



FCC SAR TEST REPORT

Report No.: STS2004153H01

Issued for

Beijing Qi Bao Technology Co.,Ltd.

1701-36,17th Floor,15th Floor, Building 3,No.10, Jiuxianqiao Road,Chaoyang District,Beijing,China.

Product Name:	Kids Watch
Brand Name:	Ⓢ360
Model Name:	A1
Series Model:	N/A
FCC ID:	2AV3DW901O
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEEE 1528: 2013
Max. Report SAR (1g):	Front of face: 0.261W/kg
Max. Report SAR (10g):	Wrist:0.351W/kg

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Test Report Certification

Applicant's name : Beijing Qi Bao Technology Co.,Ltd.
Address : 1701-36,17th Floor,15th Floor, Building 3,No.10,Jiuxianqiao Road,Chaoyang District,Beijing,China.
Manufacture's Name : Beijing Qi Bao Technology Co.,Ltd.
Address : 1701-36,17th Floor,15th Floor, Building 3,No.10,Jiuxianqiao Road,Chaoyang District,Beijing,China.

Product description

Product name : Kids Watch
Brand name : 360
Model name : A1
Series Model : N/A

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

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

Date of Test :
Date (s) of performance of tests : 13 Apr. 2020~15 Apr. 2020
Date of Issue : 16 Apr. 2020
Test Result : **Pass**

Testing Engineer :

Aaron Bu

(Aaron Bu)

Technical Manager :

Jason Lu

(Jason Lu)

Authorized Signatory :

Vita Li

(Vita Li)





Table of Contents

1.General Information	5
1.1 EUT Description	5
1.2 Test Environment	6
1.3 Test Factory	6
2.Test Standardsand Limits	7
3. SAR Measurement System	8
3.1 Definition of Specific Absorption Rate (SAR)	8
3.2 SAR System	8
4. Tissue Simulating Liquids	11
4.1 Simulating Liquids Parameter Check	11
5. SAR System Validation	13
5.1 Validation System	13
5.2 Validation Result	13
6. SAR Evaluation Procedures	14
7. EUT Test Position	15
8.Uncertainty	16
8.1 Measurement Uncertainty	16
8.2 System validation Uncertainty	17
9. Conducted Power Measurement	18
9.1 Test Result	18
9.2 SAR Test Exclusions Applied	20
10. EUT And Test Setup Photo	21
10.1 EUT Photo	21
10.2 Setup Photo	24
11. SAR Result Summary	26
11.1 Front of face SAR	26
11.2 Wrist SAR	27
12. Equipment List	29
Appendix A. System Validation Plots	30
Appendix B. SAR Test Plots	42
Appendix C. Probe Calibration And Dipole Calibration Report	48

**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	16 Apr. 2020	STS2004153H01	ALL	Initial Issue
Note: Format version of the report-V01				





1. General Information

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

1.1 EUT Description

Product Name	Kids Watch			
Brand Name	360			
Model Name	A1			
Series Model	N/A			
Model Difference	N/A			
Battery	Rated Voltage: 3.85V; Charge Limit: 4.4V; Capacity:780mAh			
Device Category	Portable			
Product stage	Production unit			
Exposure Environment	General Population / Uncontrolled			
IMEI	N/A			
Hardware Version	V0			
Software Version	W901O_GSM34.0.14_with_datebase_release			
Frequency Range	GSM 850:824.2~848.8MHz PCS1900:1850.2~1909.8MHz WLAN802.11b/g/n(HT20): 2412~2462MHz WLAN 802.11n(HT40): 2422~2452MHz GPS: 1575.42MHz			
Max. Reported SAR	Band	Mode	Front of face-1g (W/kg)	Wrist-10g (W/kg)
	PCB	GSM 850	0.249	0.298
	PCB	GSM 1900	0.139	0.351
	DTS	WLAN	0.261	0.166
Sum SAR			0.510	0.517
Limit			1.6	4.0
FCCEquipment Class	PCS Licensed Transmitter(PCB) Digital Transmission System (DTS)			
Operating Mode	GSM: GSM Voice; GPRS Class 12;			
Antenna Specification	GSM: PIFA Antenna WLAN: PIFA Antenna			
SIM Card	Only support single card			
Note: 1 The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power				



1.2 Test Environment

Ambient conditions in the SAR laboratory:

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

1.3 Test Factory

ShenZhen STS Test Services Co.,Ltd.

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

FCC test Firm Registration No.: 625569

IC Registration No.: 12108A

A2LA Certificate No.: 4338.01





2. Test Standards and Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D01v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	FCC KDB 648474 D04 v01r03	SAR Evaluation Considerations for Wireless Handsets
8	FCC KDB 248227 D01 Wi-Fi SAR v02r02	SAR Considerations for 802.11 Devices

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

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

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

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

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

Population/Uncontrolled Environments:

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

Occupational/Controlled Environments:

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

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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

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

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

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

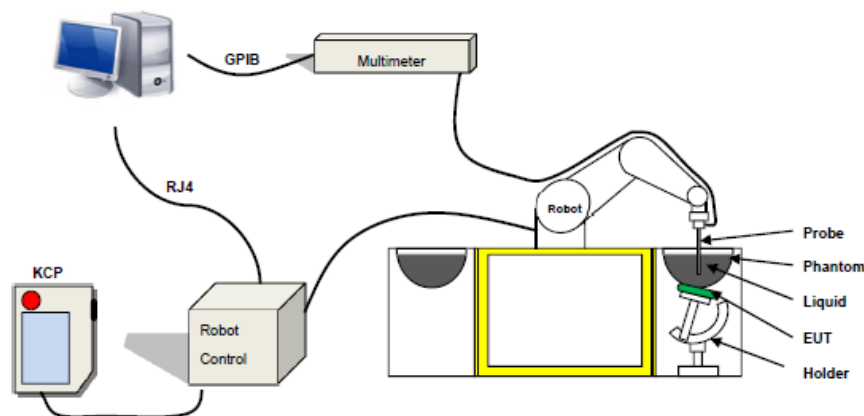
$$SAR = \frac{\sigma E^2}{\rho}$$

Where: σ is the conductivity of the tissue;

ρ is the mass density of the tissue and E is the RMS electrical field strength.

3.2 SAR System

MVG SAR System Diagram:



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

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

The following figure shows the system.



The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The 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 41/18 EPGO334 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: 450 MHz to 6 GHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°



Figure 1-MVG COMOSAR Dosimetric E field Dipole

3.2.2 Phantom

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

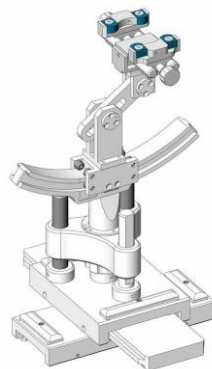
SN 32/14 SAM115



SN 32/14 SAM116



3.2.3 Device Holder



The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ± 0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.



4. Tissue Simulating Liquids

4.1 Simulating Liquids Parameter Check

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

Head Tissue

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

Body Tissue

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

Tissue dielectric parameters for head and body phantoms				
Frequency	ϵ_r		σ S/m	
	Head	Body	Head	Body
300	45.3	58.2	0.87	0.92
450	43.5	56.7	0.87	0.94
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 condition		Head Simulating Liquid		Parameters	Target	Measured	Deviation [%]	Limited [%]
	Temp. [°C]	Humidity [%]	Frequency	Temp. [°C]					
2020-04-13	21.4	43	835 MHz	21.1	Permittivity:	41.50	42.25	1.81	±5
					Conductivity:	0.90	0.88	-2.22	± 5
2020-04-14	21.6	49	1900 MHz	21.4	Permittivity:	40.00	39.73	-0.68	± 5
					Conductivity:	1.40	1.42	1.43	± 5
2020-04-15	22.8	52	2450 MHz	22.5	Permittivity:	39.20	38.93	-0.69	± 5
					Conductivity:	1.80	1.77	-1.67	± 5

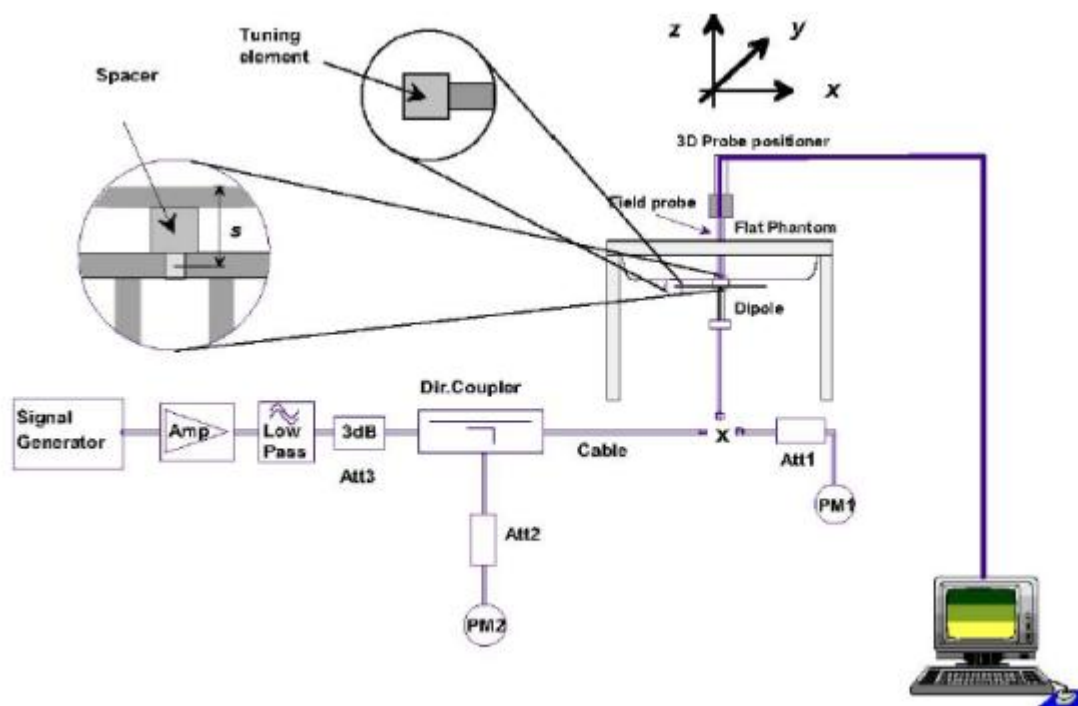
Date	Ambient condition		Body Simulating Liquid		Parameters	Target	Measured	Deviation [%]	Limited [%]
	Temp. [°C]	Humidity [%]	Frequency	Temp. [°C]					
2020-04-13	21.4	43	835 MHz	21.2	Permittivity:	55.20	56.33	2.05	± 5
					Conductivity	0.97	0.95	-2.06	± 5
2020-04-14	21.6	49	1900 MHz	21.3	Permittivity:	53.30	53.86	1.05	± 5
					Conductivity	1.52	1.55	1.97	± 5
2020-04-15	22.8	52	2450 MHz	22.5	Permittivity:	52.70	52.46	-0.46	± 5
					Conductivity	1.95	1.98	1.54	± 5

5. SAR System Validation

5.1 Validation System

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

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



5.2 Validation Result

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

Freq.(MHz)	Power(mW)	Tested Value(W/Kg)	Normalized SAR (W/kg)	Target(W/Kg)	Tolerance(%)	Date
835 Head	100	0.992	9.92	9.56	3.77	2020-04-13
835Body	100	0.967	9.67	9.56	1.15	2020-04-13
1900 Head	100	4.034	40.34	39.7	1.61	2020-04-14
1900 Body	100	4.091	40.91	39.7	3.05	2020-04-14
2450 Head	100	5.098	50.98	52.4	-2.71	2020-04-15
2450Body	100	5.149	51.49	52.4	-1.74	2020-04-15

Note:

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



6. SAR Evaluation Procedures

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

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

Area Scan& Zoom Scan:

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

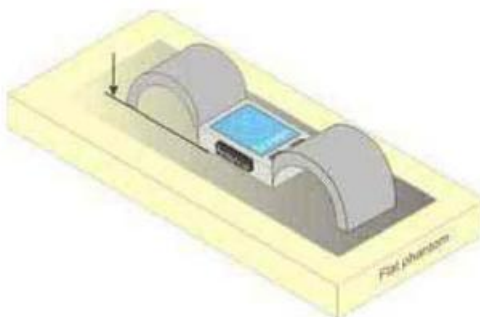
7. EUT Test Position

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



8. Uncertainty

8.1 Measurement Uncertainty

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

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



8.2 System validation Uncertainty

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



9. Conducted Power Measurement

9.1 Test Result

Burst Average Power (dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM(GMSK, 1-Slot)	32.67	32.53	32.46	27.92	27.41	27.71
GPRS (GMSK, 1-Slot)	32.64	32.57	32.54	28.29	27.57	28.11
GPRS (GMSK, 2-Slot)	32.34	32.10	32.08	27.82	27.14	27.66
GPRS (GMSK, 3-Slot)	31.92	31.60	31.67	27.34	26.71	27.19
GPRS (GMSK, 4-Slot)	31.48	31.20	31.19	26.86	26.25	26.76
EGPRS(8PSK, 1-Slot)	-	-	-	-	-	-
EGPRS(8PSK, 2-Slot)	-	-	-	-	-	-
EGPRS(8PSK, 3-Slot)	-	-	-	-	-	-
EGPRS(8PSK, 4-Slot)	-	-	-	-	-	-
Remark: GPRS, CS4 coding scheme. EGPRS, MCS9 coding scheme. Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link Multi-Slot Class 12 , Support Max 4 downlink, 4 uplink , 5 working link						

Fram- Average Power(dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM(GMSK, 1-Slot)	23.64	23.50	23.43	18.89	18.38	18.68
GPRS (GMSK, 1-Slot)	23.61	23.54	23.51	19.26	18.54	19.08
GPRS (GMSK, 2-Slot)	26.32	26.08	26.06	21.80	21.12	21.64
GPRS (GMSK, 3-Slot)	27.66	27.34	27.41	23.08	22.45	22.93
GPRS (GMSK, 4-Slot)	28.47	28.19	28.18	23.85	23.24	23.75
EGPRS(8PSK, 1-Slot)	-	-	-	-	-	-
EGPRS(8PSK, 2-Slot)	-	-	-	-	-	-
EGPRS(8PSK, 3-Slot)	-	-	-	-	-	-
EGPRS(8PSK, 4-Slot)	-	-	-	-	-	-
Remark : 1. SAR testing was performed on the maximum frame-averaged power mode. 2. The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below: Frame-averaged power = Burst averaged power (1 Tx Slot) – 9.03 dB Frame-averaged power = Burst averaged power (2 Tx Slots) – 6.02 dB Frame-averaged power = Burst averaged power (3 Tx Slots) - 4.26 dB Frame-averaged power = Burst averaged power (4 Tx Slots) – 3.01 dB						

**WLAN**

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
802.11b	1	2412	13.87
	6	2437	13.69
	11	2462	13.52
802.11g	1	2412	10.70
	6	2437	10.24
	11	2462	10.23
802.11n(HT 20)	1	2412	10.60
	6	2437	10.16
	11	2462	10.20
802.11n(HT 40)	3	2422	9.99
	6	2437	9.79
	9	2452	9.73



9.2 SAR Test Exclusions Applied

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

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

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

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

$$\frac{\text{Max Power of Channel (mW)}}{\text{Test Separation Dist (mm)}} * \sqrt{\text{Frequency (GHz)}} \leq 3.0$$

Based on the maximum conducted power of **2.4 GHz WLAN Front of face** (rounded to the nearest mW) and the antenna to user separation distance,

2.4 GHz WLAN Front of face SAR was required; $[(25.119/10) * \sqrt{2.480}] = 3.94 > 3.0$.

Based on the maximum conducted power of **2.4 GHz WLAN Wrist** (rounded to the nearest mW) and the antenna to user separation distance,

2.4 GHz WLAN Wrist SAR was required; $[(25.119/5) * \sqrt{2.480}] = 7.88 > 7.5$.

10. EUT And Test Setup Photo

10.1 EUT Photo

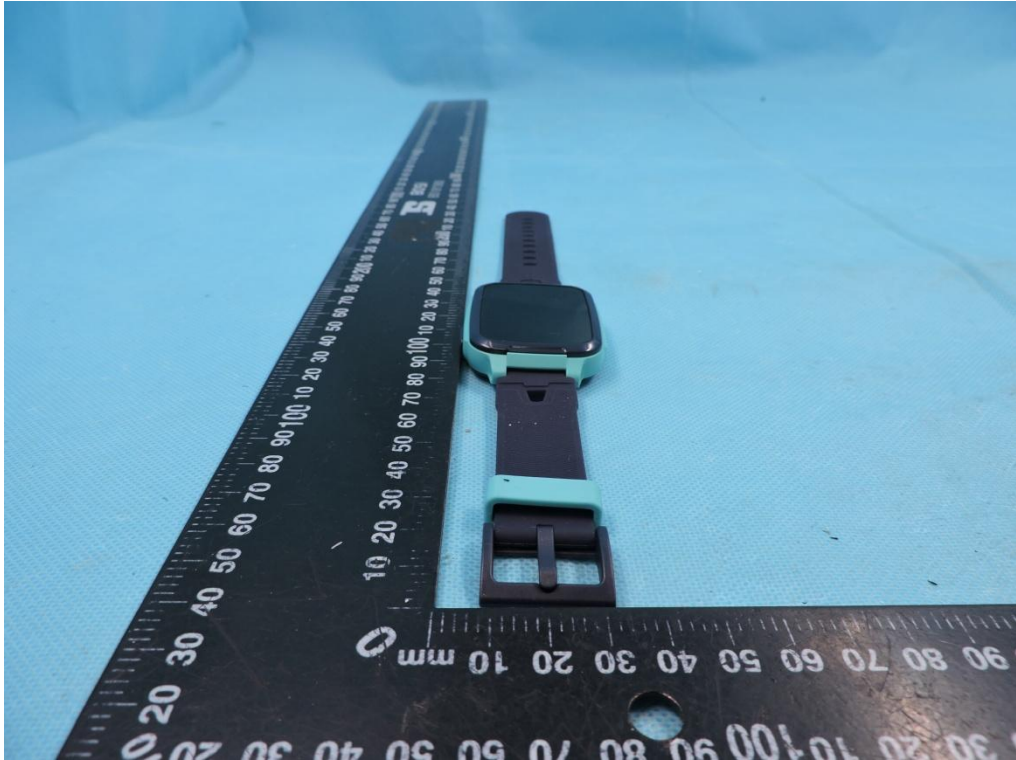
Front side



Back side



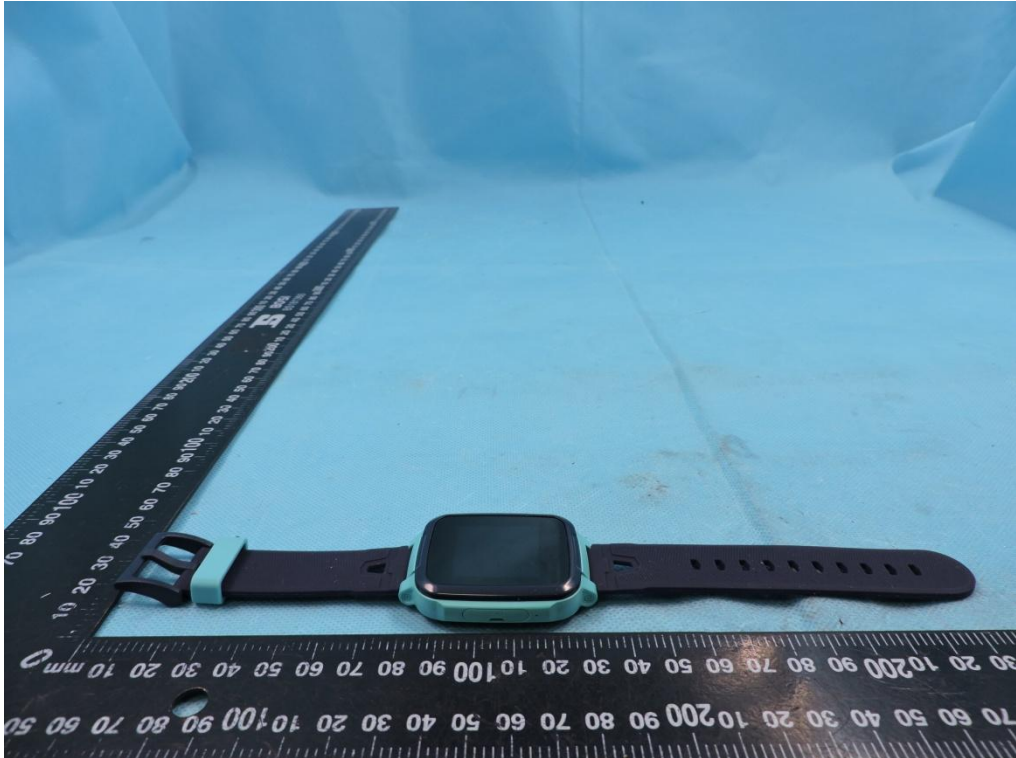
Top Edge



Bottom Edge



Left Edge

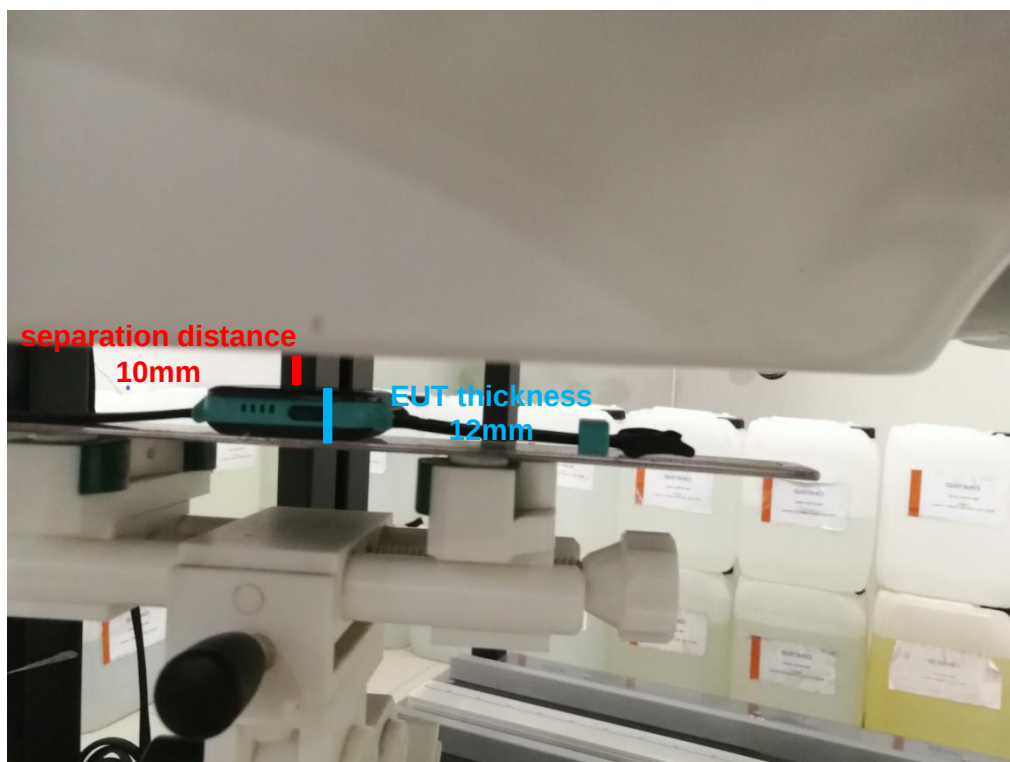


Right Edge



10.2 Setup Photo

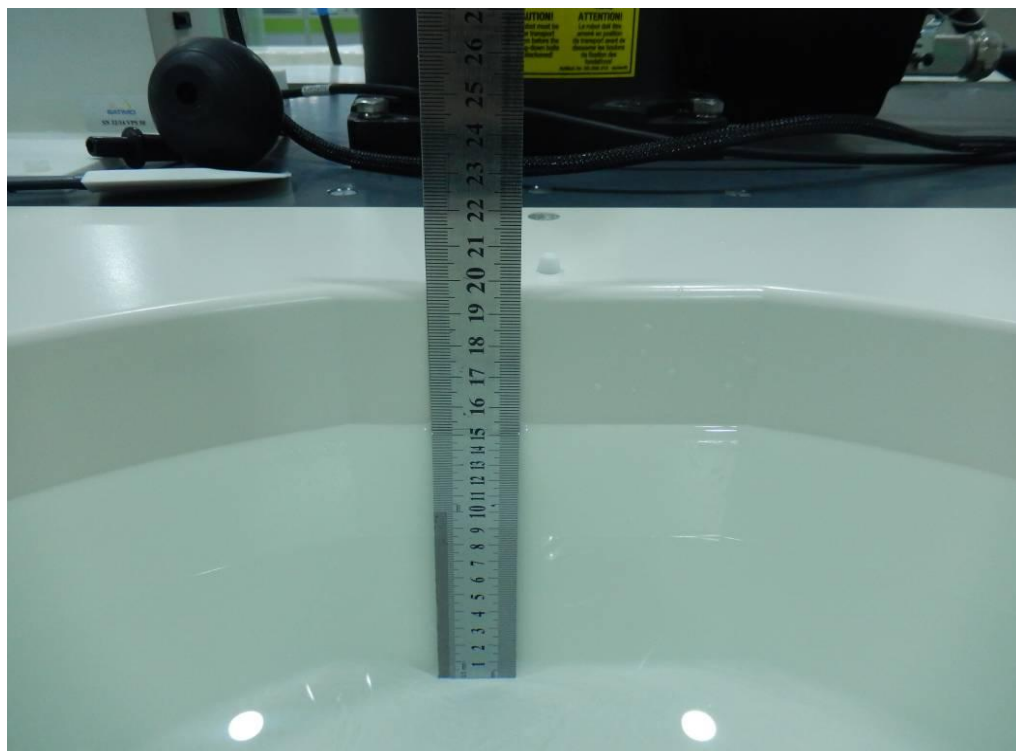
Front of face(separation distance is 10mm)



Wrist(separation distance is 0mm)



Liquid depth (15 cm)





11. SAR Result Summary

11.1 Front of face SAR

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
GSM 850	Voice	Frontof face	128	0.231	1.79	33	32.67	0.249	1
GSM1900	Voice	Frontof face	512	0.136	-2.40	28	27.92	0.139	3

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Duty cycle(%)	Scaled SAR (W/Kg)	Meas. No.
WLAN	802.11b	Front of face	1	0.253	0.71	14	13.87	100	0.261	5

Note:

- Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - For WWAN: Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
- Per KDB 248227- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. (The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **0.261**W/Kg for Head)
- Per KDB 865664 D01, Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg



11.2 Wrist SAR

Band	Mode	Test Position	Ch.	Result 10g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
GSM 850	GPRS Data-4 Slot	Wrist	128	0.264	1.34	32	31.48	0.298	2
GSM1900	GPRS Data-4 Slot	Wrist	512	0.340	-1.58	27	26.86	0.351	4

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Duty cycle(%)	Scaled SAR (W/Kg)	Meas. No.
WLAN	802.11b	Wrist	1	0.161	0.67	14	13.87	100	0.166	6

Note:

1. The test separation of all above table is 0mm.
2. Per KDB 248227- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. (The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **0.080** W/Kg for Body)
3. 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 + WLAN
Wrist	1.GSM + WLAN

NOTE:

1. For simultaneous transmission at head and body exposure position, 2transmitters simultaneous transmission was the worst state.
2. Based upon KDB 447498 D01 v05, BT SAR is excluded as below table.
3. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
4. For minimum test separation distance $\leq 50\text{mm}$, Bluetooth standalone SAR is excluded according to $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f} (\text{GHz}) / x] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
5. The reported SAR summation is calculated based on the same configuration and test position.
6. KDB 447498 / 4.3.2 (2) 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:
 - a) $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f} (\text{GHz}) / x] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$; Where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.
 - b) 0.4 W/Kg for 1-g SAR and 1.0 W/Kg for 10-g SAR, when the separation distance is $> 50 \text{ mm}$.

Simultaneous Mode	Position	Mode	Max. SAR (W/kg)	Sum SAR (W/kg)
GSM + 2.4G WLAN	Front of face (1g)	GSM Voice	0.249	0.510
		2.4G WLAN	0.261	
GSM + 2.4G WLAN	Wrist (10g)	GSM Voice	0.351	0.517
		2.4G WLAN	0.166	

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

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



12. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
835MHz Dipole	MVG	SID835	SN 30/14 DIP0G835-332	2017.08.15	2020.08.14
1900MHz Dipole	MVG	SID1900	SN 30/14 DIP1G900-333	2017.08.15	2020.08.14
2450MHzDipole	MVG	SID2450	SN 30/14 DIP2G450-335	2017.08.15	2020.08.14
E-Field Probe	MVG	SSE2	SN 41/18 EPOG334	2019.06.04	2020.06.03
Dielectric Probe Kit	MVG	SCLMP	SN 32/14 OCPG67	2019.11.25	2020.11.24
Antenna	MVG	ANTA3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	MVG	SAM	SN 32/14 SAM115	N/A	N/A
Phantom2	MVG	SAM	SN 32/14 SAM116	N/A	N/A
Phone holder	MVG	N/A	SN 32/14 MSH97	N/A	N/A
Laptop holder	MVG	N/A	SN 32/14 LSH29	N/A	N/A
Attenuator	Agilent	99899	DC-18GHz	N/A	N/A
Directional coupler	Narda	4226-20	3305	N/A	N/A
Network Analyzer	Agilent	8753ES	US38432810	2019.10.11	2020.10.10
Multi Meter	Keithley	Multi Meter 2000	4050073	2019.10.11	2020.10.10
Signal Generator	Agilent	N5182A	MY50140530	2019.10.09	2020.10.08
Wireless Communication Test Set	Agilent	8960-E5515C	MY48360751	2019.10.09	2020.10.08
Wireless Communication Test Set	R&S	CMW500	117239	2019.10.09	2020.10.08
Power Amplifier	DESAY	ZHL-42W	9638	2019.10.09	2020.10.08
Power Meter	R&S	NRP	100510	2019.10.16	2020.10.15
Power Meter	Agilent	E4418B	GB43312526	2019.10.16	2020.10.15
Power Sensor	R&S	NRP-Z11	101919	2019.10.09	2020.10.08
Power Sensor	Agilent	E9301A	MY41497725	2019.10.09	2020.10.08
Temperature hygrometer	SuWei	SW-108	N/A	2019.10.13	2020.10.12
Thermograph	Elitech	RC-4	S/N EF7176501537	2019.10.11	2020.10.10

Note:

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

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

Return-loss in within 20% of calibrated measurement



Appendix A. System Validation Plots

System Performance Check Data(835MHz Head)

Type: Phone measurement (Complete)

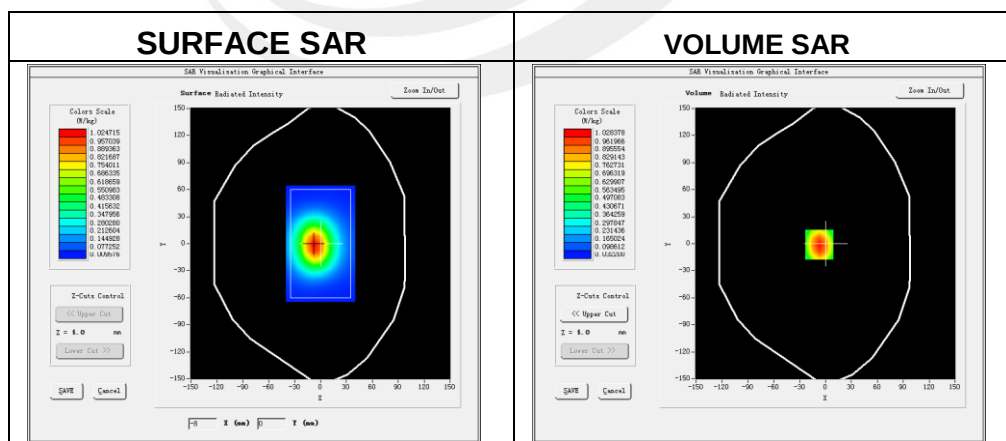
Area scan resolution: dx=8mm,dy=8mm

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

Date of measurement: 2020-04-13

Experimental conditions

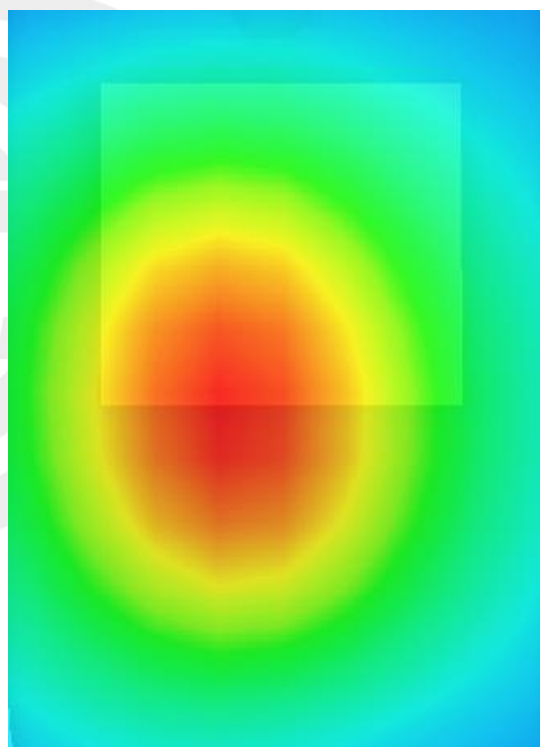
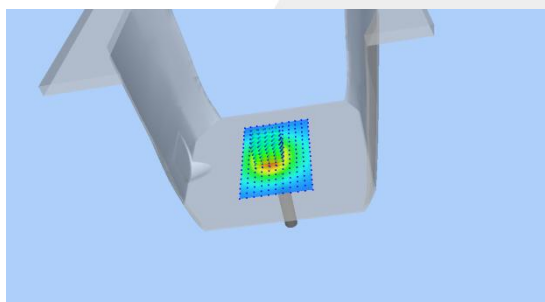
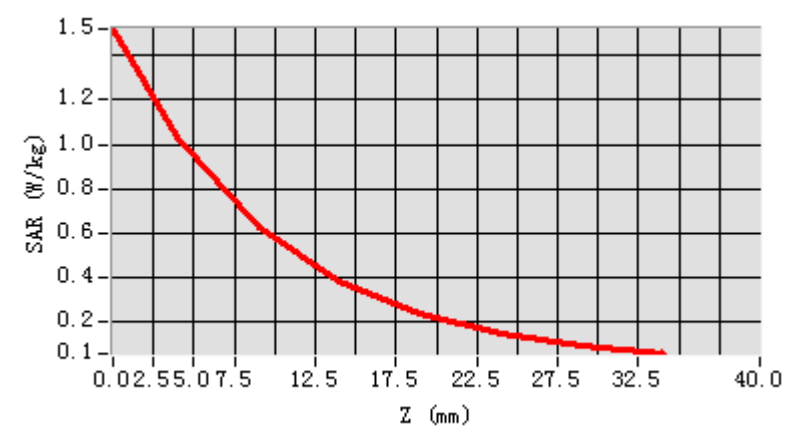
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	42.25
Conductivity (S/m)	0.88
Power drift (%)	1.41
Probe	SN 41/18 EPG0334
ConvF:	1.48
Crest factor:	1:1



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

SAR 10g (W/Kg)	0.611461
SAR 1g (W/Kg)	0.991785

Z Axis Scan





System Performance Check Data(835MHz Body)

Type: Phone measurement (Complete)

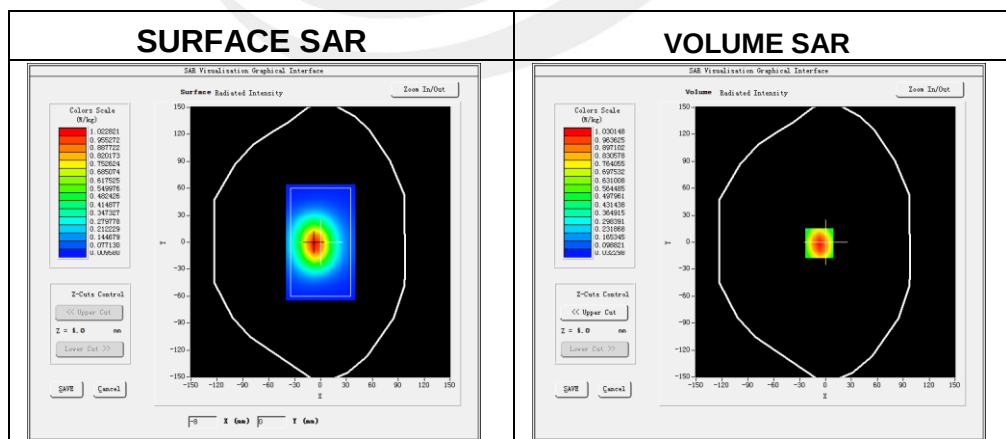
Area scan resolution: dx=8mm,dy=8mm

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

Date of measurement: 2020-04-13

Experimental conditions.

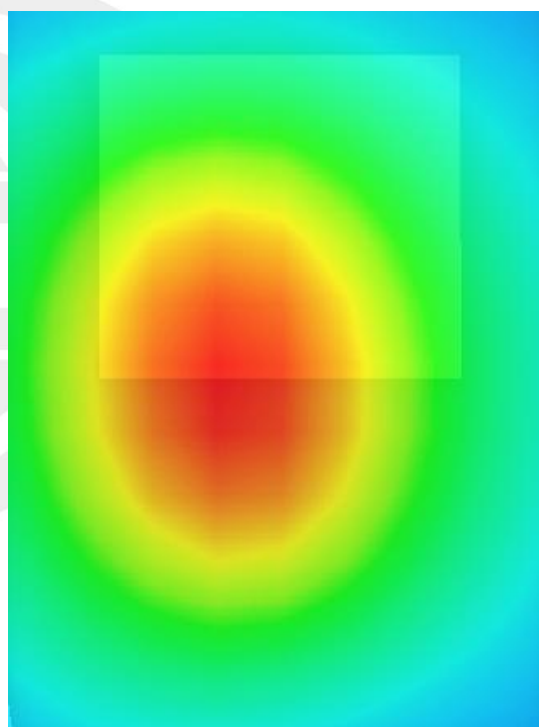
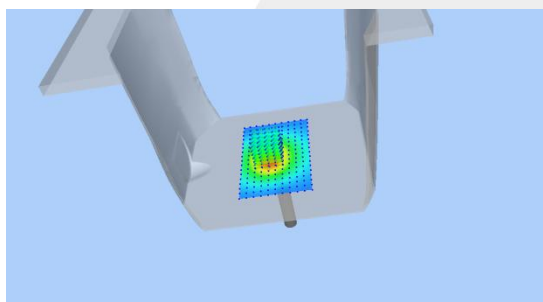
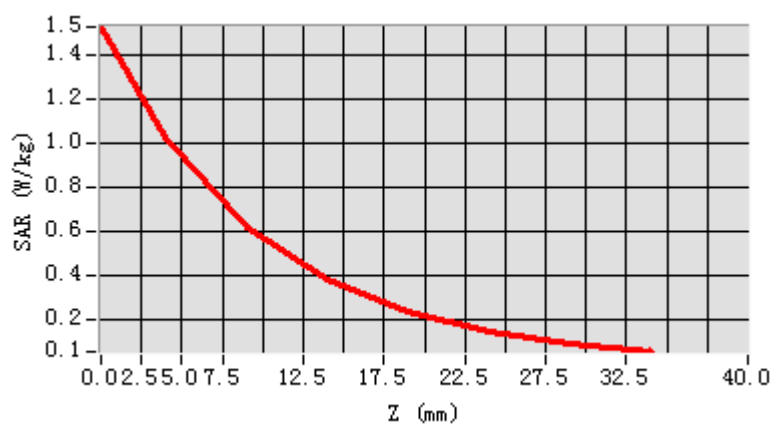
Probe	
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	56.33
Conductivity (S/m)	0.95
Power drift (%)	0.83
Probe	SN 41/18 EPGO334
ConvF:	1.53
Crest factor:	1:1



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

SAR 10g (W/Kg)	0.602329
SAR 1g (W/Kg)	0.967212

Z Axis Scan





System Performance Check Data(1900MHz Head)

Type: Phone measurement (Complete)

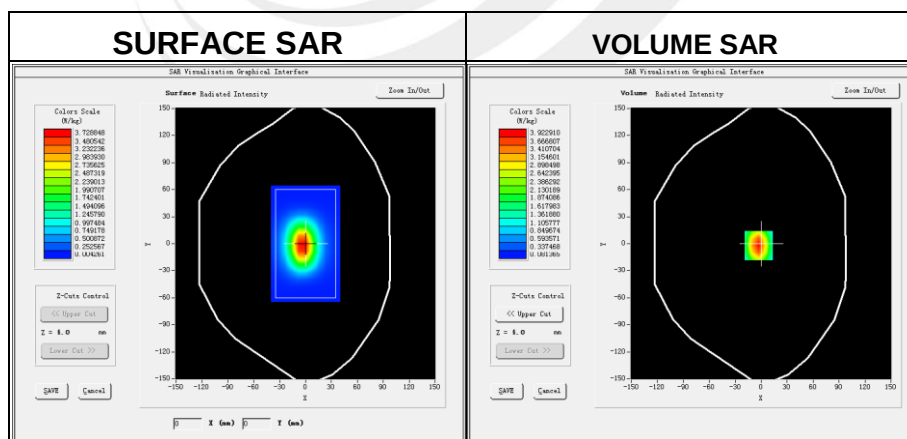
Area scan resolution: dx=8mm,dy=8mm

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

Date of measurement: 2020-04-14

Experimental conditions.

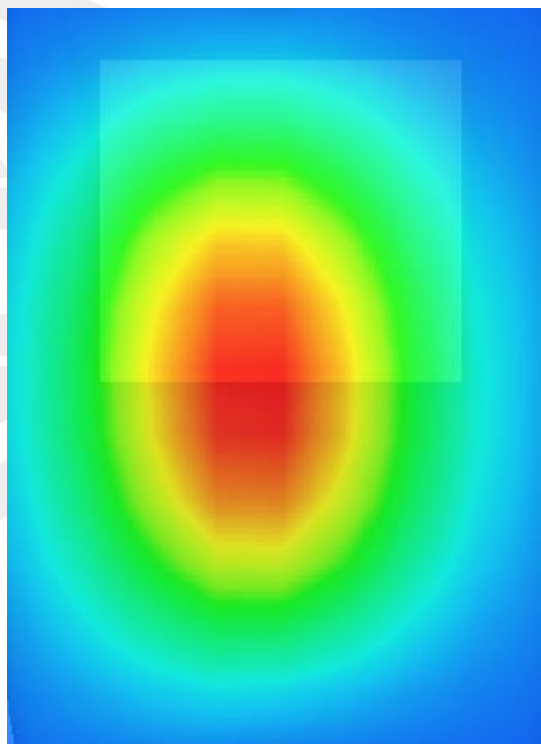
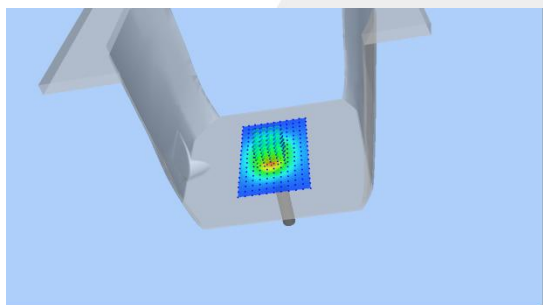
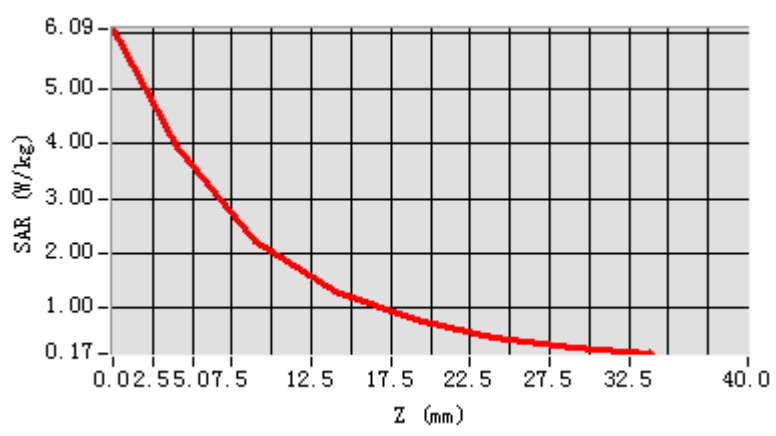
Phantom	Validation plane
Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900MHz
Relative permittivity	39.73
Conductivity (S/m)	1.42
Power drift (%)	2.57
Probe	SN 41/18 EPGO334
ConvF:	1.84
Crest factor:	1:1



Maximum location: X=-3.00, Y=-2.00

SAR 10g (W/Kg)	1.967923
SAR 1g (W/Kg)	4.034481

Z Axis Scan





System Performance Check Data(1900MHz Body)

Type: Phone measurement (Complete)

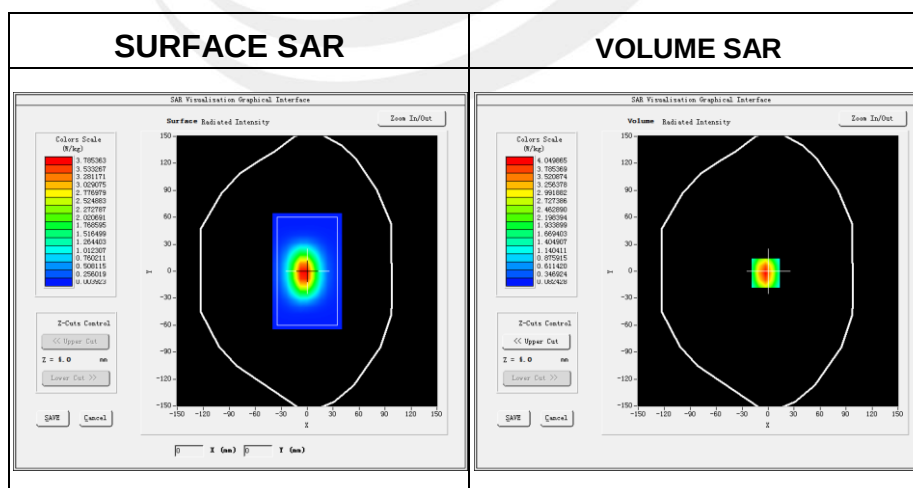
Area scan resolution: dx=8mm,dy=8mm

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

Date of measurement: 2020-04-14

Experimental conditions.

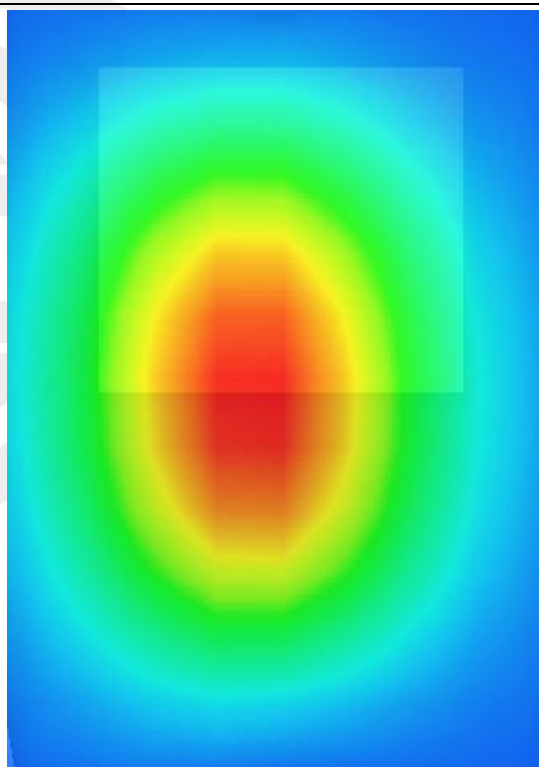
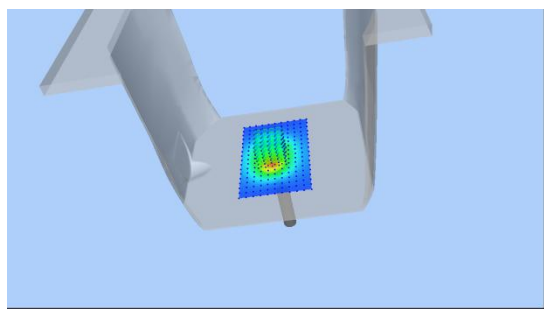
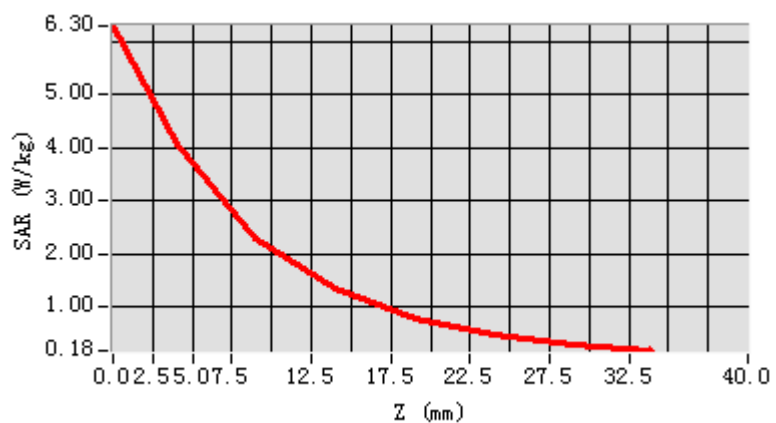
Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900
Relative permittivity	53.86
Conductivity (S/m)	1.55
Power drift (%)	-0.27
Probe	SN 41/18 EPGO334
ConvF:	1.88
Crest factor:	1:1



Maximum location: X=-3.00, Y=-2.00

SAR 10g (W/Kg)	2.065548
SAR 1g (W/Kg)	4.091176

Z Axis Scan



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

Type: Phone measurement (Complete)

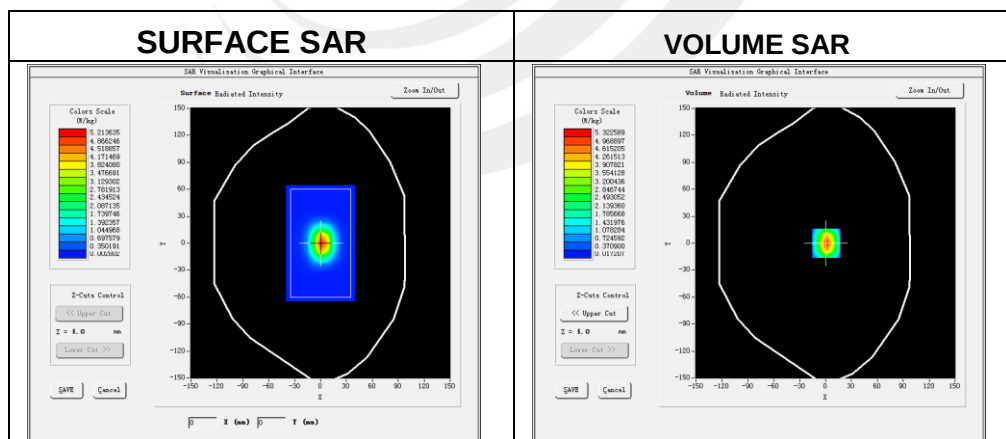
Area scan resolution: dx=8mm,dy=8mm

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

Date of measurement: 2020-04-15

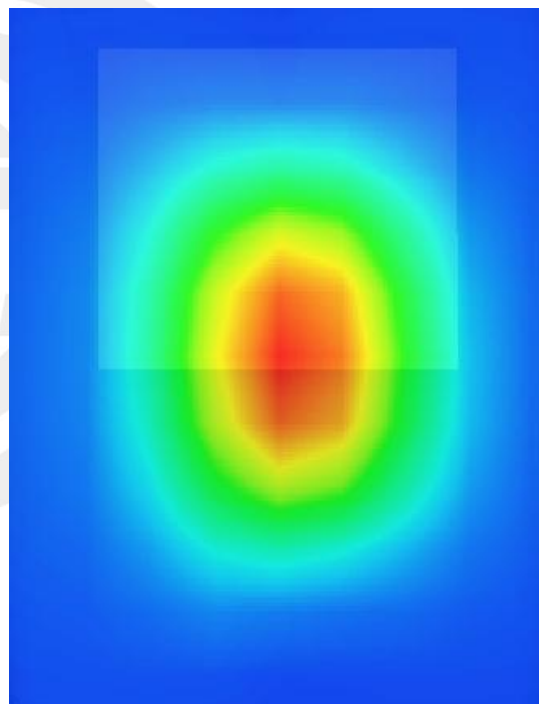
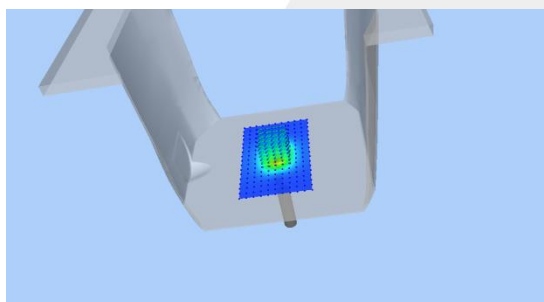
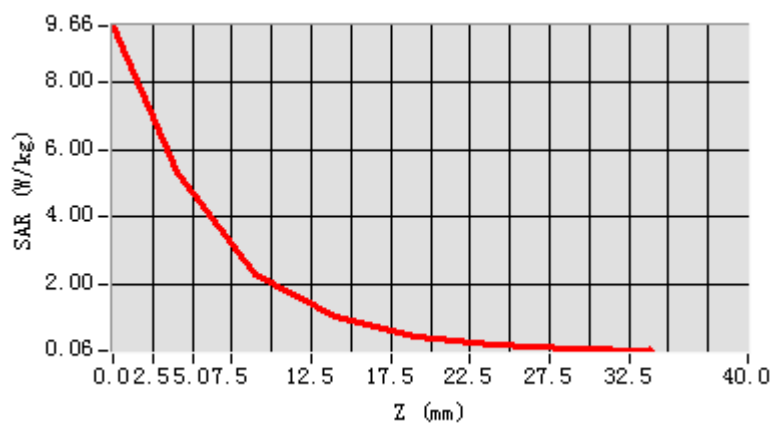
Experimental conditions.

Device Position	Validation plane
Band	2450MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	38.93
Conductivity (S/m)	1.77
Power drift (%)	1.34
Probe	SN 41/18 EPG0334
ConvF	1.97
Crest factor	1:1

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

SAR 10g (W/Kg)	2.411485
SAR 1g (W/Kg)	5.098473

Z Axis Scan



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

Type: Phone measurement (Complete)

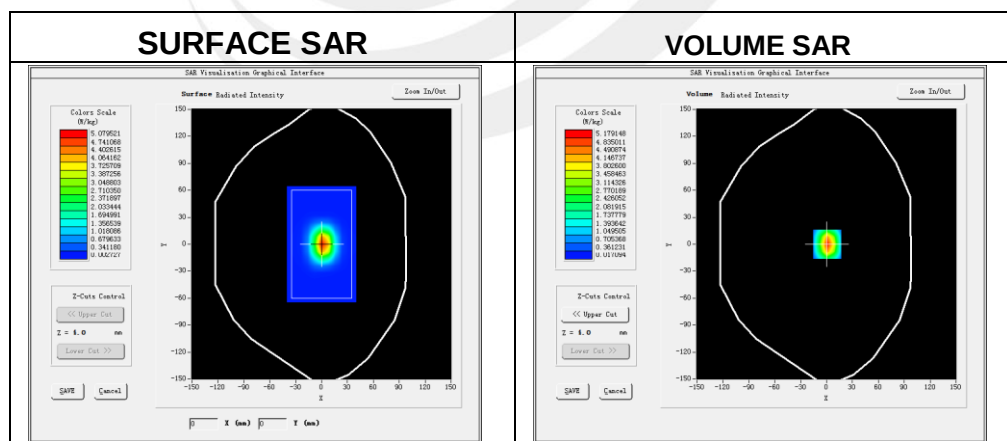
Area scan resolution: dx=8mm,dy=8mm

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

Date of measurement: 2020-04-15

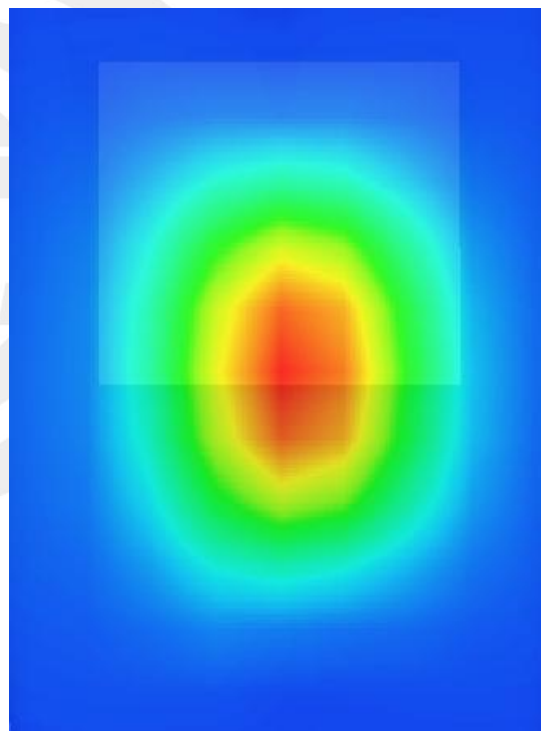
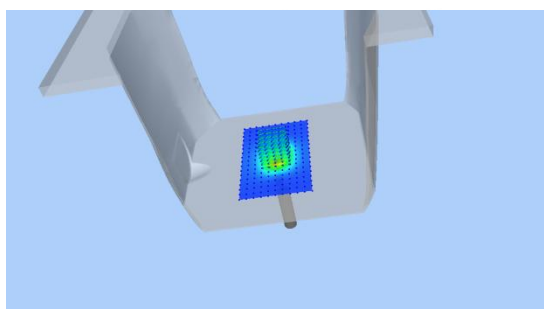
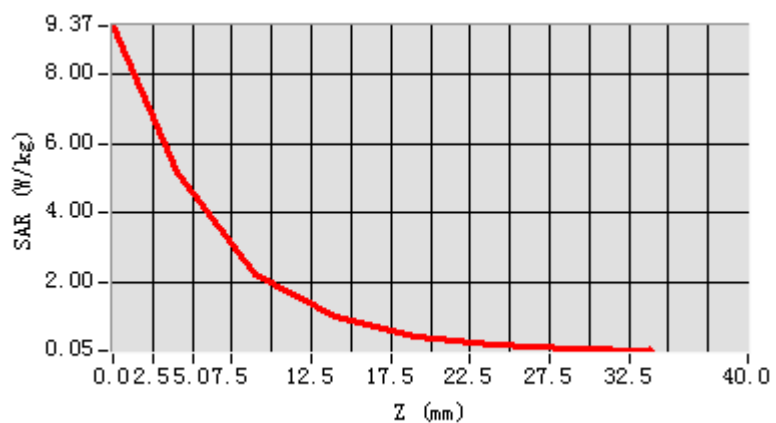
Experimental conditions.

Device Position	Validation plane
Band	2450MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	52.46
Conductivity (S/m)	1.98
Power drift (%)	1.63
Probe	SN 41/18 EPGO334
ConvF	2.02
Crest factor:	1:1

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

SAR 10g (W/Kg)	2.446732
SAR 1g (W/Kg)	5.148957

Z Axis Scan



Appendix B. SAR Test Plots

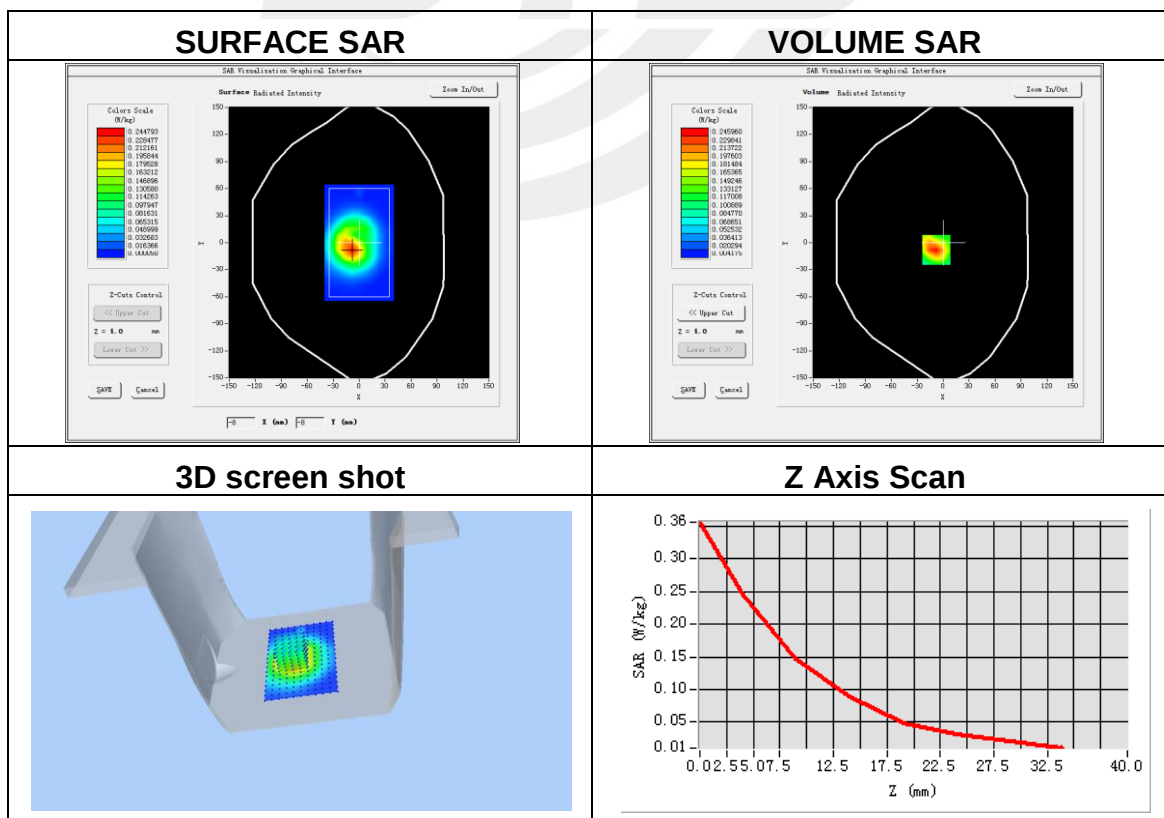
Plot 1: DUT: Kids Watch; EUT Model: A1

Test Date	2020-04-13
Probe	SN 41/18 EPG0334
ConvF	1.48
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Front of face
Band	GSM850
Channels	Low
Signal	TDMA (Crest factor: 8.0)
Frequency (MHz)	824.2
Relative permittivity (real part)	42.25
Conductivity (S/m)	0.88
Variation (%)	1.79

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

SAR Peak: 0.37 W/kg

SAR 10g (W/Kg)	0.126377
SAR 1g (W/Kg)	0.230826





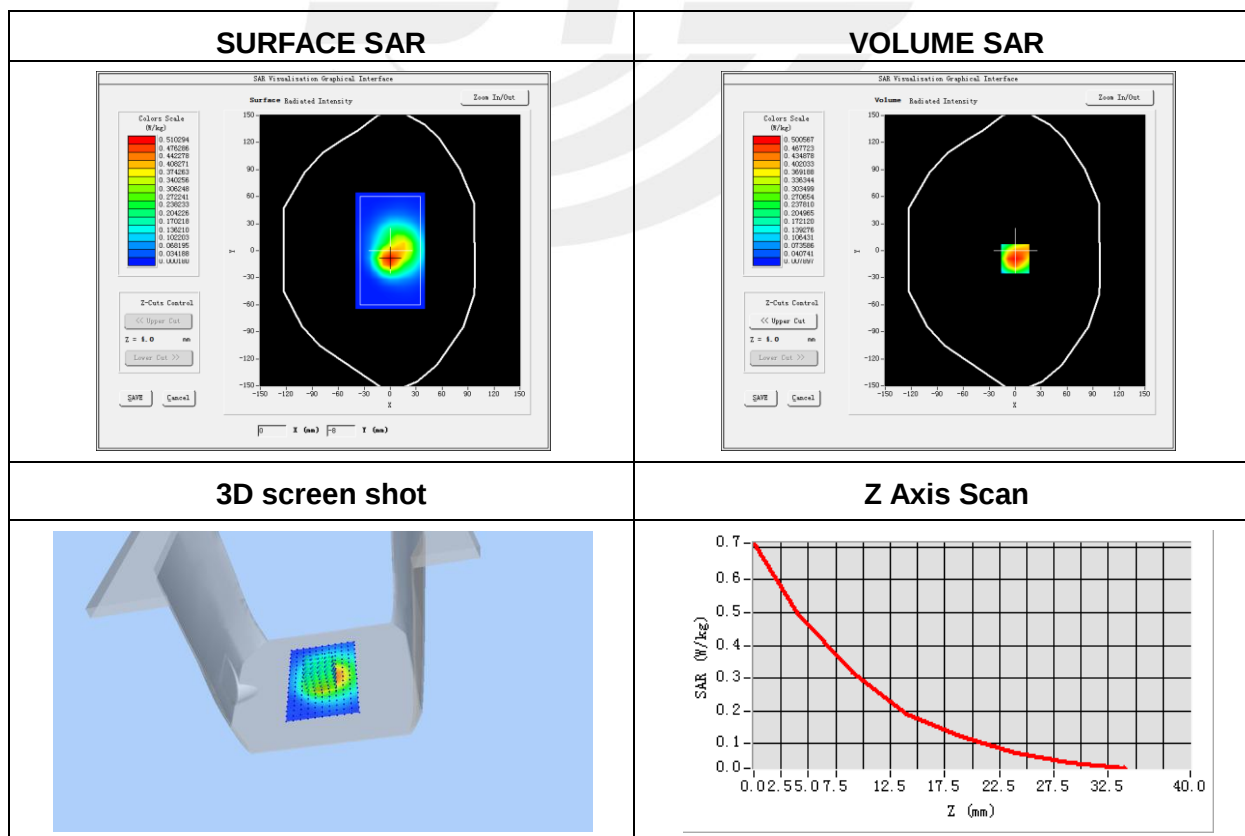
Plot 2: DUT: Kids Watch; EUT Model: A1

Test Date	2020-04-13
Probe	SN 41/18 EPG0334
ConvF	1.53
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Wrist
Band	GPRS 850
Channels	Low
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	824.2
Relative permittivity (real part)	56.33
Conductivity (S/m)	0.95
Variation (%)	1.34

Maximum location: X=0.00, Y=-9.00

SAR Peak: 0.76 W/kg

SAR 10g (W/Kg)	0.263732
SAR 1g (W/Kg)	0.482940



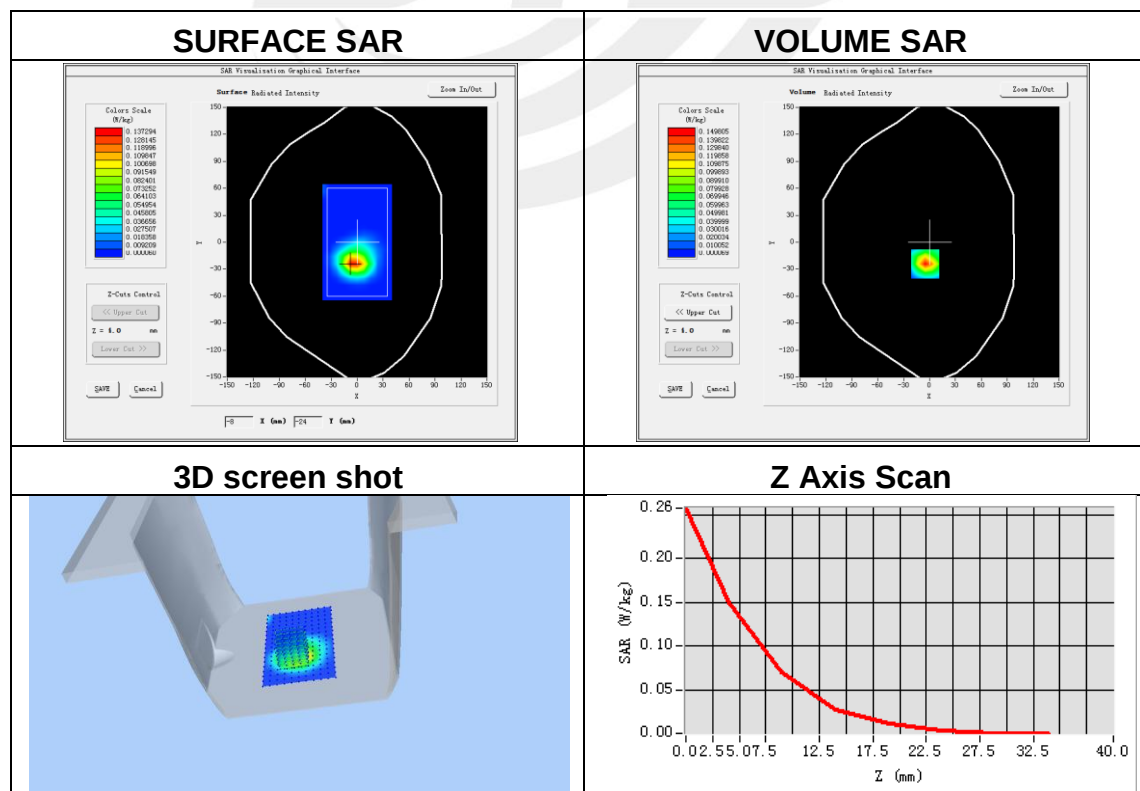
Plot 3: DUT: Kids Watch; EUT Model: A1

Test Date	2020-04-14
Probe	SN 41/18 EPGO334
ConvF	1.84
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Front of face
Band	GSM1900
Channels	Low
Signal	TDMA (Crest factor: 8.0)
Frequency (MHz)	1850.2
Relative permittivity (real part)	39.73
Conductivity (S/m)	1.42
Variation (%)	-2.40

Maximum location: X=-5.00, Y=-24.00

SAR Peak: 0.26 W/kg

SAR 10g (W/Kg)	0.058332
SAR 1g (W/Kg)	0.135987



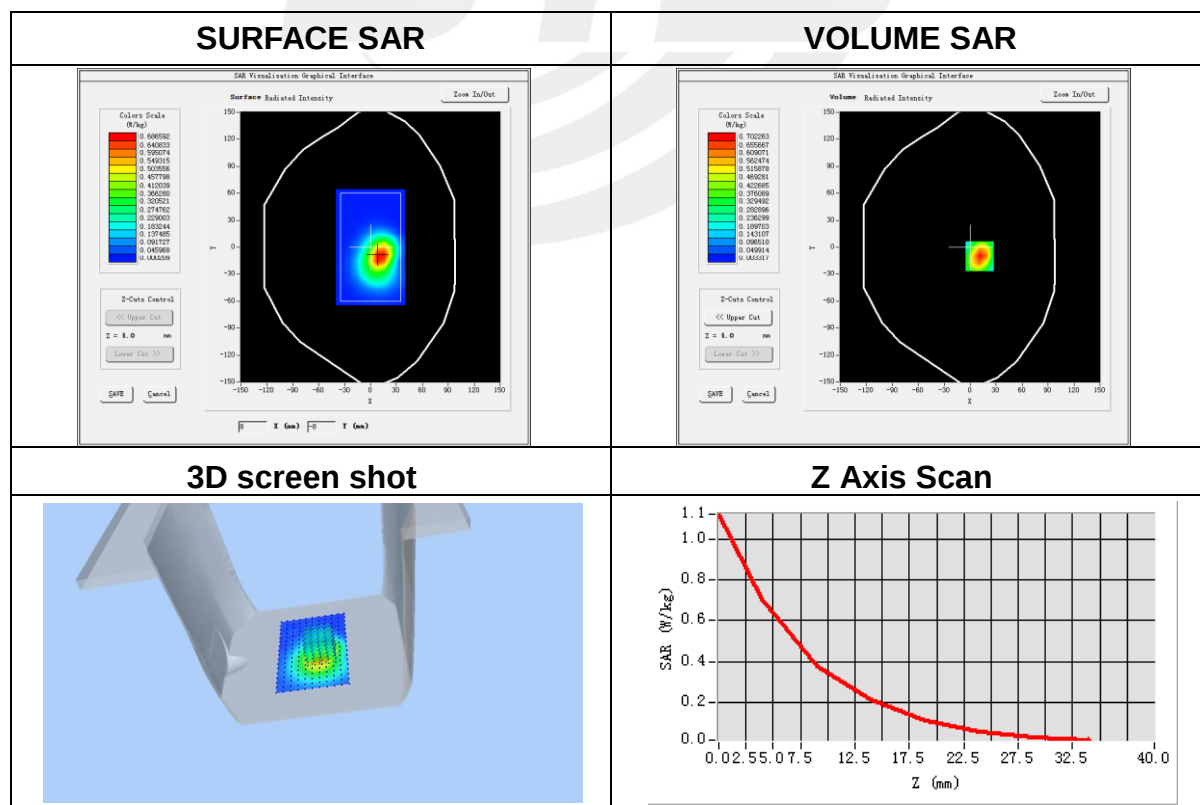

Plot 4: DUT: Kids Watch; EUT Model: A1

Test Date	2020-04-14
Probe	SN 41/18 EPG0334
ConvF	1.88
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7, dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Wrist
Band	GSM 1900
Channels	Low
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	1850.2
Relative permittivity (real part)	53.86
Conductivity (S/m)	1.55
Variation (%)	-1.58

Maximum location: X=11.00, Y=-10.00

SAR Peak: 1.13 W/kg

SAR 10g (W/Kg)	0.339626
SAR 1g (W/Kg)	0.669419



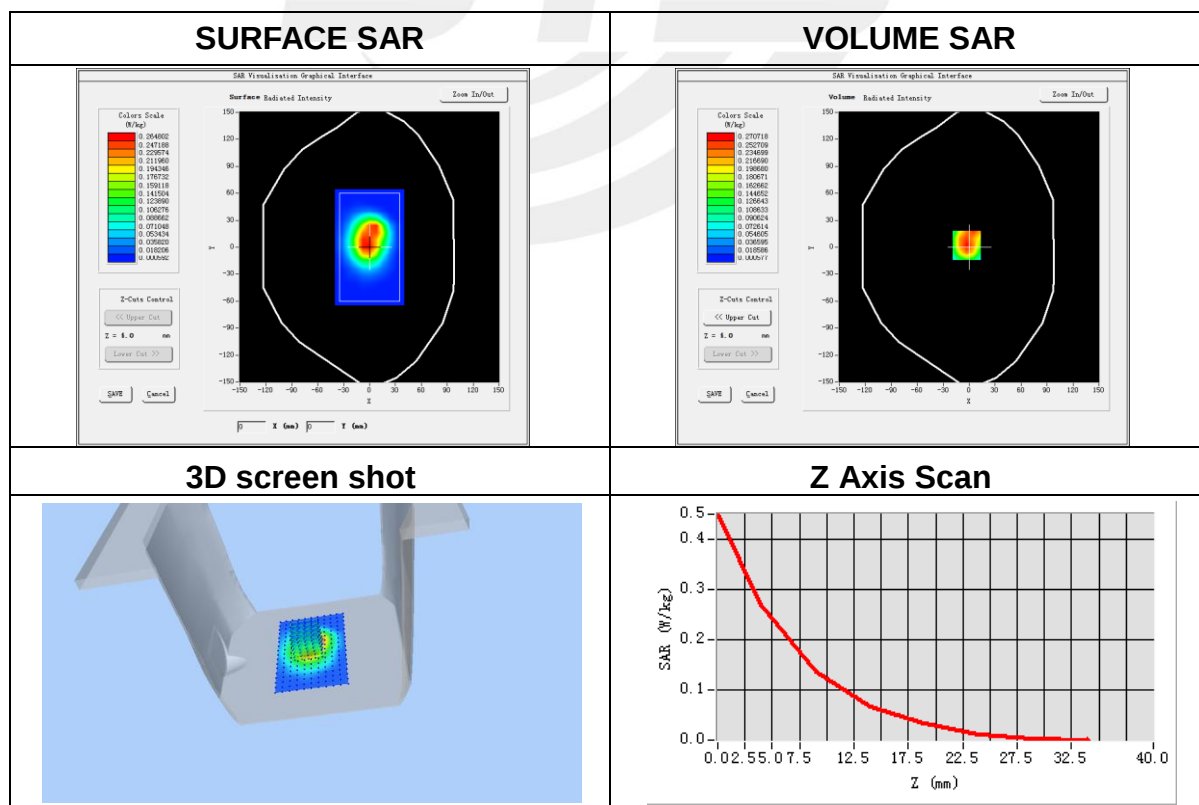
Plot 5: DUT: Kids Watch; EUT Model: A1

Test Date	2020-04-15
Probe	SN 41/18 EPG0334
ConvF	1.97
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Front of face
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	38.93
Conductivity (S/m)	1.77
Variation (%)	0.71

Maximum location: X=-3.00, Y=2.00

SAR Peak: 0.47 W/kg

SAR 10g (W/Kg)	0.127854
SAR 1g (W/Kg)	0.252956



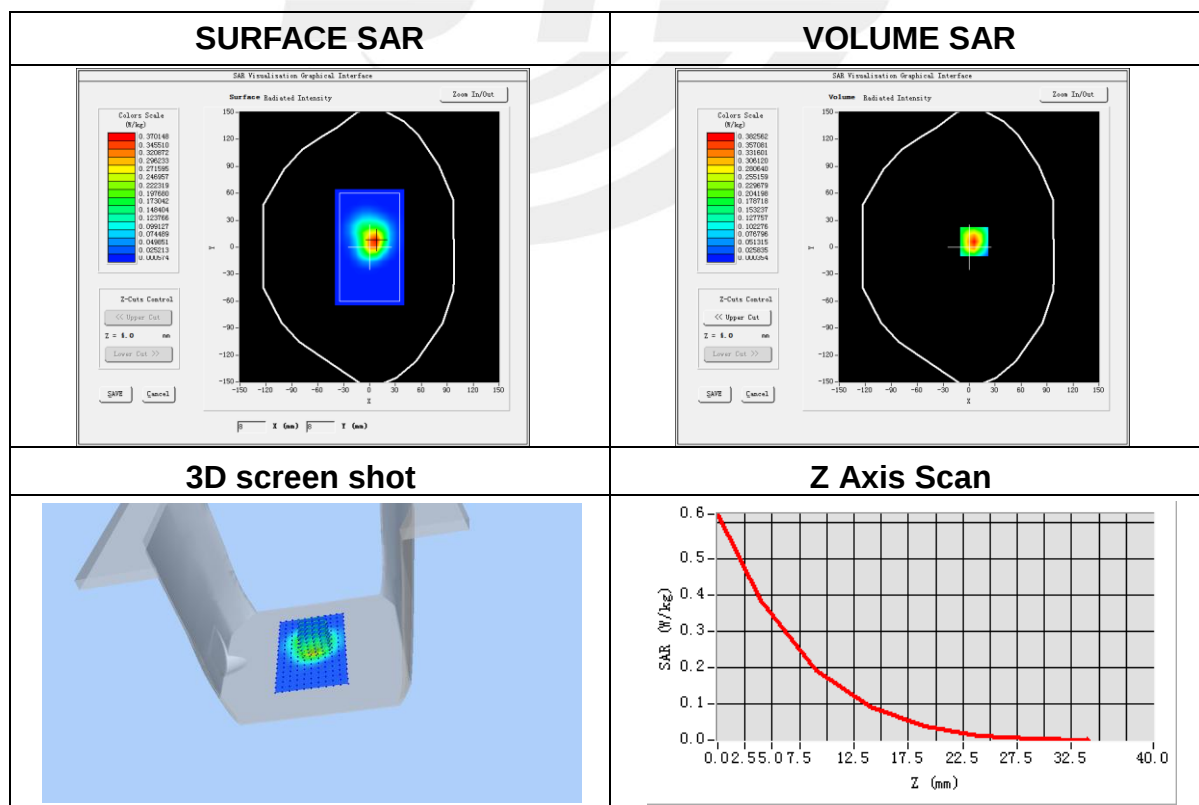

Plot 6: DUT: Kids Watch; EUT Model: A1

Test Date	2020-04-15
Probe	SN 41/18 EPG0334
ConvF	2.02
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Wrist
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	52.46
Conductivity (S/m)	1.98
Variation (%)	0.67

Maximum location:X=6.00, Y=6.00

SAR Peak: 0.62 W/kg

SAR 10g (W/Kg)	0.160983
SAR 1g (W/Kg)	0.353463





Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※END OF THE REPORT※※※※

