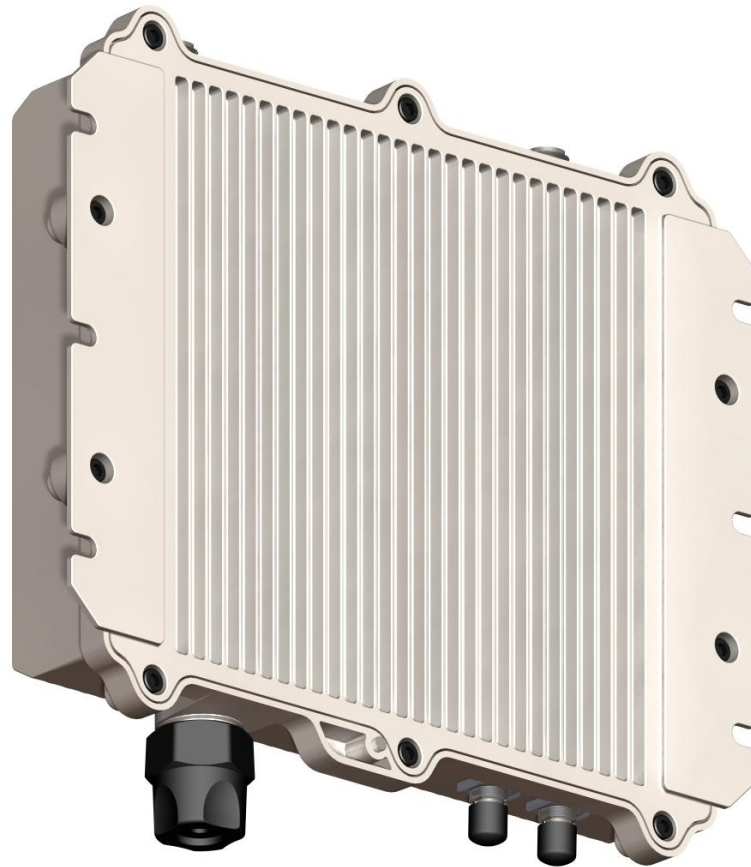


# RDL-3000

## *Broadband Wireless Radio Platform*



## Antenna Guide

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# 1 Antenna Specifications

This document provides technical details of available antennas for the RDL-3000 broadband wireless product.

| Table 1: RDL-3000 Antennas |      |            |                       |                          |
|----------------------------|------|------------|-----------------------|--------------------------|
| Redline Order #            | App. | Gain (dBi) | Type                  | Redline Mounting Bracket |
| A9014MTD                   | SC   | 14         | 90°<br>Panel, Dual    | 3K-HD-MNT                |
| A6015MTD                   | SC   | 15         | 60°<br>Panel, Dual    | 3K-HD-MNT                |
| A2308MFD                   | SS.  | 23         | 8°<br>Panel, Dual     | 3K-LW-MNT*<br>3K-HD-MNT  |
| A2FT2906LTPD               | SS   | 29         | 6°<br>Parabolic, Dual | 3K-SA-MNT                |
| A3FT3204LTPD               | SS   | 32         | 4°<br>Parabolic, Dual | 3K-SA-MNT                |

\*Recommended mounting.

### Important Notice:

Operation in some frequency bands may be subject to license. Use of some antennas listed in this guide may not be allowed in your region (refer to product User Manuals). Contact authorities in the country of installation for complete information regarding the licensing regime and operating restrictions for that regulatory domain.

## 1.1 A9014MTD Sector Antenna

Sector , 14 dBi, 90 degree, dual polarity, 4.9-5.95 GHz

|                                   |   |                 |                |              |
|-----------------------------------|---|-----------------|----------------|--------------|
| <b>Regulatory</b>                 |   |                 |                |              |
| Compliance                        | RoHS , CE 0682                            |                 |                |              |
| <b>Electrical</b>                 |   |                 |                |              |
| Frequency range                   | 4.9 – 5.95 GHz                            |                 |                |              |
| Gain                              | 14 dBi (min.)                             |                 |                |              |
| VSWR                              | 2 :1 (max) 1.7 : 1 (typ)                  |                 |                |              |
| Azimuth beam width                | Port V: 90°(typ) @11 dBi Gain             |                 |                |              |
|                                   | Port H: 90°(typ) @10 dBi Gain             |                 |                |              |
| 3 dB elevation beam width         | 8° (typ)                                  |                 |                |              |
| Polarization                      | Dual Linear Vertical + Horizontal         |                 |                |              |
| FtB ratio                         | 25 dB (typ)                               |                 |                |              |
| PtP isolation                     | 30 dB (min)                               |                 |                |              |
| Cross polarization                | -25 dB (typ) , -15 dB (max)               |                 |                |              |
| EI side lobe level                | -10 dB (typ.)                             |                 |                |              |
| Input impedance                   | 50 (ohm)                                  |                 |                |              |
| Input power                       | 20 W (max)                                |                 |                |              |
| Lightning protection              | DC Grounded                               |                 |                |              |
| <b>Mechanical</b>                 |   |                 |                |              |
| Dimensions                        | 500 x 200 x 30 mm (max)                   |                 |                |              |
| Connector                         | 2 x N –type female                        |                 |                |              |
| Weight                            | 1.5 (kg)                                  |                 |                |              |
| Base plate                        | Aluminum with chemical conversion coating |                 |                |              |
| Radome                            | Plastic                                   |                 |                |              |
| Radome thickness                  | 2.0 ± 0.2 mm                              |                 |                |              |
| <b>Environmental</b>              |   |                 |                |              |
| <b>Test</b>                       | <b>Standard</b>                           | <b>Duration</b> | <b>Temp.</b>   | <b>Notes</b> |
| Low temperature                   | IEC 68-2-1                                | 72 h            | -55°C          | -            |
| High temperature                  | IEC 68-2-2                                | 72 h            | +71°C          | -            |
| Temp. Cycling                     | IEC 68-2-14                               | 1 h             | -45°C<br>+70°C | 3 Cycles     |
| Vibration                         | IEC 60721-3-4                             | 30 min/axis     | -              | Random 4M5   |
| Shock mechanical                  | IEC 60721-3-4                             | -               | -              | 4M5          |
| Humidity                          | ETSI EN300-2-4<br>T4.1E                   | 144 h           | -              | 95%          |
| Water tightness                   | IEC 529                                   | -               | -              | IP67         |
| Solar radiation                   | ASTM G 53                                 | 1000 h          | -              | -            |
| Flammability                      | UL 94                                     | -               | -              | Class HB     |
| Salt spray                        | IEC 68-2-11 Ka                            | 500 h           | -              | -            |
| Ice and snow                      | -   | -               | -              | 25mm Radial  |
| Wind speed survival               | -   | -               | -              | 220 Km/h     |
| Operation                         | -   | -               | -              | 160 Km/h     |
| Wind load (survival) front thrust | -   | -               | -              | 26.8 Kg      |
| Side thrust                       | -   | -               | -              | 1.3 Kg       |



**Figure 1: A9014MTD Sector Antenna 500 mm (20 in) - Front View**

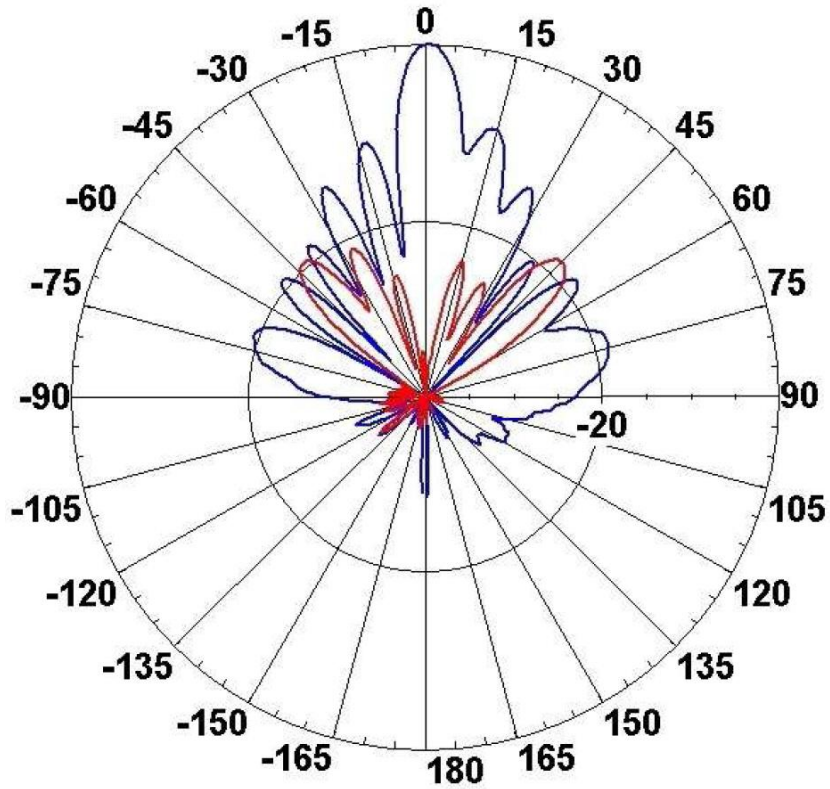


Figure 2: A9014MTD Sector Antenna - 5.25 GHZ E-Plane Pattern

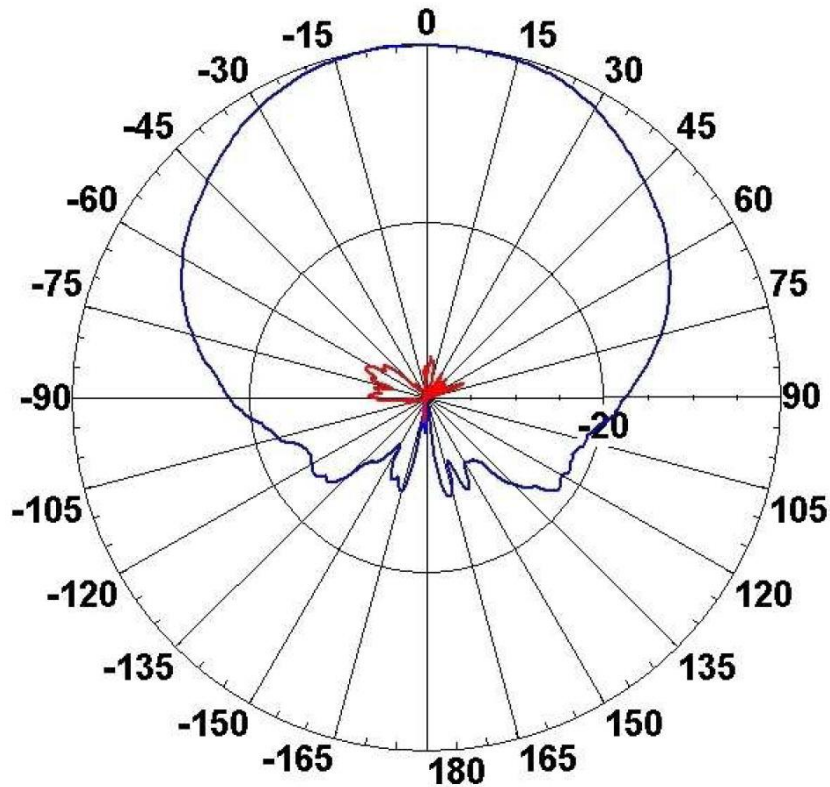


Figure 3: A9014MTD Sector Antenna - 5.25 GHZ A-Plane Pattern

## 1.2 A6015MTD Sector Antenna

Sector, 15 dBi, 60 degree, dual polarity, 4.9-5.95 GHz

|                                   |   |                 |                |              |
|-----------------------------------|---|-----------------|----------------|--------------|
| <b>Regulatory</b>                 |   |                 |                |              |
| Compliance                        | RoHS , CE 0682                            |                 |                |              |
| <b>Electrical</b>                 |   |                 |                |              |
| Frequency range                   | 4.9 – 5.95 GHz                            |                 |                |              |
| Gain                              | 15 dBi (min.) 15.5 dBi (typ.)             |                 |                |              |
| VSWR                              | 2 :1 (max) 1.7 : 1 (typ)                  |                 |                |              |
| 3 dB azimuth beam width           | 60° (typ)                                 |                 |                |              |
| 3 dB elevation beam width         | 8° (typ)                                  |                 |                |              |
| Polarization                      | Dual Linear Vertical + Horizontal         |                 |                |              |
| FtB ratio                         | 20 dB (typ)                               |                 |                |              |
| PtP isolation                     | 22 dB (min)                               |                 |                |              |
| Cross polarization                | -15 dB (typ) , -15 dB (max)               |                 |                |              |
| El side lobe level                | -12 dB (typ.)                             |                 |                |              |
| Input impedance                   | 50 (ohm)                                  |                 |                |              |
| Input power                       | 20 W (max)                                |                 |                |              |
| Lightning protection              | DC Grounded                               |                 |                |              |
| <b>Mechanical</b>                 |   |                 |                |              |
| Dimensions                        | 500 x 200 x 30 mm (max)                   |                 |                |              |
| Connector                         | 2 x N –type female                        |                 |                |              |
| Weight                            | 1.5 (kg)                                  |                 |                |              |
| Base plate                        | Aluminum with chemical conversion coating |                 |                |              |
| Radome                            | Plastic                                   |                 |                |              |
| Radome thickness                  | 2.0 ± 0.2 mm                              |                 |                |              |
| <b>Environmental</b>              |   |                 |                |              |
| <b>Test</b>                       | <b>Standard</b>                           | <b>Duration</b> | <b>Temp.</b>   | <b>Notes</b> |
| Low temperature                   | IEC 68-2-1                                | 72 h            | -55°C          | -            |
| High temperature                  | IEC 68-2-2                                | 72 h            | +71°C          | -            |
| Temp. Cycling                     | IEC 68-2-14                               | 1 h             | -45°C<br>+70°C | 3 Cycles     |
| Vibration                         | IEC 60721-3-4                             | 30 min/axis     | -              | Random 4M5   |
| Shock mechanical                  | IEC 60721-3-4                             | -               | -              | 4M5          |
| Humidity                          | ETSI EN300-2-4<br>T4.1E                   | 144 h           | -              | 95%          |
| Water tightness                   | IEC 529                                   | -               | -              | IP67         |
| Solar radiation                   | ASTM G 53                                 | 1000 h          | -              | -            |
| Flammability                      | UL 94                                     | -               | -              | Class HB     |
| Salt spray                        | IEC 68-2-11 Ka                            | 500 h           | -              | -            |
| Ice and snow                      | -   | -               | -              | 25mm Radial  |
| Wind speed survival               | -   | -               | -              | 220 Km/h     |
| Operation                         | -   | -               | -              | 160 Km/h     |
| Wind load (survival) front thrust | -   | -               | -              | 26.8 Kg      |
| Side thrust                       | -   | -               | -              | 1.3 Kg       |





**Figure 4: A6015MTD Sector Antenna 500 mm (20 in) - Front View**

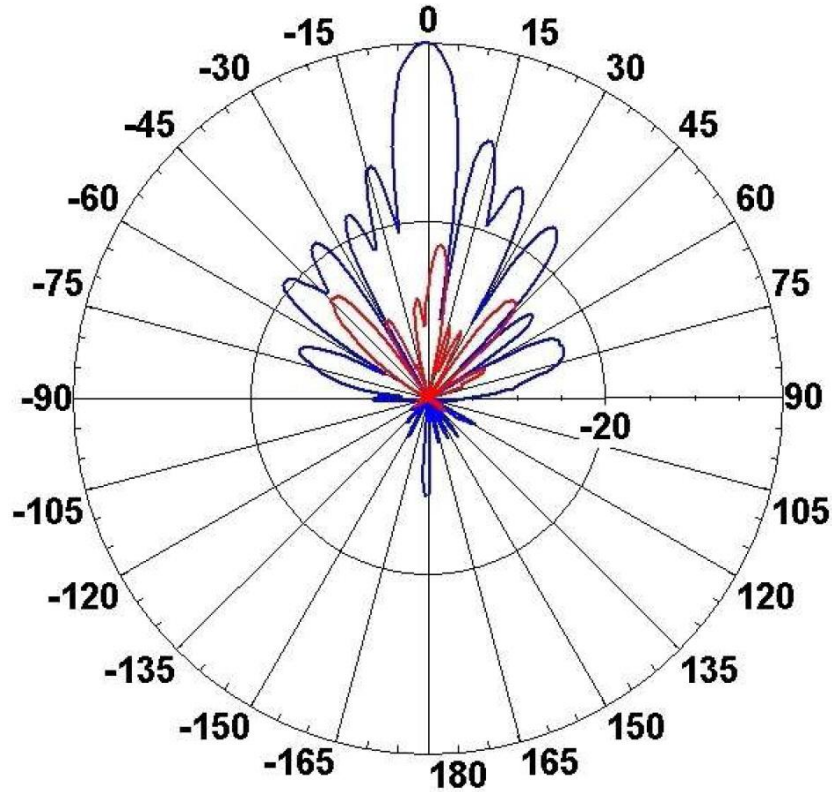


Figure 5: A6015MTD Sector Antenna - 5.25 GHZ E-Plane Pattern

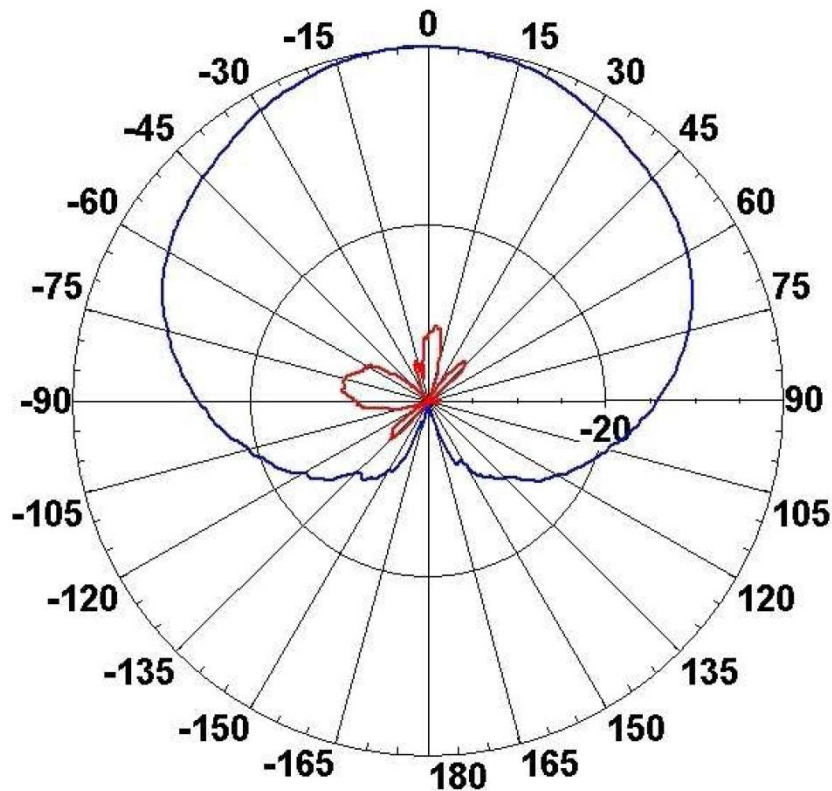


Figure 6: A6015MTD Sector Antenna - 5.25 GHZ A-Plane Pattern

### 1.3 A2308MFD Subscriber/PTP Antenna

Flat panel, 23 dBi, 8 degree, dual polarity, 4.9-5.8 GHz

|  |                      |  |                |  |
|--|----------------------|--|----------------|--|
| <b>Regulatory</b>                                    |                      | ESTI EN 302085 V1.1.2 (2001-02)  |                |  |
| Compliance   |                      | RoHS , CE <sub>0682</sub>  |                |  |
| <b>Electrical</b>                                    |                      |  |                |  |
| Frequency Range                                      |                      | 4.9-5.8 GHz  |                |  |
| Gain @   | Port H               | 21.5 dBi (min) @ 4.900-5.000 GHz<br>22.0 dBi (min) @ 5.000-5.350 GHz<br>23.0 dBi (min) @ 5.350-5.800 GHz<br>22.0 dBi (min) @ 5.800-6.000 GHz |                |  |
| Gain @   | Port V               | 23.0 dBi (min) @ 4.900-5.0 GHz<br>24.0 dBi (min) @ 5.000-5.875 GHz<br>23.0 dBi (min) @ 5.875-6.000 GHz                                       |                |  |
| VSWR   |                      | 2.3:1 (max) @ 4.900 – 4.950 GHz<br>2.0:1 (max), 1.7:1 (typ) @ 4.950 – 5.800 GHz<br>2.5:1 (max) @ 5.800 – 6.000 GHz                           |                |  |
| 3 dB Beam width                                      |                      | 8° (typ)   |                |  |
| Polarization   |                      | Dual Linear (Vertical & Horizontal)  |                |  |
| Side lobes Level                                     |                      | ETSI EN 302 085 V1.1.2 (2001-02), TS1-TS3 @4.9-5.875 GHz   |                |  |
| Cross Polarization                                   |                      | ETSI EN 302 085 V1.1.2 (2001-02), TS1-TS3  |                |  |
| Port To Port Isolation                               |                      | -40 dB (max)   |                |  |
| F/B Ratio  |                      | -35 dB (max)   |                |  |
| Input Impedance                                      |                      | 50 (ohm)   |                |  |
| Input Power  |                      | 6W (max)   |                |  |
| Lightning Protection                                 |                      | DC Grounded  |                |  |
| <b>Mechanical</b>                                    |                      |  |                |  |
| Dimensions (LxWxD)                                   |                      | 371 x 371 x 40 mm (14.6 x 14.5 in) max.  |                |  |
| Weight   |                      | 2.0 Kg (4.4 lb) Max.   |                |  |
| Connector  |                      | Two N-Type female  |                |  |
| Radome   |                      | Plastic PC. (RAL 9002)   |                |  |
| Base Plate   |                      | Aluminum with chemical conversion coating  |                |  |
| <b>Environmental</b>                                 |                      |  |                |  |
| <b>Test</b>  | <b>Standard</b>      | <b>Duration</b>  | <b>Temp.</b>   | <b>Notes</b>                             |
| Low Temperature                                      | IEC 68-2-1           | 72 h   | -55 C          | -  |
| High Temperature                                     | IEC 68-2-2           | 72 h   | +71 C          | -  |
| Temp. Cycling  | IEC 68-2-14          | 1 h  | -45 C to +70 C | 3 Cycles                                 |
| Vibration  | IEC 60721-3-4        | 30 min/axis  | -              | Random 4M3                               |
| Shock Mechanical                                     | IEC 60721-3-4        | -  | -              | 4M3                                      |
| Humidity   | ETSI EN300-2-4 T4.1E | 144 h  | -              | 95%                                      |
| Water Tightness                                      | IEC 529              | -  | -              | IP67                                     |
| Solar Radiation                                      | ASTM G53             | 3000 h   | -              | -  |
| Flammability   | UL 94                | -  | -              | Class HB                                 |
| <b>Test</b>  | <b>Standard</b>      | <b>Duration</b>  | <b>Temp.</b>   | <b>Notes</b>                             |
| Salt Spray   | IEC 68-2-11 Ka       | 500 h  | -              |  |
| Ice And Snow   | -                    | -  | -              | 25 mm (1 in) Radial                      |
| Wind Speed:<br>Survival<br>Operation                 | --                   | --   | --             | 220 Km/h (137 mph)<br>160 Km/h (100 mph) |
| Wind Load (Survival):<br>Front Thrust<br>Side Thrust | --                   | --   | --             | 39.6 kg (87 lbs)<br>4.3 kg (9.5 lbs)     |



**Figure 7: A2308MFD Subscriber/PTP Antenna 371 mm (15 in) - Front View**

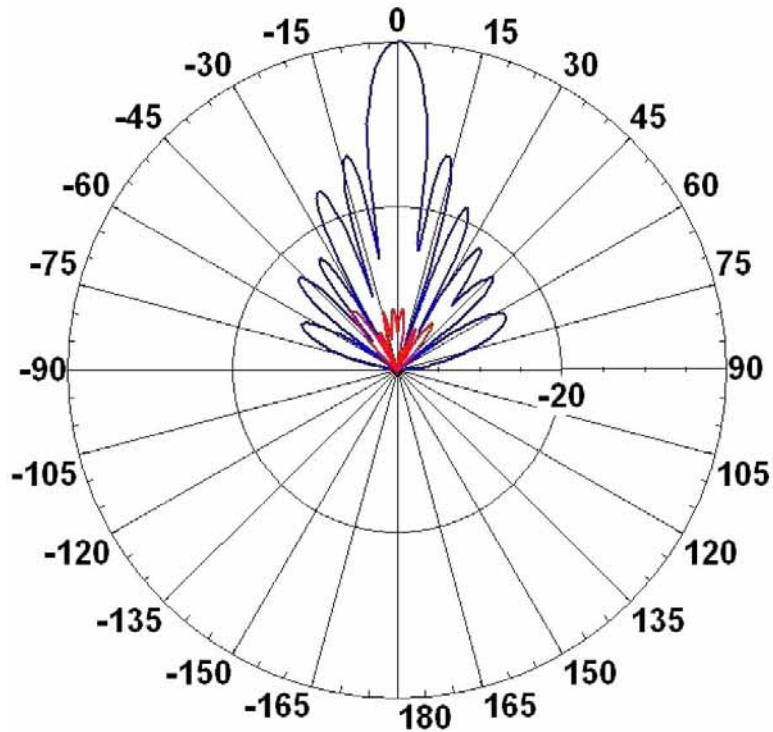


Figure 8: A2308MFD Subscriber/PTP Antenna - 5.7 GHZ E-Plane Pattern

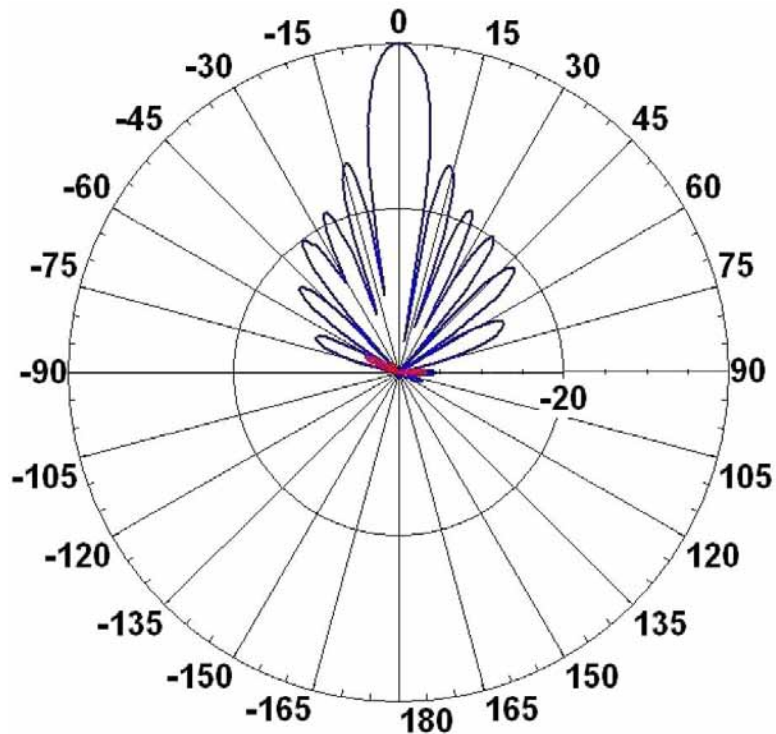


Figure 9: A2308MFD Subscriber/PTP Antenna - 5.7 GHZ A-Plane Pattern

## 1.4 A2FT2906LTPD Subscriber/PTP Antenna

Parabolic, 29 dBi, 6 degree, dual polarity, 4.9-5.8 GHz

| Parameter                          | Min  | Typ          | Max       | Units      |
|------------------------------------|--|--------------|-----------|------------|
| Frequency range (single pol.)      | 4900   |              | 5875      | MHz        |
| Frequency range (dual pol.)        | 4900   |              | 5875      | MHz        |
| VSWR (single pol.)                 |  | 1.5:1        |           |            |
| VSWR (dual pol.)                   |  | 1.8:1        |           |            |
| Impedance                          |  | 50           |           | OHM        |
| Cross-pol. suppression             |  | >30          |           | dB         |
| Sidelobes                          | ETSI EN 302.326-3 DN1-DN5, ETSI EN 300.833 class 1 |              |           |            |
| Port-to-port isolation (dual pol.) |  | >30          |           | dB         |
| Input power                        |  |              | 100       | W          |
| Mechanical downtilt                |  |              | 30        | deg        |
| Pole diameter (OD)                 | 50 (2)   |              | 101.6 (4) | mm (inch)  |
| Operating temperature              | -40  |              | +70       | Centigrade |
|                                    |  | <b>Value</b> |           |            |
| Gain                               |  | 29           |           | dBi        |
| Beamwidth                          |  | 6            |           | degrees    |
| Front-to-back                      |  | >32          |           | dB         |
| Weight                             |  | 8 (17.6)     |           | Kg (lb)    |
| Dimensions (diameter)              |  | 648 (25.5)   |           | mm (inch)  |
| Wind Loading                       |  |              |           |            |
| 100 MPH                            |  | 51 (113)     |           | Kg (lb)    |
| 125 MPH                            |  | 80 (177)     |           |            |



Figure 10: A2FT2906LTPD Subscriber/PTP Antenna 648mm (2 ft) - Front/Side View

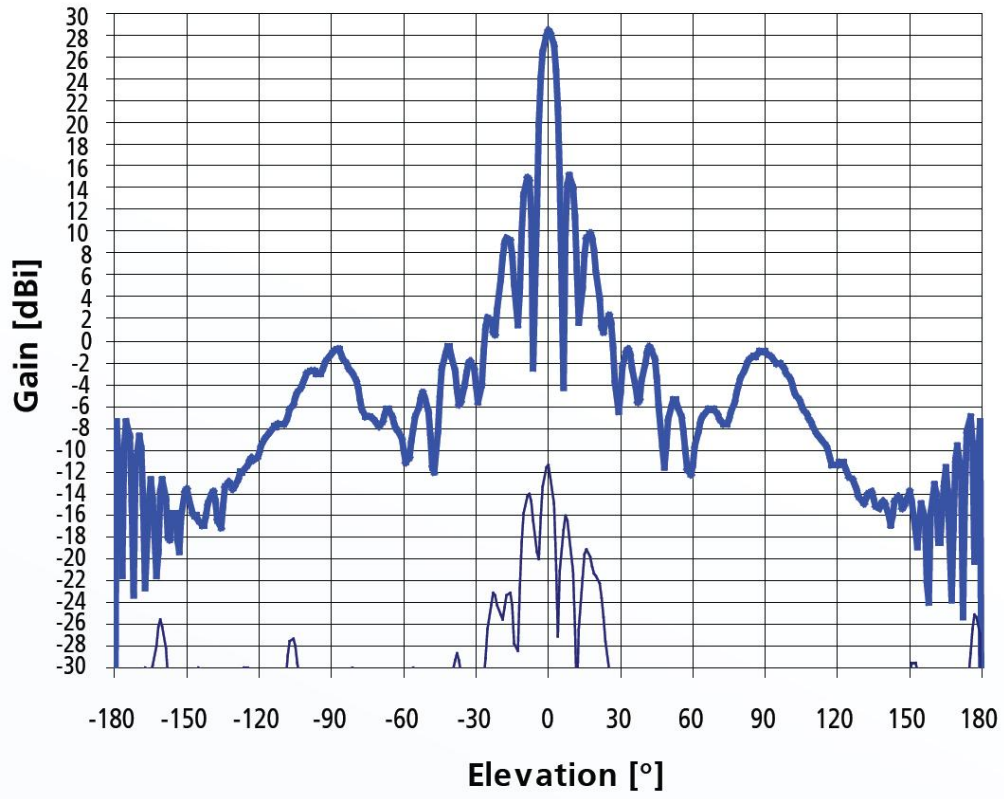


Figure 11: A2FT2906LTPD Subscriber/PTP Antenna - 5.7 GHZ E-Plane Pattern

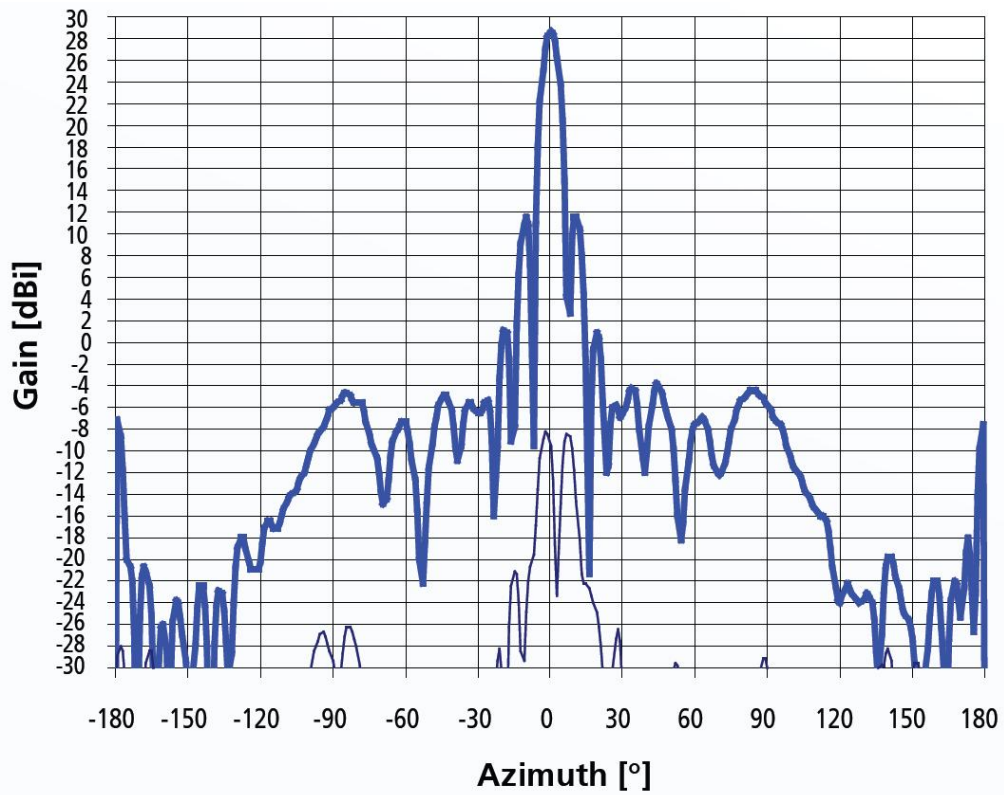


Figure 12: A2FT2906LTPD Subscriber/PTP Antenna - 5.7 GHZ A-Plane Pattern

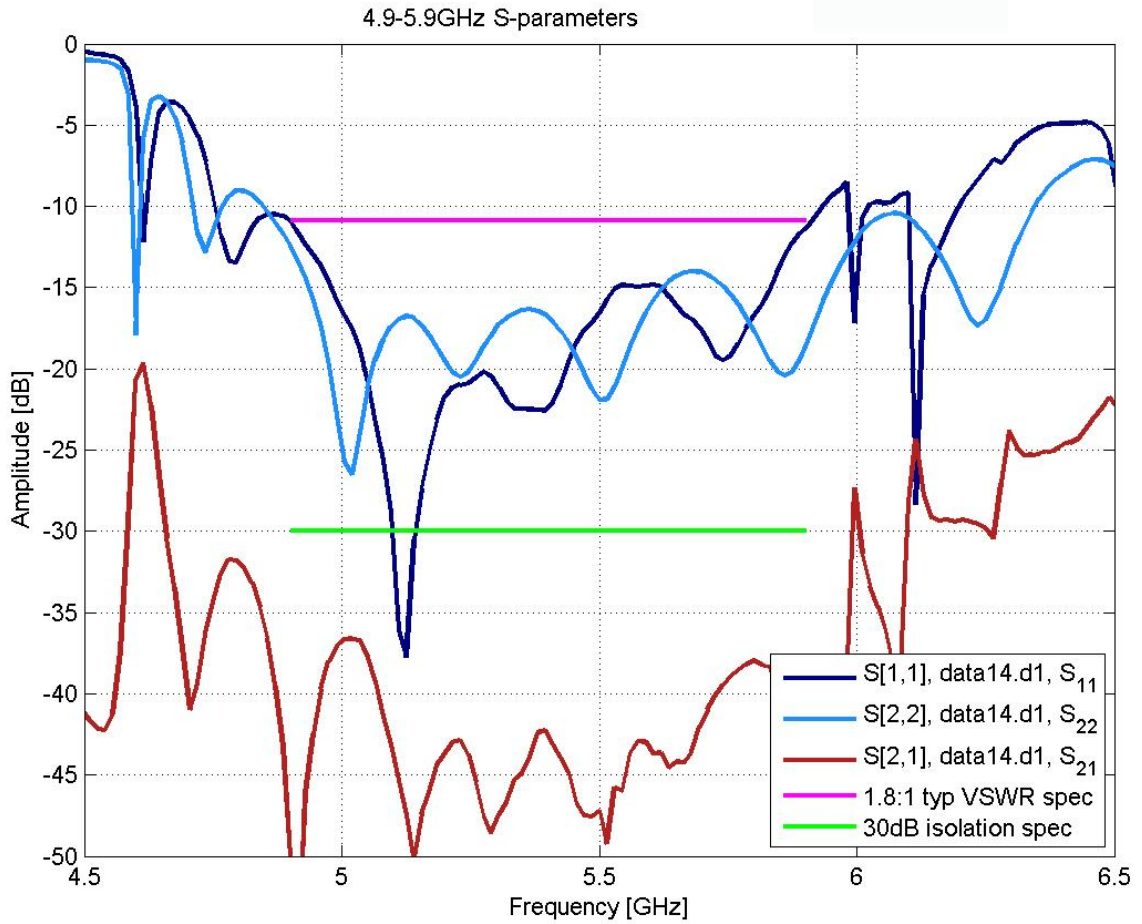


Figure 13: A2FT2906LTPD Subscriber/PTP Antenna - S-Parameters



### 1.5 A3FT3204LTPD Subscriber/PTP Antenna

Parabolic, 32 dBi, 4 degree, dual polarity, 4.9-5.8 GHz

| Parameter                          | Min  | Typ                    | Max       | Units      |
|------------------------------------|--|------------------------|-----------|------------|
| Frequency range (single pol.)      | 4900   |                        | 5875      | MHz        |
| Frequency range (dual pol. )       | 4900   |                        | 5875      | MHz        |
| VSWR (single pol.)                 |  | 1.5:1                  |           |            |
| VSWR (dual pol.)                   |  | 1.8:1                  |           |            |
| Impedance                          |  | 50                     |           | OHM        |
| Cross-pol. suppression             |  | >30                    |           | dB         |
| Port-to-port isolation (dual pol.) |  | >30                    |           | dB         |
| Input power                        |  |                        | 100       | W          |
| Mechanical downtilt                |  |                        | 30        | deg        |
| Pole diameter (OD)                 | 50 (2)   |                        | 101.6 (4) | mm (inch)  |
| Operating temperature              | -40  |                        | 70        | Centigrade |
|                                    |  | <b>Value</b>           |           |            |
| Gain                               |  | 32                     |           | dBi        |
| Beamwidth                          |  | 4                      |           | degrees    |
| Front-to-back                      |  | >38                    |           | dB         |
| Weight                             |  | 10 (22)                |           | Kg (lb)    |
| Dimensions (diameter)              |  | 927 (36.5)             |           | mm (inch)  |
| Wind Loading<br>100 MPH<br>125 MPH |  | 182 (400)<br>116 (256) |           | Kg (lb)    |
| Sidelobes                          | ETSI EN 302.326-3 DN1-DN5, ETSI EN 300.833 class 1 |                        |           |            |



Figure 14: A3FT3204LTPD Subscriber/PTP Antenna 927 mm (3 ft) - Front/Side View

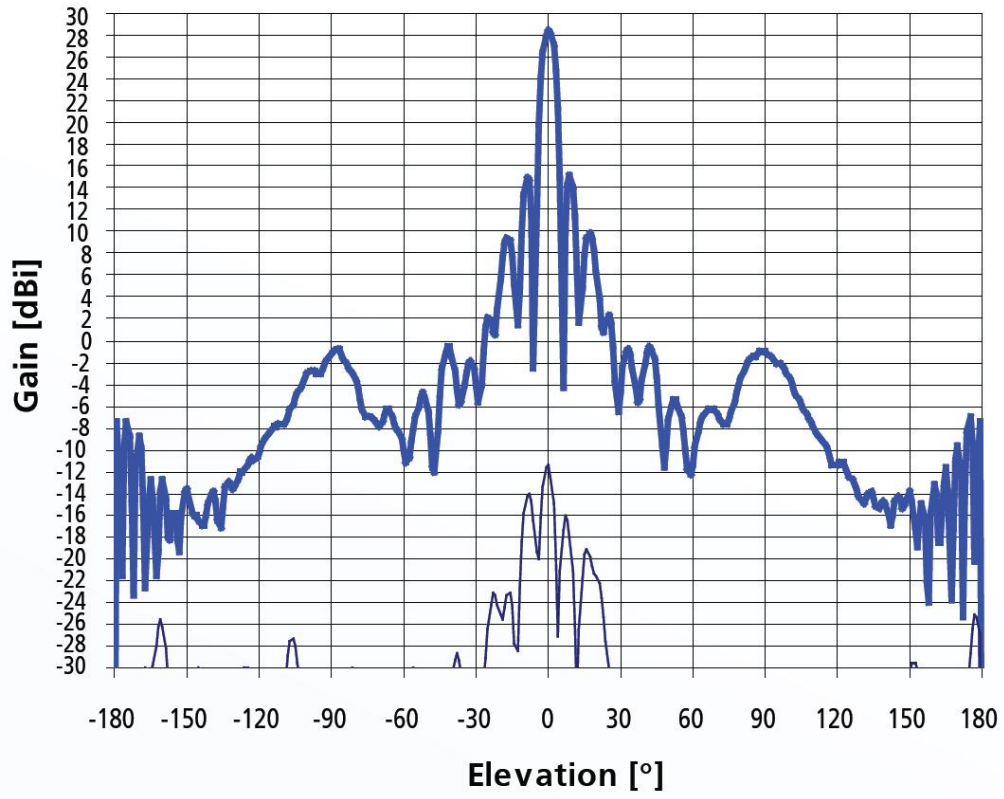


Figure 15: A3FT3204LTPD Subscriber/PTP Antenna - 5.7 GHZ E-Plane Pattern

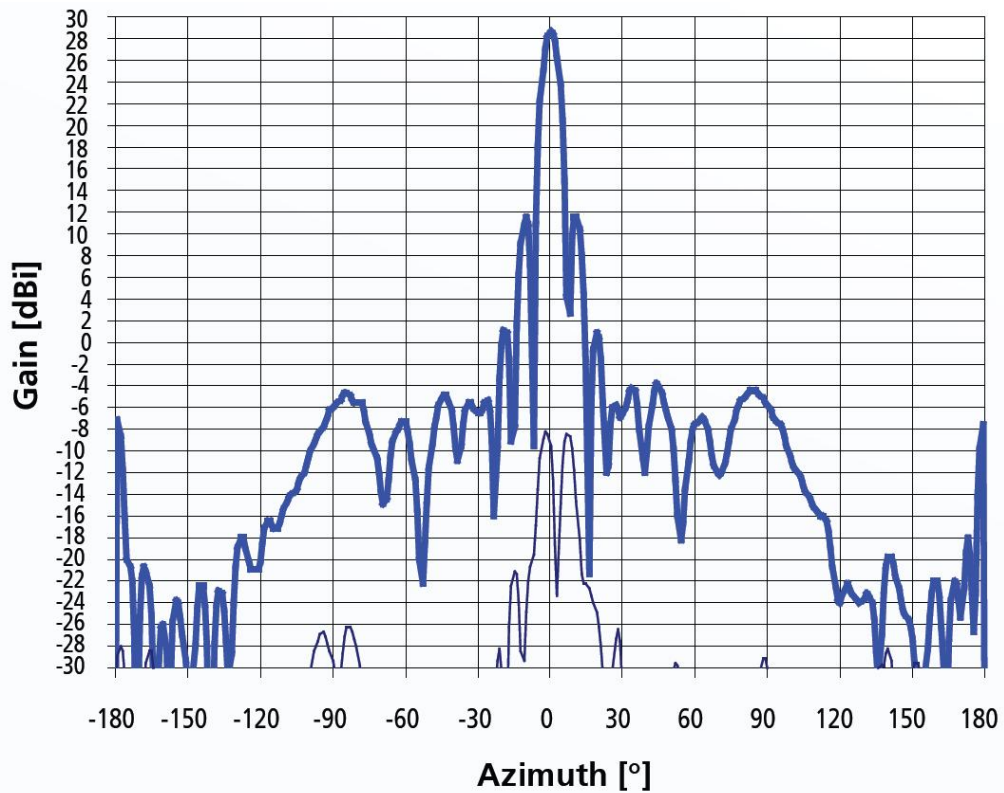


Figure 16: A3FT3204LTPD Subscriber/PTP Antenna - 5.7 GHZ A-Plane Pattern

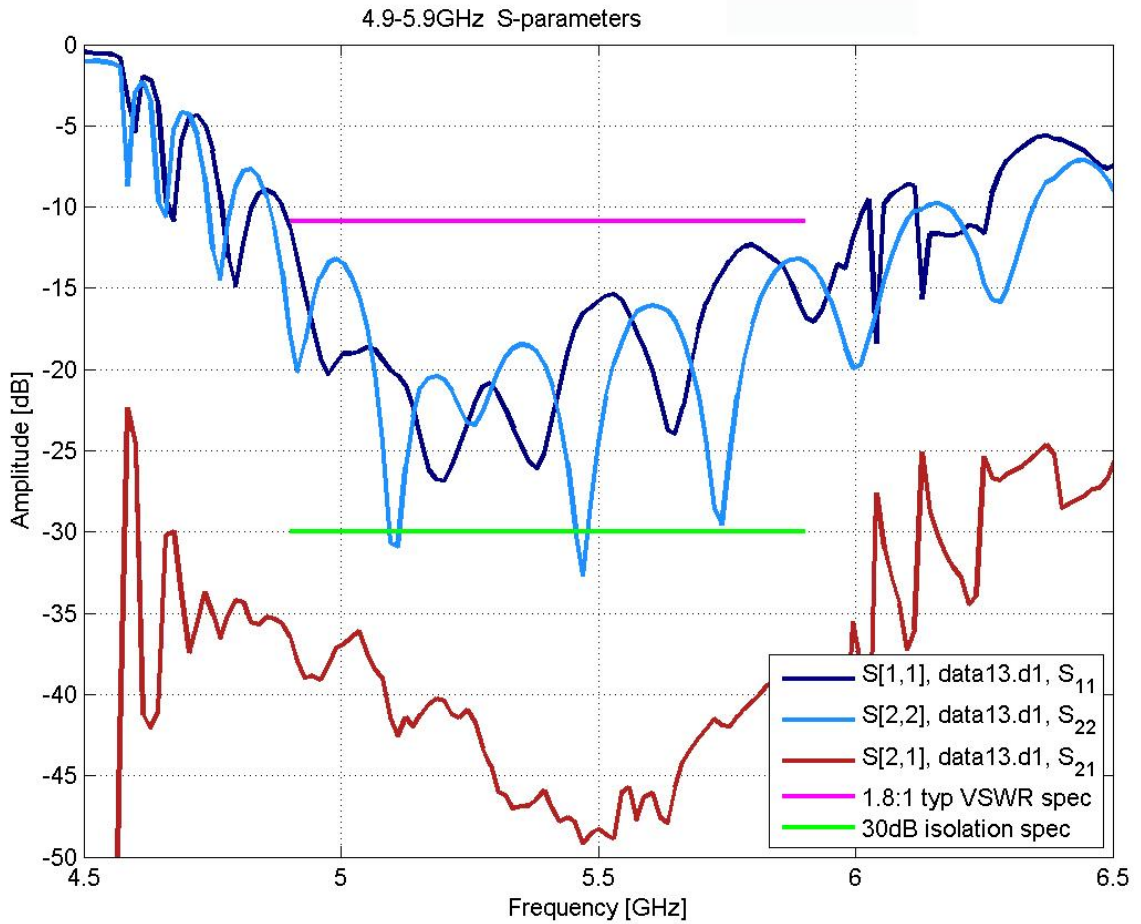


Figure 17: A3FT3204LTPD Subscriber/PTP Antenna - S-Parameters

