S T S LAB

FCC SAR TEST REPORT

Report No.: STS2305328H01

Issued for

TickTalk Tech LLC

565 W Lambert Rd, Unit B, Brea, CA 92821

Product Name:	TickTalk 5 Kids Smartwatch
Brand Name:	TickTalk
Model Name:	TickTalk TT5
Series Model:	N/A
FCC ID:	2AS8N-TT5
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEC/IEEE 62209-1528
Max. Report SAR:	Front of face: 0.274 W/kg (1g)
	Wrist: 0.522 W/kg(10g)

Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from STS, All Test Data Presented in this report is only applicable to presented Test sample.

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
TEL: +86-755 3688 6288 FAX: +86-755 3688 6277 E-mail:sts@stsapp.com

TESTING • CONSULTING • SOLUTION • CERTIFICATION
APPROVAL

Test Report Certification

Applicant's name ..... : TickTalk Tech LLC

Address ..... : 565 W Lambert Rd, Unit B, Brea, CA 92821

Manufacture's Name ..... : Famous Works Electronics (Shanghai) Co., Ltd

Address ..... : ROOM2236,3TH BLDG,NO.1473,ZHEN GUANG RD,SHANGHAI,CHINA

Product description

Product name ..... : TickTalk 5 Kids Smartwatch

Brand name ..... : TickTalk

Model name..... : TickTalk TT5

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..... : 30 May 2023~ 07 Jun. 2023

Date of Issue..... : 09 Jun. 2023

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

Testing Engineer : Shi fan. long

((Shifan. Long)

Technical Manager : Sean She

(Sean she)

Authorized Signatory : Bovey Yang

(Bovey Yang)

TESTING CONSULTING SOLUTION CERTIFICATION STS APPROVAL

Table of Contents

1. General Information **5**

1.1 EUT Description 5

1.2 Test Environment 7

1.3 Test Factory 7

2. Test Standards And Limits **8**

3. SAR Measurement System **9**

3.1 Definition Of Specific Absorption Rate (SAR) 9

3.2 SAR System 9

4. Tissue Simulating Liquids **12**

4.1 Simulating Liquids Parameter Check 12

5. SAR System Validation **15**

5.1 Validation System 15

5.2 Validation Result 16

6. SAR Evaluation Procedures **17**

7. EUT Test Position **18**

7.1 SAR Test Exclusions Applied 19

8 Measurement Uncertainty **20**

9. Conducted Power Measurement **21**

9.1 Test Result 21

10. EUT And Test Setup Photo **40**

10.1 EUT Photo 40

10.2 Setup Photo 44

11. SAR Result Summary **46**

11.1 Front of face SAR 46

11.2 Wrist SAR 47

12. Equipment List **50**

Appendix A. System Validation Plots **51**

Appendix B. SAR Test Plots **61**

Appendix C. Probe Calibration And Dipole Calibration Report **85**

Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	09 Jun. 2023	STS2305328H01	ALL	Initial Issue

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

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	TickTalk TT5			
Brand Name	TickTalk			
Model Name	TickTalk TT5			
Series Model	N/A			
Model Difference	N/A			
Battery	Rated Voltage: 3.87V Charge Limit Voltage: 4.45V Capacity: 770mAh			
Device Category	Portable			
Product stage	Production unit			
Exposure Environment	General Population / Uncontrolled			
Hardware Version	N/A			
Software Version	N/A			
Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV:1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699MHz ~ 716 MHz LTE Band 17: 704MHz ~ 716 MHz LTE Band 66: 1710 MHz ~ 1780 MHz WLAN 802.11b/g/n20: 2412 MHz ~ 2462 MHz WLAN 802.11n40: 2422 MHz ~ 2452 MHz BLE: 2402 MHz to 2480 MHz			
Max. Reported SAR	Band	Mode	Front of face-1g (W/kg)	Wrist-10g (W/kg)
	PCT	WCDMA Band II	0.031	0.226
	PCT	WCDMA Band IV	0.024	0.252
	PCT	WCDMA Band V	0.057	0.364
	PCT	LTE Band 2	0.026	0.126
	PCT	LTE Band 4	0.208	0.522
	PCT	LTE Band 5	0.273	0.320
	PCT	LTE Band 7	0.038	0.239
	PCT	LTE Band 12	0.132	0.454
	PCT	LTE Band 17	0.243	0.457
	PCT	LTE Band 66	0.054	0.188
	DTS	2.4G WLAN	0.274	0.380
	DTS	BLE Note	0.582	1.455
Sum SAR			0.854	1.977
Limit(W/kg)			1.6	4
FCC Equipment Class	PCS Licensed Transmitter worn on body (PCT) Digital Transmission System (DTS)			

Operating Mode	WCDMA: HSDPA:QPSK/16QAM; HSUPA:BPSK LTE:QPSK,16QAM WLAN: 802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g/n(OFDM):BPSK,QPSK,16-QAM,64-QAM BLE: GFSK
Antenna Specification	WCDMA/LTE: PIFA Antenna WLAN/BLE: PIFA Antenna
SIM Card	Support single card
Sample number	230525008-1
Note: 1.BLE SAR was estimated 2.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 (℃)	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 D01v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	FCC KDB 941225 D05 v02r05	SAR for LTE Devices
8	FCC KDB 648474 D04 v01r03	SAR Evaluation Considerations for Wireless Handsets
9	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 1gram 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(1g)
PARTIAL WRIST LIMIT
4.0 W/kg(10g)

3. SAR Measurement System

3.1 Definition Of Specific Absorption Rate (SAR)

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

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

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

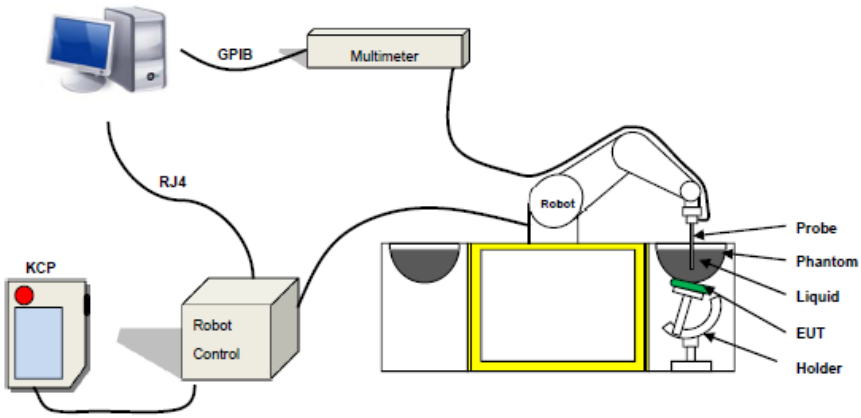
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SAR System

MVG SAR System Diagram:



COMOSAR is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The COMOSAR system consists of the following items:
- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

The following figure shows the system.

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

3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 07/21 EPGO352 with following specifications is used
- Probe Length: 330 mm
- Length of Individual Dipoles: 2mm
- 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

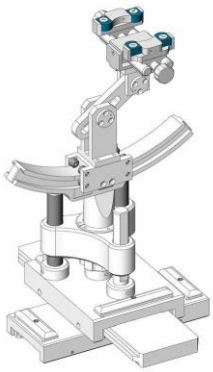
3.2.2 Phantom

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.

Figure-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

4.1 Simulating Liquids Parameter Check

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Head Tissue

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

Body Tissue

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

Tissue dielectric parameters for head and body phantoms				
Frequency	εr		σ S/m	
	Head	Body	Head	Body
300	45.3	58.2	0.87	0.92
450	43.5	56.7	0.87	0.94
835	41.5	55.2	0.90	0.97
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
1900	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]					
2023-05-30	22.4	41	704	22.1	Permittivity	42.15	43.38	2.93	±5
					Conductivity	0.89	0.90	1.47	±5
2023-05-30	22.4	41	709	22.2	Permittivity	42.12	43.15	2.45	±5
					Conductivity	0.89	0.95	7.07	±5
2023-05-30	22.4	42	750	22.0	Permittivity	41.90	42.06	0.38	±5
					Conductivity	0.89	0.88	-1.12	±5
2023-05-31	21.1	47	826.4	20.8	Permittivity	41.54	41.49	-0.12	±5
					Conductivity	0.90	0.92	2.34	±5
2023-05-31	21.1	47	829	20.7	Permittivity	41.53	41.42	-0.26	±5
					Conductivity	0.90	0.93	3.41	±5
2023-05-31	21.2	47	835	20.9	Permittivity	41.50	41.77	0.65	±5
					Conductivity	0.90	0.93	3.33	±5
2023-06-02	23.3	50	1720	23.0	Permittivity	40.11	40.51	0.99	±5
					Conductivity	1.35	1.34	-1.05	±5
2023-06-02	21.2	47	1732.5	20.9	Permittivity	40.10	40.71	1.53	±5
					Conductivity	1.36	1.33	-2.31	±5
2023-06-02	21.3	47	1745	21.0	Permittivity	40.08	40.61	1.33	±5
					Conductivity	1.37	1.41	3.03	±5
2023-06-02	21.4	48	1752.6	21.1	Permittivity	40.07	41.29	3.05	±5
					Conductivity	1.37	1.36	-0.94	±5
2023-06-02	21.2	47	1732.5	21.0	Permittivity	40.10	40.69	1.48	±5
					Conductivity	1.36	1.36	-0.10	±5
2023-06-02	21.4	48	1755	21.1	Permittivity	40.06	41.01	2.36	±5
					Conductivity	1.37	1.40	1.87	±5
2023-06-02	21.5	48	1800	21.2	Permittivity	40.00	40.32	0.80	±5
					Conductivity	1.40	1.39	-0.71	±5
2023-06-02	21.4	48	1852.4	21.1	Permittivity	39.93	41.27	3.37	±5
					Conductivity	1.43	1.45	1.40	±5
2023-06-02	21.4	48	1860	21.1	Permittivity	39.91	41.04	2.82	±5
					Conductivity	1.43	1.47	2.49	±5
2023-06-05	23.9	56	2412	23.6	Permittivity	39.27	40.06	2.02	±5
					Conductivity	1.77	1.75	-0.92	±5

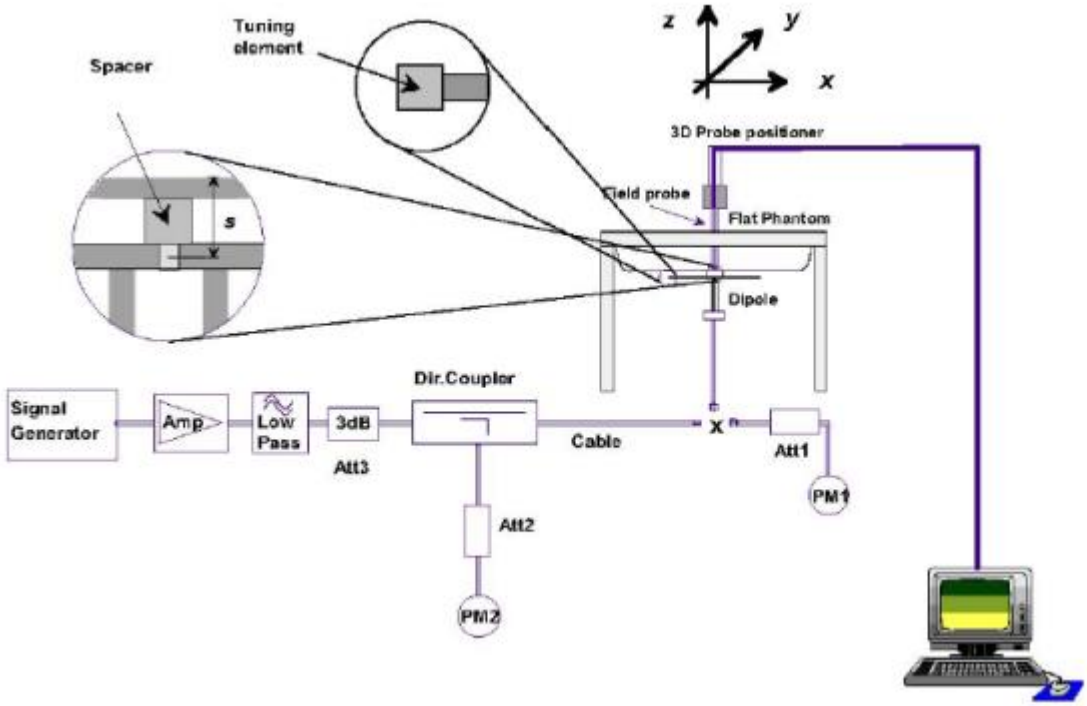
2023-06-05	24.0	56	2437	23.8	Permittivity	39.22	39.69	1.19	±5
					Conductivity	1.79	1.76	-1.59	±5
2023-06-05	24.0	57	2450	23.7	Permittivity	39.20	40.14	2.40	±5
					Conductivity	1.80	1.86	3.33	±5
2023-06-05	24.1	57	2462	23.8	Permittivity	39.18	39.29	0.28	±5
					Conductivity	1.81	1.84	1.62	±5
2023-06-07	20.3	42	2510	20.0	Permittivity	39.12	39.59	1.20	±5
					Conductivity	1.86	1.88	0.86	±5
2023-06-07	20.4	42	2560	20.2	Permittivity	39.05	39.44	0.99	±5
					Conductivity	1.92	1.92	0.14	±5
2023-06-07	20.4	42	2600	20.1	Permittivity	39.00	39.98	2.51	±5
					Conductivity	1.96	2.00	2.04	±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	Frequency (MHz)	Power	SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	Drift (%)	1W Target		Difference percentage		Limit
						SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	1g	10g	(%)
2023-05-30	750	100 mW	0.872	0.531	1.42	8.48	5.53	2.83%	-3.98%	10
		Normalize to 1 Watt	8.72	5.31						
2023-05-31	835	100 mW	0.934	0.604	-0.55	9.63	6.15	-3.01%	-1.79%	10
		Normalize to 1 Watt	9.34	6.04						
2023-06-02	1800	100 mW	3.998	1.886	1.62	38.31	19.96	4.36%	-5.51%	10
		Normalize to 1 Watt	39.98	18.86						
2023-06-05	2450	100 mW	5.381	2.301	-0.08	54.7	24.11	-1.63%	-4.56%	10
		Normalize to 1 Watt	53.81	23.01						
2023-06-07	2600	100 mW	5.657	2.402	3.25	56.19	24.08	0.68%	-0.25%	10
		Normalize to 1 Watt	56.57	24.02						

Note:

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

6. SAR Evaluation Procedures

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

-Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface.

-Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.

-Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.

-Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

Area Scan& Zoom Scan:

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r01 quoted below.

When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

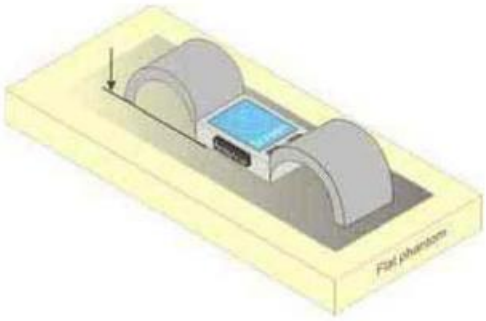
7. EUT Test Position

This EUT was tested in Front Face and Rear Face.

Limb-worn Position Conditions

Transmitters that are built-in within a wrist watch or similar wrist-worn devices typically operate in speaker mode for voice communication, with the device worn on the wrist and positioned next to the mouth. Next to the mouth exposure requires 1-g SAR and the wrist-worn condition requires 10-g extremity SAR

(1) Next to the mouth use is evaluated with the front of the device positioned at 10 mm from a flat phantom filled with head tissue-equivalent medium



Test position for limb-worn devices

7.1 SAR Test Exclusions Applied

Standalone SAR test exclusion applies 447498 D04 Interim General Radio Frequency Exposure Guidelines v01. The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (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). Pth is given by:

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

Where

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

and

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

d = the separation distance (cm);

Function	Fre. (GHz)	Separation distance (cm)	Max Turn up power (dBm)	Max Turn up power (mW)	Pth (mW)
BLE	2.44	0.5	4	2.51	2.75

Note: The Maximum power is less than the Pth, complies with the exemption requirements.

8 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. $a(x_i)$	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	√3	0.09	1	0.09	∞
LIN	Probe linearity and detection limit	R	1.27	√3	0.73	1	0.73	∞
BBS	Broadband signal	R	0.12	√3	0.07	1	0.07	∞
ISO	Probe isotropy	R	0.16	√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/δ	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	√3	1.56	c_ε, c_σ	1.56	∞
EPS	Shell permittivity	R	2.1	√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	√3	1.97	1	1.97	∞
TAS	Time-average SAR	R	1.8	√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	√3	1.04	1	1.04	
u(ΔSAR)	Combined uncertainty						10.84	
U	Expanded uncertainty and effective degrees of freedom					U =	21.68	

9. Conducted Power Measurement

9.1 Test Result

WCDMA

Band	WCDMA Band 2			WCDMA Band 4			WCDMA Band 5		
Channel	9262	9400	9538	1312	1413	1513	4132	4183	4233
Frequency (MHz)	1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.6	846.6
HSDPA Subtest-1	20.26	20.18	20.16	20.11	20.14	20.19	20.27	20.21	20.07
HSDPA Subtest-2	20.26	20.19	20.15	20.07	20.11	20.19	20.27	20.23	20.05
HSDPA Subtest-3	20.23	20.2	20.15	20.07	20.11	20.16	20.29	20.21	20.08
HSDPA Subtest-4	20.28	20.22	20.16	20.09	20.11	20.18	20.3	20.24	20.06
HSUPA Subtest-1	18.27	18.15	18.06	17.68	18.06	18.18	17.94	18.24	18.13
HSUPA Subtest-2	18.26	17.78	17.49	18.05	18.04	18.18	18.34	18.21	18.12
HSUPA Subtest-3	17.87	17.76	18.1	18.05	17.59	18.15	17.95	18.25	17.53
HSUPA Subtest-4	17.67	17.67	18.08	17.7	17.48	17.57	18.32	17.84	18.13
HSUPA Subtest-5	17.87	17.56	17.61	18.05	18.07	18.17	18.35	18.27	17.55

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

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

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

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

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

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

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

2.4G WLAN

2.4GWIFI				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
802.11b	1	2412	14.18	26.18
	7	2437	15.05	31.99
	11	2462	13.74	23.66
802.11g	1	2412	10.69	11.72
	7	2437	12.4	17.38
	11	2462	11.4	13.80
802.11 n-HT20	1	2412	10.08	10.19
	7	2437	11.97	15.74
	11	2462	10.88	12.25
802.11 n-HT40	3	2422	10.45	11.09
	6	2437	11.5	14.13
	9	2452	11.33	13.58

BLE

BLE				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	2.97	1.98
	19	2440	3.77	2.38
	39	2480	0	1.00

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 ½ 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 ½ 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 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	23.14	22.92	22.55
1.4	1	2		23.26	23.02	22.70
1.4	1	5		23.13	22.91	22.58
1.4	3	0		22.96	23.03	22.51
1.4	3	1		22.64	22.55	22.53
1.4	3	2		22.65	22.50	22.51
1.4	6	0		21.62	21.49	21.59
1.4	1	0	16-QAM	21.52	21.38	21.43
1.4	1	2		21.64	21.47	21.53
1.4	1	5		21.59	21.38	21.44
1.4	3	0		21.66	21.66	21.47
1.4	3	1		21.65	21.72	21.49
1.4	3	2		21.65	21.67	21.46
1.4	6	0		20.57	20.49	20.45
3	1	0	QPSK	22.69	22.44	22.58
3	1	7		22.75	22.59	22.62
3	1	14		22.58	22.43	22.58
3	8	0		21.60	21.46	21.55
3	8	4		21.58	21.48	21.54
3	8	7		21.54	21.46	21.49
3	15	0		21.50	21.46	21.49
3	1	0	16-QAM	21.57	21.62	21.96
3	1	7		21.69	21.71	21.98
3	1	14		21.51	21.57	21.86
3	8	0		20.62	20.45	20.68
3	8	4		20.65	20.47	20.71
3	8	7		20.58	20.47	20.61
3	15	0		20.59	20.45	20.53

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.48	22.40	22.41
5	1	12		22.59	22.45	22.51
5	1	24		22.49	22.36	22.43
5	12	0		21.48	21.37	21.45
5	12	6		21.56	21.44	21.52
5	12	11		21.45	21.34	21.33
5	25	0		21.49	21.39	21.37
5	1	0	16-QAM	21.53	21.59	21.22
5	1	12		21.63	21.68	21.28
5	1	24		21.53	21.55	21.15
5	12	0		20.50	20.53	20.46
5	12	6		20.58	20.53	20.51
5	12	11		20.47	20.44	20.31
5	25	0		20.52	20.42	20.45
10	1	0	QPSK	22.59	22.44	22.46
10	1	24		22.78	22.61	22.71
10	1	49		22.51	22.37	22.53
10	25	0		21.56	21.46	21.51
10	25	12		21.57	21.50	21.54
10	25	24		21.55	21.38	21.47
10	50	0		21.54	21.49	21.49
10	1	0	16-QAM	21.51	21.55	21.94
10	1	24		21.72	21.73	22.13
10	1	49		21.46	21.48	21.82
10	25	0		20.65	20.51	20.57
10	25	12		20.66	20.53	20.59
10	25	24		20.62	20.45	20.51
10	50	0		20.58	20.52	20.54

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	22.56	22.36	22.40
15	1	37		22.60	22.45	22.50
15	1	74		22.45	22.28	22.41
15	36	0		21.67	21.53	21.57
15	36	18		21.64	21.49	21.57
15	36	39		21.58	21.46	21.53
15	75	0		21.61	21.53	21.59
15	1	0	16-QAM	21.80	21.51	21.91
15	1	38		21.90	21.56	21.99
15	1	75		21.72	21.40	21.72
15	36	0		20.65	20.55	20.58
15	36	18		20.61	20.52	20.61
15	36	39		20.62	20.49	20.57
15	75	0		20.56	20.52	20.57
20	1	0	QPSK	22.33	22.30	22.24
20	1	49		22.69	22.61	22.67
20	1	99		22.18	22.15	22.25
20	50	0		21.55	21.46	21.59
20	50	24		21.61	21.47	21.54
20	50	49		21.51	21.38	21.51
20	100	0		21.47	21.45	21.47
20	1	0	16-QAM	21.84	21.44	21.44
20	1	49		22.13	21.75	21.75
20	1	99		21.67	21.30	21.30
20	50	0		20.53	20.50	20.50
20	50	24		20.53	20.51	20.51
20	50	49		20.51	20.39	20.39
20	100	0		20.54	20.45	20.45

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	22.86	22.47	22.50
1.4	1	2		22.99	22.60	22.55
1.4	1	5		22.90	22.48	22.45
1.4	3	0		22.95	22.44	22.55
1.4	3	1		22.99	22.49	22.56
1.4	3	2		22.91	22.46	22.52
1.4	6	0		22.00	21.55	21.61
1.4	1	0	16-QAM	21.87	21.43	21.62
1.4	1	2		21.95	21.53	21.73
1.4	1	5		21.55	21.47	21.62
1.4	3	0		21.57	21.51	21.48
1.4	3	1		21.62	21.55	21.54
1.4	3	2		21.58	21.50	21.52
1.4	6	0		20.47	20.41	20.54
3	1	0	QPSK	22.57	22.56	22.57
3	1	7		22.69	22.67	22.67
3	1	14		22.58	22.50	22.53
3	8	0		21.52	21.61	21.60
3	8	4		21.55	21.61	21.60
3	8	7		21.53	21.57	21.57
3	15	0		21.50	21.58	21.54
3	1	0	16-QAM	21.53	21.70	22.03
3	1	7		21.66	21.79	22.16
3	1	14		21.51	21.72	22.01
3	8	0		20.57	20.51	20.67
3	8	4		20.61	20.52	20.68
3	8	7		20.58	20.52	20.67
3	15	0		20.53	20.45	20.56

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.46	22.49	22.48
5	1	12		22.62	22.57	22.55
5	1	24		22.51	22.50	22.46
5	12	0		21.52	21.54	21.58
5	12	6		21.58	21.58	21.57
5	12	11		21.50	21.47	21.47
5	25	0		21.52	21.60	21.52
5	1	0	16-QAM	21.54	21.72	21.33
5	1	12		21.64	21.78	21.41
5	1	24		21.55	21.72	21.33
5	12	0		20.52	20.51	20.52
5	12	6		20.57	20.58	20.54
5	12	11		20.49	20.50	20.47
5	25	0		20.52	20.46	20.51
10	1	0	QPSK	22.59	22.61	22.61
10	1	24		22.79	22.71	22.69
10	1	49		22.62	22.58	22.51
10	25	0		21.61	21.61	21.69
10	25	12		21.60	21.64	21.61
10	25	24		21.67	21.63	21.52
10	50	0		21.62	21.61	21.59
10	1	0	16-QAM	21.54	21.75	22.06
10	1	24		21.65	21.83	22.12
10	1	49		21.59	21.72	21.95
10	25	0		20.65	20.55	20.68
10	25	12		20.66	20.58	20.61
10	25	24		20.67	20.58	20.50
10	50	0		20.59	20.56	20.57

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	22.51	22.53	22.53
15	1	37		22.59	22.56	22.58
15	1	74		22.47	22.49	22.41
15	36	0		21.62	21.70	21.82
15	36	18		21.66	21.68	21.70
15	36	39		21.72	21.65	21.57
15	75	0		21.71	21.68	21.70
15	1	0	16-QAM	21.77	21.66	22.01
15	1	38		21.86	21.69	22.01
15	1	75		21.75	21.64	21.88
15	36	0		20.59	20.57	20.75
15	36	18		20.56	20.62	20.66
15	36	39		20.61	20.58	20.52
15	75	0		20.60	20.61	20.63
20	1	0	QPSK	22.36	22.45	22.43
20	1	49		22.73	22.72	22.74
20	1	99		22.31	22.33	22.28
20	50	0		21.50	21.52	21.71
20	50	24		21.61	21.62	21.64
20	50	49		21.59	21.51	21.39
20	100	0		21.60	21.51	21.56
20	1	0	16-QAM	21.82	21.59	21.63
20	1	49		22.18	21.86	21.98
20	1	99		21.77	21.50	21.53
20	50	0		20.46	20.45	20.64
20	50	24		20.48	20.55	20.59
20	50	49		20.52	20.41	20.31
20	100	0		20.53	20.44	20.55

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	21.79	21.61	21.38
1.4	1	2		21.90	21.68	21.49
1.4	1	5		21.79	21.59	21.35
1.4	3	0		21.86	21.69	21.52
1.4	3	1		21.88	21.70	21.53
1.4	3	2		21.85	21.67	21.50
1.4	6	0		20.91	20.70	20.48
1.4	1	0	16-QAM	20.81	20.74	20.35
1.4	1	2		20.92	20.84	20.41
1.4	1	5		20.86	20.72	20.36
1.4	3	0		21.01	20.66	20.68
1.4	3	1		20.98	20.70	20.71
1.4	3	2		20.97	20.68	20.68
1.4	6	0		19.79	19.70	19.52
3	1	0	QPSK	21.88	21.65	21.47
3	1	7		21.94	21.81	21.55
3	1	14		21.82	21.54	21.43
3	8	0		20.90	20.66	20.45
3	8	4		20.88	20.66	20.49
3	8	7		20.83	20.59	20.43
3	15	0		20.84	20.63	20.48
3	1	0	16-QAM	20.93	20.82	21.01
3	1	7		21.00	20.92	21.11
3	1	14		20.79	20.74	20.92
3	8	0		19.89	19.66	19.66
3	8	4		19.92	19.68	19.71
3	8	7		19.87	19.62	19.64
3	15	0		19.87	19.63	19.58

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	21.79	21.65	21.53
5	1	12		21.84	21.68	21.54
5	1	24		21.72	21.53	21.40
5	12	0		20.83	20.64	20.58
5	12	6		20.86	20.67	20.54
5	12	11		20.82	20.54	20.49
5	25	0		20.85	20.65	20.50
5	1	0	16-QAM	20.86	20.86	20.34
5	1	12		20.94	20.90	20.39
5	1	24		20.82	20.74	20.21
5	12	0		19.86	19.80	19.58
5	12	6		19.85	19.81	19.62
5	12	11		19.84	19.68	19.51
5	25	0		19.85	19.71	19.59
10	1	0	QPSK	21.88	21.74	21.64
10	1	24		22.00	21.76	21.79
10	1	49		21.69	21.65	21.46
10	25	0		20.88	20.73	20.67
10	25	12		20.80	20.70	20.62
10	25	24		20.83	20.63	20.52
10	50	0		20.83	20.69	20.62
10	1	0	16-QAM	20.88	20.88	21.14
10	1	24		20.94	20.95	21.26
10	1	49		20.66	20.74	20.97
10	25	0		19.94	19.82	19.75
10	25	12		19.97	19.77	19.68
10	25	24		19.95	19.66	19.64
10	50	0		19.91	19.77	19.68

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	21.37	21.28	21.42
5	1	12		21.47	21.43	21.55
5	1	24		21.33	21.29	21.44
5	12	0		20.35	20.33	20.49
5	12	6		20.46	20.41	20.54
5	12	11		20.39	20.35	20.49
5	25	0		20.42	20.36	20.51
5	1	0	16-QAM	20.47	20.56	20.24
5	1	12		20.55	20.63	20.35
5	1	24		20.41	20.50	20.25
5	12	0		19.42	19.38	19.48
5	12	6		19.45	19.44	19.53
5	12	11		19.42	19.42	19.47
5	25	0		19.44	19.34	19.49
10	1	0	QPSK	21.65	21.42	21.42
10	1	24		21.77	21.50	21.59
10	1	49		21.60	21.33	21.44
10	25	0		20.56	20.42	20.43
10	25	12		20.56	20.43	20.46
10	25	24		20.55	20.37	20.44
10	50	0		20.54	20.41	20.43
10	1	0	16-QAM	20.56	20.49	20.84
10	1	24		20.65	20.68	20.98
10	1	49		20.51	20.44	20.80
10	25	0		19.59	19.43	19.41
10	25	12		19.58	19.38	19.45
10	25	24		19.59	19.35	19.42
10	50	0		19.52	19.33	19.37

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	21.39	21.32	21.30
15	1	37		21.48	21.33	21.40
15	1	74		21.33	21.18	21.32
15	36	0		20.51	20.41	20.46
15	36	18		20.51	20.40	20.48
15	36	39		20.48	20.36	20.44
15	75	0		20.50	20.37	20.47
15	1	0	16-QAM	20.67	20.48	20.73
15	1	38		20.76	20.46	20.82
15	1	75		20.61	20.31	20.70
15	36	0		19.44	19.38	19.44
15	36	18		19.46	19.31	19.43
15	36	39		19.41	19.32	19.42
15	75	0		19.43	19.34	19.42
20	1	0	QPSK	21.18	21.16	21.18
20	1	49		21.51	21.46	21.52
20	1	99		21.07	21.06	21.16
20	50	0		20.33	20.31	20.33
20	50	24		20.41	20.33	20.34
20	50	49		20.29	20.23	20.28
20	100	0		20.34	20.27	20.28
20	1	0	16-QAM	20.68	20.31	20.38
20	1	49		21.01	20.61	20.70
20	1	99		20.55	20.19	20.33
20	50	0		19.35	19.22	19.28
20	50	24		19.40	19.30	19.32
20	50	49		19.27	19.17	19.24
20	100	0		19.37	19.22	19.28

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	23.10	22.98	22.52
1.4	1	2		23.20	23.07	22.66
1.4	1	5		23.14	22.99	22.58
1.4	3	0		23.10	23.04	22.56
1.4	3	1		23.16	22.84	22.63
1.4	3	2		23.11	22.67	22.59
1.4	6	0		22.26	21.61	21.58
1.4	1	0	16-QAM	22.23	21.49	21.45
1.4	1	2		22.33	21.60	21.57
1.4	1	5		22.25	21.44	21.53
1.4	3	0		22.05	21.75	21.59
1.4	3	1		22.13	21.78	21.62
1.4	3	2		22.10	21.74	21.59
1.4	6	0		21.13	20.54	20.45
3	1	0	QPSK	23.12	22.61	22.51
3	1	7		23.26	22.70	22.65
3	1	14		23.10	22.53	22.56
3	8	0		22.13	21.57	21.49
3	8	4		22.16	21.58	21.58
3	8	7		22.13	21.55	21.53
3	15	0		21.65	21.50	21.49
3	1	0	16-QAM	21.56	21.72	21.95
3	1	7		21.72	21.81	22.10
3	1	14		21.57	21.63	22.01
3	8	0		20.61	20.48	20.59
3	8	4		20.62	20.51	20.68
3	8	7		20.60	20.49	20.65
3	15	0		20.57	20.45	20.50

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.98	22.48	22.42
5	1	12		22.68	22.59	22.62
5	1	24		22.52	22.44	22.55
5	12	0		21.60	21.49	21.55
5	12	6		21.58	21.54	21.51
5	12	11		21.57	21.51	21.49
5	25	0		21.55	21.49	21.52
5	1	0	16-QAM	21.57	21.69	21.21
5	1	12		21.65	21.77	21.40
5	1	24		21.56	21.64	21.36
5	12	0		20.49	20.51	20.50
5	12	6		20.55	20.58	20.48
5	12	11		20.57	20.50	20.49
5	25	0		20.52	20.45	20.51
10	1	0	QPSK	23.10	22.58	22.59
10	1	24		22.72	22.69	22.63
10	1	49		22.59	22.52	22.60
10	25	0		21.56	21.50	21.50
10	25	12		21.60	21.57	21.53
10	25	24		21.66	21.51	21.45
10	50	0		21.62	21.51	21.48
10	1	0	16-QAM	21.61	21.73	22.06
10	1	24		21.67	21.80	21.97
10	1	49		21.52	21.62	22.04
10	25	0		20.61	20.44	20.49
10	25	12		20.67	20.54	20.52
10	25	24		20.71	20.46	20.41
10	50	0		20.59	20.49	20.44

LTE Band 17 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	23.08	22.94	22.48
5	1	12		23.12	23.03	22.66
5	1	24		22.98	22.96	22.56
5	12	0		22.02	21.66	21.55
5	12	6		22.10	21.77	21.57
5	12	11		22.11	21.46	21.50
5	25	0		22.06	21.47	21.54
5	1	0	16-QAM	22.15	21.71	21.25
5	1	12		22.19	21.73	21.43
5	1	24		22.07	21.67	21.34
5	12	0		20.97	20.49	20.48
5	12	6		21.05	20.51	20.53
5	12	11		21.02	20.42	20.46
5	25	0		21.00	20.40	20.52
10	1	0	QPSK	23.10	22.59	22.55
10	1	24		23.26	22.66	22.64
10	1	49		22.74	22.58	22.59
10	25	0		21.49	21.51	21.51
10	25	12		21.57	21.53	21.55
10	25	24		21.46	21.46	21.47
10	50	0		21.49	21.49	21.49
10	1	0	16-QAM	21.57	21.72	22.03
10	1	24		21.67	21.84	22.10
10	1	49		21.53	21.69	22.04
10	25	0		20.54	20.46	20.49
10	25	12		20.58	20.46	20.53
10	25	24		20.50	20.39	20.48
10	50	0		20.46	20.43	20.44

LTE Band 66 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	22.16	22.12	21.71
1.4	1	2		22.28	22.25	21.81
1.4	1	5		22.17	22.11	21.69
1.4	3	0		22.18	22.25	21.66
1.4	3	1		22.23	22.27	21.72
1.4	3	2		22.22	22.24	21.65
1.4	6	0		20.84	21.29	20.77
1.4	1	0	16-QAM	20.64	21.18	20.65
1.4	1	2		20.78	21.26	20.74
1.4	1	5		20.69	21.17	20.67
1.4	3	0		20.77	21.27	20.71
1.4	3	1		20.80	20.99	20.74
1.4	3	2		20.76	20.95	20.72
1.4	6	0		19.63	19.77	19.64
3	1	0	QPSK	22.25	21.74	21.72
3	1	7		21.86	21.90	21.81
3	1	14		21.74	21.74	21.65
3	8	0		20.77	20.77	20.68
3	8	4		20.78	20.79	20.74
3	8	7		20.77	20.75	20.72
3	15	0		20.71	20.74	20.66
3	1	0	16-QAM	20.73	20.88	21.18
3	1	7		20.87	21.03	21.29
3	1	14		20.70	20.86	21.16
3	8	0		19.76	19.74	19.75
3	8	4		19.77	19.74	19.81
3	8	7		19.75	19.65	19.79
3	15	0		19.70	19.67	19.63

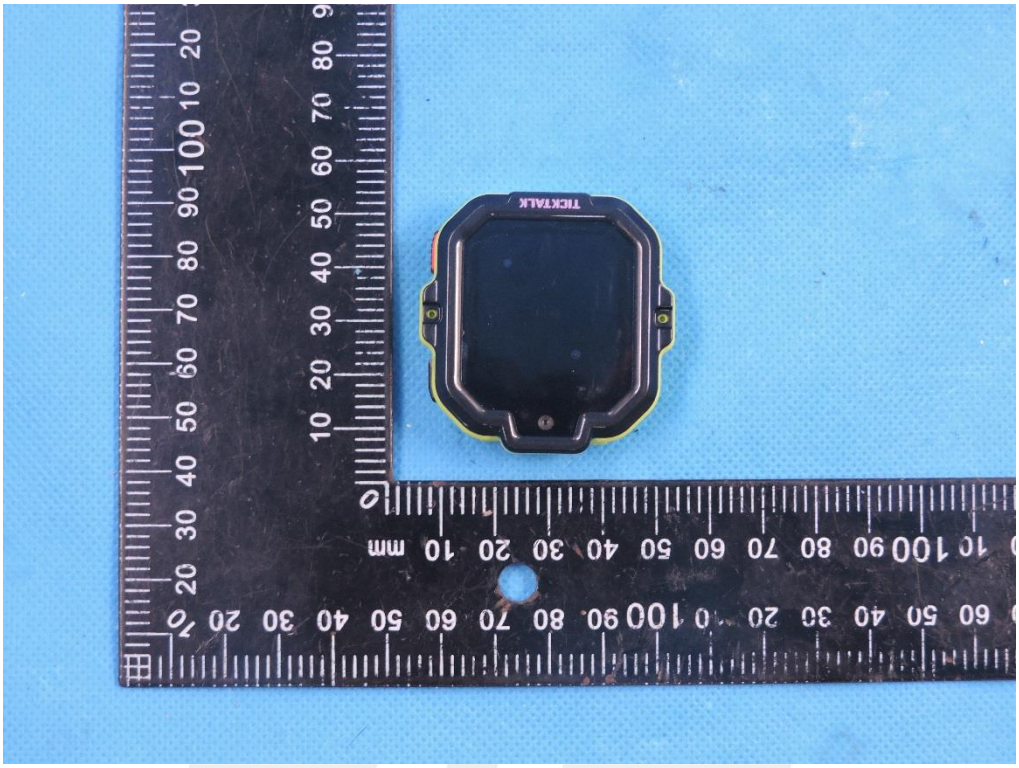
LTE Band 66 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.12	22.13	21.63
5	1	12		22.26	21.82	21.71
5	1	24		22.16	21.65	21.61
5	12	0		21.18	20.70	20.64
5	12	6		21.26	20.77	20.71
5	12	11		21.18	20.69	20.69
5	25	0		21.20	20.69	20.65
5	1	0	16-QAM	21.01	20.77	20.84
5	1	12		21.12	20.89	20.94
5	1	24		20.98	20.76	20.81
5	12	0		20.00	19.69	19.60
5	12	6		20.12	19.76	19.68
5	12	11		19.79	19.65	19.65
5	25	0		19.67	19.69	19.57
10	1	0	QPSK	22.19	22.23	21.77
10	1	24		22.39	22.25	21.85
10	1	49		22.24	22.21	21.72
10	25	0		21.27	21.30	20.72
10	25	12		21.27	21.30	20.76
10	25	24		21.25	21.20	20.80
10	50	0		21.23	21.22	20.72
10	1	0	16-QAM	21.38	21.72	20.74
10	1	24		21.53	21.75	20.84
10	1	49		21.39	21.53	20.64
10	25	0		20.25	20.05	19.70
10	25	12		20.24	20.29	19.75
10	25	24		20.10	20.05	19.79
10	50	0		19.89	20.22	19.67

LTE Band 66 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	22.18	21.75	21.73
15	1	37		21.80	21.79	21.72
15	1	74		21.66	21.64	21.57
15	36	0		20.82	20.88	20.81
15	36	18		20.84	20.85	20.82
15	36	39		20.85	20.71	20.82
15	75	0		20.86	20.86	20.82
15	1	0	16-QAM	21.02	20.84	21.22
15	1	38		21.10	20.90	21.24
15	1	75		20.91	20.77	21.05
15	36	0		19.78	19.83	19.78
15	36	18		19.77	19.83	19.78
15	36	39		19.76	19.70	19.81
15	75	0		19.75	19.77	19.75
20	1	0	QPSK	21.55	21.63	21.58
20	1	49		21.95	21.96	21.82
20	1	99		21.55	21.55	21.43
20	50	0		20.80	20.88	20.77
20	50	24		20.80	20.82	20.75
20	50	49		20.80	20.61	20.80
20	100	0		20.82	20.76	20.77
20	1	0	16-QAM	21.04	20.76	20.80
20	1	49		21.40	21.05	21.07
20	1	99		20.99	20.72	20.67
20	50	0		19.71	19.88	19.70
20	50	24		19.74	19.73	19.70
20	50	49		19.70	19.55	19.71
20	100	0		19.77	19.75	19.69

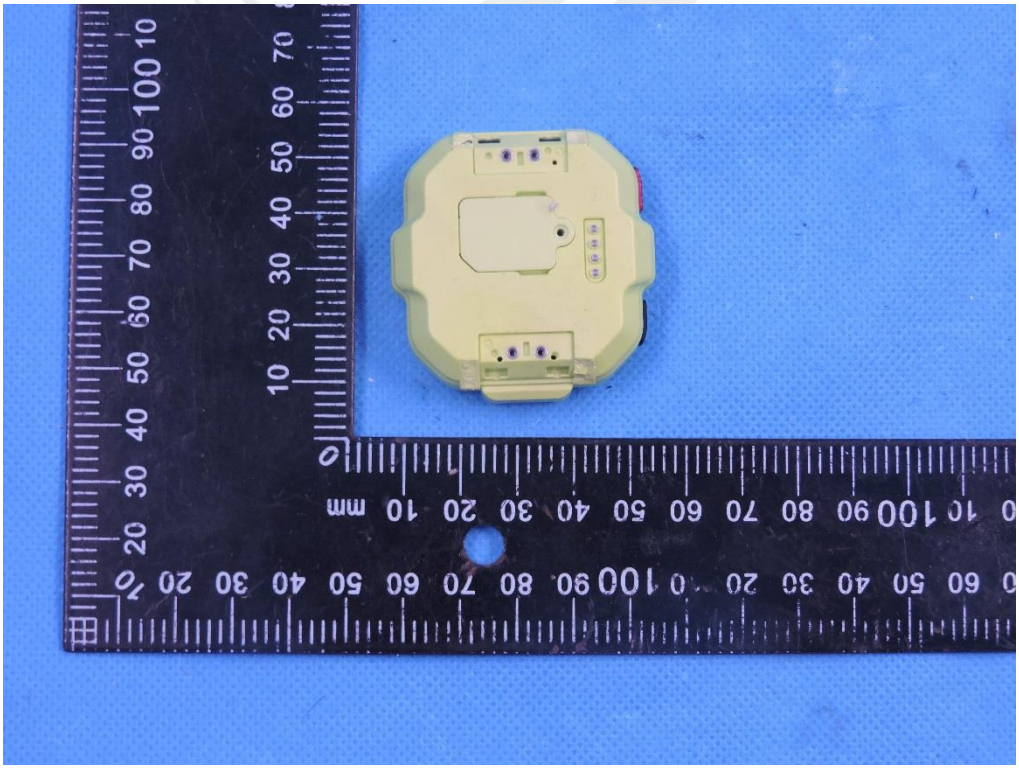
10. EUT And Test Setup Photo

10.1 EUT Photo

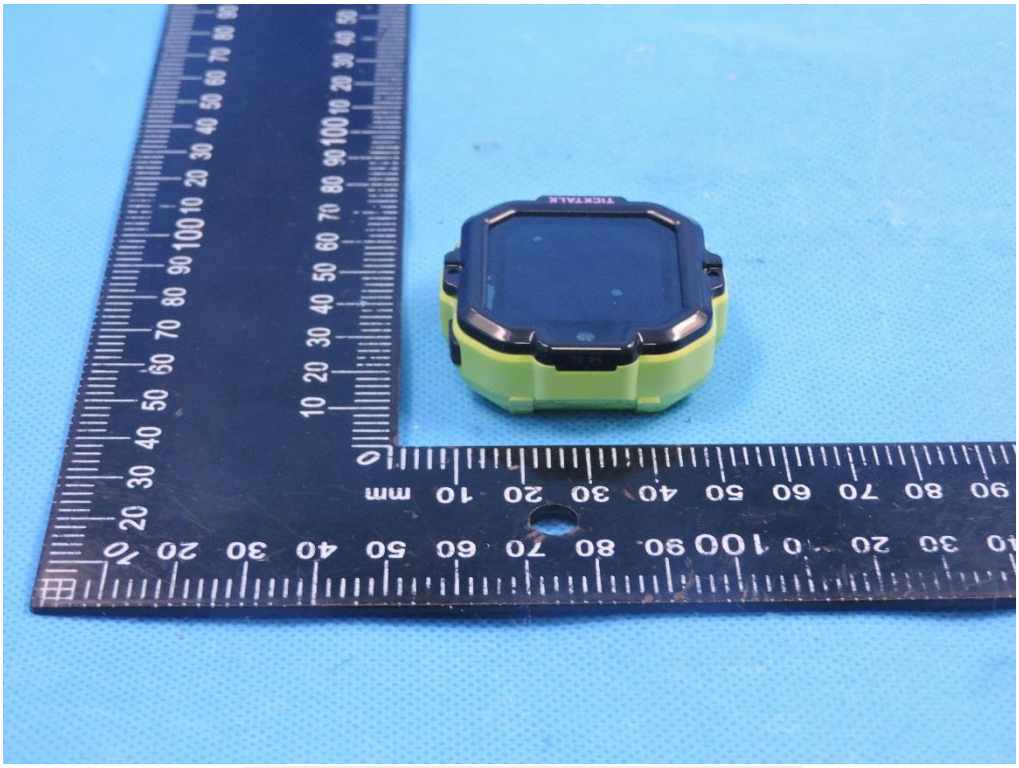
Front side



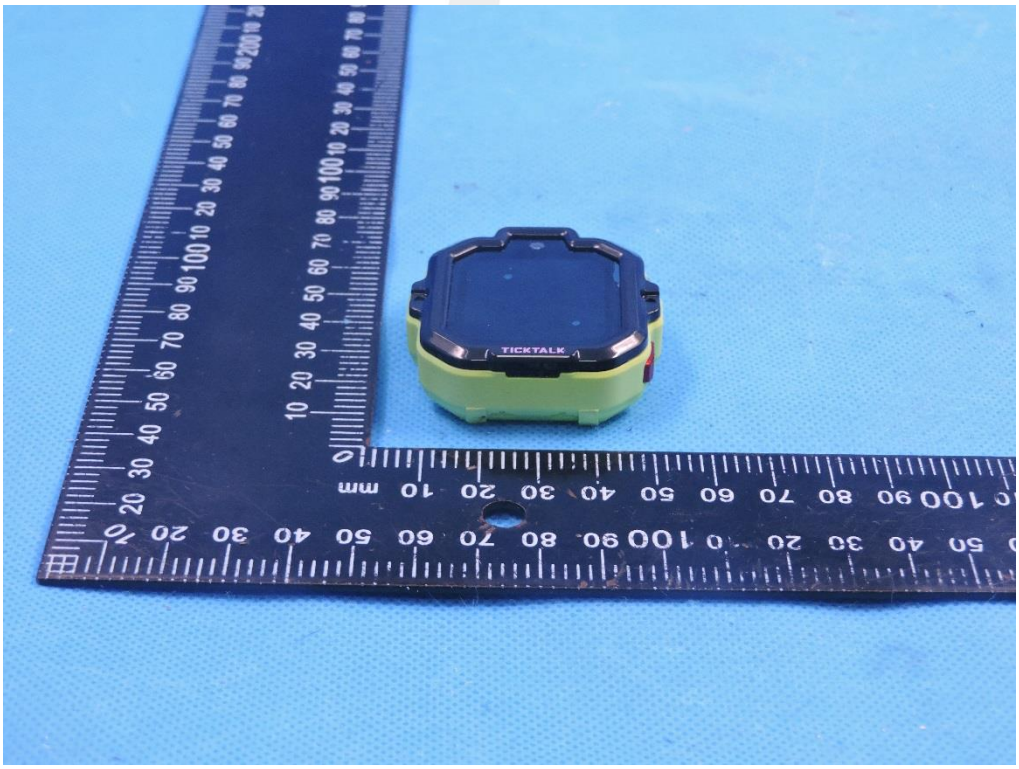
Back side



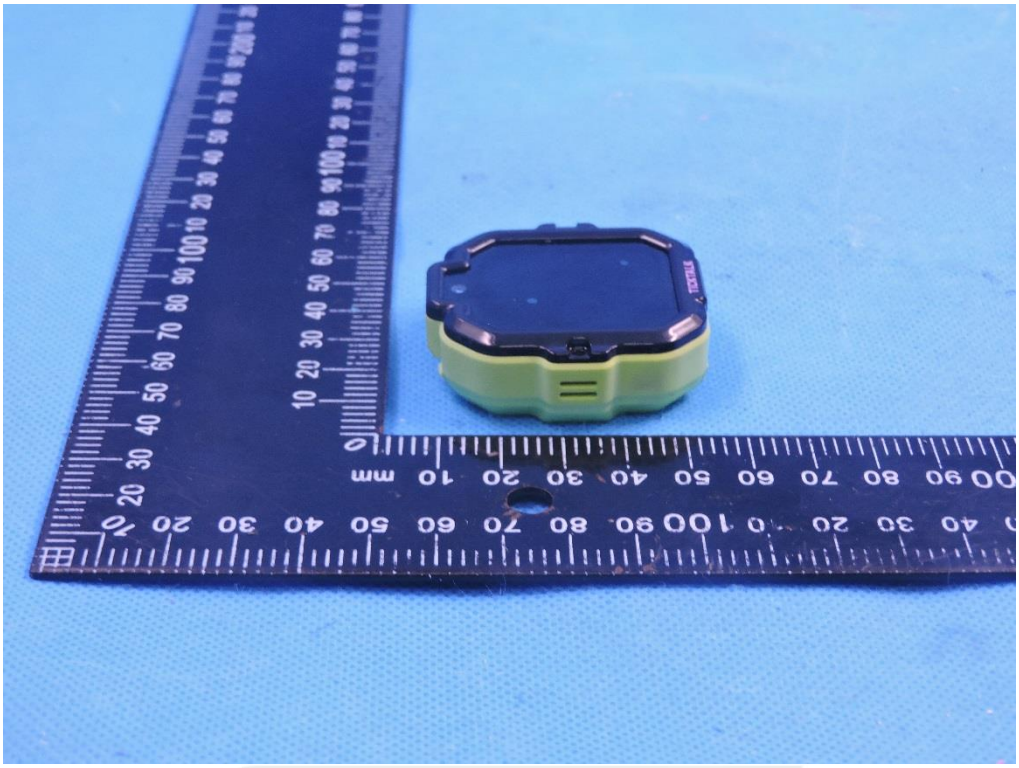
Top Edge



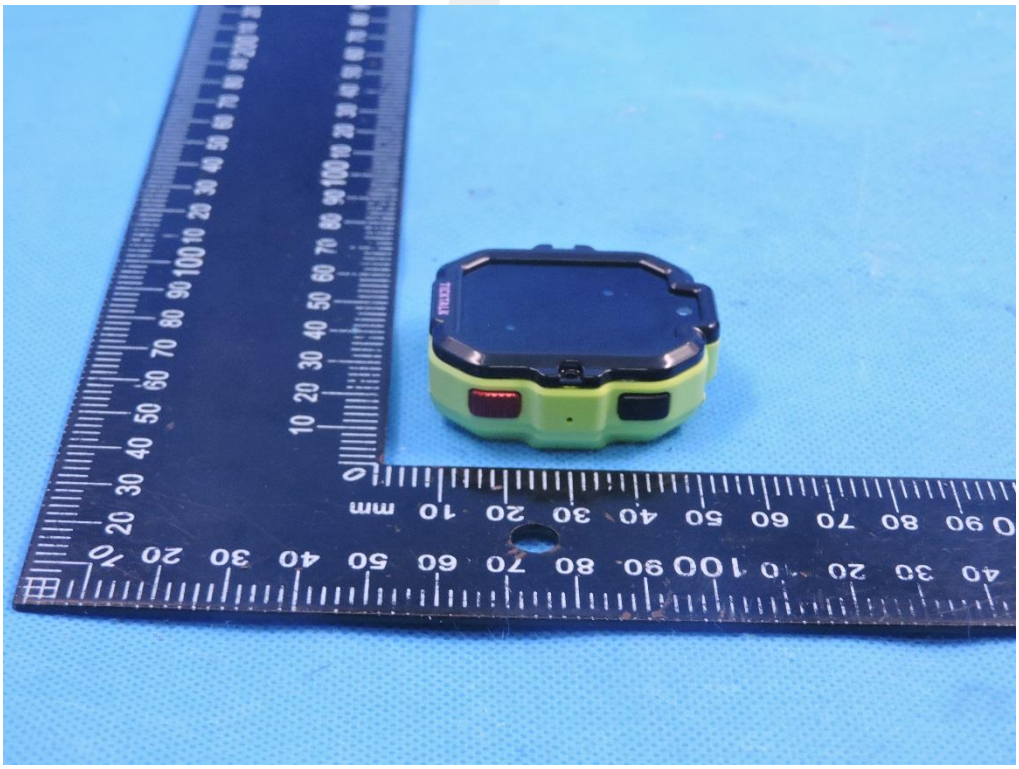
Bottom Edge



Left Edge



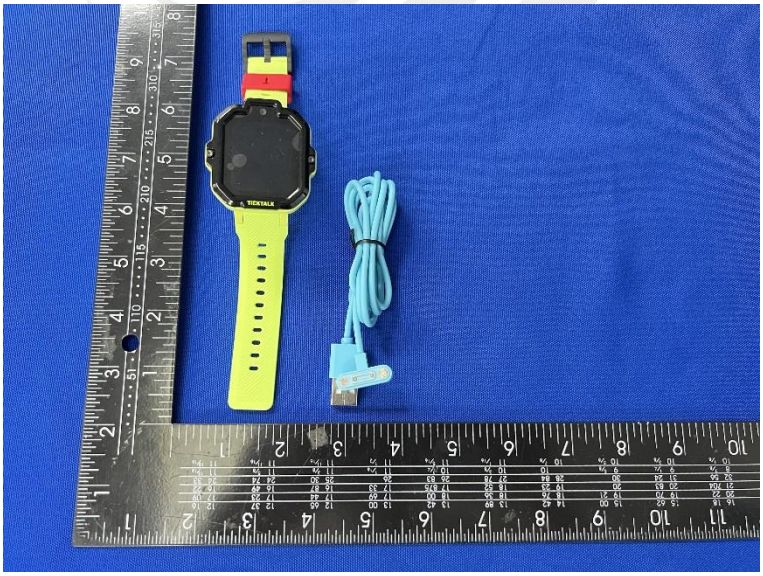
Right Edge



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

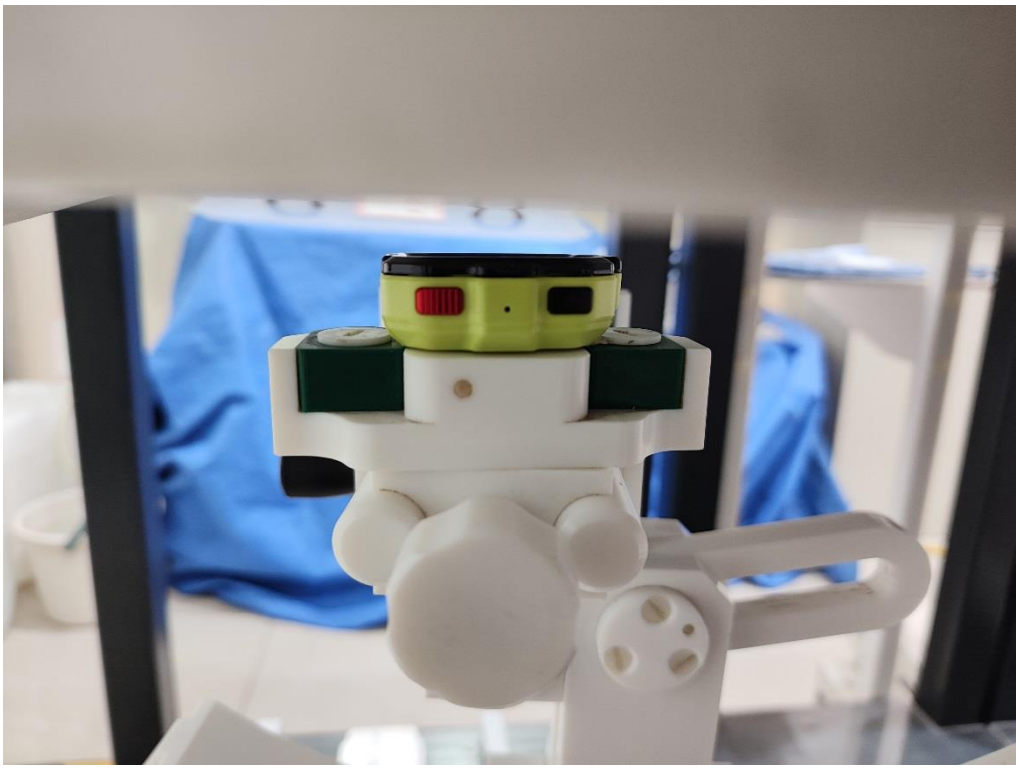
Front side TickTalk 5 Kids Smartwatch

Front side TickTalk 5 Kids Smartwatch

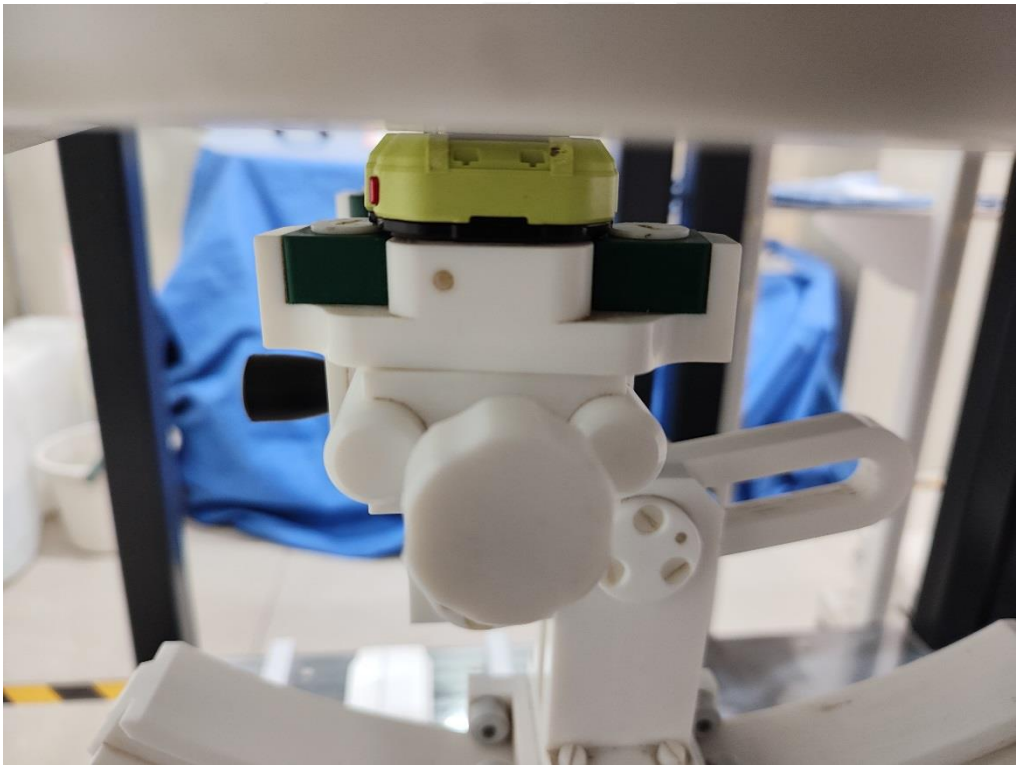


10.2 Setup Photo

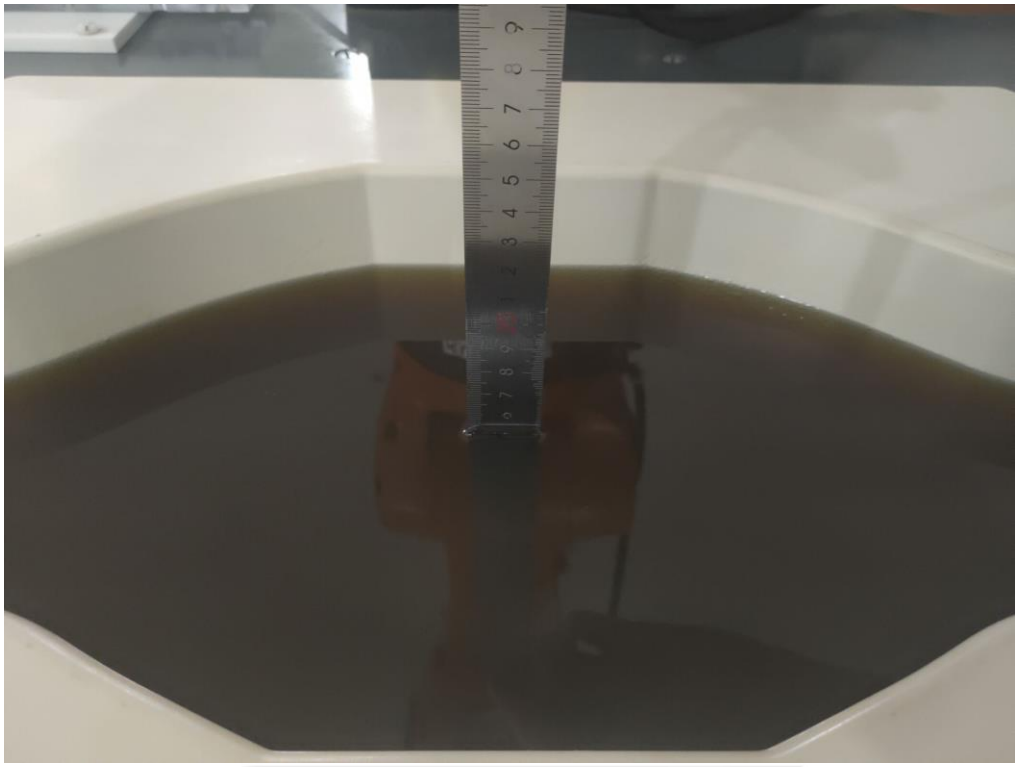
Front of face(separation distance is 10mm)



Wrist(separation distance is 0mm)



Liquid depth (15 cm)



11. SAR Result Summary

11.1 Front of face 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.
WCDMA Band 2	HSDPA	Front of face	1852.4	0.029	3.44	20.50	20.28	**0.031**	**1**
WCDMA Band 4	HSDPA	Front of face	1752.6	0.023	-2.43	20.50	20.30	**0.024**	**3**
WCDMA Band 5	HSDPA	Front of face	826.4	0.053	-2.75	20.50	20.19	**0.057**	**5**
2.4GHz WLAN	802.11b	Front of face	2412	0.136	-3.10	15.50	14.18	0.184	/
		Front of face	2437	0.247	-0.88	15.50	15.05	**0.274**	**7**
		Front of face	2462	0.142	-0.17	15.50	13.74	0.213	/

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	49	Front of face	1860	0.024	-2.90	23	22.69	**0.026**	**9**
			50	24	Front of face	1860	0.022	3.87	22	21.61	0.024	/
LTE Band 4	20M	QPSK	1	49	Front of face	1745	0.196	-0.60	23	22.74	**0.208**	**11**
			50	0	Front of face	1745	0.165	-1.47	22	21.71	0.176	/
LTE Band 5	10M	QPSK	1	24	Front of face	829	0.243	-3.58	22.5	22	**0.273**	**13**
			25	0	Front of face	829	0.202	-0.73	21	20.88	0.208	/
LTE Band 7	10M	QPSK	1	49	Front of face	2560	0.034	-3.52	22	21.52	**0.038**	**15**
			50	24	Front of face	2510	0.016	-3.53	20.5	20.41	0.016	/
LTE Band 12	10M	QPSK	1	0	Front of face	704	0.120	-2.39	23.5	23.1	**0.132**	**17**
			25	24	Front of face	704	0.085	-2.62	22	21.66	0.092	/
LTE Band 17	10M	QPSK	1	0	Front of face	709	0.230	1.14	23.5	23.26	**0.243**	**19**
			25	0	Front of face	709	0.165	2.85	22	21.57	0.182	/
LTE Band 66	20M	QPSK	1	0	Front of face	1755	0.054	0.88	22	21.96	**0.054**	**21**
			50	0	Front of face	1755	0.023	-1.32	21	20.88	0.024	/

Note:

1. The test separation of all above table is 10mm.
2. Per KDB865664 D01, Repeated measurement is not required when the original highest measured SAR is <0.80 W/kg

11.2 Wrist SAR

Band	Model	Test Position	Freq.	SAR (10g) (W/kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
WCDMA Band 2	HSDPA	Wrist	1852.4	0.215	1.47	20.50	20.28	**0.226**	**2**
WCDMA Band 4	HSDPA	Wrist	1752.6	0.241	2.68	20.50	20.30	**0.252**	**4**
WCDMA Band 5	HSDPA	Wrist	826.4	0.339	1.74	20.50	20.19	**0.364**	**6**
2.4GHz WLAN	802.11b	Wrist	2437	0.343	2.39	15.50	15.05	**0.380**	**8**

Band	BW (MHz)	Mod.	RB Size	RB offset	Test Position	Freq.	Result 10g (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	49	Wrist	1860	0.117	1.25	23	22.69	**0.126**	**10**
			50	24	Wrist	1860	0.099	2.83	22	21.61	0.108	/
LTE Band 4	20M	QPSK	1	49	Wrist	1720	0.421	1.74	23	22.73	0.448	**/**
			1	49	Wrist	1732.5	0.442	-3.95	23	22.72	0.471	**/**
			1	49	Wrist	1745	0.492	-1.44	23	22.74	**0.522**	**12**
			50	0	Wrist	1745	0.369	-0.35	22	21.71	0.394	/
LTE Band 5	10M	QPSK	1	24	Wrist	829	0.285	2.86	22.5	22	**0.320**	**14**
			25	0	Wrist	829	0.254	2.77	21	20.88	0.261	/
LTE Band 7	10M	QPSK	1	49	Wrist	2560	0.214	-3.58	22	21.52	**0.239**	**16**
			50	24	Wrist	2510	0.195	0.20	20.5	20.41	0.199	/
LTE Band 12	10M	QPSK	1	0	Wrist	704	0.414	1.94	23.5	23.1	**0.454**	**18**
			25	24	Wrist	704	0.325	1.07	22	21.66	0.351	/
LTE Band 17	10M	QPSK	1	0	Wrist	709	0.432	-1.96	23.5	23.26	**0.457**	**20**
			25	0	Wrist	709	0.269	2.66	22	21.57	0.297	/
LTE Band 66	20M	QPSK	1	0	Wrist	1755	0.186	-3.55	22	21.96	**0.188**	**22**
			50	0	Wrist	1755	0.156	-0.67	21	20.88	0.160	/

Note:

3. The test separation of all above table is 0mm.
4. Per KDB865664 D01, Repeated measurement is not required when the original highest measured SAR is <2.00 W/kg

Simultaneous Multi-band Transmission Evaluation:

Application Simultaneous Transmission information:

Position	Simultaneous State
Front to face	1. GSM +2.4G WLAN
	2. GSM + BLE
	3. WCDMA +2.4G WLAN
	4. WCDMA +BLE
	5. LTE + 2.4G WLAN
	6. LTE + BLE
Wrist	1. GSM +2.4G WLAN
	2. GSM + BLE
	3. WCDMA +2.4G WLAN
	4. WCDMA +BLE
	5. LTE + 2.4G WLAN
	6. LTE + BLE

NOTE:

1. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
2. The reported SAR summation is calculated based on the same configuration and test position.
3. 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 · Pant / Pth [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).

Estimated SAR		Antenna to user(cm)	Pant	Pth	Stand Alone SAR(1g) [W/kg]
BLE	Body	≤0.5	1	2.75	0.582
	Wrist	≤0.5	1	2.75	1.455

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

Simultaneous Mode	Position	Mode	Max. SAR (W/kg)	1-g Sum SAR (W/kg)
WCDMA + 2.4G WLAN	Body	WCDMA	0.057	0.331
		2.4G WLAN	0.274	
	Wrist	WCDMA	0.364	0.745
		2.4G WLAN	0.380	
WCDMA + Bluetooth	Body	WCDMA	0.057	0.639
		Bluetooth	0.582	
	Wrist	WCDMA	0.364	1.819
		Bluetooth	1.455	
LTE + 2.4G WLAN	Body	LTE	0.273	0.547
		2.4G WLAN	0.274	
	Wrist	LTE	0.522	0.903
		2.4G WLAN	0.380	
LTE + Bluetooth	Body	LTE	0.273	0.854
		Bluetooth	0.582	
	Wrist	LTE	0.522	1.977
		Bluetooth	1.455	

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.

12. 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
2450MHz Dipole	MVG	SID2450	SN 30/14 DIP2G450-335	2020.07.14	2023.07.13
2600MHz Dipole	MVG	SID2600	SN 30/14 DIP2G600-336	2020.07.14	2023.07.13
E-Field Probe	MVG	SSE2	SN 07/21 EPGO352	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 Calibration Accessories	PNA	ZVL6	N/A	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

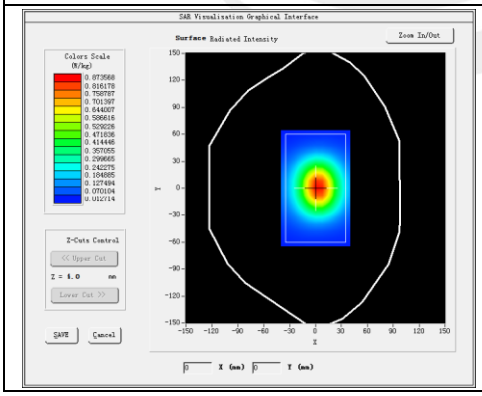
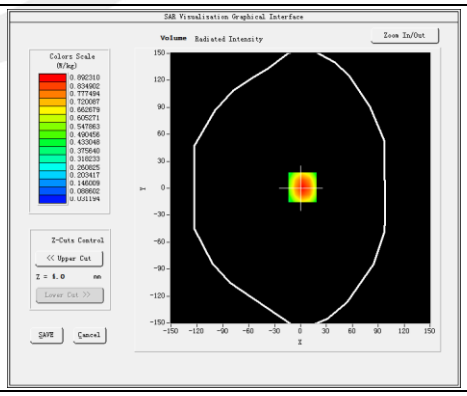
Appendix A. System Validation Plots

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: 2023-05-30

Experimental conditions

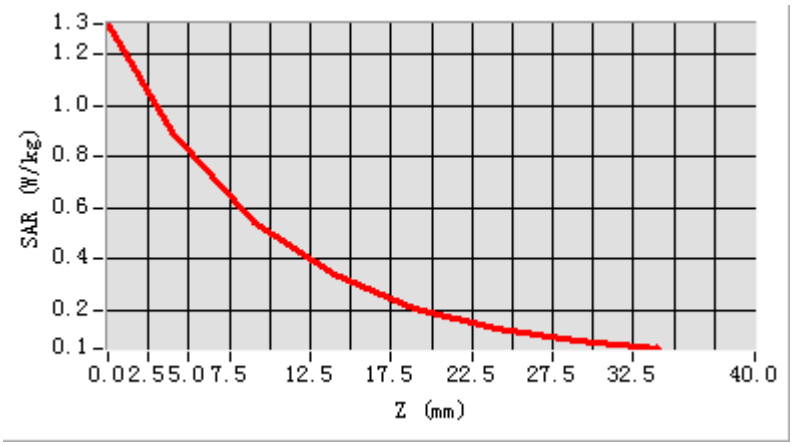
Phantom	Validation plane
Device Position	-
Band	750MHz
Channels	-
Signal	CW
Frequency (MHz)	750MHz
Relative permittivity	42.06
Conductivity (S/m)	0.88
Probe	SN 07/21 EPGO352
ConvF	1.58
Crest factor	1:1

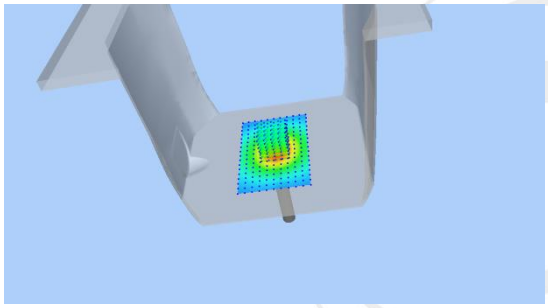
SURFACE SAR	VOLUME SAR
	

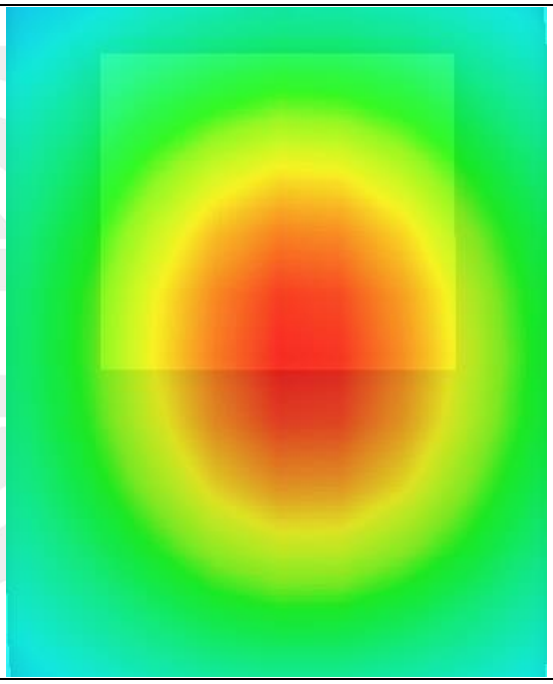
Maximum location: X=2.00, Y=1.00

SAR 10g (W/Kg)	0.531374
SAR 1g (W/Kg)	0.871897

Z Axis Scan


1.3
1.2
1.0
0.8
0.6
0.4
0.2
0.1
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)



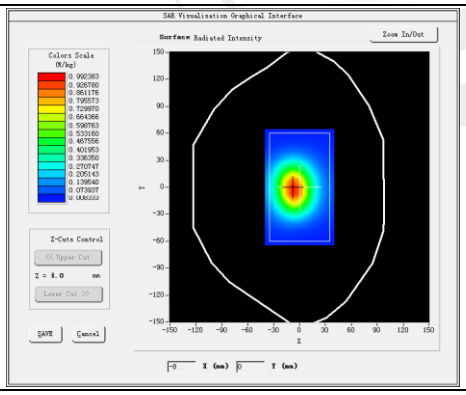
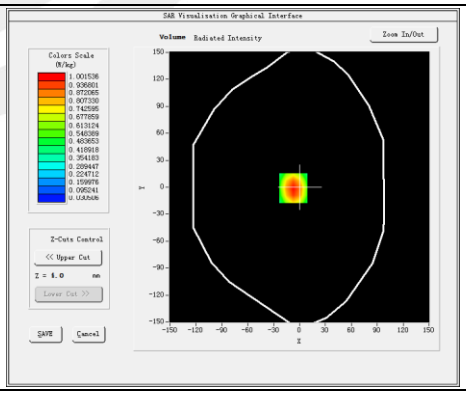


System Performance Check Data (835MHz)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2023-05-31

Experimental conditions

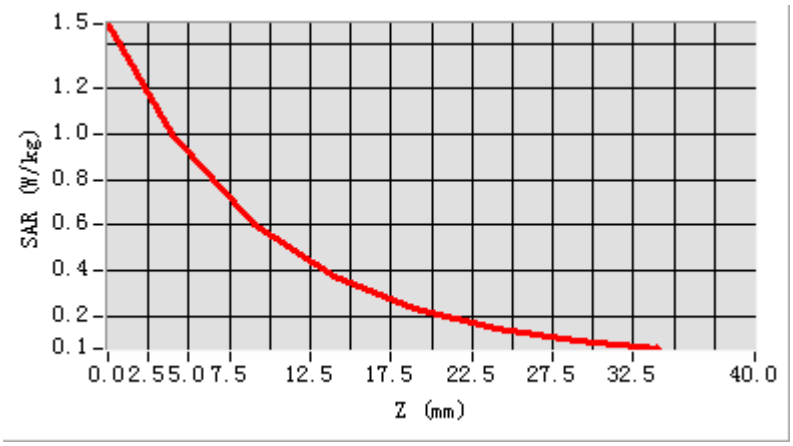
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	41.77
Conductivity (S/m)	0.93
Probe	SN 07/21 EPGO352
ConvF:	1.57
Crest factor:	1:1

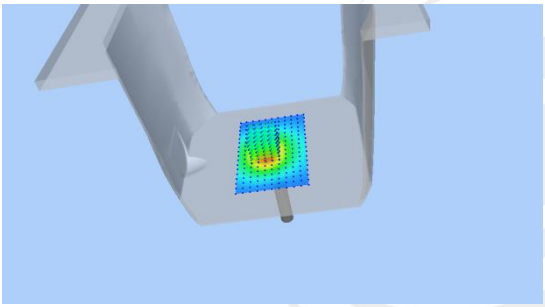
SURFACE SAR	VOLUME SAR
	

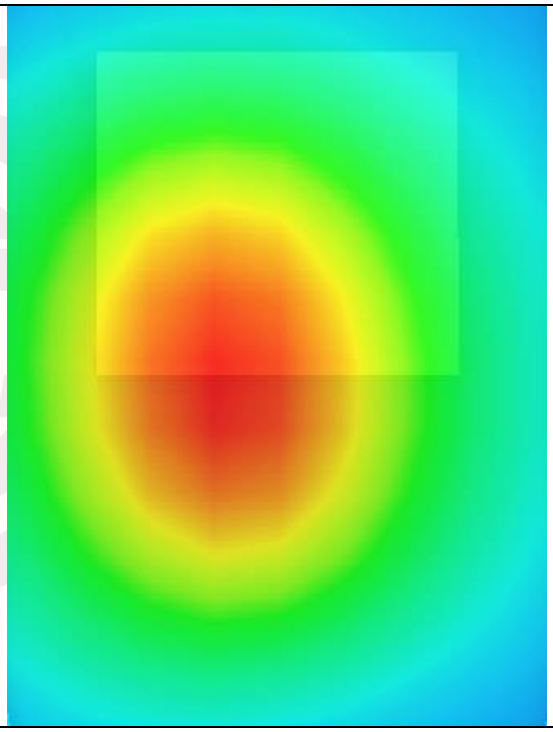
Maximum location: X=-7.00, Y=-1.00

SAR 10g (W/Kg)	0.604135
SAR 1g (W/Kg)	0.933804

Z Axis Scan


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



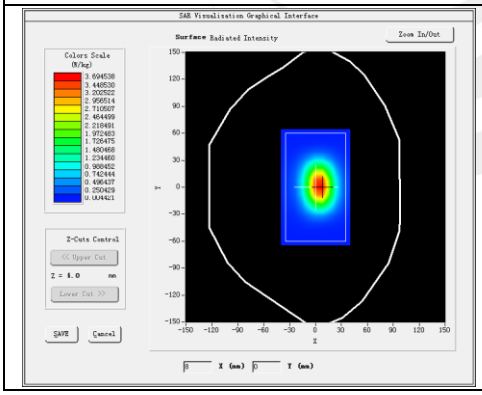
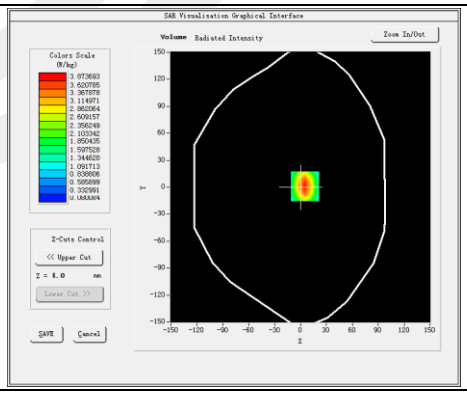


System Performance Check Data (1800MHz)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2023-06-02

Experimental conditions.

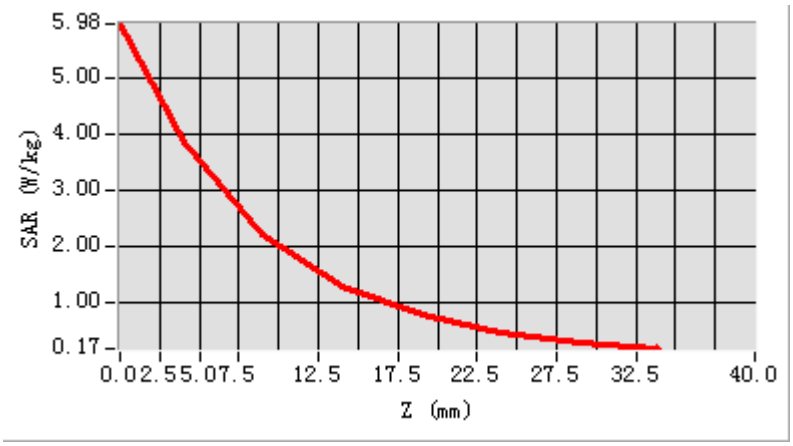
Phantom	Validation plane
Device Position	-
Band	1800MHz
Channels	-
Signal	CW
Frequency (MHz)	1800MHz
Relative permittivity	40.32
Conductivity (S/m)	1.39
Probe	SN 07/21 EPGO352
ConvF	1.60
Crest factor:	1:1

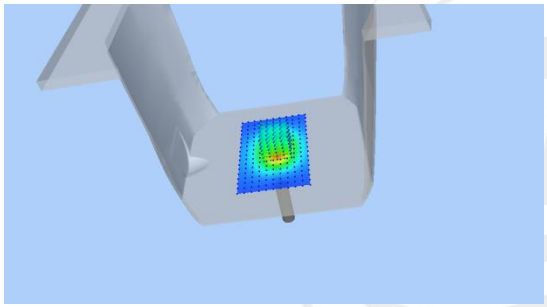
SURFACE SAR	VOLUME SAR
	

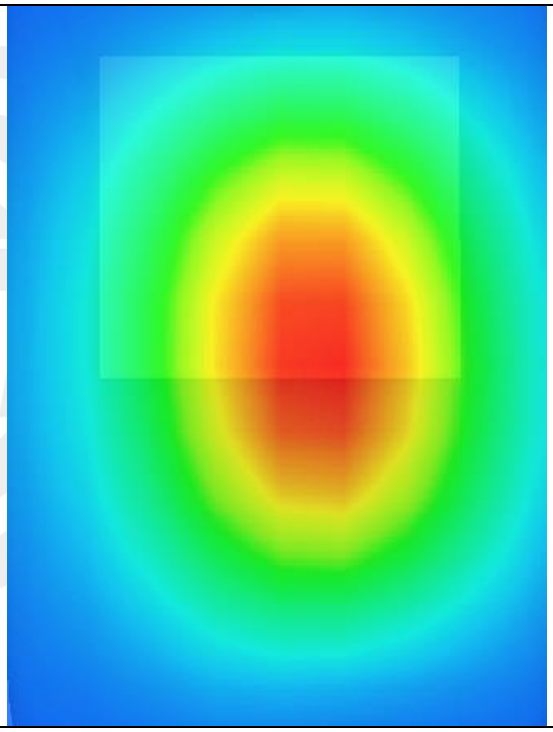
Maximum location: X=5.00, Y=1.00

SAR 10g (W/Kg)	1.886369
SAR 1g (W/Kg)	3.997746

Z Axis Scan


5.98
5.00
4.00
3.00
2.00
1.00
0.17
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)





System Performance Check Data (2450MHz)

Type: Phone measurement (Complete)

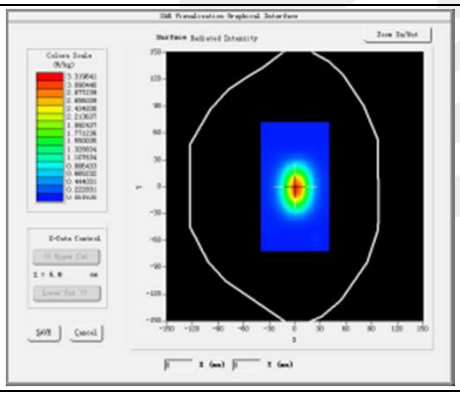
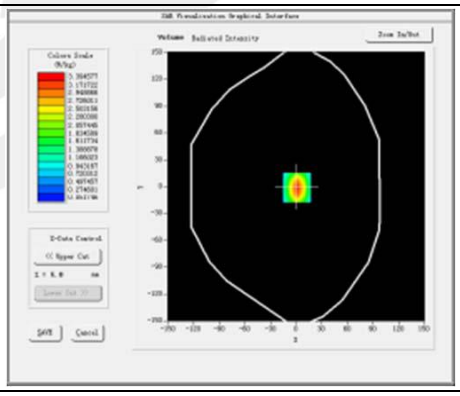
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement: 2023-06-06

Experimental conditions.

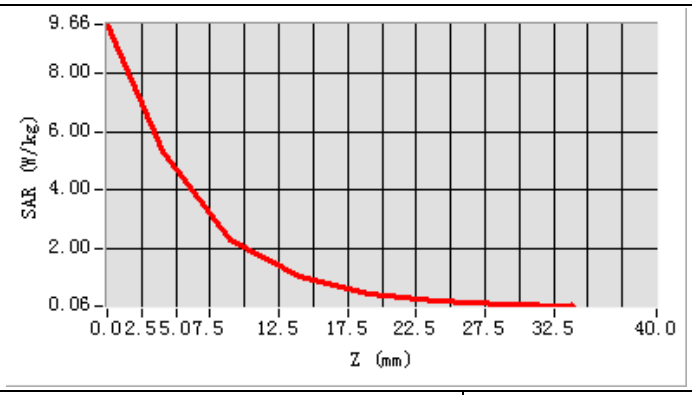
Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	40.14
Conductivity (S/m)	1.86
Probe	SN 07/21 EPGO352
ConvF	1.75
Crest factor:	1:1

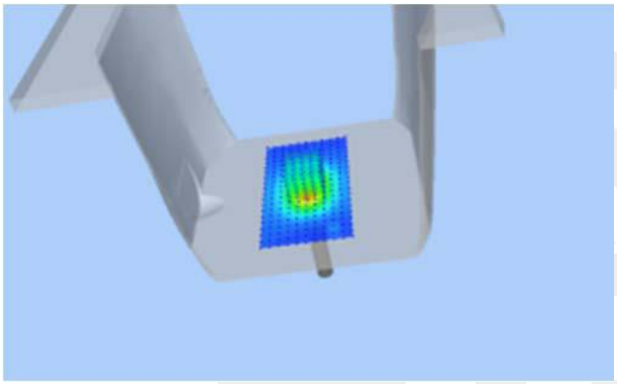
SURFACE SAR	VOLUME SAR
	

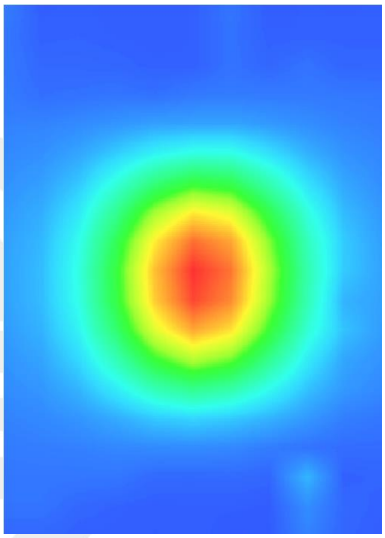
Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	2.301326
SAR 1g (W/Kg)	5.380691

Z Axis Scan


9.66
8.00
6.00
4.00
2.00
0.06
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)



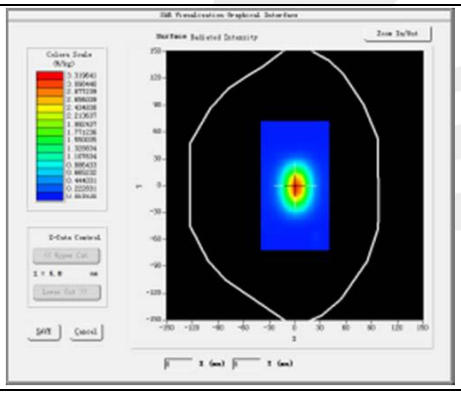
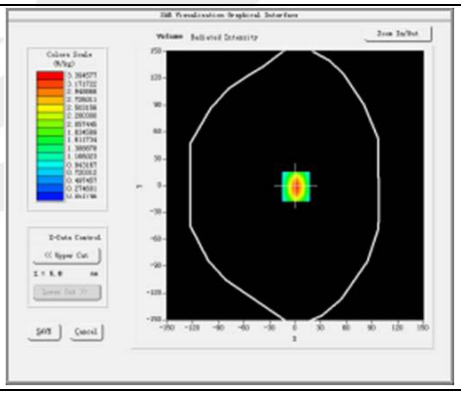


System Performance Check Data (2600MHz)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2023-06-07

Experimental conditions.

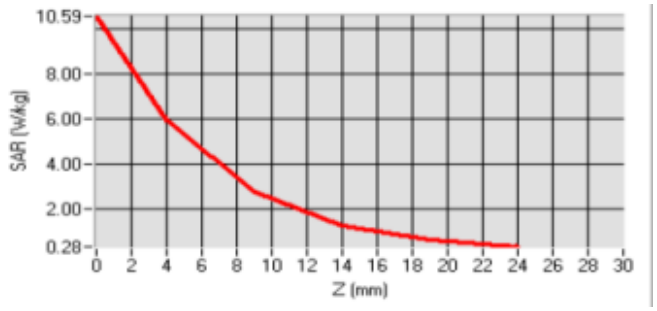
Device Position	Validation plane
Band	2600 MHz
Channels	-
Signal	CW
Frequency (MHz)	2600
Relative permittivity	39.98
Conductivity (S/m)	2.00
Probe	SN 07/21 EPGO352
ConvF	1.63
Crest factor:	1:1

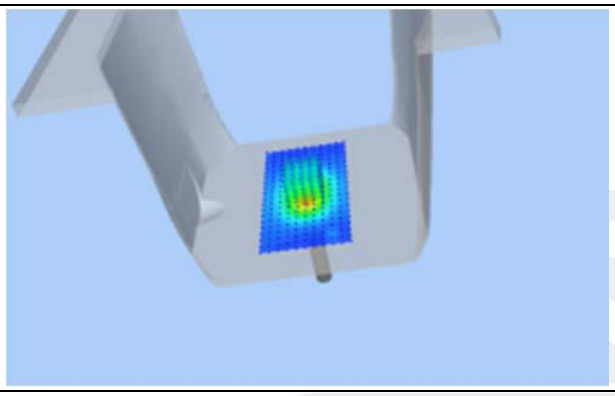
SURFACE SAR	VOLUME SAR
	

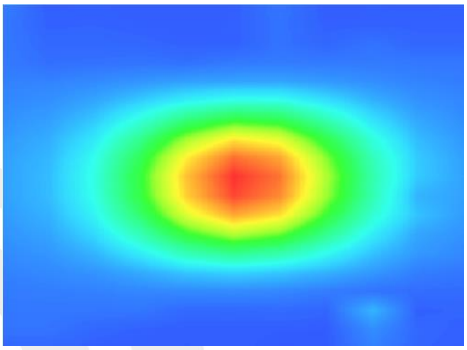
Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	2.401755
SAR 1g (W/Kg)	5.656818

Z Axis Scan


10.59
8.00
6.00
4.00
2.00
0.28
SAR (W/kg)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Z (mm)





Appendix B. SAR Test Plots

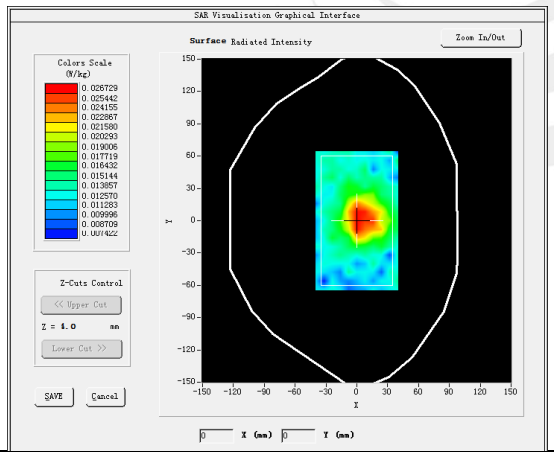
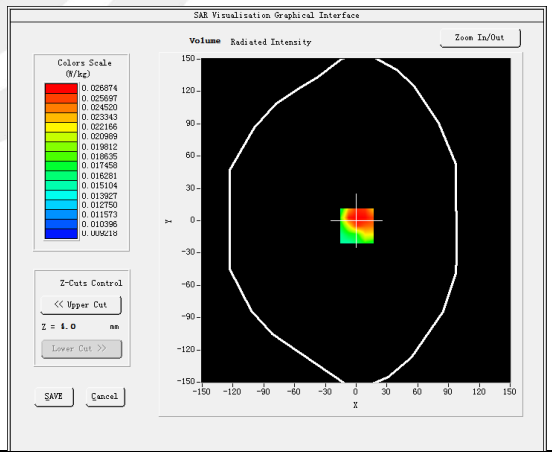
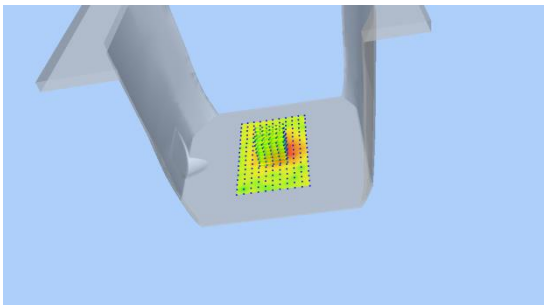
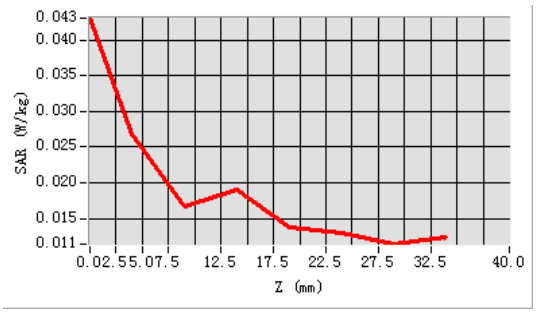
Plot 1: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.78
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	Front of face
Band	WCDMA II
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1852.4
Relative permittivity (real part)	41.27
Conductivity (S/m)	1.45

Maximum location: X=1.00, Y=-5.00

SAR Peak: 0.05 W/kg

SAR 10g (W/Kg)	0.020726
SAR 1g (W/Kg)	0.029430

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

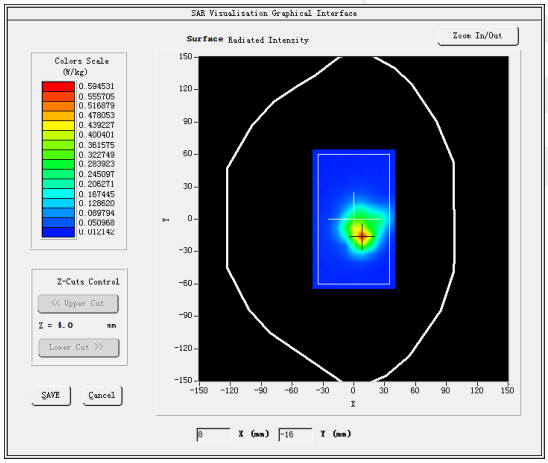
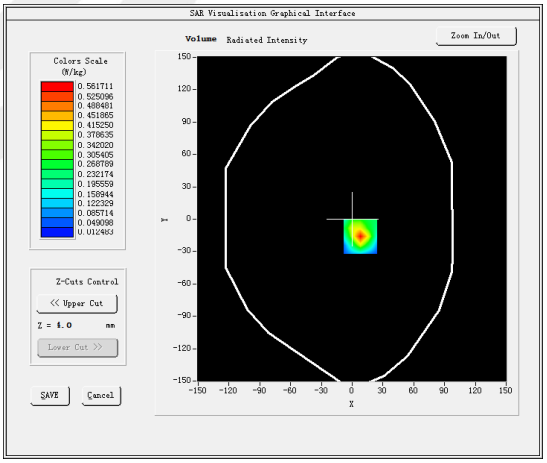
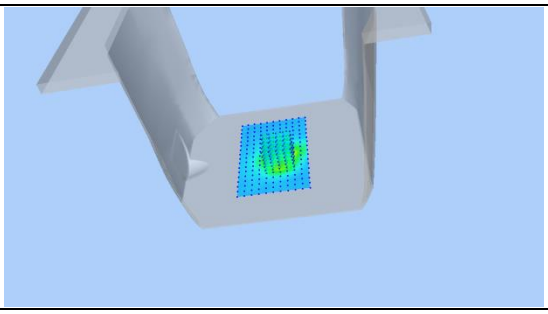
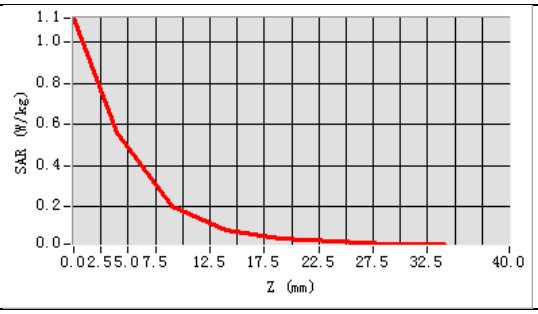
Plot 2: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.78
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	Wrist
Band	WCDMA II
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1852.4
Relative permittivity (real part)	41.27
Conductivity (S/m)	1.45

Maximum location: X=8.00, Y=-16.00

SAR Peak: 1.10 W/kg

SAR 10g (W/Kg)	0.214288
SAR 1g (W/Kg)	0.515933

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

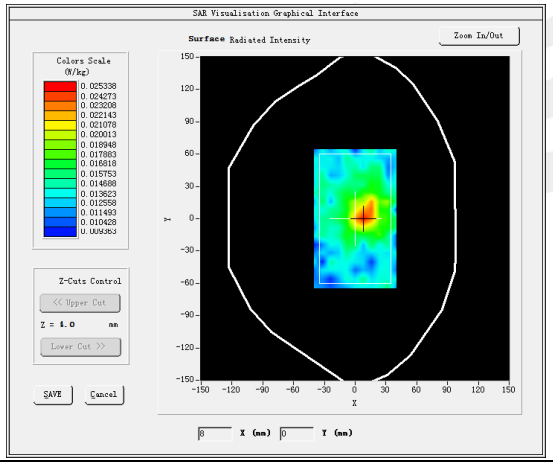
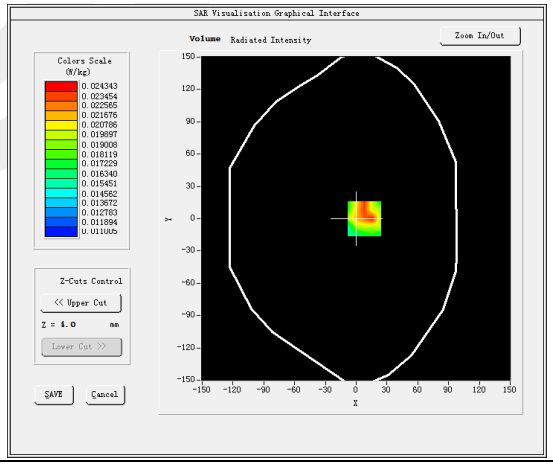
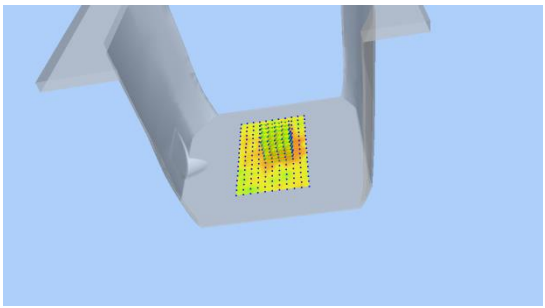
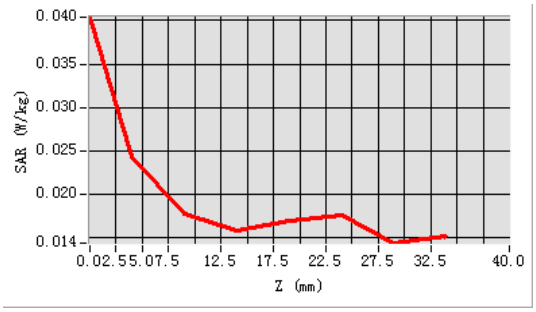
Plot 3: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.60
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	Front of face
Band	WCDMA IV
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1752.6
Relative permittivity (real part)	41.29
Conductivity (S/m)	1.36

Maximum location: X=8.00, Y=0.00

SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.019059
SAR 1g (W/Kg)	0.023485

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

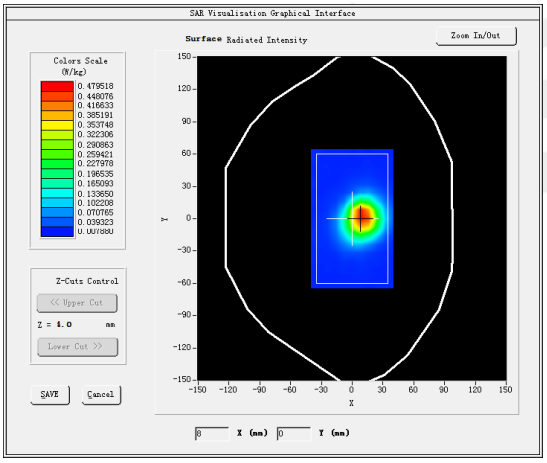
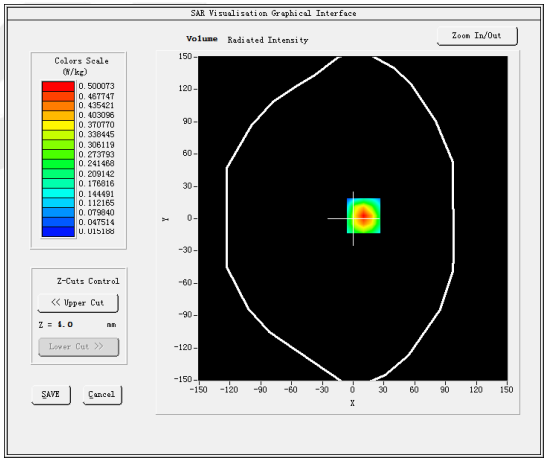
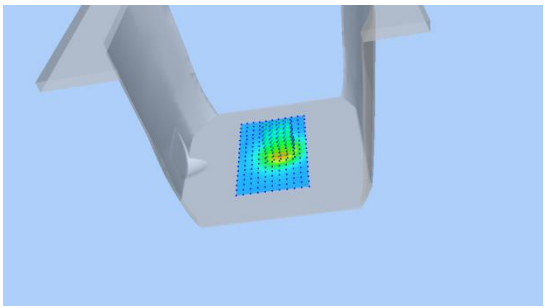
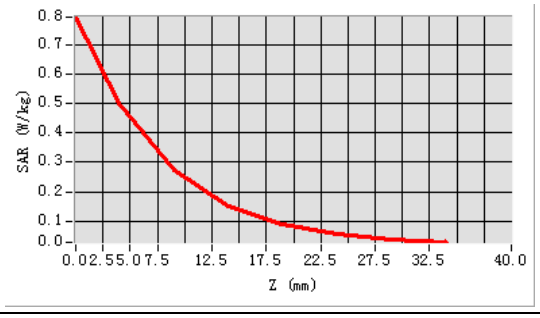
Plot 4: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.60
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	Wrist
Band	WCDMA IV
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1752.6
Relative permittivity (real part)	41.29
Conductivity (S/m)	1.36

Maximum location: X=10.00, Y=3.00

SAR Peak: 0.88 W/kg

SAR 10g (W/Kg)	0.241408
SAR 1g (W/Kg)	0.476304

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

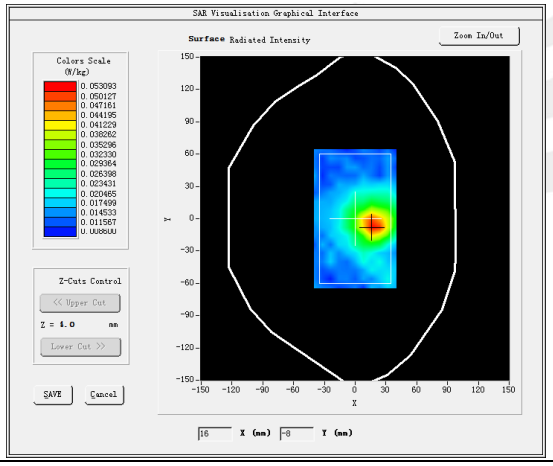
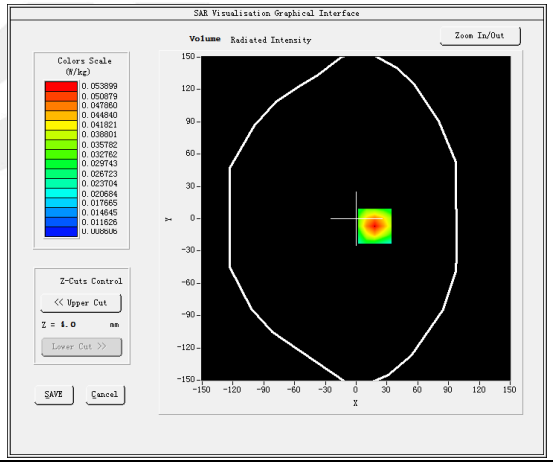
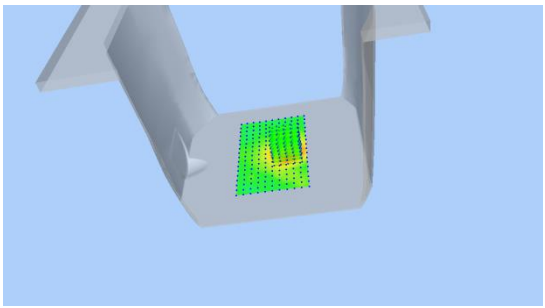
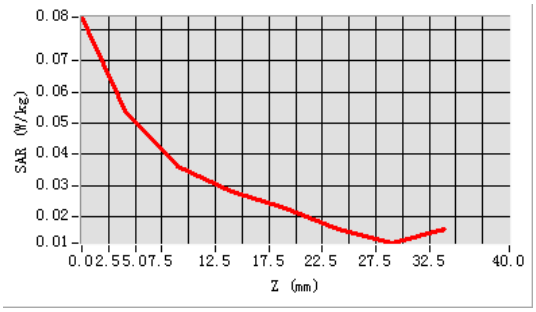
Plot 5: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-05-31
ConvF	1.57
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	Front of face
Band	WCDMA V
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	826.4
Relative permittivity (real part)	41.49
Conductivity (S/m)	0.92

Maximum location: X=18.00, Y=-7.00

SAR Peak: 0.08 W/kg

SAR 10g (W/Kg)	0.032776
SAR 1g (W/Kg)	0.053011

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

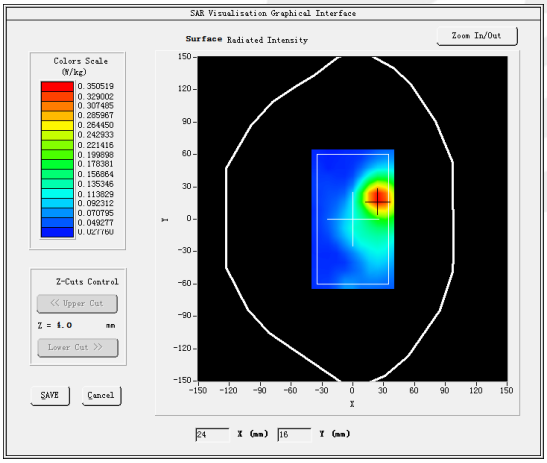
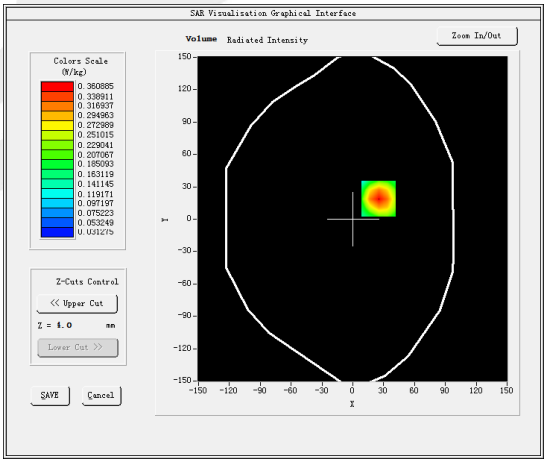
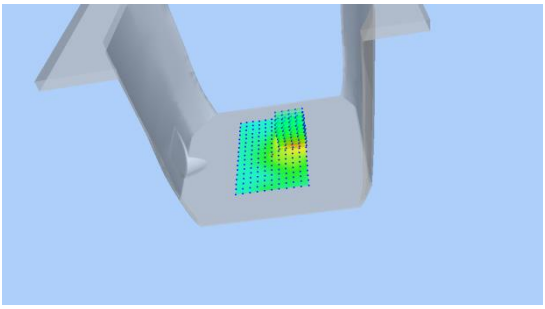
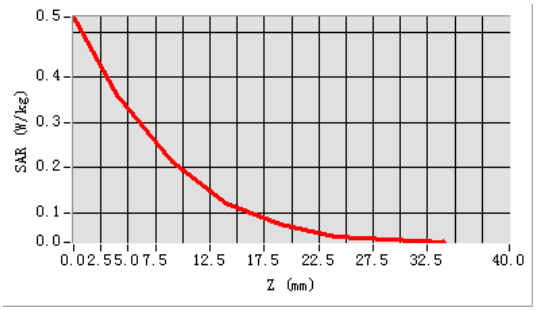
Plot 6: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-05-31
ConvF	1.57
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	Wrist
Band	WCDMA V
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	826.4
Relative permittivity (real part)	41.49
Conductivity (S/m)	0.92

Maximum location: X=25.00, Y=19.00

SAR Peak: 0.53 W/kg

SAR 10g (W/Kg)	0.338751
SAR 1g (W/Kg)	0.524122

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

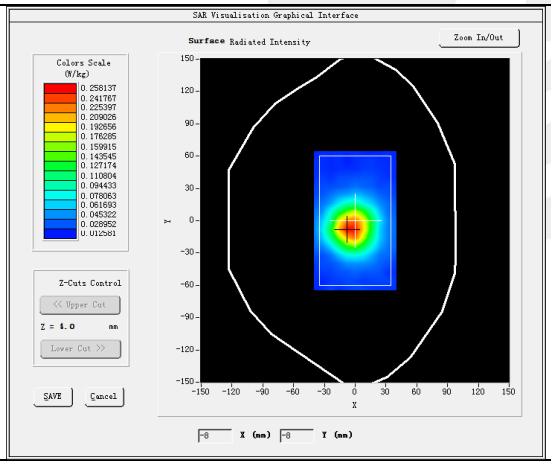
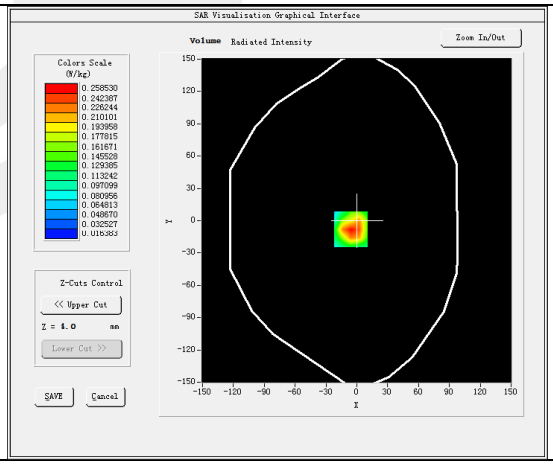
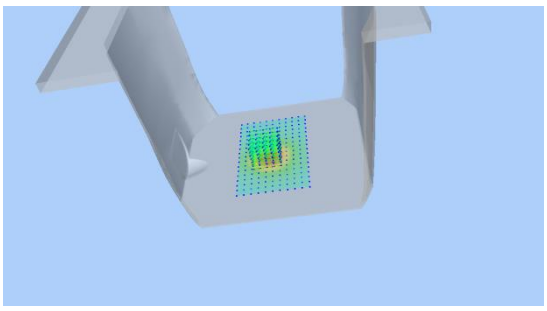
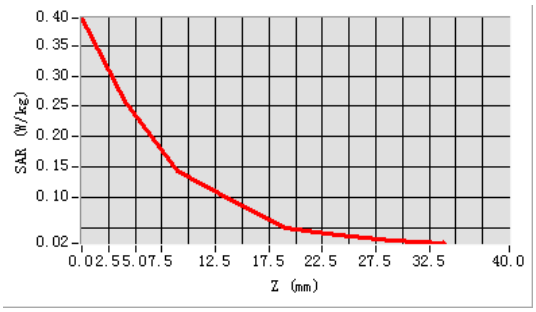
Plot 7: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-05
ConvF	1.75
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	Front of face
Band	IEEE 802.11b ISM
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2437
Relative permittivity (real part)	39.69
Conductivity (S/m)	1.76

Maximum location: X=-6.00, Y=-8.00

SAR Peak: 0.41 W/kg

SAR 10g (W/Kg)	0.133806
SAR 1g (W/Kg)	0.246743

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

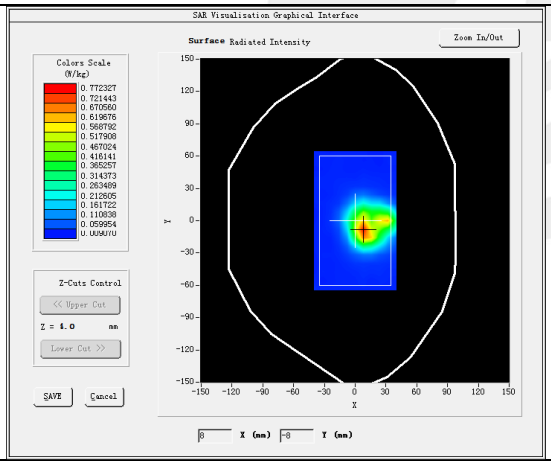
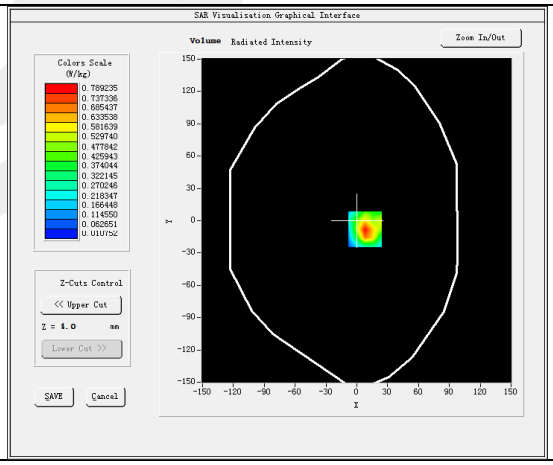
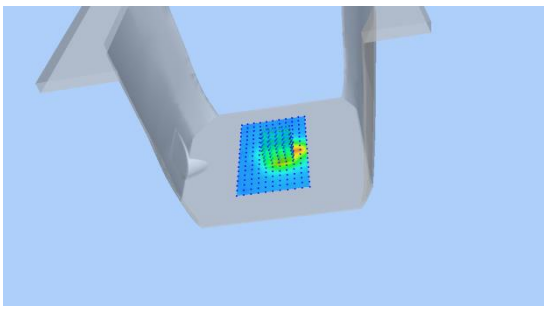
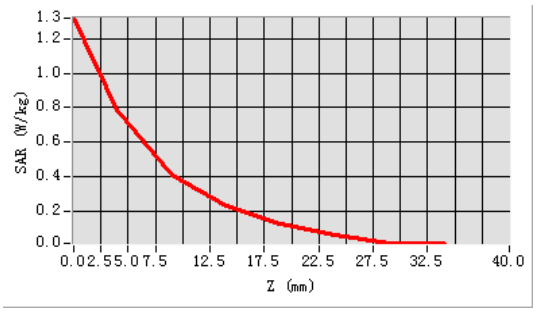
Plot 8: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-05
ConvF	1.75
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	Wrist
Band	IEEE 802.11b ISM
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2437
Relative permittivity (real part)	39.69
Conductivity (S/m)	1.76

Maximum location: X=8.00, Y=-8.00

SAR Peak: 1.37 W/kg

SAR 10g (W/Kg)	0.342533
SAR 1g (W/Kg)	0.750267

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

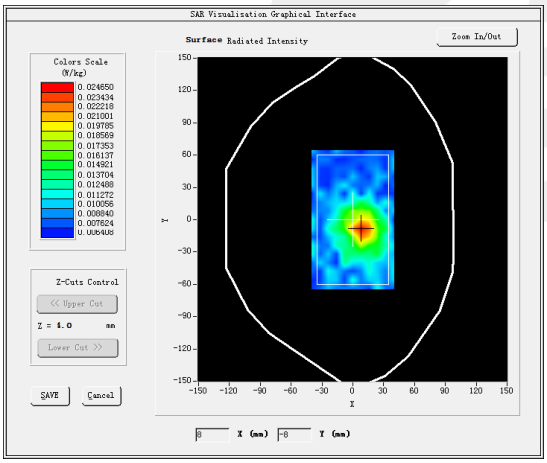
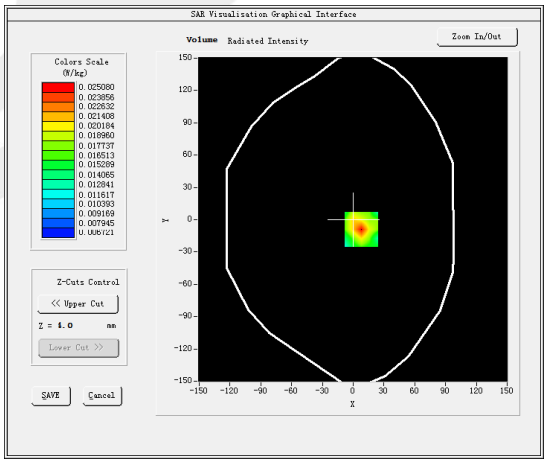
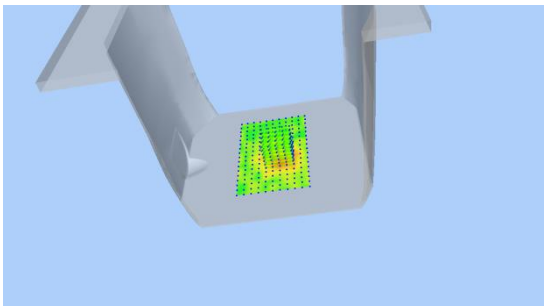
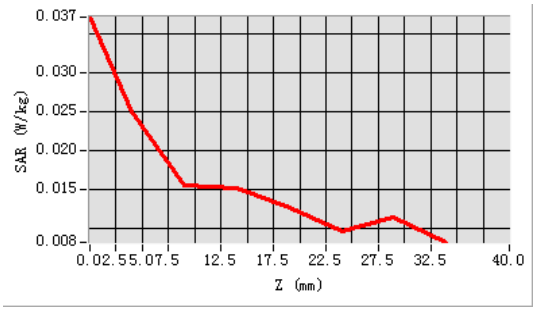
Plot 9: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.78
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	Front of face
Band	LTE Band 2
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	1860
Relative permittivity (real part)	41.04
Conductivity (S/m)	1.47

Maximum location: X=8.00, Y=-9.00

SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.016040
SAR 1g (W/Kg)	0.023693

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

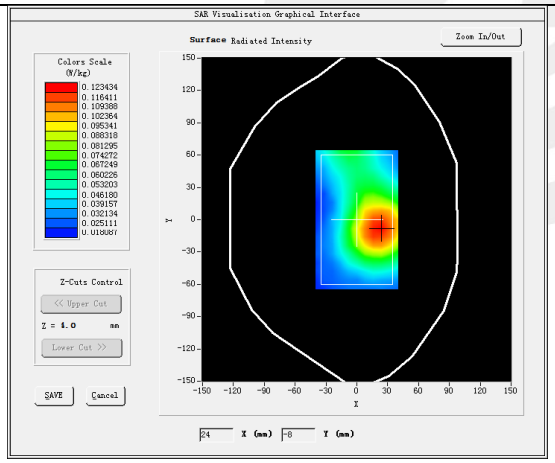
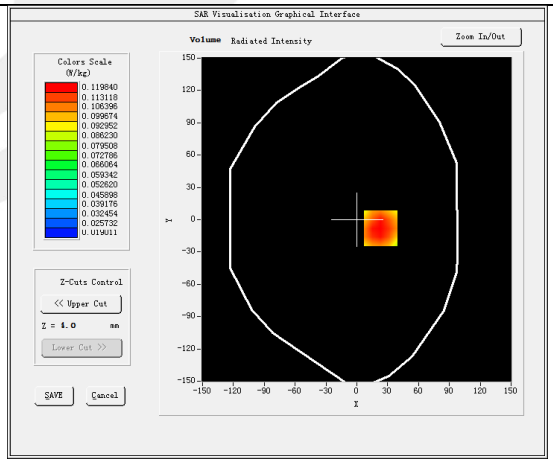
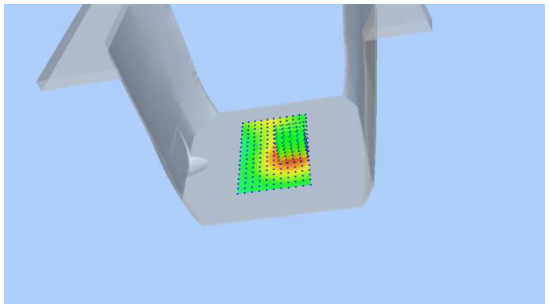
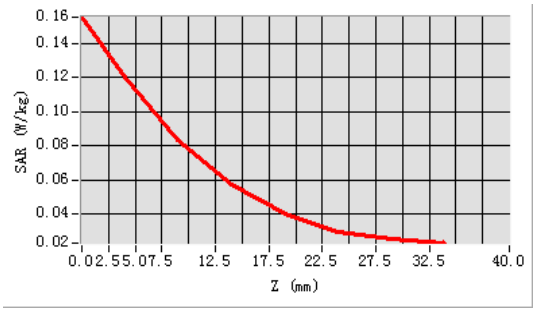
Plot 10: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.78
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	Wrist
Band	LTE Band 2
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1860
Relative permittivity (real part)	41.04
Conductivity (S/m)	1.47

Maximum location: X=23.00, Y=-8.00

SAR Peak: 0.16 W/kg

SAR 10g (W/Kg)	0.116502
SAR 1g (W/Kg)	0.245612

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

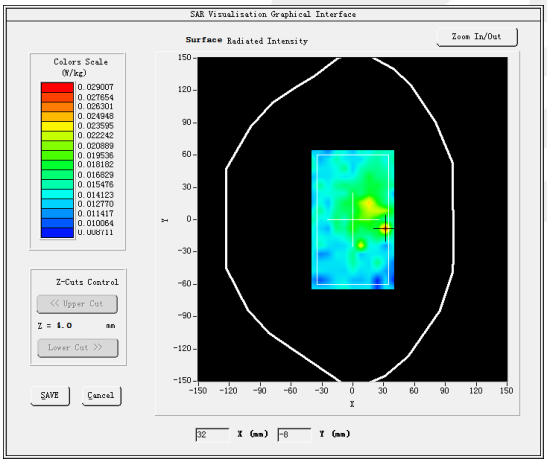
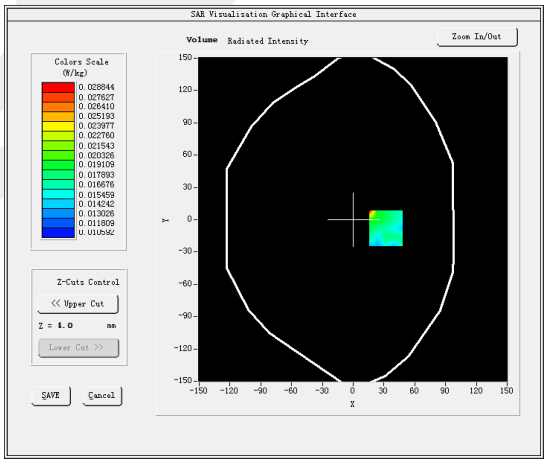
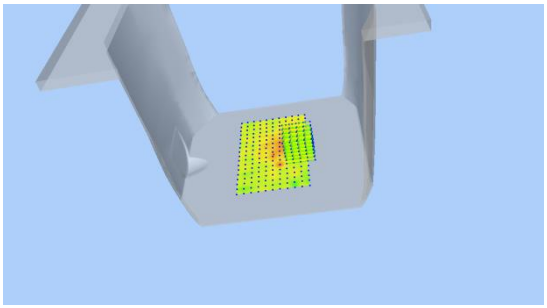
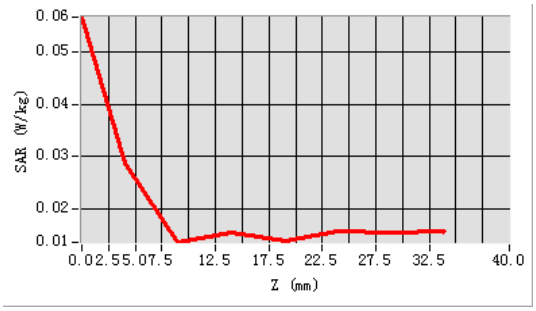
Plot 11: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.60
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	Front of face
Band	LTE Band 4
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1745
Relative permittivity (real part)	40.61
Conductivity (S/m)	1.41

Maximum location: X=32.00, Y=-8.00

SAR Peak: 0.05 W/kg

SAR 10g (W/Kg)	0.165050
SAR 1g (W/Kg)	0.196210

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

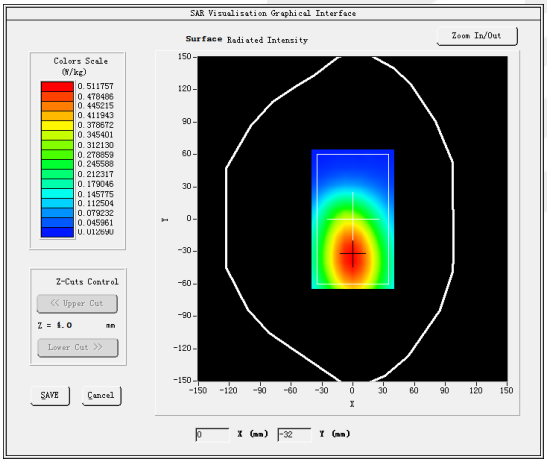
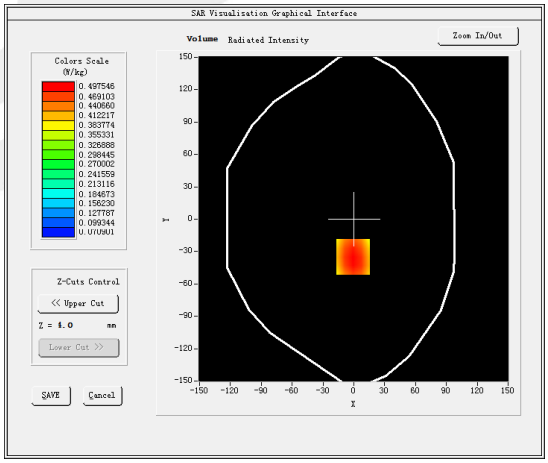
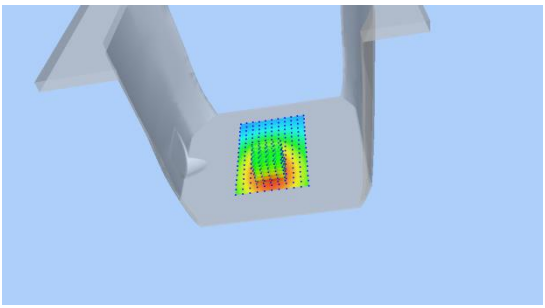
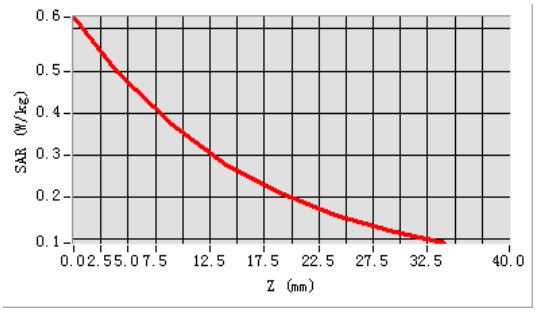
Plot 12: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.60
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	Wrist
Band	LTE Band 4
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1745
Relative permittivity (real part)	40.61
Conductivity (S/m)	1.41

Maximum location: X=-1.00, Y=-35.00

SAR Peak: 0.64 W/kg

SAR 10g (W/Kg)	0.491651
SAR 1g (W/Kg)	0.52142

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

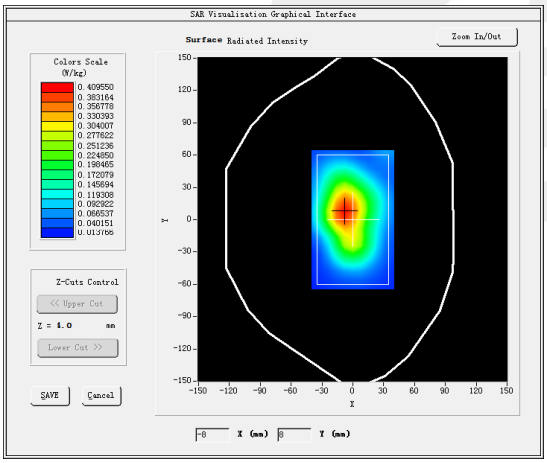
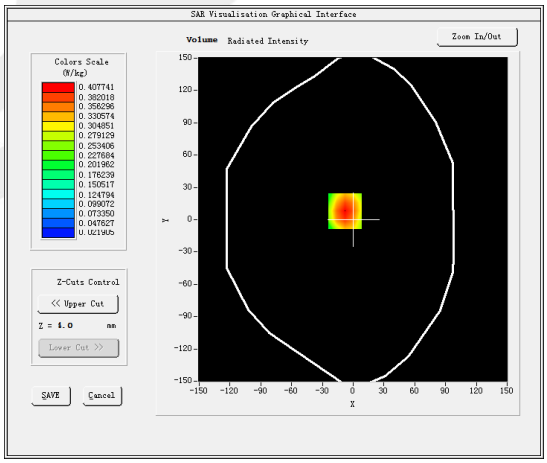
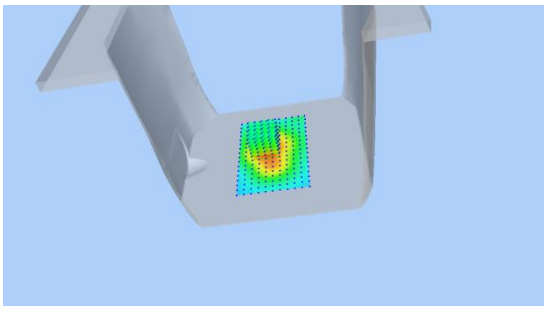
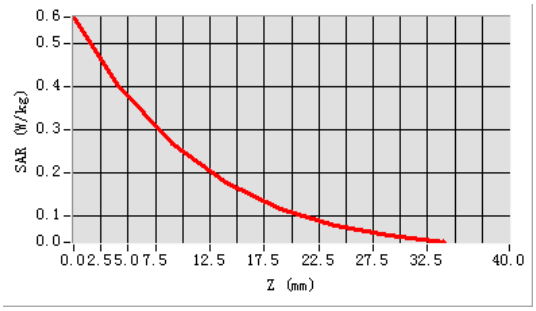
Plot 13: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-05-31
ConvF	1.57
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	Front of face
Band	LTE Band 5
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	829
Relative permittivity (real part)	41.42
Conductivity (S/m)	0.93

Maximum location: X=-8.00, Y=8.00

SAR Peak: 0.57 W/kg

SAR 10g (W/Kg)	0.195852
SAR 1g (W/Kg)	0.243602

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

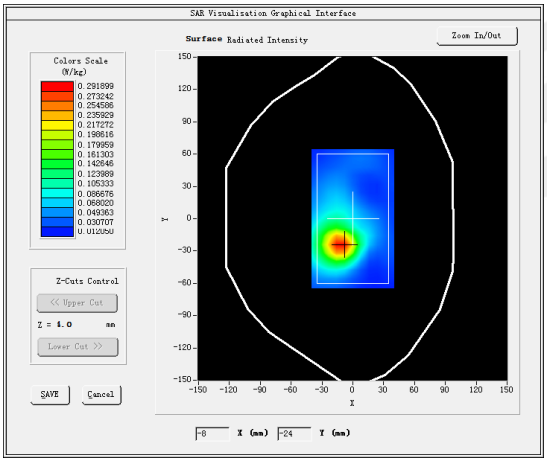
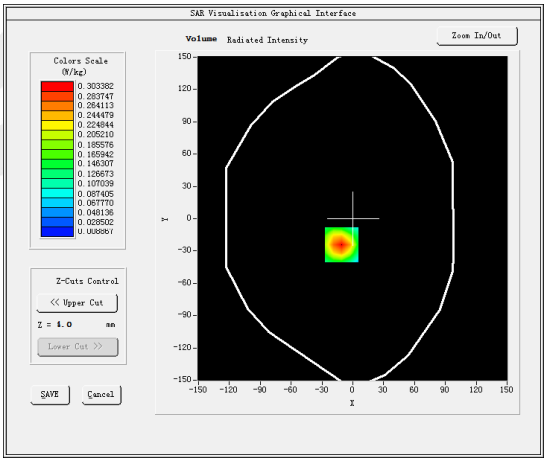
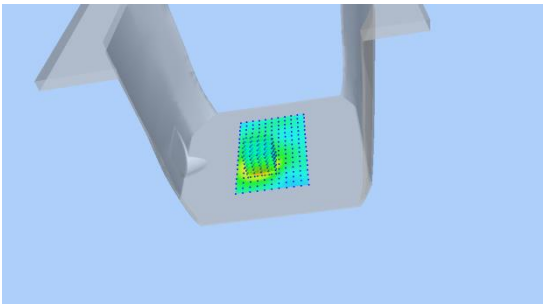
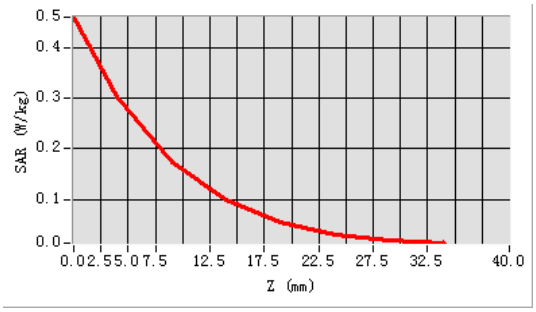
Plot 14: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-05-31
ConvF	1.57
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	Wrist
Band	LTE Band 5
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	829
Relative permittivity (real part)	41.42
Conductivity (S/m)	0.93

Maximum location: X=-11.00, Y=-24.00

SAR Peak: 0.46 W/kg

SAR 10g (W/Kg)	0.285067
SAR 1g (W/Kg)	0.325120

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

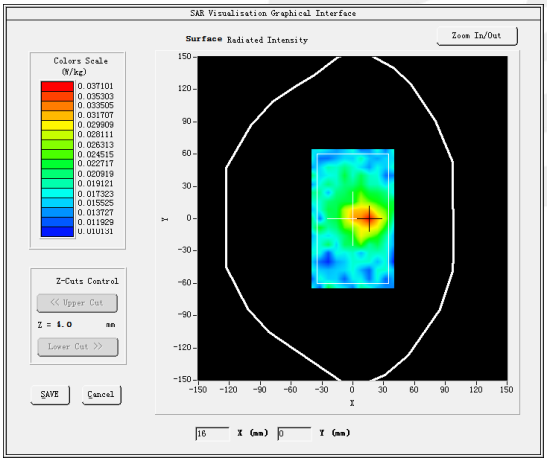
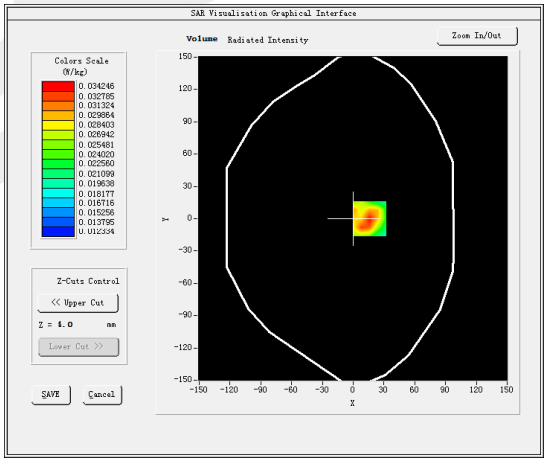
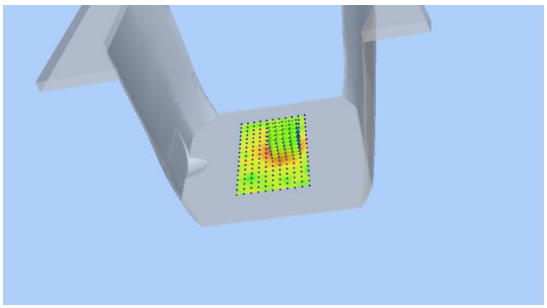
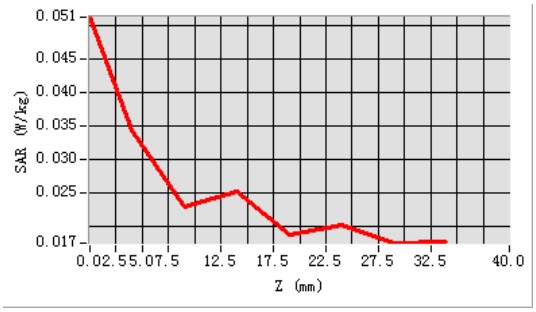
Plot 15: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-07
ConvF	1.63
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	Front of face
Band	LTE Band 7
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2560
Relative permittivity (real part)	39.44
Conductivity (S/m)	1.92

Maximum location: X=16.00, Y=0.00

SAR Peak: 0.05 W/kg

SAR 10g (W/Kg)	0.024241
SAR 1g (W/Kg)	0.033581

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

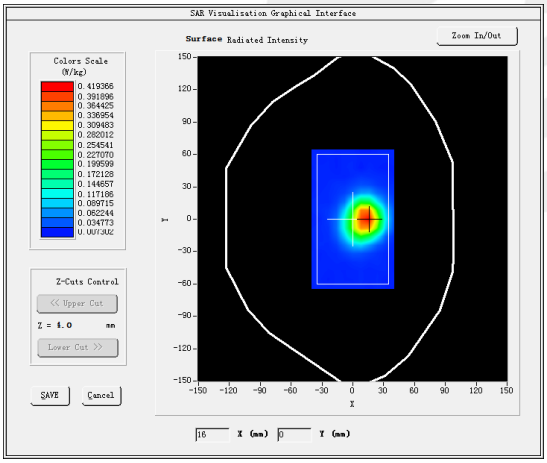
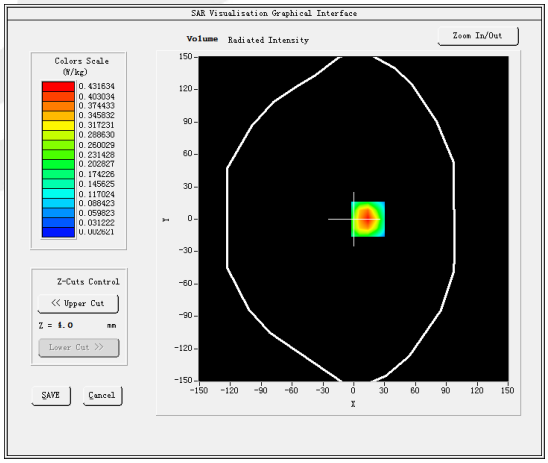
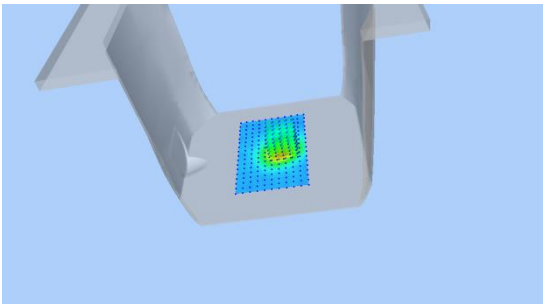
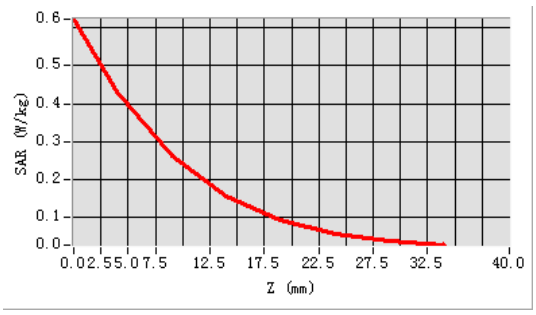
Plot 16: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-07
ConvF	1.63
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	Wrist
Band	LTE Band 7
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2560
Relative permittivity (real part)	39.44
Conductivity (S/m)	1.92

Maximum location: X=14.00, Y=0.00

SAR Peak: 0.72 W/kg

SAR 10g (W/Kg)	0.214631
SAR 1g (W/Kg)	0.413597

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

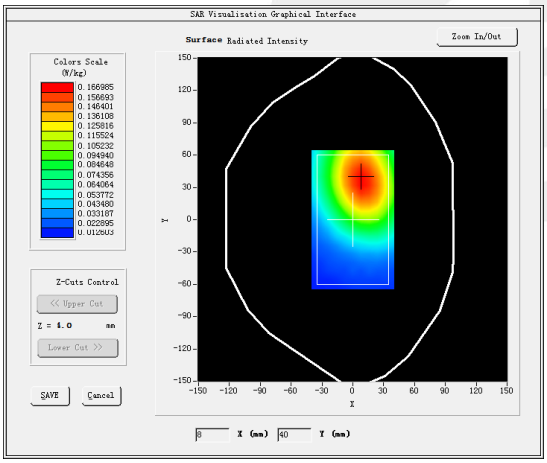
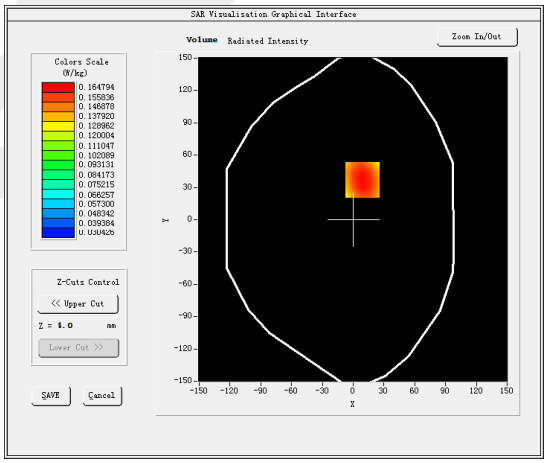
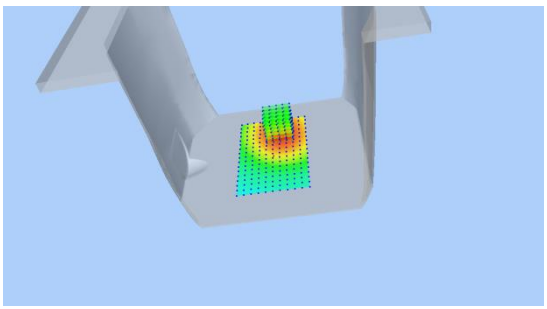
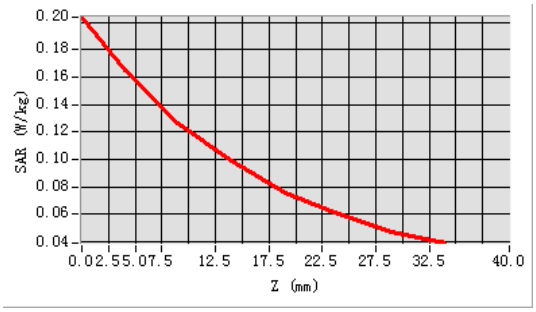
Plot 17: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-05-30
ConvF	1.58
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	Front of face
Band	LTE Band 12
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	704
Relative permittivity (real part)	43.38
Conductivity (S/m)	0.90

Maximum location: X=9.00, Y=37.00

SAR Peak: 0.21 W/kg

SAR 10g (W/Kg)	0.102145
SAR 1g (W/Kg)	0.120298

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

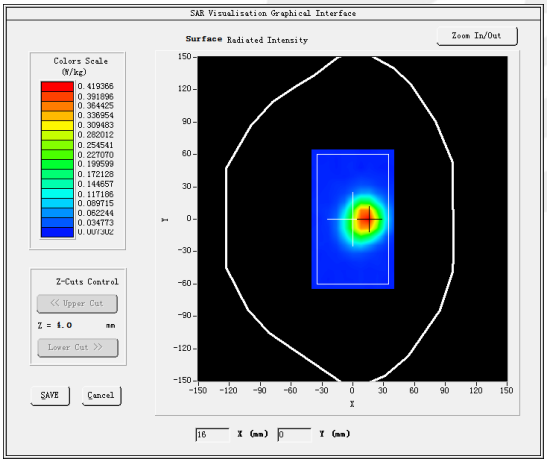
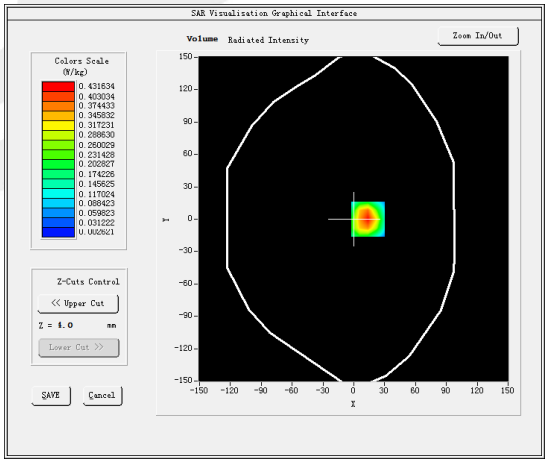
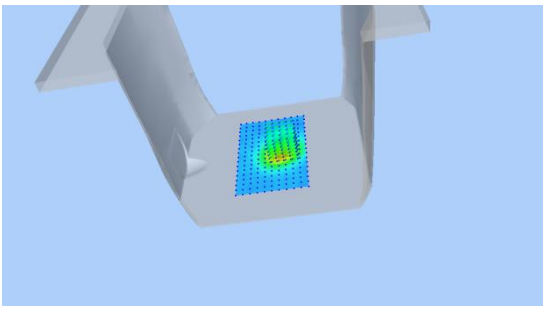
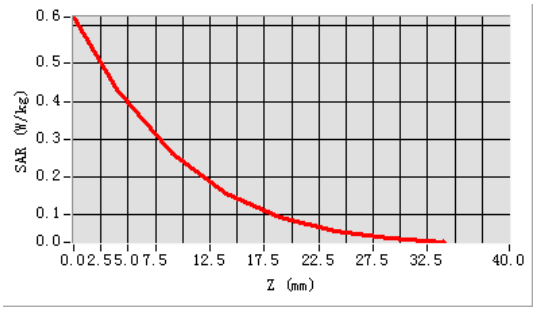
Plot 18: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-05-30
ConvF	1.58
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	Wrist
Band	LTE Band 12
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	704
Relative permittivity (real part)	43.38
Conductivity (S/m)	0.90

Maximum location: X=14.00, Y=0.00

SAR Peak: 0.72 W/kg

SAR 10g (W/Kg)	0.413597
SAR 1g (W/Kg)	0.625145

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

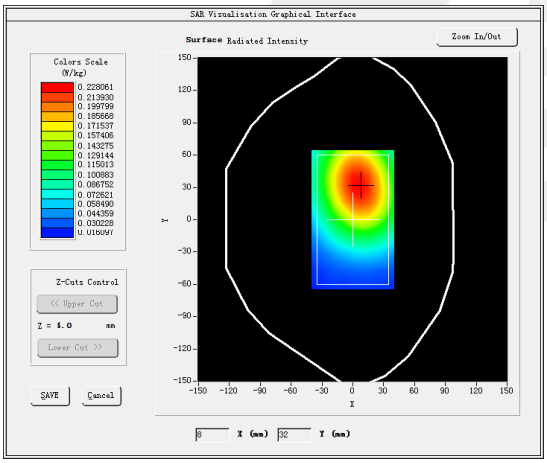
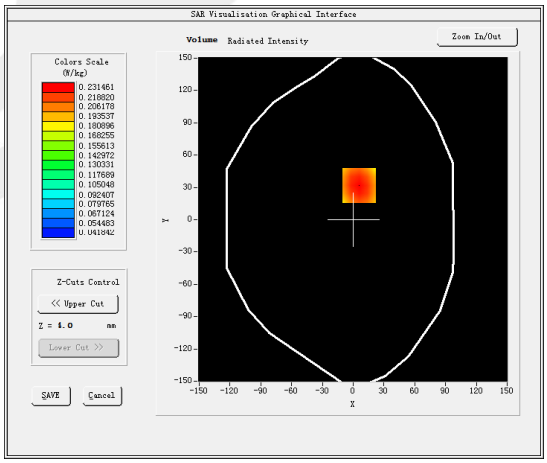
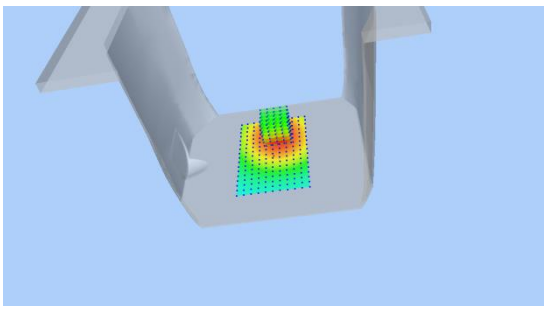
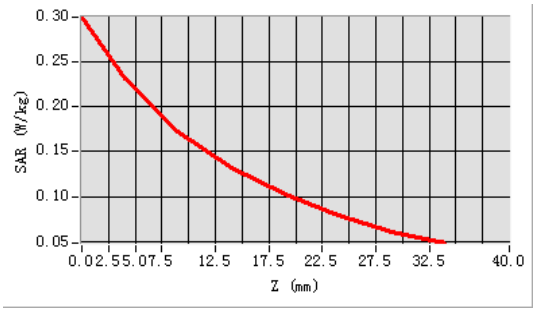
Plot 19: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-05-30
ConvF	1.58
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	Front of face
Band	LTE Band 17
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	709
Relative permittivity (real part)	43.15
Conductivity (S/m)	0.95

Maximum location: X=6.00, Y=32.00

SAR Peak: 0.30 W/kg

SAR 10g (W/Kg)	0.166307
SAR 1g (W/Kg)	0.229607

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

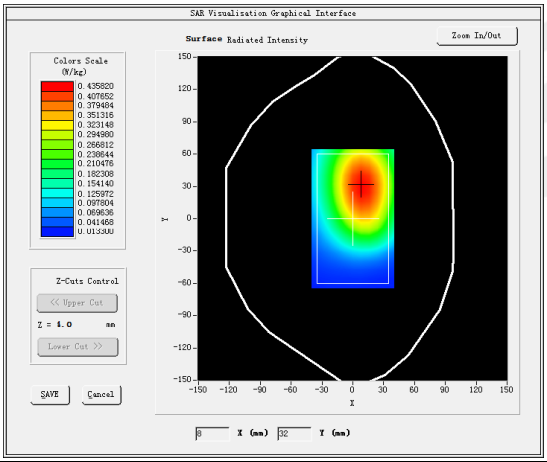
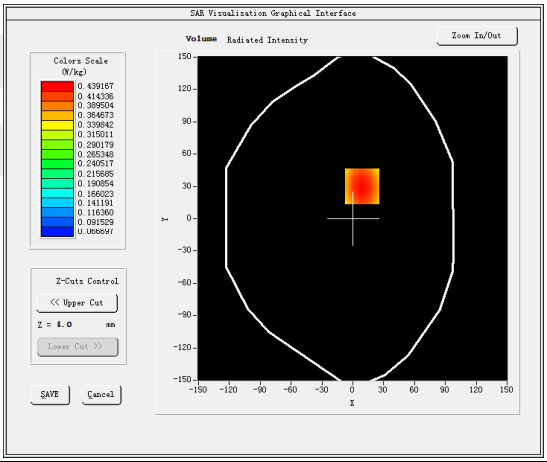
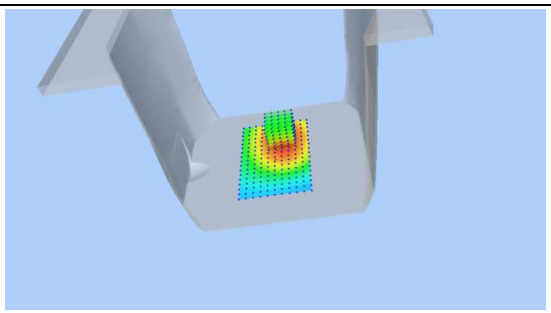
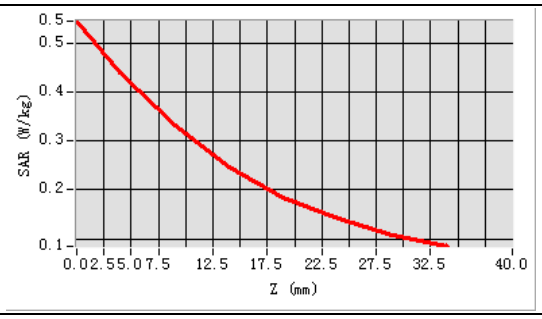
Plot 20: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-05-30
ConvF	1.58
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	Wrist
Band	LTE Band 17
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	709
Relative permittivity (real part)	43.15
Conductivity (S/m)	0.95

Maximum location: X=9.00, Y=30.00

SAR Peak: 0.55 W/kg

SAR 10g (W/Kg)	0.432355
SAR 1g (W/Kg)	0.496521

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

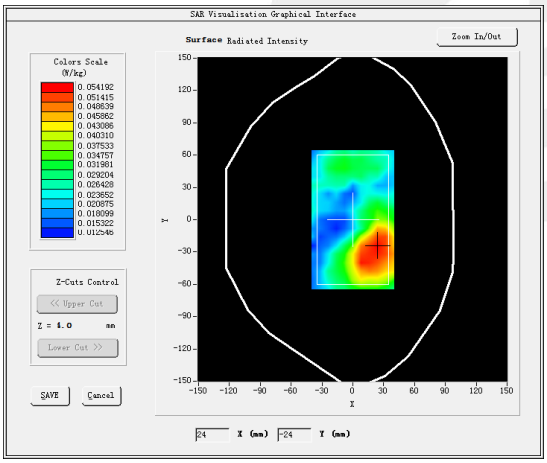
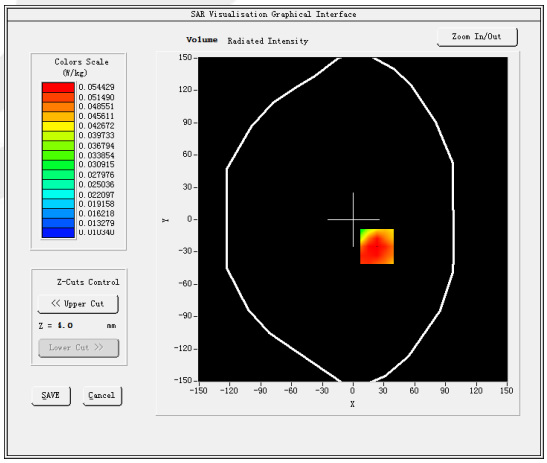
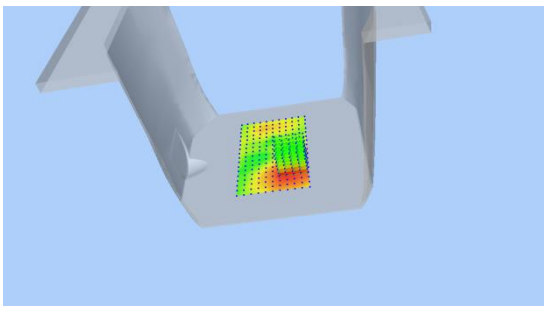
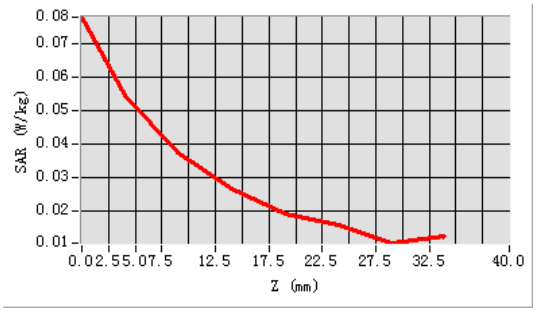
Plot 21: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.60
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	Front of face
Band	LTE Band 66
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1755
Relative permittivity (real part)	41.01
Conductivity (S/m)	1.40

Maximum location: X=23.00, Y=-25.00

SAR Peak: 0.08 W/kg

SAR 10g (W/Kg)	0.036405
SAR 1g (W/Kg)	0.053767

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

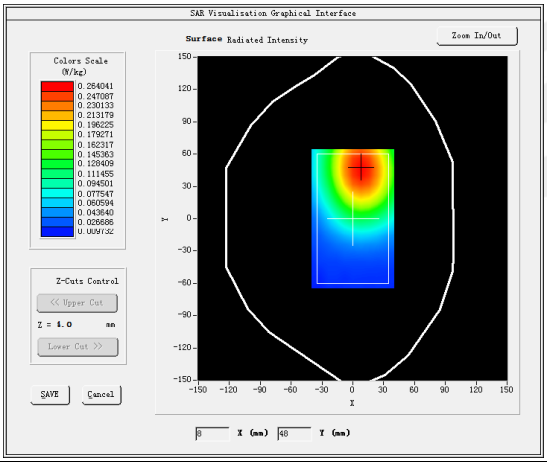
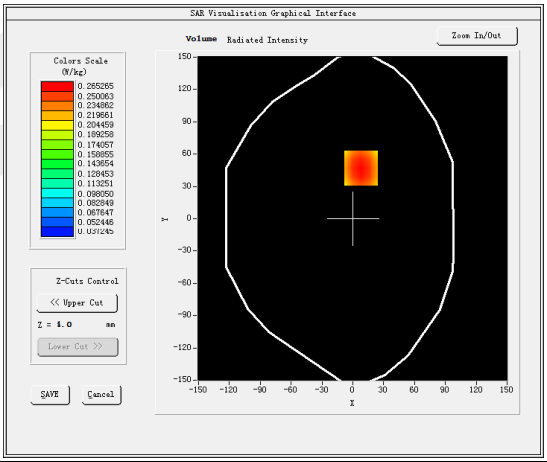
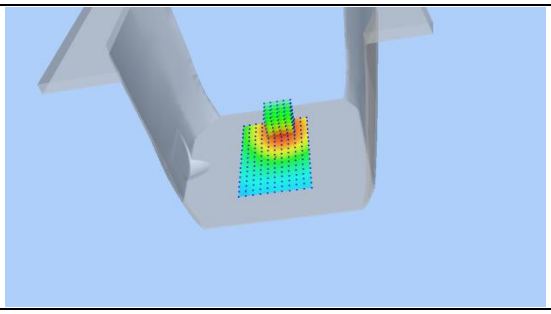
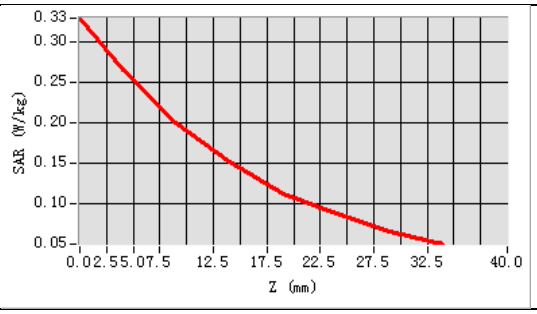
Plot 22: DUT: TickTalk 5 Kids Smartwatch; EUT Model: TickTalk 5 Kids Smartwatch

Test Date	2023-06-02
ConvF	1.60
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	Wrist
Band	LTE Band 66
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	1755
Relative permittivity (real part)	41.01
Conductivity (S/m)	1.40

Maximum location: X=8.00, Y=47.00

SAR Peak: 0.33 W/kg

SAR 10g (W/Kg)	0.185824
SAR 1g (W/Kg)	0.256460

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

Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※