



## Satellite IoT D2D Ready

# TN & NTN Dual-Mode Antenna - Satellite IoT Direct to Device Ready

## Direct Mount Multi-Port MIMO Antenna Covering 4G/5G/Satellite Band 25

The 3-port L001256-01 direct to device (D2D) antenna offers multi-protocol to support multiple applications with one antenna. They support high quality 2G, 3G, 4G, 5G, Band 25 Cellular.

They are engineered for high reliability and they support 2x2 MIMO for better throughput. The L001256-01 antenna is an excellent addition to new designs, or as a replacement for existing SISO phantom antennas suitable for both metallic and non-metallic surfaces.

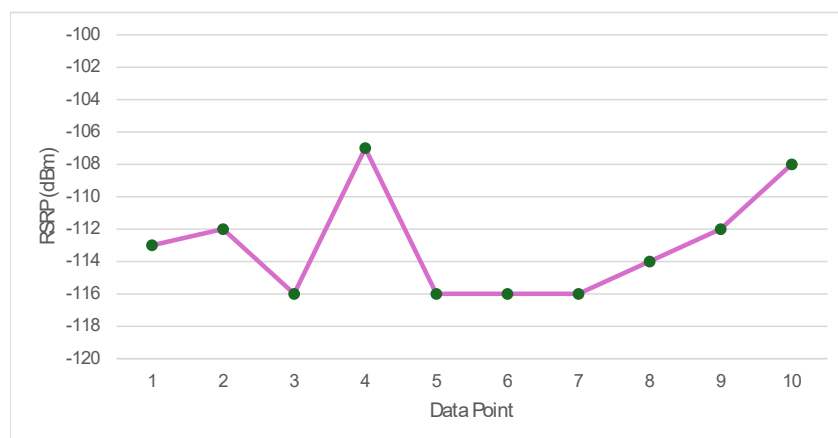
## SATELLITE IOT D2D COMMUNICATIONS

Low Earth Orbit (LEO) satellites, positioned a few hundred km's above Earth, orbit rapidly and are ideal for IoT networks. A LEO satellite constellation can now support low data rate communications through specific LTE frequencies.

- Dual-mode capable - Supporting Terrestrial Networks (TN) and Non-Terrestrial Networks (NTN) from a single antenna
  - 698-3800 MHz terrestrial cellular coverage
  - Band 25 (1900 MHz) cellular satellite coverage
    - Testing available for other/future cellular satellite D2D frequency bands used by various network providers
- Enabling dual-mode communications via IoT devices
  - Prioritizing terrestrial networks but capable of automatically switching to satellite when the signal is weak or unavailable

## REFERENCE SIGNAL RECEIVED POWER (RSRP) VALUES

The L001256-01 antenna was live-tested for receive signal strength. Data encompasses multiple satellite pass-overs, showing signal strength variation; exceeding the -120 dBm minimum for IoT devices.



An RSRP value of -120 dBm is generally the recognized minimum requirement suitable for the data rates of SMS, CAT-1, CAT-1 Bis connectivity.

RSRP can be susceptible to fluctuations for a variety of reasons. These can include: satellite elevation angle; antenna radiation patterns; solar flares; atmospheric conditions, and more.

## FEATURES AND BENEFITS

- Validated for use on satcom D2D networks
- Dual-Mode TN and NTN capable
- High gain patterns
- Rugged and IP67 rated
- Suitable for vehicle and fixed position installations

## APPLICATIONS

- Non-Terrestrial and Terrestrial Networks
- Satellite IoT D2D (Direct to Device) applications
- IoT and M2M
- Smart metering and AMI
- Remote monitoring and control
- Industrial and energy
- Automation, robotics, and AI

## CONFIGURATION

| PART NUMBER | CABLE TYPE             | CABLE LENGTH    | CONNECTOR | COLOR |
|-------------|------------------------|-----------------|-----------|-------|
| L001256-01  | LMR®-195 or equivalent | 610 mm (24 in.) | SMA- male | Black |

| ELECTRICAL SPECIFICATIONS                    |                      |         |         |         |           |           |           |           |           |           |
|----------------------------------------------|----------------------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| Antenna Model                                | L001256-01           |         |         |         |           |           |           |           |           |           |
| Number of Ports                              | 2                    |         |         |         |           |           |           |           |           |           |
| Operating Frequency (MHz)                    | 617-698              | 698-824 | 824-894 | 880-960 | 1350-1550 | 1690-1880 | 1850-1990 | 1910-2180 | 2300-2500 | 2500-2700 |
| Peak Gain - Average (dBi)*                   | 2.4                  | 3.1     | 2.8     | 2.7     | 2.7       | 3.6       | 3.9       | 3.5       | 3.6       | 2.9       |
| Peak Gain - Max (dBi)*                       | 3.2                  | 4.0     | 4.0     | 3.4     | 4.7       | 4.1       | 4.1       | 4.2       | 4.0       | 3.4       |
| Peak Gain- Max, No Ground Plane (dBi)        | 3.6                  | 3.9     | 5.1     | 5.1     | 2.5       | 3.1       | 2.9       | 2.8       | 2.6       | 2.8       |
| VSWR - Max*                                  | 2.5                  |         |         |         |           |           |           |           |           |           |
| VSWR - Max, No Ground Plane                  | 3.0                  |         |         |         |           |           |           |           |           |           |
| VSWR Average*, Port 1                        | 1.4                  | 1.8     | 1.9     | 1.9     | 1.5       | 1.3       | 1.4       | 1.8       | 1.8       | 1.9       |
| VSWR Average*, Port 2                        | 1.4                  | 1.8     | 1.9     | 1.9     | 1.5       | 1.3       | 1.4       | 1.8       | 1.8       | 1.8       |
| Port-to-Port Isolation* (dB)                 | -8                   | -10     | -10     | -10     | -15       | -17       | -18       | -18       | -18       | -25       |
| Port-to-Port Isolation, No Ground Plane (dB) | -7                   | -7      | -8      | -8      | -15       | -23       | -22       | -21       | -24       | -30       |
| Nominal Impedance (Ohms)                     | 50                   |         |         |         |           |           |           |           |           |           |
| Polarization                                 | Linear vertical      |         |         |         |           |           |           |           |           |           |
| Azimuth Beamwidth (°)                        | 360, Omnidirectional |         |         |         |           |           |           |           |           |           |
| Max Power - Ambient 25°C (W)                 | 50                   |         |         |         |           |           |           |           |           |           |

\* - Measured on a one-foot ground plane.

## MECHANICAL SPECIFICATIONS

|                                      |                                    |
|--------------------------------------|------------------------------------|
| Dimensions - L x W x H - mm (inches) | 130 x 84 x 95 (5.12 x 3.31 x 3.74) |
| Weight - g (oz.)                     | 343 (12.1)                         |
| Radome/Baseplate Material            | PC, UL94 V0 Rating, UV Stable      |

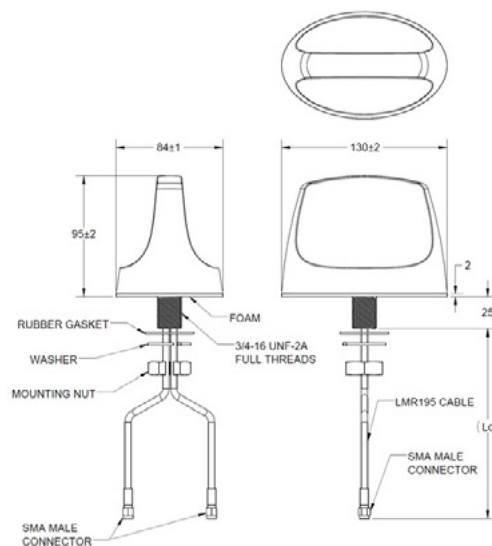
## ENVIRONMENTAL SPECIFICATIONS

|                                 |                                               |
|---------------------------------|-----------------------------------------------|
| Operating Temperature - °C (°F) | -30 to +70°C (-22 to +158°F)                  |
| Storage Temperature - °C (°F)   | -40 to +85°C (-40 to +185°F)                  |
| Material Substance Compliance   | RoHS                                          |
| Ingress Protection              | IP67 (when installed on a hard, flat surface) |

## PACKAGING INFORMATION

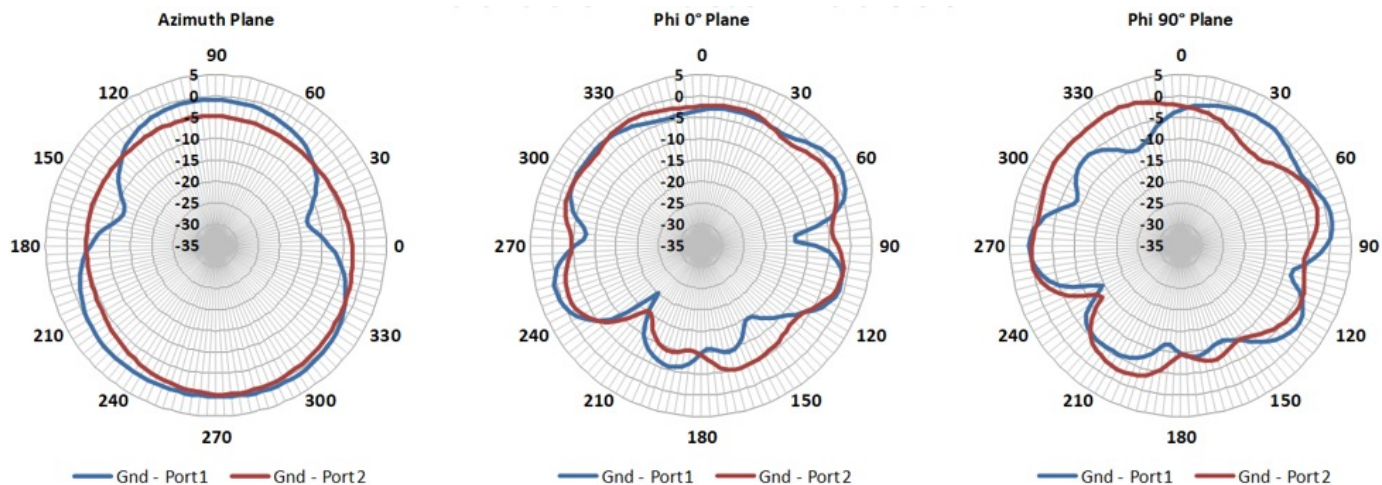
| PACKAGED DIMENSIONS         | MASTER CARTON | AIR PALLET  | OCEAN PALLET |
|-----------------------------|---------------|-------------|--------------|
| Number of Antennas          | 20            | 480         | 600          |
| Height - cm (in.)           | 30.0 (11.8)   | 135 (53.2)  | 165 (65.0)   |
| Length - cm (in.)           | 52.5 (20.7)   | 105 (41.3)  | 105 (41.3)   |
| Width - cm (in.)            | 26.5 (10.4)   | 79.5 (31.3) | 79.5 (31.3)  |
| Shipping Weight - kg (lbs.) | 7.36 (16.2)   | 190 (419)   | 230 (507)    |

## MECHANICAL DRAWING

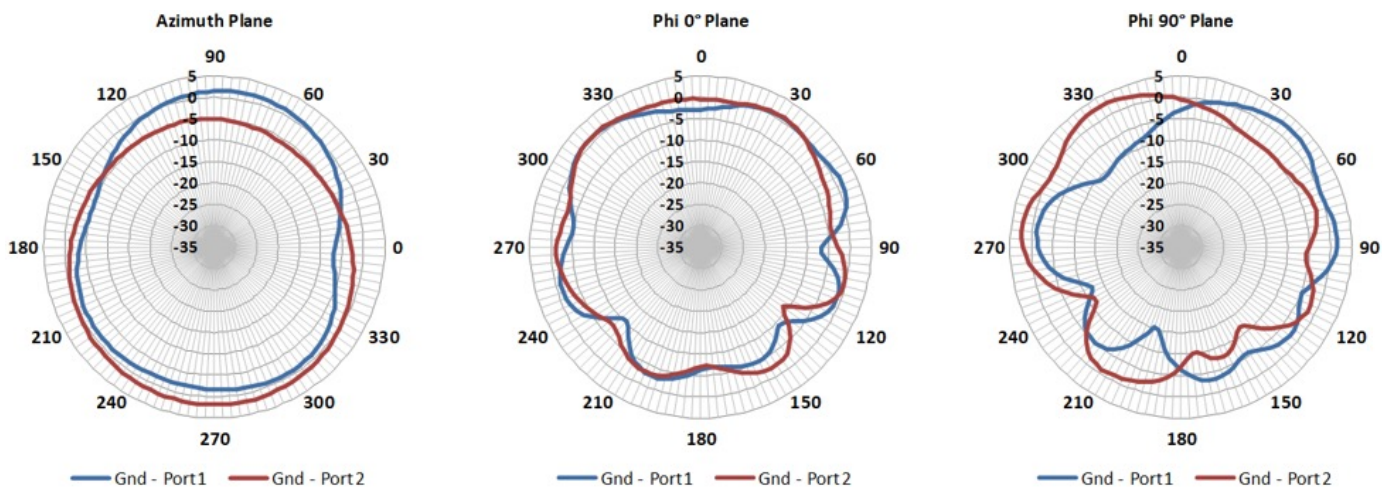


## RADIATION PATTERNS- ON GROUND PLANE

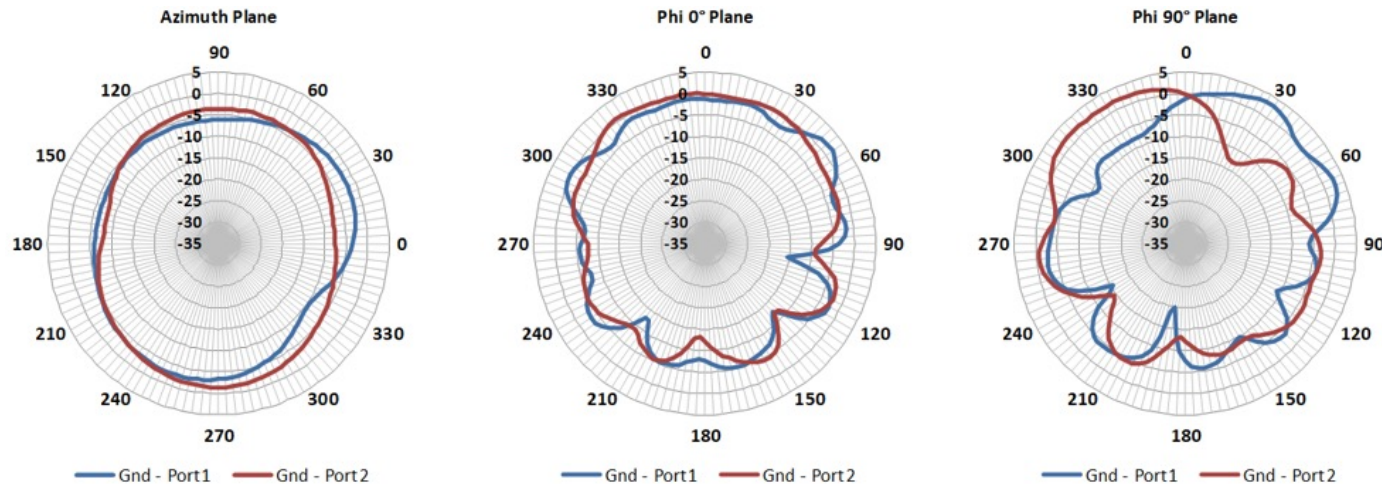
### 633 MHZ



### 725 MHZ

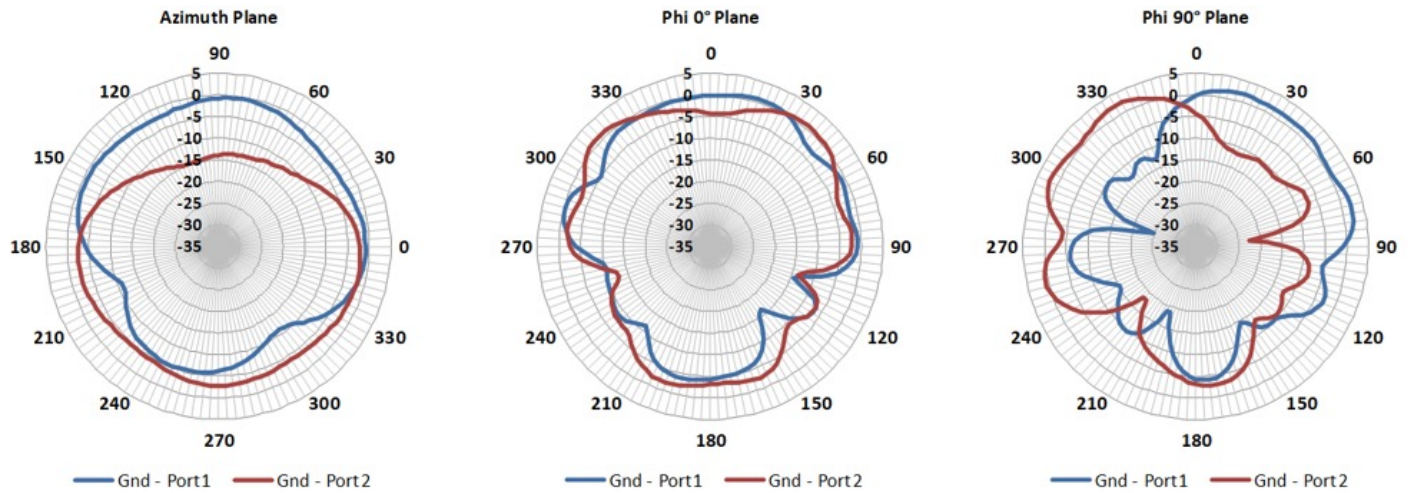


### 849 MHZ

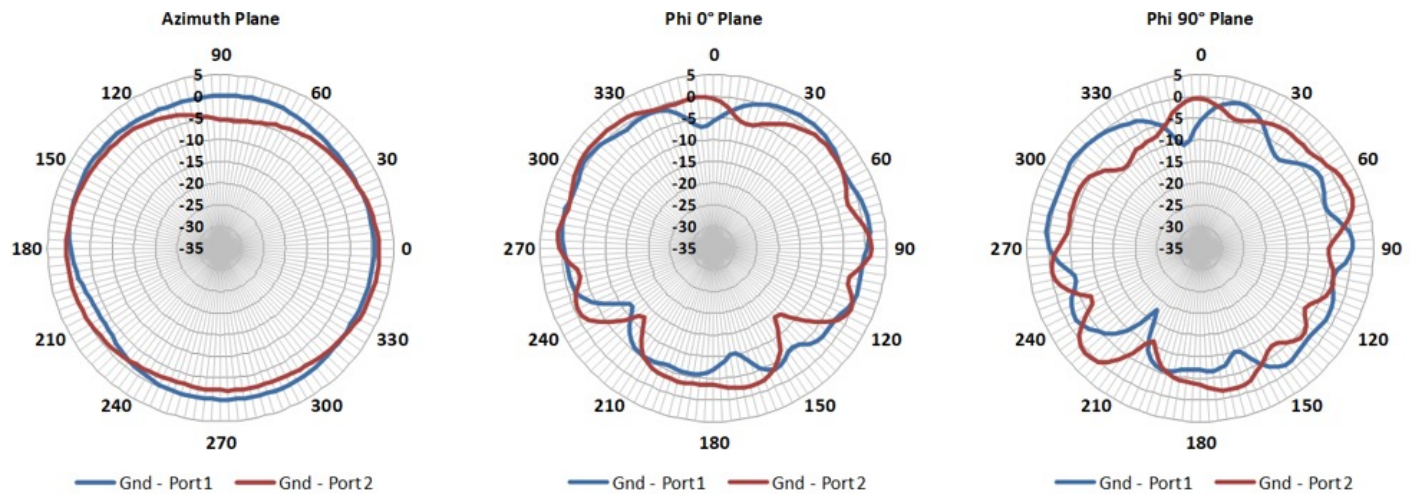


## RADIATION PATTERNS- ON GROUND PLANE

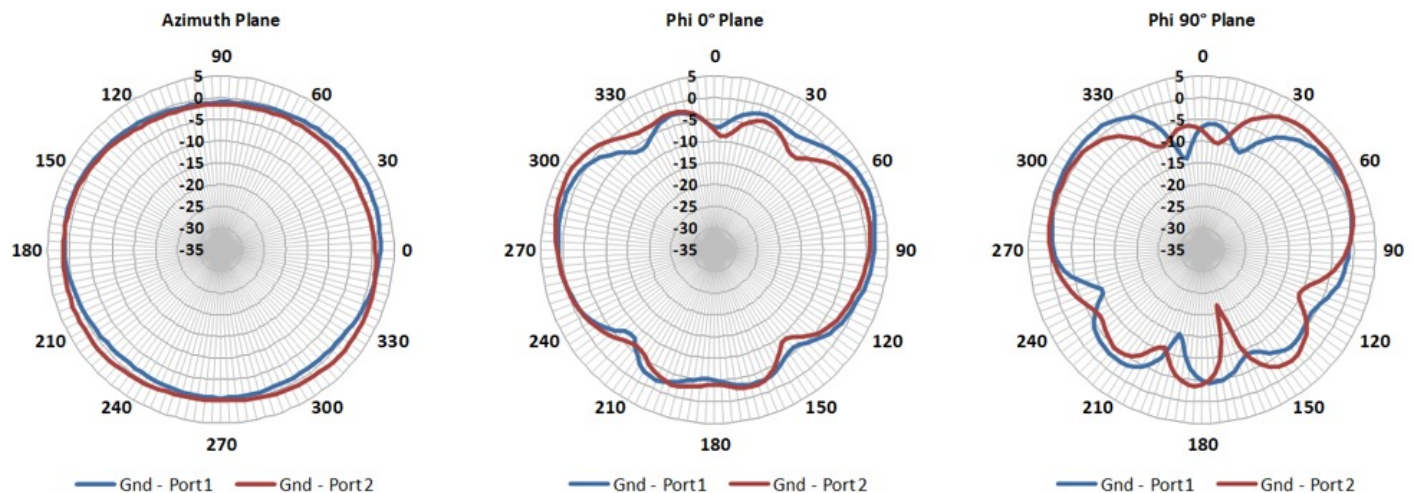
### 925 MHZ



### 1448 MHZ

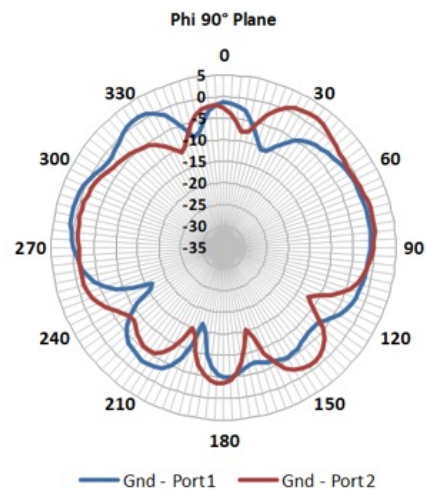
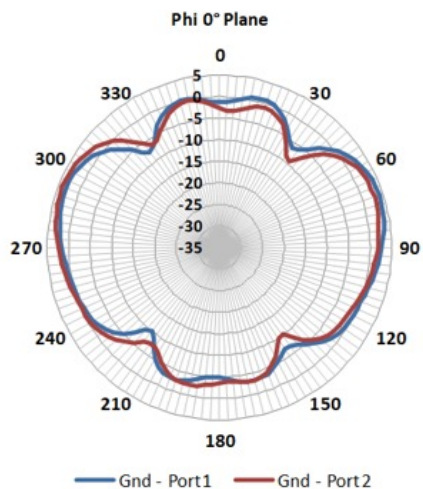
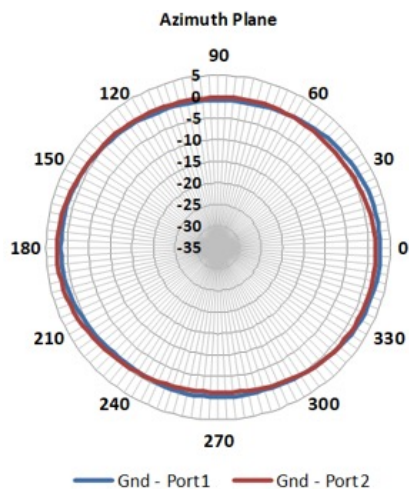


### 1730 MHZ

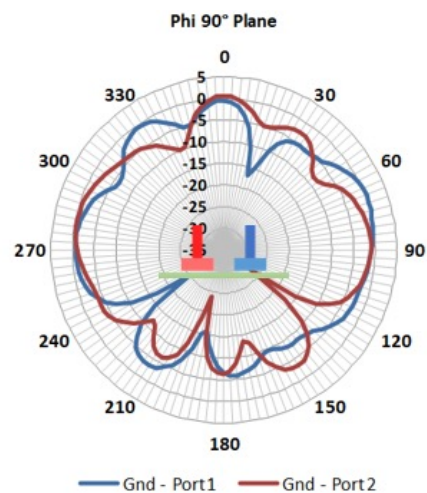
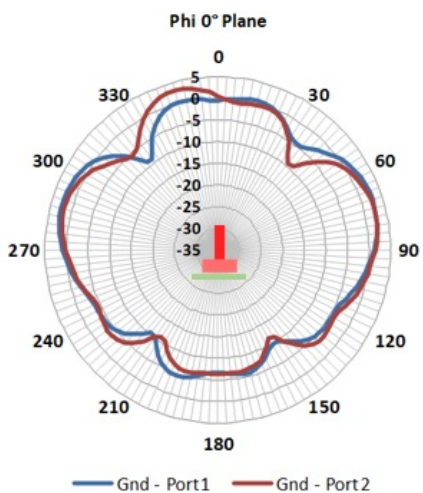
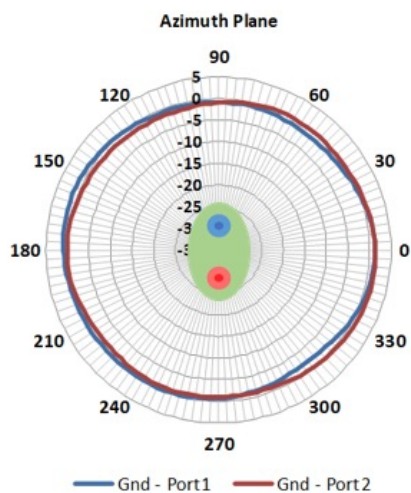


## RADIATION PATTERNS- ON GROUND PLANE

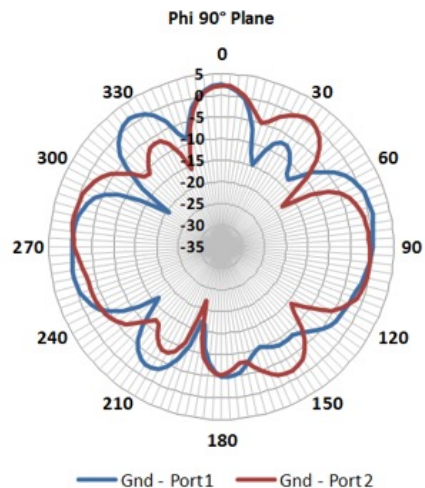
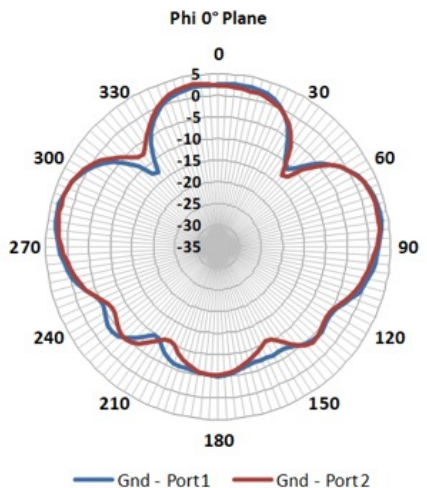
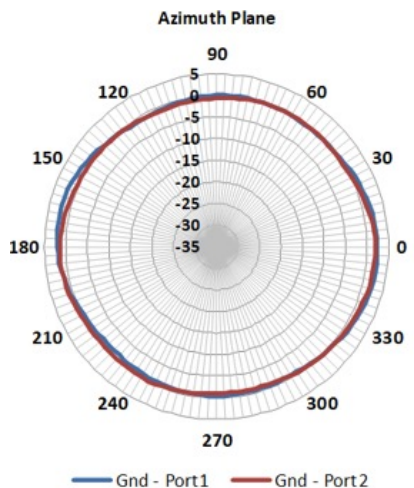
### 1930 MHZ



### 2140 MHZ

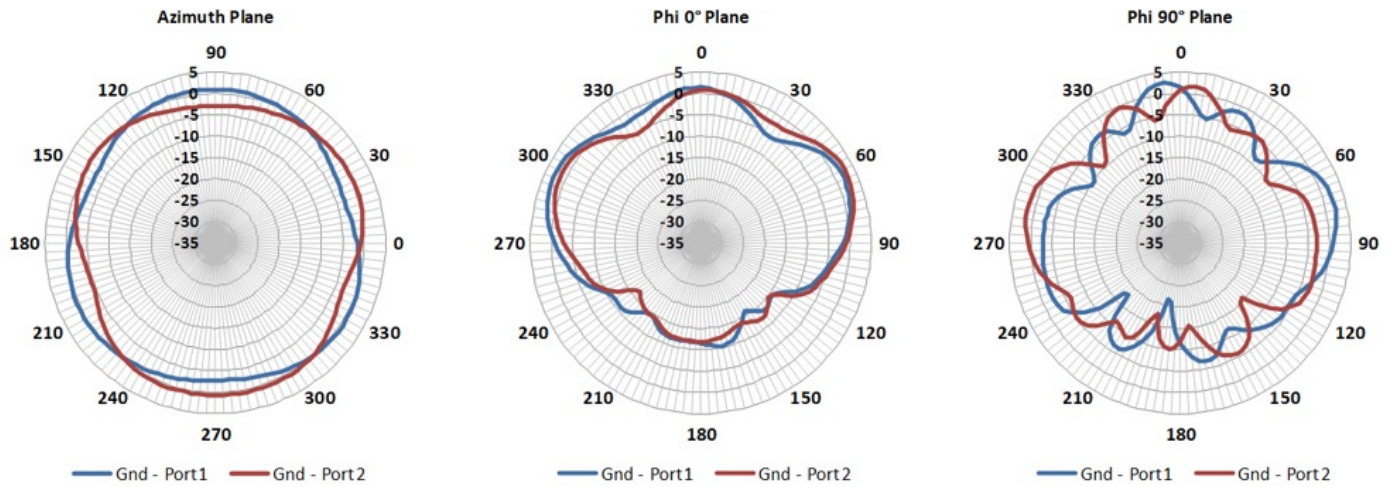


### 2300 MHZ



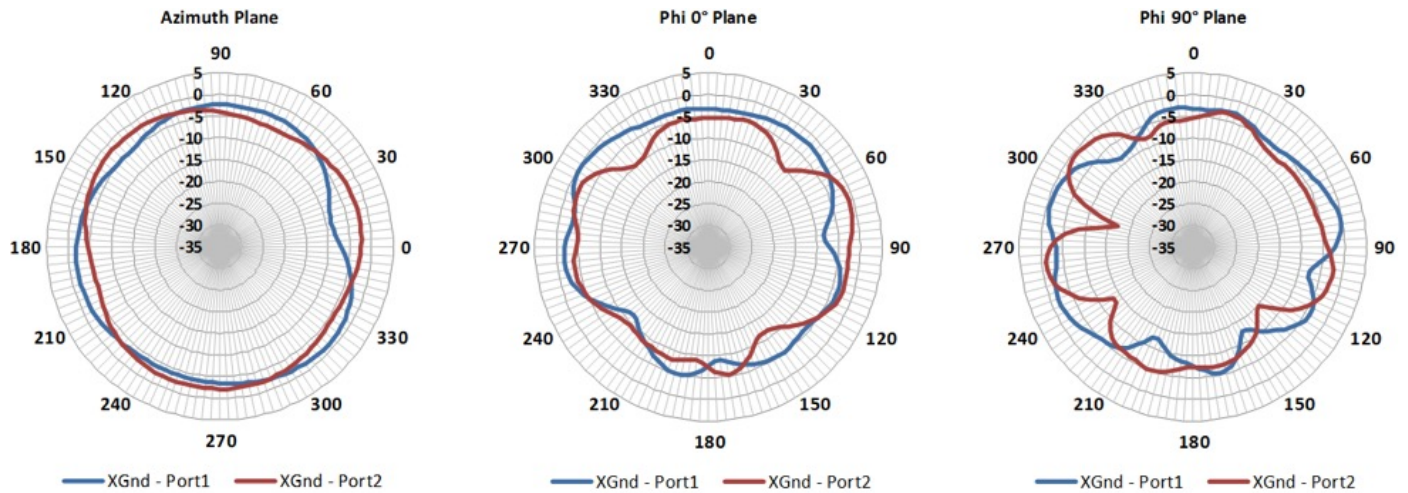
## RADIATION PATTERNS- ON GROUND PLANE

2595 MHZ

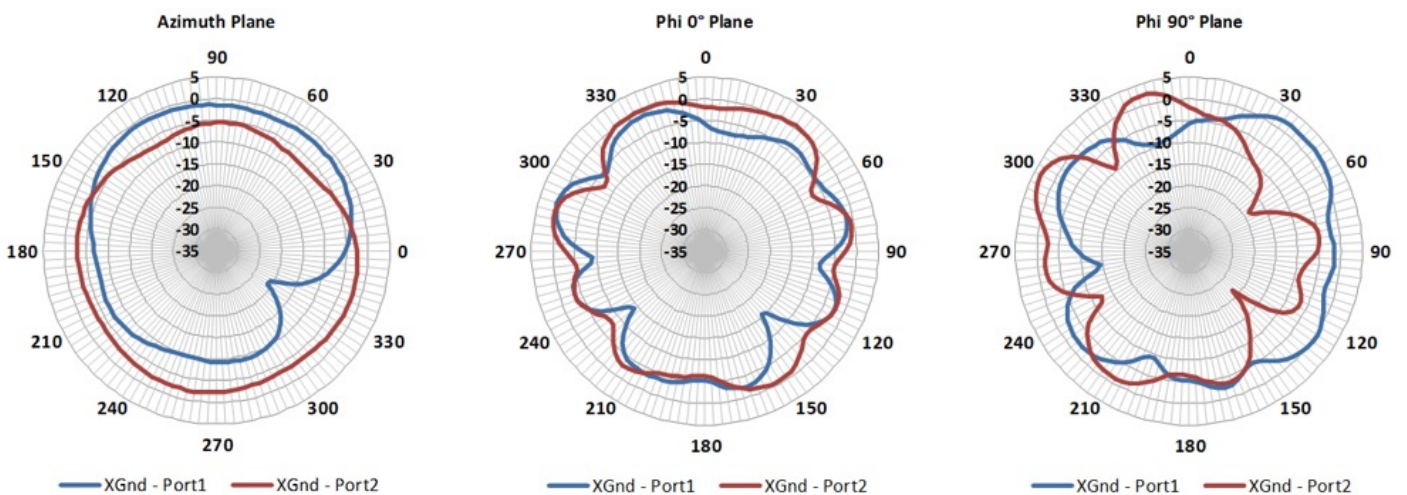


## RADIATION PATTERNS- NO GROUND PLANE

633 MHZ

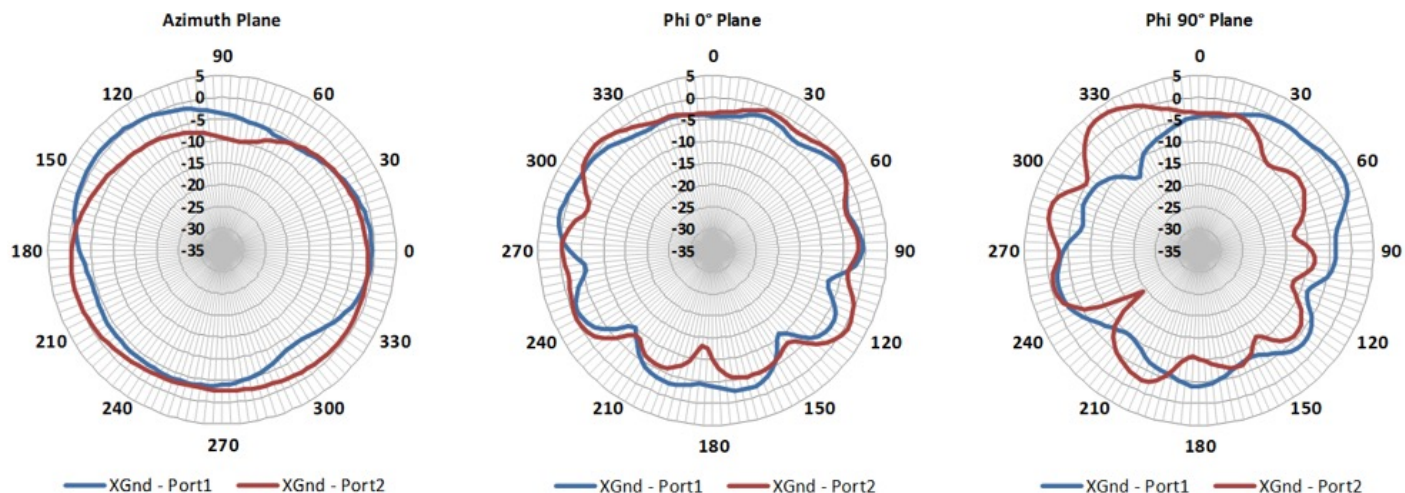


725 MHZ

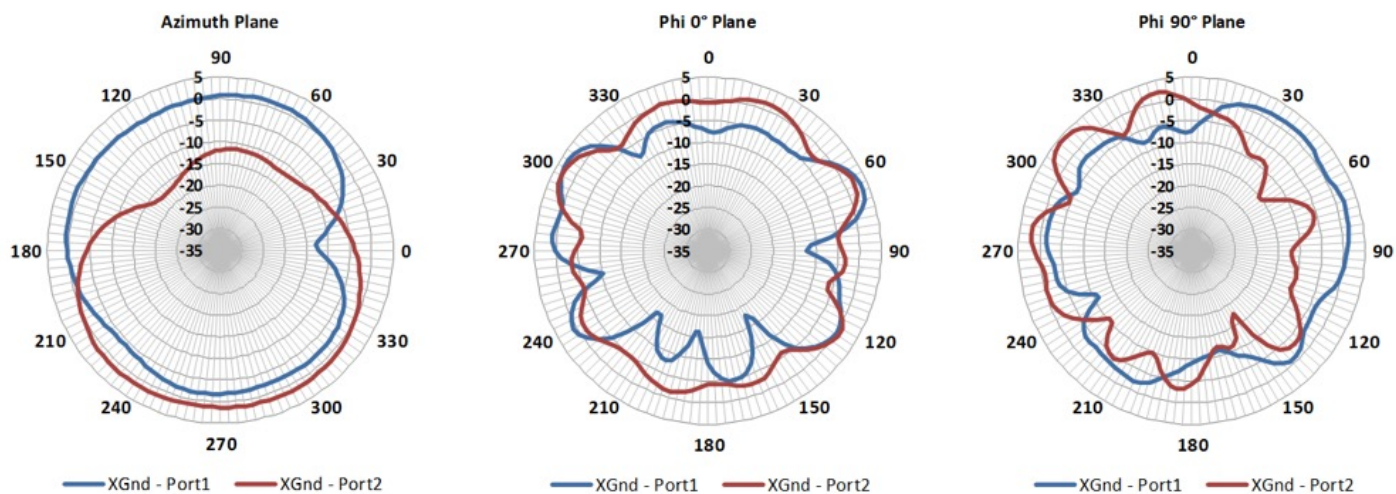


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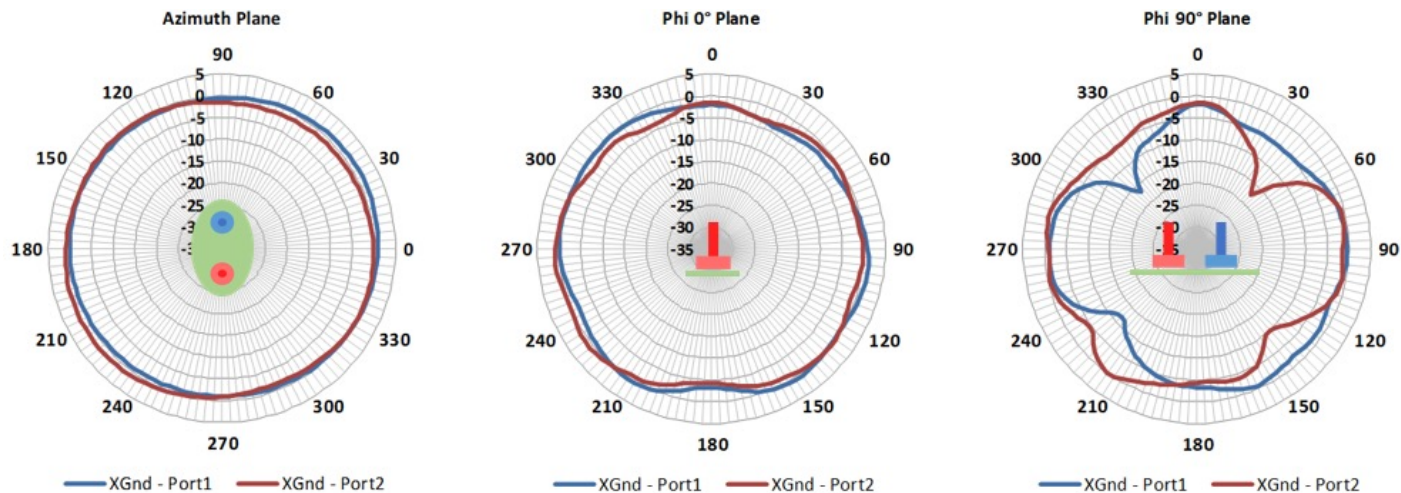
849 MHZ



925 MHZ

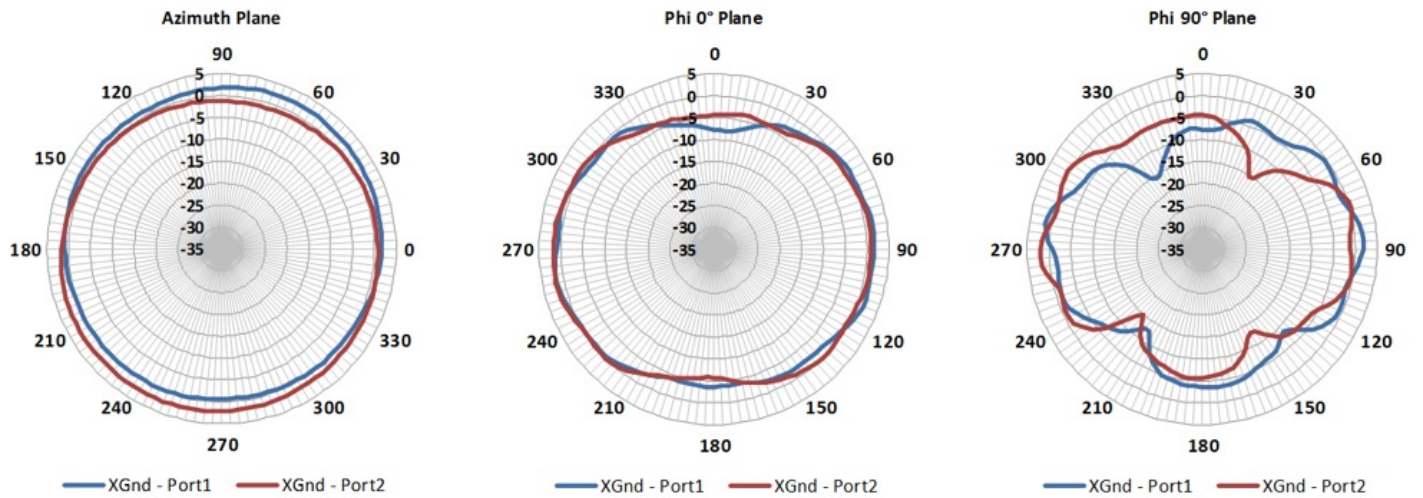


1448 MHZ

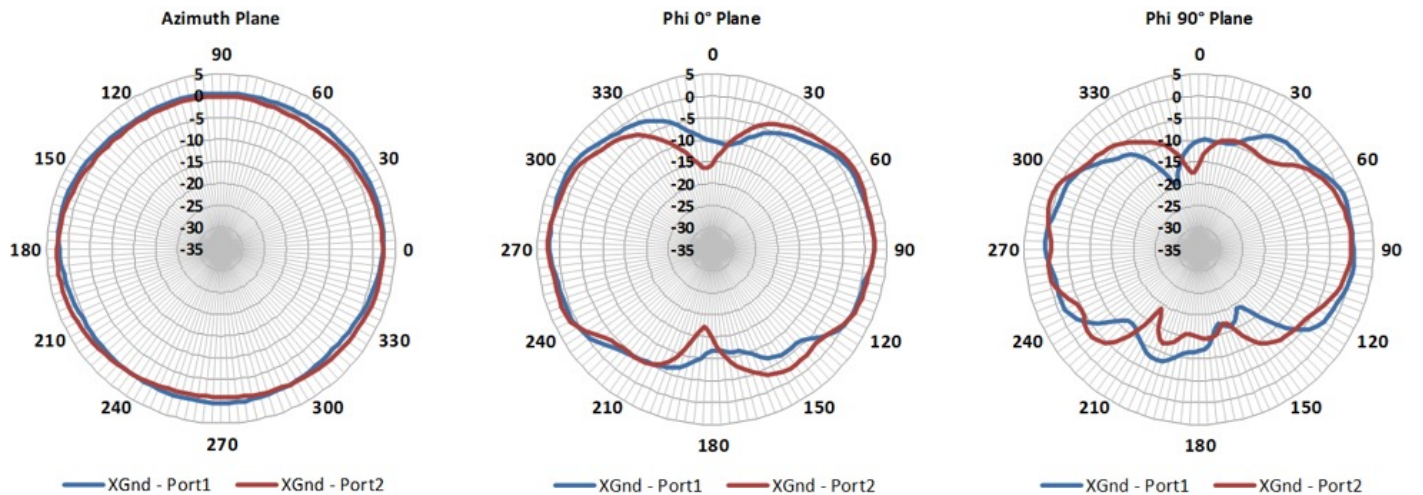


## RADIATION PATTERNS- NO GROUND PLANE

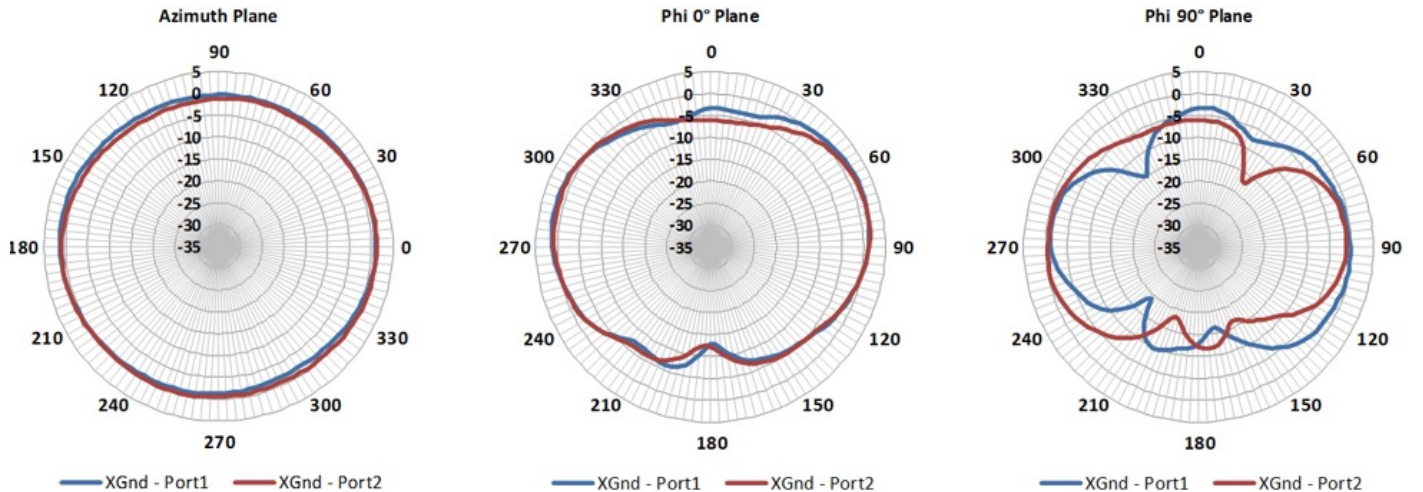
1730 MHZ



1930 MHZ

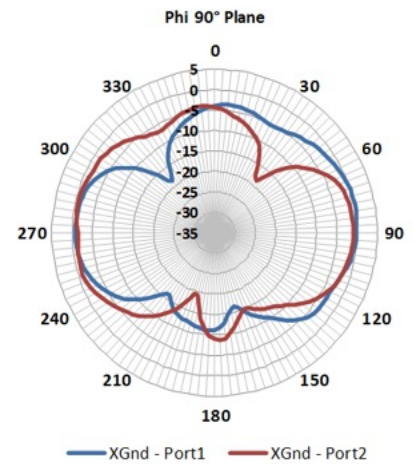
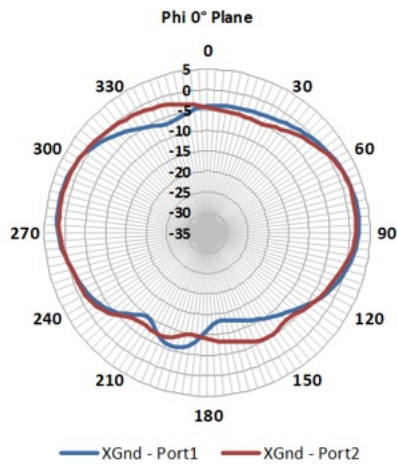
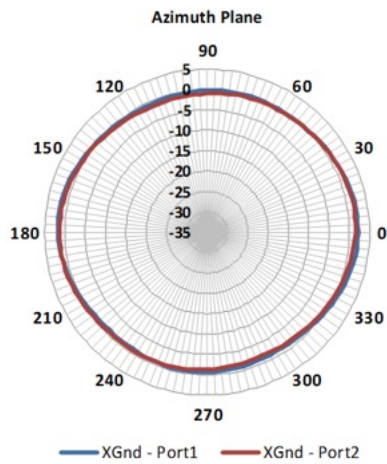


2140 MHZ

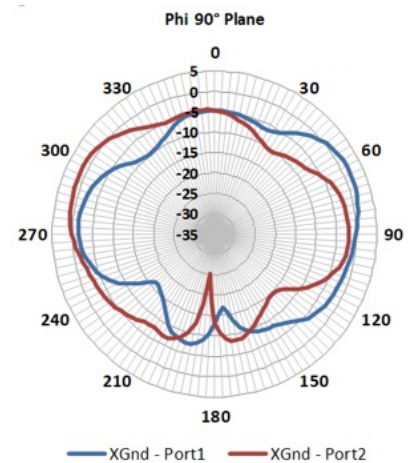
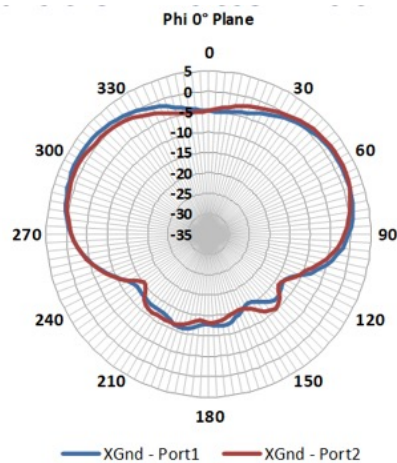
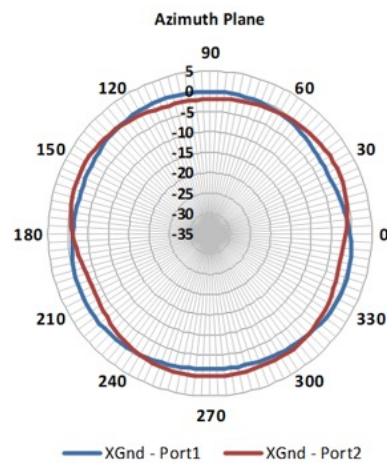


## RADIATION PATTERNS- NO GROUND PLANE

2300 MHZ



2595 MHZ



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## TE TECHNICAL SUPPORT CENTER

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