

RF Exposure Lab

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CERTIFICATE OF COMPLIANCE SAR EVALUATION

Novatel Wireless
9645 Scranton Road, Suite 205
San Diego, CA 92121

Dates of Test: Aug. 30, Sept. 2, 3, 7, Nov. 12, 20, 2010
Test Report Number:

SAR.20100806

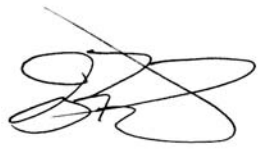
Revision K

| | |
|------------------------|---|
| FCC ID: | PKRNVWMIFI4082 |
| IC Certificate: | 3229B-MIFI4082 |
| Model(s): | MiFi4082 |
| Test Sample: | Engineering Unit Same as Production |
| Serial No.: | Eng 9 |
| Equipment Type: | Wireless Personal Router |
| Classification: | PCS Licensed Transmitter (PCB) |
| TX Frequency Range: | 824.7–848.3 MHz, 1851.25–1908.75 MHz, 2501–2685 MHz, 2412–2462 MHz |
| Frequency Tolerance: | ± 2.5 ppm |
| Maximum RF Output: | 835 MHz – 24.55 dB, 1900 MHz – 24.11 dB , 2600 MHz – 24.76 dB, 2450 MHz – 17.85 dB Conducted |
| Signal Modulation: | CDMA, QPSK, 16QAM, DSSS, OFDM |
| Antenna Type (Length): | Internal |
| Application Type: | Certification |
| FCC Rule Parts: | Part 15, 22, 24, 27 |
| KDB Issued for Test: | KDB 869935 |
| Industry Canada: | RSS-102 |

This wireless mobile and/or portable device has been shown to be compliant for localized specific absorption rate (SAR) for uncontrolled environment/general exposure limits specified in ANSI/IEEE Std. C95.1-1992 and had been tested in accordance with the measurement procedures specified in IEEE 1528-2003, OET Bulletin 65 Supp. C, RSS-102 and Safety Code 6 (See test report).

I attest to the accuracy of the data. All measurements were performed by myself or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RF Exposure Lab, LLC certifies that no party to this application has been denied FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).



Jay M. Moulton
Vice President



Certificate # 2387.01

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1. Introduction

This measurement report shows compliance of the Novatel Wireless Model MiFi4082 FCC ID: PKRNVWMIFI4082 with FCC Part 2, 1093, ET Docket 93-62 Rules for mobile and portable devices and IC Certificate: 3229B-MIFI4082 with RSS102 & Safety Code 6. The FCC have adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on August 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC regulated portable devices. [1], [6]

The test procedures, as described in ANSI C95.1 – 1999 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [2], ANSI C95.3 – 2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields [3], FCC OET Bulletin 65 Supp. C – 2001 [4], IEEE Std.1528 – 2003 Recommended Practice [5], and Industry Canada Safety Code 6 Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3kHz to 300 GHz were employed.

SAR Definition [5]

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ).

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

SAR is expressed in units of watts per kilogram (W/kg). SAR can be related to the electric field at a point by

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

where:

σ = conductivity of the tissue (S/m)

ρ = mass density of the tissue (kg/m³)

E = rms electric field strength (V/m)

2. SAR Measurement Setup

Robotic System

The measurements are conducted utilizing the ALSAS-10-U automated dosimetric assessment system. The ALSAS-10-U is designed and manufactured by Aprel Laboratories in Nepean, Ontario, Canada. The system utilizes a Robcomm 3 robot manufactured by ThermoCRS located in Michigan USA.

System Hardware

The system consists of a six axis articulated arm, controller for precise probe positioning (0.05 mm repeatability), a power supply, a teach pendant for teaching area scans, near field probe, an IBM Pentium 4™ 2.66 GHz PC with Windows XP Pro™, and custom software developed to enable communications between the robot controller software and the host operating system.

An amplifier is located on the articulated arm, which is isolated from the custom designed end effector and robot arm. The end effector provides the mechanical touch detection functionality and probe connection interface. The amplifier is functionally validated within the manufacturer's site and calibrated at NCL Calibration Laboratories. A Data Acquisition Card (DAC) is used to collect the signal as detected by the isotropic e-field probe. The DAC manufacturer calibrates the DAC to NIST standards. A formal verification is executed using all mechanical and electronic components to prove conformity of the measurement platform as a whole.

System Description

The ALSAS-10-U has been designed to measure devices within the compliance environment to meet all recognized standards. The system also conforms to standards, which are currently being developed by the scientific and manufacturing community.

The course scan resolution is defined by the operator and reflects the requirements of the standard to which the device is being tested. Precise measurements are made within the predefined course scan area and the values are logged.

The user predefines the sample rate for which the measurements are made so as to ensure that the full duty-cycle of a pulse modulation device is covered during the sample. The following algorithm is an example of the function used by the system for linearization of the output for the probe.

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



The April E-Field probe is evaluated to establish the diode compression point.

A complex algorithm is then used to calculate the values within the measured points down to a resolution of 1mm. The data from this process is then used to provide the co-ordinates from which the cube scan is created for the determination of the 1 g and 10 g averages.

Cube scan averaging consists of a number of complex algorithms, which are used to calculate the one, and ten gram averages. The basis for the cube scan process is centered on the location where the maximum measured SAR value was found. When a secondary peak value is found which is within 60% of the initial peak value, the system will report this back to the operator who can then assess the need for further analysis of both the peak values prior to the one and ten-gram cube scan averaging process. The algorithm consists of 3D cubic Spline, and Lagrange extrapolation to the surface, which form the matrix for calculating the measurement output for the one and ten gram average values. The resolution for the physical scan integral is user defined with a final calculated resolution down to 1mm.

In-depth analysis for the differential of the physical scanning resolution for the cube scan analysis has been carried out, to identify the optimum setting for the probe positioning steps, and this has been determined at 8mm increments on the X, & Y planes. The reduction of the physical step increment increased the time taken for analysis but did not provide a better uncertainty or return on measured values.

The final output from the system provides data for the area scan measurements, physical and splined (1mm resolution) cube scan with physical and calculated values (1mm resolution).

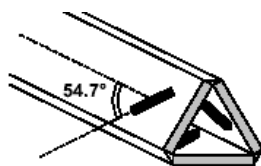
The overall uncertainty for the methodology and algorithms the ALSAS-10-U used during the SAR calculation was evaluated using the data from IEEE 1528 f3 algorithm:

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

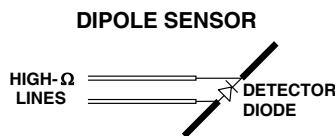
The probe used during the measurement process has been assessed to provide values for diode compression. These values are calculated during the probe calibration exercise and are used in the mathematical calculations for the assessment of SAR.

E-Field Probe

The E-field probe used by RF Exposure Lab, LLC, has been fully calibrated and assessed for isotropic, and boundary effect. The probe utilizes a triangular sensor arrangement as detailed in the diagram below right.



Δ-BEAM



The SAR is assessed with the probe which moves at a default height of 4mm from the center of the diode, which is mounted to the sensor, to the phantom surface (Z height). The diagram above right shows how the center of the sensor is defined with the location of the diode placed at the center of the dipole. The 4mm default in the Z axis is the optimum height for assessing SAR where the boundary effect is at its least, with the probe located closest to the phantom surface (boundary).

The manufacturer specified precision of the robot is ± 0.05 mm and the precision of the APREL bottom detection device is ± 0.1 mm. These precisions are calibrated and tested in the manufacturing process of the bottom detection device. A constant distance is maintained because the surface of the phantom is dynamically detected for each point. The surface detection algorithm corrects the position of the robot so that the probe rests on the surface of the phantom. The probe is then moved to the measurement location 2.44 mm above the phantom surface resulting in the probe center location to be at 4.0 mm above the phantom surface. Therefore, the probe sensor will be at 4.0 mm above the phantom surface ± 0.1 mm for each SAR location for frequencies below 3 GHz. The probe is moved to the measurement location 1.44 mm above the phantom surface resulting in the probe center location to be at 2.0 mm above the phantom surface. Therefore, the probe sensor will be at 2.0 mm above the phantom surface ± 0.1 mm for each SAR location for frequencies above 3 GHz.

The probe boundary effect compensation cannot be disabled in the ALSAS-10U testing system. The probe tip will always be at least half a probe tip diameter from the phantom surface. For frequencies up to 3 GHz, the probe diameter is 5 mm. With the sensor offset set at 1.54 mm (default setting), the sensor to phantom gap will be 4.0 mm which is greater than half the probe tip diameter. For frequencies greater than 3 GHz, the probe diameter is 3 mm. With the sensor offset set at 0.56 mm (default setting), the sensor to phantom gap will be 3.0 mm which is greater than half the probe tip diameter.

The separation of the first 2 measurement points in the zoom scan is specified in the test setup software. For frequencies below 3 GHz, the user must specify a zoom scan resolution of less than 6 mm in the z-axis to have the first two measurements within 1 cm of the surface. The z-axis is set to 4 mm as shown on each of the data sheets in Appendix B. For frequencies above 3 GHz, the user must specify a zoom scan resolution of less than 3 mm in the z-axis to have the first two measurements within 5 mm of the surface. The z-axis is set to 2 mm as shown on each of the data sheets in Appendix B.

The zoom scan volume for devices ≤ 3 GHz with a cube scan of 5x5x8 yields a volume of 32x32x28 mm³. For devices >3 GHz and <4.5 GHz, the cube scan of 9x9x9 yields a volume of 32x32x24 mm³. For devices ≥ 4.5 GHz, the cube scan of 7x7x12 yields a volume of 24x24x22 mm³.

3. Robot Specifications

Specifications

Positioner: ThermoCRS, Robot Model: Robocomm 3
Repeatability: 0.05 mm
No. of axis: 6

Data Acquisition Card (DAC) System

Cell Controller

Processor: Pentium 4™
Clock Speed: 2.66 GHz
Operating System: Windows XP Pro™

Data Converter

Features: Signal Amplifier, End Effector, DAC
Software: ALSAS 10-U Software

E-Field Probe

Model: Various See Probe Calibration Sheet
Serial Number: Various See Probe Calibration Sheet
Construction: Triangular Core Touch Detection System
Frequency: 10MHz to 6GHz

Phantom

Phantom: Uniphantom, Right Phantom, Left Phantom



4. Probe and Dipole Calibration

See Appendix D and E.

5. Phantom & Simulating Tissue Specifications

SAM Phantom



The Aprel system utilizes three separate phantoms. Each phantom for SAR assessment testing is a low loss dielectric shell, with shape and dimensions derived from the anthropomorphic data of the 90th percentile adult male head dimensions as tabulated by the US Army. The SAM phantom shell is bisected along the mid sagittal plane into right and left halves. The perimeter sidewalls of each phantom half is extended to allow filling with liquid to a depth of 15 cm that is sufficient to minimize reflections from the upper surface [5]. The Uni-Phantom is used to conduct body measurements and held to face measurements. The depth of the phantom allows for 15 cm of tissue material to be filled within the phantom. See photos in Appendix C.

Head & Body Simulating Mixture Characterization

The head and body mixtures consist of the material based on the table listed below. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. Body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations.

Table 5.1 Typical Composition of Ingredients for Tissue

| Ingredients | | Simulating Tissue | | | |
|---------------------|--------|-------------------|---------------|---------------|---------------|
| | | 835 MHz Body | 1900 MHz Body | 2450 MHz Body | 2600 MHz Body |
| Mixing Percentage | | | | | |
| Water | | 52.40 | 69.91 | 73.20 | 69.83 |
| Sugar | | 45.00 | 0.00 | 0.00 | 0.00 |
| Salt | | 1.40 | 0.13 | 0.04 | 0.00 |
| HEC | | 1.00 | 0.00 | 0.00 | 0.00 |
| Bactericide | | 0.10 | 0.00 | 0.00 | 0.00 |
| DGBE | | 0.00 | 29.96 | 26.70 | 30.17 |
| Dielectric Constant | Target | 55.20 | 53.30 | 52.70 | 52.51 |
| Conductivity (S/m) | Target | 0.97 | 1.52 | 1.95 | 2.16 |

Device Holder



In combination with the SAM phantom, the mounting device enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation point is the ear opening. The devices can easily, accurately, and repeatably be positioned according to the FCC specifications. The device holder can be locked at different phantom locations (left head, right head, and uni-phantom).

Body Worn Configurations

Body-worn operating configurations are tested a normal use configuration. Body dielectric parameters are used.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worst-case positioning is then documented and used to perform Body SAR testing. All test position spacings are documented.

In order for users to be aware of the body-worn operating requirements for meeting RF exposure compliance, operating instructions and cautions statements are included in the user's manual.

6. ANSI/IEEE C95.1 – 1992 RF Exposure Limits [2]

Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 8.1 Human Exposure Limits

| | UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g) | CONTROLLED ENVIROMENT Professional Population (W/kg) or (mW/g) |
|--|--|--|
| SPATIAL PEAK SAR ¹ Head | 1.60 | 8.00 |
| SPATIAL AVERAGE SAR ² Whole Body | 0.08 | 0.40 |
| SPATIAL PEAK SAR ³ Hands, Feet, Ankles, Wrists | 4.00 | 20.00 |

¹ The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

² The Spatial Average value of the SAR averaged over the whole body.

³ The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

7. Measurement Uncertainty

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) % | v_i |
|---|-----------------|--------------------------|------------|------------------|-------------------|---------------------------------|----------------------------------|----------|
| Measurement System | | | | | | | | |
| Probe Calibration | 3.5 | normal | 1 | 1 | 1 | 3.5 | 3.5 | ∞ |
| Axial Isotropy | 3.7 | rectangular | $\sqrt{3}$ | 0.7 | 0.7 | 1.5 | 1.5 | ∞ |
| Hemispherical Isotropy | 10.9 | rectangular | $\sqrt{3}$ | 0.7 | 0.7 | 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. Restriction | 0.4 | rectangular | $\sqrt{3}$ | 1 | 1 | 0.2 | 0.2 | ∞ |
| 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 | 7 |
| Device Holder Uncertainty | 2.0 | normal | 1 | 1 | 1 | 2.0 | 2.0 | 2 |
| Drift of Output Power | 4.2 | rectangular | $\sqrt{3}$ | 1 | 1 | 2.4 | 2.4 | ∞ |
| 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.) | 0.5 | normal | 1 | 0.7 | 0.5 | 0.4 | 0.3 | 5 |
| Liquid Permittivity (target) | 5.0 | rectangular | $\sqrt{3}$ | 0.6 | 0.5 | 1.7 | 1.4 | ∞ |
| Liquid Permittivity (meas.) | 1.0 | normal | 1 | 0.6 | 0.5 | 0.6 | 0.5 | 5 |
| Combined Uncertainty | | RSS | | | | 9.6 | 9.4 | >500 |
| Combined Uncertainty (coverage factor=2) | | Normal (k=2) | | | | 19.1 | 18.8 | >500 |

8. System Verification

Tissue Verification

Table 8.1 Measured Tissue Parameters

| | | 835 MHz Body | | 1900 MHz Body | | 2450 MHz Body | |
|---------------------------------|------|---------------|----------|---------------|----------|---------------|----------|
| Date(s) | | Aug. 30, 2010 | | Aug. 30, 2010 | | Sep. 3, 2010 | |
| Liquid Temperature (°C) | 20.0 | Target | Measured | Target | Measured | Target | Measured |
| Dielectric Constant: ϵ | | 55.20 | 55.01 | 53.30 | 53.12 | 52.70 | 52.41 |
| Conductivity: σ | | 0.97 | 0.99 | 1.52 | 1.54 | 1.95 | 1.96 |
| | | 2590 MHz Body | | 2590 MHz Body | | 2590 MHz Body | |
| Date(s) | | Sep. 2, 2010 | | Sep. 7, 2010 | | Nov. 12, 2010 | |
| Liquid Temperature (°C) | 20.0 | Target | Measured | Target | Measured | Target | Measured |
| Dielectric Constant: ϵ | | 52.52 | 52.39 | 52.52 | 52.47 | 52.52 | 52.28 |
| Conductivity: σ | | 2.15 | 2.19 | 2.15 | 2.20 | 2.15 | 2.17 |
| | | 2590 MHz Body | | | | | |
| Date(s) | | Nov. 20, 2010 | | | | | |
| Liquid Temperature (°C) | 20.0 | Target | Measured | | | | |
| Dielectric Constant: ϵ | | 52.52 | 52.07 | | | | |
| Conductivity: σ | | 2.15 | 2.18 | | | | |

See Appendix A for data printout.

Test System Verification

Prior to assessment, the system is verified to the $\pm 10\%$ of the specifications at the test frequency by using the system kit. Power is normalized to 1 watt. (Graphic Plots Attached)

Table 8.2 System Dipole Verification Target & Measured

| | Test Frequency | Target 1W SAR _{1g} (W/kg) per Certificate | Tissue Used for Calibration | Tissue Used for Verification | Measure SAR _{1g} (W/kg) | Deviation (%) |
|-------------|----------------|--|-----------------------------|------------------------------|----------------------------------|---------------|
| 30-Aug-2010 | 835 MHz | 9.49 | Head | Body | 9.51 | + 0.21 |
| 30-Aug-2010 | 1900 MHz | 38.70 | Head | Body | 38.91 | + 0.54 |
| 03-Sep-2010 | 2450 MHz | 53.10 | Head | Body | 52.68 | - 0.79 |
| 02-Sep-2010 | 2590 MHz | 56.42 | Body | Body | 53.24 | - 5.64 |
| 07-Sep-2010 | 2590 MHz | 56.42 | Body | Body | 53.79 | - 4.66 |
| 12-Nov-2010 | 2590 MHz | 56.42 | Body | Body | 54.01 | - 4.27 |
| 20-Nov-2010 | 2590 MHz | 56.42 | Body | Body | 54.40 | - 3.58 |

See Appendix A for data plots.

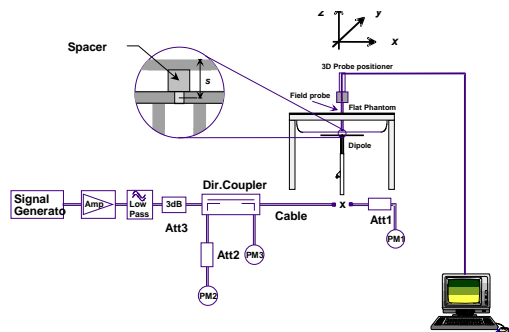


Figure 8.1 Dipole Verification Test Setup

Note: The earlier system verifications (prior to Nov. 10) were conducted using head tissue for the dipole calibration due to a misunderstanding. All subsequent measurements were conducted with the dipole calibrated with body tissue with the exception of 2600 MHz. All system verifications were conducted with the dipole calibrated with body tissue. Prior to November 10, the verification measurements were conducted using body tissue, but the dipole calibration and target value was determined by the manufacturer of the dipole using head tissue. After November 10, all verification measurements were conducted using body tissue and a calibration on the dipole with body tissue.

9. SAR Test Data Summary

See Measurement Result Data Pages

See Appendix B for SAR Test Data Plots.
See Appendix C for SAR Test Setup Photos.

Procedures Used To Establish Test Signal

The device was either placed into simulated transmit mode using the manufacturer's test codes or the actual transmission is activated through a base station simulator or similar equipment. See data pages for actual procedure used in measurement.

Device Test Condition

In order to verify that the device was tested at full power, conducted output power measurements were performed before and after each SAR measurement to confirm the output power unless otherwise noted. If a conducted power deviation of more than 5% occurred, the test was repeated. The power drift of each test is measured at the start of the test and again at the end of the test. The drift percentage is calculated by the formula $((\text{end}/\text{start})-1)*100$ and rounded to three decimal places. The drift percentage is calculated into the resultant SAR value on the data sheet for each test.

The testing was conducted on top, bottom and edges closest to each antenna. The top, bottom, end, left and right testing was conducted for the WWAN antenna. The sixth side of the unit was not tested as the WWAN antenna was more than 2.5 cm from the side. The right, top and bottom was tested for the WLAN antenna. The remain three sided were not tested as the antenna was more than 2.5 cm from the three sides. The WiMax testing was conducted on the left, top and bottom for each antenna. The remaining three sides were not tested as the antenna is located more than 2.5 cm from the side. All testing was conducted per TCB Workshop October 2010 presentation. See the photo in Appendix C for a pictorial of the setups, labeling of the sides tested and antenna locations.

The 1xRTT testing was conducted in RC3 with the device configured using TDSO/SO32 with FCH transmitting at full rate. The power control was set to "All Bits Up." 1xRTT did not require SAR testing due to the measured power being less than 1/4 dB of Rev. 0.

The Rev. 0 testing was conducted with the Reverse Data Channel rate of 153.6 kbps. The Forward Traffic Channel data rate is set to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots. The power control was set to "All Bits Up." Other rates were not tested due to the conducted power measured was less than 1/4 dB higher than 153.6 kbps.

The Rev. A Subtype 2 testing was conducted with the Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots. The Forward Traffic Channel data rate is set to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots. The power control was set to "All Bits Up." Rev. A did not require SAR testing due to the measured power being less than 1/4 dB of Rev. 0.

10. FCC 3G Measurement Procedures – Oct. 2007 (revised)

Power measurements were performed using a base station simulator under average power.

10.1 Procedures Used to Establish RF Signal for SAR

The device was placed into a simulated call using a base station simulator in a screen room. Such test signals offer a consistent means for testing SAR and recommended for evaluating SAR. The SAR measurement software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more than 5% occurred, the tests were repeated.

10.2 SAR Measurement Conditions for CDMA2000, 1xEV-DO

10.2.1 Output Power Verification 1xRTT

Use CDMA2000 Rev 6 protocol in the call box.

- 1) Test for Reverse/Forward TCH RC1, Reverse/Forward TCH RC2, and RC3 Reverse FCH and demodulation of RC 3, 4 and 5.
 - a. Set up a call using Fundamental Channel Test Mode 1 (RC1, SO 2) with 9600 bps data rate only.
 - b. As per C.S0011 or TIA/EIA-98-F Table 4.4.5.2-1, set the test parameters.
 - c. Send continuously '0' power control bits to the device.
 - d. Measure the output power at device antenna connector as recorded on the power meter with values corrected for cables losses.
 - e. Repeat step b through d for Fundamental Channel Test Mode:
 - i. RC1, SO2
 - ii. RC2, SO9
 - iii. RC1, SO55
 - iv. RC3, SO55
- 2) Test for RC 3 Reverse FCH, RC3 Reverse SCH0 and demodulation of RC 3, 4 and 5.
 - a. Set up a call using Supplemental Channel Test Mode 3 (RC 3, SO 32) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
 - b. As per C.S0011 or TIA/EIA-98-F Table 4.4.5.2-2, set the test parameters.
 - c. Send alternating '0' and '1' power control bit to the device.
 - d. Determine the active channel configuration. If the desired channel configuration is not the active channel configuration, increase $\hat{\rho}$ by 1 dB and repeat the verification. Repeat this step until the desired channel configuration becomes active.
 - e. Measure the output power at the device antenna connector.
 - f. Decrease $\hat{\rho}$ by 0.5 dB.
 - g. Determine the active channel configuration. If the active channel configuration is the desired channel configuration, measure the output power at the device antenna connector.
 - h. Repeat step f and g until the output power no longer increases or the desired channel configuration is no longer active. Record the highest output power achieved with the desired channel configuration active.
 - i. Repeat step a through h ten times and average the result.

10.3.1 Output Power Verification 1xRTT

- 1) Use 1xEV-DO Rel 0 protocol in the call box 8960.
 - a. FTAP
 - Select Test Application Protocol to FTAP
 - Set FTAP Rate to 307.2 kbps (2 Slot, QPSK)
 - Generator Info -> Termination Parameters -> Max Forward Packet Duration -> 16 Slots
 - Set \hat{I} or to -60 dBm/1.23 MHz
 - Send continuously '0' power control bits
 - Measure the power at device antenna connector
 - b. RTAP
 - Select Test Application Protocol to RTAP
 - Set RTAP Rate to 9.6 kbps
 - Generator Info -> Termination Parameters -> Max Forward Packet Duration -> 16 Slots
 - Set \hat{I} or to -60 dBm/1.23 MHz
 - Send continuously '0' power control bits
 - Measure the power at device antenna connector
 - Repeat above steps for RTAP Rate = 19.2 kbps, 38.4 kbps, 76.8 kbps and 153.6 kbps respectively
- 2) Use 1xEV-DO Rev A protocol in the call box 8960
 - a. FETAP
 - Select Test Application Protocol to FETAP
 - Set FETAP Rate to 307.2 kbps (2 Slot, QPSK)
 - Generator Info -> Termination Parameters -> Max Forward Packet Duration -> 16 Slots
 - Set \hat{I} or to -60 dBm/1.23 MHz
 - Send continuously '0' power control bits
 - Measure the power at device antenna connector
 - b. RETAP
 - Select Test Application Protocol to RETAP
 - F-Traffic Format -> 4 (1024, 2, 128) Canonical (307.2k, QPSK) • Set R-Data Pkt Size to 128
 - Protocol Subtype Config -> Release A Physical Layer Subtype -> Subtype 2 -> PL Subtype 2 Access Channel MAC Subtype -> Default (Subtype 0)
 - Generator Info -> Termination Parameters -> Max Forward Packet Duration -> 16 Slots ->ACK R-Data After -> Subpacket 0 (All ACK)
 - Set \hat{I} or to -60 dBm/1.23 MHz
 - Send continuously '0' power control bits
 - Measure the power at device antenna connector
 - Repeat above steps for R-Data Pkt Size = 256, 512, 768, 1024, 1536, 2048, 3072, 4096, 6144, 8192, 12288 respectively.

1xRTT Power Measurements

| IS-2000 | Channel | SO2 [dBm] | SO9 [dBm] | SO55 [dBm] | SO55 [dBm] |
|----------|--------------|-----------|-----------|------------|------------|
| | F-RC | RC1 | RC2 | RC1 | RC3 |
| Band | Vocoder Rate | Full | Full | Full | Full |
| Cellular | 1013 | 24.39 | 24.42 | 24.68 | 24.61 |
| | 384 | 24.25 | 24.36 | 24.59 | 24.35 |
| | 777 | 24.41 | 24.51 | 24.48 | 24.49 |
| PCS | 25 | 23.92 | 24.06 | 24.25 | 24.03 |
| | 600 | 24.12 | 24.01 | 24.08 | 23.92 |
| | 1175 | 23.86 | 24.02 | 23.91 | 23.97 |

EvDo Rev 0 Power Measurements

| 1x EvDo Rev. 0 [dBm] - FTAP rate = 2 Slot Version 307.2 kbps | | | | | | |
|--|-----------|----------|-----------|-----------|-----------|------------|
| | RTAP Rate | 9.6 kbps | 19.2 kbps | 38.4 kbps | 76.8 kbps | 153.6 kbps |
| Band | Channel | | | | | |
| Cellular | 1013 | 24.36 | 24.42 | 24.37 | 24.41 | 24.49 |
| | 384 | 24.42 | 24.48 | 24.51 | 24.47 | 24.55 |
| | 777 | 24.31 | 24.36 | 24.28 | 24.37 | 24.40 |
| PCS | 25 | 24.09 | 24.01 | 23.99 | 24.05 | 24.11 |
| | 600 | 23.90 | 23.85 | 23.89 | 23.87 | 23.93 |
| | 1175 | 24.02 | 24.03 | 24.06 | 23.98 | 24.07 |

EvDo Rev A Power Measurements

| 1x EvDo Rev. A Type 2 [dBm] - FETAP rate = 2 Slot Version 307.2 kbps | | | | | | | | | | | | | |
|--|---------------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| | RETAP Payload | 128 bits | 256 bits | 512 bits | 768 bits | 1024 bits | 1536 bits | 2048 bits | 3072 bits | 4096 bits | 6144 bits | 8192 bits | 12288 bits |
| Band | Channel | | | | | | | | | | | | |
| Cellular | 1013 | 23.98 | 24.01 | 24.08 | 24.12 | 24.07 | 24.03 | 23.99 | 24.11 | 24.16 | 24.05 | 24.07 | 23.97 |
| | 384 | 24.10 | 24.05 | 24.13 | 24.09 | 24.12 | 24.15 | 24.19 | 24.07 | 24.20 | 24.02 | 24.13 | 24.18 |
| | 777 | 24.10 | 24.24 | 24.21 | 24.30 | 24.25 | 24.16 | 24.19 | 24.13 | 24.32 | 24.22 | 24.26 | 24.27 |
| PCS | 25 | 23.82 | 23.79 | 23.75 | 23.81 | 23.71 | 23.76 | 23.71 | 23.79 | 23.85 | 23.82 | 23.84 | 23.80 |
| | 600 | 23.72 | 23.76 | 23.70 | 23.75 | 23.80 | 23.69 | 23.75 | 23.81 | 23.81 | 23.80 | 23.74 | 23.78 |
| | 1175 | 23.80 | 23.86 | 23.88 | 23.85 | 23.83 | 23.79 | 23.84 | 23.89 | 23.90 | 23.87 | 23.85 | 23.89 |

Power Control was set in "All Bits Up" for all measurements.

10.4.1 WiMax System Description

The device is a 2.5 GHz WiMax transceiver using Beceem chipset which supports 2xTx and 2xRx for this device. Both antennas are used for both transmitting and receiving. The two antennas are not capable of transmitting simultaneously with each other. Only one antenna can transmit at a time. Its uplink is capable of both 10 MHz and 5 MHz bandwidths. The uplink sub-frame is triggered by an Allocation Start Time contained in the information of UL-MAP. This information specifies the starting times of the Uplink and Downlink frames. In any UL sub-frame, the duty factor ranging and bandwidth information is used to ensure optimal system operation. In normal device transmission, the device will transmit control signaling at the first 3 uplink symbols and then use the rest of the uplink symbols for data traffic bursts in the uplink sub-frame. Since the first 3 symbols are also used for ranging detection purposes and are shared among other device users, its transmitting power is much smaller than the data burst symbol power. During the testing modes, the first 3 symbols have no power output and the data traffic bursts are always running at the maximum output power level. In the real usage, the data burst power will be adjusted according to the signal strength of the communication. In this way, by using the test mode arrangement, we are transmitting at a worst case RF level during the data portion Symbols 4 to 18.

The data burst zone can operate in one of two modes:

PUSC

For the 10 MHz bandwidth, it has 35 sub-channels structured from 1024 subcarriers; 184 are used as spare/safeguard subcarriers, leaving 840 available for transmission. From this, 560 subcarriers for data transmission with 280 subcarriers intended for pilot use. For the 5 MHz bandwidth, it contains 17 sub-channels using 512 subcarriers; 104 subcarriers are spare/safeguard subcarriers, 272 for data transmission, and 136 for pilot.

AMC

For the 10 MHz bandwidth, it has 48 sub-channels structured from 1024 subcarriers; 160 are used as spare/safeguard subcarriers, leaving 864 available for transmission. From this, 768 subcarriers for data transmission with 96 subcarriers intended for pilot use. For the 5 MHz bandwidth, it contains 24 sub-channels using 512 subcarriers; 80 subcarriers as spare/safeguard subcarriers, 384 for data transmission, and 48 for pilot.

The base station simulator (Agilent E6651A Mobile WiMax Test Set) produces a downlink DL burst every 5 milliseconds which simulates the transmission of a base-station operating under normal mode. This DL burst instructs the mobile station MS to transmit for 15 symbols in the UL data zone. This UL transmission is repeated every 5 milliseconds. The TX power of the mobile station is set to maximum power. The Mobile WiMax Test Set and MS use the same frequency. The Mobile WiMax Test Set power is much lower than the MS Tx power (~80 dB lower) and does not affect the SAR readings.

The MS synchronizes to the signal from the Mobile WiMax Test Set in frequency and time. It then demodulates two maps contained in the Mobile WiMax Test Set DL frame. The first map (DL map) specifies the number of DL symbols (29). The second map (UL map) specifies the number of UL symbols (18). The UL map also tells the MS to transmit a burst which occupies all data symbols and all sub-channels. No control channel transmissions are requested by the Mobile WiMax Test Set. Measurements are taken in this configuration with the MS transmitting

using the 29:18 ratio, but since there is no energy in the control symbols, the effective power is only across 15 symbols.

As mentioned above the DL:UL frame is specified in the DL and UL maps respectively. There is no ranging present when there is data traffic. The other types of control traffic are HARQ ACK/NACK, CQICH (CINR reporting) and bandwidth BW requests. BW requests are piggy-backed onto the data symbols when traffic is present. Since the BW requests are shared across the Control Symbols (traffic versus non-traffic modes), the control traffic that is relevant to the SAR calculation is CQICH and HARQ ACK/NACK. The maximum power for this control traffic is 42.75 mW (5/35 of 299.23 mW) for 10 MHz and 86.01 mW (5/17 of 292.42 mW) for 5 MHz.

In the test mode, the UL operates in PUSC or AMC with all data sub-channels (All 35 sub-channels for 10 MHz) occupied with data. During normal operation, the MS will transmit on all sub-channels when the maximum UL throughput is required. It is possible for the MS to transmit with fewer sub-channels. The sub-channels consist of tones that are distributed over the entire signal BW and a jump every three symbols so that the spectral density and hence SAR for the fractional sub-channel case will be similar to the full sub-channel case that is tested. (Note: In the WiMax standard, a sub-channel consists of tones that are spread across the occupied bandwidth. After every three symbols, the tones that make up the sub-channel switch to a new set of frequencies spread across the band. This “jumping” is called sub-channel rotation and helps to give the sub-channel frequency diversity.)

Equipment Used for network side:

Agilent E6651A Mobile WiMax Test Set

The testing was done using a common 29:18 ratio as this is the maximum achievable ratio for the product. The 29 indicates the number of downlink (from the base station) symbols, and the 18 indicates the number of uplink (transmitted from the MS) symbols. Inside the uplink, 15 symbols are used for data, and three of the symbols are used for sending control information to the network. During the testing, the control symbols contained no information, so did not contribute to the total energy transmitted. To compensate for the maximum energy which may be present in the 3 control symbols, the following scheme is used for the scaling factor:

Maximum output power of 5 MHz is 24.66 dBm = 292.42 mW

The maximum power in 5 MHz control traffic is 86.01 mW (5/17 of 292.42 mW)

Scaled factor for 5 MHz Bandwidth = see table below

Maximum output power of 10 MHz is 24.76 dBm = 299.23 mW

The maximum power in 10 MHz control traffic is 42.75 mW (5/35 of 299.23 mW)

Scaled factor for 10 MHz Bandwidth = see table below

Conversion Factor for 5 MHz Bandwidth = $1(15/48) = 3.2$

Conversion Factor for 10 MHz Bandwidth = $1/(14/48) = 3.4$

10.5.1 WiMax Conducted Power Measurements

PUSC

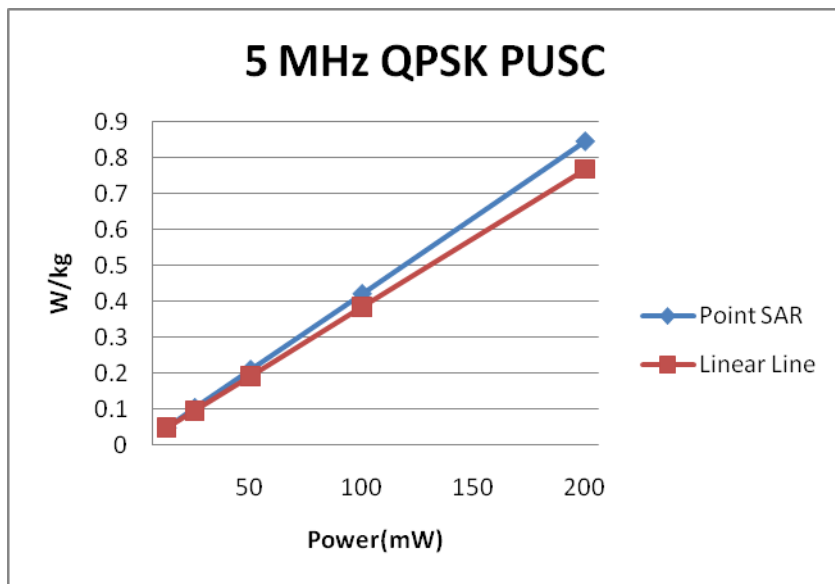
| Bandwidth | Frequency (MHz) | QPSK | | 16QAM | |
|-----------|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | Coding Rate 1/2 (dBm) | Coding Rate 3/4 (dBm) | Coding Rate 1/2 (dBm) | Coding Rate 3/4 (dBm) |
| 5 MHz | 2498.5 | 24.48 | 24.50 | 24.32 | 24.30 |
| | 2593.0 | 24.38 | 24.40 | 24.03 | 24.07 |
| | 2687.5 | 24.34 | 24.43 | 24.41 | 24.46 |
| 10 MHz | 2501.0 | 24.09 | 24.19 | 24.53 | 24.46 |
| | 2593.0 | 24.17 | 24.09 | 23.98 | 23.91 |
| | 2685.0 | 24.02 | 24.10 | 24.40 | 24.03 |

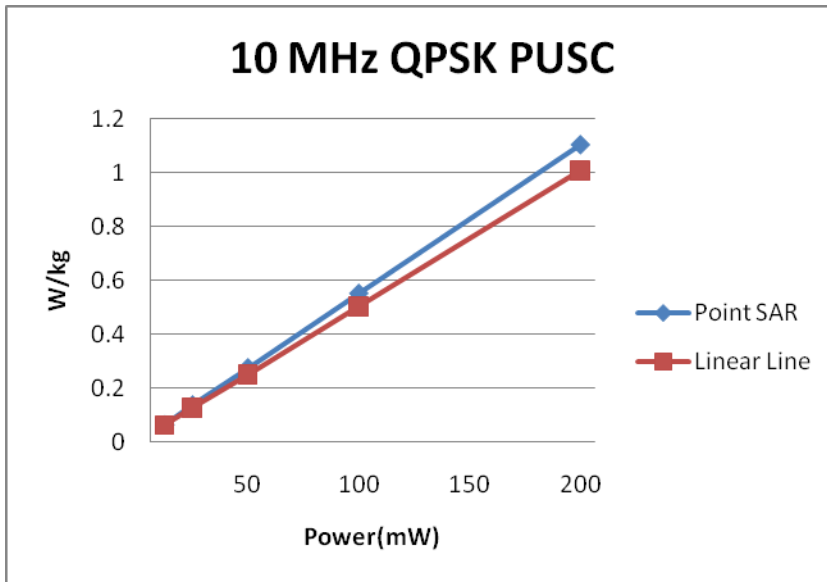
AMC

| Bandwidth | Frequency (MHz) | QPSK | | 16QAM | |
|-----------|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | Coding Rate 1/2 (dBm) | Coding Rate 3/4 (dBm) | Coding Rate 1/2 (dBm) | Coding Rate 3/4 (dBm) |
| 5 MHz | 2498.5 | 24.45 | 24.52 | 24.10 | 24.27 |
| | 2593.0 | 24.48 | 24.24 | 23.99 | 23.99 |
| | 2687.5 | 24.30 | 24.33 | 24.45 | 24.44 |
| 10 MHz | 2501.0 | 24.17 | 24.19 | 24.48 | 24.46 |
| | 2593.0 | 23.97 | 24.16 | 23.95 | 23.92 |
| | 2685.0 | 24.11 | 24.00 | 24.20 | 24.06 |

Linearity Response Check PUSC

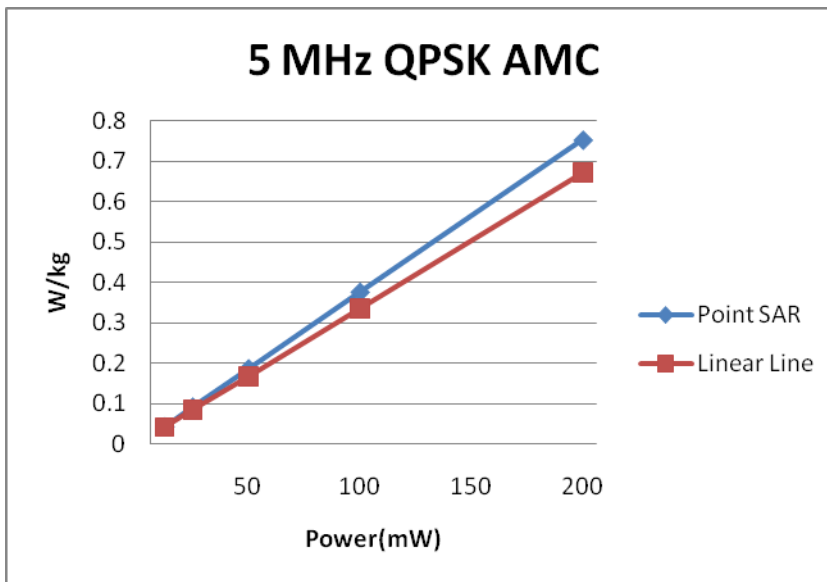
| Output Power | dBm | 11 | 14 | 17 | 20 | 23 |
|---------------------------------------|-----|-------|-------|-------|-------|--------|
| | mW | 12.5 | 25 | 50 | 100 | 200 |
| 5 MHz Single Point SAR (W/kg) | | 0.048 | 0.104 | 0.210 | 0.421 | 0.845 |
| 5 MHz Linear Line | | 0.048 | 0.096 | 0.192 | 0.384 | 0.768 |
| Percent Deviation | | 0.000 | 8.333 | 9.375 | 9.635 | 10.026 |
| 10 MHz Single Point SAR (W/kg) | | 0.063 | 0.137 | 0.275 | 0.552 | 1.105 |
| 10 MHz Linear Line | | 0.063 | 0.126 | 0.252 | 0.504 | 1.008 |
| Percent Deviation | | 0.000 | 8.730 | 9.127 | 9.524 | 9.623 |

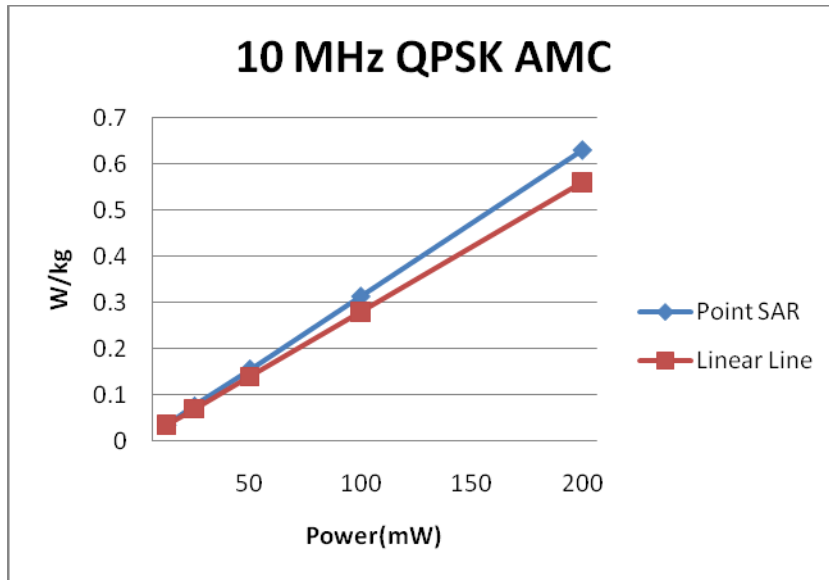




Linearity Response Check AMC

| Output Power | dBm | 11 | 14 | 17 | 20 | 23 |
|---------------------------------------|-----|-------|-------|--------|--------|--------|
| | mW | 12.5 | 25 | 50 | 100 | 200 |
| 5 MHz Single Point SAR (W/kg) | | 0.042 | 0.091 | 0.186 | 0.376 | 0.753 |
| 5 MHz Linear Line | | 0.042 | 0.084 | 0.168 | 0.336 | 0.672 |
| Percent Deviation | | 0.000 | 8.333 | 10.714 | 11.905 | 12.054 |
| 10 MHz Single Point SAR (W/kg) | | 0.035 | 0.076 | 0.156 | 0.314 | 0.631 |
| 10 MHz Linear Line | | 0.035 | 0.070 | 0.140 | 0.280 | 0.560 |
| Percent Deviation | | 0.000 | 8.571 | 11.429 | 12.143 | 12.679 |





Scaling Factor

| PUSC | | | | | | | | |
|----------------|-------|-------|--------|-------|-------|-------|------------------|-------|
| | High | | Middle | | Low | | Max. Rated Power | |
| | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| 5 MHz | 272 | 276 | 274 | 253 | 281 | 270 | 282 | 282 |
| Scaling Factor | 1.098 | 1.082 | 1.090 | 1.180 | 1.063 | 1.106 | | |
| 10 MHz | 252 | 275 | 261 | 250 | 256 | 284 | 282 | 282 |
| Scaling Factor | 1.151 | 1.055 | 1.111 | 1.160 | 1.133 | 1.021 | | |

| AMC | | | | | | | | |
|----------------|-------|-------|--------|-------|-------|-------|------------------|-------|
| | High | | Middle | | Low | | Max. Rated Power | |
| | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| 5 MHz | 269 | 279 | 281 | 251 | 279 | 257 | 282 | 282 |
| Scaling Factor | 1.110 | 1.070 | 1.063 | 1.190 | 1.070 | 1.162 | | |
| 10 MHz | 258 | 263 | 249 | 248 | 261 | 281 | 282 | 282 |
| Scaling Factor | 1.124 | 1.103 | 1.165 | 1.170 | 1.111 | 1.032 | | |

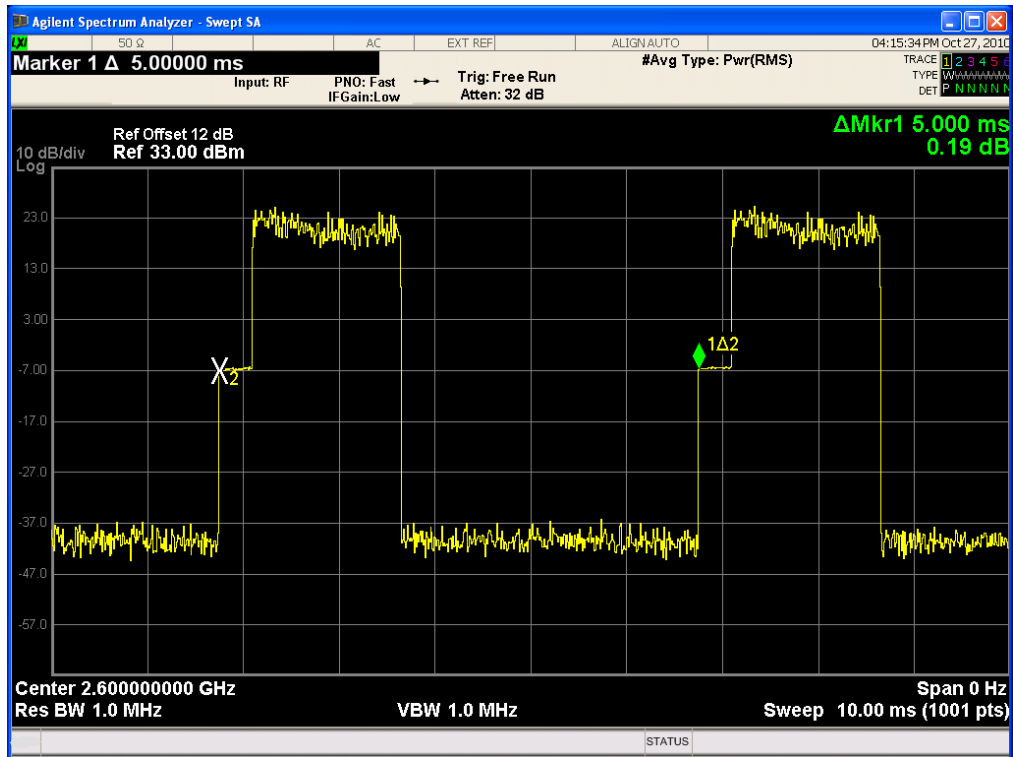
5 MHz calculation of Scaling Factor formula used is as follows:

$$\frac{[(\text{Rated Power} \times 5/17) \times 3 + (\text{Rated Power} \times 15)]}{[\text{Measured Power} \times 15]}$$

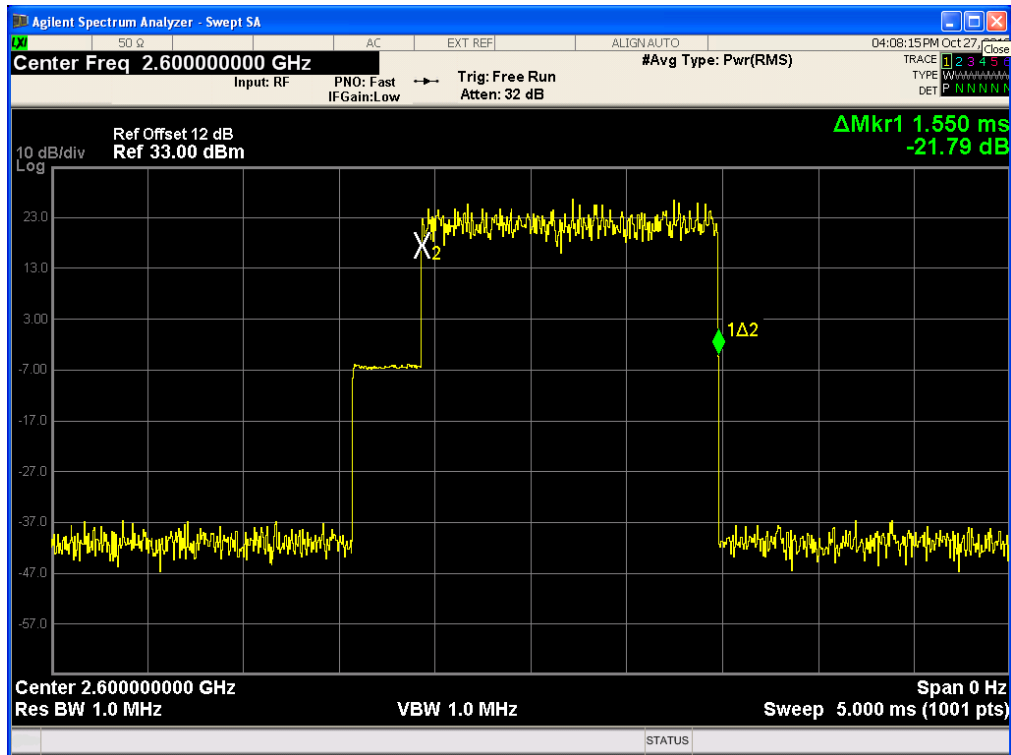
10 MHz calculation of Scaling Factor formula used is as follows:

$$\frac{[(\text{Rated Power} \times 5/35) \times 3 + (\text{Rated Power} \times 15)]}{[\text{Measured Power} \times 15]}$$

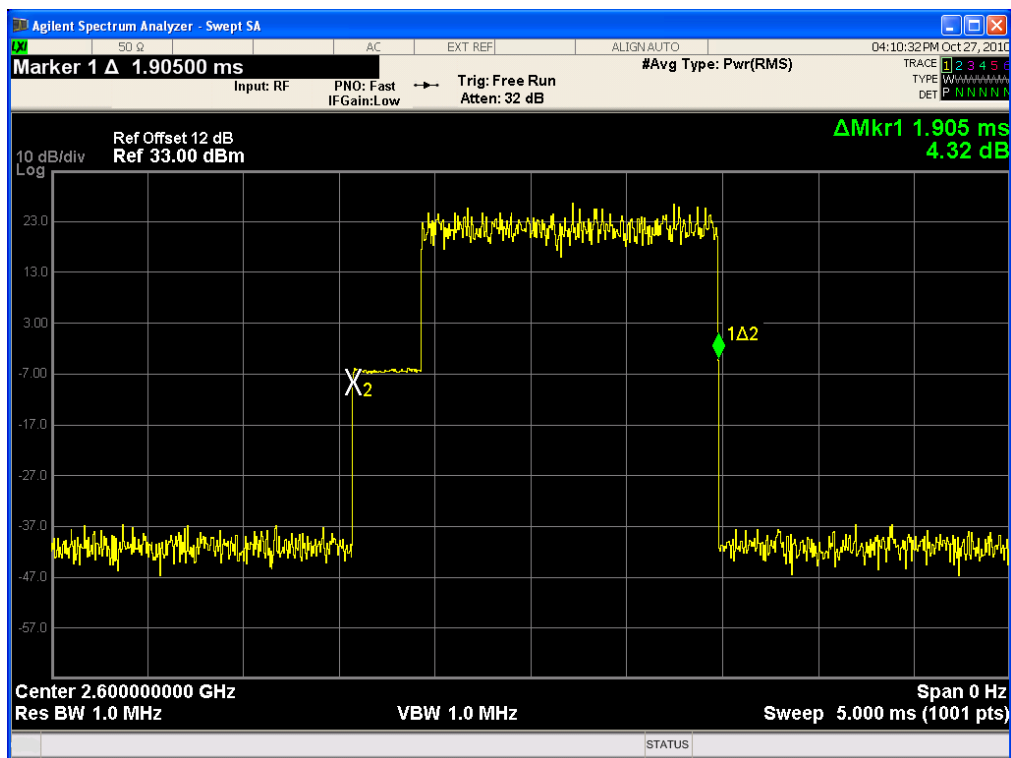
10.6.1 Spectrum Analyzer Plots



Timing Plot for WiMax Signal



WiMax Pulse with 15 Traffic on, 3 controls inactive (DC)



WiMax Timing Plot Burst

| 802.11b | | | |
|---------|---------|-----------|-------|
| Freq | Channel | Data Rate | Power |
| 2412 | 1 | 1 | 17.62 |
| 2437 | 6 | 1 | 17.85 |
| 2462 | 11 | 1 | 16.97 |
| 2437 | 6 | 2 | 17.83 |
| 2437 | 6 | 5.5 | 17.80 |
| 2437 | 6 | 11 | 17.82 |
| | | | |
| 802.11g | | | |
| Freq | Channel | Data Rate | Power |
| 2412 | 1 | 6 | 10.80 |
| 2437 | 6 | 6 | 11.51 |
| 2462 | 11 | 6 | 11.81 |
| 2437 | 6 | 9 | 11.79 |
| 2437 | 6 | 12 | 11.72 |
| 2437 | 6 | 18 | 11.80 |
| 2437 | 6 | 24 | 11.76 |
| 2437 | 6 | 36 | 11.79 |
| 2437 | 6 | 48 | 11.75 |
| 2437 | 6 | 54 | 11.78 |
| | | | |
| 802.11n | | | |
| Freq | Channel | Data Rate | Power |
| 2412 | 1 | 6.5/7.2 | 11.61 |
| 2437 | 6 | 6.5/7.2 | 11.82 |
| 2462 | 11 | 6.5/7.2 | 11.31 |
| 2437 | 6 | 13/14.4 | 11.71 |
| 2437 | 6 | 19.5/21.7 | 11.73 |
| 2437 | 6 | 26/28.9 | 11.79 |
| 2437 | 6 | 39/43.3 | 11.70 |
| 2437 | 6 | 52/57.8 | 11.73 |
| 2437 | 6 | 58.5/65 | 11.76 |
| 2437 | 6 | 65/72.2 | 11.78 |


SAR Data Summary – 835 MHz Body – Rev 0

MEASUREMENT RESULTS

| Gap | Position | Frequency | | Rev Level | Begin/End Power | | Reverse Channel | Forward Channel | SAR (W/kg) |
|-------|----------|-----------|------|-----------|-----------------|-------|-----------------|-------------------|------------|
| | | MHz | Ch. | | (dBm) | (dBm) | | | |
| 12 mm | Top | 824.7 | 1013 | Rev 0 | 24.49 | 24.46 | 153.6 kbps | 2 Slot 307.2 kbps | 1.40 |
| | | 836.6 | 384 | Rev 0 | 24.55 | 24.51 | 153.6 kbps | 2 Slot 307.2 kbps | 1.38 |
| | | 848.3 | 777 | Rev 0 | 24.40 | 24.35 | 153.6 kbps | 2 Slot 307.2 kbps | 1.40 |
| | Bottom | 824.7 | 1013 | Rev 0 | 24.45 | 24.42 | 153.6 kbps | 2 Slot 307.2 kbps | 0.91 |
| | | 836.6 | 384 | Rev 0 | 24.52 | 24.47 | 153.6 kbps | 2 Slot 307.2 kbps | 1.06 |
| | | 848.3 | 777 | Rev 0 | 24.38 | 24.34 | 153.6 kbps | 2 Slot 307.2 kbps | 0.99 |
| | End | 848.3 | 777 | Rev 0 | 24.39 | 24.32 | 153.6 kbps | 2 Slot 307.2 kbps | 0.10 |
| | Left | 848.3 | 777 | Rev 0 | 24.36 | 24.31 | 153.6 kbps | 2 Slot 307.2 kbps | 0.69 |
| | Right | 848.3 | 777 | Rev 0 | 24.34 | 24.33 | 153.6 kbps | 2 Slot 307.2 kbps | 0.79 |
| | Top | 848.3 | 777 | Rev A | 24.32 | 24.28 | 4096 bits | 2 Slot 307.2 kbps | 1.33 |

Body
1.6 W/kg (mW/g)
averaged over 1 gram

1. Battery is fully charged for all tests.
 Power Measured Conducted ERP EIRP
2. SAR Measurement
 Phantom Configuration Left Head Uniphantom Right Head
 SAR Configuration Head Body
3. Test Signal Call Mode Test Code Base Station Simulator
4. Test Configuration With Belt Clip Without Belt Clip N/A



 Jay M. Moulton
 Vice President

Note: When the highest SAR channel is 3 dB or more below the limit the remaining channels are not required to be tested per KDB 447498 section 1) e). The 12 mm gap for testing was approved by the FCC for testing this device in KDB inquiry 869935. The testing was conducted on top, bottom and edges closest to each antenna. The top, bottom, end, left and right testing was conducted for the WWAN antenna. The sixth side of the unit was not tested as the WWAN antenna was more than 2.5 cm from the side. All testing was conducted per TCB Workshop October 2010 presentation. See the photo in Appendix C for a pictorial of the setups, labeling of the sides tested and antenna locations.

SAR Data Summary – 1900 MHz Body – Rev 0

MEASUREMENT RESULTS

| Gap | Position | Frequency | | Rev Level | Begin/End Power | | Reverse Channel | Forward Channel | SAR (W/kg) |
|-------|----------|-----------|------|-----------|-----------------|-------|-----------------|-------------------|------------|
| | | MHz | Ch. | | (dBm) | (dBm) | | | |
| 12 mm | Top | 1851.25 | 25 | Rev 0 | 24.11 | 24.02 | 153.6 kbps | 2 Slot 307.2 kbps | 1.38 |
| | | 1880.00 | 600 | Rev 0 | 23.93 | 23.87 | 153.6 kbps | 2 Slot 307.2 kbps | 1.25 |
| | | 1908.75 | 1175 | Rev 0 | 24.07 | 24.00 | 153.6 kbps | 2 Slot 307.2 kbps | 0.73 |
| | Bottom | 1851.25 | 25 | Rev 0 | 24.05 | 24.03 | 153.6 kbps | 2 Slot 307.2 kbps | 1.03 |
| | | 1880.00 | 600 | Rev 0 | 23.88 | 23.84 | 153.6 kbps | 2 Slot 307.2 kbps | 1.12 |
| | | 1908.75 | 1175 | Rev 0 | 24.05 | 23.99 | 153.6 kbps | 2 Slot 307.2 kbps | 1.09 |
| | End | 1851.25 | 25 | Rev 0 | 24.09 | 24.01 | 153.6 kbps | 2 Slot 307.2 kbps | 0.50 |
| | Left | 1851.25 | 25 | Rev 0 | 24.05 | 23.97 | 153.6 kbps | 2 Slot 307.2 kbps | 0.80 |
| | | 1880.00 | 600 | Rev 0 | 23.90 | 23.83 | 153.6 kbps | 2 Slot 307.2 kbps | 0.85 |
| | | 1908.75 | 1175 | Rev 0 | 24.02 | 23.89 | 153.6 kbps | 2 Slot 307.2 kbps | 0.75 |
| | Right | 1851.25 | 25 | Rev 0 | 24.09 | 24.02 | 153.6 kbps | 2 Slot 307.2 kbps | 0.28 |
| | Top | 1851.25 | 25 | Rev A | 23.85 | 23.81 | 4096 bits | 2 Slot 307.2 kbps | 1.06 |

Body
1.6 W/kg (mW/g)
averaged over 1 gram

1. Battery is fully charged for all tests.
 Power Measured Conducted ERP EIRP
2. SAR Measurement
 Phantom Configuration Left Head Uniphantom Right Head
 SAR Configuration Head Body
3. Test Signal Call Mode Test Code Base Station Simulator
4. Test Configuration With Belt Clip Without Belt Clip N/A



Jay M. Moulton
 Vice President

Note: When the highest SAR channel is 3 dB or more below the limit the remaining channels are not required to be tested per KDB 447498 section 1) e). The 12 mm gap for testing was approved by the FCC for testing this device in KDB inquiry 869935. The testing was conducted on top, bottom and edges closest to each antenna. The top, bottom, end, left and right testing was conducted for the WWAN antenna. The sixth side of the unit was not tested as the WWAN antenna was more than 2.5 cm from the side. All testing was conducted per TCB Workshop October 2010 presentation. See the photo in Appendix C for a pictorial of the setups, labeling of the sides tested and antenna locations.

SAR Data Summary – 2450 MHz Body

| MEASUREMENT RESULTS | | | | | | | | |
|---------------------|--------|-----------|-----|------|------------|-----------------|-------|------------|
| Gap | Side | Frequency | | Mode | Modulation | Begin/End Power | | SAR (W/kg) |
| | | MHz | Ch. | | | | | |
| 12 mm | Top | 2437 | 6 | b | DSSS | 17.85 | 17.80 | 0.17 |
| | Bottom | 2437 | 6 | b | DSSS | 17.82 | 17.81 | 0.08 |
| | Right | 2437 | 6 | b | DSSS | 17.84 | 17.82 | 0.16 |

Body
1.6 W/kg (mW/g)
averaged over 1 gram

1. Battery is fully charged for all tests.
 Power Measured Conducted ERP EIRP
2. SAR Measurement
 Phantom Configuration Left Head Uniphantom Right Head
 SAR Configuration Head Body
3. Test Signal Call Mode Test Code Base Station Simulator
4. Test Configuration With Belt Clip Without Belt Clip N/A



Jay M. Moulton
 Vice President

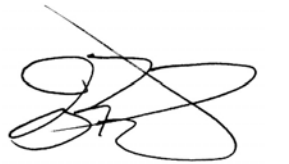
Note: When the highest conducted power channel is 3 dB or more below the limit the remaining channels are not required to be tested per KDB 447498 section 1) e). The 12 mm gap for testing was approved by the FCC for testing this device in KDB inquiry 869935. Test was conducted for 802.11b only as 802.11g and 802.11n power levels were not greater than 0.25 dB than 802.11b per 248227. The testing was conducted on top, bottom and edges closest to each antenna. The right, top and bottom was tested for the WLAN antenna. The remain three sided were not tested as the antenna was more than 2.5 cm from the three sides. All testing was conducted per TCB Workshop October 2010 presentation. See the photo in Appendix C for a pictorial of the setups, labeling of the sides tested and antenna locations.

SAR Data Summary – 2600 MHz Body – WiMax 5 MHz PUSC

| MEASUREMENT RESULTS | | | | | | | | | | |
|---------------------|------|----------|-----------|-----|------------|-----------------|-------|------------|----------------|----------------------|
| Gap | Ant. | Position | Frequency | | Modulation | Begin/End Power | | SAR (W/kg) | Scaling Factor | Calculated SAR(W/kg) |
| | | | MHz | Ch. | | (dBm) | (dBm) | | | |
| 12 mm | 1 | Top | 2498.5 | Low | QPSK 1/2 | 24.58 | 24.52 | 0.419 | 1.063 | 0.45 |
| | | Bottom | 2498.5 | Low | QPSK 1/2 | 24.56 | 24.53 | 0.219 | 1.063 | 0.23 |
| | | Side | 2498.5 | Low | QPSK 1/2 | 24.52 | 24.50 | 0.486 | 1.063 | 0.52 |
| | | Top | 2498.5 | Low | 16QAM 1/2 | 24.32 | 24.29 | 0.319 | 1.106 | 0.35 |
| | | Bottom | 2498.5 | Low | 16QAM 1/2 | 24.30 | 24.26 | 0.226 | 1.106 | 0.25 |
| | | Side | 2498.5 | Low | 16QAM 1/2 | 24.29 | 24.25 | 0.409 | 1.106 | 0.45 |
| | 2 | Top | 2498.5 | Low | QPSK 1/2 | 24.54 | 24.51 | 0.405 | 1.133 | 0.46 |
| | | Bottom | 2498.5 | Low | QPSK 1/2 | 24.53 | 24.52 | 0.204 | 1.133 | 0.23 |
| | | Side | 2498.5 | Low | QPSK 1/2 | 24.55 | 24.50 | 0.371 | 1.133 | 0.42 |
| | | Top | 2498.5 | Low | 16QAM 1/2 | 24.31 | 24.30 | 0.470 | 1.021 | 0.48 |
| | | Bottom | 2498.5 | Low | 16QAM 1/2 | 24.28 | 24.23 | 0.293 | 1.021 | 0.30 |
| | | Side | 2498.5 | Low | 16QAM 1/2 | 24.29 | 24.27 | 0.341 | 1.021 | 0.35 |

Body
1.6 W/kg (mW/g)
 averaged over 1 gram

1. Battery is fully charged for all tests.
 Power Measured Conducted ERP EIRP
2. SAR Measurement
 Phantom Configuration Left Head Uniphantom Right Head
 SAR Configuration Head Body
3. Test Signal Call Mode Test Code Base Station Simulator
4. Test Configuration With Belt Clip Without Belt Clip N/A



Jay M. Moulton
 Vice President

Note: When the highest conducted power channel is 3 dB or more below the limit the remaining channels are not required to be tested per KDB 447498 section 1) e). The 12 mm gap for testing was approved by the FCC for testing this device in KDB inquiry 869935. Test reduction was based on TCB workshop slides from April and October of 2010. Testing conducted per FCC WiMax KDB 615223. The two antennas are not capable of transmitting simultaneously with each other. The testing was conducted on top, bottom and edges closest to each antenna. The WiMax testing was conducted on the left, top and bottom for each antenna. The remaining three sides were not tested as the antenna is located more than 2.5 cm from the side. All testing was conducted per TCB Workshop October 2010 presentation. See the photo in Appendix C for a pictorial of the setups, labeling of the sides tested and antenna locations.

SAR Data Summary – 2600 MHz Body – WiMax 10 MHz PUSC

| MEASUREMENT RESULTS | | | | | | | | | | | |
|---------------------|------|----------|-----------|--------|------------|-----------------|-------|------------|----------------|----------------|------|
| Gap | Ant. | Position | Frequency | | Modulation | Begin/End Power | | SAR (W/kg) | Scaling Factor | Calculated SAR | |
| | | | MHz | Ch. | | (dBm) | (dBm) | | | | |
| 12 mm | 1 | Top | 2593.0 | Mid | QPSK 1/2 | 24.09 | 24.06 | 0.635 | 1.111 | 0.71 | |
| | | Bottom | 2593.0 | Mid | QPSK 1/2 | 24.06 | 24.03 | 0.350 | 1.111 | 0.39 | |
| | | Side | 2593.0 | Mid | QPSK 1/2 | 24.07 | 24.00 | 0.639 | 1.111 | 0.71 | |
| | | Top | 2593.0 | Mid | 16QAM 1/2 | 24.73 | 24.71 | 0.570 | 1.160 | 0.66 | |
| | | Bottom | 2593.0 | Mid | 16QAM 1/2 | 24.70 | 24.65 | 0.313 | 1.160 | 0.36 | |
| | | Side | 2593.0 | Mid | 16QAM 1/2 | 24.69 | 24.63 | 0.544 | 1.160 | 0.63 | |
| | 2 | Top | 2501.0 | Low | QPSK 1/2 | 24.05 | 24.01 | 0.718 | 1.133 | 0.81 | |
| | | | 2593.0 | Mid | QPSK 1/2 | 24.05 | 24.00 | 0.761 | 1.111 | 0.85 | |
| | | | 2685.0 | High | QPSK 1/2 | 24.00 | 23.95 | 0.781 | 1.151 | 0.90 | |
| | | Bottom | 2593.0 | Mid | QPSK 1/2 | 24.06 | 23.99 | 0.512 | 1.111 | 0.57 | |
| | | | Side | 2593.0 | Mid | QPSK 1/2 | 24.08 | 24.01 | 0.669 | 1.111 | 0.74 |
| | | | Top | 2501.0 | Low | 16QAM 1/2 | 24.51 | 24.42 | 0.574 | 1.021 | 0.59 |
| | | 2593.0 | | Mid | 16QAM 1/2 | 24.71 | 24.62 | 0.722 | 1.160 | 0.84 | |
| | | 2685.0 | | High | 16QAM 1/2 | 24.37 | 24.30 | 0.729 | 1.055 | 0.77 | |
| | | Bottom | 2593.0 | Mid | 16QAM 1/2 | 24.70 | 24.65 | 0.499 | 1.160 | 0.58 | |
| | | | Side | 2593.0 | Mid | 16QAM 1/2 | 24.71 | 24.67 | 0.600 | 1.160 | 0.70 |

Body
1.6 W/kg (mW/g)
 averaged over 1 gram

- 1. Battery is fully charged for all tests.
 Power Measured Conducted ERP EIRP
- 2. SAR Measurement
 Phantom Configuration Left Head Uniphantom Right Head
 SAR Configuration Head Body
- 3. Test Signal Call Mode Test Code Base Station Simulator
- 4. Test Configuration With Belt Clip Without Belt Clip N/A


 Jay M. Moulton
 Vice President

Note: When the highest conducted power channel is 3 dB or more below the limit the remaining channels are not required to be tested per KDB 447498 section 1) e). The 12 mm gap for testing was approved by the FCC for testing this device in KDB inquiry 869935. Test reduction was based on TCB workshop slides from April and October of 2010. Testing conducted per FCC WiMax KDB 615223. The two antennas are not capable of transmitting simultaneously with each other. The testing was conducted on top, bottom and edges closest to each antenna. The WiMax testing was conducted on the left, top and bottom for each antenna. The remaining three sides were not tested as the antenna is located more than 2.5 cm from the side. All testing was conducted per TCB Workshop October 2010 presentation. See the photo in Appendix C for a pictorial of the setups, labeling of the sides tested and antenna locations.

SAR Data Summary – 2600 MHz Body – WiMax 5 & 10 MHz AMC

| MEASUREMENT RESULTS | | | | | | | | | | |
|---------------------|----------|------|-----------|-----|---------------|-----------------|-------|------------|----------------|----------------|
| Gap | Position | Ant. | Frequency | | Modulation | Begin/End Power | | SAR (W/kg) | Scaling Factor | Calculated SAR |
| | | | MHz | Ch. | | (dBm) | (dBm) | | | |
| 12 mm | Top | 1 | 2498.5 | Low | 5 MHz QPSK ½ | 24.48 | 24.43 | 0.514 | 1.070 | 0.55 |
| | Bottom | | 2498.5 | Low | 5 MHz QPSK ½ | 24.45 | 24.44 | 0.293 | 1.070 | 0.31 |
| | Side | | 2498.5 | Low | 5 MHz QPSK ½ | 24.53 | 24.49 | 0.404 | 1.070 | 0.43 |
| | Top | 2 | 2593.0 | Mid | 10 MHz QPSK ½ | 24.08 | 24.01 | 0.609 | 1.165 | 0.71 |
| | Bottom | | 2593.0 | Mid | 10 MHz QPSK ½ | 24.09 | 24.03 | 0.352 | 1.165 | 0.41 |
| | Side | | 2593.0 | Mid | 10 MHz QPSK ½ | 24.04 | 23.99 | 0.643 | 1.165 | 0.75 |

Body
1.6 W/kg (mW/g)
averaged over 1 gram

1. Battery is fully charged for all tests.
 Power Measured Conducted ERP EIRP
2. SAR Measurement
 Phantom Configuration Left Head Uniphantom Right Head
 SAR Configuration Head Body
3. Test Signal Call Mode Test Code Base Station Simulator
4. Test Configuration With Belt Clip Without Belt Clip N/A



Jay M. Moulton
 Vice President

Note: When the highest conducted power channel is 3 dB or more below the limit the remaining channels are not required to be tested per KDB 447498 section 1) e). The 12 mm gap for testing was approved by the FCC for testing this device in KDB inquiry 869935. Test reduction was based on TCB workshop slides from April and October of 2010. Control symbols were not used in AMC tests and scaling for AMC results used the power of PUSC control symbols. Testing conducted per FCC WiMax KDB 615223. The two antennas are not capable of transmitting simultaneously with each other. The testing was conducted on top, bottom and edges closest to each antenna. The WiMax testing was conducted on the left, top and bottom for each antenna. The remaining three sides were not tested as the antenna is located more than 2.5 cm from the side. All testing was conducted per TCB Workshop October 2010 presentation. See the photo in Appendix C for a pictorial of the setups, labeling of the sides tested and antenna locations.

11. Test Equipment List

Table 12.1 Equipment Specifications

| Type | Calibration Due Date | Serial Number |
|--|----------------------|-----------------|
| ThermoCRS Robot | N/A | RAF0338198 |
| ThermoCRS Controller | N/A | RCF0338224 |
| ThermoCRS Teach Pendant (Joystick) | N/A | STP0334405 |
| IBM Computer, 2.66 MHz P4 | N/A | 8189D8U KCPR08N |
| Apriel E-Field Probe ALS-E020 | 10/21/2010 | RFE-217 |
| Apriel E-Field Probe ALS-E030 | 07/14/2011 | E030-001 |
| Apriel Dummy Probe | N/A | 023 |
| Apriel Left Phantom | N/A | RFE-267 |
| Apriel Right Phantom | N/A | RFE-268 |
| Apriel UniPhantom | N/A | RFE-273 |
| Apriel Verification Dipole ALS-D-450-S-2 | 01/12/2011 | RFE-362 |
| Apriel Verification Dipole ALS-D-835-S-2 | 01/14/2011 | 180-00561 |
| Apriel Verification Dipole ALS-D-900-S-2 | 01/12/2011 | RFE-275 |
| Apriel Verification Dipole ALS-D-1900-S-2 | 01/15/2011 | 210-00713 |
| Apriel Verification Dipole ALS-D-2450-S-2 | 01/12/2011 | RFE-278 |
| Apriel Verification Dipole RFE-D-2600-S-2 | 01/18/2011 | RFE-121 |
| Apriel Verification Dipole RFE-D-BB-S-2 | 01/12/2011 | 235-00801 |
| Agilent (HP) 437B Power Meter | 03/24/2011 | 3125U08837 |
| Agilent (HP) 8481B Power Sensor | 03/24/2011 | 3318A05384 |
| Advantest R3261A Spectrum Analyzer | 03/24/2011 | 31720068 |
| Agilent (HP) 8350B Signal Generator | 04/19/2011 | 2749A10226 |
| Agilent (HP) 83525A RF Plug-In | 04/19/2011 | 2647A01172 |
| Agilent (HP) 8753C Vector Network Analyzer | 03/25/2011 | 3135A01724 |
| Agilent (HP) 85047A S-Parameter Test Set | 03/25/2011 | 2904A00595 |
| Agilent (HP) E55125C Base Station Sim. | 03/25/2012 | MY48360364 |
| Agilent (HP) E6651A WiMax Base Station | 10/22/2010 | MY48150124 |
| Apriel Dielectric Probe Assembly | N/A | 0011 |
| Head Equivalent Matter (450 MHz) | N/A | N/A |
| Head Equivalent Matter (835 MHz) | N/A | N/A |
| Head Equivalent Matter (1900 MHz) | N/A | N/A |
| Head Equivalent Matter (2450 MHz) | N/A | N/A |
| Body Equivalent Matter (450 MHz) | N/A | N/A |
| Body Equivalent Matter (835 MHz) | N/A | N/A |
| Body Equivalent Matter (1900 MHz) | N/A | N/A |
| Body Equivalent Matter (2450 MHz) | N/A | N/A |
| Body Equivalent Matter (2600 MHz) | N/A | N/A |
| Body Equivalent Matter (5200 MHz) | N/A | N/A |
| Body Equivalent Matter (5800 MHz) | N/A | N/A |

12. Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body is a very complex phenomena that depends on the mass, shape, and size of the body; the orientation of the body with respect to the field vectors; and, the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

13. References

- [1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radio Frequency Radiation, August 1996
- [2] ANSI/IEEE C95.1 – 1992, American National Standard Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300kHz to 100GHz, New York: IEEE, 1992.
- [3] ANSI/IEEE C95.3 – 1992, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave, New York: IEEE, 1992.
- [4] Federal Communications Commission, OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, June 2001.
- [5] IEEE Standard 1528 – 2003, IEEE Recommended Practice for Determining the Peak-Spatial Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communication Devices: Measurement Techniques, October 2003.
- [6] Industry Canada, RSS – 102e, Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands), March 2010.
- [7] Health Canada, Safety Code 6, Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3kHz to 300 GHz, 2009.

Appendix A – System Verification Plots and Data

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*****
Test Result for UIM Dielectric Parameter
Mon 30/Aug/2010 07:02:25
Freq Frequency(GHz)
FCC_eH      FCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon
FCC_sH      FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB      FCC Limits for Body Epsilon
FCC_sB      FCC Limits for Body Sigma
Test_e      Epsilon of UIM
Test_s      Sigma of UIM
*****
Freq      FCC_eB      FCC_sB      Test_e      Test_s
0.8050    55.32      0.97      55.16      0.94
0.8150    55.28      0.97      55.10      0.95
0.8250    55.24      0.97      55.06      0.97
0.8350    55.20      0.97      55.01      0.99
0.8450    55.17      0.98      54.96      1.01
0.8550    55.14      0.99      54.92      1.03
0.8650    55.11      1.01      54.87      1.05

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*****
Test Result for UIM Dielectric Parameter
Mon 30/Aug/2010 07:48:34
Freq Frequency(GHz)
FCC_eH      FCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon
FCC_sH      FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB      FCC Limits for Body Epsilon
FCC_sB      FCC Limits for Body Sigma
Test_e      Epsilon of UIM
Test_s      Sigma of UIM
*****
Freq      FCC_eB      FCC_sB      Test_e      Test_s
1.8700    53.30      1.52      53.05      1.49
1.8800    53.30      1.52      53.07      1.50
1.8900    53.30      1.52      53.10      1.52
1.9000    53.30      1.52      53.12      1.54
1.9100    53.30      1.52      53.14      1.56
1.9200    53.30      1.52      53.16      1.58
1.9300    53.30      1.52      53.19      1.59

```

Test Result for UIM Dielectric Parameter

Fri 03/Sep/2010 07:24:22

Freq Frequency(GHz)

FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon

FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma

FCC_eB FCC Limits for Body Epsilon

FCC_sB FCC Limits for Body Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|--------|--------|--------|--------|--------|
| 2.4200 | 52.74 | 1.92 | 52.50 | 1.90 |
| 2.4300 | 52.73 | 1.93 | 52.47 | 1.92 |
| 2.4400 | 52.71 | 1.94 | 52.43 | 1.94 |
| 2.4500 | 52.70 | 1.95 | 52.41 | 1.96 |
| 2.4600 | 52.69 | 1.96 | 52.39 | 1.98 |
| 2.4700 | 52.67 | 1.98 | 52.36 | 2.00 |
| 2.4800 | 52.66 | 1.99 | 52.33 | 2.01 |

Test Result for UIM Dielectric Parameter

Thu 02/Sep/2010 08:01:51

Freq Frequency(GHz)

FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon

FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma

FCC_eB FCC Limits for Body Epsilon

FCC_sB FCC Limits for Body Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|--------|--------|--------|--------|--------|
| 2.5000 | 52.64 | 2.02 | 52.58 | 2.03 |
| 2.5100 | 52.62 | 2.04 | 52.55 | 2.05 |
| 2.5200 | 52.61 | 2.05 | 52.52 | 2.07 |
| 2.5300 | 52.60 | 2.06 | 52.50 | 2.09 |
| 2.5400 | 52.59 | 2.08 | 52.49 | 2.11 |
| 2.5500 | 52.57 | 2.09 | 52.47 | 2.12 |
| 2.5600 | 52.56 | 2.11 | 52.45 | 2.14 |
| 2.5700 | 52.55 | 2.12 | 52.43 | 2.16 |
| 2.5800 | 52.53 | 2.13 | 52.42 | 2.17 |
| 2.5900 | 52.52 | 2.15 | 52.39 | 2.19 |
| 2.6000 | 52.51 | 2.16 | 52.38 | 2.21 |
| 2.6100 | 52.50 | 2.18 | 52.35 | 2.22 |
| 2.6200 | 52.48 | 2.19 | 52.33 | 2.25 |
| 2.6300 | 52.47 | 2.21 | 52.32 | 2.27 |
| 2.6400 | 52.46 | 2.22 | 52.30 | 2.29 |
| 2.6500 | 52.45 | 2.23 | 52.29 | 2.30 |
| 2.6600 | 52.43 | 2.25 | 52.27 | 2.32 |
| 2.6700 | 52.42 | 2.26 | 52.25 | 2.34 |
| 2.6800 | 52.41 | 2.28 | 52.23 | 2.35 |
| 2.6900 | 52.39 | 2.29 | 52.20 | 2.37 |
| 2.7000 | 52.38 | 2.30 | 52.19 | 2.39 |

Test Result for UIM Dielectric Parameter

Tue 07/Sep/2010 08:04:22

Freq Frequency(GHz)

FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon

FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma

FCC_eB FCC Limits for Body Epsilon

FCC_sB FCC Limits for Body Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|--------|--------|--------|--------|--------|
| 2.5000 | 52.64 | 2.02 | 52.65 | 2.03 |
| 2.5100 | 52.62 | 2.04 | 52.63 | 2.05 |
| 2.5200 | 52.61 | 2.05 | 52.62 | 2.07 |
| 2.5300 | 52.60 | 2.06 | 52.60 | 2.08 |
| 2.5400 | 52.59 | 2.08 | 52.59 | 2.10 |
| 2.5500 | 52.57 | 2.09 | 52.55 | 2.12 |
| 2.5600 | 52.56 | 2.11 | 52.53 | 2.14 |
| 2.5700 | 52.55 | 2.12 | 52.52 | 2.17 |
| 2.5800 | 52.53 | 2.13 | 52.50 | 2.19 |
| 2.5900 | 52.52 | 2.15 | 52.47 | 2.20 |
| 2.6000 | 52.51 | 2.16 | 52.45 | 2.22 |
| 2.6100 | 52.50 | 2.18 | 52.43 | 2.25 |
| 2.6200 | 52.48 | 2.19 | 52.40 | 2.27 |
| 2.6300 | 52.47 | 2.21 | 52.38 | 2.29 |
| 2.6400 | 52.46 | 2.22 | 52.36 | 2.31 |
| 2.6500 | 52.45 | 2.23 | 52.35 | 2.33 |
| 2.6600 | 52.43 | 2.25 | 52.33 | 2.34 |
| 2.6700 | 52.42 | 2.26 | 52.31 | 2.35 |
| 2.6800 | 52.41 | 2.28 | 52.30 | 2.37 |
| 2.6900 | 52.39 | 2.29 | 52.29 | 2.39 |
| 2.7000 | 52.38 | 2.30 | 52.27 | 2.40 |

Test Result for UIM Dielectric Parameter

Fri 12/Nov/2010 06:53:41

Freq Frequency(GHz)

FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon

FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma

FCC_eB FCC Limits for Body Epsilon

FCC_sB FCC Limits for Body Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|--------|--------|--------|--------|--------|
| 2.5000 | 52.64 | 2.02 | 52.44 | 2.05 |
| 2.5100 | 52.62 | 2.04 | 52.41 | 2.06 |
| 2.5200 | 52.61 | 2.05 | 52.40 | 2.08 |
| 2.5300 | 52.60 | 2.06 | 52.38 | 2.09 |
| 2.5400 | 52.59 | 2.08 | 52.37 | 2.11 |
| 2.5500 | 52.57 | 2.09 | 52.35 | 2.12 |
| 2.5600 | 52.56 | 2.11 | 52.33 | 2.13 |
| 2.5700 | 52.55 | 2.12 | 52.32 | 2.15 |
| 2.5800 | 52.53 | 2.13 | 52.30 | 2.16 |
| 2.5900 | 52.52 | 2.15 | 52.28 | 2.17 |
| 2.6000 | 52.51 | 2.16 | 52.26 | 2.19 |
| 2.6100 | 52.50 | 2.18 | 52.25 | 2.21 |
| 2.6200 | 52.48 | 2.19 | 52.23 | 2.23 |
| 2.6300 | 52.47 | 2.21 | 52.21 | 2.24 |
| 2.6400 | 52.46 | 2.22 | 52.20 | 2.25 |
| 2.6500 | 52.45 | 2.23 | 52.18 | 2.27 |
| 2.6600 | 52.43 | 2.25 | 52.16 | 2.28 |
| 2.6700 | 52.42 | 2.26 | 52.14 | 2.29 |
| 2.6800 | 52.41 | 2.28 | 52.13 | 2.32 |
| 2.6900 | 52.39 | 2.29 | 52.12 | 2.34 |
| 2.7000 | 52.38 | 2.30 | 52.10 | 2.35 |

Test Result for UIM Dielectric Parameter

Sat 20/Nov/2010 08:41:58

Freq Frequency(GHz)

FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon

FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma

FCC_eB FCC Limits for Body Epsilon

FCC_sB FCC Limits for Body Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|--------|--------|--------|--------|--------|
| 2.5000 | 52.64 | 2.02 | 52.28 | 2.03 |
| 2.5100 | 52.62 | 2.04 | 52.26 | 2.05 |
| 2.5200 | 52.61 | 2.05 | 52.24 | 2.06 |
| 2.5300 | 52.60 | 2.06 | 52.22 | 2.08 |
| 2.5400 | 52.59 | 2.08 | 52.19 | 2.10 |
| 2.5500 | 52.57 | 2.09 | 52.17 | 2.11 |
| 2.5600 | 52.56 | 2.11 | 52.15 | 2.13 |
| 2.5700 | 52.55 | 2.12 | 52.12 | 2.15 |
| 2.5800 | 52.53 | 2.13 | 52.09 | 2.16 |
| 2.5900 | 52.52 | 2.15 | 52.07 | 2.18 |
| 2.6000 | 52.51 | 2.16 | 52.05 | 2.19 |
| 2.6100 | 52.50 | 2.18 | 52.03 | 2.20 |
| 2.6200 | 52.48 | 2.19 | 52.00 | 2.22 |
| 2.6300 | 52.47 | 2.21 | 51.98 | 2.23 |
| 2.6400 | 52.46 | 2.22 | 51.96 | 2.25 |
| 2.6500 | 52.45 | 2.23 | 51.94 | 2.26 |
| 2.6600 | 52.43 | 2.25 | 51.93 | 2.28 |
| 2.6700 | 52.42 | 2.26 | 51.90 | 2.30 |
| 2.6800 | 52.41 | 2.28 | 51.89 | 2.32 |
| 2.6900 | 52.39 | 2.29 | 51.87 | 2.33 |
| 2.7000 | 52.38 | 2.30 | 51.85 | 2.34 |

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 07:04:19 AM
End Time : 30-Aug-2010 07:19:26 AM
Scanning Time : 907 secs

Product Data

Device Name : Verification
Serial No. : 835
Type : Dipole
Model : ALS-D-835-S-2
Frequency : 835.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time : 0 min(s)
Length : 161 mm
Width : 3.6 mm
Depth : 89.8 mm
Antenna Type : Internal
Orientation : Touch
Power Drift-Start : 1.038 W/kg
Power Drift-Finish: 1.045 W/kg
Power Drift (%) : 0.605

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 49.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

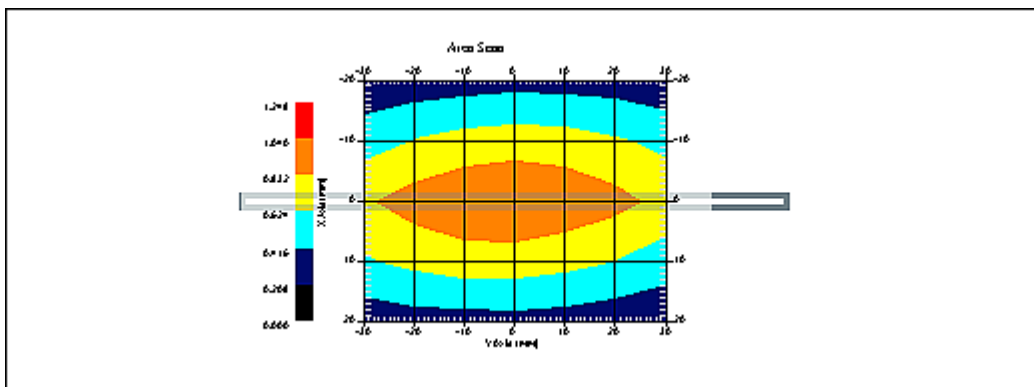
Name : Probe 217 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 25.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 9:21:48 AM
Area Scan : 5x7x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

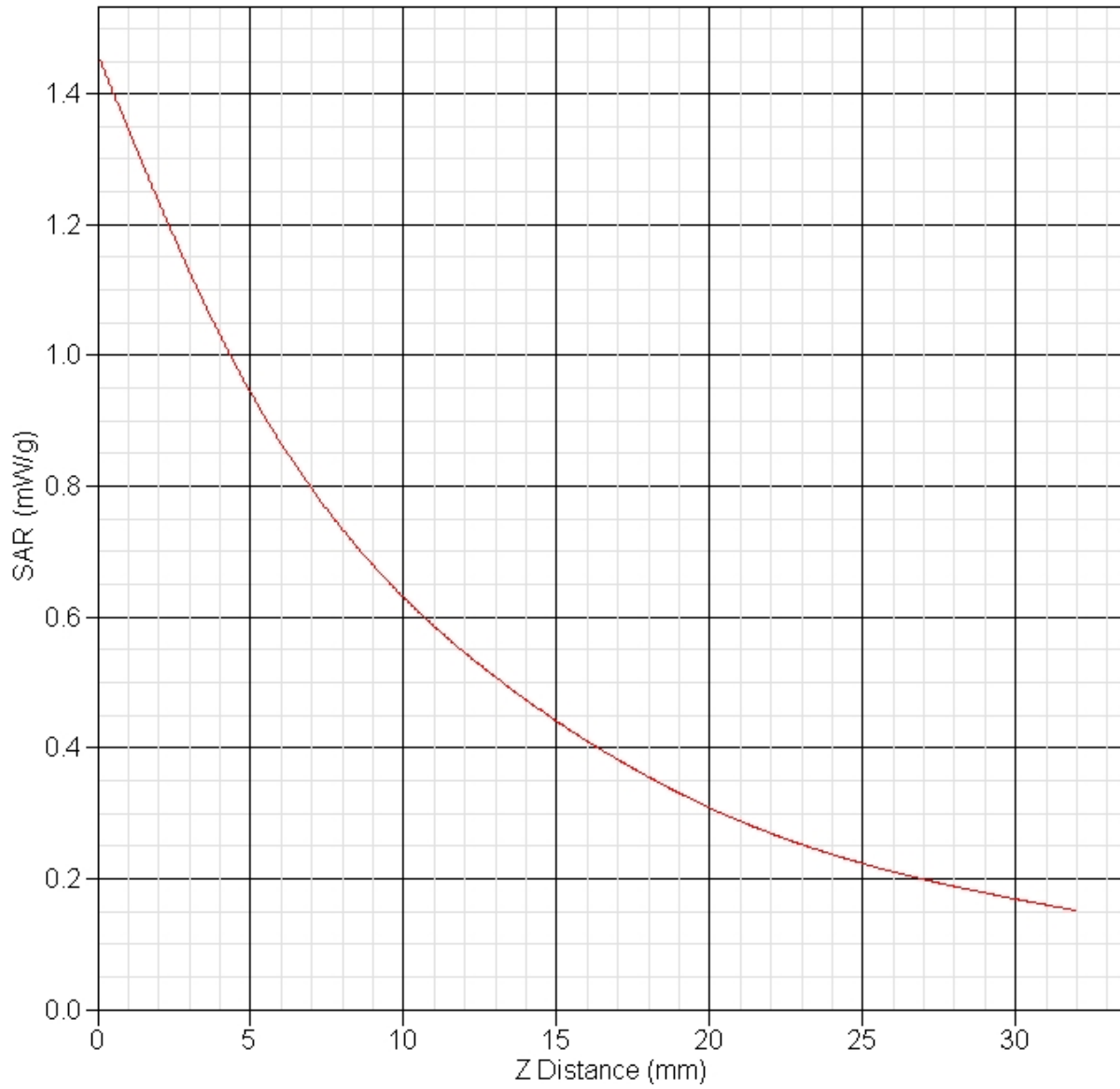
Other Data

DUT Position : Touch
Separation : 15 mm
Channel : Low



1 gram SAR value : 0.951 W/kg
10 gram SAR value : 0.603 W/kg
Area Scan Peak SAR : 1.042 W/kg
Zoom Scan Peak SAR : 1.461 W/kg

SAR-Z Axis
at Hotspot x:0.21 y:-0.14



SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 07:56:43 AM
End Time : 30-Aug-2010 08:09:47 AM
Scanning Time : 784 secs

Product Data

Device Name : Verification
Serial No. : 1900
Type : Dipole
Model : ALS-D-1900-S-2
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time : 0 min(s)
Length : 68 mm
Width : 3.6 mm
Depth : 39.5 mm
Antenna Type : Internal
Orientation : Touch
Power Drift-Start : 4.458 W/kg
Power Drift-Finish: 4.423 W/kg
Power Drift (%) : -0.792

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 49.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

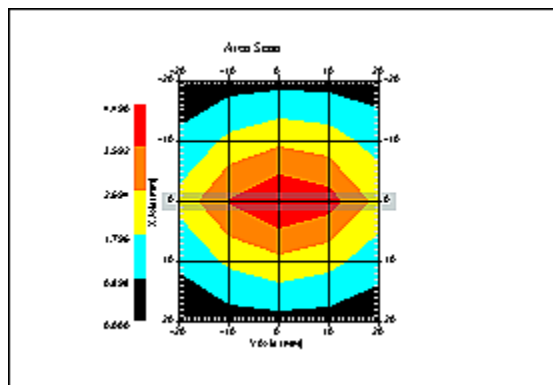
Name : Probe 217 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 8:03:12 AM
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

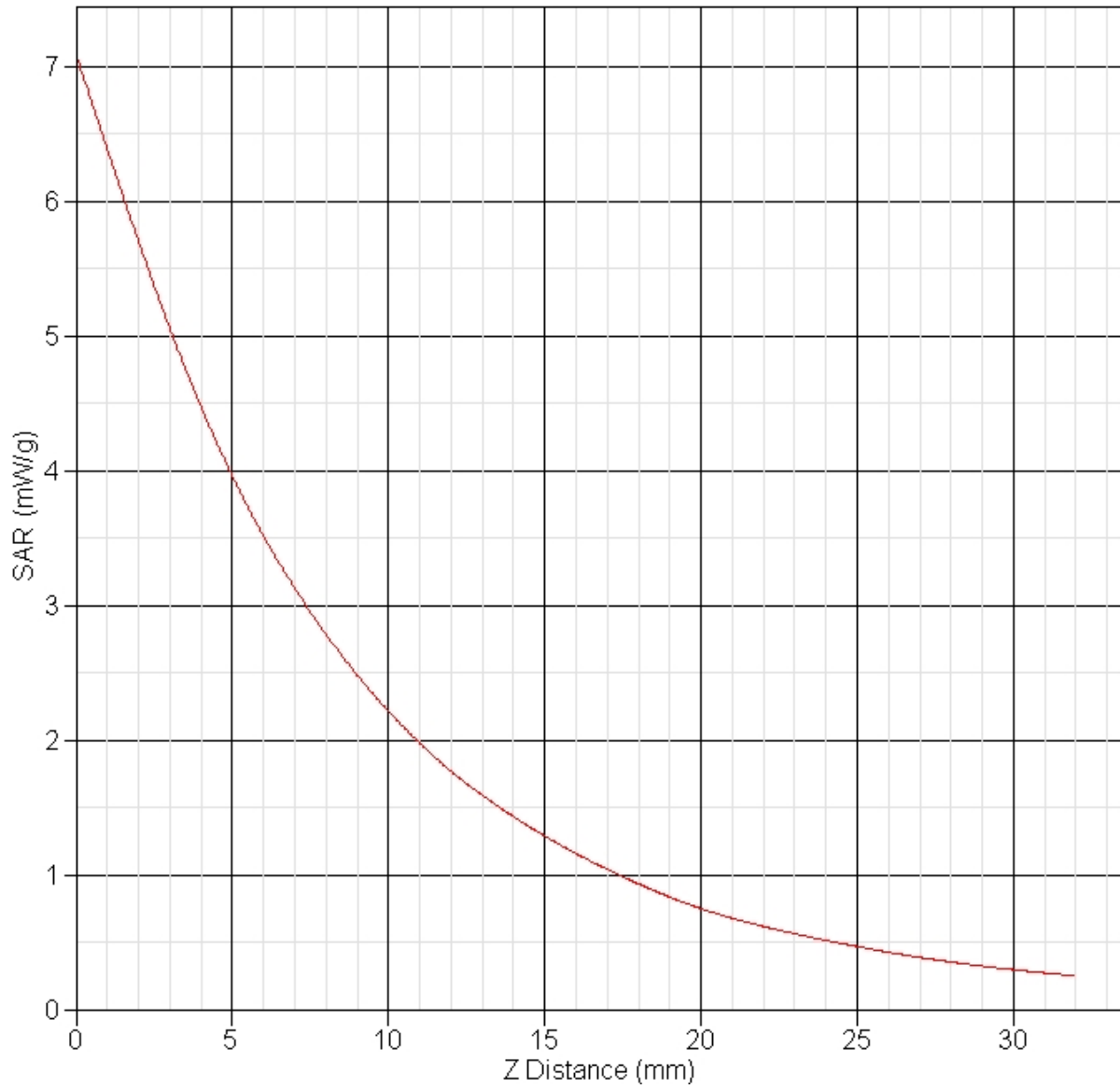
Other Data

DUT Position : Touch
Separation : 10 mm
Channel : Mid



1 gram SAR value : 3.891 W/kg
10 gram SAR value : 1.987 W/kg
Area Scan Peak SAR : 4.490 W/kg
Zoom Scan Peak SAR : 7.096 W/kg

SAR-Z Axis
at Hotspot x:0.25 y:-0.15



SAR Test Report

By Operator : Jay
Measurement Date : 03-Sep-2010
Starting Time : 03-Sep-2010 07:33:46 AM
End Time : 03-Sep-2010 07:46:56 AM
Scanning Time : 790 secs

Product Data

Device Name : Verification
Serial No. : 2450
Type : Dipole
Model : ALS-D-2450-S-2
Frequency : 2450.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time : 0 min(s)
Length : 51.5 mm
Width : 3.6 mm
Depth : 30.4 mm
Antenna Type : Internal
Orientation : Touch
Power Drift-Start : 6.188 W/kg
Power Drift-Finish: 6.204 W/kg
Power Drift (%) : 0.260

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2450
Frequency : 2450.00 MHz
Last Calib. Date : 03-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.41 F/m
Sigma : 1.96 S/m
Density : 1000.00 kg/cu. m

Probe Data

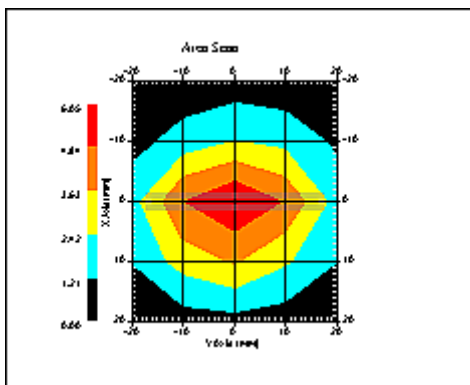
Name : Probe 217 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2450.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 3.61
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 03-Sep-2010
Set-up Time : 7:40:13 AM
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

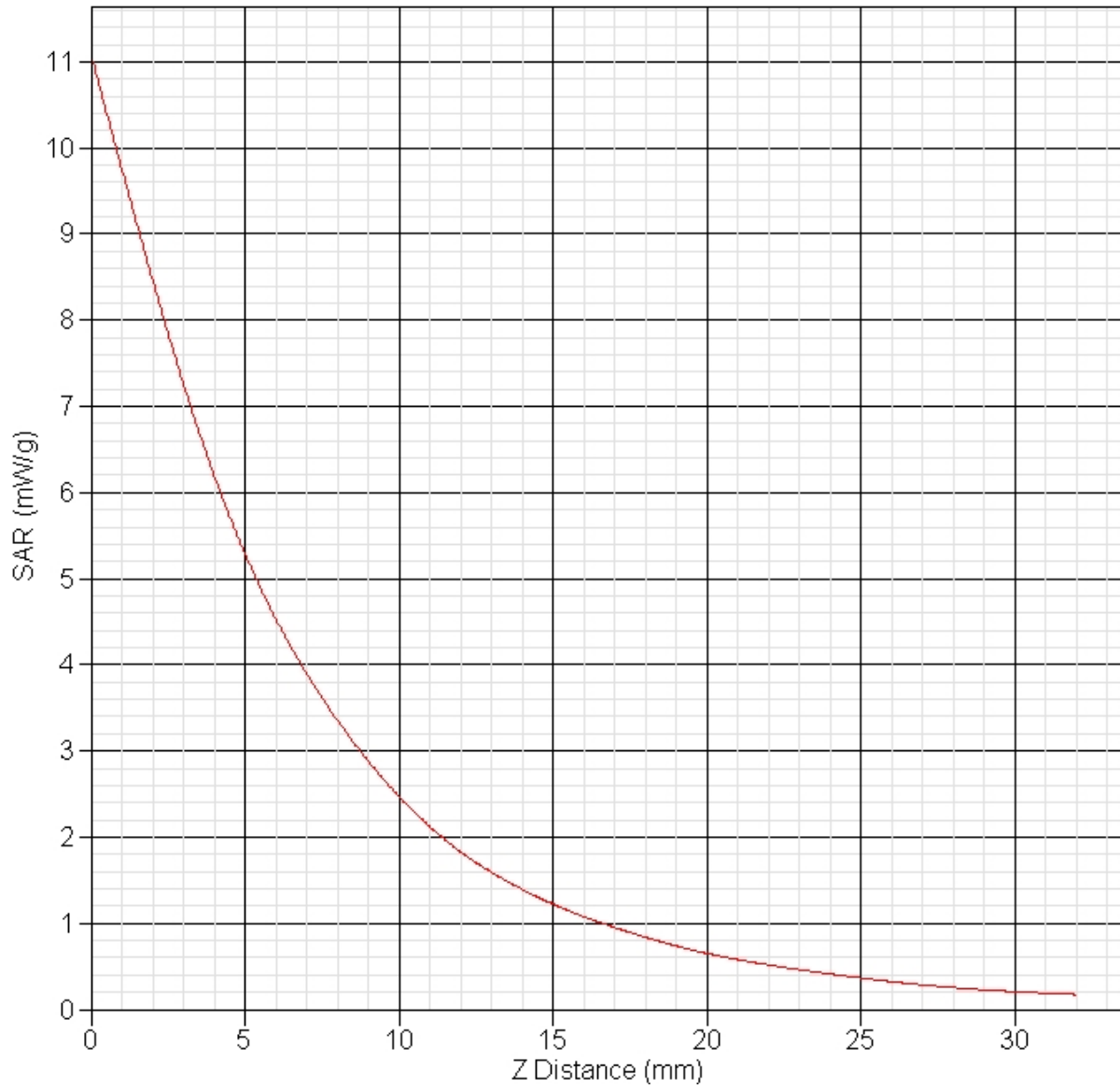
Other Data

DUT Position : Touch
Separation : 10 mm
Channel : Mid



1 gram SAR value : 5.268 W/kg
10 gram SAR value : 2.367 W/kg
Area Scan Peak SAR : 6.049 W/kg
Zoom Scan Peak SAR : 11.090 W/kg

SAR-Z Axis
at Hotspot x:0.22 y:-0.14



SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 08:09:21 AM
End Time : 02-Sep-2010 08:22:20 AM
Scanning Time : 779 secs

Product Data

Device Name : Verification
Serial No. : 2600
Type : Dipole
Model : ALS-D-2600-S-2
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time : 0 min(s)
Length : 48.8 mm
Width : 3.6 mm
Depth : 32.8 mm
Antenna Type : Internal
Orientation : Touch
Power Drift-Start : 6.280 W/kg
Power Drift-Finish: 6.193 W/kg
Power Drift (%) : -1.375

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.39 F/m
Sigma : 2.19 S/m
Density : 1000.00 kg/cu. m

Probe Data

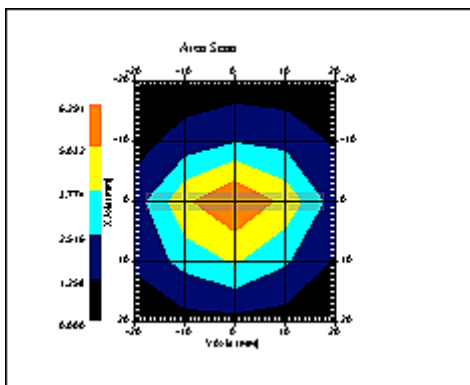
Name : Probe 217 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 16-Aug-2007
Set-up Time : 7:40:13 AM
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

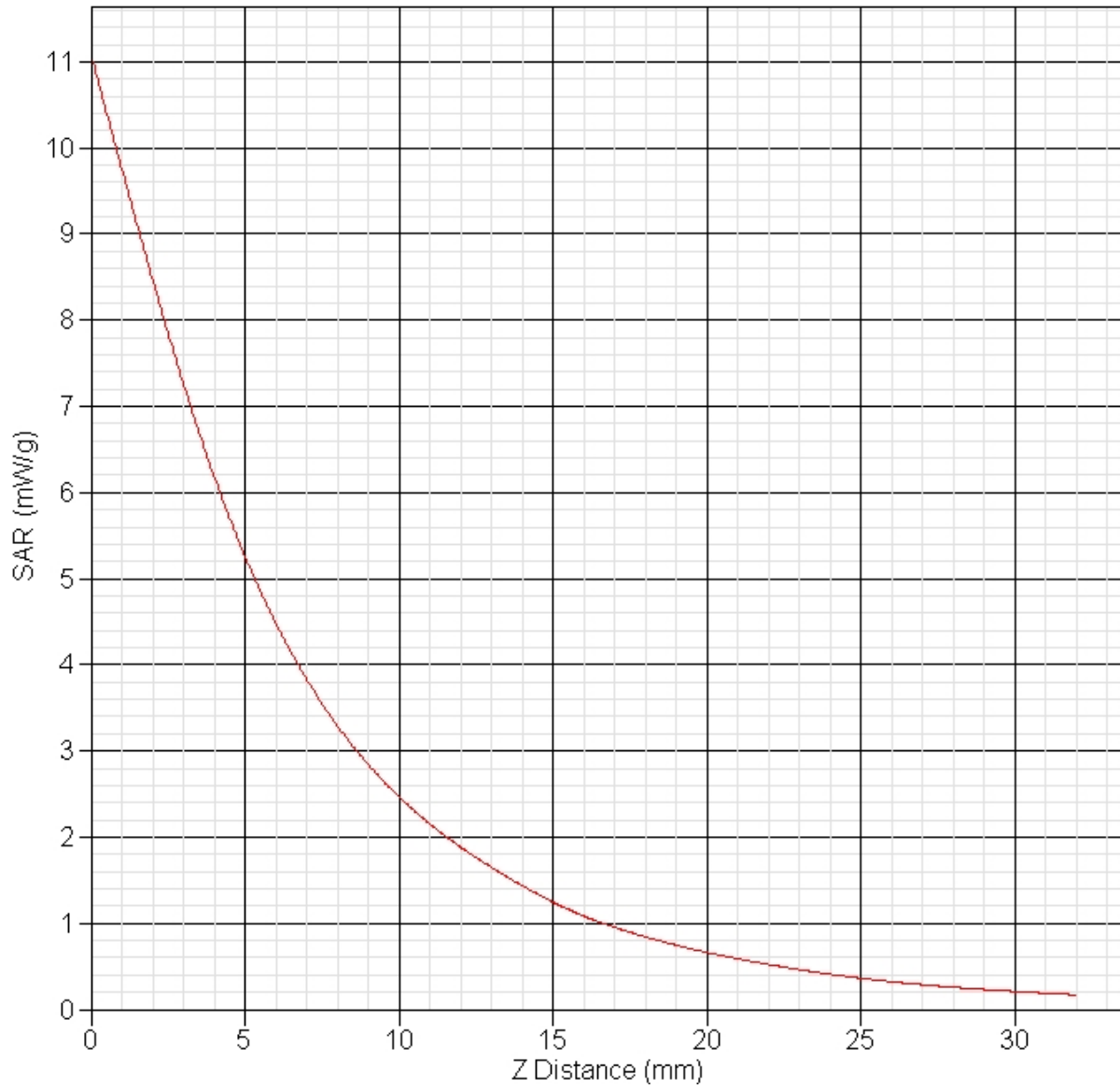
Other Data

DUT Position : Touch
Separation : 10 mm
Channel : Mid



1 gram SAR value : 5.324 W/kg
10 gram SAR value : 2.414 W/kg
Area Scan Peak SAR : 6.291 W/kg
Zoom Scan Peak SAR : 11.090 W/kg

SAR-Z Axis
at Hotspot x:0.23 y:-0.15



SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 08:09:13 AM
End Time : 07-Sep-2010 08:22:07 AM
Scanning Time : 774 secs

Product Data

Device Name : Verification
Serial No. : 2600
Type : Dipole
Model : ALS-D-2600-S-2
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time : 0 min(s)
Length : 48.8 mm
Width : 3.6 mm
Depth : 32.8 mm
Antenna Type : Internal
Orientation : Touch
Power Drift-Start : 6.215 W/kg
Power Drift-Finish: 6.280 W/kg
Power Drift (%) : 1.050

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.47 F/m
Sigma : 2.20 S/m
Density : 1000.00 kg/cu. m

Probe Data

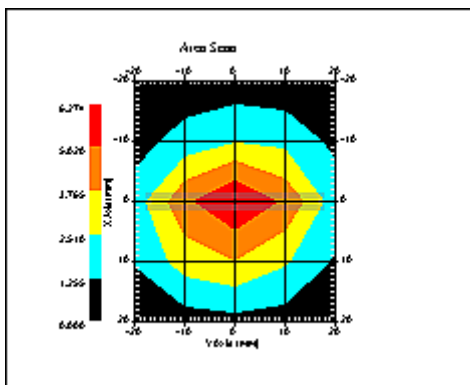
Name : Probe 217 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 7:40:13 AM
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

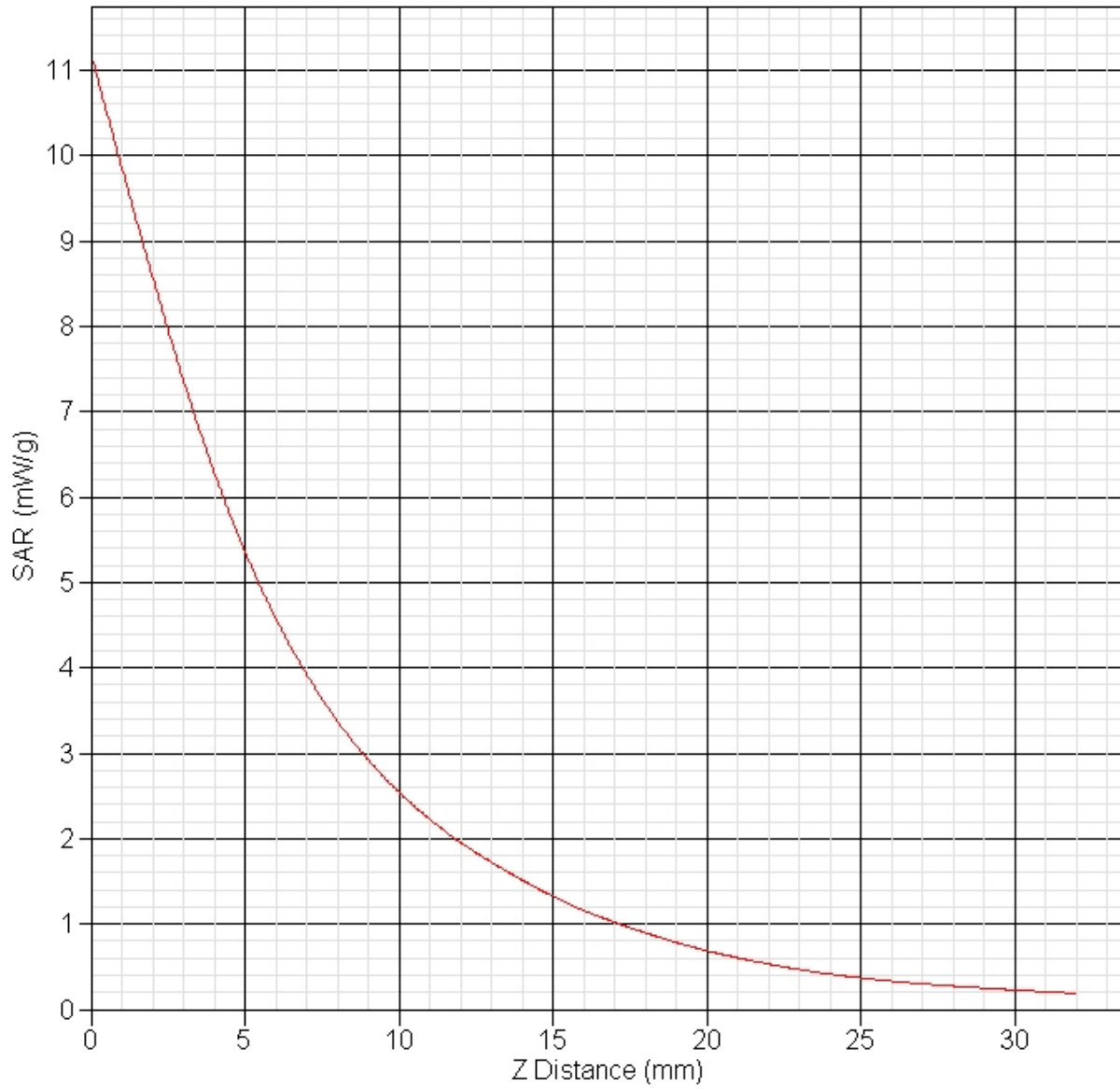
Other Data

DUT Position : Touch
Separation : 10 mm
Channel : Mid



1 gram SAR value : 5.379 W/kg
10 gram SAR value : 2.452 W/kg
Area Scan Peak SAR : 6.274 W/kg
Zoom Scan Peak SAR : 11.190 W/kg

SAR-Z Axis
at Hotspot x:0.24 y:-0.13



SAR Test Report

By Operator : Jay
Measurement Date : 12-Nov-2010
Starting Time : 12-Nov-2010 07:04:38 AM
End Time : 12-Nov-2010 07:17:36 AM
Scanning Time : 778 secs

Product Data

Device Name : Verification
Serial No. : 2600
Type : Dipole
Model : ALS-D-2600-S-2
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time : 0 min(s)
Length : 51.5 mm
Width : 3.6 mm
Depth : 30.4 mm
Antenna Type : Internal
Orientation : Touch
Power Drift-Start : 5.255 W/kg
Power Drift-Finish: 5.385 W/kg
Power Drift (%) : 2.475

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 12-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.28 F/m
Sigma : 2.17 S/m
Density : 1000.00 kg/cu. m

Probe Data

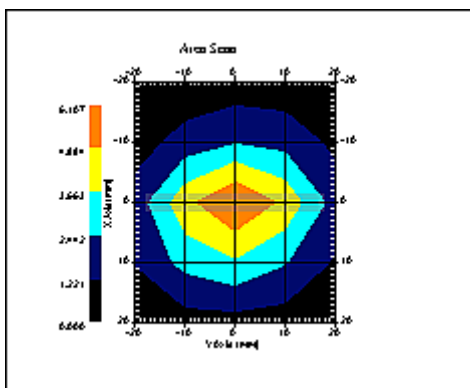
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 12-Nov-2010
Set-up Time : 7:40:13 AM
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

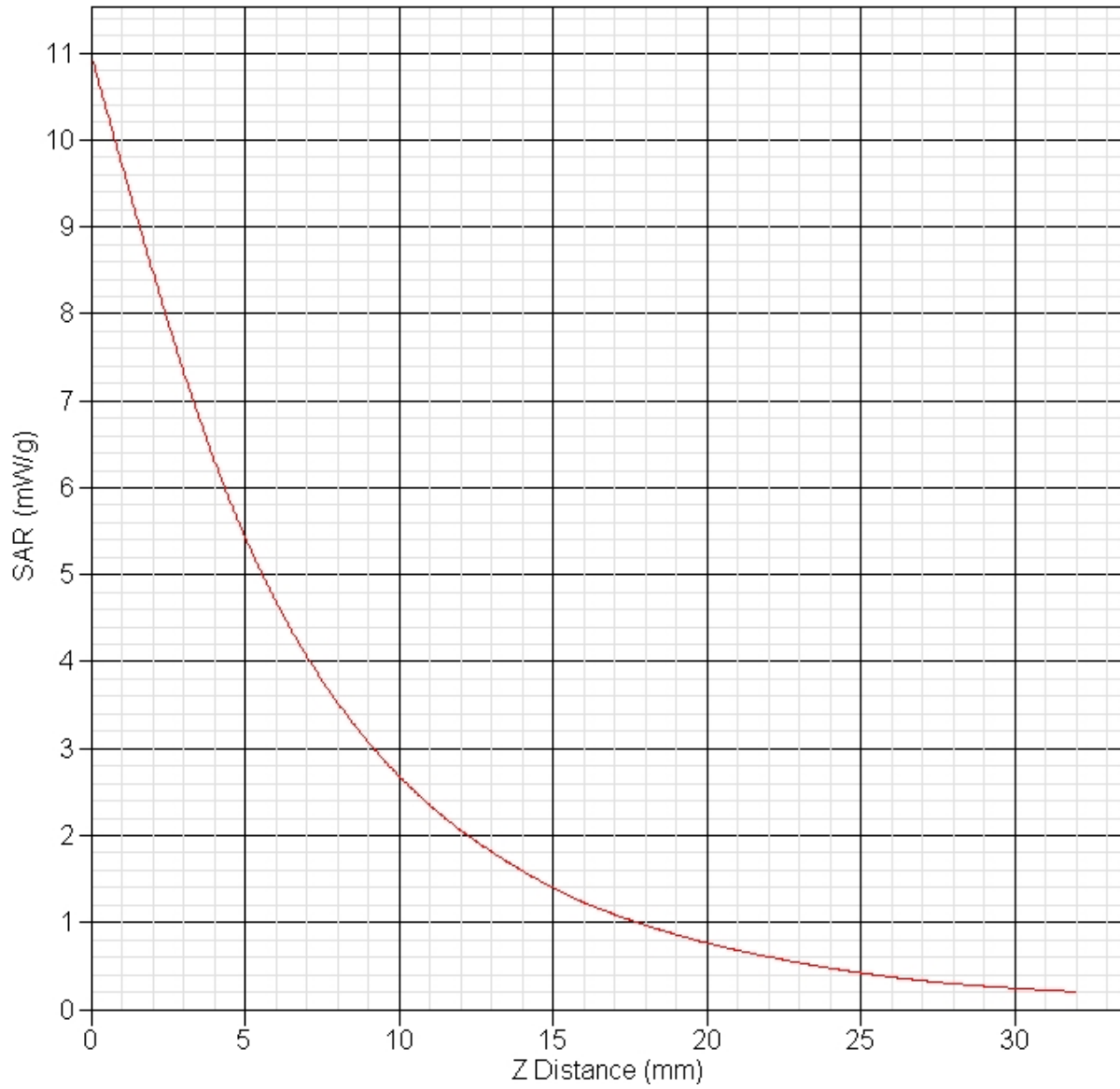
Other Data

DUT Position : Touch
Separation : 10 mm
Channel : Mid



1 gram SAR value : 5.401 W/kg
10 gram SAR value : 2.484 W/kg
Area Scan Peak SAR : 6.107 W/kg
Zoom Scan Peak SAR : 10.990 W/kg

SAR-Z Axis
at Hotspot x:0.30 y:-0.18



SAR Test Report

By Operator : Jay
Measurement Date : 20-Nov-2010
Starting Time : 20-Nov-2010 08:52:56 AM
End Time : 20-Nov-2010 09:06:02 AM
Scanning Time : 786 secs

Product Data

Device Name : Verification
Serial No. : 2600
Type : Dipole
Model : ALS-D-2600-S-2
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time : 0 min(s)
Length : 51.5 mm
Width : 3.6 mm
Depth : 30.4 mm
Antenna Type : Internal
Orientation : Touch
Power Drift-Start : 6.381 W/kg
Power Drift-Finish: 6.404 W/kg
Power Drift (%) : 0.355

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 20-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.07 F/m
Sigma : 2.18 S/m
Density : 1000.00 kg/cu. m

Probe Data

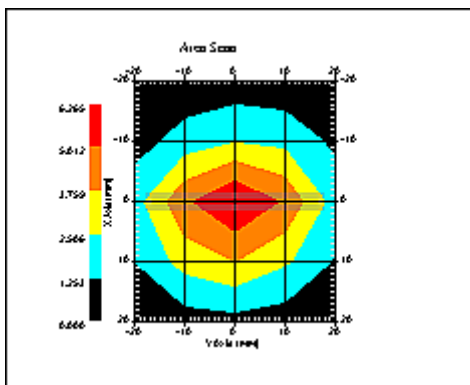
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 20-Nov-2010
Set-up Time : 7:40:13 AM
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

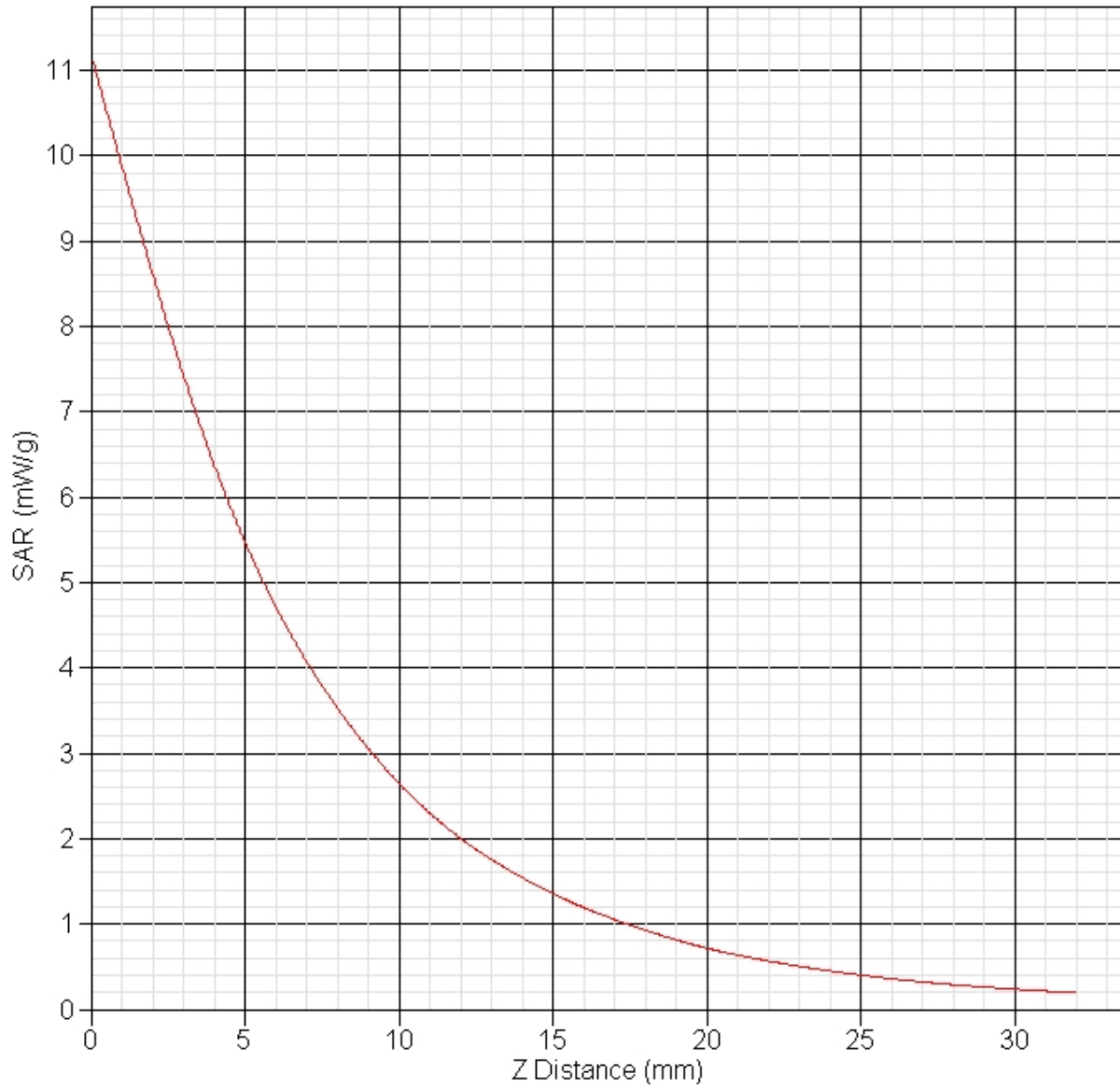
Other Data

DUT Position : Touch
Separation : 10 mm
Channel : Mid



1 gram SAR value : 5.440 W/kg
10 gram SAR value : 2.476 W/kg
Area Scan Peak SAR : 6.265 W/kg
Zoom Scan Peak SAR : 11.190 W/kg

SAR-Z Axis
at Hotspot x:0.24 y:-0.18



Appendix B – SAR Test Data Plots

Note: In all data sheets in Appendix B, the frequency noted in the ‘Product Data’ section is the frequency band which the device was transmitting. This frequency does not refer to the actual frequency and channel of the test. The channel is listed in the ‘Other Data’ section of the data sheet as Low, Mid or High. The actual test frequency is listed in Section 12 in each of the data summary sheets.

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 02:23:03 PM
End Time : 30-Aug-2010 02:39:08 PM
Scanning Time : 965 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 1.257 W/kg
Power Drift-Finish: 1.277 W/kg
Power Drift (%) : 1.633

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

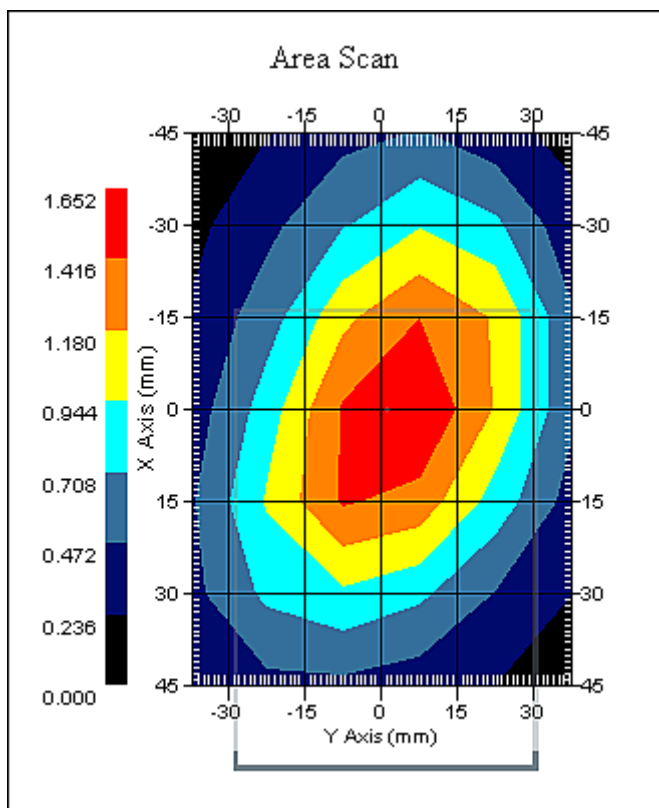
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 1.396 W/kg
10 gram SAR value : 1.051 W/kg
Area Scan Peak SAR : 1.651 W/kg
Zoom Scan Peak SAR : 2.062 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 02:05:01 PM
End Time : 30-Aug-2010 02:21:29 PM
Scanning Time : 988 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 1.132 W/kg
Power Drift-Finish: 1.175 W/kg
Power Drift (%) : 3.845

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

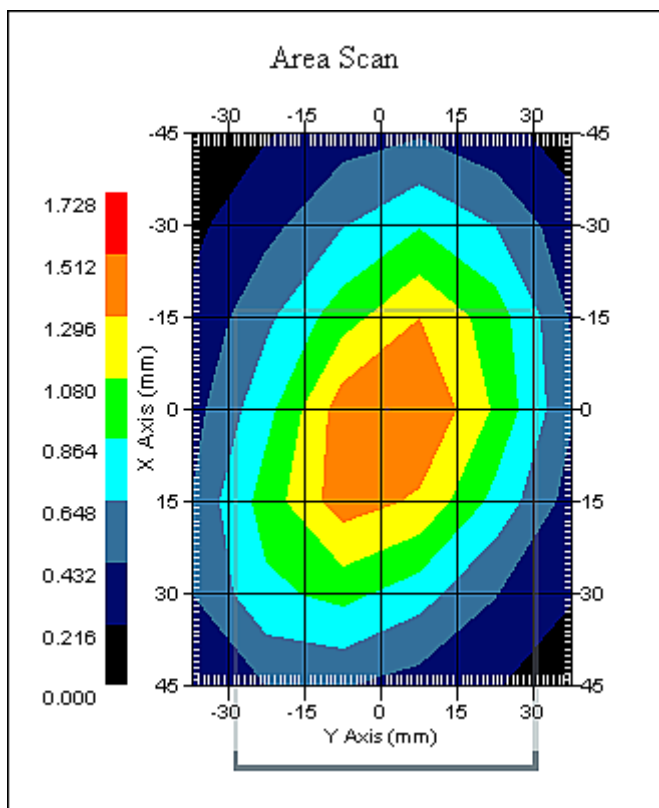
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Mid



1 gram SAR value : 1.376 W/kg
10 gram SAR value : 1.009 W/kg
Area Scan Peak SAR : 1.515 W/kg
Zoom Scan Peak SAR : 2.061 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 02:40:20 PM
End Time : 30-Aug-2010 02:56:33 PM
Scanning Time : 973 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 1.139 W/kg
Power Drift-Finish: 1.155 W/kg
Power Drift (%) : 1.438

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

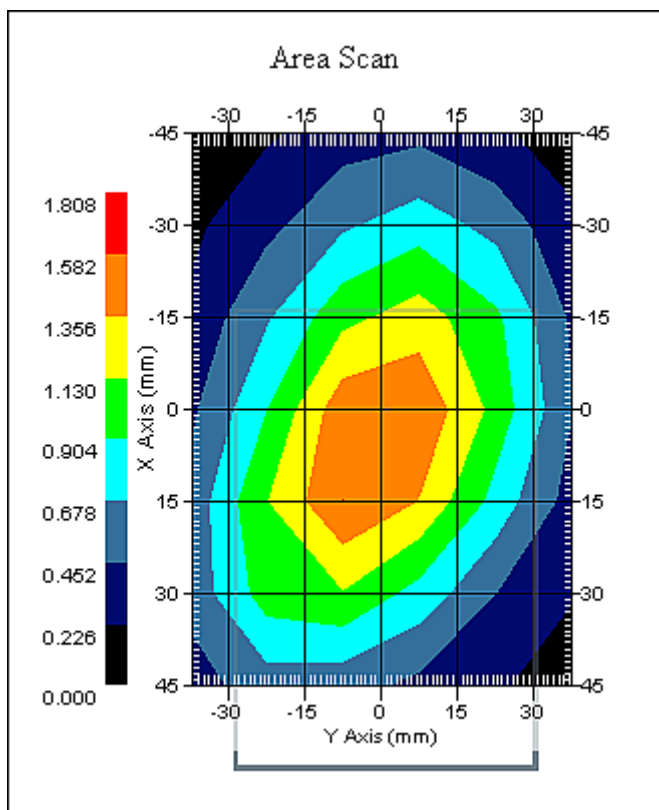
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

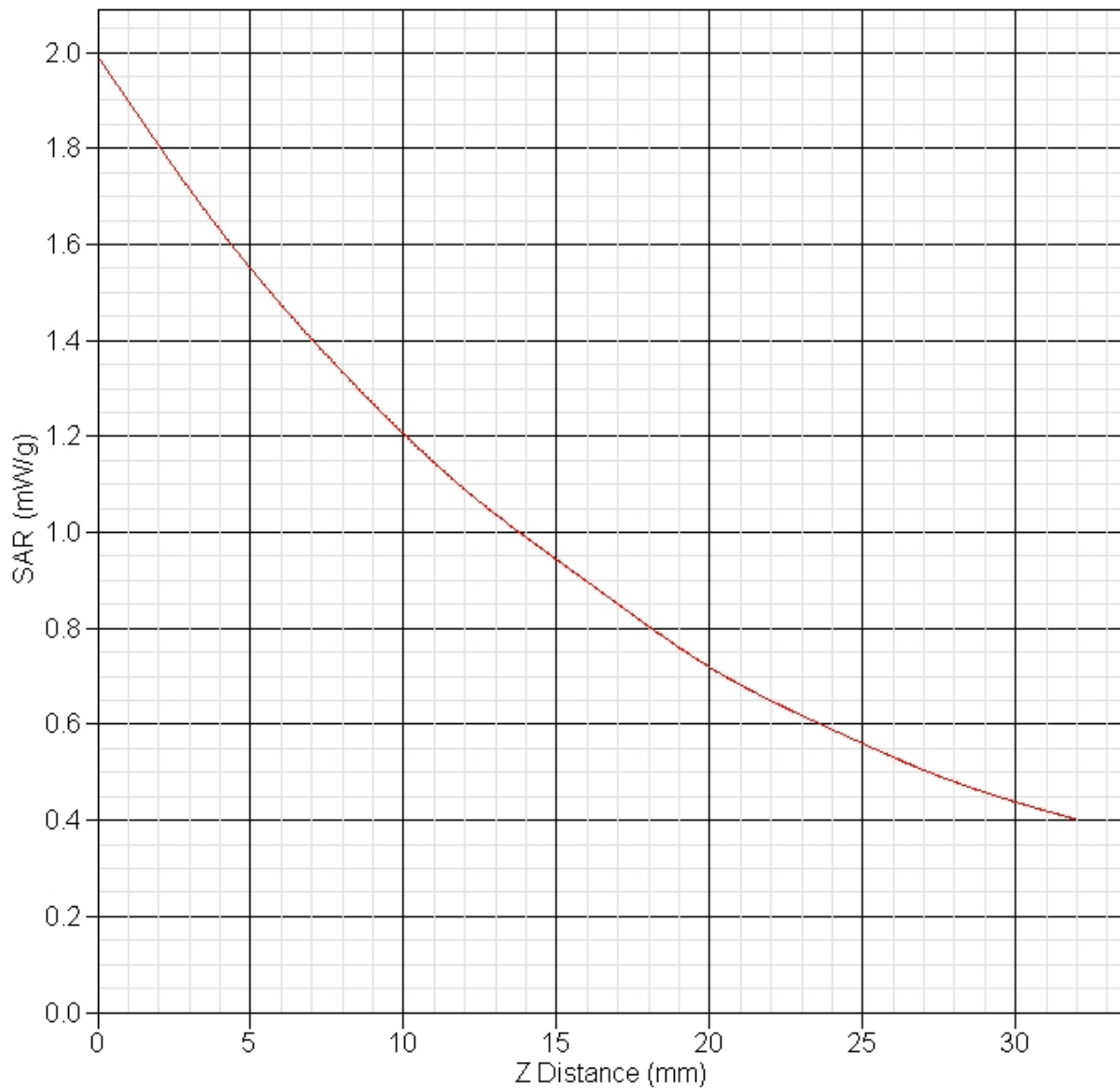
Other Data

DUT Position : Top
Separation : 12 mm
Channel : High



1 gram SAR value : 1.398 W/kg
10 gram SAR value : 1.033 W/kg
Area Scan Peak SAR : 1.583 W/kg
Zoom Scan Peak SAR : 1.991 W/kg

SAR-Z Axis
at Hotspot x:22.06 y:0.83



SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 03:57:30 PM
End Time : 30-Aug-2010 04:13:32 PM
Scanning Time : 962 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Bottom
Power Drift-Start : 0.806 W/kg
Power Drift-Finish: 0.825 W/kg
Power Drift (%) : 2.411

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

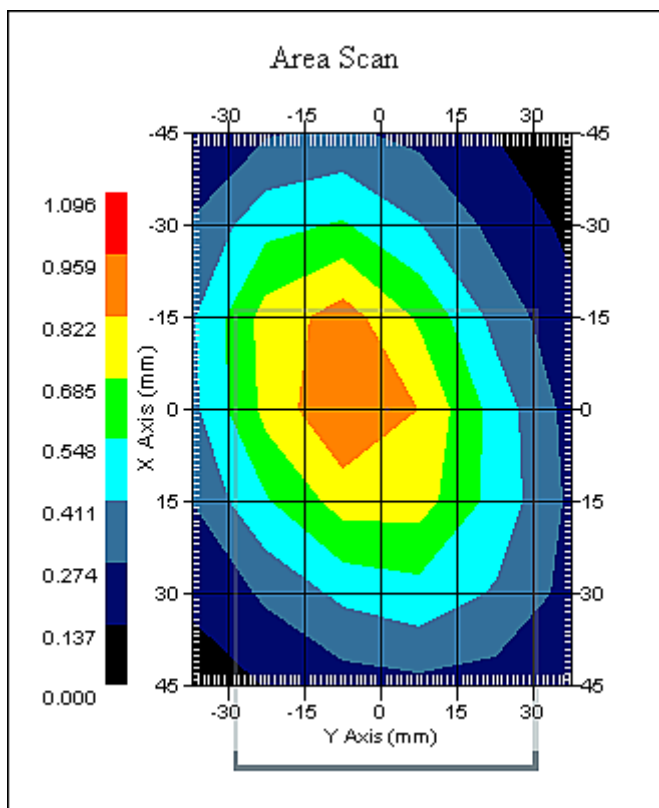
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.914 W/kg
10 gram SAR value : 0.656 W/kg
Area Scan Peak SAR : 0.960 W/kg
Zoom Scan Peak SAR : 1.231 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 03:40:17 PM
End Time : 30-Aug-2010 03:56:14 PM
Scanning Time : 957 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Bottom
Power Drift-Start : 0.922 W/kg
Power Drift-Finish: 0.924 W/kg
Power Drift (%) : 0.151

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

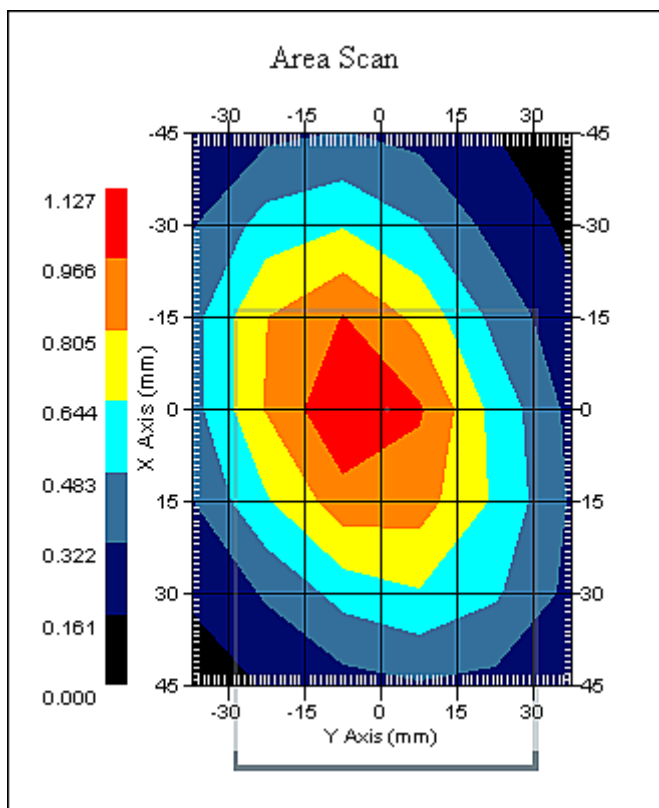
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Mid



1 gram SAR value : 1.058 W/kg
10 gram SAR value : 0.749 W/kg
Area Scan Peak SAR : 1.127 W/kg
Zoom Scan Peak SAR : 1.461 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 03:21:45 PM
End Time : 30-Aug-2010 03:37:44 PM
Scanning Time : 959 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Bottom
Power Drift-Start : 0.814 W/kg
Power Drift-Finish: 0.778 W/kg
Power Drift (%) : -4.428

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

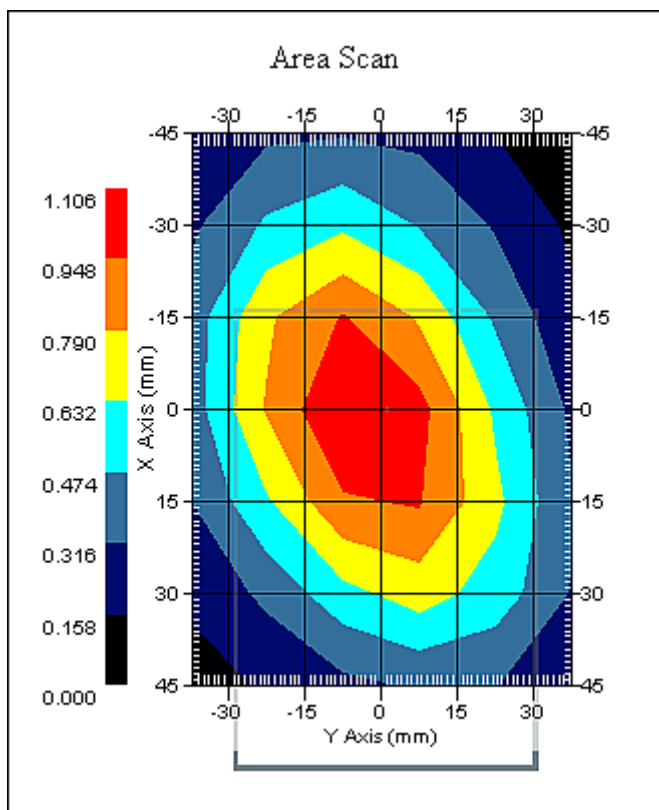
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : High



1 gram SAR value : 0.994 W/kg
10 gram SAR value : 0.699 W/kg
Area Scan Peak SAR : 1.105 W/kg
Zoom Scan Peak SAR : 1.461 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 04:15:14 PM
End Time : 30-Aug-2010 04:31:22 PM
Scanning Time : 968 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 60 mm
Width : 12 mm
Depth : 90 mm
Antenna Type : Internal
Orientation : End
Power Drift-Start : 0.093 W/kg
Power Drift-Finish: 0.095 W/kg
Power Drift (%) : 2.153

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

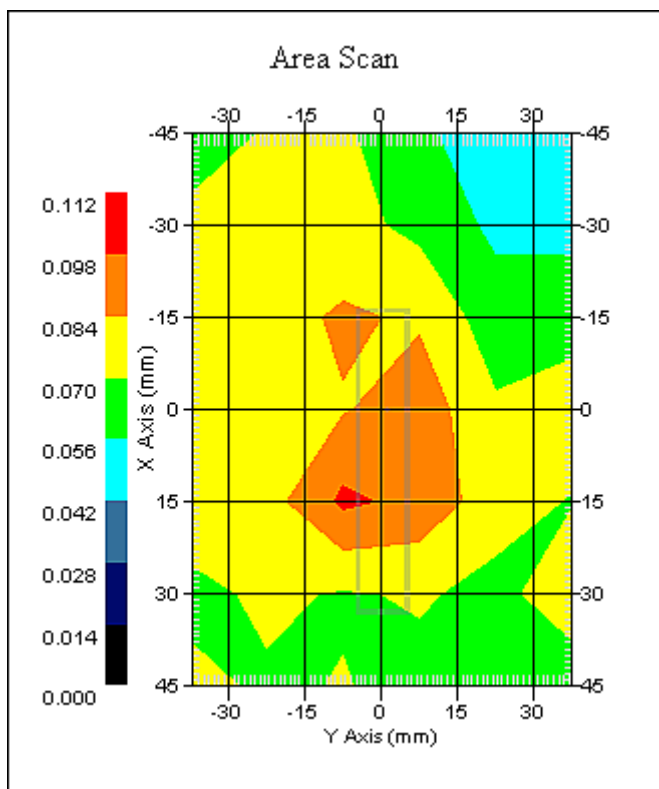
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : End
Separation : 12 mm
Channel : High



1 gram SAR value : 0.101 W/kg
10 gram SAR value : 0.075 W/kg
Area Scan Peak SAR : 0.101 W/kg
Zoom Scan Peak SAR : 0.150 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 04:32:53 PM
End Time : 30-Aug-2010 04:49:06 PM
Scanning Time : 973 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal
Orientation : Left
Power Drift-Start : 0.582 W/kg
Power Drift-Finish: 0.565 W/kg
Power Drift (%) : -2.937

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

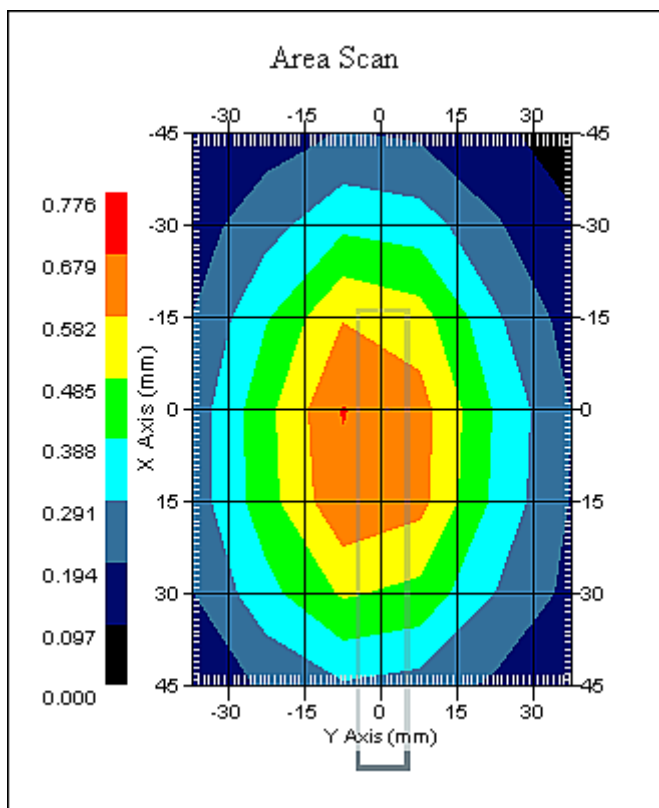
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : High



1 gram SAR value : 0.686 W/kg
10 gram SAR value : 0.482 W/kg
Area Scan Peak SAR : 0.682 W/kg
Zoom Scan Peak SAR : 0.920 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 04:50:27 PM
End Time : 30-Aug-2010 05:06:36 PM
Scanning Time : 969 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal
Orientation : Right
Power Drift-Start : 0.570 W/kg
Power Drift-Finish: 0.585 W/kg
Power Drift (%) : -2.639

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

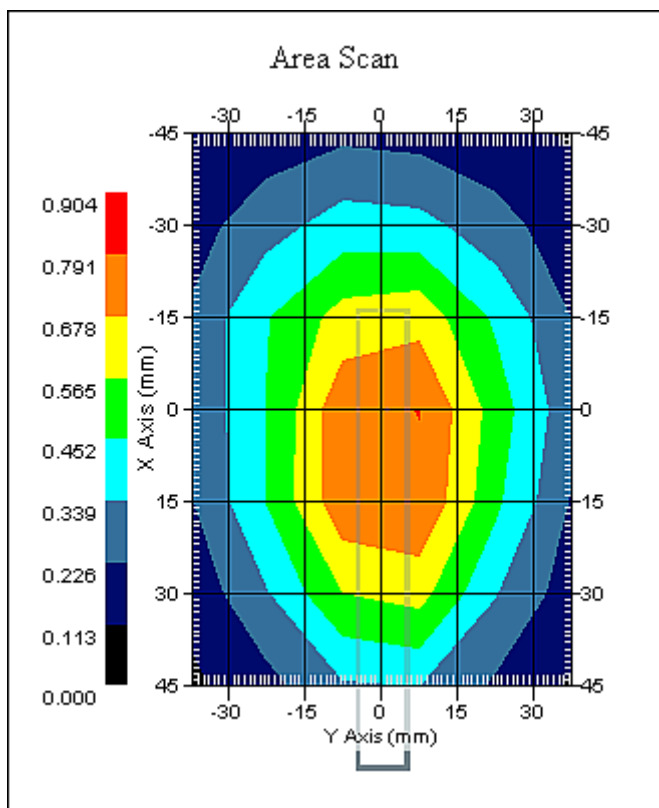
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Right
Separation : 12 mm
Channel : High



1 gram SAR value : 0.789 W/kg
10 gram SAR value : 0.564 W/kg
Area Scan Peak SAR : 0.793 W/kg
Zoom Scan Peak SAR : 1.060 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 02:57:58 PM
End Time : 30-Aug-2010 03:14:05 PM
Scanning Time : 967 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. A
Model : MiFi4082
Frequency : 850.00 MHz
Max. Transmit Pwr : 0.285 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 1.125 W/kg
Power Drift-Finish: 1.071 W/kg
Power Drift (%) : -4.778

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 835
Frequency : 835.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 40.00 RH%
Epsilon : 55.01 F/m
Sigma : 0.99 S/m
Density : 1000.00 kg/cu. m

Probe Data

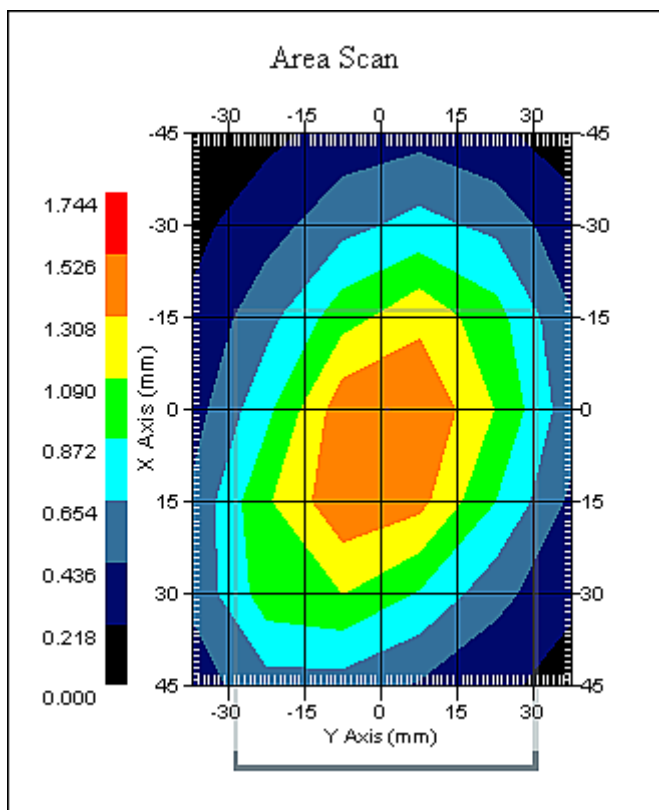
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 835.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 6.1
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 12:47:41 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : High



1 gram SAR value : 1.330 W/kg
10 gram SAR value : 0.980 W/kg
Area Scan Peak SAR : 1.527 W/kg
Zoom Scan Peak SAR : 1.961 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 08:22:54 AM
End Time : 30-Aug-2010 08:39:13 AM
Scanning Time : 979 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 1.327 W/kg
Power Drift-Finish: 1.382 W/kg
Power Drift (%) : 4.125

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

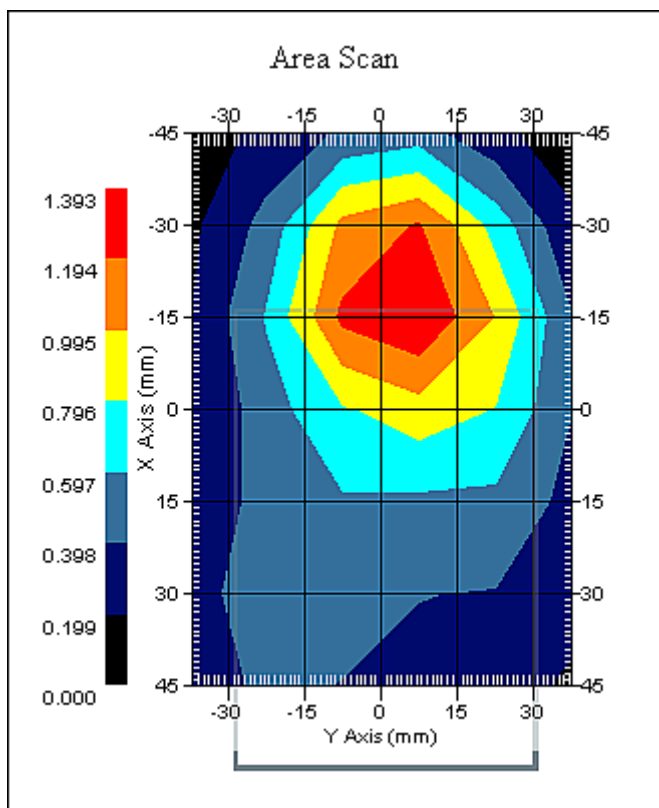
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

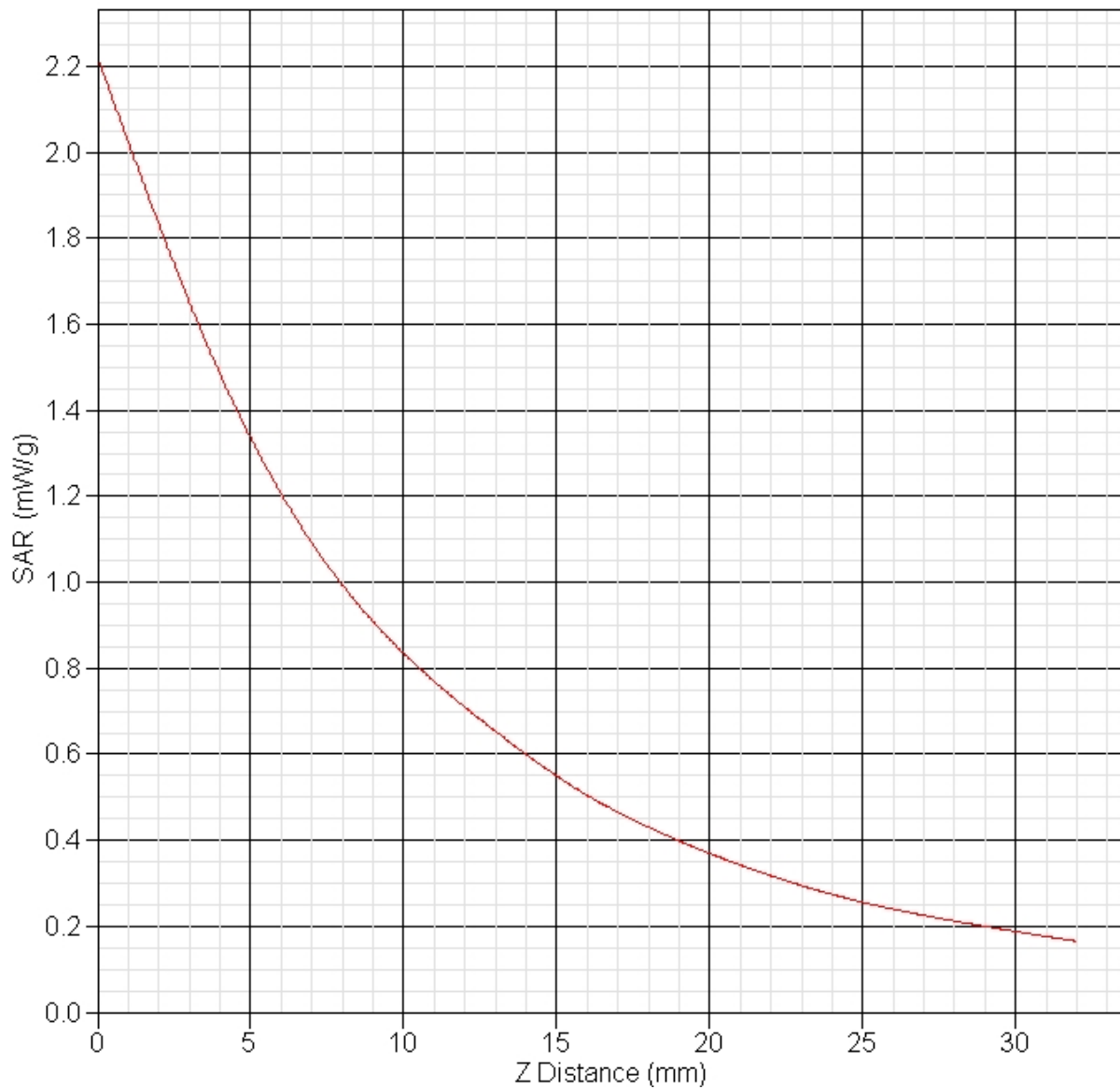
Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 1.377 W/kg
10 gram SAR value : 0.838 W/kg
Area Scan Peak SAR : 1.393 W/kg
Zoom Scan Peak SAR : 2.222 W/kg

SAR-Z Axis
at Hotspot x:-7.90 y:-0.11



SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 08:41:47 AM
End Time : 30-Aug-2010 08:57:55 AM
Scanning Time : 968 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 1.311 W/kg
Power Drift-Finish: 1.286 W/kg
Power Drift (%) : -1.928

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

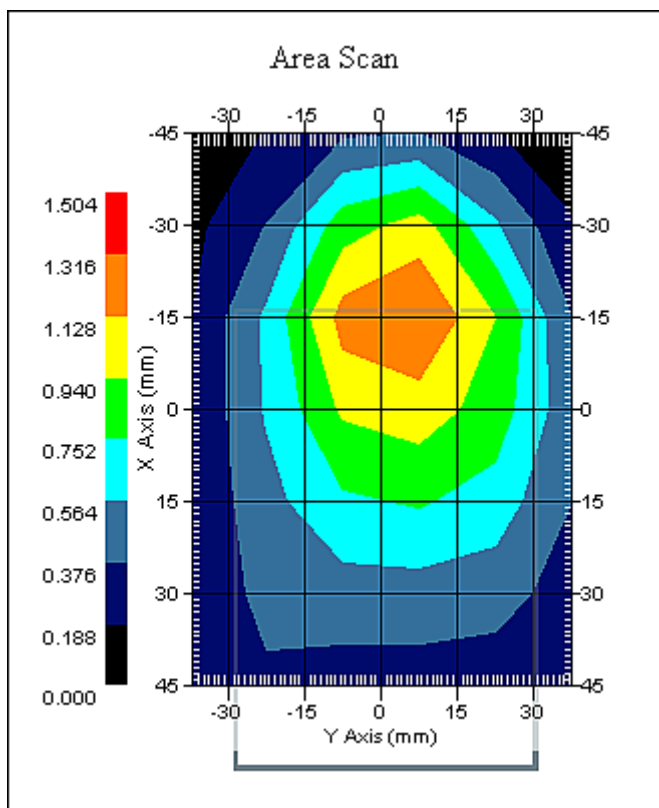
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Mid



1 gram SAR value : 1.248 W/kg
10 gram SAR value : 0.786 W/kg
Area Scan Peak SAR : 1.317 W/kg
Zoom Scan Peak SAR : 1.901 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 08:59:09 AM
End Time : 30-Aug-2010 09:15:16 AM
Scanning Time : 967 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 0.723 W/kg
Power Drift-Finish: 0.705 W/kg
Power Drift (%) : -2.489

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

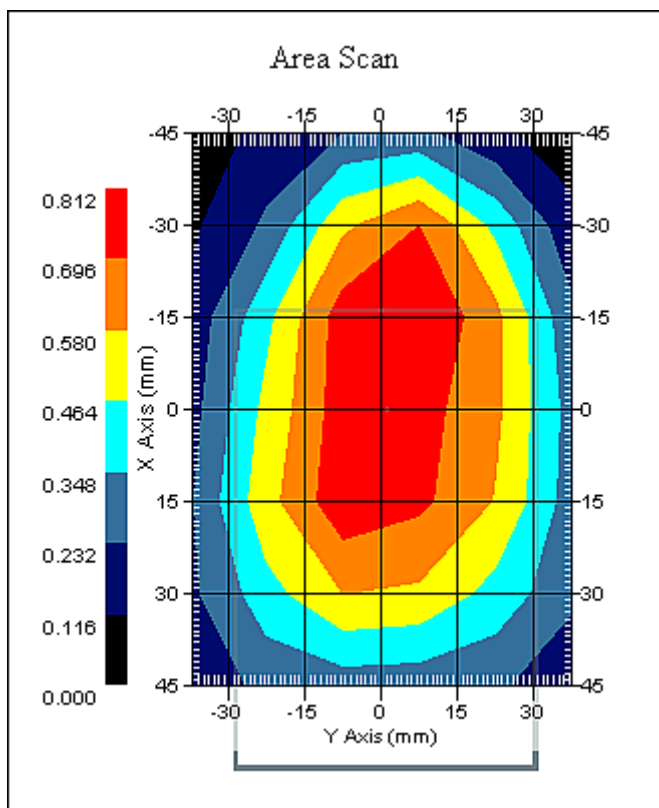
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : High



1 gram SAR value : 0.726 W/kg
10 gram SAR value : 0.471 W/kg
Area Scan Peak SAR : 0.809 W/kg
Zoom Scan Peak SAR : 1.090 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 09:41:44 AM
End Time : 30-Aug-2010 09:57:54 AM
Scanning Time : 970 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Bottom
Power Drift-Start : 1.012 W/kg
Power Drift-Finish: 1.020 W/kg
Power Drift (%) : 0.725

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

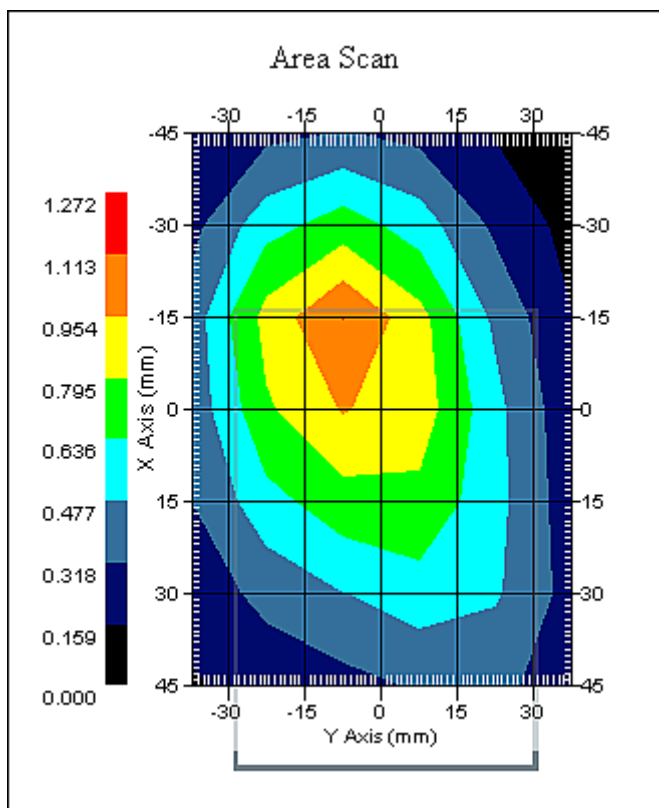
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Low



1 gram SAR value : 1.031 W/kg
10 gram SAR value : 0.654 W/kg
Area Scan Peak SAR : 1.114 W/kg
Zoom Scan Peak SAR : 1.551 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 09:59:20 AM
End Time : 30-Aug-2010 10:15:37 AM
Scanning Time : 977 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Bottom
Power Drift-Start : 0.995 W/kg
Power Drift-Finish: 1.015 W/kg
Power Drift (%) : 2.012

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

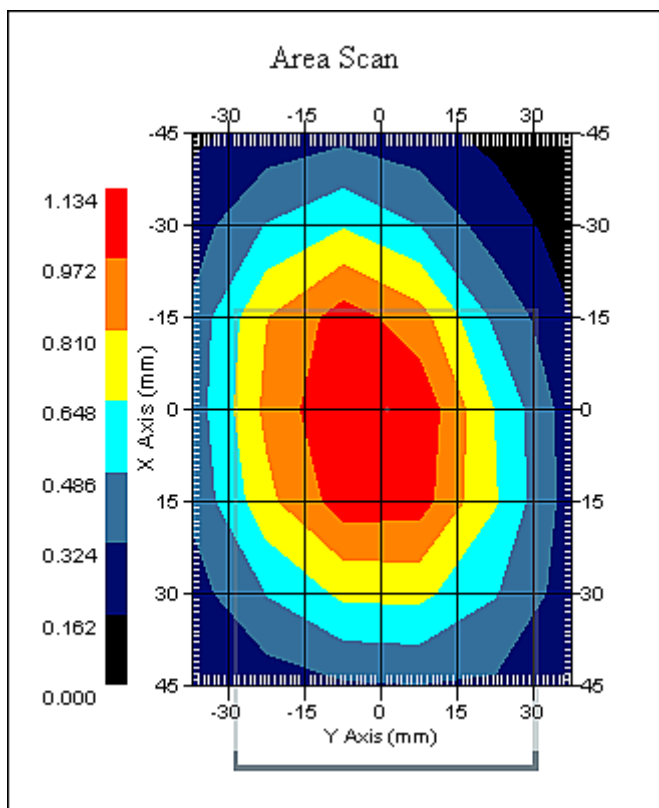
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Mid



1 gram SAR value : 1.123 W/kg
10 gram SAR value : 0.726 W/kg
Area Scan Peak SAR : 1.131 W/kg
Zoom Scan Peak SAR : 1.661 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 10:16:58 AM
End Time : 30-Aug-2010 10:33:02 AM
Scanning Time : 964 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Bottom
Power Drift-Start : 0.667 W/kg
Power Drift-Finish: 0.651 W/kg
Power Drift (%) : -2.370

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

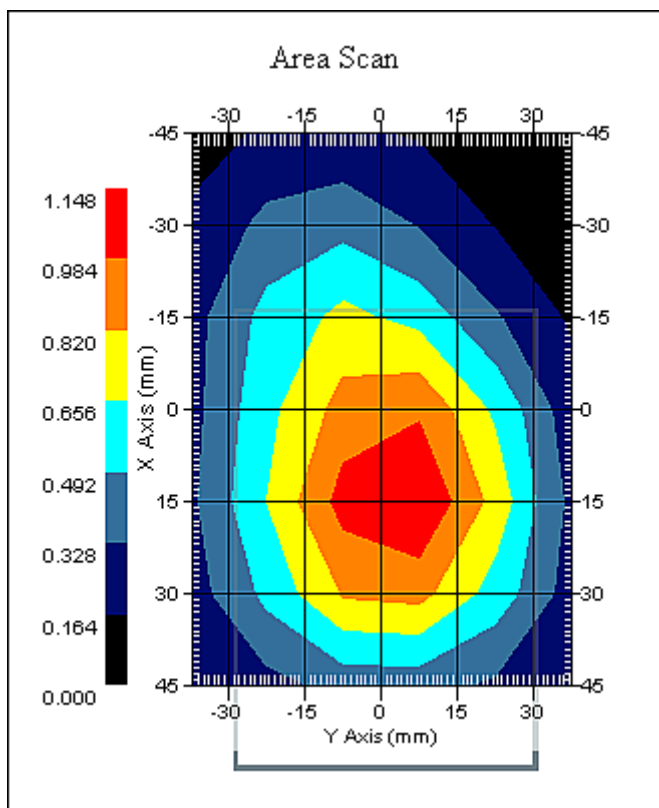
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : High



1 gram SAR value : 1.093 W/kg
10 gram SAR value : 0.699 W/kg
Area Scan Peak SAR : 1.148 W/kg
Zoom Scan Peak SAR : 1.641 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 10:50:41 AM
End Time : 30-Aug-2010 11:06:51 AM
Scanning Time : 970 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 60 mm
Width : 12 mm
Depth : 90 mm
Antenna Type : Internal
Orientation : End
Power Drift-Start : 0.412 W/kg
Power Drift-Finish: 0.425 W/kg
Power Drift (%) : 3.158

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

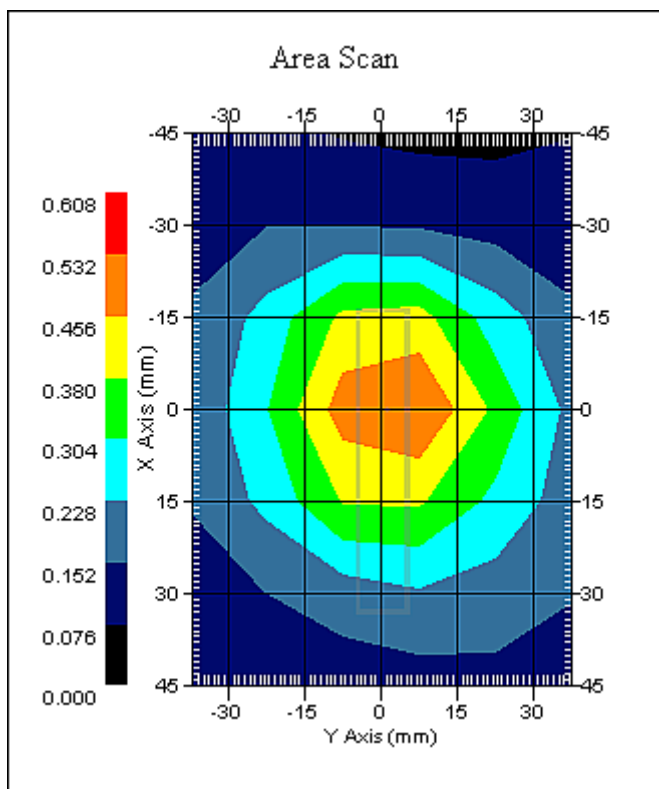
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : End
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.498 W/kg
10 gram SAR value : 0.318 W/kg
Area Scan Peak SAR : 0.533 W/kg
Zoom Scan Peak SAR : 0.770 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 11:08:23 AM
End Time : 30-Aug-2010 11:24:37 AM
Scanning Time : 974 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal
Orientation : Left
Power Drift-Start : 0.433 W/kg
Power Drift-Finish: 0.444 W/kg
Power Drift (%) : 2.522

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

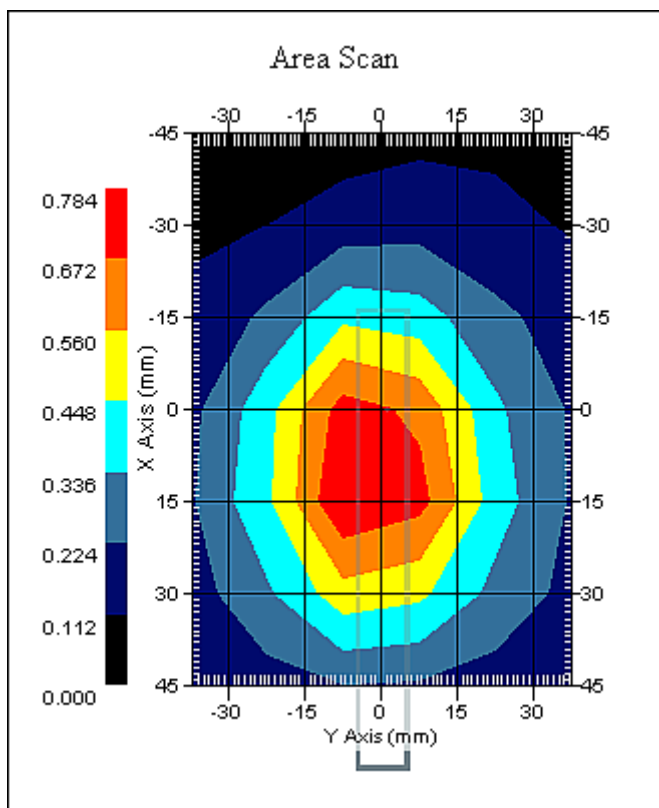
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.802 W/kg
10 gram SAR value : 0.496 W/kg
Area Scan Peak SAR : 0.781 W/kg
Zoom Scan Peak SAR : 1.281 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 11:34:04 AM
End Time : 30-Aug-2010 11:50:13 AM
Scanning Time : 969 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal
Orientation : Left
Power Drift-Start : 0.429 W/kg
Power Drift-Finish: 0.437 W/kg
Power Drift (%) : 1.681

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

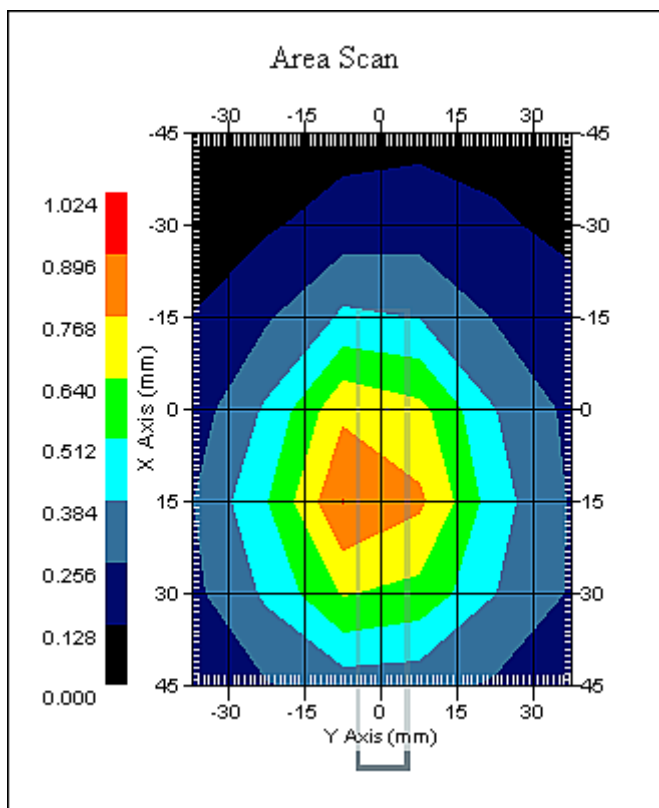
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.850 W/kg
10 gram SAR value : 0.532 W/kg
Area Scan Peak SAR : 0.899 W/kg
Zoom Scan Peak SAR : 1.271 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 11:51:44 AM
End Time : 30-Aug-2010 12:07:51 PM
Scanning Time : 967 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal
Orientation : Left
Power Drift-Start : 0.395 W/kg
Power Drift-Finish: 0.405 W/kg
Power Drift (%) : 2.620

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

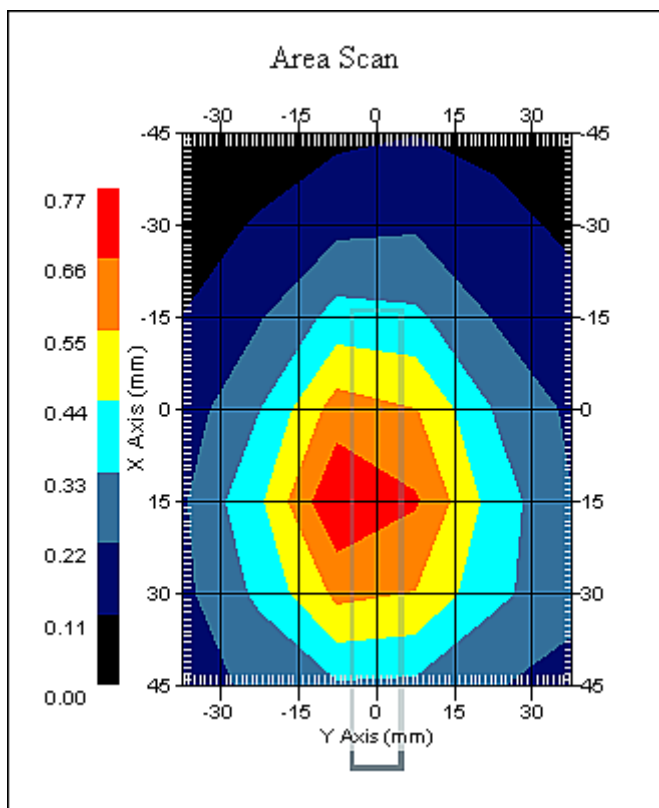
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : High



1 gram SAR value : 0.748 W/kg
10 gram SAR value : 0.463 W/kg
Area Scan Peak SAR : 0.768 W/kg
Zoom Scan Peak SAR : 1.161 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 12:09:10 PM
End Time : 30-Aug-2010 12:25:21 PM
Scanning Time : 971 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. 0
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal
Orientation : Right
Power Drift-Start : 0.118 W/kg
Power Drift-Finish: 0.123 W/kg
Power Drift (%) : 4.236

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

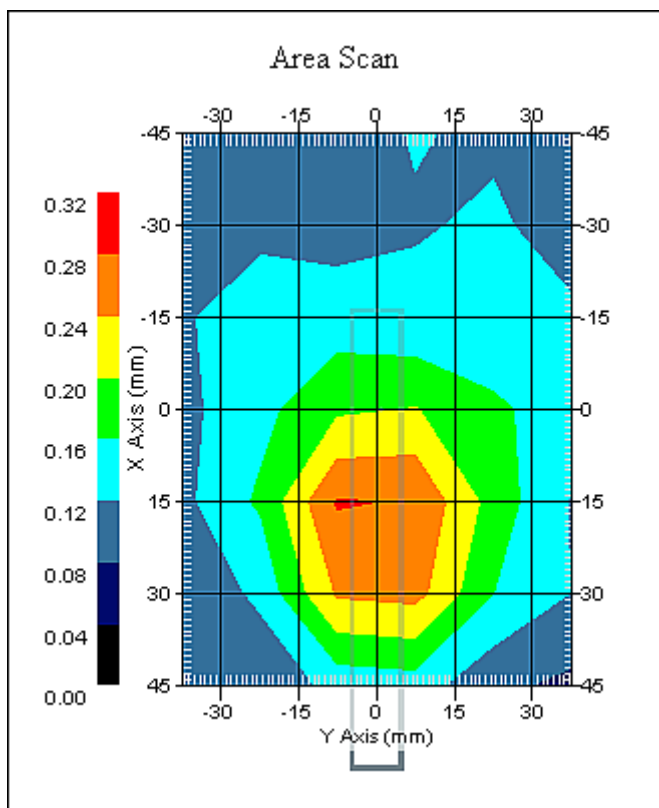
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Right
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.279 W/kg
10 gram SAR value : 0.183 W/kg
Area Scan Peak SAR : 0.283 W/kg
Zoom Scan Peak SAR : 0.370 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 30-Aug-2010
Starting Time : 30-Aug-2010 09:24:07 AM
End Time : 30-Aug-2010 09:40:16 AM
Scanning Time : 969 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : Rev. A
Model : MiFi4082
Frequency : 1900.00 MHz
Max. Transmit Pwr : 0.258 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 1.093 W/kg
Power Drift-Finish: 1.096 W/kg
Power Drift (%) : 0.299

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 1900
Frequency : 1900.00 MHz
Last Calib. Date : 30-Aug-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 36.00 RH%
Epsilon : 53.12 F/m
Sigma : 1.54 S/m
Density : 1000.00 kg/cu. m

Probe Data

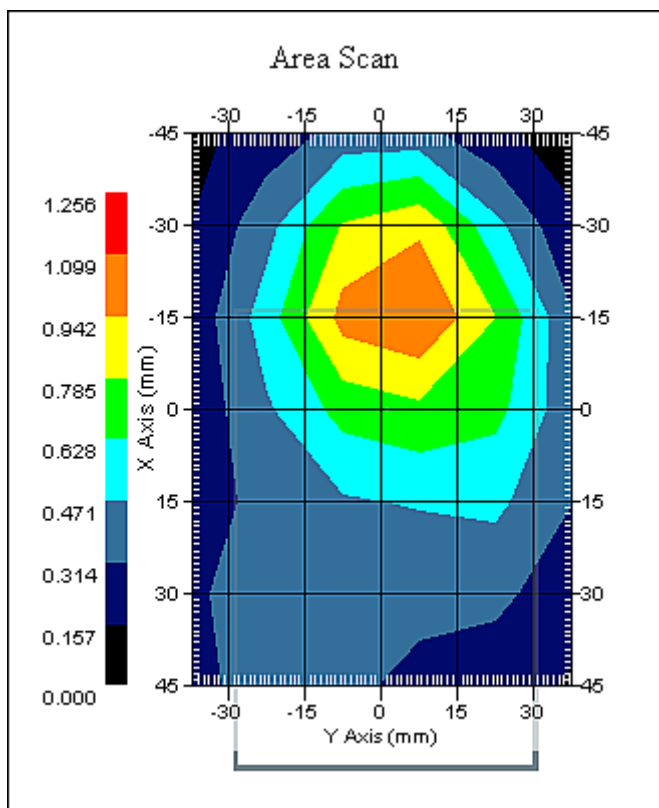
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 1900.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.85
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 30-Aug-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 1.063 W/kg
10 gram SAR value : 0.667 W/kg
Area Scan Peak SAR : 1.100 W/kg
Zoom Scan Peak SAR : 1.641 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 03-Sep-2010
Starting Time : 03-Sep-2010 08:13:49 AM
End Time : 03-Sep-2010 08:30:22 AM
Scanning Time : 993 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : 802.11b
Model : MiFi4082
Frequency : 2450.00 MHz
Max. Transmit Pwr : 0.061 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Top
Power Drift-Start : 0.223 W/kg
Power Drift-Finish: 0.226 W/kg
Power Drift (%) : 1.348

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2450
Frequency : 2450.00 MHz
Last Calib. Date : 03-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 46.00 RH%
Epsilon : 52.41 F/m
Sigma : 1.96 S/m
Density : 1000.00 kg/cu. m

Probe Data

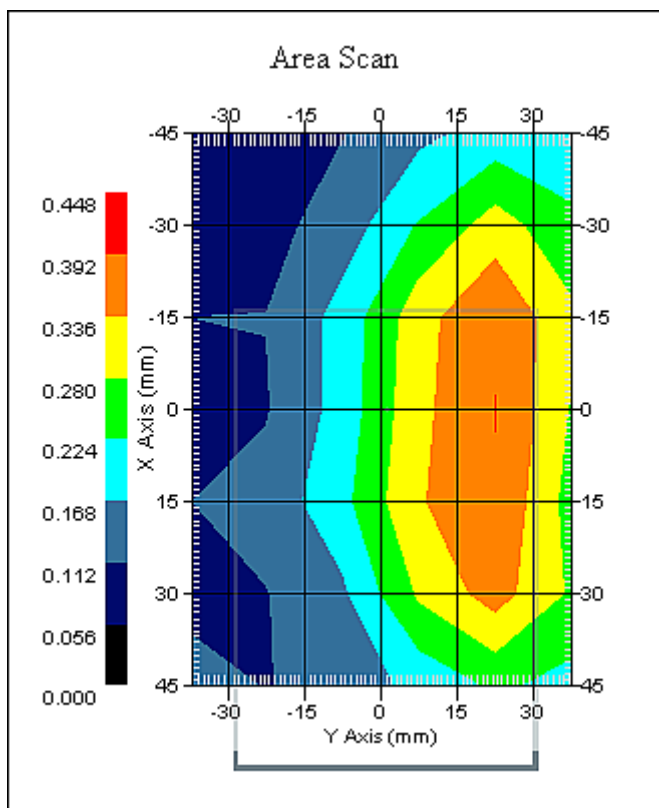
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2450.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 3.61
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 03-Sep-2010
Set-up Time : 8:00:02 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

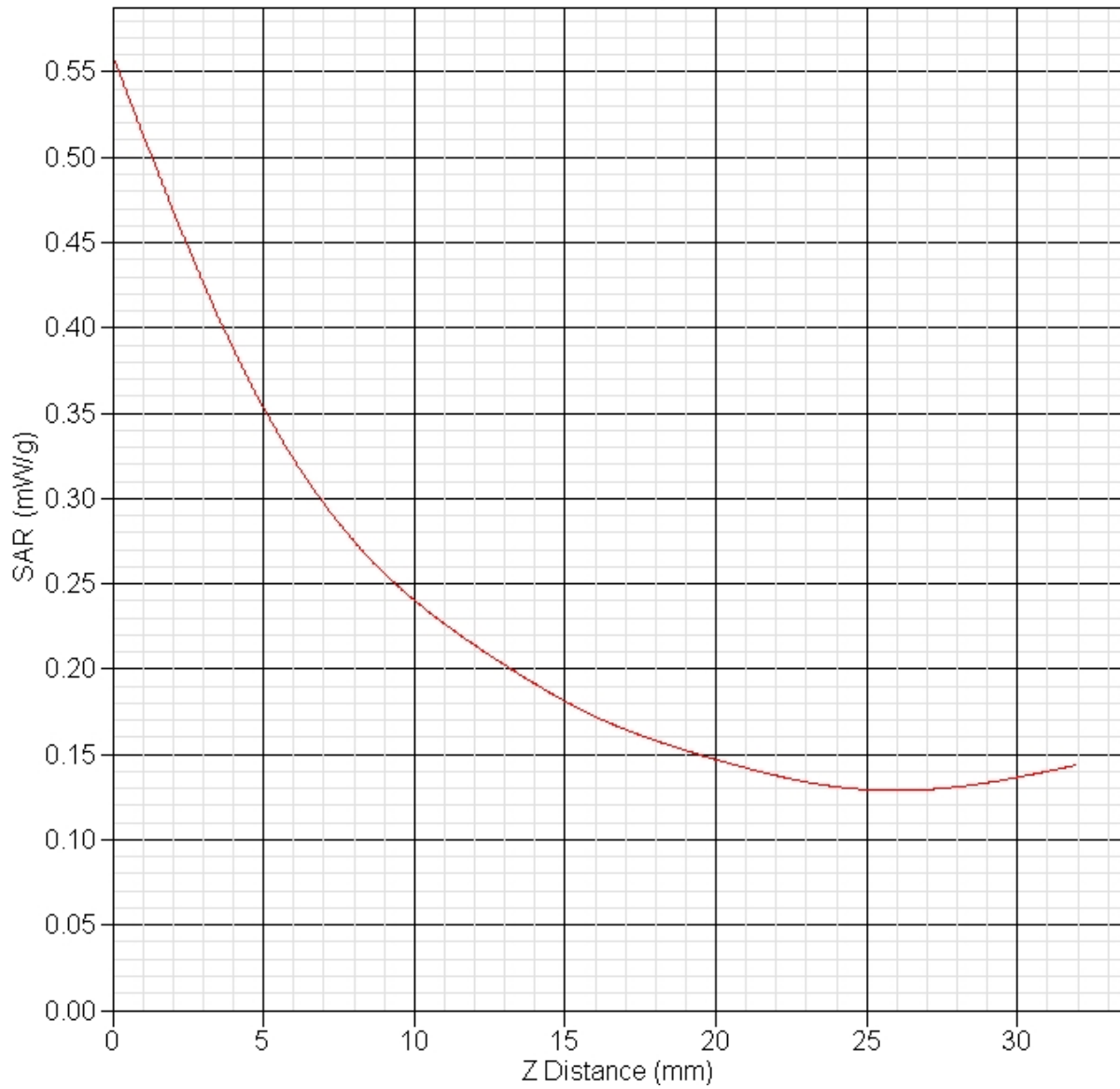
Other Data

DUT Position : Top
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.172 W/kg
10 gram SAR value : 0.146 W/kg
Area Scan Peak SAR : 0.393 W/kg
Zoom Scan Peak SAR : 0.560 W/kg

SAR-Z Axis
at Hotspot x:-0.93 y:22.84



SAR Test Report

By Operator : Jay
Measurement Date : 03-Sep-2010
Starting Time : 03-Sep-2010 10:06:30 AM
End Time : 03-Sep-2010 10:23:03 AM
Scanning Time : 993 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : 802.11b
Model : MiFi4082
Frequency : 2450.00 MHz
Max. Transmit Pwr : 0.061 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal
Orientation : Bottom
Power Drift-Start : 0.155 W/kg
Power Drift-Finish: 0.150 W/kg
Power Drift (%) : -3.335

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2450
Frequency : 2450.00 MHz
Last Calib. Date : 03-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 46.00 RH%
Epsilon : 52.41 F/m
Sigma : 1.96 S/m
Density : 1000.00 kg/cu. m

Probe Data

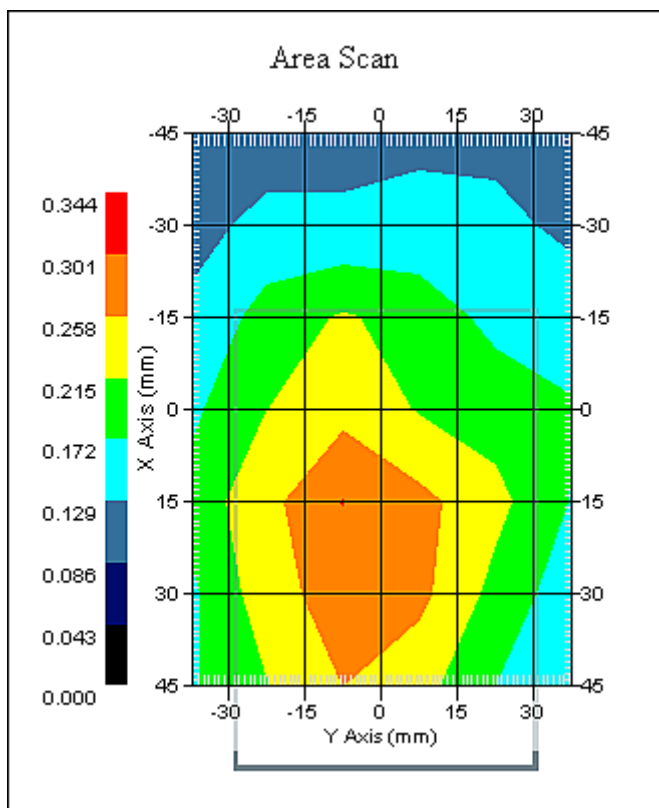
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2450.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 3.61
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 03-Sep-2010
Set-up Time : 8:00:02 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.082 W/kg
10 gram SAR value : 0.100 W/kg
Area Scan Peak SAR : 0.202 W/kg
Zoom Scan Peak SAR : 0.330 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 03-Sep-2010
Starting Time : 03-Sep-2010 09:27:34 AM
End Time : 03-Sep-2010 09:44:06 AM
Scanning Time : 992 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : 802.11b
Model : MiFi4082
Frequency : 2450.00 MHz
Max. Transmit Pwr : 0.061 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal
Orientation : Right
Power Drift-Start : 0.272 W/kg
Power Drift-Finish: 0.266 W/kg
Power Drift (%) : -2.204

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2450
Frequency : 2450.00 MHz
Last Calib. Date : 03-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 46.00 RH%
Epsilon : 52.41 F/m
Sigma : 1.96 S/m
Density : 1000.00 kg/cu. m

Probe Data

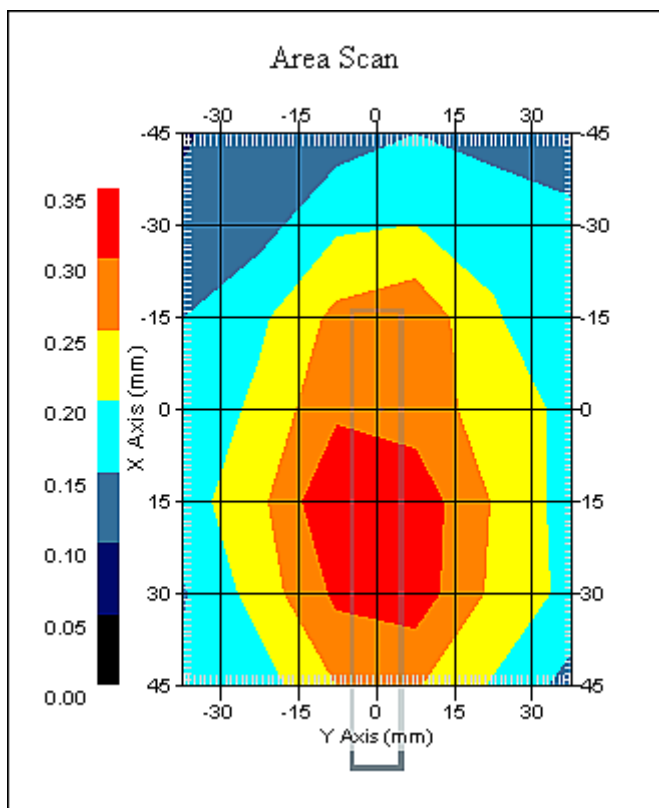
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2450.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 3.61
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 1
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 03-Sep-2010
Set-up Time : 8:00:02 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Right
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.162 W/kg
10 gram SAR value : 0.133 W/kg
Area Scan Peak SAR : 0.348 W/kg
Zoom Scan Peak SAR : 0.460 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 10:18:16 AM
End Time : 02-Sep-2010 10:36:57 AM
Scanning Time : 1121 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Top
Power Drift-Start : 0.066 W/kg
Power Drift-Finish: 0.068 W/kg
Power Drift (%) : 3.038

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

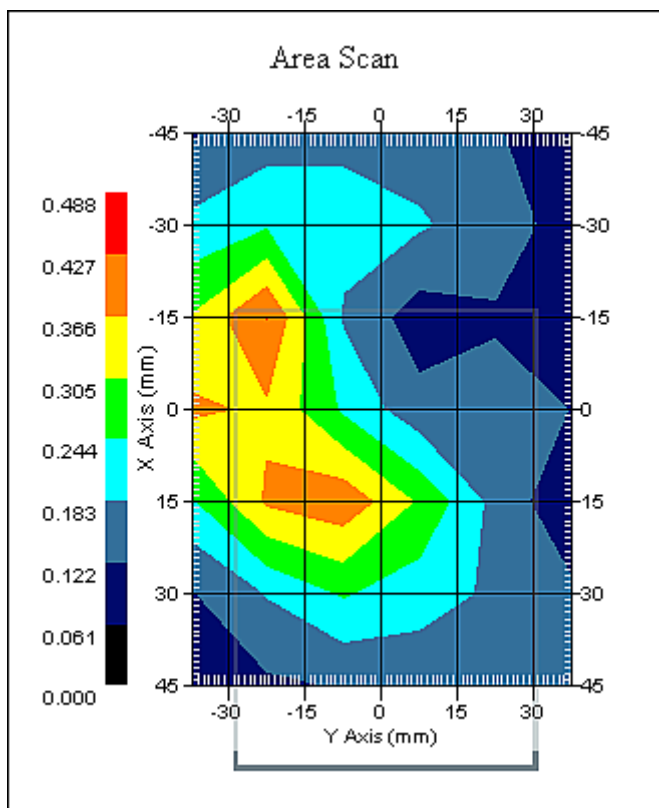
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.419 W/kg
10 gram SAR value : 0.251 W/kg
Area Scan Peak SAR : 0.422 W/kg
Zoom Scan Peak SAR : 0.757 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 10:38:46 AM
End Time : 02-Sep-2010 10:57:12 AM
Scanning Time : 1106 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Bottom
Power Drift-Start : 0.121 W/kg
Power Drift-Finish: 0.118 W/kg
Power Drift (%) : -2.476

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

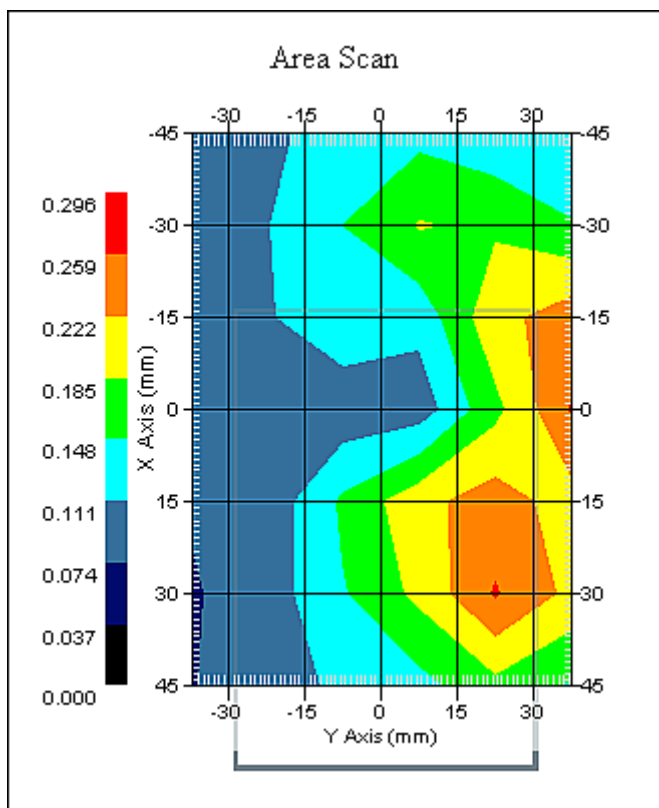
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.219 W/kg
10 gram SAR value : 0.165 W/kg
Area Scan Peak SAR : 0.258 W/kg
Zoom Scan Peak SAR : 0.393 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 10:58:49 AM
End Time : 02-Sep-2010 11:17:19 AM
Scanning Time : 1110 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 1
Orientation : Left
Power Drift-Start : 0.248 W/kg
Power Drift-Finish: 0.250 W/kg
Power Drift (%) : 0.801

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

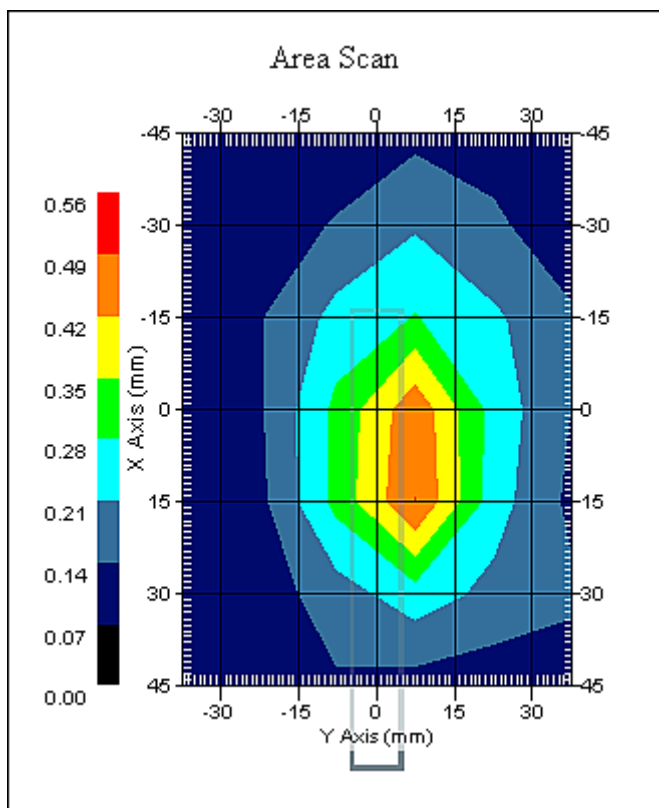
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

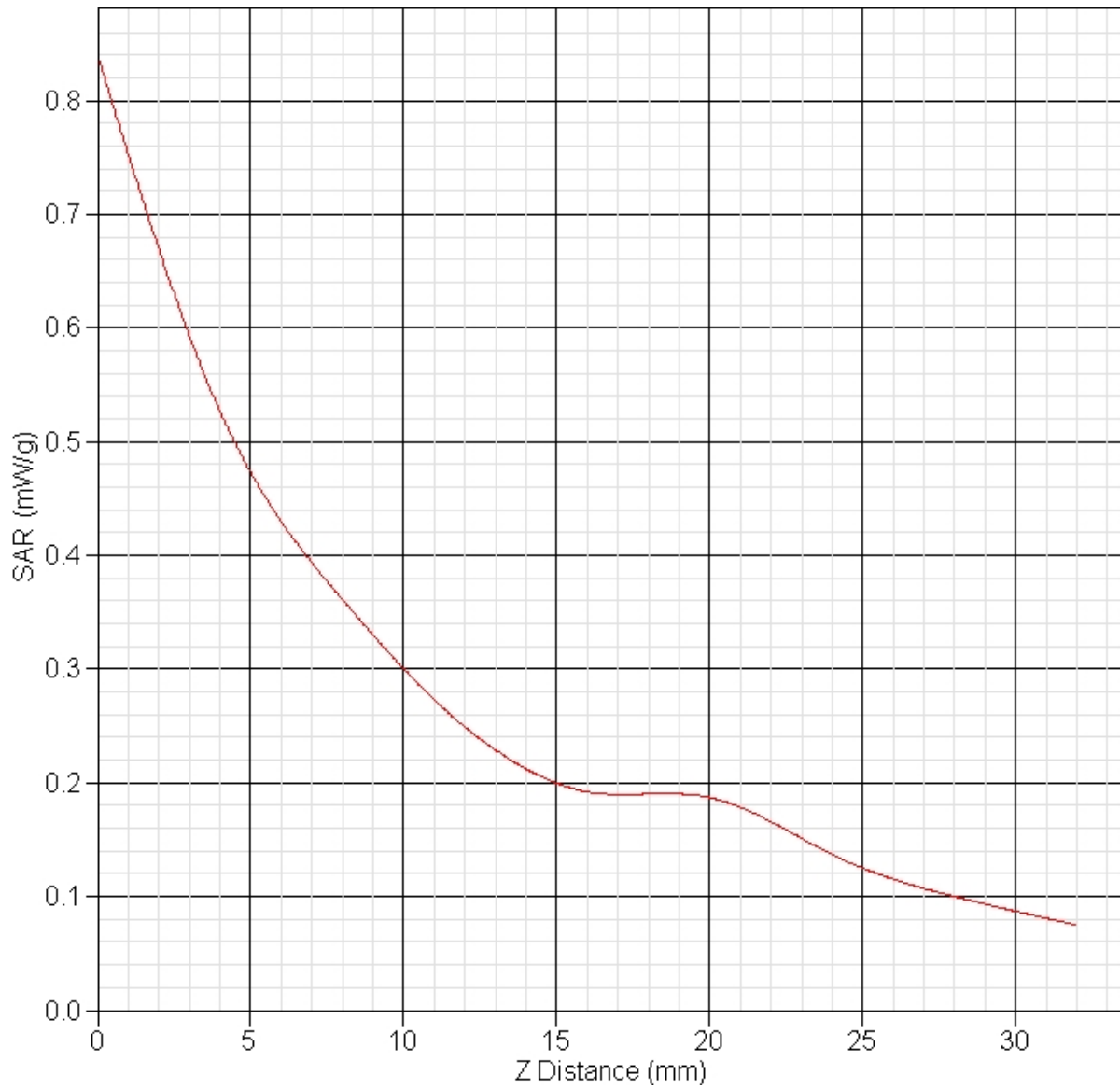
Other Data

DUT Position : Left
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.486 W/kg
10 gram SAR value : 0.289 W/kg
Area Scan Peak SAR : 0.483 W/kg
Zoom Scan Peak SAR : 0.826 W/kg

SAR-Z Axis
at Hotspot x:22.07 y:7.87



SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 11:59:14 AM
End Time : 02-Sep-2010 12:17:55 PM
Scanning Time : 1121 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Top
Power Drift-Start : 0.180 W/kg
Power Drift-Finish: 0.180 W/kg
Power Drift (%) : 0.288

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

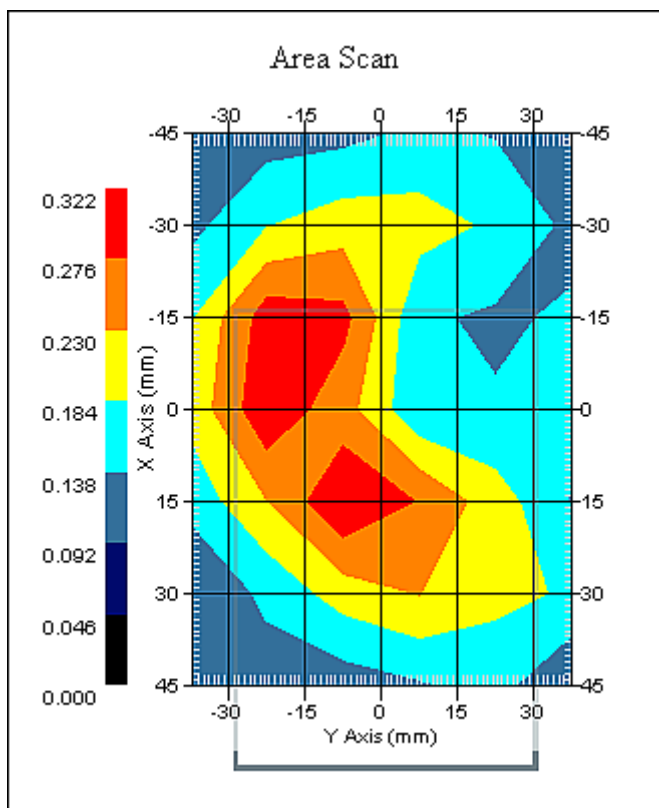
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.319 W/kg
10 gram SAR value : 0.201 W/kg
Area Scan Peak SAR : 0.317 W/kg
Zoom Scan Peak SAR : 0.570 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 11:39:43 AM
End Time : 02-Sep-2010 11:58:06 AM
Scanning Time : 1103 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Bottom
Power Drift-Start : 0.129 W/kg
Power Drift-Finish: 0.134 W/kg
Power Drift (%) : 3.871

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

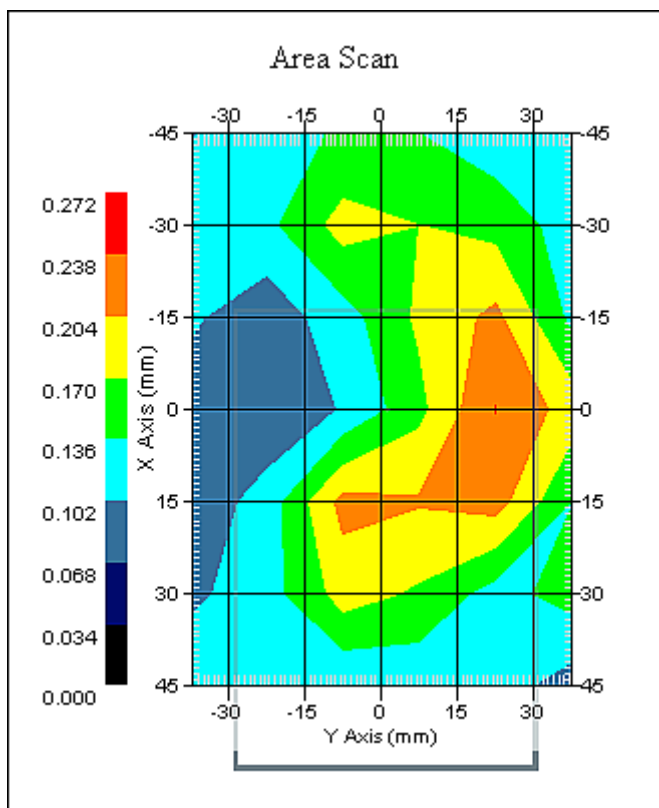
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.226 W/kg
10 gram SAR value : 0.158 W/kg
Area Scan Peak SAR : 0.235 W/kg
Zoom Scan Peak SAR : 0.354 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 11:19:41 AM
End Time : 02-Sep-2010 11:38:15 AM
Scanning Time : 1114 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 1
Orientation : Left
Power Drift-Start : 0.345 W/kg
Power Drift-Finish: 0.358 W/kg
Power Drift (%) : 3.768

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

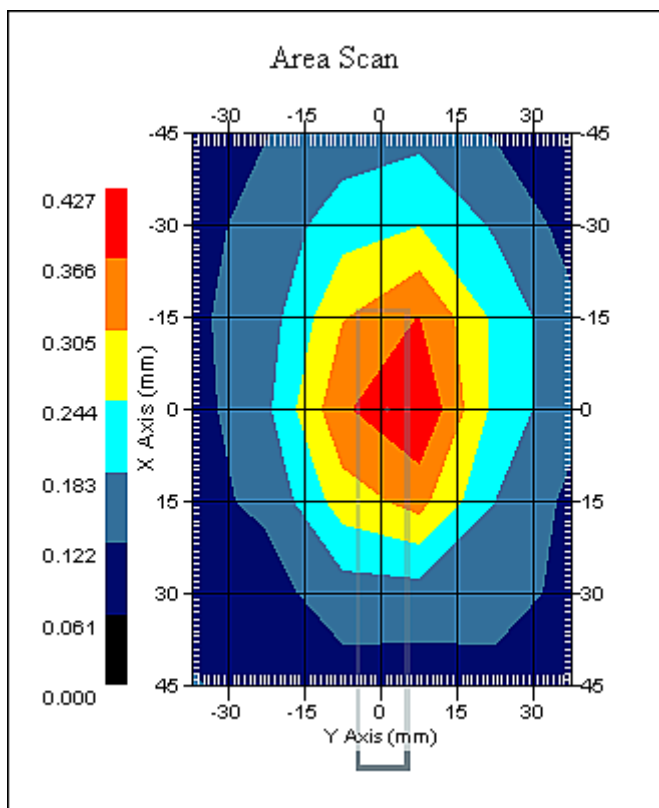
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.409 W/kg
10 gram SAR value : 0.255 W/kg
Area Scan Peak SAR : 0.418 W/kg
Zoom Scan Peak SAR : 0.668 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 12:36:41 PM
End Time : 02-Sep-2010 12:55:00 PM
Scanning Time : 1099 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Top
Power Drift-Start : 0.142 W/kg
Power Drift-Finish: 0.149 W/kg
Power Drift (%) : 4.920

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

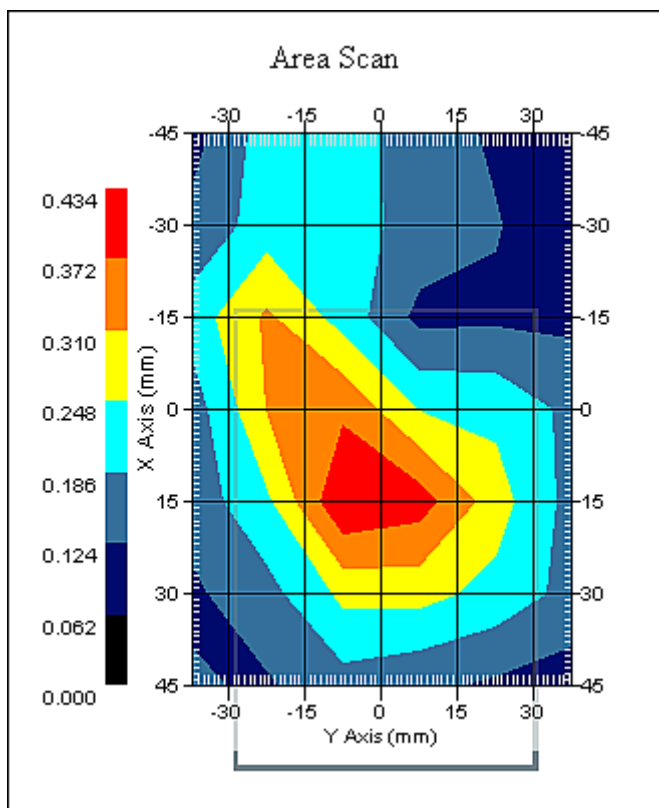
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.405 W/kg
10 gram SAR value : 0.256 W/kg
Area Scan Peak SAR : 0.424 W/kg
Zoom Scan Peak SAR : 0.668 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 12:56:20 PM
End Time : 02-Sep-2010 01:14:46 PM
Scanning Time : 1106 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Bottom
Power Drift-Start : 0.132 W/kg
Power Drift-Finish: 0.138 W/kg
Power Drift (%) : 4.540

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

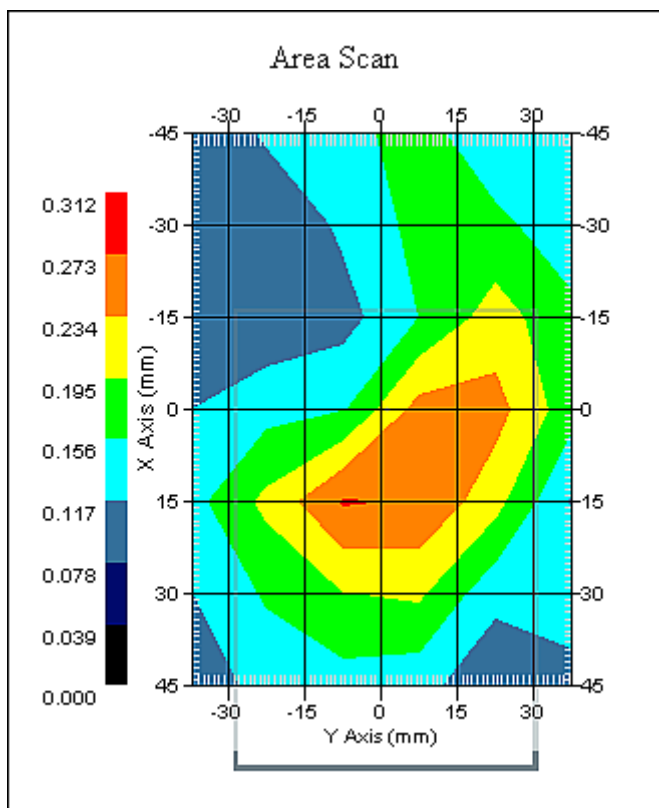
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.204 W/kg
10 gram SAR value : 0.162 W/kg
Area Scan Peak SAR : 0.272 W/kg
Zoom Scan Peak SAR : 0.334 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 01:17:54 PM
End Time : 02-Sep-2010 01:36:30 PM
Scanning Time : 1116 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK ½ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 2
Orientation : Left
Power Drift-Start : 0.324 W/kg
Power Drift-Finish: 0.334 W/kg
Power Drift (%) : 3.264

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

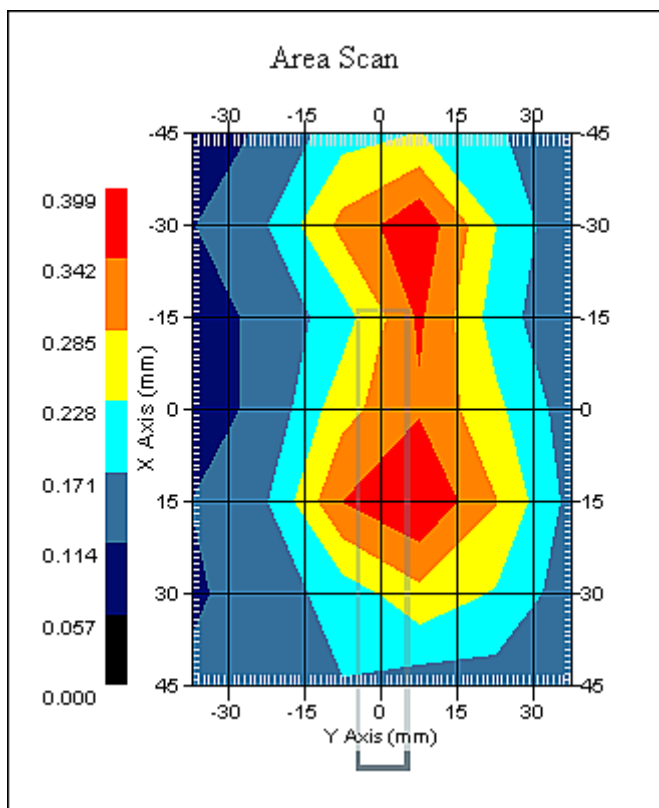
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.371 W/kg
10 gram SAR value : 0.239 W/kg
Area Scan Peak SAR : 0.393 W/kg
Zoom Scan Peak SAR : 0.600 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 02:43:05 PM
End Time : 02-Sep-2010 03:01:47 PM
Scanning Time : 1122 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Top
Power Drift-Start : 0.168 W/kg
Power Drift-Finish: 0.174 W/kg
Power Drift (%) : 3.570

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

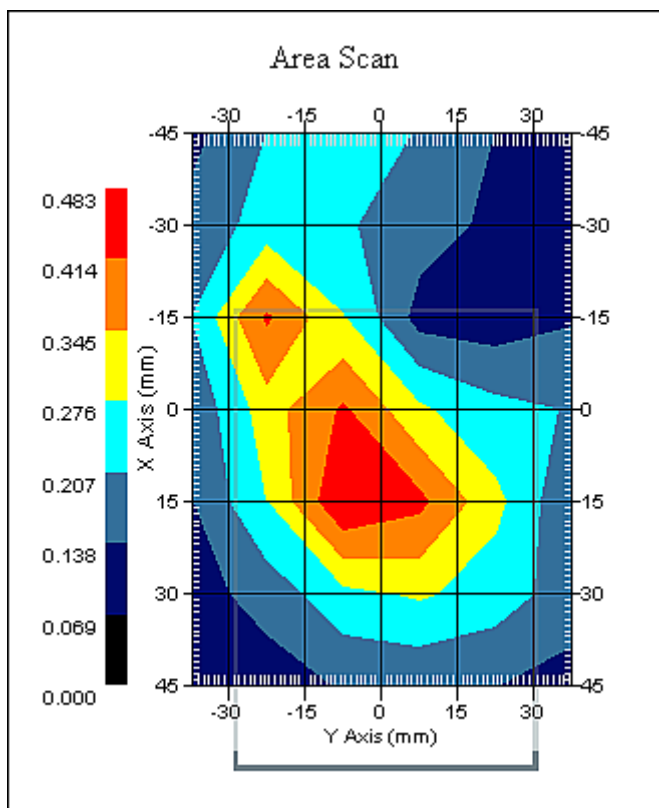
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.470 W/kg
10 gram SAR value : 0.287 W/kg
Area Scan Peak SAR : 0.474 W/kg
Zoom Scan Peak SAR : 0.865 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 02:03:10 PM
End Time : 02-Sep-2010 02:21:44 PM
Scanning Time : 1114 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 2
Orientation : Bottom
Power Drift-Start : 0.182 W/kg
Power Drift-Finish: 0.188 W/kg
Power Drift (%) : 3.249

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

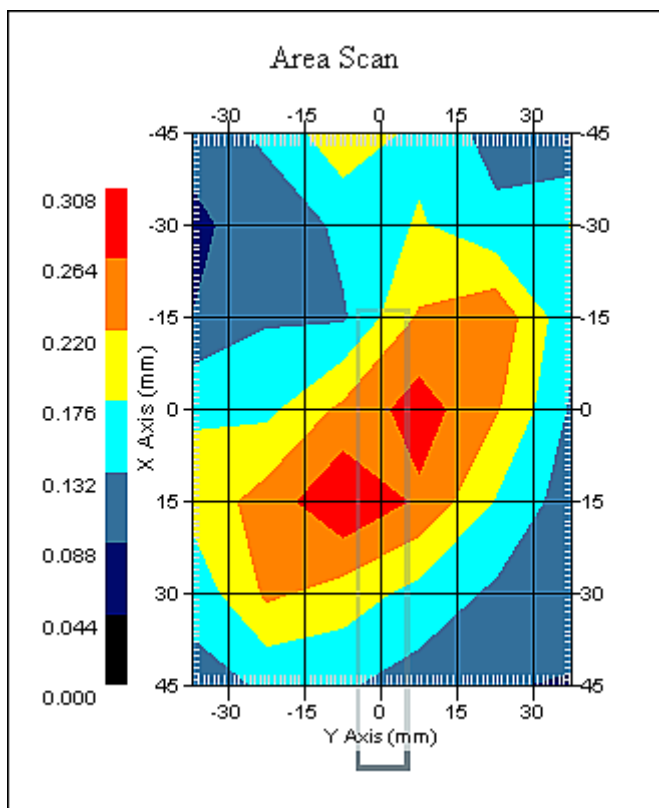
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.293 W/kg
10 gram SAR value : 0.192 W/kg
Area Scan Peak SAR : 0.301 W/kg
Zoom Scan Peak SAR : 0.482 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 01:37:43 PM
End Time : 02-Sep-2010 01:56:23 PM
Scanning Time : 1120 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 2
Orientation : Left
Power Drift-Start : 0.314 W/kg
Power Drift-Finish: 0.305 W/kg
Power Drift (%) : -2.697

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.58 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

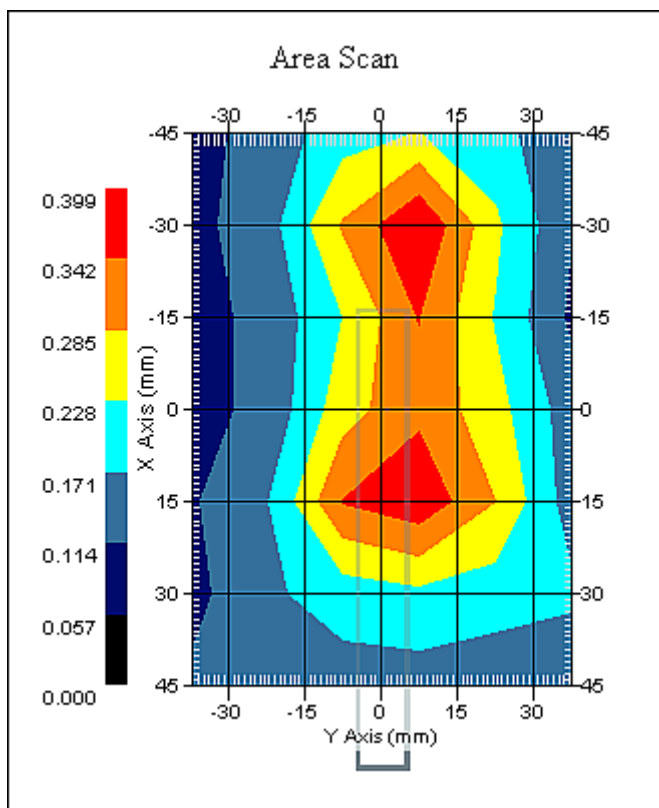
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 7:08:15 AM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.341 W/kg
10 gram SAR value : 0.207 W/kg
Area Scan Peak SAR : 0.390 W/kg
Zoom Scan Peak SAR : 0.580 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 03:19:34 PM
End Time : 02-Sep-2010 03:38:37 PM
Scanning Time : 1143 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Top
Power Drift-Start : 0.250 W/kg
Power Drift-Finish: 0.261 W/kg
Power Drift (%) : 4.435

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.39 F/m
Sigma : 2.19 S/m
Density : 1000.00 kg/cu. m

Probe Data

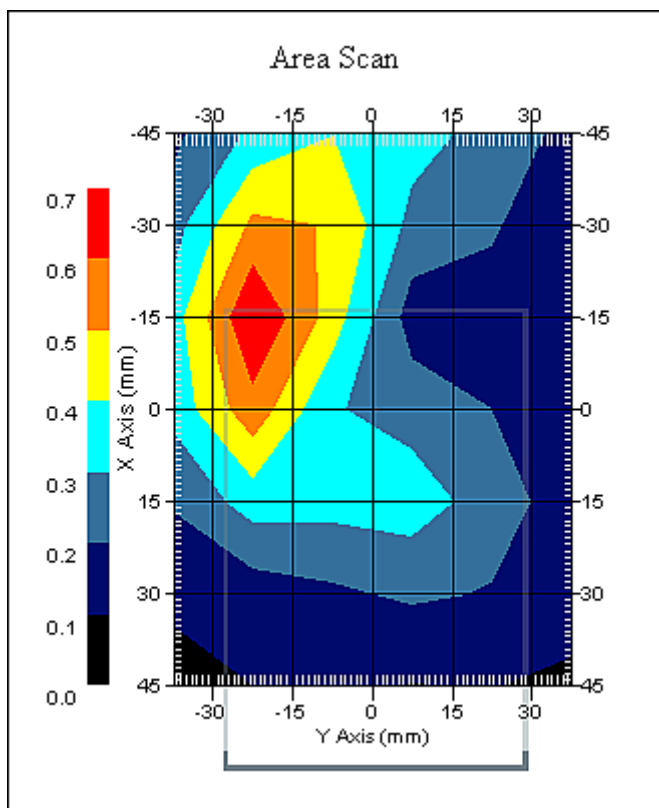
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.635 W/kg
10 gram SAR value : 0.360 W/kg
Area Scan Peak SAR : 0.697 W/kg
Zoom Scan Peak SAR : 1.000 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 03:39:54 PM
End Time : 02-Sep-2010 03:58:16 PM
Scanning Time : 1102 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Bottom
Power Drift-Start : 0.236 W/kg
Power Drift-Finish: 0.243 W/kg
Power Drift (%) : 3.222

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.39 F/m
Sigma : 2.19 S/m
Density : 1000.00 kg/cu. m

Probe Data

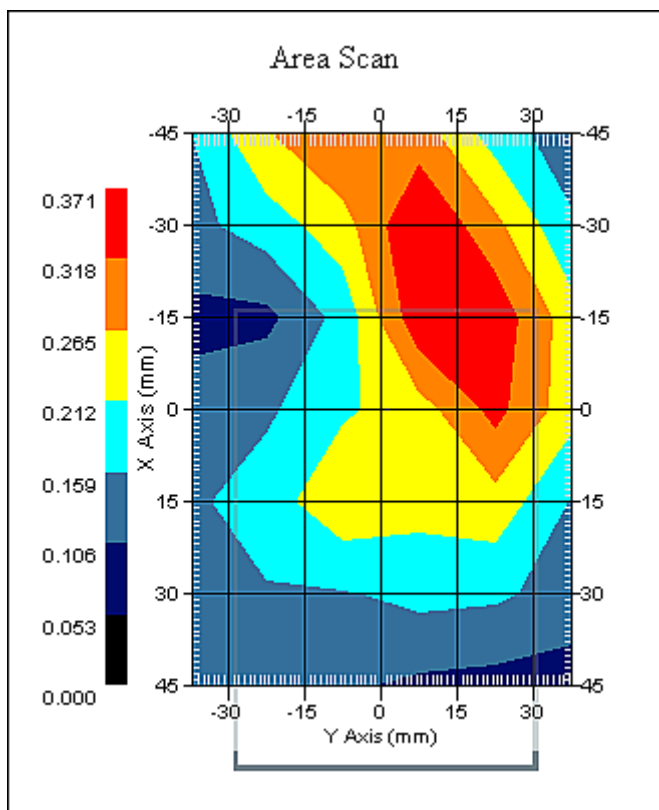
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.350 W/kg
10 gram SAR value : 0.225 W/kg
Area Scan Peak SAR : 0.371 W/kg
Zoom Scan Peak SAR : 0.510 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 03:59:47 PM
End Time : 02-Sep-2010 04:18:41 PM
Scanning Time : 1134 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 1
Orientation : Left
Power Drift-Start : 0.628 W/kg
Power Drift-Finish: 0.638 W/kg
Power Drift (%) : 1.574

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.39 F/m
Sigma : 2.19 S/m
Density : 1000.00 kg/cu. m

Probe Data

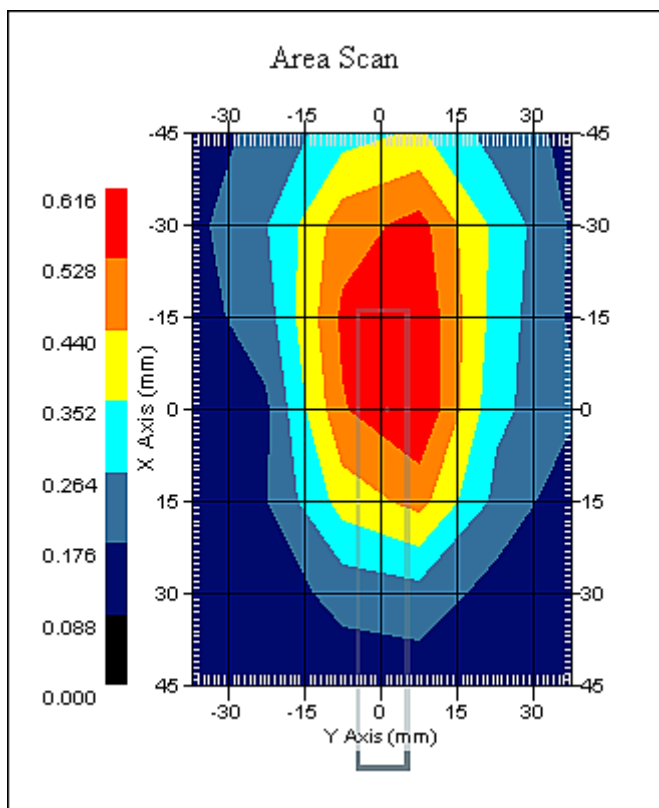
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.639 W/kg
10 gram SAR value : 0.380 W/kg
Area Scan Peak SAR : 0.616 W/kg
Zoom Scan Peak SAR : 1.080 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 05:00:34 PM
End Time : 02-Sep-2010 05:19:29 PM
Scanning Time : 1135 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Top
Power Drift-Start : 0.135 W/kg
Power Drift-Finish: 0.137 W/kg
Power Drift (%) : 1.481

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.39 F/m
Sigma : 2.19 S/m
Density : 1000.00 kg/cu. m

Probe Data

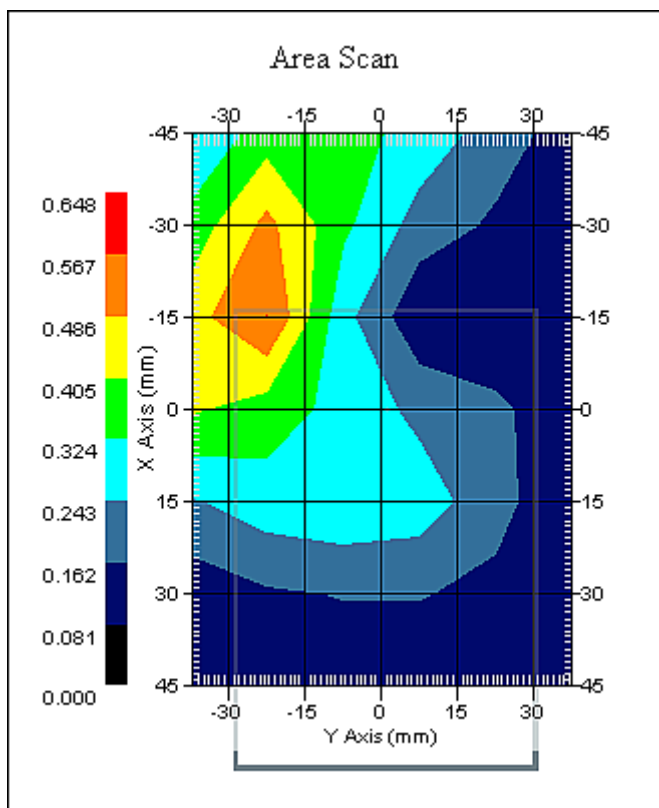
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.570 W/kg
10 gram SAR value : 0.329 W/kg
Area Scan Peak SAR : 0.568 W/kg
Zoom Scan Peak SAR : 1.030 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 04:40:36 PM
End Time : 02-Sep-2010 04:58:53 PM
Scanning Time : 1097 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Bottom
Power Drift-Start : 0.210 W/kg
Power Drift-Finish: 0.204 W/kg
Power Drift (%) : -3.037

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.39 F/m
Sigma : 2.19 S/m
Density : 1000.00 kg/cu. m

Probe Data

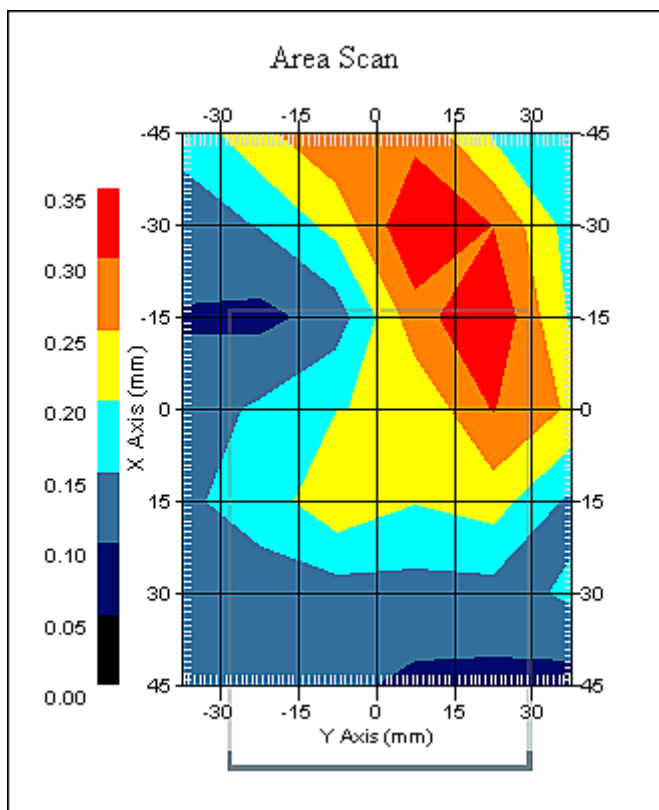
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.313 W/kg
10 gram SAR value : 0.204 W/kg
Area Scan Peak SAR : 0.347 W/kg
Zoom Scan Peak SAR : 0.400 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 02-Sep-2010
Starting Time : 02-Sep-2010 04:20:03 PM
End Time : 02-Sep-2010 04:38:56 PM
Scanning Time : 1133 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 1
Orientation : Left
Power Drift-Start : 0.636 W/kg
Power Drift-Finish: 0.632 W/kg
Power Drift (%) : -0.678

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 02-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.39 F/m
Sigma : 2.19 S/m
Density : 1000.00 kg/cu. m

Probe Data

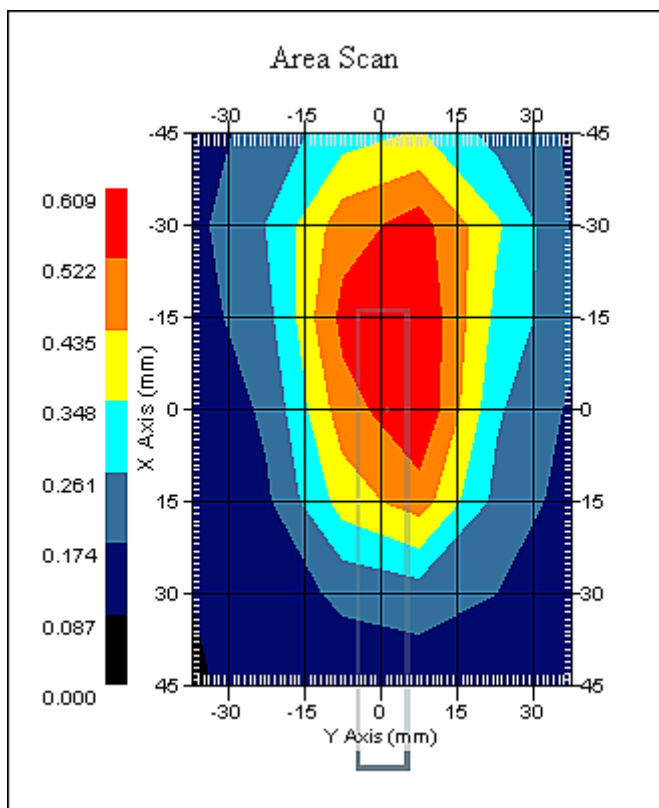
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 02-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.544 W/kg
10 gram SAR value : 0.309 W/kg
Area Scan Peak SAR : 0.609 W/kg
Zoom Scan Peak SAR : 1.020 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 12-Nov-2010
Starting Time : 12-Nov-2010 04:01:14 PM
End Time : 12-Nov-2010 04:26:15 PM
Scanning Time : 1501 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.25 W
Drift Time : 0 min(s)
Length : 60 mm
Width : 90 mm
Depth : 12 mm
Antenna Type : Internal - Ant 1
Orientation : Top
Power Drift-Start : 0.329 W/kg
Power Drift-Finish: 0.318 W/kg
Power Drift (%) : -3.258

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 12-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.44 F/m
Sigma : 2.05 S/m
Density : 1000.00 kg/cu. m

Probe Data

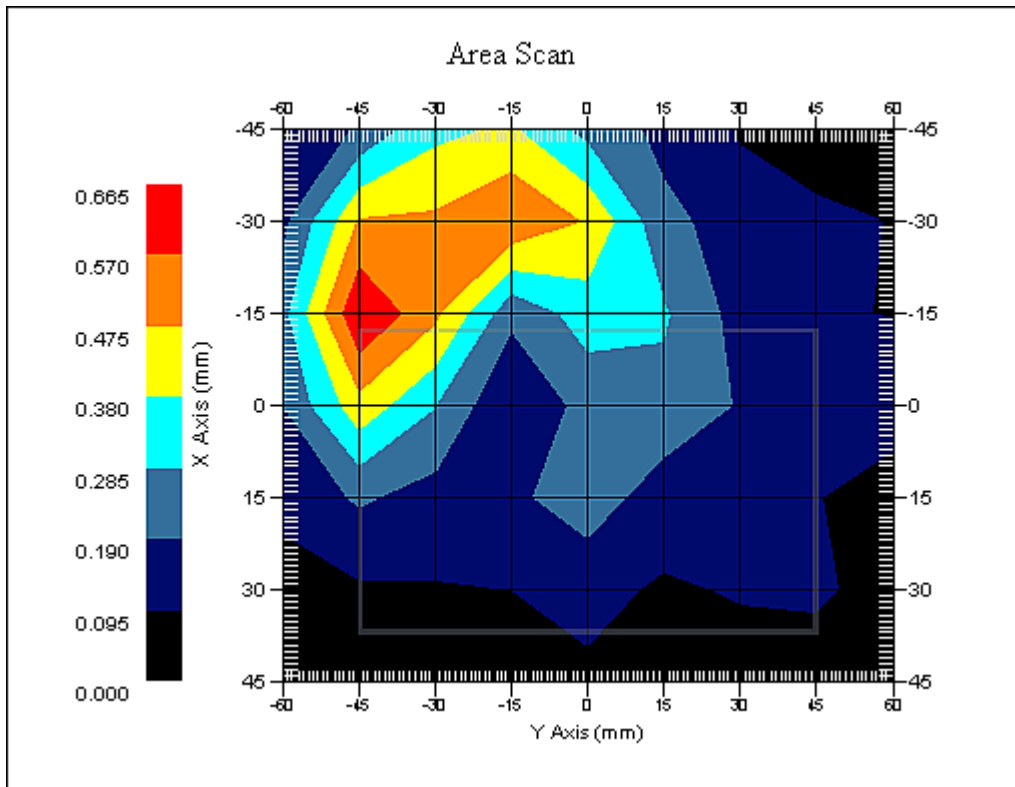
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 12-Nov-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.718 W/kg
10 gram SAR value : 0.492 W/kg
Area Scan Peak SAR : 0.651 W/kg
Zoom Scan Peak SAR : 1.475 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 09:07:15 AM
End Time : 07-Sep-2010 09:28:03 AM
Scanning Time : 1248 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Top
Power Drift-Start : 0.699 W/kg
Power Drift-Finish: 0.715 W/kg
Power Drift (%) : 2.347

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.47 F/m
Sigma : 2.20 S/m
Density : 1000.00 kg/cu. m

Probe Data

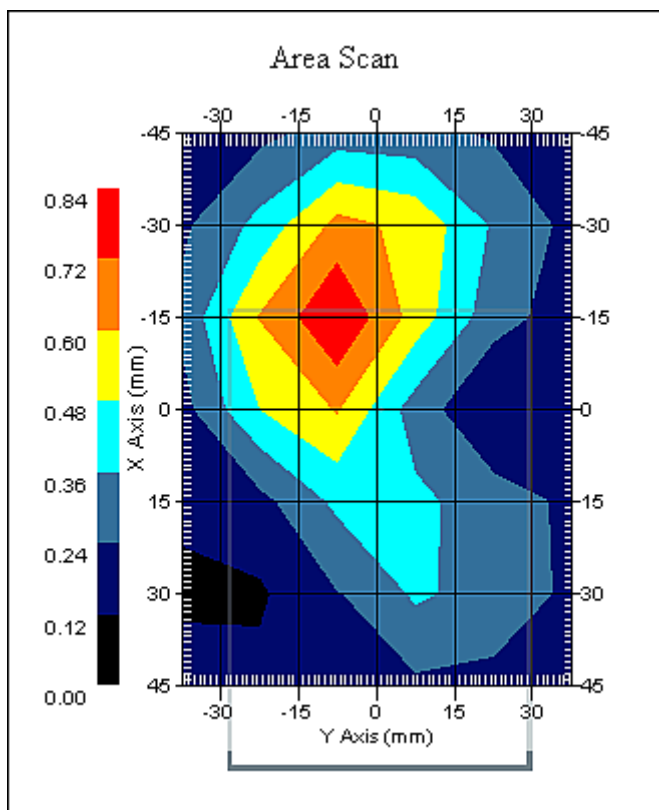
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.761 W/kg
10 gram SAR value : 0.451 W/kg
Area Scan Peak SAR : 0.839 W/kg
Zoom Scan Peak SAR : 1.281 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 12-Nov-2010
Starting Time : 12-Nov-2010 04:38:59 PM
End Time : 12-Nov-2010 05:04:36 PM
Scanning Time : 1537 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK $\frac{1}{2}$ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.25 W
Drift Time : 0 min(s)
Length : 60 mm
Width : 90 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Top
Power Drift-Start : 0.304 W/kg
Power Drift-Finish: 0.292 W/kg
Power Drift (%) : -2.994

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2690
Frequency : 2690.00 MHz
Last Calib. Date : 12-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.12 F/m
Sigma : 2.34 S/m
Density : 1000.00 kg/cu. m

Probe Data

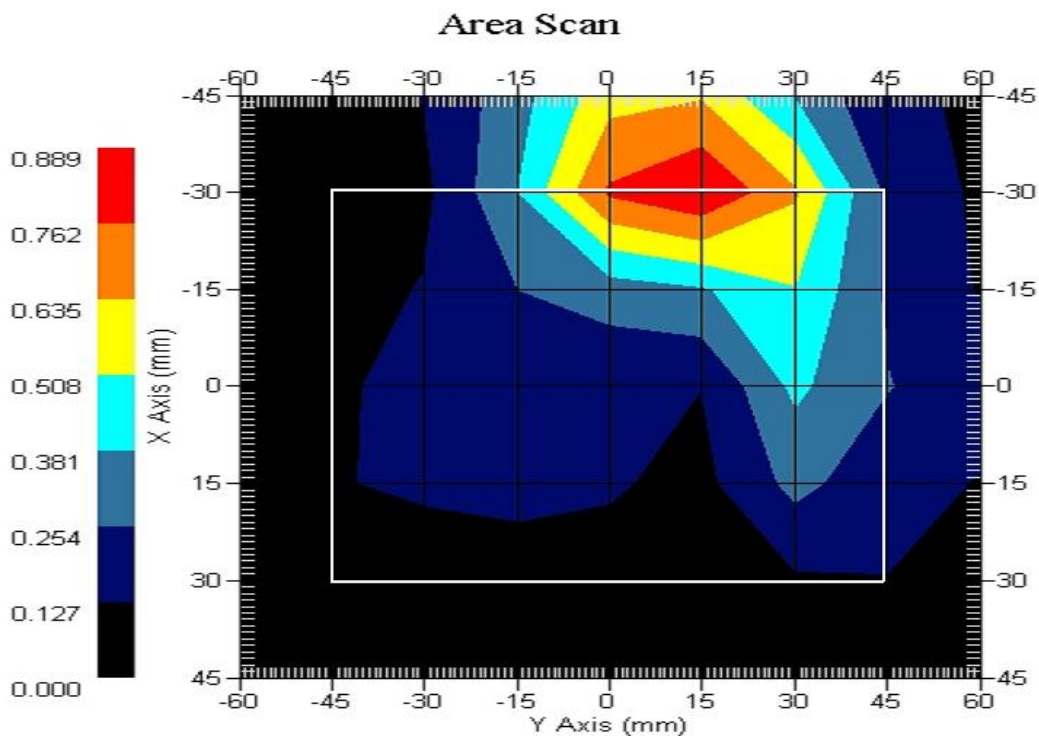
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 12-Nov-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

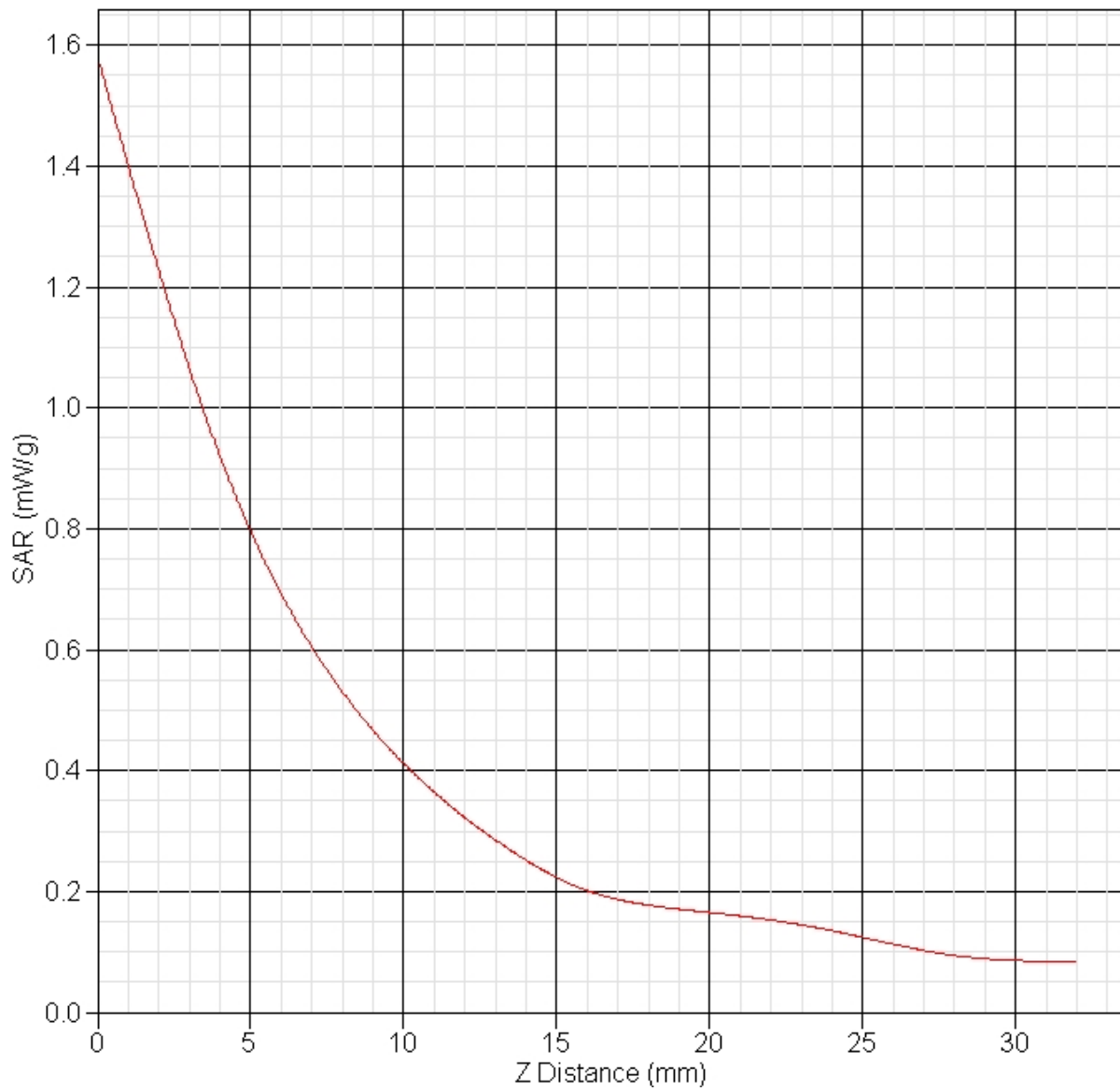
Other Data

DUT Position : Top
Separation : 12 mm
Channel : High



1 gram SAR value : 0.781 W/kg
10 gram SAR value : 0.471 W/kg
Area Scan Peak SAR : 0.908 W/kg
Zoom Scan Peak SAR : 1.617 W/kg

SAR-Z Axis
at Hotspot x:-22.91 y:14.90



SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 09:30:04 AM
End Time : 07-Sep-2010 09:50:31 AM
Scanning Time : 1227 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Bottom
Power Drift-Start : 0.358 W/kg
Power Drift-Finish: 0.367 W/kg
Power Drift (%) : 2.510

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.47 F/m
Sigma : 2.20 S/m
Density : 1000.00 kg/cu. m

Probe Data

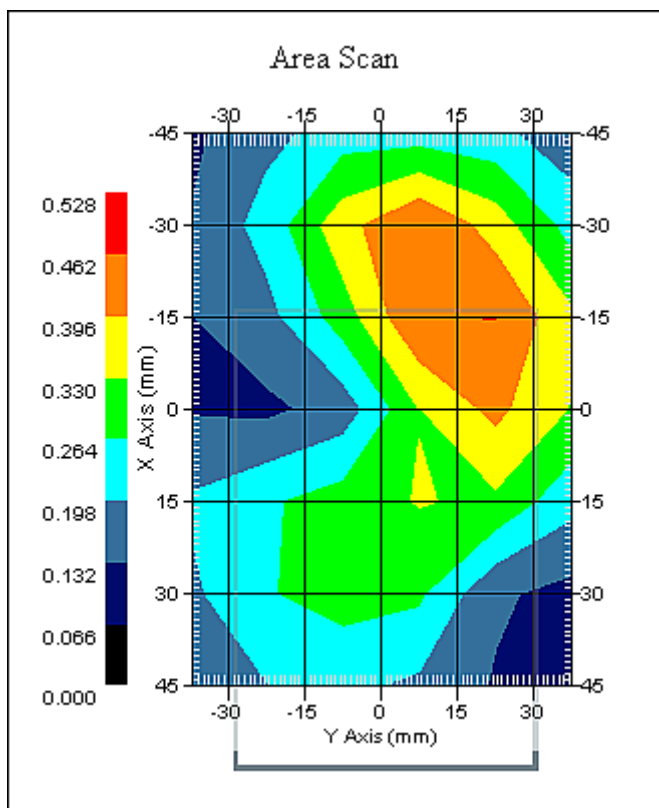
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.512 W/kg
10 gram SAR value : 0.342 W/kg
Area Scan Peak SAR : 0.463 W/kg
Zoom Scan Peak SAR : 0.830 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 10:14:28 AM
End Time : 07-Sep-2010 10:35:25 AM
Scanning Time : 1257 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 2
Orientation : Left
Power Drift-Start : 0.696 W/kg
Power Drift-Finish: 0.718 W/kg
Power Drift (%) : 3.096

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.47 F/m
Sigma : 2.20 S/m
Density : 1000.00 kg/cu. m

Probe Data

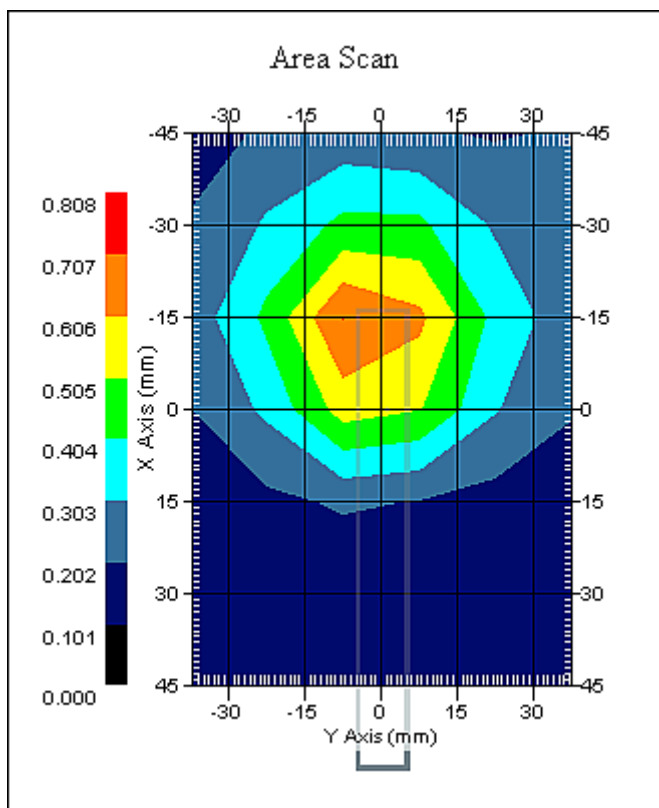
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.669 W/kg
10 gram SAR value : 0.382 W/kg
Area Scan Peak SAR : 0.708 W/kg
Zoom Scan Peak SAR : 1.131 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 12-Nov-2010
Starting Time : 12-Nov-2010 03:32:59 PM
End Time : 12-Nov-2010 03:58:19 PM
Scanning Time : 1520 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.25 W
Drift Time : 0 min(s)
Length : 60 mm
Width : 90 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Top
Power Drift-Start : 0.290 W/kg
Power Drift-Finish: 0.301 W/kg
Power Drift (%) : 3.797

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 12-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.44 F/m
Sigma : 2.05 S/m
Density : 1000.00 kg/cu. m

Probe Data

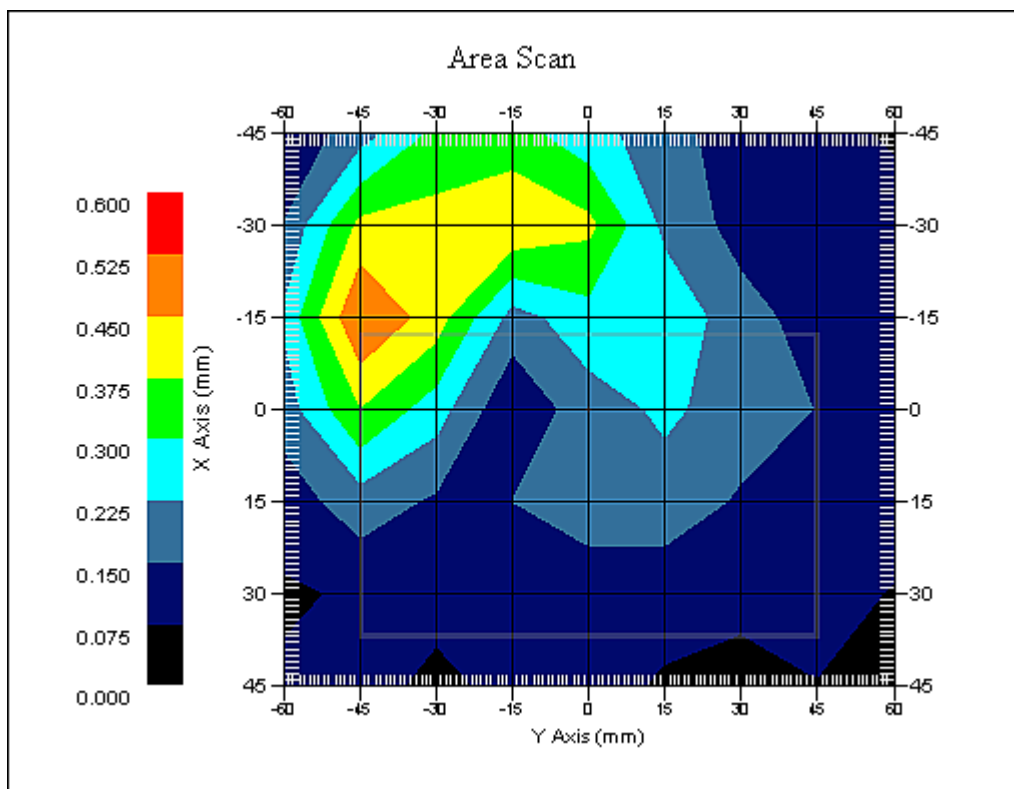
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 12-Nov-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.574 W/kg
10 gram SAR value : 0.312 W/kg
Area Scan Peak SAR : 0.518 W/kg
Zoom Scan Peak SAR : 0.816 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 11:00:01 AM
End Time : 07-Sep-2010 11:21:19 AM
Scanning Time : 1278 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Top
Power Drift-Start : 0.657 W/kg
Power Drift-Finish: 0.681 W/kg
Power Drift (%) : 3.659

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.47 F/m
Sigma : 2.20 S/m
Density : 1000.00 kg/cu. m

Probe Data

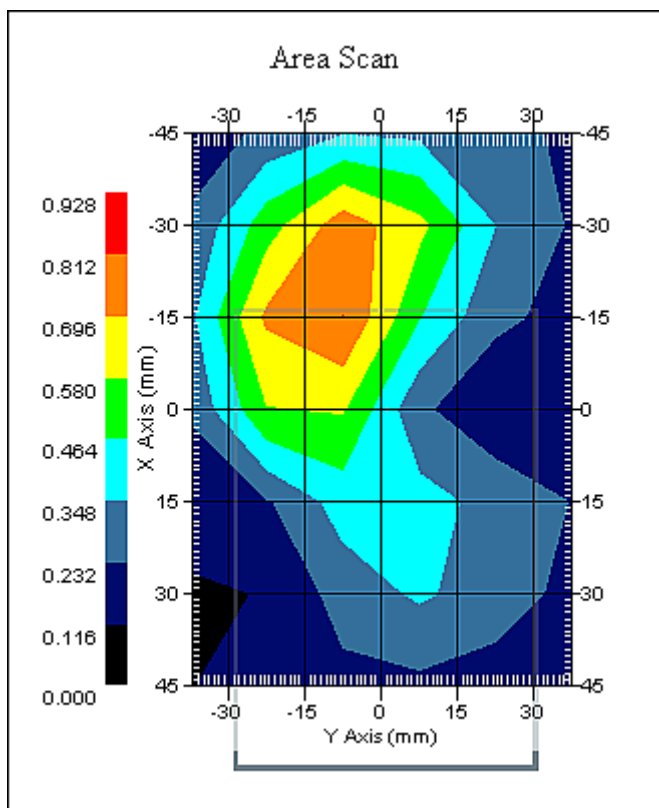
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.722 W/kg
10 gram SAR value : 0.435 W/kg
Area Scan Peak SAR : 0.813 W/kg
Zoom Scan Peak SAR : 1.381 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 12-Nov-2010
Starting Time : 12-Nov-2010 05:09:22 PM
End Time : 12-Nov-2010 05:34:44 PM
Scanning Time : 1522 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.25 W
Drift Time : 0 min(s)
Length : 60 mm
Width : 90 mm
Depth : 12 mm
Antenna Type : Internal- Ant 2
Orientation : Top
Power Drift-Start : 0.515 W/kg
Power Drift-Finish: 0.509 W/kg
Power Drift (%) : -1.204

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2690
Frequency : 2690.00 MHz
Last Calib. Date : 12-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.12 F/m
Sigma : 2.34 S/m
Density : 1000.00 kg/cu. m

Probe Data

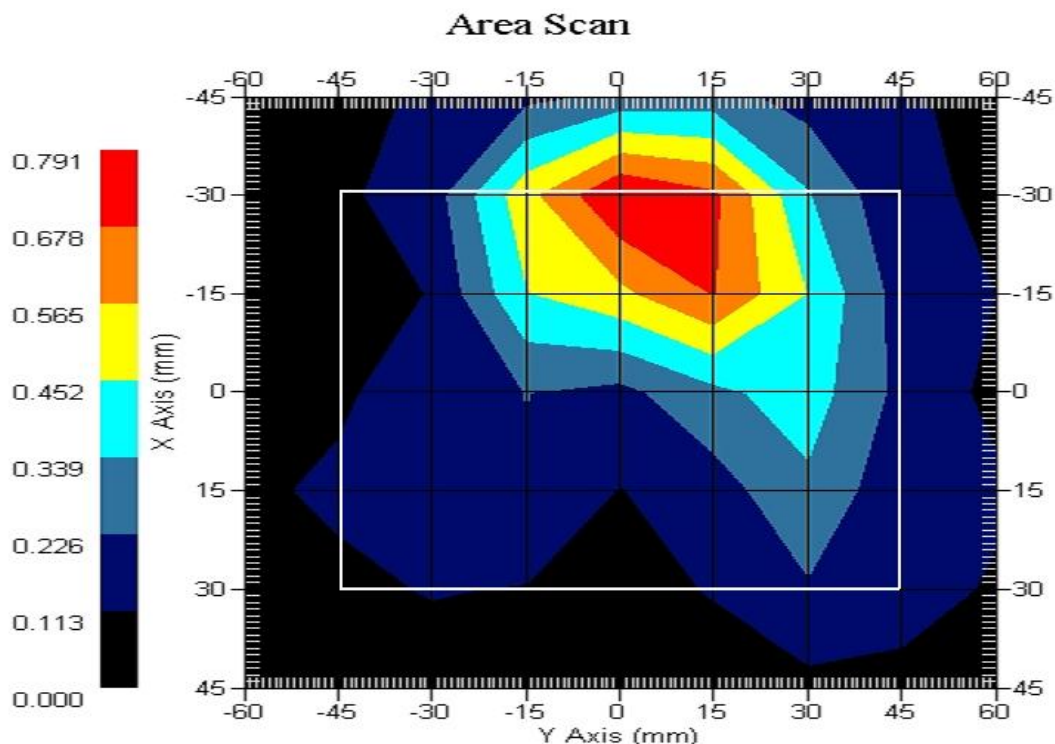
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 12-Nov-2010
Set-up Time : 7:08:04 AM
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : High



1 gram SAR value : 0.729 W/kg
10 gram SAR value : 0.373 W/kg
Area Scan Peak SAR : 0.807 W/kg
Zoom Scan Peak SAR : 1.157 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 11:22:54 AM
End Time : 07-Sep-2010 11:43:28 AM
Scanning Time : 1234 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Bottom
Power Drift-Start : 0.316 W/kg
Power Drift-Finish: 0.326 W/kg
Power Drift (%) : 3.395

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.47 F/m
Sigma : 2.20 S/m
Density : 1000.00 kg/cu. m

Probe Data

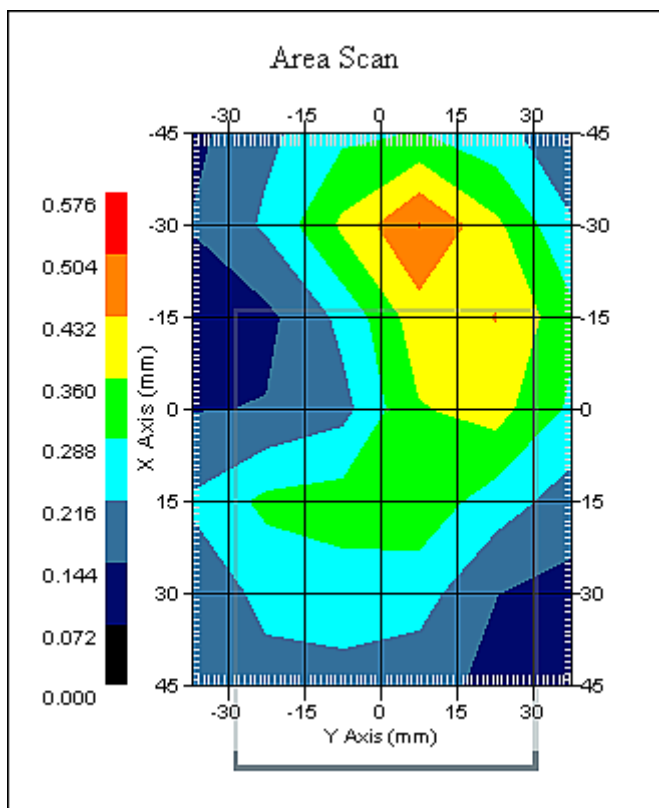
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.499 W/kg
10 gram SAR value : 0.309 W/kg
Area Scan Peak SAR : 0.506 W/kg
Zoom Scan Peak SAR : 0.840 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 10:37:30 AM
End Time : 07-Sep-2010 10:58:12 AM
Scanning Time : 1242 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : PUSC 16QAM ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 2
Orientation : Left
Power Drift-Start : 0.647 W/kg
Power Drift-Finish: 0.646 W/kg
Power Drift (%) : -0.134

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.47 F/m
Sigma : 2.20 S/m
Density : 1000.00 kg/cu. m

Probe Data

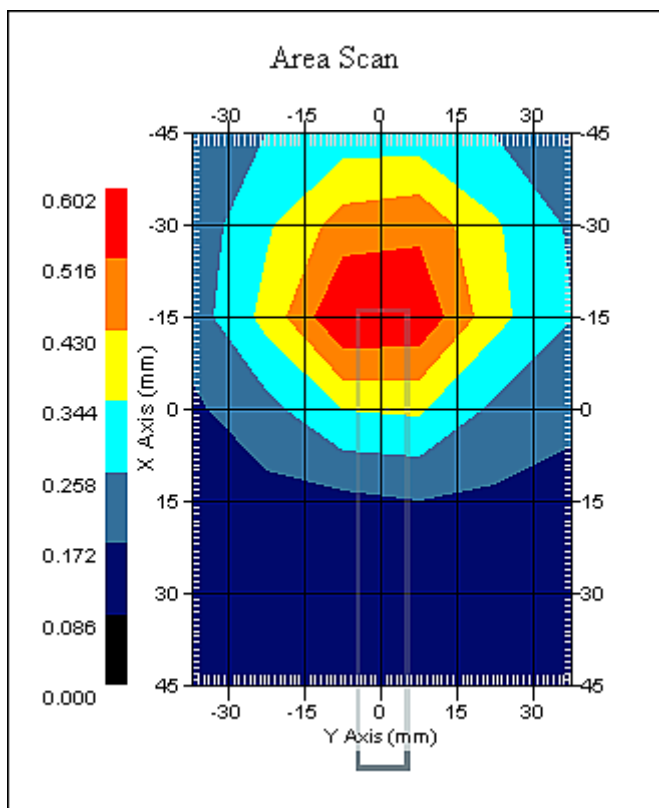
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.600 W/kg
10 gram SAR value : 0.425 W/kg
Area Scan Peak SAR : 0.600 W/kg
Zoom Scan Peak SAR : 1.020 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 20-Nov-2010
Starting Time : 20-Nov-2010 09:27:30 AM
End Time : 20-Nov-2010 09:53:34 AM
Scanning Time : 1564 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : AMC QPSK $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 1
Orientation : Top
Power Drift-Start : 0.536 W/kg
Power Drift-Finish: 0.511 W/kg
Power Drift (%) : -4.833

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 20-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.28 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

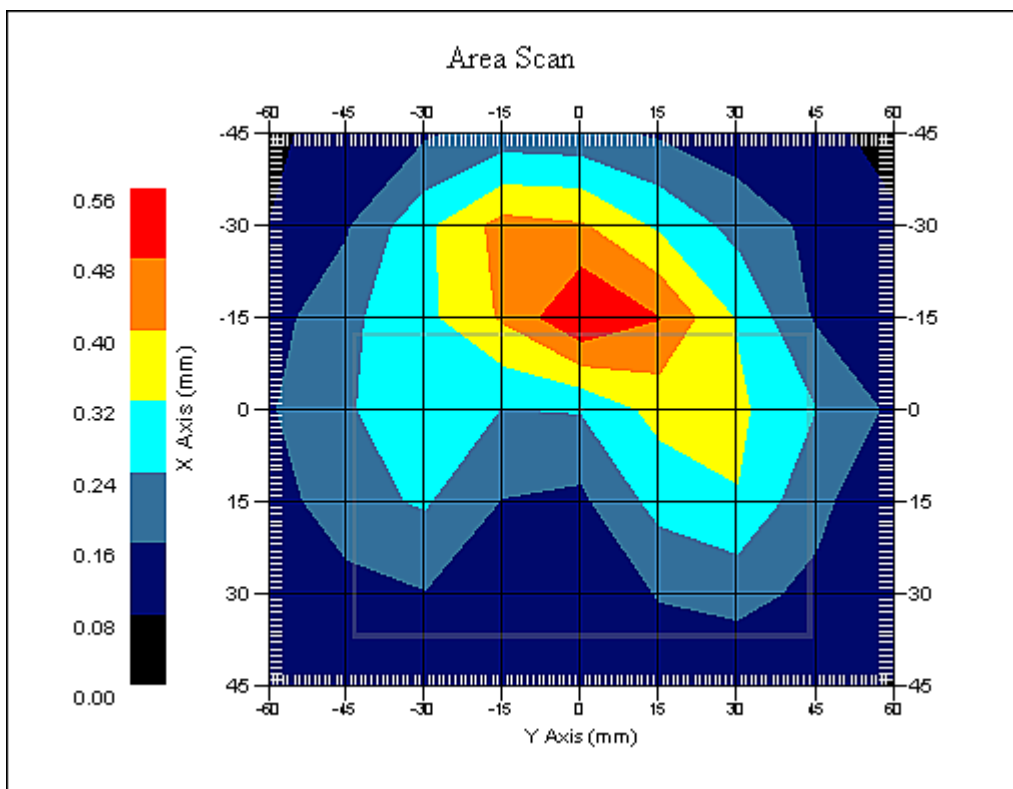
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 20-Nov-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.514 W/kg
10 gram SAR value : 0.301 W/kg
Area Scan Peak SAR : 0.560 W/kg
Zoom Scan Peak SAR : 0.900 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 20-Nov-2010
Starting Time : 20-Nov-2010 09:56:46 AM
End Time : 20-Nov-2010 10:22:03 AM
Scanning Time : 1517 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : AMC QPSK $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 1
Orientation : Bottom
Power Drift-Start : 0.270 W/kg
Power Drift-Finish: 0.278 W/kg
Power Drift (%) : 2.966

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 20-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.28 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

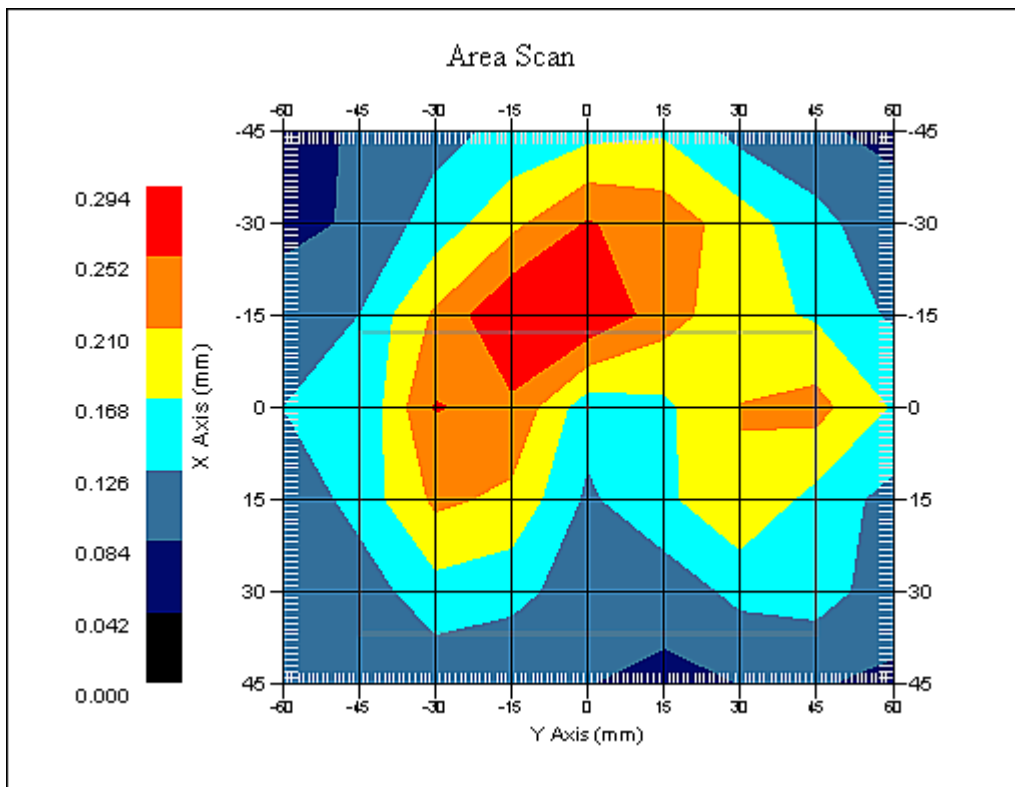
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 20-Nov-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.293 W/kg
10 gram SAR value : 0.181 W/kg
Area Scan Peak SAR : 0.294 W/kg
Zoom Scan Peak SAR : 0.520 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 12:17:36 PM
End Time : 07-Sep-2010 12:38:56 PM
Scanning Time : 1280 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : AMC QPSK $\frac{1}{2}$ 5 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 12 mm
Depth : 60 mm
Antenna Type : Internal - Ant 1
Orientation : Left
Power Drift-Start : 0.623 W/kg
Power Drift-Finish: 0.611 W/kg
Power Drift (%) : -1.922

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2500
Frequency : 2500.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.65 F/m
Sigma : 2.03 S/m
Density : 1000.00 kg/cu. m

Probe Data

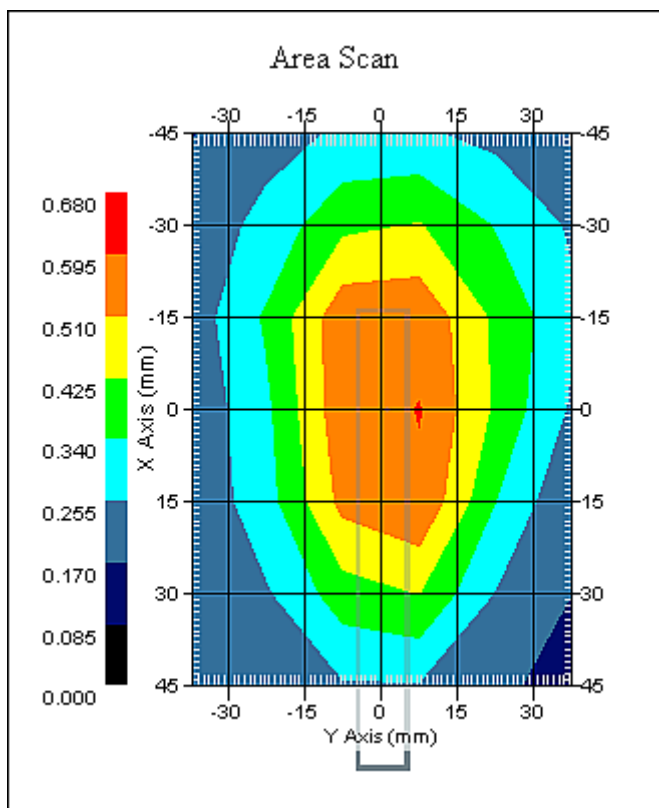
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.2
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.2
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Left
Separation : 12 mm
Channel : Low



1 gram SAR value : 0.404 W/kg
10 gram SAR value : 0.271 W/kg
Area Scan Peak SAR : 0.587 W/kg
Zoom Scan Peak SAR : 0.993 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 07-Sep-2010
Starting Time : 07-Sep-2010 11:45:45 AM
End Time : 07-Sep-2010 12:06:48 PM
Scanning Time : 1263 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : AMC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Top
Power Drift-Start : 0.714 W/kg
Power Drift-Finish: 0.695 W/kg
Power Drift (%) : -2.586

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 07-Sep-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.47 F/m
Sigma : 2.20 S/m
Density : 1000.00 kg/cu. m

Probe Data

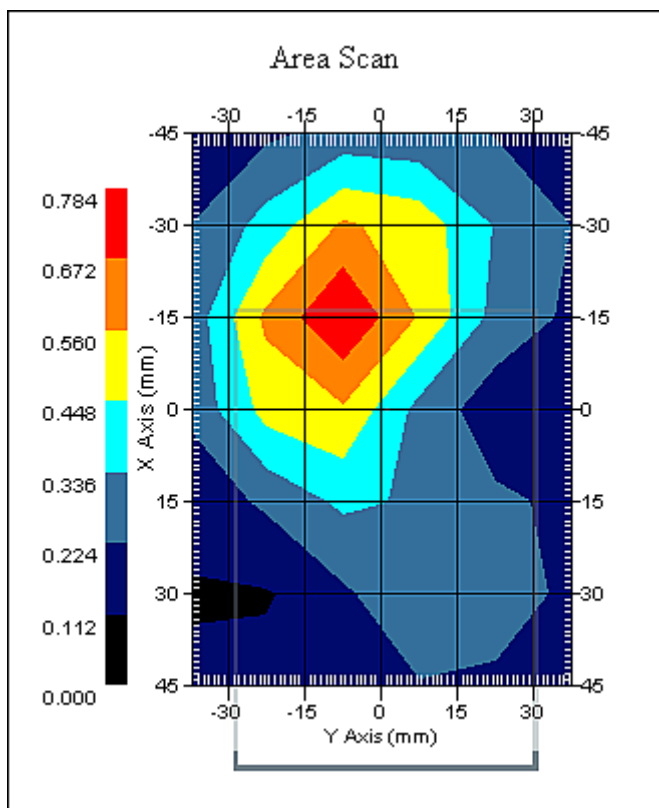
Name : RFEL 217
Model : E020
Type : E-Field Triangle
Serial No. : 217
Last Calib. Date : 21-Oct-2009
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 3.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 07-Sep-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x6x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Top
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.609 W/kg
10 gram SAR value : 0.376 W/kg
Area Scan Peak SAR : 0.782 W/kg
Zoom Scan Peak SAR : 1.191 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 20-Nov-2010
Starting Time : 20-Nov-2010 10:24:46 AM
End Time : 20-Nov-2010 10:50:21 AM
Scanning Time : 1535 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : AMC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Bottom
Power Drift-Start : 0.353 W/kg
Power Drift-Finish: 0.348 W/kg
Power Drift (%) : -1.260

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 20-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.07 F/m
Sigma : 2.18 S/m
Density : 1000.00 kg/cu. m

Probe Data

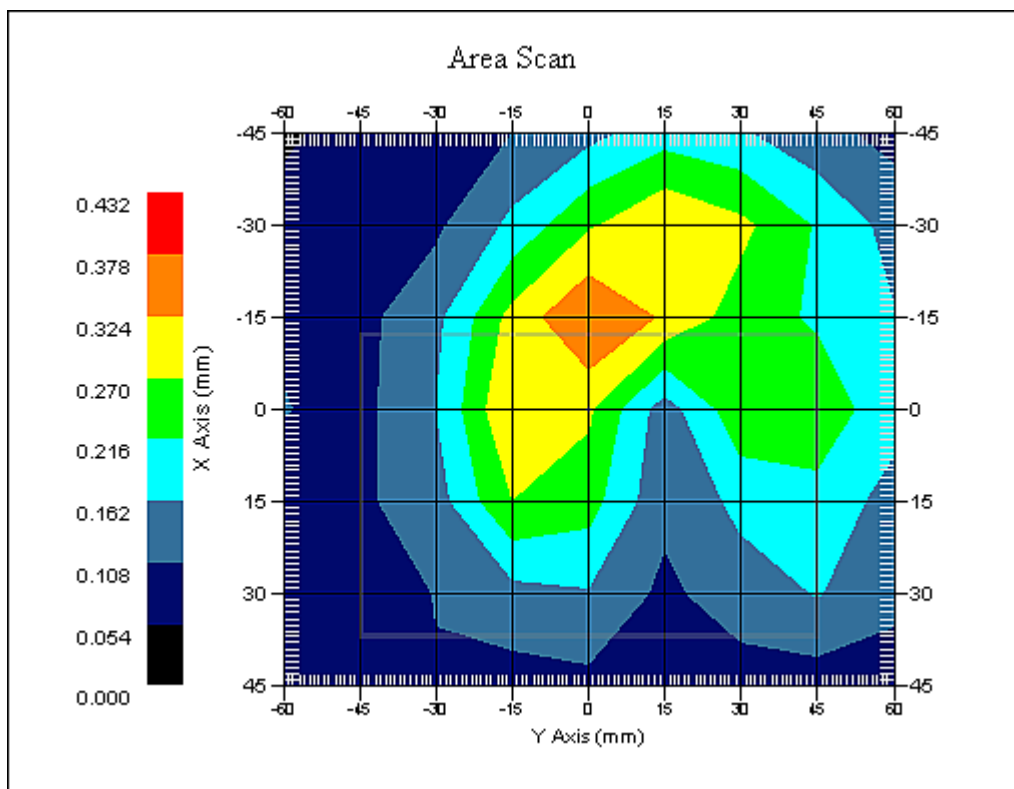
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 20-Nov-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Bottom
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.352 W/kg
10 gram SAR value : 0.217 W/kg
Area Scan Peak SAR : 0.380 W/kg
Zoom Scan Peak SAR : 0.650 W/kg

SAR Test Report

By Operator : Jay
Measurement Date : 20-Nov-2010
Starting Time : 20-Nov-2010 10:53:54 AM
End Time : 20-Nov-2010 11:19:42 AM
Scanning Time : 1548 secs

Product Data

Device Name : Novatel Wireless
Serial No. : Eng 9
Mode : AMC QPSK ½ 10 MHz
Model : MiFi4082
Frequency : 2600.00 MHz
Max. Transmit Pwr : 0.295 W
Drift Time : 0 min(s)
Length : 90 mm
Width : 60 mm
Depth : 12 mm
Antenna Type : Internal - Ant 2
Orientation : Side
Power Drift-Start : 0.515 W/kg
Power Drift-Finish: 0.530 W/kg
Power Drift (%) : 2.978

Phantom Data

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

Tissue Data

Type : BODY
Serial No. : 2590
Frequency : 2590.00 MHz
Last Calib. Date : 20-Nov-2010
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 45.00 RH%
Epsilon : 52.07 F/m
Sigma : 2.18 S/m
Density : 1000.00 kg/cu. m

Probe Data

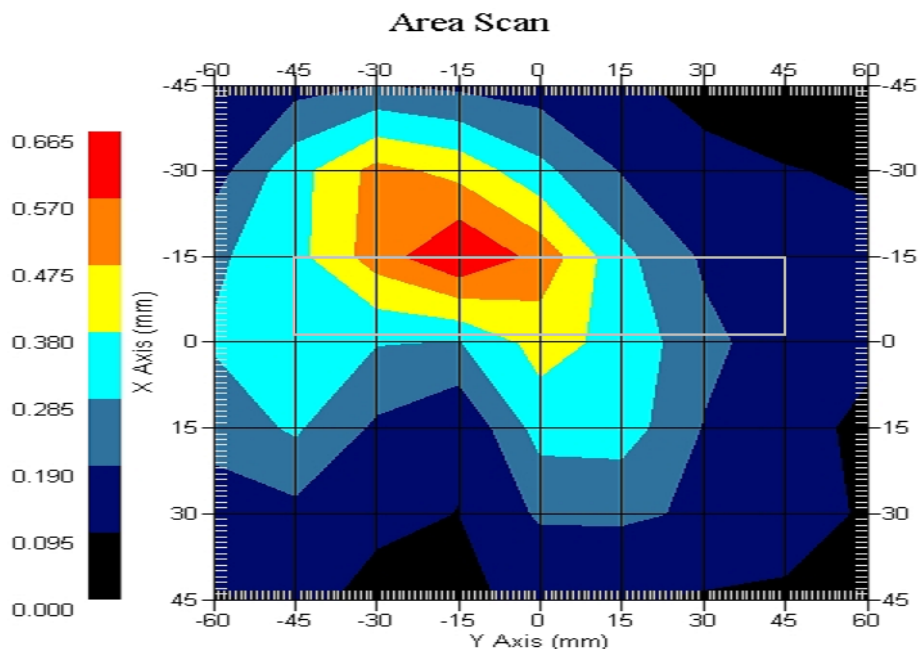
Name : Probe 215 - RFEL
Model : E020
Type : E-Field Triangle
Serial No. : 215
Last Calib. Date : 22-Sep-2010
Frequency : 2600.00 MHz
Duty Cycle Factor: 3.4
Conversion Factor: 4.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu\text{V}/(\text{V}/\text{m})^2$
Compression Point: 95.00 mV
Offset : 1.56 mm

Measurement Data

Crest Factor : 3.4
Scan Type : Complete
Tissue Temp. : 20.00 °C
Ambient Temp. : 23.00 °C
Set-up Date : 20-Nov-2010
Set-up Time : 2:42:58 PM
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

Other Data

DUT Position : Side
Separation : 12 mm
Channel : Mid



1 gram SAR value : 0.643 W/kg
10 gram SAR value : 0.349 W/kg
Area Scan Peak SAR : 0.664 W/kg
Zoom Scan Peak SAR : 1.201 W/kg

Appendix D – Probe Calibration Data Sheets

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1079

Client.: RFEL

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

BODY Calibration

Manufacturer: APREL Laboratories

Model No.: E-020

Serial No.: 217

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2

Project No: RFEL-E020-CAL-5477

Calibrated: 21st October 2009

Released on: 28th October 2009

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary
This calibration has been conducted in line with the SCC ISO-IEC 17025 Scope of Accreditation
Accredited Laboratory Number 48

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

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-020 217.

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

IEC 62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1 & 2: Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 300 MHz to 3 GHz)"

IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

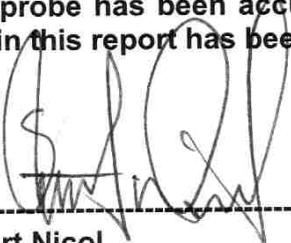
Conditions

Probe 217 was a re-calibration.

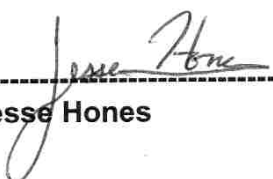
Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C

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

Calibration Results Summary

| | |
|-----------------------|---------------------|
| Probe Type: | E-Field Probe E-020 |
| Serial Number: | 217 |
| 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 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Y: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Z: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Diode Compression Point: | 95 mV |

Sensitivity in Body Tissue Measured

Frequency: 835 MHz

Epsilon: 54.9 (+/-5%) **Sigma:** 1.04 S/m (+/-5%)

ConvF

Channel X: 6.1

Channel Y: 6.1

Channel Z: 6.1

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

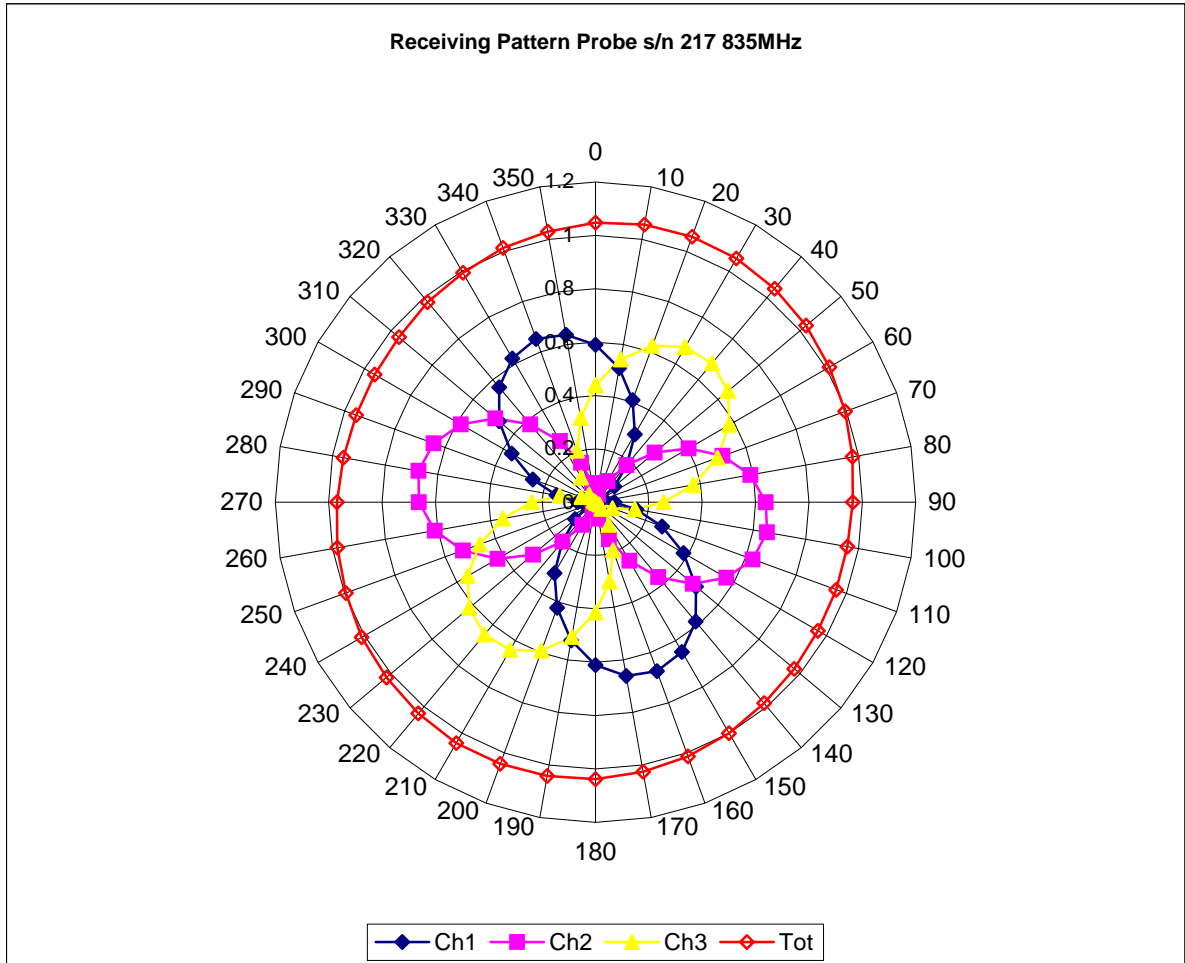
Boundary Effect:

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.

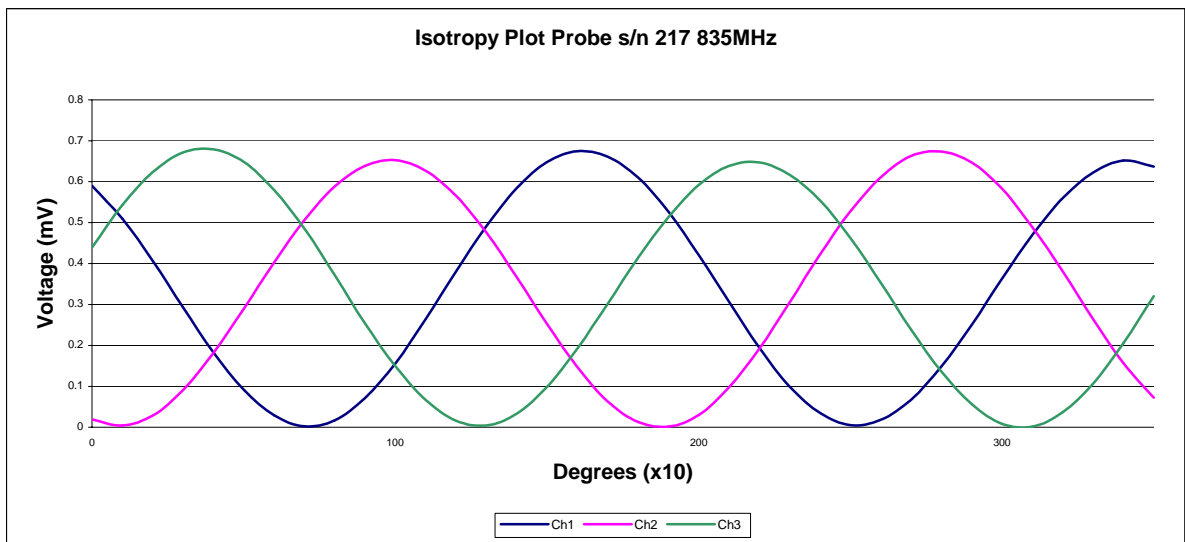
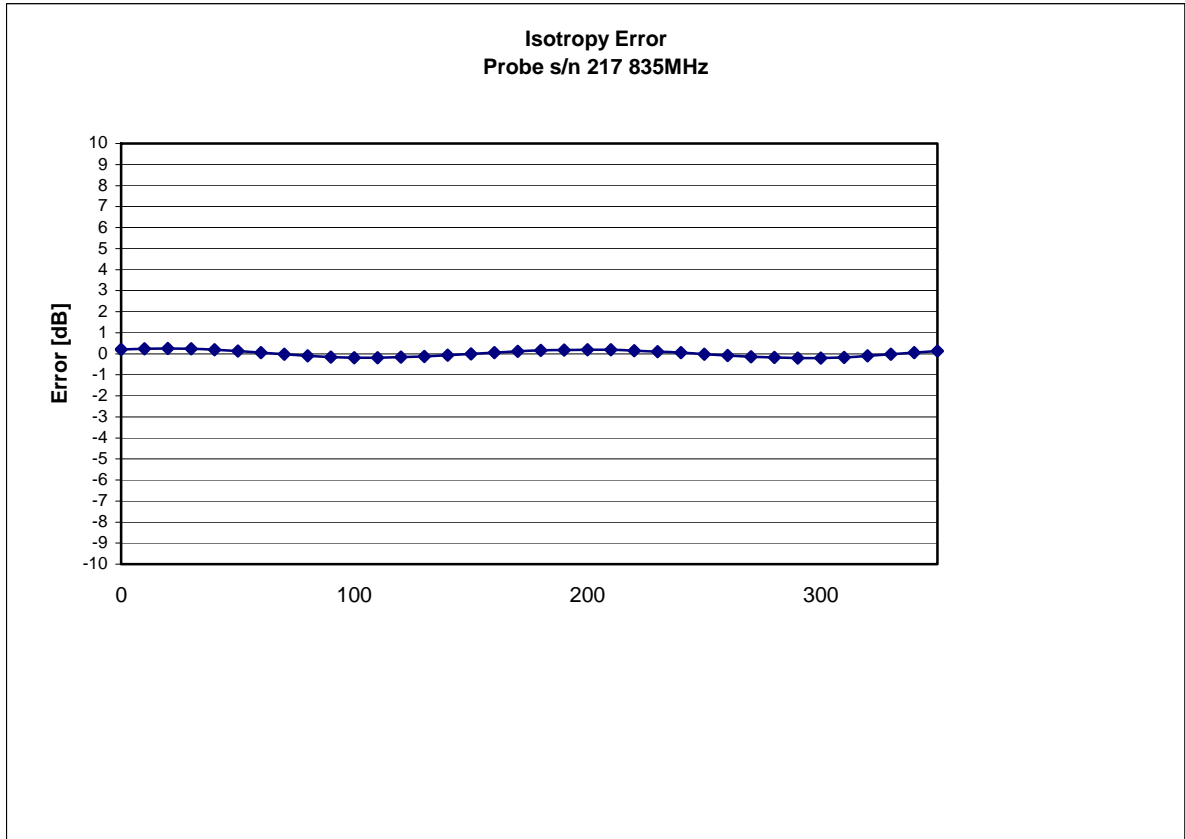
Spatial Resolution:

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.

Receiving Pattern 835 MHz (Air)



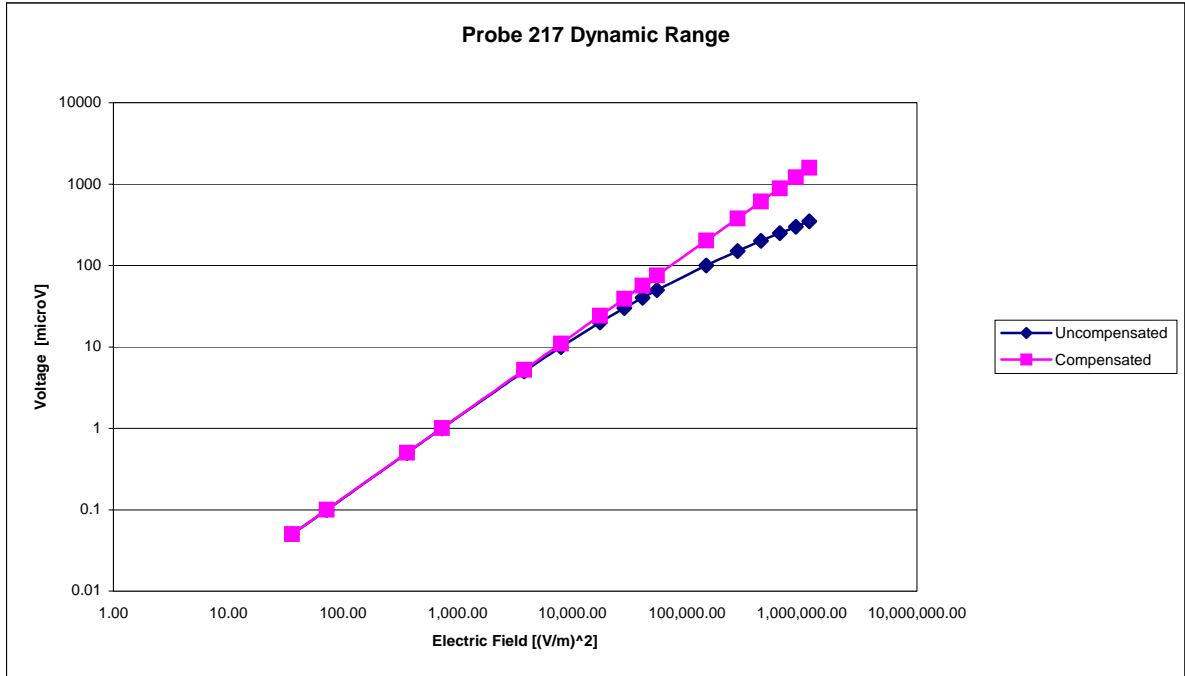
Isotropy Error 835 MHz (Air)



Isotropicity Tissue:

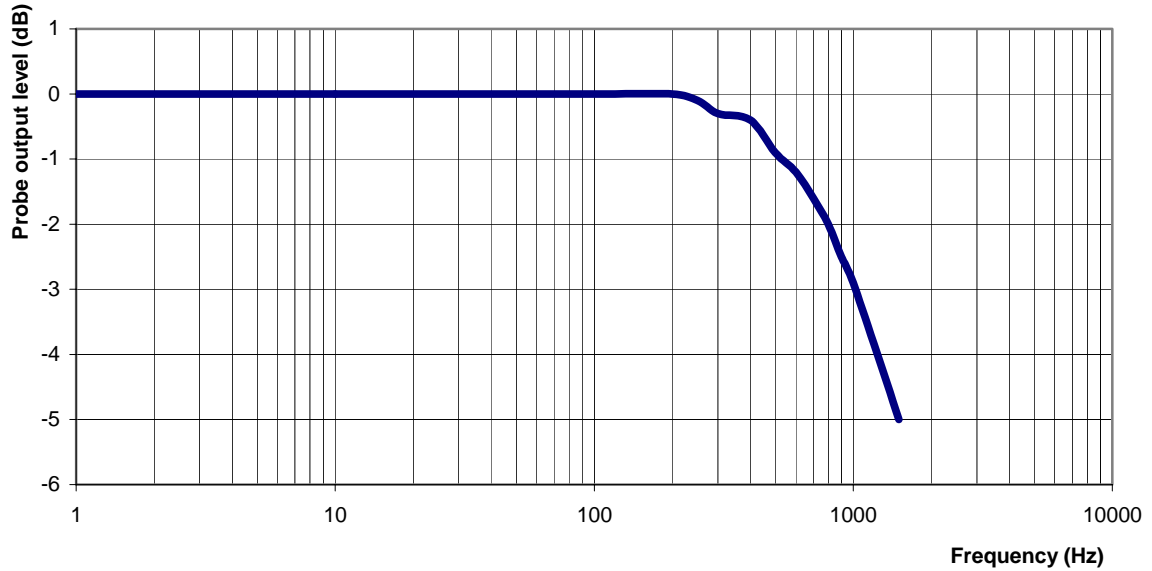
0.10 dB

Dynamic Range



Video Bandwidth

Probe Frequency Characteristics



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

Conversion Factor Uncertainty Assessment Measured

Sensitivity in Body Tissue

Frequency: 835 MHz
Epsilon: 54.9 (+/-5%) **Sigma:** 1.04 S/m (+/-5%)

ConvF

Channel X: 6.1 7%(K=2)
Channel Y: 6.1 7%(K=2)
Channel Z: 6.1 7%(K=2)

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

Boundary Effect:

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

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2009.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1084

Client.: RFEL

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

BODY Calibration

Manufacturer: APREL Laboratories

Model No.: E-020

Serial No.: 217

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2

Project No: RFEL-E020-CAL-5477

Calibrated: 21st October 2009

Released on: 28th October 2009

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary
This calibration has been conducted in line with the SCC ISO-IEC 17025 Scope of Accreditation
Accredited Laboratory Number 48

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

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-020 217.

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

IEC 62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1 & 2: Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 300 MHz to 3 GHz)"

IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

Conditions

Probe 217 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

Calibration Results Summary

| | |
|-----------------------|---------------------|
| Probe Type: | E-Field Probe E-020 |
| Serial Number: | 217 |
| 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 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Y: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Z: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Diode Compression Point: | 95 mV |

Sensitivity in Body Tissue Measured

Frequency: 1900 MHz

Epsilon: 54.6 (+/-5%) **Sigma:** 1.55 S/m (+/-5%)

ConvF

Channel X: 4.85

Channel Y: 4.85

Channel Z: 4.85

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

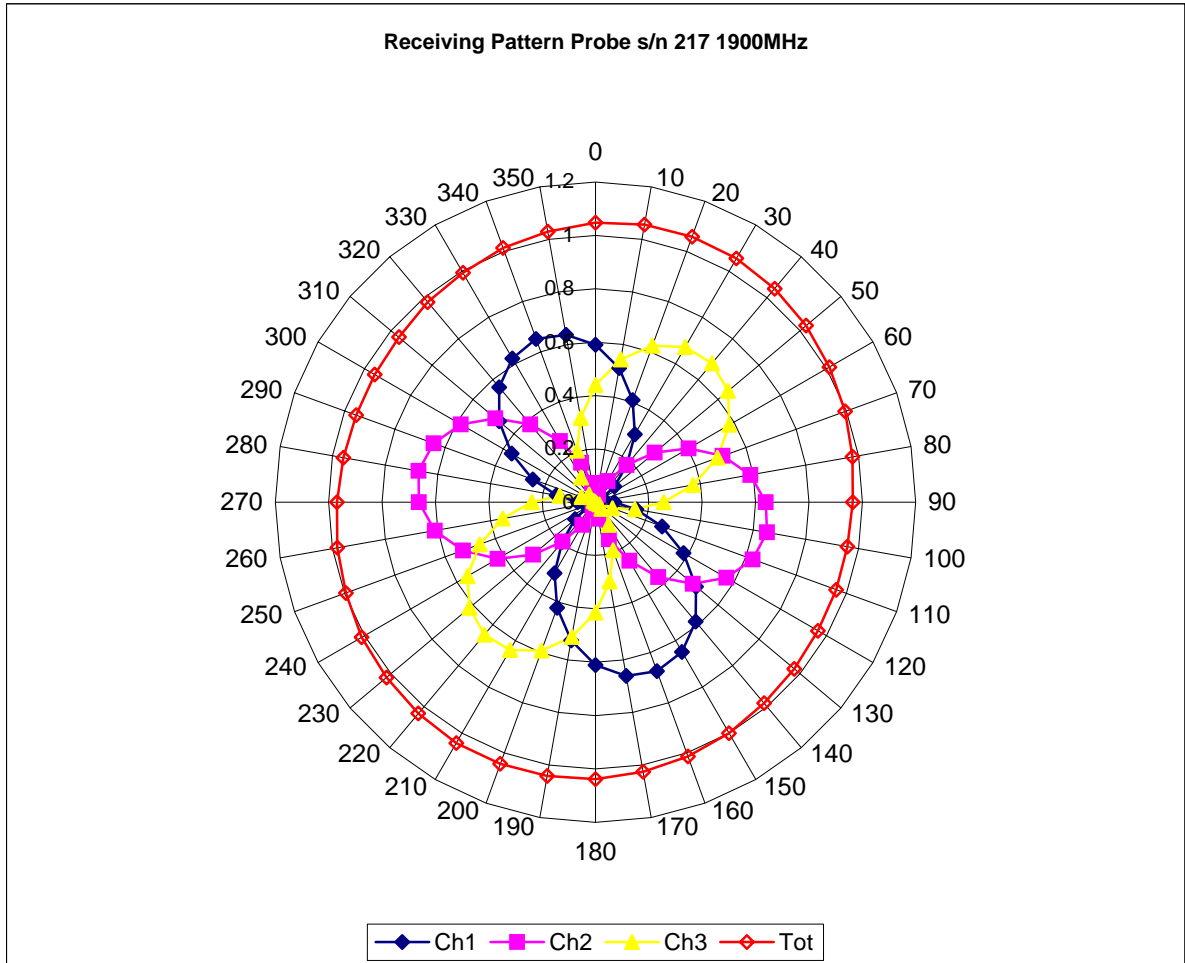
Boundary Effect:

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.

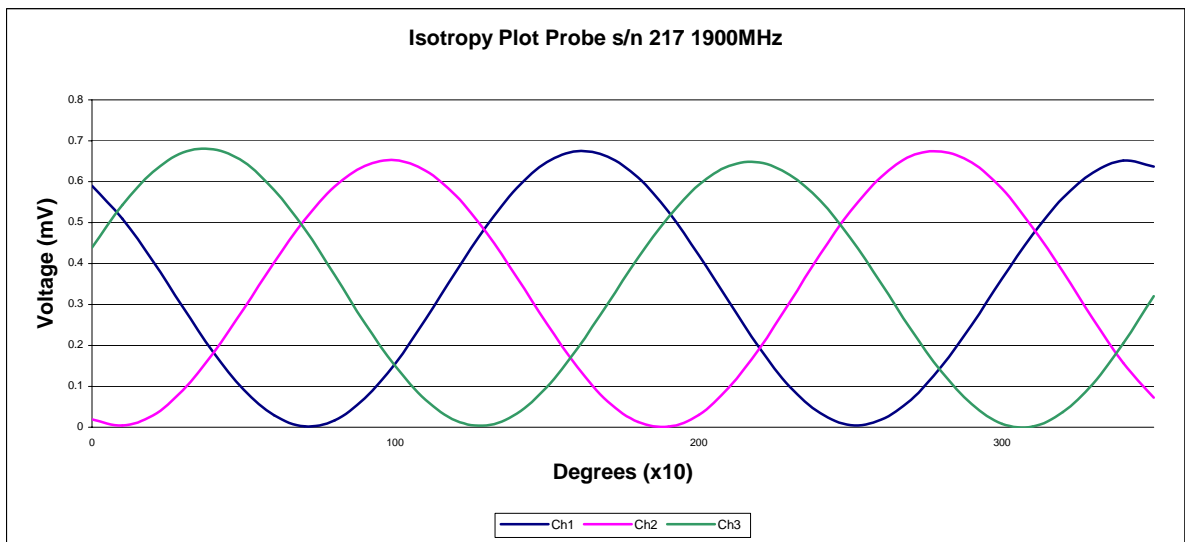
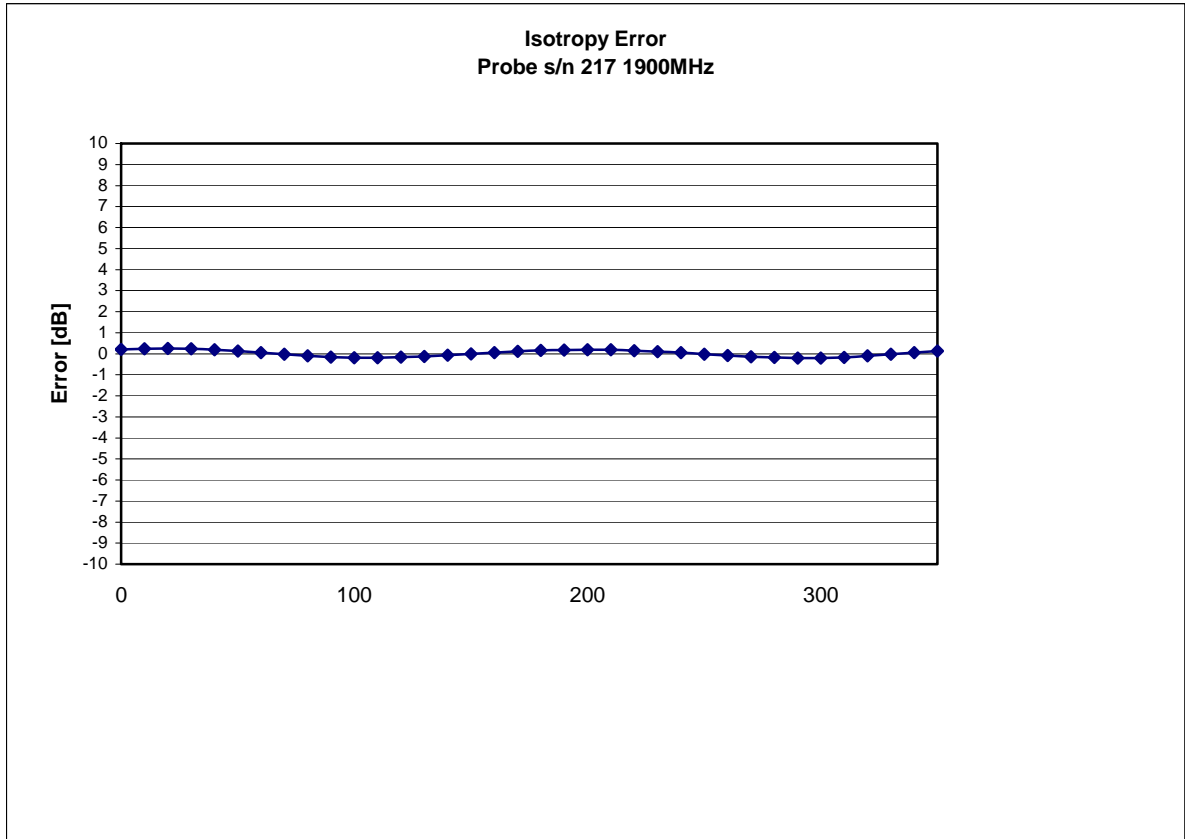
Spatial Resolution:

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.

Receiving Pattern 1900 MHz (Air)



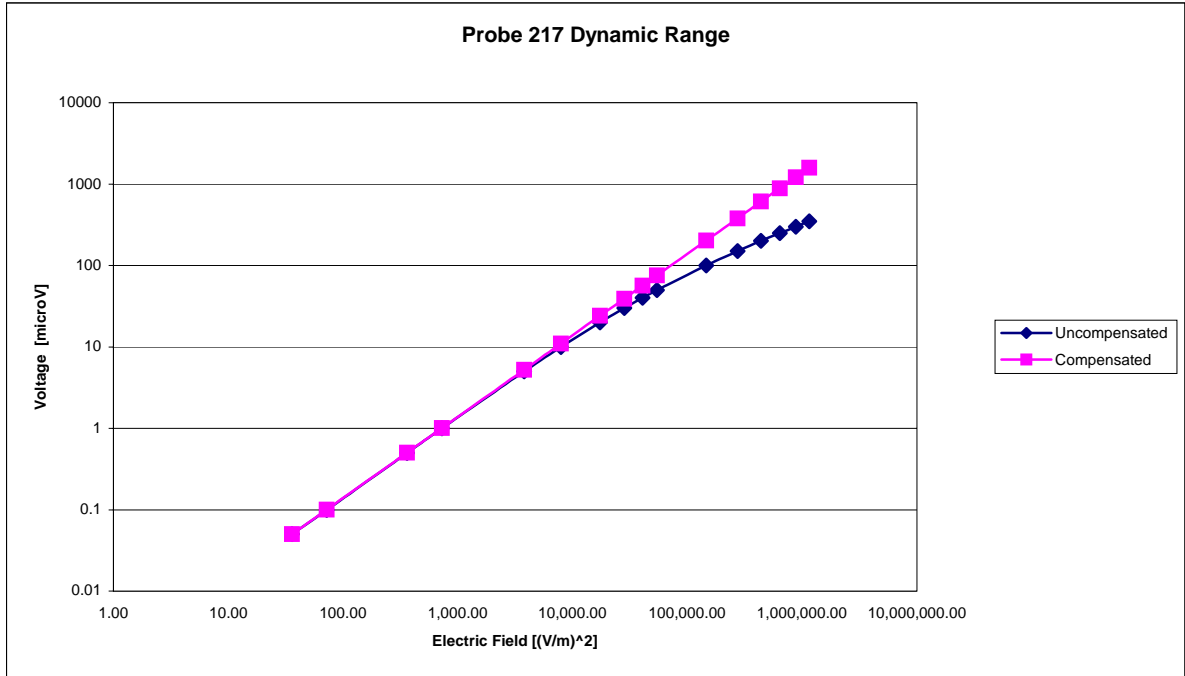
Isotropy Error 1900 MHz (Air)



Isotropicity Tissue:

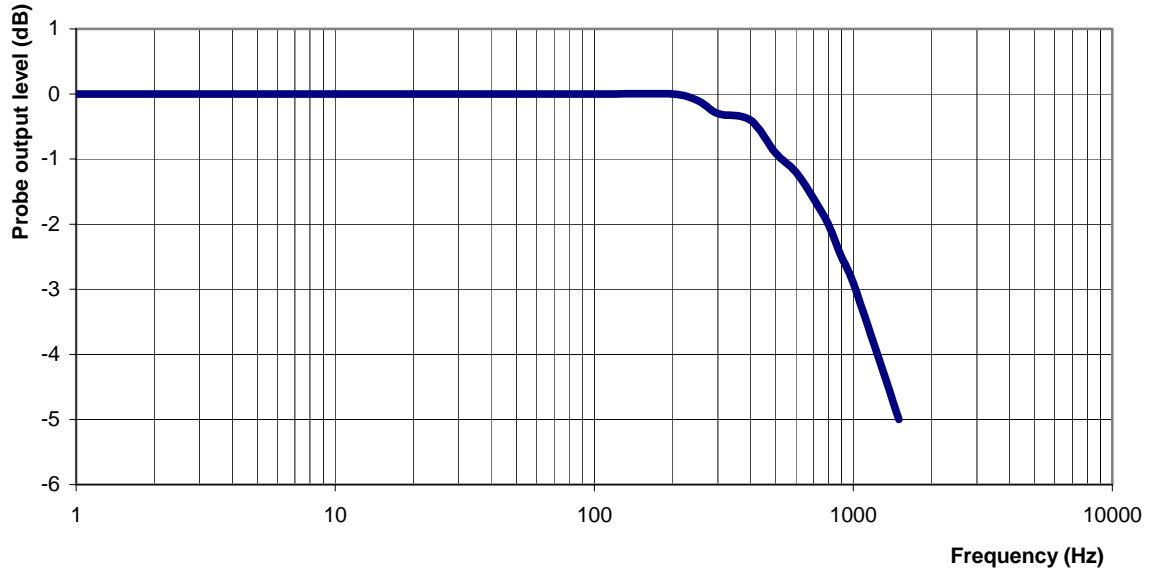
0.10 dB

Dynamic Range



Video Bandwidth

Probe Frequency Characteristics



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

Conversion Factor Uncertainty Assessment Measured

Sensitivity in Body Tissue

Frequency: 1900 MHz

Epsilon: 54.6 (+/-5%) **Sigma:** 1.55 S/m (+/-5%)

ConvF

Channel X: 4.85 7%(K=2)

Channel Y: 4.85 7%(K=2)

Channel Z: 4.85 7%(K=2)

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

Boundary Effect:

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

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2009.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1086

Client.: RFEL

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 2450 MHz

BODY Calibration

Manufacturer: APREL Laboratories

Model No.: E-020

Serial No.: 217

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2

Project No: RFEL-E020-CAL-5477

Calibrated: 21st October 2009

Released on: 28th October 2009

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary
This calibration has been conducted in line with the SCC ISO-IEC 17025 Scope of Accreditation
Accredited Laboratory Number 48

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

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-020 217.

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

IEC 62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1 & 2: Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 300 MHz to 3 GHz)"

IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

Conditions

Probe 217 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

Calibration Results Summary

| | |
|-----------------------|---------------------|
| Probe Type: | E-Field Probe E-020 |
| Serial Number: | 217 |
| Frequency: | 2450 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 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Y: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Z: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Diode Compression Point: | 95 mV |

Sensitivity in Body Tissue Measured

Frequency: 2450 MHz

Epsilon: 53.4 (+/-5%) **Sigma:** 1.95 S/m (+/-5%)

ConvF

Channel X: 3.61

Channel Y: 3.61

Channel Z: 3.61

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

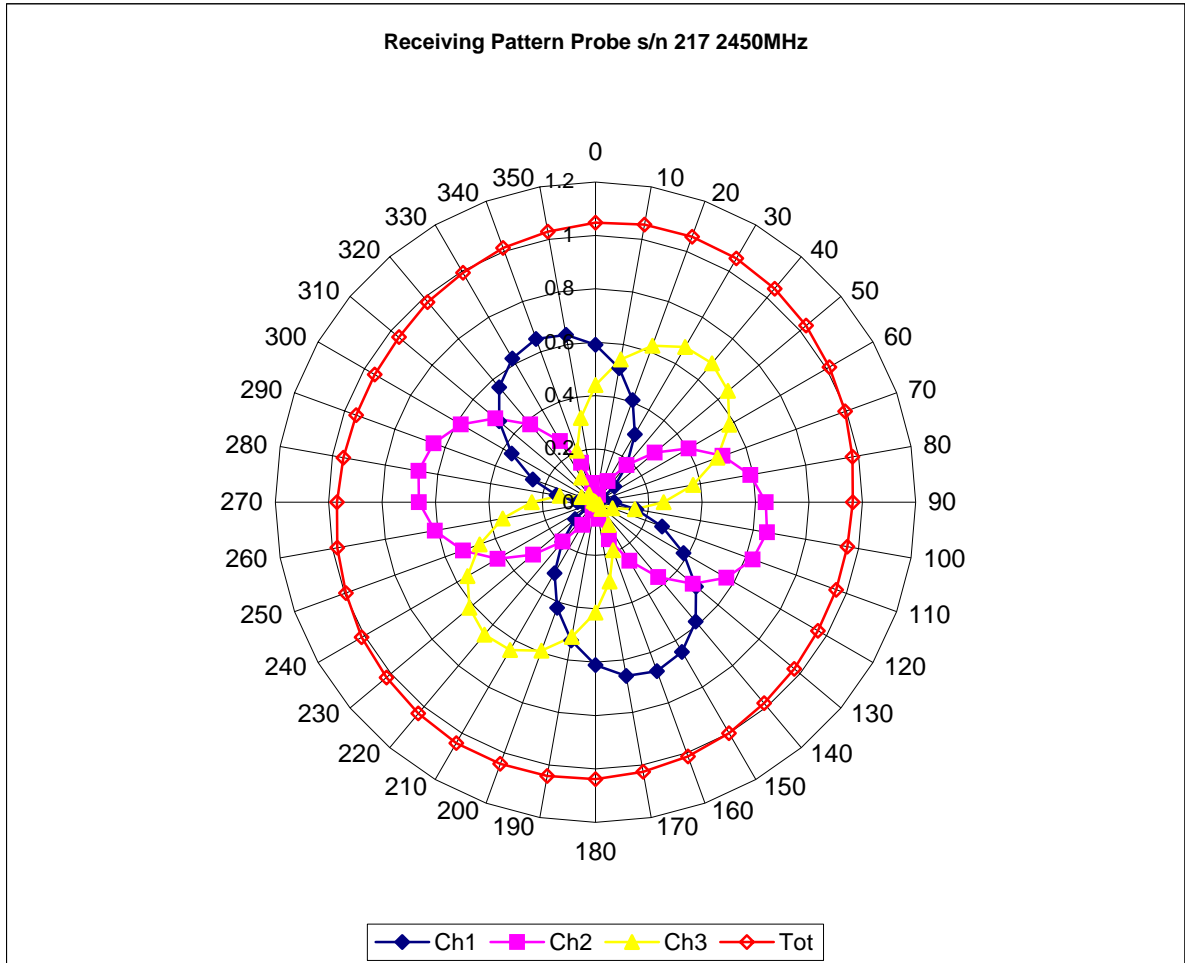
Boundary Effect:

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.

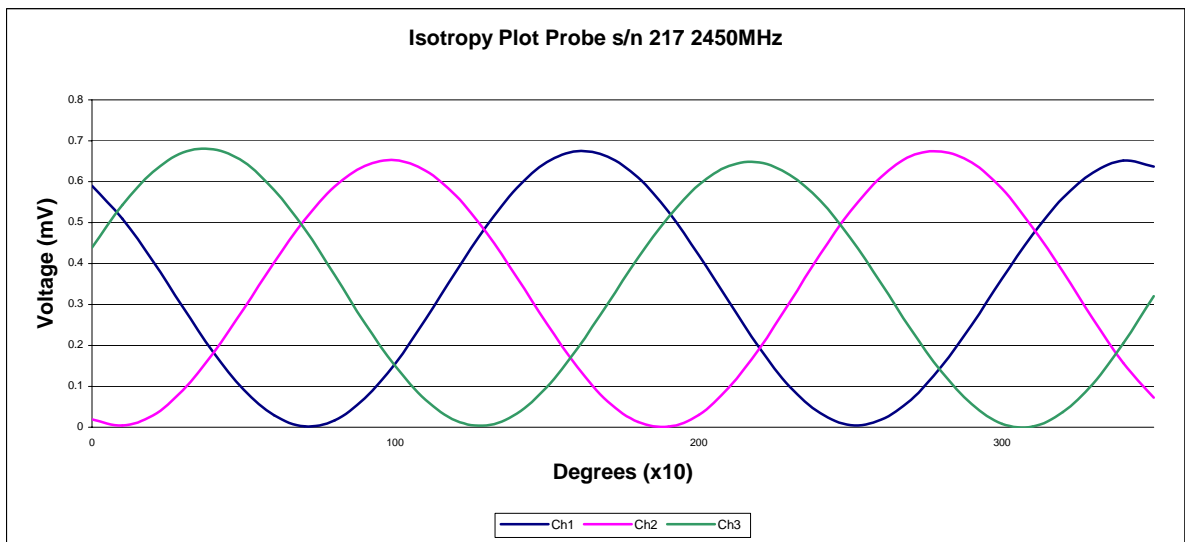
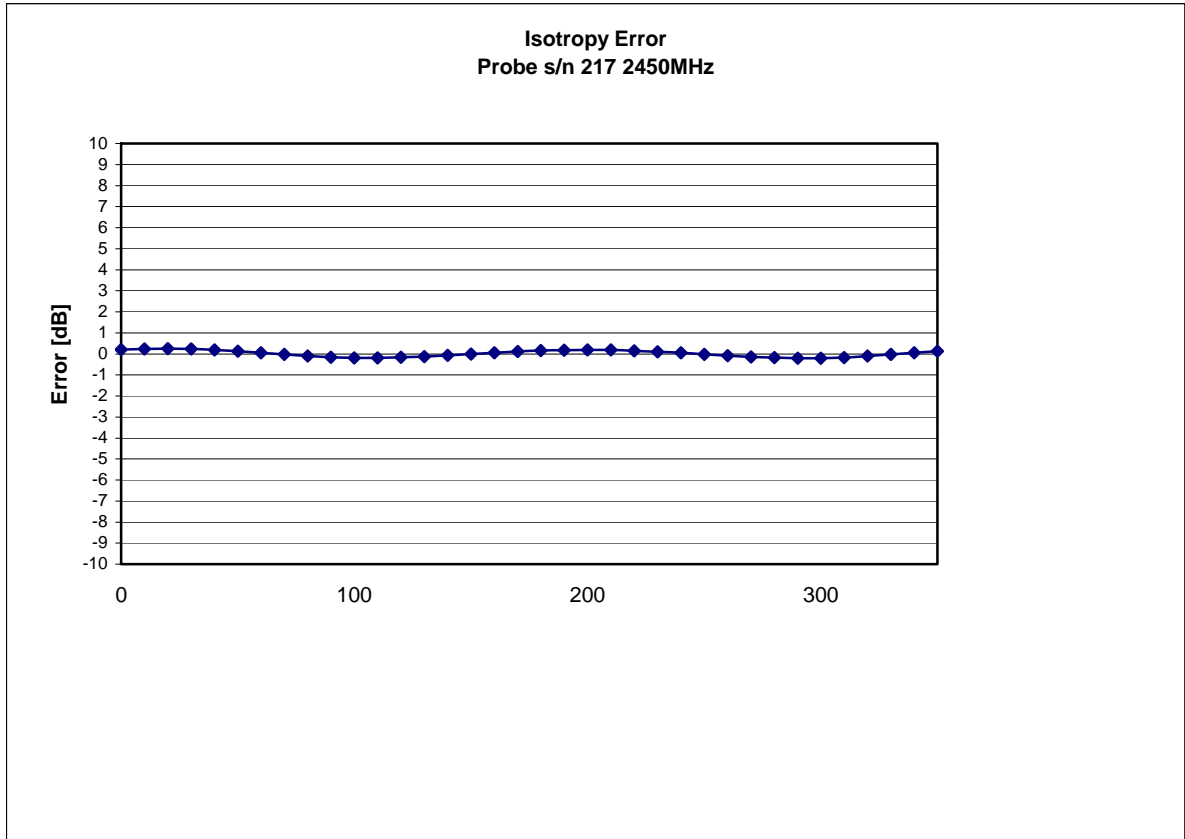
Spatial Resolution:

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.

Receiving Pattern 2450 MHz (Air)



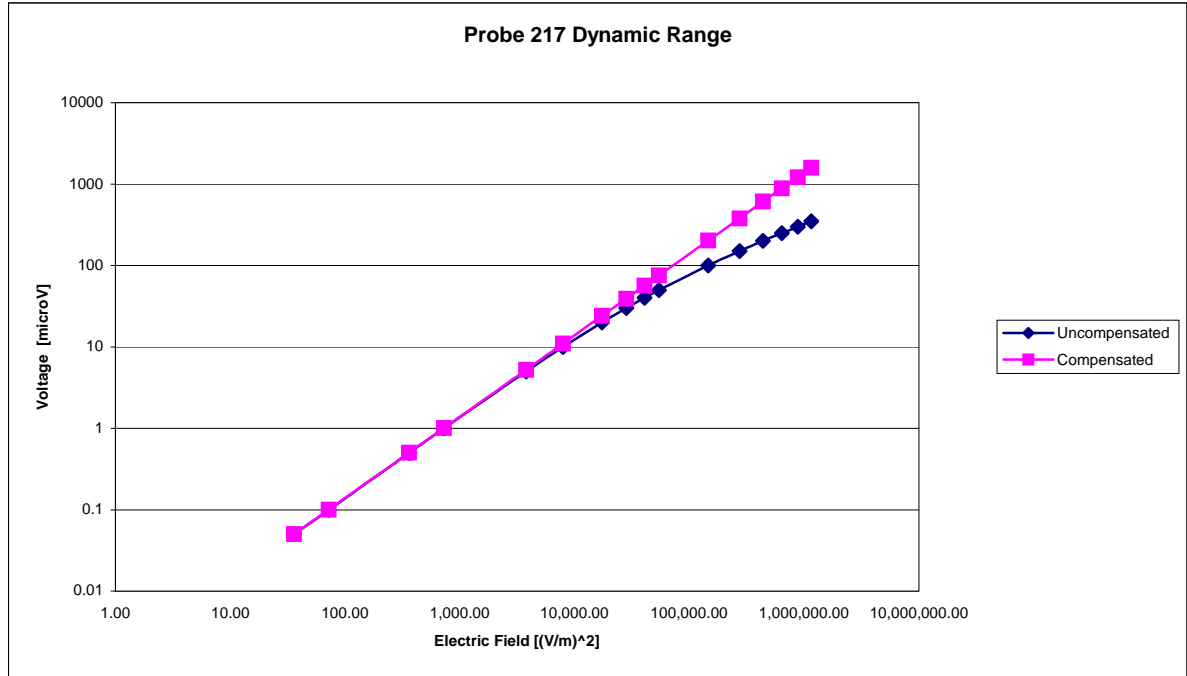
Isotropy Error 2450 MHz (Air)



Isotropicity Tissue:

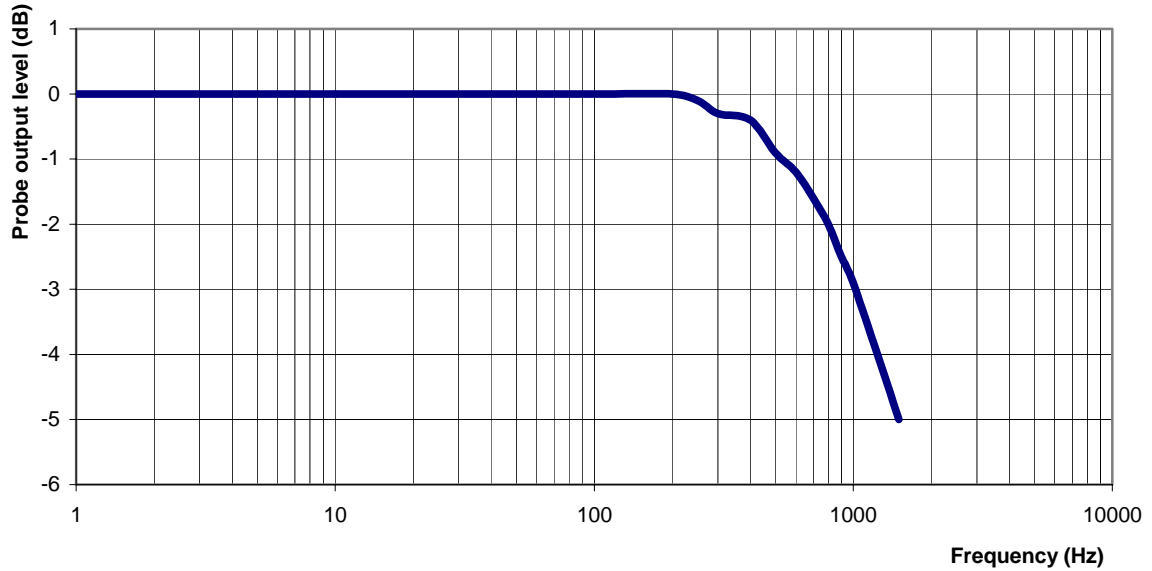
0.10 dB

Dynamic Range



Video Bandwidth

Probe Frequency Characteristics



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

Conversion Factor Uncertainty Assessment

Sensitivity in Body Tissue

Frequency: 2450 MHz
Epsilon: 53.4 (+/-5%) **Sigma:** 1.95 S/m (+/-5%)

ConvF

Channel X: 3.61 7%(K=2)
Channel Y: 3.61 7%(K=2)
Channel Z: 3.61 7%(K=2)

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

Boundary Effect:

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

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2009.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1091

Client.: RFEL

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 2600 MHz

BODY Calibration

Manufacturer: APREL Laboratories

Model No.: E-020

Serial No.: 217

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2

Project No: RFEL-E020-CAL-5477

Calibrated: 21st October 2009

Released on: 28th October 2009

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary
This calibration has been conducted in line with the SCC ISO-IEC 17025 Scope of Accreditation
Accredited Laboratory Number 48

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

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-020 217.

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
IEC 62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1 & 2: Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 300 MHz to 3 GHz)"
IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

Conditions

Probe 217 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

Calibration Results Summary

| | |
|-----------------------|---------------------|
| Probe Type: | E-Field Probe E-020 |
| Serial Number: | 217 |
| Frequency: | 2600 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: | $1.2 \mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Y: | $1.2 \mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Z: | $1.2 \mu\text{V}/(\text{V}/\text{m})^2$ |
| Diode Compression Point: | 95 mV |

Sensitivity in Body Tissue Measured

Frequency: 2600 MHz

Epsilon: 50.82 (+/-5%) **Sigma:** 2.24 S/m (+/-5%)

ConvF

Channel X: 3.6

Channel Y: 3.6

Channel Z: 3.6

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

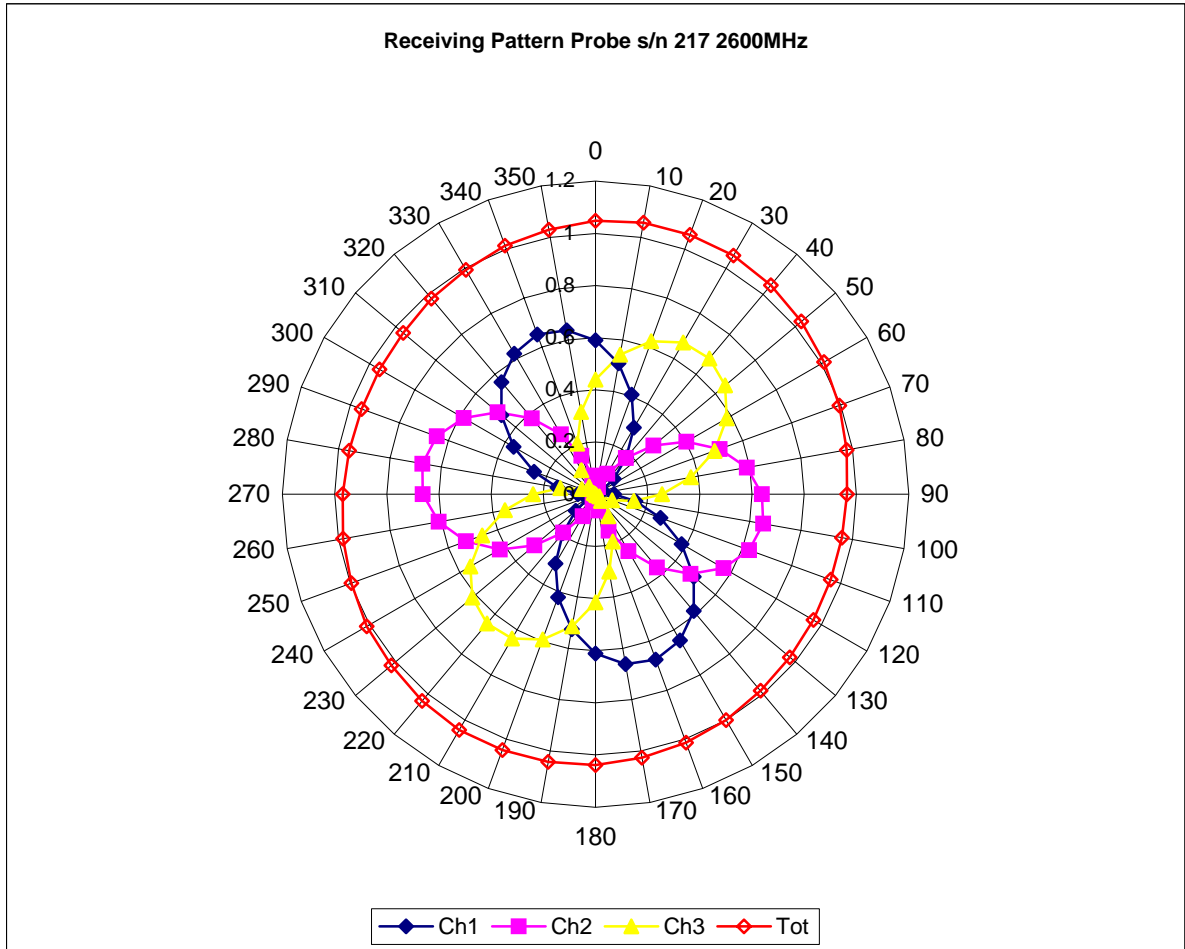
Boundary Effect:

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.

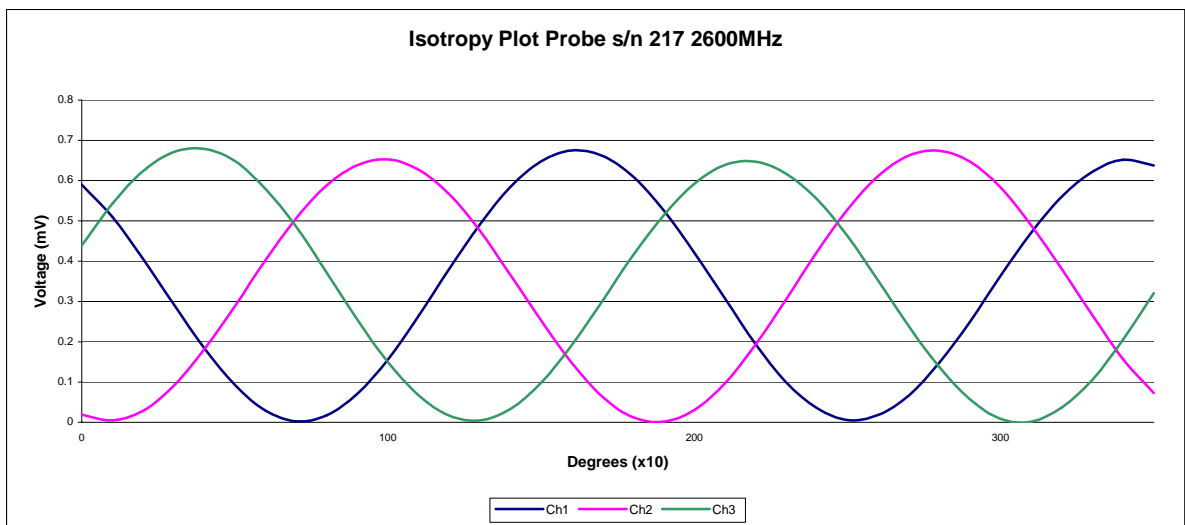
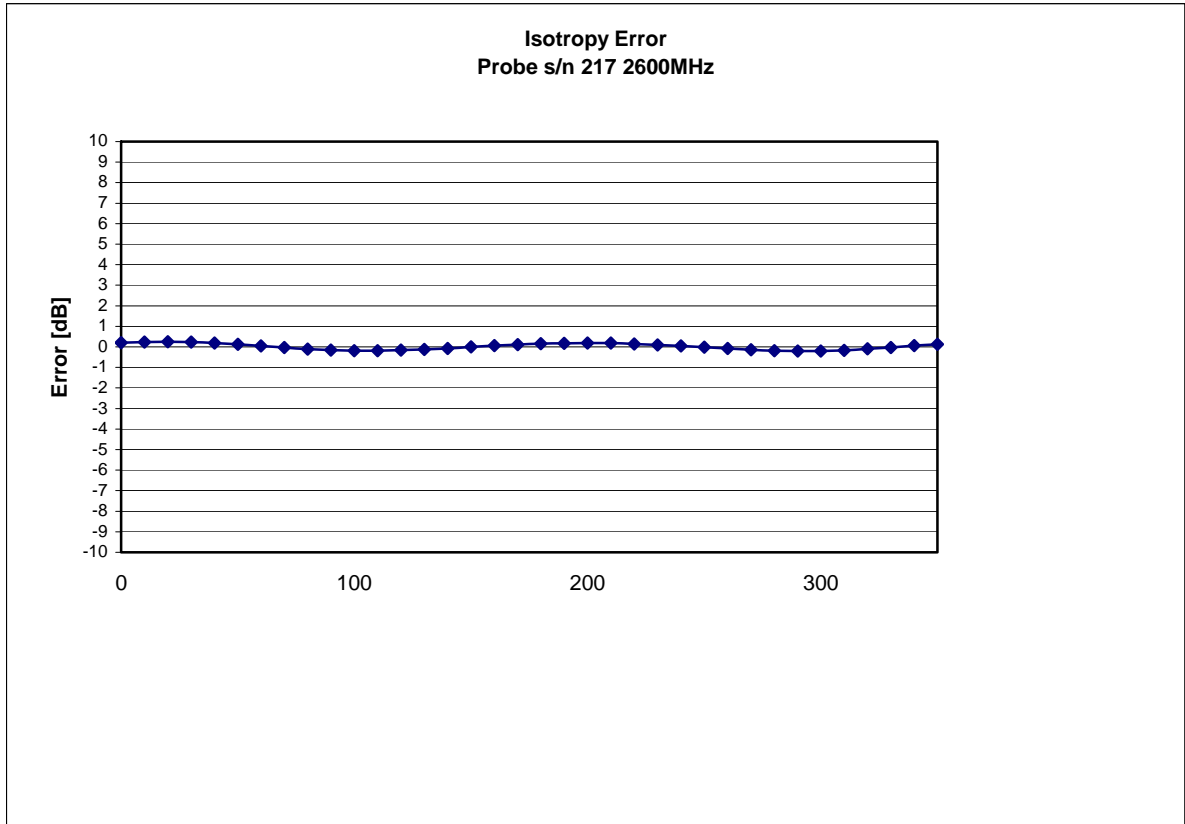
Spatial Resolution:

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.

Receiving Pattern 2600 MHz (Air)



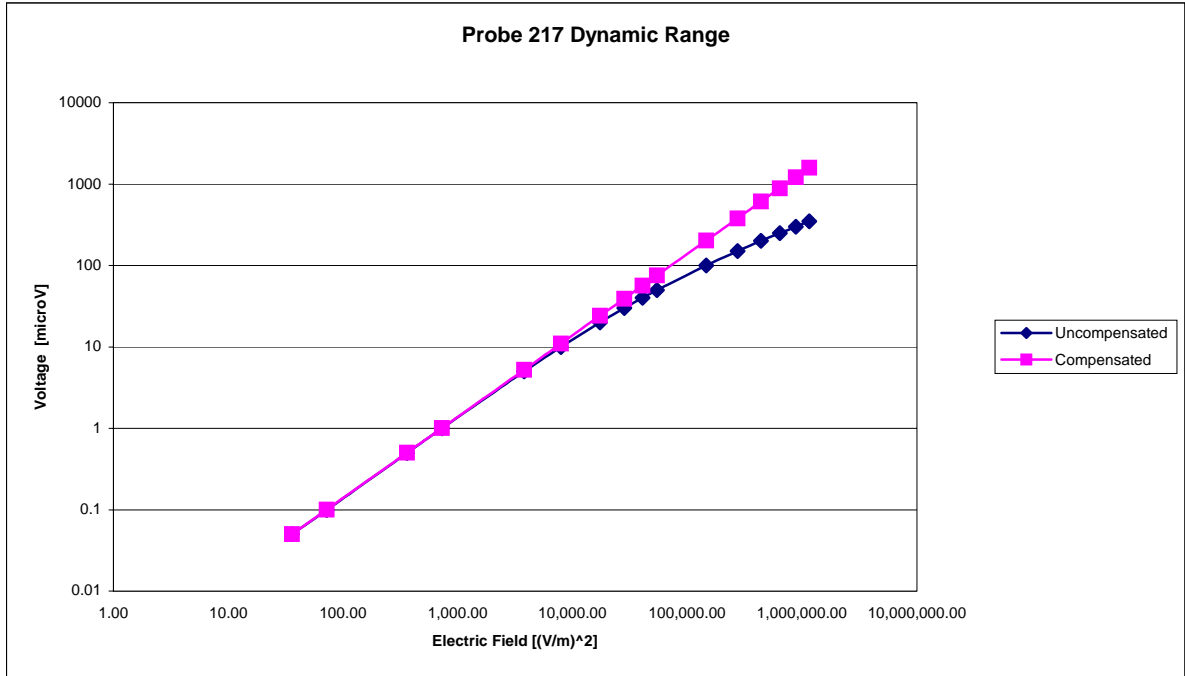
Isotropy Error 2600 MHz (Air)



Isotropicity Tissue:

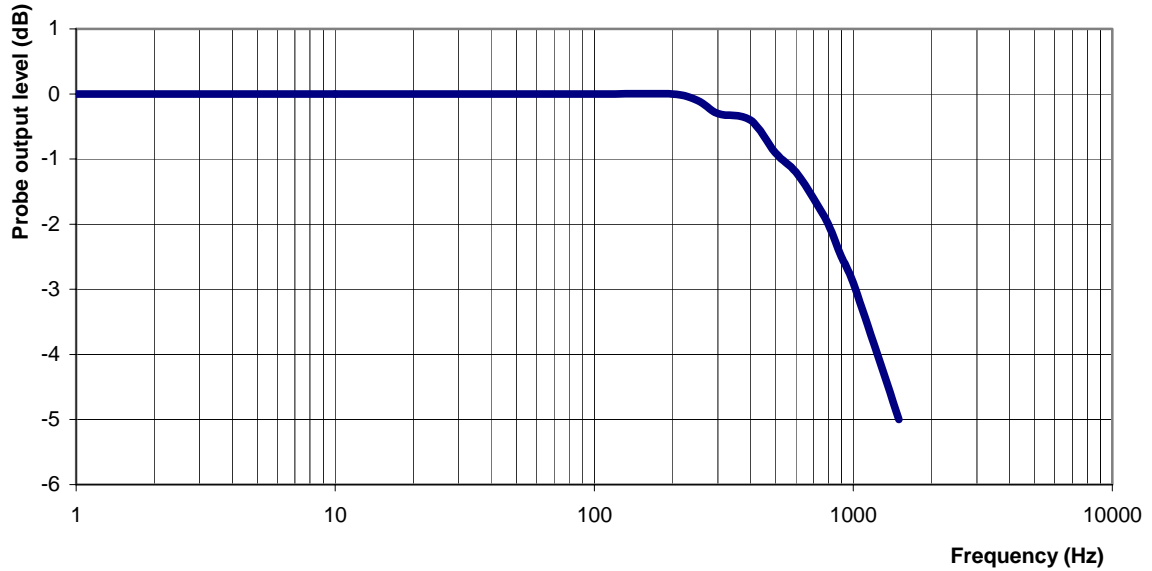
0.10 dB

Dynamic Range



Video Bandwidth

Probe Frequency Characteristics



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

Conversion Factor Uncertainty Assessment Measured

Sensitivity in Body Tissue

Frequency: 2600 MHz

Epsilon: 50.82 (+/-5%) **Sigma:** 2.24 S/m (+/-5%)

ConvF

Channel X: 3.6 7%(K=2)

Channel Y: 3.6 7%(K=2)

Channel Z: 3.6 7%(K=2)

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

Boundary Effect:

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

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2009.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1165

Client.: RFEL

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 2600 MHz

Manufacturer: APREL Laboratories

Model No.: E-020

Serial No.: 215

Body Calibration

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2

Project No: RFEL-E-020-Cal-5539

Calibrated: 22 September 2010

Released on: 27 September 2010

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary
This calibration has been conducted in line with the SCC ISO-IEC 17025 Scope of Accreditation
Accredited Laboratory Number 48

Released By: _____

NCL CALIBRATION LABORATORIES

17 Bentley Ave
NEPEAN, ONTARIO
CANADA K2E 6T7

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

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-020 215.

References

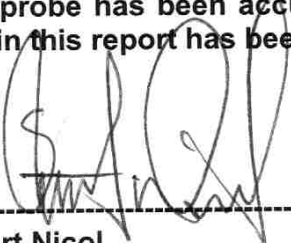
SSI/DRB-TP-D01-032-E020-V2 E-Field Probe Calibration Procedure
IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"
IEEE 1309 "IEEE Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9 KHz to 40 GHz" 2005
SSI-TP-011 Tissue Calibration Procedure
IEC 62209 "Human exposure to radio frequency fields from handheld and body-mounted wireless communication devices –Human models, instrumentation and procedures Part 1 & 2: Procedure to determine the Specific Absorption Rate (SAR) for handheld devices used in close proximity of the ear (frequency range of 200MHz to 3GHz)"

Conditions

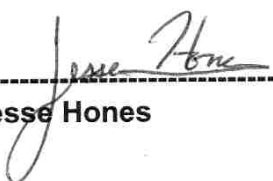
Probe 215 was a re-calibration.

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

Calibration Results Summary

| | |
|-----------------------|---------------------|
| Probe Type: | E-Field Probe E-020 |
| Serial Number: | 215 |
| Frequency: | 2600 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 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Y: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Z: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Diode Compression Point: | 95 mV |

Sensitivity in Body Tissue Measured

Frequency: 2600 MHz

Epsilon: 51.95 (+/-5%) **Sigma:** 2.08 S/m (+/-5%)

ConvF

Channel X: 4.7

Channel Y: 4.7

Channel Z: 4.7

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

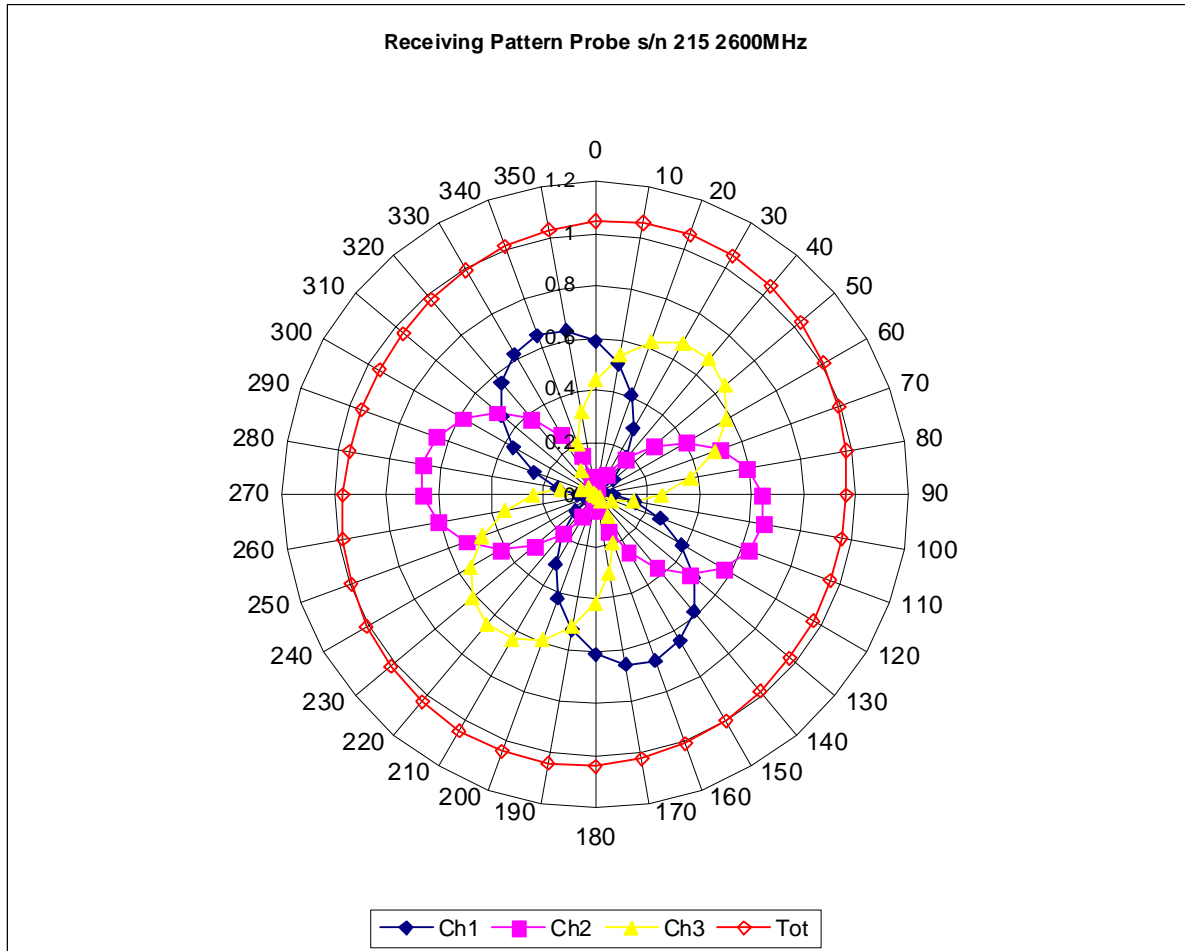
Boundary Effect:

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.

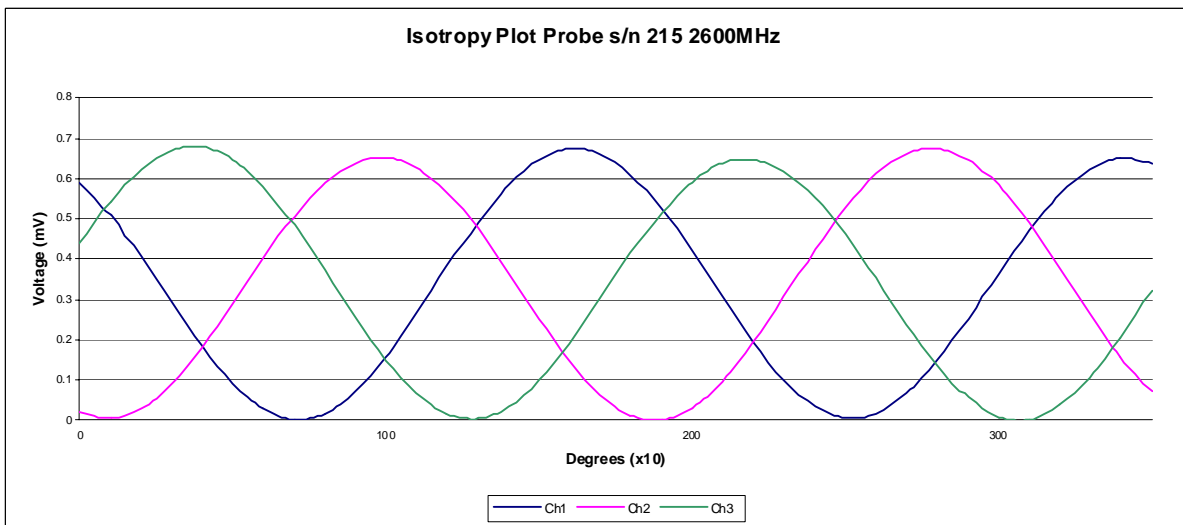
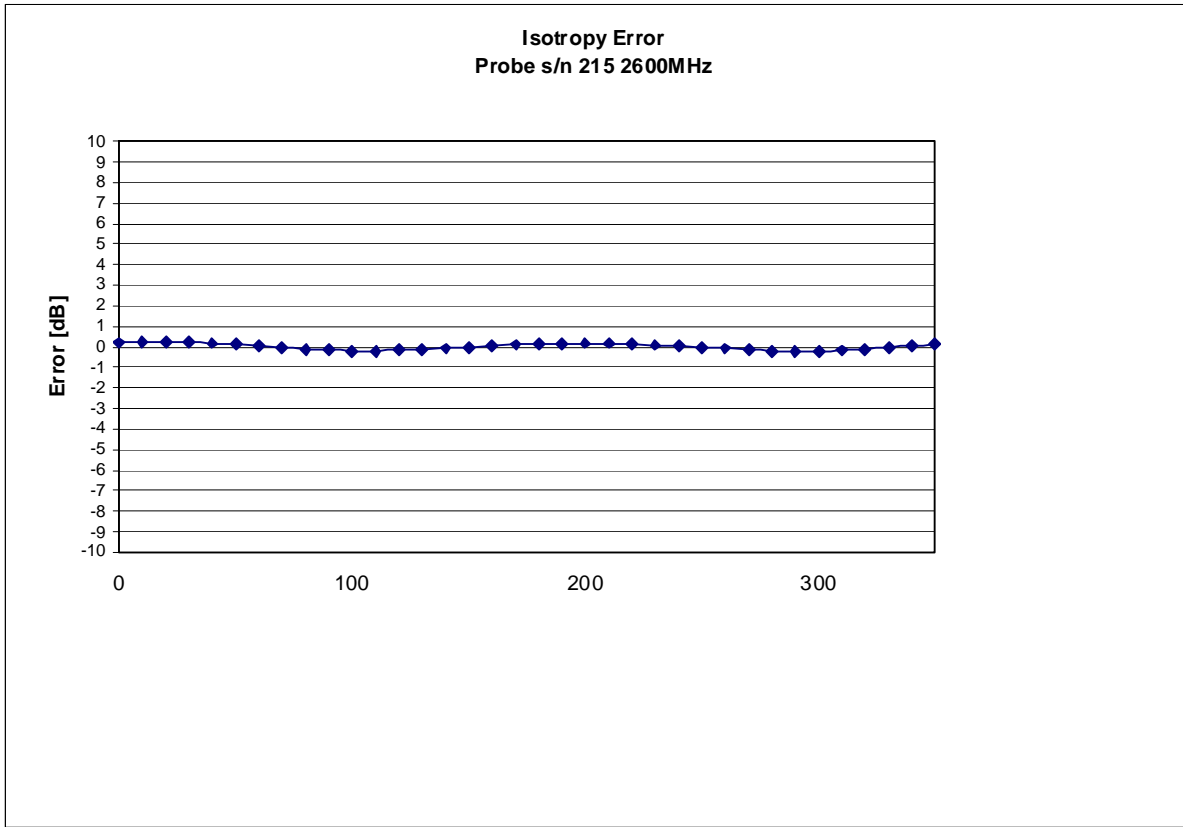
Spatial Resolution:

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.

Receiving Pattern 2600 MHz (Air)



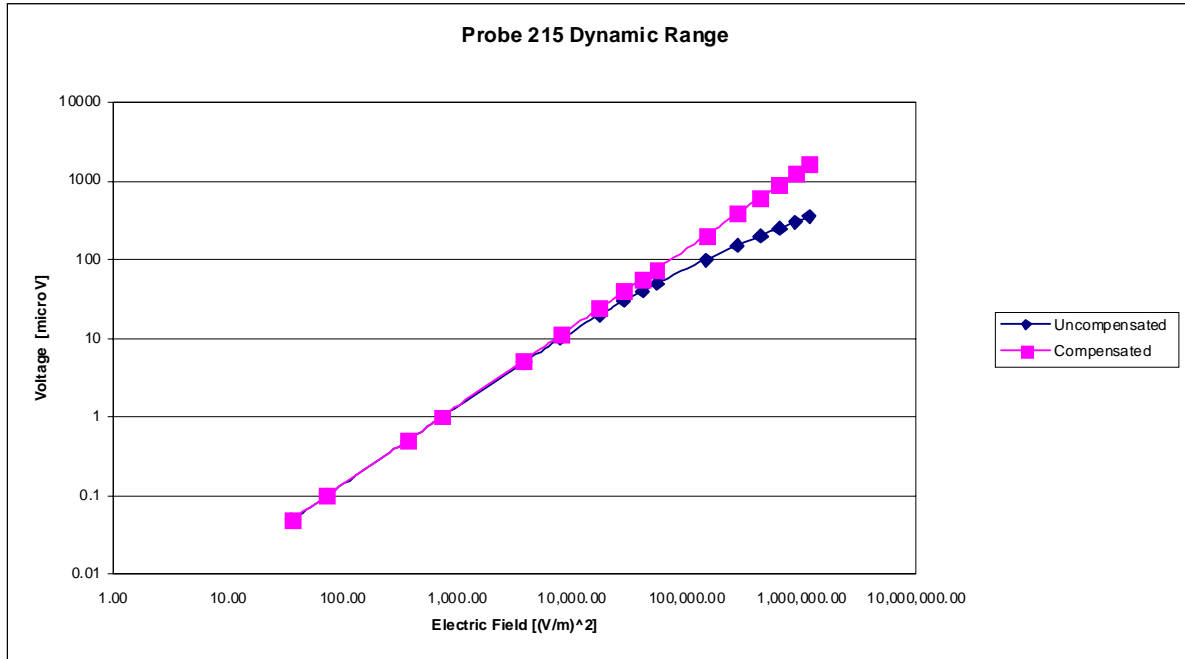
Isotropy Error 2600 MHz (Air)



Isotropicity Tissue:

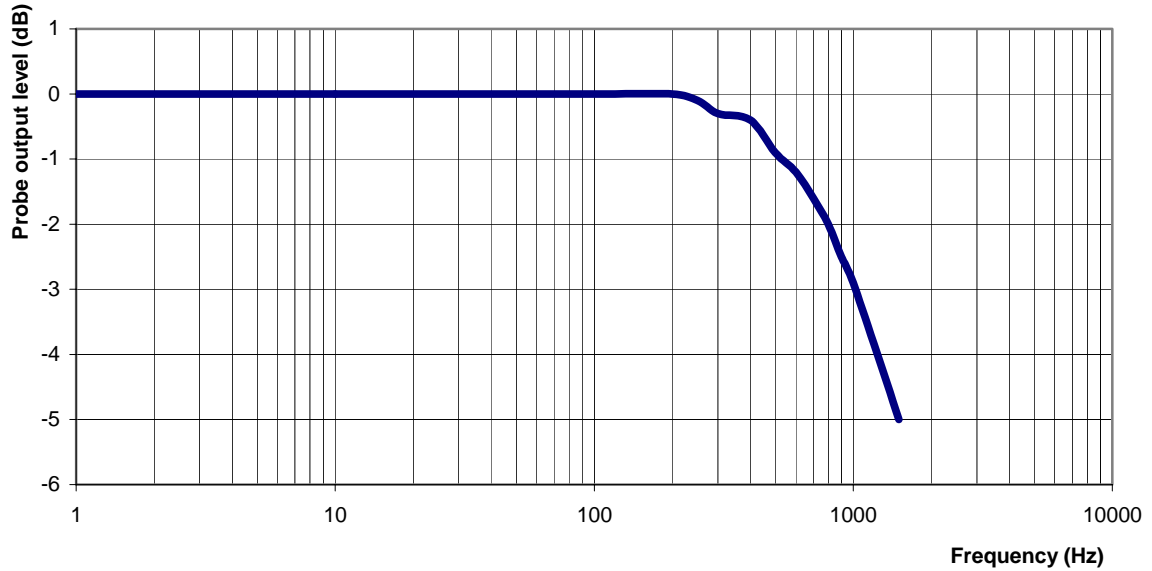
0.10 dB

Dynamic Range



Video Bandwidth

Probe Frequency Characteristics



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

Conversion Factor Uncertainty Assessment Measured

Sensitivity in Body Tissue

Frequency: 2600 MHz

Epsilon: 51.95 (+/-5%) **Sigma:** 2.08 S/m (+/-5%)

ConvF

Channel X: 4.7 7%(K=2)

Channel Y: 4.7 7%(K=2)

Channel Z: 4.7 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 2.5mm 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.

Appendix E – Dipole Calibration Data Sheets

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1114
Project Number: RFEL-835-Dipole-5480

CERTIFICATE OF CALIBRATION

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

Validation Dipole

Manufacturer: APREL Laboratories

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

Frequency: 835 MHz

Serial No: 180-00561

Customer: RFEL

Calibrated: 14th January 2010
Released on: 19th January 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) 820-4162

NCL Calibration Laboratories

Division of APREL Laboratories.

Conditions

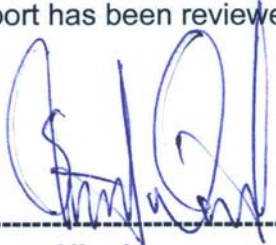
Dipole 180-00561 was a new calibration.

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

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

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

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



Stuart Nicol



C. Teodorian

Calibration Results Summary

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

Mechanical Dimensions

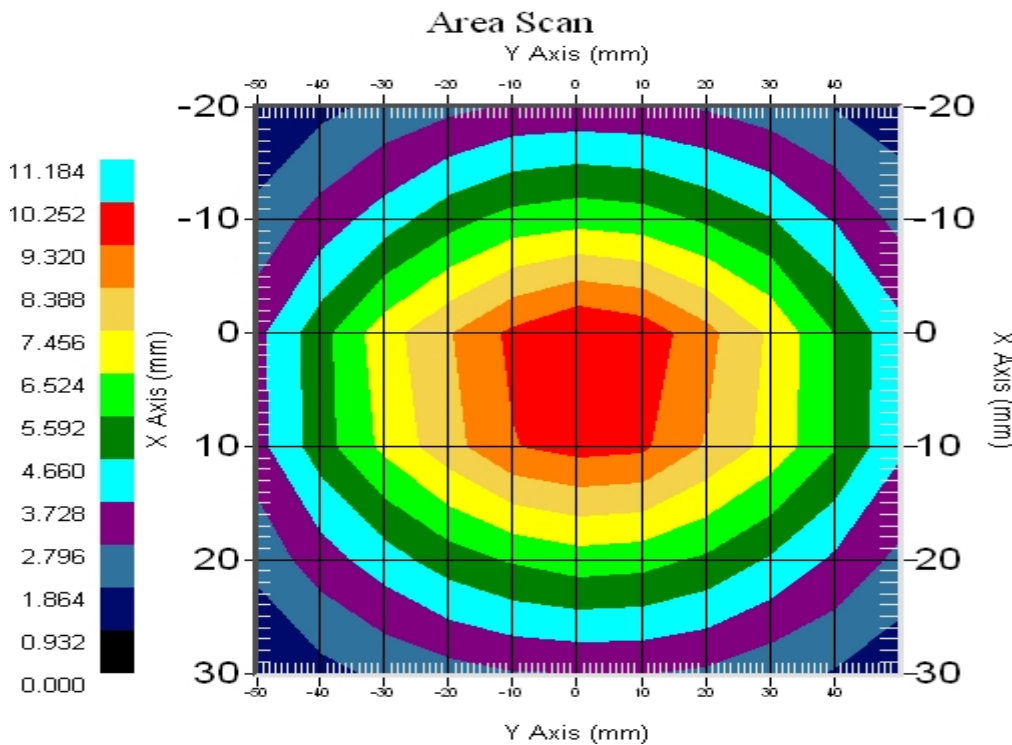
Length: 161.0 mm
Height: 89.8 mm

Electrical Specification

SWR: 1.009U
Return Loss: -47.751 dB
Impedance: 50.065 Ω

System Validation Results

| Frequency | 1 Gram | 10 Gram | Peak |
|-----------|--------|---------|-------|
| 835 MHz | 9.49 | 6.1 | 14.21 |



Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole 180-00561. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 130 MHz to 26 GHz E-Field Probe Serial Number 2225.

References

SSI-TP-018-ALSAS Dipole Calibration Procedure

SSI-TP-016 Tissue Calibration Procedure

IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"

Conditions

Dipole 180-00561 was a new calibration.

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

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

Dipole Calibration Results

Mechanical Verification

| APREL Length | APREL Height | Measured Length | Measured Height |
|---------------------|---------------------|------------------------|------------------------|
| 161.0 mm | 89.8 mm | 162.1 mm | 89.8 mm |

Tissue Validation

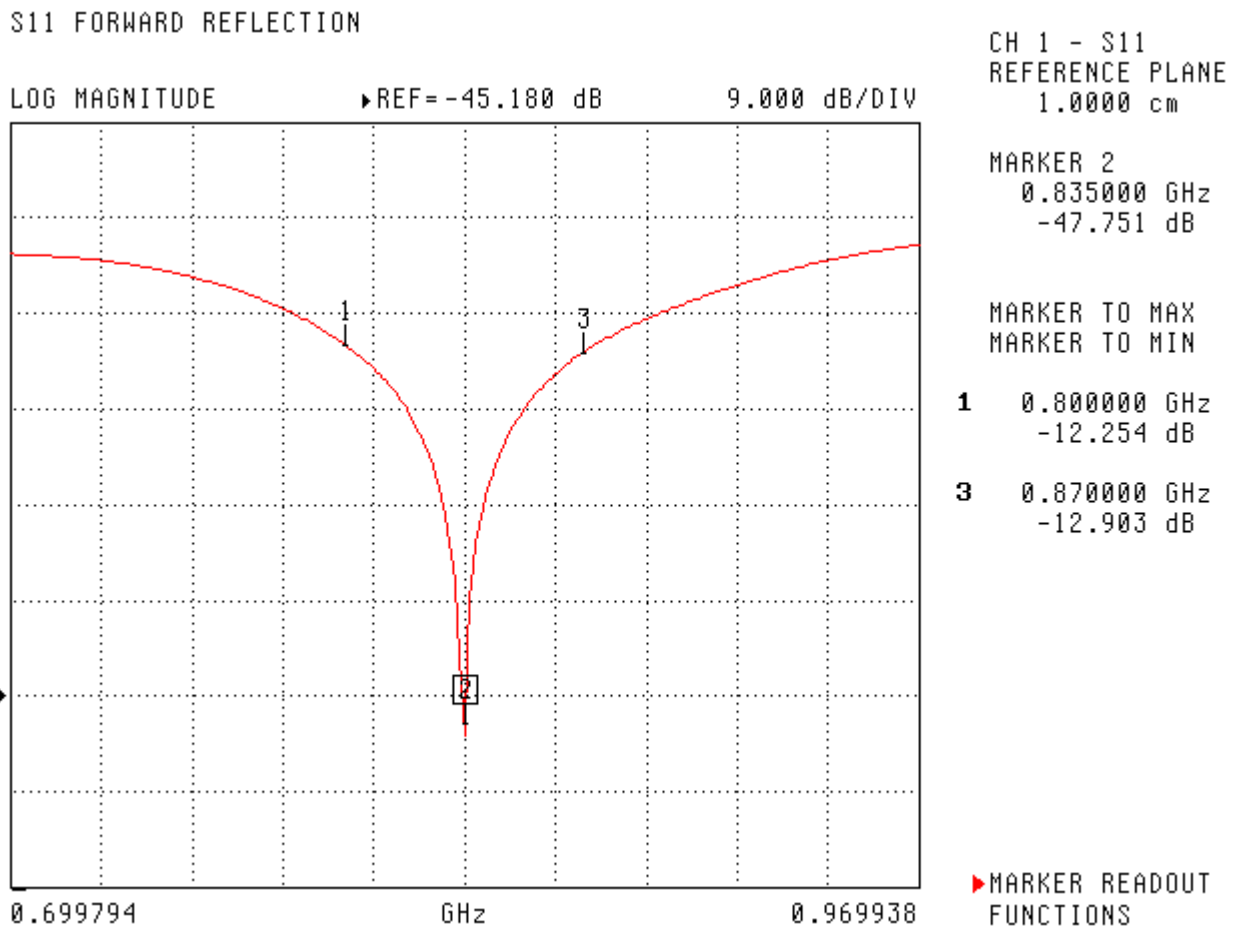
| Head Tissue 835MHz | Measured |
|---|-----------------|
| Dielectric constant, ϵ_r | 41.54 |
| Conductivity, σ [S/m] | 0.91 |

Electrical Calibration

| Test | Result |
|-----------|-----------------|
| S11 RL | -47.751dB |
| SWR | 1.009U |
| Impedance | 50.065 Ω |

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

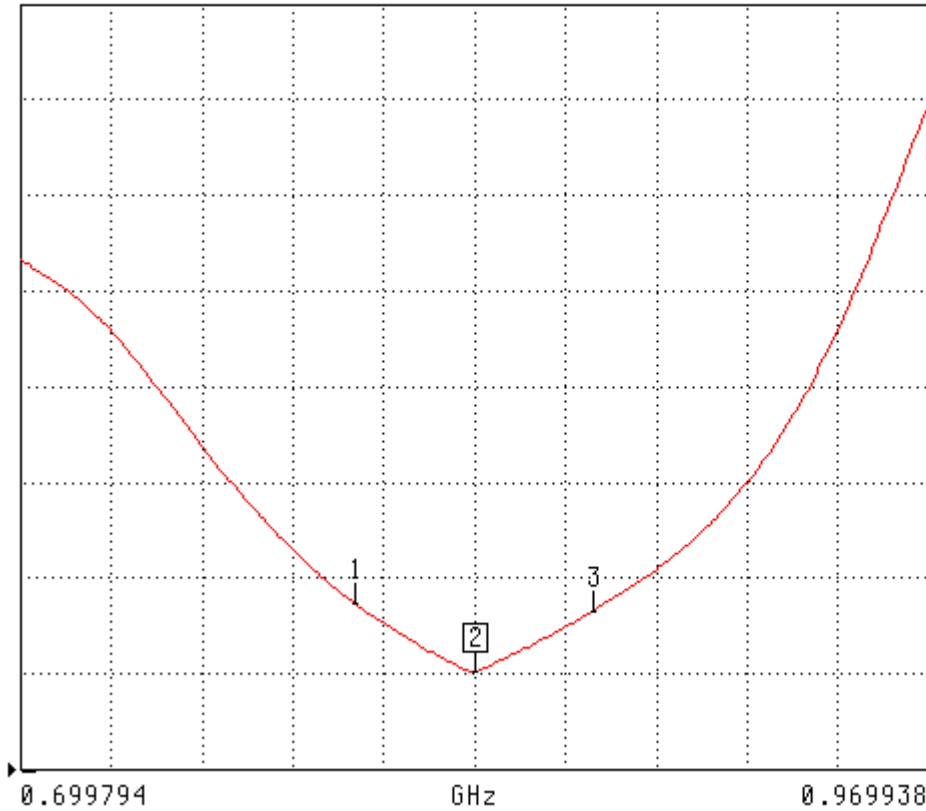
S11 Parameter Return Loss



SWR

S11 FORWARD REFLECTION

SWR ▶REF= 97.512 mU 900.000 mU/DIV



CH 1 - S11
REFERENCE PLANE
1.0000 cm

MARKER 2
0.835000 GHz
1.009 U

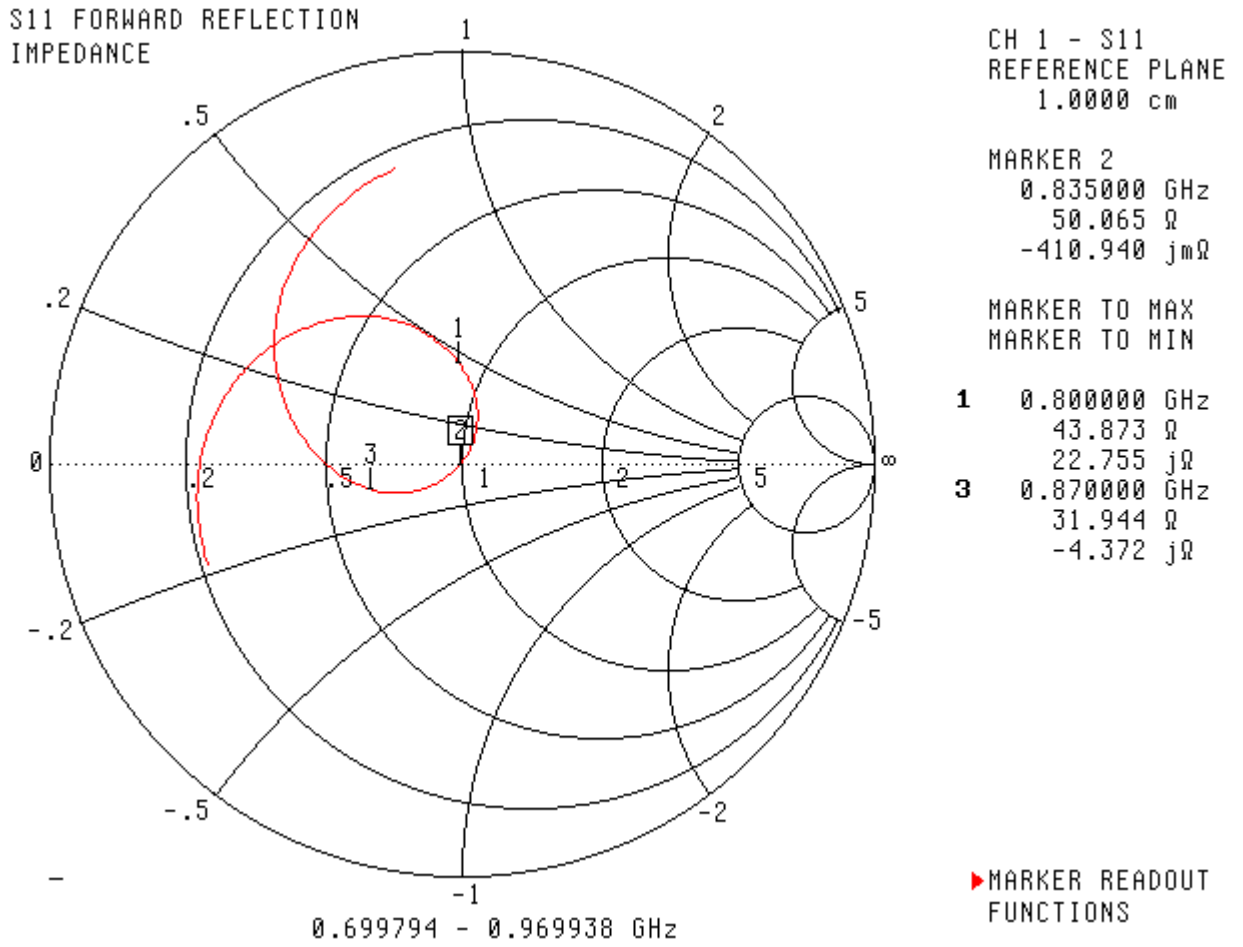
MARKER TO MAX
MARKER TO MIN

1 0.800000 GHz
1.645 U

3 0.870000 GHz
1.585 U

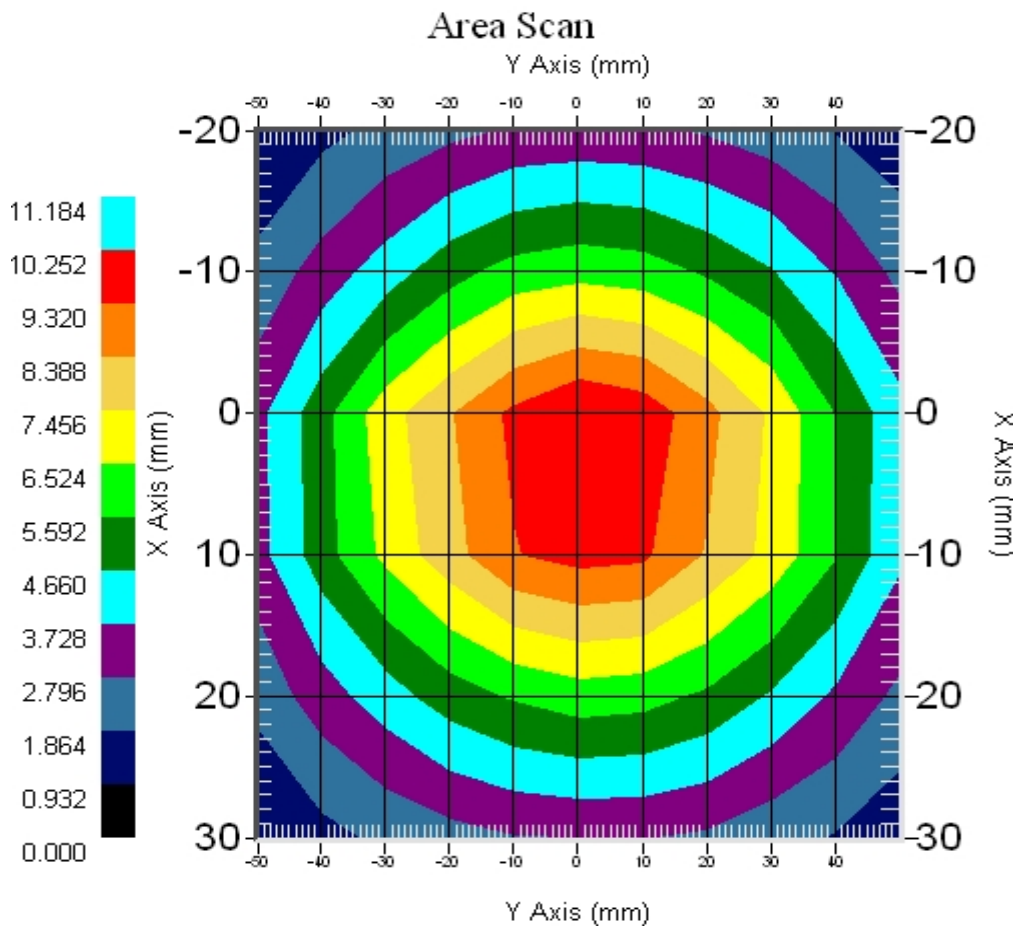
▶ MARKER READOUT
FUNCTIONS

Smith Chart Dipole Impedance



System Validation Results Using the Electrically Calibrated Dipole

| Head Tissue Frequency | 1 Gram | 10 Gram | Peak Above Feed Point |
|-----------------------|--------|---------|-----------------------|
| 835 MHz | 9.49 | 6.1 | 14.21 |



NCL Calibration Laboratories

Division of APREL Laboratories.

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2009.

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1115
Project Number: RFEL-1900-Dipole-5481

C E R T I F I C A T E O F C A L I B R A T I O N

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

Validation Dipole

Manufacturer: APREL Laboratories

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

Frequency: 1900 MHz

Serial No: 210-00713

Customer: RFEL

Calibrated: 15th January 2010
Released on: 19th January 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) 820-4162

NCL Calibration Laboratories

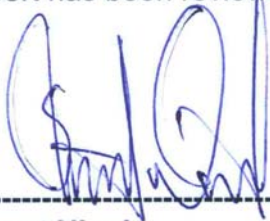
Division of APREL Laboratories.

Conditions

Dipole 210-00713 was new and taken from stock prior to calibration.

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

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



Stuart Nicol



C. Teodorian

Calibration Results Summary

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

Mechanical Dimensions

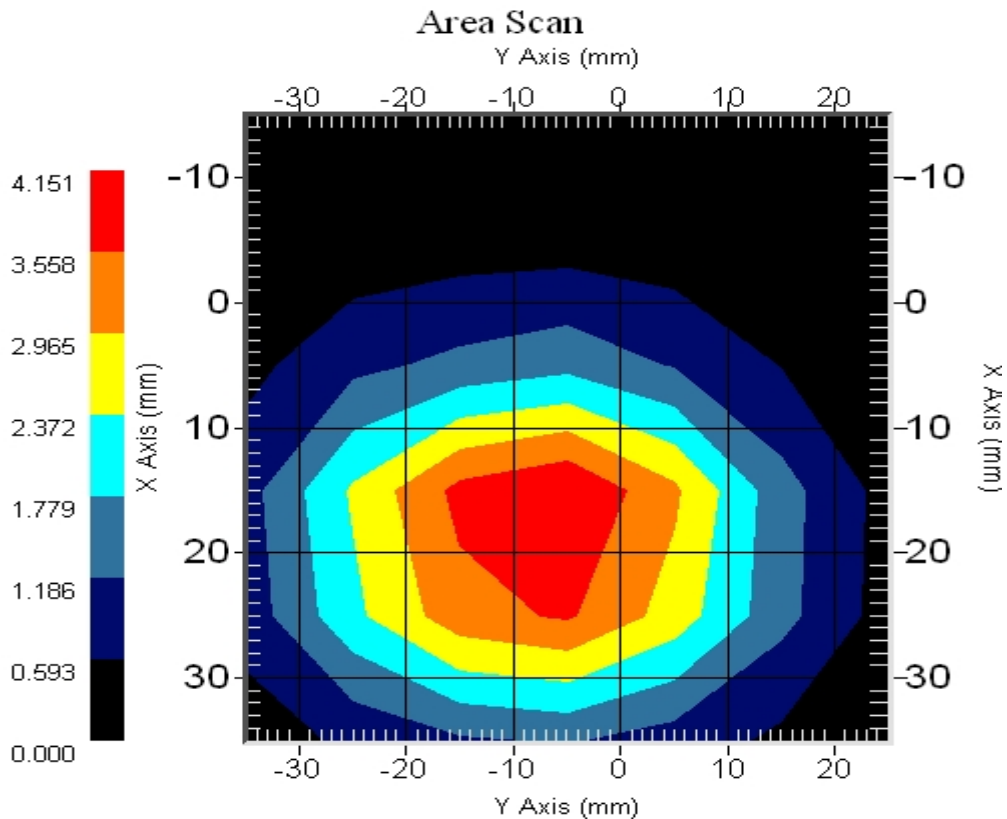
Length: 67.1 mm
Height: 38.9 mm

Electrical Specification

SWR: 1.011U
Return Loss: -45.642dB
Impedance: 50.194Ω

System Validation Results

| Frequency | 1 Gram | 10 Gram | Peak |
|-----------|--------|---------|------|
| 1900 MHz | 38.7 | 20.5 | 69.7 |



Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole 210-00713. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 130 MHz to 26 GHz E-Field Probe Serial Number 226.

References

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

Conditions

Dipole 210-00713 was new taken from stock.

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

Dipole Calibration Results

Mechanical Verification

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

Tissue Validation

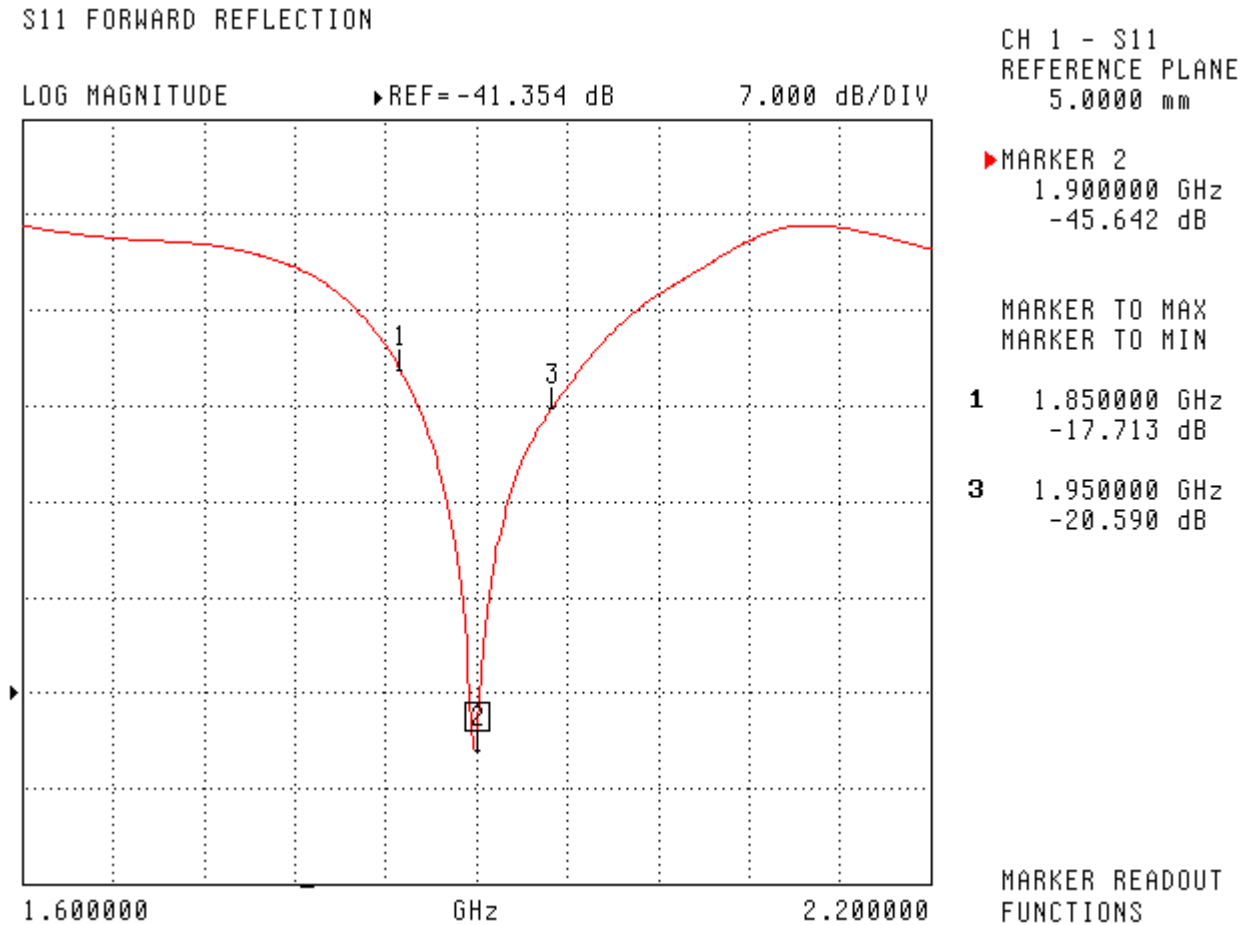
| Head Tissue 1900 MHz | Measured |
|---|-----------------|
| Dielectric constant, ϵ_r | 40.03 |
| Conductivity, σ [S/m] | 1.38 |

Electrical Calibration

| Test | Result |
|-----------|-----------------|
| S11 R/L | -45.642dB |
| SWR | 1.011U |
| Impedance | 50.194 Ω |

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

S11 Parameter Return Loss

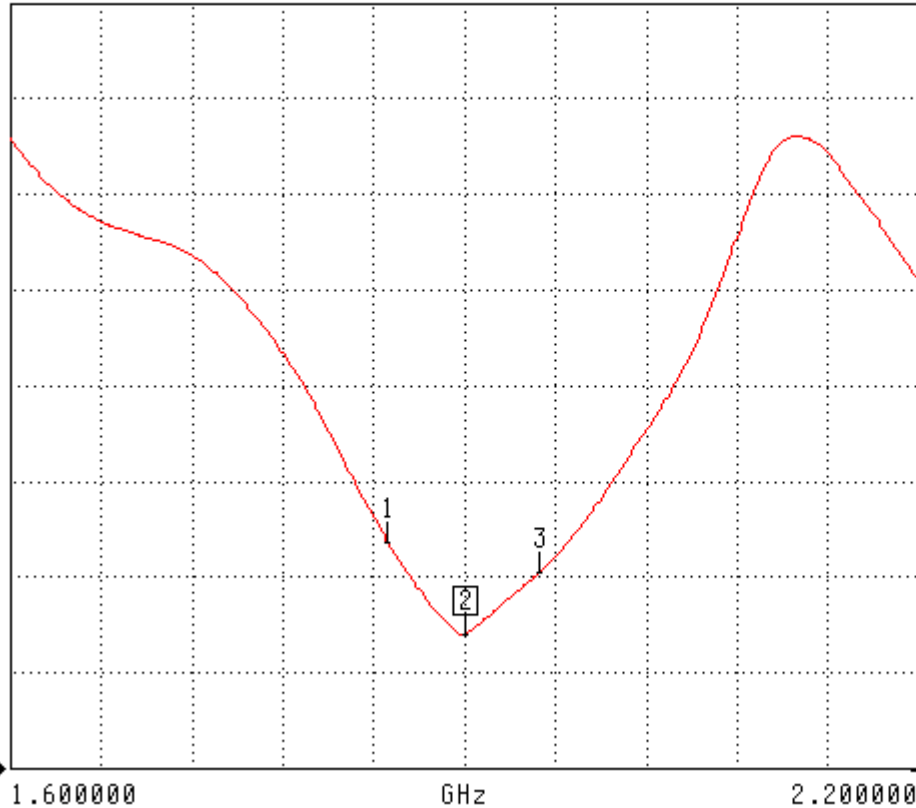


SWR

S11 FORWARD REFLECTION

SWR REF=592.479 mU 300.000 mU/DIV

CH 1 - S11
REFERENCE PLANE
5.0000 mm



▶ MARKER 2
1.900000 GHz
1.011 U

MARKER TO MAX
MARKER TO MIN

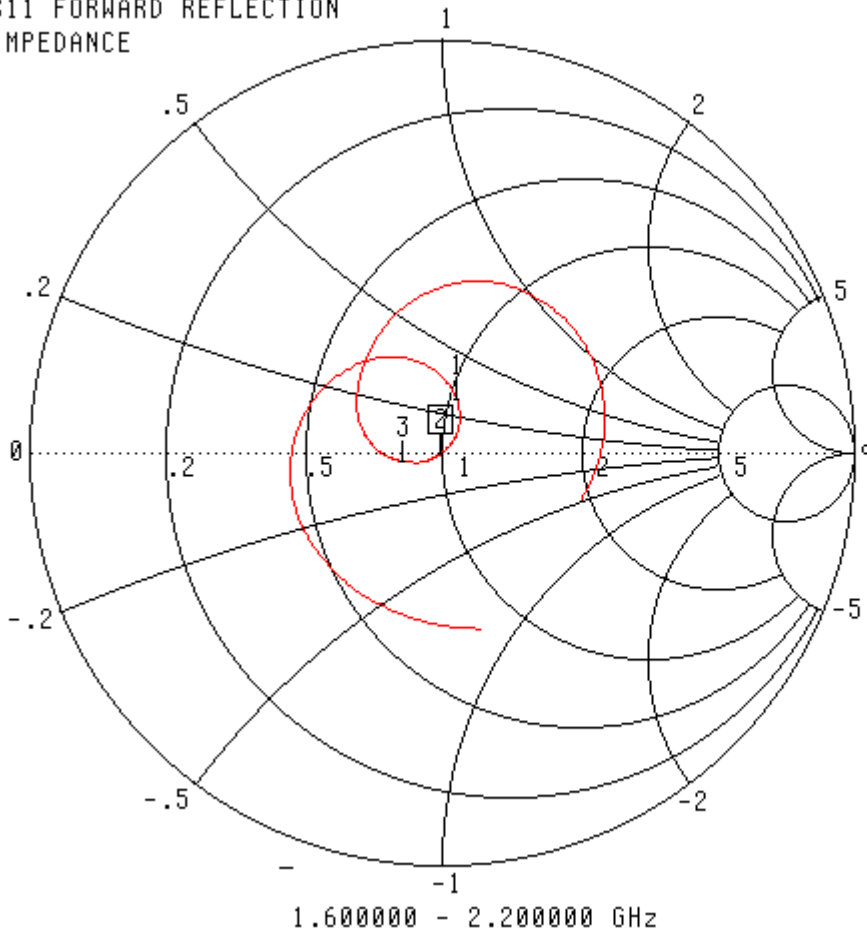
1 1.850000 GHz
1.299 U

3 1.950000 GHz
1.206 U

MARKER READOUT
FUNCTIONS

Smith Chart Dipole Impedance

S11 FORWARD REFLECTION
IMPEDANCE



CH 1 - S11
REFERENCE PLANE
5.0000 mm

▶ MARKER 2
1.900000 GHz
50.194 Ω
-486.191 jΩ

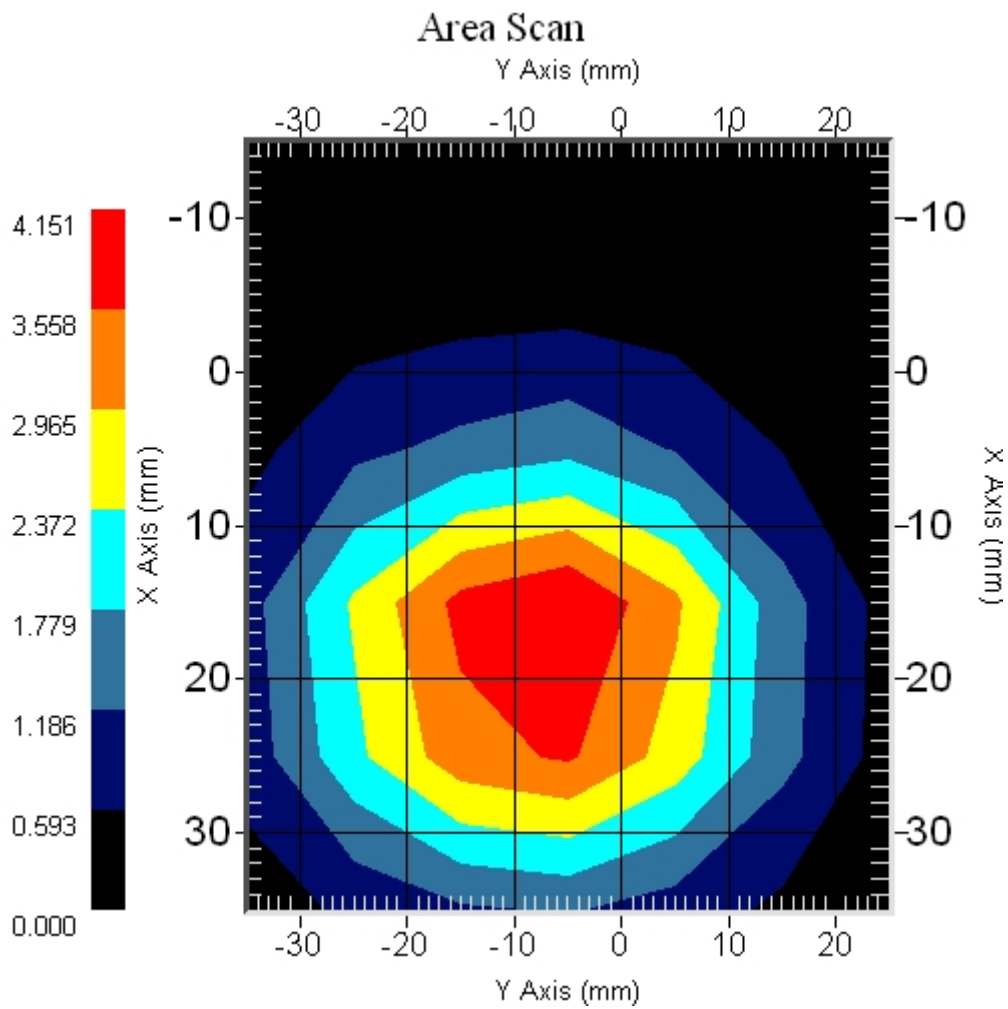
MARKER TO MAX
MARKER TO MIN

| | | | |
|----------|--------------|----------|-----------|
| 1 | 1.850000 GHz | 52.569 Ω | 13.209 jΩ |
| 3 | 1.950000 GHz | 41.678 Ω | -2.040 jΩ |

MARKER READOUT
FUNCTIONS

System Validation Results Using the Electrically Calibrated Dipole

| Head Tissue Frequency | 1 Gram | 10 Gram | Peak Above Feed Point |
|-----------------------|--------|---------|-----------------------|
| 1900 MHz | 38.7 | 20.5 | 69.7 |



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 2009.

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1109

Project Number: RFEB-5495

C E R T I F I C A T E O F C A L I B R A T I O N

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

Validation Dipole

Manufacturer: APREL Laboratories

Part number: ALS-D-2450-S-2

Frequency: 2450 MHz

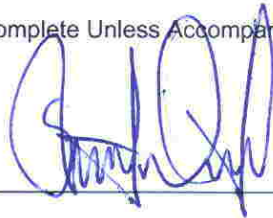
Serial No: RFE-278

Customer: RFEL

Calibrated: 12th January 2010
Released on: 12th January 2010

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

Released By: _____



NCL CALIBRATION LABORATORIES

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Division of APREL Lab.
TEL: (613) 820-4988
FAX: (613) 820-4162

NCL Calibration Laboratories

Division of APREL Laboratories.

Conditions

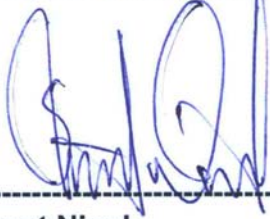
Dipole RFE-278 was a new calibration.

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

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

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

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



Stuart Nicol



C. Teodorian

Calibration Results Summary

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

Mechanical Dimensions

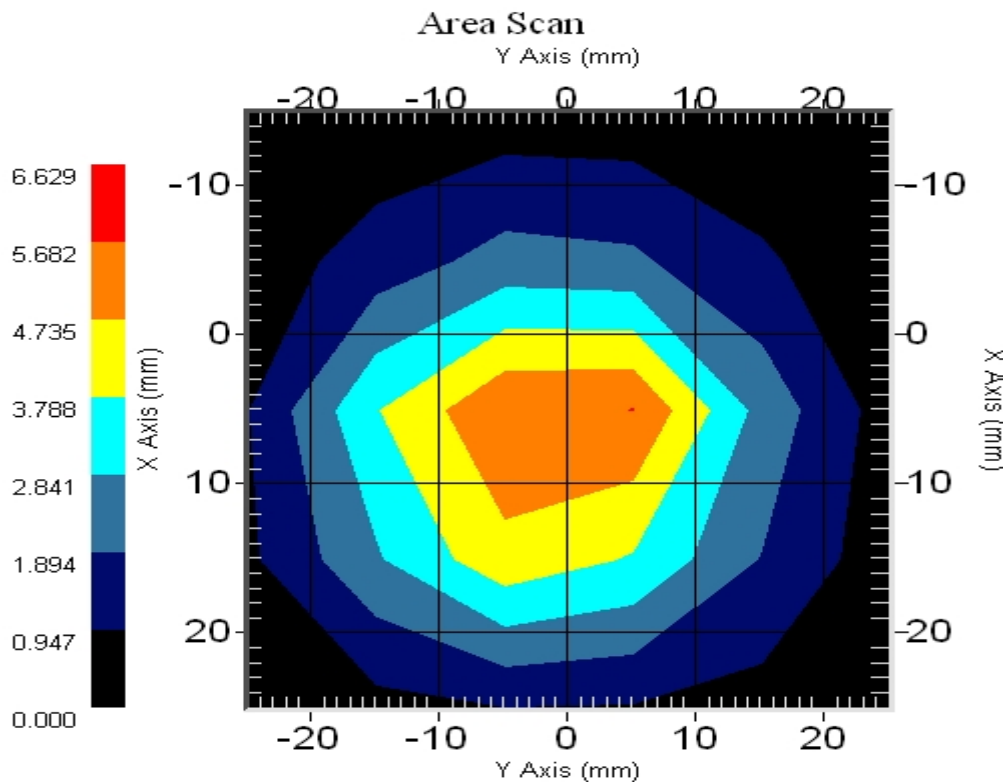
Length: 51.5 mm
Height: 30.4 mm

Electrical Specification

SWR: 1.070 U
Return Loss: -29.451 dB
Impedance: 50.710 Ω

System Validation Results @ 100mW

| Frequency | 1 Gram | 10 Gram | Peak |
|-----------|--------|---------|-------|
| 2450 MHz | 5.31 | 2.44 | 10.18 |



Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole RFE-278. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 130 MHz to 26 GHz E-Field Probe Serial Number 226.

References

SSI-TP-018-ALSAS Dipole Calibration Procedure

SSI-TP-016 Tissue Calibration Procedure

IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"

Conditions

Dipole RFE-278 was a re-calibration.

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

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

Dipole Calibration Results

Mechanical Verification

| APREL Length | APREL Height | Measured Length | Measured Height |
|---------------------|---------------------|------------------------|------------------------|
| 51.5 mm | 30.4 mm | 52.1 mm | 31.0 mm |

Tissue Validation

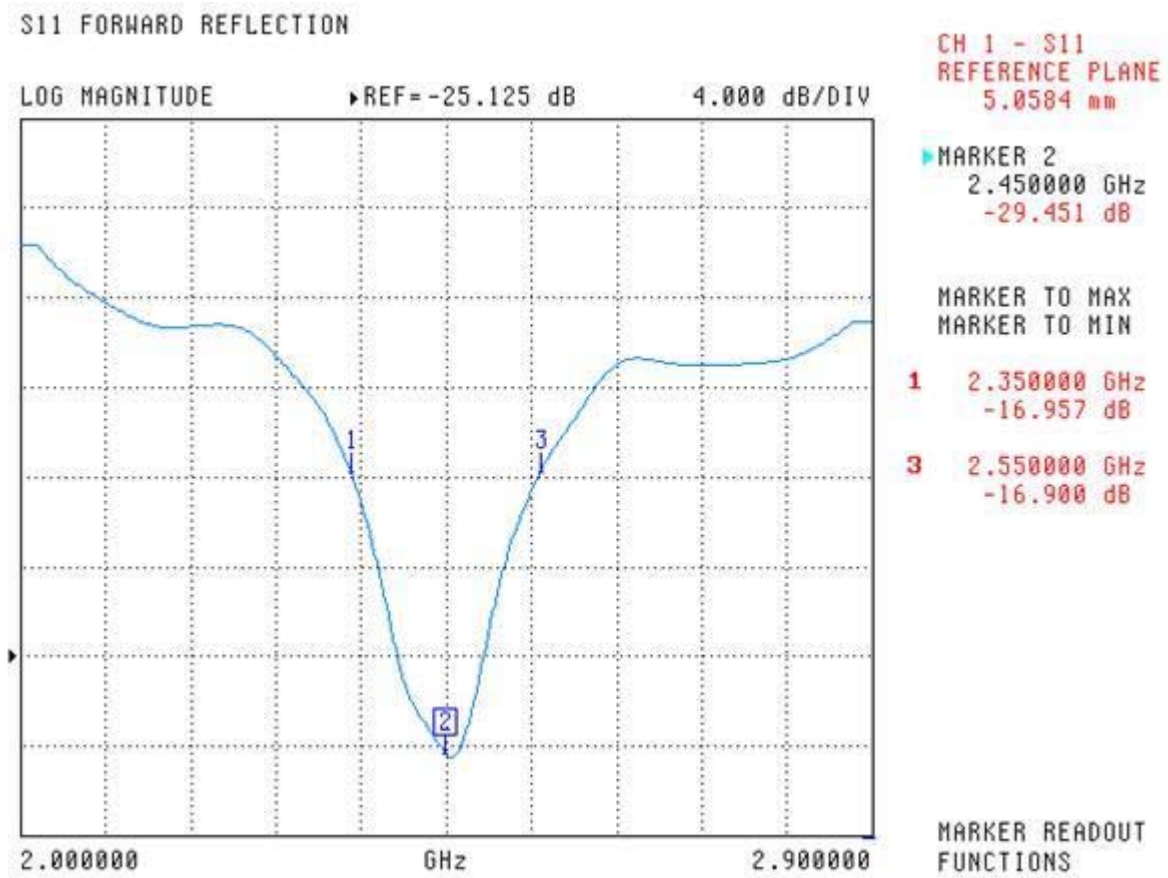
| Head Tissue 2450 MHz | Measured |
|---|-----------------|
| Dielectric constant, ϵ_r | 39.8 |
| Conductivity, σ [S/m] | 1.85 |

Electrical Calibration

| Test | Result |
|-----------|-----------------|
| S11 R/L | -29.451 dB |
| SWR | 1.070 U |
| Impedance | 50.710 Ω |

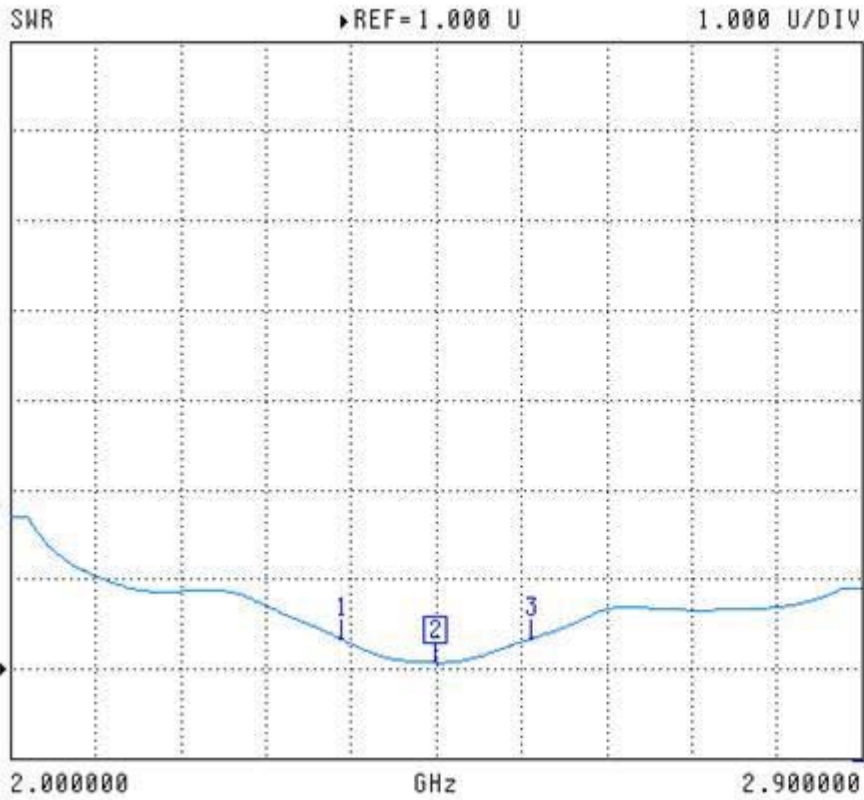
The Following Graphs are the results as displayed on the Vector Network Analyzer.

S11 Parameter Return Loss



SWR

S11 FORWARD REFLECTION



CH 1 - S11
REFERENCE PLANE
5.0584 mm

MARKER 2
2.450000 GHz
1.070 U

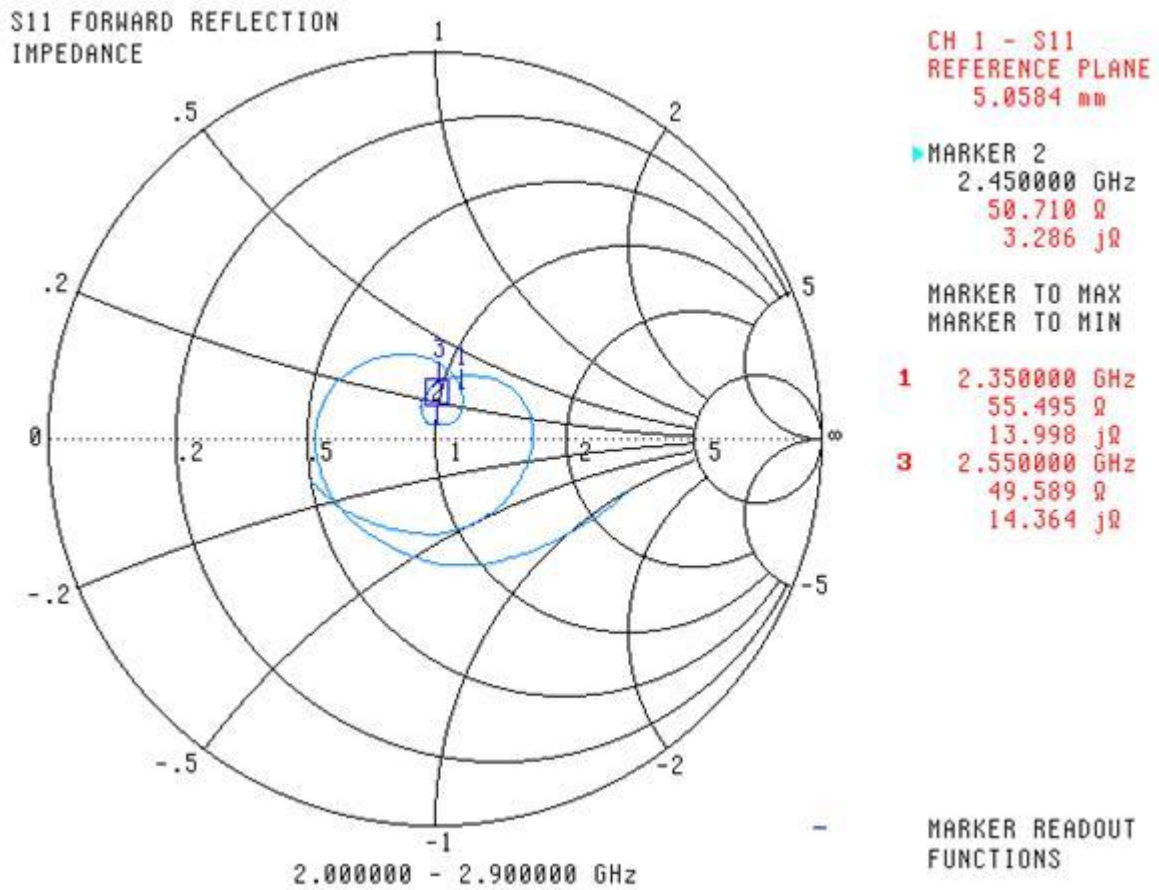
MARKER TO MAX
MARKER TO MIN

1 2.350000 GHz
1.334 U

3 2.550000 GHz
1.335 U

MARKER READOUT
FUNCTIONS

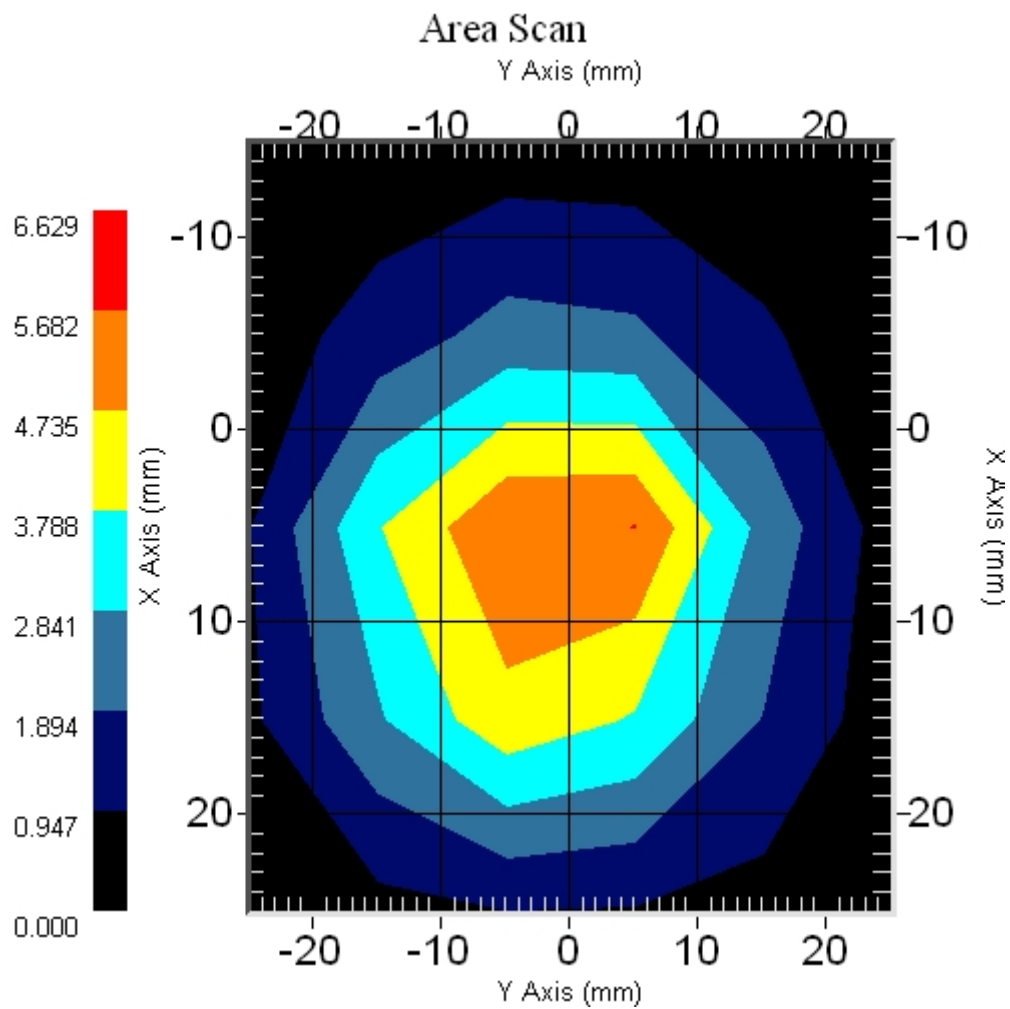
Smith Chart Dipole Impedance



System Validation Results Using the Electrically Calibrated Dipole

Results @ 100mW

| Head Tissue Frequency | 1 Gram | 10 Gram | Peak Above Feed Point |
|-----------------------|--------|---------|-----------------------|
| 2450 MHz | 5.31 | 2.44 | 10.18 |



Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2009.

NCL CALIBRATION LABORATORIES

Calibration File No.: CP-1165

Client.: RFEL

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 2600 MHz

Manufacturer: APREL Laboratories

Model No.: E-020

Serial No.: 215

Body Calibration

Calibration Procedure: SSI/DRB-TP-D01-032-E020-V2

Project No: RFEL-E-020-Cal-5539

Calibrated: 22 September 2010

Released on: 27 September 2010

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary
This calibration has been conducted in line with the SCC ISO-IEC 17025 Scope of Accreditation
Accredited Laboratory Number 48

Released By: _____

NCL CALIBRATION LABORATORIES

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NEPEAN, ONTARIO
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FAX: (613) 820-4161

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-020 215.

References

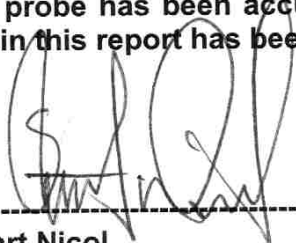
SSI/DRB-TP-D01-032-E020-V2 E-Field Probe Calibration Procedure
IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"
IEEE 1309 "IEEE Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9 KHz to 40 GHz" 2005
SSI-TP-011 Tissue Calibration Procedure
IEC 62209 "Human exposure to radio frequency fields from handheld and body-mounted wireless communication devices –Human models, instrumentation and procedures Part 1 & 2: Procedure to determine the Specific Absorption Rate (SAR) for handheld devices used in close proximity of the ear (frequency range of 200MHz to 3GHz)"

Conditions

Probe 215 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

Calibration Results Summary

| | |
|-----------------------|---------------------|
| Probe Type: | E-Field Probe E-020 |
| Serial Number: | 215 |
| Frequency: | 2600 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 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Y: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Channel Z: | 1.2 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| Diode Compression Point: | 95 mV |

Sensitivity in Body Tissue Measured

Frequency: 2600 MHz
Epsilon: 51.95 (+/-5%) **Sigma:** 2.08 S/m (+/-5%)

ConvF

Channel X: 4.7 @ 2600MHz +/- 5%
Channel Y: 4.7 @ 2600MHz +/- 5%
Channel Z: 4.7 @ 2600MHz +/- 5%

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

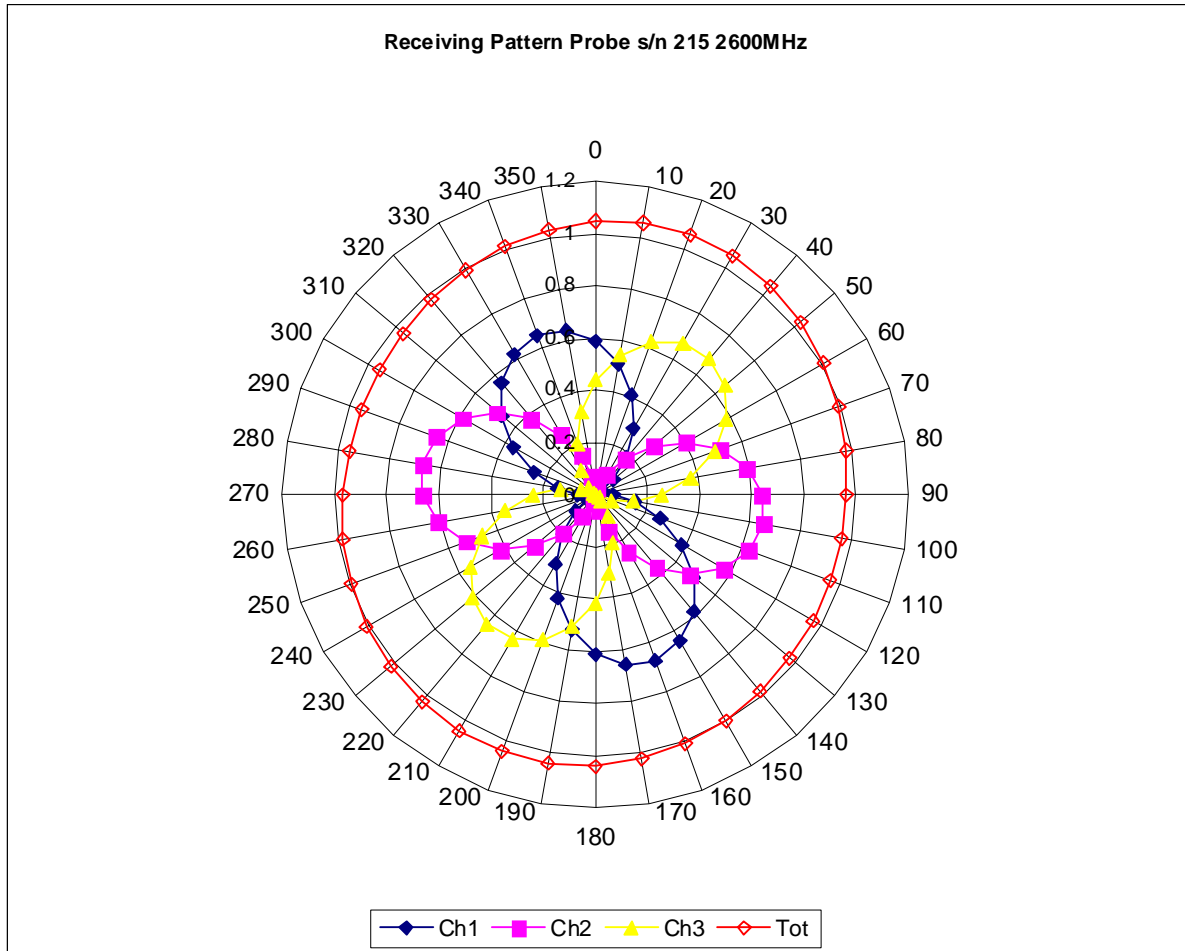
Boundary Effect:

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.

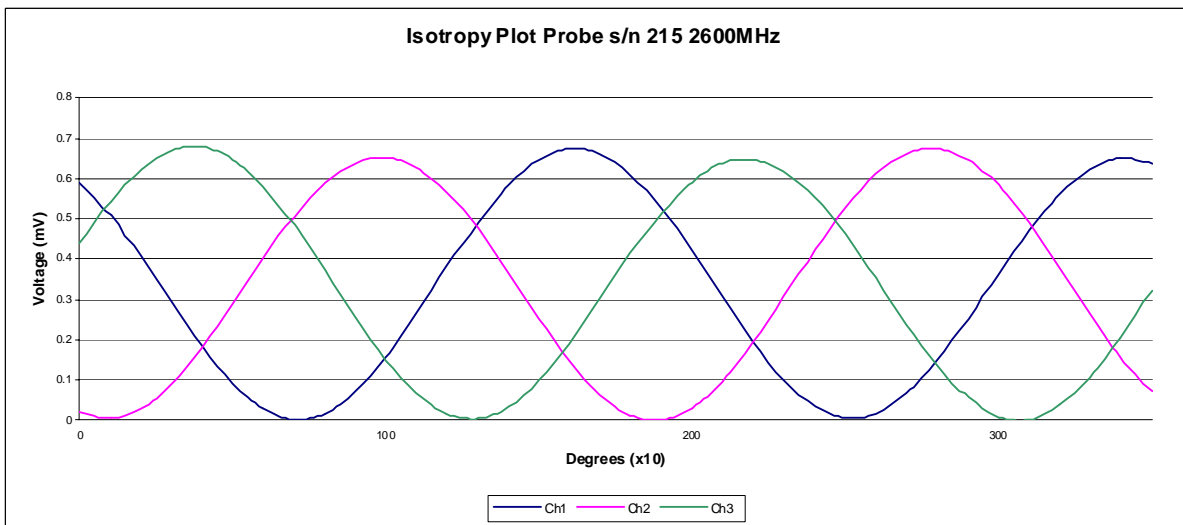
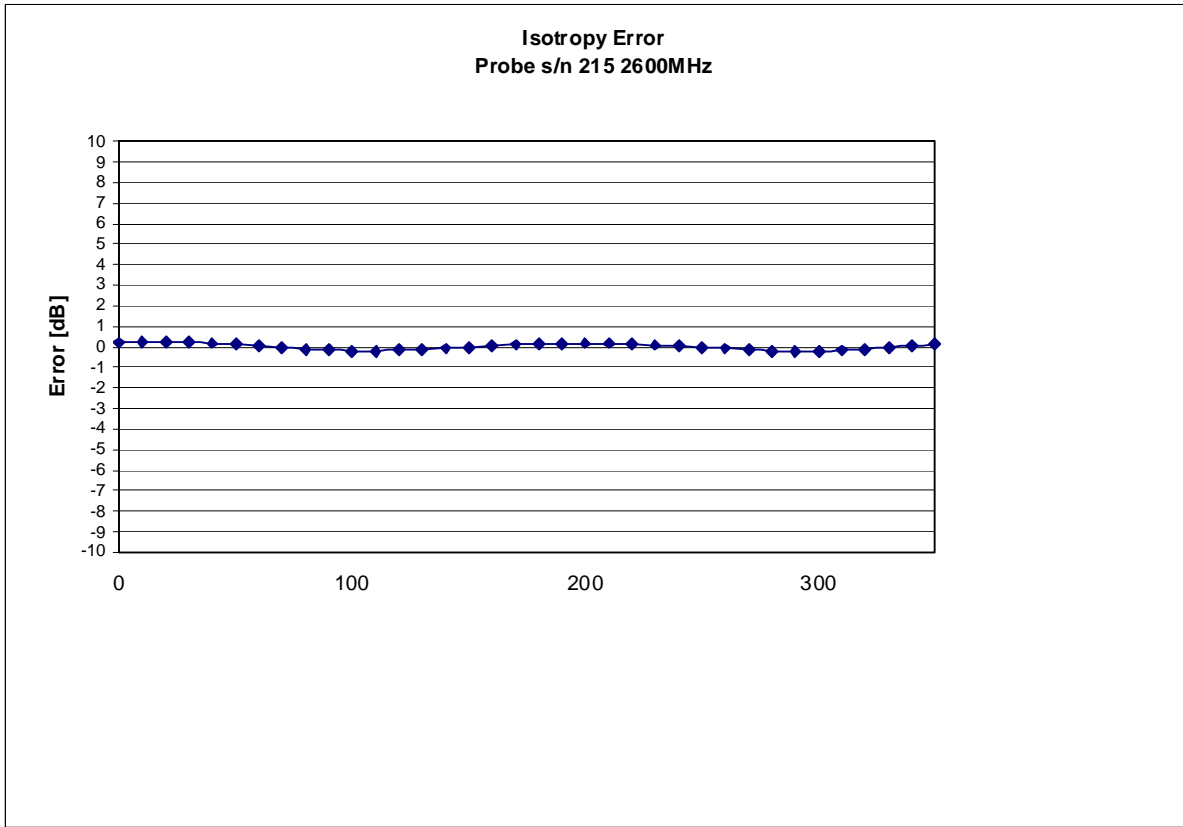
Spatial Resolution:

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.

Receiving Pattern 2600 MHz (Air)



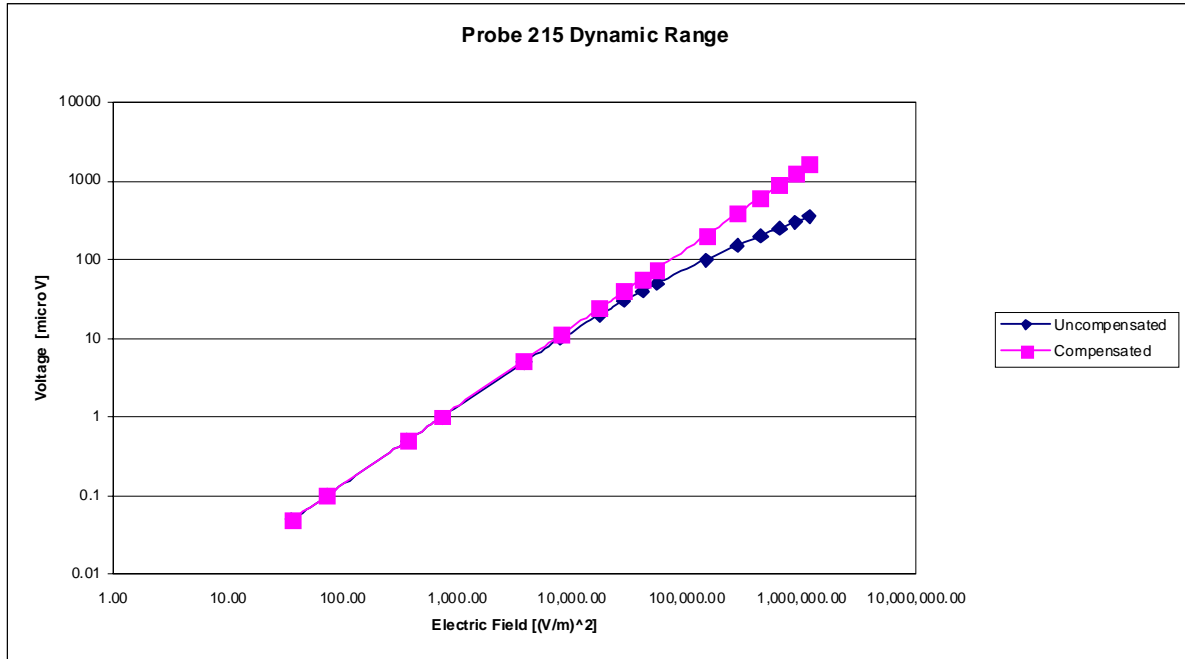
Isotropy Error 2600 MHz (Air)



Isotropicity Tissue:

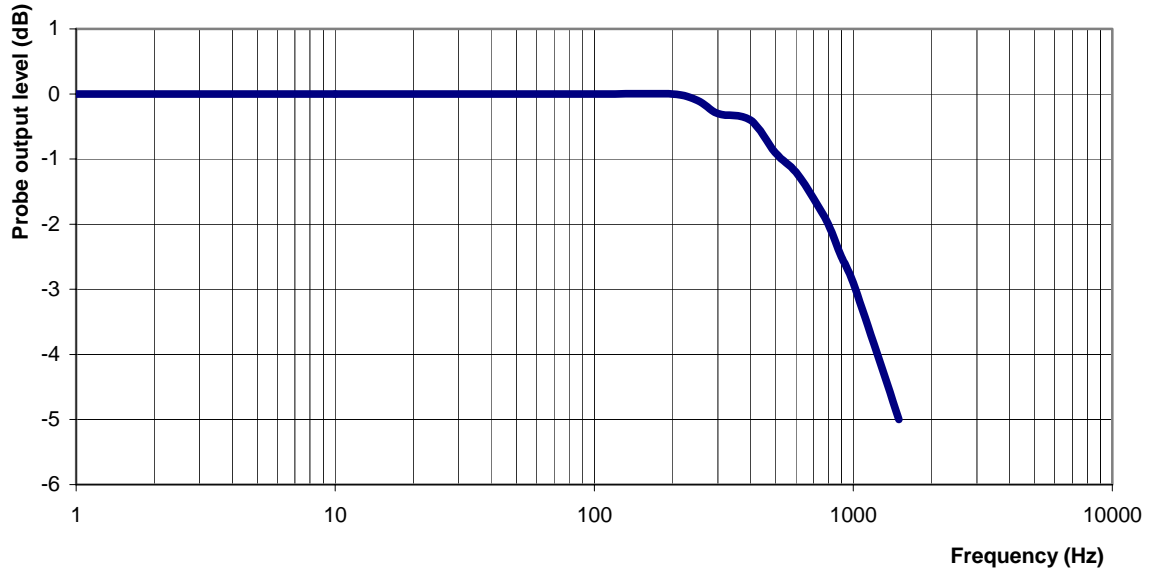
0.10 dB

Dynamic Range



Video Bandwidth

Probe Frequency Characteristics



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

Conversion Factor Uncertainty Assessment Measured

Sensitivity in Body Tissue

Frequency: 2600 MHz
Epsilon: 51.95 (+/-5%) **Sigma:** 2.08 S/m (+/-5%)

ConvF

Channel X: 4.7 7%(K=2)
Channel Y: 4.7 7%(K=2)
Channel Z: 4.7 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 2.5mm the evaluated uncertainty (increase in the probe sensitivity) is less than 2%.

Conversion Factor Validity:

The conversion factor is valid to +/- 5% of 2600MHz.

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 F – Phantom Calibration Data Sheets

NCL CALIBRATION LABORATORIES

Calibration File No.: RFE-273

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 National Standards.

Thickness of the UniPhantom is 2 mm \pm 10%
Pinna thickness is 6 mm \pm 10%

| | | | |
|-------------|---------|----------------|----------|
| Resolution: | 0.01 mm | Calibrated to: | 0.0 mm |
| Stability: | OK | Accuracy: | < 0.1 mm |

Calibrated By: Karen K. Feb 17/04.

NCL CALIBRATION LABORATORIES

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