

# GSM Antenna

**MODEL: TH-88**

GSM800/GSM900/DCS1800/PCS1900/3G2170



## 1.1 Electrical Properties

Parameter	Description
Frequency Band	800/900/1800/1900/2170 MHz
Nominal Impedance	50 ohm
Polarization	Vertical
Electrical Wave	1 / 2 $\lambda$ Dipole
Return Loss	Please See Data
V.S.W.R	3.5:1
Antenna Average Gain	3~5dBi
Note: Gain includes the cable loss	

## 1.2 Mechanical Properties

Parameter	Description
Antenna Type	External Antenna
Antenna Cover	ABS
Touch Type	Screw Type
Connector Type	SMA 180°(Male)
Antenna Dimensions	272mm $\pm$ 3
Antenna Color	Black
Operating Temperature Range	-20°C~+60°C
Storage Temperature Range	-30°C~+70°C

## 2. APPEARANCE

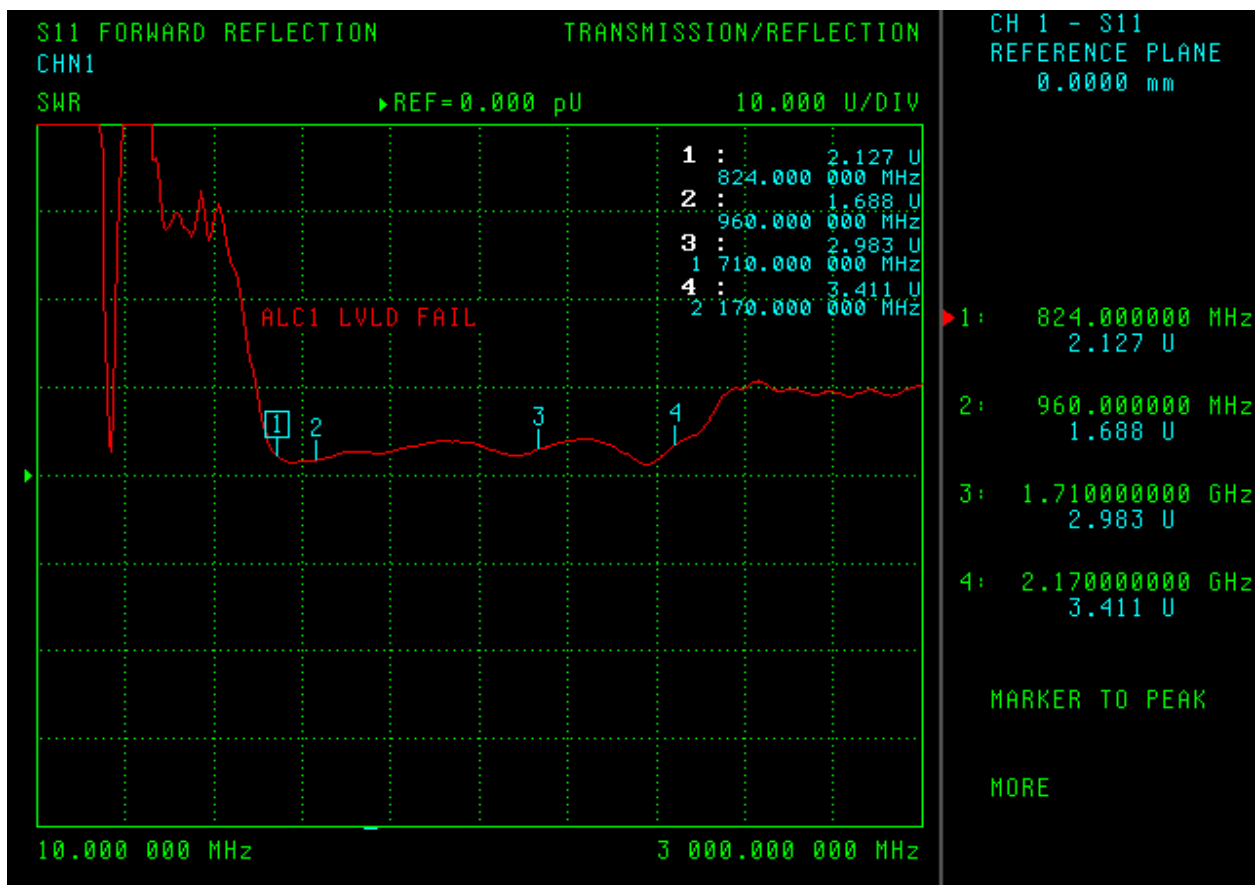
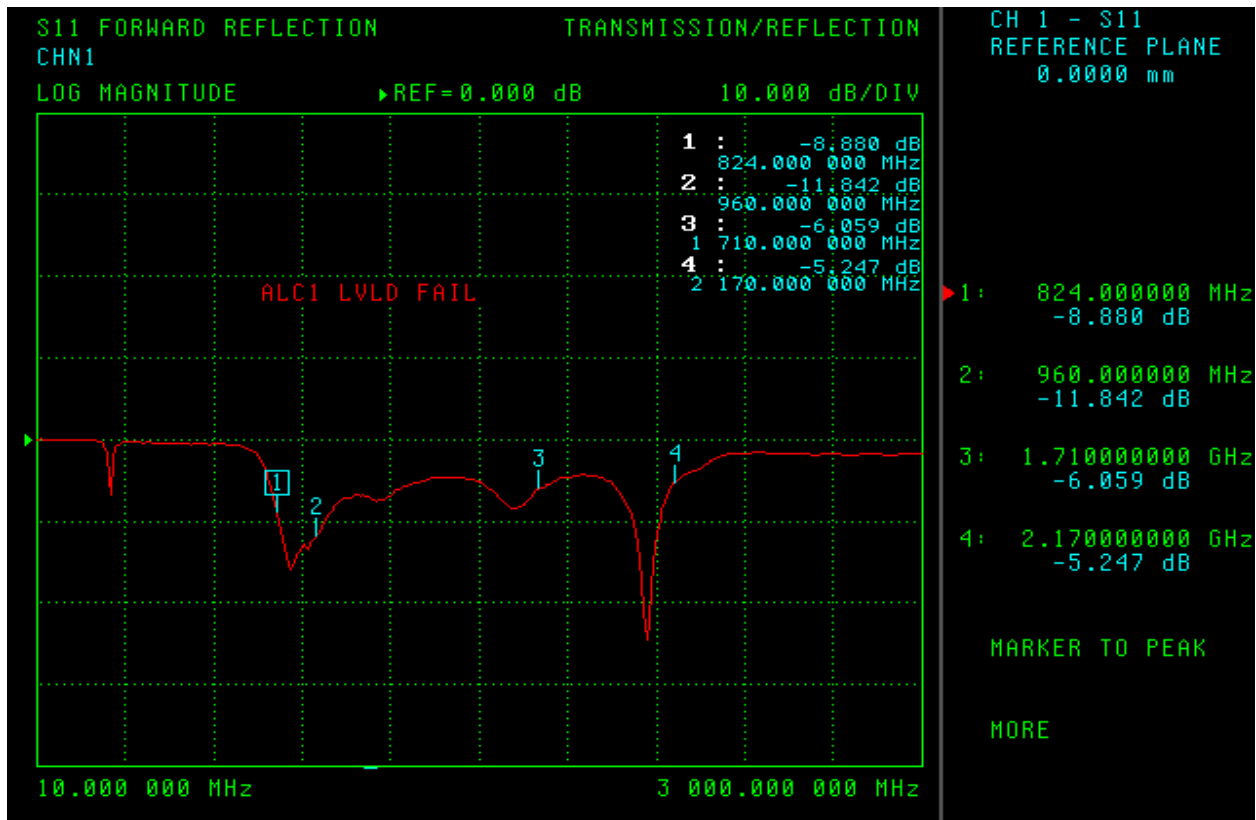
NO.	NAME	FINISH	Q. TY
01	Core tube	Black	01
02	Fixed upper	Black	01
03	Fixed beneath	Black	01
04	RIVET	Chrom plating	02
05	SMA 180' (Male)	Black-nickel plating	01

272±3

CUSTOMER'S	MODEL	PARTS NUMBER	FREQUENCY	UNIT	SCALE	DATE	VERSION
	X XX±0.15	NAME	82A-990/716-2170MHz	M/M		20100811	1
SURFACE ROUGHNESS	$\sqrt{R}$	APPEARANCE	EA-292-1				

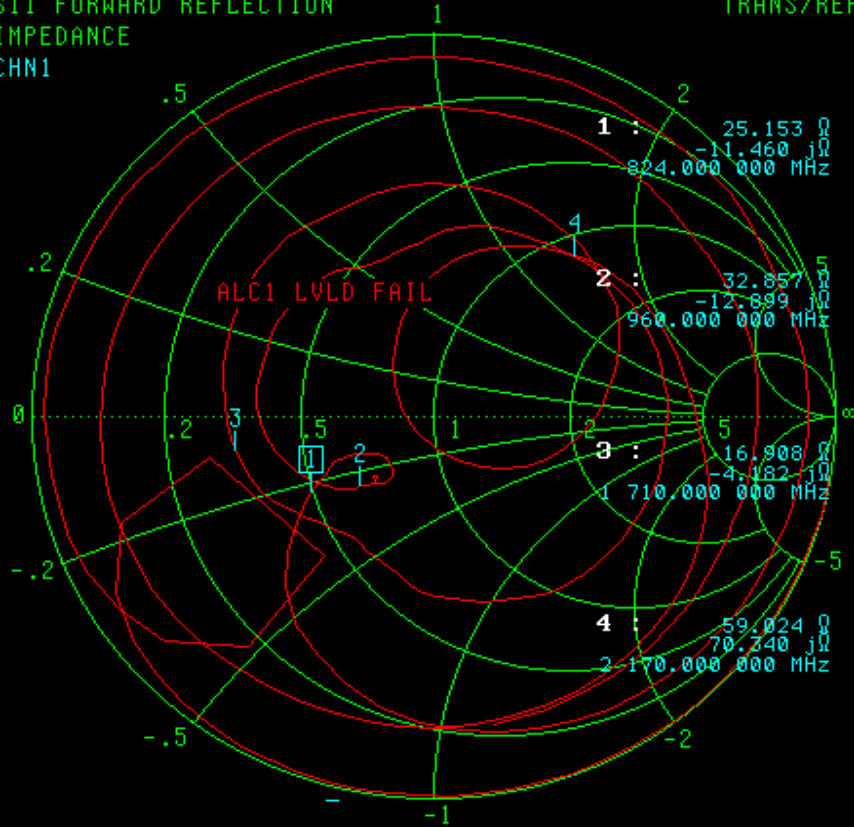
### 3.FREQUENCY



S11 FORWARD REFLECTION  
IMPEDANCE  
CHN1

TRANS/REFL

CH 1 - S11  
REFERENCE PLANE  
0.0000 mm



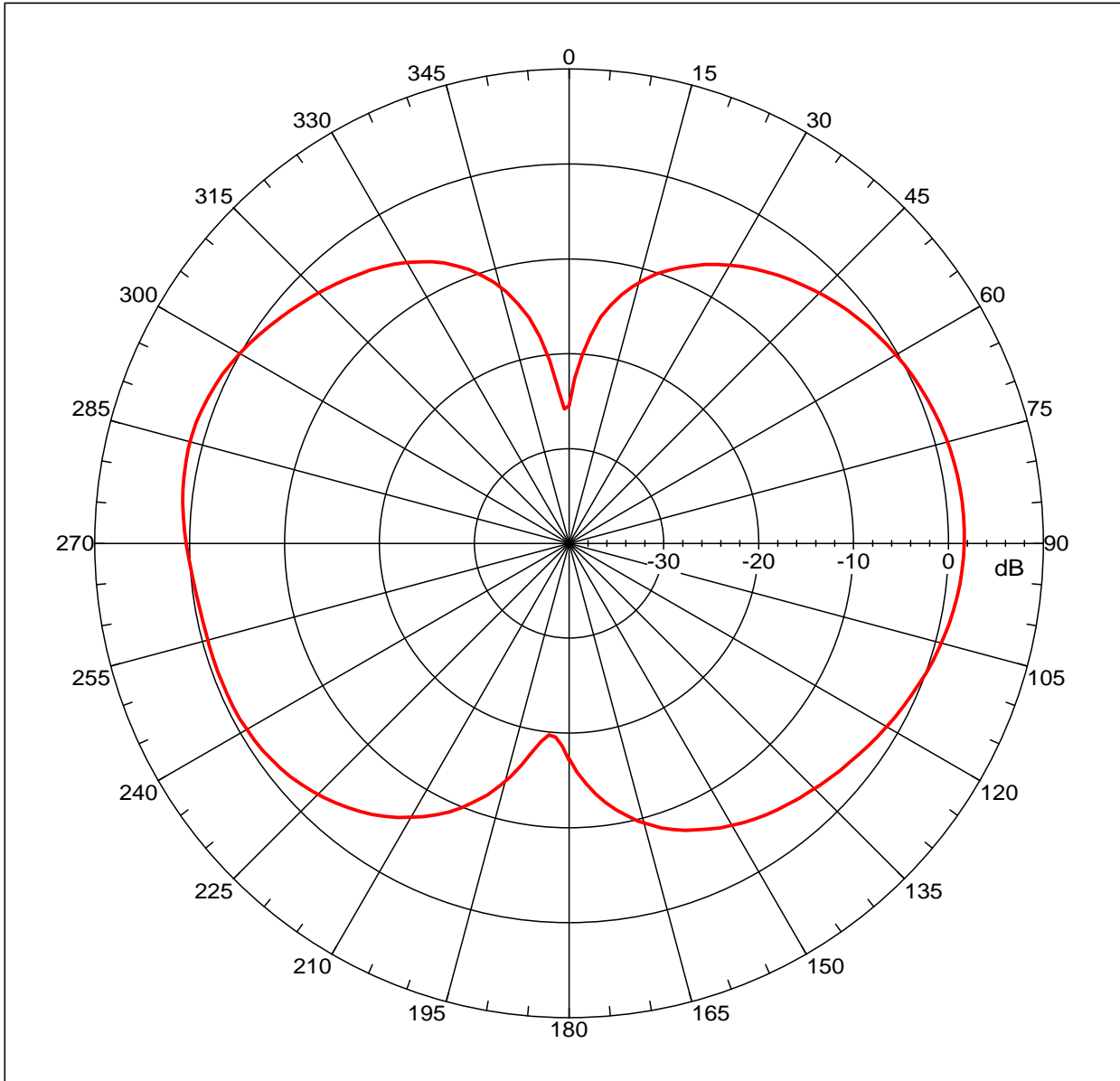
10.000 000 MHz - 3 000.000 000 MHz

- 1: 824.000000 MHz  
25.153 Ω  
-11.460 jΩ
- 2: 960.000000 MHz  
32.857 Ω  
-12.899 jΩ
- 3: 1.71000000 GHz  
16.908 Ω  
-4.182 jΩ
- 4: 2.17000000 GHz  
59.024 Ω  
70.340 jΩ

MARKER TO PEAK

MORE

# Far-field amplitude of 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 1.69114 dBi  
 Max far-field (global) = -41.3082 dB, Max far-field (plot) = -41.30822 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 87.99999 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

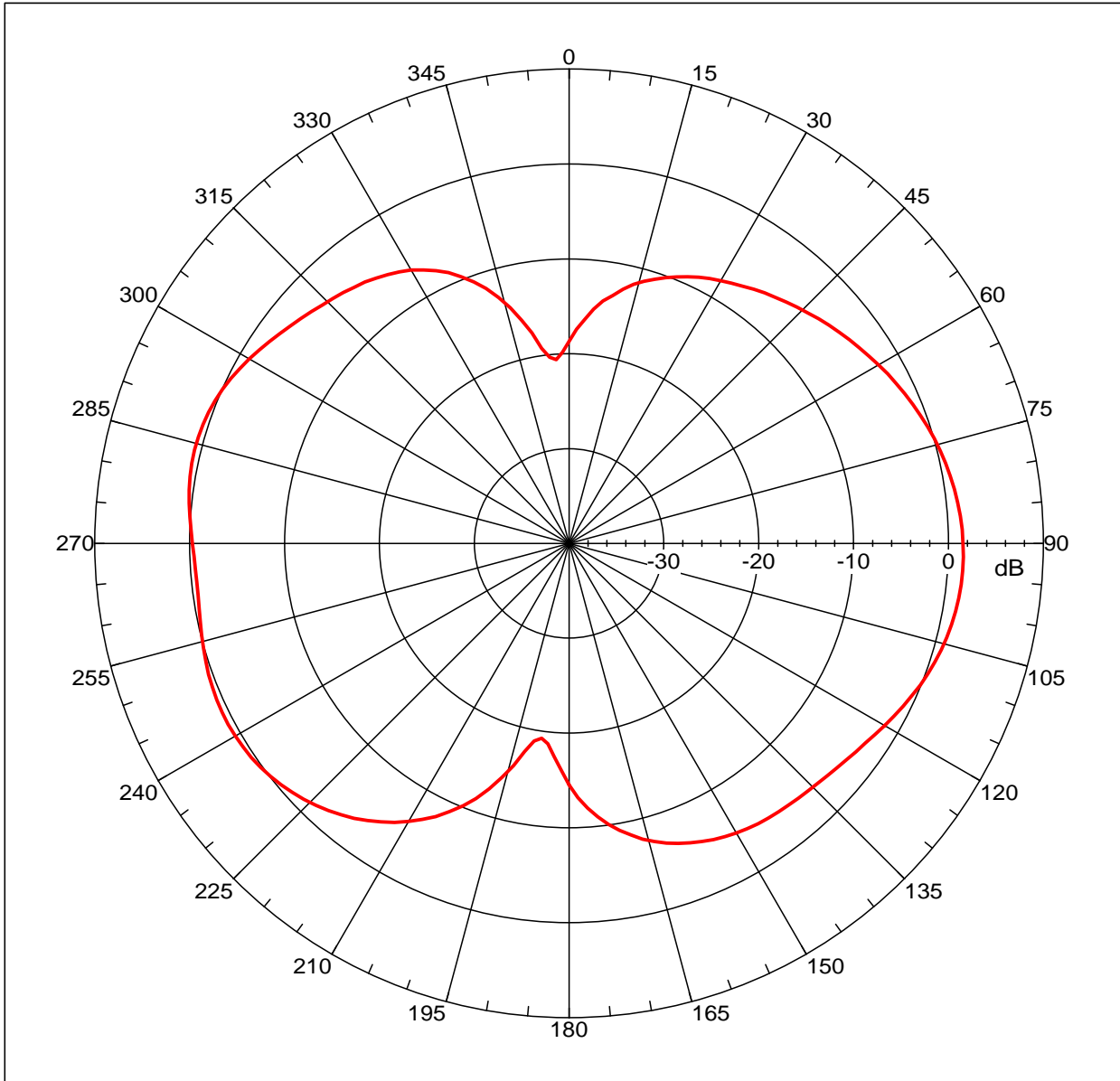
Far-field Cut Analysis:  
 Avg value: -3.275 dB  
 -3. dB beam width: 67.50 deg  
 -6. dB beam width: 104.94 deg  
 -10. dB beam width: 139.20 deg  
 Left Sidelobe: -0.34 dB at -75.419 deg  
 Right Sidelobe: Not Found

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 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 1.58786 dBi  
 Max far-field (global) = -39.17997 dB, Max far-field (plot) = -39.17999 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 93.99999 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

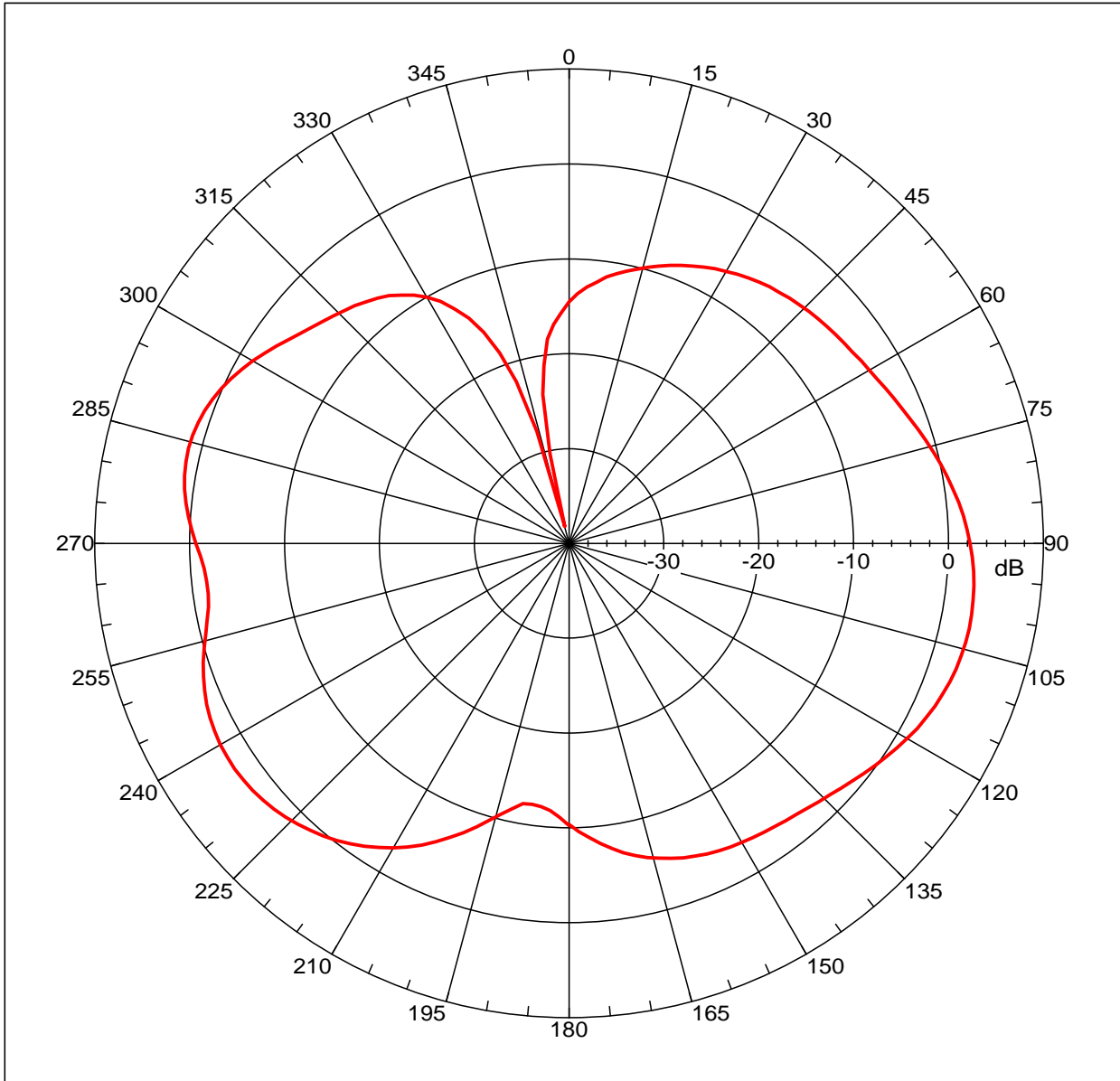
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -3.582 dB  
 -3. dB beam width: 54.20 deg  
 -6. dB beam width: 98.04 deg  
 -10. dB beam width: 140.40 deg  
 Left Sidelobe: -0.91 dB at -75.419 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 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 3.12838 dBi  
 Max far-field (global) = -38.4313 dB, Max far-field (plot) = -38.43132 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 102.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

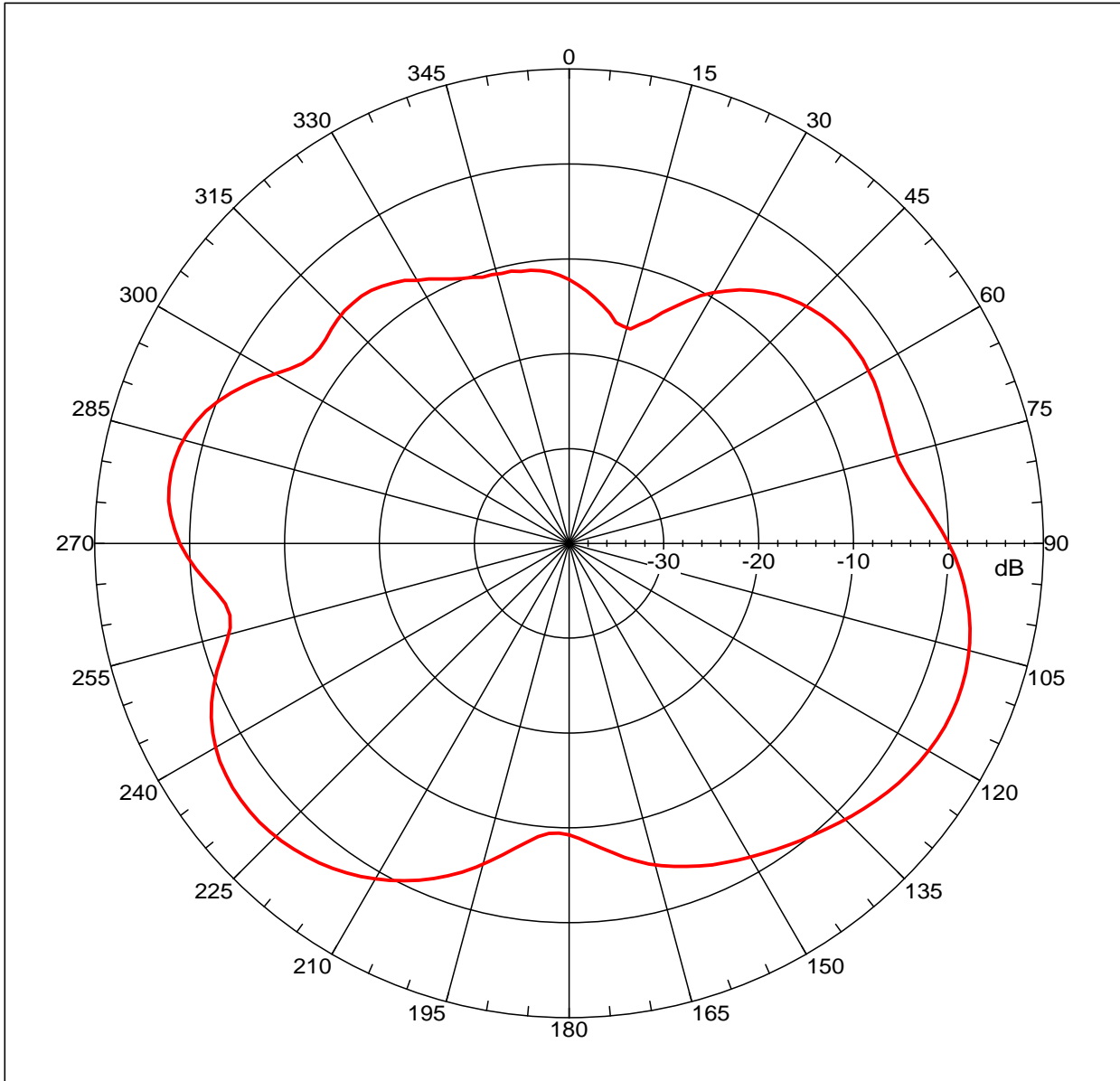
Far-field Cut Analysis:  
 Avg value: -2.719 dB  
 -3. dB beam width: 46.61 deg  
 -6. dB beam width: 78.30 deg  
 -10. dB beam width: 140.46 deg  
 Left Sidelobe: -1.80 dB at -75.419 deg  
 Right Sidelobe: Not Found

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 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 4.12803 dBi  
 Max far-field (global) = -38.50164 dB, Max far-field (plot) = -38.50168 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 111.99999 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -2.001 dB  
 -3. dB beam width: 41.99 deg  
 -6. dB beam width: 65.91 deg  
 -10. dB beam width: 129.30 deg  
 Left Sidelobe: -14.81 dB at -11.061 deg  
 Right Sidelobe: Not Found

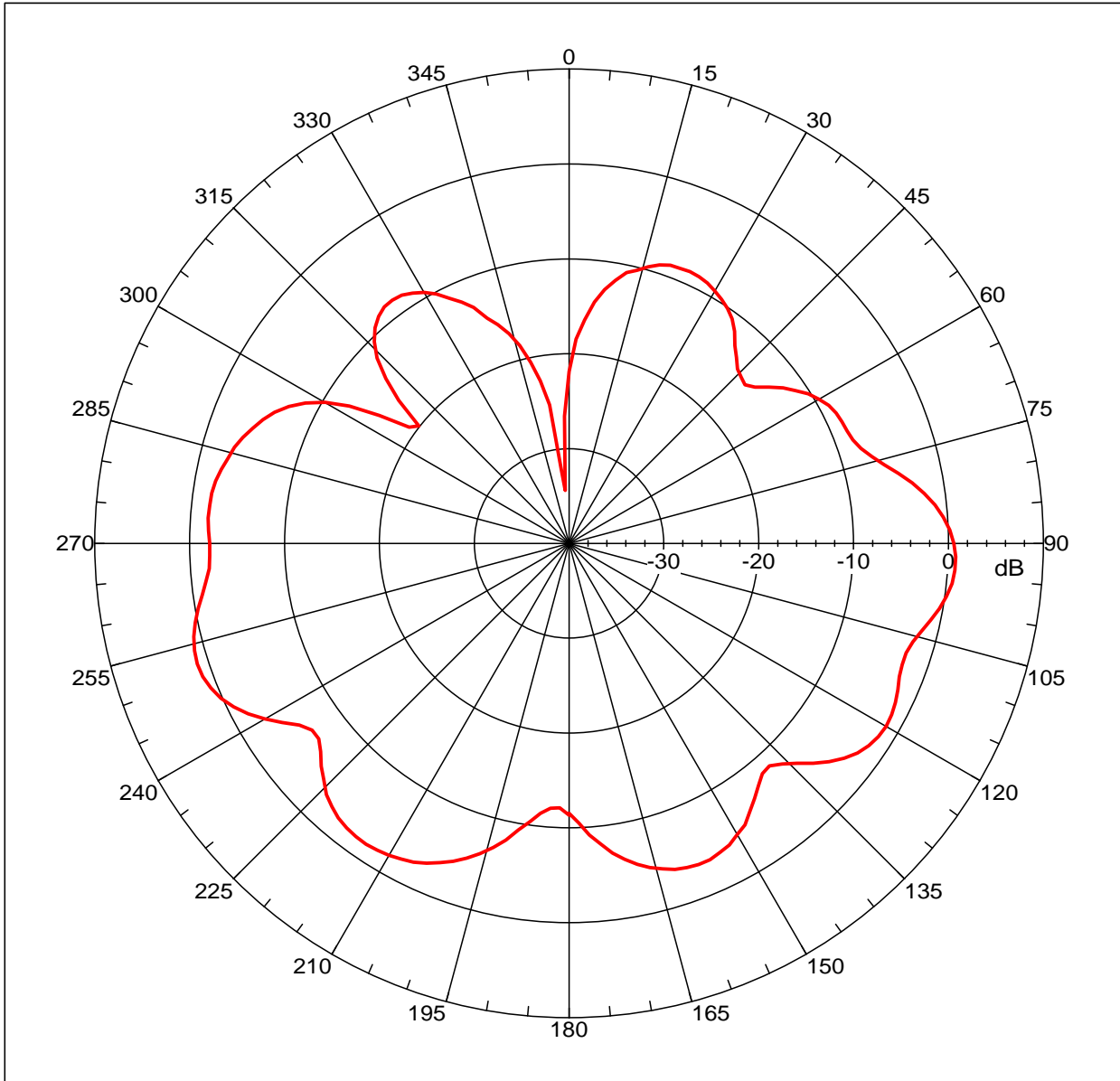
Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #pts = 181  
 Start = -180.00001 deg, Stop = 180.00001 deg, Delta = 2.000 deg  
 Elevation (deg)  
 Center = 0.000 deg, #pts = 1

Selected beam(s) 1 of 10

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



# Far-field amplitude of 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 1.19579 dBi  
 Max far-field (global) = -43.9968 dB, Max far-field (plot) = -43.99691 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -108.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

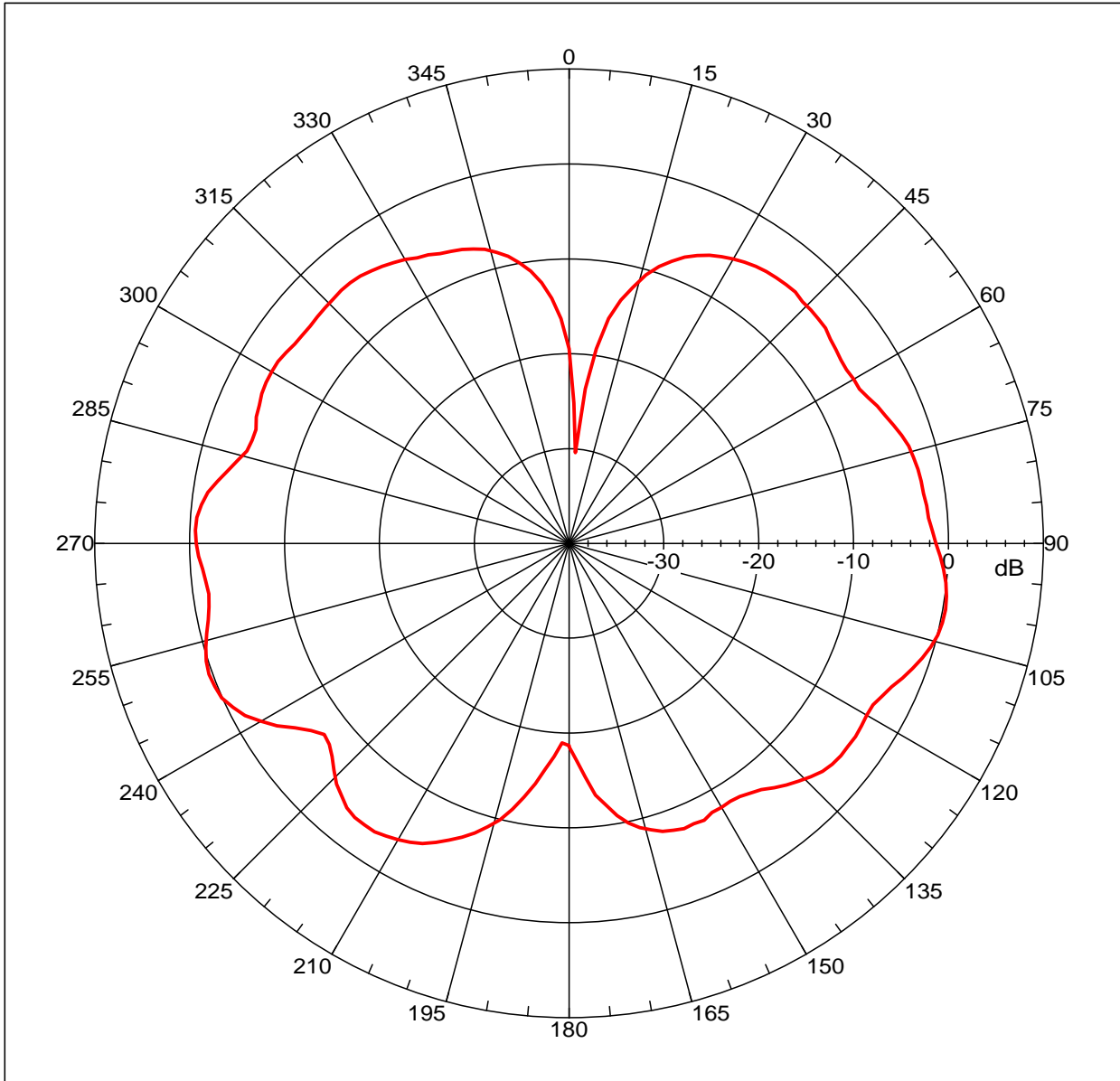
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -5.604 dB  
 -3. dB beam width: 23.46 deg  
 -6. dB beam width: 53.77 deg  
 -10. dB beam width: 108.11 deg  
 Left Sidelobe: -2.95 dB at -145.810 deg  
 Right Sidelobe: -9.51 dB at -35.196 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 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 0.36248 dBi  
 Max far-field (global) = -46.45956 dB, Max far-field (plot) =  
 -46.45973 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -110.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88  
 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

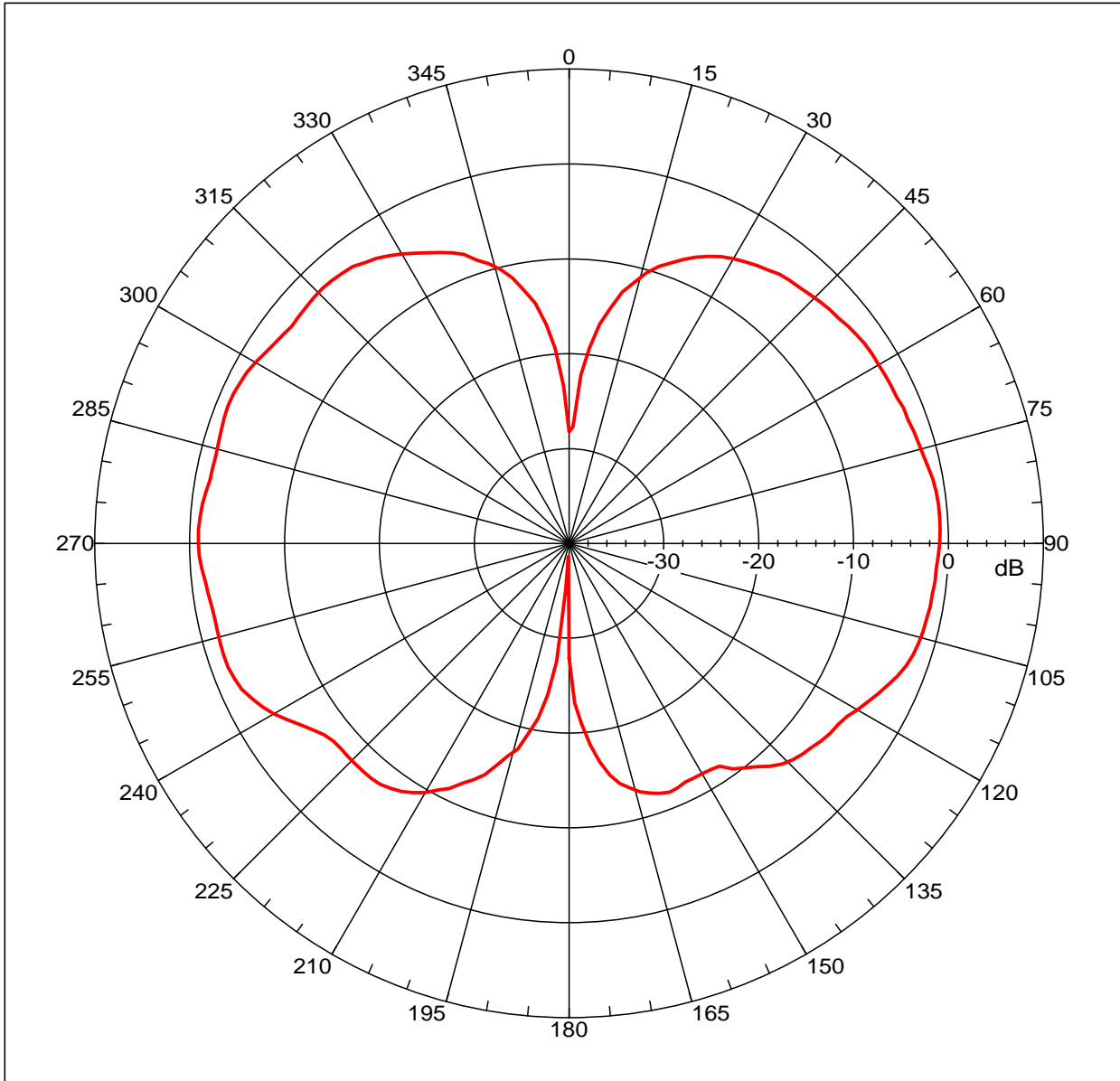
Far-field Cut Analysis:  
 Avg value: -4.889 dB  
 -3. dB beam width: 41.05 deg  
 -6. dB beam width: 96.03 deg  
 -10. dB beam width: 155.48 deg  
 Left Sidelobe: -3.67 dB at -143.799 deg  
 Right Sidelobe: -0.96 dB at -87.486 deg

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 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = -0.84259 dBi  
 Max far-field (global) = -47.51116 dB, Max far-field (plot) = -47.51133 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 84.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

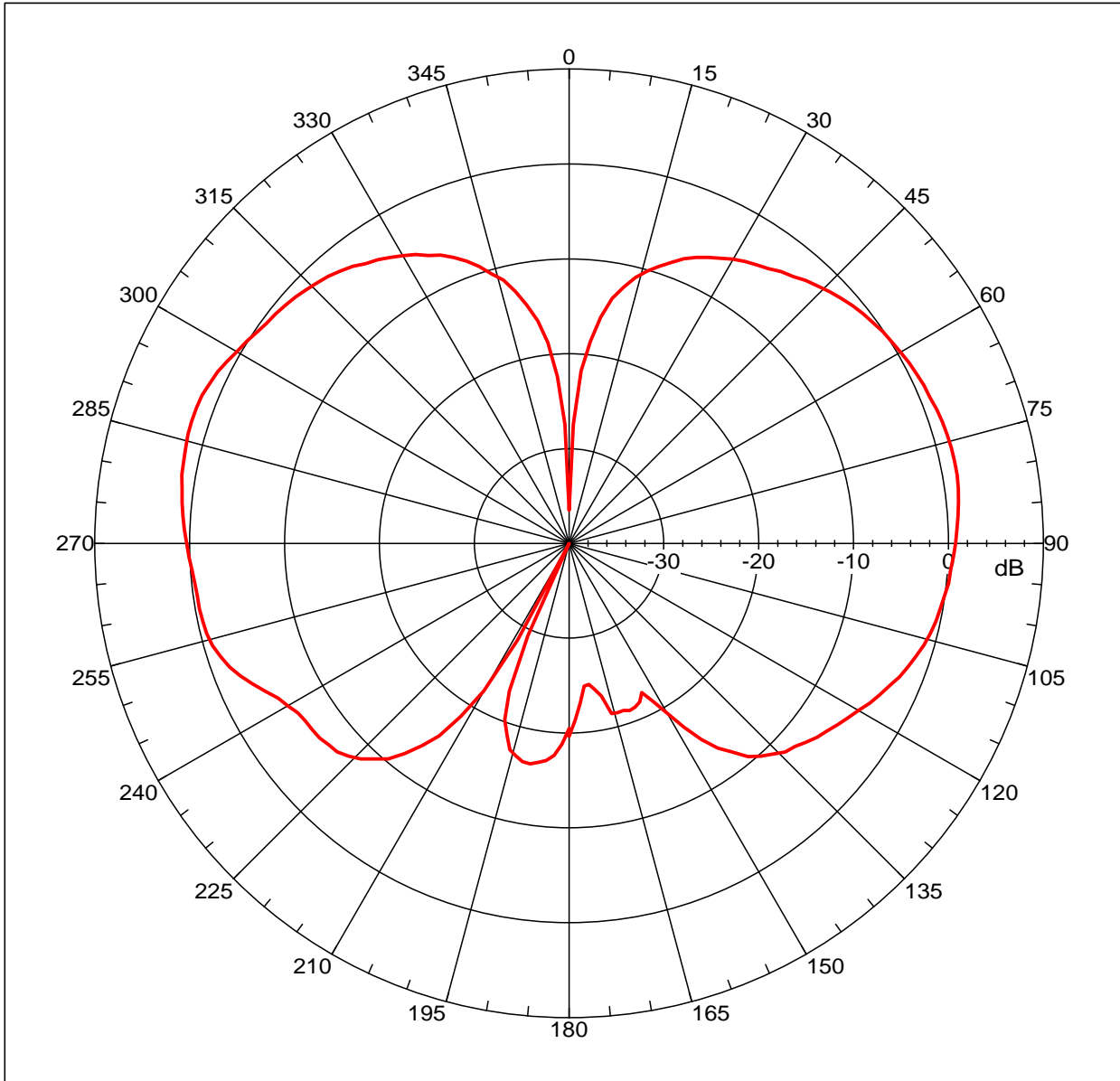
Far-field Cut Analysis:  
 Avg value: -5.403 dB  
 -3. dB beam width: 76.78 deg  
 -6. dB beam width: 108.28 deg  
 -10. dB beam width: 129.88 deg  
 Left Sidelobe: -1.79 dB at -43.240 deg  
 Right Sidelobe: Not Found

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 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 1.80724 dBi  
 Max far-field (global) = -45.99886 dB, Max far-field (plot) = -45.99897 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -72.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

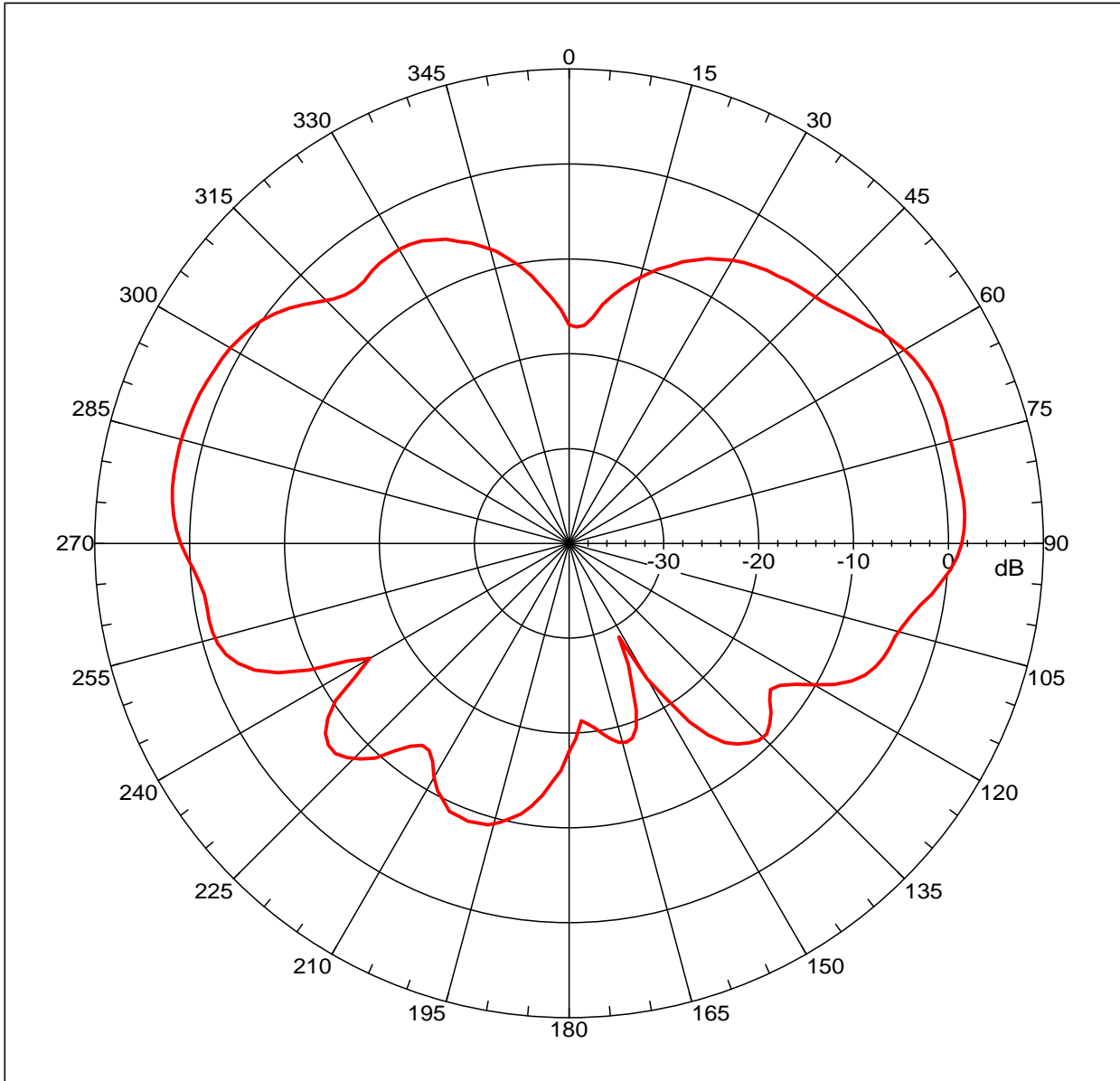
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -4.599 dB  
 -3. dB beam width: 59.39 deg  
 -6. dB beam width: 82.93 deg  
 -10. dB beam width: 115.72 deg  
 Left Sidelobe: -18.20 dB at -169.944 deg  
 Right Sidelobe: -0.28 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
8	1.990 GHz	Azimuth	Elevation	Single-pol

# Far-field amplitude of 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 2.31376 dBi  
 Max far-field (global) = -45.01294 dB, Max far-field (plot) = -45.0131 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -76.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

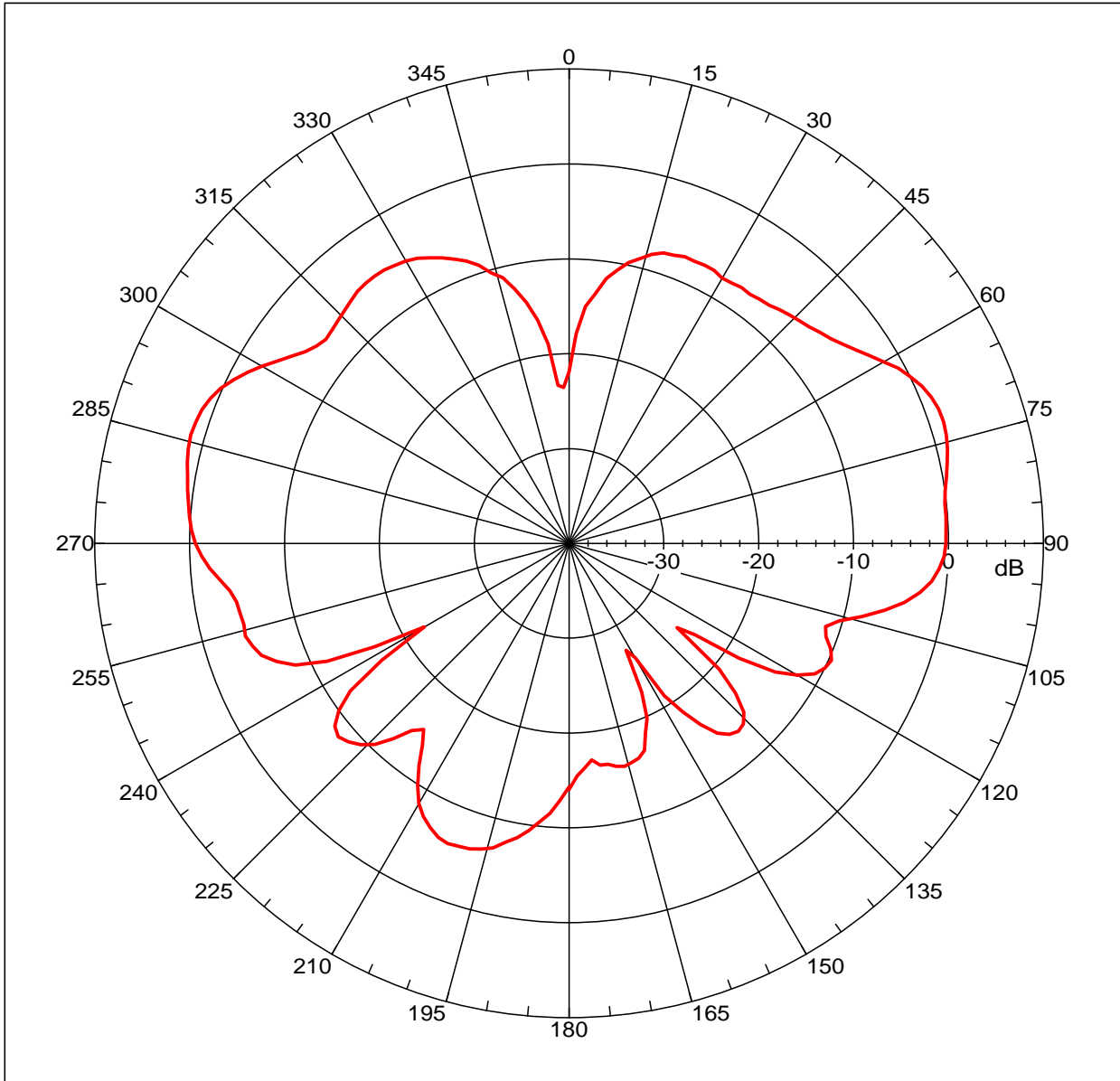
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -4.697 dB  
 -3. dB beam width: 43.70 deg  
 -6. dB beam width: 66.24 deg  
 -10. dB beam width: 99.80 deg  
 Left Sidelobe: -9.17 dB at -131.732 deg  
 Right Sidelobe: -0.49 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
9	2.100 GHz	Azimuth	Elevation	Single-pol

# Far-field amplitude of 20100310 TH88 800-2100mhz E-PLANE.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 1.49392 dBi  
 Max far-field (global) = -46.03819 dB, Max far-field (plot) = -46.03831 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 72.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz E-PLANE

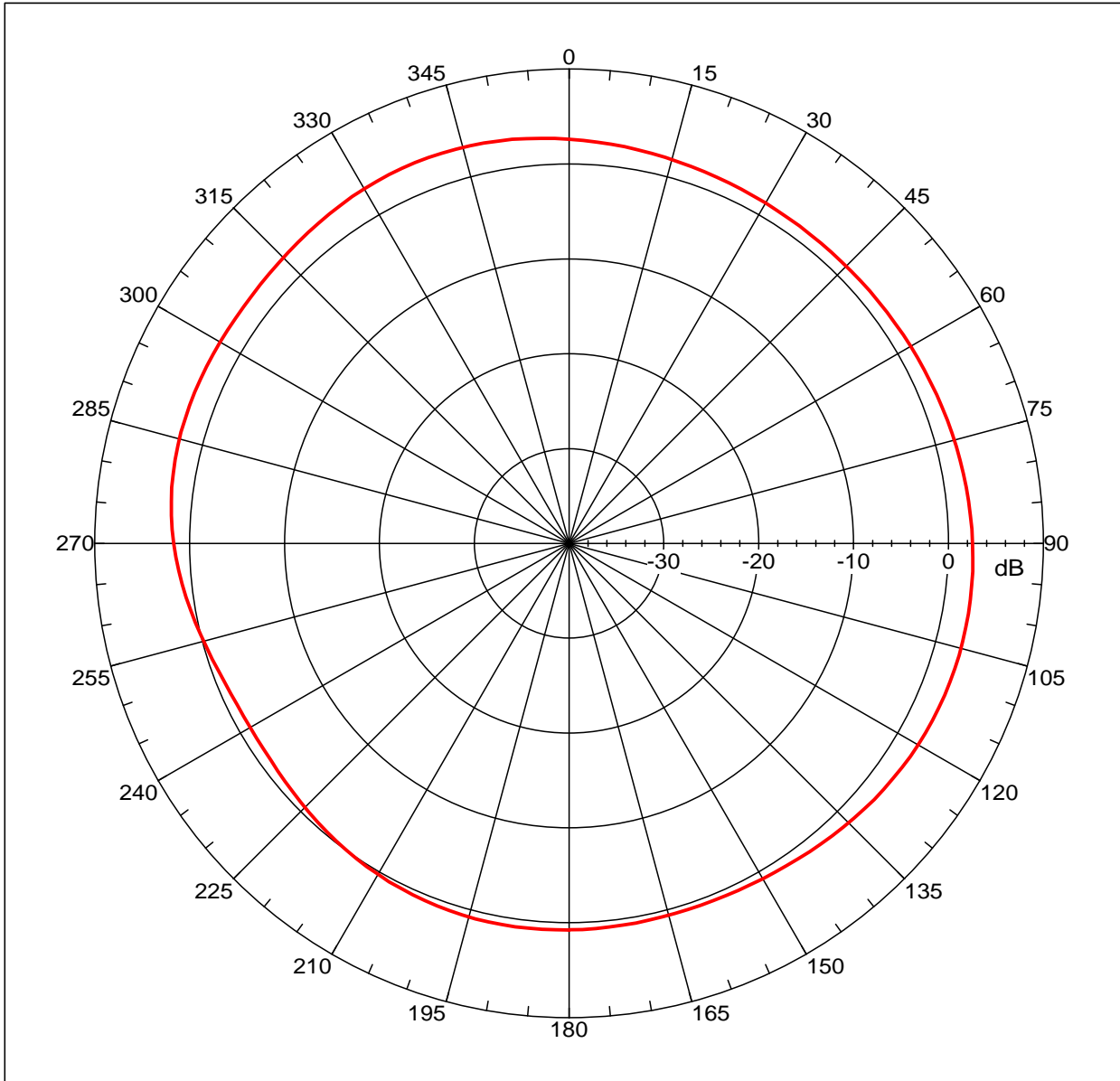
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz E-PLANE.nsi  
 Measurement date/time: 3/10/2010 11:28:15 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -6.352 dB  
 -3. dB beam width: 35.49 deg  
 -6. dB beam width: 47.27 deg  
 -10. dB beam width: 89.33 deg  
 Left Sidelobe: -6.67 dB at -35.196 deg  
 Right Sidelobe: -11.21 dB at 115.643 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

# Far-field amplitude of 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 3.273 dBi  
 Max far-field (global) = -39.72634 dB, Max far-field (plot) = -39.72634 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -20.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

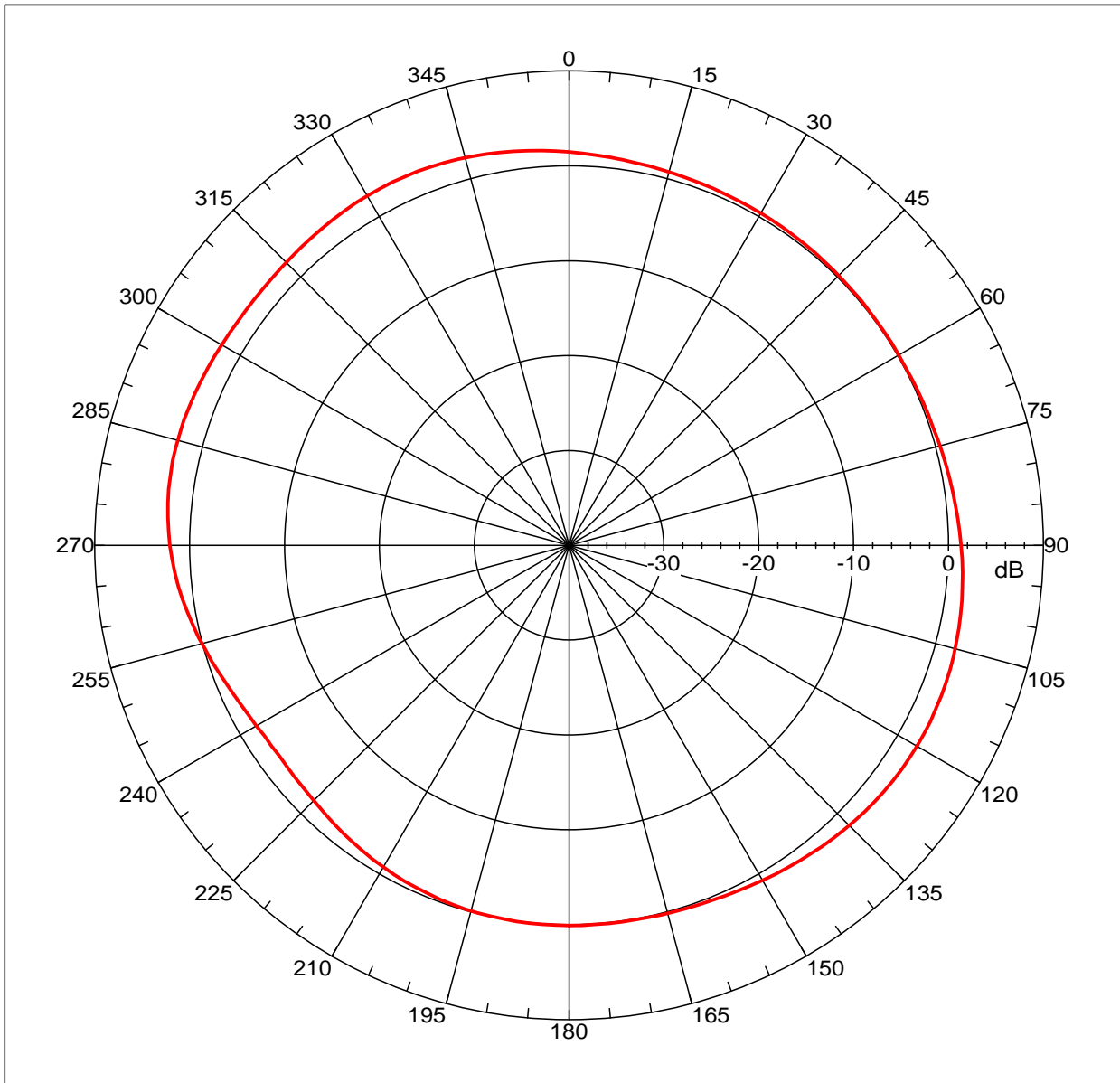
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: 1.615 dB  
 -3. dB beam width: Not Found  
 -6. dB beam width: Not Found  
 -10. dB beam width: Not Found  
 Left Sidelobe: -2.48 dB at -167.933 deg  
 Right Sidelobe: -0.54 dB at 101.564 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
1	0.824 GHz	Azimuth	Elevation	Single-pol

# Far-field amplitude of 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 2.70159 dBi  
 Max far-field (global) = -38.06624 dB, Max far-field (plot) =  
 -38.06624 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -78.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88  
 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

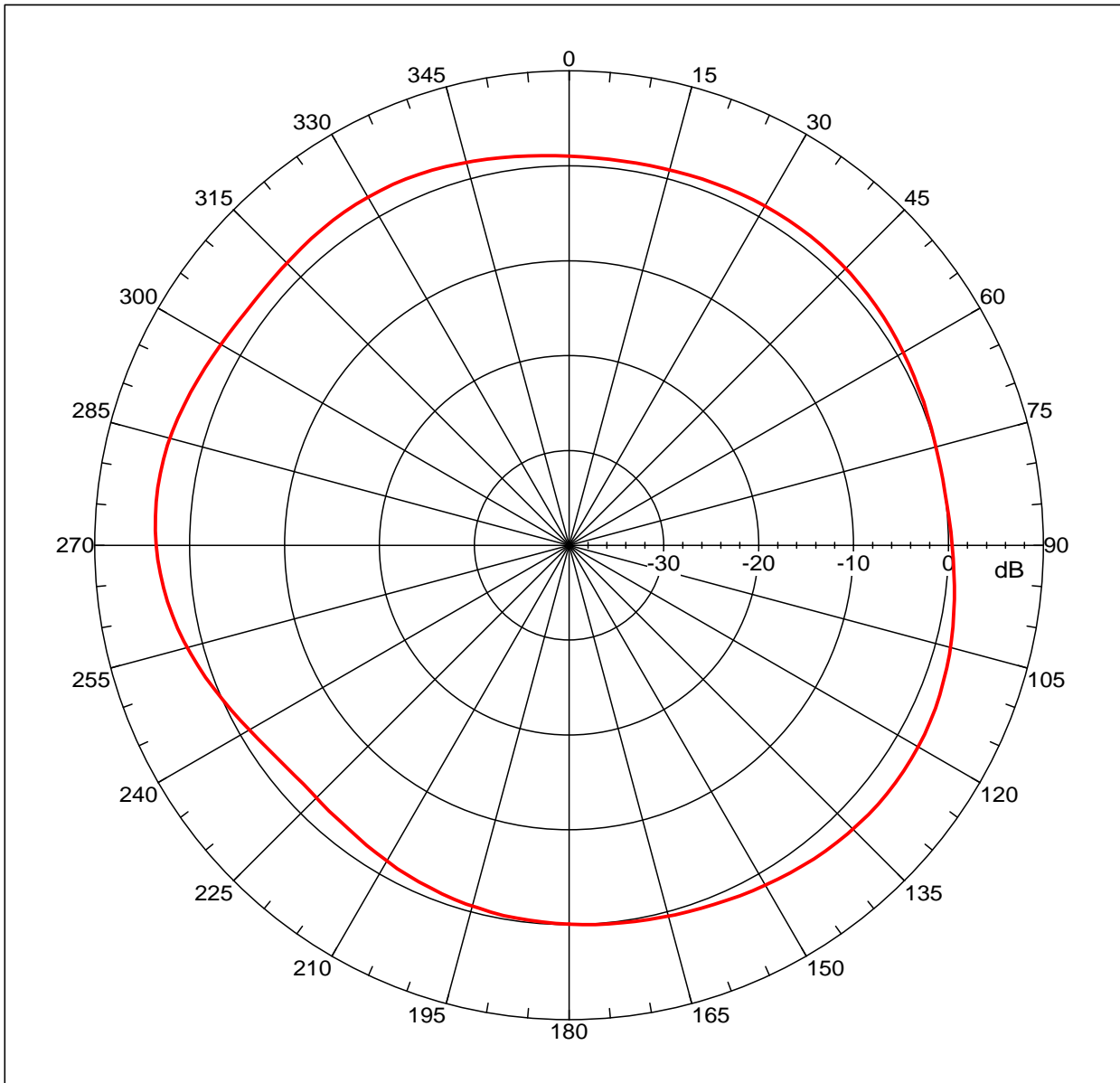
Far-field Cut Analysis:  
 Avg value: 0.973 dB  
 -3. dB beam width: Not Found  
 -6. dB beam width: Not Found  
 -10. dB beam width: Not Found  
 Left Sidelobe: Not Found  
 Right Sidelobe: -0.33 dB at 117.654 deg  
 Far-field display setup  
 Azimuth (deg)  
 Span = 360.00001 deg, Center = 0.000 deg, #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 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 3.74655 dBi  
 Max far-field (global) = -37.81313 dB, Max far-field (plot) = -37.81314 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -82.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

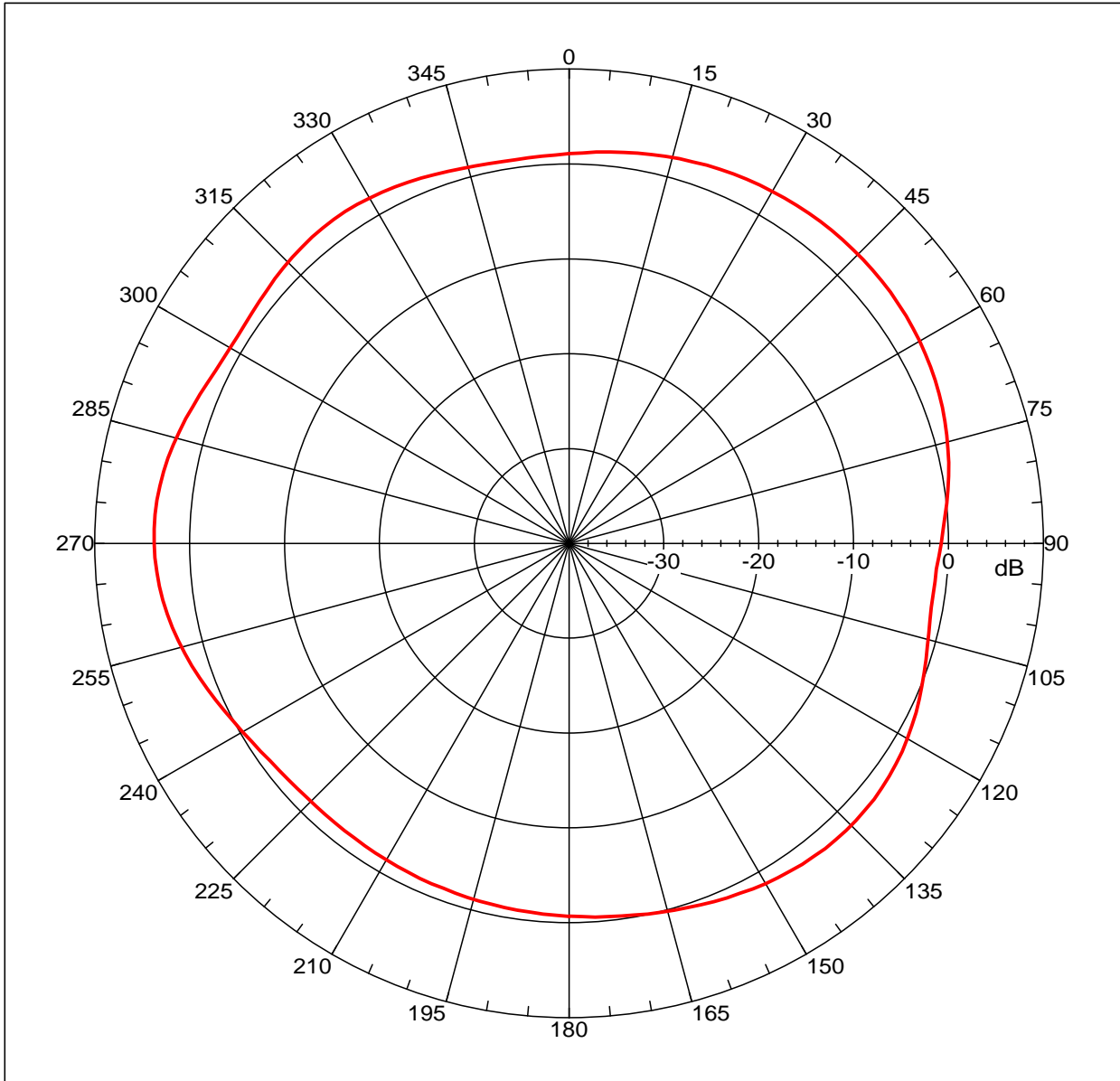
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: 1.171 dB  
 -3. dB beam width: 169.35 deg  
 -6. dB beam width: Not Found  
 -10. dB beam width: Not Found  
 Left Sidelobe: Not Found  
 Right Sidelobe: -1.20 dB at 125.698 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
3	0.900 GHz	Azimuth	Elevation	Single-pol

# Far-field amplitude of 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 3.73893 dBi  
 Max far-field (global) = -38.89074 dB, Max far-field (plot) = -38.89074 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -88.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

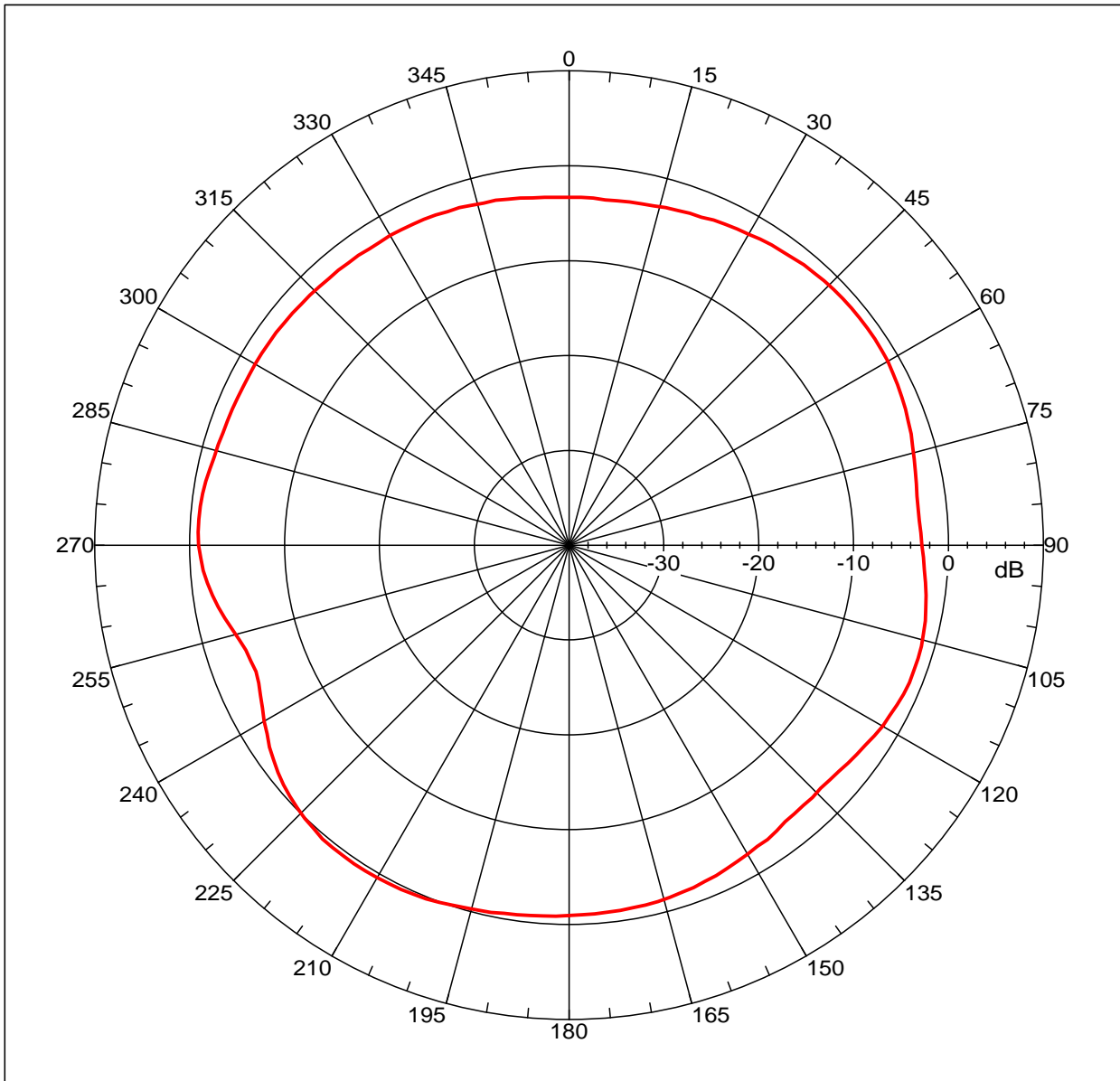
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: 1.219 dB  
 -3. dB beam width: 194.20 deg  
 -6. dB beam width: Not Found  
 -10. dB beam width: Not Found  
 Left Sidelobe: Not Found  
 Right Sidelobe: -1.54 dB at -35.196 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 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 0.5269 dBi  
 Max far-field (global) = -44.66569 dB, Max far-field (plot) = -44.66573 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -146.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

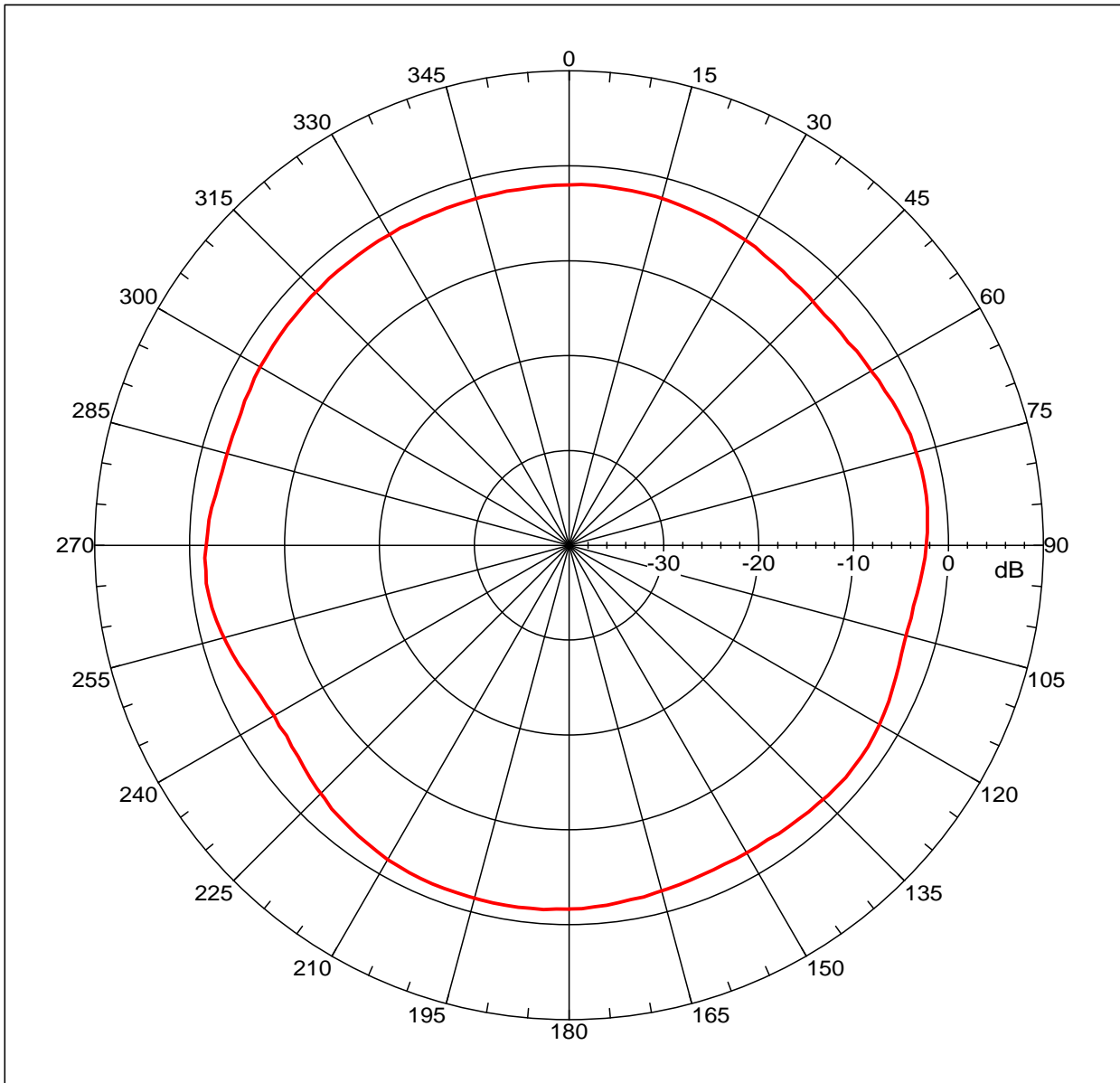
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -1.821 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: -1.42 dB at -87.486 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 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = -1.45698 dBi  
 Max far-field (global) = -48.27902 dB, Max far-field (plot) = -48.27904 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -168.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

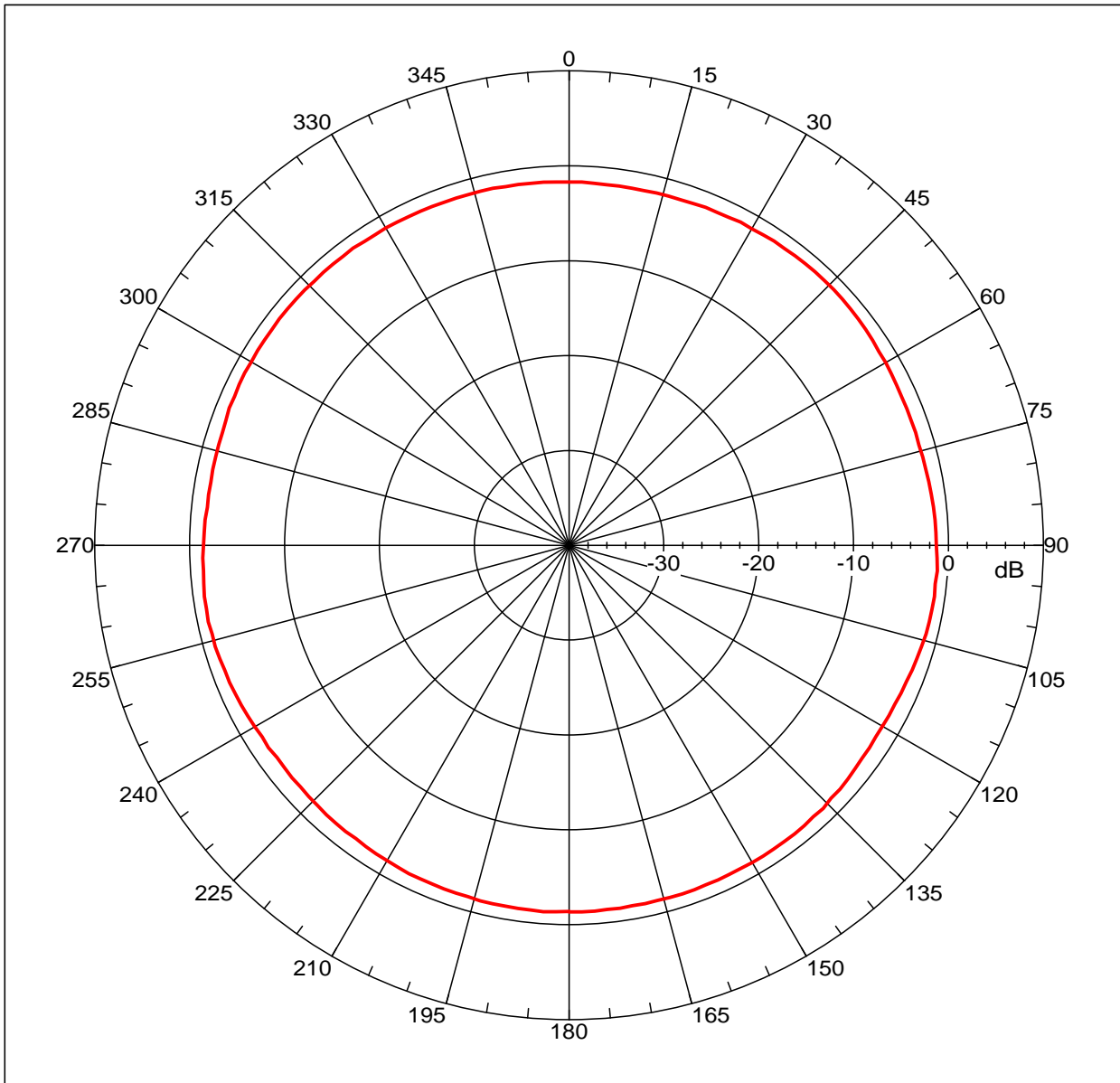
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -2.423 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: -0.11 dB at -95.531 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 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = -1.08396 dBi  
 Max far-field (global) = -47.75253 dB, Max far-field (plot) = -47.75259 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 93.99999 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

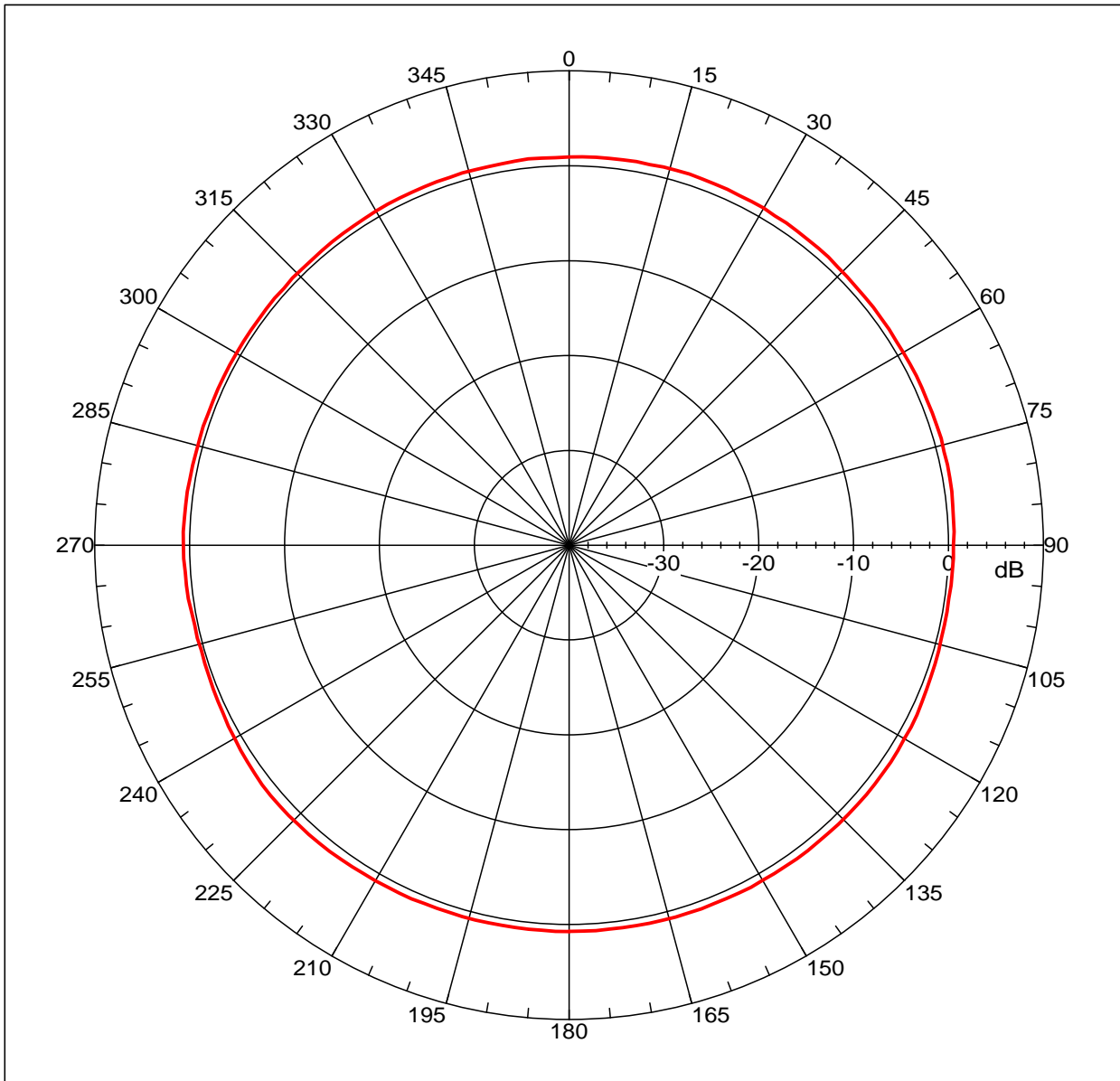
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: -1.490 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
7	1.880 GHz	Azimuth	Elevation	Single-pol

# Far-field amplitude of 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 1.10392 dBi  
 Max far-field (global) = -46.70218 dB, Max far-field (plot) = -46.70219 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: 17.99999 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

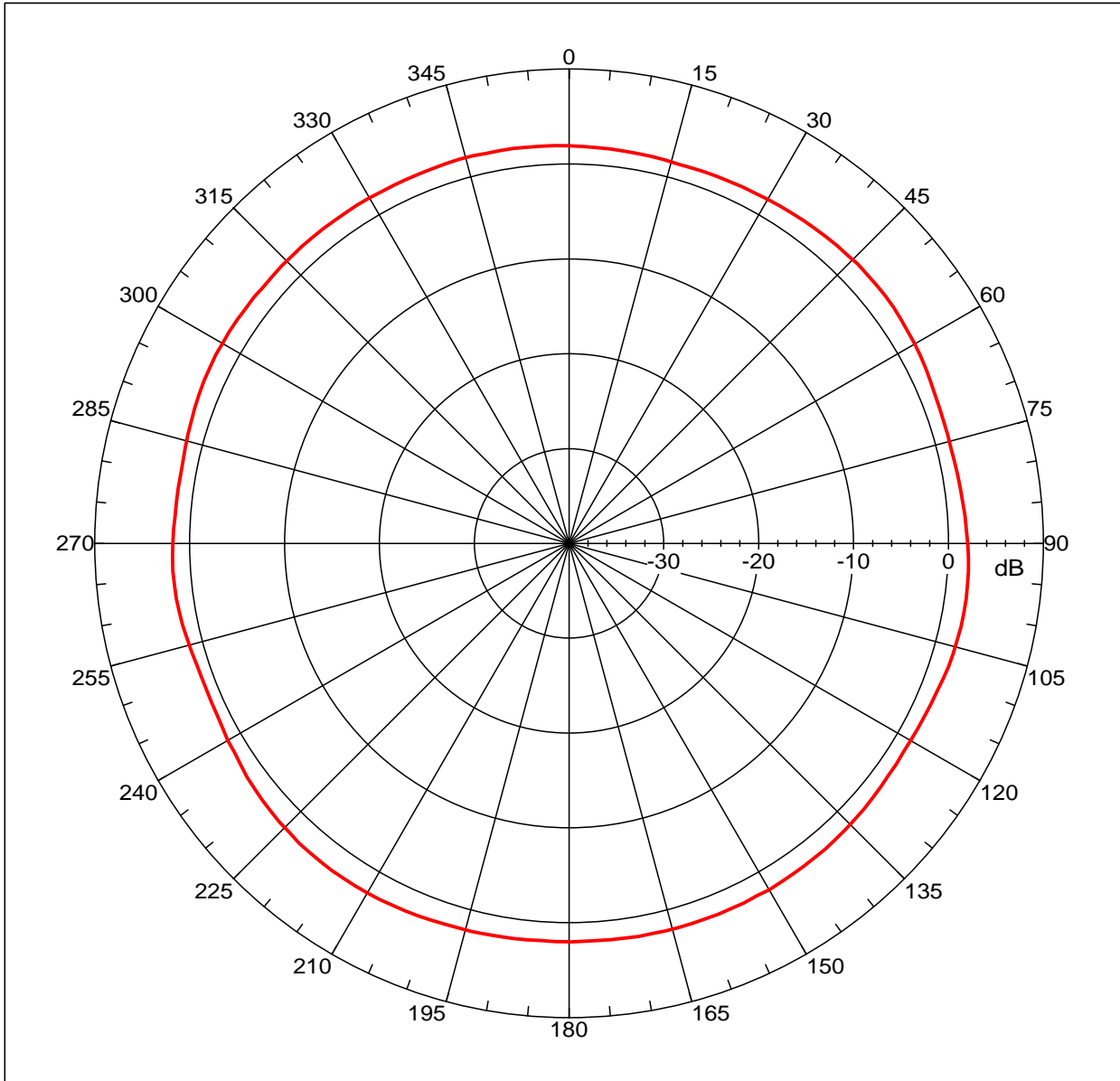
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: 0.727 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 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 2.61057 dBi  
 Max far-field (global) = -44.71613 dB, Max far-field (plot) = -44.71618 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -144.000 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

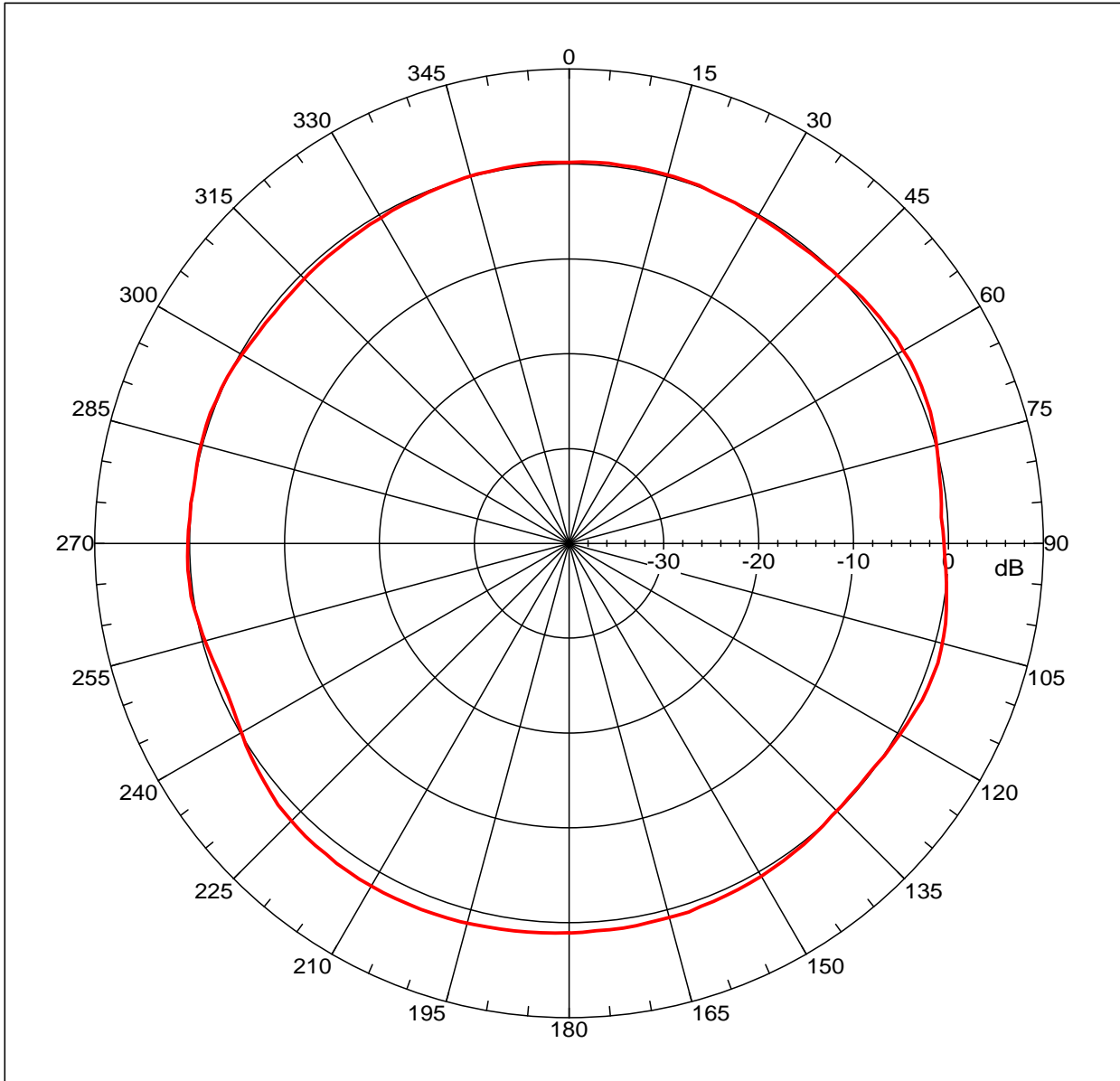
NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: 1.958 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: -0.28 dB at 47.263 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 20100310 TH88 800-2100mhz H-PLANE01.nsi



Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg  
 Gain = 1.71623 dBi  
 Max far-field (global) = -45.81588 dB, Max far-field (plot) = -45.81591 dB  
 Normalization: Reference, Network offset = 0.000 dB  
 Hpeak at: -148.00001 deg, Vpeak at: 0.000 deg  
 Plot centering: On

20100310 TH88 800-2100mhz H-PLANE

NSI2000 V4.0.124, Filename: C:\nsi2000\Data\20100310 TH88 800-2100mhz H-PLANE01.nsi  
 Measurement date/time: 3/10/2010 11:34:10 AM, Filetype: NSI-97

Far-field Cut Analysis:  
 Avg value: 0.319 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: -1.03 dB at 59.330 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