

# GSM Antenna

**MODEL: TH-88A**

GSM800/GSM900/DCS1800/PCS1900/3G2170



## 1. GENERAL DESCRIPTION

Model No
TH88A-SMA90(M)

Below is a table summarizing the antenna design specification.

### 1.1 Electrical Properties

Parameter	Description
Frequency Band	800/900/1800/1900/2100 MHz
Nominal Impedance	50 ohm
Polarization	Vertical
Return Loss	Please See Data-1
V.S.W.R	2.3:1
Note: Gain includes the cable loss	

### 1.2 Mechanical Properties

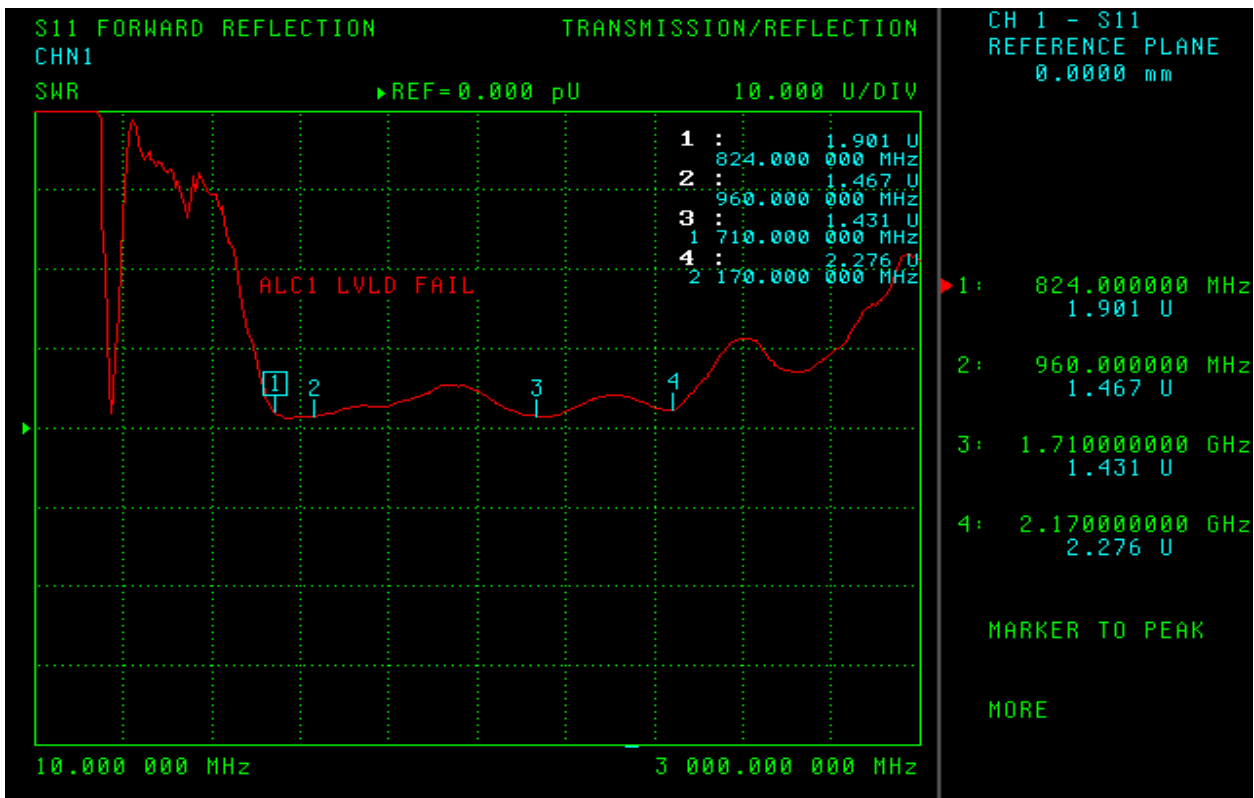
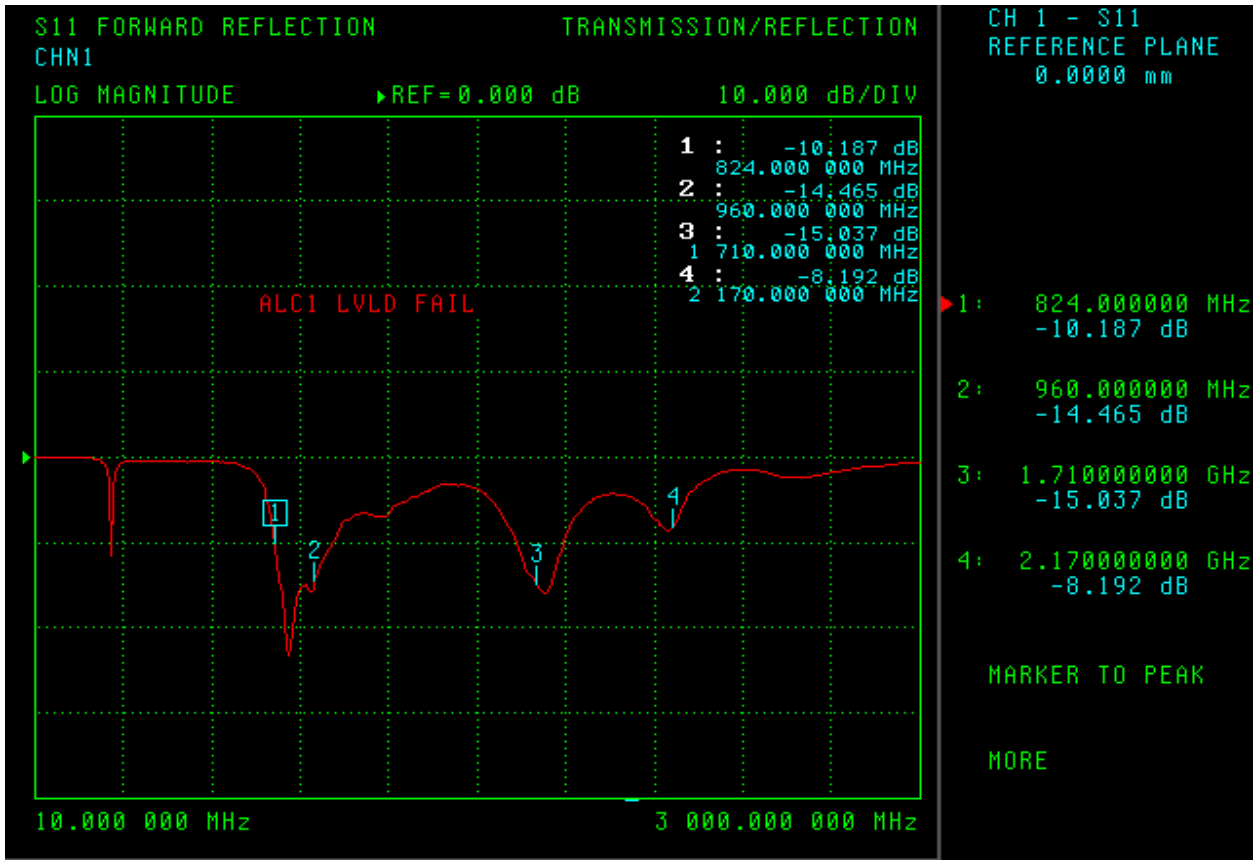
Parameter	Description
Antenna Type	External Antenna
Antenna Cover	TPE
Touch Type	Screw Type
Connector Type	SMA 180°(Male)
Antenna Dimensions	240 mm ±5
Operating Temperature Range	-20°C~+60°C
Storage Temperature Range	-30°C~+70°C

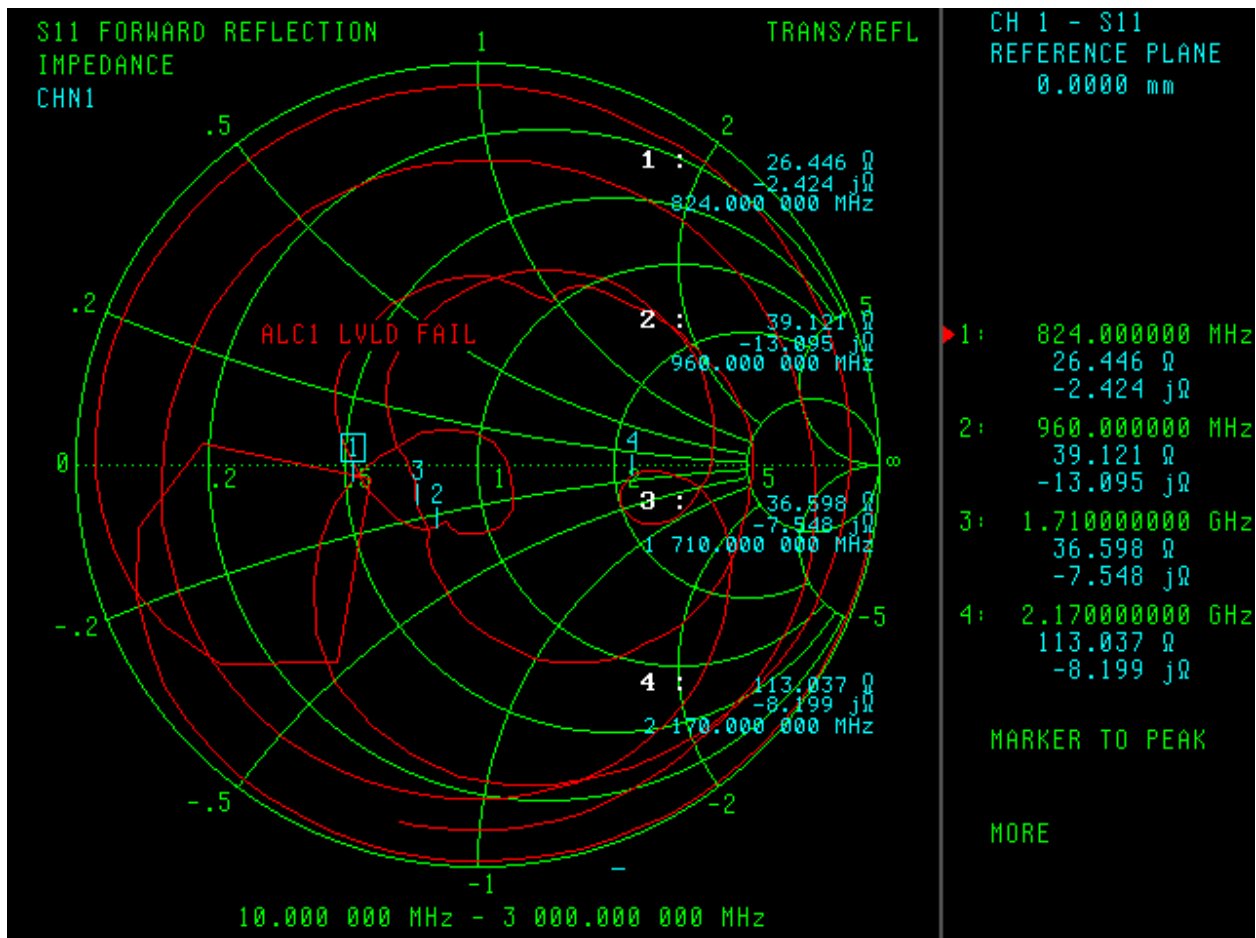
### 2. Appearance

NO.	NAME	FINISH	Q, TY
01	Core tube	Black	01
02	SMA 180°(Male)	Chrom plating	01

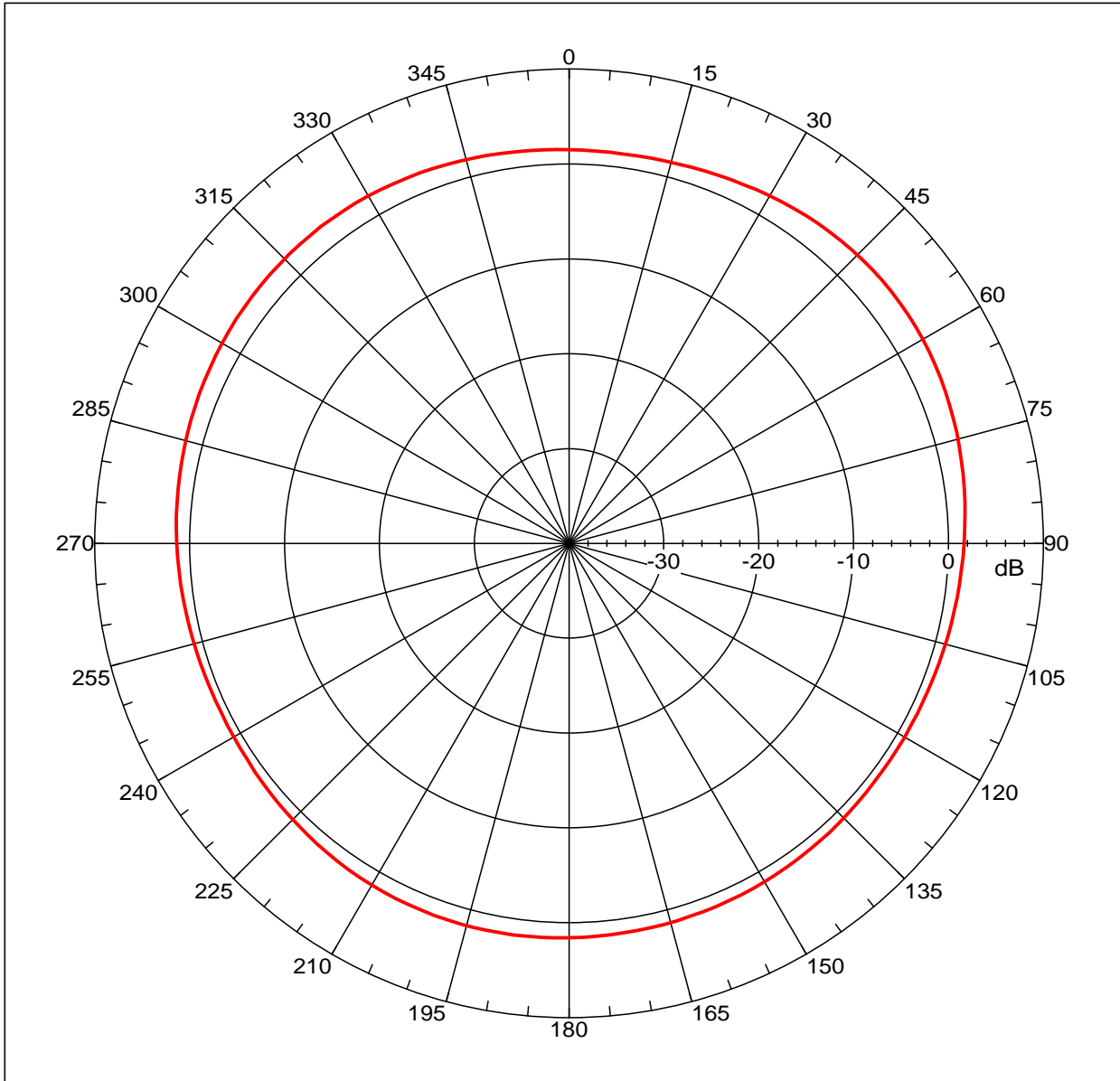
 Third angle projection	CUSTOMER' S	MODEL	PARTS NUMBER	FREQUENCY	UNIT	SCALE	DATE	VERSION
				800/900/1800/1900/2100MHz	M/M		20100902	1
	TOLERANCE	X. XX±0. 15	NAME	PARTS NUMBER	APPROVED	CHECKED	DRAWING	DESIGNED
SURFACE ROUGHNESS	$\frac{S}{\sqrt{V}}$	APPEARANCE						

### 3. Return Loss, V.S.W.R. and Smith Chart





Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 3.11894 dBi  
Max far-field (global) = -39.8804 dB, Max far-field (plot) = -39.88041 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: 51.99999 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi

Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:

- Avg value: 1.711 dB
- 3. dB beam width: Not Found
- 6. dB beam width: Not Found
- 10. dB beam width: Not Found
- Left Sidelobe: Not Found
- Right Sidelobe: Not Found

Far-field display setup

Azimuth (deg)

Span = 360.00001 deg, Center = 0.000 deg, #pts = 181

Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000

deg

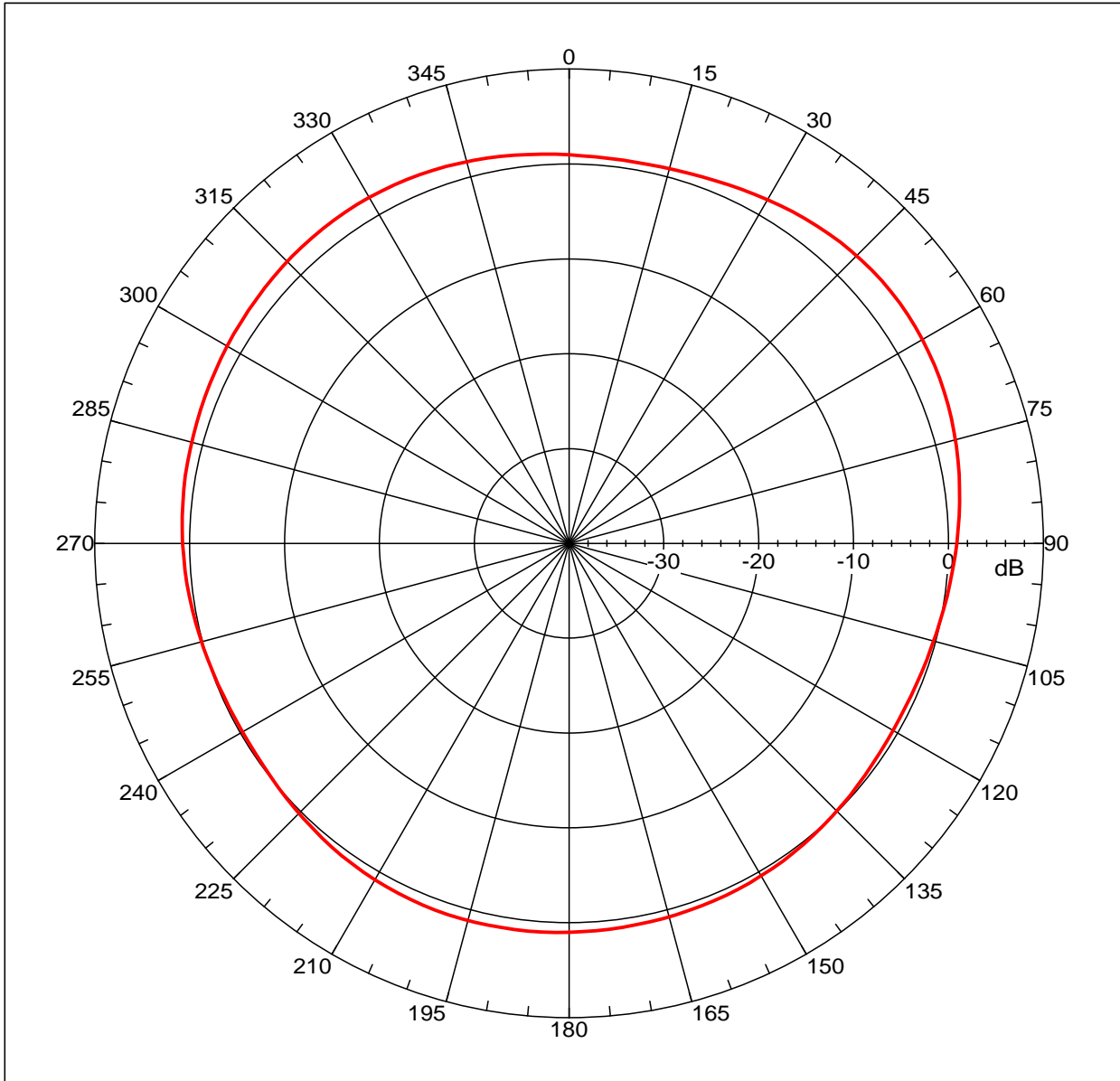
Elevation (deg)

Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
1	0.824 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 3.08177 dBi  
 Max far-field (global) = -37.68606 dB, Max far-field (plot) = -37.68606 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 53.99999 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

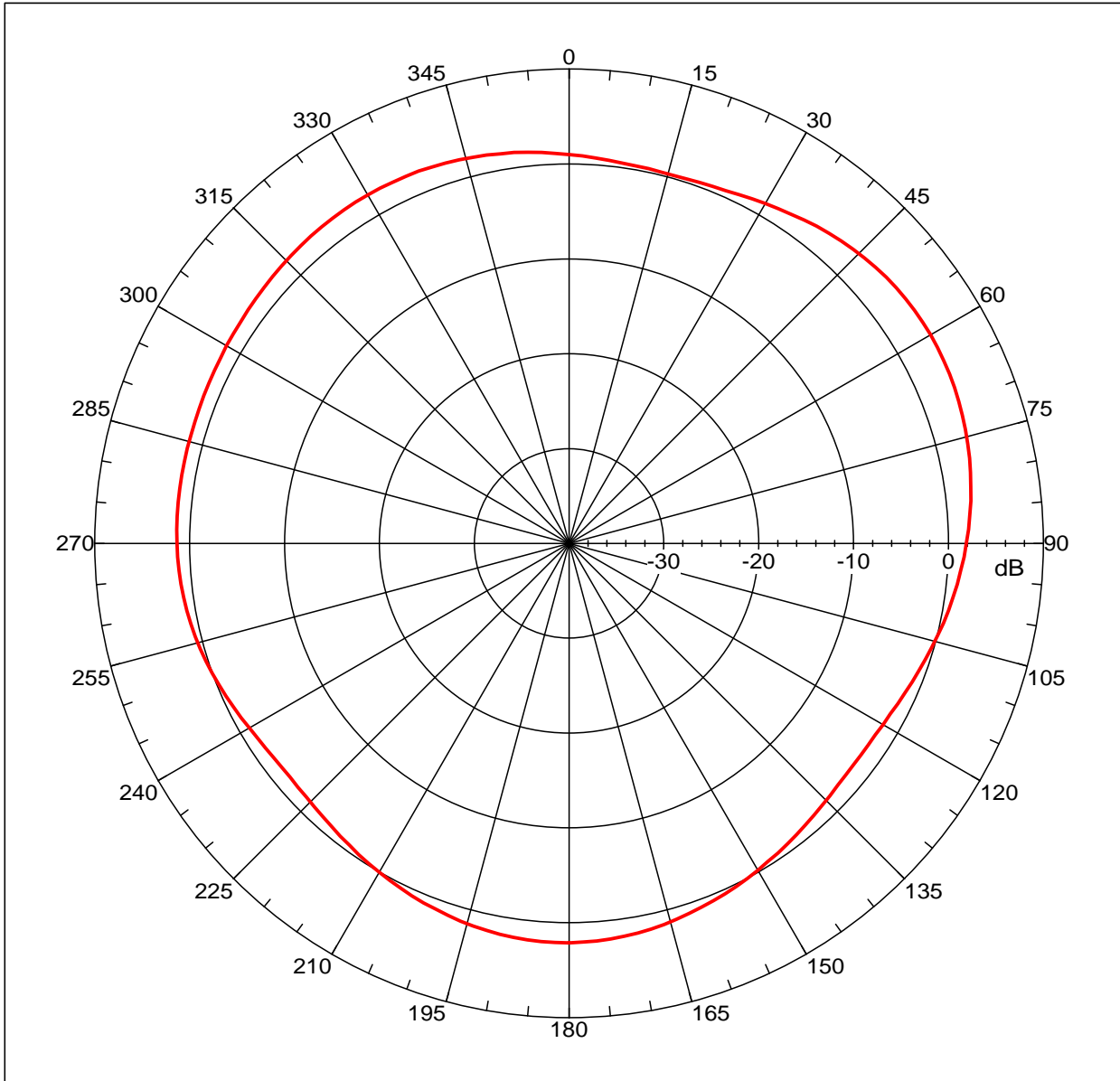
NSI2000 V4.0.124, Filename:C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: 1.104 dB  
 -3. dB beam width: 206.49 deg  
 -6. dB beam width: Not Found  
 -10. dB beam width: Not Found  
 Left Sidelobe: -0.96 dB at -31.173 deg  
 Right Sidelobe: Not Found  
 Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
2	0.860 GHz	Azimuth	Elevation	Single-pol

### Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 3.98863 dBi  
Max far-field (global) = -37.57105 dB, Max far-field (plot) = -37.57106 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: 59.99999 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

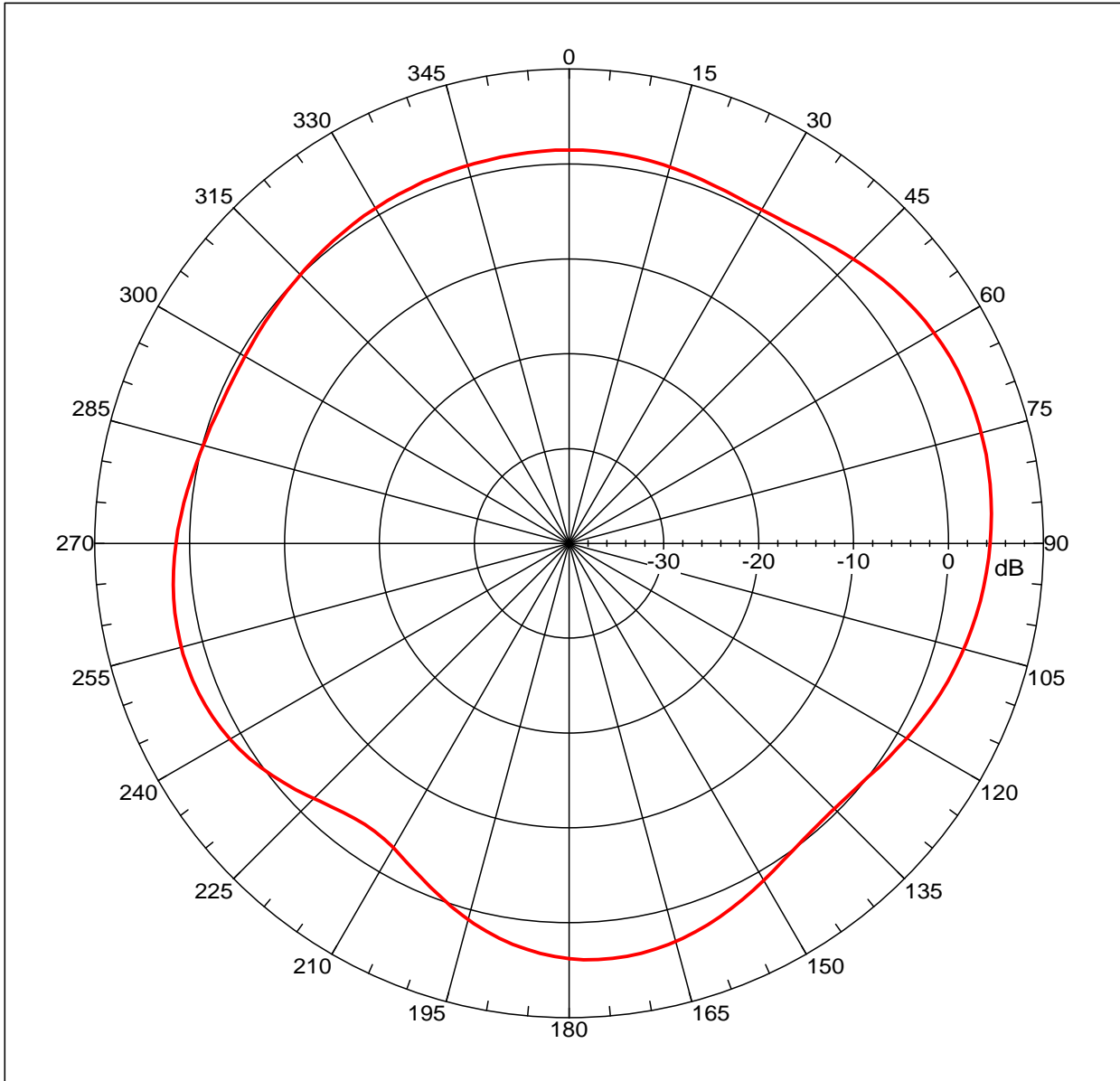
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi  
Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
Avg value: 1.184 dB  
-3. dB beam width: 70.67 deg  
-6. dB beam width: Not Found  
-10. dB beam width: Not Found  
Left Sidelobe: -1.58 dB at -31.173 deg  
Right Sidelobe: Not Found  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
3	0.900 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 4.98837 dBi  
 Max far-field (global) = -37.6413 dB, Max far-field (plot) = -37.6413 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 73.99999 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi

Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: 1.616 dB  
 -3. dB beam width: 71.56 deg  
 -6. dB beam width: Not Found  
 -10. dB beam width: Not Found  
 Left Sidelobe: -2.67 dB at -105.587 deg  
 Right Sidelobe: -1.00 dB at 175.978 deg

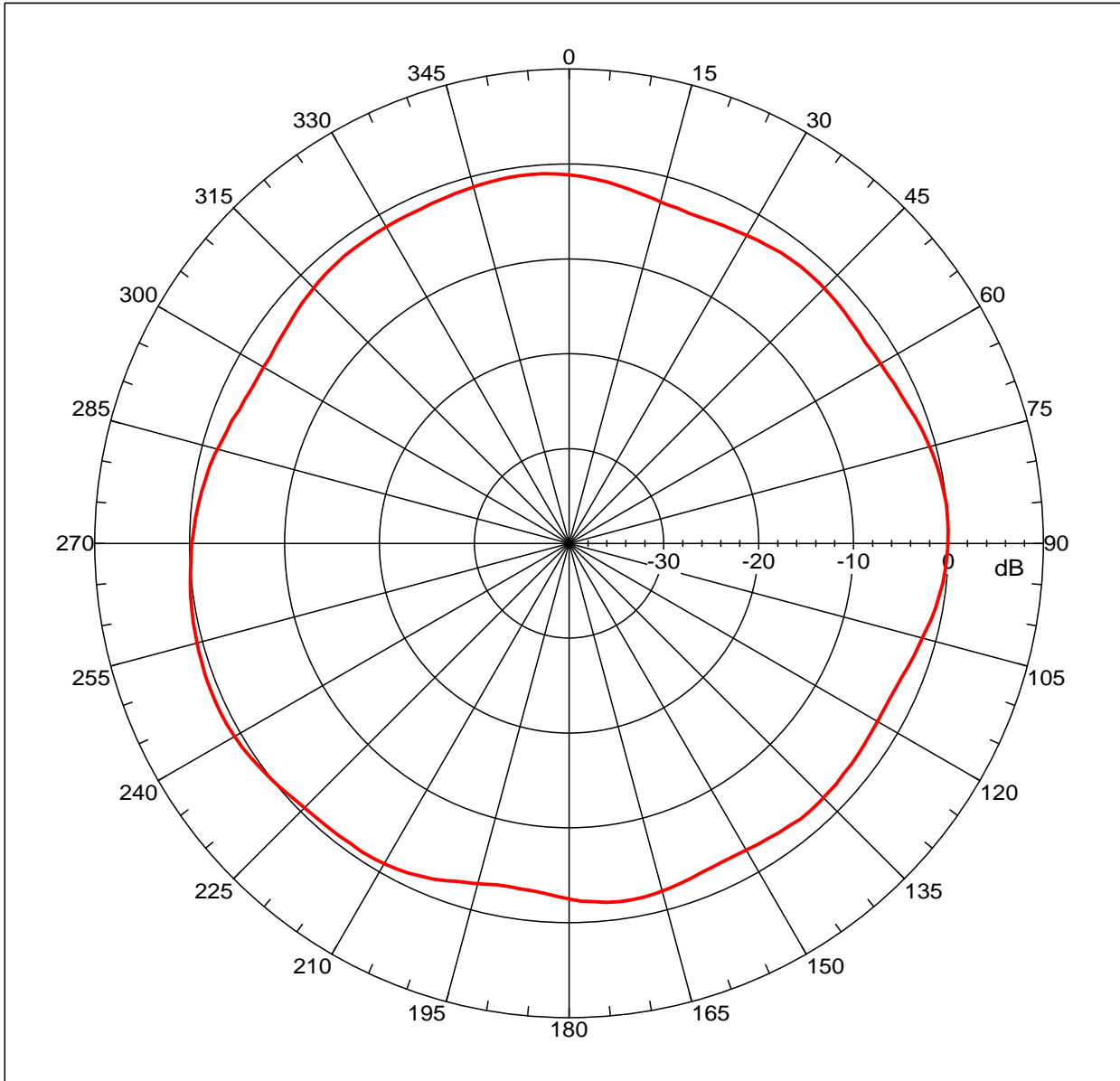
Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
4	0.960 GHz	Azimuth	Elevation	Single-pol



Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 0.84127 dBi  
 Max far-field (global) = -44.35132 dB, Max far-field (plot) = -44.35133 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -114.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

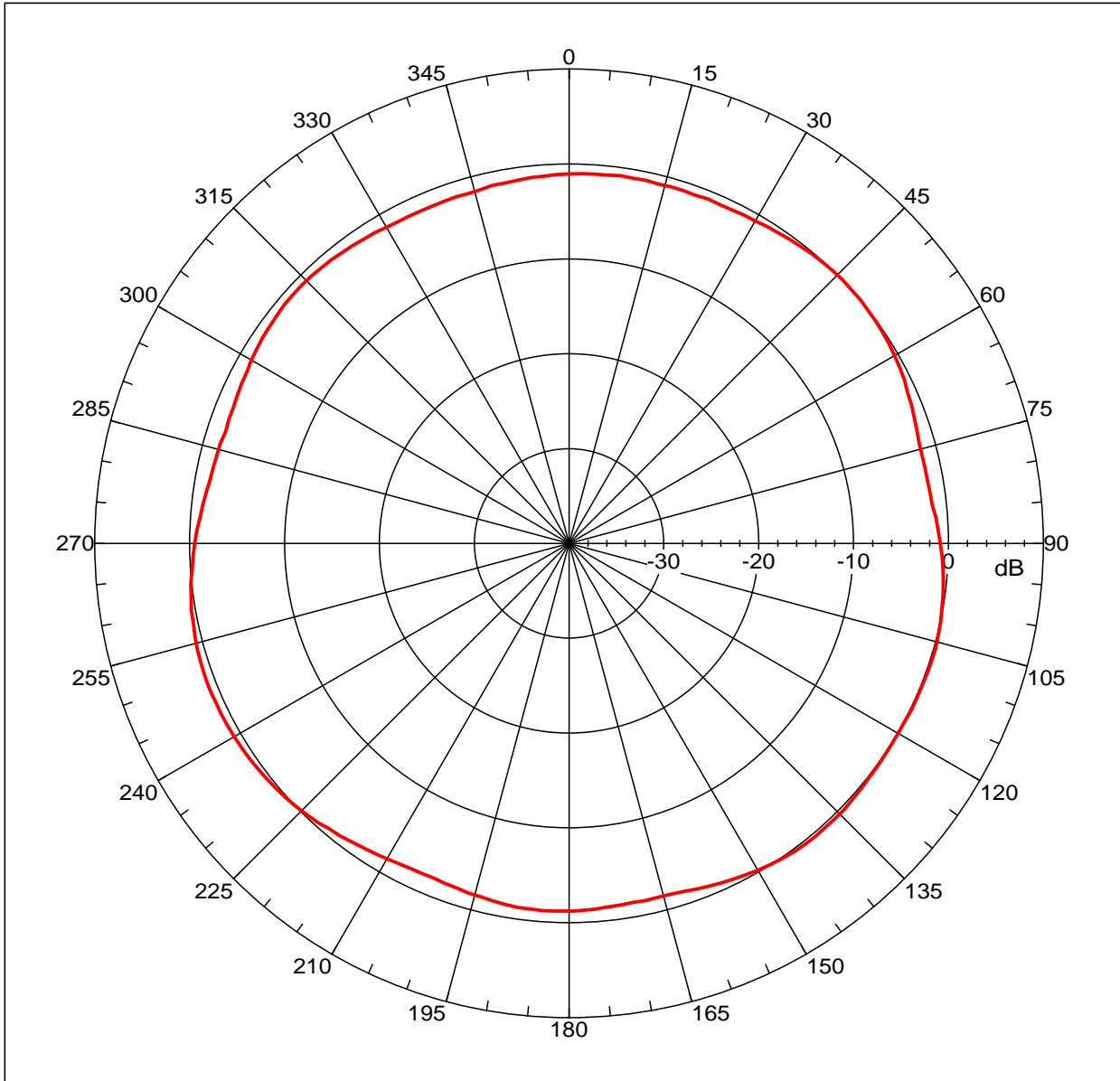
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -1.472 dB  
 -3. dB beam width: 89.92 deg  
 -6. dB beam width: Not Found  
 -10. dB beam width: Not Found  
 Left Sidelobe: Not Found  
 Right Sidelobe: -2.29 dB at -27.151 deg  
 Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
5	1.710 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 0.89994 dBi  
Max far-field (global) = -45.9221 dB, Max far-field (plot) = -45.92213 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: -112.00001 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

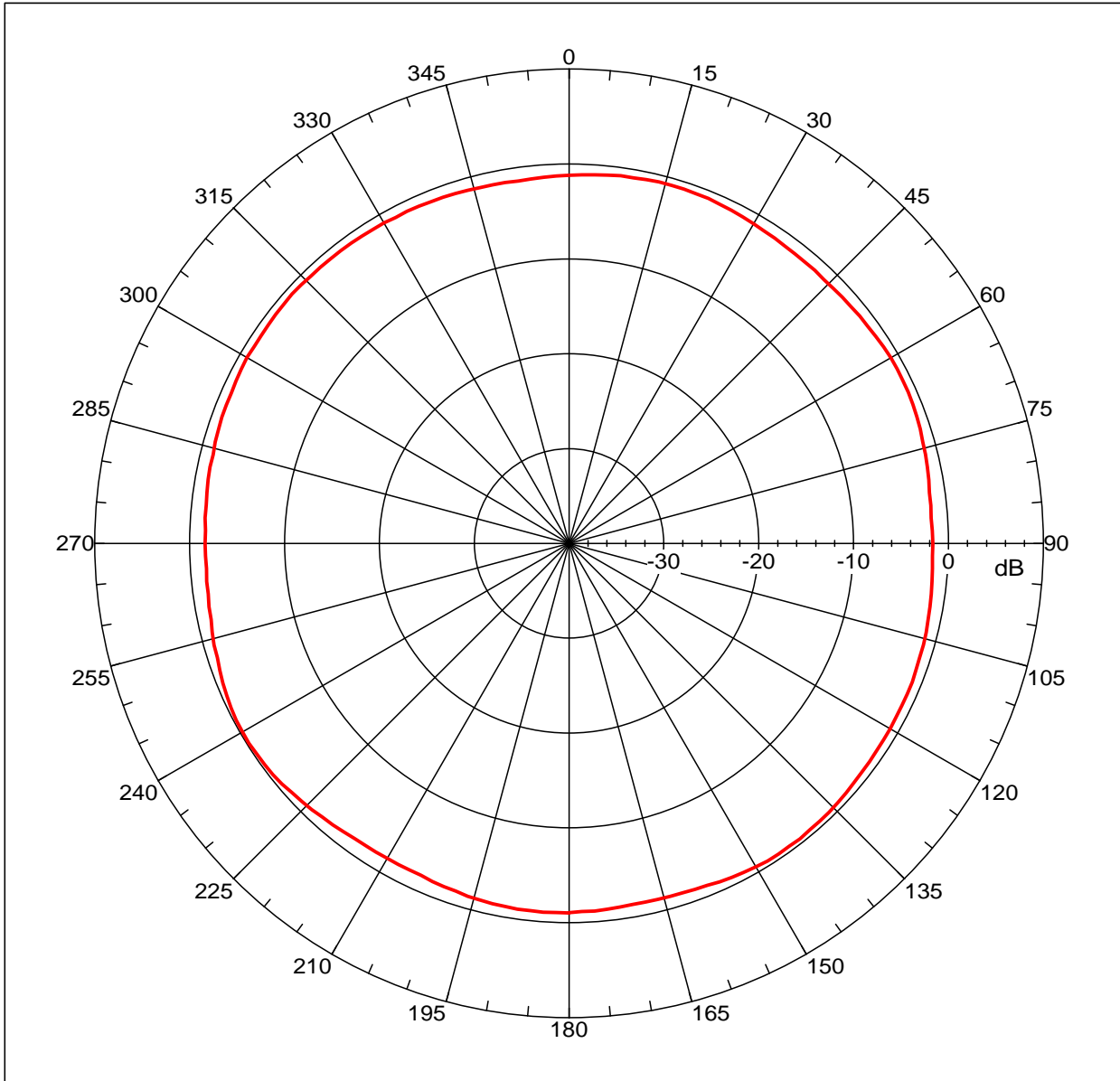
NSI2000 V4.0.124, Filename:C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi  
Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
Avg value: -0.705 dB  
-3. dB beam width: Not Found  
-6. dB beam width: Not Found  
-10. dB beam width: Not Found  
Left Sidelobe: Not Found  
Right Sidelobe: -1.75 dB at -49.274 deg  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
6	1.800 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = -0.2259 dBi  
 Max far-field (global) = -46.89447 dB, Max far-field (plot) = -46.89448 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -122.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

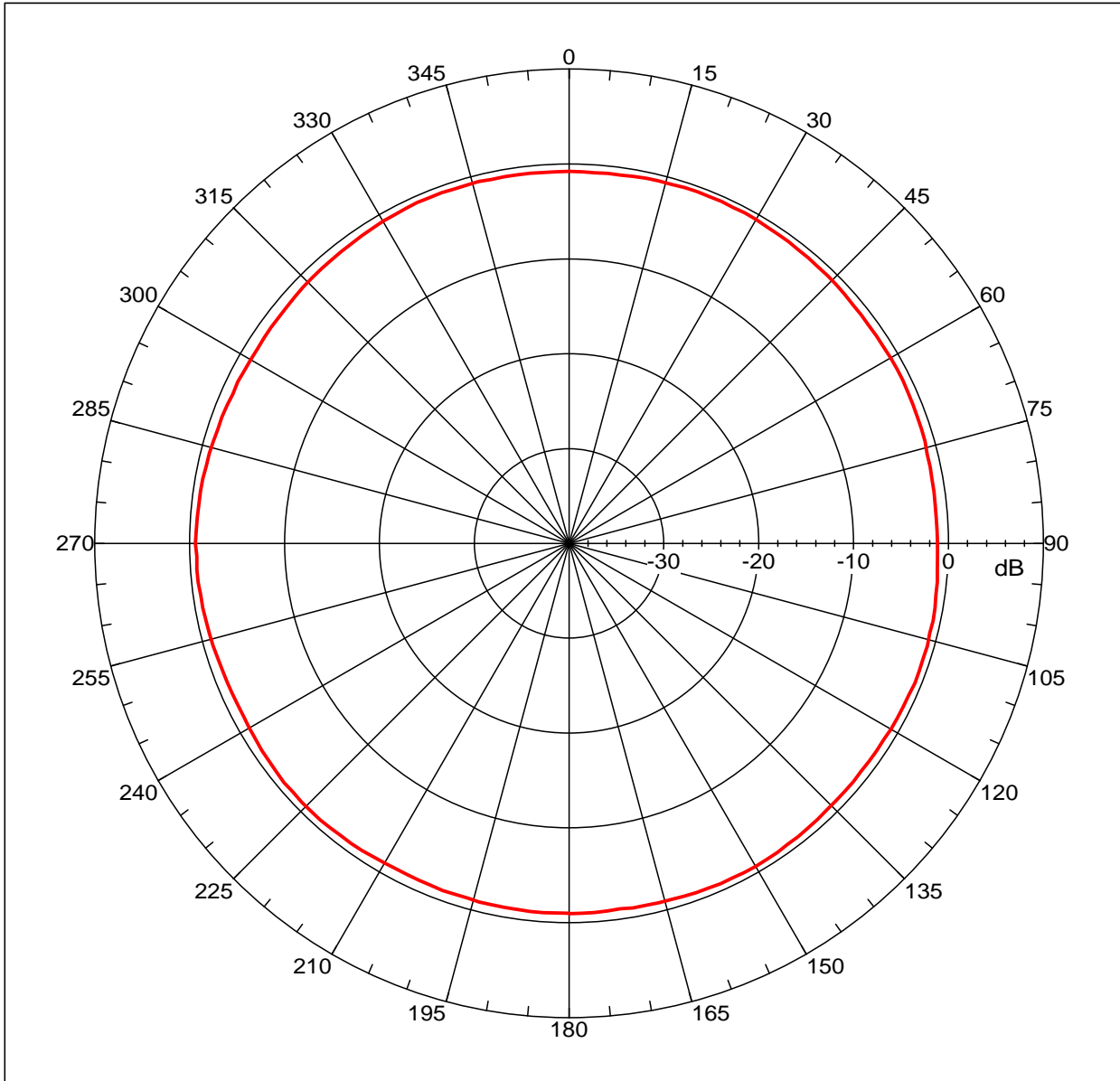
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -1.089 dB  
 -3. dB beam width: Not Found  
 -6. dB beam width: Not Found  
 -10. dB beam width: Not Found  
 Left Sidelobe: Not Found  
 Right Sidelobe: -0.32 dB at 139.777 deg  
 Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
7	1.880 GHz	Azimuth	Elevation	Single-pol

### Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = -0.55281 dBi  
Max far-field (global) = -48.35891 dB, Max far-field (plot) = -48.35892 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: 27.99999 deg, Vpeak at: 0.000 deg  
Plot centering: On

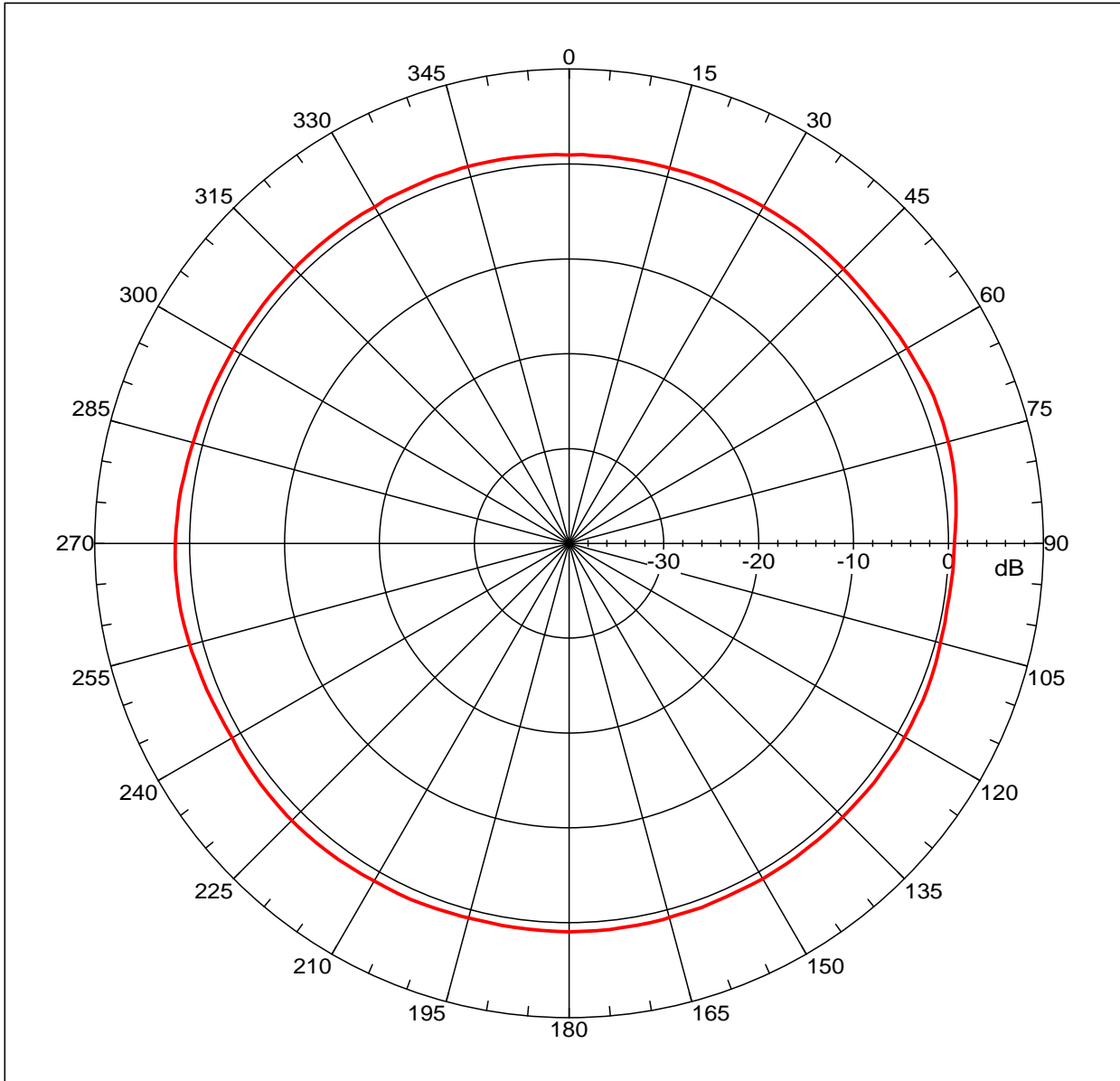
20100924 TH88A 800-2100mhz H-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi  
Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97  
Far-field Cut Analysis:  
Avg value: -0.902 dB  
-3. dB beam width: Not Found  
-6. dB beam width: Not Found  
-10. dB beam width: Not Found  
Left Sidelobe: Not Found  
Right Sidelobe: Not Found  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
8	1.990 GHz	Azimuth	Elevation	Single-pol

### Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 1.56563 dBi  
Max far-field (global) = -45.76107 dB, Max far-field (plot) = -45.76109 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: -94.00001 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

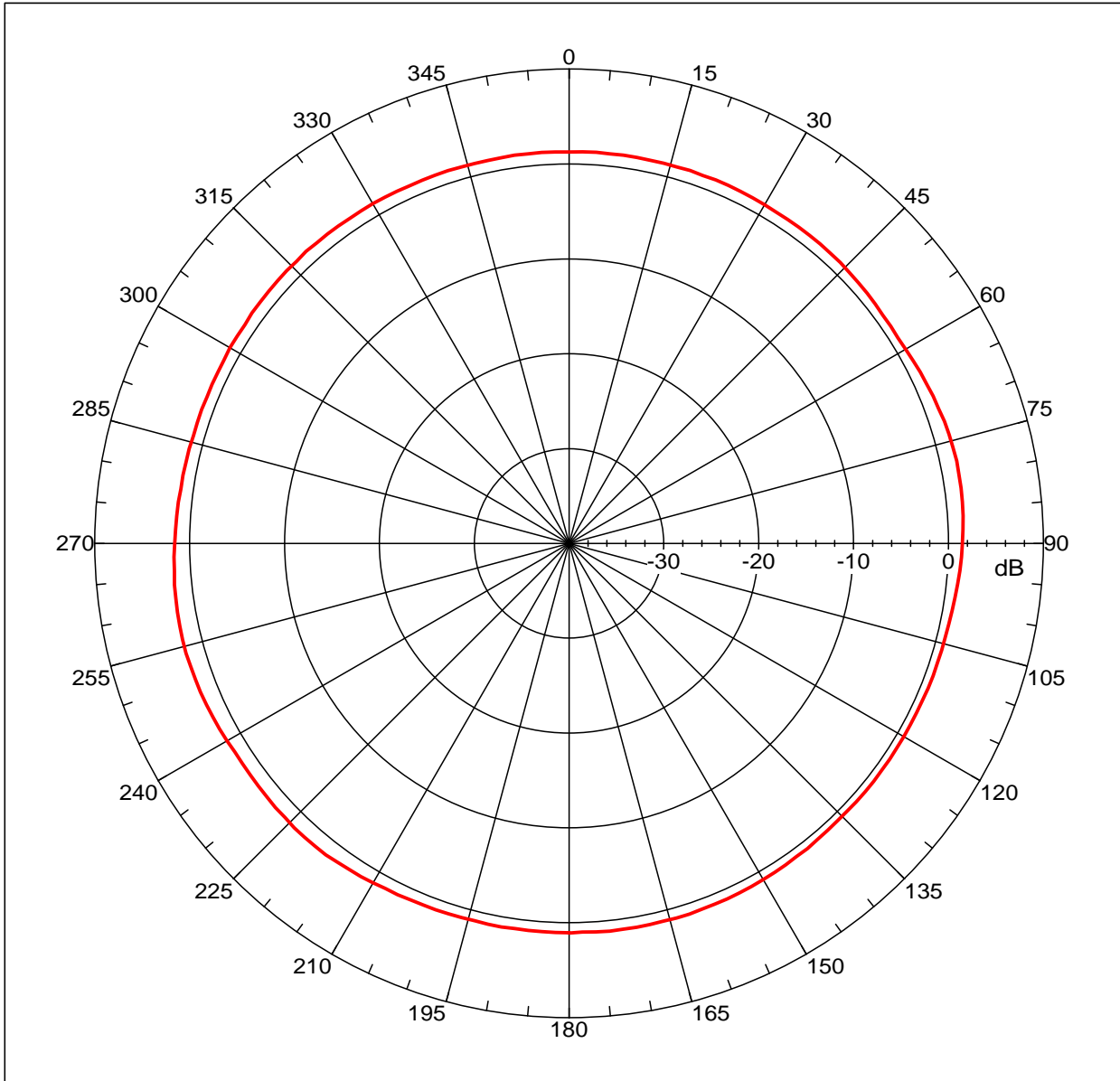
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi  
Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
Avg value: 1.002 dB  
-3. dB beam width: Not Found  
-6. dB beam width: Not Found  
-10. dB beam width: Not Found  
Left Sidelobe: Not Found  
Right Sidelobe: Not Found  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
9	2.100 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 1.99658 dBi  
Max far-field (global) = -45.53553 dB, Max far-field (plot) = -45.53554 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: -106.00001 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz H-PLANE

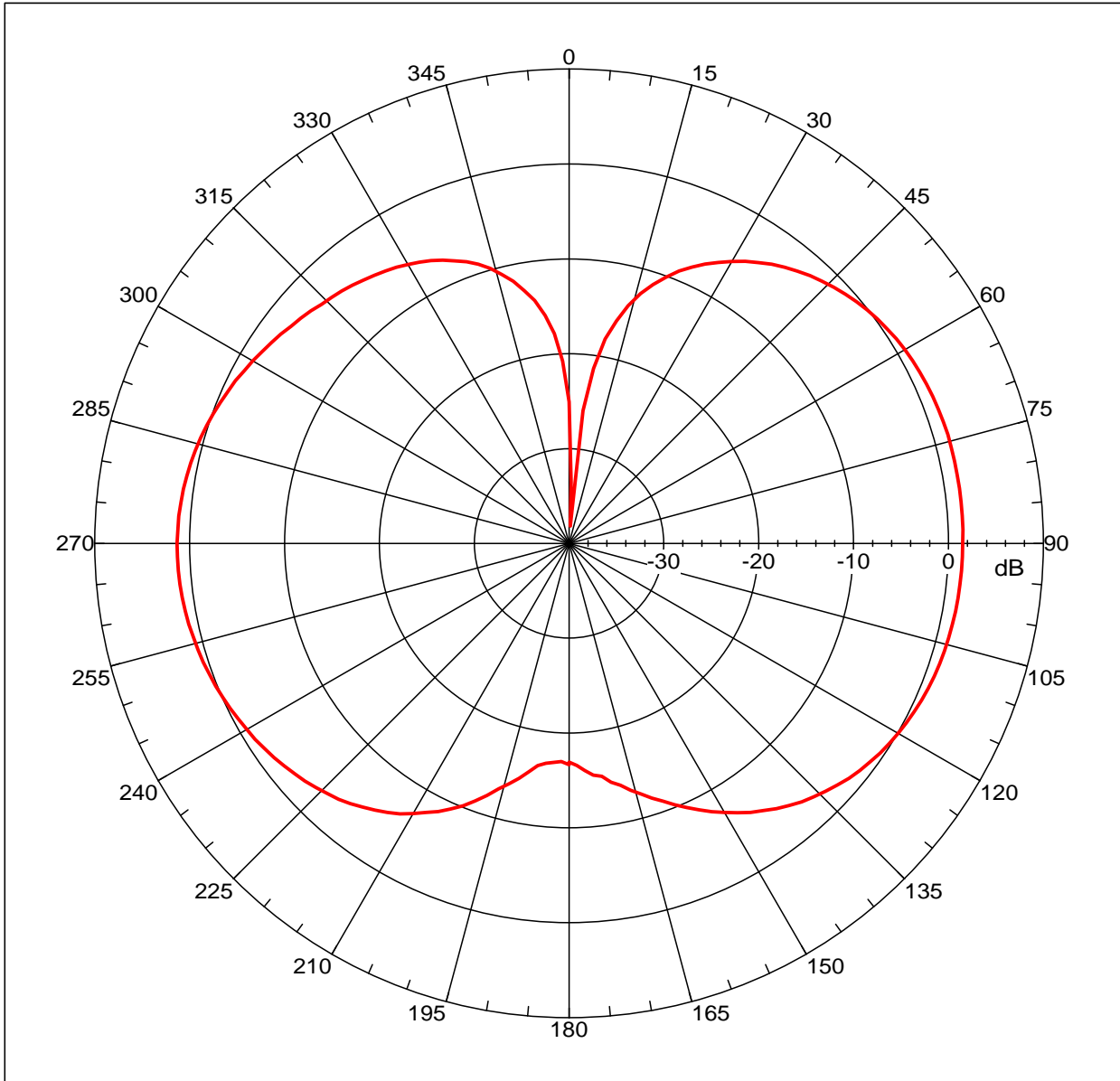
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz H-PLANE01.nsi  
Measurement date/time: 9/24/2010 9:15:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
Avg value: 1.251 dB  
-3. dB beam width: Not Found  
-6. dB beam width: Not Found  
-10. dB beam width: Not Found  
Left Sidelobe: Not Found  
Right Sidelobe: Not Found  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
10	2.170 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 1.55179 dBi  
 Max far-field (global) = -41.44755 dB, Max far-field (plot) = -41.44756 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 81.99999 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi

Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:

Avg value: -3.155 dB  
 -3. dB beam width: 85.62 deg  
 -6. dB beam width: 108.79 deg  
 -10. dB beam width: 130.70 deg  
 Left Sidelobe: -0.25 dB at -89.497 deg  
 Right Sidelobe: Not Found

Far-field display setup

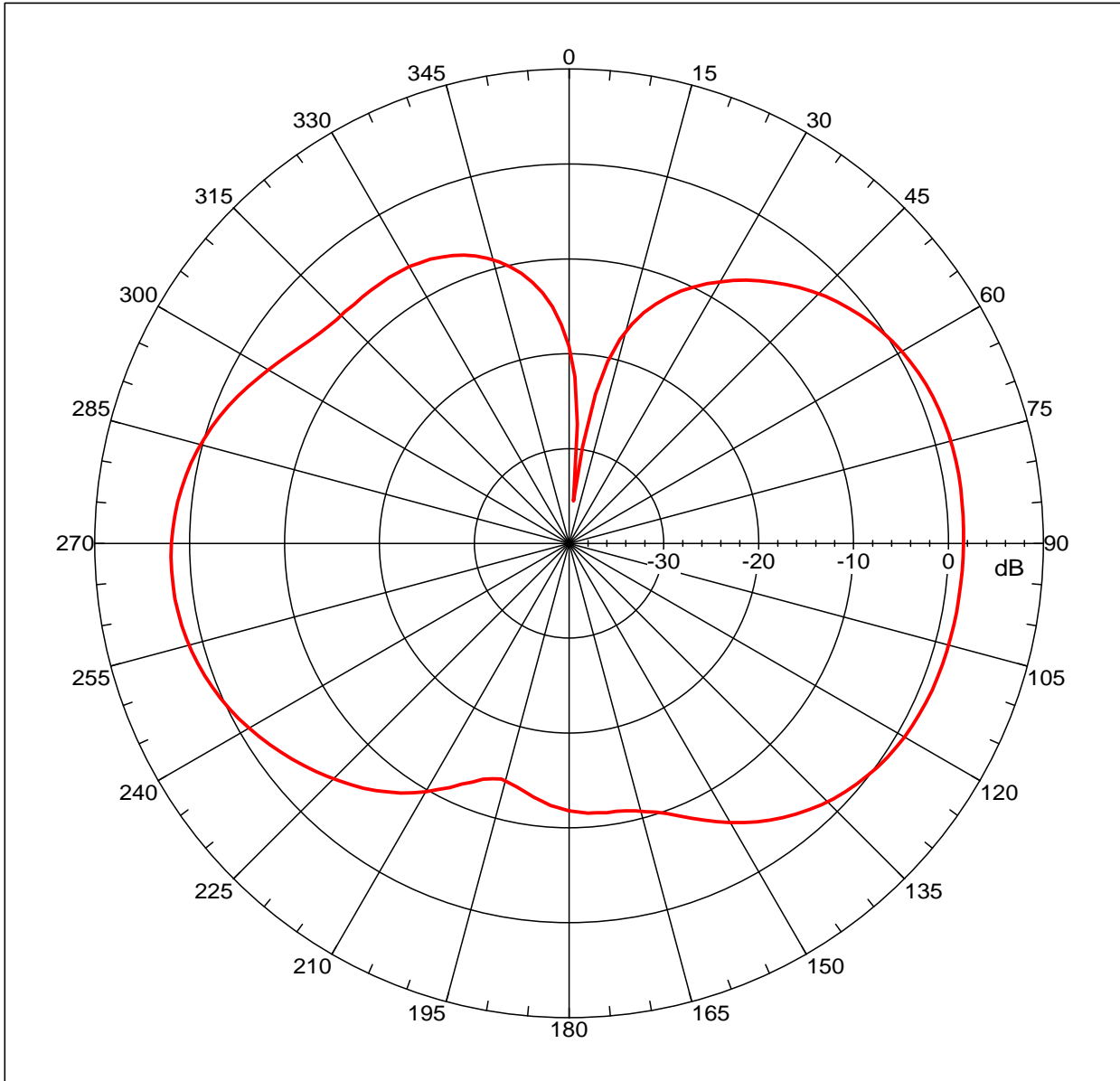
Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000

deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
1	0.824 GHz	Azimuth	Elevation	Single-pol

### Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 1.97275 dBi  
Max far-field (global) = -38.79508 dB, Max far-field (plot) = -38.79509 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: -94.00001 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

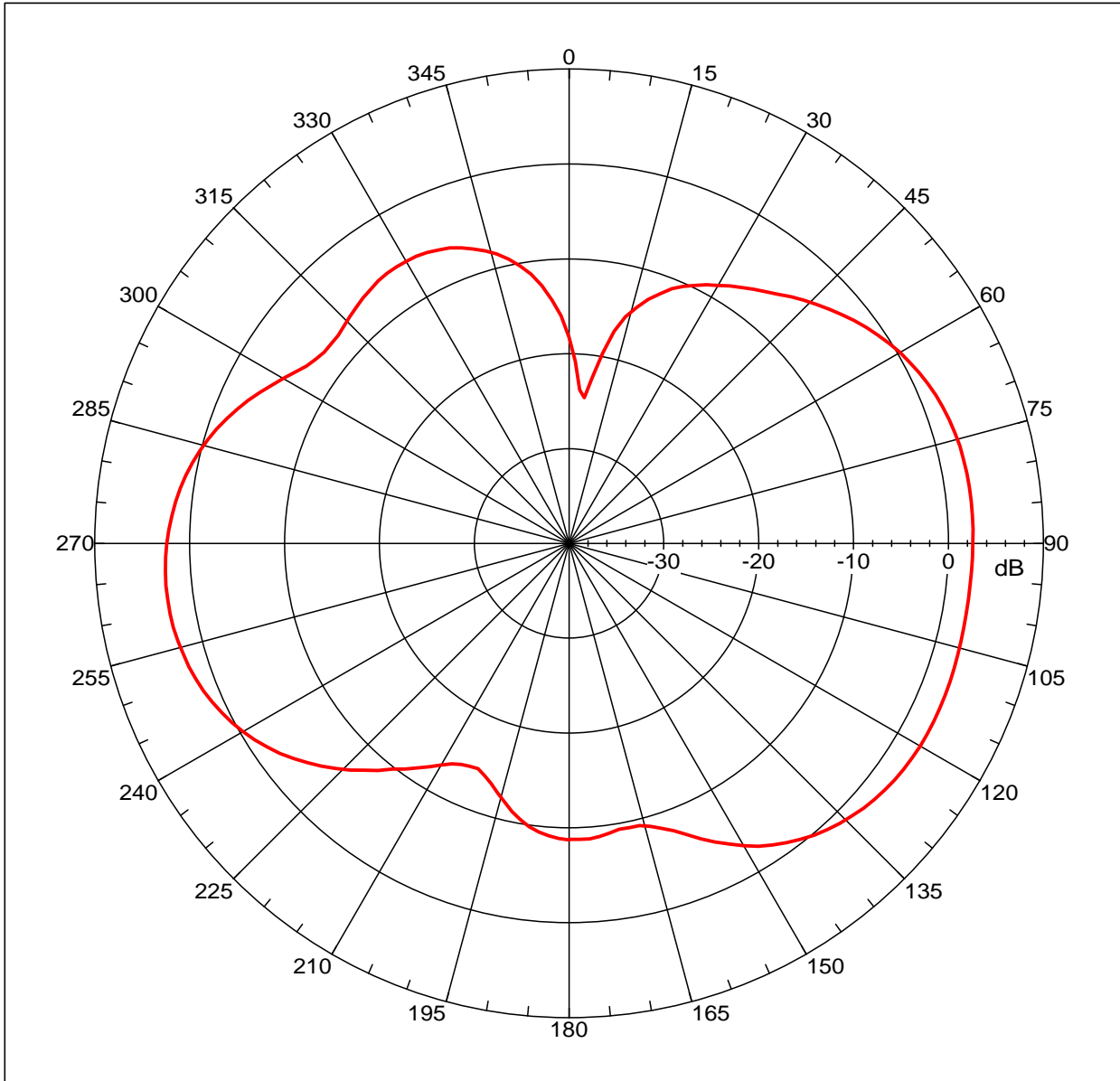
Far-field Cut Analysis:  
Avg value: -3.301 dB  
-3. dB beam width: 50.86 deg  
-6. dB beam width: 74.58 deg  
-10. dB beam width: 127.49 deg  
Left Sidelobe: Not Found  
Right Sidelobe: -0.27 dB at 79.441 deg  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
2	0.860 GHz	Azimuth	Elevation	Single-pol



Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 2.77642 dBi  
 Max far-field (global) = -38.78326 dB, Max far-field (plot) = -38.78327 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 116.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

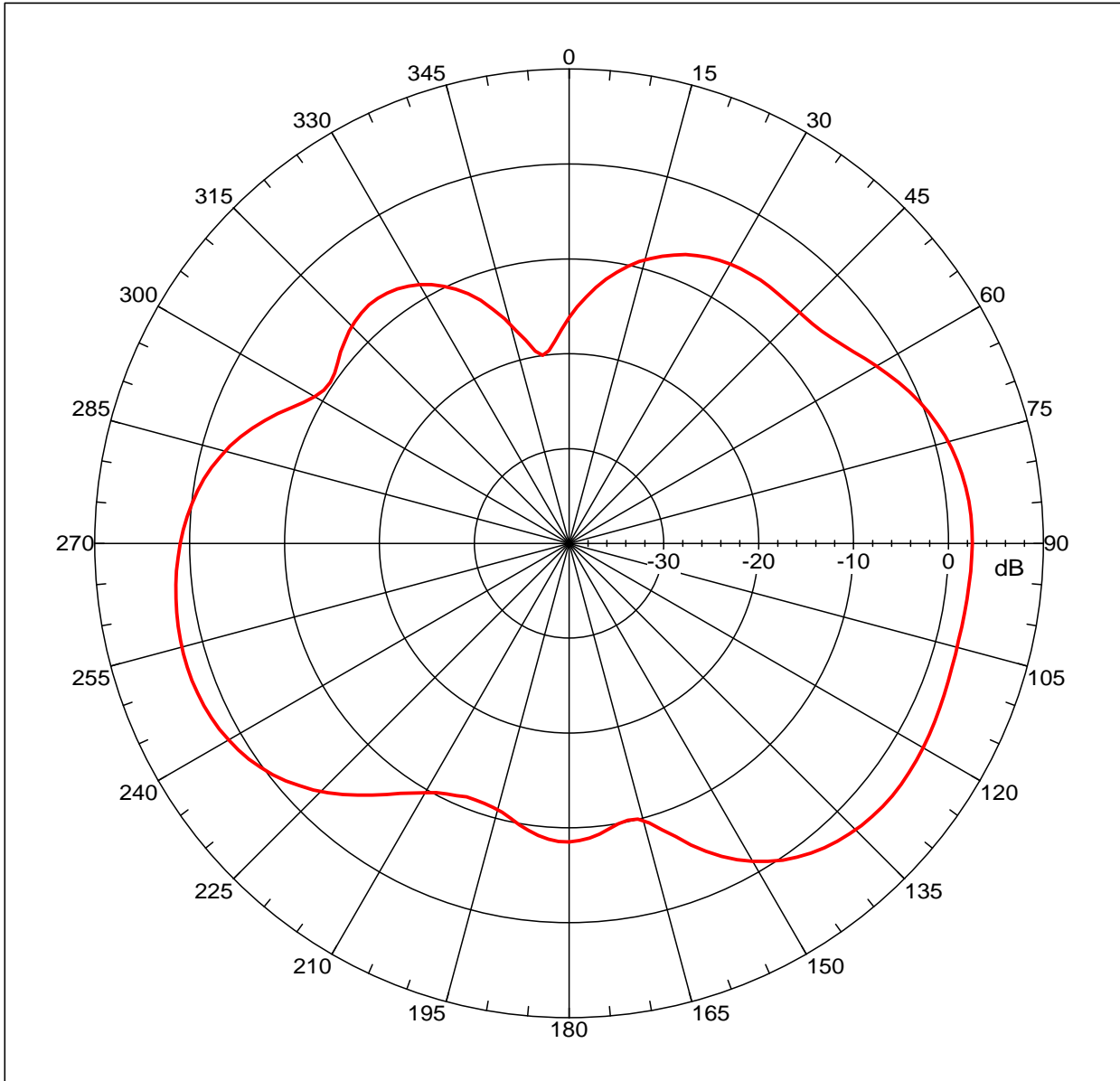
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -2.649 dB  
 -3. dB beam width: 83.89 deg  
 -6. dB beam width: 102.97 deg  
 -10. dB beam width: 124.53 deg  
 Left Sidelobe: -8.43 dB at -31.173 deg  
 Right Sidelobe: Not Found  
 Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
3	0.900 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 3.24927 dBi  
 Max far-field (global) = -39.3804 dB, Max far-field (plot) = -39.38042 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 126.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

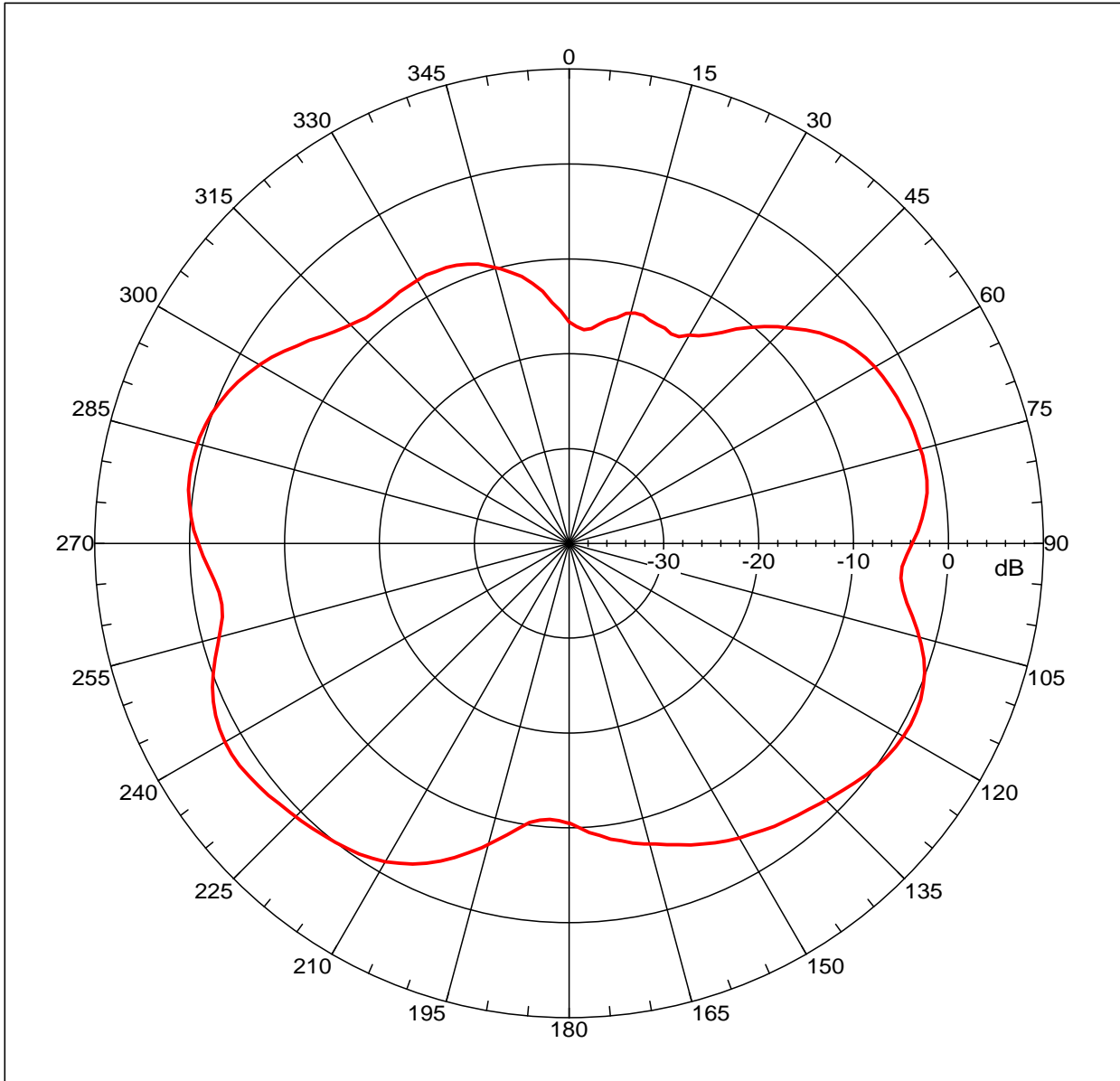
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -2.789 dB  
 -3. dB beam width: 76.87 deg  
 -6. dB beam width: 93.99 deg  
 -10. dB beam width: 135.85 deg  
 Left Sidelobe: -10.45 dB at -39.218 deg  
 Right Sidelobe: Not Found  
 Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
4	0.960 GHz	Azimuth	Elevation	Single-pol

### Far-field amplitude of 20100924 TH88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 1.92073 dBi  
Max far-field (global) = -43.27186 dB, Max far-field (plot) = -43.27191 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: -122.00001 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

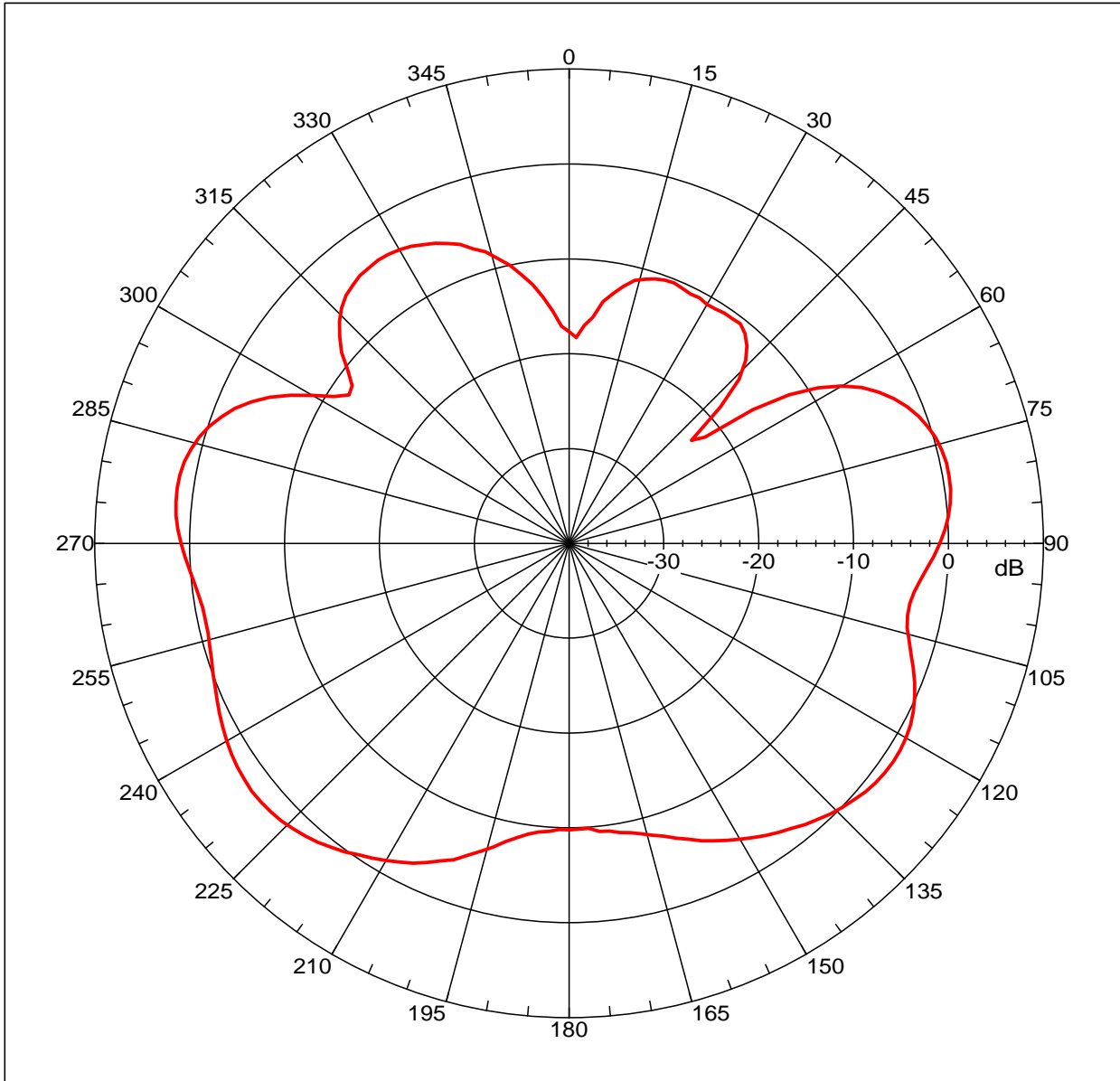
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:  
Avg value: -3.798 dB  
-3. dB beam width: 42.14 deg  
-6. dB beam width: 103.73 deg  
-10. dB beam width: 126.52 deg  
Left Sidelobe: Not Found  
Right Sidelobe: -1.26 dB at -77.430 deg  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
5	1.710 GHz	Azimuth	Elevation	Single-pol

### Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 2.4254 dBi  
Max far-field (global) = -44.39664 dB, Max far-field (plot) = -44.39673 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: -128.000 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

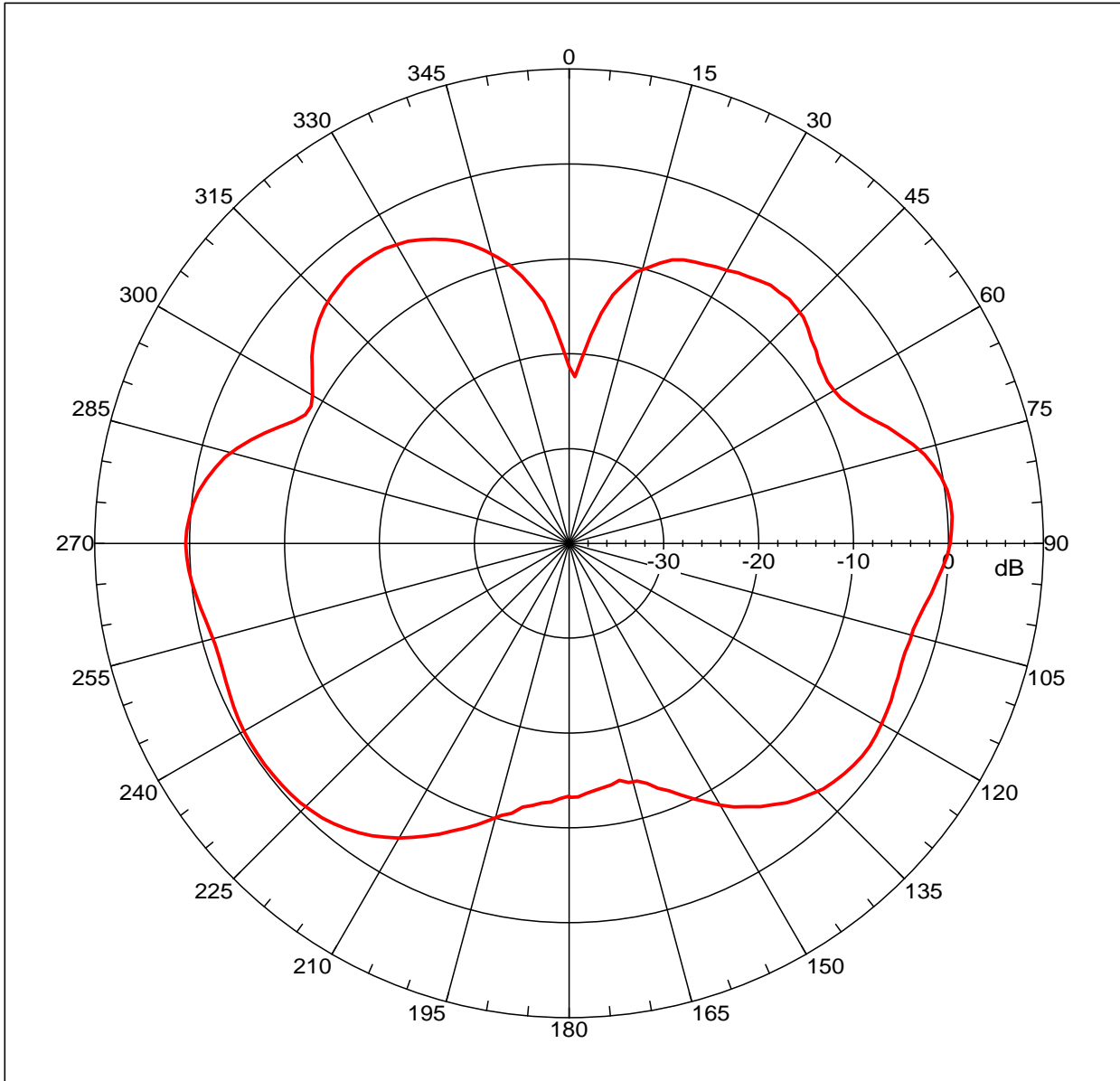
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:  
Avg value: -3.431 dB  
-3. dB beam width: 40.65 deg  
-6. dB beam width: 91.89 deg  
-10. dB beam width: 106.70 deg  
Left Sidelobe: Not Found  
Right Sidelobe: -0.73 dB at -81.453 deg  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
6	1.800 GHz	Azimuth	Elevation	Single-pol

### Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = 0.46166 dBi  
Max far-field (global) = -46.20691 dB, Max far-field (plot) = -46.20695 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: 85.99999 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

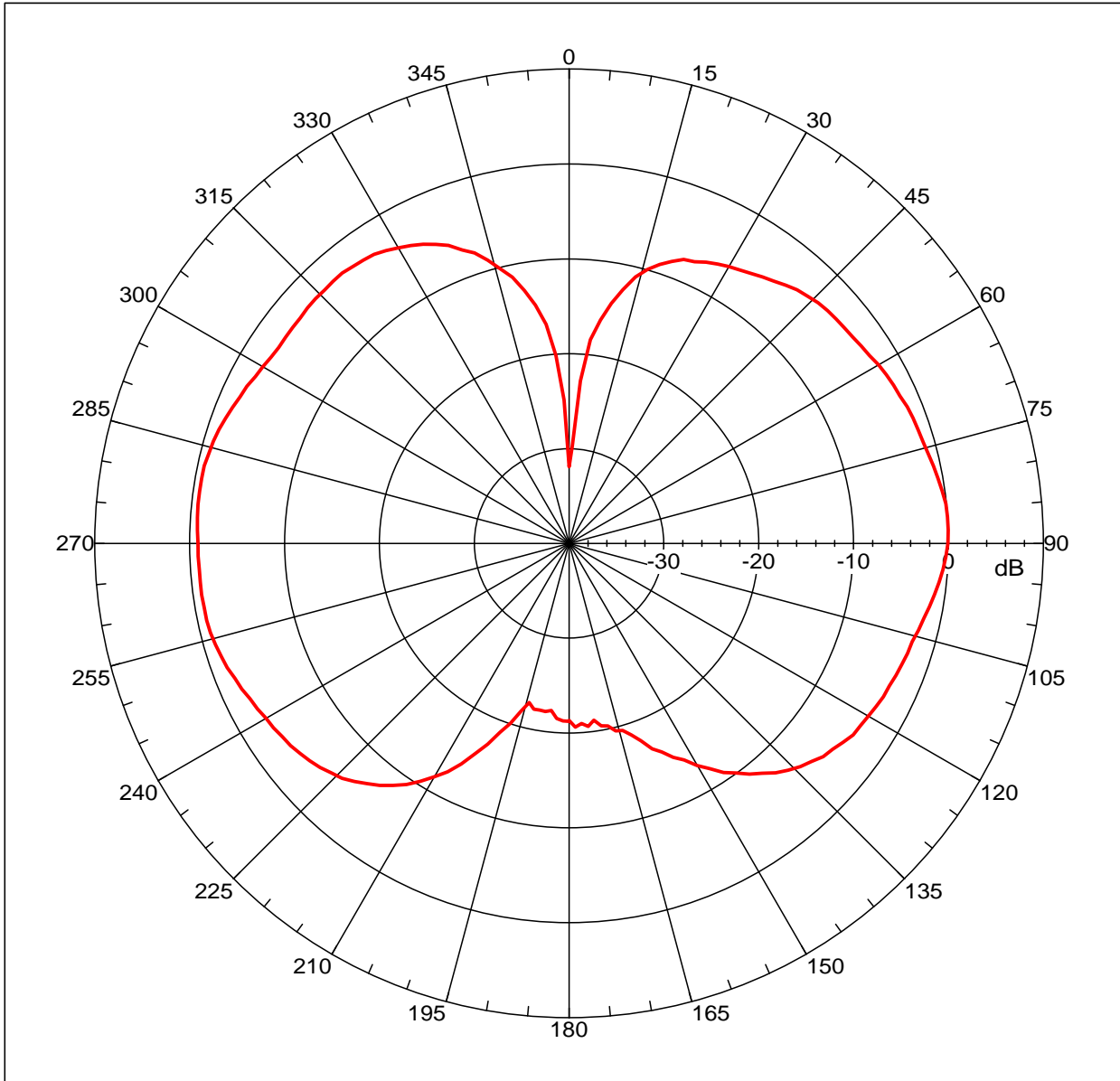
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:  
Avg value: -4.604 dB  
-3. dB beam width: 30.21 deg  
-6. dB beam width: 76.36 deg  
-10. dB beam width: 137.06 deg  
Left Sidelobe: -5.81 dB at 43.240 deg  
Right Sidelobe: Not Found  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
7	1.880 GHz	Azimuth	Elevation	Single-pol

### Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
Gain = -0.01746 dBi  
Max far-field (global) = -47.82356 dB, Max far-field (plot) = -47.82364 dB  
Normalization: Reference, Network offset = 0.000 dB  
Hpeak at: 87.99999 deg, Vpeak at: 0.000 deg  
Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

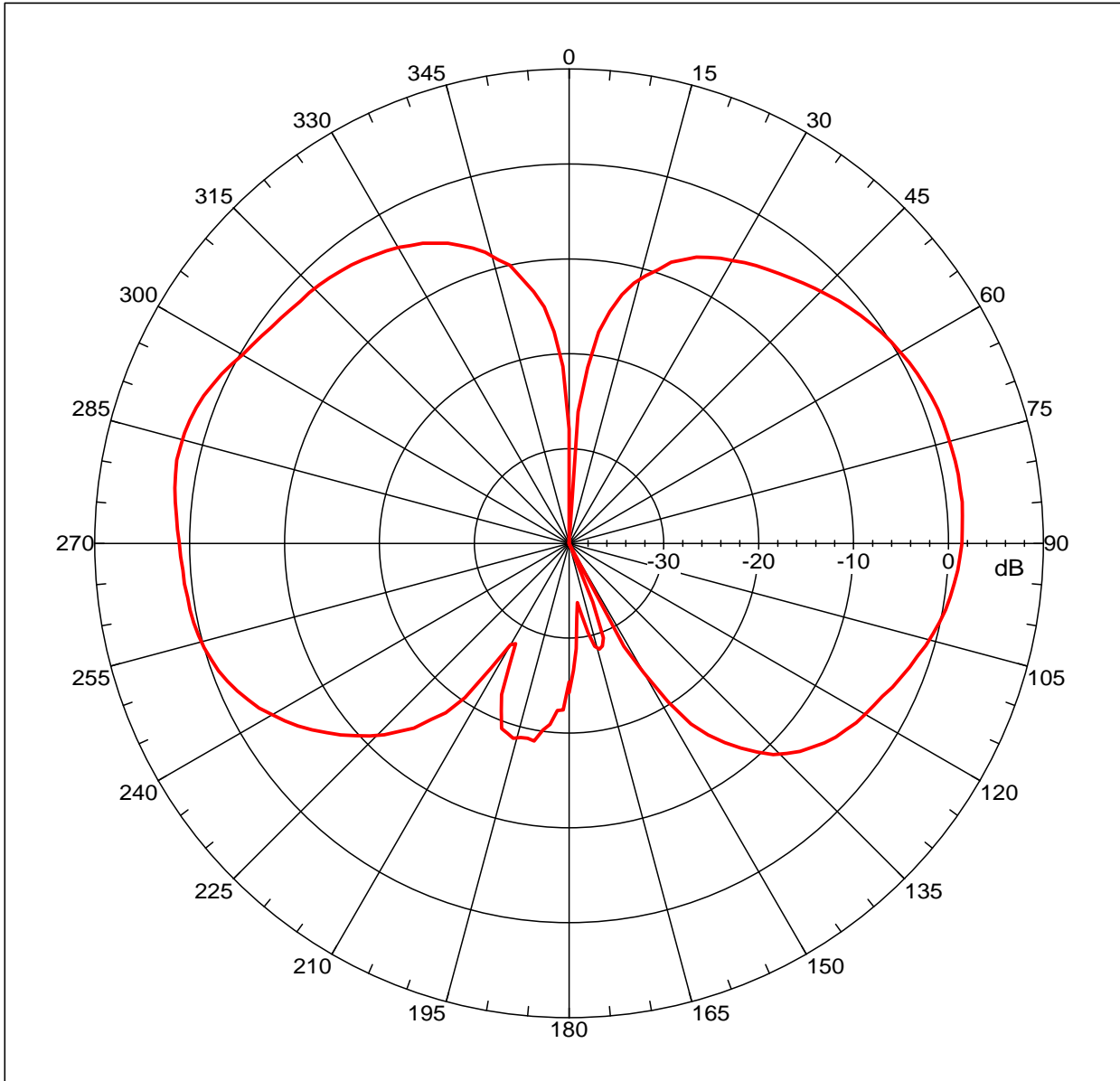
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:  
Avg value: -5.233 dB  
-3. dB beam width: 59.76 deg  
-6. dB beam width: 102.02 deg  
-10. dB beam width: 128.69 deg  
Left Sidelobe: -2.80 dB at -39.218 deg  
Right Sidelobe: Not Found  
Far-field display setup  
Azimuth (deg)  
Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
Elevation (deg)  
Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
8	1.990 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 2.25204 dBi  
 Max far-field (global) = -45.07466 dB, Max far-field (plot) = -45.07474 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -78.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

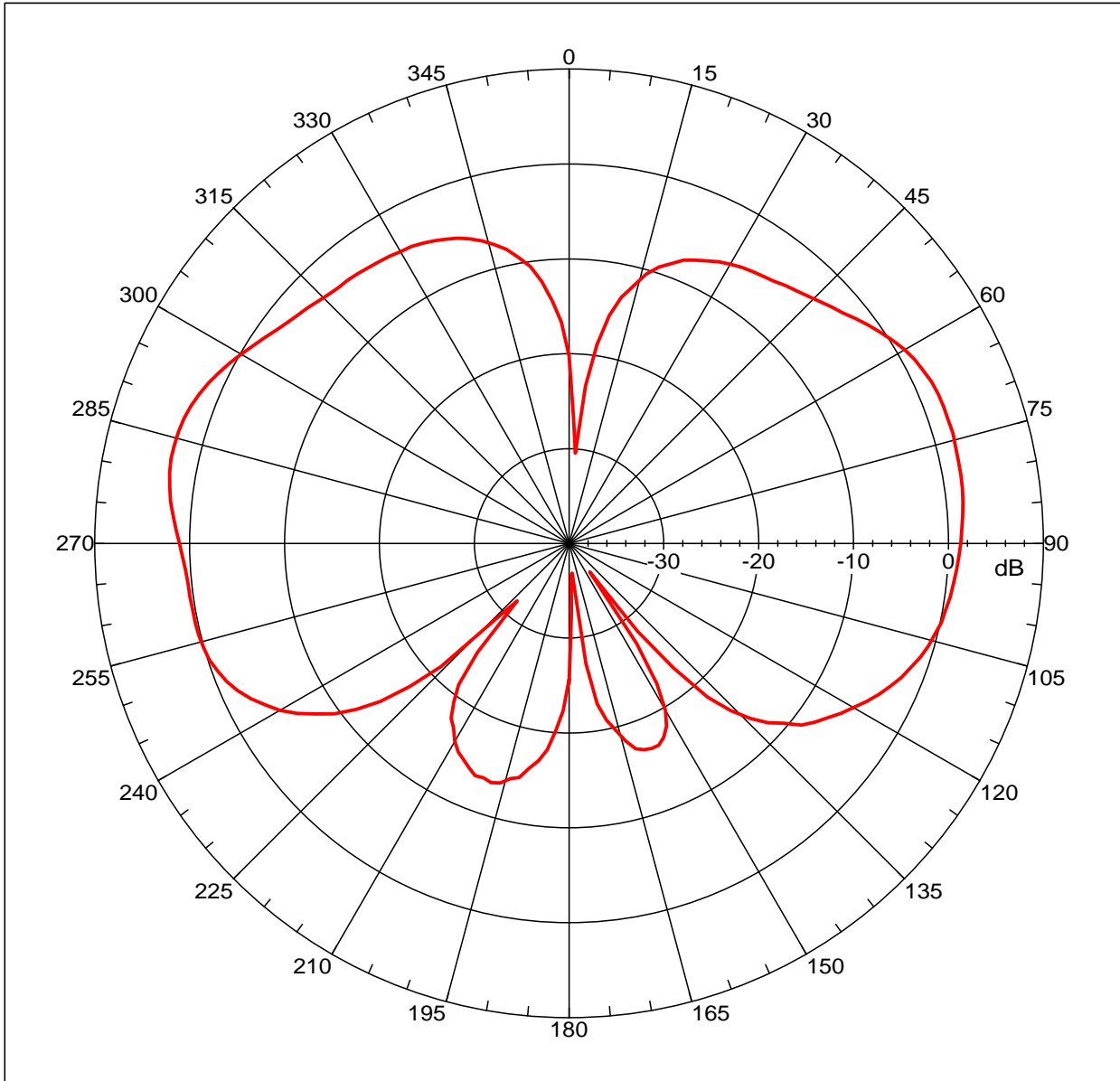
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -4.438 dB  
 -3. dB beam width: 53.43 deg  
 -6. dB beam width: 88.70 deg  
 -10. dB beam width: 112.15 deg  
 Left Sidelobe: -20.88 dB at -163.911 deg  
 Right Sidelobe: -0.61 dB at 81.453 deg  
 Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
9	2.100 GHz	Azimuth	Elevation	Single-pol

Far-field amplitude of 20100924 TH-88A 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 2.88511 dBi  
 Max far-field (global) = -44.647 dB, Max far-field (plot) = -44.64706 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -78.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100924 TH88A 800-2100mhz E-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100924 TH88A 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 9/24/2010 9:05:35 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -4.543 dB  
 -3. dB beam width: 47.81 deg  
 -6. dB beam width: 70.32 deg  
 -10. dB beam width: 108.47 deg  
 Left Sidelobe: -16.47 dB at -157.877 deg  
 Right Sidelobe: -0.86 dB at 71.397 deg  
 Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

Beam	Frequency	Azimuth	Elevation	Pol
10	2.170 GHz	Azimuth	Elevation	Single-pol