S T S L A B

FCC SAR TEST REPORT

Report No.: STS2005025H01

Issued for

Justice Tech Solutions, LLC

13530 Fifth Street, Chino, CA 91710 United States

Product Name:	Securebook 5.0
Brand Name:	Justice Tech Solutions
Model Name:	JTS-SD50W
Series Model:	JTS-SDB50W
FCC ID:	2AS4KJTS-SD50W
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEEE 1528: 2013
Max. Report SAR (1g):	Body: 0.592 W/kg

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Test Report Certification

Applicant’s name .... : Justice Tech Solutions, LLC

Address .... : 13530 Fifth Street, Chino, CA 91710 United States

Manufacture's Name............ : Justice Tech Solutions, LLC

Address .... : 13530 Fifth Street, Chino, CA 91710 United States

Product description

Product name .... : Securebook 5.0

Brand name .... : Justice Tech Solutions

Model name .... : JTS-SD50W

Series Model.......................... : JTS-SDB50W

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............ : 28 May 2020~31 May 2020

Date of Issue.. : 02 June 2020

Test Result.. : **Pass**

Testing Engineer : Aaron Bu

(Aaron Bu)

Technical Manager : Jason Lu

(Jason Lu)

TESTING • CONSULTING • CERTIFICATION • SOLUTION • STS APPROVAL

Authorized Signatory : Vita Li

(Vita Li)

Table of Contents

Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	02 June 2020	STS2005025H01	ALL	Initial Issue
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

<table>
<tr><td>Product Name</td><td colspan="3">Securebook 5.0</td></tr>
<tr><td>Brand Name</td><td colspan="3">Justice Tech Solutions</td></tr>
<tr><td>Model Name</td><td colspan="3">JTS-SD50W</td></tr>
<tr><td>Series Model</td><td colspan="3">JTS-SDB50W</td></tr>
<tr><td>Model Difference</td><td colspan="3">JTS-SDB50W: remove the USB, HDMI, RJ45 connectors</td></tr>
<tr><td>Device Category</td><td colspan="3">Portable</td></tr>
<tr><td>Product stage</td><td colspan="3">Production unit</td></tr>
<tr><td>RF Exposure Environment</td><td colspan="3">General Population / Uncontrolled</td></tr>
<tr><td>Hardware Version</td><td colspan="3">N/A</td></tr>
<tr><td>Software Version</td><td colspan="3">N/A</td></tr>
<tr><td>Frequency Range</td><td colspan="3">2.4GHz WLAN IEEE 802.11b/g/n(HT20/40): 2412MHz to 2462 MHz
5GHz IEEE 802.11a/n/ac (20MHz): 5180 MHz to 5825 MHz
5GHz IEEE 802.11n/ac (40MHz): 5190 MHz to 5795 MHz
5GHz IEEE 802.11ac (80MHz): 5120 MHz, 5290 MHz, 5530 MHz to 5610MHz, 5775 MHz</td></tr>
<tr><td rowspan="6">Max. Reported SAR(1g): (Limit:1.6W/kg)</td><td>Band</td><td>Mode</td><td>Body SAR (W/kg)</td></tr>
<tr><td>DTS</td><td>2.4G WLAN</td><td>0.592</td></tr>
<tr><td>NII</td><td>5.2G WLAN</td><td>0.273</td></tr>
<tr><td>NII</td><td>5.3G WLAN</td><td>0.490</td></tr>
<tr><td>NII</td><td>5.6G WLAN</td><td>0.266</td></tr>
<tr><td>NII</td><td>5.8G WLAN</td><td>0.210</td></tr>
<tr><td>FCC Equipment Class</td><td colspan="3">Digital Transmission System (DTS)
Unlicensed National Information Infrastructure TX (NII)</td></tr>
<tr><td>Operating Mode:</td><td colspan="3">802.11b(DSSS): CCK,DQPSK,DBPSK
802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM
802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM
802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM</td></tr>
<tr><td>Antenna Specification:</td><td colspan="3">WLAN: PIFA Antenna</td></tr>
<tr><td>Adapter</td><td colspan="3">1. SOY-1200300US-214
Input: AC100-240V~50/60Hz 1.5A Max
Output: DC 12V/3A
2. JHD-AP045U-120300-AS
Input: AC100-240V~50/60Hz,1.5A
Output: DC 12V/3A</td></tr>
</table>

1.2 Test Environment

Ambient conditions in the SAR laboratory:

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

1.3 Test Factory

ShenZhen STS Test Services Co.,Ltd.

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

FCC test Firm Registration No.: 625569

IC Registration No.: 12108A

A2LA Certificate No.: 4338.01

2. Test Standards

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

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

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3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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

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

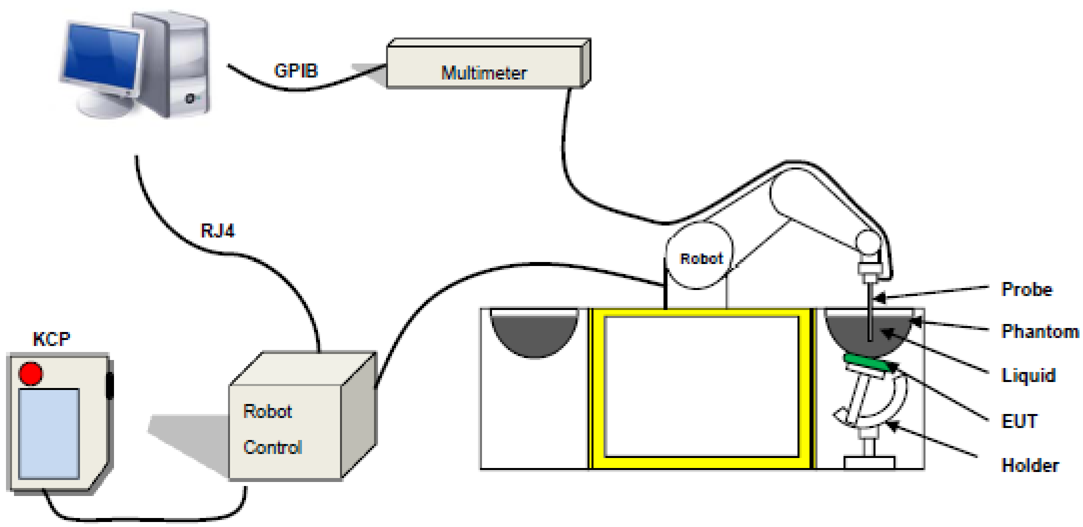
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SAR System

MVG SAR System Diagram:



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

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

The following figure shows the system.

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

3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 41/18 EPG0334 with following specifications is used

- Probe Length: 330 mm
- Length of Individual Dipoles: 2 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter: 2.5 mm
- Distance between dipole/probe extremity: 1 mm
- Dynamic range: 0.01-100 W/kg
- Probe linearity: 3%
- Axial Isotropy: < 0.10 dB
- Spherical Isotropy: < 0.10 dB
- Calibration range: 450 MHz to 6 GHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°

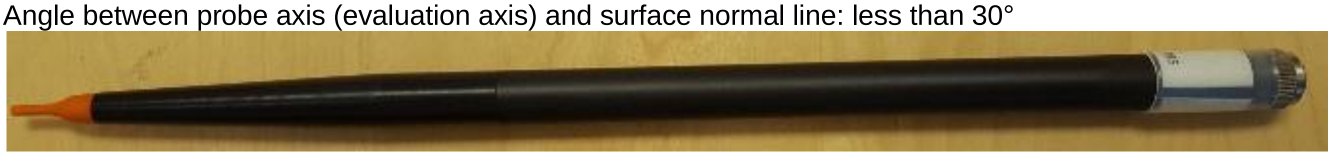


Figure 1-MVG COMOSAR Dosimetric E field Dipole

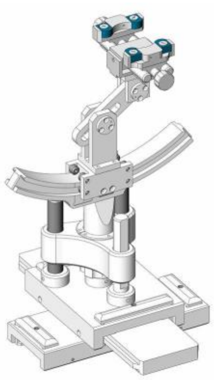
3.2.2 Phantom

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

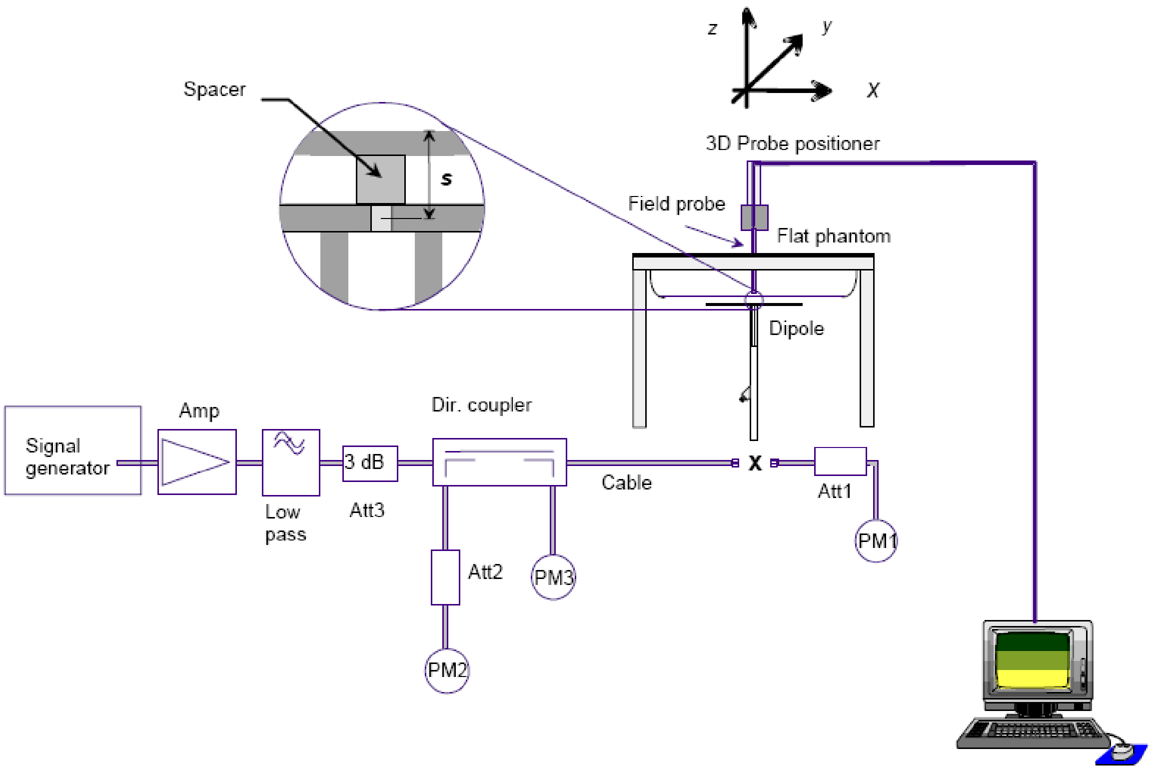
Date	Ambient condition		Body Simulating Liquid		Parameters	Target	Measured	Deviation [%]	Limited [%]
	Temp. [°C]	Humidity [%]	Frequency	Temp. [°C]					
2020-05-28	22.5	47	2450 MHz	22.2	Permittivity:	39.2	38.70	-1.27	±5
					Conductivity:	1.8	1.86	3.18	±5
2020-05-29	22.9	63	5200 MHz	22.6	Permittivity:	36.0	36.15	0.42	±5
					Conductivity:	4.66	4.63	-0.55	±5
2020-05-29	22.9	63	5300 MHz	22.6	Permittivity:	35.8	34.89	-2.54	±5
					Conductivity:	4.86	4.91	1.11	±5
2020-05-30	22.5	60	5600 MHz	22.3	Permittivity:	35.5	36.85	3.81	±5
					Conductivity:	5.07	5.03	-0.78	±5
2020-05-31	23.6	55	5800 MHz	23.3	Permittivity:	35.3	35.68	1.08	±5
					Conductivity:	5.27	5.31	0.76	±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
2450 Body	100	2.320	23.20	24	-3.32	2020-05-28
5200 Body	100	5.683	56.83	56.9	-0.12	2020-05-28
5300 Body	100	5.894	58.94	58.43	0.87	2020-05-29
5600 Body	100	5.935	59.35	59.97	-1.03	2020-05-30
5800 Body	100	6.033	60.326	61.5	-1.91	2020-05-31

Note:

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

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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.

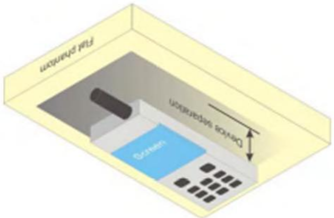
7. EUT Test Position

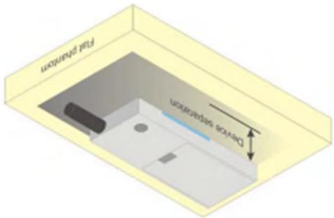
This EUT was tested in Front Face and Rear Face.

7.1 Define Two Imaginary Lines on the Handset

Body-worn Position Conditions:

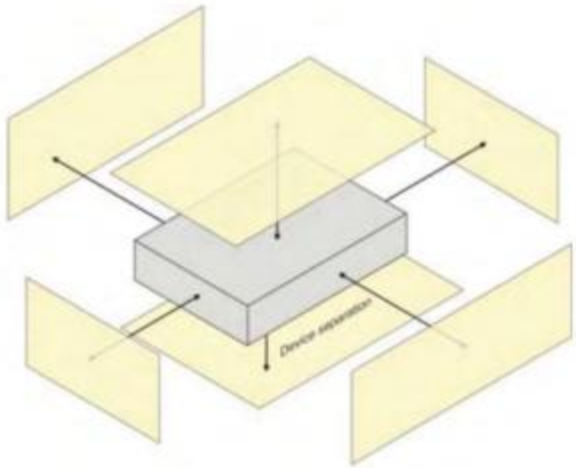
Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same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





7.2 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).



8. Uncertainty

8.1 Measurement Uncertainty

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

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
Measurement System								
Probe calibration	5.831	N	1	1	1	5.83	5.83	∞
Axial Isotropy	0.695	R	√3	√0.5	√0.5	0.28	0.28	∞
Hemispherical Isotropy	1.045	R	√3	√0.5	√0.5	0.43	0.43	∞
Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
Linearity	0.685	R	√3	1	1	0.40	0.40	∞
System detection limits	1.0	R	√3	1	1	0.58	0.58	∞
Modulation response	3.0	R	√3	1	1	1.73	1.73	∞
Readout Electronics	0.021	N	1	1	1	0.021	0.021	∞
Response Time	0	R	√3	1	1	0	0	∞
Integration Time	1.4	R	√3	1	1	0.81	0.81	∞
RF ambient conditions-Noise	3.0	R	√3	1	1	1.73	1.73	∞
RF ambient conditions-reflections	3.0	R	√3	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	1.4	R	√3	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	∞
Post-processing	2.3	R	√3	1	1	1.33	1.33	∞
Test sample Related								
Test sample positioning	2.6	N	1	1	1	2.6	2.6	∞
Device holder uncertainty	3	N	1	1	1	3	3	∞
SAR drift measurement	5	R	√3	1	1	2.89	2.89	∞
SAR scaling	5	R	√3	1	1	2.89	2.89	∞
Phantom and tissue parameters								
Phantom uncertainty（shape and thickness uncertainty）	4	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity （temperature uncertainty）	2.5	R	√3	0.78	0.71	1.13	1.02	∞
Liquid conductivity （measured）	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity （temperature uncertainty）	2.5	R	√3	0.23	0.26	0.33	0.38	∞
Liquid permittivity （measured）	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				9.79	9.59	
Expanded Uncertainty (95% Confidence interval)		K=2				19.58	19.18	

8.2 System validation Uncertainty

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
Measurement System								
Probe calibration	5.831	N	1	1	1	5.83	5.83	∞
Axial Isotropy	0.695	R	$\sqrt{3}$	1	1	0.40	0.40	∞
Hemispherical Isotropy	1.045	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	0.685	R	$\sqrt{3}$	1	1	0.40	0.40	∞
System detection limits	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	3.0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Readout Electronics	0.021	N	1	1	1	0.021	0.021	∞
Response Time	0.0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Integration Time	1.4	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-Noise	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions-reflections	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Post-Processing	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
System validation source								
Deviation of experimental dipole from numerical dipole	5.0	N	1	1	1	5.00	5.00	∞
Input power and SAR drift measurement	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Other source contribution Uncertainty	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and set-up								
Phantom uncertainty（shape and thickness uncertainty）	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity（temperature uncertainty）	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid conductivity（measured）	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity（temperature uncertainty）	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Liquid permittivity（measured）	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				9.718	9.517	
Expanded Uncertainty (95% Confidence interval)		K=2				19.44	19.04	

9. Conducted Power Measurement

9.1 Test Result

WLAN (2.4Gband)

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
802.11b	1	2412	11.58
	6	2437	10.92
	11	2462	10.31
802.11g	1	2412	11.89
	7	2442	11.18
	11	2462	10.30
802.11n (HT20)	1	2412	11.83
	7	2442	11.08
	11	2462	10.18
802.11n (HT40)	3	2422	11.36
	7	2442	10.88
	11	2462	10.05

WLAN (5.2Gband)

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
802.11a	36	5180	11.25
	40	5200	10.98
	48	5240	10.65
802.11 n-HT20	36	5180	10.82
	40	5200	10.84
	48	5240	11.06
802.11 n-HT40	38	5190	11.34
	46	5230	11.71
802.11 ac-VHT20	36	5180	10.92
	40	5200	11.01
	48	5240	11.34
802.11 ac-VHT40	38	5190	11.41
	46	5230	11.61
802.11 ac-VHT80	42	5210	12.46

WLAN (5.3Gband)

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
802.11a	52	5260	11.50
	60	5300	11.80
	64	5320	11.81
802.11 n-HT20	52	5260	10.99
	60	5300	10.97
	64	5320	11.38
802.11 n-HT40	54	5270	11.27
	62	5310	11.69
802.11 ac-VHT20	52	5260	11.01
	60	5300	11.26
	64	5320	11.44
802.11 ac-VHT40	54	5270	11.61
	62	5310	11.76
802.11 ac-VHT80	58	5290	12.40

WLAN (5.6Gband)

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
802.11a	100	5500	12.44
	116	5580	12.39
	140	5700	11.38
802.11 n-HT20	100	5500	12.38
	116	5580	12.05
	140	5700	11.26
802.11 n-HT40	102	5510	12.74
	110	5550	12.79
	134	5670	11.62
802.11 ac-VHT20	100	5500	12.35
	116	5580	12.36
	140	5700	11.10
802.11 ac-VHT40	102	5510	12.75
	110	5550	12.81
	134	5670	11.68
802.11 ac-VHT80	106	5530	13.32
	122	5610	13.50

WLAN (5.8Gband)

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
802.11a	149	5745	11.47
	157	5785	11.25
	165	5825	10.97
802.11 n-HT20	149	5745	11.72
	157	5785	11.56
	165	5825	10.76
802.11 n-HT40	151	5755	12.12
	159	5795	11.72
802.11 ac-VHT20	149	5745	11.79
	157	5785	11.62
	165	5825	11.40
802.11 ac-VHT40	151	5755	11.74
	159	5795	11.73
802.11 ac-VHT80	155	5775	12.61

9.2 Tune-up Power

WLAN (2.4Gband)

Mode	WLAN(AVG)
IEEE 802.11b	11±1dBm
IEEE 802.11g	11±1dBm
IEEE 802.11n(HT 20)	11±1dBm
IEEE 802.11n(HT 40)	11±1dBm

WLAN (5.2Gband)

Mode	WLAN(AVG)
802.11a	11±1dBm
802.11 n20-HT0	11±1dBm
802.11 n40-HT0	11±1dBm
802.11 ac20-VHT0	11±1dBm
802.11 ac40-VHT0	11±1dBm
802.11 ac80-VHT0	12±1dBm

WLAN (5.3Gband)

Mode	WLAN(AVG)
802.11a	11±1dBm
802.11 n20-HT0	11±1dBm
802.11 n40-HT0	11±1dBm
802.11 ac20-VHT0	11±1dBm
802.11 ac40-VHT0	11±1dBm
802.11 ac80-VHT0	12±1dBm

WLAN (5.6Gband)

Mode	WLAN(AVG)
802.11a	12±1dBm
802.11 n20-HT0	12±1dBm
802.11 n40-HT0	12±1dBm
802.11 ac20-VHT0	12±1dBm
802.11 ac40-VHT0	12±1dBm
802.11 ac80-VHT0	13±1dBm

WLAN (5.8Gband)

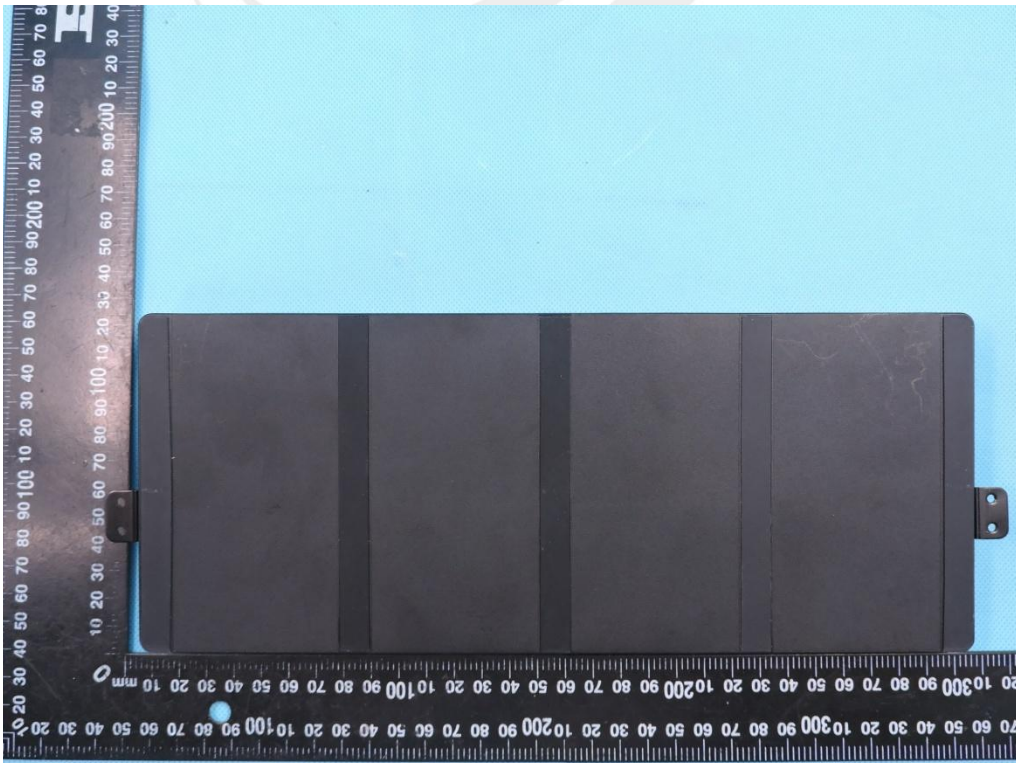
Mode	WLAN(AVG)
802.11a	11±1dBm
802.11 n20-HT0	11±1dBm
802.11 n40-HT0	12±1dBm
802.11 ac20-VHT0	11±1dBm
802.11 ac40-VHT0	11±1dBm
802.11 ac80-VHT0	12±1dBm

10. EUT and Test Setup Photo

10.1 EUT Photo

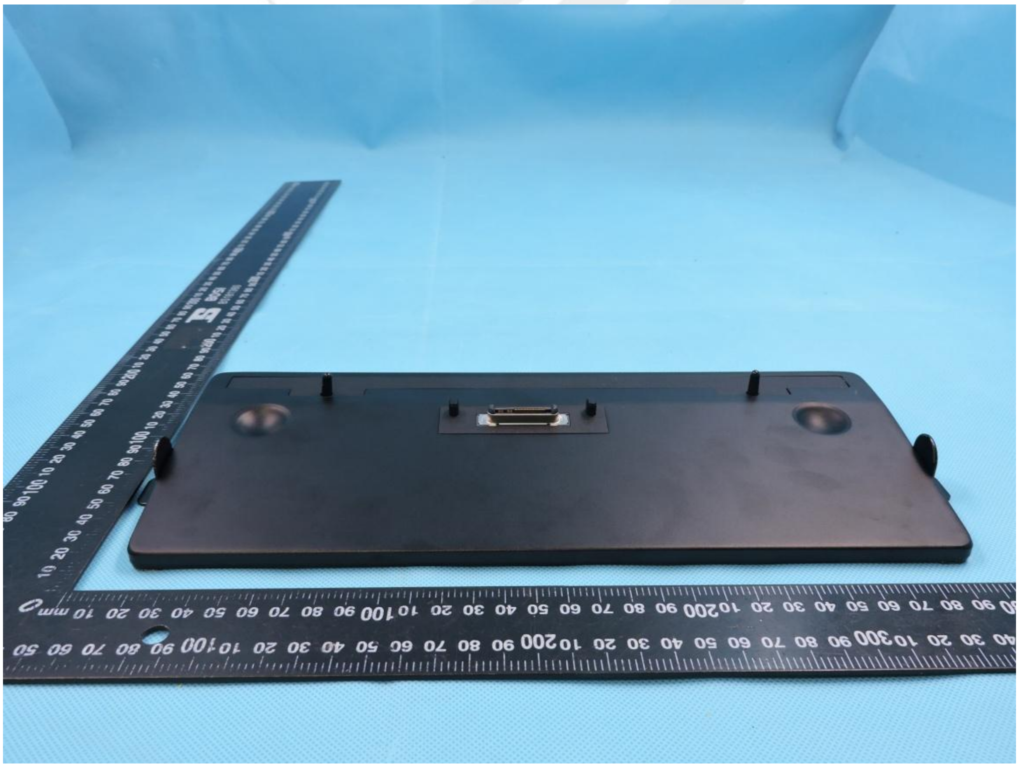
Front side

Back side

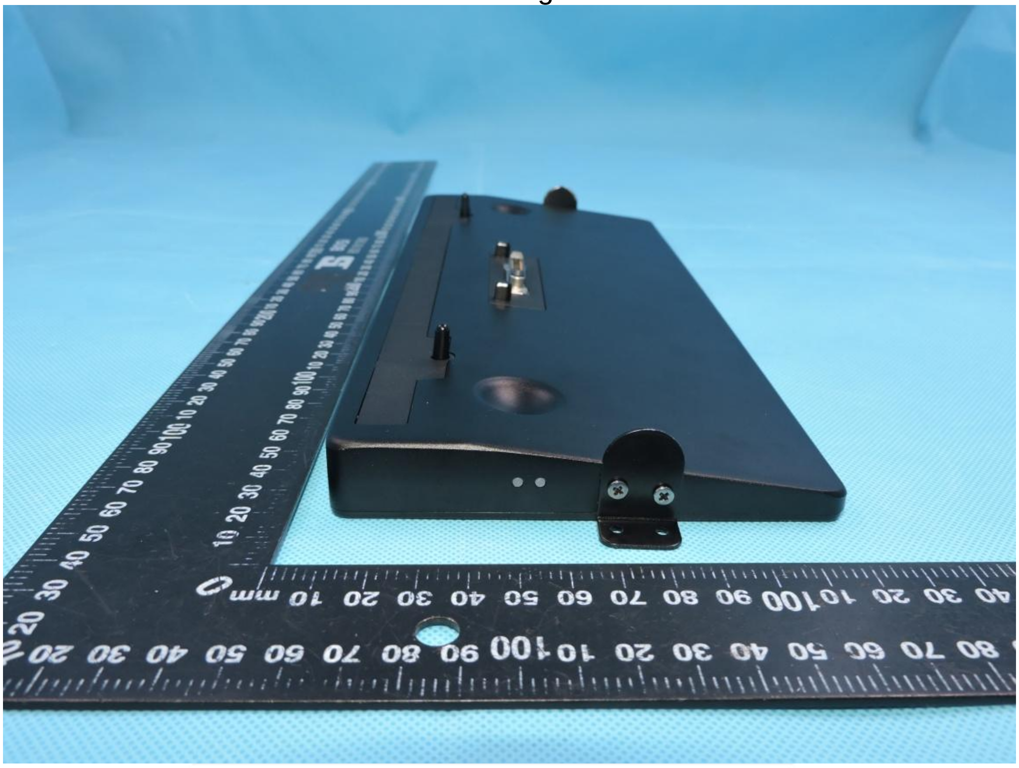


Top Edge

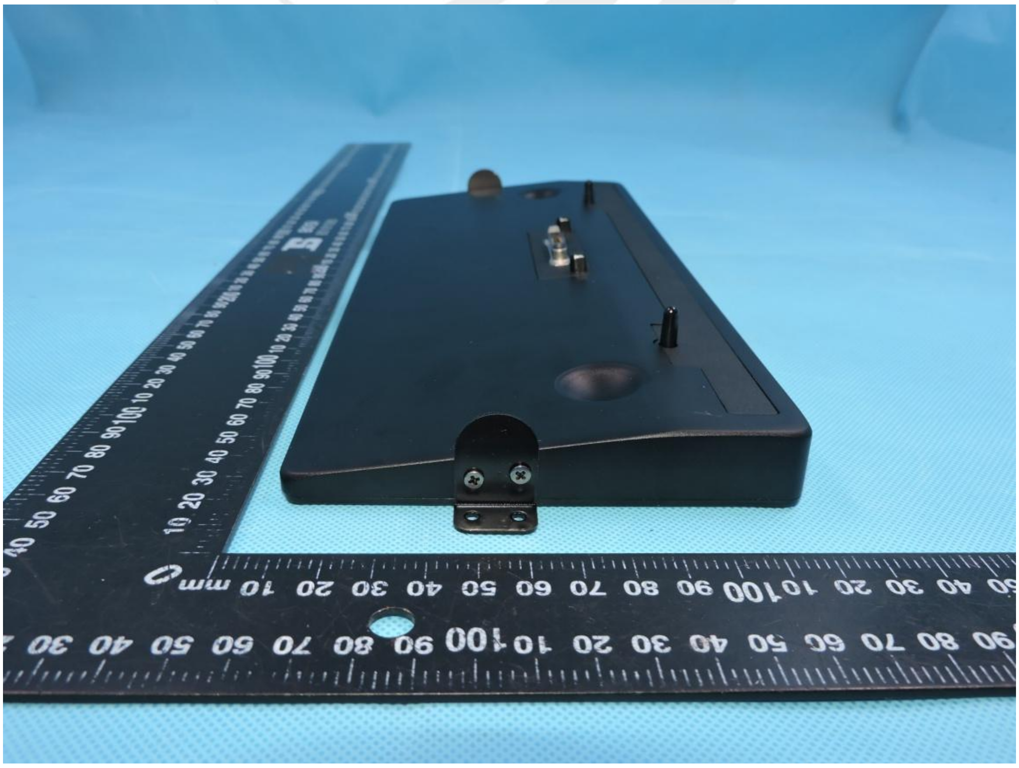
Bottom Edge



Left Edge



Right Edge



10.2 Setup Photo

Body Back side

11. SAR Result Summary

11.1 Body SAR

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Duty cycle(%)	Scaled SAR (W/Kg)	Meas. No.
2.4G WLAN	802.11g	Back side	1	0.577	-0.01	12	11.89	100	**0.592**	1
5.2G WLAN	802.11ac	Back side	42	0.241	3.28	13	12.46	100	**0.273**	2
5.3G WLAN	802.11ac	Back side	58	0.427	1.82	13	12.40	100	**0.490**	3
5.6G WLAN	802.11ac	Back side	122	0.237	2.74	14	13.50	100	**0.266**	4
5.8G WLAN	802.11ac	Back side	155	0.192	-1.55	13	12.61	100	**0.210**	5

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. 2.4G WLAN and 5G WLAN can't simultaneous transmission at the same time.

12. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
2450MHzDipole	MVG	SID2450	SN 30/14 DIP2G450-335	2017.08.15	2020.08.14
Waveguide	MVG	SWG5500	SN 13/14 WGA32	2017.08.15	2020.08.14
E-Field Probe	MVG	SSE2	SN 41/18 EPGO334	2019.06.04	2020.06.03
Dielectric Probe Kit	MVG	SCLMP	SN 32/14 OCPG67	2019.11.25	2020.11.24
Antenna	MVG	ANTA3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	MVG	SAM	SN 32/14 SAM115	N/A	N/A
Phantom2	MVG	SAM	SN 32/14 SAM116	N/A	N/A
Laptop holder	MVG	N/A	SN 32/14 LSH29	N/A	N/A
Attenuator	Agilent	99899	DC-18GHz	N/A	N/A
Directional coupler	Narda	4226-20	3305	N/A	N/A
Network Analyzer	Agilent	8753ES	US38432810	2019.10.11	2020.10.10
Multi Meter	Keithley	Multi Meter 2000	4050073	2019.10.11	2020.10.10
Signal Generator	Agilent	N5182A	MY50140530	2019.10.09	2020.10.08
Power Amplifier	DESAY	ZHL-42W	9638	2019.10.09	2020.10.08
Power Meter	R&S	NRP	100510	2019.10.16	2020.10.15
Power Meter	Agilent	E4418B	GB43312526	2019.10.16	2020.10.15
Power Sensor	R&S	NRP-Z11	101919	2019.10.09	2020.10.08
Power Sensor	Agilent	E9301A	MY41497725	2019.10.09	2020.10.08
Temperature hygrometer	SuWei	SW-108	N/A	2019.10.13	2020.10.12
Thermograph	Elitech	RC-4	S/N EF7176501537	2019.10.11	2020.10.10

Note:
Per KDB 865664 D01, Dipole SAR Validation Verification, STS LAB has adopted 3 years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole
2. System validation with specific dipole is within 10% of calibrated value

Return-loss in within 20% of calibrated measurement

Appendix A. System Validation Plots

System Performance Check Data (2450MHz)

Type: Phone measurement (Complete)

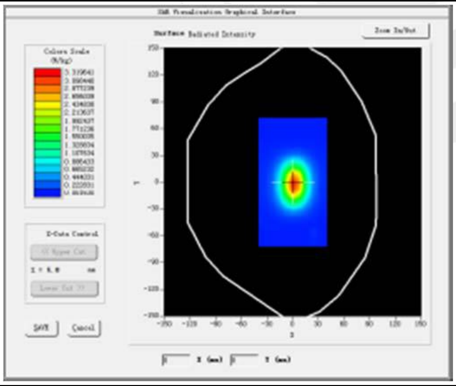
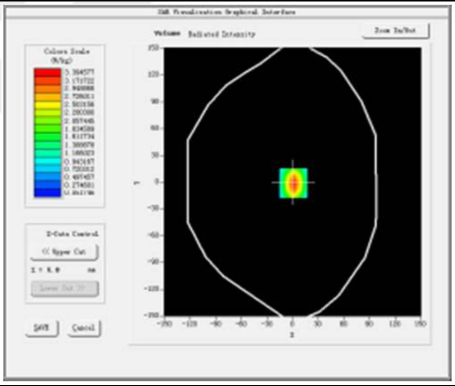
Area scan resolution: dx=8mm, dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 2020-05-28

Experimental conditions.

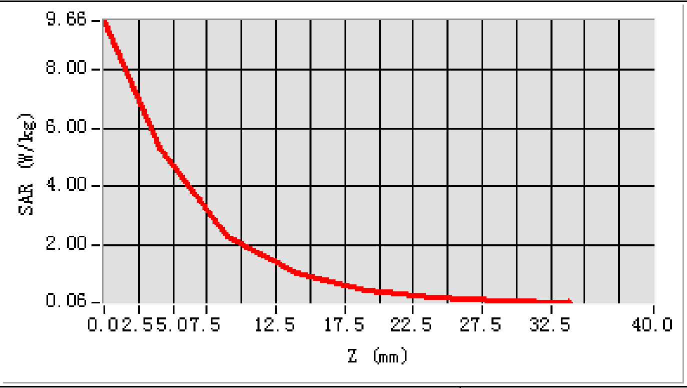
Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	38.70
Conductivity (S/m)	1.86
Probe	SN 41/18 EPGO334
ConvF	1.97
Crest factor:	1:1

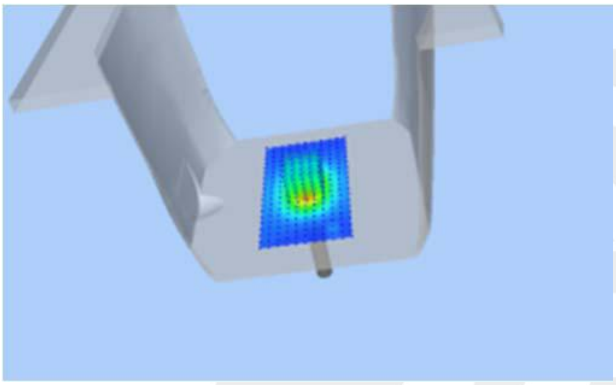
SURFACE SAR	**VOLUME SAR**
	

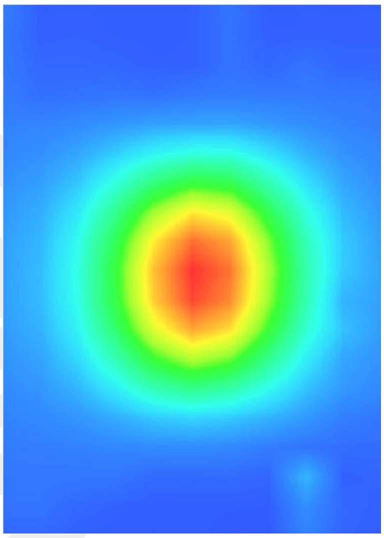
Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	2.320430
SAR 1g (W/Kg)	5.150291

Z Axis Scan


9.66
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)



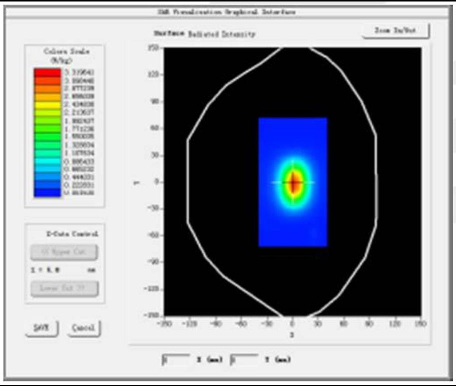
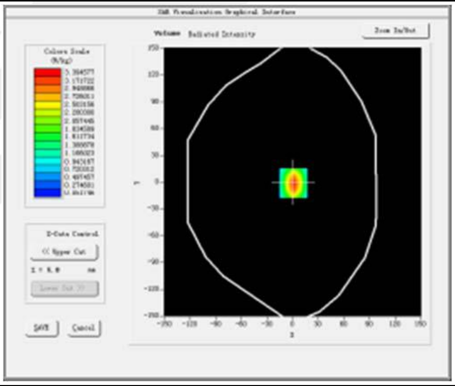


System Performance Check Data(5200MHz)

Type: Dipole measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2020-05-28

Experimental conditions.

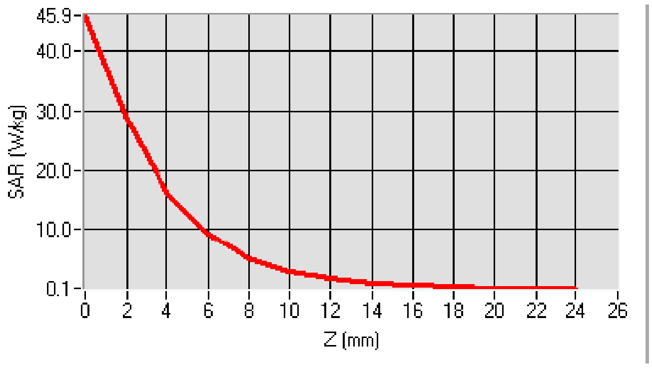
Device Position	Validation plane
Band	5200 MHz
Channels	-
Signal	CW
Frequency (MHz)	5200
Relative permittivity	36.15
Conductivity (S/m)	4.63
Probe	SN 41/18 EPGO334
ConvF	1.86
Crest factor:	1:1

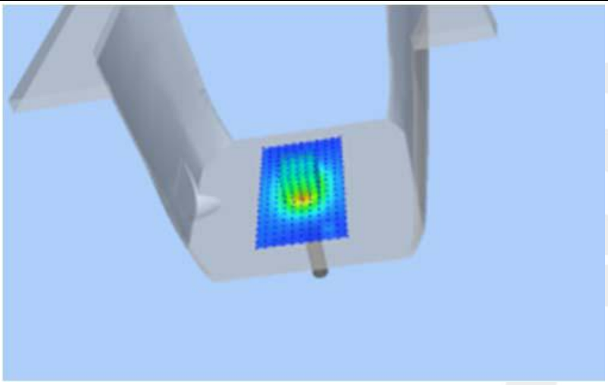
SURFACE SAR	VOLUME SAR
	

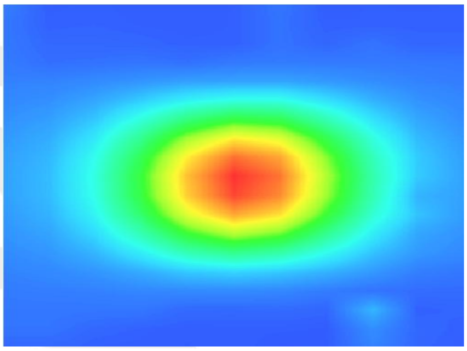
Maximum location: X=7.00, Y=2.00

SAR 10g (W/Kg)	5.682779
SAR 1g (W/Kg)	15.897544

Z Axis Scan





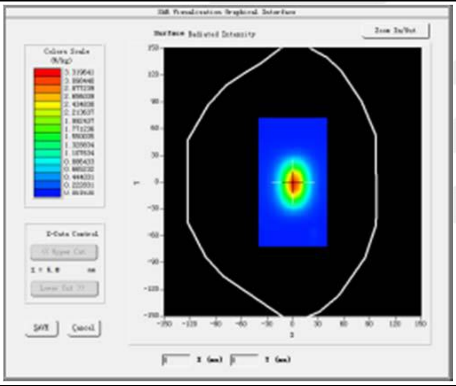
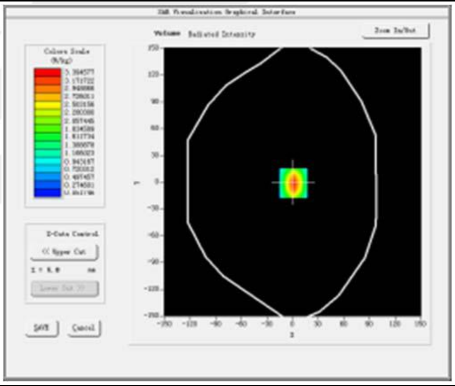


System Performance Check Data(5300MHz)

Type: Dipole measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2020-05-29

Experimental conditions.

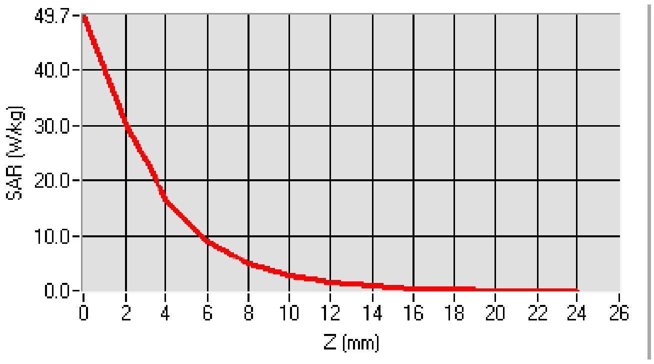
Device Position	Validation plane
Band	5400 MHz
Channels	-
Signal	CW
Frequency (MHz)	5400
Relative permittivity	34.89
Conductivity (S/m)	4.91
Probe	SN 41/18 EPGO334
ConvF	2.07
Crest factor:	1:1

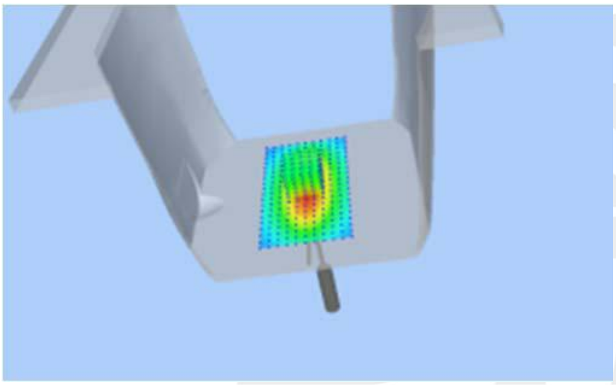
SURFACE SAR	VOLUME SAR
	

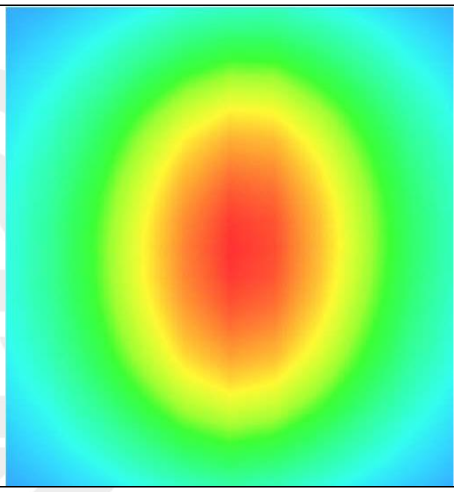
Maximum location: X=7.00, Y=2.00

SAR 10g (W/Kg)	5.894186
SAR 1g (W/Kg)	16.453283

Z Axis Scan





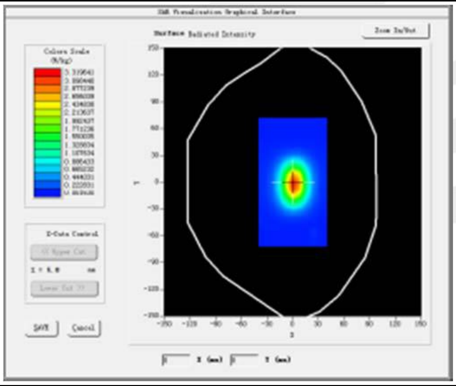
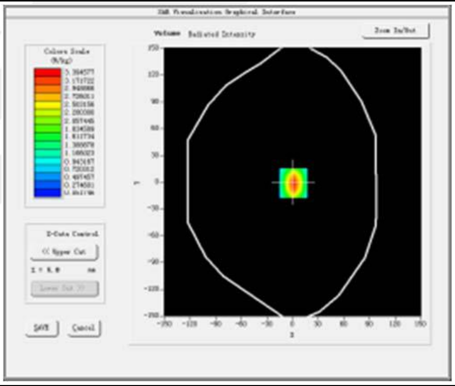


System Performance Check Data(5600MHz)

Type: Dipole measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2020-05-30

Experimental conditions.

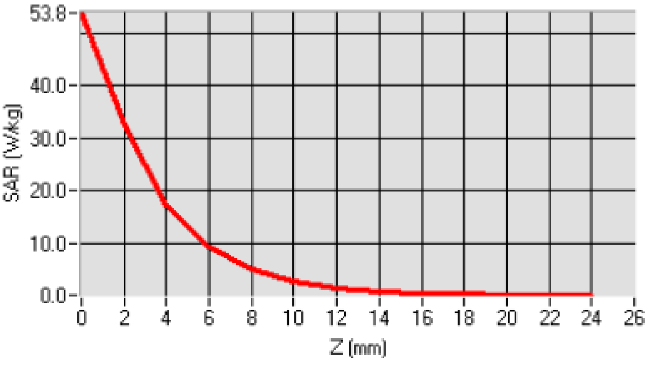
Device Position	Validation plane
Band	5600 MHz
Channels	-
Signal	CW
Frequency (MHz)	5600
Relative permittivity	36.85
Conductivity (S/m)	5.03
Probe	SN 41/18 EPGO334
ConvF	2.14
Crest factor:	1:1

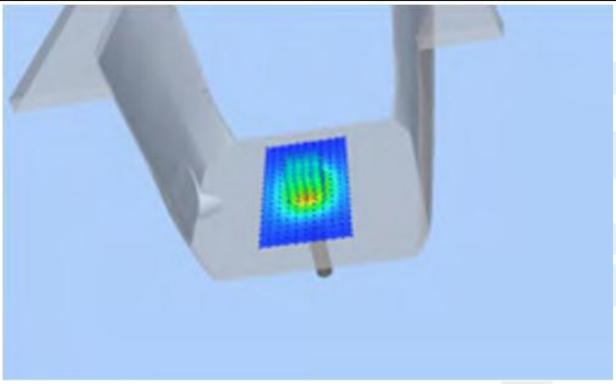
SURFACE SAR	VOLUME SAR
	

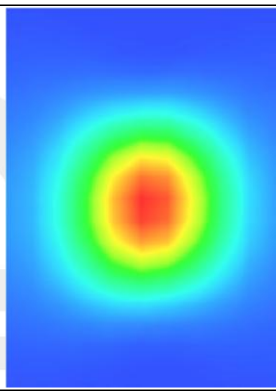
Maximum location: X=7.00, Y=2.00

SAR 10g (W/Kg)	5.934651
SAR 1g (W/Kg)	17.028746

Z Axis Scan





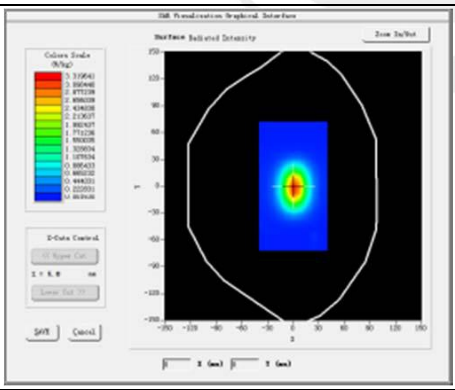
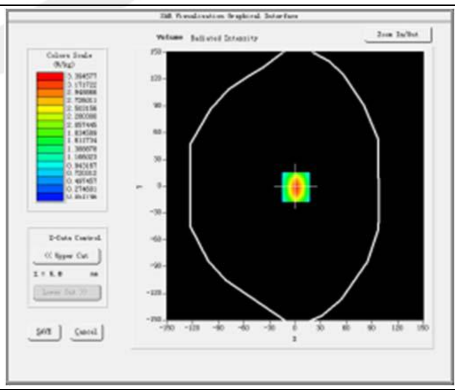


System Performance Check Data(5800MHz)

Type: Dipole measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2020-05-31

Experimental conditions.

Device Position	Validation plane
Band	5800 MHz
Channels	-
Signal	CW
Frequency (MHz)	5800
Relative permittivity	35.68
Conductivity (S/m)	5.31
Power drift (%)	-1.00
Probe	SN 45/15 EPGO281
ConvF	2.60
Crest factor:	1:1

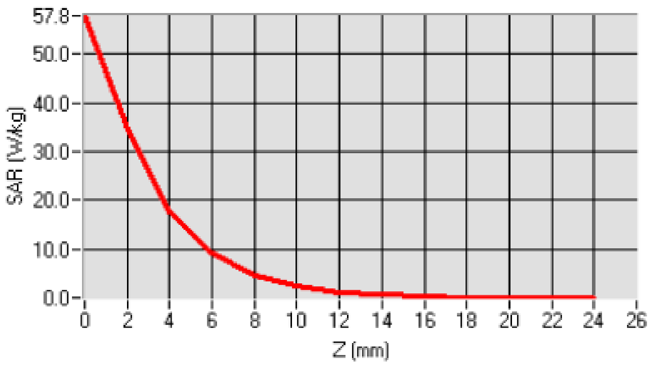
SURFACE SAR	VOLUME SAR
	

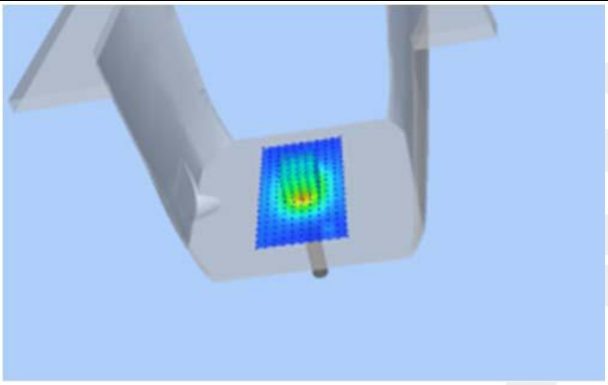
Maximum location: X=7.00, Y=2.00

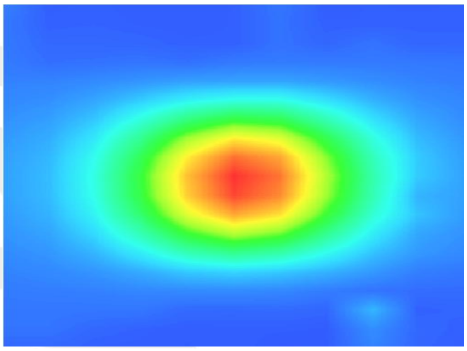
SAR 10g (W/Kg)	6.032685
SAR 1g (W/Kg)	18.541394

A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China
Tel: +86-755 3688 6288 Fax:+86-755 3688 6277 Http://www.stsapp.com E-mail: sts@stsapp.com

Z Axis Scan


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





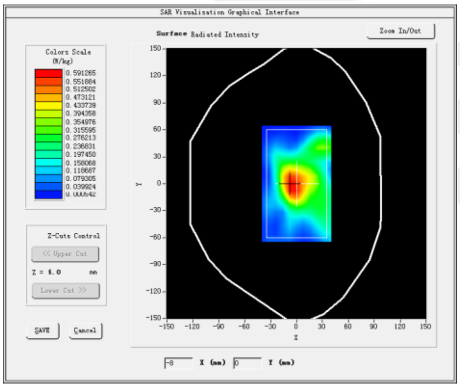
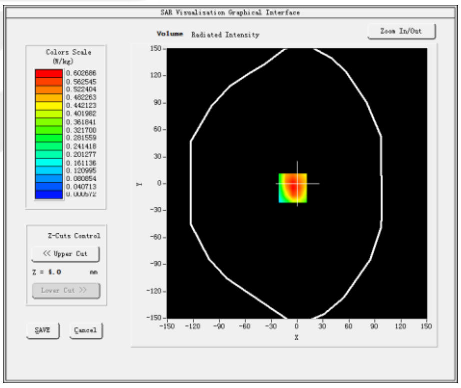
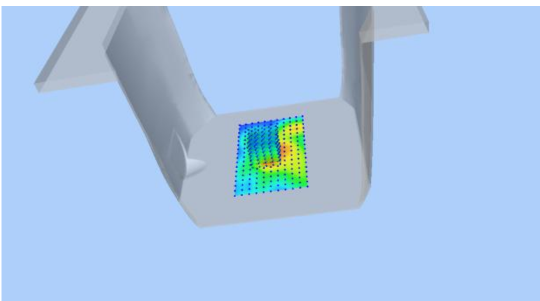
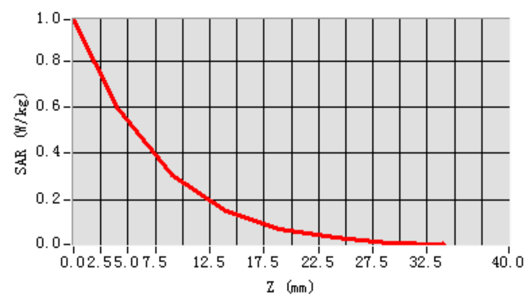
Appendix B. SAR Test Plots

Plot 1: DUT: Securebook 5.0; EUT Model: JTS-SD50W

Test Date	2020-05-28
Probe	SN 41/18 EPGO334
ConvF	1.97
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 802.11g ISM
Channels	Low
Signal	IEEE802.g (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	39.2
Conductivity (S/m)	1.8

Maximum location: X=-5.00, Y=-5.00
SAR Peak: 0.99 W/kg

SAR 10g (W/Kg)	0.294888
SAR 1g (W/Kg)	0.576663

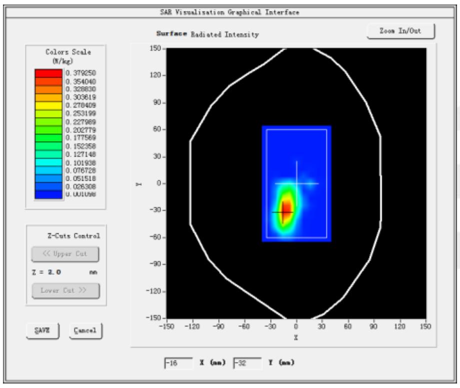
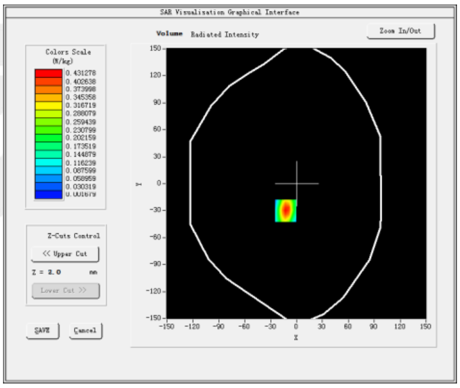
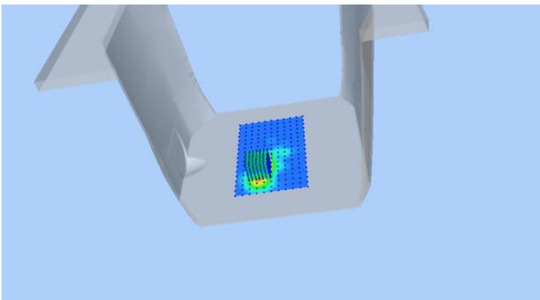
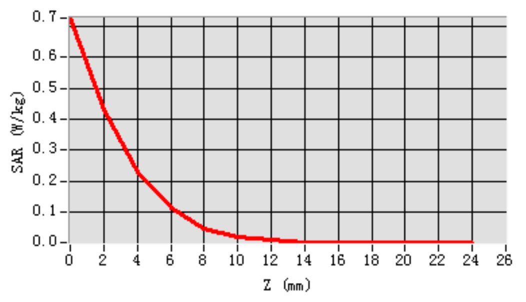
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 2: DUT: Securebook 5.0; EUT Model: JTS-SD50W

Test Date	2020-05-28
Probe	SN 41/18 EPGO334
ConvF	1.86
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 802.11ac ISM
Signal	IEEE802.ac (Crest factor: 1.0)
Frequency (MHz)	5210
Relative permittivity (real part)	36.0
Conductivity (S/m)	4.66

Maximum location: X=-13.00, Y=-30.00
SAR Peak: 0.76 W/kg

SAR 10g (W/Kg)	0.085546
SAR 1g (W/Kg)	0.241256

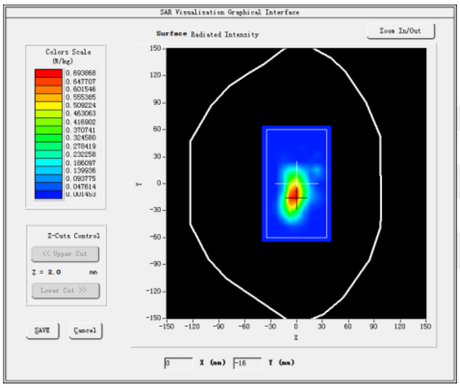
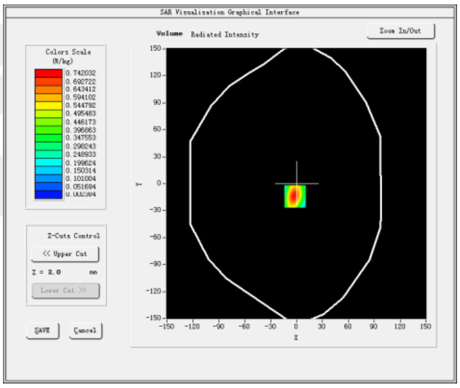
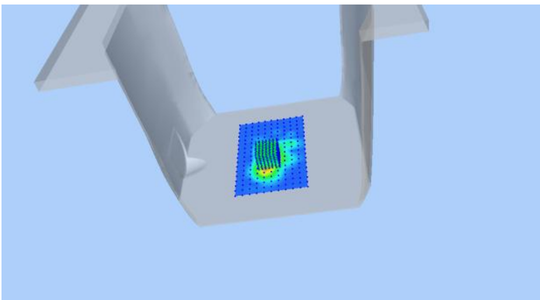
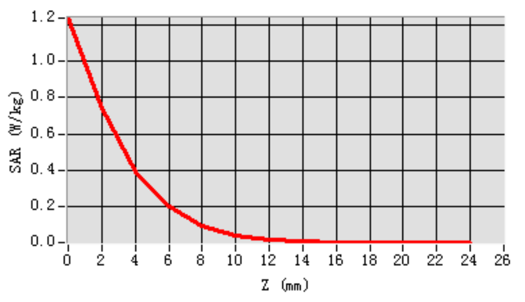
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 3: DUT: Securebook 5.0; EUT Model: JTS-SD50W

Test Date	2020-05-29
Probe	SN 41/18 EPGO334
ConvF	2.07
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 802.11ac ISM
Signal	IEEE802.ac (Crest factor: 1.0)
Frequency (MHz)	5290
Relative permittivity (real part)	35.8
Conductivity (S/m)	4.86

Maximum location: X=-2.00, Y=-14.00
SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.155769
SAR 1g (W/Kg)	0.427077

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

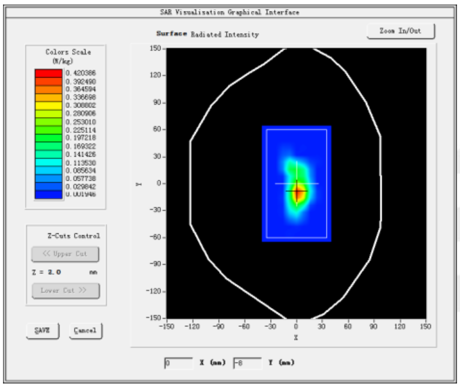
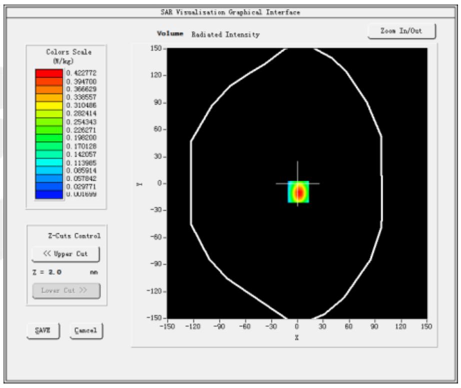
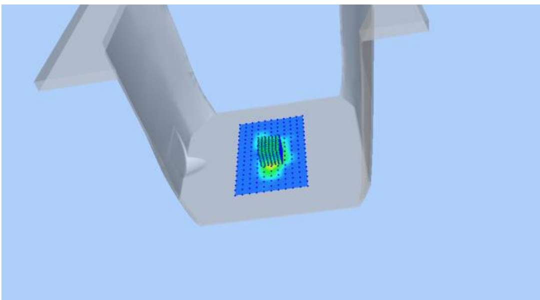
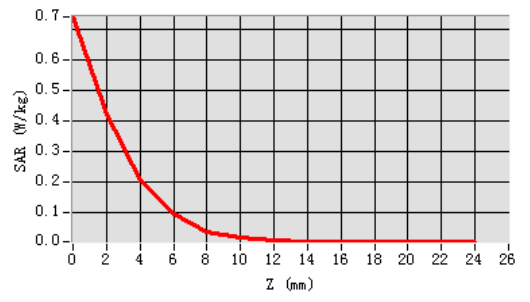
Plot 4: DUT: Securebook 5.0; EUT Model: JTS-SD50W

Test Date	2020-05-30
Probe	SN 41/18 EPGO334
ConvF	2.14
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 802.11ac ISM
Signal	IEEE802.ac (Crest factor: 1.0)
Frequency (MHz)	5610
Relative permittivity (real part)	35.5
Conductivity (S/m)	5.07

Maximum location: X=1.00, Y=-9.00

SAR Peak: 0.79 W/kg

SAR 10g (W/Kg)	0.081349
SAR 1g (W/Kg)	0.236574

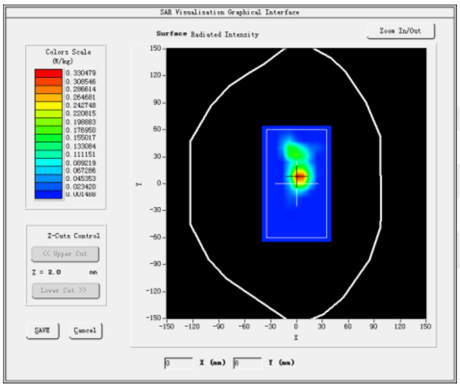
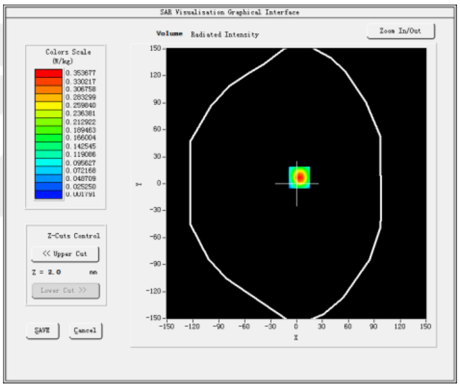
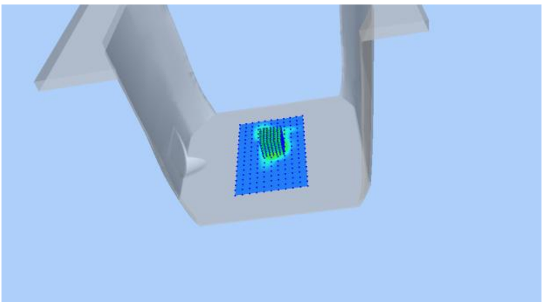
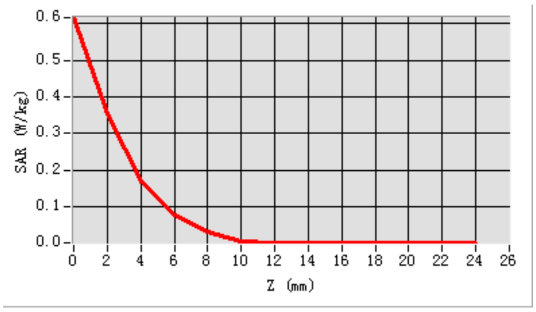
SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

Plot 5: DUT: Securebook 5.0; EUT Model: JTS-SD50W

Test Date	2020-05-31
Probe	SN 41/18 EPGO334
ConvF	2.60
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 802.11ac ISM
Signal	IEEE802.ac (Crest factor: 1.0)
Frequency (MHz)	5775
Relative permittivity (real part)	35.3
Conductivity (S/m)	5.27

Maximum location: X=-3.00, Y=7.00
SAR Peak: 0.65 W/kg

SAR 10g (W/Kg)	0.063288
SAR 1g (W/Kg)	0.191633

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※※※※※