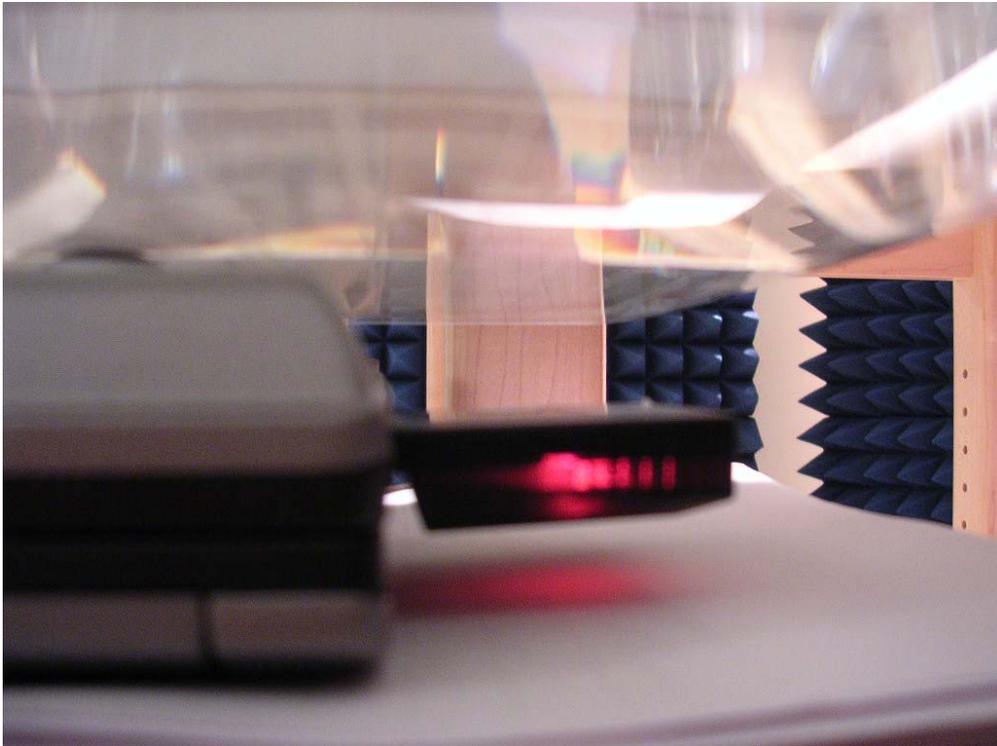


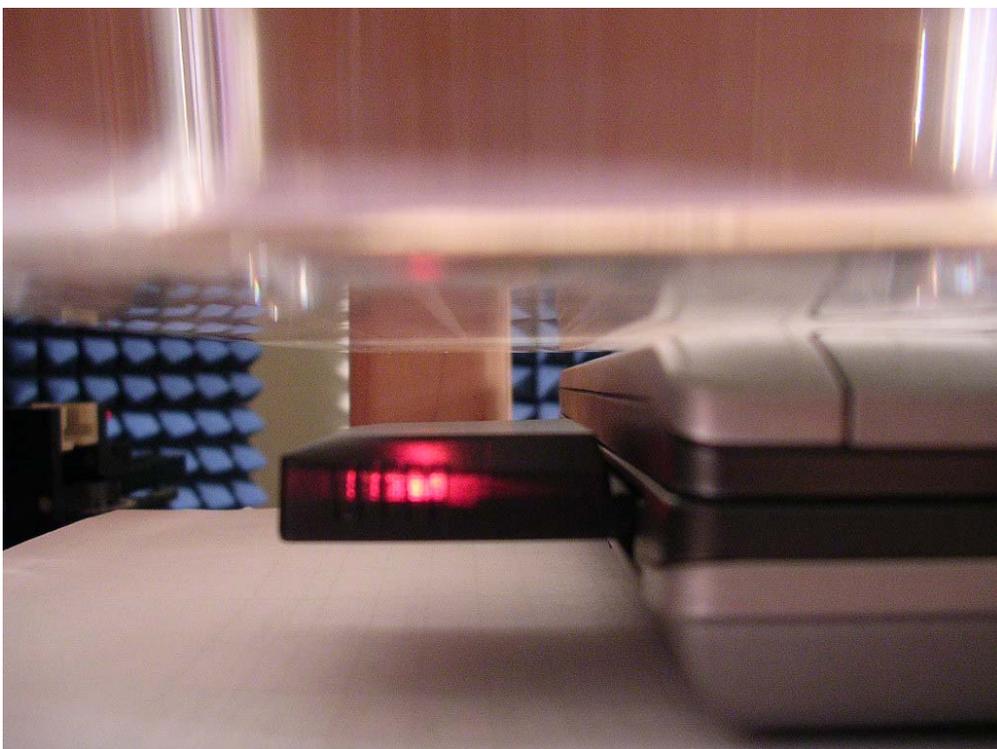
Test Setup Photographs

WiMAX with Notebook (Dell M/N: Precision M65)

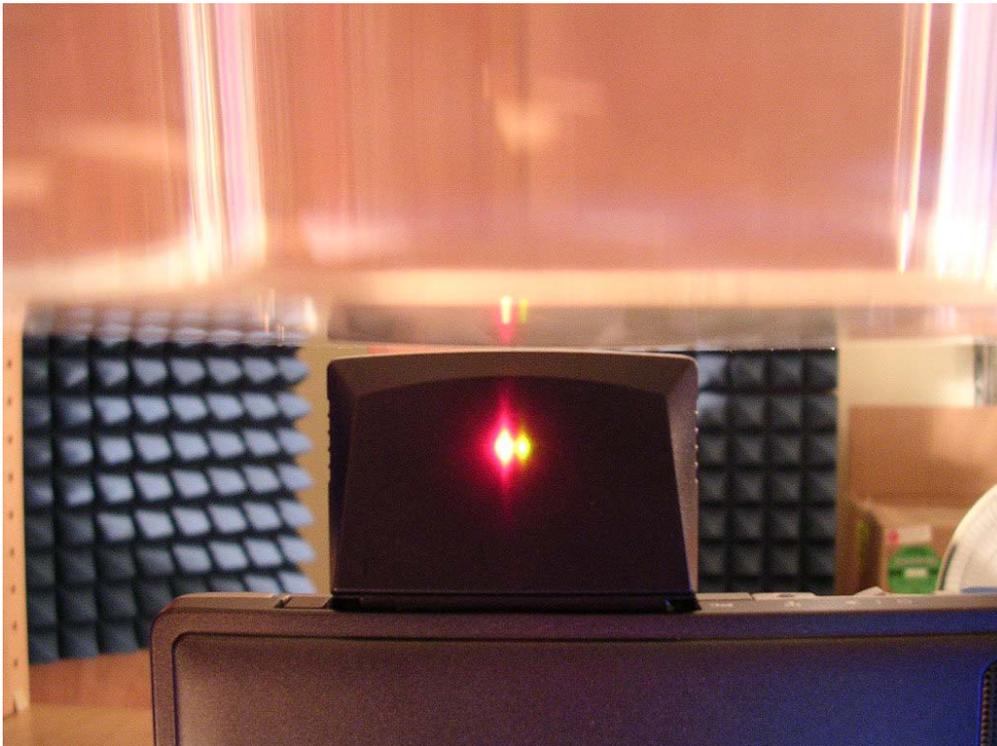
EUT Back



EUT Front



EUT Top



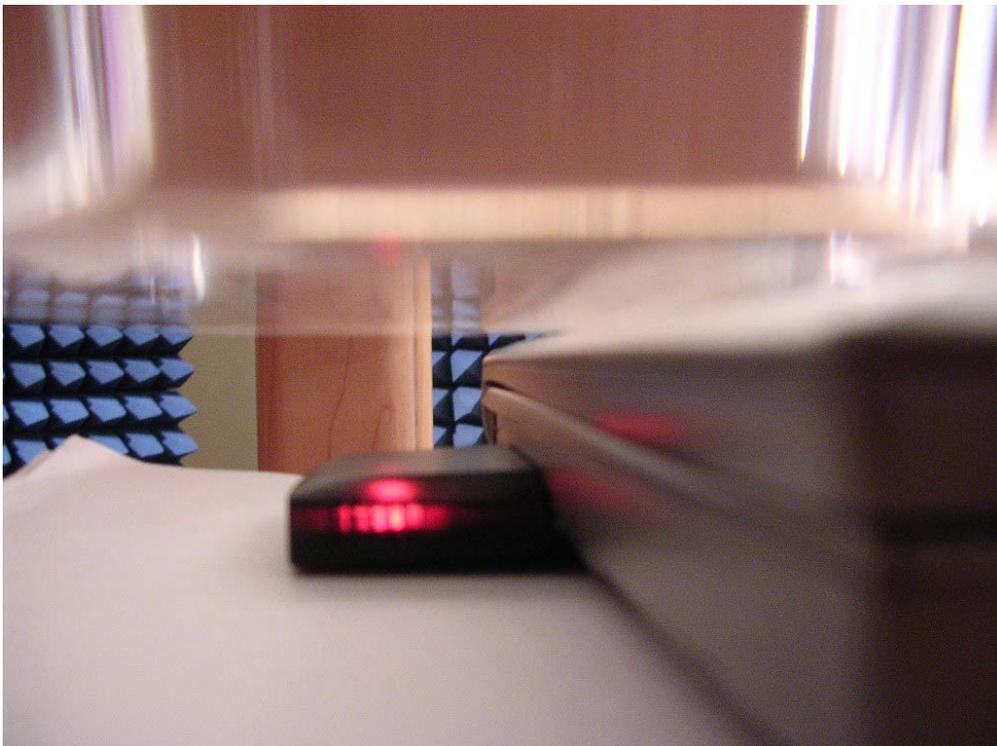
Test Setup Photographs

WiMAX with Notebook (Dell M/N: D400)

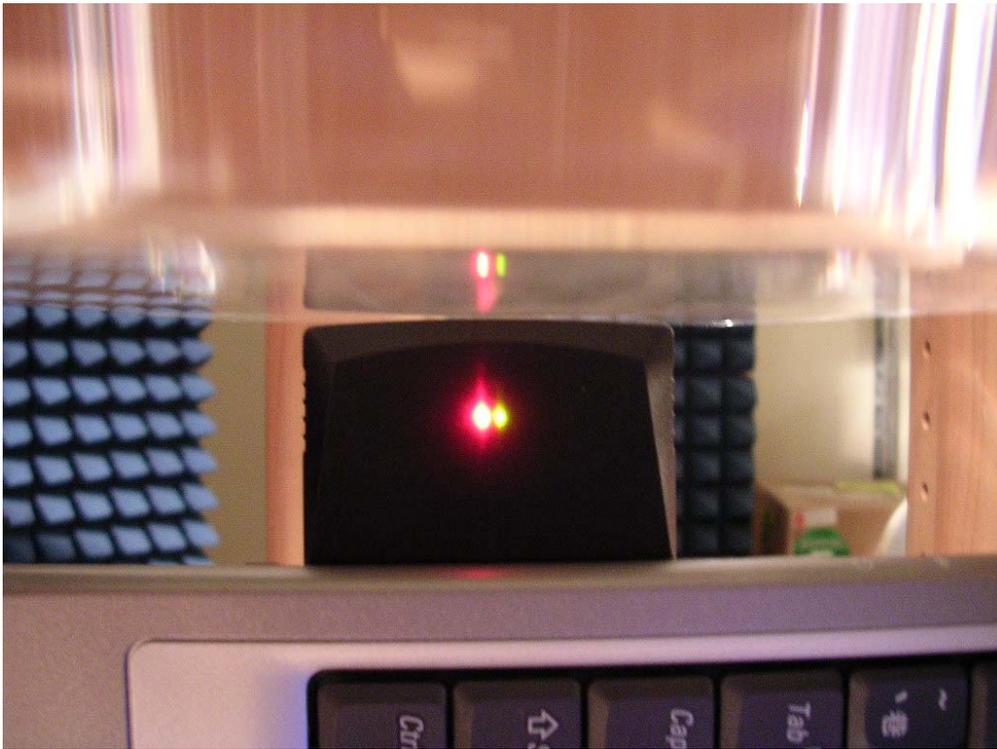
EUT Back



EUT Front



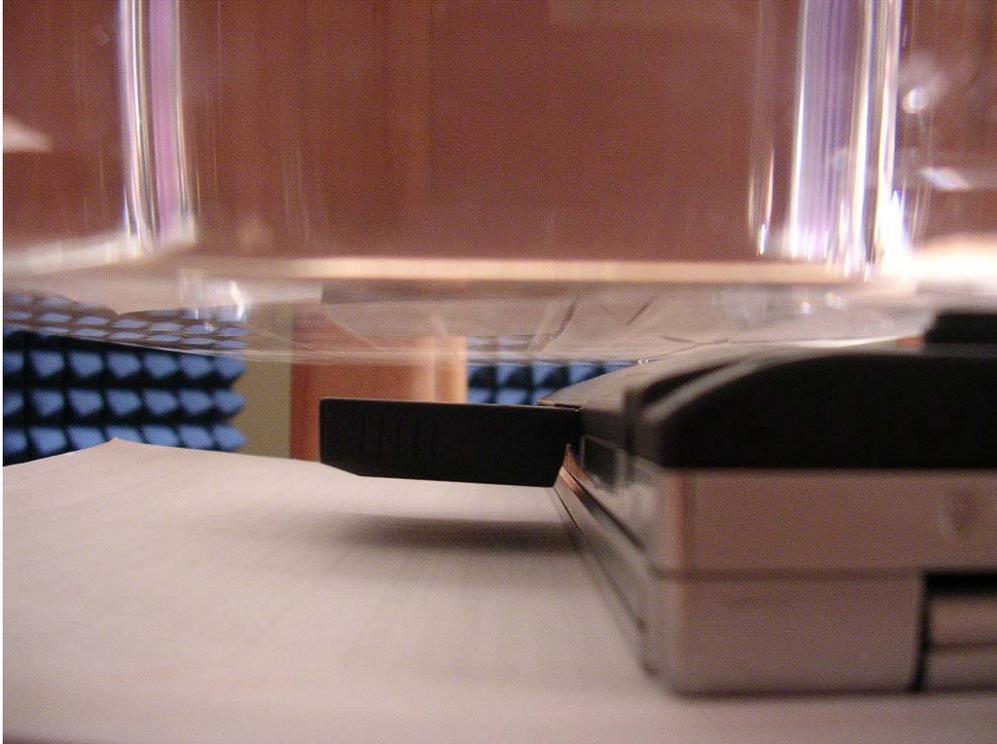
EUT Top



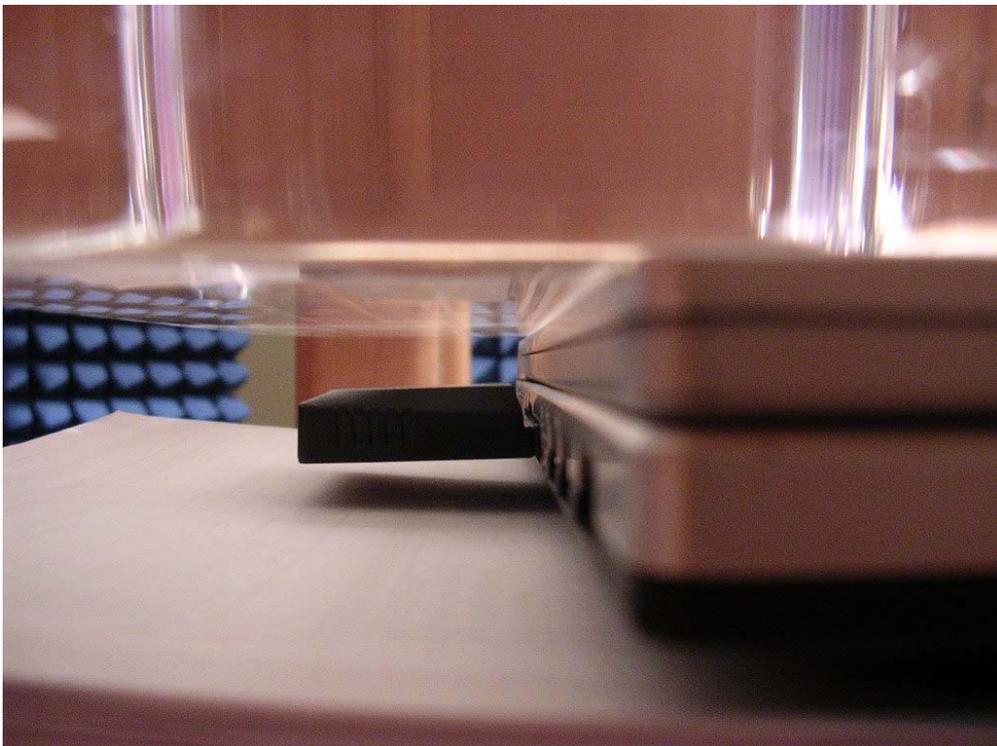
Test Setup Photographs

WiMAX with Notebook (ASUS M/N: S1300)

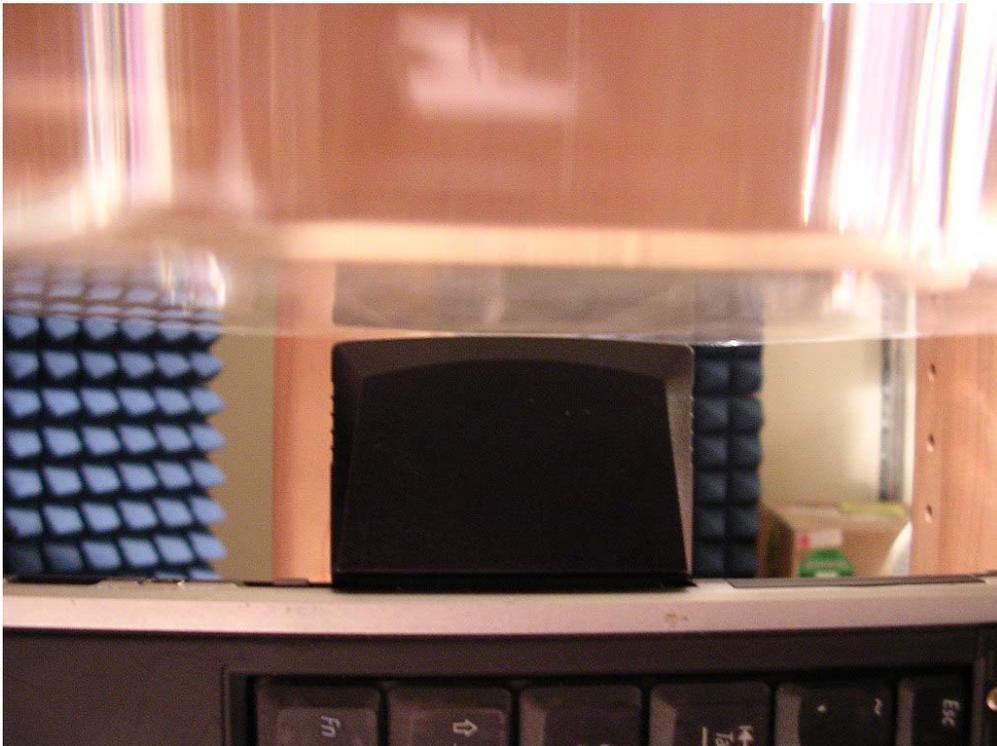
EUT Back



EUT Front



EUT Top



EUT Photographs



NCL CALIBRATION LABORATORIES

Calibration File No.: CP-719

Client: QUIETEK

CERTIFICATE OF CALIBRATION

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

Equipment: Miniature Isotropic RF Probe 2600 MHz

Manufacturer: APREL Laboratories

Model No.: ALS-E-020

Serial No.: 265

Body Calibration

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

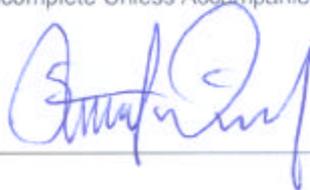
Project No: QTKB-2600-PC-5265

Calibrated: 29th December 2006

Released on: 29th December 2006

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

Released By: _____



NCL CALIBRATION LABORATORIES

17 Bentley Avenue
Ottawa, ONTARIO
CANADA K2E 8T7

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

Introduction

This Calibration Report reproduces the results of the calibration performed in line with the SSI/DRB-TP-D01-032-E020-V2 E-Field Probe Calibration Procedure. The results contained within this report are for APREL E-Field Probe E-020 265.

References

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

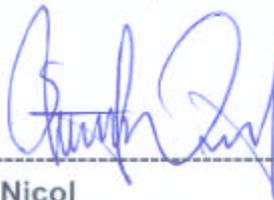
Conditions

Probe 265 was a re-calibration.

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

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

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



S. Nicol



M. Nesterova

Calibration Results Summary

Probe Type:	E-Field Probe E-020
Serial Number:	265
Frequency:	2600 MHz
Sensor Offset:	1.56 mm
Sensor Length:	2.5 mm
Tip Enclosure:	Ertalyte*
Tip Diameter:	<5 mm
Tip Length:	60 mm
Total Length:	290 mm

*Resistive to recommended tissue recipes per IEEE-1528

Sensitivity in Air

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

Sensitivity in Body Tissue

Frequency: 2600 MHz

Epsilon: 50.18 (+/-5%) **Sigma:** 2.07 S/m (+/-5%)

ConvF

Channel X: 4.32

Channel Y: 4.32

Channel Z: 4.32

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

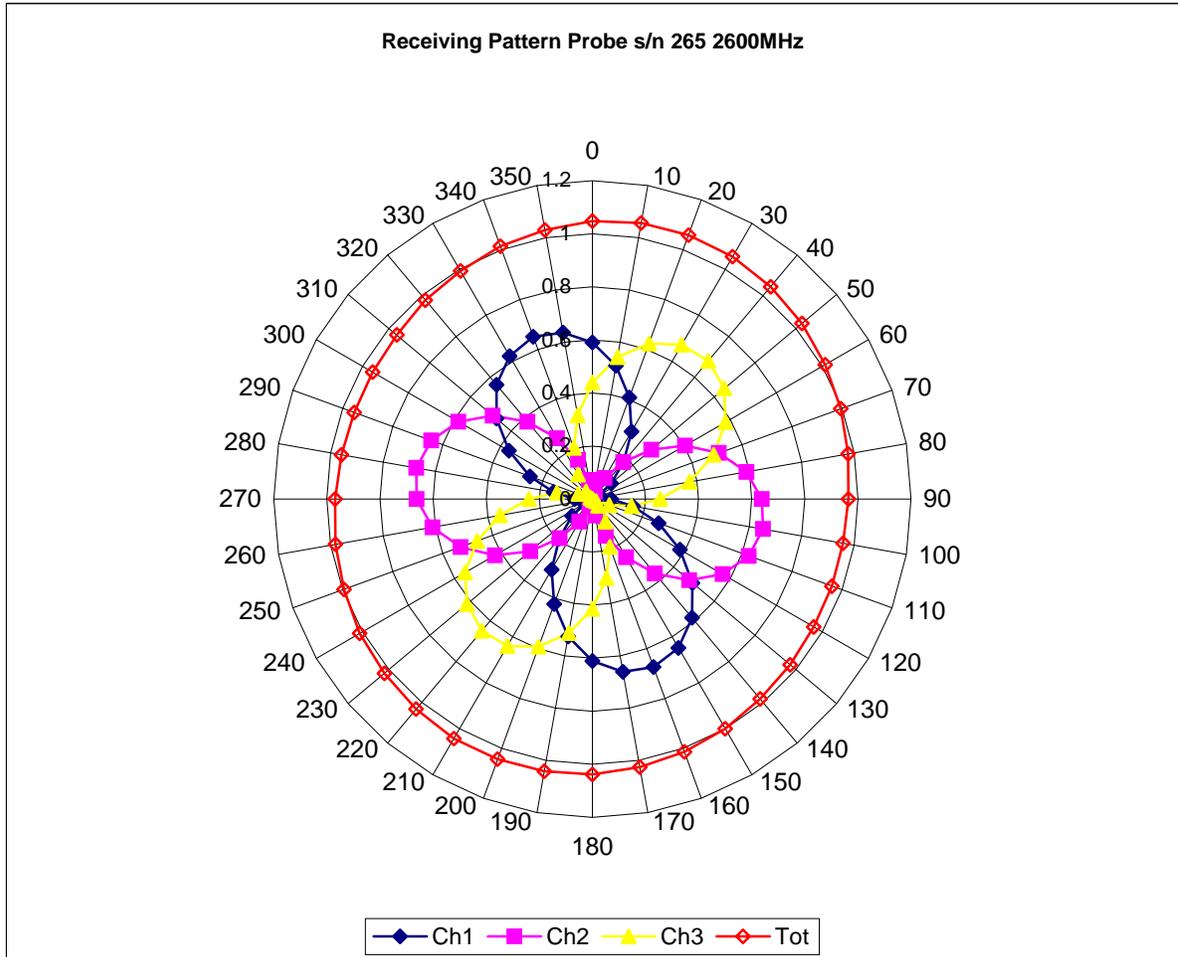
Boundary Effect:

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

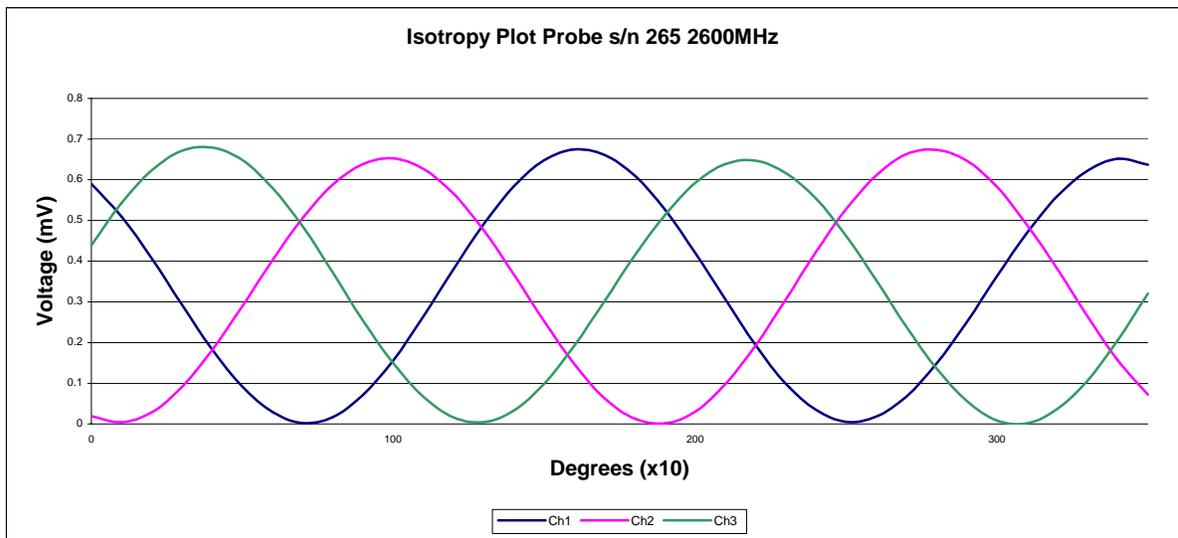
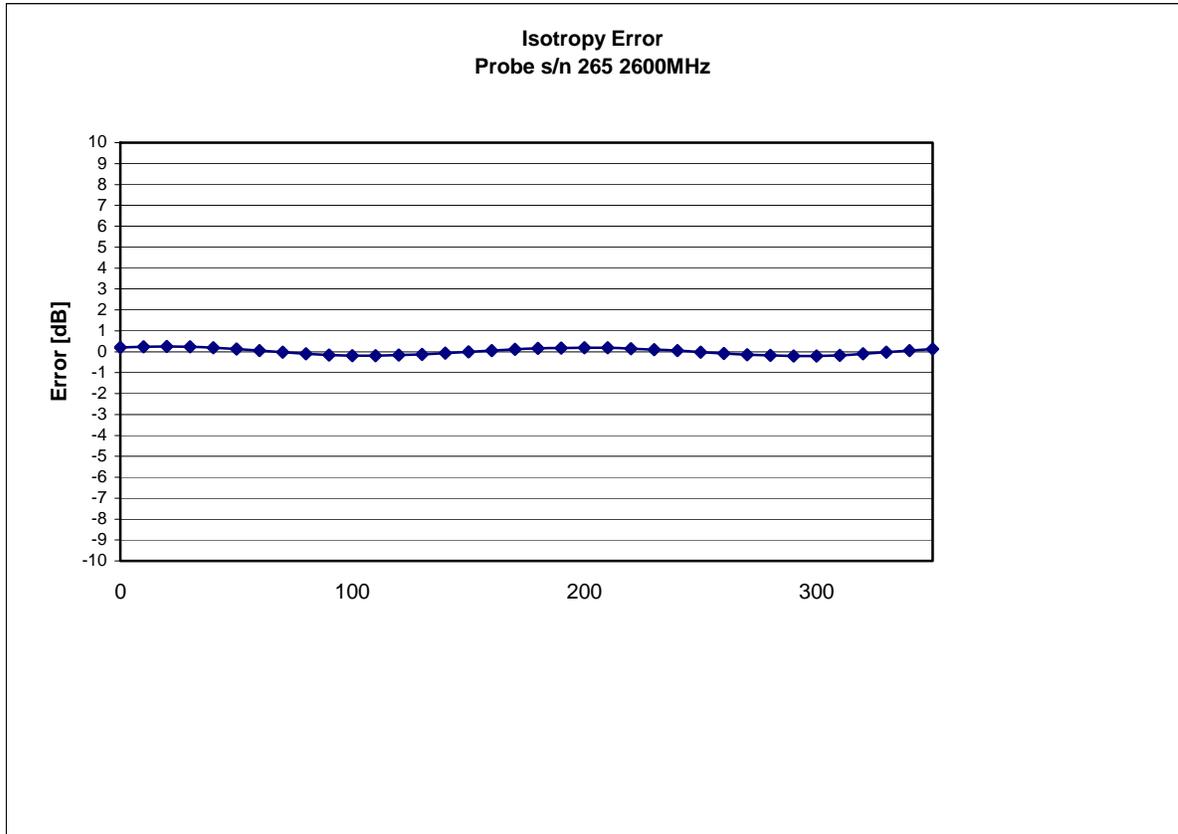
Spatial Resolution:

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

Receiving Pattern 2600 MHz (Air)



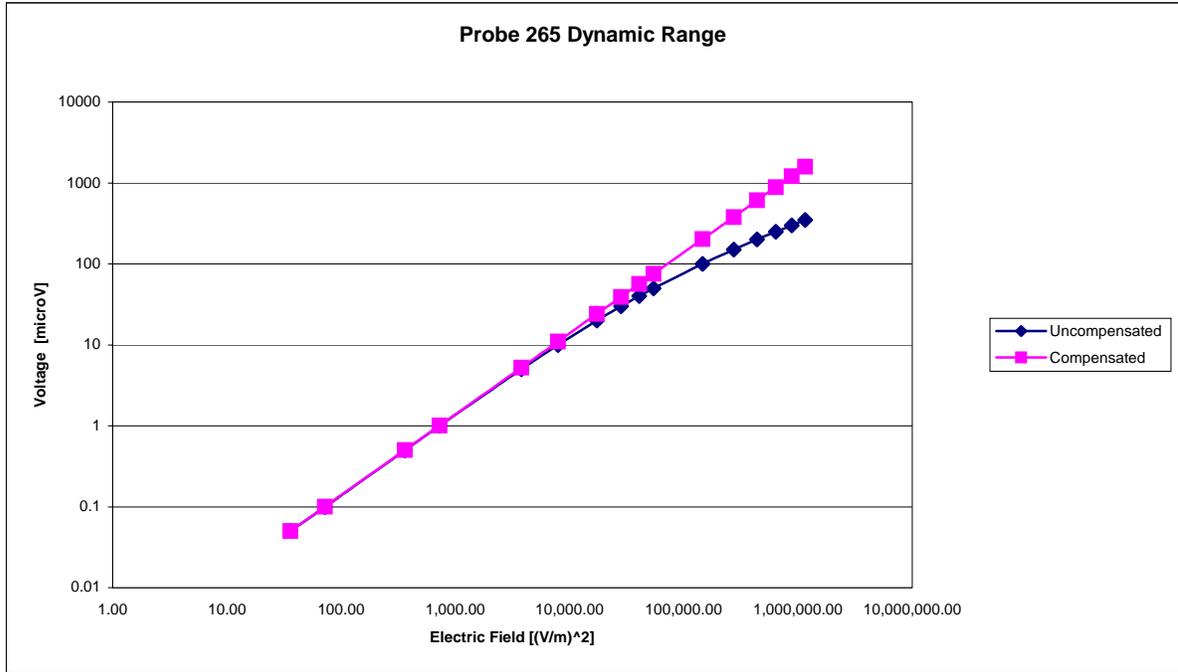
Isotropy Error 2600 MHz (Air)



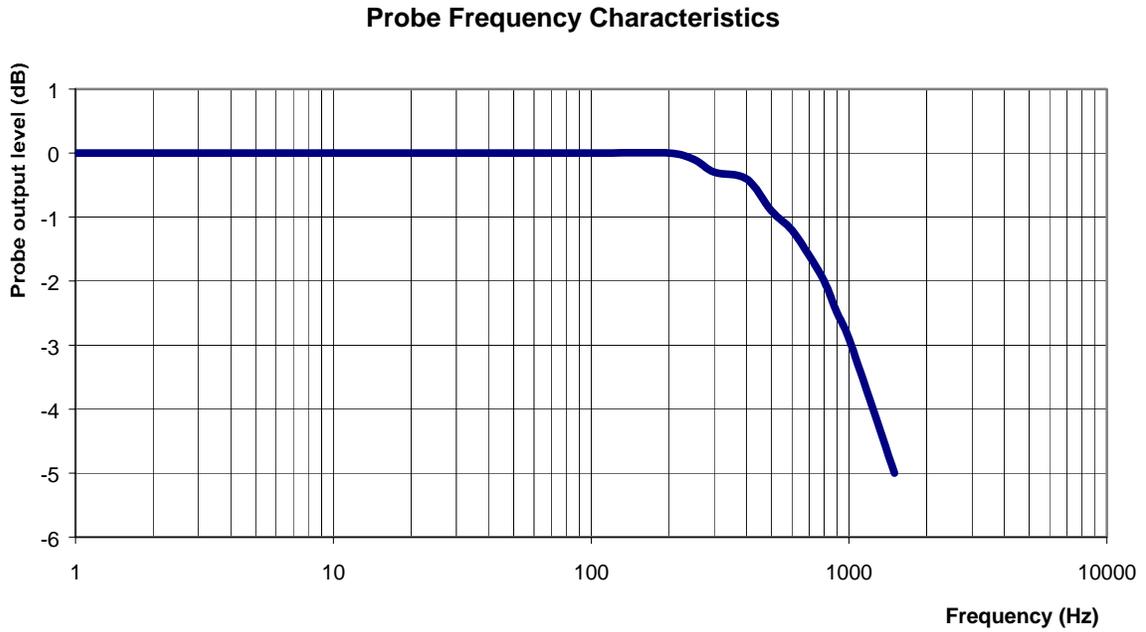
Isotropicity in Tissue:

0.10 dB

Dynamic Range



Video Bandwidth



Video Bandwidth at 500 Hz 1 dB
Video Bandwidth at 1000 Hz 3 dB

Conversion Factor Uncertainty Assessment

Frequency: 2600 MHz
Epsilon: 50.18 (+/-5%) **Sigma:** 2.07 S/m (+/-5%)

ConvF

Channel X: 4.32 7%(K=2)
Channel Y: 4.32 7%(K=2)
Channel Z: 4.32 7%(K=2)

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

Boundary Effect:

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

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2006.



Appendix - Dipole Calibration

Validation Dipole 2600MHz

P/N: ALS-D-2600-S-2

S/N: QTK-225-00901

NCL CALIBRATION LABORATORIES

Calibration File No: DC-720
Project Number: QTKB-2600-Dipole-5265

CERTIFICATE OF CALIBRATION

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

APREL Validation Dipole

Manufacturer: APREL Laboratories

Part number: ALS-D-2600-S-2

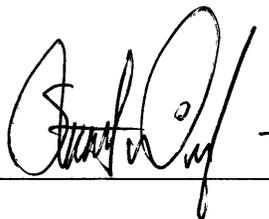
Frequency: 2600 MHz

Serial No: 225-00901

Customer: Quietek

Calibrated: 27th December 2006
Released on: 27th December 2006

Released By: _____



NCL CALIBRATION LABORATORIES

17 Bentley Avenue
Ottawa, ONTARIO
CANADA K2E 6T7

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

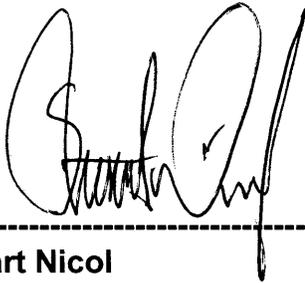
Conditions

Dipole 225-00901 was new and taken from stock prior to calibration.

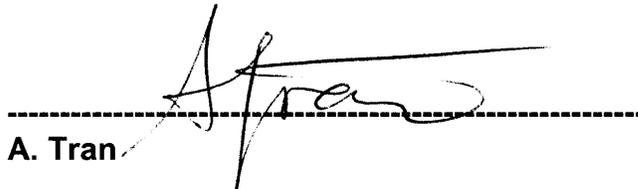
Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C

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



A. Tran

Calibration Results Summary

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

Mechanical Dimensions

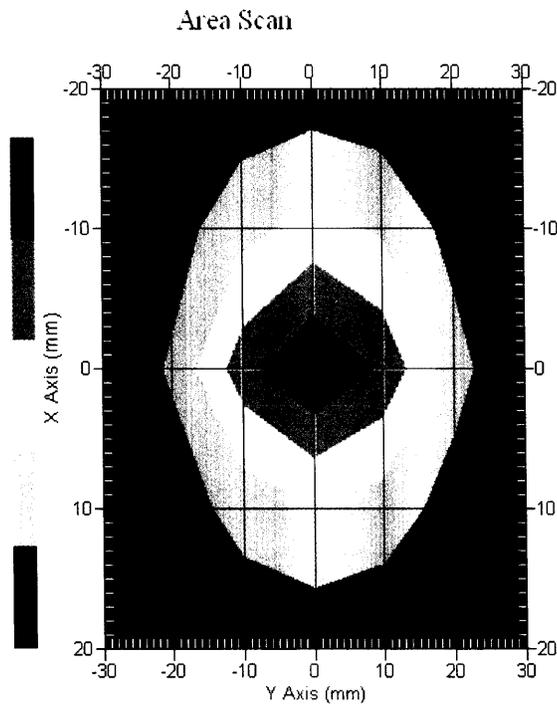
Length: 49.5 mm
Height: 30 mm

Electrical Specification

SWR: 1.086 U
Return Loss: -27.7 dB
Impedance: 47.71 Ω

System Validation Results

Frequency	1 Gram	10 Gram	Peak
2600 MHz	54.0	23.0	119.0



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 225-00901. 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 40 MHz to 26 GHz E-Field Probe Serial Number 225.

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 225-00901 was new taken from stock.

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

Dipole Calibration Results

Mechanical Verification

Measured Length	Measured Height
49.5 mm	30 mm

Tissue Validation

Body Tissue 2600 MHz	Measured
Dielectric constant, ϵ_r	50.18
Conductivity, σ [S/m]	2.07

Electrical Calibration

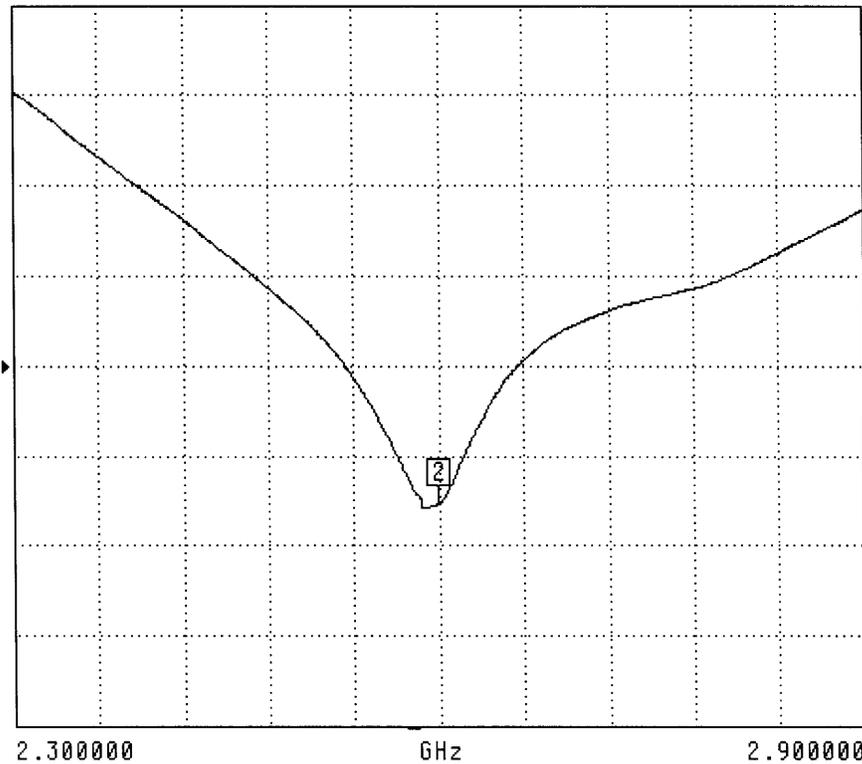
Test	Result
S11 R/L	-27.7 dB
SWR	1.086 U
Impedance	47.71 Ω

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

S11 Parameter Return Loss

S11 FORWARD REFLECTION

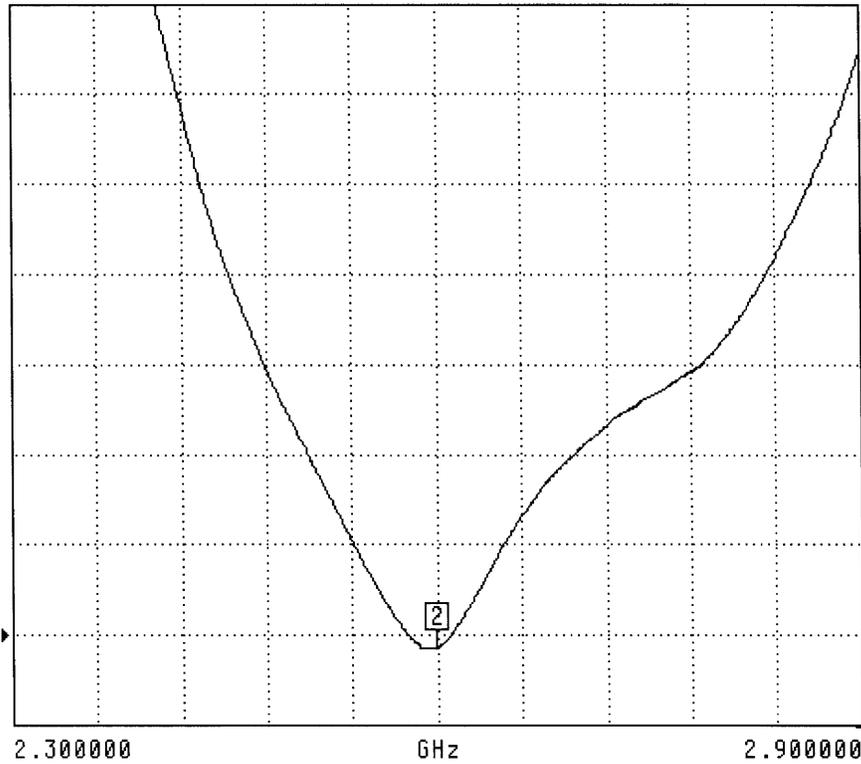
LOG MAGNITUDE ▶REF=-20.000 dB 5.000 dB/DIV



SWR

S11 FORWARD REFLECTION

SWR ▶REF=1.100 U 100.000 mU/DIV



CH 1 - S11
REFERENCE PLANE
5.0226 mm

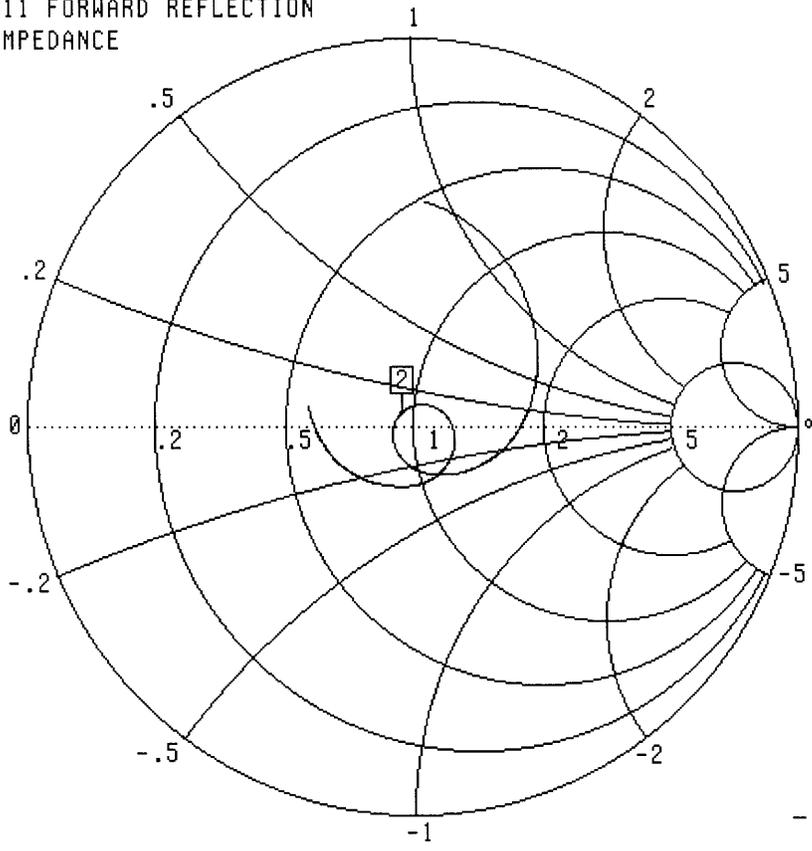
▶MARKER 2
2.600000 GHz
1.086 U

MARKER TO MAX
MARKER TO MIN

MARKER READOUT
FUNCTIONS

Smith Chart Dipole Impedance

S11 FORWARD REFLECTION
IMPEDANCE



CH 1 - S11
REFERENCE PLANE
5.0226 mm

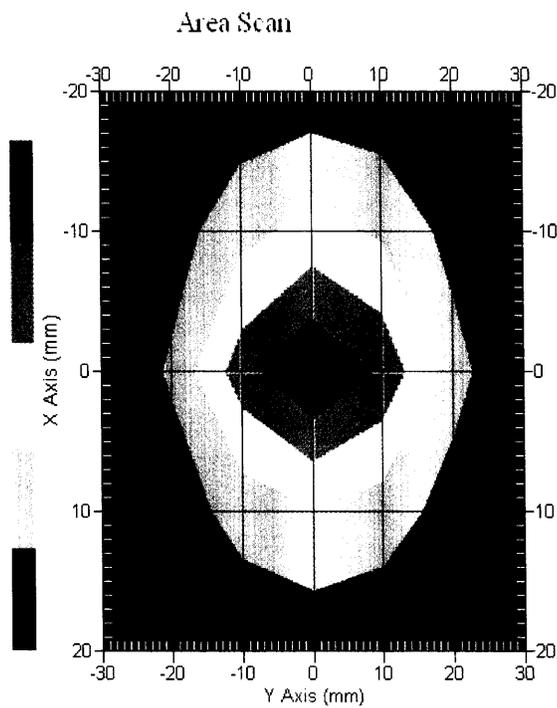
▶ MARKER 2
2.600000 GHz
47.706 Ω
3.299 $j\Omega$

MARKER TO MAX
MARKER TO MIN

MARKER READOUT
FUNCTIONS

System Validation Results Using the Electrically Calibrated Dipole

Head Tissue Frequency	1 Gram	10 Gram	Peak Above Feed Point
2600 MHz	54.0	23.0	119.0



NCL Calibration Laboratories

Division of APREL Laboratories.

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2006.