

SAR EVALUATION REPORT

For

ITALCOM GROUP

1728 Coral Way, Coral Gables, Miami, Florida, 518048, United States

FCC ID: YPVITALCOMFLYII

Report Type: Original Report	Product Type: Mobile Phone
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Report Number: RSZ140304014-20	
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Attestation of Test Results		
EUT Information	Company Name	ITALCOM GROUP
	EUT Description	Mobile Phone
	FCC ID	YPVITALCOMFLYII
	Model Number	FLY II
	Test Date	2014-03-25 to 2014-03-26
Frequency	Max. SAR Level(s) Reported	Limit(W/Kg)
GSM 850	0.552 W/kg 1g Head SAR 0.975 W/kg 1g Body SAR	1.6
PCS 1900	0.310 W/kg 1g Head SAR 0.820 W/kg 1g Body SAR	
WCDMA850	0.361 W/kg 1g Head SAR 0.365 W/kg 1g Body SAR	
WCDMA1900	0.361 W/kg 1g Head SAR 0.755 W/kg 1g Body SAR	
Simultaneous	0.924 W/kg 1g Head SAR 1.161 W/kg 1g Body SAR	
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.	
	IEEE1528:2003 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 KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies. KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets KDB 865664 D01 SAR Measurement Requirements for 100 MHz to 6 GHz KDB 941225 D01 SAR Measurement Procedures for 3G Devices-CDMA 2000/EV-Do WCDMA/HSDPA/HSUPA KDB 941225 D06 SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities.	
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 1528-2003 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	RSZ140304014-20	Original Report	2014-03-31

EUT DESCRIPTION

This report has been prepared on behalf of ITALCOM GROUP and their product, FCC ID: YPVITALCOMFLYII, Model: FLY II or the EUT (Equipment under Test) as referred to in the rest of this report. The EUT is a Mobile Phone.

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 Data, WCDMA, WiFi and Bluetooth
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) WiFi: 2412MHz-2462MHz Bluetooth : 2402MHz-2480MHz
Conducted RF Power:	GSM 850 : 32.51 dBm PCS 1900: 28.79 dBm WCDMA 850: 22.65 dBm WCDMA 1900: 22.57 dBm WiFi: 9.47 dBm Bluetooth: 4.86 dBm
Dimensions (L*W*H):	143 mm (L) × 72 mm (W) × 8 mm (H)
Power Source:	3.7 V _{DC} 1600 mAh Rechargeable Battery
Normal Operation:	Head and Body-worn

REFERENCE, STANDARDS, AND GUIDELINES

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

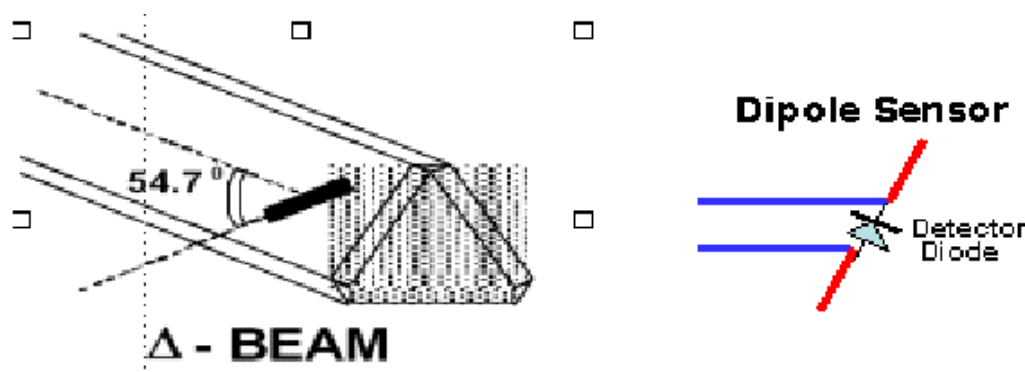
The overall uncertainty for the methodology and algorithms the used during the SAR calculation was evaluated using the data from IEEE 1528 based on the example f3 algorithm:

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

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	$0.70 \mu\text{V}/(\text{V}/\text{m})^2$ to $0.85 \mu\text{V}/(\text{V}/\text{m})^2$
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 5 μV 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.

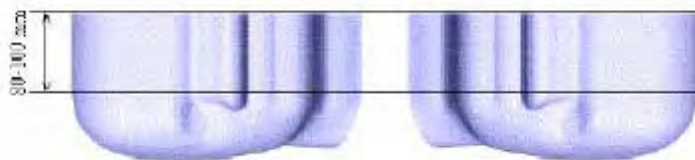


Phantom Types

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	
	ϵ_r	σ (S/m)	ϵ_r	σ (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

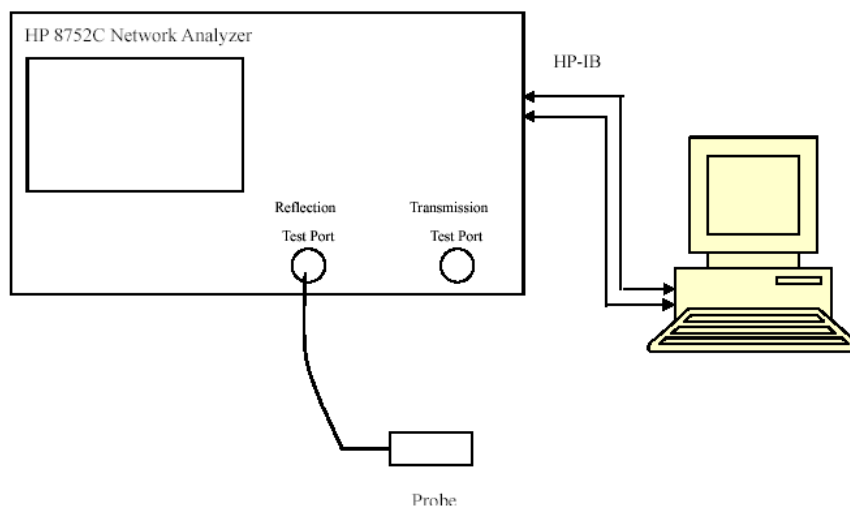
EQUIPMENT LIST AND CALIBRATION

Equipments List & Calibration Information

Equipment	Model	Calibration Date	S/N
CRS F3 robot	ALS-F3	N/A	RAF0805352
CRS F3 Software	ALS-F3-SW	N/A	N/A
CRS C500C controller	ALS-C500	N/A	RCF0805379
Probe mounting device & Boundary Detection Sensor System	ALS-PMDPS-3	N/A	120-00270
Universal Work Station	ALS-UWS	N/A	100-00157
Data Acquisition Package	ALS-DAQ-PAQ-3	2013-10-08	110-00212
Miniature E-Field Probe	ALS-E-020	2013-10-08	500-00283
Dipole, 835MHz	ALS-D-835-S-2	2011-08-25	180-00558
Dipole, 1900MHz	ALS-D-1900-S-2	2011-08-25	210-00710
Dipole Spacer	ALS-DS-U	N/A	250-00907
Device holder/Positioner	ALS-H-E-SET-2	N/A	170-00510
Left ear SAM phantom	ALS-P-SAM-L	N/A	130-00311
Right ear SAM phantom	ALS-P-SAM-R	N/A	140-00359
UniPhantom	ALS-P-UP-1	N/A	150-00413
Simulated Tissue 835 MHz Head	ALS-TS-835-H	Each Time	270-01002
Simulated Tissue 835 MHz Body	ALS-TS-835-B	Each Time	270-02101
Simulated Tissue 1900 MHz Head	ALS-TS-1900-H	Each Time	295-01103
Simulated Tissue 1900 MHz Body	ALS-TS-1900-B	Each Time	295-02102
Power Amplifier	5S1G4	N/A	71377
Synthesized Sweeper	HP 8341B	2013-05-09	2624A00116
UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	2013-11-23	106891
EMI Test Receiver	ESCI	2013-11-12	101120

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)	$\Delta\epsilon_r$	$\Delta\sigma$ (S/m)	
824.2	Head	41.39	0.91	41.50	0.90	-0.265	1.111	±5
	Body	55.06	0.95	55.20	0.97	-0.254	-2.062	±5
826.4	Head	41.28	0.91	41.50	0.90	-0.530	1.111	±5
	Body	55.08	0.96	55.20	0.97	-0.217	-1.031	±5
836.6	Head	41.35	0.92	41.50	0.90	-0.361	2.222	±5
	Body	55.13	0.97	55.20	0.97	-0.127	0.000	±5
846.6	Head	41.20	0.92	41.50	0.90	-0.723	2.222	±5
	Body	55.20	0.99	55.20	0.97	0.000	2.062	±5
848.8	Head	41.14	0.92	41.50	0.90	-0.867	2.222	±5
	Body	55.22	0.99	55.20	0.97	0.036	2.062	±5
1850.2	Head	39.99	1.42	40.00	1.40	-0.025	1.429	±5
	Body	52.99	1.50	53.30	1.52	-0.582	-1.316	±5
1852.4	Head	40.00	1.42	40.00	1.40	0.000	1.429	±5
	Body	52.97	1.50	53.30	1.52	-0.619	-1.316	±5
1880.0	Head	40.00	1.40	40.00	1.40	0.000	0.000	±5
	Body	52.78	1.54	53.30	1.52	-0.976	1.316	±5
1907.6	Head	40.00	1.42	40.00	1.40	0.000	1.429	±5
	Body	52.74	1.56	53.30	1.52	-1.051	2.632	±5
1909.8	Head	40.01	1.42	40.00	1.40	0.025	1.429	±5
	Body	52.84	1.55	53.30	1.52	-0.863	1.974	±5

*Liquid Verification was performed on 2014-03-25.

Please refer to the following tables.

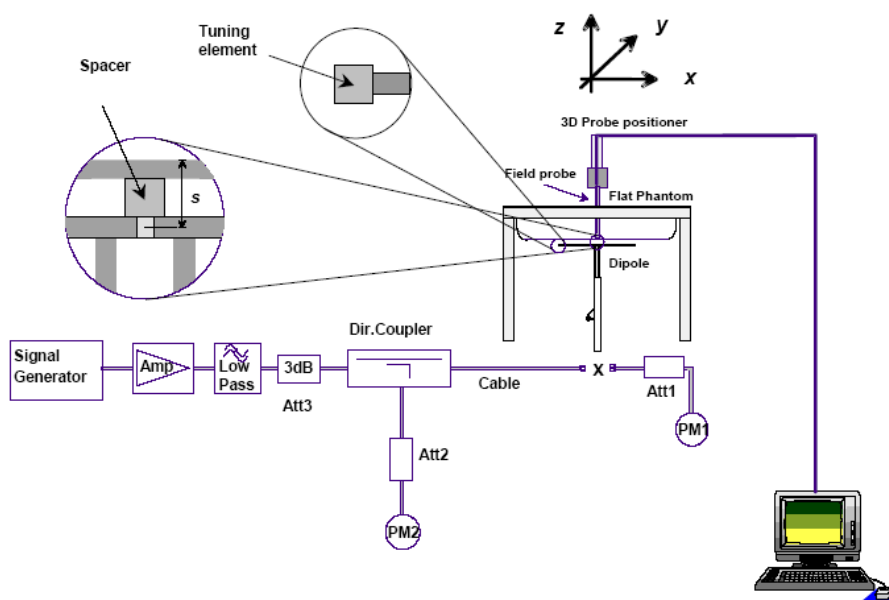
835 MHz Head				835 MHz Body		
Frequency (MHz)	e'	e''		Frequency (MHz)	e'	e''
824.0	41.4051	19.8317		824.0	55.0600	20.7246
824.5	41.3741	19.8322		824.5	55.0632	20.6241
825.0	41.3574	19.8328		825.0	55.0663	20.6366
825.5	41.2523	19.8333		825.5	55.0694	20.6491
826.0	41.2706	19.8339		826.0	55.0726	20.7841
826.5	41.2925	19.8344		826.5	55.0757	20.8479
827.0	41.2690	19.8350		827.0	55.0788	20.7624
827.5	41.3163	19.8355		827.5	55.0820	20.6405
828.0	41.3359	19.8361		828.0	55.0851	20.6751
828.5	41.3423	19.8367		828.5	55.0883	20.6325
829.0	41.3933	19.8372		829.0	55.0914	20.7366
829.5	41.3418	19.8378		829.5	55.0945	20.6795
830.0	41.3781	19.8383		830.0	55.0977	20.5574
830.5	41.3382	19.8389		830.5	55.1008	20.6218
831.0	41.3112	19.8394		831.0	55.1040	20.6069
831.5	41.3307	19.8400		831.5	55.1071	20.8143
832.0	41.2925	19.8405		832.0	55.1102	20.7920
832.5	41.2674	19.8411		832.5	55.1134	20.5687
833.0	41.3079	19.8416		833.0	55.1165	20.5021
833.5	41.3393	19.8422		833.5	55.1196	20.6135
834.0	41.3367	19.8427		834.0	55.1228	20.7654
834.5	41.3353	19.8433		834.5	55.1259	20.6584
835.0	41.3601	19.8439		835.0	55.1291	20.6018
835.5	41.3611	19.8447		835.5	55.1322	20.8495
836.0	41.3647	19.8456		836.0	55.1353	20.8565
836.5	41.3498	19.8464		836.5	55.1385	20.7143
837.0	41.3366	19.8473		837.0	55.1416	20.5413
837.5	41.3308	19.8481		837.5	55.1447	20.5776
838.0	41.3540	19.8490		838.0	55.1479	20.8619
838.5	41.3125	19.8498		838.5	55.1510	20.8771
839.0	41.3024	19.8507		839.0	55.1542	20.7991
839.5	41.3049	19.8516		839.5	55.1573	20.7341
840.0	41.3160	19.5524		840.0	55.1604	20.8012
840.5	41.3053	19.5533		840.5	55.1636	20.8466
841.0	41.2886	19.5541		841.0	55.1667	20.8017
841.5	41.3180	19.5550		841.5	55.1699	20.7384
842.0	41.3197	19.5558		842.0	55.1730	20.9143
842.5	41.3234	19.5567		842.5	55.1761	20.8828
843.0	41.3175	19.5475		843.0	55.1793	20.8432
843.5	41.2412	19.5484		843.5	55.1824	20.7987
844.0	41.3175	19.5492		844.0	55.1855	20.8164
844.5	41.2718	19.5501		844.5	55.1887	20.8423
845.0	41.1978	19.5509		845.0	55.1918	20.7517
845.5	41.2131	19.5518		845.5	55.1950	20.6981
846.0	41.1677	19.5727		846.0	55.1981	20.8711
846.5	41.2086	19.5736		846.5	55.2012	20.9325
847.0	41.1889	19.5744		847.0	55.2044	20.8813
847.5	41.1921	19.5753		847.5	55.2075	20.8016
848.0	41.1657	19.5761		848.0	55.2106	20.8918
848.5	41.1703	19.5770		848.5	55.2138	20.9699
849.0	41.1305	19.5778		849.0	55.2169	20.9701

1900 MHz Head				1900 MHz Body		
Frequency (MHz)	e'	e''		Frequency (MHz)	e'	e''
1850.0	39.9938	13.8220		1850.0	53.0230	14.5890
1851.2	39.9960	13.7920		1851.2	52.9549	14.5464
1852.4	39.9963	13.7593		1852.4	52.9738	14.5475
1853.6	39.9965	13.7827		1853.6	52.9503	14.5238
1854.8	39.9968	13.7766		1854.8	52.8532	14.5432
1856.0	39.9970	13.7007		1856.0	52.9562	14.5797
1857.2	39.9973	13.8406		1857.2	52.9494	14.6056
1858.4	39.9975	13.7368		1858.4	52.9314	14.5269
1859.6	39.9978	13.7907		1859.6	52.9131	14.5212
1860.8	39.9980	13.7920		1860.8	52.8088	14.5740
1862.0	39.9983	13.8086		1862.0	52.8365	14.4012
1863.2	39.9985	13.8310		1863.2	52.7825	14.4140
1864.4	39.9988	13.8660		1864.4	52.8173	14.4311
1865.6	39.9990	13.4606		1865.6	52.8237	14.4021
1866.8	39.9993	13.4494		1866.8	52.8987	14.3927
1868.0	39.9996	13.4679		1868.0	52.9672	14.4088
1869.2	39.9998	13.5287		1869.2	52.9762	14.4312
1870.4	40.0000	13.5214		1870.4	52.8897	14.4826
1871.6	40.0003	13.4953		1871.6	52.8321	14.4834
1872.8	40.0005	13.5254		1872.8	52.8706	14.5123
1874.0	40.0008	13.4680		1874.0	52.7970	14.5207
1875.2	40.0010	13.5021		1875.2	52.8602	14.5839
1876.4	40.0013	13.5001		1876.4	52.7633	14.5067
1877.6	40.0015	13.5646		1877.6	52.8656	14.5867
1878.8	40.0018	13.4602		1878.8	52.8934	14.7186
1880.0	40.0020	13.4054		1880.0	52.7757	14.7375
1881.2	40.0023	13.4541		1881.2	52.7339	14.7346
1882.4	40.0025	13.4767		1882.4	52.8295	14.7059
1883.6	40.0028	13.4455		1883.6	52.7950	14.6620
1884.8	40.0030	13.4461		1884.8	52.8199	14.6847
1886.0	40.0033	13.4454		1886.0	52.8551	14.6169
1887.2	40.0035	13.4406		1887.2	52.8359	14.5931
1888.4	40.0038	13.4356		1888.4	52.9256	14.6274
1889.6	40.0040	13.4309		1889.6	52.8561	14.6320
1890.8	40.0043	13.4260		1890.8	52.9018	14.6888
1892.0	40.0045	13.4212		1892.0	52.8898	14.4850
1893.2	40.0048	13.4163		1893.2	52.8622	14.4459
1894.4	40.0050	13.4115		1894.4	52.8349	14.4950
1895.6	40.0053	13.4066		1895.6	52.8277	14.8288
1896.8	40.0055	13.4018		1896.8	52.8176	14.8269
1898.0	40.0058	13.3969		1898.0	52.8179	14.8075
1899.2	40.0060	13.3921		1899.2	52.8949	14.8079
1900.4	40.0063	13.3872		1900.4	52.8599	14.7066
1901.6	40.0065	13.3824		1901.6	52.8633	14.7959
1902.8	40.0068	13.3775		1902.8	52.8324	14.7559
1904.0	40.0070	13.3727		1904.0	52.9141	14.7247
1905.2	40.0073	13.3678		1905.2	52.8259	14.6933
1906.4	40.0075	13.3630		1906.4	52.8158	14.6182
1907.6	40.0078	13.3582		1907.6	52.7415	14.7350
1908.8	40.0080	13.3533		1908.8	52.8258	14.6704
1910.0	40.0083	13.3485		1910.0	52.8523	14.6340

System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$. 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	2013-10-08	2014-10-07
APREL	Dipole antenna(850MHz)	ALS-D-835-S-2	180-00558	2011-08-25	2014-08-24
APREL	Dipole antenna(1900MHz)	ALS-D-1900-S-2	210-00710	2011-08-25	2014-08-24

System Accuracy Check Results

Date	Frequency Band	Liquid Type	Measured SAR (W/Kg)		Target Value (W/Kg)	Delta (%)	Tolerance (%)
2014-3-25	835	Head	1g	9.725	9.59	1.408	± 10
		Body	1g	9.529	9.684	-1.601	± 10
	1900	Head	1g	39.901	39.648	0.638	± 10
		Body	1g	39.489	39.769	-0.704	± 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 : 9.859 W/kg
Power Drift-Finish : 9.804 W/kg
Power Drift (%) : -0.576

Phantom Data

Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
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 : 25-Mar-2014
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 41.36 F/m
Sigma : 0.92 S/m
Density : 1000.00 kg/cu. m

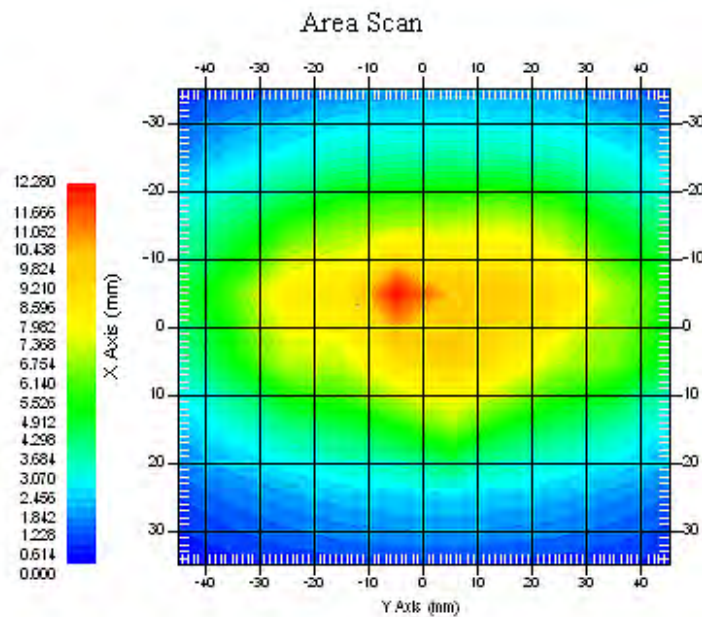
Probe Data

Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 500-00283
Last Calib. Date : 08-Oct-2013
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
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 : 9.725 W/kg
10 gram SAR value : 6.617 W/kg
Area Scan Peak SAR : 12.277 W/kg
Zoom Scan Peak SAR : 15.128 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 : 10.021 W/kg
Power Drift-Finish : 10.125 W/kg
Power Drift (%) : 1.017

Phantom Data

Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
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 : 25-Mar-2014
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 55.13 F/m
Sigma : 0.97 S/m
Density : 1000.00 kg/cu. m

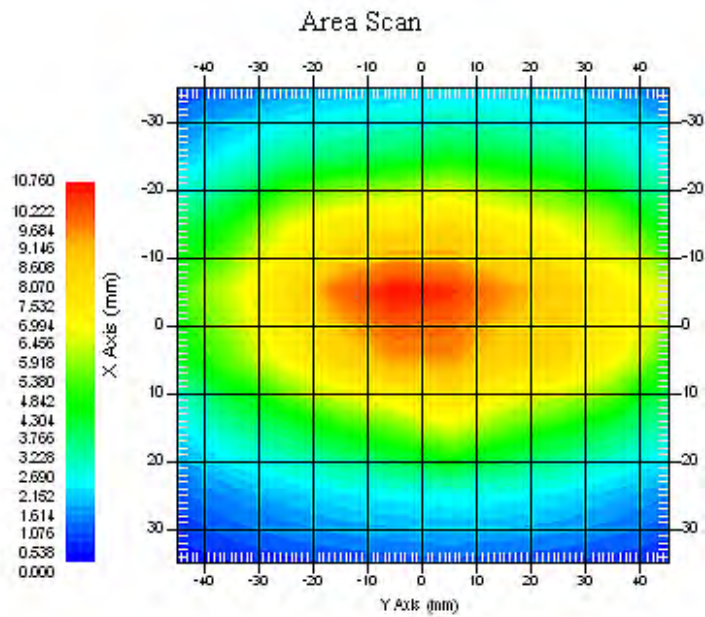
Probe Data

Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 500-00283
Last Calib. Date : 08-Oct-2013
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
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 : 9.529 W/kg
10 gram SAR value : 6.317 W/kg
Area Scan Peak SAR : 10.755 W/kg
Zoom Scan Peak SAR : 15.924 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 : 40.528 W/kg
Power Drift-Finish : 40.001 W/kg
Power Drift (%) : -1.257

Phantom Data

Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
Serial No. : System Default
Location : Center
Description : Default

Tissue Data

Type : Head
Serial No. : 295-01103
Frequency : 1900.00 MHz
Last Calib. Date : 25-Mar-2014
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 40.01 F/m
Sigma : 1.41 S/m
Density : 1000.00 kg/cu. M

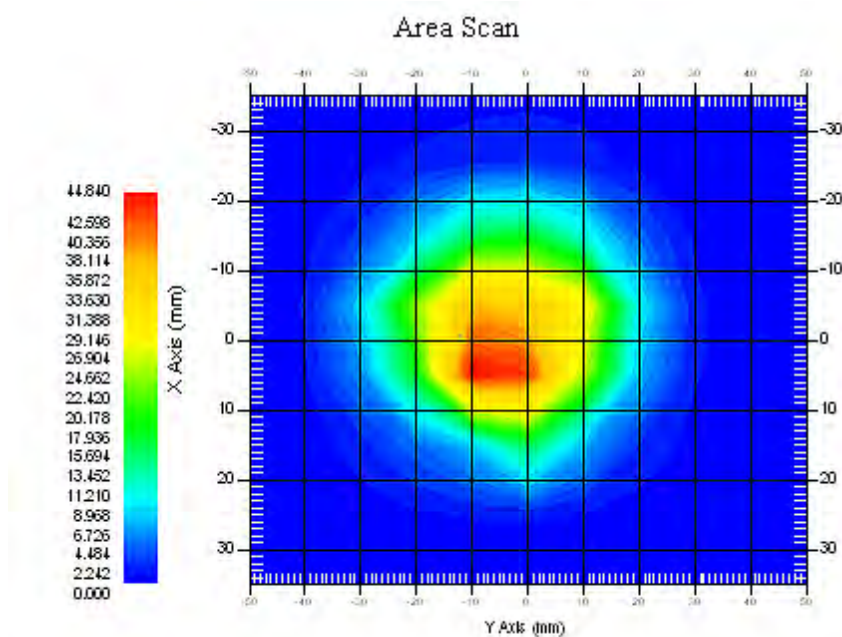
Probe Data

Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 500-00283
Last Calib. Date : 08-Oct-2013
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.8
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
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 : 39.901 W/kg
10 gram SAR value : 20.418 W/kg
Area Scan Peak SAR : 44.837 W/kg
Zoom Scan Peak SAR : 89.025 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 : 39.685 W/kg
Power Drift-Finish : 39.102 W/kg
Power Drift (%) : -1.387

Phantom Data

Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
Serial No. : System Default
Location : Center
Description : Default

Tissue Data

Type : Body
Serial No. : 295-02102
Frequency : 1900.00 MHz
Last Calib. Date : 25-Mar-2014
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 52.86 F/m
Sigma : 1.55 S/m
Density : 1000.00 kg/cu. m

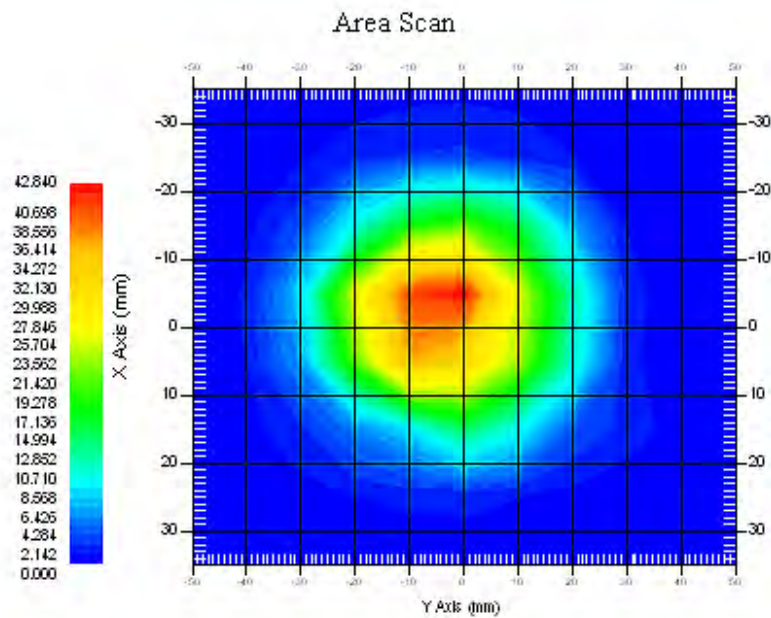
Probe Data

Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 500-00283
Last Calib. Date : 08-Oct-2013
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
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 : 39.489 W/kg
10 gram SAR value : 20.577 W/kg
Area Scan Peak SAR : 42.836 W/kg
Zoom Scan Peak SAR : 81.065 W/kg



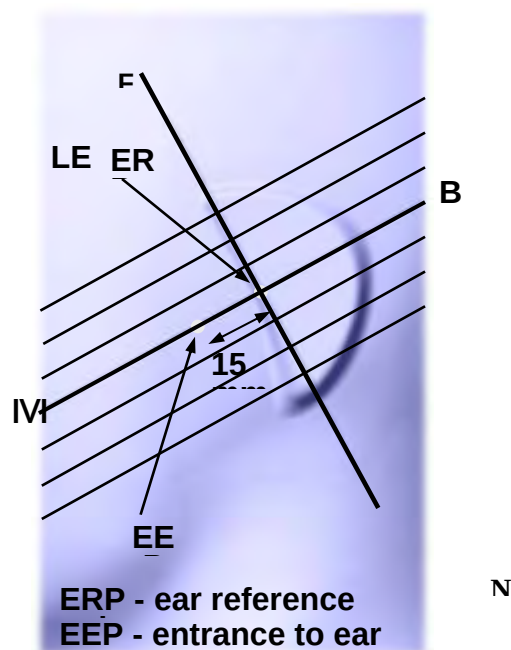
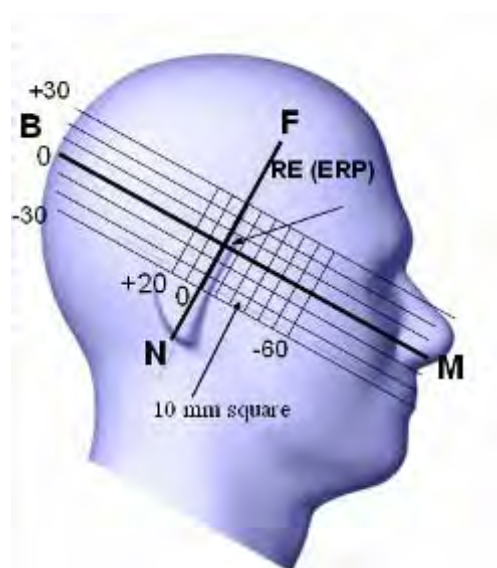
1900 MHz System Validation with Body Tissue

EUT TEST STRATEGY AND METHODOLOGY

Test Positions for Device Operating Next to a Person's Ear

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned in a normal operating position with the “test device reference point” located along the “vertical centerline” on the front of the device aligned to the “ear reference point”. The “test device reference point” should be located at the same level as the center of the earpiece region. The “vertical centerline” should bisect the front surface of the handset at its top and bottom edges. A “ear reference point” is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the “phantom reference plane” defined by the three lines joining the center of each “ear reference point” (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the “N-F” line defined along the base of the ear spacer that contains the “ear reference point”. For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The “test device reference point” is aligned to the “ear reference point” on the head phantom and the “vertical centerline” is aligned to the “phantom reference plane”. This is called the “initial ear position”. While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:



Cheek/Touch Position

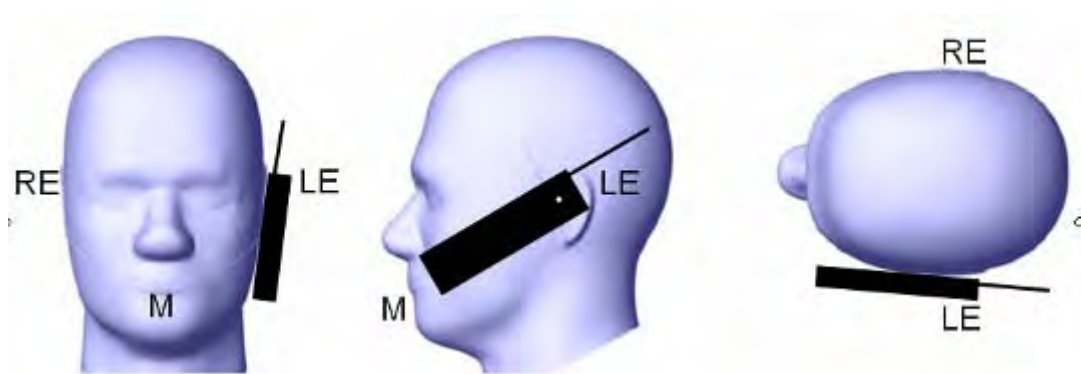
The device is brought toward the mouth of the head phantom by pivoting against the “ear reference point” or along the “N-F” line for the SCC-34/SC-2 head phantom.

This test position is established:

- o When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
- o (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

Cheek /Touch Position



Ear/Tilt Position

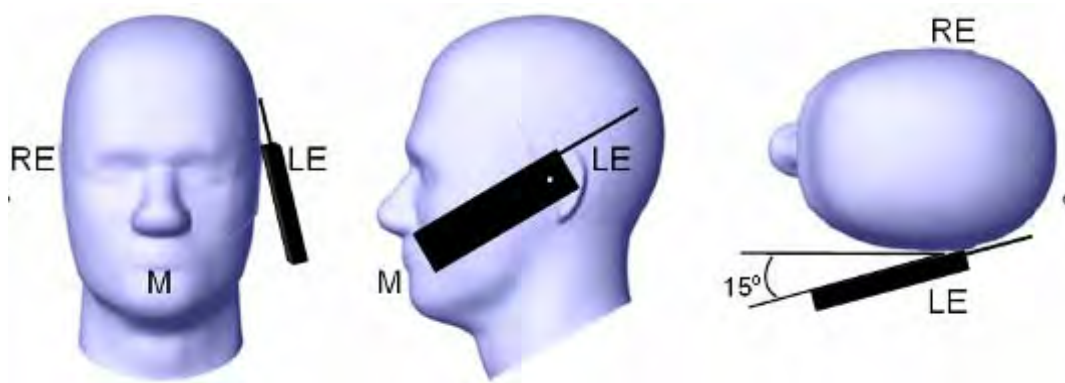
With the handset aligned in the “Cheek/Touch Position”:

1) If the earpiece of the handset is not in full contact with the phantom’s ear spacer (in the “Cheek/Touch position”) and the peak SAR location for the “Cheek/Touch” position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the “initial ear position” by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.

2) (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both “ear reference points” (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the “test device reference point” until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point is by 15 80°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both “ear reference points” until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the “Cheek/Touch” and “Ear/Tilt” positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s). If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

Ear /Tilt 15° Position



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.

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.

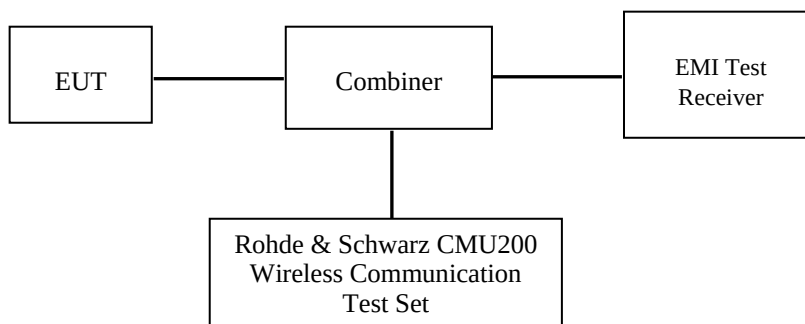
CONDUCTED OUTPUT POWER MEASUREMENT

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
GSM 850	33.00	33.00	33.00
GPRS 1 slot	33.00	33.00	33.00
GPRS 2 slot	32.00	32.00	32.00
GPRS 3 slot	30.00	30.00	30.00
GPRS 4 slot	29.50	29.50	29.50
PCS 1900	29.00	29.00	29.00
GPRS 1 slot	29.00	29.00	29.00
GPRS 2 slot	28.50	28.50	28.50
GPRS 3 slot	28.00	28.00	28.00
GPRS 4 slot	27.00	27.00	27.00
WCDMA850	23.00	23.00	23.00
WCDMA1900	23.00	23.00	23.00
WiFi	9.50	9.50	9.50
Bluetooth	5.00	5.00	5.00

Test Results:**GSM**

Band	Frequency (MHz)	Conducted Peak Output Power	
		Meas. Power (dBm)	Meas. Power (W)
GSM 850	824.2	32.19	1.656
	836.6	32.35	1.718
	848.8	32.51	1.782
PCS 1900	1850.2	28.79	0.757
	1880.0	28.52	0.711
	1909.8	28.40	0.692

GPRS

Band	Channel No.	Frequency (MHz)	RF Peak Output Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
GSM 850	128	824.2	32.40	31.27	29.52	29.03
	190	836.6	32.53	31.48	29.73	29.24
	251	848.8	32.67	31.66	29.87	29.43
PCS 1900	512	1850.2	28.87	28.23	26.50	26.00
	661	1880.0	28.62	28.01	26.48	25.93
	810	1909.8	28.53	28.08	27.46	26.96

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	23.40	25.27	25.27	26.03
	190	836.6	23.53	25.48	25.48	26.24
	251	848.8	23.67	25.66	25.62	26.43
PCS 1900	512	1850.2	19.87	22.23	22.25	23.00
	661	1880.0	19.62	22.01	22.23	22.93
	810	1909.8	19.53	22.08	23.21	23.96

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 timeslots has been activated separately with power level 5(850 MHz band) and 0(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
	β_c / β_d	8/15

Results (12.2kbps RMC)

Band	Frequency (MHz)	Channel NO.	Conducted Output Power	
			(dBm)	(Watt)
WCDMA 850	826.4	4132	22.15	0.164
	836.6	4183	22.57	0.181
	846.6	4233	22.65	0.184
WCDMA 1900	1852.4	9262	22.57	0.181
	1880.0	9400	22.48	0.177
	1907.6	9538	22.38	0.173

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			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c / β_d	2/15	12/15	15/8	15/4
	β_{hs}	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			
	$A_{hs} = \beta_{hs} / \beta_c$	30/15			

Results (HSDPA)

Band	Frequency (MHz)	Channel NO.	Conducted Output Power (dBm)			
			Subset 1	Subset 2	Subset 3	Subset 4
WCDMA 850	826.4	4132	21.25	21.19	21.19	21.23
	836.6	4183	21.35	21.42	21.35	21.41
	846.6	4233	21.42	21.35	21.29	21.39
WCDMA 1900	1852.4	9262	21.35	21.26	21.39	21.47
	1880.0	9400	21.26	21.24	21.18	21.32
	1907.6	9538	21.21	21.18	21.14	21.26

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				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	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				
	A _{hs} = β_{hs}/β_c	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_FCI _s	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	

Results (HSUPA)

Band	Frequency (MHz)	Channel NO.	Conducted Output Power (dBm)				
			Subset 1	Subset 2	Subset 3	Subset 4	Subset 5
WCDMA 850	826.4	4132	21.08	21.13	21.24	21.16	21.26
	836.6	4183	21.52	21.49	21.32	21.47	21.48
	846.6	4233	21.21	21.26	21.32	21.29	21.42
WCDMA 1900	1852.4	9262	21.25	21.26	21.18	21.05	21.14
	1880.0	9400	21.15	21.08	21.06	21.17	21.13
	1907.6	9538	21.12	21.08	21.14	21.09	21.06

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 when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than measured without HSDPA using 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.
3. KDB 941225 D01-Body SAR is not required for HSUPA when the maximum average output of each RF channel with HSUPA active is less than ¼ dB higher than measured without HSUPA using 12.2kbps RMC and the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.

Bluetooth

Mode	Channel frequency (MHz)	Reading power (dBm)	Power output (mw)	Limit (mw)
BDR(GFSK)	(Low)2402	2.00	1.585	1000
	(Middle)2441	4.86	3.062	1000
	(High)2480	4.16	2.606	1000
EDR(4-DQPSK)	(Low)2402	2.55	1.799	1000
	(Middle)2441	4.52	2.831	1000
	(High)2480	3.75	2.371	1000
EDR-8DPSK	(Low)2402	2.91	1.954	1000
	(Middle)2441	4.84	3.048	1000
	(High)2480	4.18	2.618	1000

WiFi

Band	Frequency (MHz)	Conducted Output Power	
		(dBm)	(mw)
802.11b	2412	8.99	7.925
	2437	9.40	8.710
	2462	9.47	8.851
802.11g	2412	7.84	6.081
	2437	8.14	6.516
	2462	8.43	6.966
802.11n-HT20	2412	8.22	6.637
	2437	8.18	6.577
	2462	8.37	6.871
802.11n-HT40	2422	8.25	6.683
	2437	8.03	6.353
	2452	8.22	6.637

Note:

1. The output power was tested under data rate 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n-HT20 and 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 °C
Relative Humidity:	50-53 %
ATM Pressure:	1001-1002 mbar

Testing was performed by Wilson Chen from 2014-3-25 to 2014-3-26.

GSM 850:

EUT Position	Frequency (MHz)		Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	FCC 1g SAR (W/Kg)		
	Channel	MHz					Scaled Factor	Meas. SAR	Scaled SAR
Left Head Cheek	128(Low)	824.2	GSM	/	/	/	/	/	/
	190(Middle)	836.6	GSM	-0.795	32.35	33.00	1.161	0.358	0.416
	251(High)	848.8	GSM	/	/	/	/	/	/
Left Head Tilt	128(Low)	824.2	GSM	/	/	/	/	/	/
	190(Middle)	836.6	GSM	1.556	32.35	33.00	1.161	0.319	0.371
	251(High)	848.8	GSM	/	/	/	/	/	/
Right Head Cheek	128(Low)	824.2	GSM	-2.715	32.19	33.00	1.205	0.419	0.505
	190(Middle)	836.6	GSM	1.258	32.35	33.00	1.161	0.475	0.552
	251(High)	848.8	GSM	-0.843	32.51	33.00	1.119	0.447	0.500
Right Head Tilt	128(Low)	824.2	GSM	/	/	/	/	/	/
	190(Middle)	836.6	GSM	-2.044	32.35	33.00	1.161	0.22	0.256
	251(High)	848.8	GSM	/	/	/	/	/	/
Body-Front-Headset (10mm)	128(Low)	824.2	GSM	/	/	/	/	/	/
	190(Middle)	836.6	GSM	-1.773	32.35	33.00	1.161	0.328	0.381
	251(High)	848.8	GSM	/	/	/	/	/	/
Body-Back-Headset (10mm)	128(Low)	824.2	GSM	/	/	/	/	/	/
	190(Middle)	836.6	GSM	2.827	32.35	33.00	1.161	0.388	0.451
	251(High)	848.8	GSM	/	/	/	/	/	/

PCS Band:

EUT Position	Frequency (MHz)		Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	FCC 1g SAR (W/Kg)		
	Channel	MHz					Scaled Factor	Meas. SAR	Scaled SAR
Left Head Cheek	512(Low)	1850.2	GSM	/	/	/	/	/	/
	661(Middle)	1880.0	GSM	-2.179	28.52	29.00	1.117	0.242	0.270
	810(High)	1909.8	GSM	/	/	/	/	/	/
Left Head Tilt	512(Low)	1850.2	GSM	/	/	/	/	/	/
	661(Middle)	1880.0	GSM	1.058	28.52	29.00	1.117	0.135	0.151
	810(High)	1909.8	GSM	/	/	/	/	/	/
Right Head Cheek	512(Low)	1850.2	GSM	-0.719	28.79	29.00	1.050	0.258	0.271
	661(Middle)	1880.0	GSM	1.092	28.52	29.00	1.117	0.278	0.310
	810(High)	1909.8	GSM	-1.183	28.40	29.00	1.148	0.255	0.293
Right Head Tilt	512(Low)	1850.2	GSM	/	/	/	/	/	/
	661(Middle)	1880.0	GSM	-1.934	28.52	29.00	1.117	0.162	0.181
	810(High)	1909.8	GSM	/	/	/	/	/	/
Body-Front-Headset (10mm)	512(Low)	1850.2	GSM	/	/	/	/	/	/
	661(Middle)	1880.0	GSM	-1.859	28.52	29.00	1.117	0.342	0.382
	810(High)	1909.8	GSM	/	/	/	/	/	/
Body-Back-Headset (10mm)	512(Low)	1850.2	GSM	/	/	/	/	/	/
	661(Middle)	1880.0	GSM	1.293	28.52	29.00	1.117	0.439	0.490
	810(High)	1909.8	GSM	/	/	/	/	/	/

Note:

1. When the 1-g SAR is $\leq 0.8\text{W/Kg}$, testing for other channels are optional.
2. The EUT transmit and receive through the same GSM antenna while testing SAR.
3. 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.

WCDMA 850

EUT Position	Frequency (MHz)		Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	FCC 1g SAR (W/Kg)		
	Channel	MHz					Scaled Factor	Meas. SAR	Scaled SAR
Left Head Cheek	4132	826.4	WCDMA 850						
	4183	836.6	WCDMA 850						
	4233	846.6	WCDMA 850	1.828	22.65	23.00	1.084	0.333	0.361
Left Head Tilt	4132	826.4	WCDMA 850	/	/	/	/	/	/
	4183	836.6	WCDMA 850	/	/	/	/	/	/
	4233	846.6	WCDMA 850	0.859	22.65	23.00	1.084	0.165	0.179
Right Head Cheek	4132	826.4	WCDMA 850	/	/	/	/	/	/
	4183	836.6	WCDMA 850	/	/	/	/	/	/
	4233	846.6	WCDMA 850	-0.791	22.65	23.00	1.084	0.275	0.298
Right Head Tilt	4132	826.4	WCDMA 850	/	/	/	/	/	/
	4183	836.6	WCDMA 850	/	/	/	/	/	/
	4233	846.6	WCDMA 850	1.319	22.65	23.00	1.084	0.149	0.162

WCDMA1900

EUT Position	Frequency (MHz)		Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	FCC 1g SAR (W/Kg)		
	Channel	MHz					Scaled Factor	Meas. SAR	Scaled SAR
Left Head Cheek	9262	1852.4	WCDMA1900	1.566	22.48	23.00	1.127	0.219	0.247
	9400	1880.0	WCDMA1900	/	/	/	/	/	/
	9538	1907.6	WCDMA1900	/	/	/	/	/	/
Left Head Tilt	9262	1852.4	WCDMA1900	-0.667	22.48	23.00	1.127	0.103	0.116
	9400	1880.0	WCDMA1900	/	/	/	/	/	/
	9538	1907.6	WCDMA1900	/	/	/	/	/	/
Right Head Cheek	9262	1852.4	WCDMA1900	1.552	22.57	23.00	1.104	0.327	0.361
	9400	1880.0	WCDMA1900						
	9538	1907.6	WCDMA1900						
Right Head Tilt	9262	1852.4	WCDMA1900	1.659	22.48	23.00	1.127	0.121	0.136
	9400	1880.0	WCDMA1900	/	/	/	/	/	/
	9538	1907.6	WCDMA1900	/	/	/	/	/	/

Note:

1. When the 1-g SAR is $\leq 0.8\text{W/Kg}$, 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 when the maximum average output of each RF channel with HSDPA active is less than $\frac{1}{4}$ dB higher than measured without HSDPA using 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is $< 75\%$ of SAR limit.

4. KDB 941225 D01-Body SAR is not required for HSUPA when the maximum average output of each RF channel with HSUPA active is less than ¼ dB higher than measured without HSUPA using 12.2kbps RMC and the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.
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.
4. KDB447498D01-When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

Mobile Hot-Spot Test Result

The DUT is capable of functioning as a WiFi 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.

Hot spot-GPRS (Frequency Band: 835)

EUT Position	Frequency (MHz)		Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	FCC 1g SAR (W/Kg)		
	Channel	MHz					Scaled Factor	Meas. SAR	Scaled SAR
Body-Front (10mm)	128(Low)	824.2	GPRS	/	/	/	/	/	/
	190(Middle)	836.6	GPRS	1.182	29.24	29.50	1.062	0.434	0.461
	251(High)	848.8	GPRS	/	/	/	/	/	/
Body-Back (10mm)	128(Low)	824.2	GPRS	1.919	29.03	29.50	1.114	0.875	0.975
	190(Middle)	836.6	GPRS	-1.819	29.24	29.50	1.062	0.825	0.876
	251(High)	848.8	GPRS	-1.372	29.43	29.50	1.016	0.853	0.867
Body-Left (10mm)	128(Low)	824.2	GPRS	/	/	/	/	/	/
	190(Middle)	836.6	GPRS	-1.339	29.24	29.50	1.062	0.424	0.450
	251(High)	848.8	GPRS	/	/	/	/	/	/
Body-Right (10mm)	128(Low)	824.2	GPRS	/	/	/	/	/	/
	190(Middle)	836.6	GPRS	1.214	29.24	29.50	1.062	0.478	0.507
	251(High)	848.8	GPRS	/	/	/	/	/	/
Body-Bottom (10mm)	128(Low)	824.2	GPRS	/	/	/	/	/	/
	190(Middle)	836.6	GPRS	-0.869	29.24	29.50	1.062	0.041	0.044
	251(High)	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.

Hot spot-GPRS (Frequency Band: 1900)

EUT Position	Frequency (MHz)		Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	FCC 1g SAR (W/Kg)		
	Channel	MHz					Scaled Factor	Meas. SAR	Scaled SAR
Body-Front (10mm)	512(Low)	1850.2	GPRS	/	/	/	/	/	/
	661(Middle)	1880.0	GPRS	-1.729	25.93	27.00	1.279	0.559	0.715
	810(High)	1909.8	GPRS	/	/	/	/	/	/
Body-Back (10mm)	512(Low)	1850.2	GPRS	-0.918	26.00	27.00	1.259	0.651	0.820
	661(Middle)	1880.0	GPRS	1.993	25.93	27.00	1.279	0.623	0.797
	810(High)	1909.8	GPRS	0.811	26.96	27.00	1.009	0.677	0.683
Body-Left (10mm)	512(Low)	1850.2	GPRS	/	/	/	/	/	/
	661(Middle)	1880.0	GPRS	-1.124	25.93	27.00	1.279	0.125	0.160
	810(High)	1909.8	GPRS	/	/	/	/	/	/
Body-Right (10mm)	512(Low)	1850.2	GPRS	/	/	/	/	/	/
	661(Middle)	1880.0	GPRS	-1.303	25.93	27.00	1.279	0.178	0.228
	810(High)	1909.8	GPRS	/	/	/	/	/	/
Body-Bottom (10mm)	512(Low)	1850.2	GPRS	/	/	/	/	/	/
	661(Middle)	1880.0	GPRS	0.684	25.93	27.00	1.279	0.281	0.360
	810(High)	1909.8	GPRS	/	/	/	/	/	/

Note:

1. When the 1-g SAR is $\leq 0.8\text{W/Kg}$, 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.

Hot Spot-WCDMA850

EUT Position	Frequency (MHz)		Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	FCC 1g SAR (W/Kg)		
	Channel	MHz					Scaled Factor	Meas. SAR	Scaled SAR
Body-Front (10mm)	4132	826.4	WCDMA850	/	/	/	/	/	/
	4183	836.6	WCDMA850	/	/	/	/	/	/
	4233	846.6	WCDMA850	-1.856	22.65	23.00	1.084	0.249	0.270
Body-Back (10mm)	4132	826.4	WCDMA850	/	/	/	/	/	/
	4183	836.6	WCDMA850	/	/	/	/	/	/
	4233	846.6	WCDMA850	-2.137	22.65	23.00	1.084	0.337	0.365
Body-Left (10mm)	4132	826.4	WCDMA850	/	/	/	/	/	/
	4183	836.6	WCDMA850	/	/	/	/	/	/
	4233	846.6	WCDMA850	1.387	22.65	23.00	1.084	0.211	0.229
Body-Right (10mm)	4132	826.4	WCDMA850	/	/	/	/	/	/
	4183	836.6	WCDMA850	/	/	/	/	/	/
	4233	846.6	WCDMA850	-0.989	22.65	23.00	1.084	0.325	0.352
Body-Bottom (10mm)	4132	826.4	WCDMA850	/	/	/	/	/	/
	4183	836.6	WCDMA850	/	/	/	/	/	/
	4233	846.6	WCDMA850	-1.815	22.65	23.00	1.084	0.286	0.310

Hot Spot-WCDMA1900

EUT Position	Frequency (MHz)		Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	FCC 1g SAR (W/Kg)		
	Channel	MHz					Scaled Factor	Meas. SAR	Scaled SAR
Body-Front (10mm)	9262	1852.4	WCDMA1900	1.322	22.57	23.00	1.104	0.486	0.537
	9400	1880.0	WCDMA1900	/	/	/	/	/	/
	9538	1907.6	WCDMA1900	/	/	/	/	/	/
Body-Back (10mm)	9262	1852.4	WCDMA1900	1.473	22.57	23.00	1.104	0.684	0.755
	9400	1880.0	WCDMA1900	/	/	/	/	/	/
	9538	1907.6	WCDMA1900	/	/	/	/	/	/
Body-Left (10mm)	9262	1852.4	WCDMA1900	-2.344	22.57	23.00	1.104	0.039	0.043
	9400	1880.0	WCDMA1900	/	/	/	/	/	/
	9538	1907.6	WCDMA1900	/	/	/	/	/	/
Body-Right (10mm)	9262	1852.4	WCDMA1900	-1.715	22.57	23.00	1.104	0.186	0.205
	9400	1880.0	WCDMA1900	/	/	/	/	/	/
	9538	1907.6	WCDMA1900	/	/	/	/	/	/
Body-Bottom (10mm)	9262	1852.4	WCDMA1900	-2.126	22.57	23.00	1.104	0.321	0.354
	9400	1880.0	WCDMA1900	/	/	/	/	/	/
	9538	1907.6	WCDMA1900	/	/	/	/	/	/

Note:

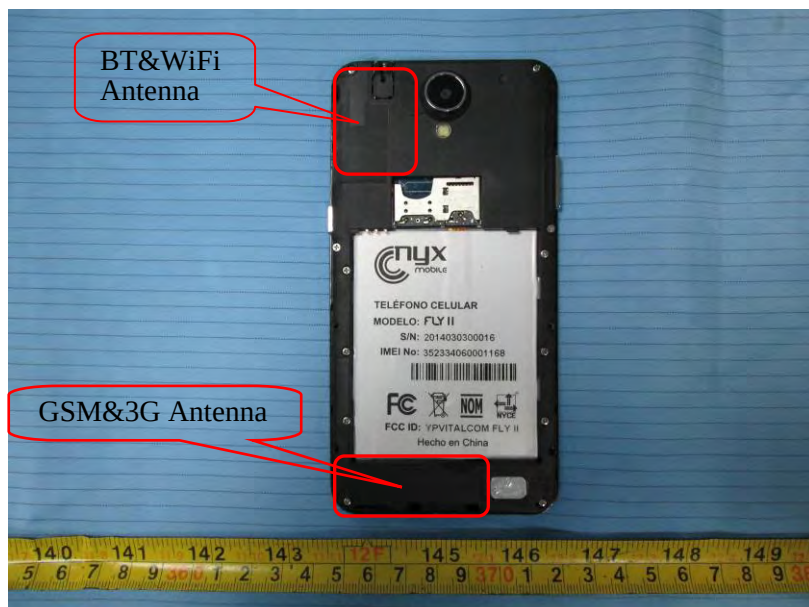
1. When the 1-g SAR is $\leq 0.8\text{W/Kg}$, testing for other channels are optional.
2. The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2 kbps RMC (reference measurement Channel) Configured in Test Loop Model.
3. KDB 941225 D01-Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than $\frac{1}{4}$ dB higher than measured without HSDPA using 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is $< 75\%$ of SAR limit.
4. KDB 941225 D01-Body SAR is not required for HSUPA when the maximum average output of each RF channel with HSUPA active is less than $\frac{1}{4}$ dB higher than measured without HSUPA using 12.2kbps RMC and the maximum SAR for 12.2kbps RMC is $< 75\%$ of SAR limit.

SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

KDB 447498D01 General RF Exposure Guidance v05r02

Stand-alone and simultaneous SAR evaluation for a cell phone with multiple transmitters is based on the antennas distance of each radio.

BT, WiFi, GSM and 3G Antenna Location:



Antenna Information:

Description of Simultaneous Transmit Capabilities			Antennas Distance (mm)
Transmitter Combination	Simultaneous?	Hotspot?	
GSM + GPRS	×	×	0
GSM + WCDMA	×	×	0
GSM + Bluetooth	√	×	96
GSM + WiFi	√	√	56
GPRS + WCDMA	×	×	0
GPRS + Bluetooth	√	×	96
GPRS + WiFi	√	√	96
WCDMA + Bluetooth	√	×	96
WCDMA + WiFi	√	√	96

Standalone SAR test exclusion considerations

Head Position:

Mode	Frequency (MHz)	P _{avg} (dBm)	P _{avg} (mW)	Distance (mm)	Calculated value	Threshold (1-g)	SAR Test Exclusion
GSM850	850	23.51	224.388	0	41.4	3.0	No
PCS1900	1900	19.79	95.280	0	26.3	3.0	No
WCDMSA850	850	22.65	184.077	0	33.9	3.0	No
WCDMSA1900	1900	22.57	180.717	0	49.8	3.0	No
WiFi	2450	9.47	8.851	0	2.8	3.0	Yes
Bluetooth	2450	4.86	3.062	0	1.0	3.0	Yes

Body Position:

Mode	Frequency (MHz)	P _{avg} (dBm)	P _{avg} (mW)	Distance (mm)	Calculated value	Threshold (1-g)	SAR Test Exclusion
GSM850	850	26.43	439.542	10.00	40.5	3.0	No
PCS1900	1900	23.96	248.886	10.00	34.3	3.0	No
WCDMSA850	850	22.65	184.077	10.00	17.0	3.0	No
WCDMSA1900	1900	22.57	180.717	10.00	24.9	3.0	No
WiFi	2450	9.47	8.851	10.00	1.4	3.0	Yes
Bluetooth	2450	4.86	3.062	10.00	0.5	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:

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

$[\sqrt{f(\text{GHz})}] \leq 3.0$ 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.

Simultaneous SAR test exclusion considerations:**GSM with BT:**

Mode	Position	Reported SAR (W/kg)		ΣSAR
		GSM	BT	< 1.6W/kg
GSM850	Left Head Cheek	0.416	0.132	0.548
	Left Head Tile	0.371	0.132	0.503
	Right Head Cheek	0.552	0.132	0.684
	Right Head Tilt	0.256	0.132	0.388
	Body–Headset-Front	0.381	0.066	0.447
	Body–Headset-Back	0.451	0.066	0.517
PCS1900	Left Head Cheek	0.270	0.132	0.402
	Left Head Tile	0.151	0.132	0.283
	Right Head Cheek	0.310	0.132	0.442
	Right Head Tilt	0.181	0.132	0.313
	Body–Headset-Front	0.382	0.066	0.448
	Body–Headset-Back	0.490	0.066	0.556

WCDMA with BT:

Mode	Position	Reported SAR (W/kg)		ΣSAR
		WCDMA	BT	< 1.6W/kg
WCDMA 850	Left Head Cheek	0.361	0.132	0.493
	Left Head Tile	0.179	0.132	0.311
	Right Head Cheek	0.298	0.132	0.43
	Right Head Tilt	0.162	0.132	0.294
	Body–Headset-Front	0.270	0.066	0.336
	Body–Headset-Back	0.365	0.066	0.431
WCDMA 1900	Left Head Cheek	0.247	0.132	0.379
	Left Head Tile	0.116	0.132	0.248
	Right Head Cheek	0.361	0.132	0.493
	Right Head Tilt	0.136	0.132	0.268
	Body–Headset-Front	0.537	0.066	0.603
	Body–Headset-Back	0.755	0.066	0.821

GSM with WiFi:

Mode	Position	Reported SAR (W/kg)		ΣSAR
		GSM	WiFi	< 1.6W/kg
GSM850	Left Head Cheek	0.416	0.372	0.788
	Left Head Tile	0.371	0.372	0.743
	Right Head Cheek	0.552	0.372	0.924
	Right Head Tilt	0.256	0.372	0.628
	Body–Headset-Front	0.381	0.186	0.567
	Body–Headset-Back	0.451	0.186	0.637
PCS1900	Left Head Cheek	0.270	0.372	0.642
	Left Head Tile	0.151	0.372	0.523
	Right Head Cheek	0.310	0.372	0.682
	Right Head Tilt	0.181	0.372	0.553
	Body–Headset-Front	0.382	0.186	0.568
	Body–Headset-Back	0.490	0.186	0.676

WCDMA with WiFi:

Mode	Position	Reported SAR (W/kg)		ΣSAR
		WCDMA	WiFi	< 1.6W/kg
WCDMA 850	Left Head Cheek	0.361	0.372	0.733
	Left Head Tile	0.179	0.372	0.551
	Right Head Cheek	0.298	0.372	0.670
	Right Head Tilt	0.162	0.372	0.534
	Body–Headset-Front	0.270	0.186	0.456
	Body–Headset-Back	0.365	0.186	0.551
WCDMA 1900	Left Head Cheek	0.247	0.372	0.619
	Left Head Tile	0.116	0.372	0.488
	Right Head Cheek	0.361	0.372	0.733
	Right Head Tilt	0.136	0.372	0.508
	Body–Headset-Front	0.537	0.186	0.723
	Body–Headset-Back	0.755	0.186	0.941

Mode	Frequency (GHz)	Distance (mm)	P _{avg} (dBm)	P _{avg} (mW)	Estimated _{1-g} (W/kg)
BT Head	2.45	0	5.0	3.162	0.132
BT Body	2.45	10	5.0	3.162	0.066
Wifi Head	2.45	0	9.5	8.913	0.372
Wifi Body	2.45	10	9.5	8.913	0.186

Note:

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:

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

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

Conclusion:

$\Sigma \text{SAR} < 1.6 \text{ W/kg}$ therefore simultaneous transmission SAR with Volume Scans is **not** required.

Hotspot:

Evaluations for Simultaneous SAR, Mobile Hot Spot Positions						
Test Position	Body-Front (1.0cm)	Body-Back (1.0cm)	Body-Left (1.0cm)	Body-Right (1.0cm)	Body-Bottom (1.0cm)	Body-Top (1.0cm)
Mode	Stand Alone 1-g SAR (W/Kg)					
GSM 850	0.461	0.975	0.450	0.407	0.044	/
PCS 1900	0.715	0.820	0.160	0.228	0.360	/
WCDMA850	0.270	0.365	0.229	0.352	0.310	/
WCDMA 1900	0.548	0.755	0.043	0.205	0.354	/
WiFi	0.186	0.186	/	0.186	/	0.186
	Σ 1-g SAR(W/Kg)					
GSM850 + WiFi	0.647	1.161	/	0.593	/	/
PCS 1900 + WiFi	0.901	1.006	/	0.414	/	/
WCDMA850 + WiFi	0.456	0.551	/	0.538	/	/
WCDMA 1900 + WiFi	0.734	0.941	/	0.391	/	/

Note:

If the sum of the 1g SAR measured for the simultaneously transmitting antennas is less than the SAR limit, SAR measurement for simultaneous transmission is not required.

EUT SCAN RESULTS

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

Left Head Cheek (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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : -0.795

Tissue Data

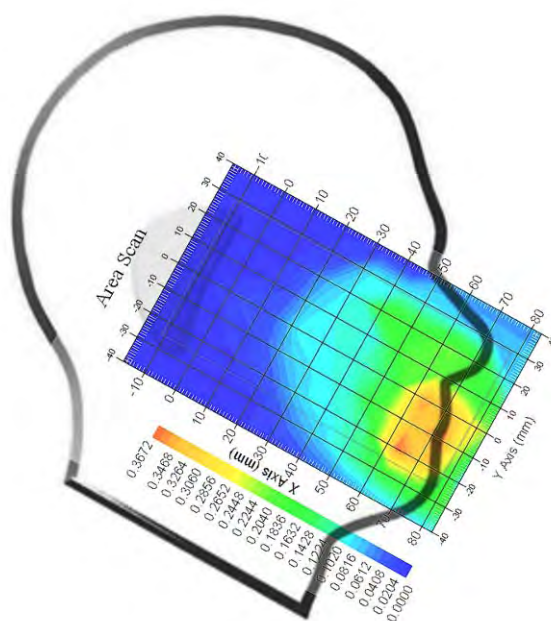
Type : Head
Frequency : 836.6 MHz
Epsilon : 41.35 F/m
Sigma : 0.92 S/m
Density : 1000.00 kg/cu. m

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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.358 W/kg
10 gram SAR value : 0.157 W/kg
Area Scan Peak SAR : 0.360 W/kg
Zoom Scan Peak SAR : 0.618 W/kg

Plot 1#



Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Left Head Tilt (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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : 1.556

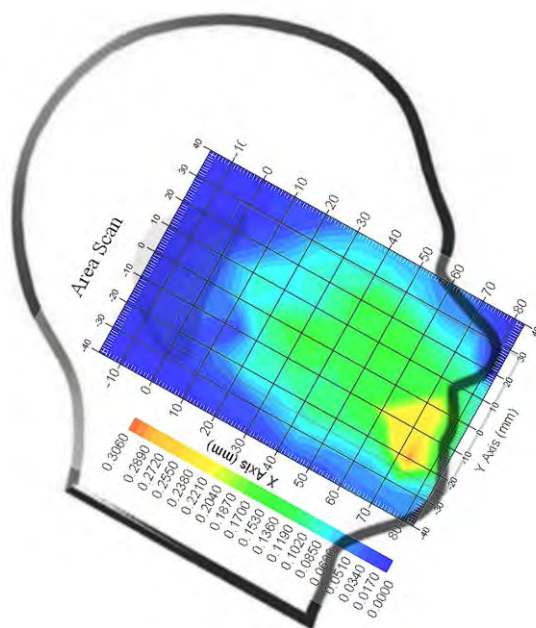
Tissue Data

Type : Head
Frequency : 836.6 MHz
Epsilon : 41.35 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.319 W/kg
10 gram SAR value : 0.125 W/kg
Area Scan Peak SAR : 0.306 W/kg
Zoom Scan Peak SAR : 0.573 W/kg

Plot 2#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Right Head Cheek (824.2 MHz Low 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 : 0.003 W/kg
Power Drift-Finish : 0.003 W/kg
Power Drift (%) : -2.715

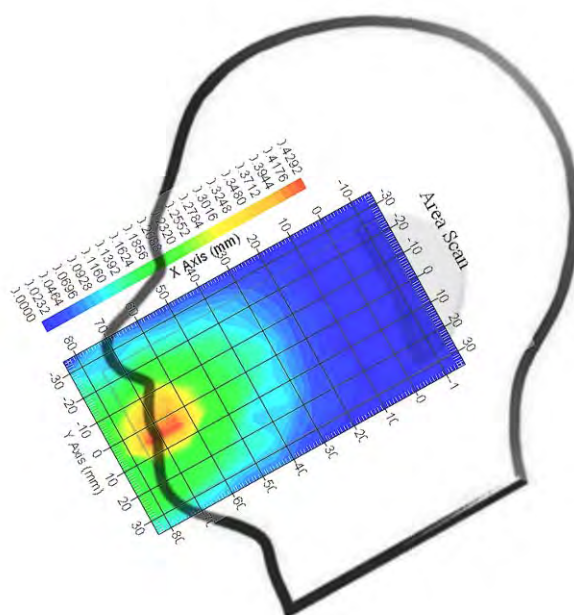
Tissue Data

Type : Head
Frequency : 824.2 MHz
Epsilon : 41.39 F/m
Sigma : 0.91 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.419 W/kg
10 gram SAR value : 0.257 W/kg
Area Scan Peak SAR : 0.428 W/kg
Zoom Scan Peak SAR : 0.805 W/kg

Plot 3#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Right Head Cheek (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 : 0.005 W/kg
Power Drift-Finish : 0.005 W/kg
Power Drift (%) : 1.258

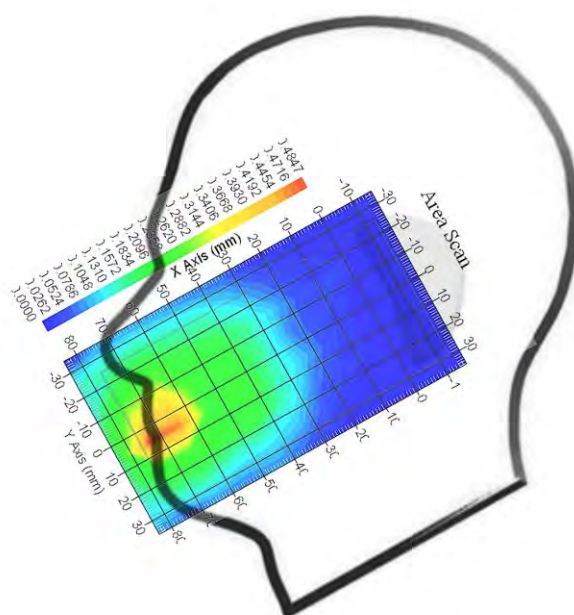
Tissue Data

Type : Head
Frequency : 836.6 MHz
Epsilon : 41.35 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 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.475 W/kg
10 gram SAR value : 0.269 W/kg
Area Scan Peak SAR : 0.480 W/kg
Zoom Scan Peak SAR : 0.807 W/kg

Plot 4#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Right Head Cheek (848.8 MHz High 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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : -0.843

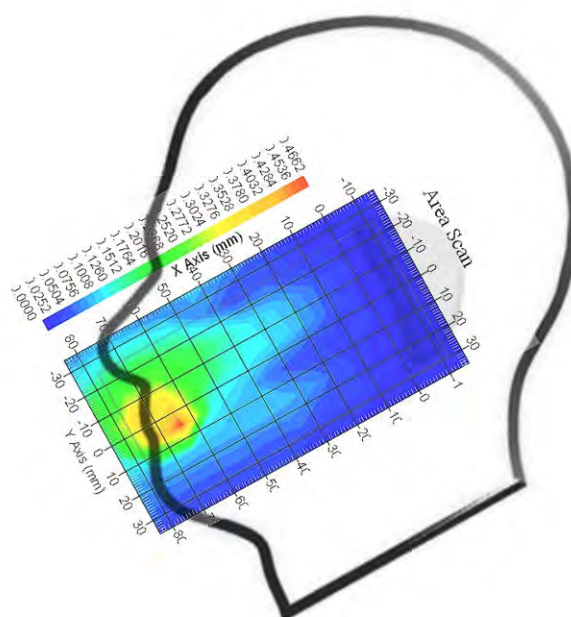
Tissue Data

Type : Head
Frequency : 848.8 MHz
Epsilon : 41.14 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.447 W/kg
10 gram SAR value : 0.271 W/kg
Area Scan Peak SAR : 0.450 W/kg
Zoom Scan Peak SAR : 0.891 W/kg

Plot 5#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Right Head Tilt (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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : -2.044

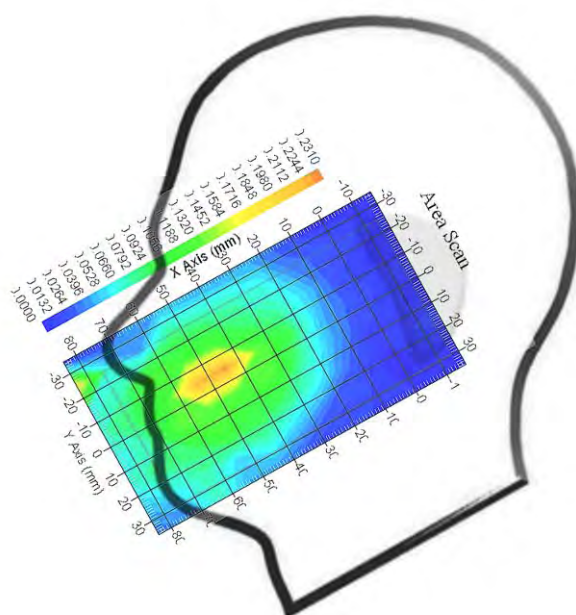
Tissue Data

Type : Head
Frequency : 836.6 MHz
Epsilon : 41.35 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.220 W/kg
10 gram SAR value : 0.124 W/kg
Area Scan Peak SAR : 0.235 W/kg
Zoom Scan Peak SAR : 0.610 W/kg

Plot 6#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn Front-Headset (836.6 MHz Middle Channel)**

Measurement Data

Test mode : GSM
Crest Factor : 8
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 : 0.419 W/kg
Power Drift-Finish : 0.412 W/kg
Power Drift (%) : -1.773

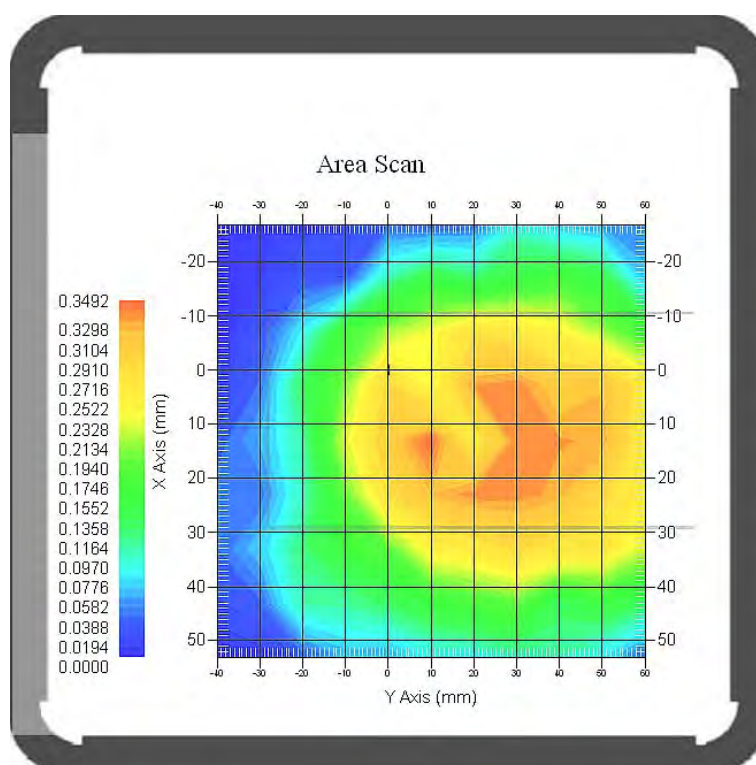
Tissue Data

Type : Body
Frequency : 836.6 MHz
Epsilon : 55.13 F/m
Sigma : 0.97 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 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.328 W/kg
10 gram SAR value : 0.112 W/kg
Area Scan Peak SAR : 0.339 W/kg
Zoom Scan Peak SAR : 0.715 W/kg

Plot 7#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn Back-Headset (836.6 MHz Middle Channel)**

Measurement Data

Test mode : GSM
Crest Factor : 8
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 : 0.588 W/kg
Power Drift-Finish : 0.601 W/kg
Power Drift (%) : 2.827

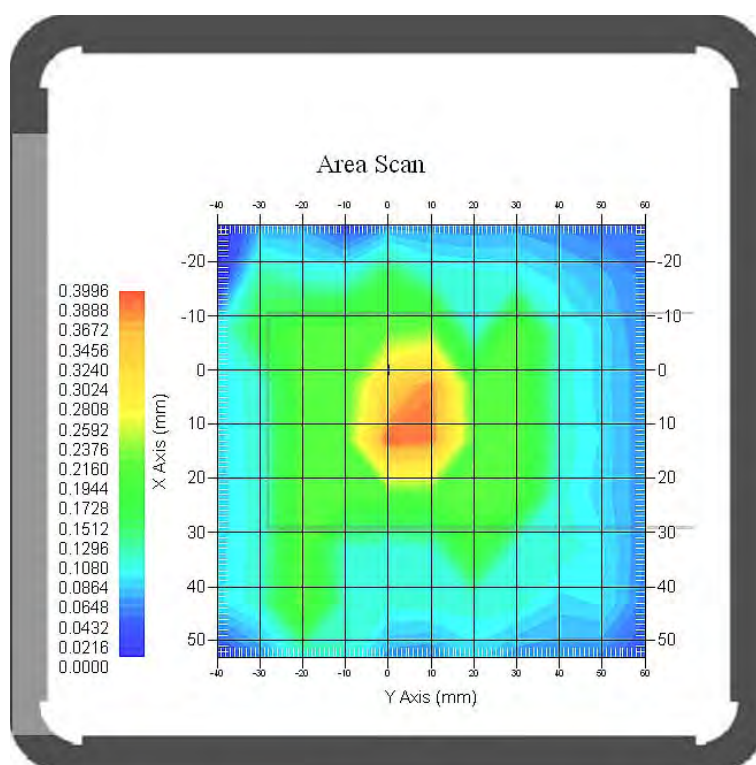
Tissue Data

Type : Body
Frequency : 836.6 MHz
Epsilon : 55.13 F/m
Sigma : 0.97 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.388 W/kg
10 gram SAR value : 0.249 W/kg
Area Scan Peak SAR : 0.395 W/kg
Zoom Scan Peak SAR : 1.236 W/kg

Plot 8#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Left Head Cheek (1880 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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : -2.179

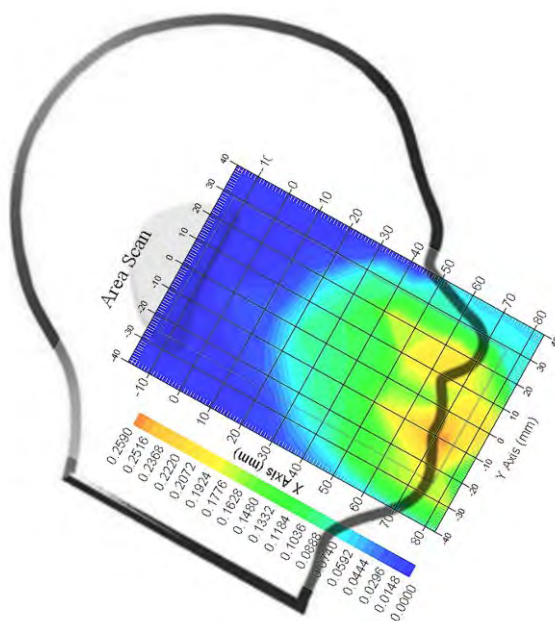
Tissue Data

Type : Head
Frequency : 1880 MHz
Epsilon : 40.00 F/m
Sigma : 1.40 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.242 W/kg
10 gram SAR value : 0.129 W/kg
Area Scan Peak SAR : 0.251 W/kg
Zoom Scan Peak SAR : 0.914 W/kg

Plot 9#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Left Head Tilt (1880 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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : 1.058

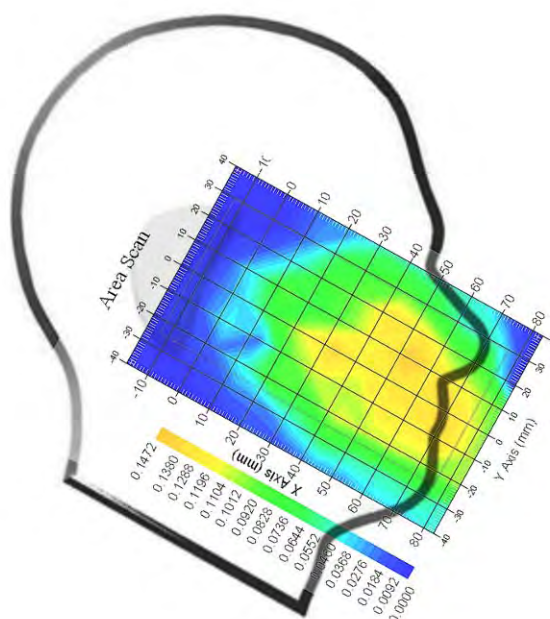
Tissue Data

Type : Head
Frequency : 1880 MHz
Epsilon : 40.00 F/m
Sigma : 1.40 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.135 W/kg
10 gram SAR value : 0.075 W/kg
Area Scan Peak SAR : 0.144 W/kg
Zoom Scan Peak SAR : 0.318 W/kg

Plot 10#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Right Head Cheek (1850.2 MHz Low 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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : -0.719

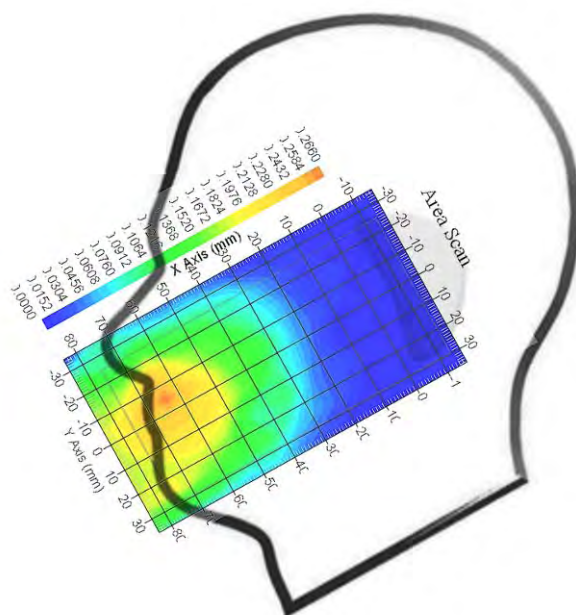
Tissue Data

Type : Head
Frequency : 1850.2 MHz
Epsilon : 39.99 F/m
Sigma : 1.42 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.258 W/kg
10 gram SAR value : 0.127 W/kg
Area Scan Peak SAR : 0.264 W/kg
Zoom Scan Peak SAR : 0.920 W/kg

Plot 11#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Right Head Cheek (1880 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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : 1.092

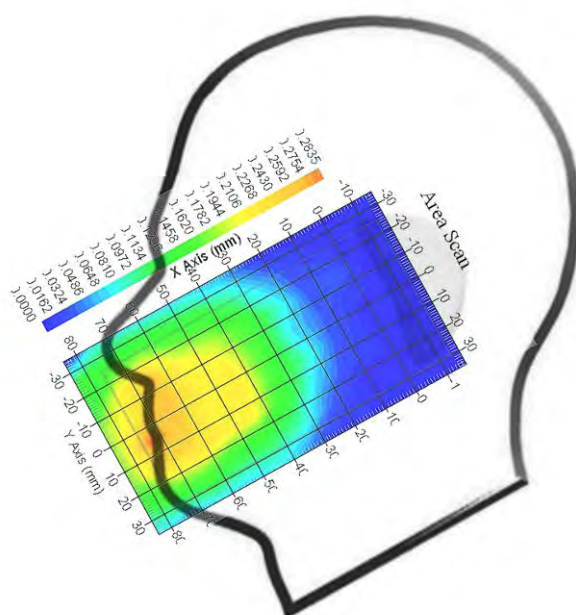
Tissue Data

Type : Head
Frequency : 1880 MHz
Epsilon : 40.00 F/m
Sigma : 1.40 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.278 W/kg
10 gram SAR value : 0.135 W/kg
Area Scan Peak SAR : 0.285 W/kg
Zoom Scan Peak SAR : 0.603 W/kg

Plot 12#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Right Head Cheek (1909.8 MHz High 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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : -1.183

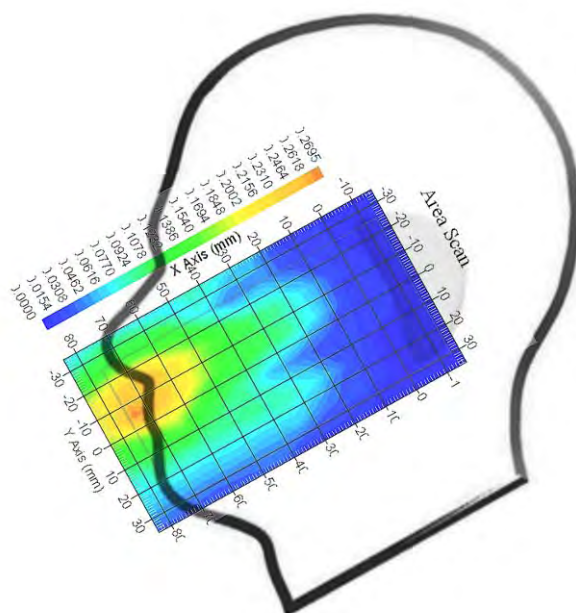
Tissue Data

Type : Head
Frequency : 1909.8 MHz
Epsilon : 40.01 F/m
Sigma : 1.42 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.255 W/kg
10 gram SAR value : 0.139 W/kg
Area Scan Peak SAR : 0.261 W/kg
Zoom Scan Peak SAR : 0.660 W/kg

Plot 13#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Right Head Tilt (1880 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 : 0.011 W/kg
Power Drift-Finish : 0.011 W/kg
Power Drift (%) : -1.934

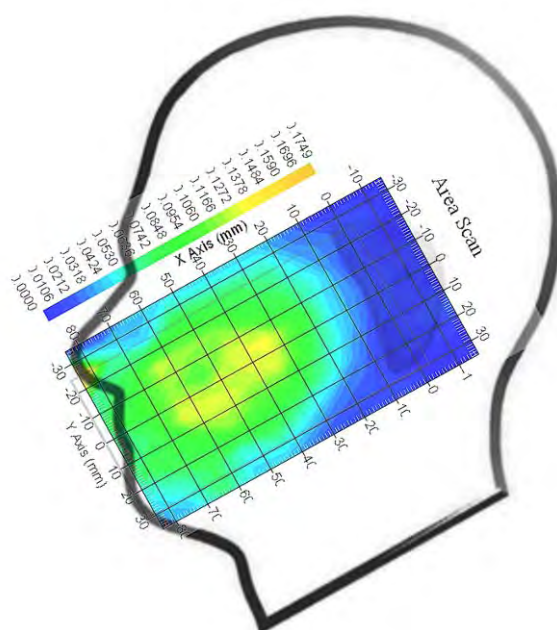
Tissue Data

Type : Head
Frequency : 1880 MHz
Epsilon : 40.00 F/m
Sigma : 1.40 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.162 W/kg
10 gram SAR value : 0.089 W/kg
Area Scan Peak SAR : 0.175 W/kg
Zoom Scan Peak SAR : 0.418 W/kg

Plot 14#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn Front-Headset (1880 MHz Middle Channel)**

Measurement Data

Test mode : GSM
Crest Factor : 8
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 : 0.377 W/kg
Power Drift-Finish : 0.370 W/kg
Power Drift (%) : -1.859

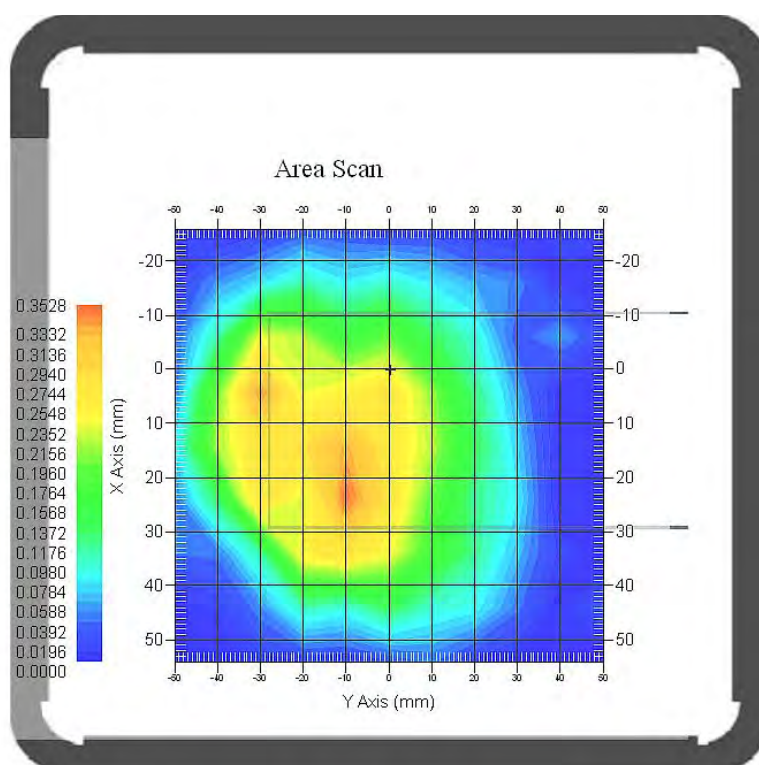
Tissue Data

Type : Body
Frequency : 1880 MHz
Epsilon : 52.78 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 8
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.342 W/kg
10 gram SAR value : 0.167 W/kg
Area Scan Peak SAR : 0.350 W/kg
Zoom Scan Peak SAR : 0.629 W/kg

Plot 15#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn Back- Headset (1880 MHz Middle Channel)**

Measurement Data

Test mode : GSM
Crest Factor : 8
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 : 0.495 W/kg
Power Drift-Finish : 0.501W/kg
Power Drift (%) : 1.293

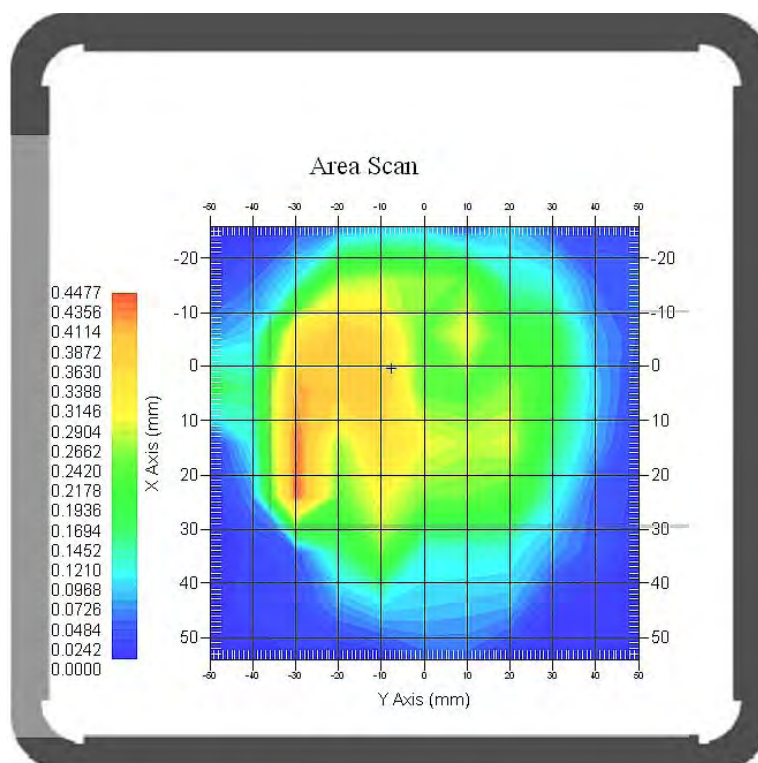
Tissue Data

Type : Body
Frequency : 1880 MHz
Epsilon : 52.78 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 8
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.439 W/kg
10 gram SAR value : 0.276 W/kg
Area Scan Peak SAR : 0.440 W/kg
Zoom Scan Peak SAR : 0.621 W/kg

Plot 16#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Left Head Cheek (846.6 MHz High Channel)****Measurement Data**

Test mode : WCDMA850
Crest Factor : 1
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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : 1.828

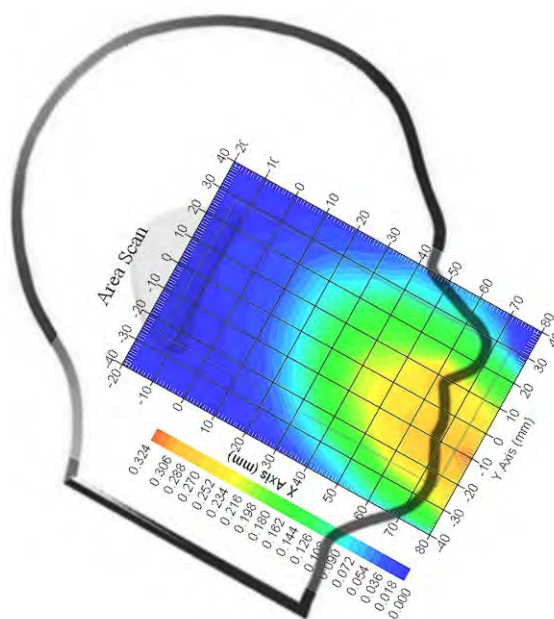
Tissue Data

Type : Head
Frequency : 846.6 MHz
Epsilon : 41.20 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 : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.333 W/kg
10 gram SAR value : 0.164 W/kg
Area Scan Peak SAR : 0.325 W/kg
Zoom Scan Peak SAR : 0.511 W/kg

Plot 17#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Left Head Tilt (846.6 MHz High Channel)****Measurement Data**

Test mode : WCDMA850
Crest Factor : 1
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 : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : 0.859

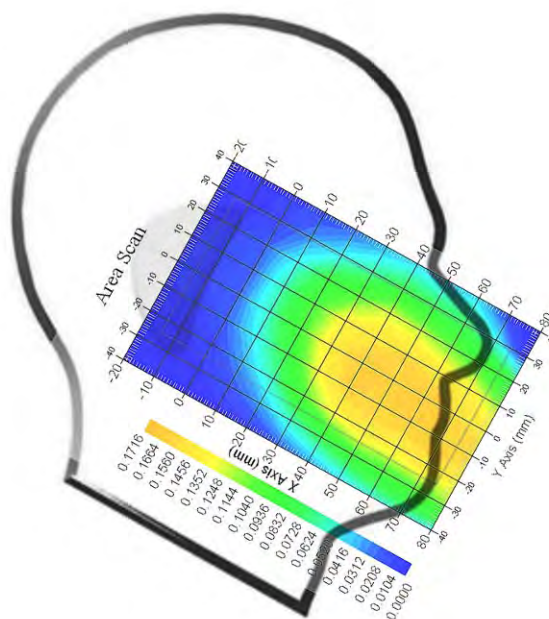
Tissue Data

Type : Head
Frequency : 846.6 MHz
Epsilon : 41.20 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 : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.165 W/kg
10 gram SAR value : 0.085 W/kg
Area Scan Peak SAR : 0.170 W/kg
Zoom Scan Peak SAR : 0.270 W/kg

Plot 18#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Right Head Cheek (846.6 MHz High Channel)****Measurement Data**

Test mode : WCDMA850
Crest Factor : 1
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 : 0.002 W/kg
Power Drift-Finish : 0.002 W/kg
Power Drift (%) : -0.791

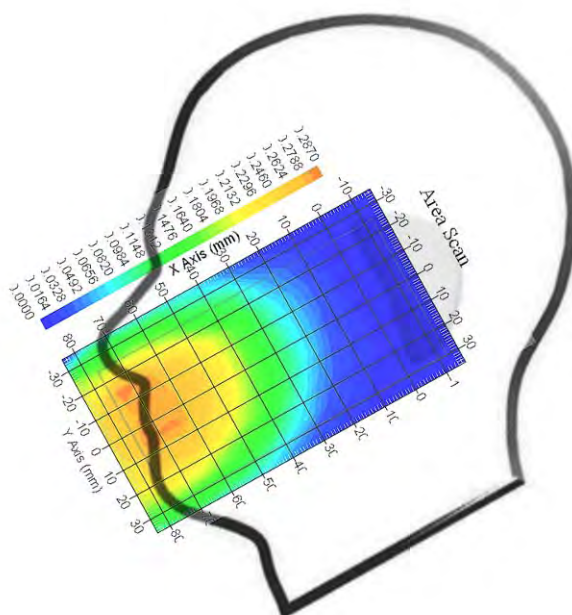
Tissue Data

Type : Head
Frequency : 846.6 MHz
Epsilon : 41.20 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 : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.275 W/kg
10 gram SAR value : 0.134 W/kg
Area Scan Peak SAR : 0.285 W/kg
Zoom Scan Peak SAR : 0.518 W/kg

Plot 19#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Right Head Tilt (846.6 MHz High Channel)****Measurement Data**

Test mode : WCDMA850
Crest Factor : 1
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 : 0.002 W/kg
Power Drift-Finish : 0.002 W/kg
Power Drift (%) : 1.319

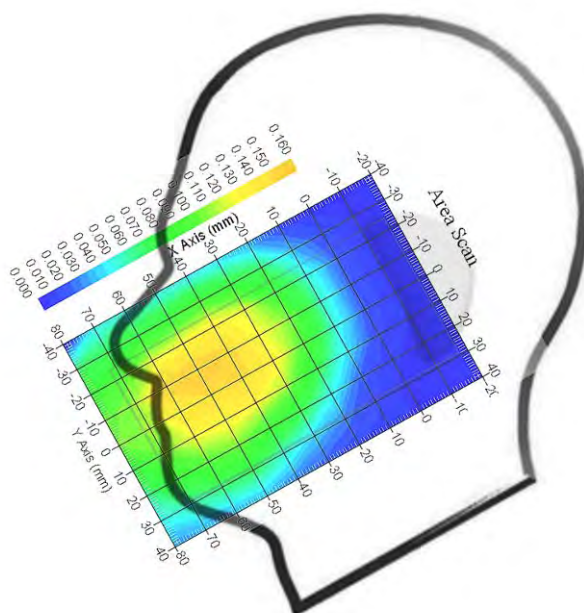
Tissue Data

Type : Head
Frequency : 846.6 MHz
Epsilon : 41.20 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 : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.149 W/kg
10 gram SAR value : 0.071 W/kg
Area Scan Peak SAR : 0.160 W/kg
Zoom Scan Peak SAR : 0.258 W/kg

Plot 20#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Left Head Cheek (1852.4 MHz Low Channel)****Measurement Data**

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.001 W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : 1.566

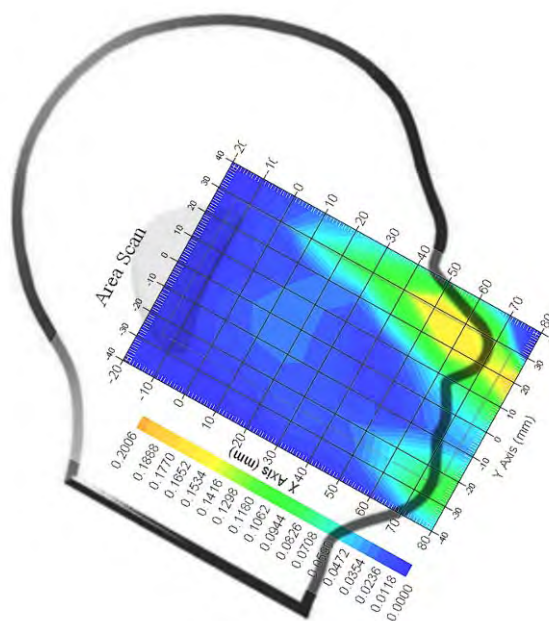
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 40.00 F/m
Sigma : 1.42 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.8
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.219 W/kg
10 gram SAR value : 0.111 W/kg
Area Scan Peak SAR : 0.200 W/kg
Zoom Scan Peak SAR : 0.480 W/kg

Plot 21#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Left Head Tilt (1852.4 MHz Low Channel)****Measurement Data**

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.002 W/kg
Power Drift-Finish : 0.002 W/kg
Power Drift (%) : -0.667

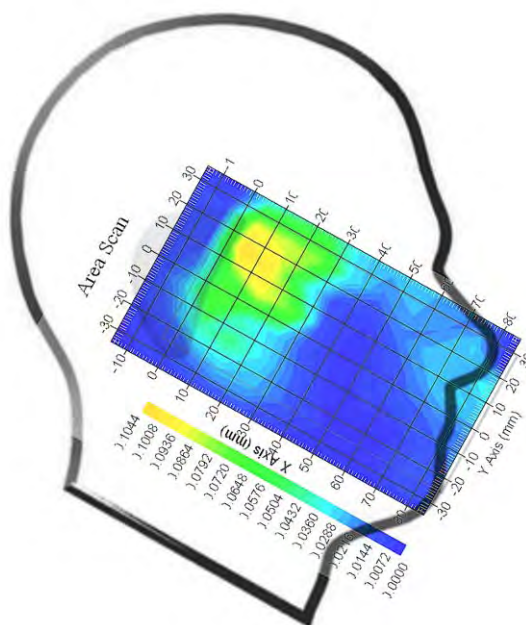
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 40.00 F/m
Sigma : 1.42 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.8
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.103 W/kg
10 gram SAR value : 0.060 W/kg
Area Scan Peak SAR : 0.104 W/kg
Zoom Scan Peak SAR : 0.219 W/kg

Plot 22#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Right Head Cheek (1852.4 MHz Low Channel)****Measurement Data**

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.002 W/kg
Power Drift-Finish : 0.002 W/kg
Power Drift (%) : 1.552

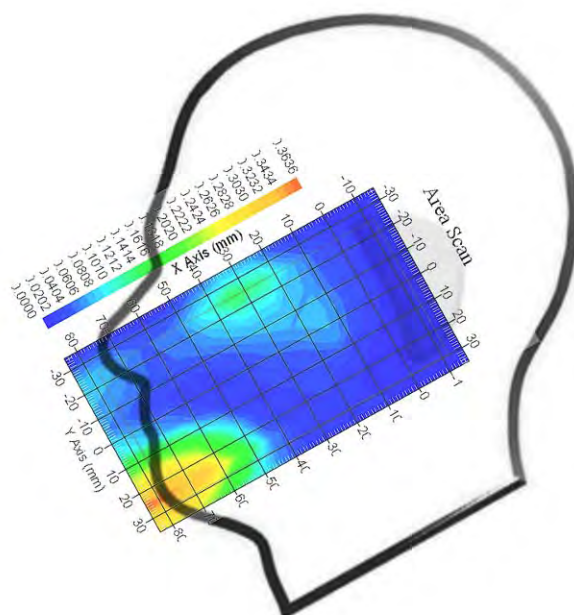
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 40.00 F/m
Sigma : 1.42 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.8
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.327 W/kg
10 gram SAR value : 0.166 W/kg
Area Scan Peak SAR : 0.363 W/kg
Zoom Scan Peak SAR : 0.499 W/kg

Plot 23#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Right Head Tilt (1852.4 MHz Low Channel)****Measurement Data**

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.001W/kg
Power Drift-Finish : 0.001 W/kg
Power Drift (%) : 1.659

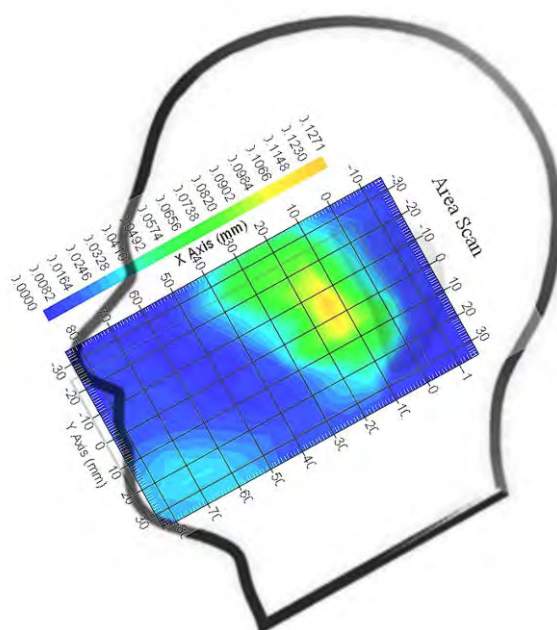
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 40.00 F/m
Sigma : 1.42 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.8
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.121 W/kg
10 gram SAR value : 0.086 W/kg
Area Scan Peak SAR : 0.128 W/kg
Zoom Scan Peak SAR : 0.239 W/kg

Plot 24#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Front (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 : 0.688 W/kg
Power Drift-Finish : 0.695 W/kg
Power Drift (%) : 1.182

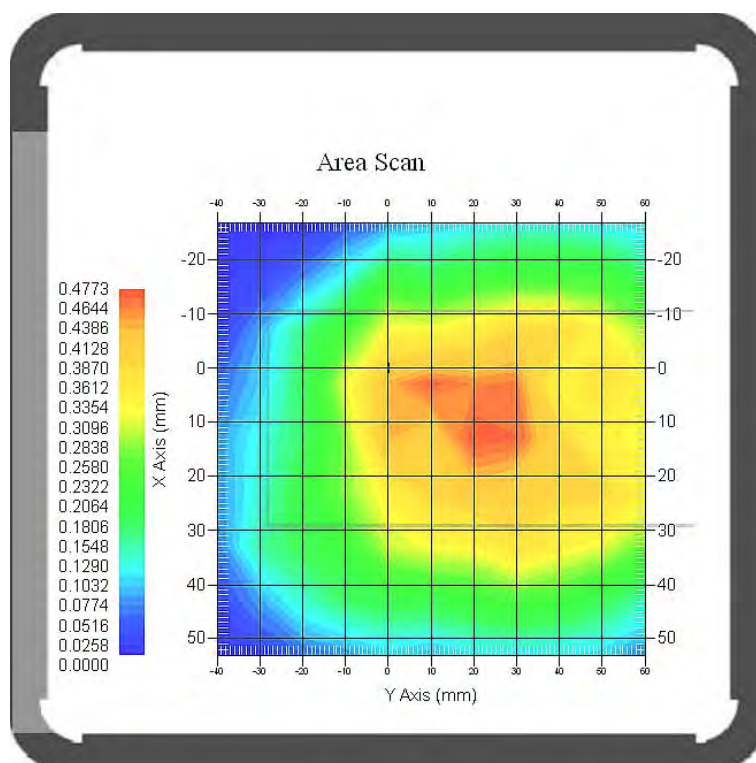
Tissue Data

Type : Body
Frequency : 836.6 MHz
Epsilon : 55.13 F/m
Sigma : 0.97 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.434 W/kg
10 gram SAR value : 0.229 W/kg
Area Scan Peak SAR : 0.456 W/kg
Zoom Scan Peak SAR : 0.828 W/kg

Plot 25#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Back (824.2 MHz Low 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 : 1.102 W/kg
Power Drift-Finish : 1.123 W/kg
Power Drift (%) : 1.919

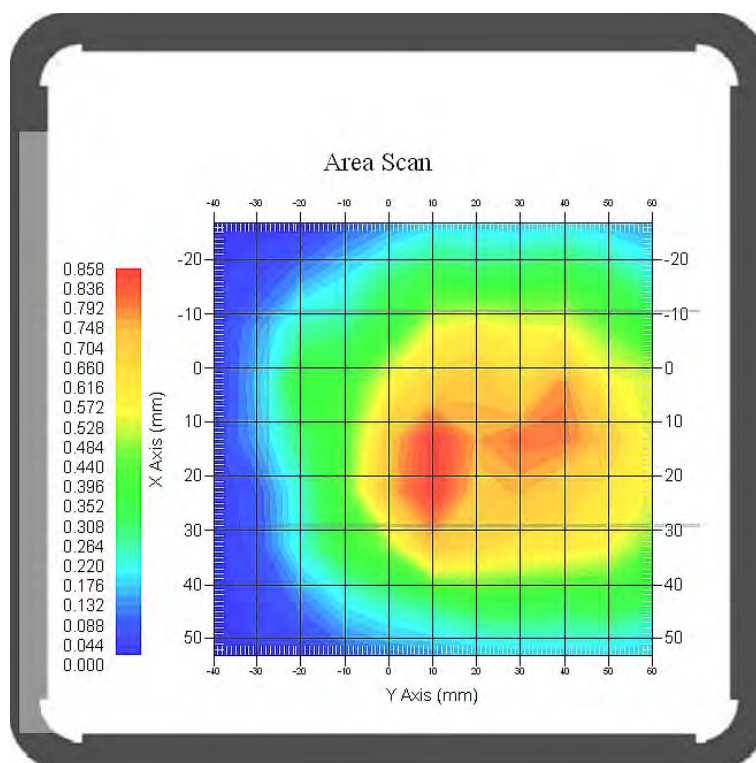
Tissue Data

Type : Body
Frequency : 824.2 MHz
Epsilon : 55.06 F/m
Sigma : 0.95 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.875 W/kg
10 gram SAR value : 0.402 W/kg
Area Scan Peak SAR : 0.851 W/kg
Zoom Scan Peak SAR : 1.233 W/kg

Plot 26#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**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 : 1.052 W/kg
Power Drift-Finish : 1.030 W/kg
Power Drift (%) : -1.819

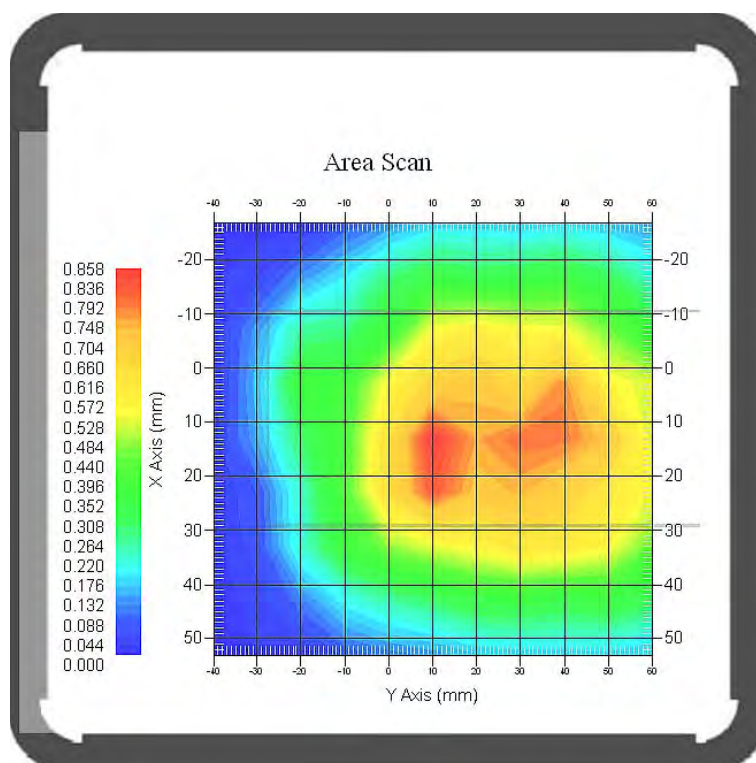
Tissue Data

Type : Body
Frequency : 836.6 MHz
Epsilon : 55.13 F/m
Sigma : 0.97 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 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.825 W/kg
10 gram SAR value : 0.436 W/kg
Area Scan Peak SAR : 0.850 W/kg
Zoom Scan Peak SAR : 1.229 W/kg

Plot 27#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Back (848.8 MHz High 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 : 0.988 W/kg
Power Drift-Finish : 0.975 W/kg
Power Drift (%) : -1.372

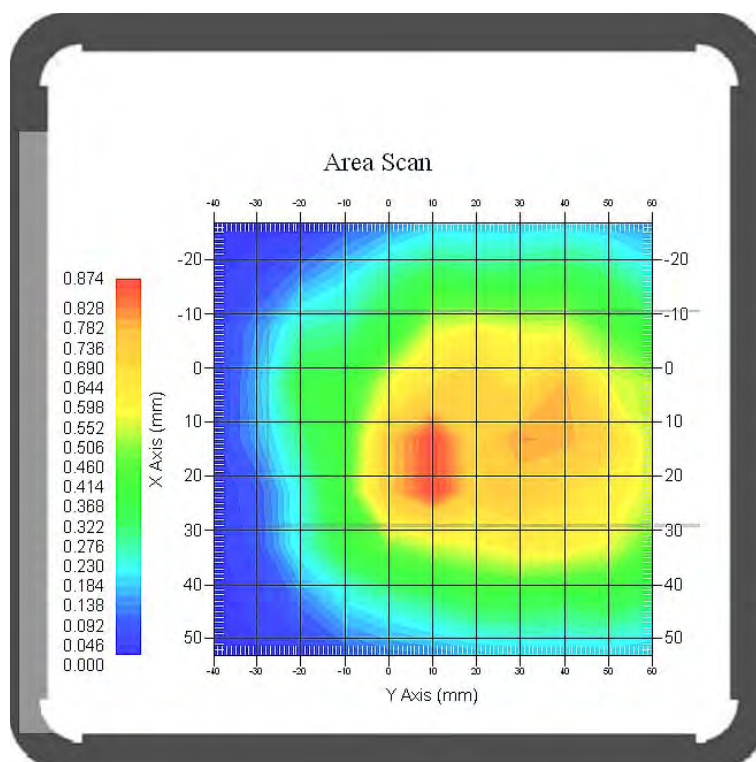
Tissue Data

Type : Body
Frequency : 848.8 MHz
Epsilon : 55.22 F/m
Sigma : 0.99 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.853 W/kg
10 gram SAR value : 0.495 W/kg
Area Scan Peak SAR : 0.843 W/kg
Zoom Scan Peak SAR : 1.505 W/kg

Plot 28#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Left (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 : 0.518 W/kg
Power Drift-Finish : 0.512 W/kg
Power Drift (%) : -1.339

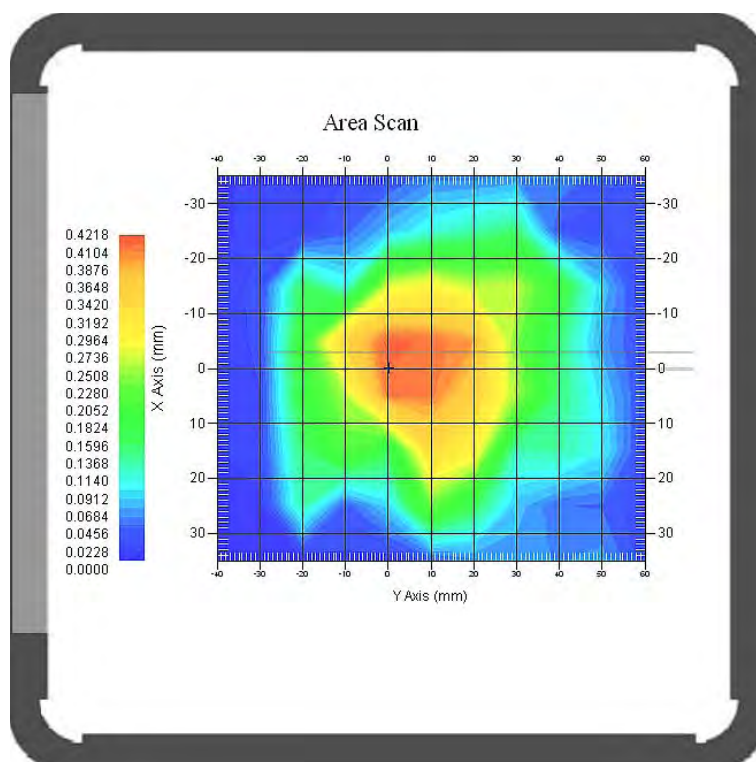
Tissue Data

Type : Body
Frequency : 836.6 MHz
Epsilon : 55.13 F/m
Sigma : 0.97 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.424 W/kg
10 gram SAR value : 0.275 W/kg
Area Scan Peak SAR : 0.451 W/kg
Zoom Scan Peak SAR : 1.142 W/kg

Plot 29#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Right (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 : 0.495 W/kg
Power Drift-Finish : 0.501 W/kg
Power Drift (%) : 1.214

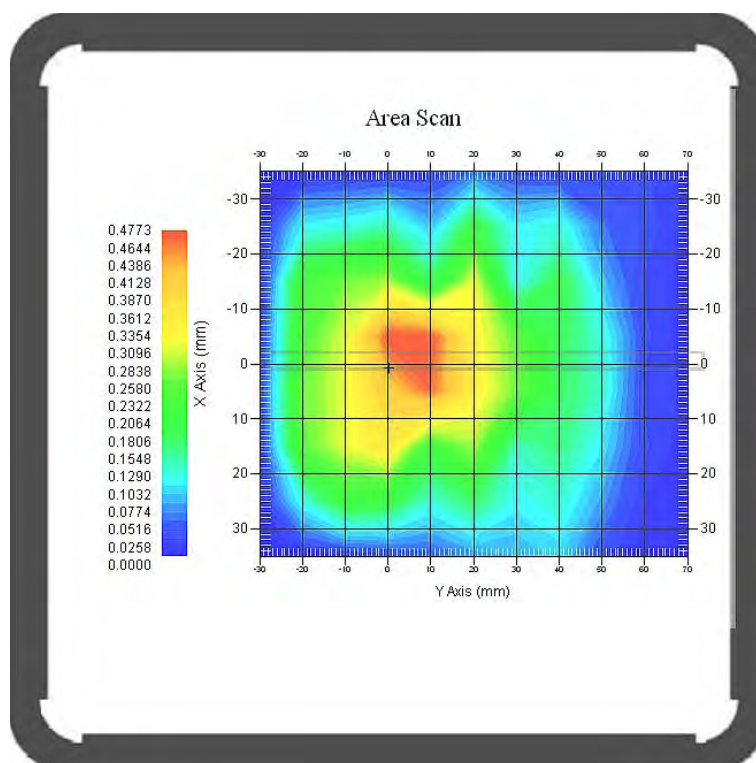
Tissue Data

Type : Body
Frequency : 836.6 MHz
Epsilon : 55.13 F/m
Sigma : 0.97 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.478 W/kg
10 gram SAR value : 0.285 W/kg
Area Scan Peak SAR : 0.451 W/kg
Zoom Scan Peak SAR : 1.008 W/kg

Plot 30#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Bottom (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 : 0.625 W/kg
Power Drift-Finish : 0.620 W/kg
Power Drift (%) : -0.869

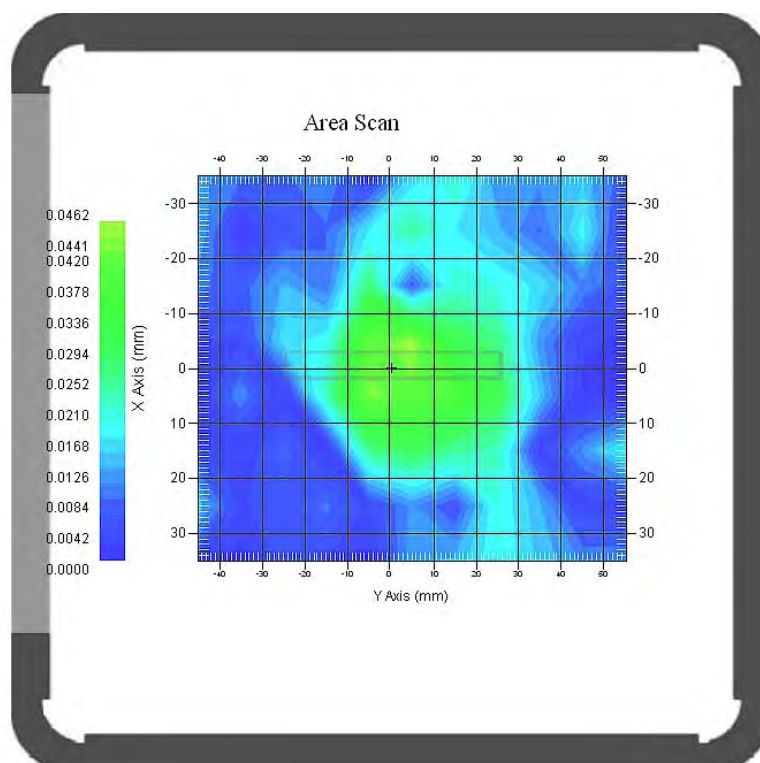
Tissue Data

Type : Body
Frequency : 836.6 MHz
Epsilon : 55.13 F/m
Sigma : 0.97 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 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.041 W/kg
10 gram SAR value : 0.021 W/kg
Area Scan Peak SAR : 0.045 W/kg
Zoom Scan Peak SAR : 0.060 W/kg

Plot 31#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Front (1880 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 : 0.513 W/kg
Power Drift-Finish : 0.505 W/kg
Power Drift (%) : -1.729

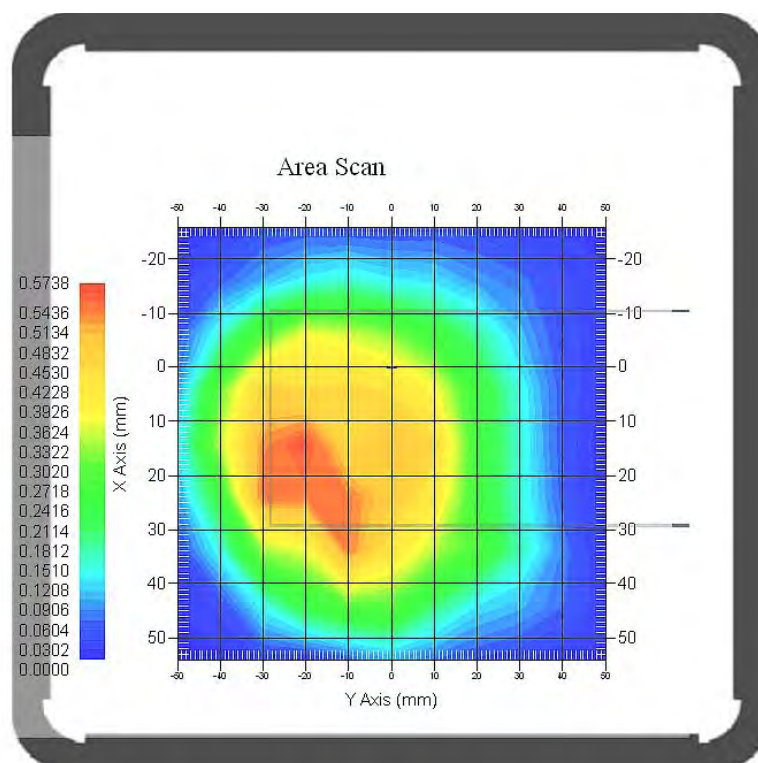
Tissue Data

Type : Body
Frequency : 1880 MHz
Epsilon : 53.78 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 2
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.559 W/kg
10 gram SAR value : 0.248 W/kg
Area Scan Peak SAR : 0.570 W/kg
Zoom Scan Peak SAR : 0.929 W/kg

Plot 32#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Back (1850.2 MHz Low 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 : 0.859 W/kg
Power Drift-Finish : 0.851 W/kg
Power Drift (%) : -0.918

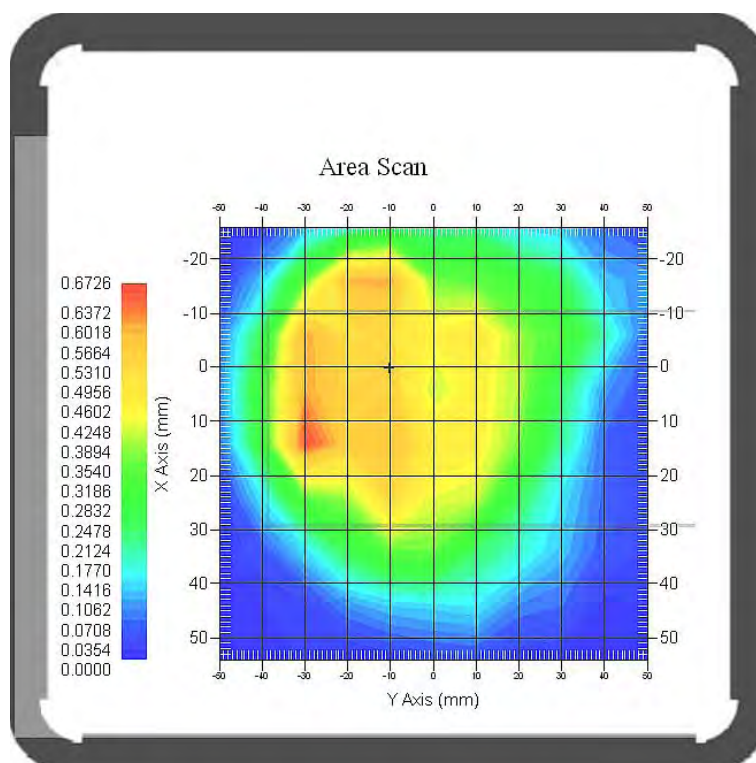
Tissue Data

Type : Body
Frequency : 1850.2 MHz
Epsilon : 52.99 F/m
Sigma : 1.50 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 2
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.651 W/kg
10 gram SAR value : 0.339 W/kg
Area Scan Peak SAR : 0.670 W/kg
Zoom Scan Peak SAR : 1.293 W/kg

Plot 33#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Back (1880 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 : 0.936 W/kg
Power Drift-Finish : 0.948 W/kg
Power Drift (%) : 1.993

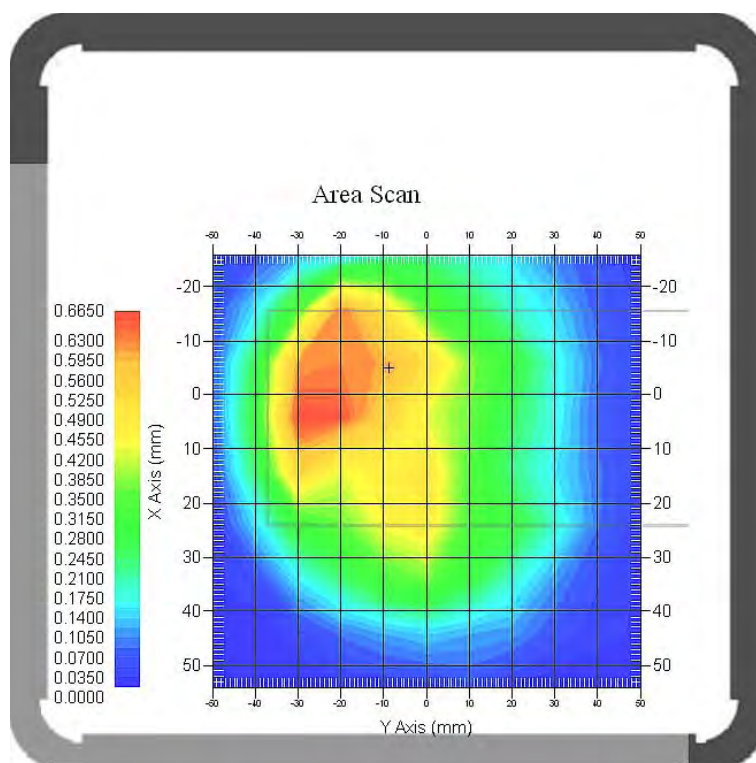
Tissue Data

Type : Body
Frequency : 1880 MHz
Epsilon : 52.78 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 2
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.623 W/kg
10 gram SAR value : 0.361 W/kg
Area Scan Peak SAR : 0.611 W/kg
Zoom Scan Peak SAR : 1.500 W/kg

Plot 34#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Back (1909.8 MHz High 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 : 0.893 W/kg
Power Drift-Finish : 0.901 W/kg
Power Drift (%) : 0.811

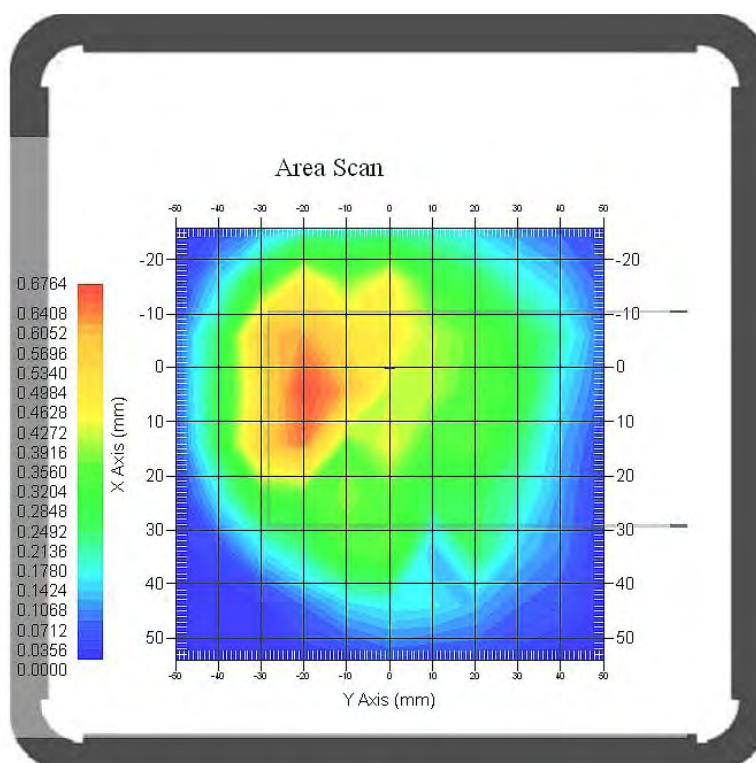
Tissue Data

Type : Body
Frequency : 1909.8 MHz
Epsilon : 52.84 F/m
Sigma : 1.55 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 2
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.677 W/kg
10 gram SAR value : 0.324 W/kg
Area Scan Peak SAR : 0.653 W/kg
Zoom Scan Peak SAR : 1.421 W/kg

Plot 35#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Left (1880 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 : 0.553 W/kg
Power Drift-Finish : 0.547 W/kg
Power Drift (%) : -1.124

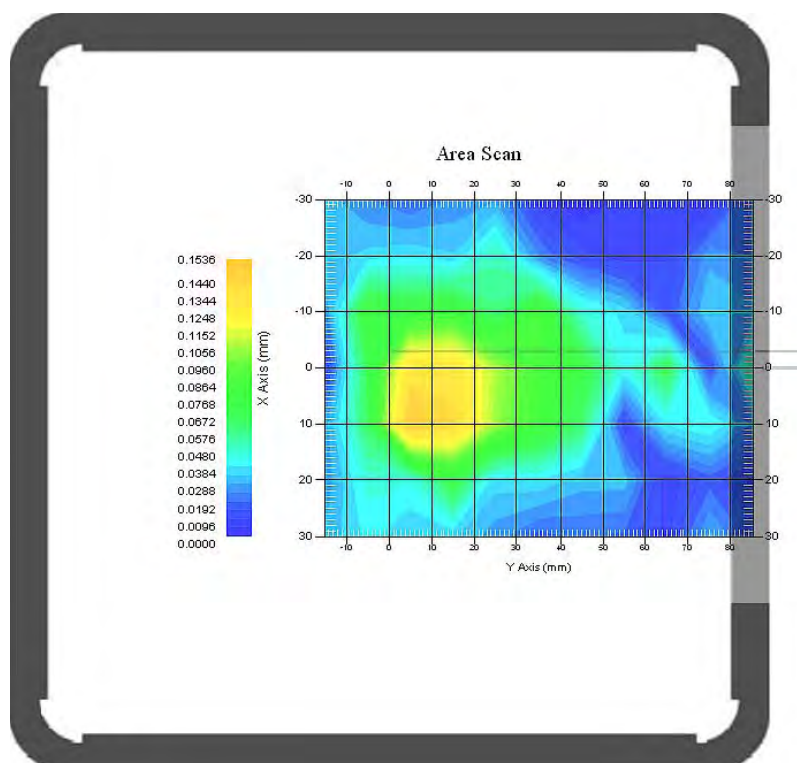
Tissue Data

Type : Body
Frequency : 1880 MHz
Epsilon : 52.78 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 2
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.125 W/kg
10 gram SAR value : 0.046 W/kg
Area Scan Peak SAR : 0.153 W/kg
Zoom Scan Peak SAR : 0.371 W/kg

Plot 36#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Right (1880 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 : 0.396 W/kg
Power Drift-Finish : 0.391 W/kg
Power Drift (%) : -1.303

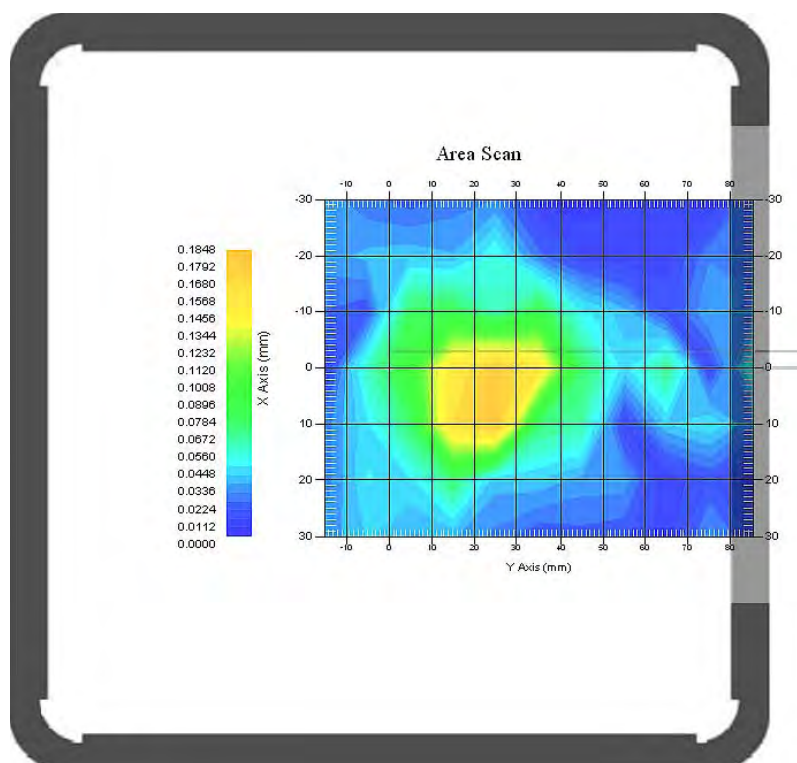
Tissue Data

Type : Body
Frequency : 1880 MHz
Epsilon : 52.78 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 2
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.178 W/kg
10 gram SAR value : 0.076 W/kg
Area Scan Peak SAR : 0.180 W/kg
Zoom Scan Peak SAR : 0.316 W/kg

Plot 37#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**Body-worn-Bottom (1880 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 : 0.426 W/kg
Power Drift-Finish : 0.429 W/kg
Power Drift (%) : 0.684

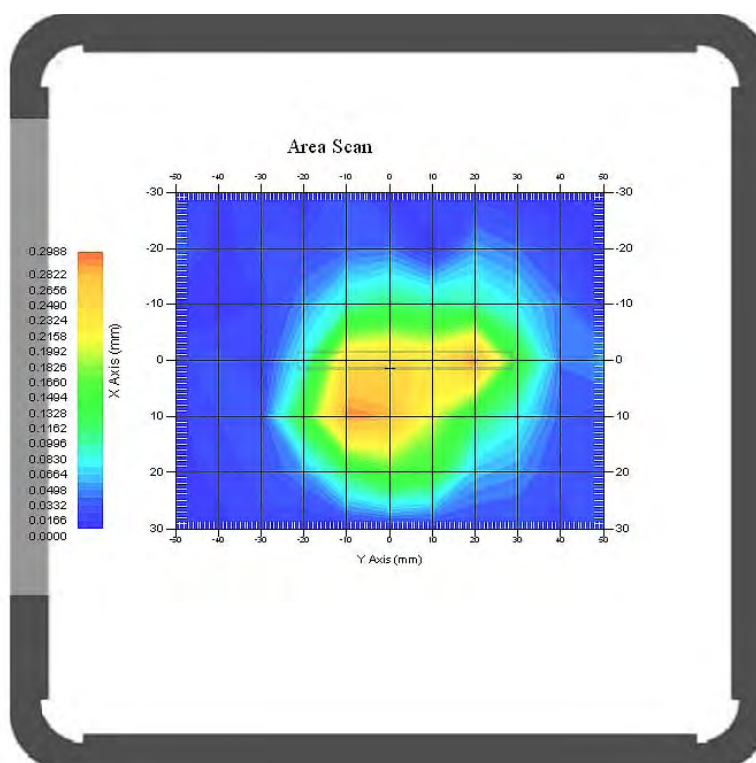
Tissue Data

Type : Body
Frequency : 1880 MHz
Epsilon : 52.78 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 2
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.281 W/kg
10 gram SAR value : 0.130 W/kg
Area Scan Peak SAR : 0.293 W/kg
Zoom Scan Peak SAR : 0.619 W/kg

Plot 38#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Body-Worn-Front (846.6 MHz High Channel)**

Measurement Data

Test mode : WCDMA850
Crest Factor : 1
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 : 0.361 W/kg
Power Drift-Finish : 0.354 W/kg
Power Drift (%) : -1.856

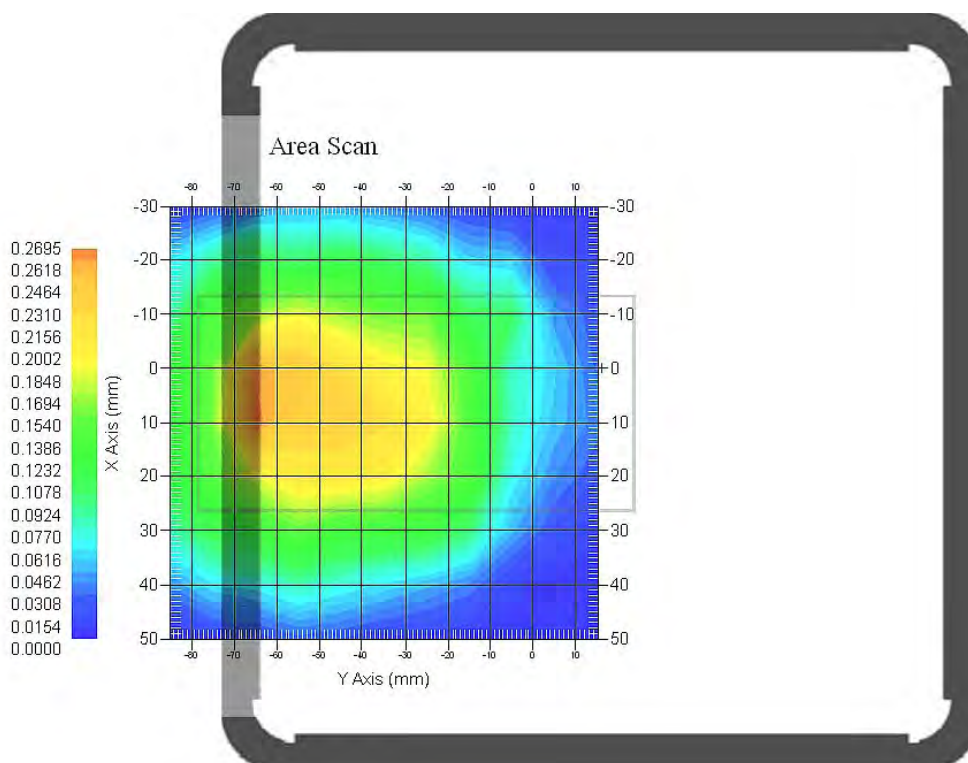
Tissue Data

Type : Body
Frequency : 846.6 MHz
Epsilon : 55.20 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.249 W/kg
10 gram SAR value : 0.139 W/kg
Area Scan Peak SAR : 0.266 W/kg
Zoom Scan Peak SAR : 0.682 W/kg

Plot 39#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Body-Worn-Back (846.6 MHz High Channel)**

Measurement Data

Test mode : WCDMA850
Crest Factor : 1
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 : 0.602 W/kg
Power Drift-Finish : 0.589 W/kg
Power Drift (%) : -2.137

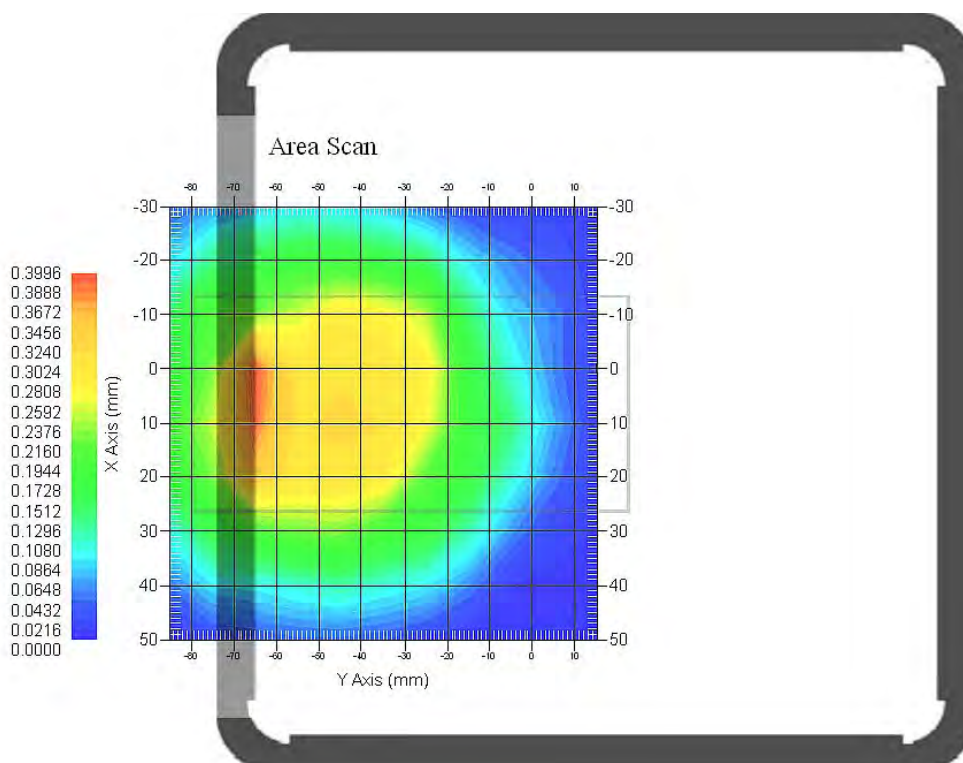
Tissue Data

Type : Body
Frequency : 846.6 MHz
Epsilon : 55.20 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.337 W/kg
10 gram SAR value : 0.279 W/kg
Area Scan Peak SAR : 0.395 W/kg
Zoom Scan Peak SAR : 0.626 W/kg

Plot 40#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Body-Worn-Left (846.6 MHz High Channel)**

Measurement Data

Test mode : WCDMA850
Crest Factor : 1
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 : 0.326 W/kg
Power Drift-Finish : 0.331 W/kg
Power Drift (%) : 1.387

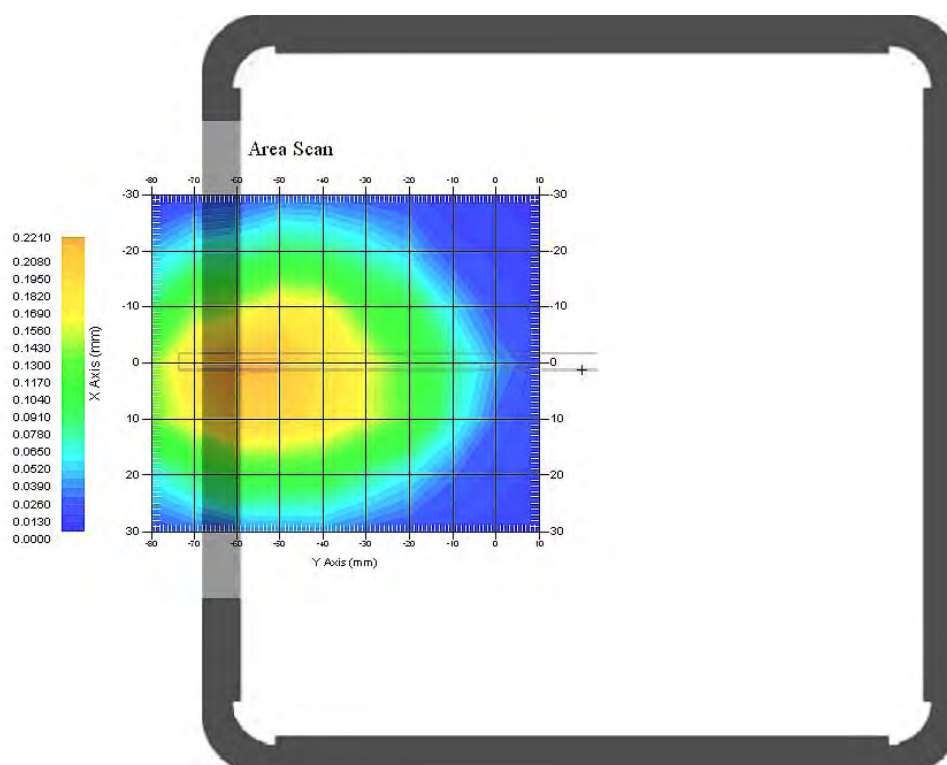
Tissue Data

Type : Body
Frequency : 846.6 MHz
Epsilon : 55.20 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.211 W/kg
10 gram SAR value : 0.112 W/kg
Area Scan Peak SAR : 0.220 W/kg
Zoom Scan Peak SAR : 0.418 W/kg

Plot 41#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Body-Worn-Right (846.6 MHz High Channel)**

Measurement Data

Test mode : WCDMA850
Crest Factor : 1
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 : 0.302 W/kg
Power Drift-Finish : 0.299 W/kg
Power Drift (%) : -0.989

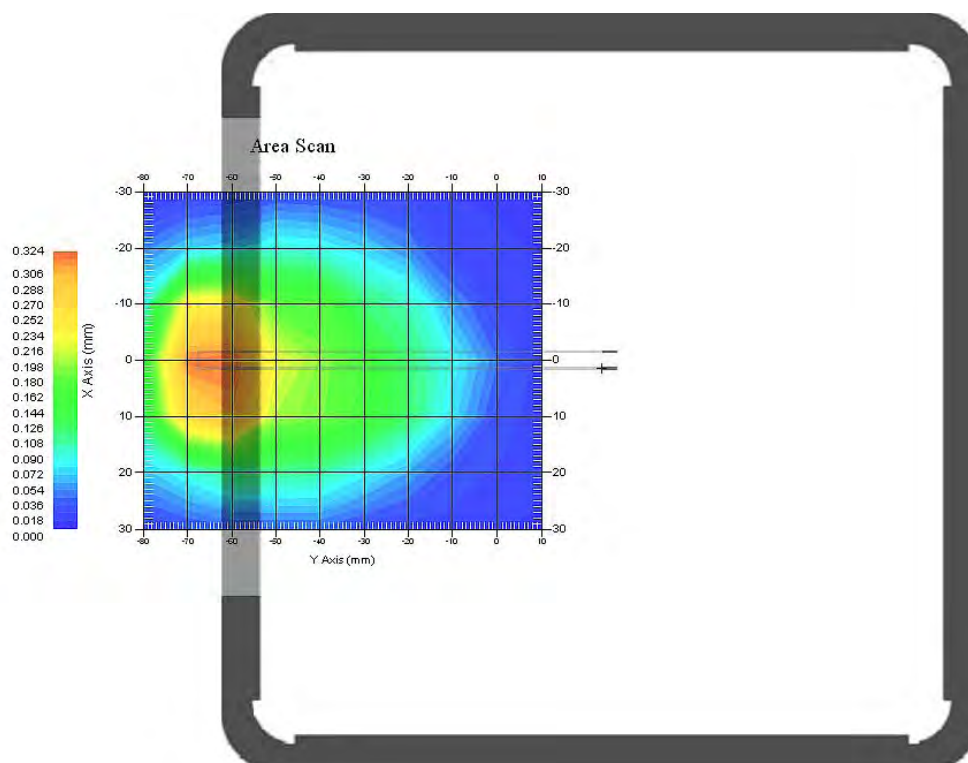
Tissue Data

Type : Body
Frequency : 846.6 MHz
Epsilon : 55.20 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.325 W/kg
10 gram SAR value : 0.158 W/kg
Area Scan Peak SAR : 0.321 W/kg
Zoom Scan Peak SAR : 0.429 W/kg

Plot 42#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA850; Body-Worn- Bottom (846.6 MHz High Channel)**

Measurement Data

Test mode : WCDMA850
Crest Factor : 1
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 : 0.269 W/kg
Power Drift-Finish : 0.265 W/kg
Power Drift (%) : -1.815

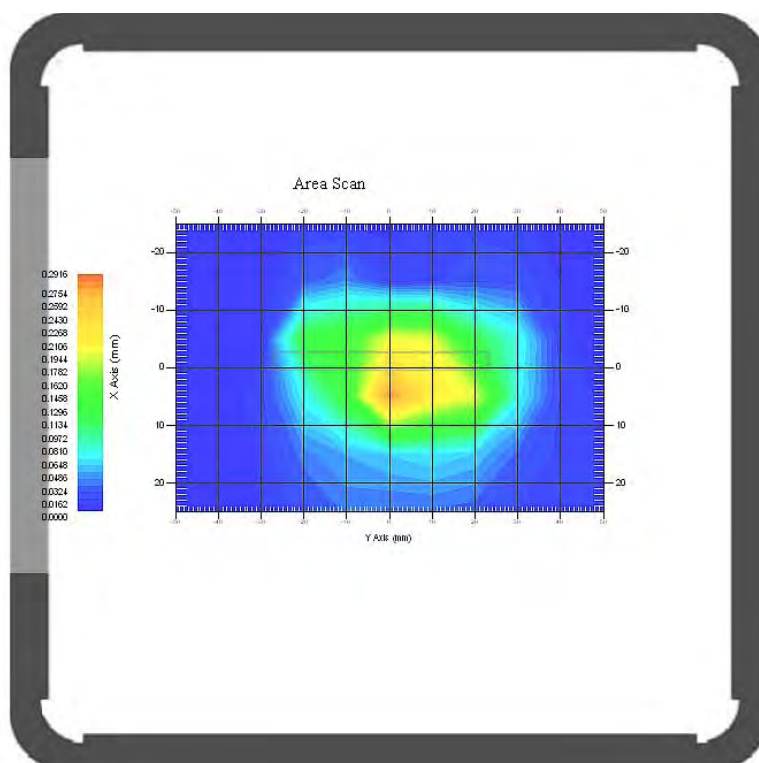
Tissue Data

Type : Body
Frequency : 846.6 MHz
Epsilon : 55.20 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 835
Duty Cycle Factor : 1
Conversion Factor : 5.9
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.286 W/kg
10 gram SAR value : 0.165 W/kg
Area Scan Peak SAR : 0.290 W/kg
Zoom Scan Peak SAR : 0.558 W/kg

Plot 43#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Body-Worn-Front (1852.4 MHz Low Channel)****Measurement Data**

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.305 W/kg
Power Drift-Finish : 0.309 W/kg
Power Drift (%) : 1.322

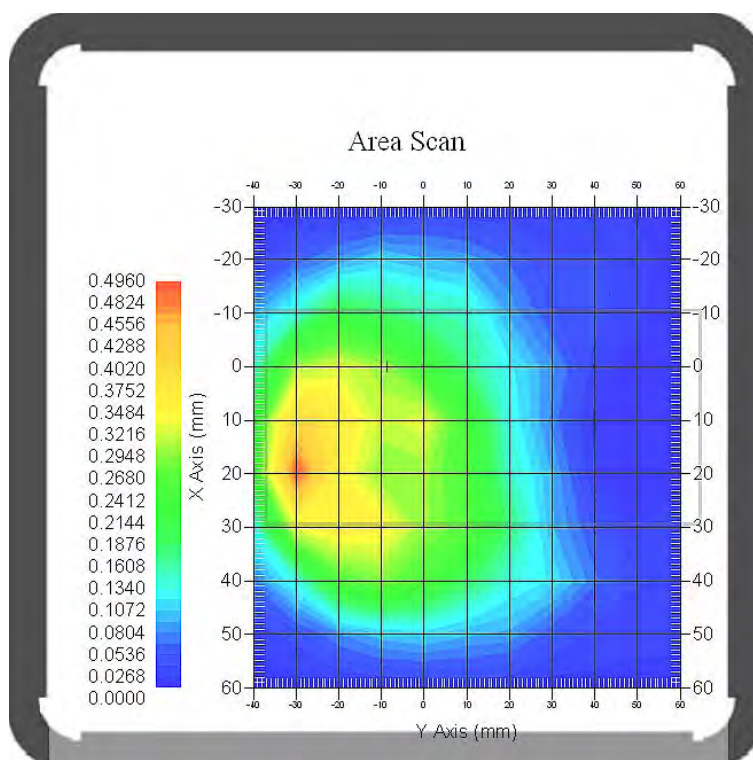
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 52.97 F/m
Sigma : 1.50 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.486 W/kg
10 gram SAR value : 0.213 W/kg
Area Scan Peak SAR : 0.493 W/kg
Zoom Scan Peak SAR : 0.659 W/kg

Plot 44#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Body-Worn-Back (1852.4 MHz Low Channel)**

Measurement Data

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.425 W/kg
Power Drift-Finish : 0.431 W/kg
Power Drift (%) : 1.473

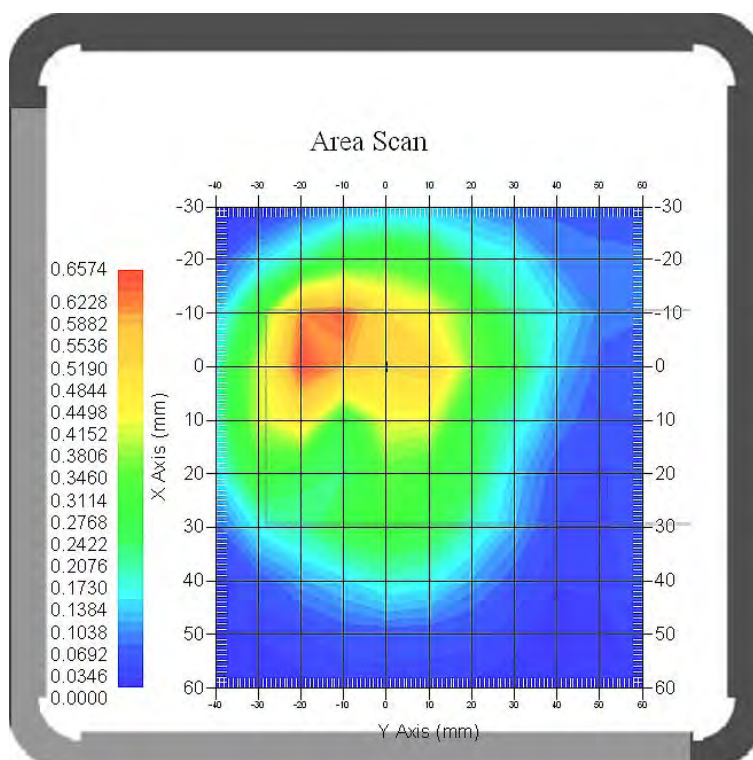
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 52.97 F/m
Sigma : 1.50 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.684 W/kg
10 gram SAR value : 0.346 W/kg
Area Scan Peak SAR : 0.654 W/kg
Zoom Scan Peak SAR : 0.959 W/kg

Plot 45#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Body-Worn-Left (1852.4 MHz Low Channel)**

Measurement Data

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.329 W/kg
Power Drift-Finish : 0.321 W/kg
Power Drift (%) : -2.344

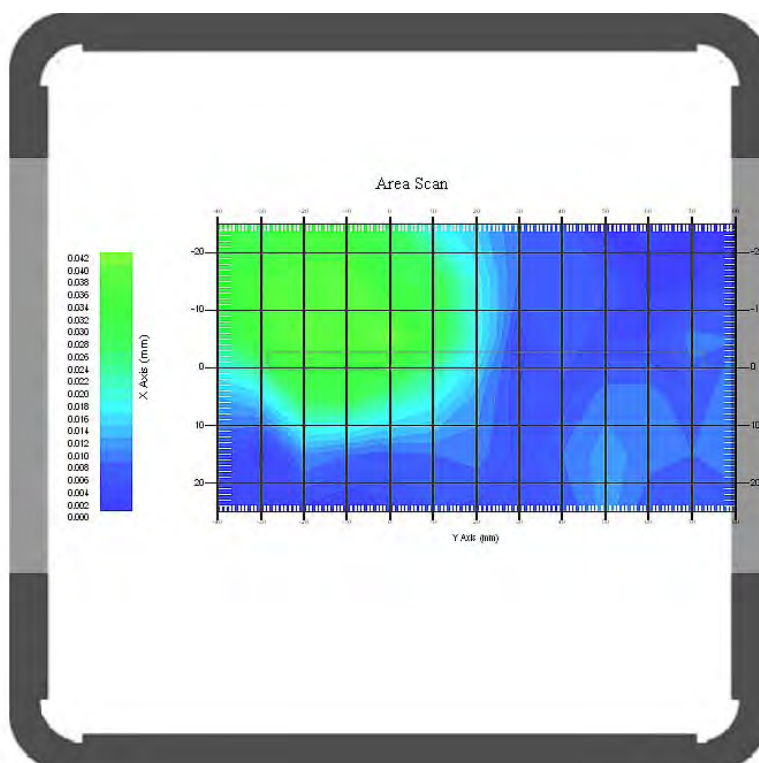
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 52.97 F/m
Sigma : 1.50 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.039 W/kg
10 gram SAR value : 0.022 W/kg
Area Scan Peak SAR : 0.048 W/kg
Zoom Scan Peak SAR : 0.501 W/kg

Plot 46#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Body-Worn-Right (1852.4 MHz Low Channel)**

Measurement Data

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.255 W/kg
Power Drift-Finish : 0.250 W/kg
Power Drift (%) : -1.715

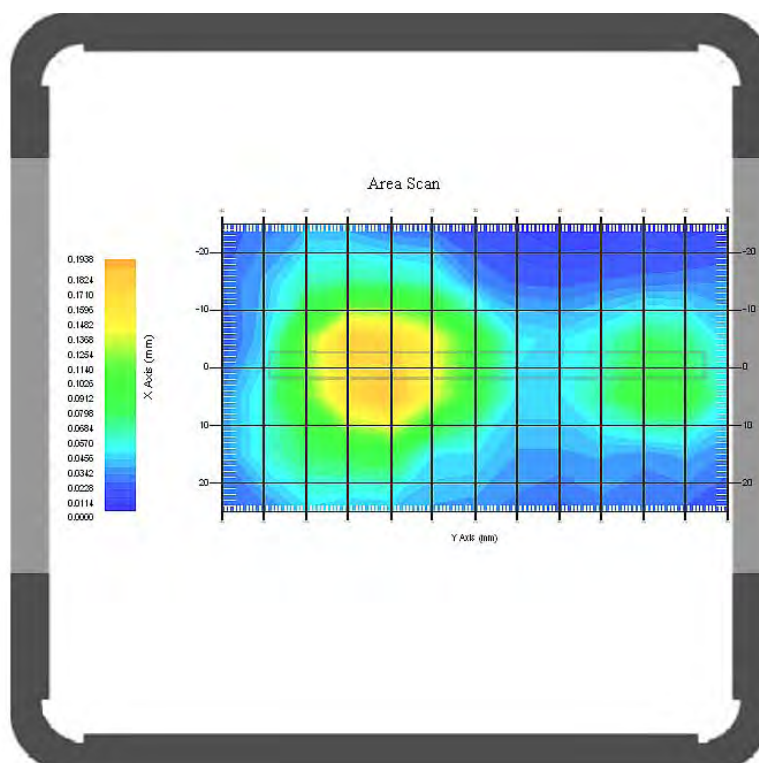
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 52.97 F/m
Sigma : 1.50 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.186 W/kg
10 gram SAR value : 0.085 W/kg
Area Scan Peak SAR : 0.196 W/kg
Zoom Scan Peak SAR : 0.418 W/kg

Plot 47#

Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)**WCDMA1900; Body-Worn-Bottom (1852.4 MHz Low Channel)**

Measurement Data

Test mode : WCDMA1900
Crest Factor : 1
Scan Type : Complete
Area Scan : 11x9x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.195 W/kg
Power Drift-Finish : 0.191 W/kg
Power Drift (%) : -2.126

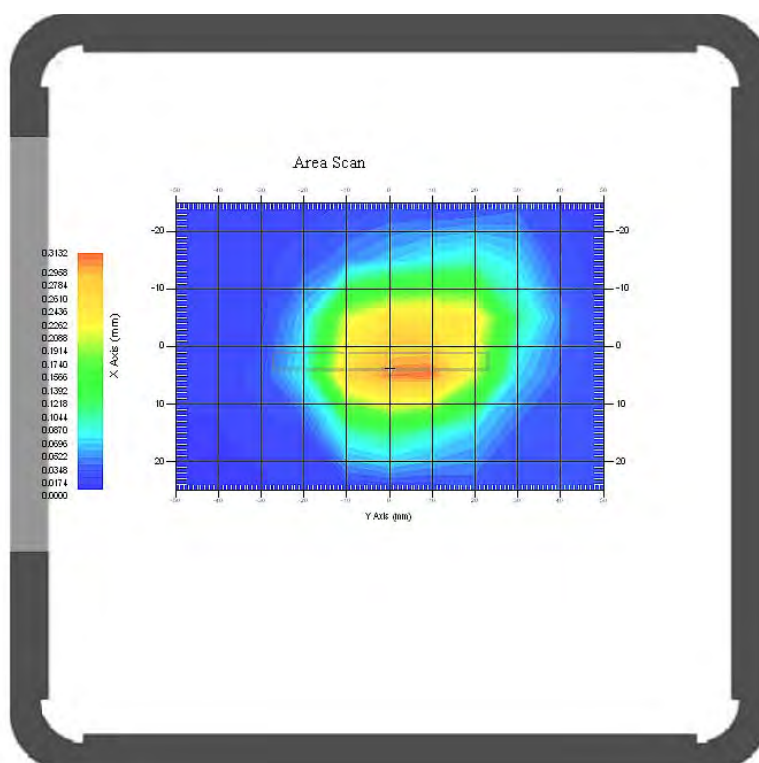
Tissue Data

Type : Head
Frequency : 1852.4 MHz
Epsilon : 52.97 F/m
Sigma : 1.50 S/m
Density : 1000.00 kg/cu. m

Probe Data

Serial No. : 500-00283
Frequency Band : 1900
Duty Cycle Factor : 1
Conversion Factor : 4.5
Probe Sensitivity : 1.20 1.20 1.20 $\mu\text{V}/(\text{V/m})^2$
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.321 W/kg
10 gram SAR value : 0.153 W/kg
Area Scan Peak SAR : 0.318 W/kg
Zoom Scan Peak SAR : 0.631 W/kg

Plot 48#

APPENDIX A MEASUREMENT UNCERTAINTY

The uncertainty budget has been determined for the measurement system and is given in the following Table.

Measurement Uncertainty for 300MHz to 3GHz

Source of Uncertainty	Tolerance Value	Probability Distribution	Divisor	c_1^1 (1-g)	c_1^1 (10-g)	Standard Uncertainty (1-g) %	Standard Uncertainty (10-g) %
Measurement System							
Probe Calibration	3.5	normal	1	1	1	3.5	3.5
Axial Isotropy	3.7	rectangular	$\sqrt{3}$	$(1-cp)^{1/2}$	$(1-cp)^{1/2}$	1.5	1.5
Hemispherical Isotropy	10.9	rectangular	$\sqrt{3}$	$\sqrt{cp}$	$\sqrt{cp}$	4.4	4.4
Boundary Effect	1.0	rectangular	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	rectangular	$\sqrt{3}$	1	1	2.7	2.7
Detection Limit	1.0	rectangular	$\sqrt{3}$	1	1	0.6	0.6
Readout Electronics	1.0	normal	1	1	1	1.0	1.0
Response Time	0.8	rectangular	$\sqrt{3}$	1	1	0.5	0.5
Integration Time	1.7	rectangular	$\sqrt{3}$	1	1	1.0	1.0
RF Ambient Condition -Noise	0.006	rectangular	$\sqrt{3}$	1	1	0.003	0.003
RF Ambient Condition - Reflections	3.0	rectangular	$\sqrt{3}$	1	1	1.7	1.7
Probe Positioner Mech. Restrictions	0.4	rectangular	$\sqrt{3}$	1	1	0.2	0.2
Restriction							
Probe Positioning with respect to Phantom Shell	2.9	rectangular	$\sqrt{3}$	1	1	1.7	1.7
Extrapolation and Integration	3.7	rectangular	$\sqrt{3}$	1	1	2.1	2.1
Test Sample Positioning	0.023	normal	1	1	1	0.023	0.023
Device Holder Uncertainty	6.215	normal	1	1	1	6.215	6.215
Drift of Output Power	4.627	rectangular	$\sqrt{3}$	1	1	2.67	2.67
Phantom and Setup							
Phantom Uncertainty(shape & thickness tolerance)	3.4	rectangular	$\sqrt{3}$	1	1	2.0	2.0
Liquid Conductivity(target)	5.0	rectangular	$\sqrt{3}$	0.7	0.5	2.0	1.4
Liquid Conductivity(meas.)	1.938	normal	1	0.7	0.5	1.36	0.97
Liquid Permittivity(target)	5.0	rectangular	$\sqrt{3}$	0.6	0.5	1.7	1.4
Liquid Permittivity(meas.)	3.093	normal	1	0.6	0.5	1.86	1.55
Combined Uncertainty		RSS				10.78	10.55
Expanded uncertainty (coverage factor=2)		Normal(k=2)				21.56	21.10

APPENDIX B – PROBE CALIBRATION CERTIFICATES

NCL CALIBRATION LABORATORIES

Calibration File No.: PC-1537

Task No: BACL-5745

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the
NCL CALIBRATION LABORATORIES by qualified personnel following recognized
procedures and using transfer standards traceable to NRC/NIST.

Equipment: Miniature Isotropic RF Probe

Record of Calibration

Head and Body

Manufacturer: APREL Laboratories

Model No.: E-020

Serial No.: 500-00283

Calibration Procedure: D01-032-E020-V2, D22-012-Tissue, D28-002-Dipole
Project No: BACL-5745

Calibrated: 8th October 2013

Released on: 8th October 2013

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By:



Art Brennan, Quality Manager

NCL CALIBRATION LABORATORIES

Suite 102, 303 Terry Fox Dr.
OTTAWA, ONTARIO
CANADA K2K 3J1

Division of APREL Lab.
TEL: (613) 435-8300
FAX: (613) 435-8306

NCL Calibration Laboratories

Division of APREL Inc.

Introduction

This Calibration Report reproduces the results of the calibration performed in line with the references listed below. Calibration is performed using accepted methodologies as per the references listed below. Probes are calibrated for air, and tissue and the values reported are the results from the physical quantification of the probe through meteorological practices.

Calibration Method

Probes are calibrated using the following methods.

<1000MHz

TEM Cell for sensitivity in air

Standard phantom using temperature transfer method for sensitivity in tissue

>1000MHz

Waveguide* method to determine sensitivity in air and tissue

*Waveguide is numerically (simulation) assessed to determine the field distribution and power

The boundary effect for the probe is assessed using a standard flat phantom where the probe output is compared against a numerically simulated series of data points

References

- IEEE Standard 1528
IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
- EN 62209-1
Human Exposure to RF Fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures-Part 1: Procedure to measure the Specific Absorption Rate (SAR) for hand-held mobile wireless devices
- IEC 62209-2
Human exposure to RF fields from hand-held and body-mounted wireless devices - Human models, instrumentation, and procedures - Part 2: specific absorption rate (SAR) for wireless communication devices (30 MHz - 6 GHz)
- TP-D01-032-E020-V2 E-Field probe calibration procedure
- D22-012-Tissue dielectric tissue calibration procedure
- D28-002-Dipole procedure for validation of SAR system using a dipole
- IEEE 1309 Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

Page 2 of 10

This page has been reviewed for content and attested to on Page 2 of this document.

NCL Calibration Laboratories

Division of APREL Inc.

Conditions

Probe 500-00283 was a recalibration.

Ambient Temperature of the Laboratory: 22 °C +/- 1.5°C**Temperature of the Tissue:** 21 °C +/- 1.5°C**Relative Humidity:** < 60%**Primary Measurement Standards**

Instrument	Serial Number	Cal due date
Tektronix USB Power Meter	11C940	May 14, 2015
Signal Generator HP 83640B	3844A00689	Feb 12, 2015

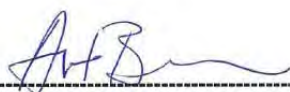
Secondary Measurement Standards

Network Analyzer Anritsu 37347C	002106	Feb. 20, 2015
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Attestation

The below named signatories have conducted the calibration and review of the data which is presented in this calibration report.

We the undersigned attest that to the best of our knowledge the calibration of this subject has been accurately conducted and that all information contained within the results pages have been reviewed for accuracy.



Art Brennan, Quality Manager



Dan Brooks, Test Engineer

Page 3 of 10

This page has been reviewed for content and attested to on Page 2 of this document.

NCL Calibration Laboratories

Division of APREL Inc.

Probe Summary

Probe Type:	E-Field Probe E020
Serial Number:	500-00283
Frequency:	As presented on page 5
Sensor Offset:	1.56
Sensor Length:	2.5
Tip Enclosure:	Composite*
Tip Diameter:	< 2.9 mm
Tip Length:	55 mm
Total Length:	289 mm

*Resistive to recommended tissue recipes per IEEE-1528

Sensitivity in Air

Channel X:	$1.2 \mu\text{V}/(\text{V}/\text{m})^2$
Channel Y:	$1.2 \mu\text{V}/(\text{V}/\text{m})^2$
Channel Z:	$1.2 \mu\text{V}/(\text{V}/\text{m})^2$
Diode Compression Point:	95 mV

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This page has been reviewed for content and attested to on Page 2 of this document.

NCL Calibration Laboratories

Division of APREL Inc.

Calibration for Tissue (Head H, Body B)

Frequency	Tissue Type	Measured Epsilon	Measured Sigma	Standard Uncertainty (%)	Calibration Frequency Range (MHz)	Conversion Factor
450 H	Head	44.29	0.86	3.5	±50	5.7
450 B	Body	56.6	0.94	3.5	±50	5.8
750 H	Head	42.7	0.85	3.5	±50	5.6
750 B	Body	56.6	0.94	3.5	±50	5.5
835 H	Head	42.35	0.938	3.5	±50	5.9
835 B	Body	56.65	1.018	3.5	±50	5.9
900 H	Head	X	X	X	X	X
900 B	Body	X	X	X	X	X
1450 H	Head	X	X	X	X	X
1450 B	Body	X	X	X	X	X
1500 H	Head	X	X	X	X	X
1500 B	Body	X	X	X	X	X
1640 H	Head	X	X	X	X	X
1640 B	Body	X	X	X	X	X
1750 H	Head	38.51	1.36	3.5	±75	5.4
1750 B	Body	51.79	1.53	3.5	±75	5.3
1800 H	Head	38.26	1.41	3.5	±75	5.0
1800 B	Body	51.61	1.58	3.5	±75	5.0
1900 H	Head	38.03	1.36	3.5	±75	4.8
1900 B	Body	53.13	1.58	3.5	±75	4.5
2000 H	Head	X	X	X	X	X
2000 B	Body	X	X	X	X	X
2100 H	Head	X	X	X	X	X
2100 B	Body	X	X	X	X	X
2300 H	Head	X	X	X	X	X
2300 B	Body	X	X	X	X	X
2450 H	Head	37.64	1.88	3.5	±75	4.9
2450 B	Body	50.7	2.03	3.5	±75	4.3
2600 H	Head	X	X	X	X	X
2600 B	Body	X	X	X	X	X
3000 H	Head	X	X	X	X	X
3000 B	Body	X	X	X	X	X
3600 H	Head	X	X	X	X	X
3600 B	Body	X	X	X	X	X
5250 H	Head	34.65	4.8	3.5	±100	2.7
5250 B	Body	47.6	5.3	3.5	±100	2.6
5600 H	Head	33.2	5.15	3.5	±100	2.5
5600 B	Body	45.21	5.57	3.5	±100	2.2
5800 H	Head	32.72	5.38	3.5	±100	3.2
5800 B	Body	44.28	6.04	3.5	±100	2.5

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This page has been reviewed for content and attested to on Page 2 of this document.

NCL Calibration Laboratories

Division of APREL Inc.

Boundary Effect:

Uncertainty resulting from the boundary effect is less than 2.1% for the distance between the tip of the probe and the tissue boundary, when less than 0.58mm.

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.

DAQ-PAQ Contribution

To minimize the uncertainty calculation all tissue sensitivity values were calculated using a load impedance of 5 M Ω .

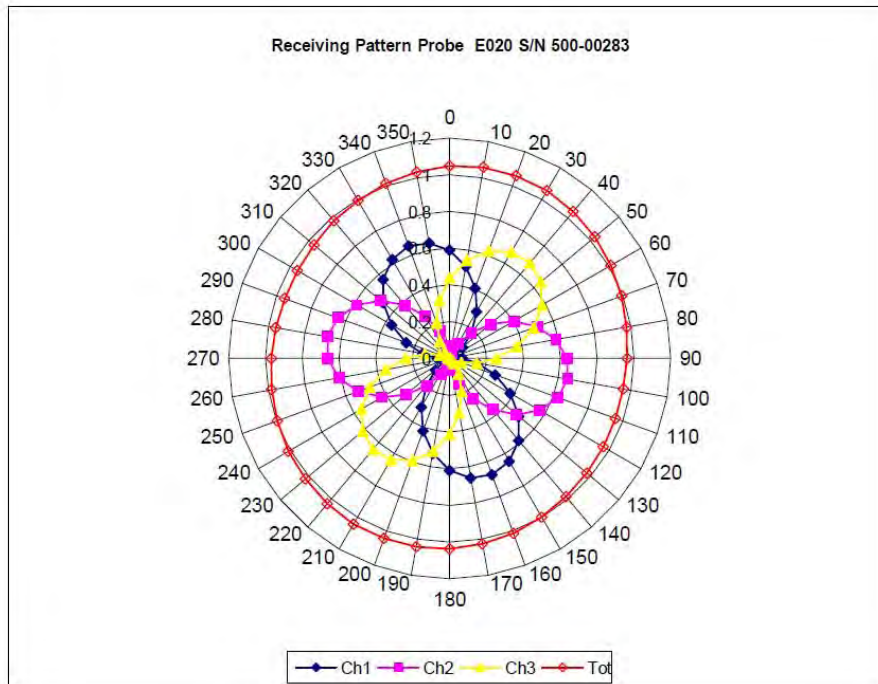
Page 6 of 10

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NCL Calibration Laboratories

Division of APREL Inc.

Receiving Pattern Air



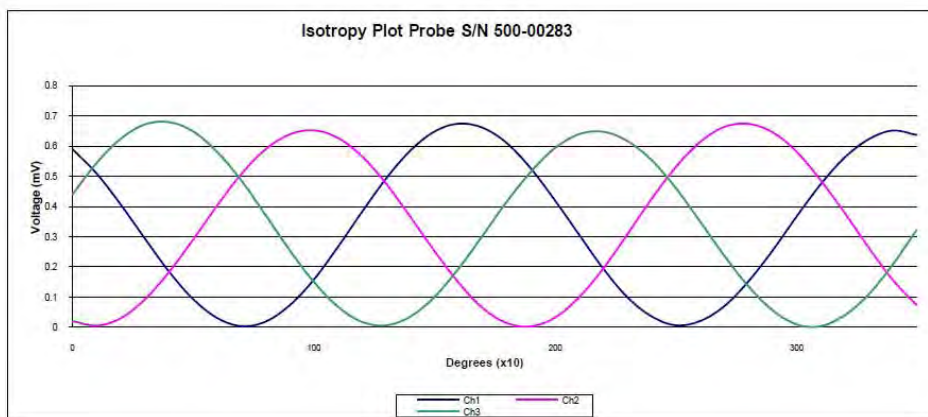
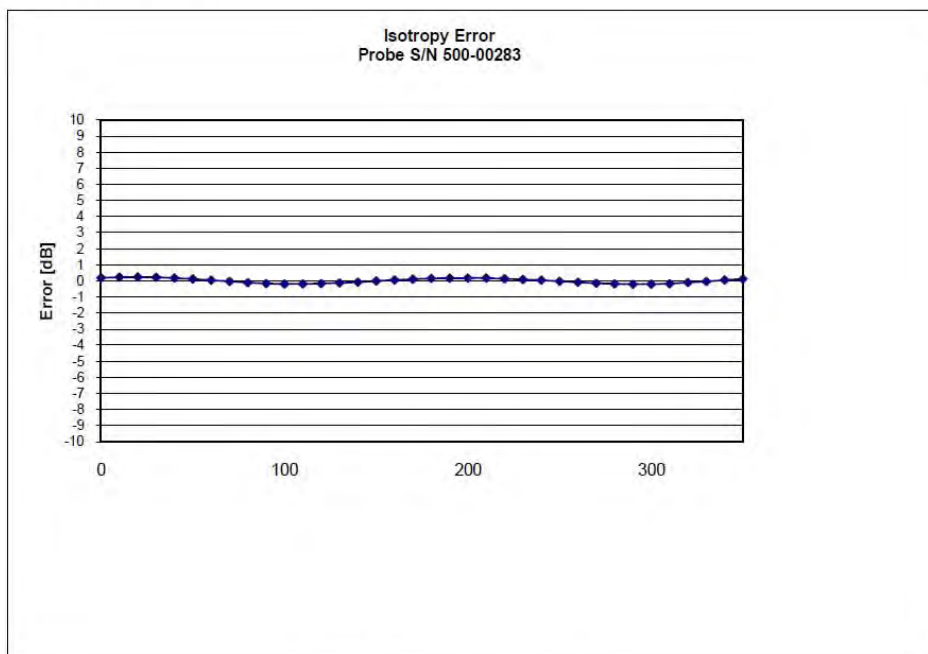
Page 7 of 10

This page has been reviewed for content and attested to on Page 2 of this document.

NCL Calibration Laboratories

Division of APREL Inc.

Isotropy Error Air



Isotropy Tissue:

0.10 dB

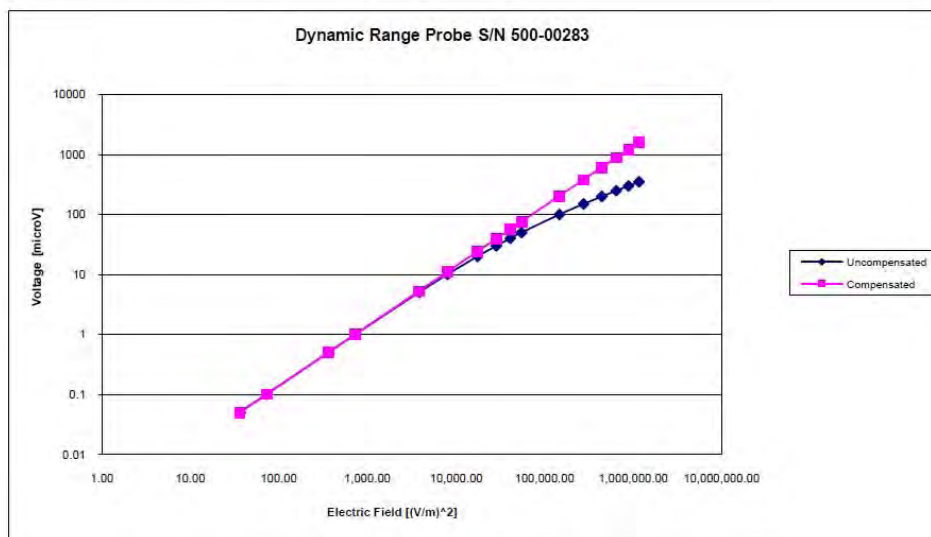
Page 8 of 10

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NCL Calibration Laboratories

Division of APREL Inc.

Dynamic Range

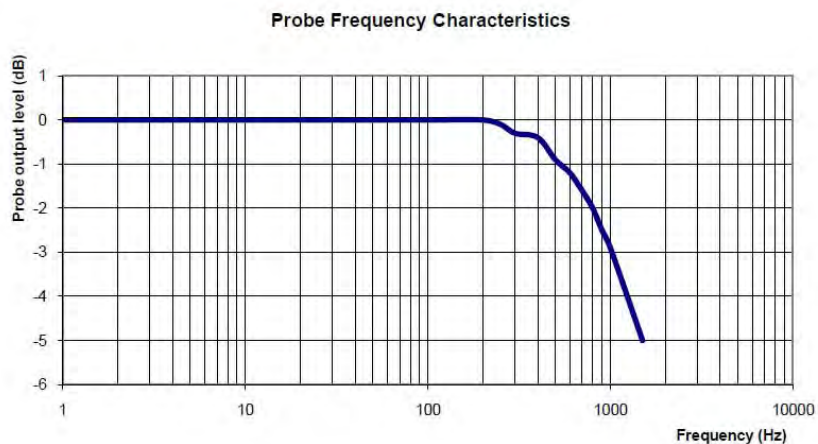


Page 9 of 10

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NCL Calibration Laboratories

Division of APREL Inc.

Video Bandwidth

Video Bandwidth at 500 Hz 1 dB
Video Bandwidth at 1.02 KHz: 3 dB

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2013.

Page 10 of 10

This page has been reviewed for content and attested to on Page 2 of this document.

APPENDIX C DIPOLE CALIBRATION CERTIFICATES

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1327
Project Number: BAC-dipole-cal-5618

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the
NCL CALIBRATION LABORATORIES by qualified personnel following recognized
procedures and using transfer standards traceable to NRC/NIST.

Validation Dipole(Head and Body)

Manufacturer: APREL Laboratories

Part number: ALS-D-835-S-2

Frequency: 835 MHz

Serial No: 180-00558

Customer: Bay Area Compliance Laboratory

Calibrated: 25th August 2011

Released on: 25th August 2011

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: _____

NCL CALIBRATION LABORATORIES

Suite 102, 303 Terry Fox Dr.
Kanata, ONTARIO
CANADA K2K 3J1

Division of APREL Lab.
TEL: (613) 435-8300
FAX: (613)435-8306

NCL Calibration Laboratories

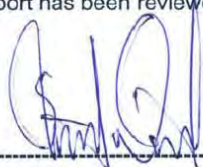
Division of APREL Laboratories.

Conditions

Dipole 180-00558 was received in good condition and a re-calibration.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C**Temperature of the Tissue:** 21 °C +/- 0.5°C

We the undersigned attest that to the best of our knowledge the calibration of this device has been accurately conducted and that all information contained within this report has been reviewed for accuracy.



Stuart Nicol



C. Teodorian

Primary Measurement Standards

Instrument	Serial Number	Cal due date
Power meter Anritsu MA2408A	245025437	Nov.4, 2011
Power Sensor Anritsu MA2481D	103555	Nov 4, 2011
Attenuator HP 8495A (70dB) 1	944A10711	Aug.8, 2012
Network Analyzer Agilent E5071C	1334746J	Feb. 8, 2012
Secondary Measurement Standards		
Signal Generator Agilent E4438C	-506 MY55182336	June 7, 2012

This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories

Division of APREL Laboratories.

Calibration Results Summary

The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions

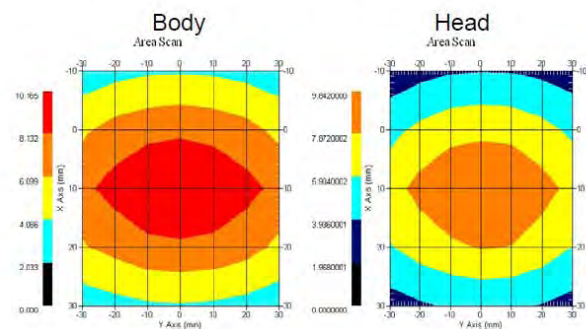
Length: 162.2 mm
Height: 89.4 mm

Electrical Specification

Tissue	Frequency	SWR:	Return Loss	Impedance
Head	835 MHz	1.0417 U	-35.395dB	49.020 Ω
Body	835 MHz	1.1177 U	-25.424dB	55.435 Ω

System Validation Results

Tissue	Frequency	1 Gram	10 Gram	Peak
Head	835 MHz	9.590	6.003	15.013
Body	835 MHz	9.684	6.263	14.23



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NCL Calibration Laboratories

Division of APREL Laboratories.

Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole 180-00558. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 130 MHz to 26 GHz E-Field Probe Serial Number 212.

References

SSI-TP-018-ALSAS Dipole Calibration Procedure
SSI-TP-016 Tissue Calibration Procedure
IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"

Conditions

Dipole 180-00558 was new taken from stock.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C

Temperature of the Tissue: 20 °C +/- 0.5°C

Dipole Calibration uncertainty

The calibration uncertainty for the dipole is made up of various parameters presented below.

Mechanical	1%
Positioning Error	1.22%
Electrical	1.7%
Tissue	2.2%
Dipole Validation	2.2%
TOTAL	8.32% (16.64% K=2)

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NCL Calibration Laboratories

Division of APREL Laboratories.

Dipole Calibration Results**Mechanical Verification**

APREL Length	APREL Height	Measured Length	Measured Height
161.0 mm	89.8 mm	162.2 mm	89.4 mm

Tissue Type	Return Loss:	SWR:	Impedance:
Head	-35.395 dB	1.0417 U	49.020 Ω
Body	-25.454 dB	1.1177 U	55.435 Ω

Tissue Validation

	Dielectric constant, ϵ_r	Conductivity, σ [S/m]
Head Tissue 835MHz	41.78	0.92
Body Tissue 835MHz	56.37	0.95

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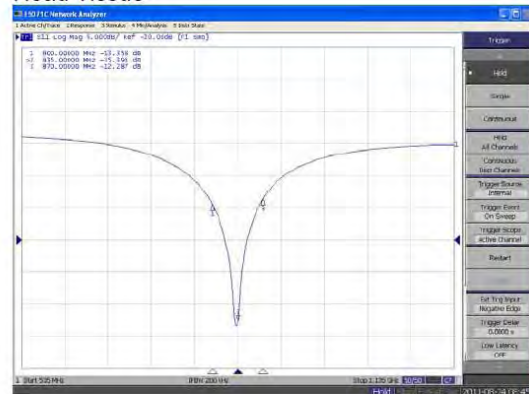
NCL Calibration Laboratories

Division of APREL Laboratories.

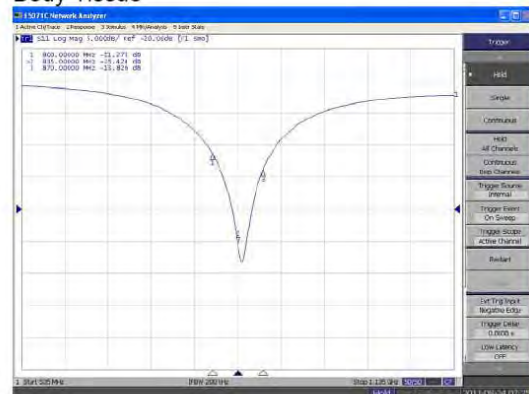
The Following Graphs are the results as displayed on the Vector Network Analyzer.

S11 Parameter Return Loss

Head Tissue



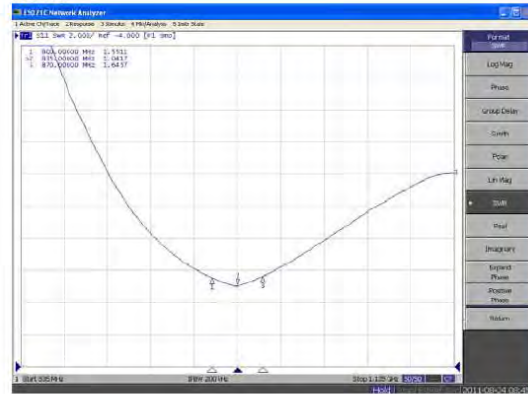
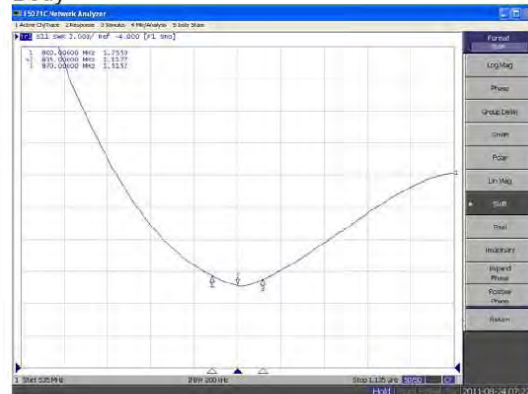
Body Tissue



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NCL Calibration Laboratories

Division of APREL Laboratories.

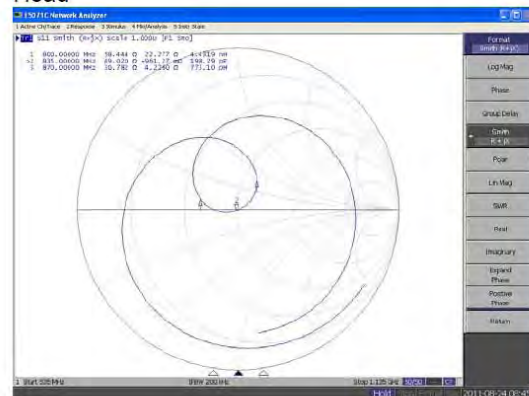
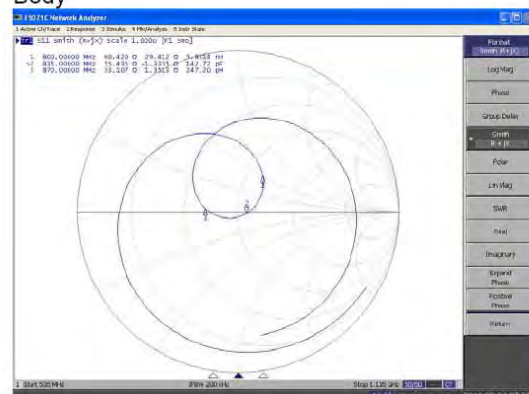
**SWR
Head****Body**

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NCL Calibration Laboratories

Division of APREL Laboratories.

Smith Chart Dipole Impedance**Head****Body**

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NCL Calibration Laboratories

Division of APREL Laboratories.

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List 2011.

This page has been reviewed for content and attested to by signature within this document.

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835MHz Dipole Calibration By BACL at 2013-12-20

Mechanical Verification

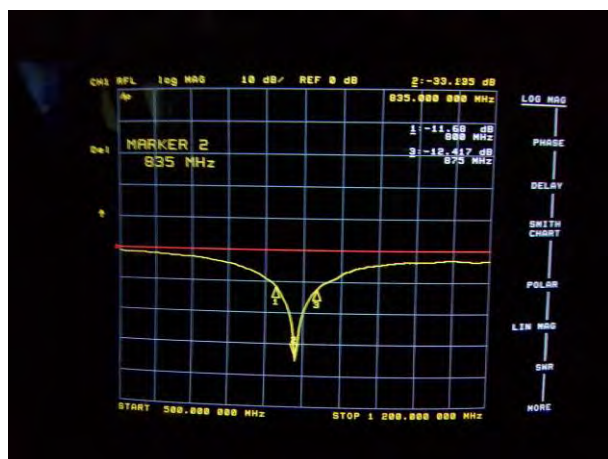
APREL Length	APREL Height	Measured Length	Measured Height
161.0 mm	89.8 mm	161.1 mm	89.7 mm

Tissue Type	Measured Return Loss	Measured Impedance
Head	-33.135 dB	51.898 Ω
Body	-25.362 dB	50.604 Ω

Test Graphs:

Head Tissue

Return Loss :

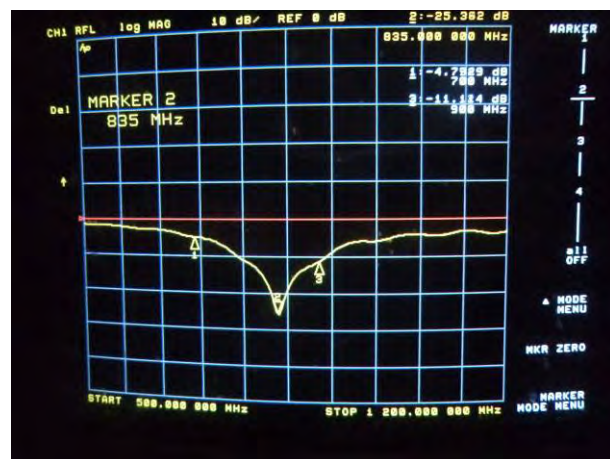


Impedance :

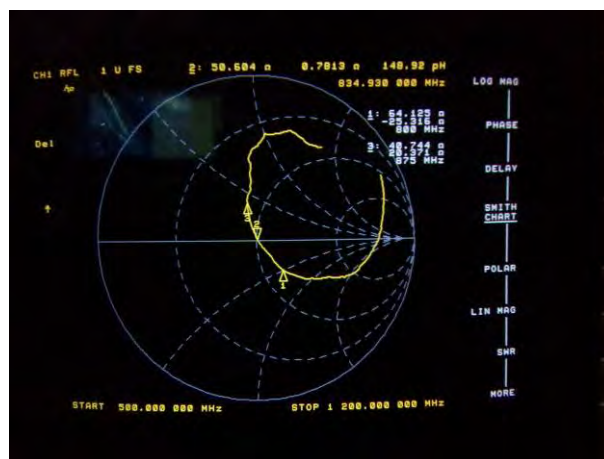


Body Tissue

Return Loss :



Impedance :



NCL CALIBRATION LABORATORIES

Calibration File No: DC-1331
Project Number: BAC-dipole –cal-5615

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the
NCL CALIBRATION LABORATORIES by qualified personnel following recognized
procedures and using transfer standards traceable to NRC/NIST.

Validation Dipole (Head & Body)

Manufacturer: APREL Laboratories

Part number: ALS-D-1900-S-2

Frequency: 1900 MHz

Serial No: 210-00710

Customer: Bay Area Compliance Laboratory

Calibrated: 25th August, 2011
Released on: 25th August, 2011

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: _____

NCL CALIBRATION LABORATORIES

Suite 102, 303 Terry Fox Dr.
Kanata, ONTARIO
CANADA K2K 3J1

Division of APREL Lab.
TEL: (613) 435-8300
FAX: (613) 435-8306

NCL Calibration Laboratories

Division of APREL Laboratories.

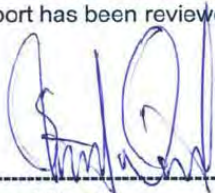
Conditions

Dipole 210-00710 was received in good condition and was a re-calibration.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C

Temperature of the Tissue: 21 °C +/- 0.5°C

We the undersigned attest that to the best of our knowledge the calibration of this device has been accurately conducted and that all information contained within this report has been reviewed for accuracy.



Stuart Nicol



C. Teodorian

Primary Measurement Standards

Instrument	Serial Number	Cal due date
Power meter Anritsu MA2408A	245025437	Nov.4, 2011
Power Sensor Anritsu MA2481D	103555	Nov 4, 2011
Attenuator HP 8495A (70dB) 1	944A10711	Aug.8, 2012
Network Analyzer Agilent E5071C	1334746J	Feb. 8, 2012
Secondary Measurement Standards		
Signal Generator Agilent E4438C	-506 MY55182336	June 7, 2012

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NCL Calibration Laboratories

Division of APREL Laboratories.

Calibration Results Summary

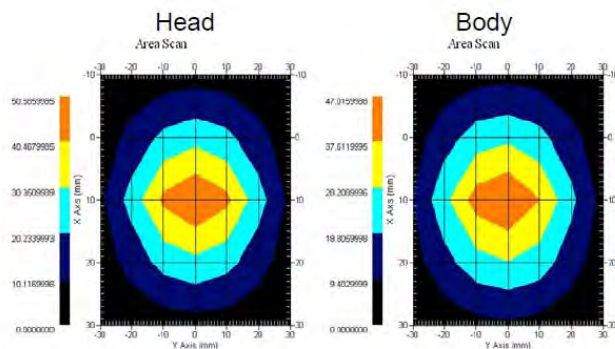
The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions**Length:** 67.1 mm**Height:** 38.9 mm**Electrical Specification**

Tissue	Frequency	SWR:	Return Loss	Impedance
Head	1900MHz	1.0417 U	-35.395dB	49.020 Ω
Body	1900MHz	1.1177 U	-25.424dB	55.435 Ω

System Validation Results

Tissue	Frequency	1 Gram	10 Gram	Peak
Head	1900 MHz	39.648	20.311	73.365
Body	1900 MHz	39.769	20.176	75.866



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Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole 210-00710. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 130 MHz to 26 GHz E-Field Probe Serial Number 212.

References

SSI-TP-018-ALSAS Dipole Calibration Procedure
SSI-TP-016 Tissue Calibration Procedure
IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"

Conditions

Dipole 210-00710 was new taken from stock.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C
Temperature of the Tissue: 20 °C +/- 0.5°C

Dipole Calibration uncertainty

The calibration uncertainty for the dipole is made up of various parameters presented below.

Mechanical	1%
Positioning Error	1.22%
Electrical	1.7%
Tissue	2.2%
Dipole Validation	2.2%
TOTAL	8.32% (16.64% K=2)

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Dipole Calibration Results**Mechanical Verification**

APREL Length	APREL Height	Measured Length	Measured Height
68.0 mm	39.5 mm	67.1mm	38.9 mm

Electrical Validation

Tissue Type	Return Loss:	SWR:	Impedance:
Head	-29.360 dB	1.0732 U	47.869 Ω
Body	-22.799 dB	1.1566 U	48.022 Ω

Tissue Validation

	Dielectric constant, ϵ_r	Conductivity, σ [S/m]
Head Tissue 1900MHz	38.4	1.43
Body Tissue 1900MHz	51.87	1.59

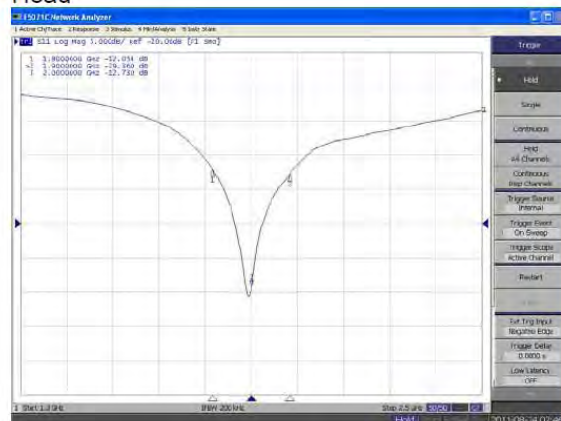
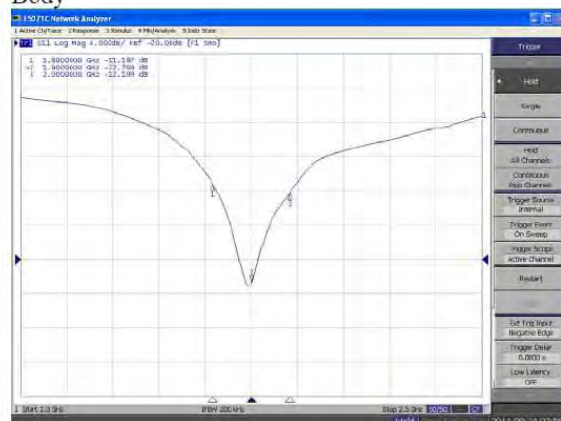
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The Following Graphs are the results as displayed on the Vector Network Analyzer.

S11 Parameter Return Loss**Head****Body**

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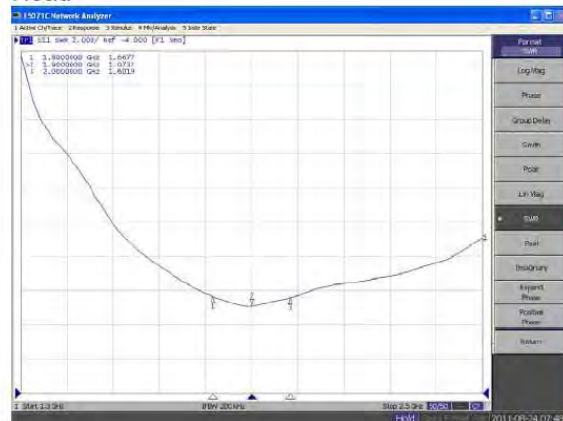
6

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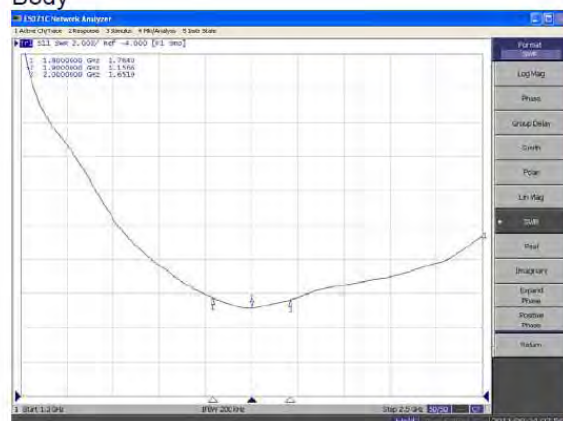
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SWR

Head



Body



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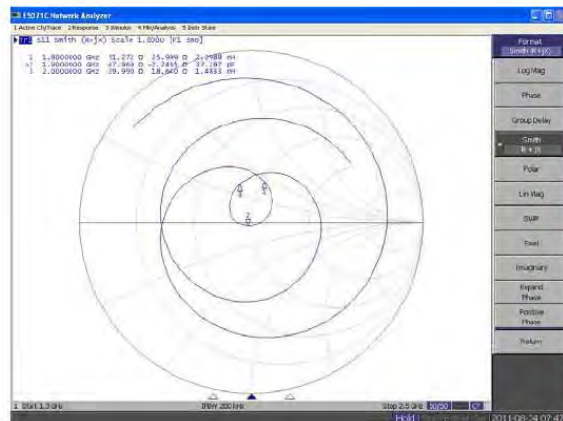
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NCL Calibration Laboratories

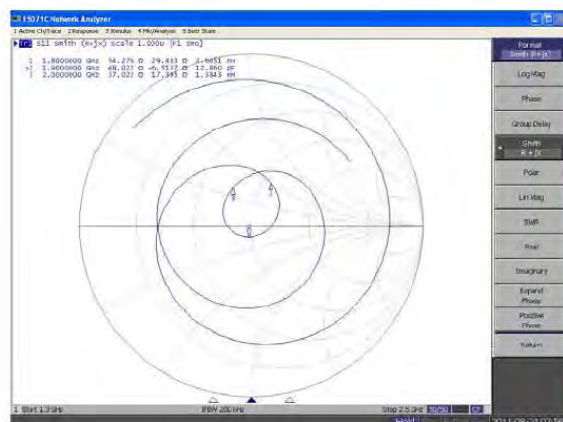
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Smith Chart Dipole Impedance

Head



Body



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Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List 2011

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1900MHz Dipole Calibration By BACL at 2013-12-20

Mechanical Verification

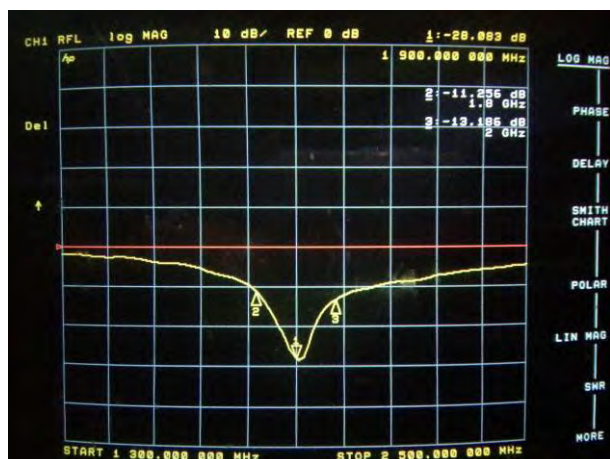
APREL Length	APREL Height	Measured Length	Measured Height
68.0 mm	39.4 mm	68.3 mm	39.2 mm

Tissue Type	Measured Return Loss	Measured Impedance
Head	-28.083 dB	47.477 Ω
Body	-22.022 dB	48.076 Ω

Test Graphs:

Head Tissue

Return Loss :

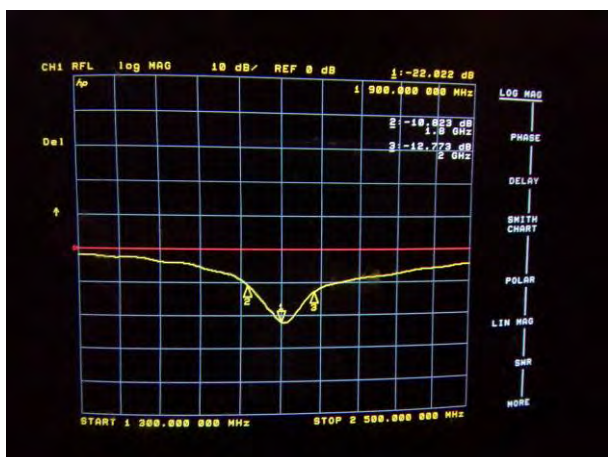


Impedance :



Body Tissue

Return Loss :

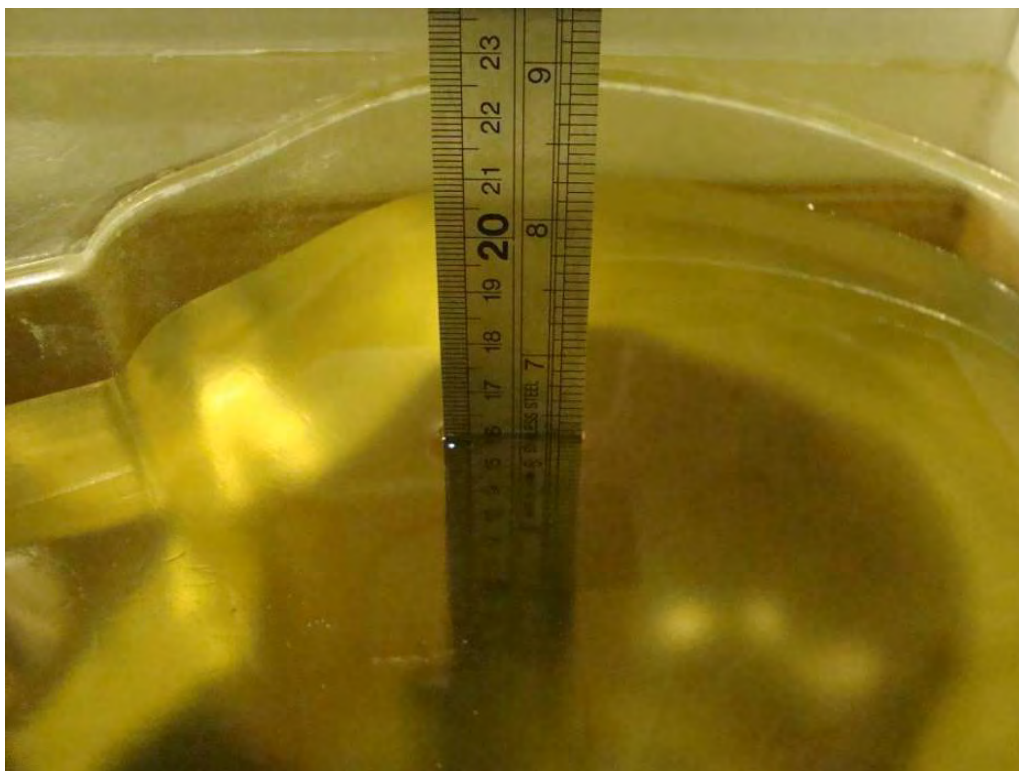


Impedance :

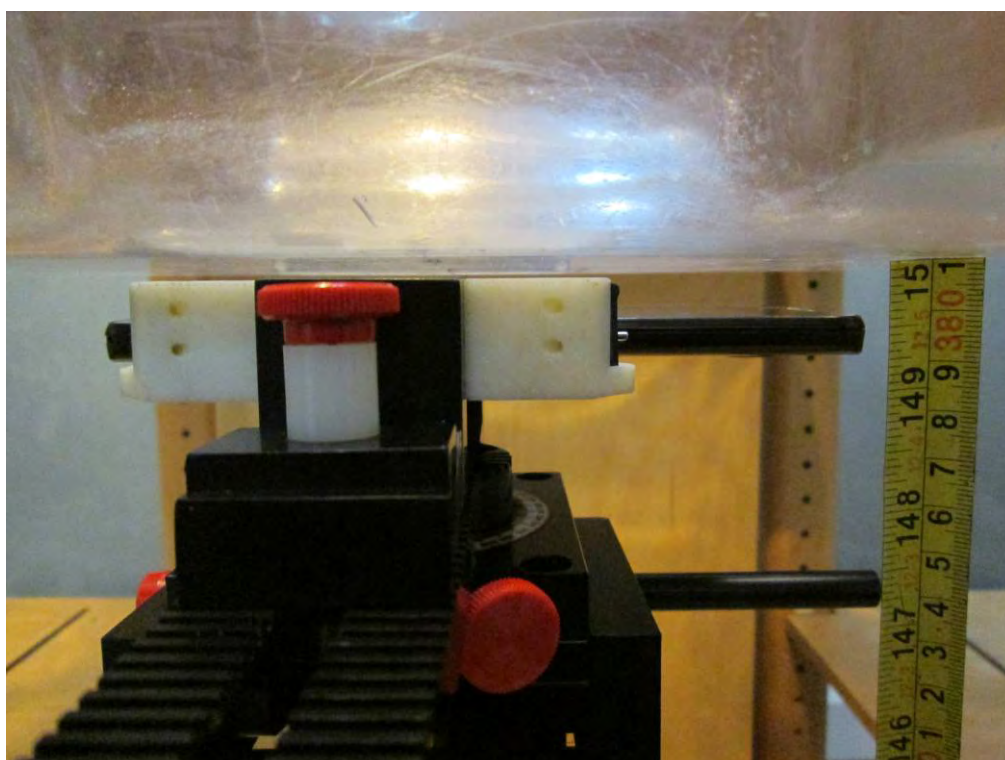


APPENDIX D EUT TEST POSITION PHOTOS

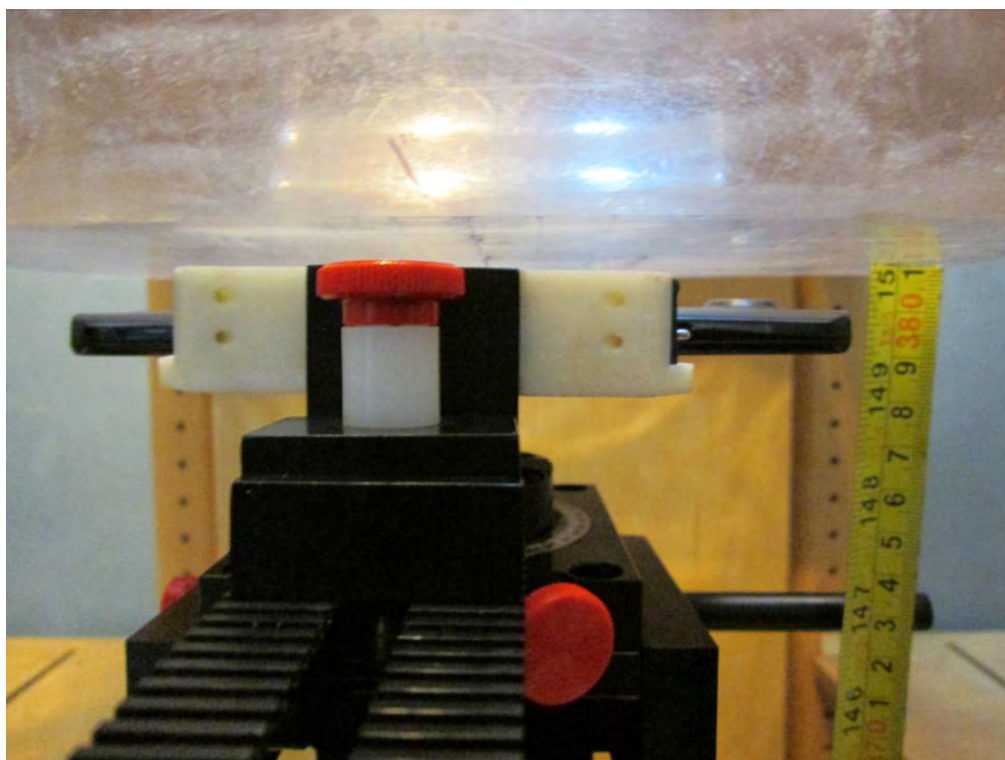
Liquid depth $\geq 15\text{cm}$



Body-worn Front Setup Photo



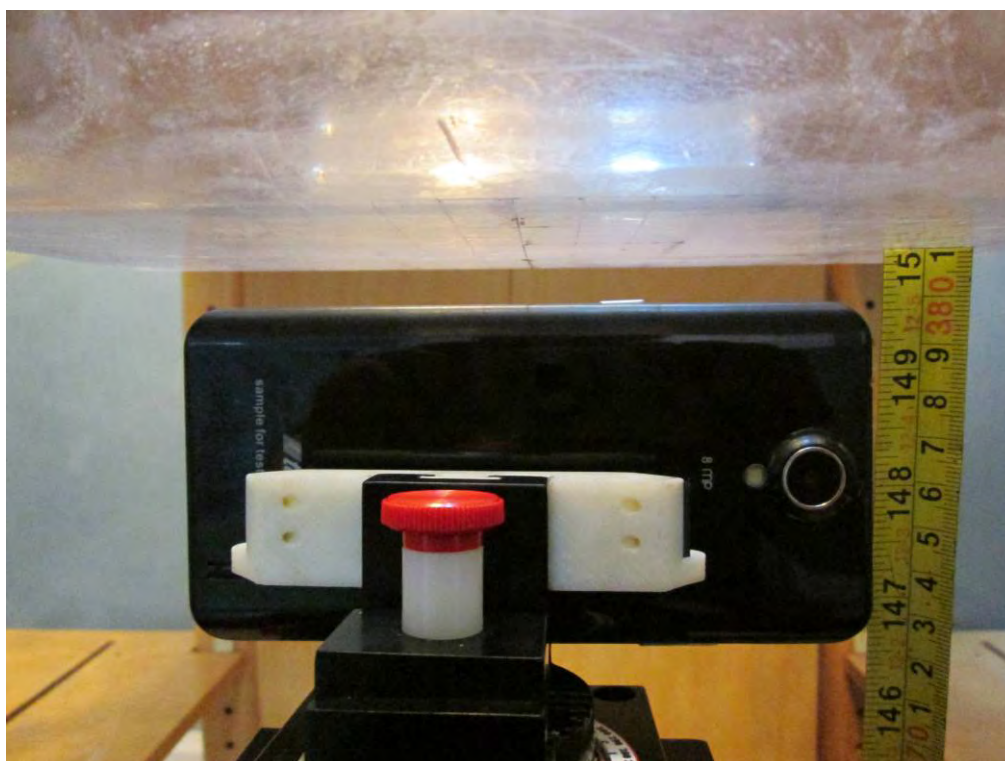
Body-worn Back Setup Photo



Body-worn Left Setup Photo



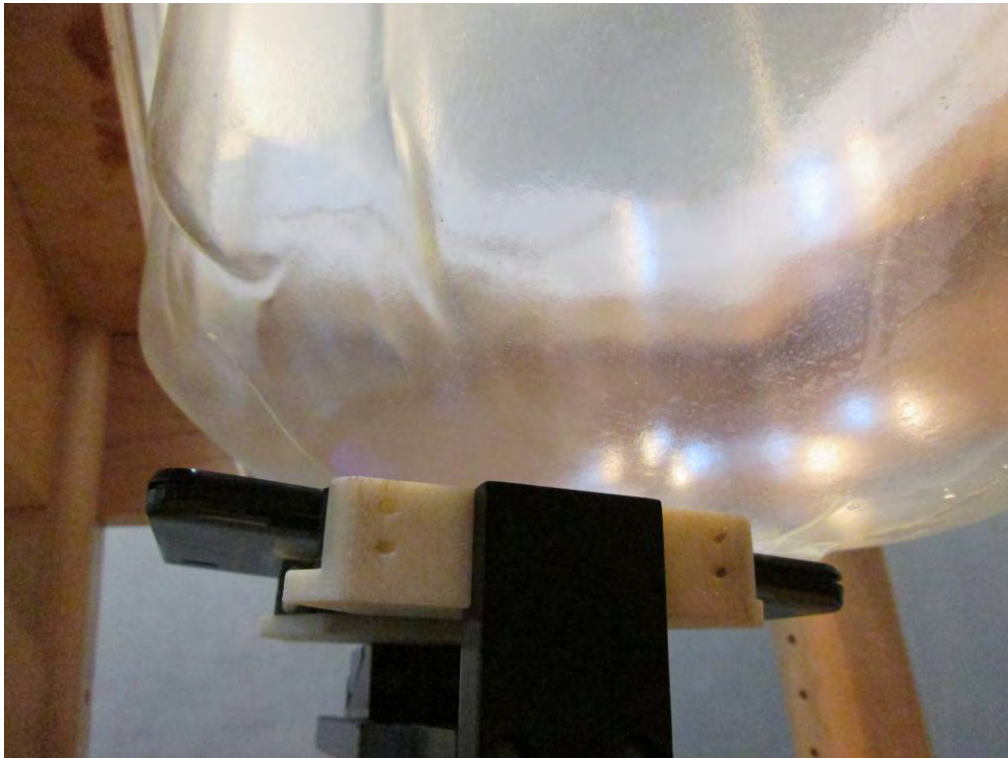
Body-worn Right Setup Photo



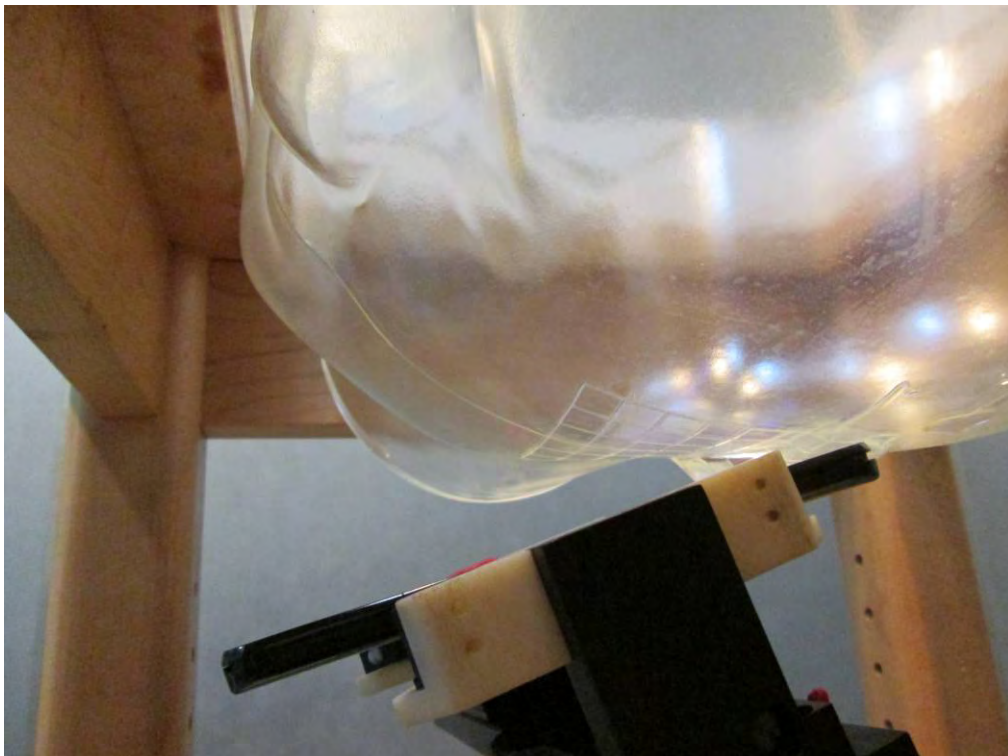
Body-worn Bottom Setup Photo



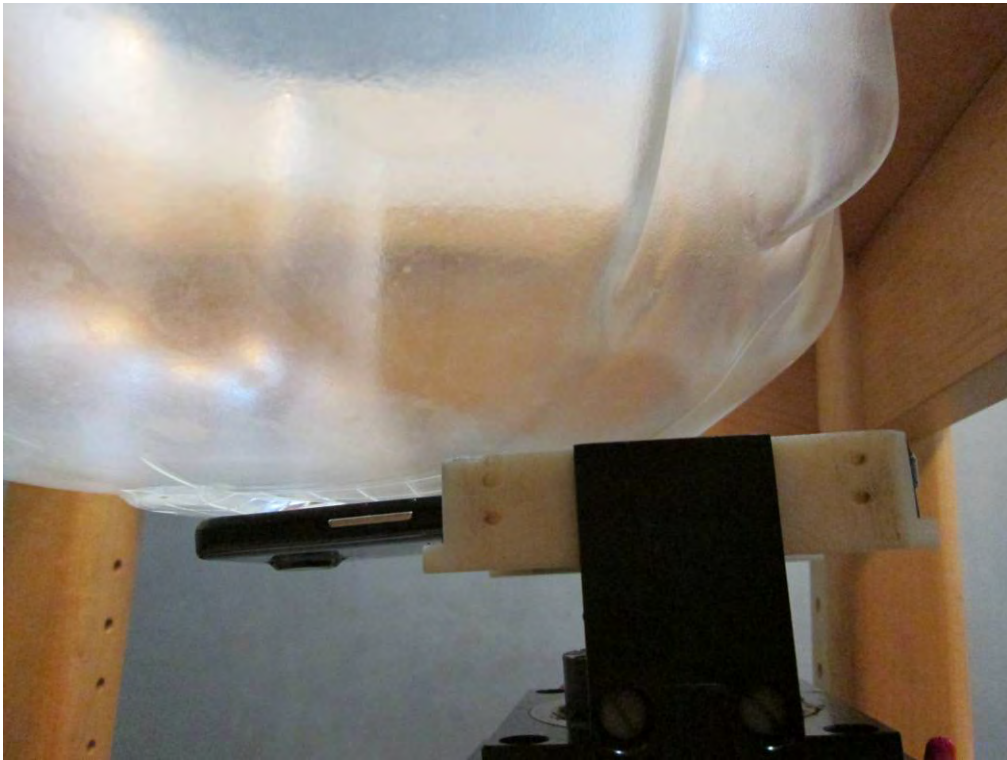
Left Head Touch Setup Photo



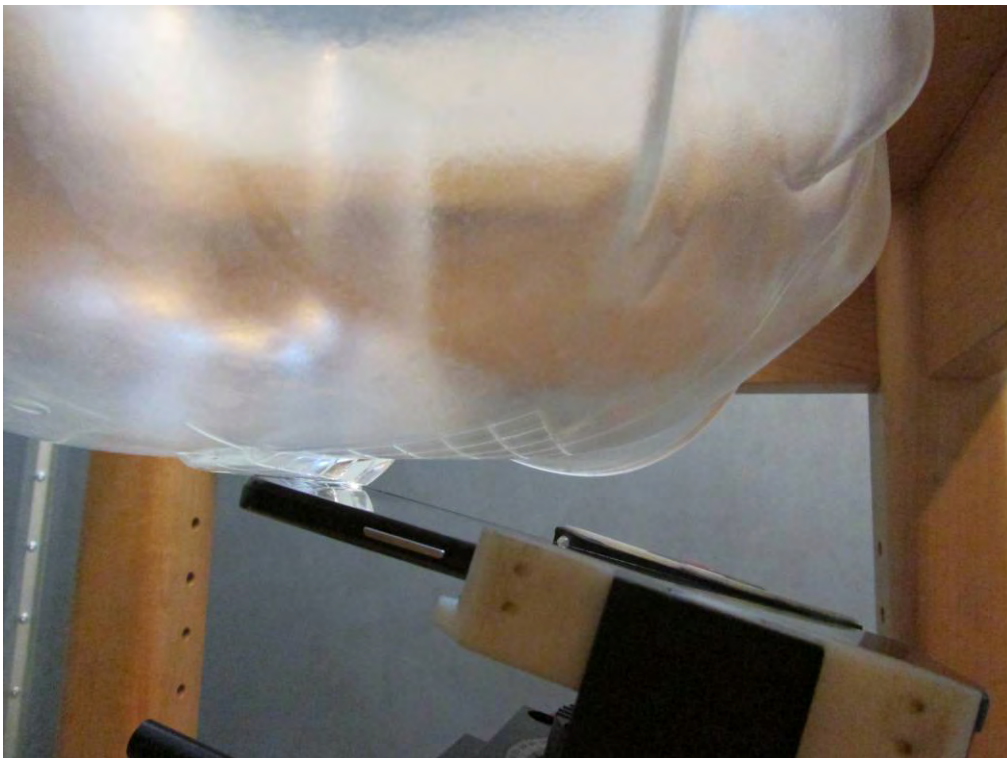
Left Head Tilt Setup Photo



Right Head Touch Setup Photo



Right Head Tilt Setup Photo



APPENDIX E EUT PHOTOS

EUT – Front View



EUT – Back View



EUT – Left Side View



EUT – Right Side View



EUT – Top View



EUT – Bottom View



EUT – Battery off View

APPENDIX F INFORMATIVE REFERENCES

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******* END OF REPORT *******