

Timothy R Johnson
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Re : FCC ID : O8FMADECA
CRN : 24414
Applicant : Palmone

Subject : Request for additional information

Dear Tim,

This is in response to your e-mail dated November 8, 2005, requesting additional information for FCC ID: O8FMADECA.

3) From the report it is not clear if the measurement was to probe sensor center rather than nearest element point. Please clarify. If the probe center was used demonstrate that it provides a conservative rating. A Z axis scan at the worst case configuration for both E and H field is sufficient.

Response: As shown in figure1 on page 13 of the report, the 10 mm separation distance was defined from the nearest point of the probe sensor element. This is also mentioned on page 16, step 1 of the probe modulation response measurement procedure, that figure 1 is the setup used for the measurement. For the RF emissions measurement of WD, the automated scanning software automatically sets up the separation distance according to the definition in figure 1, using the sensor offset stated in the corresponding probe calibration certificates.

4) Please provide the measured data and full details that justified the 5.1dB PMF. Please also give an example of how the PMF was used to arrive at the final value.

Response: The measured 5.1dB PMF for the CDMA signal shows on page 17 of the report was due to a misrepresentation of the automated measurement software display. The actual measured PMF for the CDMA signal can be calculated from the dipole validation results on page 15 of the report and are shown in the revised tables below. And these numbers were the actual values been used in the software algorithm of the automated measurement system for the purpose of calculating measured E and H field values.

Signal Type	Freq	Average Input Power	Measured Peak E-field	Target E-field Value	Deviation	Modulation Factor
	(MHz)	(mW)	(V/m)	(V/m)	(%)	-
CW	835	100	244	265	-7.9	-
CW	1880	100	196	211	-7.1	-
80% AM	835	31	148	-	-	-
80% AM	1880	31	119	-	-	-
CDMA	835	31	246	-	-	0.992
CDMA	1880	31	194	-	-	1.010

As an example how the PMF was used to arrive at the final value, for $f=824\text{MHz}$, measured average E field = $55.17(\text{V/M})$. So the Peak E field = $55.17 * \text{sqr}.2 * 0.992 = 77.4(\text{V/M})$. This calculation is carried out in the algorithm and only the final peak value is presented.

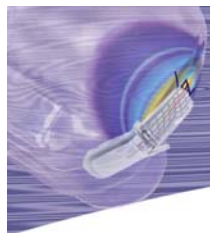
Signal Type	Freq	Average Input Power	Measured Peak H-field	Target H-field Value	Deviation	Modulation Factor
	(MHz)	(mW)	(V/m)	(V/m)	(%)	-
CW	835	100	0.707	0.673	5.1	-
CW	1880	100	0.687	0.645	6.5	-
80% AM	835	31	0.430	-	-	-
80% AM	1880	31	0.418	-	-	-
CDMA	835	31	0.672	-	-	1.052
CDMA	1880	31	0.642	-	-	1.070

For E-field, the PMFs are 0.992 for 835MHz and 1.01 for 1880MHz.

For H-field, the PMFs are 1.052 for 835MHz and 1.07 for 1880MHz.

Please also see below an explanation from the Director of the ALSAS–10U system development.

The original software build was based on a previous iteration of the HAC standard and included for computational post processing was a table of “Probe Modulation Factors” which was inserted as a user reference to allow for support of more complex measurements e.g. UMTS, OFDM, etc. At the time of use this feature was completely disabled and was a legacy display which was referenced by the engineer. I have reviewed the report issued by the test engineer and it appears that he has



misrepresented the physical characteristics of the output within the context of his report, and caused a contradiction.

For example,,

On page 15 the PMF is shown on the table and can be calculated as this,

$$\text{PMF} = [\text{fx } 835]^{\text{CW}} / [\text{fx } 835]^{\text{CDMA}} = 244/246 \text{ Ratio} = 0.992$$

and,,

$$\text{PMF} = [\text{fx } 1880]^{\text{CW}} / [\text{fx } 1880]^{\text{CDMA}} = 196/194 \text{ Ratio} = 1.01$$

The statement made on page 17 of the report is not an accurate representation of the physical phenomenon and thus should be updated to the example detailed above.

If you have any additional questions please let me know.

5) *Please provide probe certification information for all frequency bands used. Only information for 1880 MHz band was located.*

Response: Please see attached E and H field probe calibration certificates for 835MHz.

6) *Please provide the measurement plot of the rotation at the final measurement location mentioned on page 20.*

Response: Please see the attached rotation plots.

7) Please provide 0 span plots used for validation and PMF measurements. Please explain why 100mW power was used for CW and 31mW was used for AM and CDMA. For AM and CDMA validation please show that PMF is as expected.

Response: The 0 span plots of the WD signals used for the system validation and PMF measurements are shown on page 69 to page 74 of the report.

The 100mW for CW and 31mW for AM and CDMA signals shown in the table on page 15 of report are the average input power levels. The corresponding peak input power is 100mW for all three types of signals. This is with respect to the requirements of the ANSI PC63.19-2005 Rev.3.6 standard. The detailed information are shown in the table below:

Signal Type	Freq (MHz)	Average Input Power (mW)	Average Input Power (dBm)	Peak Input Power (mW)	Peak Input Power (dBm)	Peak to Average Ratio (dB)
CW	835	100	20.0	100	20.0	0.0
CW	1880	100	20.0	100	20.0	0.0
80% AM	835	31	14.9	100	20.0	5.1
80% AM	1880	31	14.9	100	20.0	5.1
CDMA	835	31	14.9	100	20.0	5.1
CDMA	1880	31	14.9	100	20.0	5.1

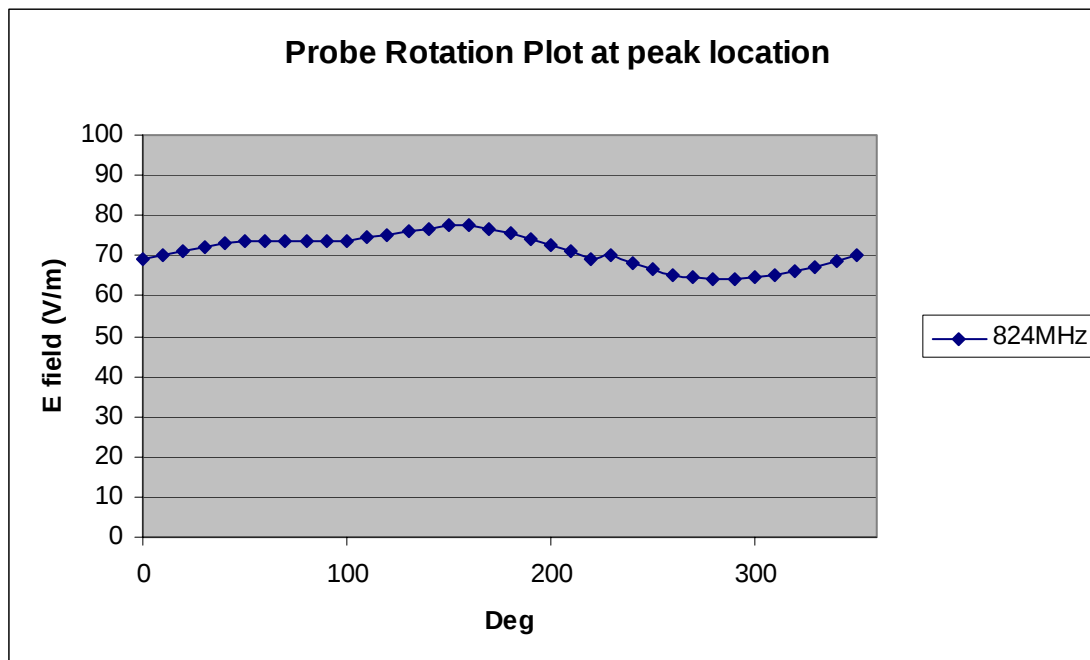
Thank you,

Jay

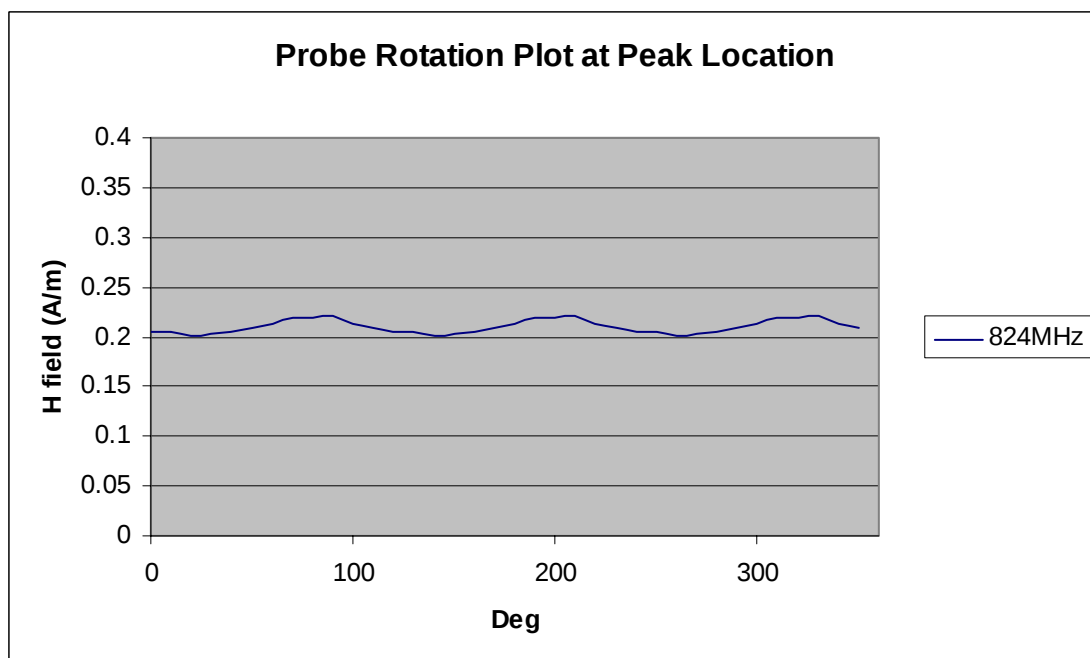
Probe Rotation Plots at Peak Measurement Location after exclusion

1. Frequency 824 MHz, Channel CDMA991

E-field

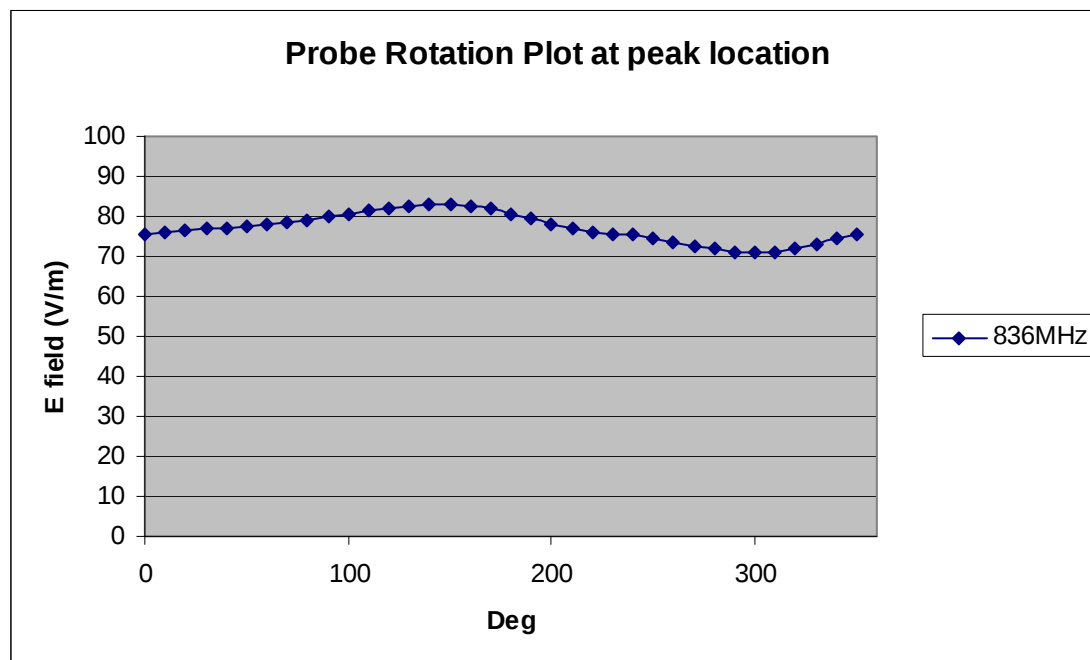


H-field

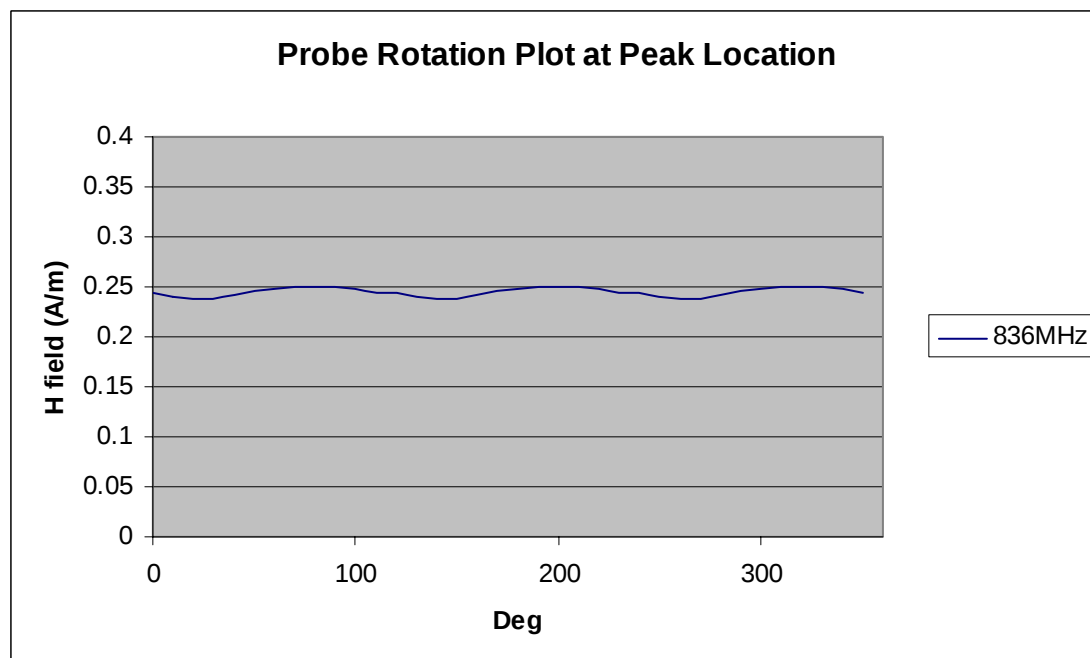


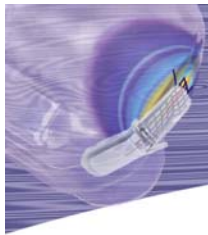
2. Frequency 836.5 MHz, Channel CDMA384

E-field



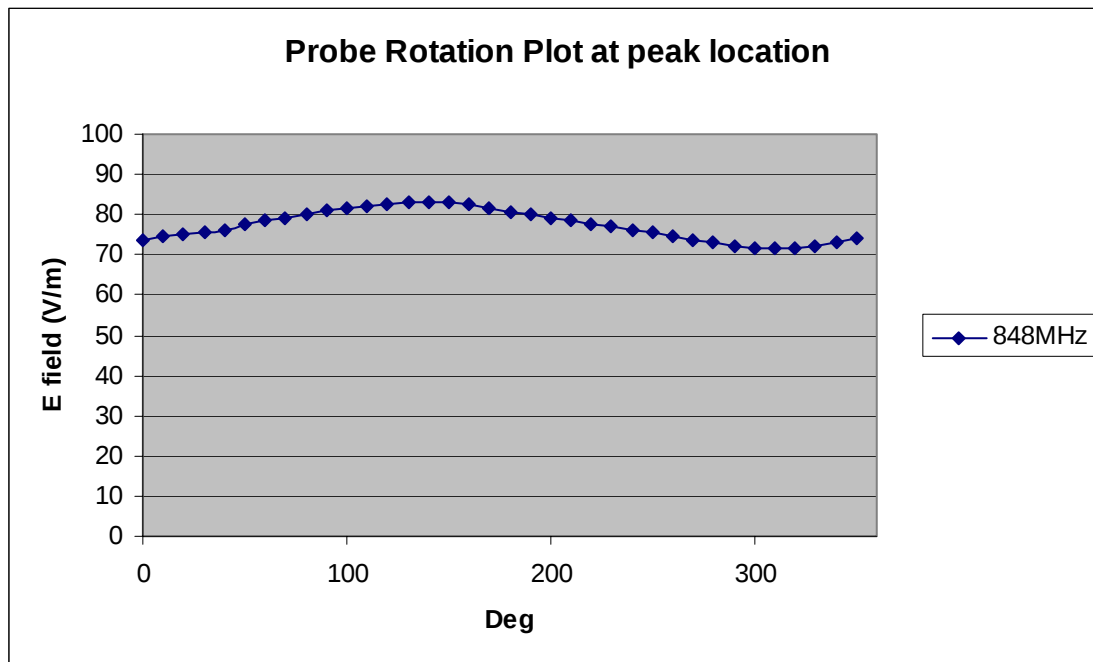
H-field



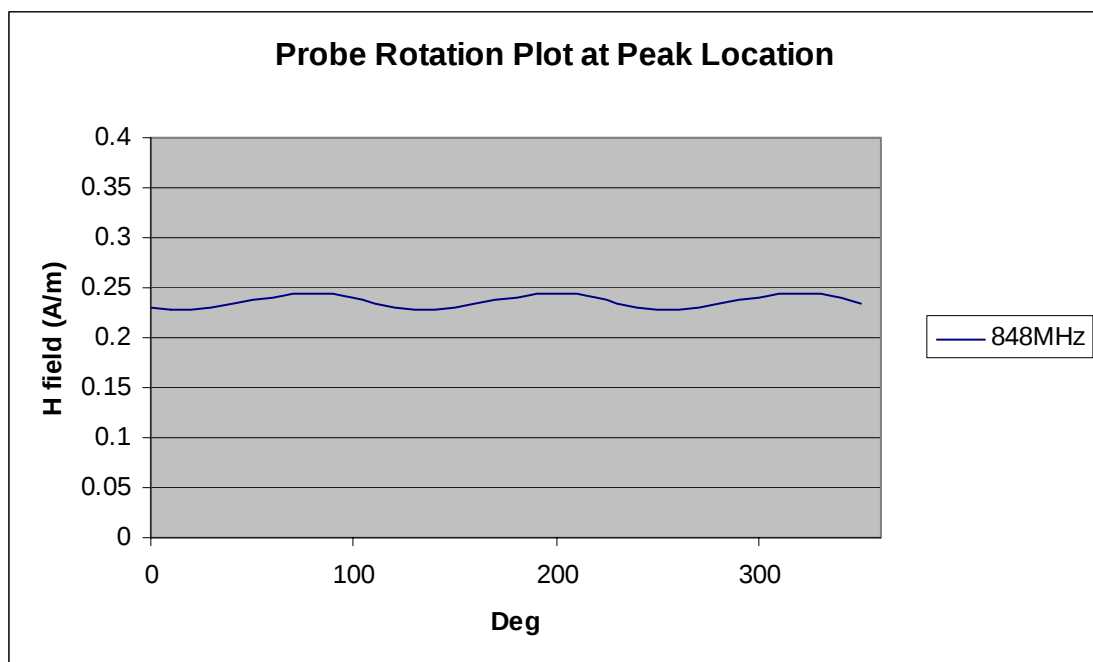


3. Frequency 849 MHz, Channel CDMA799

E-field

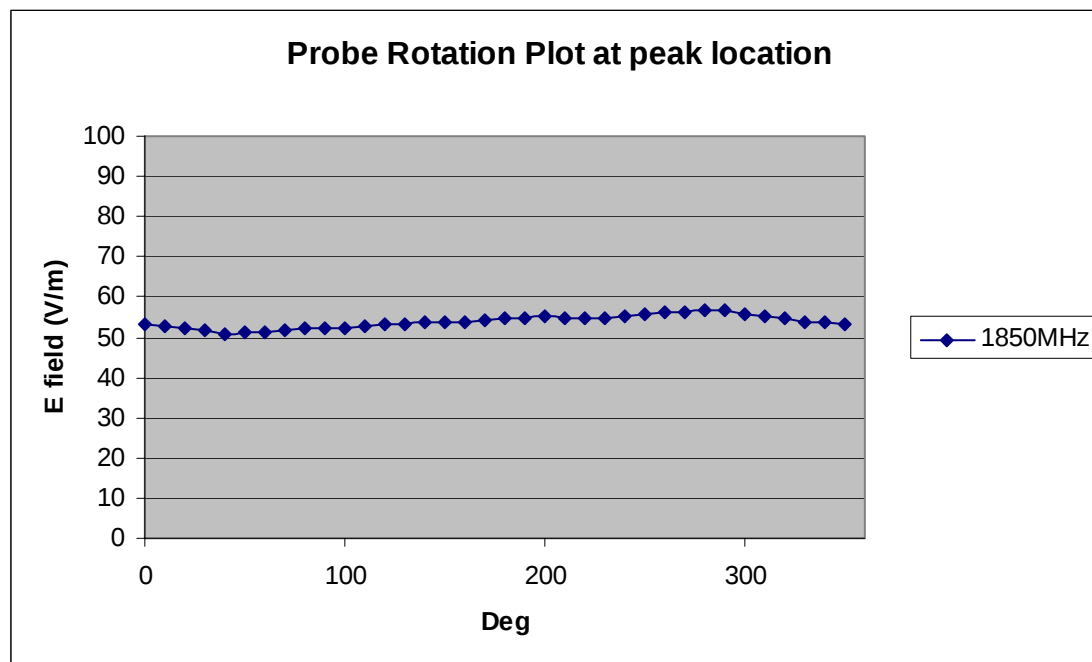


H-field

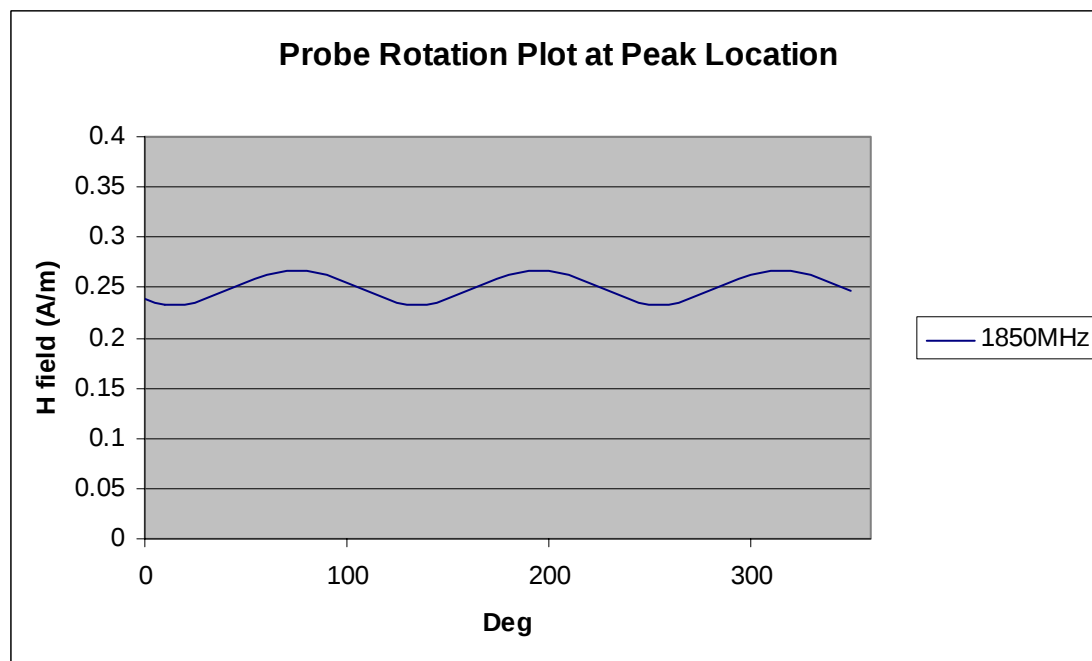


4. Frequency 1850 MHz, Channel PCS001

E-field

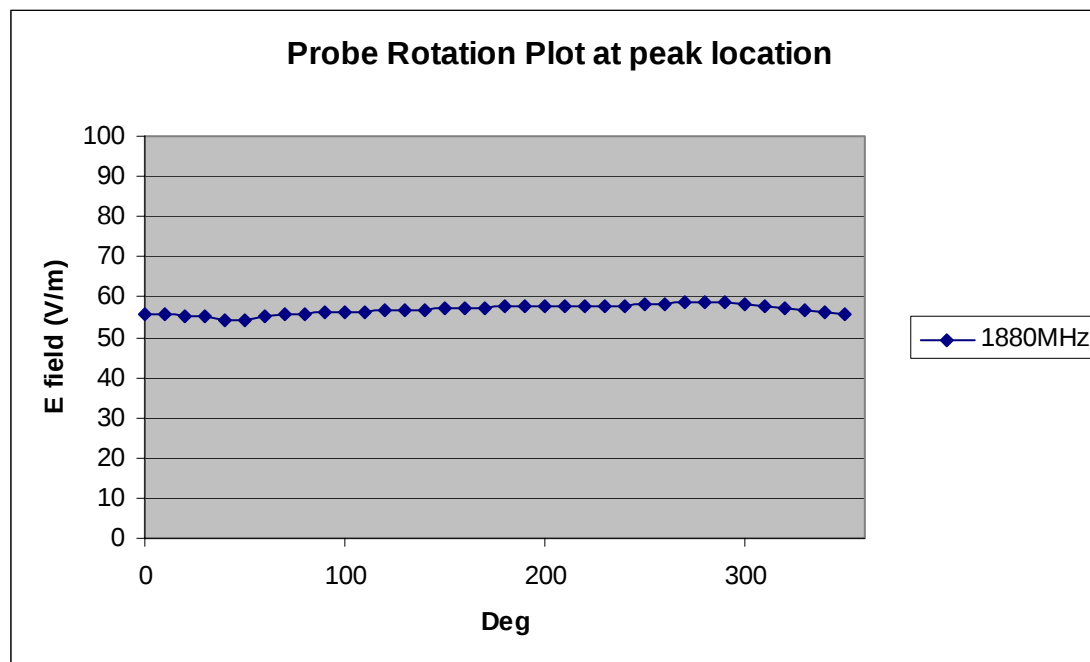


H-field

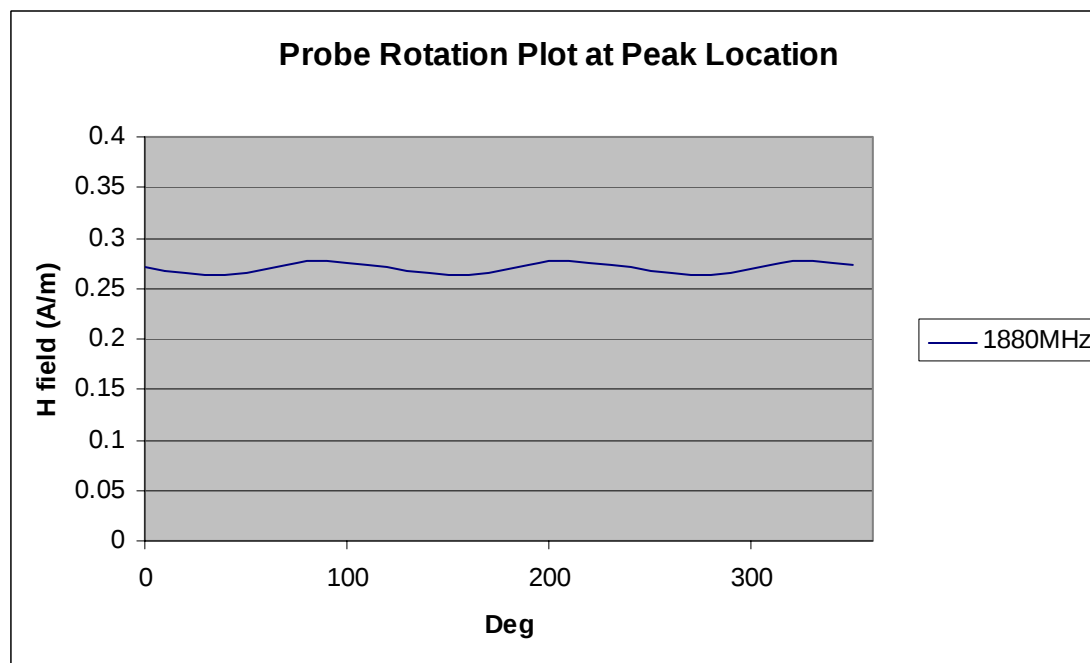


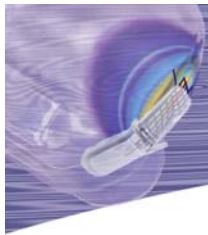
5. Frequency 1880 MHz, Channel PCS600

E-field



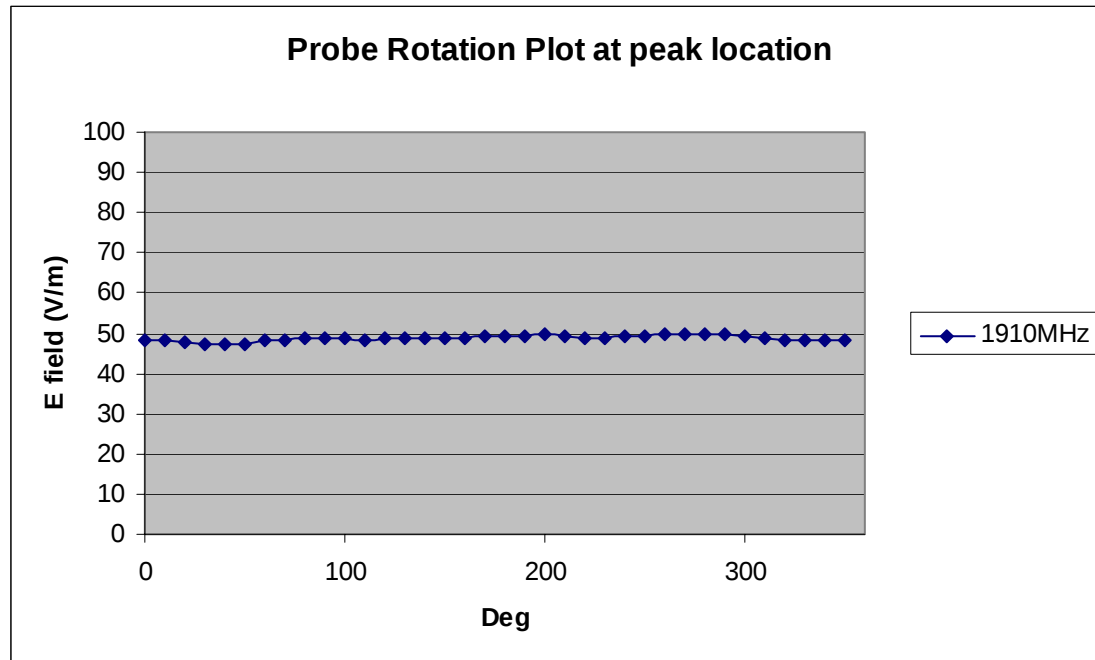
H-field



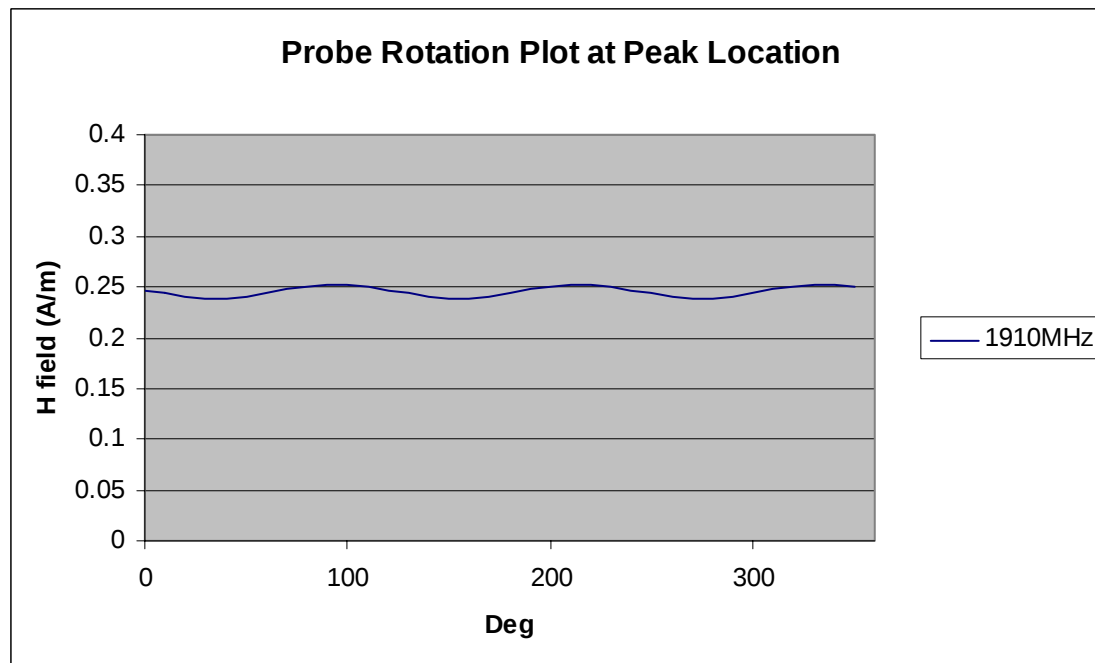


6. Frequency 1910 MHz, Channel PCS1199

E-field



H-field





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Probe Calibration Certificates

NCL CALIBRATION LABORATORIES

Client.: APREL

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

Manufacturer: APREL Laboratories

Model No.: E-020

Serial No.: 269

IN AIR Calibration

Calibration Procedure: SSI/DRB-TP-D01-038

Project No: Internal

Calibrated: 21nd May 2005

Released on: 21nd May 2005

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

Released By: _____

NCL CALIBRATION LABORATORIES

51 SPECTRUM WAY
NEPEAN, ONTARIO
CANADA K2R 1E6

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

Introduction

This Calibration Report reproduces the results of the calibration performed in line with the SSI/DRB-TP-D01-038 E-Field Probe Calibration Procedure. The results contained within this report are for APREL E-Field Probe E-020 269.

References

SSI/DRB-TP-D01-038 E-Field Probe Calibration Procedure
IEEE Std 1309-2005 "Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9 kHz to 40GHz".

Conditions

Probe 269 was a new probe taken from stock prior to calibration.

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

Sensor offset

Each probe is comprised of 3 electric field sensors and positioned at 90 degree to each other in XYZ arrangement. Their electric center makes the calibrated center of the probe. The center is aligned with the main axis of the probe. For constructional reasons it is located a small distance, specified as the vertical offset, above the tip of the probe. The actual offset is specified in the probe's calibration certificate to allow for proper referencing to the probe's calibrated center when the probe's vertical position relative to the tested object is set by touching it with the probe's tip.

Calibration Results Summary

Probe Type: E-Field Probe E-020
Serial Number: 269
Frequency: 835 MHz
Sensor Offset: 1.56 mm
Sensor Length: 2.5 mm
Tip Enclosure: Ertalyte
Tip Diameter: 5 mm
Tip Length: 60 mm
Total Length: 290 mm

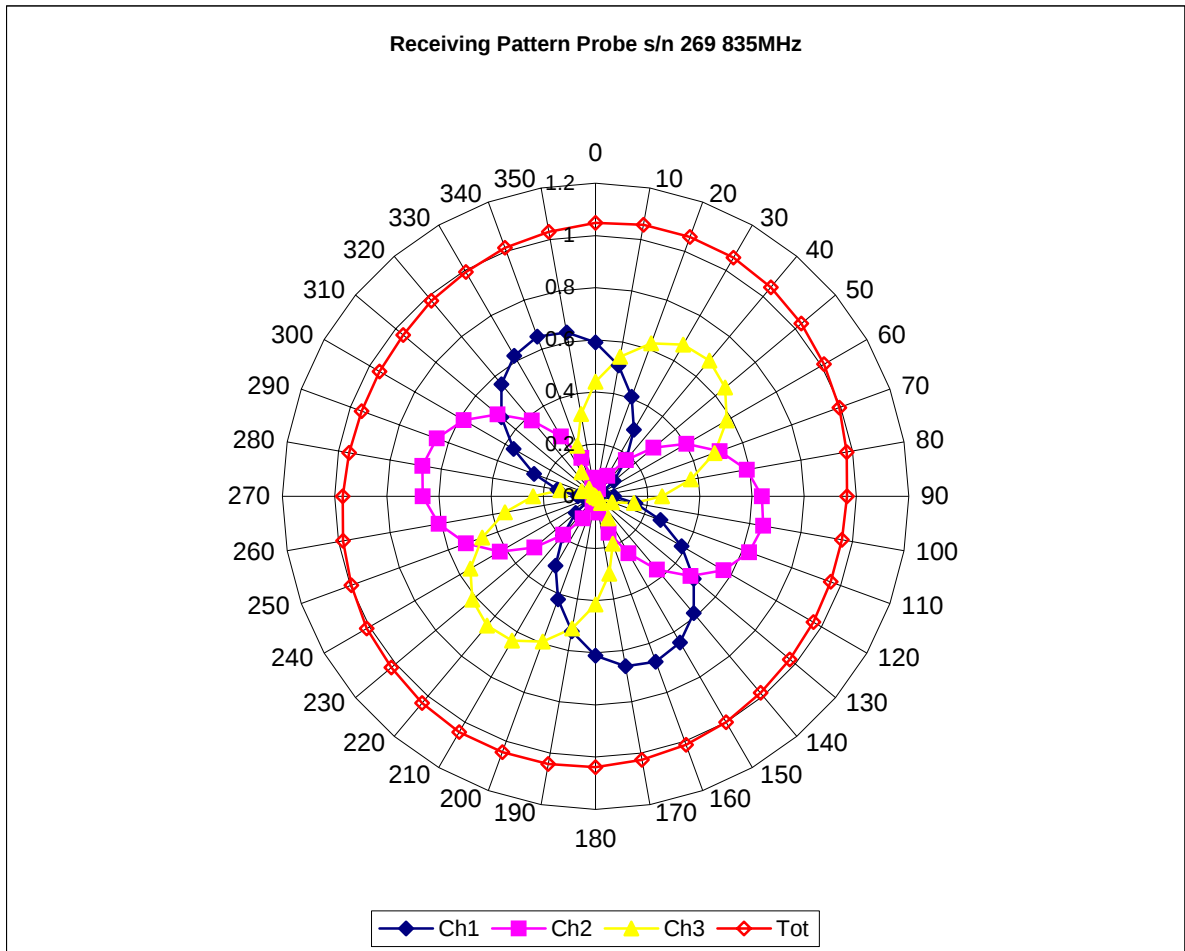
Sensitivity in Air

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

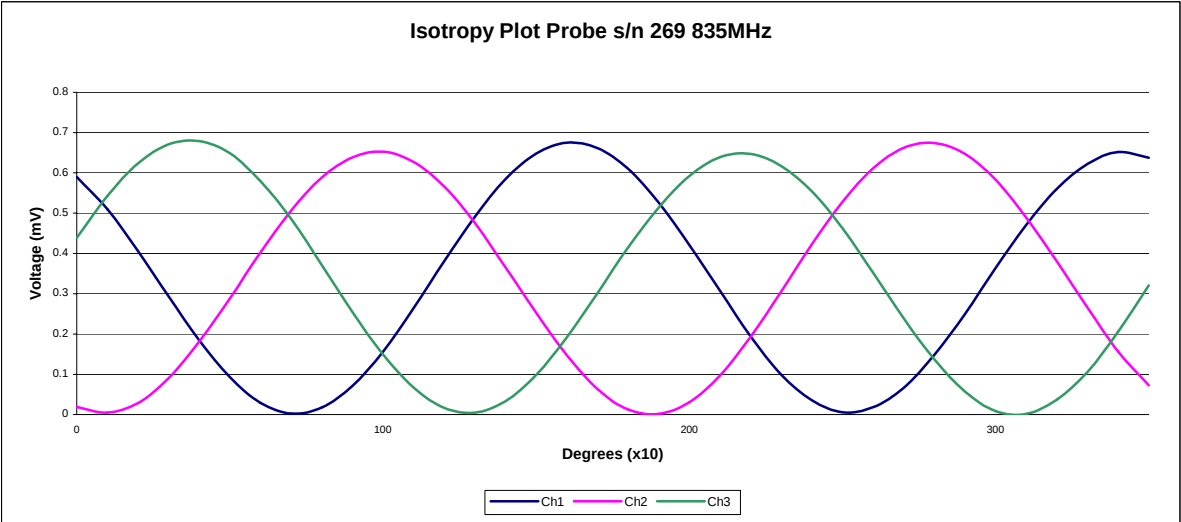
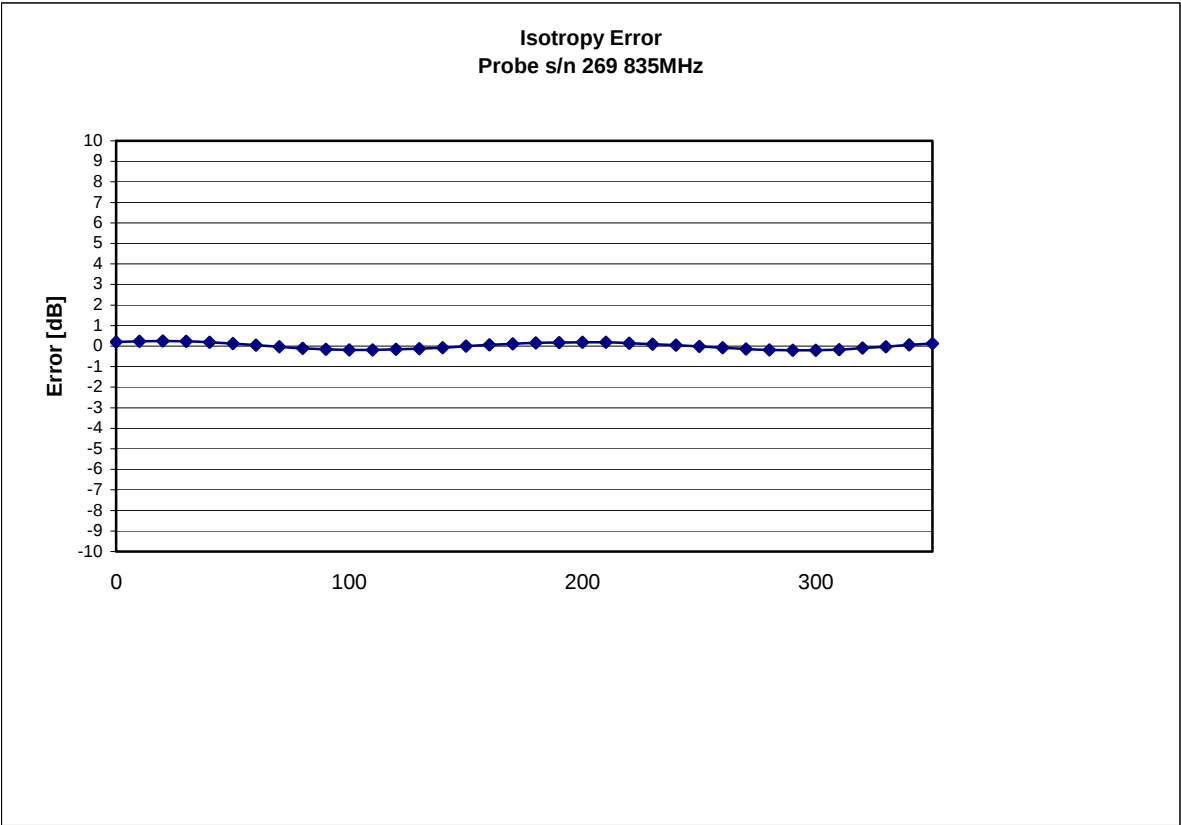
Spatial Resolution:

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 at 835MHz



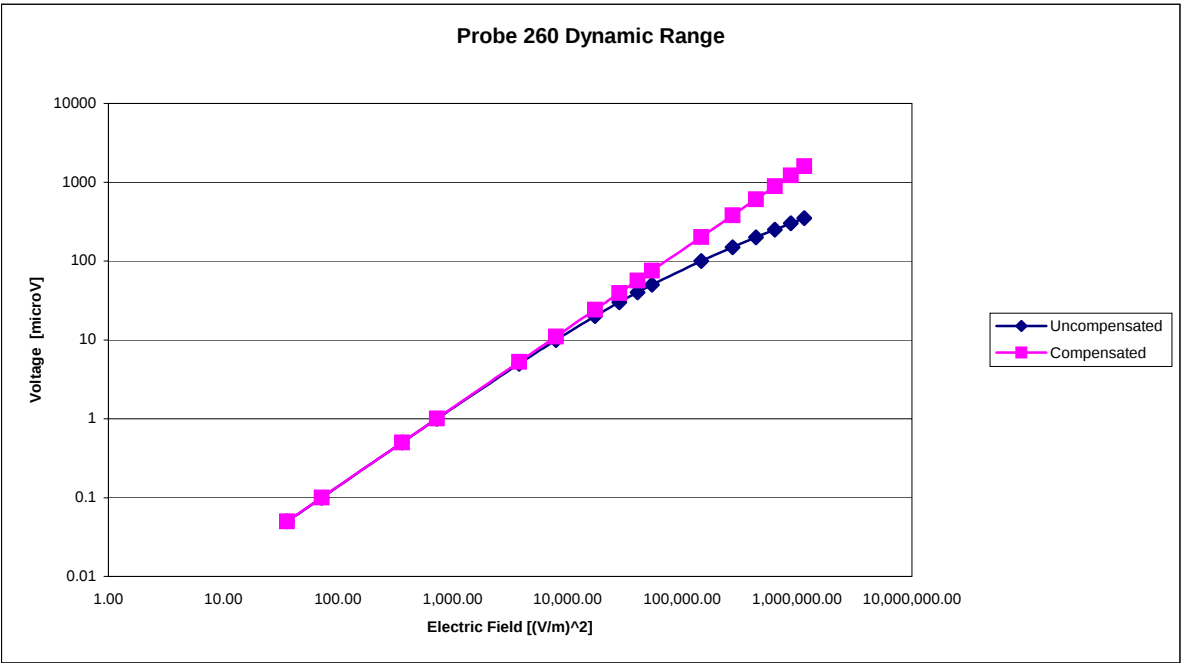
Isotropy Error 835 MHz



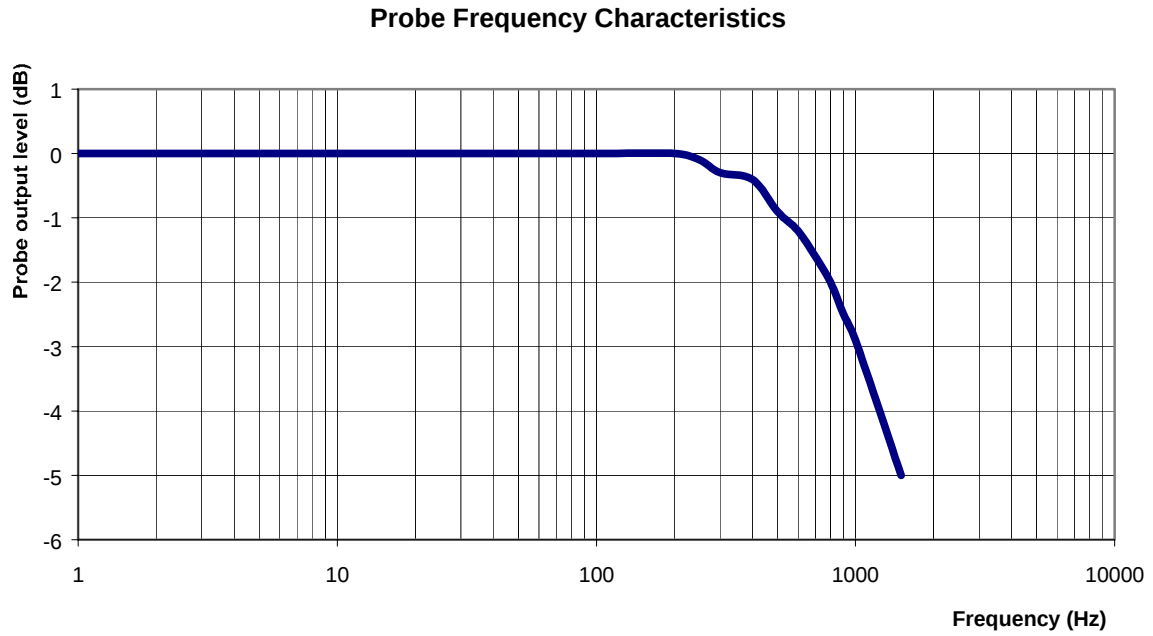
Isotropy:

0.10 dB

Dynamic Range



Video Bandwidth



Video Bandwidth at 500 Hz 1 dB

Video Bandwidth at 1.02 KHz: 3 dB

NCL Calibration Laboratories

Division of APREL Laboratories.

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 2005.

+ NCL CALIBRATION LABORATORIES

Client.: APREL

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 H-field RF Probe

Manufacturer: APREL Laboratories

Model No.: H-020

Serial No.: 101

IN AIR Calibration

Calibration Procedure: SSI/DRB-TP-D01-038

Project No: Internal

Calibrated: 2nd October 2004

Released on: 2nd October 2004

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

Released By: _____

NCL CALIBRATION LABORATORIES

51 SPECTRUM WAY
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FAX: (613) 820-4161

Introduction

This Calibration Report reproduces the results of the calibration performed in line with the SSI/DRB-TP-D01-038 H-Field Probe Calibration Procedure. The results contained within this report are for APREL H-Field Probe H-020 101.

References

SSI/DRB-TP-D01-038 H-Field Probe Calibration Procedure
IEEE Std 1309-2005 "Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9 kHz to 40GHz".

Conditions

Probe 101 was a new probe taken from stock prior to calibration.

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

Sensor offset

Each probe is comprised of 3 magnetic sensors and positioned at 90 degree to each other in XYZ arrangement. Their electric center makes the calibrated center of the probe

Calibration Results Summary

Probe Type: H-Field Probe H-020

Serial Number: 101

Frequencies: see the table "Sensitivity in Air" below

Sensor Offset: 3.0 mm

Sensor Diameter: 4.0 mm

Tip Enclosure: Polycarbonate

Tip Diameter: 8 mm

Total Length: 290 mm

Sensitivity in Air

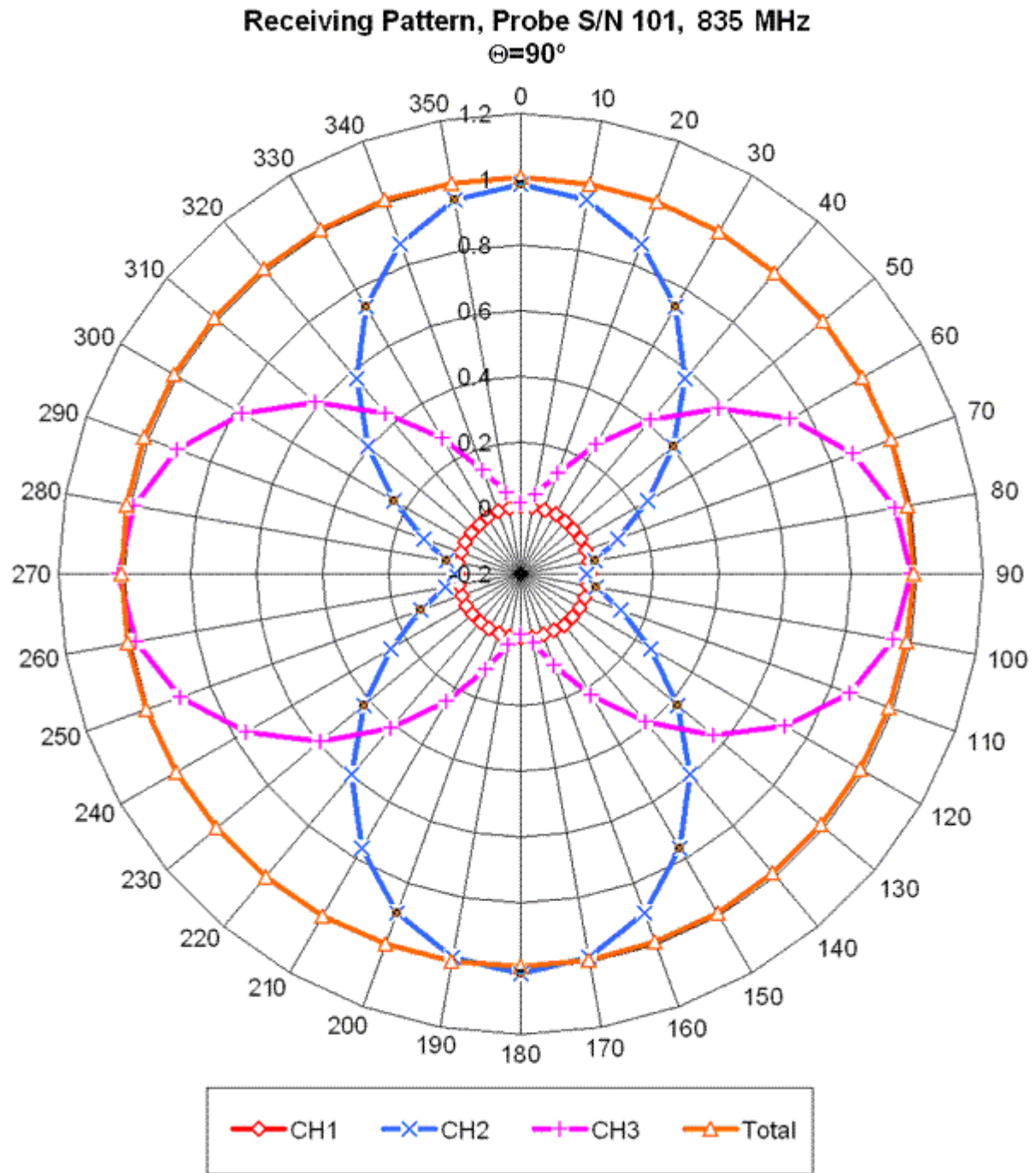
Frequency	Channel X	Channel Y	Channel Z
824.2MHz	$84.2\text{mV}/(\text{A}/\text{m})^2$	$84.2\text{mV}/(\text{A}/\text{m})^2$	$84.2\text{mV}/(\text{A}/\text{m})^2$
836.5MHz	$86.7\text{mV}/(\text{A}/\text{m})^2$	$86.7\text{mV}/(\text{A}/\text{m})^2$	$86.7\text{mV}/(\text{A}/\text{m})^2$
848.8MHz	$89.3\text{mV}/(\text{A}/\text{m})^2$	$89.3\text{mV}/(\text{A}/\text{m})^2$	$89.3\text{mV}/(\text{A}/\text{m})^2$
1850MHz	$424.1\text{mV}/(\text{A}/\text{m})^2$	$424.1\text{mV}/(\text{A}/\text{m})^2$	$424.1\text{mV}/(\text{A}/\text{m})^2$
1880MHz	$438.0\text{mV}/(\text{A}/\text{m})^2$	$438.0\text{mV}/(\text{A}/\text{m})^2$	$438.0\text{mV}/(\text{A}/\text{m})^2$
1910MHz	$452.1\text{mV}/(\text{A}/\text{m})^2$	$452.1\text{mV}/(\text{A}/\text{m})^2$	$452.1\text{mV}/(\text{A}/\text{m})^2$

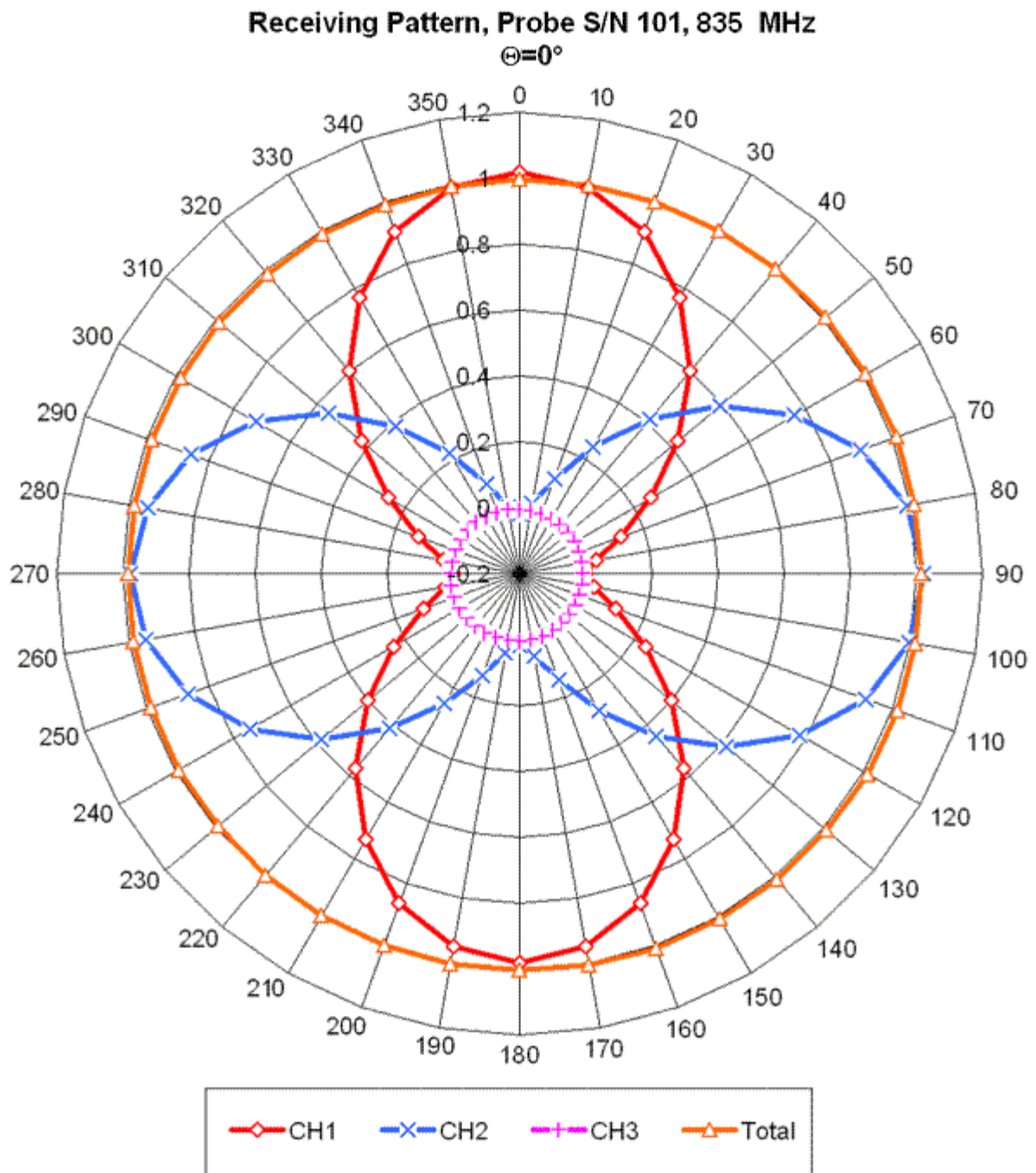
Diode Compression Point: 95 mV

Spatial Resolution:

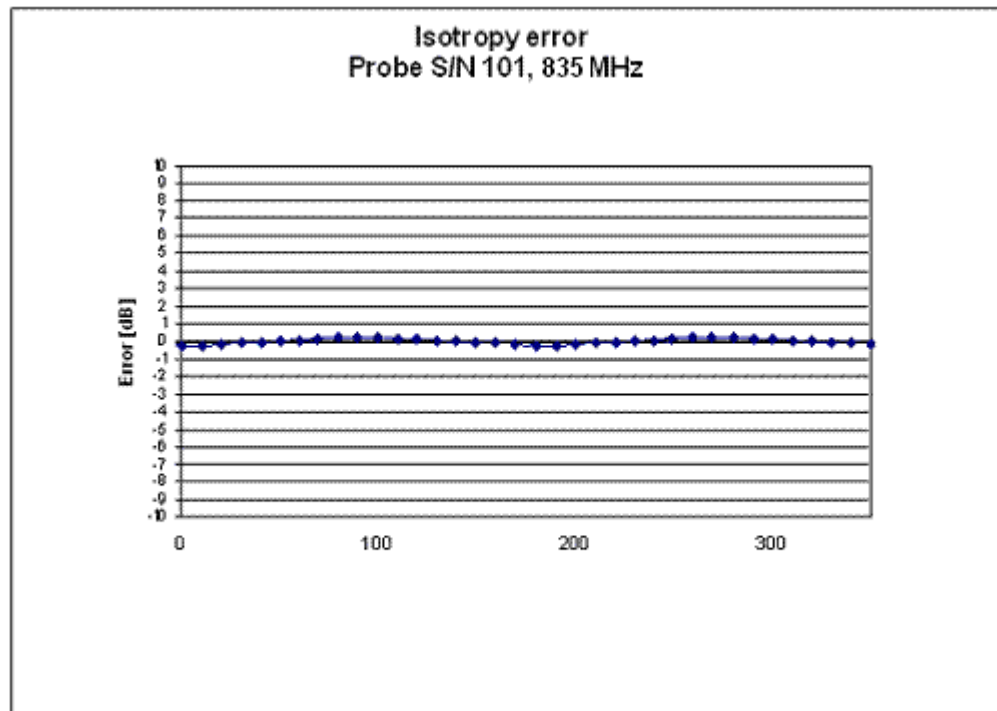
The measured probe tip diameter is 5 mm (+/- 0.01 mm) and therefore meets the requirements of SSI/DRB-TP-D01-032 for spatial resolution.

Receiving Pattern at 835 MHz





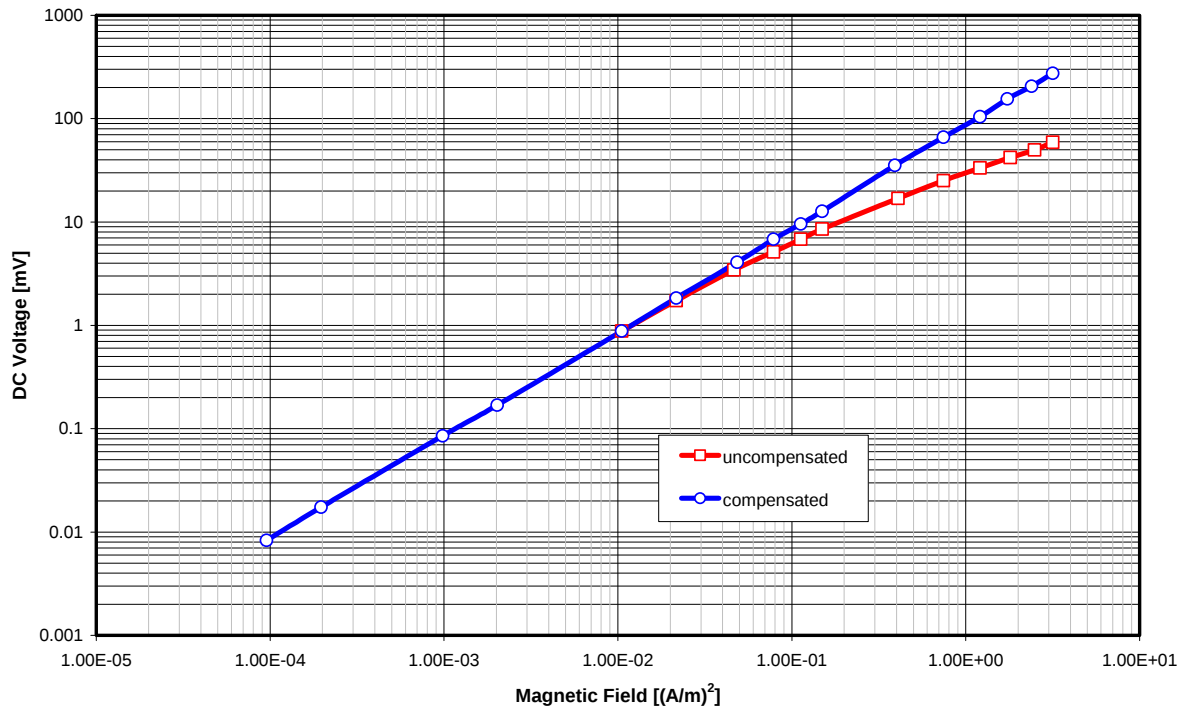
Isotropy Error 835 MHz



Isotropy: 0.10 dB

Dynamic Range

Dynamic Range, Probe S/N 101, 835MHz



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 2005.