FCC SAR Test Report

Product	:	Mobile Phone
Trade mark	:	LeEco
Model/Type reference	:	Le X522
Report Number	:	1611100482SAR-1
Date of Issue	:	Nov. 29, 2016
FCC ID	:	2AFWMLEX522
Test Standards	:	FCC 47 CFR Part 2 (2.1093) IEEE C95.1:1992 IEEE 1528:2013
Test result	:	PASS

Prepared for:

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Version

Version No.	Date	Description
V1.0	Nov. 29, 2016	Original

Contents

1 General Information

1.1 Statement of Compliance

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

Equipment Class	Mode	Highest Reported Head SAR_{1g} (W/kg)	Highest Reported Body-worn SAR_{1g} (1.5 cm Gap) (W/kg)	Highest Reported Hotspot SAR_{1g} (1.0 cm Gap) (W/kg)	Highest Reported Extremity SAR_{10g} (0 cm Gap) (W/kg)
PCE	GSM850	0.21	0.16	0.19	N/A
	GSM1900	0.13	0.43	0.66	N/A
	WCDMA II	0.16	0.68	0.95	N/A
	WCDMA IV	0.11	0.26	1.01	N/A
	WCDMA V	0.21	0.15	0.21	N/A
	LTE 2	0.11	0.40	1.10	N/A
	LTE 4	0.09	0.28	0.96	N/A
	LTE 5	0.18	0.11	0.21	N/A
	LTE 7	0.13	0.42	0.72	N/A
	LTE 12	0.16	0.14	0.20	N/A
	LTE 17	0.15	0.14	0.21	N/A
DTS	2.4G WLAN	1.13	0.17	0.29	N/A
NII	5.2G WLAN	N/A	N/A	N/A	N/A
	5.3G WLAN	1.13	0.28	N/A	1.04
	5.6G WLAN	1.19	0.31	N/A	1.05
	5.8G WLAN	1.05	0.48	N/A	1.69
DSS	Bluetooth	0.22	N/A	N/A	N/A
Highest Simultaneous Transmission SAR		Head (W/kg)	Body-worn (W/kg)	Hotspot (W/kg)	Extremity (W/kg)
PCE + DTS		1.32	0.72	1.10	N/A
PCE + NII		1.38	1.16	N/A	1.69
PCE + DSS		0.41	0.82	N/A	N/A

1.2 EUT Description

1.2.1 General Description

Product Name	Mobile Phone
Trade mark	LeEco
Model No.(EUT)	Le X522
FCC ID	2AFWMLEX522
Device Dimension	Overall (Length × Width) : 150mm × 74mm
	Overall Diagonal : 162mm
	Display Diagonal : 145mm
Tx Frequency Bands (Unit: MHz)	GSM850 : 824.2 ~ 848.8
	GSM1900 : 1850.2 ~ 1909.8
	WCDMA Band II : 1852.4 ~ 1907.6
	WCDMA Band IV : 1712.4 ~ 1752.6
	WCDMA Band V : 826.4 ~ 846.6
	LTE Band 2 : 1850.7 ~ 1909.3 (1.4M), 1851.5 ~ 1908.5 (3M), 1852.5 ~ 1907.5 (5M), 1855 ~ 1905 (10M), 1857.5 ~ 1902.5 (15M), 1860 ~ 1900 (20M)
	LTE Band 4 : 1710.7 ~ 1754.3 (1.4M), 1711.5 ~ 1753.5 (3M), 1712.5 ~ 1752.5 (5M), 1715 ~ 1750 (10M), 1717.5 ~ 1747.5 (15M), 1720 ~ 1745 (20M)
	LTE Band 5 : 824.7 ~ 848.3 (1.4M), 825.5 ~ 847.5 (3M), 826.5 ~ 846.5 (5M), 829 ~ 844 (10M)
	LTE Band 7 : 2502.5 ~ 2567.5 (5M), 2505 ~ 2565 (10M), 2507.5 ~ 2562.5 (15M), 2510 ~ 2560 (20M)
	LTE Band 12 : 699.7 ~ 715.3 (1.4M), 700.5 ~ 714.5 (3M), 701.5 ~ 713.5 (5M), 704 ~ 711 (10M)
	LTE Band 17 : 706.5 ~ 713.5 (5M), 709 ~ 711 (10M)
	WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825
	Bluetooth : 2402 ~ 2480
Device Class	B
Antenna Type	Fixed Internal Antenna
EUT Stage	Identical Prototype
Declaration of Differences	SAR testing of LTE 2 hotspot mode, WLAN and BT was verified based on the worst case SAR configuration of the original SAR report with report No. RXA1604-0079SAR01R3, after comparing the worst case result in the original report and this report for different mode of each band, the larger one will be used in chapter 1.1 and 4.6, which is more conservative. The differences compared with original report are changing the antenna supplier, antenna layout and antenna matching of GPS/BT/WLAN 3 to 1 antenna, and changing the tune up from 20.5dBm to 16.5dbm of LTE 2 hotspot mode, and changing the tune up from 14.0dBm to 11.0dbm of 5.6G WLAN Call on mode.

1.2.2 Wireless Technologies

GSM	Voice
	GPRS (Multi-Slot Class : 12-4UP)
	EDGE (Multi-Slot Class : 12-4UP)
WCDMA	RMC
	HSDPA
	HSUPA
	DC-HSDPA
	HSPA+
LTE	QPSK
	16QAM
	Rel. 10 CA (1 Uplink and 2 Downlinks)
2.4G WLAN	802.11b
	802.11g
	802.11n (HT20/HT40)
5G WLAN	802.11a
	802.11n (HT20/HT40)
	802.11ac (VHT20/VHT40/VHT80)
Bluetooth	GFSK π/4-DQPSK 8-DPSK LE
Power Reduction	Hotspot
	5G WLAN : Call on
Wireless Router (Hotspot)	2.4G WLAN : Support
	5G WLAN : Not Support
Dual SIM	SIM 1 : GSM + WCDMA + LTE
	SIM 2 : GSM + WCDMA + LTE
	Note : This device support dual SIM but they share the same antenna. Since these two SIM are used for subscriber identification only and it is not related to RF identity, only SIM1 was used for SAR testing.

1.2.3 List of Accessory

Battery	**Brand Name**	SCUD
	Model Name	LTF21A
	Power Rating	3.83Vdc, 3000mAh
	Type	Li-ion

1.3 Maximum Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	GSM850
GSM (GMSK, 1Tx-slot)	33.0
GPRS (GMSK, 1Tx-slot)	33.0
GPRS (GMSK, 2Tx-slot)	31.0
GPRS (GMSK, 3Tx-slot)	29.0
GPRS (GMSK, 4Tx-slot)	27.5
EDGE (GMSK, 1Tx-slot)	33.0
EDGE (GMSK, 2Tx-slot)	31.0
EDGE (GMSK, 3Tx-slot)	29.0
EDGE (GMSK, 4Tx-slot)	27.5
EDGE (8PSK, 1Tx-slot)	26.5
EDGE (8PSK, 2Tx-slot)	24.5
EDGE (8PSK, 3Tx-slot)	22.5
EDGE (8PSK, 4Tx-slot)	21.5

Mode	GSM1900 (without Power Reduction)	GSM1900 (with Power Reduction)	Power Reduction (dB)
GSM (GMSK, 1Tx-slot)	31.0	30.0	1.0
GPRS (GMSK, 1Tx-slot)	31.0	30.0	1.0
GPRS (GMSK, 2Tx-slot)	28.0	27.0	1.0
GPRS (GMSK, 3Tx-slot)	26.0	25.0	1.0
GPRS (GMSK, 4Tx-slot)	24.5	23.5	1.0
EDGE (GMSK, 1Tx-slot)	31.0	30.0	1.0
EDGE (GMSK, 2Tx-slot)	28.0	27.0	1.0
EDGE (GMSK, 3Tx-slot)	26.0	25.0	1.0
EDGE (GMSK, 4Tx-slot)	24.5	23.5	1.0
EDGE (8PSK, 1Tx-slot)	24.5	23.5	1.0
EDGE (8PSK, 2Tx-slot)	22.5	21.5	1.0
EDGE (8PSK, 3Tx-slot)	20.5	19.5	1.0
EDGE (8PSK, 4Tx-slot)	19.5	18.5	1.0

Mode	WCDMA Band II (without Power Reduction)	WCDMA Band II (with Power Reduction)	Power Reduction (dB)
RMC 12.2K	23.5	19.5	4.0
HSDPA	23.5	19.0	4.5
DC-HSDPA	23.5	19.0	4.5
HSUPA	23.5	19.0	4.5
HSPA+	21.0	21.0	0.0

Mode	WCDMA Band IV (without Power Reduction)	WCDMA Band IV (with Power Reduction)	Power Reduction (dB)
RMC 12.2K	23.5	21.5	2.0
HSDPA	23.5	21.5	2.0
DC-HSDPA	23.5	21.5	2.0
HSUPA	23.5	21.5	2.0
HSPA+	21.5	21.5	0.0

Mode	WCDMA Band V
RMC 12.2K	23.5
HSDPA	23.5
DC-HSDPA	23.5
HSUPA	23.0
HSPA+	21.5

Mode	LTE 2 (without Power Reduction)	LTE 2 (with Power Reduction)	Power Reduction (dB)
QPSK / 16QAM	23.5	16.5	7.0

Mode	LTE 4 (without Power Reduction)	LTE 4 (with Power Reduction)	Power Reduction (dB)
QPSK / 16QAM	23.5	20.5	3.0

Mode	LTE 5
QPSK / 16QAM	23.5

Mode	LTE 7 (without Power Reduction)	LTE 7 (with Power Reduction)	Power Reduction (dB)
QPSK / 16QAM	23.0	19.5	3.5

Mode	LTE 12	LTE 17
QPSK / 16QAM	23.5	23.5

Mode	2.4G WLAN
802.11b	15.0
802.11g	14.5
802.11n HT20	12.0
802.11n HT40	11.0

< Call off >

Mode	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
802.11a	15.0	15.0	15.0	14.0
802.11n HT20	11.0	11.0	11.0	10.0
802.11n HT40	8.5	8.5	8.0	7.5
802.11ac VHT20	13.5	13.5	13.5	11.0
802.11ac VHT40	11.0	11.0	11.0	9.0
802.11ac VHT80	7.0	7.0	7.0	7.0

< Call on >

Mode	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
802.11a	14.0	14.0	11.0	11.0

Mode	2.4G Bluetooth
Bluetooth DH	10.0
Bluetooth 2DH	8.0
Bluetooth 3DH	8.0
Bluetooth LE	2.0

1.4 Other Information

Sample Received Date:	Nov. 15, 2016
Sample tested Date:	Nov. 21, 2016 ~ Nov. 22, 2016

1.5 Testing Location

Sub-contract lab:

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

Address: Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055, P. R. China

Telephone: +86 (0) 755 2662 7338 Fax:+86 (0) 755 2662 7238

Mail: manager@ccic-set.com Website: http://www.ccic-set.com

1.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1659

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

1.7 Guidance Standard

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, ANSI/IEEE C95.1-1992, the following FCC Published RF exposure KDB procedures:

KDB 865664 D01 v01r04
KDB 865664 D02 v01r02
KDB 248227 D01 v02r02
KDB 447498 D01 v06
KDB 648474 D04 v01r03
KDB 941225 D01 v03r01
KDB 941225 D05 v02r05
KDB 941225 D05A v01r02
KDB 941225 D06 v02r01

The equipment have been tested by **CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.**, and found compliance with the requirement of the above standards.

2 Specific Absorption Rate (SAR)

2.1 Introduction

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, by appropriate techniques, to produce specific absorption rates (SARs) as averaged over the whole-body, any 1 g or any 10 g of tissue (defined as a tissue volume in the shape of a cube). All SAR values are to be averaged over any six-minute period. When portable device was used within 20 cm of the user's body, SAR evaluation of the device will be required. The SAR limit in chapter 2.3.

2.2 SAR Definition

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

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be related to the electrical field in the tissue by

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

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

2.3 SAR Limits

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

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

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

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

Note:

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.
2. At frequencies above 6.0 GHz, SAR limits are not applicable and MPE limits for power density should be applied at 5 cm or more from the transmitting device.
3. The SAR limit is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

3 SAR Measurement System

3.1 SATIMO Measurement System

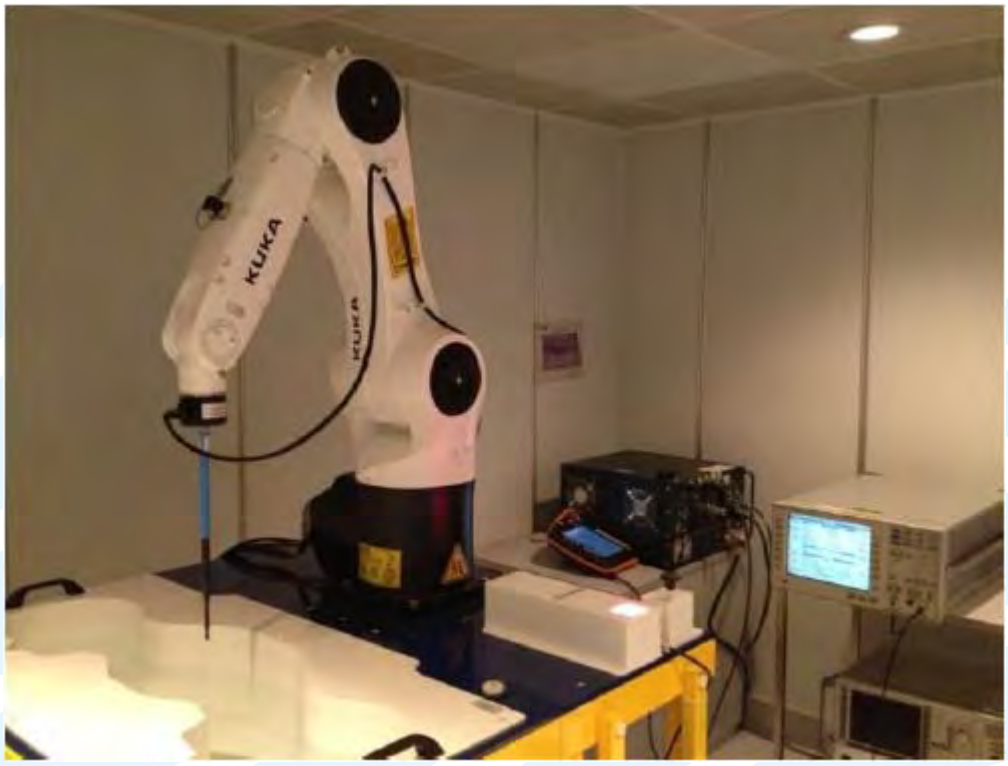


Fig-3.1 SATIMO Measurement System

3.1.1 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SATIMO. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

Fig-3.2 SAM Twin Phantom

3.1.2 Probe Specification

Fig-3.3 Probe

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	700 MHz to 3 GHz; Linearity: ± 0.5 dB (700 MHz to 3 GHz)
Directivity	± 0.25 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	1.5 µW/g to 100 mW/g; Linearity: ± 0.5 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 5 mm Distance from probe tip to dipole centers: <2.7 mm
Application	General dosimetry up to 3 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones
Frequency	5GHz to 6 GHz; Linearity: ± 0.5 dB (5GHz to 6 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	1.5 µW/g to 100 mW/g; Linearity: ± 0.8 dB
Dimensions	Overall length: 330 mm Tip diameter: 2.5 mm Distance from probe tip to dipole centers: 1 mm
Application	General dosimetry from 5GHz up to 6 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones
Compatibility	COMOSAR

Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:

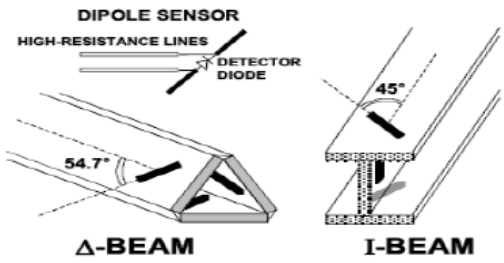


Fig-3.4 Probe

3.1.3 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SATIMO as an integral part of the COMOSAR test system.

The device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

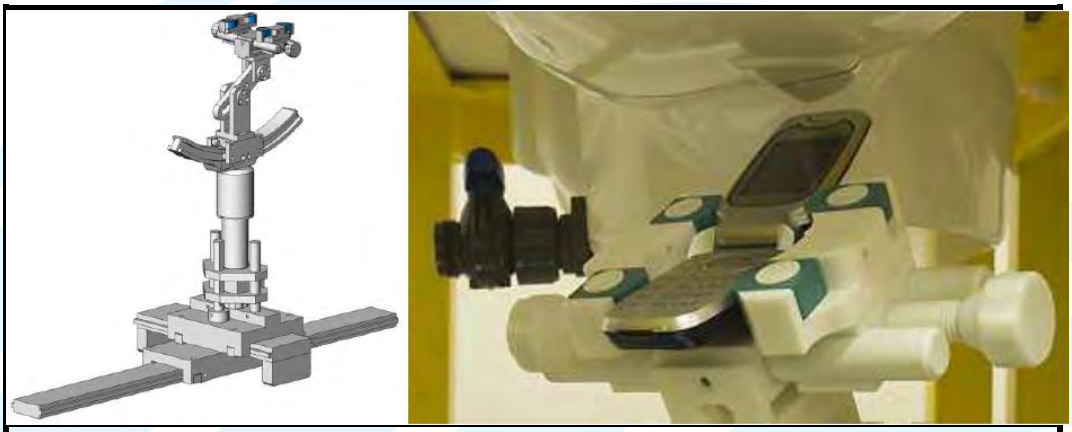


Fig-3.5 Device holder

3.2 SAR Measurement Procedure

According to the SAR test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

3.2.1 Area & Zoom Scan Procedure

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. According to KDB 865664 D01, the resolution for Area and Zoom scan is specified in the table below.

Items	<= 2 GHz	2-3 GHz	3-4 GHz	4-5 GHz	5-6 GHz
Area Scan (Δx, Δy)	<= 15 mm	<= 12 mm	<= 12 mm	<= 10 mm	<= 10 mm
Zoom Scan (Δx, Δy)	<= 8 mm	<= 5 mm	<= 5 mm	<= 4 mm	<= 4 mm
Zoom Scan (Δz)	<= 5 mm	<= 5 mm	<= 4 mm	<= 3 mm	<= 2 mm
Zoom Scan Volume	>= 30 mm	>= 30 mm	>= 28 mm	>= 25 mm	>= 22 mm

Note:

When zoom scan is required and report SAR is <= 1.4 W/kg, the zoom scan resolution of Δx / Δy (2-3GHz: <= 8 mm, 3-4GHz: <= 7 mm, 4-6GHz: <= 5 mm) may be applied.

3.2.2 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In SATIMO measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

3.3 Test Equipment

Equipment	Model	SN	Cal. Date	Cal. Interval
System Simulator	E5515C	GB 47200710	Jun. 10, 2016	1 Year
System Simulator	CMW500	130805	Aug. 10, 2016	1 Year
SAR Probe	SATIMO	SN43/15 EP276	Dec. 09, 2015	1 Year
SAR Probe	SATIMO	SN27/15 EPGO261	Jul. 09, 2016	1 Year
Dipole	SID1900	SN09/13 DIP1G900-218	Aug. 28, 2014	3 Year
Dipole	SID2450	SN09/13 DIP2G450-220	Aug. 28, 2014	3 Year
Dipole	5G-6GHz	SN15/15 WGA 39	Jun. 01, 2016	1 Year
Vector Network Analyzer	ZVB8	A0802530	Jun. 08, 2016	1 Year
Signal Generator	SMR27	A0304219	Jun. 08, 2016	1 Year
Power Meter	NRP2	A140401673	Mar. 27, 2016	1 Year
Power Sensor	NPR-Z11	1138.3004.02-114072-nq	Mar. 27, 2016	1 Year
Amplifier	Nucletudes	143060	Mar. 27, 2016	1 Year
Directional Coupler	DC6180A	305827	Mar. 27, 2016	1 Year
Power Meter	NRVS	A0802531	Mar. 27, 2016	1 Year
Power Sensor	NRV-Z4	100069	Mar. 27, 2016	1 Year
Multimeter	Keithley-2000	4014020	Mar. 27, 2016	1 Year

3.4 Measurement Uncertainty

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

3.5 Tissue Dielectric Parameter Measurement & System Verification

3.5.1 Tissue Simulating Liquids

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm with ≤±0.5 cm variation for SAR measurements ≤ 3 GHz and ≥ 10.0 cm with ≤± 0.5 cm variation for measurements > 3 GHz. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.

Fig-3.6 Photo of Liquid Height

Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of ±5%	Target Conductivity	Range of ±5%
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53
For Body				
750	55.5	52.7 ~ 58.3	0.96	0.91 ~ 1.01
835	55.2	52.4 ~ 58.0	0.97	0.92 ~ 1.02
900	55.0	52.3 ~ 57.8	1.05	1.00 ~ 1.10
1450	54.0	51.3 ~ 56.7	1.30	1.24 ~ 1.37
1640	53.8	51.1 ~ 56.5	1.40	1.33 ~ 1.47
1750	53.4	50.7 ~ 56.1	1.49	1.42 ~ 1.56
1800	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
1900	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2000	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2300	52.9	50.3 ~ 55.5	1.81	1.72 ~ 1.90
2450	52.7	50.1 ~ 55.3	1.95	1.85 ~ 2.05
2600	52.5	49.9 ~ 55.1	2.16	2.05 ~ 2.27
3500	51.3	48.7 ~ 53.9	3.31	3.14 ~ 3.48
5200	49.0	46.6 ~ 51.5	5.30	5.04 ~ 5.57
5300	48.9	46.5 ~ 51.3	5.42	5.15 ~ 5.69
5500	48.6	46.2 ~ 51.0	5.65	5.37 ~ 5.93
5600	48.5	46.1 ~ 50.9	5.77	5.48 ~ 6.06
5800	48.2	45.8 ~ 50.6	6.00	5.70 ~ 6.30

The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.4	57.0	-	41.1	-
H835	0.1	-	1.0	1.4	57.0	-	40.5	-
H900	0.1	-	1.0	1.5	56.5	-	40.9	-
H1450	-	45.5	-	0.7	-	-	53.8	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	44.5	-	0.3	-	-	55.2	-
H1800	-	44.9	-	0.2	-	-	54.9	-
H1900	-	44.9	-	0.2	-	-	54.9	-
H2000	-	50	-	–	-	-	50	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.52	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	29.4	-	0.4	-	-	70.2	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.5.2 System Check Description

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

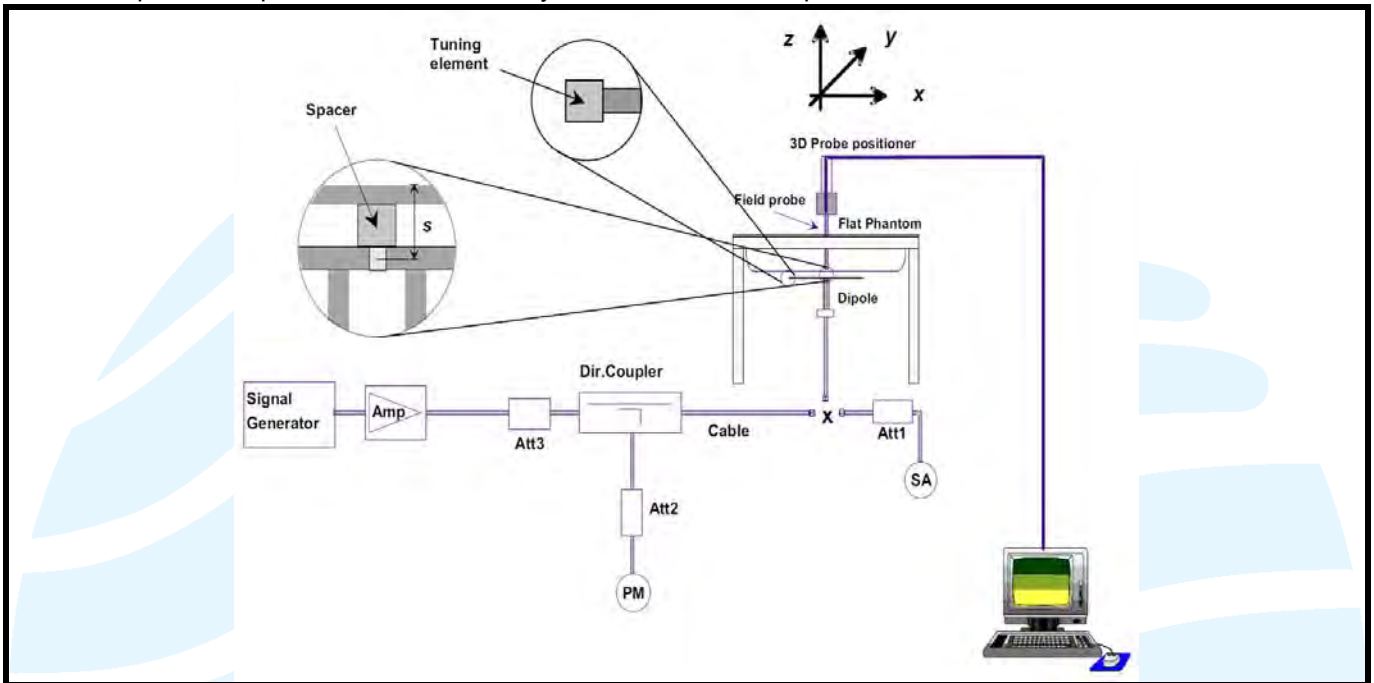


Fig-3.7 System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The spectrum analyzer measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (10 mW is used for 700 MHz to 3 GHz, 10 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

3.5.3 Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
H2450	2450	21.3	1.799	39.200	1.80	39.20	-0.03	0.00	Nov. 21, 2016
H5G	5400	21.3	4.851	34.597	4.86	35.80	-0.18	-3.36	Nov. 21, 2016
H5G	5800	21.3	5.215	33.655	5.27	35.30	-1.05	-4.66	Nov. 21, 2016
B1900	1900	21.3	1.513	53.286	1.52	53.30	-0.43	-0.03	Nov. 22, 2016
B2450	2450	21.3	1.861	51.651	1.95	52.70	-4.55	-1.99	Nov. 21, 2016
B5G	5400	21.3	5.498	47.465	5.53	48.70	-0.59	-2.54	Nov. 21, 2016
B5G	5600	21.3	5.612	47.565	5.77	48.50	-2.73	-1.93	Nov. 21, 2016
B5G	5800	21.3	5.846	46.548	6.00	48.20	-2.56	-3.43	Nov. 21, 2016

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. The variation of the liquid temperature must be within ±2 °C during the test..

3.5.4 System Verification

The measuring result for system verification is tabulated as below.

Test Date	Mode	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N
Nov. 21, 2016	Head	2450	53.60	0.5239	52.39	-2.25	SN09/13 DIP2G450-220	SN 43/15 EP276
Nov. 21, 2016	Head	5400	162.87	1.6356	163.56	0.42	SN15/15 WGA 39	SN 27/15 EPGO261
Nov. 21, 2016	Head	5800	181.89	1.7080	170.80	-6.10	SN15/15 WGA 39	SN 27/15 EPGO261
Nov. 22, 2016	Body	1900	40.81	0.4074	40.74	-0.17	SN09/13 DIP1G900-218	SN 43/15 EP276
Nov. 21, 2016	Body	2450	52.66	0.5359	53.59	1.77	SN09/13 DIP2G450-220	SN 43/15 EP276
Nov. 21, 2016	Body	5400	162.18	1.6346	163.46	0.79	SN15/15 WGA 39	SN 27/15 EPGO261
Nov. 21, 2016	Body	5600	168.73	1.7093	170.93	1.30	SN15/15 WGA 39	SN 27/15 EPGO261
Nov. 21, 2016	Body	5800	176.72	1.7988	179.88	1.79	SN15/15 WGA 39	SN 27/15 EPGO261

Note:

Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

4 SAR Measurement Evaluation

4.1 EUT Configuration and Setting

<Connections between EUT and System Simulator>

For WWAN SAR testing, the EUT was linked and controlled by base station emulator (Agilent E5515C is used for GSM/WCDMA/CDMA, and Anritsu MT8820C is used for LTE). Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

<Considerations Related to GSM / GPRS / EDGE for Setup and Testing>

For GSM850 frequency band, the power control level is set to 5 for GSM mode and GPRS (GMSK: CS1), and set to 8 for EDGE (GMSK: MCS1, 8PSK: MCS9). For GSM1900 frequency band, the power control level is set to 0 for GSM mode and GPRS (GMSK: CS1), and set to 2 for EDGE (GMSK: MCS1, 8PSK: MCS9).

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

<Considerations Related to WCDMA for Setup and Testing>

WCDMA Handsets Head SAR

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode.

WCDMA Handsets Body-worn SAR

SAR for body-worn configurations is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to other spreading codes and multiple $DPDCH_n$ configurations supported by the handset with 12.2 kbps RMC as the primary mode.

Handsets with Release 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body-worn configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the “Release 5 HSDPA Data Devices”, for the highest reported SAR body-worn exposure configuration in 12.2 kbps RMC. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

Handsets with Release 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the “Release 6 HSPA Data Devices”, for the highest reported body-worn exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn measurements is tested for next to the ear head exposure.

Release 5 HSDPA Data Devices

The 3G SAR test reduction procedure is applied to body SAR with 12.2 kbps RMC as the primary mode. Otherwise, body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH / HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors (β_c, β_d), and HS-DPCCH power offset parameters (Δ_{ACK}, Δ_{NACK}, Δ_{CQI}) are set according to values indicated in below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs} (1)	CM (dB)(2)	MPR
1	2 / 15	15 / 15	64	2 / 15	4 / 15	0.0	0
2	12 / 15 (3)	15 / 15 (3)	64	12 / 15 (3)	24 / 15	1.0	0
3	15 / 15	8 / 15	64	15 / 8	30 / 15	1.5	0.5
4	15 / 15	4 / 15	64	15 / 4	30 / 15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ A_{hs} = β_{hs} / β_c = 30 / 15 ⇔ β_{hs} = 30 / 15 * β_c.
Note 2: CM = 1 for β_c / β_d = 12 / 15, β_{hs} / β_c = 24 / 15.
Note 3: For subtest 2 the β_c / β_d ratio of 12 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11 / 15 and β_d = 15 / 15.

Release 6 HSUPA Data Devices

The 3G SAR test reduction procedure is applied to body SAR with 12.2 kbps RMC as the primary mode. Otherwise, body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode. Otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing. Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in below.

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11 / 15 (3)	15 / 15 (3)	64	11 / 15 (3)	22 / 15	209 / 225	1039 / 225	4	1	1.0	0.0	20	75
2	6 / 15	15 / 15	64	6 / 15	12 / 15	12 / 15	94 / 75	4	1	3.0	2.0	12	67
3	15 / 15	9 / 15	64	15 / 9	30 / 15	30 / 15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2 / 15	15 / 15	64	2 / 15	4 / 15	2 / 15	56 / 75	4	1	3.0	2.0	17	71
5	15 / 15 (4)	15 / 15 (4)	64	15 / 15 (4)	30 / 15	24 / 15	134 / 15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ A_{hs} = β_{hs} / β_c = 30 / 15 ⇔ β_{hs} = 30 / 15 * β_c.
Note 2: CM = 1 for β_c / β_d = 12 / 15, β_{hs} / β_c = 24 / 15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c / β_d ratio of 11 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10 / 15 and β_d = 15 / 15.
Note 4: For subtest 5 the β_c / β_d ratio of 15 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14 / 15 and β_d = 15 / 15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} cannot be set directly; it is set by Absolute Grant Value.

HSPA+ SAR Guidance

The 3G SAR test reduction procedure is applied to HSPA+ (uplink) with 12.2 kbps RMC as the primary mode. Otherwise, when SAR is required for Rel. 6 HSPA, SAR is required for Rel. 7 HSPA+. Power is measured for HSPA+ that supports uplink 16QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

DC-HSDPA SAR Guidance

The 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Otherwise, when SAR is required for Rel. 5 HSDPA, SAR is required for Rel. 8 DC-HSDPA. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

<Considerations Related to LTE for Setup and Testing>

This device contains LTE transmitter which follows 3GPP standards, is category 3, supports both QPSK and 16QAM modulations, and supported LTE band and channel bandwidth is listed in below. The output power was tested per 3GPP TS 36.521-1 maximum transmit procedures for both QPSK and 16QAM modulation. The results please refer to section 4.4 of this report.

EUT Supported LTE Band and Channel Bandwidth						
LTE Band	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz
2	V	V	V	V	V	V
4	V	V	V	V	V	V
5	V	V	V	V		
7			V	V	V	V
12	V	V	V	V		
17			V	V		

The LTE maximum power reduction (MPR) in accordance with 3GPP TS 36.101 is active all times during LTE operation. The allowed MPR for the maximum output power is specified in below.

Modulation	Channel Bandwidth / RB Configurations						LTE MPR Setting (dB)
	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	<= 5	<= 4	<= 8	<= 12	<= 16	<= 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2

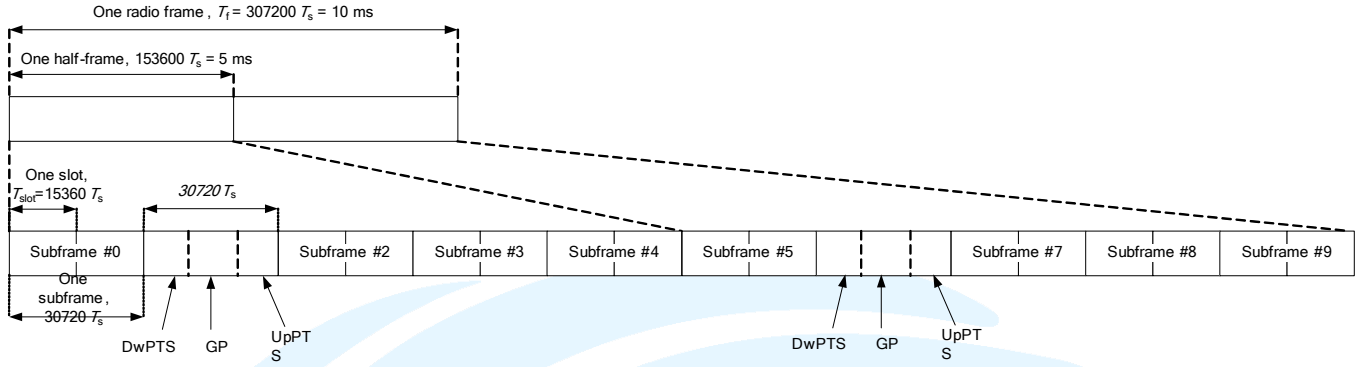
Note: MPR is according to the standard and implemented in the circuit (mandatory).

In addition, the device is compliant with additional maximum power reduction (A-MPR) requirements defined in 3GPP TS 36.101 section 6.2.4 that was disabled for all FCC compliance testing.

During LTE SAR testing, the related parameters of operating band, channel bandwidth, uplink channel number, modulation type, and RB was set in base station simulator. When the EUT has registered and communicated to base station simulator, the simulator set to make EUT transmitting the maximum radiated power.

TDD-LTE Setup Configurations

According to KDB 941225 D05, SAR testing for TDD-LTE device must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP TDD-LTE configurations. The TDD-LTE of this device supports frame structure type 2 defined in 3GPP TS 36.211 section 4.2, and the frame structure configuration can be referred to below.



3GPP TS 36.211 Figure 4.2-1: Frame Structure Type 2

Special Subframe Configuration	Normal Cyclic Prefix in Downlink			Extended Cyclic Prefix in Downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink
0	6592·Ts	2192·Ts	2560·Ts	7680·Ts	2192·Ts	2560·Ts
1	19760·Ts			20480·Ts		
2	21952·Ts			23040·Ts		
3	24144·Ts			25600·Ts		
4	26336·Ts			7680·Ts	4384·Ts	5120·Ts
5	6592·Ts	4384·Ts	5120·Ts	20480·Ts		
6	19760·Ts			23040·Ts		
7	21952·Ts			12800·Ts		
8	24144·Ts			-	-	-
9	13168·Ts			-	-	-

3GPP TS 36.211 Table 4.2-1: Configuration of Special Subframe

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-Point Periodicity	Subframe Number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

3GPP TS 36.211 Table 4.2-2: Uplink-Downlink Configurations

The variety of different TD-LTE uplink-downlink configurations allows a network operator to allocate the network's capacity between uplink and downlink traffic to meet the needs of the network. The uplink duty cycle of these seven configurations can readily be computed and shown in below.

UL-DL Configuration	0	1	2	3	4	5	6
Highest Duty-Cycle	63.33%	43.33%	23.33%	31.67%	21.67%	11.67%	53.33%

Considering the highest transmission duty cycle, TDD-LTE was tested using Uplink-Downlink Configuration 0 with 6 uplink subframe and 2 special subframe. The special subframe was set to special subframe configuration 7 using

extended cyclic prefix uplink. Therefore, SAR testing for TDD-LTE was performed at the maximum output power with highest transmission duty cycle of 63.33%.

LTE Downlink Carrier Aggregation (CA) Setup Configurations

LTE Carrier Aggregation (CA) was defined in 3GPP release 10 and higher. The LTE device in CA mode has one Primary Component Carrier (PCC) and one or more Secondary Component Carriers (SCC). PCC acts as the anchor carrier and can optionally cross-schedule data transmission on SCC. The RRC connection is only handled by one cell, the PCC for downlink and uplink communications. After making a data connection to the PCC, the LTE device adds the SCC on the downlink only. All uplink communications and acknowledgements remain identical to release 8 specifications on the PCC. The combinations of downlink carrier aggregation supported by this device are listed in below.

EUT Supported Combinations of Downlink Carrier Aggregation							
Intra-Band Contiguous CA Operating Bands							
CA_2							
Inter-Band CA Operating Bands (Two Bands)							
CA_2-4	CA_4-12						
CA_2-12	CA_4-17						
CA_2-17							
Intra-Band Non-Contiguous CA Operating Bands (with Two Sub-Blocks)							
CA_2-2	CA_4-4						

<Considerations Related to WLAN for Setup and Testing>

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. The test frequencies established using test mode must correspond to the actual channel frequencies. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

According to KDB 248227 D01, this device has installed WLAN engineering testing software which can provide continuous transmitting RF signal. During WLAN SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

Initial Test Configuration

An initial test configuration is determined for OFDM transmission modes in 2.4 GHz and 5 GHz bands according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.

Subsequent Test Configuration

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. When the highest reported SAR for the initial test configuration according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n). After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following.

1) The channel closest to mid-band frequency is selected for SAR measurement.

2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

Test Reduction for U-NII-1 (5.2 GHz) and U-NII-2A (5.3 GHz) Bands

For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following.

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition).

2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

<Considerations Related to Bluetooth for Setup and Testing>

This device has installed Bluetooth engineering testing software which can provide continuous transmitting RF signal. During Bluetooth SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

<Duty Cycle>

For WLAN and BT SAR test, the correct crest factor parameter in the SAR measurement system software was set. The duty cycle as below table.

Duty Cycle	
2.4G WLAN	100%
5G WLAN	97%
BT	100%

Note: Crest Factor = 1 / Duty Cycle

4.2 EUT Testing Position

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

4.2.1 Head Exposure Conditions

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

1. Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

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

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

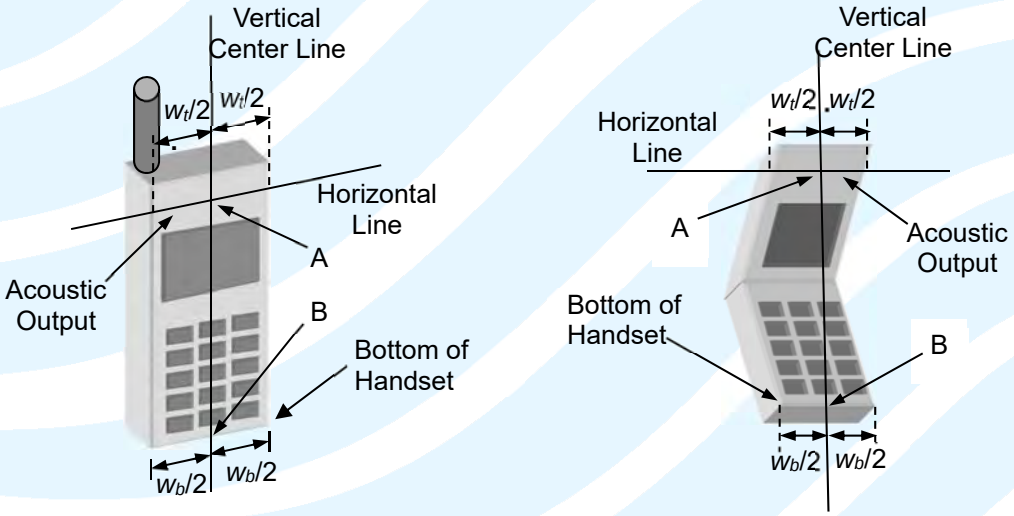


Fig-4.1 Illustration for Handset Vertical and Horizontal Reference Lines

2. Cheek Position

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

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig-4.2).

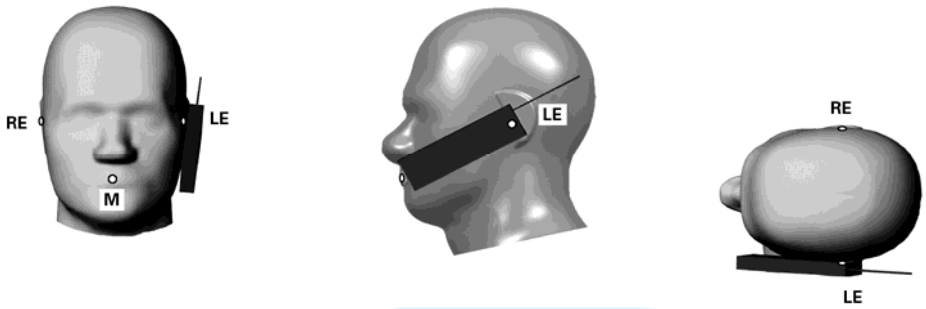


Fig-4.2 Illustration for Cheek Position

3. Tilted Position

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

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig-4.3).

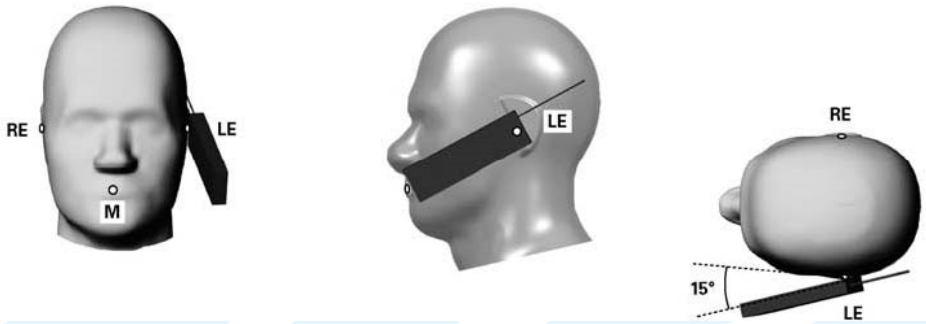


Fig-4.3 Illustration for Tilted Position

4.2.2 Body-worn Accessory Exposure 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 D01 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

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

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

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

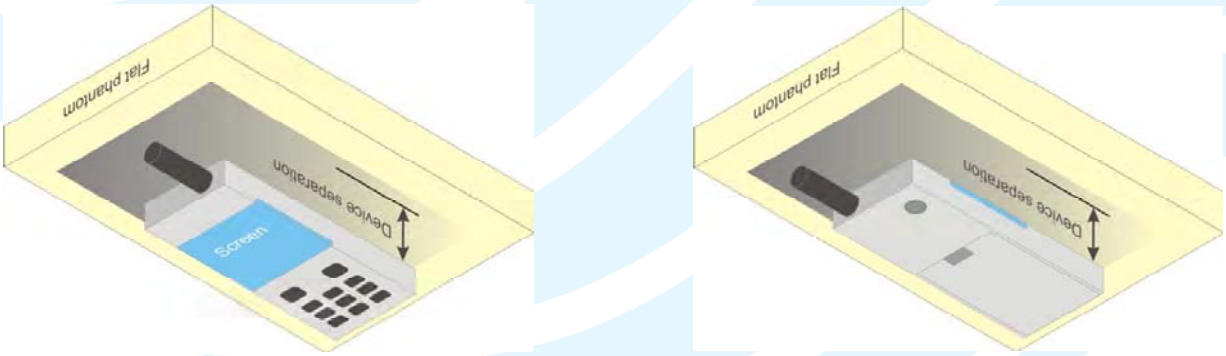
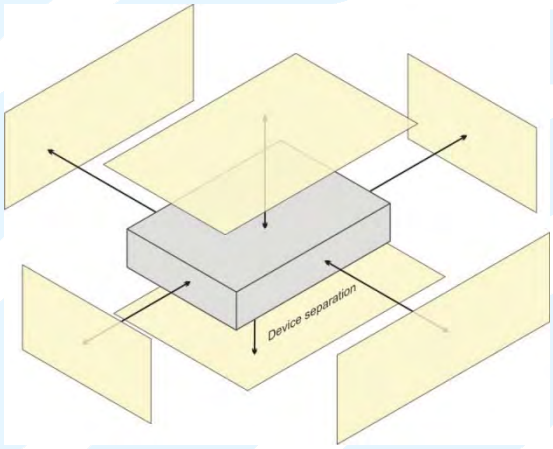


Fig-4.4 Illustration for Body Worn Position

4.2.3 Hotspot Mode Exposure 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 D06. 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).



Based on the antenna location shown on appendix D of this report, the SAR testing required for hotspot mode is listed as below.

Antenna	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
WWAN Ant-1	Yes	Yes	Yes	Yes	N/A	Yes
WLAN / BT	Yes	Yes	N/A	Yes	Yes	N/A

4.2.4 Extremity Exposure Conditions

For smart phones with a display diagonal dimension > 15 cm or an overall diagonal dimension > 16 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance.

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.
2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at <= 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg. The normal tablet procedures in KDB 616217 are required when the over diagonal dimension of the device is > 20 cm. Hotspot mode SAR is not required when normal tablet procedures are applied. Extremity 10-g SAR is also not required for the front (top) surface of large form factor full size tablets. The more conservative tablet SAR results can be used to support the 10-g extremity SAR for phablet mode.
3. The simultaneous transmission operating configurations applicable to voice and data transmissions for both phone and mini-tablet modes must be taken into consideration separately for 1-g and 10-g SAR to determine the simultaneous transmission SAR test exclusion and measurement requirements for the relevant wireless modes and exposure conditions.

4.3 Measured Conducted Power Result

The measuring conducted average power (Unit: dBm) is shown as below.

<Full Power>

GSM 850		Burst Average Power(dBm)			Division Factors (dB)	Frame-Average Power(dBm)			Burst Tune-up Limit (dBm)
Tx Channel		128	190	251		128	190	251	
Frequency(MHz)		824.2	836.6	848.8		824.2	836.6	848.8	
GSM(GMSK)		32.23	32.37	32.39	9.03	23.20	23.34	23.36	33.00
GPRS (GMSK)	1Txslot	32.30	**32.48**	32.44	9.03	23.27	23.45	23.41	33.00
	2Txslots	30.68	30.86	30.67	6.02	24.66	**24.84**	24.65	31.00
	3Txslots	28.41	28.61	28.62	4.26	24.15	24.35	24.36	29.00
	4Txslots	26.93	27.05	27.09	3.01	23.92	24.04	24.08	27.50
EGPRS (GMSK)	1Txslot	32.26	32.45	32.39	9.03	23.23	23.42	23.36	33.00
	2Txslots	30.60	30.81	30.61	6.02	24.58	24.79	24.59	31.00
	3Txslots	28.36	28.56	28.55	4.26	24.10	24.30	24.29	29.00
	4Txslots	26.88	27.00	27.03	3.01	23.87	23.99	24.02	27.50
EGPRS (8PSK)	1Txslot	25.82	25.79	25.74	9.03	16.79	16.76	16.71	26.50
	2Txslots	23.63	23.62	23.61	6.02	17.61	17.60	17.59	24.50
	3Txslots	21.60	21.67	21.67	4.26	17.34	17.41	17.41	22.50
	4Txslots	20.92	20.96	20.98	3.01	17.91	17.95	17.97	21.50
GSM 1900		Power(dBm)			Division Factors (dB)	Power(dBm)			Burst Tune-up Limit (dBm)
Tx Channel		512	661	810		512	661	810	
Frequency(MHz)		1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM(GMSK)		**29.31**	29.10	29.28	9.03	20.28	20.07	20.25	31.00
GPRS (GMSK)	1Txslot	29.30	29.09	29.22	9.03	20.27	20.06	20.19	31.00
	2Txslots	27.53	27.24	27.32	6.02	**21.51**	21.22	21.30	28.00
	3Txslots	25.06	24.83	25.01	4.26	20.80	20.57	20.75	26.00
	4Txslots	23.60	23.26	23.56	3.01	20.59	20.25	20.55	24.50
EGPRS (GMSK)	1Txslot	29.21	29.02	29.14	9.03	20.18	19.99	20.11	31.00
	2Txslots	27.46	27.17	27.24	6.02	21.44	21.15	21.22	28.00
	3Txslots	25.01	24.76	24.95	4.26	20.75	20.50	20.69	26.00
	4Txslots	23.51	23.20	23.51	3.01	20.50	20.19	20.50	24.50
EGPRS (8PSK)	1Txslot	24.25	24.13	24.18	9.03	15.22	15.10	15.15	24.50
	2Txslots	21.89	21.91	22.03	6.02	15.87	15.89	16.01	22.50
	3Txslots	20.15	19.95	19.97	4.26	15.89	15.69	15.71	20.50
	4Txslots	18.76	18.47	18.54	3.01	15.75	15.46	15.53	19.50

<Hotspot on Reduce Power>

GSM 1900		Burst Average Power(dBm)			Division Factors (dB)	Frame-Average Power(dBm)			Burst Tune-up Limit (dBm)
Tx Channel		512	661	810		512	661	810	
Frequency(MHz)		1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM(GMSK)		28.09	28.06	**28.46**	9.03	19.06	19.03	19.43	30.00
GPRS (GMSK)	1Txslot	28.05	28.11	28.29	9.03	19.02	19.08	19.26	30.00
	2Txslots	26.10	26.13	26.52	6.02	20.08	20.11	**20.50**	27.00
	3Txslots	23.54	23.61	24.19	4.26	19.28	19.35	19.93	25.00
	4Txslots	22.03	22.06	22.60	3.01	19.02	19.05	19.59	23.50
EGPRS (GMSK)	1Txslot	28.06	28.04	28.23	9.03	19.03	19.01	19.20	30.00
	2Txslots	26.05	26.07	26.46	6.02	20.03	20.05	20.44	27.00
	3Txslots	23.47	23.55	24.12	4.26	19.21	19.29	19.86	25.00
	4Txslots	21.98	22.00	22.53	3.01	18.97	18.99	19.52	23.50
EGPRS (8PSK)	1Txslot	23.20	23.35	23.45	9.03	14.17	14.32	14.42	23.50
	2Txslots	20.56	20.90	21.33	6.02	14.54	14.88	15.31	21.50
	3Txslots	18.73	18.83	19.25	4.26	14.47	14.57	14.99	19.50
	4Txslots	17.29	17.37	17.68	3.01	14.28	14.36	14.67	18.50

<Full Power>

WCDMA **Hotspot Off**		Band II(dBm)				Band IV(dBm)				Band V(dBm)			
Tx Channel		9262	9400	9538	Tune-up Limit (dBm)	1312	1413	1513	Tune-up Limit (dBm)	4132	4183	4233	Tune-up Limit (dBm)
Frequency(MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.6	846.6	
RMC	12.2kbps	22.41	22.63	22.68	23.50	22.60	22.80	**22.80**	23.50	22.88	22.83	22.91	23.50
	64kbps	22.40	22.61	**22.75**	23.50	22.44	22.63	22.66	23.50	22.86	22.95	22.92	23.50
	144kbps	22.39	22.60	22.75	23.50	22.54	22.71	22.74	23.50	22.96	22.96	22.93	23.50
	384kbps	22.39	22.59	22.74	23.50	22.53	22.73	22.73	23.50	22.96	**22.97**	22.91	23.50
HSDPA	Sub 1	21.83	22.05	22.10	23.50	22.52	22.72	22.72	23.50	22.21	22.16	22.24	23.50
	Sub 2	21.82	22.04	22.09	23.50	22.51	22.71	22.71	23.50	22.29	22.24	22.32	23.50
	Sub 3	21.31	21.53	21.58	23.00	22.00	22.20	22.20	23.00	21.78	21.73	21.81	23.00
	Sub 4	21.30	21.52	21.57	23.00	21.99	22.19	22.19	23.00	21.77	21.72	21.80	23.00
HSUPA	Sub 1	21.79	22.01	22.06	23.50	22.48	22.68	22.68	23.50	22.26	22.21	22.29	23.00
	Sub 2	19.78	20.00	20.05	21.50	20.47	20.67	20.67	21.50	20.25	20.20	20.28	21.00
	Sub 3	20.76	20.99	21.04	22.50	21.45	21.66	21.66	22.50	21.18	21.13	21.37	22.00
	Sub 4	19.75	19.98	20.03	21.50	20.44	20.65	20.65	21.50	20.17	20.12	20.36	21.00
	Sub 5	21.74	21.97	22.02	23.50	22.43	22.64	22.64	23.50	22.32	22.27	22.35	23.00
DC-HSDPA	Sub 1	21.75	21.99	22.02	23.50	22.44	22.66	22.64	23.50	22.31	22.22	22.30	23.50
	Sub 2	21.74	21.98	22.01	23.50	22.43	22.65	22.63	23.50	22.30	22.21	22.29	23.50
	Sub 3	21.32	21.47	21.52	23.00	22.01	22.14	22.14	23.00	21.79	21.70	21.78	23.00
	Sub 4	21.31	21.46	21.51	23.00	22.00	22.13	22.13	23.00	21.78	21.79	21.76	23.00
HSPA+	16QAM	19.80	20.04	20.09	21.00	20.49	20.71	20.71	21.50	20.27	20.28	20.25	21.50

<Hotspot Reduce Power>

WCDMA **Hotspot On**		Band II(dBm)				Band IV(dBm)			
Tx Channel		9262	9400	9538	Tune-up Limit (dBm)	1312	1413	1513	Tune-up Limit (dBm)
Frequency(MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
RMC	12.2kbps	19.45	19.42	19.45	19.50	21.23	21.28	**21.30**	21.50
	64kbps	**19.48**	19.30	19.34	19.50	21.17	21.16	21.14	21.50
	144kbps	19.39	19.25	19.33	19.50	21.08	21.11	21.13	21.50
	384kbps	19.38	19.26	19.34	19.50	21.07	21.12	21.14	21.50
HSDPA	Sub 1	18.87	18.75	18.83	19.00	21.06	21.11	21.13	21.50
	Sub 2	18.95	18.83	18.91	19.00	21.14	21.19	21.21	21.50
	Sub 3	18.44	18.32	18.40	18.50	20.63	20.68	20.70	21.00
	Sub 4	18.43	18.31	18.39	18.50	20.62	20.67	20.69	21.00
HSUPA	Sub 1	18.92	18.80	18.88	19.00	21.11	21.16	21.18	21.50
	Sub 2	16.91	16.79	16.87	17.00	19.10	19.15	19.17	19.50
	Sub 3	17.84	17.72	17.96	18.00	20.03	20.08	20.26	20.50
	Sub 4	16.83	16.71	16.95	17.00	19.02	19.07	19.25	19.50
	Sub 5	18.98	18.86	18.94	19.00	21.17	21.22	21.24	21.50
DC-HSDPA	Sub 1	18.97	18.81	18.89	19.00	21.16	21.17	21.19	21.50
	Sub 2	18.96	18.80	18.88	19.00	21.15	21.16	21.18	21.50
	Sub 3	18.45	18.29	18.37	18.50	20.64	20.65	20.67	21.00
	Sub 4	18.44	18.38	18.35	18.50	20.63	20.74	20.65	21.00

LTE FDD Band 2 Full Power				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				18607/1850.7	18900/1880	19193/1909.3	
1.4MHz	QPSK	1	0	22.44	22.32	22.34	23.50
		1	2	22.68	22.71	22.83	
		1	5	22.45	22.32	22.43	
		3	0	22.61	22.45	22.57	23.50
		3	2	22.54	22.56	22.67	
		3	3	22.47	22.60	22.66	
		6	0	21.38	21.47	21.51	22.50
	16QAM	1	0	21.37	21.90	21.99	22.50
		1	2	21.50	21.89	21.89	
		1	5	20.85	21.60	22.00	
		3	0	21.56	21.47	21.59	22.50
		3	2	21.50	21.51	21.72	
		3	3	21.49	21.42	21.53	
		6	0	20.54	20.46	20.65	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18615/1851.5	18900/1880	19185/1908.5	
3MHz	QPSK	1	0	22.46	22.36	22.37	23.50
		1	7	22.71	22.76	22.87	
		1	14	22.48	22.37	22.47	
		8	0	21.63	21.49	21.62	22.50
		8	4	21.58	21.58	21.71	
		8	7	21.49	21.63	21.68	
		15	0	21.41	21.51	21.54	22.50
	16QAM	1	0	21.40	21.91	21.90	22.50
		1	7	21.53	21.94	21.93	
		1	14	20.87	21.64	21.90	
		8	0	20.59	20.52	20.63	21.50
		8	4	20.53	20.56	20.76	
		8	7	20.51	20.46	20.58	
		15	0	20.57	20.50	20.68	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18625/1852.5	18900/1880	19175/1907.5	
5MHz	QPSK	1	0	22.43	22.34	22.33	23.50
		1	13	22.69	22.72	22.84	
		1	24	22.45	22.32	22.43	
		12	0	21.60	21.44	21.58	22.50
		12	6	21.56	21.54	21.66	
		12	13	21.47	21.61	21.64	
		25	0	21.39	21.50	21.52	22.50
	16QAM	1	0	21.37	21.90	21.99	22.50
		1	13	21.50	21.92	21.90	
		1	24	20.84	21.62	21.99	

		12	0	20.57	20.48	20.60	21.50
		12	6	20.50	20.51	20.72	
		12	13	20.48	20.41	20.54	
		25	0	20.55	20.46	20.63	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18650/1855	18900/1880	19150/1905	
10MHz	QPSK	1	0	22.45	22.35	22.36	23.50
		1	25	22.72	22.77	22.88	
		1	49	22.47	22.36	22.46	
		25	0	21.63	21.49	21.62	22.50
		25	13	21.59	21.59	21.70	
		25	25	21.49	21.65	21.69	
		50	0	21.47	21.52	21.56	22.50
	16QAM	1	0	21.39	21.90	21.90	22.50
		1	25	21.53	21.96	21.93	
		1	49	20.87	21.64	21.90	
		25	0	20.60	20.53	20.64	21.50
		25	13	20.52	20.55	20.75	
		25	25	20.51	20.46	20.58	
		50	0	20.58	20.51	20.67	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18675/1857.5	18900/1880	19125/1902.5	
15MHz	QPSK	1	0	22.44	22.31	22.34	23.50
		1	38	22.70	22.76	22.85	
		1	74	22.44	22.31	22.42	
		36	0	21.61	21.45	21.59	22.50
		36	18	21.56	21.54	21.66	
		36	39	21.46	21.62	21.65	
		75	0	21.45	21.48	21.51	22.50
	16QAM	1	0	21.34	21.90	21.99	22.50
		1	38	21.51	21.93	21.91	
		1	74	20.84	21.60	21.99	
		36	0	20.57	20.51	20.61	21.50
		36	18	20.49	20.50	20.71	
		36	39	20.49	20.42	20.55	
		75	0	20.55	20.46	20.63	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18700/1860	18900/1880	19100/1900	
20MHz	QPSK	1	0	22.41	22.27	22.31	23.50
		1	50	22.69	22.72	22.83	
		1	99	22.42	22.30	22.39	
		50	0	21.58	21.40	21.55	22.50
		50	25	21.54	21.50	21.63	
		50	50	21.43	21.57	21.61	
		100	0	21.42	21.43	21.47	22.50
	16QAM	1	0	21.32	21.98	21.94	22.50
		1	50	21.47	21.91	21.87	

		1	99	20.82	21.57	21.97	
		50	0	20.54	20.47	20.58	21.50
		50	25	20.46	20.48	20.68	
		50	50	20.46	20.37	20.51	
		100	0	20.53	20.42	20.60	21.50

LTE FDD Band 2 Hotspot Reduce Power				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				18607/1850.7	18900/1880	19193/1909.3	
1.4MHz	QPSK	1	0	15.54	15.77	16.07	16.5
		1	2	15.73	15.87	16.10	
		1	5	15.59	15.57	15.80	
		3	0	15.53	15.76	16.06	16.5
		3	2	15.72	15.86	16.09	
		3	3	15.58	15.56	15.79	
		6	0	15.51	15.69	15.95	16.5
	16QAM	1	0	14.96	15.44	15.70	16.5
		1	2	15.54	15.69	15.84	
		1	5	14.86	15.26	15.69	
		3	0	14.94	15.42	15.68	16.5
		3	2	15.52	15.67	15.82	
		3	3	14.84	15.24	15.67	
		6	0	15.56	15.87	15.89	16.5
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18615/1851.5	18900/1880	19185/1908.5	
3MHz	QPSK	1	0	15.57	15.80	16.10	16.5
		1	7	15.76	15.90	16.13	
		1	14	15.62	15.60	15.83	
		8	0	15.54	15.82	16.00	16.5
		8	4	15.68	15.86	16.03	
		8	7	15.57	15.47	16.02	
		15	0	15.54	15.72	15.98	16.5
	16QAM	1	0	14.99	15.47	15.73	16.5
		1	7	15.57	15.72	15.87	
		1	14	14.89	15.29	15.72	
		8	0	15.45	15.78	16.07	16.5
		8	4	15.72	15.95	15.99	
		8	7	15.45	15.91	15.91	
		15	0	15.59	15.90	15.92	16.5
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18625/1852.5	18900/1880	19175/1907.5	
5MHz	QPSK	1	0	15.60	15.83	16.13	16.5
		1	13	15.79	15.93	16.16	
		1	24	15.65	15.63	15.86	
		12	0	15.57	15.85	16.03	16.5
		12	6	15.71	15.89	16.06	
		12	13	15.60	15.50	16.05	
		25	0	15.57	15.75	16.01	16.5
	16QAM	1	0	15.02	15.50	15.76	16.5
		1	13	15.60	15.75	15.90	
		1	24	14.92	15.32	15.75	

		12	0	15.48	15.81	16.10	16.5
		12	6	15.75	15.98	16.02	
		12	13	15.48	15.94	15.94	
		25	0	15.62	15.93	15.95	16.5
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18650/1855	18900/1880	19150/1905	
10MHz	QPSK	1	0	15.62	15.85	16.15	16.5
		1	25	15.81	15.95	16.18	
		1	49	15.67	15.65	15.88	
		25	0	15.59	15.87	16.05	16.5
		25	13	15.73	15.91	16.08	
		25	25	15.62	15.52	16.07	
		50	0	15.59	15.77	16.03	16.5
	16QAM	1	0	15.04	15.52	15.78	16.5
		1	25	15.62	15.77	15.92	
		1	49	14.94	15.34	15.77	
		25	0	15.50	15.83	16.12	16.5
		25	13	15.77	16.00	16.04	
		25	25	15.50	15.96	15.96	
		50	0	15.64	15.95	15.97	16.5
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18675/1857.5	18900/1880	19125/1902.5	
15MHz	QPSK	1	0	15.65	15.88	16.18	16.5
		1	38	15.84	15.98	16.21	
		1	74	15.70	15.68	15.91	
		36	0	15.62	15.90	16.08	16.5
		36	18	15.76	15.94	16.11	
		36	39	15.65	15.55	16.10	
		75	0	15.62	15.80	16.06	16.5
	16QAM	1	0	15.07	15.55	15.81	16.5
		1	38	15.65	15.80	15.95	
		1	74	14.97	15.37	15.80	
		36	0	15.53	15.86	16.15	16.5
		36	18	15.80	16.03	16.07	
		36	39	15.53	15.99	15.99	
		75	0	15.67	15.98	16.00	16.5
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				18700/1860	18900/1880	19100/1900	
20MHz	QPSK	1	0	15.70	15.93	16.23	16.5
		1	50	15.89	16.03	**16.26**	
		1	99	15.75	15.73	15.96	
		50	0	15.67	15.95	16.13	16.5
		50	25	15.81	15.99	16.16	
		50	50	15.70	15.60	16.15	
		100	0	15.67	15.85	16.11	16.5
	16QAM	1	0	15.12	15.60	15.86	16.5
		1	50	15.70	15.85	16.00	

		1	99	15.02	15.42	15.85	
		50	0	15.58	15.91	16.20	16.5
		50	25	15.85	16.08	16.12	
		50	50	15.58	16.04	16.04	
		100	0	15.72	16.03	16.05	16.5

LTE FDD Band 4 Full Power				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				19957/1710.7	20175/1732.5	20393/1754.3	
1.4MHz	QPSK	1	0	22.97	22.99	22.93	23.50
		1	2	22.95	22.91	22.91	
		1	5	22.96	22.93	22.90	
		3	0	22.92	22.95	22.92	23.50
		3	2	22.90	22.95	22.94	
		3	3	22.95	22.93	22.94	
		6	0	21.85	21.94	21.94	22.50
	16QAM	1	0	21.46	21.39	21.58	22.50
		1	2	21.90	21.66	21.79	
		1	5	21.46	21.98	21.46	
		3	0	21.90	21.86	21.98	22.50
		3	2	21.95	21.84	21.94	
		3	3	21.94	21.85	21.91	
		6	0	20.91	20.95	20.95	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				19965/1711.5	20175/1732.5	20385/1753.5	
3MHz	QPSK	1	0	22.99	22.90	22.96	23.50
		1	7	22.98	22.96	22.95	
		1	14	22.99	22.98	22.94	
		8	0	21.94	21.99	21.97	22.50
		8	4	21.94	21.97	21.98	
		8	7	21.97	21.96	21.96	
		15	0	21.88	21.98	21.97	22.50
	16QAM	1	0	21.49	21.41	21.61	22.50
		1	7	21.91	21.71	21.83	
		1	14	21.48	21.90	21.49	
		8	0	20.90	20.91	20.90	21.50
		8	4	20.98	20.89	20.98	
		8	7	20.96	20.89	20.96	
		15	0	20.94	20.99	20.98	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				19975/1712.5	20175/1732.5	20375/1752.5	
5MHz	QPSK	1	0	22.96	22.90	22.92	23.50
		1	13	22.96	22.92	22.92	
		1	24	22.96	22.93	22.90	
		12	0	21.91	21.94	21.93	22.50
		12	6	21.92	21.93	21.93	
		12	13	21.95	21.94	21.92	
		25	0	21.86	21.97	21.95	22.50
	16QAM	1	0	21.46	21.37	21.58	22.50
		1	13	21.90	21.69	21.80	
		1	24	21.45	22.00	21.45	

		12	0	20.90	20.87	20.99	
		12	6	20.95	20.84	20.94	21.50
		12	13	20.93	20.84	20.92	
		25	0	20.92	20.95	20.93	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20000/1715	20175/1732.5	20350/1750	
10MHz	QPSK	1	0	22.98	22.90	22.95	
		1	25	22.99	22.97	22.96	23.50
		1	49	22.98	22.97	22.93	
		25	0	21.94	21.99	21.97	
		25	13	21.95	21.98	21.97	22.50
		25	25	21.97	21.98	21.97	
		50	0	21.94	21.99	21.99	22.50
	16QAM	1	0	21.48	21.40	21.60	
		1	25	21.91	21.73	21.83	22.50
		1	49	21.48	21.90	21.48	
		25	0	20.90	20.92	20.90	
		25	13	20.97	20.88	20.97	21.50
		25	25	20.96	20.89	20.96	
		50	0	20.95	21.00	20.97	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20025/1717.5	20175/1732.5	20325/1747.5	
15MHz	QPSK	1	0	22.97	22.98	22.93	
		1	38	22.97	22.96	22.93	23.50
		1	74	22.95	22.92	22.89	
		36	0	21.92	21.95	21.94	
		36	18	21.92	21.93	21.93	22.50
		36	39	21.94	21.95	21.93	
		75	0	21.92	21.95	21.94	22.50
	16QAM	1	0	21.43	21.38	21.58	
		1	38	21.90	21.70	21.81	22.50
		1	74	21.45	21.98	21.45	
		36	0	20.90	20.90	21.00	
		36	18	20.94	20.83	20.93	21.50
		36	39	20.94	20.85	20.93	
		75	0	20.92	20.95	20.93	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20050/1720	20175/1732.5	20300/1745	
20MHz	QPSK	1	0	22.94	22.94	22.90	
		1	50	22.96	22.92	22.91	23.50
		1	99	22.93	22.91	22.86	
		50	0	21.89	21.90	21.90	
		50	25	21.90	21.89	21.90	22.50
		50	50	21.91	21.90	21.89	
		100	0	21.89	21.90	21.90	22.50
	16QAM	1	0	21.41	21.34	21.53	22.50
		1	50	21.99	21.68	21.77	

		1	99	21.43	21.95	21.43	
		50	0	20.99	20.86	20.97	21.50
		50	25	20.91	20.81	20.90	
		50	50	20.91	20.80	20.89	
		100	0	20.90	20.91	20.90	21.50

LTE FDD Band 4 Hotspot Reduce Power				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				19957/1710.7	20175/1732.5	20393/1754.3	
1.4MHz	QPSK	1	0	19.45	19.65	19.18	20.50
		1	2	19.60	19.58	19.35	
		1	5	19.52	19.50	19.36	
		3	0	19.90	19.94	19.89	20.50
		3	2	19.82	19.92	19.87	
		3	3	19.95	19.93	19.91	
		6	0	19.28	19.35	19.37	19.50
	16QAM	1	0	19.39	19.10	19.10	19.50
		1	2	19.43	18.80	19.27	
		1	5	19.24	18.62	19.14	
		3	0	19.35	19.25	19.32	19.50
		3	2	19.40	19.37	19.40	
		3	3	19.33	19.38	19.44	
		6	0	18.37	18.27	18.44	18.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				19965/1711.5	20175/1732.5	20385/1753.5	
3MHz	QPSK	1	0	19.47	19.69	19.21	20.50
		1	7	19.63	19.63	19.39	
		1	14	19.55	19.55	19.40	
		8	0	19.42	19.48	19.44	19.50
		8	4	19.36	19.44	19.41	
		8	7	19.47	19.46	19.43	
		15	0	19.31	19.39	19.40	19.50
	16QAM	1	0	19.42	19.12	19.13	19.50
		1	7	19.46	18.85	19.31	
		1	14	19.26	18.66	19.17	
		8	0	18.38	18.30	18.36	18.50
		8	4	18.43	18.42	18.44	
		8	7	18.35	18.42	18.49	
		15	0	18.40	18.31	18.47	18.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				19975/1712.5	20175/1732.5	20375/1752.5	
5MHz	QPSK	1	0	19.44	19.67	19.17	20.50
		1	13	19.61	19.59	19.36	
		1	24	19.52	19.50	19.36	
		12	0	19.39	19.43	19.40	19.50
		12	6	19.34	19.40	19.36	
		12	13	19.45	19.44	19.39	
		25	0	19.29	19.38	19.38	19.50
	16QAM	1	0	19.39	19.08	19.10	19.50
		1	13	19.43	18.83	19.28	
		1	24	19.23	18.64	19.13	

		12	0	18.36	18.26	18.33	
		12	6	18.40	18.37	18.40	18.50
		12	13	18.32	18.37	18.45	
		25	0	18.38	18.27	18.42	18.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20000/1715	20175/1732.5	20350/1750	
10MHz	QPSK	1	0	19.46	19.68	19.20	
		1	25	19.64	19.64	19.40	20.50
		1	49	19.54	19.54	19.39	
		25	0	19.42	19.48	19.44	
		25	13	19.37	19.45	19.40	19.50
		25	25	19.47	19.48	19.44	
		50	0	19.37	19.40	19.42	19.50
	16QAM	1	0	19.41	19.11	19.12	
		1	25	19.46	18.87	19.31	19.50
		1	49	19.26	18.66	19.16	
		25	0	18.39	18.31	18.37	
		25	13	18.42	18.41	18.43	18.50
		25	25	18.35	18.42	18.49	
		50	0	18.41	18.32	18.46	18.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20025/1717.5	20175/1732.5	20325/1747.5	
15MHz	QPSK	1	0	19.45	19.64	19.18	
		1	38	19.62	19.63	19.37	20.50
		1	74	19.51	19.49	19.35	
		36	0	19.40	19.44	19.41	
		36	18	19.34	19.40	19.36	19.50
		36	39	19.44	19.45	19.40	
		75	0	19.35	19.36	19.37	19.50
	16QAM	1	0	19.36	19.09	19.10	
		1	38	19.44	18.84	19.29	19.50
		1	74	19.23	18.62	19.13	
		36	0	18.36	18.29	18.34	
		36	18	18.39	18.36	18.39	18.50
		36	39	18.33	18.38	18.46	
		75	0	18.38	18.27	18.42	18.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20050/1720	20175/1732.5	20300/1745	
20MHz	QPSK	1	0	19.42	19.60	19.15	
		1	50	19.61	19.59	19.35	20.50
		1	99	19.49	19.48	19.32	
		50	0	19.37	19.39	19.37	
		50	25	19.32	19.36	19.33	19.50
		50	50	19.41	19.40	19.36	
		100	0	19.32	19.31	19.33	19.50
	16QAM	1	0	19.34	19.05	19.05	19.50
		1	50	19.40	18.82	19.25	

		1	99	19.21	18.59	19.11	
		50	0	18.33	18.25	18.31	18.50
		50	25	18.36	18.34	18.36	
		50	50	18.30	18.33	18.42	
		100	0	18.36	18.23	18.39	18.50

LTE FDD Band 5				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				20407/824.7	20525/836.5	20643/848.3	
1.4MHz	QPSK	1	0	22.94	22.64	22.79	23.50
		1	2	22.91	22.85	22.91	
		1	5	22.64	22.85	22.96	
		3	0	22.95	22.67	22.92	23.50
		3	2	22.90	22.84	22.94	
		3	3	22.79	22.92	22.96	
		6	0	21.87	21.79	21.96	22.50
	16QAM	1	0	21.90	21.95	22.00	22.50
		1	2	21.98	21.96	21.98	
		1	5	21.72	21.99	21.98	
		3	0	21.95	21.67	21.95	22.50
		3	2	21.95	21.91	21.94	
		3	3	21.74	21.98	21.92	
		6	0	20.99	20.90	20.96	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20415/825.5	20525/836.5	20635/847.5	
3MHz	QPSK	1	0	22.96	22.68	22.82	23.50
		1	7	22.94	22.90	22.95	
		1	14	22.67	22.90	23.00	
		8	0	21.97	21.71	21.97	22.50
		8	4	21.94	21.86	21.98	
		8	7	21.81	21.95	21.98	
		15	0	21.90	21.83	21.99	22.50
	16QAM	1	0	21.90	21.97	21.90	22.50
		1	7	21.90	21.90	21.90	
		1	14	21.74	21.90	21.90	
		8	0	20.98	20.72	20.99	21.50
		8	4	20.98	20.96	20.98	
		8	7	20.76	20.90	20.97	
		15	0	20.90	20.94	20.99	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20425/826.5	20525/836.5	20625/846.5	
5MHz	QPSK	1	0	22.94	22.63	22.79	23.50
		1	13	22.93	22.90	22.93	
		1	24	22.63	22.84	22.95	
		12	0	21.95	21.67	21.94	22.50
		12	6	21.92	21.82	21.93	
		12	13	21.78	21.94	21.95	
		25	0	21.94	21.80	21.96	22.50
	16QAM	1	0	21.98	21.94	22.00	22.50
		1	13	21.99	22.00	22.00	
		1	24	21.71	21.99	21.97	
		12	0	20.96	20.71	20.97	21.50

		12	6	20.94	20.90	20.93	
		12	13	20.74	20.98	20.94	
		25	0	21.00	20.90	20.94	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20450/829	20525/836.5	20600/844	
10MHz	QPSK	1	0	22.91	22.59	22.76	23.50
		1	25	22.92	22.86	22.91	
		1	49	22.61	22.83	22.92	
		25	0	21.92	21.62	21.90	22.50
		25	13	21.90	21.78	21.90	
		25	25	21.75	21.89	21.91	
		50	0	21.91	21.75	21.92	22.50
	16QAM	1	0	21.96	21.90	21.95	22.50
		1	25	21.95	21.98	21.96	
		1	49	21.69	21.96	21.95	
		25	0	20.93	20.67	20.94	21.50
		25	13	20.91	20.88	20.90	
		25	25	20.71	20.93	20.90	
		50	0	20.98	20.86	20.91	21.50

LTE FDD Band 7 Full Power				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				20775/2502.5	21100/2535	21425/2567.5	
5MHz	QPSK	1	0	21.60	21.85	21.96	23.00
		1	13	22.08	22.13	21.98	
		1	24	21.38	21.74	21.68	
		12	0	20.89	20.89	21.04	22.00
		12	6	20.81	20.80	21.01	
		12	13	20.86	20.78	21.02	
		25	0	20.77	20.83	21.06	22.00
	16QAM	1	0	21.14	20.90	20.59	22.00
		1	13	21.43	21.11	20.78	
		1	24	21.04	20.95	20.56	
		12	0	19.61	19.77	19.95	21.00
		12	6	19.97	19.71	20.09	
		12	13	19.66	19.94	20.03	
		25	0	19.84	19.79	19.89	21.00
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20800/2505	21100/2535	21400/2565	
10MHz	QPSK	1	0	21.62	21.86	21.99	23.00
		1	25	22.11	22.18	22.02	
		1	49	21.40	21.78	21.71	
		25	0	20.92	20.94	21.08	22.00
		25	13	20.84	20.85	21.05	
		25	25	20.88	20.82	21.07	
		50	0	20.85	20.85	21.10	22.00
	16QAM	1	0	21.16	20.93	20.61	22.00
		1	25	21.46	21.15	20.81	
		1	49	21.07	20.97	20.59	
		25	0	19.64	19.82	19.99	21.00
		25	13	19.99	19.75	20.12	
		25	25	19.69	19.99	20.07	
		50	0	19.87	19.84	19.93	21.00
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20825/2507.5	21100/2535	21375/2562.5	
15MHz	QPSK	1	0	21.61	21.82	21.97	23.00
		1	38	22.09	22.17	21.99	
		1	74	21.37	21.73	21.67	
		36	0	20.90	20.90	21.05	22.00
		36	18	20.81	20.80	21.01	
		36	39	20.85	20.79	21.03	
		75	0	20.83	20.81	21.05	22.00
	16QAM	1	0	21.11	20.91	20.59	22.00
		1	38	21.44	21.12	20.79	
		1	74	21.04	20.93	20.56	

		36	0	19.61	19.80	19.96	21.00
		36	18	19.96	19.70	20.08	
		36	39	19.67	19.95	20.04	
		75	0	19.84	19.79	19.89	21.00
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20850/2510	21100/2535	21350/2560	
20MHz	QPSK	1	0	21.58	21.78	21.94	23.00
		1	50	22.08	22.13	21.97	
		1	99	21.35	21.72	21.64	
		50	0	20.87	20.85	21.01	22.00
		50	25	20.79	20.76	20.98	
		50	50	20.82	20.74	20.99	
		100	0	20.80	20.76	21.01	22.00
	16QAM	1	0	21.09	20.87	20.54	22.00
		1	50	21.40	21.10	20.75	
		1	99	21.02	20.90	20.54	
		50	0	19.58	19.76	19.93	21.00
		50	25	19.93	19.68	20.05	
		50	50	19.64	19.90	20.00	
		100	0	19.82	19.75	19.86	21.00

LTE FDD Band 7 Hotspot Reduce Power				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				20775/2502.5	21100/2535	21425/2567.5	
5MHz	QPSK	1	0	18.68	19.03	18.93	19.50
		1	13	19.23	19.25	19.09	
		1	24	18.23	18.26	18.62	
		12	0	18.43	18.42	18.45	18.50
		12	6	18.42	18.44	18.43	
		12	13	18.41	18.45	18.38	
		25	0	18.41	18.47	18.44	18.50
	16QAM	1	0	18.47	18.42	18.43	18.50
		1	13	18.45	18.38	18.45	
		1	24	18.46	18.36	18.47	
		12	0	17.37	17.44	17.46	17.50
		12	6	17.47	17.44	17.48	
		12	13	17.37	17.48	17.45	
		25	0	17.46	17.46	17.48	17.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20800/2505	21100/2535	21400/2565	
10MHz	QPSK	1	0	18.70	19.04	18.96	19.50
		1	25	19.26	19.30	19.13	
		1	49	18.25	18.30	18.65	
		25	0	18.46	18.46	18.47	18.50
		25	13	18.45	18.44	18.47	
		25	25	18.43	18.47	18.43	
		50	0	18.46	18.42	18.44	18.50
	16QAM	1	0	18.45	18.43	18.45	18.50
		1	25	18.43	18.42	18.48	
		1	49	18.39	18.38	18.40	
		25	0	17.40	17.45	17.46	17.50
		25	13	17.47	17.44	17.42	
		25	25	17.40	17.43	17.47	
		50	0	17.45	17.44	17.43	17.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20825/2507.5	21100/2535	21375/2562.5	
15MHz	QPSK	1	0	18.69	19.00	18.94	19.50
		1	38	19.24	19.29	19.10	
		1	74	18.22	18.25	18.61	
		36	0	18.44	18.47	18.46	18.50
		36	18	18.42	18.44	18.43	
		36	39	18.40	18.46	18.39	
		75	0	18.47	18.48	18.49	18.50
	16QAM	1	0	18.47	18.43	18.43	18.50
		1	38	18.42	18.39	18.46	
		1	74	18.46	18.34	18.47	
		36	0	17.37	17.47	17.47	17.50

		36	18	17.46	17.49	17.49	
		36	39	17.38	17.49	17.46	
		75	0	17.46	17.40	17.41	17.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				20850/2510	21100/2535	21350/2560	
20MHz	QPSK	1	0	18.66	18.96	18.91	19.50
		1	50	19.23	19.25	19.08	
		1	99	18.20	18.24	18.58	
		50	0	18.41	18.42	18.47	18.50
		50	25	18.40	18.44	18.40	
		50	50	18.37	18.41	18.35	
		100	0	18.44	18.43	18.45	18.50
	16QAM	1	0	18.45	18.39	18.38	18.50
		1	50	18.48	18.37	18.42	
		1	99	18.44	18.31	18.45	
		50	0	17.34	17.43	17.44	17.50
		50	25	17.43	17.47	17.46	
		50	50	17.35	17.44	17.42	
		100	0	17.44	17.46	17.48	17.50

LTE FDD Band 12				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				23017/699.7	23095/707.5	23173/715.3	
1.4MHz	QPSK	1	0	22.86	22.74	22.55	23.50
		1	2	22.64	22.72	22.59	
		1	5	22.93	22.72	22.90	
		3	0	22.73	22.65	22.79	23.50
		3	2	22.45	22.72	22.80	
		3	3	22.69	22.67	22.92	
		6	0	21.52	21.67	21.89	22.50
	16QAM	1	0	21.37	21.86	21.99	22.50
		1	2	21.43	21.92	21.95	
		1	5	21.35	21.82	21.93	
		3	0	21.58	21.69	21.74	22.50
		3	2	21.67	21.74	21.74	
		3	3	21.92	21.72	21.98	
		6	0	20.60	20.78	20.86	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				23025/700.5	23095/707.5	23165/714.5	
3MHz	QPSK	1	0	22.87	22.77	22.57	23.50
		1	7	22.68	22.78	22.64	
		1	14	22.95	22.76	22.93	
		8	0	21.75	21.69	21.84	22.50
		8	4	21.50	21.75	21.83	
		8	7	21.71	21.72	21.95	
		15	0	21.61	21.72	21.94	22.50
	16QAM	1	0	21.39	21.87	21.91	22.50
		1	7	21.46	21.99	21.99	
		1	14	21.37	21.86	21.95	
		8	0	20.62	20.75	20.79	21.50
		8	4	20.69	20.78	20.77	
		8	7	20.94	20.76	20.93	
		15	0	20.64	20.83	20.88	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				23035/701.5	23095/707.5	23155/713.5	
5MHz	QPSK	1	0	22.86	22.73	22.55	23.50
		1	13	22.66	22.77	22.61	
		1	24	22.92	22.71	22.89	
		12	0	21.73	21.65	21.81	22.50
		12	6	21.47	21.70	21.79	
		12	13	21.68	21.69	21.91	
		25	0	21.59	21.68	21.89	22.50
	16QAM	1	0	21.34	21.85	21.99	22.50
		1	13	21.44	21.96	21.97	
		1	24	21.34	21.82	21.92	
		12	0	20.59	20.73	20.76	21.50

		12	6	20.66	20.73	20.73	
		12	13	20.92	20.72	21.00	
		25	0	20.61	20.78	20.84	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				23060/704	23095/707.5	23130/711	
10MHz	QPSK	1	0	22.83	22.69	22.52	23.50
		1	25	22.65	22.73	22.59	
		1	49	22.90	22.70	22.86	
		25	0	21.70	21.60	21.77	22.50
		25	13	21.45	21.66	21.76	
		25	25	21.65	21.64	21.97	
		50	0	21.56	21.63	21.85	22.50
	16QAM	1	0	21.32	21.81	21.94	22.50
		1	25	21.40	21.94	21.93	
		1	49	21.32	21.79	21.90	
		25	0	20.56	20.69	20.73	21.50
		25	13	20.63	20.71	20.70	
		25	25	20.89	20.67	20.96	
		50	0	20.59	20.74	20.81	21.50

LTE FDD Band 17				Conducted Power(dBm)			Tune-up Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				23755/706.5	23790/710	23825/713.5	
5MHz	QPSK	1	0	22.46	22.75	22.48	23.50
		1	13	22.54	22.97	22.51	
		1	24	22.87	22.98	22.75	
		12	0	21.58	21.68	21.79	22.50
		12	6	21.58	21.56	21.70	
		12	13	21.67	21.74	21.89	
		25	0	21.70	21.74	21.76	22.50
	16QAM	1	0	21.79	21.27	21.88	22.50
		1	13	21.93	21.51	21.79	
		1	24	21.91	21.41	21.83	
		12	0	20.68	20.79	20.83	21.50
		12	6	20.85	20.88	20.65	
		12	13	20.83	20.94	20.72	
		25	0	20.79	20.89	20.83	21.50
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Tune-up Limit (dBm)
				23780/709	23790/710	23800/711	
10MHz	QPSK	1	0	22.43	22.71	22.45	23.50
		1	25	22.53	22.93	22.49	
		1	49	22.85	22.91	22.72	
		25	0	21.55	21.63	21.75	22.50
		25	13	21.56	21.52	21.67	
		25	25	21.64	21.69	21.85	
		50	0	21.67	21.69	21.72	22.50
	16QAM	1	0	21.77	21.23	21.83	22.50
		1	25	21.89	21.49	21.75	
		1	49	21.89	21.38	21.81	
		25	0	20.65	20.75	20.80	21.50
		25	13	20.82	20.86	20.62	
		25	25	20.80	20.89	20.68	
		50	0	20.77	20.85	20.80	21.50

<LTE CA>

DL LTE CA Class	PCC								SCC			Power		
	PCC Band	PCC BW (MHz)	PCC UL RB size	PCC UL RB offset	PCC DL RB size	PCC DL RB offset	PCC UL CH	PCC DL CH	SCC Band	SCC BW (MHz)	SCC DL CH	Rel 8 LTE Tx Power (dBm)	Rel 10 DL LTE CA Tx Power (dBm)	Tune-up
CA_2C	2	5	1	13	25	0	18983	983	2	20	1100	22.84	22.76	23.50
	2	10	1	25	50	0	18956	956	2	20	1100	22.88	22.78	23.50
	2	15	1	38	75	0	18929	929	2	20	1100	22.85	22.77	23.50
	2	20	1	50	100	0	18902	902	2	20	1100	22.83	22.75	23.50
CA_2A-2A	2	5	1	13	25	0	18625	625	2	20	1100	22.87	22.76	23.50
	2	10	1	25	50	0	18650	650	2	20	1100	22.86	22.78	23.50
	2	15	1	38	75	0	18675	675	2	20	1100	22.82	22.73	23.50
	2	20	1	50	100	0	18700	700	2	20	1100	22.81	22.72	23.50
CA_4A-4A	4	5	1	13	25	0	19975	1975	4	20	2300	22.96	22.87	23.50
	4	10	1	25	50	0	20000	2000	4	20	2300	22.99	22.86	23.50
	4	15	1	38	75	0	20025	2025	4	20	2300	22.97	22.84	23.50
	4	20	1	50	100	0	20050	2050	4	20	2300	22.96	22.83	23.50
CA_2A-4A	2	1.4	1	2	6	0	19193	1193	4	20	2050	22.82	22.71	23.50
	2	3	1	7	15	0	19185	1185	4	20	2050	22.87	22.76	23.50
	2	5	1	13	25	0	19175	1175	4	20	2050	22.84	22.73	23.50
	2	10	1	25	50	0	19150	1150	4	20	2050	22.88	22.79	23.50
	2	15	1	38	75	0	19125	1125	4	20	2050	22.85	22.74	23.50
	2	20	1	50	100	0	19100	1100	4	20	2050	22.83	22.70	23.50
	4	5	1	24	25	0	19975	1975	2	20	1100	22.96	22.84	23.50
	4	10	1	25	50	0	20000	2000	2	20	1100	22.99	22.82	23.50
	4	15	1	38	75	0	20025	2025	2	20	1100	22.97	22.85	23.50
	4	20	1	50	100	0	20050	2050	2	20	1100	22.96	22.82	23.50
CA_2A-12A	2	5	1	13	25	0	19175	1175	12	10	5060	22.82	22.73	23.50
	2	10	1	25	50	0	19150	1150	12	10	5060	22.85	22.75	23.50
	12	3	1	14	15	0	23025	2025	2	10	1150	22.97	22.86	23.50
	12	5	1	24	25	0	23035	5035	2	10	1150	22.98	22.84	23.50
	12	10	1	49	50	0	23060	5060	2	10	1150	22.96	22.83	23.50
CA_2A-17A	2	5	1	13	25	0	19175	1175	17	10	5790	22.83	22.71	23.50
	2	10	1	25	50	0	19150	1150	17	10	5790	22.81	22.70	23.50
	17	5	1	24	25	0	23790	5790	2	10	1150	22.98	22.86	23.50
	17	10	1	25	50	0	23790	5790	2	10	1150	22.93	22.82	23.50
CA_4A-12A	4	1.4	1	0	6	0	20175	2175	12	10	5060	22.91	22.80	23.50
	4	3	1	14	15	0	19965	1965	12	10	5060	22.93	22.82	23.50
	4	5	1	24	25	0	19975	1975	12	10	5060	22.95	22.84	23.50
	4	10	1	25	50	0	20000	2000	12	10	5060	22.96	22.86	23.50
	12	3	1	14	15	0	23025	2025	4	10	2000	22.93	22.81	23.50
	12	5	1	24	25	0	23035	5035	4	10	2000	22.91	22.82	23.50
	12	10	1	49	50	0	23060	5060	4	10	2000	22.90	22.86	23.50
CA_4A-17A	4	5	1	24	25	0	19975	1975	17	10	5790	22.95	22.81	23.50
	4	10	1	25	50	0	20000	2000	17	10	5790	22.93	22.86	23.50

	17	5	1	24	25	0	23790	5790	4	10	2000	22.91	22.84	23.50
	17	10	1	25	50	0	23790	5790	4	10	2000	22.95	22.83	23.50

<WLAN 2.4G>

Mode	802.11b		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power	**14.55**	14.46	14.54
Mode	**802.11g**		
Channel / Frequency (MHz)	**1 (2412)**	**6 (2437)**	**11 (2462)**
Average Power	13.75	13.72	**13.97**
Mode	**802.11n (HT20)**		
Channel / Frequency (MHz)	**1 (2412)**	**6 (2437)**	**11 (2462)**
Average Power	11.23	11.74	**11.76**
Mode	**802.11n (HT40)**		
Channel / Frequency (MHz)	**3 (2422)**	**6 (2437)**	**9 (2452)**
Average Power	10.62	10.67	**10.79**

Call off

<WLAN 5.2G>

Mode	802.11a			
Channel / Frequency (MHz)	36 (5180)	40 (5200)	44 (5220)	48 (5240)
Average Power	14.02	14.19	14.2	**14.23**
Mode	**802.11n (HT20)**			
Channel / Frequency (MHz)	**36 (5180)**	**40 (5200)**	**44 (5220)**	**48 (5240)**
Average Power	9.75	9.79	9.92	**10.12**
Mode	**802.11n (HT40)**			
Channel / Frequency (MHz)	**38 (5190)**		**46 (5230)**	
Average Power	**8.36**		8.13	
Mode	**802.11ac (VHT20)**			
Channel / Frequency (MHz)	**36 (5180)**	**40 (5200)**	**44 (5220)**	**48 (5240)**
Average Power	12.84	12.81	12.88	**12.96**
Mode	**802.11ac (VHT40)**			
Channel / Frequency (MHz)	**38 (5190)**		**46 (5230)**	
Average Power	**10.15**		10.11	
Mode	**802.11ac (VHT80)**			
Channel / Frequency (MHz)	**42 (5210)**			
Average Power	**6.14**			

<WLAN 5.3G>

Mode	802.11a			
Channel / Frequency (MHz)	52 (5260)	56 (5280)	60 (5300)	64 (5320)
Average Power	**14.45**	14.37	14.23	14.33
Mode	**802.11n (HT20)**			
Channel / Frequency (MHz)	**52 (5260)**	**56 (5280)**	**60 (5300)**	**64 (5320)**
Average Power	10.01	10.2	10.26	**10.39**
Mode	**802.11n (HT40)**			
Channel / Frequency (MHz)	**54 (5270)**		**62 (5310)**	
Average Power	**7.86**		7.74	
Mode	**802.11ac (VHT20)**			
Channel / Frequency (MHz)	**52 (5260)**	**56 (5280)**	**60 (5300)**	**64 (5320)**
Average Power	12.88	12.87	12.93	**13.03**
Mode	**802.11ac (VHT40)**			
Channel / Frequency (MHz)	**54 (5270)**		**62 (5310)**	
Average Power	10.22		**10.31**	
Mode	**802.11ac (VHT80)**			
Channel / Frequency (MHz)	**58 (5290)**			
Average Power	**6.17**			

<WLAN 5.6G>

Mode	802.11a					
Channel / Frequency (MHz)	100 (5500)	112 (5560)	116 (5580)	120 (5600)	128 (5640)	140 (5700)
Average Power	14.37	14.38	14.42	14.38	**14.71**	14.63
Mode	802.11n (HT20)					
Channel / Frequency (MHz)	100 (5500)	112 (5560)	116 (5580)	120 (5600)	128 (5640)	140 (5700)
Average Power	10.24	10.1	10.23	10.31	10.11	**10.38**
Mode	802.11n (HT40)					
Channel / Frequency (MHz)	102 (5510)	110 (5550)	118 (5590)	126 (5630)		134 (5670)
Average Power	7.57	7.56	7.55	7.61		**7.76**
Mode	802.11ac (VHT20)					
Channel / Frequency (MHz)	100 (5500)	112 (5560)	116 (5580)	120 (5600)	128 (5640)	140 (5700)
Average Power	13.04	13.12	13.21	13.16	13.22	**13.32**
Mode	802.11ac (VHT40)					
Channel / Frequency (MHz)	102 (5510)	110 (5550)	118 (5590)	126 (5630)		134 (5670)
Average Power	10.21	10.13	10.16	10.33		**10.64**
Mode	802.11ac (VHT80)					
Channel / Frequency (MHz)	106 (5530)			122 (5610)		
Average Power	6.23			**6.43**		

<WLAN 5.8G>

Mode	802.11a		
Channel / Frequency (MHz)	149 (5745)	157 (5785)	165 (5825)
Average Power	**13.30**	13.22	13.27
Mode	802.11n (HT20)		
Channel / Frequency (MHz)	149 (5745)	157 (5785)	165 (5825)
Average Power	9.24	9.20	**9.30**
Mode	802.11n (HT40)		
Channel / Frequency (MHz)	151 (5755)		159 (5795)
Average Power	**7.46**		7.38
Mode	802.11ac (VHT20)		
Channel / Frequency (MHz)	149 (5745)	157 (5785)	165 (5825)
Average Power	**10.53**	10.51	10.47
Mode	802.11ac (VHT40)		
Channel / Frequency (MHz)	151 (5755)		159 (5795)
Average Power	8.15		**8.22**
Mode	802.11ac (VHT80)		
Channel / Frequency (MHz)	155 (5775)		
Average Power	**6.27**		

Call on

<WLAN 5.2G>

Mode	802.11a			
Channel / Frequency (MHz)	36 (5180)	40 (5200)	44 (5220)	48 (5240)
Average Power	13.52	13.61	13.56	**13.72**

<WLAN 5.3G>

Mode	802.11a			
Channel / Frequency (MHz)	52 (5260)	56 (5280)	60 (5300)	64 (5320)
Average Power	13.77	**13.80**	13.57	13.68

<WLAN 5.6G>

Mode	802.11a					
Channel / Frequency (MHz)	100 (5500)	112 (5560)	116 (5580)	120 (5600)	128 (5640)	140 (5700)
Average Power	10.14	10.39	10.31	10.36	10.32	**10.43**

<WLAN 5.8G>

Mode	802.11a		
Channel / Frequency (MHz)	149 (5745)	157 (5785)	165 (5825)
Average Power	**10.52**	10.36	10.41

<Bluetooth>

Mode	Bluetooth GFSK		
Channel / Frequency (MHz)	0 (2402)	39 (2441)	78 (2480)
Average Power	6.29	**9.89**	8.05
Mode	Bluetooth π/4-DQPSK		
Channel / Frequency (MHz)	0 (2402)	39 (2441)	78 (2480)
Average Power	5.99	**7.93**	5.96
Mode	Bluetooth 8-DPSK		
Channel / Frequency (MHz)	0 (2402)	39 (2441)	78 (2480)
Average Power	4.15	**7.94**	5.98
Mode	Bluetooth LE		
Channel / Frequency (MHz)	0 (2402)	19 (2440)	39 (2480)
Average Power	-2.42	**0.99**	-1.32

4.4 SAR Test Exclusion Evaluations

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

$$\frac{\text{Max. Tune up Power}_{(mW)}}{\text{Min. Test Separation Distance}_{(mm)}} \times \sqrt{f_{(GHz)}} \leq 3.0 \text{ for SAR-1g, } \leq 7.5 \text{ for SAR-10g}$$

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

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Body-Worn		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
BT (2.441 GHz)	10.0	10	15	1.0	No

Note:

1. When separation distance <= 50 mm and the calculated result shown in above table is <= 3.0 for SAR-1g exposure condition, or <= 7.5 for SAR-10g exposure condition, the SAR testing exclusion is applied.

<Estimated SAR Calculation>

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

$$\text{Estimated SAR} = \frac{\text{Max. Tune up Power}_{(mW)}}{\text{Min. Test Separation Distance}_{(mm)}} \times \frac{\sqrt{f_{(GHz)}}}{7.5}$$

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

Mode / Band	Frequency (GHz)	Max. Tune-up Power (dBm)	Test Position	Separation Distance (mm)	Estimated SAR (W/kg)
BT (DSS)	2.441	10.0	Body-worn	15	0.139

Note:

1. The separation distance is determined from the outer housing of the EUT to the user.
2. When standalone SAR testing is not required, an estimated SAR can be applied to determine simultaneous transmission SAR test exclusion.

4.5 SAR Testing Results

4.5.1 SAR Test Reduction Considerations

<KDB 447498 D01, General RF Exposure Guidance>

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

(1) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz

(2) ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz

(3) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

<KDB 941225 D01, 3G SAR Measurement Procedures>

The mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. 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.

<KDB 941225 D05, SAR Evaluation Considerations for LTE Devices>

(1) QPSK with 1 RB and 50% RB allocation

Start with the largest channel bandwidth and measure SAR, 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. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

(2) QPSK with 100% RB allocation

SAR is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

(3) Higher order modulations

SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > 1/2 dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

(4) Other channel bandwidth

SAR is required when the highest maximum output power of the smaller channel bandwidth is > 1/2 dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

<KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters>

(1) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial

test position. When the reported SAR of initial test position is <= 0.4 W/kg, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is <= 0.8 W/kg or all test positions are measured.

(2) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg.

(3) For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is <= 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is <= 1.2 W/kg.

4.5.2 SAR Results for Head Exposure Condition

Plot No.	Band	Mode	Test Position	Ch.	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
1	802.11b	-	Left Cheek	1	15.0	14.55	0.817	1.11	**0.91**
	802.11b	-	Left Cheek	11	15.0	14.54	0.758	1.11	0.84
2	802.11a	-	Right Cheek	64	14.0	13.68	1.049	1.08	**1.13**
	802.11a	-	Right Cheek	56	14.0	13.80	0.896	1.05	0.94
3	802.11a	-	Left Cheek	140	11.0	10.43	0.815	1.14	**0.93**
	802.11a	-	Left Cheek	112	11.0	10.39	0.802	1.15	0.92
4	802.11a	-	Right Cheek	165	11.0	10.41	0.915	1.15	**1.05**
	802.11a	-	Right Cheek	149	11.0	10.52	0.896	1.12	1.00
5	BT	-	Left Cheek	39	10.0	9.89	0.218	1.03	**0.22**

4.5.3 SAR Results for Body-worn Exposure Condition (Separation Distance is 1.5 cm)

Plot No.	Band	Mode	Test Position	Ch.	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
6	802.11b	-	Rear Face	6	15.0	14.46	0.152	1.13	**0.17**
7	802.11a	-	Rear Face	64	15.0	14.33	0.24	1.17	**0.28**
8	802.11a	-	Front Face	120	15.0	14.38	0.272	1.15	**0.31**
9	802.11a	-	Front Face	149	14.0	13.30	0.408	1.17	**0.48**

4.5.4 SAR Results for Hotspot Exposure Condition (Separation Distance is 1.0 cm)

Plot No.	Band	Mode	Test Position	Ch.	RB	offset	Maximum Tune-up (dBm)	Conducted Power (dBm)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
10	LTE 2	QPSK20M	Bottom Side	18700	1	50	16.5	15.89	0.864	1.15	**0.99**
	LTE 2	QPSK20M	Bottom Side	18900	1	50	16.5	16.03	0.812	1.11	0.90
	LTE 2	QPSK20M	Bottom Side	19100	1	50	16.5	16.26	0.795	1.06	0.84
11	802.11b	-	Rear Face	6	-	-	15.0	14.46	0.26	1.13	**0.29**

4.5.5 SAR Results for Extremity Exposure Condition (Separation Distance is 0 cm)

Plot No.	Band	Test Position	Ch.	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Measured SAR-1g (W/kg)	Scaling Factor	Scaled SAR-1g (W/kg)
12	802.11a	Rear Face	64	15.0	14.33	0.496	1.17	**0.58**
13	802.11a	Rear Face	120	15.0	14.38	0.906	1.15	**1.05**
14	802.11a	Rear Face	149	14.0	13.30	1.437	1.17	**1.69**

4.6 Smultaneous Multi-band Transmission Evaluation

<Simultaneous Transmission Possibilities>

The simultaneous transmission possibilities for this device are listed as below.

Simultaneous Transmission Configurations	Head (Voice / VoIP)	Body-worn (Voice / VoIP)	Hotspot (Data)	Extremity (Data)
GSM (Voice / Data) + WLAN (Data)	Yes	Yes	Yes	Yes
WCDMA (Voice / Data) + WLAN (Data)	Yes	Yes	Yes	Yes
LTE (Data) + WLAN (Data)	Yes	Yes	Yes	Yes
GSM (Voice / Data) + BT (Data)	Yes	Yes	No	No
WCDMA (Voice / Data) + BT (Data)	Yes	Yes	No	No
LTE (Data) + BT (Data)	Yes	Yes	No	No

Note :

1. The 2.4G WLAN and 5G WLAN cannot transmit simultaneously.
2. The WLAN and Bluetooth cannot transmit simultaneously, so there is no co-location test requirement for WLAN and Bluetooth.
3. Only 2.4G WLAN (802.11b/g/n) supports wireless hotspot capability. 5G WLAN (802.11a/n/ac) does not support wireless hotspot mode.

<SAR Summation Analysis>

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR_{1g} of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR_{1g} 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR_{1g} is greater than the SAR limit (SAR_{1g} 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

Position		Max. Standalone SAR										
		GSM		WCDMA			LTE					
		850	1900	II	IV	V	2	4	5	7	12	17
Head	Left Cheek	0.193	0.133	0.158	0.112	0.148	0.056	0.077	0.158	0.065	0.162	0.148
	Left Tilted	0.148	0.031	0.062	0.034	0.134	0.032	0.022	0.103	0.025	0.119	0.133
	Right Cheek	0.212	0.081	0.107	0.113	0.209	0.114	0.091	0.175	0.126	0.137	0.138
	Right Tilted	0.212	0.040	0.076	0.035	0.023	0.034	0.025	0.091	0.084	0.119	0.105
Body-Worn	Rear Face	0.156	0.301	0.550	0.215	0.145	0.347	0.182	0.098	0.424	0.142	0.129
	Front Face	0.095	0.429	0.684	0.257	0.117	0.403	0.281	0.112	0.405	0.122	0.135
Hotspot	Rear Face	0.189	0.297	0.413	0.438	0.214	0.526	0.435	0.180	0.302	0.195	0.204
	Front Face	0.160	0.390	0.477	0.517	0.183	0.544	0.509	0.205	0.318	0.162	0.212
	Left Side	0.054	0.038	0.044	0.119	0.046	0.098	0.053	0.029	0.135	0.056	0.116
	Right Side	0.125	0.051	0.061	0.025	0.132	0.006	0.050	0.114	0.081	0.057	0.188
	Top Side	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Bottom Side	0.099	0.661	0.952	1.009	0.147	1.097	0.955	0.092	0.721	0.055	0.059
Extremity	Rear Face	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Front Face	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Left Side	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Right Side	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Top Side	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Bottom Side	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Position		Max. Standalone SAR					
		WLAN					BT
		2.4G	5.2G	5.3G	5.6G	5.8G	2.4G
Head	Left Cheek	1.127	0.000	0.969	1.189	0.877	0.220
	Left Tilted	0.695	0.000	0.896	1.058	0.824	0.096
	Right Cheek	0.287	0.000	1.130	1.131	1.050	0.059
	Right Tilted	0.256	0.000	1.073	1.086	0.903	0.025
Body-Worn	Rear Face	0.170	0.000	0.280	0.086	0.097	0.139
	Front Face	0.038	0.000	0.148	0.310	0.480	0.139
Hotspot	Rear Face	0.290	0.000	0.000	0.000	0.000	N/A
	Front Face	0.084	0.000	0.000	0.000	0.000	N/A
	Left Side	0.000	0.000	0.000	0.000	0.000	N/A
	Right Side	0.023	0.000	0.000	0.000	0.000	N/A
	Top Side	0.073	0.000	0.000	0.000	0.000	N/A
	Bottom Side	0.000	0.000	0.000	0.000	0.000	N/A
Extremity	Rear Face	0.000	0.000	1.042	1.050	1.690	N/A
	Front Face	0.000	0.000	0.382	0.477	0.458	N/A
	Left Side	0.000	0.000	0.000	0.000	0.000	N/A
	Right Side	0.000	0.000	0.012	0.027	0.023	N/A
	Top Side	0.000	0.000	0.047	0.244	0.183	N/A
	Bottom Side	0.000	0.000	0.000	0.000	0.000	N/A

Position		Highest Simultaneous Transmission SAR	WWAN+WLAN(DTS)										
			GSM		WCDMA			LTE					
			850	1900	II	IV	V	2	4	5	7	12	17
Head	Left Cheek	1.32	1.32	1.26	1.29	1.24	1.28	1.18	1.20	1.29	1.19	1.29	1.28
	Left Tilted		0.84	0.73	0.76	0.73	0.83	0.73	0.72	0.80	0.72	0.81	0.83
	Right Cheek		0.50	0.37	0.39	0.40	0.50	0.40	0.38	0.46	0.41	0.42	0.43
	Right Tilted		0.47	0.30	0.33	0.29	0.28	0.29	0.28	0.35	0.34	0.38	0.36
Body-Worn	Rear Face	0.72	0.33	0.47	0.72	0.39	0.32	0.52	0.35	0.27	0.59	0.31	0.30
	Front Face		0.13	0.47	0.72	0.30	0.16	0.44	0.32	0.15	0.44	0.16	0.17
Hotspot	Rear Face	1.10	0.48	0.59	0.70	0.73	0.50	0.82	0.73	0.47	0.59	0.49	0.49
	Front Face		0.24	0.47	0.56	0.60	0.27	0.63	0.59	0.29	0.40	0.25	0.30
	Left Side		0.05	0.04	0.04	0.12	0.05	0.10	0.05	0.03	0.14	0.06	0.12
	Right Side		0.15	0.07	0.08	0.05	0.16	0.03	0.07	0.14	0.10	0.08	0.21
	Top Side		0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	Bottom Side		0.10	0.66	0.95	1.01	0.15	1.10	0.96	0.09	0.72	0.06	0.06
Extremity	Rear Face	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Front Face		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Left Side		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Top Side		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bottom Side		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Position		Highest Simultaneous Transmission SAR	WWAN+WLAN(NII)										
			GSM		WCDMA			LTE					
			850	1900	II	IV	V	2	4	5	7	12	17
Head	Left Cheek	1.38	1.38	1.32	1.35	1.30	1.34	1.25	1.27	1.35	1.25	1.35	1.34
	Left Tilted		1.21	1.09	1.12	1.09	1.19	1.09	1.08	1.16	1.08	1.18	1.19
	Right Cheek		1.34	1.21	1.24	1.24	1.34	1.25	1.22	1.31	1.26	1.27	1.27
	Right Tilted		1.30	1.13	1.16	1.12	1.11	1.12	1.11	1.18	1.17	1.21	1.19
Body-Worn	Rear Face	1.16	0.44	0.58	0.83	0.50	0.43	0.63	0.46	0.38	0.70	0.42	0.41
	Front Face		0.58	0.91	1.16	0.74	0.60	0.88	0.76	0.59	0.89	0.60	0.62
Extremity	Rear Face	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69
	Front Face		0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
	Left Side		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Right Side		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	Top Side		0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
	Bottom Side		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Position		Highest Simultaneous Transmission SAR	WWAN+BT(DSS)										
			GSM		WCDMA			LTE					
			850	1900	II	IV	V	2	4	5	7	12	17
Head	Left Cheek	0.41	0.41	0.35	0.38	0.33	0.37	0.28	0.30	0.38	0.29	0.38	0.37
	Left Tilted		0.24	0.13	0.16	0.13	0.23	0.13	0.12	0.20	0.12	0.22	0.23
	Right Cheek		0.27	0.14	0.17	0.17	0.27	0.17	0.15	0.23	0.19	0.20	0.20
	Right Tilted		0.24	0.07	0.10	0.06	0.05	0.06	0.05	0.12	0.11	0.14	0.13
Body-Worn	Rear Face	0.82	0.30	0.44	0.69	0.35	0.28	0.49	0.32	0.24	0.56	0.28	0.27
	Front Face		0.23	0.57	0.82	0.40	0.26	0.54	0.42	0.25	0.54	0.26	0.27

*** End of Report ***

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Appendix A. SAR Plots of System Verification

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

RESULTS

TYPE	BAND	Liquid	
Validation	CW1900	Body	Measurement 1: Validation Plane with Body device position on Middle Channel in CW mode
Validation	CW2450	Head	Measurement 2: Validation Plane with Body device position on Middle Channel in CW mode
Validation	CW2450	Body	Measurement 3: Validation Plane with Body device position on Middle Channel in CW mode
Validation	CW5400	Head	Measurement 4: Validation Plane with Body device position on Middle Channel in CW mode
Validation	CW5400	Body	Measurement 5: Validation Plane with Body device position on Middle Channel in CW mode
Validation	CW5600	Body	Measurement 6: Validation Plane with Body device position on Middle Channel in CW mode
Validation	CW5800	Head	Measurement 7: Validation Plane with Body device position on Middle Channel in CW mode
Validation	CW5800	Body	Measurement 8: Validation Plane with Body device position on Middle Channel in CW mode

MEASUREMENT 1

Type: Validation measurement

Date of measurement: 22/11/2016

Measurement duration: 22 minutes 31 seconds

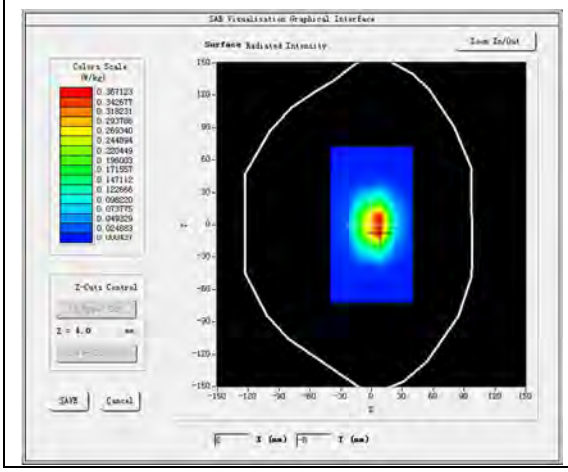
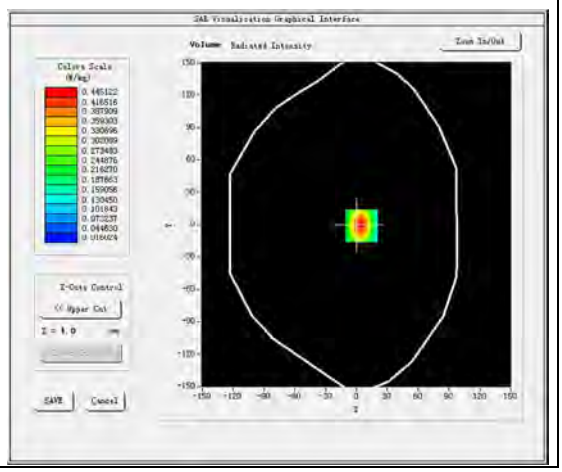
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	CW1900
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results:

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	1900.0
Relative permittivity (real part)	53.286414
Relative permittivity (imaginary	14.338118
Conductivity (S/m)	1.513468
Variation (%)	-0.91
Temperature:	21.3°C
ConvF:	6.18

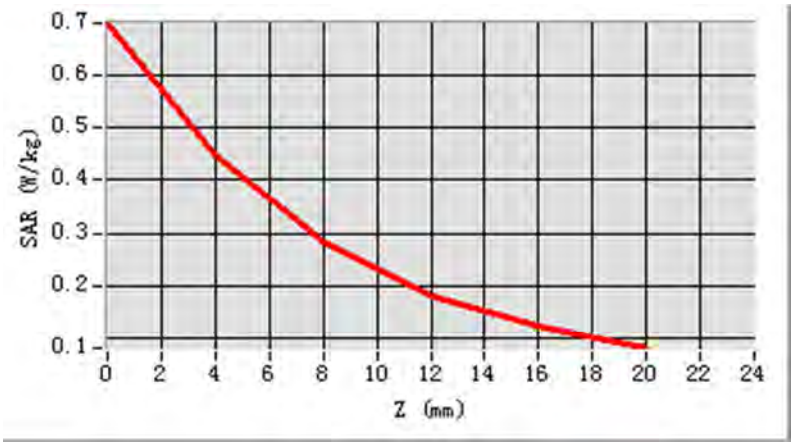
SURFACE SAR	**VOLUME SAR**
	

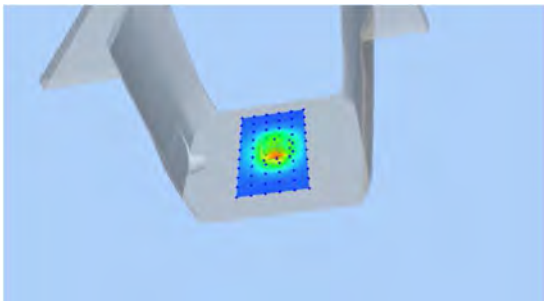
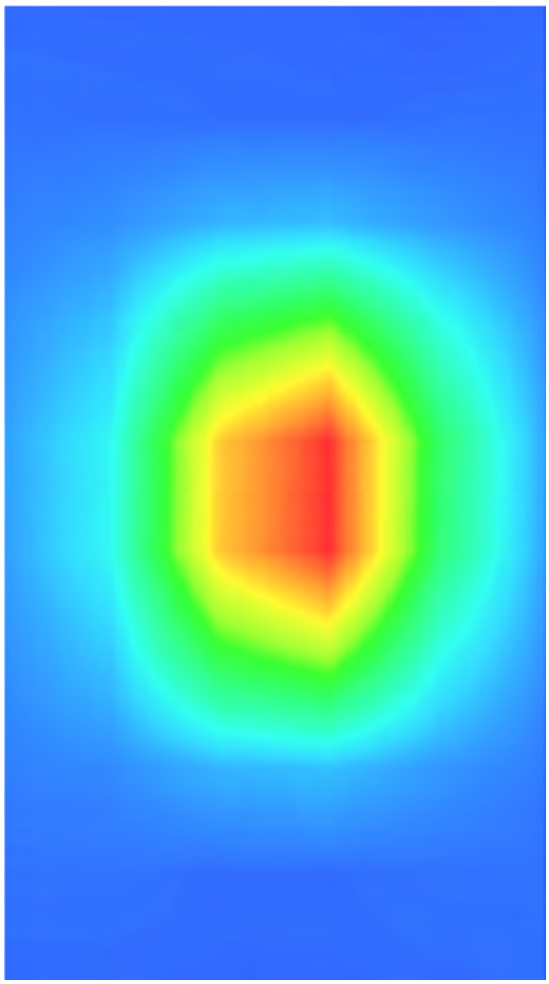
Maximum location: X=5.00, Y=-1.00

SAR Peak: 0.70 W/kg

SAR 10g (W/Kg)	0.216303
SAR 1g (W/Kg)	0.407405

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	0.6971	0.4451	0.2821	0.1824	0.1228



3D screen shot	Hot spot position
	

MEASUREMENT 2

Type: Validation measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 35 seconds

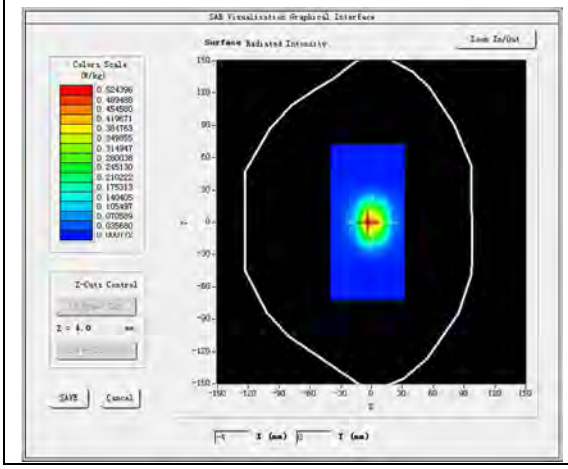
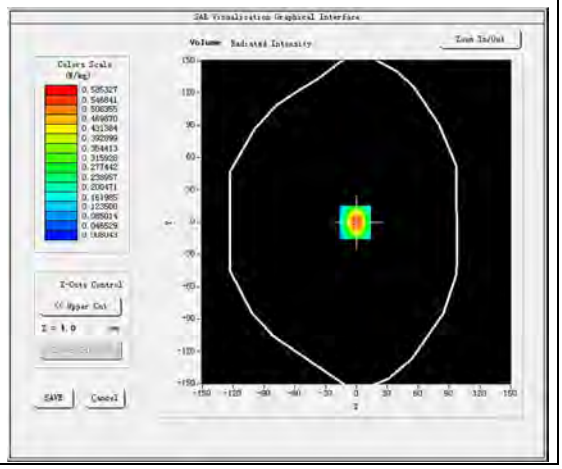
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	CW2450
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	2450.0
Relative permittivity (real part)	39.200001
Relative permittivity (imaginary	13.220000
Conductivity (S/m)	1.799389
Variation (%)	-0.23
Temperature:	21.3°C
ConvF:	5.52

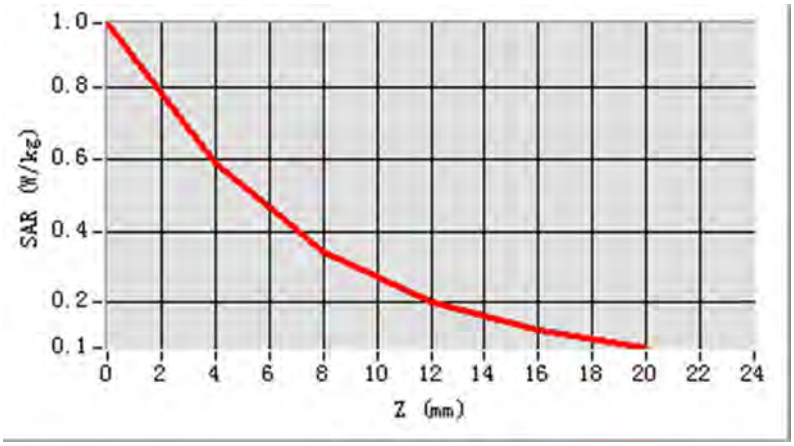
SURFACE SAR	**VOLUME SAR**
	

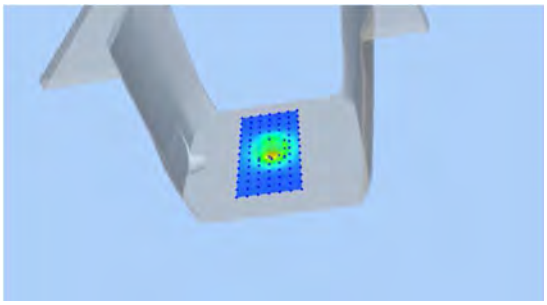
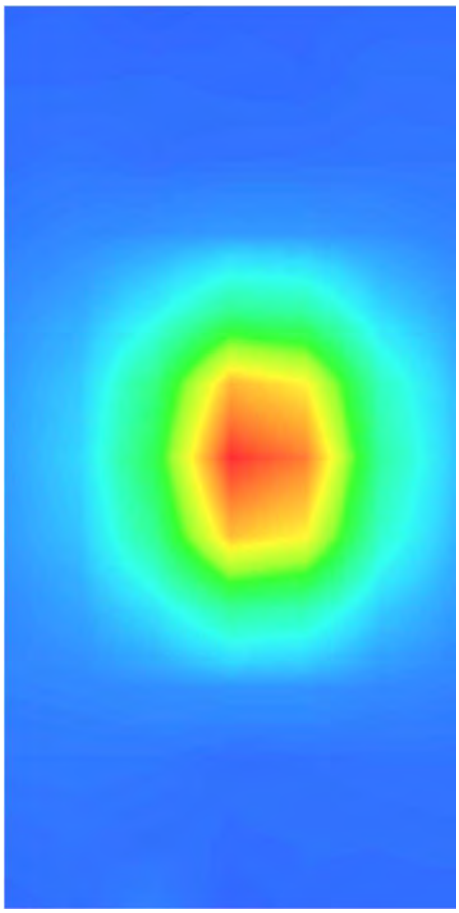
Maximum location: X=-1.00, Y=0.00

SAR Peak: 0.98 W/kg

SAR 10g (W/Kg)	0.246812
SAR 1g (W/Kg)	0.523939

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	0.9759	0.5853	0.3434	0.2030	0.1242



3D screen shot	Hot spot position
	

MEASUREMENT 3

Type: Validation measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 36 seconds

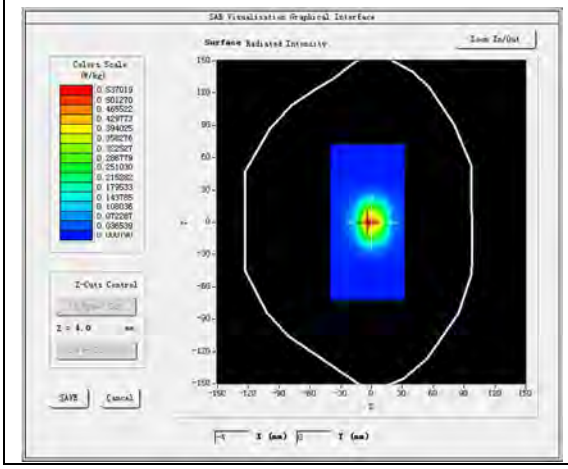
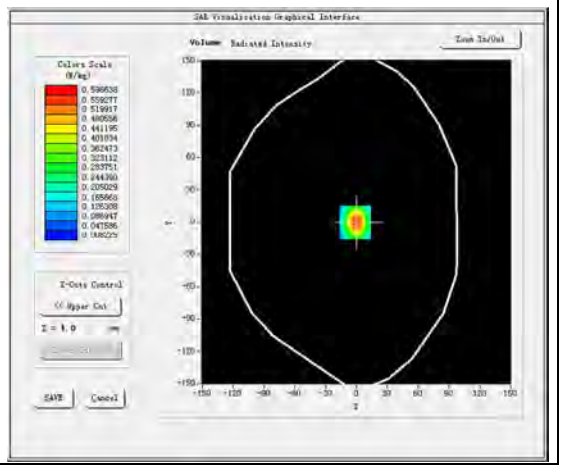
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	CW2450
Channels	Middle
Signal	CW (Crest factor: 1.0)

B.SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	2450.0
Relative permittivity (real part)	51.651340
Relative permittivity (imaginary	13.601696
Conductivity (S/m)	1.861342
Variation (%)	-0.25
Temperature:	21.3°C
ConvF:	5.70

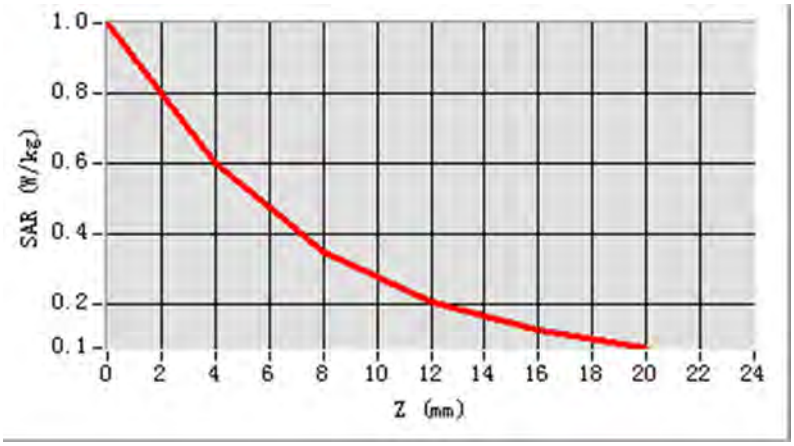
SURFACE SAR	**VOLUME SAR**
	

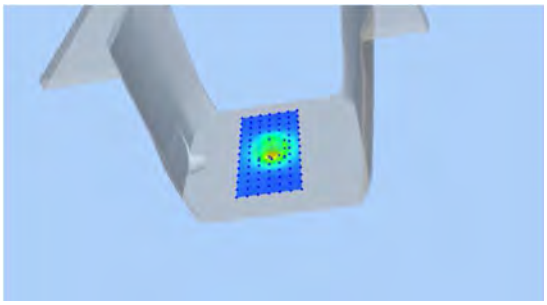
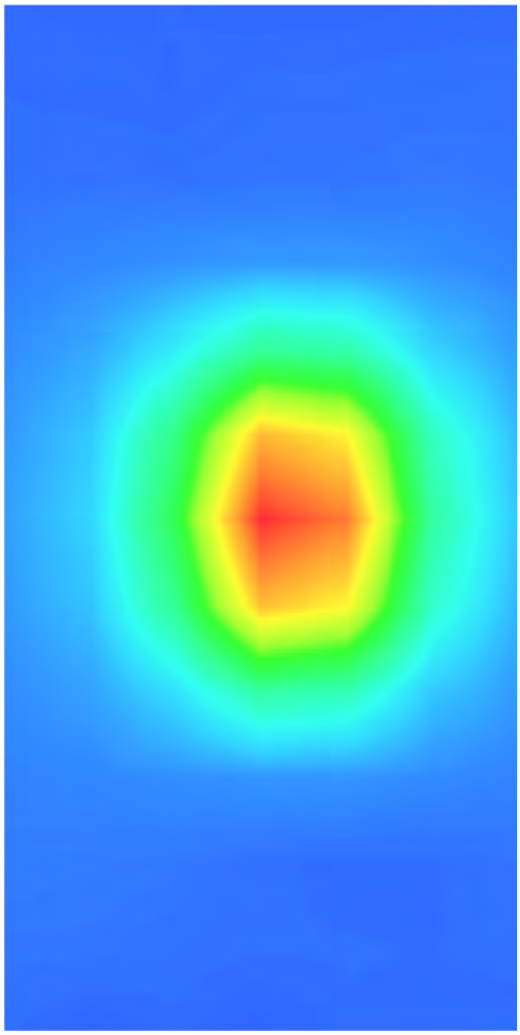
Maximum location: X=-1.00, Y=0.00

SAR Peak: 1.00 W/kg

SAR 10g (W/Kg)	0.252316
SAR 1g (W/Kg)	0.535939

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	0.9998	0.5986	0.3506	0.2069	0.1266



3D screen shot	Hot spot position
	

MEASUREMENT 4

Type: Validation measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 35 seconds

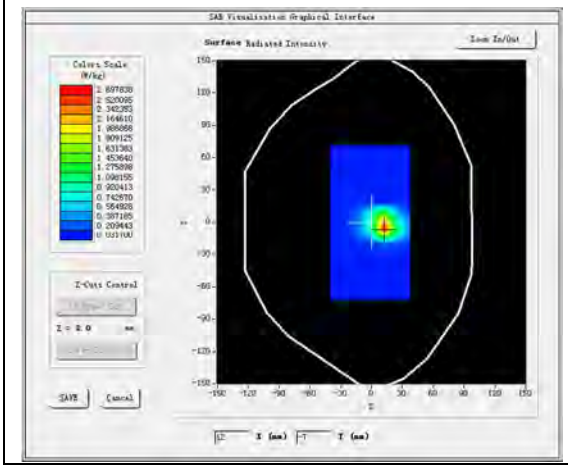
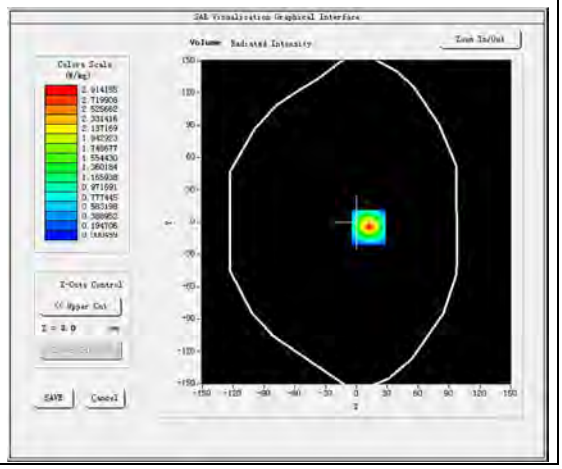
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	6x6x12,dx=5mm dy=5mm dz=2mm
Phantom	Validation plane
Device Position	Body
Band	CW5400
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5400.0
Relative permittivity (real part)	34.597461
Relative permittivity (imaginary	16.171153
Conductivity (S/m)	4.851346
Variation (%)	-1.54
Temperature:	21.3°C
ConvF:	2.31

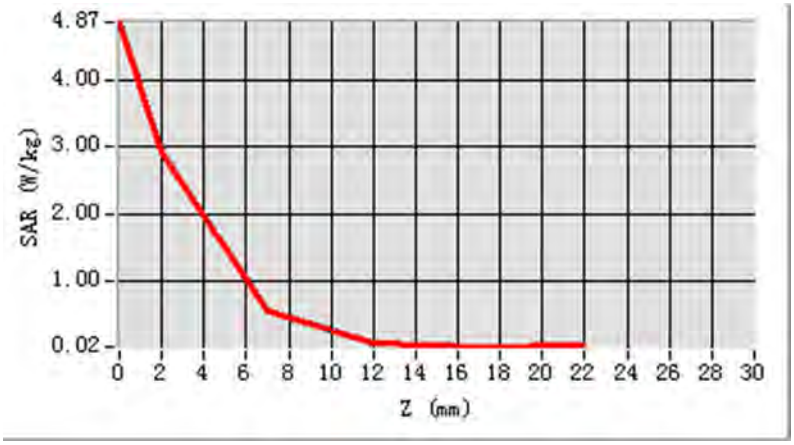
SURFACE SAR	**VOLUME SAR**
	

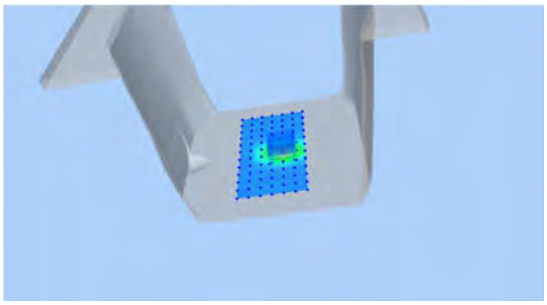
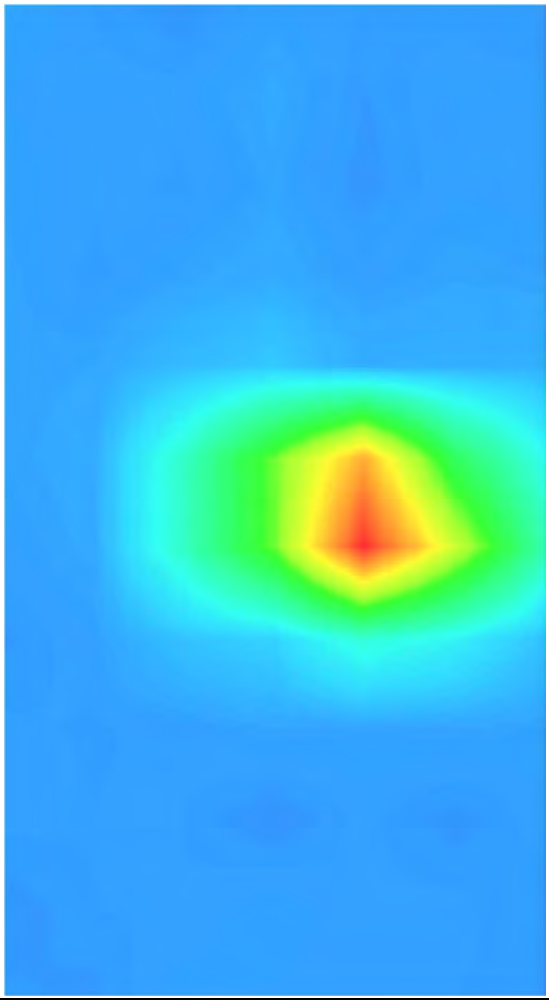
Maximum location: X=12.00, Y=-5.00

SAR Peak: 5.10 W/kg

SAR 10g (W/Kg)	0.576750
SAR 1g (W/Kg)	1.635621

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	4.8665	2.9142	0.5669	0.0613	0.0161



3D screen shot	Hot spot position
	

MEASUREMENT 5

Type: Validation measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 21 seconds

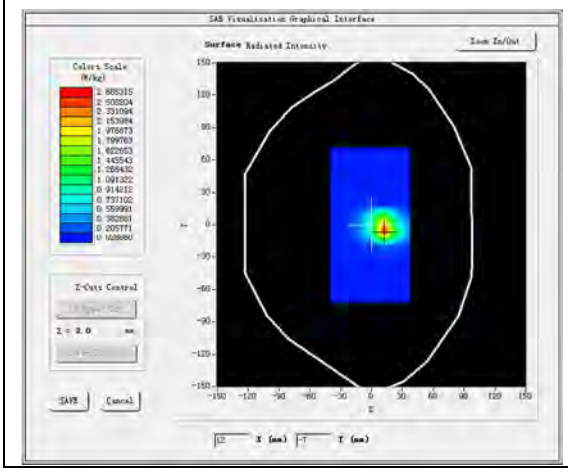
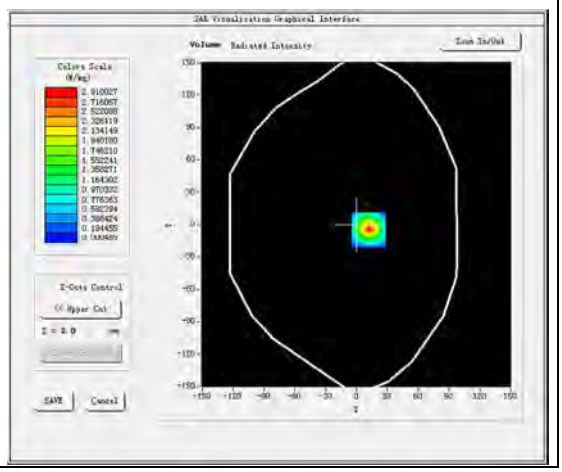
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	6x6x12,dx=5mm dy=5mm dz=2mm
Phantom	Validation plane
Device Position	Body
Band	CW5400
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5400.0
Relative permittivity (real part)	47.464712
Relative permittivity (imaginary	18.325373
Conductivity (S/m)	5.497612
Variation (%)	-0.88
Temperature:	21.3°C
ConvF:	2.43

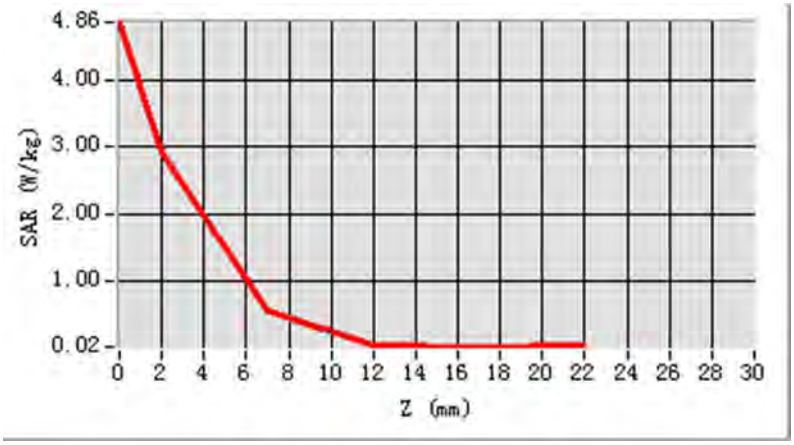
SURFACE SAR	**VOLUME SAR**
	

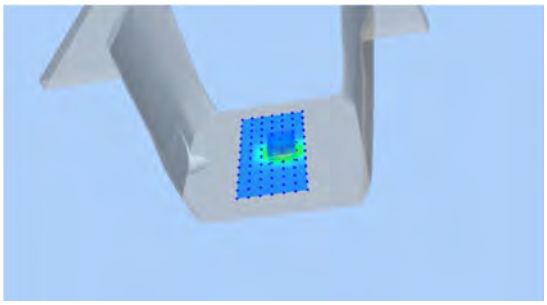
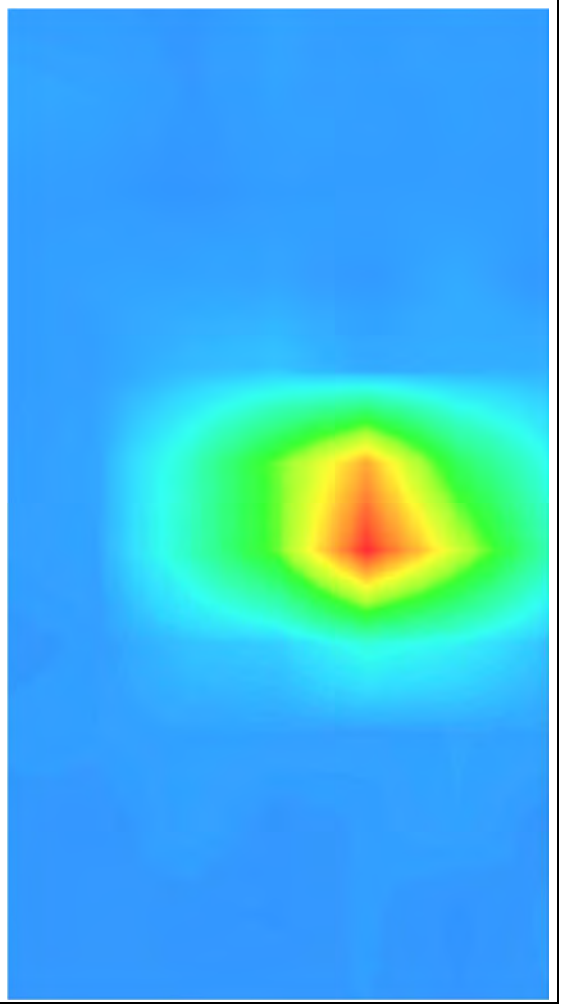
Maximum location: X=12.00, Y=-5.00

SAR Peak: 5.09 W/kg

SAR 10g (W/Kg)	0.577124
SAR 1g (W/Kg)	1.634620

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	4.8609	2.9100	0.5660	0.0620	0.0173



3D screen shot	Hot spot position
	

MEASUREMENT 6

Type: Validation measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 42 seconds

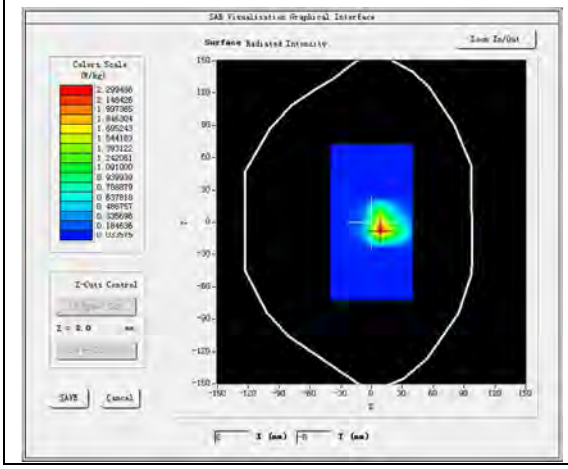
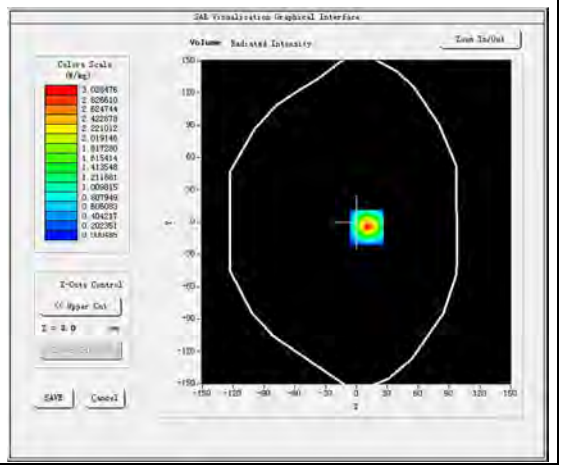
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	6x6x12,dx=5mm dy=5mm dz=2mm
Phantom	Validation plane
Device Position	Body
Band	CW5600
Channels	Middle
Signal	CW (Crest factor: 1.0)

B.SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5600.0
Relative permittivity (real part)	47.564610
Relative permittivity (imaginary	18.039668
Conductivity (S/m)	5.612341
Variation (%)	-0.75
Temperature:	21.3°C
ConvF:	2.43

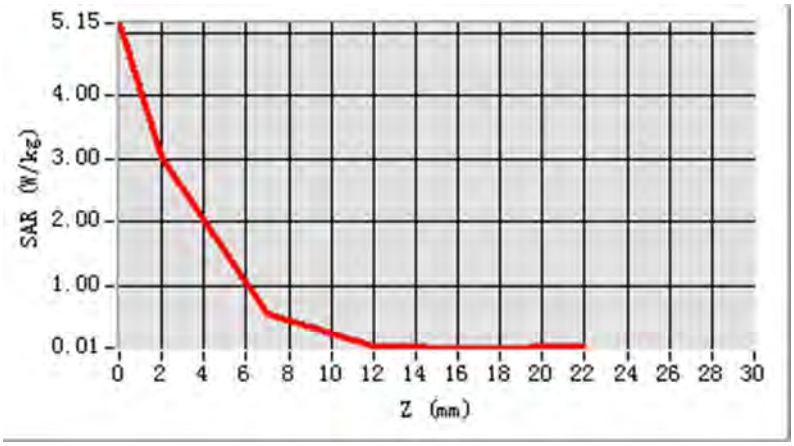
SURFACE SAR	**VOLUME SAR**
	

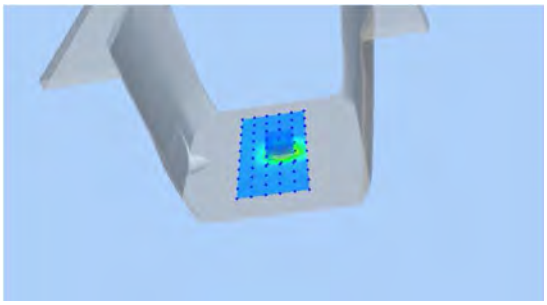
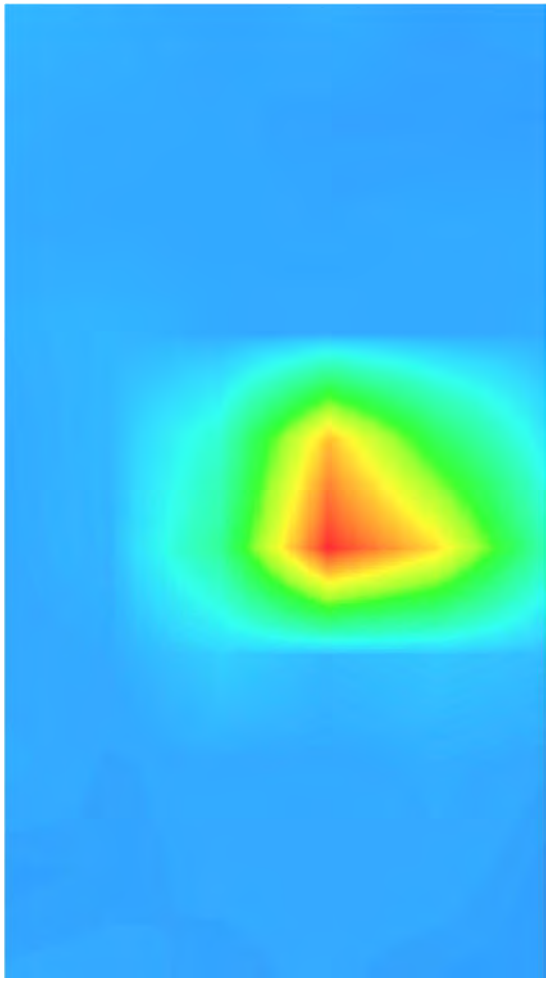
Maximum location: X=10.00, Y=-5.00

SAR Peak: 5.46 W/kg

SAR 10g (W/Kg)	0.603436
SAR 1g (W/Kg)	1.709298

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	5.1485	3.0285	0.5371	0.0450	0.0118



3D screen shot	Hot spot position
	

MEASUREMENT 7

Type: Validation measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 52 seconds

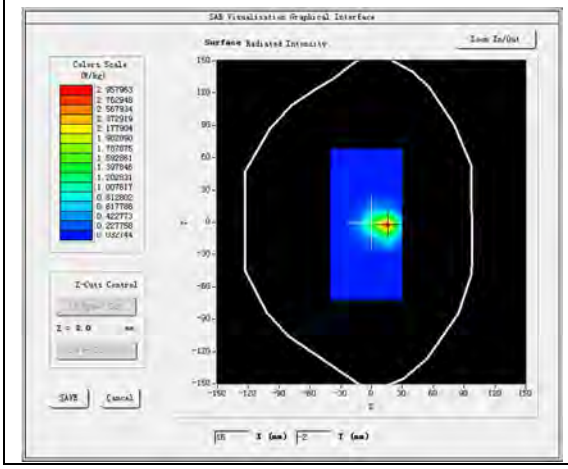
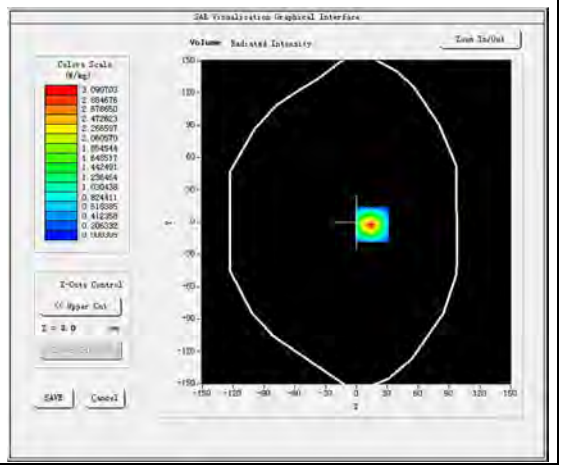
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	6x6x12,dx=5mm dy=5mm dz=2mm
Phantom	Validation plane
Device Position	Body
Band	CW5800
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5800.0
Relative permittivity (real part)	33.654764
Relative permittivity (imaginary	16.183285
Conductivity (S/m)	5.214614
Variation (%)	-0.55
Temperature:	21.3°C
ConvF:	2.34

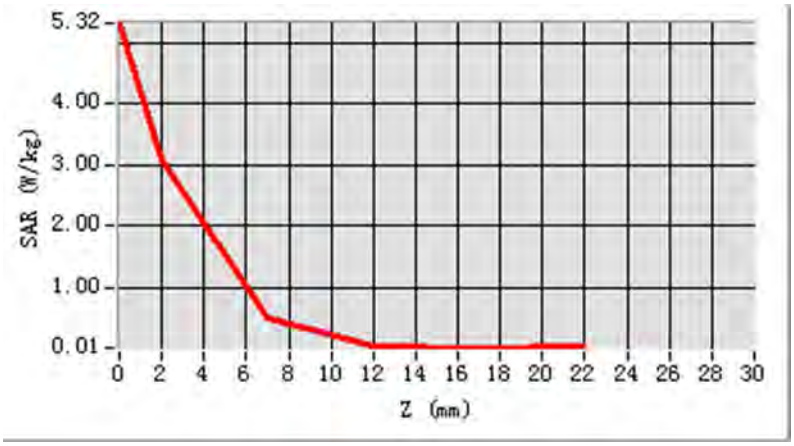
SURFACE SAR	**VOLUME SAR**
	

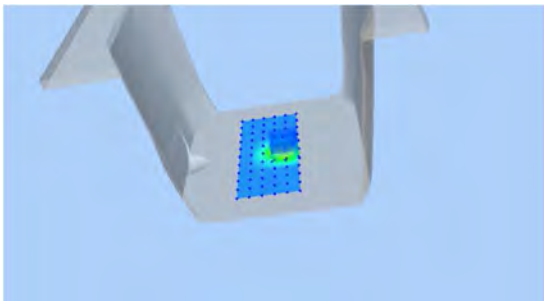
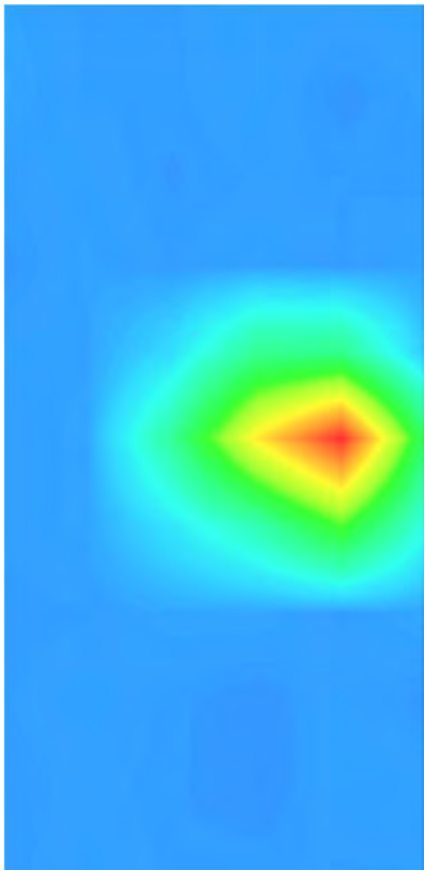
Maximum location: X=15.00, Y=-2.00

SAR Peak: 5.58 W/kg

SAR 10g (W/Kg)	0.598981
SAR 1g (W/Kg)	1.707975

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	5.3180	3.0907	0.5118	0.0328	0.0068



3D screen shot	Hot spot position
	

MEASUREMENT 8

Type: Validation measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 36 seconds

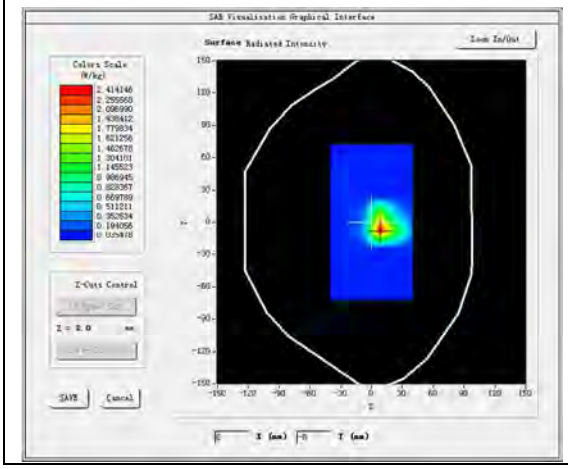
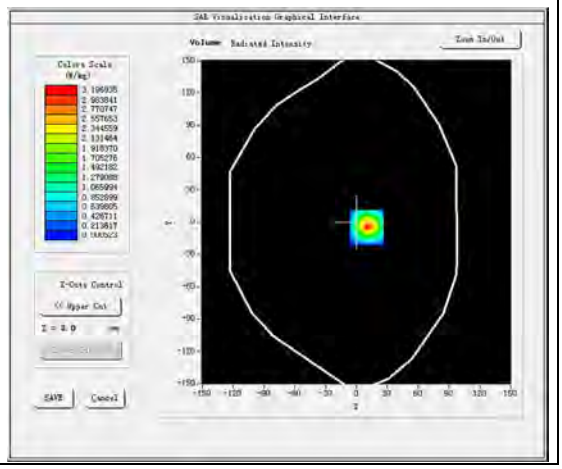
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	6x6x12,dx=5mm dy=5mm dz=2mm
Phantom	Validation plane
Device Position	Body
Band	CW5800
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5800.0
Relative permittivity (real part)	46.547694
Relative permittivity (imaginary	18.143174
Conductivity (S/m)	5.846134
Variation (%)	-2.39
Temperature:	21.3°C
ConvF:	2.39

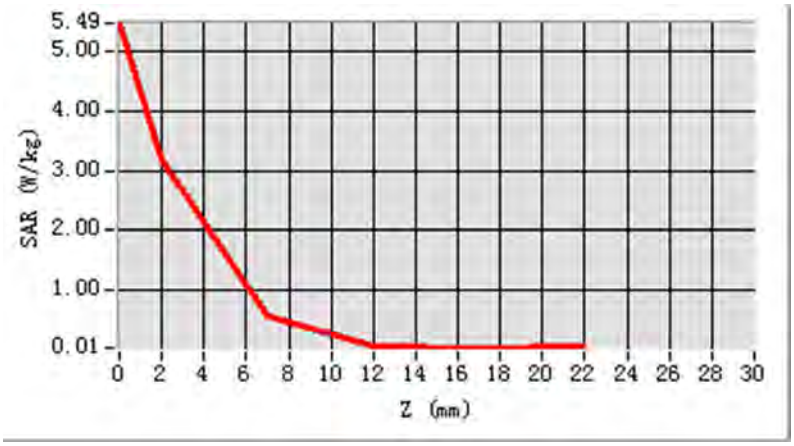
SURFACE SAR	**VOLUME SAR**
	

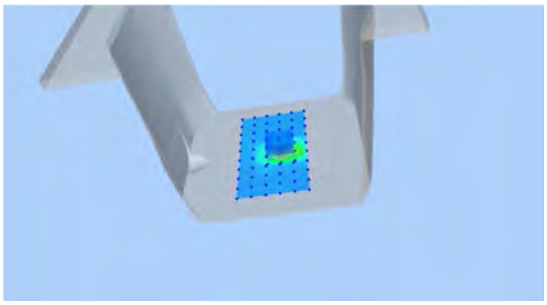
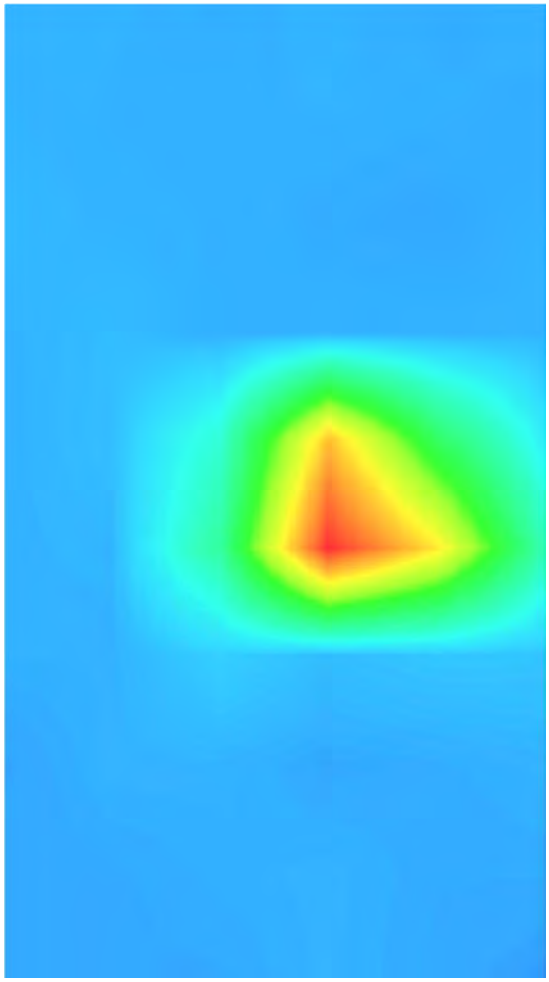
Maximum location: X=10.00, Y=-5.00

SAR Peak: 5.83 W/kg

SAR 10g (W/Kg)	0.634367
SAR 1g (W/Kg)	1.798768

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	5.4900	3.1969	0.5369	0.0379	0.0101



3D screen shot	Hot spot position
	

Appendix B. SAR Plots of SAR Measurement

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.

Plot No	Band	Mode	Test Position	Channel
1	802.11b		Left Cheek	1

Type: Phone measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 36 seconds

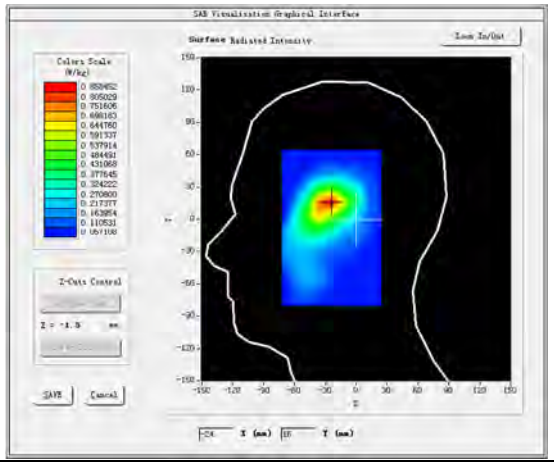
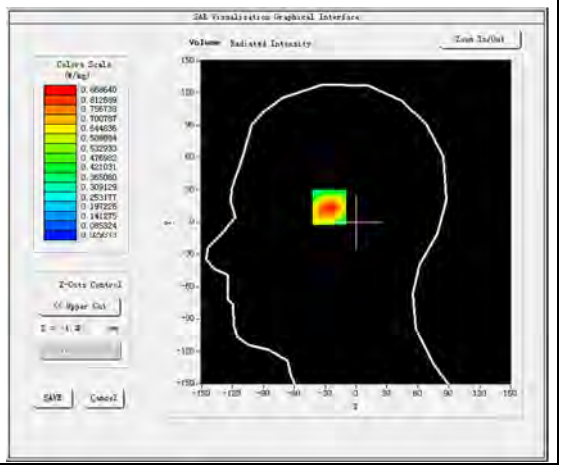
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
ConvF	5.52

B.SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	2412.0
Relative permittivity (real part)	39.200001
Relative permittivity (imaginary	13.220000
Conductivity (S/m)	1.799389
Variation (%)	0.29

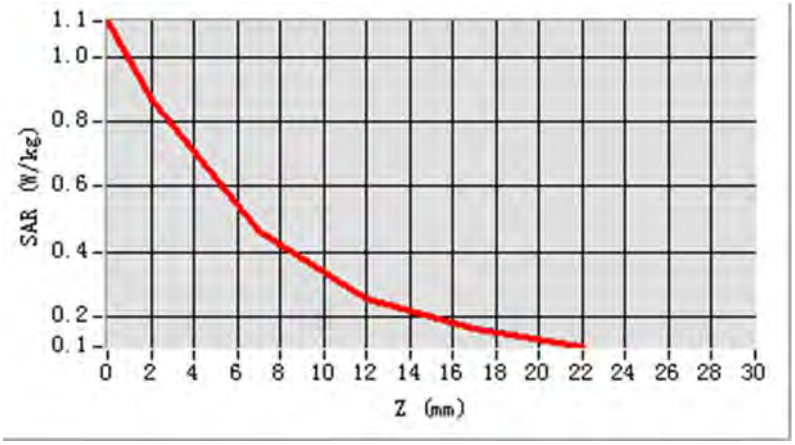
SURFACE SAR	VOLUME SAR
	

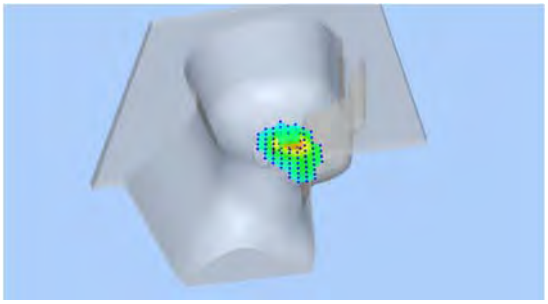
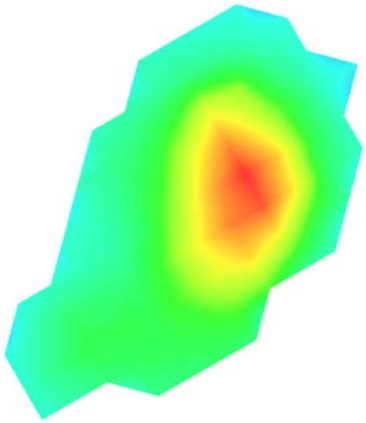
Maximum location: X=-25.00, Y=16.00

SAR Peak: 1.41 W/kg

SAR 10g (W/Kg)	0.444160
SAR 1g (W/Kg)	0.817400

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.1099	0.8686	0.4650	0.2589	0.1615



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Channel
2	802.11a		Right Cheek	64

Type: Phone measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 24 seconds

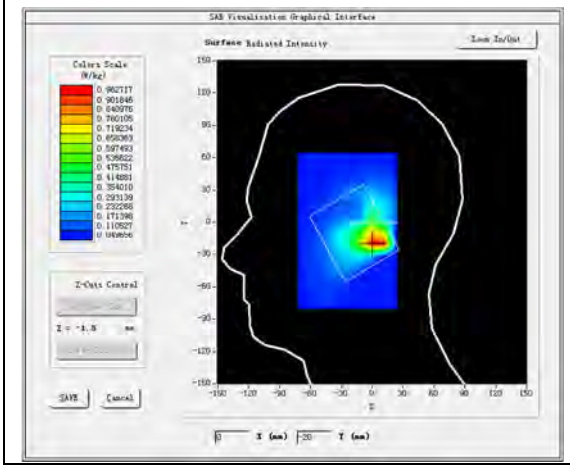
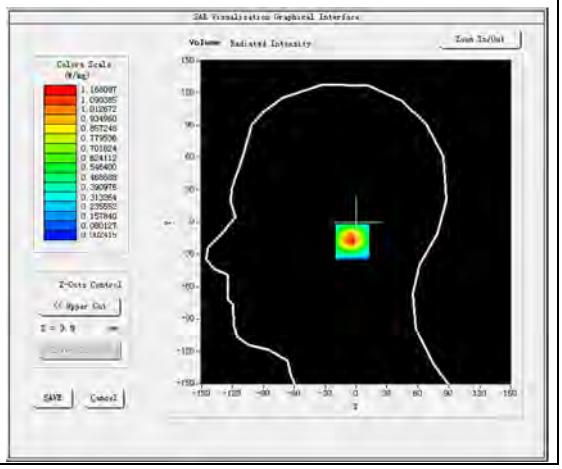
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Right Head
Device Position	Cheek
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.31

B. SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	5320.0
Relative permittivity (real part)	34.597461
Relative permittivity (imaginary	16.171153
Conductivity (S/m)	4.851346
Variation (%)	4.36

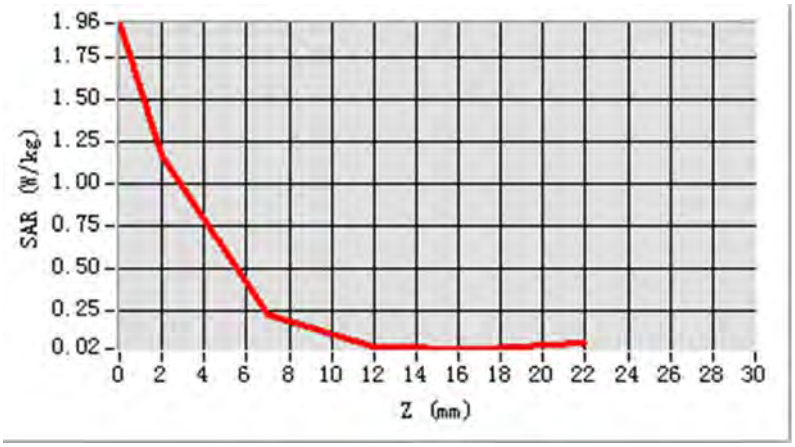
SURFACE SAR	VOLUME SAR
	

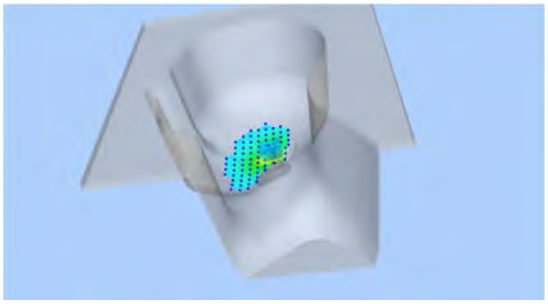
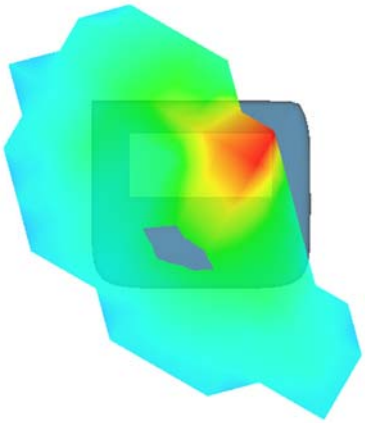
Maximum location: X=3.00, Y=-18.00

SAR Peak: 3.11 W/kg

SAR 10g (W/Kg)	0.446719
SAR 1g (W/Kg)	1.049412

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.9581	1.1681	0.2277	0.0311	0.0182



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Channel
3	802.11a		Left Cheek	140

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 32 seconds

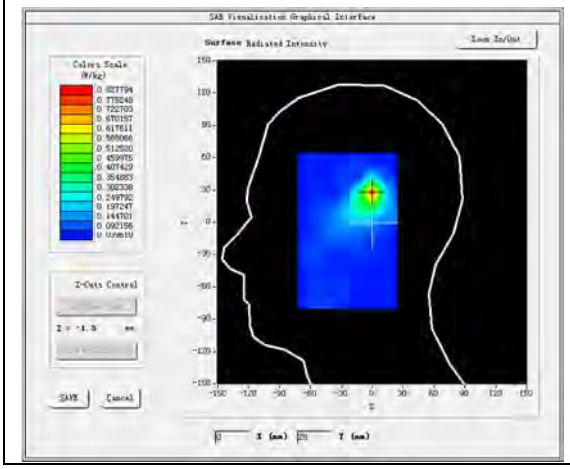
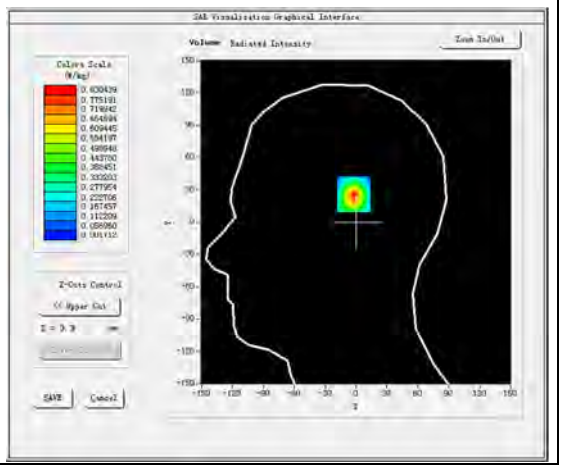
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.34

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5700.0
Relative permittivity (real part)	33.654764
Relative permittivity (imaginary	16.183285
Conductivity (S/m)	5.214614
Variation (%)	1.91

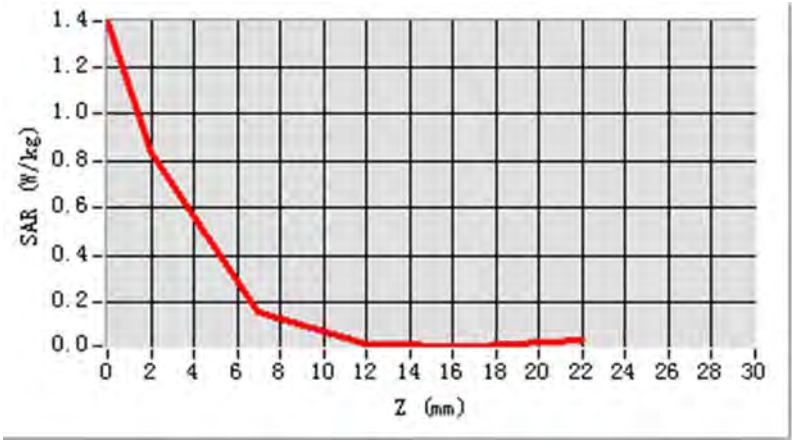
SURFACE SAR	VOLUME SAR
	

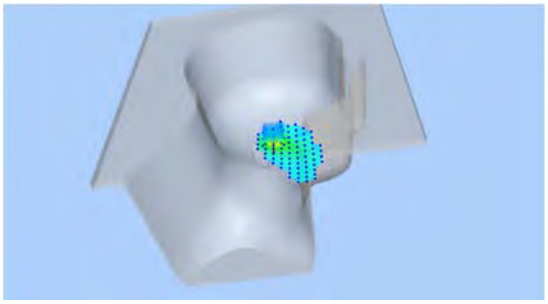
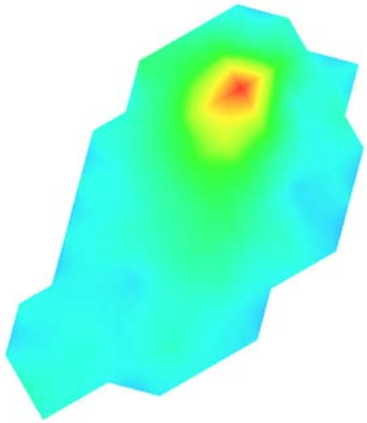
Maximum location: X=0.00, Y=28.00

SAR Peak: 2.20 W/kg

SAR 10g (W/Kg)	0.301638
SAR 1g (W/Kg)	0.814886

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.3925	0.8304	0.1621	0.0229	0.0145



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Separation Distance (cm)	Channel
4	802.11a		Right Cheek	1.5	165

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 26 seconds

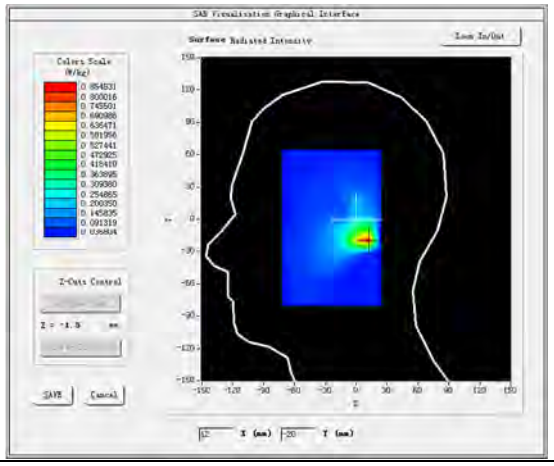
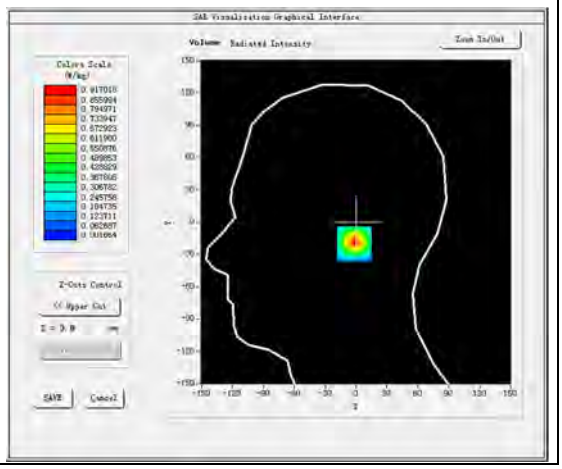
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Right head
Device Position	Cheek
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.34

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5825.0
Relative permittivity (real part)	33.654764
Relative permittivity (imaginary	16.183285
Conductivity (S/m)	5.214614
Variation (%)	-2.23

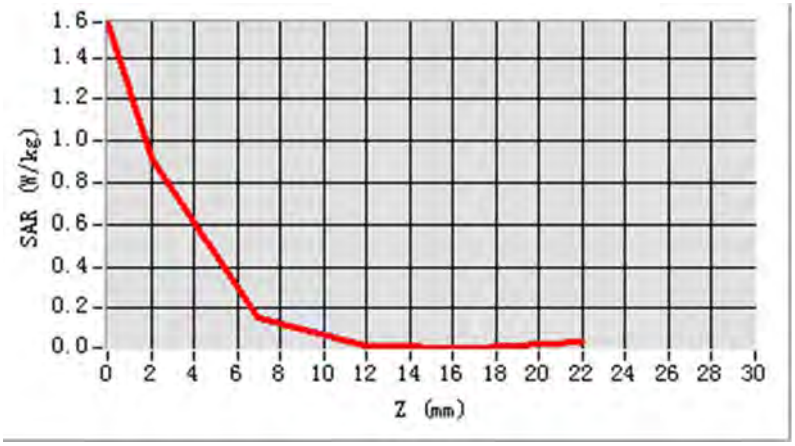
SURFACE SAR	VOLUME SAR
	

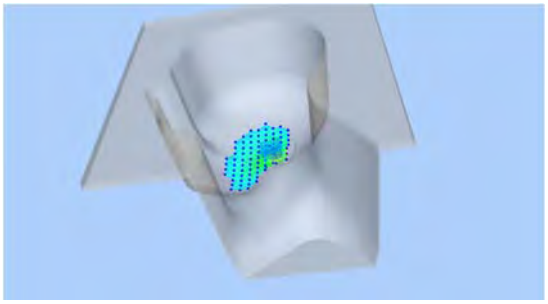
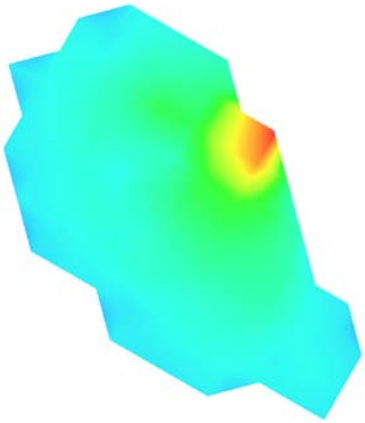
Maximum location: X=5.00, Y=-20.00

SAR Peak: 2.52 W/kg

SAR 10g (W/Kg)	0.334842
SAR 1g (W/Kg)	0.915416

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.5700	0.9170	0.1602	0.0172	0.0120



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Channel
5	BT		Left Cheek	39

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 22 seconds

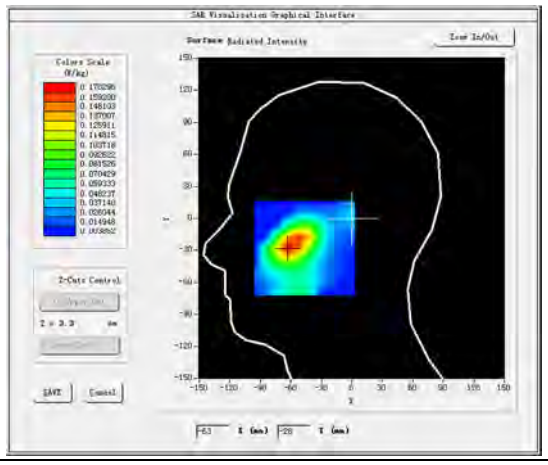
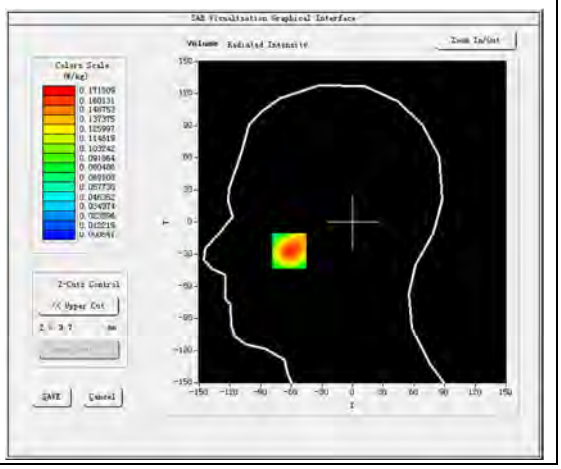
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left Head
Device Position	Cheek
Band	Bluetooth
Channels	Middle
Signal	Bluetooth
ConvF	5.52

B. SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	2441.0
Relative permittivity (real part)	39.200001
Relative permittivity (imaginary	13.220000
Conductivity (S/m)	1.799389
Variation (%)	-0.17

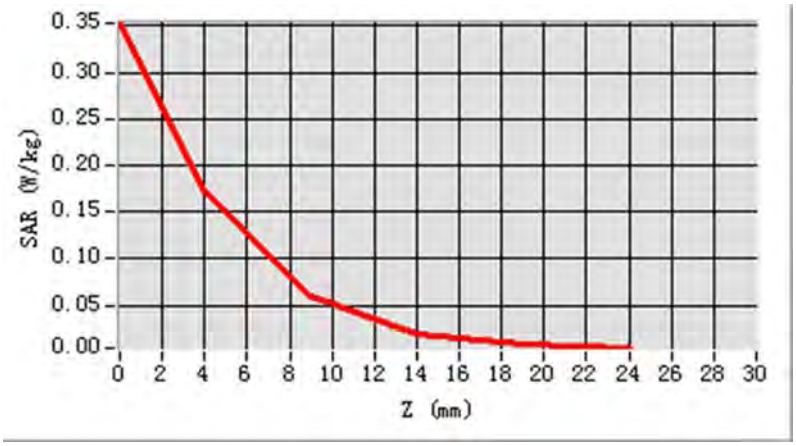
SURFACE SAR	VOLUME SAR
	

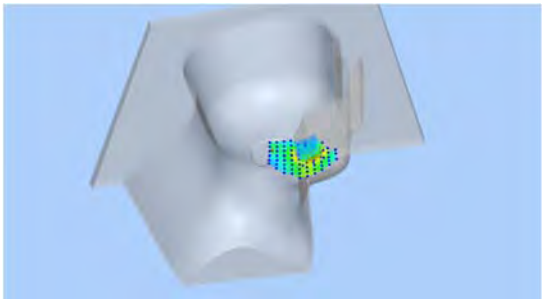
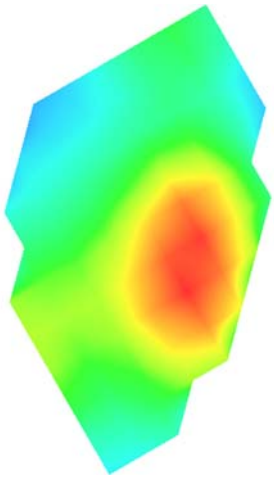
Maximum location: X=-62.00, Y=-27.00

SAR Peak: 1.33W/kg

SAR 10g (W/Kg)	0.134796
SAR 1g (W/Kg)	0.217864

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.3456	0.2542	0.1023	0.3846	0.0246



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Channel	Separation Distance (cm)
6	802.11b		Rear Face	6	1.5

Type: Phone measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 15 seconds

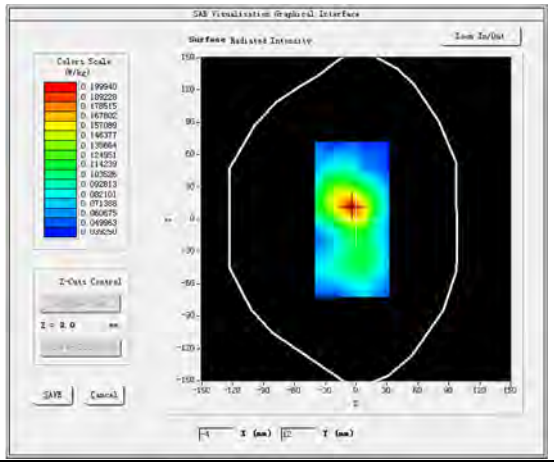
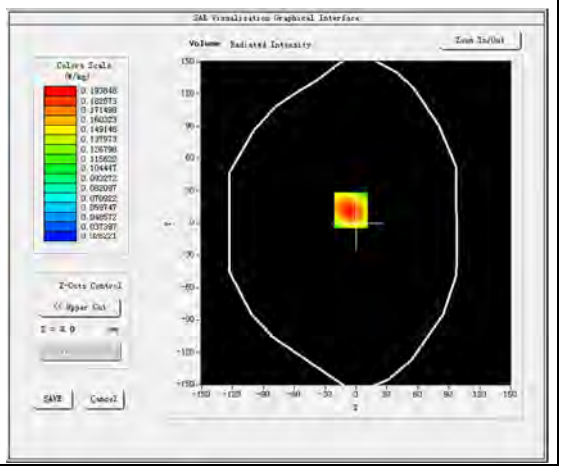
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11b ISM
Channels	Middle
Signal	IEEE802.b (Crest factor: 1.0)
ConvF	5.70

B.SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	2437.0
Relative permittivity (real part)	51.651340
Relative permittivity (imaginary	13.601696
Conductivity (S/m)	1.851342
Variation (%)	-2.230000
ConvF:	5.70

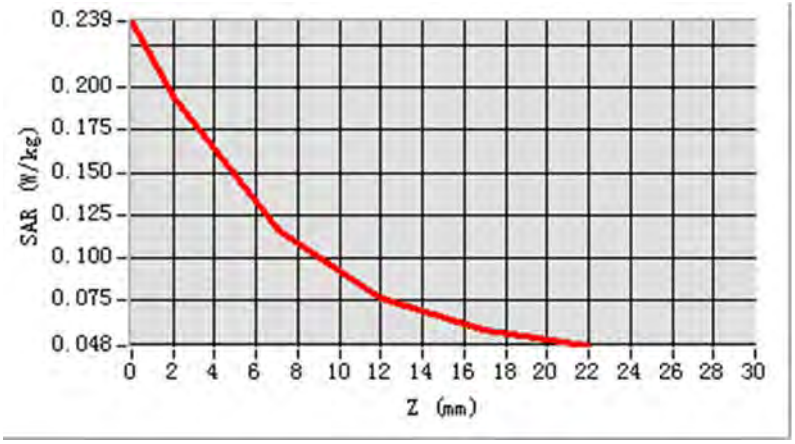
SURFACE SAR	**VOLUME SAR**
	

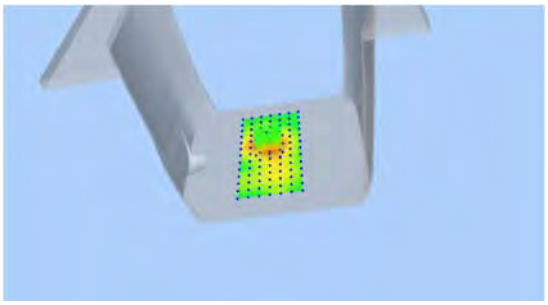
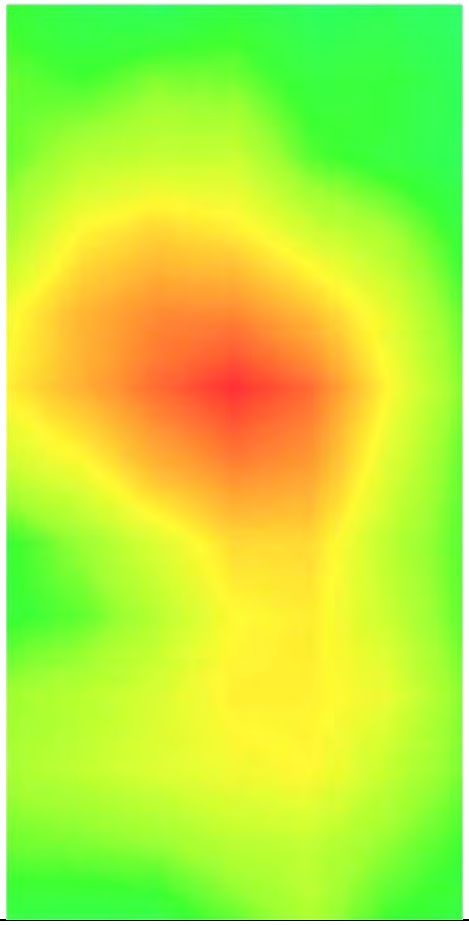
Maximum location: X=-5.00, Y=12.00

SAR Peak: 0.24 W/kg

SAR 10g (W/Kg)	0.098780
SAR 1g (W/Kg)	0.151534

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.2389	0.1938	0.1170	0.0769	0.0583



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Separation Distance (cm)	Channel
7	**802.11a**		**Rear Face**	**1.5**	**64**

Type: Phone measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 48 seconds

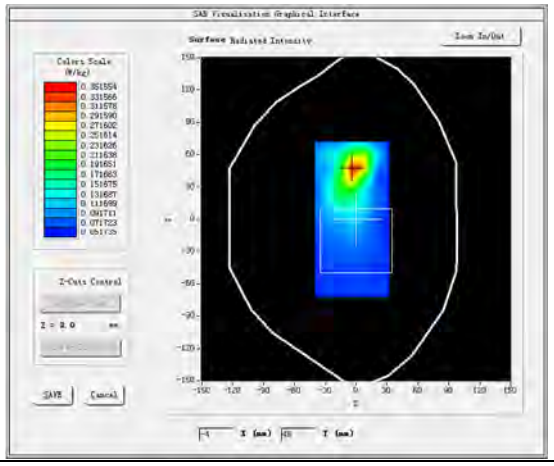
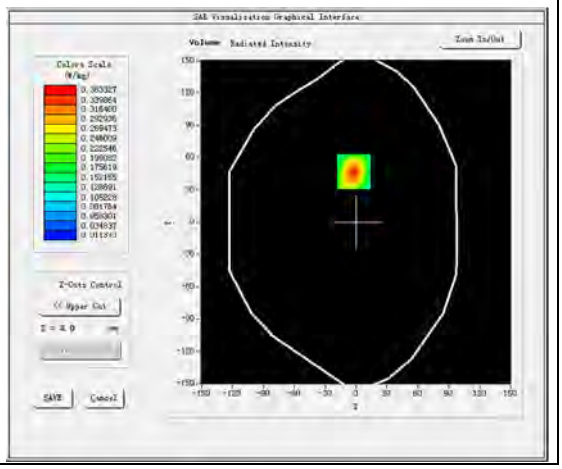
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.43

B.SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	5320.0
Relative permittivity (real part)	47.464712
Relative permittivity (imaginary	18.325373
Conductivity (S/m)	5.497612
Variation (%)	-3.53

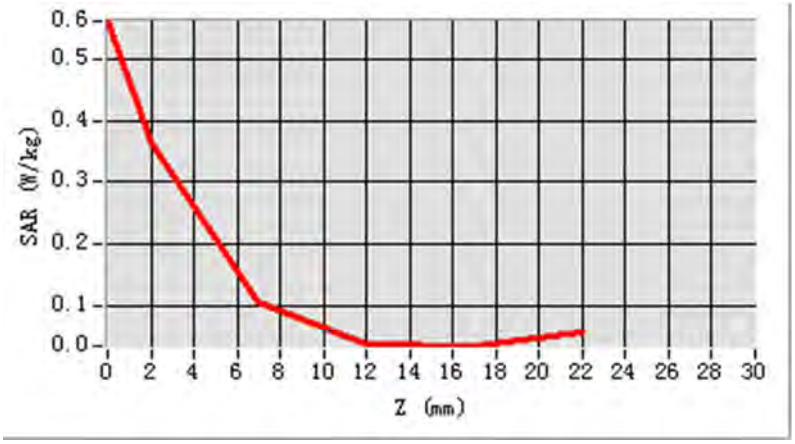
SURFACE SAR	VOLUME SAR
	

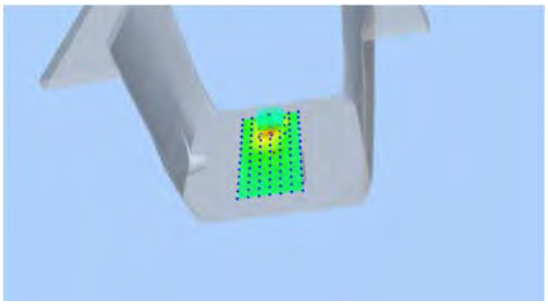
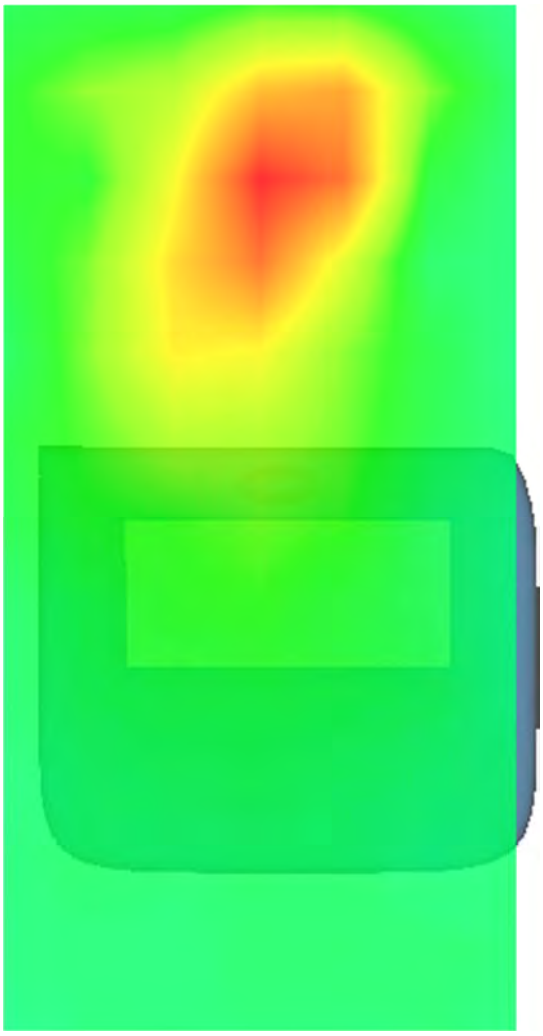
Maximum location: X=-2.00, Y=47.00

SAR Peak: 0.58 W/kg

SAR 10g (W/Kg)	0.120488
SAR 1g (W/Kg)	0.240431

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.5627	0.3633	0.1057	0.0369	0.0334



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Separation Distance (cm)	Channel
8	802.11a		Front Face	1.5	120

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 13 seconds

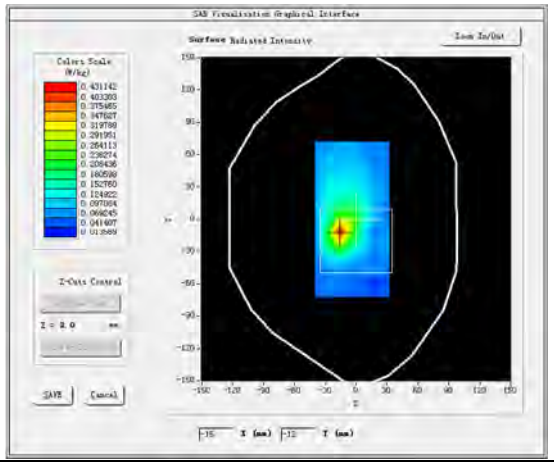
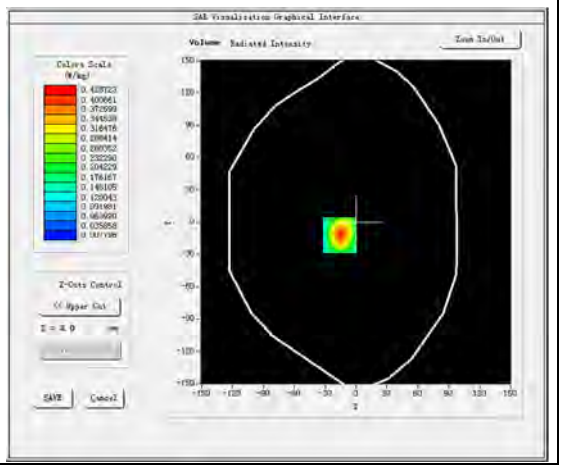
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.43

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5600.0
Relative permittivity (real part)	47.564610
Relative permittivity (imaginary	18.039668
Conductivity (S/m)	5.612341
Variation (%)	-0.88

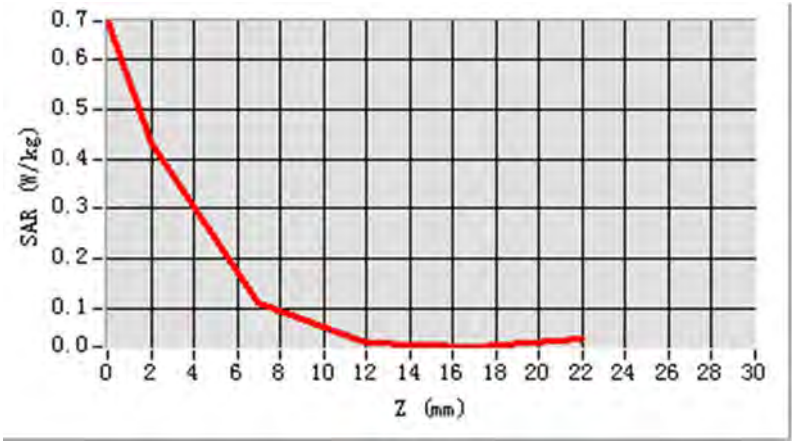
SURFACE SAR	VOLUME SAR
	

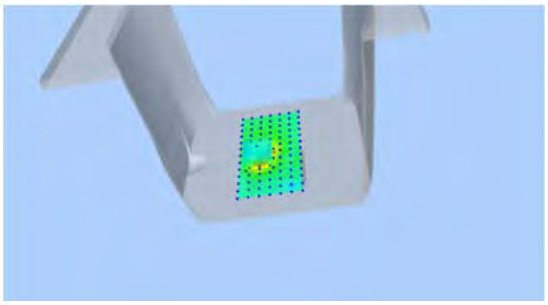
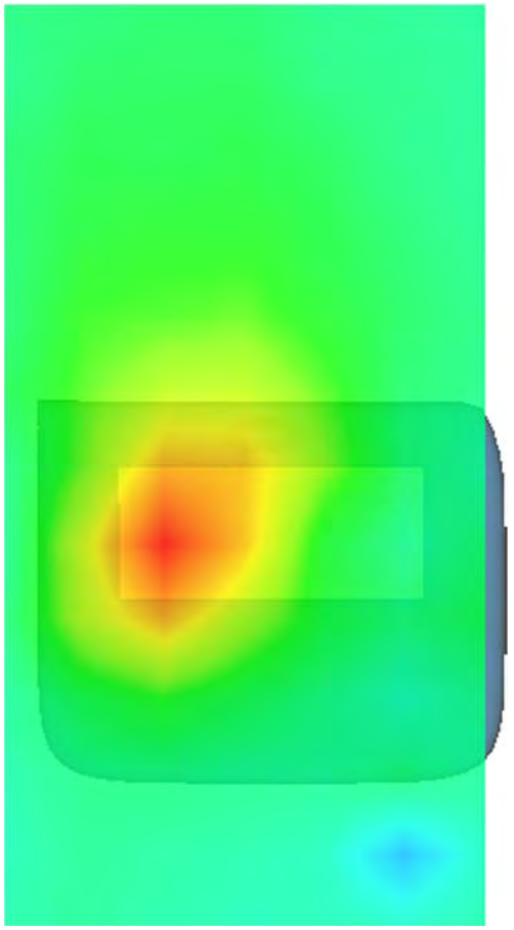
Maximum location: X=-16.00, Y=-12.00

SAR Peak: 0.70 W/kg

SAR 10g (W/Kg)	0.126071
SAR 1g (W/Kg)	0.272385

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	0.6751	0.4287	0.1146	0.0325	0.0249



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Separation Distance (cm)	Channel
9	802.11a		Face Upward	1.5	149

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 25 seconds

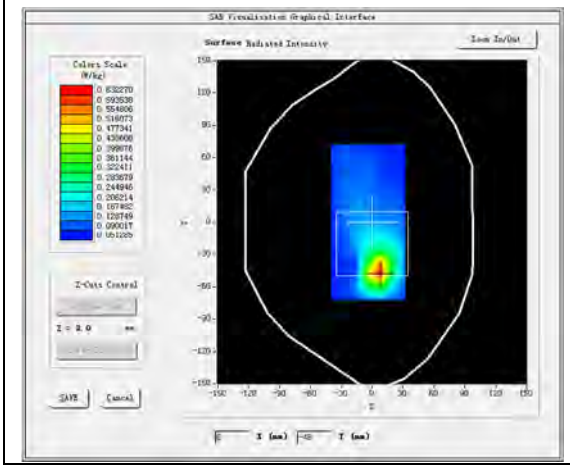
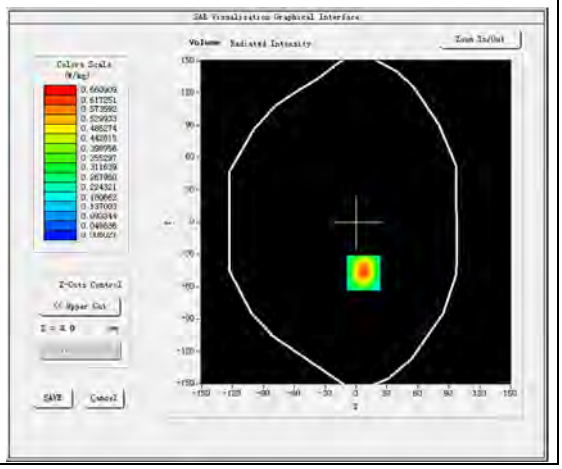
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.39

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5745.0
Relative permittivity (real part)	46.547694
Relative permittivity (imaginary	18.143174
Conductivity (S/m)	5.846134
Variation (%)	-2.16

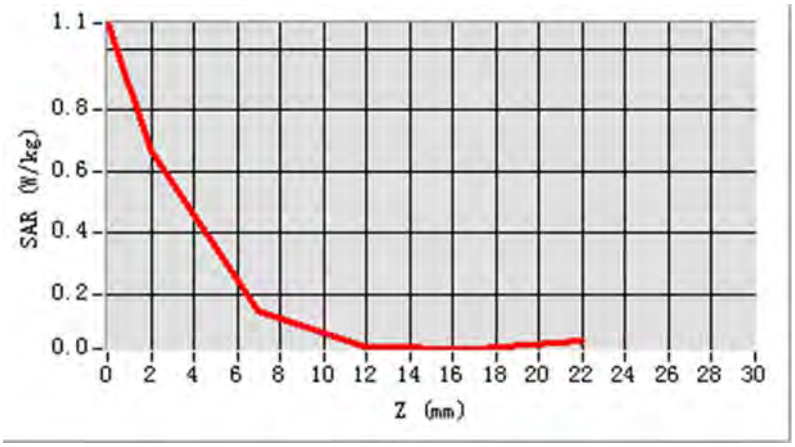
SURFACE SAR	VOLUME SAR
	

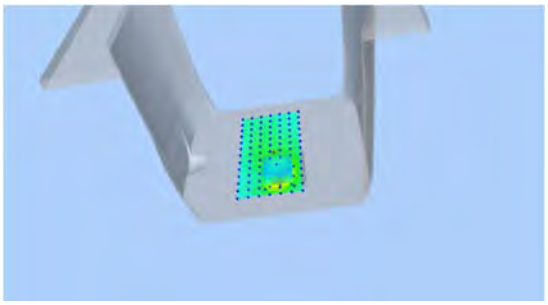
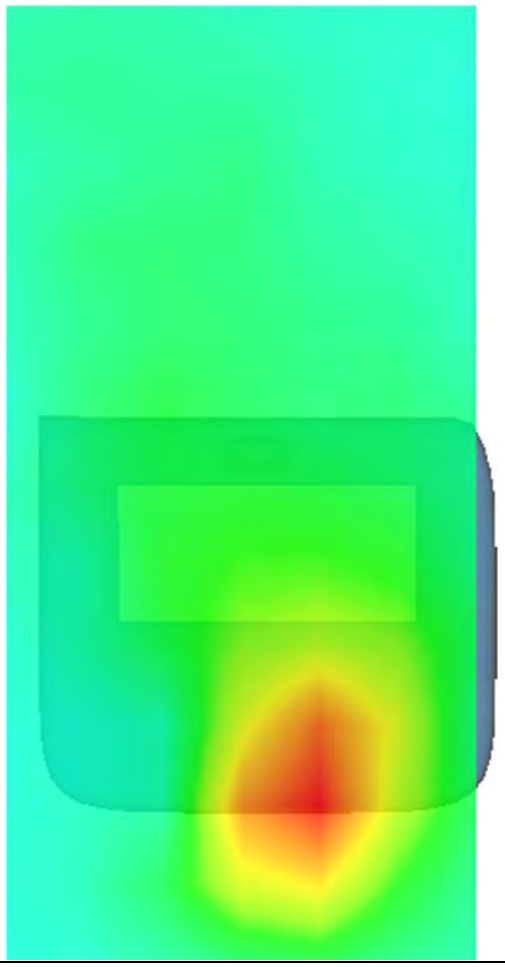
Maximum location: X=7.00, Y=-47.00

SAR Peak: 1.12 W/kg

SAR 10g (W/Kg)	0.174779
SAR 1g (W/Kg)	0.407666

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.0825	0.6609	0.1466	0.0295	0.0219



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Channel	RB	offset	Separation Distance (cm)
10	**LTE Band 2**	**QPSK20M**	**Bottom Side**	**18700**	**1**	**50**	**1**

Type: Phone measurement

Date of measurement: 22/11/2016

Measurement duration: 22 minutes 18 seconds

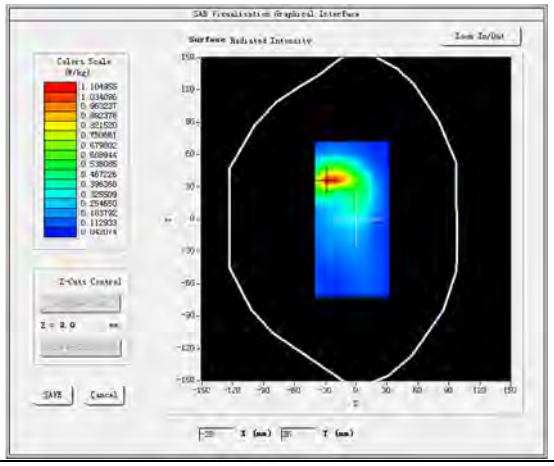
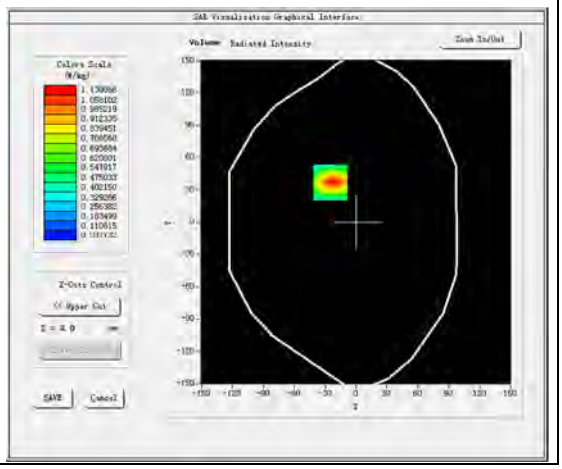
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band 2
Channels	Low
Signal	LTE (Crest factor: 1.0)
ConvF	6.18

B.SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	1860
Relative permittivity (real part)	53.286414
Relative permittivity (imaginary	14.338118
Conductivity (S/m)	1.513468
Variation (%)	-1.53

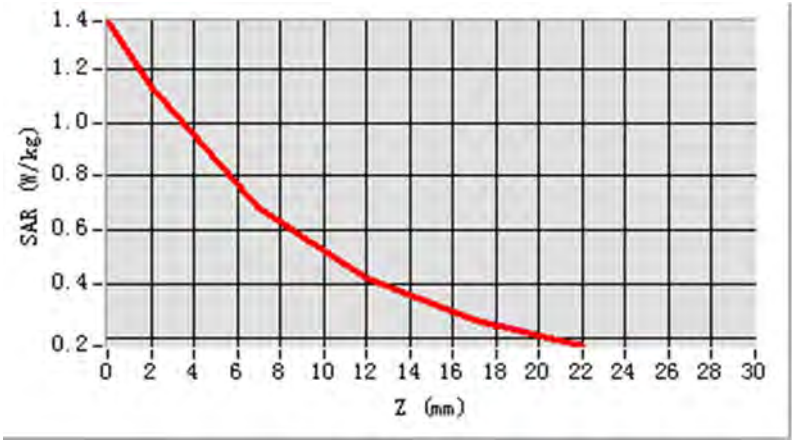
SURFACE SAR	VOLUME SAR
	

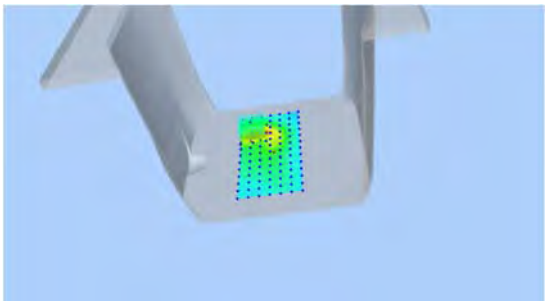
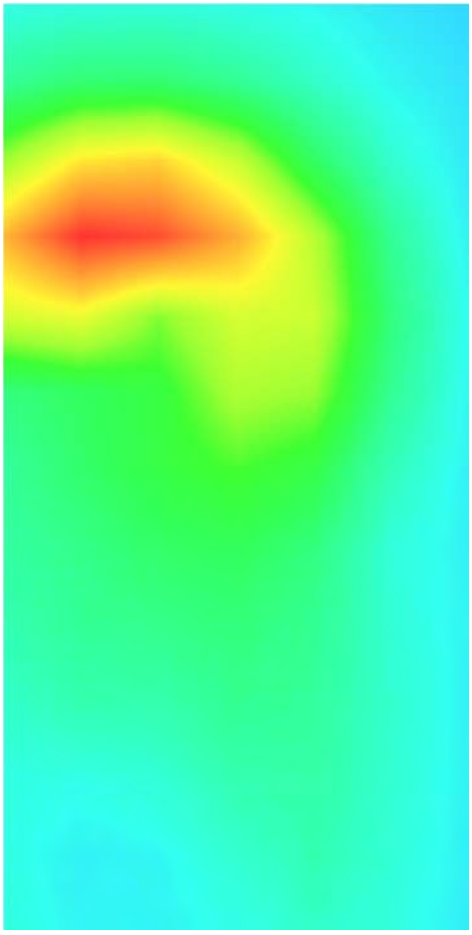
Maximum location: X=-25.00, Y=37.00

SAR Peak: 1.39 W/kg

SAR 10g (W/Kg)	0.477041
SAR 1g (W/Kg)	0.863961

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	1.3769	1.1310	0.6858	0.4209	0.2677



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Channel	Separation Distance (cm)
11	**802.11b**		**Rear Face**	**6**	**1**

Type: Phone measurement

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 25 seconds

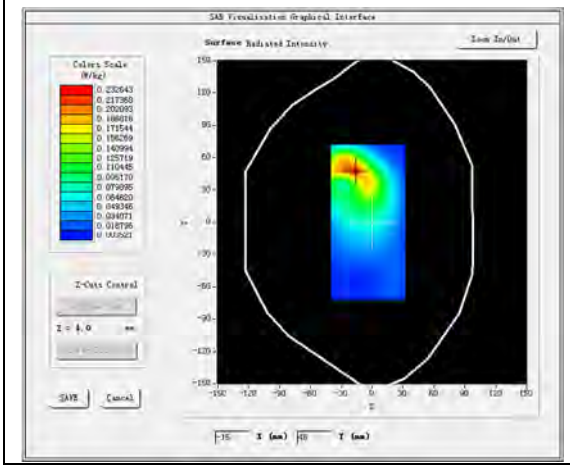
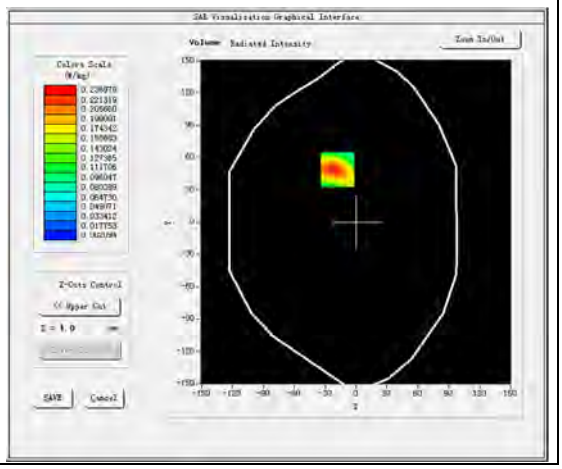
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11b ISM
Channels	Middle
Signal	IEEE802.b (Crest factor: 1.0)
ConvF	5.70

B. SAR Measurement Results

E-Field Probe	SATIMO SN_43/15_EP276
Frequency (MHz)	2437.0
Relative permittivity (real part)	51.651340
Relative permittivity (imaginary	13.601696
Conductivity (S/m)	1.851342
Variation (%)	1.42

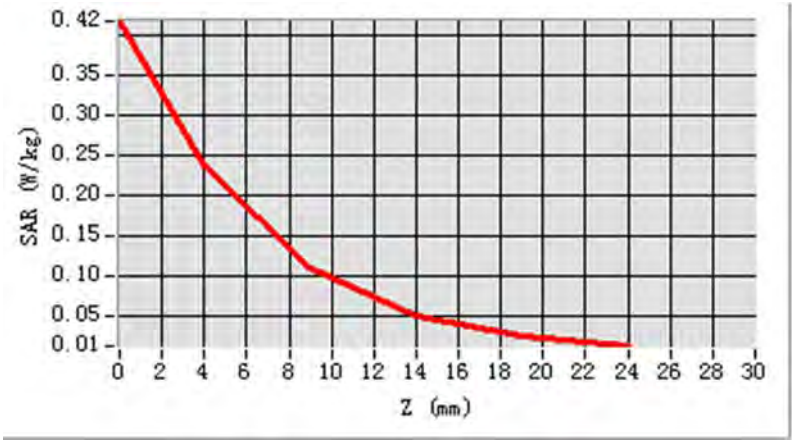
SURFACE SAR	VOLUME SAR
	

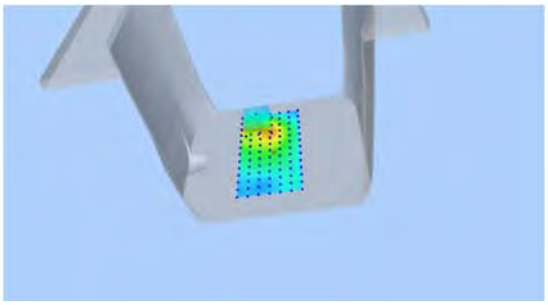
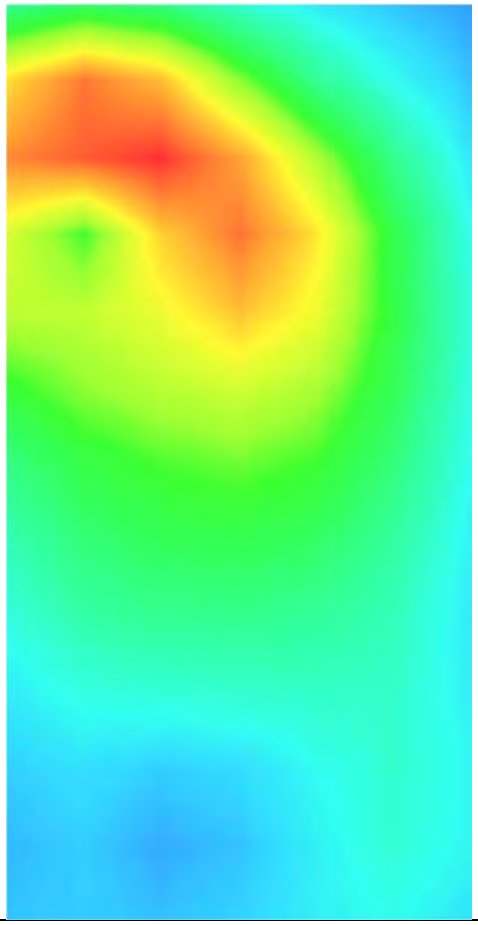
Maximum location: X=-18.00, Y=49.00

SAR Peak: 0.42 W/kg

SAR 10g (W/Kg)	0.132968
SAR 1g (W/Kg)	0.259903

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.4176	0.2370	0.1094	0.0496	0.0242



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Separation Distance (cm)	Channel
12	**802.11a**		**Rear Face**	**0**	**64**

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 29 seconds

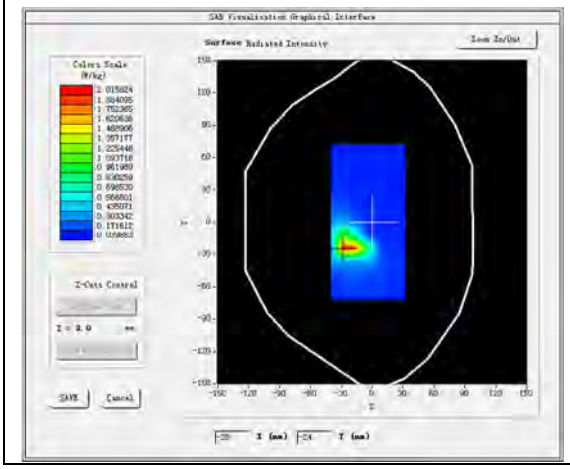
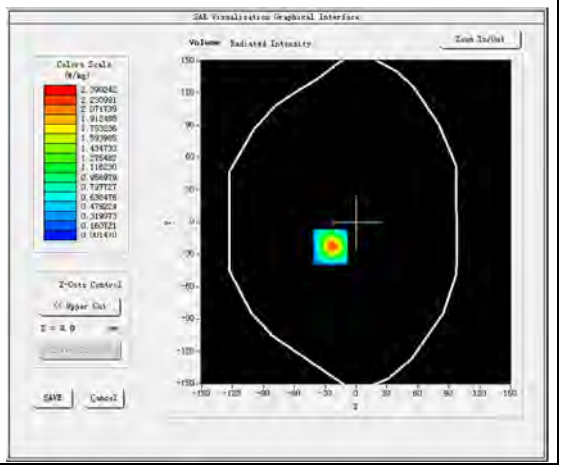
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.43

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5320.0
Relative permittivity (real part)	34.597461
Relative permittivity (imaginary	16.171153
Conductivity (S/m)	4.851346
Variation (%)	4.36

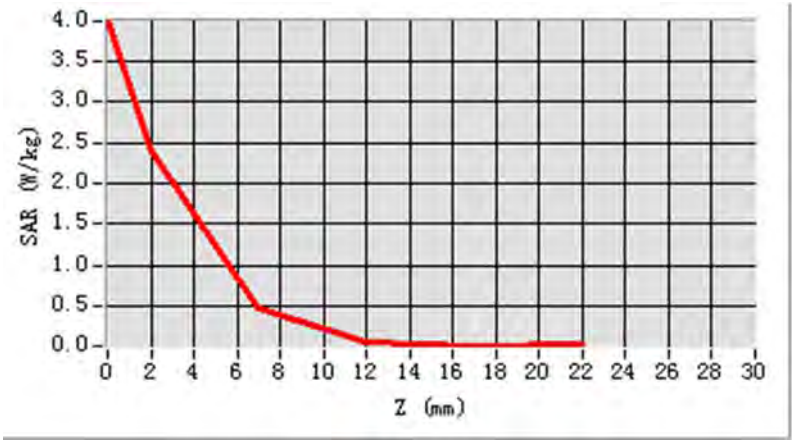
SURFACE SAR	VOLUME SAR
	

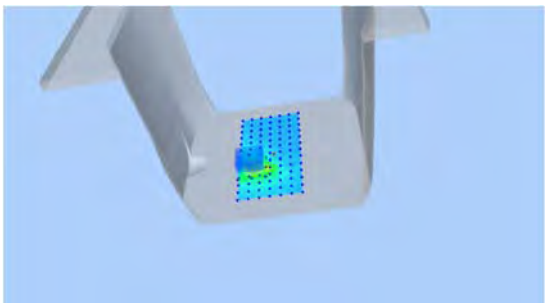
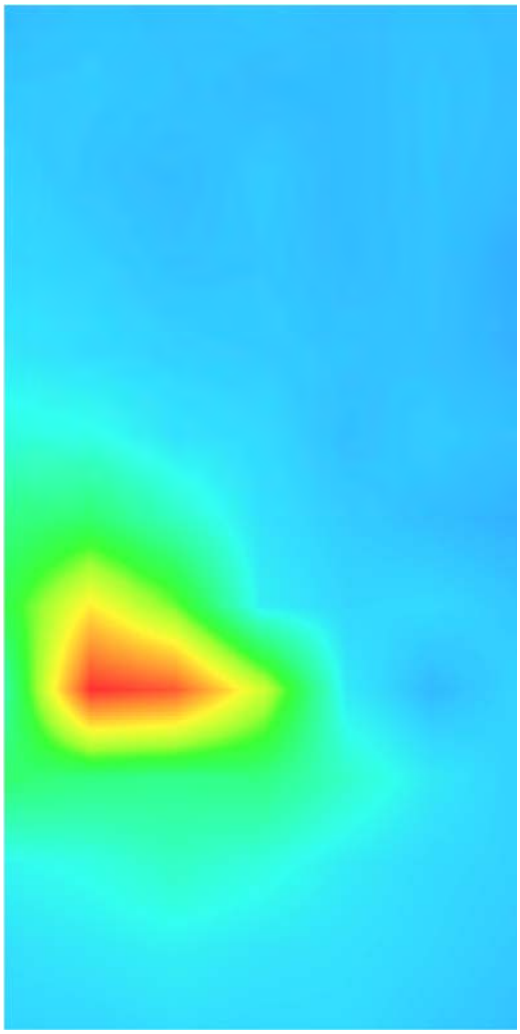
Maximum location: X=-25.00, Y=-23.00

SAR Peak: 4.22 W/kg

SAR 10g (W/Kg)	0.495578
SAR 1g (W/Kg)	1.370710

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	3.9790	2.3902	0.4759	0.0590	0.0215



3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Separation Distance (cm)	Channel
13	**802.11a**		**Rear Face**	**0**	**120**

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 34 seconds

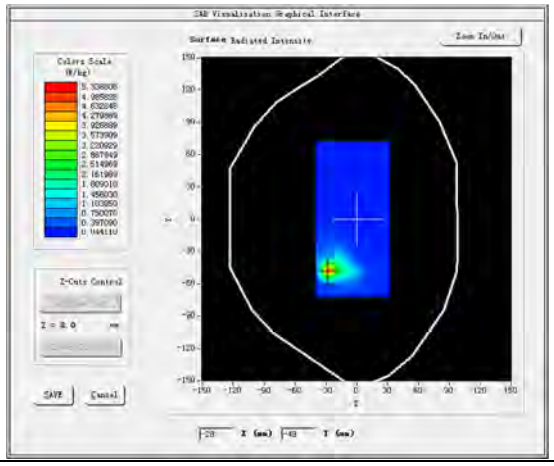
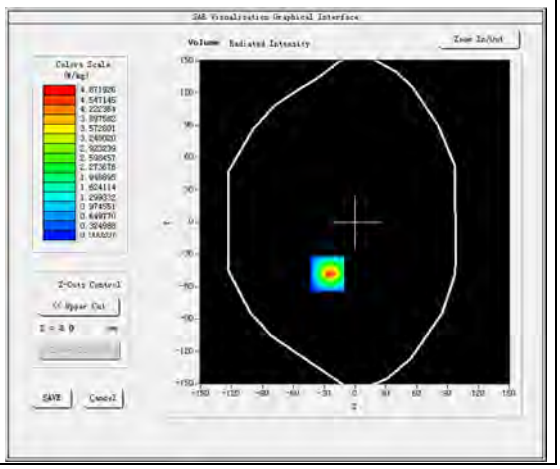
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.43

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5600.0
Relative permittivity (real part)	47.564610
Relative permittivity (imaginary	18.039668
Conductivity (S/m)	5.612341
Variation (%)	-0.64

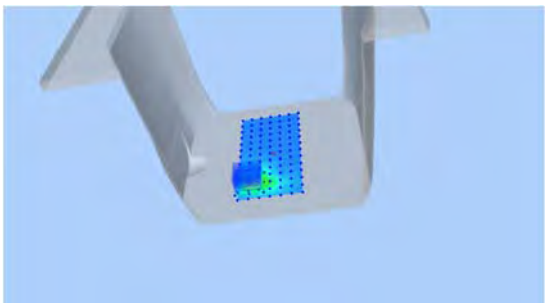
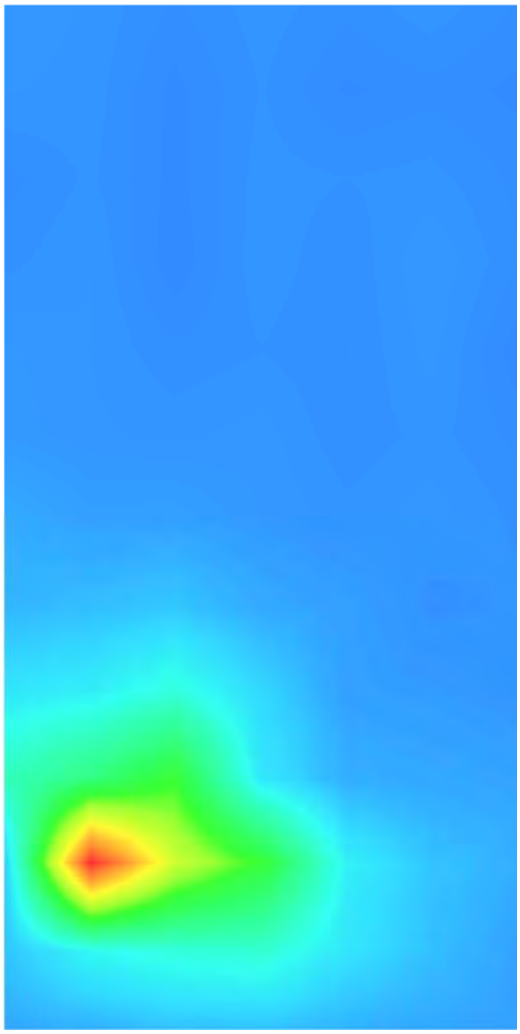
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-27.00, Y=-48.00

SAR Peak: 9.27 W/kg

SAR 10g (W/Kg)	0.905785
SAR 1g (W/Kg)	2.691730

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	8.5835	4.8719	0.6981	0.0205	0.0011

3D screen shot	Hot spot position
	

Plot No	Band	Mode	Test Position	Separation Distance (cm)	Channel
14	**802.11a**		**Rear Face**	**0**	**149**

Date of measurement: 21/11/2016

Measurement duration: 22 minutes 41seconds

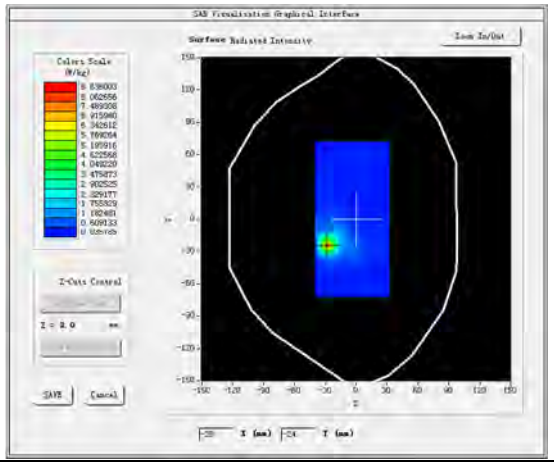
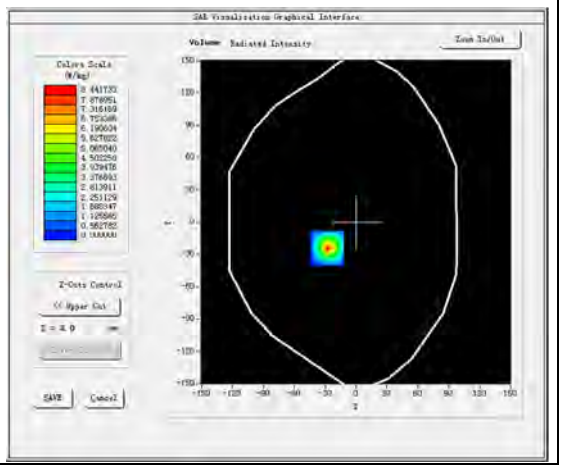
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11a U-NII
Channels	Middle
Signal	IEEE802.a (Crest factor: 1.0)
ConvF	2.39

B. SAR Measurement Results

E-Field Probe	SATIMO SN_27/15_EPGO261
Frequency (MHz)	5745
Relative permittivity (real part)	46.547694
Relative permittivity (imaginary	18.143174
Conductivity (S/m)	5.846134
Variation (%)	-3.09

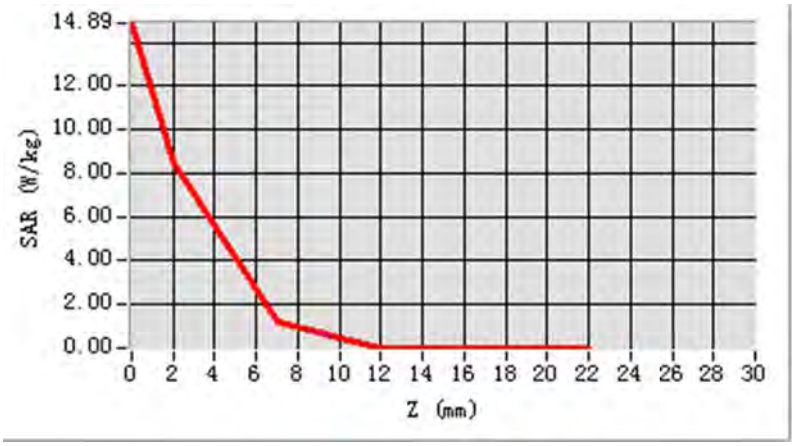
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-28.00, Y=-24.00

SAR Peak: 1.80 W/kg

SAR 10g (W/Kg)	1.437021
SAR 1g (W/Kg)	4.480724

Z (mm)	0.00	2.00	7.00	12.00	17.00
SAR (W/Kg)	14.8875	8.4417	1.1912	0.0266	0.0000



3D screen shot	Hot spot position