

# RF Exposure Lab

802 N. Twin Oaks Valley Road, Suite 105 • San Marcos, CA 92069 • U.S.A.  
TEL (760) 471-2100 • FAX (760) 471-2121  
<http://www.rfexposurelab.com>

## CERTIFICATE OF COMPLIANCE SAR EVALUATION

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

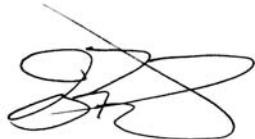
Dates of Test: September 8 – 12, 2011  
Test Report Number: SAR.20110904  
Revision F

FCC ID:	PKRNVWMIFI4620
Model(s):	MiFi4620L
Test Sample:	Engineering Unit Same as Production
Serial Number:	21
Equipment Type:	Wireless Hotspot Modem
Classification:	PCS Licensed Transmitter (PCB)
TX Frequency Range:	824.2 – 848.8 MHz; 1850.2 – 1909.8 MHz; 779.5 – 784.5 MHz, 2412 – 2462 MHz
Frequency Tolerance:	± 2.5 ppm
Maximum RF Output:	835 MHz (CDMA) – 24.50 dBm, 835 MHz (WCDMA) – 24.50 dBm, 835 MHz (GPRS) – 32.70 dBm, 1900 MHz (CDMA) – 24.50 dBm, 1900 MHz (WCDMA) – 24.50 dBm, 1900 MHz (GPRS) – 29.96 dBm, 750 MHz – 24.4 dBm, 2450 MHz – 17.48 dBm Conducted
Signal Modulation:	CDMA, WCDMA, GMSK, 8-PSK, QPSK, 16QAM, DSSS, OFDM
Antenna Type:	Internal
Application Type:	Certification
FCC Rule Parts:	Part 2, 15, 22, 24, 27
KDB Test Methodology:	KDB 447498, KDB 248227, KDB 648474, KDB 941225 D01, D02, D03, D05 & D06
KDB Issued for Test:	None
Maximum SAR Value:	1.397 W/kg Individual; 1.570 W/kg Simultaneous
Separation Distance:	10 mm

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, and OET Bulletin 65 Supp. C (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 is subject to a denial of Federal benefits that includes 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

## Table of Contents

1. Introduction.....	3
SAR Definition [5] .....	3
2. SAR Measurement Setup.....	4
Robotic System.....	4
System Hardware .....	4
System Description.....	4
E-Field Probe .....	5
3. Robot Specifications.....	7
4. Probe and Dipole Calibration .....	8
5. Phantom & Simulating Tissue Specifications.....	9
SAM Phantom.....	9
Head & Body Simulating Mixture Characterization.....	9
Device Holder .....	9
6. ANSI/IEEE C95.1 – 1992 RF Exposure Limits [2].....	10
Uncontrolled Environment .....	10
Controlled Environment .....	10
7. Measurement Uncertainty.....	11
8. System Validation.....	12
Tissue Verification .....	12
Test System Verification .....	12
9. SAR Test Data Summary .....	14
Procedures Used To Establish Test Signal.....	14
Device Test Condition.....	14
Figure 9.1 .....	15
10. FCC 3G Measurement Procedures .....	16
10.1 Procedures Used to Establish RF Signal for SAR.....	16
10.2 SAR Measurement Conditions for CDMA2000, 1xEV-DO .....	16
10.3 SAR Measurement Conditions for WCDMA/HSDPA/HSUPA.....	18
10.4 SAR Measurement Conditions for GSM.....	18
10.5 SAR Measurement Conditions for LTE Band 13.....	23
SAR Data Summary – 835 MHz Body - CDMA.....	27
SAR Data Summary – 835 MHz Body - WCDMA .....	28
SAR Data Summary – 835 MHz Body - GPRS .....	29
SAR Data Summary – 1900 MHz Body - CDMA.....	30
SAR Data Summary – 1900 MHz Body - WCDMA .....	31
SAR Data Summary – 1900 MHz Body - GPRS .....	32
SAR Data Summary – 750 MHz Body – LTE Band 13 10 MHz QPSK .....	33
SAR Data Summary – 750 MHz Body – LTE Band 13 10 MHz 16QAM .....	34
SAR Data Summary – 2450 MHz Body.....	35
SAR Data Summary – Simultaneous Evaluation.....	36
11. Test Equipment List .....	38
12. Conclusion .....	39
13. References.....	40
Appendix A – System Validation Plots and Data .....	41
Appendix B – SAR Test Data Plots.....	66
Appendix D – Probe Calibration Data Sheets.....	252
Appendix E – Dipole Calibration Data Sheets .....	263
Appendix F – Phantom Calibration Data Sheets .....	304

## 1. Introduction

This measurement report shows compliance of the Novatel Wireless Model MiFi4620L FCC ID: PKRNVWMIFI4620 with FCC Part 2, 1093, ET Docket 93-62 Rules for mobile and portable devices. 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], and IEEE Std.1528 – 2003 Recommended Practice [5] were employed.

For mobile hotspots, the device is required to be tested on all six sides of the modem when the antenna is within 25 mm of each side.

## 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 ( $\rho$ ).

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

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:

$\sigma$  = conductivity of the tissue (S/m)

$\rho$  = mass density of the tissue (kg/m<sup>3</sup>)

$E$  = 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 pendent 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 validation 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.

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



The Aprel 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).

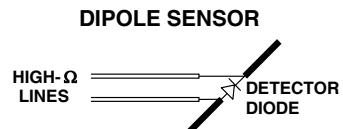
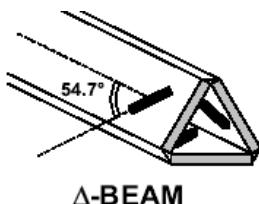
The overall uncertainty for the methodology and algorithms the ALSAS-10-U used during the SAR calculation was evaluated using the data from IEEE 1528 f3 algorithm:

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

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.



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  $\pm 0.05$  mm and the precision of the APREL bottom detection device is  $\pm 0.1$  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  $\pm 0.1$  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  $\pm 0.1$  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  $\leq 3$  GHz with a cube scan of 5x5x8 yields a volume of  $32 \times 32 \times 28$  mm<sup>3</sup>. For devices  $> 3$  GHz and  $< 4.5$  GHz, the cube scan of 9x9x9 yields a volume of  $32 \times 32 \times 24$  mm<sup>3</sup>. For devices  $\geq 4.5$  GHz, the cube scan of 7x7x12 yields a volume of  $24 \times 24 \times 22$  mm<sup>3</sup>.

### 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 90<sup>th</sup> 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 head 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 issue 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	782 MHz Body
Mixing Percentage				
Water	52.50	69.91	73.20	52.50
Sugar	45.00	0.00	0.00	45.00
Salt	1.40	0.13	0.10	1.40
HEC	1.00	0.00	0.00	1.00
Bactericide	0.10	0.00	0.00	0.10
DGBE	0.00	29.96	26.70	0.00
Dielectric Constant	Target	55.20	53.30	52.70
Conductivity (S/m)	Target	0.97	1.52	1.95

### Device Holder



In combination with the SAM phantom, the scissor jack mounting device with 6 inches of Styrofoam enables the ability to mount the device under test to the uni-phantom. The devices can easily, accurately, and repeatably be positioned according to the FCC specifications.

## 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 ENVIRONMENT Professional Population (W/kg) or (mW/g)
SPATIAL PEAK SAR <sup>1</sup> Head	1.60	8.00
SPATIAL AVERAGE SAR <sup>2</sup> Whole Body	0.08	0.40
SPATIAL PEAK SAR <sup>3</sup> Hands, Feet, Ankles, Wrists	4.00	20.00

<sup>1</sup> 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.

<sup>2</sup> The Spatial Average value of the SAR averaged over the whole body.

<sup>3</sup> 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	$\infty$
Axial Isotropy	3.7	rectangular	$\sqrt{3}$	0.7	0.7	1.5	1.5	$\infty$
Hemispherical Isotropy	10.9	rectangular	$\sqrt{3}$	0.7	0.7	4.4	4.4	$\infty$
Boundary Effect	1.0	rectangular	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
Linearity	4.7	rectangular	$\sqrt{3}$	1	1	2.7	2.7	$\infty$
Detection Limit	1.0	rectangular	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
Readout Electronics	1.0	normal	1	1	1	1.0	1.0	$\infty$
Response Time	0.8	rectangular	$\sqrt{3}$	1	1	0.5	0.5	$\infty$
Integration Time	1.7	rectangular	$\sqrt{3}$	1	1	1.0	1.0	$\infty$
RF Ambient Condition	3.0	rectangular	$\sqrt{3}$	1	1	1.7	1.7	$\infty$
Probe Positioner Mech. Restriction	0.4	rectangular	$\sqrt{3}$	1	1	0.2	0.2	$\infty$
Probe Positioning with respect to Phantom Shell	2.9	rectangular	$\sqrt{3}$	1	1	1.7	1.7	$\infty$
Extrapolation and Integration	3.7	rectangular	$\sqrt{3}$	1	1	2.1	2.1	$\infty$
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	$\infty$
Phantom and Setup								
Phantom Uncertainty (shape & thickness tolerance)	3.4	rectangular	$\sqrt{3}$	1	1	2.0	2.0	$\infty$
Liquid Conductivity (target)	5.0	rectangular	$\sqrt{3}$	0.7	0.5	2.0	1.4	$\infty$
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	$\infty$
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 Validation

### Tissue Verification

**Table 8.1 Measured Tissue Parameters**

		835 MHz Body		835 MHz Body		1900 MHz Body					
Date(s)		Sep. 9, 2011		Sep. 10, 2011		Sep. 8, 2011					
Liquid Temperature (°C)	20.0	Target	Measured	Target	Measured	Target	Measured				
Dielectric Constant: $\epsilon$	55.20	54.61	55.20	54.37	53.30	53.21					
Conductivity: $\sigma$	0.97	0.99	0.97	0.98	1.52	1.56					
		1900 MHz Body		782 MHz Body		782 MHz Body					
Date(s)		Sep. 9, 2011		Sep. 10, 2011		Sep. 11, 2011					
Liquid Temperature (°C)	20.0	Target	Measured	Target	Measured	Target	Measured				
Dielectric Constant: $\epsilon$	53.30	53.12	55.41	55.05	55.41	54.91					
Conductivity: $\sigma$	1.52	1.57	0.97	0.99	0.97	0.98					
		2450 MHz Body									
Date(s)		Sep. 12, 2011									
Liquid Temperature (°C)	20.0	Target	Measured								
Dielectric Constant: $\epsilon$	52.70	52.23									
Conductivity: $\sigma$	1.95	1.98									

See Appendix A for data printout.

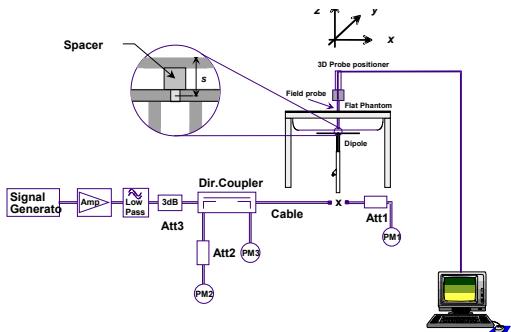
### Test System Verification

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 Validation Target & Measured**

	Test Frequency	Targeted SAR <sub>1g</sub> (W/kg)	Measure SAR <sub>1g</sub> (W/kg)	Tissue Used for Verification	Deviation (%)
09-Sep-2011	835 MHz	9.81	9.96	Body	+ 1.53
10-Sep-2011	835 MHz	9.81	9.47	Body	- 3.47
08-Sep-2011	1900 MHz	40.90	41.23	Body	+ 0.81
09-Sep-2011	1900 MHz	40.90	40.99	Body	+ 0.22
10-Sep-2011	750 MHz	8.70	8.89	Body	+ 2.18
11-Sep-2011	750 MHz	8.70	8.97	Body	+ 3.10
12-Sep-2011	2450 MHz	51.50	52.17	Body	+ 1.30

See Appendix A for data plots.

**Figure 8.1 Dipole Validation Test Setup**

Note: KDB 450824 D01 and D02 was applied for probe calibration frequencies greater than or equal to 50 MHz of the DUT frequencies and dipole extended calibrations (See Appendix E).

## 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  $((\text{end/start})-1)*100$  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 all edges closest to each antenna. Side A, Side B, Side C, Side D and Side F testing was conducted for the WWAN antenna. The Side E was not tested as the WWAN antenna was more than 2.5 cm from this side. The Side A, Side B, Side E and Side F were tested for the WLAN antenna. Side C and Side D were not tested as the antenna was more than 2.5 cm from these sides. All testing was conducted per KDB 941225 D06. See the photo in Appendix C for a pictorial of the setups, labeling of the sides tested and antenna locations. The distance between the WWAN and WLAN antenna is 4.26 cm.

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  $\frac{1}{4}$  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  $\frac{1}{4}$  dB higher than 153.6 kbps.

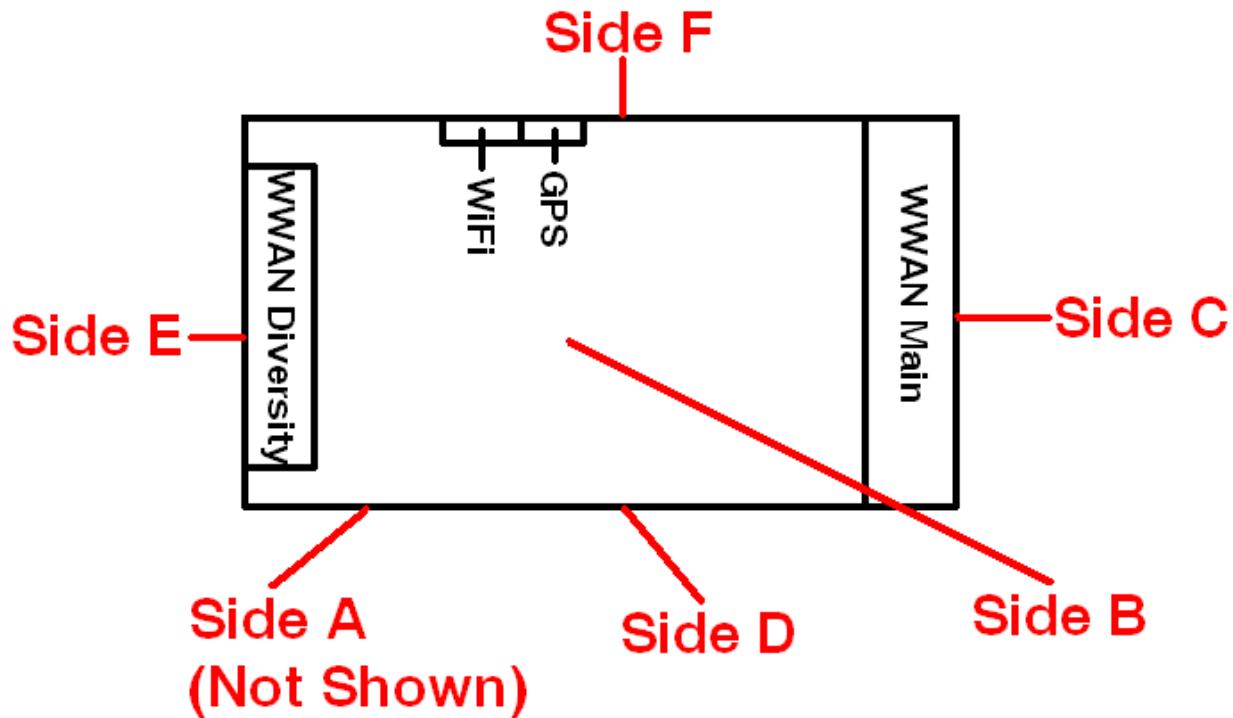
The Rev. A Subtype 2 testing was conducted with the Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots. The Forward Traffic Channel data rate is set to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots. The power control was set to "All Bits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

This device is capable of operating in 850/1900 GPRS/EDGE frequency bands. In GPRS mode, the device is in Class 4 for 850 MHz and Class 1 for 1900 MHz. In EDGE mode, the device is in Class E2 for 850/1900 MHz. The testing was conducted in the

GPRS mode. The GPRS mode has 1-slot, 2-slot, 3-slot and 4-slot configurations. The power measured is peak power. The average power in GPRS 1-Slot is  $>\frac{1}{2}$  dB higher than the average power in 2-slot, 3-slot and 4-slot modes. The EDGE mode is  $>4$  dB lower than its equivalent slot configuration for GPRS. Therefore, the device was only tested in the highest power configuration which was 1-slot GPRS.

The WCDMA testing was conducted using 12.2 kbps RMC configured in Test Loop Mode 1. The HSPA testing was conducted with HS-DPCCH, E-DPCCH and E-DPDCH all enabled and a 12.2 kbps RMC. FRC was configured according to HS-DPCCH Sub-Test 1 using H-set 1 and QPSK.

**Figure 9.1**  
**SAR Location Diagram of Modem Testing**



## 10. FCC 3G Measurement Procedures

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 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  $\Delta$  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  $\Delta$  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.

#### 10.2.2 Output Power Verification 1xEvDo

- 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  $\Delta$  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  $\text{I}_{\text{or}}$  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

- 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  $\text{I}_{\text{or}}$  to -60 dBm/1.23 MHz
  - Send continuously '0' power control bits
  - Measure the power at device antenna connector
- 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  $\text{I}_{\text{or}}$  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.

### CDMA Power Measurements

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

		IS-2000	1Xev-Do Rev. 0	1Xev-Do Rev. A Subtype 0/1		1Xev-Do Rev. A Subtype 2		
	Channel	TDSO SO32 RC3	FTAP [dBm]	RTAP [dBm]	FTAP [dBm]	RTAP [dBm]	FETAP [dBm]	RETAP [dBm]
Cellular	1013	24.41	24.43	24.39	24.45	24.42	24.47	24.40
	384	24.49	24.50	24.47	24.49	24.50	24.41	24.46
	777	24.46	24.44	24.43	24.40	24.48	24.46	24.41
PCS	25	24.50	24.45	24.48	24.50	24.47	24.43	24.44
	600	24.48	24.47	24.42	24.46	24.44	24.41	24.40
	1175	24.47	24.45	24.46	24.42	24.37	24.39	24.40

## 10.3 SAR Measurement Conditions for WCDMA/HSDPA/HSUPA

Configure the call box 8960 to support all WCDMA tests in respect to the 3GPP 34.121 (listed in Table below). Measure the power at Ch4132, 4182 and 4233 for US cell; Ch9262, 9400 and 9538 for US PCS band.

For Rel99

- Set a Test Mode 1 loop back with a 12.2kbps Reference Measurement Channel (RMC).
- Set and send continuously Up power control commands to the device
- Measure the power at the device antenna connector using the power meter with average detector.

For HSDPA Rel 6

- Establish a Test Mode 1 look back with both 1 12.2kbps RMC channel and a H-Set1 Fixed Reference Channel (FRC). With the 8960 this is accomplished by setting the signal Channel Coding to “Fixed Reference Channel” and configuring for HSET-1 QKSP.
- Set beta values and HSDPA settings for HSDPA Subtest1 according to Table below.
- Send continuously Up power control commands to the device
- Measure the power at the device antenna connector using the power meter with modulated average detector.
- Repeat the measurement for the HSDPA Subtest2, 3 and 4 as given in Table below.

For HSUPA Rel 6

- Use UL RMC 12.2kbps and FRC H-Set1 QPSK, Test Mode 1 loop back. With the 8960 this is accomplished by setting the signal Channel Coding to “E-DCH Test Channel” and configuring the equipment category to Cat5\_10ms.
- Set the Absolute Grant for HSUPA Subtest1 according to Table below.
- Set the device power to be at least 5dB lower than the Maximum output power
- Send power control bits to give one TPC\_cmd = +1 command to the device. If device doesn't send any E-DPCH data with decreased E-TFCI within 500ms, then repeat this process until the decreased E-TFCI is reported.
- Confirm that the E-TFCI transmitted by the device is equal to the target E-TFCI in Table below. If the E-TFCI transmitted by the device is not equal to the target E-TFCI, then send power control bits to give one TPC\_cmd = -1 command to the UE. If UE sends any E-DPCH data with decreased E-TFCI within 500 ms, send new power control bits to give one TPC\_cmd = -1 command to the UE. Then confirm that the E-TFCI transmitted by the UE is equal to the target E-TFCI in Table below.
- Measure the power using the power meter with modulated average detector.
- Repeat the measurement for the HSUPA Subtest2, 3, 4 and 5 as given in Table below.

## 10.4 SAR Measurement Conditions for GSM

Configure the 8960 box to support GMSK and 8PSK call respectively, and set one timeslot and two timeslot transmission for GMSK GSM/GPRS and 8PSK EDGE. Measure and record power outputs for both modulations.

3GPP Release Version	Mode	Cellular Band [dBm]			Sub-Test (See Table Below)	MPR
		4132	5183	4233		
99	WCDMA	24.47	24.50	24.48	-	-
6	HSDPA	24.45	24.41	24.45	1	0
6		24.48	24.43	24.40	2	0
6		24.01	23.96	23.99	3	0.5
6		24.06	23.94	23.97	4	0.5
6		24.42	24.49	24.41	1	0
6	HSUPA	22.56	22.47	22.48	2	2
6		23.52	23.55	23.40	3	1
6		22.43	22.59	22.52	4	2
6		24.45	24.48	24.44	5	0

3GPP Release Version	Mode	PCS Band [dBm]			Sub-Test (See Table Below)	MPR
		9262	9400	9538		
99	WCDMA	24.50	24.49	24.46	-	-
6	HSDPA	24.47	24.41	24.45	1	0
6		24.43	24.43	24.40	2	0
6		23.92	24.06	23.97	3	0.5
6		23.97	24.04	23.95	4	0.5
6		24.50	24.46	24.42	1	0
6	HSUPA	22.56	22.62	22.50	2	2
6		23.54	23.57	23.46	3	1
6		22.48	22.51	22.53	4	2
6		24.43	24.48	24.45	5	0

#### Sub-Test Setup for Release 6 HSDPA

Sub-Test	$\beta_c$	$\beta_d$	$B_c / \beta_d$	$\beta_{hs}$
1	2/15	15/15	2/15	4/15
2	12/15	15/15	15/15	24/15
3	15/15	8/15	15/8	30/15
4	15/15	4/15	15/4	30/15

$\Delta_{ack}, \Delta_{nack}$  and  $\Delta_{cqi} = 8$

#### Sub-Test Setup for Release 6 HSUPA

Sub-Test	$\beta_c$	$\beta_d$	$B_c / \beta_d$	$\beta_{hs}$	$B_{ec}$	$B_{ed}$	MPR	AG Index	E-TFCI
1	11/15	15/15	11/15	22/15	209/225	1039/225	0.0	20	75
2	6/15	15/15	6/15	12/15	12/15	94/75	2.0	12	67
3	15/15	9/15	15/9	30/15	30/15	47/15	1.0	15	92
4	2/15	15/15	2/15	4/15	2/15	56/15	2.0	17	71
5	15/15	15/15	15/15	30/15	24/15	134/15	0.0	21	81

$\Delta_{ack}, \Delta_{nack}$  and  $\Delta_{cqi} = 8$

GPRS-GMSK/1 slot			
Band	Channel	Peak Power	Frame Average
Cellular	128	32.70	23.67
	190	32.62	23.59
	251	32.55	23.52
PCS	512	29.04	20.01
	661	29.48	20.45
	810	29.96	20.93

GPRS-GMSK/2 slot			
Band	Channel	Peak Power	Frame Average
Cellular	128	29.22	23.20
	190	29.18	23.16
	251	29.07	23.05
PCS	512	25.47	19.45
	661	25.76	19.74
	810	26.10	20.08

GPRS-GMSK/3 slot			
Band	Channel	Peak Power	Frame Average
Cellular	128	27.33	23.07
	190	27.27	23.01
	251	27.16	22.90
PCS	512	23.27	19.01
	661	23.69	19.43
	810	24.39	20.13

GPRS-GMSK/4 slot			
Band	Channel	Peak Power	Frame Average
Cellular	128	25.82	22.81
	190	25.63	22.62
	251	24.49	21.48
PCS	512	22.10	19.09
	661	22.23	19.22
	810	22.65	19.64

EDGE-8PSK/1 slot			
Band	Channel	Peak Power	Frame Average
Cellular	128	25.96	16.93
	190	25.88	16.85
	251	25.80	16.77
PCS	512	24.63	15.60
	661	24.09	16.06
	810	25.50	16.47

EDGE-8PSK/2 slot			
Band	Channel	Peak Power	Frame Average
Cellular	128	22.85	16.83
	190	22.72	16.70
	251	22.65	16.63
PCS	512	22.45	16.43
	661	21.85	15.83
	810	22.30	16.28

EDGE-8PSK/3 slot			
Band	Channel	Peak Power	Frame Average
Cellular	128	21.61	17.35
	190	21.57	17.31
	251	21.51	17.25
PCS	512	19.84	15.58
	661	20.33	16.07
	810	20.76	16.50

EDGE-8PSK/4 slot			
Band	Channel	Peak Power	Frame Average
Cellular	128	20.45	17.44
	190	20.46	17.45
	251	20.43	17.42
PCS	512	18.56	15.55
	661	18.99	15.98
	810	19.50	16.49

802.11b			
Freq	Channel	Data Rate	Avg. Power
2412	1	1	17.38
2437	6	1	17.48
2462	11	1	17.42
2412	1	2	17.33
2437	6	2	17.32
2462	11	2	17.26
2412	1	5.5	17.31
2437	6	5.5	17.29
2462	11	5.5	17.20
2412	1	11	17.39
2437	6	11	17.37
2462	11	11	17.23
802.11g			
Freq	Channel	Data Rate	Avg. Power
2412	1	6	14.32
2437	6	6	14.48
2462	11	6	14.42
2412	1	9	14.33
2437	6	9	14.21
2462	11	9	14.29
2412	1	12	14.11
2437	6	12	14.06
2462	11	12	14.11
2412	1	18	14.14
2437	6	18	14.13
2462	11	18	14.13
2412	1	24	13.94
2437	6	24	13.97
2462	11	24	14.02
2412	1	36	13.37
2437	6	36	13.52
2462	11	36	13.52
2412	1	48	13.35
2437	6	48	13.41
2462	11	48	13.45
2412	1	54	13.25
2437	6	54	13.24
2462	11	54	13.32

802.11n			
Freq	Channel	Data Rate	Avg. Power
2412	1	6.5	14.40
2437	6	6.5	14.49
2462	11	6.5	14.46
2412	1	13	14.36
2437	6	13	14.32
2462	11	13	14.40
2412	1	20	14.28
2437	6	20	14.05
2462	11	20	14.20
2412	1	26	14.02
2437	6	26	13.94
2462	11	26	14.05
2412	1	39	13.51
2437	6	39	13.52
2462	11	39	13.66
2412	1	52	13.50
2437	6	52	13.36
2462	11	52	13.40
2412	1	58	13.11
2437	6	58	13.22
2462	11	58	13.35
2412	1	65	12.98
2437	6	65	12.97
2462	11	65	13.12

## 10.5 SAR Measurement Conditions for LTE Band 13

### 10.5.1 LTE Functionality

This device supports 5 MHz and 10 MHz bandwidths. At the 5 MHz bandwidth operation, there are two channels of operation. At the 10 MHz bandwidth, there is one channel of operation.

### 10.5.2 Test Conditions

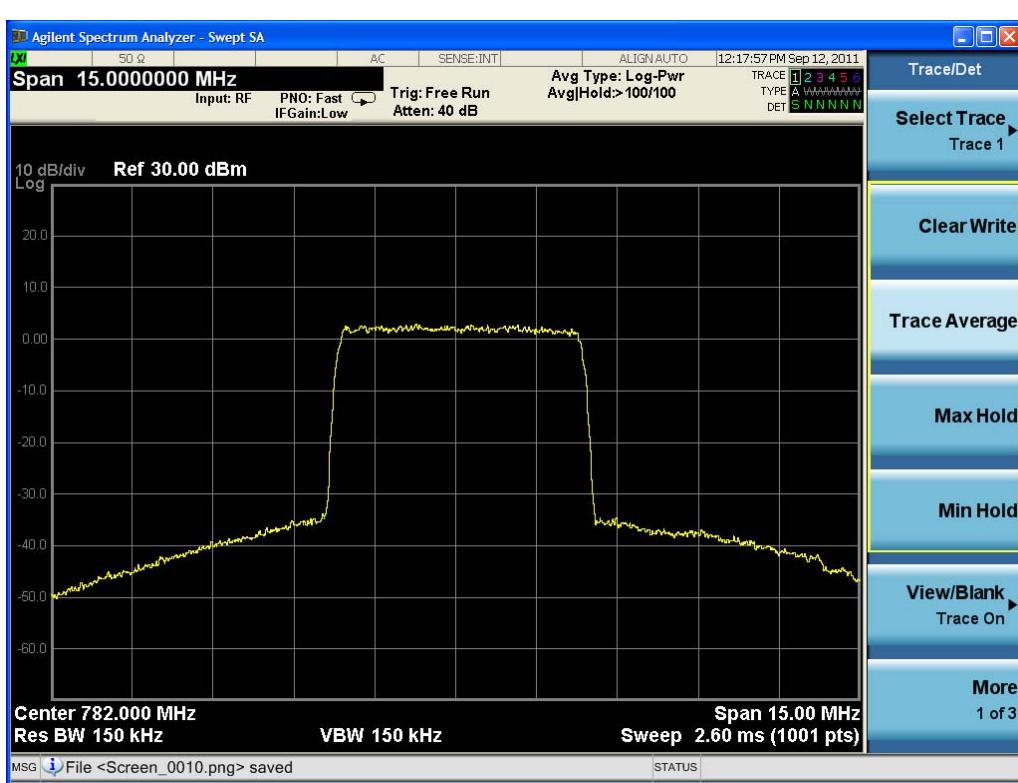
All SAR measurements for LTE were performed using the Anritsu MT8820C. A closed loop power control setting allowed the UE to transmit at the maximum output power during the SAR measurements. The 5 MHz bandwidth was not tested due to the maximum conducted measured output power was within  $\frac{1}{2}$  dB of the 10 MHz bandwidth maximum conducted output power measurement and the SAR was less than 1.45 W/kg per KDB 941225 D05.

MPR was enabled for this device. A-MPR was disabled for all SAR test measurements.

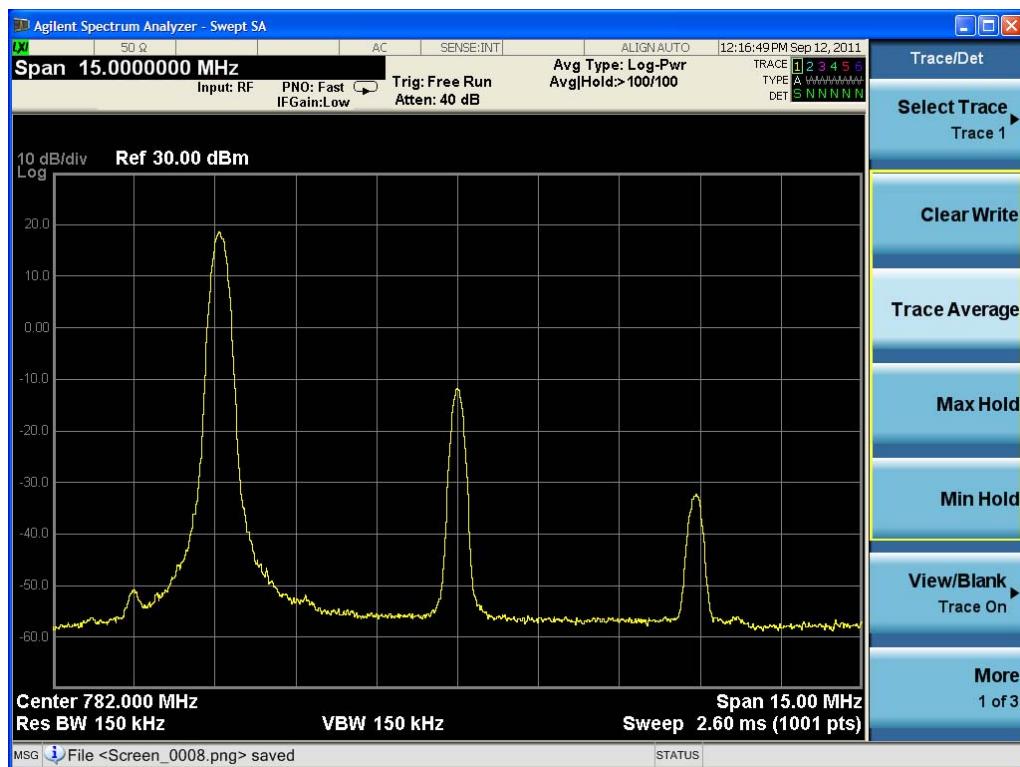
**Band 13 LTE Power Measurements**

Freq. (MHz)	Modulation	Channel Bandwidth (MHz)	RB Size	RB Offset	MPR Enabled Max. Avg. Power (dBm)	MPR Target Backoff (dB)
779.5	QPSK	5	1	0	24.3	0
	16QAM	5	1	0	23.7	1
	QPSK	5	1	24	24.5	0
	16QAM	5	1	24	23.9	1
	QPSK	5	12	6	23.4	1
	16QAM	5	12	6	22.7	2
	QPSK	5	25	0	23.7	1
	16QAM	5	25	0	22.3	2
784.5	QPSK	5	1	0	24.5	0
	16QAM	5	1	0	23.9	1
	QPSK	5	1	24	24.5	0
	16QAM	5	1	24	23.8	1
	QPSK	5	12	6	23.5	1
	16QAM	5	12	6	22.4	2
	QPSK	5	25	0	23.4	1
	16QAM	5	25	0	22.4	2
782	QPSK	10	1	0	24.5	0
	16QAM	10	1	0	24.0	1
	QPSK	10	1	49	24.5	0
	16QAM	10	1	49	23.9	1
	QPSK	10	25	13	23.7	1
	16QAM	10	25	13	22.4	2
	QPSK	10	50	0	23.6	1
	16QAM	10	50	0	22.4	2

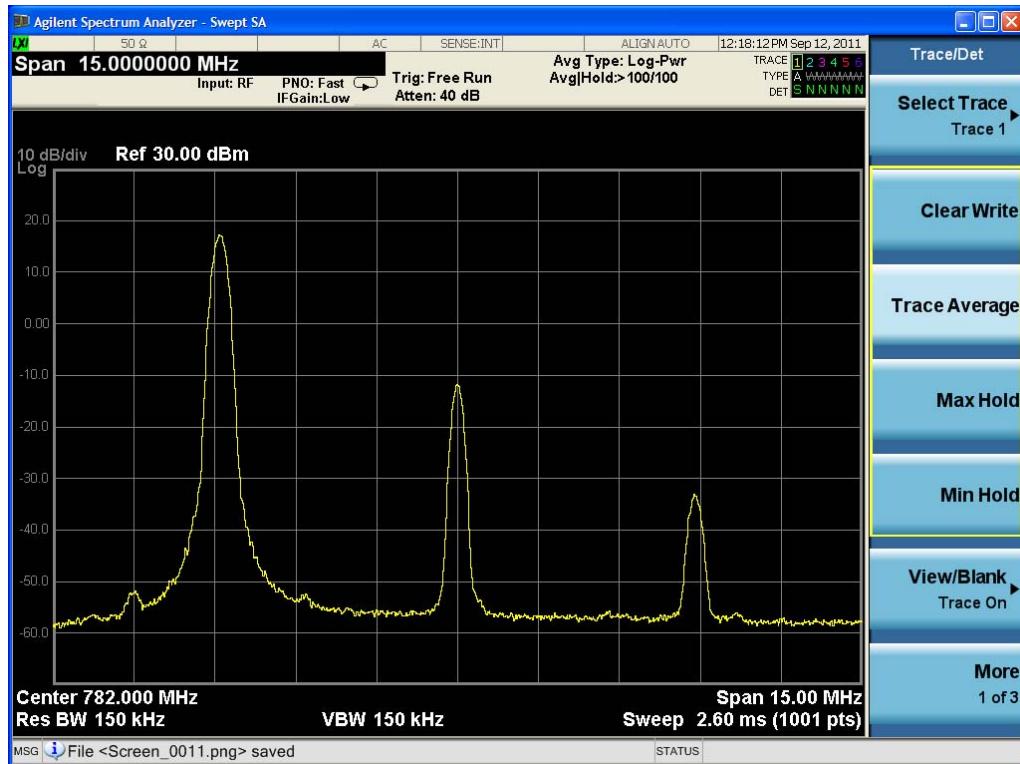
## 10.5.2 Plots



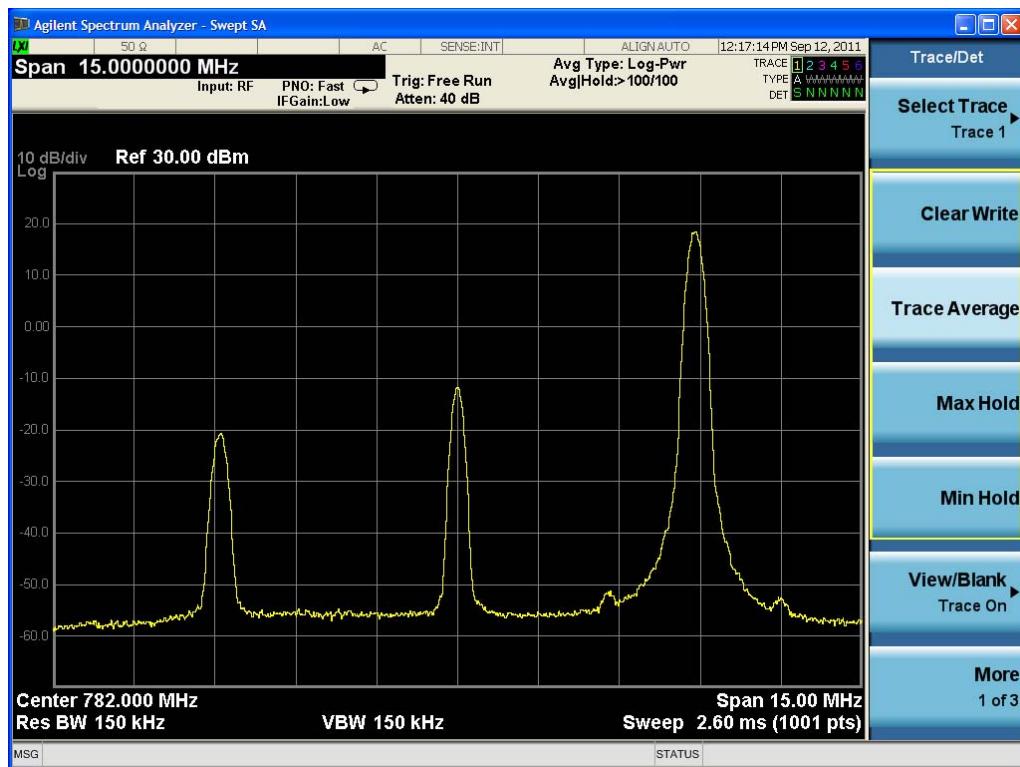
**RB 25 Offset 13 16QAM**



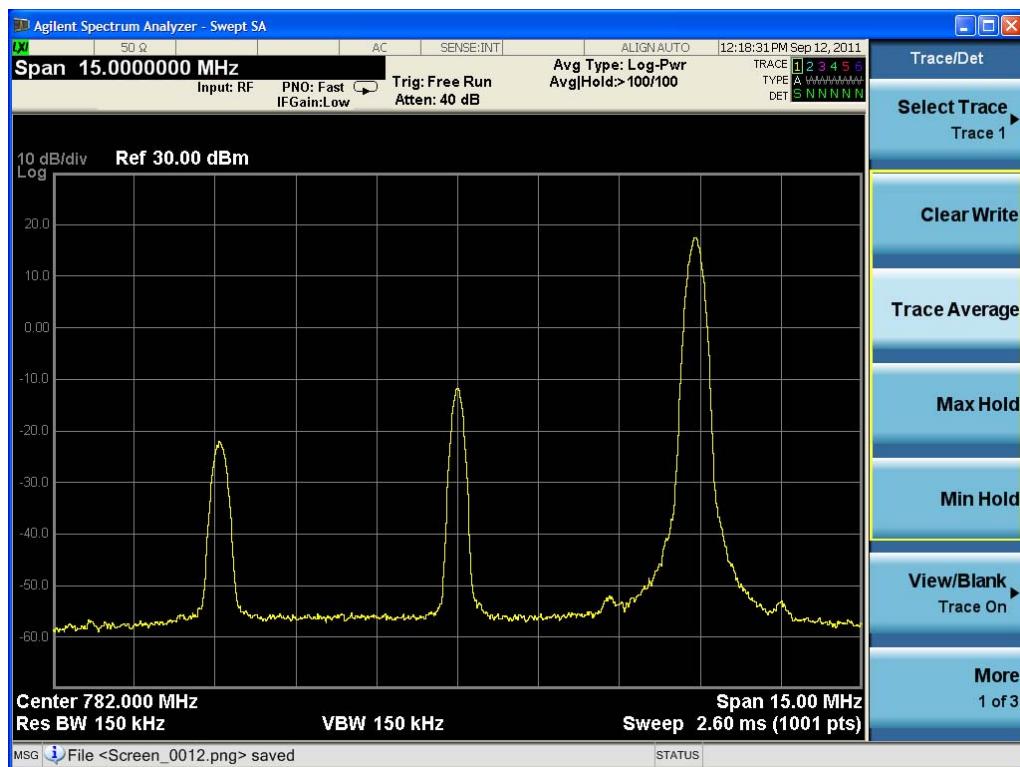
RB 1 Offset 0 QPSK



RB 1 Offset 0 16QAM



RB 1 Offset 49 QPSK



RB 1 Offset 49 16QAM

## SAR Data Summary – 835 MHz Body - CDMA

## MEASUREMENT RESULTS

Gap	Frequency		Rev Level/ Modulation	Position	End Power (dBm)	Drift (%)	Reverse Channel	Forward Channel	SAR (W/kg)
	MHz	Ch.							
10 mm	824.7	1013	Rev 0	Side A	24.43	+ 0.795	153.6 kbps	2 Slot 307.2 kbps	1.256
	836.52	384	Rev 0		24.50	+ 1.207	153.6 kbps	2 Slot 307.2 kbps	1.397
	848.31	777	Rev 0		24.44	+ 2.533	153.6 kbps	2 Slot 307.2 kbps	1.210
	824.7	1013	Rev 0	Side B	24.43	+ 0.944	153.6 kbps	2 Slot 307.2 kbps	1.148
	836.52	384	Rev 0		24.50	- 1.948	153.6 kbps	2 Slot 307.2 kbps	1.268
	848.31	777	Rev 0		24.44	+ 1.347	153.6 kbps	2 Slot 307.2 kbps	1.080
	836.52	384	Rev 0	Side C	24.50	+ 4.755	153.6 kbps	2 Slot 307.2 kbps	0.198
	836.52	384	Rev 0	Side D	24.50	+ 0.361	153.6 kbps	2 Slot 307.2 kbps	0.672
	836.52	384	Rev 0	Side F	24.50	+ 0.522	153.6 kbps	2 Slot 307.2 kbps	0.794

**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

5. Tissue Depth is at least 15.0 cm



Jay M. Moulton  
Vice President

Note: SAR Tested on the Highest output power channel. When the measured 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 testing was conducted for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. All testing was conducted per KDB 447498, 941225 D01 & D06 and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – 835 MHz Body - WCDMA

## MEASUREMENT RESULTS

Gap	Frequency		Rev Level/ Modulation	Position	End Power (dBm)	Drift (%)	RMC	Test Set Up	SAR (W/kg)
	MHz	Ch.							
10 mm	826.4	4132	WCDMA	Side A	24.47	+ 2.632	12.2 kbps	Test Loop 1	1.159
	836.6	4183	WCDMA		24.50	- 3.291	12.2 kbps	Test Loop 1	1.302
	846.6	4233	WCDMA		24.48	+ 0.940	12.2 kbps	Test Loop 1	1.210
	826.4	4132	WCDMA	Side B	24.47	- 0.738	12.2 kbps	Test Loop 1	1.082
	836.6	4183	WCDMA		24.50	+ 1.430	12.2 kbps	Test Loop 1	1.237
	846.6	4233	WCDMA		24.48	+ 2.776	12.2 kbps	Test Loop 1	1.029
	836.6	4183	WCDMA	Side C	24.50	+ 1.223	12.2 kbps	Test Loop 1	0.172
	836.6	4183	WCDMA	Side D	24.50	+ 1.729	12.2 kbps	Test Loop 1	0.640
	836.6	4183	WCDMA	Side F	24.50	+ 0.964	12.2 kbps	Test Loop 1	0.784

**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

5. Tissue Depth is at least 15.0 cm



Jay M. Moulton  
Vice President

Note: SAR Tested on the Highest output power channel. When the measured 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 testing was conducted for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. All testing was conducted per KDB 447498, 941225 D02 & D06 and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – 835 MHz Body - GPRS

MEASUREMENT RESULTS									
Gap	Frequency		Rev Level/ Modulation	Position	End Power (dBm)	Drift (%)	TX Level	Multislot Configuration	SAR (W/kg)
	MHz	Ch.							
10 mm	824.2	128	GMSK	Side A	32.70	+ 0.524	5	1 Slot	0.698
	824.2	128	GMSK	Side B	32.70	- 3.693	5	1 Slot	0.723
	824.2	128	GMSK	Side C	32.70	- 1.938	5	1 Slot	0.115
	824.2	128	GMSK	Side D	32.70	- 2.078	5	1 Slot	0.382
	824.2	128	GMSK	Side F	32.70	+ 2.730	5	1 Slot	0.431
					<b>Body</b> <b>1.6 W/kg (mW/g)</b> <small>averaged over 1 gram</small>				

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
5. Tissue Depth is at least 15.0 cm



Jay M. Moulton  
Vice President

Note: SAR Tested on the Highest output power channel according to April 2010 TCB Workshop SAR notes. When the measured 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 testing was conducted for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. All testing was conducted per KDB 447498, 941225 D03 & D06 and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – 1900 MHz Body - CDMA

## MEASUREMENT RESULTS

Gap	Frequency		Rev Level/ Modulation	Position	End Power (dBm)	Drift (%)	Reverse Channel	Forward Channel	SAR (W/kg)
	MHz	Ch.							
10 mm	1851.25	25	Rev 0	Side A	24.50	- 1.113	153.6 kbps	2 Slot 307.2 kbps	1.240
	1880.00	600	Rev 0		24.47	+ 2.346	153.6 kbps	2 Slot 307.2 kbps	1.104
	1908.75	1175	Rev 0		24.45	- 0.555	153.6 kbps	2 Slot 307.2 kbps	0.992
	1851.25	25	Rev 0	Side B	24.50	- 0.480	153.6 kbps	2 Slot 307.2 kbps	1.106
	1880.00	600	Rev 0		24.47	- 0.308	153.6 kbps	2 Slot 307.2 kbps	1.067
	1908.75	1175	Rev 0		24.45	+ 0.277	153.6 kbps	2 Slot 307.2 kbps	1.037
	1851.25	25	Rev 0	Side C	24.50	+ 3.102	153.6 kbps	2 Slot 307.2 kbps	1.396
	1880.00	600	Rev 0		24.47	+ 1.481	153.6 kbps	2 Slot 307.2 kbps	1.046
	1908.75	1175	Rev 0		24.45	+ 2.279	153.6 kbps	2 Slot 307.2 kbps	0.732
	1851.25	25	Rev 0	Side D	24.50	+ 2.908	153.6 kbps	2 Slot 307.2 kbps	0.911
	1880.00	600	Rev 0		24.47	- 0.029	153.6 kbps	2 Slot 307.2 kbps	0.780
	1908.75	1175	Rev 0		24.45	- 0.509	153.6 kbps	2 Slot 307.2 kbps	0.576
	1851.25	25	Rev 0	Side F	24.50	- 2.550	153.6 kbps	2 Slot 307.2 kbps	0.497

**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

5. Tissue Depth is at least 15.0 cm



Jay M. Moulton  
Vice President

Note: SAR Tested on the Highest output power channel. When the measured 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 testing was conducted for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. All testing was conducted per KDB 447498, 941225 D01 & D06 and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – 1900 MHz Body - WCDMA

## MEASUREMENT RESULTS

Gap	Frequency		Rev Level/ Modulation	Position	End Power (dBm)	Drift (%)	RMC	Test Set Up	SAR (W/kg)
	MHz	Ch.							
10 mm	1852.4	9262	WCDMA	Side A	24.50	- 0.403	12.2 kbps	Test Loop 1	1.191
	1880.0	9400	WCDMA		24.49	+ 2.466	12.2 kbps	Test Loop 1	1.335
	1907.6	9538	WCDMA		24.46	- 4.449	12.2 kbps	Test Loop 1	1.260
	1852.4	9262	WCDMA	Side B	24.50	- 2.852	12.2 kbps	Test Loop 1	0.960
	1880.0	9400	WCDMA		24.49	+ 1.695	12.2 kbps	Test Loop 1	1.159
	1907.6	9538	WCDMA		24.46	- 1.710	12.2 kbps	Test Loop 1	1.143
	1852.4	9262	WCDMA	Side C	24.50	+ 0.229	12.2 kbps	Test Loop 1	0.972
	1880.0	9400	WCDMA		24.49	+ 2.157	12.2 kbps	Test Loop 1	0.834
	1907.6	9538	WCDMA		24.46	- 0.521	12.2 kbps	Test Loop 1	0.630
	1880.0	9400	WCDMA	Side D	24.49	- 0.806	12.2 kbps	Test Loop 1	0.567
	1852.4	9262	WCDMA	Side F	24.50	- 0.933	12.2 kbps	Test Loop 1	0.824
	1880.0	9400	WCDMA		24.49	+ 1.898	12.2 kbps	Test Loop 1	0.818
	1907.6	9538	WCDMA		24.46	+ 0.746	12.2 kbps	Test Loop 1	0.682

**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
5. Tissue Depth is at least 15.0 cm



Jay M. Moulton  
Vice President

Note: SAR Tested on the Highest output power channel. When the measured channel is 3 dB or more below the limit the remaining channels are not required to be tested per KDB 447498 section 1) e). Per April 2010 TCB Workshop notes, the use of the mid channel or the highest output power channel may be used for SAR testing as long as the powers are within 0.5 dB across all channels. The testing was conducted for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. All testing was conducted per KDB 447498, 941225 D02 & D06 and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – 1900 MHz Body - GPRS

## MEASUREMENT RESULTS

Gap	Frequency		Rev Level/ Modulation	Position	End Power (dBm)	Drift (%)	TX Level	Multislot Configuration	SAR (W/kg)
	MHz	Ch.							
10 mm	1909.8	810	GMSK	Side A	29.96	- 0.870	0	1 Slot	0.543
	1909.8	810	GMSK	Side B	29.96	- 3.762	0	1 Slot	0.569
	1909.8	810	GMSK	Side C	29.96	+ 2.932	0	1 Slot	0.467
	1909.8	810	GMSK	Side D	29.96	- 2.406	0	1 Slot	0.406
	1909.8	810	GMSK	Side F	29.96	- 1.146	0	1 Slot	0.351

**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  
5. Tissue Depth is at least 15.0 cm



Jay M. Moulton  
Vice President

Note: SAR Tested on the Highest output power channel according to April 2010 TCB Workshop SAR notes. When the measured 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 testing was conducted for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. All testing was conducted per KDB 447498, 941225 D03 & D06 and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – 750 MHz Body – LTE Band 13 10 MHz QPSK

MEASUREMENT RESULTS										
Gap	Position	Frequency		Modulation	RB Size	RB Offset	MPR Target	End Power (dBm)	Drift (%)	SAR (W/kg)
		MHz	Ch.							
10 mm	Side A	782.0	23230	QPSK	25	13	1	23.7	+ 2.526	1.091
		782.0	23230	QPSK	1	49	0	24.5	+ 0.551	1.338
		782.0	23230	QPSK	1	0	0	24.5	- 4.124	1.152
	Side B	782.0	23230	QPSK	25	13	1	23.7	+ 2.411	0.960
		782.0	23230	QPSK	1	49	0	24.5	- 0.981	1.206
		782.0	23230	QPSK	1	0	0	24.5	- 1.681	1.045
	Side C	782.0	23230	QPSK	25	13	1	23.7	- 1.943	0.192
		782.0	23230	QPSK	1	49	0	24.5	+ 2.301	0.223
		782.0	23230	QPSK	1	0	0	24.5	+ 0.996	0.212
	Side D	782.0	23230	QPSK	25	13	1	23.7	+ 0.526	0.403
		782.0	23230	QPSK	1	49	0	24.5	+ 1.777	0.508
		782.0	23230	QPSK	1	0	0	24.5	+ 1.050	0.444
	Side F	782.0	23230	QPSK	25	13	1	23.7	+ 1.990	0.469
		782.0	23230	QPSK	1	49	0	24.5	- 1.336	0.643
		782.0	23230	QPSK	1	0	0	24.5	+ 0.507	0.517

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

1. Battery is fully charged for all tests.  
Power Measured Conducted
2. SAR Measurement  
Phantom Configuration Left Head Uniphantom  
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
5. Tissue Depth is at least 15.0 cm

ERP EIRP

Right Head  
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 941225. Test reduction was based on KDB941225 D05. The testing was conducted for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. The 5 MHz bandwidth was not tested due to the maximum conducted measured output power was within ½ dB of the 10 MHz bandwidth maximum conducted output power measurement and the SAR was less than 1.45 W/kg per KDB 941225 D05. MPR was enabled for this device during testing. A-MPR was disabled for all SAR test measurements. All testing was conducted per KDB 941225 D05, KDB 447498, and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – 750 MHz Body – LTE Band 13 10 MHz 16QAM

## MEASUREMENT RESULTS

Gap	Position	Frequency		Modulation	RB Size	RB Offset	MPR Target	End Power (dBm)	Drift (%)	SAR (W/kg)
		MHz	Ch.							
10 mm	Side A	782.0	23230	16QAM	25	13	2	22.4	+ 3.347	0.761
		782.0	23230	16QAM	1	49	1	23.9	-0.847	0.956
		782.0	23230	16QAM	1	0	1	24.0	-3.243	0.872
	Side B	782.0	23230	16QAM	25	13	2	22.4	+ 4.887	0.733
		782.0	23230	16QAM	1	49	1	23.9	+ 0.918	0.972
		782.0	23230	16QAM	1	0	1	24.0	-3.985	0.814
	Side C	782.0	23230	16QAM	25	13	2	22.4	+ 3.485	0.150
		782.0	23230	16QAM	1	49	1	23.9	+ 4.200	0.172
		782.0	23230	16QAM	1	0	1	24.0	-3.599	0.168
	Side D	782.0	23230	16QAM	25	13	2	22.4	-0.315	0.331
		782.0	23230	16QAM	1	49	1	23.9	-0.766	0.445
		782.0	23230	16QAM	1	0	1	24.0	-0.284	0.377
	Side F	782.0	23230	16QAM	25	13	2	22.4	-0.001	0.438
		782.0	23230	16QAM	1	49	1	23.9	+ 3.163	0.611
		782.0	23230	16QAM	1	0	1	24.0	+ 0.899	0.481

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

1. Battery is fully charged for all tests.  
 Power Measured Conducted
2. SAR Measurement  
 Phantom Configuration Left Head Uniphantom  
 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
5. Tissue Depth is at least 15.0 cm

ERP EIRP  
Right Head  
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 941225. Test reduction was based on KDB941225 D05. The testing was conducted for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. The 5 MHz bandwidth was not tested due to the maximum conducted measured output power was within ½ dB of the 10 MHz bandwidth maximum conducted output power measurement and the SAR was less than 1.45 W/kg per KDB 941225 D05. MPR was enabled for this device during testing. A-MPR was disabled for all SAR test measurements. All testing was conducted per KDB 941225 D05, KDB 447498, and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – 2450 MHz Body

MEASUREMENT RESULTS								
Gap	Side	Frequency		Mode	Modulation	End Power	Drift (%)	SAR (W/kg)
		MHz	Ch.					
10 mm	Side A	2437	6	802.11b	DSSS	17.48	+ 0.170	0.173
	Side B	2437	6	802.11b	DSSS	17.48	+ 2.480	0.190
	Side E	2437	6	802.11b	DSSS	17.48	+ 0.188	0.123
	Side F	2437	6	802.11b	DSSS	17.48	- 0.092	0.194

**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
5. Tissue Depth is at least 15.0 cm



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). 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 for all sides and surfaces where a transmitting antenna was located within 25 mm from that surface or edge. All testing was conducted per KDB 447498, KDB 248227 and OET Bulletin 65. See the photo in Appendix C and diagram on page 15 for a pictorial of the setup and labeling of the test locations and distances.

## SAR Data Summary – Simultaneous Evaluation

Simult Tx	Configuration	Cell. EvDo SAR (W/kg)	2.4 GHz WiFi SAR (W/kg)	SAR (W/kg) Sum
Body SAR	Side A	1.397	0.173	1.570
	Side B	1.268	0.190	1.458
	Side C	0.198	-	0.198
	Side D	0.672	-	0.672
	Side E	-	0.123	0.123
	Side F	0.794	0.194	0.988
	Configuration	Cell. WCDMA SAR (W/kg)	2.4 GHz WiFi SAR (W/kg)	SAR (W/kg) Sum
	Side A	1.302	0.173	1.475
	Side B	1.237	0.190	1.427
	Side C	0.172	-	0.172
	Side D	0.640	-	0.640
	Side E	-	0.123	0.123
	Side F	0.784	0.194	0.978
Body SAR	Configuration	Cell. GPRS SAR (W/kg)	2.4 GHz WiFi SAR (W/kg)	SAR (W/kg) Sum
	Side A	0.698	0.173	0.871
	Side B	0.723	0.190	0.913
	Side C	0.115	-	0.115
	Side D	0.382	-	0.382
	Side E	-	0.123	0.123
	Side F	0.431	0.194	0.625
	Configuration	PCS EvDo SAR (W/kg)	2.4 GHz WiFi SAR (W/kg)	SAR (W/kg) Sum
	Side A	1.240	0.173	1.413
	Side B	1.106	0.190	1.296
	Side C	1.396	-	1.396
	Side D	0.911	-	0.911
	Side E	-	0.123	0.123
	Side F	0.497	0.194	0.691
Body SAR	Configuration	PCS WCDMA SAR (W/kg)	2.4 GHz WiFi SAR (W/kg)	SAR (W/kg) Sum
	Side A	1.335	0.173	1.508
	Side B	1.159	0.190	1.349
	Side C	0.972	-	0.972
	Side D	0.567	-	0.567
	Side E	-	0.123	0.123
	Side F	0.824	0.194	1.018
	Configuration	PCS GPRS SAR (W/kg)	2.4 GHz WiFi SAR (W/kg)	SAR (W/kg) Sum
	Side A	0.543	0.173	0.716
	Side B	0.569	0.190	0.759
	Side C	0.467	-	0.467
	Side D	0.406	-	0.406
	Side E	-	0.123	0.123
	Side F	0.351	0.194	0.545

Simult Tx	Configuration	LTE SAR (W/kg)	2.4 GHz WiFi SAR (W/kg)	SAR (W/kg) Sum
Body SAR	Side A	1.338	0.173	1.511
	Side B	1.206	0.190	1.396
	Side C	0.223	-	0.223
	Side D	0.508	-	0.508
	Side E	-	0.123	0.123
	Side F	0.643	0.194	0.837

The sum of the highest SAR in each of the WWAN modes with the highest SAR in WLAN is below 1.6 W/kg. Therefore, simultaneous testing is not required per KDB 648474.

Simultaneous Tx Modes	GPRS/EDGE	WCDMA	CDMA	LTE	802.11b/g/n
1	<b>ON</b>	OFF	OFF	OFF	<b>ON</b>
2	OFF	<b>ON</b>	OFF	OFF	<b>ON</b>
3	OFF	OFF	<b>ON</b>	OFF	<b>ON</b>
4	OFF	OFF	OFF	<b>ON</b>	<b>ON</b>

## 11. Test Equipment List

Table 11.1 Equipment Specifications

Type	Calibration Due Date	Calibration Done Date	Serial Number
ThermoCRS Robot	N/A	N/A	RAF0338198
ThermoCRS Controller	N/A	N/A	RCF0338224
ThermoCRS Teach Pendant (Joystick)	N/A	N/A	STP0334405
IBM Computer, 2.66 MHz P4	N/A	N/A	8189D8U KCPR08N
Apres E-Field Probe ALS-E020	07/07/2012	09/07/2011	RFE-217
Apres E-Field Probe ALS-E030	07/14/2012	07/14/2011	E030-001
Apres Dummy Probe	N/A	N/A	023
Apres Left Phantom	N/A	N/A	RFE-267
Apres Right Phantom	N/A	N/A	RFE-268
Apres UniPhantom	N/A	N/A	RFE-273
Apres Validation Dipole ALS-D-450-S-2 Head	01/12/2012	01/12/2010	RFE-362
Apres Validation Dipole ALS-D-450-S-2 Body	01/19/2012	01/19/2011	RFE-362
Apres Validation Dipole ALS-D-750-S-2 Head	01/14/2012	01/14/2010	177-00501
Apres Validation Dipole ALS-D-750-S-2 Body	11/15/2011	11/15/2010	177-00501
Apres Validation Dipole ALS-D-835-S-2 Head	01/14/2012	01/14/2010	180-00561
Apres Validation Dipole ALS-D-835-S-2 Body	11/16/2011	11/16/2010	180-00561
Apres Validation Dipole ALS-D-900-S-2 Head	01/12/2012	01/12/2010	RFE-275
Apres Validation Dipole ALS-D-900-S-2 Body	11/19/2011	11/19/2010	RFE-275
Apres Validation Dipole ALS-D-1900-S-2 Head	01/15/2012	01/15/2010	210-00713
Apres Validation Dipole ALS-D-1900-S-2 Body	11/16/2011	11/16/2010	210-00713
Apres Validation Dipole ALS-D-2450-S-2 Head	01/12/2012	01/12/2010	RFE-278
Apres Validation Dipole ALS-D-2450-S-2 Body	11/18/2011	11/18/2010	RFE-278
Apres Validation Dipole RFE-D-2600-S-2 Body	01/18/2012	01/18/2010	RFE-121
Apres Validation Dipole RFE-D-BB-S-2 Head	01/12/2012	01/12/2010	235-00801
Apres Validation Dipole RFE-D-BB-S-2 Body	02/09/2012	02/09/2011	235-00801
Agilent (HP) 437B Power Meter	03/30/2012	03/30/2011	3125U08837
Agilent (HP) 8481B Power Sensor	03/30/2012	03/30/2011	3318A05384
Agilent N1911A Power Meter	03/30/2012	03/30/2011	GB45100254
Agilent N1922A Power Sensor	03/30/2012	03/30/2011	MY45240464
Advantest R3261A Spectrum Analyzer	03/30/2012	03/30/2011	31720068
Agilent (HP) 8350B Signal Generator	03/31/2012	03/31/2011	2749A10226
Agilent (HP) 83525A RF Plug-In	03/31/2012	03/31/2011	2647A01172
Agilent (HP) 8753C Vector Network Analyzer	03/30/2012	03/30/2011	3135A01724
Agilent (HP) 85047A S-Parameter Test Set	03/31/2012	03/31/2011	2904A00595
Agilent (HP) 8960 Base Station Sim.	03/25/2012	03/25/2011	MY48360364
Anritsu MT8820C	03/23/2012	03/23/2011	6201010002
Apres Dielectric Probe Assembly	N/A	N/A	0011
Head Equivalent Matter (450 MHz)	N/A	N/A	N/A
Head Equivalent Matter (835/900 MHz)	N/A	N/A	N/A
Head Equivalent Matter (1900 MHz)	N/A	N/A	N/A
Head Equivalent Matter (2450 MHz)	N/A	N/A	N/A
Body Equivalent Matter (450 MHz)	N/A	N/A	N/A
Body Equivalent Matter (750 MHz)	N/A	N/A	N/A
Body Equivalent Matter (835/900 MHz)	N/A	N/A	N/A
Body Equivalent Matter (1900 MHz)	N/A	N/A	N/A
Body Equivalent Matter (2450 MHz)	N/A	N/A	N/A
Body Equivalent Matter (2600 MHz)	N/A	N/A	N/A
Body Equivalent Matter (5200 MHz)	N/A	N/A	N/A
Body Equivalent Matter (5800 MHz)	N/A	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.

## Appendix A – System Validation Plots and Data

```
*****
Test Result for UIM Dielectric Parameter
Fri 09/Sep/2011 05:39:56
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      54.75      0.96
0.8150    55.28      0.97      54.70      0.97
0.8250    55.24      0.97      54.66      0.98
0.8350    55.20      0.97      54.61      0.99
0.8450    55.17      0.98      54.58      1.01
0.8550    55.14      0.99      54.54      1.03
0.8650    55.11      1.01      54.50      1.04
*****
Test Result for UIM Dielectric Parameter
Sat 10/Sep/2011 07:55:49
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      54.24      0.94
0.8150    55.28      0.97      54.28      0.95
0.8250    55.24      0.97      54.33      0.96
0.8350    55.20      0.97      54.37      0.98
0.8450    55.17      0.98      54.40      0.99
0.8550    55.14      0.99      54.44      1.02
0.8650    55.11      1.01      54.48      1.04
```

\*\*\*\*\*

Test Result for UIM Dielectric Parameter

Thu 08/Sep/2011 07:52:39

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	53.28	1.54
1.8800	53.30	1.52	53.26	1.55
1.8900	53.30	1.52	53.23	1.55
<b>1.9000</b>	<b>53.30</b>	<b>1.52</b>	<b>53.21</b>	<b>1.56</b>
1.9100	53.30	1.52	53.19	1.57
1.9200	53.30	1.52	53.18	1.58
1.9300	53.30	1.52	53.16	1.59

\*\*\*\*\*

\*\*\*\*\*

Test Result for UIM Dielectric Parameter

Fri 09/Sep/2011 07:05:22

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
1.8700	53.30	1.52	53.17	1.55
1.8800	53.30	1.52	53.16	1.56
1.8900	53.30	1.52	53.14	1.56
<b>1.9000</b>	<b>53.30</b>	<b>1.52</b>	<b>53.12</b>	<b>1.57</b>
1.9100	53.30	1.52	53.11	1.58
1.9200	53.30	1.52	53.09	1.58
1.9300	53.30	1.52	53.08	1.59

\*\*\*\*\*

\*\*\*\*\*  
Test Result for UIM Dielectric Parameter  
Sat 10/Sep/2011 03:42:29  
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
0.7520	55.52	0.96	55.18	0.95
0.7620	55.48	0.96	55.13	0.96
0.7720	55.45	0.97	55.09	0.98
<b>0.7820</b>	<b>55.41</b>	<b>0.97</b>	<b>55.05</b>	<b>0.99</b>
0.7920	55.37	0.97	55.00	1.01
0.8020	55.33	0.97	54.95	1.02
0.8120	55.29	0.97	54.91	1.04

\*\*\*\*\*  
Test Result for UIM Dielectric Parameter  
Sun 11/Sep/2011 06:56:15  
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
0.7520	55.52	0.96	55.04	0.95
0.7620	55.48	0.96	54.99	0.96
0.7720	55.45	0.97	54.95	0.98
<b>0.7820</b>	<b>55.41</b>	<b>0.97</b>	<b>54.91</b>	<b>0.98</b>
0.7920	55.37	0.97	54.86	1.01
0.8020	55.33	0.97	54.82	1.02
0.8120	55.29	0.97	54.77	1.04

\*\*\*\*\*

Test Result for UIM Dielectric Parameter

Mon 12/Sep/2011 07:56:29

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
2.4100	52.75	1.91	52.35	1.92
2.4200	52.74	1.92	52.32	1.93
2.4300	52.73	1.93	52.28	1.95
<b>2.4400</b>	<b>52.71</b>	<b>1.94</b>	<b>52.25</b>	<b>1.97</b>
2.4500	52.70	1.95	52.23	1.98
2.4600	52.69	1.96	52.21	2.00
2.4700	52.67	1.98	52.18	2.02

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 06:00:41 PM  
End Time : 09-Sep-2011 06:15:52 PM  
Scanning Time : 911 secs

## Product Data

Device Name : Validation  
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 : 1.176 W/kg  
Power Drift-Finish: 1.143 W/kg  
Power Drift (%) : -2.806

## 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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 49.00 RH%  
Epsilon : 54.61 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

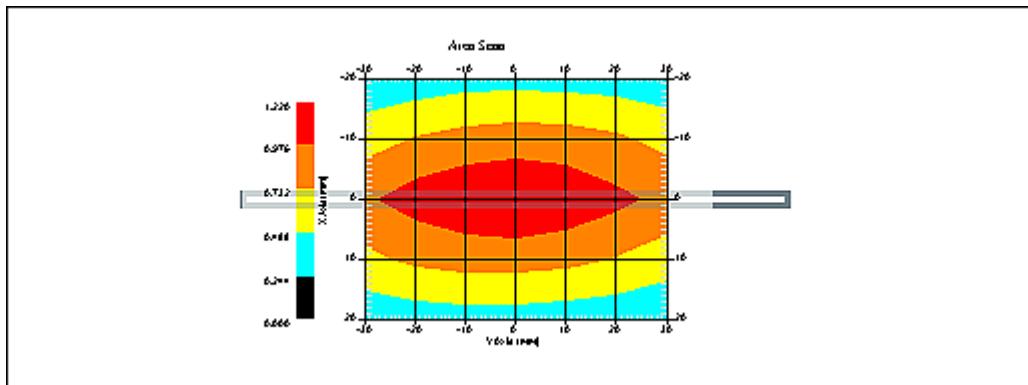
Name : Probe 217 - RFEL  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

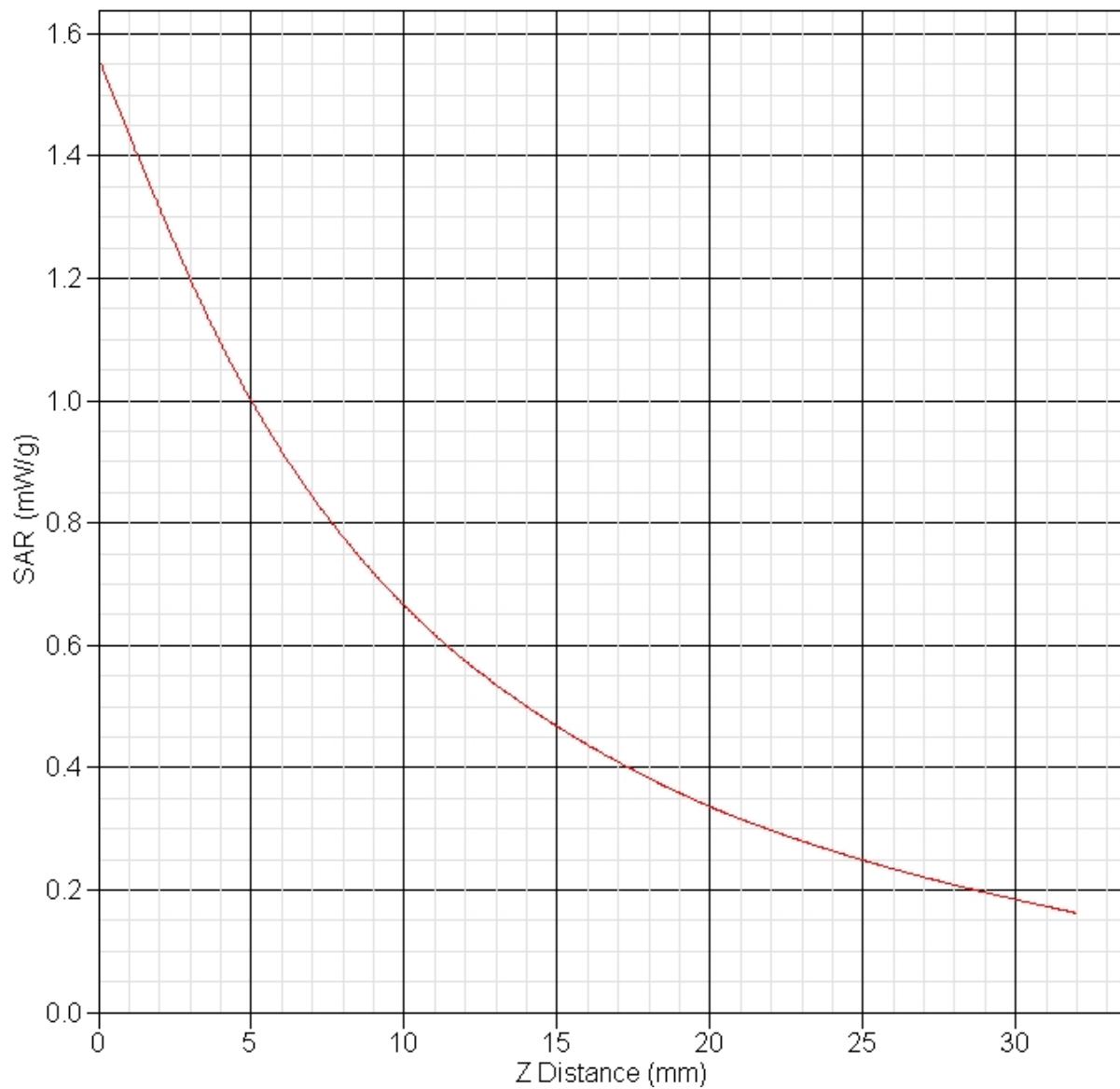
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 25.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 9:21:48 AM  
Area Scan : 5x7x1 : Measurement x=10mm, y=10mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Touch  
Separation : 15 mm  
Channel : Mid



1 gram SAR value : 0.996 W/kg  
10 gram SAR value : 0.598 W/kg  
Area Scan Peak SAR : 1.199 W/kg  
Zoom Scan Peak SAR : 1.552 W/kg

**SAR-Z Axis**  
at Hotspot x:0.25 y:-0.20

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 08:00:18 AM  
End Time : 10-Sep-2011 08:15:26 AM  
Scanning Time : 908 secs

## Product Data

Device Name : Validation  
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 : 1.052 W/kg  
Power Drift-Finish: 1.016 W/kg  
Power Drift (%) : -3.422

## 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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 49.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

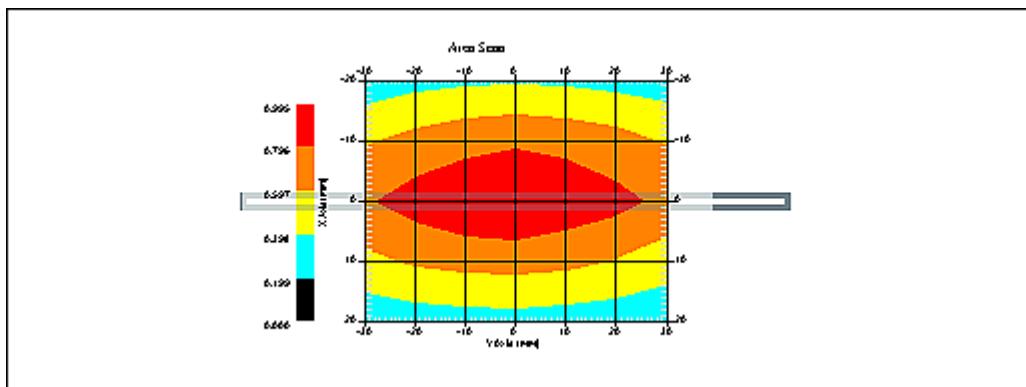
Name : Probe 217 - RFEL  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

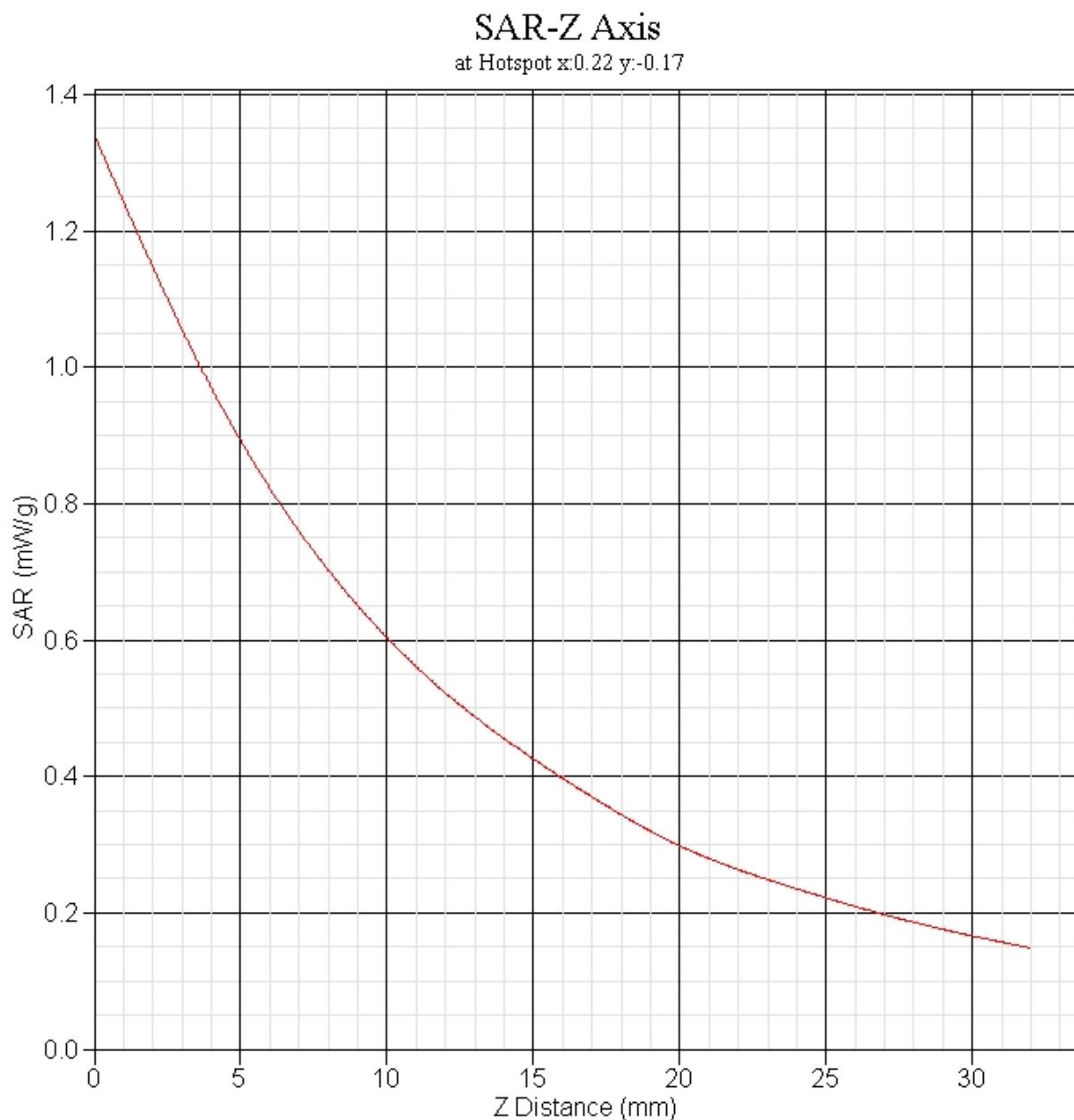
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 25.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 9:21:48 AM  
Area Scan : 5x7x1 : Measurement x=10mm, y=10mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Touch  
Separation : 15 mm  
Channel : Mid



1 gram SAR value : 0.947 W/kg  
10 gram SAR value : 0.636 W/kg  
Area Scan Peak SAR : 0.987 W/kg  
Zoom Scan Peak SAR : 1.333 W/kg



**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 08:07:44 AM  
End Time : 08-Sep-2011 08:20:46 AM  
Scanning Time : 782 secs

## Product Data

Device Name : Validation  
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 : 4.265 W/kg  
Power Drift-Finish: 4.129 W/kg  
Power Drift (%) : -3.189

## 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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 49.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

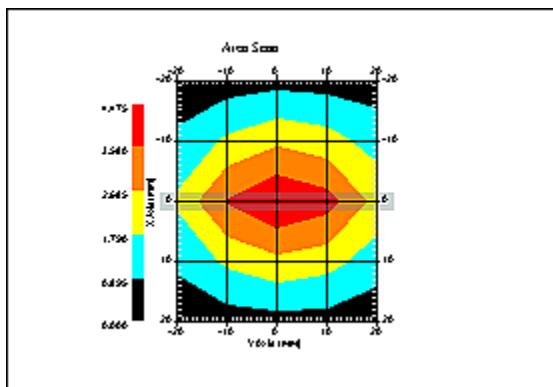
Name : Probe 217 - RFEL  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

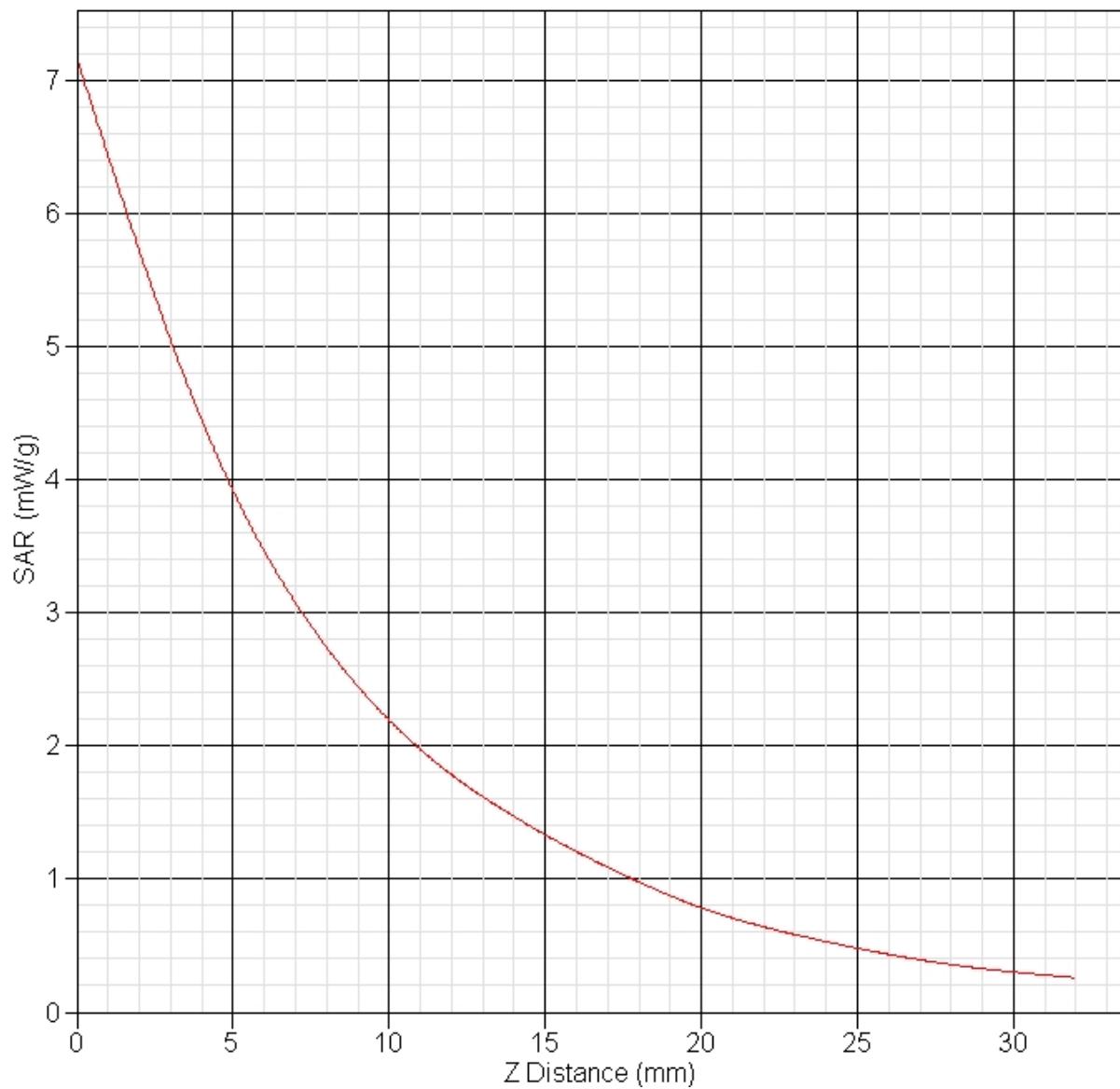
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 8:03:12 AM  
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Touch  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 4.123 W/kg  
10 gram SAR value : 2.109 W/kg  
Area Scan Peak SAR : 4.497 W/kg  
Zoom Scan Peak SAR : 7.182 W/kg

**SAR-Z Axis**  
at Hotspot x:0.25 y:-0.18

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 07:27:43 AM  
End Time : 09-Sep-2011 07:40:37 AM  
Scanning Time : 774 secs

## Product Data

Device Name : Validation  
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 : 4.567 W/kg  
Power Drift-Finish: 4.498 W/kg  
Power Drift (%) : -1.511

## 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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 49.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

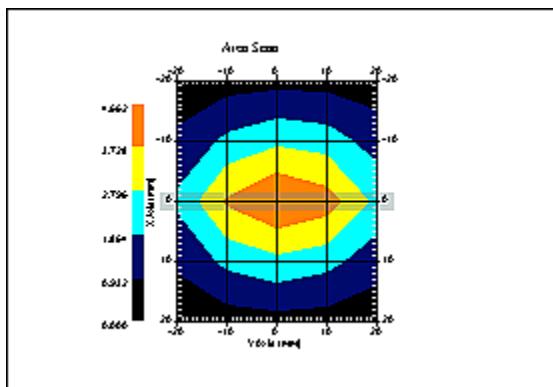
Name : Probe 217 - RFEL  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

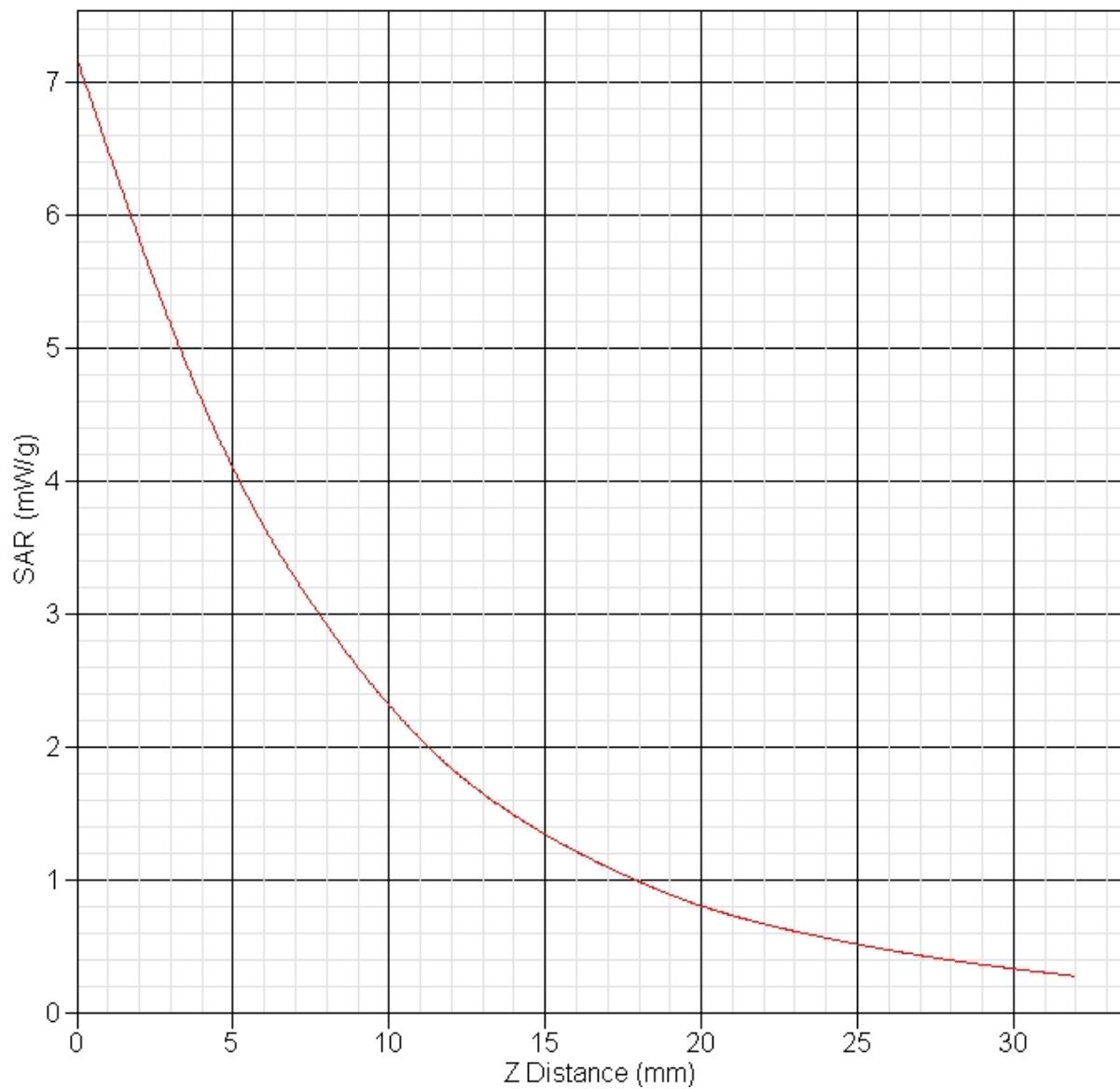
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 8:03:12 AM  
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Touch  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 4.099 W/kg  
10 gram SAR value : 2.106 W/kg  
Area Scan Peak SAR : 4.683 W/kg  
Zoom Scan Peak SAR : 7.164 W/kg

**SAR-Z Axis**  
at Hotspot x:0.22 y:-0.15

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 03:51:11 PM  
End Time : 10-Sep-2011 04:06:12 PM  
Scanning Time : 901 secs

## Product Data

Device Name : Validation  
Serial No. : 750  
Type : Dipole  
Model : ALS-D-750-S-2  
Frequency : 750.00 MHz  
Max. Transmit Pwr : 0.1 W  
Drift Time : 0 min(s)  
Length : 180.2 mm  
Width : 3.6 mm  
Depth : 97.0 mm  
Antenna Type : Internal  
Orientation : Touch  
Power Drift-Start : 1.068 W/kg  
Power Drift-Finish: 1.045 W/kg  
Power Drift (%) : -2.152

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 49.00 RH%  
Epsilon : 55.18 F/m  
Sigma : 0.95 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

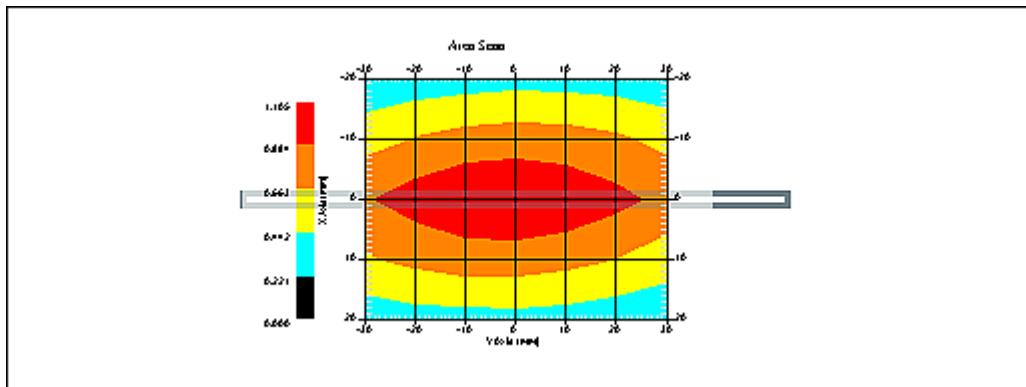
Name : Probe 217 - RFEL  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

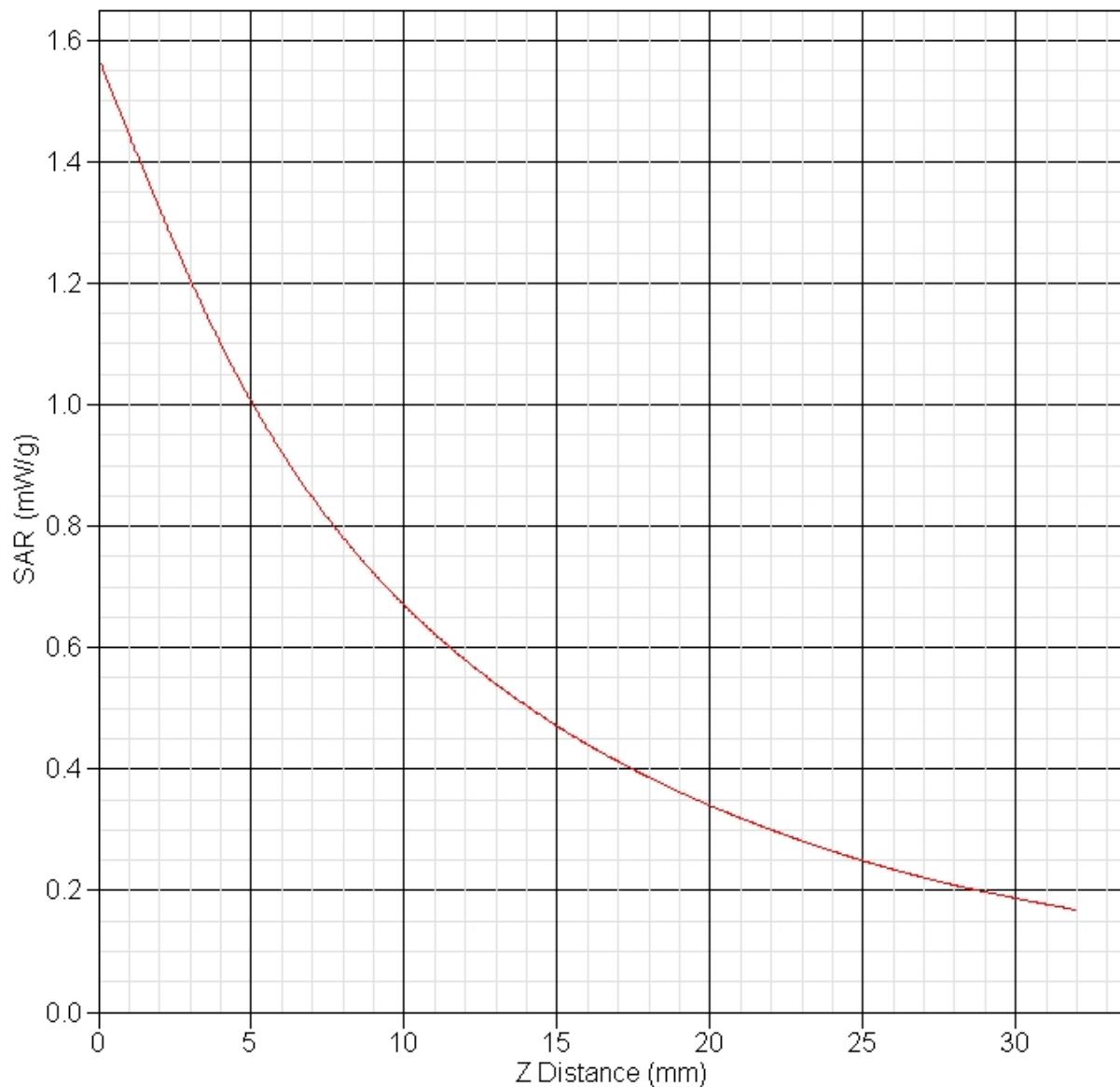
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 25.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 8:36:21 AM  
Area Scan : 5x7x1 : Measurement x=10mm, y=10mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Touch  
Separation : 15 mm  
Channel : Mid



1 gram SAR value : 0.889 W/kg  
10 gram SAR value : 0.574 W/kg  
Area Scan Peak SAR : 1.112 W/kg  
Zoom Scan Peak SAR : 1.568 W/kg

**SAR-Z Axis**  
at Hotspot x:0.20 y:-0.14

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 07:07:45 AM  
End Time : 11-Sep-2011 07:22:55 AM  
Scanning Time : 910 secs

## Product Data

Device Name : Validation  
Serial No. : 750  
Type : Dipole  
Model : ALS-D-750-S-2  
Frequency : 750.00 MHz  
Max. Transmit Pwr : 0.1 W  
Drift Time : 0 min(s)  
Length : 180.2 mm  
Width : 3.6 mm  
Depth : 97.0 mm  
Antenna Type : Internal  
Orientation : Touch  
Power Drift-Start : 1.105 W/kg  
Power Drift-Finish: 1.086 W/kg  
Power Drift (%) : -1.719

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 49.00 RH%  
Epsilon : 55.64 F/m  
Sigma : 0.95 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

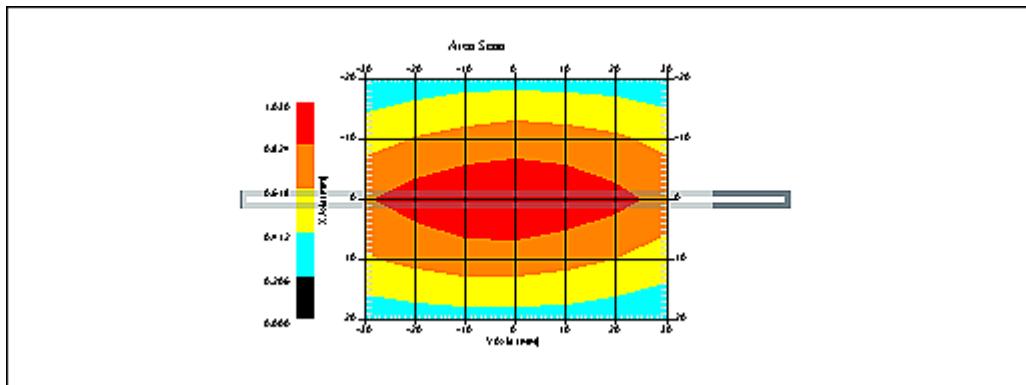
Name : Probe 217 - RFEL  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

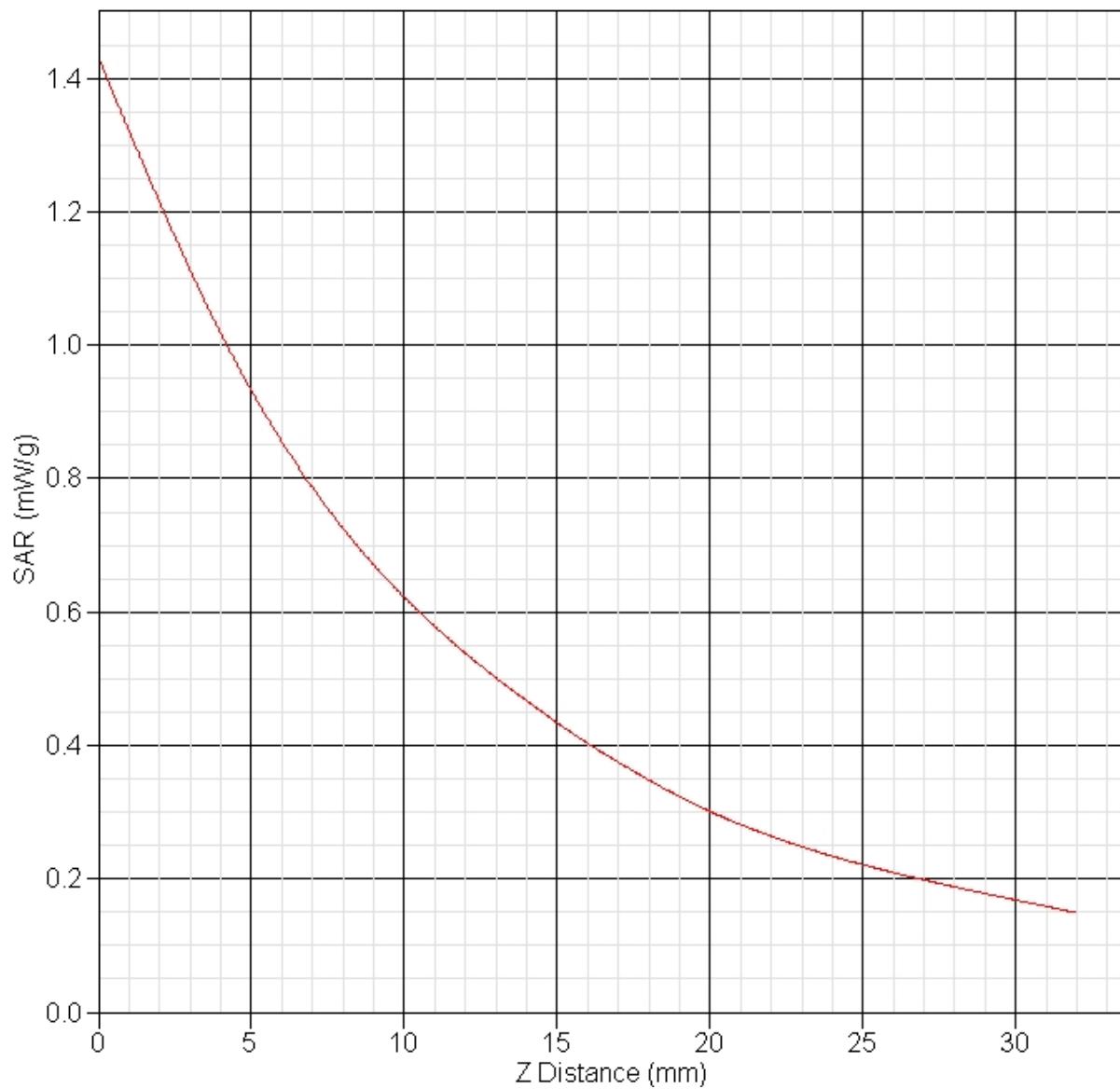
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 25.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 8:36:21 AM  
Area Scan : 5x7x1 : Measurement x=10mm, y=10mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Touch  
Separation : 15 mm  
Channel : Mid



1 gram SAR value : 0.897 W/kg  
10 gram SAR value : 0.573 W/kg  
Area Scan Peak SAR : 1.097 W/kg  
Zoom Scan Peak SAR : 1.436 W/kg

**SAR-Z Axis**  
at Hotspot x:0.26 y:-0.21

**SAR Test Report**

By Operator : Jay  
Measurement Date : 12-Sep-2011  
Starting Time : 12-Sep-2011 08:09:29 AM  
End Time : 12-Sep-2011 08:23:47 AM  
Scanning Time : 858 secs

Product Data  
Device Name : Validation  
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 : 6.373 W/kg  
Power Drift-Finish: 6.568 W/kg  
Power Drift (%) : 3.061

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

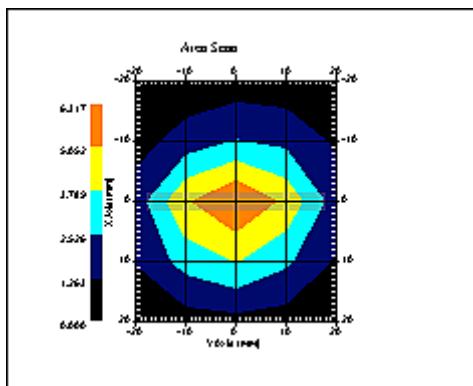
Tissue Data  
Type : BODY  
Serial No. : 2450  
Frequency : 2450.00 MHz  
Last Calib. Date : 12-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 45.00 RH%  
Epsilon : 52.23 F/m  
Sigma : 1.97 S/m  
Density : 1000.00 kg/cu. m  
Probe Data  
Name : Probe 217 - RFEL  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 2450.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 3.94  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

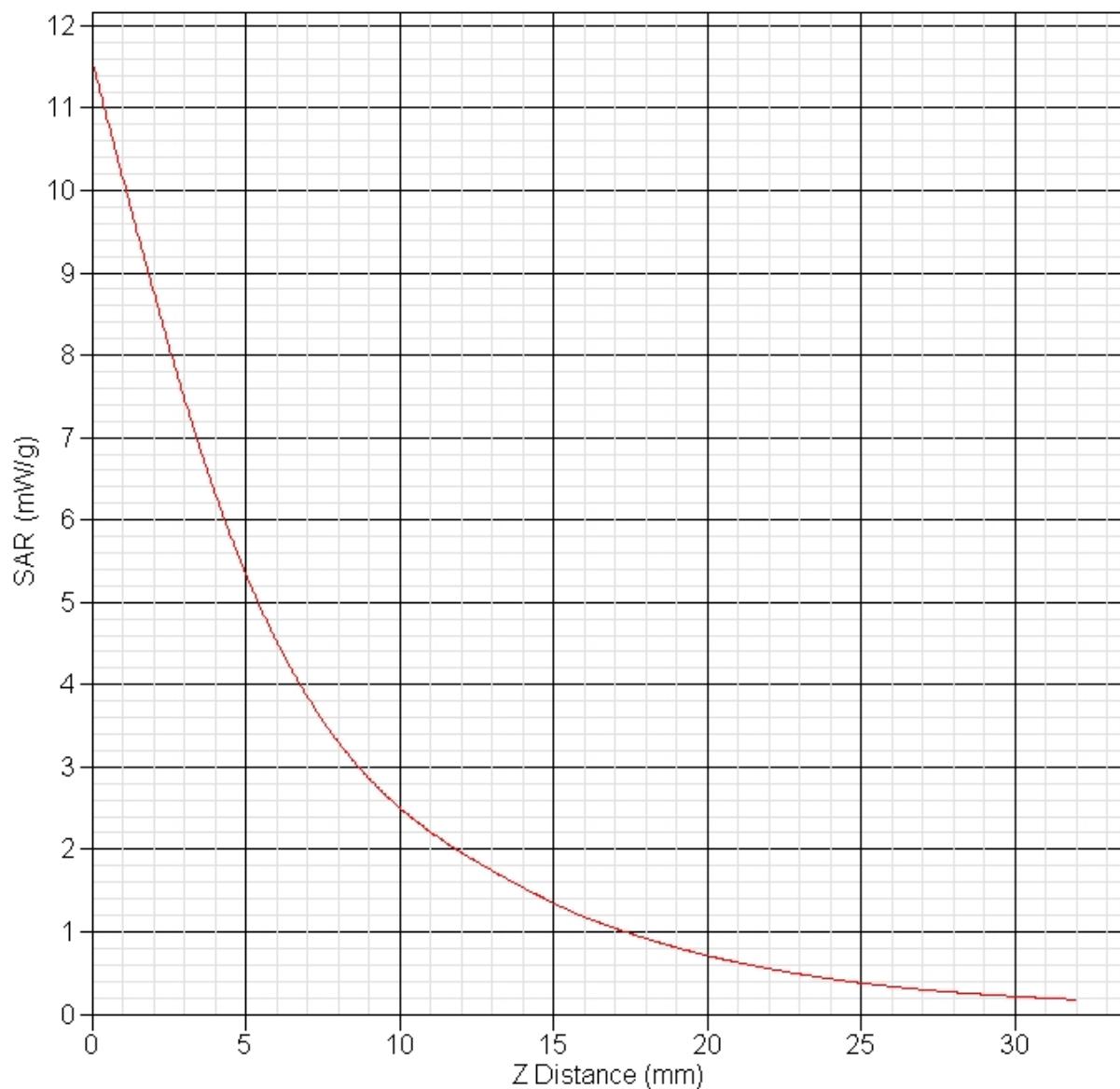
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 12-Sep-2011  
Set-up Time : 7:40:13 AM  
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Touch  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 5.217 W/kg  
10 gram SAR value : 2.328 W/kg  
Area Scan Peak SAR : 6.156 W/kg  
Zoom Scan Peak SAR : 11.492 W/kg

**SAR-Z Axis**  
at Hotspot x:0.24 y:-0.15

## 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 10 in each of the data summary sheets.

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 12:20:45 PM  
End Time : 10-Sep-2011 12:39:20 PM  
Scanning Time : 1115 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.526 W/kg  
Power Drift-Finish: 0.530 W/kg  
Power Drift (%) : 0.795

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

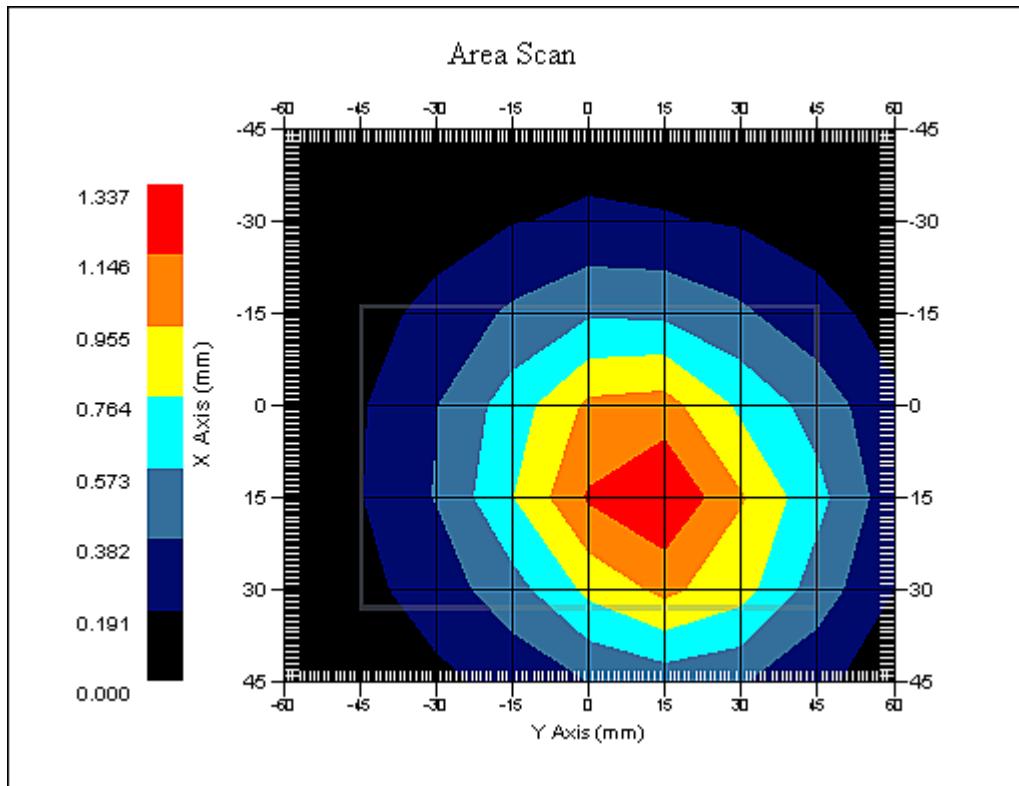
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 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 : Side A  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 1.256 W/kg  
10 gram SAR value : 0.867 W/kg  
Area Scan Peak SAR : 1.336 W/kg  
Zoom Scan Peak SAR : 1.721 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 11:58:47 AM  
End Time : 10-Sep-2011 12:17:22 PM  
Scanning Time : 1115 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.611 W/kg  
Power Drift-Finish: 0.619 W/kg  
Power Drift (%) : 1.207

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

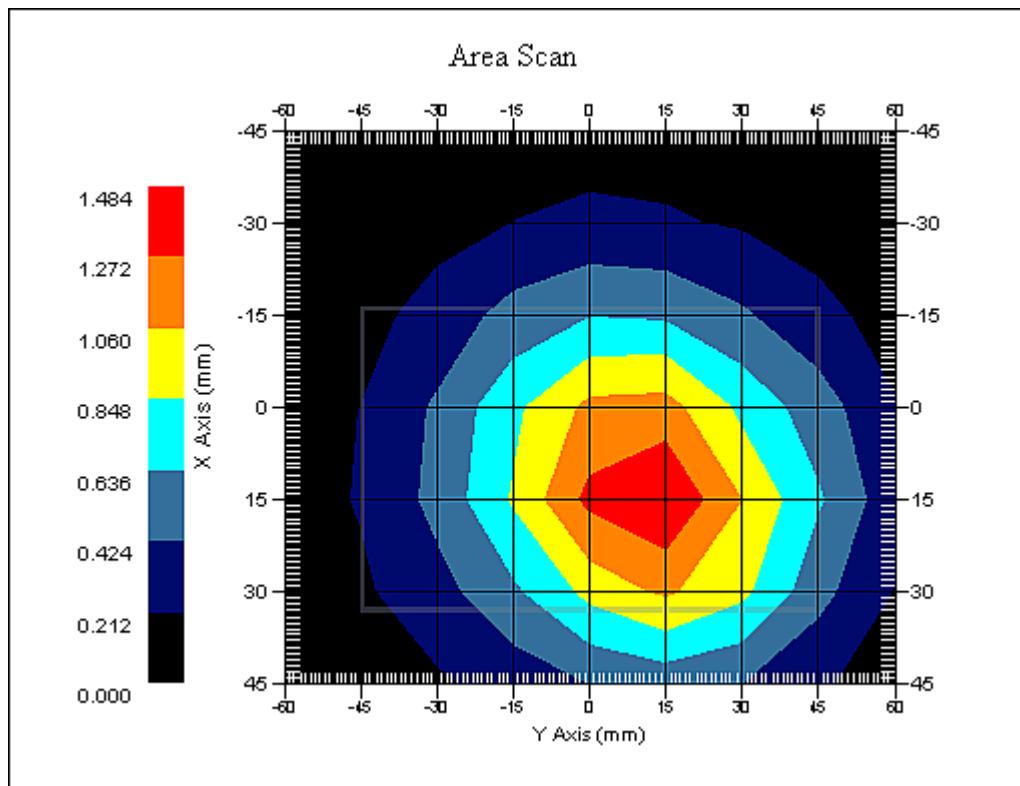
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

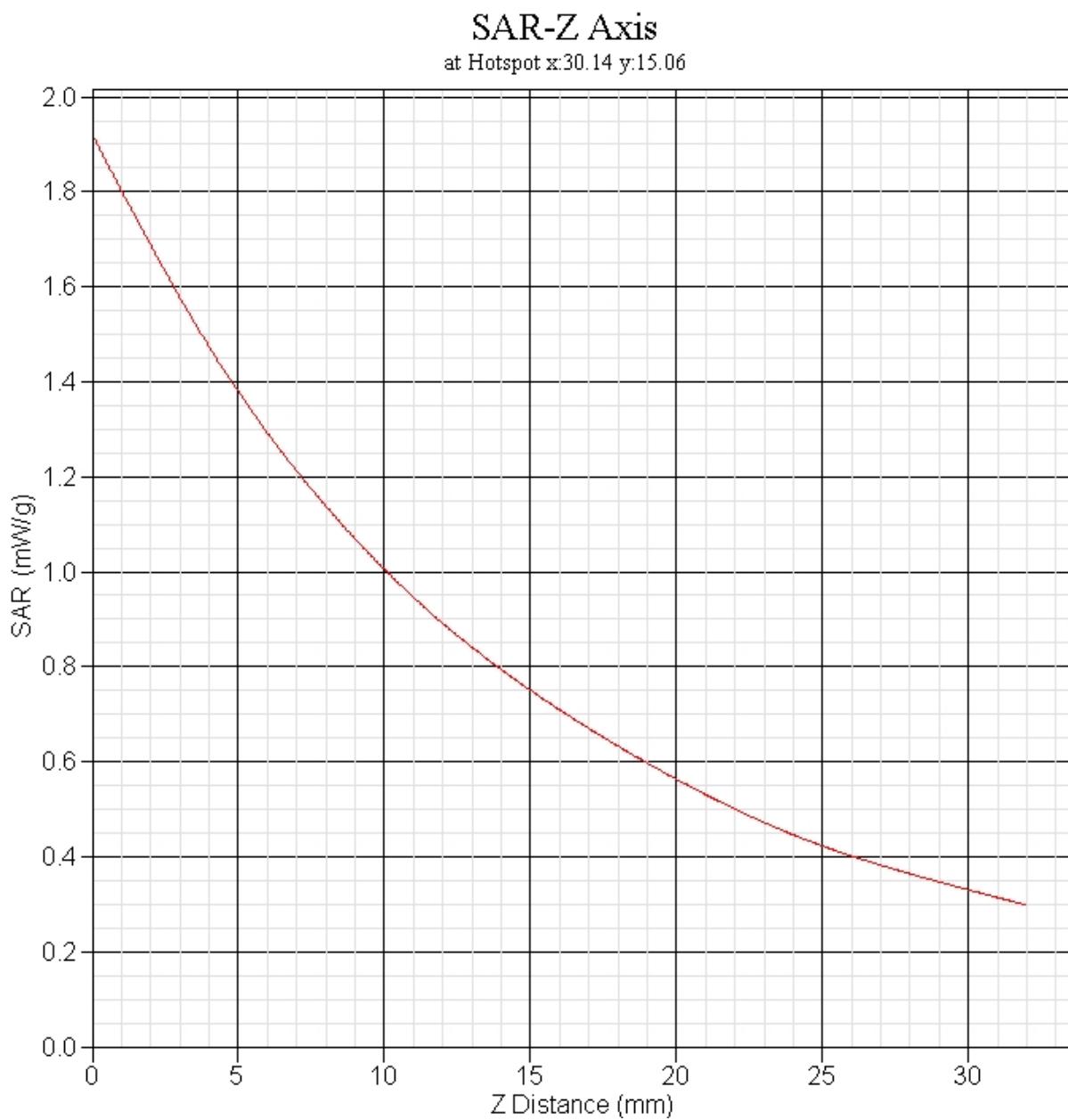
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 AM  
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side A  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.397 W/kg  
10 gram SAR value : 0.964 W/kg  
Area Scan Peak SAR : 1.482 W/kg  
Zoom Scan Peak SAR : 1.921 W/kg



**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 12:41:46 PM  
End Time : 10-Sep-2011 01:00:24 PM  
Scanning Time : 1118 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.551 W/kg  
Power Drift-Finish: 0.565 W/kg  
Power Drift (%) : 2.533

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

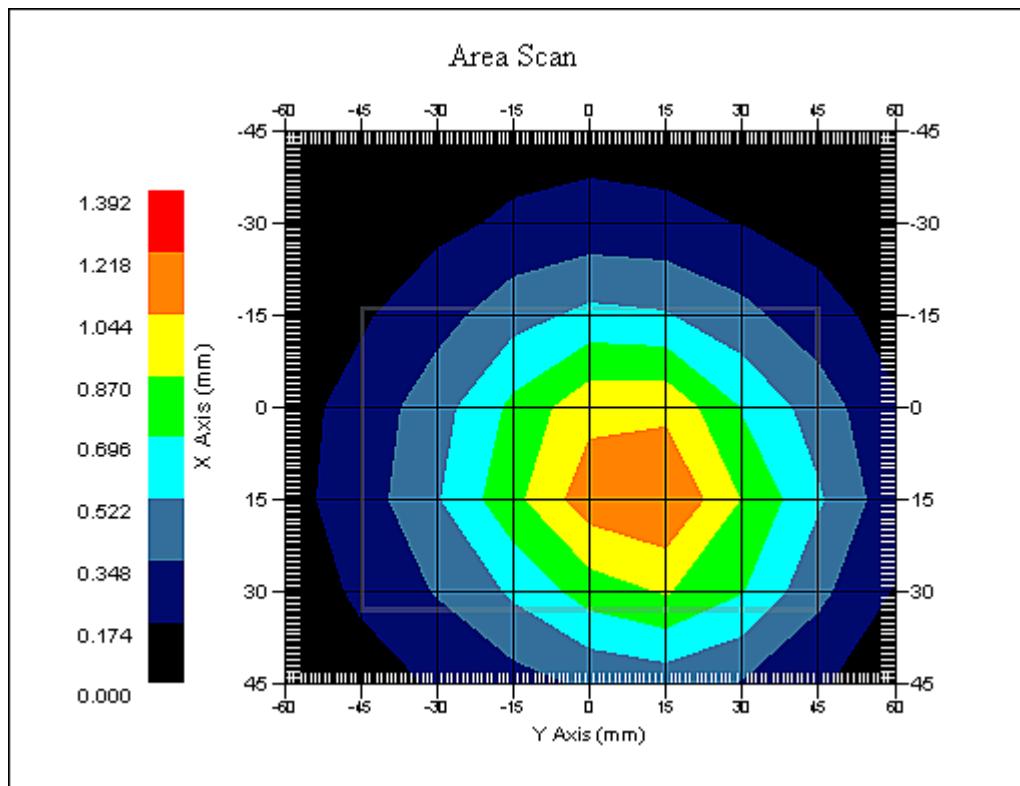
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 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 : Side A  
Separation : 10 mm  
Channel : High



1 gram SAR value : 1.210 W/kg  
10 gram SAR value : 0.833 W/kg  
Area Scan Peak SAR : 1.220 W/kg  
Zoom Scan Peak SAR : 1.631 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 01:25:56 PM  
End Time : 10-Sep-2011 01:44:43 PM  
Scanning Time : 1127 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.860 W/kg  
Power Drift-Finish: 0.869 W/kg  
Power Drift (%) : 0.944

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

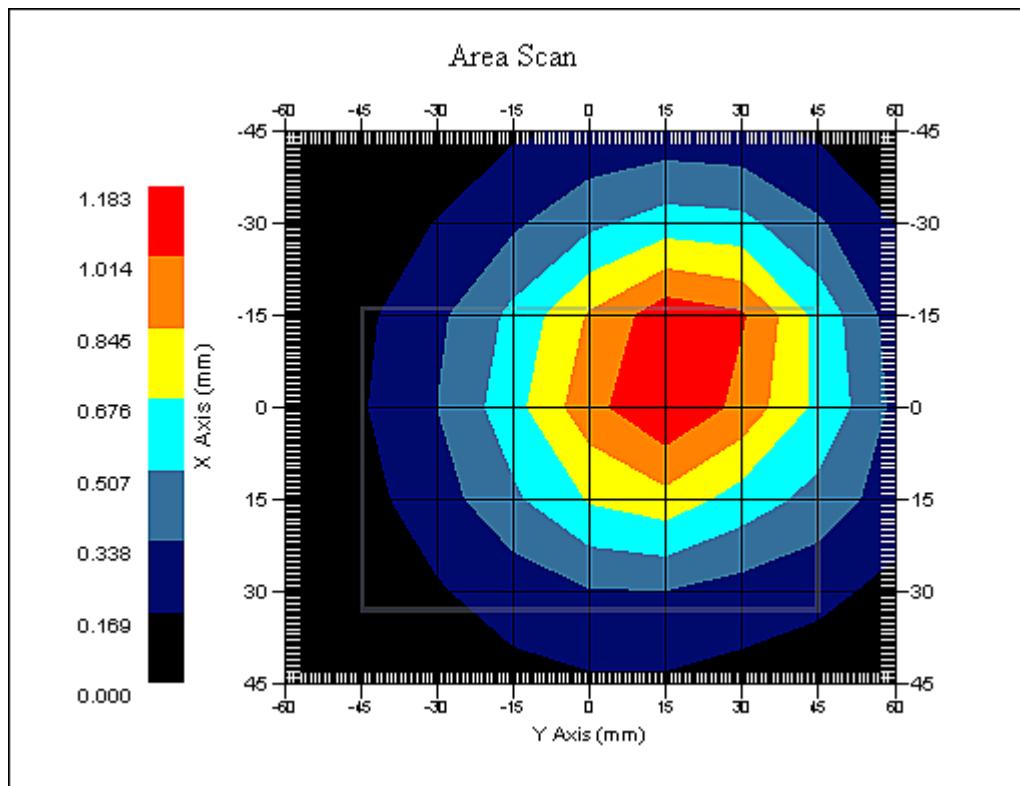
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 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 : Side B  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 1.148 W/kg  
10 gram SAR value : 0.780 W/kg  
Area Scan Peak SAR : 1.181 W/kg  
Zoom Scan Peak SAR : 1.571 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 01:03:21 PM  
End Time : 10-Sep-2011 01:22:06 PM  
Scanning Time : 1125 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.926 W/kg  
Power Drift-Finish: 0.908 W/kg  
Power Drift (%) : -1.948

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

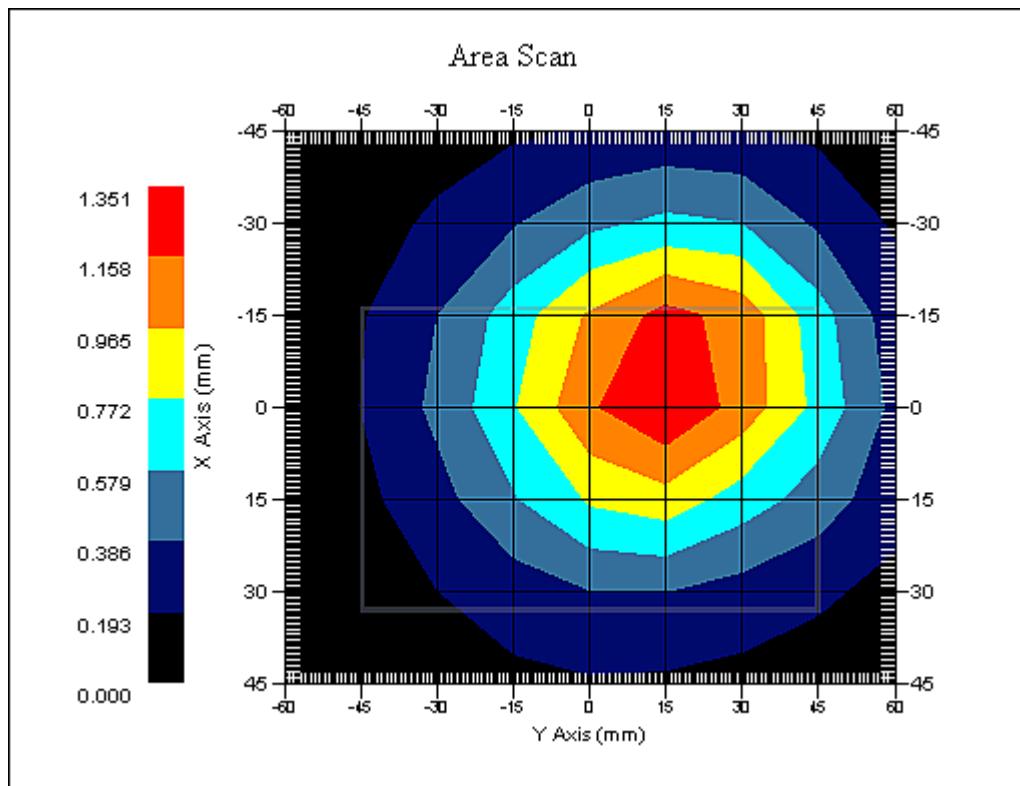
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 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 : Side B  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.268 W/kg  
10 gram SAR value : 0.862 W/kg  
Area Scan Peak SAR : 1.350 W/kg  
Zoom Scan Peak SAR : 1.731 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 01:47:25 PM  
End Time : 10-Sep-2011 02:06:13 PM  
Scanning Time : 1128 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.892 W/kg  
Power Drift-Finish: 0.904 W/kg  
Power Drift (%) : 1.347

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. : 835  
Frequency : 835.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

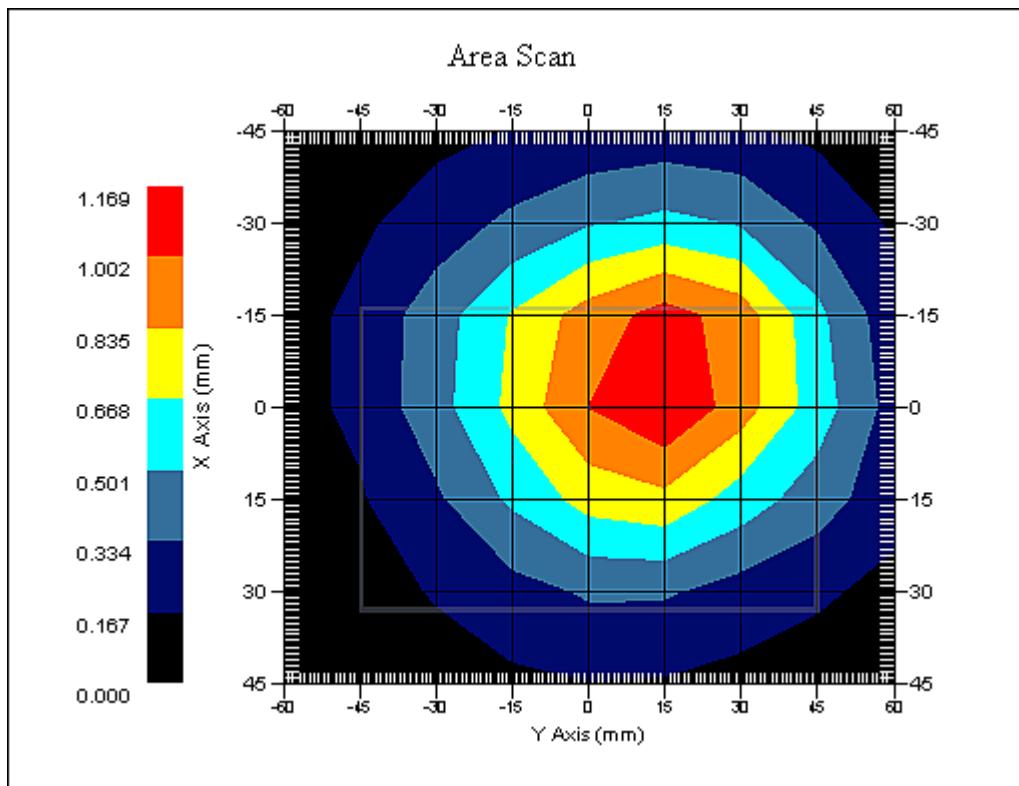
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 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 : Side B  
Separation : 10 mm  
Channel : High



1 gram SAR value : 1.080 W/kg  
10 gram SAR value : 0.735 W/kg  
Area Scan Peak SAR : 1.168 W/kg  
Zoom Scan Peak SAR : 1.501 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 02:21:37 PM  
End Time : 10-Sep-2011 02:35:26 PM  
Scanning Time : 829 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.166 W/kg  
Power Drift-Finish: 0.174 W/kg  
Power Drift (%) : 4.755

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

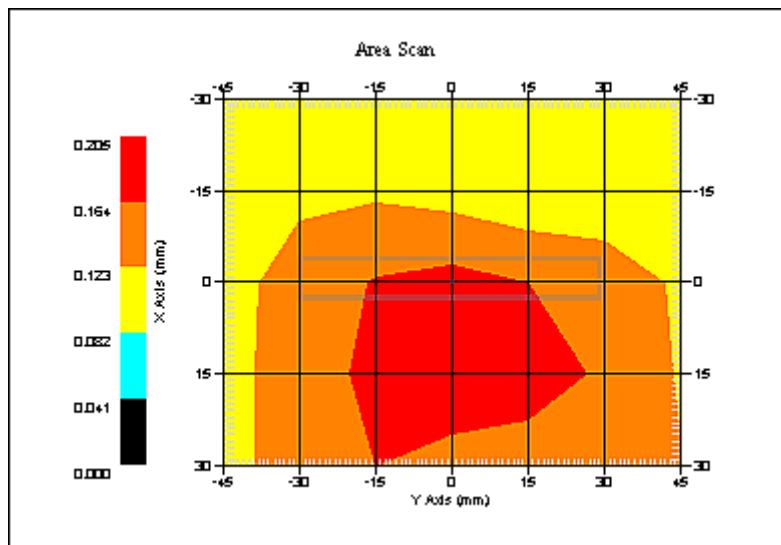
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.198 W/kg  
10 gram SAR value : 0.136 W/kg  
Area Scan Peak SAR : 0.204 W/kg  
Zoom Scan Peak SAR : 0.290 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 02:57:46 PM  
End Time : 10-Sep-2011 03:13:18 PM  
Scanning Time : 932 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D  
Power Drift-Start : 0.667 W/kg  
Power Drift-Finish: 0.669 W/kg  
Power Drift (%) : 0.361

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

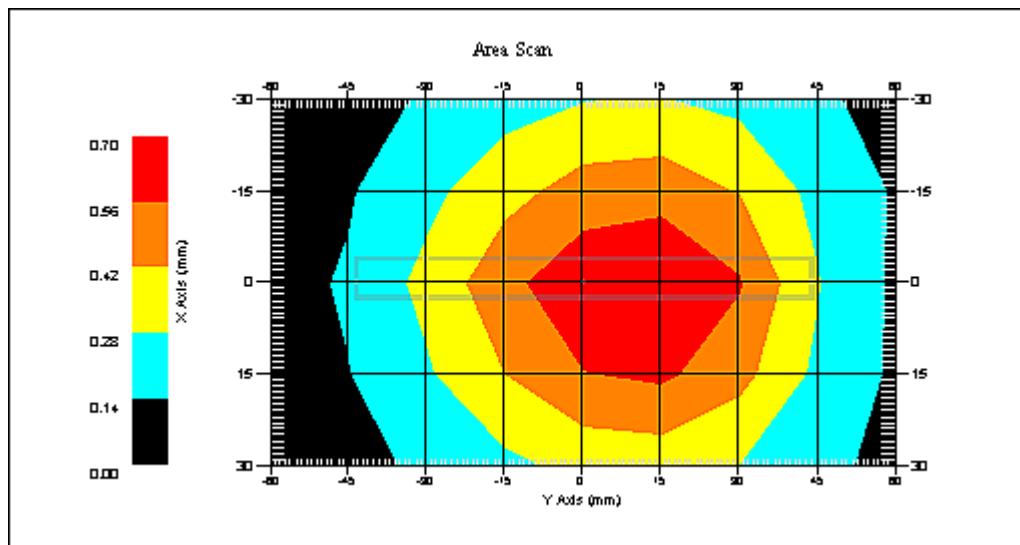
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.672 W/kg  
10 gram SAR value : 0.482 W/kg  
Area Scan Peak SAR : 0.699 W/kg  
Zoom Scan Peak SAR : 0.900 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 02:38:10 PM  
End Time : 10-Sep-2011 02:53:51 PM  
Scanning Time : 941 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.846 W/kg  
Power Drift-Finish: 0.851 W/kg  
Power Drift (%) : 0.522

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. : 835  
Frequency : 835.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

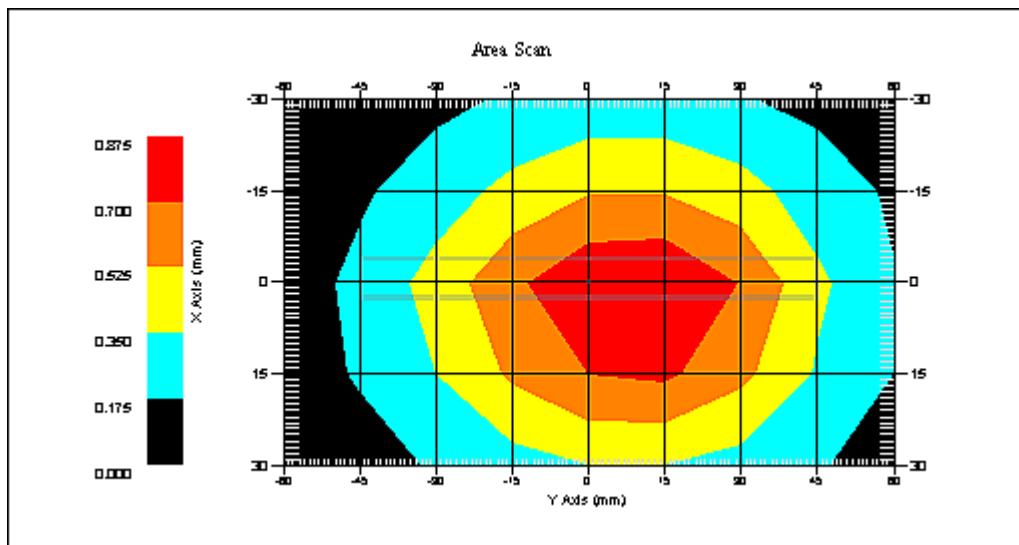
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.794 W/kg  
10 gram SAR value : 0.547 W/kg  
Area Scan Peak SAR : 0.874 W/kg  
Zoom Scan Peak SAR : 1.161 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 08:42:42 AM  
End Time : 10-Sep-2011 09:02:50 AM  
Scanning Time : 1208 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.618 W/kg  
Power Drift-Finish: 0.634 W/kg  
Power Drift (%) : 2.632

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

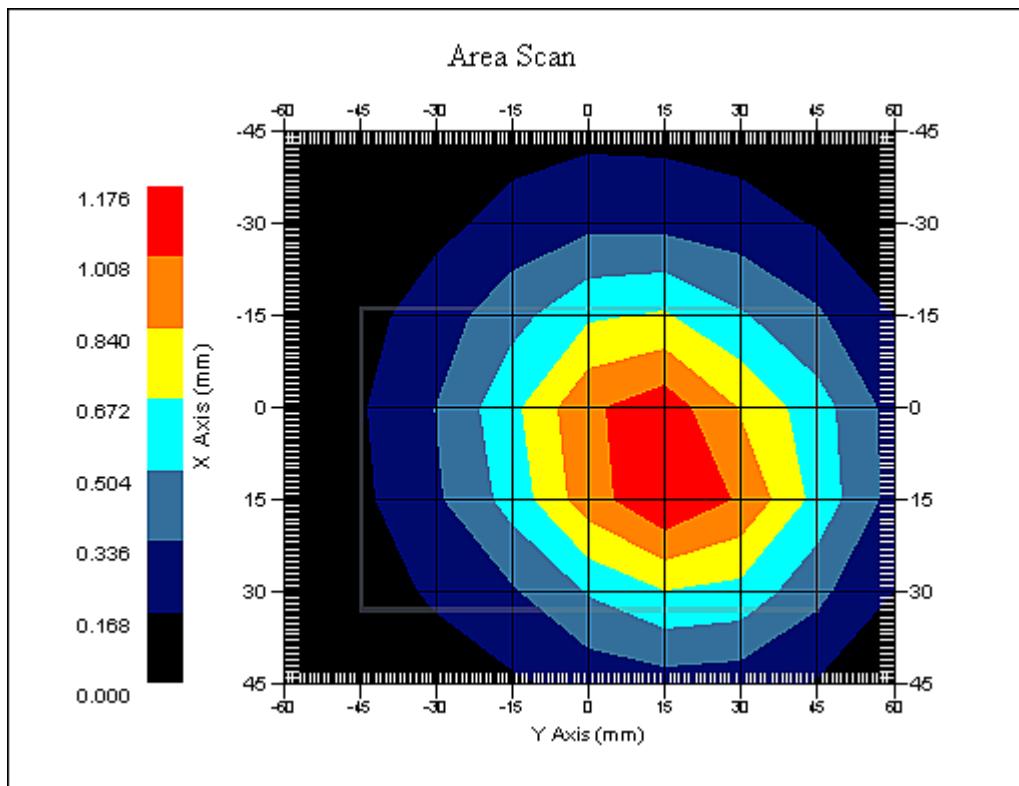
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 8:03:05 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 : Side A  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 1.159 W/kg  
10 gram SAR value : 0.811 W/kg  
Area Scan Peak SAR : 1.174 W/kg  
Zoom Scan Peak SAR : 1.581 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 08:19:24 AM  
End Time : 10-Sep-2011 08:39:42 AM  
Scanning Time : 1218 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.754 W/kg  
Power Drift-Finish: 0.729 W/kg  
Power Drift (%) : -3.291

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

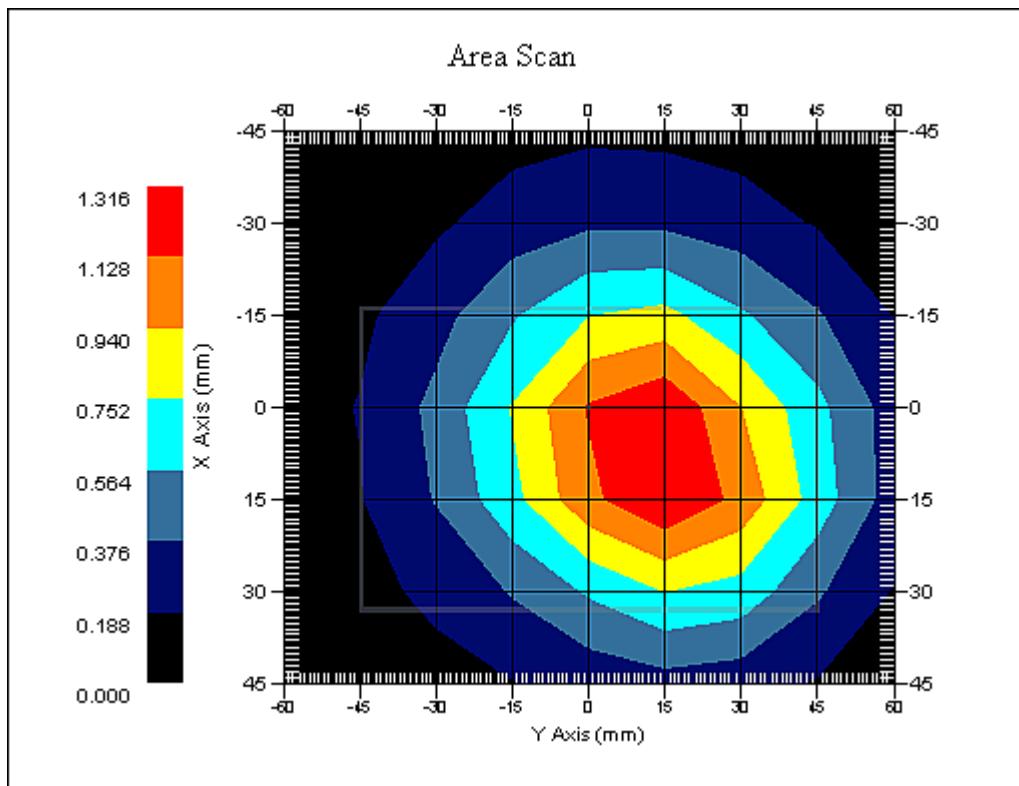
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 8:03:05 AM  
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

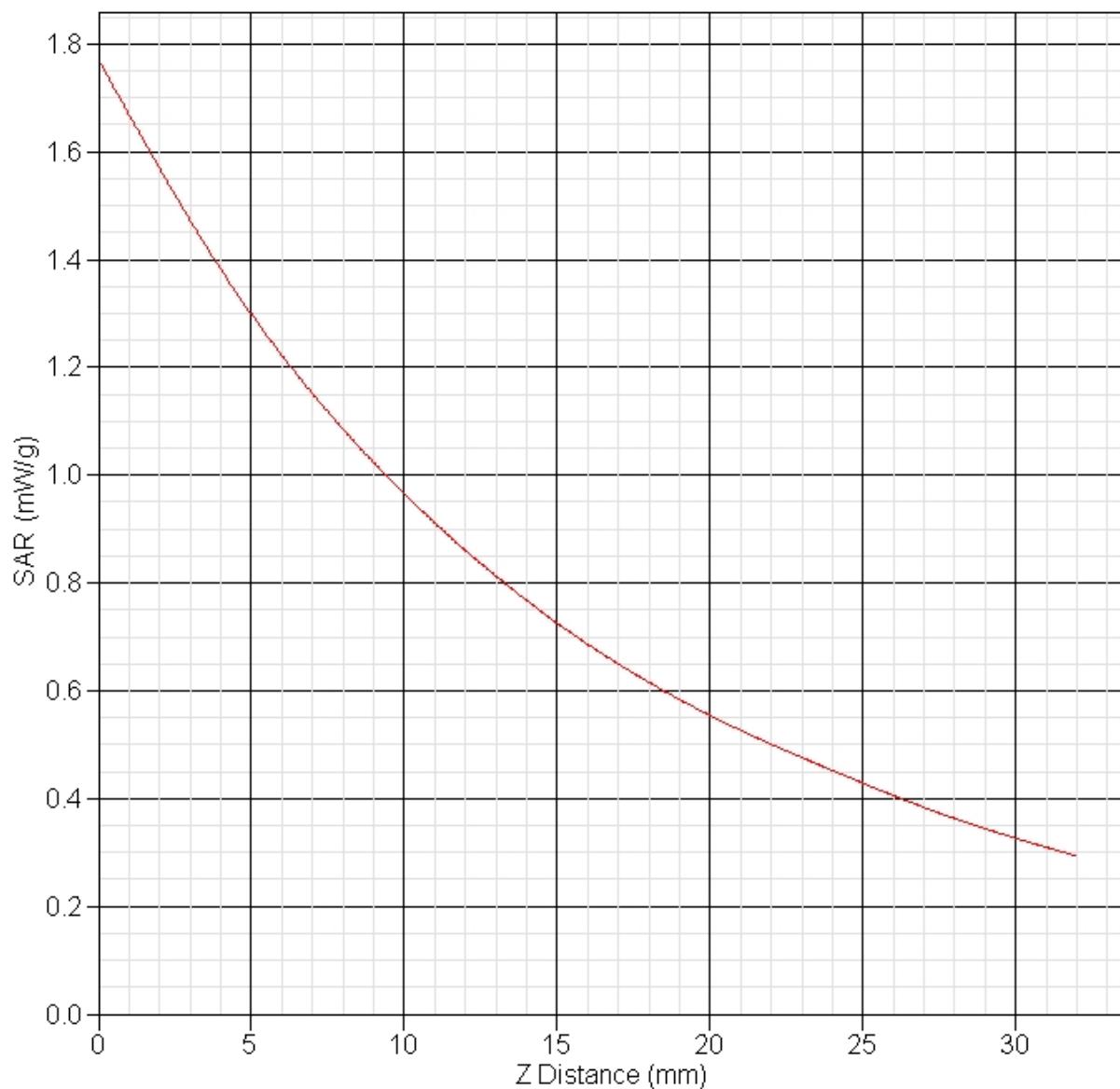
DUT Position : Side A  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.302 W/kg  
10 gram SAR value : 0.913 W/kg  
Area Scan Peak SAR : 1.316 W/kg  
Zoom Scan Peak SAR : 1.771 W/kg

**SAR-Z Axis**

at Hotspot x:22.22 y:15.06



**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 09:06:36 AM  
End Time : 10-Sep-2011 09:26:52 AM  
Scanning Time : 1216 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.758 W/kg  
Power Drift-Finish: 0.765 W/kg  
Power Drift (%) : 0.940

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

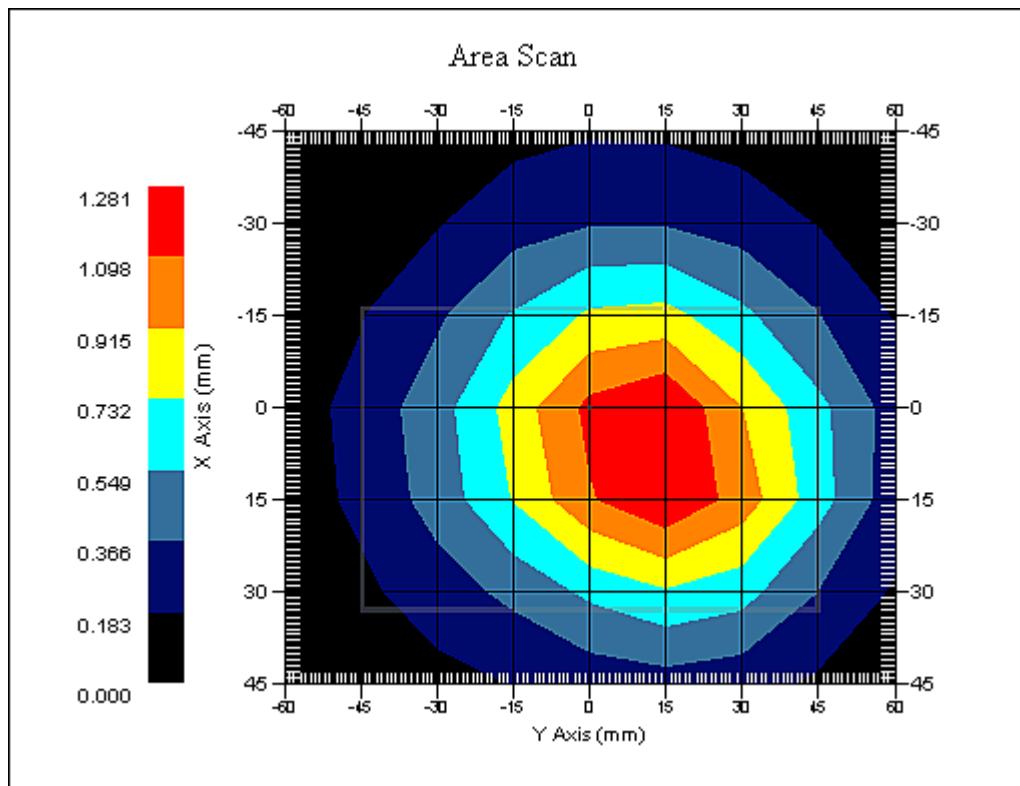
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 8:03:05 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 : Side A  
Separation : 10 mm  
Channel : High



1 gram SAR value : 1.210 W/kg  
10 gram SAR value : 0.838 W/kg  
Area Scan Peak SAR : 1.279 W/kg  
Zoom Scan Peak SAR : 1.671 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 10:00:16 AM  
End Time : 10-Sep-2011 10:18:54 AM  
Scanning Time : 1118 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.825 W/kg  
Power Drift-Finish: 0.819 W/kg  
Power Drift (%) : -0.738

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

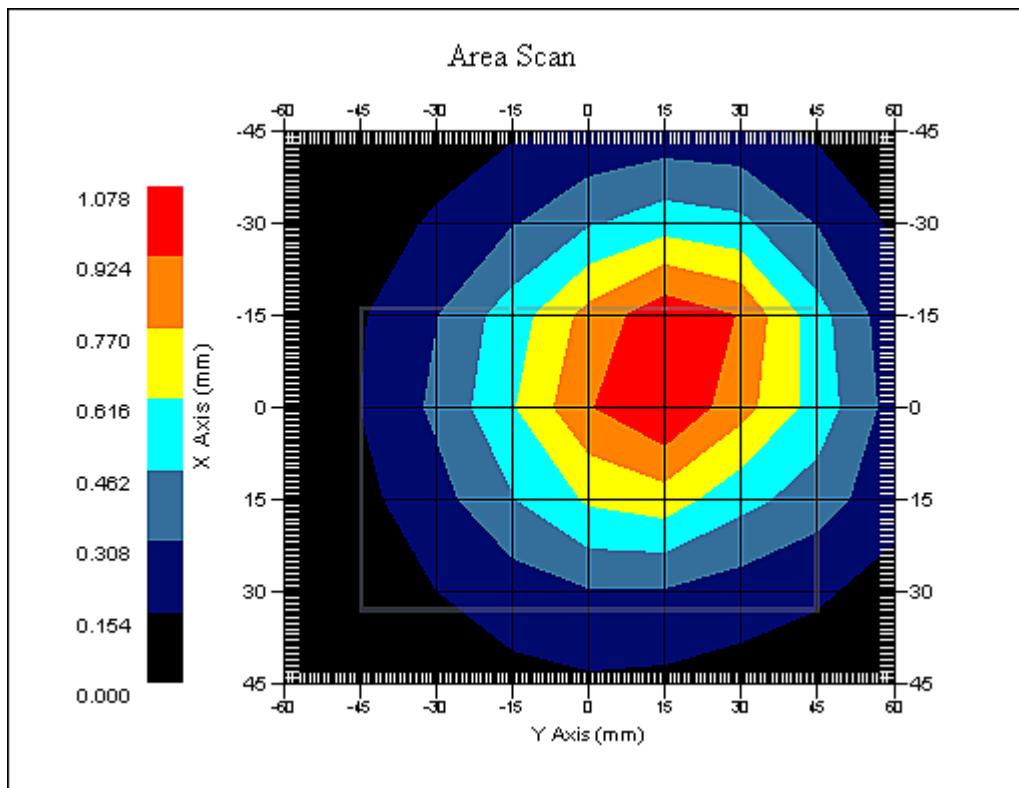
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 10:26:58 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 : Side B  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 1.082 W/kg  
10 gram SAR value : 0.754 W/kg  
Area Scan Peak SAR : 1.078 W/kg  
Zoom Scan Peak SAR : 1.491 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 09:36:36 AM  
End Time : 10-Sep-2011 09:55:22 AM  
Scanning Time : 1126 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.968 W/kg  
Power Drift-Finish: 0.982 W/kg  
Power Drift (%) : 1.430

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

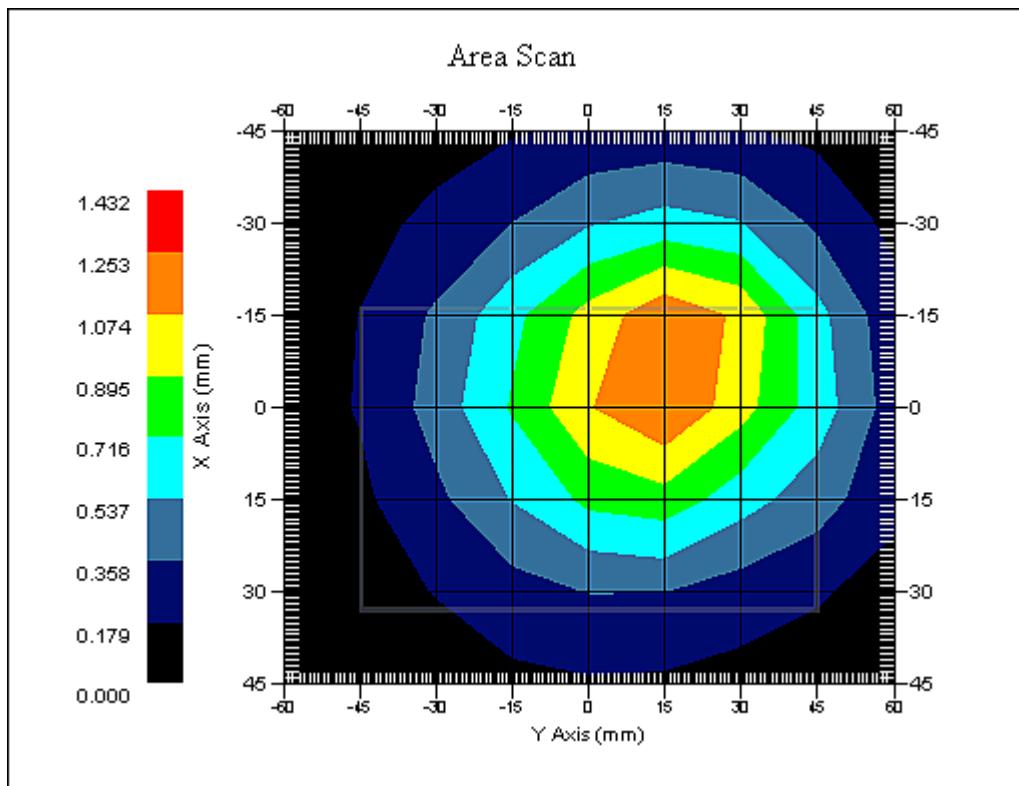
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 8:03:05 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 : Side B  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.237 W/kg  
10 gram SAR value : 0.862 W/kg  
Area Scan Peak SAR : 1.255 W/kg  
Zoom Scan Peak SAR : 1.691 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 10:21:33 AM  
End Time : 10-Sep-2011 10:41:28 AM  
Scanning Time : 1195 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.675 W/kg  
Power Drift-Finish: 0.694 W/kg  
Power Drift (%) : 2.776

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

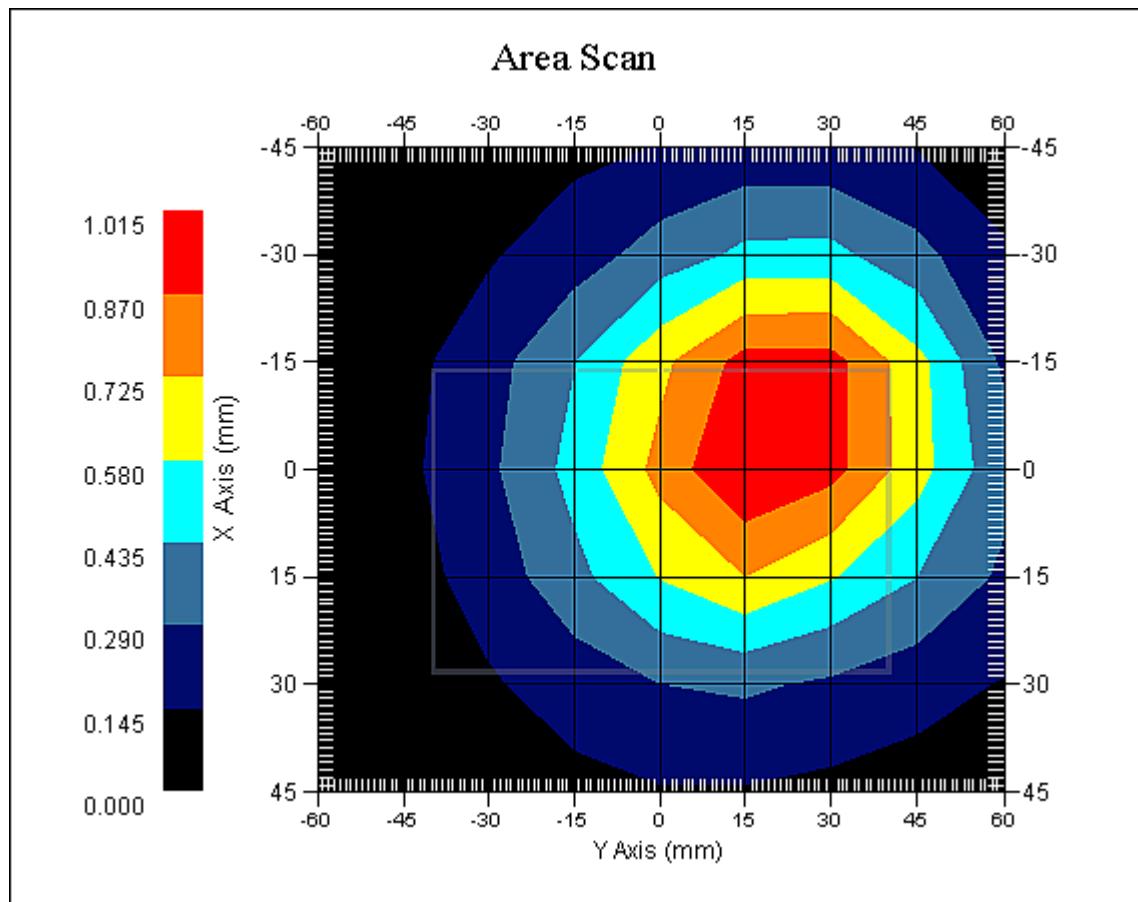
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 10:26:58 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 : Side B  
Separation : 10 mm  
Channel : High



1 gram SAR value : 1.029 W/kg  
10 gram SAR value : 0.705 W/kg  
Area Scan Peak SAR : 1.015 W/kg  
Zoom Scan Peak SAR : 1.421 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 10:47:30 AM  
End Time : 10-Sep-2011 11:01:27 AM  
Scanning Time : 837 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.178 W/kg  
Power Drift-Finish: 0.180 W/kg  
Power Drift (%) : 1.223

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

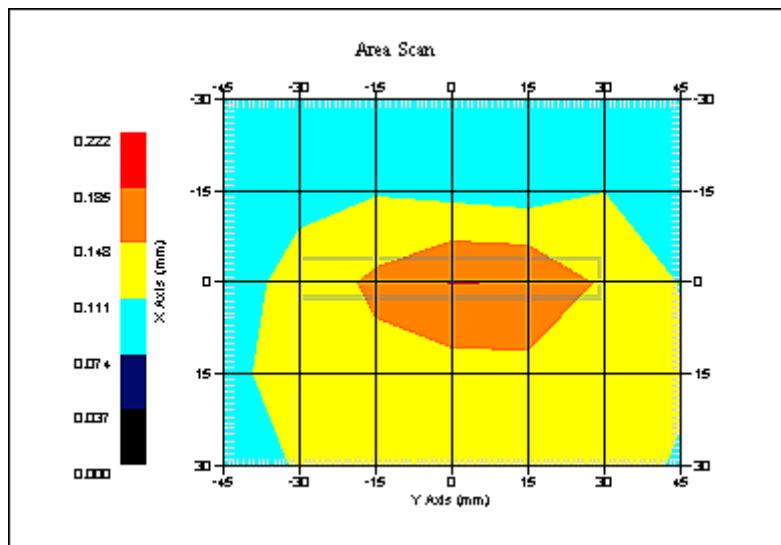
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.172 W/kg  
10 gram SAR value : 0.122 W/kg  
Area Scan Peak SAR : 0.186 W/kg  
Zoom Scan Peak SAR : 0.240 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 11:25:08 AM  
End Time : 10-Sep-2011 11:40:33 AM  
Scanning Time : 925 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D  
Power Drift-Start : 0.610 W/kg  
Power Drift-Finish: 0.621 W/kg  
Power Drift (%) : 1.729

## 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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

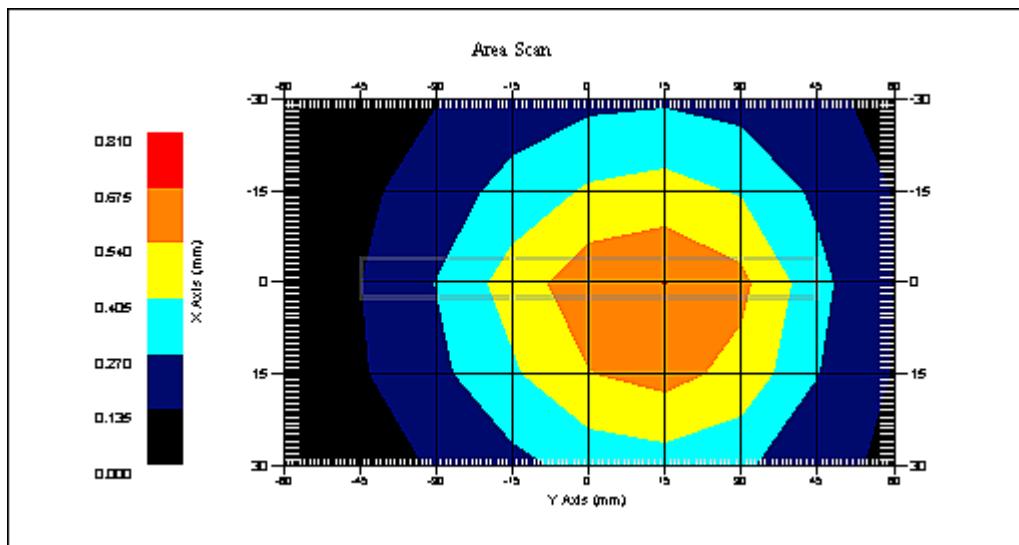
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.640 W/kg  
10 gram SAR value : 0.454 W/kg  
Area Scan Peak SAR : 0.677 W/kg  
Zoom Scan Peak SAR : 0.840 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 11:06:29 AM  
End Time : 10-Sep-2011 11:22:05 AM  
Scanning Time : 936 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.730 W/kg  
Power Drift-Finish: 0.737 W/kg  
Power Drift (%) : 0.964

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 : 10-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.37 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

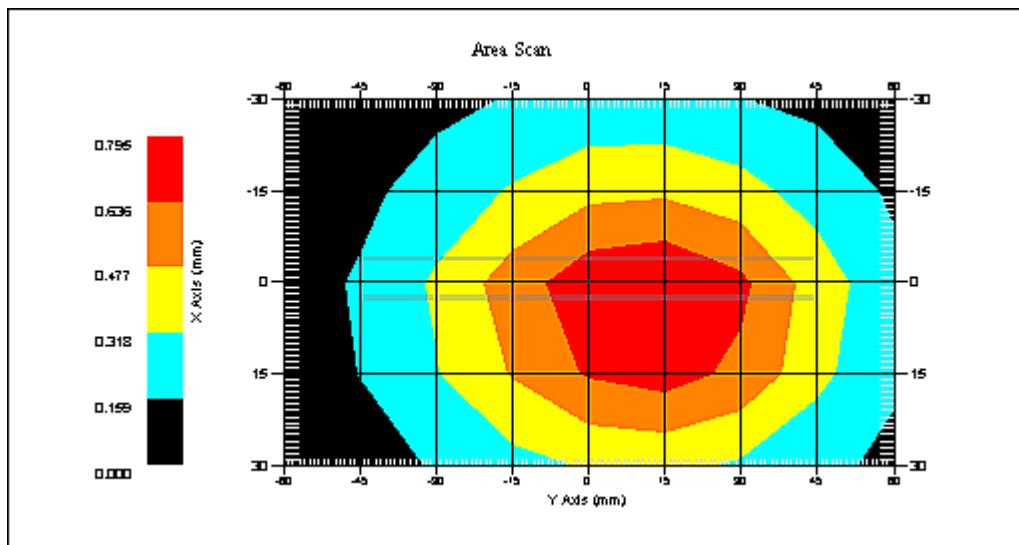
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 11:37:15 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.784 W/kg  
10 gram SAR value : 0.540 W/kg  
Area Scan Peak SAR : 0.794 W/kg  
Zoom Scan Peak SAR : 1.091 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 08:10:36 PM  
End Time : 09-Sep-2011 08:38:19 PM  
Scanning Time : 1663 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 1.862 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.443 W/kg  
Power Drift-Finish: 0.445 W/kg  
Power Drift (%) : 0.524

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.61 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

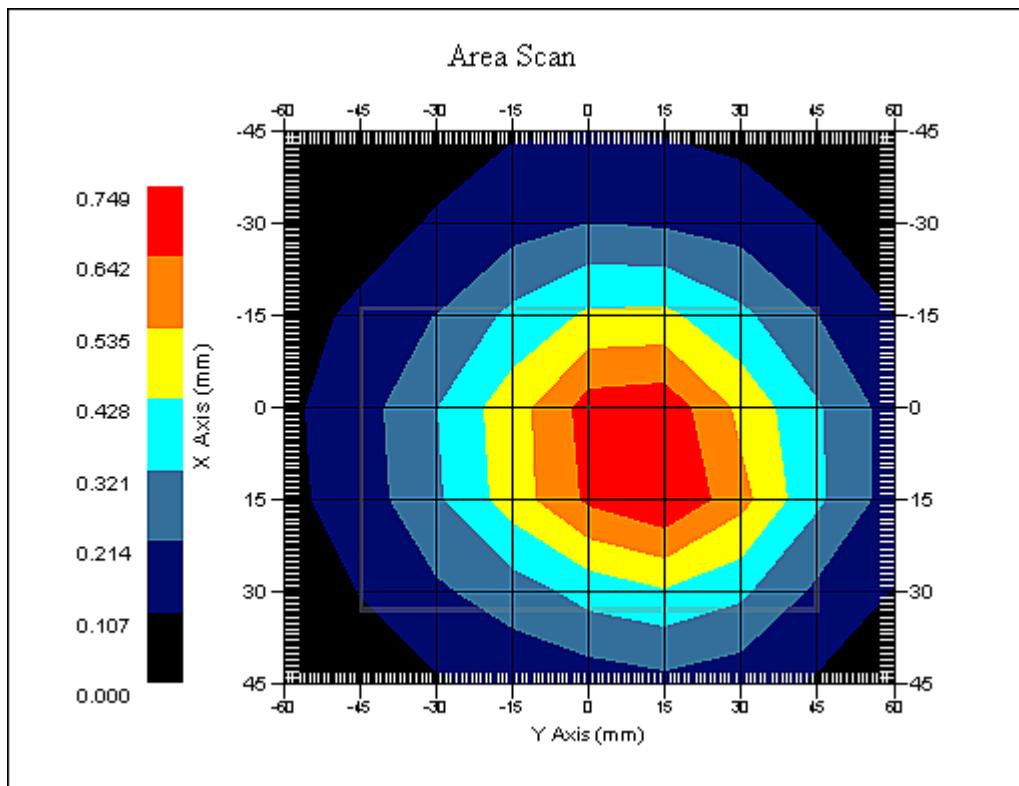
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 5:22:52 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 A  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.698 W/kg  
10 gram SAR value : 0.481 W/kg  
Area Scan Peak SAR : 0.747 W/kg  
Zoom Scan Peak SAR : 0.980 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 07:40:40 PM  
End Time : 09-Sep-2011 08:08:38 PM  
Scanning Time : 1678 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 1.862 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.611 W/kg  
Power Drift-Finish: 0.589 W/kg  
Power Drift (%) : -3.693

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.61 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

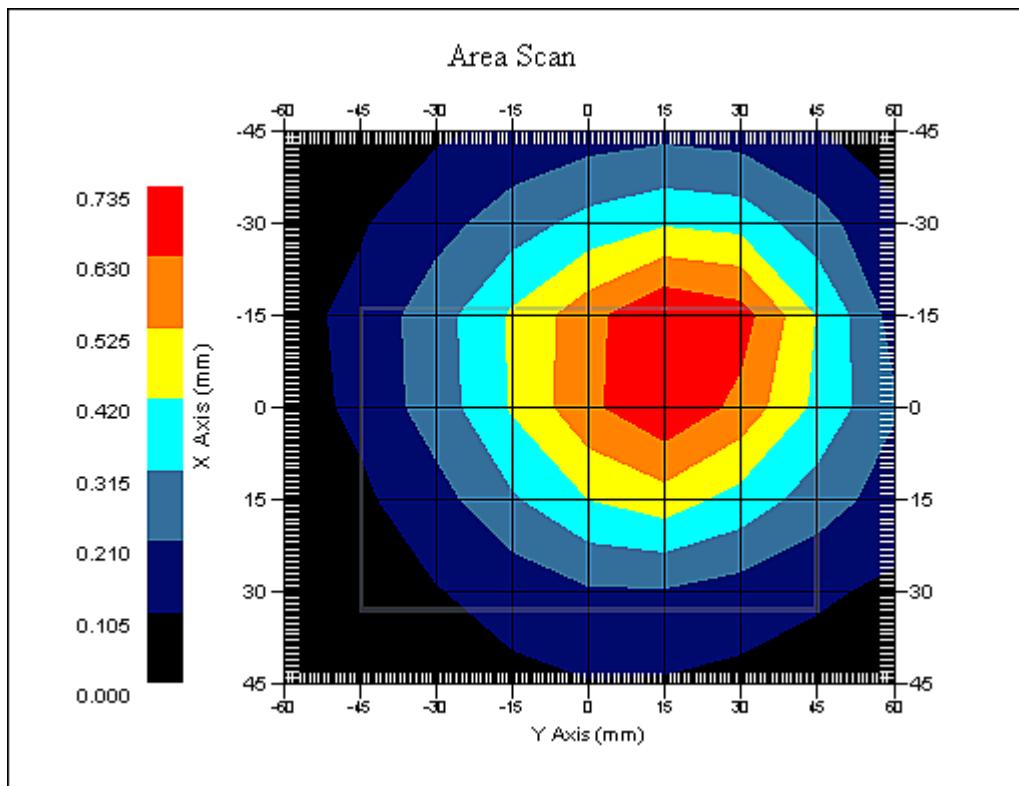
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

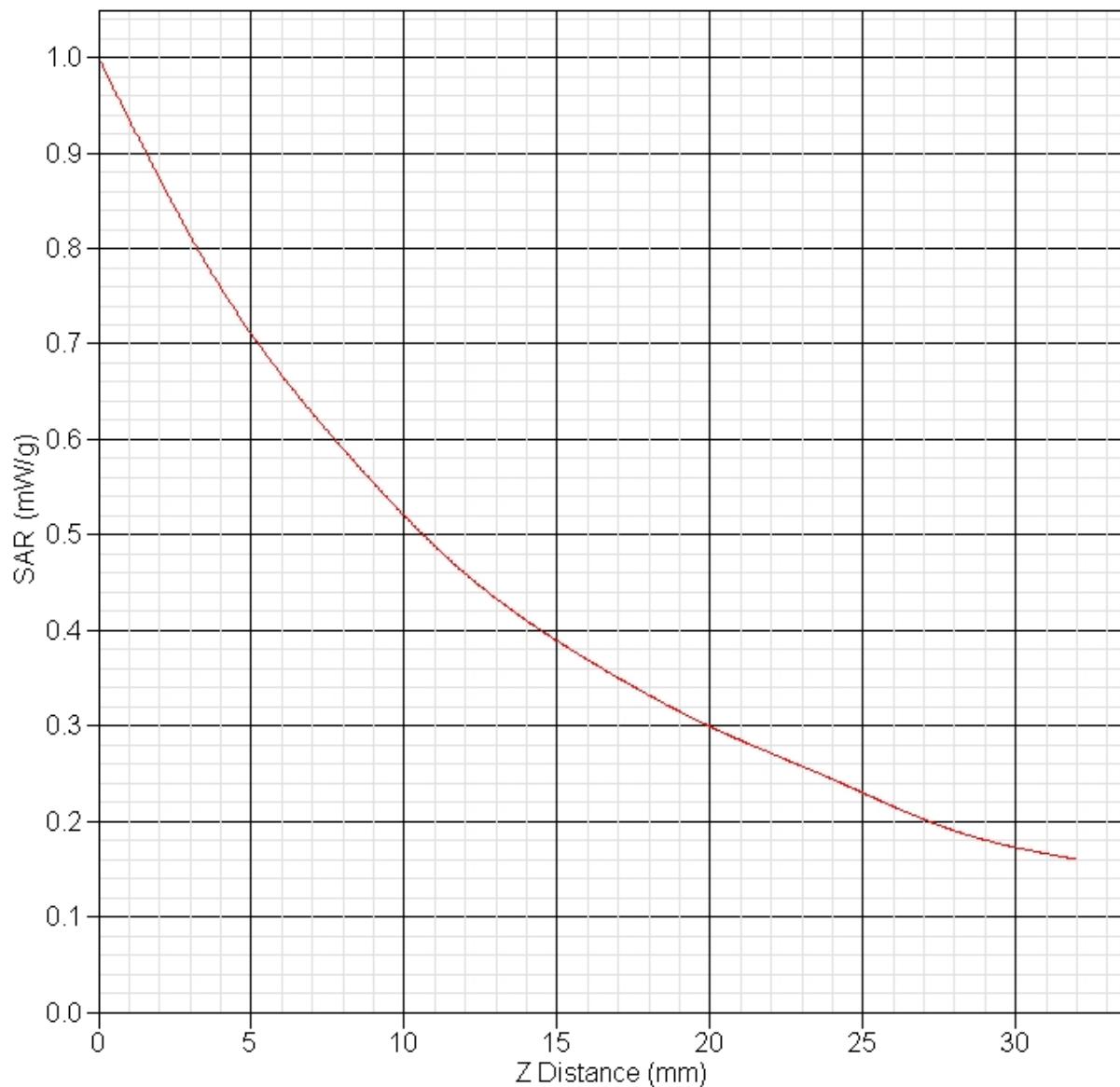
Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 5:22:52 PM  
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side B  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.723 W/kg  
10 gram SAR value : 0.494 W/kg  
Area Scan Peak SAR : 0.734 W/kg  
Zoom Scan Peak SAR : 1.000 W/kg

**SAR-Z Axis**  
at Hotspot x:8.18 y:23.06

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 07:15:37 PM  
End Time : 09-Sep-2011 07:36:15 PM  
Scanning Time : 1238 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 1.862 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.121 W/kg  
Power Drift-Finish: 0.118 W/kg  
Power Drift (%) : -1.938

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.61 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

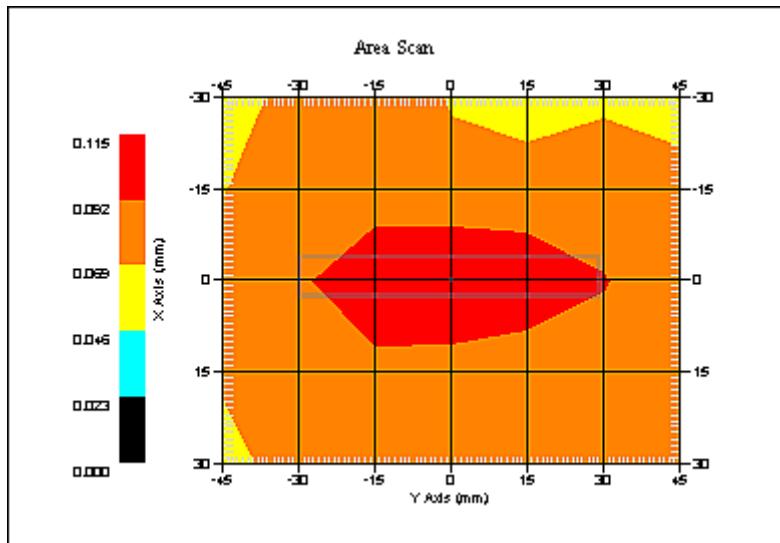
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 5:22:52 PM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.115 W/kg  
10 gram SAR value : 0.083 W/kg  
Area Scan Peak SAR : 0.115 W/kg  
Zoom Scan Peak SAR : 0.180 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 06:49:30 PM  
End Time : 09-Sep-2011 07:13:16 PM  
Scanning Time : 1426 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 1.862 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D  
Power Drift-Start : 0.401 W/kg  
Power Drift-Finish: 0.393 W/kg  
Power Drift (%) : -2.078

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.61 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

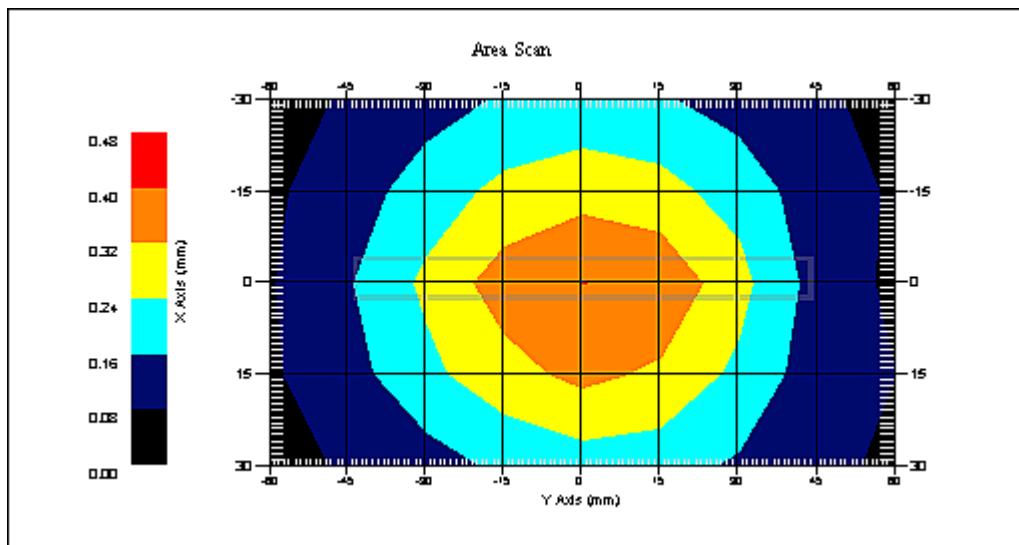
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 5:22:52 PM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.382 W/kg  
10 gram SAR value : 0.272 W/kg  
Area Scan Peak SAR : 0.401 W/kg  
Zoom Scan Peak SAR : 0.500 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 06:23:05 PM  
End Time : 09-Sep-2011 06:46:54 PM  
Scanning Time : 1429 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 850.00 MHz  
Max. Transmit Pwr : 1.862 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.411 W/kg  
Power Drift-Finish: 0.422 W/kg  
Power Drift (%) : 2.730

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 40.00 RH%  
Epsilon : 54.61 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

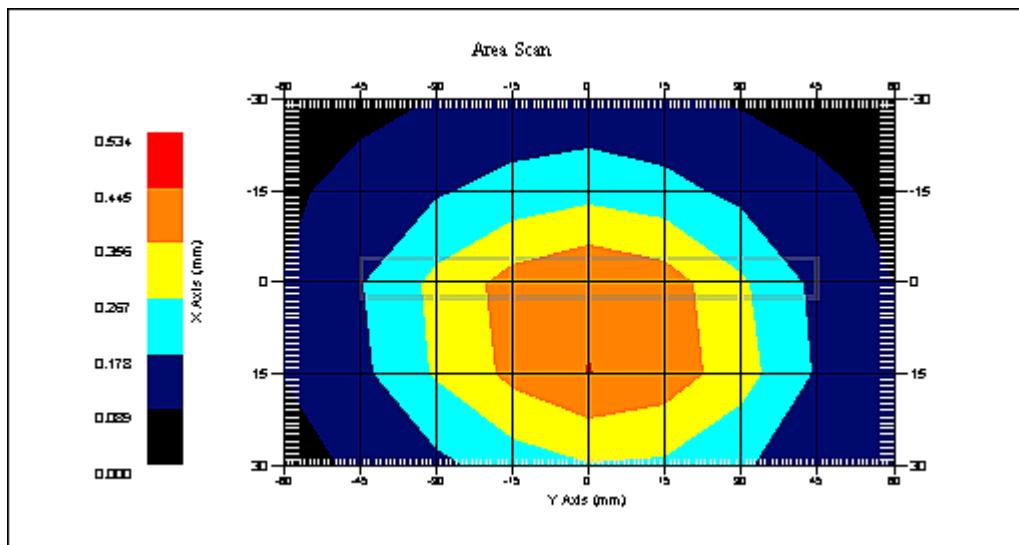
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 835.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 6.4  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 5:22:52 PM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.431 W/kg  
10 gram SAR value : 0.303 W/kg  
Area Scan Peak SAR : 0.447 W/kg  
Zoom Scan Peak SAR : 0.610 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 11:37:13 AM  
End Time : 08-Sep-2011 12:07:58 PM  
Scanning Time : 1845 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 1.127 W/kg  
Power Drift-Finish: 1.114 W/kg  
Power Drift (%) : -1.113

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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

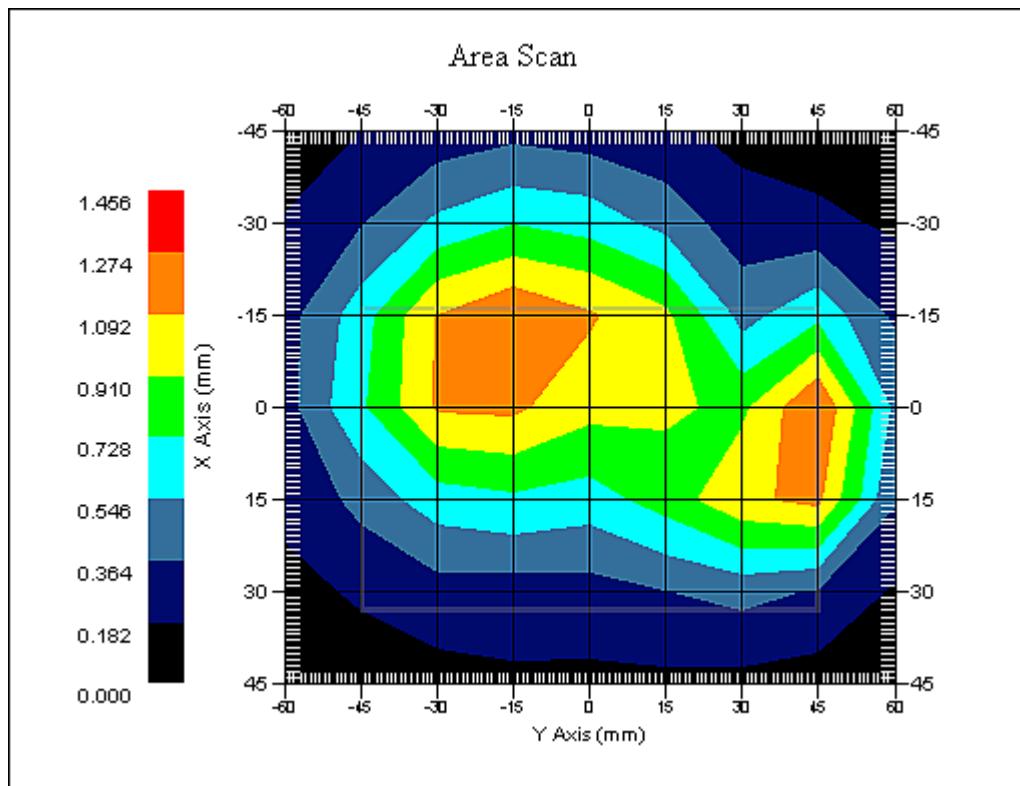
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 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 : Side A  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 1.240 W/kg  
10 gram SAR value : 0.791 W/kg  
Area Scan Peak SAR : 1.277 W/kg  
Zoom Scan Peak SAR : 1.861 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 11:04:15 AM  
End Time : 08-Sep-2011 11:34:49 AM  
Scanning Time : 1834 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 1.020 W/kg  
Power Drift-Finish: 1.044 W/kg  
Power Drift (%) : 2.346

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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

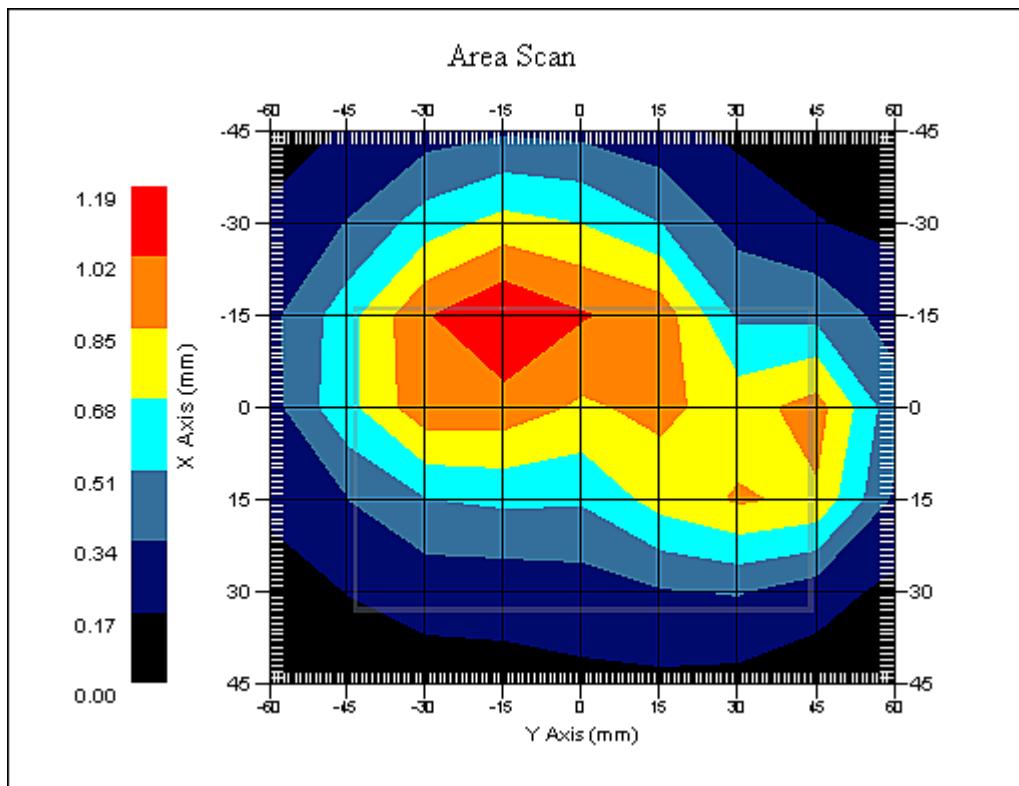
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 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 : Side A  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.104 W/kg  
10 gram SAR value : 0.699 W/kg  
Area Scan Peak SAR : 1.187 W/kg  
Zoom Scan Peak SAR : 1.671 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 10:40:20 AM  
End Time : 08-Sep-2011 11:00:56 AM  
Scanning Time : 1236 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.948 W/kg  
Power Drift-Finish: 0.943 W/kg  
Power Drift (%) : -0.555

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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

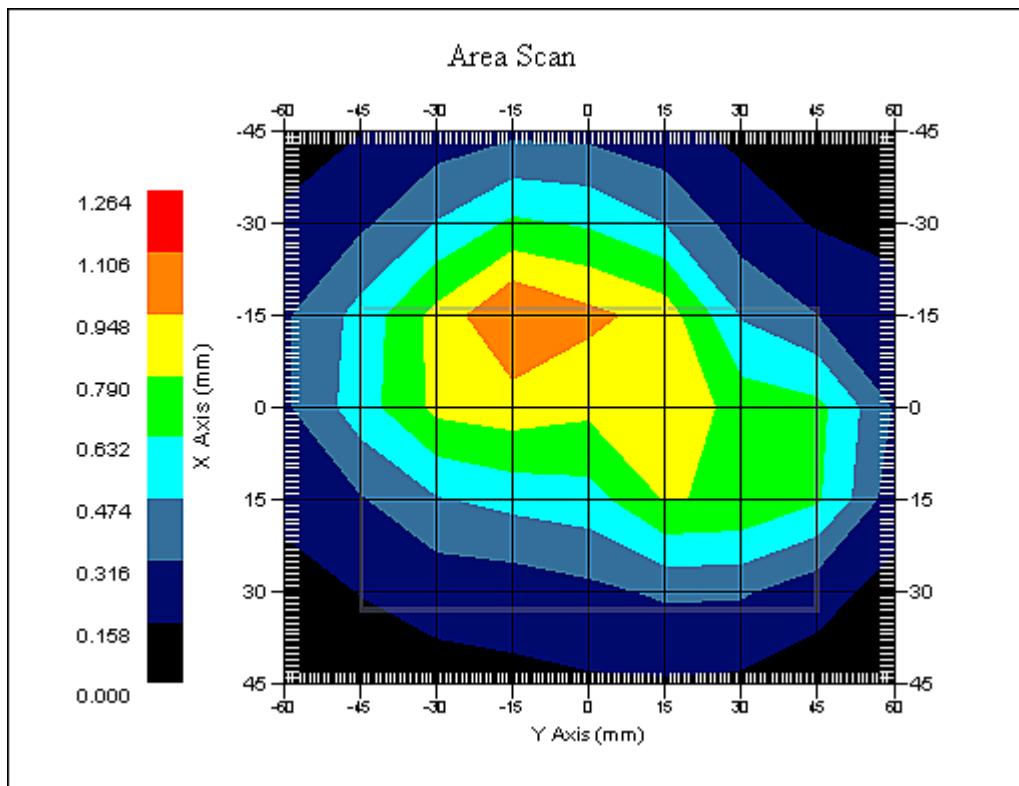
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 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 : Side A  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.992 W/kg  
10 gram SAR value : 0.640 W/kg  
Area Scan Peak SAR : 1.107 W/kg  
Zoom Scan Peak SAR : 1.471 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 12:11:20 PM  
End Time : 08-Sep-2011 12:51:55 PM  
Scanning Time : 2435 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.582 W/kg  
Power Drift-Finish: 0.580 W/kg  
Power Drift (%) : -0.480

## 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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

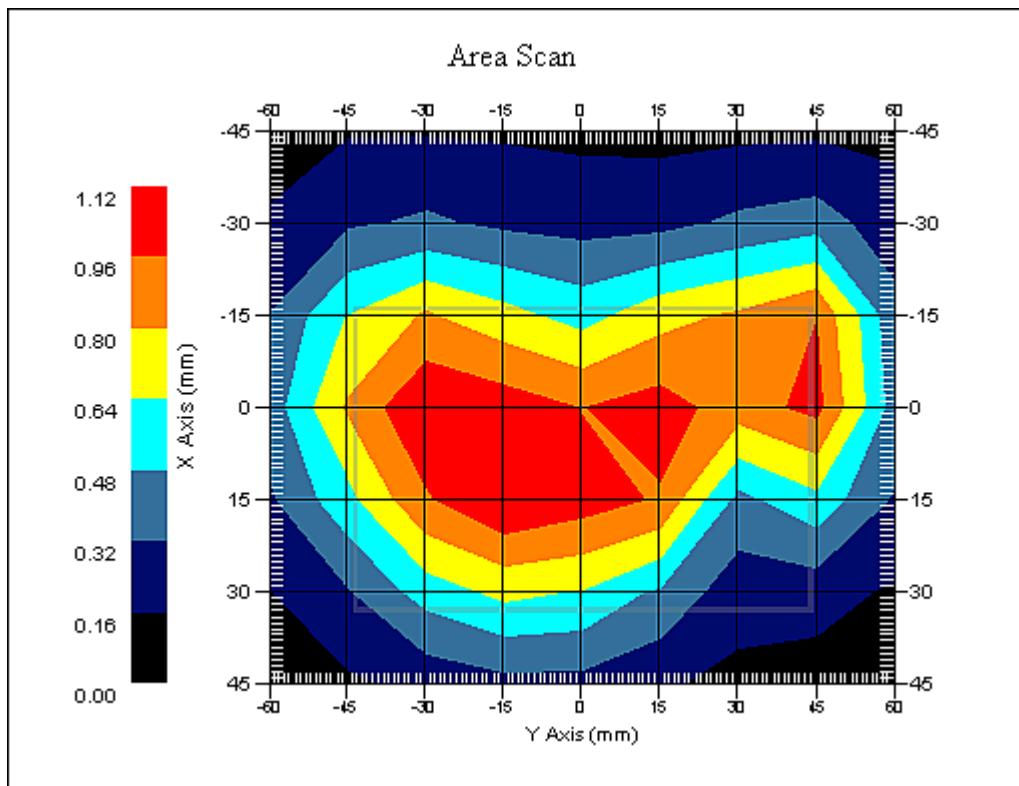
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 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 : Side B  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 1.106 W/kg  
10 gram SAR value : 0.734 W/kg  
Area Scan Peak SAR : 1.119 W/kg  
Zoom Scan Peak SAR : 1.601 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 12:53:39 PM  
End Time : 08-Sep-2011 01:25:09 PM  
Scanning Time : 1830 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.588 W/kg  
Power Drift-Finish: 0.586 W/kg  
Power Drift (%) : -0.308

## 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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

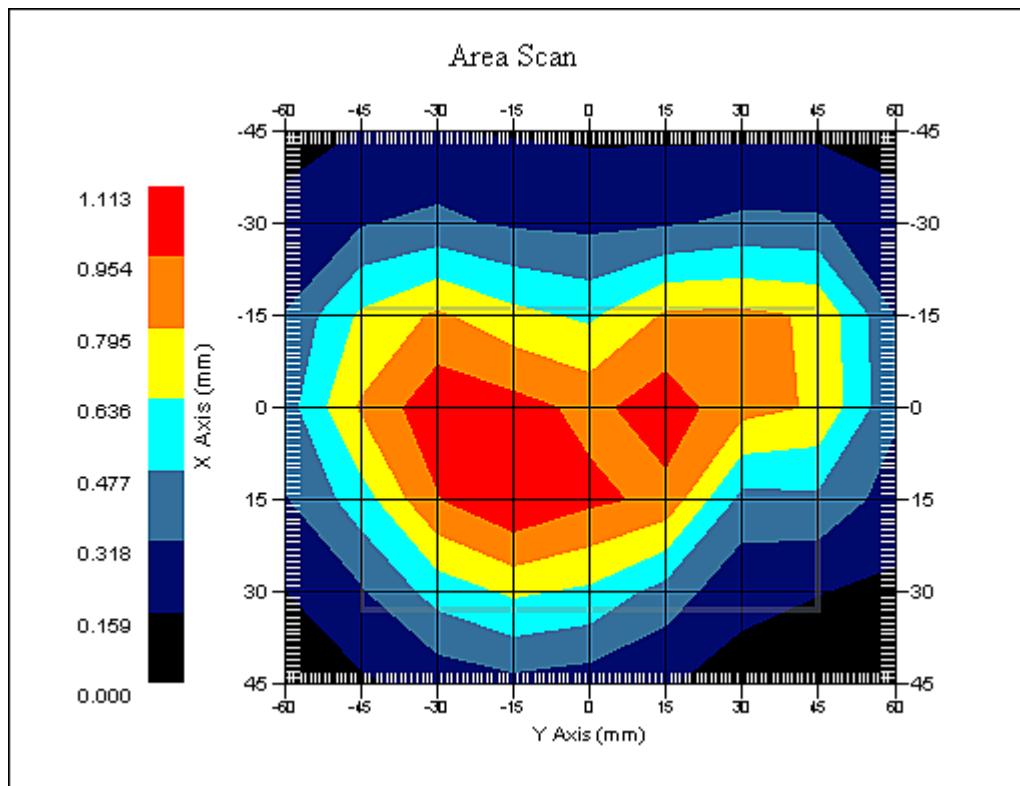
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 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 : Side B  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.067 W/kg  
10 gram SAR value : 0.709 W/kg  
Area Scan Peak SAR : 1.110 W/kg  
Zoom Scan Peak SAR : 1.541 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 01:27:07 PM  
End Time : 08-Sep-2011 01:57:51 PM  
Scanning Time : 1844 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.627 W/kg  
Power Drift-Finish: 0.629 W/kg  
Power Drift (%) : 0.277

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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

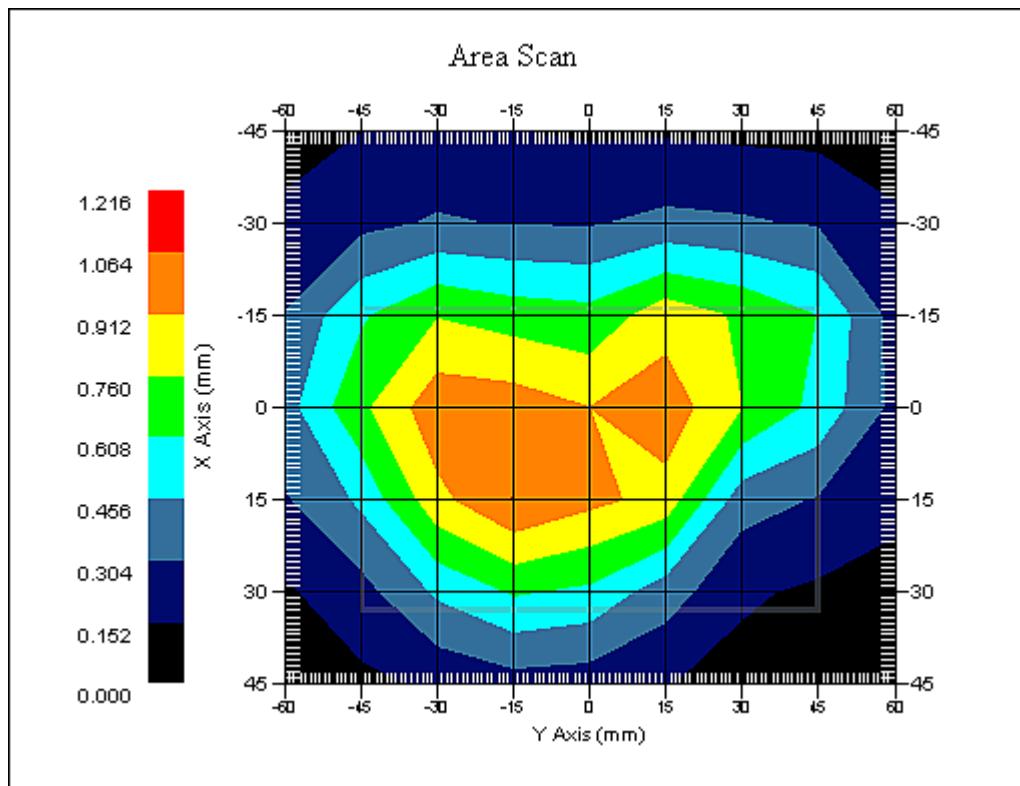
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 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 : Side B  
Separation : 10 mm  
Channel : High



1 gram SAR value : 1.037 W/kg  
10 gram SAR value : 0.680 W/kg  
Area Scan Peak SAR : 1.067 W/kg  
Zoom Scan Peak SAR : 1.531 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 09:46:31 AM  
End Time : 08-Sep-2011 10:01:58 AM  
Scanning Time : 927 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 1.225 W/kg  
Power Drift-Finish: 1.263 W/kg  
Power Drift (%) : 3.102

## 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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

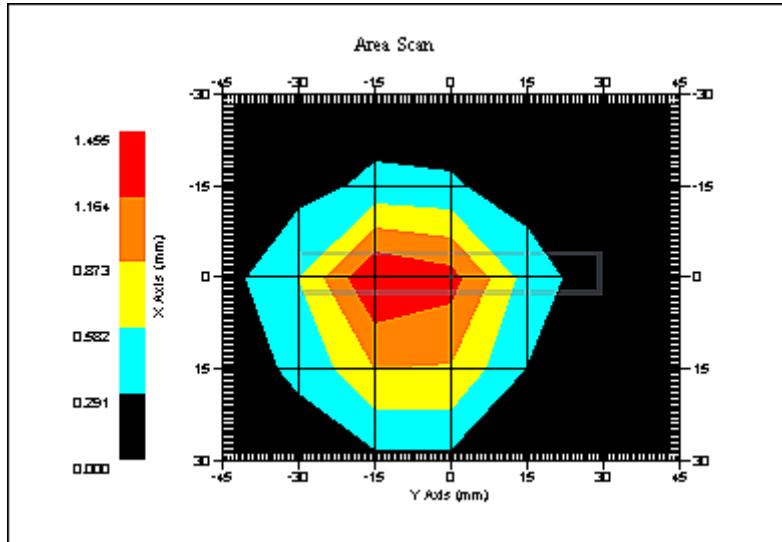
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

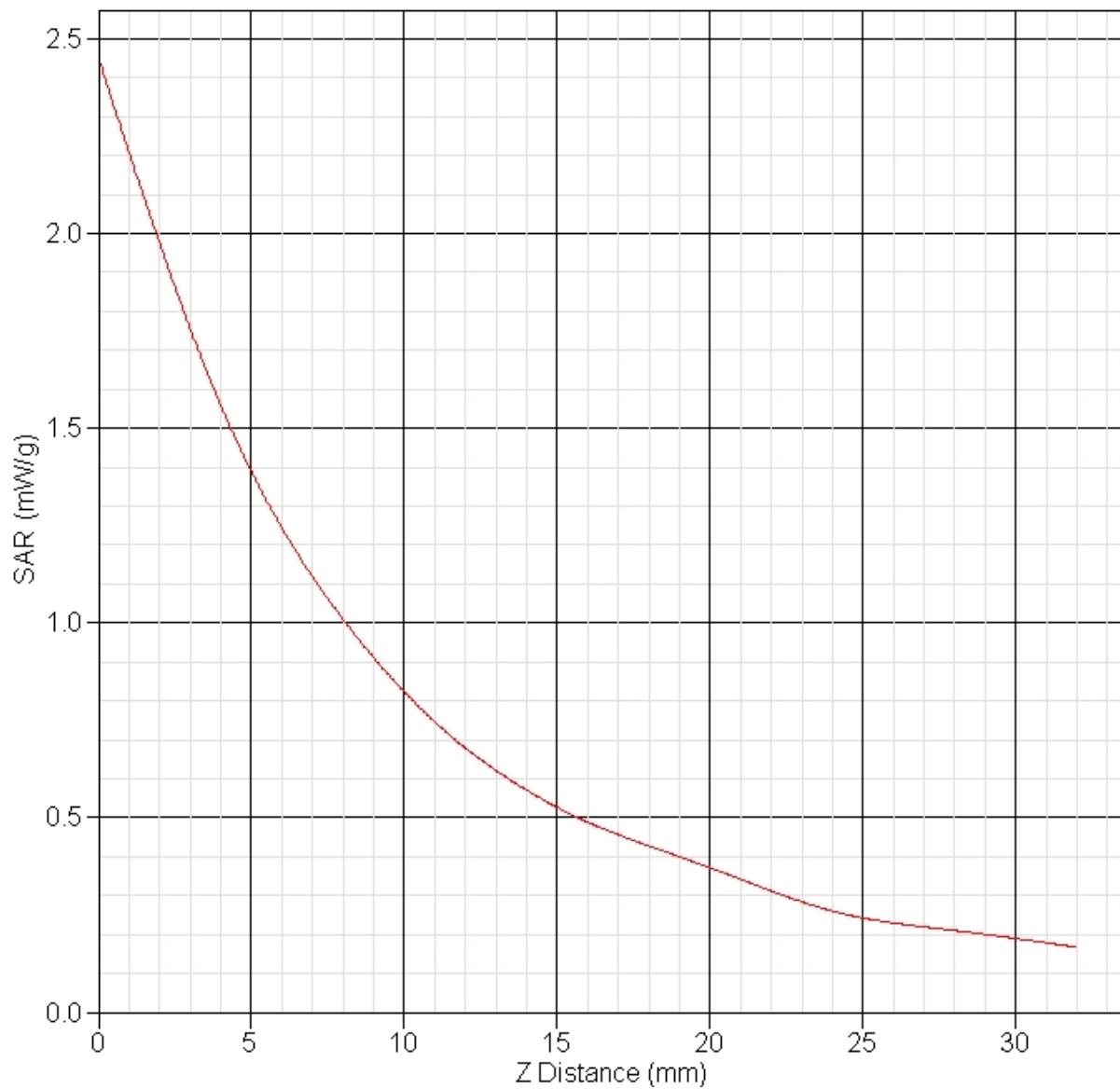
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 1.396 W/kg  
10 gram SAR value : 0.720 W/kg  
Area Scan Peak SAR : 1.454 W/kg  
Zoom Scan Peak SAR : 2.452 W/kg

**SAR-Z Axis**  
at Hotspot x:8.20 y:-6.94

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 10:04:08 AM  
End Time : 08-Sep-2011 10:19:13 AM  
Scanning Time : 905 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.931 W/kg  
Power Drift-Finish: 0.945 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. : 1900  
Frequency : 1900.00 MHz  
Last Calib. Date : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

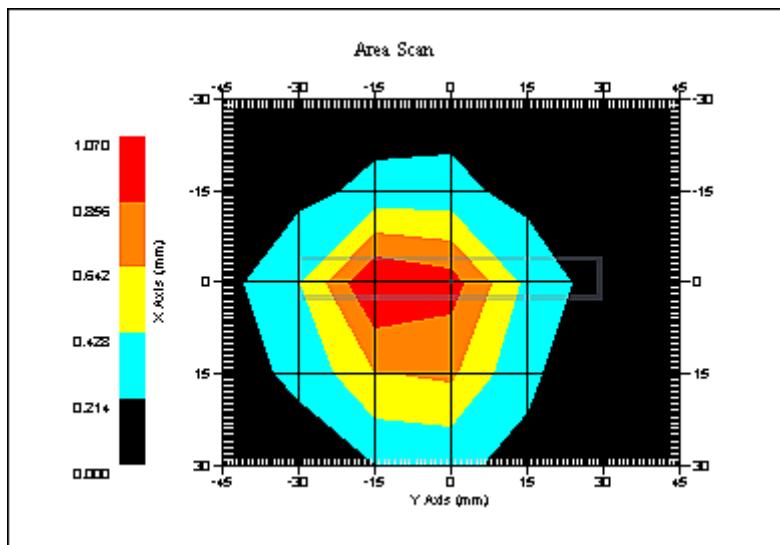
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.046 W/kg  
10 gram SAR value : 0.545 W/kg  
Area Scan Peak SAR : 1.070 W/kg  
Zoom Scan Peak SAR : 1.841 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 08-Sep-2011  
Starting Time : 08-Sep-2011 10:22:53 AM  
End Time : 08-Sep-2011 10:37:53 AM  
Scanning Time : 900 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.659 W/kg  
Power Drift-Finish: 0.674 W/kg  
Power Drift (%) : 2.279

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 : 08-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.21 F/m  
Sigma : 1.56 S/m  
Density : 1000.00 kg/cu. m

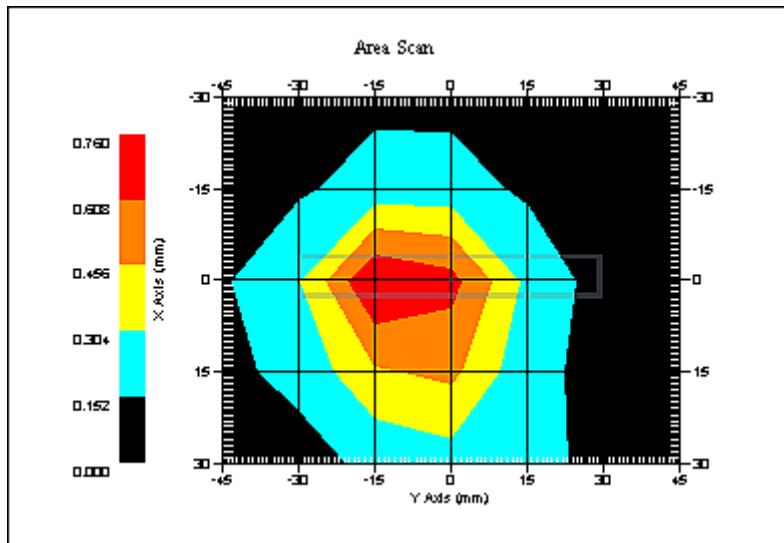
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 08-Sep-2011  
Set-up Time : 9:07:55 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.732 W/kg  
10 gram SAR value : 0.392 W/kg  
Area Scan Peak SAR : 0.759 W/kg  
Zoom Scan Peak SAR : 1.281 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 08:20:56 AM  
End Time : 09-Sep-2011 08:37:57 AM  
Scanning Time : 1021 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D  
Power Drift-Start : 0.873 W/kg  
Power Drift-Finish: 0.899 W/kg  
Power Drift (%) : 2.908

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

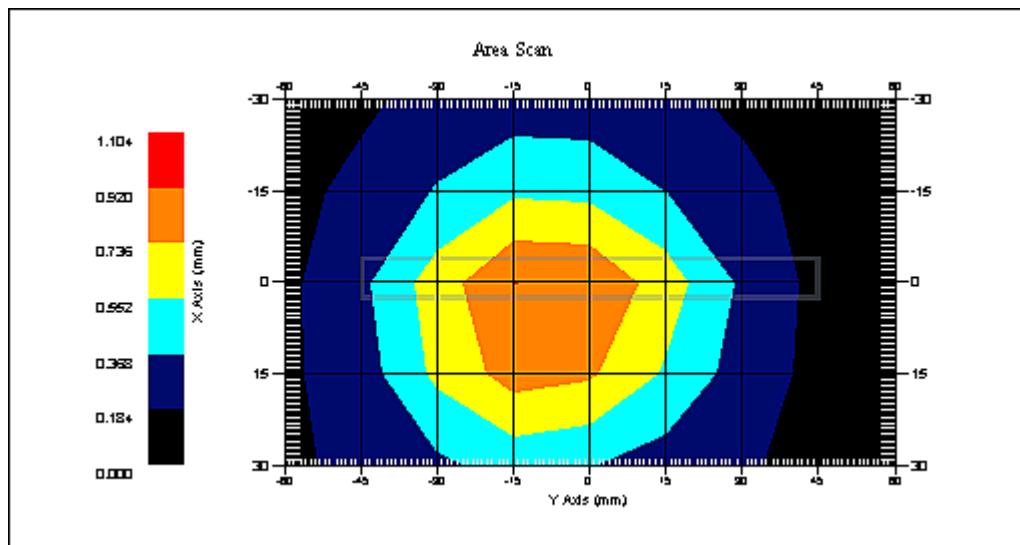
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.911 W/kg  
10 gram SAR value : 0.569 W/kg  
Area Scan Peak SAR : 0.922 W/kg  
Zoom Scan Peak SAR : 1.401 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 08:40:47 AM  
End Time : 09-Sep-2011 08:57:48 AM  
Scanning Time : 1021 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D  
Power Drift-Start : 0.731 W/kg  
Power Drift-Finish: 0.730 W/kg  
Power Drift (%) : -0.029

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

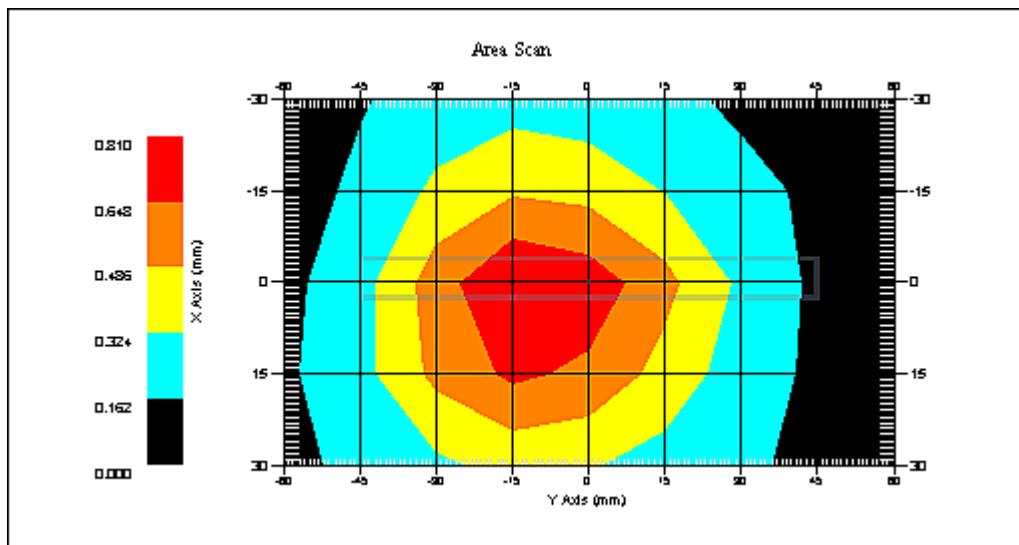
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.780 W/kg  
10 gram SAR value : 0.490 W/kg  
Area Scan Peak SAR : 0.810 W/kg  
Zoom Scan Peak SAR : 1.131 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 08:59:13 AM  
End Time : 09-Sep-2011 09:16:14 AM  
Scanning Time : 1021 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D  
Power Drift-Start : 0.581 W/kg  
Power Drift-Finish: 0.578 W/kg  
Power Drift (%) : -0.509

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

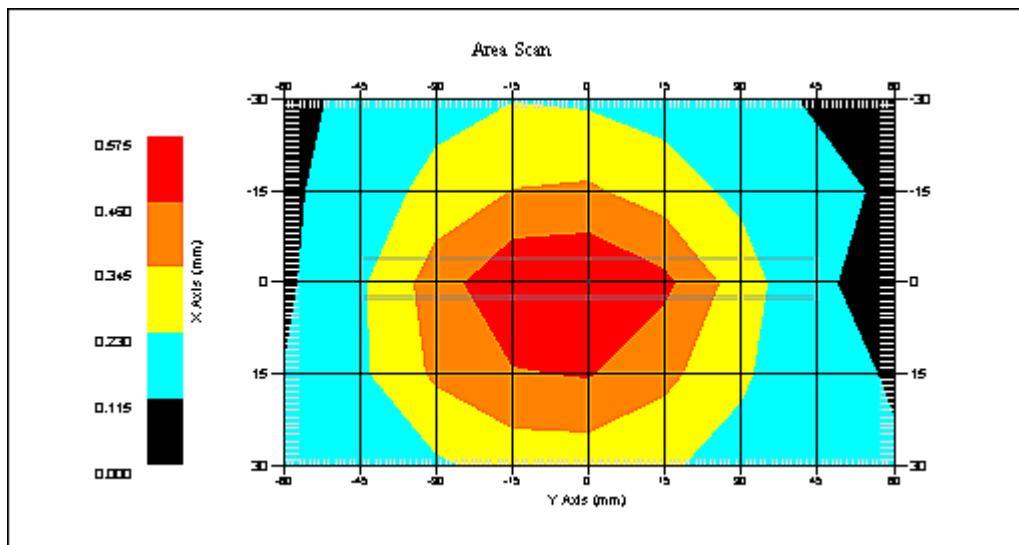
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.576 W/kg  
10 gram SAR value : 0.365 W/kg  
Area Scan Peak SAR : 0.575 W/kg  
Zoom Scan Peak SAR : 0.880 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 07:50:05 AM  
End Time : 09-Sep-2011 08:17:54 AM  
Scanning Time : 1669 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : Rev. 0  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.430 W/kg  
Power Drift-Finish: 0.419 W/kg  
Power Drift (%) : -2.550

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

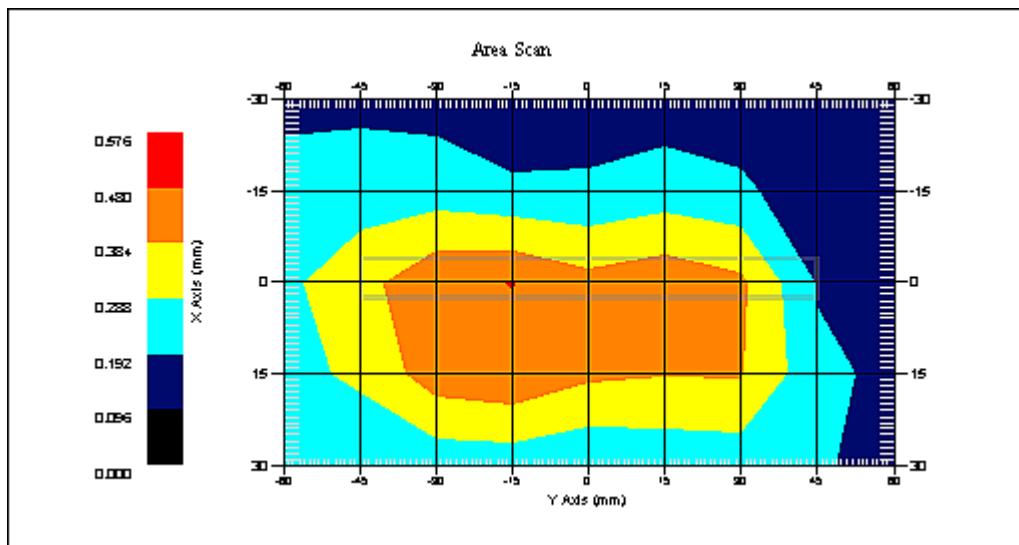
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.497 W/kg  
10 gram SAR value : 0.322 W/kg  
Area Scan Peak SAR : 0.482 W/kg  
Zoom Scan Peak SAR : 0.750 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 12:31:02 PM  
End Time : 09-Sep-2011 01:01:38 PM  
Scanning Time : 1836 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.937 W/kg  
Power Drift-Finish: 0.933 W/kg  
Power Drift (%) : -0.403

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

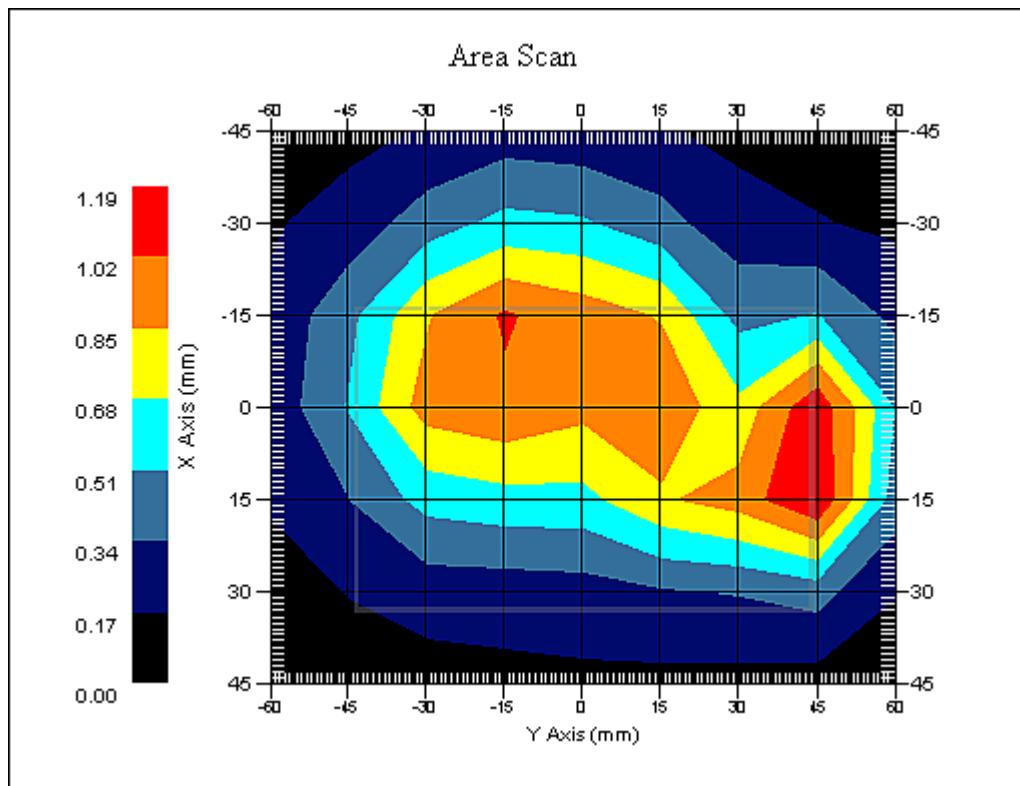
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 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 : Side A  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 1.191 W/kg  
10 gram SAR value : 0.668 W/kg  
Area Scan Peak SAR : 1.190 W/kg  
Zoom Scan Peak SAR : 2.051 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 01:04:12 PM  
End Time : 09-Sep-2011 01:44:39 PM  
Scanning Time : 2427 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 1.149 W/kg  
Power Drift-Finish: 1.178 W/kg  
Power Drift (%) : 2.466

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

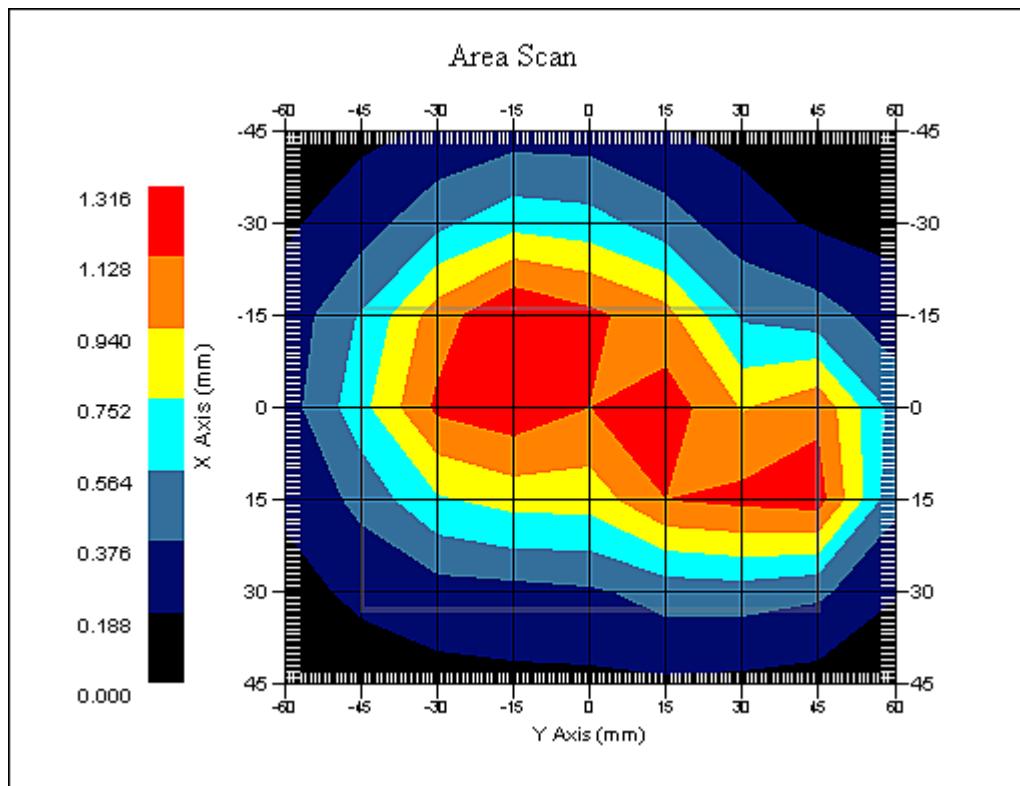
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

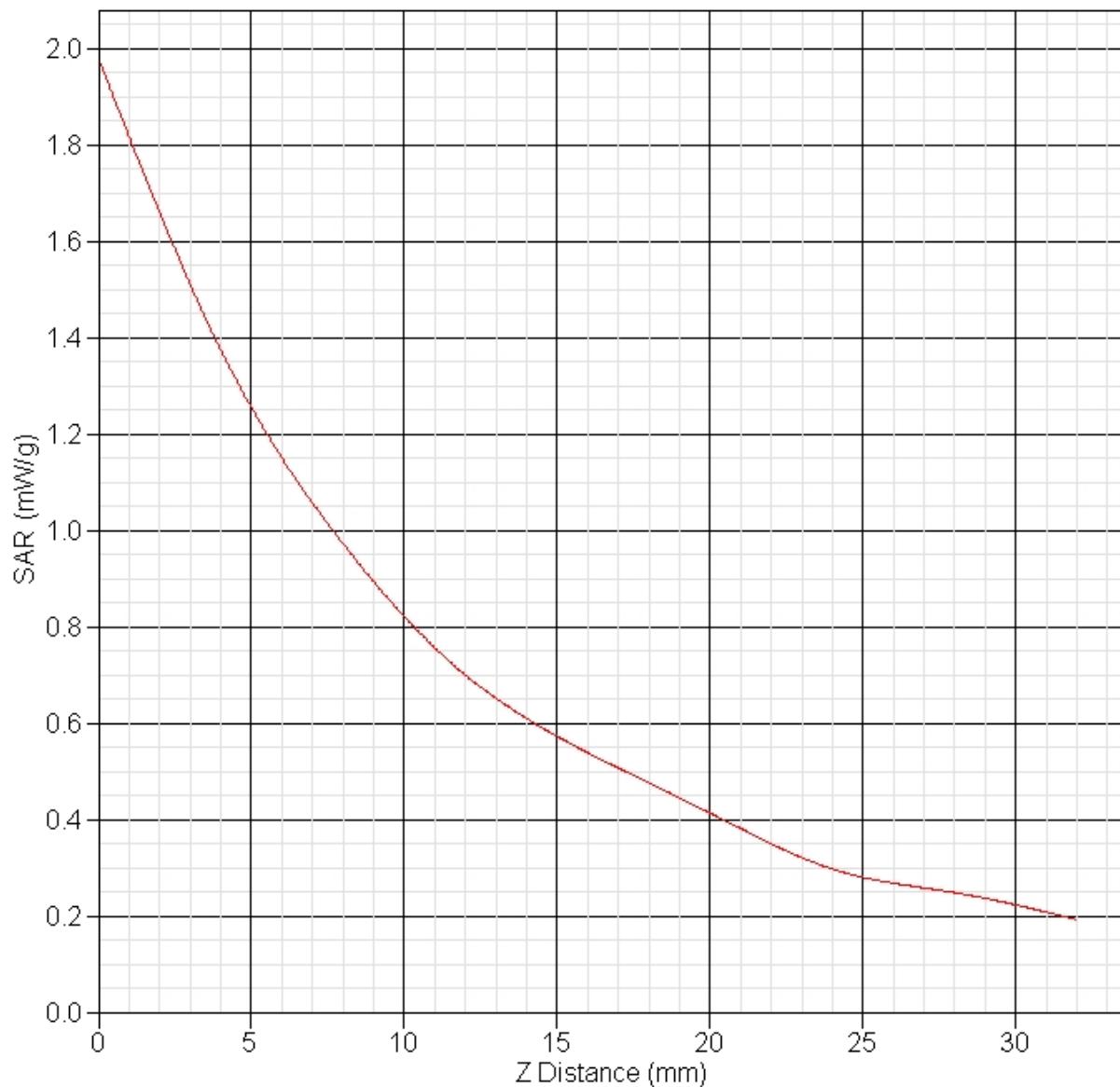
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side A  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.335 W/kg  
10 gram SAR value : 0.857 W/kg  
Area Scan Peak SAR : 1.313 W/kg  
Zoom Scan Peak SAR : 1.981 W/kg

**SAR-Z Axis**  
at Hotspot x:8.11 y:-14.94

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 01:47:12 PM  
End Time : 09-Sep-2011 02:07:41 PM  
Scanning Time : 1229 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 1.157 W/kg  
Power Drift-Finish: 1.106 W/kg  
Power Drift (%) : -4.449

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

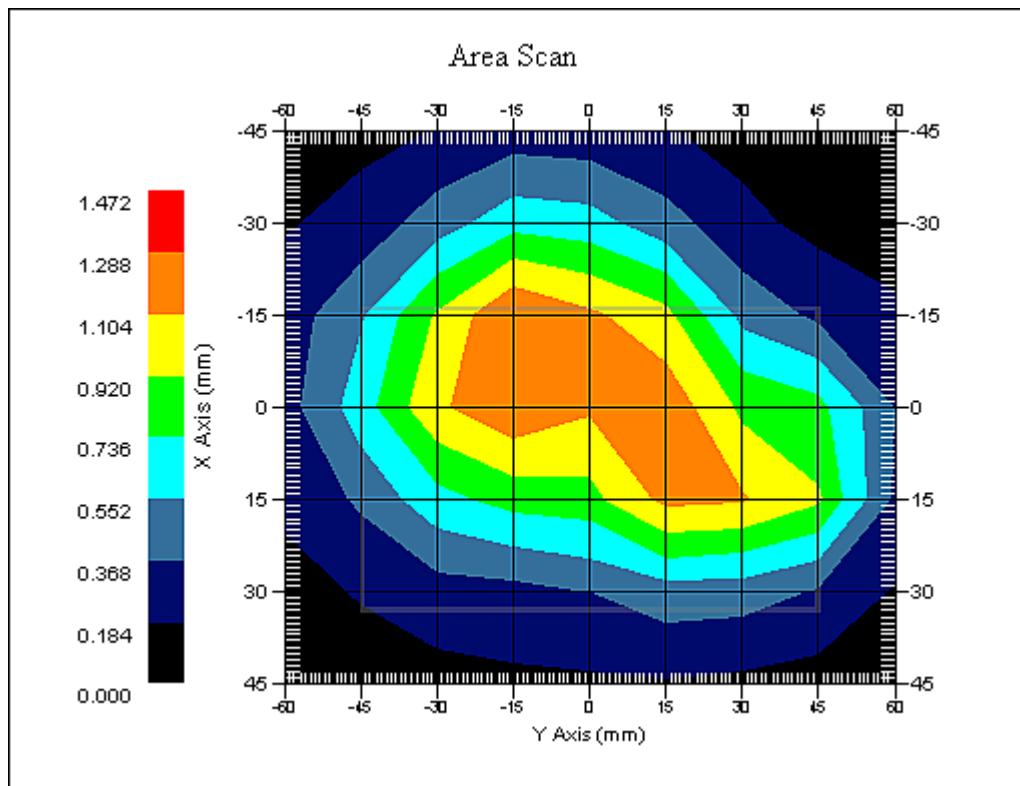
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 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 : Side A  
Separation : 10 mm  
Channel : High



1 gram SAR value : 1.260 W/kg  
10 gram SAR value : 0.808 W/kg  
Area Scan Peak SAR : 1.289 W/kg  
Zoom Scan Peak SAR : 1.871 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 11:58:40 AM  
End Time : 09-Sep-2011 12:29:11 PM  
Scanning Time : 1831 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.455 W/kg  
Power Drift-Finish: 0.442 W/kg  
Power Drift (%) : -2.852

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

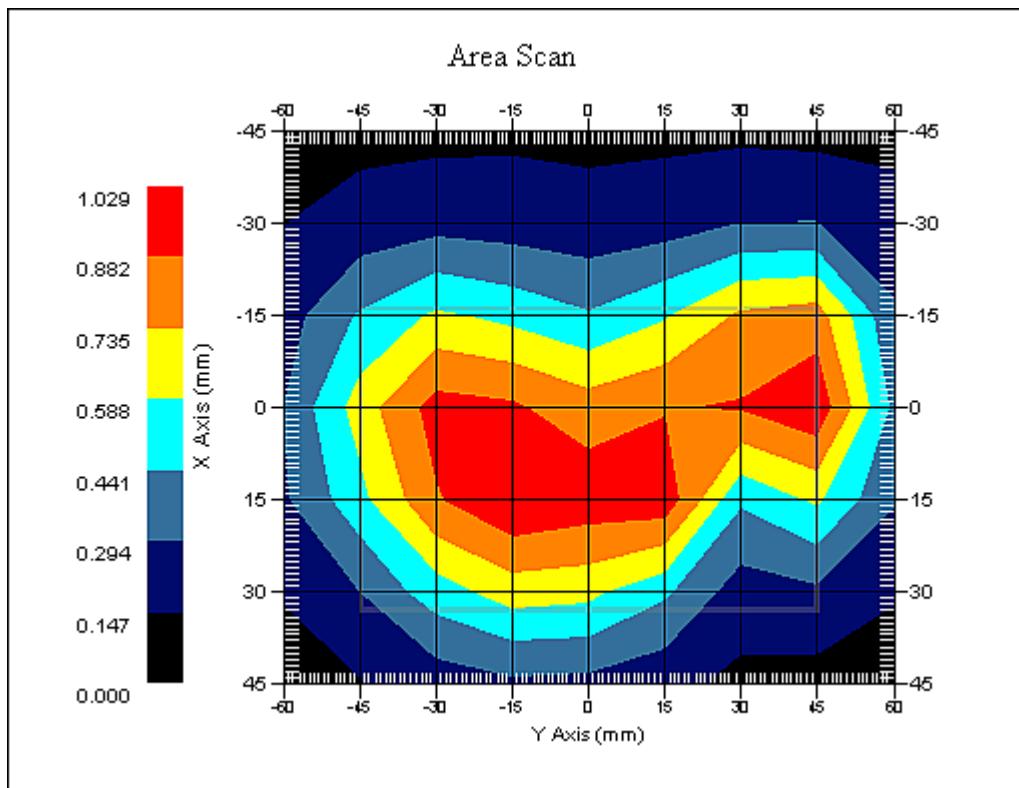
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 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 : Side B  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.960 W/kg  
10 gram SAR value : 0.635 W/kg  
Area Scan Peak SAR : 1.027 W/kg  
Zoom Scan Peak SAR : 1.361 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 11:24:59 AM  
End Time : 09-Sep-2011 11:55:24 AM  
Scanning Time : 1825 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.535 W/kg  
Power Drift-Finish: 0.544 W/kg  
Power Drift (%) : 1.695

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

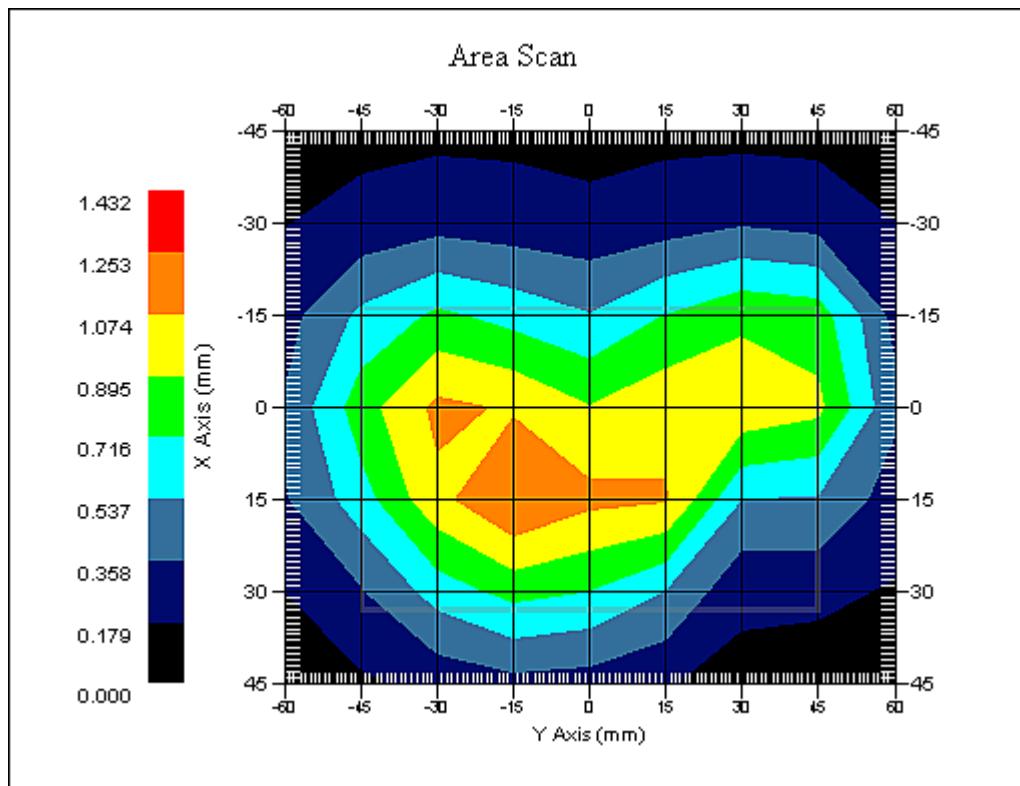
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 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 : Side B  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.159 W/kg  
10 gram SAR value : 0.756 W/kg  
Area Scan Peak SAR : 1.256 W/kg  
Zoom Scan Peak SAR : 1.681 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 10:59:53 AM  
End Time : 09-Sep-2011 11:20:38 AM  
Scanning Time : 1245 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 1.076 W/kg  
Power Drift-Finish: 1.058 W/kg  
Power Drift (%) : -1.710

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

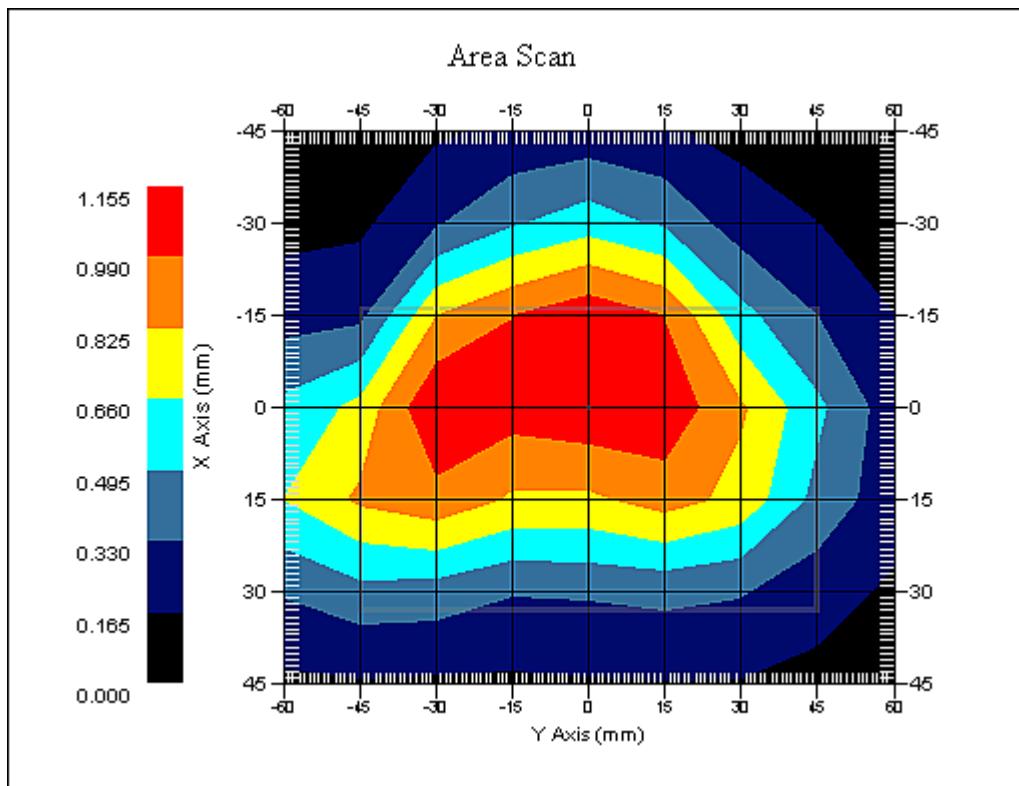
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 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 : Side B  
Separation : 10 mm  
Channel : High



1 gram SAR value : 1.143 W/kg  
10 gram SAR value : 0.750 W/kg  
Area Scan Peak SAR : 1.152 W/kg  
Zoom Scan Peak SAR : 1.681 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 02:12:11 PM  
End Time : 09-Sep-2011 02:27:11 PM  
Scanning Time : 900 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.281 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.898 W/kg  
Power Drift-Finish: 0.900 W/kg  
Power Drift (%) : 0.229

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

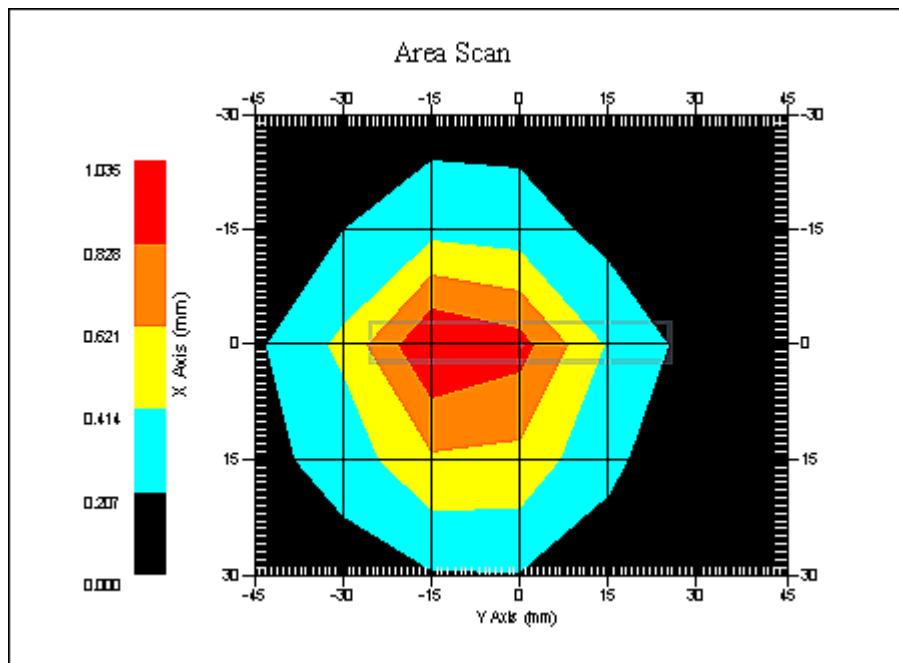
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.972 W/kg  
10 gram SAR value : 0.553 W/kg  
Area Scan Peak SAR : 1.034 W/kg  
Zoom Scan Peak SAR : 1.611 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 02:31:32 PM  
End Time : 09-Sep-2011 02:46:28 PM  
Scanning Time : 896 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.764 W/kg  
Power Drift-Finish: 0.780 W/kg  
Power Drift (%) : 2.157

## 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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

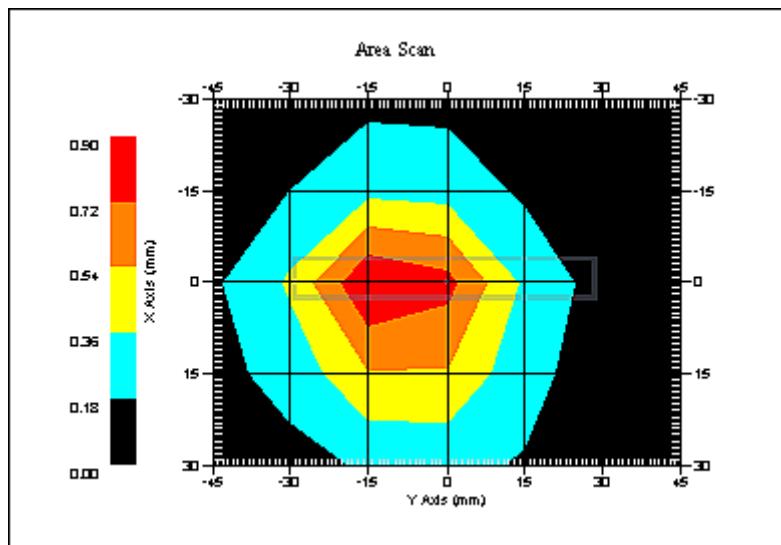
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.834 W/kg  
10 gram SAR value : 0.479 W/kg  
Area Scan Peak SAR : 0.899 W/kg  
Zoom Scan Peak SAR : 1.371 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 02:49:57 PM  
End Time : 09-Sep-2011 03:05:05 PM  
Scanning Time : 908 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.602 W/kg  
Power Drift-Finish: 0.599 W/kg  
Power Drift (%) : -0.521

## 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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

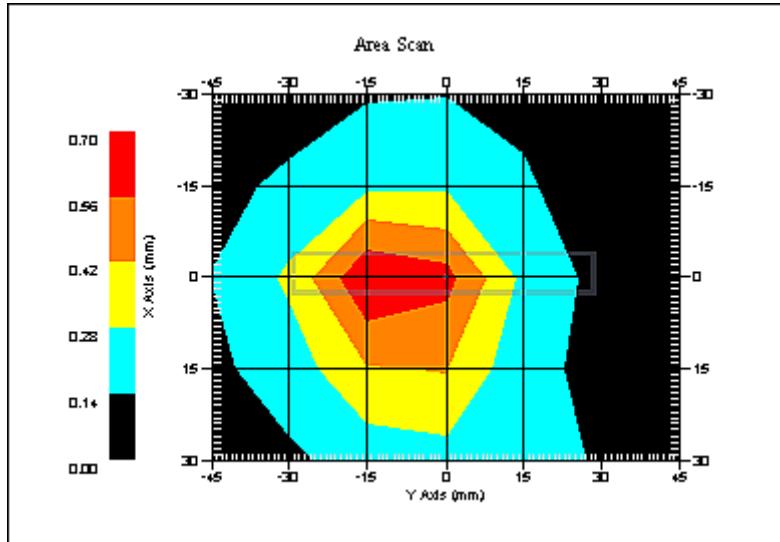
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.630 W/kg  
10 gram SAR value : 0.358 W/kg  
Area Scan Peak SAR : 0.699 W/kg  
Zoom Scan Peak SAR : 1.020 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 09:26:50 AM  
End Time : 09-Sep-2011 09:53:47 AM  
Scanning Time : 1617 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D  
Power Drift-Start : 0.548 W/kg  
Power Drift-Finish: 0.544 W/kg  
Power Drift (%) : -0.806

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

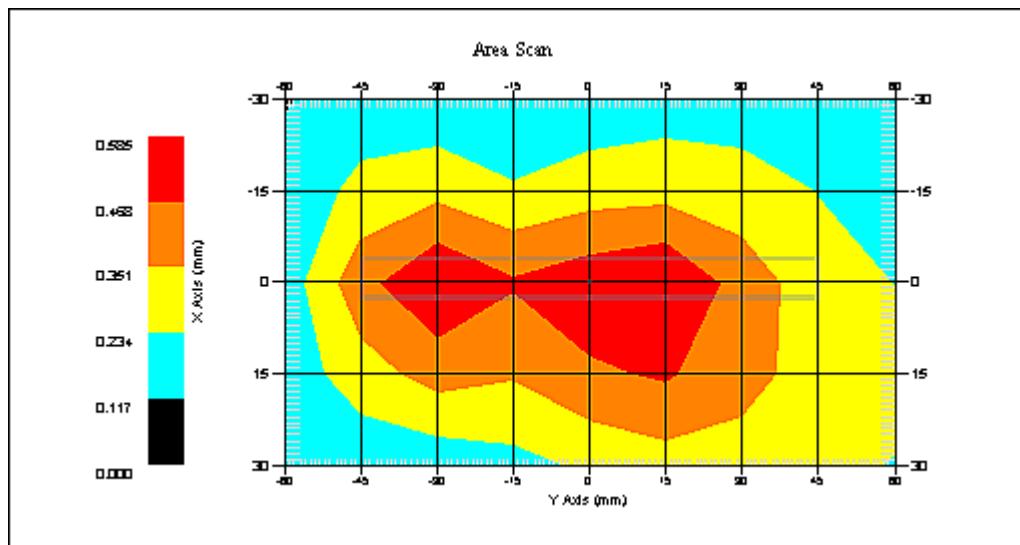
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.567 W/kg  
10 gram SAR value : 0.366 W/kg  
Area Scan Peak SAR : 0.584 W/kg  
Zoom Scan Peak SAR : 0.860 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 10:18:25 AM  
End Time : 09-Sep-2011 10:35:10 AM  
Scanning Time : 1005 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.813 W/kg  
Power Drift-Finish: 0.806 W/kg  
Power Drift (%) : -0.933

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

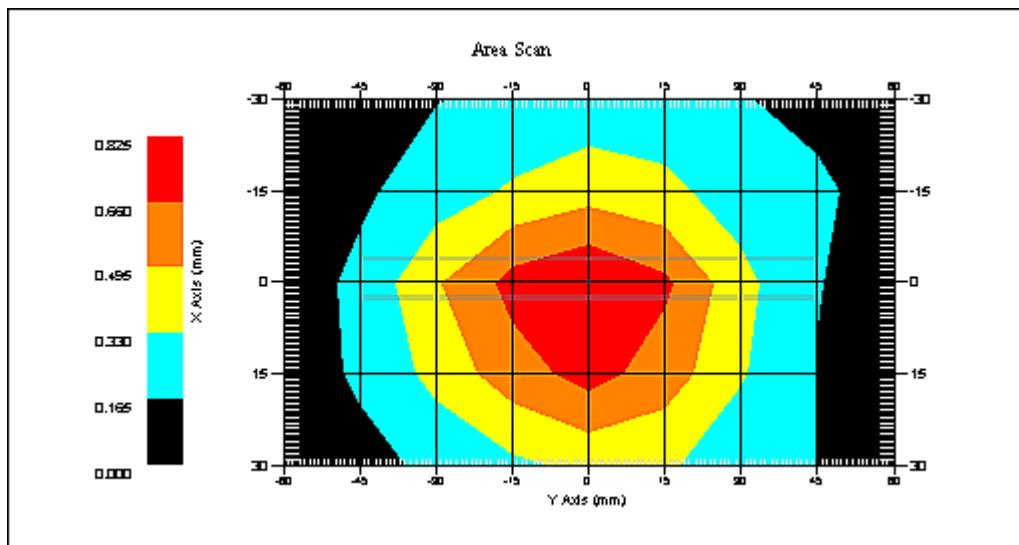
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : Low



1 gram SAR value : 0.824 W/kg  
10 gram SAR value : 0.512 W/kg  
Area Scan Peak SAR : 0.823 W/kg  
Zoom Scan Peak SAR : 1.281 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 09:58:07 AM  
End Time : 09-Sep-2011 10:15:02 AM  
Scanning Time : 1015 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.810 W/kg  
Power Drift-Finish: 0.825 W/kg  
Power Drift (%) : 1.898

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

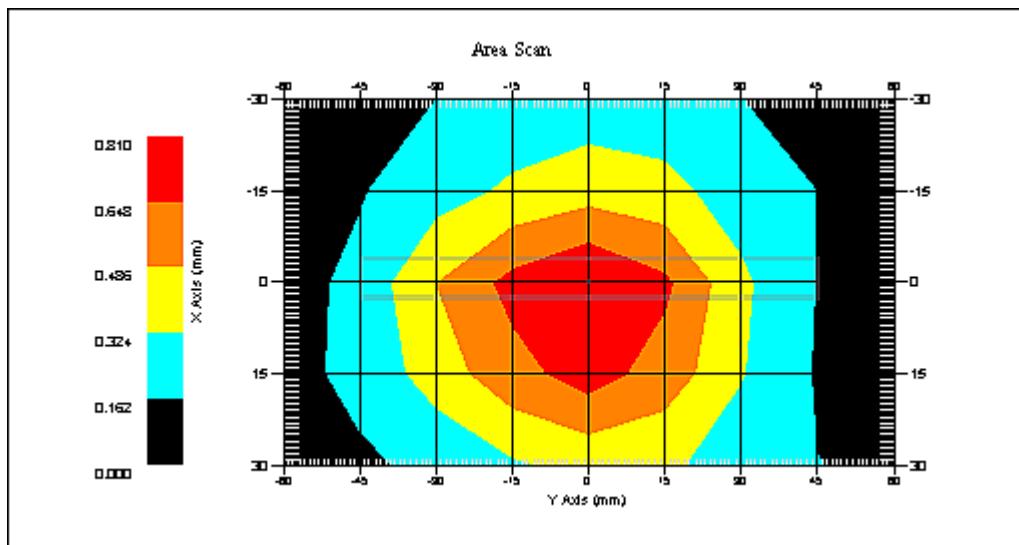
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.818 W/kg  
10 gram SAR value : 0.507 W/kg  
Area Scan Peak SAR : 0.809 W/kg  
Zoom Scan Peak SAR : 1.301 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 10:38:21 AM  
End Time : 09-Sep-2011 10:55:16 AM  
Scanning Time : 1015 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : WCDMA  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.282 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.660 W/kg  
Power Drift-Finish: 0.665 W/kg  
Power Drift (%) : 0.746

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

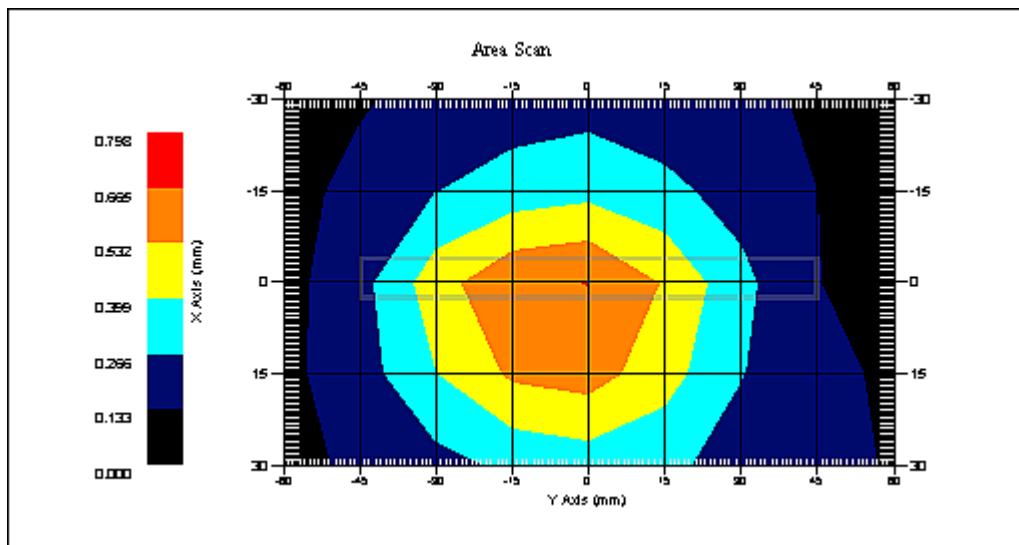
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.682 W/kg  
10 gram SAR value : 0.426 W/kg  
Area Scan Peak SAR : 0.667 W/kg  
Zoom Scan Peak SAR : 1.100 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 04:04:24 PM  
End Time : 09-Sep-2011 04:41:26 PM  
Scanning Time : 2222 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.991 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.432 W/kg  
Power Drift-Finish: 0.428 W/kg  
Power Drift (%) : -0.870

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

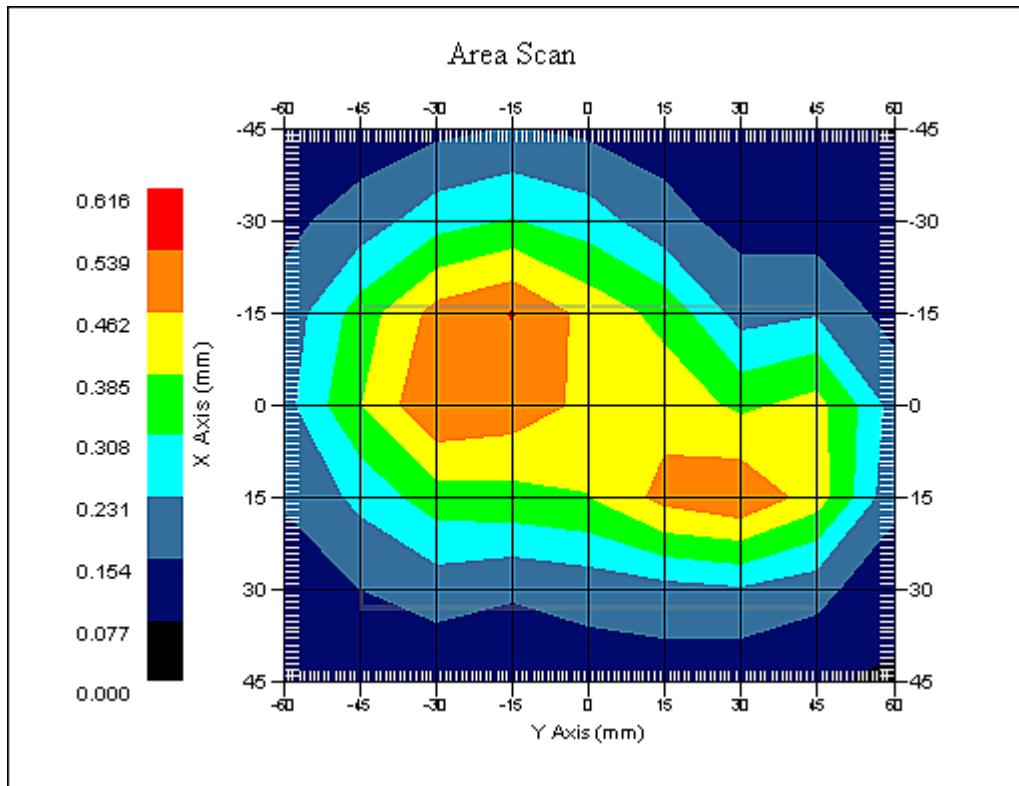
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 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 : Side A  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.543 W/kg  
10 gram SAR value : 0.357 W/kg  
Area Scan Peak SAR : 0.542 W/kg  
Zoom Scan Peak SAR : 0.780 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 03:32:45 PM  
End Time : 09-Sep-2011 04:00:22 PM  
Scanning Time : 1657 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.991 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.319 W/kg  
Power Drift-Finish: 0.307 W/kg  
Power Drift (%) : -3.762

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

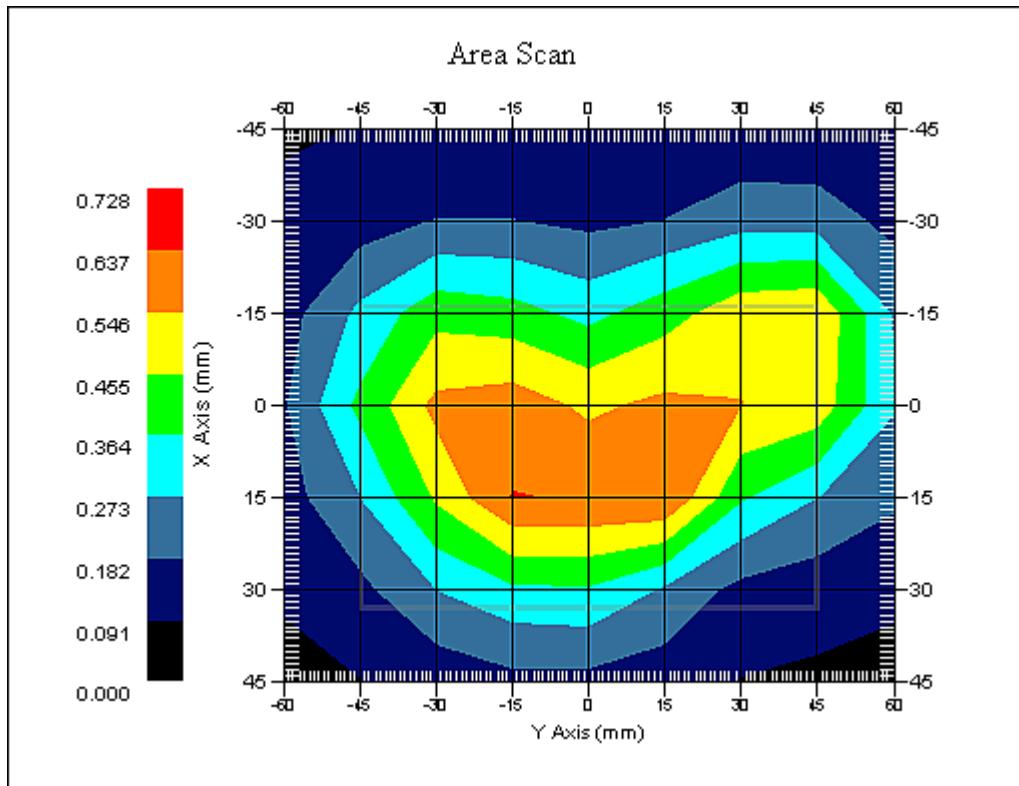
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

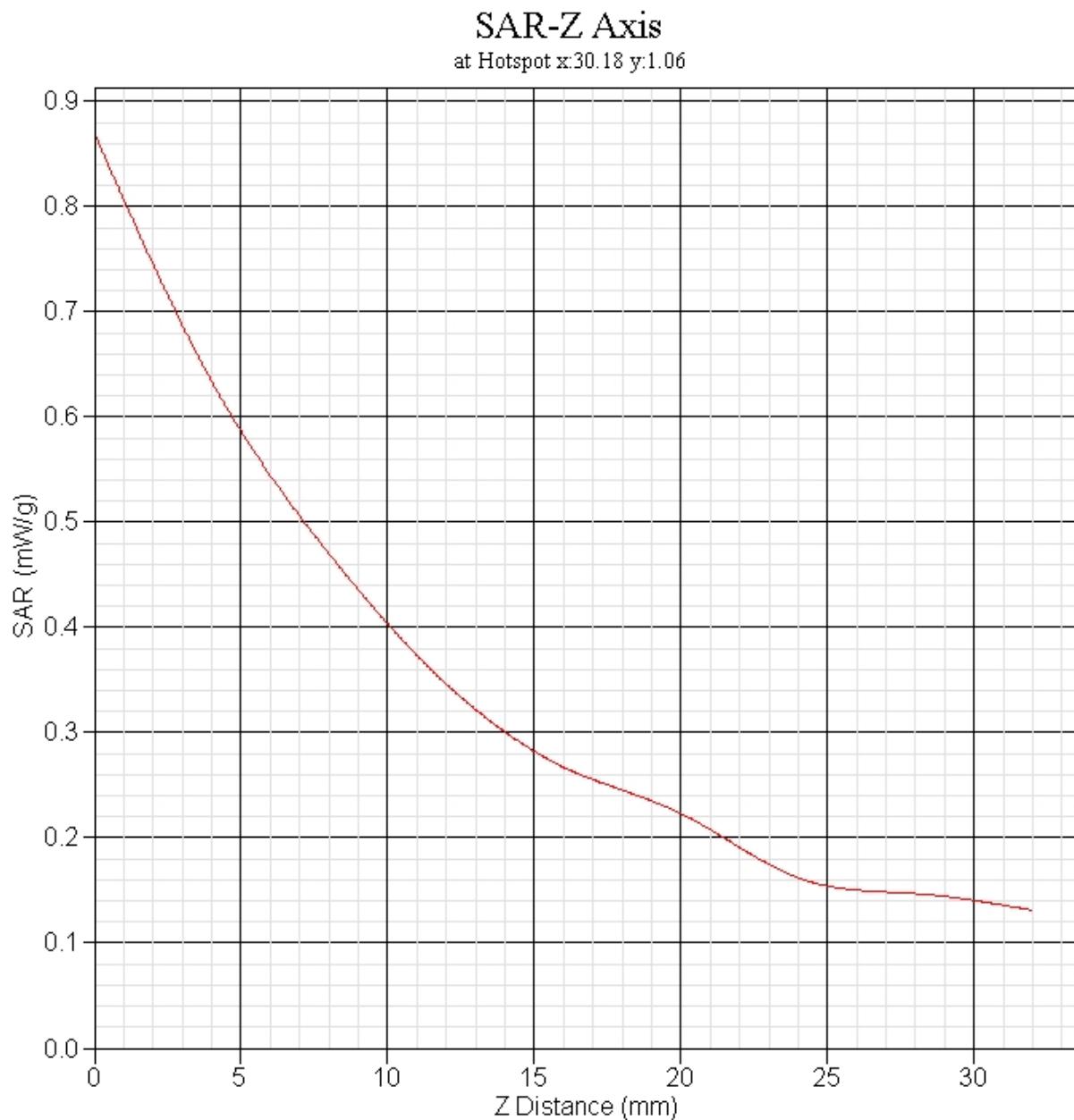
Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side B  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.569 W/kg  
10 gram SAR value : 0.354 W/kg  
Area Scan Peak SAR : 0.640 W/kg  
Zoom Scan Peak SAR : 0.870 W/kg



**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 03:08:54 PM  
End Time : 09-Sep-2011 03:29:21 PM  
Scanning Time : 1227 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.991 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C  
Power Drift-Start : 0.440 W/kg  
Power Drift-Finish: 0.453 W/kg  
Power Drift (%) : 2.932

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

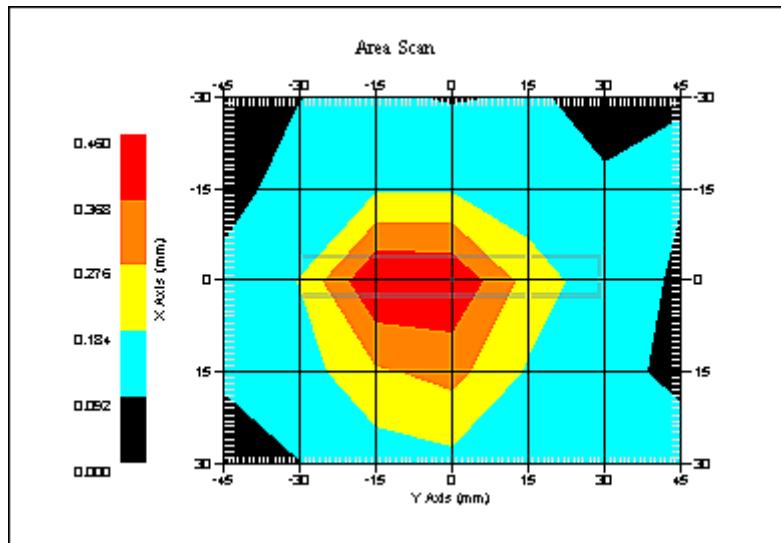
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.467 W/kg  
10 gram SAR value : 0.277 W/kg  
Area Scan Peak SAR : 0.458 W/kg  
Zoom Scan Peak SAR : 0.830 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 05:12:33 PM  
End Time : 09-Sep-2011 05:35:24 PM  
Scanning Time : 1371 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.991 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D  
Power Drift-Start : 0.416 W/kg  
Power Drift-Finish: 0.406 W/kg  
Power Drift (%) : -2.406

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

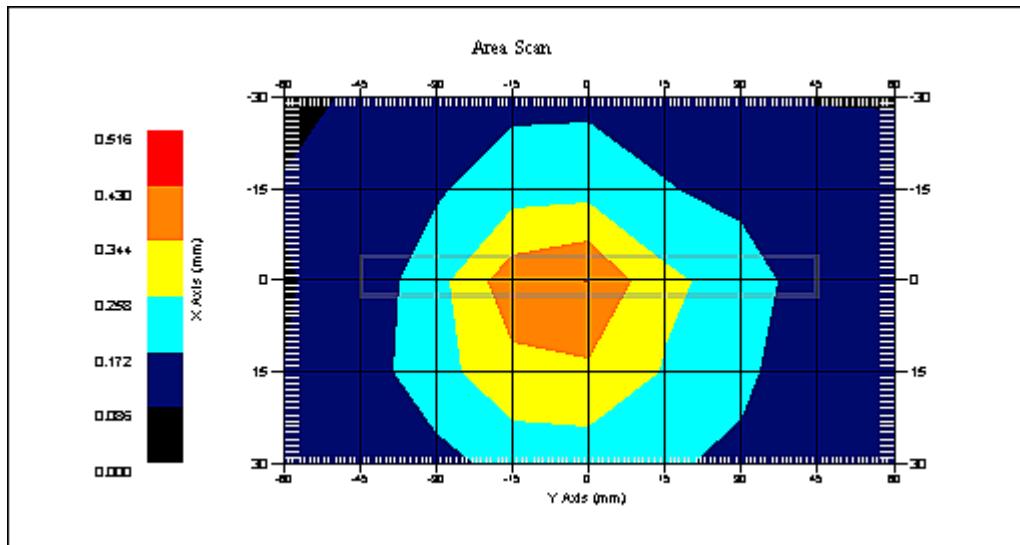
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.406 W/kg  
10 gram SAR value : 0.262 W/kg  
Area Scan Peak SAR : 0.432 W/kg  
Zoom Scan Peak SAR : 0.620 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 09-Sep-2011  
Starting Time : 09-Sep-2011 04:46:33 PM  
End Time : 09-Sep-2011 05:09:35 PM  
Scanning Time : 1382 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : GPRS 1-Slot  
Model : MiFi4620L  
Frequency : 1900.00 MHz  
Max. Transmit Pwr : 0.991 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.297 W/kg  
Power Drift-Finish: 0.293 W/kg  
Power Drift (%) : -1.146

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 : 09-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 36.00 RH%  
Epsilon : 53.12 F/m  
Sigma : 1.57 S/m  
Density : 1000.00 kg/cu. m

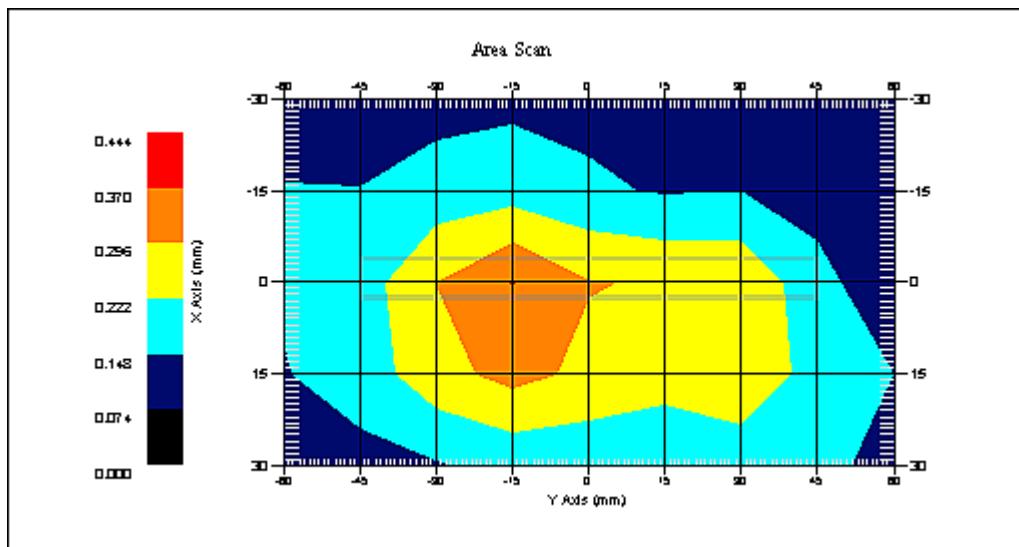
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 1900.00 MHz  
Duty Cycle Factor: 8.3  
Conversion Factor: 4.8  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 8.3  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 09-Sep-2011  
Set-up Time : 7:48:32 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : High



1 gram SAR value : 0.351 W/kg  
10 gram SAR value : 0.231 W/kg  
Area Scan Peak SAR : 0.372 W/kg  
Zoom Scan Peak SAR : 0.520 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 04:38:39 PM  
End Time : 10-Sep-2011 04:57:18 PM  
Scanning Time : 1119 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.788 W/kg  
Power Drift-Finish: 0.808 W/kg  
Power Drift (%) : 2.526

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

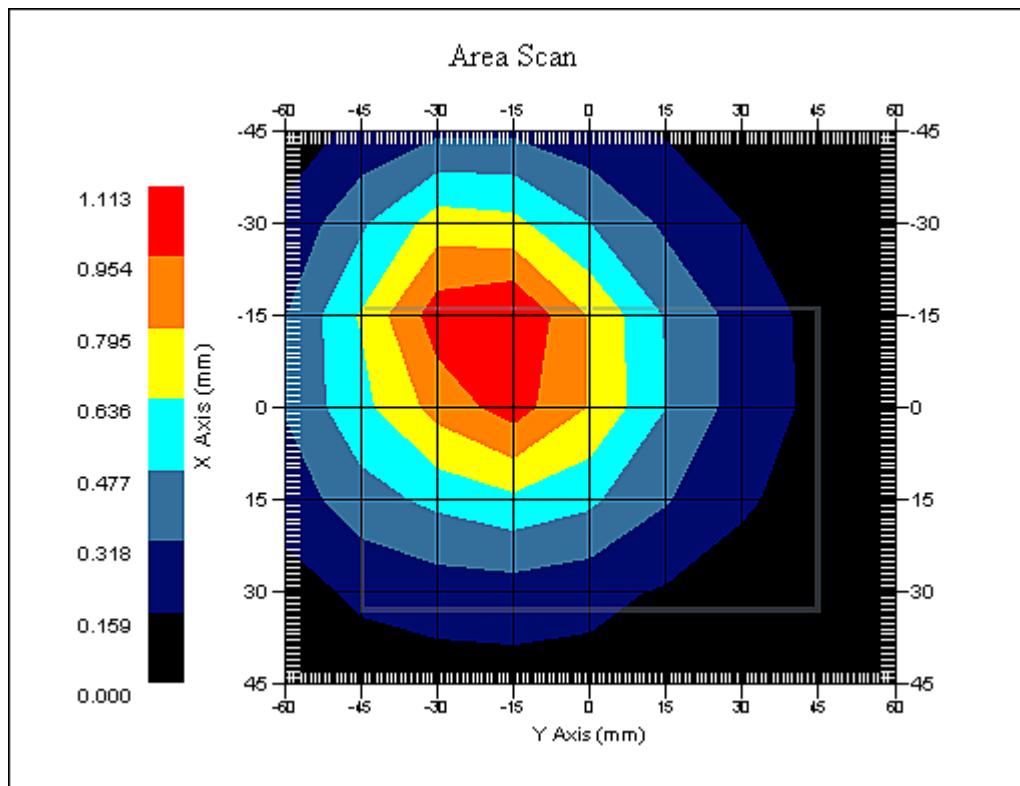
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 4:38:30 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 A : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.091 W/kg  
10 gram SAR value : 0.749 W/kg  
Area Scan Peak SAR : 1.113 W/kg  
Zoom Scan Peak SAR : 1.481 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 05:22:44 PM  
End Time : 10-Sep-2011 05:41:29 PM  
Scanning Time : 1125 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.994 W/kg  
Power Drift-Finish: 0.999 W/kg  
Power Drift (%) : 0.551

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

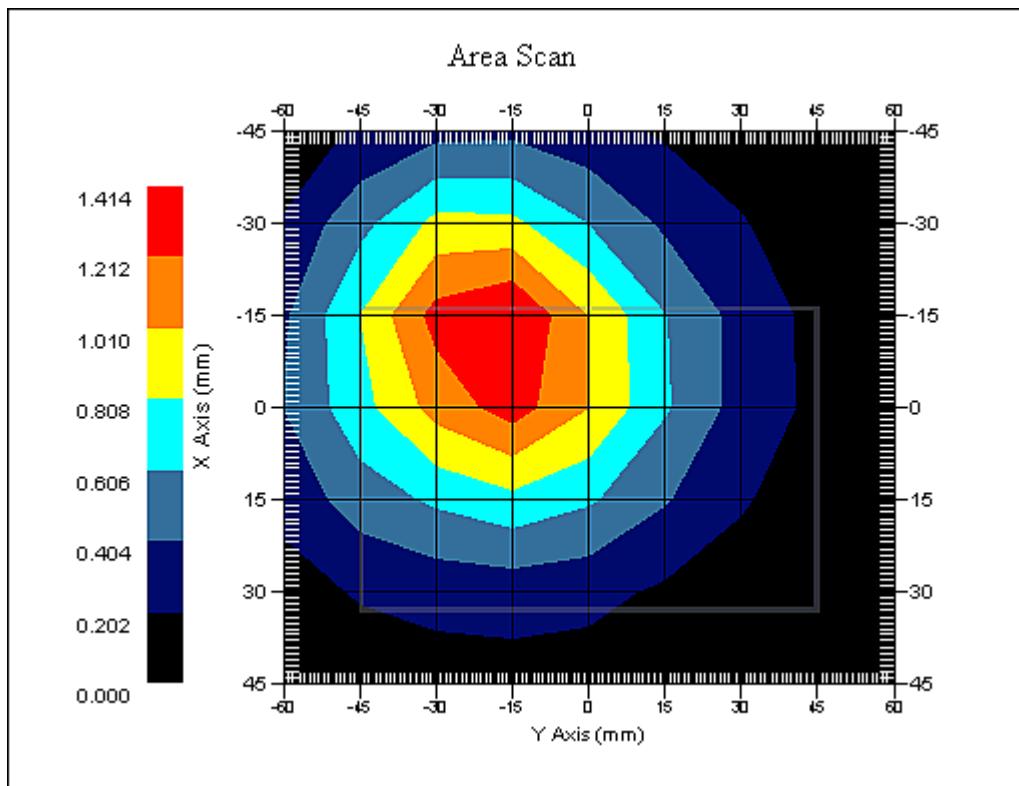
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

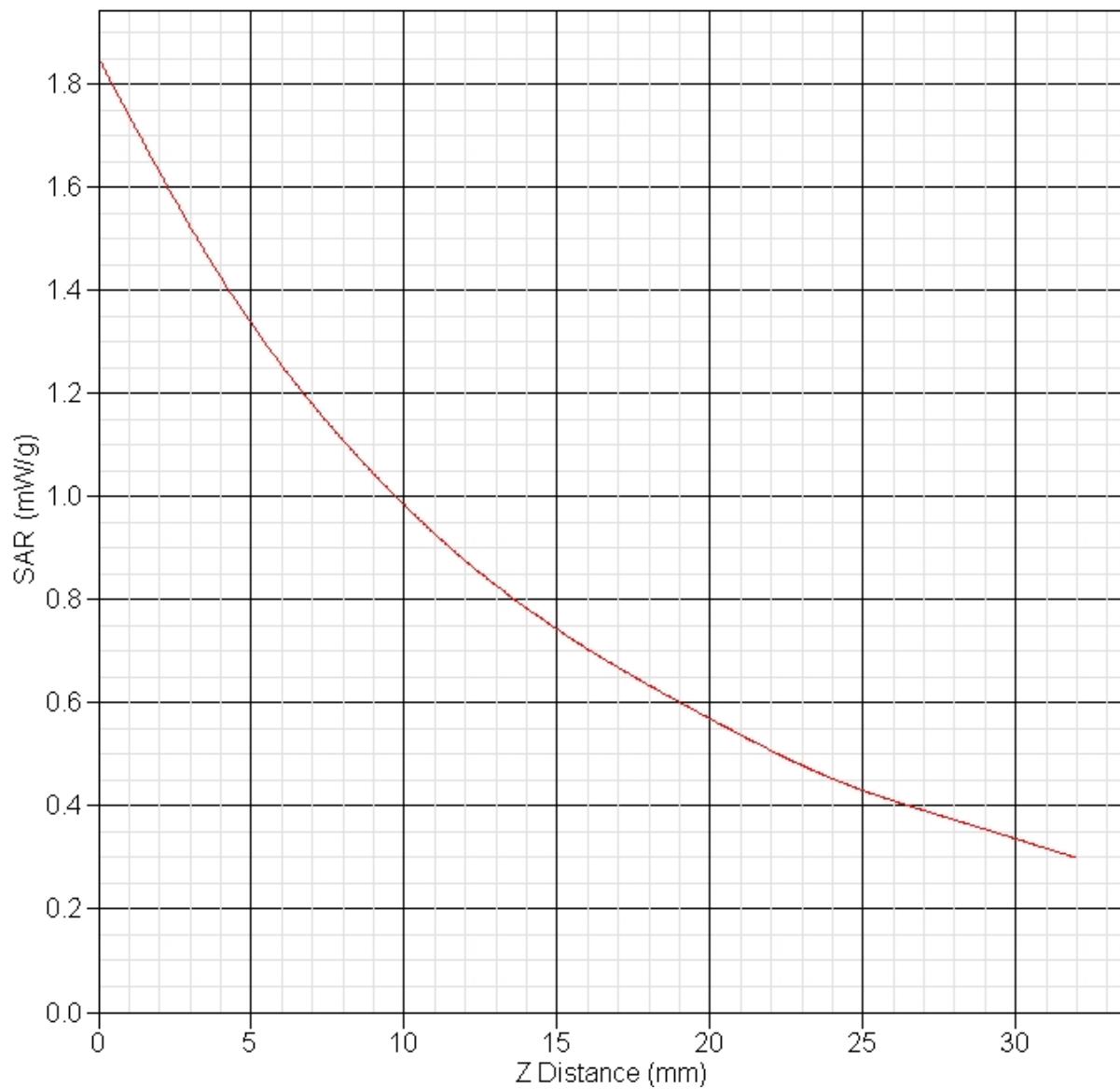
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 4:38:30 PM  
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side A : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.338 W/kg  
10 gram SAR value : 0.921 W/kg  
Area Scan Peak SAR : 1.413 W/kg  
Zoom Scan Peak SAR : 1.851 W/kg

**SAR-Z Axis**  
at Hotspot x:8.12 y:-22.94

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 05:01:38 PM  
End Time : 10-Sep-2011 05:20:25 PM  
Scanning Time : 1127 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A : RB Size - 1 RB : Offset - 0  
Power Drift-Start : 0.856 W/kg  
Power Drift-Finish: 0.821 W/kg  
Power Drift (%) : -4.124

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

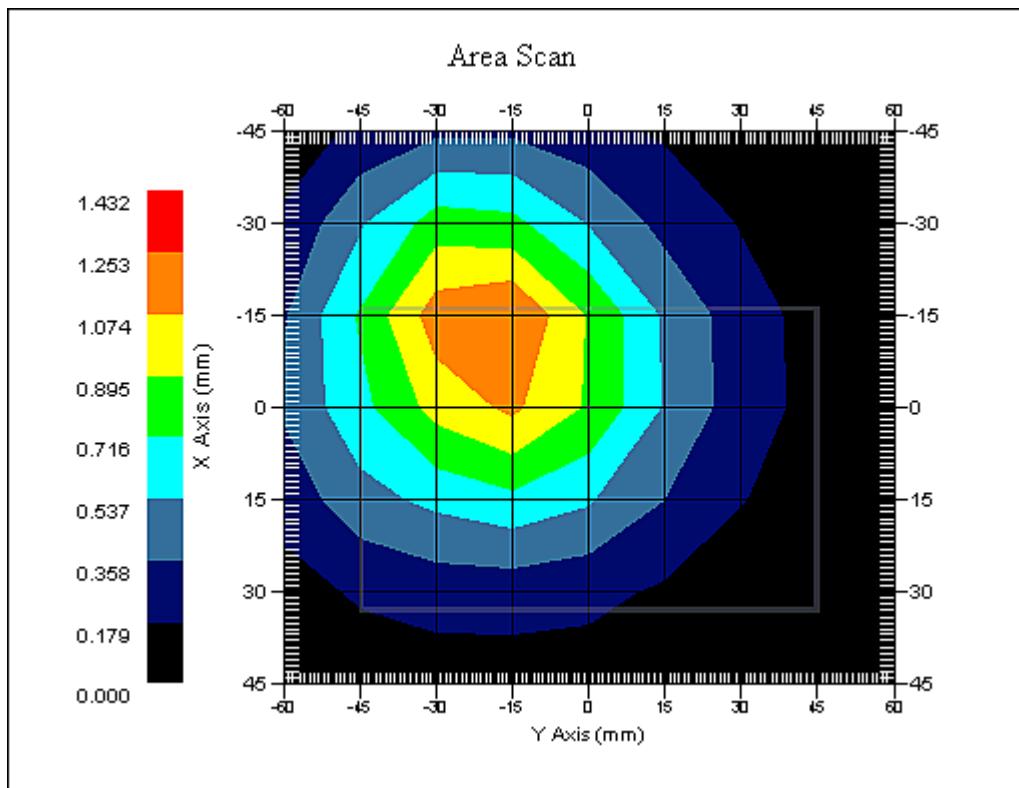
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 4:38:30 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 A : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.152 W/kg  
10 gram SAR value : 0.798 W/kg  
Area Scan Peak SAR : 1.256 W/kg  
Zoom Scan Peak SAR : 1.771 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 05:43:24 PM  
End Time : 10-Sep-2011 06:02:15 PM  
Scanning Time : 1131 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.650 W/kg  
Power Drift-Finish: 0.666 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

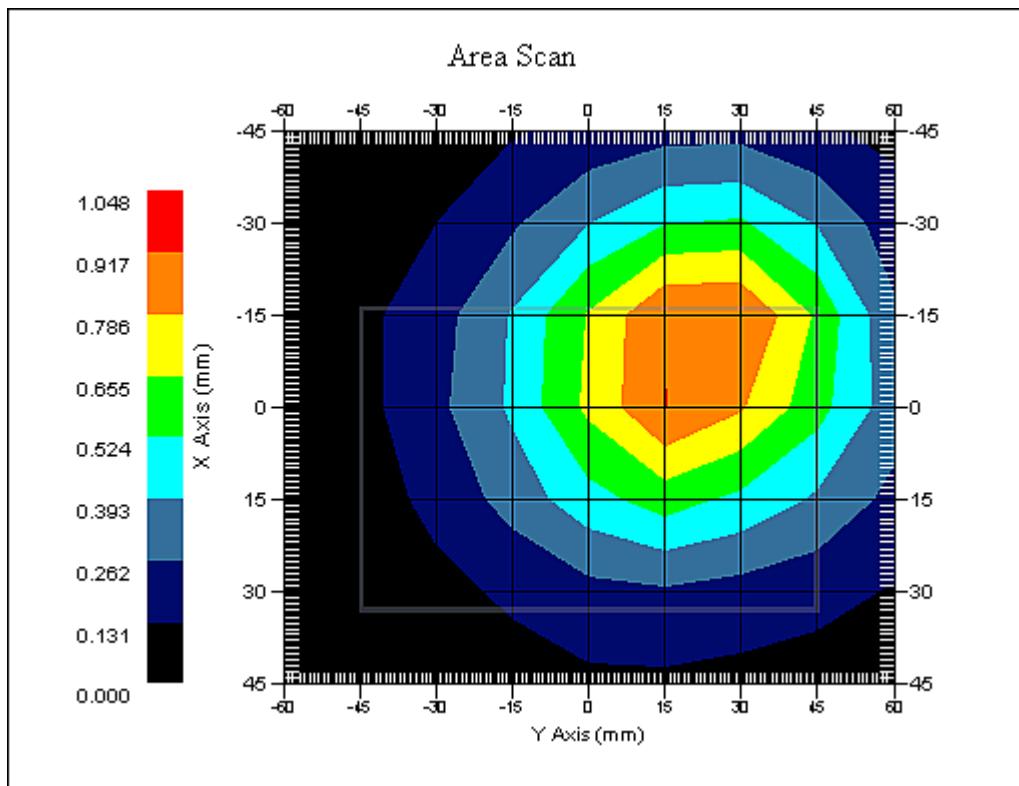
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 4:38:30 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 B : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.960 W/kg  
10 gram SAR value : 0.667 W/kg  
Area Scan Peak SAR : 0.919 W/kg  
Zoom Scan Peak SAR : 1.311 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 06:26:55 PM  
End Time : 10-Sep-2011 06:45:50 PM  
Scanning Time : 1135 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.843 W/kg  
Power Drift-Finish: 0.835 W/kg  
Power Drift (%) : -0.981

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

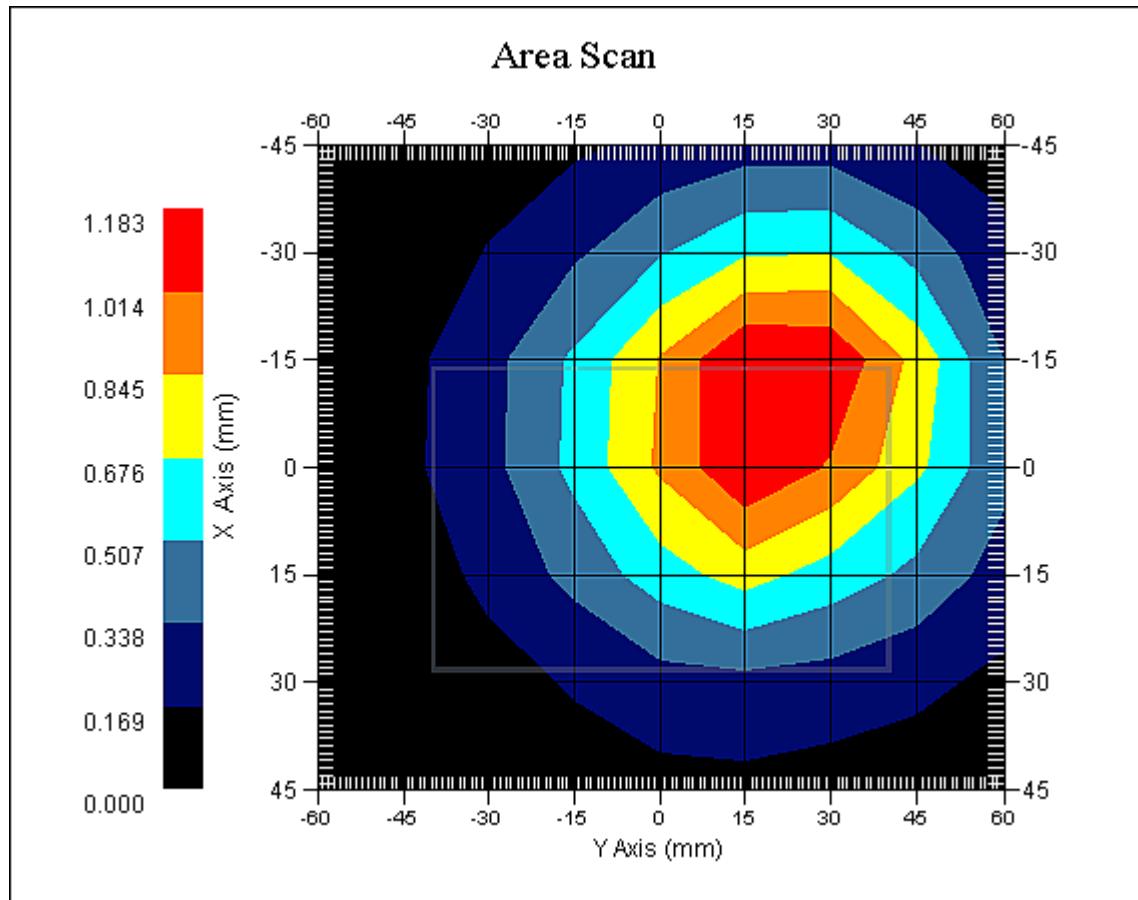
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 4:38:30 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 B : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.206 W/kg  
10 gram SAR value : 0.824 W/kg  
Area Scan Peak SAR : 1.183 W/kg  
Zoom Scan Peak SAR : 1.661 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 06:05:20 PM  
End Time : 10-Sep-2011 06:24:01 PM  
Scanning Time : 1121 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B : RB Size - 1 RB : Offset - 0  
Power Drift-Start : 0.723 W/kg  
Power Drift-Finish: 0.711 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

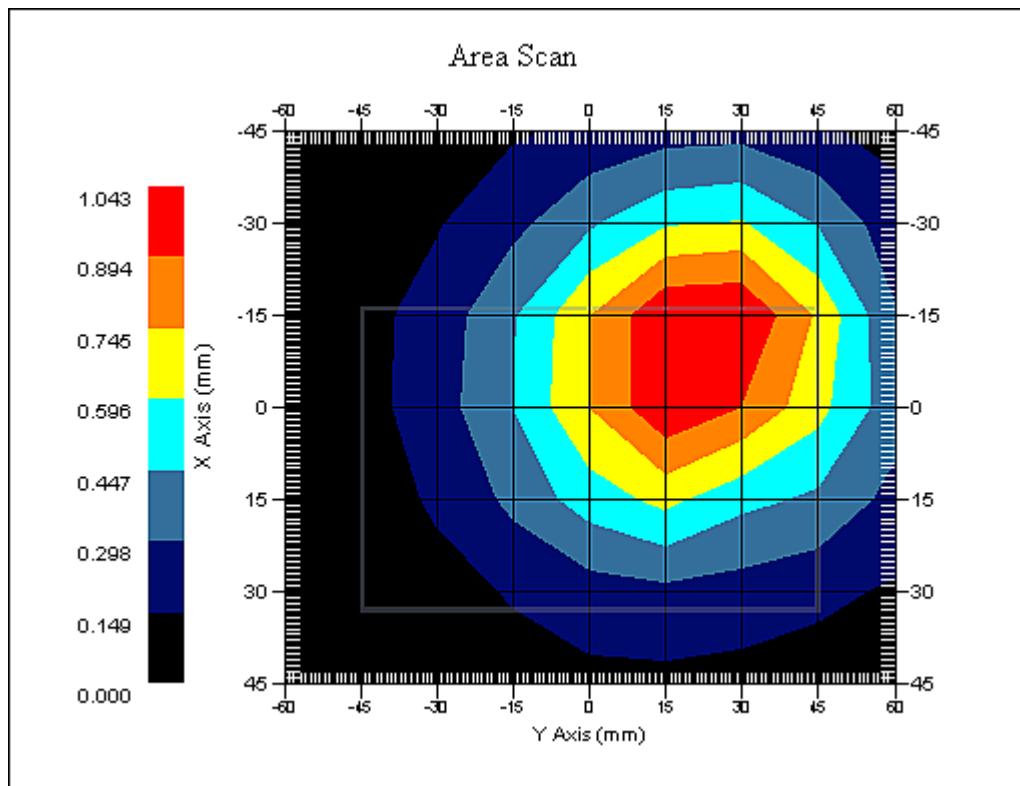
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 4:38:30 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 B : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 1.045 W/kg  
10 gram SAR value : 0.714 W/kg  
Area Scan Peak SAR : 1.043 W/kg  
Zoom Scan Peak SAR : 1.521 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 06:57:53 PM  
End Time : 10-Sep-2011 07:11:54 PM  
Scanning Time : 841 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.208 W/kg  
Power Drift-Finish: 0.204 W/kg  
Power Drift (%) : -1.943

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

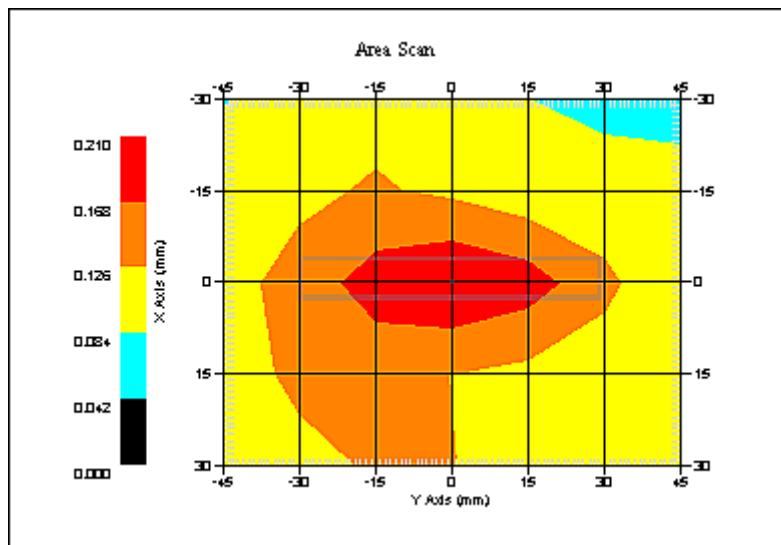
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.192 W/kg  
10 gram SAR value : 0.132 W/kg  
Area Scan Peak SAR : 0.208 W/kg  
Zoom Scan Peak SAR : 0.290 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 07:31:09 PM  
End Time : 10-Sep-2011 07:44:55 PM  
Scanning Time : 826 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.235 W/kg  
Power Drift-Finish: 0.240 W/kg  
Power Drift (%) : 2.301

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

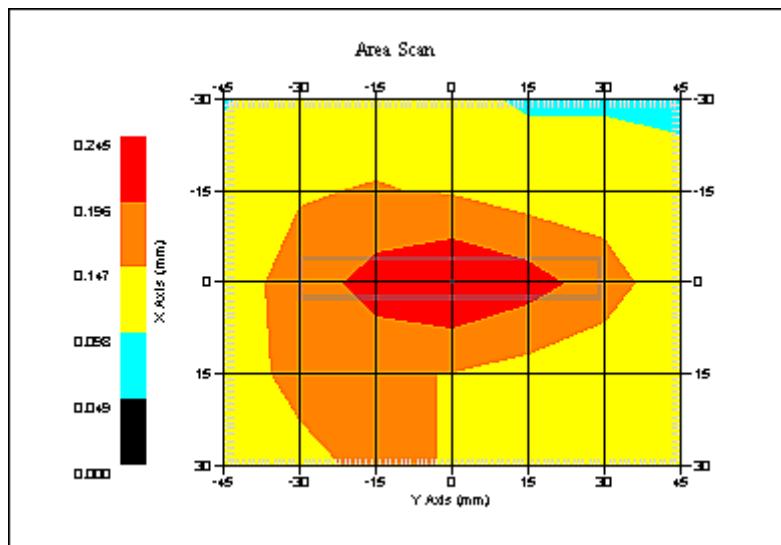
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.223 W/kg  
10 gram SAR value : 0.152 W/kg  
Area Scan Peak SAR : 0.244 W/kg  
Zoom Scan Peak SAR : 0.340 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 07:14:03 PM  
End Time : 10-Sep-2011 07:27:57 PM  
Scanning Time : 834 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C : RB Size - 1 RB : Offset - 0  
Power Drift-Start : 0.229 W/kg  
Power Drift-Finish: 0.232 W/kg  
Power Drift (%) : 0.996

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

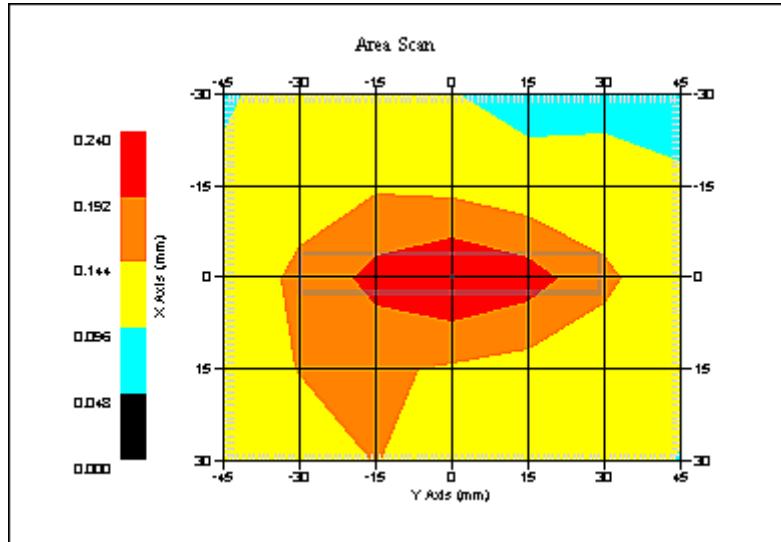
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.212 W/kg  
10 gram SAR value : 0.147 W/kg  
Area Scan Peak SAR : 0.240 W/kg  
Zoom Scan Peak SAR : 0.310 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 09:02:13 PM  
End Time : 10-Sep-2011 09:17:53 PM  
Scanning Time : 940 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.348 W/kg  
Power Drift-Finish: 0.350 W/kg  
Power Drift (%) : 0.526

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

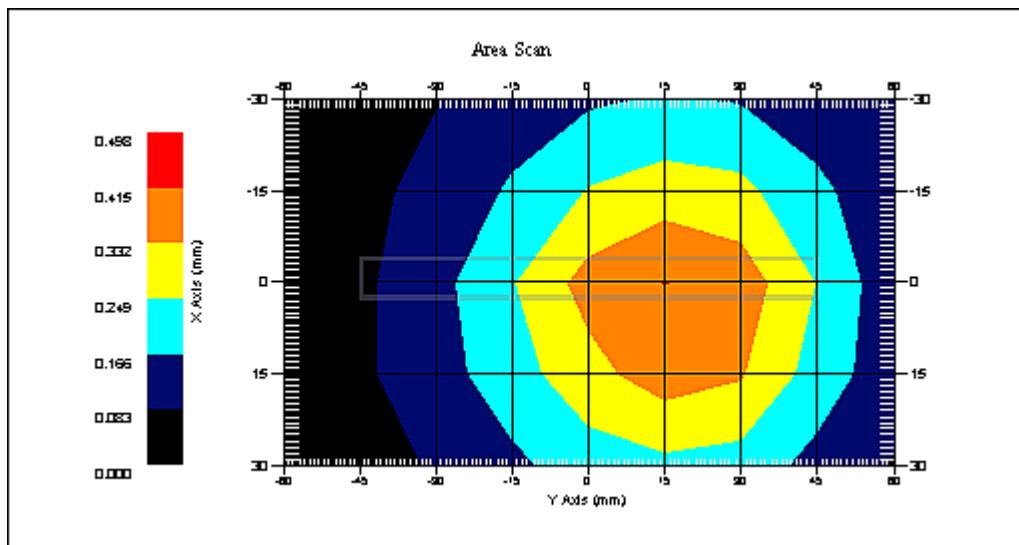
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.403 W/kg  
10 gram SAR value : 0.292 W/kg  
Area Scan Peak SAR : 0.417 W/kg  
Zoom Scan Peak SAR : 0.510 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 09:40:52 PM  
End Time : 10-Sep-2011 09:56:24 PM  
Scanning Time : 932 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.445 W/kg  
Power Drift-Finish: 0.453 W/kg  
Power Drift (%) : 1.777

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

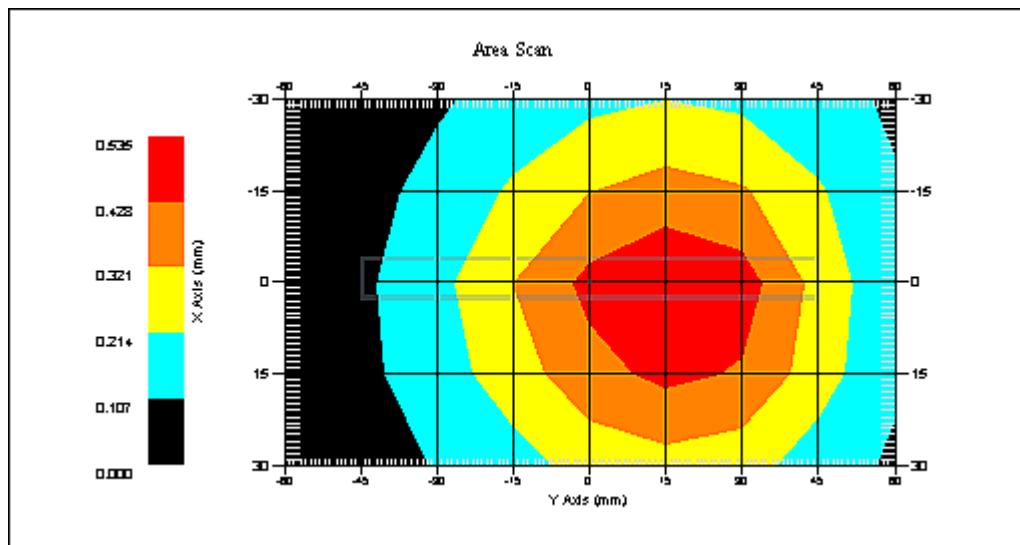
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.508 W/kg  
10 gram SAR value : 0.364 W/kg  
Area Scan Peak SAR : 0.535 W/kg  
Zoom Scan Peak SAR : 0.680 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 09:21:08 PM  
End Time : 10-Sep-2011 09:36:38 PM  
Scanning Time : 930 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D : RB Size - 1 RB : Offset - 0  
Power Drift-Start : 0.374 W/kg  
Power Drift-Finish: 0.378 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

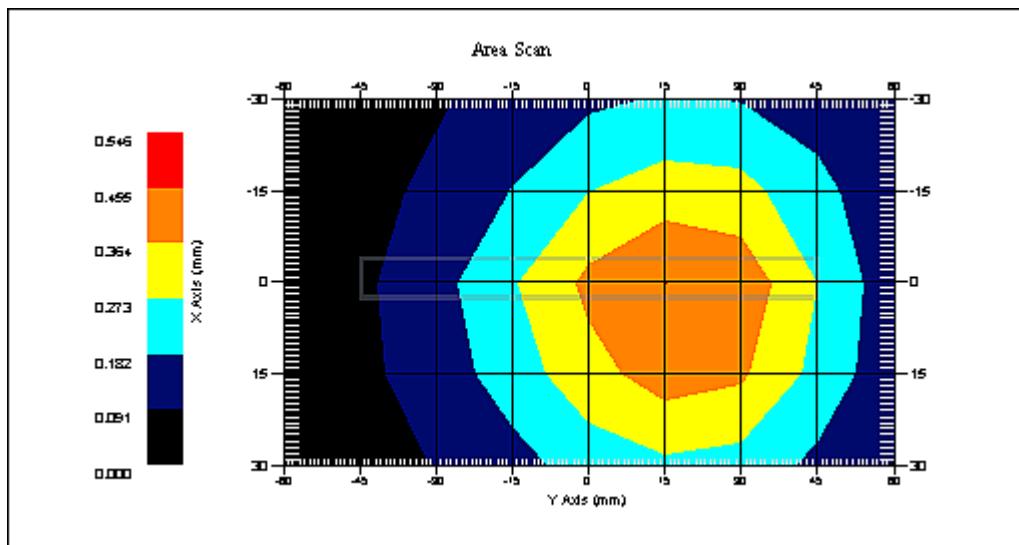
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.444 W/kg  
10 gram SAR value : 0.320 W/kg  
Area Scan Peak SAR : 0.456 W/kg  
Zoom Scan Peak SAR : 0.590 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 07:47:58 PM  
End Time : 10-Sep-2011 08:03:37 PM  
Scanning Time : 939 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.431 W/kg  
Power Drift-Finish: 0.439 W/kg  
Power Drift (%) : 1.990

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

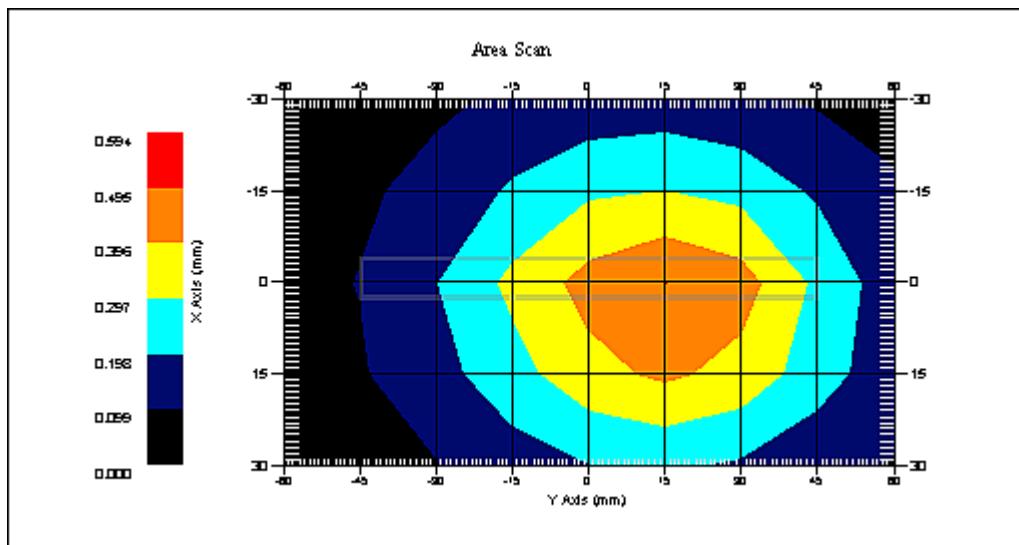
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.469 W/kg  
10 gram SAR value : 0.328 W/kg  
Area Scan Peak SAR : 0.496 W/kg  
Zoom Scan Peak SAR : 0.620 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 08:43:46 PM  
End Time : 10-Sep-2011 08:59:19 PM  
Scanning Time : 933 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.624 W/kg  
Power Drift-Finish: 0.615 W/kg  
Power Drift (%) : -1.336

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

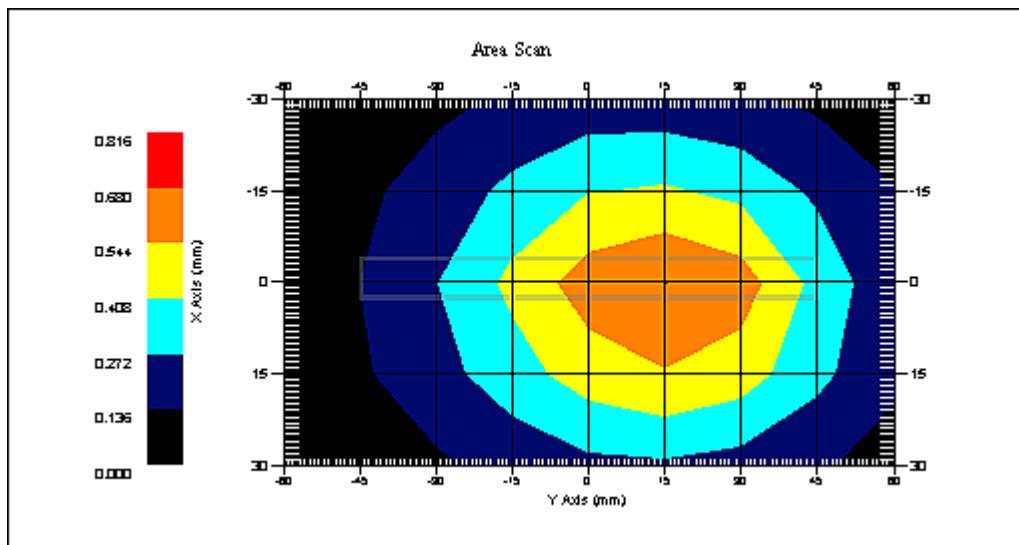
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.643 W/kg  
10 gram SAR value : 0.442 W/kg  
Area Scan Peak SAR : 0.681 W/kg  
Zoom Scan Peak SAR : 0.890 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 10-Sep-2011  
Starting Time : 10-Sep-2011 08:07:12 PM  
End Time : 10-Sep-2011 08:22:44 PM  
Scanning Time : 932 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : QPSK - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F : RB Size - 1 RB : Offset - 0  
Power Drift-Start : 0.468 W/kg  
Power Drift-Finish: 0.470 W/kg  
Power Drift (%) : 0.507

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 10-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 55.05 F/m  
Sigma : 0.99 S/m  
Density : 1000.00 kg/cu. m

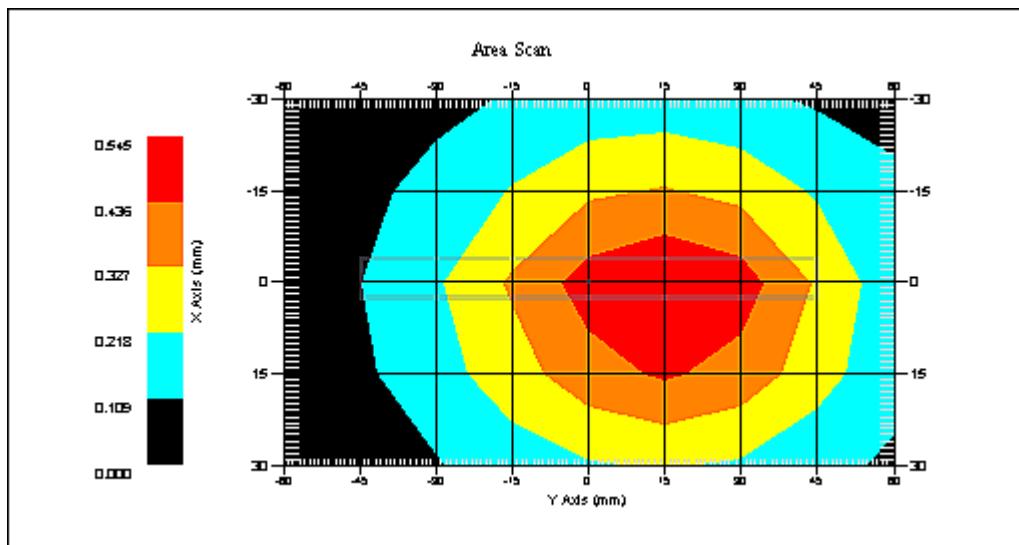
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 10-Sep-2011  
Set-up Time : 6:54:13 PM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.517 W/kg  
10 gram SAR value : 0.367 W/kg  
Area Scan Peak SAR : 0.544 W/kg  
Zoom Scan Peak SAR : 0.700 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 07:30:07 AM  
End Time : 11-Sep-2011 07:50:38 AM  
Scanning Time : 1231 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.296 W/kg  
Power Drift-Finish: 0.306 W/kg  
Power Drift (%) : 3.347

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

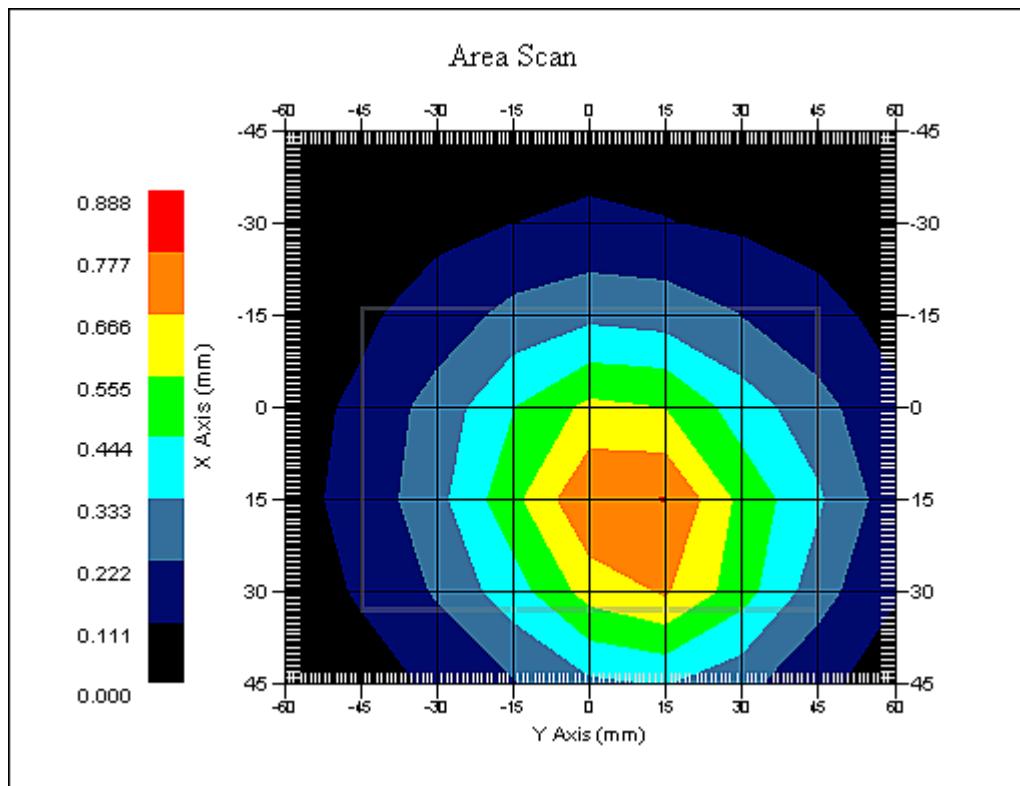
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 7:28:46 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 : Side A : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.761 W/kg  
10 gram SAR value : 0.519 W/kg  
Area Scan Peak SAR : 0.779 W/kg  
Zoom Scan Peak SAR : 1.071 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 08:15:40 AM  
End Time : 11-Sep-2011 08:36:08 AM  
Scanning Time : 1228 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.389 W/kg  
Power Drift-Finish: 0.386 W/kg  
Power Drift (%) : -0.847

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

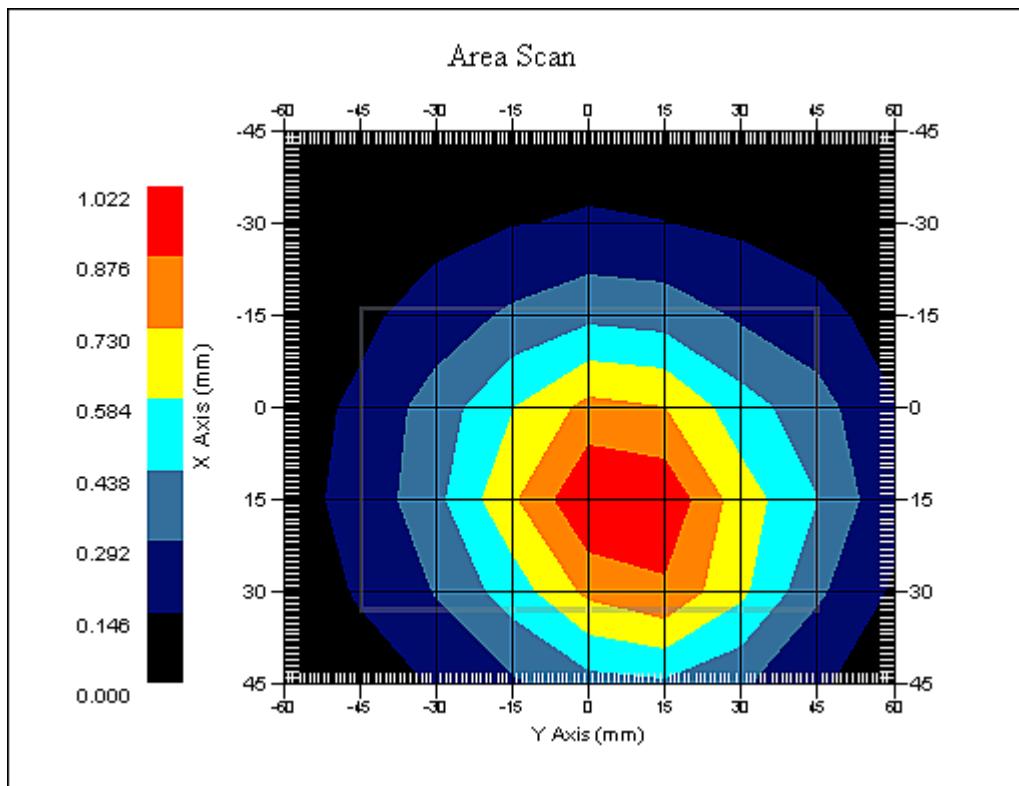
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 7:28:46 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 : Side A : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.956 W/kg  
10 gram SAR value : 0.643 W/kg  
Area Scan Peak SAR : 1.019 W/kg  
Zoom Scan Peak SAR : 1.281 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 07:52:46 AM  
End Time : 11-Sep-2011 08:13:05 AM  
Scanning Time : 1219 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A : RB Size - 1 RB : Offset - 0  
Power Drift-Start : 0.341 W/kg  
Power Drift-Finish: 0.330 W/kg  
Power Drift (%) : -3.243

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

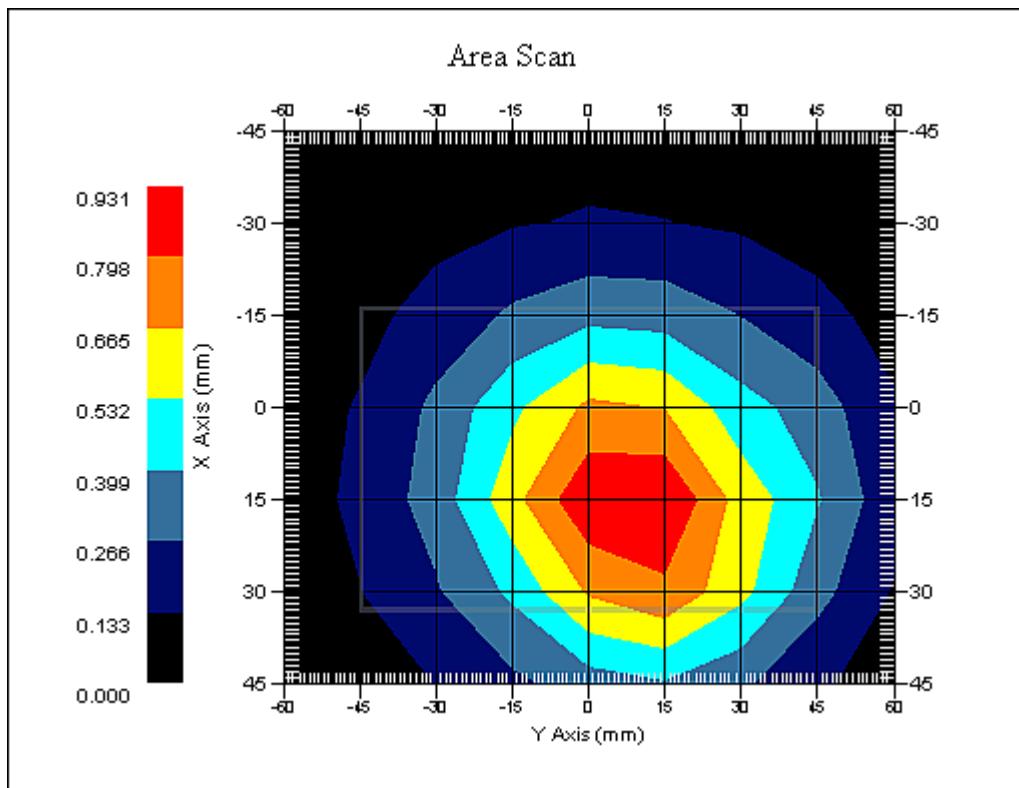
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 7:28:46 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 : Side A : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.872 W/kg  
10 gram SAR value : 0.612 W/kg  
Area Scan Peak SAR : 0.930 W/kg  
Zoom Scan Peak SAR : 1.201 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 08:38:56 AM  
End Time : 11-Sep-2011 08:59:14 AM  
Scanning Time : 1218 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.555 W/kg  
Power Drift-Finish: 0.582 W/kg  
Power Drift (%) : 4.887

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

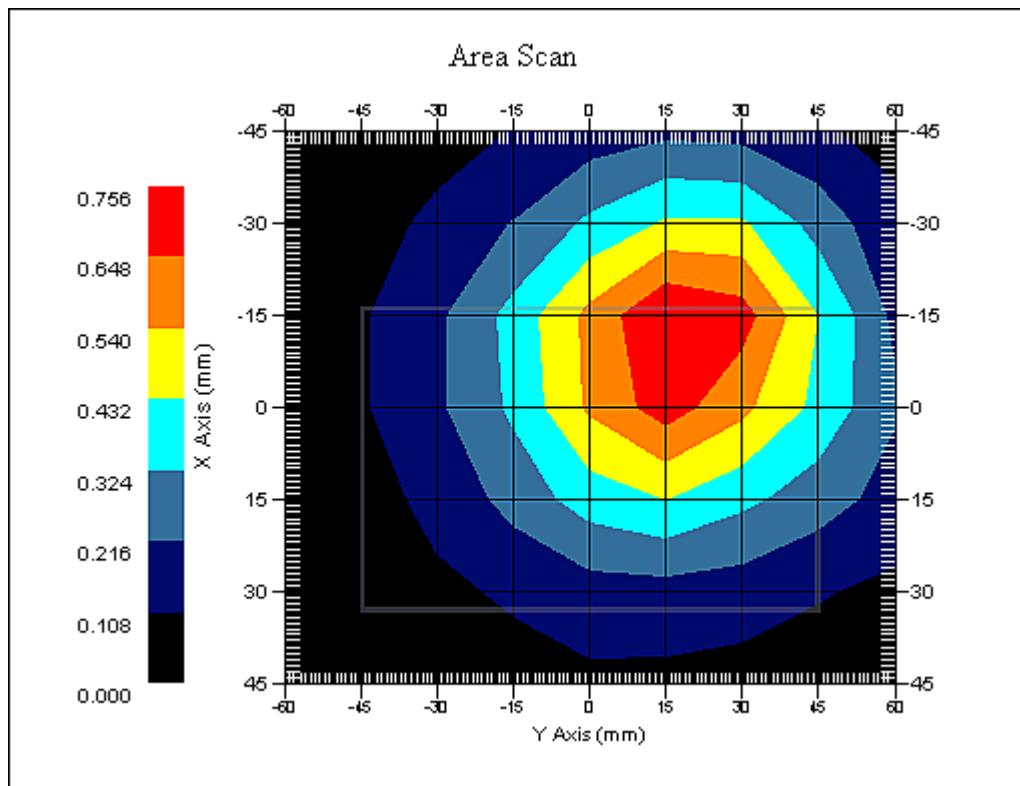
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 7:28:46 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 : Side B : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.733 W/kg  
10 gram SAR value : 0.507 W/kg  
Area Scan Peak SAR : 0.754 W/kg  
Zoom Scan Peak SAR : 0.990 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 09:25:32 AM  
End Time : 11-Sep-2011 09:46:10 AM  
Scanning Time : 1238 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.758 W/kg  
Power Drift-Finish: 0.765 W/kg  
Power Drift (%) : 0.918

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

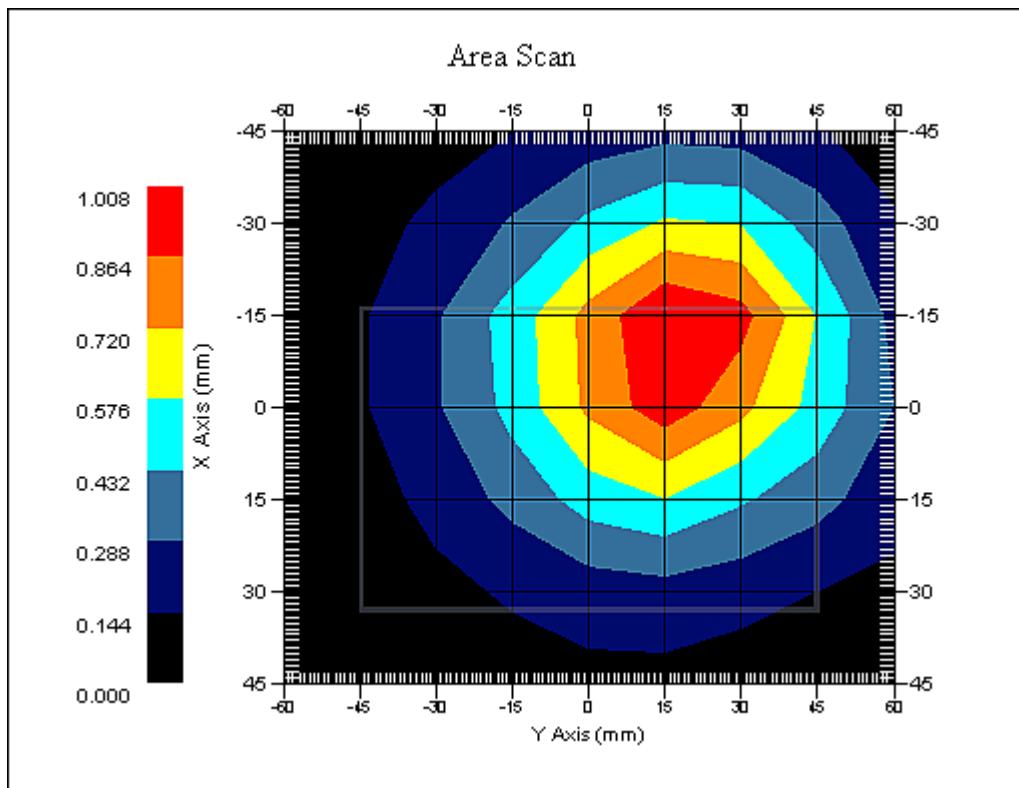
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

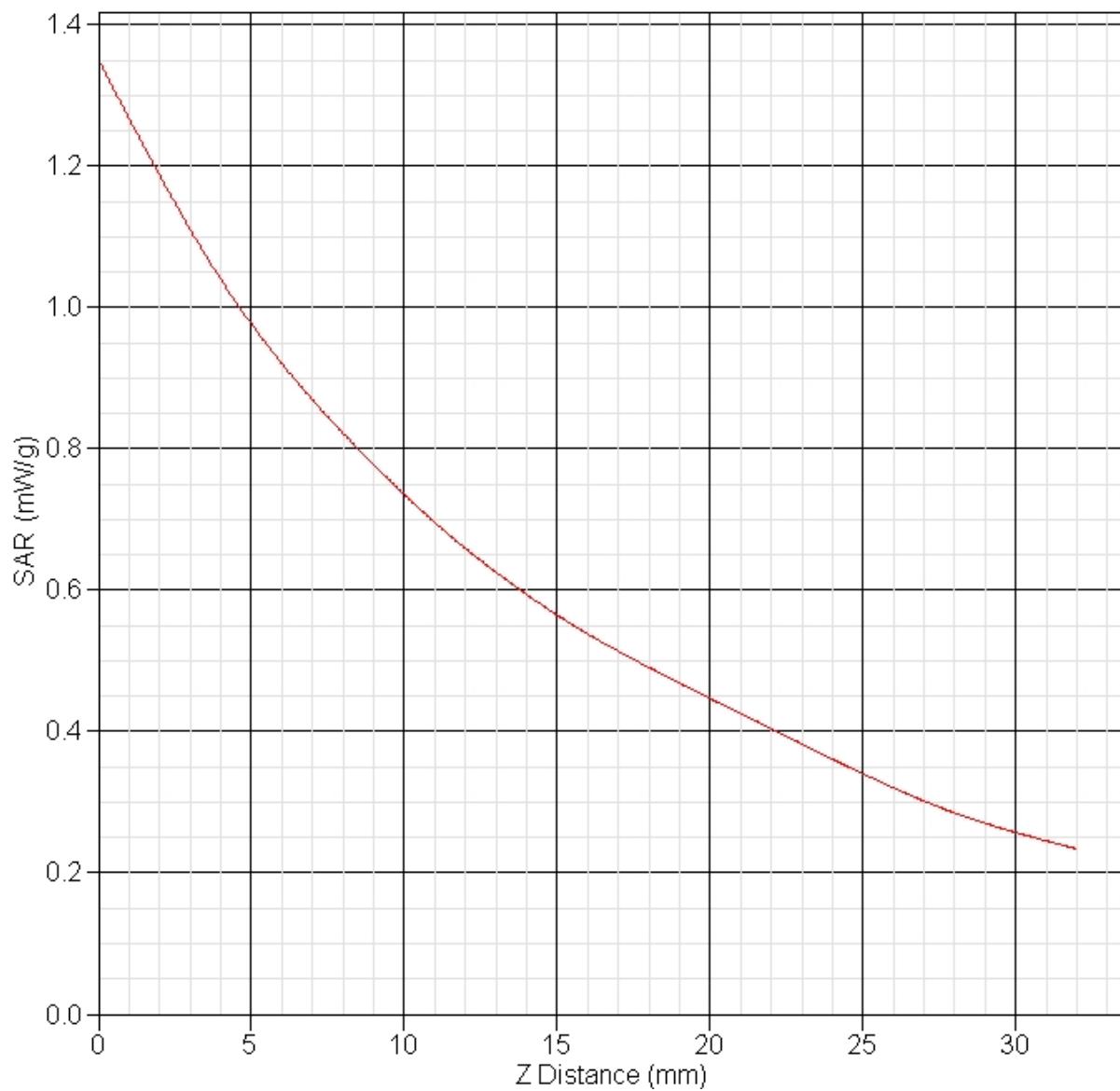
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 7:28:46 AM  
Area Scan : 7x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side B : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.972 W/kg  
10 gram SAR value : 0.656 W/kg  
Area Scan Peak SAR : 1.006 W/kg  
Zoom Scan Peak SAR : 1.351 W/kg

**SAR-Z Axis**  
at Hotspot x:8.11 y:15.05

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 09:01:51 AM  
End Time : 11-Sep-2011 09:22:03 AM  
Scanning Time : 1212 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.646 W/kg  
Power Drift-Finish: 0.620 W/kg  
Power Drift (%) : -3.985

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

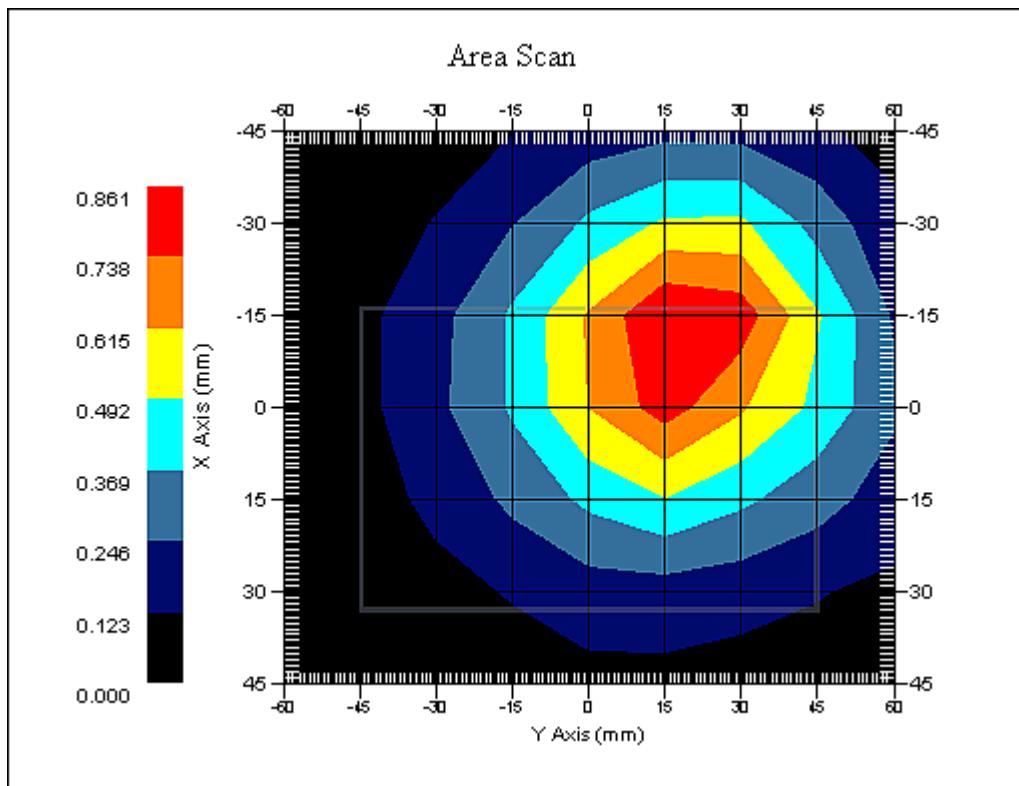
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 7:28:46 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 : Side B : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.814 W/kg  
10 gram SAR value : 0.548 W/kg  
Area Scan Peak SAR : 0.859 W/kg  
Zoom Scan Peak SAR : 1.191 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 10:02:52 AM  
End Time : 11-Sep-2011 10:17:38 AM  
Scanning Time : 886 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.154 W/kg  
Power Drift-Finish: 0.159 W/kg  
Power Drift (%) : 3.485

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

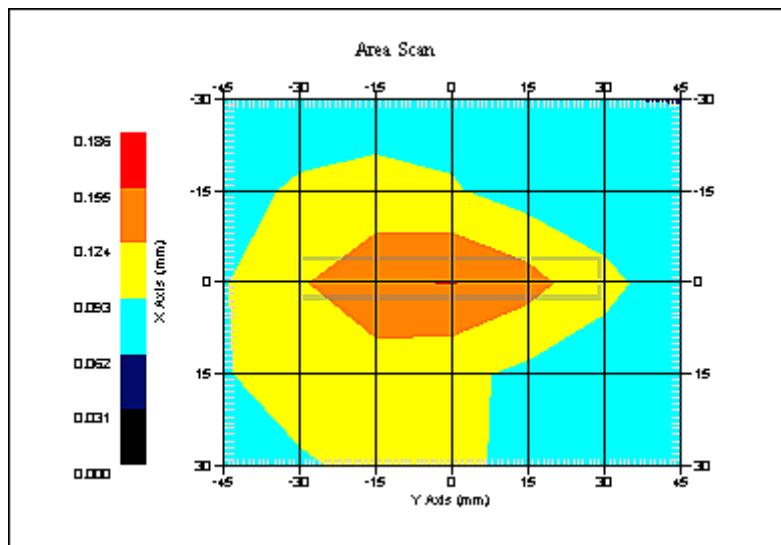
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 7:28:46 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.150 W/kg  
10 gram SAR value : 0.107 W/kg  
Area Scan Peak SAR : 0.156 W/kg  
Zoom Scan Peak SAR : 0.190 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 11:01:52 AM  
End Time : 11-Sep-2011 11:15:54 AM  
Scanning Time : 842 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.171 W/kg  
Power Drift-Finish: 0.178 W/kg  
Power Drift (%) : 4.200

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

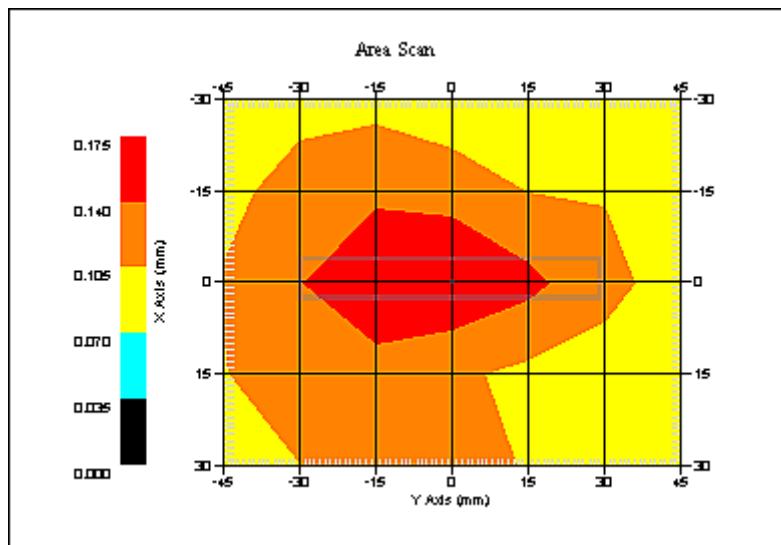
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 11:01:36 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.172 W/kg  
10 gram SAR value : 0.122 W/kg  
Area Scan Peak SAR : 0.174 W/kg  
Zoom Scan Peak SAR : 0.240 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 10:27:46 AM  
End Time : 11-Sep-2011 10:41:45 AM  
Scanning Time : 839 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side C : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.167 W/kg  
Power Drift-Finish: 0.161 W/kg  
Power Drift (%) : -3.599

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

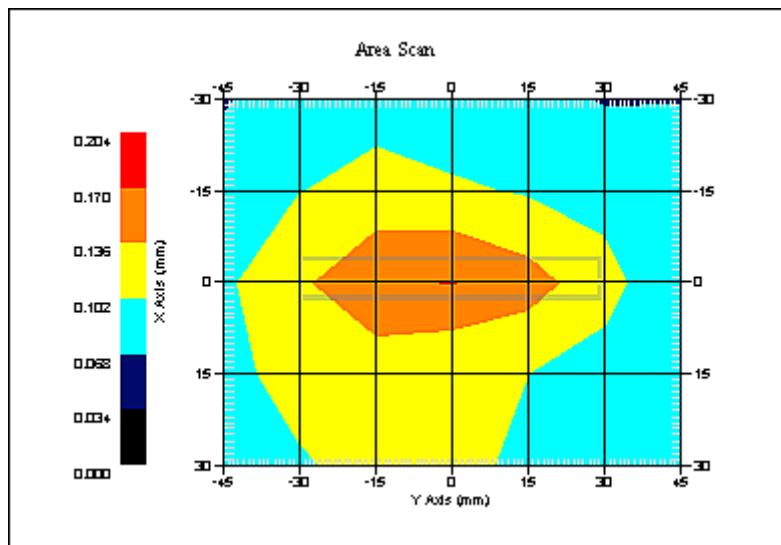
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 7:28:46 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side C : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.168 W/kg  
10 gram SAR value : 0.119 W/kg  
Area Scan Peak SAR : 0.171 W/kg  
Zoom Scan Peak SAR : 0.230 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 12:18:38 PM  
End Time : 11-Sep-2011 12:34:13 PM  
Scanning Time : 935 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.283 W/kg  
Power Drift-Finish: 0.282 W/kg  
Power Drift (%) : -0.315

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

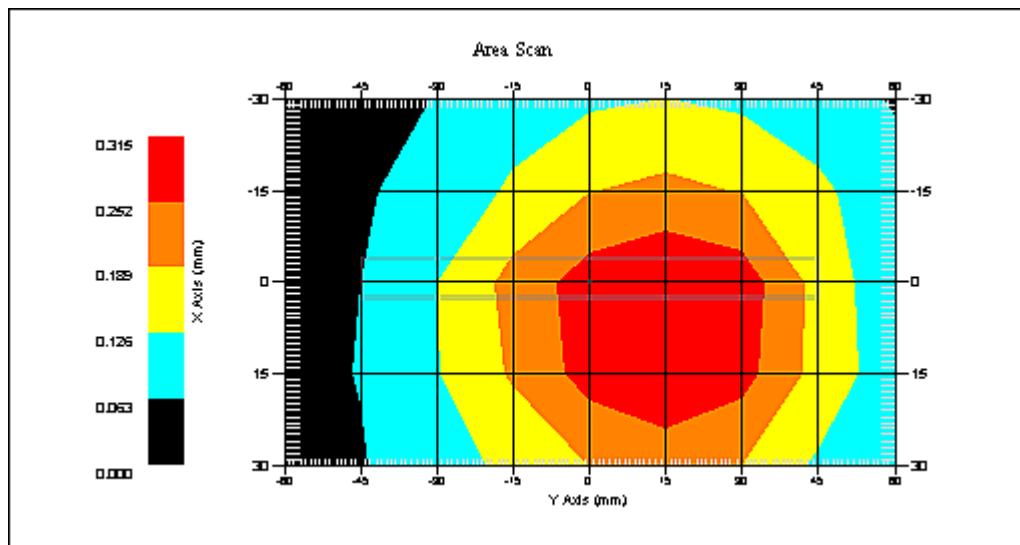
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 11:01:36 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.331 W/kg  
10 gram SAR value : 0.241 W/kg  
Area Scan Peak SAR : 0.315 W/kg  
Zoom Scan Peak SAR : 0.450 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 12:58:02 PM  
End Time : 11-Sep-2011 01:13:39 PM  
Scanning Time : 937 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.396 W/kg  
Power Drift-Finish: 0.393 W/kg  
Power Drift (%) : -0.766

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

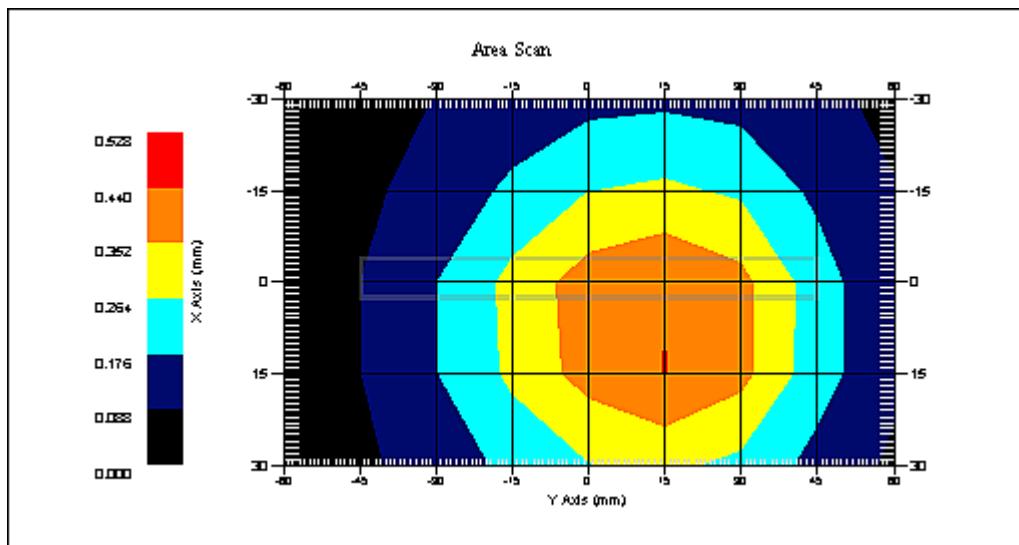
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 11:01:36 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.445 W/kg  
10 gram SAR value : 0.330 W/kg  
Area Scan Peak SAR : 0.442 W/kg  
Zoom Scan Peak SAR : 0.580 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 12:37:56 PM  
End Time : 11-Sep-2011 12:53:37 PM  
Scanning Time : 941 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side D : RB Size - 1 RB : Offset - 0  
Power Drift-Start : 0.315 W/kg  
Power Drift-Finish: 0.314 W/kg  
Power Drift (%) : -0.284

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

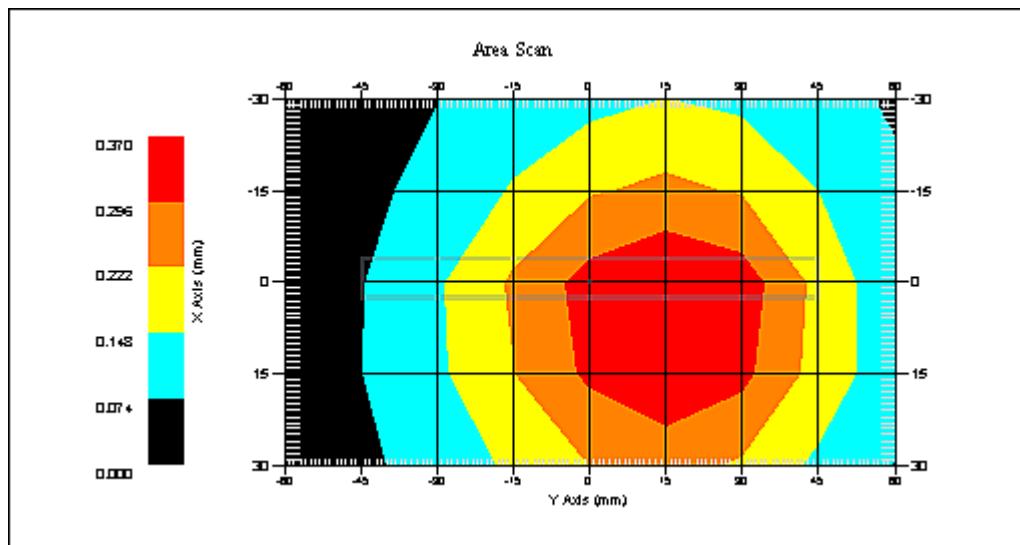
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 11:01:36 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side D : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.377 W/kg  
10 gram SAR value : 0.271 W/kg  
Area Scan Peak SAR : 0.368 W/kg  
Zoom Scan Peak SAR : 0.510 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 11:20:51 AM  
End Time : 11-Sep-2011 11:36:32 AM  
Scanning Time : 941 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F : RB Size - 25 RB : Offset - 13  
Power Drift-Start : 0.373 W/kg  
Power Drift-Finish: 0.373 W/kg  
Power Drift (%) : -0.001

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

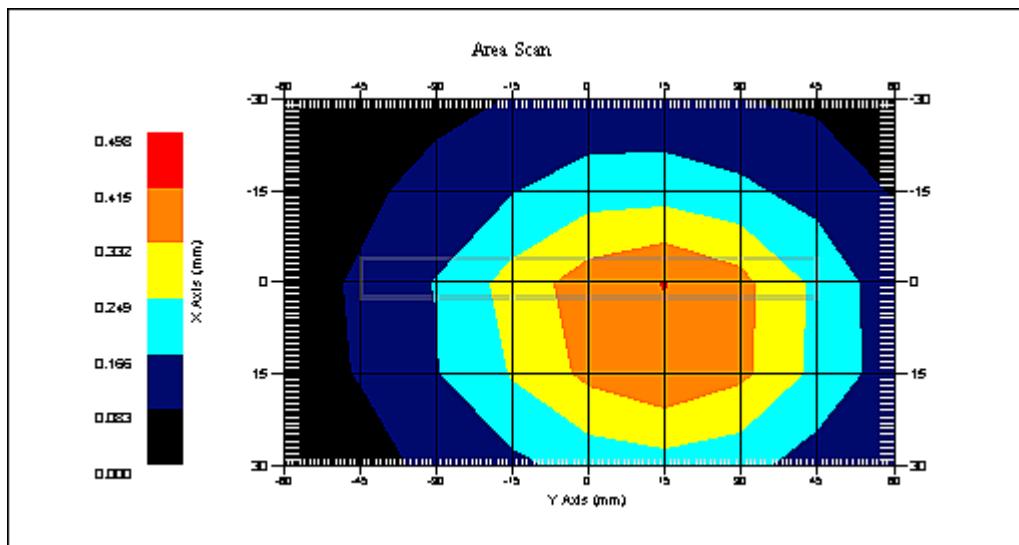
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 11:01:36 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F : RB Size - 25 RB : Offset - 13  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.438 W/kg  
10 gram SAR value : 0.300 W/kg  
Area Scan Peak SAR : 0.417 W/kg  
Zoom Scan Peak SAR : 0.620 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 11:57:58 AM  
End Time : 11-Sep-2011 12:13:37 PM  
Scanning Time : 939 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F : RB Size - 1 RB : Offset - 49  
Power Drift-Start : 0.515 W/kg  
Power Drift-Finish: 0.531 W/kg  
Power Drift (%) : 3.163

## 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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

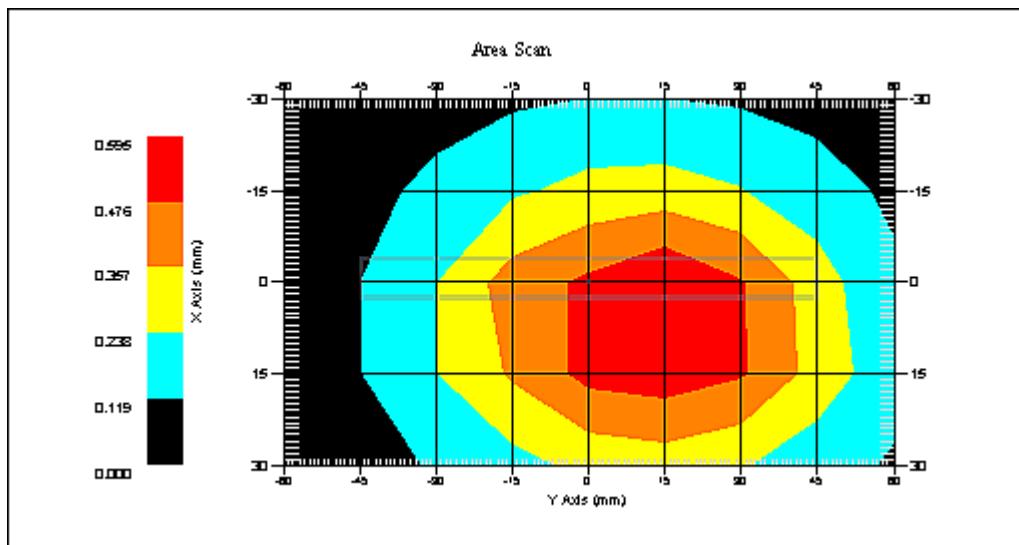
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 11:01:36 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F : RB Size - 1 RB : Offset - 49  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.611 W/kg  
10 gram SAR value : 0.415 W/kg  
Area Scan Peak SAR : 0.594 W/kg  
Zoom Scan Peak SAR : 0.860 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 11-Sep-2011  
Starting Time : 11-Sep-2011 11:39:36 AM  
End Time : 11-Sep-2011 11:55:17 AM  
Scanning Time : 941 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 16QAM - 10 MHz Bandwidth  
Model : MiFi4620L  
Frequency : 782.00 MHz  
Max. Transmit Pwr : 0.295 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F : RB Size - 1 RB : Offset - 0  
Power Drift-Start : 0.416 W/kg  
Power Drift-Finish: 0.419 W/kg  
Power Drift (%) : 0.899

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. : 782  
Frequency : 782.00 MHz  
Last Calib. Date : 11-Sep-2011  
Temperature : 23.00 °C  
Ambient Temp. : 22.00 °C  
Humidity : 42.00 RH%  
Epsilon : 54.91 F/m  
Sigma : 0.98 S/m  
Density : 1000.00 kg/cu. m

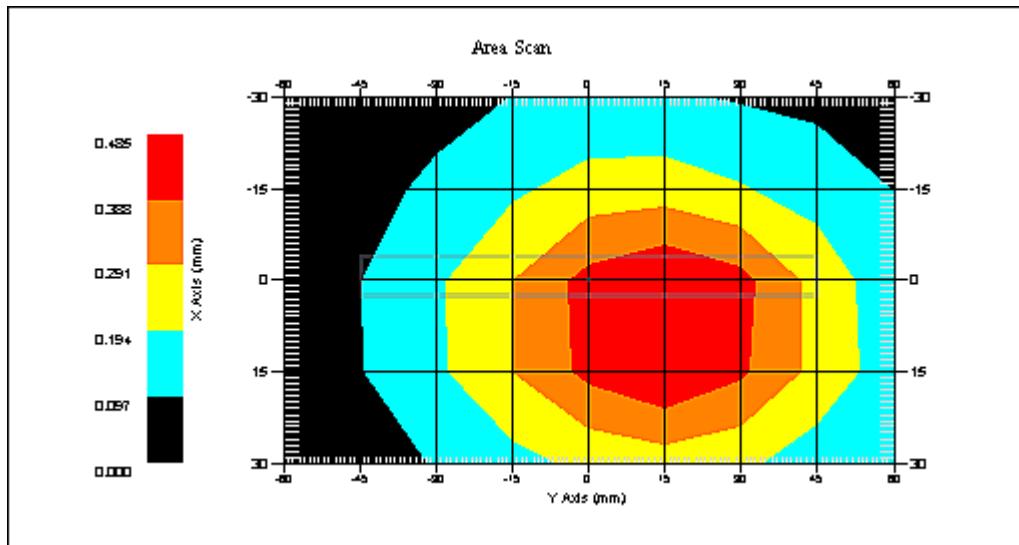
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 750.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 6.3  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 23.00 °C  
Ambient Temp. : 22.00 °C  
Set-up Date : 11-Sep-2011  
Set-up Time : 11:01:36 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F : RB Size - 1 RB : Offset - 0  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.481 W/kg  
10 gram SAR value : 0.332 W/kg  
Area Scan Peak SAR : 0.483 W/kg  
Zoom Scan Peak SAR : 0.650 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 12-Sep-2011  
Starting Time : 12-Sep-2011 09:52:41 AM  
End Time : 12-Sep-2011 10:23:22 AM  
Scanning Time : 1841 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 802.11b  
Model : MiFi4620L  
Frequency : 2450.00 MHz  
Max. Transmit Pwr : 0.056 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side A  
Power Drift-Start : 0.113 W/kg  
Power Drift-Finish: 0.113 W/kg  
Power Drift (%) : 0.170

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 : 12-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 46.00 RH%  
Epsilon : 52.23 F/m  
Sigma : 1.97 S/m  
Density : 1000.00 kg/cu. m

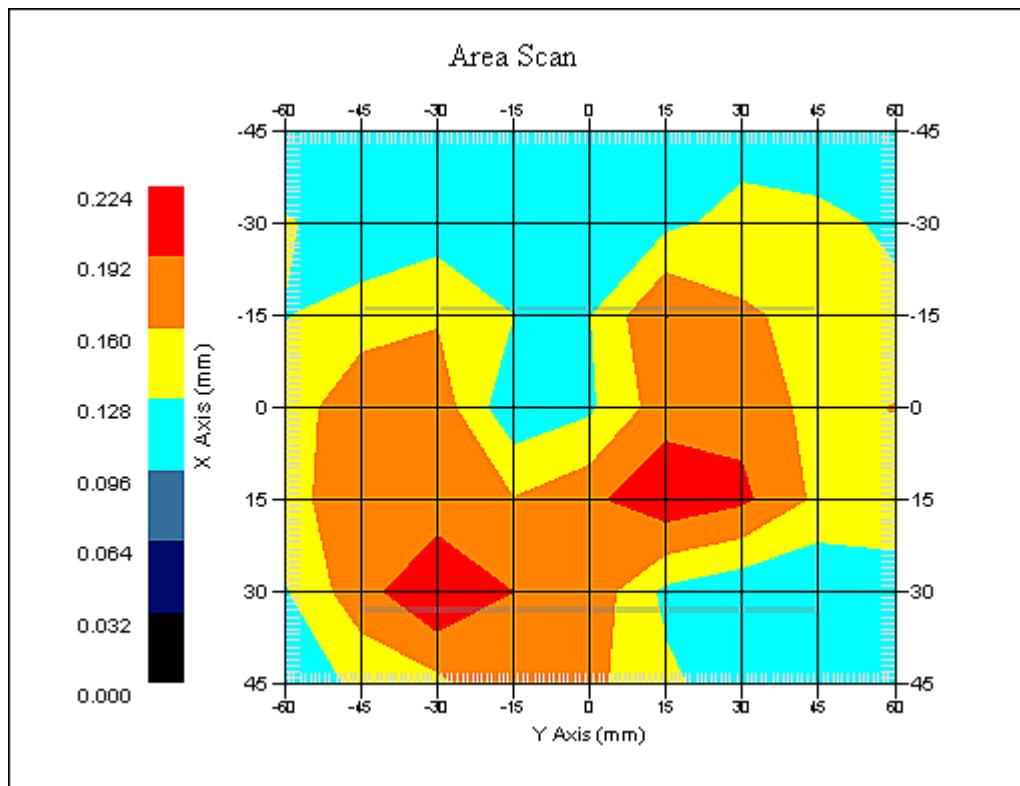
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 2450.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 3.94  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 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-Sep-2011  
Set-up Time : 9:26:08 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 : Side A  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.173 W/kg  
10 gram SAR value : 0.141 W/kg  
Area Scan Peak SAR : 0.222 W/kg  
Zoom Scan Peak SAR : 0.370 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 12-Sep-2011  
Starting Time : 12-Sep-2011 08:59:45 AM  
End Time : 12-Sep-2011 09:30:19 AM  
Scanning Time : 1834 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 802.11b  
Model : MiFi4620L  
Frequency : 2450.00 MHz  
Max. Transmit Pwr : 0.056 W  
Drift Time : 0 min(s)  
Length : 60 mm  
Width : 90 mm  
Depth : 10 mm  
Antenna Type : Internal  
Orientation : Side B  
Power Drift-Start : 0.161 W/kg  
Power Drift-Finish: 0.165 W/kg  
Power Drift (%) : 2.480

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 : 12-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 46.00 RH%  
Epsilon : 52.23 F/m  
Sigma : 1.97 S/m  
Density : 1000.00 kg/cu. m

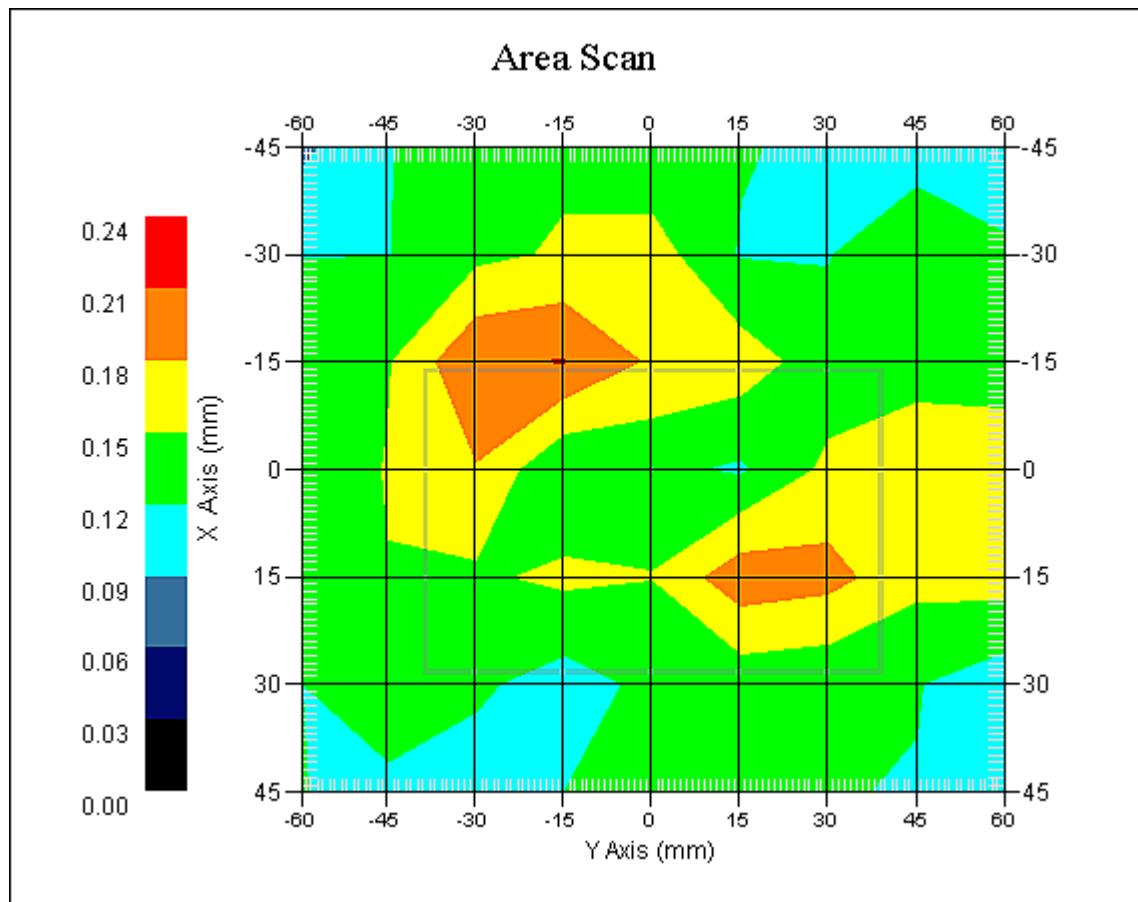
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 2450.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 3.94  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 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-Sep-2011  
Set-up Time : 8:23:58 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 : Side B  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.190 W/kg  
10 gram SAR value : 0.150 W/kg  
Area Scan Peak SAR : 0.211 W/kg  
Zoom Scan Peak SAR : 0.240 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 12-Sep-2011  
Starting Time : 12-Sep-2011 11:04:34 AM  
End Time : 12-Sep-2011 11:19:47 AM  
Scanning Time : 913 secs

## Product Data

Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 802.11b  
Model : MiFi4620L  
Frequency : 2450.00 MHz  
Max. Transmit Pwr : 0.056 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 60 mm  
Depth : 90 mm  
Antenna Type : Internal  
Orientation : Side E  
Power Drift-Start : 0.208 W/kg  
Power Drift-Finish: 0.208 W/kg  
Power Drift (%) : 0.188

## 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 : 12-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 46.00 RH%  
Epsilon : 52.23 F/m  
Sigma : 1.97 S/m  
Density : 1000.00 kg/cu. m

## Probe Data

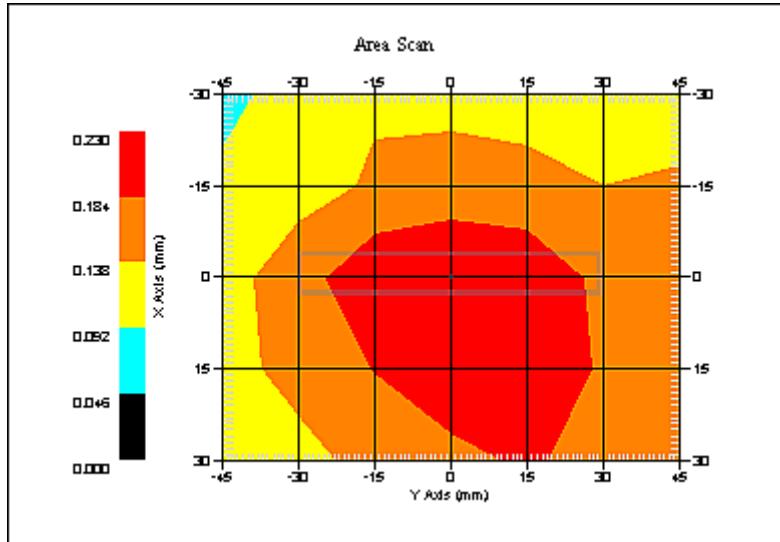
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 2450.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 3.94  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 12-Sep-2011  
Set-up Time : 11:03:38 AM  
Area Scan : 5x7x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side E  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.123 W/kg  
10 gram SAR value : 0.097 W/kg  
Area Scan Peak SAR : 0.200 W/kg  
Zoom Scan Peak SAR : 0.270 W/kg

**SAR Test Report**

By Operator : Jay  
Measurement Date : 12-Sep-2011  
Starting Time : 12-Sep-2011 10:43:13 AM  
End Time : 12-Sep-2011 11:00:05 AM  
Scanning Time : 1012 secs

Product Data  
Device Name : Novatel Wireless  
Serial No. : 21  
Mode : 802.11b  
Model : MiFi4620L  
Frequency : 2450.00 MHz  
Max. Transmit Pwr : 0.056 W  
Drift Time : 0 min(s)  
Length : 10 mm  
Width : 90 mm  
Depth : 60 mm  
Antenna Type : Internal  
Orientation : Side F  
Power Drift-Start : 0.185 W/kg  
Power Drift-Finish: 0.184 W/kg  
Power Drift (%) : -0.092

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 : 12-Sep-2011  
Temperature : 20.00 °C  
Ambient Temp. : 23.00 °C  
Humidity : 46.00 RH%  
Epsilon : 52.23 F/m  
Sigma : 1.97 S/m  
Density : 1000.00 kg/cu. m

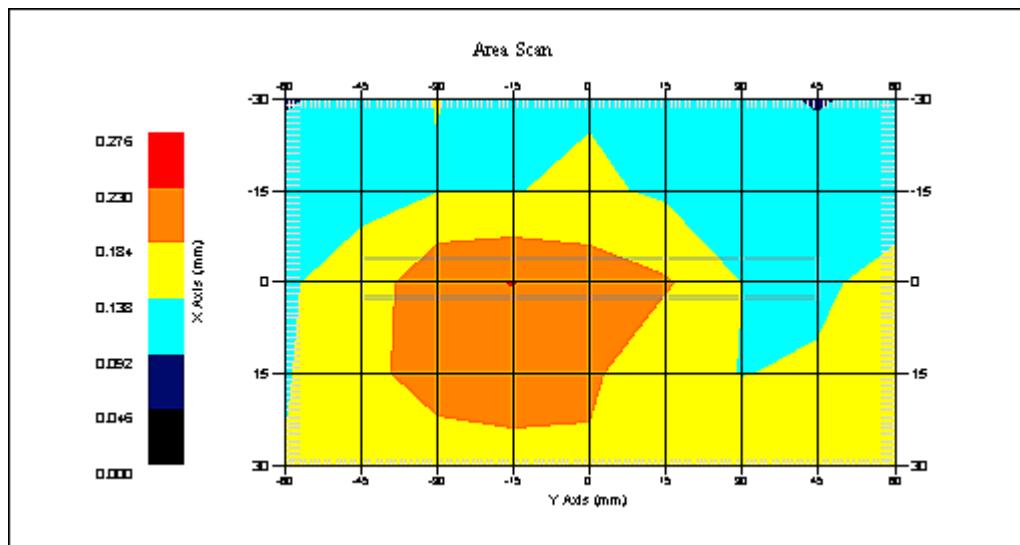
Probe Data  
Name : RFEL 217  
Model : E020  
Type : E-Field Triangle  
Serial No. : 217  
Last Calib. Date : 07-Sep-2011  
Frequency : 2450.00 MHz  
Duty Cycle Factor: 1  
Conversion Factor: 3.94  
Probe Sensitivity: 1.20 1.20 1.20  $\mu$ V/ (V/m)<sup>2</sup>  
Compression Point: 95.00 mV  
Offset : 1.56 mm

## Measurement Data

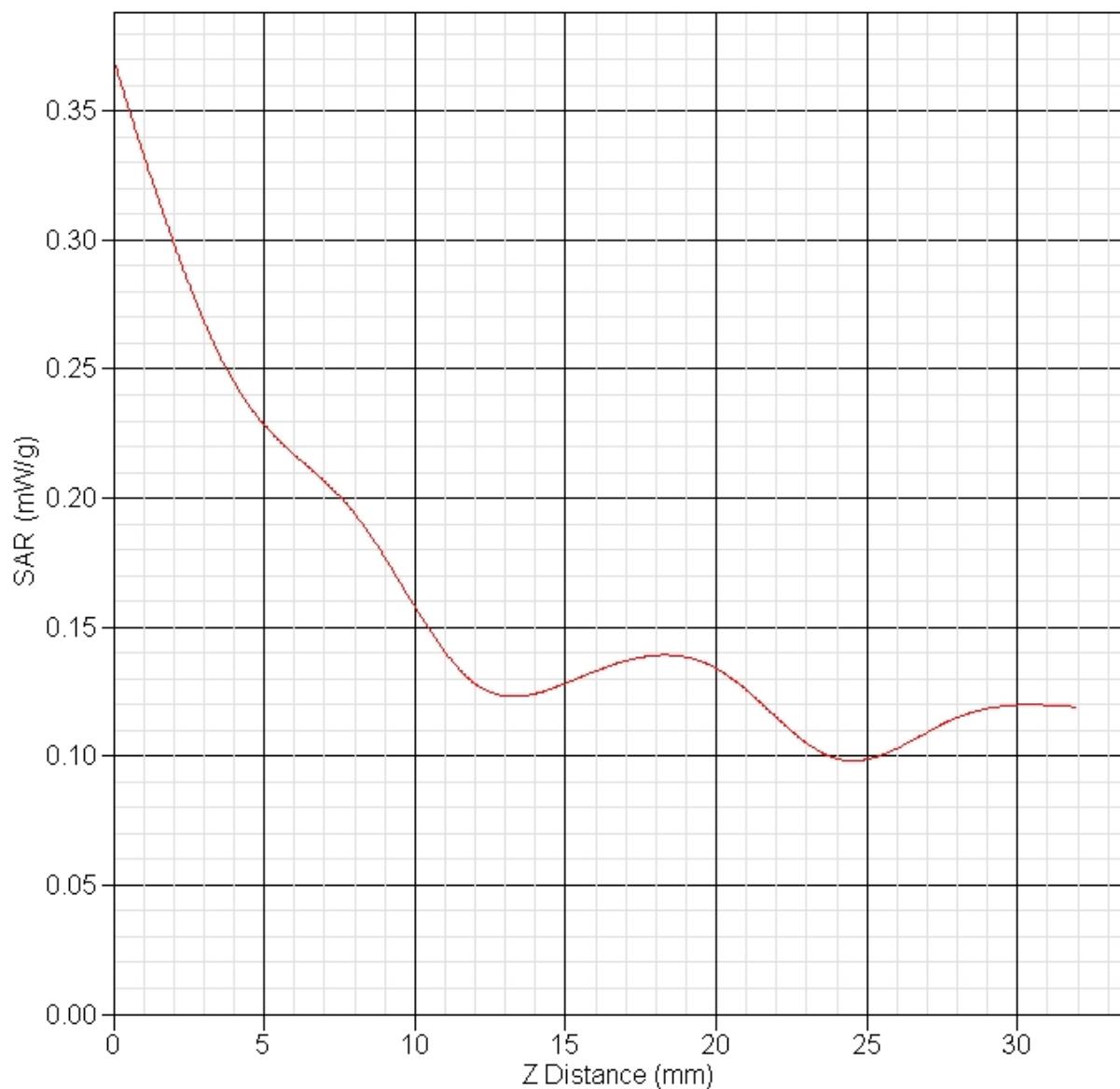
Crest Factor : 1  
Scan Type : Complete  
Tissue Temp. : 20.00 °C  
Ambient Temp. : 23.00 °C  
Set-up Date : 12-Sep-2011  
Set-up Time : 9:26:08 AM  
Area Scan : 5x9x1 : Measurement x=15mm, y=15mm, z=4mm  
Zoom Scan : 5x5x8 : Measurement x=8mm, y=8mm, z=4mm

## Other Data

DUT Position : Side F  
Separation : 10 mm  
Channel : Mid



1 gram SAR value : 0.194 W/kg  
10 gram SAR value : 0.152 W/kg  
Area Scan Peak SAR : 0.231 W/kg  
Zoom Scan Peak SAR : 0.367 W/kg

**SAR-Z Axis**  
at Hotspot x:8.22 y:-14.96

## Appendix D – Probe Calibration Data Sheets

# NCL CALIBRATION LABORATORIES

Calibration File No.: PC1333-1350

Client.: RFEL

## 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.

Equipment: Miniature Isotropic RF Probe

Record of Calibration

Head and Body

Manufacturer: APREL Laboratories

**Model No.:** E-020

**Serial No.:** 217

**Calibration Procedure:** D01-032-E020-V2, D22-012-Tissue, D28-002-Dipole  
**Project No:** RFEL-PC-5620

**Calibrated:** 7<sup>th</sup> September 2011  
**Released on:** 7<sup>th</sup> September 2011

**Approved By:** Stuart Nicol

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

Released By: \_\_\_\_\_

**NCL CALIBRATION LABORATORIES**

303 Terry Fox Drive, Suite 102  
Kanata, Ontario  
CANADA K2K 3J1

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

# **NCL Calibration Laboratories**

---

Division of APREL Inc.

## **Introduction**

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

## **Calibration Method**

Probes are calibrated using the following methods.

<1000MHz

TEM Cell for sensitivity in air

Standard phantom using temperature transfer method for sensitivity in tissue

>1000MHz

Waveguide\* method to determine sensitivity in air and tissue

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

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

## **References**

- IEEE Standard 1528 (2003) including Amendment 1  
IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
- EN 62209-1 (2006)  
Human Exposure to RF Fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures-Part 1: Procedure to measure the Specific Absorption Rate (SAR) for hand-held mobile wireless devices
- IEC 62209-2 Ed. 1.0 (2010-03)  
Human exposure to RF fields from hand-held and body-mounted wireless devices - Human models, instrumentation, and procedures - Part 2: specific absorption rate (SAR) for wireless communication devices (30 MHz - 6 GHz)
- TP-D01-032-E020-V2 E-Field probe calibration procedure
- D22-012-Tissue dielectric tissue calibration procedure
- D28-002-Dipole procedure for validation of SAR system using a dipole
- IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

# **NCL Calibration Laboratories**

Division of APREL Inc.

## **Conditions**

Probe 217 was a re-calibration.

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

## **Primary Measurement Standards**

<b>Instrument</b>	<b>Serial Number</b>	<b>Cal date</b>
Power meter Anritsu MA2408A	90025437	Nov.4, 2010
Power Sensor Anritsu MA2481D	103555	Nov 4, 2010
Attenuator HP 8495A (70dB)	1944A10711	Sept. 14, 2010
Network Analyzer Anritsu MT8801C	MB11855	Feb. 8, 2011

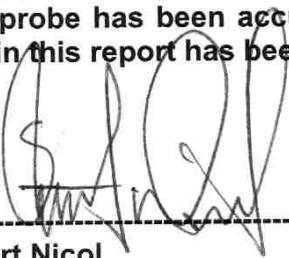
## **Secondary Measurement Standards**

Signal Generator Agilent E4438C -506 MY55182336 June 7, 2011

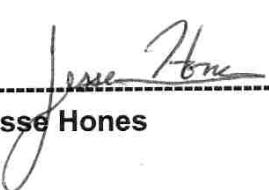
## **Attestation**

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

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



-----  
**Stuart Nicol**



-----  
**Jesse Hones**

# **NCL Calibration Laboratories**

---

Division of APREL Inc.

## **Probe Summary**

**Probe Type:** E-Field Probe E020  
**Serial Number:** 217  
**Frequency:** 750MHz  
**Sensor Offset:** 1.56  
**Sensor Length:** 2.5  
**Tip Enclosure:** Composite\*  
**Tip Diameter:** < 2.9 mm  
**Tip Length:** 55 mm  
**Total Length:** 289 mm

\*Resistive to recommended tissue recipes per IEEE-1528

## **Sensitivity in Air**

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

# NCL Calibration Laboratories

Division of APREL Inc.

## Calibration for Tissue (Head H, Body B)

Frequency	Tissue Type	Measured Epsilon	Measured Sigma	Calibration Uncertainty	Tolerance Uncertainty for 5%*	Conversion Factor
450 H	Head	45.31	0.91	4.1	3.6	5.8
450 B	Body	56.77	0.99	4.1	3.6	6.0
650 B	Body	57.42	0.91	3.96	3.5	6.2
750 H	Head	X	X	X	X	X
750 B	Body	55.54	0.94	3.94	3.4	6.3
835 H	Head	42.5	0.93	3.5	3.4	6.4
835 B	Body	56.37	0.954	3.5	3.4	6.4
900 H	Head	41.89	1.0	3.5	3.4	6.1
900 B	Body	53.68	1.05	3.5	3.4	6.1
1450 H	Head	X	X	X	X	X
1450 B	Body	X	X	X	X	X
1500 H	Head	X	X	X	X	X
1500 B	Body	X	X	X	X	X
1640 H	Head	39.0	1.25	3.5	2.7	5.2
1640 B	Body	52.03	1.39	3.5	2.7	5.0
1735 H	Head	X	X	X	X	X
1735 B	Body	51.68	1.5	3.5	2.7	5.2
1800 H	Head	38.38	1.39	3.5	2.7	4.9
1800 B	Body	51.54	1.56	3.5	2.7	5.1
1900 H	Head	38.4	1.43	3.5	2.7	4.9
1900 B	Body	52.08	1.59	3.5	2.7	4.8
2000 H	Head	X	X	X	X	X
2000 B	Body	X	X	X	X	X
2100 H	Head	X	X	X	X	X
2100 B	Body	X	X	X	X	X
2300 H	Head	X	X	X	X	X
2300 B	Body	X	X	X	X	X
2450 H	Head	38.2	1.82	3.5	3.5	3.91
2450 B	Body	51.74	1.96	3.5	3.5	3.94
2600 H	Head	X	X	X	X	X
2600 B	Body	51.18	2.16	3.5	3.5	4.0
3000 H	Head	X	X	X	X	X
3000 B	Body	X	X	X	X	X
3600 H	Head	X	X	X	X	X
3600 B	Body	X	X	X	X	X
5200 H	Head	X	X	X	X	X
5200 B	Body	X	X	X	X	X
5600 H	Head	X	X	X	X	X
5600 B	Body	X	X	X	X	X
5800 H	Head	X	X	X	X	X
5800 B	Body	X	X	X	X	X

## **NCL Calibration Laboratories**

---

Division of APREL Inc.

### **Boundary Effect:**

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

### **Spatial Resolution:**

The spatial resolution uncertainty is less than 1.5% for 4.9mm diameter probe.  
The spatial resolution uncertainty is less than 1.0% for 2.5mm diameter probe.

### **DAQ-PAQ Contribution**

To minimize the uncertainty calculation all tissue sensitivity values were calculated using a load impedance of  $5\text{ M}\Omega$ .

### **Boundary Effect:**

For a distance of 0.58mm the worst case evaluated uncertainty (increase in the probe sensitivity) is less than 2.1%.

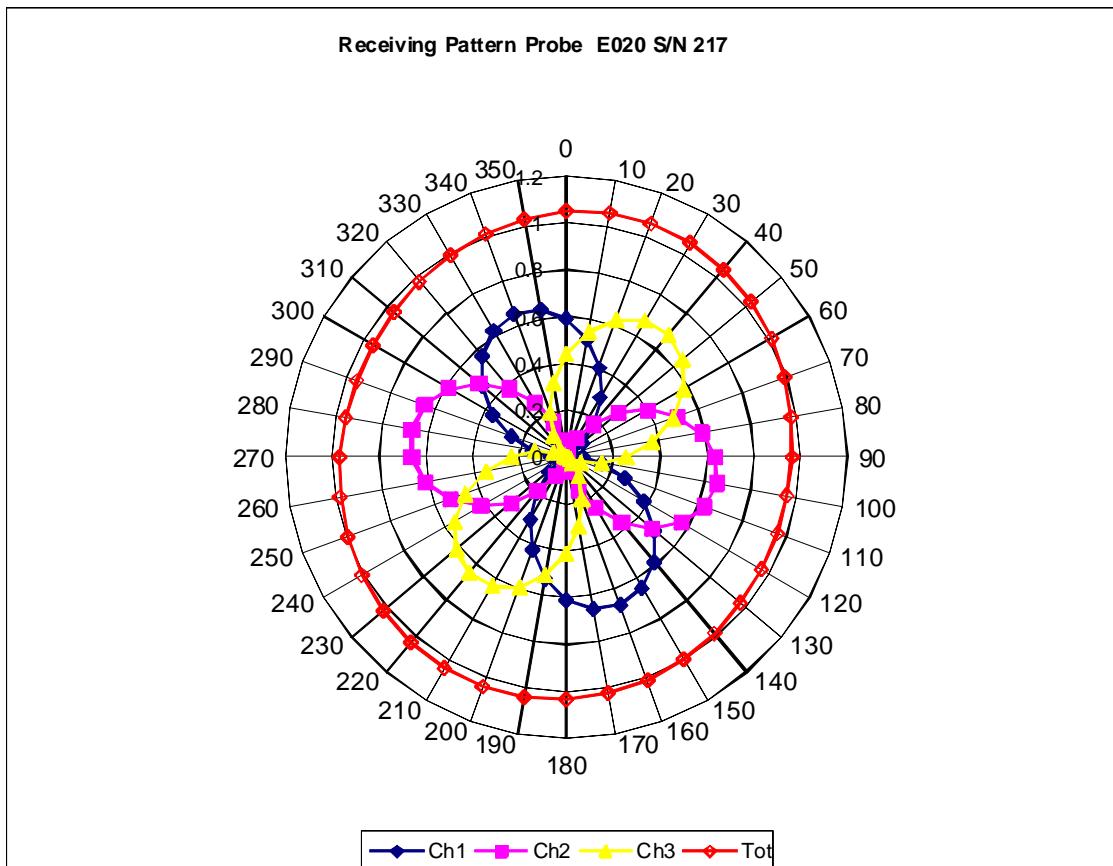
### **NOTES:**

\*The maximum deviation from the centre frequency when comparing the lower to upper range is listed.

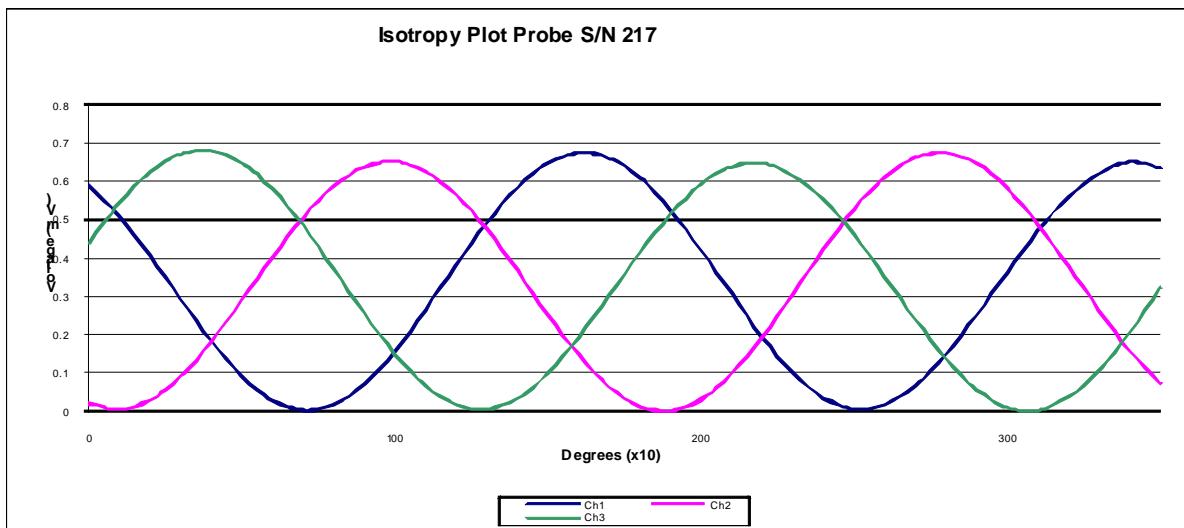
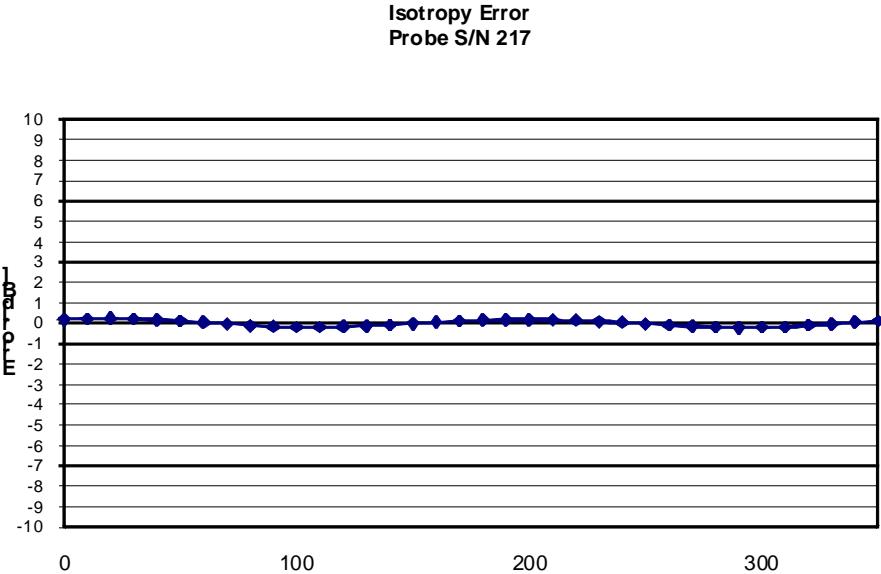
The probe was received in good condition.

Probe was calibrated on new DAC-PAQ.

## Receiving Pattern Air



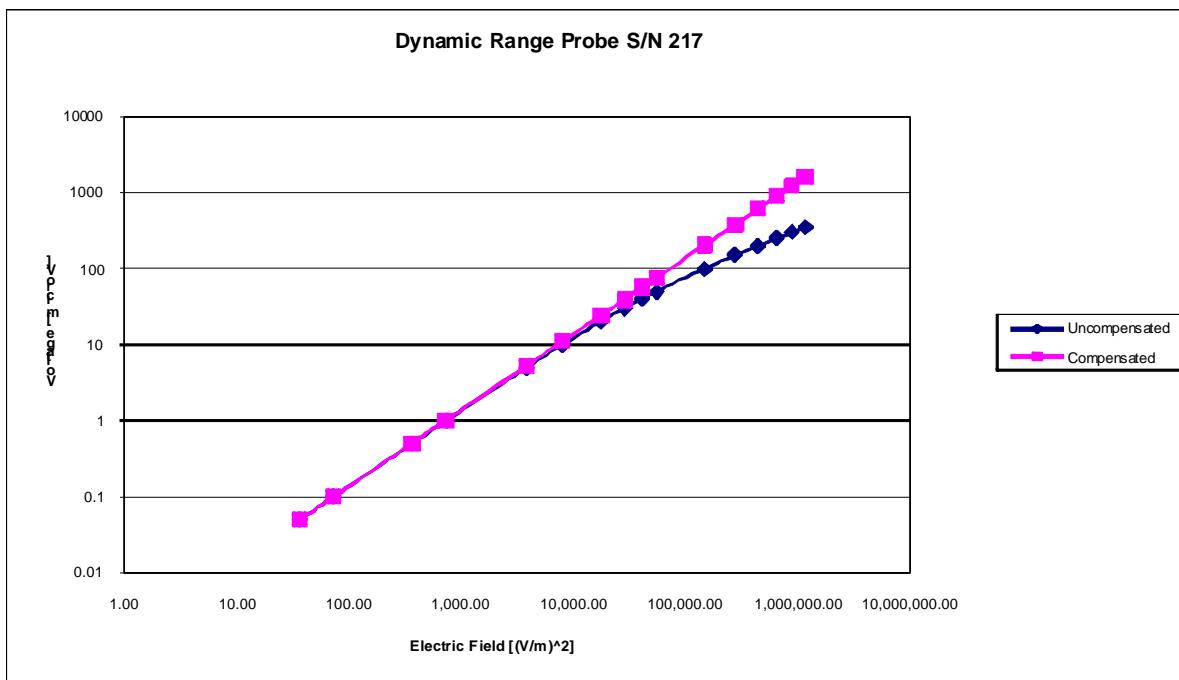
## Isotropy Error



Isotropicity Tissue:

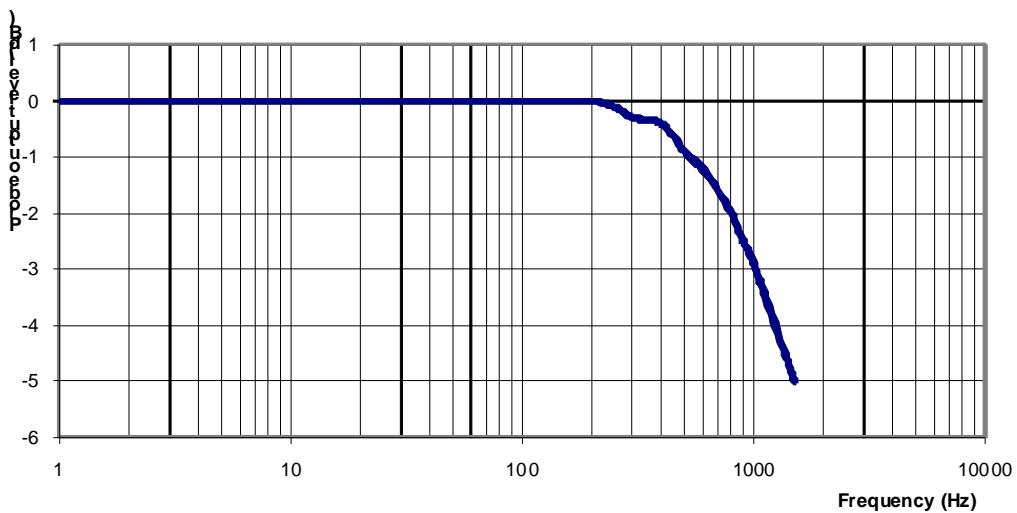
0.12 dB

## Dynamic Range



## Video Bandwidth

**Probe Frequency Characteristics**



**Video Bandwidth at 500 Hz**

1 dB

**Video Bandwidth at 1.02 KHz:**

3 dB

## Test Equipment

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

## Appendix E – Dipole Calibration Data Sheets

## **NCL CALIBRATION LABORATORIES**

Calibration File No: DC-1178  
Project Number: RFEL-DC-750B-5548

## **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-750-S-2

Frequency: 750 MHz Body

Serial No: 177-00501

Customer: RFEL

Body Calibration

Calibrated: 15<sup>th</sup> November 2010

Released on: 16<sup>th</sup> November 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 177-00501 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

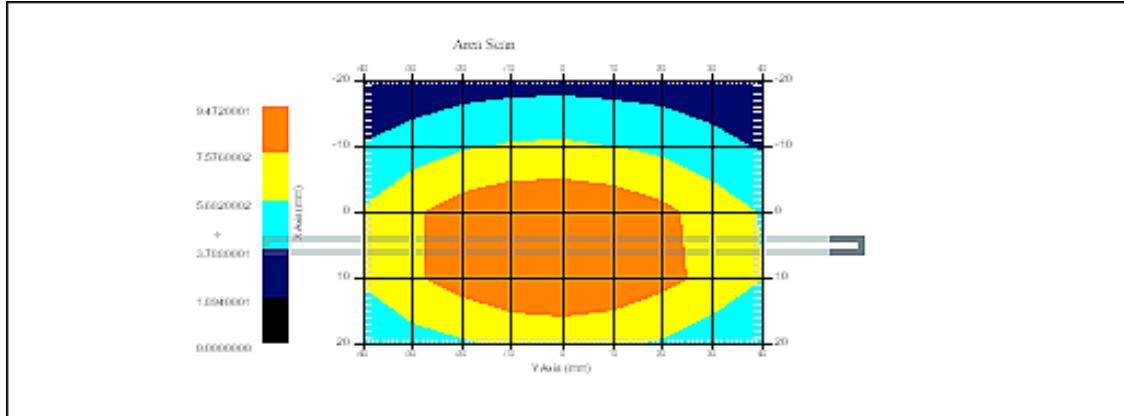
**Length:** 180.2 mm  
**Height:** 97.0 mm

### Electrical Specification

**SWR:** 1.098U  
**Return Loss:** -27.875 dB  
**Impedance:** 52.754  $\Omega$

### System Validation Results

Frequency	1 Gram	10 Gram	Peak
750 MHz	8.7	5.64	12.9



## 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 177-00501. 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 177-00501 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 uncertainty

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

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

## **NCL Calibration Laboratories**

Division of APREL Laboratories.

### **Dipole Calibration Results**

#### **Mechanical Verification**

<b>APREL Length</b>	<b>APREL Height</b>	<b>Measured Length</b>	<b>Measured Height</b>
180.0 mm	97.8 mm	180.2 mm	97.0 mm

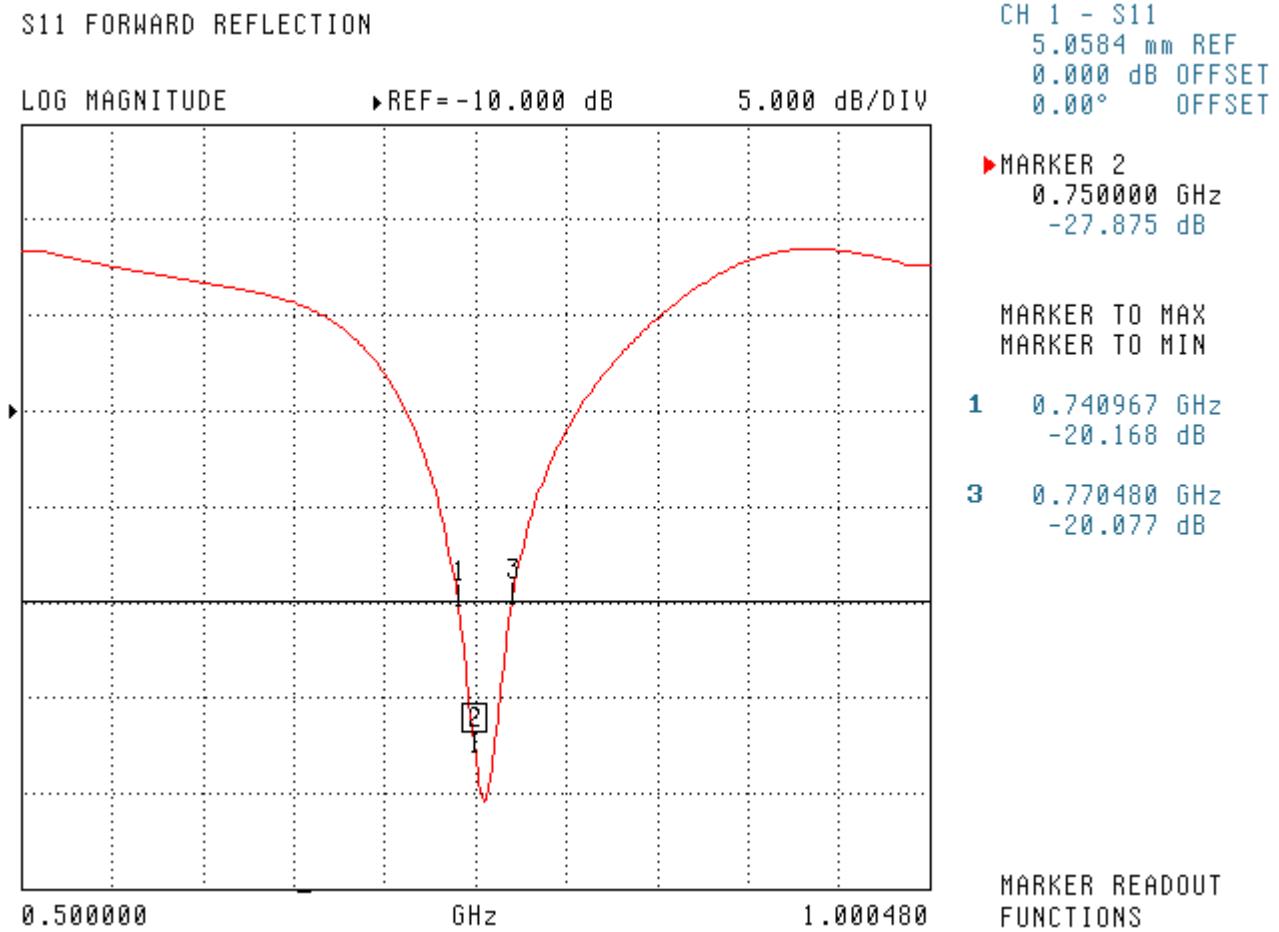
#### **Tissue Validation**

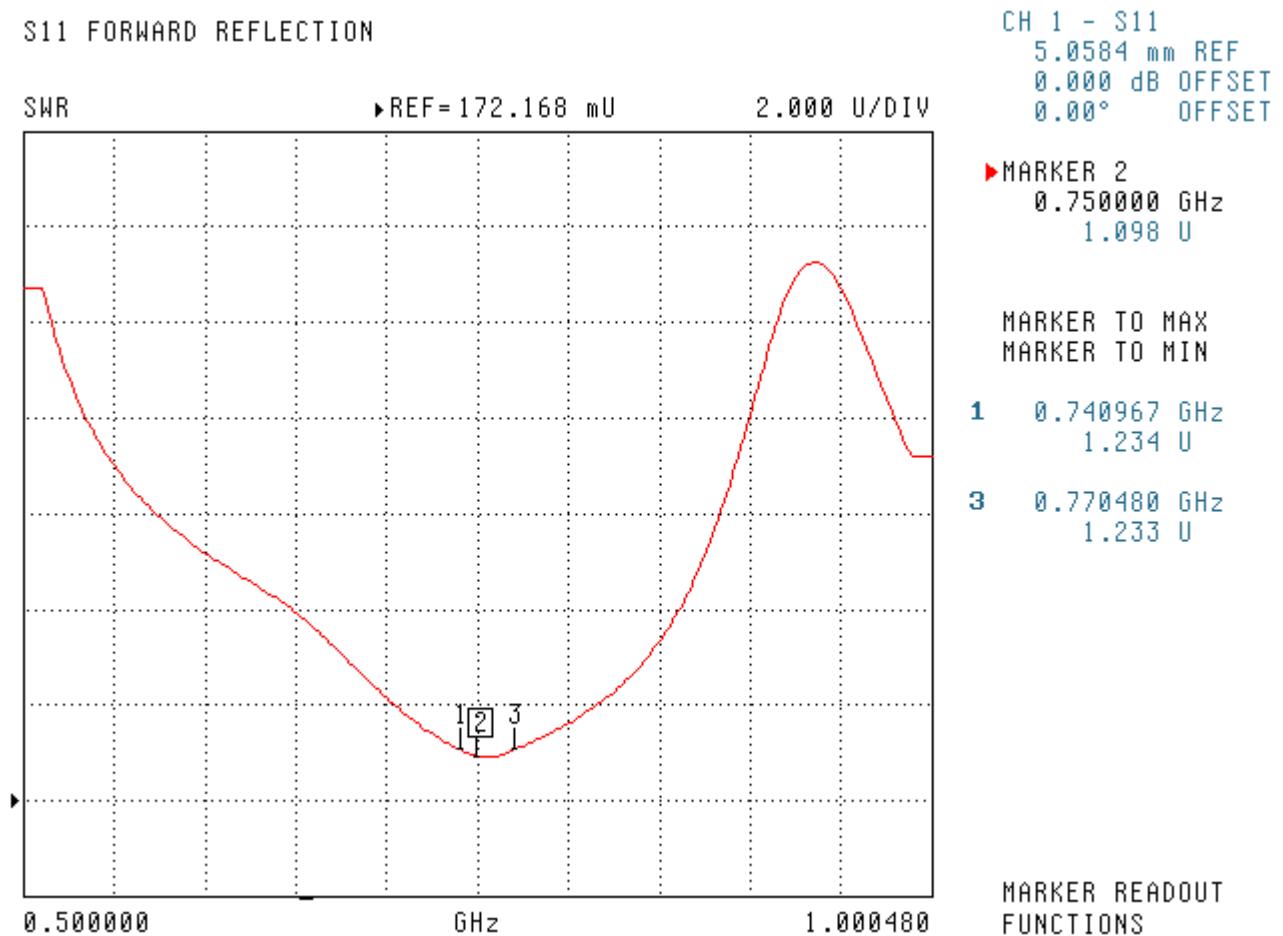
<b>Body Tissue 750MHz</b>	<b>Measured</b>
<b>Dielectric constant, <math>\epsilon_r</math></b>	57.07
<b>Conductivity, <math>\sigma</math> [S/m]</b>	1.02

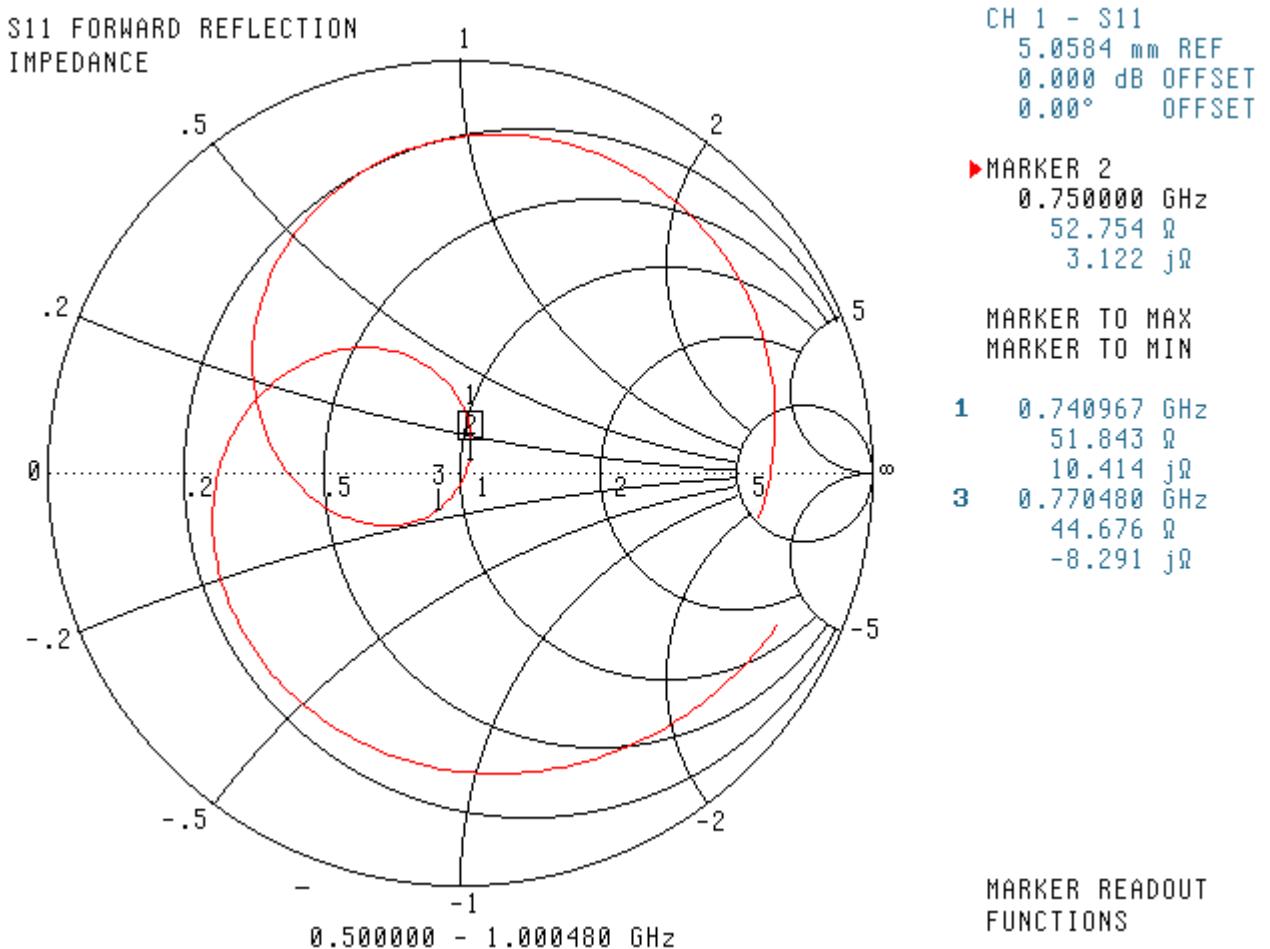
**Electrical Calibration**

Test	Result
S11 RL	-27.875dB
SWR	1.098U
Impedance	52.754 $\Omega$

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

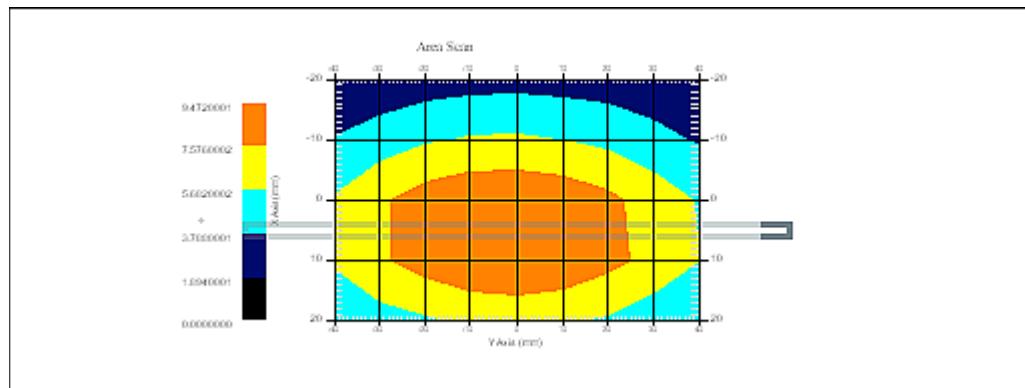
**S11 Parameter Return Loss**

**SWR**

**Smith Chart Dipole Impedance**

**System Validation Results Using the Electrically Calibrated Dipole**

Body Tissue Frequency	1 Gram	10 Gram	Peak Above Feed Point
750 MHz	8.7	5.64	12.9



## **Test Equipment**

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2010.

## **NCL CALIBRATION LABORATORIES**

Calibration File No: DC-1179  
Project Number: RFEL-DC-835B-5549

## **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-835-S-2

Frequency: 835 MHz Body

Serial No: 180-00561

Customer: RFEL

Body Calibration

Calibrated: 16<sup>th</sup> November 2010  
Released on: 16<sup>th</sup> November 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.

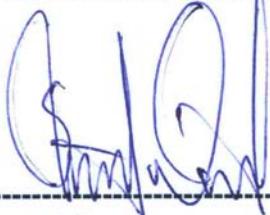
### **Conditions**

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

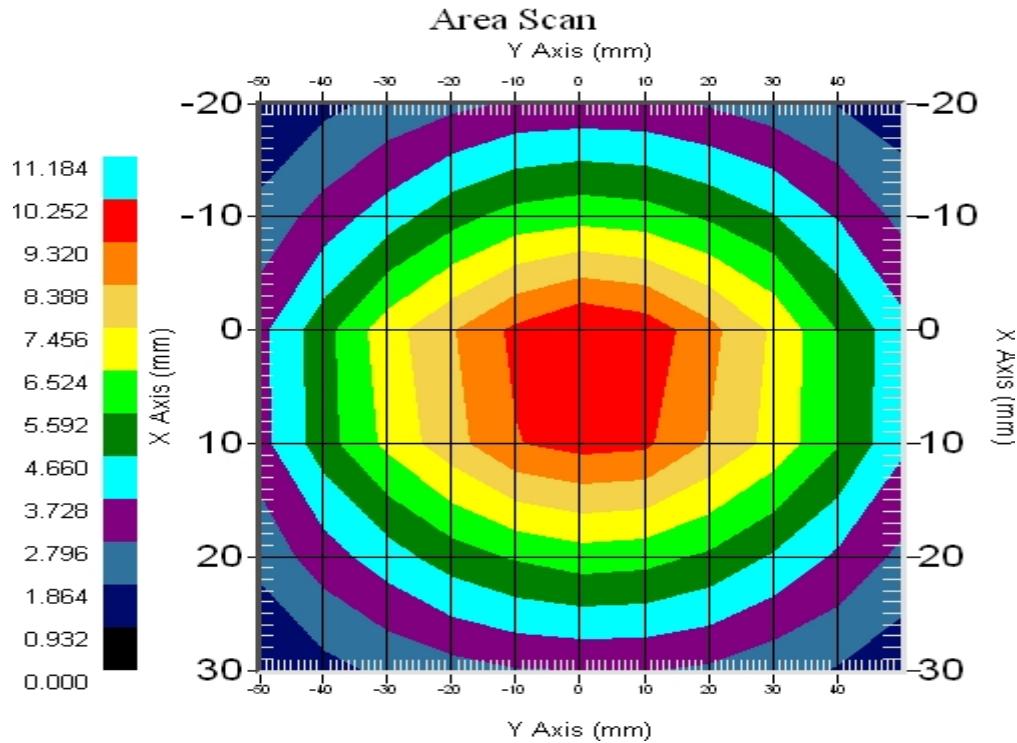
**Length:** 161.0 mm  
**Height:** 89.8 mm

### Electrical Specification

**SWR:** 1.143U  
**Return Loss:** -24.058 dB  
**Impedance:** 55.519  $\Omega$

### System Validation Results

Frequency	1 Gram	10 Gram	Peak
835 MHz	9.81	6.3	14.87



## 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 uncertainty

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

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

## **NCL Calibration Laboratories**

Division of APREL Laboratories.

### **Dipole Calibration Results**

#### **Mechanical Verification**

<b>APREL Length</b>	<b>APREL Height</b>	<b>Measured Length</b>	<b>Measured Height</b>
161.0 mm	89.8 mm	162.1 mm	89.8 mm

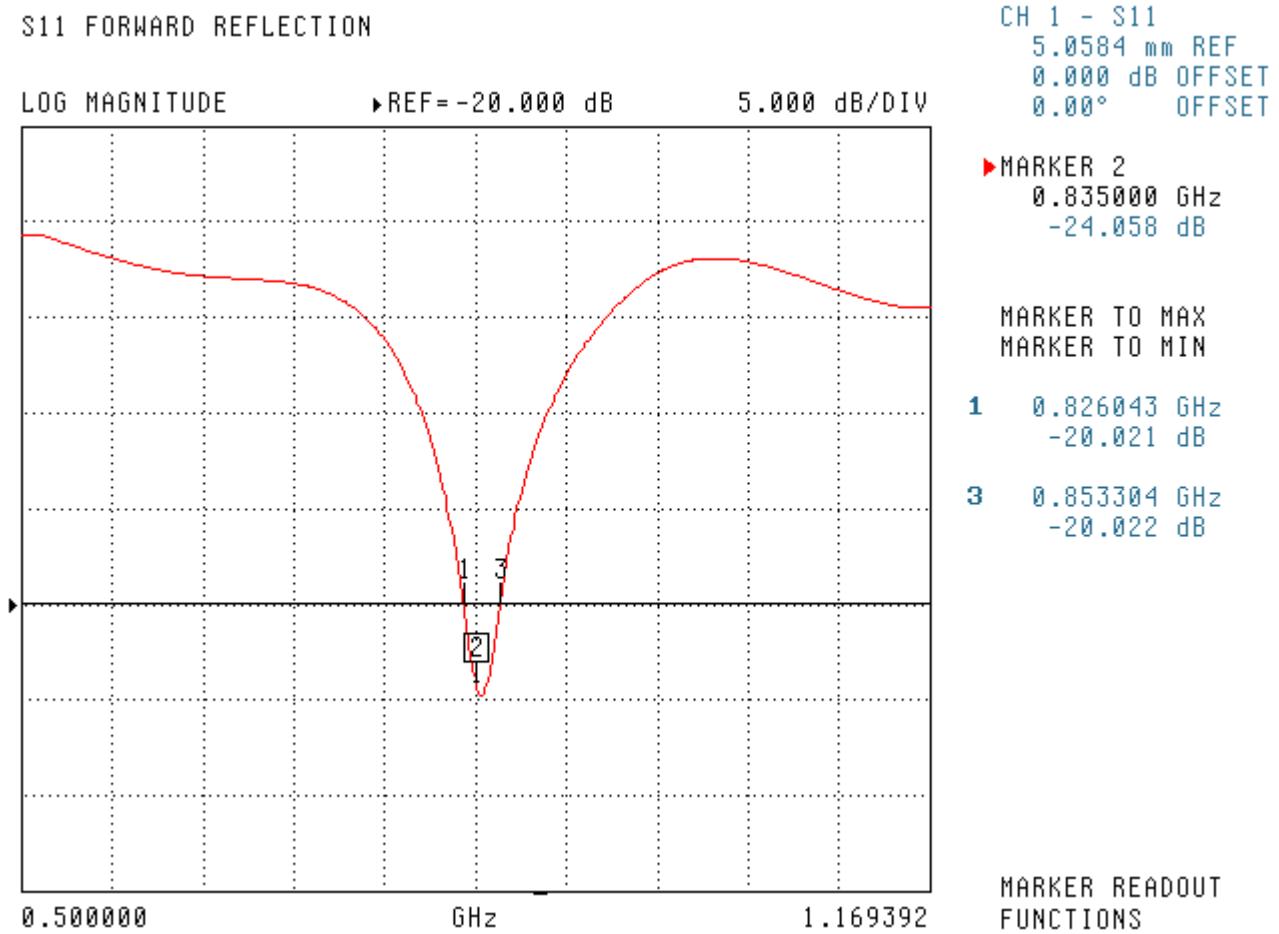
#### **Tissue Validation**

<b>Body Tissue 835MHz</b>	<b>Measured</b>
<b>Dielectric constant, <math>\epsilon_r</math></b>	57.19
<b>Conductivity, <math>\sigma</math> [S/m]</b>	0.97

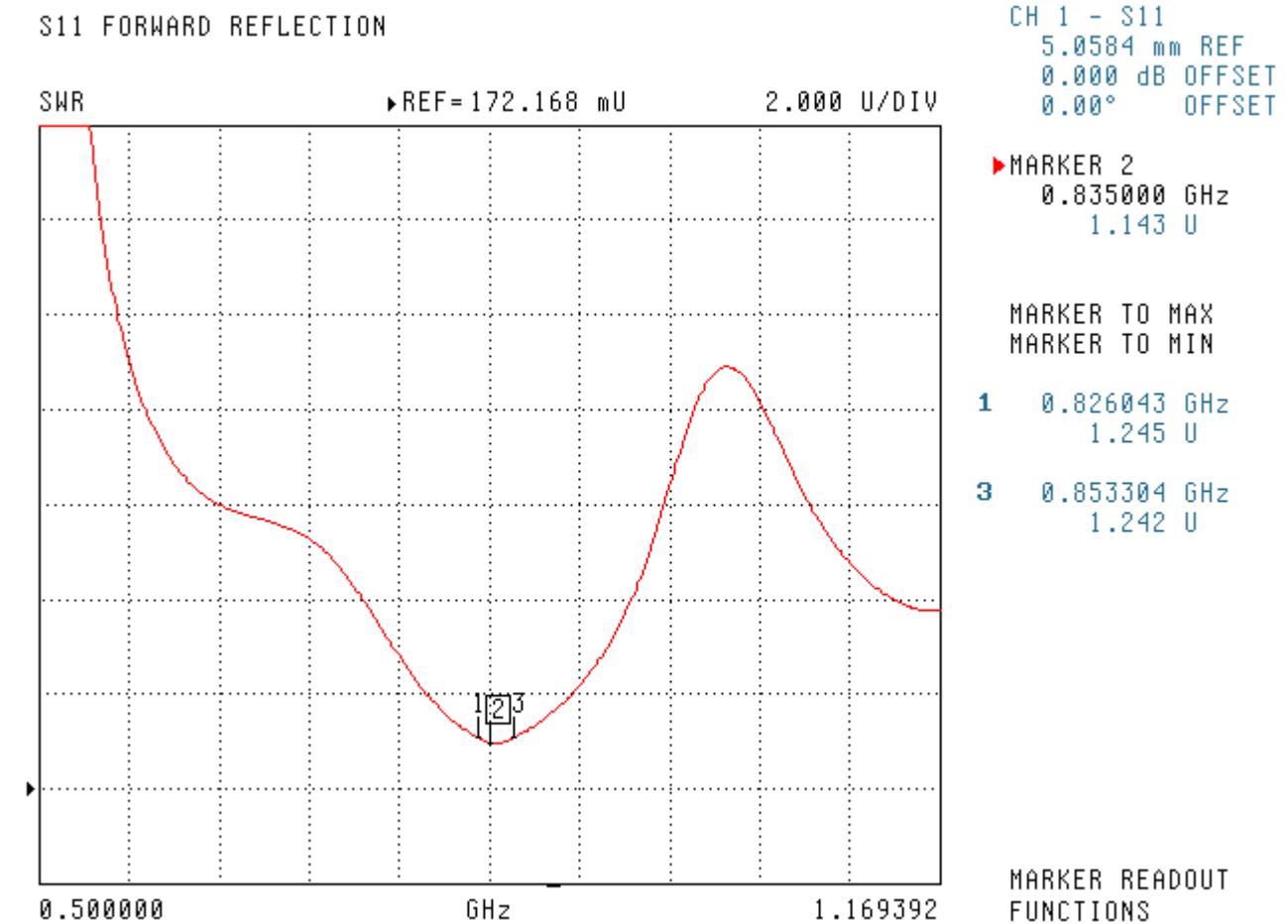
**Electrical Calibration**

Test	Result
S11 RL	-24.058dB
SWR	1.143U
Impedance	55.519 $\Omega$

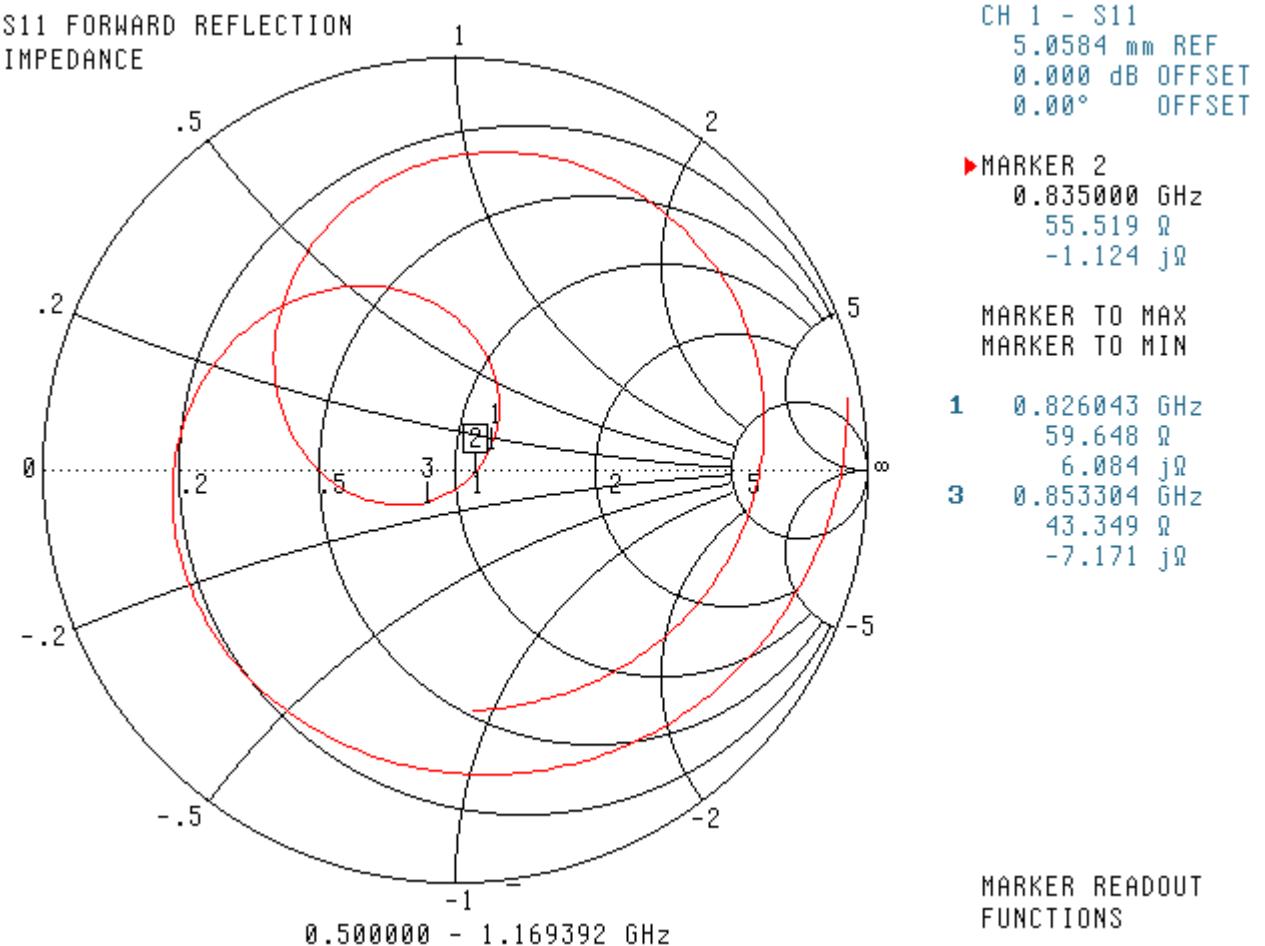
The Following Graphs are the results as displayed on the Vector Network Analyzer.

**S11 Parameter Return Loss**

## SWR

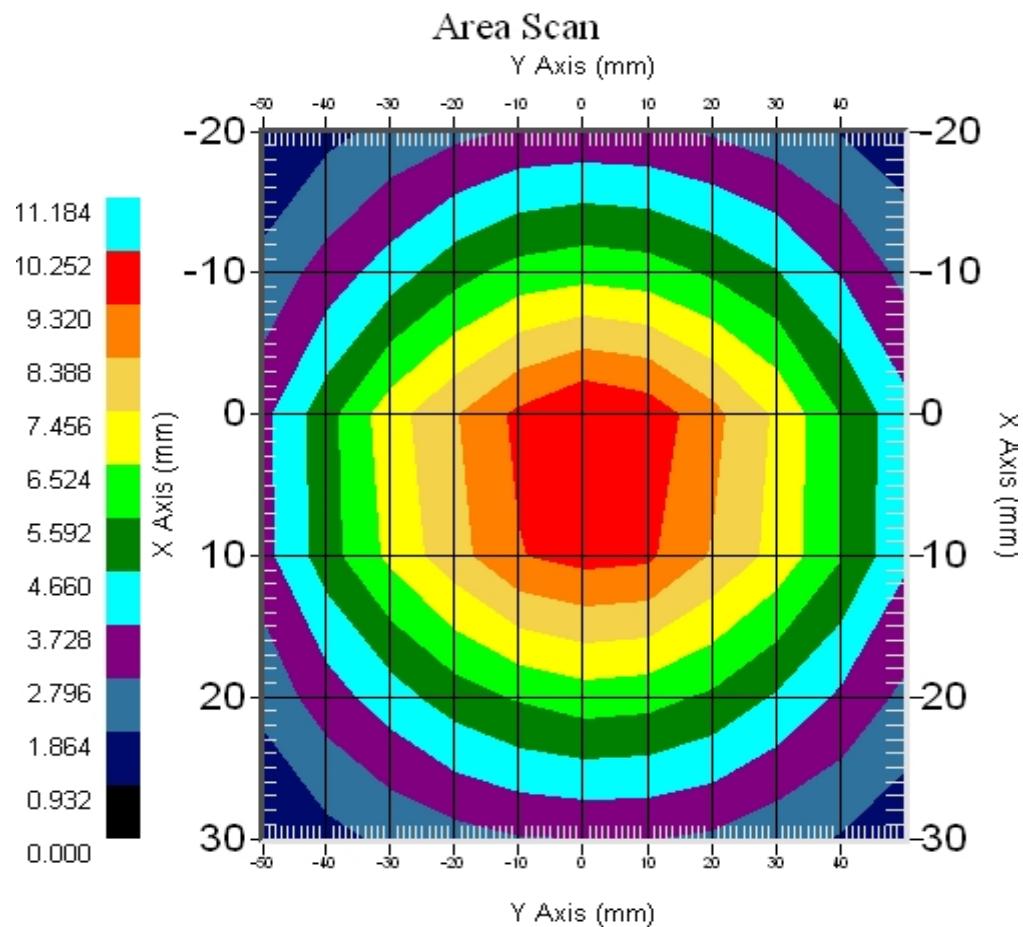


## Smith Chart Dipole Impedance



**System Validation Results Using the Electrically Calibrated Dipole**

Body Tissue Frequency	1 Gram	10 Gram	Peak Above Feed Point
835 MHz	9.81	6.3	14.87



## **Test Equipment**

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2010.

## NCL CALIBRATION LABORATORIES

Calibration File No: DC-1180  
Project Number: RFEL-DC-1900B-5550

## 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.

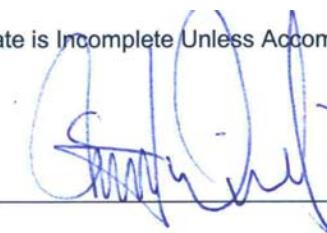
Validation Dipole

Manufacturer: APREL Laboratories  
Part number: ALS-D-1900-S-2  
Frequency: 1900 MHz Body  
Serial No: 210-00713

Customer: RFEL  
Body Calibration

Calibrated: 16 November 2010  
Released on: 16<sup>th</sup> November 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**

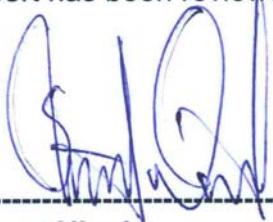
Division of APREL Laboratories.

### **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

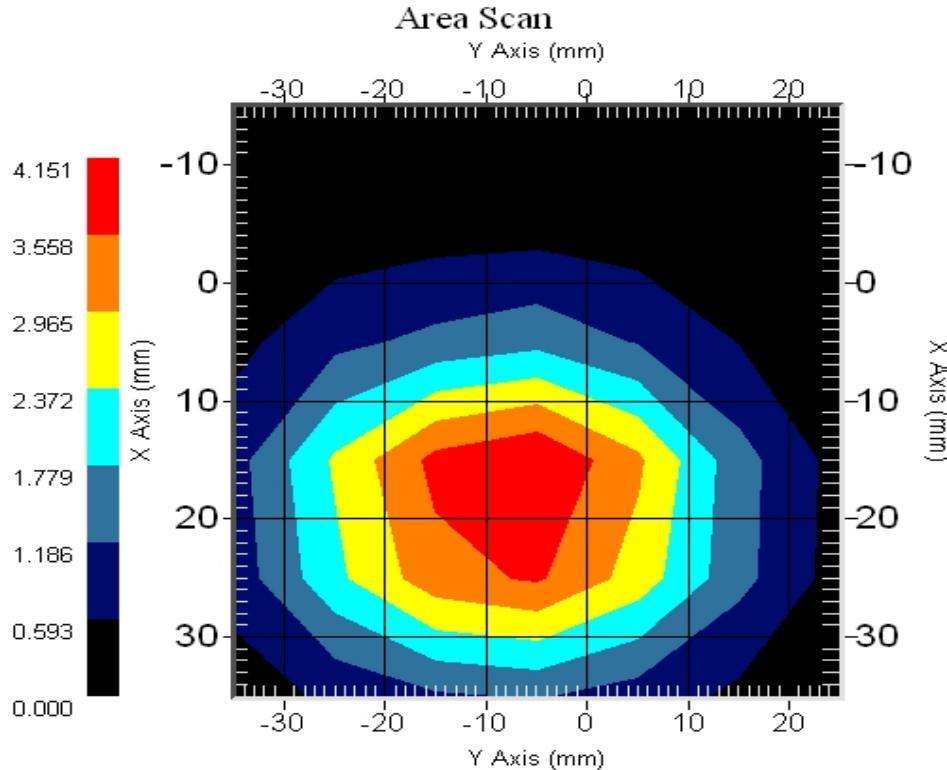
**Length:** 67.1 mm  
**Height:** 38.9 mm

### Electrical Specification

**SWR:** 1.122U  
**Return Loss:** -24.913dB  
**Impedance:** 53.469Ω

### System Validation Results

Frequency	1 Gram	10 Gram	Peak
1900 MHz	40.9	20.9	71.7



## 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 uncertainty

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

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

## **NCL Calibration Laboratories**

Division of APREL Laboratories.

### **Dipole Calibration Results**

#### **Mechanical Verification**

<b>APREL Length</b>	<b>APREL Height</b>	<b>Measured Length</b>	<b>Measured Height</b>
68.0 mm	39.5 mm	67.1mm	38.9 mm

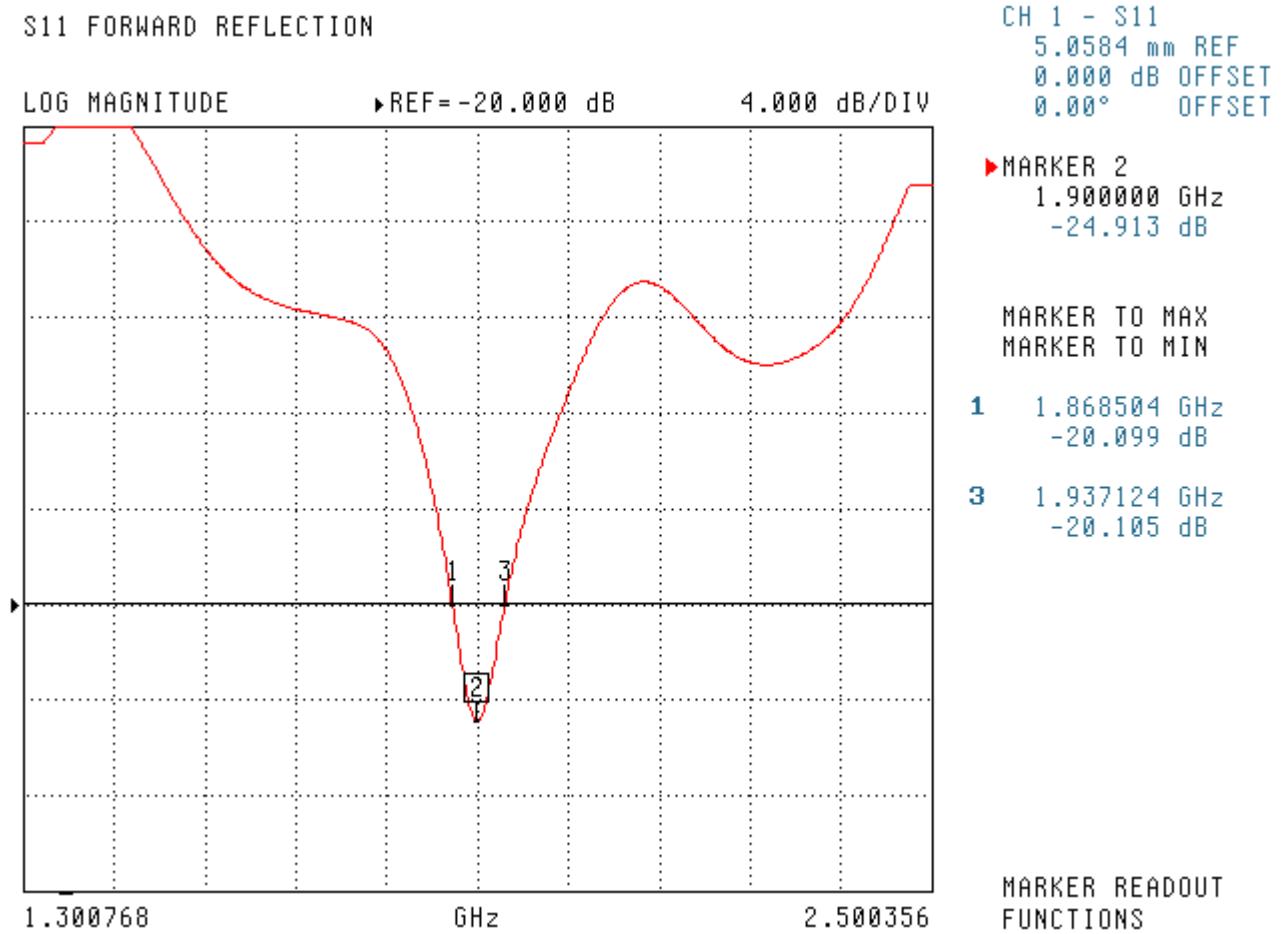
#### **Tissue Validation**

<b>Body Tissue 1900 MHz</b>	<b>Measured</b>
<b>Dielectric constant, <math>\epsilon_r</math></b>	53.87
<b>Conductivity, <math>\sigma</math> [S/m]</b>	1.55

**Electrical Calibration**

Test	Result
S11 R/L	-24.913dB
SWR	1.122U
Impedance	53.469 $\Omega$

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

**S11 Parameter Return Loss**

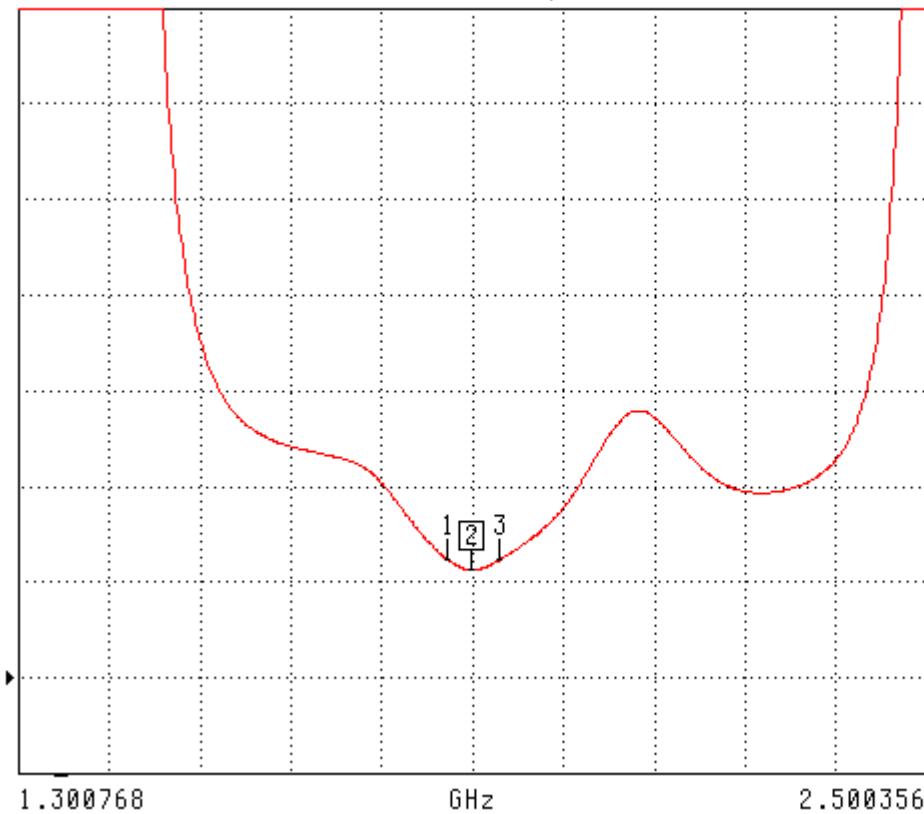
**SWR**

S11 FORWARD REFLECTION

SWR

►REF= 0.000 pU

1.000 U/DIV



CH 1 - S11  
5.0584 mm REF  
0.000 dB OFFSET  
0.00° OFFSET

► MARKER 2  
1.900000 GHz  
1.122 U

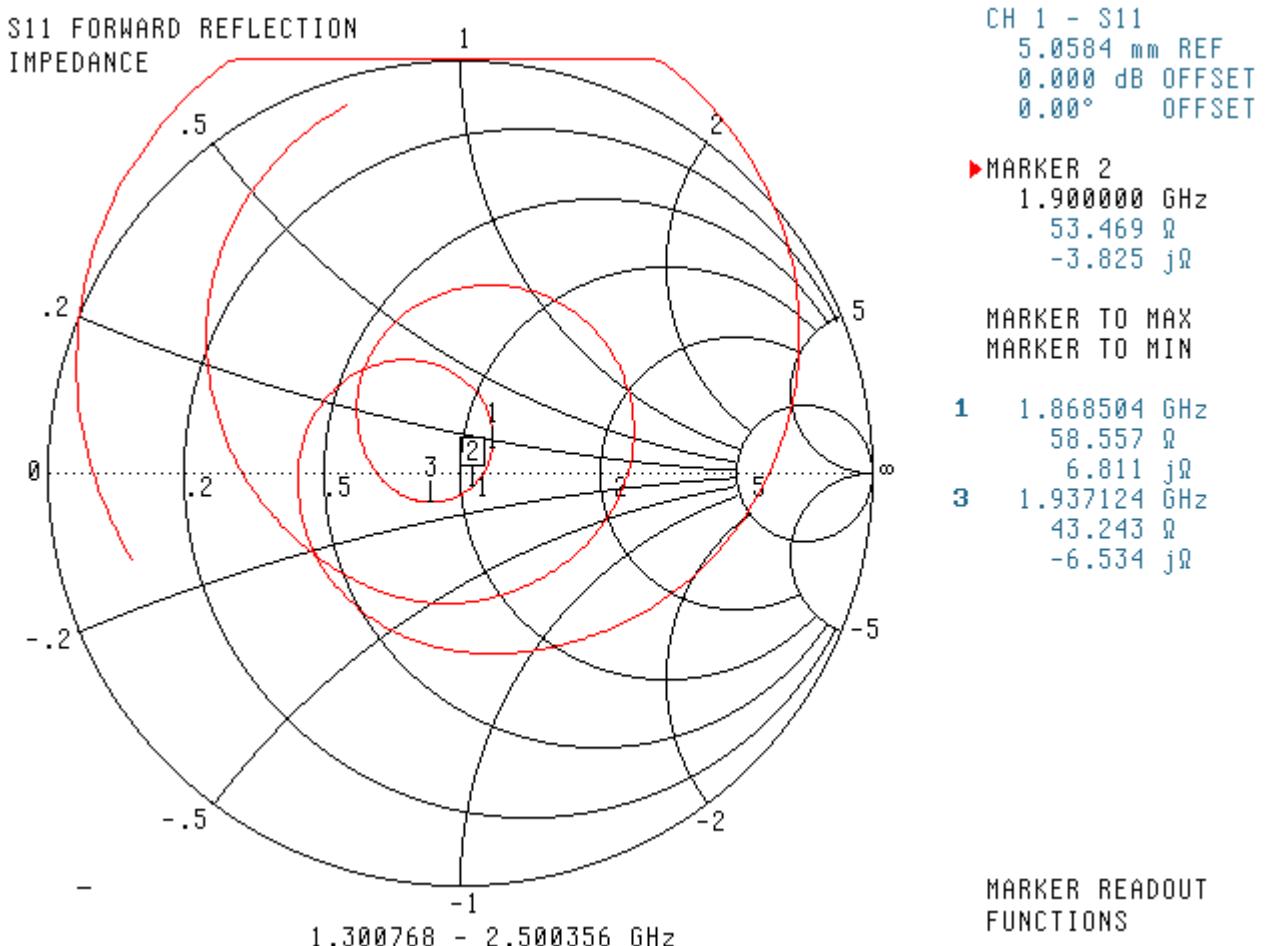
MARKER TO MAX  
MARKER TO MIN

1 1.868504 GHz  
1.231 U

3 1.937124 GHz  
1.226 U

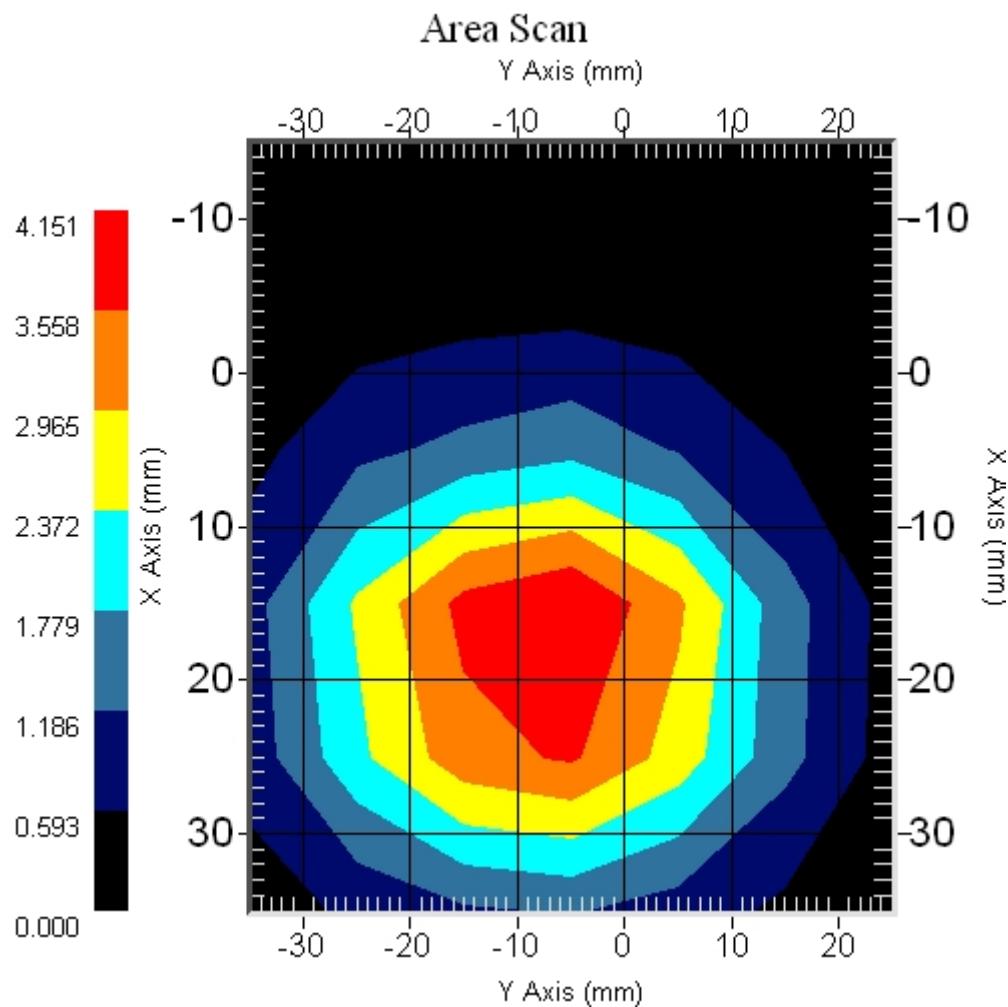
► MARKER READOUT  
FUNCTIONS

## Smith Chart Dipole Impedance



## System Validation Results Using the Electrically Calibrated Dipole

Body Tissue Frequency	1 Gram	10 Gram	Peak Above Feed Point
1900 MHz	40.9	20.9	71.7



## **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 2010.

## NCL CALIBRATION LABORATORIES

Calibration File No: DC-1182  
Project Number: RFEB-5552

## 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 Body

Serial No: RFE-278

Customer: RFEL

Body Calibration

Calibrated: 18<sup>th</sup> November 2010

Released on: 19<sup>th</sup> November 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.

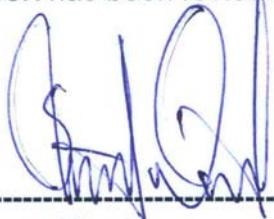
### **Conditions**

Dipole 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

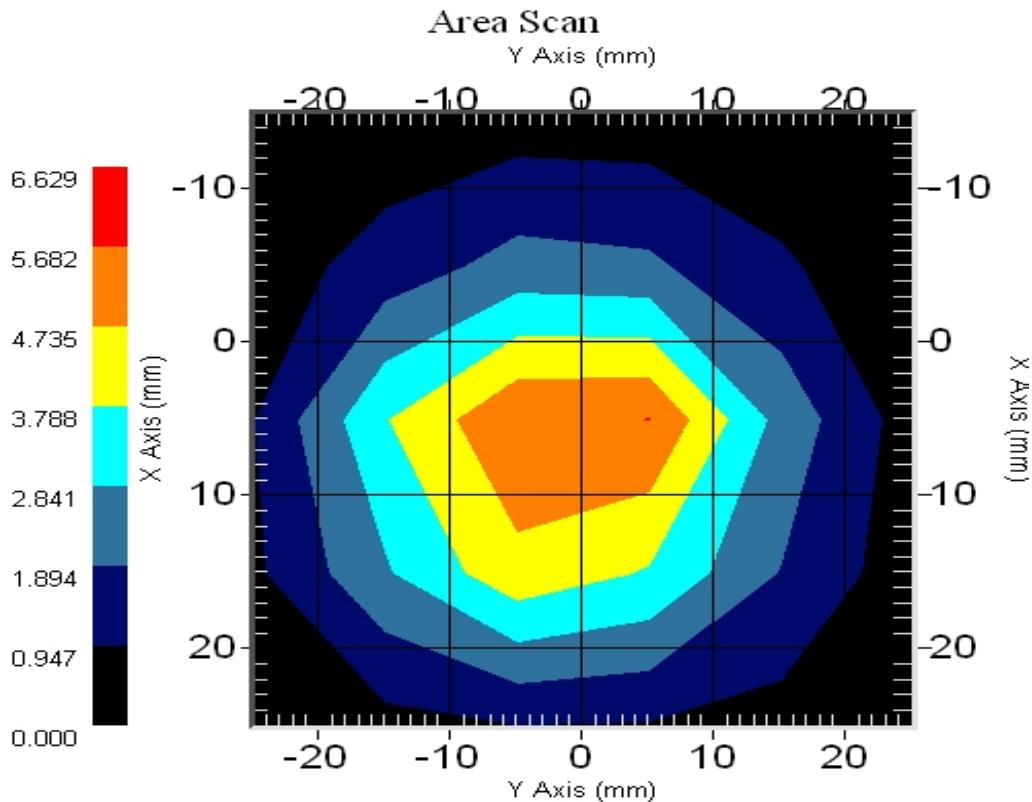
**Length:** 51.5 mm  
**Height:** 30.4 mm

## Electrical Specification

**SWR:** 1.249 U  
**Return Loss:** -19.170 dB  
**Impedance:** 42.223  $\Omega$

## System Validation Results @ 100mW

Frequency	1 Gram	10 Gram	Peak
2450 MHz	5.15	2.31	10.01



## 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 uncertainty

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

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

## **NCL Calibration Laboratories**

Division of APREL Laboratories.

### **Dipole Calibration Results**

#### **Mechanical Verification**

<b>APREL Length</b>	<b>APREL Height</b>	<b>Measured Length</b>	<b>Measured Height</b>
51.5 mm	30.4 mm	52.1 mm	31.0 mm

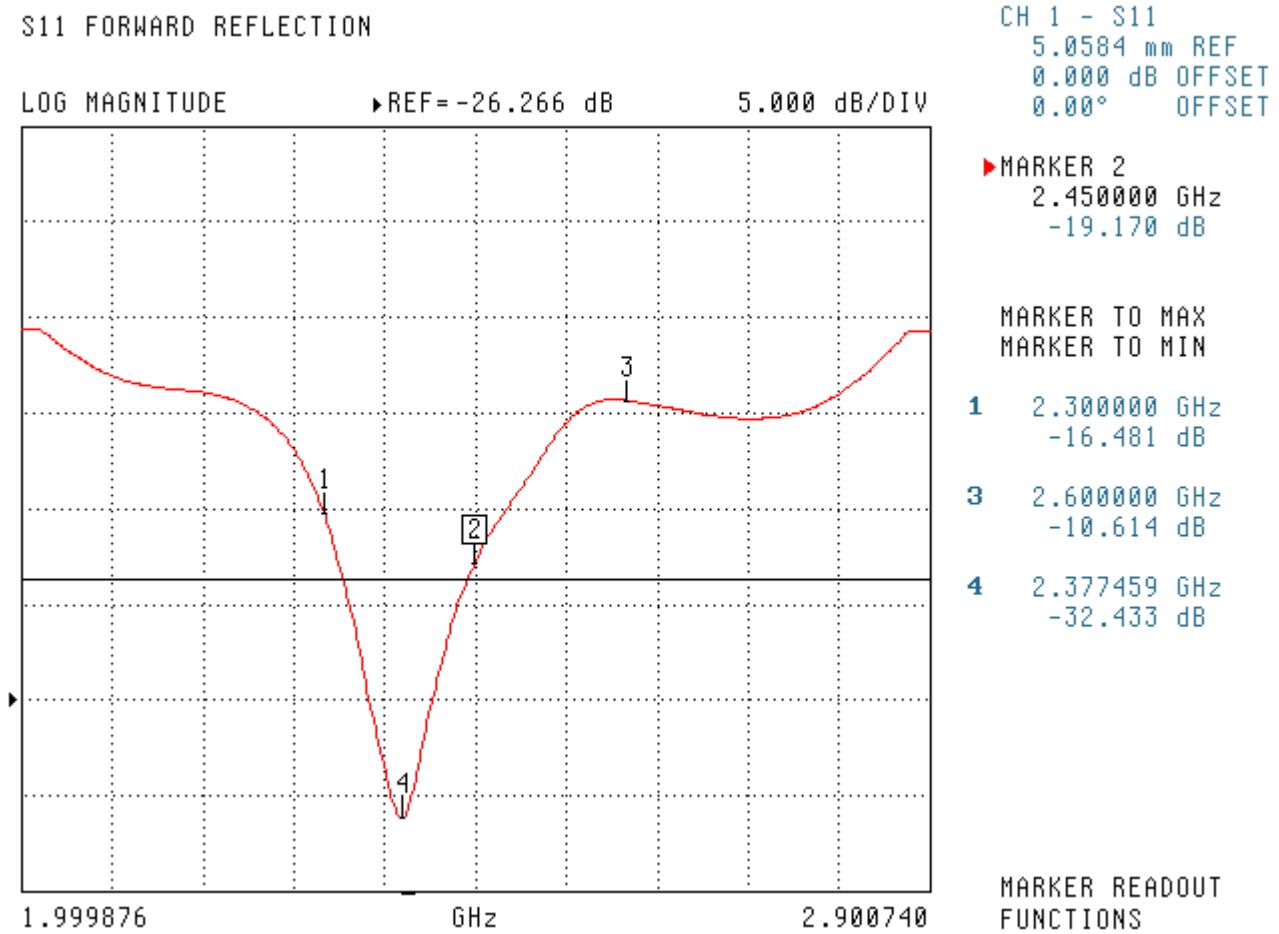
#### **Tissue Validation**

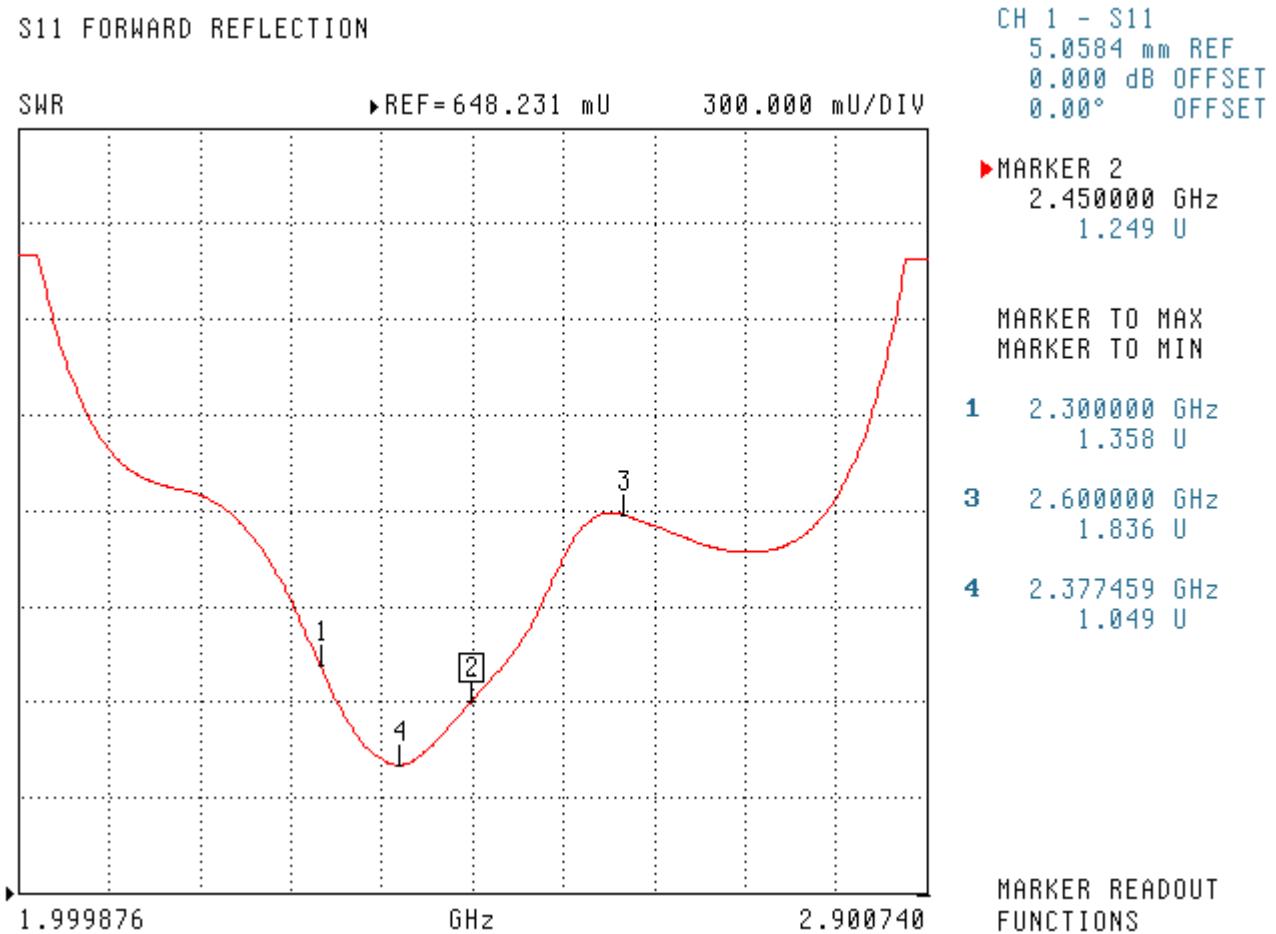
<b>Body Tissue 2450 MHz</b>	<b>Measured</b>
<b>Dielectric constant, <math>\epsilon_r</math></b>	52.0
<b>Conductivity, <math>\sigma</math> [S/m]</b>	1.92

**Electrical Calibration**

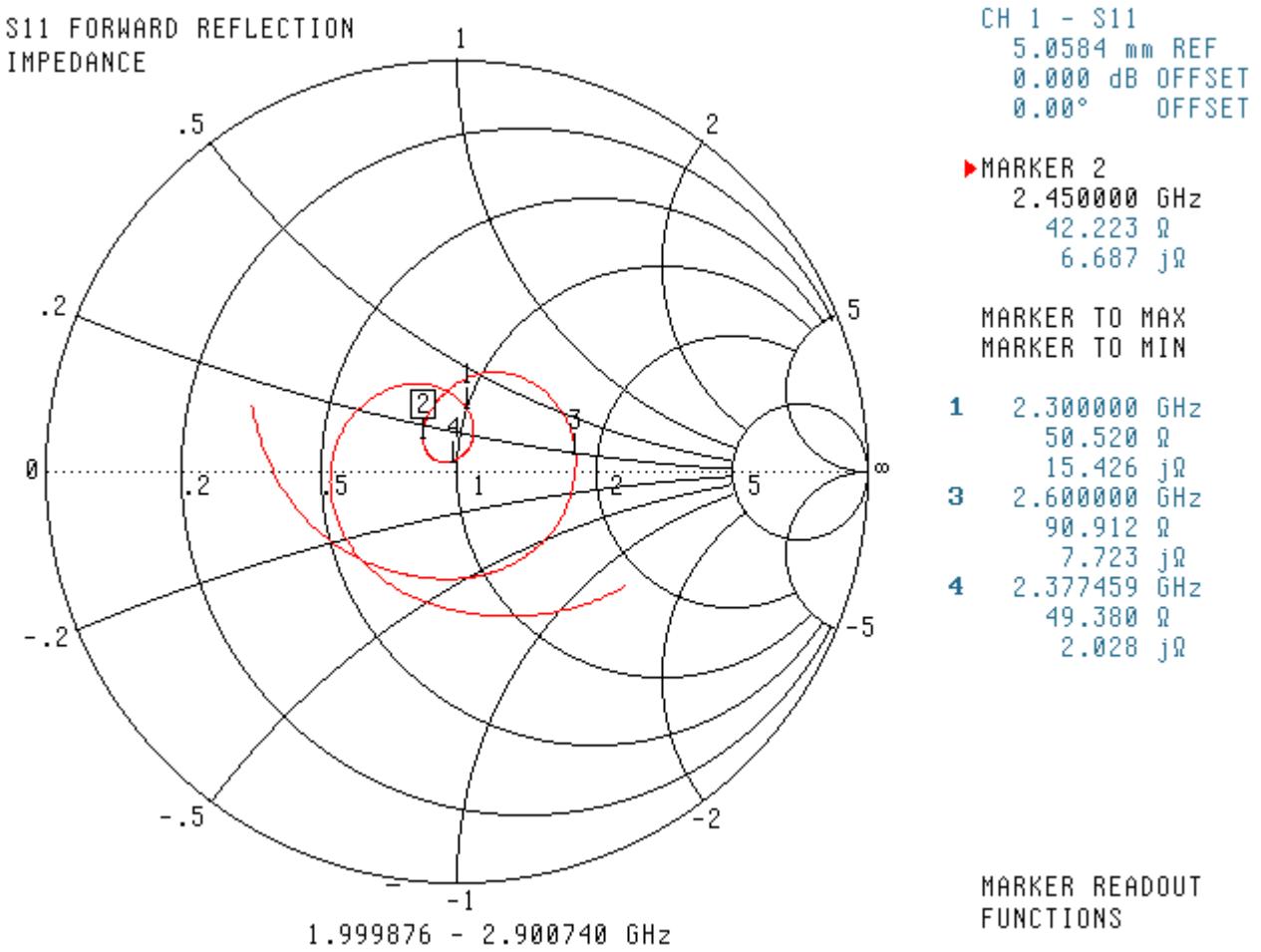
Test	Result
S11 R/L	-19.170 dB
SWR	1.249 U
Impedance	42.223 $\Omega$

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

**S11 Parameter Return Loss**

**SWR**

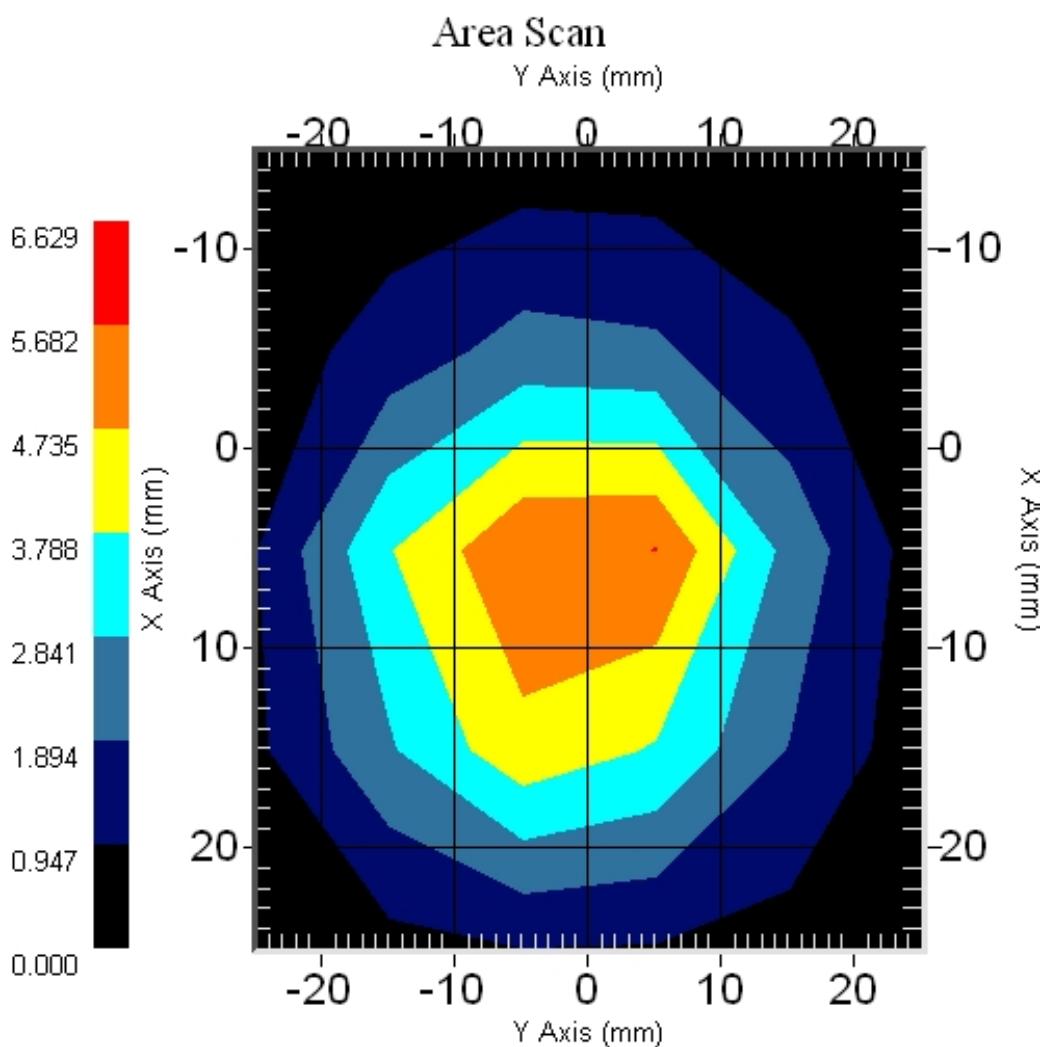
## Smith Chart Dipole Impedance



## System Validation Results Using the Electrically Calibrated Dipole

## Results @ 100mW

Body Tissue Frequency	1 Gram	10 Gram	Peak Above Feed Point
2450 MHz	5.15	2.31	10.01



## **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**

51 SPECTRUM WAY  
NEPEAN, ONTARIO  
CANADA K2R 1E6

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