

SAR Test Report

Report No.: AGC01662180102FH05

FCC ID : OMCIFT1018

PRODUCT DESIGNATION : TABLET

BRAND NAME : iFIT

MODEL NAME : IFT1018

CLIENT : ICON Health & Fitness Inc.

DATE OF ISSUE : Mar. 23,2018

STANDARD(S) : IEEE Std. 1528:2013
FCC 47CFR § 2.1093
IEEE/ANSI C95.1:2005

REPORT VERSION : V1.0

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 23,2018	Valid	Initial Release

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Test Report Certification

Applicant Name	ICON Health & Fitness Inc.
Applicant Address	1500 South 1000 West, Logan, UT 84321,USA
Manufacturer Name	ICON Health & Fitness Inc.
Manufacturer Address	1500 South 1000 West, Logan, UT 84321,USA
Product Designation	TABLET
Brand Name	iFIT
Model Name	IFT1018
Different Description	N/A
EUT Voltage	DC3.8V by battery
Applicable Standard	IEEE Std. 1528:2013 FCC 47CFR § 2.1093 IEEE/ANSI C95.1:2005
Test Date	Mar. 01,2018
Report Template	AGCRT- US -2.4G/SAR (2018-01-01)

Note: The results of testing in this report apply to the product/system which was tested only.

Tested By

SUN Yin

Sun Yin (Yin Cheng)

Mar. 01,2018

Checked By

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Mar. 23,2018

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TABLE OF CONTENTS

1. SUMMARY OF MAXIMUM SAR VALUE	5
2. GENERAL INFORMATION.....	6
2.1. EUT DESCRIPTION.....	6
3. SAR MEASUREMENT SYSTEM	7
3.1. THE SATIMO SYSTEM USED FOR PERFORMING COMPLIANCE TESTS CONSISTS OF FOLLOWING ITEMS.....	7
3.2. COMOSAR E-FIELD PROBE	8
3.3. ROBOT.....	8
3.4. VIDEO POSITIONING SYSTEM	9
3.5. DEVICE HOLDER	9
3.6. ELLI39 PHANTOM.....	10
4. SAR MEASUREMENT PROCEDURE	11
4.1. SPECIFIC ABSORPTION RATE (SAR)	11
4.2. SAR MEASUREMENT PROCEDURE	12
4.3. RF EXPOSURE CONDITIONS.....	14
5. TISSUE SIMULATING LIQUID	15
5.1. THE COMPOSITION OF THE TISSUE SIMULATING LIQUID.....	15
5.2. TISSUE DIELECTRIC PARAMETERS FOR HEAD AND BODY PHANTOMS.....	15
5.3. TISSUE CALIBRATION RESULT	16
6. SAR SYSTEM CHECK PROCEDURE.....	17
6.1. SAR SYSTEM CHECK PROCEDURES.....	17
6.2. SAR SYSTEM CHECK	18
7. EUT TEST POSITION	19
7.1. BODY WORN POSITION.....	19
8. SAR EXPOSURE LIMITS	20
9. TEST FACILITY	21
10. TEST EQUIPMENT LIST	22
11. MEASUREMENT UNCERTAINTY	23
12. CONDUCTED POWER MEASUREMENT	24
13. TEST RESULTS.....	25
13.1. SAR TEST RESULTS SUMMARY	25
APPENDIX A. SAR SYSTEM CHECK DATA	28
APPENDIX B. SAR MEASUREMENT DATA.....	30
APPENDIX C. TEST SETUP PHOTOGRAPHS	32
APPENDIX D. CALIBRATION DATA.....	32

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1. SUMMARY OF MAXIMUM SAR VALUE

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

Frequency Band	Highest Reported 1g-SAR(W/Kg)	SAR Test Limit (W/Kg)
	Body (with 0mm separation)	
802.11b	0.963	1.6
SAR Test Result	PASS	

This device is compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/Kg) specified in IEEE Std. 1528:2013; FCC 47CFR § 2.1093; IEEE/ANSI C95.1:2005 and the following specific FCC Test Procedures:

- KDB 447498 D01 General RF Exposure Guidance v06
- KDB 865664 D01 SAR Measurement 100MHz to 6GHz v01r04
- KDB 248227 D01 802 11 Wi-Fi SAR v02r02
- KDB 616217 D04 SAR for laptop and tablets v01r02

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2. GENERAL INFORMATION

2.1. EUT Description

General Information	
Product Designation	TABLET
Test Model	IFT1018
Hardware Version	9731C
Software Version	iFit_Compass_V1.4
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
Bluetooth	
Operation Frequency	2402~2480MHz
Antenna Gain	2.23dBi
Bluetooth Version	BR/EDR, BLE
Type of modulation	BR/EDR :GFSK, $\pi/4$ -DQPSK, 8-DPSK; BLE : GFSK
Max. conducted Power	BR/EDR : 3.28dBm; BLE : -0.99dBm
WIFI	
WIFI Specification	☐ 802.11a ☒ 802.11b ☒ 802.11g ☒ 802.11n(20) ☒ 802.11n(40)
Operation Frequency	2412~2472MHz
Max. conducted Power	11b: 13.4dBm,11g: 12.3dBm,11n(20): 11.5dBm,11n(40): 12.7dBm
Antenna Gain	2.23dBi
Accessories	
Battery	Brand name: N/A Model No. : BT-H001 Manufacturer Name: ZHAOQING FENGHUA LITHIUM BATTERY CO.,LTD Manufacturer Address: 2#Taihe Road, Mugang Town, Zhaoqing, Guangdong, China Voltage and Capacitance: 3.8V & 6000mAh
Adapter	Brand name: N/A Model No. : SAW12-050-200USB Manufacturer Name: SHENZHEN SHI YING YUAN ELECTRONICS CO LTD Manufacturer Address: FI 5-7 Of West, Bldg 8,Hongye Industry Park Lezhujiao Resident Squad, Huangmabu Community Xixiang St, Bao'an District Shenzhen, Guangdong518101 CHINA Input: AC 100-240V, 50/60Hz, 200mA
Earphone	Brand name: N/A Model No. : N/A

Note:1.CMU200 can measure the average power and Peak power at the same time

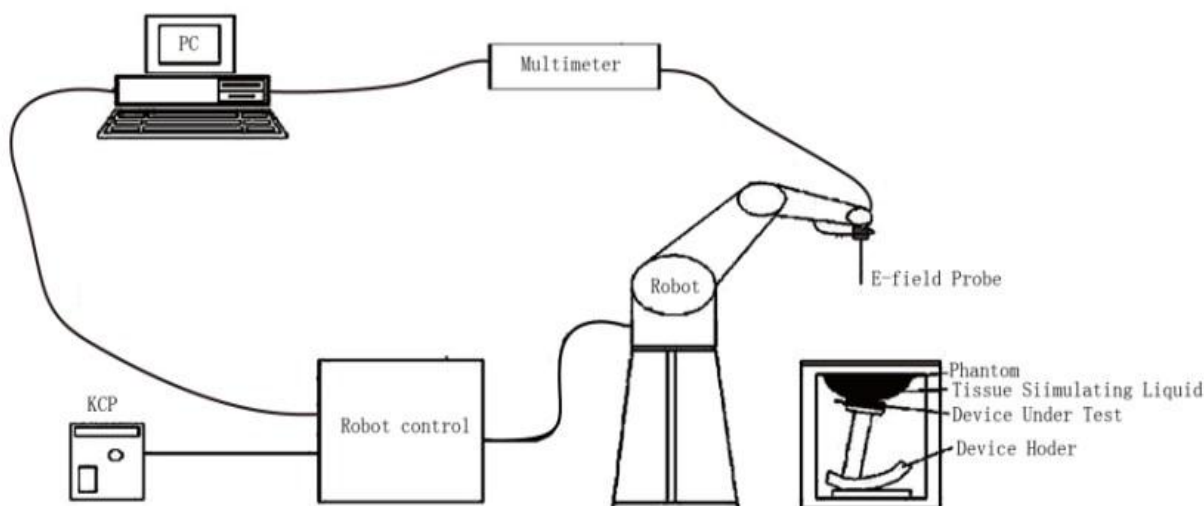
2.The sample used for testing is end product.

Product	Type
	☒ Production unit ☐ Identical Prototype

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3. SAR MEASUREMENT SYSTEM

3.1. The SATIMO system used for performing compliance tests consists of following items



The COMOSAR system for performing compliance tests consists of the following items:

- The PC. It controls most of the bench devices and stores measurement data. A computer running WinXP and the Opensar software.
- The E-Field probe. The probe is a 3-axis system made of 3 distinct dipoles. Each dipole returns a voltage in function of the ambient electric field.
- The Keithley multimeter measures each probe dipole voltages.
- The SAM phantom simulates a human head. The measurement of the electric field is made inside the phantom.
- The liquids simulate the dielectric properties of the human head tissues.
- The network emulator controls the mobile phone under test.
- The validation dipoles are used to measure a reference SAR. They are used to periodically check the bench to make sure that there is no drift of the system characteristics over time.
- The phantom, the device holder and other accessories according to the targeted measurement.

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3.2. COMOSAR E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SATIMO. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. SATIMO conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528 and relevant KDB files.) The calibration data are in Appendix D.

Isotropic E-Field Probe Specification

Model	SSE2	
Manufacture	MVG	
Identification No.	SN 08/16 EPGO282	
Frequency	0.7GHz-6GHz Linearity:±0.06dB(700MHz-6GHz)	
Dynamic Range	0.01W/Kg-100W/Kg Linearity:±0.06dB	
Dimensions	Overall length:330mm Length of individual dipoles:2mm Maximum external diameter:8mm Probe Tip external diameter:2.5mm Distance between dipoles/ probe extremity:1mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

3.3. Robot

The COMOSAR system uses the KUKA robot from SATIMO SA (France).For the 6-axis controller COMOSAR system, the KUKA robot controller version from SATIMO is used.

The XL robot series have many features that are important for our application:

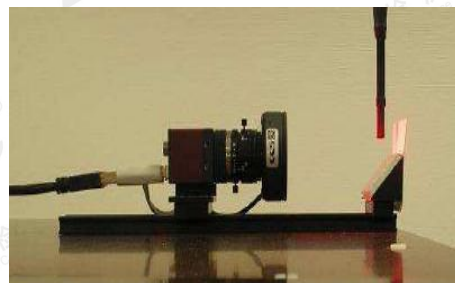
- ☐ High precision (repeatability 0.02 mm)
- ☐ High reliability (industrial design)
- ☐ Jerk-free straight movements
- ☐ Low ELF interference (the closed metallic construction shields against motor control fields)
- ☐ 6-axis controller



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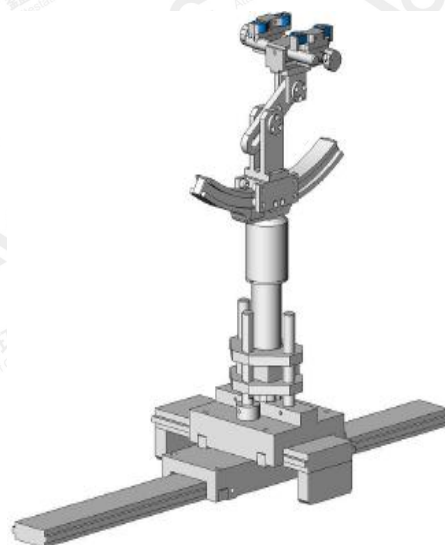
3.4. Video Positioning System

The video positioning system is used in OpenSAR to check the probe. Which is composed of a camera, LED, mirror and mechanical parts. The camera is piloted by the main computer with firewire link. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip. The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.



3.5. Device Holder

The COMOSAR device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR). Thus the device needs no repositioning when changing the angles. The COMOSAR device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon_r = 3$ and loss tangent $\delta = 0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.



3.6. ELLI39 Phantom

The Flat phantom is a fiberglass shell phantom with 2mm $\pm$ 0.2 mm shell thickness. It has only one measurement area for Flat phantom



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4. SAR MEASUREMENT PROCEDURE

4.1. Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in 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 occupational/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 given mass 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 can be obtained using either of the following equations:

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

$$SAR = c_h \left. \frac{dT}{dt} \right|_{t=0}$$

Where

SAR	is the specific absorption rate in watts per kilogram;
E	is the r.m.s. value of the electric field strength in the tissue in volts per meter;
σ	is the conductivity of the tissue in siemens per metre;
ρ	is the density of the tissue in kilograms per cubic metre;
C _h	is the heat capacity of the tissue in joules per kilogram and Kelvin;
$\left. \frac{dT}{dt} \right _{t=0}$	is the initial time derivative of temperature in the tissue in kelvins per second

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4.2. SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurement are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface is 2.7mm This distance cannot be smaller than the distance os sensor calibration points to probe tip as `defined in the probe properties,

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in SATIMO software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in db) is specified in the standards for compliance testing. For example, a 2db range is required in IEEE Standard 1528, whereby 3db is a requirement when compliance is assessed in accordance with the ARIB standard (Japan) If one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximum are detected, the number of Zoom Scan has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100MHz to 6GHz

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}	$\leq 2 \text{ GHz: } \leq 15 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 12 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 12 \text{ mm}$ $4 - 6 \text{ GHz: } \leq 10 \text{ mm}$
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scan are used to assess the peak spatial SAR value within a cubic average volume containing 1g abd 10g of simulated tissue. The Zoom Scan measures points(refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1g and 10g and displays these values next to the job's label.

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Zoom Scan Parameters extracted from KDB865664 d01 SAR Measurement 100MHz to 6GHz

Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			$\leq 2 \text{ GHz}: \leq 8 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz}: \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz}: \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 4 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 3 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 3 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz}: \geq 28 \text{ mm}$ $4 - 5 \text{ GHz}: \geq 25 \text{ mm}$ $5 - 6 \text{ GHz}: \geq 22 \text{ mm}$
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.				
* When zoom scan is required and the <u>reported</u> SAR from the <u>area scan based 1-g SAR estimation</u> procedures of KDB 447498 is $\leq 1.4 \text{ W/kg}$, $\leq 8 \text{ mm}$, $\leq 7 \text{ mm}$ and $\leq 5 \text{ mm}$ zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 4: Power Drift Measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the same settings. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

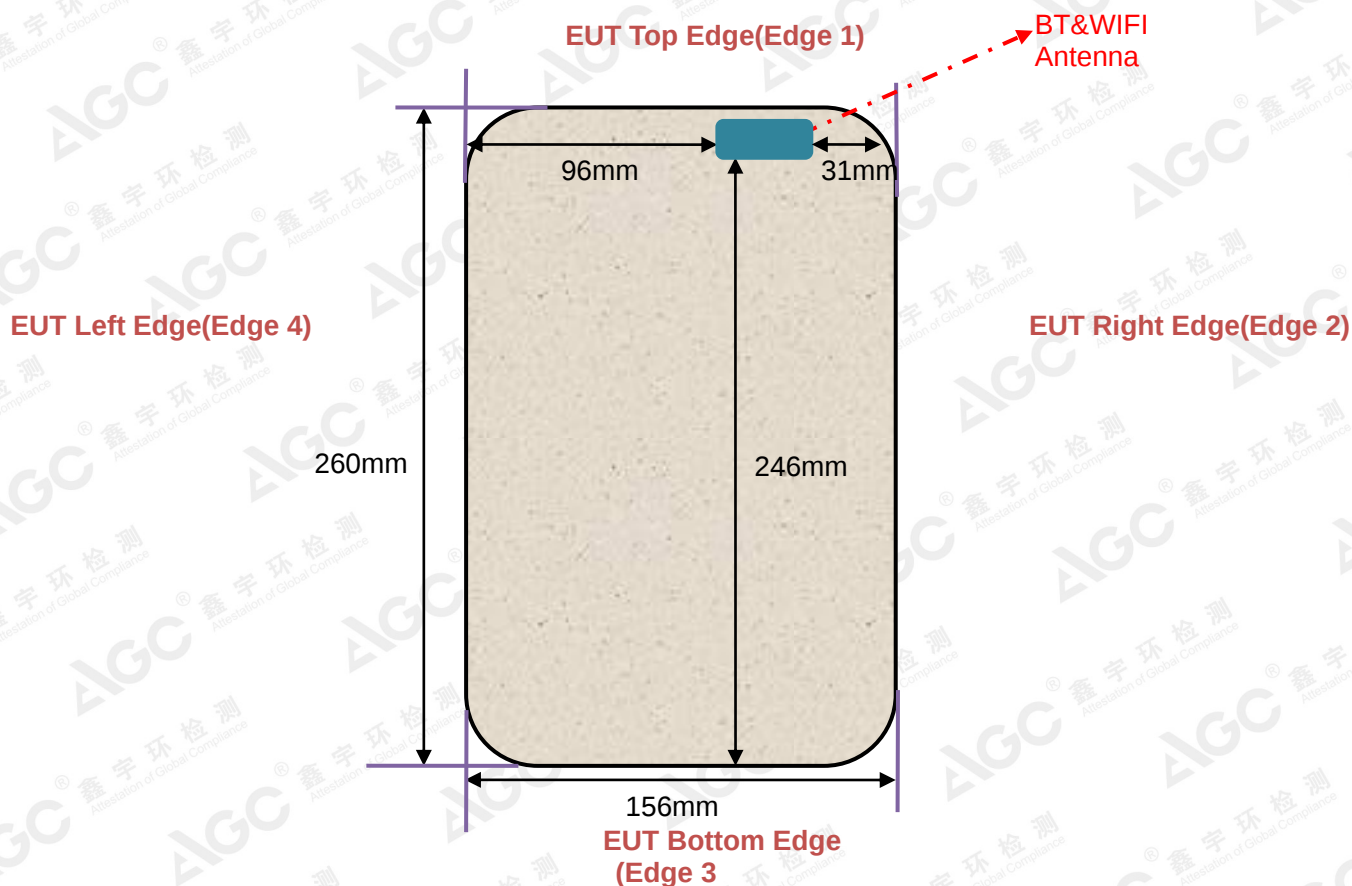
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4.3. RF Exposure Conditions

Test Configuration and setting:

For WLAN testing, the EUT is configured with the WLAN continuous TX tool through engineering command.

Antenna Location: (front view)



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5. TISSUE SIMULATING LIQUID

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in 5.2

5.1. The composition of the tissue simulating liquid

Ingredient (% Weight) Frequency (MHz)	Water	NaCl	Polysorbate 20	DGBE	1,2 Propanediol	Triton X-100
2450 Body	70	1	0.0	9	0.0	20

5.2. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE 1528 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 IEEE 1528 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 IEEE 1528.

Target Frequency (MHz)	head		body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	1.01	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73

(ϵ_r = relative permittivity, σ = conductivity and $\rho = 1000 \text{ kg/m}^3$)

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5.3. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using SATIMO Dielectric Probe Kit and R&S Network Analyzer ZVL6.

Tissue Stimulant Measurement for 2450MHz					
Body	Fr. (MHz)	Dielectric Parameters ($\pm 5\%$)		Tissue Temp [$^{\circ}\text{C}$]	Test time
		$\epsilon_r 52.7(50.065-55.335)$	$\delta [s/m] 1.95(1.8525-2.0475)$		
	2412	54.21	1.88	21.0	Mar. 01,2018
	2437	53.33	1.88		
	2450	53.29	1.92		
	2462	53.05	1.97		

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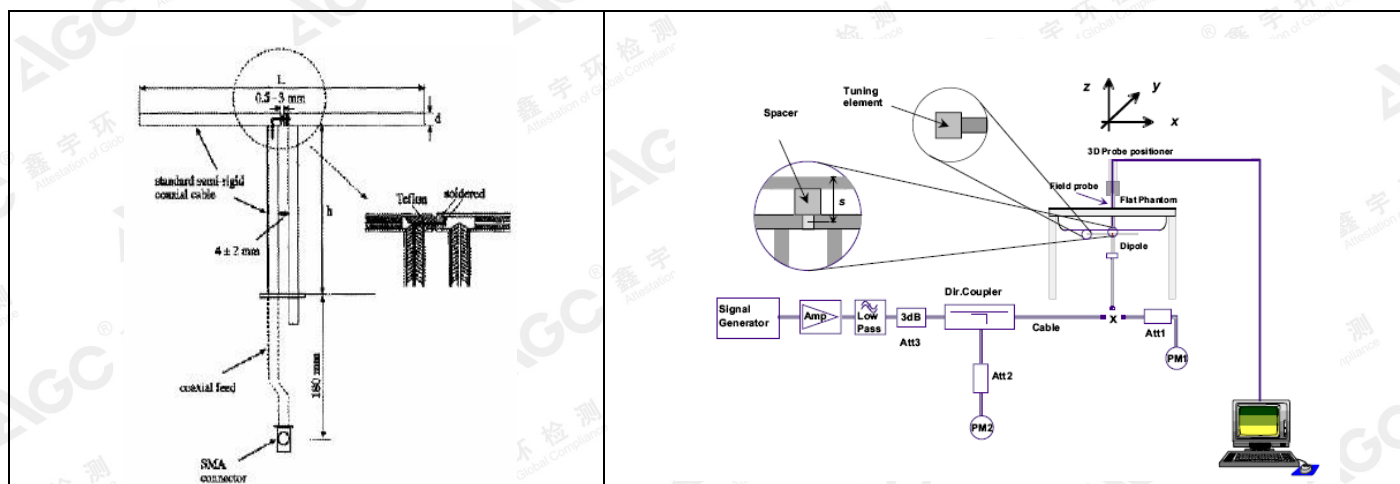
6. SAR SYSTEM CHECK PROCEDURE

6.1. SAR System Check Procedures

SAR system check is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

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

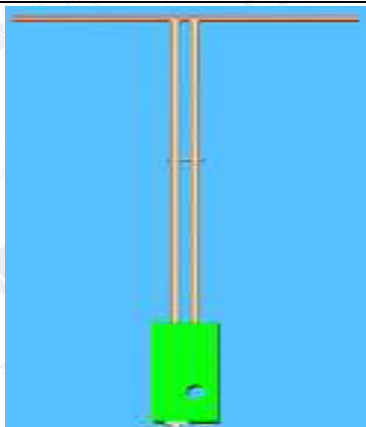
The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system check setup is shown as below.



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6.2. SAR System Check

6.2.1. Dipoles

	The dipoles used is based on the IEEE-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of IEEE. the table below provides details for the mechanical and electrical Specifications for the dipoles.
---	---

Frequency	L (mm)	h (mm)	d (mm)
2450MHz	51.5	30.4	3.6

6.2.2. System Check Result

System Performance Check at 2450MHz for Body								
Validation Kit: SN 29/15DIP 2G450-393								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Normalized to 1W(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
2450	49.92	23.16	44.928-54.912	20.844-25.476	54.36	24.01	21.0	Mar. 01,2018

Note:

(1) We use a CW signal of 18dBm for system check, and then all SAR value are normalized to 1W forward power. The result must be within ±10% of target value.

(2) Tested normalized SAR (W/kg) = Tested SAR (W/kg) × [1000/ 10^{1.8}]

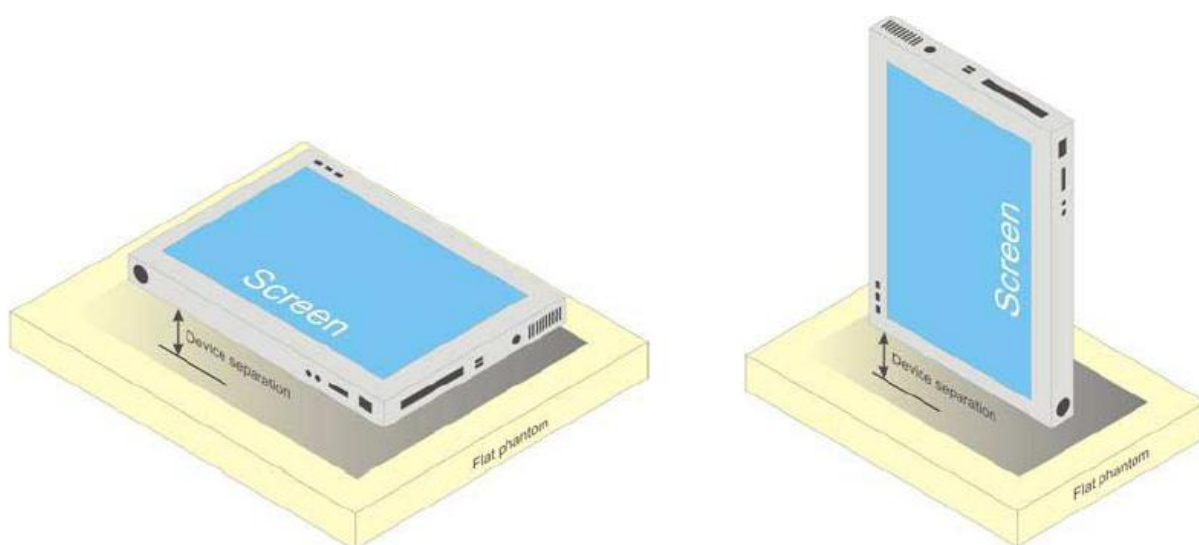
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7. EUT TEST POSITION

This EUT was tested in **Body back, Body front and 4 edges.**

7.1. Body Worn Position

- (1) To position the EUT parallel to the phantom surface.
- (2) To adjust the EUT parallel to the flat phantom.
- (3) To adjust the distance between the EUT surface and the flat phantom to **0mm**.



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8. SAR EXPOSURE LIMITS

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

Type Exposure	Uncontrolled Environment Limit (W/kg)
Spatial Peak SAR (1g cube tissue for brain or body)	1.60
Spatial Average SAR (Whole body)	0.08
Spatial Peak SAR (Limbs)	4.0

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9. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen 518012
NVLAP Lab Code	600153-0
Designation Number	CN5028
Test Firm Registration Number	682566
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0

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10. TEST EQUIPMENT LIST

Equipment description	Manufacturer/ Model	Identification No.	Current calibration date	Next calibration date
SAR Probe	MVG	SN 08/16 EPGO282	Aug. 08,2017	Aug. 07,2018
Phantom	SATIMO	SN_2316_ELLI39	N/A	N/A
Liquid	SATIMO	-	Validated. No cal required.	Validated. No cal required.
Multimeter	Keithley 2000	1188656	Mar. 01,2018	Feb. 28,2019
Dipole	SATIMO SID2450	SN29/15 DIP 2G450-393	July 05,2016	July 04,2019
Signal Generator	Agilent-E4438C	US41461365	Mar. 01,2018	Feb. 28,2019
Vector Analyzer	Agilent / E4440A	US41421290	Mar. 01,2018	Feb. 28,2019
Network Analyzer	Rhode & Schwarz ZVL6	SN100132	Mar. 01,2018	Feb. 28,2019
Attenuator	Warison /WATT-6SR1211	N/A	N/A	N/A
Attenuator	Mini-circuits / VAT-10+	N/A	N/A	N/A
Amplifier	EM30180	SN060552	Mar. 01,2018	Feb. 28,2019
Directional Couple	Werlatone/ C5571-10	SN99463	June 20,2017	June 19,2018
Directional Couple	Werlatone/ C6026-10	SN99482	June 20,2017	June 19,2018
Power Sensor	NRP-Z21	1137.6000.02	Oct. 12,2017	Oct. 11,2018
Power Sensor	NRP-Z23	US38261498	Mar. 01,2018	Feb. 28,2019
Power Viewer	R&S	V2.3.1.0	N/A	N/A

Note: Per KDB 865664 Dipole SAR Validation, AGC 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;
3. Return-loss is within 20% of calibrated measurement;
4. Impedance is within 5Ω of calibrated measurement.

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11. MEASUREMENT UNCERTAINTY

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/Kg, the extensive SAR measurement uncertainty analysis described in IEEE 1528-2013 is not required in SAR reports submitted for equipment approval.

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12. CONDUCTED POWER MEASUREMENT

WIFI 2.4G

Mode	Data Rate (Mbps)	Channel	Frequency(MHz)	Maximum Conducted Power (dBm)
802.11b	1	01	2412	13.4
		06	2437	13.1
		11	2462	13.3
802.11g	6	01	2412	12.3
		06	2437	12.3
		11	2462	12.3
802.11n(20)	6.5	01	2412	11.5
		06	2437	11.3
		11	2462	11.4
802.11n(40)	13.5	03	2422	11.0
		06	2437	11.6
		09	2452	12.7

Bluetooth_V3.0

Modulation	Channel	Frequency(MHz)	Maximum Conducted Power (dBm)
GFSK	0	2402	3.13
	39	2441	3.28
	78	2480	2.63
$\pi/4$ -DQPSK	0	2402	2.27
	39	2441	2.34
	78	2480	1.78
8-DPSK	0	2402	2.23
	39	2441	2.42
	78	2480	1.76

Bluetooth_V4.0 BLE

Modulation	Channel	Frequency(MHz)	Maximum Conducted Power (dBm)
GFSK	0	2402	-1.14
	19	2440	-0.99
	39	2480	-1.52

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13. TEST RESULTS

13.1. SAR Test Results Summary

13.1.1. Test position and configuration

Body SAR was performed with the device 0mm from the phantom according to KDB 616217.

13.1.2. Operation Mode

1. Per KDB 447498 D01 v06 ,for each exposure position, if the highest 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional.
2. Per KDB 865664 D01 v01r04,for each frequency band, if the measured SAR is ≥ 0.8 W/Kg, testing for repeated SAR measurement is required , that the highest measured SAR is only to be tested. When the SAR results are near the limit, the following procedures are required for each device to verify these types of SAR measurement related variation concerns by repeating the highest measured SAR configuration in each frequency band.
 - (1) When the original highest measured SAR is ≥ 0.8 W/Kg, repeat that measurement once.
 - (2) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is >1.20 or when the original or repeated measurement is ≥ 1.45 W/Kg.
 - (3) Perform a third repeated measurement only if the original, first and second repeated measurement is ≥ 1.5 W/Kg and ratio of largest to smallest SAR for the original, first and second measurement is ≥ 1.20 .
3. Maximum Scaling SAR in order to calculate the Maximum SAR values to test under the standard Peak Power, Calculation method is as follows:
Maximum Scaling SAR =tested SAR (Max.) $\times$ [maximum turn-up power (mw)/ maximum measurement output power(mw)]
4. Sensors have no any influence on power level or SAR result.
5. Bluetooth and WIFI have same antennas, and cannot transmit simultaneously;
6. According to KDB 447498 D01, annex A, SAR is not required for bluetooth because its maximum output power is less than 10 mW.

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13.1.3. SAR Test Results Summary

SAR MEASUREMENT									
Depth of Liquid (cm):>15					Relative Humidity (%): 48.3				
Product: TABLET									
Test Mode: 802.11b									
Position	Mode	Ch.	Fr. (MHz)	Power Drift (<±5%)	SAR (1g) (W/kg)	Max. Tune-up Power (dBm)	Meas. output Power (dBm)	Scaled SAR (W/Kg)	Limit (W/kg)
Body back	DTS	1	2412	-0.61	0.768	14.00	13.4	0.882	1.6
Body back	DTS	06	2437	-1.15	0.783	14.00	13.1	0.963	1.6
Body back	DTS	11	2462	1.21	0.770	14.00	13.3	0.905	1.6
Body front	DTS	06	2437	-3.53	0.499	14.00	13.1	0.614	1.6
Edge 1 (Top)	DTS	06	2437	-0.01	0.344	14.00	13.1	0.423	1.6

Note:

- (1).When the 1-g Reported SAR is ≤ 0.8 W/kg, testing for low and high channel is optional. Refer to KDB 447498.
- (2). The test separation of all above table is 0mm.
- (3). Plots are only shown for the bold marked worst case SAR results

Repeated SAR										
Product: TABLET										
Test Mode: 802.11b										
Position	Mode	Ch.	Fr. (MHz)	Power Drift (<±5%)	Once SAR (1g) (W/kg)	Power Drift (<±5%)	Twice SAR (1g) (W/kg)	Power Drift (<±5%)	Third SAR (1g) (W/kg)	Limit (W/kg)
Body back	DTS	06	2437	-0.39	0.753	--	--	--	--	1.6

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SAR Test Exclusion Consideration for Adjacent Edges

Per KDB 447498 D01 cl. 4.3.1:

a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$

b) For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

1) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)]\}$ mW, for 100 MHz to 1500 MHz

2) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot 10]\}$ mW, for > 1500 MHz and ≤ 6 GHz

Edge 2(Right)

SAR test exclusion threshold

$$= [(\text{min. test separation distance, mm}) \cdot 3] / \sqrt{f(\text{GHz})}$$
$$= (31 \times 3) / \sqrt{2.412}$$
$$= 59.881 \text{ mW.}$$

Edge 3(Bottom)

SAR test exclusion threshold

$$= (\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \times 10 \text{ mW}$$
$$= 96.583 + (246 - 50) \times 10 \text{ mW}$$
$$= 2056.583 \text{ mW.}$$

Edge 4 (Left)

SAR test exclusion threshold

$$= (\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \times 10 \text{ mW}$$
$$= 96.583 + (96 - 50) \times 10 \text{ mW}$$
$$= 556.583 \text{ mW.}$$

Conclusion

Since the Maximum Tune-up Power [25.119mW(14dBm)] is less than the SAR Exclusion Threshold for bottom, Right and left edges, SAR evaluation for these adjacent edges are not required.

APPENDIX A. SAR SYSTEM CHECK DATA

Test Laboratory: AGC Lab

Date: Mar. 01, 2018

System Check Body 2450 MHz

DUT: Dipole 2450 MHz Type: SID 2450

Communication System CW; Communication System Band: D2450 (2450.0 MHz); Duty Cycle: 1:1; Conv.F=2.58

Frequency: 2450 MHz; Medium parameters used: $f = 2450$ MHz; $\sigma = 1.92$ mho/m; $\epsilon_r = 53.29$; $\rho = 1000$ kg/m³ ;

Phantom section: Flat Section; Input Power=18dBm

Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

SATIMO Configuration:

Probe: SSE2; Calibrated: Aug. 08, 2017; Serial No.: SN 08/16 EPGO282

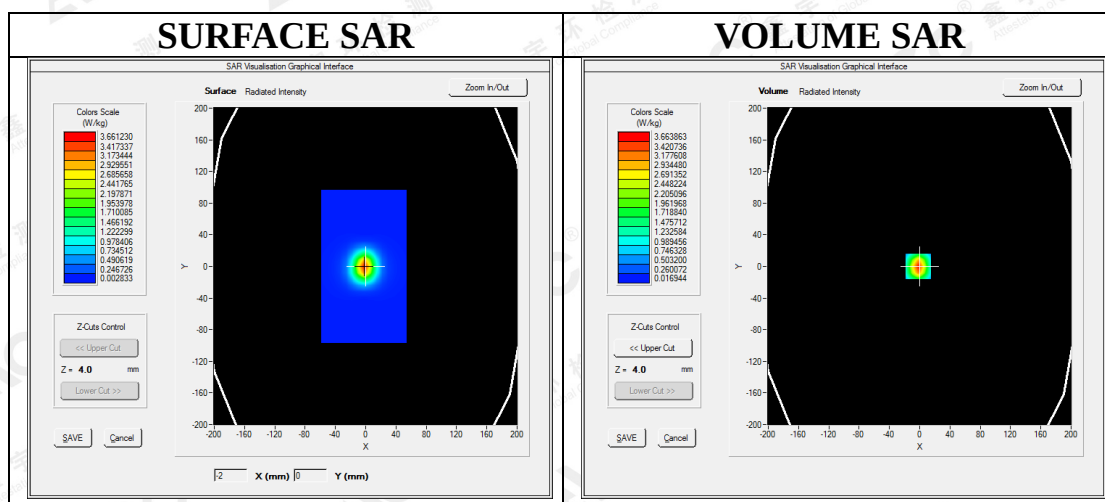
Sensor-Surface: 4mm (Mechanical Surface Detection)

Phantom: ELLI39 Phantom

Measurement SW: OpenSAR V4_02_35

Configuration/System Check 2450MHz Body/Area Scan: Measurement grid: dx=8mm, dy=8mm

Configuration/System Check 2450MHz Body/Zoom Scan: Measurement grid: dx=5mm, dy=5mm, dz=5mm

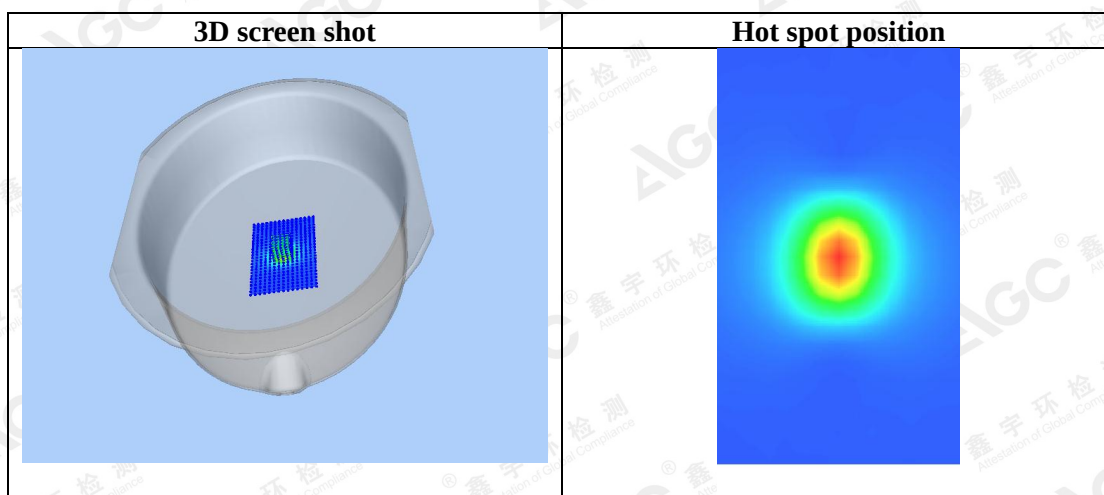
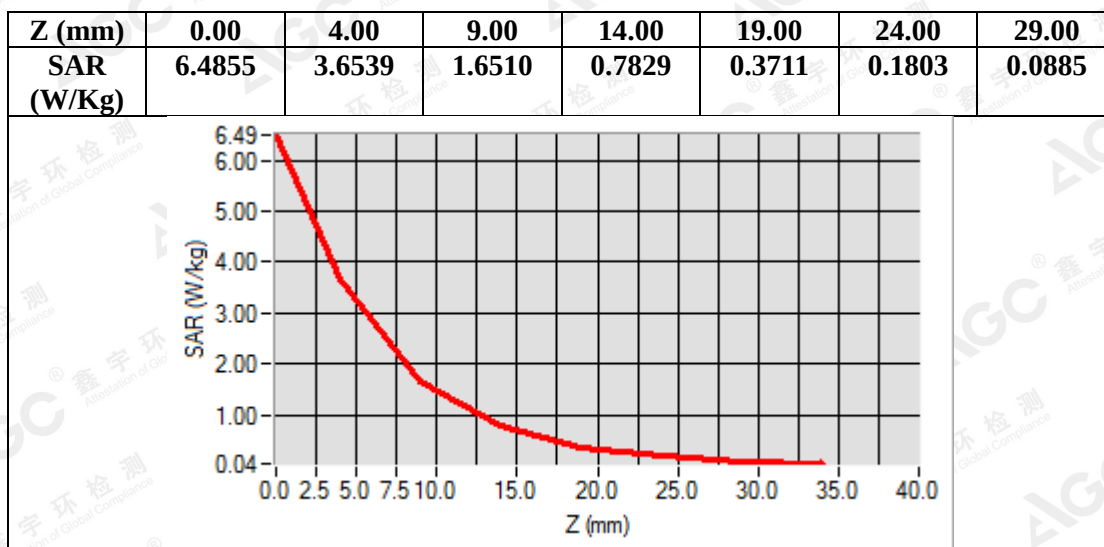


Maximum location: X=-2.00, Y=0.00

SAR Peak: 6.41 W/kg

SAR 10g (W/Kg)	1.515203
SAR 1g (W/Kg)	3.429571

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APPENDIX B. SAR MEASUREMENT DATA

Test Laboratory: AGC Lab
802.11b Mid-Body-Worn- Back (DTS)
DUT: TABLET; Type: IFT1018

Date: Mar. 01,2018

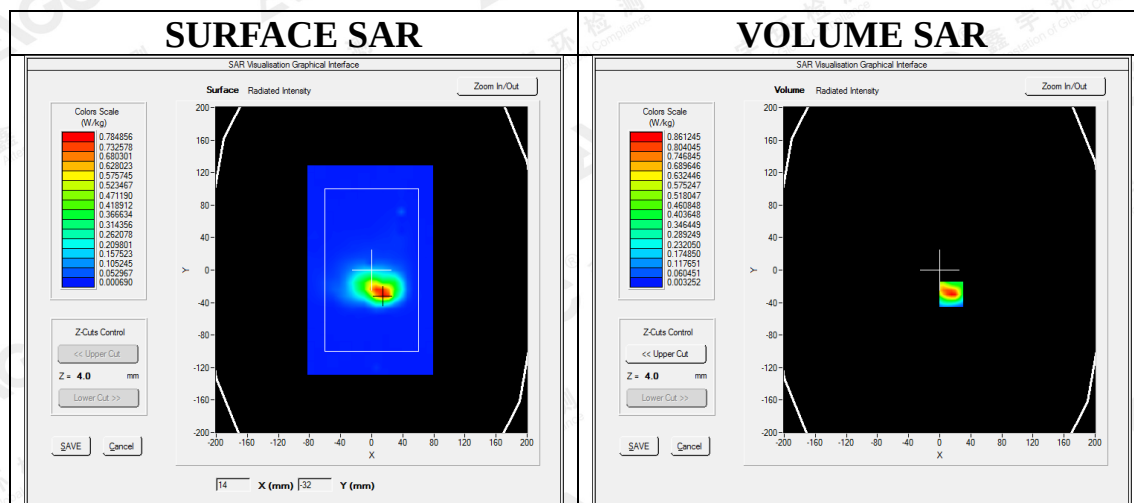
Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1; Conv.F=2.58;
Frequency: 2437 MHz; Medium parameters used: $f = 2450$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 53.33$; $\rho = 1000$ kg/m³ ;
Phantom section: Flat Section
Ambient temperature (°C): 21.5, Liquid temperature (°C): 21.0

SATIMO Configuration:

Probe: SSE2; Calibrated: Aug. 08,2017; Serial No.: SN 08/16 EPGO282
Sensor-Surface: 4mm (Mechanical Surface Detection)
Phantom: ELLI39 Phantom
Measurement SW: OpenSAR V4_02_35

Configuration/802.11b Mid- Body- Back /Area Scan: Measurement grid: dx=8mm, dy=8mm
Configuration/802.11b Mid- Body- Back /Zoom Scan: Measurement grid: dx=5mm,dy=5mm, dz=5mm;

Area Scan	sam_direct_droit2_surf8mm.txt
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	ELLI
Device Position	Body Back
Band	2450MHz
Channels	Middle
Signal	Crest factor: 1.0



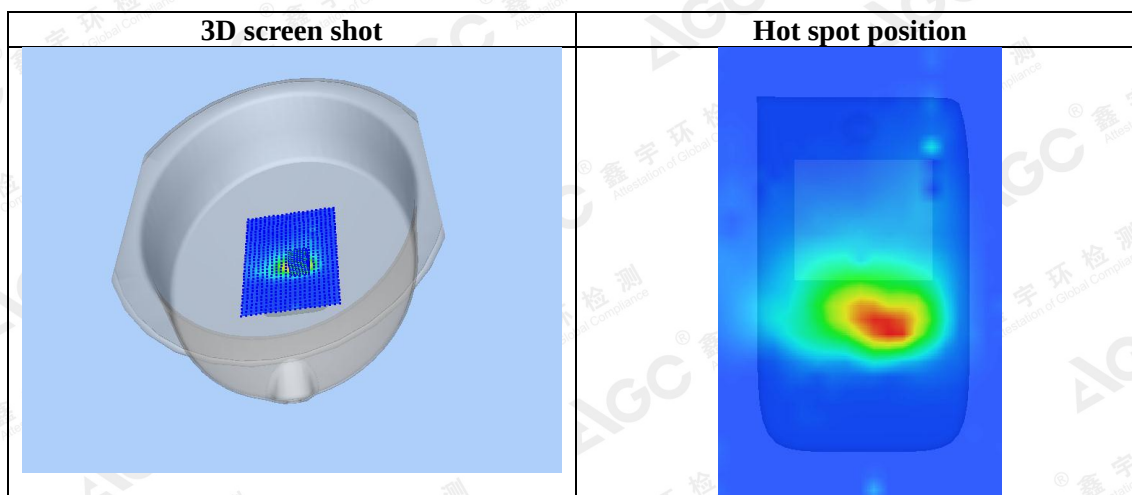
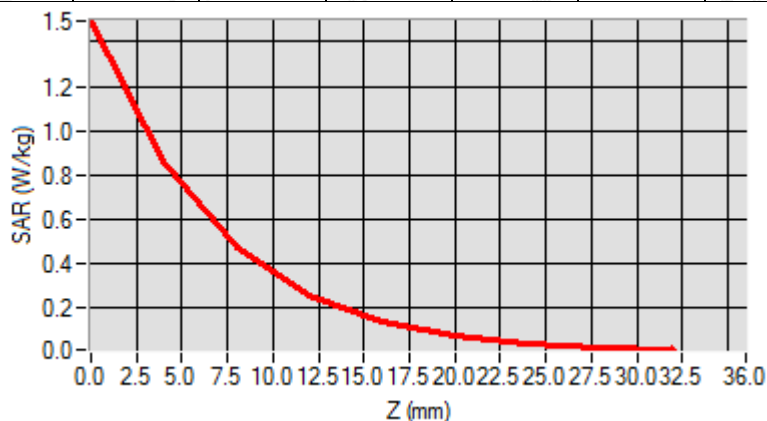
Maximum location: X=15.00, Y=-30.00

SAR Peak: 1.48 W/kg

SAR 10g (W/Kg)	0.361073
SAR 1g (W/Kg)	0.783317

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Z (mm)	0.00	4.00	8.00	12.00	16.00	20.00	24.00	28.00
SAR (W/Kg)	1.4934	0.8612	0.4725	0.2571	0.1401	0.0776	0.0437	0.0237



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APPENDIX C. TEST SETUP PHOTOGRAPHS

Refer to Attached files.

APPENDIX D. CALIBRATION DATA

Refer to Attached files.

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