

ANTENNA GAIN EVALUATION

Test Lab:

CELLTECH RESEARCH INC.
Testing and Engineering Services
1955 Moss Court
Kelowna, B.C.
Canada V1Y 9L3
Phone: 250 - 860-3130
Fax: 250 - 860-3110
Toll Free: 1-877-545-6287
e-mail: info@celltechlabs.com
web site: www.celltechlabs.com

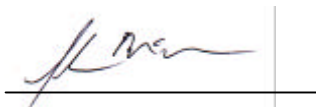
Applicant Information:

ITRONIX CORPORATION
801 South Stevens Street
Spokane, WA 99024
Attn: Duane Radmer, Sr. Electrical Engineer
Wireless Product Development
Phone: 509-742-1293
Fax: 509-626-4204

LAN Card FCC ID: LDK102040
LAN Card Model: AIR-LMC350
FCC Classification: Part 15 Spread Spectrum Transmitter (DSS)
Laptop PC Model: IX250
**Equipment Type: ITRONIX IX250 Rugged Laptop PC with CISCO 2.4GHz
Direct Sequence Spread Spectrum PCMCIA LAN Card**
Tx Frequency Range: 2412 - 2465 MHz
Channels Tested: 2412.0, 2437.0, 2462.0 MHz
EUT Antenna Type: Whip
Horn Antenna Type: Double Ridged Guide

I attest to the accuracy of data in this report. All measurements reported herein were performed by me 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.

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



Shawn McMillen
General Manager
Celltech Research Inc.



TABLE OF CONTENTS

1.1	GENERAL INFORMATION	1
2.1	EVALUATION SUMMARY	2
3.1	LIST OF TEST EQUIPMENT	3
ATTACHMENT A:	EUT ANTENNA GAIN PLOTS AND DATA	
ATTACHMENT B:	HORN ANTENNA GAIN PLOTS	
ATTACHMENT C:	EUT GAIN VALUES RELATIVE TO HORN ANTENNA	
ATTACHMENT D:	PHOTOGRAPHS	
ATTACHMENT E:	EUT ANTENNA SPECIFICATIONS	
ATTACHMENT F:	GAIN & ANTENNA FACTORS FOR HORN ANTENNA	

MEASUREMENT REPORT

1.1 GENERAL INFORMATION

APPLICANT:

ITRONIX CORPORATION
801 South Stevens Street
Spokane, WA 99024
Attn: Fred Phillips, Certification Engineer
Phone: 509-742-1506
Fax: 509-626-4204

PC Model	IX250	
LAN Card Model	AIR-LMC350	
EUT Type	Rugged Laptop PC with CISCO 2.4GHz Direct Sequence Spread Spectrum PCMCIA Wireless LAN Card	
Classification	Part 15 Spread Spectrum Transmitter (DSS)	
Tx Freq. Range	2412 - 2465 MHz	
Max. RF Output Power	1.76 Watts	
EUT Antenna Type	Whip (Itronix)	
Horn Antenna Type	Double Ridged Guide (ETS)	
Modulation Tested	Unmodulated Carrier	
Channels / Conducted Power	EUT Antenna Gain Tests	
	Channel 2412	12.70 dBm
	Channel 2437	13.70 dBm
	Channel 2462	14.70 dBm
	Horn Antenna Gain Tests	
	Channel 2412	12.70 dBm
	Channel 2437	13.70 dBm
	Channel 2462	14.70 dBm

2.1 EVALUATION SUMMARY

The antenna gain evaluation of the EUT was based on the following conditions and provisions.

1. The EUT was powered in CW mode and allowed sufficient time to warm up in order to minimize drift.
2. The conducted power was measured at the antenna feed point at the beginning of each channel being evaluated.
3. The EUT was placed on a turntable at a distance of 5 meters from the receiving horn antenna on an OATS.
4. The EUT was rotated 360 degrees and the receiving antenna varied in height to allow elevation angles from 0 up to 30 degrees.
5. The field strength was recorded graphically and in tabular form and is included in this report.
6. A double-ridged horn antenna was put in place of the EUT and powered by an external analog signal source. The forward conducted power was set to the same level as the EUT for each channel being measured.
7. The horn antenna was rotated 180 degrees in order to capture the highest signal strength for each elevation level of the receiving antenna.
8. The horn antenna was calibrated according to ANSI standards and the reported gain for the frequencies tested was 7.8dBi. A calibrated antenna gain table is included in this report.
9. The gain of the EUT relative to the horn antenna was derived at each angle of elevation and is include in this report.

3.1 TEST EQUIPMENT

<u>Type</u>	<u>Model</u>	<u>Calib. Date</u>	<u>Serial No.</u>
Signal Generator	HP 8648D (9kHz-4.0GHz)	Nov 1999	3847A00611
Gigatronics Power Meter	8652A	Oct 1999	1835272
Gigatronics Power Sensor (2)	80701A (0.05-18GHz)	Oct 1999	1833535, 1833542
Amplifier Research Power Amp.	5S1G4 (5W, 800MHz-4.2GHz)	N/A	26235
Microwave System Amplifier	HP 83017A (0.5-26.5GHz)	N/A	3123A00587
Network Analyzer	HP 8753E (30kHz-3GHz)	Nov 1999	US38433013
Audio Analyzer	HP 8903B	March 1999	3729A18691
Modulation Analyzer	HP 8901A	March 1999	3749A07154
Frequency Counter	HP 53181A (3GHz)	May 1999	3736A05175
CDMA Base Station Test Set	Agilent E8285A	N/A	US40332926
DC Power Supply	HP E3611A	N/A	KR83015294
Multi-Device Controller	EMCO 2090	N/A	9912-1484
Mini Mast	EMCO 2075	N/A	0001-2277
Turntable	EMCO 2080-1.2/1.5	N/A	0002-1002
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	Oct. 2000	6267
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	Oct. 2000	6276
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	Sept 1998	9120A-239
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	Sept 1998	9120A-240
Roberts Dipoles	Compliance Design (2 sets) 3121C	June 2000	
Spectrum Analyzer	HP 8594E	March 2000	3543A02721
Spectrum Analyzer	HP E4408B	Nov 1999	US39240170
Shielded Screen Room	Lindgren R.F. 18W-2/2-0	N/A	16297
Environmental Chamber	ESPEC ECT-2 (Temperature/Humidity)	Feb 2000	0510154-B

ATTACHMENT A – EUT ANTENNA GAIN PLOTS & DATA

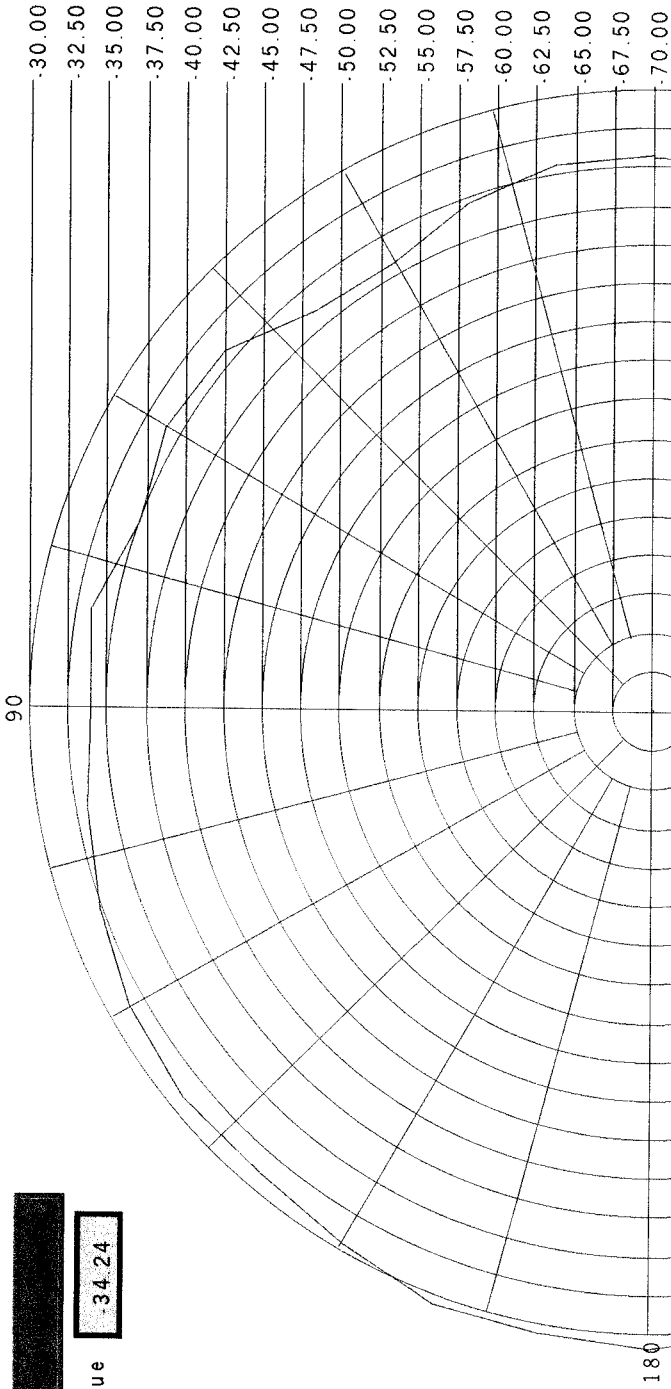
Company Name:		Itronix				
EUT:		Cisco Lan Card				
Channel:		2412				
Conducted Power:		12.78dBm				
Antenna Polarization:		Vertical				
Angle	FS at 0 Degrees	FS at 10 Degrees	FS at 20 Degrees	FS at 30 Degrees		
0	-36.39	-35.59	-36.39	-38.22		
10	-36.02	-36.09	-36.21	-38.36		
20	-36.21	-36.63	-36.23	-38.5		
30	-37.26	-37.53	-36.25	-39.01		
40	-37.92	-37.8	-36.04	-39.8		
50	-36.33	-37.02	-35.97	-39.27		
60	-35.03	-36.25	-36.11	-38.43		
70	-35.36	-35.67	-35.88	-38.78		
80	-35.29	-35.08	-35.26	-38.76		
90	-35.33	-34.92	-35.24	-38.24		
100	-34.85	-34.78	-34.64	-37.8		
110	-34.46	-34.29	-34.74	-37.39		
120	-34.58	-33.85	-33.71	-36.23		
130	-32.75	-32.08	-33.97	-36.21		
140	-34.18	-32.52	-33.31	-35.08		
150	-33.29	-32.89	-32.31	-32.75		
160	-31.65	-31.65	-31.44	-32.05		
170	-31.83	-31.18	-30.33	-32.22		
180	-31.44	-30.97	-29.91	-32.31		
190	-30.9	-30.83	-29.99	-32.24		
200	-31.25	-31.04	-30.29	-32.22		
210	-31.76	-32.05	-31.65	-32.73		
220	-32.47	-33.43	-34.74	-34.6		
230	-33.22	-35.36	-36.77	-34.99		
240	-35.08	-35.79	-34.6	-33.99		
250	-35.26	-33.15	-33.73	-35.67		
260	-33.2	-32.78	-35.01	-39.31		
270	-34.85	-35.38	-35.59	-38.43		
280	-35.95	-34.92	-34.81	-38.13		
290	-36.14	-34.39	-35.67	-40.84		
300	-35.56	-35.01	-38.34	-41.25		
310	-35.15	-34.6	-37.76	-41.11		
320	-36.14	-35.1	-37.94	-43.46		
330	-35.05	-37.21	-40.25	-38.78		
340	-35.36	-36.88	-37.99	-37.42		
350	-36.26	-35.22	-37.07	-37.97		
360	-36.25	-35.29	-36.58	-37.92		

Company Name:		Itronix				
EUT:		Cisco Lan Card				
Channel:		2437				
Conducted Power:		13.70dBm				
Antenna Polarization:		Vertical				
Angle	FS at 0 Degrees	FS at 10 Degrees	FS at 20 Degrees	FS at 30 Degrees		
0	-35.68	-35.3	-34	-37.47		
10	-35.02	-35.75	-34.33	-37.72		
20	-34.45	-35.25	-35.34	-36.78		
30	-34.28	-35.32	-36.12	-36.45		
40	-35.02	-35.23	-36.03	-36.8		
50	-35.3	-34.33	-35.27	-36.52		
60	-34.07	-33.56	-35.23	-35.55		
70	-32.74	-32.76	-35.25	-35.41		
80	-32.09	-31.85	-33.74	-34.89		
90	-31.19	-31.35	-33.25	-34.52		
100	-30.68	-30.7	-32.11	-34.79		
110	-31.07	-31.28	-31.68	-34.33		
120	-31.17	-30.59	-31.03	-34.23		
130	-30.32	-30.06	-31.07	-34.14		
140	-30.82	-29.64	-31.24	-34.84		
150	-30.87	-29.85	-30.25	-31.61		
160	-30.02	-28.81	-29.47	-30.51		
170	-29.93	-29.18	-28.98	-30.41		
180	-30.66	-29.95	-28.58	-30.96		
190	-30.77	-30.16	-28.67	-30.77		
200	-31.35	-30.77	-29.59	-30.44		
210	-32.53	-32.11	-31.45	-30.94		
220	-34.14	-33.09	-33.56	-33.81		
230	-34.82	-32.99	-34.16	-37.31		
240	-35.3	-34.38	-35.55	-36.99		
250	-37.65	-38.84	-36.01	-34.7		
260	-36.57	-35.96	-33.88	-35.43		
270	-35.63	-35.16	-34.05	-37.4		
280	-35.27	-36.03	-34.21	-37.7		
290	-34.47	-36.33	-34.82	-40.57		
300	-37.03	-36.73	-33.06	-42.02		
310	-34.28	-34.16	-33.72	-41.45		
320	-35.37	-34.58	-35.68	-44.69		
330	-34.75	-36.05	-37.65	-41.08		
340	-33.46	-34.49	-36.4	-37.49		
350	-34.33	-33.81	-34.91	-36.82		
360	-35.43	-35.13	-33.81	-37.6		

Company Name:		Itronix				
EUT:		Cisco Lan Card				
Channel:		2462				
Conducted Power:		14.70dBm				
Antenna Polarization:		Vertical				
Angle	FS at 0 Degrees	FS at 10 Degrees	FS at 20 Degrees	FS at 30 Degrees		
0	-34.05	-36.71	-35.66	-35.42		
10	-34.29	-36.6	-35.16	-34.91		
20	-35.14	-36.6	-34.52	-34.59		
30	-36.74	-37.18	-34.36	-34.95		
40	-36.5	-37.68	-34.98	-35.39		
50	-34.12	-36.13	-35.37	-35.21		
60	-33.89	-35.23	-34.66	-34.71		
70	-35	-35.69	-33.49	-34.05		
80	-33.33	-33.66	-33.54	-34.19		
90	-33.91	-33.05	-32.68	-34.26		
100	-33.21	-32.81	-31.78	-33.68		
110	-32.26	-31.81	-31.64	-34.29		
120	-31.45	-31.78	-31.31	-33.05		
130	-30.96	-30.71	-31.31	-33.33		
140	-31.1	-30.3	-30.69	-33.14		
150	-30.47	-29.69	-29.55	-31.31		
160	-29.41	-29.07	-28.4	-30.05		
170	-29.32	-29.07	-27.72	-29.69		
180	-29.05	-28.87	-27.41	-29.69		
190	-29.34	-28.8	-27.46	-29.69		
200	-30.26	-29.39	-27.79	-29.74		
210	-30.9	-30.16	-29.25	-30.69		
220	-31.24	-30.57	-31.1	-33.14		
230	-30.99	-31.06	-31.95	-33.96		
240	-32.09	-33.07	-32.3	-32.58		
250	-32.93	-32.07	-31.36	-32.84		
260	-31.84	-30.78	-31.48	-35		
270	-32.3	-32.72	-34.26	-35.9		
280	-33.17	-33.87	-34.19	-35.05		
290	-34.8	-34.03	-34.08	-36.39		
300	-34.59	-33.56	-35.59	-36.25		
310	-33.89	-34.71	-38.01	-35		
320	-35.46	-36.34	-36.53	-34.89		
330	-33.73	-35.55	-35.8	-35		
340	-33.84	-34.26	-35.44	-35.53		
350	-33.94	-34.93	-36.04	-35.66		
360	-34.24	-36.41	-35.78	-35.02		

ATTACHMENT B – HORN ANTENNA GAIN PLOTS

max value 34.24



Company Name

EUT

Conducted

Polarization

2462.00

Date:

Time:

maximum

-30.00

minimum

-70.00

clip to min

log

grid color

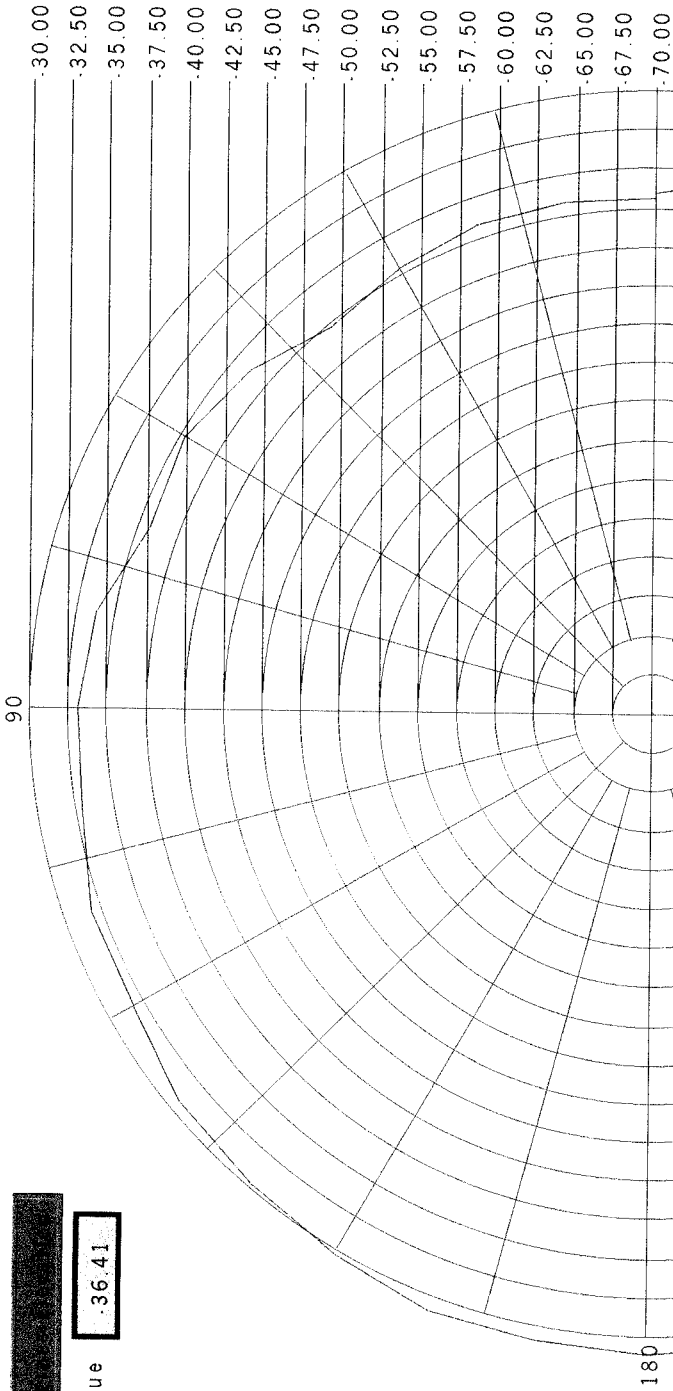
plot color

Decimal 2

visible section



max value 36.41



Company Name

EUT

Conducted

Polarization

2462.00

Date:

Time:

maximum

-30.00

minimum

-70.00

clip to min

log

grid color

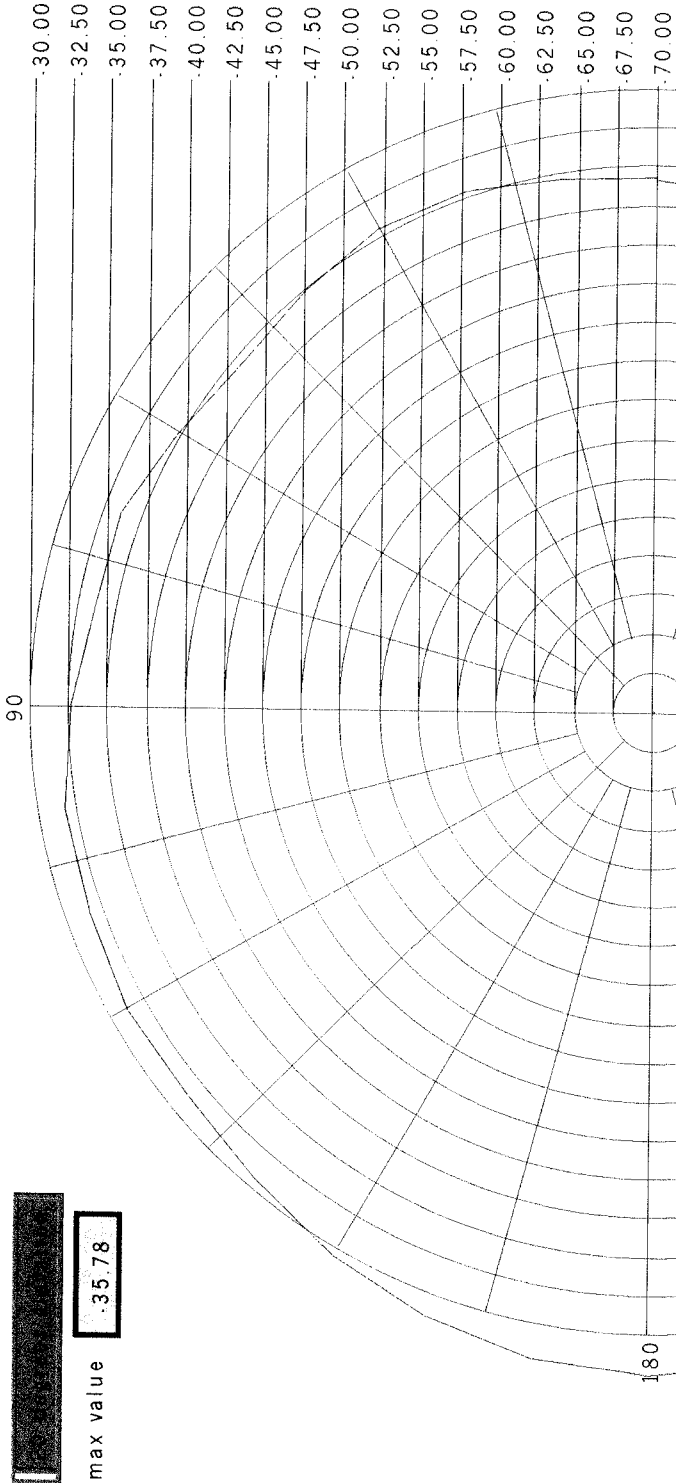
plot color

Decimal

2

visible section





Company Name

EUT

Conducted

Polarization

2462.00

Date:

Time:

maximum

minimum

clip to min

log

grid color

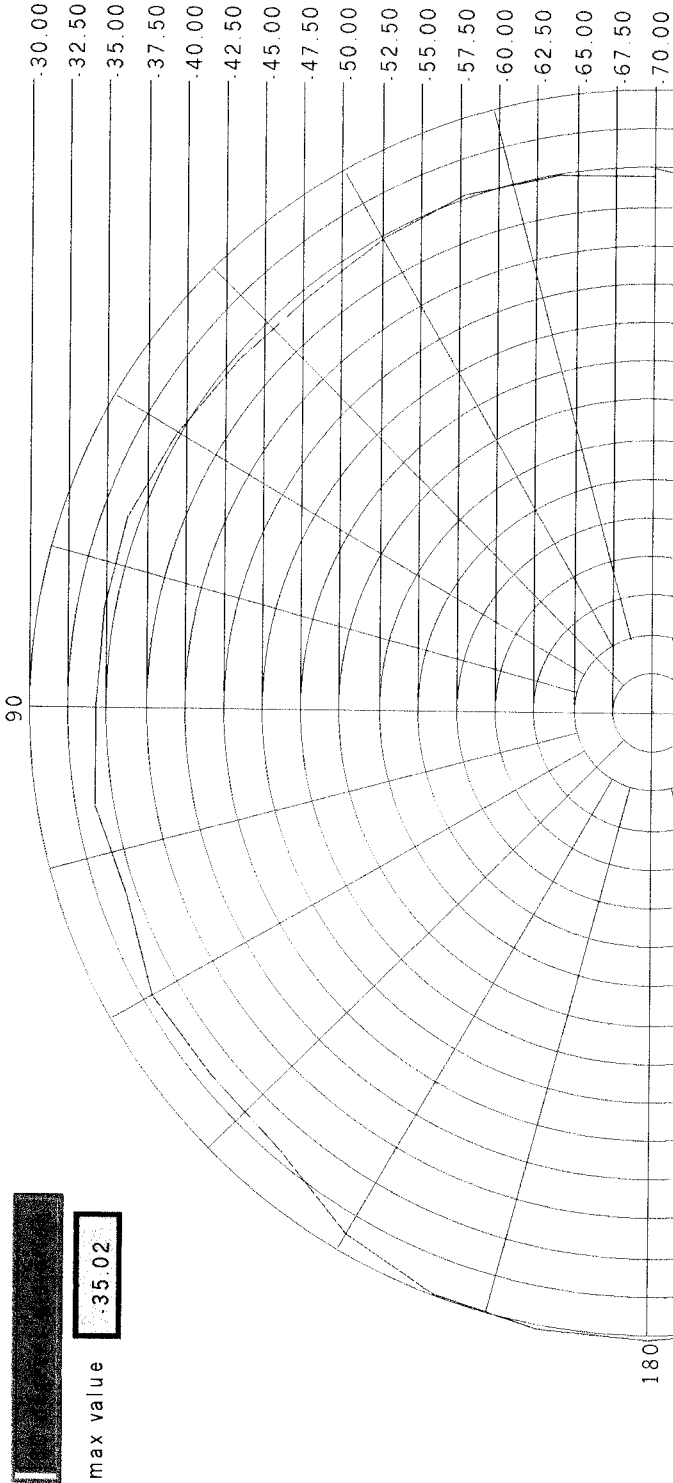
plot color

Decimal

2

visible section





Company Name

EUT

Conducted

Polarization

2462.00

Date:

Time:

maximum

minimum

clip to min

log

grid color

plot color

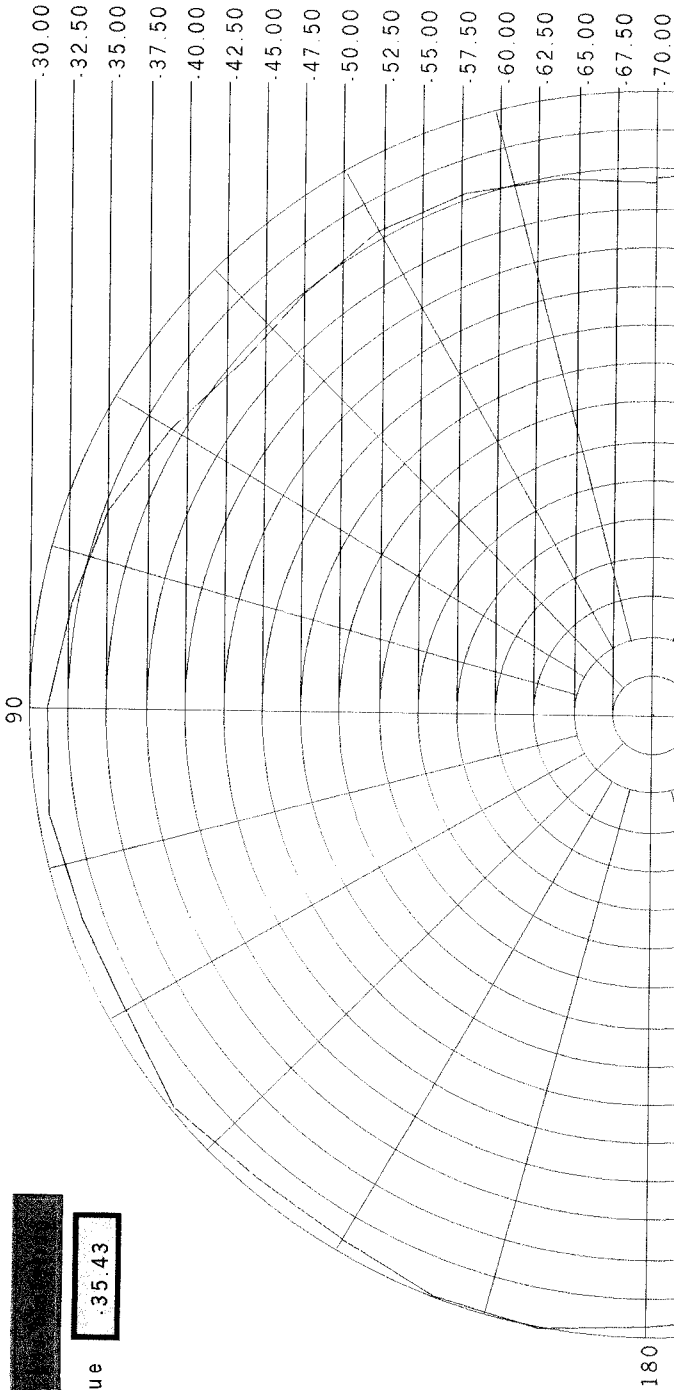
Decimal

2

visible section



max value .35.43



Company Name

EUT

Conducted

13.70dB

Polarization

NA

2437.00

Date:

5/20/01

Time:

7:59 PM

maximum

.30.00

minimum

.70.00

clip to min

log

grid color

plot color

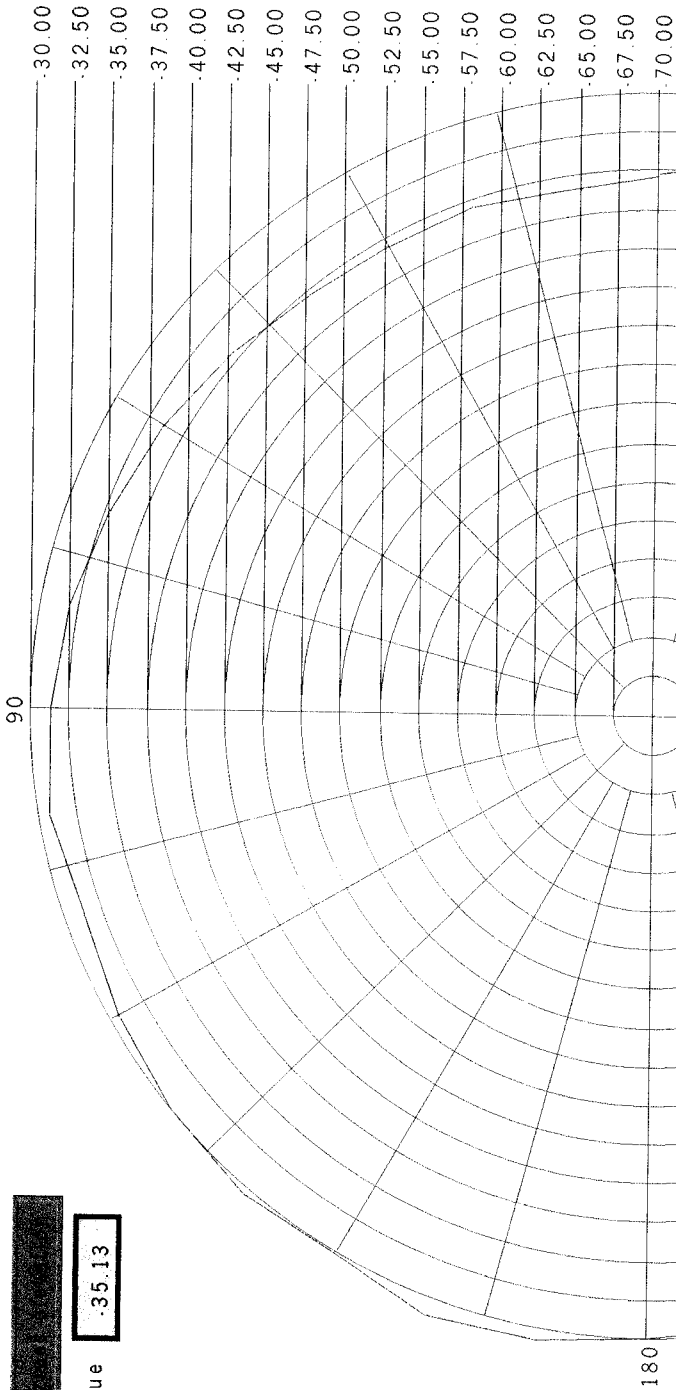
Decimal

2

visible section



max value
-35.13



Company Name

EUT

Conducted

Polarization

2437.00

Date:

Time:

maximum

-30.00

minimum

.70.00

clip to min

log

grid color

plot color

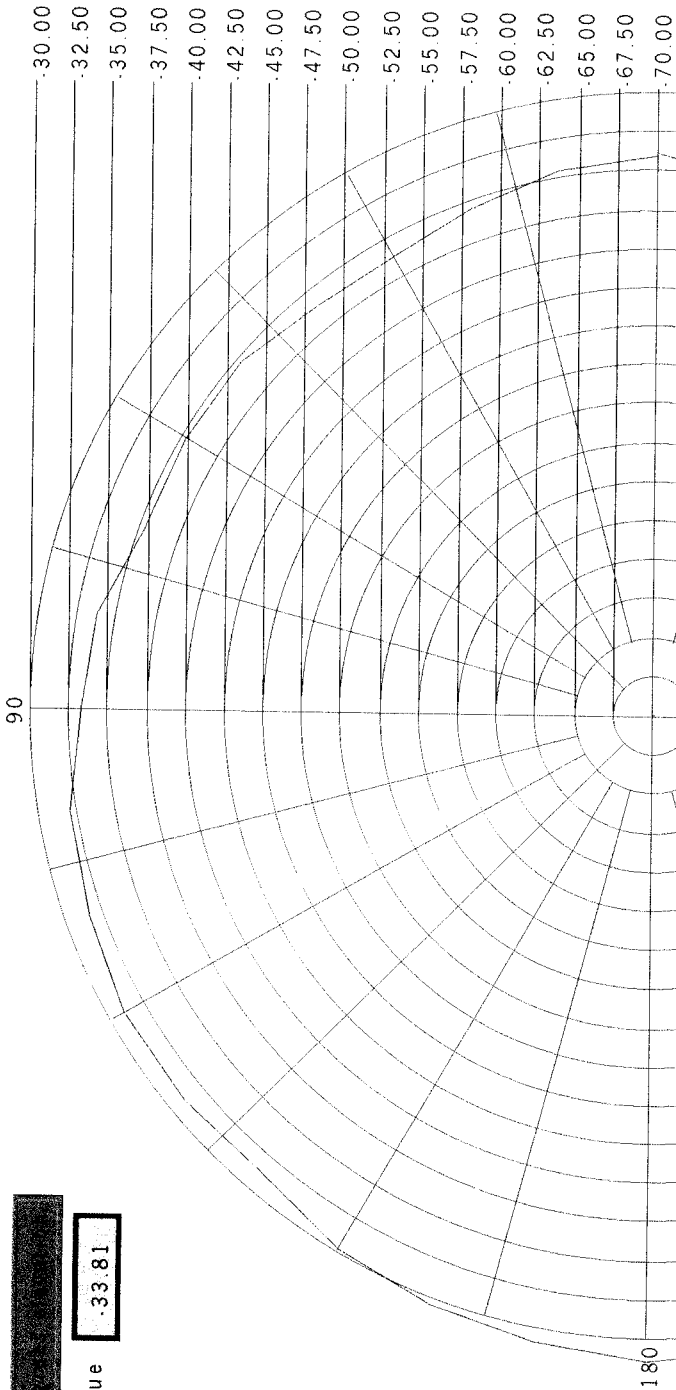
Decimal

2

visible section



max value .33.81



Company Name

EUT

Conducted

13.7000

Polarization

V

2437.00

Date:

5/2/03

Time:

4:35 PM

maximum

-30.00

minimum

.70.00

clip to min

log

grid color

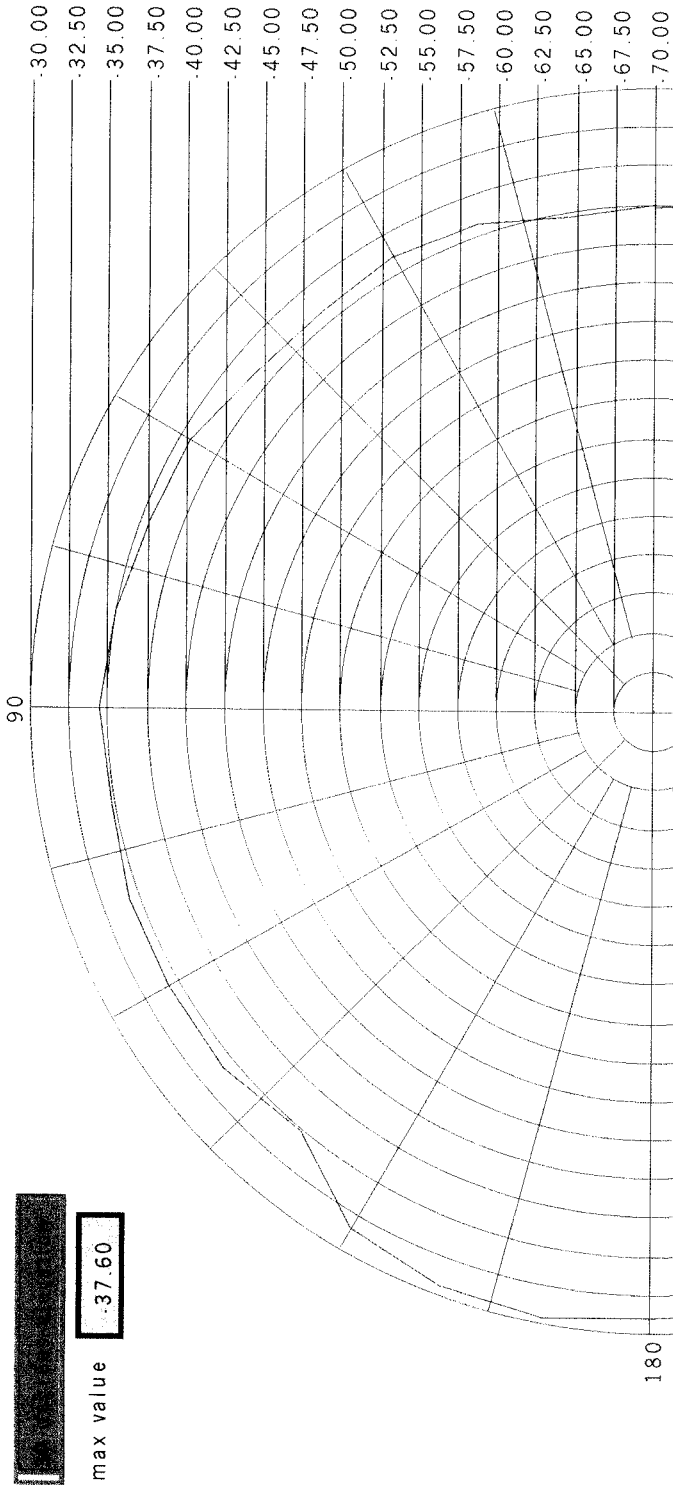
plot color

Decimal

2

visible section





Company Name

EUT

Conducted

Polarization

2437.00

Date:

Time:

maximum

minimum

clip to min

log

grid color

plot color

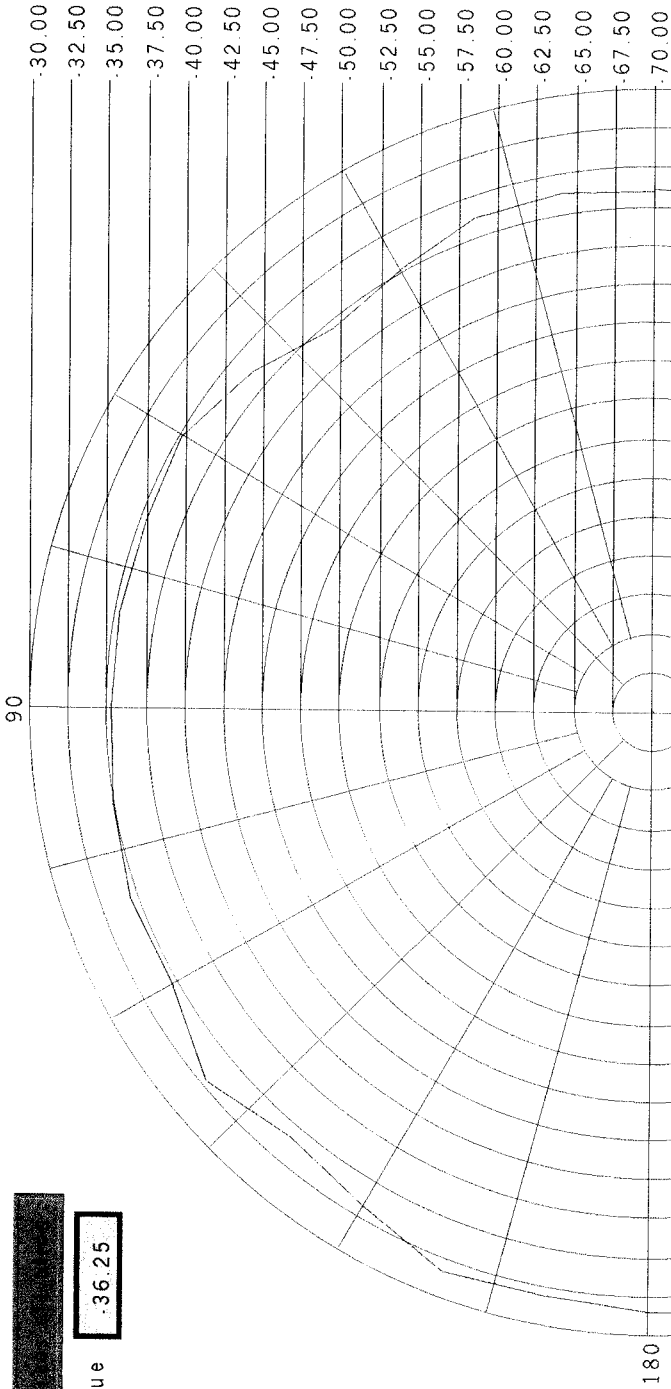
Decimal

2

visible section



max value 36.25



Company Name

127000

EUT

127000

Conducted

127000

Polarization

127000

2412.00

Date:

127000

Time:

127000

maximum

30.00

minimum

70.00

clip to min

127000

log

127000

grid color

127000

plot color

127000

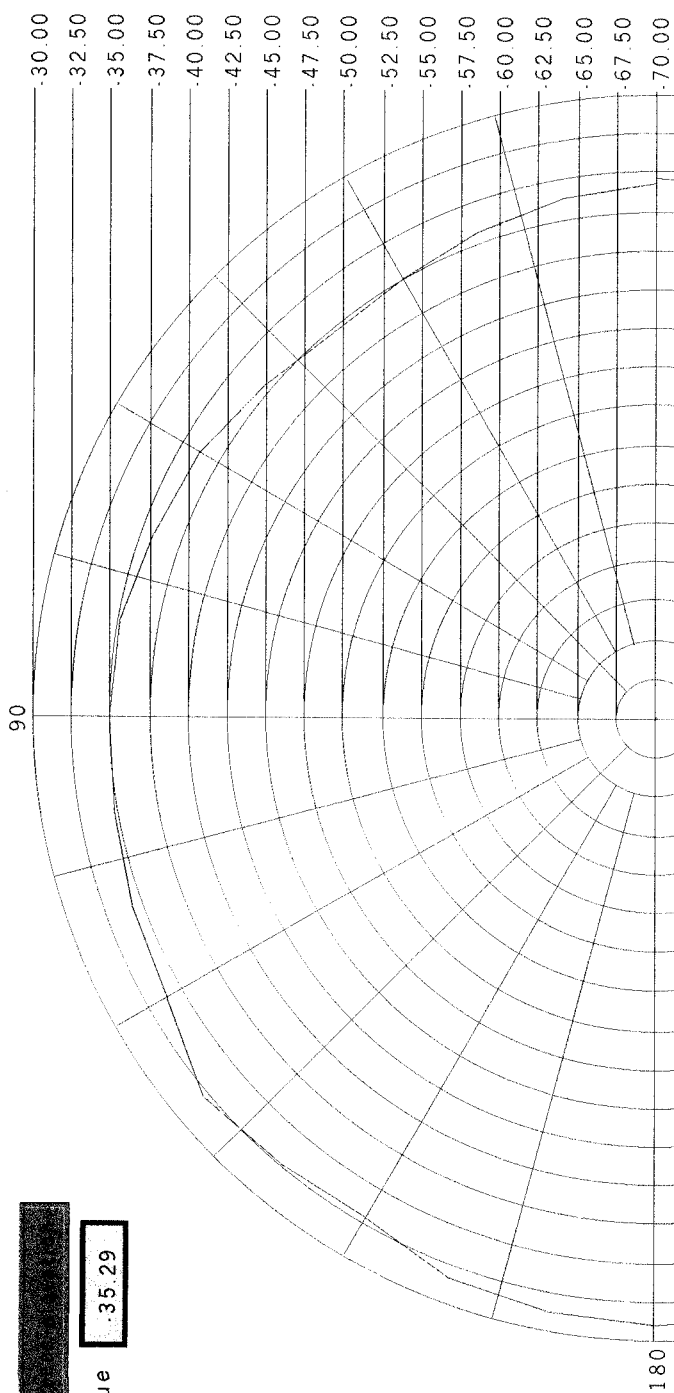
Decimal

2

visible section



max value 35.29



Company Name

EUT

Conducted 127089

Polarization

2412.00

Date:

Time:

maximum .30.00

minimum .70.00

clip to min

log

grid color

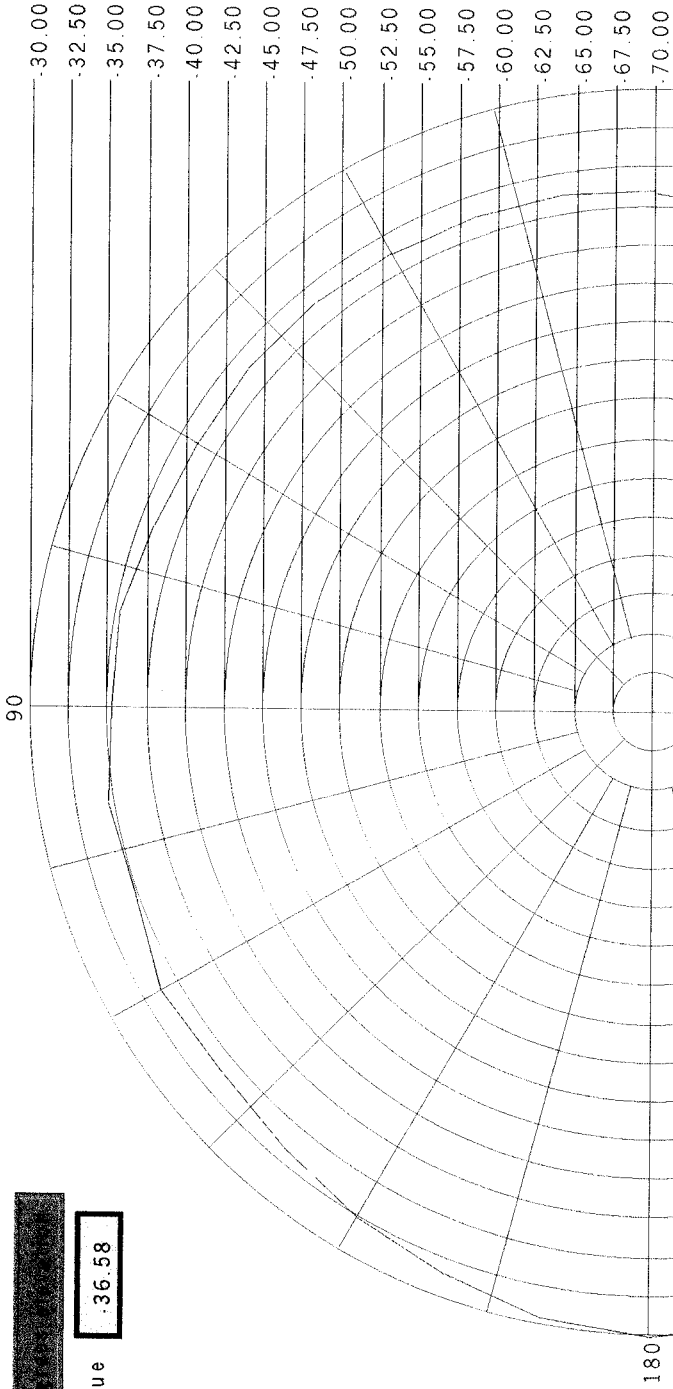
plot color

Decimal 2

visible section



max value .36.58



Company Name

XXXXXX

EUT

XXXXXX

Conducted

12.7000B

Polarization

XXXXXX

2412.00

Date:

XXXXXX

Time:

XXXXXX

maximum

.30.00

minimum

.70.00

clip to min

XXXXXX

log

XXXXXX

grid color

XXXXXX

plot color

XXXXXX

Decimal

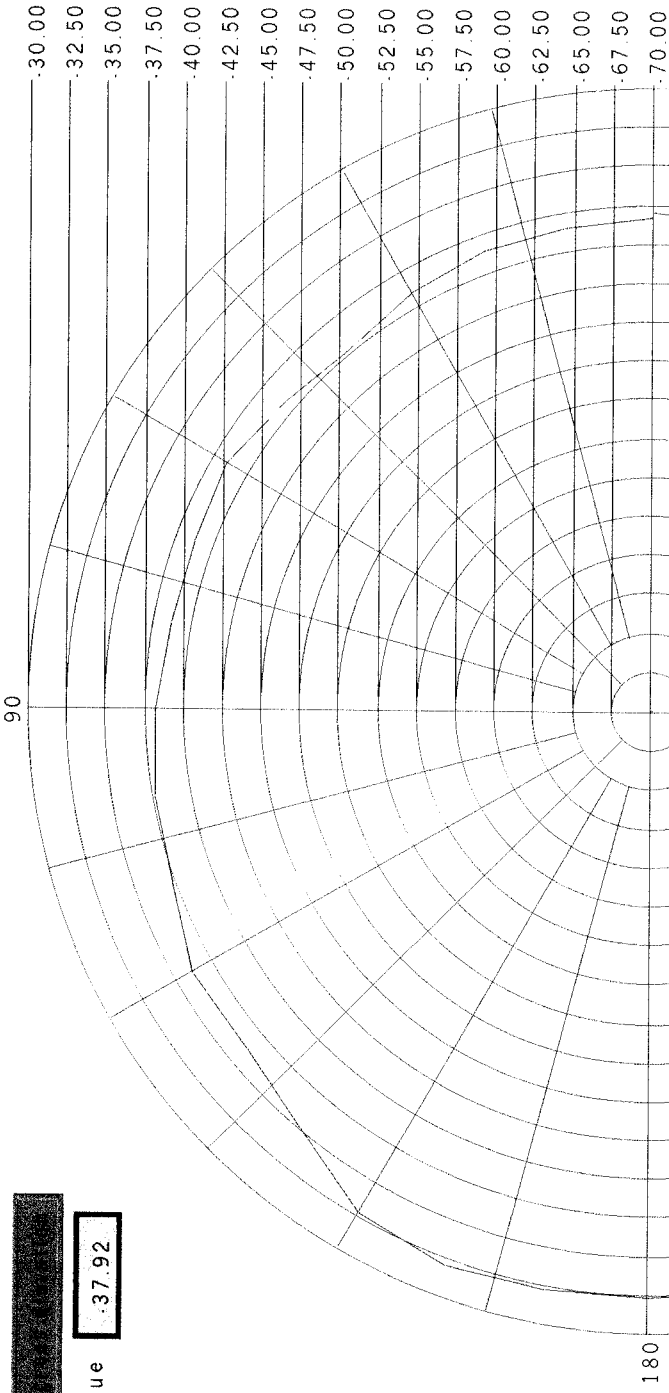
2

visible section



max value

37.92



Company Name

100000

EUT

00000

Conducted

127000

Polarization

Y

2412.00

Date:

5/2/01

Time:

3:35 PM

maximum

-30.00

minimum

-70.00

clip to min

log

grid color

plot color

Decimal

2

visible section



ATTACHMENT C – EUT GAIN VALUES RELATIVE TO HORN ANTENNA

Gain values of EUT relative to a Horn Antenna				
Channel 2412				
Gain of Horn antenna 7.8dBi				
Conducted power 12.78dBm				
Angle	FS at 0 Degrees	FS at 10 Degrees	FS at 20 Degrees	FS at 30 Degrees
0	-6.4	2.71	-2.18	0.28
10	-6.03	2.21	-2	0.14
20	-6.22	1.67	-2.02	0
30	-7.27	0.77	-2.04	-0.51
40	-7.93	0.5	-1.83	-1.3
50	-6.34	1.28	-1.76	-0.77
60	-5.04	2.05	-1.9	0.07
70	-5.37	2.63	-1.67	-0.28
80	-5.3	3.22	-1.05	-0.26
90	-5.34	3.38	-1.03	0.26
100	-4.86	3.52	-0.43	0.7
110	-4.47	4.01	-0.53	1.11
120	-4.59	4.45	0.5	2.27
130	-2.76	6.22	0.24	2.29
140	-4.19	5.78	0.9	3.42
150	-3.3	5.41	1.9	5.75
160	-1.66	6.65	2.77	6.45
170	-1.84	7.12	3.88	6.28
180	-1.45	7.33	4.3	6.19
190	-0.91	7.47	4.22	6.26
200	-1.26	7.26	3.92	6.28
210	-1.77	6.25	2.56	5.77
220	-2.48	4.87	-0.53	3.9
230	-3.23	2.94	-2.56	3.51
240	-5.09	2.51	-0.39	4.51
250	-5.27	5.15	0.48	2.83
260	-3.21	5.52	-0.8	-0.81
270	-4.86	2.92	-1.38	0.07
280	-5.96	3.38	-0.6	0.37
290	-6.15	3.91	-1.46	-2.34
300	-5.57	3.29	-4.13	-2.75
310	-5.16	3.7	-3.55	-2.61
320	-6.15	3.2	-3.73	-4.96
330	-5.06	1.09	-6.04	-0.28
340	-5.37	1.42	-3.78	1.08
350	-6.27	3.08	-2.86	0.53
360	-6.26	3.01	-2.37	0.58

Gain values of EUT relative to a Horn Antenna				
Channel 2437				
Gain of Horn antenna 7.8dBi				
Conducted power 13.70dBm				
Angle	FS at 0 Degrees	FS at 10 Degrees	FS at 20 Degrees	FS at 30 Degrees
0	-5.93	0.93	-0.02	0.88
10	-5.27	0.48	-0.35	0.63
20	-4.7	0.98	-1.36	1.57
30	-4.53	0.91	-2.14	1.9
40	-5.27	1	-2.05	1.55
50	-5.55	1.9	-1.29	1.83
60	-4.32	2.67	-1.25	2.8
70	-2.99	3.47	-1.27	2.94
80	-2.34	4.38	0.24	3.46
90	-1.44	4.88	0.73	3.83
100	-0.93	5.53	1.87	3.56
110	-1.32	4.95	2.3	4.02
120	-1.42	5.64	2.95	4.12
130	-0.57	6.17	2.91	4.21
140	-1.07	6.59	2.74	3.51
150	-1.12	6.38	3.73	6.74
160	-0.27	7.42	4.51	7.84
170	-0.18	7.05	5	7.94
180	-0.91	6.28	5.4	7.39
190	-1.02	6.07	5.31	7.58
200	-1.6	5.46	4.39	7.91
210	-2.78	4.12	2.53	7.41
220	-4.39	3.14	0.42	4.54
230	-5.07	3.24	-0.18	1.04
240	-5.55	1.85	-1.57	1.36
250	-7.9	-2.61	-2.03	3.65
260	-6.82	0.27	0.1	2.92
270	-5.88	1.07	-0.07	0.95
280	-5.52	0.2	-0.23	0.65
290	-4.72	-0.1	-0.84	-2.22
300	-7.28	-0.5	0.92	-3.67
310	-4.53	2.07	0.26	-3.1
320	-5.62	1.65	-1.7	-6.34
330	-5	0.18	-3.67	-2.73
340	-3.71	1.74	-2.42	0.86
350	-4.58	2.42	-0.93	1.53
360	-5.68	1.1	0.17	0.75

Gain values of EUT relative to a Horn Antenna				
Channel 2462				
Gain of Horn antenna 7.8dBi				
Conducted power 14.70dBm				
Angle	FS at 0 Degrees	FS at 10 Degrees	FS at 20 Degrees	FS at 30 Degrees
0	-4.84	-2.51	-2.53	3.42
10	-5.08	-2.4	-2.03	3.93
20	-5.93	-2.4	-1.39	4.25
30	-7.53	-2.98	-1.23	3.89
40	-7.29	-3.48	-1.85	3.45
50	-4.91	-1.93	-2.24	3.63
60	-4.68	-1.03	-1.53	4.13
70	-5.79	-1.49	-0.36	4.79
80	-4.12	0.54	-0.41	4.65
90	-4.7	1.15	0.45	4.58
100	-4	1.39	1.35	5.16
110	-3.05	2.39	1.49	4.55
120	-2.24	2.42	1.82	5.79
130	-1.75	3.49	1.82	5.51
140	-1.89	3.9	2.44	5.7
150	-1.26	4.51	3.58	7.53
160	-0.2	5.13	4.73	8.79
170	-0.11	5.13	5.41	9.15
180	0.16	5.33	5.72	9.15
190	-0.13	5.4	5.67	9.15
200	-1.05	4.81	5.34	9.1
210	-1.69	4.04	3.88	8.15
220	-2.03	3.63	2.03	5.7
230	-1.78	3.14	1.18	4.88
240	-2.88	1.13	0.83	6.26
250	-3.72	2.13	1.77	6
260	-2.63	3.42	1.65	3.84
270	-3.09	1.48	-1.13	2.94
280	-3.96	0.33	-1.06	3.79
290	-5.59	0.17	-0.95	2.45
300	-5.38	0.64	-2.46	2.59
310	-4.68	-0.51	-4.88	3.84
320	-6.25	-2.14	-3.4	3.95
330	-4.52	-1.35	-2.67	3.84
340	-4.63	-0.06	-2.31	3.31
350	-4.73	-0.73	-2.91	3.18
360	-5.03	-2.21	-2.65	3.82

ATTACHMENT D – PHOTOGRAPHS

CELLTECH RESEARCH INC.
1955 Moss Court, Kelowna
B.C. CANADA V1Y 9L3

Test Report S/N: 050201-102KBC
Date(s) of Tests: May 3, 2001
Antenna Gain Evaluation

EUT PHOTOGRAPHS

Itronix IX250 Rugged Laptop PC



EXTERNAL EUT PHOTOGRAPHS

Itronix IX250 Whip Antenna



CELLTECH RESEARCH INC.
1955 Moss Court, Kelowna
B.C. CANADA V1Y 9L3

Test Report S/N: 050201-102KBC
Date(s) of Tests: May 3, 2001
Antenna Gain Evaluation

EUT PHOTOGRAPHS

Cisco 2.4GHz DSSS PCMCIA LAN Card



EUT PHOTOGRAPHS

Cisco LAN Card installed in Itronix IX250 Laptop PC

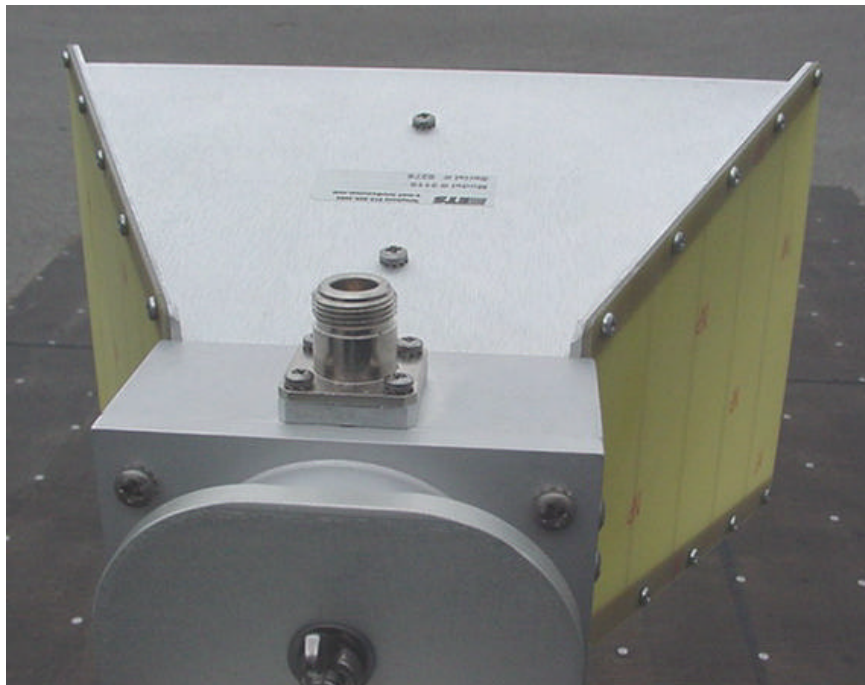
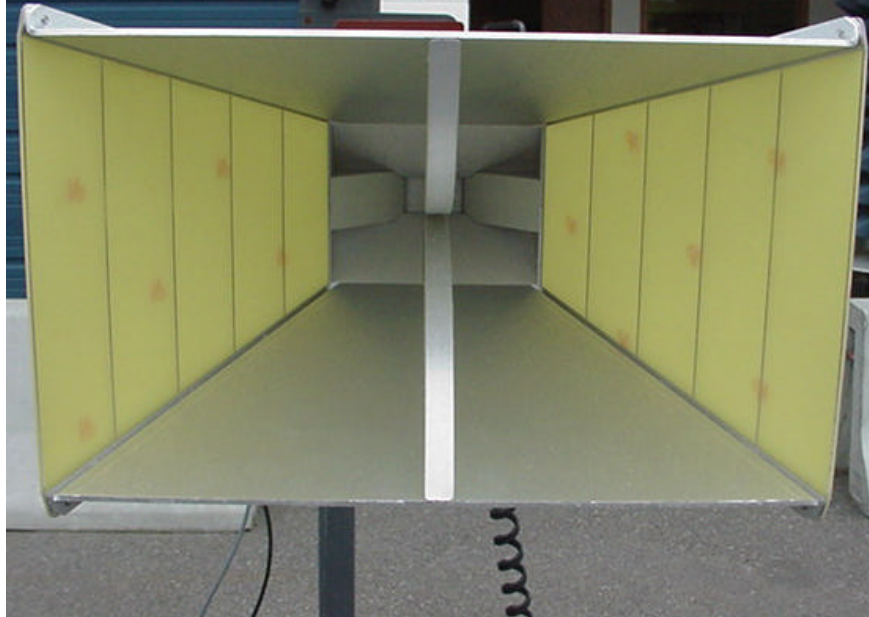


TEST SETUP PHOTOGRAPHS



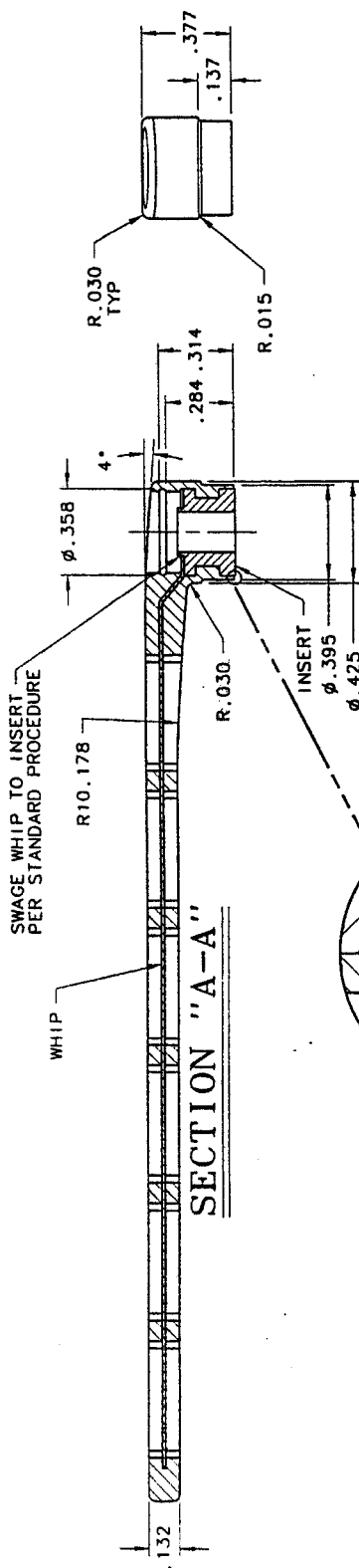
TEST SETUP PHOTOGRAPHS

ETS Model: 3115 Double-Ridged Horn Antenna (S/N: 6276)



ATTACHMENT E – EUT ANTENNA SPECIFICATIONS

1. MATERIAL: RUBBER SANTOPRENE, 221-80 DARK GRAY.
2. FINISH: SPI D-3
3. FLASH: .015 MAX.
4. DEGATE: $\pm .015$ MAX.
5. EJECTOR MARKS: $\pm .010$ MAX.
6. CORNERS AND FILLETS SHOWN SHARP: .015 MAX.
7. SINK: .015 MAX.
8. PART(S) SHALL BE PACKAGED FOR SHIPMENT AND/OR STORAGE IN A CLEAN PROTECTIVE CONTAINER.



DOCUMENT
NOV 18 1997
CONTROL

-	B	1182	JMD	MAINTENANCE RELEASE	14-07-97 7/11/97
-	A	1063	JMS	PRODUCTION RELEASE	
ZONE	REV.	ECO	BY	DESCRIPTION	
DATE	DATE	DATE	DATE	DATE	
TITLE					
ANTENNA, WHIP, XCS, RAM					
SIZE			B		
DWG. NO			47-0055-001		
SUPERSEDES					
PROJECT					
DATE			7/11/97		
MECH. ENG			E. RYAN		
DATE			7-21-97		
MFG. ENG			J. B. RYAN		
SCALE			NONE		
SHEET			1 of 3		
REV			B		

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES
DO NOT SCALE DRAWINGS

NOTES:
1. KEEP AS NOTED
2. SEE # 10 HIGH
3. SEE # 10S HIGH
SEE DIMENSIONS NOT TO SCALE

MILITARY WHEEL
MOUNTING

HARTEX

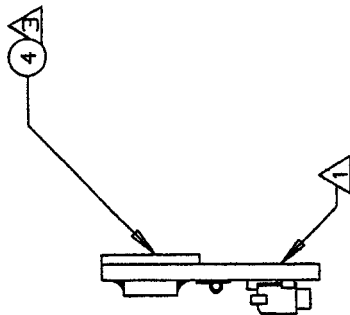
U.S. PATENT OFFICE
REGISTERED
1910
179

DOCUMENT
OCT 02 2000
CONTROL

ITRONIX						A	2002	Release		
801 SOUTH STEVENS, SPOKANE, WA. 99204						ELECTRICIAN:	DATE:	TITLE:		
NOTICE OF PROPRIETARY INFORMATION INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS PROPERTY OF ITRONIX CORP. WHEREAS THE EMPLOYEE HAS REQUESTED A RECRUITMENT FOR THE PURPOSES OF OBTAINING EMPLOYMENT WITH ANOTHER COMPANY, THE RECRUITMENT IS HEREBY TO BE FURNISHED TO THE CUSTOMER IT SHALL BE USED SOLELY FOR PURPOSES OF INSPECTION, INSTALLATION, OR MAINTENANCE, WHEREAS FURNISHING TO A SUPPLIER, IT SHALL BE USED SOLELY IN THE PERFORMANCE OF THE WORK CONTRACTED FOR BY THIS COMPANY, THE INFORMATION SHALL NOT BE USED OR DISCLOSED BY THE RECRUITMENT FOR ANY OTHER PURPOSE WHATSOEVER.						DRAWN BY:	DATE:	SCH, XC RF Modem		
						Mike Decker	07 July 00	Antenna, WLAN		
						CHECKED BY:	DATE:			
						[Signature]	9/25/00			
						TLS ENGINEER	DATE:	DRAWING NUMBER		
						[Signature]	9/28/00	95-0330-001		
						DATE CHANGED:	SHEET:			
By [Signature]	9-28-00	PROTOKOL	1 of 1							

ECO# 2081
Page 28

A diagram of the rear panel of the 6000 series power supply. It shows a circular power connector (labeled 2), a ground terminal (labeled 3), a fuse holder (labeled 4), a DC output terminal (labeled 5), and a DC output terminal block (labeled 6). A line labeled 1 points to the top of the unit.



1

A

3

4

5

THE FINISHED PCB ASSEMBLY MUST CONFORM WITH THE
CURRENT REVISION OF ITRONIX PCBA GENERAL
SPECIFICATION DOC. #93-0050-001.

OCT 02 2000

CONTROL

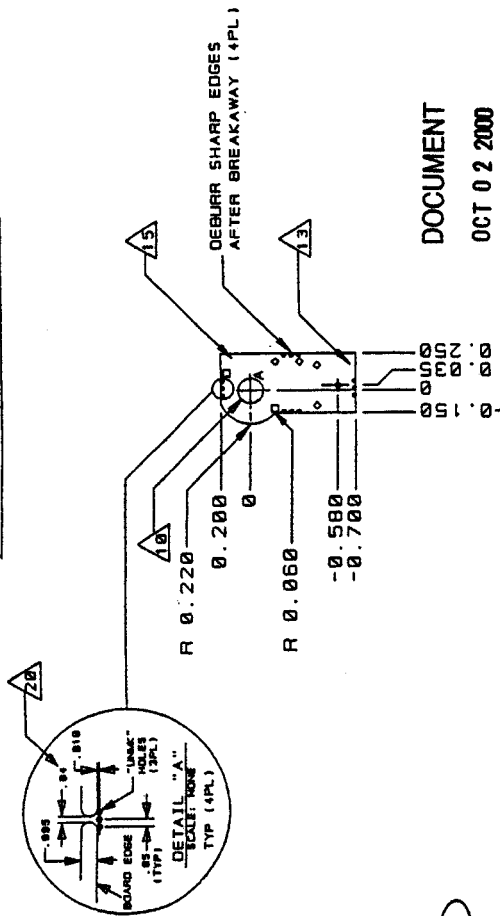
-	-	A	2002	Release				
ZONE	REV.	REF.	BY	DESCRIPTION	APP.	DATE		
GROUP	K.	JENS	DATE	TITLE				
000000	18	AUG 88	18 AUG 88	PCBA - ANTENNA				
000000	9-30-00	9-30-00	9-30-00	CONN. C-NWK.				
000000	9/30/00	9/30/00	9/30/00	B	58-0330-001			
000000	9/30/00	9/30/00	9/30/00	PH. STAMP	PHOTOTYPE			
000000	9-28-00	9-28-00	9-28-00	NONE				
000000	9-28-00	9-28-00	9-28-00					

[illegible]

NOTES: UNLESS OTHERWISE SPECIFIED

1. BASE MATERIAL: FL-GFN .063C ±.008 - 1/1 A2A
U.L. APPROVED FR4 (OR EQUIVALENT) TOTAL .063 THK.
1 OUNCE COPPER OUTER LAYERS. FLAMMABILITY RATING
94V0. P.C. CARD WILL BE U.L. RECOGNIZED COMPONENT
DIRECTORY SECTION ZPMV2.
2. PHOTO ARTWORK: ITRONIX P/N
COMPONENT LAYER (1) 14-0330-001 REV-1
CIRCUIT LAYER (2) 14-0330-001 REV-1
SOLDERMASK LAYER (1) 14-0330-001 REV-1
PASTERMASK LAYER (1) 14-0330-001 REV-1
3. REGISTRATION: CONDUCTIVE LAYERS AND SOLDERMASK SHALL
BE REGISTERED TO EACH OTHER WITHIN 0.005 INCH.
4. LOCATING DIMENSIONS HAVE PRECEDENCE OVER POSITION OF ANY
PHOTO ARTWORK PADS OR REFERENCE.
5. CONDUCTOR WIDTHS AND SPACING BETWEEN CONDUCTORS SHALL BE
WITHIN 10 PERCENT OF THE PHOTO ARTWORK, AND IN NO CASE
SHALL VARY MORE THAN ± 0.005 INCH.
6. TOOLING HOLES AND FIELD HOLES SHALL BE DRILLED IN THE SAME
DRILLING SET-UP. NO SECONDARY DRILLING OR REAMING PERMITTED.
7. TIN LEAD COATING: APPLY TO ALL COPPER SURFACES EXPOSED FROM
SOLDERMASK. 88/40 ±10% TIN LEAD. MINIMUM THICKNESS 0.0005-0.0005 INCH. MAXIMUM THICKNESS ON COPPER SURFACES 0.001 INCH.
ON COPPER EDGES 0.0005 INCH.
8. PLATED THROUGH HOLES SHALL HAVE 0.001 INCH MINIMUM
PLATED COPPER WALL.
9. HOLE SIZE DIMENSIONS APPLY AFTER TIN PLATE.
10. INDICATED HOLE SHALL BE CONCENTRIC TO THE ARTWORK PAD WITHIN
0.005 INCH.
11. MINIMUM ANNULAR RING SHALL BE 0.002 INCH EXCEPT VIAS
WHICH MAY HAVE A MAXIMUM OF 0.000 BREAK OUT.
12. SOLDERMASK: LAYER 1 ONLY, TO CONFORM TO IPC-SM-848
CLASS III REQUIREMENTS.
13. U.L. RECOGNIZED VENDOR TRADEMARK, TYPE DESIGNATION AND DATE
CODE SHALL APPEAR IN THE AREA SHOWN. (SILK SCREEN ACCEPTABLE) (LAYER 1)
14. MAXIMUM BOW AND TWIST, CLASS "A" PER IPC-600 0.010 INCH/INCH.
15. THE REV LETTER TO WHICH THE PART WAS MANUFACTURED SHALL
APPEAR IN THE AREA SHOWN. (LAYER 1)
16. SOLDER FILLED VIAS ACCEPTABLE.
17. PARTS SHALL BE CLEAN AND FREE OF CONTAMINANTS AND
PACKAGED IN CLEAN PROTECTIVE CONTAINERS.
18. PARTS SHALL CONFORM TO THESE SPECIFICATIONS AND
"IPC-A-600" LATEST REVISIONS.
19. PALLET INFORMATION IS TO BE SUPPLIED BY THE ASSEMBLER AND
APPROVED BY ITRONIX MANUFACTURING ENGINEERING.
20. NOTE THE DIMENSION AT BREAKAWAY TAB IS 0.040.

AS VIEWED FROM LAYER 1



ATTACHMENT F – GAIN AND ANTENNA FACTORS FOR HORN ANTENNA



Gain and Antenna Factors for Double Ridged Guide Antenna
Manufactured by EMC Test Systems
Model Number: 3115 Serial Number: 6276
3.0 Meter Calibration Polarization: Horizontal

Frequency (MHz)	Antenna Factor (dB/m)	Gain Numeric	Gain dBi
1000	26.5	2.37	3.7
1500	27.2	4.53	6.6
2000	29.6	4.63	6.7
2500	30.4	6.03	7.8
3000	32.0	5.91	7.7
3500	33.3	6.06	7.8
4000	34.7	5.72	7.6
4500	34.7	7.25	8.6
5000	35.7	7.13	8.5
5500	36.5	7.04	8.5
6000	36.7	8.09	9.1
6500	36.9	9.13	9.6
7000	37.8	8.59	9.3
7500	38.7	8.02	9.0
8000	39.1	8.34	9.2
8500	39.4	8.68	9.4
9000	40.2	8.11	9.1
9500	40.3	8.90	9.5
10000	40.3	9.74	9.9
10500	40.4	10.67	10.3
11000	40.7	10.92	10.4
11500	40.4	12.72	11.0
12000	40.5	13.55	11.3
12500	41.2	12.41	10.9
13000	41.6	12.28	10.9
13500	42.0	12.02	10.8
14000	42.1	12.74	11.1
14500	42.6	12.10	10.8
15000	42.5	13.15	11.2
15500	40.8	21.21	13.3
16000	40.6	23.31	13.7
16500	41.9	18.34	12.6
17000	43.0	15.37	11.9
17500	44.4	11.56	10.6
18000	45.9	8.79	9.4

Specification compliance testing factor (3.0 meter spacing) to be added to receiver meter reading in dBV to convert to field intensity in dBV/meter. Calibrated 14 Nov 00 (DD/MM/YYYY). Calibration per ANSI C63.5.