SAR EVALUATION REPORT

For

BEYOND RADIO TECHNOLOGY LIMITED

Room 11, 20/F, Grandtech Centre No.8 On Ping Street Shatin, NT, Hong Kong

FCC ID: 2AFV9FX100SERIES

Report Type:	Product Type:
Original Report	NFC Device

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Report Number:	RSZ150901007-20
Report Date:	2015-10-10
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

Attestation of Test Results			
EUT Information	Company Name	BEYOND RADIO TECHNOLOGY LIMITED	
	EUT Description	NFC Device	
	FCC ID	2AFV9FX100SERIES	
	Model Number	Tested Model: FX 100 Multiple Model: FX 100 Series	
	Test Date	2015-09-29	
Frequency	**Max. SAR Level(s) Reported**		**Limit(W/Kg)**
GSM 850	0.806 W/kg 1g Faceup SAR 1.352 W/kg 1g Body SAR		**1. 6**
PCS 1900	0.440 W/kg 1g Faceup SAR 0.909 W/kg 1g Body SAR		
WCDMA850	0.760 W/kg 1g Faceup SAR 1.165 W/kg 1g Body SAR		
WCDMA1900	0.420 W/kg 1g Faceup SAR 0.962 W/kg 1g Body SAR		
Simultaneous	0.992 W/kg 1g Faceup SAR 1.724 W/kg 1g Body SAR(SPLSR=0.0284)		
Hotspot	1.724 W/kg 1g Body SAR(SPLSR=0.0284)		
Applicable Standards	**ANSI / IEEE C95.1 : 2005** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fileds,3 kHz to 300 GHz.		
	ANSI / IEEE C95.3 : 2002 IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to SuchFields,100 kHz—300 GHz.		
	IEEE1528:2013 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques		
	KDB procedures KDB447498 D01 General RF Exposure Guidance v05r02. KDB 648474 D04 Handset SAR v01r02. KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03 KDB 865664 D02 RF Exposure Reporting v01r01 KDB 941225 D01 3G SAR Procedures v03 KDB 941225 D06 Hotspot Mode v02		

Note: This wireless device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in ANSI/IEEE Standards and has been tested in accordance with the measurement procedures specified in IEEE 1528-2013 and RF exposure KDB procedures.

The results and statements contained in this report pertain only to the device(s) evaluated.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RSZ150901007-20	Original Report	2015-10-10

EUT DESCRIPTION

This report has been prepared on behalf of BEYOND RADIO TECHNOLOGY LIMITED and their product, FCC ID: 2AFV9FX100SERIES , Model: FX 100 or the EUT (Equipment under Test) as referred to in the rest of this report.

*Note:
1. This series products model: FX 100 and FX 100 Series, we select model: FX 100 to test, there is no electrical change has been made to the equipment, please refer to the product similarity letter.
2. The device is capable of personal hotspot mode. Wi-Fi Hotspot mode permits the device to share its cellular data connection with other 2.4 GHz Wi-Fi enabled devices (channels 1 - 13).

Technical Specification

Product Type	Portable
Exposure Category:	Population / Uncontrolled
Antenna Type(s):	Internal Antenna
Body-Worn Accessories:	Headset
Face-Head Accessories:	None
Multi-slot Class:	Class12
Operation Mode :	GSM Voice,GPRS/EDGE Data, WCDMA,Bluetooth and Wi-Fi
Frequency Band:	GSM 850 : 824-849 MHz(TX) ; 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX) ; 1930-1990 MHz(RX) WCDMA850: 824-849 MHz(TX) ; 869-894 MHz(RX) WCDMA1900: 1850-1910 MHz(TX) ; 1930-1990 MHz(RX) Wi-Fi(802.11b/g/n20): 2412MHz-2472MHz Wi-Fi(n40): 2422MHz-2462MHz Bluetooth:2402-2480MHz
Conducted RF Power:	GSM 850 :32.16 dBm PCS 1900:29.55 dBm WCDMA 850:22.76 dBm WCDMA 1900:22.17 dBm Wi-Fi(802.11b/g/n20): 9.41 dBm Wi-Fi(802.11n40):8.28 dBm Bluetooth3.0: 2.36 dBm BLE: -5.37 dBm
Dimensions (L*W*H):	103 mm (L) × 63 mm (W) × 14 mm (H)
Power Source:	3.7 V_{DC} Rechargeable Battery
Normal Operation:	Faceup and Body-worn

REFERENCE, STANDARDS, AND GUILDELINES

FCC:

The Report and Order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). According to the Supplement C of OET Bulletin 65 “Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

CE:

The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 2 mW/g as recommended by EN62209-1 for an uncontrolled environment. According to the Standard, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in Europe is 2 mW/g average over 10 gram of tissue mass.

The test configurations were laid out on a specially designed test fixture to ensure the reproducibility of measurements. Each configuration was scanned for SAR. Analysis of each scan was carried out to characterize the above effects in the device.

SAR Limits

FCC Limit (1g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

CE Limit (10g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 10 g of tissue)	2.0	10
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

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

General Population/Uncontrolled environments Spatial Peak limit 1.6W/kg (FCC) & 2 W/kg (CE) applied to the EUT.

FACILITIES

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect data is located at 6/F, the 3rd Phase of WanLi Industrial Building, Shi Hua Road, Fu Tian Free Trade Zone, Shenzhen, Guangdong, P.R. of China

DESCRIPTION OF TEST SYSTEM

These measurements were performed with ALSAS 10 Universal Integrated SAR Measurement system from APREL Laboratories.

ALSAS-10U System Description

ALSAS-10-U is fully compliant with the technical and scientific requirements of IEEE 1528, IEC 62209, CENELEC, ARIB, ACA, and the Federal Communications Commission. The system comprises of a six axes articulated robot which utilizes a dedicated controller.
ALSAS-10U uses the latest methodologies. And FDTD modeling to provide a platform which is repeatable with minimum uncertainty.

Applications

Predefined measurement procedures compliant with the guidelines of CENELEC, IEEE, IEC, FCC, etc are utilized during the assessment for the device. Automatic detection for all SAR maxima are embedded within the core architecture for the system, ensuring that peak locations used for centering the zoom scan are within a 1mm resolution and a 0.05mm repeatable position. System operation range currently available up-to 6 GHz in simulated tissue.

Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a 10mm2 step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments.

Where the system identifies multiple SAR peaks (which are within 25% of peak value) the system will provide the user with the option of assessing each peak location individually for zoom scan averaging.

Zoom Scan (Cube Scan Averaging)

The averaging zoom scan volume utilized in the ALSAS-10U software is in the shape of a cube and the side dimension of a 1 g or 10 g mass is dependent on the density of the liquid representing the simulated tissue. A density of 1000 kg/m3 is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm,with the side length of the 10 g cube 21,5mm.

When the cube intersects with the surface of the phantom, it is oriented so that 3 vertices touch the surface of the shell or the center of a face is tangent to the surface. The face of the cube closest to the surface is modified in order to conform to the tangent surface.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications (including FCC) utilize a physical step of 5x5x8 (8mmx8mmx5mm) providing a volume of 32mm in the X & Y axis, and 35mm in the Z axis.

ALSAS-10U Interpolation and Extrapolation Uncertainty

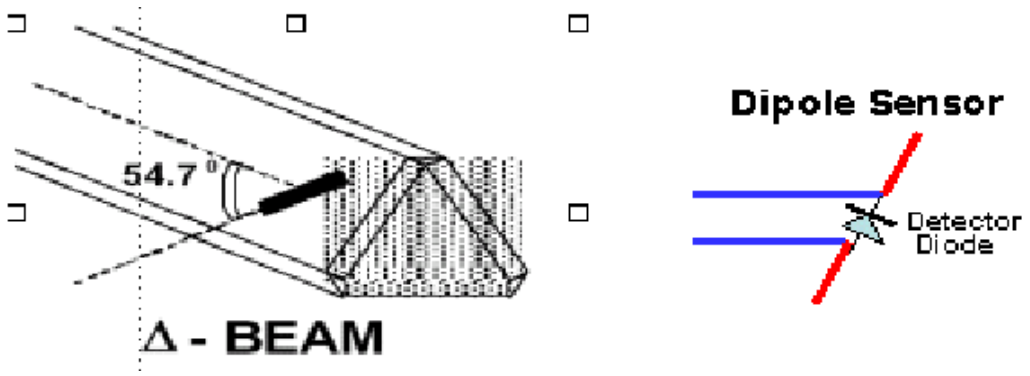
The overall uncertainty for the methodology and algorithms the used during the SAR calculation was evaluated using the data from IEEE 1528 based on the example f3 algorithm:

$$f_3(x,y,z) = A \frac{a^2}{\frac{a^2}{4} + x'^2 + y'^2} \cdot \left(e^{-\frac{2z}{a}} + \frac{a^2}{2(a+2z)^2} \right)$$

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:



SAR is assessed with a calibrated probe which moves at a default height of 5mm from the center of the diode, which is mounted to the sensor, to the phantom surface (in the Z Axis). The 5mm offset height has been selected so as to minimize any resultant boundary effect due to the probe being in close proximity to the phantom surface.

The following algorithm is an example of the function used by the system for linearization of the output from the probe when measuring complex modulation schemes.

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

Isotropic E-Field Probe Specification

Calibration Method	Frequency Dependent Below 1 GHz Calibration in air performed in a TEM Cell Above 1 GHz Calibration in air performed in waveguide
Sensitivity	0.70 μV/(V/m)^2 to 0.85 μV/(V/m)^2
Dynamic Range	0.0005 W/kg to 100 W/kg
Isotropic Response	Better than 0.1 dB
Diode Compression Point (DCP)	Calibration for Specific Frequency
Probe Tip Diameter	< 2.9 mm
Sensor Offset	1.56 (+/- 0.02 mm)
Probe Length	289 mm
Video Bandwidth	@ 500 Hz: 1 dB @ 1.02 kHz: 3 dB
Boundary Effect	Less than 2.1% for distance greater than 0.58 mm
Spatial Resolution	The spatial resolution uncertainty is less than 1.5% for 4.9mm diameter probe. The spatial resolution uncertainty is less than 1.0% for 2.5mm diameter probe

Boundary Detection Unit and Probe Mounting Device

ALSAS-10U incorporates a boundary detection unit with a sensitivity of 0.05mm for detecting all types of surfaces. The robust design allows for detection during probe tilt (probe normalize) exercises, and utilizes a second stage emergency stop. The signal electronics are fed directly into the robot controller for high accuracy surface detection in lateral and axial detection modes (X, Y, & Z).

The probe is mounted directly onto the Boundary Detection unit for accurate tooling and displacement calculations controlled by the robot kinematics. The probe is connect to an isolated probe interconnect where the output stage of the probe is fed directly into the amplifier stage of the Daq-Paq.

Daq-Paq (Analog to Digital Electronics)

ALSAS-10U incorporates a fully calibrated Daq-Paq (analog to digital conversion system) which has a 4 channel input stage, sent via a 2 stage auto-set amplifier module. The input signal is amplified accordingly so as to offer a dynamic range from 5μV to 800mV. Integration of the fields measured is carried out at board level utilizing a Co-Processor which then sends the measured fields down into the main computational module in digitized form via an RS232 communications port. Probe linearity and duty cycle compensation is carried out within the main Daq-Paq module.

ADC	12 Bit
Amplifier Range	20 mV to 200 mV and 150 mV to 800 mV
Field Integration	Local Co-Processor utilizing proprietary integration algorithms
Number of Input Channels	4 in total 3 dedicated and 1 spare
Communication	Packet data via RS232

Axis Articulated Robot

ALSAS-10U utilizes a six axis articulated robot, which is controlled using a Pentium based real-time movement controller. The movement kinematics engine utilizes proprietary (Thermo CRS) interpolation and extrapolation algorithms, which allow full freedom of movement for each of the six joints within the working envelope. Utilization of joint 6 allows for full probe rotation with a tolerance better than 0.05mm around the central axis.

Robot/Controller Manufacturer	Thermo CRS
Number of Axis	Six independently controlled axis
Positioning Repeatability	0.05 mm
Controller Type	Single phase Pentium based C500C
Robot Reach	710 mm
Communication	RS232 and LAN compatible

ALSAS Universal Workstation

ALSAS Universal workstation allows for repeatability and fast adaptability. It allows users to do calibration, testing and measurements using different types of phantoms with one set up, which significantly speeds up the measurement process.

Universal Device Positioner

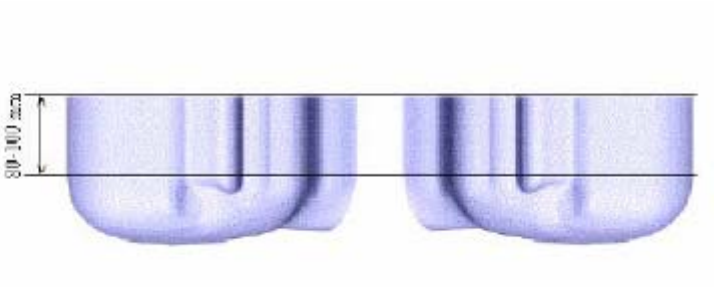
The universal device positioner allows complete freedom of movement of the EUT. Developed to hold a EUT in a free-space scenario any additional loading attributable to the material used in the construction of the positioner has been eliminated. Repeatability has been enhanced through the linear scales which form the design used to indicate positioning for any given test scenario in all major axes. A 15° tilt indicator is included for the of aid cheek to tilt movements for head SAR analysis. Overall uncertainty for measurements have been reduced due to the design of the Universal device positioner, which allows positioning of a device in as near to a free-space scenario as possible, and by providing the means for complete repeatability.

Phantom Types

The ALSAS-10U allows the integration of multiple phantom types. SAM Phantoms fully compliant with IEEE 1528, Universal Phantom, and Universal Flat.

APREL SAM Phantoms

The SAM phantoms developed using the IEEE SAM CAD file. They are fully compliant with the requirements for both IEEE 1528 and FCC Supplement C. Both the left and right SAM phantoms are interchangeable, transparent and include the IEEE 1528 grid with visible NF and MB lines.



APREL Laboratories Universal Phantom

The Universal Phantom is used on the ALSAS-10U as a system validation phantom. The Universal Phantom has been fully validated both experimentally from 800MHz to 6GHz and numerically using XFDTD numerical software.

The shell thickness is 2mm overall, with a 4mm spacer located at the NF/MB intersection providing an overall thickness of 6mm in line with the requirements of IEEE-1528.

The design allows for fast and accurate measurements, of handsets, by allowing the conservative SAR to be evaluated at on frequency for both left and right head experiments in one measurement.

Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (Nacl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (s/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Recommended Tissue Dielectric Parameters for Head and Body

Frequency (MHz)	Head Tissue		Body Tissue	
	εr	O' (S/m)	εr	O' (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

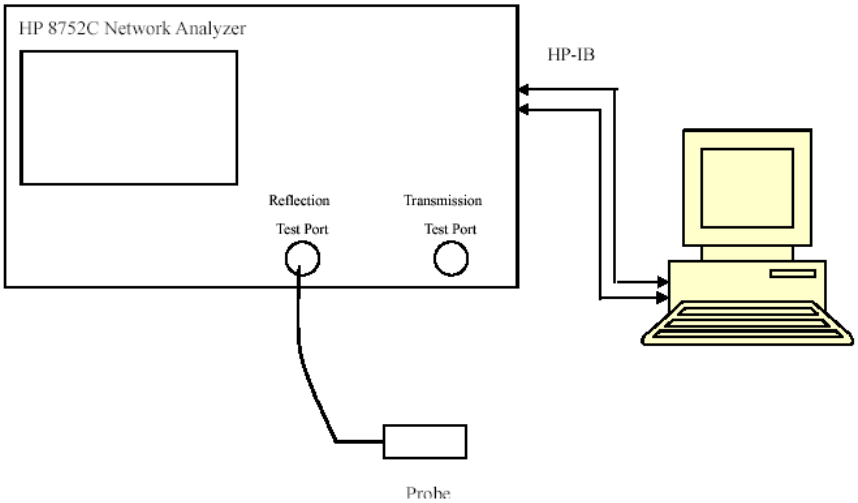
EQUIPMENT LIST AND CALIBRATION

Equipments List & Calibration Information

Equipment	Model	Calibration Date	Calibration Due Date	S/N
CRS F3 robot	ALS-F3	N/A	N/A	RAF0805352
CRS F3 Software	ALS-F3-SW	N/A	N/A	N/A
CRS C500C controller	ALS-C500	N/A	N/A	RCF0805379
Probe mounting device & Boundary Detection Sensor System	ALS-PMDPS-3	N/A	N/A	120-00270
Universal Work Station	ALS-UWS	N/A	N/A	100-00157
Data Acquisition Package	ALS-DAQ-PAQ-3	2014-10-14	2015-10-14	110-00212
Miniature E-Field Probe	ALS-E-020	2014-10-14	2015-10-14	500-00283
Dipole, 835MHz	ALS-D-835-S-2	2014-10-08	2017-10-08	180-00558
Dipole, 1900MHz	ALS-D-1900-S-2	2014-10-09	2017-10-09	210-00710
Dipole Spacer	ALS-DS-U	N/A	N/A	250-00907
Device holder/Positioner	ALS-H-E-SET-2	N/A	N/A	170-00510
UniPhantom	ALS-P-UP-1	N/A	N/A	150-00413
Simulated Tissue 835 MHz Head	ALS-TS-835-H	Each Time	Each Time	270-01002
Simulated Tissue 835 MHz Body	ALS-TS-835-B	Each Time	Each Time	270-02101
Simulated Tissue 1900 MHz Head	ALS-TS-1900-H	Each Time	Each Time	295-01103
Simulated Tissue 1900 MHz Body	ALS-TS-1900-B	Each Time	Each Time	295-02102
Directional couple	DC6180A	N/A	N/A	0325849
Power Amplifier	5S1G4	N/A	N/A	71377
Dielectric probe kit	HP85070B	2015-06-13	2016-06-13	US33020324
Attenuator	3dB	2015-05-08	2016-05-08	5402
Network analyzer	8752C	2015-06-03	2016-06-03	3410A02356
Synthesized Sweeper	HP 8341B	2015-06-03	2016-06-03	2624A00116
UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	2014-11-23	2015-11-23	106891
EMI Test Receiver	ESCI	2015-06-13	2016-06-13	101746

SAR MEASUREMENT SYSTEM VERIFICATION

Liquid Verification



Liquid Verification Setup Block Diagram

Liquid Verification Results

Frequency	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	σ (S/m)	ε_r	σ (S/m)	$\Delta\varepsilon_r$	Δσ (S/m)	
824.2	Head	41.06	0.90	41.50	0.90	-1.060	0.000	±5
	Body	53.83	0.95	55.20	0.97	-2.482	-2.062	±5
826.4	Head	41.02	0.90	41.50	0.90	-1.157	0.000	±5
	Body	53.84	0.95	55.20	0.97	-2.464	-2.062	±5
836.6	Head	41.06	0.92	41.50	0.90	-1.060	2.222	±5
	Body	53.86	0.96	55.20	0.97	-2.428	-1.031	±5
846.6	Head	41.09	0.91	41.50	0.90	-0.988	1.111	±5
	Body	53.78	0.97	55.20	0.97	-2.572	0.000	±5
848.8	Head	41.05	0.92	41.50	0.90	-1.084	2.222	±5
	Body	53.78	0.98	55.20	0.97	-2.572	1.031	±5
1850.2	Head	39.59	1.38	40.00	1.40	-1.025	-1.429	±5
	Body	51.83	1.48	53.30	1.52	-2.758	-2.632	±5
1852.4	Head	39.67	1.37	40.00	1.40	-0.825	-2.143	±5
	Body	52.02	1.50	53.30	1.52	-2.402	-1.316	±5
1880.0	Head	39.55	1.39	40.00	1.40	-1.125	-0.714	±5
	Body	51.95	1.51	53.30	1.52	-2.533	-0.658	±5
1907.6	Head	39.62	1.42	40.00	1.40	-0.950	1.429	±5
	Body	51.80	1.54	53.30	1.52	-2.814	1.316	±5
1909.8	Head	39.55	1.41	40.00	1.40	-1.125	0.714	±5
	Body	51.76	1.53	53.30	1.52	-2.889	0.658	±5

**Liquid Verification was performed on 2015-09-29.*

Please refer to the following tables.

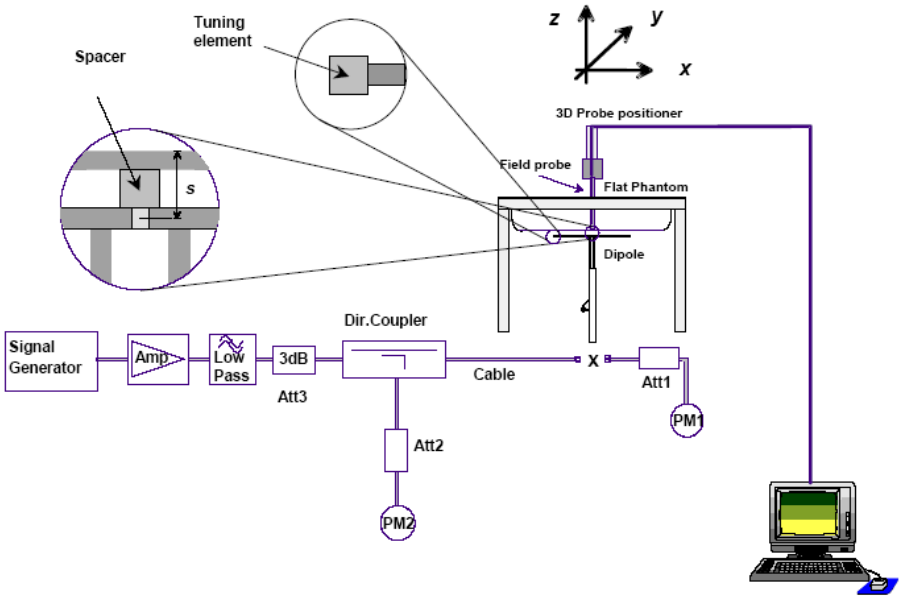
835 MHz Head				835 MHz Body		
Frequency (MHz)	e'	e''		Frequency (MHz)	e'	e''
824.0	41.0593	19.6763		824.0	53.8278	20.6746
824.5	41.0113	19.7322		824.5	53.7830	20.6421
825.0	41.0731	19.7423		825.0	53.8490	20.6554
825.5	41.0910	19.7644		825.5	53.7721	20.6927
826.0	41.0567	19.7581		826.0	53.7754	20.6330
826.5	41.0200	19.6846		826.5	53.8446	20.6333
827.0	41.1040	19.6913		827.0	53.7993	20.6455
827.5	41.0582	19.6907		827.5	53.8070	20.6271
828.0	41.0484	19.6714		828.0	53.8655	20.6692
828.5	41.0320	19.6682		828.5	53.8646	20.6875
829.0	41.0441	19.7316		829.0	53.8107	20.6740
829.5	41.0577	19.6730		829.5	53.8494	20.6754
830.0	41.0310	19.6877		830.0	53.7949	20.7024
830.5	41.0271	19.6970		830.5	53.8704	20.6930
831.0	40.9995	19.6634		831.0	53.8072	20.6713
831.5	41.0662	19.7011		831.5	53.7672	20.6854
832.0	41.0220	19.6921		832.0	53.7724	20.6697
832.5	41.0361	19.7706		832.5	53.8191	20.6522
833.0	41.0849	19.6774		833.0	53.8316	20.6750
833.5	41.0664	19.6718		833.5	53.8515	20.6364
834.0	41.0196	19.7489		834.0	53.8613	20.6701
834.5	41.0402	19.7704		834.5	53.8346	20.6799
835.0	41.0793	19.6818		835.0	53.8338	20.6828
835.5	41.0605	19.7265		835.5	53.8593	20.6244
836.0	41.0799	19.6691		836.0	53.8413	20.7049
836.5	41.0740	19.6991		836.5	53.8144	20.6716
837.0	41.1020	19.7664		837.0	53.7679	20.7031
837.5	41.0779	19.7393		837.5	53.8247	20.6202
838.0	41.0798	19.7410		838.0	53.7948	20.6575
838.5	41.0935	19.7032		838.5	53.7986	20.6737
839.0	41.1013	19.7691		839.0	53.8580	20.6934
839.5	41.0941	19.6961		839.5	53.8276	20.7042
840.0	41.0792	19.4113		840.0	53.7849	20.6200
840.5	41.0279	19.4046		840.5	53.8437	20.6872
841.0	41.0360	19.4636		841.0	53.7942	20.6730
841.5	41.0688	19.4612		841.5	53.8115	20.7031
842.0	41.0313	19.4288		842.0	53.8580	20.6822
842.5	41.0178	19.3685		842.5	53.8132	20.7094
843.0	41.0900	19.3971		843.0	53.7715	20.6591
843.5	41.0165	19.4515		843.5	53.8235	20.6483
844.0	41.0609	19.4736		844.0	53.7722	20.6159
844.5	41.0707	19.4655		844.5	53.8052	20.6656
845.0	41.0197	19.3712		845.0	53.7826	20.6472
845.5	41.0345	19.3790		845.5	53.7801	20.6911
846.0	41.0860	19.3648		846.0	53.8023	20.6602
846.5	41.0908	19.3736		846.5	53.7813	20.6124
847.0	41.0591	19.3995		847.0	53.8577	20.6996
847.5	41.0142	19.4640		847.5	53.8667	20.6571
848.0	41.0530	19.3832		848.0	53.7835	20.6938
848.5	41.0276	19.4478		848.5	53.8207	20.6265
849.0	41.0508	19.4285		849.0	53.7773	20.6915

1900 MHz Head				1900 MHz Body		
Frequency (MHz)	e'	e''		Frequency (MHz)	e'	e''
1850.0	39.5851	13.3800		1850.0	51.8287	14.4137
1851.2	39.5840	13.4082		1851.2	52.0308	14.4957
1852.4	39.6655	13.2671		1852.4	52.0242	14.5720
1853.6	39.6465	13.2799		1853.6	51.8808	14.4604
1854.8	39.6008	13.3247		1854.8	51.9324	14.4525
1856.0	39.6112	13.3333		1856.0	51.8127	14.5581
1857.2	39.7332	13.2662		1857.2	51.9309	14.5443
1858.4	39.6537	13.2995		1858.4	51.8114	14.4381
1859.6	39.6309	13.3410		1859.6	51.9750	14.5095
1860.8	39.5970	13.3782		1860.8	51.9052	14.4367
1862.0	39.5516	13.2787		1862.0	51.8797	14.4393
1863.2	39.5625	13.2903		1863.2	51.7682	14.5597
1864.4	39.6173	13.2501		1864.4	51.8769	14.4671
1865.6	39.6918	13.2614		1865.6	51.9351	14.5527
1866.8	39.6292	13.2991		1866.8	52.0081	14.5663
1868.0	39.5438	13.2880		1868.0	52.0301	14.4600
1869.2	39.6802	13.4302		1869.2	52.0722	14.5451
1870.4	39.7389	13.3166		1870.4	51.9276	14.4482
1871.6	39.6784	13.4166		1871.6	51.7994	14.4435
1872.8	39.6380	13.3296		1872.8	51.9770	14.5008
1874.0	39.7058	13.2959		1874.0	52.0658	14.5791
1875.2	39.7159	13.4222		1875.2	51.9997	14.5112
1876.4	39.6823	13.4240		1876.4	52.0120	14.4355
1877.6	39.7235	13.3631		1877.6	51.9757	14.4890
1878.8	39.6046	13.3119		1878.8	51.7528	14.4384
1880.0	39.5451	13.2884		1880.0	51.9464	14.4520
1881.2	39.5733	13.2533		1881.2	52.0284	14.5666
1882.4	39.6888	13.2645		1882.4	51.9419	14.4345
1883.6	39.7358	13.3302		1883.6	51.8799	14.5232
1884.8	39.6597	13.3358		1884.8	51.9409	14.4449
1886.0	39.6450	13.3502		1886.0	51.8827	14.4983
1887.2	39.7091	13.2759		1887.2	51.9870	14.4412
1888.4	39.5735	13.4242		1888.4	51.8999	14.5020
1889.6	39.5530	13.2971		1889.6	51.9719	14.4537
1890.8	39.6865	13.2847		1890.8	51.9938	14.5444
1892.0	39.7230	13.3733		1892.0	51.8567	14.5718
1893.2	39.6890	13.2665		1893.2	51.8811	14.4199
1894.4	39.5449	13.4138		1894.4	52.0118	14.4976
1895.6	39.6429	13.3969		1895.6	51.9656	14.4640
1896.8	39.5700	13.4188		1896.8	51.7890	14.5067
1898.0	39.5516	13.3855		1898.0	51.9613	14.5199
1899.2	39.5765	13.3689		1899.2	52.0542	14.4192
1900.4	39.5498	13.4342		1900.4	51.8935	14.5259
1901.6	39.7336	13.3131		1901.6	51.7699	14.5240
1902.8	39.5900	13.3156		1902.8	51.9799	14.5731
1904.0	39.6796	13.3570		1904.0	52.0104	14.4597
1905.2	39.7298	13.4012		1905.2	51.8509	14.5439
1906.4	39.6725	13.3034		1906.4	52.0773	14.5240
1907.6	39.6225	13.3549		1907.6	51.8014	14.4961
1908.8	39.6966	13.4275		1908.8	52.0054	14.5589
1910.0	39.5464	13.2533		1910.0	51.7615	14.4279

System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

System Verification Setup Block Diagram



Probe and dipole antenna List and Detail

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
APREL	Probe	ALS-E-020	500-00283	2014-10-14	2015-10-13
APREL	Dipole antenna(835MHz)	ALS-D-835-S-2	180-00558	2014-10-08	2017-10-07
APREL	Dipole antenna(1900MHz)	ALS-D-1900-S-2	210-00710	2014-10-09	2017-10-08

System Accuracy Check Results

Date	Frequency Band	Liquid Type	Measured SAR (W/Kg)		Target Value (W/Kg)	Delta (%)	Tolerance (%)
2015-09-29	835	Head	1g	9.522	9.773	-2.568	±10
		Body	1g	9.420	9.736	-3.246	±10
	1900	Head	1g	40.706	39.481	3.103	±10
		Body	1g	41.759	39.715	5.147	±10

*All SAR values are normalized to 1 Watt forward power.

SAR SYSTEM VALIDATION DATA

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

System Performance Check 835 MHz Head Liquid

Dipole 835 MHz; Type: ALS-D-835-S-2; S/N: 180-00558

Product Data
Device Name : Dipole 835 MHz
Serial No. : 180-00558
Type : Dipole
Model : ALS-D-835-S-2
Frequency Band : 835
Max. Transmit Pwr : 1 W
Drift Time : 3 min(s)
Power Drift-Start : 9.823 W/kg
Power Drift-Finish : 9.536 W/kg
Power Drift (%) : -3.839

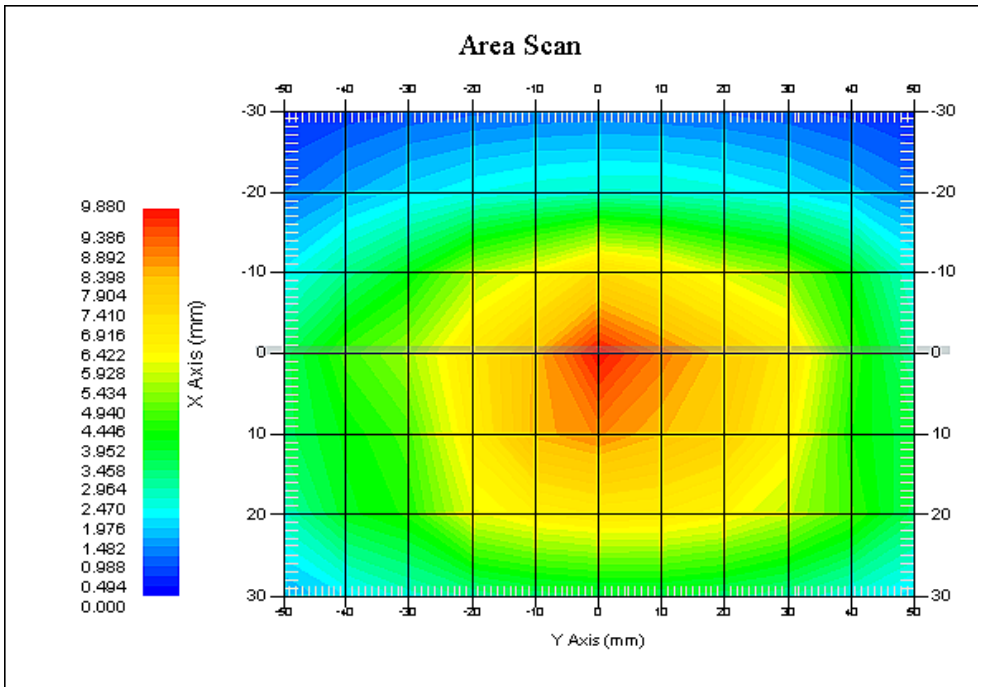
Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Serial No. : System Default
Location : Center
Description : Default
Phantom Data

Tissue Data
Type : Head
Serial No. : 270-01002
Frequency : 835.0 MHz
Last Calib. Date : 29-Sep-2015
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 41.08 F/m
Sigma : 0.91 S/m
Density : 1000.00 kg/cu. m

Probe Data
Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 500-00283
Last Calib. Date : 14-Oct-2014
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 µV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

Measurement Data
Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 21.00 °C
Ambient Temp. : 21.00 °C
Area Scan : 7x9x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm

1 gram SAR value : 9.522 W/kg
10 gram SAR value : 6.456 W/kg
Area Scan Peak SAR : 9.857 W/kg
Zoom Scan Peak SAR : 14.680 W/kg



835 MHz System Validation with Head Tissue

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

System Performance Check 835 MHz Body Liquid

Dipole 835 MHz; Type: ALS-D-835-S-2; S/N: 180-00558

Product Data
Device Name : Dipole 835 MHz
Serial No. : 180-00558
Type : Dipole
Model : ALS-D-835-S-2
Frequency Band : 835
Max. Transmit Pwr : 1 W
Drift Time : 3 min(s)
Power Drift-Start : 9.315 W/kg
Power Drift-Finish : 9.128 W/kg
Power Drift (%) : -2.037

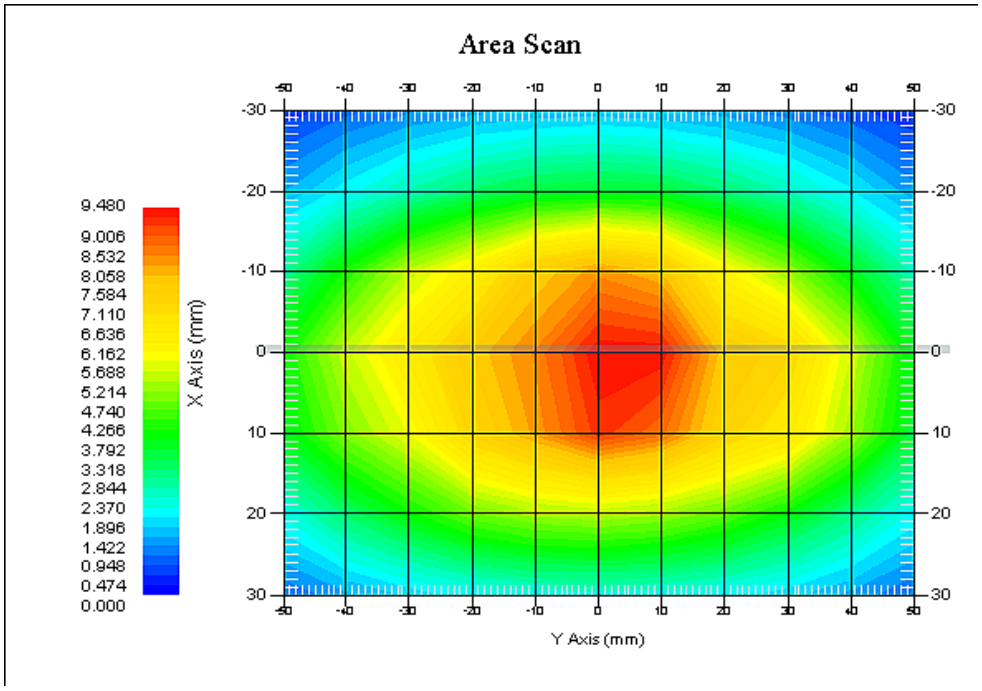
Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Serial No. : System Default
Location : Center
Description : Default
Phantom Data

Tissue Data
Type : Body
Serial No. : 270-02101
Frequency : 835.0 MHz
Last Calib. Date : 29-Sep-2015
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 53.83 F/m
Sigma : 0.96 S/m
Density : 1000.00 kg/cu. m

Probe Data
Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 500-00283
Last Calib. Date : 14-Oct-2014
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 µV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

Measurement Data
Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 21.00 °C
Ambient Temp. : 21.00 °C
Area Scan : 7x9x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm

1 gram SAR value : 9.420 W/kg
10 gram SAR value : 6.588 W/kg
Area Scan Peak SAR : 9.465 W/kg
Zoom Scan Peak SAR : 14.628 W/kg



835 MHz System Validation with Body Tissue

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

System Performance Check 1900 MHz Head Liquid

Dipole 1900 MHz; Type: ALS-D-1900-S-2; S/N: 210-00710

Product Data
Device Name : Dipole 1900MHz
Serial No. : 210-00710
Type : Dipole
Model : ALS-D-1900-S-2
Frequency Band : 1900
Max. Transmit Pwr : 1 W
Drift Time : 3 min(s)
Power Drift-Start : 44.620 W/kg
Power Drift-Finish : 44.106 W/kg
Power Drift (%) : -1.063

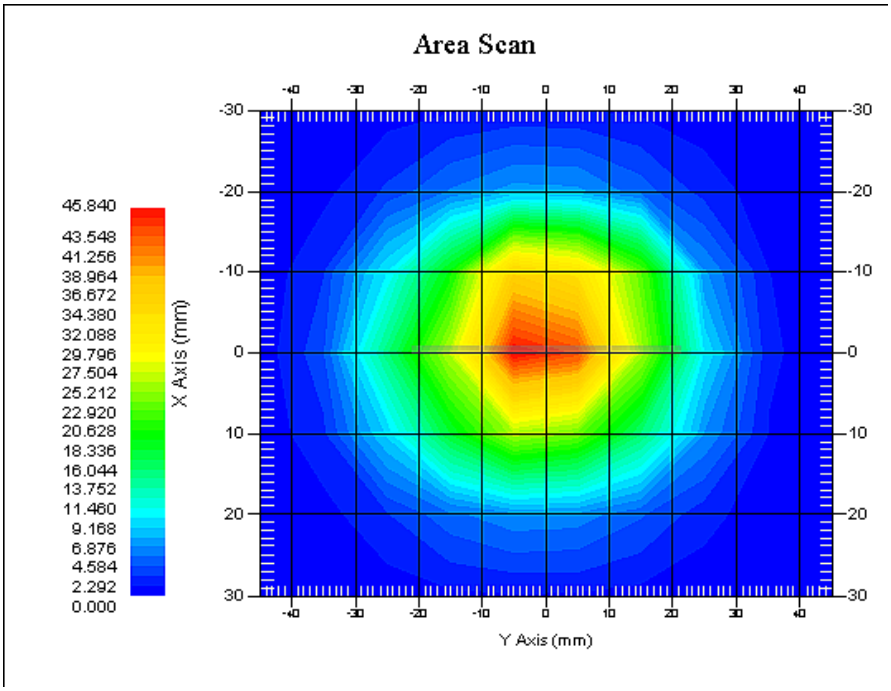
Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Serial No. : System Default
Location : Center
Description : Default

Tissue Data
Type : Head
Serial No. : 295-01103
Frequency : 1900.00 MHz
Last Calib. Date : 29-Sep-2015
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 39.55 F/m
Sigma : 1.41 S/m
Density : 1000.00 kg/cu. M

Probe Data
Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 500-00283
Last Calib. Date : 14-Oct-2014
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.8
Probe Sensitivity : 1.20 1.20 1.20 µV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

Measurement Data
Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 20.00 °C
Area Scan : 7x9x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm

1 gram SAR value : 40.706 W/kg
10 gram SAR value : 20.118 W/kg
Area Scan Peak SAR : 45.816 W/kg
Zoom Scan Peak SAR : 69.375 W/kg



1900 MHz System Validation with Head Tissue

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

System Performance Check 1900 MHz Body Liquid

Dipole 1900 MHz; Type: ALS-D-1900-S-2; S/N: 210-00710

Product Data
Device Name : Dipole 1900MHz
Serial No. : 210-00710
Type : Dipole
Model : ALS-D-1900-S-2
Frequency Band : 1900
Max. Transmit Pwr : 1 W
Drift Time : 3 min(s)
Power Drift-Start : 45.403 W/kg
Power Drift-Finish : 45.912 W/kg
Power Drift (%) : 1.093

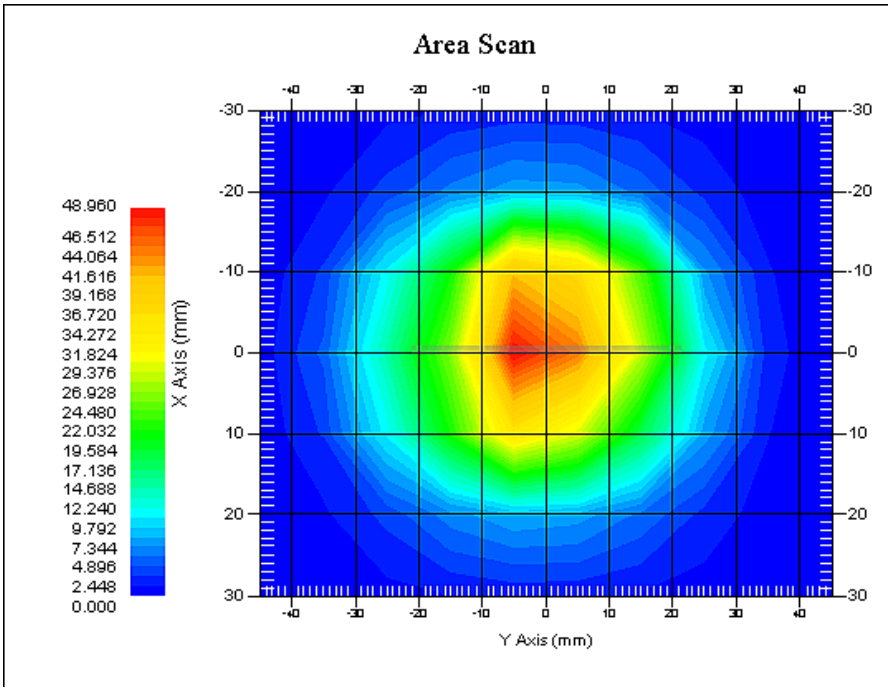
Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Serial No. : System Default
Location : Center
Description : Default

Tissue Data
Type : Body
Serial No. : 295-02102
Frequency : 1900.00 MHz
Last Calib. Date : 29-Sep-2015
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 51.92 F/m
Sigma : 1.53 S/m
Density : 1000.00 kg/cu. m

Probe Data
Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 500-00283
Last Calib. Date : 14-Oct-2014
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 µV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

Measurement Data
Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 21.00 °C
Area Scan : 7x9x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm

1 gram SAR value : 41.759 W/kg
10 gram SAR value : 21.260 W/kg
Area Scan Peak SAR : 48.833 W/kg
Zoom Scan Peak SAR : 69.336 W/kg



1900 MHz System Validation with Body Tissue

EUT TEST STRATEGY AND METHODOLOGY

Test positions for body-worn and other configurations

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.

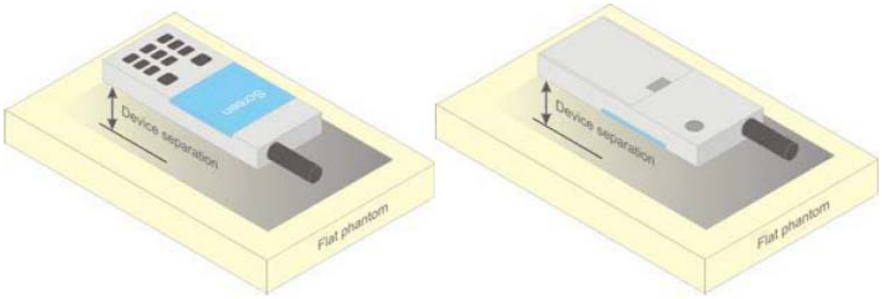


Figure 5 – Test positions for body-worn devices

SAR Evaluation Procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop. The SAR at this point is measured at the start of the test and then again at the end of the testing.

Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the head or EUT and the horizontal grid spacing was 10 mm x 10 mm. Based on these data, the area of the maximum absorption was determined by spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

Step 3: Around this point, a volume of 35 mm x 35 mm x 35 mm was assessed by measuring 7x 7 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1) The data at the surface were extrapolated, since the center of the dipoles is 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

2) The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one dimensional splines with the “Not a knot"-condition (in x, y and z-directions). The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10)

were interpolated to calculate the averages.

All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

Test Position

According to KDB 447498 D01: Support the body-worn accessory test configurations.Devices that are designed to operate on the body of user using lanyards and straps,or without requiring additional body-worn accessories,must be tested for SAR compliance using a conservative minimum test separation distance ≤5mm to support compliance.

Since the EUT has no voice receiver,so the head mode cannot to be considered as the intended use,we select Faceup mode(test separation distance 10mm) instead of the head mode.

Test methodology

KDB 447498 D01 General RF Exposure Guidance v05r02.
KDB 648474 D04 Handset SAR v01r02.
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
KDB 865664 D02 RF Exposure Reporting v01r01
KDB 941225 D01 3G SAR Procedures v03
KDB 941225 D06 Hotspot Mode v02

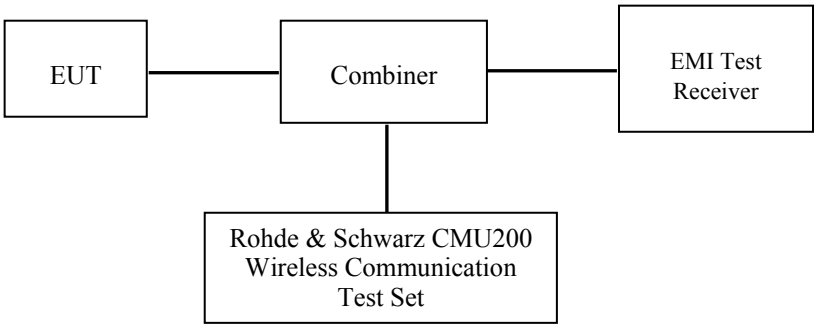
CONDUCTED OUTPUT POWER MEASUREMENT

Provision Applicable

The measured peak output power should be greater and within 5% than EMI measurement.

Test Procedure

The RF output of the transmitter was connected to the input of the EMI Test Receiver through sufficient attenuation.



GSM&3G

Maximum Output Power among production units

Max Target Power for Production Unit (dBm)				
Mode/Band		Channel		
		Low	Middle	High
GMS 850		32.20	32.20	32.20
GPRS850 1 slot		32.30	32.30	32.30
GPRS850 2 slots		31.60	31.60	31.60
GPRS850 3 slots		29.90	29.90	29.90
GPRS850 4 slots		28.80	28.80	28.80
EGPRS850 1 slot		28.00	28.00	28.00
EGPRS850 2 slots		26.60	26.60	26.60
EGPRS850 3 slots		24.20	24.20	24.20
EGPRS850 4 slots		23.00	23.00	23.00
GPRS1900 1 slot		29.60	29.60	29.60
PCS 1900		29.60	29.60	29.60
GPRS1900 2 slots		28.90	28.90	28.90
GPRS1900 3 slots		27.10	27.10	27.10
GPRS1900 4 slots		26.10	26.10	26.10
EGPRS1900 1 slot		27.30	27.30	27.30
EGPRS1900 2 slots		26.10	26.10	26.10
EGPRS1900 3 slots		23.90	23.90	23.90
EGPRS1900 4 slots		22.60	22.60	22.60
WCDMA850	RMC	22.80	22.80	22.80
	HSDPA	21.80	21.80	21.80
	HSUPA	21.60	21.60	21.60
	DC-HSDPA	21.10	21.10	21.10
	HSPA+	21.00	21.00	21.00
WCDMA1900	RMC	22.20	22.20	21.00
	HSDPA	21.20	21.20	21.20
	HSUPA	21.00	21.00	21.00
	DC-HSDPA	20.90	20.90	20.90
	HSPA+	20.80	20.80	20.80
Wi-Fi(802.11b/g/n20)		9.50	9.50	9.50
Wi-Fi(802.11n40)		8.30	8.30	8.30
Bluetooth3.0		2.40	2.40	2.40
BLE		-5.30	-5.30	-5.30

Test Results:

GSM:

Band	Frequency (MHz)	Conducted Output Power	
		Meas. Power (dBm)	Meas. Power (W)
GSM 850	824.2	32.13	1.633
	836.6	**32.16**	1.644
	848.8	32.14	1.637
PCS 1900	1850.2	29.53	0.897
	1880.0	**29.55**	0.902
	1909.8	29.44	0.879

GPRS:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
GSM 850	128	824.2	32.19	31.55	29.81	28.74
	190	836.6	32.23	31.54	29.80	28.72
	251	848.8	32.20	31.50	29.74	28.68
PCS 1900	512	1850.2	29.55	28.80	27.04	26.02
	661	1880.0	29.52	28.75	27.03	25.99
	810	1909.8	29.45	28.72	26.99	25.96

EDGE:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
GSM 850	128	824.2	27.93	26.57	24.18	22.98
	190	836.6	27.73	26.35	23.97	22.76
	251	848.8	27.53	26.16	23.69	22.52
PCS 1900	512	1850.2	27.22	26.07	23.88	22.53
	661	1880.0	27.09	25.89	23.67	22.31
	810	1909.8	26.84	25.73	23.46	22.15

For SAR, the time based average power is relevant, the difference in between depends on the duty cycle of the TDMA signal.

Number of Time slot	1	2	3	4
Duty Cycle	1:8	1:4	1:2.66	1:2
Time based Ave. power compared to slotted Ave. power	-9 dB	-6 dB	-4.25 dB	-3 dB
Crest Factor	8	4	2.66	2

The time based average power for GPRS

Band	Channel No.	Frequency (MHz)	Time based average Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
GSM 850	128	824.2	23.19	25.55	25.56	**25.74**
	190	836.6	23.23	25.54	25.55	25.72
	251	848.8	23.20	25.50	25.49	25.68
PCS 1900	512	1850.2	20.55	22.80	22.79	**23.02**
	661	1880.0	20.52	22.75	22.78	22.99
	810	1909.8	20.45	22.72	22.74	22.96

The time based average power for EDGE

Band	Channel No.	Frequency (MHz)	Time based average Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
GSM 850	128	824.2	18.93	**20.57**	19.93	19.98
	190	836.6	18.73	20.35	19.72	19.76
	251	848.8	18.53	20.16	19.44	19.52
PCS 1900	512	1850.2	18.22	**20.07**	19.63	19.53
	661	1880.0	18.09	19.89	19.42	19.31
	810	1909.8	17.84	19.73	19.21	19.15

Note:
1. Rohde & Schwarz Radio Communication Tester (CMU200) was used for the measurement of GSM peak and average output power for active timeslots.
2. For GSM voice, 1 timeslot has been activated with power level 5 (850 MHz band) and 0 (1900 MHz band).
3. For GPRS, 1, 2, 3 and 4 timeslots has been activated separately with power level 3(850 MHz band) and 3(1900 MHz band).
4. For E-GRPS, 1, 2, 3 and 4 timeslots has been activated separately with power control level 6(850 MHz band) and 5(1900 MHz band).

WCDMA-Release 99:

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification. The EUT has a nominal maximum output power of 24dBm (+1.7/-3.7).

WCDMA General Settings	**Loopback Mode**	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc /βd	8/15

WCDMA HSDPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subset	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/ βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR(dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	D_{CQI}	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs= βhs/βc	30/15			

WCDMA HSUPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

	Mode	HSUPA	HSUPA	HSUPA	HSUPA	HSUPA
	Subset	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/ βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	CM(dB)	1.0	3.0	2.0	3.0	1.0
	MPR(dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback	4ms				
	CQI Repetition Factor	2				
	Ahs= βhs/βc	30/15				
HSUPA Specific Settings	DE-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_FCls	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27	

HSPA+

The following tests were conducted according to the test requirements in Table C.11.1.4 of 3GPP TS 34.121-1

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

DC-HSDPA

The following tests were conducted according to the test requirements in Table Table C.8.1.12 of 3GPP TS 34.121-1

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

Results (12.2kbps RMC)

WCDMA 850

	Test Mode	3GPP Sub Test	Averaged Mean Power (dBm)		
			Low Frequency	Mid Frequency	High Frequency
Test Condition	RMC12.2k		22.68	**22.76**	22.61
	Rel 6 HSDPA	1	21.69	21.73	21.62
		2	21.58	21.69	21.51
		3	21.58	21.64	21.56
		4	21.61	21.68	21.50
	Rel 6 HSUPA	1	21.52	21.55	21.43
		2	21.40	21.45	21.34
		3	21.41	21.48	21.31
		4	21.49	21.45	21.38
		5	21.48	21.48	21.35
	DC-HSDPA	1	21.05	21.06	20.95
		2	21.01	20.98	20.90
		3	20.95	20.94	20.88
		4	20.95	20.98	20.85
	HSPA+	1	20.91	20.93	20.82

WCDMA 1900

	Test Mode	3GPP Sub Test	Averaged Mean Power (dBm)		
			Low Frequency	Mid Frequency	High Frequency
Test Condition	RMC12.2k		21.65	**22.17**	20.89
	Rel 6 HSDPA	1	21.13	21.15	21.02
		2	21.02	21.05	20.91
		3	21.07	21.09	20.97
		4	21.07	21.12	20.93
	Rel 6 HSUPA	1	20.95	20.99	20.88
		2	20.87	20.90	20.81
		3	20.87	20.96	20.81
		4	20.84	20.92	20.77
		5	20.83	20.93	20.78
	DC-HSDPA	1	20.82	20.85	20.78
		2	20.73	20.76	20.68
		3	20.75	20.78	20.72
		4	20.71	20.74	20.68
	HSPA+	1	20.69	20.72	20.63

Note:

1. The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2 kbps RMC (reference measurement Channel) Configured in Test Loop Model 1.

2. KDB 941225 D01-Body SAR is not required for HSDPA/HSUPA/HSPA+/DC-HSDPA when the maximum average output of each RF channel is less than ¼ dB higher than measured 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.

Bluetooth

Mode	Channel No.	Channel frequency (MHz)	Conducted Output Power	
			(dBm)	(dBm)
BDR(GFSK)	0	2402	**2.36**	1.722
	39	2441	2.30	1.698
	78	2480	2.24	1.675
EDR(4-DQPSK)	0	2402	1.98	1.578
	39	2441	1.91	1.552
	78	2480	1.97	1.574
EDR(8-DPSK)	0	2402	2.36	1.722
	39	2441	2.24	1.675
	78	2480	2.29	1.694
Bluetooth LE	0	2402	-5.37	0.290
	19	2440	-5.38	0.290
	39	2480	-5.50	0.282

Wi-Fi

Band	Channel No.	Channel frequency (MHz)	Conducted Output Power	
			(dBm)	(mw)
802.11b	1	2412	9.38	8.670
	7	2442	9.14	8.204
	13	2472	**9.41**	8.730
802.11g	1	2412	8.38	6.887
	7	2442	8.33	6.808
	13	2472	8.64	7.311
802.11n HT20	1	2412	8.41	6.934
	7	2442	8.23	6.653
	13	2472	8.29	6.745
802.11n HT40	1	2422	8.26	6.699
	5	2442	8.23	6.653
	9	2462	8.28	6.730

Note:

1. The output power was tested under data rate 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n HT20, 13.5Mbps for 802.11n HT40.

SAR MEASUREMENT RESULTS

This page summarizes the results of the performed dosimetric evaluation.

SAR Test Data

Environmental Conditions

Temperature:	21-24 ℃
Relative Humidity:	50-53 %
ATM Pressure:	1001-1002 mbar

Testing was performed by Terry XiaHou on 2015-09-29

The DUT is capable of functioning as a Wi-Fi to Cellular Mobile hotspot. Additional SAR testing was performed according to KDB 941225 D06. Testing was performed with a separation of 1cm between the DUT and the flat phantom. The DUT was positioned for SAR tests with the front and back surfaces facing the phantom, and also with the edges facing the phantom in which the transmitting antenna is <2.5 cm from the edge. Each transmit band was utilized for SAR testing. The tested mode has been selected within each band that exhibits the highest time average output power.

GSM 850

EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Faceup (10mm)	824.2	GSM	-2.569	28.74	28.80	1.014	0.677	0.686	/
	836.6	GSM	0.977	28.72	28.80	1.019	0.791	**0.806**	**1#**
	848.8	GSM	0.811	28.68	28.80	1.028	0.726	0.746	/
Body-Back (5mm)	824.2	GPRS	2.715	28.74	28.80	1.014	0.965	0.978	/
	836.6	GPRS	-1.922	28.72	28.80	1.019	1.327	**1.352**	**2#**
	848.8	GPRS	-3.408	28.68	28.80	1.028	1.173	1.206	/
Body-Left (5mm)	824.2	GPRS	/	/	/	/	/	/	/
	836.6	GPRS	2.278	28.72	28.80	1.019	0.627	0.639	/
	848.8	GPRS	/	/	/	/	/	/	/
Body-Right (5mm)	824.2	GPRS	/	/	/	/	/	/	/
	836.6	GPRS	-0.699	28.72	28.80	1.019	0.769	0.783	/
	848.8	GPRS	/	/	/	/	/	/	/
Body-Bottom (5mm)	824.2	GPRS	/	/	/	/	/	/	/
	836.6	GPRS	-2.845	28.72	28.80	1.019	0.379	0.386	/
	848.8	GPRS	/	/	/	/	/	/	/

Note:
1 .When the 1-g SAR is ≤ 0.8W/Kg, testing for other channels are optional.
2. The EUT is a Capability Class B mobile phone which can be attached to both GPRS and GSM services.
3.The Multi-slot Classes of EUT is Class 12 which has maximum 4 Downlink slots and 4 Uplink slots, the maximum active slots is 5, when perform the multiple slots scan, 1DL+4UL is the worst case.

4. The EUT transmit and receive through the same GSM antenna while testing SAR.
5. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.

PCS 1900

EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Faceup (10mm)	1850.2	GSM	/	/	/	/	/	/	/
	1880.0	GSM	-1.527	25.99	26.10	1.026	0.429	**0.440**	**3#**
	1909.8	GSM	/	/	/	/	/	/	/
Body-Back (5mm)	1850.2	GPRS	0.826	26.02	26.10	1.019	0.892	**0.909**	**4#**
	1880.0	GPRS	-2.153	25.99	26.10	1.026	0.781	0.801	/
	1909.8	GPRS	3.110	25.96	26.10	1.033	0.836	0.863	/
Body-Left (5mm)	1850.2	GPRS	/	/	/	/	/	/	/
	1880.0	GPRS	1.124	25.99	26.10	1.026	0.225	0.231	/
	1909.8	GPRS	/	/	/	/	/	/	/
Body-Right (5mm)	1850.2	GPRS	/	/	/	/	/	/	/
	1880.0	GPRS	-0.954	25.99	26.10	1.026	0.316	0.324	/
	1909.8	GPRS	/	/	/	/	/	/	/
Body-Bottom (5mm)	1850.2	GPRS	/	/	/	/	/	/	/
	1880.0	GPRS	-1.181	25.99	26.10	1.026	0.673	0.690	/
	1909.8	GPRS	/	/	/	/	/	/	/

Note:
1 .When the 1-g SAR is ≤ 0.8W/Kg, testing for other channels are optional.
2. The EUT is a Capability Class B mobile phone which can be attached to both GPRS and GSM services.
3. The Multi-slot Classes of EUT is Class12 which has maximum 4 Downlink slots and 4 Uplink slots, the maximum active slots is 5, when perform the multiple slots scan, 1DL+4UL is the worst case.
4. The EUT transmit and receive through the same GSM antenna while testing SAR.
5. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.

WCDMA850

EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Faceup (10mm)	826.4	RMC							
	836.6	RMC	-1.506	22.76	22.80	1.009	0.753	**0.760**	**5#**
	846.6	RMC							
Body-Back (5mm)	826.4	RMC	-1.767	22.68	22.80	1.028	1.133	**1.165**	**6#**
	836.6	RMC	2.612	22.76	22.80	1.009	1.060	1.070	/
	846.6	RMC	-2.642	22.61	22.80	1.045	0.957	1.000	/
Body-Left (5mm)	826.4	RMC	/	/	/	/	/	/	/
	836.6	RMC	1.965	22.76	22.80	1.009	0.622	0.628	/
	846.6	RMC	/	/	/	/	/	/	/
Body-Right (5mm)	826.4	RMC	/	/	/	/	/	/	/
	836.6	RMC	2.521	22.76	22.80	1.009	0.668	0.674	/
	846.6	RMC	/	/	/	/	/	/	/
Body-Bottom (5mm)	826.4	RMC	/	/	/	/	/	/	/
	836.6	RMC	-2.980	22.76	22.80	1.009	0.336	0.339	/
	846.6	RMC	/	/	/	/	/	/	/

WCDMA1900

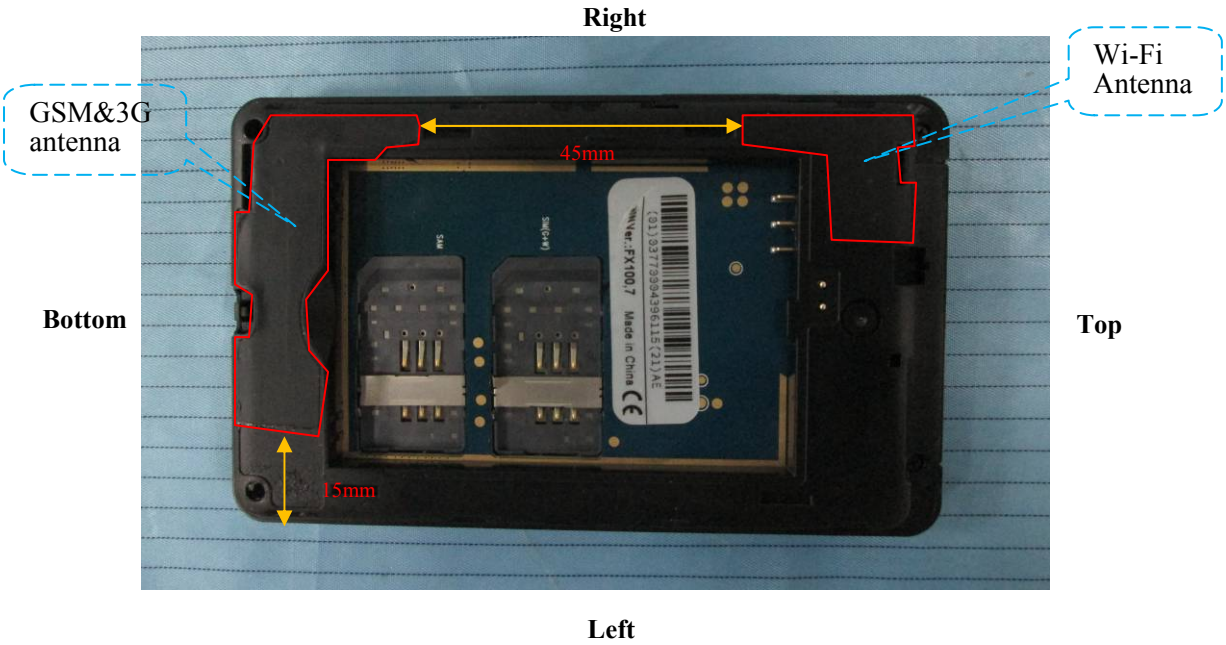
EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Faceup (10mm)	1852.4	RMC							
	1880.0	RMC	1.293	22.17	22.20	1.007	0.417	**0.420**	**7#**
	1907.6	RMC							
Body-Back (5mm)	1852.4	RMC	2.723	21.65	22.20	1.135	0.832	0.944	/
	1880.0	RMC	1.047	22.17	22.20	1.007	0.955	**0.962**	**8#**
	1907.6	RMC	-2.521	20.89	21.00	1.026	0.710	0.728	/
Body-Left (5mm)	1852.4	RMC	/	/	/	/	/	/	/
	1880.0	RMC	2.254	22.17	22.20	1.007	0.350	0.352	/
	1907.6	RMC	/	/	/	/	/	/	/
Body-Right (5mm)	1852.4	RMC	/	/	/	/	/	/	/
	1880.0	RMC	1.941	22.17	22.20	1.007	0.382	0.385	/
	1907.6	RMC	/	/	/	/	/	/	/
Body-Bottom (5mm)	1852.4	RMC	/	/	/	/	/	/	/
	1880.0	RMC	-0.735	22.17	22.20	1.007	0.762	0.767	/
	1907.6	RMC	/	/	/	/	/	/	/

Note:

1. When the 1-g SAR is ≤ 0.8W/Kg, testing for other channels are optional.
2. The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2 kbps RMC (reference measurement Channel) Configured in Test Loop Model.
3. KDB 941225 D01-Body SAR is not required for HSDPA/HSUPA/HSPA+/DC-HSDPA when the maximum average output of each RF channel is less than ¼ dB higher than measured 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.
4. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.

SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

Bluetooth & Wi-Fi and GSM&3G Antennas Location:



Simultaneous Transmission:

Description of Simultaneous Transmit Capabilities			Antennas Distance (mm)
Transmitter Combination	Simultaneous?	Hotspot?	
GSM + WCDMA	×	×	0
GSM + Bluetooth	√	×	45
GSM + WLAN	√	√	45
WCDMA + Bluetooth	√	×	45
WCDMA + WLAN	√	√	45

Standalone SAR test exclusion considerations

Mode	Frequency (GHz)	Test Position	P_{avg} (dBm)	P_{avg} (mW)	Distance (mm)	Calculated value	Threshold (1-g)	SAR Test Exclusion
Bluetooth	2.48	Faceup	2.40	1.74	10	0.3	3.0	Yes
Bluetooth	2.48	Body	2.40	1.74	5	0.5	3.0	Yes
Wi-Fi	2.472	Faceup	9.50	8.91	10	1.4	3.0	Yes
Wi-Fi	2.472	Body	9.50	8.91	5	2.8	3.0	Yes

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

Standalone SAR estimation:

Mode	Frequency (GHz)	Distance (mm)	P_{avg} (dBm)	P_{avg} (mW)	Estimated $_{1-g}$ (W/kg)
Bluetooth Faceup	2.48	10	2.40	1.74	0.036
Bluetooth Body	2.48	5	2.40	1.74	0.073
Wi-Fi Faceup	2.472	10	9.50	8.91	0.186
Wi-Fi Body	2.472	5	9.50	8.91	0.372

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

[(*max. power of channel, including* ***tune-up tolerance****, mW*)/(*min. test separation distance,mm*)]·[√f(GHz)/*x*] W/kg for *test separation distances* ≤ 50 mm;

where *x* = 7.5 for 1-g SAR.

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

Simultaneous SAR test exclusion considerations:

Mode (SAR1+SAR2)	Position	Reported SAR (W/kg)		ΣSAR
		SAR1	SAR2	< 1.6W/kg
GSM 850 + BT	Faceup	0.806	0.036	0.842
	Body-Back	1.352	0.073	1.425
	Body-Left	0.639	0.073	0.712
	Body-Right	0.783	0.073	0.856
	Body-Bottom	0.386	0.073	0.459
GSM 850 + Wi-Fi	Faceup	0.806	0.186	**0.992**
PCS 1900 + BT	Faceup	0.440	0.036	0.476
	Body-Back	0.909	0.073	0.982
	Body-Left	0.231	0.073	0.304
	Body-Right	0.324	0.073	0.397
	Body-Bottom	0.690	0.073	0.763
PCS 1900 + Wi-Fi	Faceup	0.440	0.186	0.626
WCDMA 850 + BT	Faceup	0.760	0.036	0.796
	Body-Back	1.165	0.073	1.238
	Body-Left	0.628	0.073	0.701
	Body-Right	0.674	0.073	0.747
	Body-Bottom	0.339	0.073	0.412
WCDMA 850 + Wi-Fi	Faceup	0.760	0.186	0.946
WCDMA 1900 + BT	Faceup	0.420	0.036	0.456
	Body-Back	0.962	0.073	1.035
	Body-Left	0.352	0.073	0.425
	Body-Right	0.385	0.073	0.458
	Body-Bottom	0.767	0.073	0.840
WCDMA 1900 + Wi-Fi	Faceup	0.420	0.186	0.606

Conclusion:

ΣSAR < 1.6 W/kg therefore simultaneous transmission SAR with Volume Scans is **not** required.

Hotspot:

Evaluations for Simultaneous SAR, Mobile Hot Spot Positions					
Test Position	Body-Back (5mm)	Body-Left (5mm)	Body-Right (5mm)	Body-Bottom (5mm)	Body-Top (5mm)
Mode	Stand Alone 1-g SAR (W/Kg)				
GPRS 850	1.352	0.639	0.783	0.386	/
GPRS 1900	0.909	0.231	0.324	0.690	/
WCDMA850	1.165	0.628	0.674	0.339	/
WCDMA 1900	0.962	0.352	0.385	0.767	/
Wi-Fi	0.372	0.372	0.372	0.372	0.372
	∑ 1-g SAR(W/Kg)				
GPRS850 + Wi-Fi	**1.724**(Note 1)	1.011	1.155	0.758	/
GPRS1900 + Wi-Fi	1.281	0.603	0.696	1.062	/
WCDMA850 + Wi-Fi	1.537	1.000	1.046	0.711	/
WCDMA 1900 + Wi-Fi	1.334	0.724	0.757	1.139	/

Note 1:
When the sum is greater than the SAR limit, the SAR to peak location separation ratio(SPLSR) was applied to determine if simultaneous transmission SAR test exclusion applies.

SPLSR:

Distance(Ri) = $[(x_1-x_2)^2+(y_1-y_2)^2+(z_1-z_2)^2]^{0.5}$=79.6mm

SPLSR= $(SAR1 + SAR2)^{1.5}/Ri=(1.352+0.372)^{1.5}/79.6 = 0.0284 < 0.04$

Conclusion:

Sum of SAR: **Σ SAR < 1.6 W/kg** or SAR to peak location separation ratio:**$(SAR1 + SAR2)^{1.5}/Ri < 0.04$,** therefore simultaneous transmission SAR with Volume Scans is **not required**.

SAR Plots (Summary of the Highest SAR Values)

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

GSM 850;Faceup (836.6 MHz Middle Channel)

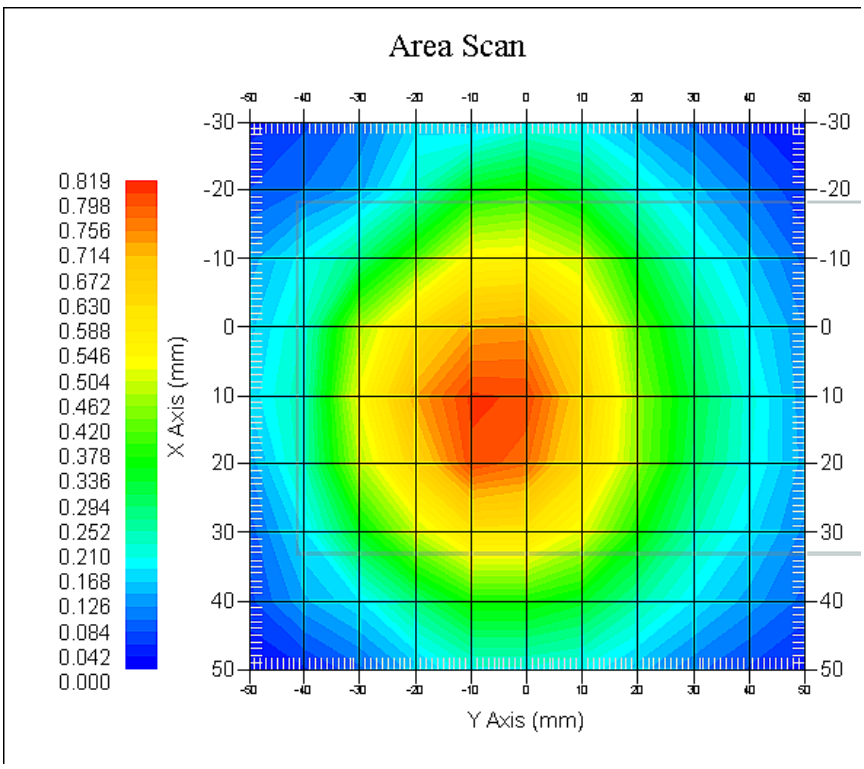
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type : Complete
Area Scan : 11x8x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.720 W/kg
Power Drift-Finish : 0.727 W/kg
Power Drift (%) : 0.977

Tissue Data
Type : Head
Frequency : 836.6 MHz
Epsilon : 41.06 F/m
Sigma : 0.92 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 500-00283
Frequency Band : 835
Duty Cycle Factor : 8
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 µV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.791 W/kg
10 gram SAR value : 0.587 W/kg
Area Scan Peak SAR : 0.806 W/kg
Zoom Scan Peak SAR : 1.316 W/kg

Plot 1#



Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

GSM 850; Body-worn- Back (836.6 MHz Middle Channel)

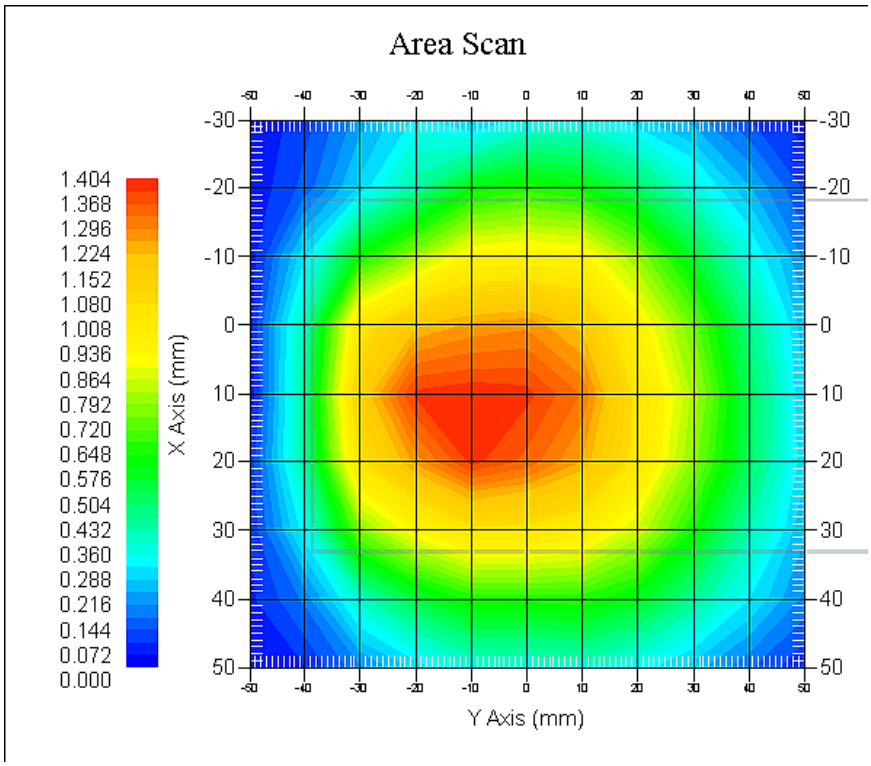
Measurement Data
Test mode : GPRS
Crest Factor : 2
Scan Type： : Complete
Area Scan : 8x11x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 1.285 W/kg
Power Drift-Finish : 1.261W/kg
Power Drift (%) : -1.922

Tissue Data
Type : Body
Frequency : 836.6 MHz
Epsilon : 53.79 F/m
Sigma : 0.96 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 500-00283
Frequency Band : 835
Duty Cycle Factor : 2
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 µV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 1.327 W/kg
10 gram SAR value : 0.987 W/kg
Area Scan Peak SAR : 1.386 W/kg
Zoom Scan Peak SAR : 2.257 W/kg

Plot 2#



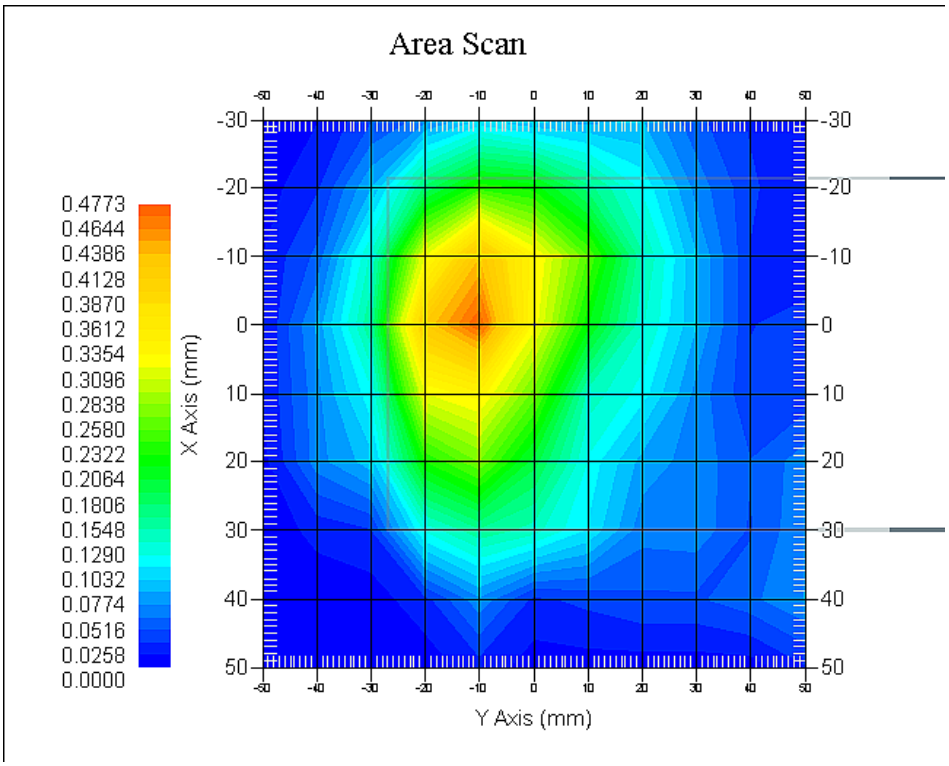
Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

PCS 1900;Faceup(1880MHz Middle Channel)

Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type : Complete
Area Scan : 11x8x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.335 W/kg
Power Drift-Finish : 0.330 W/kg
Power Drift (%) : -1.527

Tissue Data
Type : Head
Frequency : 1880 MHz
Epsilon : 39.55 F/m
Sigma : 1.39 S/m
Density : 1000.00 kg/cu. M

Probe Data
Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 8
Conversion Factor : 4.8
Probe Sensitivity : 1.20 1.20 1.20 µV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.429 W/kg
10 gram SAR value : 0.264 W/kg
Area Scan Peak SAR : 0.475 W/kg
Zoom Scan Peak SAR : 0.733 W/kg

Plot 3#