

AR-186 GPS, GLONASS, 2G AND 3G MULTI-BAND ANTENNA



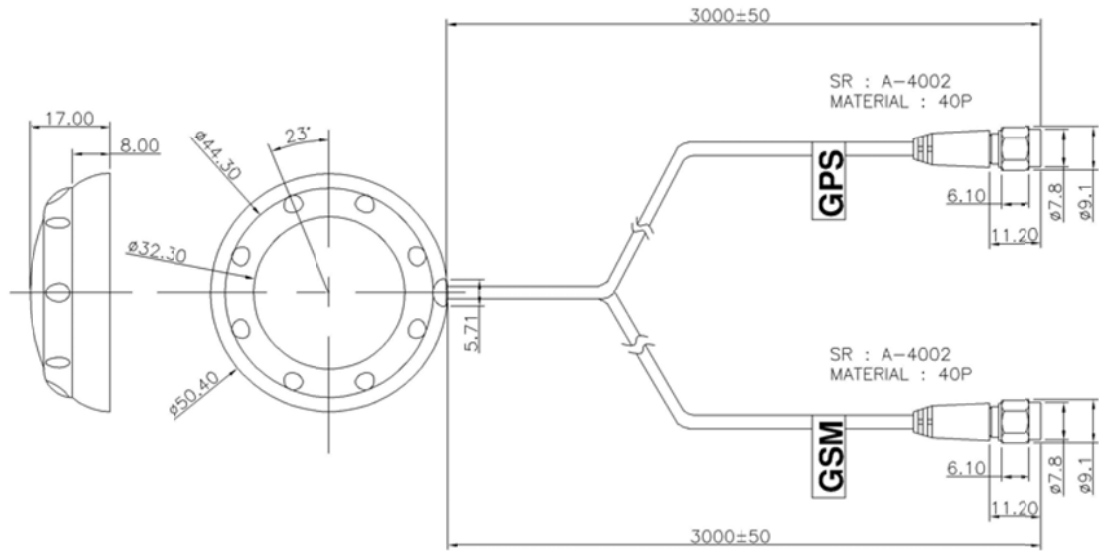
Features

- ✦ 3M sticker mount
- ✦ Compact size
- ✦ Easy to install
- ✦ 2-stage LNA
- ✦ 10 watt RF suppression protection
- ✦ Wide power supply range
- ✦ Short circuit protection
- ✦ RoHS compliant

Specifications

Category	GPS/GLONASS Antenna	Communication Antenna
Frequency	1575.42MHz ± 10 MHz	GSM 900 (-10 ~ +60) MHz
	1602 ± 5 MHz	DCS 1800 ±90 MHz
		WCDMA 2100 (-180 ~ +70) MHz
Gain	28 ± 1 dB (3m Cable)	0 dB (3m cable)
V.S.W.R.	<2.0 (3m cable)	2.0:1 (3m cable)
Noise Figure	1.0 typical	--
Band Width	26.6 MHz min. @S11< -10dB	70 MHz
		180 MHz
		250 MHz
Impedance	50Ω typical	50Ω typical
Polarization	Right-hand circular	Linear and vertical
Power supply	2.8 ~ 5.0V DC	
Power Consumption	11mA±2 @3V , 29mA±3 @5V	
Dimension	Ø50.4 mm x 17 mm(H)	
Operation Temperature	-30 °C to +85 °C	
Storage Temperature	-40 °C to +95 °C	
Coax Connector	BNC, SMB, Fakra, SMA, MCX, MMCX, GT5 or on request	
Coax Cable	Low loss RG-174	
Mount	3M sticker	

Mechanical Diagram



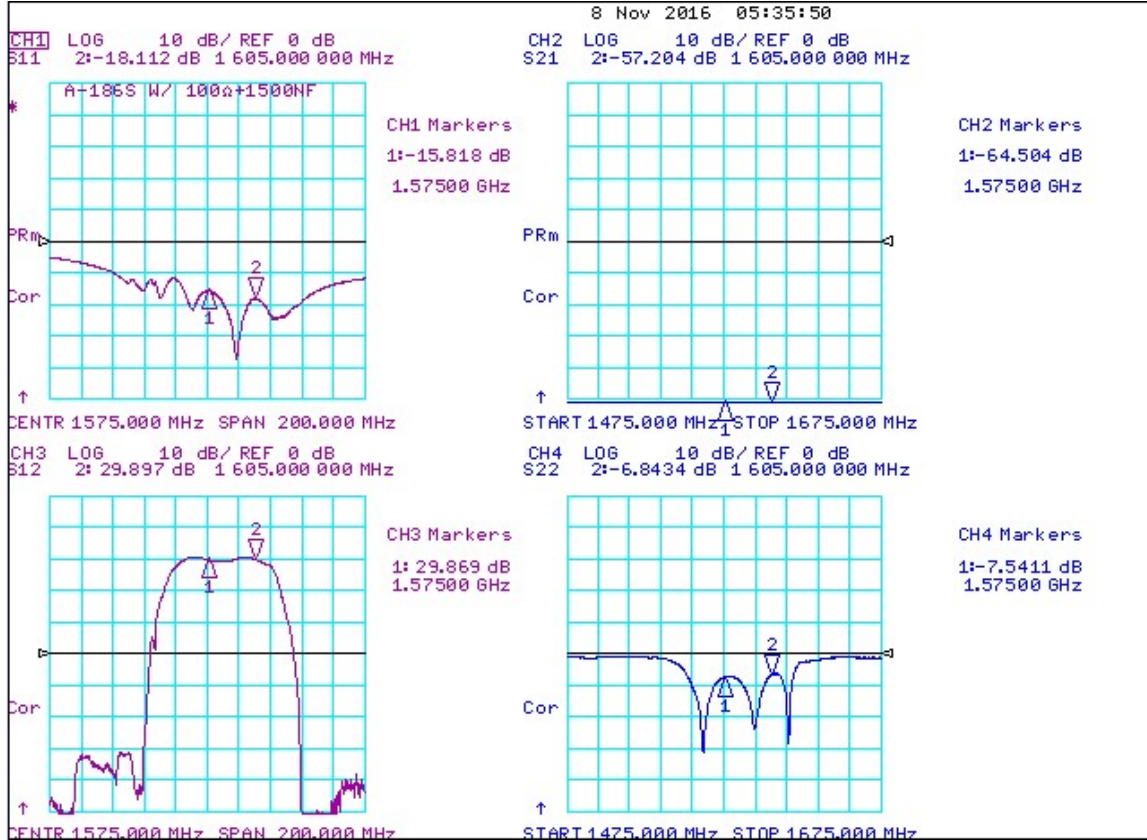
NOTE:

- Avoid running the antenna cable next to other antenna cables from two way radios, cell phones, etc
- Do NOT lengthen/shorten the shielded antenna cable
- Take special care when plugging and unplugging the antenna connector
- Take extreme care in handling and not to place the antenna under any metal structure surface such as a metal roof rack

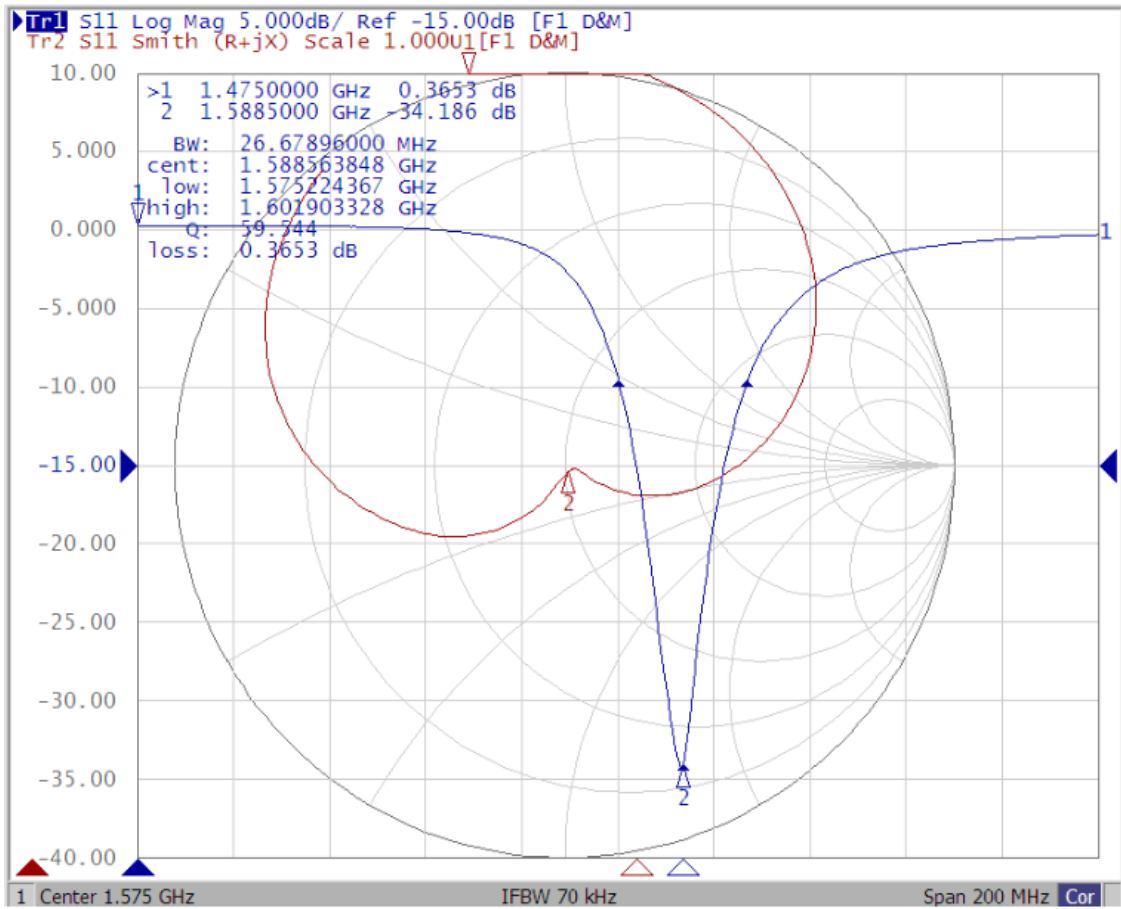
Test Reports

GPS/GLONASS Antenna

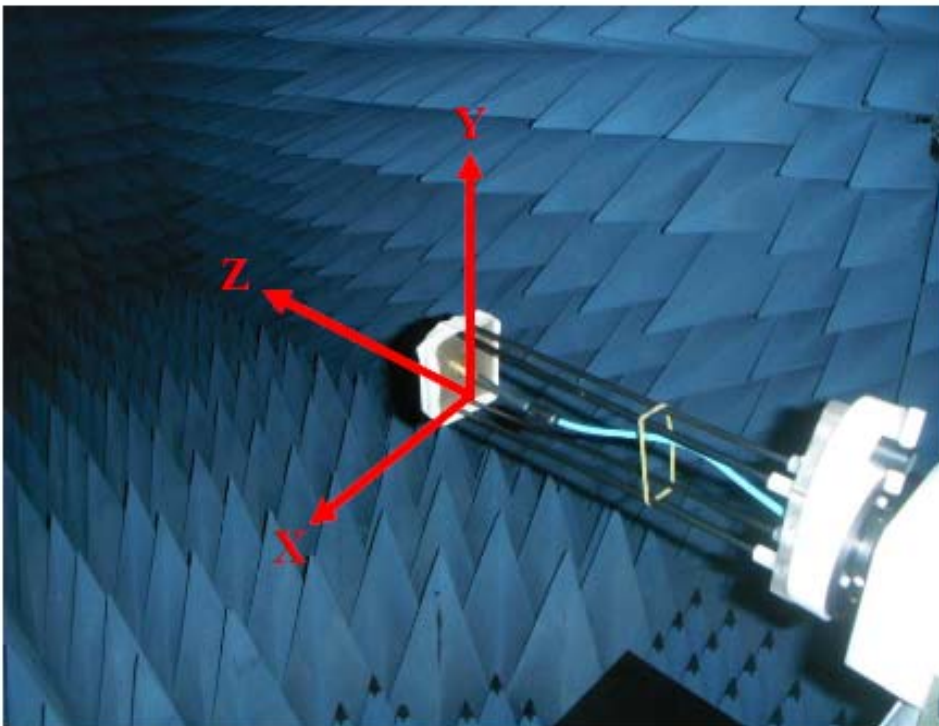
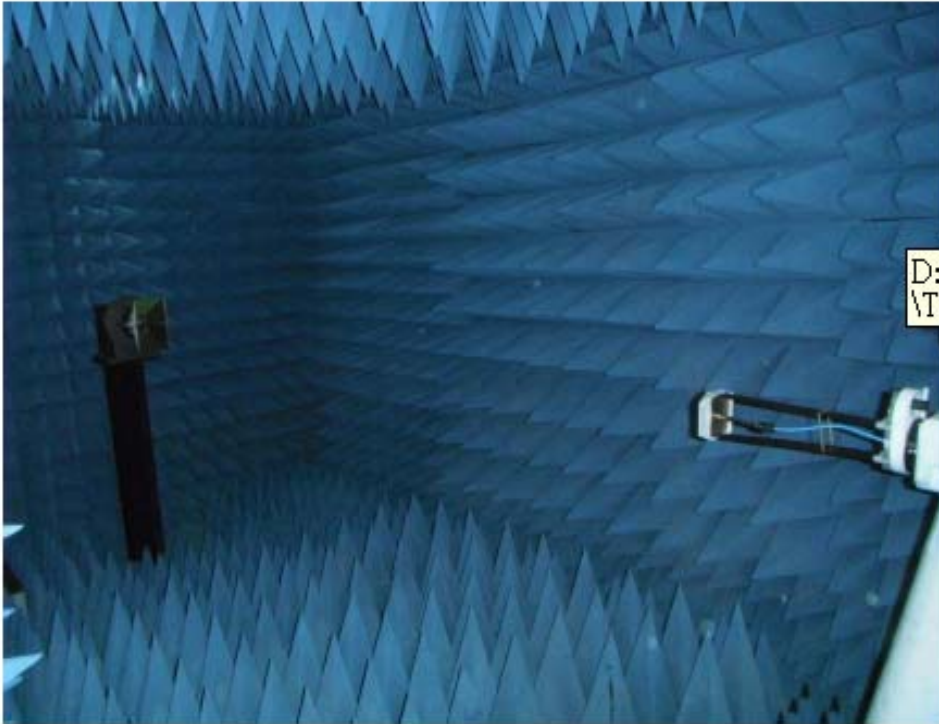
Return loss and Gain



Bandwidth

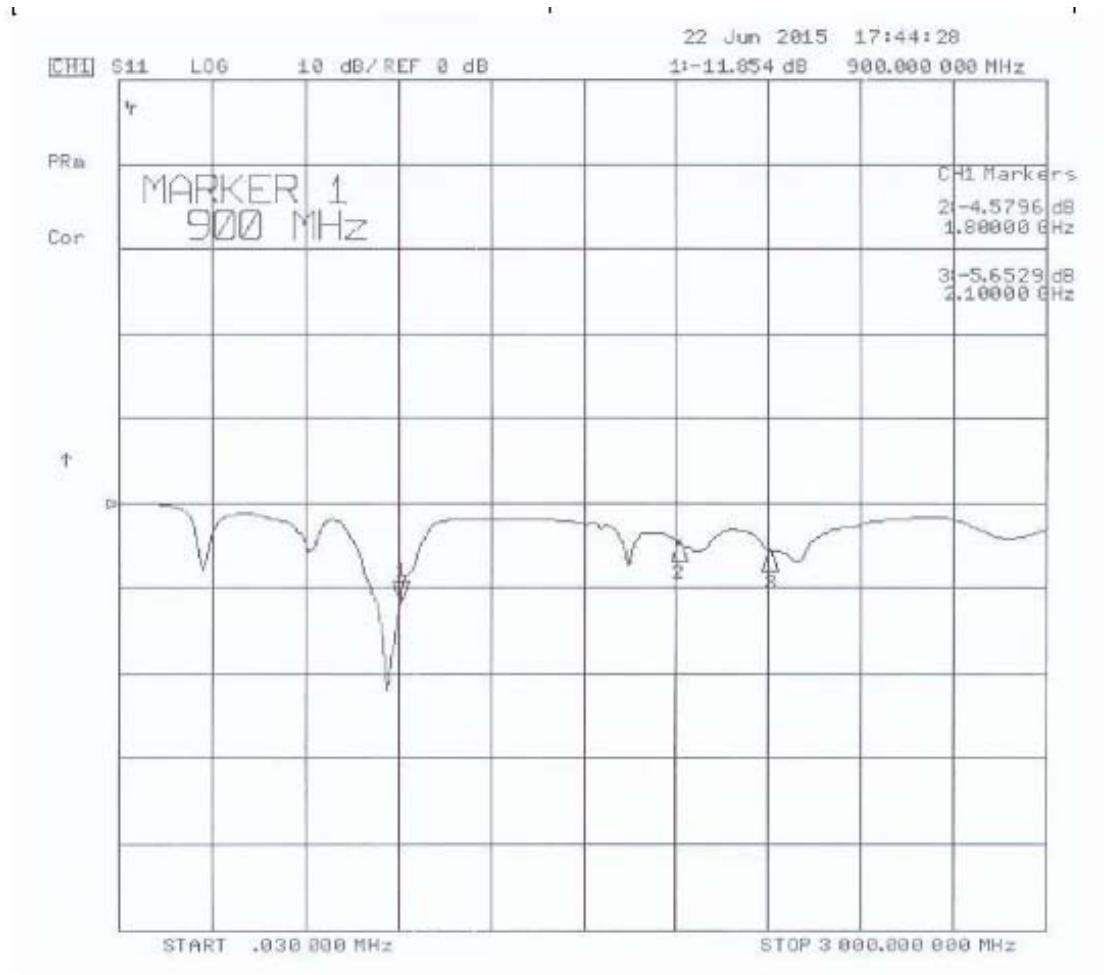


Patch Antenna Setup

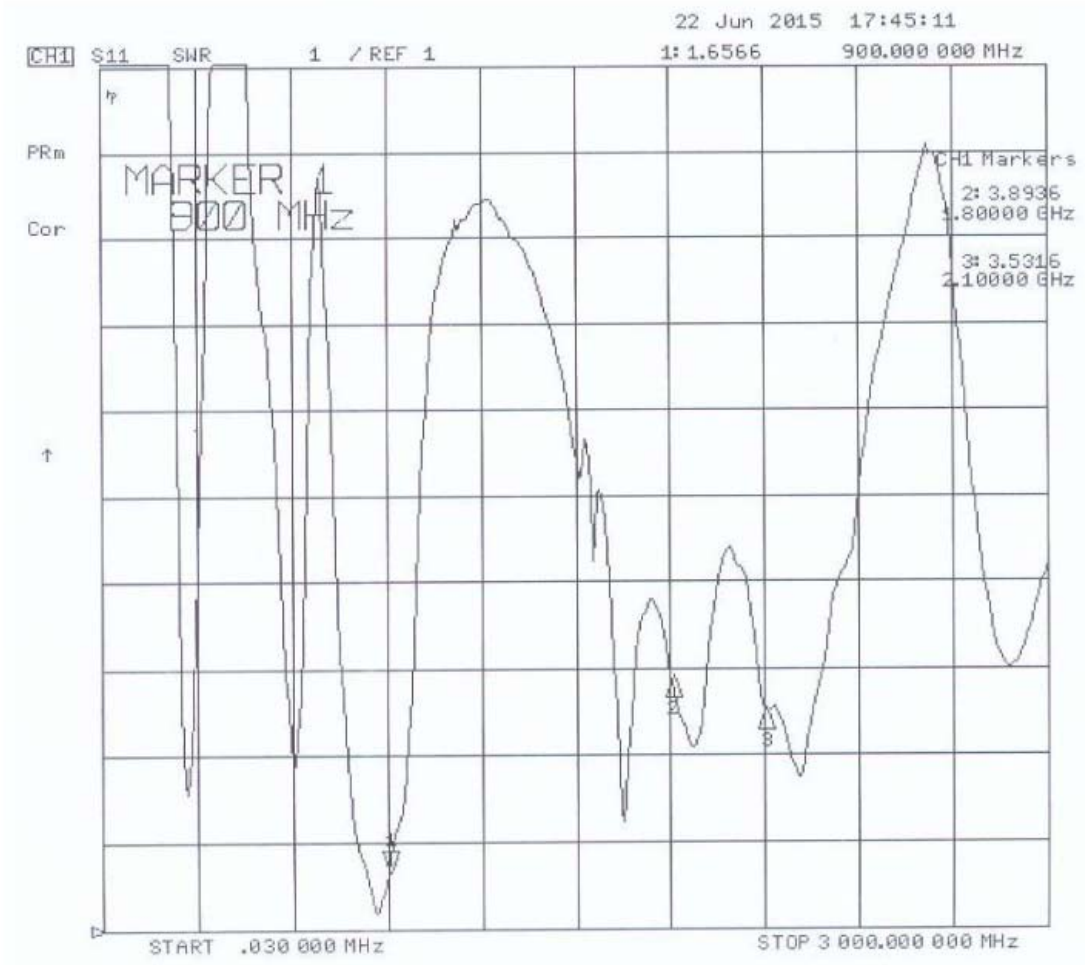


Communication Antenna

Return Loss

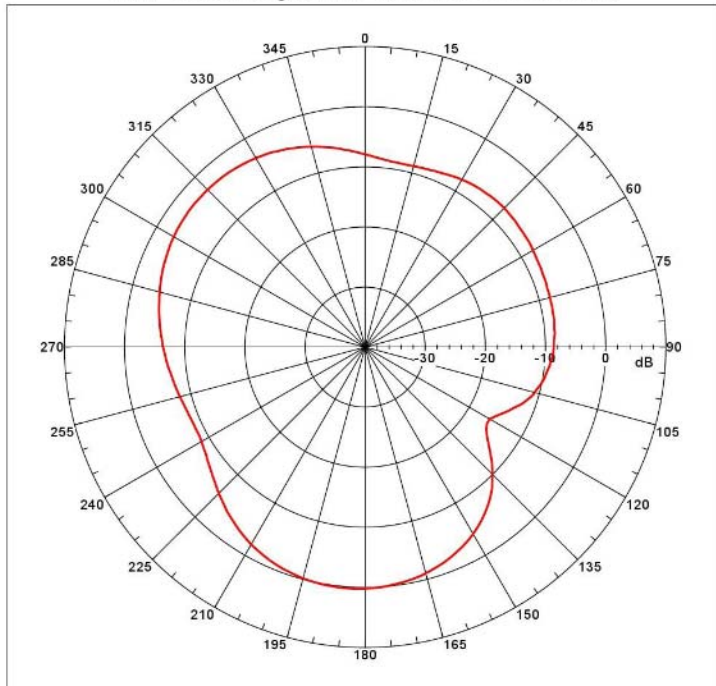


VSWR



Antenna Pattern (890MHz)

Far-field amplitude of R30-GSM-E.nsi



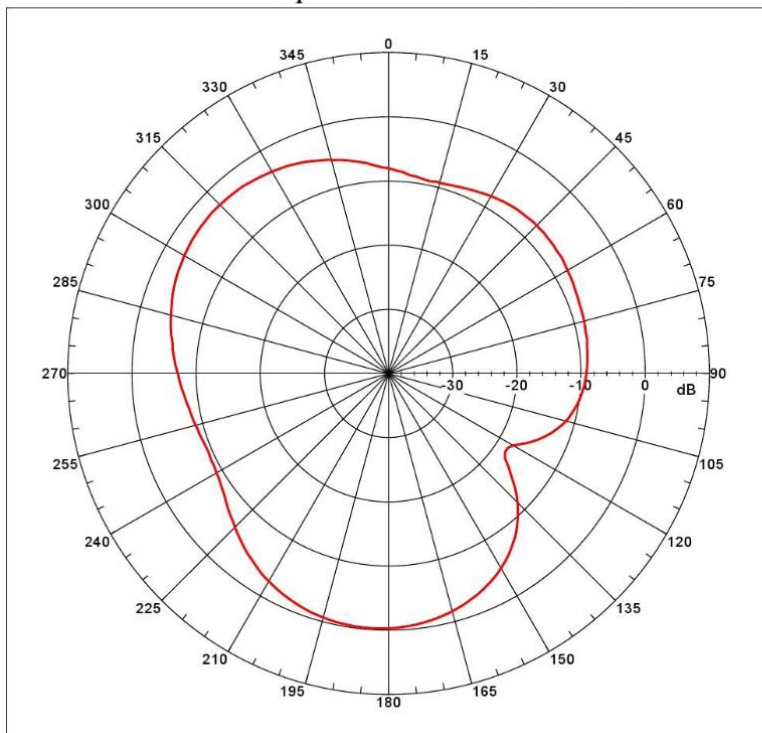
```

Far-field amplitude, Eprinciple: Linear, Tau = 0.000 deg
Gain = 0.25304 dBi
Max far-field (global) = -41.03864 dB, Max far-field (plot) =
-41.03864 dB
Normalization: Reference, Network offset = 0.000 dB
Vpeak at: -178.000 deg, Vpeak at: 0.000 deg
Plot centering: On

R30-GSM-E
NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\R3
0\GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-97
Far-field Cut Analysis:
Avg value: -5.888 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: -3.18 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 5
Beam Frequency Azimuth Elevation Pol
-----
1 0.900 GHz Azimuth Elevation Single-pol
  
```

Antenna Pattern (900MHz)

Far-field amplitude of R30-GSM-E.nsi



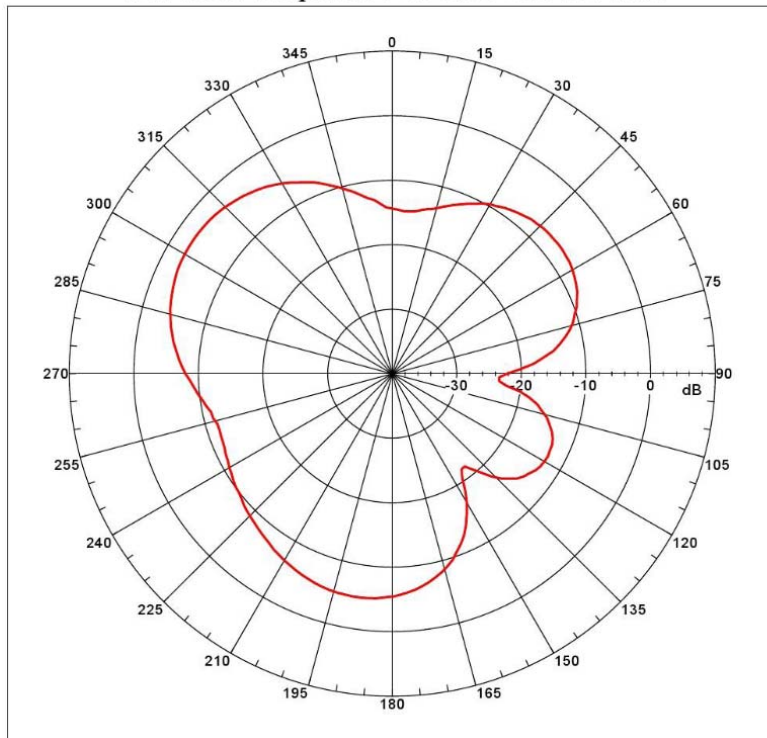
```

Far-field amplitude, Eprinciple: Linear, Tau = 0.000 deg
Gain = -0.23281 dBi
Max far-field (global) = -41.79249 dB, Max far-field (plot) =
-41.79249 dB
Normalization: Reference, Network offset = 0.000 dB
Vpeak at: -178.000 deg, Vpeak at: 0.000 deg
Plot centering: On

R30-GSM-E
NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\R3
0\GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-97
Far-field Cut Analysis:
Avg value: -5.888 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: -2.56 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 5
Beam Frequency Azimuth Elevation Pol
-----
2 0.900 GHz Azimuth Elevation Single-pol
  
```

Antenna Pattern (960MHz)

Far-field amplitude of R30-GSM-E.nsi



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Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg
Gain = -2.90828 dBi
Max far-field (global) = -45.53795 dB, Max far-field (plot) =
-45.53795 dB
Normalization: Reference, Network offset = 0.000 dB
Hpeak at: -58.00001 deg, Vpeak at: 0.000 deg
Plot centering: On

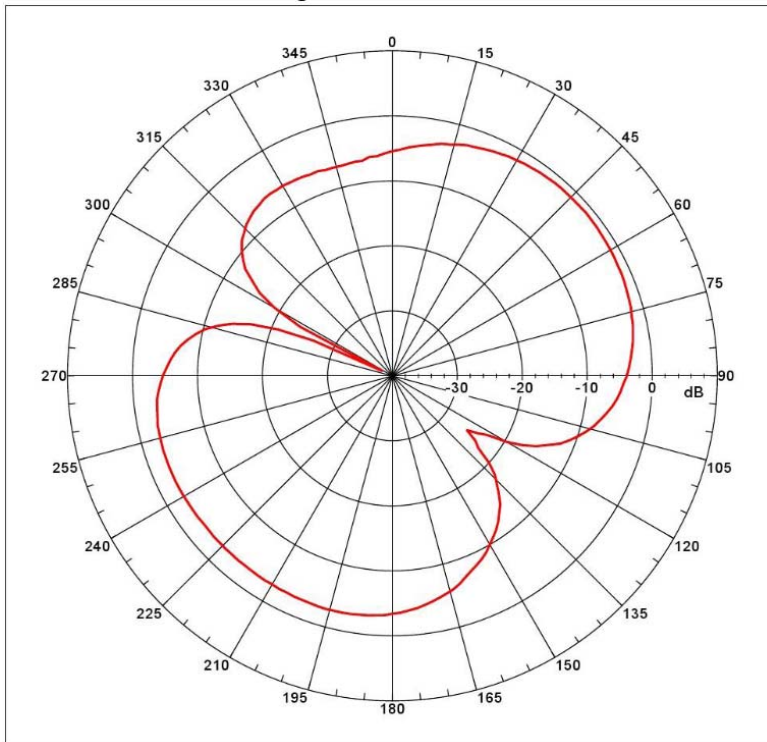
R30-GSM-E

NSI2000 V4.0.124, Filename: C:\Documents and Settings\NSI\Desktop\R3
0 GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-57
Far-field Cut Analysis:
Avg value: -8.914 dB
-3. dB beam width: 52.23 deg
-6. dB beam width: 73.73 deg
-10. dB beam width: Not Found
Left Sidelobe: -2.01 dB at -166.544 deg
Right Sidelobe: -4.47 dB at 53.256 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 9
Beam Frequency Azimuth Elevation Pol
----
3 0.960 GHz Azimuth Elevation Single-pol
  
```

Antenna Pattern (1710MHz)

Far-field amplitude of R30-GSM-E.nsi



```

Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg
Gain = -1.06512 dBi
Max far-field (global) = -46.26071 dB, Max far-field (plot) =
-46.26071 dB
Normalization: Reference, Network offset = 0.000 dB
Hpeak at: 49.99999 deg, Vpeak at: 0.000 deg
Plot centering: On

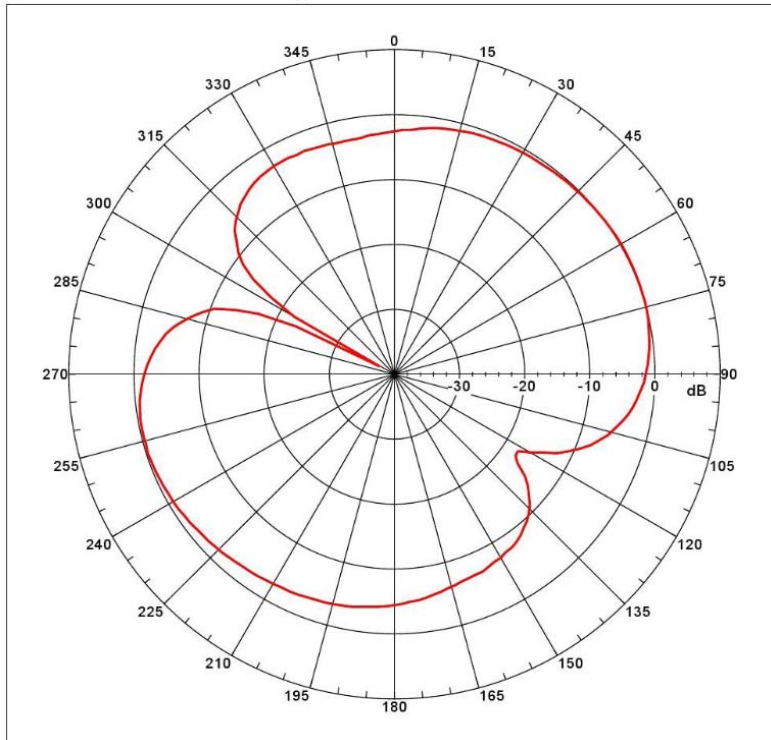
R30-GSM-E

NSI2000 V4.0.124, Filename: C:\Documents and Settings\NSI\Desktop\R3
0 GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-57
Far-field Cut Analysis:
Avg value: -5.183 dB
-3. dB beam width: 52.27 deg
-6. dB beam width: 143.12 deg
-10. dB beam width: 163.38 deg
Left Sidelobe: -1.96 dB at -107.598 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 9
Beam Frequency Azimuth Elevation Pol
----
4 1.710 GHz Azimuth Elevation Single-pol
  
```

Antenna Pattern (1800MHz)

Far-field amplitude of R30-GSM-E.nsi



```

Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg
Gain = 0.17236 dBi
Max far-field (global) = -46.64968 dB, Max far-field (plot) =
-46.64968 dB
Normalization: Reference, Network offset = 0.000 dB
Hpeak at: 59.99999 deg, Vpeak at: 0.000 deg
Plot centering: On

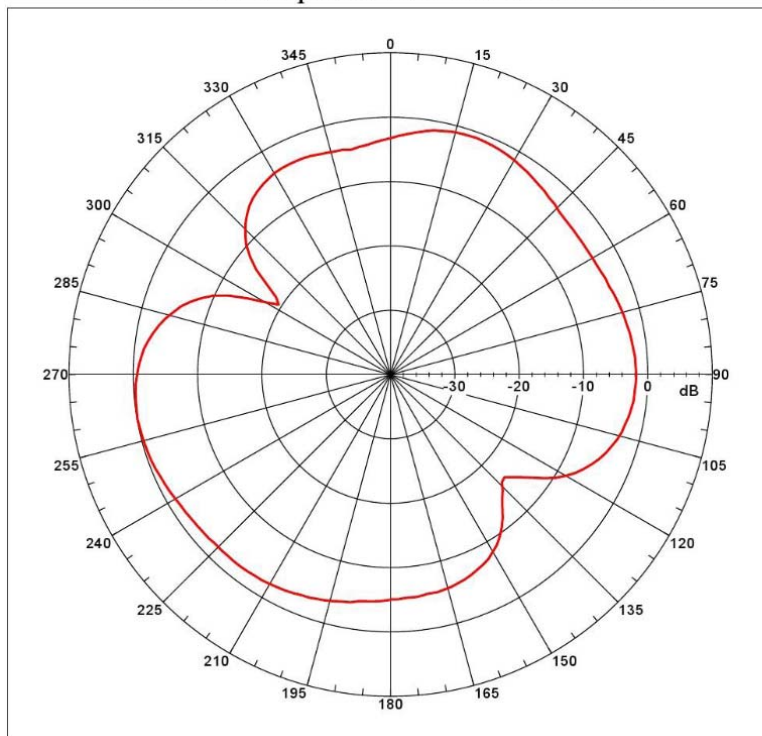
R30-GSM-E

NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\R3
0-GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-97
Far-field Cut Analysis:
Avg value: -3.374 dB
-3. dB beam width: 100.13 deg
-6. dB beam width: 151.71 deg
-10. dB beam width: 165.84 deg
Left Sidelobe: -0.51 dB at -103.575 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 9
Beam Frequency Azimuth Elevation Pol
-----
5 1.800 GHz Azimuth Elevation Single-pol
  
```

Antenna Pattern (1890MHz)

Far-field amplitude of R30-GSM-E.nsi



```

Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg
Gain = -0.082 dBi
Max far-field (global) = -46.93411 dB, Max far-field (plot) =
-46.93411 dB
Normalization: Reference, Network offset = 0.000 dB
Hpeak at: -100.00001 deg, Vpeak at: 0.000 deg
Plot centering: On

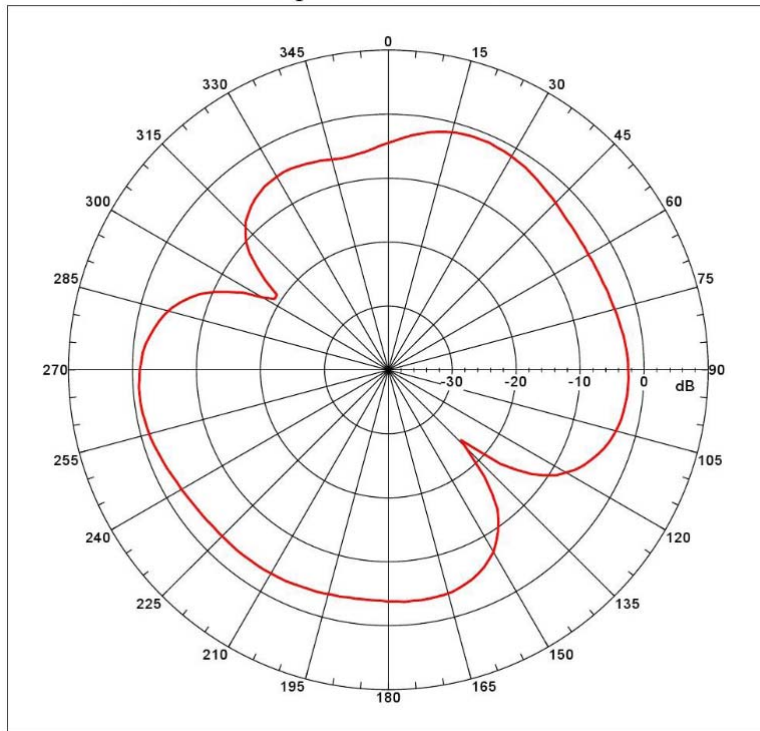
R30-GSM-E

NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\R3
0-GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-97
Far-field Cut Analysis:
Avg value: -3.887 dB
-3. dB beam width: 81.15 deg
-6. dB beam width: Not Found
-10. dB beam width: Not Found
Left Sidelobe: Not Found
Right Sidelobe: -3.64 dB at -23.128 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 9
Beam Frequency Azimuth Elevation Pol
-----
6 1.890 GHz Azimuth Elevation Single-pol
  
```

Antenna Pattern (1920MHz)

Far-field amplitude of R30-GSM-E.nsi



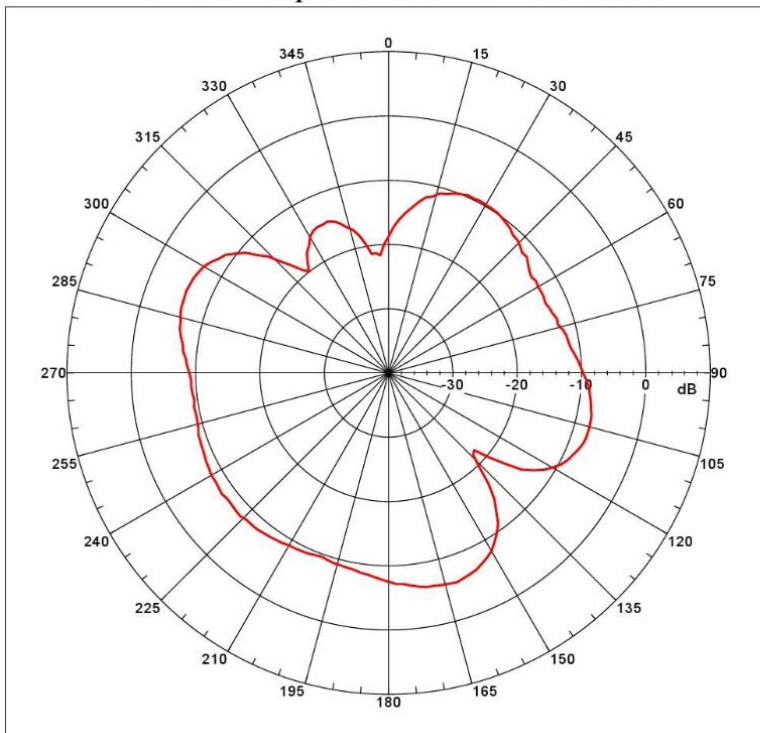
```

Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg
Gain = -0.81931 dB
Max far-field (global) = -48.37105 dB, Max far-field (plot) =
-48.37107 dB
Normalization: Reference, Network offset = 0.000 dB
Hpeak at: -58.00001 deg, Vpeak at: 0.000 deg
Plot centering: On

R30-GSM-E
NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\R3
0-GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-97
Far-field Cut Analysis:
Avg value: -4.288 dB
-3. dB beam width: 97.65 deg
-6. dB beam width: Not Found
-10. dB beam width: Not Found
Left Sidelobe: Not Found
Right Sidelobe: -4.11 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 9
Beam Frequency Azimuth Elevation Pol
-----
7 1.920 GHz Azimuth Elevation Single-pol
  
```

Antenna Pattern (2100MHz)

Far-field amplitude of R30-GSM-E.nsi



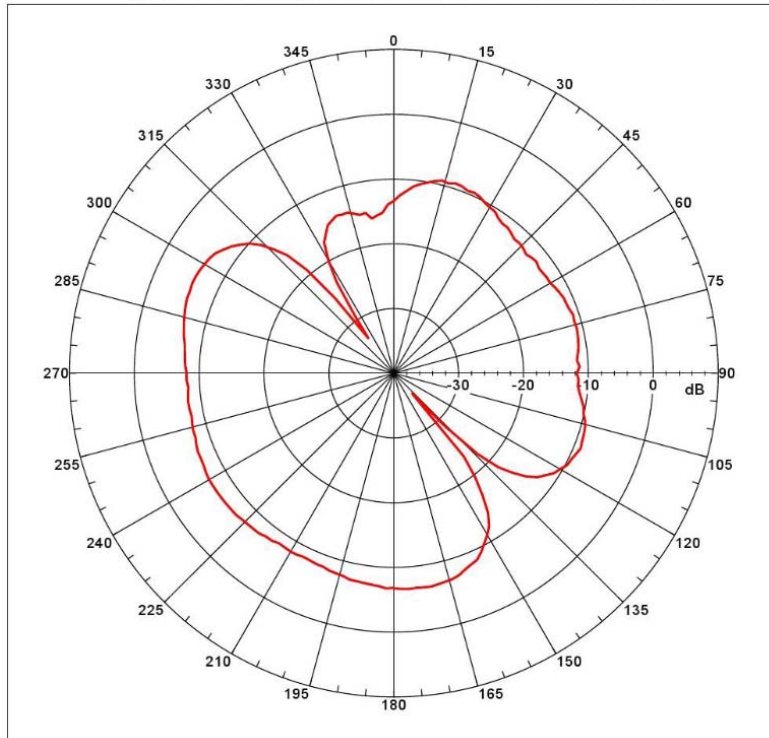
```

Far-field amplitude, Eprincipal: Linear, Tau = 0.000 deg
Gain = -5.72849 dB
Max far-field (global) = -53.05519 dB, Max far-field (plot) =
-53.0554 dB
Normalization: Reference, Network offset = 0.000 dB
Hpeak at: 107.590 deg, Vpeak at: 0.000 deg
Plot centering: On

R30-GSM-E
NSI2000 V4.0.124, Filename:C:\Documents and Settings\NSI\Desktop\R3
0-GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-97
Far-field Cut Analysis:
Avg value: -10.122 dB
-3. dB beam width: Not Found
-6. dB beam width: Not Found
-10. dB beam width: Not Found
Left Sidelobe: -1.64 dB at 107.590 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 9
Beam Frequency Azimuth Elevation Pol
-----
8 2.100 GHz Azimuth Elevation Single-pol
  
```

Antenna Pattern (2170MHz)

Far-field amplitude of R30-GSM-E.nsi



```

Far-field amplitude, Epsincipal: Linear, Tau = 0.000 deg
Gain = -3.5274 dB!
Max far-field (global) = -33.51951 dB, Max far-field (plot) =
-53.51956 dB
Normalisation: Reference, Network offset = 0.000 dB
Hpeak at: -66.00001 deg, Vpeak at: 0.000 deg
Plot centering: On

R30-GSM-E
NSI2000 V4.0.124, Filename:C:\Documents and Settings\WSI\Desktop\R3
0\GSM-CH07\R30-GSM-E.nsi
Measurement date/time: 3/4/2016 3:11:19 PM, Filetype: NSI-97
Far-field Cut Analysis:
Avg value: -9.876 dB
-3. dB beam width: Not Found
-6. dB beam width: Not Found
-10. dB beam width: Not Found
Left Sidelobe: -1.16 dB at -116.665 deg
Right Sidelobe: -0.14 dB at -15.106 deg
Far-field display setup
Azimuth (deg)
Span = 260.00001 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 9
Beam Frequency Azimuth Elevation Pol
-----
9 2.170 GHz Azimuth Elevation Single-pol
  
```