



# FCC SAR TEST REPORT

Report No.: STS2012030H02

Issued for

QR TECH CO.,LTD

99 Moo 20, Tambol Lumlookka, Amphur Lumlookka, Patumthani, 12150 Thailand

Product Name:	Smart Watch		
Brand Name:	QR Tech		
Model Name:	H88		
Series Model:	H88-X(X=1-9, A-Z, blank or "-")		
FCC ID:	2AYH5-H88FCC202012		
	ANSI/IEEE Std. C95.1		
Test Standard:	FCC 47 CFR Part 2 ( 2.1093)		
	IEEE 1528: 2013		
Max. Report	Body: 0.370 W/kg (1g)		
SAR:	Wrist: 0.204 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







# **Test Report Certification**

Applicant's name ...... QR TECH CO.,LTD

99 Moo 20, Tambol Lumlookka, Amphur Lumlookka, Patumthani, Address ....::

12150 Thailand

Manufacture's Name.....: XI'AN AIRUNBOT INFORMATION TECHNOLOGY CO.,LTD

10505 BLOCKS B AND C WEST ELECTRONIC COMMUNITY

Address ...... WEST SECTION ELECTRONIC FIRST ROAD HIGHTECH

ZONE CHINA

**Product description** 

Product name .....: Smart Watch

Brand name ...... : QR Tech

Model name .....: H88

Series Model...... H88-X(X=1-9, A-Z, blank or "-")

ANSI/IEEE Std. C95.1-1992

**Standards** ...... 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 ...... 11 Dec. 2020

Date of Issue...... 21 Dec. 2020

Test Result..... Pass

**Testing Engineer** 

(Lemon Li)

emm li

Technical Manager

Authorized Signatory:

(Sean she)

(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 Standards And 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
9.2 SAR Test Exclusions Applied	25
10. EUT And Test Setup Photo	26
10.1 EUT Photo	26
10.2 Setup Photo	29
11. SAR Result Summary	31
11.1 Front of face SAR	31
11.2 Wrist SAR	31
12. Equipment List	34
Appendix A. System Validation Plots	35
Appendix B. SAR Test Plots	39
Appendix C. Probe Calibration And Dipole Calibration Report	46



Page 4 of 46 Report No.: STS2012030H02

# **Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	21 Dec. 2020	STS2012030H02	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

Brand Name	1.1 EO 1 Description									
Model Name   H88	Product Name	Smart V	Smart Watch							
Series Model   H88-X(X=1-9, A-Z, blank or "-")	Brand Name	QR Tec	QR Tech							
Model Difference   Only different in model names.	Model Name	H88	H88							
Capacity: 600mA   Rated Voltage: 3.7V   Charge Limit: 4.2V	Series Model	H88-X(	H88-X(X=1-9, A-Z, blank or "-")							
Rated Voltage: 3.7V   Charge Limit: 4.2V	Model Difference	Only dif								
Charge Limit: 4.2V			-							
Portable	Battery									
Product stage	Dovice Category									
Exposure Environment   General Population / Uncontrolled     IMEI	<b>.</b> .									
MEI				atrollod						
Hardware Version   C41_V1.2	•		•	illonea						
C41P-HH88-EU-P2-BDS-V0.3.41										
LTE Band 38: 2570 MHz to 2620 MHz				20.0.44						
LTE Band 40: 2300 MHz to 2400 MHz	Software Version									
Max. Reported         (W/kg)         0.192           PCE         LTE Band 40         0.365         0.204         D.089           DTS         2.4G WLAN         0.370         0.058         D.058           DSS         Bluetooth Note         0.017         0.033         Sum SAR           Limit (W/kg)         1.6         4         4           FCC Equipment Class         Licensed Portable Transmitter Held to Ear (PCE)         Part 15 Spread Spectrum Transmitter (DSS)         Digital Transmission System (DTS)           LTE: QPSK, 16QAM           WLAN: 802.11 b/g/n(HT20)         Bluetooth: 4.1(GFSK +π/4DQPSK+8DPSK)           BLE: GFSK         LTE: PIFA Antenna           Bluetooth: PIFA Antenna         GPS: PIFA Antenna           SIM Card         Support single card	Frequency Range	LTE Ba WLAN8 Bluetoo	LTE Band 40: 2300 MHz to 2400 MHz LTE Band 41: 2496 MHz to 2690 MHz WLAN802.11b/g/n20: 2412 MHz to 2462 MHz Bluetooth: 2402 MHz to 2480 MHz							
PCE		Band	Mode							
PCE	May Papartad			` •						
PCE										
DSS BluetoothNote 0.017 0.033  Sum SAR 0.735 0.262  Limit (W/kg) 1.6 4  Licensed Portable Transmitter Held to Ear (PCE) Part 15 Spread Spectrum Transmitter (DSS) Digital Transmission System (DTS)  LTE: QPSK, 16QAM WLAN: 802.11 b/g/n(HT20) Bluetooth: 4.1(GFSK +π/4DQPSK+8DPSK) BLE: GFSK  LTE: PIFA Antenna Bluetooth: PIFA Antenna WLAN: PIFA Antenna GPS: PIFA Antenna Support single card	57 ti C									
Sum SAR       0.735       0.262         Limit (W/kg)       1.6       4         FCC Equipment Class       Licensed Portable Transmitter Held to Ear (PCE) Part 15 Spread Spectrum Transmitter (DSS) Digital Transmission System (DTS)         LTE: QPSK, 16QAM WLAN: 802.11 b/g/n(HT20) Bluetooth: 4.1(GFSK +π/4DQPSK+8DPSK) BLE: GFSK         LTE: PIFA Antenna Bluetooth: PIFA Antenna GPS: PIFA Antenna         SIM Card       Support single card										
Limit (W/kg)  1.6  4  Licensed Portable Transmitter Held to Ear (PCE) Part 15 Spread Spectrum Transmitter (DSS) Digital Transmission System (DTS)  LTE: QPSK, 16QAM WLAN: 802.11 b/g/n(HT20) Bluetooth: 4.1(GFSK +π/4DQPSK+8DPSK) BLE: GFSK  LTE: PIFA Antenna Bluetooth: PIFA Antenna WLAN: PIFA Antenna GPS: PIFA Antenna SIM Card  Support single card	Cum CAD	D88	Bluetooth							
Licensed Portable Transmitter Held to Ear (PCE)   Part 15 Spread Spectrum Transmitter (DSS)   Digital Transmission System (DTS)										
Operating Mode       WLAN: 802.11 b/g/n(HT20)	FCC Equipment Class	Part 15	Spread Spectrum T	tter Held to Ear (PCE) ransmitter (DSS)	•					
Antenna Specification  Bluetooth: PIFA Antenna WLAN: PIFA Antenna GPS: PIFA Antenna  SIM Card  Support single card	Operating Mode	WLAN: Bluetoo BLE: G	LTE: QPSK, 16QAM WLAN: 802.11 b/g/n(HT20) Bluetooth: 4.1(GFSK +π/4DQPSK+8DPSK)							
	Antenna Specification	Bluetoo WLAN:	LTE: PIFA Antenna Bluetooth: PIFA Antenna WLAN: PIFA Antenna							
Note:	SIM Card	Support	single card							
NOIG.	Note:									

- 1. Bluetooth 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 (°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 D01 v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting

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

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

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

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

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

### Population/Uncontrolled Environments:

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

### Occupational/Controlled Environments:

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

# NOTE GENERAL POPULATION/UNCONTROLLED EXPOSURE PARTIAL BODY LIMIT 1.6 W/kg (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:

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

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

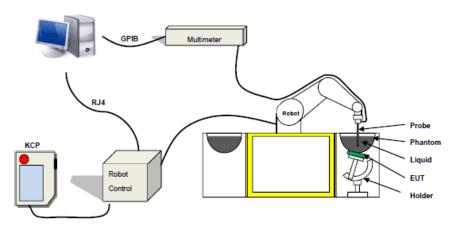
$$SAR = \frac{\sigma E^2}{\rho}$$

Where:  $\sigma$  is the conductivity of the tissue;

 $\rho$  is the mass density of the tissue and E is the RMS electrical field strength.

### 3.2 SAR System

MVG SAR System Diagram:



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

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



The following figure shows the system.



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

### 3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 41/18 EPGO334 with following specifications is used

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



Figure 1-MVG COMOSAR Dosimetric E field Dipole



### 3.2.2 Phantom

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



Figure-SN 32/14 SAM115



Figure-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  $\pm$  0.5 mm would produce a SAR uncertainty of  $\pm$  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.

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





# 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	cellulose	DGBE	HEC	NaCl	Preventol	Sugar	X100	Water	Conductivity	Permittivity
(MHz)	%	%	%	%	%	%	%	%	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	1	/	30.45	55.2	1.4	40.0
2000	/	44.5	/	0.3	1	1	/	55.2	1.4	40.0
2450	/	44.9	1/	0.1	/	1	/	55.0	1.80	39.2
2600	/	45.0	1	0.1	/	1	/	54.9	1.96	39.0

### **Body Tissue**

Frequency	cellulose	DGBE	HEC	NaCl	Preventol	Sugar	X100	Water	Conductivity	Permittivity
(MHz)	%	%	%	%	%	%	%	%	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	1	50.8	0.97	55.2
900	0.2	1	1	0.9	0.1	48.2	1	50.8	1.05	55.0
1800	/	29.4	1	0.4	1	1	30.45	70.2	1.52	53.3
1900	/	29.4	1	0.4	1	1	30.45	70.2	1.52	53.3
2000	/	29.4	/	0.4	1	1	/	70.2	1.52	53.3
2450	/	31.3	/	0.1	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	3	cr	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				



Page 12 of 46

Report No.: STS2012030H02

# **LIQUID MEASUREMENT RESULTS**

Doto	Ambient		Simulating Liquid		Parameters	Torgot	Magaurad	Deviation	Limited
Date	Date Temp. Humidity [°C] %	Frequency	Temp. [°C]	raiameters	Target	Measured	%	%	
2020-12-11	22.4	48	2450 MHz	2450 MHz 22.2	Permittivity	39.2	39.45	0.64	±5
2020-12-11	22.4	40	2430 10172   22.2	22.2	Conductivity	1.8	1.77	-1.67	±5
2020-12-11	22.4	48	2600 MHz	22.2	Permittivity	39	38.25	-1.92	±5
2020-12-11	22.4	40	2000 IVITZ	22.2	Conductivity	1.96	1.89	-3.57	±5



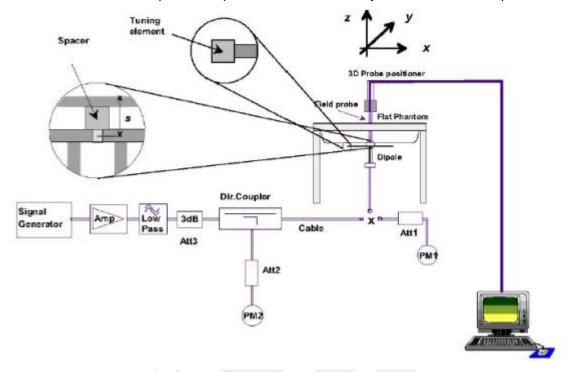


# 5. SAR System Validation

### 5.1 Validation System

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

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



### 5.2 Validation Result

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

Date	Freq.	Power	Power drift	Tested Value	Normalized SAR	Target SAR	Tolerance
Bailo	(MHz)	(mW)	(%)	(W/Kg)	(W/kg)	10g(W/kg)	(%)
2020-12-11	2450	100	1.29	5.181	51.81	52.40	-1.13
2020-12-11	2600	100	0.21	5.395	53.95	55.30	-2.44

### Note:

- The tolerance limit of System validation ±10%.
- 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.



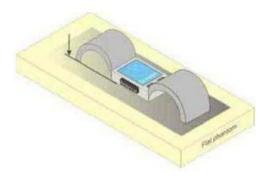
# 7. EUT Test Position

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	$\sqrt{3}$	√0.5	√0.5	0.28	0.28	8
Hemispherical Isotropy	1.045	R	$\sqrt{3}$	√0.5	√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		1						
conditions-Noise	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient	3.0	R	. [2	1	1	1.73	1.73	∞
conditions-reflections	3.0	1	$\sqrt{3}$	/ / ' /	'	1.73	1.73	~
Probe positioner	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
mechanical tolerance			70					
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	2.3	I N	γ3	<u>'</u>		1.33	1.33	_ ~
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 parame		- 1	1 42			2.00	2.00	
Phantom uncertainty (shape								
and thickness uncertainty)	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Uncertainty in SAR								
correction for deviations in	1.9	N	1	1	0.84	1.90	1.60	∞
permittivity and conductivity								
Liquid conductivity	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
(temperature uncertainty)	2.0	- 1	73	0.70	0.7 1	1.10	1.02	
Liquid conductivity	4	N	1	0.78	0.71	3.12	2.84	М
(measured)	_			-				
Liquid permittivity	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
(temperature uncertainty)		-	"	1				
Liquid permittivity (measured)	5	N	1	0.23	0.26	1.15	1.30	М
Combined Standard								
Uncertainty		RSS				9.79	9.59	
Expanded Uncertainty		14.0				40.50	40.40	
(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	8
Axial Isotropy	0.695	R	$\sqrt{3}$	1	1	0.40	0.40	8
Hemispherical Isotropy	1.045	R	$\sqrt{3}$	0	0	0.00	0.00	8
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	8
Linearity	0.685	R	$\sqrt{3}$	1	1	0.40	0.40	8
System detection limits	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	8
Modulation response	3.0	R	$\sqrt{3}$	0	0	0.00	0.00	8
Readout Electronics	0.021	N	1	1	1	0.021	0.021	8
Response Time	0.0	R	$\sqrt{3}$	0	0	0.00	0.00	8
Integration Time	1.4	R	$\sqrt{3}$	0	0	0.00	0.00	- 8
RF ambient conditions-Noise	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	8
RF ambient conditions-reflections	3.0	R	√3	1	1	1.73	1.73	8
Probe positioner mechanical tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	8
Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	8
Post-Processing	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	8
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	√3	1	1	2.89	2.89	8
Other source contribution Uncertainty	2.0	R	√3	1	1	1.15	1.15	8
Phantom and set-up						1		
Phantom uncertainty (shape and thickness uncertainty)	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	8
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	8
Liquid conductivity (temperature uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	8
Liquid conductivity (measured)	4	N	1	0.78	0.71	3.12	2.84	М
Liquid permittivity (temperature uncertainty)	2.5	R	√3	0.23	0.26	0.33	0.38	8
Liquid permittivity (measured)	5	N	1	0.23	0.26	1.15	1.30	М
Combined Standard Uncertainty		RSS				9.718	9.517	
Expanded Uncertainty (95% Confidence interval)		K=2				19.44	19.04	



# 9. Conducted Power Measurement

### **2.4G WLAN**

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
	1	2412	10.67
802.11b	6	2437	12.06
	11	2462	9.59
	1	2412	7.48
802.11g	6	2437	9.42
	11	2462	6.80
	1	2412	6.92
802.11n(HT 20)	6	2437	8.96
	11	2462	6.13

### **Bluetooth**

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
GFSK(1Mbps)	0	2402	-1.99
	39	2441	-1.68
	78	2480	-1.49
	0	2402	-5.32
π/4-DQPSK(2Mbps)	39	2441	-2.81
	78	2480	-3.33
	0	2402	-5.40
8DPSK(3Mbps)	39	2441	-2.88
	78	2480	-3.36

### BLE

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	
	0	2402	-11.01	
GFSK(1Mbps)	19	2440	-8.71	
	39	2480	-8.42	





### **LTE Conducted Power**

### **General Note:**

- 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 38 Maxim	um Average Po	ower [dBm]		
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0		21.23	21.16	21.28
5	1	12		20.98	20.89	21.01
5	1	24		20.70	20.65	20.74
5	12	0	QPSK	20.44	20.42	20.50
5	12	6		20.21	20.15	20.28
5	12	11		19.95	19.89	20.00
5	25	0		19.69	19.69	19.79
5	1	0		20.96	20.87	21.04
5	1	12		20.76	20.58	20.79
5	1	24		20.46	20.29	20.57
5	12	0	16-QAM	20.23	20.03	20.36
5	12	6		19.98	19.79	20.10
5	12	11		19.74	19.56	19.80
5	25	0		19.44	19.28	19.56
10	1	0		21.05	21.11	21.19
10	1	24		20.79	20.85	20.90
10	1	49		20.52	20.62	20.70
10	25	0	QPSK	20.30	20.39	20.43
10	25	12		20.08	20.17	20.15
10	25	24		19.86	19.93	19.90
10	50	0		19.58	19.65	19.62
10	1	0		20.82	20.88	20.96
10	1	24		20.53	20.66	20.68
10	1	49		20.31	20.43	20.44
10	25	0	16-QAM	20.02	20.16	20.20
10	25	12		19.73	19.87	19.98
10	25	24		19.47	19.64	19.73
10	50	0		19.21	19.36	19.47



	LTE	Band 38 Maximu	ım Average Po	wer [dBm]		
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0		21.27	21.30	21.25
15	1	37		21.03	21.00	21.03
15	1	74		20.81	20.75	20.82
15	36	0	QPSK	20.56	20.52	20.60
15	36	18		20.29	20.22	20.33
15	36	39		19.99	19.98	20.06
15	75	0		19.69	19.69	19.82
15	1	0		20.99	21.08	20.95
15	1	38		20.74	20.83	20.66
15	1	75		20.50	20.58	20.39
15	36	0	16-QAM	20.22	20.38	20.14
15	36	18		19.96	20.16	19.92
15	36	39		19.67	19.90	19.66
15	75	0		19.39	19.60	19.37
20	1	0		21.33	21.37	21.32
20	1	49		21.06	21.09	21.11
20	1	99		20.84	20.86	20.83
20	50	0	QPSK	20.60	20.61	20.62
20	50	24		20.33	20.36	20.32
20	50	49		20.03	20.11	20.12
20	100	0		19.82	19.83	19.86
20	1	0		21.09	21.07	21.08
20	1	49		20.86	20.83	20.84
20	1	99		20.66	20.57	20.60
20	50	0	16-QAM	20.41	20.30	20.32
20	50	24		20.16	20.08	20.04
20	50	49		19.88	19.80	19.81
20	100	0		19.64	19.53	19.54



	LTE	Band 40 Maximu	ım Average Po	ower [dBm]		
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0		21.62	21.58	21.67
5	1	12		21.37	21.34	21.43
5	1	24		21.10	21.09	21.20
5	12	0	QPSK	20.81	20.81	20.95
5	12	6		20.55	20.51	20.70
5	12	11		20.29	20.28	20.47
5	25	0		20.08	20.08	20.23
5	1	0		21.33	21.31	21.43
5	1	12		21.08	21.02	21.17
5	1	24		20.83	20.75	20.89
5	12	0	16-QAM	20.63	20.50	20.67
5	12	6		20.36	20.23	20.45
5	12	11		20.06	20.03	20.21
5	25	0		19.84	19.82	19.95
10	1	0		N/A	21.75	N/A
10	1	24		N/A	21.49	N/A
10	1	49		N/A	21.20	N/A
10	25	0	QPSK	N/A	20.95	N/A
10	25	12		N/A	20.66	N/A
10	25	24		N/A	20.42	N/A
10	50	0		N/A	20.16	N/A
10	1	0		N/A	21.51	N/A
10	1	24		N/A	21.24	N/A
10	1	49		N/A	20.99	N/A
10	25	0	16-QAM	N/A	20.75	N/A
10	25	12		N/A	20.54	N/A
10	25	24		N/A	20.25	N/A
10	50	0		N/A	20.04	N/A



	LTE	Band 41 Maximu	ım Average Po	wer [dBm]		
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0		21.48	21.53	21.47
5	1	12		21.28	21.30	21.21
5	1	24		20.98	21.09	20.97
5	12	0	QPSK	20.74	20.83	20.75
5	12	6		20.45	20.55	20.46
5	12	11		20.23	20.31	20.22
5	25	0		19.98	20.01	19.93
5	1	0		21.21	21.26	21.17
5	1	12		20.95	20.98	20.92
5	1	24		20.67	20.69	20.70
5	12	0	16-QAM	20.46	20.44	20.42
5	12	6		20.19	20.19	20.16
5	12	11		19.95	19.91	19.88
5	25	0		19.73	19.65	19.67
10	1	0		21.52	21.49	21.60
10	1	24		21.23	21.29	21.40
10	1	49		20.97	20.99	21.19
10	25	0	QPSK	20.73	20.78	20.91
10	25	12		20.49	20.50	20.67
10	25	24		20.20	20.27	20.45
10	50	0		19.90	20.02	20.16
10	1	0		21.27	21.26	21.39
10	1	24		20.98	20.99	21.12
10	1	49		20.72	20.73	20.90
10	25	0	16-QAM	20.45	20.45	20.63
10	25	12		20.20	20.16	20.40
10	25	24		19.93	19.87	20.17
10	50	0		19.72	19.63	19.92



	LTE	Band 41 Maxim	um Average P	ower [dBm]		
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0		21.55	21.67	21.39
15	1	37		21.28	21.44	21.13
15	1	74		21.07	21.21	20.86
15	36	0	QPSK	20.83	20.99	20.61
15	36	18		20.60	20.74	20.34
15	36	39		20.40	20.52	20.10
15	75	0		20.14	20.28	19.82
15	1	0		21.33	21.44	21.19
15	1	38		21.06	21.14	20.95
15	1	75		20.84	20.90	20.66
15	36	0	16-QAM	20.59	20.64	20.46
15	36	18		20.29	20.39	20.25
15	36	39		20.06	20.17	20.02
15	75	0		19.78	19.93	19.76
20	1	0		21.71	21.84	21.88
20	1	49		21.42	21.56	21.65
20	1	99		21.22	21.31	21.39
20	50	0	QPSK	21.00	21.05	21.11
20	50	24		20.78	20.77	20.88
20	50	49		20.53	20.55	20.61
20	100	0		20.26	20.28	20.36
20	1	0		21.51	21.55	21.66
20	1	49		21.28	21.29	21.36
20	1	99		21.01	21.00	21.10
20	50	0	16-QAM	20.79	20.78	20.83
20	50	24		20.57	20.56	20.55
20	50	49		20.35	20.33	20.26
20	100	0		20.14	20.07	20.04



### 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:

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

- f(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.

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

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

**Bluetooth Head SAR was not required**;  $[(0.794/5)^* \sqrt{2.480} = 0.27 < 3.0.$ 

Based on the maximum conducted power of **Bluetooth Body** (rounded to the nearest mW) and the antenna to user separation distance,

Bluetooth Body SAR was not required;  $[(0.794/10)^* \sqrt{2.480}] = 0.13 < 3.0$ .

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 SAR was required**;  $[(16.032/5)^* \sqrt{2.437}] = 5.01 > 3.0$ .

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

**2.4 GHz WLAN SAR was not required**;  $[(16.032/10)^* \sqrt{2.437}] = 2.50 < 3.0$ .





# 10. EUT And Test Setup Photo

### 10.1 EUT Photo





Back side





Top Edge

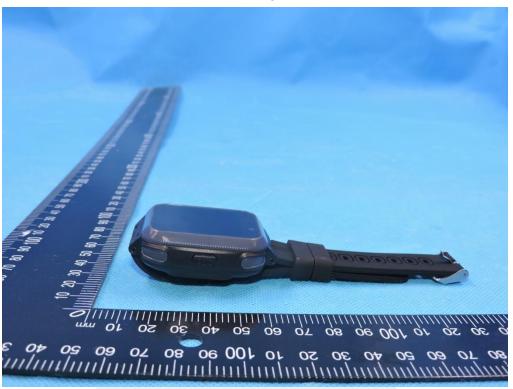


**Bottom Edge** 





# Left Edge



Right Edge



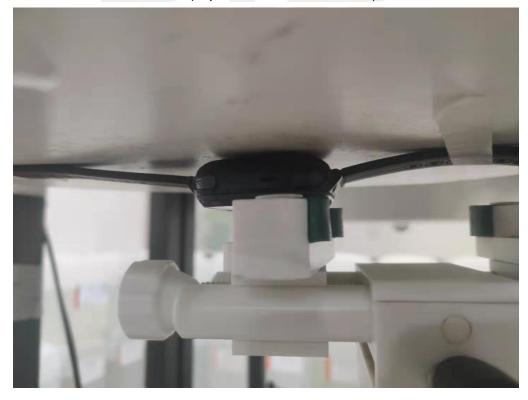


# 10.2 Setup Photo





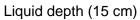
Wrist (separation distance is 0mm)

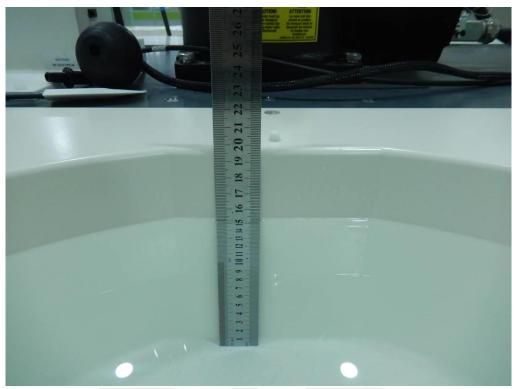
















# 11. SAR Result Summary

### 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.
LTE BAND38	QPSK	Front of face	38000	0.287	-2.57	21.5	21.37	0.296	1
LTE BAND40	QPSK	Front of face	39150	0.345	-2.02	22	21.75	0.365	3
LTE BAND41	QPSK	Front of face	41490	0.120	-1.48	22	21.60	0.132	5

### 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	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.
LTE BAND38	QPSK	Wrist	38000	0.186	-0.39	21.5	21.37	0.192	2
LTE BAND40	QPSK	Wrist	39150	0.193	1.43	22	21.75	0.204	4
LTE BAND41	QPSK	Wrist	41490	0.081	-0.45	22	21.60	0.089	6
2.4GWLAN	802.11b	Wrist	6	0.052	1.11	12.5	12.06	0.058	7

### 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	1. LTE + Bluetooth
face	2. LTE +2.4G WLAN
Wrist	1. LTE + Bluetooth
VVIISE	2. LTE +2.4G WLAN

### NOTE:

- 1. For simultaneous transmission at head and body exposure position, 2 transmitters 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  $\leq$  50mm,Bluetooth standalone SAR is excluded according to [(max. power of channel, including tune-up tolerance, mW)/ (min. test separation distance, mm)·[ $\sqrt{f}$  (GHz) /x]  $\leq$  3.0 for 1-g SAR and  $\leq$  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) (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[ $\sqrt{f}$  (GHz) /x] W/kg for test separation distances  $\leq$  50 mm;Where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
  - b) 0.4W/Kg for 1-g SAR and 1.0W/Kg for 10-g SAR, when the separation distance is >50mm.

Estimated SAR		Maximum Power  dBm mW		Antenna to user(mm)	Frequency(GHz)	Stand alone SAR [W/kg]
		ubili	IIIVV	to user(mm)		OAR [W/Rg]
ВТ	Front of face(1g)	-1	0.794	10	2.480	0.017
	Wrist(10g)		0.701	5	2.480	0.033
2.4G WLAN	Front of face(1g)	12.5	17.783	10	2437	0.370



Page 33 of 46 Report No.: STS2012030H02

Simultaneous Mode	Position	Mode	Max. SAR (W/kg)	Sum SAR (W/kg)	
LTE + Bluetooth	Front of	LTE	0.365	0.382	
LIE + Bluetootii	Face(1g)	Bluetooth	0.017	0.362	
LTE + Bluetooth	Wrigh(10g)	LTE	0.204	0.237	
LIE + Bluetootii	Wrist(10g)	Bluetooth	0.033	0.237	
LTE + 2.4G WLAN	Front of	LTE	0.365	0.725	
LIE + 2.4G WLAN	face(1g)	2.4G WLAN	0.370	0.735	
LTE + 2.4G WLAN	Wrist(10g)	LTE	0.204	0.262	
LIE + 2.4G WLAIN	vv115t(10g)	2.4G WLAN	0.058	0.202	

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
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 41/18 EPGO334	2020.07.14	2021.07.13
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	E4419B	QB43312265	2019.10.12	2020.10.11
Power Sensor	R&S	NRP-Z11	101919	2019.10.12	2020.10.11
Power Sensor	HP	E9300A	US39210170	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:

<sup>1.</sup> There is no physical damage on the dipole

<sup>2.</sup> System validation with specific dipole is within 10% of calibrated value Return-loss in within 20% of calibrated measurement



# **Appendix A. System Validation Plots**

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

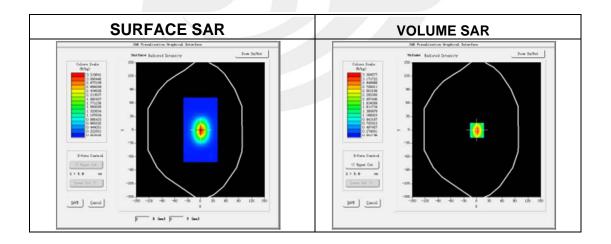
Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement: 2020-12-11

# **Experimental conditions.**

Device Position	Validation plane		
Band	2450 MHz		
Channels	_		
Signal	CW		
Frequency (MHz)	2450		
Relative permittivity	39.45		
Conductivity (S/m)	1.77		
Probe	SN 41/18 EPGO334		
ConvF	1.97		
Crest factor:	1:1		

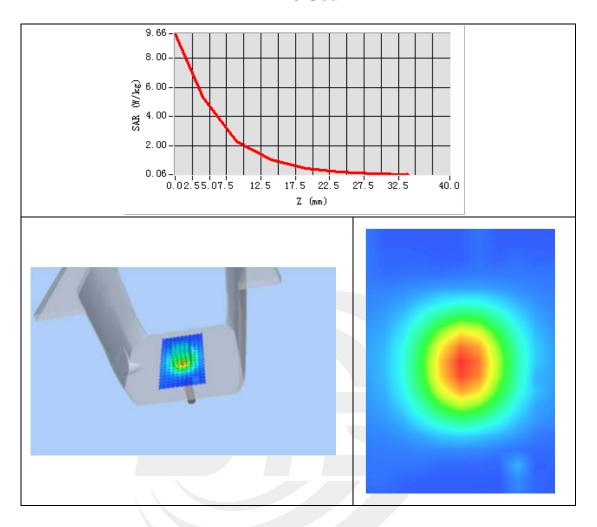


### Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	2.374045
SAR 1g (W/Kg)	5.181341



# **Z Axis Scan**





# System Performance Check Data (2600MHz)

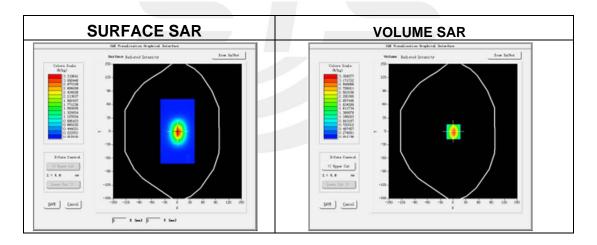
Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement: 2020-12-11

# **Experimental conditions.**

Device Position	Validation plane		
Band	2600 MHz		
Channels	-		
Signal	CW		
Frequency (MHz)	2600		
Relative permittivity	38.25		
Conductivity (S/m)	1.89		
Probe	SN 41/18 EPGO334		
ConvF	1.85		
Crest factor:	1:1		

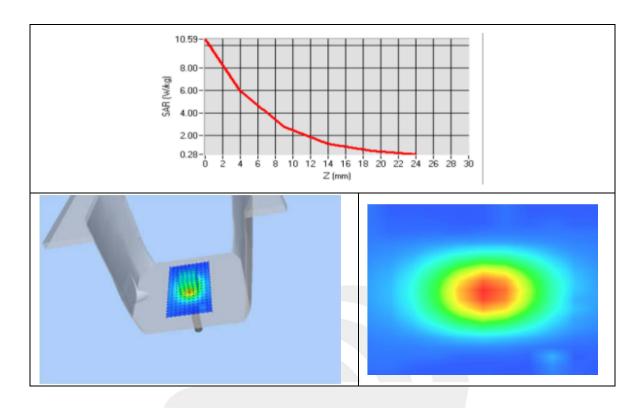


Maximum location: X=3.00, Y=1.00

SAR 10g (W/Kg)	2.497086
SAR 1g (W/Kg)	5.395157



# **Z Axis Scan**





# **Appendix B. SAR Test Plots**

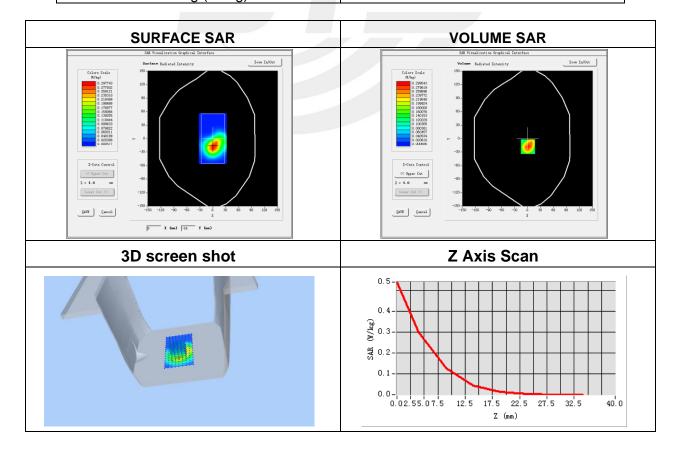
Plot 1: DUT: Smart Watch; EUT Model: H88

2020-12-11
SN 41/18 EPGO334
1.85
dx=8mm, dy=8mm, h= 5.00 mm
5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Validation plane
Front of face
LTE Band 38
Middle
LTE (Crest factor: 1.0)
2595
38.25
1.89

Maximum location: X=1.00, Y=-18.00

SAR Peak: 0.54 W/kg

SAR 10g (W/Kg)	0.128807
SAR 1g (W/Kg)	0.287180





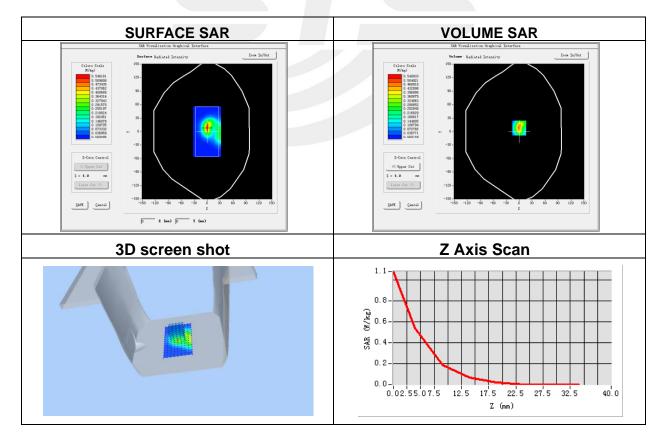
Plot 2: DUT: Smart Watch; EUT Model: H88

2020-09-21
SN 41/18 EPGO334
1.85
dx=8mm, dy=8mm, h= 5.00 mm
5x5x7, dx=8mm, dy=8mm, dz=5mm,
Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Validation plane
Wrist
LTE Band 38
Middle
LTE (Crest factor: 1.0)
2595
38.25
1.89

Maximum location: X=0.00, Y=8.00

SAR Peak: 1.07 W/kg

SAR 10g (W/Kg)	0.186401
SAR 1g (W/Kg)	0.495467





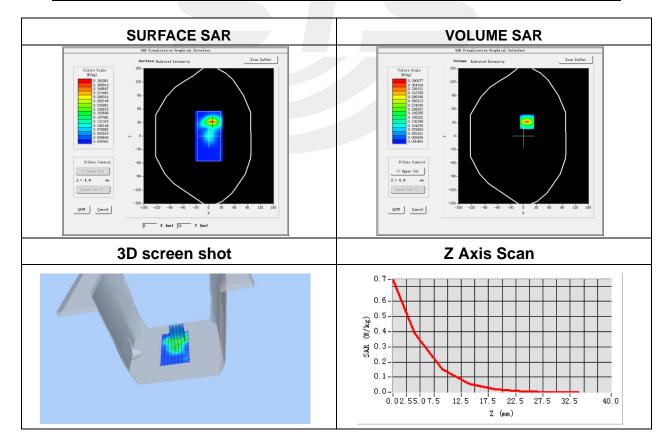
Plot 3: DUT: Smart Watch; EUT Model: H88

Test Date	2020-12-11
Probe	SN 41/18 EPGO334
ConvF	1.97
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 40
Channels	Middle
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2350
Relative permittivity (real part)	39.45
Conductivity (S/m)	1.77

Maximum location: X=8.00, Y=32.00

SAR Peak: 0.73 W/kg

SAR 10g (W/Kg)	0.129335
SAR 1g (W/Kg)	0.345253





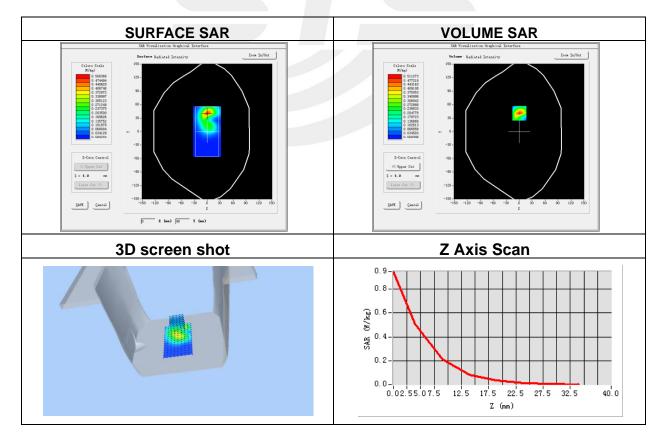
Plot 4: DUT: Smart Watch; EUT Model: H88

2020-09-21
SN 41/18 EPGO334
1.97
dx=8mm, dy=8mm, h= 5.00 mm
5x5x7, dx=8mm, dy=8mm, dz=5mm,
Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Validation plane
Wrist
LTE Band 40
Middle
LTE (Crest factor: 1.0)
2350
39.45
1.77

Maximum location: X=1.00, Y=41.00

SAR Peak: 0.94 W/kg

SAR 10g (W/Kg)	0.193137
SAR 1g (W/Kg)	0.471506





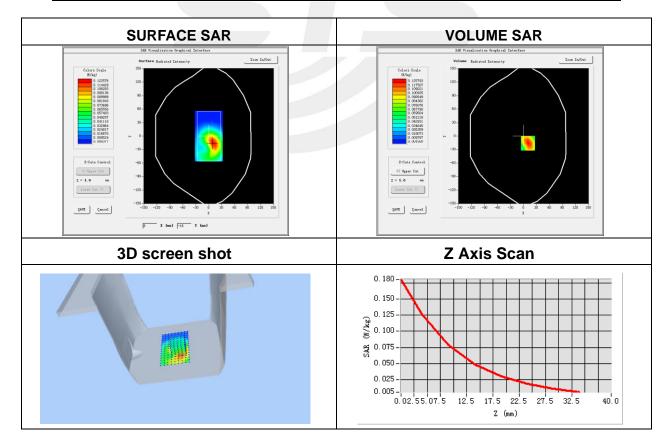
Plot 5: DUT: Smart Watch; EUT Model: H88

Test Date	2020-12-11
Probe	SN 41/18 EPGO334
ConvF	1.85
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 41
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2680
Relative permittivity (real part)	38.25
Conductivity (S/m)	1.89

Maximum location: X=10.00, Y=-16.00

SAR Peak: 0.18 W/kg

SAR 10g (W/Kg)	0.070661
SAR 1g (W/Kg)	0.120158





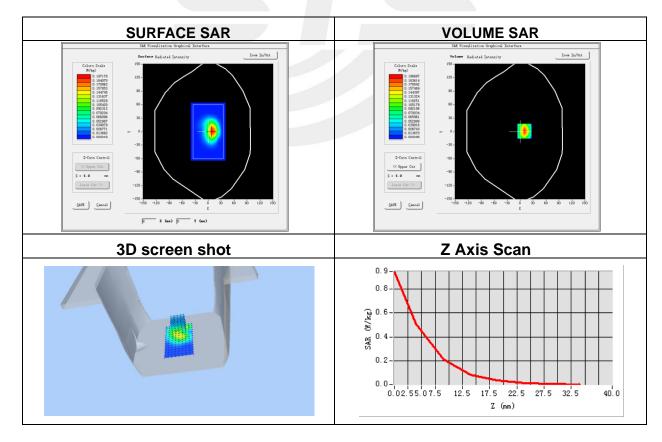
Plot 6: DUT: Smart Watch; EUT Model: H88

Test Date	2020-12-11
Probe	SN 41/18 EPGO334
ConvF	1.85
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 41
Channels	High
Signal	LTE (Crest factor: 1.0)
Frequency (MHz)	2680
Relative permittivity (real part)	38.25
Conductivity (S/m)	1.89

Maximum location: X=10.00, Y=1.00

SAR Peak: 0.33 W/kg

SAR 10g (W/Kg)	0.080553
SAR 1g (W/Kg)	0.182475



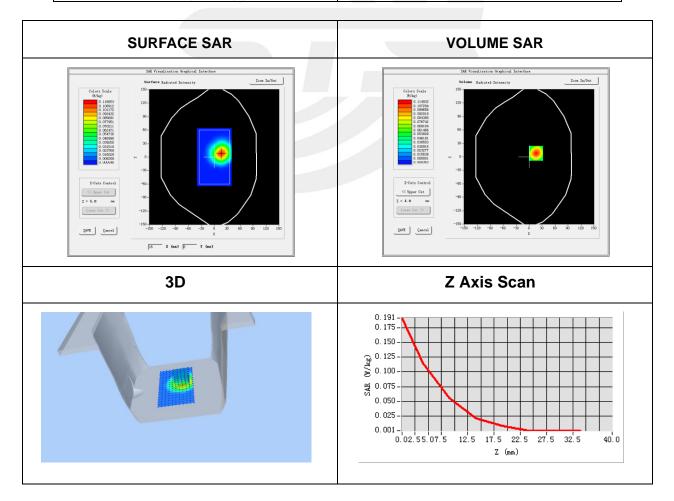


Plot 7: DUT: Smart Watch; EUT Model: H88

Test Date	2020-09-25
Probe	SN 41/18 EPGO334
ConvF	1.97
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
Channels	Middle
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2437
Relative permittivity (real part)	39.45
Conductivity (S/m)	1.77

Maximum location: X=16.00, Y=8.00 SAR Peak: 0.19 W/kg

SAR 10g (W/Kg)	0.051649
SAR 1g (W/Kg)	0.108666







# Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.

