Satellite IoT D2D Ready

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

Ground Plane Independent 3-Port Antenna

Covering 4G/5G/Satellite Band 25, Wi-Fi and GNSS

The 3-port L001269-01 direct to device (D2D) antenna offers 4G/5G/satellite band 25 cellular, Wi-Fi and GNSS coverage through a 3-port configuration (3 antennas in one) in an extremely compact and ground plane independent form factor.

The cellular bands operate in dual mode, being capable of communication with both satellites and terrestial cellular base stations. As a ground plane independent antenna it can operate on both metallic and non-metallic surfaces. This feature combined with an IP67 rating makes this antenna an ideal solution for a broad range of IoT applications in both indoor and outdoor environments.

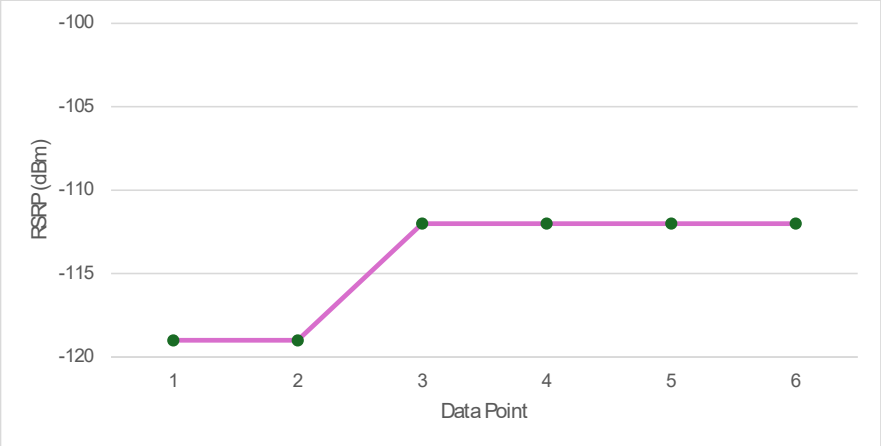
SATELLITE IOT D2D COMMUNICATIONS

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 L001269-01 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

- 4G/5G Cellular, Wi-Fi and GNSS from a single antenna
- Supports CAT-M, CAT-1 to CAT-4, and NB-IoT
- Suitable for mounting on a variety of surfaces
- Radome is paintable using commonly available spray paints (must not contain metal)
- Ground plane independent
- Low profile, extremely compact form factor
- Ruggedized and less prone to vandalization

APPLICATIONS

- IoT endpoints
- Digital display and signage
- EV charging
- Smart lockers and storage
- Ticketing systems
- Smart terminals
- Data monitoring

SPECIFICATIONS

ELECTRICAL SPECIFICATION							
	4G/5G Cellular					Wi-Fi	
Operating Frequency (MHz)	698-750	750-850	850-960	1690-2690	3300-3800	2400-2500	5150-5900
Free Space Performance							
VSWR - Typical	<3.9:1	<3.5:1	<4.0:1	<1.5:1	<1.5:1	<1.5:1	<1.5:1
Peak Gain - Max (dBi)	1.83			6		3	4
On Metallic Ground Plane Performance							
VSWR - Typical	<3.0:1	<3.3:1	<4.0:1	<1.5:1	<1.5:1	<1.5:1	<1.5:1
Peak Gain - Max (dBi)	2.86			6		6	5.5
Isolation (dB)	>-15			>-10	>-20	>-10	>-25
Input Max Power (W)	20					5	
Polarization	Linear						
Azimuth Beamwidth	360 °, Omnidirectional						

Measured with a 3.3 ft (1 m) cable, with and without a 2 ft (0.6m) diameter ground plane

ELECTRICAL SPECIFICATION - GNSS	
Frequency (MHz)	1559-1606
Passive Antenna Gain (dBi)	3.0
LNA Gain @ Room Temperature (dB)	26 ± 3
Noise Figure @ Room Temperature (dB)	< 2.8
Max VSWR @ Room Temperature	< 2.0:1
Polarization	RHCP
Nominal Impedance (ohm)	50
Operating Supply Voltage (Vdc)	2.5-7.0
Current Consumption, Max @ room temp. (mA)	11.5 @ 3.0V
Out-of-band Signal Rejection, Min @ room temp. (dBc)	80 @ 1 – 1525 MHz 80 @ 1428 – 2700 MHz 70 @ 4900 – 5800 MHz

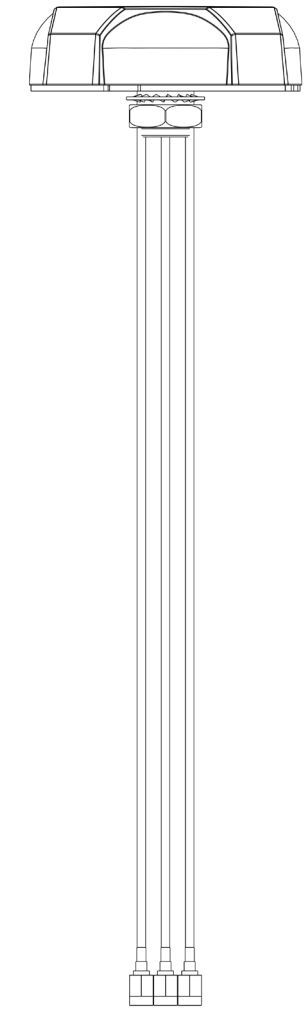
MECHANICAL SPECIFICATION	
Dimensions – height x diameter – mm (in.)	26 x Ø90.2 (1.02 x 3.55)
Weight – g (oz.)	175.5 (6.19)
Mounting	M16 Stud
Radome	ASA (Black)
Cable	RG174 (3.3 feet / 1m)
Connector	4G/5G Cellular - SMA, Wi-Fi - RP-SMA, GNSS - SMA

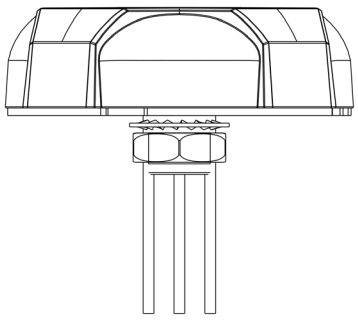
ENVIRONMENTAL SPECIFICATION	
Operating Temperature – °C (°F)	-40 to +85°C (-40 to +185°F)
Storage Temperature – °C (°F)	-40 to +85°C (-40 to +185°F)
Ingress Protection (IP Rating)	IP67, IP69K
Material Substance Compliance	RoHS Compliant CE & UKCA Compliant

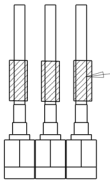
GLOBAL 4G/5G CELLULAR COVERAGE

FREQUENCY	RF BANDS
698-806 MHz	12, 13, 14, 17, 28, 29, 44, 67, 68, 85 N12, N14, N28, N29, N83
807-960 MHz	5, 6, 8, 18, 19, 20, 26, 27 N5, N8, N18, N20, N81, N82, N89, N91, N92, N93, N94
1690-2200 MHz	1, 2, 3, 4, 9, 10, 15, 16, 23, 25, 33, 34, 35, 36, 37, 39, 65, 66, 70 N34, N39, N65, N66, N70, N80, N84, N86, N95
2200-2700 MHz	7, 30, 38, 40, 41,69 N30, N38, N40, N41, N90
3300-3800 MHz	22, 42, 43, 48 N48, N78

MECHANICAL DRAWINGS



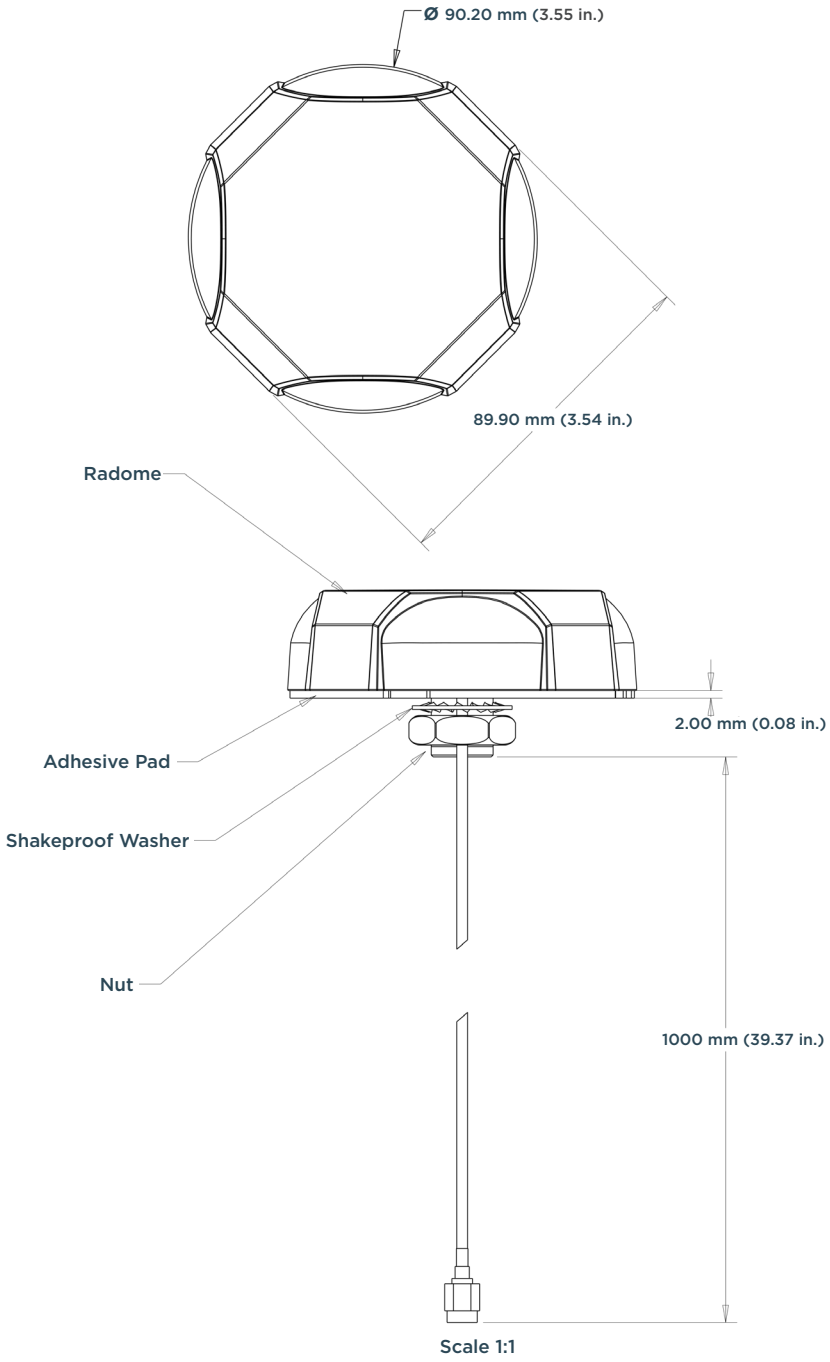




Scale 1:1

Heat Shrink Tube Indentification

	Cellular	Wi-Fi	GNSS
HST Colour	Yellow	Red	White



Scale 1:1

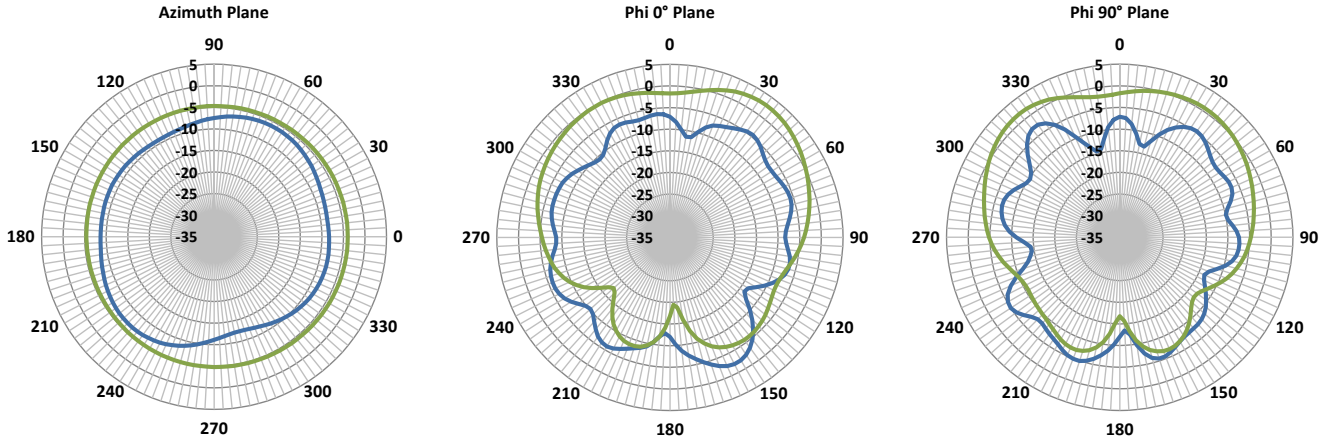
RADIATION PATTERNS - 4G/5G CELLULAR

Key

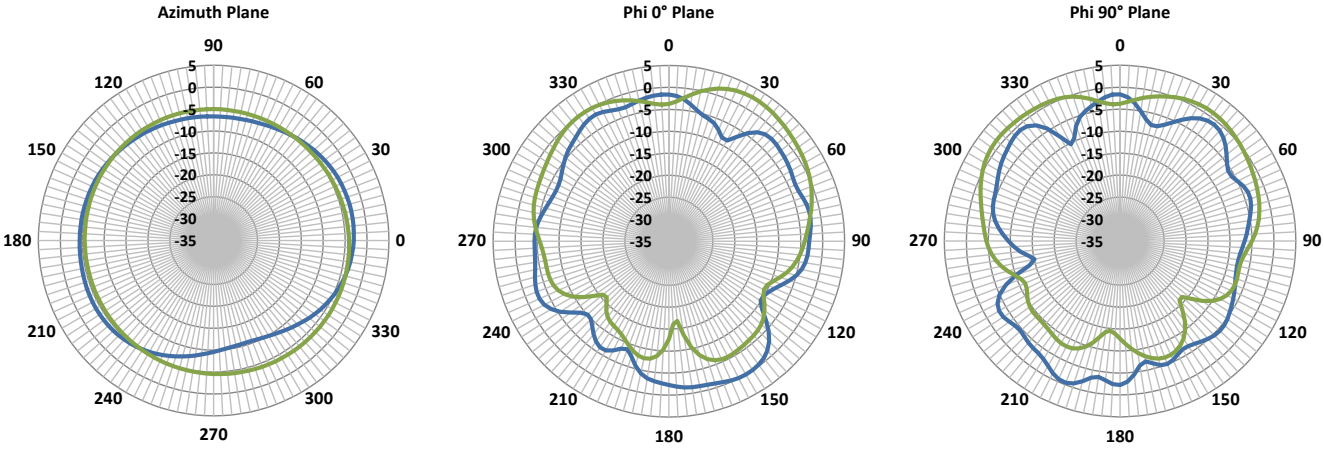
Measured in Free Space — Measured with Ground Plane

Note - A label on the antenna base indicates the direction of 0° for ease of orientation and placement.

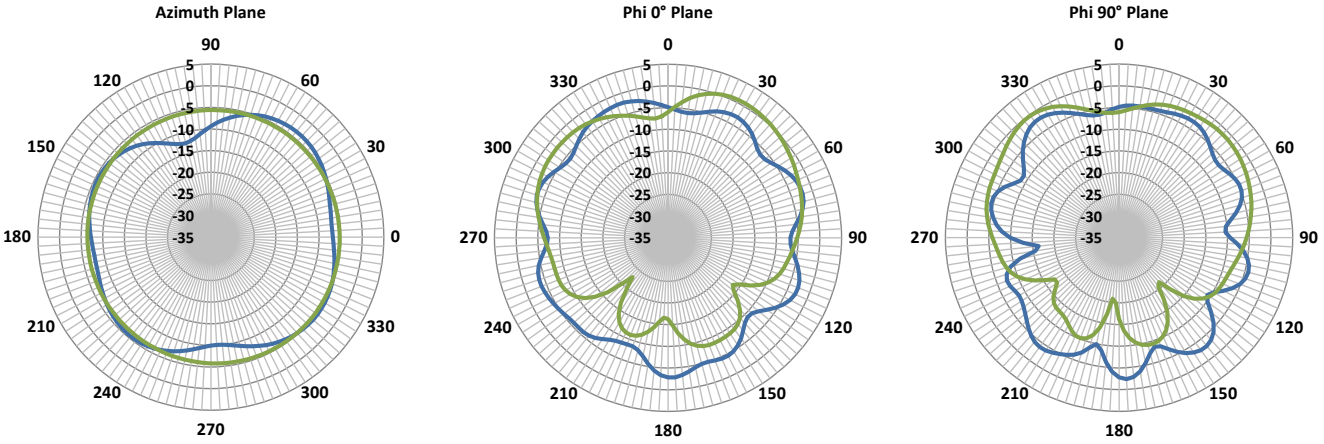
Radiation Patterns at 698 MHz



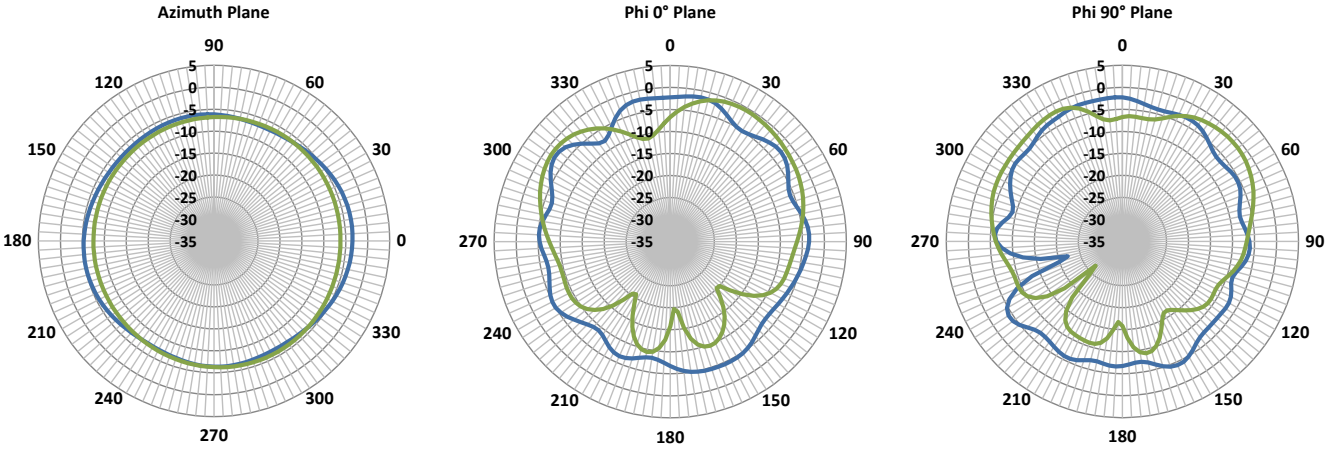
Radiation Patterns at 750 MHz



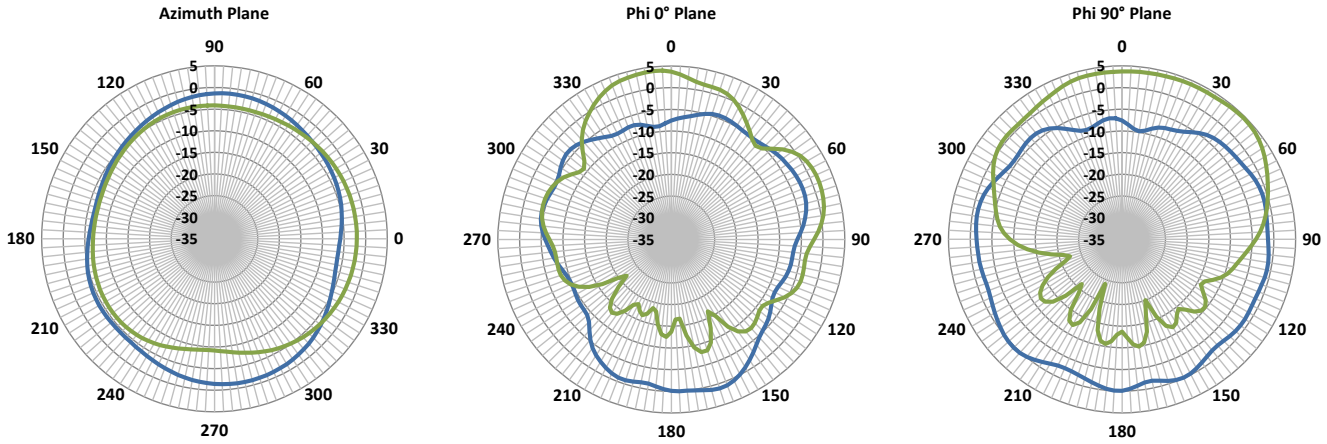
Radiation Pattern at 850 MHz



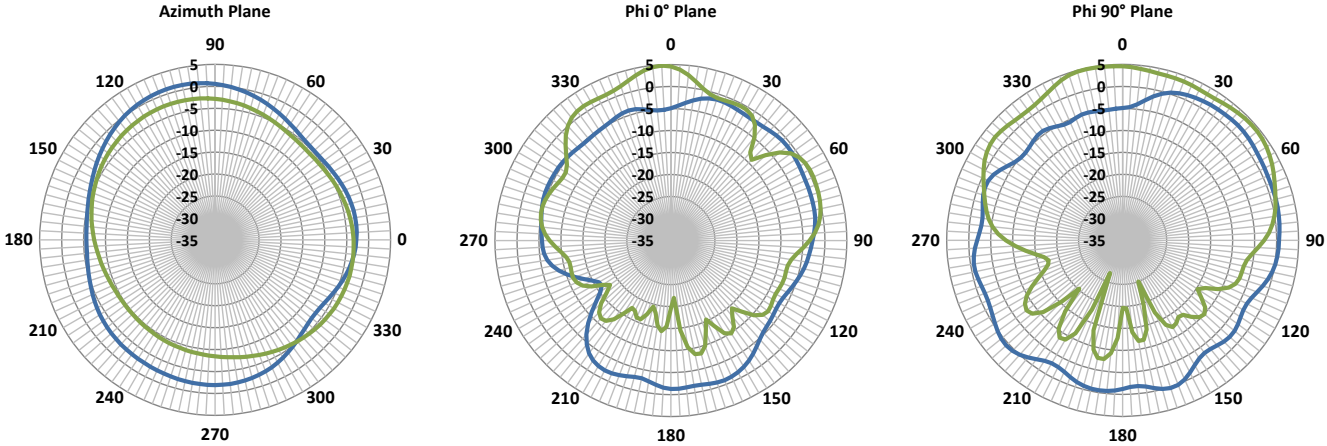
Radiation Pattern at 960 MHz



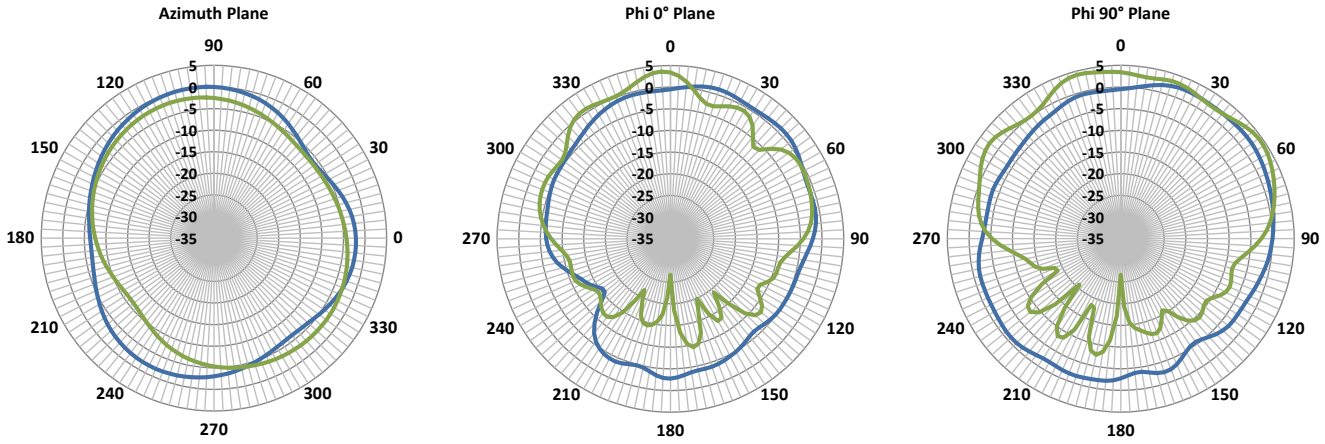
Radiation Pattern at 1690 MHz



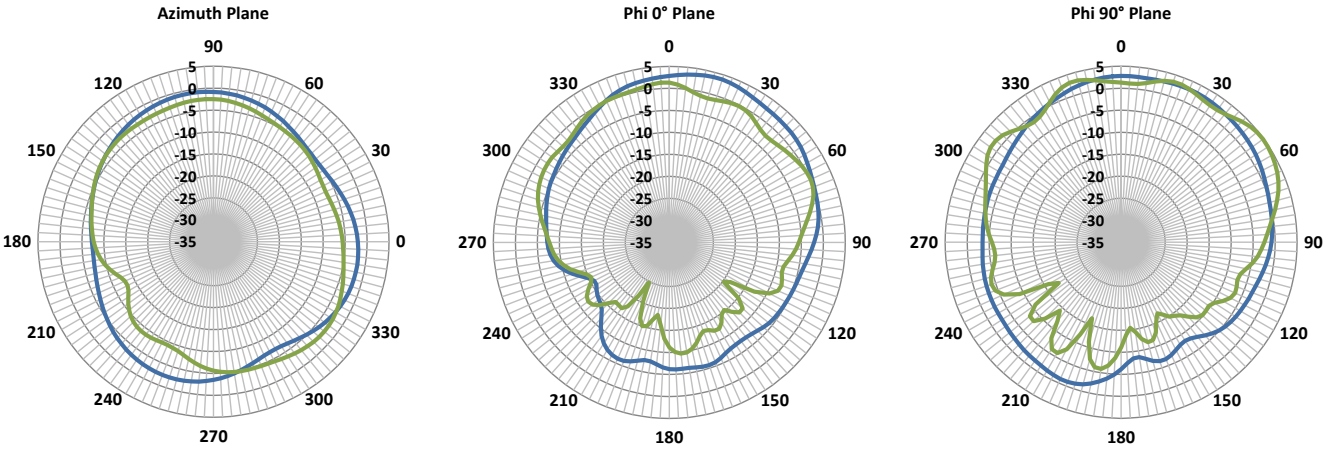
Radiation Pattern at 1800 MHz



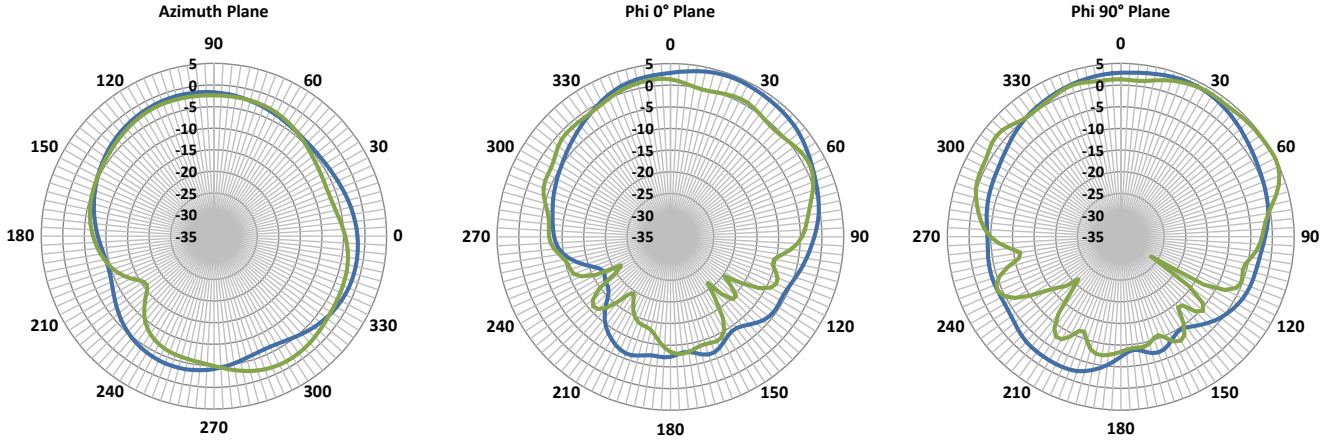
Radiation Pattern at 1900 MHz



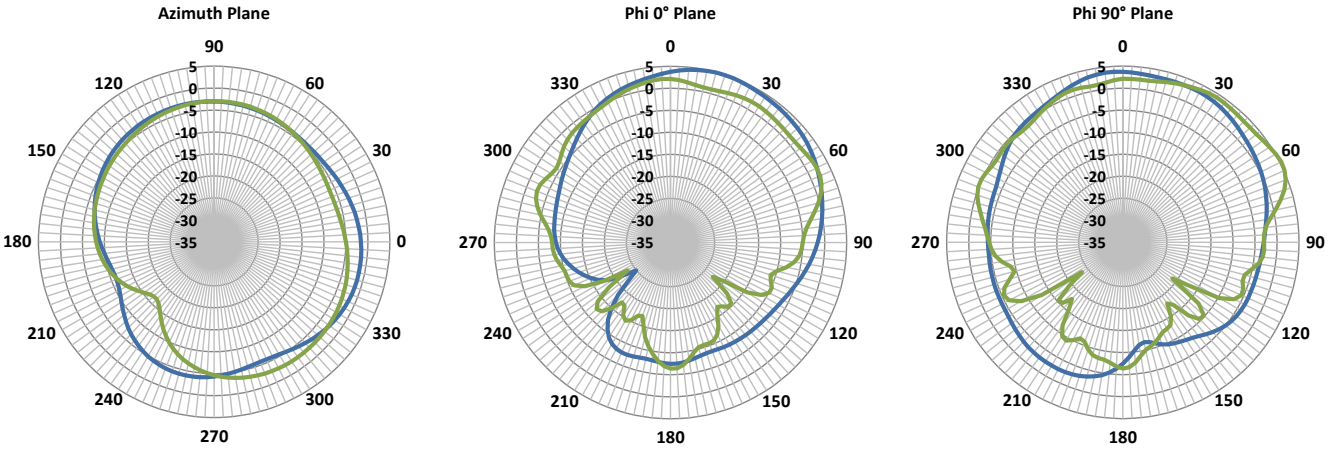
Radiation Pattern at 2100 MHz



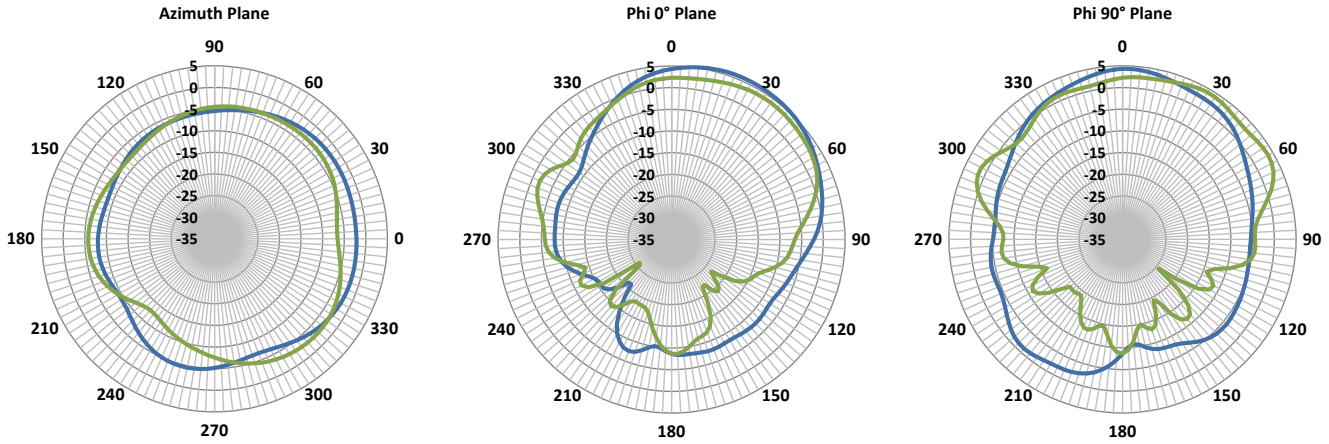
Radiation Pattern at 2200 MHz



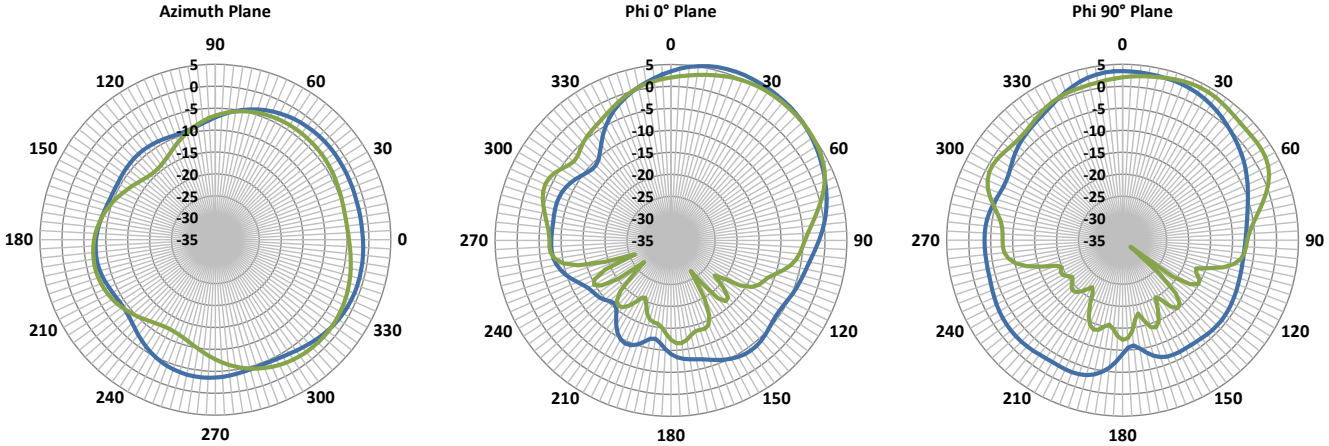
Radiation Pattern at 2300 MHz



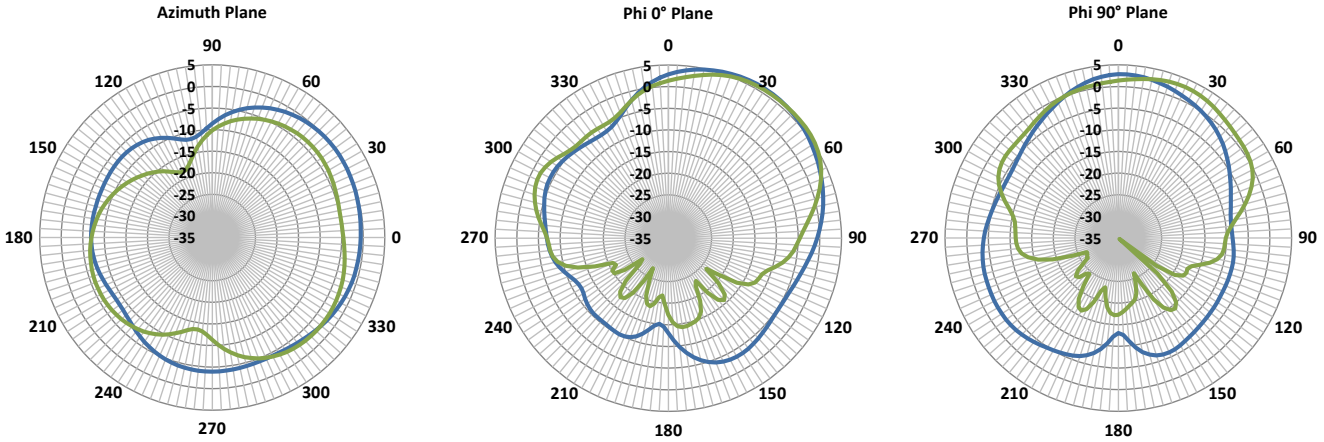
Radiation Pattern at 2500 MHz



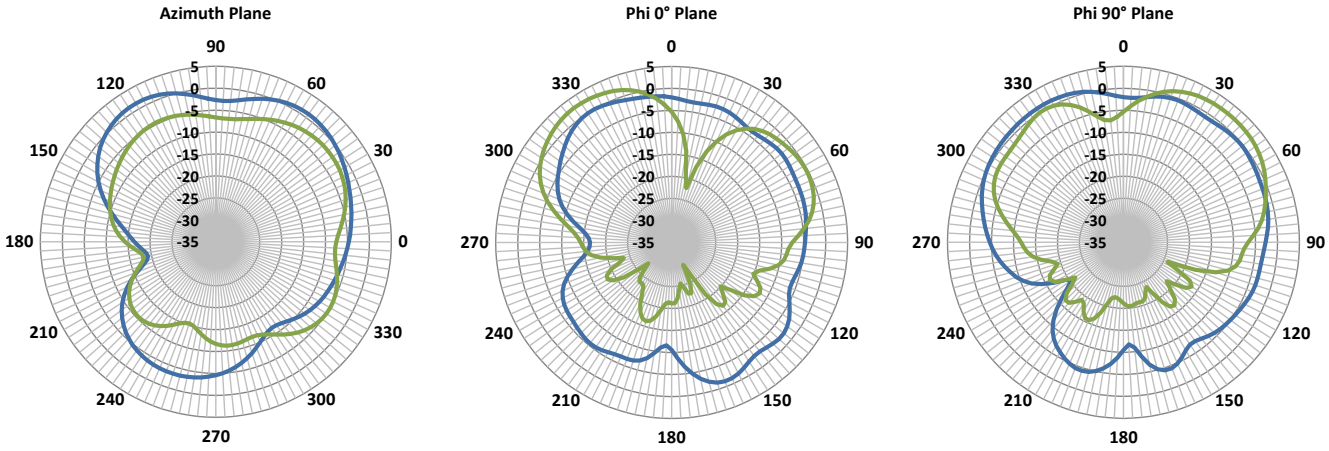
Radiation Pattern at 2600 MHz



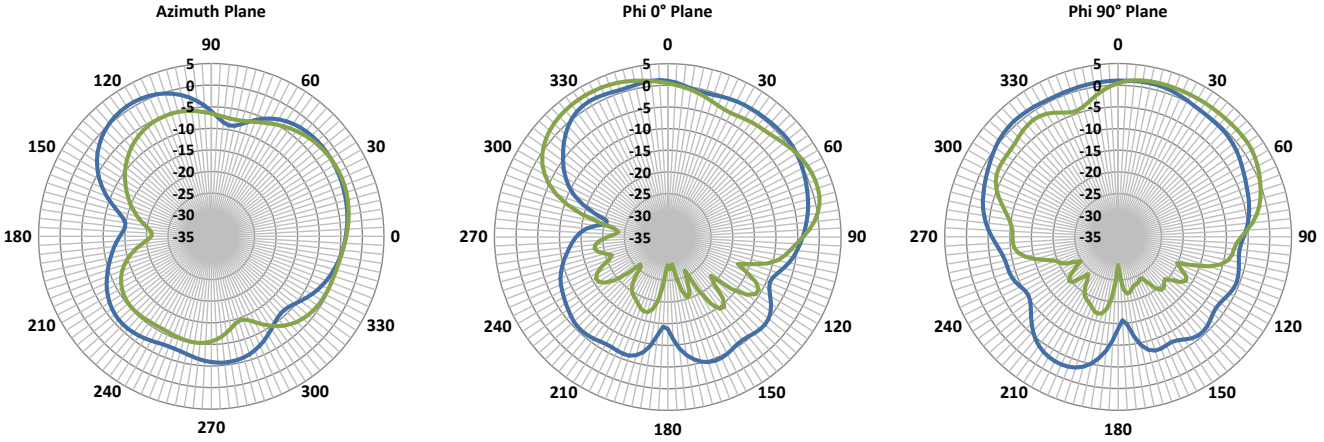
Radiation Pattern at 2690 MHz



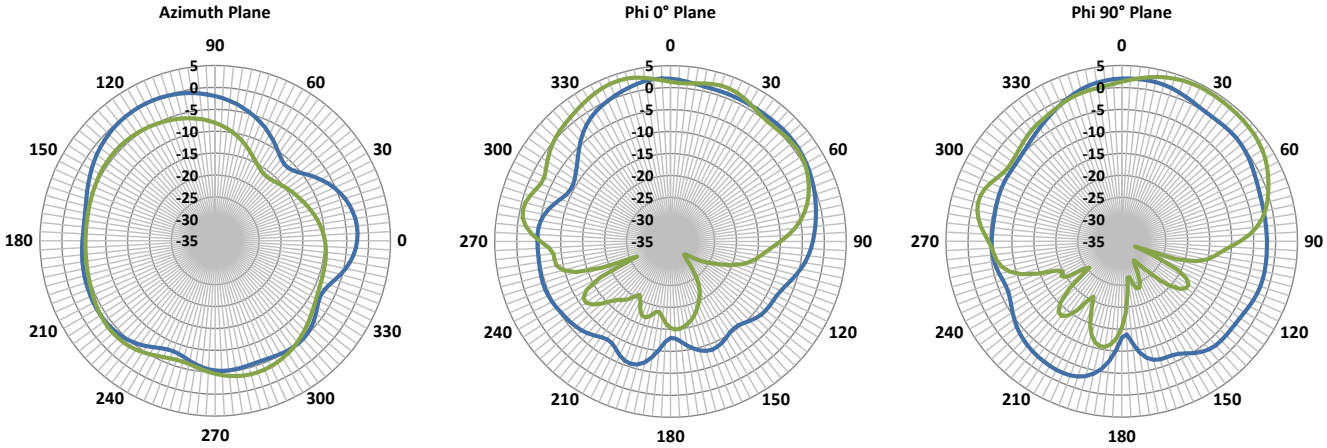
Radiation Pattern at 3300 MHz



Radiation Pattern at 3500 MHz



Radiation Pattern at 3800 MHz



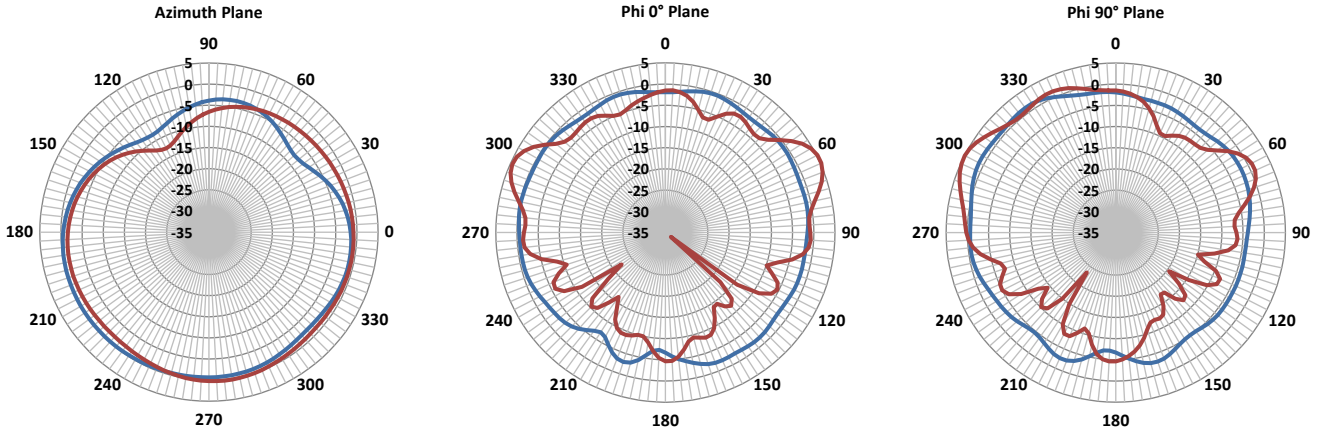
RADIATION PATTERNS - WI-FI

Key

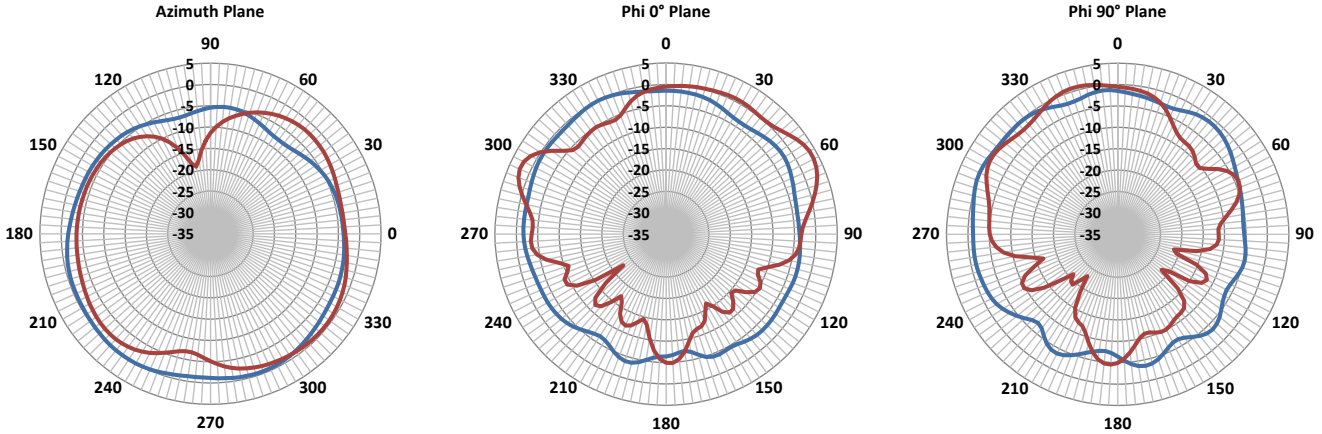
Measured in Free Space

Measured with Ground Plane

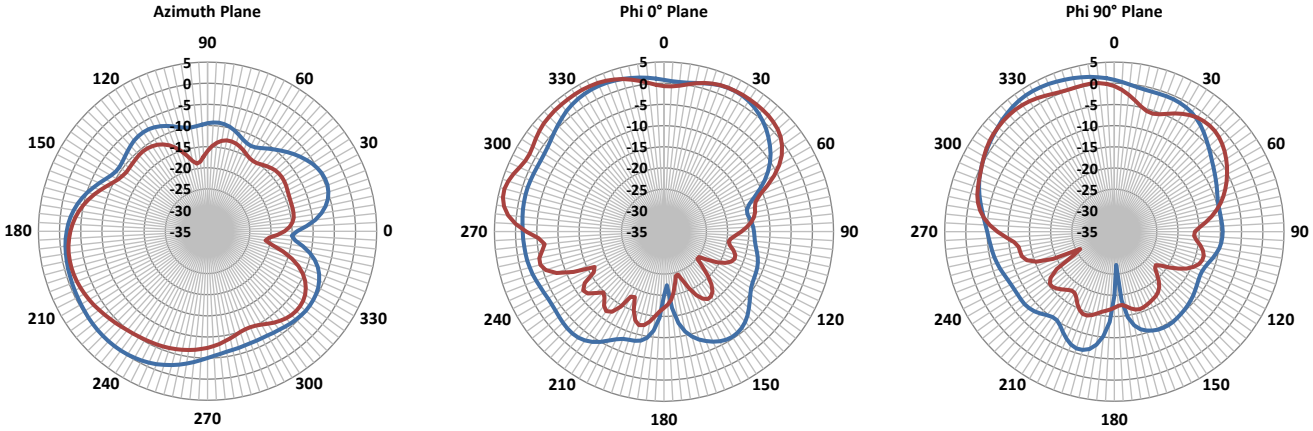
Radiation Pattern at 2400 MHz



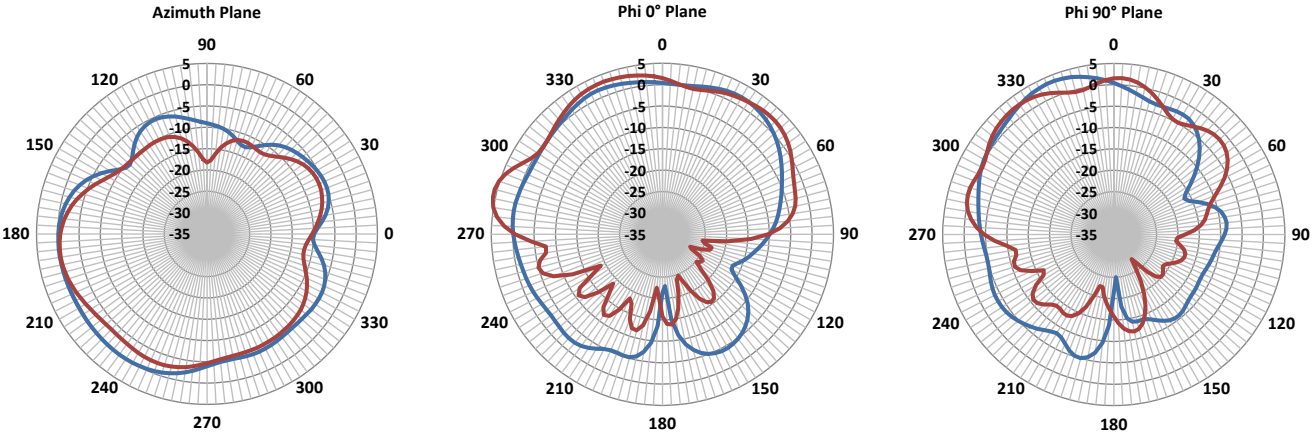
Radiation Pattern at 2480 MHz



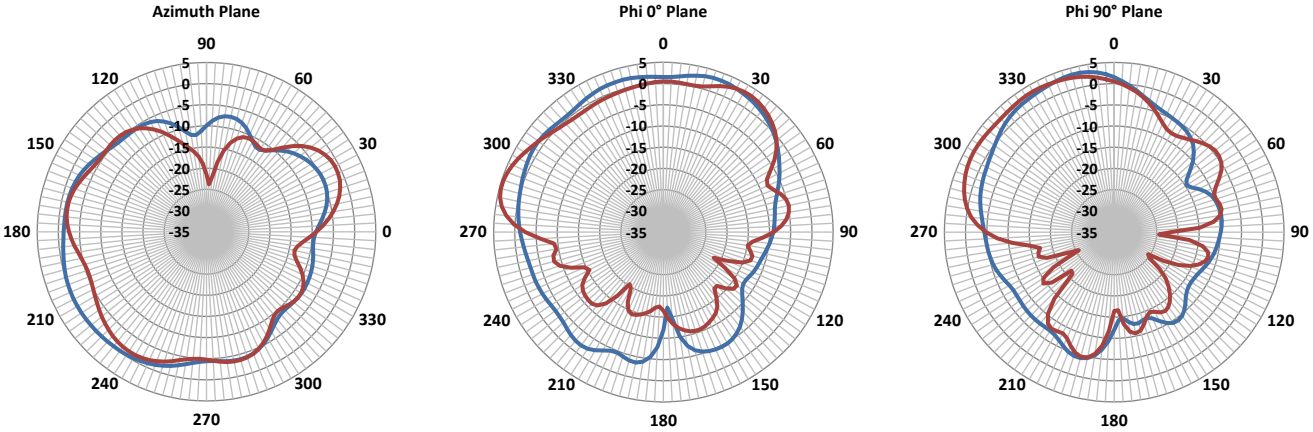
Radiation Pattern at 5150 MHz



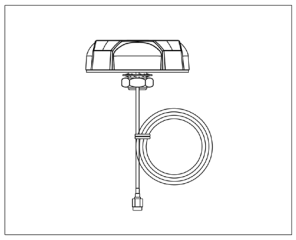
Radiation Pattern at 5450 MHz



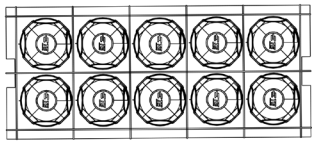
Radiation Pattern at 5850 MHz



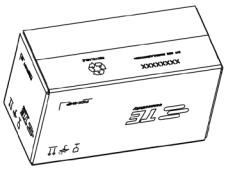
PACKING INFORMATION

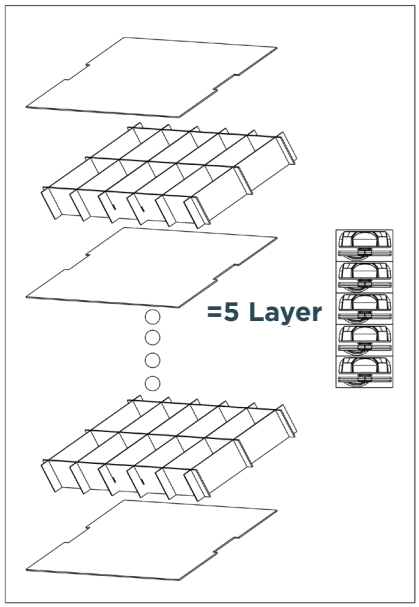


1 PCS/Bubble Pack

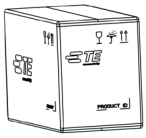


5 PCS x 2
Grid - 10PCS/layer

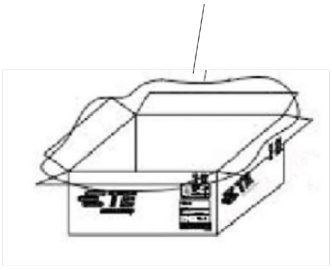




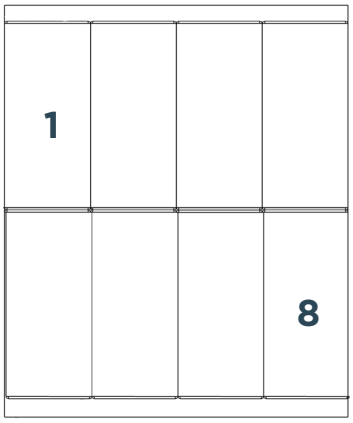
Carton = 50 PCS



Waterproof Bag



10 PCS/layer x 5
=50 PCS/Carton



Pallet - 1200x1000mm
Carton x 8 PCS - 4 Layers
Total - 1600 PCS Antenna

TE TECHNICAL SUPPORT CENTER

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