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FCC SAR TEST REPORT

Report No.: STS2303348H01

Issued for

WHOOPT INTERNATIONAL TRADING LIMITED

Flat-B 8/F Chong Gming Building 72 Cheung Sha Wan Road,
Kowloon, Hong Kong

Product Name:	10.1 inch Quad Core 4G Tablet PC
Brand Name:	WHOOPT
Model Name:	TAB-10US
Series Model:	N/A
FCC ID:	2AP7LTAB10US
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEC/IEEE 62209-1528
Max. Report SAR (1g):	Body: 0.925 W/kg

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Test Report Certification

Applicant's name : WHOOP INTERNATIONAL TRADING LIMITED
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Kowloon, Hong Kong
Manufacturer's Name : Shenzhen Teleone Technology Co.,Ltd
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Industry Park, 4093 Liuxian Avenue, Shenzhen, China

Product description

Product name : 10.1 inch Quad Core 4G Tablet PC
Brand name : WHOOP
Model name : TAB-10US
Series Model..... : N/A

Standards..... : ANSI/IEEE Std. C95.1-1992
FCC 47 CFR Part 2 (2.1093)
IEC/IEEE 62209-1528

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..... : 24 Apr. 2023 ~ 04 May 2023

Date of Issue..... : 05 May 2023

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

Testing Engineer :

(Shifan. Long)

Technical Manager :

(Sean she)

Authorized Signatory :

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	05 May 2023	STS2303348H01	ALL	Initial Issue





1. General Information

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

1.1 EUT Description

Product Name	10.1 inch Quad Core 4G Tablet PC
Brand Name	WHOOP
Model Name	TAB-10US
Series Model	N/A
Model Difference	N/A
Battery	Rated Voltage:3.8V Charge Limit Voltage:4.35 V Capacity: 5100mAh
Device Category	Portable
Product stage	Production unit
RF Exposure Environment	General Population / Uncontrolled
IMEI	IMEI 1: 359679048482895 IMEI 2: 867400020316620
Hardware Version	J866B_610&310_D4F_V1.0
Software Version	WHOOP_TAB-10US_13_V01_20230321
Frequency Range	GSM 850: 824 MHz ~ 849 MHz PCS1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV:1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 66: 1710 MHz ~ 1780 MHz WLAN802.11b/g/n20: 2412 MHz ~ 2462 MHz WLAN 802.11a/n20/n40/ac20/ac40/ac80: 5150 ~ 5250 MHz WLAN 802.11a/n20/n40/ac20/ac40/ac80: 5250 ~ 5350 MHz WLAN 802.11a/n20/n40/ac20/ac40/ac80: 5470 ~ 5725 MHz WLAN 802.11a/n20/n40/ac20/ac40/ac80: 5725 ~ 5850 MHz Bluetooth: 2402 MHz to 2480 MHz



Max. Reported SAR(1g): (Limit:1.6W/kg)	Band	Mode	Body Worn and Hotspot(W/kg)
	PCB	GSM 850	0.925
	PCB	GSM 1900	0.671
	PCB	WCDMA Band II	0.397
	PCB	WCDMA Band IV	0.263
	PCB	WCDMA Band V	0.251
	PCB	LTE Band 2	0.541
	PCB	LTE Band 4	0.267
	PCB	LTE Band 5	0.331
	PCB	LTE Band 12	0.138
	PCB	LTE Band 66	0.450
	DTS	2.4G WLAN	0.194
	DSS	BT	0.037
	NII	5.2G WLAN	0.517
	NII	5.3G WLAN	0.335
	NII	5.6G WLAN	0.561
NII	5.8G WLAN	0.237	
1-g Sum SAR			1.486
FCC Equipment Class	PCS Licensed Transmitter (PCB) Part 15 Spread Spectrum Transmitter (DSS) Digital Transmission System (DTS) Unlicensed National Information Infrastructure TX(NII)		
Operating Mode:	GSM: GPRS/EGPRS Class 12 WCDMA: RMC, HSDPA, HSUPA Release 6 LTE: QPSK, 16QAM 2.4G WLAN : 802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM):BPSK,QPSK,16-QAM,64-QAM 5G WLAN: 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 Bluetooth: GFSK + π /4DQPSK+8DPSK BLE: GFSK		
Antenna Specification:	GSM/WCDMA/LTE: PIFA Antenna Bluetooth: PIFA Antenna WLAN: PIFA Antenna		
SIM Card	Support dual-SIM, dual standby, the multiple SIM card with two lines cannot transmitting at the same time		
Hotspot Mode	Support		
DTM Mode	Not Support		
Note: 1. The dual SIM card mobile has 2 SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (Single active) 2. After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 card to perform all tests. 3. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power			



1.2 Test Environment

Ambient conditions in the SAR laboratory:

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

1.3 Test Factory

ShenZhen STS Test Services Co.,Ltd.

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

FCC test Firm Registration No.: 625569

IC Registration No.: 12108A

A2LA Certificate No.: 4338.01





2. Test Standards and Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEC/IEEE 62209-1528	Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)
4	FCC KDB 447498 D04 v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	FCC KDB 941225 D01 v03r01	SAR Measurement Procedures for 3G Devices
8	FCC KDB 941225 D05 v02r05	SAR for LTE Devices
9	FCC KDB 941225 D06 v02r01	Hotspot Mode SAR
10	FCC KDB 248227 D01 Wi-Fi SAR v02r02	SAR Considerations for 802.11 Devices

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

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

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

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

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

Population/Uncontrolled Environments:

Are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Occupational/Controlled Environments:

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

NOTE

GENERAL POPULATION/UNCONTROLLED EXPOSURE

PARTIAL BODY LIMIT

1.6 W/kg

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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

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

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

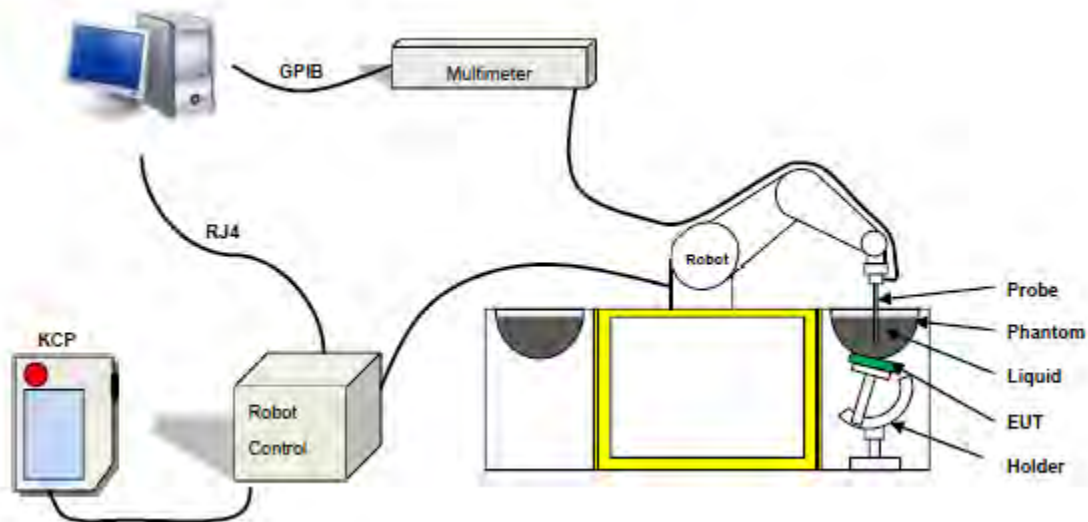
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SAR System

MVG SAR System Diagram:



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

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

The following figure shows the system.



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

3.2.1 Probe

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

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



Figure 1-MVG COMOSAR Dosimetric E field Dipole

3.2.2 Phantom

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

SN 32/14 SAM115



Figure-SN 21/21 ELLI48



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 σ	Permittivity ϵ_r
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 σ	Permittivity ϵ_r
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	ϵ_r		σ S/m	
	Head	Body	Head	Body
300	45.3	58.2	0.87	0.92
450	43.5	56.7	0.87	0.94
900	41.5	55.0	0.97	1.05
1450	40.5	54.0	1.20	1.30
1800	40.0	53.3	1.40	1.52
2450	39.2	52.7	1.80	1.95
3000	38.5	52.0	2.40	2.73
5800	35.3	48.2	5.27	6.00

**LIQUID MEASUREMENT RESULTS**

Date	Ambient		Simulating Liquid		Parameters	Target	Measured	Deviation %	Limited %
	Temp. [°C]	Humidity %	Frequency (MHz)	Temp. [°C]					
2023-04-24	20.2	58	707.5	19.8	Permittivity	42.13	43.01	2.10	±5
					Conductivity	0.89	0.88	-0.81	±5
2023-04-24	20.3	58	750	20.0	Permittivity	41.90	42.80	2.15	±5
					Conductivity	0.89	0.91	2.25	±5
2023-04-24	20.4	58	824.2	20.0	Permittivity	41.55	41.83	0.67	±5
					Conductivity	0.90	0.94	4.59	±5
2023-04-25	22.9	57	835	22.6	Permittivity	41.50	40.70	-1.93	±5
					Conductivity	0.90	0.91	1.11	±5
2023-04-25	22.9	57	836.5	22.6	Permittivity	41.49	41.27	-0.54	±5
					Conductivity	0.90	0.92	2.20	±5
2023-04-25	23.0	57	848.8	22.7	Permittivity	41.44	40.86	-1.39	±5
					Conductivity	0.90	0.93	3.15	±5
2023-04-25	23.1	58	1740	22.8	Permittivity	40.09	41.06	2.43	±5
					Conductivity	1.37	1.35	-1.15	±5
2023-04-26	20.6	46	1745	20.3	Permittivity	40.08	40.44	0.90	±5
					Conductivity	1.37	1.36	-0.63	±5
2023-04-26	20.7	46	1755	20.4	Permittivity	40.06	40.87	2.01	±5
					Conductivity	1.37	1.40	1.87	±5
2023-04-26	20.7	46	1800	20.5	Permittivity	40.00	40.89	2.23	±5
					Conductivity	1.40	1.37	-2.14	±5
2023-04-26	20.8	47	1850.2	20.6	Permittivity	39.93	40.83	2.26	±5
					Conductivity	1.43	1.44	0.79	±5
2023-04-26	20.8	47	1860	20.5	Permittivity	39.91	40.45	1.34	±5
					Conductivity	1.43	1.50	4.58	±5
2023-04-26	20.7	47	1880	20.4	Permittivity	39.89	40.19	0.76	±5
					Conductivity	1.45	1.41	-2.47	±5
2023-04-27	23.6	49	2437	23.3	Permittivity	39.22	40.20	2.49	±5
					Conductivity	1.79	1.73	-3.27	±5
2023-04-27	23.6	49	2450	23.3	Permittivity	39.20	39.70	1.28	±5
					Conductivity	1.80	1.78	-1.11	±5



2023-04-28	22.2	56	5200	21.9	Permittivity	36.00	36.51	1.42	±5
					Conductivity	4.66	4.59	-1.50	±5
2023-04-28	24.0	47	5300	23.7	Permittivity	35.90	37.11	3.37	±5
					Conductivity	4.76	4.57	-3.99	±5
2023-05-04	20.7	51	5510	20.4	Permittivity	35.66	36.13	1.31	±5
					Conductivity	4.97	4.80	-3.47	±5
2023-05-04	20.8	51	5600	20.5	Permittivity	35.55	35.89	0.96	±5
					Conductivity	5.07	5.15	1.68	±5
2023-05-04	22.9	40	5785	22.6	Permittivity	35.32	35.58	0.75	±5
					Conductivity	5.25	5.13	-2.36	±5
2023-05-04	22.9	40	5800	22.5	Permittivity	35.30	36.25	2.69	±5
					Conductivity	5.27	5.39	2.28	±5

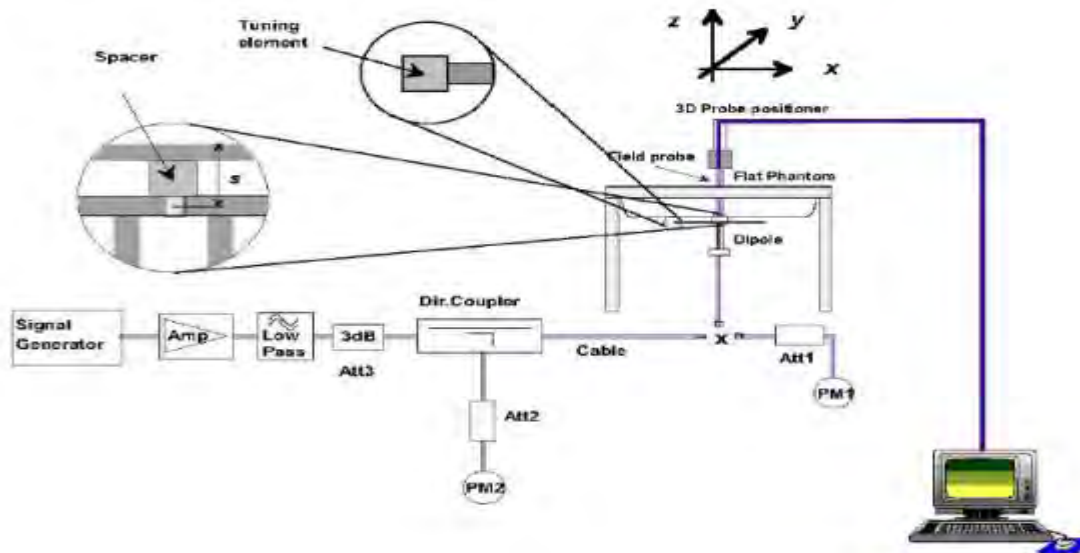


5. SAR System Validation

5.1 Validation System

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

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



5.2 Validation Result

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

Date	Freq.	Power	Tested Value	Normalized SAR	Target SAR	Tolerance	Limit
	(MHz)	(mW)	(W/Kg)	(W/kg)	1g(W/kg)	(%)	(%)
2023-04-24	750	100	0.862	8.62	8.49	-4.06	10
2023-04-25	835	100	1.002	10.02	9.63	-4.26	10
2023-04-26	1800	100	3.903	39.03	38.31	1.46	10
2023-04-27	2450	100	5.247	52.47	54.70	-3.38	10
2023-04-28	5200	100	15.074	150.74	158.49	-1.15	10
2023-04-28	5300	100	16.431	164.31	167.20	-1.72	10
2023-05-04	5600	100	17.593	175.93	175.65	-0.79	10
2023-05-04	5800	100	18.039	180.39	183.06	-0.95	10

Note:

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



6. SAR Evaluation Procedures

The procedure for assessing the average SAR value consists of the following steps:

The following steps are used for each test position

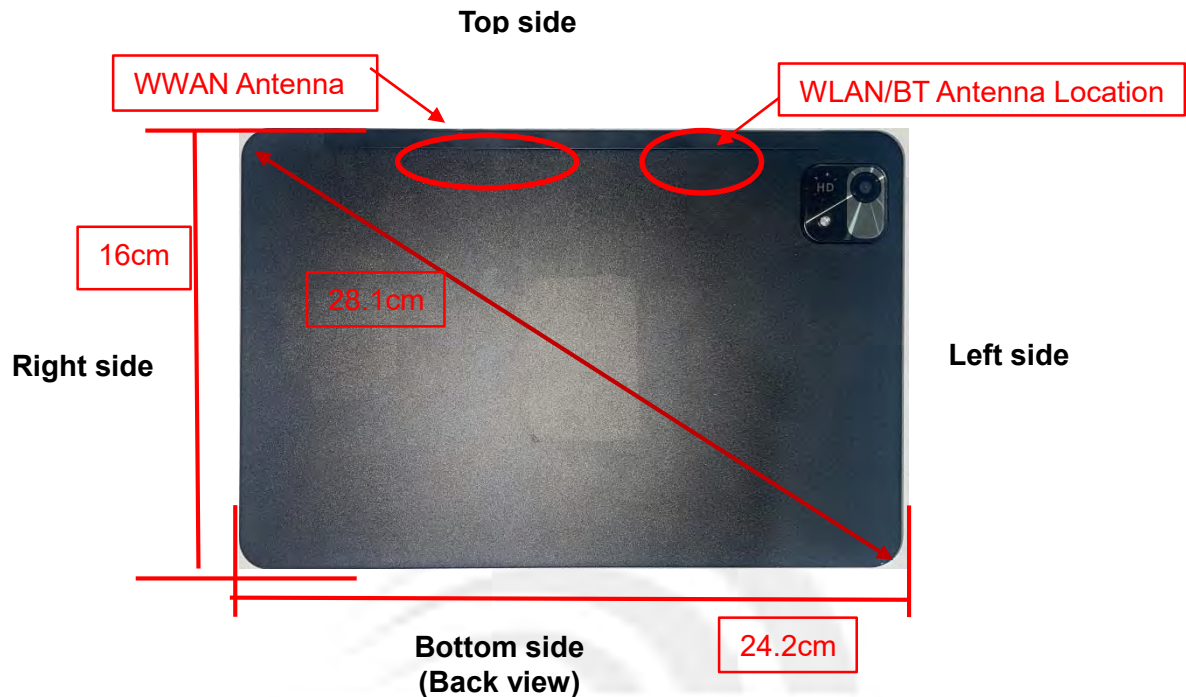
- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible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

➤ Area Scan& Zoom Scan

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01 quoted below. When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

7. EUT Antenna Location Sketch

It is a TABLET CON CHIP (4G), support GSM/WCDMA/LTE/WLAN/BT mode.



Antenna Separation Distance(cm)					
ANT	Back Side	Left Side	Right Side	Top Side	Bottom Side
WLAN/BT	≤ 0.5	3.3	5	≤ 0.5	15
WWAN	≤ 0.5	12.2	17	≤ 0.5	15

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



7.1 SAR test exclusion consider table

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

	Wireless Interface	GSM850	PCS1900	WCDMA II	WCDMA IV	WCDMA V
Exposure Position	Calculated Frequency(GHz)	0.8488	1.8502	1.88	1.74	0.8366
	Maximum Turn-up power (dBm)	24.5	18	12	13	15
	Maximum rated power(mW)	281.84	63.10	15.85	19.95	31.62
Back Side	Separation distance (cm)	0.5	0.5	0.5	0.5	0.5
	exclusion threshold(mW)	9.04	3.44	3.39	3.61	9.22
	Testing required?	YES	YES	YES	YES	YES
Left Side	Separation distance (cm)	12.5	12.5	12.5	12.5	12.5
	exclusion threshold(mW)	886.40	1287.95	1285.85	1296.05	877.54
	Testing required?	NO	NO	NO	NO	NO
Right Side	Separation distance (cm)	17	17	17	17	17
	exclusion threshold(mW)	1373.66	2268.66	2267.38	2273.58	1355.99
	Testing required?	NO	NO	NO	NO	NO
Top Side	Separation distance (cm)	0.5	0.5	0.5	0.5	0.5
	exclusion threshold(mW)	9.04	3.44	3.39	3.61	9.22
	Testing required?	YES	YES	YES	YES	YES
Bottom Side	Separation distance (cm)	15	15	15	15	15
	exclusion threshold(mW)	1149.31	1801.72	1799.92	1808.64	1135.87
	Testing required?	NO	NO	NO	NO	NO



Exposure Position	Wireless Interface	LTE Band 2	LTE Band 4	LTE Band 5	LTE Band 12	LTE Band 66
	Calculated Frequency(GHz)	1.86	1.745	0.8365	0.7075	1.755
	Maximum Turn-up power (dBm)	15	14	24	16	15
	Maximum rated power(mW)	31.62	25.12	251.19	39.81	31.62
Back Side	Separation distance (cm)	0.5	0.5	0.5	0.5	0.5
	exclusion threshold(mW)	3.42	3.60	9.22	11.67	3.58
	Testing required?	YES	YES	YES	YES	YES
Left Side	Separation distance (cm)	12.5	12.5	12.5	12.5	12.5
	exclusion threshold(mW)	1287.26	1295.67	877.47	781.20	1294.92
	Testing required?	NO	NO	NO	NO	NO
Right Side	Separation distance (cm)	17	17	17	17	17
	exclusion threshold(mW)	2268.23	2273.35	1355.85	1167.27	2272.89
	Testing required?	NO	NO	NO	NO	NO
Top Side	Separation distance (cm)	0.5	0.5	0.5	0.5	0.5
	exclusion threshold(mW)	3.42	3.60	9.22	11.67	3.58
	Testing required?	YES	YES	YES	YES	YES
Bottom Side	Separation distance (cm)	15	15	15	15	15
	exclusion threshold(mW)	1801.12	1808.32	1135.76	991.24	1807.67
	Testing required?	NO	NO	NO	NO	NO



Exposure Position	Wireless Interface	BLE	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
	Calculated Frequency(GHz)	2.44	2.437	5.2	5.3	5.1	5.785
	Maximum Turn-up power (dBm)	7	7.5	7.5	7	7.5	7
	Maximum rated power(mW)	5.01	5.62	5.62	5.01	5.62	5.01
Back Side	Separation distance (cm)	0.5	0.5	0.5	0.5	0.5	0.5
	exclusion threshold(mW)	2.75	2.76	1.50	1.48	1.53	1.38
	Testing required?	YES	YES	YES	YES	YES	YES
Left Side	Separation distance (cm)	3.3	3.3	3.3	3.3	3.3	3.3
	exclusion threshold(mW)	99.53	99.58	74.02	73.48	74.59	71.00
	Testing required?	NO	NO	NO	NO	NO	NO
Right Side	Separation distance (cm)	5	5	5	5	5	5
	exclusion threshold(mW)	219.30	219.38	174.63	173.63	175.66	169.12
	Testing required?	NO	NO	NO	NO	NO	NO
Top Side	Separation distance (cm)	0.5	0.5	0.5	0.5	0.5	0.5
	exclusion threshold(mW)	2.75	2.76	1.50	1.48	1.53	1.38
	Testing required?	YES	YES	YES	YES	YES	YES
Bottom Side	Separation distance (cm)	15	15	15	15	15	15
	exclusion threshold(mW)	1770.84	1770.98	1689.08	1687.08	1691.14	1677.87
	Testing required?	NO	NO	NO	NO	NO	NO

Note:

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



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

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

Where

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

and

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

d = the separation distance (cm);

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

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



6. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine further SAR exclusion 8. for each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of each of these configurations is less than 1/4db higher than those measured at the lower data rate than 11b mode, thus the SAR can be excluded.
7. Per KDB 616217 D04, SAR evaluation for the front surface of tablet display screens are generally not necessary.



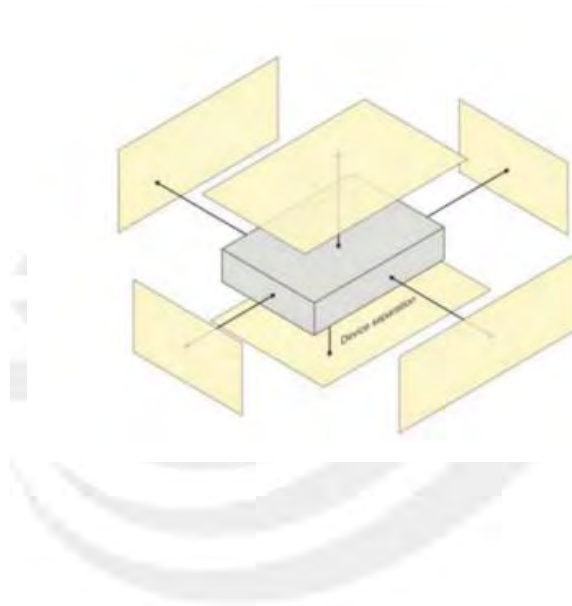
8. EUT Test Position

This EUT was tested in Back Side and Top Side.

8.1 Body-worn Position Conditions

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 $> 1.2 \text{ W/kg}$, 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.





9. Uncertainty

9.1 Measurement Uncertainty

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

Symbol	Uncertainty Component	Prob. Dist.	Unc. $u(x_i)$	Div. q_i	$u(x_i) = a(x_i)/q_i$	C_i	$u(y) = C_i * u(x_i)$	v_i
Measurement system errors								
CF	Probe calibration	N ($k = 2$)	5.72	2	2.86	1	2.86	∞
CF _{drift}	Probe calibration drift	R	0.15	$\sqrt{3}$	0.09	1	0.09	∞
LIN	Probe linearity and detection limit	R	1.27	$\sqrt{3}$	0.73	1	0.73	∞
BBS	Broadband signal	R	0.12	$\sqrt{3}$	0.07	1	0.07	∞
ISO	Probe isotropy	R	0.16	$\sqrt{3}$	0.09	1	0.09	∞
DAE	Other probe and data acquisition errors	N	2.4	1	2.40	1	2.40	∞
AMB	RF ambient and noise	N	3.51	1	3.51	1	3.51	∞
Δ_{xyz}	Probe positioning errors	N	1.2	1	1.20	2/5	1.20	
DAT	Data processing errors	N	2.1	1	2.10	1	2.10	∞
Phantom and device (DUT or validation antenna) errors								
LIQ(σ)	Measurement of phantom conductivity(σ)	N	4.1	1	4.1	C_ϵ, C_σ	4.10	∞
LIQ(T_c)	Temperature effects (medium)	R	2.7	$\sqrt{3}$	1.56	C_ϵ, C_σ	1.56	∞
EPS	Shell permittivity	R	2.1	$\sqrt{3}$	1.21	See 8.4.2.3	0.30	∞
DIS	Distance between the radiating element of the DUT and the phantom medium	N	0.7	1	0.7	2	1.40	∞
D _{xyz}	Repeatability of positioning the DUT or source against the phantom	N	1.2	1	1.2	1	1.20	5
H	Device holder effects	N	3.8	1	3.8	1	3.80	
MOD	Effect of operating mode on probe sensitivity	R	3.42	$\sqrt{3}$	1.97	1	1.97	∞
TAS	Time-average SAR	R	1.8	$\sqrt{3}$	1.04	1	1.04	∞
RF _{drift}	Variation in SAR due to drift in output of DUT	N	4.5	1	4.5	1	4.50	
VAL	Validation antenna uncertainty (validation measurement only)	N	1.4	1	1.4	1	1.40	
P _{in}	Uncertainty in accepted power (validation measurement only)	N	2.4	1	2.4	1	2.40	
Corrections to the SAR result (if applied)								
C(ϵ', σ)	Phantom deviation from target (ϵ', σ)	N	3.7	1	3.7	1	3.70	
C(R)	SAR scaling	R	1.8	$\sqrt{3}$	1.04	1	1.04	
u(Δ SAR)	Combined uncertainty						10.84	
U	Expanded uncertainty and effective degrees of freedom					U =	21.68	



10. Conducted Power Measurement

10.1 Test Result

Burst Average Power (dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GPRS (GMSK, 1-Slot)	24.78	24.03	24.53	18.15	18.07	17.90
GPRS (GMSK, 2-Slot)	24.40	24.38	24.37	18.04	18.00	17.80
GPRS (GMSK, 3-Slot)	24.21	24.20	24.16	17.96	17.89	17.64
GPRS (GMSK, 4-Slot)	24.02	23.97	23.94	17.82	17.75	17.56
EGPRS(8PSK, 1-Slot)	24.56	24.67	24.75	18.10	18.07	17.87
EGPRS(8PSK, 2-Slot)	24.35	24.45	24.57	18.04	17.97	17.78
EGPRS(8PSK, 3-Slot)	24.15	24.21	24.37	17.94	17.85	17.66
EGPRS(8PSK, 4-Slot)	23.81	23.95	24.16	17.82	17.73	17.53
Remark: GPRS, CS4 coding scheme. EGPRS, MCS5 coding scheme. Multi-Slot Class 8, Support Max 4 downlink, 1 uplink, 5 working link Multi-Slot Class 10, Support Max 4 downlink, 2 uplink, 5 working link Multi-Slot Class 12, Support Max 4 downlink, 4 uplink, 5 working link						

Frame- Average Power(dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GPRS (GMSK, 1-Slot)	15.75	15.00	15.50	9.12	9.04	8.87
GPRS (GMSK, 2-Slot)	18.38	18.36	18.35	12.02	11.98	11.78
GPRS (GMSK, 3-Slot)	19.95	19.94	19.90	13.70	13.63	13.38
GPRS (GMSK, 4-Slot)	21.01	20.96	20.93	14.81	14.74	14.55
EGPRS(8PSK, 1-Slot)	15.53	15.64	15.72	9.07	9.04	8.84
EGPRS(8PSK, 2-Slot)	18.33	18.43	18.55	12.02	11.95	11.76
EGPRS(8PSK, 3-Slot)	19.89	19.95	20.11	13.68	13.59	13.40
EGPRS(8PSK, 4-Slot)	20.80	20.94	21.15	14.81	14.72	14.52
Remark : 1. SAR testing was performed on the maximum frame-averaged power mode. 2. The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum Burst - averaged power based on time slots. The calculated method is shown as below: Frame-averaged power = Burst averaged power (1 TX Slot) – 9.03 dB Frame-averaged power = Burst averaged power (2 TX Slots) – 6.02 dB Frame-averaged power = Burst averaged power (3 TX Slots) - 4.26 dB Frame-averaged power = Burst averaged power (4 TX Slots) – 3.01 dB						

**WCDMA**

Band	WCDMA Band II			WCDMA Band IV			WCDMA Band V		
Channel	9262	9400	9538	1312	1413	1513	4132	4183	4233
Frequency (MHz)	1852.4	1880	1907.6	1712.6	1740	1752.4	826.4	836.6	846.6
RMC 12.2Kbps	11.40	11.94	11.67	12.03	12.79	12.60	14.30	14.96	14.60
HSDPA Subtest-1	11.58	11.19	10.96	12.00	11.60	11.40	14.22	13.91	13.64
HSDPA Subtest-2	10.84	11.58	11.62	11.38	12.94	12.55	13.50	14.85	14.64
HSDPA Subtest-3	11.31	11.26	11.79	12.29	12.01	12.58	14.32	14.56	14.49
HSDPA Subtest-4	11.48	10.98	10.96	12.27	12.07	11.57	14.30	13.97	14.23
HSUPA Subtest-1	11.43	11.49	11.10	11.85	11.87	11.67	14.15	14.20	13.90
HSUPA Subtest-2	11.47	11.32	11.78	11.89	11.72	12.48	14.17	14.13	14.72
HSUPA Subtest-3	11.86	11.64	11.80	12.65	12.45	12.69	14.84	14.49	14.84
HSUPA Subtest-4	11.83	11.73	11.77	12.45	12.27	12.48	14.63	14.47	14.52
HSUPA Subtest-5	11.41	11.78	11.72	12.23	12.48	12.17	14.20	14.52	14.24

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

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

UE Transmit Channel Configuration	CM(db)	MPR(db)
For all combinations of ,DPDCH,DPCCH HS-DPDCH,E-DPDCH and E-DPCCH	$0 \leq CM \leq 3.5$	$MAX(CM-1,0)$
Note: CM=1 for $\beta_c/\beta_d=12/15$, $\beta_{hs}/\beta_c=24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

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

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

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

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

**2.4G WLAN**

2.4GWIFI				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
802.11b	1	2412	5.84	3.84
	6	2437	7.48	5.60
	11	2462	6.56	4.53
802.11g	1	2412	5.29	3.38
	6	2437	7.09	5.12
	11	2462	5.71	3.72
802.11 n-HT20	1	2412	5.85	3.85
	6	2437	7.72	5.92
	11	2462	6.53	4.50

Bluetooth

BT				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	5.83	3.83
	39	2441	6.47	4.44
	78	2480	4.68	2.94
$\pi/4$ -QPSK(2Mbps)	0	2402	5.24	3.34
	39	2441	5.94	3.93
	78	2480	4.09	2.56
8DPSK(3Mbps)	0	2402	5.16	3.28
	39	2441	5.87	3.86
	78	2480	4.01	2.52

BLE

BLE				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	5.13	3.26
	19	2440	6.59	4.56
	39	2480	4.39	2.75
GFSK(2Mbps)	0	2402	5.21	3.32
	19	2440	6.64	4.61
	39	2480	4.47	2.80

**WLAN (5.2Gband)**

5.2G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	36	5180	6	3.98
	40	5200	6.84	4.83
	48	5240	6.24	4.21
802.11 n-HT20	36	5180	6.73	4.71
	40	5200	7.13	5.16
	48	5240	6.47	4.44
802.11 n-HT40	38	5190	6.98	4.99
	46	5230	6.49	4.46
802.11ac-VHT20	36	5180	6.69	4.67
	40	5200	7.06	5.08
	48	5240	6.53	4.50
802.11ac-VHT40	38	5190	6.99	5.00
	46	5230	6.41	4.38
802.11ac-VHT80	42	5210	6.74	4.72

WLAN (5.3Gband)

5.3G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	52	5260	6.39	4.36
	60	5300	6.47	4.44
	64	5320	6.09	4.06
802.11 n-HT20	52	5260	6.62	4.59
	60	5300	6.81	4.80
	64	5320	6.56	4.53
802.11 n-HT40	54	5270	6.19	4.16
	62	5310	6.66	4.63
802.11ac-VHT20	52	5260	6.56	4.53
	60	5300	6.77	4.75
	64	5320	6.36	4.33
802.11ac-VHT40	54	5270	6.31	4.28
	62	5310	6.53	4.50
802.11ac-VHT80	58	5290	6.75	4.73

**WLAN (5.6Gband)**

5.6G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	100	5500	6.65	4.62
	116	5580	5.12	3.25
	140	5700	5.41	3.48
802.11 n-HT20	100	5500	6.91	4.91
	116	5580	5.33	3.41
	140	5700	5.66	3.68
802.11 n-HT40	102	5510	7.06	5.08
	110	5550	6.14	4.11
	134	5670	5.26	3.36
802.11ac-VHT20	100	5500	7.03	5.05
	116	5580	5.47	3.52
	140	5700	5.67	3.69
802.11ac-VHT40	102	5510	7	5.01
	110	5550	6.11	4.08
	134	5670	5.32	3.40
802.11ac-VHT80	106	5530	6.52	4.49
	122	5610	5.09	3.23

**WLAN (5.8Gband)**

5.8G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	149	5745	5.62	3.65
	157	5785	6.12	4.09
	165	5825	5.29	3.38
802.11 n-HT20	149	5745	5.92	3.91
	157	5785	6.53	4.50
	165	5825	5.61	3.64
802.11 n-HT40	151	5755	5.79	3.79
	159	5795	6.42	4.39
802.11ac-VHT20	149	5745	5.93	3.92
	157	5785	6.52	4.49
	165	5825	5.6	3.63
802.11ac-VHT40	151	5755	5.79	3.79
	159	5795	6.44	4.41
802.11ac-VHT80	155	5775	5.93	3.92



LTE Conducted Power

General Note:

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



LTE Band 2

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	12.68	12.91	12.42
1.4	1	2		12.9	13.09	12.56
1.4	1	5		12.7	12.82	12.24
1.4	3	0		12.67	13.02	12.44
1.4	3	1		12.75	13.07	12.47
1.4	3	2		12.69	12.97	12.32
1.4	6	0		11.86	12.09	11.55
1.4	1	0	16-QAM	11.91	12.2	11.38
1.4	1	2		12.13	12.38	11.51
1.4	1	5		11.93	12.14	11.19
1.4	3	0		12.03	12.34	11.73
1.4	3	1		12.1	12.4	11.75
1.4	3	2		12.03	12.3	11.63
1.4	6	0		11.12	11.26	10.8
3	1	0	QPSK	12.62	13.05	12.81
3	1	7		12.83	13.15	12.76
3	1	14		12.64	12.84	12.3
3	8	0		11.85	12.18	11.79
3	8	4		11.9	12.18	11.72
3	8	7		11.86	12.08	11.52
3	15	0		11.92	12.18	11.76
3	1	0	16-QAM	12.21	12.35	11.8
3	1	7		12.42	12.44	11.74
3	1	14		12.24	12.15	11.26
3	8	0		11.05	11.14	10.97
3	8	4		11.09	11.14	10.89
3	8	7		11.05	11.03	10.7
3	15	0		11.05	11.11	10.92



LTE BAND 2

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	12.3	12.76	12.93
5	1	12		12.83	13.11	12.87
5	1	24		12.34	12.4	11.89
5	12	0		11.74	12.11	12.08
5	12	6		11.9	12.16	11.96
5	12	11		11.77	11.91	11.53
5	25	0		11.84	12.09	11.89
5	1	0	16-QAM	12.02	12.25	12.4
5	1	12		12.58	12.56	12.35
5	1	24		12.06	11.9	11.36
5	12	0		10.84	11.03	11.22
5	12	6		11	11.09	11.08
5	12	11		10.87	10.83	10.65
5	25	0		10.88	11.07	10.98
10	1	0	QPSK	12.59	13.08	14.01
10	1	24		12.96	13.12	13.6
10	1	49		13.5	12.94	12.72
10	25	0		11.91	12.34	13.05
10	25	12		12.11	12.24	12.71
10	25	24		12.43	12.24	12.27
10	50	0		12.29	12.36	12.73
10	1	0	16-QAM	11.61	12.79	13.27
10	1	24		12.06	12.68	12.88
10	1	49		12.49	12.66	11.98
10	25	0		11.11	11.3	12.15
10	25	12		11.24	11.22	11.78
10	25	24		11.53	11.18	11.36
10	50	0		11.38	11.31	11.87



LTE BAND 2

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	12.89	13.49	14.02
15	1	37		13.06	13.08	13.8
15	1	74		13.77	12.75	12.33
15	36	0		12.12	12.5	13.16
15	36	18		12.21	12.17	12.83
15	36	39		12.59	12.01	12.16
15	75	0		12.45	12.31	12.75
15	1	0	16-QAM	12.45	12.79	13.16
15	1	38		12.65	12.35	12.99
15	1	75		13.33	12.05	11.47
15	36	0		11.21	11.49	12.21
15	36	18		11.32	11.2	11.87
15	36	39		11.68	10.99	11.23
15	75	0		11.49	11.23	11.87
20	1	0	QPSK	13.5	14.15	13.7
20	1	49		13.47	13.14	14.08
20	1	99		14.68	13.41	12.74
20	50	0		12.51	12.87	13.2
20	50	24		12.65	12.31	13.09
20	50	49		13.24	12.29	12.63
20	100	0		12.96	12.64	12.95
20	1	0	16-QAM	12.87	13.53	12.98
20	1	49		12.89	12.48	13.42
20	1	99		14.05	12.79	12.01
20	50	0		11.7	11.73	12.33
20	50	24		11.83	11.22	12.22
20	50	49		12.44	11.14	11.77
20	100	0		12.07	11.52	12.07



LTE BAND 4

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	12.92	12.51	12.96
1.4	1	2		13.12	12.77	13.12
1.4	1	5		12.88	12.61	12.85
1.4	3	0		12.87	12.65	12.97
1.4	3	1		12.93	12.74	13.02
1.4	3	2		12.86	12.7	12.91
1.4	6	0		11.9	11.65	11.92
1.4	1	0	16-QAM	11.99	11.66	11.72
1.4	1	2		12.19	11.91	11.88
1.4	1	5		11.96	11.78	11.61
1.4	3	0		12.09	11.85	12.08
1.4	3	1		12.15	11.95	12.12
1.4	3	2		12.07	11.92	12.03
1.4	6	0		11.11	10.8	11.13
3	1	0	QPSK	12.79	12.48	13.2
3	1	7		12.93	12.83	13.25
3	1	14		12.64	12.76	12.92
3	8	0		11.92	11.59	12.1
3	8	4		11.92	11.7	12.07
3	8	7		11.84	11.75	11.94
3	15	0		11.91	11.75	12.07
3	1	0	16-QAM	12.26	11.62	11.98
3	1	7		12.4	11.97	12.02
3	1	14		12.12	11.92	11.68
3	8	0		10.95	10.59	11.14
3	8	4		10.96	10.69	11.11
3	8	7		10.88	10.73	10.98
3	15	0		10.98	10.67	11.18



LTE BAND 4

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	12.45	12	12.96
5	1	12		12.86	12.79	13.28
5	1	24		12.17	12.48	12.51
5	12	0		11.77	11.44	12.16
5	12	6		11.85	11.71	12.19
5	12	11		11.62	11.7	11.91
5	25	0		11.75	11.64	12.11
5	1	0	16-QAM	12.1	11.34	12.27
5	1	12		12.48	12.1	12.56
5	1	24		11.82	11.83	11.82
5	12	0		10.8	10.38	11.25
5	12	6		10.88	10.64	11.28
5	12	11		10.66	10.64	10.99
5	25	0		10.74	10.63	11.1
10	1	0	QPSK	12.32	11.92	13.36
10	1	24		12.38	12.77	13.52
10	1	49		12.29	13.38	13.3
10	25	0		11.51	11.43	12.49
10	25	12		11.42	11.77	12.42
10	25	24		11.41	12.21	12.42
10	50	0		11.47	11.88	12.49
10	1	0	16-QAM	11.87	11.16	12.29
10	1	24		11.82	11.89	12.29
10	1	49		11.84	12.63	12.21
10	25	0		10.5	10.41	11.53
10	25	12		10.42	10.73	11.47
10	25	24		10.4	11.18	11.46
10	50	0		12.45	12	12.96



LTE BAND 4

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	12.64	12.08	13.64
15	1	37		12.09	12.73	13.61
15	1	74		12.17	13.39	13.17
15	36	0		11.5	11.38	12.66
15	36	18		11.19	11.71	12.52
15	36	39		11.17	12.14	12.39
15	75	0		11.35	11.84	12.56
15	1	0	16-QAM	12.06	11.14	12.65
15	1	38		11.52	11.87	12.64
15	1	75		11.6	12.48	12.18
15	36	0		10.49	10.42	11.66
15	36	18		10.2	10.74	11.52
15	36	39		10.15	11.18	11.39
15	75	0		10.29	10.77	11.61
20	1	0	QPSK	12.86	12.4	13.94
20	1	49		11.93	12.81	13.72
20	1	99		12.71	13.85	13.77
20	50	0		11.41	11.5	12.82
20	50	24		11.05	11.82	12.68
20	50	49		11.27	12.39	12.74
20	100	0		11.34	12	12.83
20	1	0	16-QAM	12.08	11.52	13.09
20	1	49		11.24	12.01	12.89
20	1	99		11.93	12.98	12.92
20	50	0		10.43	10.45	11.9
20	50	24		10.07	10.77	11.76
20	50	49		10.29	11.34	11.81
20	100	0		10.31	10.97	11.86



LTE BAND 5

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	15.02	15.45	14.96
1.4	1	2		15.21	15.64	15.19
1.4	1	5		14.93	15.37	14.92
1.4	3	0		15.01	15.55	15.03
1.4	3	1		15.06	15.61	15.1
1.4	3	2		14.96	15.5	15.01
1.4	6	0		13.93	14.4	13.97
1.4	1	0	16-QAM	14.05	14.54	13.77
1.4	1	2		14.24	14.75	14
1.4	1	5		13.97	14.48	13.72
1.4	3	0		14.18	14.71	14.19
1.4	3	1		14.24	14.78	14.26
1.4	3	2		14.12	14.67	14.19
1.4	6	0		13.12	13.67	13.16
3	1	0	QPSK	14.92	15.45	14.89
3	1	7		14.98	15.6	15.25
3	1	14		14.66	15.36	14.97
3	8	0		13.93	14.49	13.96
3	8	4		13.93	14.53	14.04
3	8	7		13.82	14.44	14.02
3	15	0		13.87	14.44	13.98
3	1	0	16-QAM	14.31	14.54	13.71
3	1	7		14.38	14.76	14.07
3	1	14		14.05	14.47	13.77
3	8	0		12.94	13.56	12.95
3	8	4		12.94	13.6	13.04
3	8	7		12.84	13.51	13.02
3	15	0		12.93	13.49	13.07



LTE BAND 5

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	14.59	15.01	14.63
5	1	12		14.92	15.64	15.04
5	1	24		14.14	14.94	14.59
5	12	0		13.79	14.35	13.85
5	12	6		13.82	14.51	14.01
5	12	11		13.5	14.28	13.92
5	25	0		13.63	14.33	13.87
5	1	0	16-QAM	14.1	14.27	13.93
5	1	12		14.46	14.9	14.35
5	1	24		13.66	14.21	13.9
5	12	0		12.8	13.39	12.87
5	12	6		12.84	13.54	13.04
5	12	11		12.52	13.32	12.94
5	25	0		12.6	13.42	12.85
10	1	0	QPSK	15.28	14.99	15.5
10	1	24		15.27	15.66	15.01
10	1	49		15.54	15.11	15.13
10	25	0		14.3	14.37	14.19
10	25	12		14.26	14.51	13.96
10	25	24		14.4	14.47	13.98
10	50	0		14.33	14.4	14.06
10	1	0	16-QAM	14.67	14.11	14.29
10	1	24		14.63	14.71	13.82
10	1	49		14.93	14.24	13.91
10	25	0		13.38	13.43	13.15
10	25	12		13.34	13.58	12.93
10	25	24		13.48	13.54	12.93
10	50	0		13.41	13.5	13.03



LTE BAND 12

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	19.45	19.51	18.85
1.4	1	2		19.62	19.72	18.95
1.4	1	5		19.34	19.59	18.76
1.4	3	0		19.47	19.48	18.89
1.4	3	1		19.52	19.56	18.91
1.4	3	2		19.41	19.54	18.84
1.4	6	0		18.37	18.46	17.74
1.4	1	0	16-QAM	18.21	18.54	17.94
1.4	1	2		18.4	18.75	18.05
1.4	1	5		18.12	18.64	17.88
1.4	3	0		18.59	18.65	18.07
1.4	3	1		18.65	18.72	18.1
1.4	3	2		18.6	18.7	18.03
1.4	6	0		17.63	17.69	17.02
3	1	0	QPSK	19.44	19.28	18.95
3	1	7		19.46	19.55	19.02
3	1	14		18.84	19.68	18.75
3	8	0		18.43	18.36	17.82
3	8	4		18.37	18.46	17.83
3	8	7		18.11	18.56	17.75
3	15	0		18.23	18.47	17.78
3	1	0	16-QAM	18.81	18.39	17.76
3	1	7		18.85	18.67	17.82
3	1	14		18.23	18.82	17.54
3	8	0		17.52	17.39	16.9
3	8	4		17.46	17.49	16.92
3	8	7		17.19	17.59	16.84
3	15	0		17.39	17.47	16.96



LTE BAND 12

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	19.13	18.82	18.81
5	1	12		19.14	19.53	19
5	1	24		18.16	19.61	18.38
5	12	0		18.22	18.21	17.95
5	12	6		18.09	18.49	17.94
5	12	11		17.6	18.62	17.66
5	25	0		17.9	18.44	17.81
5	1	0	16-QAM	18.37	18.36	18.08
5	1	12		18.41	19.08	18.29
5	1	24		17.43	19.16	17.66
5	12	0		17.34	17.27	16.98
5	12	6		17.22	17.56	16.97
5	12	11		16.69	17.68	16.69
5	25	0		16.96	17.43	16.91
10	1	0	QPSK	19.76	18.75	18.6
10	1	24		19.13	19.44	19.46
10	1	49		20.01	20.08	19.16
10	25	0		18.4	18.14	18.11
10	25	12		18.22	18.56	18.33
10	25	24		18.57	19.06	18.24
10	50	0		18.5	18.62	18.16
10	1	0	16-QAM	19.14	17.86	17.39
10	1	24		18.54	18.56	18.24
10	1	49		19.42	19.22	17.94
10	25	0		17.45	17.14	17.13
10	25	12		17.29	17.59	17.39
10	25	24		17.62	18.06	17.29
10	50	0		17.51	17.65	17.19



LTE BAND 66

LTE Band 66 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	13.44	14.08	13.3
1.4	1	2		13.63	14.32	13.49
1.4	1	5		13.4	14.02	13.25
1.4	3	0		13.43	14.17	13.34
1.4	3	1		13.49	14.24	13.39
1.4	3	2		13.41	14.11	13.3
1.4	6	0		12.41	13.13	12.33
1.4	1	0	16-QAM	12.5	13.18	12.09
1.4	1	2		12.7	13.42	12.28
1.4	1	5		12.47	13.15	12.03
1.4	3	0		12.61	13.39	12.48
1.4	3	1		12.67	13.47	12.54
1.4	3	2		12.59	13.36	12.45
1.4	6	0		11.7	12.33	11.58
3	1	0	QPSK	13.32	14.13	13.3
3	1	7		13.46	14.3	13.53
3	1	14		13.17	14.07	13.28
3	8	0		12.4	13.18	12.25
3	8	4		12.42	13.19	12.31
3	8	7		12.33	13.14	12.27
3	15	0		12.4	13.22	12.34
3	1	0	16-QAM	12.76	13.29	12.12
3	1	7		12.9	13.45	12.34
3	1	14		12.61	13.25	12.08
3	8	0		11.55	12.19	11.38
3	8	4		11.56	12.2	11.43
3	8	7		11.47	12.15	11.4
3	15	0		11.54	12.19	11.54



LTE BAND 66

LTE Band 66 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	12.99	13.72	12.8
5	1	12		13.39	14.25	13.4
5	1	24		12.71	13.67	12.88
5	12	0		12.26	13.07	12.07
5	12	6		12.35	13.19	12.28
5	12	11		12.11	13.02	12.15
5	25	0		12.23	13.13	12.22
5	1	0	16-QAM	12.56	13.08	12.07
5	1	12		12.99	13.59	12.72
5	1	24		12.28	13.04	12.17
5	12	0		11.39	12.06	11.27
5	12	6		11.48	12.17	11.46
5	12	11		11.25	12	11.34
5	25	0		11.31	12.15	11.3
10	1	0	QPSK	12.83	13.81	13.19
10	1	24		12.84	14.25	13.31
10	1	49		12.8	14.29	13.7
10	25	0		11.96	13.14	12.12
10	25	12		11.9	13.24	12.22
10	25	24		11.87	13.37	12.44
10	50	0		11.96	13.29	12.36
10	1	0	16-QAM	12.27	13.08	11.91
10	1	24		12.34	13.4	12.12
10	1	49		12.25	13.56	12.41
10	25	0		11.06	12.13	11.3
10	25	12		10.96	12.24	11.36
10	25	24		10.97	12.35	11.61
10	50	0		11.04	12.33	11.51



LTE BAND 66

LTE Band 66 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	13.09	14.05	13.14
15	1	37		12.56	14.2	12.73
15	1	74		12.63	13.98	12.94
15	36	0		12.01	13.22	11.98
15	36	18		11.7	13.19	11.75
15	36	39		11.69	13.18	11.8
15	75	0		11.88	13.21	11.96
15	1	0	16-QAM	12.58	13.19	12.2
15	1	38		12.05	13.35	11.83
15	1	75		12.12	13.14	12
15	36	0		11.06	12.25	11.02
15	36	18		10.75	12.26	10.81
15	36	39		10.73	12.21	10.84
15	75	0		10.89	12.21	11.05
20	1	0	QPSK	13.48	14.52	13.9
20	1	49		12.53	14.3	12.93
20	1	99		13.35	14.34	13.3
20	50	0		12.11	13.43	12.38
20	50	24		11.72	13.28	11.95
20	50	49		11.98	13.35	11.99
20	100	0		12.07	13.39	12.24
20	1	0	16-QAM	12.87	13.74	13.09
20	1	49		11.92	13.51	12.17
20	1	99		12.73	13.56	12.48
20	50	0		11.17	12.36	11.49
20	50	24		10.79	12.26	11.1
20	50	49		11.05	12.28	11.11
20	100	0		11.1	12.36	11.29

11. EUT and Test Setup Photo

11.1 EUT Photo

Front side

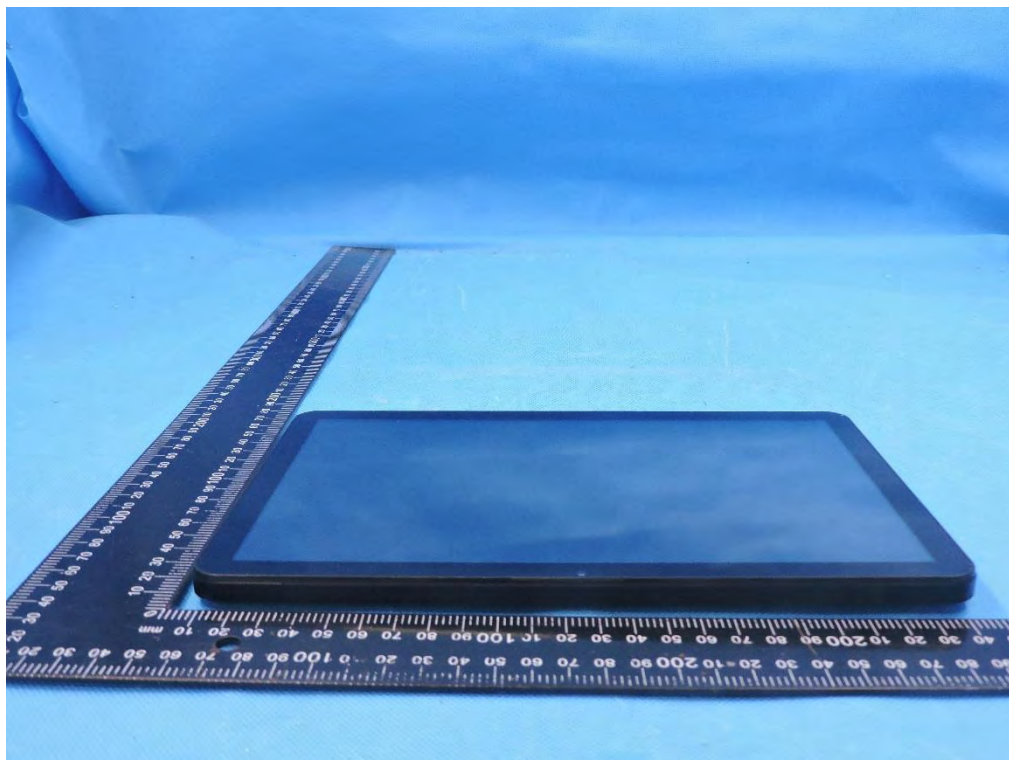


Back side

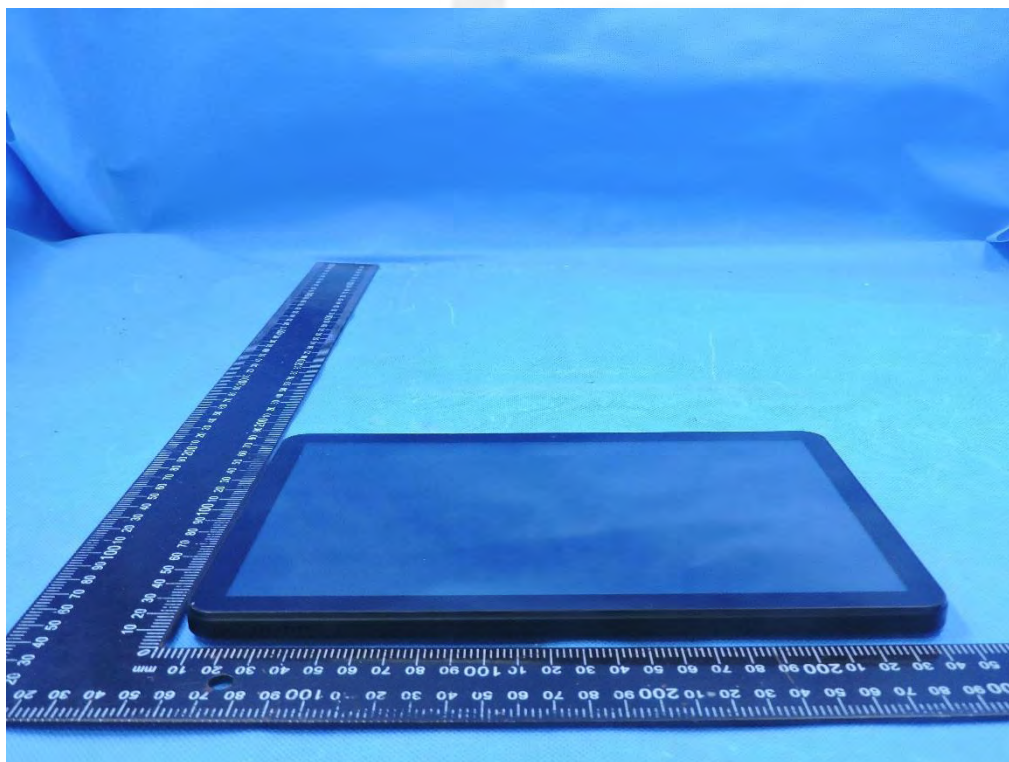




Top side

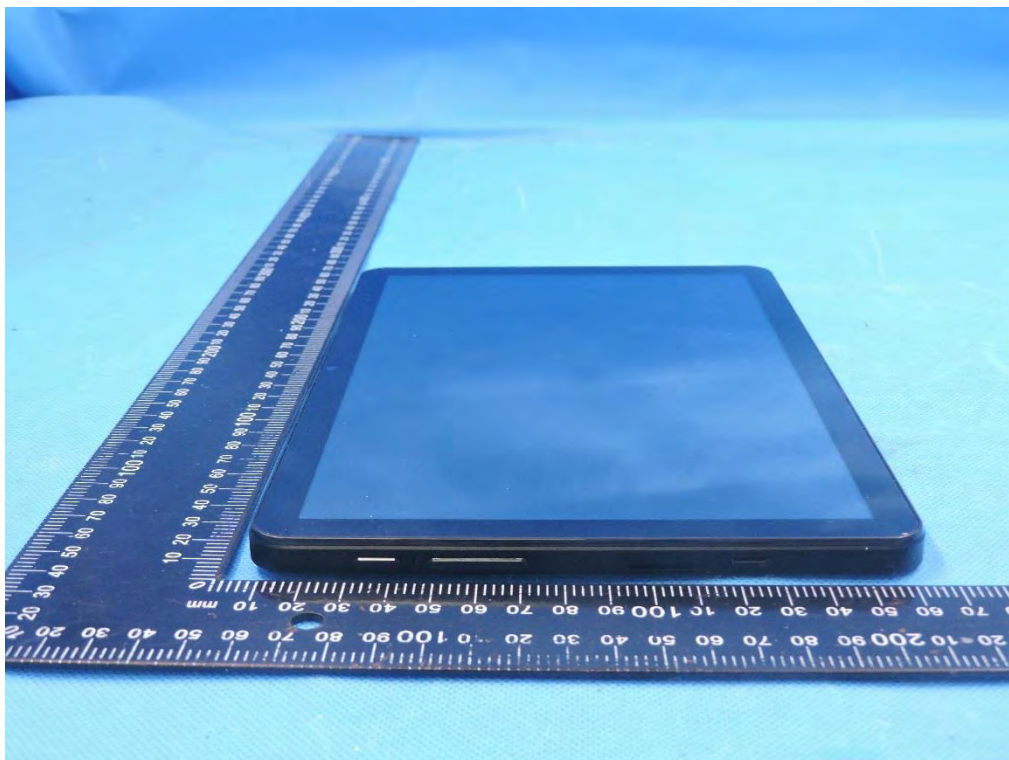


Bottom side

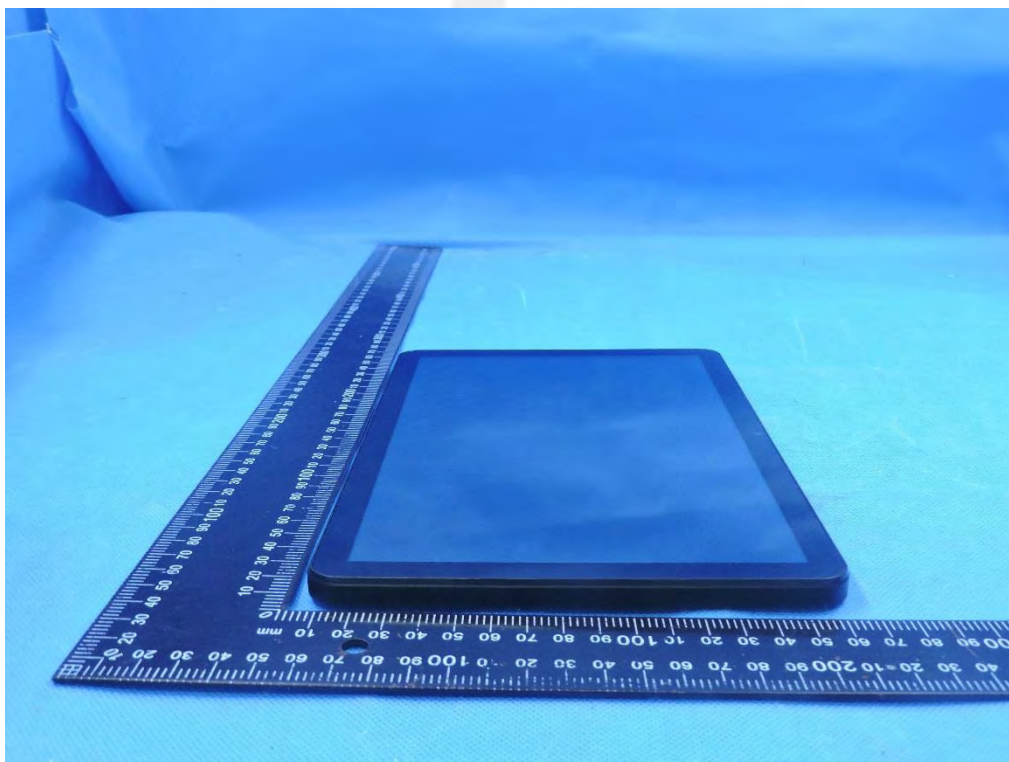




Left side

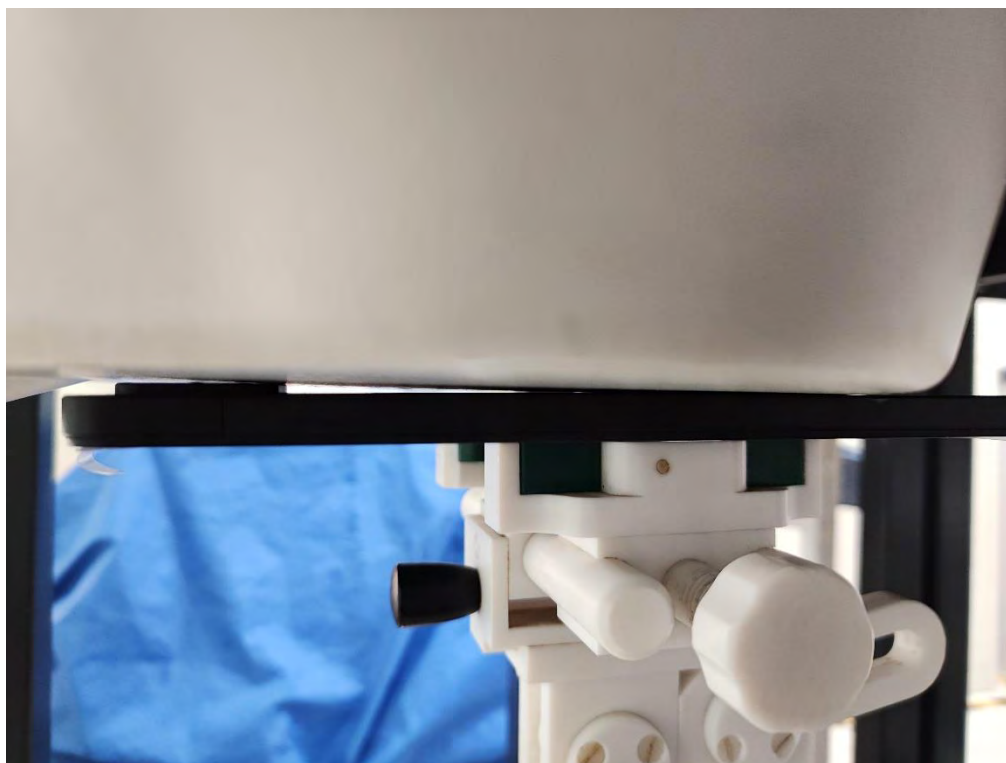


Right side



11.2 Setup Photo

Body Back side(separation distance is 0mm)

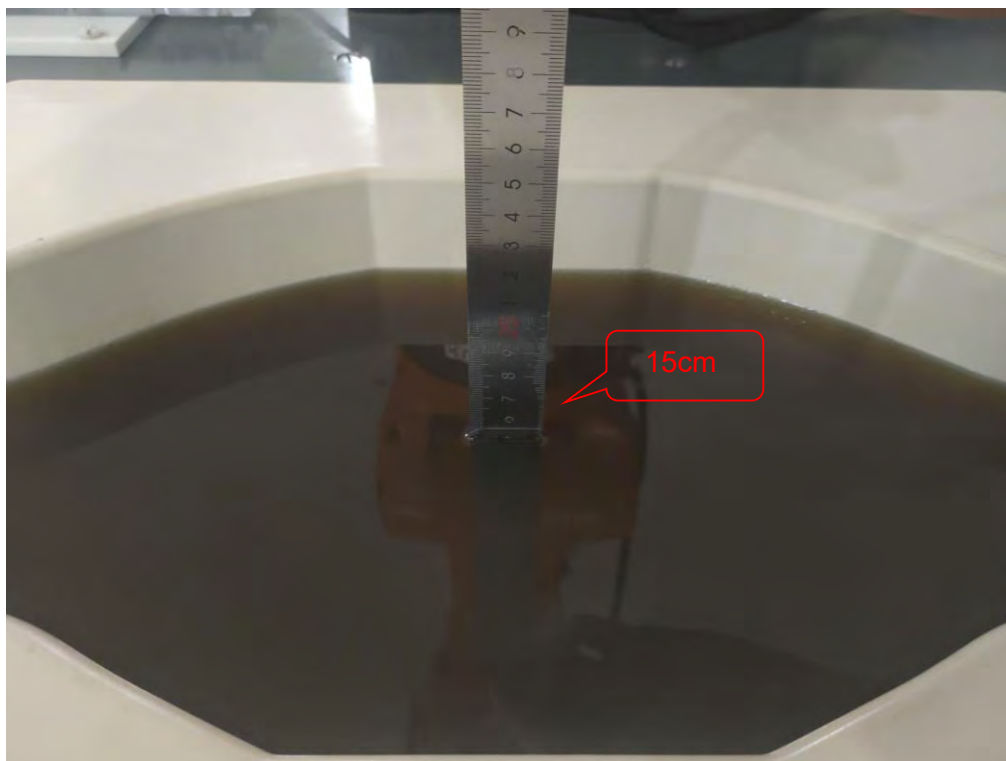


Body Top Side (separation distance is 0mm)





Liquid depth (15 cm)





12. SAR Result Summary

12.1 Body-worn and Hotspot SAR

Band	Model	Test Position	Freq.	SAR (1g) (W/kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
GSM850	EGPRS(8PSK, 4-Slot	Back Side	848.8	0.855	-3.46	24.50	24.16	0.925	1
		Back Side	836.6	0.659	2.41	24.50	24.03	0.734	/
		Back Side	824.2	0.712	0.56	24.50	24.53	0.707	/
		Top Side	848.8	0.428	-1.88	24.50	24.16	0.463	/
GSM1900	EGPRS(8PSK, 4-Slot	Back Side	1850.2	0.584	0.90	18.00	17.82	0.609	/
		Top Side	1850.2	0.644	1.53	18.00	17.82	0.671	2
WCDMA Band II	RMC	Back Side	1880	0.291	-0.58	12.00	11.94	0.295	/
		Top Side	1880	0.392	-2.03	12.00	11.94	0.397	3
WCDMA Band IV	RMC	Back Side	1740	0.251	2.98	13.00	12.79	0.263	4
		Top Side	1740	0.233	-3.78	13.00	12.79	0.245	/
WCDMA Band V	RMC	Back Side	836.6	0.249	-3.97	15.00	14.96	0.251	5
		Top Side	836.6	0.159	-1.76	15.00	14.96	0.160	/



Band	BW (MHz)	Mod.	RB Size	RB offset	Test Position	Freq.	Result 1g (W/Kg)	Power Drift(%)	Max. Turn-up Power (dBm)	Meas. Output Power (dBm)	Scaled SAR (W/Kg)	Meas. No.
LTE Band 2	20M	QPSK	1	99	Back Side	1860	0.466	-0.09	15	14.68	0.502	/
			50	49	Back Side	1860	0.374	-0.17	15	14.68	0.403	/
			1	99	Top Side	1860	0.510	3.96	13.5	13.24	0.541	6
			50	49	Top Side	1860	0.433	1.79	13.5	13.24	0.460	/
LTE Band 4	20M	QPSK	1	0	Back Side	1745	0.263	2.51	14	13.94	0.267	7
			50	0	Back Side	1745	0.223	2.07	14	13.94	0.226	/
			1	0	Top Side	1745	0.238	1.93	13	12.82	0.248	/
			50	0	Top Side	1745	0.184	0.36	13	12.82	0.192	/
LTE Band 5	10M	QPSK	1	24	Back Side	836.5	0.306	-1.44	16	15.66	0.331	8
			25	12	Back Side	836.5	0.273	-3.75	16	15.66	0.295	/
			1	24	Top Side	836.5	0.164	-2.61	15	14.51	0.184	/
			25	12	Top Side	836.5	0.135	-2.22	15	14.51	0.151	/
LTE Band 12	10M	QPSK	1	49	Back Side	707.5	0.034	0.15	20.5	20.08	0.037	/
			25	24	Back Side	707.5	0.022	1.21	20.5	20.08	0.024	/
			1	49	Top Side	707.5	0.125	1.33	19.5	19.06	0.138	9
			25	24	Top Side	707.5	0.094	-1.22	19.5	19.06	0.104	/
LTE Band 66	20M	QPSK	1	0	Back Side	1755	0.253	2.31	15	14.52	0.283	/
			50	0	Back Side	1755	0.217	-1.10	15	14.52	0.242	/
			1	0	Top Side	1755	0.443	3.71	13.5	13.43	0.450	10
			50	0	Top Side	1755	0.385	0.72	13.5	13.43	0.391	/



Band	Model	Test Position	Freq.	SAR (1g) (W/kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
2.4GHz WLAN	802.11b	Back Side	2437	0.072	-3.54	7.50	7.48	0.072	/
		Top Side	2437	0.193	-0.52	7.50	7.48	0.194	11
BLE	GFSK(2Mbps)	Back Side	2440	0.034	-3.09	7.00	6.64	0.037	12
		Top Side	2440	0.032	0.15	7.00	6.64	0.035	/
5.2GHz WLAN	802.11 n-HT20	Back Side	5200	0.155	-1.46	7.50	7.13	0.169	/
		Top Side	5200	0.475	-0.01	7.50	7.13	0.517	13
5.3GHz WLAN	802.11 n-HT20	Back Side	5300	0.126	3.09	7.00	6.81	0.132	/
		Top Side	5300	0.321	-2.30	7.00	6.81	0.335	14
5.6GHz WLAN	802.11 n-HT40	Back Side	5510	0.212	-2.60	7.50	7.06	0.235	/
		Top Side	5510	0.507	2.02	7.50	7.06	0.561	15
5.8GHz WLAN	802.11 n-HT20	Back Side	5785	0.113	-2.59	7.00	6.53	0.126	/
		Top Side	5785	0.213	-2.94	7.00	6.53	0.237	16

Note:

- The test separation of all above table is 0mm.
- Per KDB 447498 D04, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - 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.
 - Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
- Per KDB 248227- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. (The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **0.192W/Kg** for Body)
- When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the Wi-Fi transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The "Portable Hotspot" feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

**Repeated SAR**

Band	Mode	Test Position	Freq.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR(W/Kg)	Meas. No.
GSM 850	EGPRS(8PSK, 4-Slot	Back Side	848.8	0.835	1.45	24.5	24.16	0.903	-

Repeated SAR measurement

Band	Mode	Test Position	Freq.	Original Measured SAR 1g(W/kg)	1 st Repeated SAR 1g	Ratio	Original Measured SAR 1g(W/kg)	2nd Repeated SAR 1g	Ratio
GSM 850	EGPRS(8PSK, 4-Slot	Back Side	848.8	0.855	0.835	1.024	-	-	-

**Simultaneous Multi-band Transmission Evaluation:**

Application Simultaneous Transmission information:

Position	Simultaneous State
Body	1. GSM + 2.4GHz WLAN/5G WLAN
	2. GSM + Bluetooth
	3. WCDMA + 2.4GHz WLAN/5G WLAN
	4. WCDMA + Bluetooth
	5. LTE + 2.4GHz WLAN/5G WLAN
	6. LTE + Bluetooth

NOTE:

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



Simultaneous Mode	Position	Mode	Max. 1-g SAR	1-g Sum SAR
			(W/kg)	(W/kg)
GSM + 2.4G WLAN	Body	GSM	0.925	1.119
		2.4G WLAN	0.194	
GSM + Bluetooth	Body	GSM	0.925	0.962
		Bluetooth	0.037	
GSM + 5G WLAN	Body	GSM	0.925	1.486
		5G WLAN	0.561	
WCDMA + 2.4G WLAN	Body	WCDMA	0.397	0.591
		2.4G WLAN	0.194	
WCDMA + Bluetooth	Body	WCDMA	0.397	0.434
		Bluetooth	0.037	
WCDMA + 5G WLAN	Body	WCDMA	0.397	0.958
		5G WLAN	0.561	
LTE + 2.4G WLAN	Body	LTE	0.541	0.735
		2.4G WLAN	0.194	
LTE + Bluetooth	Body	LTE	0.541	0.578
		Bluetooth	0.037	
LTE + 5G WLAN	Body	LTE	0.541	1.102
		5G WLAN	0.561	

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

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



13. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
750MHz Dipole	MVG	SID750	SN 30/14 DIP0G750-331	2020.07.14	2023.07.13
835MHz Dipole	MVG	SID835	SN 30/14 DIP0G835-332	2020.07.14	2023.07.13
1800MHz Dipole	MVG	SID1800	SN 30/14 DIP1G800-329	2020.07.14	2023.07.13
2450MHzDipole	MVG	SID2450	SN 30/14 DIP2G450-335	2020.07.14	2023.07.13
Waveguide	MVG	SWG5500	SN 13/14 WGA32	2020.07.14	2023.07.13
E-Field Probe	MVG	SSE2	SN 07/21 EPOG352	2023.02.24	2024.02.23
Dielectric Probe Kit	MVG	SCLMP	SN 32/14 OCPG67	2022.11.15	2023.11.14
Antenna	MVG	ANTA3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	MVG	SAM	SN 32/14 SAM115	N/A	N/A
Phantom3	MVG	SAM	SN 21/21 ELLI48	N/A	N/A
Phone holder	MVG	N/A	SN 32/14 MSH97	N/A	N/A
Laptop holder	MVG	N/A	SN 32/14 LSH29	N/A	N/A
Attenuator	Agilent	99899	DC-18GHz	N/A	N/A
Directional coupler	Narda	4226-20	3305	N/A	N/A
Network Analyzer	Agilent	8753ES	US38432810	2022.09.28	2023.09.27
Multi Meter	Keithley	Multi Meter 2000	4050073	2022.09.29	2023.09.28
Signal Generator	Agilent	N5182A	MY50140530	2022.09.28	2023.09.27
Wireless Communication Test Set	Agilent	8960-E5515C	MY48360751	2022.09.28	2023.09.27
Wireless Communication Test Set	R&S	CMW500	156324	2022.09.29	2023.09.28
Power Amplifier	DESAY	ZHL-42W	9638	2022.10.08	2023.10.07
Power Meter	R&S	NRP	100510	2022.09.28	2023.09.27
Power Sensor	R&S	NRP-Z11	101919	2022.09.28	2023.09.27
Power Sensor	Keysight	U2021XA	MY56280002	2022.09.29	2023.09.28
Temperature hygrometer	SuWei	SW-108	N/A	2022.09.30	2023.09.29
Thermograph	Elitech	RC-4	S/N EF7176501537	2022.09.30	2023.09.29

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 (750MHz)

Type: Phone measurement (Complete)

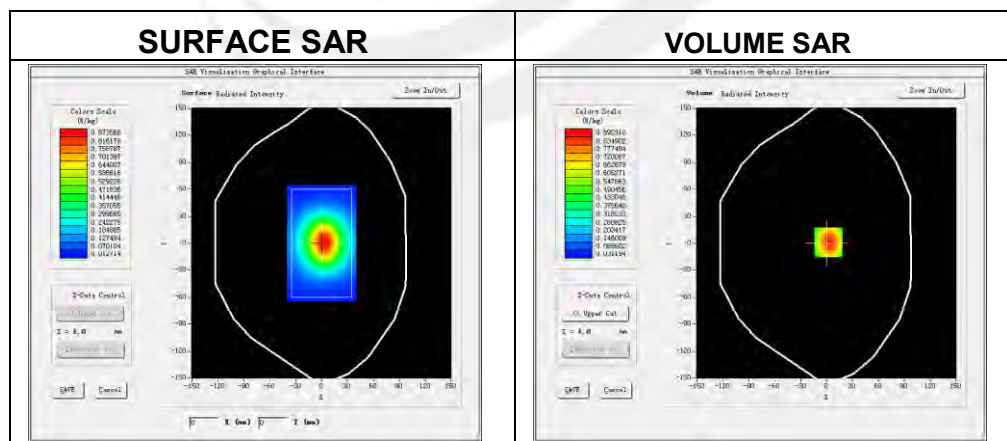
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement: 2023-04-24

Experimental conditions

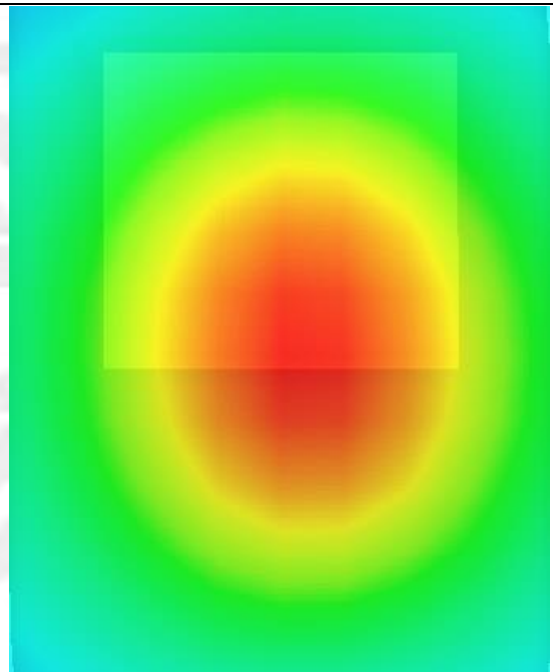
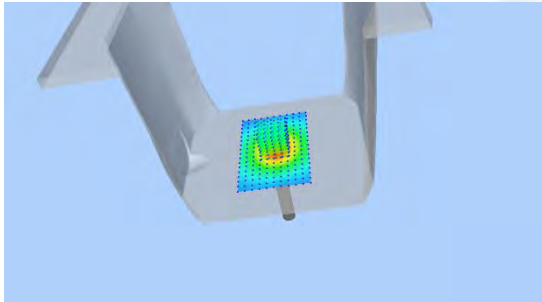
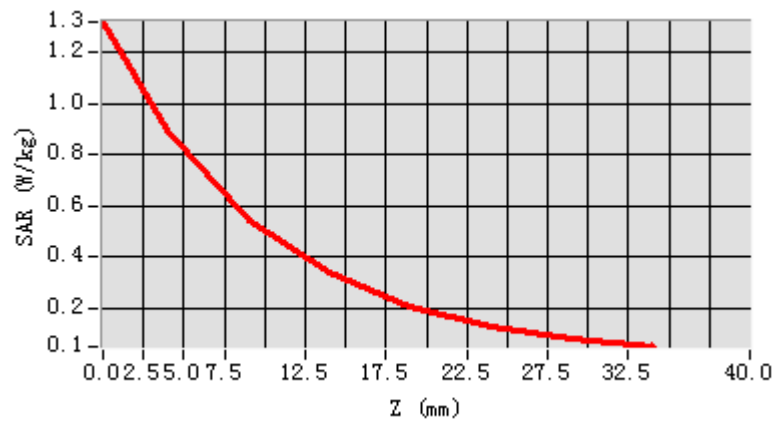
Phantom	Validation plane
Device Position	-
Band	750MHz
Channels	-
Signal	CW
Frequency (MHz)	750MHz
Relative permittivity	42.80
Conductivity (S/m)	0.91
Probe	SN 07/21 EPG0352
ConvF	1.58
Crest factor	1:1



Maximum location: X=2.00, Y=1.00

SAR 10g (W/Kg)	0.528382
SAR 1g (W/Kg)	0.861694

Z Axis Scan



**System Performance Check Data (835MHz)**

Type: Phone measurement (Complete)

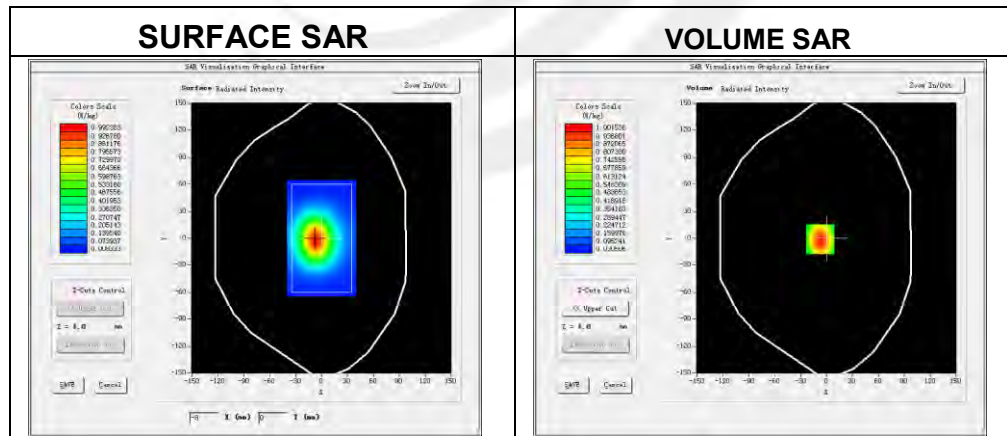
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement: 2023-04-25

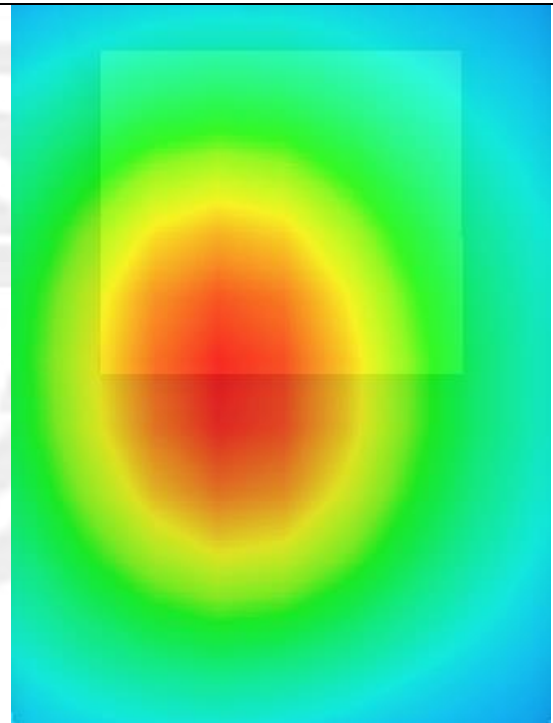
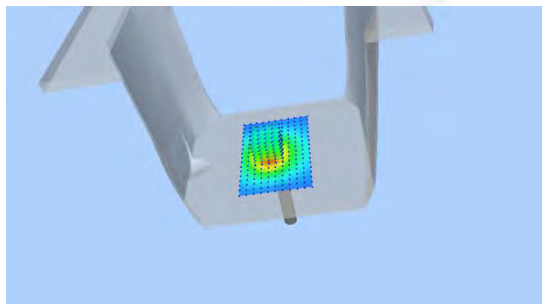
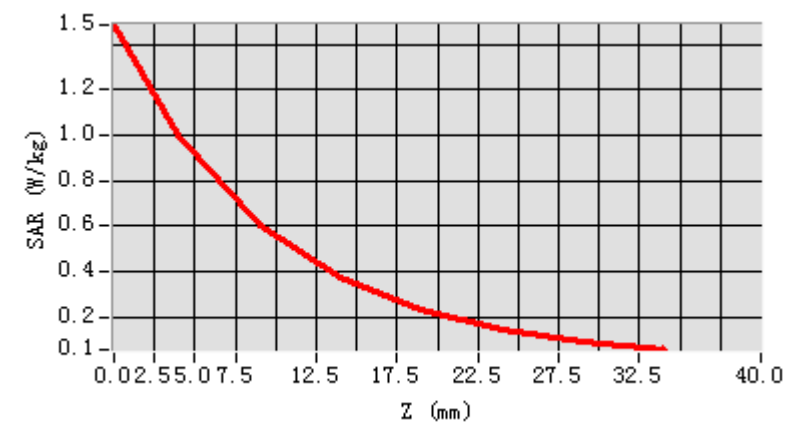
Experimental conditions

Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	40.70
Conductivity (S/m)	0.91
Probe	SN 07/21 EPG0352
ConvF:	1.57
Crest factor:	1:1

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

SAR 10g (W/Kg)	0.619671
SAR 1g (W/Kg)	1.001574

Z Axis Scan



**System Performance Check Data(1800MHz)**

Type: Phone measurement (Complete)

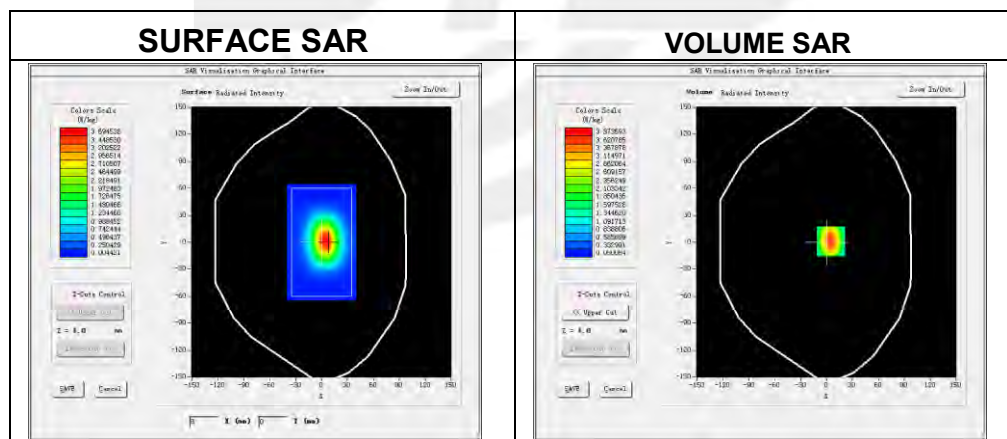
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement: 2023-04-26

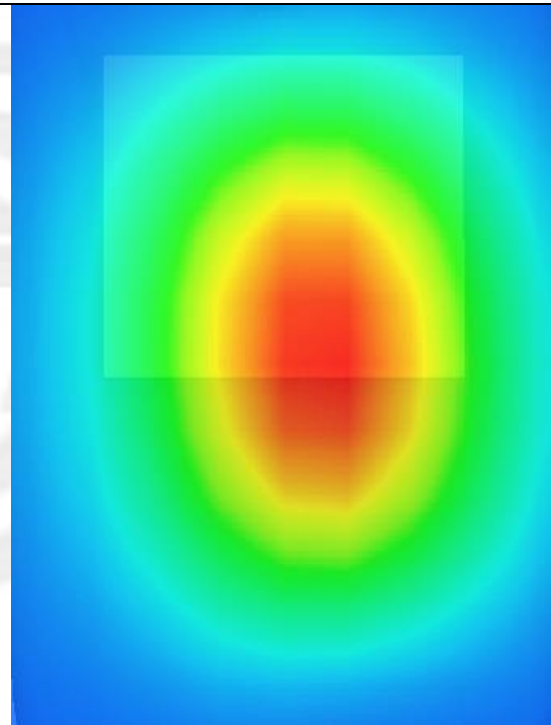
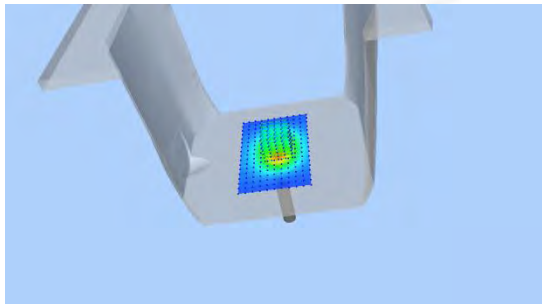
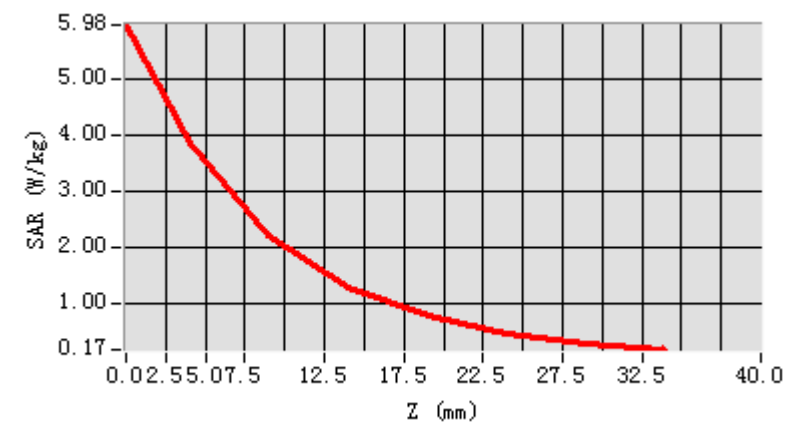
Experimental conditions.

Phantom	Validation plane
Device Position	-
Band	1800MHz
Channels	-
Signal	CW
Frequency (MHz)	1800MHz
Relative permittivity	40.89
Conductivity (S/m)	1.37
Probe	SN 07/21 EPGO352
ConvF	1.60
Crest factor:	1:1

**Maximum location: X=5.00, Y=1.00**

SAR 10g (W/Kg)	1.807993
SAR 1g (W/Kg)	3.902625

Z Axis Scan



**System Performance Check Data (2450MHz)**

Type: Phone measurement (Complete)

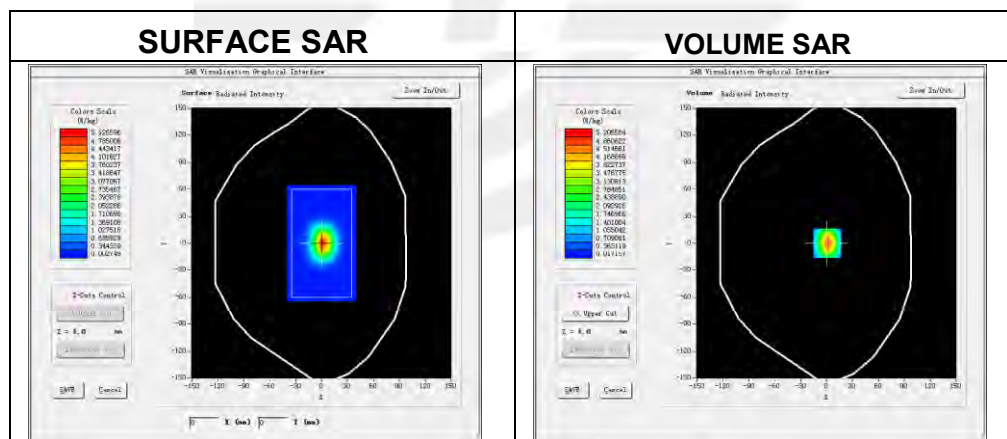
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement: 2023-04-27

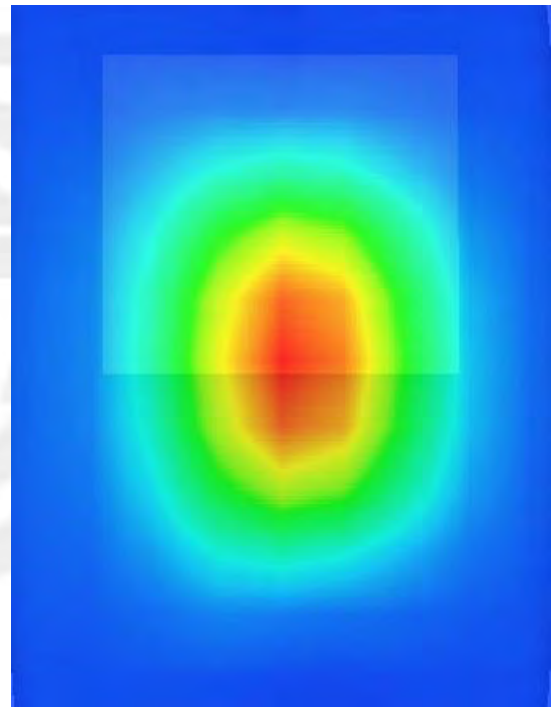
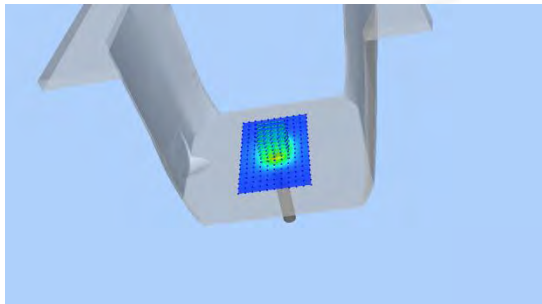
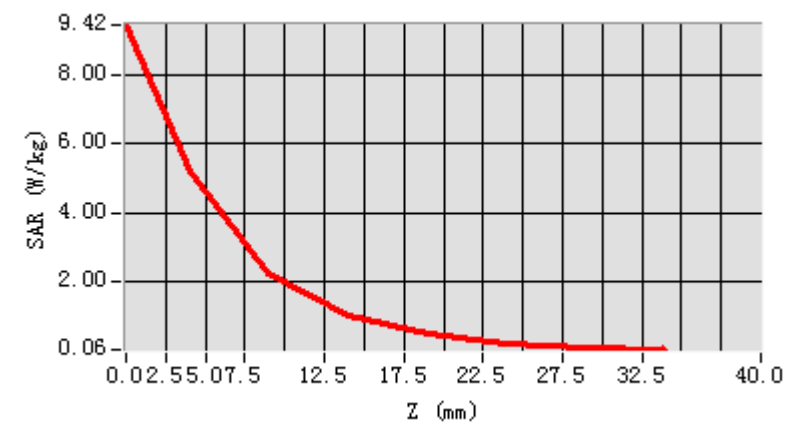
Experimental conditions.

Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	39.70
Conductivity (S/m)	1.78
Probe	SN 07/21 EPG0352
ConvF	1.75
Crest factor:	1:1

**Maximum location: X=1.00, Y=0.00**

SAR 10g (W/Kg)	2.708948
SAR 1g (W/Kg)	5.246944

Z Axis Scan



**System Performance Check Data (5200MHz)**

Type: Dipole measurement (Complete)

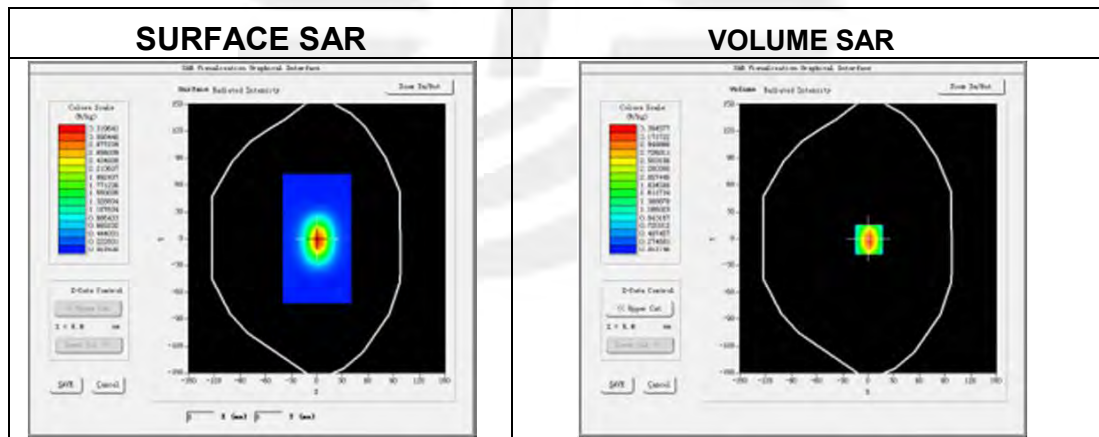
Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm

Date of measurement: 2023-04-28

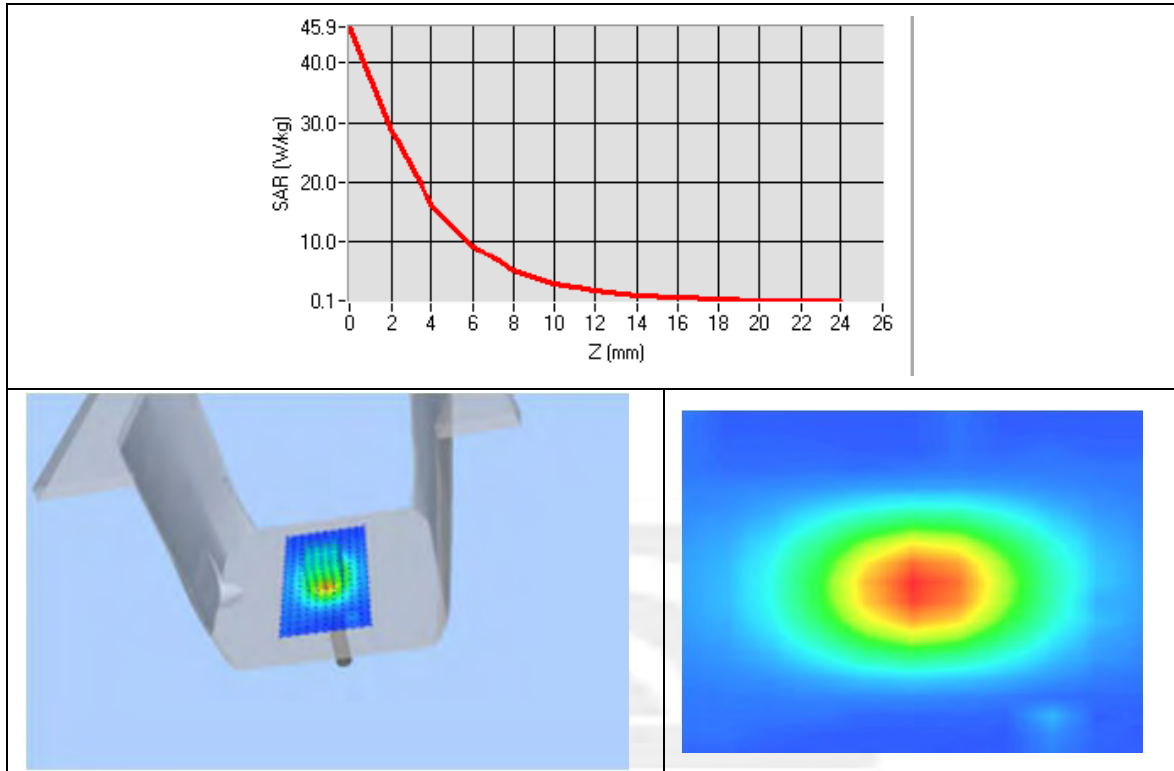
Experimental conditions.

Device Position	Validation plane
Band	5200 MHz
Channels	-
Signal	CW
Frequency (MHz)	5200
Relative permittivity	36.51
Conductivity (S/m)	4.59
Probe	SN 07/21 EPGO352
ConvF	1.47
Crest factor:	1:1

**Maximum location: X=7.00, Y=2.00**

SAR 10g (W/Kg)	5.721221
SAR 1g (W/Kg)	15.074381

Z Axis Scan



**System Performance Check Data (5300MHz)**

Type: Dipole measurement (Complete)

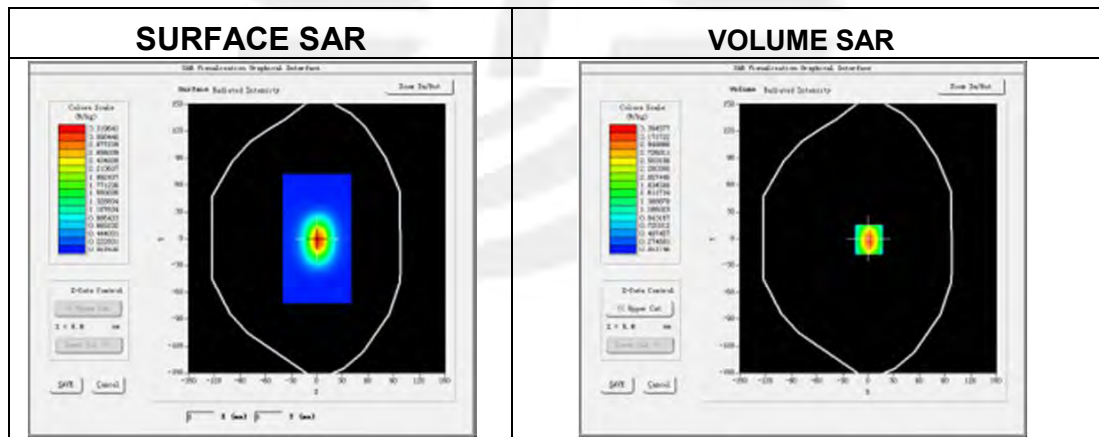
Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm

Date of measurement: 2023-04-28

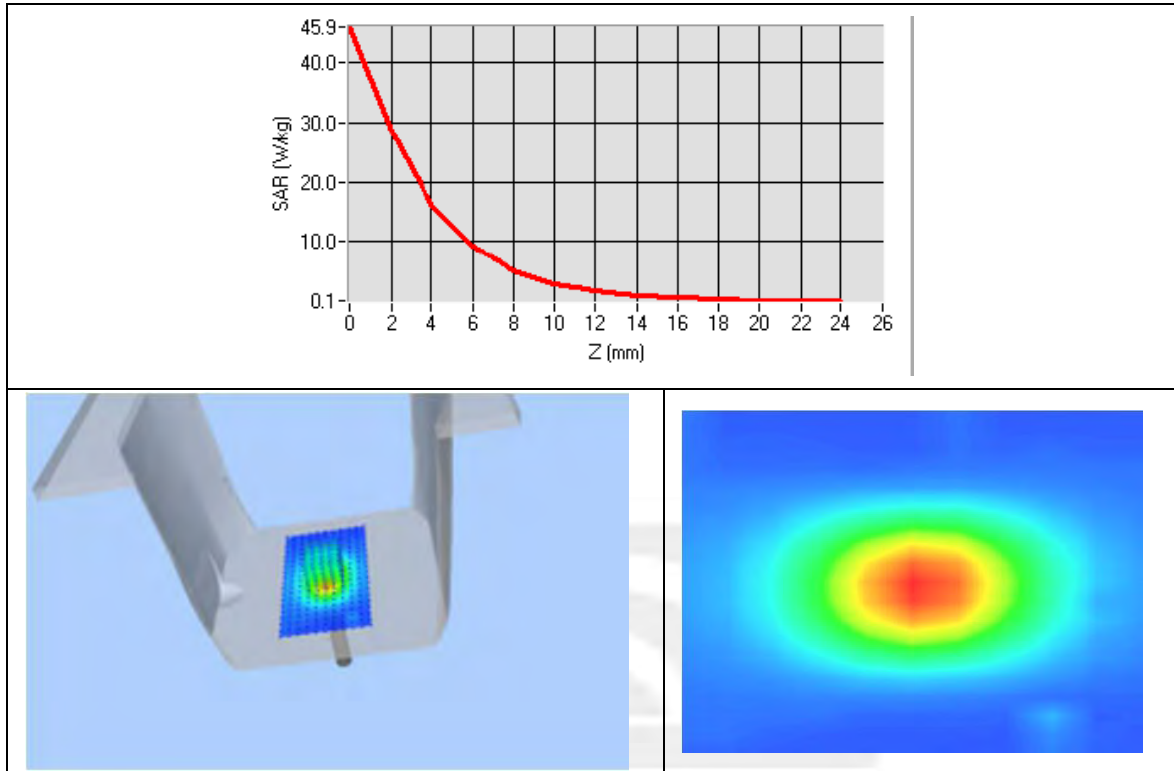
Experimental conditions.

Device Position	Validation plane
Band	5300 MHz
Channels	-
Signal	CW
Frequency (MHz)	5300
Relative permittivity	37.11
Conductivity (S/m)	4.57
Probe	SN 07/21 EPGO352
ConvF	1.65
Crest factor:	1:1

**Maximum location: X=7.00, Y=2.00**

SAR 10g (W/Kg)	5.740615
SAR 1g (W/Kg)	16.431144

Z Axis Scan



**System Performance Check Data (5600MHz)**

Type: Dipole measurement (Complete)

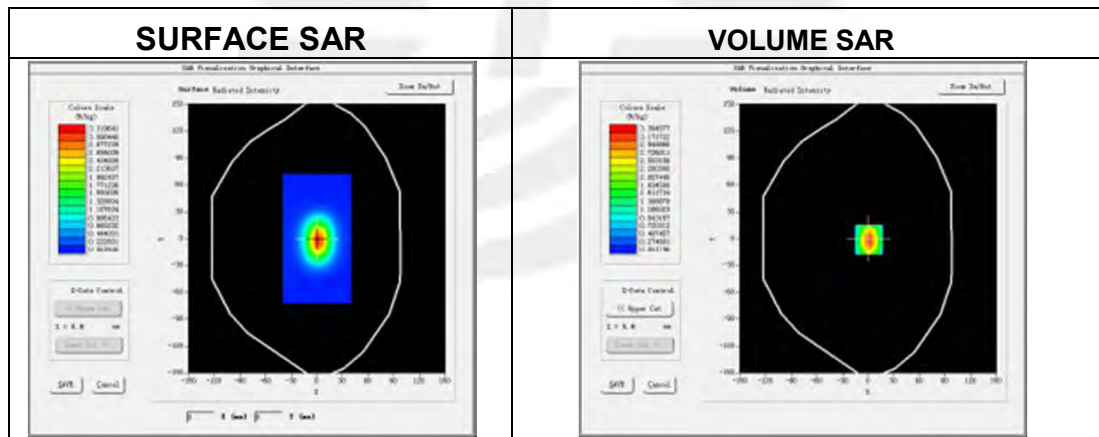
Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm

Date of measurement: 2023-05-04

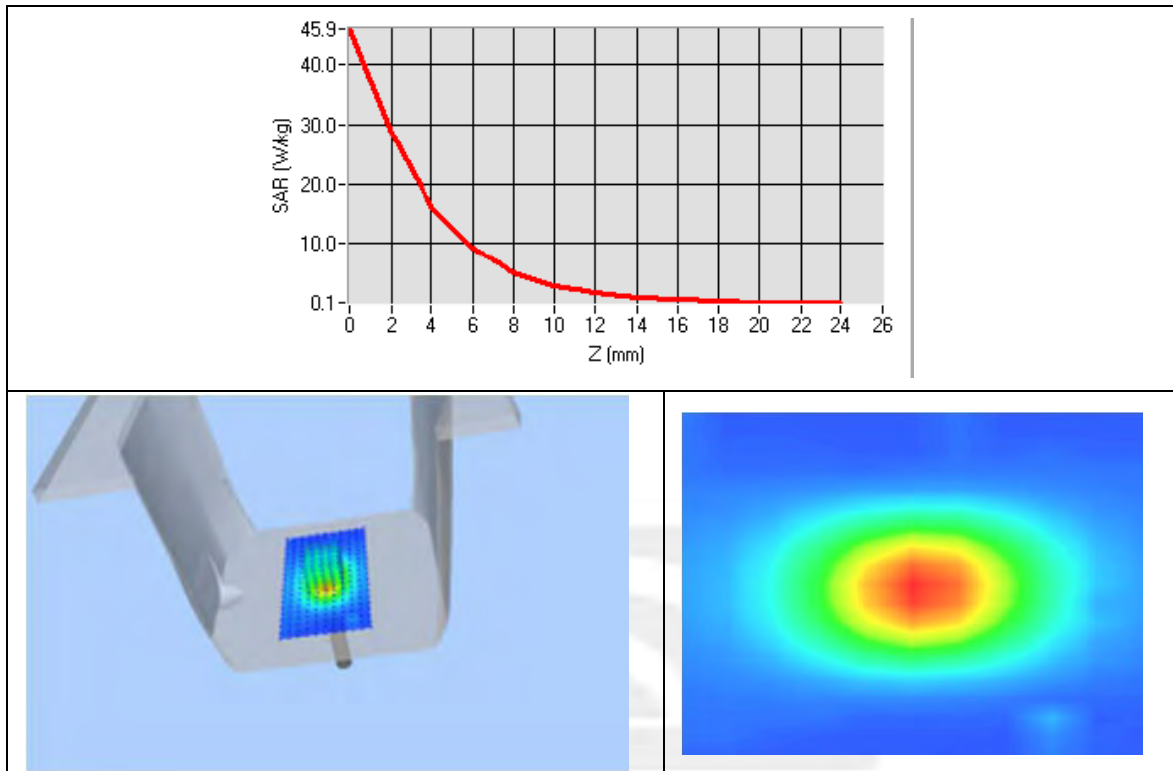
Experimental conditions.

Device Position	Validation plane
Band	5600 MHz
Channels	-
Signal	CW
Frequency (MHz)	5600
Relative permittivity	35.89
Conductivity (S/m)	5.15
Probe	SN 07/21 EPGO352
ConvF	1.74
Crest factor:	1:1

**Maximum location: X=7.00, Y=2.00**

SAR 10g (W/Kg)	5.564659
SAR 1g (W/Kg)	17.593034

Z Axis Scan



**System Performance Check Data (5800MHz)**

Type: Dipole measurement (Complete)

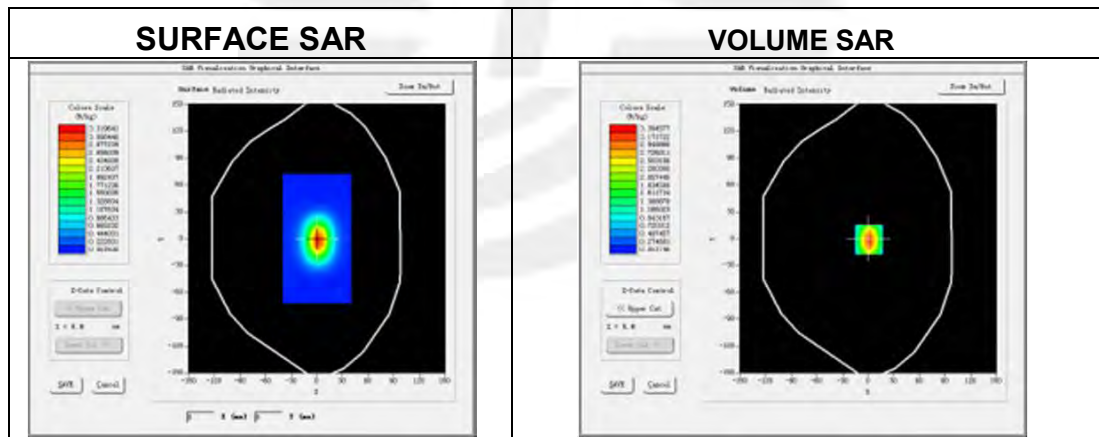
Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm

Date of measurement: 2023-05-04

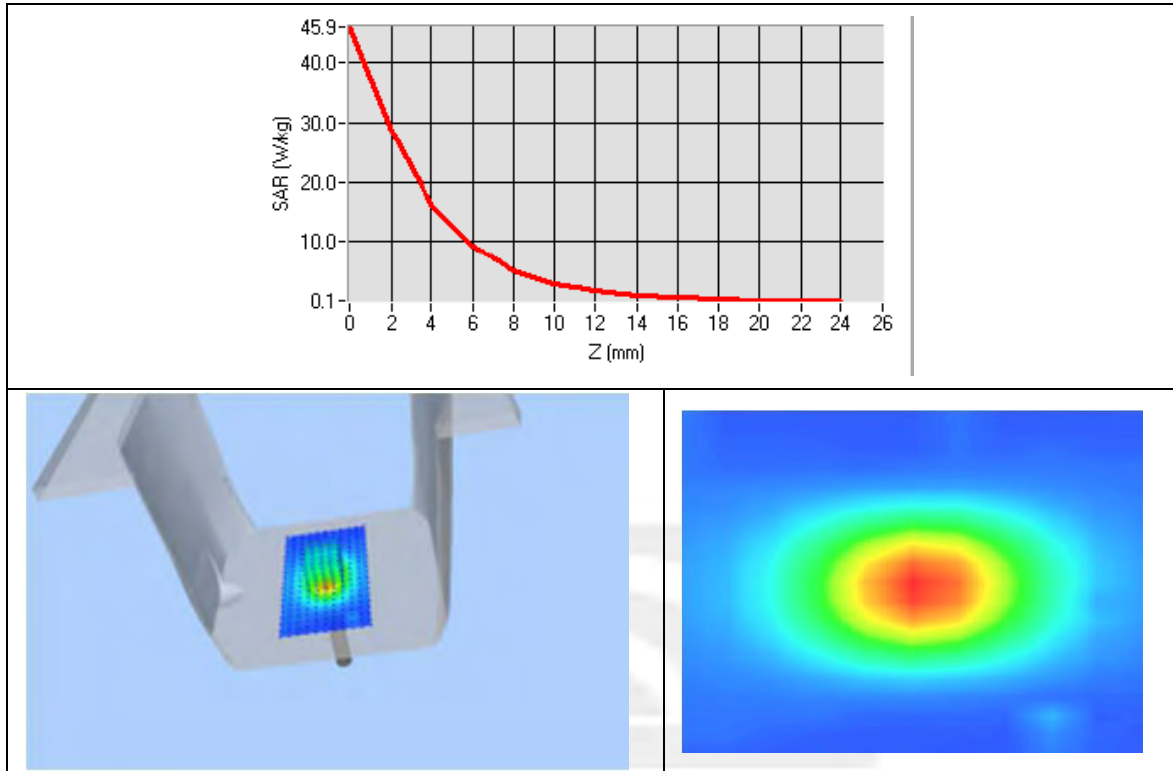
Experimental conditions.

Device Position	Validation plane
Band	5800 MHz
Channels	-
Signal	CW
Frequency (MHz)	5800
Relative permittivity	36.25
Conductivity (S/m)	5.39
Probe	SN 07/21 EPGO352
ConvF	1.64
Crest factor:	1:1

**Maximum location: X=7.00, Y=2.00**

SAR 10g (W/Kg)	6.134974
SAR 1g (W/Kg)	18.039441

Z Axis Scan





Appendix B. SAR Test Plots

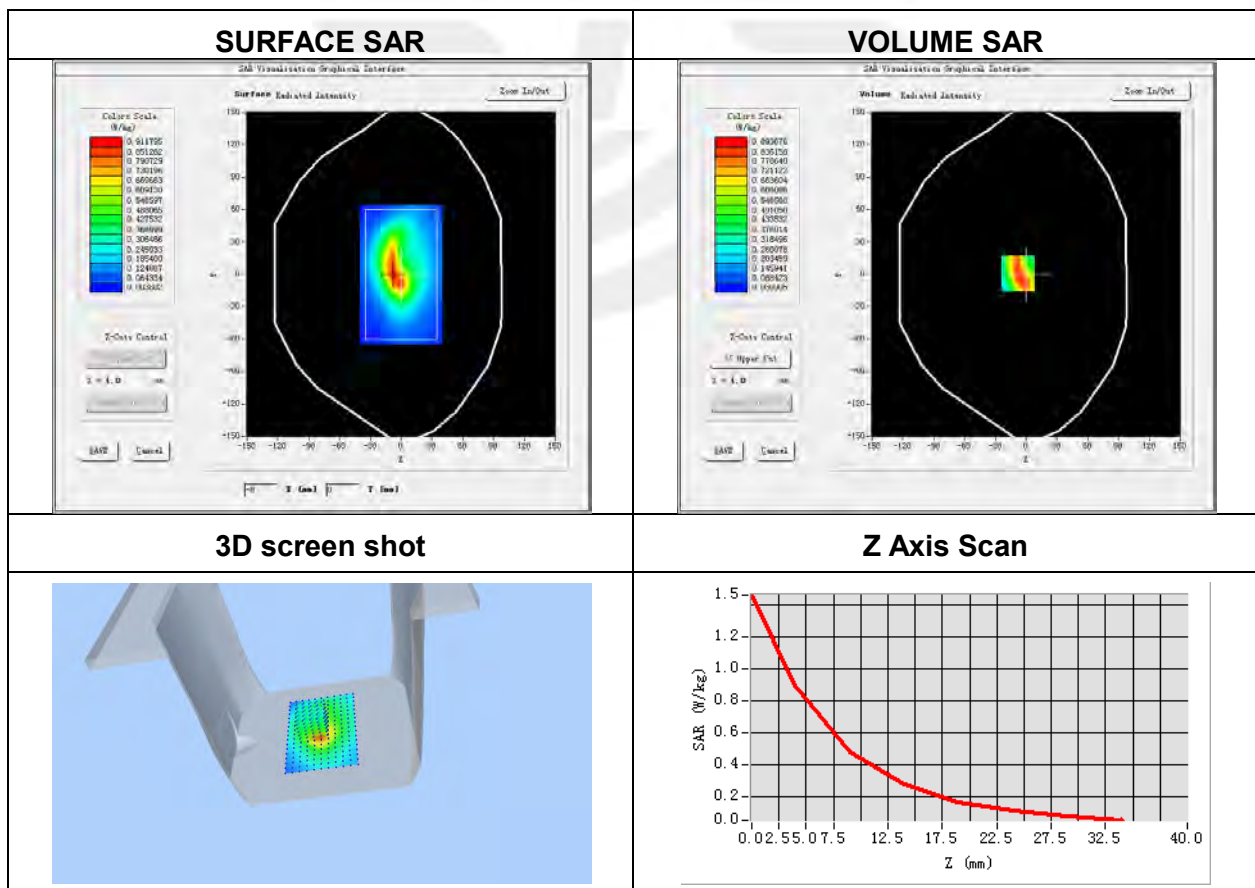
Plot 1: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-25
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	GPRS 850
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	848.8
Relative permittivity (real part)	40.86
Conductivity (S/m)	0.93

Maximum location: X=-8.00, Y=1.00

SAR Peak: 1.51 W/kg

SAR 10g (W/Kg)	0.447446
SAR 1g (W/Kg)	0.855046



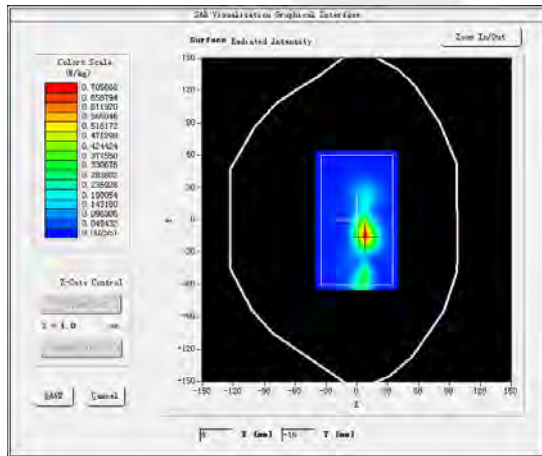
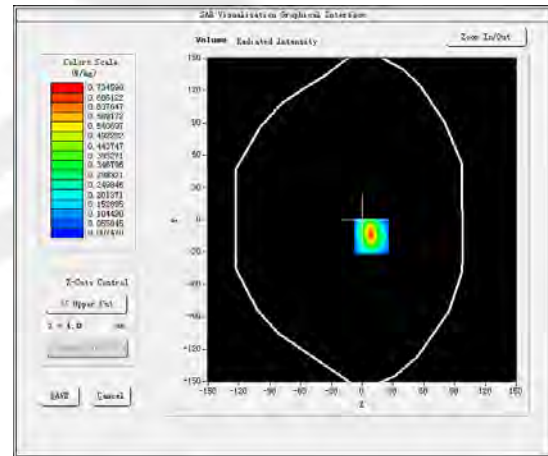
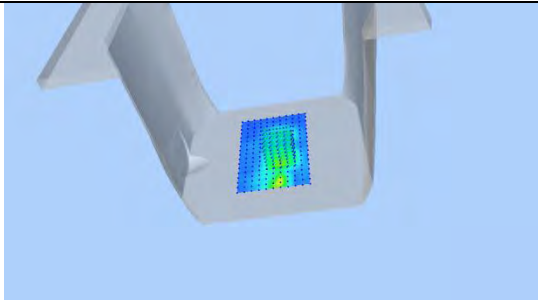
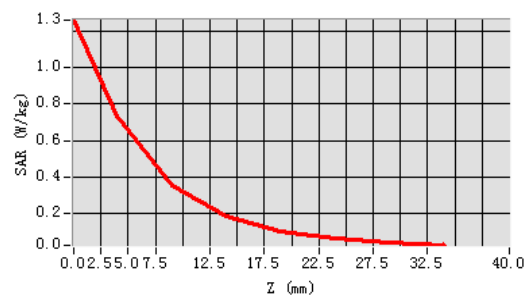

Plot 2: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-26
Probe	SN 07/21 EPG0352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	GPRS 1900
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	1850.2
Relative permittivity (real part)	40.83
Conductivity (S/m)	1.44

Maximum location: X=9.00, Y=-15.00

SAR Peak: 1.25 W/kg

SAR 10g (W/Kg)	0.269137
SAR 1g (W/Kg)	0.643697

SURFACE SAR

VOLUME SAR

3D screen shot

Z Axis Scan


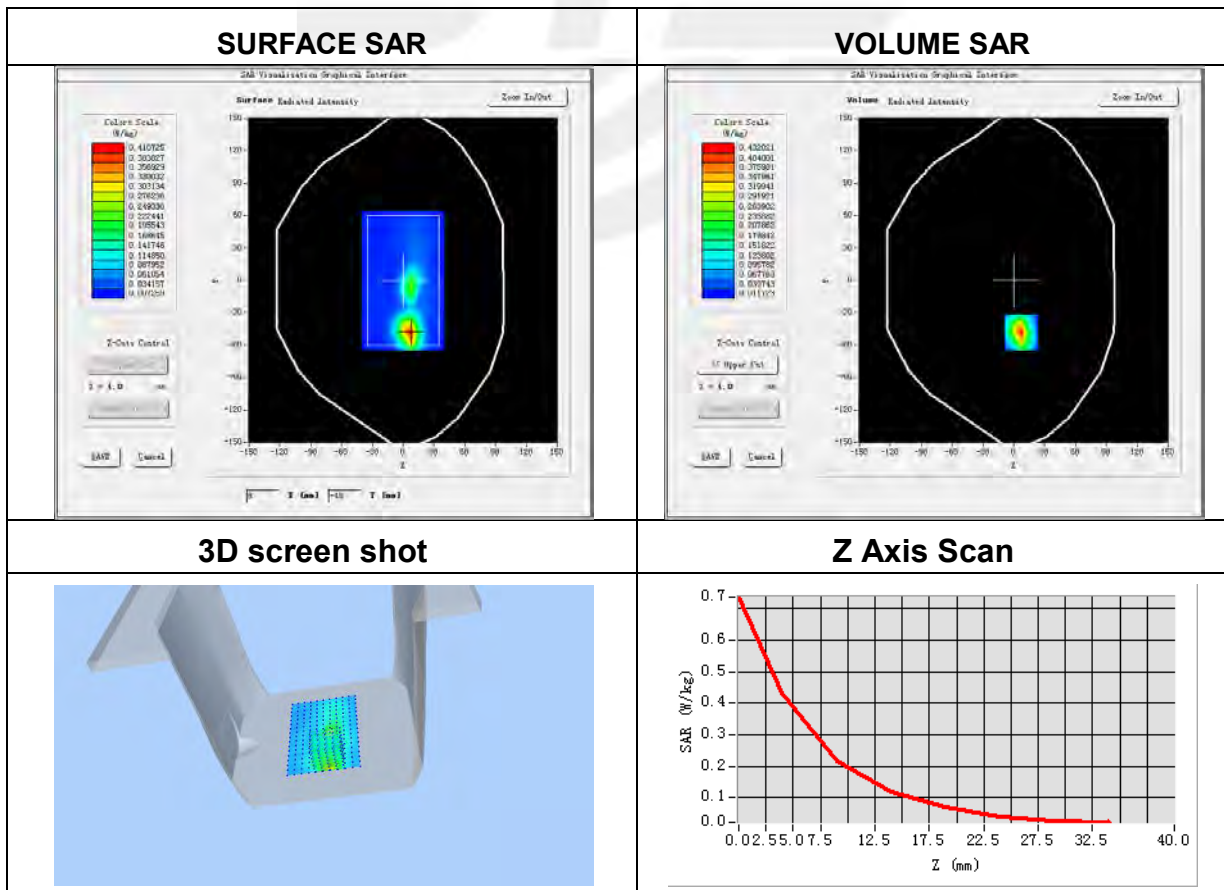
**Plot 3: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US**

Test Date	2023-04-26
Probe	SN 07/21 EPGO352
ConvF	1.84
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	WCDMA II
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1880
Relative permittivity (real part)	40.19
Conductivity (S/m)	1.41

Maximum location: X=7.00, Y=-48.00

SAR Peak: 0.73 W/kg

SAR 10g (W/Kg)	0.167848
SAR 1g (W/Kg)	0.391695



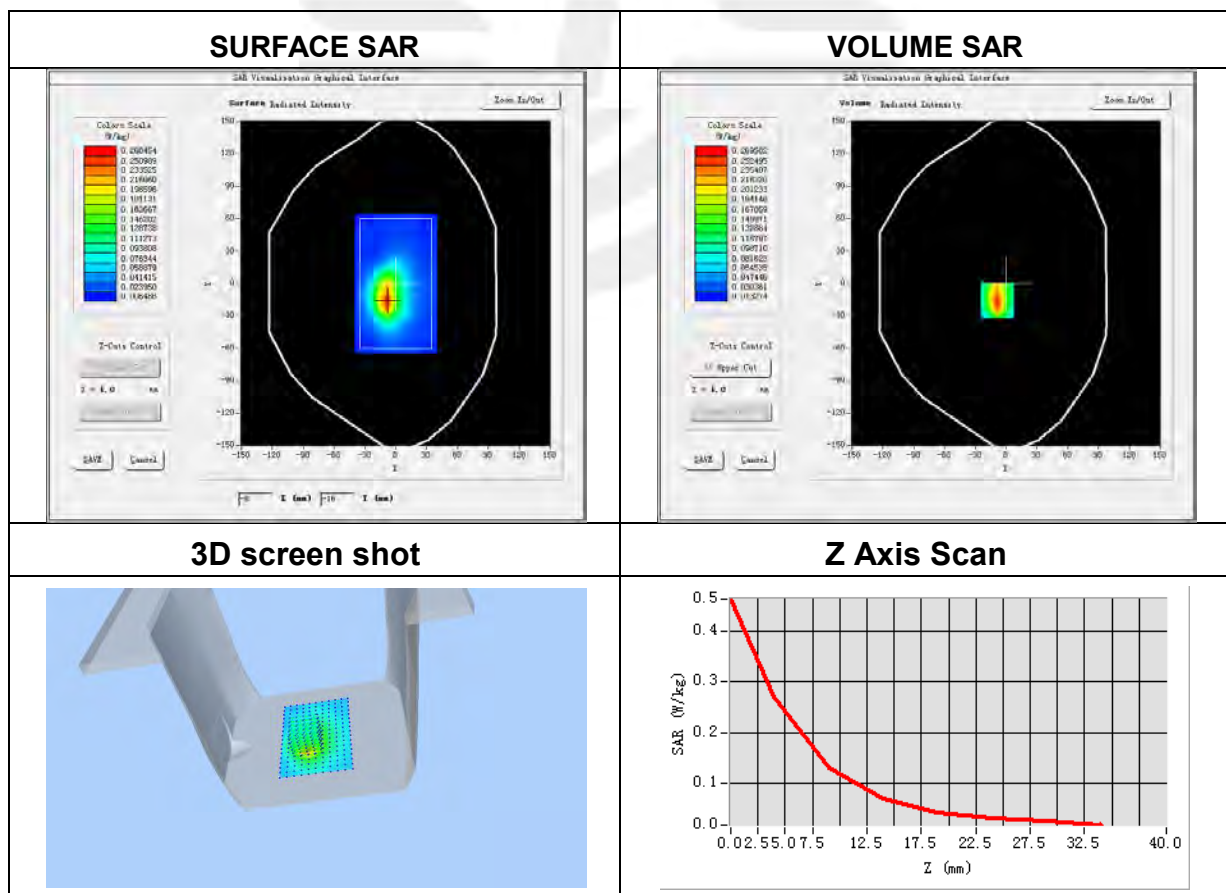
**Plot 4: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US**

Test Date	2023-04-26
Probe	SN 07/21 EPGO352
ConvF	1.60
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Bottom Side
Band	WCDMA IV
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1740
Relative permittivity (real part)	41.06
Conductivity (S/m)	1.35

Maximum location: X=-9.00, Y=-16.00

SAR Peak: 0.47 W/kg

SAR 10g (W/Kg)	0.118501
SAR 1g (W/Kg)	0.250773



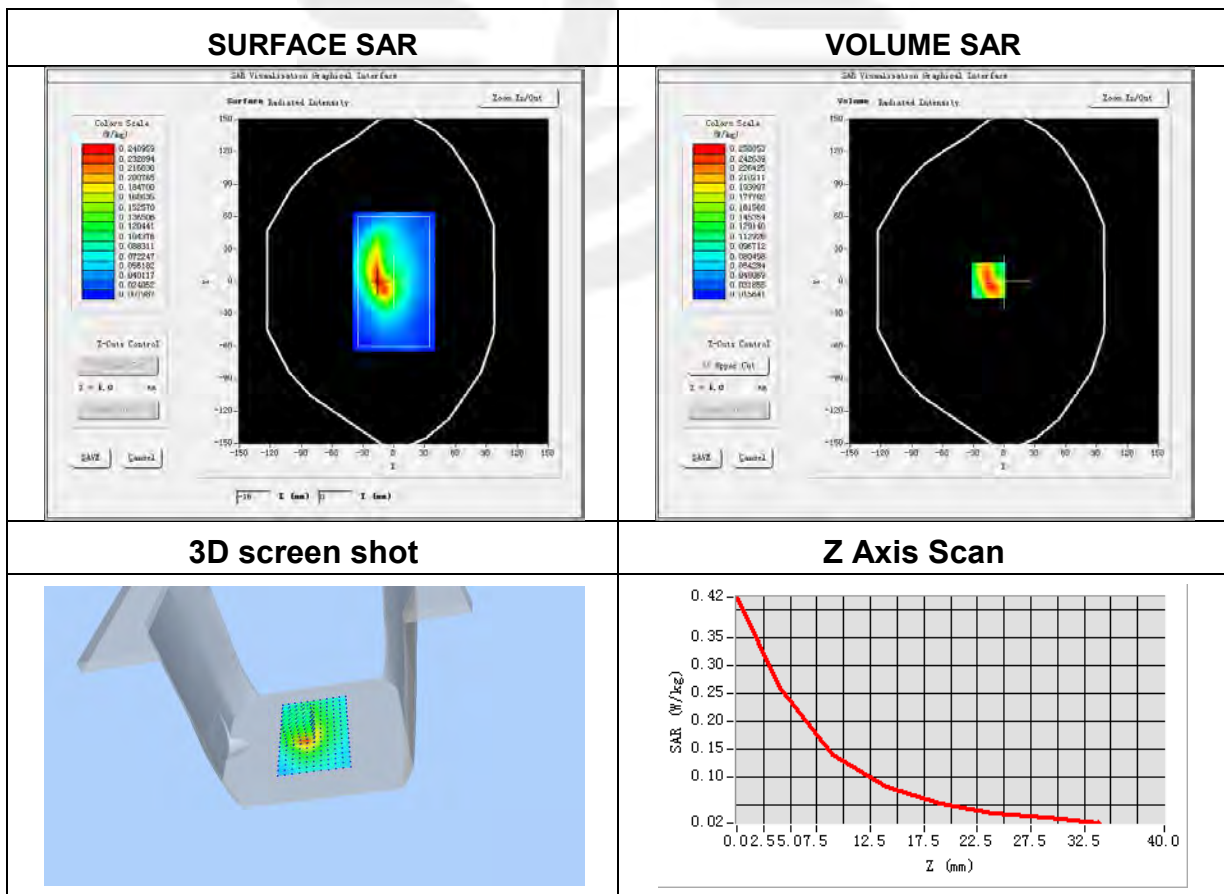
Plot 5: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-25
Probe	SN 07/21 EPGO352
ConvF	1.60
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	WCDMA Band V
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	836.6
Relative permittivity (real part)	41.27
Conductivity (S/m)	0.92

Maximum location: X=-15.00, Y=1.00

SAR Peak: 0.43 W/kg

SAR 10g (W/Kg)	0.130852
SAR 1g (W/Kg)	0.249438



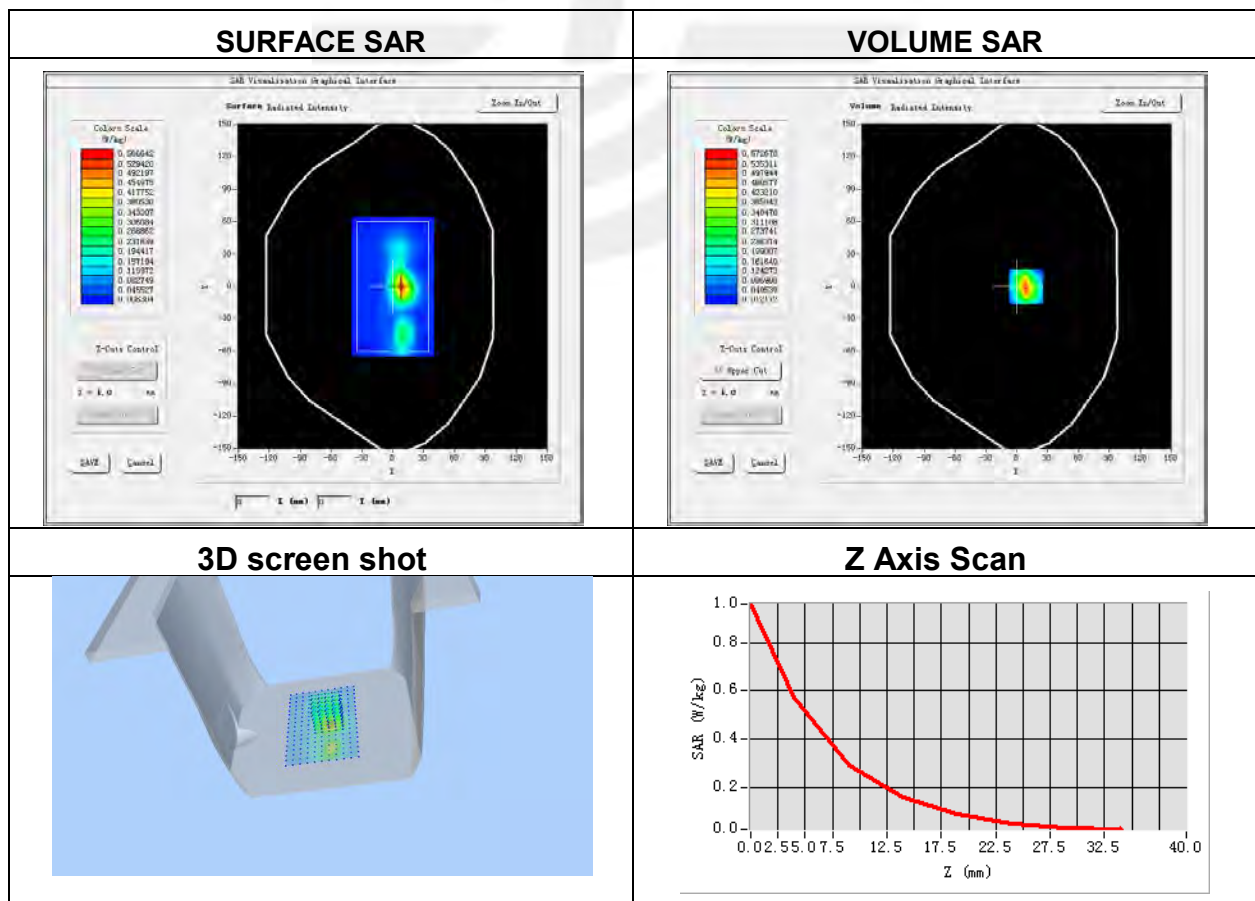
Plot 6: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-26
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	LTE Band 2(RB 1)
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1860
Relative permittivity (real part)	40.45
Conductivity (S/m)	1.50

Maximum location: X=9.00, Y=0.00

SAR Peak: 0.96 W/kg

SAR 10g (W/Kg)	0.219423
SAR 1g (W/Kg)	0.509842



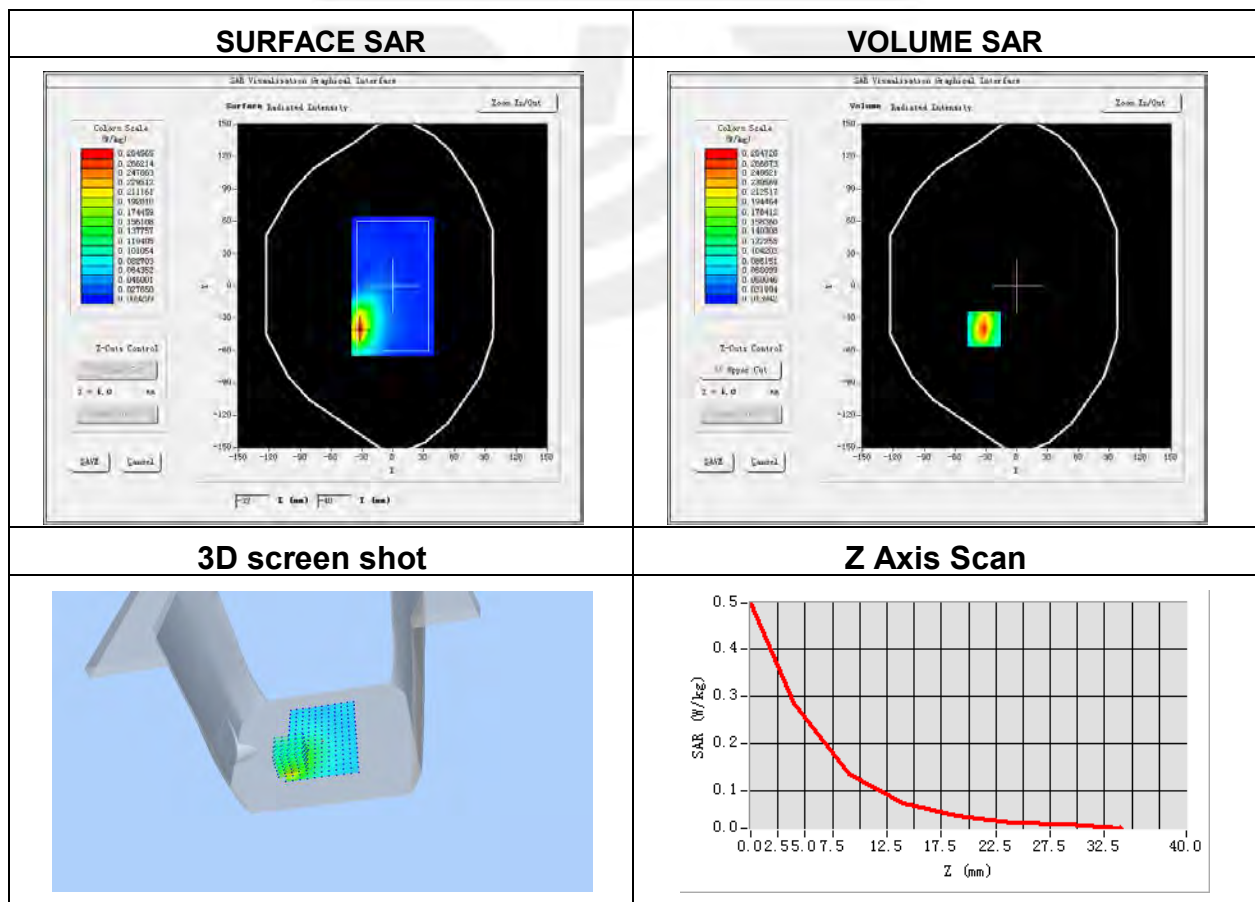
Plot 7: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-26
Probe	SN 07/21 EPG0352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Bottom Side
Band	LTE Band 4 (RB 1)
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1745
Relative permittivity (real part)	40.44
Conductivity (S/m)	1.36

Maximum location: X=-32.00, Y=-40.00

SAR Peak: 0.50 W/kg

SAR 10g (W/Kg)	0.125255
SAR 1g (W/Kg)	0.263118



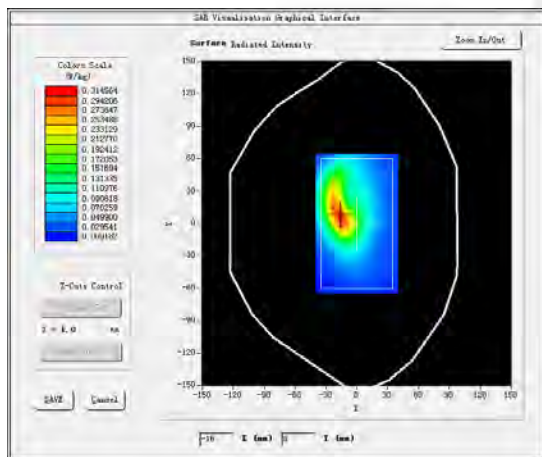
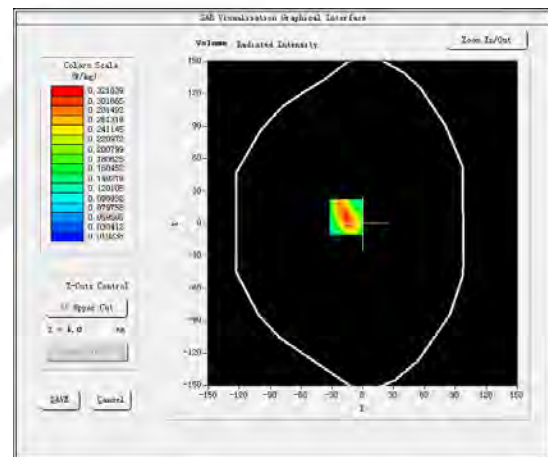
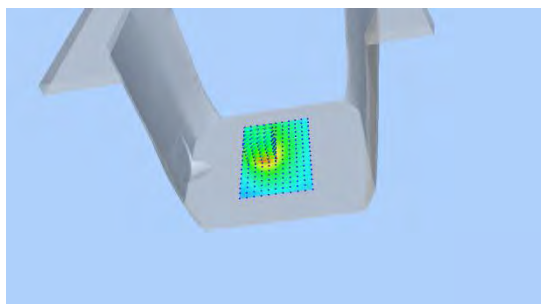
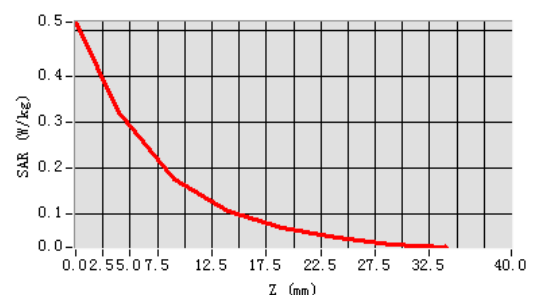
**Plot 8: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US**

Test Date	2023-04-25
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	LTE Band 5 (RB 1)
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	836.5
Relative permittivity (real part)	41.27
Conductivity (S/m)	0.92

Maximum location: X=-16.00, Y=6.00

SAR Peak: 0.52 W/kg

SAR 10g (W/Kg)	0.164135
SAR 1g (W/Kg)	0.306170

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

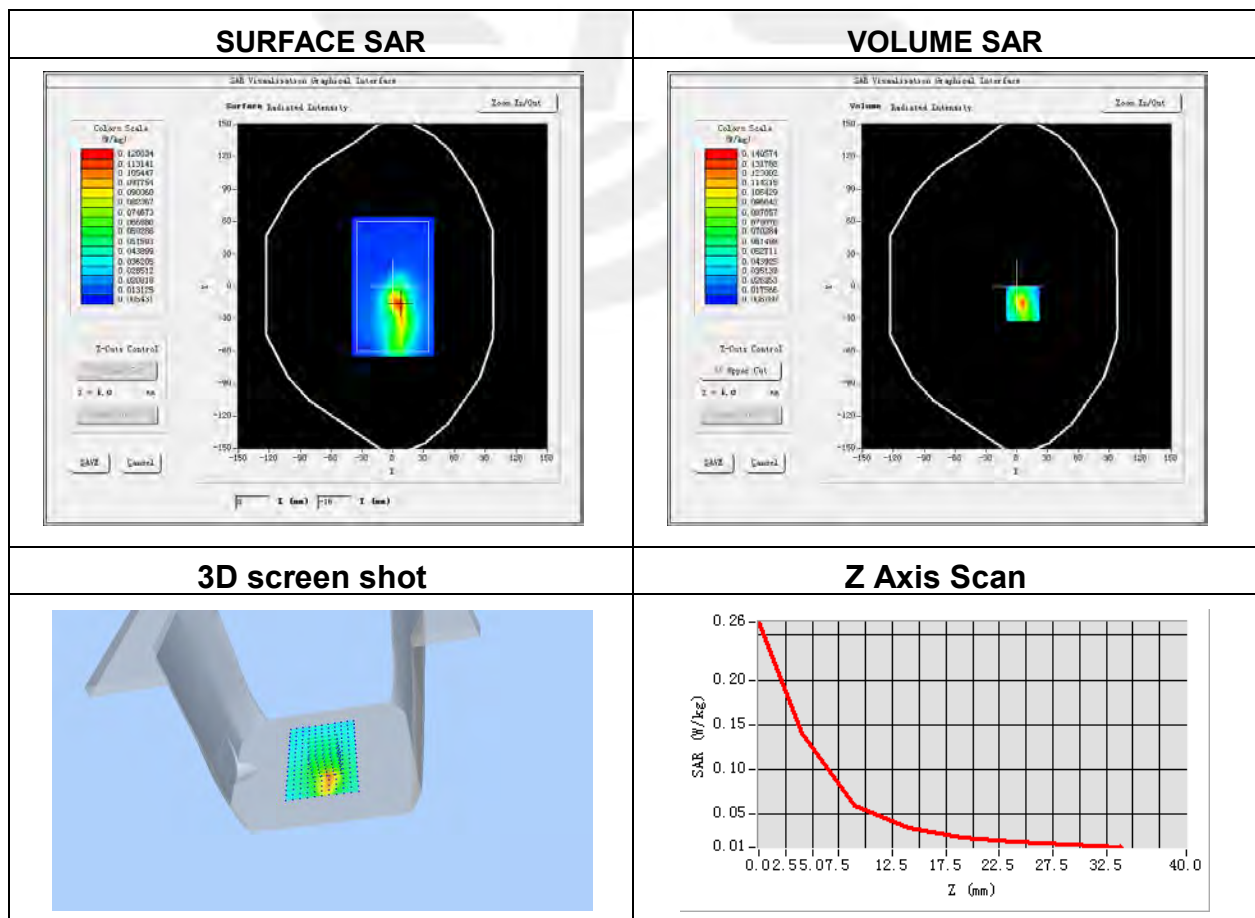
Plot 9: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-24
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	LTE Band 12 (RB 1)
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	707.5
Relative permittivity (real part)	43.01
Conductivity (S/m)	0.88

Maximum location: X=6.00, Y=-16.00

SAR Peak: 0.26 W/kg

SAR 10g (W/Kg)	0.055142
SAR 1g (W/Kg)	0.125297



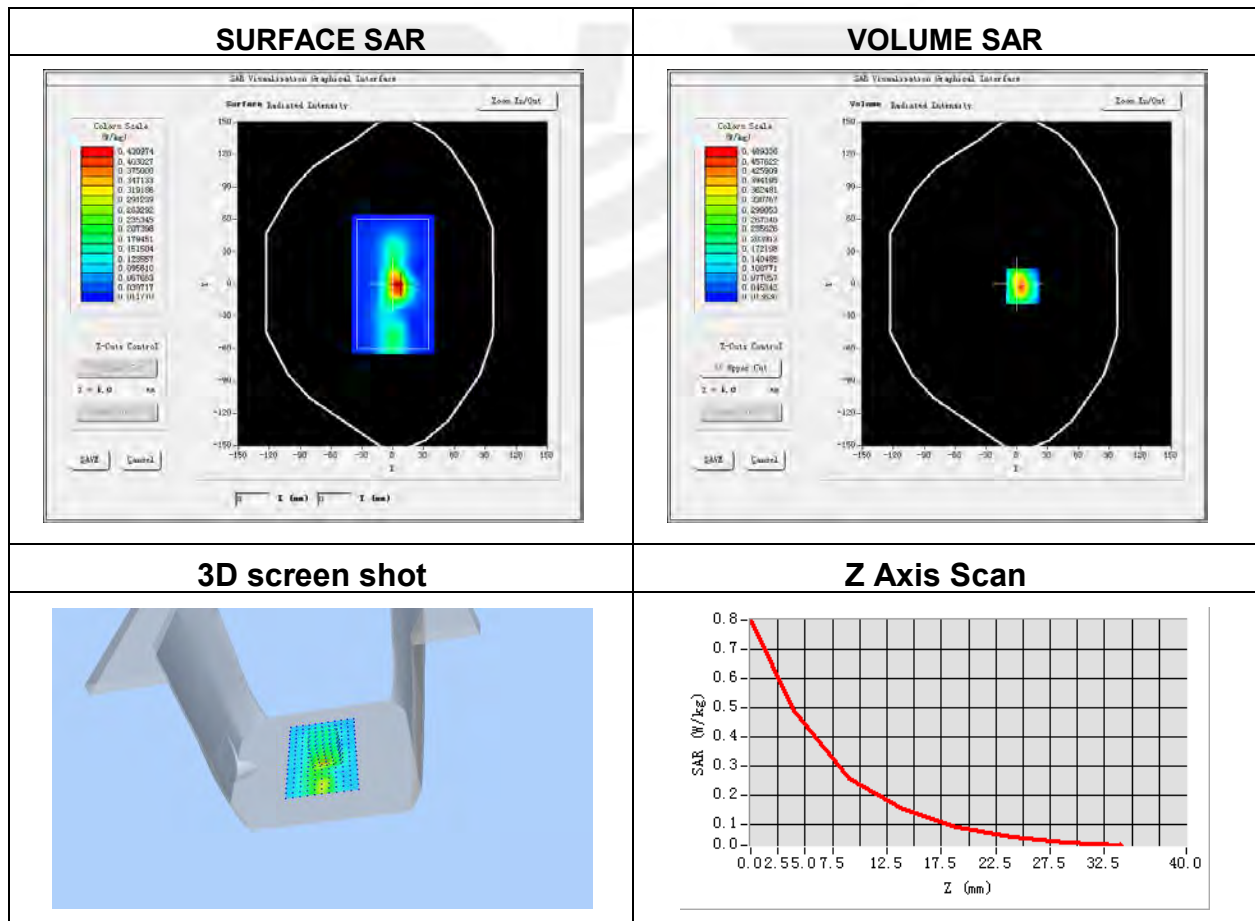

Plot 10: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-26
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	LTE Band 66 (RB 1)
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1755
Relative permittivity (real part)	40.87
Conductivity (S/m)	1.40

Maximum location: X=6.00, Y=-2.00

SAR Peak: 0.80 W/kg

SAR 10g (W/Kg)	0.205464
SAR 1g (W/Kg)	0.443486





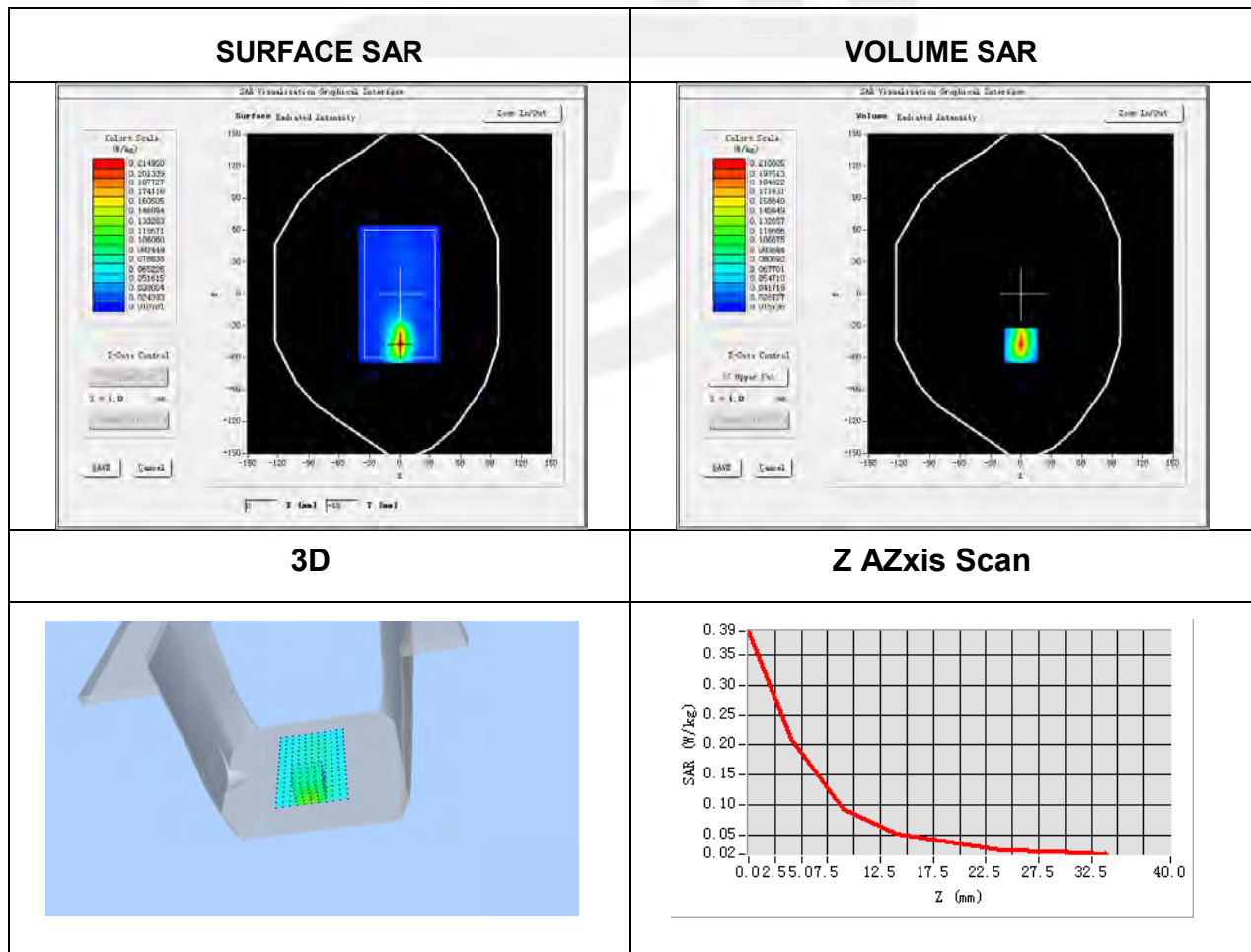
Plot 11: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-27
Probe	SN 07/21 EPG0352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	IEEE 802.11b ISM
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2437
Relative permittivity (real part)	40.20
Conductivity (S/m)	1.73

Maximum location: X=0.00, Y=-48.00

SAR Peak: 0.38 W/kg

SAR 10g (W/Kg)	0.085681
SAR 1g (W/Kg)	0.192736



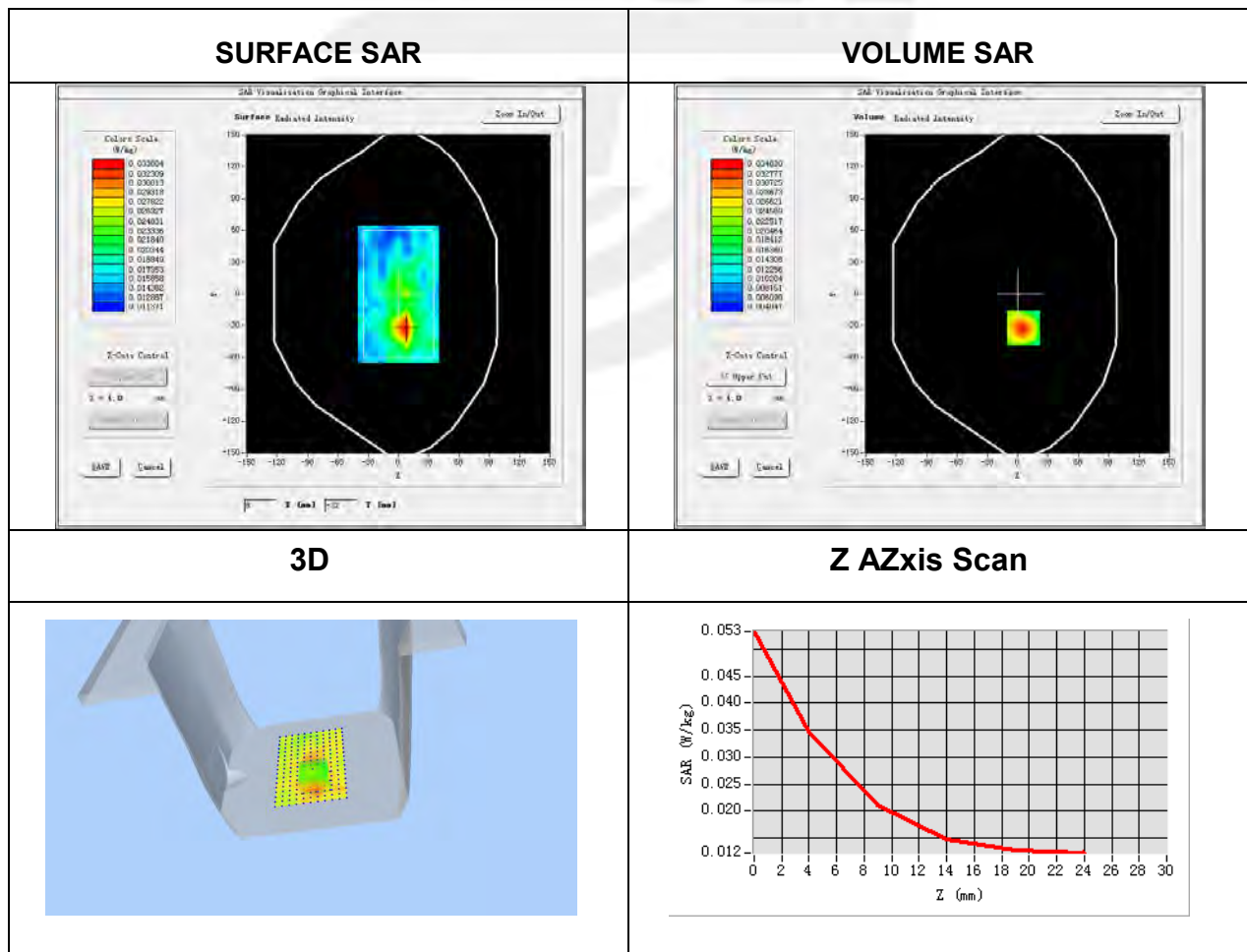
Plot 12: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-27
Probe	SN 07/21 EPG0352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back Side
Band	BLE
Signal	GFSK (Crest factor: 1.0)
Frequency (MHz)	2440
Relative permittivity (real part)	40.50
Conductivity (S/m)	1.75

Maximum location: X=6.00, Y=-32.00

SAR Peak: 0.05 W/kg

SAR 10g (W/Kg)	0.020959
SAR 1g (W/Kg)	0.034014





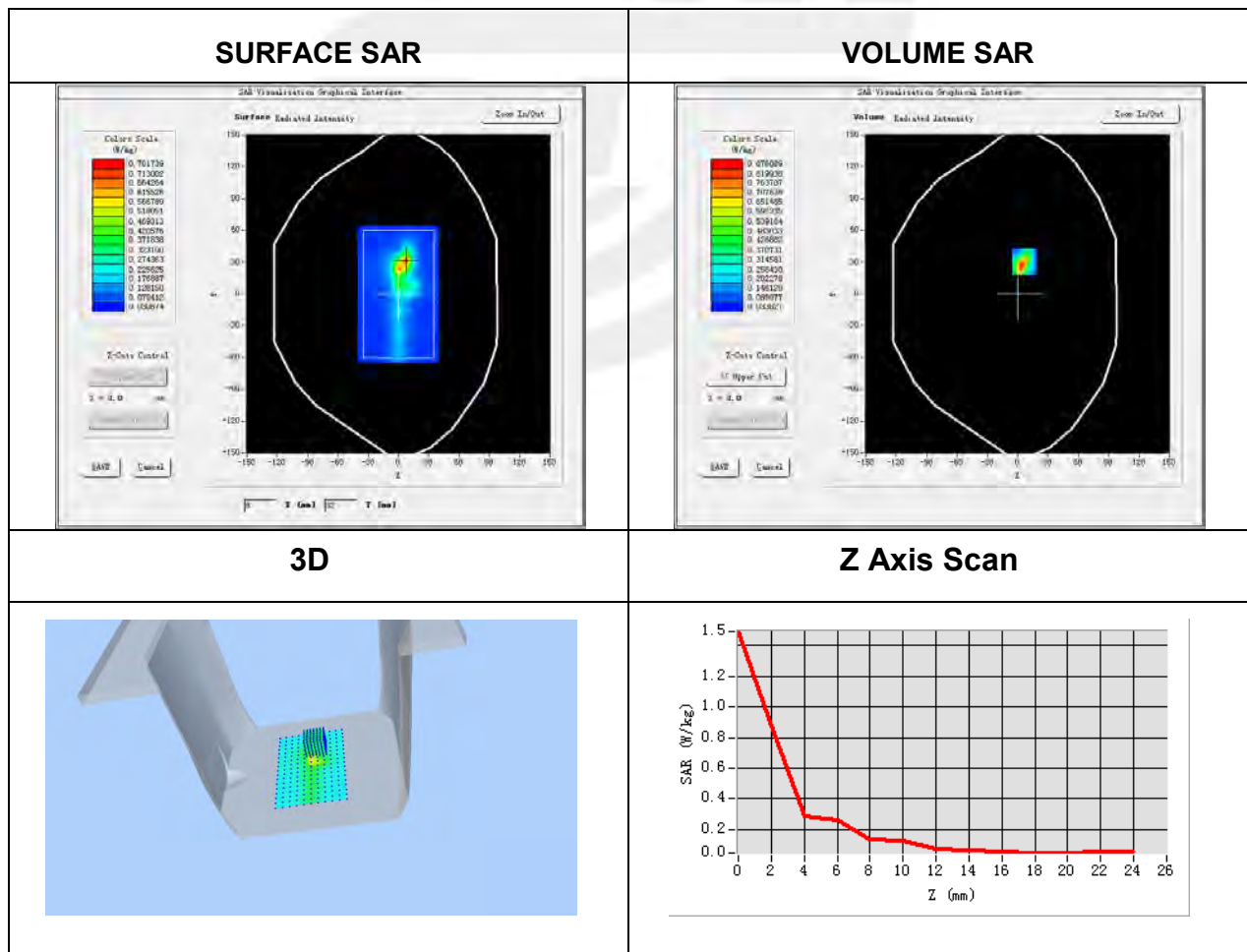
Plot 13: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-28
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	7x7x12, dx=4mm, dy=4mm, dz=2mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	IEEE 802.11a ISM
Signal	802.11 n-HT20 (Crest factor: 1.0)
Frequency (MHz)	5200
Relative permittivity (real part)	36.51
Conductivity (S/m)	4.59

Maximum location: X=7.00, Y=31.00

SAR Peak: 1.52 W/kg

SAR 10g (W/Kg)	0.169372
SAR 1g (W/Kg)	0.475296



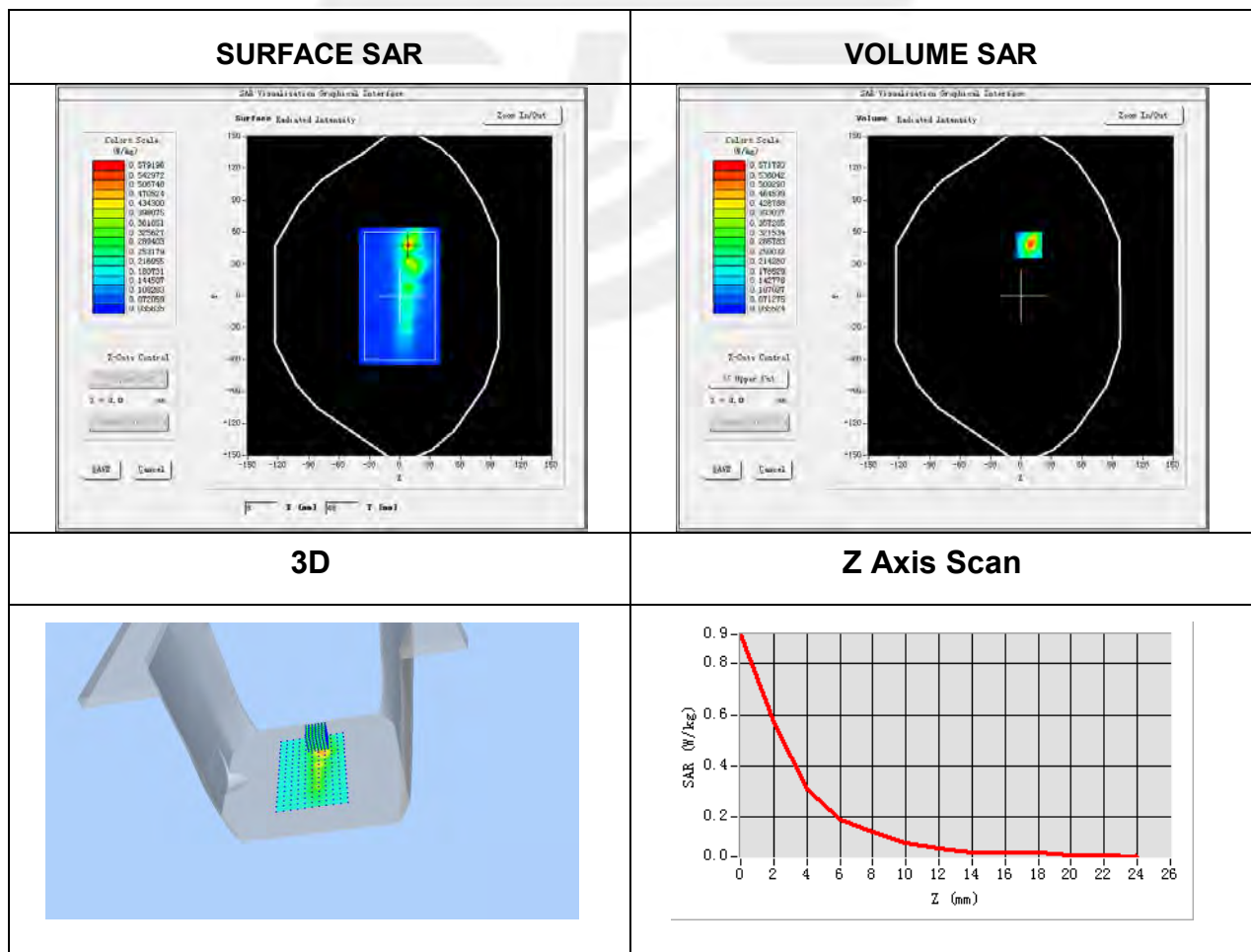
Plot 14: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-04-28
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	7x7x12, dx=4mm, dy=4mm, dz=2mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	IEEE 802.11a ISM
Signal	802.11 n-HT20 (Crest factor: 1.0)
Frequency (MHz)	5300
Relative permittivity (real part)	37.11
Conductivity (S/m)	4.57

Maximum location: X=8.00, Y=48.00

SAR Peak: 0.97 W/kg

SAR 10g (W/Kg)	0.129623
SAR 1g (W/Kg)	0.320802





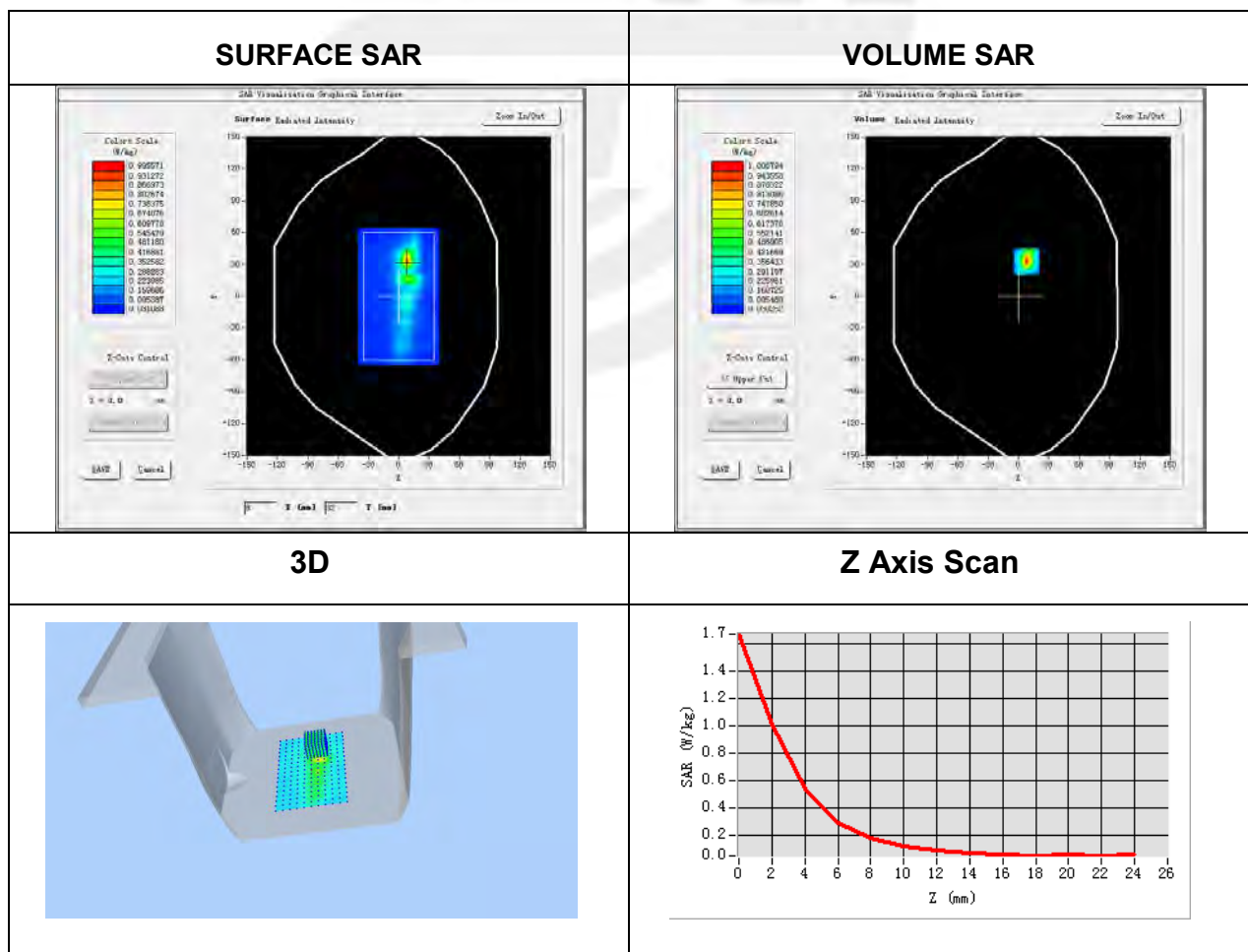
Plot 15: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-05-04
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	7x7x12, dx=4mm, dy=4mm, dz=2mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	IEEE 802.11a ISM
Signal	802.11 n-HT40 (Crest factor: 1.0)
Frequency (MHz)	5510
Relative permittivity (real part)	36.13
Conductivity (S/m)	4.80

Maximum location: X=8.00, Y=33.00

SAR Peak: 1.74 W/kg

SAR 10g (W/Kg)	0.174515
SAR 1g (W/Kg)	0.507265





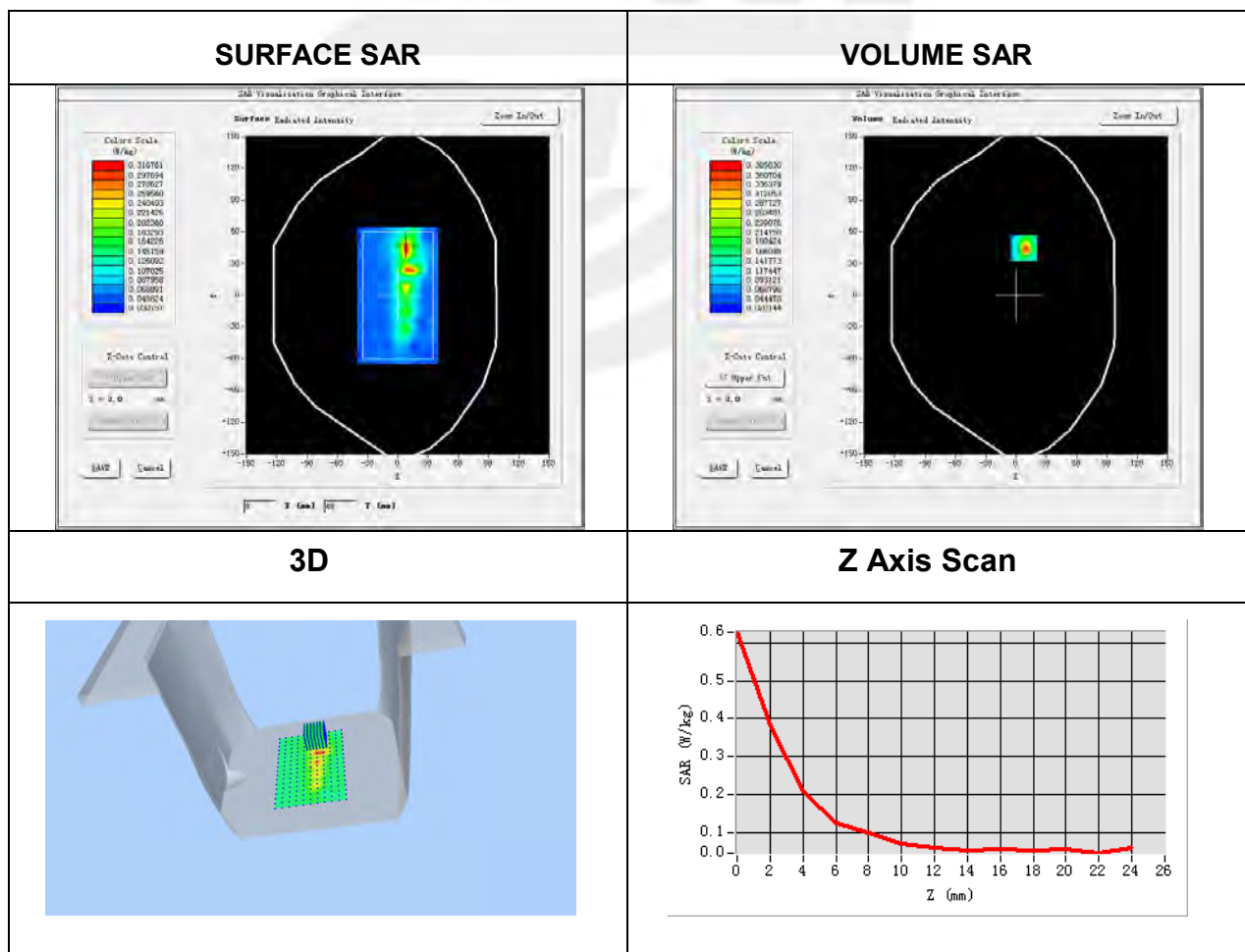
Plot 16: DUT: 10.1 inch Quad Core 4G Tablet PC; EUT Model: TAB-10US

Test Date	2023-05-04
Probe	SN 07/21 EPGO352
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	7x7x12, dx=4mm, dy=4mm, dz=2mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Top Side
Band	IEEE 802.11a ISM
Signal	802.11 n-HT20 (Crest factor: 1.0)
Frequency (MHz)	5785
Relative permittivity (real part)	35.58
Conductivity (S/m)	5.13

Maximum location: X=8.00, Y=45.00

SAR Peak: 0.68 W/kg

SAR 10g (W/Kg)	0.093898
SAR 1g (W/Kg)	0.213461





Appendix C. Probe Calibration and Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※

