NVLAP LAB CODE 200707-0

SAR EVALUATION REPORT

For

Shenzhen CE and IT Limited

#602 A Block, Xinxin Blvd., Hua Fu Road, Fu Tian District,

Shenzhen, Guangdong, China 518000

FCC ID: YG5V600

Report Type:	**Product Type:**
Original Report	GSM Mobile Phone

Test Engineer:	Allan An
Report Number:	RSZ10052803-SAR
Report Date:	2010-07-12
Reviewed By:	William Chen EMC Engineer
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Summary of Test Results	
Rule Part(s):	CFR 47 §2.1093
Test Procedure(s):	FCC OET Bulletin 65C IEEE 1528-2003
Device Type:	Portable device
Exposure Category	Population/Uncontrolled
Modulation:	GMSK
TX Frequency Range:	824-849 MHz (Cellular Band) 1850-1910 MHz (PCS Band)
Maximum Conducted Power Tested:	GSM: 31.63 dBm (Cellular Band) GSM: 29.78 dBm (PCS Band)
Antenna Type(s):	Internal Antenna
Body-Worn Accessories:	Headset
Face-Head Accessories:	None
Battery Type(s) Tested:	3.7VDC/ 700mAh Rechargeable Battery
Max. SAR Level(s) Measured:	0.395 W/Kg, 1g Head Tissue (Cellular Band) 1.128 W/Kg, 1g Body Tissue (Cellular Band) 0.335 W/Kg, 1g Head Tissue (PCS Band) 1.235 W/Kg, 1g Body Tissue (PCS Band)

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 FCC OET 65 Supplement C and IEEE 1528-2003.

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

EUT Photo

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1	RSZ10052803-SAR	Original Report	2010-07-12

REFERENCE, STANDARDS AND GUILDELINES

FCC:

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

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

CE:

The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 2 mW/g as recommended by the EN50360 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 1 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).

EUT DESCRIPTION

This Bay Area Compliance Laboratories Corp. test report has been prepared on behalf of Shenzhen CE and IT Limited. and their product Model: V600 ; FCC ID: YG5V600 or the EUT (Equipment Under Test) as referred to in the rest of this report.

Technical Specification

Item	Content
Modulation	GMSK
Frequency Band	Cellular Band: 824-849 MHz 869-894 MHz PCS Band: 1850-1910 MHz 1930-1990 MHz
Dimensions (L*W*H)	100mm (L)×40 mm (W)× 13mm (H)
Weight	60 g
Power Source	3.7 VDC/700 mAh Re-chargeable Battery
Normal Operation	Head and Body-worn

FACILITIES AND ACCREDITATION

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

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

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 21,5 mm.

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

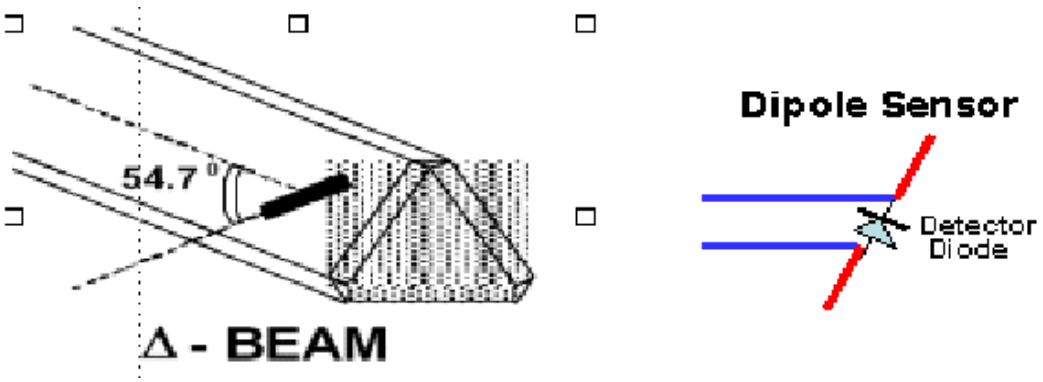
The overall uncertainty for the methodology and algorithms the used during the SAR calculation was evaluated using the data from IEEE 1528 based on the example f3 algorithm:

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

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 in Air	Frequency Dependent Below 2 GHz Calibration in air performed in a TEM Cell Above 2 GHz Calibration in air performed in waveguide
Sensitivity	0.70 μV/(V/m)^2 to 0.85 μV/(V/m)^2
Dynamic Range	0.0005 W/kg to 100 W/kg
Isotropic Response	Better than 0.2 dB
Diode Compression Point (DCP)	Calibration for Specific Frequency
Probe Tip Radius	< 5 mm
Sensor Offset	1.56 (+/- 0.02 mm)
Probe Length	290 mm
Video Bandwidth	@ 500 Hz: 1 dB @ 1.02 kHz: 3 dB
Boundary Effect	Less than 2% for distance greater than 2.4 mm
Spatial Resolution	Diameter less than 5 mm Compliant with Standards

Boundary Detection Unit and Probe Mounting Device

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

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

Daq-Paq (Analog to Digital Electronics)

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

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

Axis Articulated Robot

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

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

ALSAS Universal Workstation

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

Universal Device Positioner

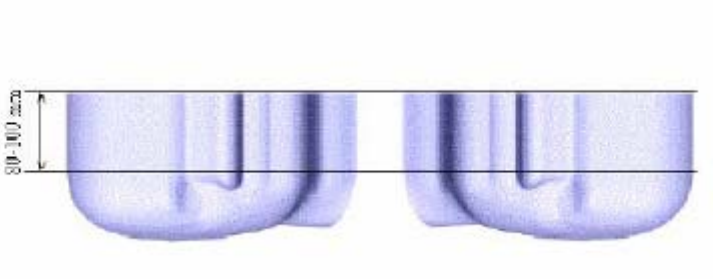
The universal device positioner allows complete freedom of movement of the EUT. Developed to hold a EUT in a free-space scenario any additional loading attributable to the material used in the construction of the positioner has been eliminated. Repeatability has been enhanced through the linear scales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

Phantom Types

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

APREL SAM Phantoms

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



APREL Laboratories Universal Phantom

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

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

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

Tissue Dielectric Parameters for Head and Body Phantoms

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

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

IEEE SCC-34/SC-2 P1528 Recommended Tissue Dielectric Parameters

Frequency (MHz)	Head Tissue		Body Tissue	
	εr	Ơ (S/m)	εr	Ơ (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

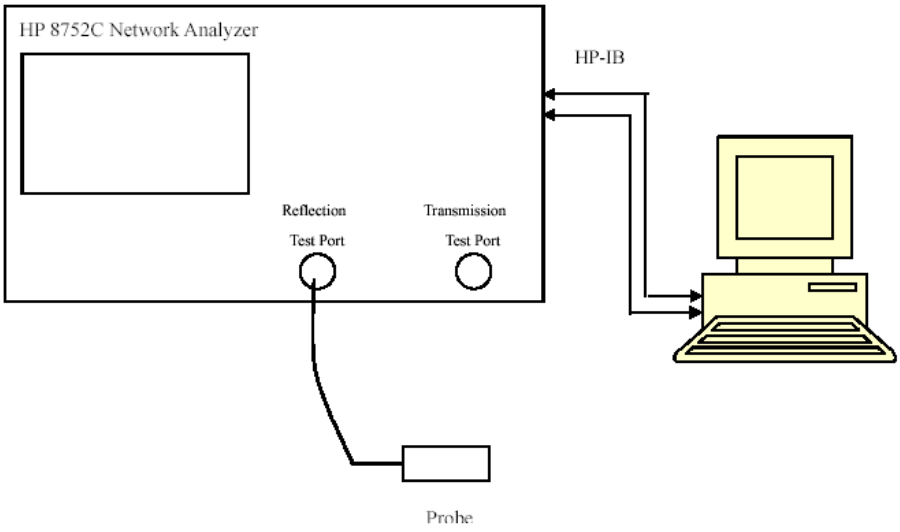
EQUIPMENT LIST AND CALIBRATION

Equipments List & Calibration Info

Equipment	Model	Calibration Due 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	N/A	110-00212
Miniature E-Field Probe	ALS-E-020	2010-09-05	273
Dipole, 835 MHz	ALS-D-835-S-2	2011-06-11	180-00558
Dipole,1900 MHz	ALS-D-1900-S-2	2011-06-11	210-00710
Dipole Spacer	ALS-DS-U	N/A	250-00907
R & S, Universal Communication Tester	CMD200	2010-09-26	1100.0008.02
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
Uni Phantom	ALS-P-UP-1	N/A	150-00413
Simulated Tissue 835 MHz Head	ALS-T-835-1-H	Each Time	270-01002
Simulated Tissue 835 MHz Body	ALS-T-835-1-B	Each Time	270-02101
Simulated Tissue 1900 MHz Head	ALS-T-1900-1-H	Each Time	295-01103
Simulated Tissue 1900 MHz Body	ALS-T-1900-1-B	Each Time	295-02102
Power Amplifier	5S1G4	N/A	71377
Spectrum Analyzer	FSEM30	2010-07-08	849720/019

SAR MEASUREMENT SYSTEM VERIFICATION

Liquid Verification



Liquid Verification Setup Block Diagram

Liquid Verification Results

Frequency (MHz)	Liquid Type	Liquid Parameter		Result
		εr	σ (S/m)	
835	Head	39.94	0.87	In Tolerance
835	Body	55.17	0.98	In Tolerance
1900	Head	39.39	1.47	In Tolerance
1900	Body	52.73	1.56	In Tolerance

The liquid verification data is 2010-07-10, Please refer to the following tables

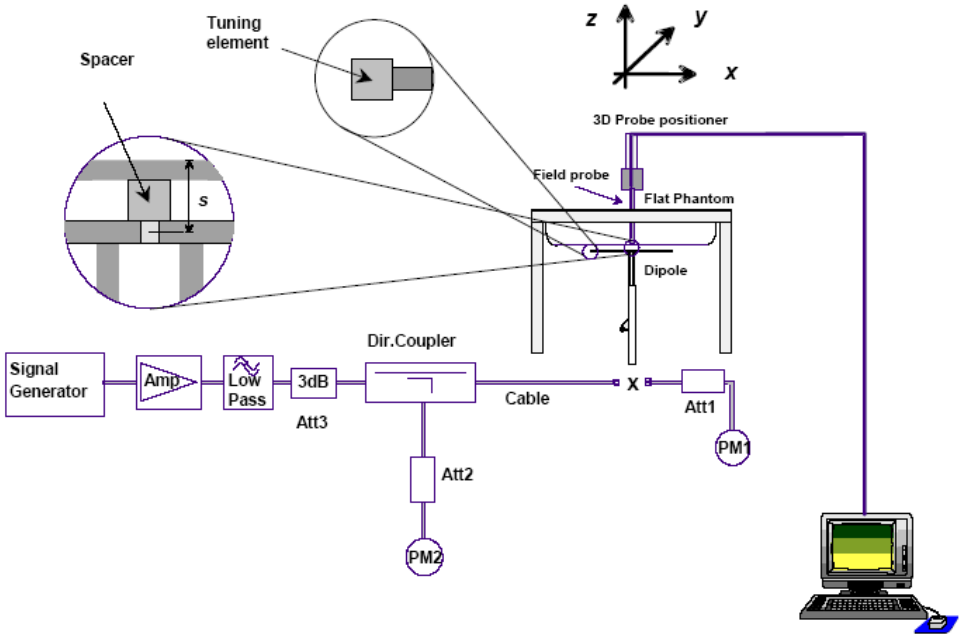
850 MHz Head				850 MHz Body		
Frequency	**e'**	**e''**		**Frequency**	**e'**	**e''**
824000000	40.029865	18.61233		824000000	55.237778	21.276034
824500000	40.071240	18.67464		824500000	55.261843	21.29966
825000000	40.070036	18.69563		825000000	55.281151	21.280279
825500000	40.051815	18.65283		825500000	55.308427	21.252340
826000000	40.063437	18.70183		826000000	55.275594	21.257914
826500000	40.001918	18.71266		826500000	55.236672	21.276899
827000000	40.040322	18.74388		827000000	55.274861	21.278316
827500000	40.029129	18.74645		827500000	55.242787	21.300332
828000000	40.028530	18.65200		828000000	55.218219	21.252779
828500000	40.045123	18.69942		828500000	55.232601	21.279685
829000000	40.004395	18.68908		829000000	55.199535	21.268751
829500000	40.026259	18.75582		829500000	55.268717	21.263965
830000000	40.014039	18.69609		830000000	55.196831	21.267632
830500000	39.998929	18.74141		830500000	55.179712	21.239705
831000000	39.983075	18.74523		831000000	55.240298	21.271246
831500000	40.010490	18.71655		831500000	55.208625	21.204610
832000000	39.996512	18.68872		832000000	55.206147	21.215507
832500000	39.961408	18.69780		832500000	55.175802	21.181681
833000000	39.938652	18.71390		833000000	55.166104	21.173241
833500000	39.903683	18.72295		833500000	55.202313	21.169551
834000000	39.904754	18.71187		834000000	55.125158	21.186612
834500000	39.949605	18.70961		834500000	55.206521	21.171289
835000000	39.936642	18.72304		835000000	55.170517	21.194855
835500000	39.887012	18.71543		835500000	55.137415	21.167814
836000000	39.891626	18.69826		836000000	55.141796	21.181547
836500000	39.914557	18.74829		836500000	55.224754	21.170904
837000000	39.882111	18.80305		837000000	55.148334	21.231758
837500000	39.917227	18.74660		837500000	55.184454	21.227808
838000000	39.849630	18.72859		838000000	55.147454	21.218830
838500000	39.874726	18.71099		838500000	55.138509	21.182769
839000000	39.882452	18.72383		839000000	55.124376	21.176093
839500000	39.856777	18.74580		839500000	55.091013	21.247802
840000000	39.838847	18.68361		840000000	55.191306	21.197366
840500000	39.839714	18.70854		840500000	55.089472	21.175170
841000000	39.809432	18.73176		841000000	55.144866	21.207305
841500000	39.823662	18.71205		841500000	55.120975	21.231646
842000000	39.778773	18.71885		842000000	55.136218	21.230030
842500000	39.817214	18.71292		842500000	55.073442	21.209406
843000000	39.828317	18.66352		843000000	55.171059	21.181531
843500000	39.783754	18.72633		843500000	55.074569	21.228367
844000000	39.751487	18.70423		844000000	55.127668	21.212099
844500000	39.764301	18.77146		844500000	55.102610	21.204280
845000000	39.775727	18.68649		845000000	55.091418	21.218215
845500000	39.700058	18.72729		845500000	55.115836	21.240050
846000000	39.734988	18.72732		846000000	55.093158	21.280057
846500000	39.716574	18.68128		846500000	55.110908	21.228596
847000000	39.749343	18.78320		847000000	55.166660	21.303045
847500000	39.705883	18.68341		847500000	55.151950	21.307414
848000000	39.664080	18.73503		848000000	55.151372	21.209045
848500000	39.639024	18.70112		848500000	55.113865	21.265495
849000000	39.653604	18.73702		849000000	55.101348	21.247453

1900 MHz Head				1900 MHz Body		
Frequency	e'	e''		Frequency	e'	e''
1850000000	39.316921	13.59078		1850000000	52.737675	14.507589
1851200000	39.289902	13.61856		1851200000	52.694928	14.505025
1852400000	39.296692	13.61347		1852400000	52.739146	14.498111
1853600000	39.280434	13.61962		1853600000	52.723112	14.501081
1854800000	39.261686	13.63630		1854800000	52.708402	14.513678
1856000000	39.300138	13.63867		1856000000	52.734113	14.494067
1857200000	39.284765	13.64131		1857200000	52.723342	14.474231
1858400000	39.268056	13.64175		1858400000	52.686870	14.498953
1859600000	39.245064	13.66106		1859600000	52.727178	14.491682
1860800000	39.255322	13.68080		1860800000	52.714200	14.510144
1862000000	39.251260	13.70642		1862000000	52.708181	14.540465
1863200000	39.217396	13.69352		1863200000	52.706455	14.563344
1864400000	39.233085	13.72185		1864400000	52.719809	14.558273
1865600000	39.217316	13.71876		1865600000	52.688186	14.535280
1866800000	39.225587	13.71573		1866800000	52.687732	14.571536
1868000000	39.234908	13.72404		1868000000	52.692727	14.544879
1869200000	39.244983	13.75282		1869200000	52.703816	14.581769
1870400000	39.234338	13.76751		1870400000	52.716561	14.588098
1871600000	39.246700	13.74693		1871600000	52.699973	14.606178
1872800000	39.230423	13.78609		1872800000	52.719983	14.620475
1874000000	39.238740	13.75902		1874000000	52.689490	14.578440
1875200000	39.221425	13.81079		1875200000	52.707723	14.626990
1876400000	39.232681	13.80283		1876400000	52.714703	14.634824
1877600000	39.233734	13.83117		1877600000	52.711090	14.663078
1878800000	39.256580	13.83691		1878800000	52.746440	14.678058
1880000000	39.253631	13.85876		1880000000	52.693101	14.671175
1881200000	39.265198	13.86552		1881200000	52.730691	14.680405
1882400000	39.249633	13.86233		1882400000	52.721742	14.666288
1883600000	39.286996	13.85290		1883600000	52.754126	14.665671
1884800000	39.278522	13.89914		1884800000	52.734418	14.675808
1886000000	39.291945	13.88971		1886000000	52.733842	14.646770
1887200000	39.303997	13.85424		1887200000	52.754063	14.660734
1888400000	39.299350	13.89205		1888400000	52.742009	14.671217
1889600000	39.324021	13.88148		1889600000	52.729971	14.681645
1890800000	39.305926	13.89786		1890800000	52.722133	14.684644
1892000000	39.349380	13.89333		1892000000	52.782022	14.706133
1893200000	39.330881	13.87114		1893200000	52.747255	14.715522
1894400000	39.322616	13.91714		1894400000	52.740180	14.703247
1895600000	39.341534	13.93999		1895600000	52.769357	14.730765
1896800000	39.342722	13.94418		1896800000	52.730146	14.755118
1898000000	39.355589	13.92900		1898000000	52.730697	14.743168
1899200000	39.391636	13.94095		1899200000	52.756664	14.759041
1900400000	39.394805	13.91995		1900400000	52.725862	14.768528
1901600000	39.366644	13.92481		1901600000	52.742854	14.814336
1902800000	39.370561	13.93316		1902800000	52.728277	14.801720
1904000000	39.386480	13.90405		1904000000	52.718419	14.770257
1905200000	39.392765	13.93480		1905200000	52.736553	14.793221
1906400000	39.362711	13.89915		1906400000	52.720706	14.810922
1907600000	39.365148	13.91439		1907600000	52.724326	14.818025
1908800000	39.347511	13.92157		1908800000	52.700646	14.799278
1910000000	39.349950	13.93681		1910000000	52.699407	14.832674

System Accuracy Verification

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

System Verification Setup Block Diagram



System Accuracy Check Results

Frequency (MHz)	1 g SAR (W/Kg)	10 g SAR (W/Kg)	Result
835	9.651	6.042	In Tolerance
1900	40.328	20.137	In Tolerance

Note: The system verification data is 2010-07-10. All SAR values are normalized to 1 Watt forward power.

IEEE P1528 recommended reference value for Head Tissue

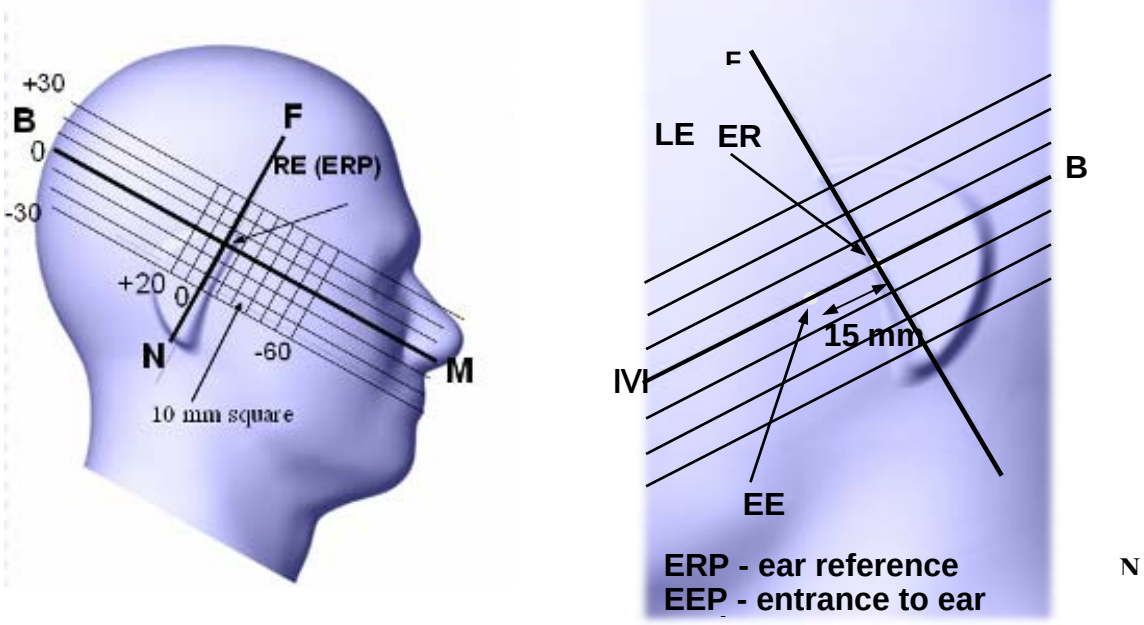
Frequency (MHz)	1 g SAR (W/Kg)	10 g SAR (W/Kg)	Local SAR at surface (above feed point)	Local SAR at surface (v=2cm offset from feed point)
300	3.0	2.0	4.4	2.1
450	4.9	3.3	7.2	3.2
835	9.5	6.2	14.1	4.9
900	10.8	6.9	16.4	5.4
1450	29.0	16.0	50.2	6.5
1800	38.1	19.8	69.5	6.8
1900	39.7	20.5	72.1	6.6
2000	41.1	21.1	74.6	6.5
2450	52.4	24.0	104.2	7.7
3000	63.8	25.7	140.2	9.5

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

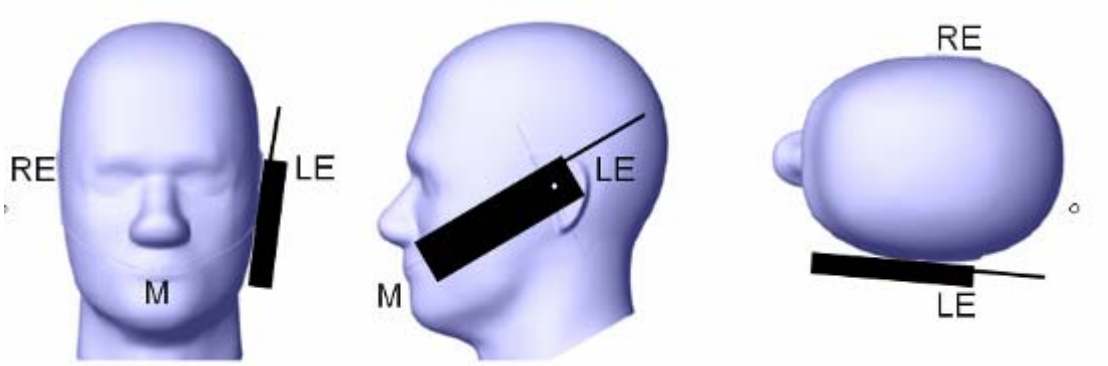
The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line for the SCC-34/SC-2 head phantom.

This test position is established:

- When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
- (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.

Check /Touch Position



Ear/Tilt Position

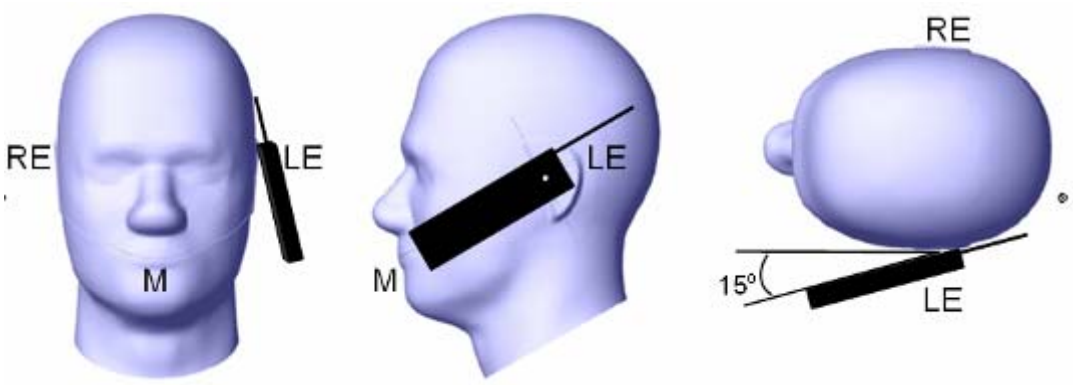
With the handset aligned in the "Cheek/Touch Position":

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 isby 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 15 mm x 15 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 30 mm x 30 mm x 21 mm was assessed by measuring 5 x 5 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.

SAR MEASUREMENT RESULTS

This page summarizes the results of the performed dosimetric evaluation. The plots with the corresponding SAR distributions, which reveal information about the location of the maximum SAR with respect to the device, could be found in Appendix E.

SAR Test Data

Environmental Conditions

Temperature:	22° C
Relative Humidity:	51%
ATM Pressure:	1005 mbar

** Testing was performed by Allan .An on 2010-07-10 to 2010-07-11*

Cellular Band:

EUT Position	Frequency (MHz)	Test Type	Test Mode	Antenna Type	Liquid	Phantom	Accessories	1g SAR Value (W/Kg)	FCC Limit (W/Kg)	Ref. Plot #
Left Head Cheek	836.6	Head	GSM	Integral	Head	Left Head	-	0.323	1.6	1
Left Head Tilt	836.6	Head	GSM	Integral	Head	Left Head	-	0.192	1.6	2
Right Head Cheek	824.2	Head	GSM	Integral	Head	Right Head	-	0.318	1.6	3
Right Head Cheek	836.6	Head	GSM	Integral	Head	Right Head	-	0.395	1.6	4
Right Head Cheek	848.8	Head	GSM	Integral	Head	Right Head	-	0.315	1.6	5
Right Head Tilt	836.6	Head	GSM	Integral	Head	Right Head	-	0.254	1.6	6
Body-Worn	836.6	Body	GSM	Integral	Body	Flat	Headset	0.305	1.6	7
Body-Worn	824.2	Body	GPRS (4 Slot)	Integral	Body	Flat	-	1.115	1.6	8
Body-Worn	836.6	Body		Integral	Body	Flat	-	1.128	1.6	9
Body-Worn	848.8	Body		Integral	Body	Flat	-	1.117	1.6	10

PCS Band:

EUT Position	Frequency (MHz)	Test Type	Test Mode	Antenna Type	Liquid	Phantom	Accessories	1g SAR Value (W/Kg)	FCC Limit (W/Kg)	Ref. Plot #
Left Head Cheek	1850.2	Head	GSM	Integral	Head	Left Head	-	0.335	1.6	11
Left Head Cheek	1880.0	Head	GSM	Integral	Head	Left Head	-	0.306	1.6	12
Left Head Cheek	1909.8	Head	GSM	Integral	Head	Left Head	-	0.301	1.6	13
Left Head Tilt	1880.0	Head	GSM	Integral	Head	Left Head	-	0.263	1.6	14
Right Head Cheek	1880.0	Head	GSM	Integral	Head	Right Head	-	0.298	1.6	15
Right Head Tilt	1880.0	Head	GSM	Integral	Head	Right Head	-	0.235	1.6	16
Body-Worn	1880.0	Body	GSM	Integral	Body	Flat	Headset	0.318	1.6	17
Body-Worn	1850.2	Body	GPRS (4 Slot)	Integral	Body	Flat	-	1.215	1.6	18
Body-Worn	1880.0	Body		Integral	Body	Flat	-	1.235	1.6	19
Body-Worn	1909.8	Body		Integral	Body	Flat	-	1.227	1.6	20

APPENDIX A – MEASUREMENT UNCERTAINTY

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

Exposure Assessment Measurement Uncertainty

Source of Uncertainty	Tolerance Value	Probability Distribution	Divisor	c_i^1 (1-g)	c_i^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	$\sqrt{3}$	$(1\text{-cp})^{1/2}$	$(1\text{-cp})^{1}_{/2}$	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	3.0	rectangular	$\sqrt{3}$	1	1	1.7	1.7
Probe Positioner Mech.	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	4.0	normal	1	1	1	4.0	4.0
Device Holder Uncertainty	2.0	normal	1	1	1	2.0	2.0
Drift of Output Power	3.2	rectangular	$\sqrt{3}$	1	1	1.8	1.8
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.)	0.0	normal	1	0.7	0.5	0.0	0.0
Liquid Permittivity(target)	5.0	rectangular	$\sqrt{3}$	0.6	0.5	1.7	1.4
Liquid Permittivity(meas.)	0.0	normal	1	0.6	0.5	0.0	0.0
Combined Uncertainty		RSS				9.4	9.2
Combined Uncertainty (coverage factor=2)		Normal(k=2)				18.8	18.5

APPENDIX B – PROBE CALIBRATION CERTIFICATES

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1013

Client.: BACL

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 835 MHz

Manufacturer: APREL Laboratories
Model No.: E-020
Serial No.: 273

Calibration in Head Tissue

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2
Project No: BACB-E field probe-cal-5476

Calibrated: 5th September 2009
Released on: 9th September 2009

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

Released By: _____

NCL CALIBRATION LABORATORIES
51 SPECTRUM WAY
NEPEAN, ONTARIO
CANADA K2R 1E6
Division of APREL Lab.
TEL: (613) 820-4988
FAX: (613) 820-4161

NCL Calibration Laboratories
Division of APREL Laboratories.

Introduction

This Calibration Report reproduces the results of the calibration performed in line with the SSI/DRB-TP-D01-032-E020-V2 E-Field Probe Calibration Procedure. The results contained within this report are for APREL E-Field Probe E-020 273.

References

SSI/DRB-TP-D01-032-E020-V2 E-Field Probe 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"
SSI-TP-011 Tissue Calibration Procedure

Conditions

Probe 273 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 probe has been accurately conducted and that all information contained within this report has been reviewed for accuracy.

Stuart Nicol

Jesse Hones

NCL Calibration Laboratories
Division of APREL Laboratories.

Calibration Results Summary

Probe Type:	E-Field Probe E-020
Serial Number:	273
Frequency:	835 MHz
Sensor Offset:	1.56 mm
Sensor Length:	2.5 mm
Tip Enclosure:	Ertalyte*
Tip Diameter:	<5 mm
Tip Length:	60 mm
Total Length:	290 mm

*Resistive to recommended tissue recipes per IEEE-1528

Sensitivity in Air

Channel X:	1.2 μV/(V/m)^2
Channel Y:	1.2 μV/(V/m)^2
Channel Z:	1.2 μV/(V/m)^2
Diode Compression Point:	95 mV

Page 3 of 10
This page has been reviewed for content and attested to on Page 2 of this document.

Sensitivity in Head Tissue Measured

Frequency: 835 MHz

Epsilon: 41.24 (+/-5%) **Sigma:** 0.87 S/m (+/-5%)

ConvF

Channel X: 6.5

Channel Y: 6.5

Channel Z: 6.5

Tissue sensitivity values were calculated using the load impedance of the APREL Laboratories Daq-Paq.

Boundary Effect:

Uncertainty resulting from the boundary effect is less than 2% for the distance between the tip of the probe and the tissue boundary, when less than 2.44mm.

Spatial Resolution:

The measured probe tip diameter is 5 mm (+/- 0.01 mm) and therefore meets the requirements of SSI/DRB-TP-D01-032 for spatial resolution.

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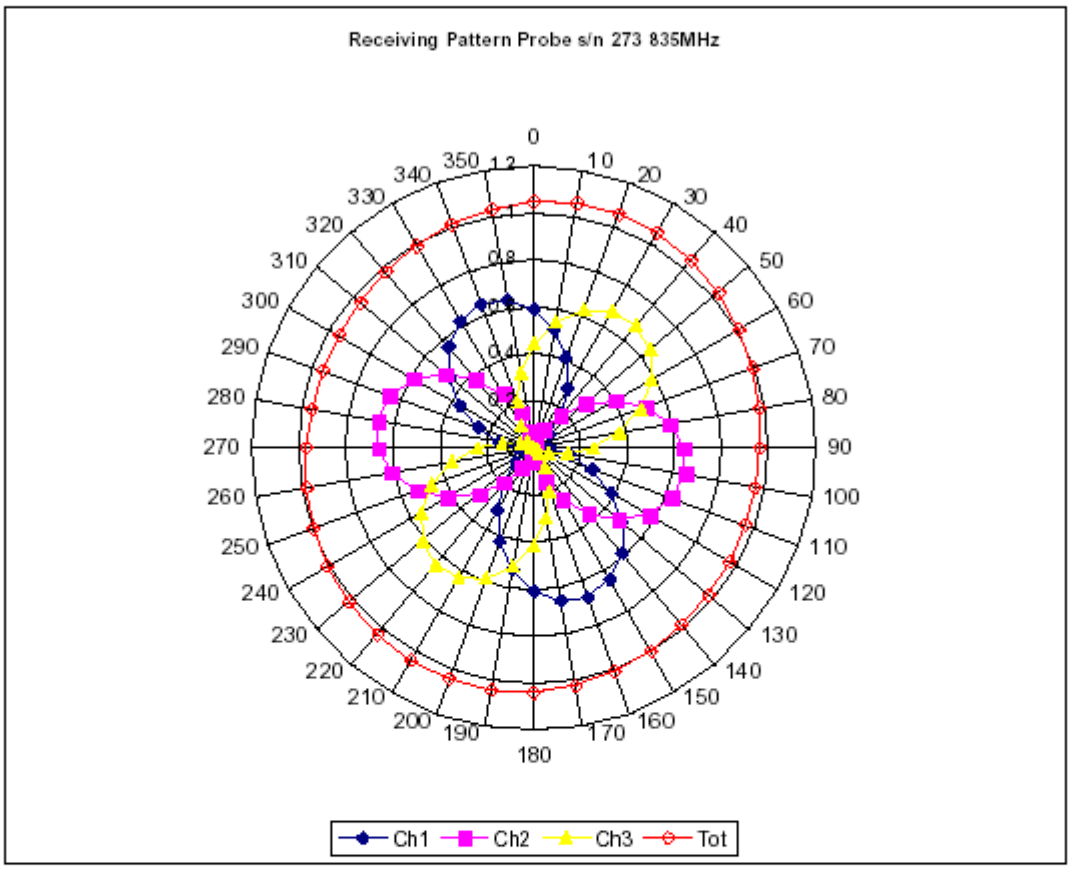
Receiving Pattern 835 MHz (Air)



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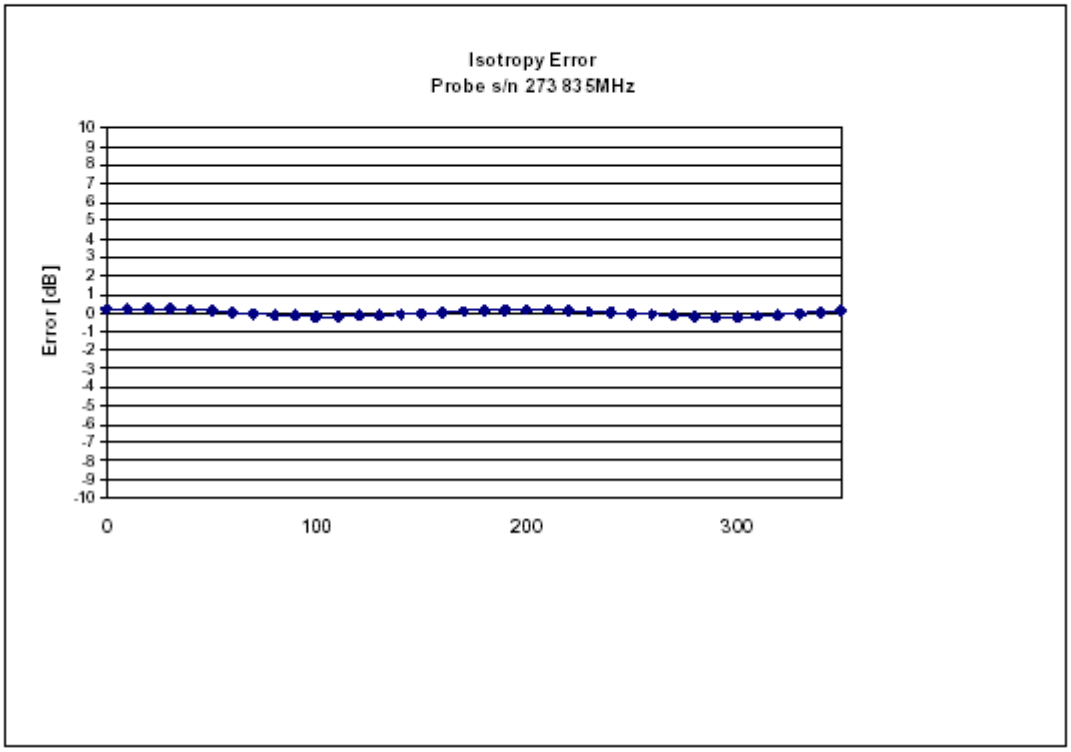
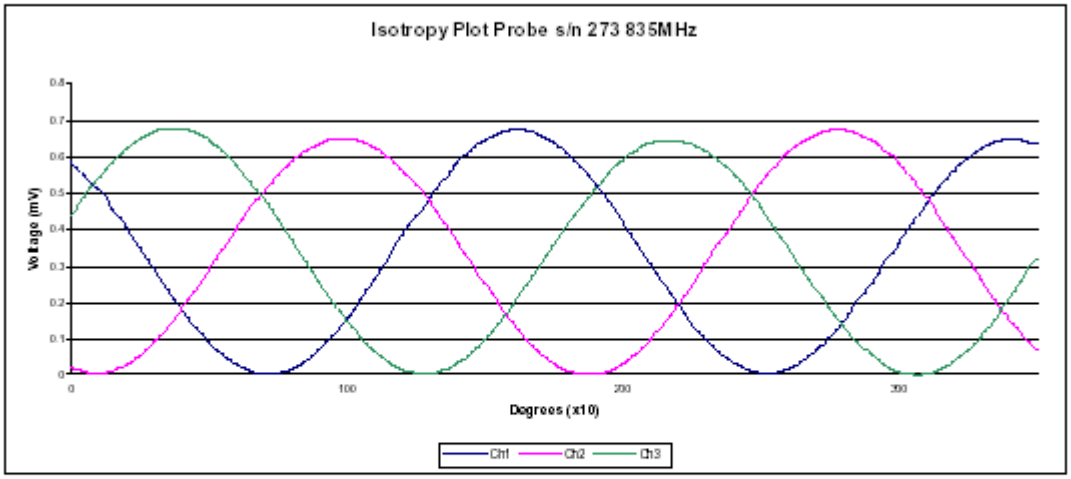
Isotropy Error 835 MHz (Air)





Isotropicity Tissue: 0.10 dB

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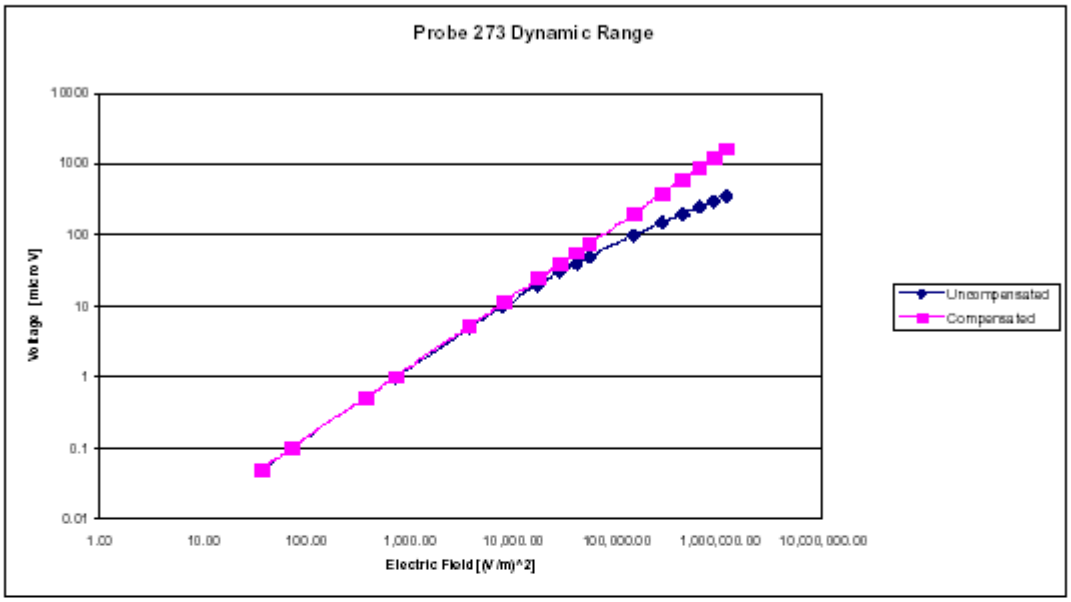
Dynamic Range



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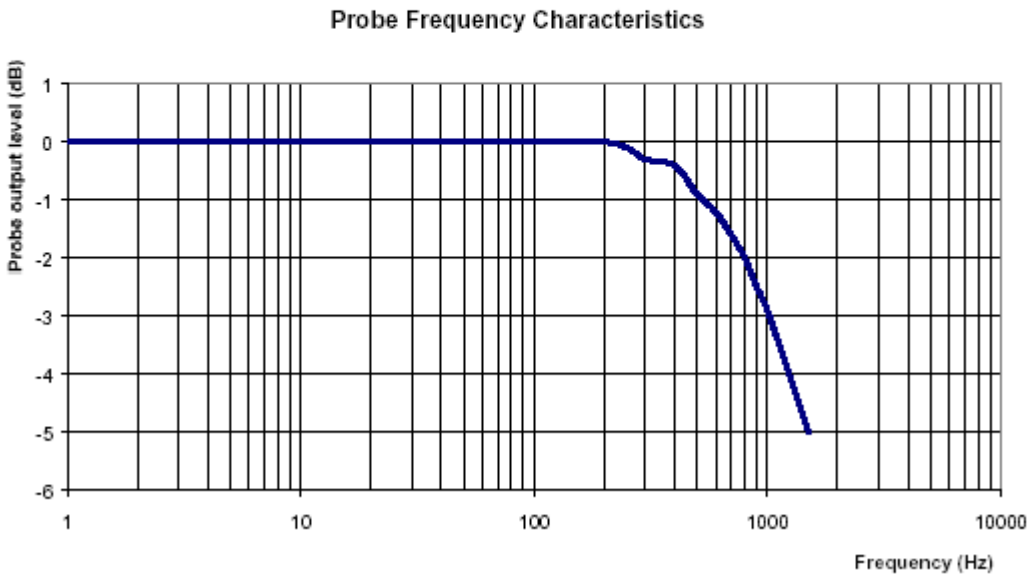
Video Bandwidth



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

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Division of APREL Laboratories.

Conversion Factor Uncertainty Assessment

Frequency:		835MHz	
Epsilon:	41.24 (+/-5%)	**Sigma:**	0.87 S/m (+/-5%)
ConvF			
Channel X:	6.5	7%(K=2)	
Channel Y:	6.5	7%(K=2)	
Channel Z:	6.5	7%(K=2)	

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

Boundary Effect:

For a distance of 2.5mm the evaluated uncertainty (increase in the probe sensitivity) is less than 2%.

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 2009.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1014

Client.: BACL

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 835 MHz

Manufacturer: APREL Laboratories
Model No.: E-020
Serial No.: 273

Calibration in Body Tissue

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2
Project No: BACB-E field probe-cal-5476

Calibrated: 5th September 2009
Released on: 9th September 2009

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

Released By: _____

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NCL Calibration Laboratories
Division of APREL Laboratories.

Introduction

This Calibration Report reproduces the results of the calibration performed in line with the SSI/DRB-TP-D01-032-E020-V2 E-Field Probe Calibration Procedure. The results contained within this report are for APREL E-Field Probe E-020 273.

References

SSI/DRB-TP-D01-032-E020-V2 E-Field Probe 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"
SSI-TP-011 Tissue Calibration Procedure

Conditions

Probe 273 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 probe has been accurately conducted and that all information contained within this report has been reviewed for accuracy.

Stuart Nicol

Jesse Hones

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 Laboratories.

Calibration Results Summary

Probe Type:	E-Field Probe E-020
Serial Number:	273
Frequency:	835 MHz
Sensor Offset:	1.56 mm
Sensor Length:	2.5 mm
Tip Enclosure:	Ertalyte*
Tip Diameter:	<5 mm
Tip Length:	60 mm
Total Length:	290 mm

*Resistive to recommended tissue recipes per IEEE-1528

Sensitivity in Air

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

Page 3 of 10
This page has been reviewed for content and attested to on Page 2 of this document.

Sensitivity in Body Tissue Measured

Frequency: 835 MHz

Epsilon: 56.16 (+/-5%) **Sigma:** 0.99 S/m (+/-10%)

ConvF

Channel X: 6.7

Channel Y: 6.7

Channel Z: 6.7

Tissue sensitivity values were calculated using the load impedance of the APREL Laboratories Daq-Paq.

Boundary Effect:

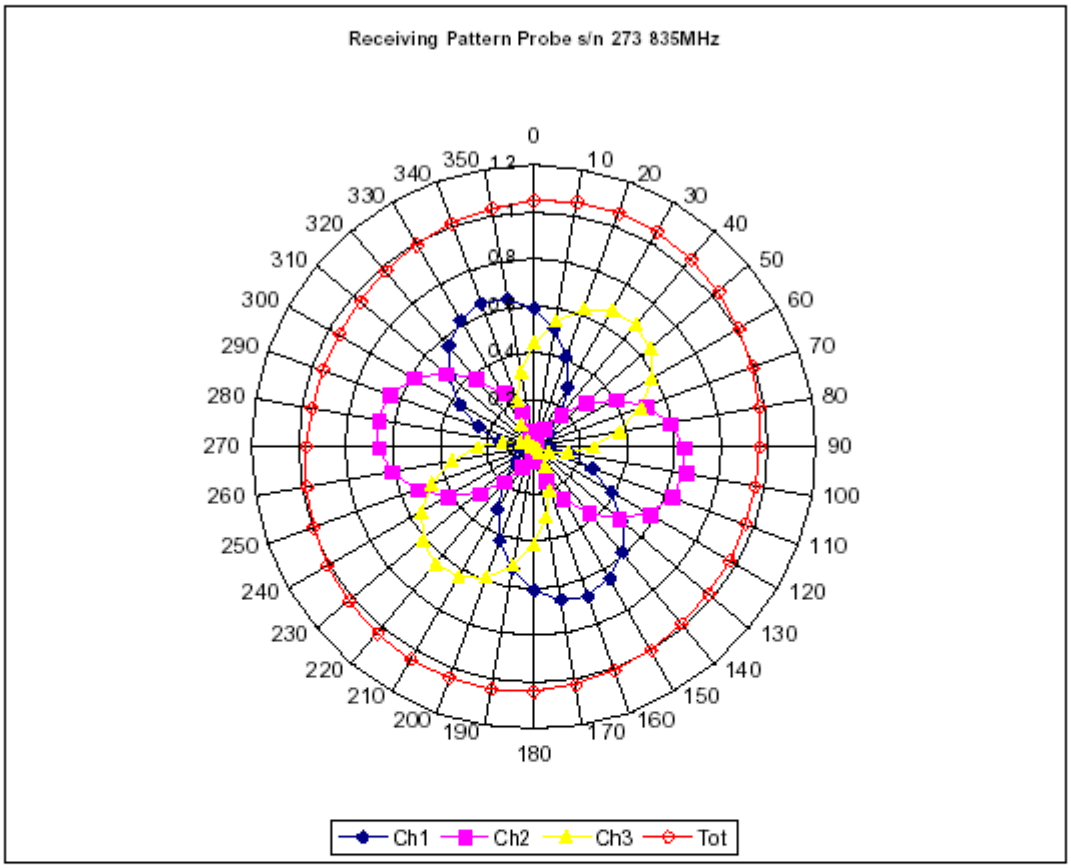
Uncertainty resulting from the boundary effect is less than 2% for the distance between the tip of the probe and the tissue boundary, when less than 2.44mm.

Spatial Resolution:

The measured probe tip diameter is 5 mm (+/- 0.01 mm) and therefore meets the requirements of SSI/DRB-TP-D01-032 for spatial resolution.

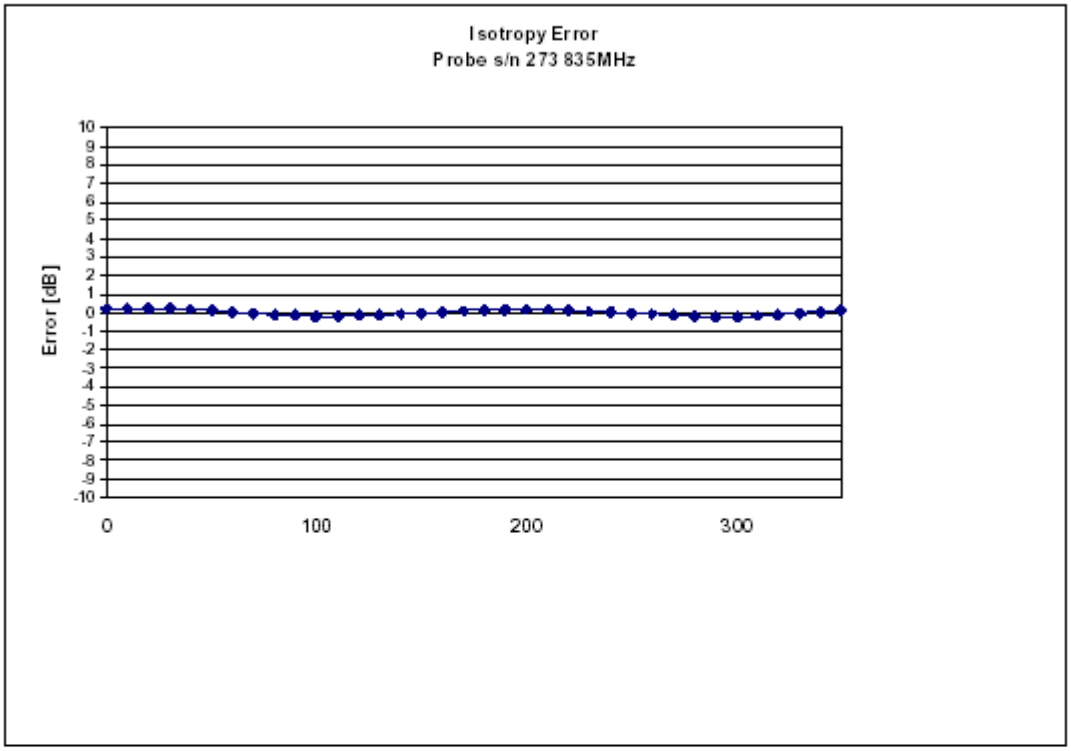
NCL Calibration Laboratories
Division of APREL Laboratories.

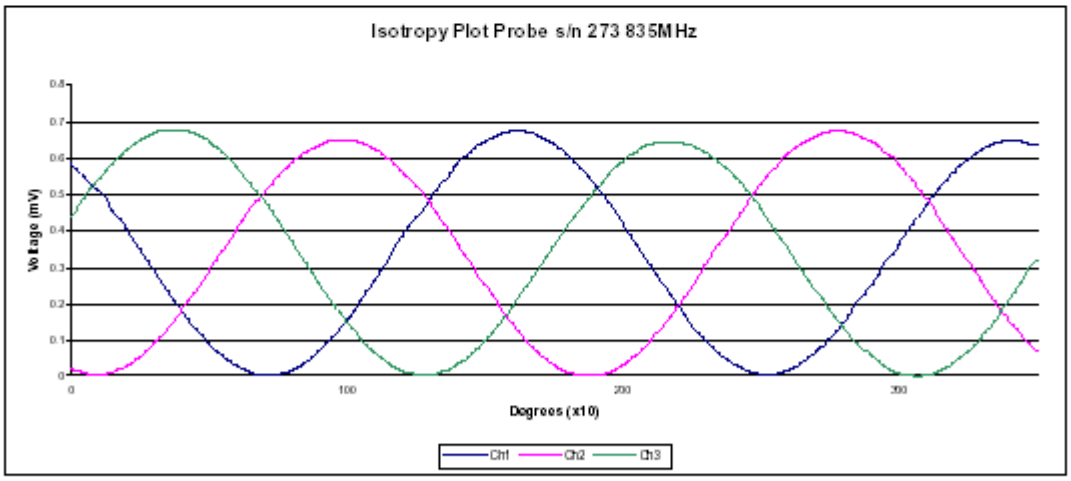
Receiving Pattern 835 MHz (Air)



NCL Calibration Laboratories
Division of APREL Laboratories.

Isotropy Error 835 MHz (Air)



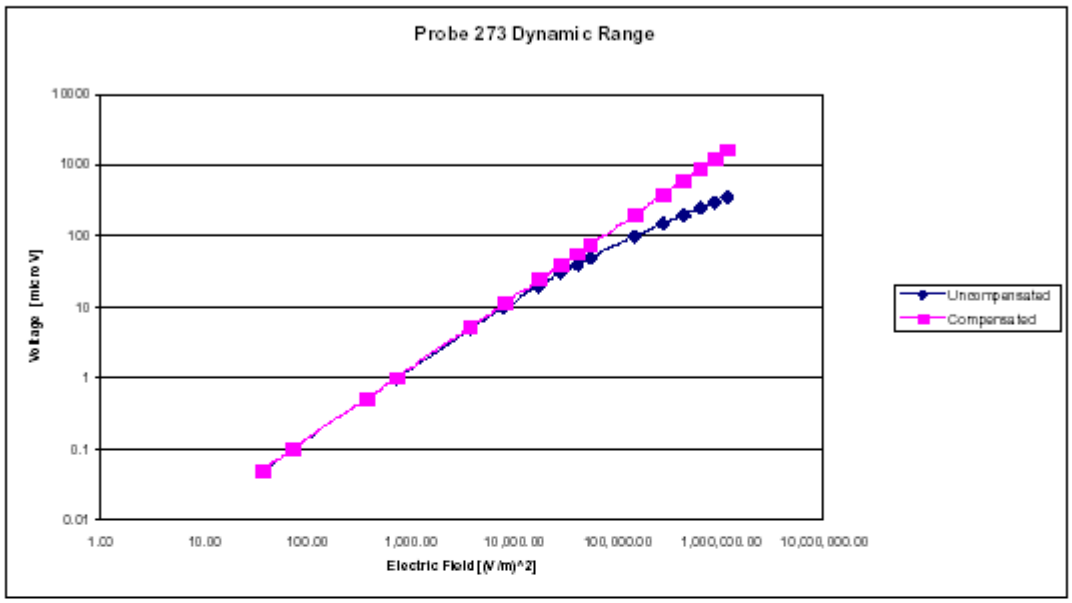


Isotropicity in Tissue: 0.10 dB

Page 6 of 10
This page has been reviewed for content and attested to on Page 2 of this document.

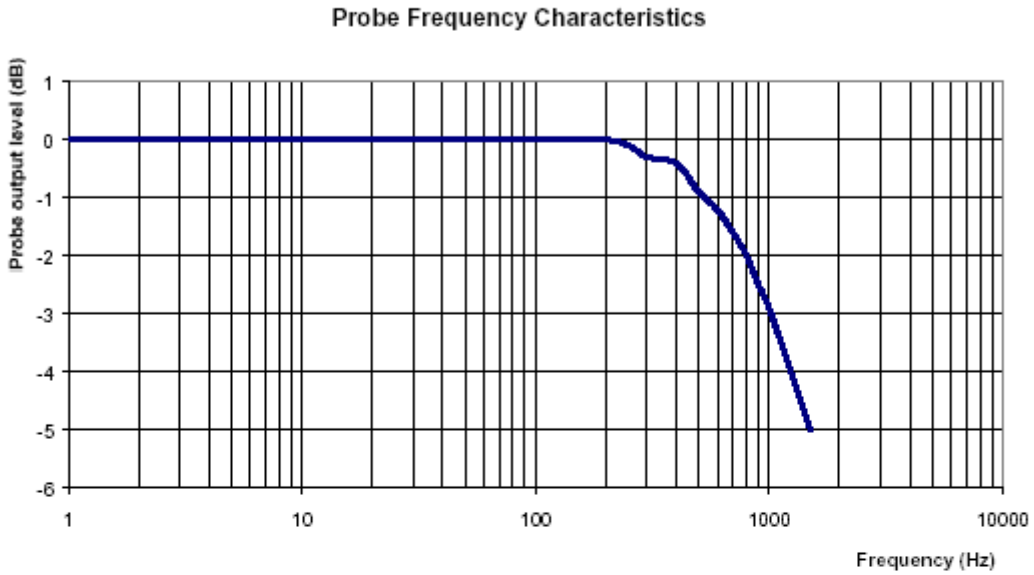
NCL Calibration Laboratories
Division of APREL Laboratories.

Dynamic Range



NCL Calibration Laboratories
Division of APREL Laboratories.

Video Bandwidth



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

NCL Calibration Laboratories
Division of APREL Laboratories.

Conversion Factor Uncertainty Assessment

Frequency:		835MHz	
Epsilon:	56.16 (+/-5%)	**Sigma:**	0.99 S/m (+/-10%)
ConvF			
Channel X:	6.7	7%(K=2)	
Channel Y:	6.7	7%(K=2)	
Channel Z:	6.7	7%(K=2)	

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

Boundary Effect:

For a distance of 2.4mm the evaluated uncertainty (increase in the probe sensitivity) is less than 2%.

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 May 2009.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1015

Client.: BACL

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 1900 MHz

Manufacturer: APREL Laboratories
Model No.: E-020
Serial No.: 273

Calibration in Head Tissue

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2
Project No: BACB-E field probe-cal-5476

Calibrated: 7th September 2009
Released on: 9th September 2009

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

Released By: _____

NCL CALIBRATION LABORATORIES
51 SPECTRUM WAY
NEPEAN, ONTARIO
CANADA K2R 1E6

Division of APREL Lab.
TEL: (613) 820-4988
FAX: (613) 820-4161

NCL Calibration Laboratories
Division of APREL Laboratories.

Introduction

This Calibration Report reproduces the results of the calibration performed in line with the SSI/DRB-TP-D01-032-E020-V2 E-Field Probe Calibration Procedure. The results contained within this report are for APREL E-Field Probe E-020 273.

References

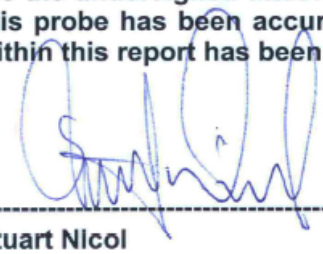
SSI/DRB-TP-D01-032-E020-V2 E-Field Probe Calibration Procedure
IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"
SSI-TP-011 Tissue Calibration Procedure

Conditions

Probe 273 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 probe has been accurately conducted and that all information contained within this report has been reviewed for accuracy.



Stuart Nicol

Jesse Hones

NCL Calibration Laboratories
Division of APREL Laboratories.

Calibration Results Summary

Probe Type:	E-Field Probe E-020
Serial Number:	273
Frequency:	1900 MHz
Sensor Offset:	1.56 mm
Sensor Length:	2.5 mm
Tip Enclosure:	Ertalyte*
Tip Diameter:	<5 mm
Tip Length:	60 mm
Total Length:	290 mm

*Resistive to recommended tissue recipes per IEEE-1528

Sensitivity in Air

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

Page 3 of 10
This page has been reviewed for content and attested to on Page 2 of this document.

Sensitivity in Head Tissue Measured

Frequency: 1900 MHz

Epsilon: 38.50 (+/-5%) **Sigma:** 1.40 S/m (+/-5%)

ConvF

Channel X: 5.25

Channel Y: 5.25

Channel Z: 5.25

Tissue sensitivity values were calculated using the load impedance of the APREL Laboratories Daq-Paq.

Boundary Effect:

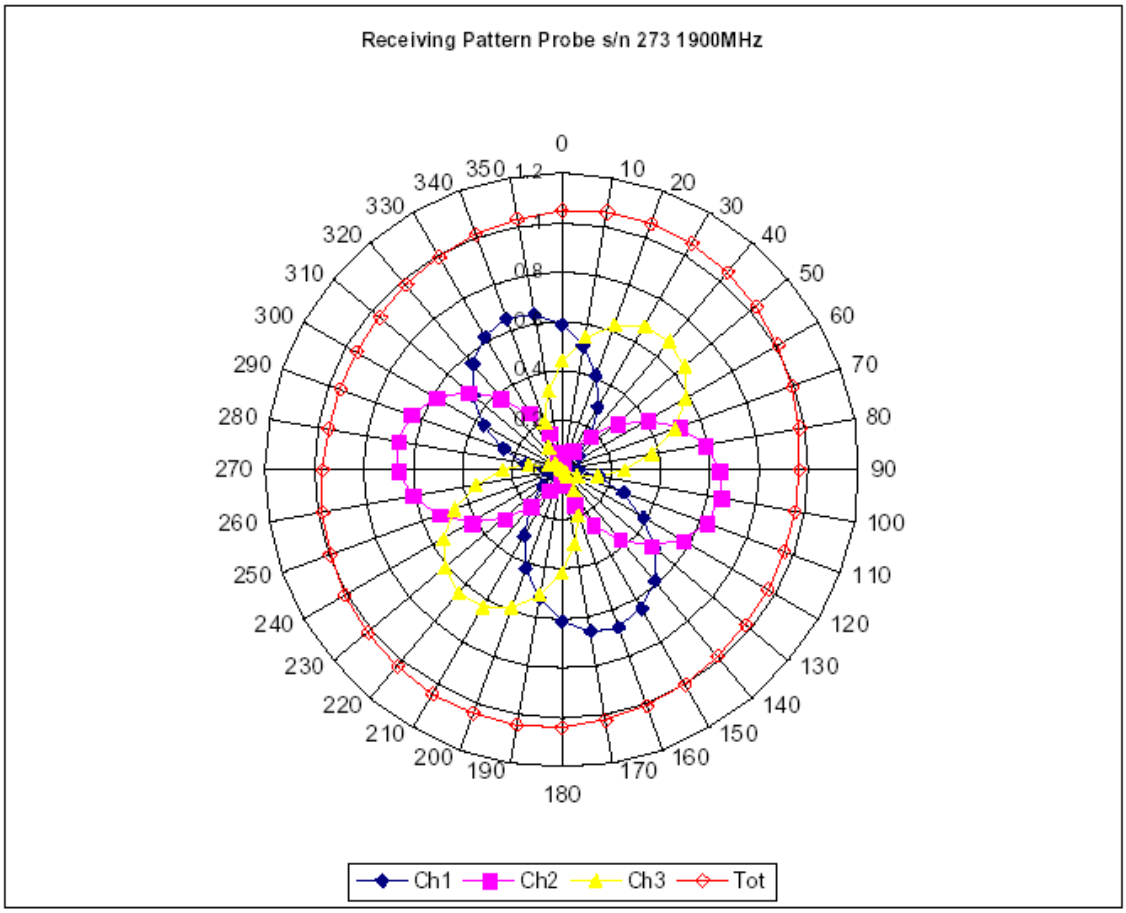
Uncertainty resulting from the boundary effect is less than 2% for the distance between the tip of the probe and the tissue boundary, when less than 2.44mm.

Spatial Resolution:

The measured probe tip diameter is 5 mm (+/- 0.01 mm) and therefore meets the requirements of SSI/DRB-TP-D01-032 for spatial resolution.

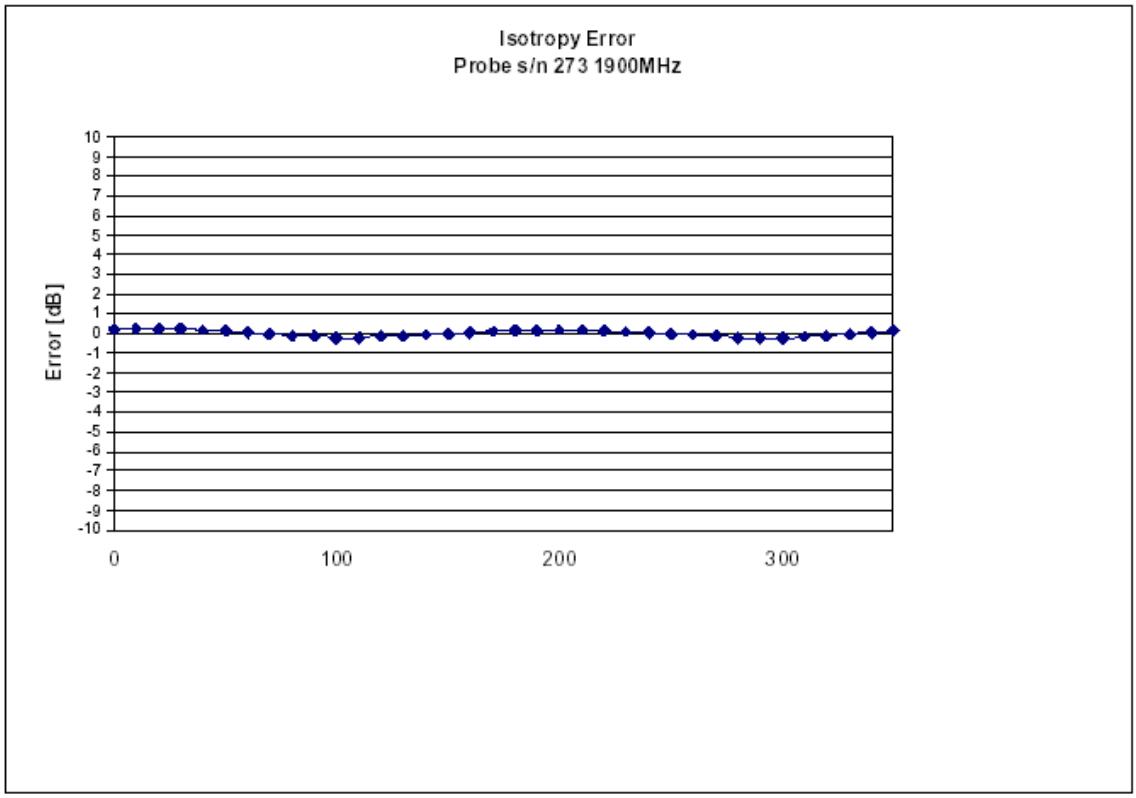
NCL Calibration Laboratories
Division of APREL Laboratories.

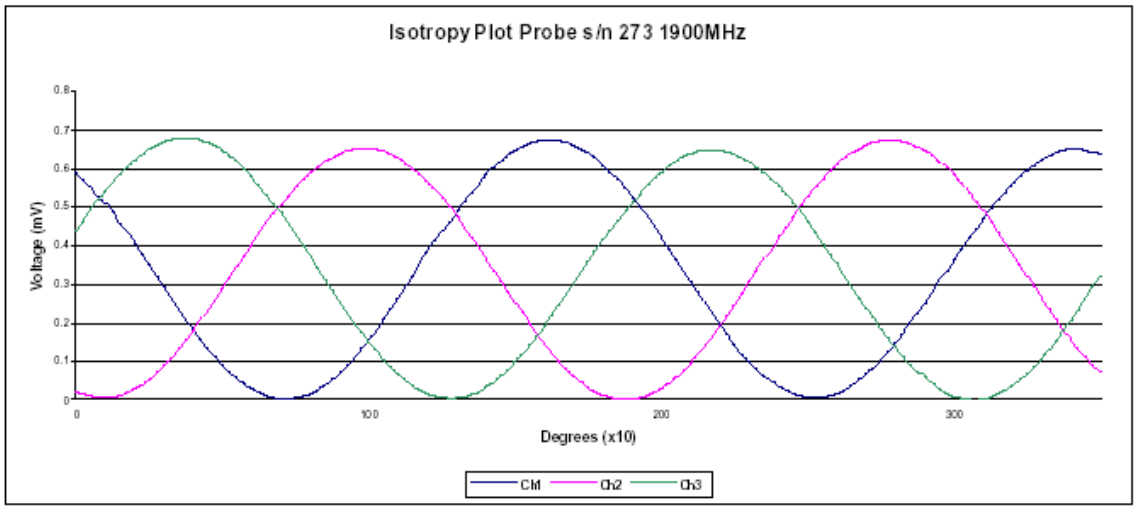
Receiving Pattern 1900 MHz (Air)



NCL Calibration Laboratories
Division of APREL Laboratories.

Isotropy Error 1900 MHz (Air)

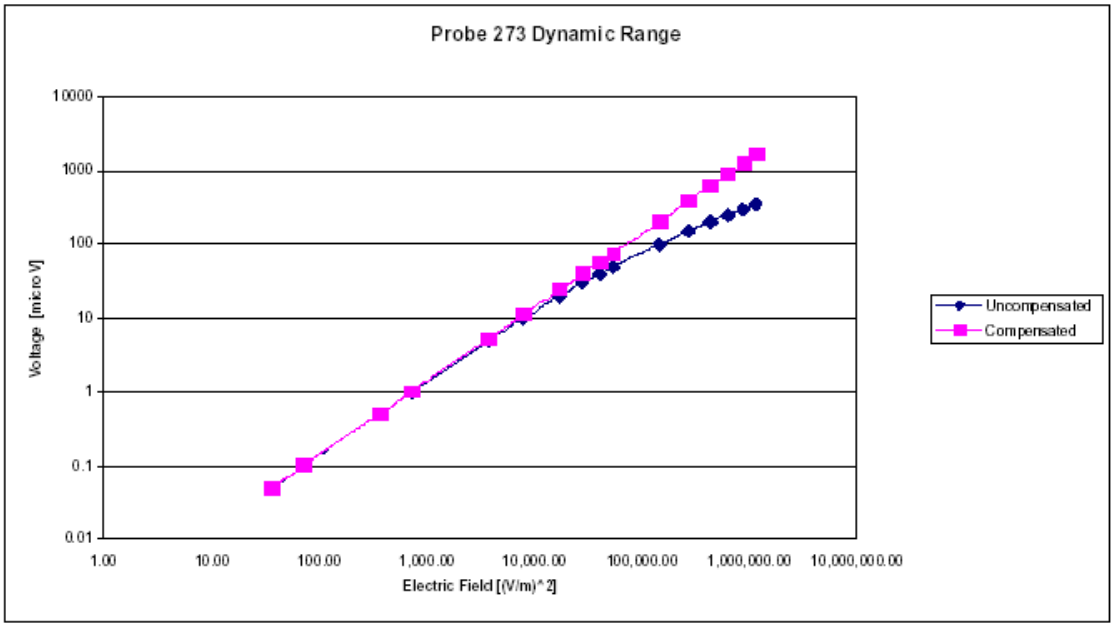




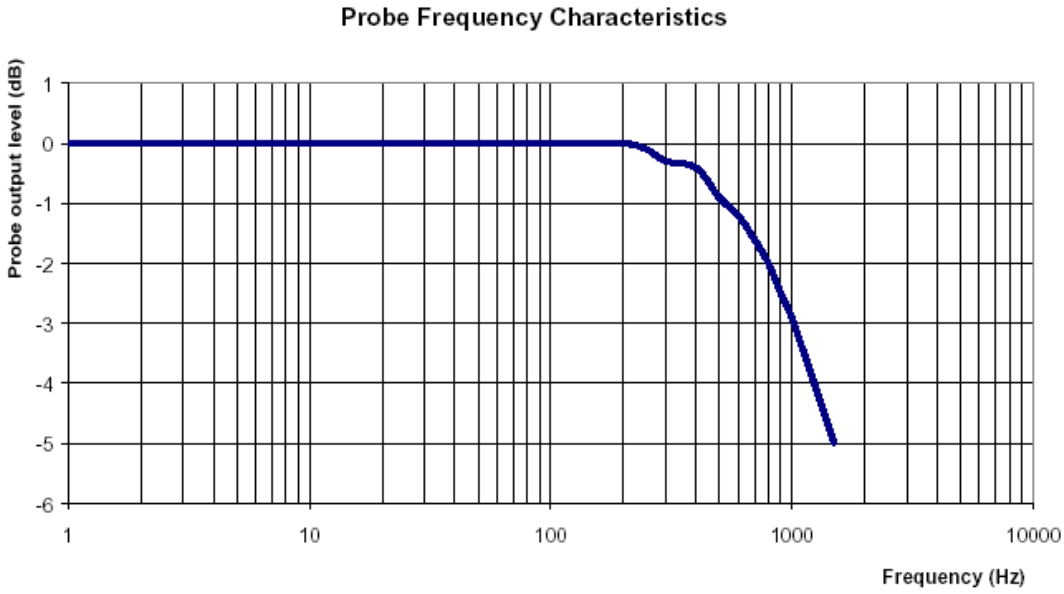
Isotropicity in Tissue: 0.10 dB

NCL Calibration Laboratories
Division of APREL Laboratories.

Dynamic Range



Video Bandwidth



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

Conversion Factor Uncertainty Assessment

Frequency:		1900MHz	
Epsilon:	38.50 (+/-5%)	**Sigma:**	1.40 S/m (+/-5%)
ConvF			
Channel X:	5.25	7%(K=2)	
Channel Y:	5.25	7%(K=2)	
Channel Z:	5.25	7%(K=2)	

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

Boundary Effect:

For a distance of 2.4mm the evaluated uncertainty (increase in the probe sensitivity) is less than 2%.

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 2009.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1016

Client.: BACL

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 1900 MHz

Manufacturer: APREL Laboratories
Model No.: E-020
Serial No.: 273

Calibration in Body Tissue

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2
Project No: BACB-E field probe-cal-5476

Calibrated: 7th September 2009
Released on: 9th September 2009

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

Released By: _____

NCL CALIBRATION LABORATORIES
51 SPECTRUM WAY
NEPEAN, ONTARIO
CANADA K2R 1E6
Division of APREL Lab.
TEL: (613) 820-4988
FAX: (613) 820-4161

NCL Calibration Laboratories
Division of APREL Laboratories.

Introduction

This Calibration Report reproduces the results of the calibration performed in line with the SSI/DRB-TP-D01-032-E020-V2 E-Field Probe Calibration Procedure. The results contained within this report are for APREL E-Field Probe E-020 273.

References

SSI/DRB-TP-D01-032-E020-V2 E-Field Probe 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"
SSI-TP-011 Tissue Calibration Procedure

Conditions

Probe 273 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 probe has been accurately conducted and that all information contained within this report has been reviewed for accuracy.

Stuart Nicol

Jesse Hones

NCL Calibration Laboratories
Division of APREL Laboratories.

Calibration Results Summary

Probe Type:	E-Field Probe E-020
Serial Number:	273
Frequency:	1900 MHz
Sensor Offset:	1.56 mm
Sensor Length:	2.5 mm
Tip Enclosure:	Ertalyte*
Tip Diameter:	<5 mm
Tip Length:	60 mm
Total Length:	290 mm

*Resistive to recommended tissue recipes per IEEE-1528

Sensitivity in Air

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

Page 3 of 10
This page has been reviewed for content and attested to on Page 2 of this document.

Sensitivity in Body Tissue Measured

Frequency: 1900 MHz

Epsilon: 53.05 (+/-5%) **Sigma:** 1.58 S/m (+/-5%)

ConvF

Channel X: 5.15

Channel Y: 5.15

Channel Z: 5.15

Tissue sensitivity values were calculated using the load impedance of the APREL Laboratories Daq-Paq.

Boundary Effect:

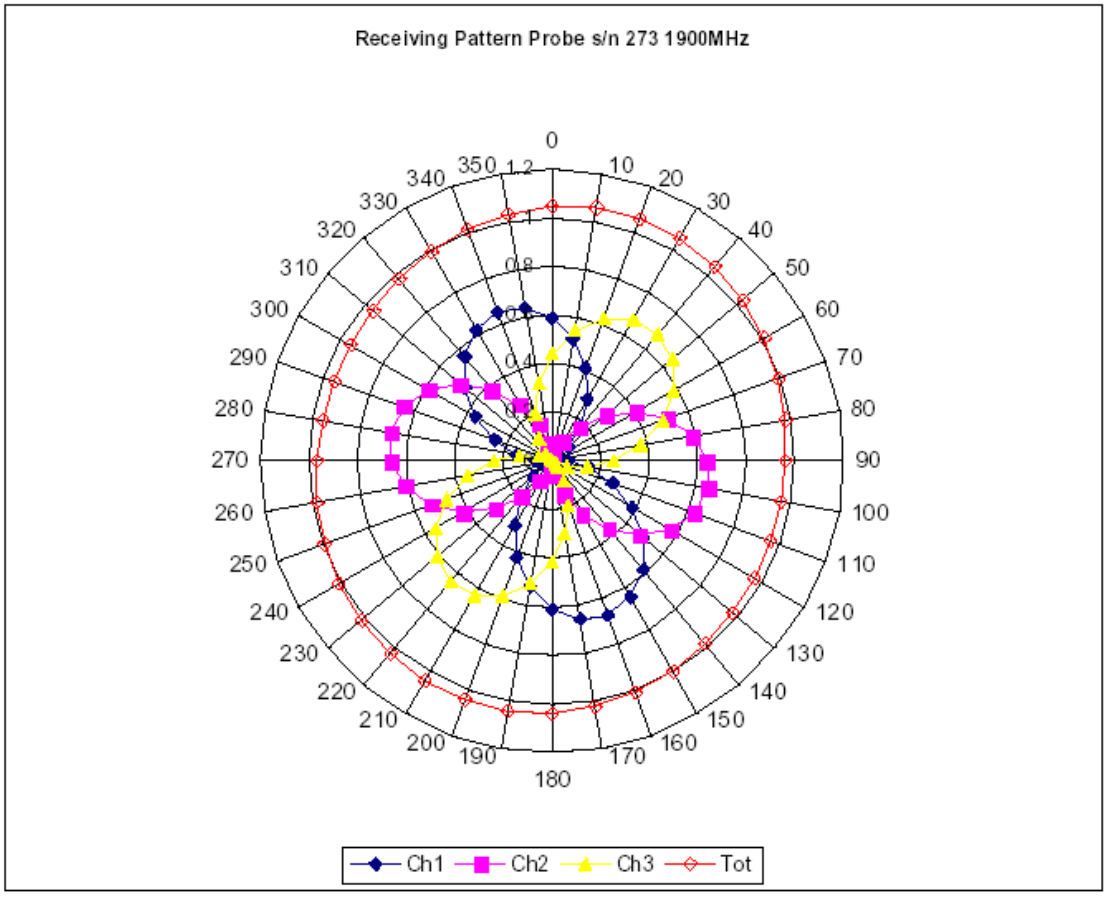
Uncertainty resulting from the boundary effect is less than 2% for the distance between the tip of the probe and the tissue boundary, when less than 2.44mm.

Spatial Resolution:

The measured probe tip diameter is 5 mm (+/- 0.01 mm) and therefore meets the requirements of SSI/DRB-TP-D01-032 for spatial resolution.

NCL Calibration Laboratories
Division of APREL Laboratories.

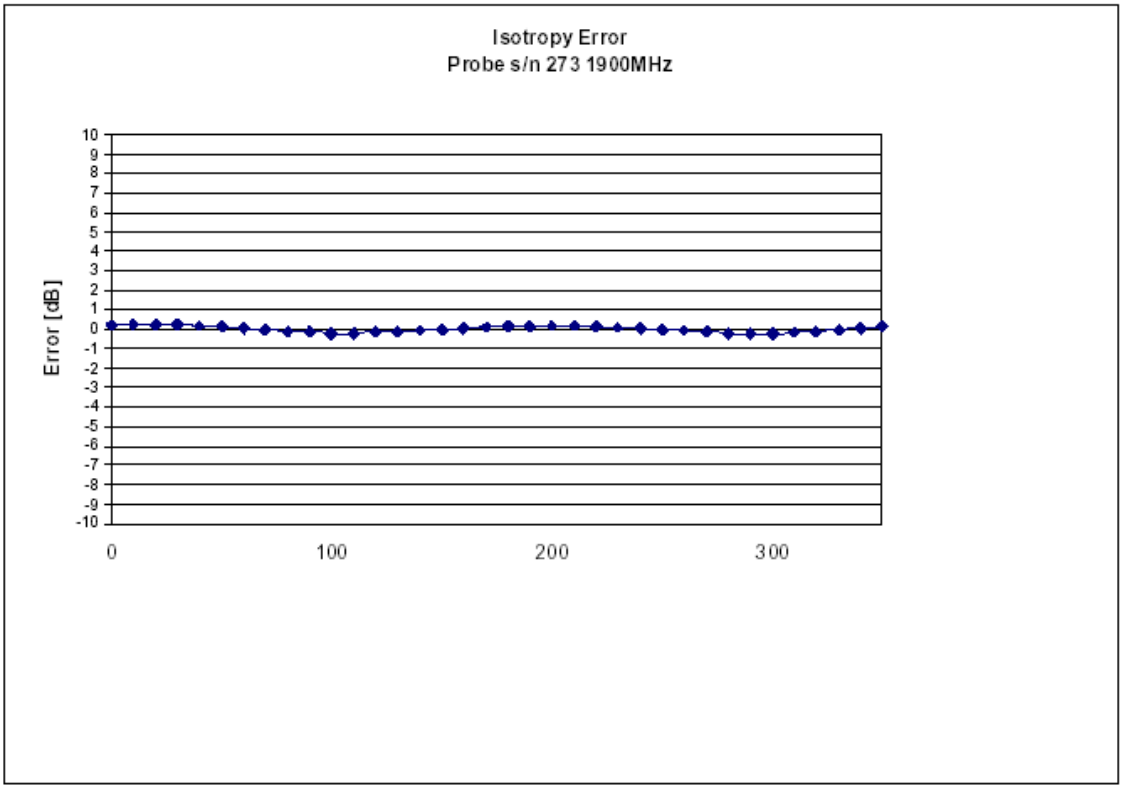
Receiving Pattern 1900 MHz (Air)

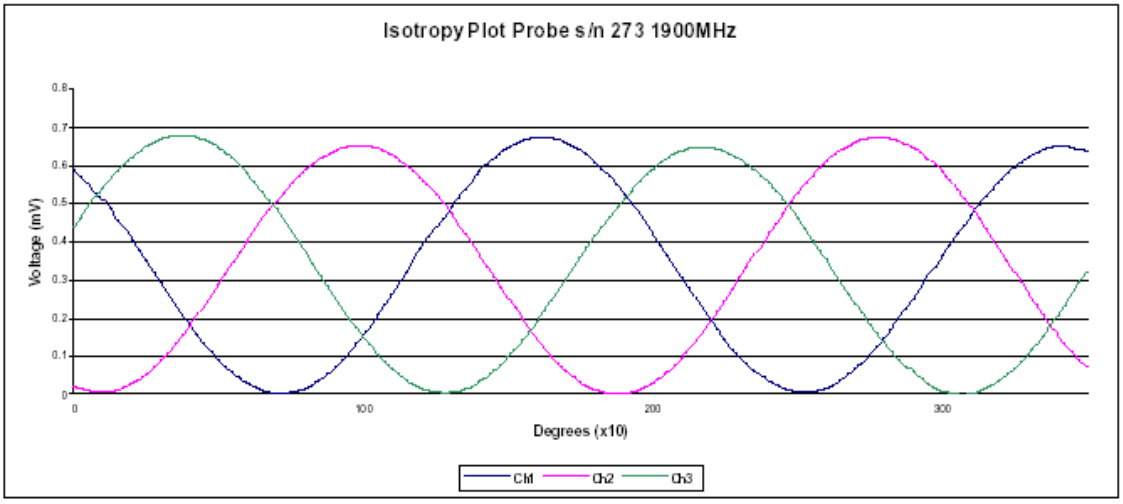


This page has been reviewed for content and attested to on Page 2 of this document.

NCL Calibration Laboratories
Division of APREL Laboratories.

Isotropy Error 1900 MHz (Air)

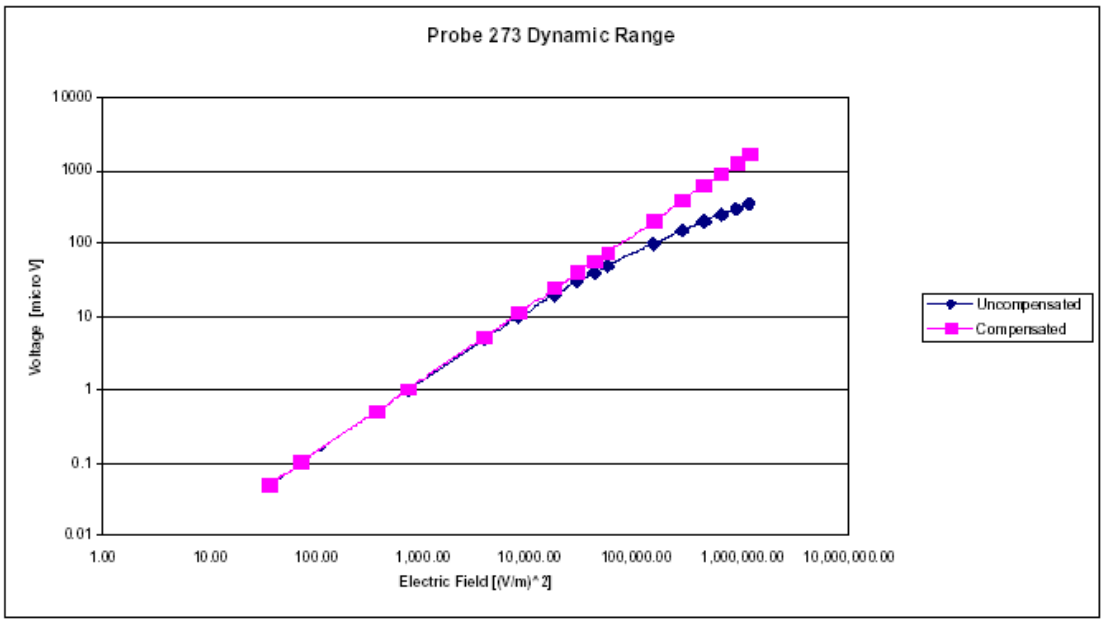




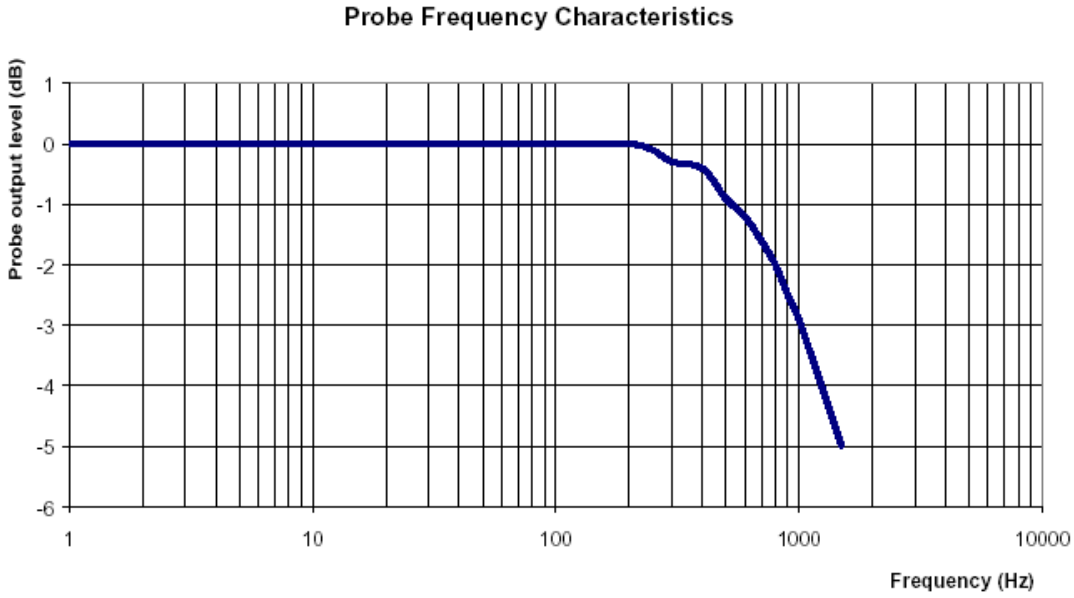
Isotropicity in Tissue: 0.10 dB

NCL Calibration Laboratories
Division of APREL Laboratories.

Dynamic Range



Video Bandwidth



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

NCL Calibration Laboratories
Division of APREL Laboratories.

Conversion Factor Uncertainty Assessment

Frequency:		1900MHz	
Epsilon:	53.05 (+/-5%)	**Sigma:**	1.58 S/m (+/-5%)
ConvF			
Channel X:	5.15	7%(K=2)	
Channel Y:	5.15	7%(K=2)	
Channel Z:	5.15	7%(K=2)	

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

Boundary Effect:

For a distance of 2.4mm the evaluated uncertainty (increase in the probe sensitivity) is less than 2%.

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 May 2009.

APPENDIX C – DIPOLE CALIBRATION CERTIFICATES

Bay Area Compliance Laboratories Corp.
(Shenzhen) 6/F, the 3rd Phase of WanLi
Industrial Building, ShiHua Road,
FuTian Free Trade Zone Shenzhen, Guangdong,
China.
Tel: +86-755-33320018
Fax: +86-755-33320008

Verification of Calibration Report	
Report Number:	CAL 2010-06-12
Description:	Dipole Antenna
Manufacturer:	APREL Laboratories
Model Number:	Dipole 835 MHz
Serial Number:	180-00558
Date of Calibration:	10 Jun 2010
Condition Received:	In Tolerance
Condition Returned:	In Tolerance
Conditions and results of calibration :	See attachment

This device has been instrumented, measured and calibrated in accordance with the Bay Area Compliance Laboratories Corp.("BACL") Quality Assurance Manual procedures and the results being traceable to the National Institute of Standards and Technology (NIST).The BACL Quality System is accredited by NVLAP to ISO/IEC 17025:2005,Unless stated Otherwise, Measurement Uncertainties are derived from ISO Guide to the Determination of Uncertainties with a Coverage Factor of k=2 for 95% level of confidence. Do compling plan or other process was used for this calibration, the results reported herein apply only to the calibration of the item desmibad above. And limitations of use (if any)shall be stated this calibration Report.

Calibrated By :	Chris. yun	**Date**	2010.06.12
Reviewed By :	Wi.cha	**Date**	2010.06.12
Quality Assurance:	Franky Chen	**Date**	2010.6.12

Attachment

Ambience Environment of Calibration

Temperature	Relative	Pressure
23℃ ± 0.5℃	48%	101.20 k Pa

Equipment List

Description	Manufacturer	Model	Serial #	Cal Date
Signal Generator	HP	8648C	3426A01345	2010-07-28
Network Analyzer	HP	5752C	3410A02356	2010-07-28
Power meter	Agilent	E4419B	MY41291511	2010-02-19
Power	Agilent	E9301A	MY41497252	2010-02-19
Reference Probe	APREL	E-Probe	E-237	2009-09-01

Measurement Conditions

APREL Version	ALSAS -10U V2.3.5
Extrapolation	Advanced Extrapolation
Phantom	Flat Phantom
Distance Dipole Center-TSL	15mm
Area Scan resolution	Dx, Dy =15mm
Zoom Scan resolution	Dx, Dy, Dz =15mm
Frequency	835 MHz ±1MHz

Calibration is performed According to the Following Standards:

1. IEEE Std 1528-2003."IEEE Recommended Practice for Determining the Peak Spatial Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices :Measurement Techniques ",December 2003
2. IEC 62209-1,"Procedure to measure the Specific Absorption Rate(SAR)for band-held devices used in close proximity to the ear (frequency rang of 300MHz to 3GHz)".
3. APREL SAR Test System Handbook.

Mechanical Dimensions

Length: 162.2 mm
Height: 89.4 mm

Dipole Calibration Results

Mechanical Verification

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

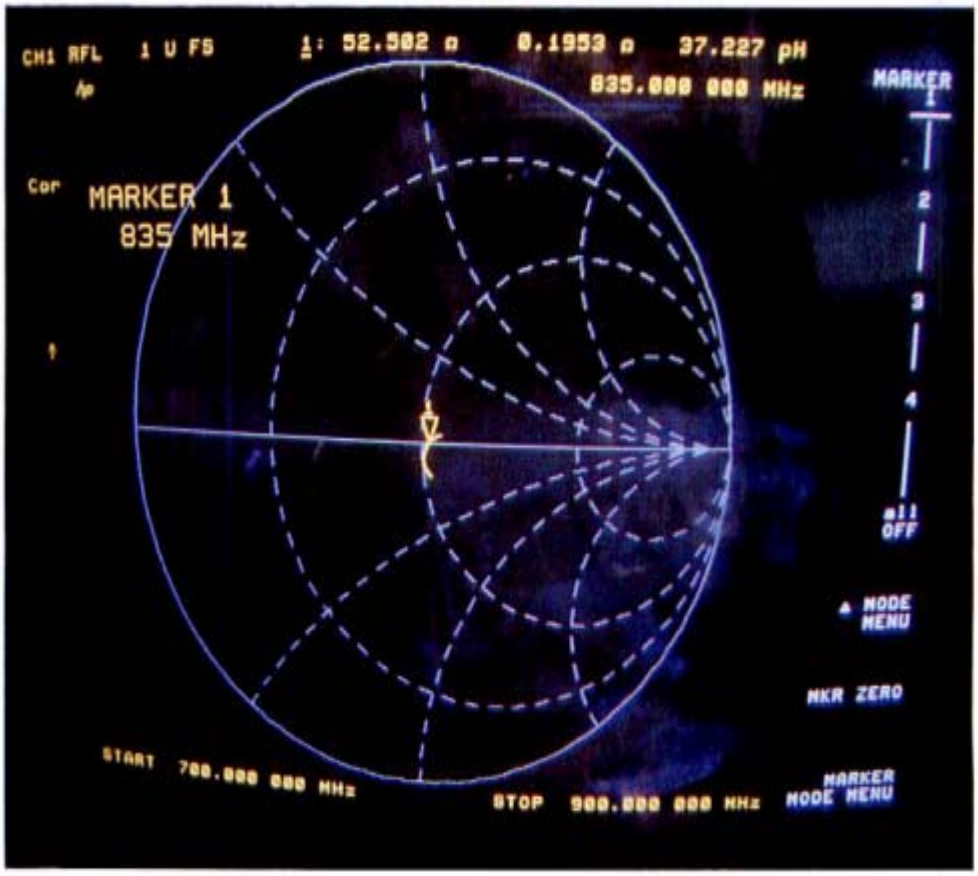
Tissue Validation

Head Tissue 835MHz	Measured
Dielectric constant, εr	
Conductivity, σ (S/m)	

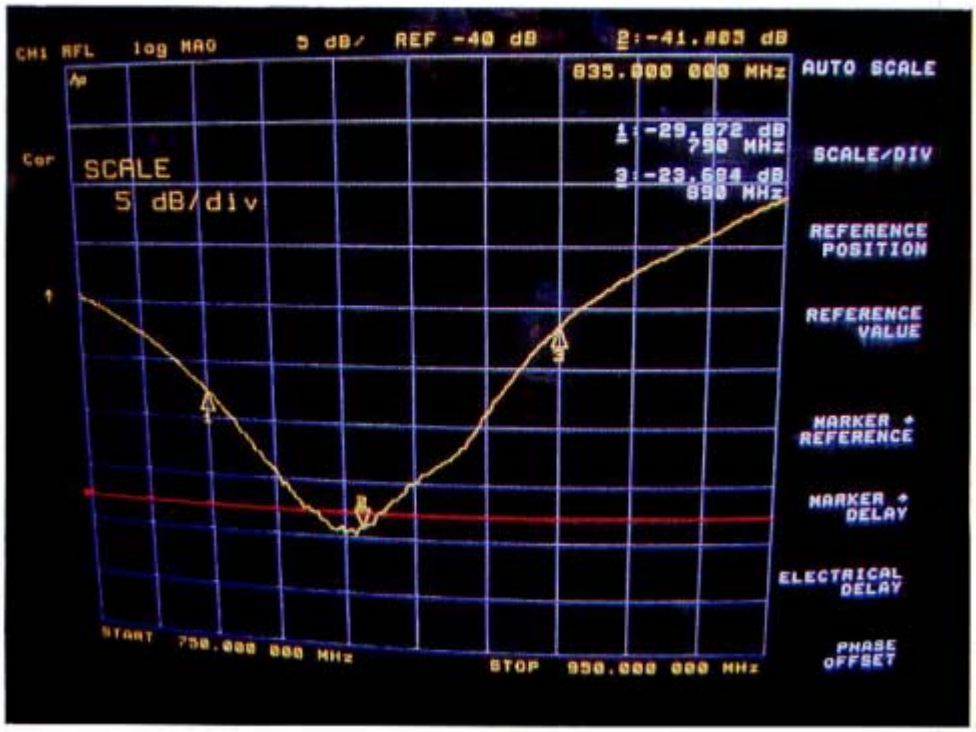
Test Result :

Impedance Measurement Plot for Head TSL	52.502
Return Loss Measurement Plot for Head TSL	-41.605
SWR	1.1706

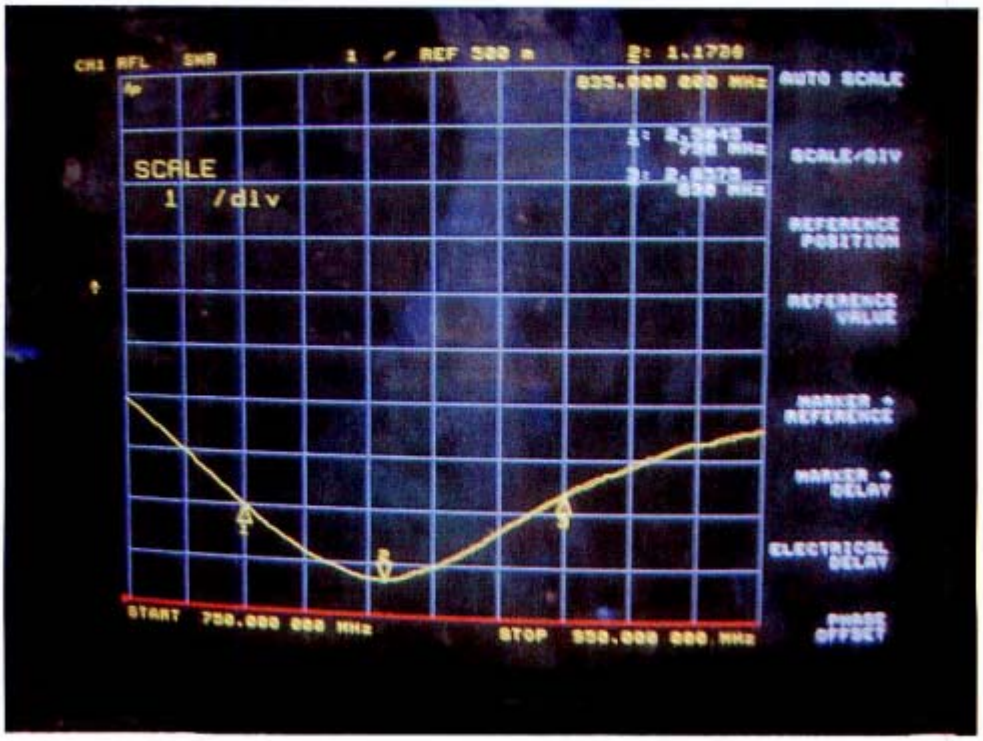
Impedance Measurement Plot for Head TSL



Return Loss Measurement Plot for Head TSL



SWR


CH1 REFL SWR
1 / REF 500 m
2: 1.1720
AUTO SCALE
SCALE
1 /div
SCALE/DIV
REFERENCE POSITION
REFERENCE VALUE
MARKER → REFERENCE
MARKER → DELAY
ELECTRICAL DELAY
PHASE OFFSET
START 750.000 000 MHz
STOP 950.000 000 MHz

Bay Area Compliance Laboratories Corp.
(Shenzhen) 6/F, the 3rd Phase of WanLi
Industrial Building, ShiHua Road,
FuTian Free Trade Zone Shenzhen, Guangdong,
China.
Tel: +86-755-33320018
Fax: +86-755-33320008

Verification of Calibration Report

Report Number:	CAL 2010-06-12
Description:	Dipole Antenna
Manufacturer:	APREL Laboratories
Model Number:	Dipole 1900MHz
Serial Number:	210-00710
Date of Calibration:	10 Jun 2010
Condition Received:	In Tolerance
Condition Returned:	In Tolerance
Conditions and results of calibration :	See attachment

This device has been instrumented, measured and calibrated in accordance with the Bay Area Compliance Laboratories Corp.("BACL") Quality Assurance Manual procedures and the results being traceable to the National Institute of Standards and Technology (NIST).The BACL Quality System is accredited by NVLAP to ISO/IEC 17025:2005,Unless stated Otherwise, Measurement Uncertainties are derived from ISO Guide to the Determination of Uncertainties with a Coverage Factor of k=2 for 95% level of confidence. Do compling plan or other process was used for this calibration, the results reported herein apply only to the calibration of the item desmibad above. And limitations of use (if any)shall be stated this calibration Report.

Calibrated By :	Chris. Yan	**Date**	2010.06.12
Reviewed By :	Lin.Cao	**Date**	2010.06.12
Quality Assurance:	Tony	**Date**	2010.6.12

Attachment

Ambience Environment of Calibration

Temperature	Relative	Pressure
23℃ ± 0.5℃	48%	101.20 k Pa

Equipment List

Description	Manufacturer	Model	Serial #	Cal Date
Signal Generator	HP	8648C	3426A01345	2010-07-28
Network Analyzer	HP	5752C	3410A02356	2010-07-28
Power meter	Agilent	E4419B	MY41291511	2010-02-19
Power	Agilent	E9301A	MY41497252	2010-02-19
Reference Probe	APREL	E-Probe	E-237	2009-09-01

Measurement Conditions

APREL Version	ALSAS -10U V2.3.5
Extrapolation	Advanced Extrapolation
Phantom	Flat Phantom
Distance Dipole Center-TSL	15mm
Area Scan resolution	Dx, Dy =15mm
Zoom Scan resolution	Dx, Dy,Dz =15mm
Frequency	1900 MHz ±1MHz

Calibration is performed According to the Following Standards:

1. IEEE Std 1528-2003."IEEE Recommended Practice for Determining the Peak Spatial Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices :Measurement Techniques ",December 2003
2. IEC 62209-1,"Procedure to measure the Specific Absorption Rate(SAR)for band-held devices used in close proximity to the ear (frequency rang of 300MHz to 3GHz)".
3. APREL SAR Test System Handbook.

Mechanical Dimensions

Length: 67.1 mm
Height: 38.9 mm

Dipole Calibration Results

Mechanical Verification

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

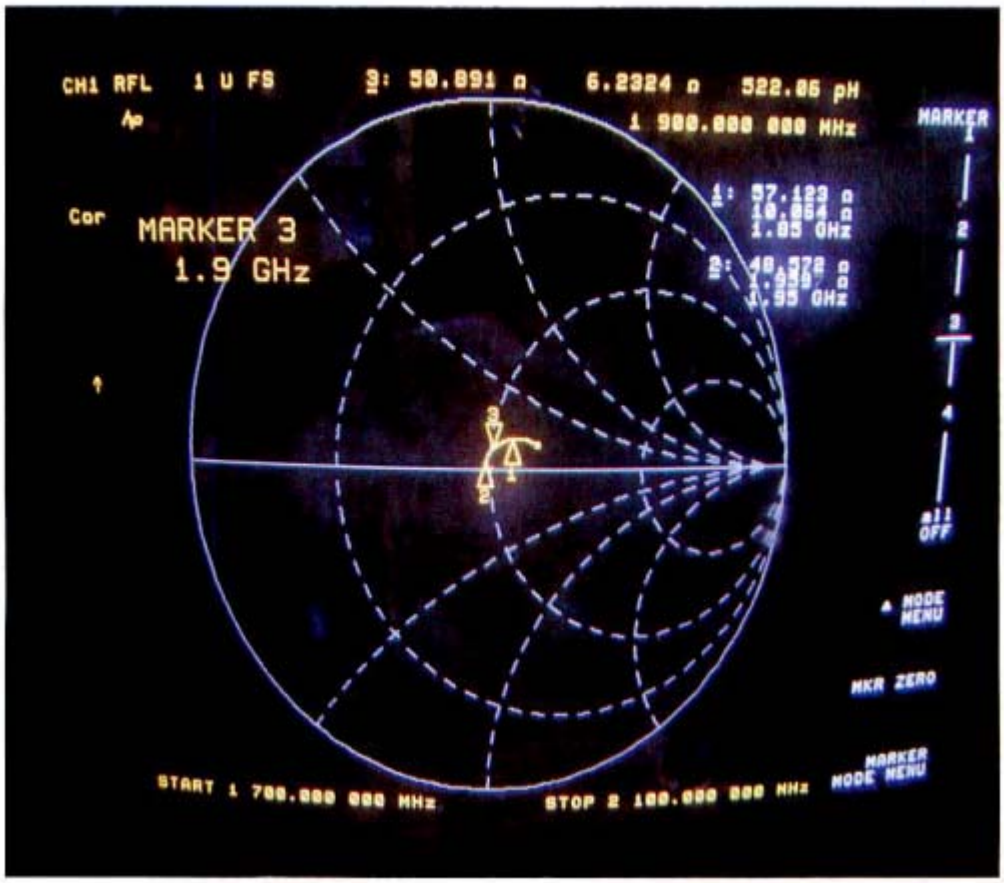
Tissue Validation

Head Tissue 1900 MHz	Measured
Dielectric constant, ε_r	41.12
Conductivity, σ (S/m)	0.92

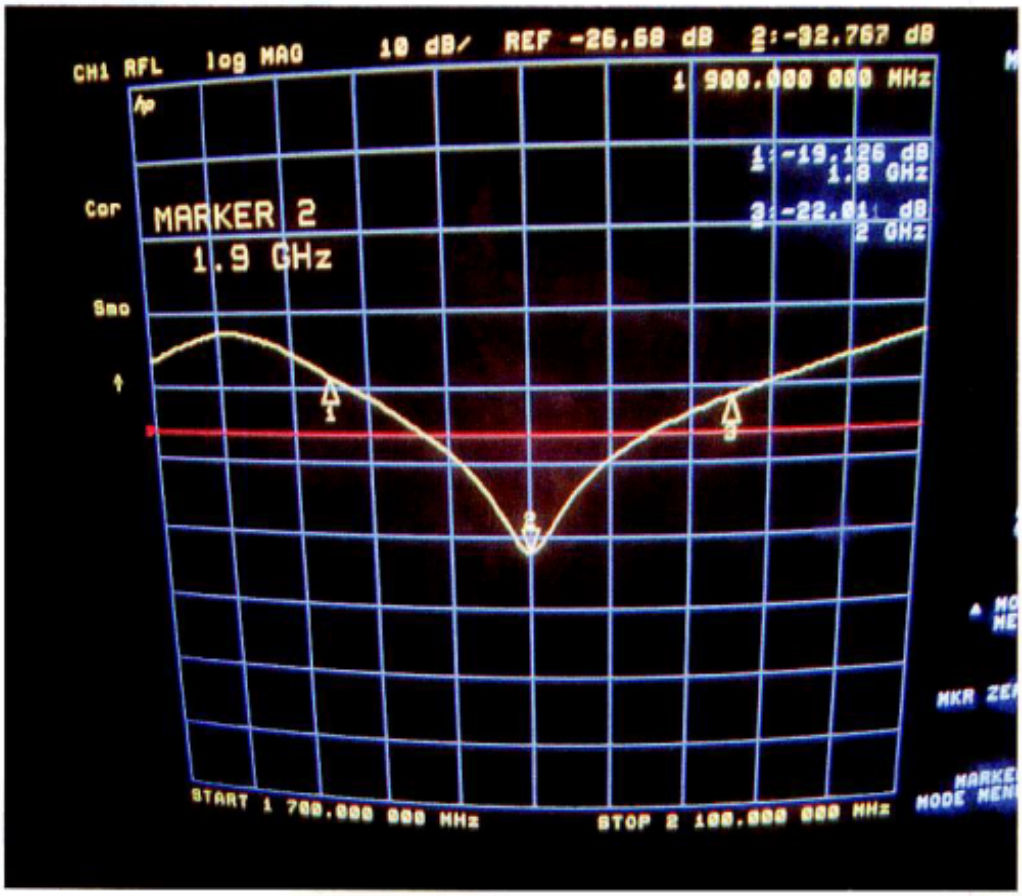
Test Result :

Impedance Measurement Plot for Head TSL	50.891
Return Loss Measurement Plot for Head TSL	-32.767
SWR	1.1586

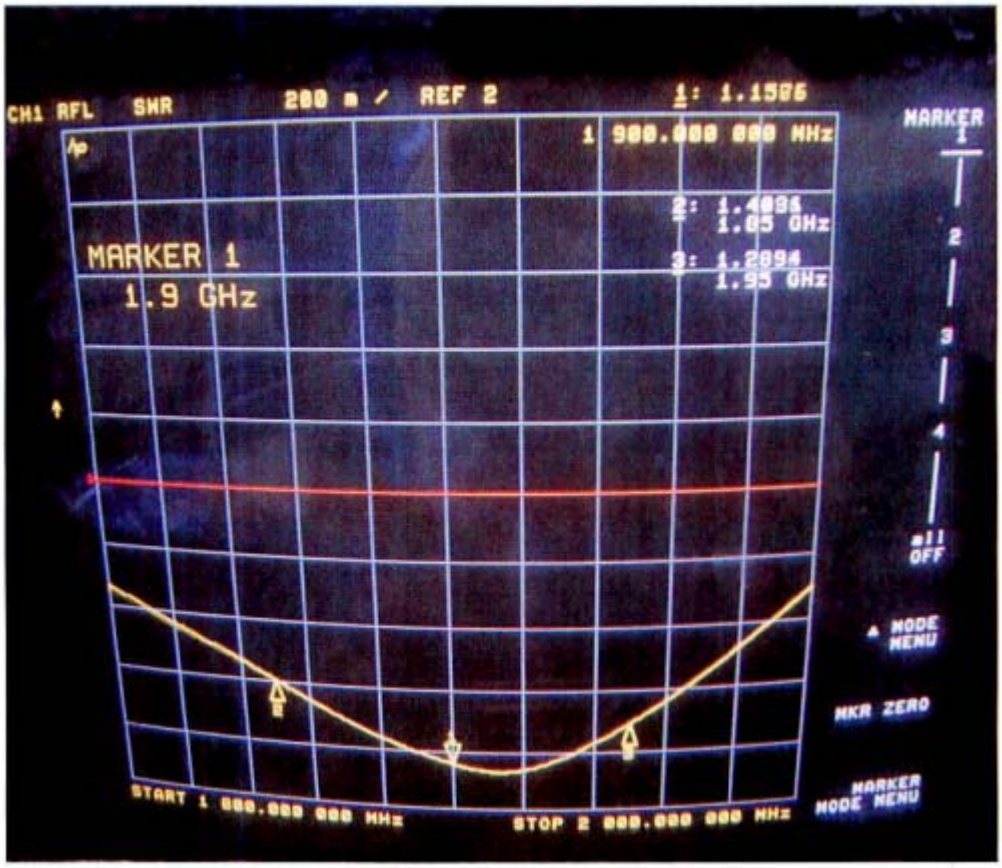
Impedance Measurement Plot for Head TSL



Return Loss Measurement Plot for Head TSL



SWR


CH1 RFL SWR
200 m / REF 2
1: 1.1586
1 900.000 000 MHz
2: 1.4036
1.85 GHz
3: 1.2894
1.95 GHz
MARKER 1
1.9 GHz
MARKER
1
2
3
4
all OFF
MODE MENU
MKR ZERO
MARKER MODE MENU
START 1 800.000 000 MHz
STOP 2 000.000 000 MHz

APPENDIX D – SAR SYSTEM VALIDATION DATA

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

System Performance Check 835MHz Head

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 : 835.00 MHz
Max. Transmit Pwr : 1 W
Drift Time : 3 min(s)
Power Drift-Start : 9.212 W/kg
Power Drift-Finish : 9.253 W/kg
Power Drift (%) : 1.137

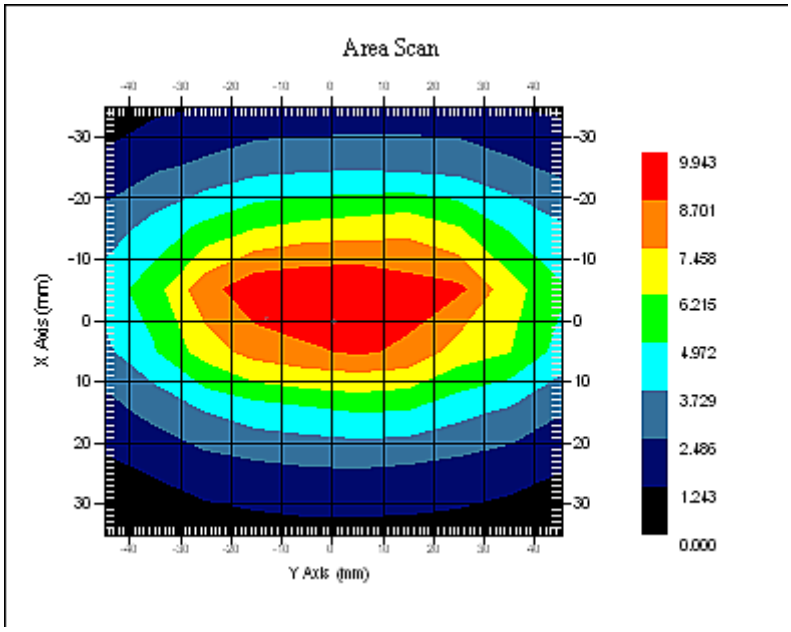
Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
Serial No. : System Default
Location : Center
Description : Default
Phantom Data

Tissue Data
Type : HEAD
Serial No. : 270-01002
Frequency : 835.00 MHz
Last Calib. Date : 5-July -2010
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 50.00 RH%
Epsilon : 39.94 F/m
Sigma : 0.87S/m
Density : 1000.00 kg/cu. m

Probe Data
Name : E-Field
Model : E-020
Type : E-Field Triangle
Serial No. : 273
Last Calib. Date : 05-Sep-2010
Frequency : 835.00 MHz
Duty Cycle Factor : 1
Conversion Factor : 6.5
Probe Sensitivity : 1.20 1.20 1.20 µV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

Measurement Data
Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 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 : 9.651 W/kg
10 gram SAR value : 6.042 W/kg
Area Scan Peak SAR : 9.876 W/kg
Zoom Scan Peak SAR : 14.328 W/kg



835 MHz System Validation

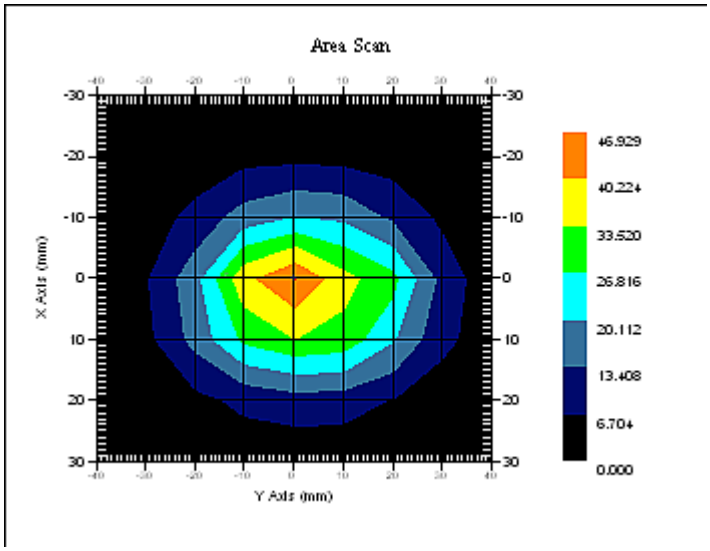
Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

System Performance Check 1900 Head

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	: 1900.00 MHz
Max. Transmit Pwr	: 1 W
Drift Time	: 3 min(s)
Power Drift-Start	: 45.287 W/kg
Power Drift-Finish	: 47.328 W/kg
Power Drift (%)	: 3.637
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	: 5-July -2010
Temperature	: 20.00 °C
Ambient Temp.	: 20.00 °C
Humidity	: 56.00 RH%
Epsilon	: 39.39F/m
Sigma	: 1.47 S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Name	: E-Field
Model	: E-020
Type	: E-Field Triangle
Serial No.	: 273
Last Calib. Date	: 05-Sep-2009
Frequency	: 1900.00 MHz
Duty Cycle Factor	: 1
Conversion Factor	: 5.25
Probe Sensitivity	: 1.20 1.20 1.20 μV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
Measurement Data	
Crest Factor	: 1
Scan Type	: Complete
Tissue Temp.	: 20.00 °C
Ambient Temp.	: 20.00 °C
Area Scan	: 7x9x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm

1 gram SAR value : 40.328 W/kg
10 gram SAR value : 20.137 W/kg
Area Scan Peak SAR : 45.836 W/kg
Zoom Scan Peak SAR : 75.249 W/kg



1900 MHz System Validation

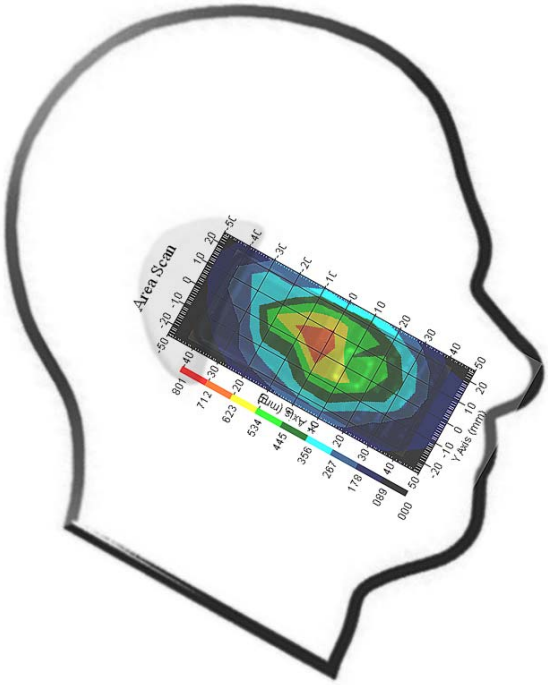
APPENDIX E – EUT SCAN RESULTS

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

Left Head Cheek (835 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 10x6x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.298 W/kg
Power Drift-Finish	: 0.274 W/kg
Power Drift (%)	: -1.105
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 39.94 F/m
Sigma	: 0.87S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Serial No.	: 273
Frequency	: 835.00 MHz
Duty Cycle Factor	: 8
Conversion Factor	: 6.5
Probe Sensitivity	: 1.20 1.20 1.20 μV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
1 gram SAR value	: 0.323 W/kg
10 gram SAR value	: 0.201 W/kg
Area Scan Peak SAR	: 0.431 W/kg
Zoom Scan Peak SAR	: 0.640 W/kg

Plot 1#

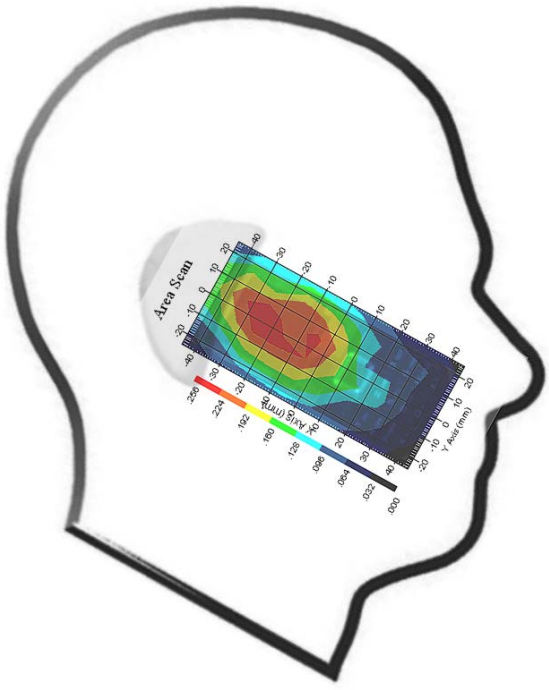


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Left Head Tilt (835 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 10x6x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.173 W/kg
Power Drift-Finish	: 0.170 W/kg
Power Drift (%)	: -1.750
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 39.94 F/m
Sigma	: 0.87S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Serial No.	: 273
Frequency	: 835.00 MHz
Duty Cycle Factor	: 8
Conversion Factor	: 6.5
Probe Sensitivity	: 1.20 1.20 1.20 µV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
1 gram SAR value	: 0.192 W/kg
10 gram SAR value	: 0.147 W/kg
Area Scan Peak SAR	: 0.235 W/kg
Zoom Scan Peak SAR	: 0.345 W/kg

Plot 2#

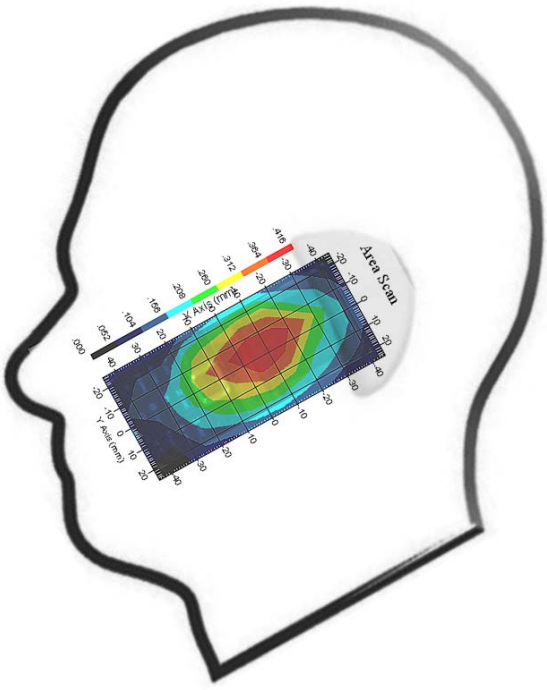


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Right Head Cheek (835 MHz Low Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type：	: Complete
Area Scan	: 10x6x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.178 W/kg
Power Drift-Finish	: 0.183 W/kg
Power Drift (%)	: 2.593
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 39.94 F/m
Sigma	: 0.87S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Serial No.	: 273
Frequency	: 835.00 MHz
Duty Cycle Factor	: 8
Conversion Factor	: 6.5
Probe Sensitivity	: 1.20 1.20 1.20 μV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
1 gram SAR value	: 0.318 W/kg
10 gram SAR value	: 0.225 W/kg
Area Scan Peak SAR	: 0.421 W/kg
Zoom Scan Peak SAR	: 0.715 W/kg

Plot 3#

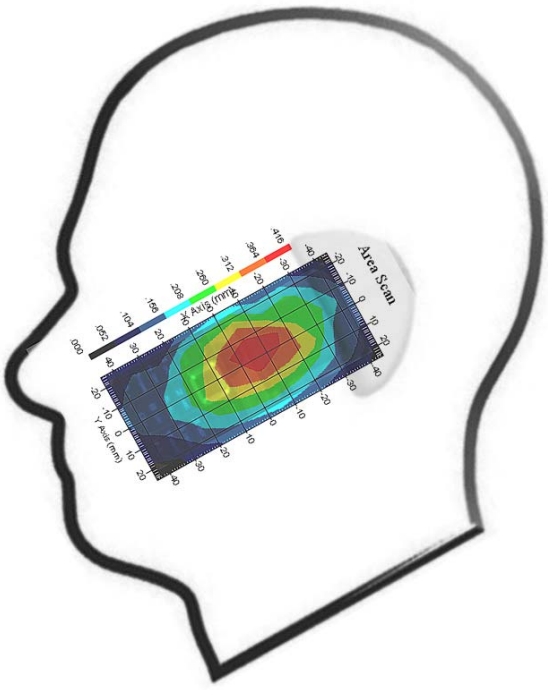


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Right Head Cheek (835 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type：	: Complete
Area Scan	: 10x6x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.179 W/kg
Power Drift-Finish	: 0.185 W/kg
Power Drift (%)	: 3.153
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 39.94 F/m
Sigma	: 0.87S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Serial No.	: 273
Frequency	: 835.00 MHz
Duty Cycle Factor	: 8
Conversion Factor	: 6.5
Probe Sensitivity	: 1.20 1.20 1.20 μV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
1 gram SAR value	: 0.395 W/kg
10 gram SAR value	: 0.268 W/kg
Area Scan Peak SAR	: 0.403 W/kg
Zoom Scan Peak SAR	: 0.530 W/kg

Plot 4#

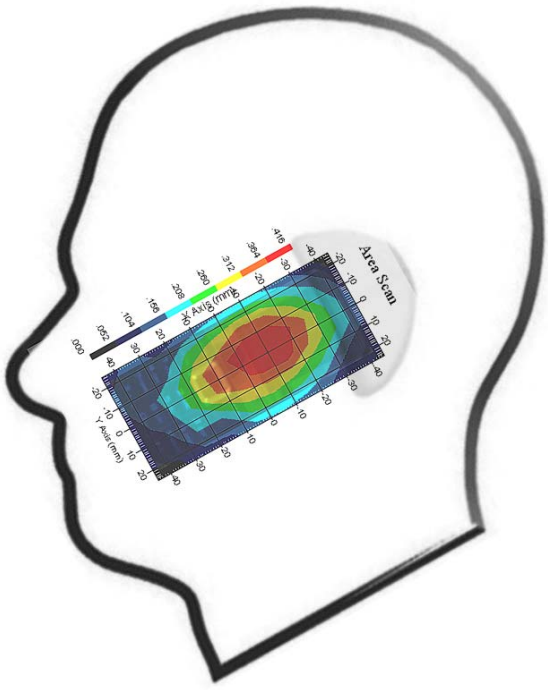


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Right Head Cheek (835 MHz High Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type：	: Complete
Area Scan	: 10x6x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.192 W/kg
Power Drift-Finish	: 0.186 W/kg
Power Drift (%)	: -3.215
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 39.94 F/m
Sigma	: 0.87S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Serial No.	: 273
Frequency	: 835.00 MHz
Duty Cycle Factor	: 8
Conversion Factor	: 6.5
Probe Sensitivity	: 1.20 1.20 1.20 μV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
1 gram SAR value	: 0.315 W/kg
10 gram SAR value	: 0.254 W/kg
Area Scan Peak SAR	: 0.412 W/kg
Zoom Scan Peak SAR	: 0.790 W/kg

Plot 5#

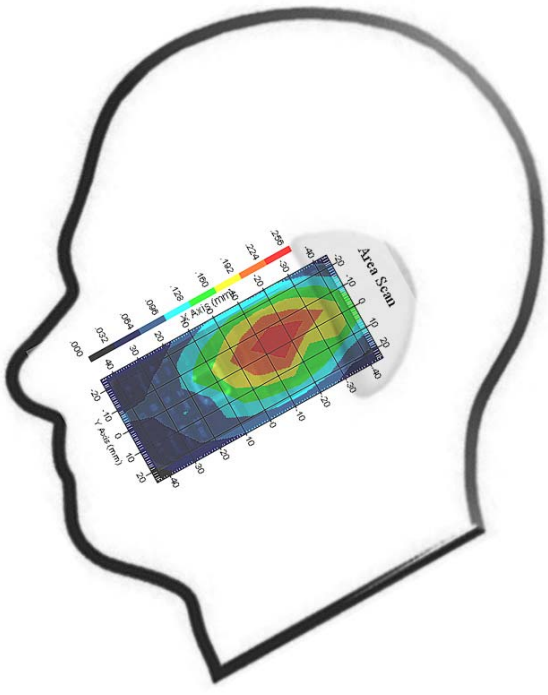


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Right Head Tilt (835 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type：	: Complete
Area Scan	: 10x6x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.185 W/kg
Power Drift-Finish	: 0.178 W/kg
Power Drift (%)	: -3.597
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 39.94 F/m
Sigma	: 0.87S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Serial No.	: 273
Frequency	: 835.00 MHz
Duty Cycle Factor	: 8
Conversion Factor	: 6.5
Probe Sensitivity	: 1.20 1.20 1.20 μV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
1 gram SAR value	: 0.254 W/kg
10 gram SAR value	: 0.142 W/kg
Area Scan Peak SAR	: 0.250 W/kg
Zoom Scan Peak SAR	: 0.351 W/kg

Plot 6#



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

Body- worn Back (835 MHz Middle Channel)

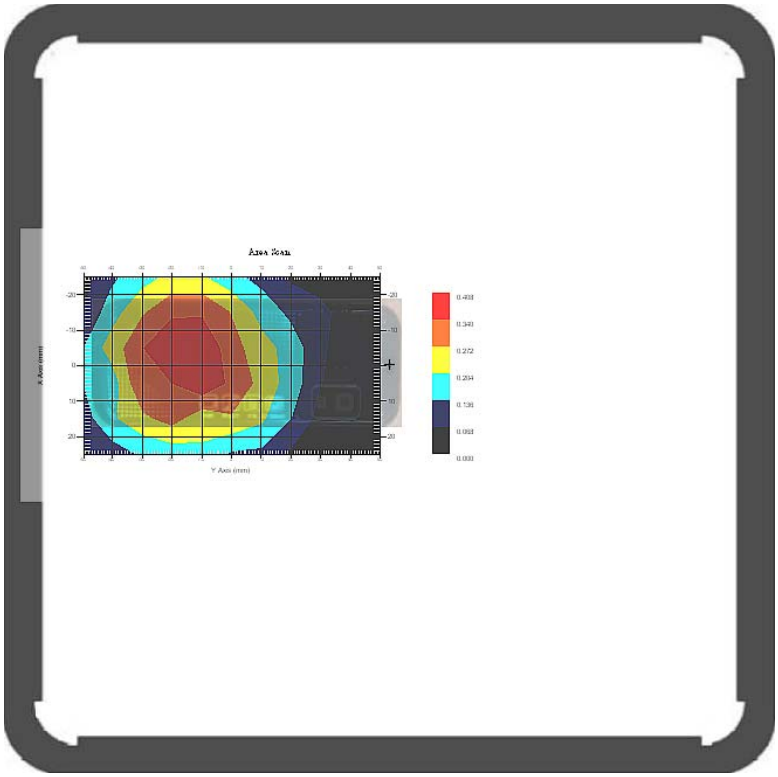
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type : Complete
Area Scan : 6x10x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.148 W/kg
Power Drift-Finish : 0.141 W/kg
Power Drift (%) : -2.666

Tissue Data
Type : BODY
Frequency : 835.00 MHz
Epsilon : 55.17 F/m
Sigma : 0.98 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 835.00 MHz
Duty Cycle Factor : 8
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.305 W/kg
10 gram SAR value : 0.199 W/kg
Area Scan Peak SAR : 0.439 W/kg
Zoom Scan Peak SAR : 0.590 W/kg

Plot 7#



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

Body- worn Back (835 MHz Low Channel)

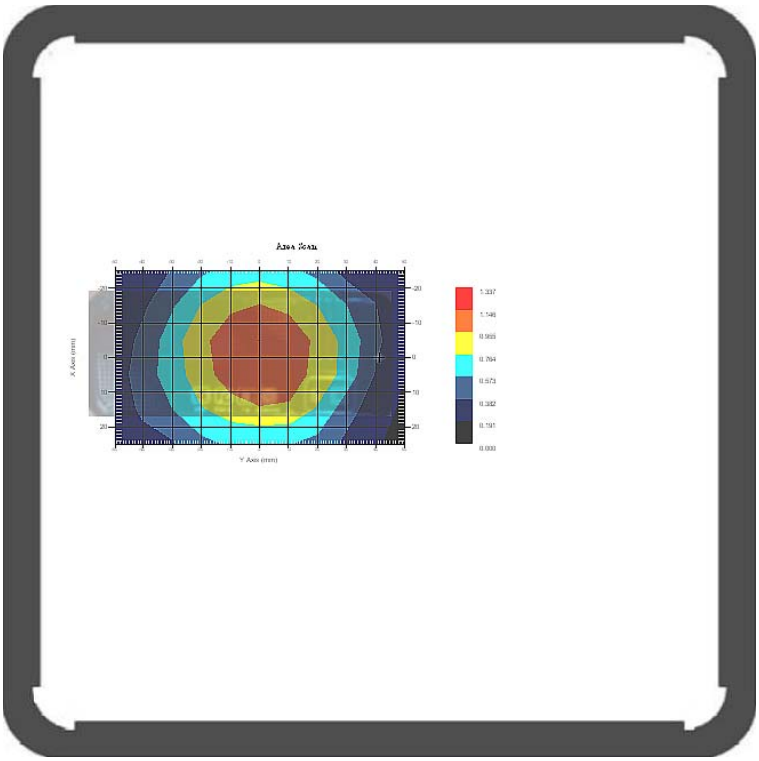
Measurement Data
Test mode : GPRS
Crest Factor : 2
Scan Type : Complete
Area Scan : 6x10x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.414 W/kg
Power Drift-Finish : 0.411 W/kg
Power Drift (%) : -3.766

Tissue Data
Type : BODY
Frequency : 835.00 MHz
Epsilon : 55.17 F/m
Sigma : 0.98 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 835.00 MHz
Duty Cycle Factor : 2
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 1.115 W/kg
10 gram SAR value : 0.790 W/kg
Area Scan Peak SAR : 1.147 W/kg
Zoom Scan Peak SAR : 2.292 W/kg

Plot 8#



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

Body- worn Back (835 MHz Middle Channel)

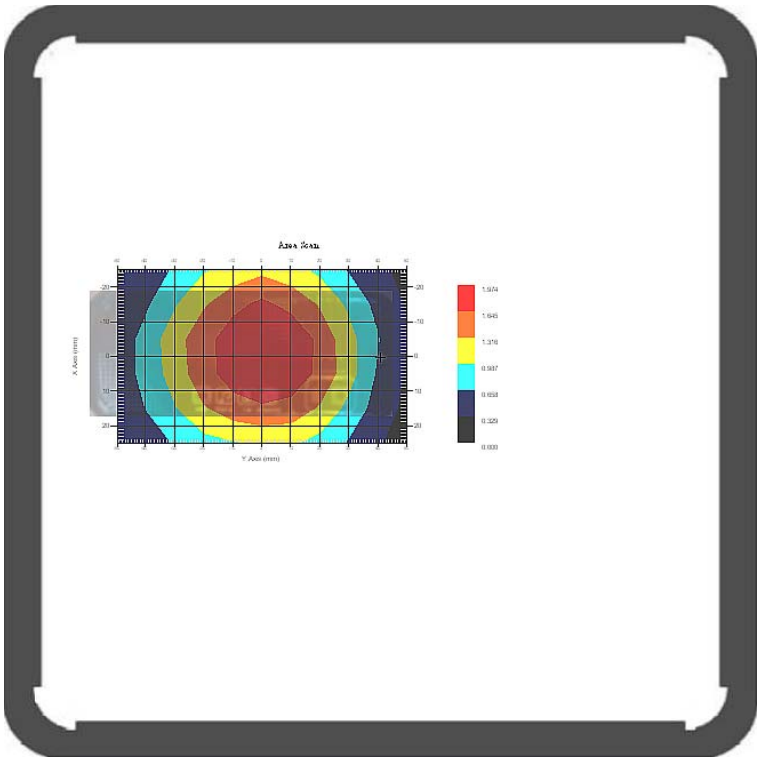
Measurement Data
Test mode : GPSR
Crest Factor : 2
Scan Type : Complete
Area Scan : 6x10x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.596 W/kg
Power Drift-Finish : 0.581 W/kg
Power Drift (%) : -2.622

Tissue Data
Type : BODY
Frequency : 835.00 MHz
Epsilon : 55.17 F/m
Sigma : 0.98 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 835.00 MHz
Duty Cycle Factor : 2
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 1.128 W/kg
10 gram SAR value : 0.808 W/kg
Area Scan Peak SAR : 1.972 W/kg
Zoom Scan Peak SAR : 2.422 W/kg

Plot 9#



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

Body- worn Back (835 MHz Middle Channel)

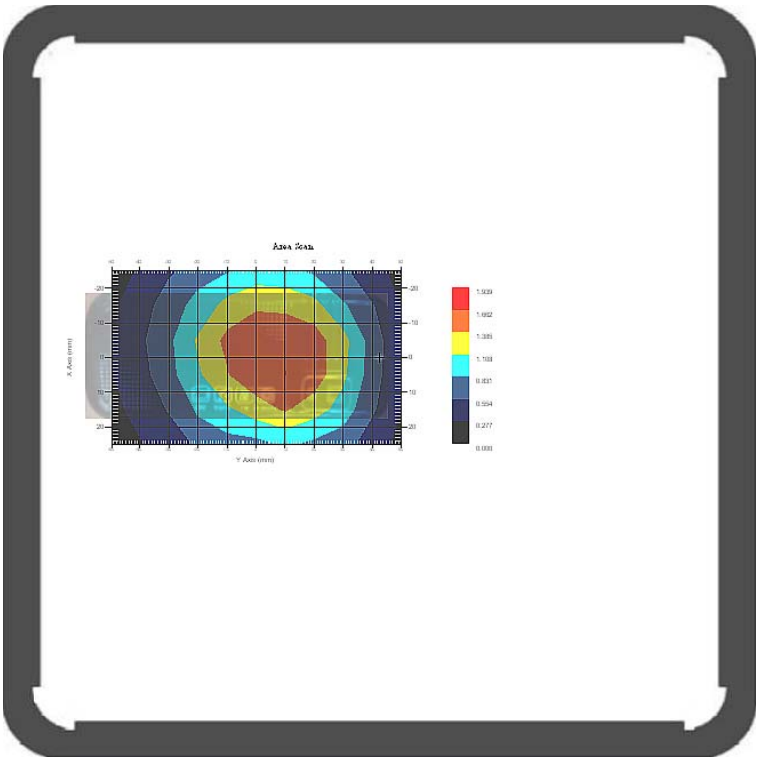
Measurement Data
Test mode : GPSR
Crest Factor : 2
Scan Type : Complete
Area Scan : 6x10x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.576 W/kg
Power Drift-Finish : 0.577 W/kg
Power Drift (%) : 1.348

Tissue Data
Type : BODY
Frequency : 835.00 MHz
Epsilon : 55.17 F/m
Sigma : 0.98 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 835.00 MHz
Duty Cycle Factor : 2
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 1.117 W/kg
10 gram SAR value : 0.771 W/kg
Area Scan Peak SAR : 1.665 W/kg
Zoom Scan Peak SAR : 2.512 W/kg

Plot 10#



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

Left Head Cheek (1900 MHz Low Channel)

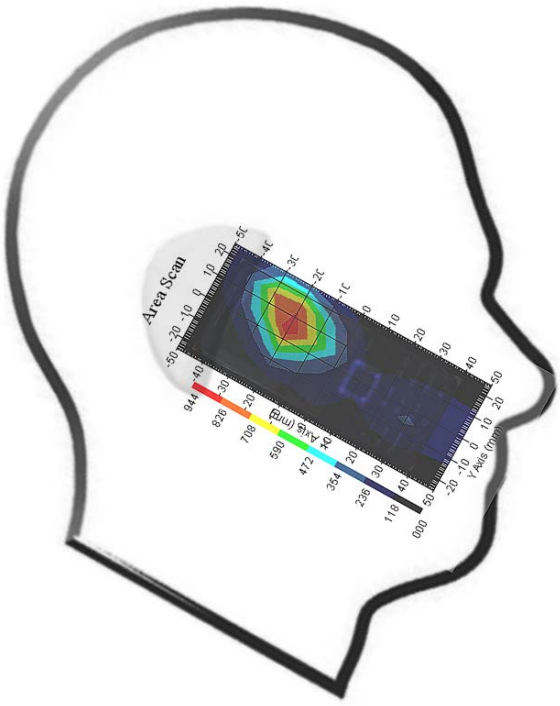
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type: : Complete
Area Scan : 10x6x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.276 W/kg
Power Drift-Finish : 0.276 W/kg
Power Drift (%) : -0.564

Tissue Data
Type : HEAD
Frequency : 1900.00 MHz
Epsilon : 39.39 F/m
Sigma : 1.47 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 8
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.335 W/kg
10 gram SAR value : 0.206 W/kg
Area Scan Peak SAR : 0.804 W/kg
Zoom Scan Peak SAR : 1.291 W/kg

Plot 11#



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

Left Head Cheek (1900 MHz Middle Channel)

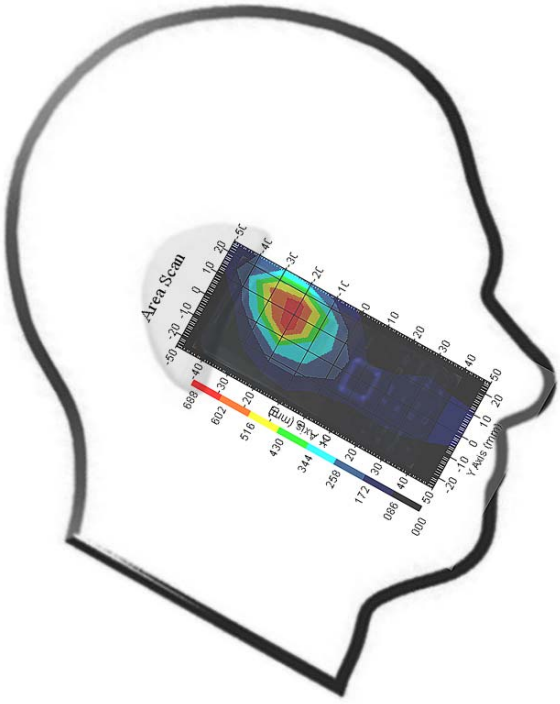
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type: : Complete
Area Scan : 10x6x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.202 W/kg
Power Drift-Finish : 0.203 W/kg
Power Drift (%) : 0.208

Tissue Data
Type : HEAD
Frequency : 1900.00 MHz
Epsilon : 39.39 F/m
Sigma : 1.47 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 8
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.306 W/kg
10 gram SAR value : 0.204 W/kg
Area Scan Peak SAR : 0.685 W/kg
Zoom Scan Peak SAR : 1.060 W/kg

Plot 12#



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

Left Head Cheek (1900 MHz High Channel)

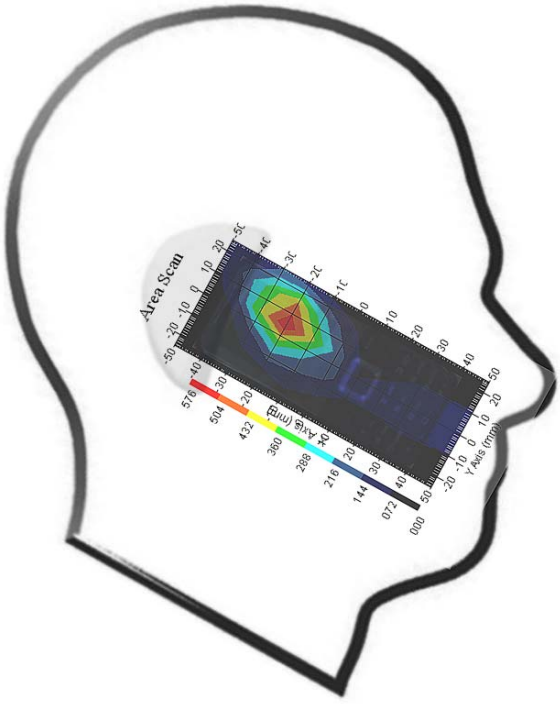
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type: : Complete
Area Scan : 10x6x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.145 W/kg
Power Drift-Finish : 0.143 W/kg
Power Drift (%) : -1.563

Tissue Data
Type : HEAD
Frequency : 1900.00 MHz
Epsilon : 39.39 F/m
Sigma : 1.47 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 8
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.301 W/kg
10 gram SAR value : 0.170 W/kg
Area Scan Peak SAR : 0.572 W/kg
Zoom Scan Peak SAR : 0.880 W/kg

Plot 13#



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

Left Head Tilt (1900 MHz Middle Channel)

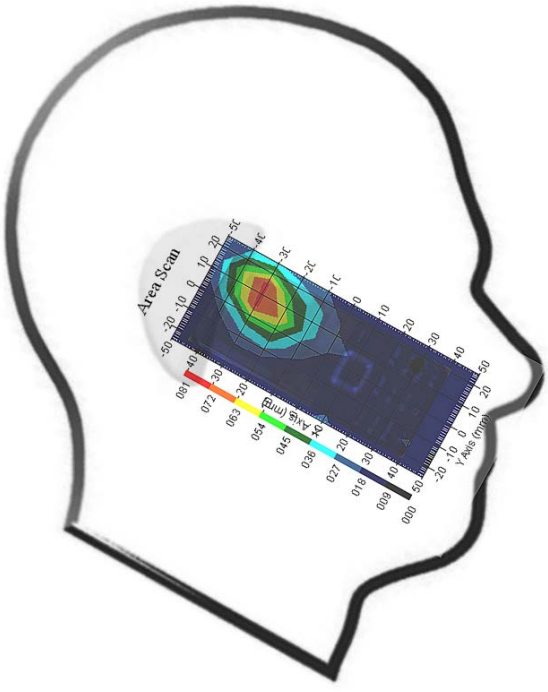
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type: : Complete
Area Scan : 10x5x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.041 W/kg
Power Drift-Finish : 0.035 W/kg
Power Drift (%) : -1.056

Tissue Data
Type : HEAD
Frequency : 1900.00 MHz
Epsilon : 39.39 F/m
Sigma : 1.47 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 8
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.263 W/kg
10 gram SAR value : 0.135 W/kg
Area Scan Peak SAR : 0.474 W/kg
Zoom Scan Peak SAR : 0.620 W/kg

Plot 14#

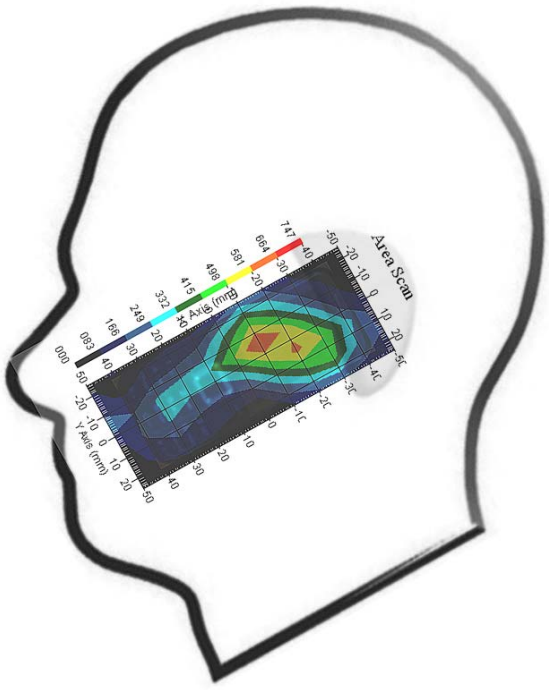


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Right Head Cheek (1900 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type:	: Complete
Area Scan	: 10x6x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.411 W/kg
Power Drift-Finish	: 0.294 W/kg
Power Drift (%)	: -2.439
Tissue Data	
Type	: HEAD
Frequency	: 1900.00 MHz
Epsilon	: 39.39 F/m
Sigma	: 1.47 S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Serial No.	: 273
Frequency	: 1900.00 MHz
Duty Cycle Factor	: 8
Conversion Factor	: 5.25
Probe Sensitivity	: 1.20 1.20 1.20 μV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
1 gram SAR value	: 0.298 W/kg
10 gram SAR value	: 0.139 W/kg
Area Scan Peak SAR	: 0.367 W/kg
Zoom Scan Peak SAR	: 0.570 W/kg

Plot 15#



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

Right Head Tilt (1900 MHz Middle Channel)

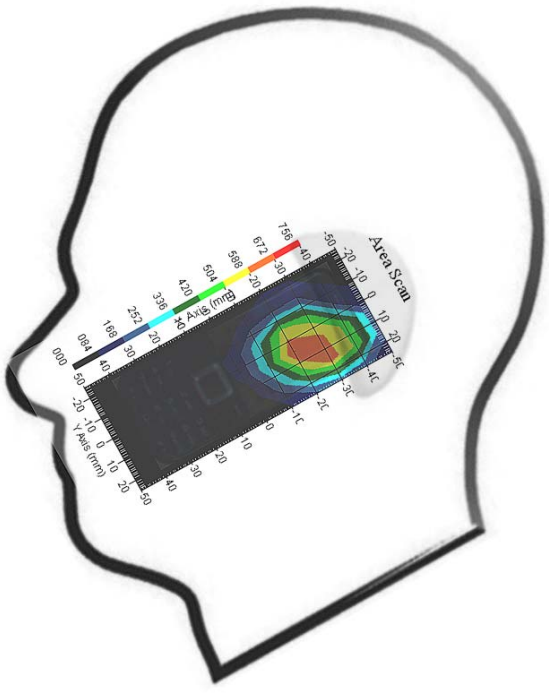
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type： : Complete
Area Scan : 10x6x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.621 W/kg
Power Drift-Finish : 0.478 W/kg
Power Drift (%) : -2.977

Tissue Data
Type : HEAD
Frequency : 1900.00 MHz
Epsilon : 39.39 F/m
Sigma : 1.47 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 8
Conversion Factor : 5.25
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.235 W/kg
10 gram SAR value : 0.125 W/kg
Area Scan Peak SAR : 0.375 W/kg
Zoom Scan Peak SAR : 0.431 W/kg

Plot 16#



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

Body- worn Back (1900 MHz Middle Channel)

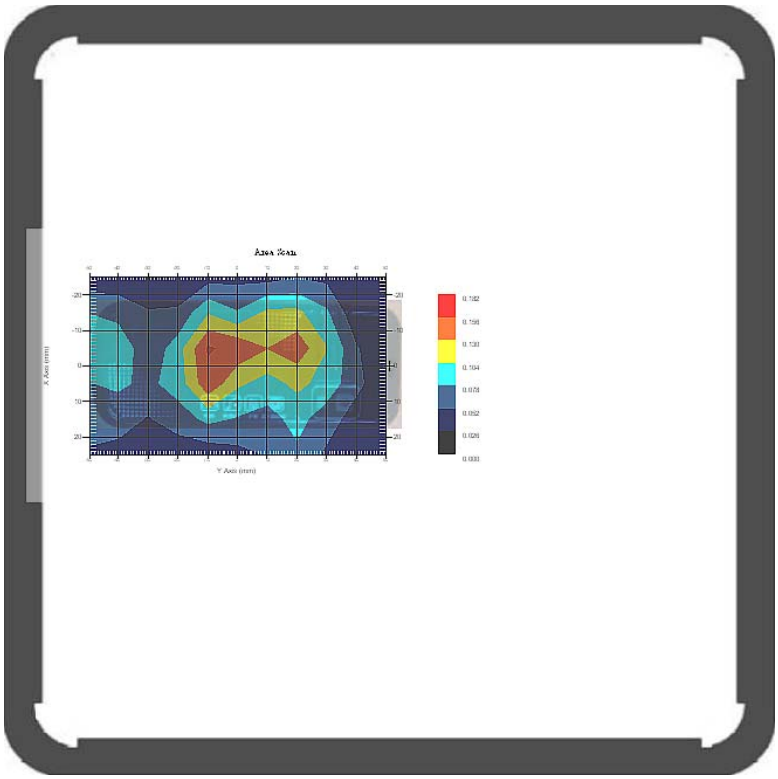
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type : Complete
Area Scan : 5x10x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.136W/kg
Power Drift-Finish : 0.140 W/kg
Power Drift (%) : 3.372

Tissue Data
Type : BODY
Frequency : 1900.00 MHz
Epsilon : 52.73 F/m
Sigma : 1.56 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 8
Conversion Factor : 5.15
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 0.318 W/kg
10 gram SAR value : 0.178 W/kg
Area Scan Peak SAR : 0.258 W/kg
Zoom Scan Peak SAR : 0.425W/kg

Plot 17#



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

Body- worn Back (1900 MHz Low Channel)

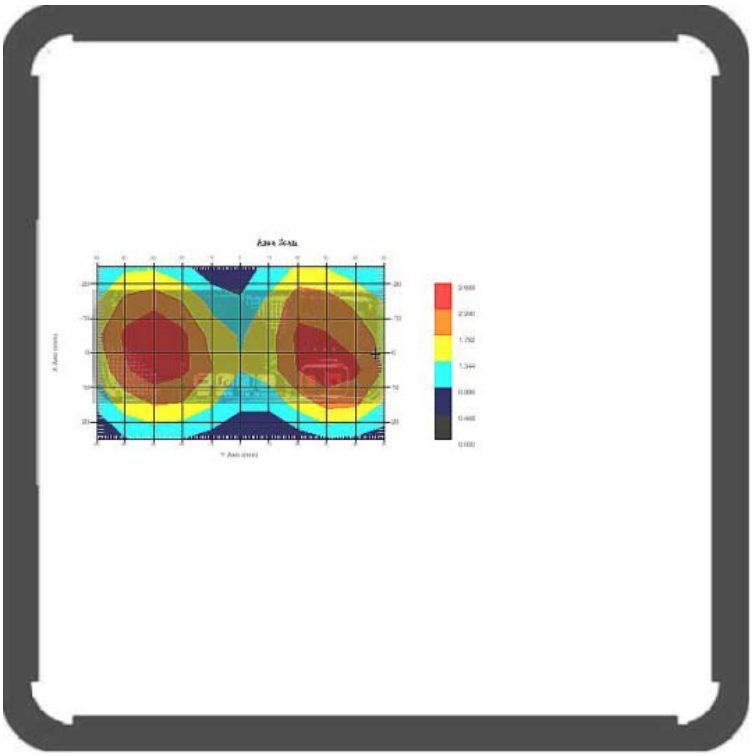
Measurement Data
Test mode : GPRS
Crest Factor : 2
Scan Type : Complete
Area Scan : 6x10x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.345 W/kg
Power Drift-Finish : 0.214 W/kg
Power Drift (%) : -2.314

Tissue Data
Type : BODY
Frequency : 1900.00 MHz
Epsilon : 52.73 F/m
Sigma : 1.56 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 2
Conversion Factor : 5.15
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 1.215 W/kg
10 gram SAR value : 1.001 W/kg
Area Scan Peak SAR : 2.212 W/kg
Zoom Scan Peak SAR : 3.073 W/kg

Plot 18#

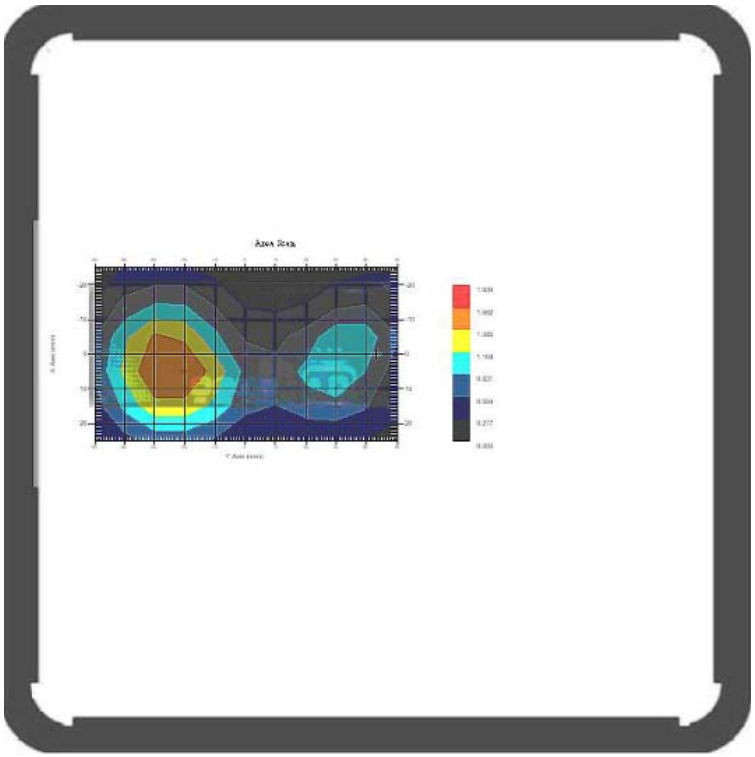


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Body- worn Back (1900 MHz Middle Channel)

Measurement Data	
Test mode	: GPRS
Crest Factor	: 2
Scan Type	: Complete
Area Scan	: 6x10x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.545 W/kg
Power Drift-Finish	: 0.422 W/kg
Power Drift (%)	: -1.009
Tissue Data	
Type	: BODY
Frequency	: 1900.00 MHz
Epsilon	: 52.73 F/m
Sigma	: 1.56 S/m
Density	: 1000.00 kg/cu. m
Probe Data	
Serial No.	: 273
Frequency	: 1900.00 MHz
Duty Cycle Factor	: 2
Conversion Factor	: 5.15
Probe Sensitivity	: 1.20 1.20 1.20 μV/(V/m)2
Compression Point	: 95.00 mV
Offset	: 1.56 mm
1 gram SAR value	: 1.235 W/kg
10 gram SAR value	: 0.951 W/kg
Area Scan Peak SAR	: 2.122 W/kg
Zoom Scan Peak SAR	: 3.158 W/kg

Plot 19#



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

Body- worn Back (1900 MHz High Channel)

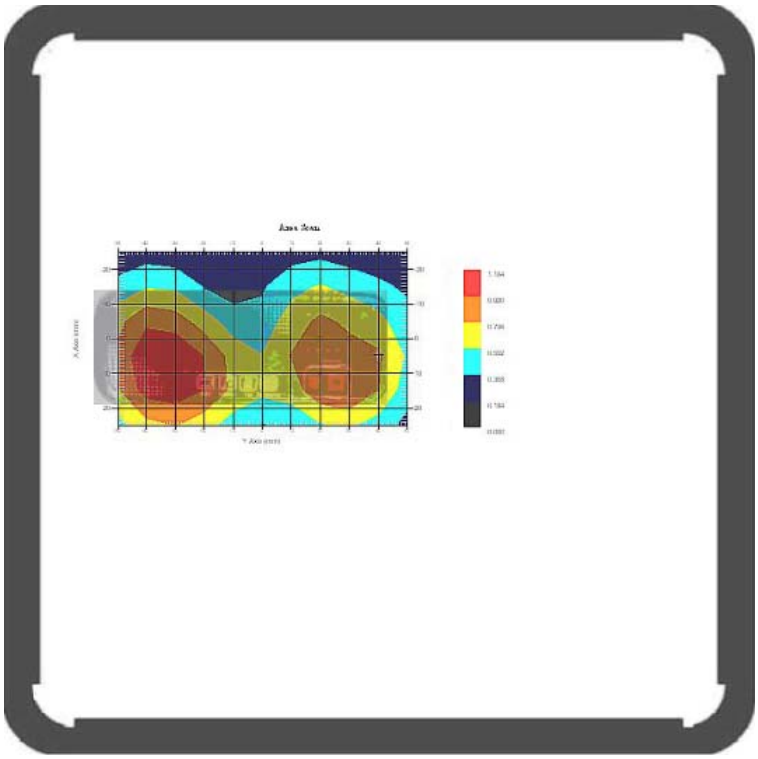
Measurement Data
Test mode : GPRS
Crest Factor : 2
Scan Type : Complete
Area Scan : 6x10x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.545 W/kg
Power Drift-Finish : 0.522 W/kg
Power Drift (%) : -3.009

Tissue Data
Type : BODY
Frequency : 1900.00 MHz
Epsilon : 52.73 F/m
Sigma : 1.56 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 2
Conversion Factor : 5.15
Probe Sensitivity : 1.20 1.20 1.20 μV/(V/m)2
Compression Point : 95.00 mV
Offset : 1.56 mm

1 gram SAR value : 1.227 W/kg
10 gram SAR value : 0.960 W/kg
Area Scan Peak SAR : 2.035 W/kg
Zoom Scan Peak SAR : 3.143 W/kg

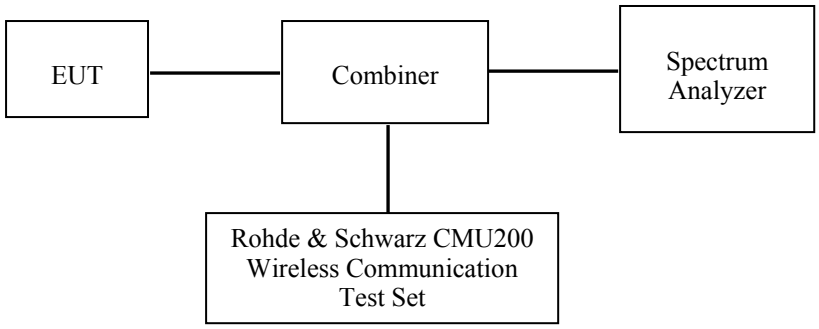
Plot 20#



APPENDIX F – CONDUCTED OUTPUT POWER MEASUREMENT

Test Block Diagram and Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.



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	1Slot	2 Slots	3 Slots	4 Slots
Duty Cycle	1:8	1:4	1:2.66	1:2
Timebased Ave. power compared to slotted Ave. power	-9 dB	-6 dB	-4.25 dB	-3 dB
Crest Factor	8	4	2.66	2

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Rohde & Schwarz	Wireless Communication Tester	CMU200	1100.0008.02	2009-09-26
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-05

Test Results

GSM Mode

Band	Channel No.	Frequency (MHz)	Conducted Output Power	
			(dBm)	(Watt)
Cellular	128	824.2	31.63	1.455
	190	836.6	31.61	1.449
	251	848.8	31.60	1.445
PCS	512	1850.2	29.78	0.951
	661	1880.0	29.60	0.912
	810	1909.8	29.36	0.863

GPRS Mode

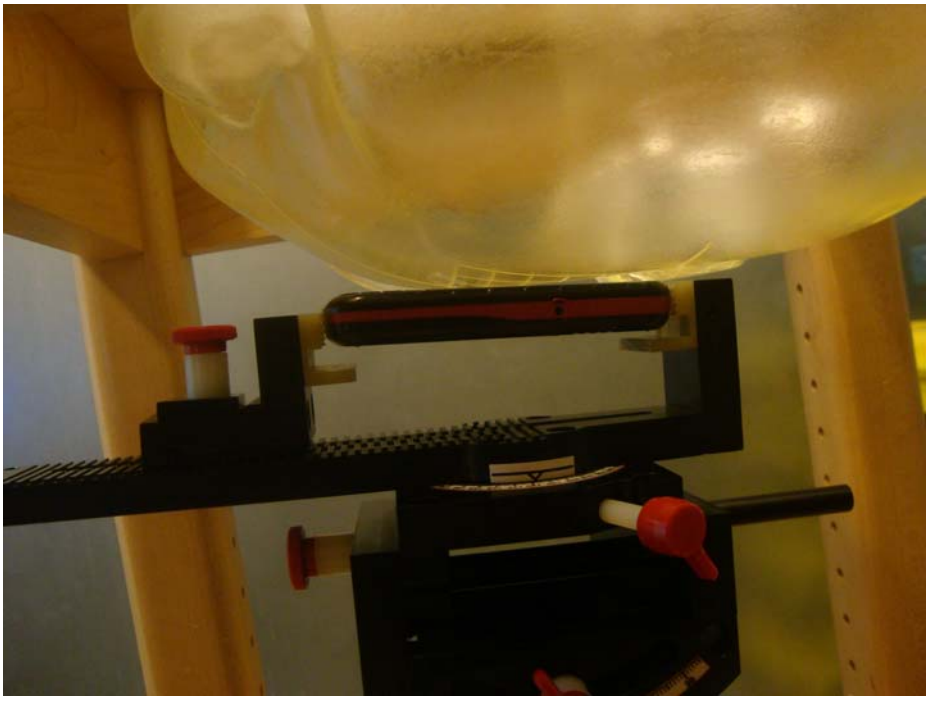
Band	Channel No.	Frequency (MHz)	Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
Cellular	128	824.2	31.33	31.31	31.30	31.40
	190	836.6	31.33	31.31	31.43	31.43
	251	848.8	31.35	31.32	31.46	31.46
PCS	512	1850.2	29.24	29.19	29.18	29.15
	661	1880.0	28.99	28.95	28.95	28.83
	810	1909.8	28.61	28.61	28.59	28.55

Time-based average power

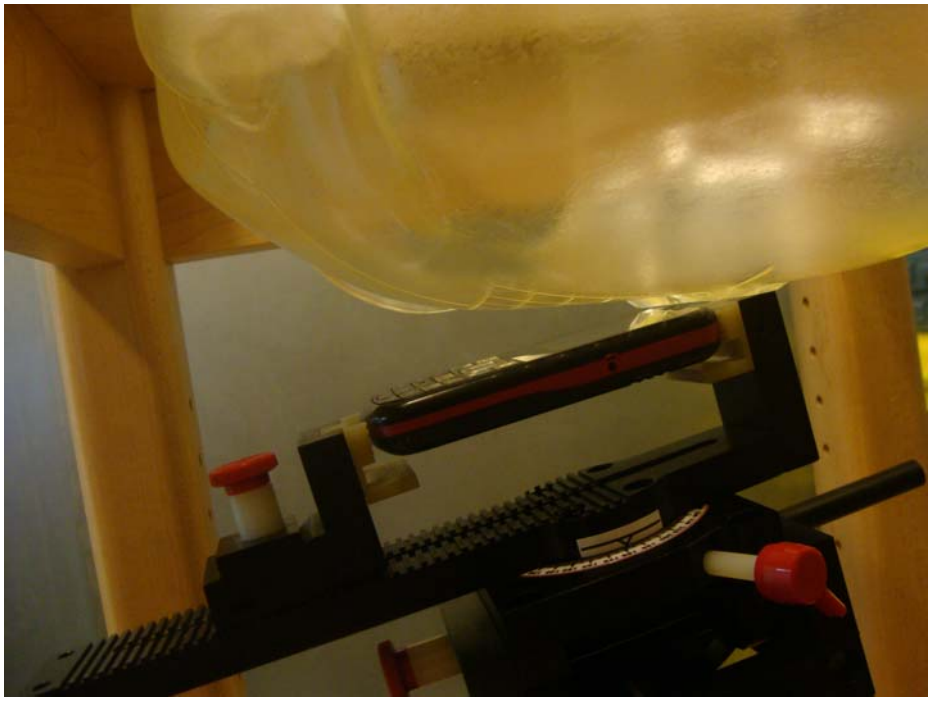
Band	Channel No.	Frequency (MHz)	Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
Cellular	128	824.2	22.33	25.31	27.05	28.40
	190	836.6	22.33	25.31	27.18	28.43
	251	848.8	22.35	25.32	27.21	28.46
PCS	512	1850.2	20.24	23.19	24.93	26.15
	661	1880.0	19.99	22.95	24.70	25.83
	810	1909.8	19.61	22.61	24.34	25.55

APPENDIX G – EUT TEST POSITION PHOTOS

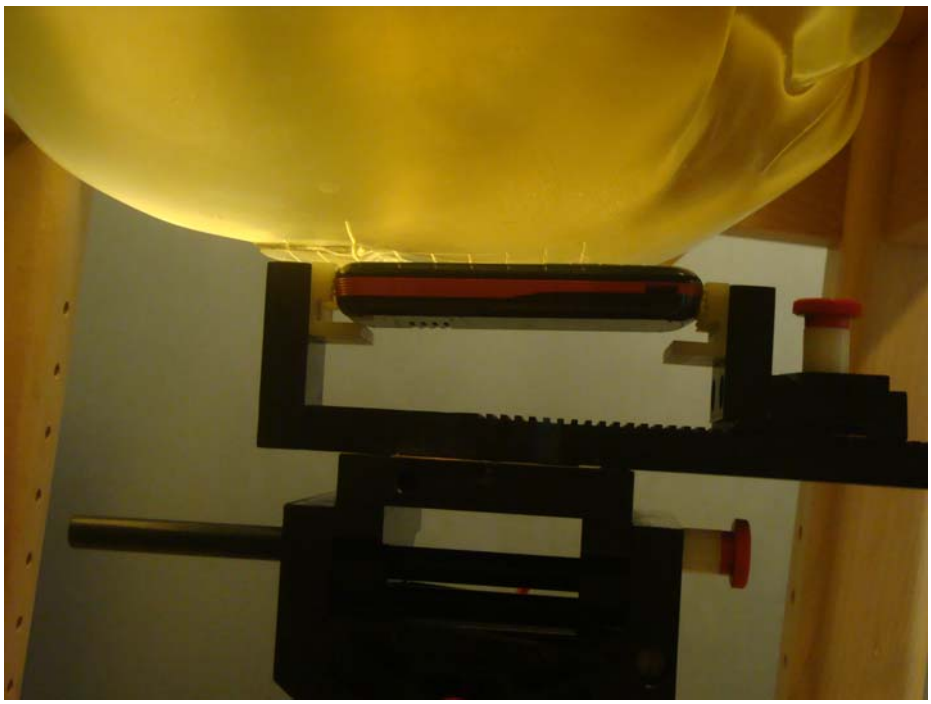
Left Head Touch Setup Photo



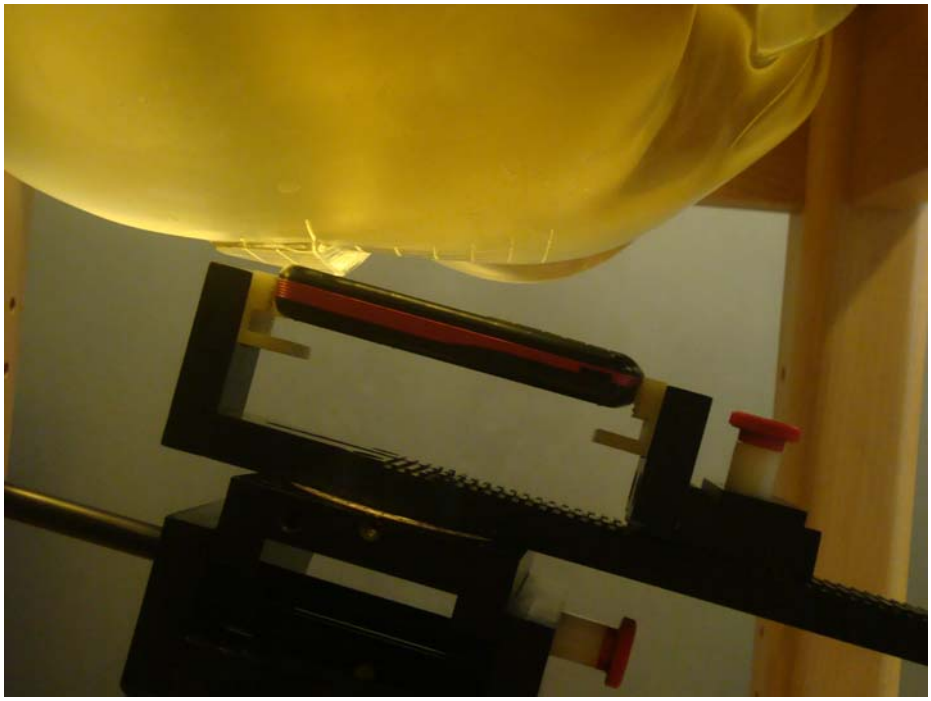
Left Head Tilt Setup Photo



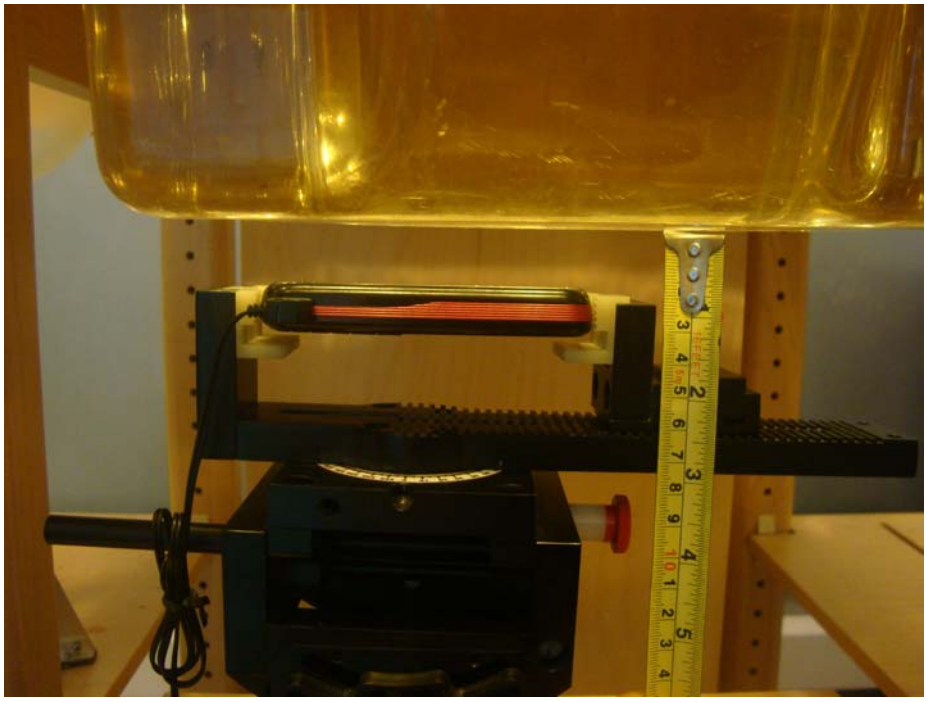
Right Head Touch Setup Photo



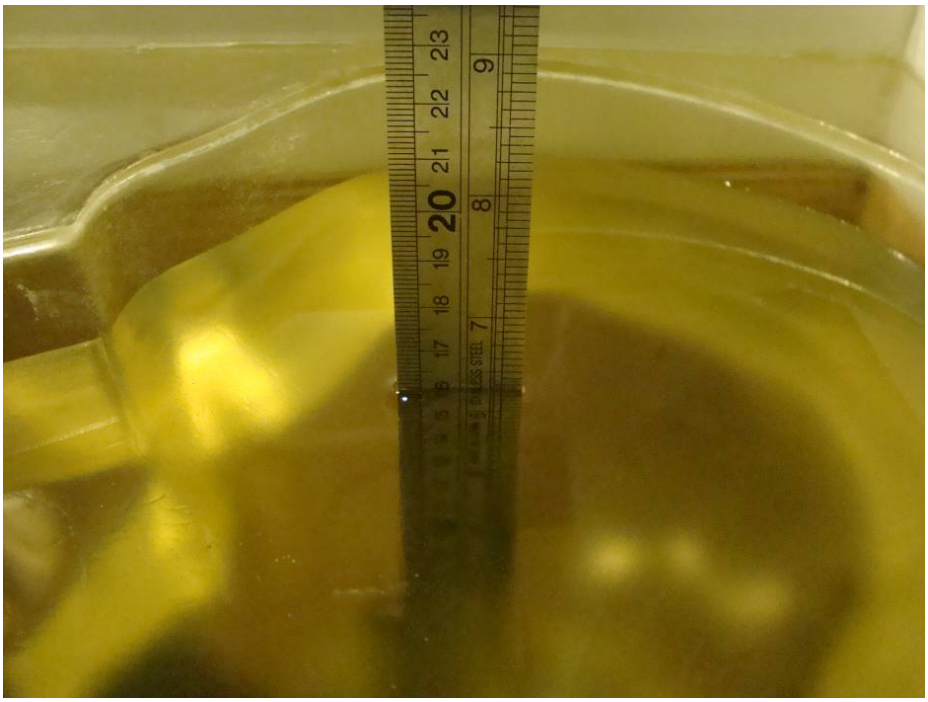
Right Head Tilt Setup Photo



Body-worn Back Setup Photo (GSM Model)



Liquid Depth ≥ 15 cm



APPENDIX H – EUT PHOTOS

EUT – Front Side View

EUT – Back Side View

EUT – Right Side View

EUT-Left Side View

EUT- Battery off View

EUT - Headset

APPENDIX I - INFORMATIVE REFERENCES

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[2] David L. Means Kwok Chan, Robert F. Cleveland, \Evaluating compliance with FCC guidelines for human exposure to radiofrequency electromagnetic fields", Tech. Rep., Federal Communication Commission, O_ce of Engineering & Technology, Washington, DC, 1997.

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[4] Niels Kuster, Ralph K.astle, and Thomas Schmid, \Dosimetric evaluation of mobile communications
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******* END OF REPORT ******