FCC SAR TEST REPORT

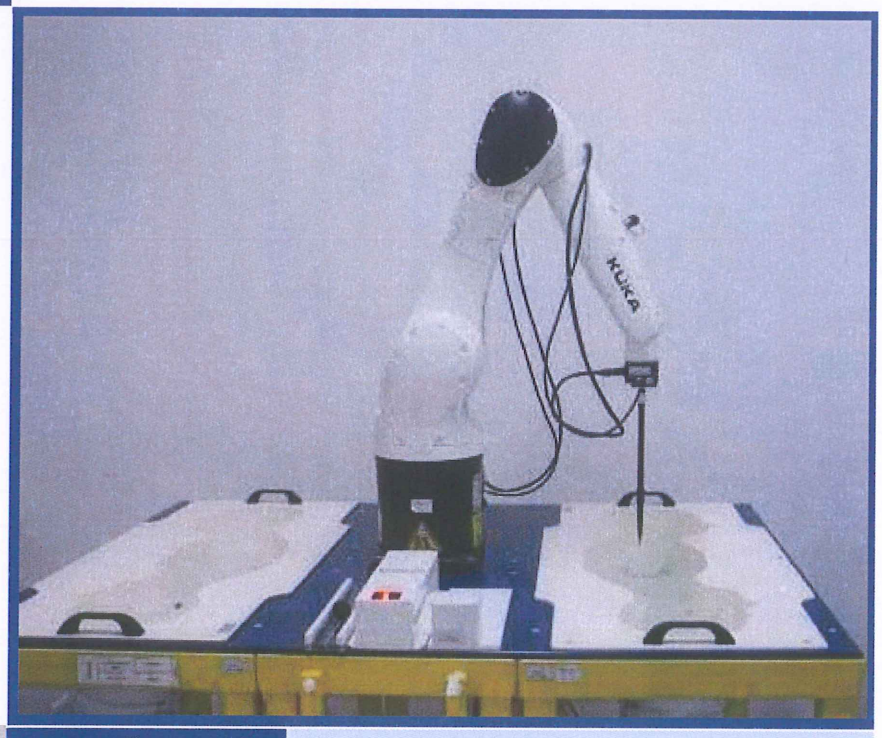
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Smart POS Terminal

ISSUED TO
Advanced Mobile Payment Inc.

Units 401-403, 15 Wertheim Court. Richmond Hill, Ontario L4B 3H7
CANADA



Report No.:	BL-SZ19A0582-701
EUT Name:	Smart POS Terminal
Model Name:	AMP 8000
Brand Name:	AMP
FCC ID:	2AKJB-AMP8000-1
Test Standard:	FCC 47 CFR Part 2.1093 ANSI C95.1: 1999 IEEE 1528: 2013
Maximum SAR:	Body (1 g): 1.061 W/kg
Test Conclusion:	Pass
Test Date:	Nov. 04, 2019 ~ Nov. 14, 2019
Date of Issue:	Jan. 15, 2020

Tested by: Zong Liyao
Zong Liyao
Date Jan. 15, 2020

Approved by:
Wei Yanquan
(Chief Engineer)
Date Jan. 15, 2020

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Block B, 1st FL,Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055
TEL: +86-755-66850100, FAX: +86-755-61824271
Email: qc@baluntek.com
www.baluntek.com

Revision History

Version	Issue Date	Revisions Content
Rev. 01	Jan. 15, 2020	Initial Issue

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1 ADMINSTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation (A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Test Environment Condition

Ambient Temperature	21℃ to 23℃
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 to 102KPa

1.4 Announce

(1) The test report reference to the report template version v2.3.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

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(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Advanced Mobile Payment Inc.
Address	Units 401-403, 15 Wertheim Court. Richmond Hill, Ontario L4B 3H7 CANADA

2.2 Manufacturer Information

Manufacturer	NEW POS TECHNOLOGY LIMITED
Address	Floor, Block A, Financial Technology Building, No.11 Keyuan Rd, Nanshan District, Shenzhen

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Smart POS Terminal
Model Name Under Test	AMP 8000
Series Model Name	N/A
Description of Model Name Differentiation	N/A
Hardware Version	N0000H30225E0
Software Version	V1.0.1
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	IES
	Model No.	IS928
	Serial No.	N/A
	Capacitance	2600 mAh
	Rated Voltage	7.2 V
	Limit Charge Voltage	8.4 V

2.6 Technical Information

Network and Wireless connectivity	2G Network GSM/GPRS/EGPRS 850/1900 MHz 3G Network WCDMA/HSDPA/HSUPA Band 2/4/5 4G Network FDD LTE Band 2/4/5/12/13 Bluetooth 4.1 (BR+EDR+BLE) WIFI 802.11a, 802.11b, 802.11g, 802.11n Band 1/4 SRD NFC

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	GSM, WCDMA, FDD-LTE, 2.4G WLAN, 5G WLAN, Bluetooth		
Frequency Range	GSM 850	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	GSM 1900	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	WCDMA Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 12	TX: 699 ~ 716 MHz	RX: 729 ~ 746 MHz
	LTE Band 13	TX: 777 ~ 787 MHz	RX: 746 ~ 756 MHz
	802.11b/g /n(HT20/HT40)	2400 ~ 2483.5 MHz	
	802.11a/ /n(HT20/HT40)	5150 ~ 5250 MHz	
		5725 ~ 5850 MHz	
	Bluetooth	2400 ~ 2483.5 MHz	
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna		
DTM	Not Support		
Hotspot Function	Not Support		
Power Reduction	Not Support		
Exposure Category	General Population/Uncontrolled exposure		
EUT Stage	Portable Device		
Product	Type		
	☒ Production unit	☐ Identical prototype	

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1999	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 941225 D01 v03r01	3G SAR MEAUREMENT PROCEDURES
6	FCC KDB 941225 D05 v02r05	SAR Evaluation Considerations for LTE Devices
7	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
8	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
9	KDB 248227 D01 v02r02	SAR Guidance for IEEE 802.11 (Wi-Fi) Transmitters

3.2 Device Category and SAR Limit

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

Table of Exposure Limits:

Body Position	SAR Value (W/Kg)	
	General Population/ Uncontrolled Exposure	Occupational/ Controlled Exposure
Whole-Body SAR (averaged over the entire body)	0.08	0.4
Partial-Body SAR (averaged over any 1 gram of tissue)	1.60	8.0
SAR for hands, wrists, feet and ankles (averaged over any 10 grams of tissue)	4.0	20.0

NOTE:

General Population/Uncontrolled: Locations where there is the exposure of individuals who have no knowledge or control of their exposure. General population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Occupational/Controlled: Locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

3.3 Test Result Summary

3.3.1 Highest SAR (1 g Value)

Band	Maximum Scaled SAR (W/kg)	Maximum Report SAR (W/kg)	Limit (W/kg)
	Body	Body	
GSM 850	0.518	1.061	1.6
GSM 1900	1.047		
WCDMA Band 2	0.818		
WCDMA Band 4	0.516		
WCDMA Band 5	0.455		
LTE Band 2	1.047		
LTE Band 4	**1.061**		
LTE Band 5	0.655		
LTE Band 12	0.871		
LTE Band 13	0.812		
WLAN 2.4G	0.522		
WLAN 5.2G	0.266		
WLAN 5.8G	0.221		
Verdict	Pass		

3.3.2 Highest Simultaneous SAR

Position	Simultaneous Configuration	Simultaneous SAR (W/kg)	Limit (W/kg)	Verdict
Body	LTE QPSK + 2.4G WLAN	1.583	1.6	Pass

3.4 Test Uncertainty

3.4.1 Measurement uncertainly evaluation for SAR test

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528 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 (10 g)	1g Ui (+-%)	10 g Ui (+-%)	Vi v_{eff}
Measurement System								
Probe calibration	5.8	N	1	1	1	5.80	5.80	∞
Axial Isotropy	3.5	R	$\sqrt{3}$	0.7	0.7	1.41	1.41	∞
Hemispherical Isotropy	5.9	R	$\sqrt{3}$	0.7	0.7	2.38	2.38	∞
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	4.7	R	$\sqrt{3}$	1	1	2.71	2.71	∞
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	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0.0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
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	∞
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
Test sample Related								
Test sample positioning	2.6	N	1	1	1	2.60	2.60	N-1
Device Holder Uncertainty	3.0	N	1	1	1	3.00	3.00	N-1
Output power Variation - SAR drift measurement	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
SAR scaling	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and Tissue Parameters								
Phantom Uncertainty (Shape and thickness tolerances)	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	∞
SAR correction for deviation(in permittivity and conductivity)	2.0	N	1	1	0.84	2.00	1.68	∞
Liquid conductivity (temperature uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.03	∞
Liquid conductivity - measurement uncertainty	5.0	N	1	0.78	0.71	3.90	3.55	M
Liquid permittivity (temperature uncertainty)	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Liquid permittivity - measurement uncertainty	5.0	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty	-	RSS	-			10.72	10.56	-
Expanded Uncertainty (95% Confidence interval)	-	k	-			21.45	21.11	-

3.4.2 Measurement uncertainly evaluation for system check

This measurement uncertainty budget is suggested by IEEE 1528. The break down of the individual uncertainties is as follows:

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System								
Probe calibration	5.8	N	1	1	1	5.80	5.30	∞
Axial Isotropy	3.5	R	$\sqrt{3}$	1	1	2.02	2.02	∞
Hemispherical Isotropy	5.9	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.58	0.56	∞
Probe Linearity	4.7	R	$\sqrt{3}$	1	1	2.71	2.71	∞
System detection limits	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	0.0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
Readout Electronics	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0.0	R	$\sqrt{3}$	1	1	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	∞
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
Dipole								
Deviation of experimental dipole	5.5	N	1	1	1	5.00	5.00	∞
Dipole axis to liquid distance	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Power drift	0.5	R	$\sqrt{3}$	1	1	0.29	0.29	∞
Phantom and Tissue Parameters								
Phantom Uncertainty (Shape and thickness tolerances)	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	∞
SAR correction for deviation(in permittivity and conductivity)	2.0	N	1	1	0.84	2.00	1.68	∞
Liquid conductivity (temperature uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid conductivity - measurement uncertainty	5.0	N	1	0.78	0.71	3.90	3.55	M
Liquid permittivity (temperature uncertainty)	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Liquid permittivity - measurement uncertainty	5.0	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty	-	RSS	-			10.43	10.25	–
Expanded Uncertainty (95% Confidence interval)	-	k	-			20.86	20.51	–

4 SAR MEASUREMENT SYSTEM

4.1 Definition of Specific Absorption Rate (SAR)

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

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

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

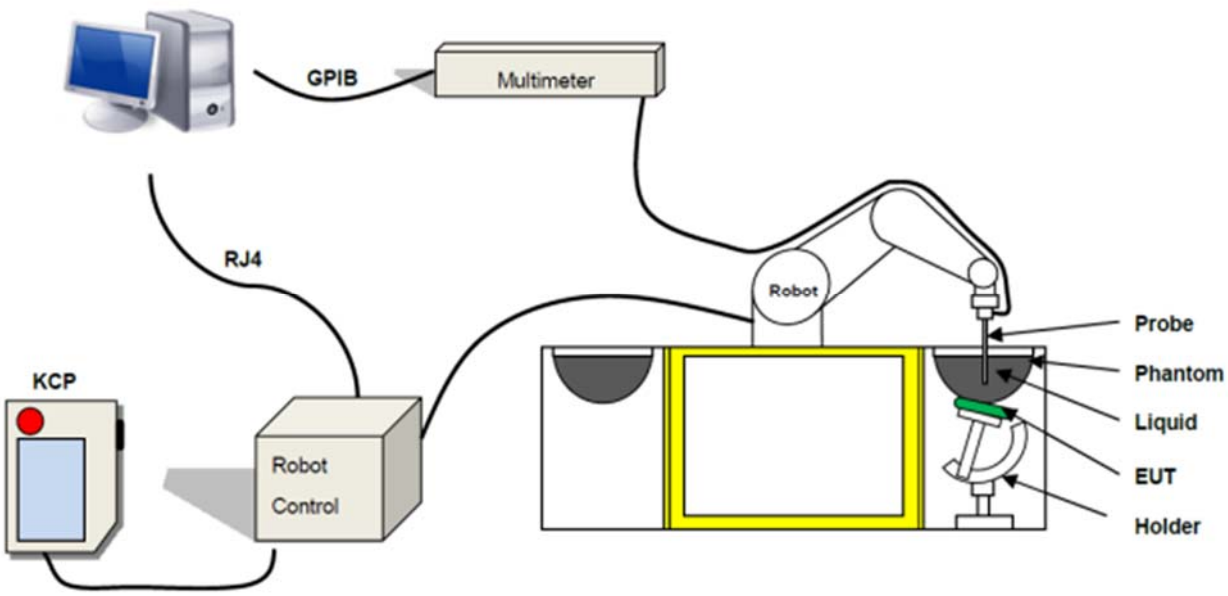
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

4.2 SATIMO SAR System

4.2.1 SATIMO SAR System Diagram



These measurements were performed with the automated near-field scanning system OPENSAR from SATIMO. The system is based on a high precision robot (working range: 850 mm), which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit.

The SAR measurements were conducted with dosimetric probe (manufactured by SATIMO), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in SAR standard with accuracy of better than ±10%. The spherical isotropy was evaluated with the procedure described in SAR standard and found to be better than ±0.25 dB. The phantom used was the SAM Phantom as described in FCC supplement C, IEEE P1528.

4.2.2 Robot

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

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

4.2.3 E-Field Probe

For the measurements the Specific Dosimetric E-Field Probe SN 31 /17 EPGO 321 with following specifications is used

-- Dynamic range: 0.01-100 W/kg

- Tip Diameter : 2.5 mm
- Lower detection limit : 10 mW/kg

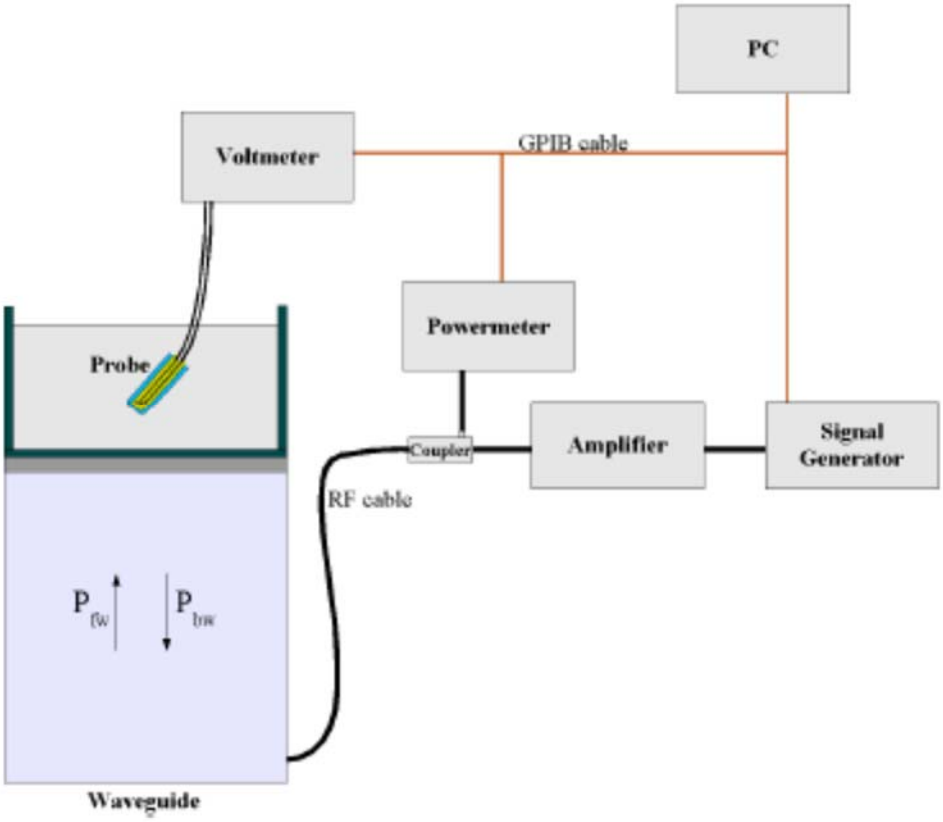
(repeatability better than +/- 1mm)

- Probe linearity: +/- 0.07 dB
- Calibration range: 300 MHz to 6000 MHz for head & body simulating liquid.

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

E-Field Probe Calibration Process

Probe calibration is realized, in compliance with CENELEC EN 62209-1/-2 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the IEC62209-1/2 annexe technique using reference guide at the five frequencies.



$$SAR = \frac{4(P_{fw} - P_{bw})}{ab\sigma} \cos^2\left(\pi \frac{y}{a}\right) c^{(2\pi/\sigma)}$$

Where :

Pfw = Forward Power

Pbw	=	Backward Power
a and b	=	Waveguide Dimensions
ı	=	Skin Depth

Keithley configuration

Rate = Medium; Filter =ON; RDGS=10; FILTER TYPE =MOVING AVERAGE; RANGE AUTO After each calibration, a SAR measurement is performed on a validation dipole and compared with a NPL calibrated probe, to verify it.

The calibration factors, CF(N), for the 3 sensors corresponding to dipole 1, dipole 2 and dipole 3 are:

CF(N)=SAR(N)/Vlin(N) (N=1,2,3)

The linearised output voltage Vlin(N) is obtained from the displayed output voltage V(N) using

Vlin(N)=V(N)*(1+V(N)/DCP(N)) (N=1,2,3)

Where the DCP is the diode compression point in mV.

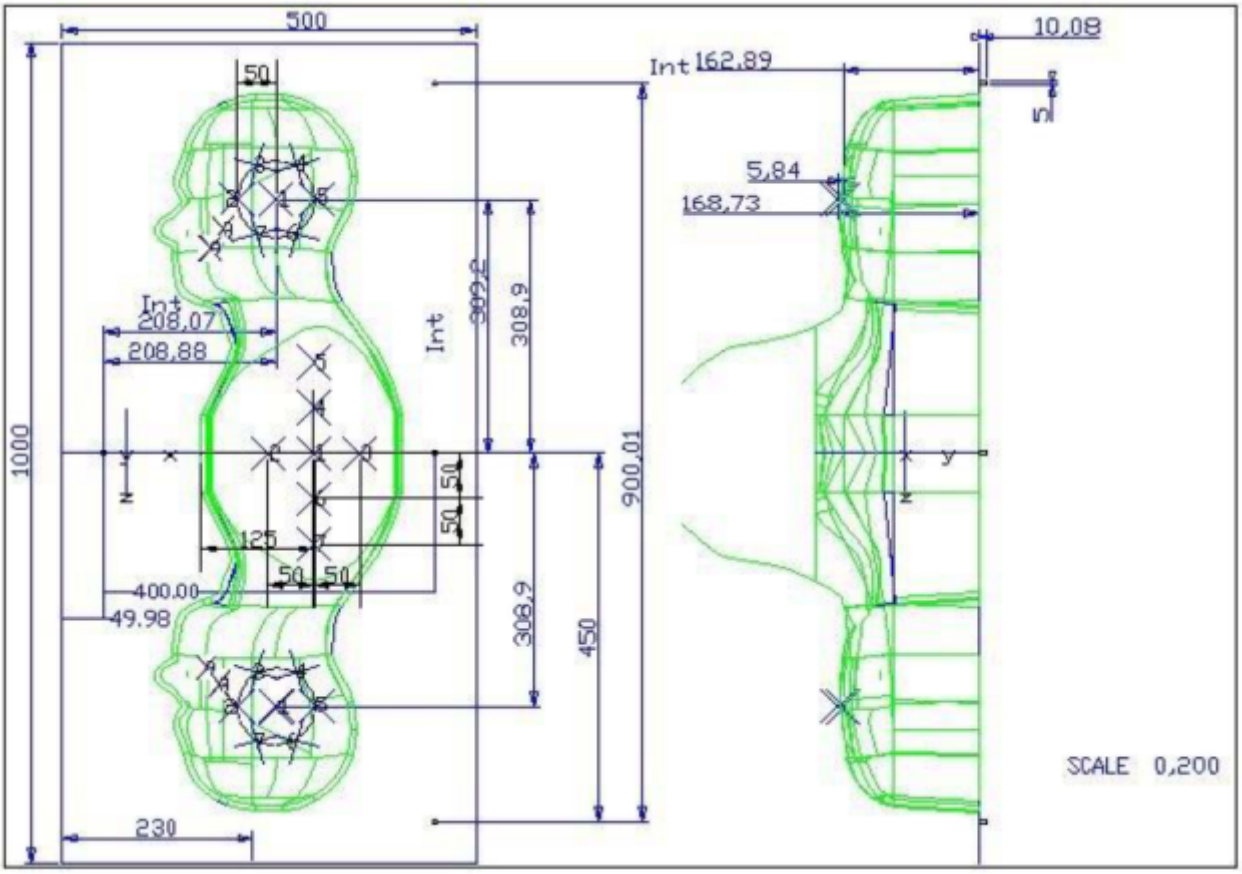
4.2.4 Phantoms

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.

Photo of Phantom SN 30/13 SAM103

Photo of Phantom SN 30/13 SAM104

Serial Number	Positionner Material	Permittivity	Loss Tangent
SN 30/13 SAM103	Gelcoat with fiberglass	3.4	0.02
SN 30/13 SAM104	Gelcoat with fiberglass	3.4	0.02



Serial Number	Left Head		Right Head		Flat Part	
SN 30/13 SAM103	2	2.00	2	2.03	1	2.09
	3	2.02	3	2.05	2	2.10
	4	2.04	4	2.04	3	2.09
	5	2.04	5	2.07	4	2.11
	6	2.02	6	2.07	5	2.11
	7	2.01	7	2.09	6	2.09
	8	2.04	8	2.10	7	2.11
	9	2.02	9	2.09	-	-
SN 30/13 SAM104	2	2.05	2	2.06	1	2.03
	3	2.08	3	2.03	2	2.03
	4	2.05	4	2.03	3	2.01
	5	2.06	5	2.02	4	2.03
	6	2.08	6	2.02	5	2.03
	7	2.06	7	2.04	6	2.00
	8	2.07	8	2.04	7	1.98
	9	2.07	9	2.05	-	-

4.2.5 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.

Serial Number	Holder Material	Permittivity	Loss Tangent
SN 25/13 MSH87	Deirin	3.7	0.005
SN 25/13 MSH88	Deirin	3.7	0.005

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

4.2.6 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 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5%.

Head Liquid Depth	Body Liquid Depth

The following table gives the recipes for tissue simulating liquid and the theoretical Conductivity/Permittivity.

Head (Reference IEEE1528)								
Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity σ (S/m)	Permittivity ε
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.4	40.0
2450	55.0	0	0	0.1	0	44.9	1.80	39.2
2600	54.9	0	0	0.1	0	45.0	1.96	39.0
Frequency(MHz)	Water (%)	Hexyl Carbitol (%)			Triton X-100 (%)		Conductivity σ (S/m)	Permittivity ε
5200	62.52	17.24			17.24		4.66	36.0
5800	62.52	17.24			17.24		5.27	35.3
Body (From instrument manufacturer)								
Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity σ (S/m)	Permittivity ε
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0.1	0	31.3	1.95	52.7
2600	68.2	0	0	0.1	0	31.7	2.16	52.5

Frequency(MHz)	Water	DGBE (%)	Salt (%)	Conductivity σ (S/m)	Permittivity ε
5200	78.60	21.40	/	5.54	47.86
5800	78.50	21.40	0.1	6.0	48.20

5 SYSTEM VERIFICATION

5.1 Antenna Port Test Requirement

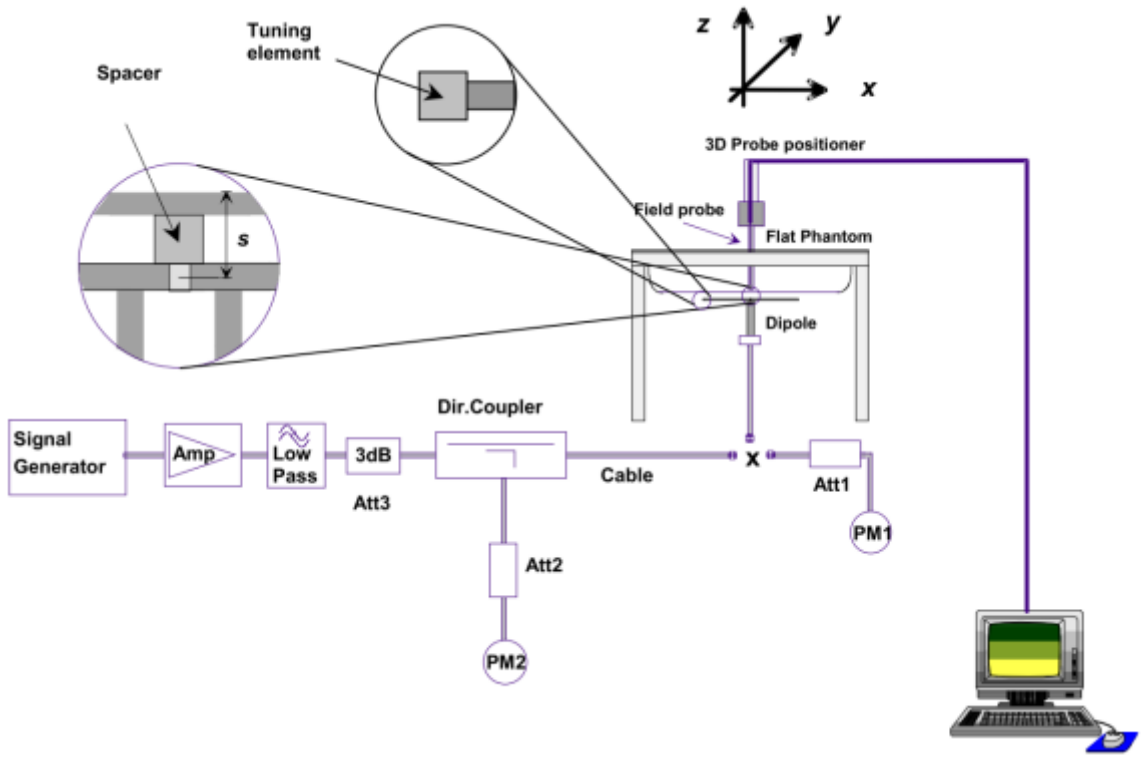
The SATIMO SAR system is equipped with one or more system validation kits. These units together with the predefined measurement procedures within the SATIMO software enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

5.2 Purpose of System Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

5.3 System Check Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



6 EUT TEST POSITION CONFIGURATUONS

According to KDB 648474 D04 Handset , handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

6.1 Head Exposure Conditions

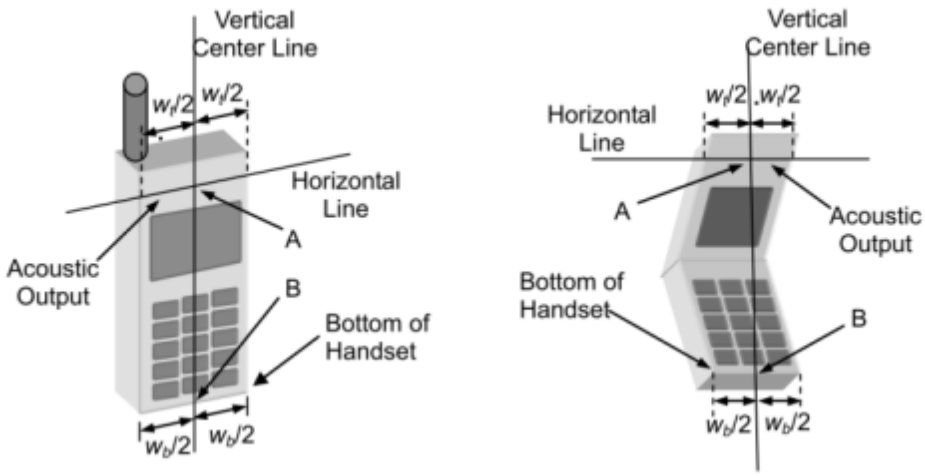
Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEEE Std 1528-2013 using the SAM phantom illustrated as below.

6.1.1 Define two imaginary lines on the handset

(a) The vertical center line passes through two points on the front side of the handset - the midpoint of the width w t of the handset at the level of the acoustic output, and the midpoint of the width w b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

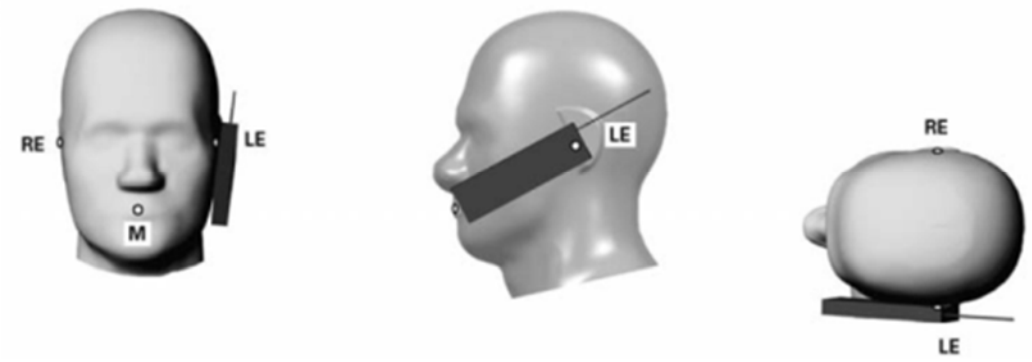
(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



6.1.2 Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

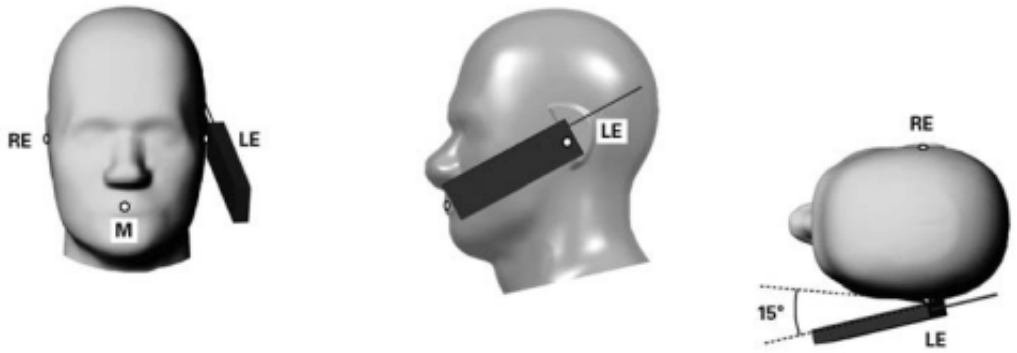
(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.



6.1.3 Tilted Position

(a) To position the device in the “cheek” position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.



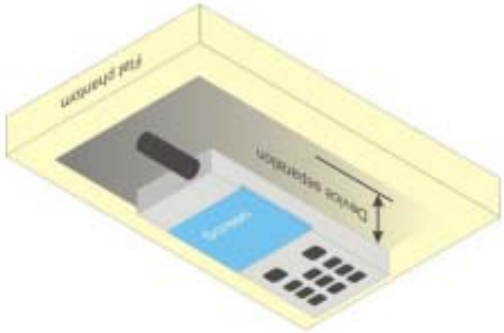
6.2 Body-worn Position Conditions

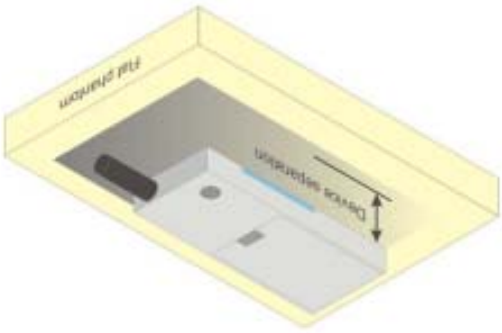
Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required. A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be

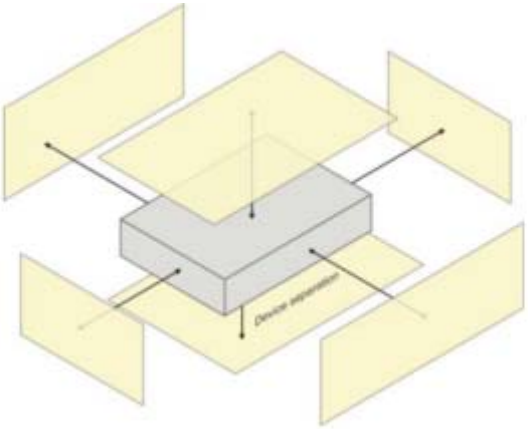
acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance <= 5 mm to support compliance.





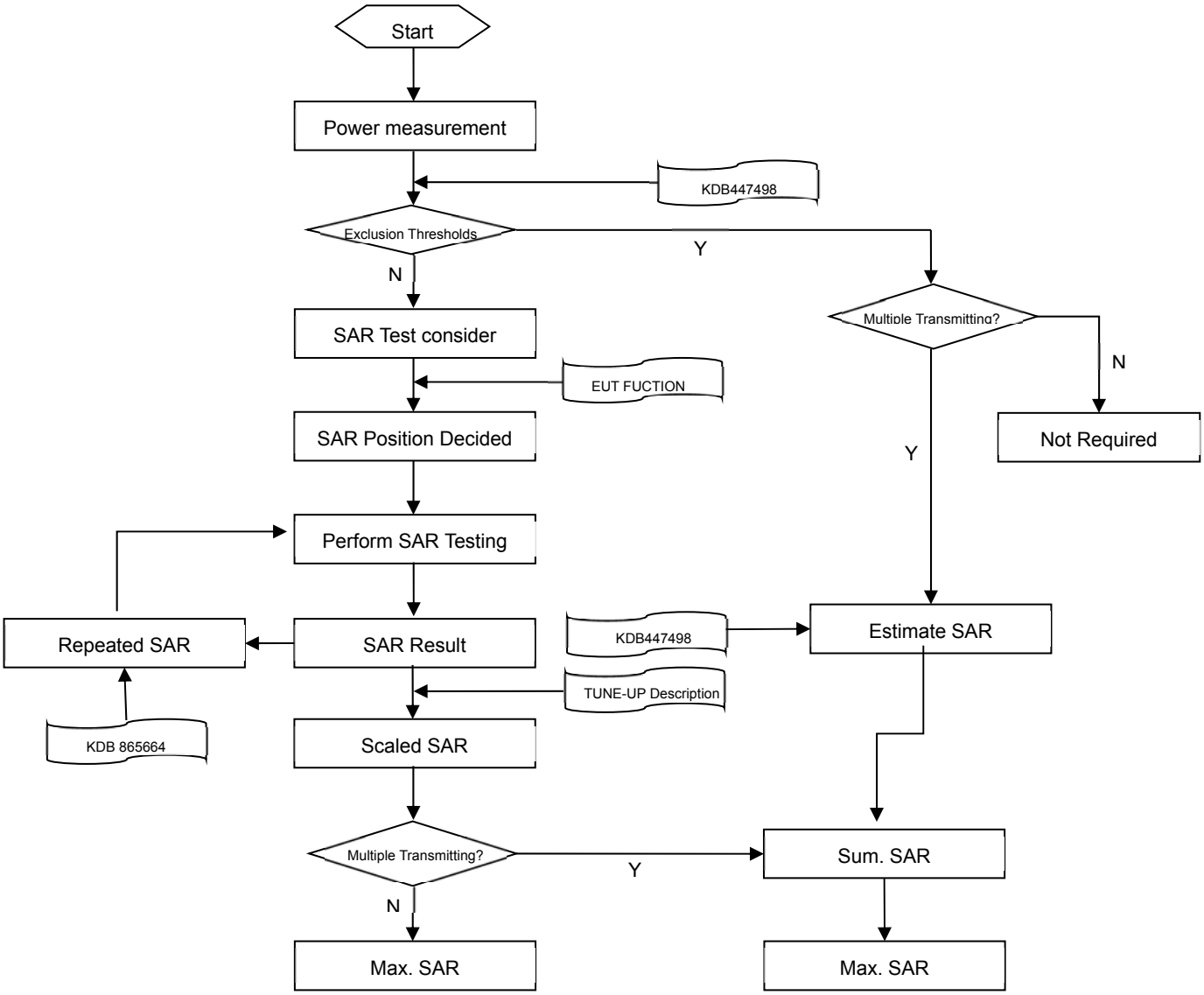
6.3 Hotspot Mode Exposure Position Conditions

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing functions, the relevant hand and body exposure conditions are tested according to the hotspot SAR procedures in KDB 941225. A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge. When the form factor of a handset is smaller than 9 cm x 5 cm, a test separation distance of 5 mm (instead of 10 mm) is required for testing hotspot mode. When the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).



7 SAR MEASUREMENT PROCEDURES

7.1 SAR Measurement Process Diagram



7.2 SAR Scan General Requirements

Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2013.

<table>
<tr><th colspan="3"></th><th>≤3GHz</th><th>>3GHz</th></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5±1 mm</td><td>½·δ·ln(2)±0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30°±1°</td><td>20°±1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx Area , Δy Area</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3–4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx Zoom , Δy Zoom</td><td>≤ 2 GHz: ≤ 8 mm
2 –3 GHz: ≤ 5 mm*</td><td>3–4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="6">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2" rowspan="3">uniform grid: Δz Zoom (n)</td><td rowspan="3">≤ 5 mm</td><td>3–4 GHz: ≤ 4 mm</td></tr>
<tr><td>4–5 GHz: ≤ 3 mm</td></tr>
<tr><td>5–6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="3">graded grid</td><td rowspan="2">Δz Zoom (1): between 1st two points closest to phantom surface</td><td rowspan="2">≤ 4 mm</td><td>3–4 GHz: ≤ 3 mm</td></tr>
<tr><td>4–5 GHz: ≤ 2.5 mm
5–6 GHz: ≤ 2 mm</td></tr>
<tr><td>Δz Zoom (n>1): between subsequent points</td><td colspan="2">≤ 1.5·Δz Zoom (n-1)</td></tr>
<tr><td rowspan="3">Minimum zoom scan volume</td><td colspan="2" rowspan="3">x, y, z</td><td rowspan="3">≥30 mm</td><td>3–4 GHz: ≥ 28 mm</td></tr>
<tr><td>4–5 GHz: ≥ 25 mm</td></tr>
<tr><td>5–6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note:
1. δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
2. * When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ⩽ 1.4 W/kg, ⩽ 8 mm, ⩽ 7 mm and ⩽ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

7.3 SAR Measurement Procedure

The following steps are used for each test position

- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

7.4 Area & Zoom Scan Procedures

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 D01 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.

8 CONDUCTED RF OUPUT POWER

8.1 GSM

GSM 850								
GSM850 Band	Burst Average Power(dBm)			Tune-up Limit (dBm)	Frame-Averaged power (dBm)			Tune-up Limit (dBm)
Channel	128	190	251		128	190	251	
GSM (GMSK, 1-Slot)	32.93	33.02	32.96	33.50	23.74	23.83	23.77	24.31
GPRS (GMSK, 1-Slot)	32.90	32.90	32.88	33.50	23.71	23.71	23.69	24.31
GPRS (GMSK, 2-Slots)	33.13	32.74	32.72	33.50	**27.00**	26.61	26.59	27.37
GPRS (GMSK, 3-Slots)	31.31	31.38	31.40	31.50	26.89	26.96	26.98	27.08
GPRS (GMSK, 4-Slots)	29.79	29.89	29.93	30.00	26.61	26.71	26.75	26.82
EGPRS (8PSK, 1-Slot)	27.00	27.30	27.34	28.00	17.81	18.11	18.15	18.81
EGPRS (8PSK, 2-Slots)	26.95	27.06	27.07	28.00	20.82	20.93	20.94	21.87
EGPRS (8PSK, 3-Slots)	26.77	26.93	26.88	27.00	22.35	22.51	22.46	22.58
EGPRS (8PSK, 4-Slots)	26.56	26.80	26.82	27.00	23.38	23.62	23.64	23.82
GSM 1900								
GSM1900 Band	Burst Average Power(dBm)			Tune-up Limit (dBm)	Frame-Averaged power(dBm)			Tune-up Limit (dBm)
Channel	512	661	810		512	661	810	
GSM (GMSK, 1-Slot)	30.95	30.89	31.03	31.50	21.76	21.70	21.84	22.31
GPRS (GMSK, 1-Slot)	30.91	30.86	30.96	31.50	21.72	21.67	21.77	22.31
GPRS (GMSK, 2-Slots)	30.70	30.67	30.79	31.50	24.57	24.54	24.66	25.37
GPRS (GMSK, 3-Slots)	30.52	30.51	30.64	31.00	26.10	26.09	26.22	26.58
GPRS (GMSK, 4-Slots)	30.37	30.37	30.51	31.00	27.19	27.19	**27.33**	27.82
EGPRS (8PSK, 1-Slot)	27.10	27.37	27.35	28.00	17.91	18.18	18.16	18.81
EGPRS (8PSK, 2-Slots)	26.77	27.09	27.07	27.50	20.64	20.96	20.94	21.37
EGPRS (8PSK, 3-Slots)	26.57	26.81	26.94	27.00	22.15	22.39	22.52	22.58
EGPRS (8PSK, 4-Slots)	26.28	26.56	26.70	27.00	23.10	23.38	23.52	23.82

Note [1]: SAR testing was performed on the maximum frame-averaged power mode.

Note [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) – 9.19 dB

Frame-averaged power = Burst averaged power (2 Tx Slots) – 6.13 dB

Frame-averaged power = Burst averaged power (3 Tx Slots) - 4.42dB

Frame-averaged power = Burst averaged power (4 Tx Slots) – 3.18 dB

8.2 WCDMA

WCDMA	Band 2				Band 4			
Channel	9262	9400	9538	Tune-up Limit (dBm)	1312	1412	1513	Tune-up Limit (dBm)
RMC 12.2Kbps	22.85	22.87	**23.16**	23.50	21.92	22.33	**22.32**	22.50
HSDPA Subtest-1	22.41	22.51	22.74	23.00	21.61	21.99	21.95	22.00
HSDPA Subtest-2	22.48	22.46	22.66	23.00	21.75	21.98	21.96	22.00
HSDPA Subtest-3	21.94	21.93	22.15	22.50	21.42	21.46	21.56	22.00
HSDPA Subtest-4	21.94	21.91	22.22	22.50	21.36	21.45	21.54	22.00
HSUPA Subtest-1	21.81	21.98	22.47	22.50	21.10	21.81	21.80	22.00
HSUPA Subtest-2	20.58	20.47	20.70	21.00	19.83	20.03	20.05	20.50
HSUPA Subtest-3	21.52	21.47	21.59	22.00	20.96	20.94	21.08	21.50
HSUPA Subtest-4	21.03	21.00	21.31	22.00	20.46	20.45	20.85	21.50
HSUPA Subtest-5	22.72	22.66	22.76	23.00	21.61	21.95	21.85	22.00
WCDMA	Band 5				-			
Channel	4132	4182	4233	Tune-up Limit (dBm)	-	-	-	-
RMC 12.2Kbps	22.52	22.58	**22.64**	23.00	-	-	-	-
HSDPA Subtest-1	22.23	22.33	22.35	22.50	-	-	-	-
HSDPA Subtest-2	22.22	22.32	22.35	22.50	-	-	-	-
HSDPA Subtest-3	21.80	21.79	21.82	22.00	-	-	-	-
HSDPA Subtest-4	21.78	21.78	21.81	22.00	-	-	-	-
HSUPA Subtest-1	21.73	22.24	21.87	22.00	-	-	-	-
HSUPA Subtest-2	20.26	20.38	20.33	20.50	-	-	-	-
HSUPA Subtest-3	21.29	21.33	21.35	21.50	-	-	-	-
HSUPA Subtest-4	20.85	21.06	21.03	21.50	-	-	-	-
HSUPA Subtest-5	22.41	22.57	22.54	23.00	-	-	-	-

8.3 LTE

FDD LTE Band 2									
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	18700	18900	19100		18700	18900	19100	
20 MHz	1 (RB_Pos:0)	22.89	**22.95**	22.94	23.00	22.45	22.60	22.34	23.00
	1 (RB_Pos:50)	22.20	22.94	22.81	23.00	21.65	22.24	22.27	23.00
	1 (RB_Pos:99)	22.91	22.76	22.78	23.00	22.36	22.37	22.32	23.00
	50 (RB_Pos:0)	21.66	21.87	21.78	22.00	20.75	20.77	20.66	21.50
	50 (RB_Pos:25)	21.48	21.79	21.88	22.00	20.58	20.67	20.73	21.50
	50 (RB_Pos:50)	21.63	21.73	21.88	22.00	20.62	20.62	20.80	21.50
	100 (RB_Pos:0)	21.62	21.88	21.83	22.00	20.63	20.76	20.70	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	18675	18900	19125		18675	18900	19125	
15 MHz	1 (RB_Pos:0)	22.71	22.88	22.92	23.00	21.85	22.28	22.65	23.00
	1 (RB_Pos:38)	22.38	22.62	22.78	23.00	21.53	22.13	22.39	23.00
	1 (RB_Pos:74)	22.66	22.79	22.98	23.00	22.12	22.49	22.66	23.00
	36 (RB_Pos:0)	21.70	21.80	21.79	22.00	20.74	20.91	20.73	21.50
	36 (RB_Pos:20)	21.44	21.79	21.87	22.00	20.49	20.80	20.81	21.50
	36 (RB_Pos:39)	21.57	21.71	21.94	22.00	20.61	20.73	20.94	21.50
	75 (RB_Pos:0)	21.66	21.70	21.90	22.00	20.55	20.61	20.87	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	18650	18900	19150		18650	18900	19150	
10 MHz	1 (RB_Pos:0)	22.62	22.63	22.78	23.00	21.68	22.05	22.14	23.00
	1 (RB_Pos:25)	22.37	22.59	22.92	23.00	21.53	22.01	22.14	23.00
	1 (RB_Pos:49)	22.44	22.60	22.65	23.00	21.44	21.94	21.72	23.00
	25 (RB_Pos:0)	21.58	21.75	21.93	22.00	20.65	20.55	21.08	21.50
	25 (RB_Pos:12)	21.45	21.76	21.90	22.00	20.44	20.50	21.13	21.50
	25 (RB_Pos:25)	21.48	21.75	21.96	22.00	20.46	20.56	21.10	21.50
	50 (RB_Pos:0)	21.57	21.79	21.93	22.00	20.63	20.60	20.91	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	18625	18900	19175		18625	18900	19175	
5 MHz	1 (RB_Pos:0)	22.47	22.68	22.83	23.00	21.64	22.27	22.26	23.00
	1 (RB_Pos:13)	22.28	22.69	22.78	23.00	21.47	21.63	21.82	23.00
	1 (RB_Pos:24)	22.44	22.78	22.80	23.00	21.47	22.15	21.58	23.00
	12 (RB_Pos:0)	21.64	21.71	21.96	22.00	20.37	20.70	20.88	21.50
	12 (RB_Pos:6)	21.68	21.71	21.91	22.00	20.41	20.72	20.83	21.50

	12 (RB_Pos:13)	21.70	21.70	21.79	22.00	20.43	20.82	20.94	21.50
	25 (RB_Pos:0)	21.66	21.73	21.88	22.00	20.53	20.84	21.02	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	18615	18900	19185		18615	18900	19185	
3.0 MHz	1 (RB_Pos:0)	22.54	22.68	22.87	23.00	21.67	22.39	22.04	23.00
	1 (RB_Pos:8)	22.51	22.60	22.61	23.00	21.77	22.20	21.68	23.00
	1 (RB_Pos:14)	22.50	22.87	22.64	23.00	21.93	22.25	21.81	23.00
	8 (RB_Pos:0)	21.60	21.76	21.84	22.00	20.34	20.79	20.96	21.50
	8 (RB_Pos:3)	21.62	21.73	21.76	22.00	20.48	20.77	20.93	21.50
	8 (RB_Pos:7)	21.64	21.75	21.67	22.00	20.51	21.08	20.90	21.50
	15 (RB_Pos:0)	21.62	21.76	21.77	22.00	20.50	20.84	20.73	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	18607	18900	19193		18607	18900	19193	
1.4 MHz	1 (RB_Pos:0)	22.51	22.46	22.65	23.00	22.14	21.91	21.91	23.00
	1 (RB_Pos:3)	22.41	22.53	22.74	23.00	22.25	22.01	21.70	23.00
	1 (RB_Pos:5)	22.39	22.54	22.66	23.00	22.14	21.89	21.92	23.00
	3 (RB_Pos:0)	22.41	22.55	22.82	23.00	21.63	21.70	21.76	23.00
	3 (RB_Pos:1)	22.44	22.59	22.72	23.00	21.68	21.82	21.76	23.00
	3 (RB_Pos:3)	22.40	22.56	22.79	23.00	21.75	21.67	21.58	23.00
	6 (RB_Pos:0)	21.48	21.70	21.91	22.00	20.85	20.74	20.75	21.50

FDD LTE Band 4									
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	20050	20175	20300		20050	20175	20300	
20 MHz	1 (RB_Pos:0)	22.27	22.45	22.86	23.00	21.30	21.58	21.83	22.50
	1 (RB_Pos:50)	22.12	**22.89**	22.26	23.00	21.04	22.22	21.42	22.50
	1 (RB_Pos:99)	22.83	22.39	22.27	23.00	21.91	22.08	21.34	22.50
	50 (RB_Pos:0)	21.23	21.33	21.50	22.00	20.41	20.41	20.54	21.50
	50 (RB_Pos:25)	21.25	21.32	21.30	22.00	20.32	20.39	20.16	21.50
	50 (RB_Pos:50)	21.26	21.48	21.27	22.00	20.34	20.55	20.21	21.50
	100 (RB_Pos:0)	21.20	21.39	21.35	22.00	20.20	20.24	20.41	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	19275	19575	19875		19275	19575	19875	
15 MHz	1 (RB_Pos:0)	22.21	22.28	22.54	23.00	21.43	21.78	22.10	22.50
	1 (RB_Pos:38)	22.03	22.25	22.02	23.00	21.15	21.84	21.97	22.50
	1 (RB_Pos:74)	22.31	22.52	22.25	23.00	21.75	22.29	22.34	22.50
	36 (RB_Pos:0)	21.30	21.39	21.41	22.00	20.35	20.44	20.50	21.50
	36 (RB_Pos:20)	21.19	21.38	21.31	22.00	20.05	20.54	20.20	21.50
	36 (RB_Pos:39)	21.22	21.50	21.32	22.00	20.20	20.67	20.23	21.50
	75 (RB_Pos:0)	21.20	21.34	21.37	22.00	20.20	20.22	20.26	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	19250	19575	19900		19250	19575	19900	
10 MHz	1 (RB_Pos:0)	22.24	22.62	22.22	23.00	21.33	21.81	21.53	22.50
	1 (RB_Pos:25)	22.01	22.67	22.24	23.00	21.23	22.16	21.46	22.50
	1 (RB_Pos:49)	22.27	22.46	22.31	23.00	21.68	21.98	21.52	22.50
	25 (RB_Pos:0)	21.23	21.35	21.32	22.00	20.29	20.23	20.56	21.50
	25 (RB_Pos:12)	21.17	21.28	21.30	22.00	20.23	20.22	20.45	21.50
	25 (RB_Pos:25)	21.20	21.51	21.34	22.00	20.26	20.27	20.38	21.50
	50 (RB_Pos:0)	21.27	21.36	21.34	22.00	20.23	20.42	20.33	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	19225	19575	19925		19225	19575	19925	
5 MHz	1 (RB_Pos:0)	21.97	22.12	22.16	23.00	21.16	21.13	21.56	22.50
	1 (RB_Pos:13)	21.72	22.27	22.02	23.00	20.57	21.12	21.23	22.50
	1 (RB_Pos:24)	21.94	22.55	22.17	23.00	20.73	21.94	21.13	22.50
	12 (RB_Pos:0)	21.19	21.32	21.24	22.00	19.95	20.06	20.05	21.50
	12 (RB_Pos:6)	21.15	21.31	21.31	22.00	19.96	20.13	20.10	21.50
	12 (RB_Pos:13)	21.16	21.42	21.34	22.00	20.02	20.48	20.11	21.50
	25 (RB_Pos:0)	21.21	21.22	21.32	22.00	20.22	20.30	20.23	21.50

Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	19215	19575	19935		19215	19575	19935	
3.0 MHz	1 (RB_Pos:0)	22.02	22.30	22.13	23.00	21.03	21.54	21.47	22.50
	1 (RB_Pos:8)	21.92	22.38	22.10	23.00	20.97	21.54	21.38	22.50
	1 (RB_Pos:14)	21.89	22.57	22.02	23.00	20.97	21.88	21.47	22.50
	8 (RB_Pos:0)	21.21	21.31	21.23	22.00	20.37	20.71	20.23	21.50
	8 (RB_Pos:3)	21.12	21.30	21.17	22.00	20.36	20.82	20.25	21.50
	8 (RB_Pos:7)	21.07	21.37	21.17	22.00	20.32	20.86	20.25	21.50
	15 (RB_Pos:0)	21.14	21.28	21.26	22.00	20.06	20.43	20.17	21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	19207	19575	19943		19207	19575	19943	
1.4 MHz	1 (RB_Pos:0)	21.90	22.28	22.09	23.00	21.72	21.83	21.29	22.50
	1 (RB_Pos:3)	21.92	22.46	22.42	23.00	21.79	21.80	21.42	22.50
	1 (RB_Pos:5)	21.80	22.42	22.10	23.00	21.76	21.67	21.27	22.50
	3 (RB_Pos:0)	22.02	22.15	22.15	23.00	21.33	20.96	21.29	22.50
	3 (RB_Pos:1)	21.95	22.10	22.19	23.00	21.21	21.18	21.38	22.50
	3 (RB_Pos:3)	21.86	22.31	22.18	23.00	21.38	21.08	21.02	22.50
	6 (RB_Pos:0)	21.03	21.21	21.11	22.00	20.36	19.91	20.33	21.50

FDD LTE Band 5									
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	20450	20525	20600		20450	20525	20600	
10 MHz	1 (RB_Pos:0)	22.98	23.07	23.03	23.50	22.01	22.07	22.18	23.00
	1 (RB_Pos:25)	22.61	**23.25**	22.74	23.50	21.72	22.61	21.46	23.00
	1 (RB_Pos:49)	22.83	22.94	22.91	23.50	22.33	22.18	22.09	23.00
	25 (RB_Pos:0)	21.95	21.89	21.94	22.50	20.62	20.99	20.98	22.00
	25 (RB_Pos:12)	21.82	21.96	21.83	22.50	20.65	21.03	20.66	22.00
	25 (RB_Pos:25)	21.99	21.98	21.92	22.50	20.80	21.04	20.79	22.00
	50 (RB_Pos:0)	21.95	21.94	21.89	22.50	20.82	20.79	20.79	22.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	20425	20525	20625		20425	20525	20625	
5MHz	1 (RB_Pos:0)	22.84	22.86	22.63	23.50	22.01	21.90	22.05	23.00
	1 (RB_Pos:13)	22.50	22.77	22.68	23.50	21.40	21.85	21.83	23.00
	1 (RB_Pos:24)	22.46	23.14	22.85	23.50	21.32	21.91	22.30	23.00
	12 (RB_Pos:0)	21.93	21.84	21.89	22.50	20.72	20.64	20.65	22.00
	12 (RB_Pos:6)	21.81	21.88	22.01	22.50	20.64	20.68	20.76	22.00
	12 (RB_Pos:13)	21.85	21.94	22.01	22.50	20.77	20.89	20.87	22.00
	25 (RB_Pos:0)	21.92	21.85	21.90	22.50	20.81	20.88	20.76	22.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	20415	20525	20635		20415	20525	20635	
3.0 MHz	1 (RB_Pos:0)	23.08	22.88	22.91	23.50	22.20	22.52	22.21	23.00
	1 (RB_Pos:8)	22.72	22.93	22.75	23.50	21.71	22.52	21.99	23.00
	1 (RB_Pos:14)	22.65	23.25	22.89	23.50	21.83	22.85	22.10	23.00
	8 (RB_Pos:0)	22.02	21.95	21.88	22.50	20.71	20.98	20.79	22.00
	8 (RB_Pos:3)	21.87	21.98	22.01	22.50	20.76	20.89	20.91	22.00
	8 (RB_Pos:7)	21.83	21.98	21.89	22.50	20.70	20.98	20.90	22.00
	15 (RB_Pos:0)	21.97	21.87	21.83	22.50	20.77	20.84	20.75	22.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	20407	20525	20643		20407	20525	20643	
1.4MHz	1 (RB_Pos:0)	23.10	22.76	22.85	23.50	22.64	22.23	22.02	23.00
	1 (RB_Pos:3)	23.08	22.87	22.93	23.50	22.65	22.33	22.01	23.00
	1 (RB_Pos:5)	22.99	22.80	22.80	23.50	22.53	22.59	22.03	23.00
	3 (RB_Pos:0)	23.00	22.84	22.91	23.50	22.26	21.80	22.31	23.00
	3 (RB_Pos:1)	22.90	22.94	22.92	23.50	22.18	21.89	22.41	23.00
	3 (RB_Pos:3)	22.89	23.03	22.88	23.50	22.10	21.74	22.28	23.00

	6 (RB_Pos:0)	21.80	21.98	21.85	22.50	20.74	20.54	21.10	22.00

FDD LTE Band 12									
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23060	23095	23130		23060	23095	23130	
10 MHz	1 (RB_Pos:0)	18.27	18.63	18.79	19.00	17.50	17.79	18.06	18.50
	1 (RB_Pos:25)	18.74	**18.92**	18.62	19.00	17.94	18.40	17.83	18.50
	1 (RB_Pos:49)	18.66	18.45	18.59	19.00	18.01	17.46	17.82	18.50
	25 (RB_Pos:0)	17.47	17.63	17.76	18.00	16.39	16.72	17.16	17.50
	25 (RB_Pos:12)	17.55	17.68	17.60	18.00	16.47	16.60	16.90	17.50
	25 (RB_Pos:25)	17.61	17.40	17.57	18.00	16.53	16.44	16.87	17.50
	50 (RB_Pos:0)	17.52	17.54	17.70	18.00	16.60	16.56	16.73	17.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23035	23095	23155		23035	23095	23155	
5MHz	1 (RB_Pos:0)	18.36	18.80	18.55	19.00	17.09	17.56	17.94	18.50
	1 (RB_Pos:13)	18.34	18.77	18.47	19.00	16.99	17.46	17.56	18.50
	1 (RB_Pos:24)	18.53	18.62	18.51	19.00	17.38	17.45	17.86	18.50
	12 (RB_Pos:0)	17.45	17.67	17.55	18.00	16.32	16.60	16.61	17.50
	12 (RB_Pos:6)	17.63	17.61	17.58	18.00	16.71	16.54	16.64	17.50
	12 (RB_Pos:13)	17.41	17.51	17.53	18.00	16.62	16.48	16.70	17.50
	25 (RB_Pos:0)	17.43	17.63	17.50	18.00	16.79	16.70	16.55	17.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23025	23095	23165		23025	23095	23165	
3.0 MHz	1 (RB_Pos:0)	18.41	18.75	18.52	19.00	18.02	17.96	17.65	18.50
	1 (RB_Pos:8)	18.19	18.65	18.46	19.00	17.64	17.84	17.68	18.50
	1 (RB_Pos:14)	18.40	18.54	18.55	19.00	17.74	17.72	17.68	18.50
	8 (RB_Pos:0)	17.39	17.70	17.54	18.00	16.70	16.88	16.79	17.50
	8 (RB_Pos:3)	17.50	17.65	17.53	18.00	16.72	16.82	16.77	17.50
	8 (RB_Pos:7)	17.51	17.52	17.51	18.00	16.83	16.73	16.65	17.50
	15 (RB_Pos:0)	17.50	17.64	17.55	18.00	16.66	16.67	16.70	17.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23017	23095	23173		23017	23095	23173	
1.4MHz	1 (RB_Pos:0)	18.30	18.71	18.64	19.00	17.85	18.08	17.72	18.50
	1 (RB_Pos:3)	18.46	18.68	18.49	19.00	17.93	18.13	17.74	18.50
	1 (RB_Pos:5)	18.47	18.67	18.52	19.00	17.95	17.92	17.72	18.50
	3 (RB_Pos:0)	18.43	18.67	18.58	19.00	17.51	17.59	18.03	18.50

	3 (RB_Pos:1)	18.55	18.66	18.59	19.00	17.44	17.52	18.15	18.50
	3 (RB_Pos:3)	18.41	18.52	18.60	19.00	17.54	17.48	18.03	18.50
	6 (RB_Pos:0)	17.25	17.59	17.51	18.00	16.66	16.19	16.79	17.50

FDD LTE Band 13									
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23230				23230			
10 MHz	1 (RB_Pos:0)	**22.96**			23.50	21.83			22.50
	1 (RB_Pos:25)	22.95			23.50	22.04			22.50
	1 (RB_Pos:49)	22.90			23.50	22.00			22.50
	25 (RB_Pos:0)	22.07			22.50	20.92			21.50
	25 (RB_Pos:12)	21.96			22.50	20.73			21.50
	25 (RB_Pos:25)	21.84			22.50	20.65			21.50
	50 (RB_Pos:0)	21.93			22.50	20.79			21.50
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23205	23230	23255		23205	23230	23255	
5MHz	1 (RB_Pos:0)	22.90	22.88	22.93	23.50	21.86	22.46	22.23	22.50
	1 (RB_Pos:13)	22.68	22.91	22.85	23.50	21.81	21.94	21.85	22.50
	1 (RB_Pos:24)	22.90	22.99	22.79	23.50	21.69	21.72	22.16	22.50
	12 (RB_Pos:0)	21.86	21.98	21.96	22.50	20.83	20.98	20.99	21.50
	12 (RB_Pos:6)	21.87	21.87	21.88	22.50	20.90	20.90	20.64	21.50
	12 (RB_Pos:13)	21.99	21.86	21.80	22.50	20.81	20.94	20.83	21.50
	25 (RB_Pos:0)	22.00	22.00	21.97	22.50	20.99	20.92	20.87	21.50

8.4 WIFI

8.4.1 2.4GWIFI

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Limit (dBm)	SAR Test Require.
2.4 (2.4~2.4835)	802.11b	1	2412	**14.81**	15.00	Yes
		6	2437	12.20	12.50	No
		11	2462	14.23	14.50	No
	802.11g	1	2412	11.56	12.00	No
		6	2437	8.88	9.50	No
		11	2462	10.24	10.50	No
	802.11n(HT20)	1	2412	10.65	11.00	No
		6	2437	8.30	9.00	No
		11	2462	9.03	9.50	No
	802.11n(HT40)	3	2422	8.49	9.00	No
		6	2437	10.11	10.50	No
		9	2452	8.96	9.50	No

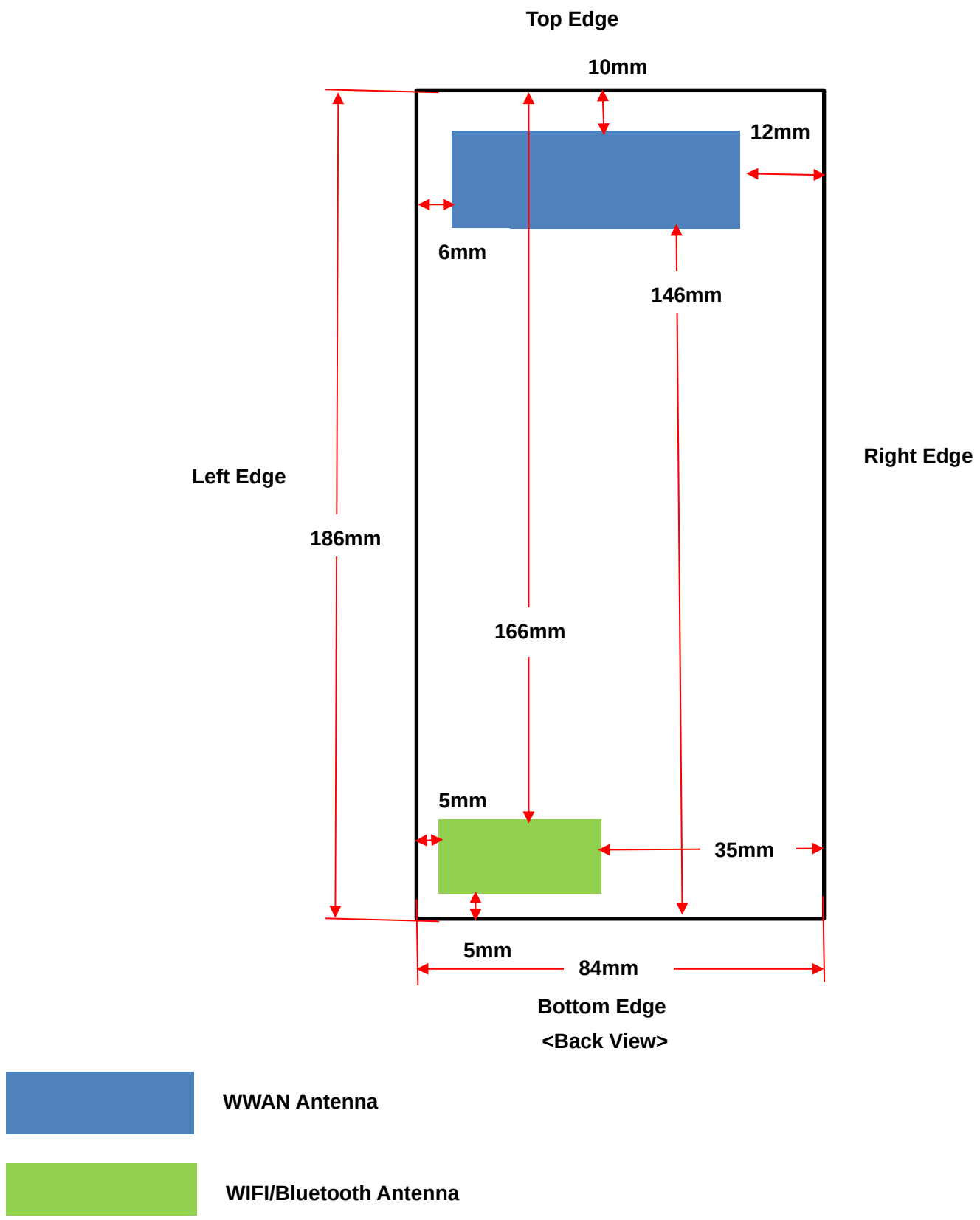
8.4.2 5GWIFI

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Limit (dBm)	SAR Test Require.
5.2 (5.15~5.25)	802.11a	36	5180	8.07	9.00	No
		40	5200	8.90	9.00	No
		48	5240	**10.57**	11.00	Yes
	802.11n(HT20)	36	5180	7.29	8.00	No
		40	5200	7.68	8.00	No
		48	5240	9.65	10.00	No
	802.11n(HT40)	38	5190	7.80	8.00	No
		46	5230	9.50	10.00	No
5.8 (5.725~5.850)	802.11a	149	5745	10.61	11.00	No
		157	5785	11.93	12.00	No
		165	5825	**12.94**	13.00	Yes
	802.11n(HT20)	149	5745	9.28	9.50	No
		157	5785	10.80	11.00	No
		165	5825	11.94	12.00	No
	802.11n(HT40)	151	5755	9.48	10.00	No
		159	5795	10.95	11.00	No

8.5 Bluetooth

Mode	GFSK			π/4-DQPSK		
Channel	0	39	78	0	39	78
Frequency (MHz)	2402	2441	2480	2402	2441	2480
Conducted Power (dBm)	7.75	**8.55**	7.99	6.31	5.69	5.79
Tune-Up Limit (dBm)	9.00			7.00		
Mode	8-DPSK			BLE		
Channel	0	39	78	0	19	39
Frequency (MHz)	2402	2441	2480	2402	2440	2480
Conducted Power (dBm)	6.22	5.60	5.80	-2.19	-3.02	-3.41
Tune-Up Limit (dBm)	7.00			-2.00		

9 EUT ANTENNA LOCATION SKETCH



9.1 SAR Test Exclusion Consider Table

According with FCC KDB 447498 D01, Appendix A, <SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm> Table, this Device SAR test configurations consider as following :

Band	Mode	Max. Peak Power		Test Position Configurations					
		dBm	mW	Front	Back	Left Edge	Right Edge	Top Edge	Bottom Edge
GSM 850	Distance to User			<5mm	<5mm	6mm	12mm	10mm	146mm
	Data	33.50	2238.72	Yes	Yes	Yes	Yes	Yes	No
GSM 1900	Distance to User			<5mm	<5mm	6mm	12mm	10mm	146mm
	Data	29.50	891.25	Yes	Yes	Yes	Yes	Yes	No
WCDMA Band 2	Distance to User			<5mm	<5mm	6mm	12mm	10mm	146mm
	RMC	23.50	223.87	Yes	Yes	Yes	Yes	Yes	No
WCDMA Band 4	Distance to User			<5mm	<5mm	6mm	12mm	10mm	146mm
	RMC	24.00	251.19	Yes	Yes	Yes	Yes	Yes	No
WCDMA Band 5	Distance to User			<5mm	<5mm	6mm	12mm	10mm	146mm
	RMC	23.00	199.53	Yes	Yes	Yes	Yes	Yes	No
LTE Band 5	Distance to User			<5mm	<5mm	6mm	12mm	10mm	146mm
	QPSK	23.50	223.87	Yes	Yes	Yes	Yes	Yes	No
LTE Band 7	Distance to User			<5mm	<5mm	6mm	12mm	10mm	146mm
	QPSK	25.00	316.23	Yes	Yes	Yes	Yes	Yes	No
WLAN 2.4 G	Distance to User			<5mm	<5mm	5mm	35mm	166mm	5mm
	802.11b	14.50	28.18	Yes	Yes	Yes	Yes	No	Yes
	802.11g	14.00	25.12	No	No	No	No	No	No
	802.11n(HT20)	13.50	22.39	No	No	No	No	No	No
	802.11n(HT40)	13.50	22.39	No	No	No	No	No	No
WLAN 5.2 G	Distance to User			<5mm	<5mm	5mm	35mm	166mm	5mm
	802.11a	11.50	14.13	Yes	Yes	Yes	Yes	No	Yes
	802.11n(HT20)	11.50	14.13	No	No	No	No	No	No
	802.11n(HT40)	10.50	11.22	No	No	No	No	No	No
WLAN 5.8 G	Distance to User			<5mm	<5mm	5mm	35mm	166mm	5mm
	802.11a	11.50	14.13	Yes	Yes	Yes	Yes	No	Yes
	802.11n(HT20)	12.00	15.85	No	No	No	No	No	No
	802.11n(HT40)	10.50	11.22	No	No	No	No	No	No
Bluetooth	Distance to User			<5mm	<5mm	5mm	35mm	166mm	5mm
	BR/EDR	8.00	6.31	No	No	No	No	No	No
	BLE	0.50	1.12	No	No	No	No	No	No

Note:

1. Maximum power is the source-based time-average power and represents the maximum RF output power including tune-up tolerance among production units
2. Per KDB 447498 D01, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. Per KDB 447498 D01, standalone SAR test exclusion threshold is applied; If the distance of the antenna to the user is

< 5mm, 5mm is used to determine SAR exclusion threshold

4. Per KDB 447498 D01, the 1-g 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)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

   a. f(GHz) is the RF channel transmit frequency in GHz
   b. Power and distance are rounded to the nearest mW and mm before calculation
   c. The result is rounded to one decimal place for comparison
   d. For < 50 mm distance, we just calculate mW of the exclusion threshold value (3.0) to do compare.

   This formula is [3.0] / [√f(GHz)] ·[(min. test separation distance, mm)] = exclusion threshold of mW.

5. Per KDB 447498 D01, at 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following

   a. [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b. [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

6. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA /HSUPA /DC-HSDPA output power is < 0.25dB higher than RMC12.2Kbps, or reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA/HSUPA/DC-HSDPA SAR evaluation can be excluded.

7. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine further SAR exclusion.8. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at the lowest data rate

8. Per KDB 248227 D01 SAR is not required for the following 2.4 GHz OFDM conditions.

   a. When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
   b. 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.

9. Per KDB 248227 D01 SAR is not required for the following U-NII-1 and U-NII-2A bands conditions.

   a. When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, each band is tested independently for SAR.
   b. When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, each band is tested independently for SAR.

10 TEST RESULTS

10.1 GSM 850

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power(dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body											
GPRS 2 slots	Front Side	0	128	824.2	4.60	0.060	33.13	33.50	1.089	0.065	/
	Back Side	0	128	824.2	-0.69	0.476	33.13	33.50	1.089	**0.518**	1#
	Left Edge	0	128	824.2	2.68	0.117	33.13	33.50	1.089	0.127	/
	Right Edge	0	128	824.2	-1.96	0.109	33.13	33.50	1.089	0.119	/
	Top Edge	0	128	824.2	-2.01	0.090	33.13	33.50	1.089	0.098	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.2 GSM 1900

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power(dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body											
GPRS 4 slots	Front Side	0	810	1909.8	-2.96	0.041	30.51	31.00	1.119	0.046	/
	Back Side	0	810	1909.8	-4.03	0.866	30.51	31.00	1.119	0.969	/
		0	512	1850.2	-2.03	0.906	30.37	31.00	1.156	**1.047**	2#
		0	661	1880.0	-4.92	0.897	30.37	31.00	1.156	1.037	/
	Left Edge	0	810	1909.8	-4.67	0.255	30.51	31.00	1.119	0.285	/
	Right Edge	0	810	1909.8	0.16	0.118	30.51	31.00	1.119	0.132	/
	Top Edge	0	810	1909.8	-1.28	0.250	30.51	31.00	1.119	0.280	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.3 WCDMA Band 2

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power(dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body											
RMC	Front Side	0	9538	1907.6	2.80	0.028	23.16	23.50	1.081	0.030	/
	Back Side	0	9538	1907.6	-0.65	0.756	23.16	23.50	1.081	**0.818**	3#
		0	9262	1852.4	2.63	0.562	22.85	23.50	1.161	0.653	/
		0	9400	1880.0	1.47	0.704	22.87	23.50	1.156	0.814	/
	Left Edge	0	9538	1907.6	0.23	0.167	23.16	23.50	1.081	0.181	/
	Right Edge	0	9538	1907.6	-2.31	0.099	23.16	23.50	1.081	0.107	/
	Top Edge	0	9538	1907.6	-0.49	0.188	23.16	23.50	1.081	0.203	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.4 WCDMA Band 4

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power(dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body											
RMC	Front Side	0	1412	1732.4	2.06	0.078	22.33	22.50	1.040	0.081	/
	Back Side	0	1412	1732.4	1.35	0.496	22.33	22.50	1.040	**0.516**	4#
	Left Edge	0	1412	1732.4	3.14	0.114	22.33	22.50	1.040	0.119	/
	Right Edge	0	1412	1732.4	1.64	0.253	22.33	22.50	1.040	0.263	/
	Top Edge	0	1412	1732.4	2.15	0.258	22.33	22.50	1.040	0.268	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.5 WCDMA Band 5

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power(dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body											
RMC	Front Side	0	4233	846.6	3.68	0.043	22.64	23.00	1.086	0.047	/
	Back Side	0	4233	846.6	1.56	0.419	22.64	23.00	1.086	**0.455**	5#
	Left Edge	0	4233	846.6	-3.81	0.113	22.64	23.00	1.086	0.123	/
	Right Edge	0	4233	846.6	3.01	0.063	22.64	23.00	1.086	0.068	/
	Top Edge	0	4233	846.6	3.26	0.085	22.64	23.00	1.086	0.092	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.6 LTE Band 2 (20MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body													
QPSK	Front Side	0	18900	1880.0	1	Low	2.23	0.041	22.95	23.00	1.012	0.041	/
		0	19100	1900.0	50	Mid	-4.54	0.028	21.88	22.00	1.028	0.029	/
	Back Side	0	18900	1880.0	1	Low	-4.03	1.035	22.95	23.00	1.012	**1.047**	6#
		0	18700	1860.0	1	High	0.06	0.935	22.91	23.00	1.021	0.955	/
		0	19100	1900.0	1	Low	2.77	1.018	22.94	23.00	1.014	1.032	/
		0	19100	1900.0	50	Mid	-2.18	0.728	21.88	22.00	1.028	0.748	/
		0	18900	1880.0	100	Low	1.60	0.715	21.88	22.00	1.028	0.735	/
	Left Edge	0	18900	1880.0	1	Low	-1.31	0.186	22.95	23.00	1.012	0.188	/
		0	19100	1900.0	50	Mid	-1.59	0.166	21.88	22.00	1.028	0.171	/
	Right Edge	0	18900	1880.0	1	Low	-1.31	0.175	22.95	23.00	1.012	0.177	/
		0	19100	1900.0	50	Mid	0.68	0.111	21.88	22.00	1.028	0.114	/
	Top Edge	0	18900	1880.0	1	Low	3.45	0.362	22.95	23.00	1.012	0.366	/
		0	19100	1900.0	50	Mid	-1.52	0.227	21.88	22.00	1.028	0.233	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.7 LTE Band 4 (20MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body													
QPSK	Front Side	0	20175	1732.5	1	Mid	-3.52	0.083	22.89	23.00	1.026	0.085	/
		0	20300	1745.0	50	Low	-2.18	0.077	21.50	22.00	1.122	0.086	/
	Back Side	0	20175	1732.5	1	Mid	-1.70	0.991	22.89	23.00	1.026	1.016	/
		0	20050	1720.0	1	High	-4.09	1.014	22.83	23.00	1.040	1.054	/
		0	20300	1745.0	1	Low	-0.19	1.027	22.86	23.00	1.033	**1.061**	7#
		0	20300	1745.0	50	Low	4.98	0.703	21.50	22.00	1.122	0.789	/
		0	20175	1732.5	100	Low	-0.02	0.658	21.39	22.00	1.151	0.757	/
	Left Edge	0	20175	1732.5	1	Mid	-0.14	0.163	22.89	23.00	1.026	0.167	/
		0	20300	1745.0	50	Low	-4.47	0.133	21.50	22.00	1.122	0.149	/
	Right Edge	0	20175	1732.5	1	Mid	-0.96	0.547	22.89	23.00	1.026	0.561	/
		0	20300	1745.0	50	Low	-2.47	0.398	21.50	22.00	1.122	0.447	/
	Top Edge	0	20175	1732.5	1	Mid	-0.66	0.635	22.89	23.00	1.026	0.651	/
		0	20300	1745.0	50	Low	-4.24	0.396	21.50	22.00	1.122	0.444	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.8 LTE Band 5 (10MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body													
QPSK	Front Side	0	20525	836.5	1	MId	-0.29	0.063	23.25	23.50	1.059	0.067	/
		0	20450	829.0	25	High	2.02	0.057	21.99	22.50	1.125	0.064	/
	Back Side	0	20525	836.5	1	MId	-2.31	0.618	23.25	23.50	1.059	**0.655**	8#
		0	20450	829.0	25	High	-0.36	0.496	21.99	22.50	1.125	0.558	/
	Left Edge	0	20525	836.5	1	MId	3.83	0.154	23.25	23.50	1.059	0.163	/
		0	20450	829.0	25	High	3.58	0.127	21.99	22.50	1.125	0.143	/
	Right Edge	0	20525	836.5	1	MId	-0.02	0.112	23.25	23.50	1.059	0.119	/
		0	20450	829.0	25	High	-0.18	0.118	21.99	22.50	1.125	0.133	/
	Top Edge	0	20525	836.5	1	MId	0.58	0.181	23.25	23.50	1.059	0.192	/
		0	20450	829.0	25	High	-4.06	0.136	21.99	22.50	1.125	0.153	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.9 LTE Band 12 (10MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body													
QPSK	Front Side	0	23095	707.5	1	Mid	-3.75	0.121	18.74	19.00	1.062	0.128	/
		0	23130	711.0	25	Low	1.08	0.087	17.76	18.00	1.057	0.092	/
	Back Side	0	23095	707.5	1	Mid	1.08	0.766	18.92	19.00	1.019	0.780	/
		0	23060	704.0	1	Mid	3.26	0.767	18.74	19.00	1.062	0.814	/
		0	23130	711.0	1	Low	-0.06	0.830	18.79	19.00	1.050	**0.871**	9#
		0	23130	711.0	25	Low	-0.69	0.642	17.76	18.00	1.057	0.678	/
		0	23130	711.0	50	Low	-3.20	0.621	17.70	18.00	1.072	0.665	/
	Left Edge	0	23095	707.5	1	Mid	-2.97	0.155	18.74	19.00	1.062	0.165	/
		0	23130	711.0	25	Low	-0.62	0.123	17.76	18.00	1.057	0.130	/
	Right Edge	0	23095	707.5	1	Mid	-1.74	0.111	18.74	19.00	1.062	0.118	/
		0	23130	711.0	25	Low	2.19	0.102	17.76	18.00	1.057	0.108	/
	Top Edge	0	23095	707.5	1	Mid	-0.57	0.105	18.74	19.00	1.062	0.111	/
		0	23130	711.0	25	Low	-1.73	0.075	17.76	18.00	1.057	0.079	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.10 LTE Band 13 (10MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body													
QPSK	Front Side	0	23230	782.0	1	Low	2.80	0.113	22.96	23.50	1.132	0.128	/
		0	23230	782.0	25	Low	-3.07	0.089	22.07	22.50	1.104	0.098	/
	Back Side	0	23230	782.0	1	Low	-0.51	0.717	22.96	23.50	1.132	**0.812**	10#
		0	23230	782.0	25	Low	-1.15	0.568	22.07	22.50	1.104	0.627	/
		0	23230	782.0	50	Low	-2.22	0.540	21.93	22.50	1.140	0.616	/
	Left Edge	0	23230	782.0	1	Low	-0.81	0.159	22.96	23.50	1.132	0.180	/
		0	23230	782.0	25	Low	3.66	0.126	22.07	22.50	1.104	0.139	/
	Right Edge	0	23230	782.0	1	Low	-2.29	0.155	22.96	23.50	1.132	0.176	/
		0	23230	782.0	25	Low	0.71	0.144	22.07	22.50	1.104	0.159	/
	Top Edge	0	23230	782.0	1	Low	-4.24	0.151	22.96	23.50	1.132	0.171	/
		0	23230	782.0	25	Low	-1.92	0.112	22.07	22.50	1.104	0.124	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.11 WIFI 2.4GHz

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power(dBm)	Duty cycle(%)	Duty Factor	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas No.
Body													
802.11 b	Front Side	0	1	2412.0	-0.56	0.025	14.81	15.00	1.045	97.27	1.028	0.027	/
	Back Side	0	1	2412.0	0.59	0.486	14.81	15.00	1.045	97.27	1.028	**0.522**	11#
	Left Edge	0	1	2412.0	-0.60	0.485	14.81	15.00	1.045	97.27	1.028	0.521	/
	Right Edge	0	1	2412.0	1.51	0.055	14.81	15.00	1.045	97.27	1.028	0.059	/
	Bottom Edge	0	1	2412.0	0.46	0.140	14.81	15.00	1.045	97.27	1.028	0.150	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.12 WIFI 5GHz

Fre. Band	Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	1 g Meas. SAR (W/Kg)	Meas. Power (dBm)	Max. tune-up Power(dBm)	Duty cycle(%)	Duty Factor	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas No.
Body														
5.2G	802.11 a	Front Side	0	48	5240.0	-0.52	0.023	10.57	11.00	1.104	85.90	1.164	0.030	/
		Back Side	0	48	5240.0	-2.39	0.207	10.57	11.00	1.104	85.90	1.164	**0.266**	12#
		Left Edge	0	48	5240.0	2.45	0.156	10.57	11.00	1.104	85.90	1.164	0.201	/
		Right Edge	0	48	5240.0	3.44	0.045	10.57	11.00	1.104	85.90	1.164	0.058	/
		Bottom Edge	0	48	5240.0	-1.06	0.087	10.57	11.00	1.104	85.90	1.164	0.112	/
5.8G	802.11 a	Front Side	0	165	5825.0	2.64	0.021	12.94	13.00	1.014	86.62	1.154	0.025	/
		Back Side	0	165	5825.0	-1.77	0.189	12.94	13.00	1.014	86.62	1.154	**0.221**	13#
		Left Edge	0	165	5825.0	-2.21	0.134	12.94	13.00	1.014	86.62	1.154	0.157	/
		Right Edge	0	165	5825.0	-2.07	0.040	12.94	13.00	1.014	86.62	1.154	0.047	/
		Bottom Edge	0	165	5825.0	1.11	0.018	12.94	13.00	1.014	86.62	1.154	0.021	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.														

11 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
3. 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, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20, and the original, first or second repeated measurement is >= 1.5 W/kg, perform a third repeated measurement.

Frequency Band (MHz)	Wireless Band	RF Exposure Conditions	Test Position	Highest Measured SAR (W/kg)	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Largest to Smallest SAR Radio
700	LTE BADN 12	Body	Back Side	0.830	Yes	0.827	1.00
1700	LTE Band 4	Body	Back Side	1.027	Yes	1.006	1.02
1900	GSM 1900	Body	Back Side	0.906	Yes	0.892	1.02
	LTE Band 2	Body	Back Side	1.035	Yes	1.014	1.02
Note: The ratio of largest to smallest SAR for the original and first repeated measurements is < 1.20, the second repeated measurement is not required.							

12 SIMULTANEOUS TRANSMISSION

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 SAR to Peak Location Ratio (SPLSR).

12.1 Simultaneous Transmission Mode Consider

No.	Simultaneous Tx Combination	Body
1	GSM + WiFi 2.4G	Yes
2	GSM + WiFi 5G	Yes
3	GSM + Bluetooth	Yes
4	UMTS + WiFi 2.4G	Yes
5	UMTS + WiFi 5G	Yes
6	UMTS + Bluetooth	Yes
7	LTE + WiFi 2.4G	Yes
8	LTE + WiFi 5G	Yes
9	LTE + Bluetooth	Yes

Note:

1. 2G&3G&4G share the same antenna and can't transmit simultaneously.
2. The Bluetooth and WLAN share the same antenna, can't transmitting together.
3. The 2.4G WLAN or 5G WLAN can transmit simultaneously with each WWAN.

12.2 Estimated SAR Calculation

According to KDB 447498 D01 when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR was estimated according to following formula to result in substantially conservative SAR values of <= 0.4 W/kg to determine simultaneous transmission SAR test exclusion.

$$\text{Estimated SAR} = \frac{Max.Tune\ Up\ Power(mw)}{Min\ Test\ Separation\ Distance} * \frac{\sqrt{f_{GHz}}}{x}$$ (where x = 7.5 for 1-g SAR)

If the minimum test separation distance is < 5 mm, a distance of 5 mm is used for estimated SAR calculation. When the test separation distance is > 50 mm, the 0.4 W/kg is used for SAR-1g.

Band	Mode	Position	Antenna To user (mm)	SAR Testing	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Frequency (GHz)	Calculation Distance/Gap (mm)	Estimated SAR (W/kg)
Bluetooth	GFSK	Front Side	5	NO	9.00	7.94	2.402	5	0.328
		Back Side	5	NO	9.00	7.94	2.402	5	0.328
		Left Edge	5	NO	9.00	7.94	2.402	5	0.328
		Right Edge	35	NO	9.00	7.94	2.402	5	0.328
		Bottom Edge	5	NO	9.00	7.94	2.402	5	0.328

Band	Position	Antenna To user (mm)	SAR Testing	Estimated SAR (W/kg)
WWLAN	Bottom Edge	> 50	NO	0.400
2.4G WLAN	Top Edge	> 50	NO	0.400
5G WLAN	Top Edge	> 50	NO	0.400
Bluetooth	Top Edge	> 50	NO	0.400

12.3 Sum SAR of Simultaneous Transmission

12.3.1 Sum Body-worn SAR of Simultaneous Transmission

Band	Position	Stand alone SAR				SUM SAR WWAN+2.4G WIFI	SUM SAR WWAN+5G WIFI	SUM SAR WWAN+Bluetooth
		1	2	3	4			
		WWAN	2.4G WIFI	5G WIFI	Bluetooth	Sum SAR (1+2)	Sum SAR (1+3)	Sum SAR (1+4)
GSM 850	Front Side	0.065	0.027	0.030	0.328	0.092	0.095	0.393
	Back Side	0.518	0.522	0.266	0.328	1.040	0.784	0.846
	Left Edge	0.127	0.521	0.201	0.328	0.648	0.328	0.455
	Right Edge	0.119	0.059	0.058	0.328	0.178	0.177	0.447
	Top Edge	0.098	0.400	0.400	0.400	0.498	0.498	0.498
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
GSM1900	Front Side	0.046	0.027	0.030	0.328	0.073	0.076	0.374
	Back Side	1.047	0.522	0.266	0.328	1.569	1.313	1.375
	Left Edge	0.285	0.521	0.201	0.328	0.806	0.486	0.613
	Right Edge	0.132	0.059	0.058	0.328	0.191	0.190	0.460
	Top Edge	0.280	0.400	0.400	0.400	0.680	0.680	0.680
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
WCDMA B2	Front Side	0.030	0.027	0.030	0.328	0.057	0.060	0.358
	Back Side	0.818	0.522	0.266	0.328	1.340	1.084	1.146
	Left Edge	0.181	0.521	0.201	0.328	0.702	0.382	0.509
	Right Edge	0.107	0.059	0.058	0.328	0.166	0.165	0.435
	Top Edge	0.203	0.400	0.400	0.400	0.603	0.603	0.603
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
WCDMA B4	Front Side	0.081	0.027	0.030	0.328	0.108	0.111	0.409
	Back Side	0.516	0.522	0.266	0.328	1.038	0.782	0.844
	Left Edge	0.119	0.521	0.201	0.328	0.640	0.320	0.447
	Right Edge	0.263	0.059	0.058	0.328	0.322	0.321	0.591
	Top Edge	0.268	0.400	0.400	0.400	0.668	0.668	0.668
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
WCDMA B5	Front Side	0.047	0.027	0.030	0.328	0.074	0.077	0.375
	Back Side	0.455	0.522	0.266	0.328	0.977	0.721	0.783
	Left Edge	0.123	0.521	0.201	0.328	0.644	0.324	0.451
	Right Edge	0.068	0.059	0.058	0.328	0.127	0.126	0.396
	Top Edge	0.092	0.400	0.400	0.400	0.492	0.492	0.492
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
LTE B2	Front Side	0.041	0.027	0.030	0.328	0.068	0.071	0.369
	Back Side	1.047	0.522	0.266	0.328	1.569	1.313	1.375
	Left Edge	0.188	0.521	0.201	0.328	0.709	0.389	0.516
	Right Edge	0.177	0.059	0.058	0.328	0.236	0.235	0.505
	Top Edge	0.366	0.400	0.400	0.400	0.766	0.766	0.766
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728

LTE B4	Front Side	0.086	0.027	0.030	0.328	0.113	0.116	0.414
	Back Side	1.061	0.522	0.266	0.328	**1.583**	1.327	1.389
	Left Edge	0.167	0.521	0.201	0.328	0.688	0.368	0.495
	Right Edge	0.561	0.059	0.058	0.328	0.620	0.619	0.889
	Top Edge	0.651	0.400	0.400	0.400	1.051	1.051	1.051
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
LTE B5	Front Side	0.067	0.027	0.030	0.328	0.094	0.097	0.395
	Back Side	0.655	0.522	0.266	0.328	1.177	0.921	0.983
	Left Edge	0.163	0.521	0.201	0.328	0.684	0.364	0.491
	Right Edge	0.133	0.059	0.058	0.328	0.192	0.191	0.461
	Top Edge	0.192	0.400	0.400	0.400	0.592	0.592	0.592
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
LTE B12	Front Side	0.128	0.027	0.030	0.328	0.155	0.158	0.456
	Back Side	0.871	0.522	0.266	0.328	1.393	1.137	1.199
	Left Edge	0.165	0.521	0.201	0.328	0.686	0.366	0.493
	Right Edge	0.118	0.059	0.058	0.328	0.177	0.176	0.446
	Top Edge	0.111	0.400	0.400	0.400	0.511	0.511	0.511
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
LTE B13	Front Side	0.128	0.027	0.030	0.328	0.155	0.158	0.456
	Back Side	0.812	0.522	0.266	0.328	1.334	1.078	1.140
	Left Edge	0.180	0.521	0.201	0.328	0.701	0.381	0.508
	Right Edge	0.176	0.059	0.058	0.328	0.235	0.234	0.504
	Top Edge	0.171	0.400	0.400	0.400	0.571	0.571	0.571
	Bottom Edge	0.400	0.150	0.112	0.328	0.550	0.512	0.728
Note: The highest Summed 1g SAR is 1.583 W/Kg < 1.6 W/kg, so Simultaneous Transmission SAR test is not required.								

13 TEST EQUIPMENTS LIST

Description	Manufacturer	Model	Serial No./Version	Cal. Date	Cal. Due
Test Software	SATIMO	OpenSAR	V4_02_31	N/A	N/A
750MHz Dipole	SATIMO	SID 750	S/N 11/17 DIP 0G750-446	2017/03/22	2020/03/21
835MHz Dipole	SATIMO	SID 835	S/N 11/17 DIP 0G750-447	2017/03/22	2020/03/21
1800MHz Dipole	SATIMO	SID 1800	S/N 11/17 DIP 1G800-449	2017/03/22	2020/03/21
1900MHz Dipole	SATIMO	SID 1900	S/N 11/17 DIP 1G900-450	2017/03/22	2020/03/21
2450MHz Dipole	SATIMO	SID 2450	S/N 11/17 DIP 2G450-452	2017/03/22	2020/03/21
Waveguide	SATIMO	SWG5500	S/N 49/16 DIP WGA42	2017/03/22	2020/03/21
E-Field Probe	MVG	SSE2	S/N 34/15 EPGO 265	2019/03/19	2020/03/18
MultiMeter	Keithley	MultiMeter 2000	4024022	2019/06/17	2020/06/16
Signal Generator	R&S	SMBV100A	260592	2019/06/13	2020/06/12
Power Meter	R&S	NRVD-B2	7250BJ-0112/2011	2019/10/30	2020/10/29
Power Sensor	R&S	NRV-Z4	100381	2019/10/30	2020/10/29
Power Sensor	R&S	NRV-Z2	100211	2019/10/30	2020/10/29
Wireless Communication Test Set	Agilent	8960-E5515C	MY50260493	2019/06/13	2020/06/13
Wireless Communication Test Set	R&S	CMW 500	151885	2019/06/13	2020/06/13
Network Analyzer	R&S	ZVL-6	101380	2019/06/20	2020/06/19
Thermometer	Elitech	RC-4HC	N/A	2019/11/02	2020/11/01
Power Amplifier	SATIMO	6552B	22374	N/A	N/A
Dielectric Probe Kit	SATIMO	SCLMP	SN 25/13 OCPG56	N/A	N/A
Antenna	SATIMO	ANTA3	SN 17/13 ZNTA45	N/A	N/A
Phantom1	SATIMO	SAM	SN 11/17 SAM133	N/A	N/A
Phantom2	SATIMO	ELLI	SN 11/17 ELLI42	N/A	N/A
Attenuator	COM-MW	ZA-S1-31	1305003187	N/A	N/A
Directional coupler	AA-MCS	AAMCS-UDC	000272	N/A	N/A

Note: Per KDB 865664 Dipole SAR Validation Verification, BALUN 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 in within 20% of calibrated measurement.
4. Impedance (real or imaginary parts) in within 5 Ohms of calibrated measurement.

ANNEX A SIMULATING LIQUID VERIFICATION RESULT

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an SCLMP Dielectric Probe Kit.

Date	Liquid Type	Fre. (MHz)	Temp. (℃)	Meas. Conductivity (σ) (S/m)	Meas. Permittivity (ε)	Target Conductivity (σ) (S/m)	Target Permittivity (ε)	Conductivity Tolerance (%)	Permittivity Tolerance (%)
2019.11.04	Body	750	21.3	0.96	55.51	0.96	55.53	0.00	-0.04
2019.11.05	Body	835	21.4	0.96	55.47	0.97	55.20	-1.03	0.49
2019.11.06	Body	835	21.3	0.97	55.85	0.97	55.20	0.00	1.18
2019.11.09	Body	1800	21.2	1.51	53.41	1.52	53.30	-0.66	0.21
2019.11.13	Body	1800	21.1	1.53	53.03	1.52	53.30	0.66	-0.51
2019.11.07	Body	1900	21.5	1.54	53.48	1.52	53.30	1.32	0.34
2019.11.08	Body	1900	21.1	1.52	53.76	1.52	53.30	0.00	0.86
2019.11.14	Body	2450	21.0	2.02	51.35	1.95	52.70	3.59	-2.56
2019.11.10	Body	5200	21.4	5.15	48.32	5.30	49.01	-2.83	-1.41
2019.11.12	Body	5800	21.5	5.80	47.09	6.00	48.20	-3.33	-2.30
Note: The tolerance limit of Conductivity and Permittivity is± 5%.									

ANNEX B SYSTEM CHECK RESULT

Comparing to the original SAR value provided by SATIMO, the validation data should be within its specification of 10%(for 1 g).

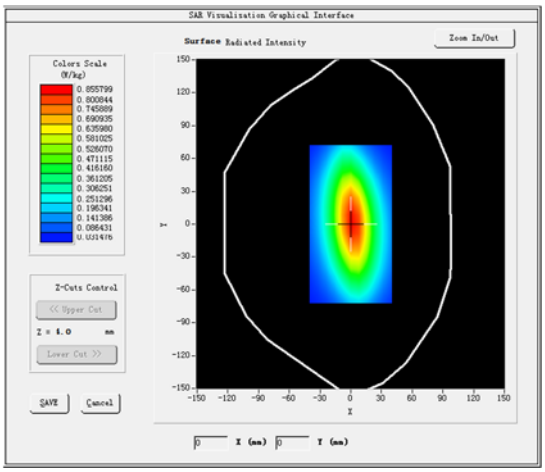
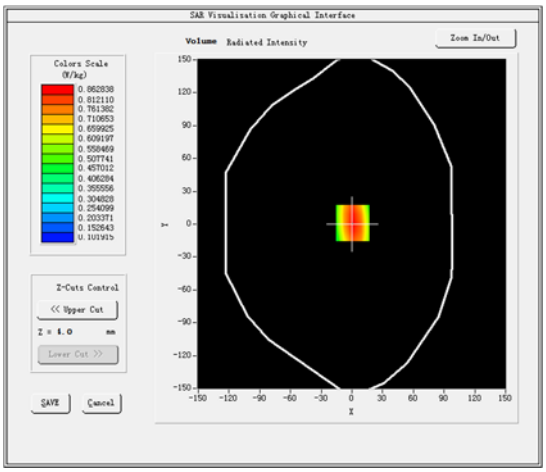
Date	Liquid Type	Freq. (MHz)	Power (mW)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Dipole SAR (W/kg)	Tolerance (%)	Targeted SAR(W/kg)	Tolerance (%)
2019.11.04	Body	750	100	0.831	8.31	8.59	-3.26	8.49	-2.12
2019.11.05	Body	835	100	0.903	9.03	9.78	-7.67	9.56	-5.54
2019.11.06	Body	835	100	0.898	8.98	9.78	-8.18	9.56	-6.07
2019.11.09	Body	1800	100	4.116	41.16	38.76	6.19	38.40	7.19
2019.11.13	Body	1800	100	4.171	41.71	38.90	7.22	38.40	8.62
2019.11.07	Body	1900	100	3.885	38.55	39.49	-2.38	39.70	-2.90
2019.11.08	Body	1900	100	3.944	39.44	40.01	-1.42	39.70	-0.65
2019.11.14	Body	2450	100	5.331	53.31	53.67	-0.67	52.40	1.74
2019.11.10	Body	5200	100	15.801	158.01	158.91	-0.57	159.00	-0.62
2019.11.12	Body	5800	100	18.905	189.05	177.09	6.75	181.20	4.33
Note: The tolerance limit of System validation ±10%.									

System Performance Check Data(750 MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2019.11.04
Measurement duration: 13 minutes 46 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	750MHz
Signal	CW
Frequency (MHz)	750.000000
Relative permittivity (real part)	55.510125
Conductivity (S/m)	0.963587
Power drift (%)	0.170000
Ambient Temperature:	22.8°C
Liquid Temperature:	21.3°C
ConvF:	1.96
Crest factor:	1:1

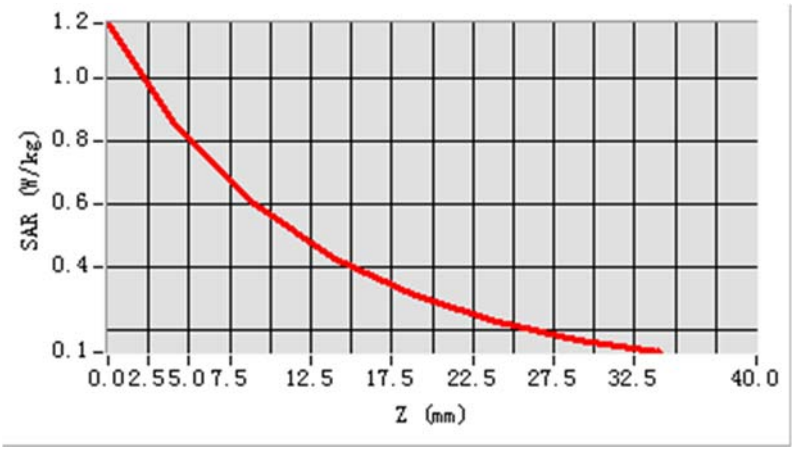
SURFACE SAR	VOLUME SAR
	

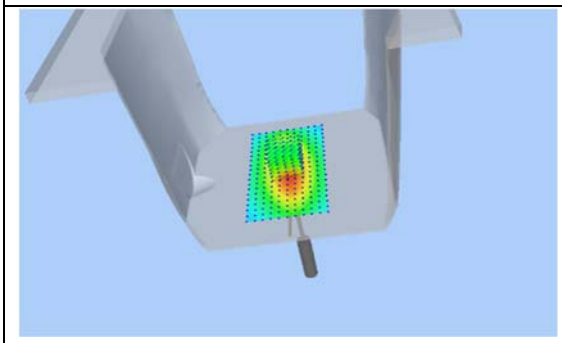
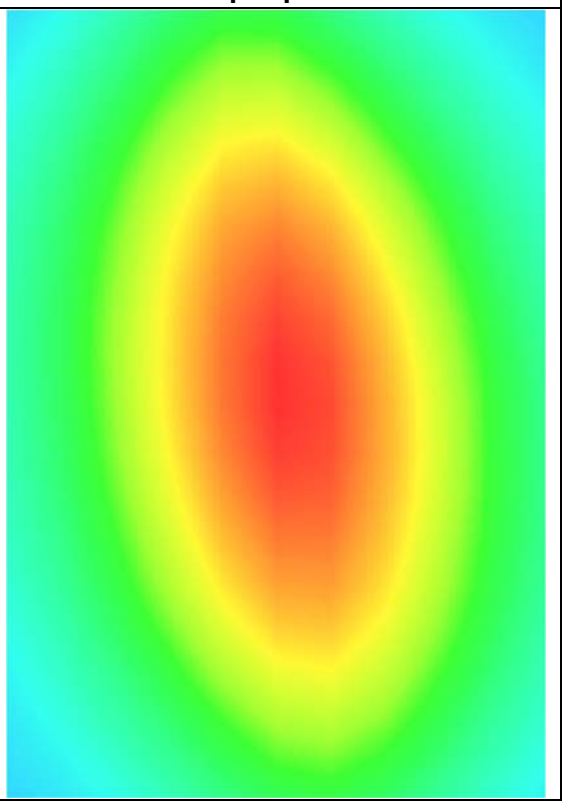
Maximum location: X=1.00, Y=1.00

SAR Peak: 1.18 W/kg

SAR 10 g (W/Kg)	0.552358
SAR 1g (W/Kg)	0.830785

Z Axis Scan



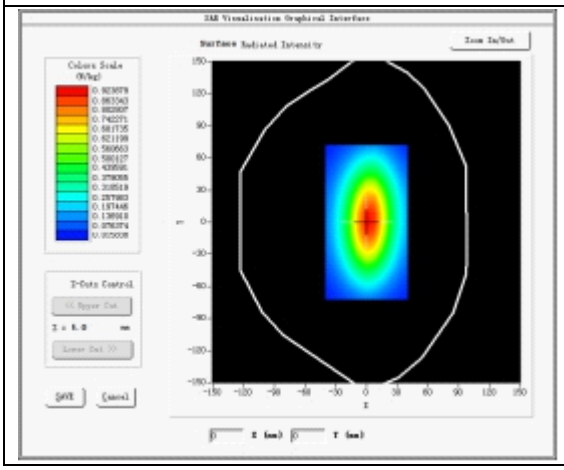
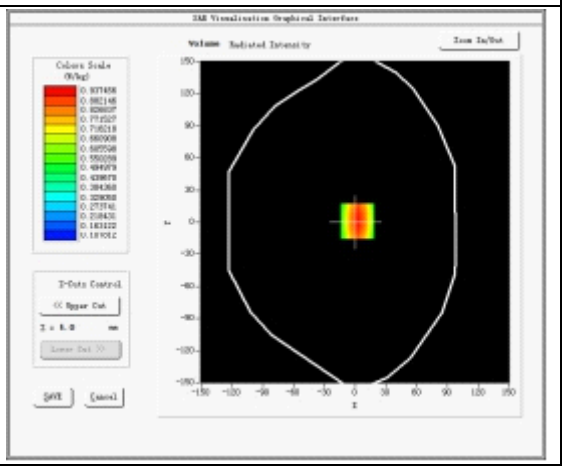
3D screen shot	Hot spot position
	

System Performance Check Data(835 MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8 mm,dy=8 mm
Zoom scan resolution: dx=8 mm, dy=8 mm, dz=5 mm
Date of measurement: 2019.11.05
Measurement duration: 13 minutes 56 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	835 MHz
Signal	CW
Frequency (MHz)	835.000000
Relative permittivity (real part)	55.470153
Conductivity (S/m)	0.960135
Power drift (%)	0.190000
Ambient Temperature:	22.6°C
Liquid Temperature:	21.4°C
ConvF:	1.98
Crest factor:	1:1

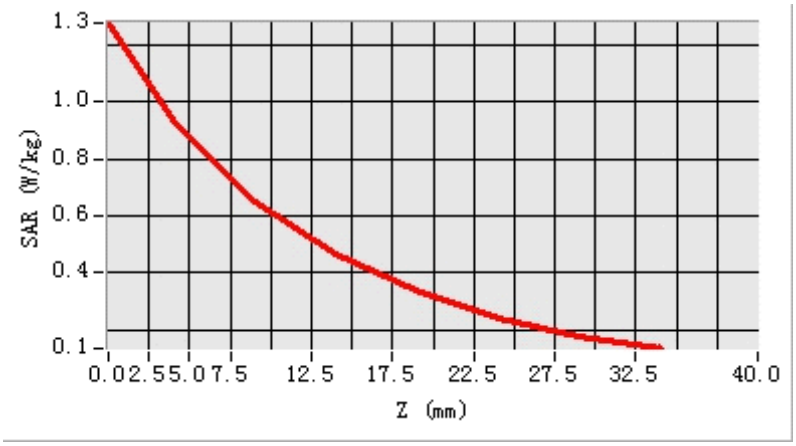
SURFACE SAR	VOLUME SAR
	

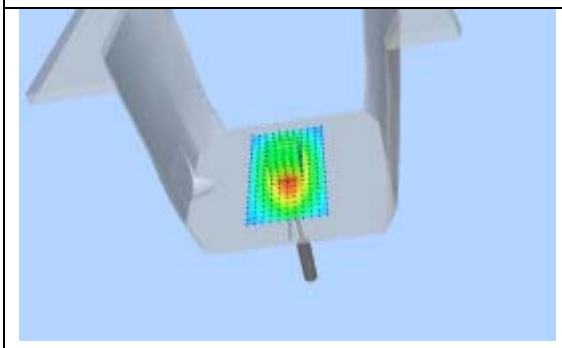
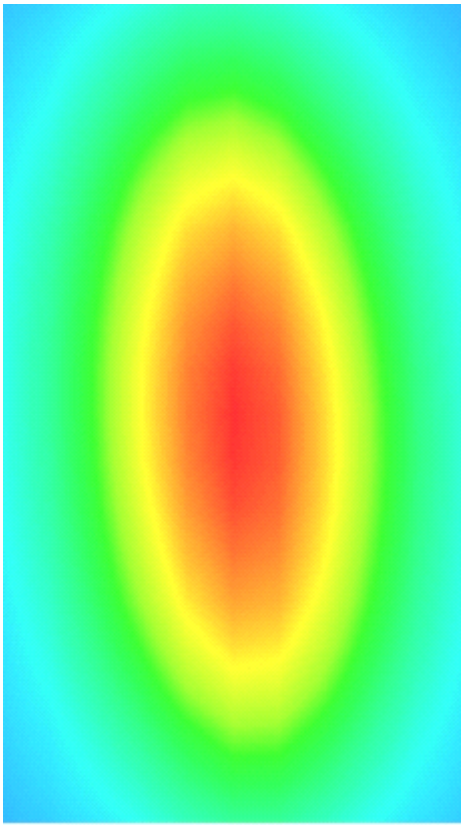
Maximum location: X=0.00, Y=0.00

SAR Peak: 1.28 W/kg

SAR 10 g (W/Kg)	0.598224
SAR 1 g (W/Kg)	0.902540

Z Axis Scan



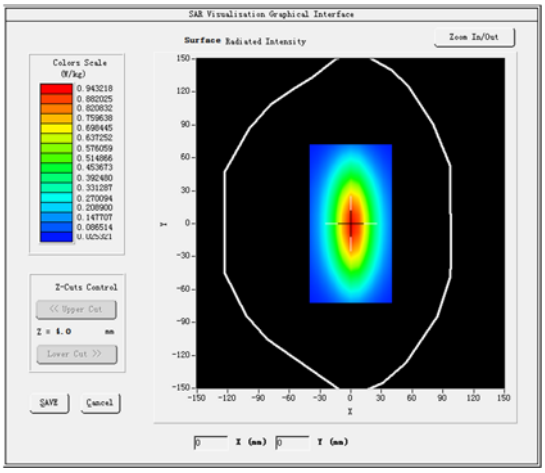
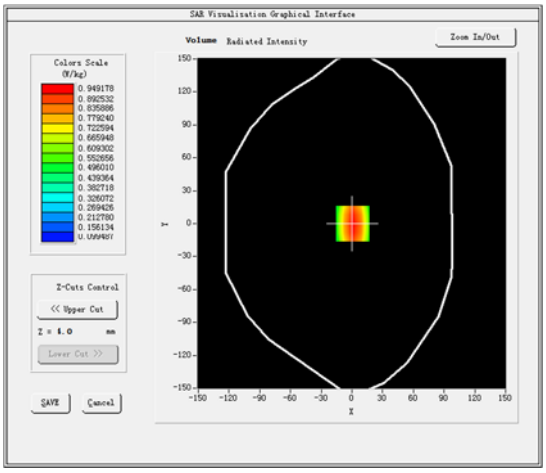
3D screen shot	Hot spot position
	

System Performance Check Data(835 MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2019.11.06
Measurement duration: 13 minutes 28 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	835MHz
Signal	CW
Frequency (MHz)	835.000000
Relative permittivity (real part)	55.851058
Conductivity (S/m)	0.970257
Power drift (%)	-0.420000
Ambient Temperature:	22.6°C
Liquid Temperature:	21.3°C
ConvF:	1.98
Crest factor:	1:1

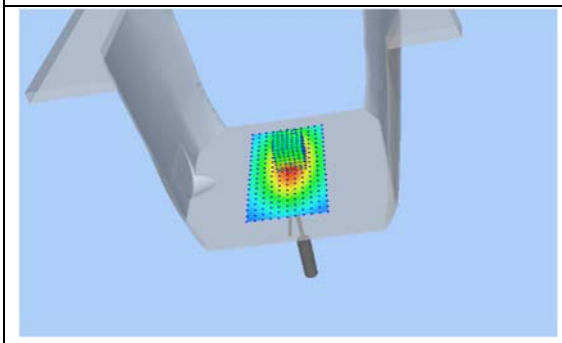
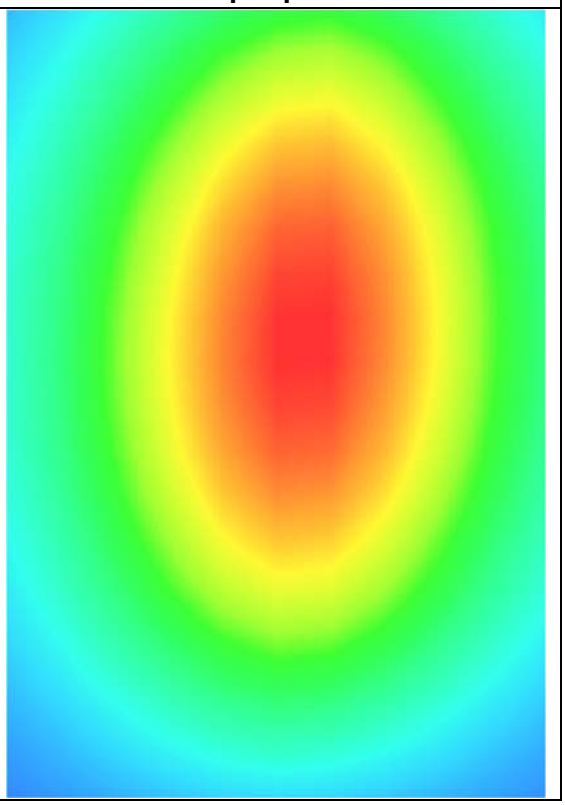
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=0.00

SAR Peak: 1.29 W/kg

SAR 10 g (W/Kg)	0.587032
SAR 1g (W/Kg)	0.898054

Z Axis Scan

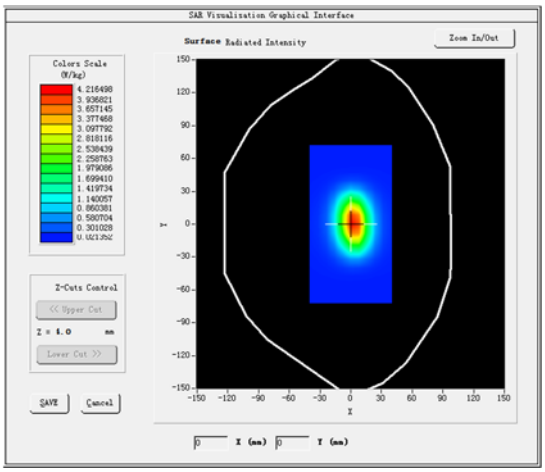
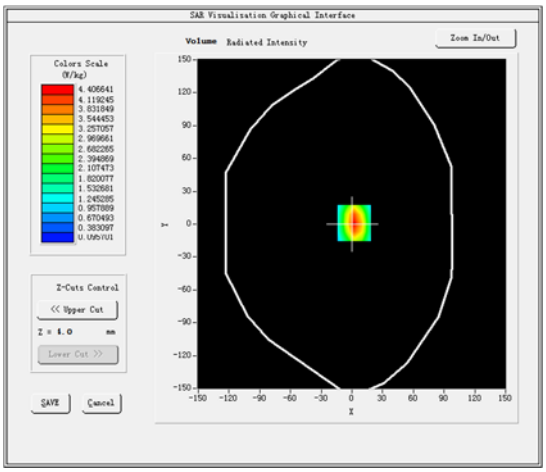
3D screen shot	Hot spot position
	

System Performance Check Data(1800MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2019.11.13
Measurement duration: 14 minutes 09 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	1800MHz
Signal	CW
Frequency (MHz)	1800.000000
Relative permittivity (real part)	53.030248
Conductivity (S/m)	1.531095
Power drift (%)	0.790000
Ambient Temperature:	22.5°C
Liquid Temperature:	21.1°C
ConvF:	2.25
Crest factor:	1:1

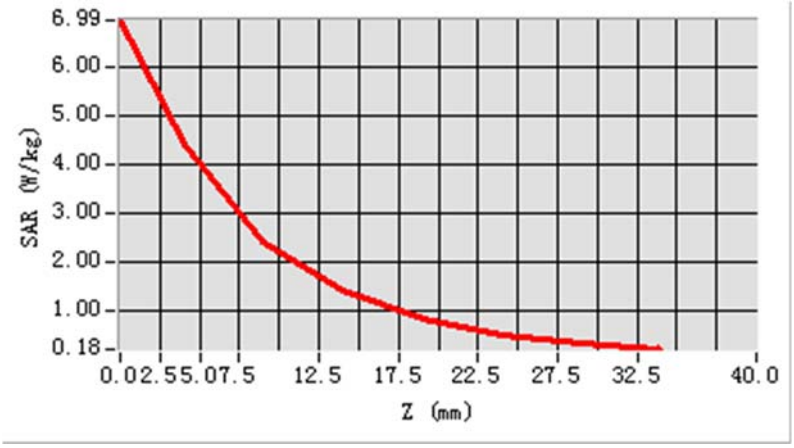
SURFACE SAR	VOLUME SAR
	

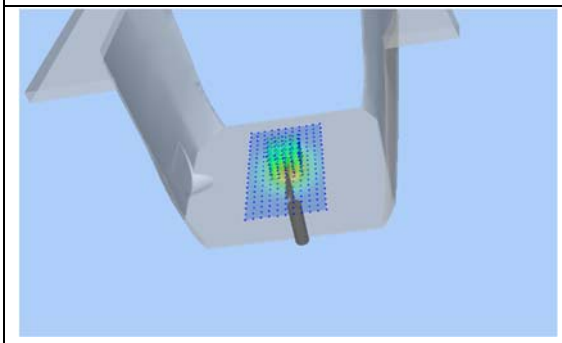
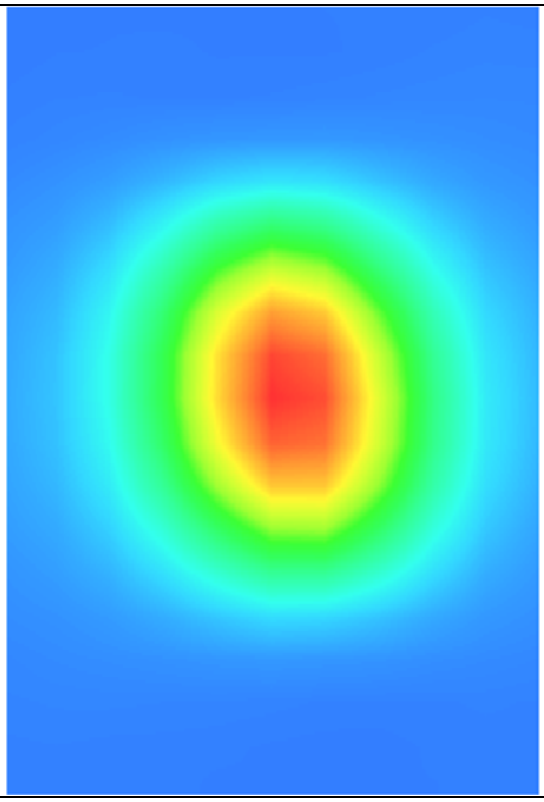
Maximum location: X=2.00, Y=1.00

SAR Peak: 6.87 W/kg

SAR 10 g (W/Kg)	2.133025
SAR 1g (W/Kg)	4.116035

Z Axis Scan



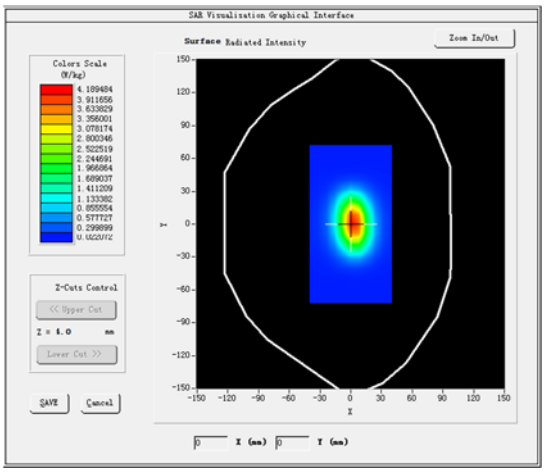
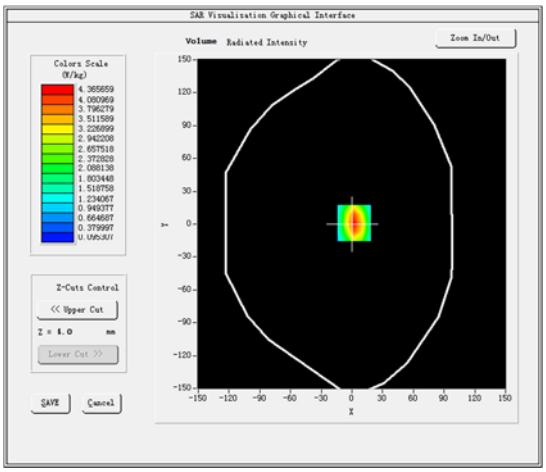
3D screen shot	Hot spot position
	

System Performance Check Data(1800MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2019.11.09
Measurement duration: 13 minutes 53 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	1800MHz
Signal	CW
Frequency (MHz)	1800.000000
Relative permittivity (real part)	53.410258
Conductivity (S/m)	1.512384
Power drift (%)	-0.530000
Ambient Temperature:	22.7°C
Liquid Temperature:	21.2°C
ConvF:	2.25
Crest factor:	1:1

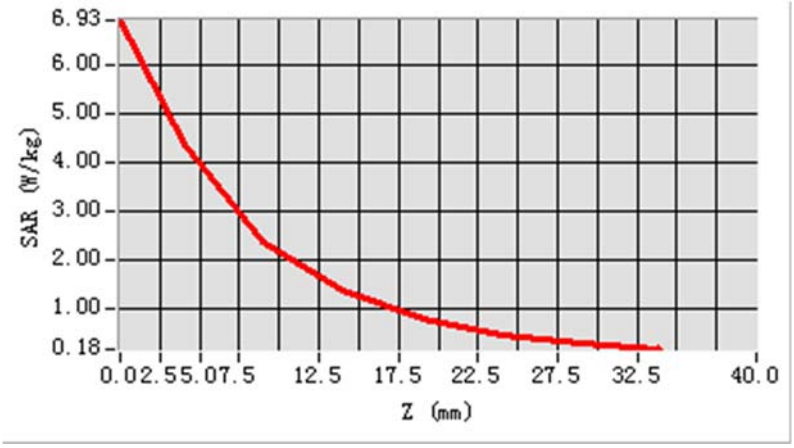
SURFACE SAR	VOLUME SAR
	

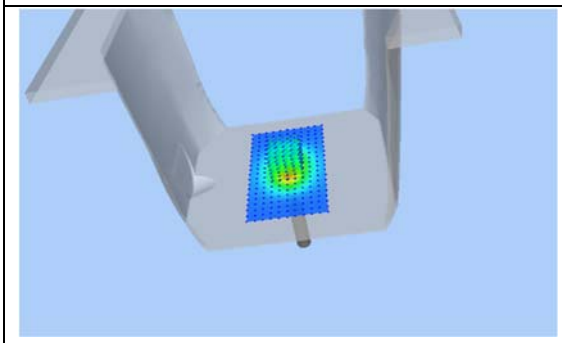
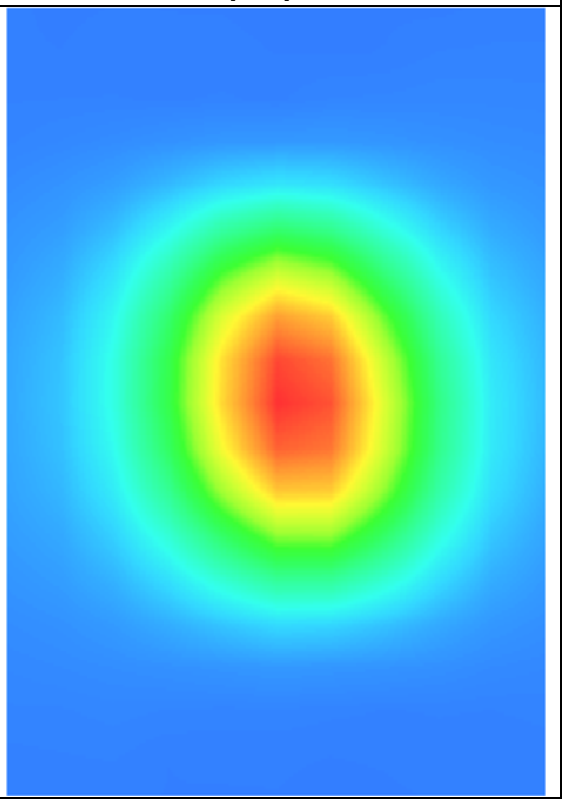
Maximum location: X=2.00, Y=1.00

SAR Peak: 6.89 W/kg

SAR 10 g (W/Kg)	2.145369
SAR 1g (W/Kg)	4.170589

Z Axis Scan



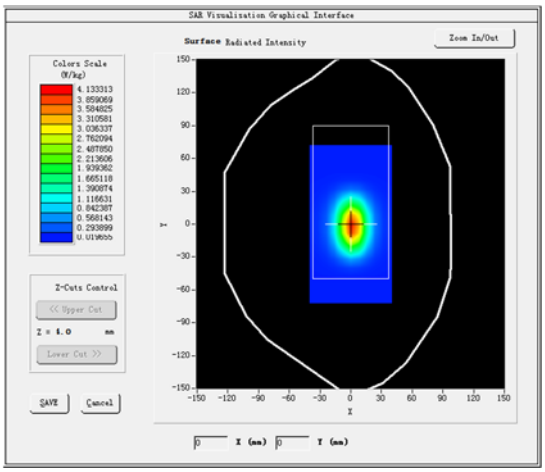
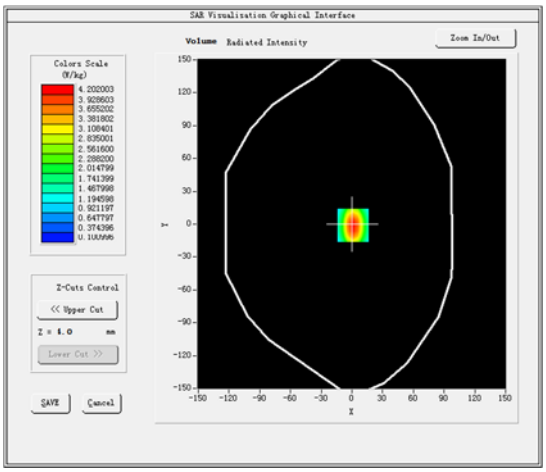
3D screen shot	Hot spot position
	

System Performance Check Data(1900MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2019.11.07
Measurement duration: 14 minutes 27 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	1900MHz
Signal	CW
Frequency (MHz)	1900.000000
Relative permittivity (real part)	53.481040
Conductivity (S/m)	1.541025
Power drift (%)	-0.750000
Ambient Temperature:	22.8°C
Liquid Temperature:	21.5°C
ConvF:	2.57
Crest factor:	1:1

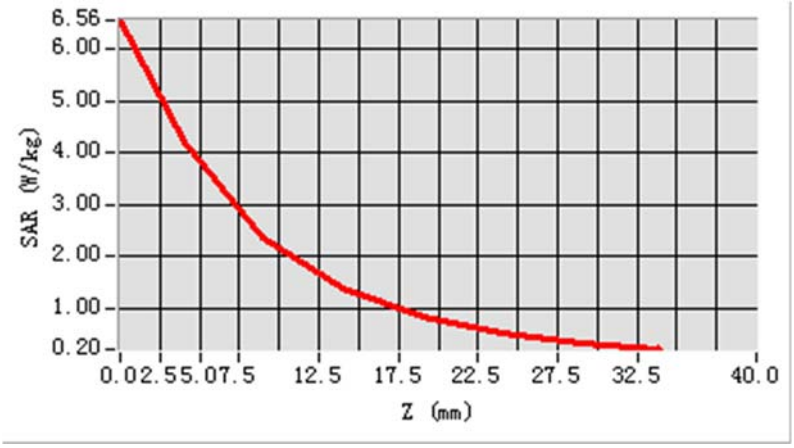
SURFACE SAR	VOLUME SAR
	

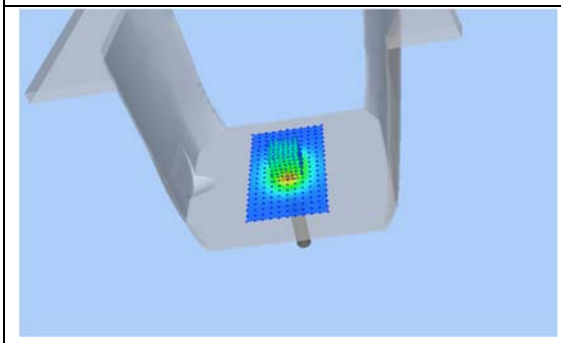
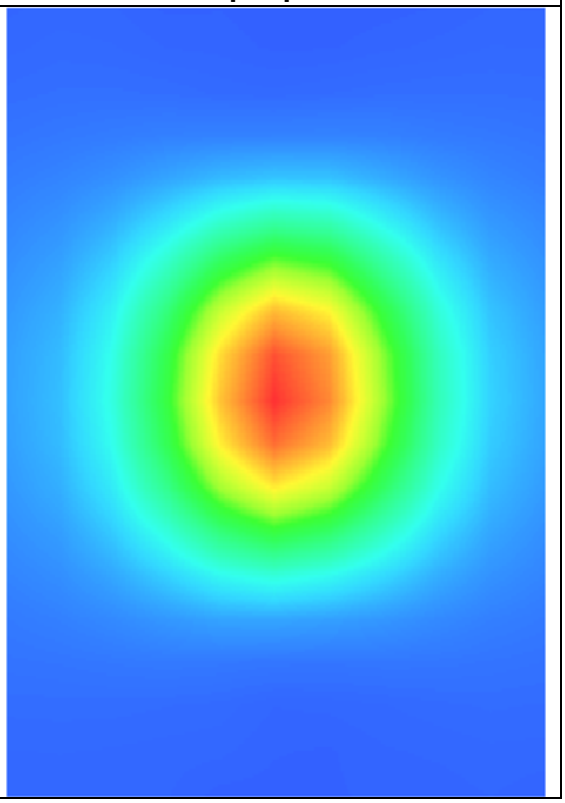
Maximum location: X=-1.00, Y=-1.00

SAR Peak: 6.54W/kg

SAR 10g (W/Kg)	2.097217
SAR 1g (W/Kg)	3.885135

Z Axis Scan



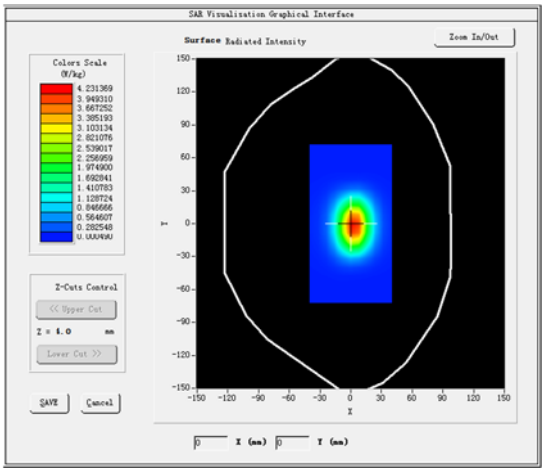
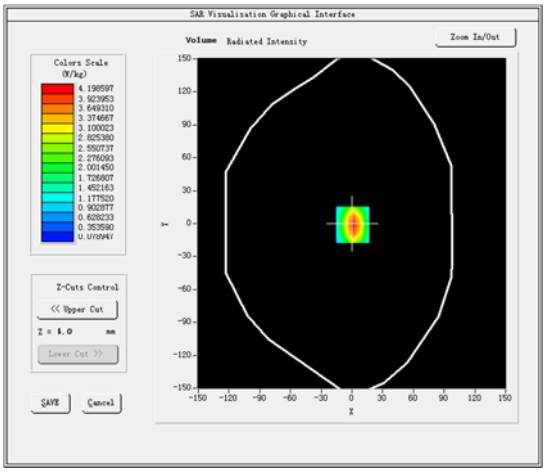
3D screen shot	Hot spot position
	

System Performance Check Data(1900MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2019.11.08
Measurement duration: 13 minutes 52 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	1900MHz
Signal	CW
Frequency (MHz)	1900.000000
Relative permittivity (real part)	53.761052
Conductivity (S/m)	1.521350
Power drift (%)	-0.780000
Ambient Temperature:	22.7°C
Liquid Temperature:	21.1°C
ConvF:	2.57
Crest factor:	1:1

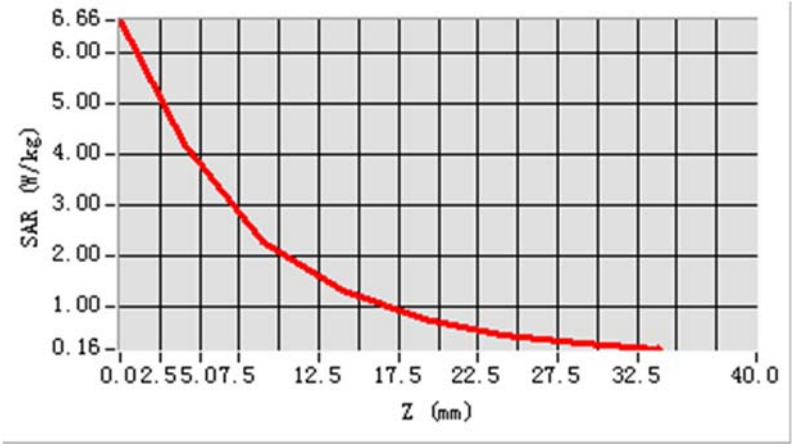
SURFACE SAR	VOLUME SAR
	

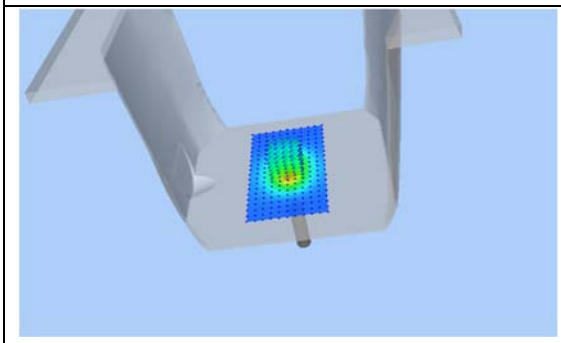
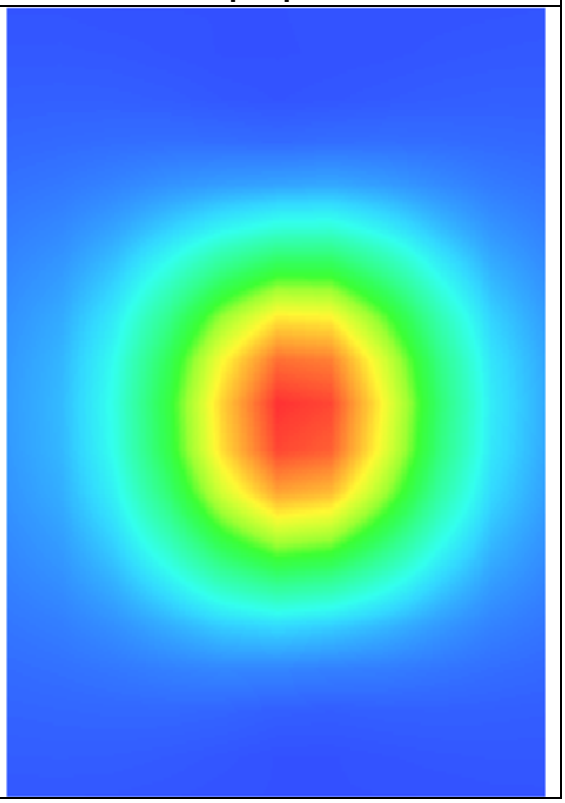
Maximum location: X=2.00, Y=-1.00

SAR Peak: 6.64W/kg

SAR 10g (W/Kg)	2.013592
SAR 1g (W/Kg)	3.944018

Z Axis Scan



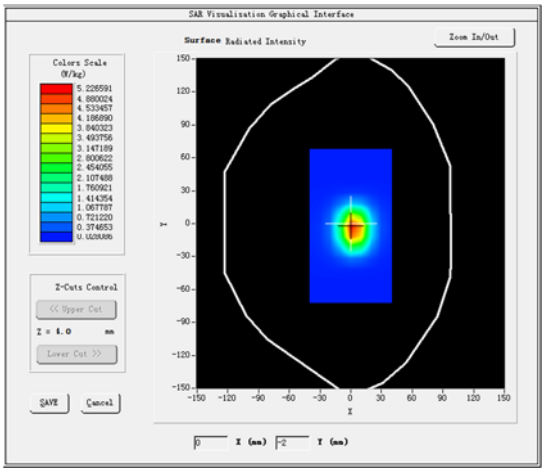
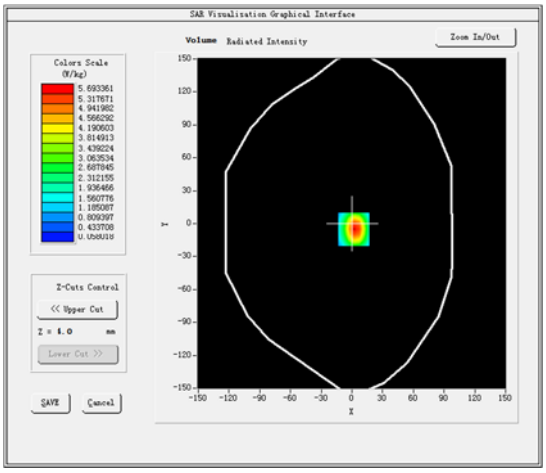
3D screen shot	Hot spot position
	

System Performance Check Data(2450MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=5mm, dy=5mm, dz=5mm
Date of measurement: 2019.11.14
Measurement duration: 17 minutes 13 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	2450MHz
Signal	CW
Frequency (MHz)	2450.000000
Relative permittivity (real part)	51.350820
Conductivity (S/m)	2.021095
Power drift (%)	-0.050000
Ambient Temperature:	22.6°C
Liquid Temperature:	21.0°C
ConvF:	2.63
Crest factor:	1:1

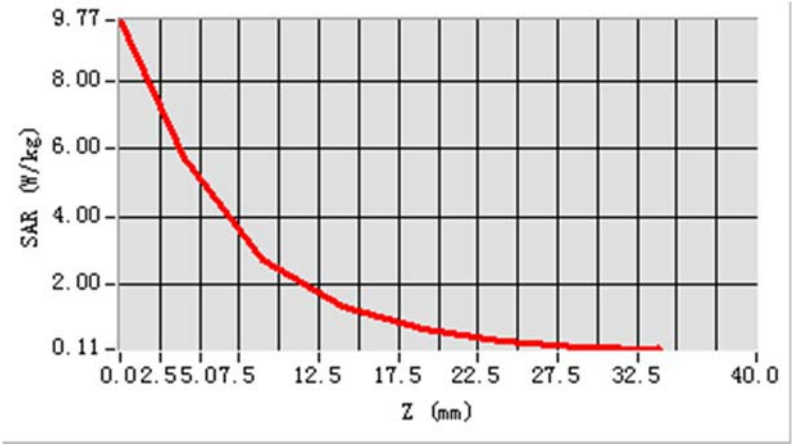
SURFACE SAR	VOLUME SAR
	

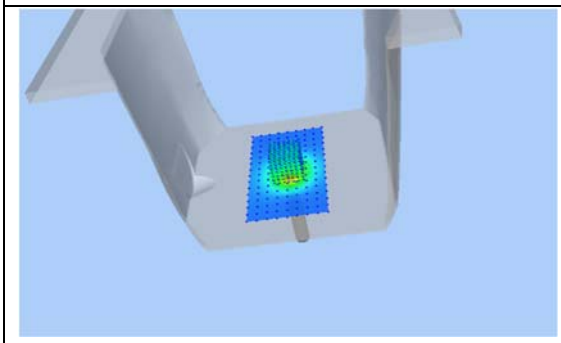
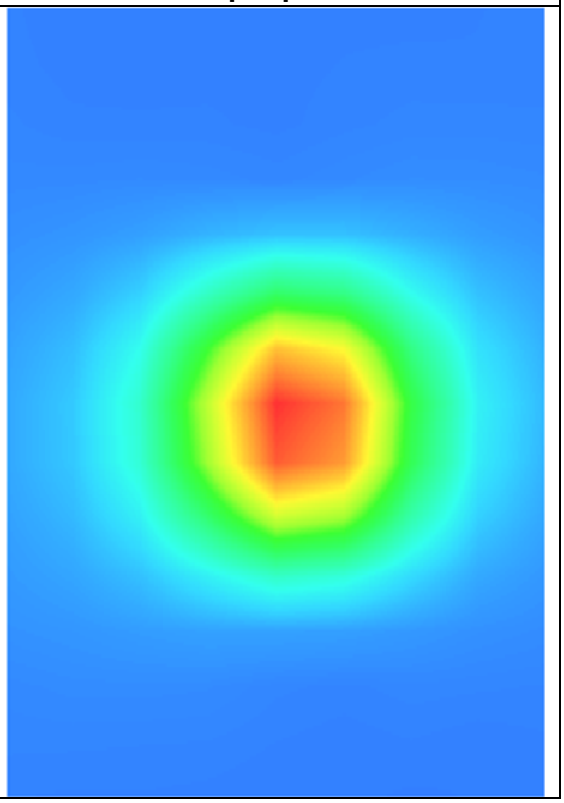
Maximum location: X=0.00, Y=-2.00

SAR Peak: 9.69 W/kg

SAR 10g (W/Kg)	2.470652
SAR 1g (W/Kg)	5.330805

Z Axis Scan



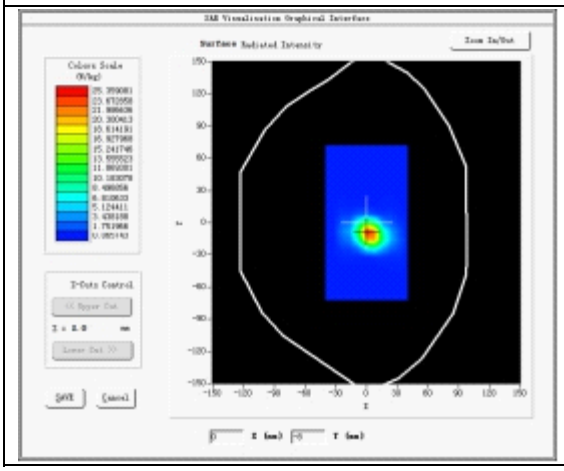
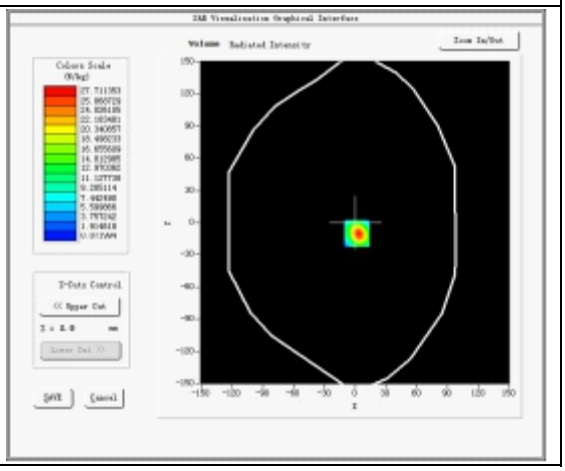
3D screen shot	Hot spot position
	

System Performance Check Data(5200 MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8 mm,dy=8 mm
Zoom scan resolution: dx=4 mm, dy=4 mm, dz=2 mm
Date of measurement: 2019.11.10
Measurement duration: 29 minutes 30 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	5200 MHz
Signal	CW
Frequency (MHz)	5200.000000
Relative permittivity (real part)	48.321043
Conductivity (S/m)	5.152384
Power drift (%)	-0.580000
Ambient Temperature:	22.8°C
Liquid Temperature:	21.4°C
ConvF:	2.14
Crest factor:	1:1

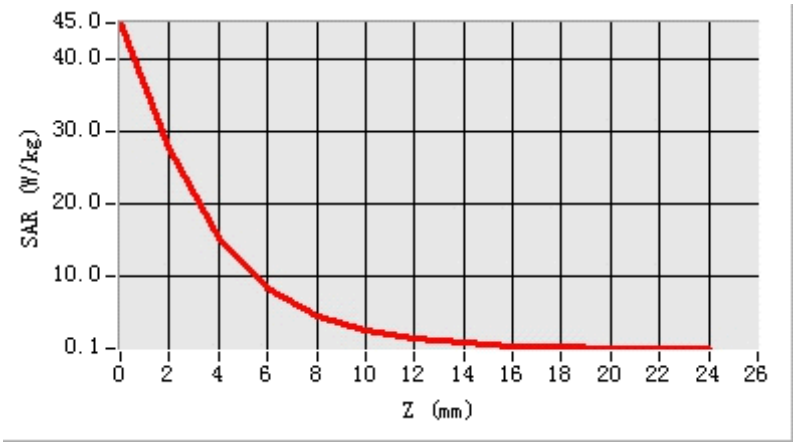
SURFACE SAR	VOLUME SAR
	

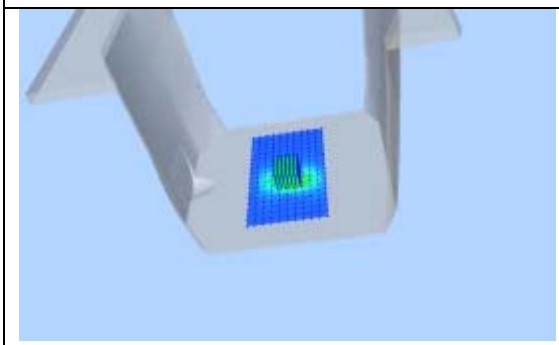
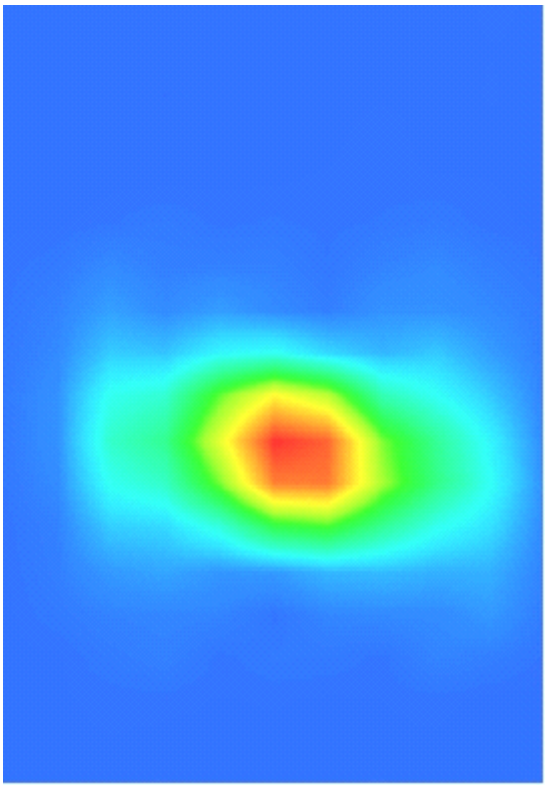
Maximum location: X=0.00, Y=-8.00

SAR Peak: 44.92 W/kg

SAR 10 g (W/Kg)	5.403762
SAR 1 g (W/Kg)	15.801074

Z Axis Scan



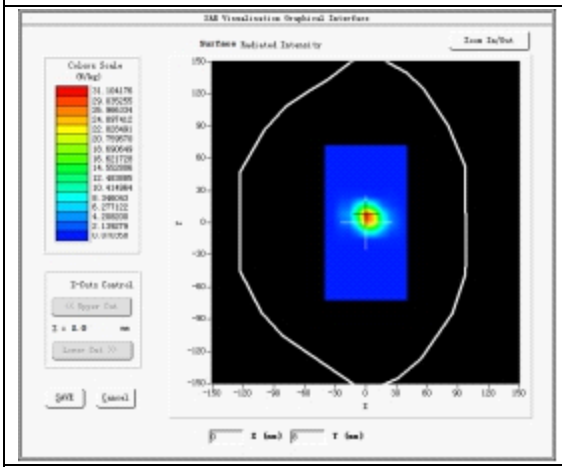
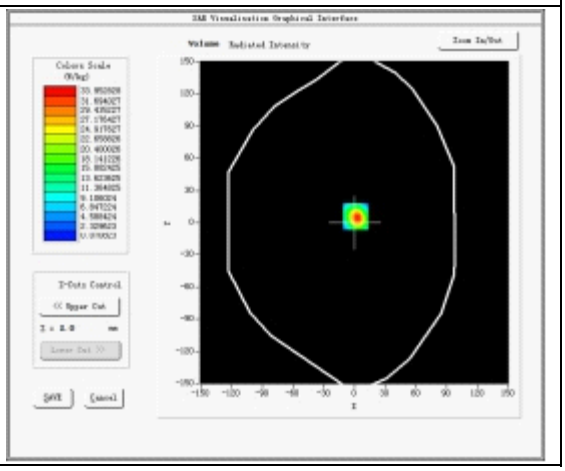
3D screen shot	Hot spot position
	

System Performance Check Data(5800 MHz)

Type: Phone measurement (Complete)
E-Field Probe: SN 34/15 SSE2 EPGO265
Area scan resolution: dx=8 mm,dy=8 mm
Zoom scan resolution: dx=4 mm, dy=4 mm, dz=2 mm
Date of measurement: 2019.11.12
Measurement duration: 29 minutes 15 seconds

Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	5800 MHz
Signal	CW
Frequency (MHz)	5800.000000
Relative permittivity (real part)	47.093120
Conductivity (S/m)	5.801368
Power drift (%)	-1.790000
Ambient Temperature:	22.7°C
Liquid Temperature:	21.5°C
ConvF:	2.22
Crest factor:	1:1

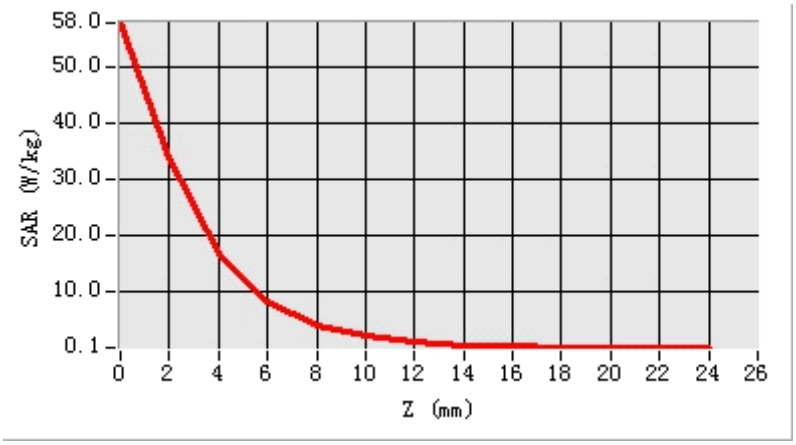
SURFACE SAR	VOLUME SAR
	

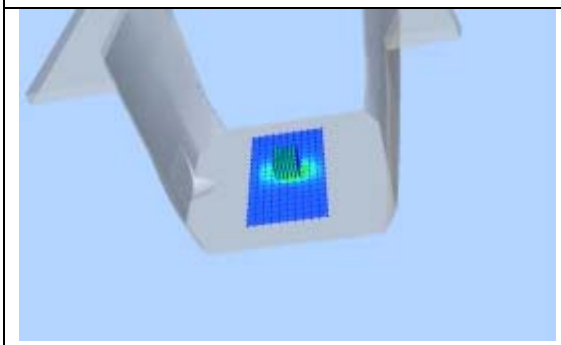
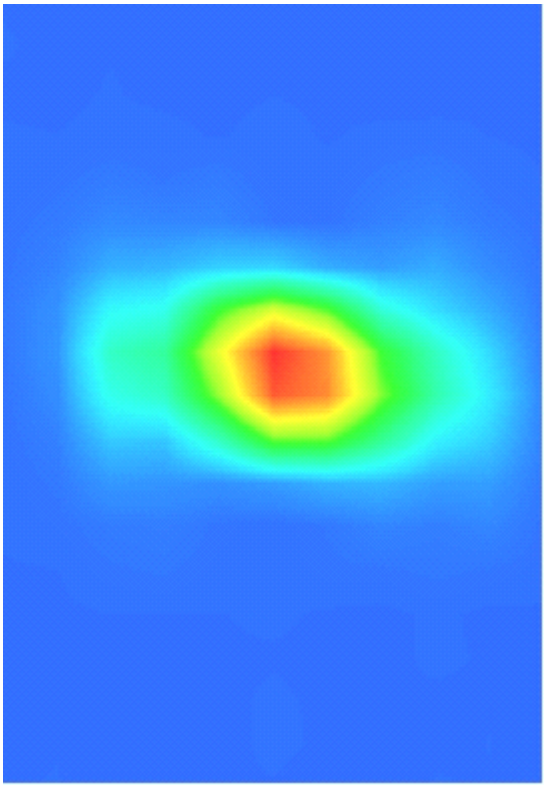
Maximum location: X=0.00, Y=8.00

SAR Peak: 57.93 W/kg

SAR 10 g (W/Kg)	6.170824
SAR 1 g (W/Kg)	18.905175

Z Axis Scan



3D screen shot	Hot spot position
	

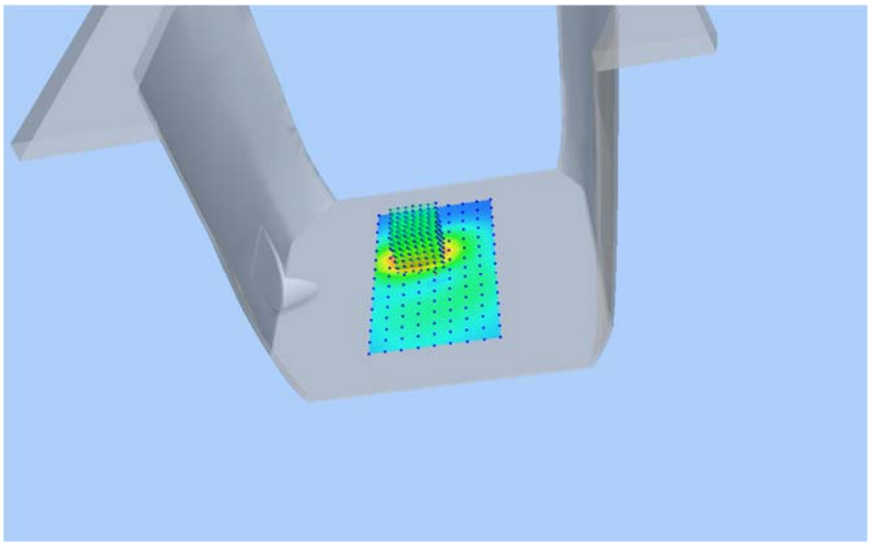
ANNEX C TEST DATA

MEAS. 1 Body Plane with Back Side 0 mm on Low Channel in GPRS 850

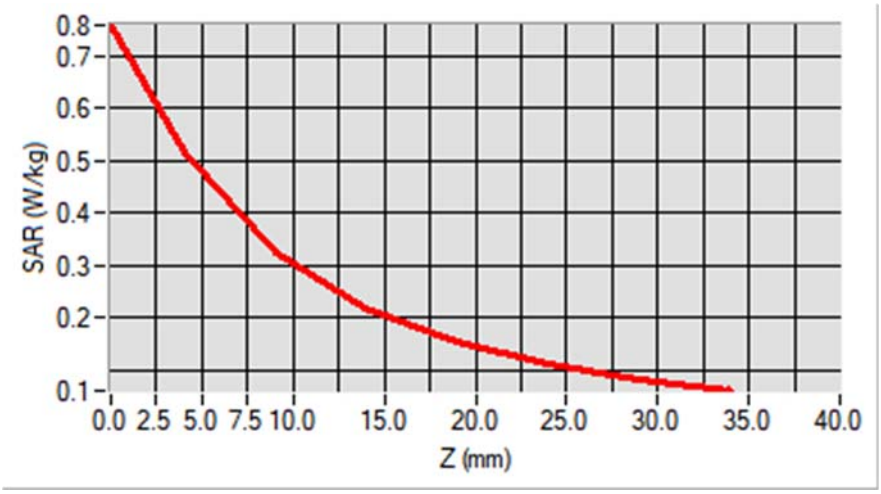
2slots mode

Test Date:	5/11/2019
Measurement duration:	15 minutes 22 seconds
Signal:	GPRS, f=824.2 MHz, Duty Cycle: 1:4.0
Liquid Parameters:	Permittivity: 55.57; Conductivity: 0.95 S/m
Test condition:	Ambient Temperature: 22.6°C, Liquid Temperature: 21.4°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 1.98
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	7x7x7,dx=5mm, dy=5mm, dz=5mm,Complete
Maximum location:	X=-10.000000, Y=18.000000
SAR 10g (W/Kg):	0.275965
SAR 1g (W/Kg):	0.476478
Power drift (%):	-0.69

3D screen shot



Z Axis Scan

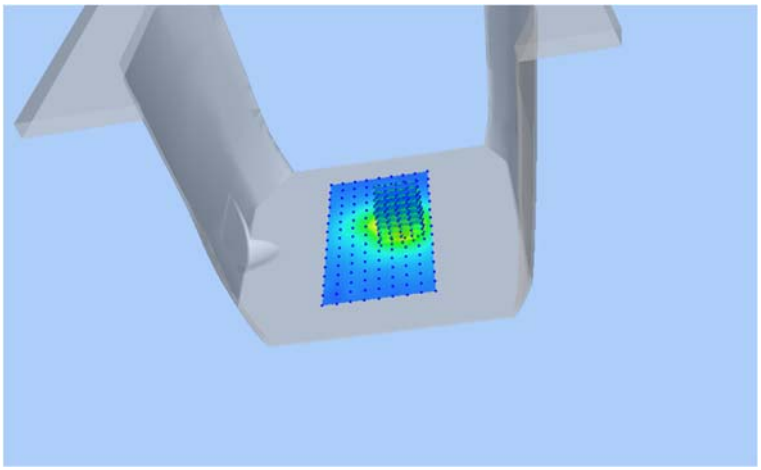


MEAS. 2 Body Plane with Back Side 0 mm on Low Channel in GPRS 1900

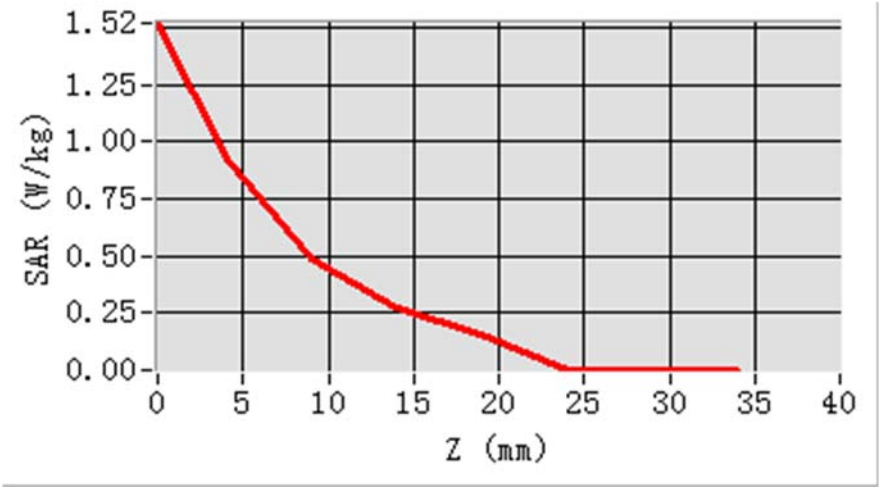
4slots mode

Test Date:	7/11/2019
Measurement duration:	13 minutes 5 seconds
Signal:	GPRS, f=1850.2 MHz, Duty Cycle: 1:2.0
Liquid Parameters:	Permittivity: 54.01; Conductivity: 1.51 S/m
Test condition:	Ambient Temperature: 22.8°C, Liquid Temperature: 21.5°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 2.57
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	5x5x7,dx=8mm, dy=8mm, dz=5mm,Complete
Maximum location:	X=20.000000, Y=-2.000000
SAR 10g (W/Kg):	0.435344
SAR 1g (W/Kg):	0.905865
Power drift (%):	-2.03

3D screen shot



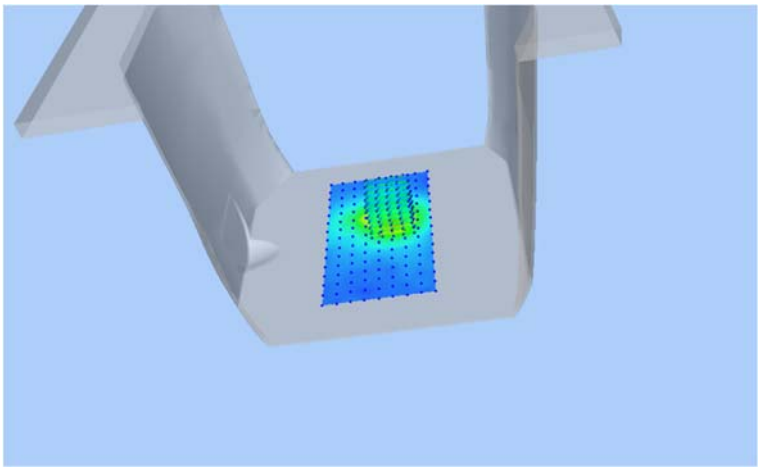
Z Axis Scan



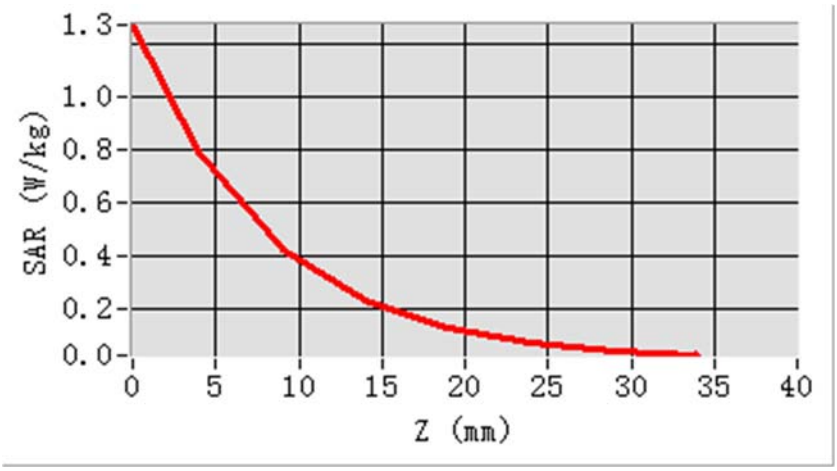
MEAS. 3 Body Plane with Back Side 0 mm on High Channel in WCDMA Band 2 mode

Test Date:	7/11/2019
Measurement duration:	13 minutes 9 seconds
Signal:	WCDMA, f=1907.6 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 53.40; Conductivity: 1.55 S/m
Test condition:	Ambient Temperature: 22.8°C, Liquid Temperature: 21.5°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 2.57
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	5x5x7,dx=8mm, dy=8mm, dz=5mm,Complete
Maximum location:	X=10.000000, Y=8.000000
SAR 10g (W/Kg):	0.373976
SAR 1g (W/Kg):	0.755662
Power drift (%):	-0.65

3D screen shot



Z Axis Scan

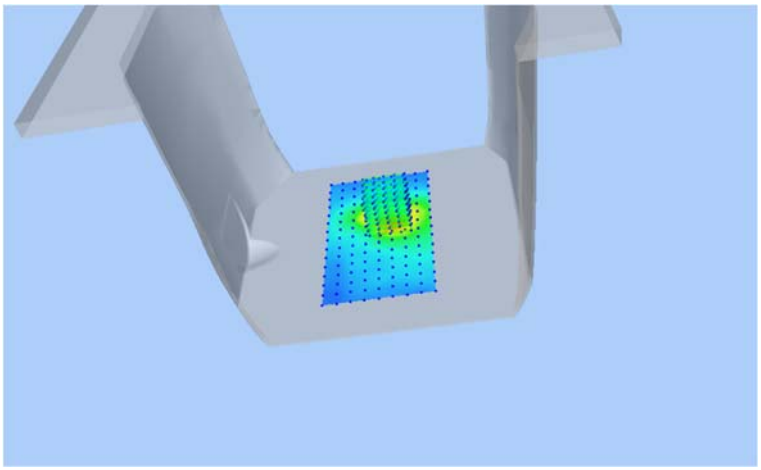


MEAS. 4 Body Plane with Back Side 0 mm on Middle Channel in WCDMA

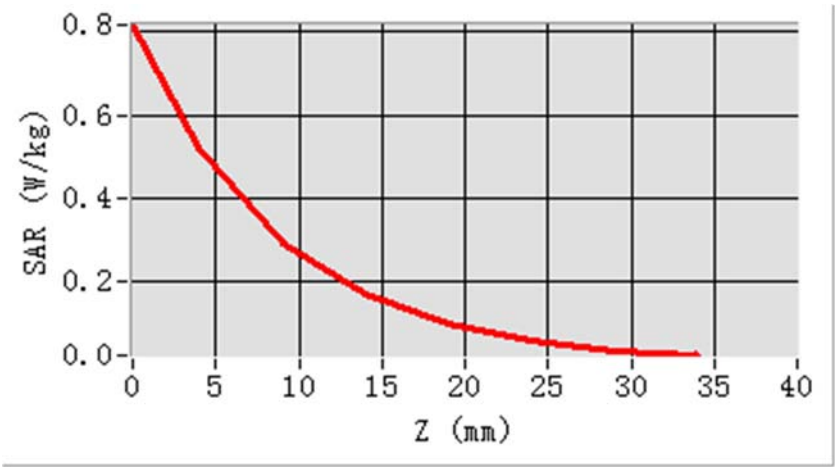
Band 4 mode

Test Date:	13/11/2019
Measurement duration:	12 minutes 56 seconds
Signal:	WCDMA, f=1732.4 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 53.75; Conductivity: 1.45 S/m
Test condition:	Ambient Temperature: 22.5°C, Liquid Temperature: 21.1°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 2.25
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	5x5x7,dx=8mm, dy=8mm, dz=5mm,Complete
Maximum location:	X=10.000000, Y=8.000000
SAR 10g (W/Kg):	0.260475
SAR 1g (W/Kg):	0.495587
Power drift (%):	1.35

3D screen shot



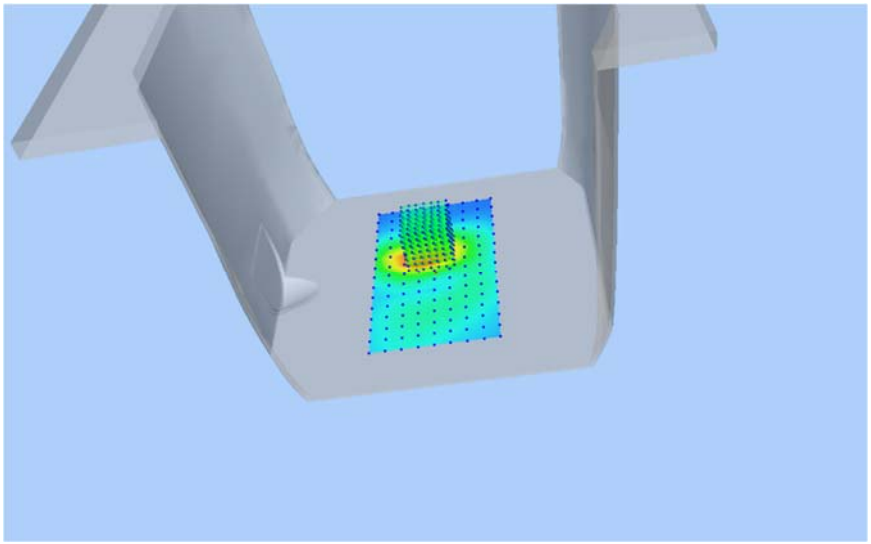
Z Axis Scan



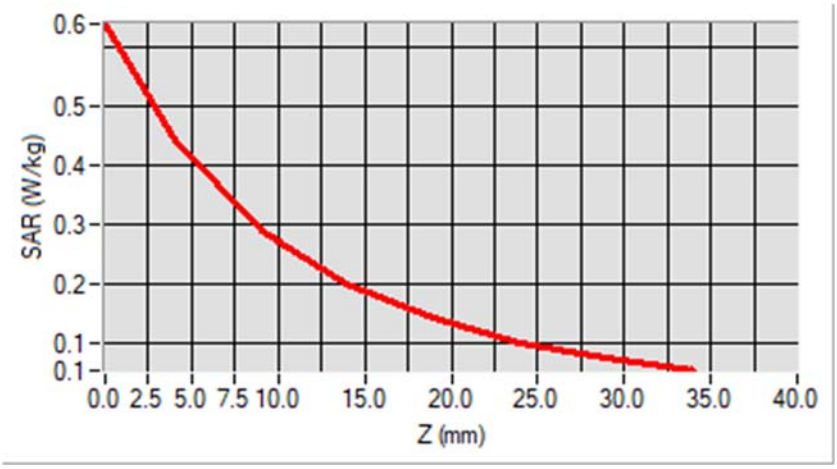
MEAS. 5 Body Plane with Back Side 0 mm on High Channel in WCDMA Band 5 mode

Test Date:	5/11/2019
Measurement duration:	17 minutes 4 seconds
Signal:	WCDMA, f=846.6 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 55.35; Conductivity: 0.98 S/m
Test condition:	Ambient Temperature: 22.6°C, Liquid Temperature: 21.4°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 1.98
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	7x7x7,dx=5mm, dy=5mm, dz=5mm,Complete
Maximum location:	X=0.000000, Y=18.000000
SAR 10g (W/Kg):	0.249282
SAR 1g (W/Kg):	0.418599
Power drift (%):	1.56

3D screen shot



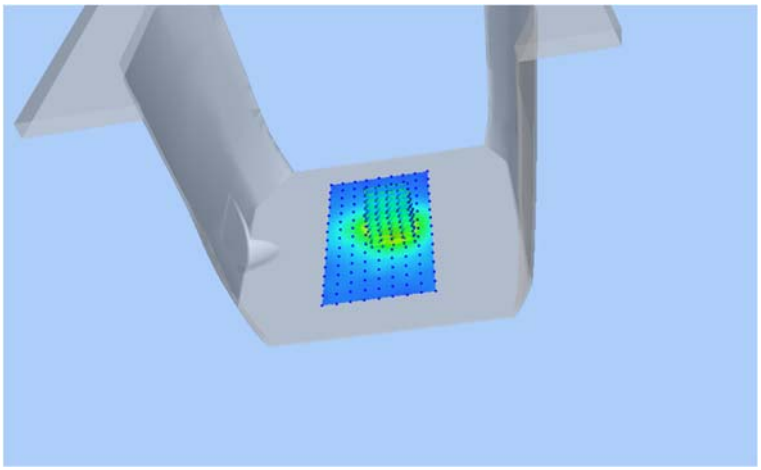
Z Axis Scan



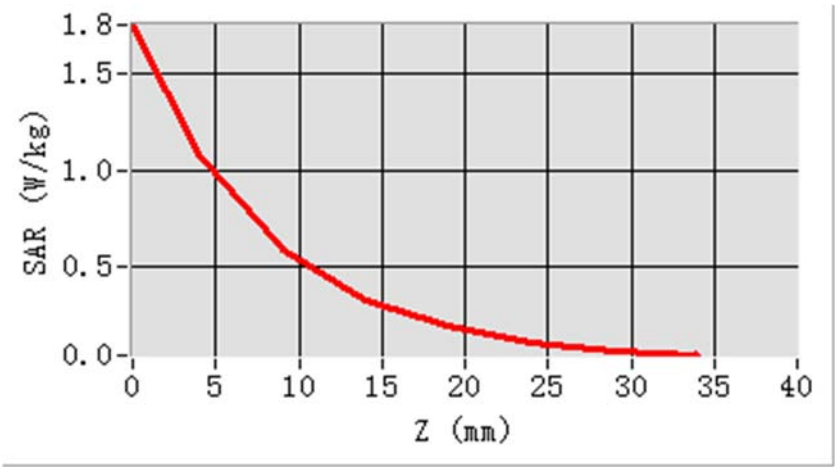
MEAS. 6 Body Plane with Back Side 0 mm on Middle Channel in LTE Band 2 mode

Test Date:	8/11/2019
Measurement duration:	13 minutes 9 seconds
Signal:	LTE, f=1880 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 53.98; Conductivity: 1.50 S/m
Test condition:	Ambient Temperature: 22.7°C, Liquid Temperature: 21.1°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 2.57
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	5x5x7,dx=8mm, dy=8mm, dz=5mm,Complete
Maximum location:	X=10.000000, Y=-2.000000
SAR 10g (W/Kg):	0.517122
SAR 1g (W/Kg):	1.035190
Power drift (%):	-4.03

3D screen shot



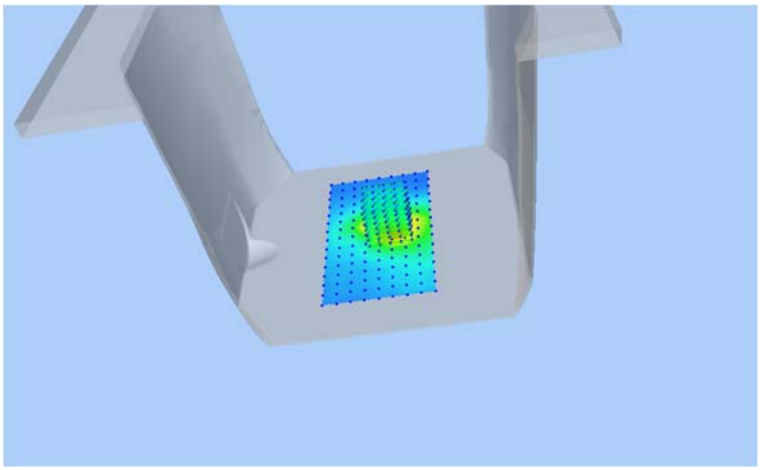
Z Axis Scan



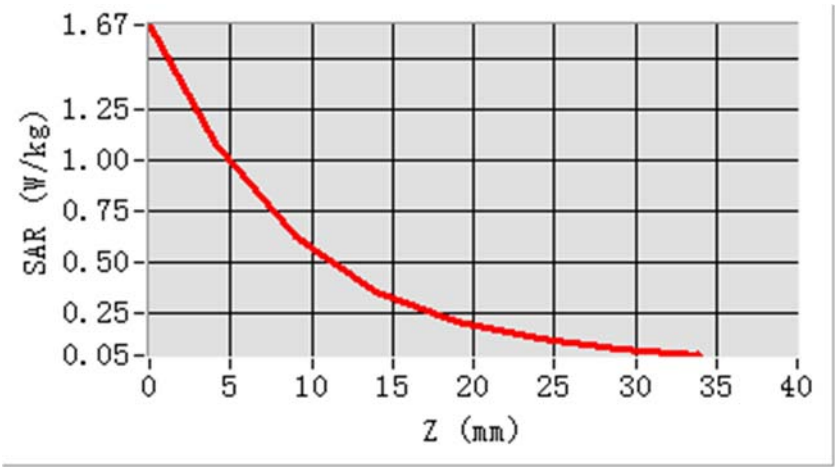
MEAS. 7 Body Plane with Back Side 0 mm on High Channel in LTE Band 4 mode

Test Date:	9/11/2019
Measurement duration:	12 minutes 57 seconds
Signal:	LTE, f=1745 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 53.98; Conductivity: 1.46 S/m
Test condition:	Ambient Temperature: 22.7°C, Liquid Temperature: 21.2°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 2.25
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	5x5x7,dx=8mm, dy=8mm, dz=5mm,Complete
Maximum location:	X=10.000000, Y=-2.000000
SAR 10g (W/Kg):	0.548158
SAR 1g (W/Kg):	1.027243
Power drift (%):	-0.19

3D screen shot



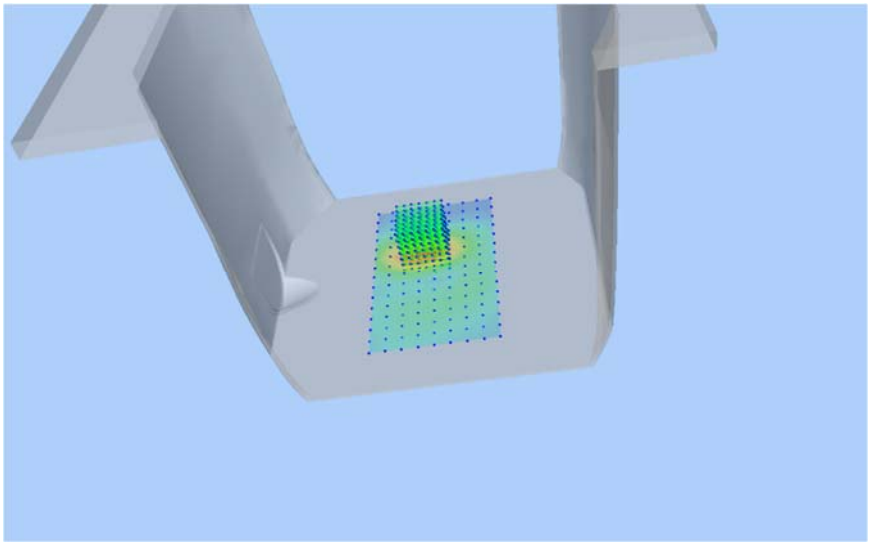
Z Axis Scan



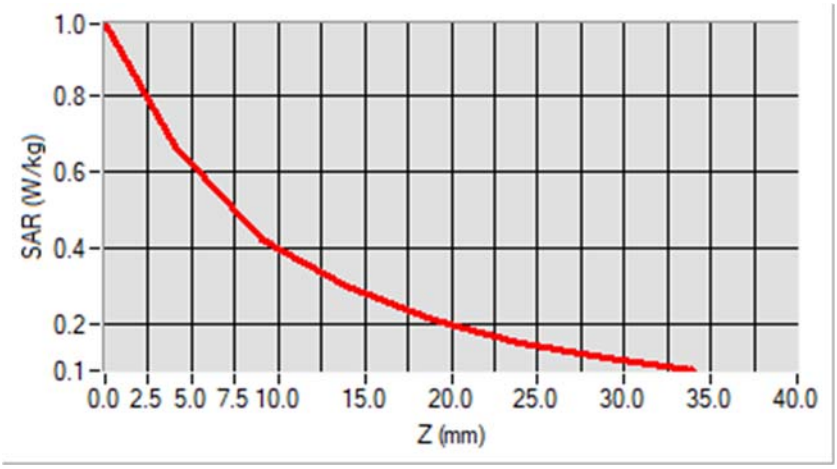
MEAS. 8 Body Plane with Back Side 0 mm on Middle Channel in LTE Band 5 mode

Test Date:	6/11/2019
Measurement duration:	16 minutes 19 seconds
Signal:	LTE, f=836.5 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 55.84; Conductivity: 0.97 S/m
Test condition:	Ambient Temperature: 22.6°C, Liquid Temperature: 21.3°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 1.98
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	7x7x7,dx=5mm, dy=5mm, dz=5mm,Complete
Maximum location:	X=0.000000, Y=18.000000
SAR 10g (W/Kg):	0.365106
SAR 1g (W/Kg):	0.617518
Power drift (%):	-2.31

3D screen shot



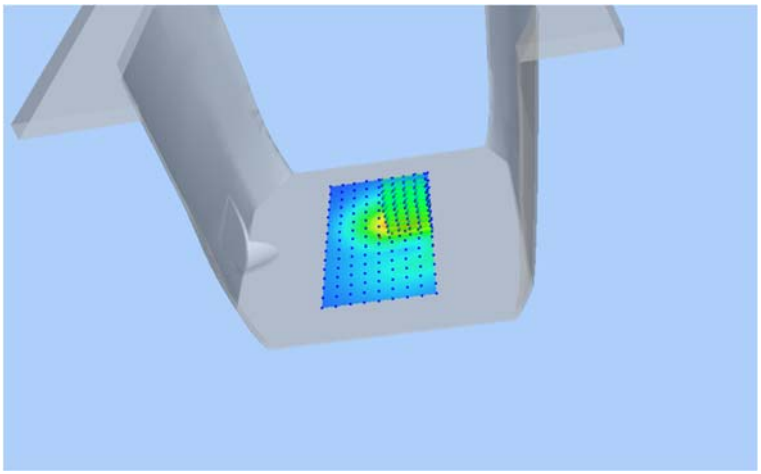
Z Axis Scan



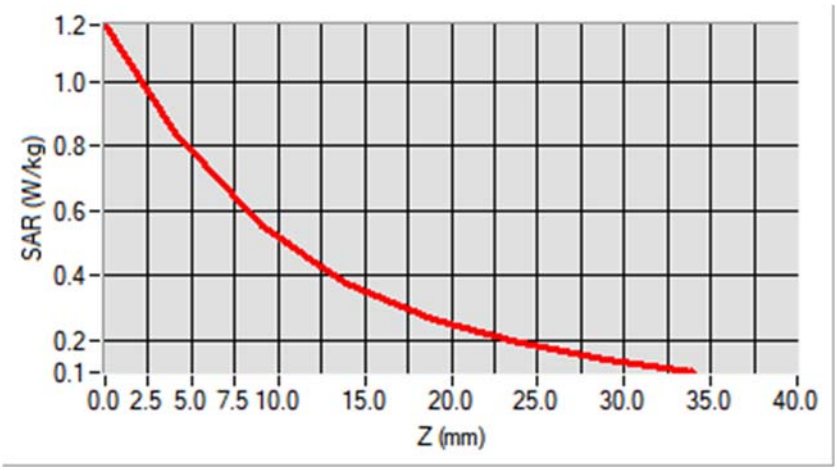
MEAS. 9 Body Plane with Back Side 0 mm on High Channel in LTE Band 12 mode

Test Date:	4/11/2019
Measurement duration:	12 minutes 45 seconds
Signal:	LTE, f=711.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 56.01; Conductivity: 0.94 S/m
Test condition:	Ambient Temperature: 22.8°C, Liquid Temperature: 21.3°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 1.96
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	5x5x7,dx=8mm, dy=8mm, dz=5mm,Complete
Maximum location:	X=20.000000, Y=8.000000
SAR 10g (W/Kg):	0.486477
SAR 1g (W/Kg):	0.829644
Power drift (%):	-0.06

3D screen shot



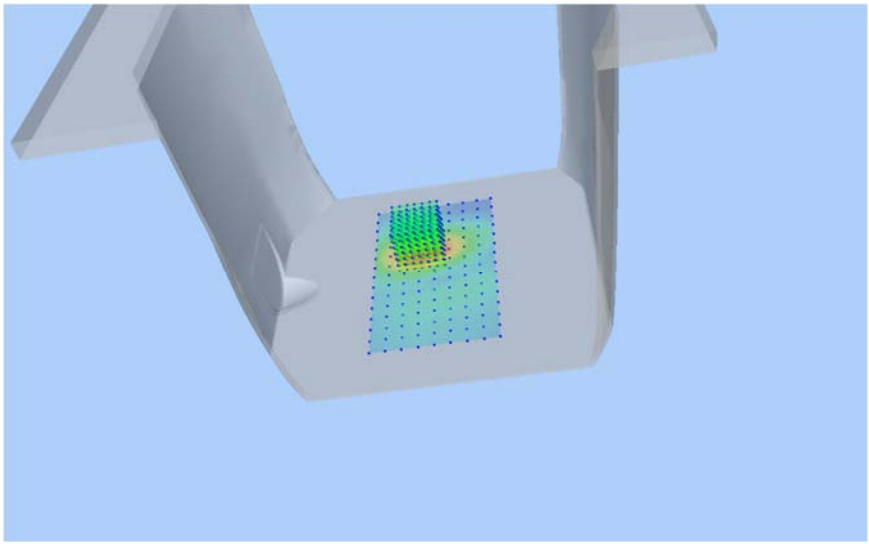
Z Axis Scan



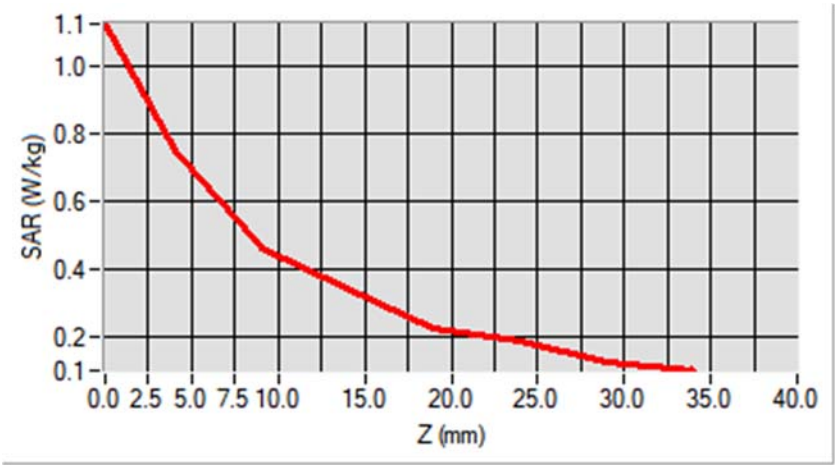
MEAS. 10 Body Plane with Back Side 0 mm on Middle Channel in LTE Band 13 mode

Test Date:	4/11/2019
Measurement duration:	15 minutes 33 seconds
Signal:	LTE, f=782.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 55.20; Conductivity: 0.97 S/m
Test condition:	Ambient Temperature: 22.8°C, Liquid Temperature: 21.3°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 1.96
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	7x7x7,dx=5mm, dy=5mm, dz=5mm,Complete
Maximum location:	X=-10.000000, Y=18.000000
SAR 10g (W/Kg):	0.442152
SAR 1g (W/Kg):	0.716967
Power drift (%):	-0.51

3D screen shot



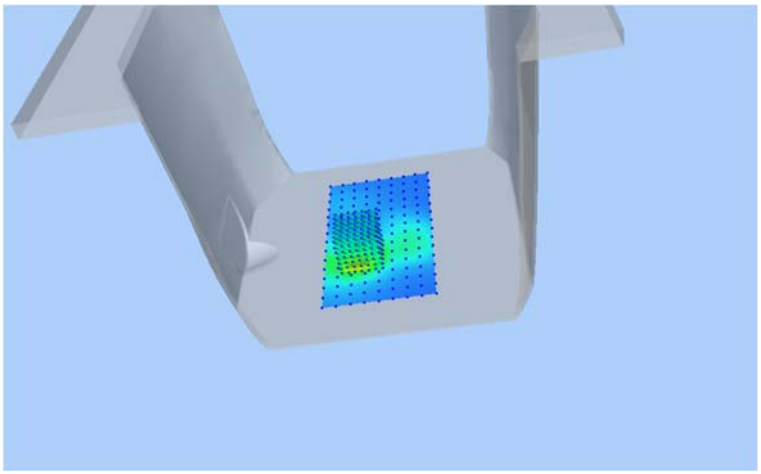
Z Axis Scan



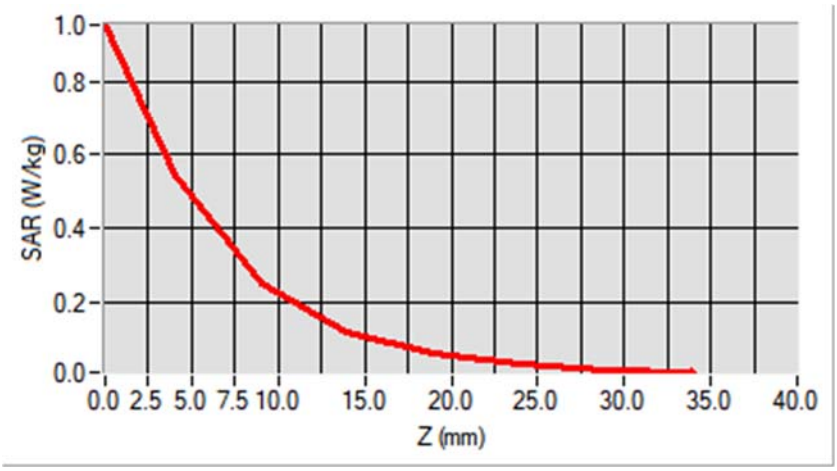
MEAS. 11 Body Plane with Back Side 0 mm on Low Channel in IEEE 802.11b mode

Test Date:	14/11/2019
Measurement duration:	14 minutes 33 seconds
Signal:	WLAN, f=2412.0 MHz, Duty Cycle: 1:1.03
Liquid Parameters:	Permittivity: 51.78; Conductivity: 1.96 S/m
Test condition:	Ambient Temperature: 22.6°C, Liquid Temperature: 21.0°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 2.63
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	7x7x7,dx=5mm, dy=5mm, dz=5mm,Complete
Maximum location:	X=-10.000000, Y=-22.000000
SAR 10g (W/Kg):	0.203935
SAR 1g (W/Kg):	0.486091
Power drift (%):	0.59

3D screen shot



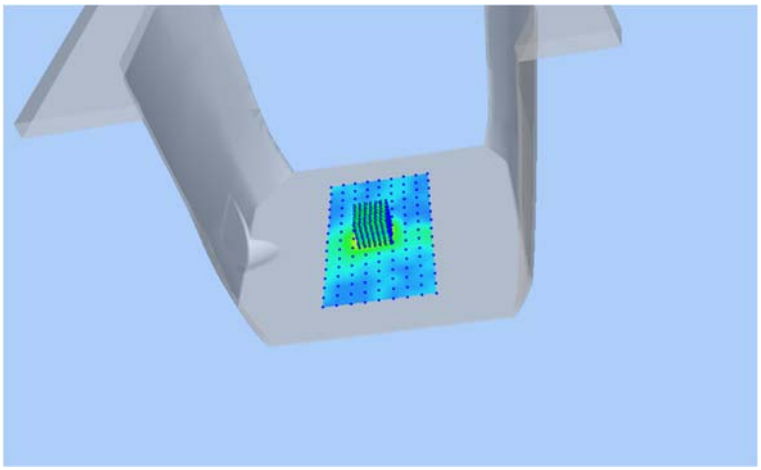
Z Axis Scan



MEAS. 12 Body Plane with Back Side 0 mm on 48 Channel in IEEE 802.11a mode

Test Date:	10/11/2019
Measurement duration:	23 minutes 58 seconds
Signal:	WLAN, f=5240.0 MHz, Duty Cycle: 1:1.16
Liquid Parameters:	Permittivity: 47.91; Conductivity: 5.21 S/m
Test condition:	Ambient Temperature: 22.8°C, Liquid Temperature: 21.4°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 2.14
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	7x7x12,dx=4mm, dy=4mm, dz=2mm,Complete
Maximum location:	X=0.000000, Y=-2.000000
SAR 10g (W/Kg):	0.071269
SAR 1g (W/Kg):	0.206642
Power drift (%):	-2.39

3D screen shot

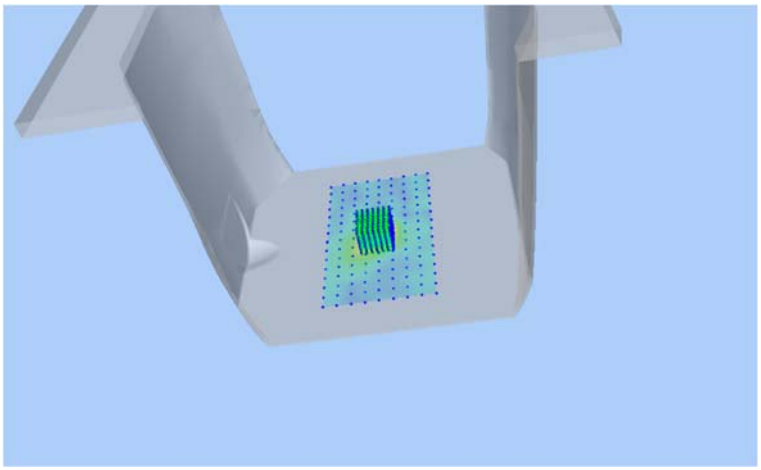


Z Axis Scan

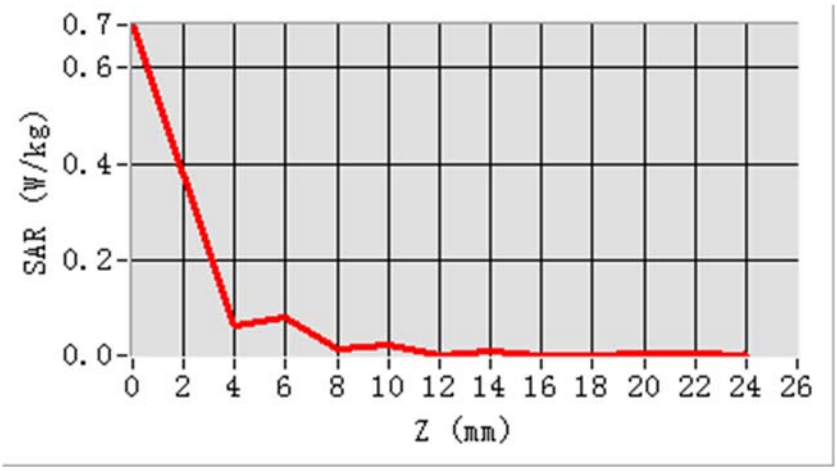
MEAS. 13 Body Plane with Back Side 0 mm on 165 Channel in IEEE 802.11a mode

Test Date:	12/11/2019
Measurement duration:	25 minutes 5 seconds
Signal:	WLAN, f=5825.0 MHz, Duty Cycle: 1:1.15
Liquid Parameters:	Permittivity: 46.82; Conductivity: 5.84 S/m
Test condition:	Ambient Temperature: 22.7°C, Liquid Temperature: 21.5°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 2.22
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	7x7x12,dx=4mm, dy=4mm, dz=2mm,Complete
Maximum location:	X=0.000000, Y=-12.000000
SAR 10g (W/Kg):	0.079788
SAR 1g (W/Kg):	0.188934
Power drift (%):	-1.77

3D screen shot



Z Axis Scan



ANNEX D EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ19A0582-AW.pdf”.

ANNEX E SAR TEST SETUP PHOTOS

Please refer the document “BL- SZ19A0582-AS.pdf”.

ANNEX F CALIBRATION REPORT

Please refer the document “CALIBRATION REPORT.pdf”.

--END OF REPORT--