S T S L A B

FCC SAR TEST REPORT

Report No: STS1505041H01

Issued for

ComTrade USA East, Inc.

275 Grove Street Suite 2-400, Newton, Massachusetts US

Product Name:	Tablet computer
Brand Name:	N/A
Model No.:	Hero 8_W - Tesla tablet H785
Series Model:	N/A
FCC ID:	2AERW-H785
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEEE 1528: 2013
Max. SAR (1g):	Body:1.325 W/kg

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Test Report Certification

Applicant's name ..... : ComTrade USA East, Inc.

Address ..... : 275 Grove Street Suite 2-400, Newton, Massachusetts US

Manufacture's Name..... : Borqs BeiJing Ltd.

Address ..... : Tower A, Building B23, Universal Business Park, No. 10 Jiuxianqiao Road, Chaoyang District Beijing, 100015 China

Product description

Product name ..... : Tablet computer

Trademark ..... : N/A

Model and/or type reference : Hero 8_W - Tesla tablet H785

Serial Model : N/A

Standards..... : ANSI/IEEE Std. C95.1-1992
FCC 47 CFR Part 2 (2.1093)
IEEE 1528: 2013

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

Date of Test ..... :

Date (s) of performance of tests..... : 21 May. 2015

Date of Issue..... : 22 May. 2015

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

Testing Engineer : Allen Chen

(Allen Chen)

Technical Manager : John Zou

(John Zou)

Authorized Signatory : Bovey Yang

(Bovey Yang)

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1. General Information

1.1 EUT Description

Equipment	Tablet computer	
Brand Name	N/A	
Model No.	Hero 8_W - Tesla tablet H785	
Serial Model	N/A	
FCC ID	2AERW-H785	
Model Difference	N/A	
Adapter	Input: AC100-240V,450m A, 50/60 Hz Output: DC 5V, 2000mA	
Battery	Rated Voltage: 3.8V Charge Limit: 4.35V Capacity: 4450mAh	
Hardware Version	N/A	
Software Version	N/A	
Frequency Range	WLAN 2.4G: 802.11 b/g/n(HT20):2412 MHz to 2462 MHz 802.11 n(HT40):2422 MHz to 2452 MHz WLAN 5G: 802.11a/n(HT20): 5180 MHz to 5240 MHz 802.11n(HT40): 5190 MHz to 5230 MHz	
Transmit Power(MAX):	2.4G wifi: 802.11b: 15.55 dBm 802.11g: 14.37 dBm 802.11n(HT20): 13.36 dBm 802.11n(HT40): 11.91 dBm	5.0G wifi: 802.11a: 14.68 dBm 802.11n(HT20): 13.35 dBm 802.11n(HT40): 12.39 dBm
Max. Reported SAR(1g):	Body: WIFI 802.11b:1.325 W/kg	
Operating Mode:	WLAN: 802.11 a/b/g/n;	
Antenna Specification:	WIFI: PIFA Antenna	
SIM Card	N/A	
Hotspot Mode:	Not Support	
DTM Mode:	Not Support	

1.2 Test Environment

Ambient conditions in the SAR laboratory:

Items	Required	Actual
Temperature (℃)	18-25	22~23
Humidity (%RH)	30-70	55~65

1.3 Test Facility

Shenzhen STS Test Services Co., Ltd.
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CNAS Registration No.: L7649;
FCC Registration No.: 842334; IC Registration No.: 12108A-1

2. Test Standards And Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D01 v05r02	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01 v01r03	SAR Measurement 100 MHz to 6 GHz
7	FCC KDB 248227 D01 Wi-Fi SAR v02	SAR Considerations for 802.11 Devices
8	FCC KDB 616217 D04	SAR Evaluation Consideration for Laptop, Notobook and Tablet Computer

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. According to EN 50360 and 1999/519/EC the limit for General Population/Uncontrolled exposure should be applied for this device, it is 2.0 W/kg as averaged over any 10 gram of tissue.

(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 10 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

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

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

NOTE

GENERAL POPULATION/UNCONTROLLED EXPOSURE

PARTIAL BODY LIMIT

1.6 W/kg

3. SAR Measurement System

3.1 Definition Of Specific Absorption Rate (SAR)

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

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

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

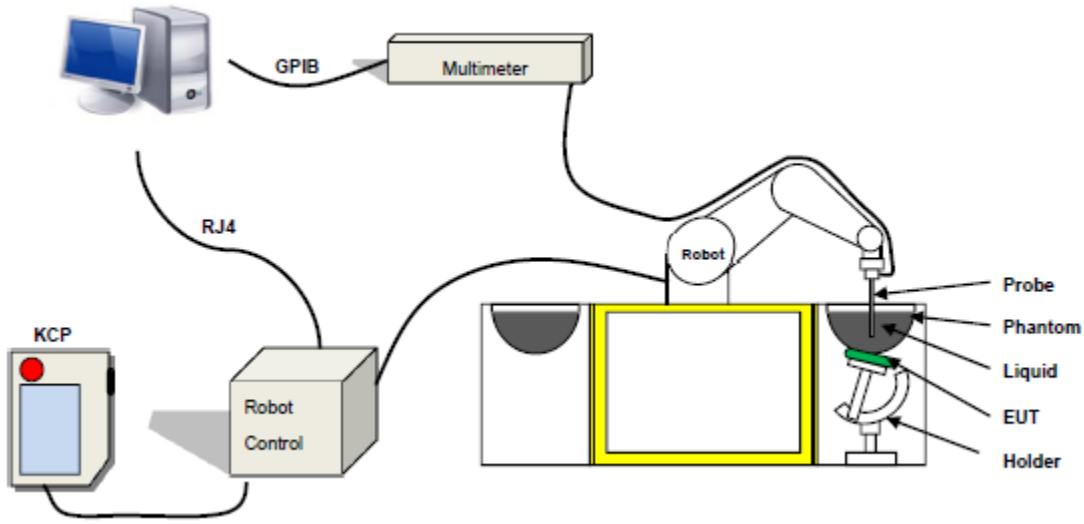
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SAR System

SATIMO SAR System Diagram:



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

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

The following figure shows the system.

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

3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 17/14 EP221 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Tip Diameter :5 mm
- Distance between probe tip and sensor center: 2.7mm
- Distance between sensor center and the inner phantom surface: 4 mm (repeatability better than +/- 1mm)
- Probe linearity: ＜0.25 dB
- Axial Isotropy: ＜0.25 dB
- Spherical Isotropy: ＜0.25 dB
- Calibration range: 450MHz to 2600MHz for head & body simulating liquid.

Angle between probe axis (evaluation axis) and suface normal line:less than 30°

Figure 1 – *Satimo COMOSAR Dosimetric E field Dipole*

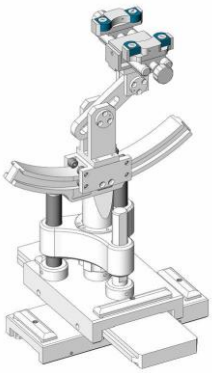
3.2.2 Phantom

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.

LIQUID MEASUREMENT RESULTS

Date: May 21, 2015 **Ambient condition:** Temperature 22.7°C **Relative humidity:** 49%

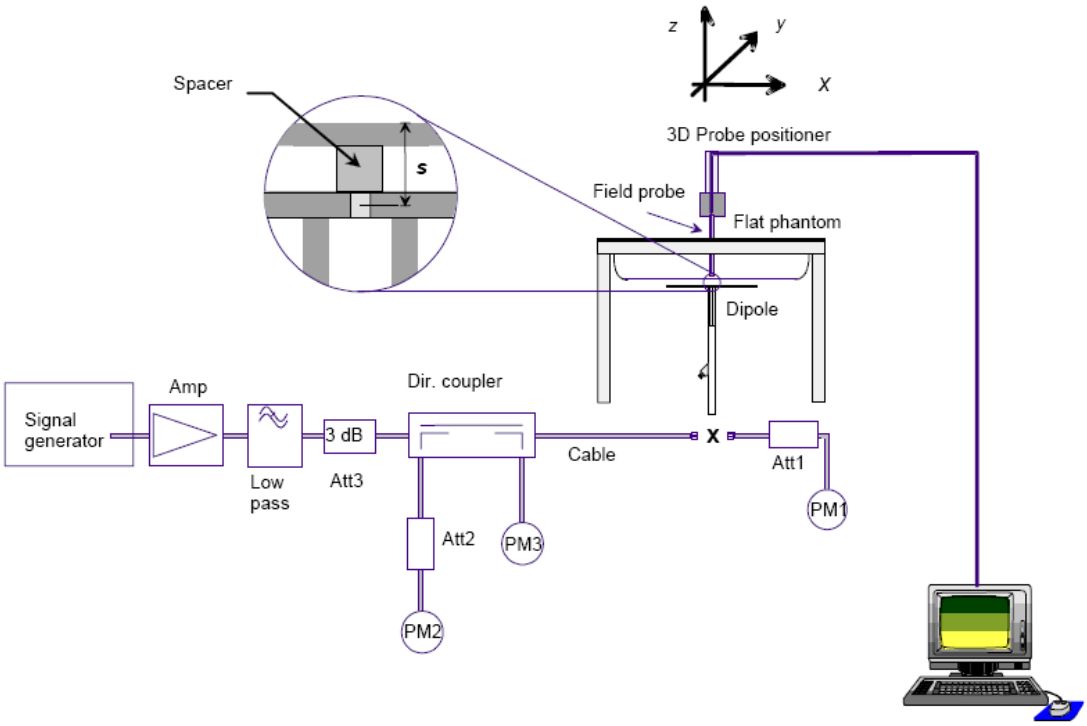
Body Simulating Liquid		Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]					
2450 MHz	22.30	Permitivity:	52.7	51.6	-2.09	± 5
		Conductivity:	1.95	1.93	-1.03	± 5
5200 MHz	22.30	Permitivity:	36.0	36.0	-0.83	± 5
		Conductivity:	4.66	4.77	2.36	± 5

5. SAR System Validation

5.1 Validation System

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

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



5.2 Validation Result

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

Ambient condition: Temperature 22.7°C **Relative humidity:** 49%

Freq.(MHz)	Power(mW)	Tested Value (W/Kg)	Normalized SAR (W/kg)	Target(W/Kg)	Tolerance(%)	Date
2450 Body	100	4.864	48.64	52.40	-2.23	2015-05-21
5200 Body	100	5.540	55.40	56.90	-2.64	2015-05-21

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.

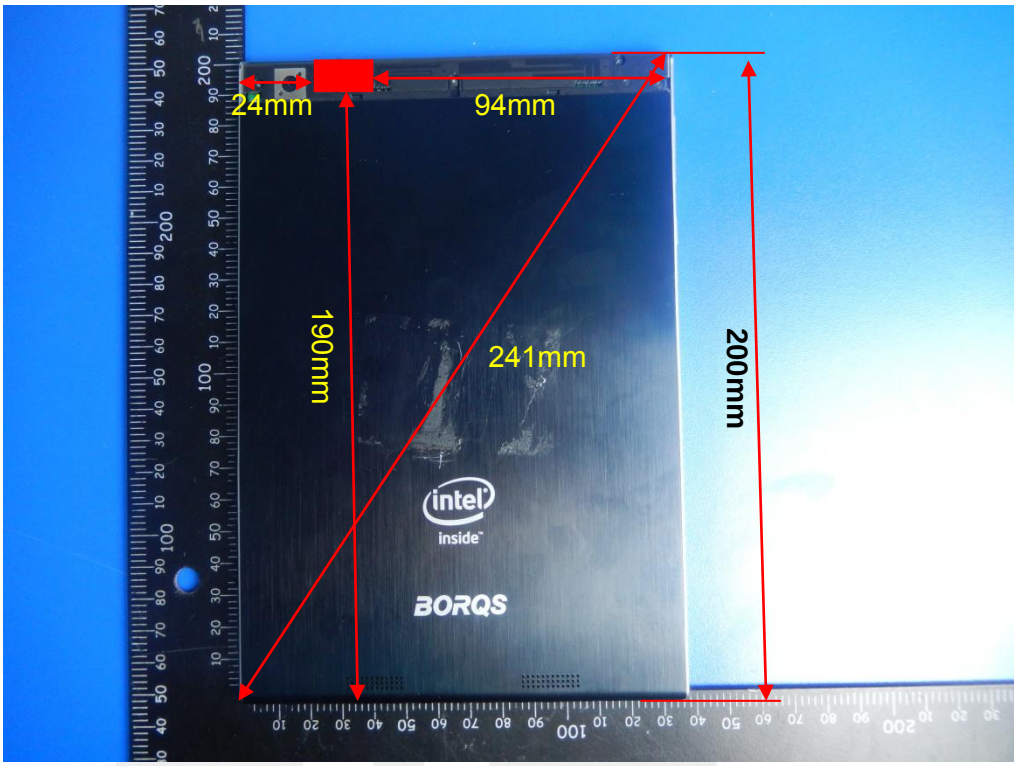
➢ Area Scan& Zoom Scan

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 D01v01r01 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 Tablet computer, support wifi mode.

The diagonal dimension is about 241 mm, So test distance is 0mm.



WIFI Antenna

7.1 SAR Test Exclusion Consider Table

According with FCC KDB 447498 D01v05r02，appendix A，<SAR test exclusion thresholds for 100MHz~6GHz and≤50mm＞table，this device SAR test configurations consider as following：

Band	Test position configurations					
	Front	Back	Right edge	Left edge	Top edge	Bottom edge
WLAN	＜5mm	＜5mm	24mm	94mm	＜5mm	190mm
	Yes	Yes	Yes	No	Yes	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 D01v05r02, 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 D01v05r02, 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 D01v05r02, 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 D01v05r02, 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

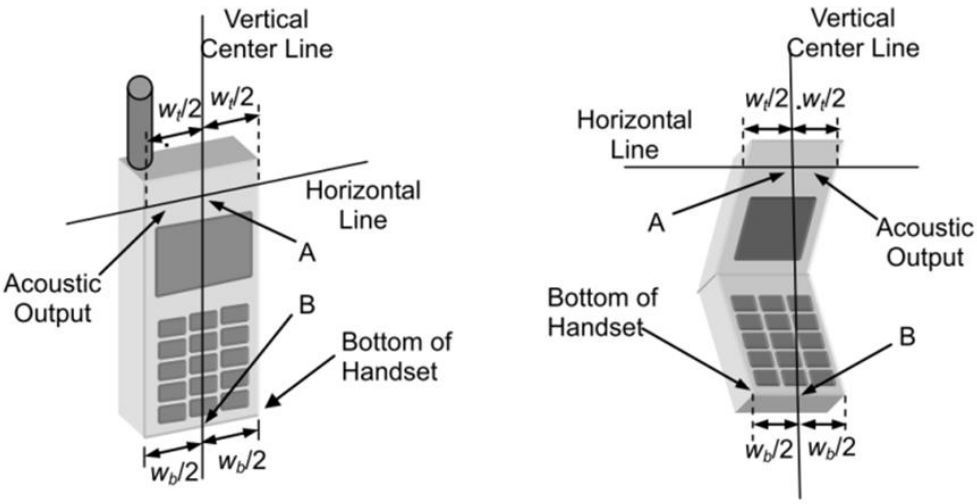
   b) [threshold at 50mm in step1]+(test separation distance -50mm) *10]mW at＞1500MHz and ≤6GHz
6. Per KDB 248227 D01v01r02,choose the highest output power channel to test SAR and determine futher SAR exclusion 8.for each frequency band ,testing at higher data rates and higher order modulations is not required when the maximum average output power for each of each of these configurations is less than 1/4db higher than those measured at the lower data rate than 11b mode ,thus the SAR can be excluded.

8. EUT Test Position

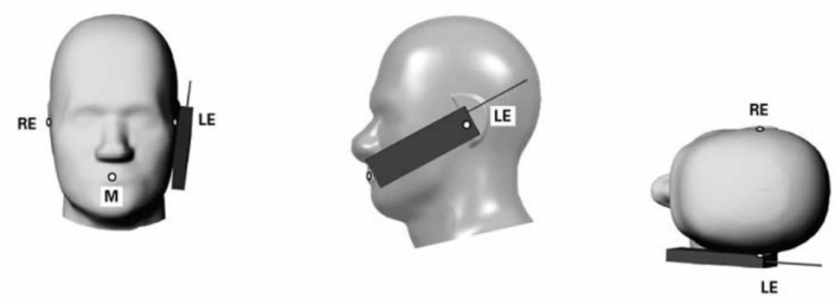
This EUT was tested in Right Cheek, Right Titled, Left Cheek, Left Titled, Front Face and Rear Face.

8.1 Define Two Imaginary Lines On The Handset

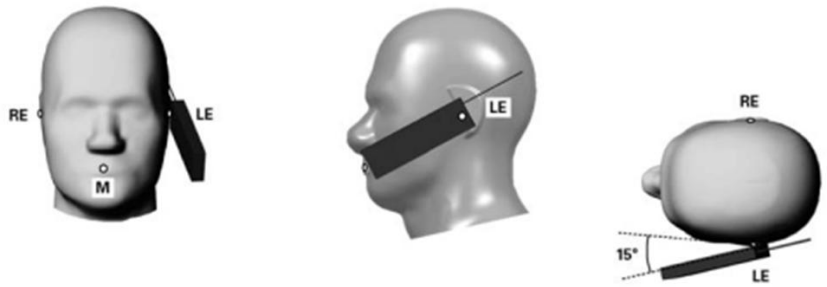
(1)The vertical centerline passes through two points on the front side of the handset the midpoint of the width wt of the handset at the level of the acoustic output, and the midpoint of the width wb of the handset.
(2)The horizontal line is perpendicular to the vertical centerline and passes through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



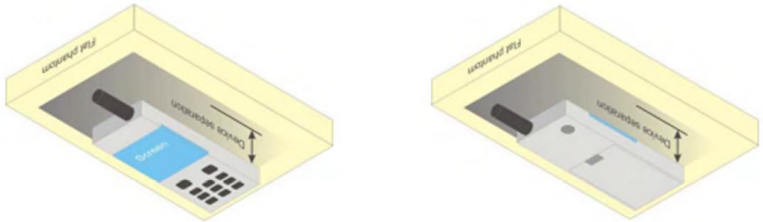
Cheek Position
1)To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane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



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



Body Position Conditions
(1) To position the EUT parallel to the phantom surface.
(2) To adjust the EUT parallel to the flat phantom.
(3) To adjust the distance between the EUT surface and the flat phantom to 5mm.



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: 2003.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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

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

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Tel: 0755-36886288 Fax: 0755-36886277 Http://www.stsapp.com E-mail: sts@stsapp.com

9.2 System validation Uncertainty

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

17	Input power and SAR drit measurement	5	R	√3	1	1	2.89	2.89	∞
18	Dipole Axis to liquid Distance	2	R	√3	1	1			∞
Phantom and set-up									
19	Phantom uncertainty	4.0	R	√3	1	1	2.31	2.31	∞
20	Uncertainty in SAR correction for deviation(in	2.0	N	1	1	0.84	2	1.68	∞
21	Liquid conductivity (target)	2	N	1	1	0.84	2.00	1.68	∞
22	Liquid conductivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	5
23	Liquid conductivity (meas)	4	N	1	0.23	0.26	0.92	1.04	5
24	Liquid Permittivity (target)	2.5	N	1	0.78	0.71	1.95	1.78	∞
25	Liquid Permittivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	5
26	Liquid Permittivity (meas)	5.0	N	1	0.23	0.26	1.15	1.30	∞
Combined standard			RSS	$U_C = \sqrt{\sum_{i=1}^{n} C_i^2 U_i^2}$			10.15%	10.05%	
Expanded uncertainty (P=95%)		$U = k\ U_C$,k=2					21.29%	21.10%	

10. Conducted Power Measurement

WIFI 2.4G power

Mode	Channel Number	Frequency (MHz)	Peak Power (dBm)
802.11b	1	2412	15.55
	6	2437	15.43
	11	2462	15.39
802.11g	1	2412	14.33
	6	2437	14.37
	11	2462	14.22
802.11n(HT20)	1	2412	13.14
	6	2437	13.36
	11	2462	13.23
802.11n(HT40)	3	2422	11.58
	6	2437	11.79
	11	2452	11.91

5.2G power

Mode	Channel Number	Frequency (MHz)	Peak Power (dBm)
802.11a	36	5180	14.68
	48	5240	14.52
802.11n(HT20)	36	5180	13.35
	48	5240	13.26
802.11n(HT40)	36	5190	12.36
	48	5230	12.39

Justification for test configurations for WLAN per KDB Publication 248227 D01Wi-Fi SAR v02:

1. Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
2. For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
3. For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
4. For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported.
5. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.
6. The bolded data rate and channel above were tested for SAR.

Turn Power

Mode	WIFI 2.4G
IEEE 802.11b	15.0±1
IEEE 802.11g	14.0±1
802.11n(HT20)	13.0±1
802.11n(HT40)	11.0±1

Mode	WIFI 5.2G
802.11a	14.0±1
802.11n(HT40)	13.0±1
802.11n(HT40)	12.0±1

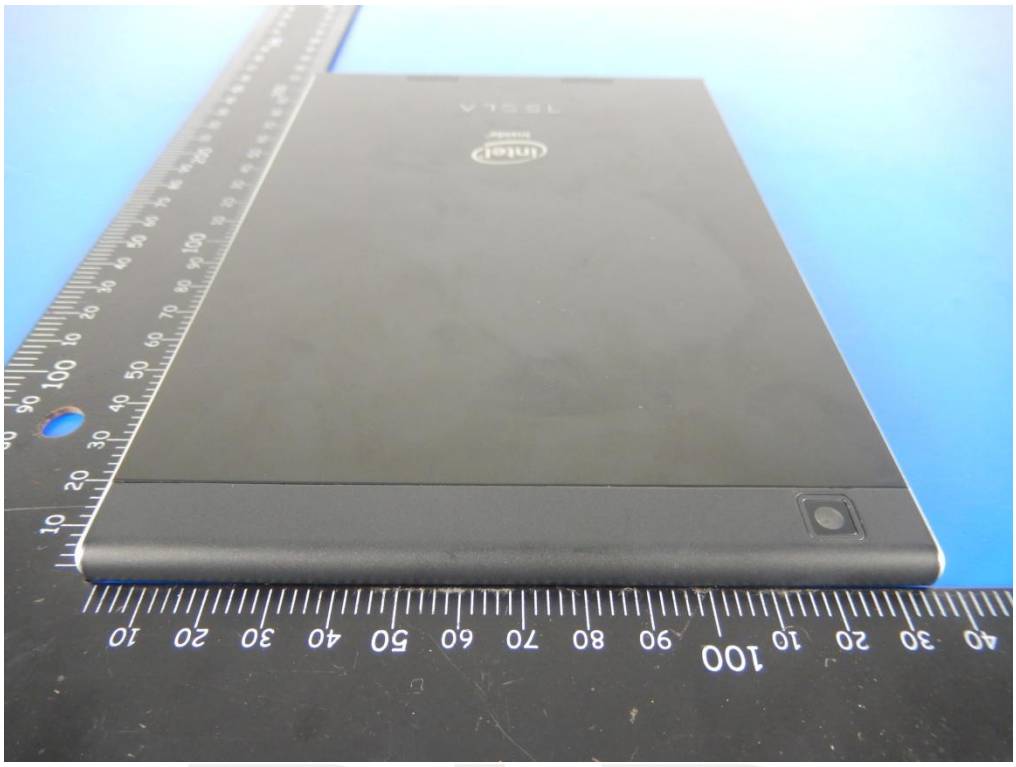
11. EUT And Test Setup Photo

11.1 EUT Photo

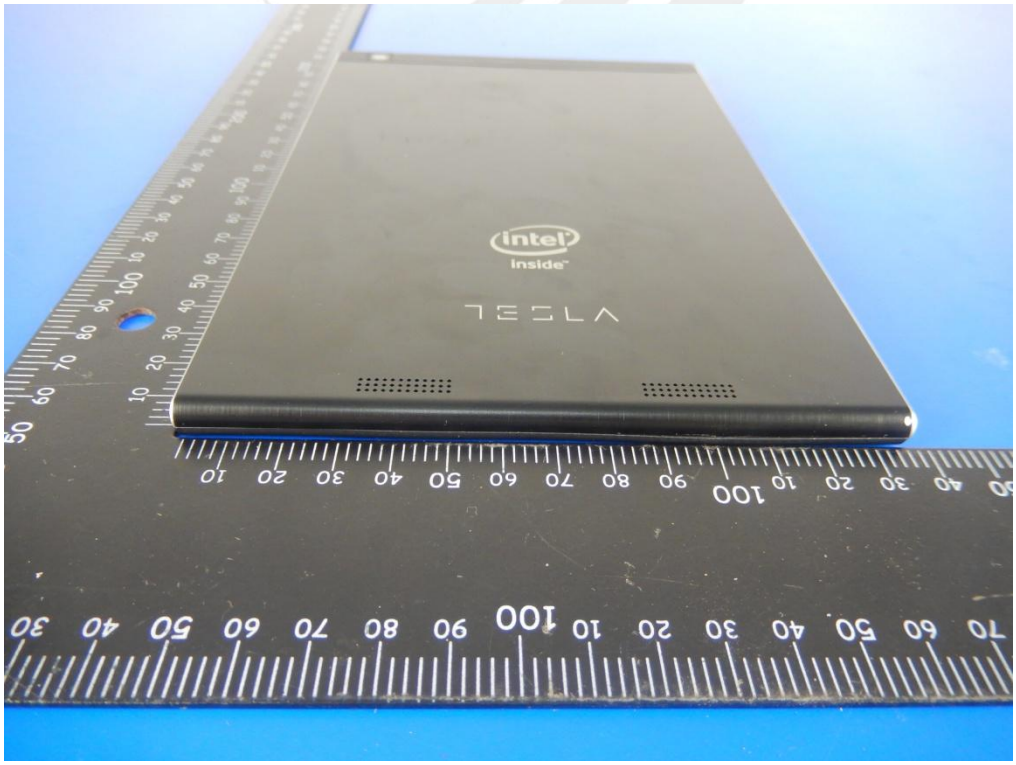
Front side

Back side

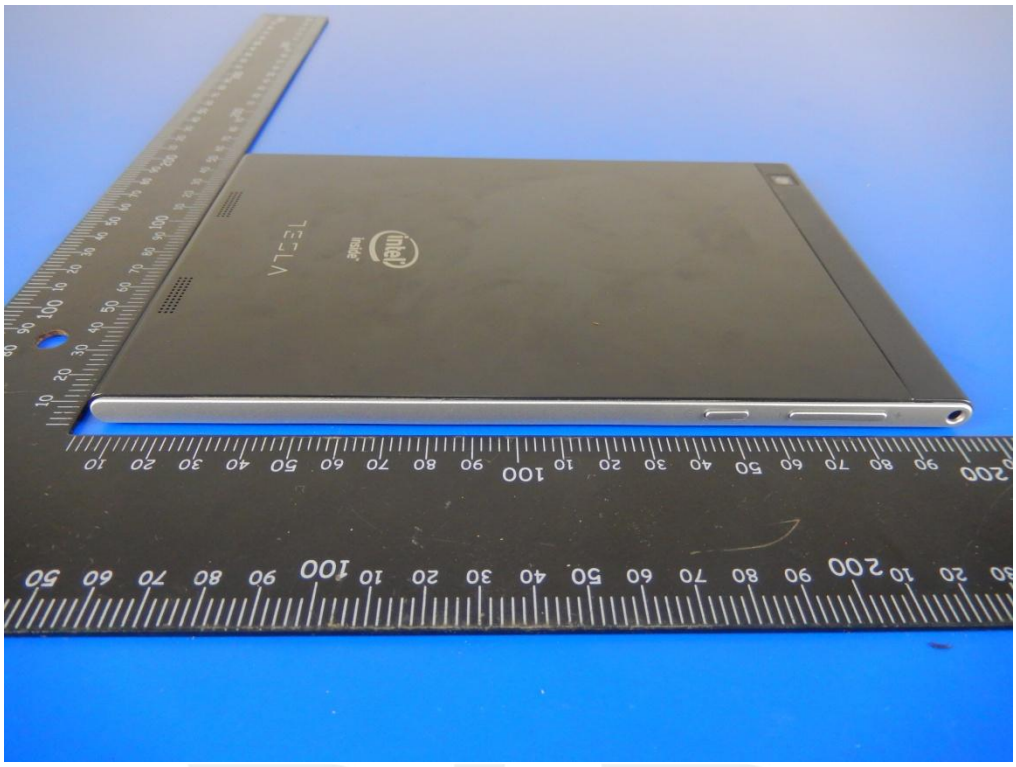
Top side



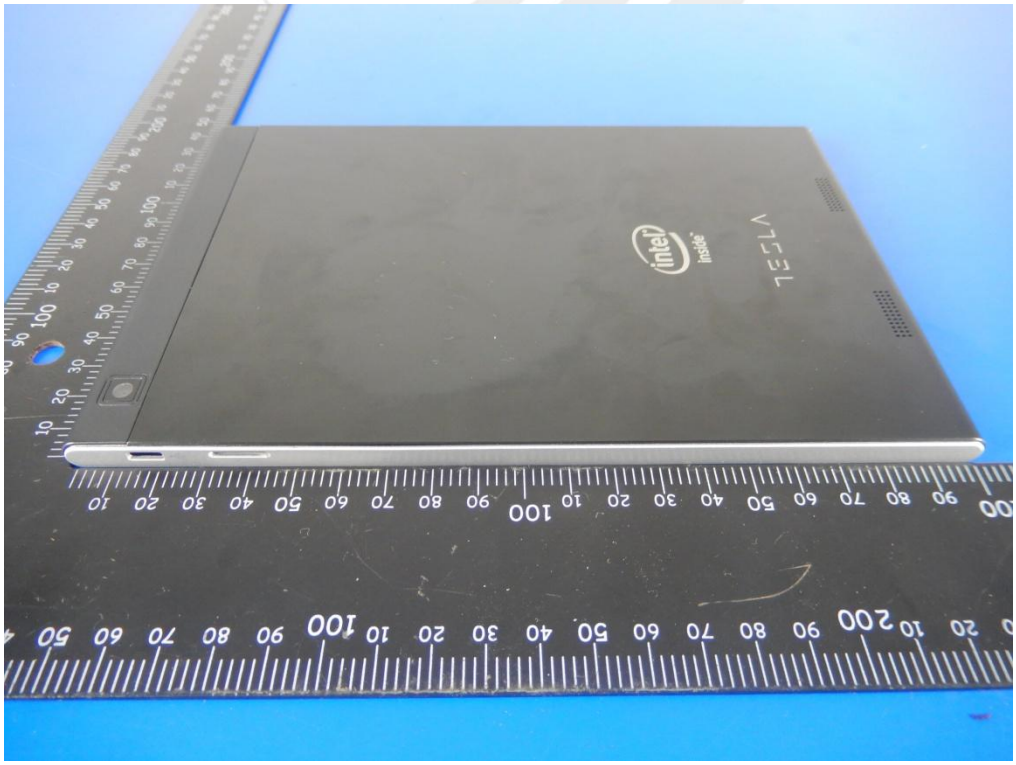
Bottom side



Left side



Right side

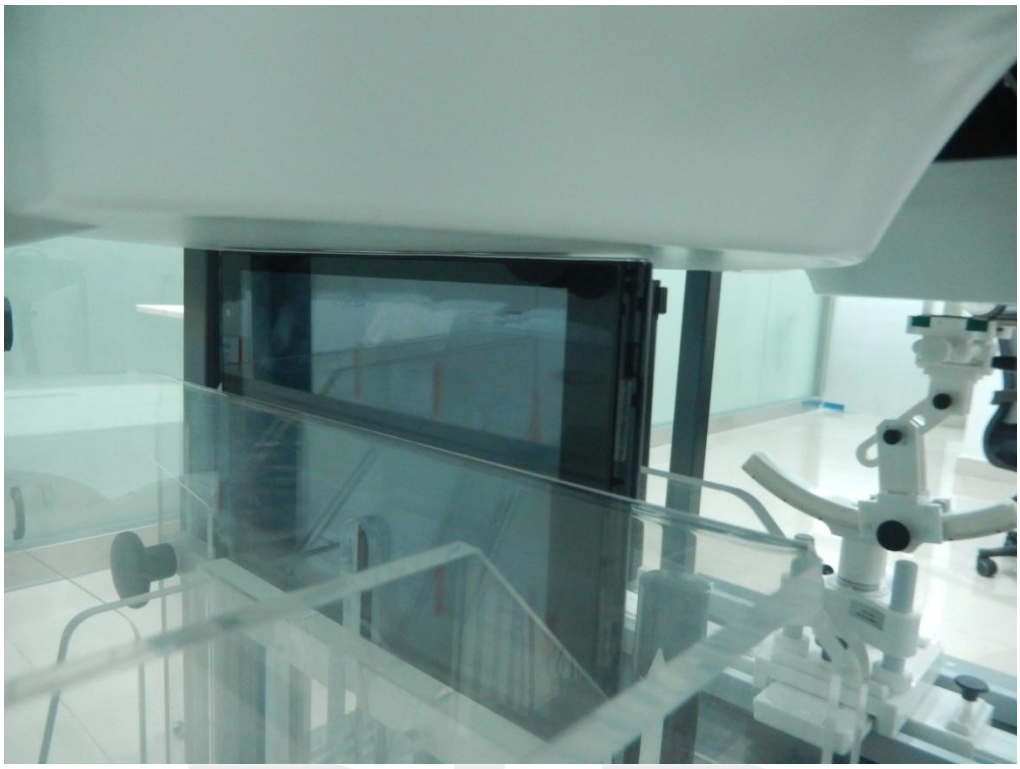


11.2 Setup Photo

Body Front side

Body Back side

Body right side



Body top side

Liquid depth (15 cm)

12. SAR Result Summary

Body (0mm between DUT and Phantom)

Band	Mode	Test Position	Channel	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Duty cycle(%)	Scaled SAR (W/Kg)	Meas. No.
WIFI	802.11a	Front	CH 36	0.204	-4.43	15	14.68	100	0.220	1
		Back	CH 36	0.768	2.68	15	14.68	100	0.827	2
		Right	CH 36	0.063	-3.30	15	14.68	100	0.068	3
		Top	CH 36	0.197	-0.16	15	14.68	100	0.212	4
	802.11b	Front	CH 1	0.446	0.11	16	15.55	100	0.495	5
		Back	CH 1	1.163	4.27	16	15.55	100	1.290	6
		Back	CH 6	1.162	4.76	16	15.43	100	1.325	8
		Back	CH 11	1.147	1.09	16	15.39	100	1.320	9
		Right	CH 1	0.063	-1.57	16	15.55	100	0.070	10
		Top	CH 1	0.328	1.21	16	15.55	100	0.364	11

Note:

1. The value with block color is the maximum Reported SAR Value of each test band.
2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is optional for such test configuration(s).
3. Per KDB 248227-When the reported SAR of the highest measured maximum output power channel (section 3.1) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration, When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing
4. Per KDB 248227-SAR is measured using the highest measured maximum output power channel for the initial test configuration.
5. 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. (2.4G WIFI: The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **1.010** W/Kg for Body/Hotspot; 5G WIFI: The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **0.609** W/Kg for Body/Hotspot)

Repeated SAR

Band	Mode	Test Position	Channel	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Duty cycle(%)	Scaled SAR (W/Kg)	Meas. No.
WIFI	802.11b	Back	CH1	1.128	0.61	16	15.55	100	1.251	7

12.3 repeated SAR measurement

Band	Mode	Test Position	Channel	Original Measured SAR 1g(mW/g)	1 st Repeated SAR 1g	Ratio	Original Measured SAR 1g(mW/g)	2nd Repeated SAR 1g	Ratio
WIFI	802.11b	Back	CH1	1.163	1.128	1.03	-	-	-

Note:

1. Per KDB 865664 D01V01,for each frequency band ,repeated SAR measurement is required only when the measured SAR is≥0.8W/Kg.
2. Per KDB 865664 D01V01,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. Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original，first and second repeated measurement is ＞1.20W/kg
5. The ratio is the difference in percentage between original and repeated measured SAR.

13. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
2450MHzDipole	SATIMO	SID2450	SN 30/14 DIP2G450-335	2014.09.01	2015.08.31
5200MHzDipole	SATIMO	SWG5500	SN 13/14 WGA32	2014.09.01	2015.08.31
E-Field Probe	SATIMO	SSE5	SN 17/14 EP221	2014.09.01	2015.08.31
E-Field Probe	SATIMO	SSE2	SN 17/14 EPG214	2014.09.01	2015.08.31
Antenna	SATIMO	ANTA3	SN 07/13 ZNTA52	2014.09.01	2015.08.31
Phantom1	SATIMO	SAM	SN 32/14 SAM115	2014.09.01	2015.08.31
Phantom2	SATIMO	SAM	SN 32/14 SAM116	2014.09.01	2015.08.31
SAR TEST BENCH	SATIMO	GSM and WCDMA mobile phone POSITIONNIN G SYSTEM	SN 32/14 MSH97	2014.09.01	2015.08.31
SAR TEST BENCH	SATIMO	LAPTOP POSITIONNIN G SYSTEM	SN 32/14 LSH29	2014.09.01	2015.08.31
Dielectric Probe Kit	SATIMO	SCLMP	SN 32/14 OCPG52	2014.09.01	2015.08.31
Multi Meter	Keithley	Multi Meter 2000	4050073	2014.11.20	2015.11.19
Signal Generator	Agilent	N5182A	MY50140530	2014.11.18	2015.11.17
Power Meter	R&S	NRP	100510	2014.10.25	2015.10.24
Power Sensor	R&S	NRP-Z11	101919	2014.10.24	2015.10.23
Network Analyzer	Agilent	5071C	EMY46103472	2014.12.12	2015.12.11

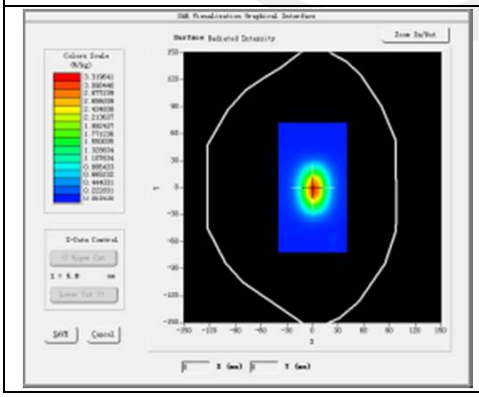
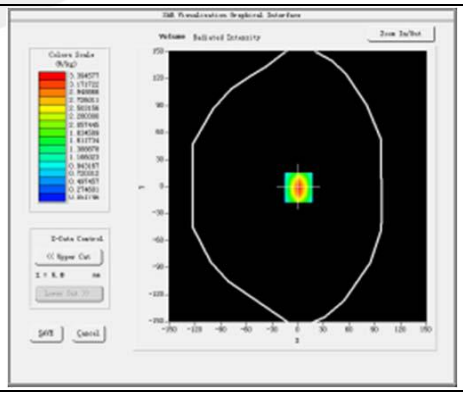
Appendix A. System Validation Plots

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: 2015-05-21
Measurement duration: 14 minutes 23 seconds

Experimental conditions.

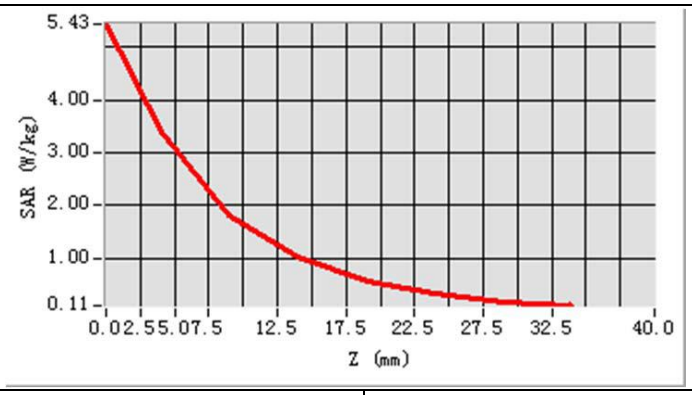
Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity (real part)	39.226002
Relative permittivity	12.930000
Conductivity (S/m)	1.95
Power drift (%)	-1.200000
Ambient Temperature	22.7°C
Liquid Temperature	22.3°C
Probe	SN 17/14 EP221
ConvF	4.25
Crest factor:	1:1

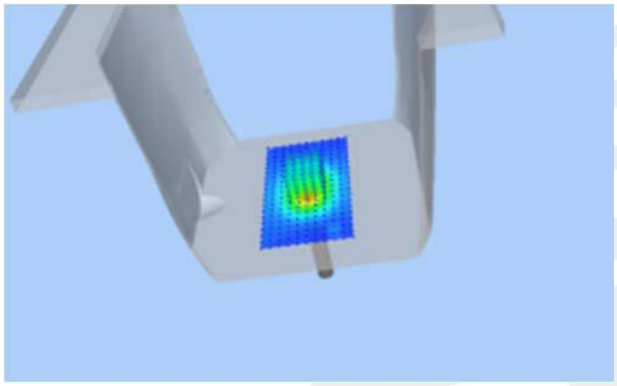
SURFACE SAR	VOLUME SAR
	

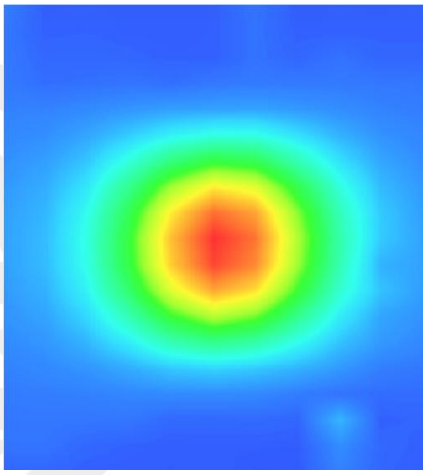
Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	2.156894
SAR 1g (W/Kg)	4.864392

Z Axis Scan


5.43
4.00
3.00
2.00
1.00
0.11
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)



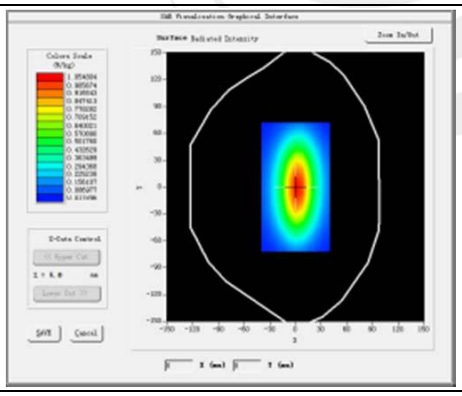
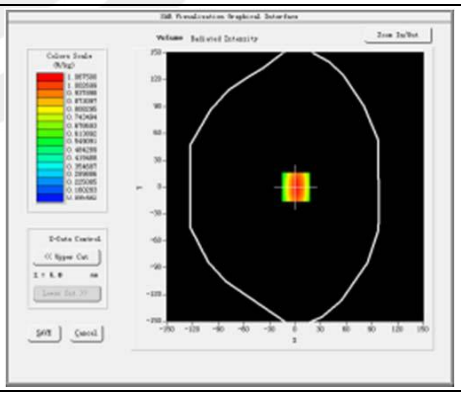


System Performance Check Data(5200MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: 4x4x2,dx=4mm dy=4mm dz=2mm,
Date of measurement: 2015-05-21

Experimental conditions.

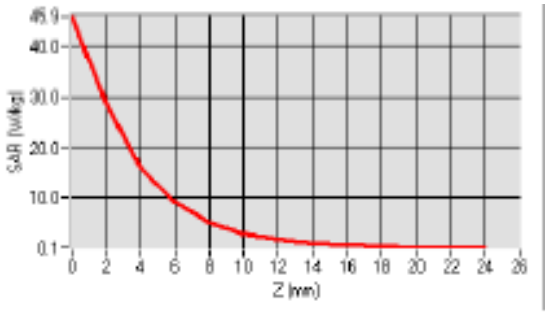
Device Position	Validation plane
Band	5200 MHz
Channels	-
Signal	CW
Frequency (MHz)	5200
Relative permittivity (real part)	36.640002
Relative permittivity (imaginary)	16.250000
Conductivity (S/m)	4.965278
Power drift (%)	4.140000
Ambient Temperature	22.7°C
Liquid Temperature	22.3°C
Probe	SN 17/14 EGP214
ConvF	16.88
Crest factor:	1:1

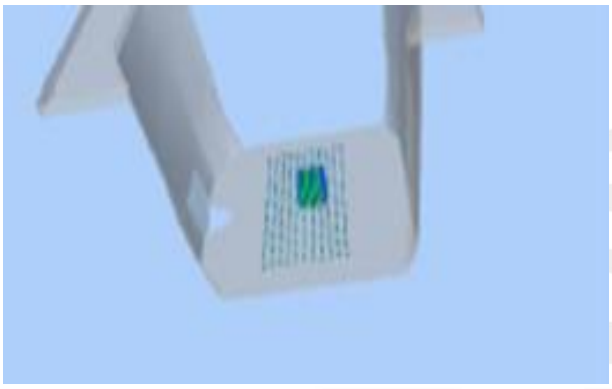
SURFACE SAR	VOLUME SAR
	

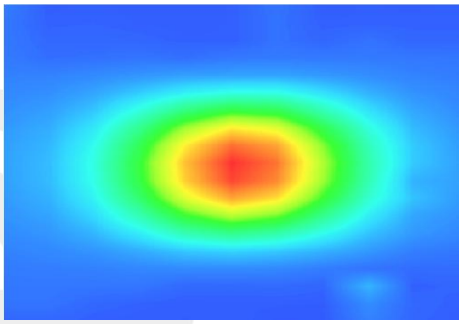
Maximum location: X=7.00, Y=2.00

SAR 10g (W/Kg)	5.643525
SAR 1g (W/Kg)	15.862541

Z Axis Scan







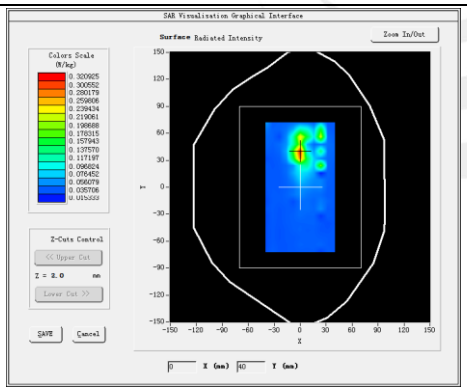
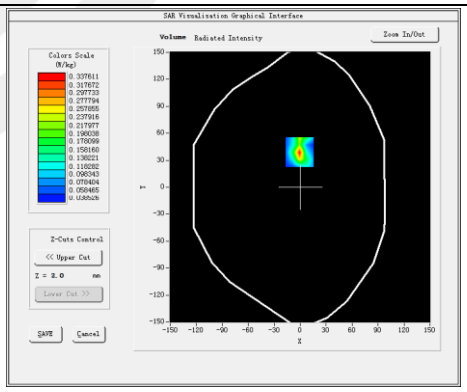
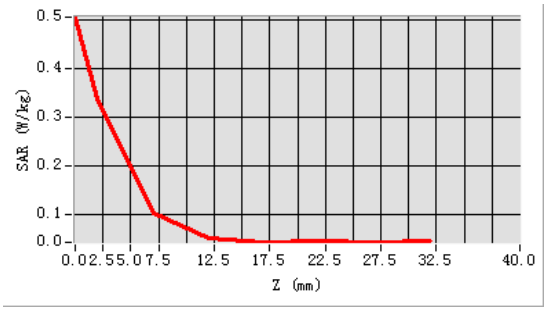
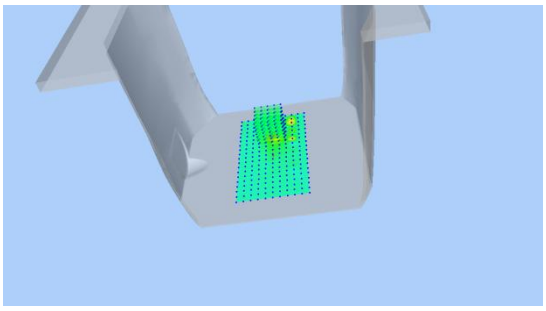
Appendix B. SAR Test Plots

Plot 1: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EGP214
ConvF	17.36
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	4x4x2,dx=4mm dy=4mm dz=2mm, Complete/ndx=4mm dy=4mm, h= 2.00 mm
Phantom	Validation plane
Device Position	Body Front
Band	IEEE 802.11a ISM
Channels	Low
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5180
Relative permittivity (real part)	35.65
Conductivity (S/m)	4.97
Variation (%)	-4.43

Maximum location: X=-1.00, Y=39.00
SAR Peak: 0.50 W/kg

SAR 10g (W/Kg)	0.084319
SAR 1g (W/Kg)	0.204368

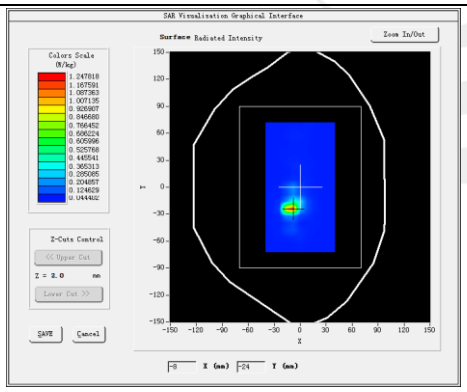
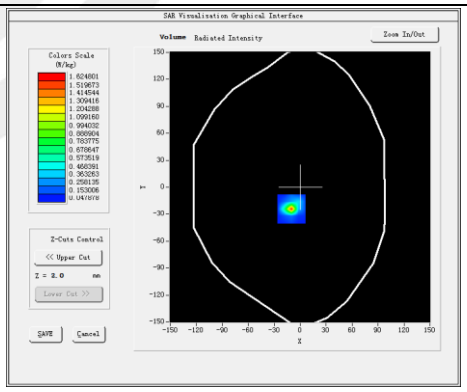
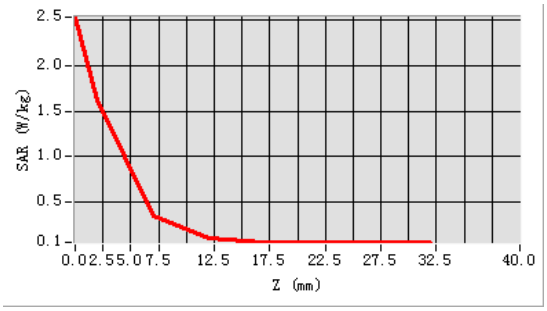
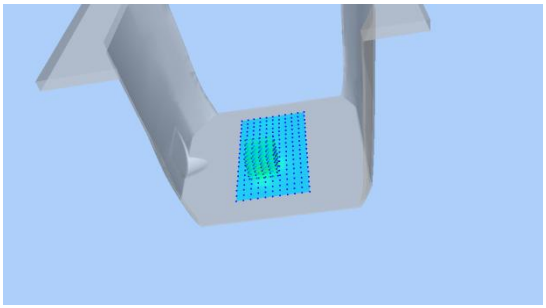
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

Plot 2: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EGP214
ConvF	17.36
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	4x4x2,dx=4mm dy=4mm dz=2mm, Complete/ndx=4mm dy=4mm, h= 2.00 mm
Phantom	Validation plane
Device Position	Body back
Band	IEEE 802.11a ISM
Channels	Low
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5180
Relative permittivity (real part)	35.65
Conductivity (S/m)	4.97
Variation (%)	2.68

Maximum location: X=-10.00, Y=-24.00
SAR Peak: 2.44 W/kg

SAR 10g (W/Kg)	0.188339
SAR 1g (W/Kg)	0.768251

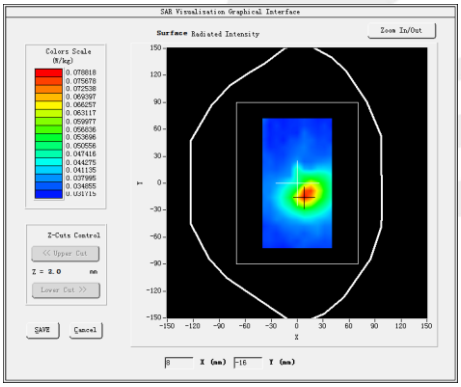
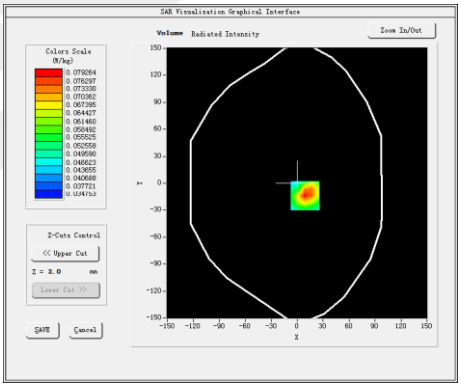
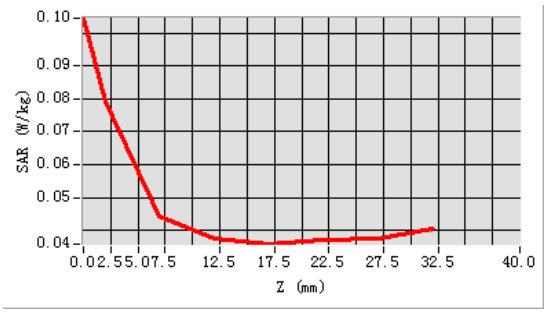
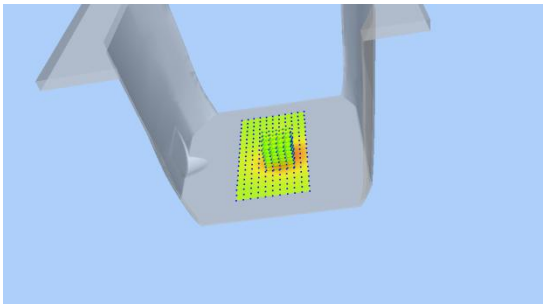
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

Plot 3: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EGP214
ConvF	17.36
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	4x4x2,dx=4mm dy=4mm dz=2mm, Complete/ndx=4mm dy=4mm, h= 2.00 mm
Phantom	Validation plane
Device Position	Body right
Band	IEEE 802.11a ISM
Channels	Low
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5180
Relative permittivity (real part)	35.65
Conductivity (S/m)	4.97
Variation (%)	-3.30

Maximum location: X=9.00, Y=-14.00
SAR Peak: 0.10 W/kg

SAR 10g (W/Kg)	0.045510
SAR 1g (W/Kg)	0.063141

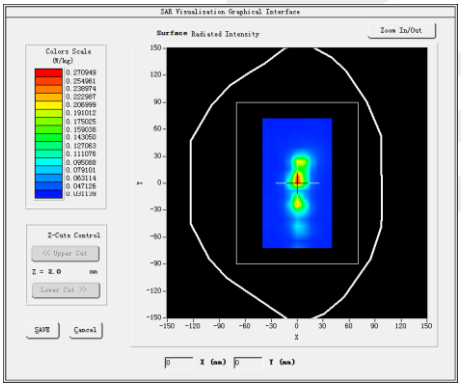
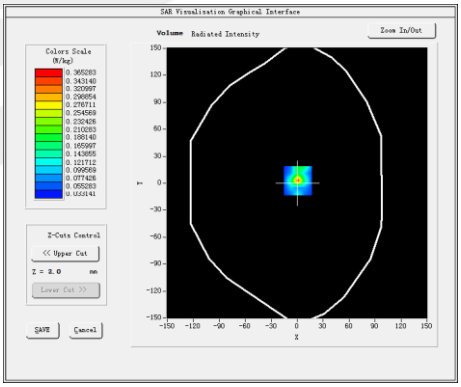
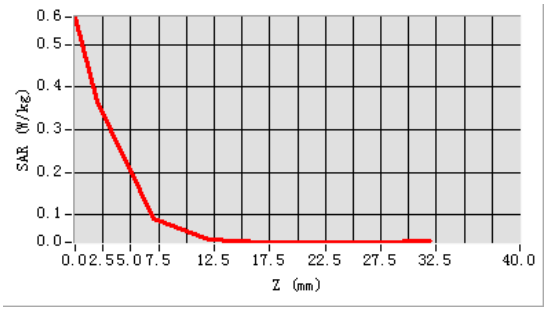
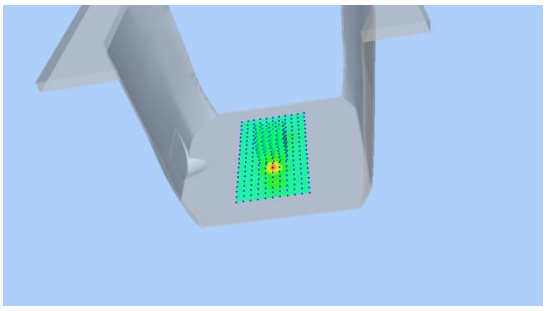
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

Plot 4: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EGP214
ConvF	17.36
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	4x4x2,dx=4mm dy=4mm dz=2mm, Complete/ndx=4mm dy=4mm, h= 2.00 mm
Phantom	Validation plane
Device Position	Body top
Band	IEEE 802.11a ISM
Channels	Low
Signal	IEEE802.a (Crest factor: 1.0)
Frequency (MHz)	5180
Relative permittivity (real part)	35.65
Conductivity (S/m)	4.97
Variation (%)	-0.16

Maximum location: X=1.00, Y=3.00
SAR Peak: 0.54 W/kg

SAR 10g (W/Kg)	0.072219
SAR 1g (W/Kg)	0.196609

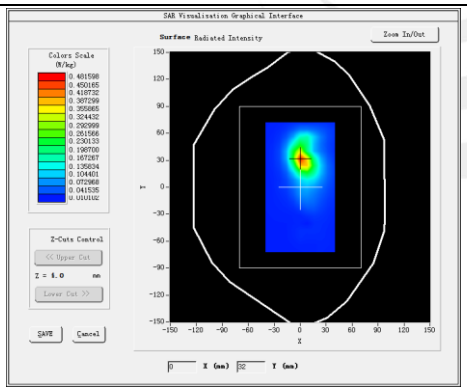
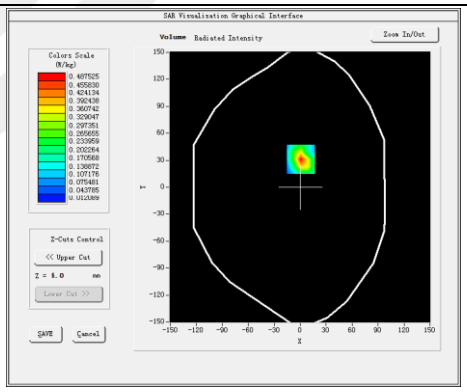
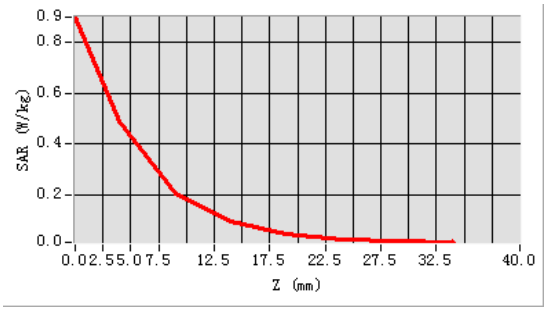
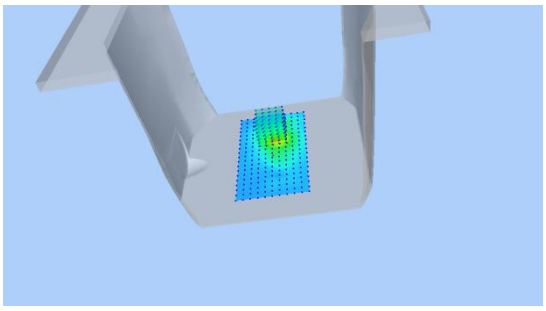
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

Plot 5: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EP221
ConvF	4.25
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body Front
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.78
Variation (%)	0.11

Maximum location: X=1.00, Y=31.00
SAR Peak: 0.89 W/kg

SAR 10g (W/Kg)	0.188212
SAR 1g (W/Kg)	0.445997

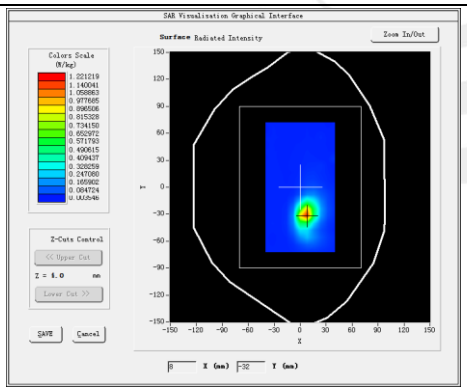
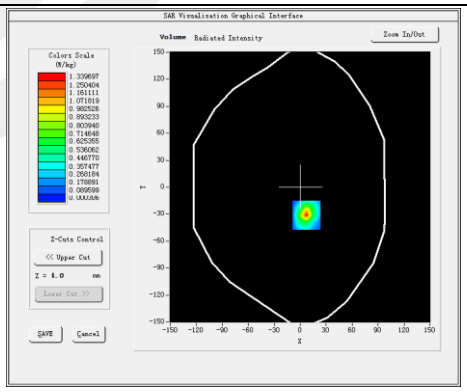
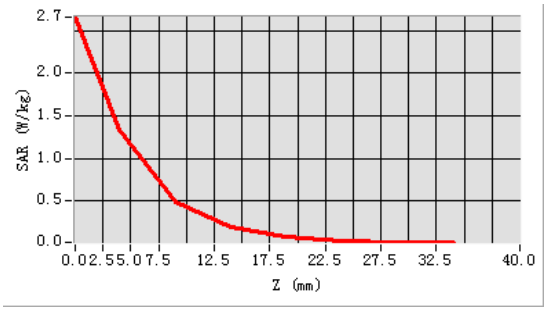
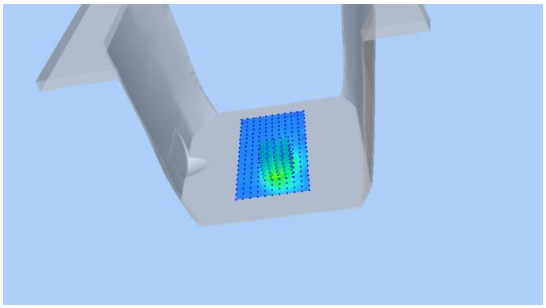
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

Plot 6: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EP221
ConvF	4.25
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	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.78
Variation (%)	4.27

Maximum location: X=7.00, Y=-31.00
SAR Peak: 2.63 W/kg

SAR 10g (W/Kg)	0.402240
SAR 1g (W/Kg)	1.162993

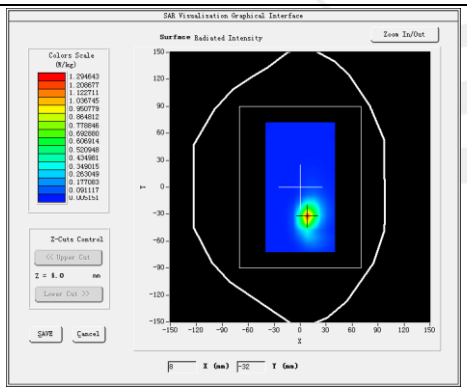
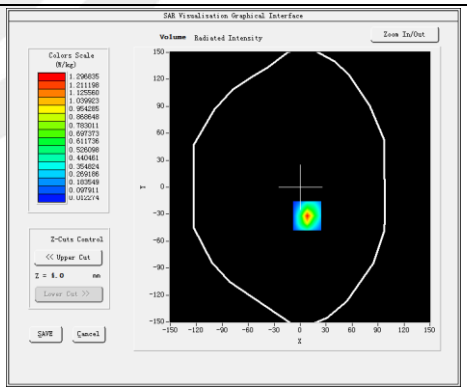
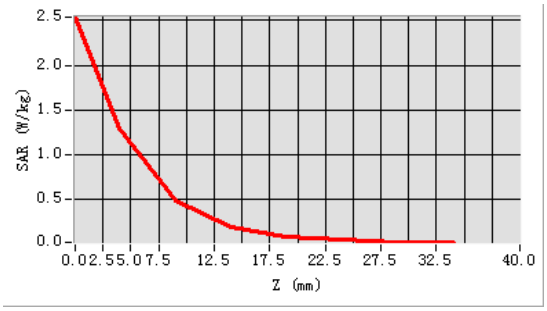
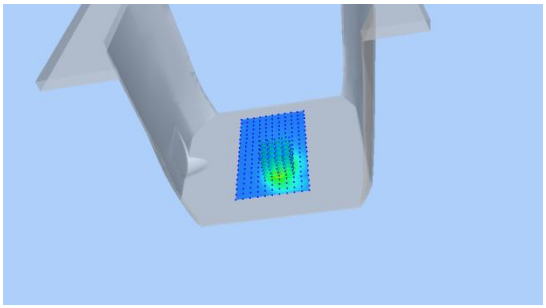
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

Plot 7: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EP221
ConvF	4.25
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-repeated
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.78
Variation (%)	0.61

Maximum location: X=8.00, Y=-32.00
SAR Peak: 2.50 W/kg

SAR 10g (W/Kg)	0.398569
SAR 1g (W/Kg)	1.128376

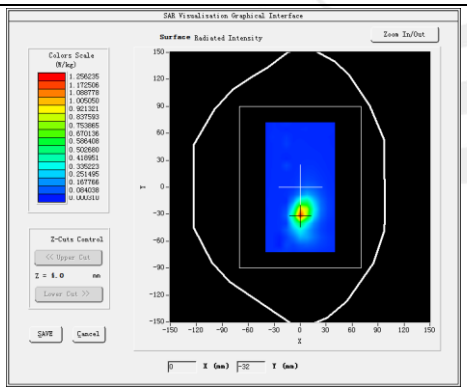
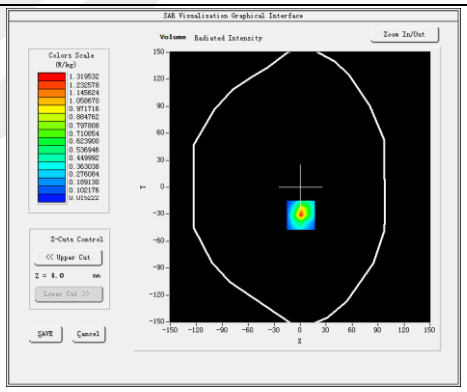
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

Plot 8: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EP221
ConvF	4.25
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
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2437
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.78
Variation (%)	4.76

Maximum location: X=1.00, Y=-31.00
SAR Peak: 2.60 W/kg

SAR 10g (W/Kg)	0.404261
SAR 1g (W/Kg)	1.161827

SURFACE SAR	VOLUME SAR
	
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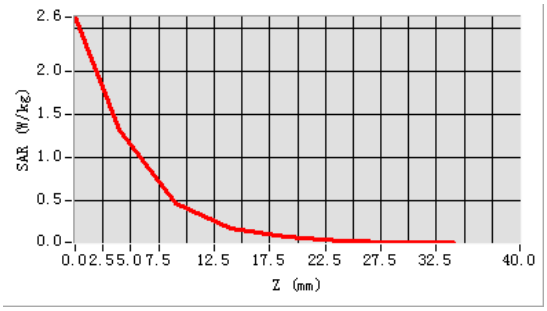
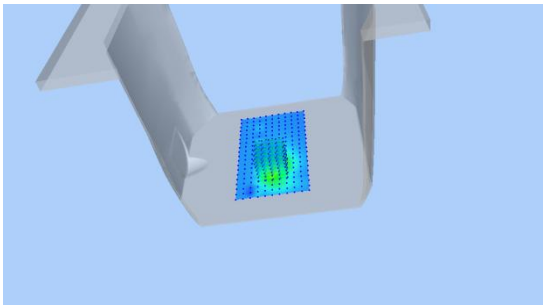
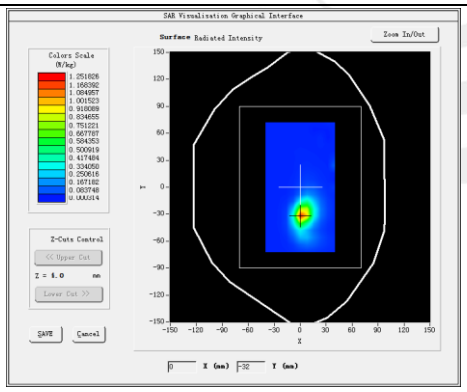
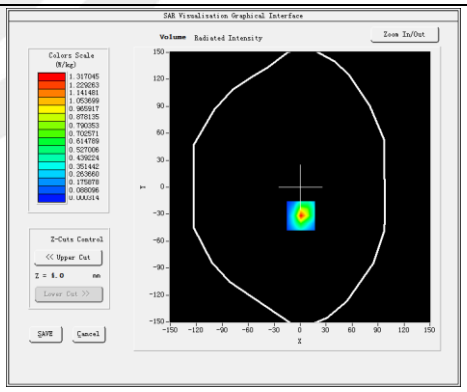
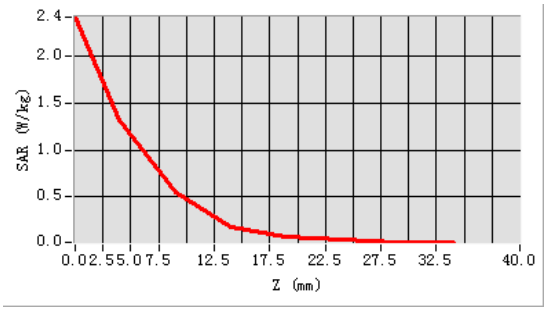
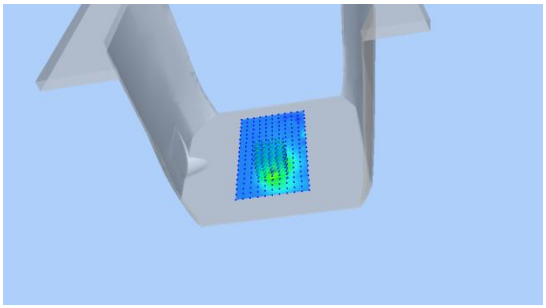
	

Plot 9: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EP221
ConvF	4.25
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	High
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2462
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.78
Variation (%)	1.09

Maximum location: X=1.00, Y=-32.00
SAR Peak: 2.44 W/kg

SAR 10g (W/Kg)	0.400682
SAR 1g (W/Kg)	1.147185

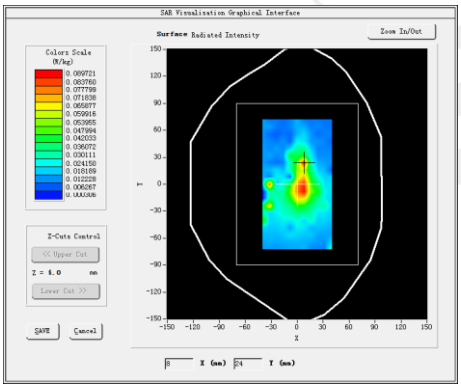
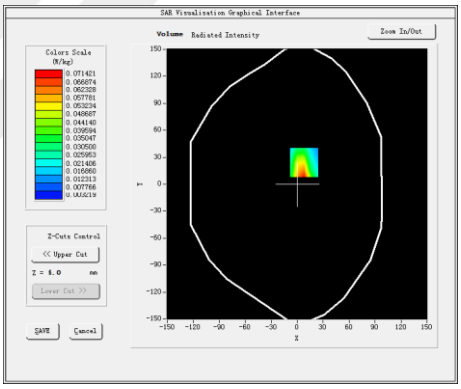
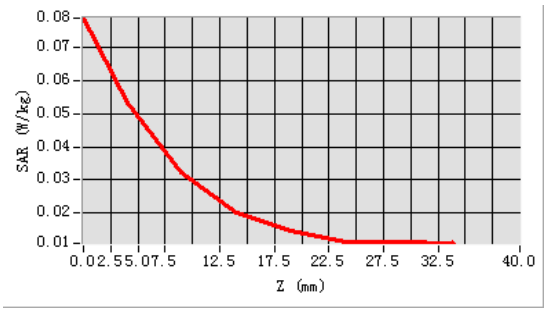
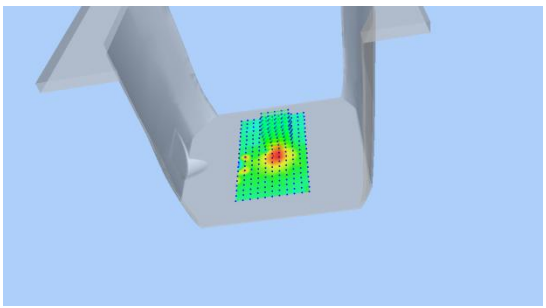
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

Plot 10: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

Test Data	2015-5-21
Probe	SN 17/14 EP221
ConvF	4.25
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 right
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.78
Variation (%)	-1.57

Maximum location: X=8.00, Y=24.00
SAR Peak: 0.11 W/kg

SAR 10g (W/Kg)	0.032738
SAR 1g (W/Kg)	0.063353

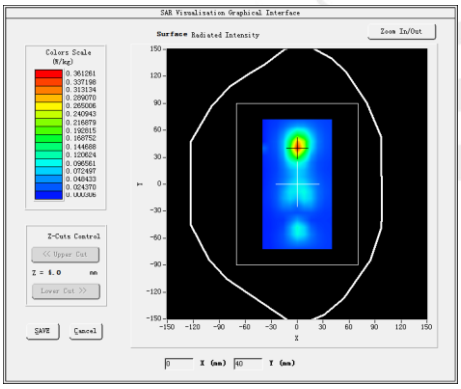
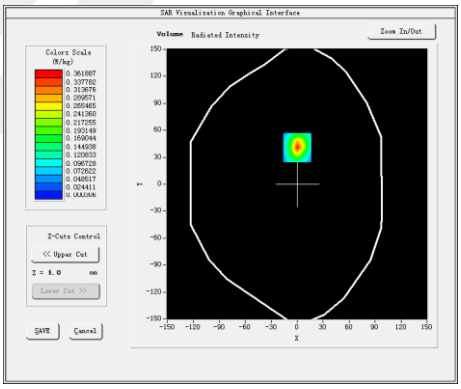
SURFACE SAR	VOLUME SAR
	
Z Axis Scan	**3D**
	

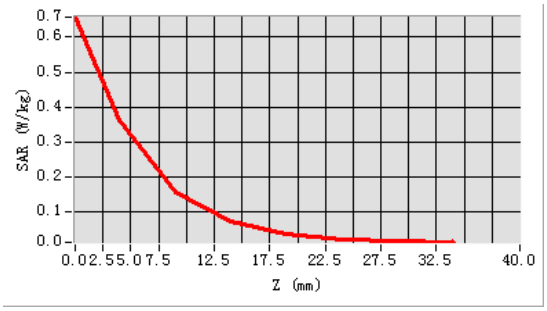
Plot 11: DUT: Tablet computer ; EUT Model: Hero 8_W - Tesla tablet H785

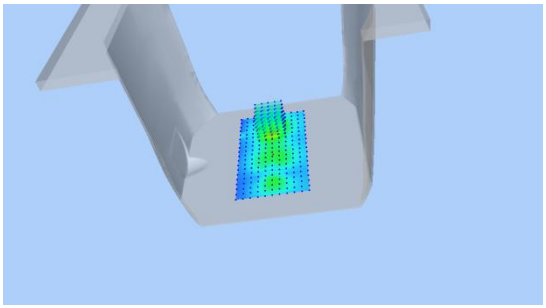
Test Data	2015-5-21
Probe	SN 17/14 EP221
ConvF	4.25
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body top
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.78
Variation (%)	1.21

Maximum location: X=0.00, Y=41.00
SAR Peak: 0.65 W/kg

SAR 10g (W/Kg)	0.138130
SAR 1g (W/Kg)	0.328118

SURFACE SAR	VOLUME SAR
	
Z Axis Scan	3D





Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※