Lab Code: 200707-0

SAR EVALUATION REPORT

For

Power Idea Technology Limited

1401A, Section B, Bin hai zhi Chuang tower, Wen xin 5th Road,

Nan Shan, Shenzhen, Guangdong, China

FCC ID: ZLELM802B

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

Test Engineer:	Cabin Hu
Report Number:	RSZ110520002-20
Report Date:	2011-06-16
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 65-C 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:	GSM850: 32.22 dBm PCS1900: 30.78 dBm
Antenna Type(s):	Internal Antenna
Body-Worn Accessories:	Headset
Face-Head Accessories:	None
Battery Type(s) Tested:	3.7VDC/1300mAh, Rechargeable Battery
Max. SAR Level(s) Measured:	0.188 W/Kg, 1g Head Tissue (Cellular Band) 0.287 W/Kg, 1g Body Tissue (Cellular Band) 0.410 W/Kg, 1g Head Tissue (PCS Band) 0.328 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

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RSZ110520002-20	Original Report	2011-06-16

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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 10 g of tissue)	2.0	10
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

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

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

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

EUT DESCRIPTION

This Bay Area Compliance Laboratories Corp. test report has been prepared on behalf of Power Idea Technology Limited, and their product, Model: LM802B, FCC ID: ZLELM802B 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)	103 mm (L)× 61 mm (W)×14 mm (H)
Weight	131 g
Power Source	3.7 VDC/1300 mAh Rechargeable 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).

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 21,5mm.

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

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

ALSAS-10U Interpolation and Extrapolation Uncertainty

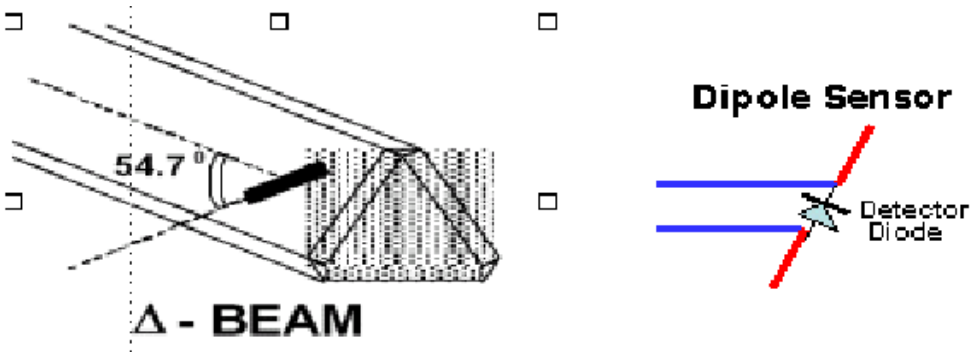
The overall uncertainty for the methodology and algorithms the used during the SAR calculation was evaluated using the data from IEEE 1528 based on the example f3 algorithm:

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

Isotropic E-Field Probe

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

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



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

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

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

Isotropic E-Field Probe Specification

Calibration 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

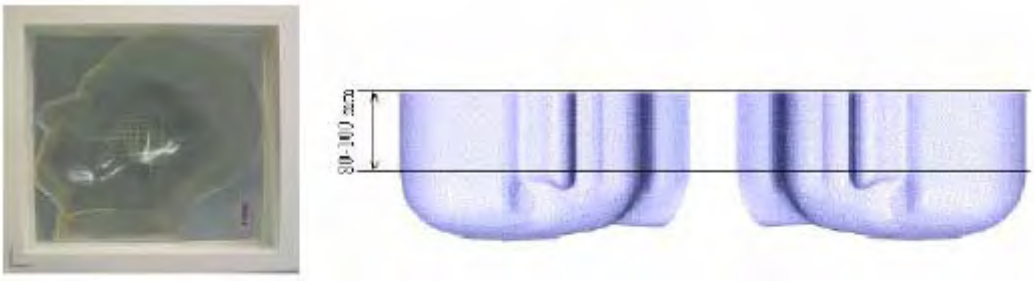
The universal device positioner allows complete freedom of movement of the EUT. Developed to hold a EUT in a free-space scenario any additional loading attributable to the material used in the construction of the positioner has been eliminated. Repeatability has been enhanced through the linear scales 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

Recommended Tissue Dielectric Parameters for Head and Body

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

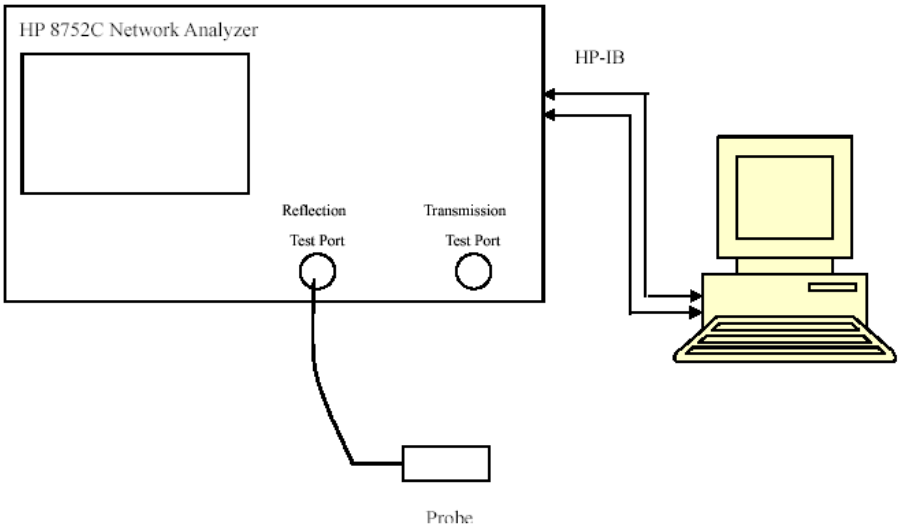
EQUIPMENT LIST AND CALIBRATION

Equipments List & Calibration Info

Equipment	Model	Calibration Date	S/N
CRS F3 robot	ALS-F3	N/A	RAF0805352
CRS F3 Software	ALS-F3-SW	N/A	N/A
CRS C500C controller	ALS-C500	N/A	RCF0805379
Probe mounting device & Boundary Detection Sensor System	ALS-PMDPS-3	N/A	120-00270
Universal Work Station	ALS-UWS	N/A	100-00157
Data Acquisition Package	ALS-DAQ-PAQ-3	N/A	110-00212
Miniature E-Field Probe	ALS-E-020	2010-08-20	273
Dipole, 835 MHz	ALS-D-835-S-2	2010-09-20	180-00558
Dipole,1900 MHz	ALS-D-1900-S-2	2010-09-20	210-00710
Dipole Spacer	ALS-DS-U	N/A	250-00907
R&S, universal Communication Tester	CMU200	2010-06-28	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
UniPhantom	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
Signal Generator	HP8648C	2010-09-18	3426A01345
Power Amplifier	5S1G4	N/A	71377
Spectrum Analyzer	FSEM30	2010-07-05	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	42.62	0.93	In Tolerance
835	Body	55.69	0.98	In Tolerance
1900	Head	40.12	1.46	In Tolerance
1900	Body	54.18	1.51	In Tolerance

**The liquid verification date is 2011-05-30.*

Please refer to the following tables

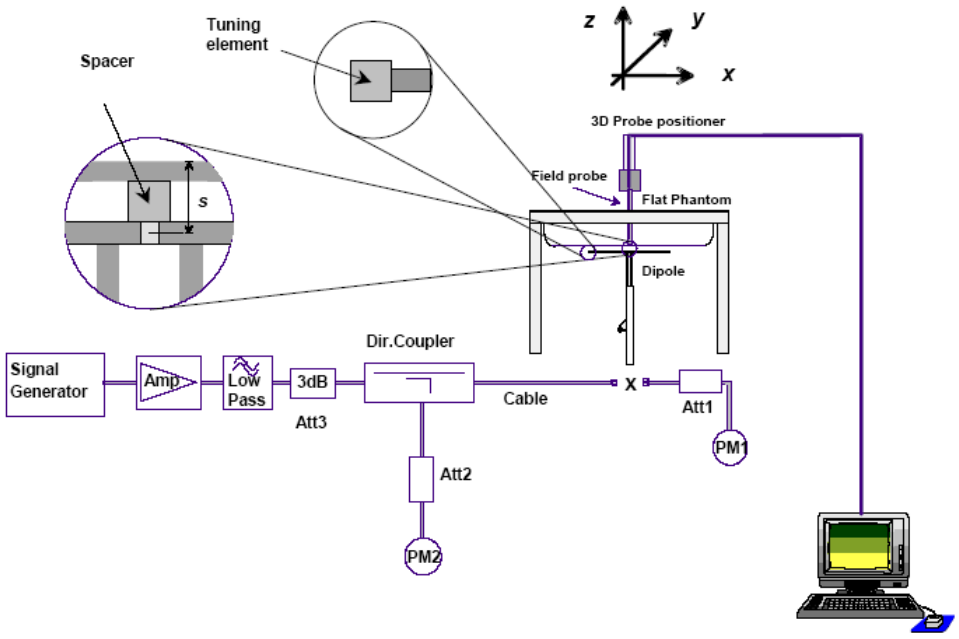
850 MHz Head				850 MHz Body		
Frequency	**e'**	**e''**	**Frequency**	**e'**	**e''**	**Frequency**
824000000	42.652279	20.113259		824000000	55.565420	21.434660
824500000	42.664336	20.090626		824500000	55.535307	21.433311
825000000	42.623371	20.088402		825000000	55.484453	21.406125
825500000	42.555718	20.067071		825500000	55.486456	21.370515
826000000	42.483277	20.047175		826000000	55.431951	21.423079
826500000	42.550369	20.030418		826500000	55.500107	21.385153
827000000	42.584953	20.049485		827000000	55.527761	21.418143
827500000	42.631454	20.054430		827500000	55.504070	21.403356
828000000	42.588018	20.042442		828000000	55.514625	21.420319
828500000	42.558678	20.079576		828500000	55.470280	21.379920
829000000	42.605127	20.084417		829000000	55.550369	21.404093
829500000	42.613726	20.142478		829500000	55.581691	21.446519
830000000	42.633460	20.091218		830000000	55.538667	21.439049
830500000	42.591650	20.047093		830500000	55.573498	21.402235
831000000	42.573785	20.123154		831000000	55.603774	21.500332
831500000	42.646601	20.109628		831500000	55.620417	21.503589
832000000	42.589524	20.048917		832000000	55.638096	21.450975
832500000	42.578617	20.038363		832500000	55.607673	21.505270
833000000	42.563607	20.050113		833000000	55.678706	21.476684
833500000	42.579311	20.095143		833500000	55.703398	21.515476
834000000	42.621161	20.048306		834000000	55.682073	21.433497
834500000	42.589613	20.075322		834500000	55.694145	21.482496
835000000	42.618490	20.111100		835000000	55.687381	21.511023
835500000	42.612384	20.062399		835500000	55.712655	21.450025
836000000	42.562117	20.042326		836000000	55.654355	21.415580
836500000	42.597238	20.081411		836500000	55.670916	21.490192
837000000	42.566399	20.055770		837000000	55.723778	21.429712
837500000	42.577995	20.085877		837500000	55.688831	21.441469
838000000	42.596853	20.051058		838000000	55.763659	21.438462
838500000	42.569732	20.055801		838500000	55.679107	21.463825
839000000	42.581355	20.085793		839000000	55.703490	21.458180
839500000	42.567120	20.045027		839500000	55.705439	21.422813
840000000	42.553733	20.024935		840000000	55.742265	21.406871
840500000	42.565751	20.002661		840500000	55.755225	21.400137
841000000	42.560474	20.063522		841000000	55.735643	21.422397
841500000	42.583456	20.043209		841500000	55.762862	21.410079
842000000	42.568725	20.018392		842000000	55.737059	21.401945
842500000	42.587457	19.983784		842500000	55.726590	21.376953
843000000	42.567704	20.012397		843000000	55.726946	21.407797
843500000	42.512079	19.989350		843500000	55.772823	21.415417
844000000	42.525240	20.023773		844000000	55.774729	21.380189
844500000	42.498624	20.028482		844500000	55.781943	21.386459
845000000	42.460861	19.995131		845000000	55.753464	21.384899
845500000	42.491382	19.983028		845500000	55.785305	21.370621
846000000	42.429753	20.008455		846000000	55.661090	21.373986
846500000	42.486968	19.947207		846500000	55.758449	21.388319
847000000	42.459528	19.983173		847000000	55.764088	21.362616
847500000	42.434246	19.956691		847500000	55.848205	21.371074
848000000	42.439134	19.962464		848000000	55.791793	21.380592
848500000	42.430740	19.992719		848500000	55.789721	21.390339
849000000	42.451724	19.983399		849000000	55.782280	21.358928

1900 MHz Head				1900 MHz Body		
Frequency	**e'**	**e''**		**Frequency**	**e'**	**e''**
1850000000	40.349201	13.809692		1850000000	54.197165	14.227881
1851200000	40.327305	13.771466		1851200000	54.168712	14.233153
1852400000	40.349367	13.758672		1852400000	54.169119	14.216085
1853600000	40.301530	13.733701		1853600000	54.154873	14.216119
1854800000	40.300427	13.763388		1854800000	54.121098	14.211213
1856000000	40.302882	13.744238		1856000000	54.133572	14.190793
1857200000	40.284475	13.741306		1857200000	54.110229	14.176570
1858400000	40.272758	13.734172		1858400000	54.161496	14.211335
1859600000	40.268622	13.744035		1859600000	54.145237	14.213306
1860800000	40.237630	13.696296		1860800000	54.100344	14.196043
1862000000	40.270332	13.720239		1862000000	54.080617	14.189814
1863200000	40.259302	13.743782		1863200000	54.062971	14.223142
1864400000	40.268944	13.701549		1864400000	54.152034	14.208267
1865600000	40.215270	13.662084		1865600000	54.155980	14.203277
1866800000	40.200967	13.675249		1866800000	54.118352	14.202185
1868000000	40.227359	13.659711		1868000000	54.125650	14.208990
1869200000	40.227059	13.695077		1869200000	54.183343	14.233825
1870400000	40.221858	13.693250		1870400000	54.150211	14.221206
1871600000	40.228571	13.680814		1871600000	54.186930	14.231186
1872800000	40.222508	13.716683		1872800000	54.176716	14.235264
1874000000	40.221079	13.740314		1874000000	54.187711	14.295232
1875200000	40.235680	13.701209		1875200000	54.204068	14.274822
1876400000	40.238981	13.712588		1876400000	54.180298	14.276273
1877600000	40.179875	13.757281		1877600000	54.119350	14.274149
1878800000	40.222039	13.747045		1878800000	54.186831	14.300916
1880000000	40.210534	13.774007		1880000000	54.183938	14.320966
1881200000	40.181428	13.778068		1881200000	54.149094	14.306222
1882400000	40.207990	13.786984		1882400000	54.124637	14.327171
1883600000	40.187760	13.785476		1883600000	54.177114	14.337511
1884800000	40.225924	13.827161		1884800000	54.225730	14.347707
1886000000	40.191285	13.856446		1886000000	54.150408	14.317732
1887200000	40.223269	13.849467		1887200000	54.110581	14.334049
1888400000	40.198108	13.810968		1888400000	54.159146	14.344082
1889600000	40.168618	13.843146		1889600000	54.112768	14.328990
1890800000	40.130908	13.818825		1890800000	54.057059	14.303632
1892000000	40.187855	13.826772		1892000000	54.150768	14.362229
1893200000	40.165399	13.836048		1893200000	54.218622	14.380813
1894400000	40.145704	13.815746		1894400000	54.136827	14.319512
1895600000	40.136074	13.835291		1895600000	54.177858	14.377822
1896800000	40.122006	13.823776		1896800000	54.159280	14.352064
1898000000	40.130702	13.828541		1898000000	54.155309	14.357981
1899200000	40.103922	13.806731		1899200000	54.193563	14.384924
1900400000	40.117002	13.808678		1900400000	54.176114	14.327961
1901600000	40.141260	13.828109		1901600000	54.248901	14.375430
1902800000	40.141568	13.819772		1902800000	54.276873	14.359036
1904000000	40.103326	13.799233		1904000000	54.229962	14.367439
1905200000	40.137225	13.843143		1905200000	54.214957	14.353376
1906400000	40.129768	13.827495		1906400000	54.258173	14.348990
1907600000	40.155773	13.830303		1907600000	54.224072	14.387060
1908800000	40.137016	13.849611		1908800000	54.261687	14.372687
1910000000	40.161155	13.878174		1910000000	54.261647	14.382535

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)	Liquid Type	1 g SAR (W/Kg)	10 g SAR (W/Kg)	Result
835	Head	9.883	6.345	In Tolerance
1900	Head	38.158	19.564	In Tolerance
835	Body	10.112	6.351	In Tolerance
1900	Body	40.056	20.478	In Tolerance

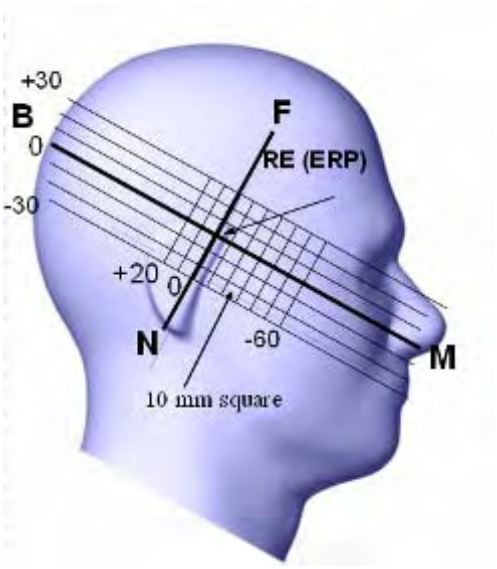
* All SAR values are normalized to 1 Watt forward power.

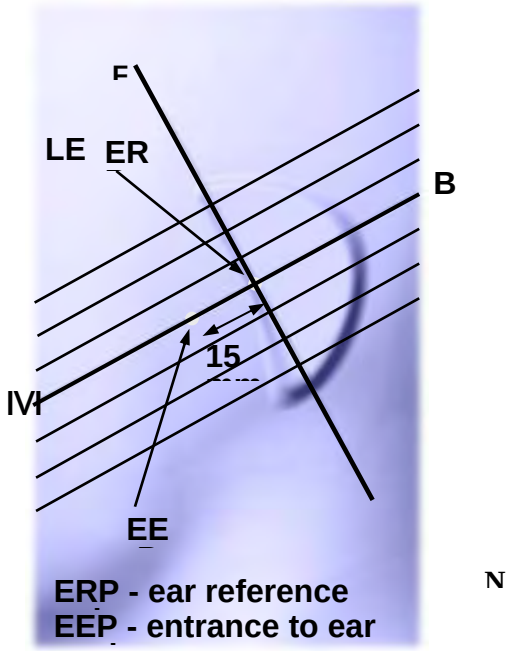
EUT TEST STRATEGY AND METHODOLOGY

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

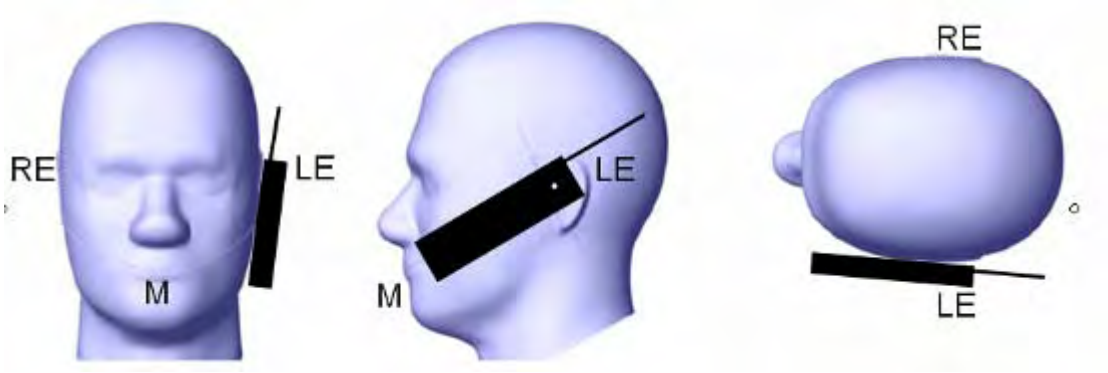
The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line for the SCC-34/SC-2 head phantom.

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

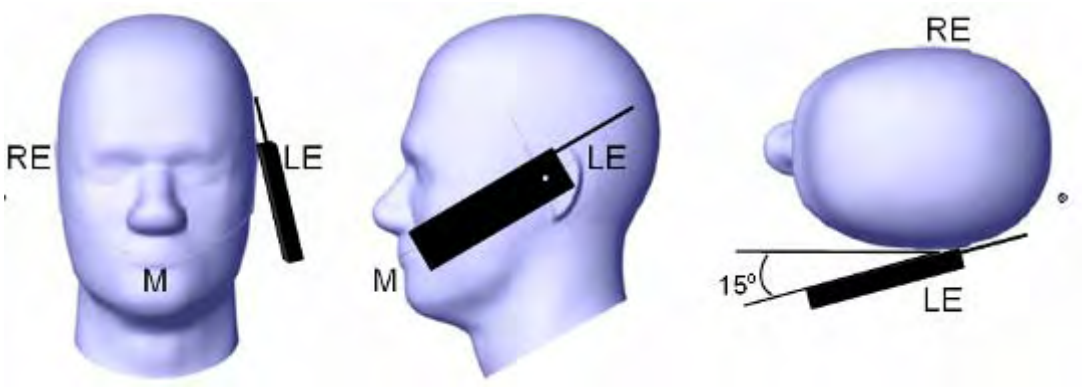
With the handset aligned in the "Cheek/Touch Position":

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.

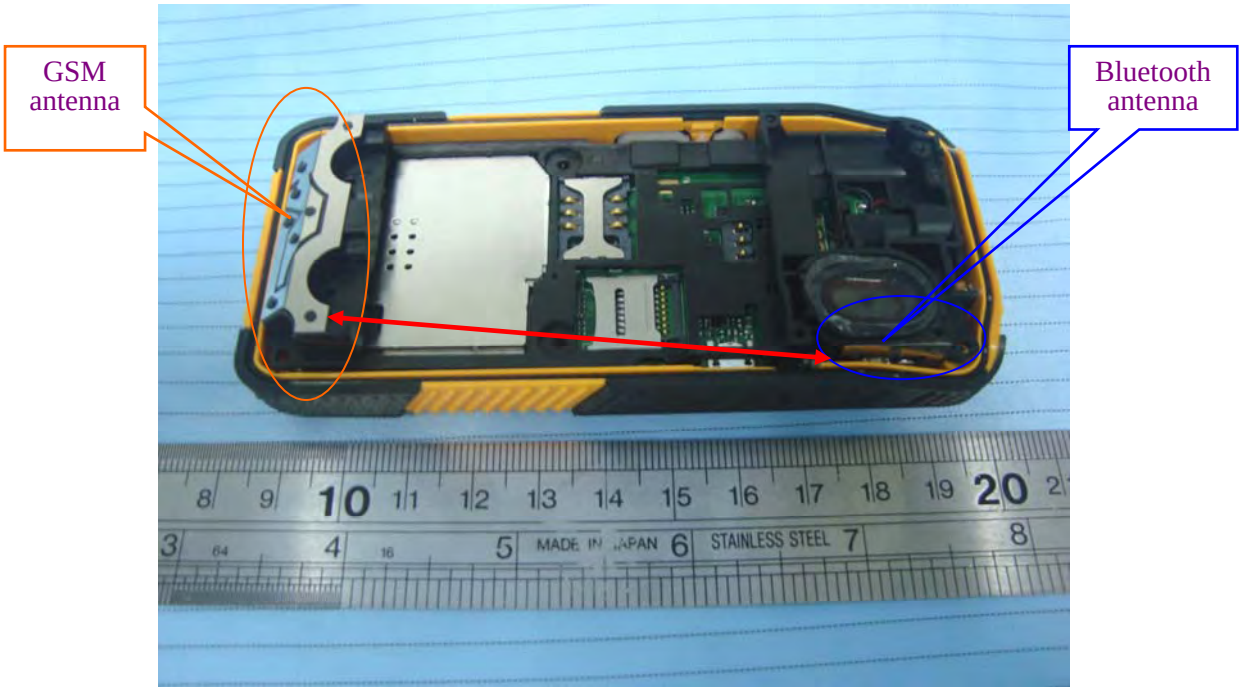
Step 4: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

SAR SIMULTANEOUS TRANSMISSION EVALUATION

Simultaneous Transmission Consideration

According to FCC KDB648474, Stand-alone and simultaneous SAR evaluation for a cell phone with multiple transmitters is base on the antennas distance of each radio.

Two radios and antenna are available in this device, i.e. GSM850/PCS1900 and 2.4 GHz Bluetooth. The distance between GSM and Bluetooth antenna is 7.4 cm, please refer to the figure of the antennas location



Antenna Location

The minimum distance between BT and GSM antenna is 7.4 cm > 5 cm. The maximum output power of Bluetooth antenna is 0.8017 mW < 2PRef (24 mW), according to KDB648474, simultaneous transmission SAR evaluation is not required for BT and GSM antenna.

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:	21° C
Relative Humidity:	56%
ATM Pressure:	1005 mbar

** Testing was performed by Cabin Hu on 2011.05.30----2011.06.01.*

Cellular Band:

EUT Position	Frequency (MHz)		Test Mode	Antenna Type	1g SAR Value (W/Kg)	FCC Limit (W/Kg)
	Channel	MHz				
Left Head Cheek	128 (Low)	824.2	GSM	Integral	0.188	1.6
	190 (Middle)	836.6	GSM	Integral	0.171	1.6
	251 (High)	848.8	GSM	Integral	0.162	1.6
Left Head Tilt	128 (Low)	824.2	GSM	Integral	0.099	1.6
	190 (Middle)	836.6	GSM	Integral	/	1.6
	251 (High)	848.8	GSM	Integral	/	1.6
Right Head Cheek	128 (Low)	824.2	GSM	Integral	0.177	1.6
	190 (Middle)	836.6	GSM	Integral	/	1.6
	251 (High)	848.8	GSM	Integral	/	1.6
Right Head Tilt	128 (Low)	824.2	GSM	Integral	0.095	1.6
	190 (Middle)	836.6	GSM	Integral	/	1.6
	251 (High)	848.8	GSM	Integral	/	1.6
Body-Worn Back	128 (Low)	824.2	GSM	Integral	0.137	1.6
	128 (Low)	824.2	GPRS	Integral	0.287	1.6
	190 (Middle)	836.6	GPRS	Integral	0.269	1.6
	251 (High)	848.8	GPRS	Integral	0.256	1.6

PCS Band:

EUT Position	Frequency (MHz)		Test Mode	Antenna Type	1g SAR Value (W/Kg)	FCC Limit (W/Kg)
	Channel	MHz				
Left Head Cheek	512 (Low)	1850.2	GSM	Integral	0.406	1.6
	661 (Middle)	1880.0	GSM	Integral	0.392	1.6
	810 (High)	1909.8	GSM	Integral	0.410	1.6
Left Head Tilt	512 (Low)	1850.2	GSM	Integral	/	1.6
	661 (Middle)	1880.0	GSM	Integral	/	1.6
	810 (High)	1909.8	GSM	Integral	0.173	1.6
Right Head Cheek	512 (Low)	1850.2	GSM	Integral	/	1.6
	661 (Middle)	1880.0	GSM	Integral	/	1.6
	810 (High)	1909.8	GSM	Integral	0.403	1.6
Right Head Tilt	512 (Low)	1850.2	GSM	Integral	/	1.6
	661 (Middle)	1880.0	GSM	Integral	/	1.6
	810 (High)	1909.8	GSM	Integral	0.166	1.6
Body-Worn Back	810 (High)	1909.8	GSM	Integral	0.168	1.6
	512 (Low)	1850.2	GPRS	Integral	0.314	1.6
	661 (Middle)	1880.0	GPRS	Integral	0.302	1.6
	810 (High)	1909.8	GPRS	Integral	0.328	1.6

Note: Body-worn with GPRS mode was tested with 2 slots configuration.

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-1139

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-E020-5537

Calibrated: 20th August 2010
Released on: 24th August 2010

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

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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: 41.04 (+/-5%) **Sigma:** 0.89 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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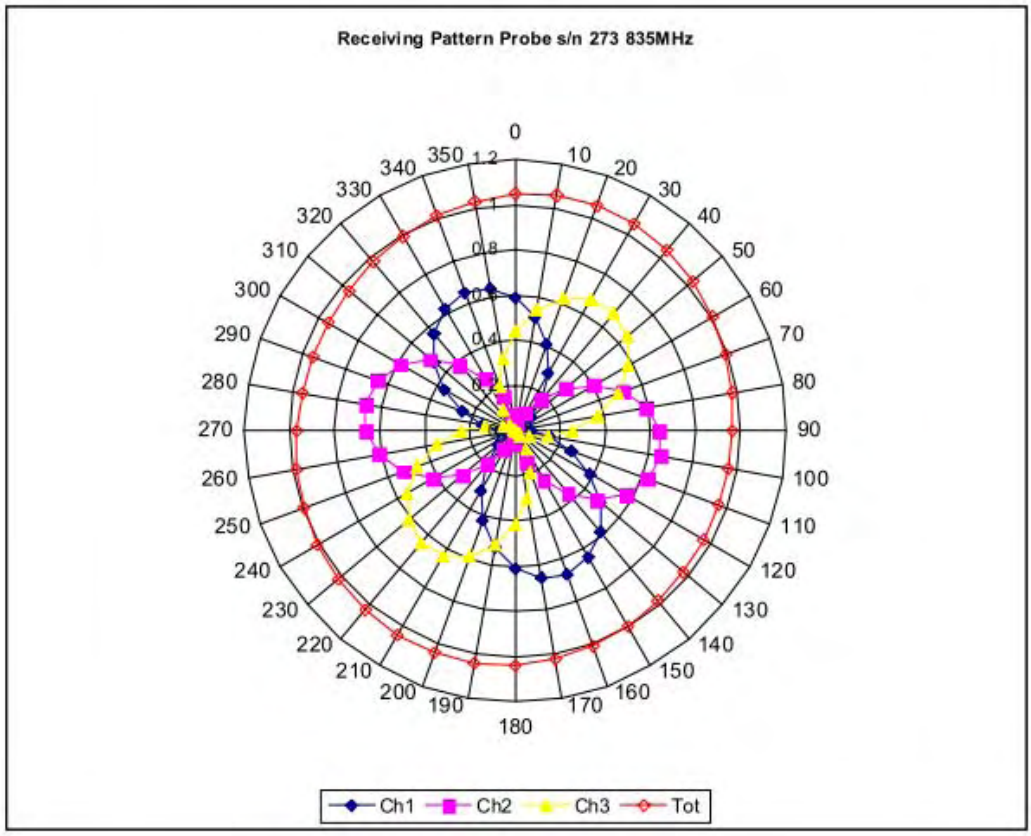
Division of APREL Laboratories.

Receiving Pattern 835 MHz (Air)



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

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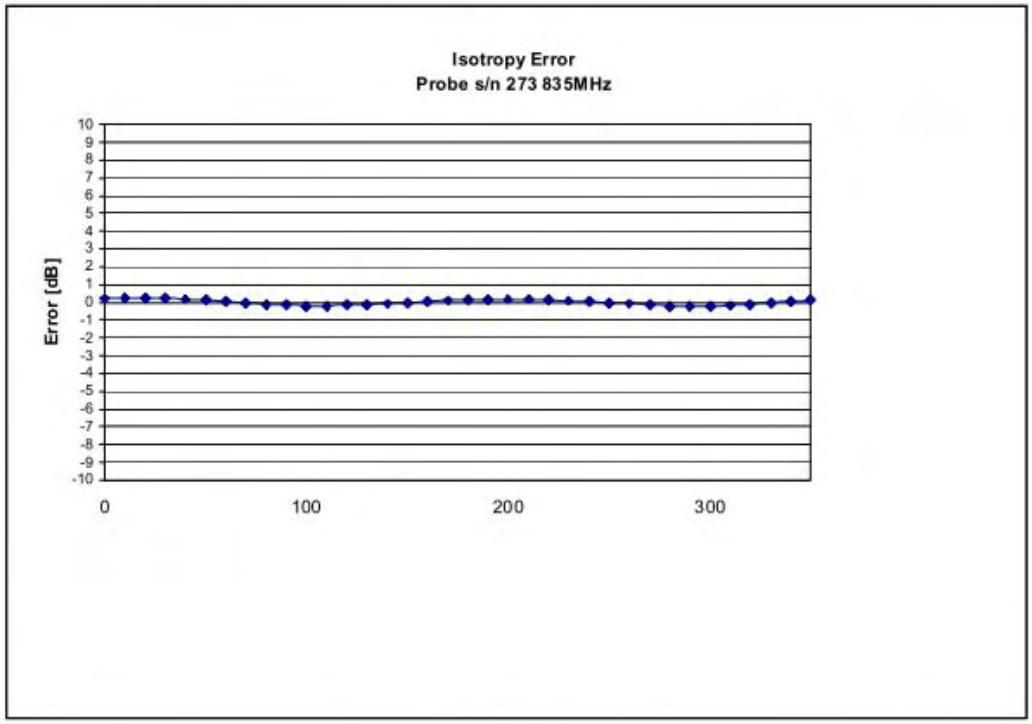
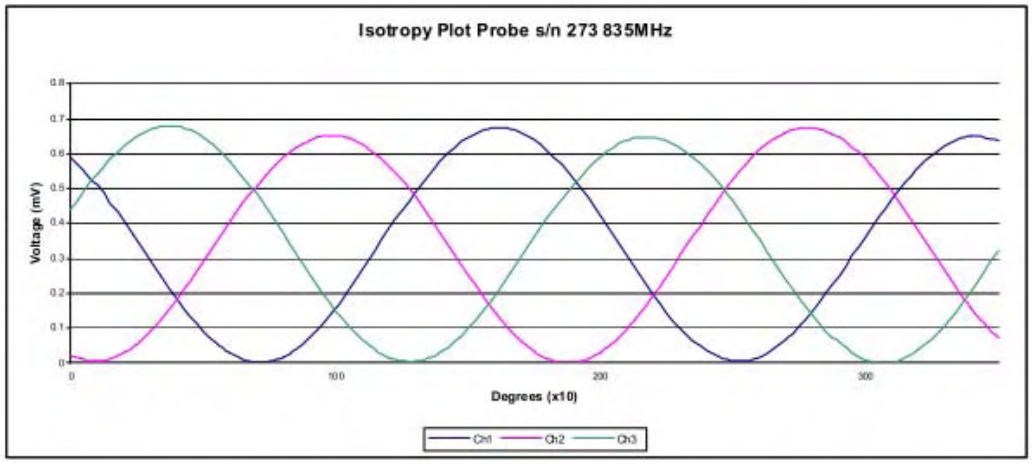
Isotropy Error 835 MHz (Air)





Isotropicity Tissue: 0.10 dB

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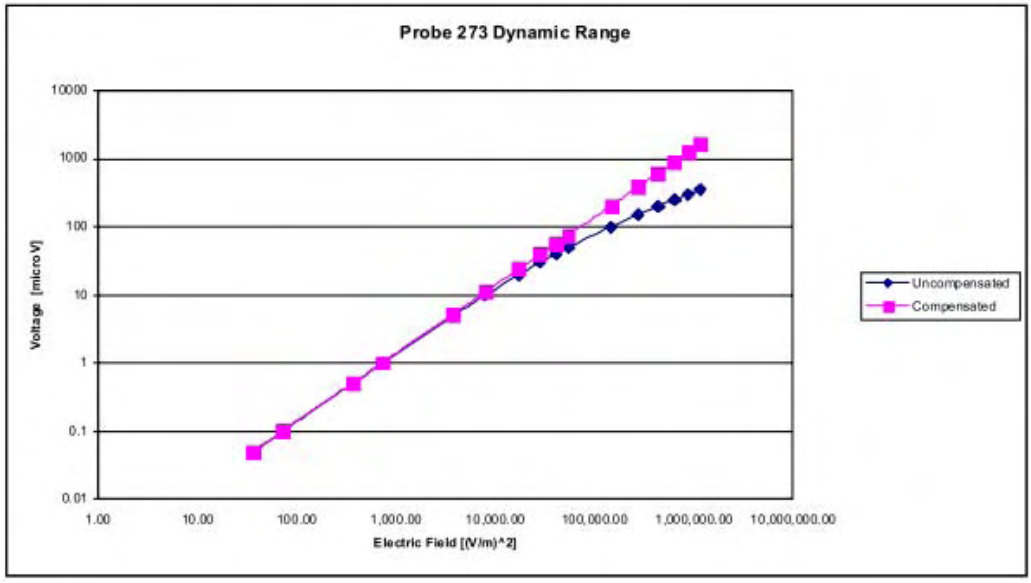
Dynamic Range



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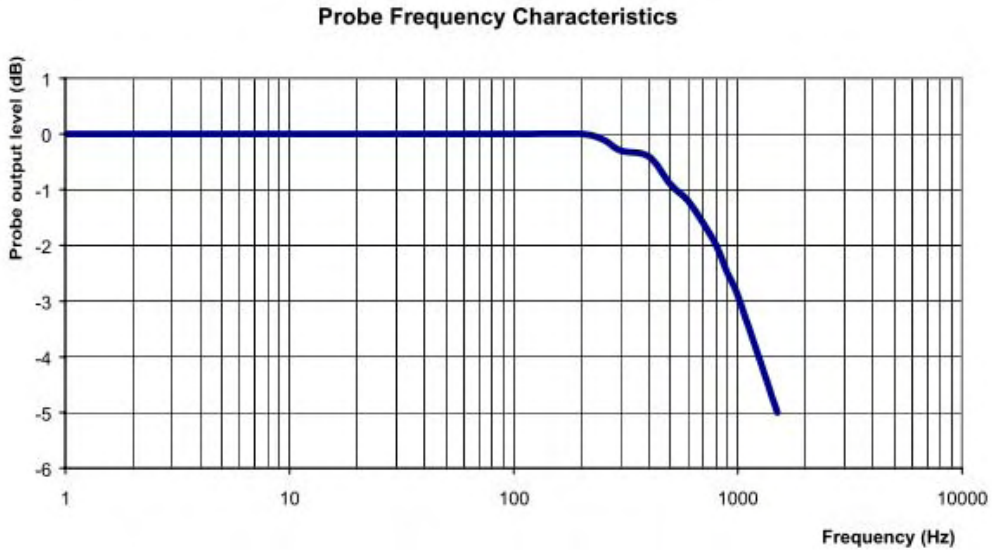
Video Bandwidth



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

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Conversion Factor Uncertainty Assessment

Frequency:		835MHz	
Epsilon:	41.04 (+/-5%)	**Sigma:**	0.89 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 2010.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1140

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-E020-5537

Calibrated: 20th August 2010
Released on: 24th August 2010

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

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: 55.91 (+/-5%) **Sigma:** 0.98 S/m (+/-5%)

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:

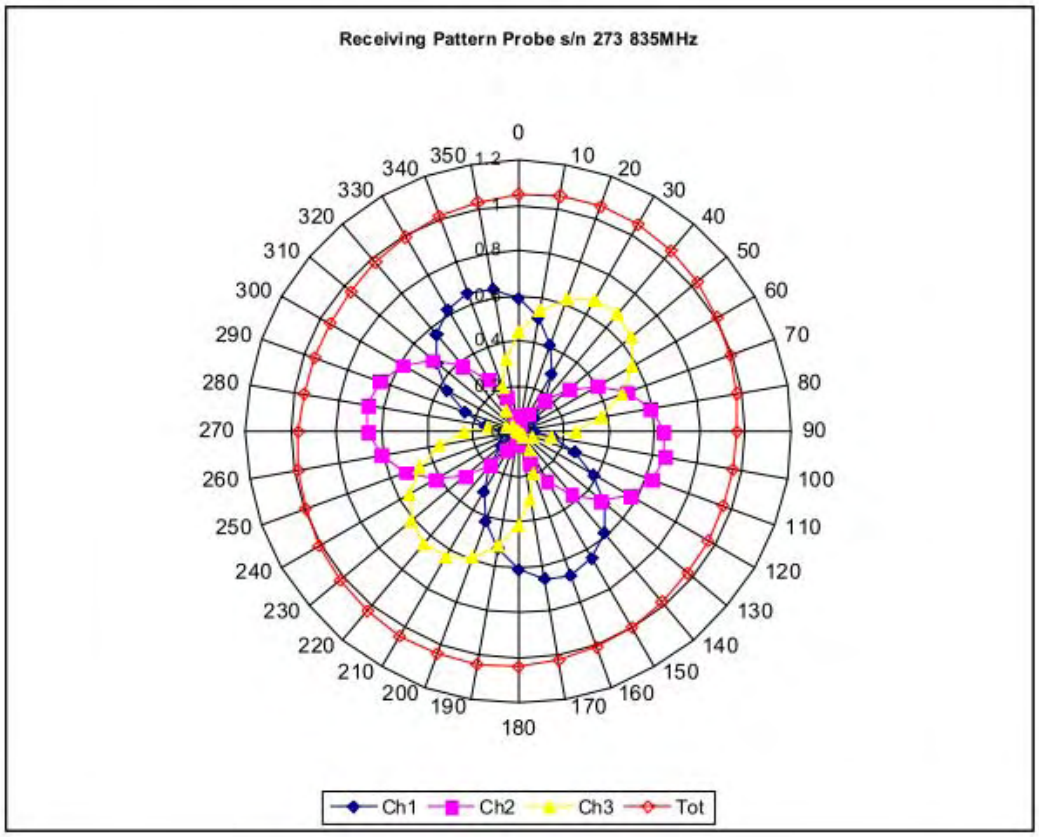
Uncertainty resulting from the boundary effect is less than 2% for the distance between the tip of the probe and the tissue boundary, when less than 2.44mm.

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.

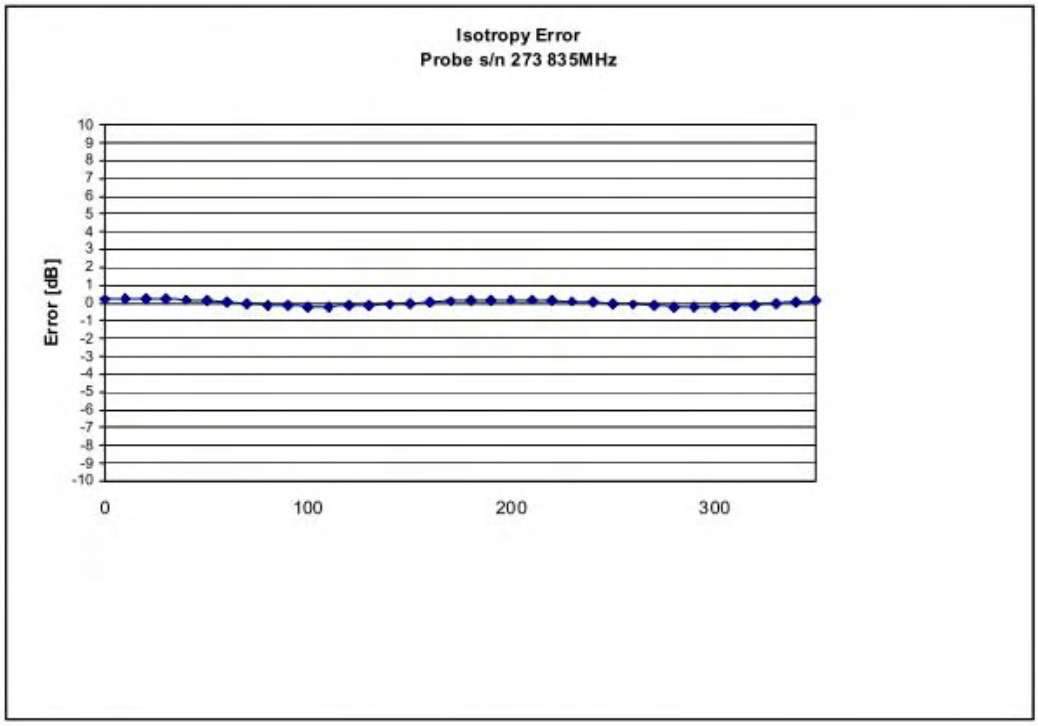
NCL Calibration Laboratories
Division of APREL Laboratories.

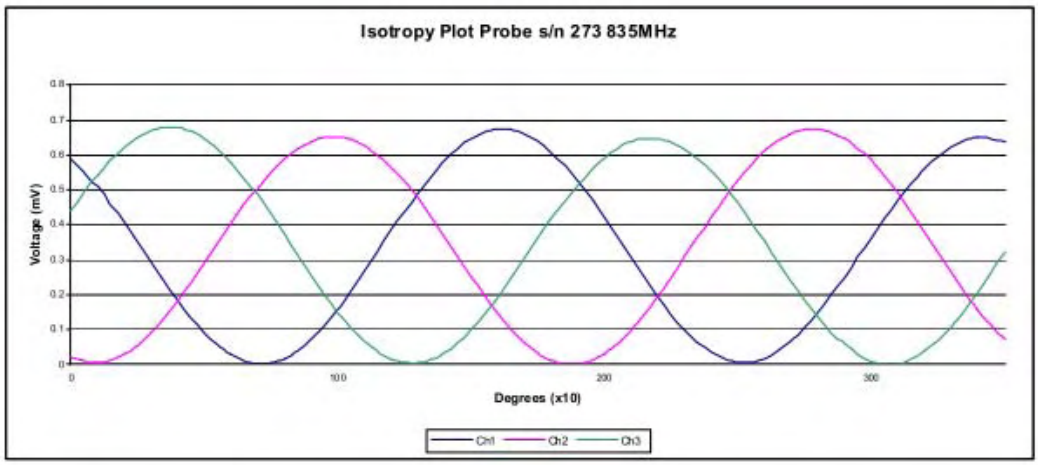
Receiving Pattern 835 MHz (Air)



NCL Calibration Laboratories
Division of APREL Laboratories.

Isotropy Error 835 MHz (Air)

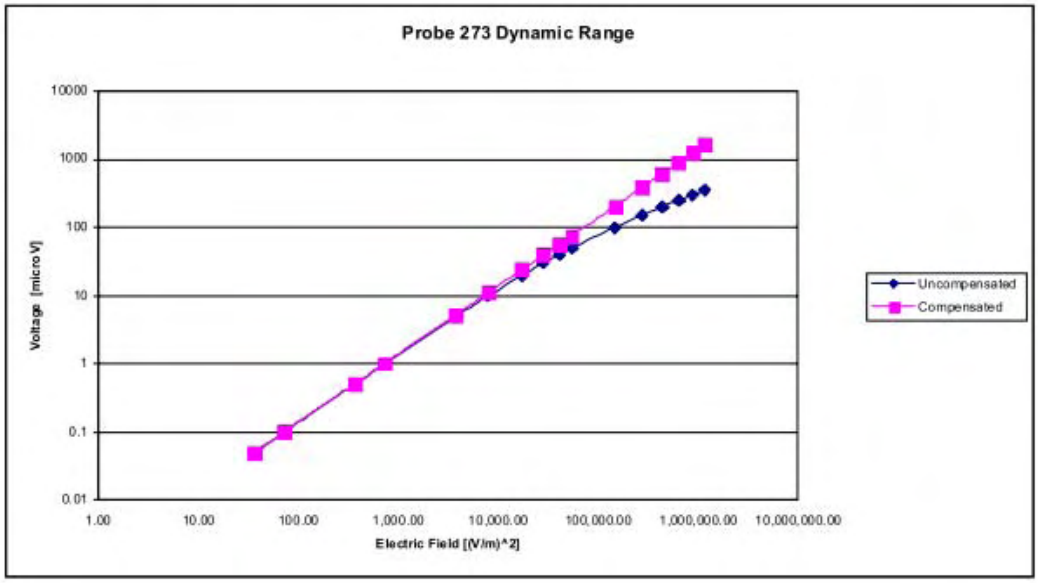




Isotropicity in Tissue: 0.10 dB

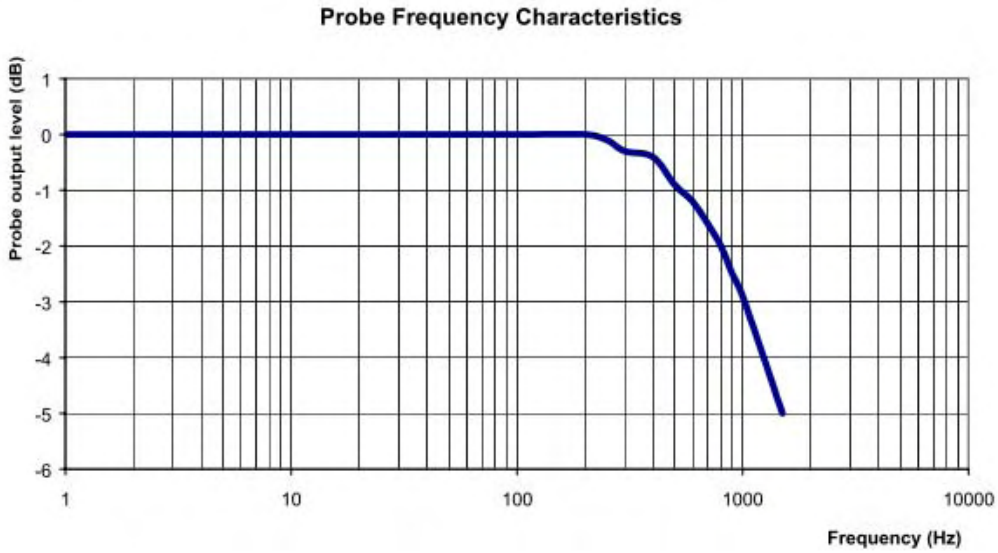
NCL Calibration Laboratories
Division of APREL Laboratories.

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:	55.91 (+/-5%)	**Sigma:**	0.98 S/m (+/-5%)
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%.

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 2010.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1141

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-E020-5537

Calibrated: 21st August 2010
Released on: 24th August 2010

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

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:	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

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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: 38.90 (+/-5%) **Sigma:** 1.39 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:

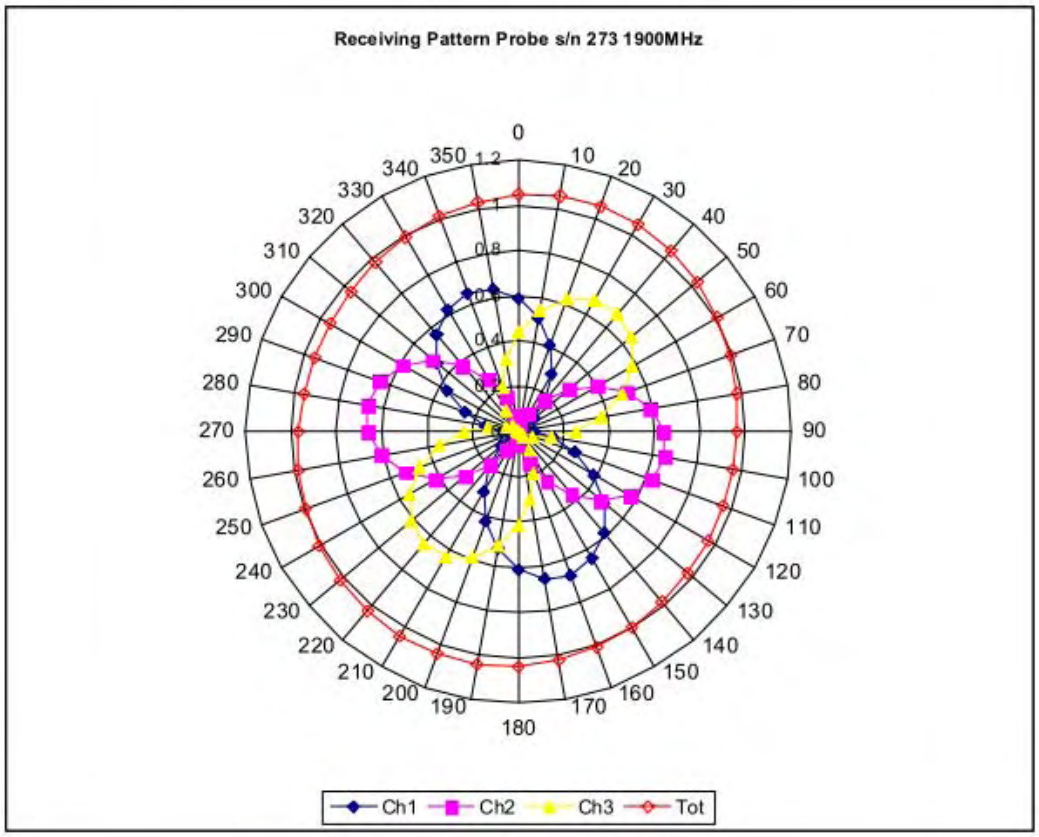
Uncertainty resulting from the boundary effect is less than 2% for the distance between the tip of the probe and the tissue boundary, when less than 2.44mm.

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.

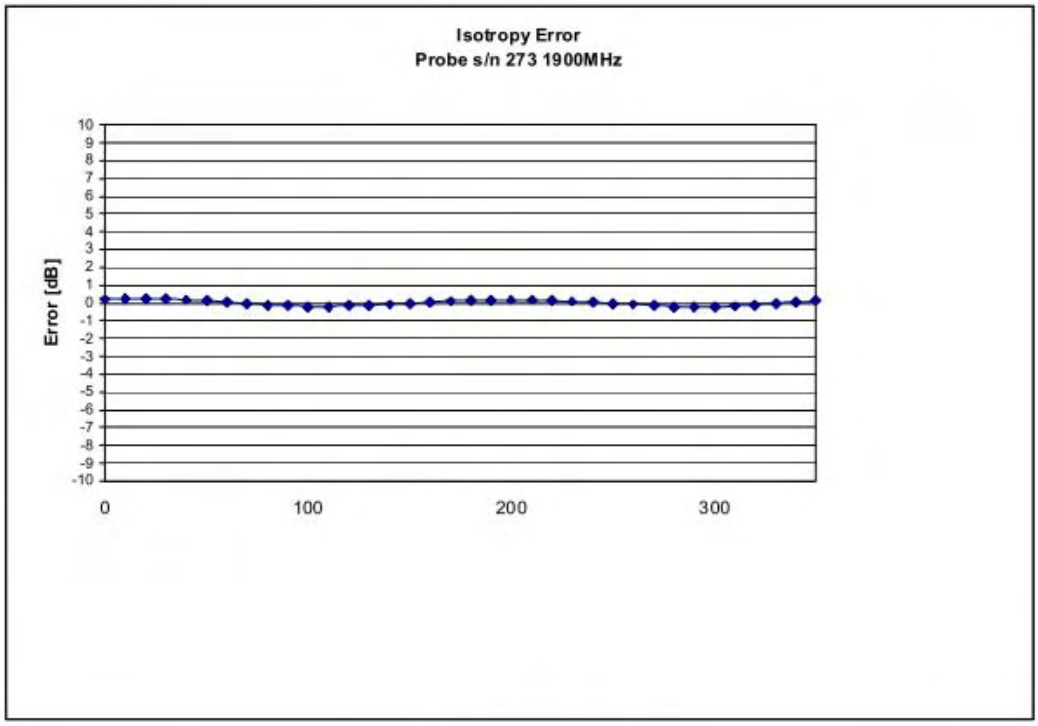
NCL Calibration Laboratories
Division of APREL Laboratories.

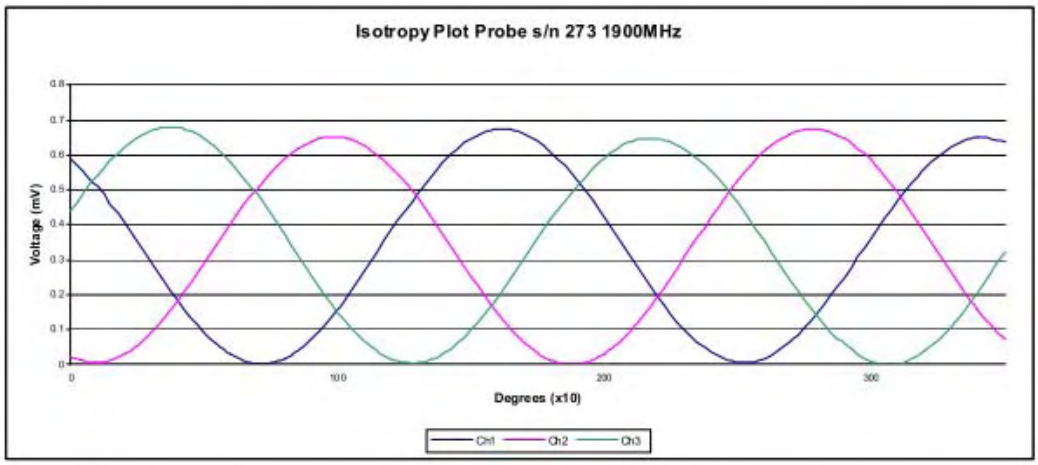
Receiving Pattern 1900 MHz (Air)



NCL Calibration Laboratories
Division of APREL Laboratories.

Isotropy Error 1900 MHz (Air)

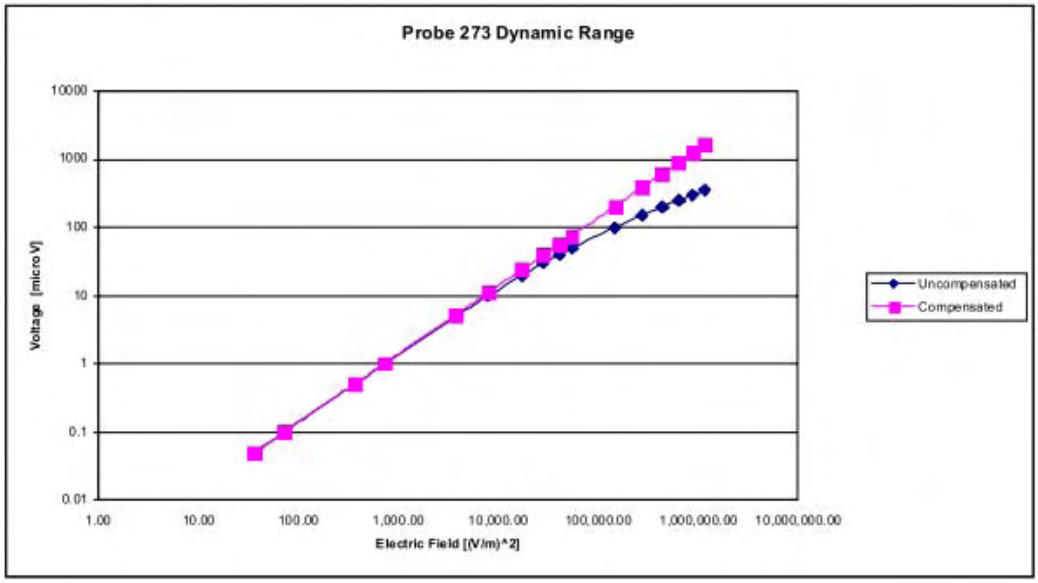




Isotropicity in Tissue: 0.10 dB

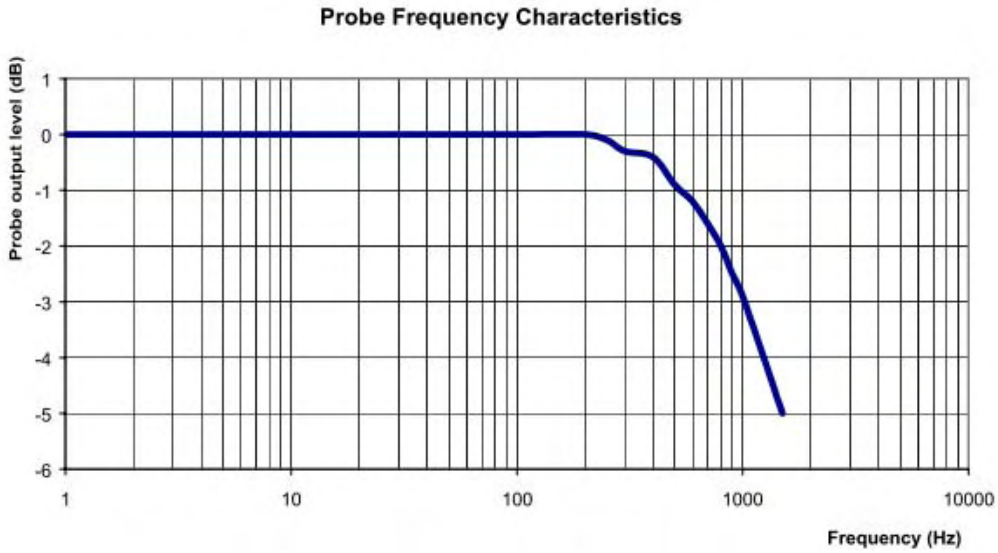
NCL Calibration Laboratories
Division of APREL Laboratories.

Dynamic Range



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:		1900MHz	
Epsilon:	38.90 (+/-5%)	**Sigma:**	1.39 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%.

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 2010.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1142

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-E020-5537

Calibrated: 21st August 2010
Released on: 24th August 2010

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

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:	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: 53.11 (+/-5%) **Sigma:** 1.56 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:

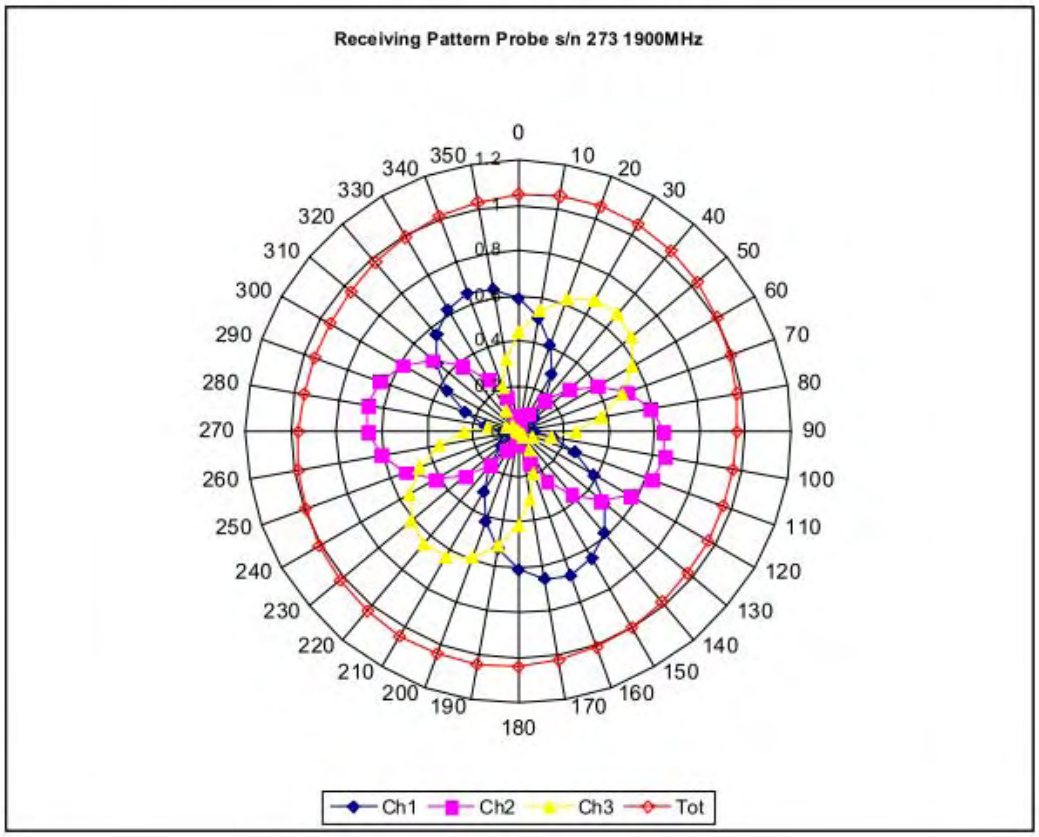
Uncertainty resulting from the boundary effect is less than 2% for the distance between the tip of the probe and the tissue boundary, when less than 2.44mm.

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.

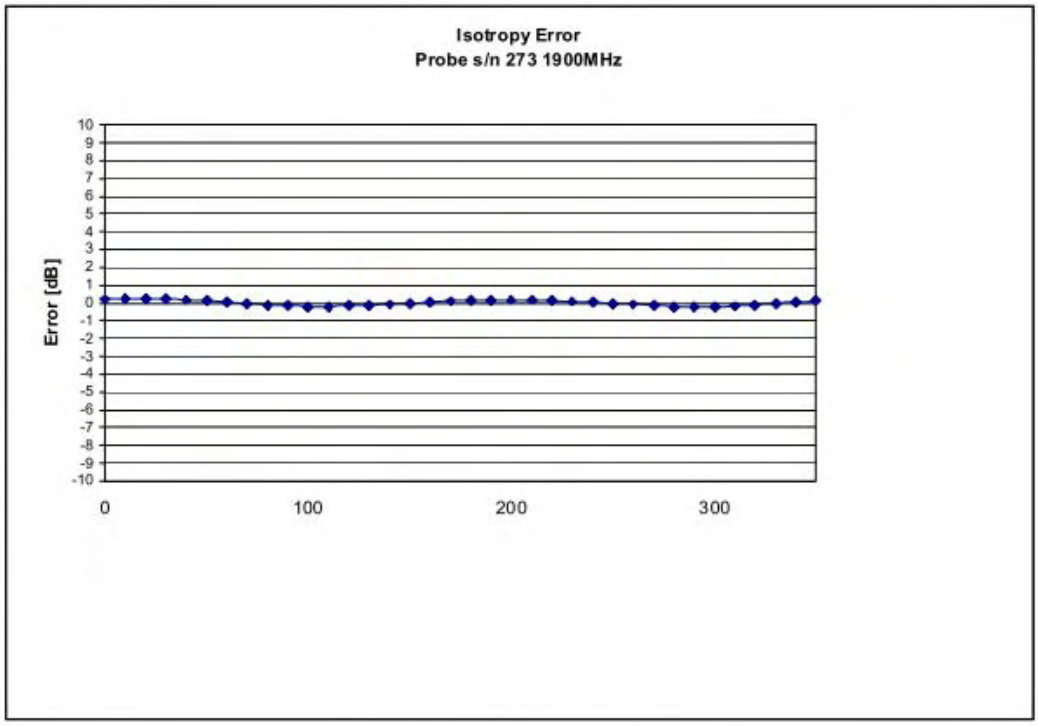
NCL Calibration Laboratories
Division of APREL Laboratories.

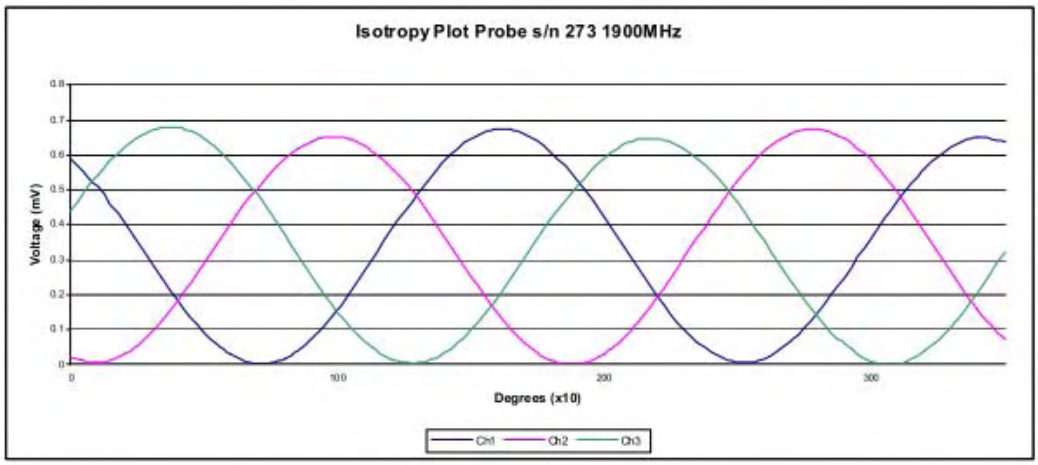
Receiving Pattern 1900 MHz (Air)



NCL Calibration Laboratories
Division of APREL Laboratories.

Isotropy Error 1900 MHz (Air)

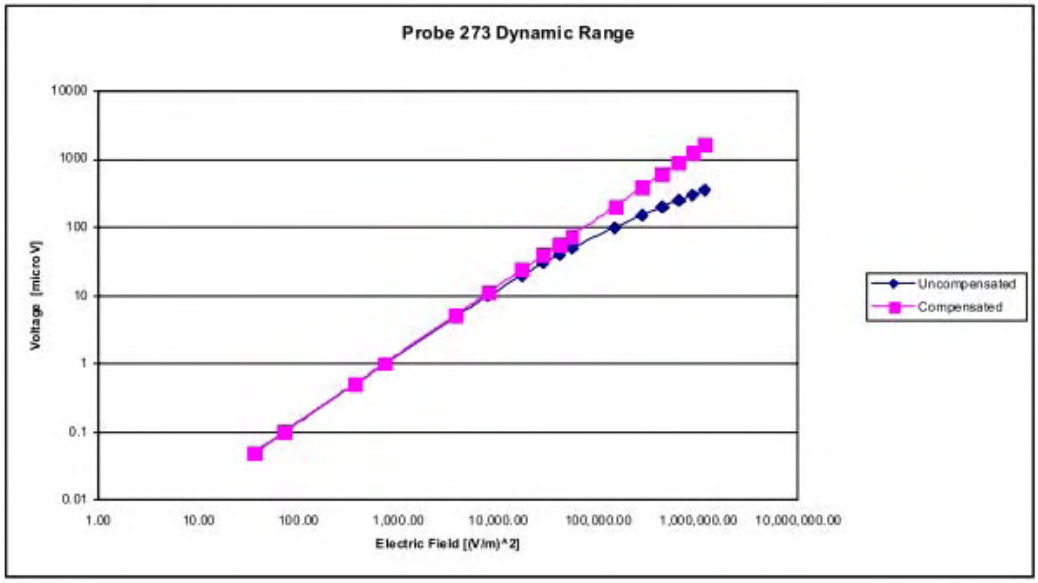




Isotropicity in Tissue: 0.10 dB

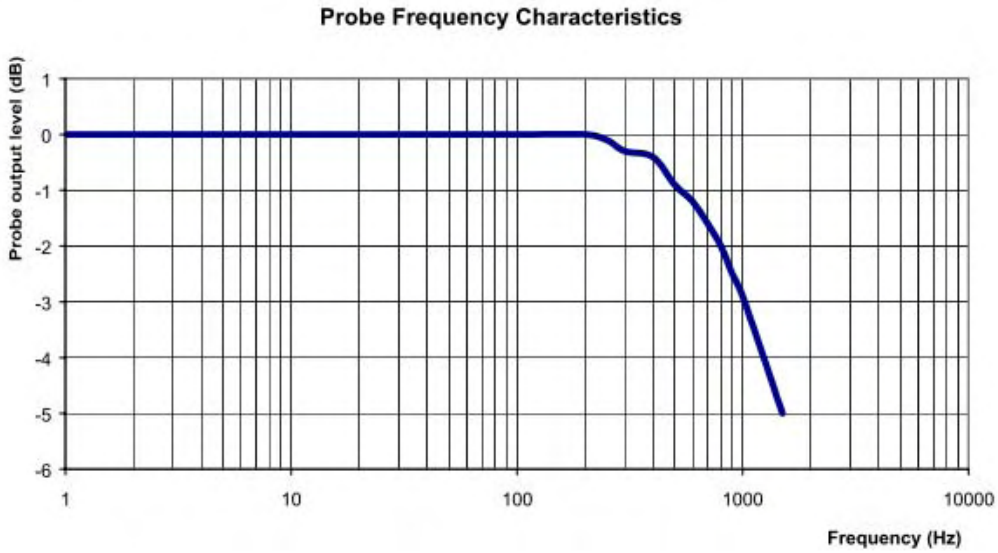
NCL Calibration Laboratories
Division of APREL Laboratories.

Dynamic Range



NCL Calibration Laboratories
Division of APREL Laboratories.

Video Bandwidth



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

Conversion Factor Uncertainty Assessment

Frequency:		1900MHz	
Epsilon:	53.11 (+/-5%)	**Sigma:**	1.56 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 2010.

APPENDIX C – DIPOLE CALIBRATION CERTIFICATES

Bay Area Compliance Laboratories Corp.
1274 Anvilwood Ave, Sunnyvale, CA 94089
Tel: (408)732-9162 / Fax: (408)732-9164

Verification of Calibration Report

Report Number: CAL 2010-09-20

Description: Dipole Antenna

Manufacturer: APREL Laboratories

Model Number: ALS-D-835-S-2

Serial Number: SN: 180-00558

Date of Calibration: 20 Sept 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 a 95% level of confidence, no sampling plan or other process was used for this calibration (unless stated otherwise), the results reported herein apply only to the calibration of the item described above, and limitations of use (if any) shall be stated this Calibration Report.

Calibrated By: Quinn Jiang — 9/20/2010 — Date

Reviewed By: Victor Zhang — 9/21/2010 — Date

Quality Assurance: Hans Mellberg — 21 SEP 2010 — Date

Attachment

Ambient Environment of Calibration

Temperature	Relative Humidity	Pressure
22 ° C	56.5 %	102.78 k Pa

Equipment List

Description	Manufacturer	Model	Serial #	Cal Date
Signal Generator	HP	8648C	3426A00417	2010-08-30
Network Analyzer	HP	8753D	3410A04346	2010-06-03
Power meter	Agilent	E4419B	MY41291511	2010-09-01
Power Sensor	Agilent	E9301A	MY41497252	2010-02-19
Reference Probe	SPEAG	ET3DV6	1604	2010-09-16

Measurement Conditions

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Flat Phantom	
Distance Dipole Center-TSL	15 mm	With Spacer
Area Scan resolution	dx,dy = 15 mm	
Zoom Scan resolution	dx,dy,dz = 5 mm	
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 hand-held devise used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005**
3. **DASY 4 System Handbook**

Calibration Data:

Head TSL Parameters
The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Head TSL Parameters	22.0°C	41.5	0.90
Measured Head TSL Parameters	22.0°C	41.5	0.89
Head TSL Temperature during test	23.0°C		

SAR result with Head TSL

SAR average over 1 cm3 (1g) of Head TSL	Condition	
SAR measured	500 mW input power	4.77 mW / g
SAR normalized	Normalized to 1W	9.54 mW / g
SAR for nominal Head TSL parameters[1]	Normalized to 1W	9.5 mW / g ± 10%

SAR average over 10 cm3 (10g) of Head TSL	Condition	
SAR measured	500 mW input power	3.02 mW / g
SAR normalized	Normalized to 1W	6.04 mW / g
SAR for nominal Head TSL parameters[1]	Normalized to 1W	6.2 mW / g ± 10%

Antenna Parameters with Head TSL

Impedance, transformed to feed point	56.174 Ω
Return Loss	-23.458 dB

DASY4 Validation Report for Head TSL

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

System Performance Test (835 MHz Head Tissue)

DUT: Dipole 835 MHz; Type: ALS-D835-S-2; Serial: SN: 180-00558

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

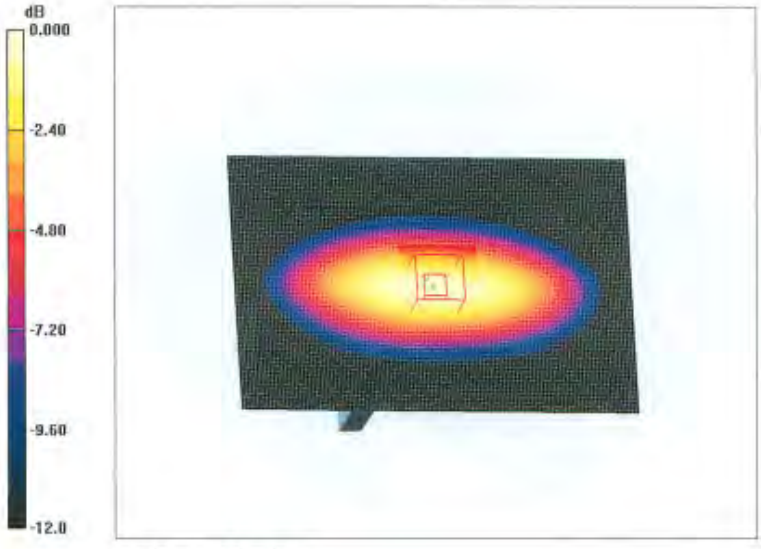
DASY4 Configuration:

- Probe: ET3DV6 - SN1604; ConvF(6.26, 6.26, 6.26); Calibrated: 9/16/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 11/8/2007
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.6 Build 23; Post processing SW: SEMCAD, V1.8 Build 184

d =15 mm, Pin = 0.5W /Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 5.08 mW/g

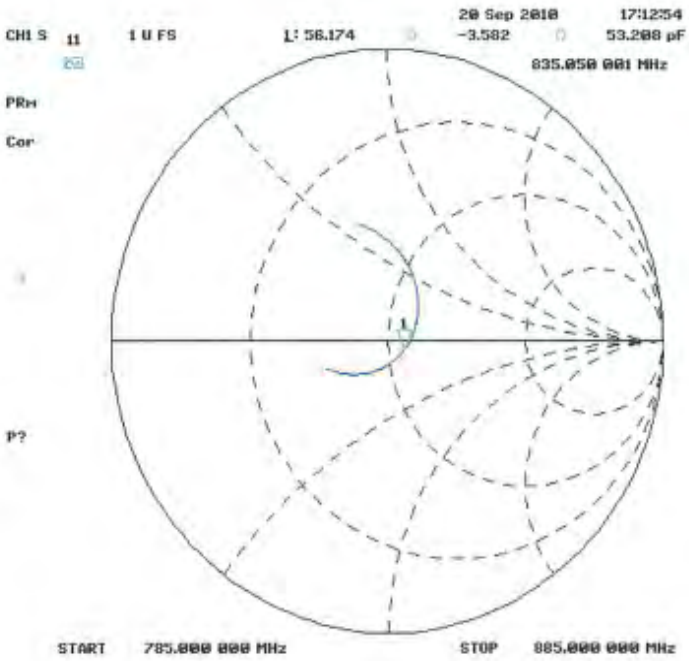
d =15 mm, Pin = 0.5W /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 77.8 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 7.35 W/kg

SAR(1 g) = 4.77 mW/g; SAR(10 g) = 3.02 mW/g
Maximum value of SAR (measured) = 5.16 mW/g

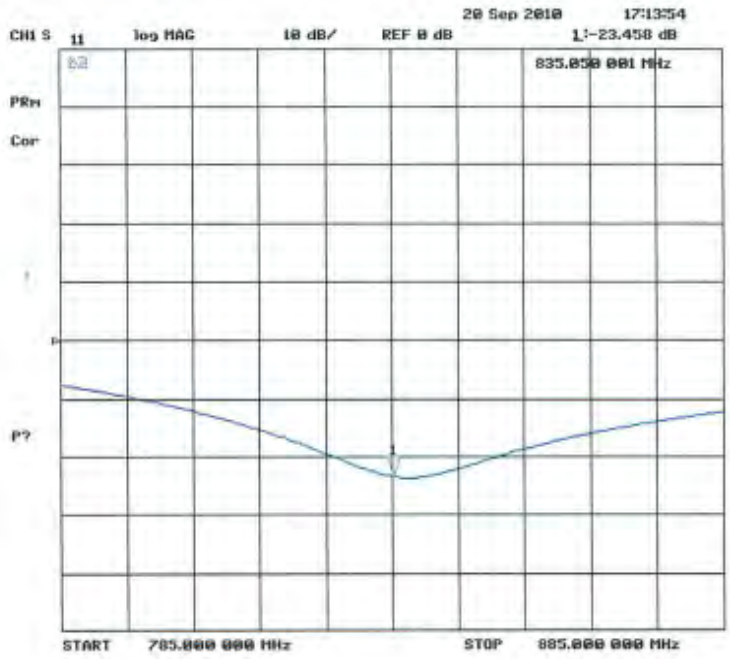


0 dB = 5.16mW/g

Impedance Measurement Plot for Head TSL



Return Loss Measurement Plot for Head TSL



Bay Area Compliance Laboratories Corp.
1274 Anvilwood Ave, Sunnyvale, CA 94089
Tel: (408)732-9162 / Fax: (408)732-9164

Verification of Calibration Report

Report Number: CAL 2010-09-20

Description: Dipole Antenna

Manufacturer: APREL Laboratories

Model Number: ALS-D-1900-S-2

Serial Number: SN: 210-00710

Date of Calibration: 20 Sept 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 a 95% level of confidence, no sampling plan or other process was used for this calibration (unless stated otherwise), the results reported herein apply only to the calibration of the item described above, and limitations of use (if any) shall be stated this Calibration Report.

Calibrated By: Quinn Jiang — Date: 9/20/2010

Reviewed By: Victor Zhang — Date: 9/21/2010

Quality Assurance: Hans Mellberg — Date: 21 SEP 2010

Attachment

Ambient Environment of Calibration

Temperature	Relative Humidity	Pressure
22 ° C	53.5 %	104.55 k Pa

Equipment List

Description	Manufacturer	Model	Serial #	Cal Date
Signal Generator	HP	8648C	3426A00417	2010-08-30
Network Analyzer	HP	8753D	3410A04346	2010-06-03
Power meter	Agilent	E4419B	MY41291511	2010-09-01
Power Sensor	Agilent	E9301A	MY41497252	2010-02-19
Reference Probe	SPEAG	ET3DV6	1604	2010-09-16

Measurement Conditions

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Flat Phantom	
Distance Dipole Center-TSL	10 mm	With Spacer
Area Scan resolution	dx,dy = 15 mm	
Zoom Scan resolution	dx,dy,dz = 5 mm	
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 hand-held devise used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005**
3. **DASY 4 System Handbook**

Calibration Data:

Head TSL Parameters
The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Head TSL Parameters	22.0°C	40.0	1.40
Measured Head TSL Parameters	(22.0±0.3)°C	39.9	1.38
Head TSL Temperature during test	(23.0±0.3)°C		

SAR result with Head TSL

SAR average over 1 cm3 (1g) of Head TSL	Condition	
SAR measured	500 mW input power	18.8 mW / g
SAR normalized	Normalized to 1W	37.6 mW / g
SAR for nominal Head TSL parameters[1]	Normalized to 1W	39.7 mW / g ± 10%

SAR average over 10 cm3 (10g) of Head TSL	Condition	
SAR measured	500 mW input power	9.58 mW / g
SAR normalized	Normalized to 1W	19.16 mW / g
SAR for nominal Head TSL parameters[1]	Normalized to 1W	20.5 mW / g ± 10%

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.727 Ω
Return Loss	-35.881 dB

[1]Correction to nominal TSL parameters according to DASY 4 System Handbook, chapter "SAR Sensitivities"

DASY4 Validation Report for Head TSL

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

System Performance Test (1900 MHz Head Tissue)

DUT: Dipole 1900 MHz; Type: ALS-D-1900-S-2; Serial: SN: 210-00710

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.38 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

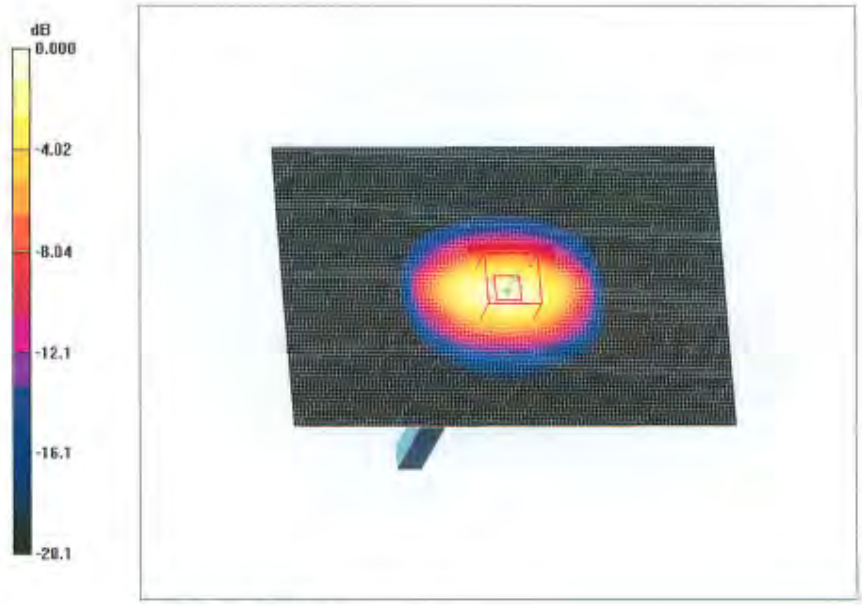
DASY4 Configuration:

- Probe: ET3DV6 - SN1604; ConvF(5.04, 5.04, 5.04); Calibrated: 9/16/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 11/8/2007
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.6 Build 23; Post processing SW: SEMCAD, V1.8 Build 184

d =10 mm, Pin = 0.5W /Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 20.7 mW/g

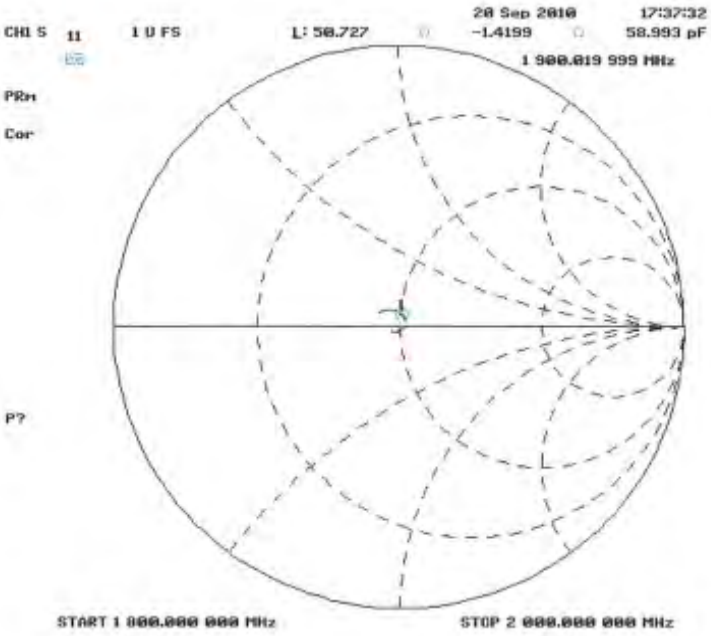
d =10 mm, Pin = 0.5W /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 127.5 V/m; Power Drift = -0.054 dB
Peak SAR (extrapolated) = 34.7 W/kg

SAR(1 g) = 18.8 mW/g; SAR(10 g) = 9.58 mW/g
Maximum value of SAR (measured) = 21.3 mW/g

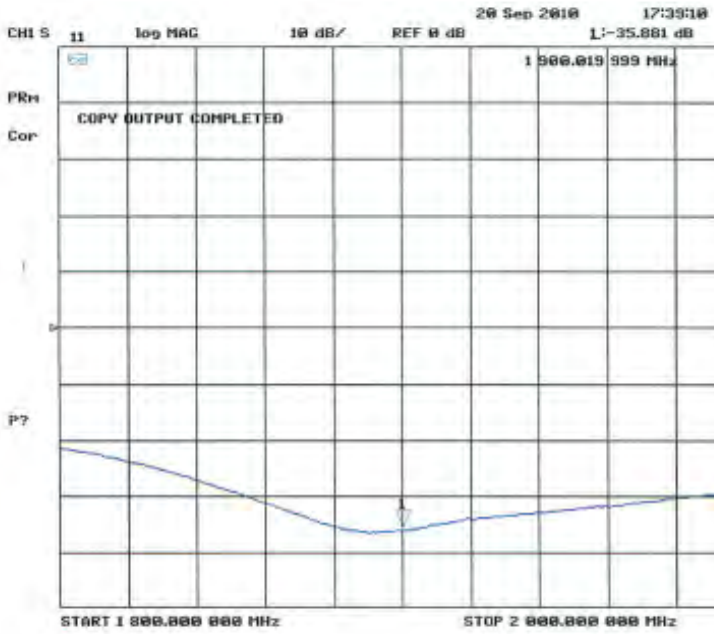


0 dB = 21.3mW/g

Impedance Measurement Plot for Head TSL



Return Loss Measurement Plot for Head TSL



APPENDIX D – SAR SYSTEM VALIDATION DATA

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

System Performance Check 835 MHz, Head Tissue

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 : 10.463 W/kg
Power Drift-Finish : 10.331 W/kg
Power Drift (%) : -0.965

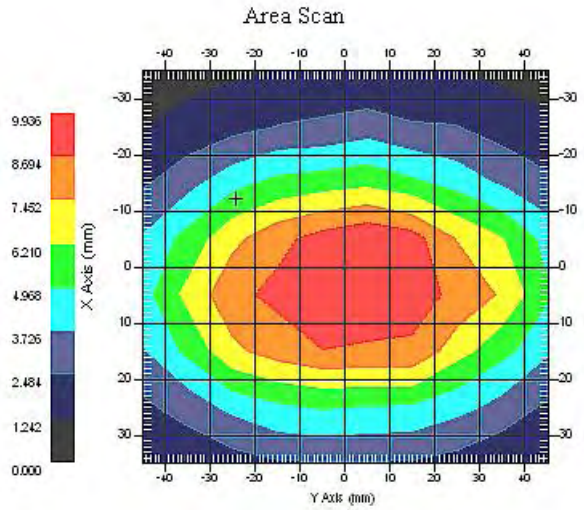
Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
Serial No. : System Default
Location : Center
Description : Default
Phantom Data

Tissue Data
Type : HEAD
Serial No. : 270-01002
Frequency : 835.00 MHz
Last Calib. Date : 30-May -2011
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 42.62 F/m
Sigma : 0.93 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 : 20-Aug-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 : 9.883 W/kg
10 gram SAR value : 6.345 W/kg
Area Scan Peak SAR : 9.936 W/kg
Zoom Scan Peak SAR : 14.390 W/kg



835 MHz System Check with Head Tissue

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

System Performance Check 835 MHz, Body Tissue

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	: 10.017 W/kg
Power Drift-Finish	: 10.149 W/kg
Power Drift (%)	: 0.674

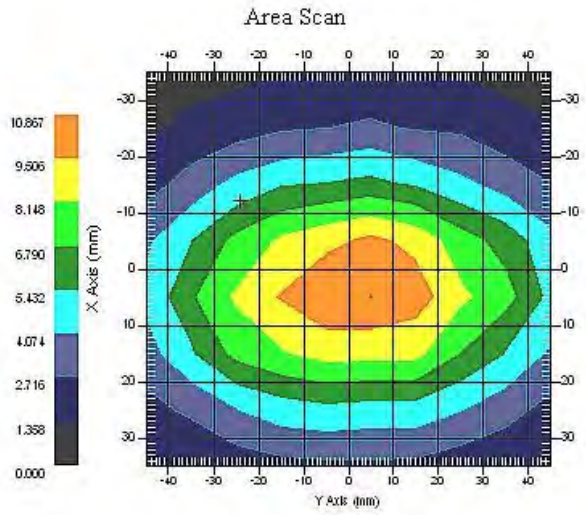
Phantom Data	
Name	: APREL-Uni
Type	: Uni-Phantom
Size (mm)	: 280 x 280 x 200
Serial No.	: System Default
Location	: Center
Description	: Default
Phantom Data	

Tissue Data	
Type	: Body
Serial No.	: 270-02101
Frequency	: 835.00 MHz
Last Calib. Date	: 30-May -2011
Temperature	: 20.00 °C
Ambient Temp.	: 21.00 °C
Humidity	: 56.00 RH%
Epsilon	: 55.69 F/m
Sigma	: 0.98S/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	: 20-Aug-2010
Frequency	: 835.00 MHz
Duty Cycle Factor	: 1
Conversion Factor	: 6.7
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 : 10.112 W/kg
10 gram SAR value : 6.351 W/kg
Area Scan Peak SAR : 10.867 W/kg
Zoom Scan Peak SAR : 15.511 W/kg



835 MHz System Check with Body Tissue

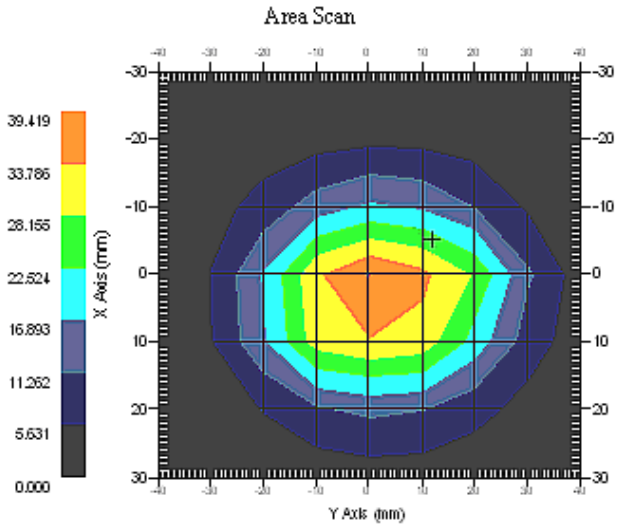
Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

System Performance Check 1900 MHz, Head Tissue

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	: 40.566 W/kg
Power Drift-Finish	: 40.068 W/kg
Power Drift (%)	: 1.087
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	: 30-May-2011
Temperature	: 20.00 °C
Ambient Temp.	: 21.00 °C
Humidity	: 56.00 RH%
Epsilon	: 40.12 F/m
Sigma	: 1.46 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	: 21-Aug-2010
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 : 38.158 W/kg
10 gram SAR value : 19.564 W/kg
Area Scan Peak SAR : 39.419 W/kg
Zoom Scan Peak SAR : 77.189 W/kg



1900 MHz System Check with Head Tissue

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

System Performance Check 1900 MHz, Body Tissue

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 : 40.368 W/kg
Power Drift-Finish : 41.205 W/kg
Power Drift (%) : 1.920

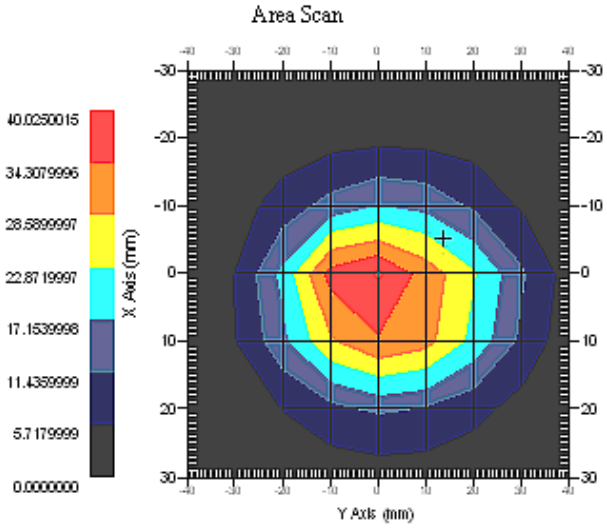
Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
Serial No. : System Default
Location : Center
Description : Default

Tissue Data
Type : Body
Serial No. : 295-02102
Frequency : 1900.00 MHz
Last Calib. Date : 30-May-2011
Temperature : 20.00 °C
Ambient Temp. : 21.00 °C
Humidity : 56.00 RH%
Epsilon : 54.18 F/m
Sigma : 1.51 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 : 21-Aug-2010
Frequency : 1900.00 MHz
Duty Cycle Factor : 1
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

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

1 gram SAR value : 40.056 W/kg
10 gram SAR value : 20.478 W/kg
Area Scan Peak SAR : 40.025 W/kg
Zoom Scan Peak SAR : 78.188 W/kg



1900 MHz System Check with Body Tissue

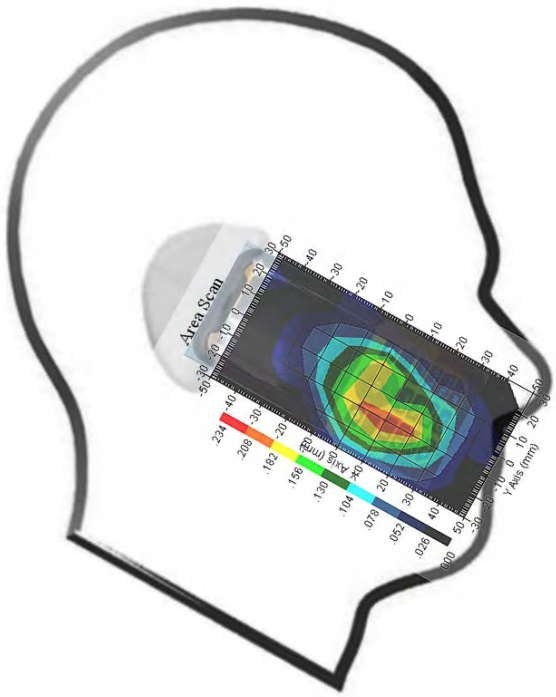
APPENDIX E – EUT SCAN RESULTS

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

Left Head Cheek (835 MHz Low Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type：	: Complete
Area Scan	: 11x7x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.020 W/kg
Power Drift-Finish	: 0.019 W/kg
Power Drift (%)	: -4.068
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 42.62 F/m
Sigma	: 0.93 S/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	: 0.188 W/kg
10 gram SAR value	: 0.113 W/kg
Area Scan Peak SAR	: 0.208 W/kg
Zoom Scan Peak SAR	: 0.360 W/kg

Plot 1#

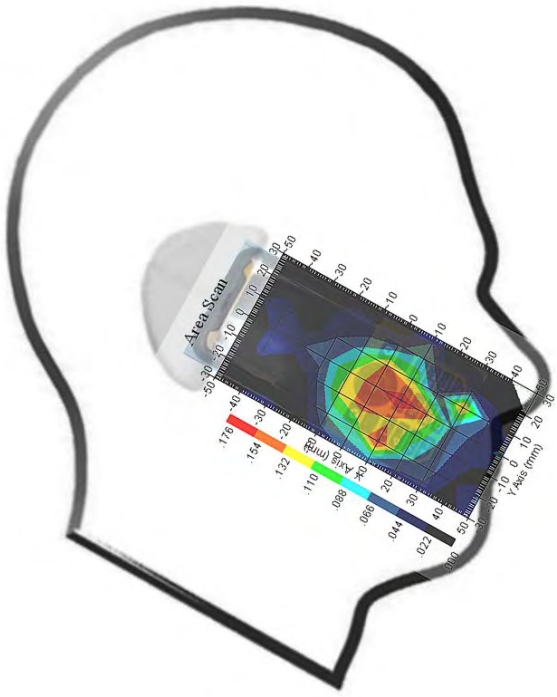


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Left Head Cheek (835 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 11x7x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.059 W/kg
Power Drift-Finish	: 0.057 W/kg
Power Drift (%)	: -3.202
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 42.62 F/m
Sigma	: 0.93 S/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	: 0.171 W/kg
10 gram SAR value	: 0.106 W/kg
Area Scan Peak SAR	: 0.173 W/kg
Zoom Scan Peak SAR	: 0.340 W/kg

Plot 2#

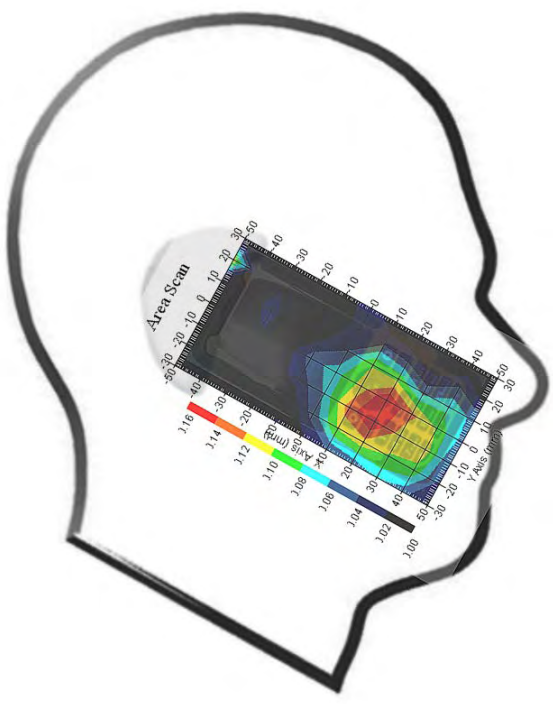


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Left Head Cheek (835 MHz High Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 11x7x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.019 W/kg
Power Drift-Finish	: 0.020 W/kg
Power Drift (%)	: 2.499
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 42.62 F/m
Sigma	: 0.93 S/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	: 0.162 W/kg
10 gram SAR value	: 0.100 W/kg
Area Scan Peak SAR	: 0.159 W/kg
Zoom Scan Peak SAR	: 0.290 W/kg

Plot 3#

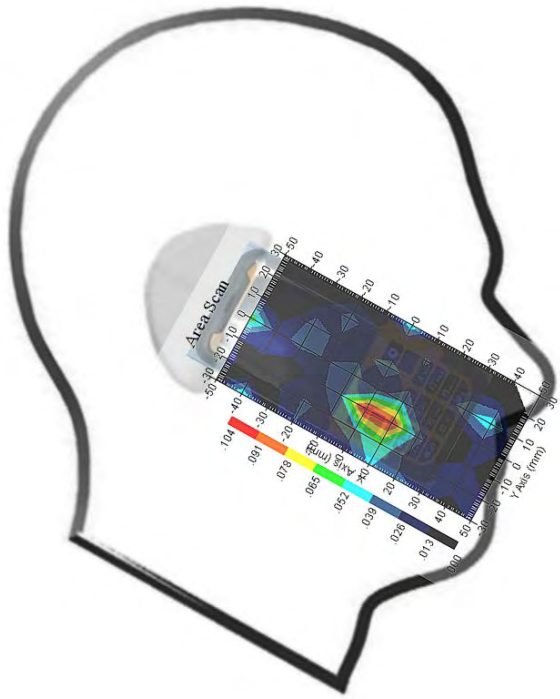


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Left Head Tilt (835 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type：	: Complete
Area Scan	: 9x7x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.017 W/kg
Power Drift-Finish	: 0.018 W/kg
Power Drift (%)	: 3.396
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 42.62 F/m
Sigma	: 0.93 S/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	: 0.099 W/kg
10 gram SAR value	: 0.055 W/kg
Area Scan Peak SAR	: 0.101 W/kg
Zoom Scan Peak SAR	: 0.210 W/kg

Plot 4#

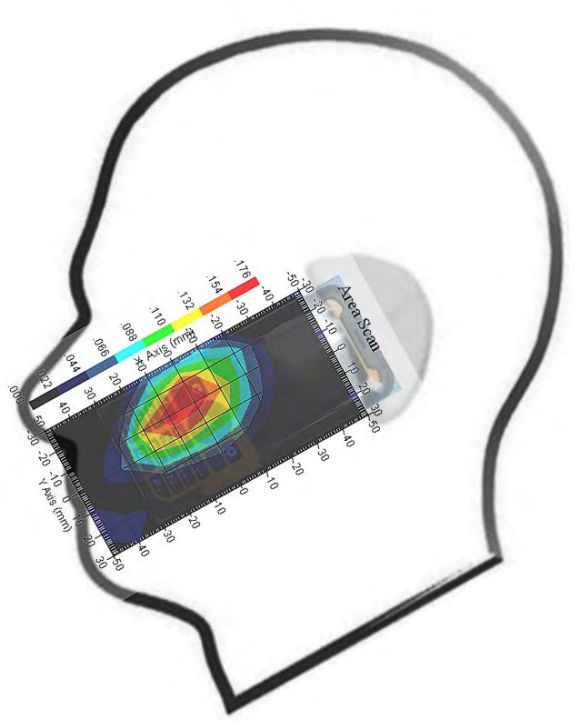


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Right Head Cheek (835 MHz High Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type：	: Complete
Area Scan	: 11x7x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.025 W/kg
Power Drift-Finish	: 0.024 W/kg
Power Drift (%)	: -2.628
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 42.62 F/m
Sigma	: 0.93 S/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	: 0.177 W/kg
10 gram SAR value	: 0.102 W/kg
Area Scan Peak SAR	: 0.174 W/kg
Zoom Scan Peak SAR	: 0.330 W/kg

Plot 5#

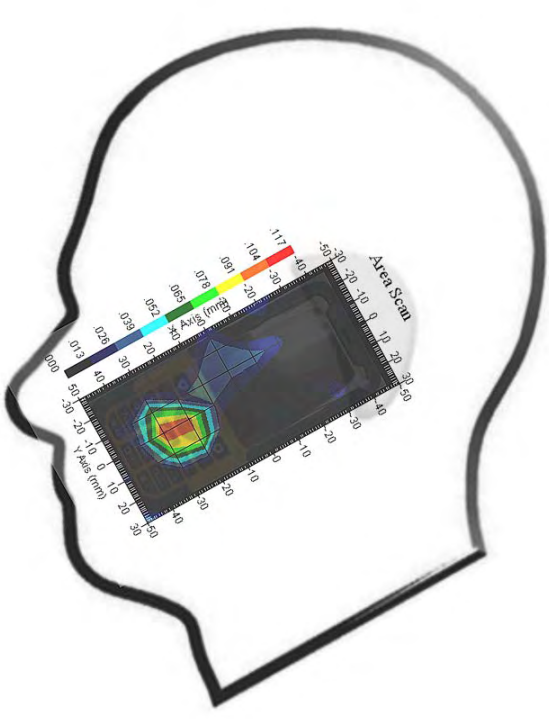


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Right Head Tilt (835 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type：	: Complete
Area Scan	: 11x7x1 : 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	: 0.040 W/kg
Power Drift (%)	: -2.516
Tissue Data	
Type	: HEAD
Frequency	: 835.00 MHz
Epsilon	: 42.62 F/m
Sigma	: 0.93 S/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	: 0.095 W/kg
10 gram SAR value	: 0.054 W/kg
Area Scan Peak SAR	: 0.106 W/kg
Zoom Scan Peak SAR	: 0.200 W/kg

Plot 6#

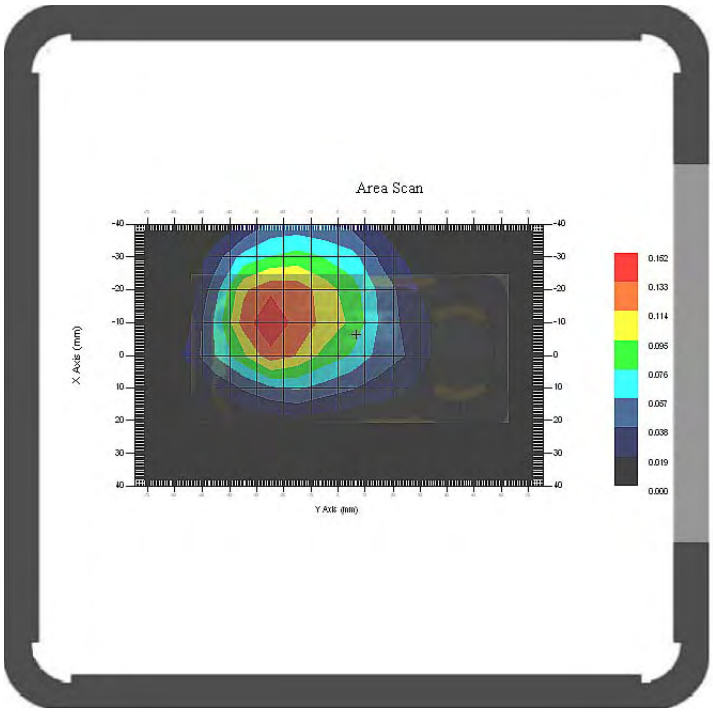


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Body- worn Back (835 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 9x17x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.102 W/kg
Power Drift-Finish	: 0.098 W/kg
Power Drift (%)	: -3.628
Tissue Data	
Type	: BODY
Frequency	: 835.00 MHz
Epsilon	: 55.69 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	: 6.7
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	: 0.137 W/kg
10 gram SAR value	: 0.069 W/kg
Area Scan Peak SAR	: 0.150 W/kg
Zoom Scan Peak SAR	: 0.190 W/kg

Plot 7#



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

Body- worn Back (835 MHz Low Channel)

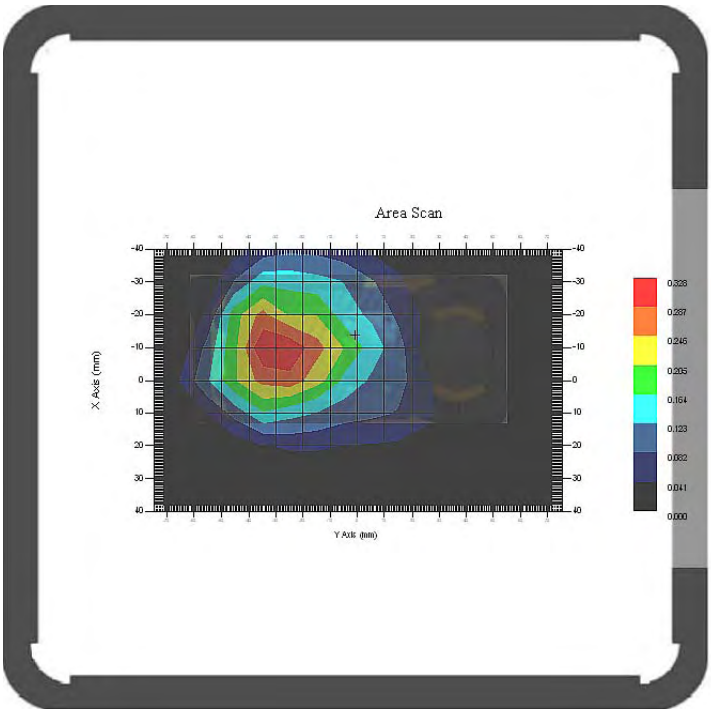
Measurement Data
Test mode : GPRS
Crest Factor : 4
Scan Type : Complete
Area Scan : 9x17x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.160 W/kg
Power Drift-Finish : 0.157 W/kg
Power Drift (%) : -1.589

Tissue Data
Type : BODY
Frequency : 835.00 MHz
Epsilon : 55.69 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 : 4
Conversion Factor : 6.7
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 : 0.287 W/kg
10 gram SAR value : 0.170 W/kg
Area Scan Peak SAR : 0.315 W/kg
Zoom Scan Peak SAR : 0.480 W/kg

Plot 8#

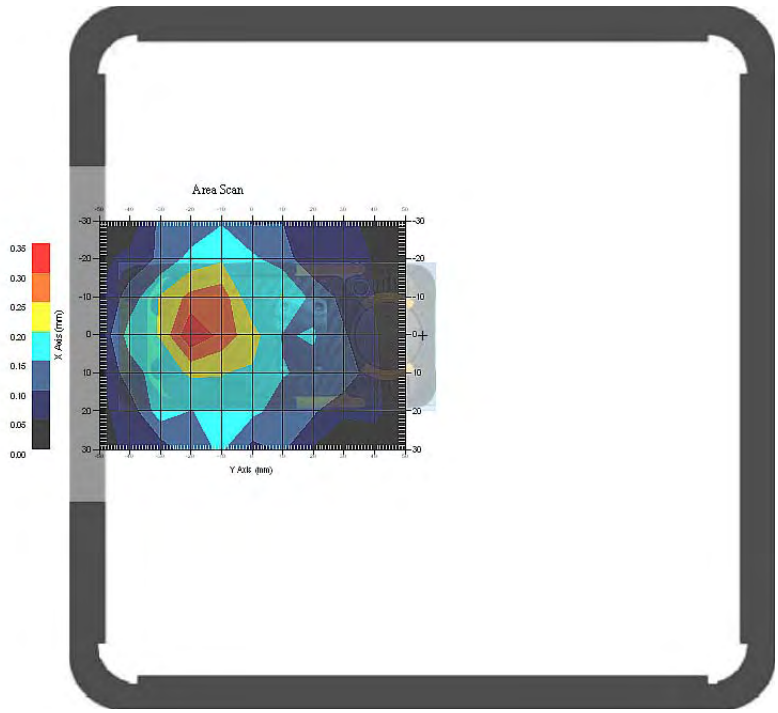


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Body- worn Back (835 MHz Middle Channel)

Measurement Data	
Test mode	: GPRS
Crest Factor	: 4
Scan Type	: Complete
Area Scan	: 7x11x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.072 W/kg
Power Drift-Finish	: 0.070 W/kg
Power Drift (%)	: -2.620
Tissue Data	
Type	: BODY
Frequency	: 835.00 MHz
Epsilon	: 55.69 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	: 4
Conversion Factor	: 6.7
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	: 0.269 W/kg
10 gram SAR value	: 0.159 W/kg
Area Scan Peak SAR	: 0.310 W/kg
Zoom Scan Peak SAR	: 0.470 W/kg

Plot 9#



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

Body- worn Back (835 MHz High Channel)

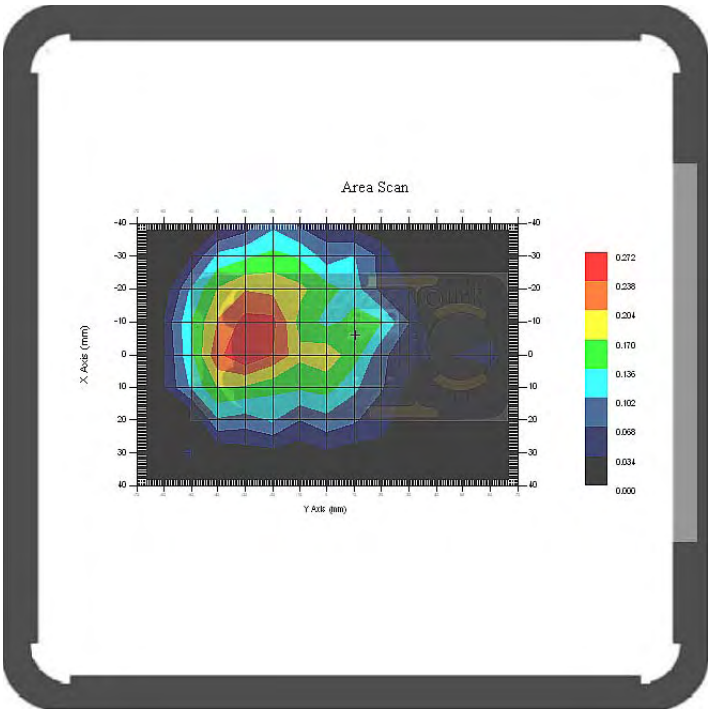
Measurement Data
Test mode : GPRS
Crest Factor : 4
Scan Type : Complete
Area Scan : 9x17x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.161 W/kg
Power Drift-Finish : 0.164 W/kg
Power Drift (%) : 2.032

Tissue Data
Type : BODY
Frequency : 835.00 MHz
Epsilon : 55.69 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 : 4
Conversion Factor : 6.7
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 : 0.256 W/kg
10 gram SAR value : 0.151 W/kg
Area Scan Peak SAR : 0.272 W/kg
Zoom Scan Peak SAR : 0.650 W/kg

Plot 10#



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

Left Head Cheek (1900 MHz Low Channel)

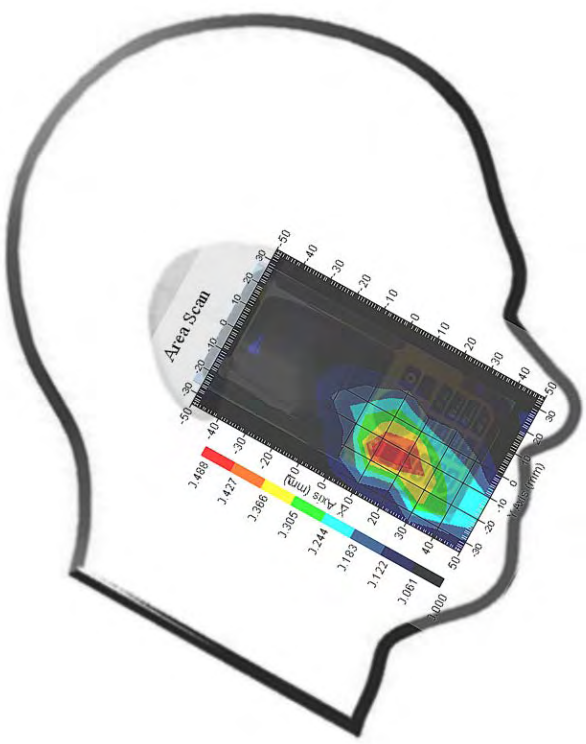
Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 11x7x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.016 W/kg
Power Drift-Finish	: 0.015 W/kg
Power Drift (%)	: -4.080

Tissue Data	
Type	: HEAD
Frequency	: 1900.00 MHz
Epsilon	: 40.12 F/m
Sigma	: 1.46 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	: 0.406 W/kg
10 gram SAR value	: 0.202 W/kg
Area Scan Peak SAR	: 0.427 W/kg
Zoom Scan Peak SAR	: 0.880 W/kg

Plot 11#



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

Left Head Cheek(1900 MHz Middle Channel)

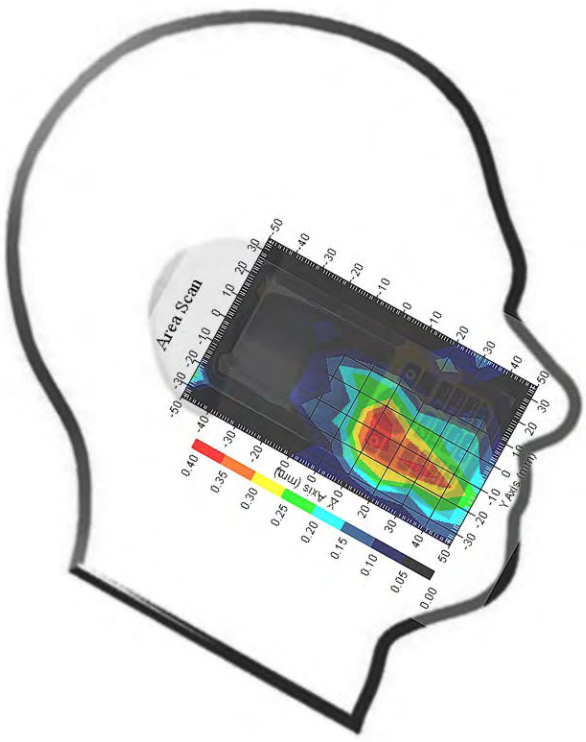
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type : Complete
Area Scan : 11x7x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.023 W/kg
Power Drift-Finish : 0.023 W/kg
Power Drift (%) : 2.338

Tissue Data
Type : HEAD
Frequency : 1900.00 MHz
Epsilon : 40.12 F/m
Sigma : 1.46 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 : 0.392 W/kg
10 gram SAR value : 0.182 W/kg
Area Scan Peak SAR : 0.400 W/kg
Zoom Scan Peak SAR : 0.940 W/kg

Plot 12#



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

Left Head Cheek(1900 MHz High Channel)

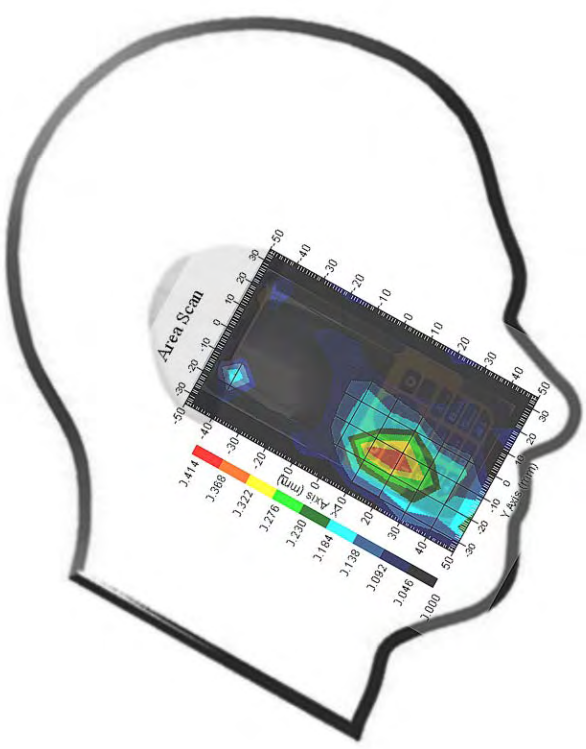
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type : Complete
Area Scan : 11x7x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7: Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.035 W/kg
Power Drift-Finish : 0.034 W/kg
Power Drift (%) : -4.050

Tissue Data
Type : HEAD
Frequency : 1900.00 MHz
Epsilon : 40.12 F/m
Sigma : 1.46 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 : 0.410 W/kg
10 gram SAR value : 0.218 W/kg
Area Scan Peak SAR : 0.414 W/kg
Zoom Scan Peak SAR : 0.910 W/kg

Plot 13#

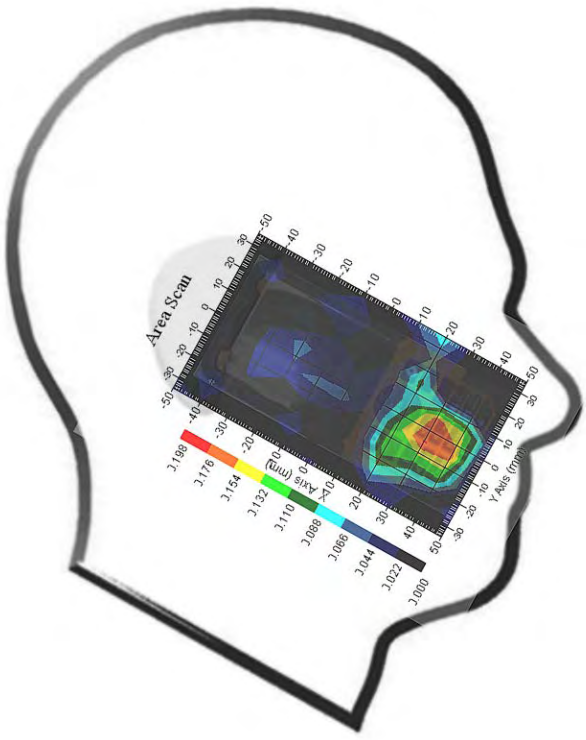


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Left Head Tilt (1900 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 11x7x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.021 W/kg
Power Drift-Finish	: 0.021 W/kg
Power Drift (%)	: -1.336
Tissue Data	
Type	: HEAD
Frequency	: 1900.00 MHz
Epsilon	: 40.12 F/m
Sigma	: 1.46 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	: 0.173 W/kg
10 gram SAR value	: 0.090 W/kg
Area Scan Peak SAR	: 0.177 W/kg
Zoom Scan Peak SAR	: 0.360 W/kg

Plot 14#

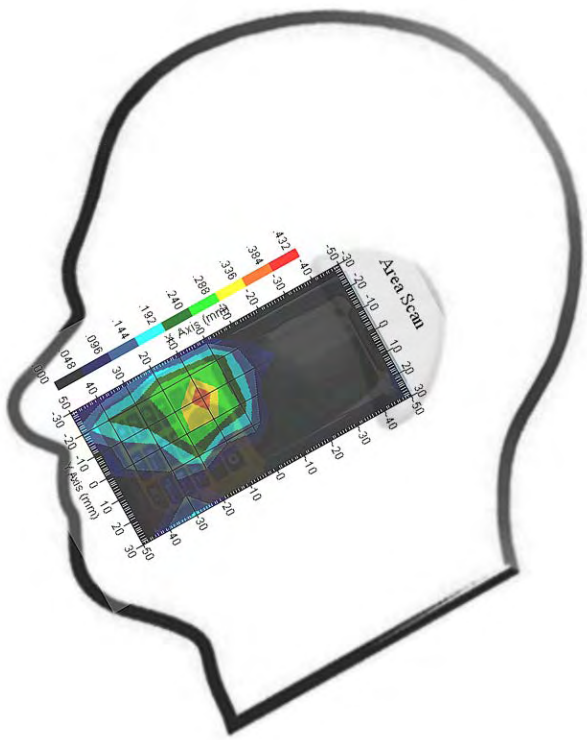


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Right Head Cheek (1900 MHz Low Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 11x7x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.040 W/kg
Power Drift-Finish	: 0.039 W/kg
Power Drift (%)	: -3.443
Tissue Data	
Type	: HEAD
Frequency	: 1900.00 MHz
Epsilon	: 40.12 F/m
Sigma	: 1.46 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	: 0.403 W/kg
10 gram SAR value	: 0.202 W/kg
Area Scan Peak SAR	: 0.406 W/kg
Zoom Scan Peak SAR	: 0.870 W/kg

Plot 15#



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

Right Head Tilt (1900 MHz Middle Channel)

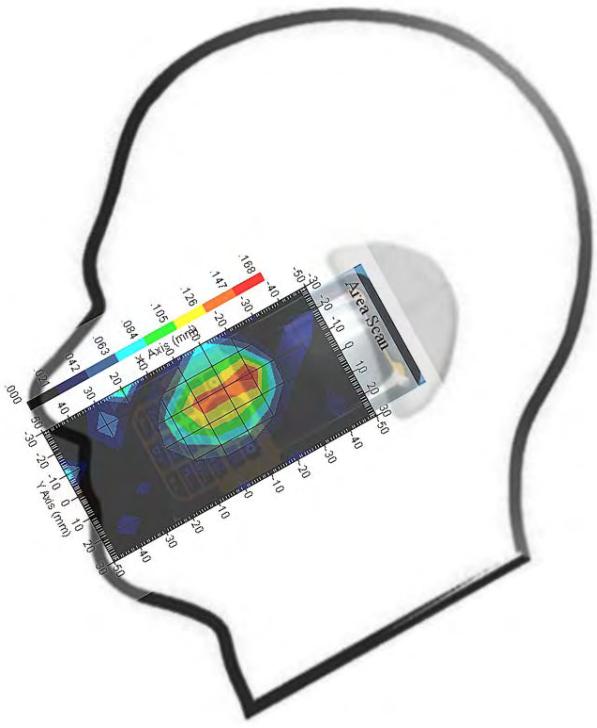
Measurement Data
Test mode : GSM
Crest Factor : 8
Scan Type : Complete
Area Scan : 11x7x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.012 W/kg
Power Drift-Finish : 0.012 W/kg
Power Drift (%) : 2.096

Tissue Data
Type : HEAD
Frequency : 1900.00 MHz
Epsilon : 40.12 F/m
Sigma : 1.46 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 : 0.166 W/kg
10 gram SAR value : 0.088 W/kg
Area Scan Peak SAR : 0.165 W/kg
Zoom Scan Peak SAR : 0.340 W/kg

Plot 16#

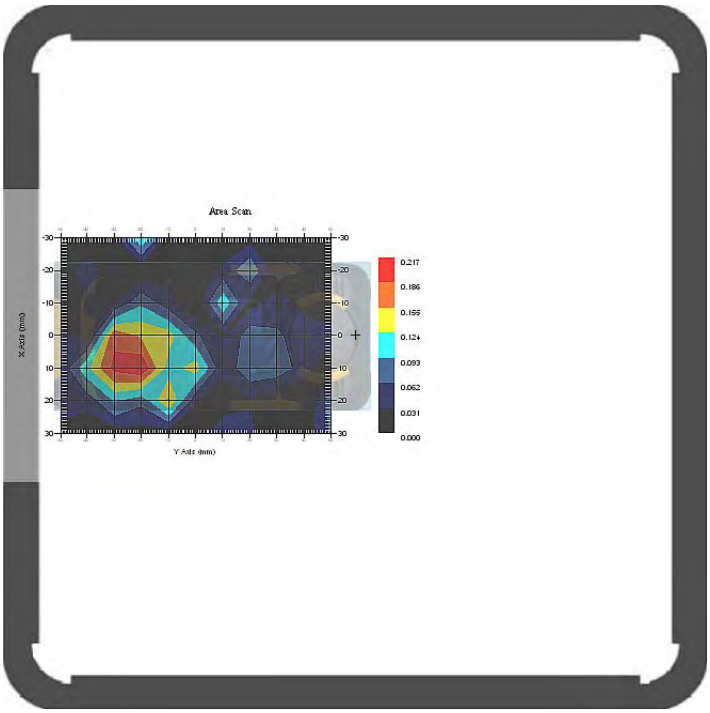


Test Laboratory: Bay Area Compliance Lab Corp. (Shenzhen)

Body- worn Back (1900 MHz Middle Channel)

Measurement Data	
Test mode	: GSM
Crest Factor	: 8
Scan Type	: Complete
Area Scan	: 7x11x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan	: 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start	: 0.085 W/kg
Power Drift-Finish	: 0.087 W/kg
Power Drift (%)	: 2.074
Tissue Data	
Type	: BODY
Frequency	: 1900.00 MHz
Epsilon	: 54.18 F/m
Sigma	: 1.51 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	: 0.168 W/kg
10 gram SAR value	: 0.080 W/kg
Area Scan Peak SAR	: 0.186 W/kg
Zoom Scan Peak SAR	: 0.370 W/kg

Plot 17#



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

Body- worn Back (1900 MHz Low Channel)

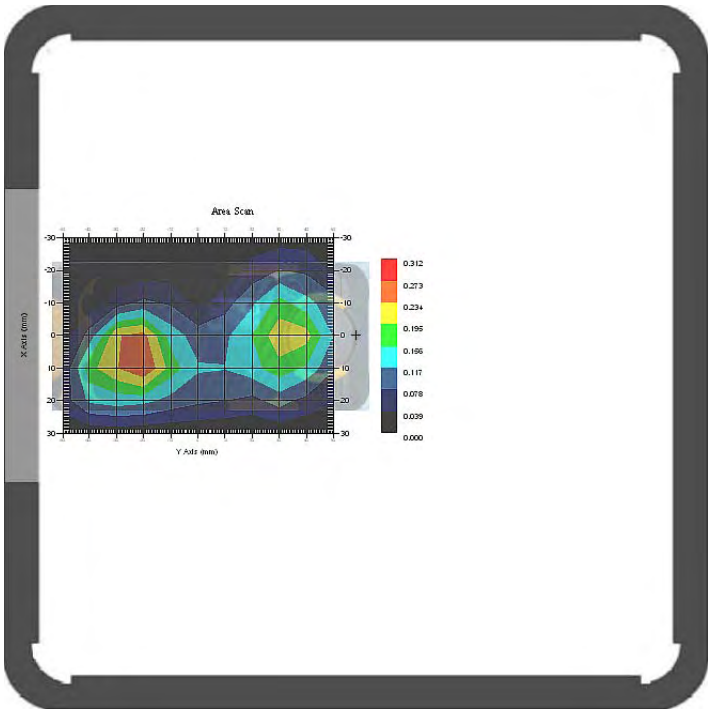
Measurement Data
Test mode : GPRS
Crest Factor : 4
Scan Type : Complete
Area Scan : 7x11x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.221 W/kg
Power Drift-Finish : 0.214 W/kg
Power Drift (%) : -2.951

Tissue Data
Type : BODY
Frequency : 1900.00 MHz
Epsilon : 54.18 F/m
Sigma : 1.51 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 4
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 : 0.314 W/kg
10 gram SAR value : 0.161 W/kg
Area Scan Peak SAR : 0.312 W/kg
Zoom Scan Peak SAR : 0.570 W/kg

Plot 18#



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

Body- worn Back (1900 MHz Middle Channel)

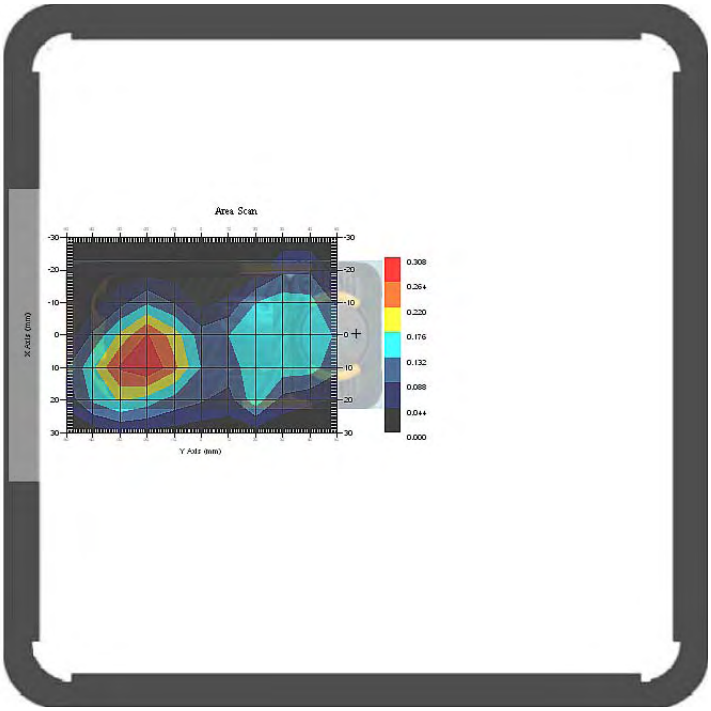
Measurement Data
Test mode : GPRS
Crest Factor : 4
Scan Type : Complete
Area Scan : 7x11x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.192 W/kg
Power Drift-Finish : 0.187 W/kg
Power Drift (%) : -3.093

Tissue Data
Type : BODY
Frequency : 1900.00 MHz
Epsilon : 54.18 F/m
Sigma : 1.51 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 4
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 : 0.302 W/kg
10 gram SAR value : 0.153 W/kg
Area Scan Peak SAR : 0.308 W/kg
Zoom Scan Peak SAR : 0.550 W/kg

Plot 19#



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

Body- worn Back (1900 MHz High Channel)

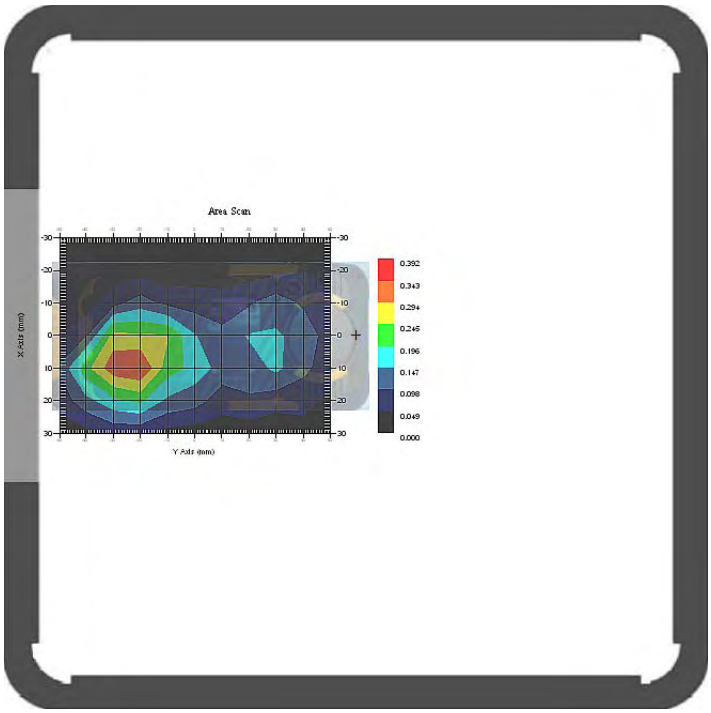
Measurement Data
Test mode : GPRS
Crest Factor : 4
Scan Type : Complete
Area Scan : 7x11x1: Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
Power Drift-Start : 0.167 W/kg
Power Drift-Finish : 0.170 W/kg
Power Drift (%) : 1.915

Tissue Data
Type : BODY
Frequency : 1900.00 MHz
Epsilon : 54.18 F/m
Sigma : 1.51 S/m
Density : 1000.00 kg/cu. m

Probe Data
Serial No. : 273
Frequency : 1900.00 MHz
Duty Cycle Factor : 4
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 : 0.328 W/kg
10 gram SAR value : 0.169 W/kg
Area Scan Peak SAR : 0.344 W/kg
Zoom Scan Peak SAR : 0.610 W/kg

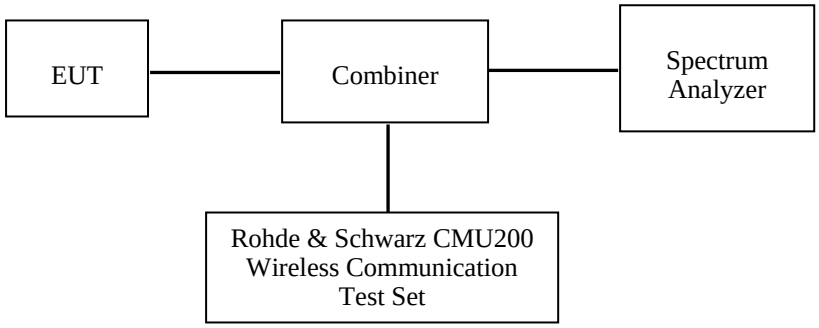
Plot 20#



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.



Test Equipment List and Details

Manufacturer	Equipment Description	Model NO.	Serial No.	Calibration Date
Rohde & Schwarz	Communication Tester	CMU200	1100.0008.02	2010-06-28
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-05

Test Results

Band	Frequency (MHz)	Conducted Output Power（GSM Mode）	
		(dBm)	(Watt)
Cellular	824.2	32.22	1.667
	836.6	32.15	1.641
	848.8	32.09	1.618
PCS	1850.2	30.65	1.161
	1880.0	30.58	1.143
	1909.8	30.78	1.197

GPRS Mode

Band	Channel No	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GSM850	128	824.2	32.05	31.21	Not support	Not support
	190	836.6	31.95	31.09	Not support	Not support
	251	848.8	31.95	30.98	Not support	Not support
PCS1900	512	1850.2	30.49	29.28	Not support	Not support
	661	1880.0	30.40	29.27	Not support	Not support
	810	1909.8	30.67	29.66	Not support	Not support

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

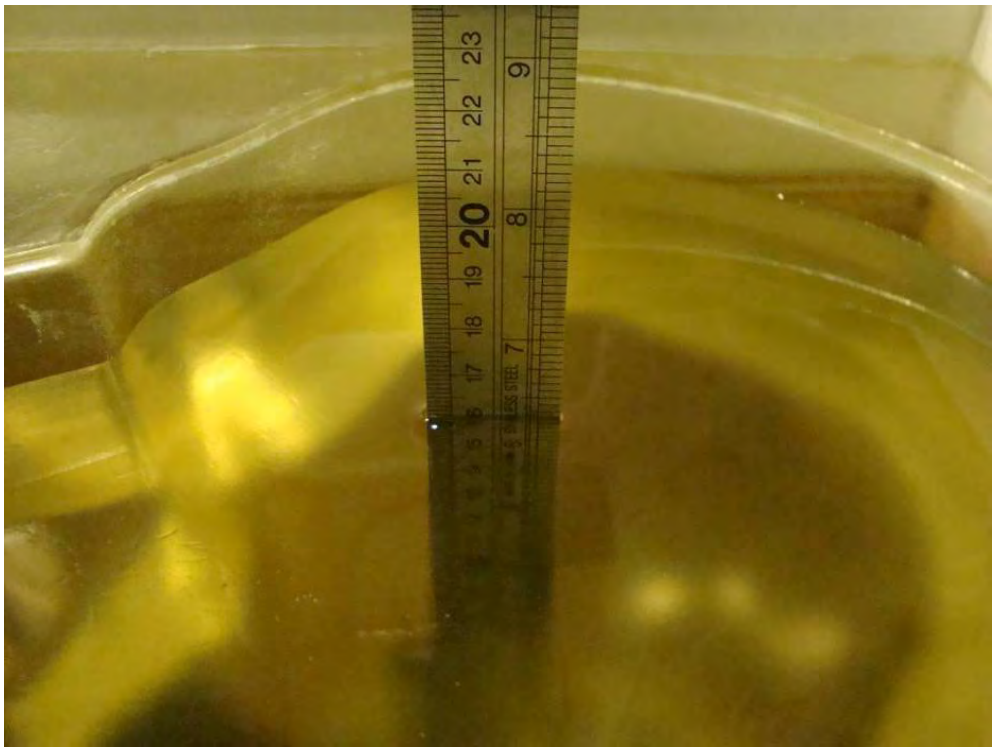
Number of Time slot	1	2	3	4
Duty Cycle	1:8	1:4	1:2.66	1:2
Time based Ave. power compared to slotted Ave. power	-9 dB	-6 dB	-4.25 dB	-3 dB
Crest Factor	8	4	2.66	2

The time based average power

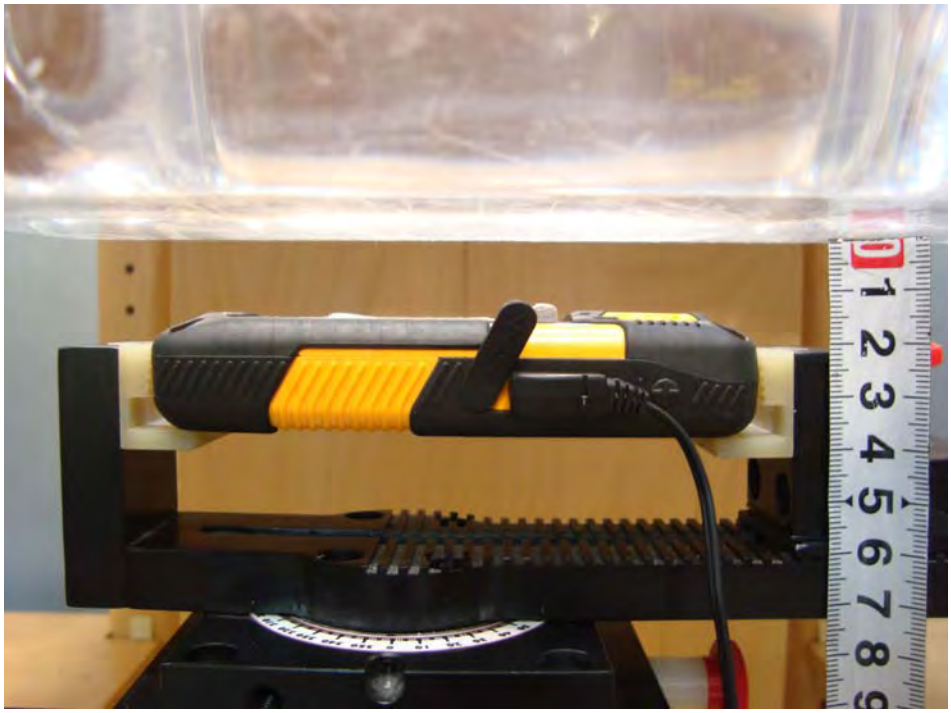
Band	Channel No	Frequency (MHz)	Time based average Power (dBm)	
			1 slot	2 slots
GSM850	128	824.2	23.05	25.21
	190	836.6	22.95	25.09
	251	848.8	22.95	24.98
PCS1900	512	1850.2	21.49	23.28
	661	1880.0	21.40	23.27
	810	1909.8	21.67	23.66

APPENDIX G – EUT TEST POSITION PHOTOS

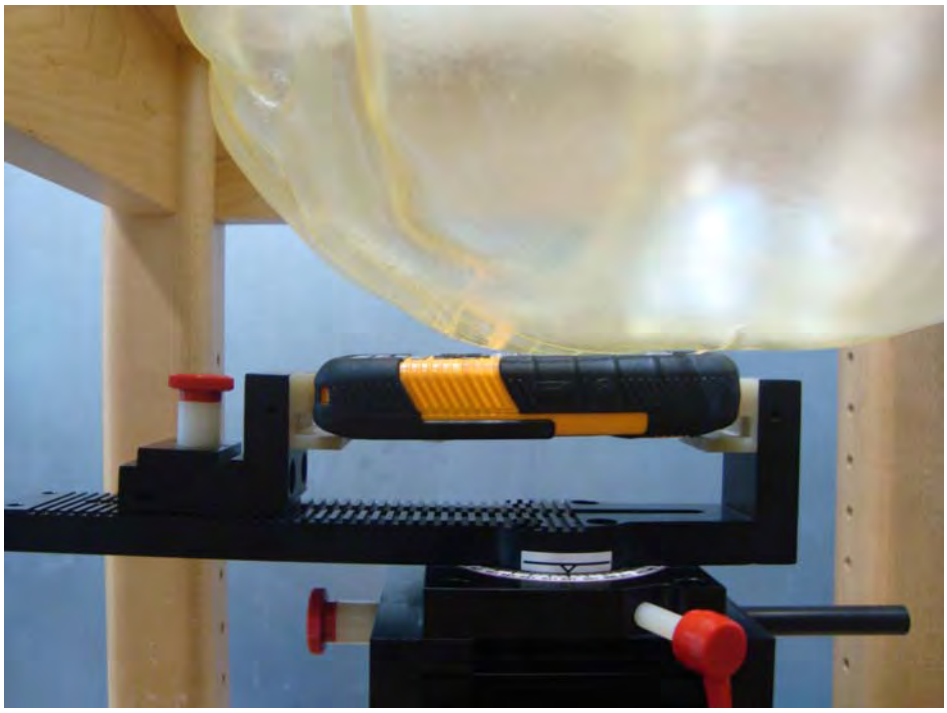
Liquid Depth ≥ 15 cm



Body-worn Back Setup Photo

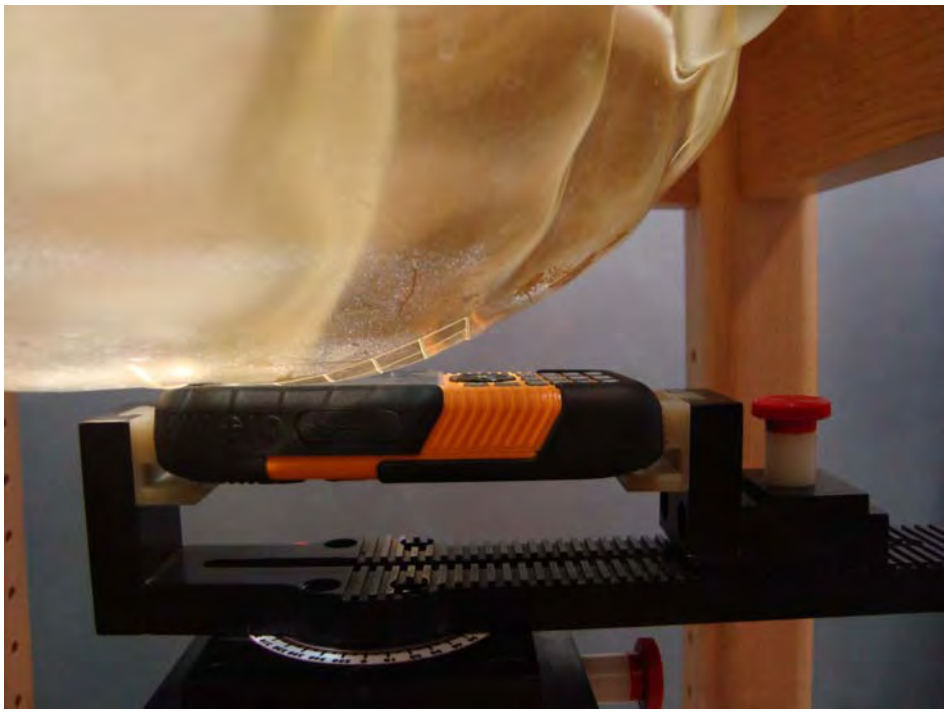


Left Head Touch Setup Photo



Left Head Tilt Setup Photo

Right Head Touch Setup Photo



Right Head Tilt Setup Photo

APPENDIX H – EUT PHOTOS

EUT – Front Side View

EUT – Back Side View

EUT- Battery Uncover View

EUT – Top Side View

EUT – Left Side View

EUT- Right Side View

EUT – Bottom Side View

EUT- Headset View

APPENDIX I - INFORMATIVE REFERENCES

[1] Federal Communications Commission, \Report and order: Guidelines for evaluating the environmental effects of radiofrequency radiation", Tech. Rep. FCC 96-326, FCC, Washington, D.C. 20554, 1996.

[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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