

FCC SAR EVALUATION REPORT

**In accordance with the requirements of
FCC 47 CFR Part 2(2.1093), ANSI/IEEE C95.1-1992 and
IEEE Std 1528-2013**

Product Name : V2 Two-in-One Tablet

Trademark : N/A

Model Name : E134

Family Model : E134-001,E134-002,E134-003,E134-004,E134-005,
E134-006,E134-007,E134-008,E134-009,E134-010,
E134-011,E134-012,E134-013,E134-014,E134-015,
E134-016,E134-017,E134-018,E134-019,E134-020,
E134-021,E134-022,E134-023,E134-024,E134-025,
E134-026,E134-027,E134-028,E134-029,E134-030

Report No. : S21091502702001

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Shenzhen**Product description**

Product name.....: V2 Two-in-One Tablet

Trademark: N/A

Model Name: E134

Family Model.....: Refer to page 1

FCC 47 CFR Part 2(2.1093)

ANSI/IEEE C95.1-1992

Standards.....: IEEE Std 1528-2013

Published RF exposure KDB procedures

This device described above has been tested by Shenzhen NTEK. In accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 and KDB 865664 D01. Testing has shown that this device is capable of compliance with localized specific absorption rate (SAR) specified in FCC 47 CFR Part 2(2.1093) and ANSI/IEEE C95.1-1992. 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.

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Date of Test

Date (s) of performance of tests: Sep. 24, 2021~ Oct. 11, 2021

Date of Issue.....: Oct. 14, 2021

Test Result.....: **Pass**Prepared By
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※ ※ Revision History ※ ※

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Rev.1.0	Initial Test Report Release	Oct. 14, 2021	Jacob Chen

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1. General Information

1.1. RF exposure 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.

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).

General Population/Uncontrolled Environments:

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

NOTE
TRUNK LIMIT
1.6 W/kg
APPLIED TO THIS EUT

1.2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for E134 are as follows.

Band	Max Reported SAR Value(W/kg)
	1-g Body (Separation distance of 0mm)
WLAN 2.4G	0.620
WLAN 5.2G	1.061
WLAN 5.3G	1.010
WLAN 5.6G	0.894
WLAN 5.8G	1.190

Note: This device is in compliance with Specific Absorption Rate (SAR) for general population / uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR Part 2(2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 & KDB 865664 D01.

1.3. EUT Description

Device Information			
Product Name	V2 Two-in-One Tablet		
Trade Name	N/A		
Model Name	E134		
Family Model	Refer to page 1		
FCC ID	2A2CZ-E134		
Device Phase	Identical Prototype		
Exposure Category	General population / Uncontrolled environment		
Antenna	FPCB Antenna		
Battery Information	DC 11.55V, 3580mAh,13.78Wh		
Hardware version:	EEM_E134_M_V2.0		
Software version	TGL_E134_V4.1.9_T1F8G1D3_20210809		
Device Operating Configurations			
Supporting Mode(s)	WLAN 2.4G/5G, Bluetooth		
Test Modulation	WLAN(DSSS/OFDM), Bluetooth(GFSK, π/4-DQPSK, 8DPSK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	WLAN 2.4G	2412-2462	
	WLAN 5.2G	5180-5240	
	WLAN 5.2G	5180-5240	
	WLAN 5.3G	5260-5320	
	WLAN 5.8G	5745-5825	

Bluetooth

2402-2480

1.4. Test specification(s)

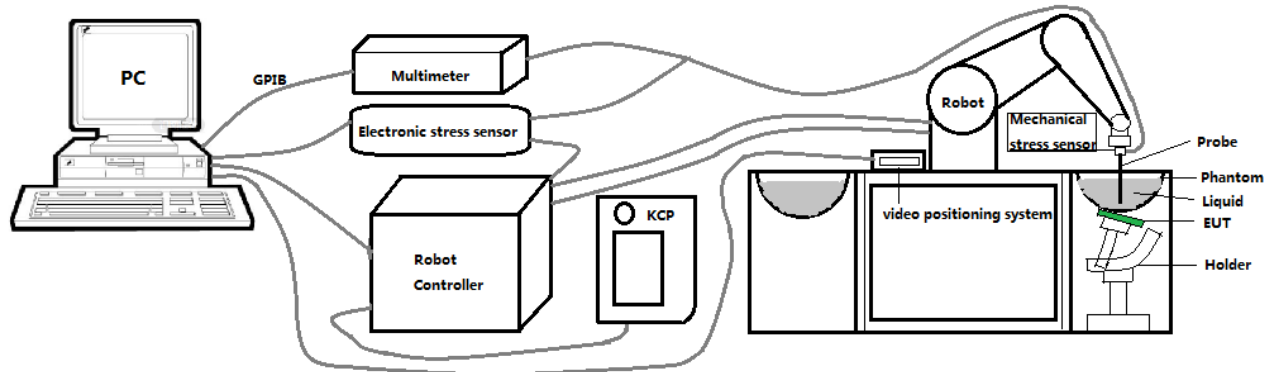
FCC 47 CFR Part 2(2.1093)
ANSI/IEEE C95.1-1992
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR
KDB 616217 D04 SAR for laptop and tablets

1.5. Ambient Condition

Ambient temperature	20°C – 24°C
Relative Humidity	30% – 70%

2. SAR Measurement System

2.1. SATIMO SAR Measurement Set-up Diagram



These measurements were performed with the automated near-field scanning system OPENSAR from SATIMO. The system is based on a high precision robot (working range: 901 mm), which positions the probes with a positional repeatability of better than ± 0.03 mm. The SAR measurements were conducted with dosimetric probe (manufactured by SATIMO), designed in the classical triangular configuration and optimized for dosimetric evaluation.

The first step of the field measurement is the evaluation of the voltages induced on the probe by the device under test. Probe diode detectors are nonlinear. Below the diode compression point, the output voltage is proportional to the square of the applied E-field; above the diode compression point, it is linear to the applied E-field. The compression point depends on the diode, and a calibration procedure is necessary for each sensor of the probe.

The Keithley multimeter reads the voltage of each sensor and send these three values to the PC. The corresponding E field value is calculated using the probe calibration factors, which are stored in the working directory. This evaluation includes linearization of the diode characteristics. The field calculation is done separately for each sensor. Each component of the E field is displayed on the "Dipole Area Scan Interface" and the total E field is displayed on the "3D Interface"

2.2. Robot

The SATIMO SAR system uses the high precision robots from KUKA. For the 6-axis controller system, the robot controller version (KUKA) from KUKA is used. The KUKA robot series have many features that are important for our application:



- High precision (repeatability ± 0.03 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

2.3. E-Field Probe

This E-field detection probe is composed of three orthogonal dipoles linked to special Schottky diodes with low detection thresholds. The probe allows the measurement of electric fields in liquids such as the one defined in the IEEE and CENELEC standards.

For the measurements the Specific Dosimetric E-Field Probe SN 08/16 EPGO287 with following specifications is used



- Dynamic range: 0.01-100 W/kg
- Tip Diameter : 2.5 mm
- Distance between probe tip and sensor center: 1 mm
- Distance between sensor center and the inner phantom surface: 2 mm (repeatability better than ± 1 mm).
- Probe linearity: ± 0.08 dB
- Axial isotropy: ± 0.01 dB
- Hemispherical Isotropy: ± 0.01 dB
- Calibration range: 650MHz to 5900MHz for head & body simulating liquid.
- Lower detection limit: 8mW/kg

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

2.3.1. E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy shall be evaluated and within ± 0.25 dB. The sensitivity parameters (Norm X, Norm Y, and Norm Z), the diode compression parameter (DCP) and the conversion factor (Conv F) of the probe are tested. The calibration data can be referred to appendix D of this report.

2.4. SAM phantoms

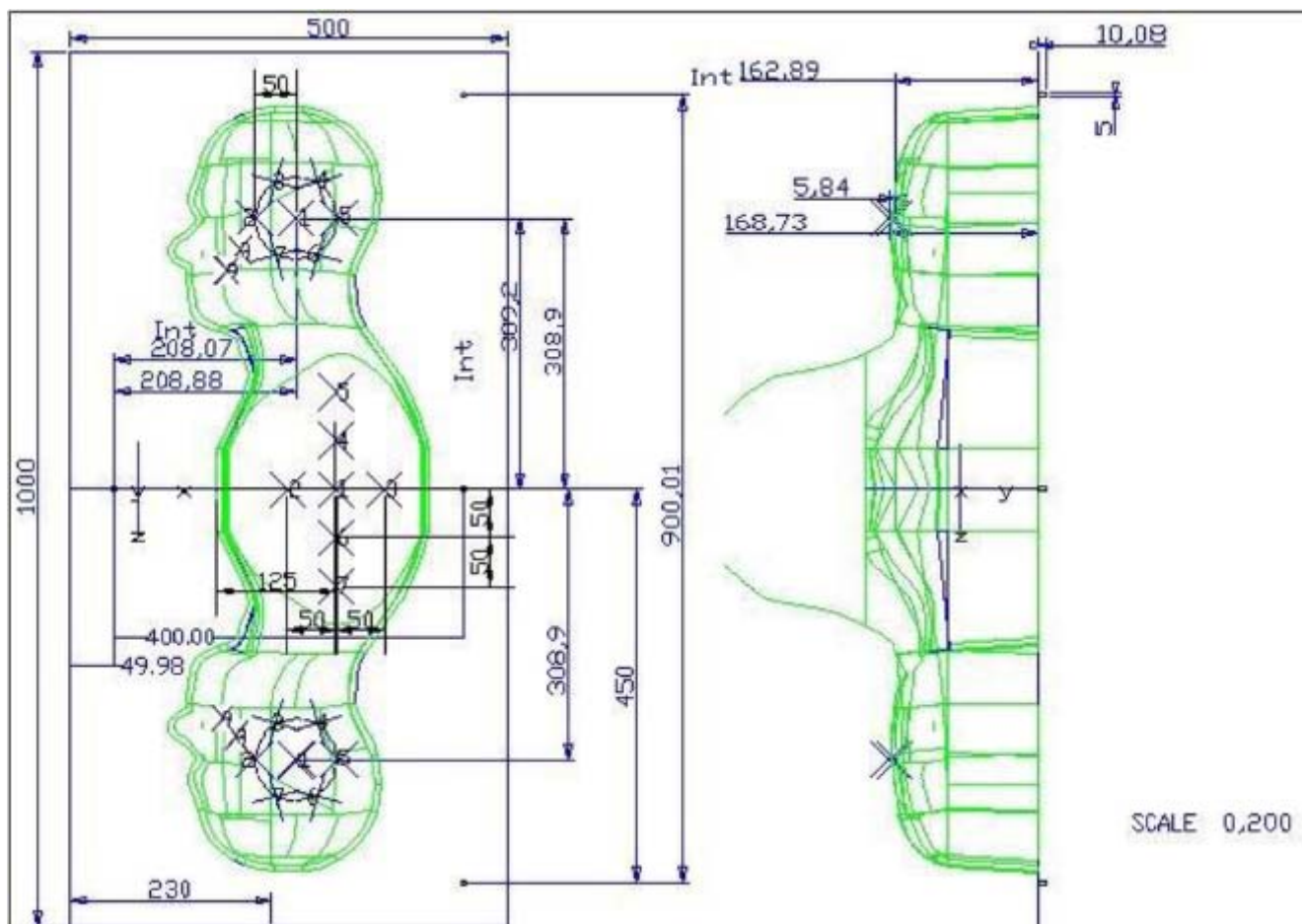
Photo of SAM phantom SN 16/15 SAM119



The SAM phantom is used to measure the SAR relative to people exposed to electro-magnetic field radiated by mobile phones.

2.4.1. Technical Data

Serial Number	Shell thickness	Filling volume	Dimensions	Positionner Material	Permittivity	Loss Tangent
SN 16/15 SAM119	2 mm ±0.2 mm	27 liters	Length:1000 mm Width:500 mm Height:200 mm	Gelcoat with fiberglass	3.4	0.02

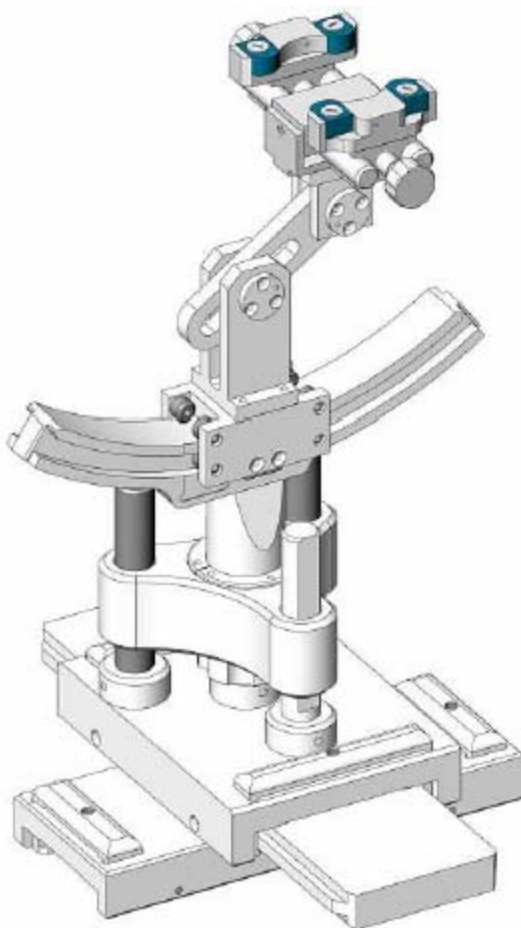


Serial Number	Left Head(mm)		Right Head(mm)		Flat Part(mm)	
SN 16/15 SAM119	2	2.02	2	2.08	1	2.09
	3	2.05	3	2.06	2	2.06
	4	2.07	4	2.07	3	2.08
	5	2.08	5	2.08	4	2.10
	6	2.05	6	2.07	5	2.10
	7	2.05	7	2.05	6	2.07
	8	2.07	8	2.06	7	2.07
	9	2.08	9	2.06	-	-

The test, based on ultrasonic system, allows measuring the thickness with an accuracy of 10 μm .

2.5. Device Holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1 degree.



Serial Number	Holder Material	Permittivity	Loss Tangent
SN 16/15 MSH100	Delrin	3.7	0.005

2.6. Test Equipment List

This table gives a complete overview of the SAR measurement equipment.

Devices used during the test described are marked ☒

	Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
					Last Cal.	Due Date
☒	MVG	E FIELD PROBE	SSE2	SN 08/16 EPGO287	Mar. 01, 2021	Feb. 28, 2022
☐	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	900 MHz Dipole	SID900	SN 03/15 DIP 0G900-348	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	Liquid measurement Kit	SCLMP	SN 21/15 OCPG 72	NCR	NCR
☒	MVG	Power Amplifier	N.A	AMPLISAR_28/14_003	NCR	NCR
☒	KEITHLEY	Millivoltmeter	2000	4072790	NCR	NCR
☐	R&S	Universal radio communication tester	CMU200	117858	Jul. 01, 2021	Jun. 30, 2022
☐	R&S	Wideband radio communication tester	CMW500	103917	Jul. 01, 2021	Jun. 30, 2022
☒	HP	Network Analyzer	8753D	3410J01136	Jul. 01, 2021	Jun. 30, 2022
☒	Agilent	PSG Analog Signal Generator	E8257D	MY51110112	Jul. 01, 2021	Jun. 30, 2022

☒	Agilent	Power meter	E4419B	MY45102538	Jul. 01, 2021	Jun. 30, 2022
☒	Agilent	Power sensor	E9301A	MY41495644	Jul. 01, 2021	Jun. 30, 2022
☒	Agilent	Power sensor	E9301A	US39212148	Jul. 01, 2021	Jun. 30, 2022
☒	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Jul. 17, 2020	Jul. 16, 2023

3. SAR Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For WLAN/Bluetooth power measurement, use engineering software to configure EUT WLAN/Bluetooth continuously transmission, at maximum RF power in each supported wireless interface and frequency band.
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/Bluetooth output power.

<SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/Bluetooth continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix A demonstrates.
- (c) Set scan area, grid size and other setting on the OPENSAR software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band.
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg.

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

3.1. Power Reference

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

3.2. Area scan & Zoom scan

The area scan is a 2D scan to find the hot spot location on the DUT. The zoom scan is a 3D scan above the hot spot to calculate the 1g and 10g SAR value.

Measurement of the SAR distribution with a grid of 8 to 16 mm * 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.

From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that will not be within the zoom scan of other peaks; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR compliance limit (e.g., 1 W/kg for 1,6 W/kg 1 g limit, or 1,26 W/kg for 2 W/kg, 10 g limit).

Area scan & Zoom scan scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm *	3 – 4 GHz: ≤ 5 mm * 4 – 6 GHz: ≤ 4 mm *
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	≤ 1.5 · $\Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

3.3. Description of interpolation/extrapolation scheme

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimise measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is used to determine this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1 mm step.

The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10 grams and 1 gram requires a very fine resolution in the three dimensional scanned data array.

3.4. Volumetric Scan

The volumetric scan consists to a full 3D scan over a specific area. This 3D scan is useful for multi Tx SAR measurement. Indeed, it is possible with OpenSAR to add, point by point, several volumetric scan to calculate the SAR value of the combined measurement as it is defined in the standard IEEE1528 and IEC62209.

3.5. Power Drift

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In OpenSAR measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in V/m. If the power drifts more than $\pm 5\%$, the SAR will be retested.

4. System Verification Procedure

4.1. Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% of weight)	Head Tissue									
Frequency Band (MHz)	750	835	900	1800	1900	2000	2450	2600	5200	5800
Water	34.40	34.40	34.40	55.36	55.36	57.87	57.87	57.87	65.53	65.53
NaCl	0.79	0.79	0.79	0.35	0.35	0.16	0.16	0.16	0.00	0.00
1,2-Propanediol	64.81	64.81	64.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	30.45	30.45	19.97	19.97	19.97	24.24	24.24
DGBE	0.00	0.00	0.00	13.84	13.84	22.00	22.00	22.00	10.23	10.23

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid depth from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm.

Photo of Liquid depth for Head Position	Photo of Liquid depth for Body Position
	

4.1.1. Tissue Dielectric Parameter Check Results

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within $\pm 5\%$ of the target values.

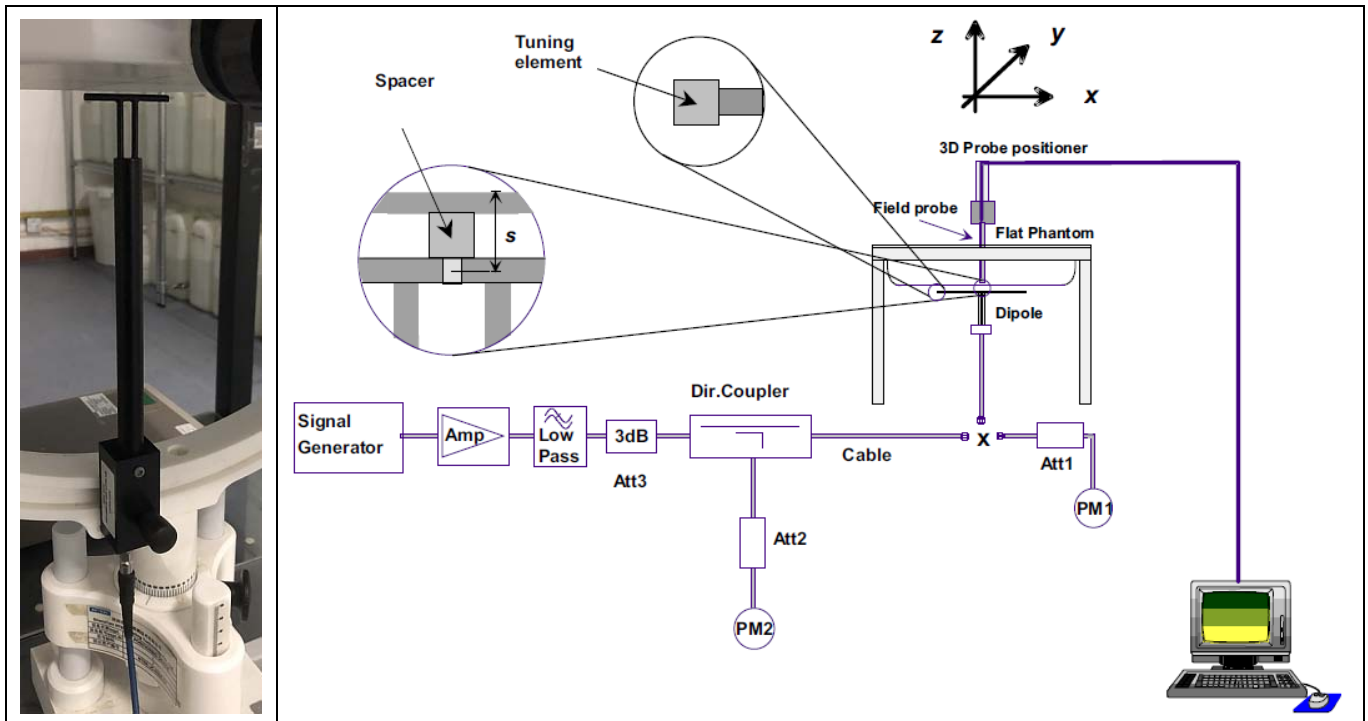
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		ϵ_r ($\pm 5\%$)	σ (S/m) ($\pm 5\%$)	ϵ_r	σ (S/m)		
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	40.73	1.77	21.7 °C	Oct. 11, 2021
Head 5200	5200	36.00 (34.20~37.80)	4.66 (4.43~4.89)	37.51	4.55	21.6 °C	Oct. 08, 2021
Head 5600	5600	35.50 (33.73~37.28)	5.07 (4.82~5.32)	36.41	5.05	21.5 °C	Sep. 24, 2021
Head 5800	5800	35.30 (33.54~37.07)	5.27 (5.01~5.53)	36.35	5.17	21.7 °C	Oct. 09, 2021

NOTE: The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.

4.2. System Verification Procedure

The system verification is performed for verifying the accuracy of the complete measurement system and performance of the software. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 100mW (below 5GHz) or 100mW (above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system verification to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system verification to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

The system verification is shown as below picture:



4.2.1. System Verification Results

Comparing to the original SAR value provided by SATIMO, the verification data should be within its specification of $\pm 10\%$. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance verification can meet the variation criterion and the plots can be referred to Appendix B of this report.

System Verification	Target SAR (1W) ($\pm 10\%$)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)		
2450MHz	53.69 (48.33~59.05)	23.94 (21.55~26.33)	56.60	24.08	21.7 °C	Oct. 11, 2021
5200MHz	162.34 (146.11~178.57)	55.42 (49.88~60.96)	168.64	57.43	21.6 °C	Oct. 08, 2021
5600MHz	174.92 (157.43~192.41)	58.63 (52.77~64.49)	188.04	60.28	21.5 °C	Sep. 24, 2021
5800MHz	178.89 (161.01~196.77)	59.32 (53.39~65.25)	184.46	60.55	21.7 °C	Oct. 09, 2021

5. SAR Measurement variability and uncertainty

5.1. SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

5.2. SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

6. RF Exposure Positions

6.1. Tablet host platform exposure conditions

Refer to KDB616217 D04, when the modular approach is used, transmitters and modules must be initially tested for standalone operations in generic host conditions according to the following minimum test separation distance and antenna installation requirements for incorporation in the tablet platform. The separation distance required for incorporation in qualified hosts is described in KDB 447498; item 5) of section 4.1 and item 1) of section 5.2.2 etc.

- ≤ 5 mm between the antenna and user for both back surface and edge exposure conditions
- the antennas used by the host must have been tested for equipment approval or qualify for SAR test exclusion
- the antenna polarization, physical orientation, rotation and installation configurations used by the host must have been tested for compliance or qualify for test exclusion
- when the *SAR Test Exclusion Threshold* in KDB 447498 applies, a *test separation distance* of 5 mm is required to determine test exclusion for the tablet platform

The antennas embedded in tablets are typically ≤ 5 mm from the outer housing. The required antenna to user test separation distance is a “not to exceed test” distance required to apply the modular approach. Instead of the typical zero gap tablet edge test requirement between the edge of a tablet and the user, when an antenna has been tested at ≤ 5 mm according to the modular approach it can be incorporated into tablets with at least twice the tested distance from the outer housing of the tablet edge; otherwise, the tablet edge zero gap test requirement applies. When the dedicated host approach is applied, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom.

7. RF Output Power

7.1. WLAN & Bluetooth Output Power

7.1.1. Output Power Results Of WLAN

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)
			ANT1		ANT2		MIMO	
802.11ax20	1	2412	12.50	11.30	12.50	11.64	15.50	14.48
	6	2437	12.50	11.73	12.50	12.04	15.50	14.90
	11	2462	12.50	12.16	12.50	12.09	15.50	15.14
802.11ax40	1	2412	11.50	10.20	11.50	10.61	14.50	13.42
	6	2437	11.50	10.55	11.50	11.05	14.50	13.82
	11	2462	11.50	11.02	11.50	11.15	14.50	14.10
802.11b	1	2412	14.00	12.79	14.00	12.98	N/A	N/A
	6	2437	14.00	13.28	14.00	13.62	N/A	N/A
	11	2462	14.00	13.68	14.00	13.48	N/A	N/A
802.11g	1	2412	13.50	12.11	13.50	12.41	N/A	N/A
	6	2437	13.50	12.63	13.50	13.05	N/A	N/A
	11	2462	13.50	13.05	13.50	12.94	N/A	N/A
802.11n (HT20)	1	2412	13.00	12.09	13.00	12.30	16.00	15.21
	6	2437	13.00	12.51	13.00	12.90	16.00	15.72
	11	2462	13.00	12.91	13.00	12.83	16.00	15.88
802.11n (HT40)	3	2422	12.00	11.16	12.50	11.44	15.00	14.31
	6	2437	12.00	11.53	12.50	11.93	15.00	14.74
	9	2452	12.00	11.87	12.50	12.03	15.00	14.96

NOTE: Power measurement results of WLAN 2.4G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)
			ANT1		ANT2		MIMO	
802.11a	36	5180	11.000	10.508	11.000	10.728	N/A	N/A
	40	5200	11.000	10.777	11.000	10.447	N/A	N/A
	48	5240	11.000	10.159	11.000	10.771	N/A	N/A
802.11n HT20	36	5180	10.000	9.672	10.000	9.939	13.000	12.818
	40	5200	10.000	9.313	10.000	9.874	13.000	12.613
	48	5240	10.000	9.304	10.000	9.631	13.000	12.481
802.11n	38	5190	8.500	8.293	9.000	8.792	12.000	11.560

HT40	46	5230	8.500	8.438	9.000	8.706	12.000	11.584
802.11ac VHT20	36	5180	9.500	9.368	10.000	9.835	13.000	12.618
	40	5200	9.500	9.263	10.000	9.875	13.000	12.590
	48	5240	9.500	9.435	10.000	9.740	13.000	12.600
802.11ac VHT40	38	5190	8.500	8.293	9.000	8.859	12.000	11.596
	46	5230	8.500	8.377	9.000	8.839	12.000	11.624
802.11ac VHT80	42	5210	9.000	8.513	9.500	9.142	12.000	11.849
802.11ac VHT160	50	5250	9.000	8.952	10.000	9.658	12.500	12.330
802.11ax20	36	5180	9.500	9.154	9.500	9.454	12.500	12.317
	40	5200	9.500	9.115	9.500	9.359	12.500	12.249
	48	5240	9.500	8.825	9.500	9.060	12.500	11.954
802.11ax40	38	5190	8.500	8.073	10.000	9.623	12.000	11.927
	46	5230	8.500	8.203	10.000	8.407	12.000	11.316
802.11ax80	42	5210	9.000	8.581	9.000	8.837	12.000	11.721
802.11ax160	50	5250	9.000	8.750	9.500	9.044	12.000	11.910

NOTE: Power measurement results of WLAN 5.2G.

Mode	Channel	Frequency (MHz)	Tune-up		Output Power (dBm)		Tune-up		Output Power (dBm)	
			ANT1		ANT2		MIMO			
802.11a	52	5260	10.500	10.366	10.500	9.985	N/A	N/A	N/A	N/A
	56	5280	10.500	10.265	10.500	10.177	N/A	N/A	N/A	N/A
	64	5320	10.500	10.408	10.500	10.477	N/A	N/A	N/A	N/A
802.11n (HT20)	52	5260	10.000	9.650	9.500	9.173	13.000	12.428	13.000	12.428
	56	5280	10.000	9.663	9.500	9.378	13.000	12.533	13.000	12.533
	64	5320	10.000	9.519	9.500	9.488	13.000	12.514	13.000	12.514
802.11n (HT40)	54	5270	9.000	8.636	9.000	8.535	12.000	11.596	12.000	11.596
	62	5310	9.000	8.445	9.000	8.687	12.000	11.578	12.000	11.578
802.11ac (VHT20)	52	5260	10.000	9.563	9.500	9.347	12.500	12.467	12.500	12.467
	56	5280	10.000	9.534	9.500	9.147	12.500	12.355	12.500	12.355
	64	5320	10.000	9.422	9.500	9.425	12.500	12.434	12.500	12.434
802.11ac (VHT40)	54	5270	9.000	8.568	9.000	8.756	12.000	11.673	12.000	11.673
	62	5310	9.000	8.557	9.000	8.772	12.000	11.676	12.000	11.676
802.11ac (VHT80)	58	5290	8.500	8.455	9.000	8.792	12.000	11.637	12.000	11.637
802.11ac (VHT80)	50	5250	9.000	8.952	10.000	9.658	12.500	12.330	12.500	12.330

802.11ax20	52	5260	9.500	9.136	9.500	9.021	12.500	12.089
	56	5280	9.500	9.359	9.500	9.086	12.500	12.235
	64	5320	9.500	8.847	9.500	9.072	12.500	11.971
802.11ax40	54	5270	8.500	8.027	9.000	8.416	11.500	11.236
	62	5310	8.500	8.101	9.000	8.502	11.500	11.316
802.11ax80	58	5290	8.500	8.301	8.500	8.405	11.500	11.364
802.11ax160	50	5250	9.000	8.750	9.500	9.044	12.000	11.910

NOTE: Power measurement results of WLAN 5.3G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)
802.11a	100	5500	10.000	9.956	10.000	9.386	N/A	N/A
	120	5600	10.000	9.912	10.000	9.482	N/A	N/A
	140	5700	10.000	9.914	10.000	9.940	N/A	N/A
802.11n (HT20)	100	5500	9.500	9.120	9.000	8.599	12.000	11.878
	120	5600	9.500	8.986	9.000	8.395	12.000	11.711
	140	5700	9.500	8.829	9.000	8.886	12.000	11.868
802.11n (HT40)	102	5510	9.500	9.253	9.500	8.250	12.500	11.791
	118	5590	9.500	8.996	9.500	8.300	12.500	11.672
	134	5670	9.500	8.961	9.500	9.118	12.500	12.051
802.11ac (HT20)	100	5500	9.500	9.109	9.000	8.480	12.000	11.816
	120	5600	9.500	8.934	9.000	8.230	12.000	11.607
	140	5700	9.500	8.774	9.000	8.862	12.000	11.829
802.11ac (HT40)	102	5510	9.000	8.649	9.000	8.600	12.000	11.635
	118	5590	9.000	8.199	9.000	8.425	12.000	11.324
	134	5670	9.000	8.489	9.000	8.763	12.000	11.638
802.11ac (VHT80)	106	5530	8.000	7.891	9.000	8.723	11.500	11.337
	122	5610	8.000	7.718	9.000	8.938	11.500	11.381
802.11ac VHT160	114	5570	8.500	8.471	8.500	8.344	11.500	11.418
802.11ax20	100	5500	9.000	8.742	9.000	8.008	12.000	11.401
	120	5600	9.000	8.627	9.000	8.257	12.000	11.456
	140	5700	9.000	8.576	9.000	8.684	12.000	11.641
802.11ax40	102	5510	9.000	8.690	8.000	7.498	11.500	11.145
	118	5590	9.000	8.546	8.000	7.160	11.500	10.918
	134	5670	9.000	8.535	8.000	7.678	11.500	11.138
802.11a80	106	5530	8.500	8.055	8.000	7.630	11.000	10.858
	122	5610	8.500	7.889	8.000	7.403	11.000	10.663

802.11ax160	114	5570	8.500	8.453	8.500	8.461	11.500	11.467
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NOTE: Power measurement results of WLAN 5.6G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)	Tune-up	Output Power (dBm)
			ANT1		ANT2		MIMO	
802.11a	149	5745	11.000	10.263	11.000	10.302	N/A	N/A
	157	5785	11.000	10.208	11.000	10.673	N/A	N/A
	165	5825	11.000	10.539	11.000	10.842	N/A	N/A
802.11n HT20	149	5745	10.000	9.315	10.000	9.491	13.000	12.414
	157	5785	10.000	9.501	10.000	9.620	13.000	12.571
	165	5825	10.000	9.487	10.000	9.629	13.000	12.569
802.11n HT40	151	5755	10.000	9.617	9.000	8.235	12.500	11.991
	159	5795	10.000	9.719	9.000	8.687	12.500	12.244
802.11ac VHT20	149	5745	10.000	9.558	10.000	9.297	13.000	12.440
	157	5785	10.000	9.537	10.000	9.543	13.000	12.550
	165	5825	10.000	9.473	10.000	9.715	13.000	12.606
802.11ac VHT40	151	5755	10.000	9.457	9.000	8.612	12.500	12.065
	159	5795	10.000	9.779	9.000	8.808	12.500	12.331
802.11ac VHT80	155	5775	9.000	8.643	9.000	8.725	12.000	11.694
802.11ax20	149	5745	8.500	8.164	10.000	8.821	12.000	11.515
	157	5785	8.500	8.230	10.000	9.273	12.000	11.793
	165	5825	8.500	8.083	10.000	9.600	12.000	11.918
802.11ax40	151	5755	9.000	8.331	9.000	8.223	12.000	11.288
	159	5795	9.000	8.580	9.000	8.537	12.000	11.569
802.11ax80	155	5775	9.000	8.701	8.000	7.714	11.500	11.246

NOTE: Power measurement results of WLAN 5.8G.

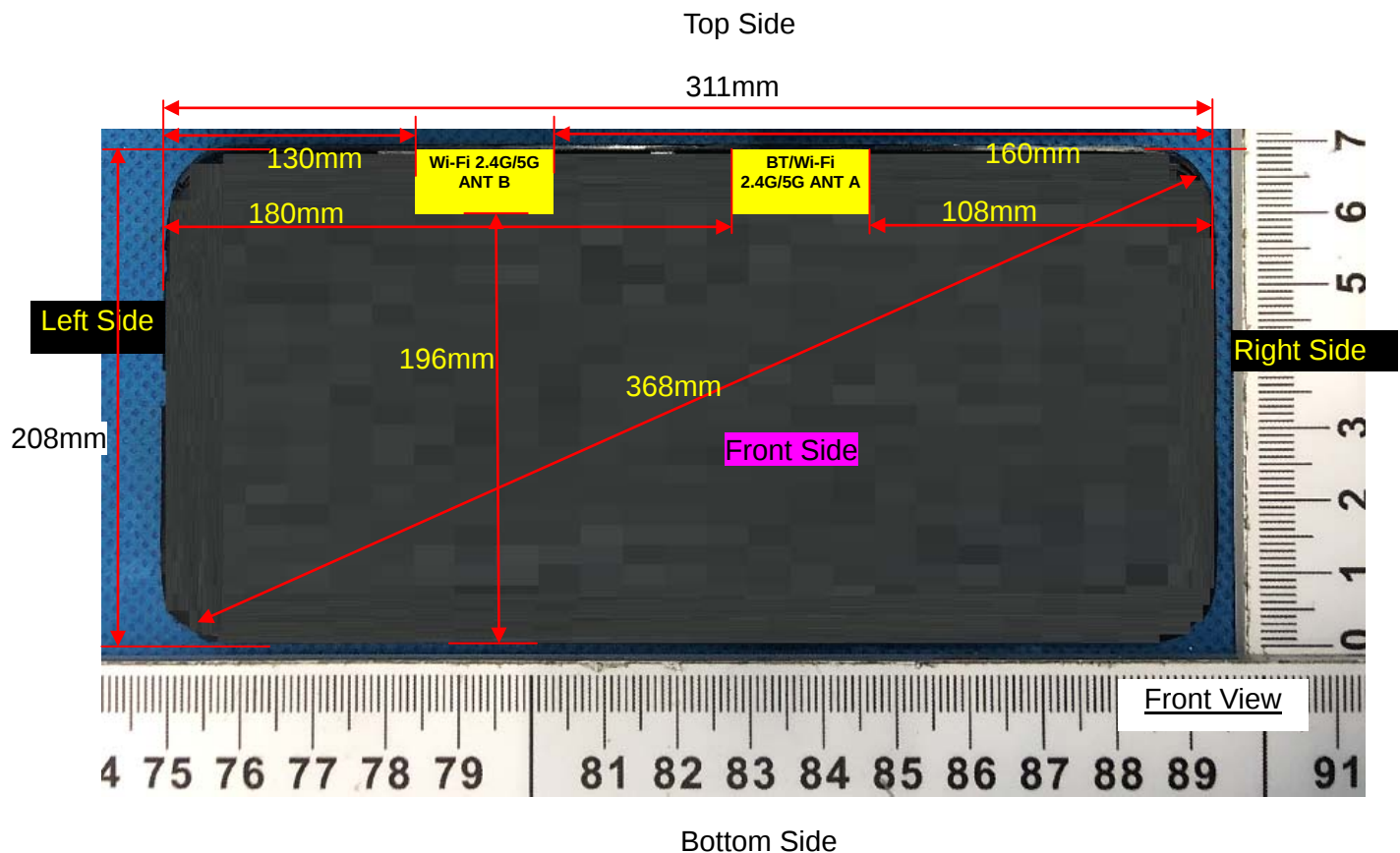
7.1.2. Output Power Results Of Bluetooth

BR+EDR	Output Power (dBm)				
	Channel	Tune-up	Data Rates		
			1M	2M	3M
	0CH	5.000	3.840	4.499	4.536
	39CH	4.500	3.237	4.122	4.233
	78CH	4.500	3.114	3.913	4.038

	Channel	Tune - up	Output Power (dBm)	
			1M	2M
BLE	0CH	3.500	3.164	3.107
	19CH	4.000	3.522	3.301
	39CH	5.000	4.587	4.717

NOTE: Power measurement results of Bluetooth.

8. Antenna Location



Note: Since the confidentiality request of EUT, the antenna location example diagram see as above.

Distance of the Antenna to the EUT surface/edge						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
BT/WLAN ANT A	5	5	180	108	5	196
WLAN ANT B	5	5	130	160	5	196

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

ANT 1

Positions for SAR tests	
Test separation distances $\leq$ 50 mm	
Exposure Positions	Tune-up Maximum power of WLAN 2.4G

	14dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	7.9
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	7.9
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	7.9
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	
	11dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.8
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.8
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.8
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.3G	
	10.5dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.2
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.2
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.2
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.6G	
	10dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	4.8
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	4.8
	SAR testing required?	YES

Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	4.8
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	11dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	6.1
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	6.1
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	6.1
	SAR testing required?	YES

NOTE: Refer to section 4.3.1 of KDB 447498 D01.

Positions for SAR tests		
Test separation distances > 50 mm		
Exposure Positions	Tune-up Maximum power of WLAN 2.4G	
	14dBm	25.12mW
Left Side	Antenna to user(mm)	180
	SAR exclusion threshold(mW)	1396
	SAR testing required?	NO
Right Side	Antenna to user(mm)	108
	SAR exclusion threshold(mW)	676
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1556
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	
	11dBm	12.59mW
Left Side	Antenna to user(mm)	180
	SAR exclusion threshold(mW)	1366
	SAR testing required?	NO
Right Side	Antenna to user(mm)	108
	SAR exclusion threshold(mW)	646
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1526
	SAR testing required?	NO

Exposure Positions	Tune-up Maximum power of WLAN 5.3G	
	10.5dBm	11.22mW
Left Side	Antenna to user(mm)	180
	SAR exclusion threshold(mW)	1365
	SAR testing required?	NO
Right Side	Antenna to user(mm)	108
	SAR exclusion threshold(mW)	645
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1525
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.6G	
	10dBm	10mW
Left Side	Antenna to user(mm)	180
	SAR exclusion threshold(mW)	1363
	SAR testing required?	NO
Right Side	Antenna to user(mm)	108
	SAR exclusion threshold(mW)	643
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1523
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	11dBm	12.59mW
Left Side	Antenna to user(mm)	180
	SAR exclusion threshold(mW)	1362
	SAR testing required?	NO
Right Side	Antenna to user(mm)	108
	SAR exclusion threshold(mW)	642
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1522
	SAR testing required?	NO

NOTE: Refer to section 4.3.1 of KDB 447498 D01.

ANT 2

Positions for SAR tests	
Test separation distances ≤ 50 mm	
Exposure Positions	Tune-up Maximum power of WLAN 2.4G
	14dBm

Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	7.9
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	7.9
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	7.9
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	
	11dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.8
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.8
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.8
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.3G	
	10.5dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.2
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.2
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.2
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.6G	
	10dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	4.8
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	4.8
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5

	SAR exclusion threshold	4.8
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	11dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	6.1
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	6.1
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	6.1
	SAR testing required?	YES

NOTE: Refer to section 4.3.1 of KDB 447498 D01.

Positions for SAR tests		
Test separation distances > 50 mm		
Exposure Positions	Tune-up Maximum power of WLAN 2.4G	
	14dBm	25.12mW
Left Side	Antenna to user(mm)	130
	SAR exclusion threshold(mW)	899
	SAR testing required?	NO
Right Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1199
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1559
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	
	11dBm	12.59mW
Left Side	Antenna to user(mm)	130
	SAR exclusion threshold(mW)	866
	SAR testing required?	NO
Right Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1166
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1526
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.3G	

	10.5dBm	11.22mW
Left Side	Antenna to user(mm)	130
	SAR exclusion threshold(mW)	865
	SAR testing required?	NO
Right Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1165
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1525
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.6G	
	10dBm	10mW
Left Side	Antenna to user(mm)	130
	SAR exclusion threshold(mW)	863
	SAR testing required?	NO
Right Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1163
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1523
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	11dBm	12.59mW
Left Side	Antenna to user(mm)	130
	SAR exclusion threshold(mW)	862
	SAR testing required?	NO
Right Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1162
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1522
	SAR testing required?	NO

NOTE: Refer to section 4.3.1 of KDB 447498 D01.

9. SAR Results

9.1. SAR measurement results

9.1.1. SAR measurement Result of WLAN 2.4G

Test Position of Body with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 10g (W/Kg)	Date
			1g	10g					
ANT1									
Front Side	6/2437	802.11b	0.330	0.134	3.68	13.28	14.00	0.390	2021/10/11
Back Side	6/2437	802.11b	0.508	0.209	1.46	13.28	14.00	0.600	2021/10/11
Top Side	6/2437	802.11b	0.275	0.109	0.69	13.28	14.00	0.325	2021/10/11
ANT2									
Front Side	6/2437	802.11b	0.336	0.136	3.36	13.62	14.00	0.367	2021/10/11
Back Side	6/2437	802.11b	0.519	0.219	4.00	13.62	14.00	0.566	2021/10/11
Top Side	6/2437	802.11b	0.260	0.106	-1.10	13.62	14.00	0.284	2021/10/11
MIMO									
Front Side	6/2437	802.11n HT20	0.354	0.149	-2.82	15.72	16.00	0.378	2021/10/11
Back Side	6/2437	802.11n HT20	0.581	0.239	2.25	15.72	16.00	0.620	2021/10/11
Top Side	6/2437	802.11n HT20	0.290	0.122	-2.53	15.72	16.00	0.309	2021/10/11

NOTE: Body SAR test results of WLAN 2.4G

9.1.2. SAR measurement Result of WLAN 5.2G

Test Position of Body with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 10g (W/Kg)	Date
			1g	10g					
ANT1									
Front Side	40/5200	802.11a	0.306	0.107	-3.57	10.777	11.000	0.322	2021/10/08
Back Side	40/5200	802.11a	0.507	0.179	0.19	10.777	11.000	0.534	2021/10/08
Top Side	40/5200	802.11a	0.255	0.088	2.95	10.777	11.000	0.268	2021/10/08
ANT2									
Front Side	40/5200	802.11a	0.480	0.156	0.41	10.447	11.000	0.545	2021/10/08
Back Side	40/5200	802.11a	0.703	0.251	0.66	10.447	11.000	0.798	2021/10/08
Top Side	40/5200	802.11a	0.395	0.127	3.31	10.447	11.000	0.449	2021/10/08
MIMO									
Front Side	40/5200	802.11n HT20	0.600	0.181	1.12	12.613	13.000	0.656	2021/10/08
Back Side	40/5200	802.11n HT20	0.971	0.303	-1.00	12.613	13.000	1.061	2021/10/08

Back Side Repeated	40/5200	802.11n HT20	0.969	0.300	1.20	12.613	13.000	1.059	2021/10/08
Top Side	40/5200	802.11n HT20	0.505	0.157	1.06	12.613	13.000	0.552	2021/10/08
Back Side	36/5180	802.11n HT20	0.842	0.254	2.06	12.818	13.000	0.878	2021/10/08
Back Side	48/5240	802.11n HT20	0.808	0.239	-2.52	12.481	13.000	0.911	2021/10/08

NOTE: Body SAR test results of WLAN 5.2G

9.1.3. SAR measurement Result of WLAN 5.3G

Test Position of Body with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 10g (W/Kg)	Date
			1g	10g					
ANT1									
Front Side	56/5280	802.11a	0.354	0.131	-2.73	10.265	10.500	0.374	2021/10/8
Back Side	56/5280	802.11a	0.574	0.212	-2.12	10.265	10.500	0.606	2021/10/8
Top Side	56/5280	802.11a	0.300	0.111	-2.45	10.265	10.500	0.317	2021/10/8
ANT2									
Front Side	56/5280	802.11a	0.438	0.135	-1.79	10.177	10.500	0.472	2021/10/8
Back Side	56/5280	802.11a	0.707	0.220	1.33	10.177	10.500	0.762	2021/10/8
Top Side	56/5280	802.11a	0.375	0.117	-0.25	10.177	10.500	0.404	2021/10/8
MIMO									
Front Side	56/5280	802.11n HT20	0.570	0.177	2.81	12.533	13.000	0.635	2021/10/8
Back Side	56/5280	802.11n HT20	0.907	0.296	4.21	12.533	13.000	1.010	2021/10/8
Back Side Repeated	56/5280	802.11n HT20	0.900	0.291	1.34	12.533	13.000	1.002	2021/10/8
Top Side	56/5280	802.11n HT20	0.465	0.149	-1.00	12.533	13.000	0.518	2021/10/8
Back Side	52/5260	802.11n HT20	0.800	0.251	0.93	12.428	13.000	0.913	2021/10/8
Back Side	64/5320	802.11n HT20	0.736	0.228	3.89	12.514	13.000	0.823	2021/10/8

9.1.4. SAR measurement Result of WLAN 5.6G

Test Position of Body with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 10g (W/Kg)	Date
			1g	10g					
ANT1									
Front Side	120/5600	802.11a	0.324	0.110	-2.03	9.912	10.000	0.331	2021/9/24
Back Side	120/5600	802.11a	0.540	0.187	0.87	9.912	10.000	0.551	2021/9/24
Top Side	120/5600	802.11a	0.295	0.102	3.80	9.912	10.000	0.301	2021/9/24
ANT2									
Front Side	120/5600	802.11a	0.396	0.118	2.88	9.482	10.000	0.446	2021/9/24
Back Side	120/5600	802.11a	0.639	0.201	1.50	9.482	10.000	0.720	2021/9/24
Top Side	120/5600	802.11a	0.340	0.104	0.75	9.482	10.000	0.383	2021/9/24
MIMO									
Front Side	118/5590	802.11n (HT40)	0.444	0.140	0.78	11.672	12.500	0.537	2021/9/24
Back Side	118/5590	802.11n (HT40)	0.739	0.246	0.69	11.672	12.500	0.894	2021/9/24
Top Side	118/5590	802.11n (HT40)	0.375	0.124	0.21	11.672	12.500	0.454	2021/9/24
Back Side	102/5510	802.11n (HT40)	0.608	0.198	1.01	11.791	12.500	0.716	2021/9/24
Back Side	134/5670	802.11n (HT40)	0.639	0.208	3.64	12.051	12.500	0.709	2021/9/24

9.1.5. SAR measurement Result of WLAN 5.8G

Test Position of Body with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 10g (W/Kg)	Date
			1g	10g					
ANT1									
Front Side	157/5785	802.11a	0.426	0.131	-0.21	10.208	11.000	0.511	2021/10/09
Back Side	157/5785	802.11a	0.697	0.223	-0.83	10.208	11.000	0.836	2021/10/09
Top Side	157/5785	802.11a	0.355	0.112	3.14	10.208	11.000	0.426	2021/10/09
ANT2									
Front Side	157/5785	802.11a	0.474	0.162	2.98	10.673	11.000	0.511	2021/10/09
Back Side	157/5785	802.11a	0.750	0.256	0.34	10.673	11.000	0.809	2021/10/09
Top Side	157/5785	802.11a	0.395	0.133	2.55	10.673	11.000	0.426	2021/10/09

MIMO									
Front Side	157/5785	802.11n HT20	0.654	0.232	-1.96	12.571	13.000	0.722	2021/10/09
Back Side	157/5785	802.11n HT20	1.078	0.386	0.65	12.571	13.000	1.190	2021/10/09
Back Side Repeated	157/5785	802.11n HT20	1.069	0.377	0.03	12.571	13.000	1.180	2021/10/09
Top Side	157/5785	802.11n HT20	0.545	0.189	-1.92	12.571	13.000	0.602	2021/10/09
Back Side	149/5745	802.11n HT20	0.864	0.303	1.01	12.414	13.000	0.989	2021/10/09
Back Side	165/5825	802.11n HT20	0.858	0.298	-1.28	12.569	13.000	0.948	2021/10/09

NOTE: Body SAR test results of WLAN 5.8G

10. Stand-alone SAR test exclusion

Refer to FCC KDB 447498D01, the 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{(GHz)}}}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- $f_{\text{(GHz)}}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

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

Mode	Pmax (dBm)	Pmax (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
Bluetooth	5.00	3.16	5	2.480	1	3	Yes

NOTE: Standalone SAR test exclusion for Bluetooth.

11. Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

12. Appendix B. System Check Plots

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MEASUREMENT 1 System Performance Check - 2450MHz
MEASUREMENT 2 System Performance Check - 5200MHz
MEASUREMENT 3 System Performance Check - 5600MHz
MEASUREMENT 4 System Performance Check - 5800MHz

MEASUREMENT 1

Date of measurement: 11/10/2021

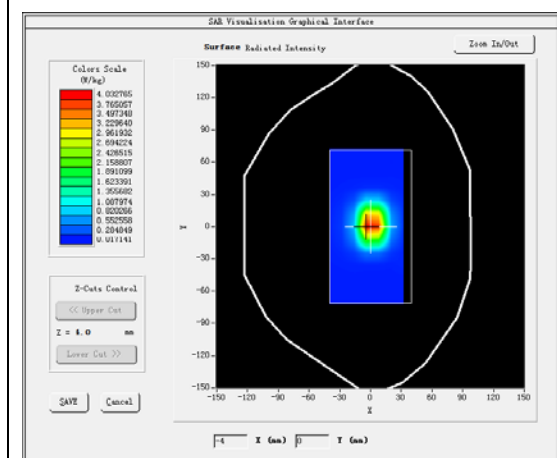
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2450</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

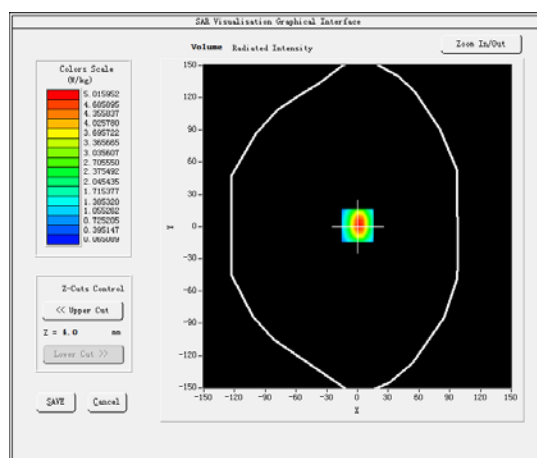
B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative permittivity (real part)	40.733711
Relative permittivity (imaginary part)	12.969064
Conductivity (S/m)	1.765234
Variation (%)	-0.310000

SURFACE SAR



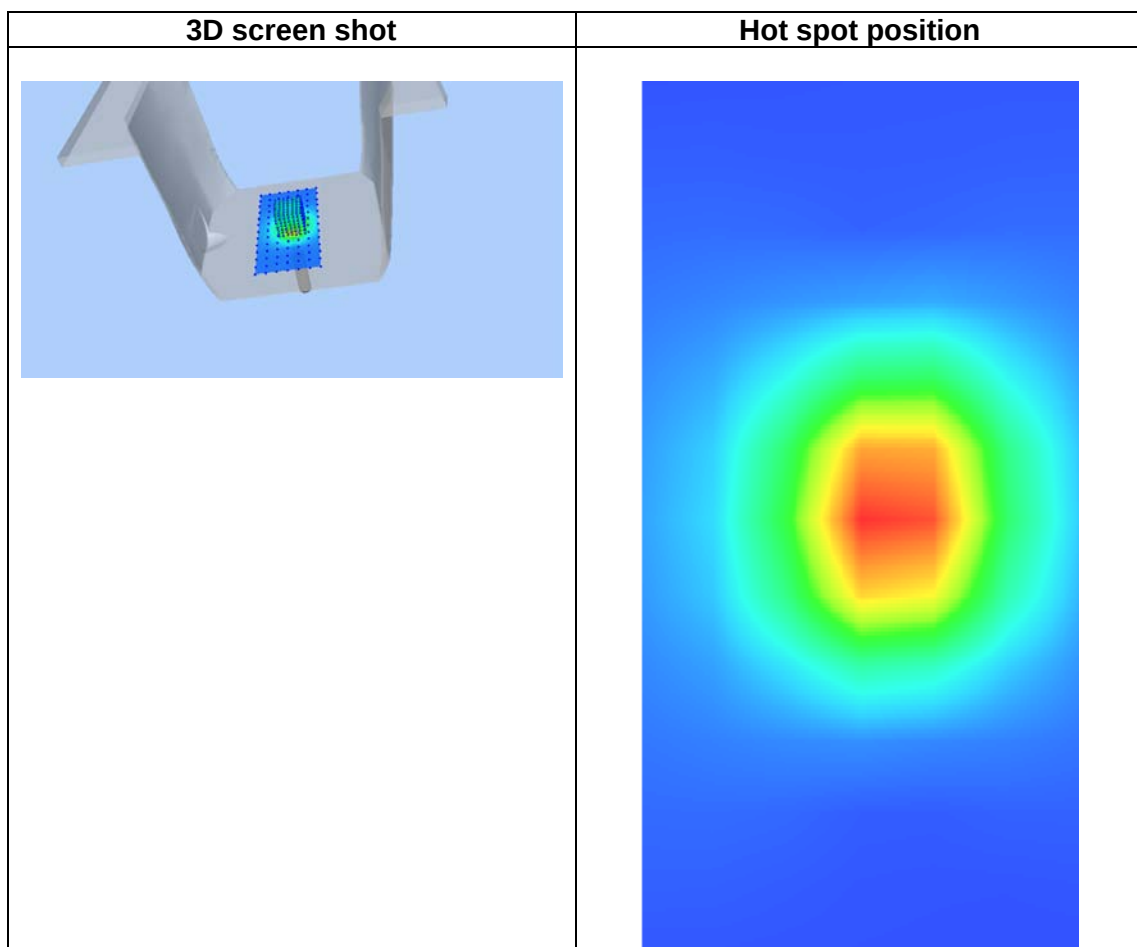
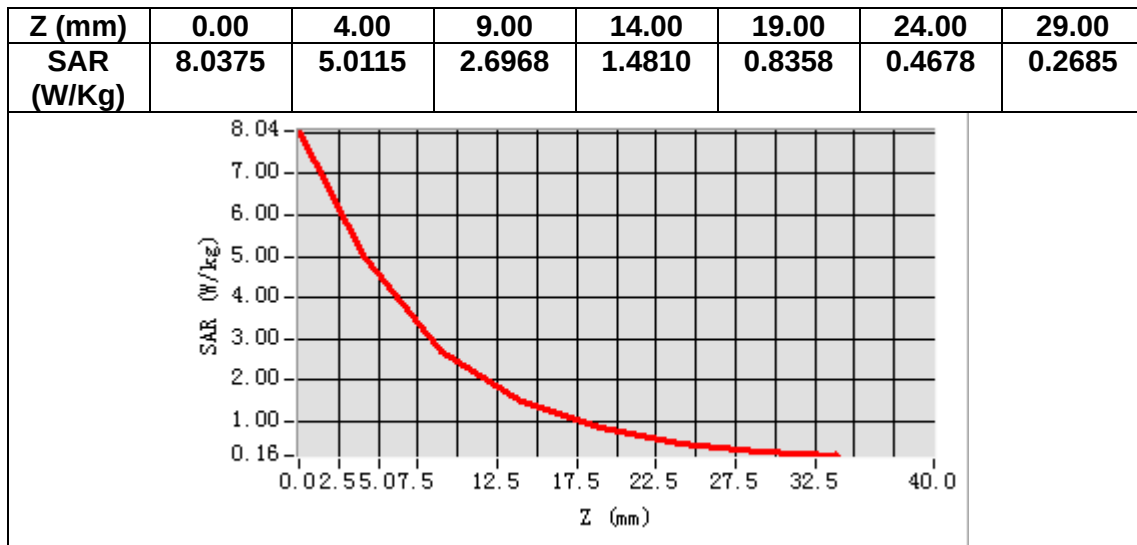
VOLUME SAR



Maximum location: X=0.00, Y=1.00

SAR Peak: 8.14 W/kg

SAR 10g (W/Kg)	2.408275
SAR 1g (W/Kg)	5.660415



MEASUREMENT 2

Date of measurement: 8/10/2021

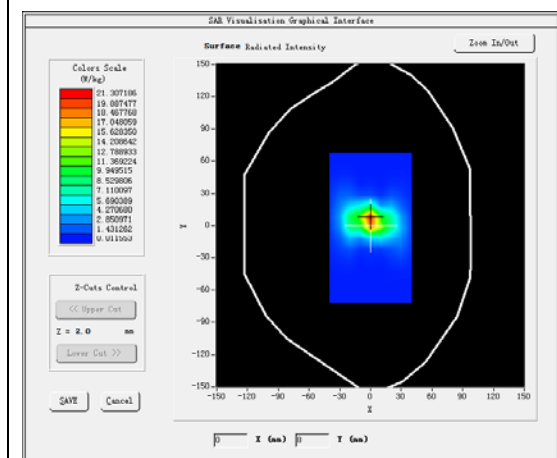
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW5200</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

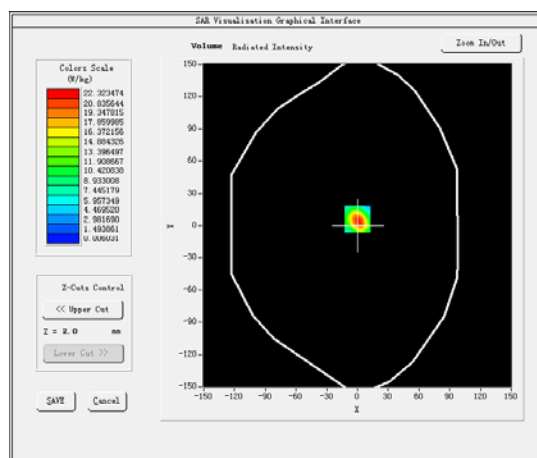
B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	37.508985
Relative permittivity (imaginary part)	15.750310
Conductivity (S/m)	4.550090
Variation (%)	4.160000

SURFACE SAR



VOLUME SAR

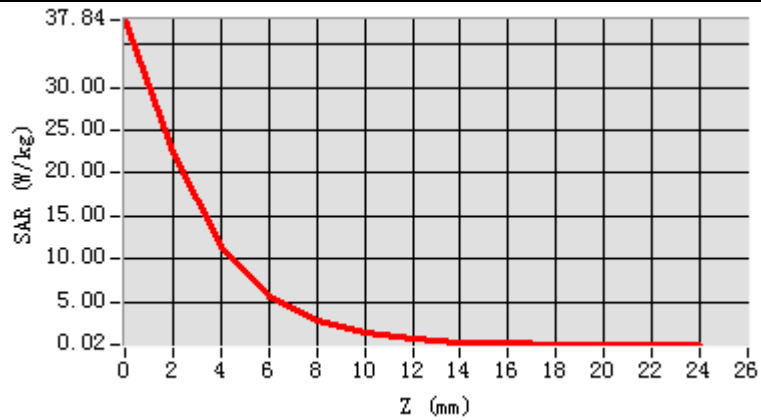


Maximum location: X=0.00, Y=6.00

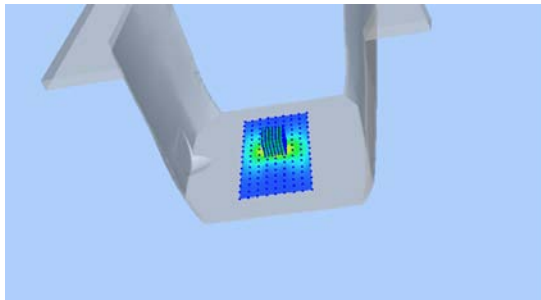
SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.743495
SAR 1g (W/Kg)	16.864221

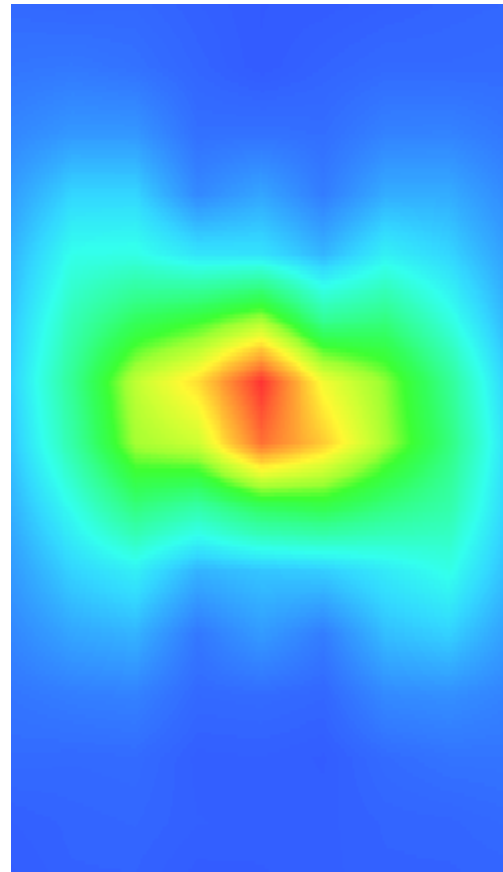
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0	12.0	14.0	16.0	18.0	20.0	22.0
SAR (W/ Kg)	37.8 362	22.3 231	11.3 780	5.66 82	2.82 43	1.40 86	0.71 31	0.36 52	0.18 63	0.10 01	0.05 42	0.03 12



3D screen shot



Hot spot position



MEASUREMENT 3

Date of measurement: 24/9/2021

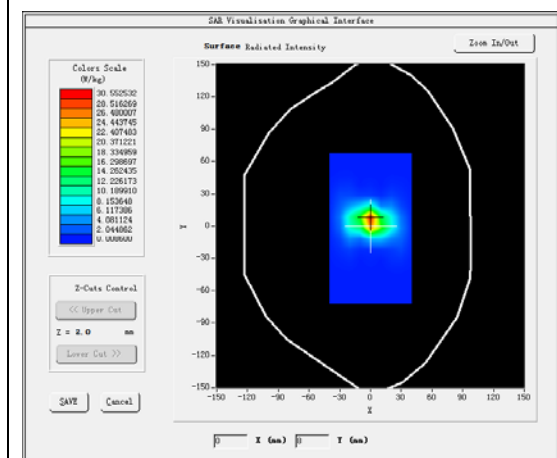
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW5600</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

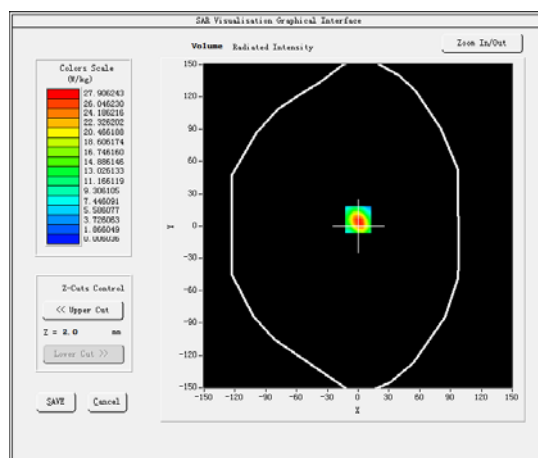
B. SAR Measurement Results

Frequency (MHz)	5600.000000
Relative permittivity (real part)	36.413311
Relative permittivity (imaginary part)	16.243014
Conductivity (S/m)	5.053382
Variation (%)	0.134270

SURFACE SAR



VOLUME SAR

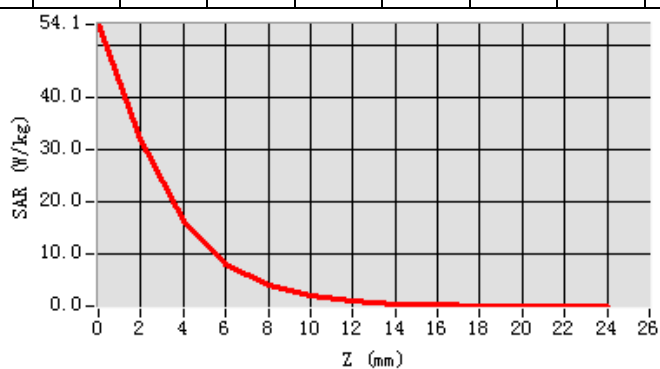


Maximum location: X=0.00, Y=6.00

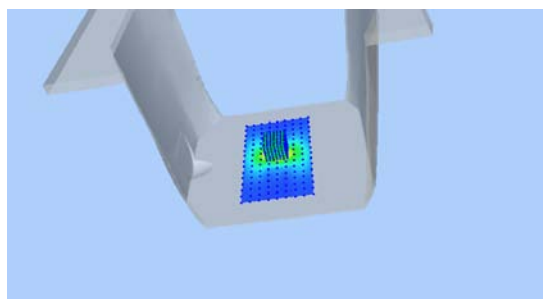
SAR Peak: 51.23 W/kg

SAR 10g (W/Kg)	6.028138
SAR 1g (W/Kg)	18.804450

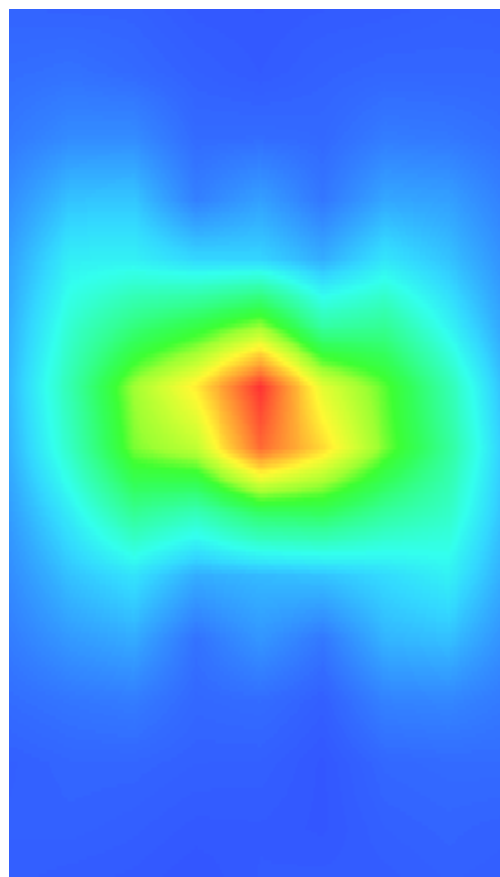
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	54.1 388	31.9 062	16.3 510	8.17 83	4.08 24	3.81 66	1.03 45	0.46 87	0.27 29	0.13 26	0.07 55	0.05 02



3D screen shot



Hot spot position



MEASUREMENT 4

Date of measurement: 9/10/2021

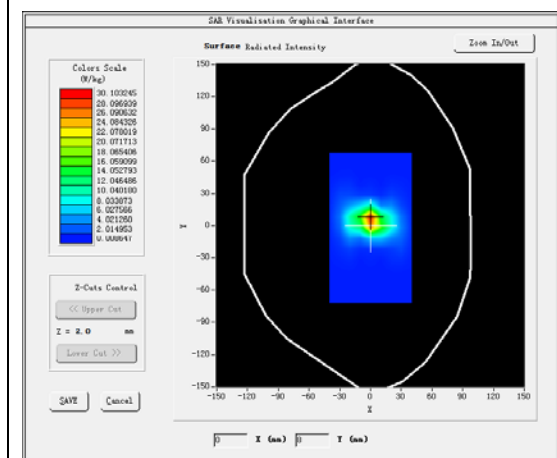
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW5800</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

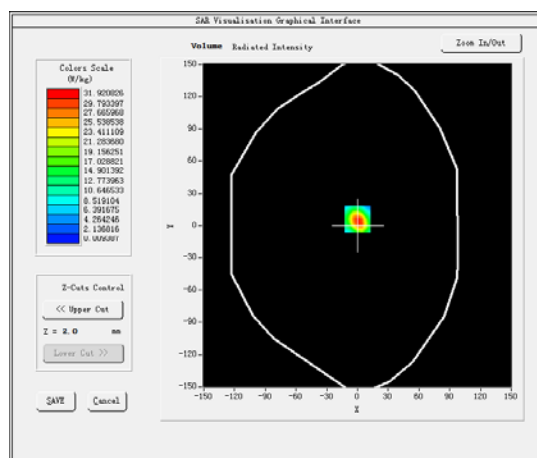
B. SAR Measurement Results

Frequency (MHz)	5800.000000
Relative permittivity (real part)	36.345182
Relative permittivity (imaginary part)	16.049354
Conductivity (S/m)	5.171459
Variation (%)	1.210000

SURFACE SAR



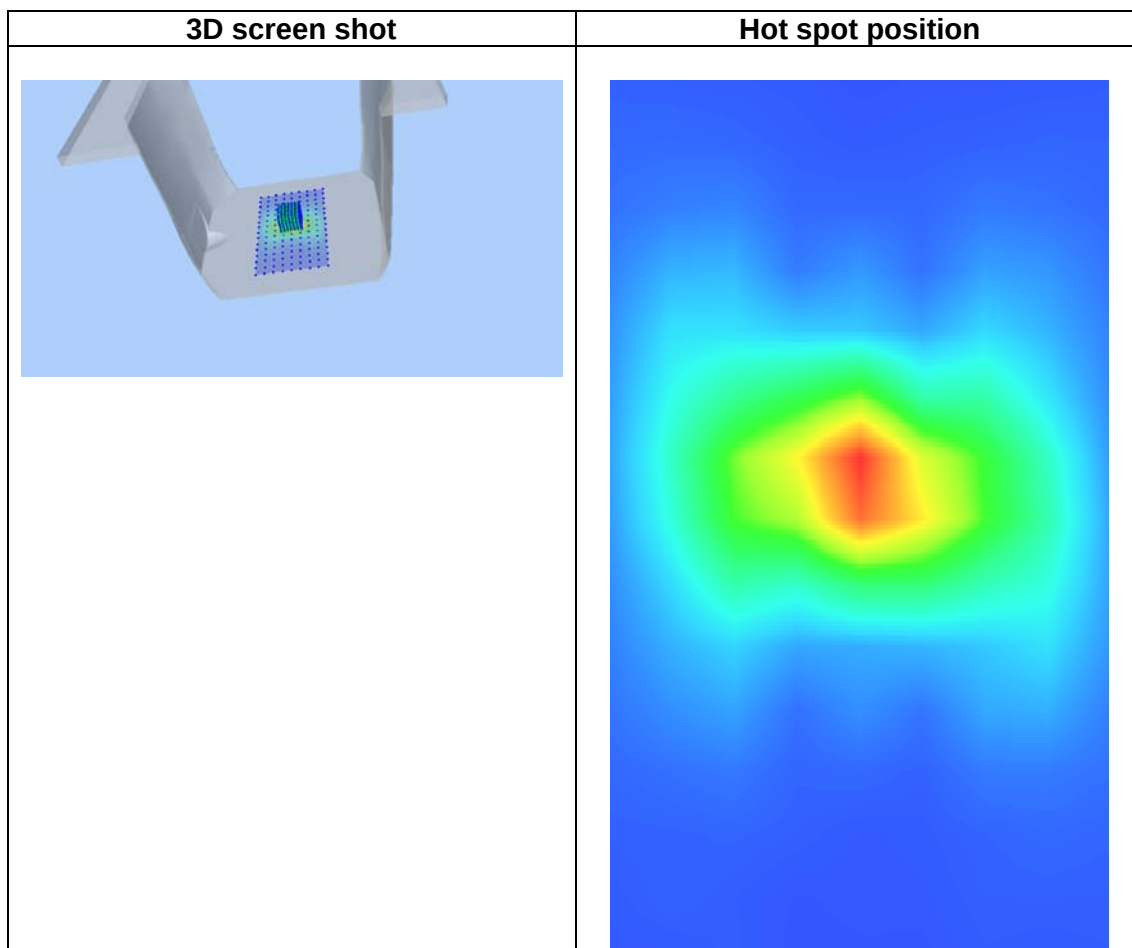
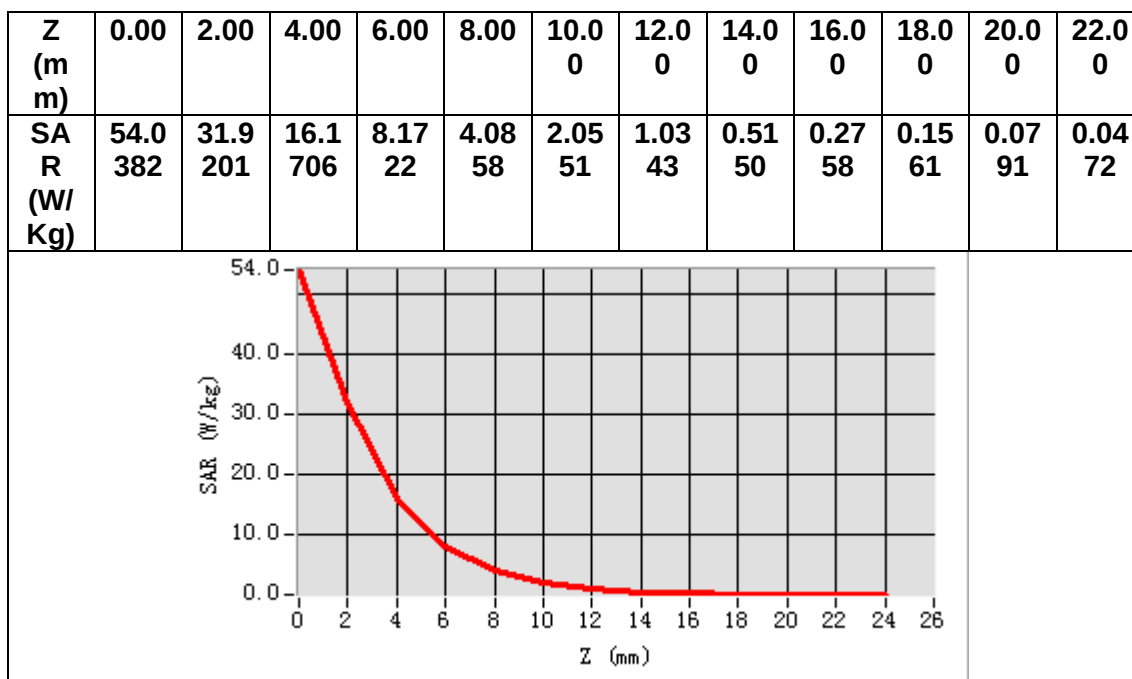
VOLUME SAR



Maximum location: X=0.00, Y=6.00

SAR Peak: 57.37 W/kg

SAR 10g (W/Kg)	6.055322
SAR 1g (W/Kg)	18.446302



13. Appendix C. Plots of High SAR Measurement

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MEASUREMENT 2 WLAN 5.3G Body
MEASUREMENT 3 WLAN 5.6G Body
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