FCC SAR TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

TD191 LTE USB Dongle

ISSUED TO
JACS SOLUTIONS INC

8808 Centre Park Dr., Suite 305 Columbia, MD 21045, USA

Report No.:	BL-SZ19A0286-701
EUT Name:	TD191 LTE USB Dongle
Model Name:	TD191
Brand Name:	JACS
FCC ID:	2AGCDJACSTD191
Test Standard:	FCC 47 CFR Part 2.1093
	ANSI C95.1: 1999
	IEEE 1528: 2013
Maximum SAR:	Body (1 g): 1.443 W/kg
Test Conclusion:	Pass
Test Date:	Oct. 28, 2019 ~ Nov. 01, 2019
Date of Issue:	Dec. 06, 2019

Tested by: Zong Liyao
(Engineer)
Date Dec. 06, 2019

Approved by: Wei Yanquan
(Chief Engineer)
Date Dec. 06, 2019

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Dec. 06, 2019	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	37% to 48%
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.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(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	JACS SOLUTIONS INC
Address	8808 Centre Park Dr., Suite 305 Columbia, MD 21045, USA

2.2 Manufacturer Information

Manufacturer	JACS SOLUTIONS INC
Address	8808 Centre Park Dr., Suite 305 Columbia, MD 21045, USA

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	TD191 LTE USB Dongle
Model Name Under Test	TD191
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	MBV1.0
Software Version	TD191_JACS_V1.1.0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Note: Not applicable.

2.6 Technical Information

Network and Wireless connectivity	3G Network WCDMA/HSDPA/HSUPA Band 1/ 2/ 4/ 5/ 8; 4G Network FDD LTE Band 1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 14/ 17/ 20/ 66

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

Operating Mode	WCDMA, FDD-LTE		
Frequency Range	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 14	TX: 788 ~ 798 MHz	RX: 758 ~ 768 MHz
	LTE Band 17	TX: 704 ~ 716 MHz	RX: 734 ~ 746 MHz
	LTE Band 66	TX: 1710 ~ 1780 MHz	RX: 2110 ~ 2200 MHz
Antenna Type	PIFA Antenna		
DTM	N/A		
Hotspot Function	N/A		
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 447498 D02v02	SAR Measurement Procedures for USB Dongle Transmitters
8	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
9	FCC KDB 865664 D02 v01r02	RF Exposure Reporting

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	
WCDMA Band 2	1.198	1.443	1.6
WCDMA Band 4	**1.443**		
WCDMA Band 5	0.281		
LTE Band 2	1.197		
LTE Band 4	1.148		
LTE Band 5	0.206		
LTE Band 12	0.371		
LTE Band 14	0.439		
LTE Band 17	0.331		
LTE Band 66	1.257		
Verdict	Pass		

3.3.2 Highest Simultaneous SAR

The EUT has only one antenna for WCDMA and LTE, and can't transmit simultaneously, so simultaneous transmission evaluation is not required in this report.

3.4 Test Uncertainty

According to KDB 865664 D01, when the highest measured 1 g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis is not required in SAR reports submitted for equipment approval.

The maximum 1 g SAR for the EUT in this report is 1.443 W/kg, which is lower than 1.5 W/kg, so the extensive SAR measurement uncertainty analysis is not required in this report.

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:

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

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

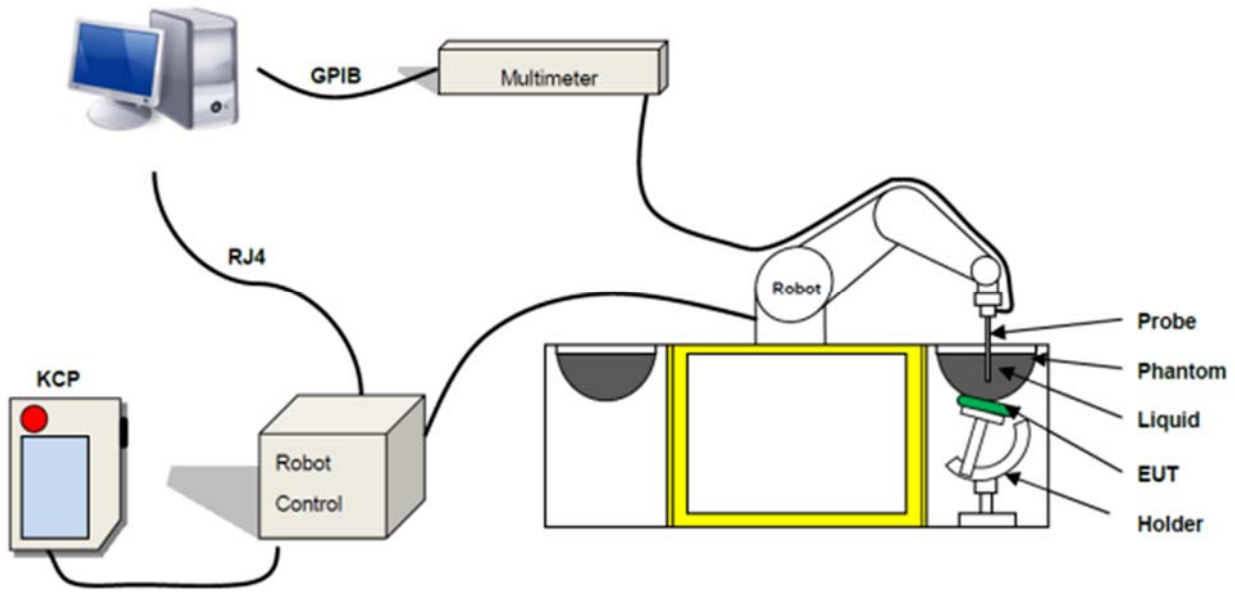
$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}\mathbf{E}^2}{\boldsymbol{\rho}}$$

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 34/15 EPGO 265 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)

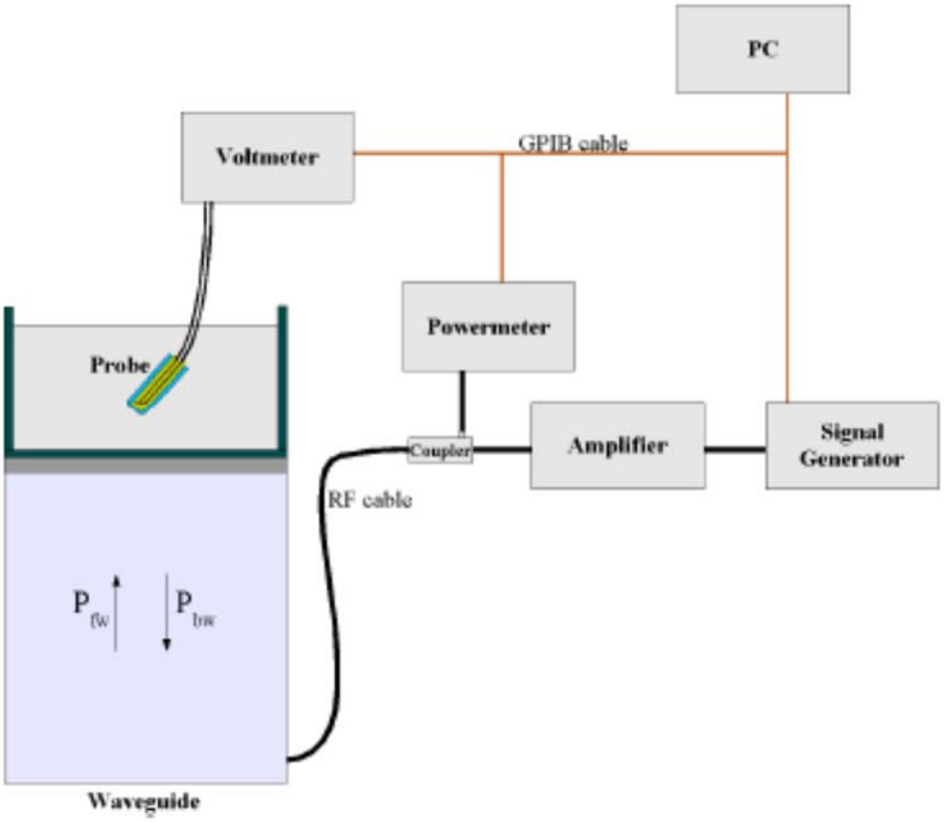
- Probe linearity: +/- 0.07 dB

- 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.

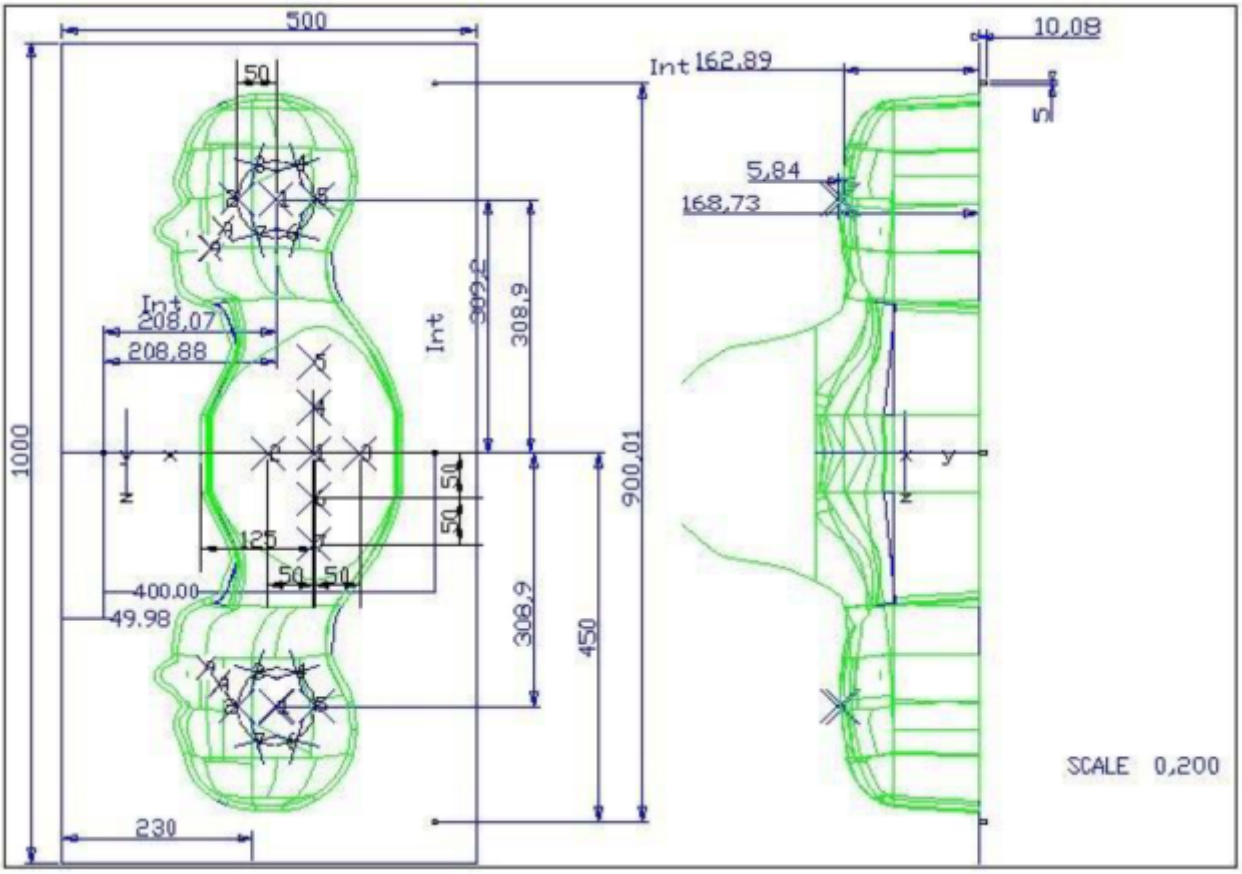
4.2.4 Phantoms

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

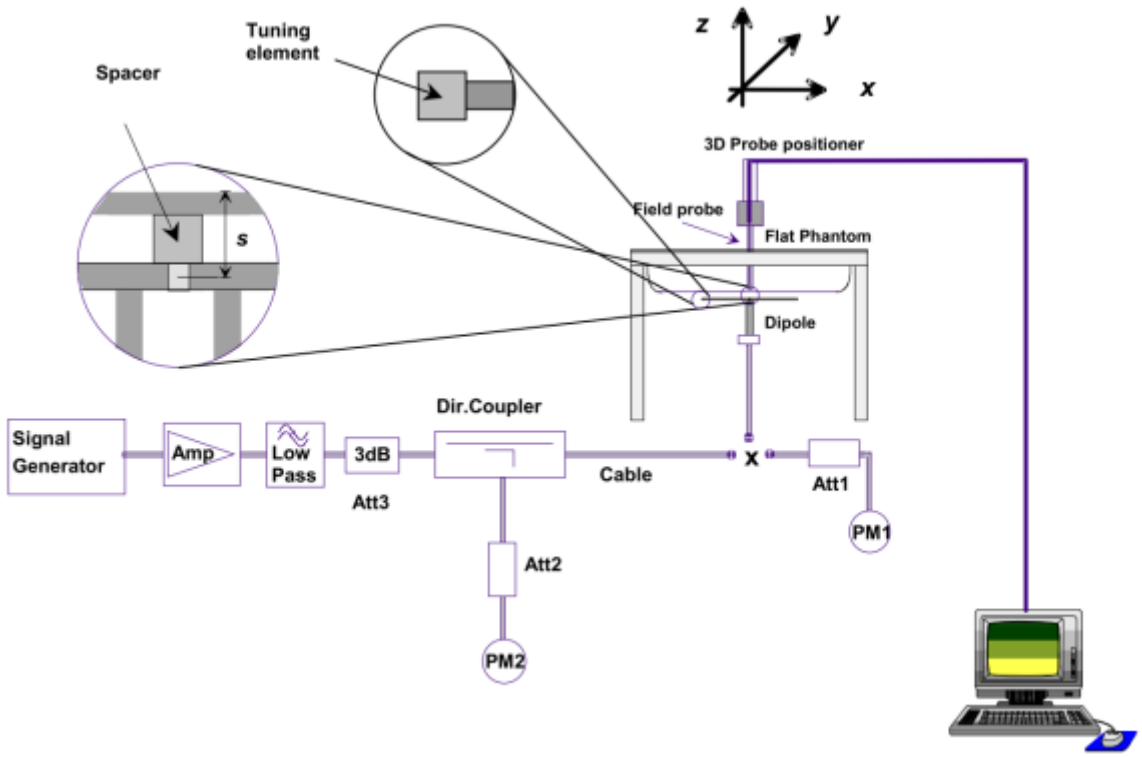
The SATIMO SAR system is equipped with one or more system validation kits. These units together with the predefined measurement procedures within the SATIMO software enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to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

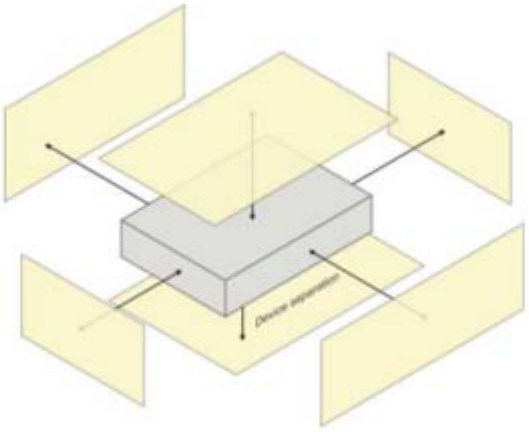
According to handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

6.1 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.

6.2 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).



6.3 USB Connector Orientations Implemented on Laptop Computers

USB dongle transmitter must show compliance at a test separation distance of 5mm.

(A) **Horizontal-Up**

(B) **Horizontal-Down**

(C) **Vertical-Front**

(D) **Vertical-Back**

Note: These are USB connector orientations on laptop computers; USB dongles have the reverse configuration for plugging into the corresponding laptop computers.

6.4 Simple Dongle Test Procedures

Test all USB orientations [see figure below: (A) Horizontal-Up, (B) Horizontal-Down, (C) Vertical-Front, and (D) Vertical-Back] with a device-to-phantom separation distance of 5 mm or less, according to KDB 447498 requirements. These test orientations are intended for the exposure conditions found in typical laptop/notebook/netbook or tablet computers with either horizontal or vertical USB connector configurations at various locations in the keyboard section of the computer. Current generation portable host computers should be used to establish the required SAR measurement separation distance. The same test separation distance must be used to test all frequency bands and modes in each USB orientation. The typical Horizontal-Up USB connection (A), found in the majority of host computers, must be tested using an appropriate host computer. A host computer with either Vertical-Front (C) or Vertical-Back (D) USB connection should be used to test one of the vertical USB orientations. If a suitable host computer is not available for testing the Horizontal-Down (B) or the remaining Vertical USB orientation, a high quality USB cable, 12 inches or less, may be used for testing these other orientations. It must be documented that the USB cable does not influence the radiating characteristics and output power of the transmitter.

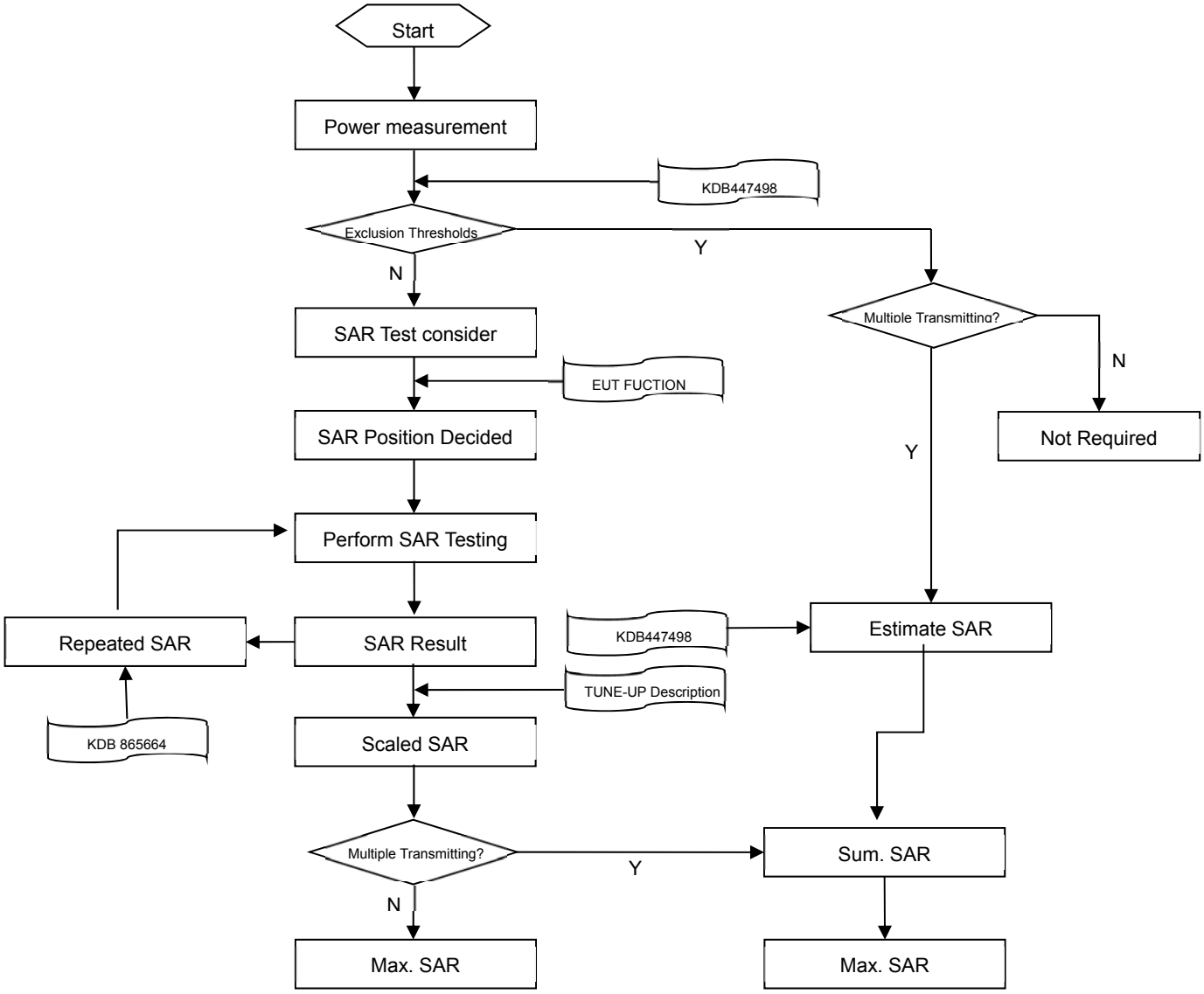
If the antenna is within 1 cm from the tip of the dongle (the end without the USB connector), the tip of the dongle should also be tested at 5 mm perpendicular to the phantom.

6.5 Dongles with Swivel or Rotating Connectors

A swivel or rotating USB connector may enable the dongle to connect in different orientations to host computers. When the antenna is built-in within the housing of a dongle, a swivel or rotating connector may allow the antenna to assume different positions. The combination of these possible configurations must be considered to determine the SAR test requirements. When the antenna is located near the tip of a dongle, it may operate at closer proximity to users in certain connector orientations where dongle tip testing may be required.
The 5 mm test separation distance used for testing simple dongles has been established based on the overall host platform (laptop/notebook/netbook) and device variations, and varying user operating configurations and exposure conditions expected for a peripheral device. The same test distance should generally apply to dongles with swivel or rotating connectors. The procedures described for simple dongles should be used to position the four surfaces of the dongle at 5 mm from the phantom to evaluate SAR. At least one of the horizontal and one of the vertical positions should be tested using an applicable host computer. If the antenna is within 1 cm from the tip of the dongle (the end without the USB connector), the tip of the dongle should also be tested at 5 mm perpendicular to the phantom. For antennas located within 2.5 cm from the USB connector and if the dongle can be positioned at 45º to 90º from the horizontal position [(A) or (B)], testing in one or more of these configurations may need to be considered. A KDB inquiry should be submitted to determine the applicable test configurations.

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="5">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="2">graded grid</td><td>Δz Zoom (1): between 1st two points closest to phantom surface</td><td rowspan="2">≤ 4 mm</td><td>3–4 GHz: ≤ 3 mm
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>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥30 mm</td><td>3–4 GHz: ≥ 28 mm
4–5 GHz: ≥ 25 mm
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 WCDMA

WCDMA	Band 2				Band 4			
Channel	9262	9400	9538	Tune-up Limit (dBm)	1312	1412	1513	Tune-up Limit (dBm)
RMC 12.2Kbps	21.96	**22.20**	21.91	22.50	21.44	21.66	**21.73**	22.50
HSDPA Subtest-1	21.20	21.32	20.75	21.50	20.66	20.87	20.76	21.00
HSDPA Subtest-2	21.29	21.33	20.70	21.50	20.71	20.92	20.85	21.00
HSDPA Subtest-3	20.77	20.89	20.35	21.00	20.28	20.41	20.34	20.50
HSDPA Subtest-4	20.84	20.91	20.42	21.00	20.24	20.51	20.35	21.00
HSUPA Subtest-1	20.62	20.98	20.84	21.00	20.58	20.87	21.08	21.50
HSUPA Subtest-2	20.22	20.37	19.69	20.50	19.41	19.71	19.81	20.00
HSUPA Subtest-3	19.83	20.18	19.87	20.50	19.19	19.40	20.32	20.50
HSUPA Subtest-4	20.37	19.97	19.97	20.50	19.71	19.93	20.07	20.50
HSUPA Subtest-5	21.19	21.11	20.93	21.50	20.79	20.92	20.94	21.00
WCDMA	Band 5				-			
Channel	4132	4182	4233	Tune-up Limit (dBm)	-	-	-	-
RMC 12.2Kbps	21.81	21.93	**21.98**	22.50	-	-	-	-
HSDPA Subtest-1	20.76	20.96	20.85	21.50	-	-	-	-
HSDPA Subtest-2	20.84	20.95	20.90	21.50	-	-	-	-
HSDPA Subtest-3	20.30	20.56	20.41	21.00	-	-	-	-
HSDPA Subtest-4	20.39	20.55	20.42	21.00	-	-	-	-
HSUPA Subtest-1	20.66	20.43	20.66	21.00	-	-	-	-
HSUPA Subtest-2	19.39	19.43	19.43	20.00	-	-	-	-
HSUPA Subtest-3	19.52	19.68	19.50	20.50	-	-	-	-
HSUPA Subtest-4	20.24	20.24	20.42	20.50	-	-	-	-
HSUPA Subtest-5	20.67	20.89	20.89	21.50	-	-	-	-

8.2 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)	21.74	22.09	21.93	22.50	21.31	20.80	20.60	22.00
	1 (RB_Pos:50)	22.28	**22.34**	22.11	22.50	21.31	20.80	20.71	22.00
	1 (RB_Pos:99)	21.55	22.05	21.59	22.50	20.25	20.17	20.66	22.00
	50 (RB_Pos:0)	20.97	20.95	20.86	21.50	19.90	19.79	19.62	20.50
	50 (RB_Pos:25)	20.93	20.91	20.89	21.50	19.95	19.95	19.74	20.50
	50 (RB_Pos:50)	20.78	20.84	20.80	21.50	19.81	19.69	19.33	20.50
	100 (RB_Pos:0)	20.87	20.88	20.84	21.50	19.82	19.79	19.63	20.50
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)	21.97	21.91	21.57	22.50	20.96	20.98	21.46	22.00
	1 (RB_Pos:38)	22.04	22.06	21.77	22.50	21.57	20.90	21.37	22.00
	1 (RB_Pos:74)	21.80	21.72	21.73	22.50	20.72	20.35	21.16	22.00
	36 (RB_Pos:0)	20.94	20.94	20.87	21.50	19.93	19.87	19.81	20.50
	36 (RB_Pos:20)	20.95	20.94	20.92	21.50	19.85	19.89	19.66	20.50
	36 (RB_Pos:39)	20.79	20.77	20.85	21.50	19.67	19.69	19.61	20.50
	75 (RB_Pos:0)	20.85	20.85	20.87	21.50	19.78	19.79	19.77	20.50
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)	22.06	21.81	22.13	22.50	20.97	20.95	20.92	22.00
	1 (RB_Pos:25)	22.24	22.37	22.23	22.50	21.64	20.59	21.01	22.00
	1 (RB_Pos:49)	21.92	21.79	21.78	22.50	20.86	20.13	20.54	22.00
	25 (RB_Pos:0)	20.98	20.86	20.86	21.50	19.80	19.70	19.94	20.50
	25 (RB_Pos:12)	21.03	20.90	20.97	21.50	19.94	20.05	20.05	20.50
	25 (RB_Pos:25)	20.91	20.83	20.84	21.50	19.62	19.67	19.80	20.50
	50 (RB_Pos:0)	20.89	20.85	20.96	21.50	19.69	19.70	19.66	20.50
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)	21.85	21.59	21.64	22.50	20.80	20.82	21.00	22.00
	1 (RB_Pos:13)	21.89	21.88	21.61	22.50	20.75	20.79	20.67	22.00
	1 (RB_Pos:24)	21.91	21.70	21.56	22.50	20.65	20.43	20.20	22.00
	12 (RB_Pos:0)	21.03	20.82	20.92	21.50	19.71	19.74	19.88	20.50
	12 (RB_Pos:6)	21.03	20.78	20.82	21.50	19.81	19.70	19.78	20.50

	12 (RB_Pos:13)	20.97	20.79	20.79	21.50	19.75	19.72	19.58	20.50
	25 (RB_Pos:0)	20.99	20.85	20.95	21.50	19.82	19.69	19.74	20.50
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)	22.18	21.85	22.03	22.50	20.97	21.46	21.01	22.00
	1 (RB_Pos:8)	22.01	21.89	22.18	22.50	21.00	21.45	21.07	22.00
	1 (RB_Pos:14)	21.87	21.86	21.83	22.50	20.96	21.51	20.91	22.00
	8 (RB_Pos:0)	21.06	20.85	20.98	21.50	20.27	19.82	19.91	20.50
	8 (RB_Pos:3)	21.08	20.83	20.91	21.50	20.27	19.80	19.85	20.50
	8 (RB_Pos:7)	21.00	20.90	20.89	21.50	20.22	19.84	19.75	20.50
	15 (RB_Pos:0)	21.01	20.91	20.99	21.50	19.91	19.81	19.82	20.50
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)	22.17	21.90	21.85	22.50	20.75	20.95	20.87	22.00
	1 (RB_Pos:3)	22.17	21.86	22.35	22.50	20.78	20.93	21.07	22.00
	1 (RB_Pos:5)	22.09	21.77	22.15	22.50	20.72	20.85	21.04	22.00
	3 (RB_Pos:0)	22.14	21.85	22.08	22.50	20.76	20.70	21.43	22.00
	3 (RB_Pos:1)	22.16	21.86	22.27	22.50	20.86	20.69	21.36	22.00
	3 (RB_Pos:3)	22.09	21.78	22.15	22.50	20.90	20.60	21.34	22.00
	6 (RB_Pos:0)	20.99	20.85	20.87	21.50	19.84	19.48	19.96	20.50

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)	22.05	22.38	22.15	23.00	21.62	21.24	21.21	22.00
	1 (RB_Pos:50)	**22.67**	22.56	22.54	23.00	21.48	21.15	21.13	22.00
	1 (RB_Pos:99)	21.94	22.22	22.02	23.00	20.65	20.90	20.97	22.00
	50 (RB_Pos:0)	21.33	21.16	21.35	22.00	20.39	20.15	20.39	21.00
	50 (RB_Pos:25)	21.37	21.26	21.25	22.00	20.54	20.40	20.29	21.00
	50 (RB_Pos:50)	21.19	21.20	21.11	22.00	20.17	20.12	20.05	21.00
	100 (RB_Pos:0)	21.31	21.15	21.30	22.00	20.31	20.10	20.21	21.00
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)	22.25	22.17	22.32	23.00	21.33	21.25	21.98	22.50
	1 (RB_Pos:38)	22.38	22.35	22.29	23.00	21.94	21.15	22.09	22.50
	1 (RB_Pos:74)	22.29	21.94	21.94	23.00	21.24	20.59	21.65	22.50
	36 (RB_Pos:0)	21.42	21.14	21.30	22.00	20.34	20.16	20.39	21.00

	36 (RB_Pos:20)	21.42	21.22	21.23	22.00	20.44	20.26	20.25	21.00
	36 (RB_Pos:39)	21.32	21.07	21.13	22.00	20.25	20.11	20.14	21.00
	75 (RB_Pos:0)	21.36	21.17	21.27	22.00	20.41	20.11	20.32	20.50
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)	22.28	22.01	22.28	23.00	21.24	21.22	21.35	22.50
	1 (RB_Pos:25)	22.47	22.57	22.38	23.00	22.03	21.19	21.32	22.50
	1 (RB_Pos:49)	22.31	21.98	21.98	23.00	21.30	20.44	20.82	22.50
	25 (RB_Pos:0)	21.33	21.07	21.24	22.00	20.50	20.19	20.17	21.00
	25 (RB_Pos:12)	21.42	21.15	21.19	22.00	20.45	20.35	20.41	21.00
	25 (RB_Pos:25)	21.35	21.06	21.12	22.00	20.29	20.35	20.23	21.00
	50 (RB_Pos:0)	21.40	21.12	21.22	22.00	20.35	20.13	20.20	21.00
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)	22.16	21.98	22.09	23.00	21.23	21.18	20.67	22.00
	1 (RB_Pos:13)	22.23	22.12	22.28	23.00	21.32	21.22	20.58	22.00
	1 (RB_Pos:24)	22.15	21.83	22.23	23.00	21.28	21.13	20.52	22.00
	12 (RB_Pos:0)	21.28	21.08	21.14	22.00	20.34	20.11	19.93	21.00
	12 (RB_Pos:6)	21.28	21.17	21.18	22.00	20.35	20.11	20.18	21.00
	12 (RB_Pos:13)	21.26	21.08	21.17	22.00	20.33	20.04	20.06	21.00
	25 (RB_Pos:0)	21.31	21.08	21.14	22.00	20.44	19.97	20.05	21.00
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)	22.45	21.92	22.03	23.00	21.14	21.19	21.08	22.00
	1 (RB_Pos:8)	22.49	21.88	22.07	23.00	20.90	21.20	21.00	22.00
	1 (RB_Pos:14)	22.38	21.89	22.08	23.00	21.17	21.19	21.05	22.00
	8 (RB_Pos:0)	21.35	21.15	20.97	22.00	20.79	20.03	19.75	22.00
	8 (RB_Pos:3)	21.38	21.21	21.02	22.00	20.54	19.96	19.80	22.00
	8 (RB_Pos:7)	21.31	21.16	20.98	22.00	20.50	20.20	19.78	22.00
	15 (RB_Pos:0)	21.41	21.14	20.98	22.00	20.36	20.17	19.78	20.50
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)	22.50	21.90	21.88	23.00	21.04	21.25	20.98	22.00
	1 (RB_Pos:3)	22.52	22.03	22.02	23.00	20.99	21.24	21.04	22.00
	1 (RB_Pos:5)	22.47	21.99	21.94	23.00	20.94	21.20	21.01	22.00
	3 (RB_Pos:0)	22.36	22.04	22.06	23.00	21.07	20.99	21.41	22.00
	3 (RB_Pos:1)	22.39	22.20	22.11	23.00	21.11	21.04	21.54	22.00

	3 (RB_Pos:3)	22.34	22.15	22.06	23.00	21.08	21.01	21.40	22.00
	6 (RB_Pos:0)	21.32	21.09	21.11	22.00	20.10	19.91	20.43	21.00

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)	21.95	21.76	22.27	23.00	21.08	21.13	21.26	22.00
	1 (RB_Pos:25)	22.30	22.41	**22.71**	23.00	21.85	21.44	21.38	22.00
	1 (RB_Pos:49)	21.99	22.12	22.15	23.00	21.32	20.75	21.05	22.00
	25 (RB_Pos:0)	21.08	21.31	21.29	22.00	20.03	20.21	20.33	21.00
	25 (RB_Pos:12)	21.22	21.32	21.42	22.00	20.27	20.49	20.55	21.00
	25 (RB_Pos:25)	21.07	21.32	21.28	22.00	20.06	20.39	20.42	21.00
	50 (RB_Pos:0)	21.14	21.29	21.38	22.00	20.18	20.12	20.33	21.00
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)	21.92	21.80	22.10	23.00	20.57	21.20	21.25	22.00
	1 (RB_Pos:13)	21.87	22.00	22.07	23.00	20.74	21.33	21.03	22.00
	1 (RB_Pos:24)	21.79	21.75	22.26	23.00	20.71	20.97	20.63	22.00
	12 (RB_Pos:0)	20.95	21.18	21.34	22.00	19.86	20.11	20.37	21.00
	12 (RB_Pos:6)	21.12	21.28	21.30	22.00	20.13	20.11	20.35	21.00
	12 (RB_Pos:13)	21.20	21.17	21.29	22.00	20.22	20.08	20.27	21.00
	25 (RB_Pos:0)	21.02	21.22	21.32	22.00	20.09	20.17	20.29	21.00
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)	21.95	22.06	22.31	23.00	21.14	21.24	21.46	22.00
	1 (RB_Pos:8)	22.23	22.20	22.44	23.00	21.06	21.23	21.49	22.00
	1 (RB_Pos:14)	22.29	22.14	22.26	23.00	21.05	21.27	21.42	22.00
	8 (RB_Pos:0)	21.07	21.35	21.32	22.00	20.10	20.28	20.40	21.00
	8 (RB_Pos:3)	21.15	21.26	21.32	22.00	20.15	20.50	20.37	21.00
	8 (RB_Pos:7)	21.17	21.21	21.31	22.00	20.16	20.44	20.20	21.00
	15 (RB_Pos:0)	21.06	21.22	21.42	22.00	20.05	20.34	20.40	21.00
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)	22.18	22.04	22.41	23.00	21.17	21.51	21.39	22.00
	1 (RB_Pos:3)	22.22	22.16	22.23	23.00	21.05	21.42	21.44	22.00
	1 (RB_Pos:5)	22.23	22.10	22.16	23.00	21.08	21.32	21.39	22.00

	3 (RB_Pos:0)	22.07	22.08	22.42	23.00	20.75	20.98	21.54	22.00
	3 (RB_Pos:1)	22.17	22.23	22.36	23.00	20.87	21.16	21.49	22.00
	3 (RB_Pos:3)	22.16	22.26	22.34	23.00	20.87	21.03	21.39	22.00
	6 (RB_Pos:0)	21.17	21.29	21.30	22.00	20.17	19.98	20.23	21.00

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)	23.19	23.05	23.23	24.00	22.34	22.29	22.23	23.00
	1 (RB_Pos:25)	23.46	**23.55**	23.45	24.00	22.74	22.44	22.20	23.00
	1 (RB_Pos:49)	23.14	22.81	22.68	24.00	22.14	21.58	21.55	23.00
	25 (RB_Pos:0)	22.44	22.20	22.40	23.00	21.37	21.29	21.64	22.00
	25 (RB_Pos:12)	22.30	22.34	22.33	23.00	21.34	21.53	21.32	22.00
	25 (RB_Pos:25)	22.31	22.31	21.98	23.00	21.35	21.47	20.94	22.00
	50 (RB_Pos:0)	22.37	22.25	22.07	23.00	21.29	21.25	21.09	22.00
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)	22.97	22.83	22.85	24.00	22.21	22.21	22.02	23.00
	1 (RB_Pos:13)	23.05	22.94	22.79	24.00	22.30	22.35	21.83	23.00
	1 (RB_Pos:24)	23.10	22.79	22.51	24.00	21.90	22.13	21.17	23.00
	12 (RB_Pos:0)	22.35	22.26	22.08	23.00	21.46	21.09	21.19	22.00
	12 (RB_Pos:6)	22.30	22.36	21.93	23.00	21.42	21.08	20.99	22.00
	12 (RB_Pos:13)	22.30	22.33	21.90	23.00	21.34	21.13	20.85	22.00
	25 (RB_Pos:0)	22.37	22.19	21.95	23.00	21.46	21.18	20.90	22.00
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)	23.37	23.05	22.87	24.00	22.25	22.30	22.17	23.00
	1 (RB_Pos:8)	23.44	23.08	22.74	24.00	22.28	22.28	21.94	23.00
	1 (RB_Pos:14)	23.26	23.12	22.69	24.00	22.24	22.33	21.94	23.00
	8 (RB_Pos:0)	22.44	22.25	22.02	23.00	21.76	21.19	21.03	22.00
	8 (RB_Pos:3)	22.39	22.27	21.87	23.00	21.79	21.51	20.97	22.00
	8 (RB_Pos:7)	22.35	22.29	21.85	23.00	21.67	21.32	20.76	22.00
	15 (RB_Pos:0)	22.38	22.32	22.08	23.00	21.37	21.41	21.10	22.00
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)	23.31	22.98	22.72	24.00	22.34	22.30	21.82	23.00
	1 (RB_Pos:3)	23.35	23.02	22.71	24.00	22.36	22.39	21.78	23.00

	1 (RB_Pos:5)	23.27	22.85	22.70	24.00	22.30	22.22	21.94	23.00
	3 (RB_Pos:0)	23.35	23.01	22.80	24.00	22.42	21.95	22.04	23.00
	3 (RB_Pos:1)	23.42	23.11	22.93	24.00	22.45	22.14	22.02	23.00
	3 (RB_Pos:3)	23.30	23.13	22.82	24.00	22.46	21.98	21.96	23.00
	6 (RB_Pos:0)	22.39	22.21	21.89	23.00	21.66	20.94	21.04	22.00

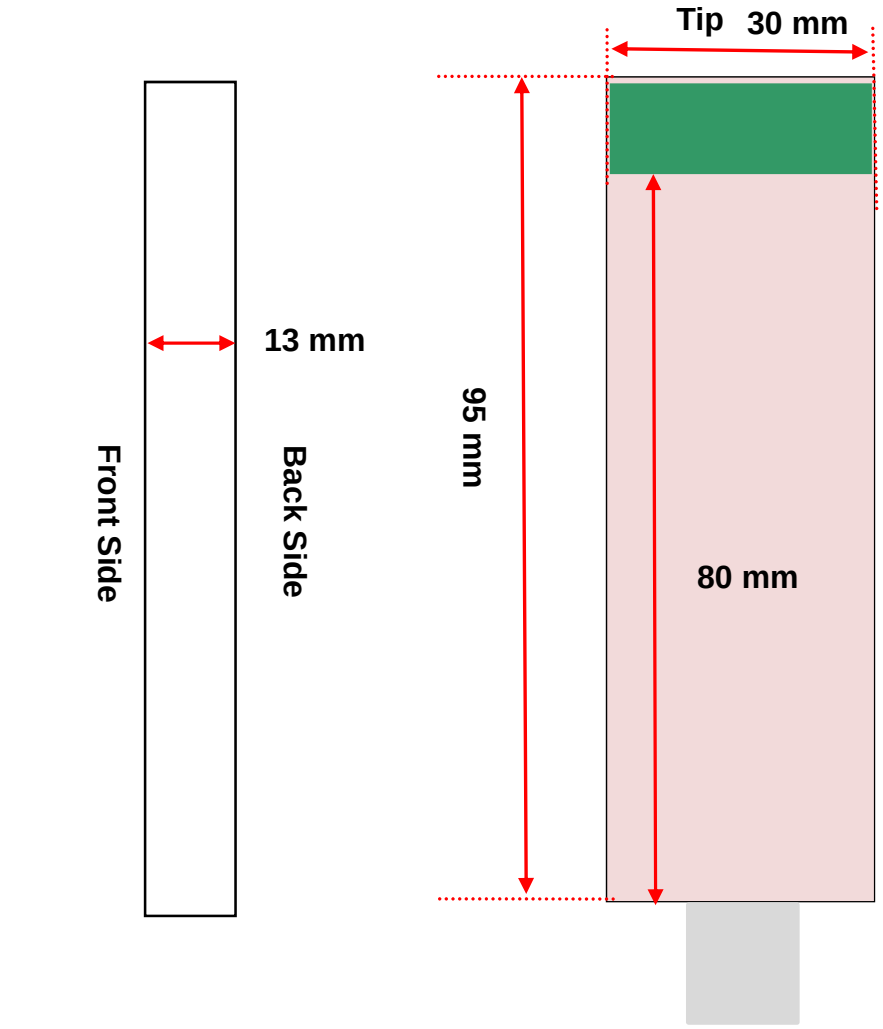
FDD LTE Band 14									
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23330				23330			
10MHz	1 (RB_Pos:0)	22.33			23.00	21.41			22.50
	1 (RB_Pos:13)	**22.50**			23.00	22.25			22.50
	1 (RB_Pos:24)	22.46			23.00	21.58			22.50
	12 (RB_Pos:0)	21.54			22.00	20.54			21.00
	12 (RB_Pos:6)	21.64			22.00	20.55			21.00
	12 (RB_Pos:13)	21.52			22.00	20.53			21.00
	25 (RB_Pos:0)	21.57			22.00	20.59			21.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23305	23330	23355		23305	23330	23355	
5MHz	1 (RB_Pos:0)	22.13	22.25	22.43	23.00	21.15	21.55	21.28	22.50
	1 (RB_Pos:25)	22.19	22.48	22.50	23.00	21.29	21.54	20.66	22.50
	1 (RB_Pos:49)	22.12	22.33	22.24	23.00	21.01	21.19	20.77	22.50
	25 (RB_Pos:0)	21.47	21.45	21.40	22.00	20.36	20.38	20.38	21.00
	25 (RB_Pos:12)	21.52	21.51	21.50	22.00	20.53	20.44	20.36	21.00
	25 (RB_Pos:25)	21.44	21.39	21.44	22.00	20.49	20.46	20.31	21.00
	50 (RB_Pos:0)	21.49	21.40	21.50	22.00	20.45	20.48	20.55	21.00

FDD LTE Band 17									
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23780	23790	23800		23780	23790	23800	
10 MHz	1 (RB_Pos:0)	22.54	22.47	22.57	23.00	21.74	21.61	21.70	22.50
	1 (RB_Pos:25)	22.56	22.64	**22.76**	23.00	22.27	21.57	21.59	22.50
	1 (RB_Pos:49)	22.38	22.31	22.40	23.00	21.48	20.69	21.45	22.50
	25 (RB_Pos:0)	21.73	21.52	21.52	22.00	20.67	20.70	20.83	21.00
	25 (RB_Pos:12)	21.64	21.49	21.42	22.00	20.47	20.69	20.58	21.00
	25 (RB_Pos:25)	21.52	21.34	21.45	22.00	20.58	20.42	20.46	21.00
	50 (RB_Pos:0)	21.63	21.48	21.59	22.00	20.57	20.56	20.57	21.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	23755	23790	23825		23755	23790	23825	
5MHz	1 (RB_Pos:0)	22.30	22.29	22.03	23.00	21.58	21.44	21.65	22.50
	1 (RB_Pos:13)	22.42	22.28	22.05	23.00	21.63	21.46	21.43	22.50
	1 (RB_Pos:24)	22.19	22.25	22.08	23.00	21.43	21.03	20.84	22.50
	12 (RB_Pos:0)	21.50	21.50	21.39	22.00	20.39	20.40	20.45	21.00
	12 (RB_Pos:6)	21.63	21.45	21.40	22.00	20.53	20.49	20.24	21.00
	12 (RB_Pos:13)	21.54	21.33	21.30	22.00	20.63	20.47	20.22	21.00
	25 (RB_Pos:0)	21.51	21.43	21.45	22.00	20.59	20.61	20.47	21.00

FDD LTE Band 66									
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	132072	132322	132572		132072	132322	132572	
20 MHz	1 (RB_Pos:0)	22.30	22.52	22.12	23.00	21.71	21.90	21.22	22.00
	1 (RB_Pos:50)	22.72	**22.74**	22.51	23.00	21.64	21.09	21.24	22.00
	1 (RB_Pos:99)	22.04	22.10	22.67	23.00	20.85	20.88	21.20	22.00
	50 (RB_Pos:0)	21.50	21.44	21.38	22.00	20.38	20.30	20.25	21.00
	50 (RB_Pos:25)	21.57	21.36	21.43	22.00	20.55	20.61	20.41	21.00
	50 (RB_Pos:50)	21.39	21.33	21.44	22.00	20.18	20.22	20.14	21.00
	100 (RB_Pos:0)	21.45	21.49	21.40	22.00	20.44	20.38	20.25	21.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	132047	132322	132597		132047	132322	132597	
15 MHz	1 (RB_Pos:0)	22.36	22.50	22.36	23.00	21.46	21.69	22.08	22.50
	1 (RB_Pos:38)	22.51	22.44	22.32	23.00	22.17	21.45	22.17	22.50
	1 (RB_Pos:74)	22.37	22.14	22.21	23.00	21.33	21.27	22.03	22.50
	36 (RB_Pos:0)	21.48	21.43	21.47	22.00	20.52	20.35	20.54	21.00
	36 (RB_Pos:20)	21.50	21.35	21.49	22.00	20.55	20.55	20.48	21.00
	36 (RB_Pos:39)	21.40	21.21	21.37	22.00	20.37	20.31	20.27	21.00
	75 (RB_Pos:0)	21.40	21.33	21.48	22.00	20.38	20.29	20.42	21.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	132022	132322	132622		132022	132322	132622	
10 MHz	1 (RB_Pos:0)	22.42	22.42	22.49	23.00	21.55	21.43	21.57	22.50
	1 (RB_Pos:25)	22.62	22.66	22.73	23.00	22.27	21.42	21.50	22.50
	1 (RB_Pos:49)	22.46	22.21	22.23	23.00	21.61	21.19	21.44	22.50
	25 (RB_Pos:0)	21.50	21.38	21.43	22.00	20.68	20.47	20.73	21.00
	25 (RB_Pos:12)	21.57	21.37	21.46	22.00	20.65	20.55	20.77	21.00
	25 (RB_Pos:25)	21.47	21.27	21.46	22.00	20.55	20.35	20.42	21.00
	50 (RB_Pos:0)	21.45	21.32	21.45	22.00	20.50	20.48	20.53	21.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	131997	132322	132647		131997	132322	132647	
5 MHz	1 (RB_Pos:0)	22.29	22.02	22.19	23.00	21.29	21.36	21.44	22.00
	1 (RB_Pos:13)	22.37	22.14	22.18	23.00	20.94	21.41	21.10	22.00
	1 (RB_Pos:24)	22.25	21.95	22.07	23.00	20.89	21.23	20.97	22.00
	12 (RB_Pos:0)	21.42	21.40	21.48	22.00	20.26	20.12	20.49	21.00
	12 (RB_Pos:6)	21.51	21.42	21.45	22.00	20.54	20.42	20.46	21.00
	12 (RB_Pos:13)	21.47	21.26	21.49	22.00	20.43	20.37	20.29	21.00
	25 (RB_Pos:0)	21.45	21.38	21.39	22.00	20.64	20.32	20.46	21.00

Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	131987	132322	132657		131987	132322	132657	
3.0 MHz	1 (RB_Pos:0)	22.46	22.33	22.55	23.00	21.31	21.44	21.54	22.00
	1 (RB_Pos:8)	22.39	22.46	22.46	23.00	21.53	21.11	21.39	22.00
	1 (RB_Pos:14)	22.41	22.36	22.58	23.00	21.55	21.15	21.59	22.00
	8 (RB_Pos:0)	21.48	21.38	21.41	22.00	20.93	20.22	20.75	21.00
	8 (RB_Pos:3)	21.45	21.40	21.48	22.00	20.99	20.30	20.59	21.00
	8 (RB_Pos:7)	21.43	21.37	21.44	22.00	20.86	20.31	20.47	21.00
	15 (RB_Pos:0)	21.50	21.36	21.49	22.00	20.68	20.37	20.33	21.00
Bandwidth (MHz)	RB Set	Power (dBm)							
		QPSK			Tune up limit (dBm)	16QAM			Tune up limit (dBm)
	Channel	131979	132322	132665		131979	132322	132665	
1.4 MHz	1 (RB_Pos:0)	22.76	22.17	22.42	23.00	21.54	21.44	21.56	22.00
	1 (RB_Pos:3)	22.79	22.28	22.76	23.00	21.52	21.39	21.65	22.00
	1 (RB_Pos:5)	22.65	22.22	22.67	23.00	21.51	21.35	21.61	22.00
	3 (RB_Pos:0)	22.51	22.29	22.27	23.00	21.49	20.88	21.90	22.00
	3 (RB_Pos:1)	22.55	22.34	22.57	23.00	21.55	21.04	21.82	22.00
	3 (RB_Pos:3)	22.71	22.29	22.55	23.00	21.62	21.15	21.79	22.00
	6 (RB_Pos:0)	21.56	21.26	21.50	22.00	20.67	20.03	20.55	21.00

9 EUT ANTENNA LOCATION SKETCH



WWAN Antenna

EUT Front View

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	Horizontal-Up	Horizontal-Down	Vertical-Front	Vertical-Back	Tip
WCDMA Band 2	Distance to User			<5mm	<5mm	<5mm	<5mm	<5mm
	RMC	22.50	177.83	Yes	Yes	Yes	Yes	Yes
WCDMA Band 4	Distance to User			<5mm	<5mm	<5mm	<5mm	<5mm
	RMC	22.50	177.83	Yes	Yes	Yes	Yes	Yes
WCDMA Band 5	Distance to User			<5mm	<5mm	<5mm	<5mm	<5mm
	RMC	22.50	177.83	Yes	Yes	Yes	Yes	Yes
LTE Band 2	Distance to User			<5mm	<5mm	<5mm	<5mm	<5mm
	QPSK	22.50	177.83	Yes	Yes	Yes	Yes	Yes
LTE Band 4	Distance to User			<5mm	<5mm	<5mm	<5mm	<5mm
	QPSK	23.00	199.53	Yes	Yes	Yes	Yes	Yes
LTE Band 5	Distance to User			<5mm	<5mm	<5mm	<5mm	<5mm
	QPSK	23.00	199.53	Yes	Yes	Yes	Yes	Yes
LTE Band 12	Distance to User			<5mm	<5mm	<5mm	<5mm	<5mm
	QPSK	24.00	251.19	Yes	Yes	Yes	Yes	Yes
LTE Band 14				<5mm	<5mm	<5mm	<5mm	<5mm
	QPSK	23.00	199.53	Yes	Yes	Yes	Yes	Yes
LTE Band 17				<5mm	<5mm	<5mm	<5mm	<5mm
	QPSK	23.00	199.53	Yes	Yes	Yes	Yes	Yes
LTE Band 66				<5mm	<5mm	<5mm	<5mm	<5mm
	QPSK	23.00	199.53	Yes	Yes	Yes	Yes	Yes

Note:

1. Maximum power is the source-based time-average power and represents the maximum RF output power 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, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ 1/4 dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

7. Per KDB 941225 D05, SAR test reduction is applied using the following criteria:

a. Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.

b. When the reported SAR is > 0.8 W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.

c. Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.

d. Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.

e. Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

10 TEST RESULTS

10.1 WCDMA Band 2

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)											
RMC	Horizontal-Up	5	9400	1880.0	-2.46	0.903	22.20	22.50	1.072	0.968	/
		5	9262	1852.4	-1.77	1.058	21.96	22.50	1.132	**1.198**	1#
		5	9538	1907.6	-1.13	0.683	21.91	22.50	1.146	0.782	/
	Horizontal-Down	5	9400	1880.0	-0.66	0.803	22.20	22.50	1.072	0.860	/
		5	9262	1852.4	-0.57	0.933	21.96	22.50	1.132	1.057	/
		5	9538	1907.6	-0.60	0.635	21.91	22.50	1.146	0.727	/
	Vertical-Front	5	9400	1880.0	1.06	0.535	22.20	22.50	1.072	0.573	/
	Vertical-Back	5	9400	1880.0	-1.35	0.309	22.20	22.50	1.072	0.331	/
	Tip	5	9400	1880.0	-0.86	0.043	22.20	22.50	1.072	0.046	/

Note[1]: Refer to ANNEX C for the detailed test data for each test configuration.

Note[2]: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note[3]: The USB cable length about 21cm.

10.2 WCDMA Band 4

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)											
RMC	Horizontal-Up	5	1513	1752.6	-2.86	1.125	21.73	22.50	1.194	1.343	/
		5	1312	1712.4	-4.04	1.094	21.44	22.50	1.276	1.396	/
		5	1412	1732.4	-0.34	1.189	21.66	22.50	1.213	**1.443**	2#
	Horizontal-Down	5	1513	1752.6	-0.38	0.818	21.73	22.50	1.194	0.977	/
		5	1312	1712.4	-2.23	0.659	21.44	22.50	1.276	0.841	/
		5	1412	1732.4	-3.20	0.769	21.66	22.50	1.213	0.933	/
	Vertical-Front	5	1513	1752.6	0.31	0.988	21.73	22.50	1.194	1.180	/
		5	1312	1712.4	-0.03	0.795	21.44	22.50	1.276	1.015	/
		5	1412	1732.4	-1.80	0.890	21.66	22.50	1.213	1.080	/
	Vertical-Back	5	1513	1752.6	-1.39	0.461	21.73	22.50	1.194	0.550	/
	Tip	5	1513	1752.6	-2.37	0.048	21.73	22.50	1.194	0.057	/

Note[1]: Refer to ANNEX C for the detailed test data for each test configuration.

Note[2]: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note[3]: The USB cable length about 21cm.

10.3WCDMA Band 5

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)											
RMC	Horizontal-Up	5	4233	846.6	-2.22	0.166	21.98	22.50	1.127	0.187	/
	Horizontal-Down	5	4233	846.6	1.79	0.249	21.98	22.50	1.127	**0.281**	3#
		5	4132	826.4	-1.53	0.204	21.81	22.50	1.172	0.239	/
		5	4182	836.4	-1.10	0.191	21.93	22.50	1.140	0.218	/
	Vertical-Front	5	4233	846.6	-2.06	0.075	21.98	22.50	1.127	0.085	/
	Vertical-Back	5	4233	846.6	-2.42	0.121	21.98	22.50	1.127	0.136	/
	Tip	5	4233	846.6	-1.57	0.044	21.98	22.50	1.127	0.050	/

Note[1]: Refer to ANNEX C for the detailed test data for each test configuration.

Note[2]: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note[3]: The USB cable length about 21cm.

10.4LTE Band 2 (20MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)													
QPSK	Horizontal-Up	5	18900	1880	1	MID	1.74	1.154	22.34	22.50	1.038	**1.197**	4#
		5	18700	1860	1	MID	-0.64	1.021	22.28	22.50	1.052	1.074	/
		5	19100	1900	1	MID	-3.43	1.022	22.11	22.50	1.094	1.118	/
		5	18700	1860	50	LOW	-2.21	0.794	20.97	21.50	1.130	0.897	/
		5	18900	1880	50	LOW	0.05	0.844	20.95	21.50	1.135	0.958	/
		5	19100	1900	50	MID	2.50	0.866	20.89	21.50	1.151	0.997	/
		5	18900	1880	100	LOW	-0.83	0.861	20.88	21.50	1.153	0.993	/
	Horizontal-Down	5	18900	1880	1	MID	-0.63	0.680	22.34	22.50	1.038	0.706	/
		5	18700	1860	50	LOW	-1.50	0.505	20.97	21.50	1.130	0.571	/
	Vertical-Front	5	18900	1880	1	MID	-2.68	0.560	22.34	22.50	1.038	0.581	/
		5	18700	1860	50	LOW	-4.87	0.210	20.97	21.50	1.130	0.237	/
	Vertical-Back	5	18900	1880	1	MID	-0.23	0.271	22.34	22.50	1.038	0.281	/
		5	18700	1860	50	LOW	-1.64	0.223	20.97	21.50	1.130	0.252	/
	Tip	5	18900	1880	1	MID	-4.98	0.040	22.34	22.50	1.038	0.042	/
		5	18700	1860	50	LOW	-0.58	0.034	20.97	21.50	1.130	0.038	/

Note[1]: Refer to ANNEX C for the detailed test data for each test configuration.

Note[2]: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note[3]: The USB cable length about 21cm.

10.5LTE Band 4 (20MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)													
QPSK	Horizontal-Up	5	20050	1720	1	MID	-1.02	1.064	22.67	23.00	1.079	**1.148**	5#
		5	20175	1732.5	1	MID	-0.43	0.946	22.56	23.00	1.107	1.047	/
		5	20300	1745	1	MID	-3.08	1.030	22.54	23.00	1.112	1.145	/
		5	20050	1720	50	MID	-3.41	0.806	21.37	22.00	1.156	0.932	/
		5	20175	1732.5	50	MID	-2.74	0.835	21.26	22.00	1.186	0.990	/
		5	20300	1745	50	LOW	-2.92	0.885	21.35	22.00	1.161	1.028	/
		5	20050	1720	100	LOW	-1.34	0.782	21.31	22.00	1.172	0.917	/
	Horizontal-Down	5	20050	1720	1	MID	-1.39	0.696	22.67	23.00	1.079	0.751	/
		5	20050	1720	50	MID	0.26	0.489	21.37	22.00	1.156	0.565	/
	Vertical-Front	5	20050	1720	1	MID	-1.33	0.729	22.67	23.00	1.079	0.787	/
		5	20050	1720	50	MID	-2.74	0.533	21.37	22.00	1.156	0.616	/
	Vertical-Back	5	20050	1720	1	MID	-3.67	0.363	22.67	23.00	1.079	0.392	/
		5	20050	1720	50	MID	-3.27	0.270	21.37	22.00	1.156	0.312	/
	Tip	5	20050	1720	1	MID	-0.16	0.041	22.67	23.00	1.079	0.044	/
		5	20050	1720	50	MID	-1.96	0.031	21.37	22.00	1.156	0.036	/

Note[1]: Refer to ANNEX C for the detailed test data for each test configuration.

Note[2]: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note[3]: The USB cable length about 21cm.

10.6 LTE Band 5 (10MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)													
QPSK	Horizontal-Up	5	20600	844	1	MID	-0.03	0.176	22.71	23.00	1.069	0.188	/
		5	20450	829	1	MID	-0.94	0.175	22.30	23.00	1.175	**0.206**	6#
		5	20525	836.5	1	MID	-1.19	0.168	22.41	23.00	1.146	0.192	/
		5	20600	844	25	MID	-0.73	0.132	21.42	22.00	1.143	0.151	/
	Horizontal-Down	5	20600	844	1	MID	-2.46	0.167	22.71	23.00	1.069	0.179	/
		5	20600	844	25	MID	-1.52	0.142	21.42	22.00	1.143	0.162	/
	Vertical-Front	5	20600	844	1	MID	0.20	0.084	22.71	23.00	1.069	0.090	/
		5	20600	844	25	MID	-0.15	0.061	21.42	22.00	1.143	0.070	/
	Vertical-Back	5	20600	844	1	MID	-0.40	0.146	22.71	23.00	1.069	0.156	/
		5	20600	844	25	MID	-2.75	0.121	21.42	22.00	1.143	0.138	/
	Tip	5	20600	844	1	MID	2.05	0.012	22.71	23.00	1.069	0.013	/
		5	20600	844	25	MID	-2.90	0.010	21.42	22.00	1.143	0.011	/

Note[1]: Refer to ANNEX C for the detailed test data for each test configuration.

Note[2]: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note[3]: The USB cable length about 21cm.

10.7 LTE Band 12 (10MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)													
QPSK	Horizontal-Up	5	23095	707.5	1	MID	-1.17	0.327	23.55	24.00	1.109	0.363	/
		5	23060	704	1	MID	-0.75	0.285	23.46	24.00	1.132	0.323	/
		5	23130	711	1	MID	-2.05	0.327	23.45	24.00	1.135	**0.371**	7#
		5	23060	704	25	LOW	-1.05	0.258	22.44	23.00	1.138	0.294	/
	Horizontal-Down	5	23095	707.5	1	MID	-0.15	0.264	23.55	24.00	1.109	0.293	/
		5	23060	704	25	LOW	-1.57	0.208	22.44	23.00	1.138	0.237	/
	Vertical-Front	5	23095	707.5	1	MID	0.30	0.184	23.55	24.00	1.109	0.204	/
		5	23060	704	25	LOW	-1.37	0.145	22.44	23.00	1.138	0.165	/
	Vertical-Back	5	23095	707.5	1	MID	-4.10	0.190	23.55	24.00	1.109	0.211	/
		5	23060	704	25	LOW	-0.31	0.141	22.44	23.00	1.138	0.160	/
	Tip	5	23095	707.5	1	MID	-1.95	0.015	23.55	24.00	1.109	0.017	/
		5	23060	704	25	LOW	-1.38	0.011	22.44	23.00	1.138	0.013	/

Note[1]: Refer to ANNEX C for the detailed test data for each test configuration.

Note[2]: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note3: The USB cable length about 21cm.

10.8LTE Band 14 (10MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)													
QPSK	Horizontal-Up	5	23330	793	1	MID	3.18	0.391	22.50	23.00	1.122	**0.439**	8#
		5	23330	793	25	MID	-0.87	0.316	21.64	22.00	1.086	0.343	/
	Horizontal-Down	5	23330	793	1	MID	0.30	0.348	22.50	23.00	1.122	0.390	/
		5	23330	793	25	MID	-0.47	0.288	21.64	22.00	1.086	0.313	/
	Vertical-Front	5	23330	793	1	MID	4.61	0.311	22.50	23.00	1.122	0.349	/
		5	23330	793	25	MID	-1.23	0.220	21.64	22.00	1.086	0.239	/
	Vertical-Back	5	23330	793	1	MID	1.48	0.362	22.50	23.00	1.122	0.406	/
		5	23330	793	25	MID	-0.77	0.281	21.64	22.00	1.086	0.305	/
	Tip	5	23330	793	1	MID	-0.65	0.009	22.50	23.00	1.122	0.010	/
		5	23330	793	25	MID	-1.16	0.008	21.64	22.00	1.086	0.009	/

Note1: Refer to ANNEX C for the detailed test data for each test configuration.

Note2: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note3: The USB cable length about 21cm.

10.9LTE Band 17 (10MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)													
QPSK	Horizontal-Up	5	23800	711	1	MID	0.37	0.304	22.76	23.00	1.057	0.321	5
		5	23780	709	25	LOW	-0.40	0.245	21.73	22.00	1.064	0.261	5
	Horizontal-Down	5	23800	711	1	MID	1.39	0.313	22.76	23.00	1.057	0.331	5
		5	23780	709	1	MID	-2.03	0.234	22.56	23.00	1.107	0.259	5
		5	23790	710	1	MID	1.15	0.237	22.64	23.00	1.086	0.257	5
		5	23780	709	25	LOW	-0.79	0.221	21.73	22.00	1.064	0.235	5
	Vertical-Front	5	23800	711	1	MID	-2.70	0.182	22.76	23.00	1.057	0.192	5
		5	23780	709	25	LOW	-1.77	0.138	21.73	22.00	1.064	0.147	5
	Vertical-Back	5	23800	711	1	MID	-0.20	0.200	22.76	23.00	1.057	0.211	5
		5	23780	709	25	LOW	-1.95	0.142	21.73	22.00	1.064	0.151	5
	Tip	5	23800	711	1	MID	3.38	0.013	22.76	23.00	1.057	0.014	5
		5	23780	709	25	LOW	-1.53	0.011	21.73	22.00	1.064	0.012	5

Note1: Refer to ANNEX C for the detailed test data for each test configuration.

Note2: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note[3]: The USB cable length about 21cm.

10.10 LTE Band 66 (20MHz Bandwidth)

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Numb.	RB Start	Power Drift (%)	Meas. SAR1 g (W/Kg)	Meas. Power (dBm)	Max. tune-up Power (dBm)	Scaling Factor	1 g Scaled SAR (W/Kg)	Meas. No.
Body (5mm)													
QPSK	Horizontal-Up	5	132322	1745	1	MID	-2.72	1.109	22.74	23.00	1.062	1.177	/
		5	132072	1720	1	MID	-2.15	0.972	22.72	23.00	1.067	1.037	/
		5	132572	1770	1	HIGH	-2.13	1.165	22.67	23.00	1.079	**1.257**	10#
		5	132072	1720	50	MID	-2.66	0.700	21.57	22.00	1.104	0.773	/
		5	132322	1745	100	LOW	-1.09	0.827	21.49	22.00	1.125	0.930	/
	Horizontal-Down	5	132322	1745	1	MID	-3.79	0.384	22.74	23.00	1.062	0.408	/
		5	132072	1720	50	MID	-1.67	0.256	21.57	22.00	1.104	0.283	/
	Vertical-Front	5	132322	1745	1	MID	-1.72	0.861	22.74	23.00	1.062	0.914	/
		5	132072	1720	1	MID	-1.55	0.704	22.72	23.00	1.067	0.751	/
		5	132572	1770	1	HIGH	-3.52	0.640	22.67	23.00	1.079	0.691	/
		5	132072	1720	50	MID	0.52	0.551	21.57	22.00	1.104	0.608	/
		5	132322	1745	100	LOW	-0.97	0.601	21.49	22.00	1.125	0.676	/
	Vertical-Back	5	132322	1745	1	MID	-3.36	0.728	22.74	23.00	1.062	0.773	/
		5	132072	1720	50	MID	-2.72	0.431	21.57	22.00	1.104	0.476	/
	Tip	5	132322	1745	1	MID	-2.55	0.042	22.74	23.00	1.062	0.045	/
		5	132072	1720	50	MID	-2.73	0.031	21.57	22.00	1.104	0.034	/

Note[1]: Refer to ANNEX C for the detailed test data for each test configuration.

Note[2]: This DUT used laptop as an assistant to help to setup communication , direct laptop plug-in for Horizontal-Up, Horizontal-Down，Vertical-Front and Tip positions，USB cable plug-in for Vertical-Back position.

Note[3]: The USB cable length about 21cm.

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
1750	WCDMA Band 4	Body	Horizontal-Up	1.189	Yes	1.158	1.03
	LTE Band 4	Body	Horizontal-Up	1.064	Yes	0.974	1.09
	LTE Band 66	Body	Horizontal-Up	1.165	Yes	1.158	1.01
1900	WCDMA Band 2	Body	Horizontal-Up	1.058	Yes	1.044	1.01
	LTE Band 2	Body	Horizontal-Up	1.154	Yes	1.062	1.09
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

The EUT has only one antenna for WCDMA and LTE, and can't transmit simultaneously, so simultaneous transmission evaluation is not required in this report.

13 TEST EQUIPMENTS LIST

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
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
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	2019/10/27	2020/10/26
Power Sensor	R&S	NRV-Z4	100381	2019/10/27	2020/10/26
Power Sensor	R&S	NRV-Z2	100211	2019/10/27	2020/10/26
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	2018/11/05	2019/11/04
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
Phantom 1	SATIMO	SAM	SN 30/13 SAM103	N/A	N/A
Phantom 2	SATIMO	SAM	SN 30/13 SAM104	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: For dipole antennas, BALUN has adopted 3 years as calibration intervals, and 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 (%)
2019.10.31	Body	750	21.3	0.96	54.79	0.96	55.53	0.00	-1.33
2019.11.01	Body	835	21.5	0.96	56.08	0.97	55.20	-1.03	1.59
2019.10.28	Body	1800	21.4	1.52	52.09	1.52	53.30	0.00	-2.27
2019.10.29	Body	1800	21.4	1.51	53.31	1.52	53.30	-0.66	0.02
2019.10.30	Body	1900	21.3	1.51	53.41	1.52	53.30	-0.66	0.21
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).

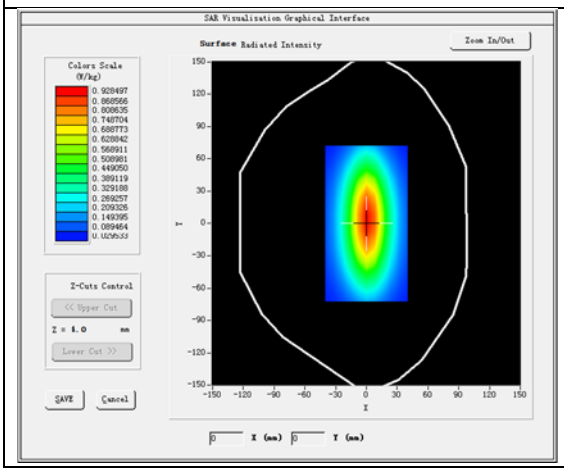
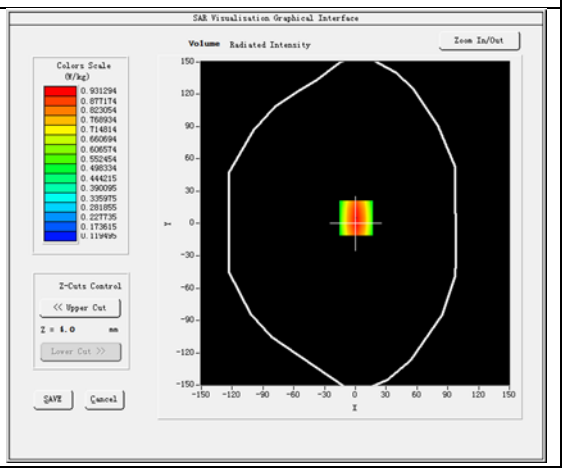
Date	Liquid Type	Freq. (MHz)	Power (mW)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Dipole SAR (W/kg)	Tolerance (%)	Targeted SAR(W/kg)	Tolerance (%)
2019.10.31	Body	750	100	0.893	8.93	8.59	3.96	8.49	5.18
2019.11.01	Body	835	100	0.965	9.65	9.78	-1.33	9.56	0.94
2019.10.28	Body	1800	100	3.945	39.45	38.90	1.41	38.40	2.73
2019.10.29	Body	1800	100	3.893	38.93	38.90	0.08	38.40	1.38
2019.10.30	Body	1900	100	4.026	40.26	40.01	0.62	39.70	1.41
Note: The tolerance limit of System validation ±10%.									

System Performance Check Data(750 MHz Body)

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: 2019.10.31
Measurement duration: 13 minutes 26 seconds

Experimental conditions.

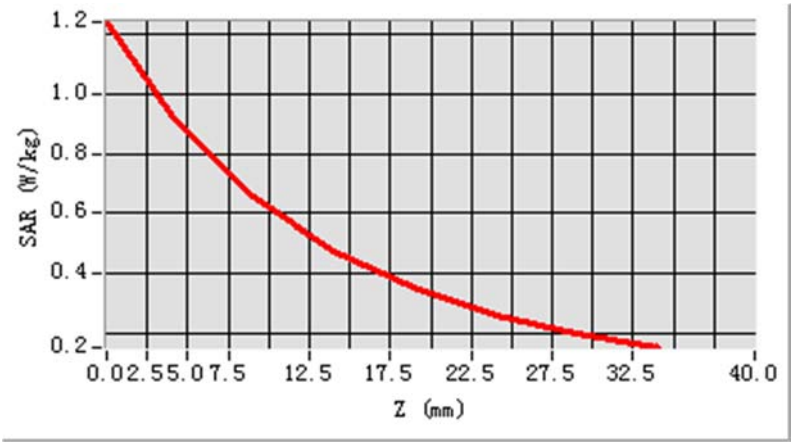
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	750MHz
Signal	CW
Frequency (MHz)	750.000000
Relative permittivity (real part)	54.788739
Conductivity (S/m)	0.963268
Power drift (%)	-2.890000
Ambient Temperature:	22.7°C
Liquid Temperature:	21.3°C
ConvF:	1.96
Crest factor:	1:1

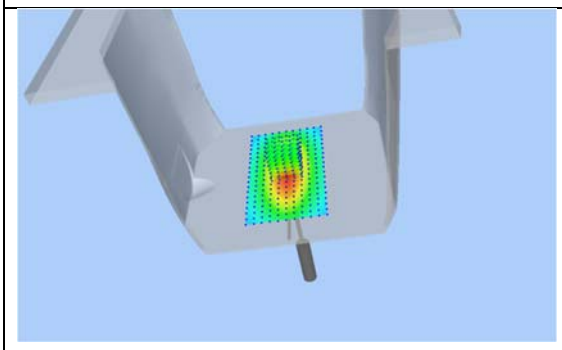
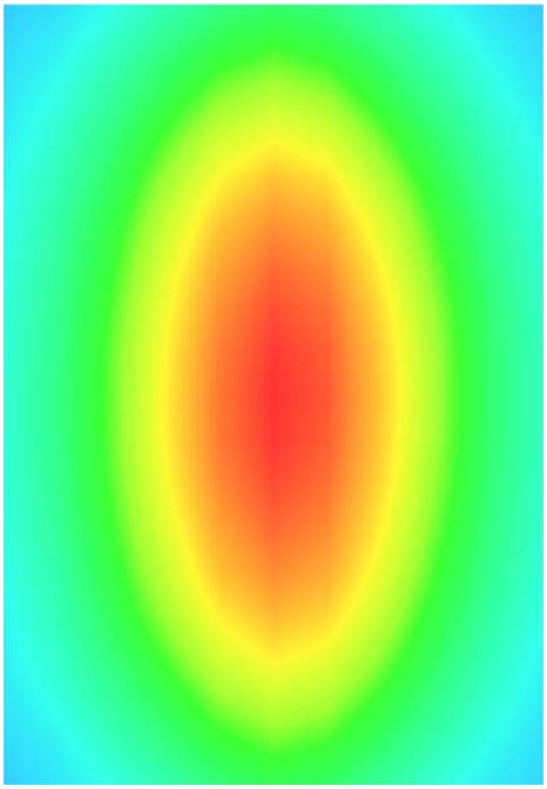
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=5.00
SAR Peak: 1.24 W/kg

SAR 10 g (W/Kg)	0.600718
SAR 1g (W/Kg)	0.893236

Z Axis Scan



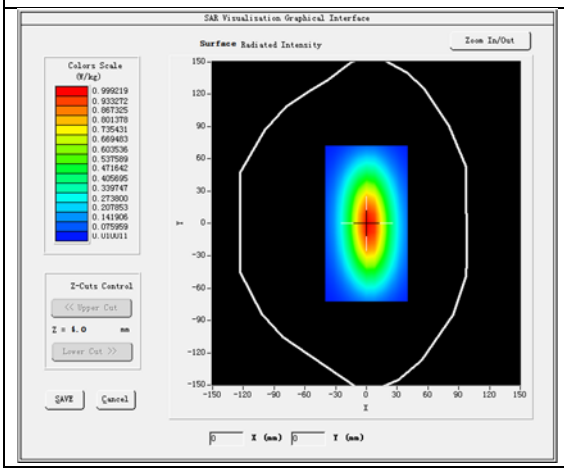
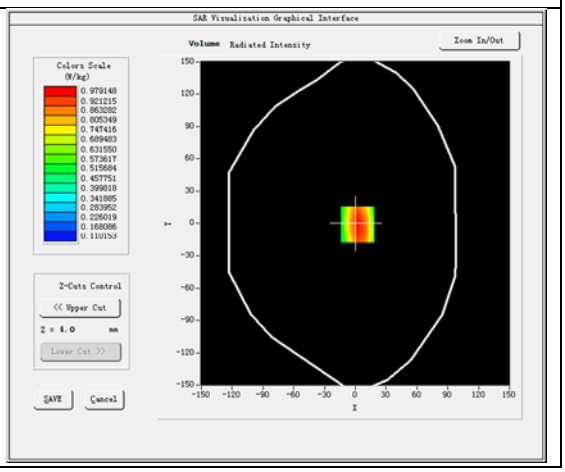
3D screen shot	Hot spot position
	

System Performance Check Data(835 MHz Body)

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: 2019.11.01
Measurement duration: 13 minutes 50 seconds

Experimental conditions.

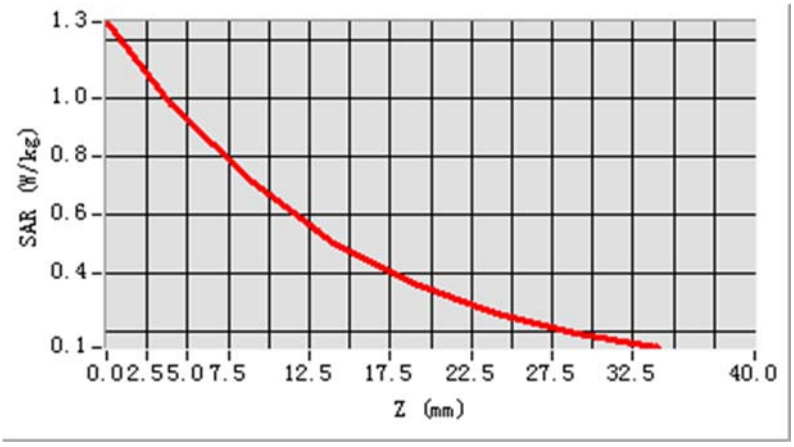
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	835MHz
Signal	CW
Frequency (MHz)	835.000000
Relative permittivity (real part)	56.081810
Conductivity (S/m)	0.962508
Power drift (%)	-0.070000
Ambient Temperature:	22.7°C
Liquid Temperature:	21.5°C
ConvF:	1.98
Crest factor:	1:1

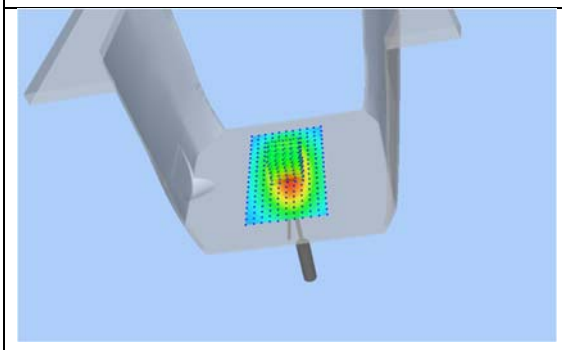
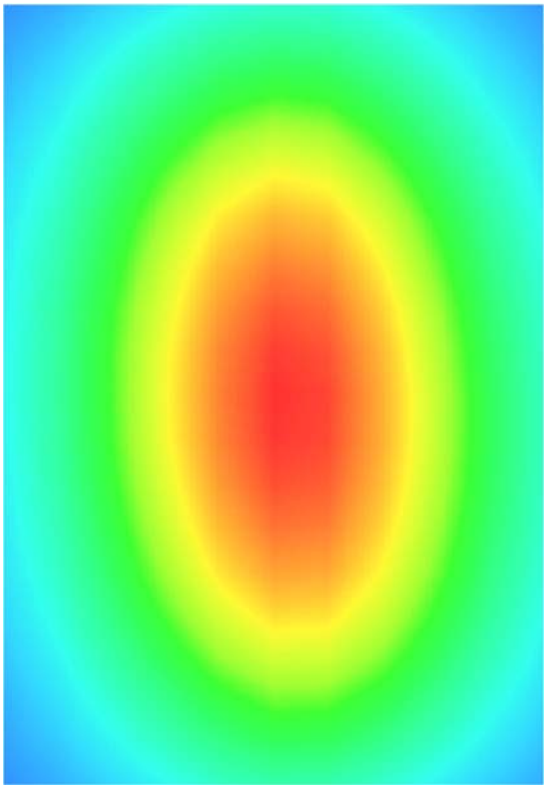
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=-1.00
SAR Peak: 1.23 W/kg

SAR 10 g (W/Kg)	0.645304
SAR 1g (W/Kg)	0.965446

Z Axis Scan



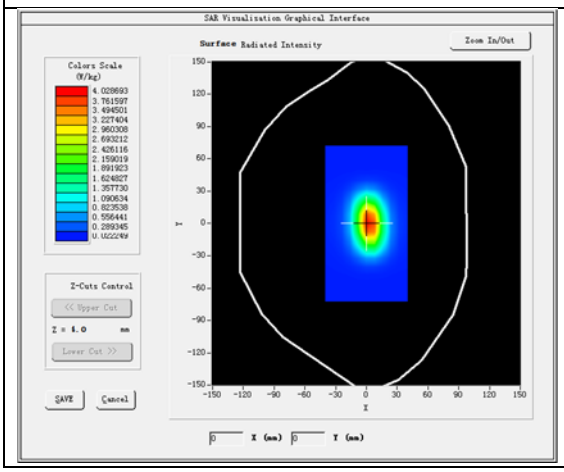
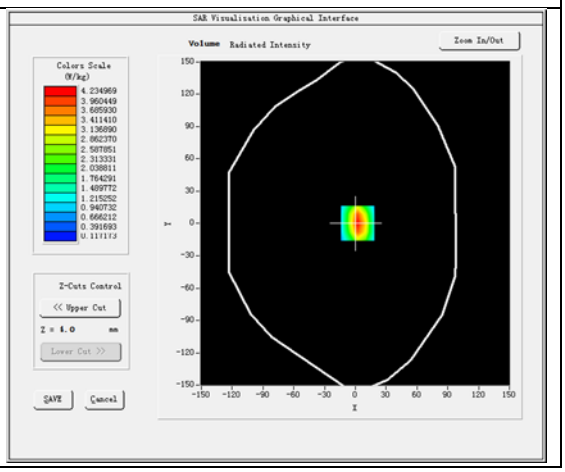
3D screen shot	Hot spot position
	

System Performance Check Data(1800MHz Body)

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: 2019.10.28
Measurement duration: 13 minutes 59 seconds

Experimental conditions.

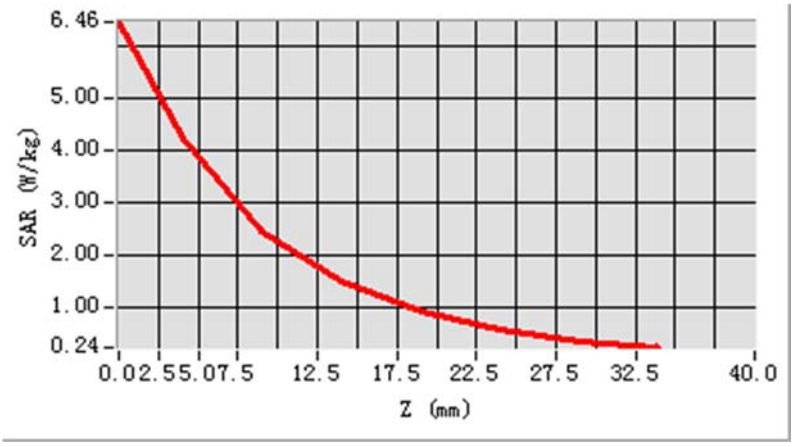
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	1800MHz
Signal	CW
Frequency (MHz)	1800.000000
Relative permittivity (real part)	52.093700
Conductivity (S/m)	1.519480
Power drift (%)	-0.640000
Ambient Temperature:	22.6°C
Liquid Temperature:	21.4°C
ConvF:	2.25
Crest factor:	1:1

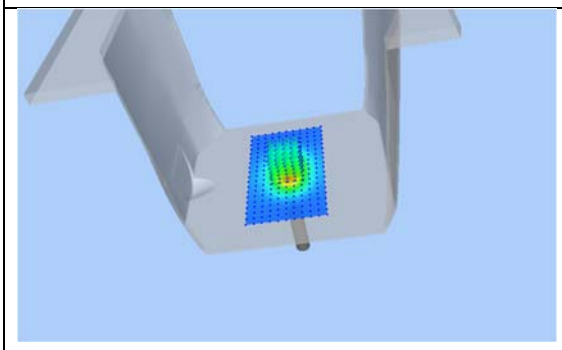
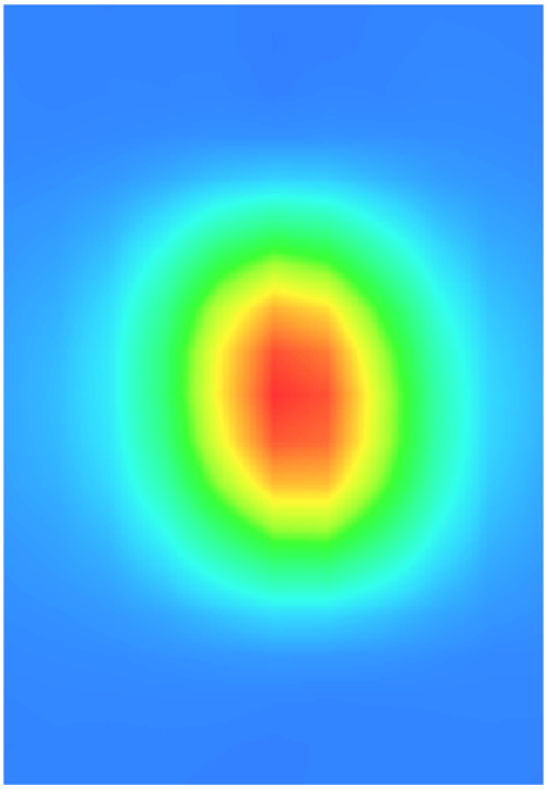
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=0.00
SAR Peak: 6.44 W/kg

SAR 10 g (W/Kg)	2.096133
SAR 1g (W/Kg)	3.945247

Z Axis Scan



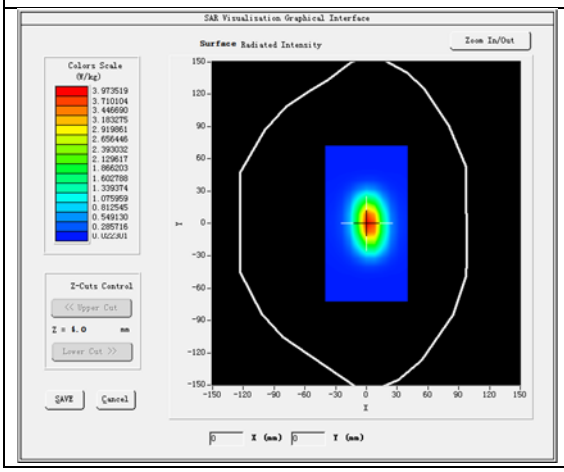
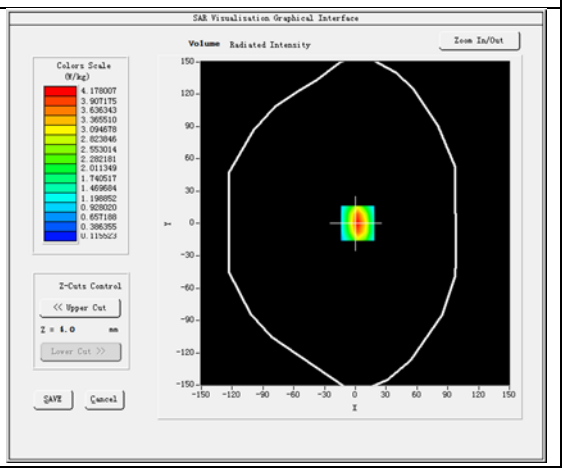
3D screen shot	Hot spot position
	

System Performance Check Data(1800MHz Body)

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: 2019.10.29
Measurement duration: 14 minutes 3 seconds

Experimental conditions.

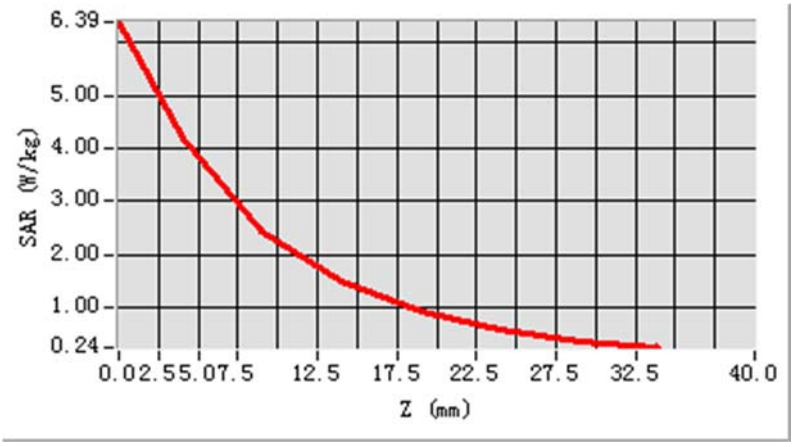
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	1800MHz
Signal	CW
Frequency (MHz)	1800.000000
Relative permittivity (real part)	53.313325
Conductivity (S/m)	1.512474
Power drift (%)	-0.450000
Ambient Temperature:	22.5°C
Liquid Temperature:	21.4°C
ConvF:	2.25
Crest factor:	1:1

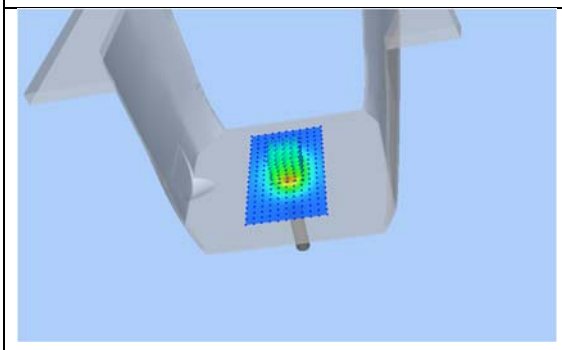
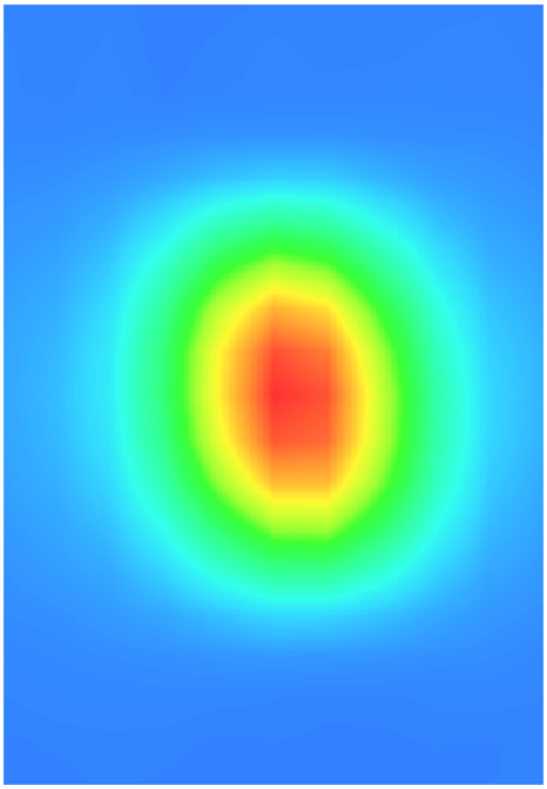
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=0.00
SAR Peak: 6.36 W/kg

SAR 10 g (W/Kg)	2.064874
SAR 1g (W/Kg)	3.892542

Z Axis Scan



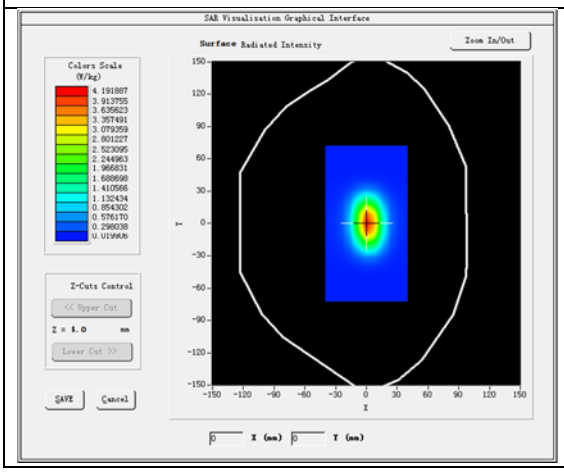
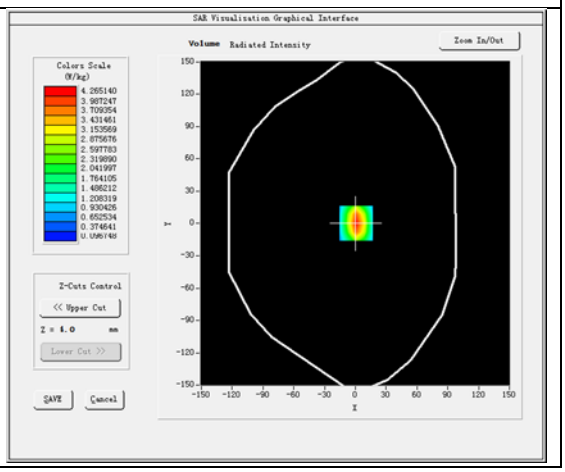
3D screen shot	Hot spot position
	

System Performance Check Data(1900MHz Body)

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: 2019.10.30
Measurement duration: 13 minutes 52 seconds

Experimental conditions.

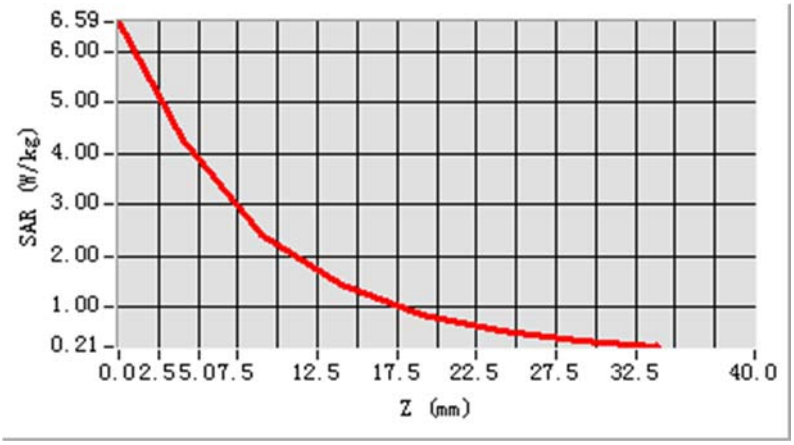
Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Band	1900MHz
Signal	CW
Frequency (MHz)	1900.000000
Relative permittivity (real part)	53.413309
Conductivity (S/m)	1.512982
Power drift (%)	-0.350000
Ambient Temperature:	22.8°C
Liquid Temperature:	21.3°C
ConvF:	2.57
Crest factor:	1:1

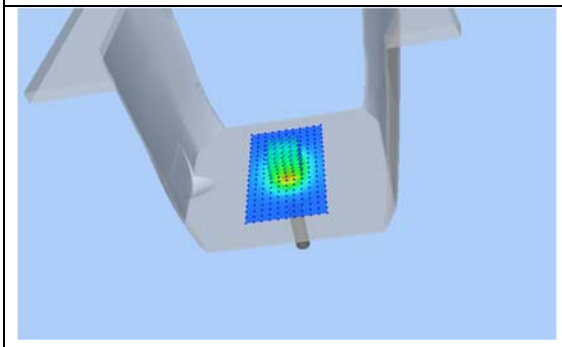
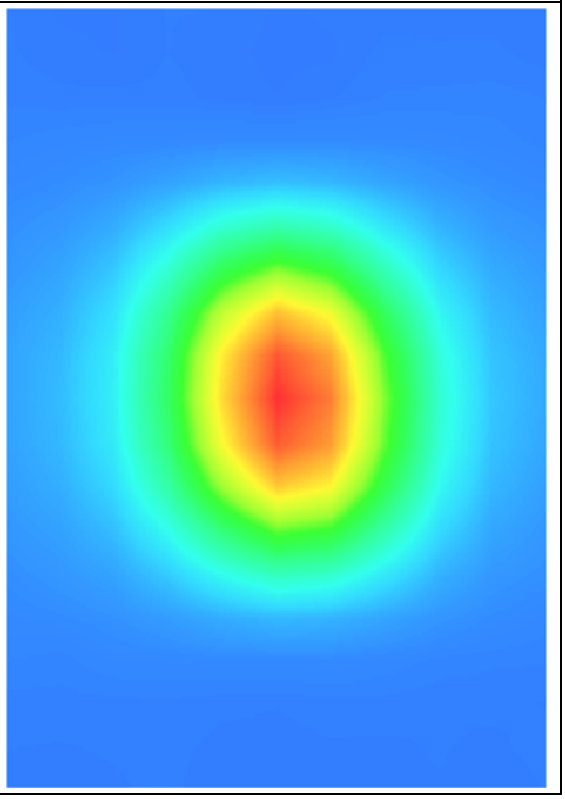
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=0.00
SAR Peak: 6.55W/kg

SAR 10g (W/Kg)	2.069685
SAR 1g (W/Kg)	4.025944

Z Axis Scan



3D screen shot	Hot spot position
	

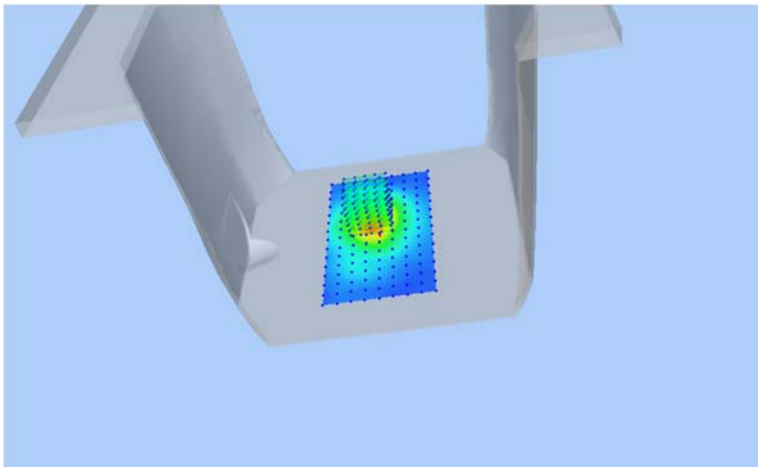
ANNEX C TEST DATA

MEAS. 1 Body Plane with Horizontal Up 5mm on Low Channel in WCDMA

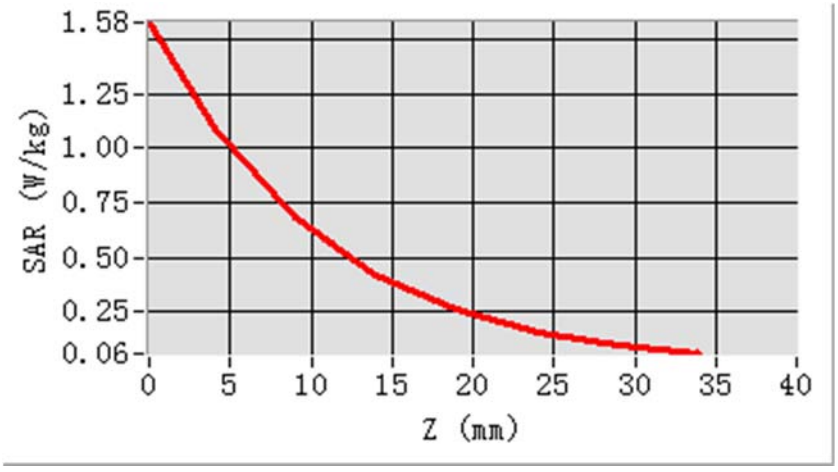
Band 2 mode

Test Date:	30/10/2019
Measurement duration:	10 minutes 37 seconds
Signal:	WCDMA, f=1852.4 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 53.98; Conductivity: 1.49 S/m
Test condition:	Ambient Temperature: 22.8°C, Liquid Temperature: 21.3°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=18.000000
SAR 10g (W/Kg):	0.581395
SAR 1g (W/Kg):	1.057860
Power drift (%):	-1.77

3D screen shot



Z Axis Scan

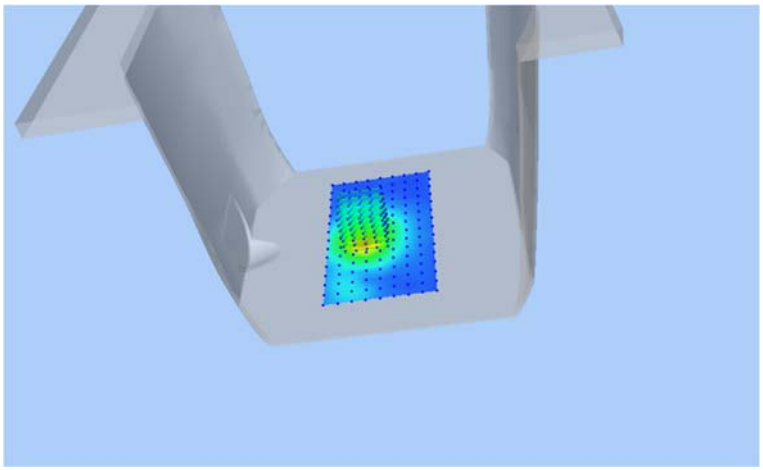


MEAS. 2 Body Plane with Horizontal Up 5mm on Middle Channel in WCDMA

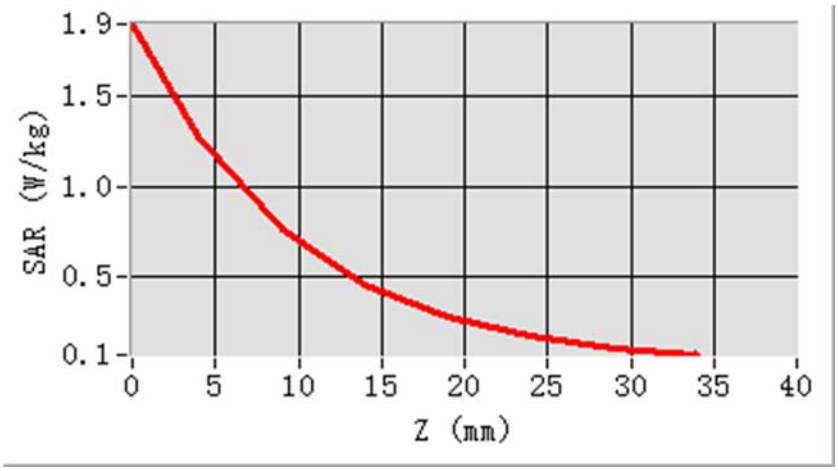
Band 4 mode

Test Date:	28/10/2019
Measurement duration:	10 minutes 50 seconds
Signal:	WCDMA, f=1732.4 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 52.83; Conductivity: 1.45 S/m
Test condition:	Ambient Temperature: 22.6°C, Liquid Temperature: 21.4°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):	0.630197
SAR 1g (W/Kg):	1.189464
Power drift (%):	0.34

3D screen shot



Z Axis Scan

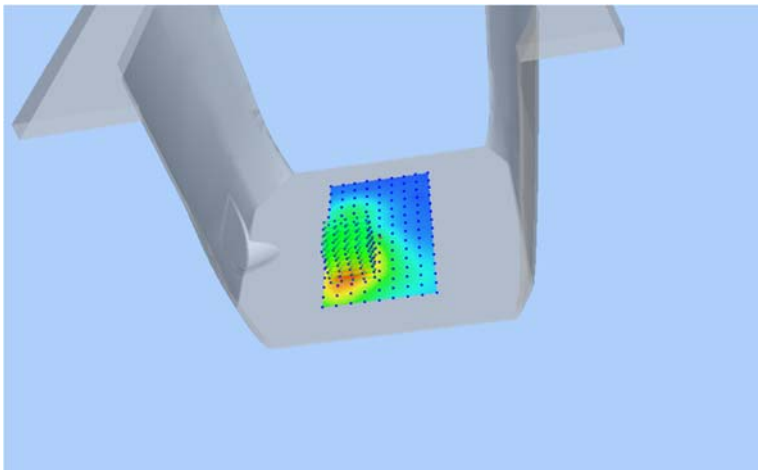


MEAS. 3 Body Plane with Horizontal Down 5mm on High Channel in WCDMA

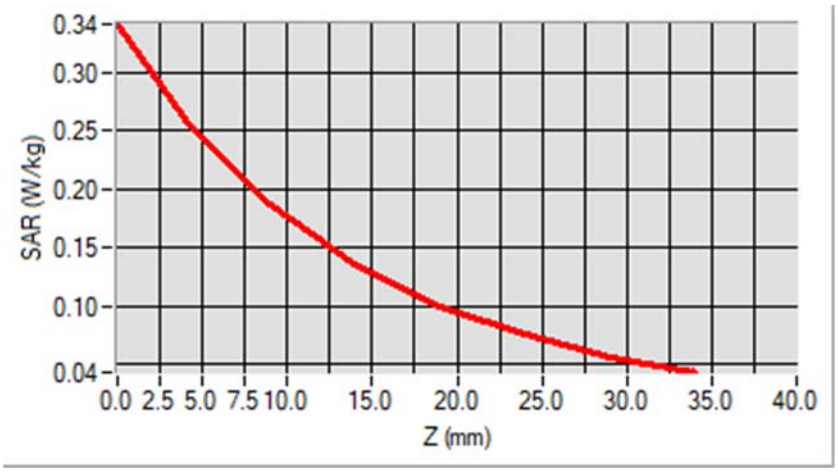
Band 5 mode

Test Date:	1/11/2019
Measurement duration:	10 minutes 28 seconds
Signal:	WCDMA, f=846.6 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 55.67; Conductivity: 0.97 S/m
Test condition:	Ambient Temperature: 22.7°C, Liquid Temperature: 21.5°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 1.98
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=-32.000000
SAR 10g (W/Kg):	0.165995
SAR 1g (W/Kg):	0.248528
Power drift (%):	1.79

3D screen shot



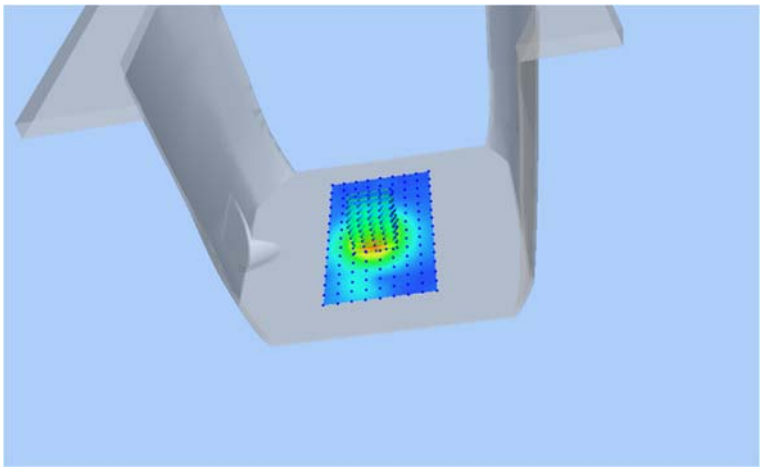
Z Axis Scan



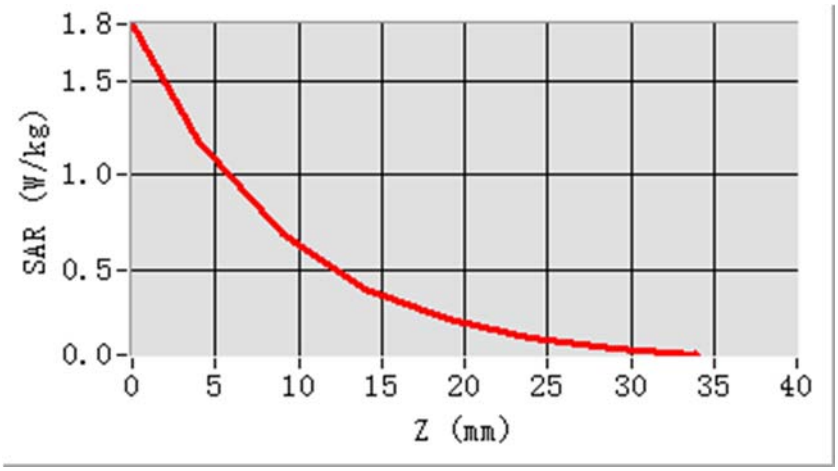
MEAS. 4 Body Plane with Horizontal Up 5mm on Middle Channel in LTE Band 2 mode with 1RB

Test Date:	30/10/2019
Measurement duration:	11 minutes 9 seconds
Signal:	LTE, f=1880.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 53.65; Conductivity: 1.50 S/m
Test condition:	Ambient Temperature: 22.8°C, Liquid Temperature: 21.3°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=0.000000, Y=-2.000000
SAR 10g (W/Kg):	0.603927
SAR 1g (W/Kg):	1.153544
Power drift (%):	1.74

3D screen shot



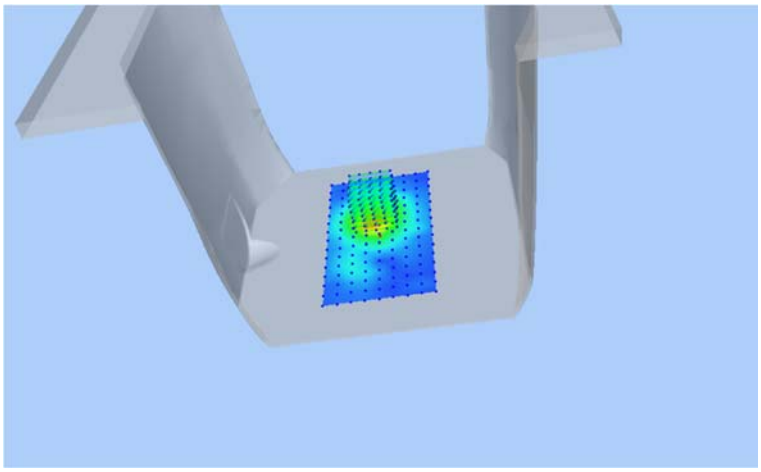
Z Axis Scan



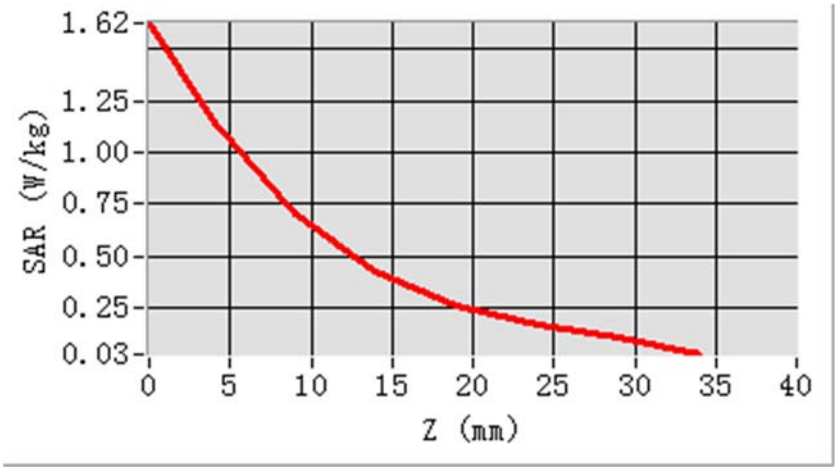
MEAS. 5 Body Plane with Horizontal Up 5mm on Low Channel in LTE Band 4 mode with 1RB

Test Date:	29/10/2019
Measurement duration:	11 minutes 17 seconds
Signal:	LTE, f=1720.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 54.17; Conductivity: 1.44 S/m
Test condition:	Ambient Temperature: 22.5°C, Liquid Temperature: 21.4°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=0.000000, Y=18.000000
SAR 10g (W/Kg):	0.573033
SAR 1g (W/Kg):	1.063942
Power drift (%):	-1.02

3D screen shot



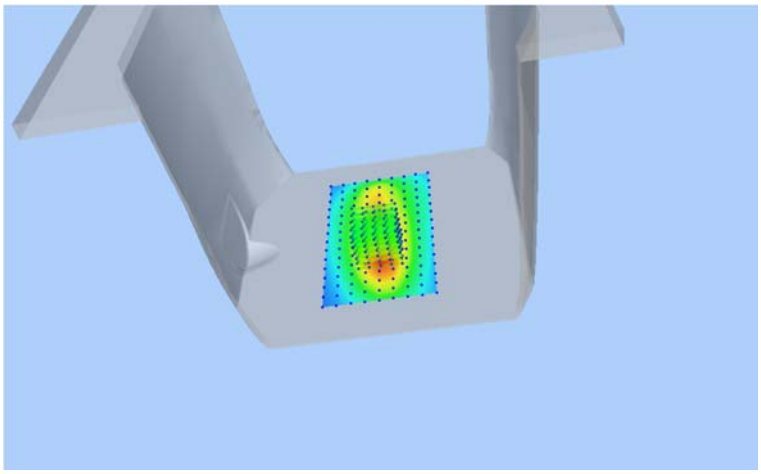
Z Axis Scan



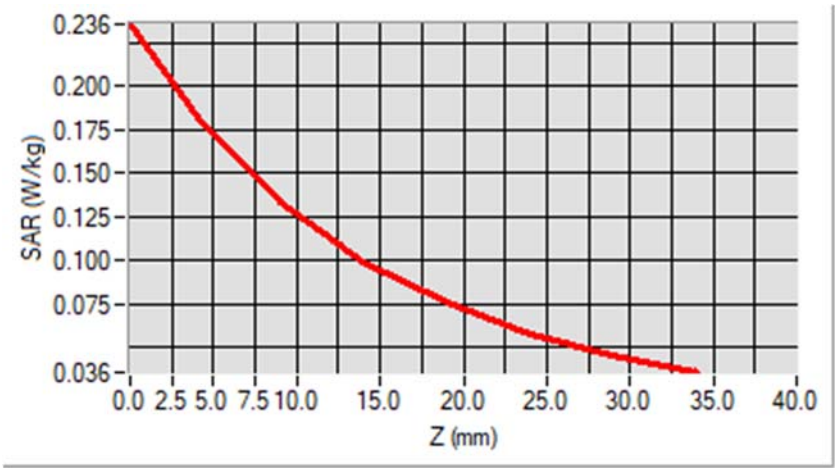
MEAS. 6 Body Plane with Horizontal Up 5mm on Low Channel in LTE Band 5 mode with 1RB

Test Date:	1/11/2019
Measurement duration:	12 minutes 19 seconds
Signal:	LTE, f=829.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 56.29; Conductivity: 0.95 S/m
Test condition:	Ambient Temperature: 22.7°C, Liquid Temperature: 21.5°C
Probe:	SN 34/15 SSE2 EPGO265, ConvF: 1.98
Area Scan:	sam_direct_droit2_surf10mm.txt, h= 5.00 mm
Zoom Scan:	5x5x7,dx=8mm, dy=8mm, dz=5mm,Complete
Maximum location:	X=0.000000, Y=-22.000000
SAR 10g (W/Kg):	0.120941
SAR 1g (W/Kg):	0.174901
Power drift (%):	-0.94

3D screen shot



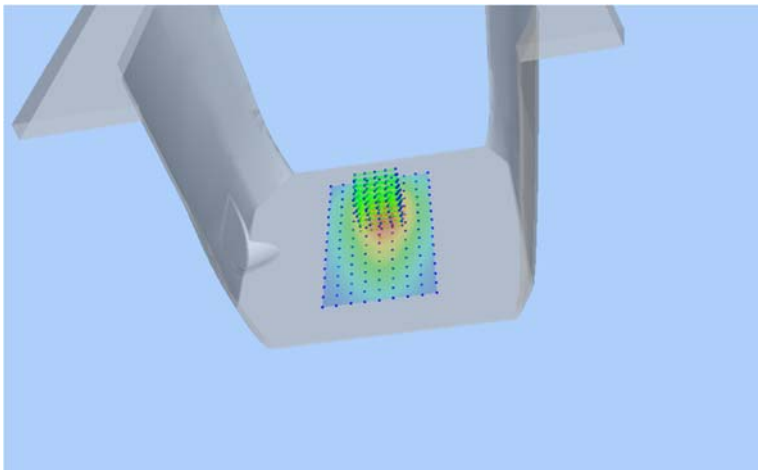
Z Axis Scan



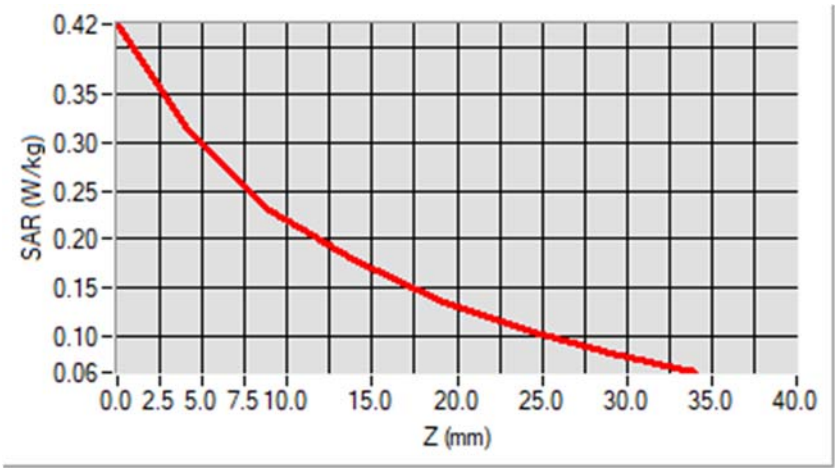
MEAS. 7 Body Plane with Horizontal Up 5mm on High Channel in LTE Band 12 mode with 1RB

Test Date:	31/10/2019
Measurement duration:	12 minutes 33 seconds
Signal:	LTE, f=711.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 55.91; Conductivity: 0.95 S/m
Test condition:	Ambient Temperature: 22.7°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=0.000000, Y=18.000000
SAR 10g (W/Kg):	0.222680
SAR 1g (W/Kg):	0.326777
Power drift (%):	-2.05

3D screen shot



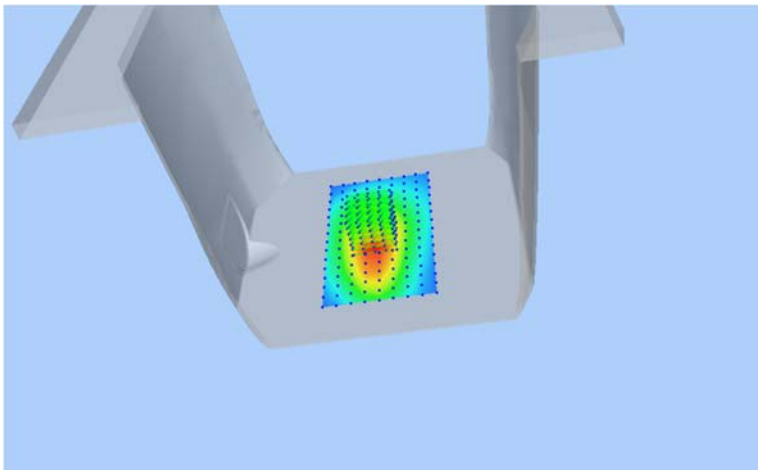
Z Axis Scan



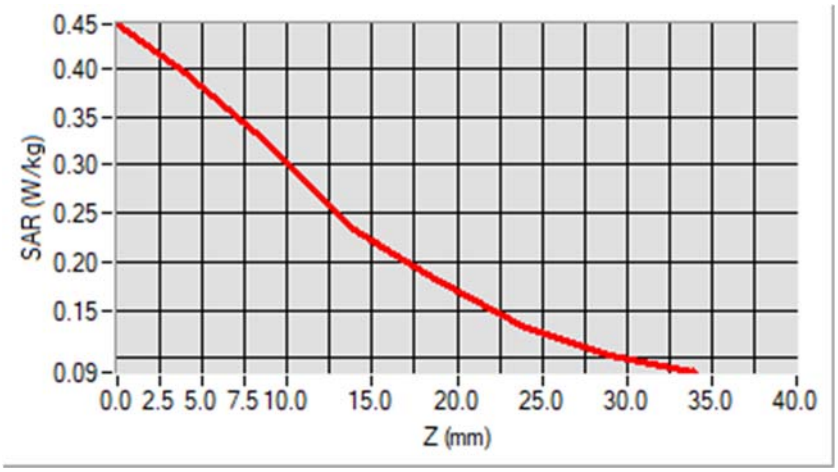
MEAS. 8 Body Plane with Horizontal Up 5mm on Middle Channel in LTE Band 14 mode with 1RB

Test Date:	31/10/2019
Measurement duration:	11 minutes 50 seconds
Signal:	LTE, f=793.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 53.71; Conductivity: 0.97 S/m
Test condition:	Ambient Temperature: 22.7°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=0.000000, Y=-2.000000
SAR 10g (W/Kg):	0.273774
SAR 1g (W/Kg):	0.391179
Power drift (%):	3.18

3D screen shot



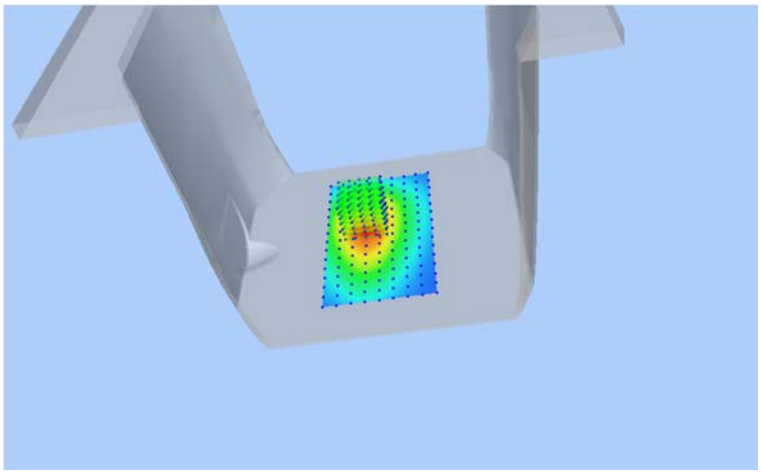
Z Axis Scan



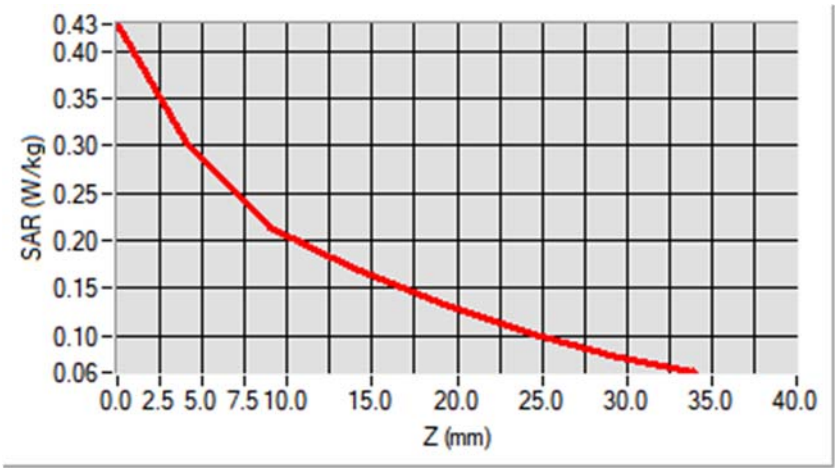
MEAS. 9 Body Plane with Horizontal Down 5mm on High Channel in LTE Band 17 mode with 1RB

Test Date:	31/10/2019
Measurement duration:	10 minutes 37 seconds
Signal:	LTE, f=711.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 55.91; Conductivity: 0.95 S/m
Test condition:	Ambient Temperature: 22.7°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=-10.000000, Y=18.000000
SAR 10g (W/Kg):	0.209507
SAR 1g (W/Kg):	0.313158
Power drift (%):	1.39

3D screen shot



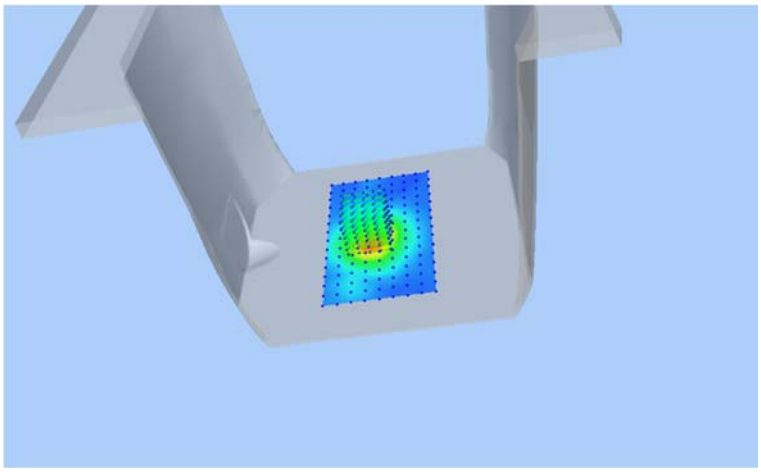
Z Axis Scan



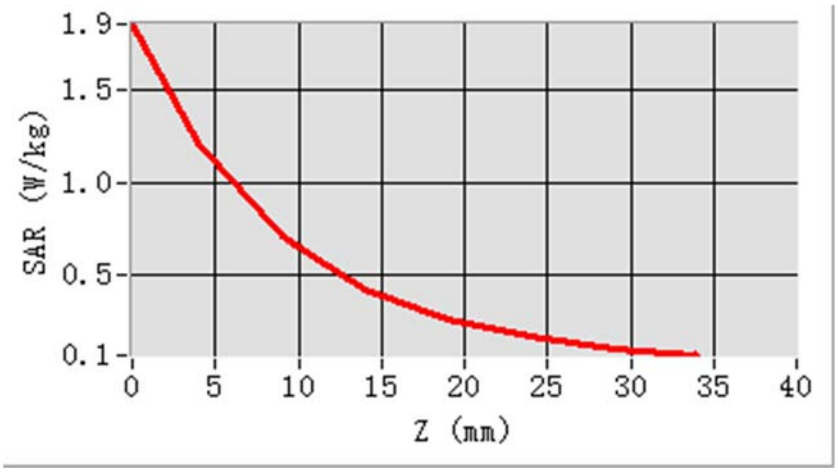
MEAS. 10 Body Plane with Horizontal Up 5mm on High Channel in LTE Band 66 mode with 1RB

Test Date:	29/10/2019
Measurement duration:	10 minutes 23 seconds
Signal:	LTE, f=1770.0 MHz, Duty Cycle: 1:1.0
Liquid Parameters:	Permittivity: 53.64; Conductivity: 1.48 S/m
Test condition:	Ambient Temperature: 22.5°C, Liquid Temperature: 21.4°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):	0.611474
SAR 1g (W/Kg):	1.165001
Power drift (%):	-2.13

3D screen shot



Z Axis Scan



ANNEX D EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ19A0286-AW.pdf”.

ANNEX E SAR TEST SETUP PHOTOS

Please refer the document “BL-SZ19A0286-AS.pdf”.

ANNEX F CALIBRATION REPORT

Please refer the document “CALIBRATION REPORT.pdf”.

--END OF REPORT--