GSM & GPS Rugged 'Puck' Antenna IP67

Features

- 4G GSM & GPS Antenna
- World-Wide Use
- Rugged M12 Screw Fix connector
- 3m RG174u-DS Low Loss
- SMA (M) Connector
- Operates –30 to +80degC

GPS

- 1575.42MHz
- Bandwidth 10MHz
- Active LNA gain: 30dB typ
- Noise Figure 1.5max
- SMA Male Connector
- Operates from 2.7—5.5V, 28mA

GSM

- 4G Antenna
  824 - 960MHz
  1710 - 2170MHz
  2.6 - 2.7GHz
- Active gain: +2dBi
- VSWR <2.0
- Omni directional
- Impedance 50ohm

Applications

- Automotive Applications
- Covert Applications
- Machine to Machine
- Secure Rugged Applications

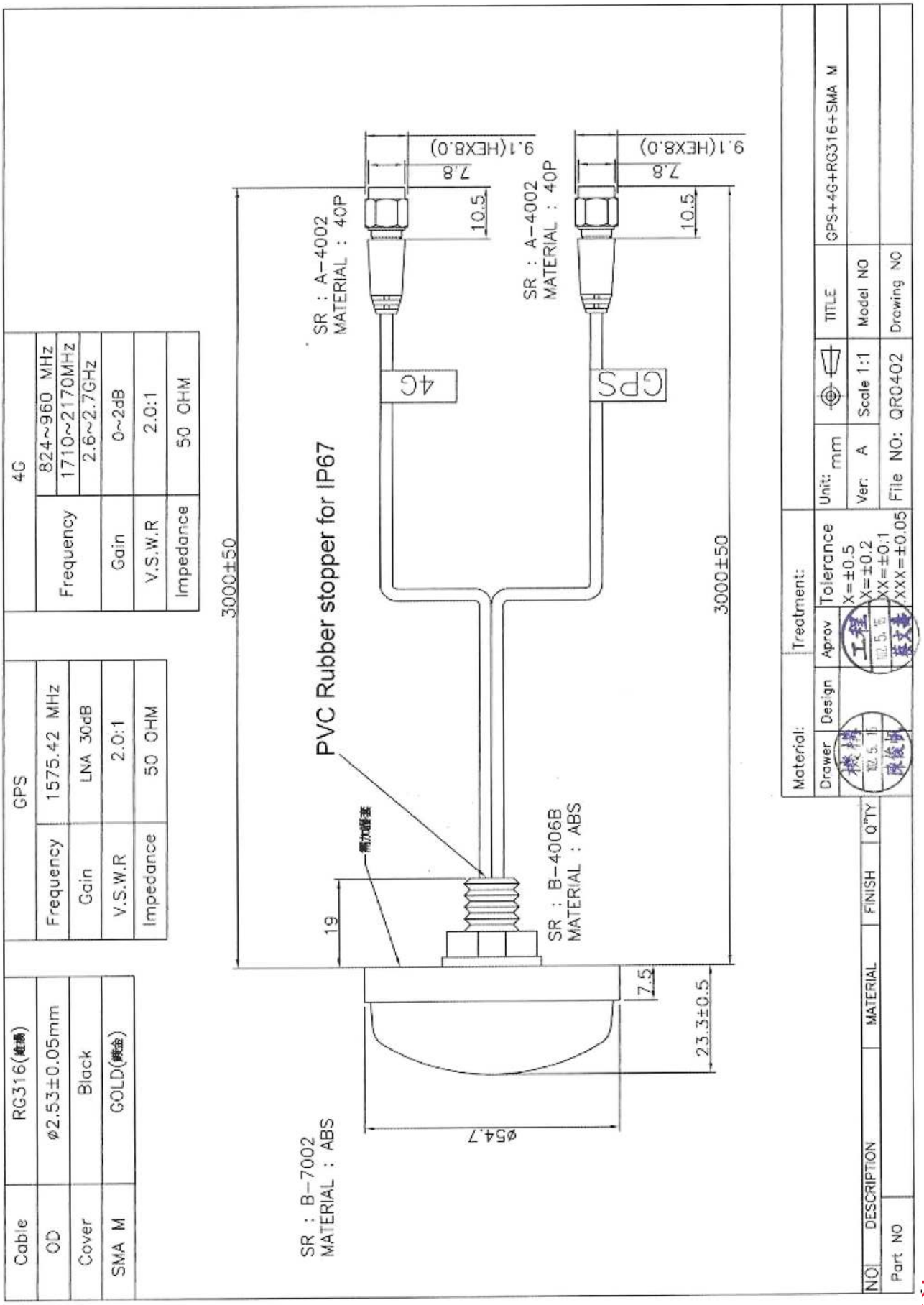
Description

A Rugged antenna with high performance for worldwide use. This antenna provides 4G GSM Antenna with 2dBi gain. Housed in a rugged low profile UV resistant IP67 housing, this antenna is compact and resistant to Vandalism.

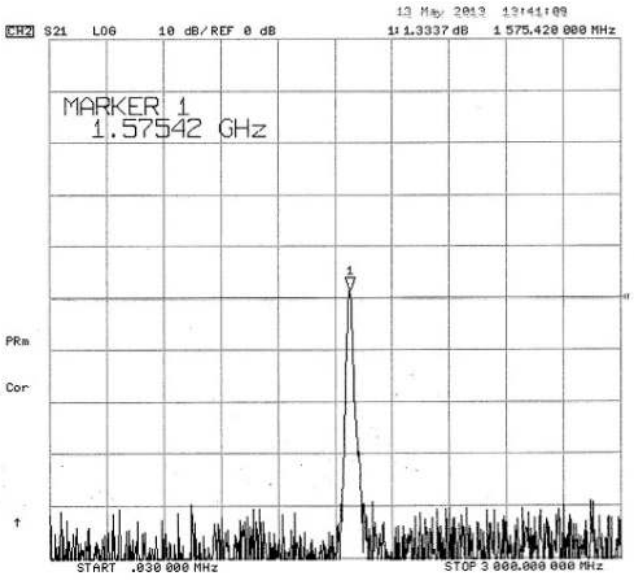
Ordering Information

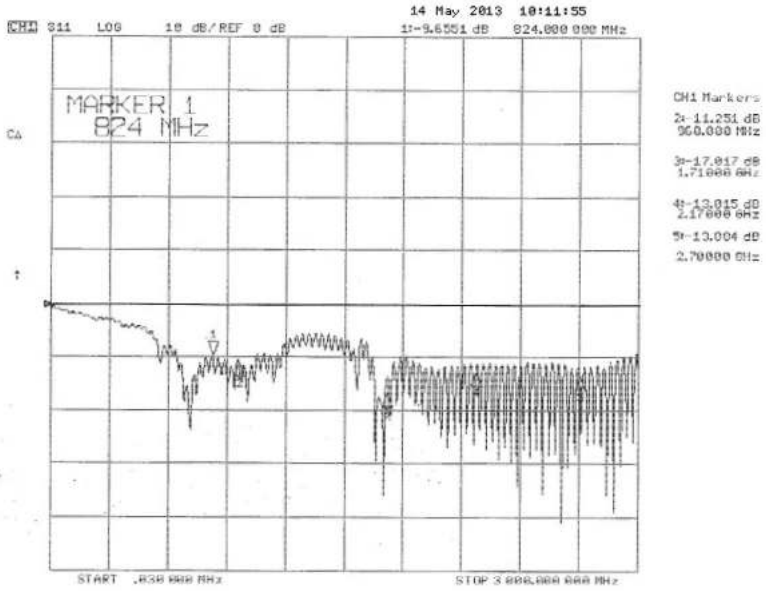
Part Number	Description	Cable Length	Connector
ANT-GSMGPSPUKS	Puck Antenna	3metres	SMA (M)

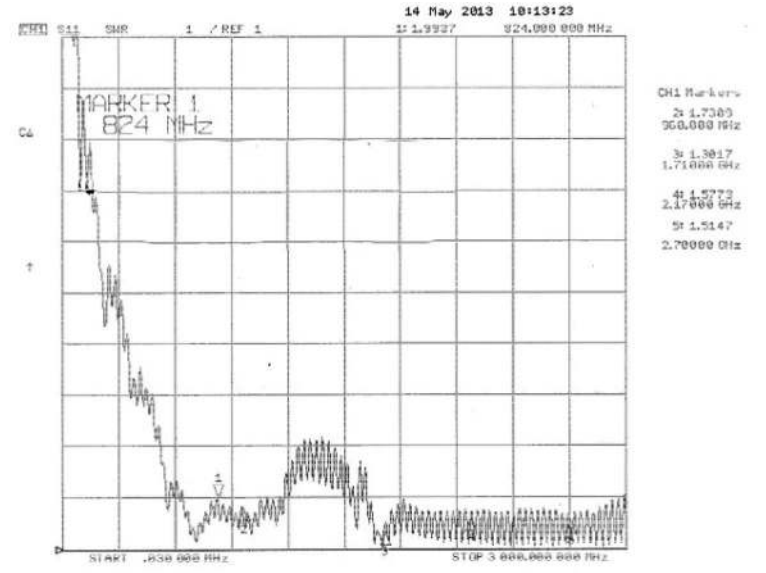
Mechanical Data



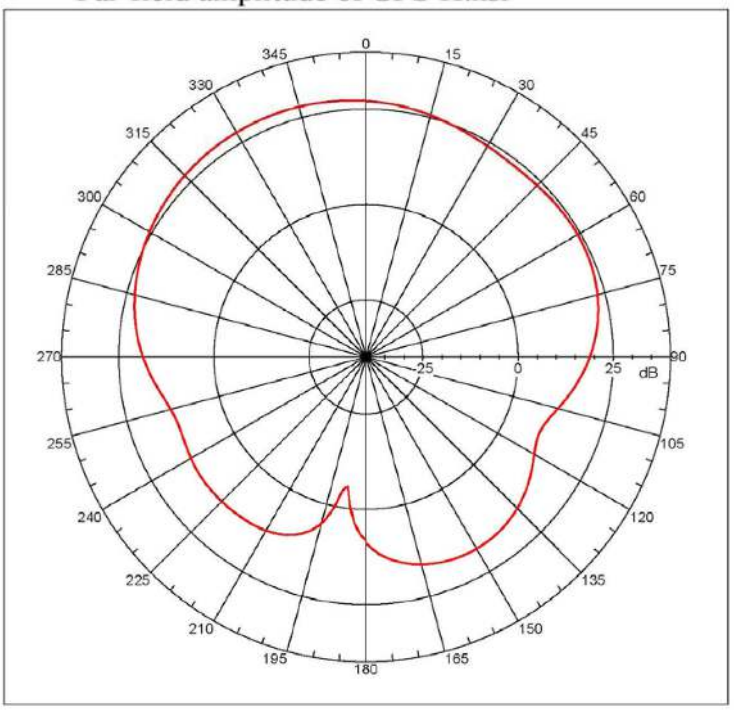
Test VSWR


13 May 2013 13:41:09
CH2 S21 LOG 10 dB/REF 0 dB
1: 1.3337 dB 1 575.420 000 MHz
MARKER 1
1.57542 GHz
PRm
Cor
START .030 000 MHz
STOP 3 000.000 000 MHz


14 May 2013 10:11:55
CH1 S11 LOG 10 dB/REF 0 dB
1: -9.6551 dB 824.000 000 MHz
MARKER 1
824 MHz
CA
CH1 Markers
2: -11.251 dB
960.000 MHz
3: -17.017 dB
1.71000 GHz
4: -13.015 dB
2.17000 GHz
5: -13.004 dB
2.70000 GHz
START .030 000 MHz
STOP 3 000.000 000 MHz


14 May 2013 10:13:23
CH1 S11 SWR 1 /REF 1
1: 1.3337 824.000 000 MHz
MARKER 1
824 MHz
CA
CH1 Markers
2: 1.7385
960.000 MHz
3: 1.3017
1.71000 GHz
4: 1.5773
2.17000 GHz
5: 1.5147
2.70000 GHz
START .030 000 MHz
STOP 3 000.000 000 MHz

Measured Performance GPS Horizontal Plane



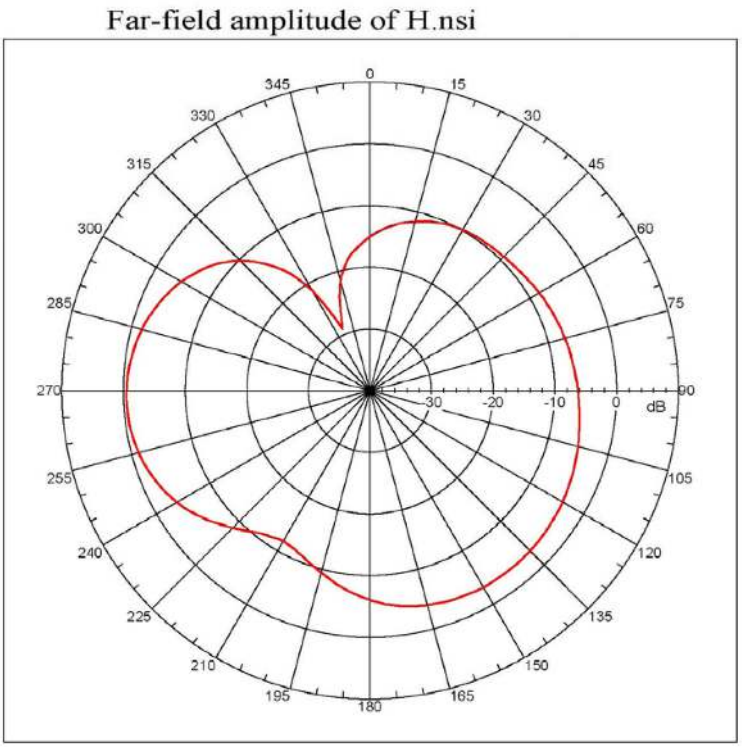

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = 28.04361  dBi
Max far-field (global) = -16.72397  dB, Max far-field (plot) =
-16.72397  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -22.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:25:47 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: 21.269 dB
   -3. dB beam width: 81.83 deg
   -6. dB beam width: 159.03 deg
   -10. dB beam width: 194.76 deg
   Left Sidelobe: -14.39 dB at -121.732  deg
   Right Sidelobe: -9.91 dB at 151.844  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 1
Beam    Frequency     Azimuth  Elevation  Pol
----    ---------     -------  ---------  ---
1       1.57542  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 824MHz Horizontal Plane



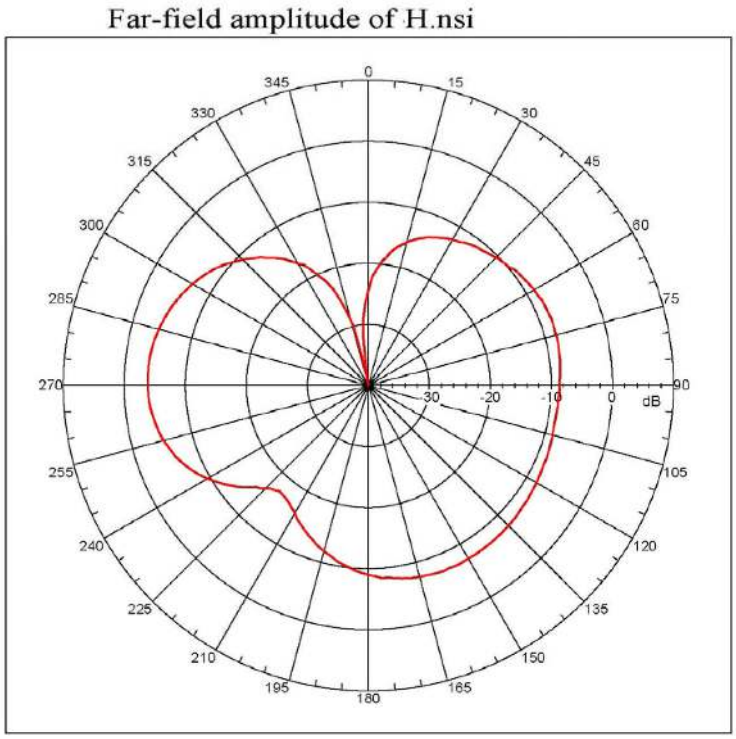

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -0.46917  dBi
Max far-field (global) = -43.48851  dB, Max far-field (plot) =
-43.48853  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -92.080  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -6.461 dB
   -3. dB beam width: 53.91 deg
   -6. dB beam width: 75.36 deg
   -10. dB beam width: 97.17 deg
   Left Sidelobe: Not Found
   Right Sidelobe: -2.66 dB at 141.789  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
1       0.824  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 850MHz Horizontal Plane



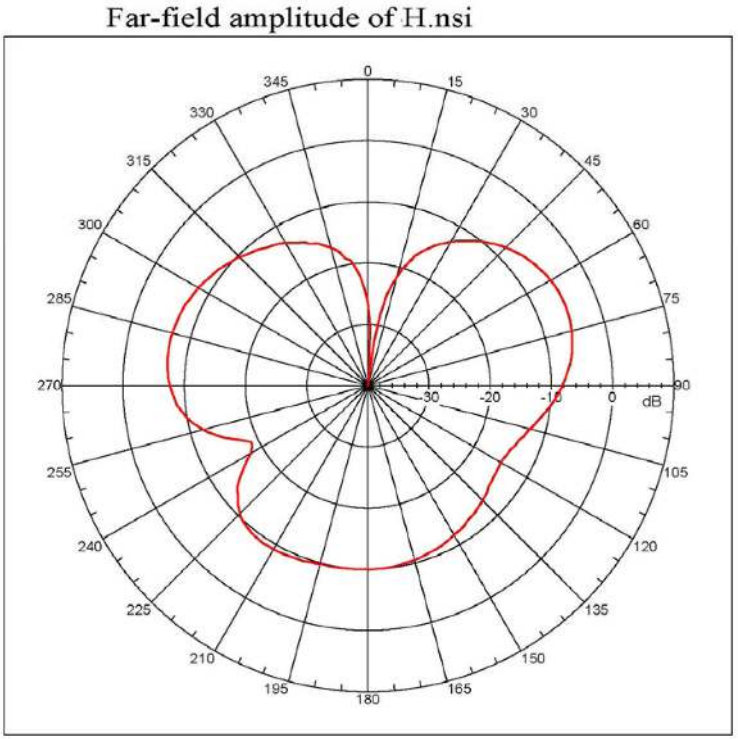

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.800  deg
Gain = -3.81927  dBi
Max far-field (global) = -65.87613  dB, Max far-field (plot) =
-65.87614  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -88.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -9.663 dB
   -3. dB beam width: 52.61 deg
   -6. dB beam width: 72.95 deg
   -10. dB beam width: 92.92 deg
   Left Sidelobe: Not Found
   Right Sidelobe: -4.28 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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
2       0.850  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 900MHz Horizontal Plane



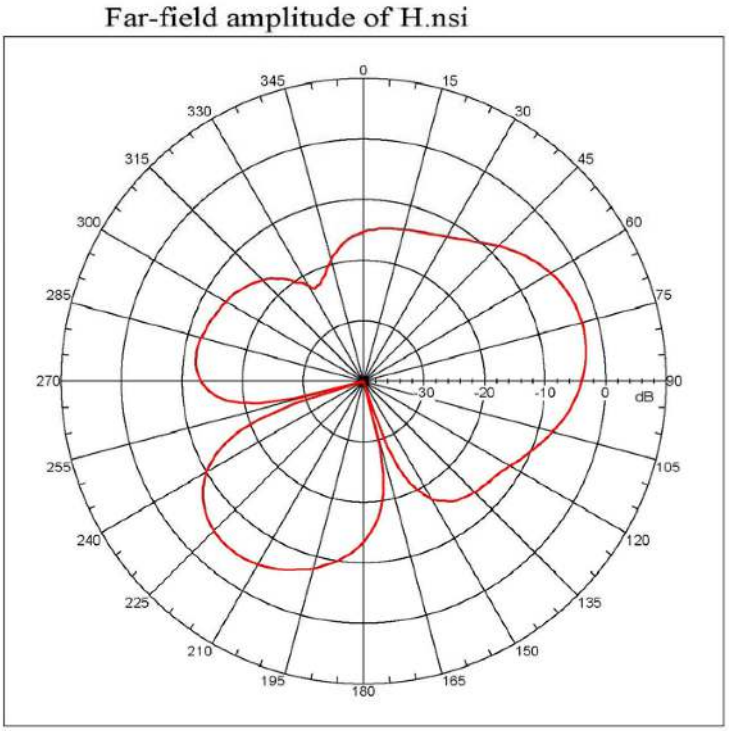

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.800  deg
Gain = -5.19695  dBi
Max far-field (global) = -46.75603  dB, Max far-field (plot) =
-46.75605  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: 67.99999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -10.752 dB
   -3. dB beam width: 45.33 deg
   -6. dB beam width: 65.64 deg
   -10. dB beam width: Not Found
   Left Sidelobe: -1.69 dB at -77.430  deg
   Right Sidelobe: -4.81 dB at 177.989  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
3       0.900  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 960MHz Horizontal Plane



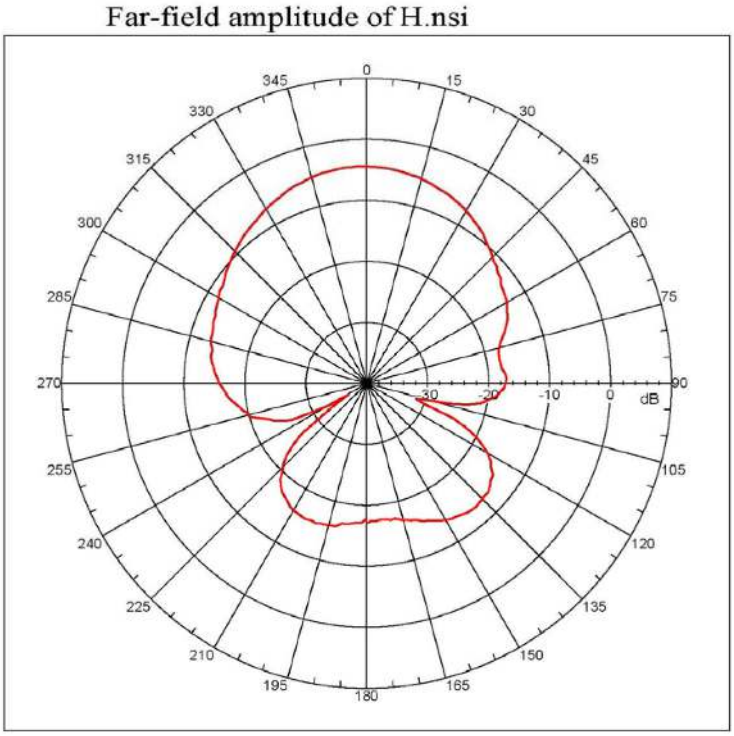

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -2.61626  dBi
Max far-field (global) = -45.24596  dB, Max far-field (plot) =
-45.246  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: 75.95999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:43 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -10.564 dB
   -3. dB beam width: 43.69 deg
   -6. dB beam width: 63.97 deg
   -10. dB beam width: 94.18 deg
   Left Sidelobe: -0.25 dB at -79.441  deg
   Right Sidelobe: Not Found
Far-field display setup
   Azimuth (deg)
      Span = 366.03001  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
4       0.960  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 1710MHz Horizontal Plane



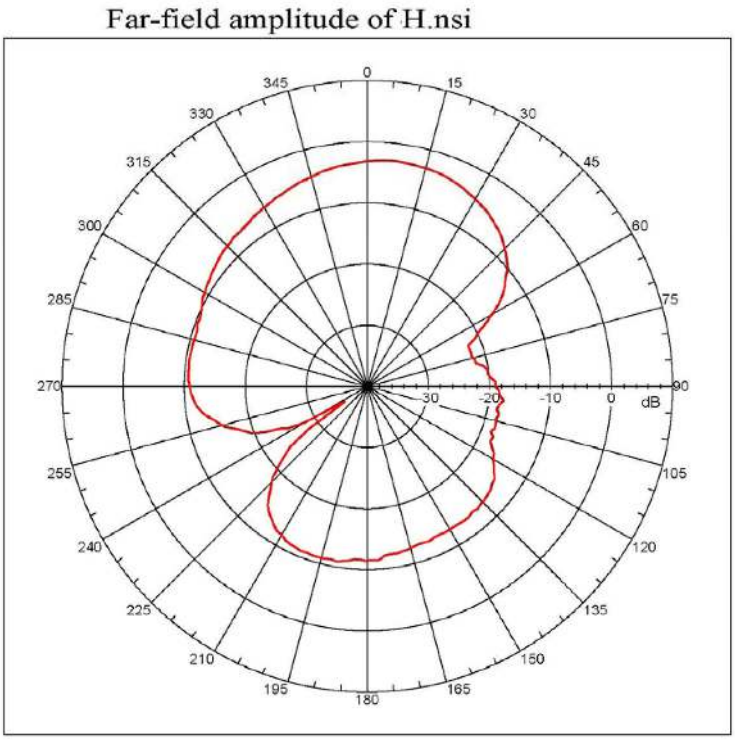

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -4.6025  dBi
Max far-field (global) = -49.59509  dB, Max far-field (plot) =
-49.59509  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -2.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:43 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -12.491 dB
   -3. dB beam width: 62.52 deg
   -6. dB beam width: 94.30 deg
   -10. dB beam width: 147.52 deg
   Left Sidelobe: -11.20 dB at -155.866  deg
   Right Sidelobe: -0.82 dB at 133.743  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
5       1.710  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 1800MHz Horizontal Plane



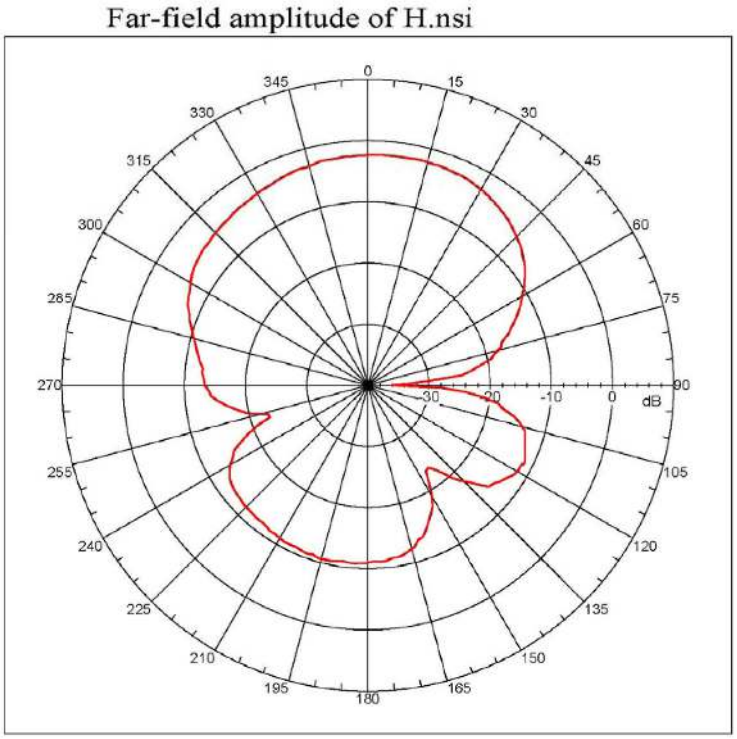

```
Far-field amplitude, Eprincipal: Linear, Tau = 8.000  deg
Gain = -2.89658  dBi
Max far-field (global) = -49.79862  dB, Max far-field (plot) =
-49.70862  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: 7.99999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -10.422 dB
   -3. dB beam width: 83.96 deg
   -6. dB beam width: 104.88 deg
   -10. dB beam width: 155.72 deg
   Left Sidelobe: -8.00 dB at -157.877  deg
   Right Sidelobe: -17.22 dB at 83.464  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
6       1.800  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 1900MHz Horizontal Plane



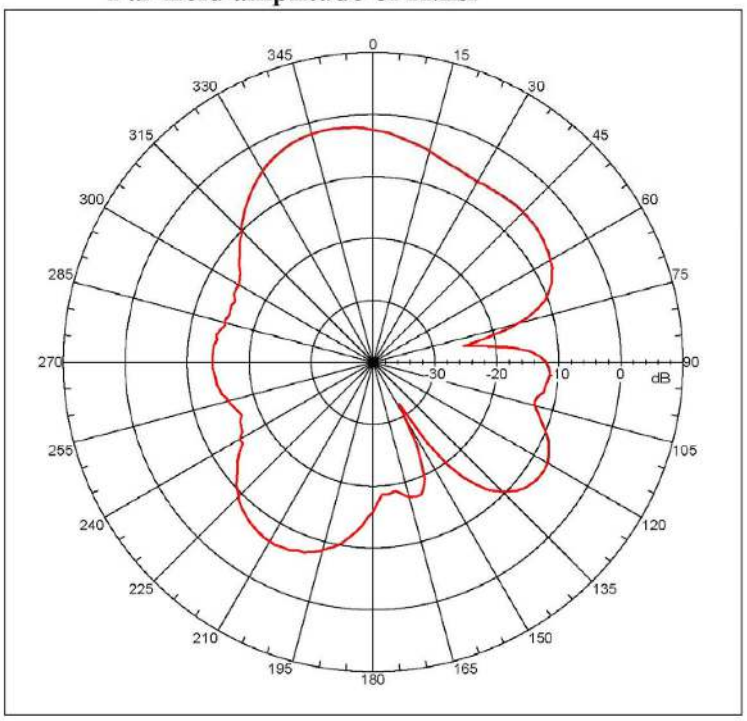

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -2.20998  dBi
Max far-field (global) = -49.24694  dB, Max far-field (plot) =
-49.24694  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: 11.99999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -9.065 dB
   -3. dB beam width: 94.99 deg
   -6. dB beam width: 121.91 deg
   -10. dB beam width: 145.78 deg
   Left Sidelobe: -9.64 dB at -133.743  deg
   Right Sidelobe: -9.19 dB at 117.554  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
7       1.900  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2100MHz Horizontal Plane



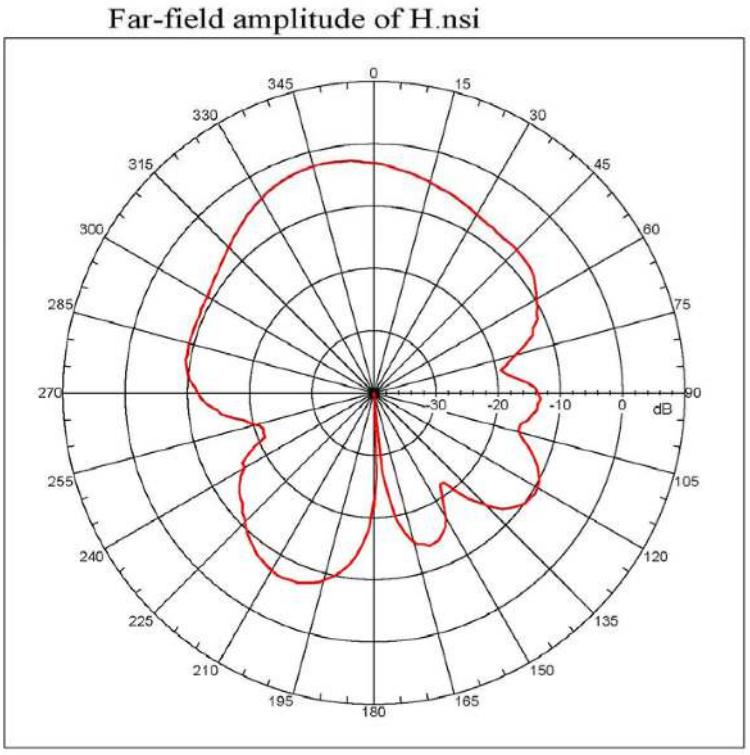

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -1.74913  dBi
Max far-field (global) = -49.07503  dB, Max far-field (plot) =
-49.07584  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -10.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.8.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -9.236 dB
   -3. dB beam width: 86.59 deg
   -6. dB beam width: 104.01 deg
   -10. dB beam width: 121.82 deg
   Left Sidelobe: -12.63 dB at -59.441  deg
   Right Sidelobe: -9.55 dB at 95.521  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
0       2.100  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2170MHz Horizontal Plane



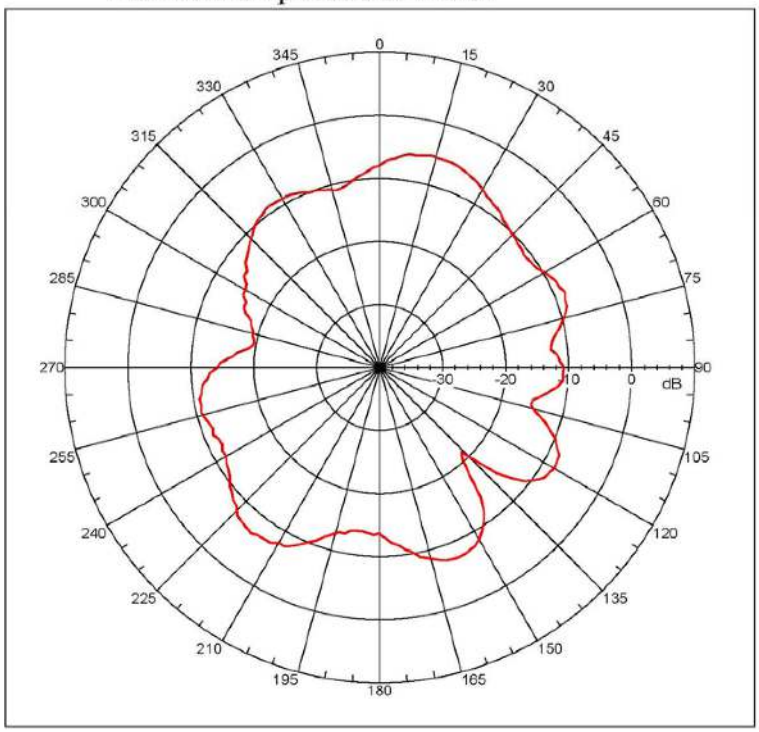

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -2.31766  dBi
Max far-field (global) = -49.84977  dB, Max far-field (plot) =
-49.84977  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -14.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.8.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -9.493 dB
   -3. dB beam width: 54.18 deg
   -6. dB beam width: 108.01 deg
   -10. dB beam width: 160.73 deg
   Left Sidelobe: -4.59 dB at -151.844  deg
   Right Sidelobe: -10.83 dB at 93.520  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
9       2.170  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2400MHz Horizontal Pane



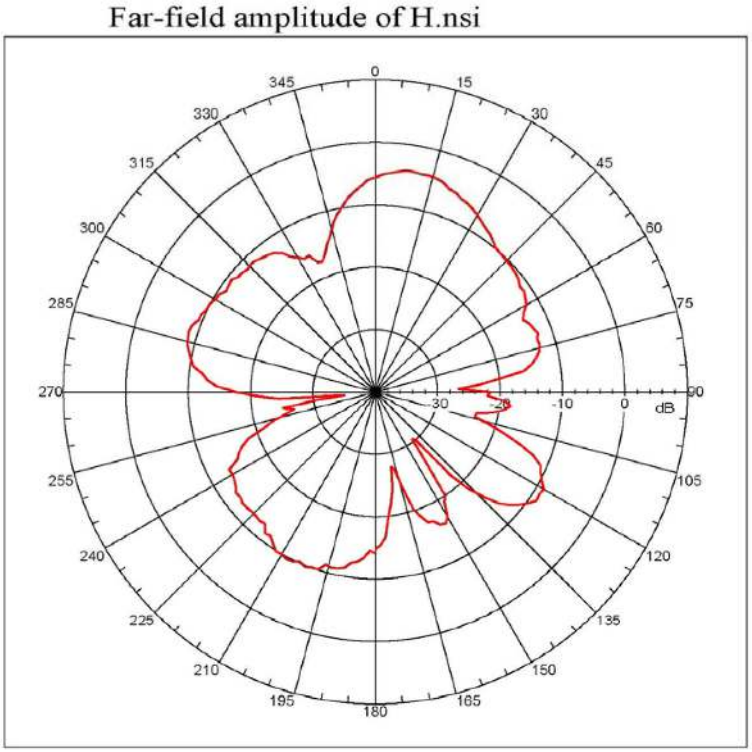

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -5.40718  dBi
Max far-field (global) = -54.41481  dB, Max far-field (plot) =
-54.41481  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: 12.99999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -10.360 dB
   -3. dB beam width: 37.29 deg
   -6. dB beam width: 225.89 deg
   -10. dB beam width: 194.12 deg
   Left Sidelobe: -3.86 dB at -27.151  deg
   Right Sidelobe: -2.66 dB at 69.395  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
10      2.400  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2500MHz Horizontal Plane



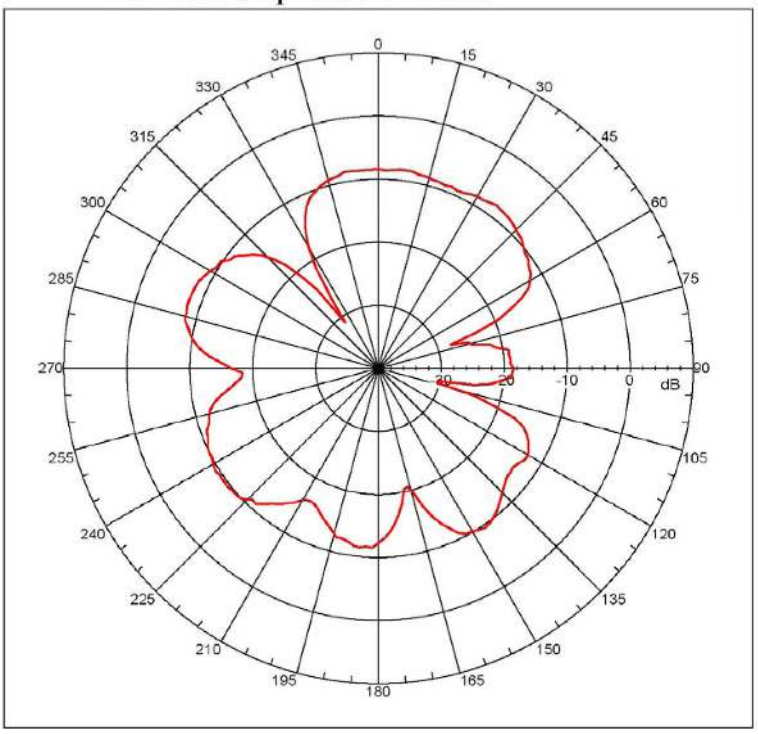

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -4.16371  dBi
Max far-field (global) = -54.2997  dB, Max far-field (plot) =
-54.29971  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: 7.99999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -12.131 dB
   -3. dB beam width: 34.22 deg
   -6. dB beam width: 54.02 deg
   -10. dB beam width: 96.86 deg
   Left Sidelobe: -11.54 dB at -25.140  deg
   Right Sidelobe: -8.12 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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
11      2.500  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2600MHz Horizontal Plane



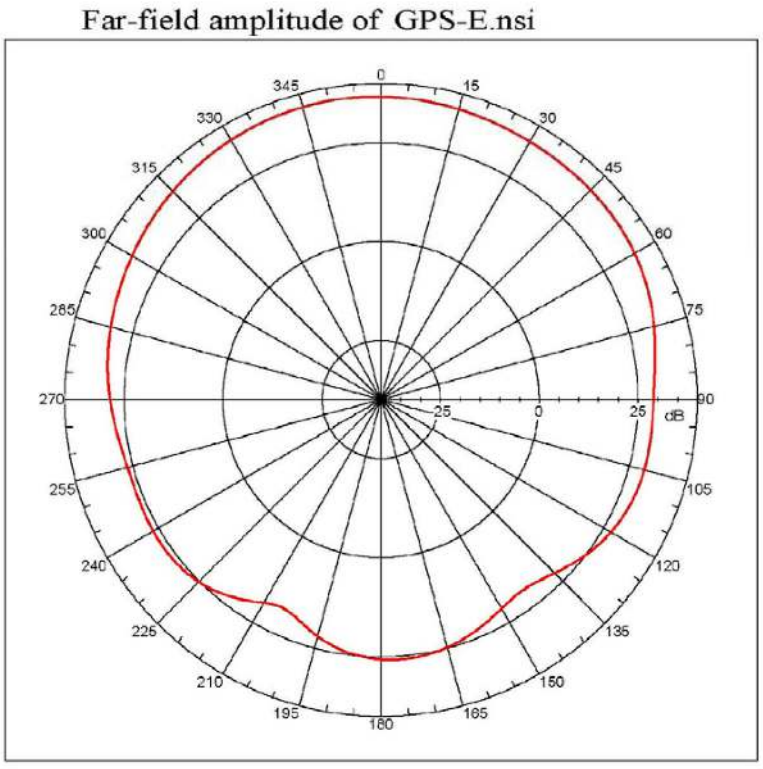

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -8.03056  dBi
Max far-field (global) = -58.37335  dB, Max far-field (plot) =
-59.37337  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -70.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.8.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 11:26:45 AM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -12.223 dB
   -3. dB beam width: 30.60 deg
   -6. dB beam width: 40.88 deg
   -10. dB beam width: 49.84 deg
   Left Sidelobe: -1.92 dB at -115.643  deg
   Right Sidelobe: -0.40 dB at -9.050  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
12      2.600  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance GPS Vertical Plane



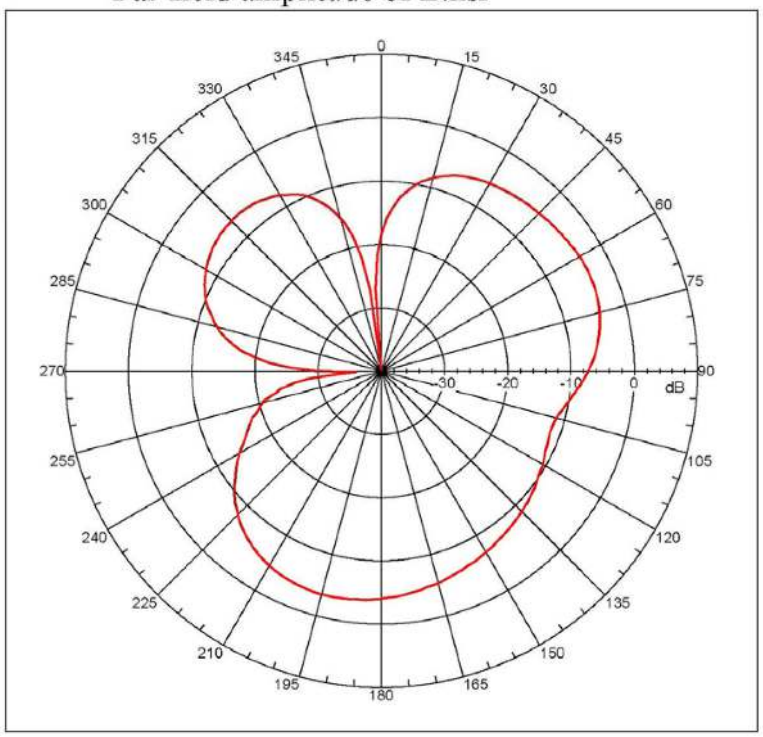

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = 36.73427  dBi
Max far-field (global) = -8.83331  dB, Max far-field (plot) =
-8.83332  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -8.80001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.8.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:28:00 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: 30.913 dB
   -3. dB beam width: 115.15 deg
   -6. dB beam width: 154.73 deg
   -10. dB beam width: 224.28 deg
   Left Sidelobe: Not Found
   Right Sidelobe: -10.93 dB at 177.989  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 1
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
1       1.57542  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 824MHz Vertical Plane



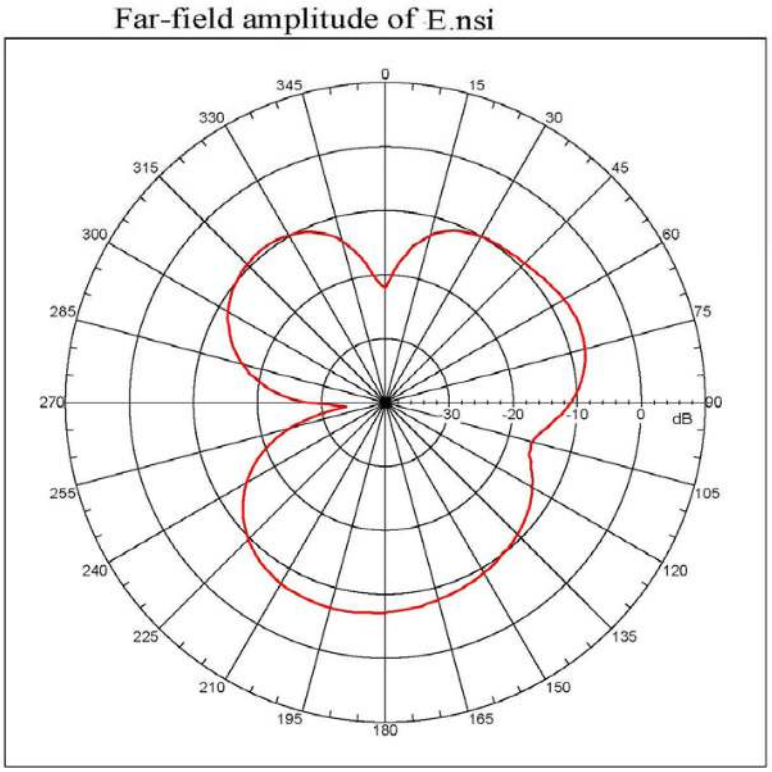

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -2.49476  dBi
Max far-field (global) = -46.4941  dB, Max far-field (plot) =
-46.49412  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -168.000  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -8.073 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: -2.98 dB at -43.240  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
1       0.824  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 850MHz VerticalPlane



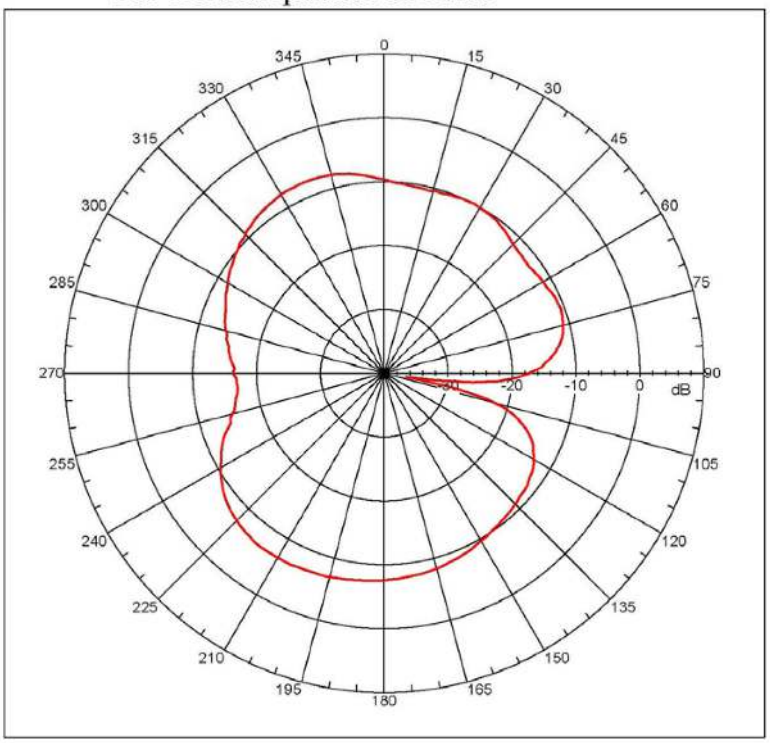

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -6.74011  dBi
Max far-field (global) = -47.99697  dB, Max far-field (plot) =
-47.99699  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -166.000  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -11.130 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: -2.54 dB at -37.207  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
2       0.850  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 900MHz Vertical Plane



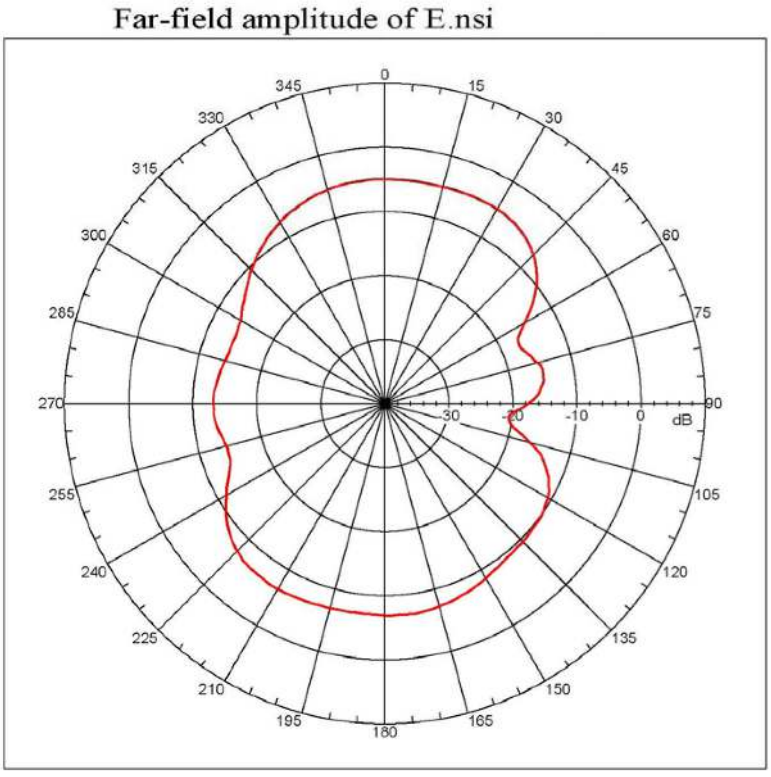

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -6.62872  dBi
Max far-field (global) = -48.1884  dB, Max far-field (plot) =
-48.18848  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: -144.000  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.8.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -10.501 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 -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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
3       0.900  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 960MHz Vertical Plane



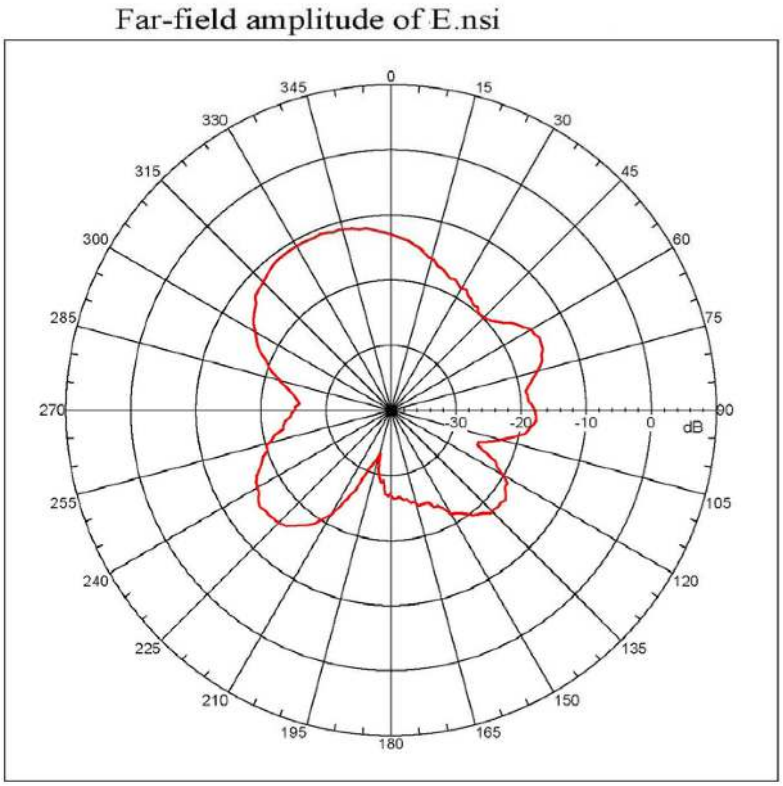

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -6.85416  dBi
Max far-field (global) = -47.48383  dB, Max far-field (plot) =
-47.48383  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: 23.99999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.8.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -9.280 dB
   -3. dB beam width: 80.40 deg
   -6. dB beam width: 100.55 deg
   -10. dB beam width: Not Found
   Left Sidelobe: -8.34 dB at -89.497  deg
   Right Sidelobe: -9.93 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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
4       0.960  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 1710MHz Vertical Plane



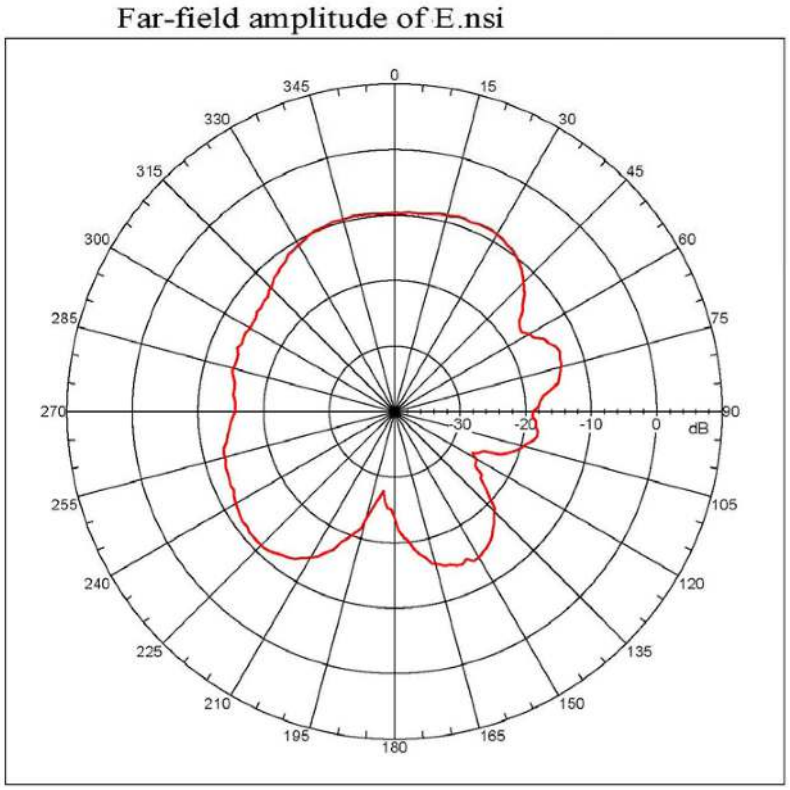

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -10.82067  dBi
Max far-field (global) = -56.01326  dB, Max far-field (plot) =
-56.01326  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: -22.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\26

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -17.657 dB
   -3. dB beam width: 58.67 deg
   -6. dB beam width: 82.47 deg
   -10. dB beam width: 175.81 deg
   Left Sidelobe: -4.18 dB at -125.698  deg
   Right Sidelobe: -3.76 dB at 65.363  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
5       1.710  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 1800MHz Vertical Plane



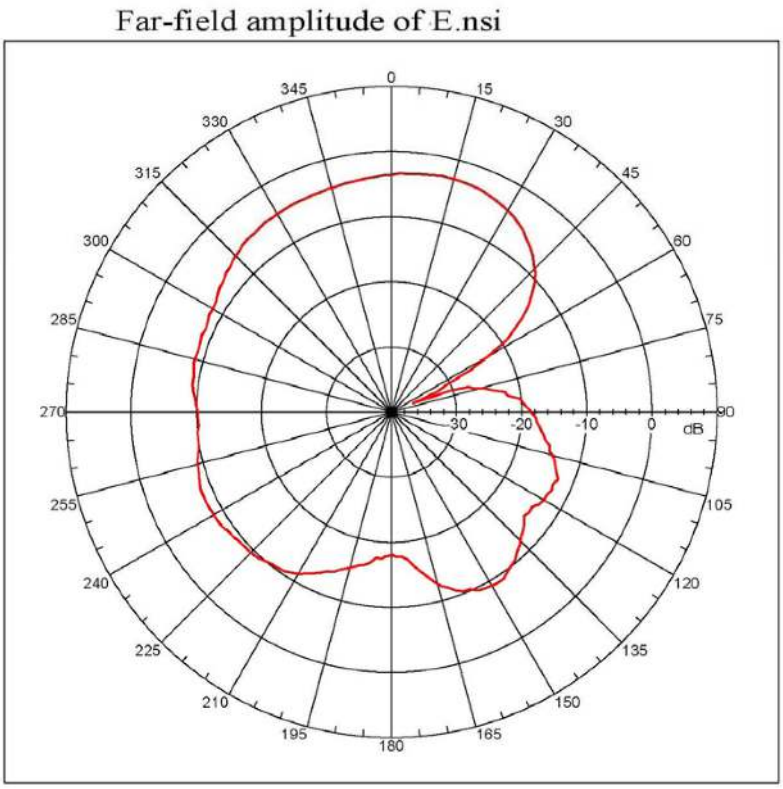

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -9.56527  dBi
Max far-field (global) = -55.38741  dB, Max far-field (plot) =
-55.38742  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: 27.99999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -13.089 dB
   -3. dB beam width: 79.57 deg
   -6. dB beam width: 121.04 deg
   -10. dB beam width: 248.62 deg
   Left Sidelobe: -4.27 dB at -107.598  deg
   Right Sidelobe: -4.62 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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
6       1.800  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 1900MHz Vertical Plane



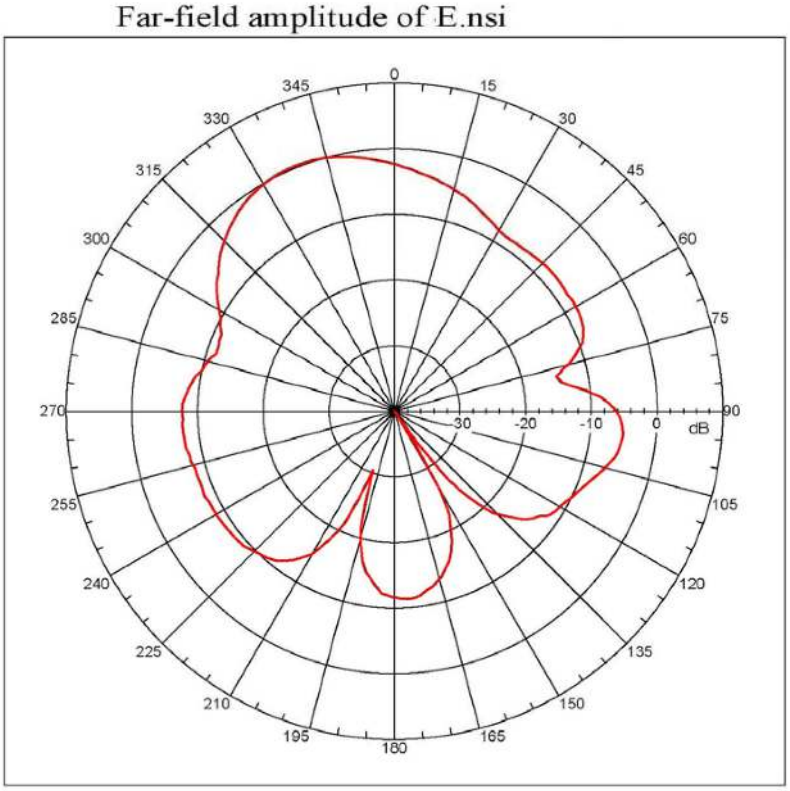

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -2.92528  dBi
Max far-field (global) = -49.96224  dB, Max far-field (plot) =
-49.96225  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: 11.99999  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:18:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -9.268 dB
   -3. dB beam width: 80.63 deg
   -6. dB beam width: 123.21 deg
   -10. dB beam width: 208.63 deg
   Left Sidelobe: -5.41 dB at -115.643  deg
   Right Sidelobe: -9.45 dB at 113.631  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
7       1.900  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2100MHz Vertical Plane



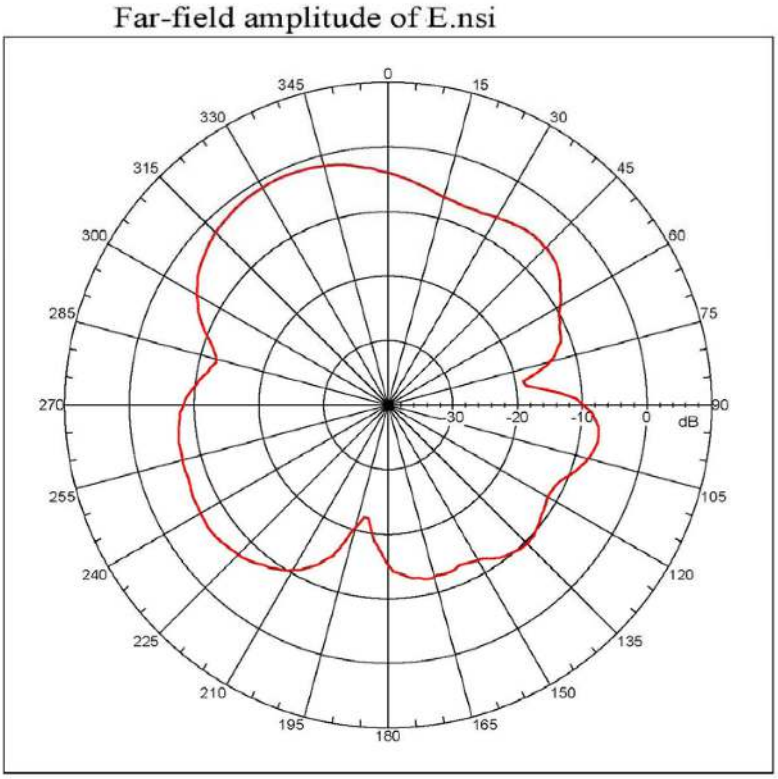

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = 0.29872  dBi
Max far-field (global) = -47.02798  dB, Max far-field (plot) =
-47.02798  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -22.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:18:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -7.897 dB
   -3. dB beam width: 44.62 deg
   -6. dB beam width: 70.54 deg
   -10. dB beam width: 132.27 deg
   Left Sidelobe: -7.94 dB at -89.497  deg
   Right Sidelobe: -5.32 dB at 97.542  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
8       2.100  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2170MHz Vertical Plane



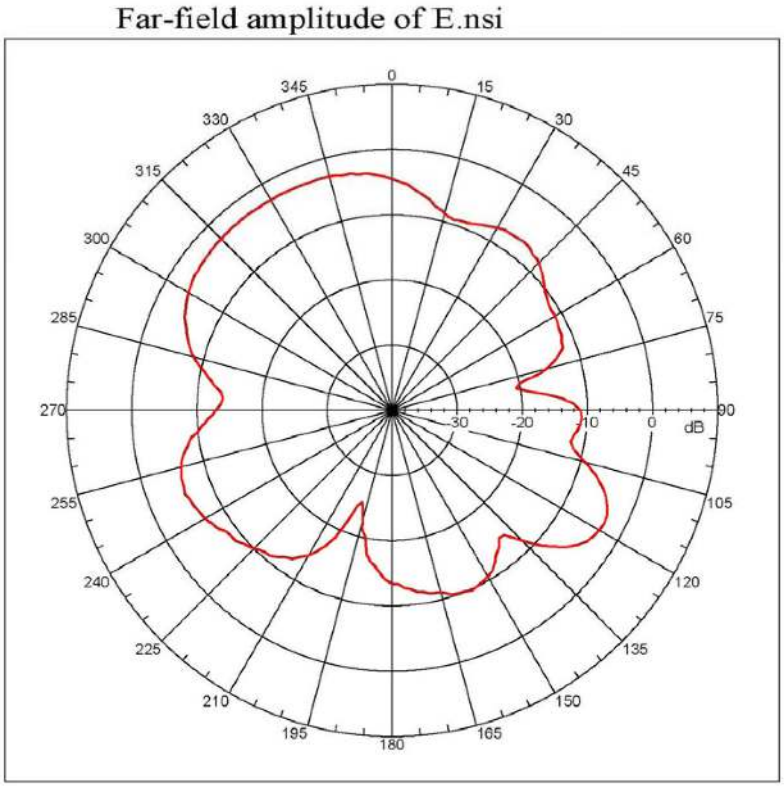

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -1.09684  dBi
Max far-field (global) = -48.57895  dB, Max far-field (plot) =
-48.57895  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: -28.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -7.645 dB
   -3. dB beam width: 54.68 deg
   -6. dB beam width: 117.19 deg
   -10. dB beam width: 138.26 deg
   Left Sidelobe: -6.65 dB at -99.553  deg
   Right Sidelobe: -4.29 dB at 43.240  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
9       2.170  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2400MHz Vertical Plane



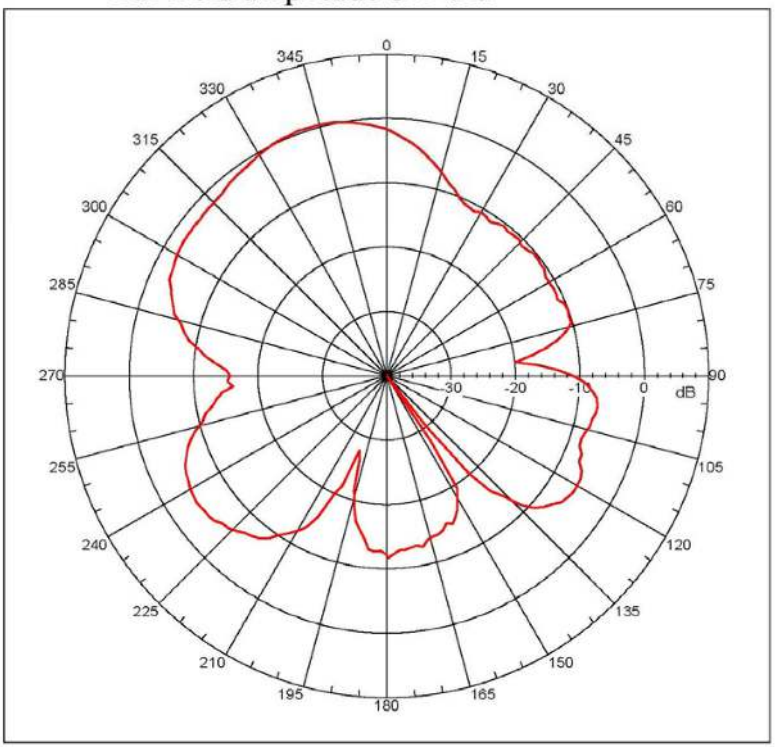

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = -2.70625  dBi
Max far-field (global) = -51.71388  dB, Max far-field (plot) =
-51.7139  dB
Normalization: Reference, Network offset = 0.000  dB
Mpeak at: -36.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -8.107 dB
   -3. dB beam width: 72.94 deg
   -6. dB beam width: 90.78 deg
   -10. dB beam width: 154.52 deg
   Left Sidelobe: -3.01 dB at -111.628  deg
   Right Sidelobe: -4.66 dB at 33.184  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
10      2.400  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2500MHz Vertical Plane



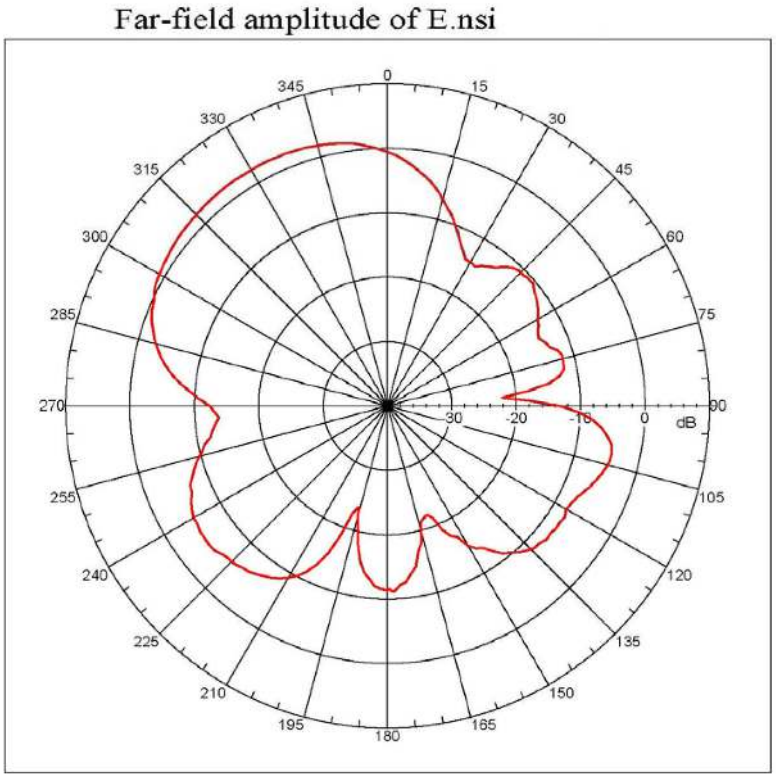

```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = 5.45901  dBi
Max far-field (global) = -49.67698  dB, Max far-field (plot) =
-49.67699  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -20.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:18:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -7.364 dB
   -3. dB beam width: 62.89 deg
   -6. dB beam width: 84.82 deg
   -10. dB beam width: 102.12 deg
   Left Sidelobe: -4.45 dB at -123.687  deg
   Right Sidelobe: -18.56 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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
11      2.500  GHz  Azimuth  Elevation  Single-pol
```

Measured Performance at 2600Hz Vertical Plane




```
Far-field amplitude, Eprincipal: Linear, Tau = 0.000  deg
Gain = 2.55806  dBi
Max far-field (global) = -47.97873  dB, Max far-field (plot) =
-47.97873  dB
Normalization: Reference, Network offset = 0.000  dB
Hpeak at: -20.00001  deg, Vpeak at: 0.000  deg
Plot centering: On


NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\20

Measurement date/time: 5/9/2013 1:10:59 PM, Filetype: NSI-97
Far-field Cut Analysis:
   Avg value: -5.678 dB
   -3. dB beam width: 69.09 deg
   -6. dB beam width: 86.26 deg
   -10. dB beam width: 100.88 deg
   Left Sidelobe: -7.55 dB at -119.685  deg
   Right Sidelobe: -12.82 dB at 51.295  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 12
Beam    Frequency   Azimuth  Elevation  Pol
----    ---------   -------  ---------  ---
12      2.600  GHz  Azimuth  Elevation  Single-pol
```

GSM & GPS Rugged 'Puck' Antenna IP67

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DO NOT
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Environment Agency Registration Number: **WEE/JB0104WV.**