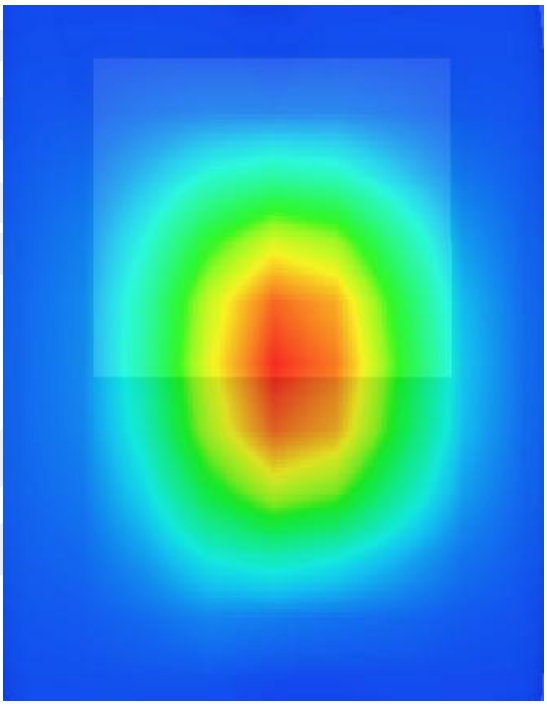
Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	2.610147
SAR 1g (W/Kg)	5.986347

Z Axis Scan


10.80
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)

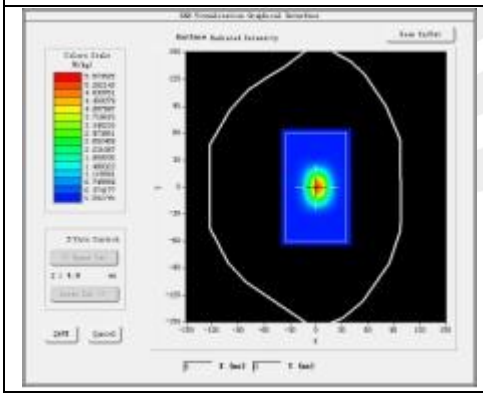
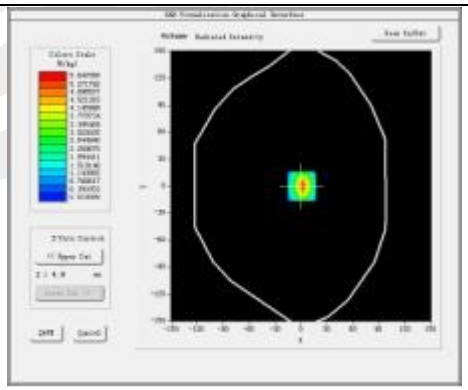




System Performance Check Data(5200MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018-12-09
Experimental conditions.

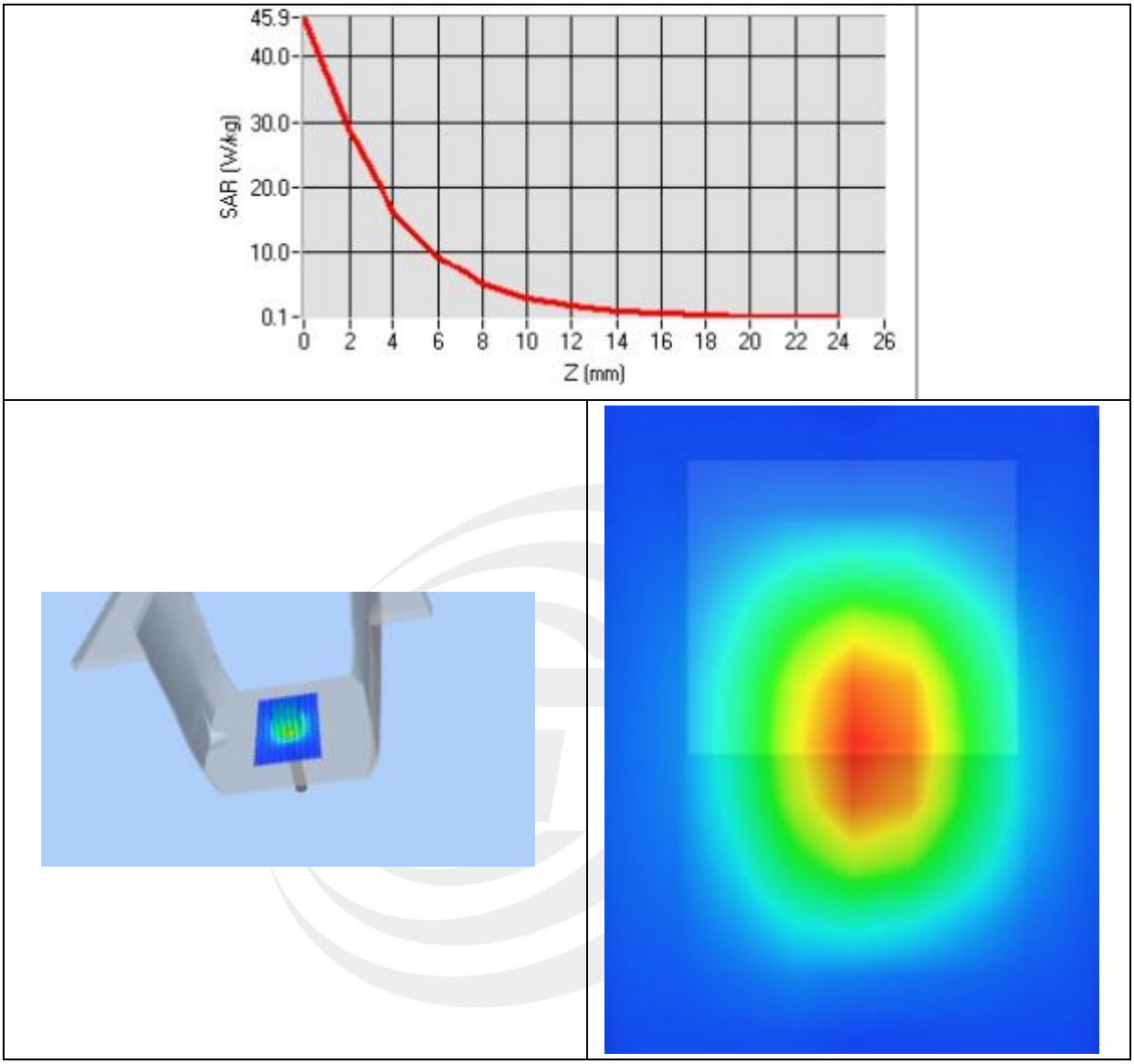
Device Position	Validation plane
Band	5200 MHz
Channels	-
Signal	CW
Frequency (MHz)	5200
Relative permittivity	48.61
Conductivity (S/m)	5.27
Power drift (%)	2.52
Probe	SN 45/15 EPGO281
ConvF	2.52
Crest factor:	1:1

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



Appendix B. SAR Test Plots

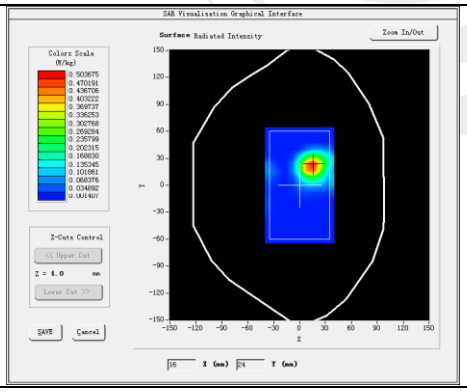
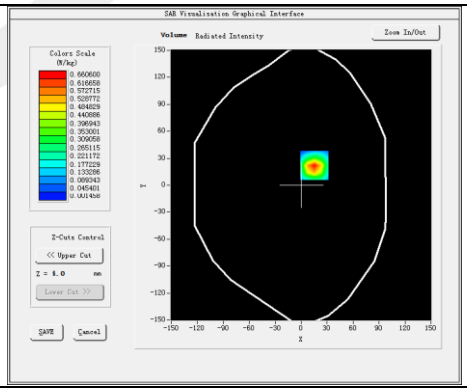
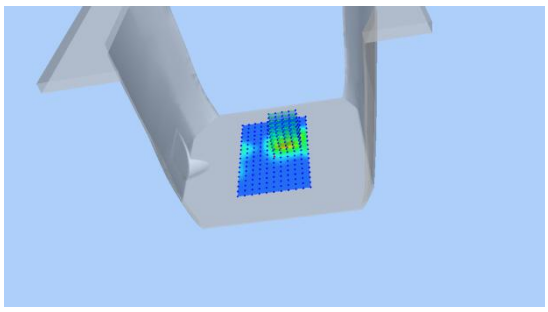
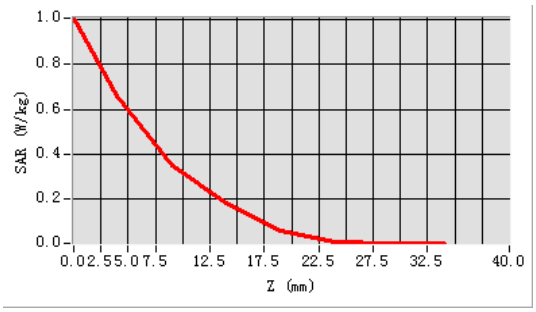
Plot 1: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-11-17
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 back
Band	WCDMA II
Channels	Low
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1852.4
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.52
Variation (%)	-1.95

Maximum location: X=15.00, Y=22.00

SAR Peak: 1.03 W/kg

SAR 10g (W/Kg)	0.267618
SAR 1g (W/Kg)	0.606630

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

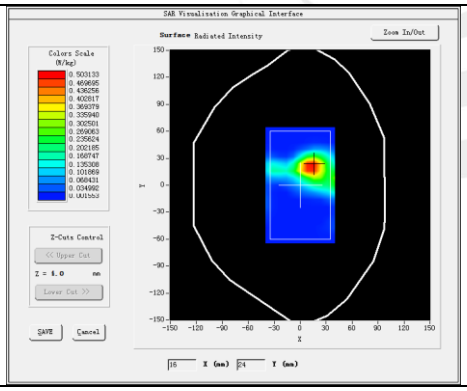
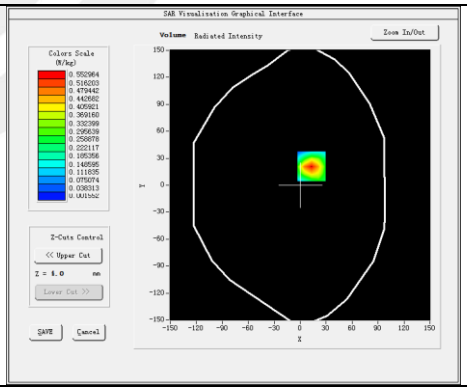
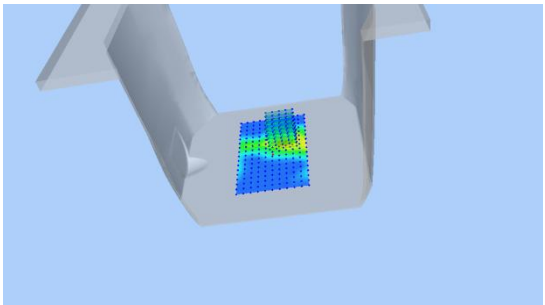
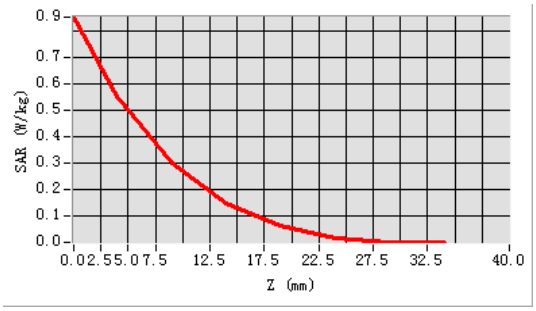
Plot 2: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-11-15
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 back
Band	WCDMA IV
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1740
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.52
Variation (%)	-1.10

Maximum location: X=13.00, Y=21.00

SAR Peak: 0.85 W/kg

SAR 10g (W/Kg)	0.240871
SAR 1g (W/Kg)	0.508595

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

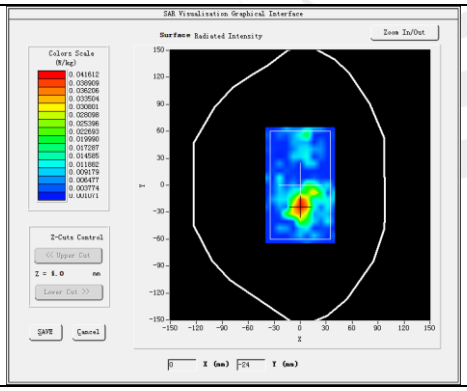
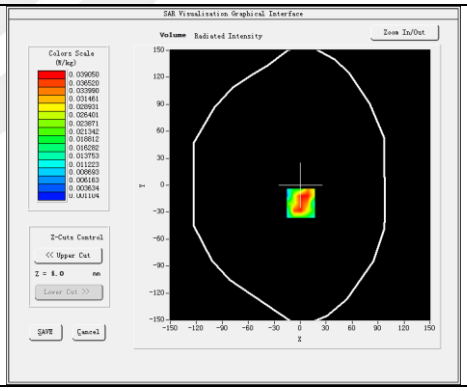
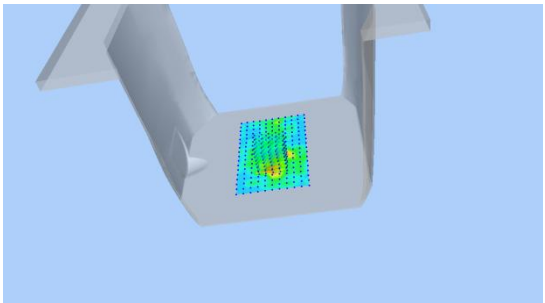
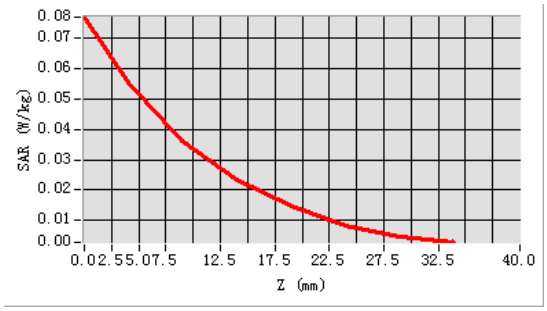
Plot 3: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-11-13
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 back
Band	WCDMA V
Channels	High
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	846.6
Relative permittivity (real part)	55.20
Conductivity (S/m)	0.97
Variation (%)	-1.21

Maximum location: X=1.00, Y=-20.00

SAR Peak: 0.08 W/kg

SAR 10g (W/Kg)	0.021496
SAR 1g (W/Kg)	0.037466

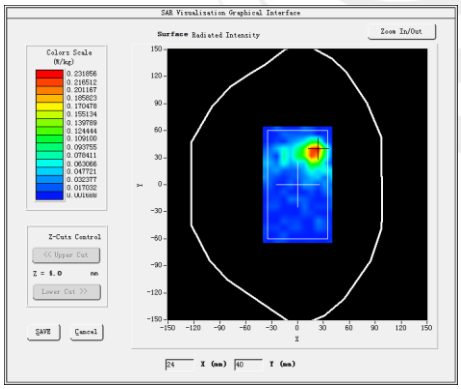
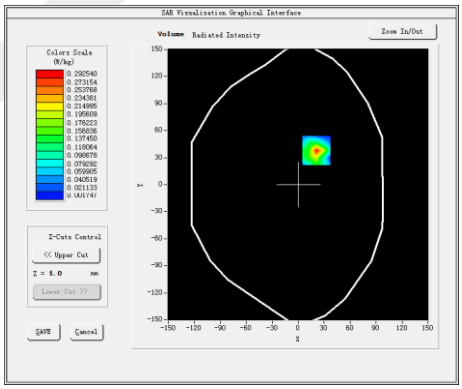
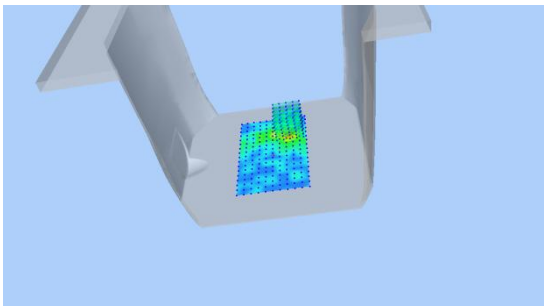
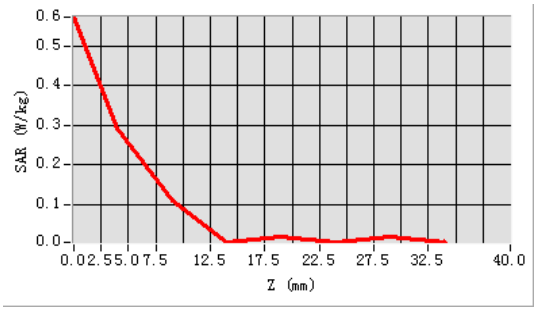
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 4: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-06
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 back
Band	IEEE 802.11b ISM
Channels	Middle
Antenna	A
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2442
Relative permittivity (real part)	52.70
Conductivity (S/m)	1.95
Variation (%)	-1.18

Maximum location: X=21.00, Y=38.00
SAR Peak: 0.59 W/kg

SAR 10g (W/Kg)	0.095246
SAR 1g (W/Kg)	0.257189

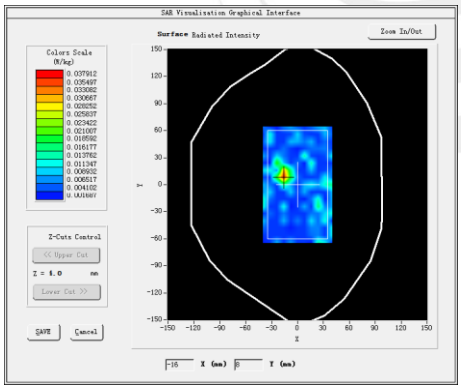
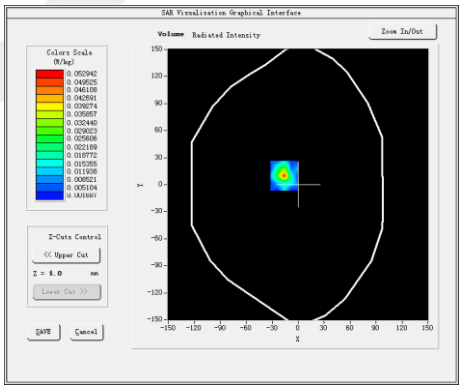
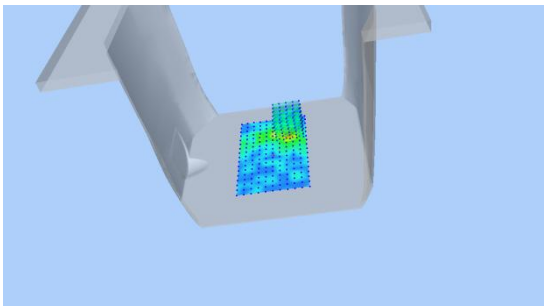
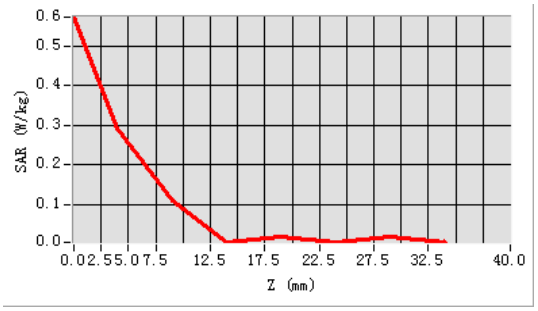
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 5: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-06
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 back
Band	IEEE 802.11b ISM
Channels	Middle
Antenna	B
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2442
Relative permittivity (real part)	52.70
Conductivity (S/m)	1.95
Variation (%)	-2.39

Maximum location: X=-16.00, Y=10.00
SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.015323
SAR 1g (W/Kg)	0.050708

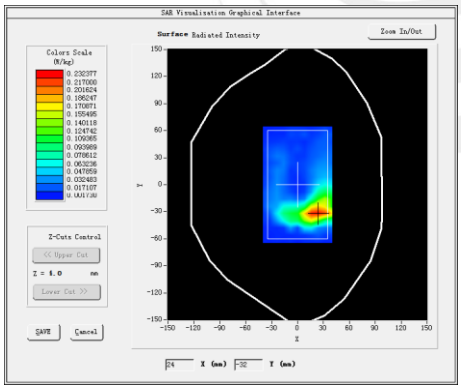
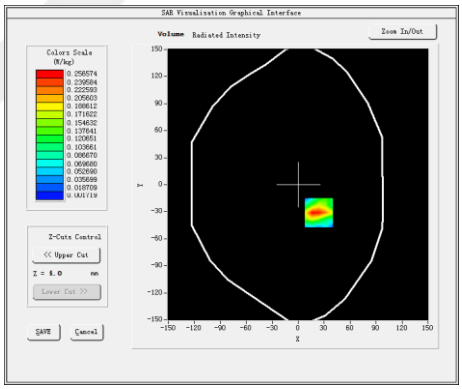
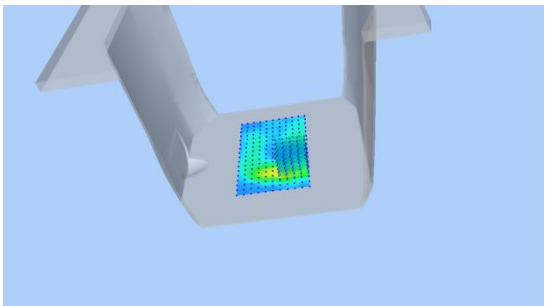
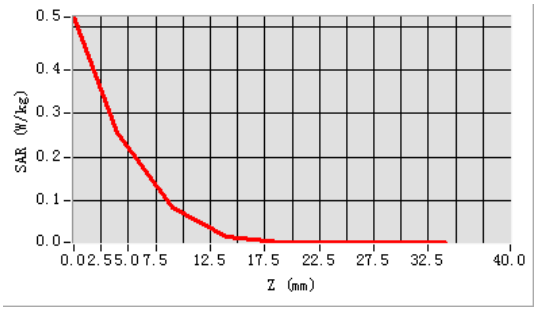
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 6: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-06
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 back
Band	IEEE 802.11n ISM
Channels	Middle
Antenna	A
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2442
Relative permittivity (real part)	52.70
Conductivity (S/m)	1.95
Variation (%)	3.22

Maximum location: X=24.00, Y=-31.00
SAR Peak: 0.55 W/kg

SAR 10g (W/Kg)	0.093161
SAR 1g (W/Kg)	0.245543

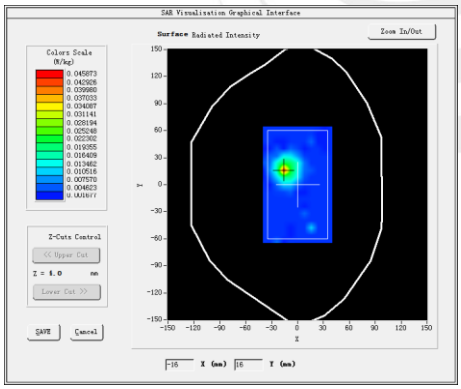
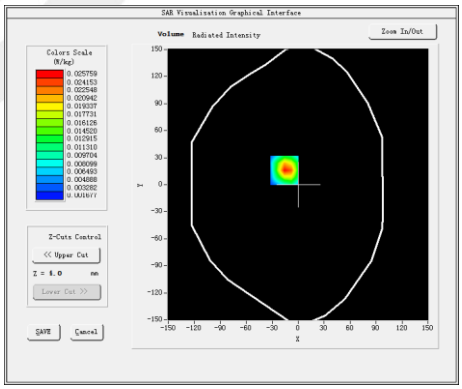
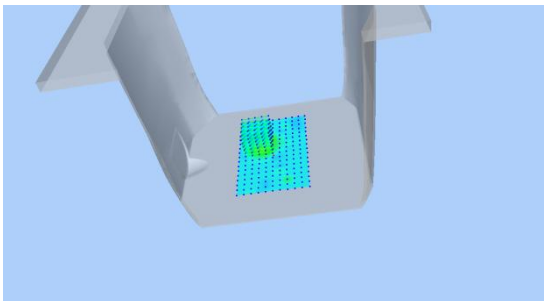
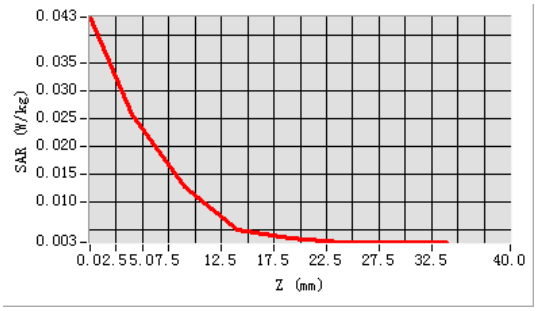
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 7: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-06
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 back
Band	IEEE 802.11n ISM
Channels	Middle
Antenna	B
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2442
Relative permittivity (real part)	52.70
Conductivity (S/m)	1.95
Variation (%)	-3.19

Maximum location: X=-16.00, Y=16.00
SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.011024
SAR 1g (W/Kg)	0.023861

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

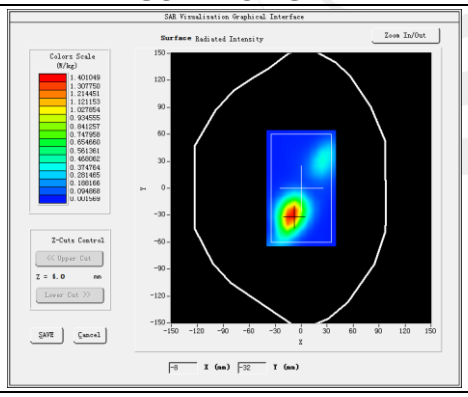
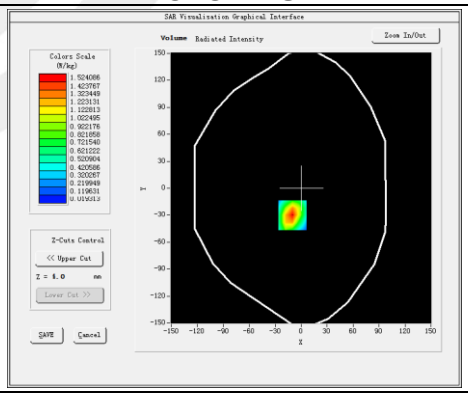
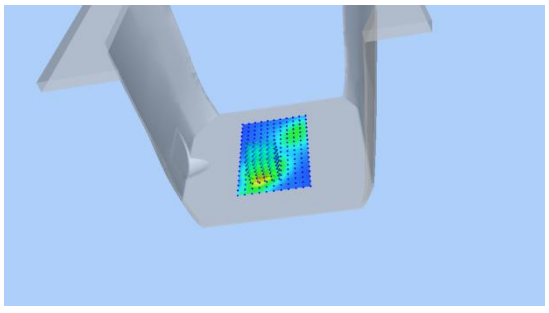
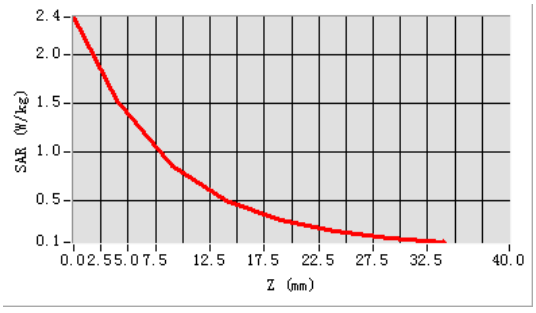
Plot 8: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-02
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	Left side
Band	LTE Band 4 (RB 1)
Channels	Middle
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1732.5
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.52
Variation (%)	-0.16

Maximum location: X=-10.00, Y=-30.00

SAR Peak: 2.38 W/kg

SAR 10g (W/Kg)	0.722062
SAR 1g (W/Kg)	1.421880

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

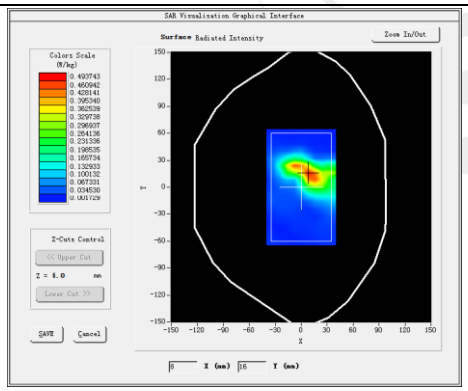
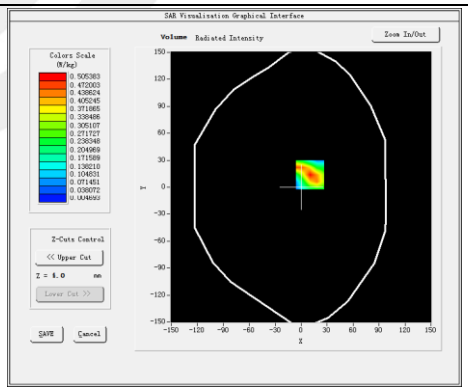
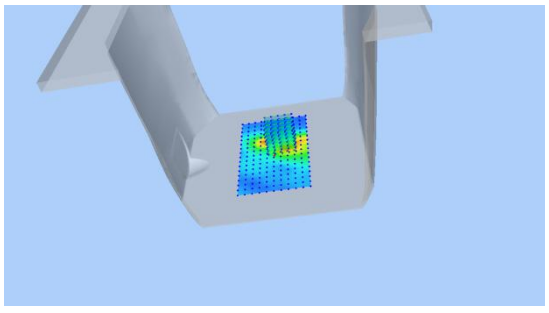
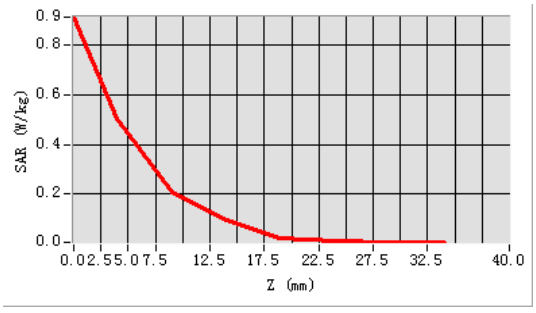
Plot 9: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-08
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 back
Band	LTE Band 7 (RB 1)
Channels	Middle
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2535
Relative permittivity (real part)	52.50
Conductivity (S/m)	2.16
Variation (%)	0.54

Maximum location: X=10.00, Y=14.00

SAR Peak: 0.90 W/kg

SAR 10g (W/Kg)	0.204027
SAR 1g (W/Kg)	0.466248

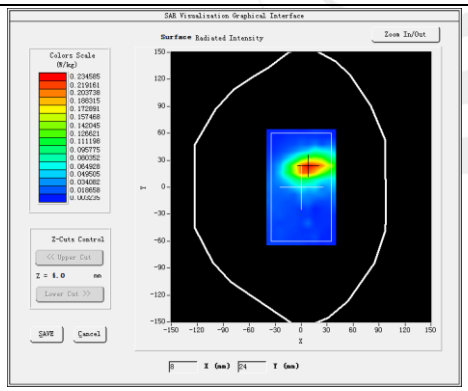
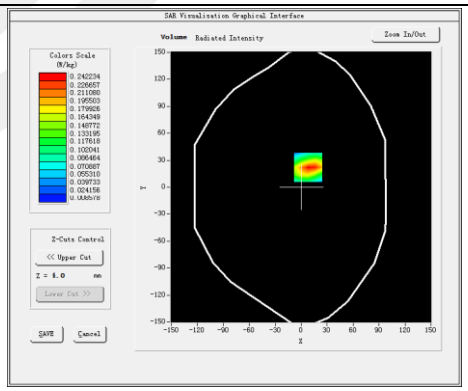
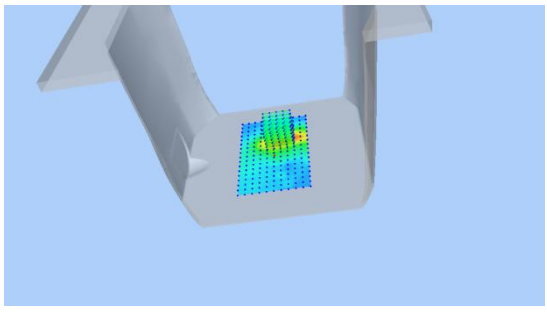
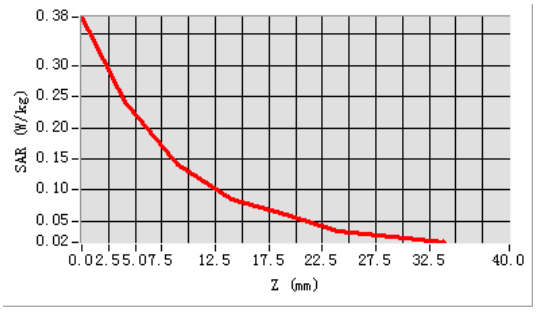
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 10: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-11-30
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 back
Band	LTE Band 12 (RB 1)
Channels	Low
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	704
Relative permittivity (real part)	55.50
Conductivity (S/m)	0.96
Variation (%)	-3.18

Maximum location: X=8.00, Y=22.00
SAR Peak: 0.38 W/kg

SAR 10g (W/Kg)	0.122657
SAR 1g (W/Kg)	0.231386

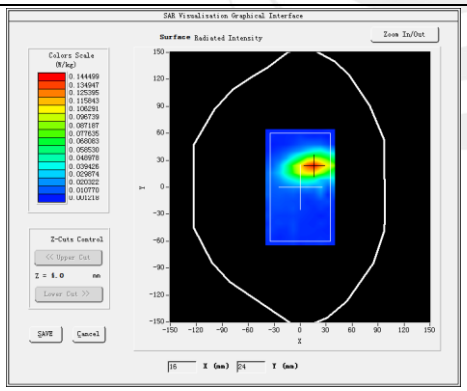
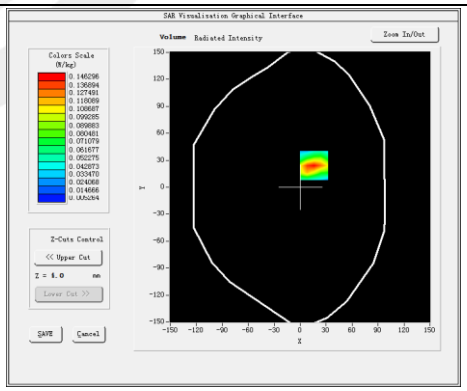
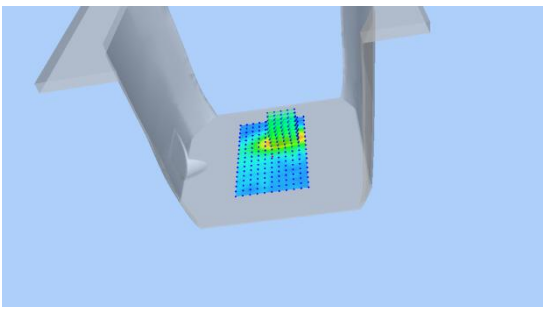
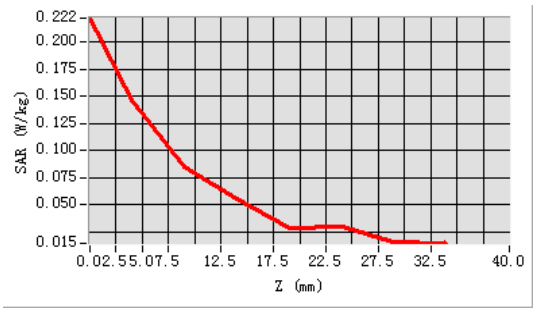
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 11: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-11-30
Probe	SN 45/15 EPGO281
ConvF	1.53
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back
Band	LTE Band 13 (RB 1)
Channels	Middle
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	782
Relative permittivity (real part)	55.50
Conductivity (S/m)	0.96
Variation (%)	-2.35

Maximum location: X=16..00, Y=24.00
SAR Peak: 0.24 W/kg

SAR 10g (W/Kg)	0.071782
SAR 1g (W/Kg)	0.137402

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

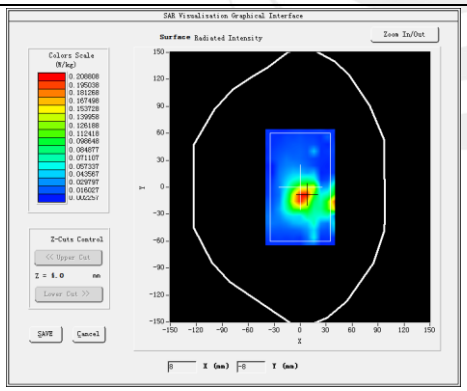
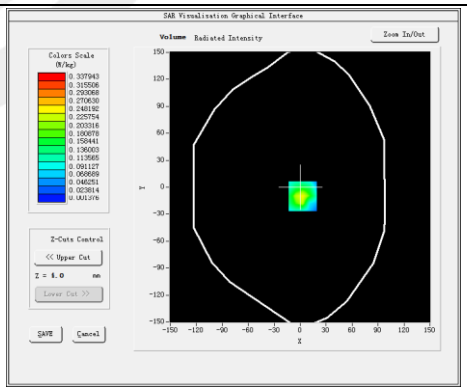
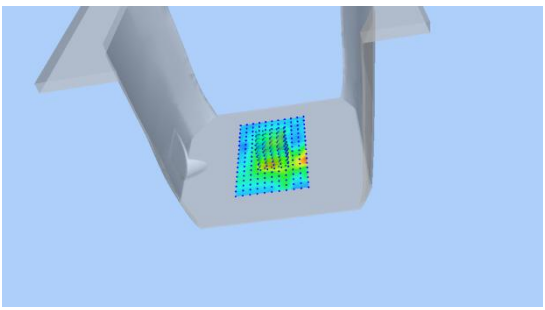
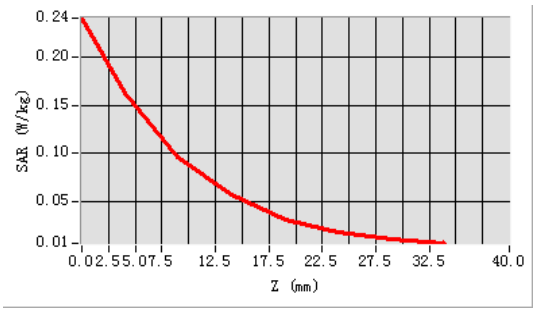
Plot 12: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-04
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 back
Band	LTE Band 25 (RB 1)
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1905
Relative permittivity (real part)	53.3
Conductivity (S/m)	1.52
Variation (%)	-0.81

Maximum location: X=3.00, Y=-10.00

SAR Peak: 0.24 W/kg

SAR 10g (W/Kg)	0.100706
SAR 1g (W/Kg)	0.207432

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

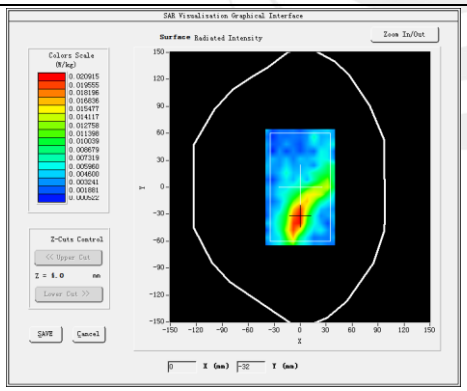
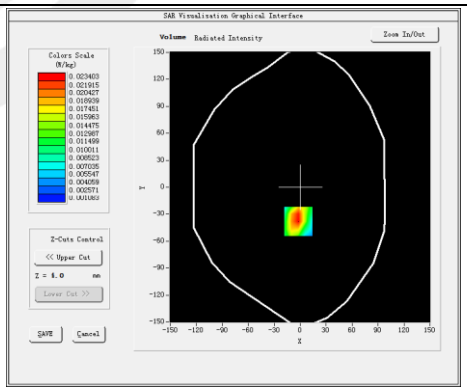
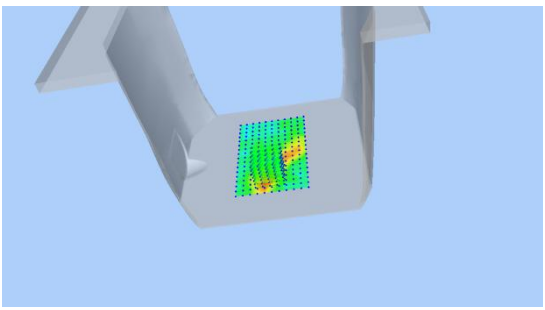
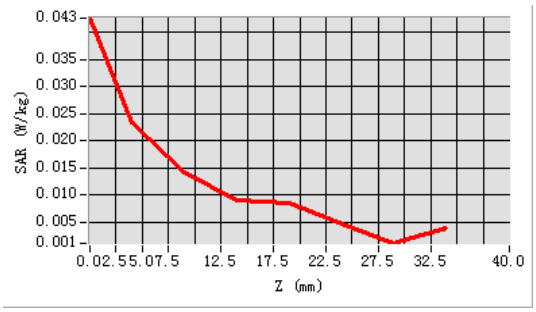
Plot 13: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-01
Probe	SN 45/15 EPGO281
ConvF	1.78
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back
Band	LTE Band 26 (RB 1)
Channels	Middle
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	876.5
Relative permittivity (real part)	55.2
Conductivity (S/m)	0.96
Variation (%)	-0.85

Maximum location: X=-2.00, Y=-38.00

SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.013281
SAR 1g (W/Kg)	0.024056

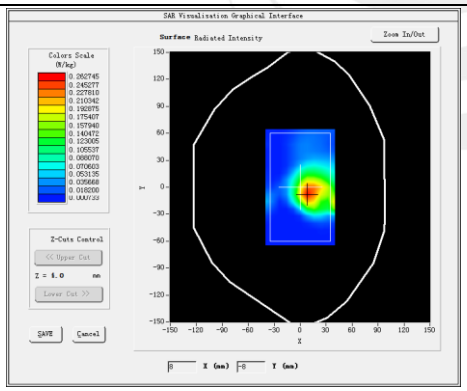
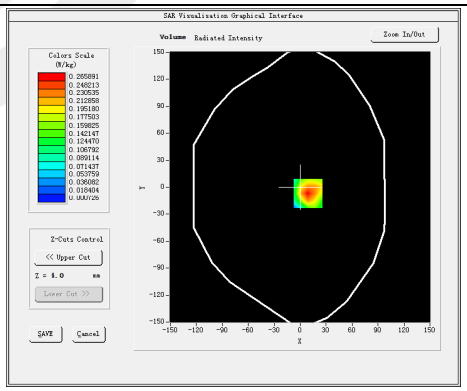
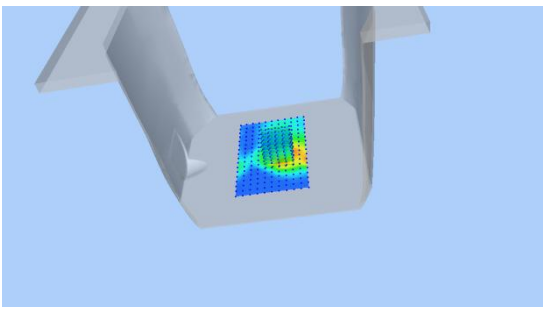
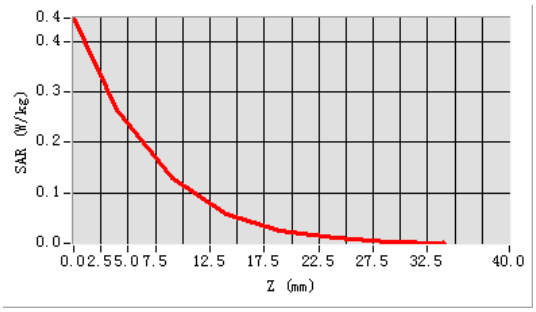
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 14: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-06
Probe	SN 45/15 EPGO281
ConvF	2.09
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back
Band	LTE Band 30 (RB 1)
Channels	Middle
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2310
Relative permittivity (real part)	52.7
Conductivity (S/m)	1.95
Variation (%)	1.69

Maximum location: X=9.00, Y=-7.00
SAR Peak: 0.45 W/kg

SAR 10g (W/Kg)	0.124341
SAR 1g (W/Kg)	0.250978

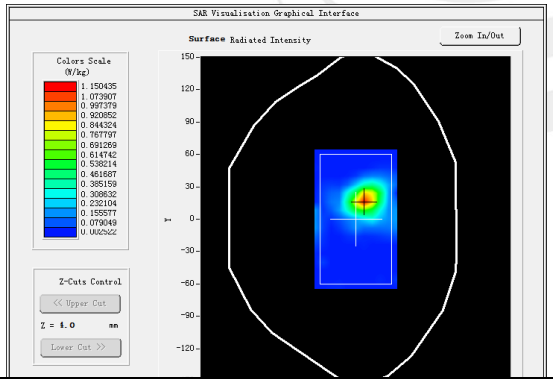
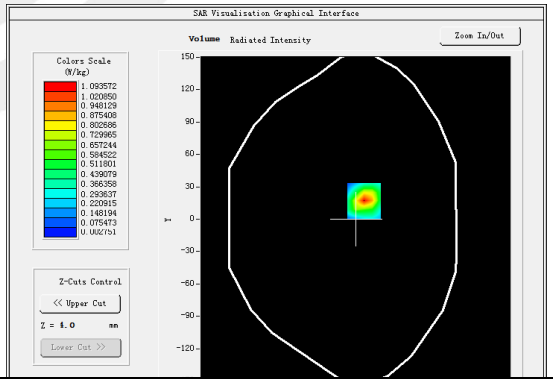
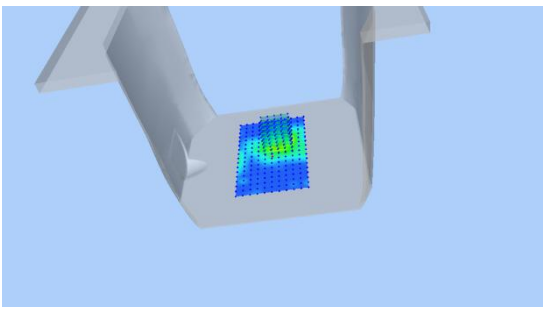
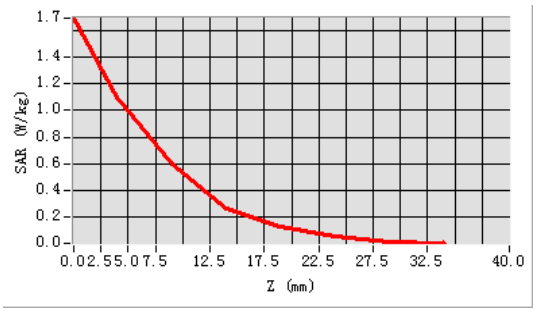
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 15: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-06
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 back
Band	LTE Band 41 (RB 1)
Channels	High
Signal	LTE (Crest factor: 1.6)
Frequency (MHz)	2310
Relative permittivity (real part)	52.5
Conductivity (S/m)	2.16
Variation (%)	-0.03

Maximum location: X=8.00, Y=17.00
SAR Peak: 1.72 W/kg

SAR 10g (W/Kg)	0.444540
SAR 1g (W/Kg)	0.975461

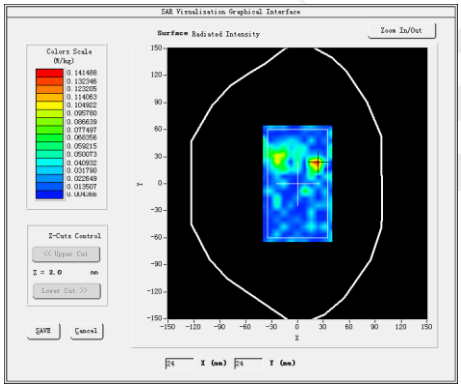
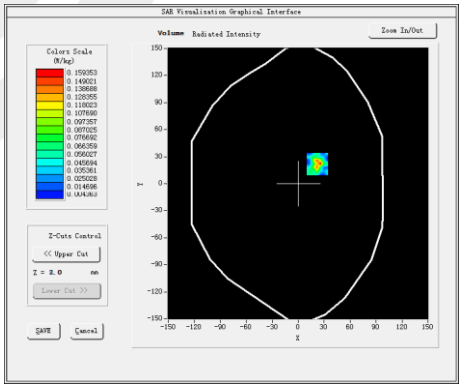
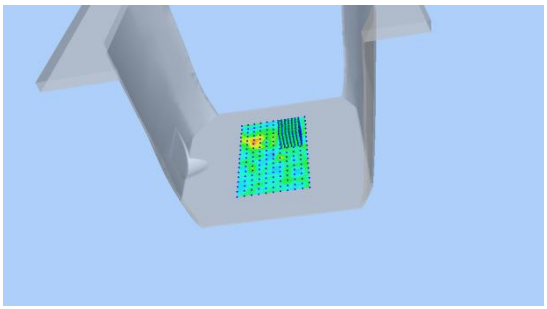
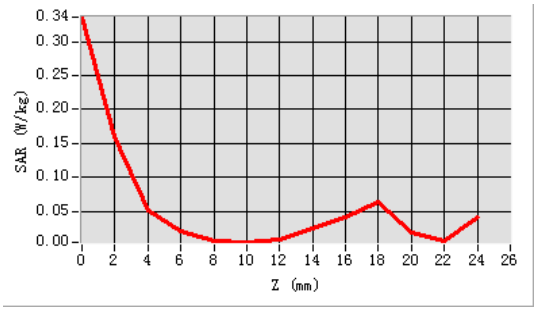
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 16: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-09
Probe	SN 45/15 EPGO281
ConvF	2.52
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back
Band	IEEE 802.11a ISM
Antenna	A
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5240
Relative permittivity (real part)	49.0
Conductivity (S/m)	5.30
Variation (%)	-2.32

Maximum location: X=22.00, Y=22.00
SAR Peak: 0.38 W/kg

SAR 10g (W/Kg)	0.032968
SAR 1g (W/Kg)	0.071181

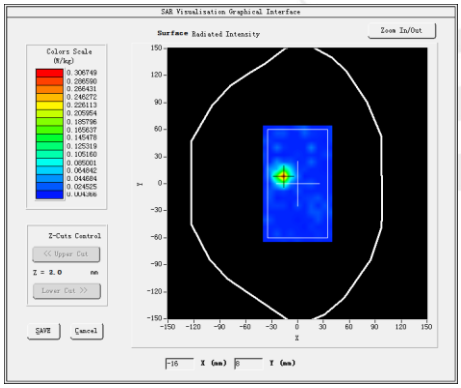
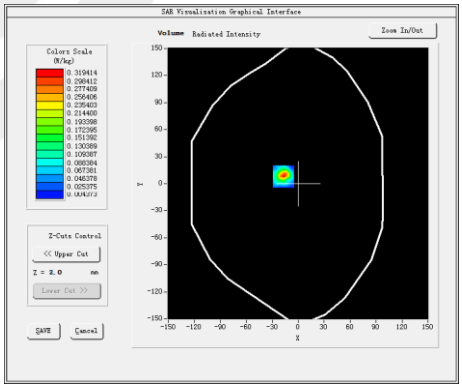
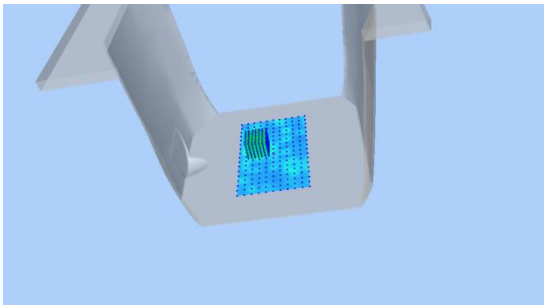
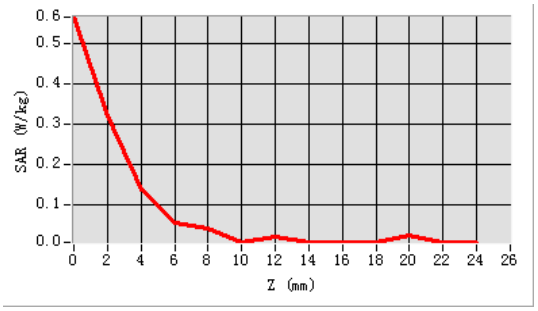
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 17: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-09
Probe	SN 45/15 EPGO281
ConvF	2.52
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back
Band	IEEE 802.11a ISM
Antenna	B
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5240
Relative permittivity (real part)	49.0
Conductivity (S/m)	5.30
Variation (%)	-2.32

Maximum location: X=-17.00, Y=8.00
SAR Peak: 0.63 W/kg

SAR 10g (W/Kg)	0.046651
SAR 1g (W/Kg)	0.161648

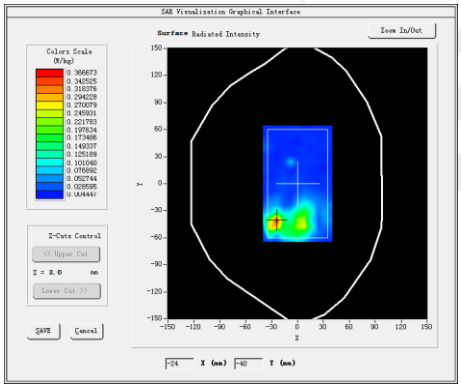
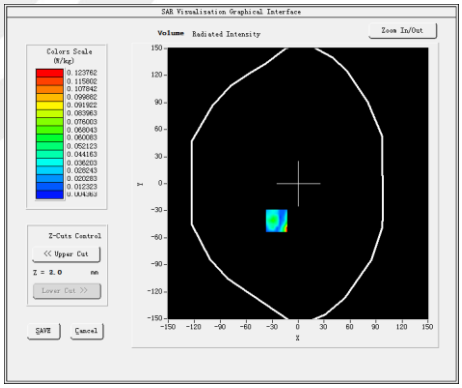
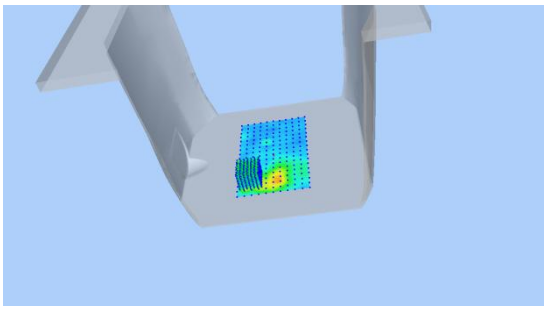
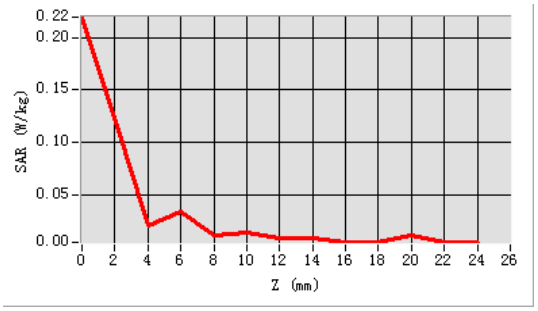
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 18: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-09
Probe	SN 45/15 EPGO281
ConvF	2.52
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back
Band	IEEE 802.11n ISM
Antenna	A
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5240
Relative permittivity (real part)	49.0
Conductivity (S/m)	5.30
Variation (%)	-2.32

Maximum location: X=-25.00, Y=-41.00
SAR Peak: 0.23 W/kg

SAR 10g (W/Kg)	0.016543
SAR 1g (W/Kg)	0.033726

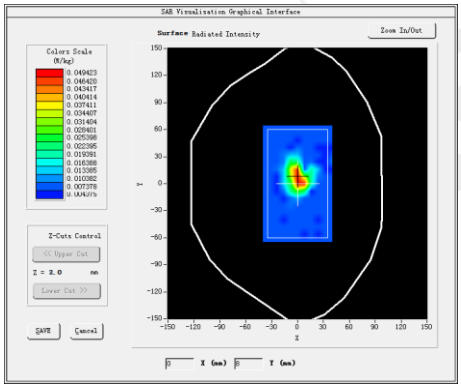
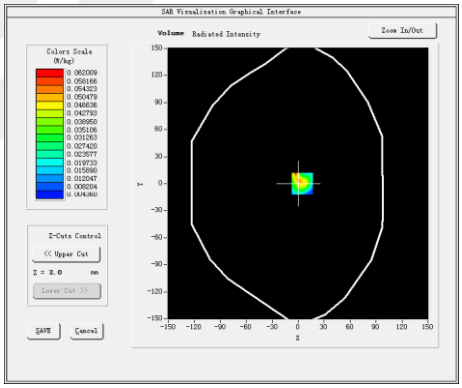
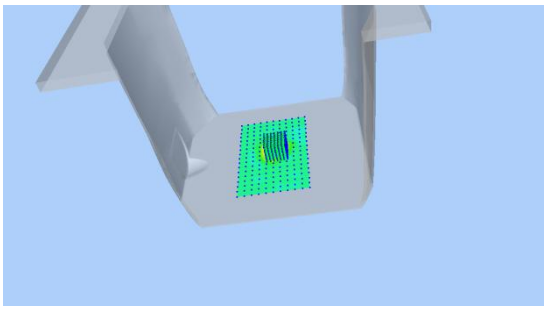
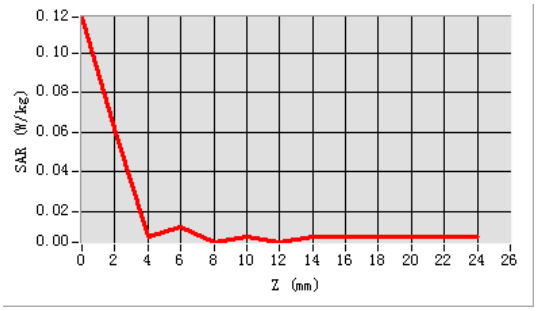
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 19: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-09
Probe	SN 45/15 EPGO281
ConvF	2.52
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back
Band	IEEE 802.11n ISM
Antenna	B
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5240
Relative permittivity (real part)	49.0
Conductivity (S/m)	5.30
Variation (%)	-2.32

Maximum location: X=5.00, Y=0.00
SAR Peak: 0.13 W/kg

SAR 10g (W/Kg)	0.015537
SAR 1g (W/Kg)	0.031132

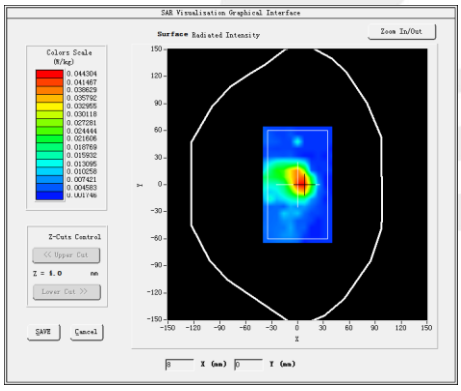
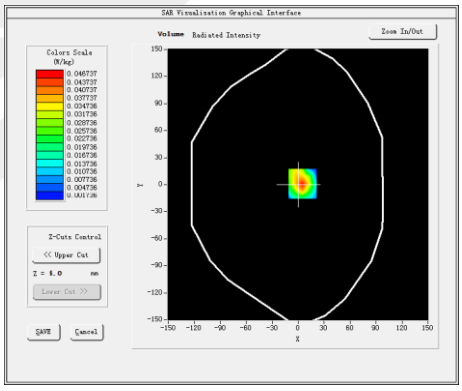
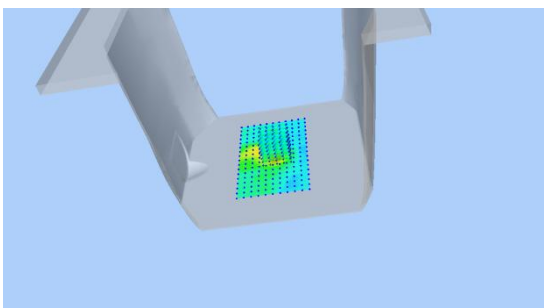
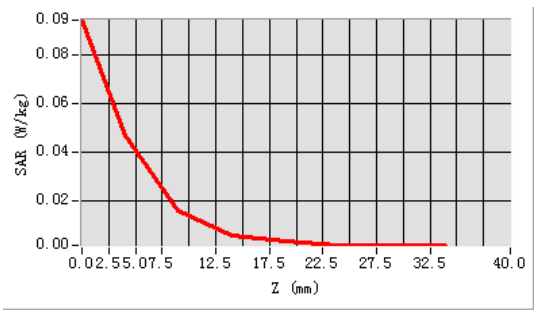
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 20: DUT: Rugged Tablet PC; EUT Model: M101S

Test Date	2018-12-06
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 back
Band	Bluetooth
Signal	GSFK
Frequency (MHz)	2480
Relative permittivity (real part)	52.7
Conductivity (S/m)	1.95
Variation (%)	-2.32

Maximum location: X=5.00, Y=1.00
SAR Peak: 0.09 W/kg

SAR 10g (W/Kg)	0.018909
SAR 1g (W/Kg)	0.044709

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

Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※