



## Satellite IoT D2D Ready

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

## 5-Port Vehicular & IOT MIMO Antenna Covering 4G/5G/Satellite Band 25, Wi-Fi and GNSS

The L001258-01 direct to device (D2D) ready multiport/multiband antenna provides an excellent solution for IoT gateway device pairing.

Configured for 2-port MIMO operation over the 3G/4G/5G/ISM/CBRS bands and 2-port MIMO operation over the low/high frequency Wi-Fi bands. An additional 5th port provides an active antenna for enabling GNSS global navigation services. With multiple connector and cable length options available this antenna series offers versatility for the installer.

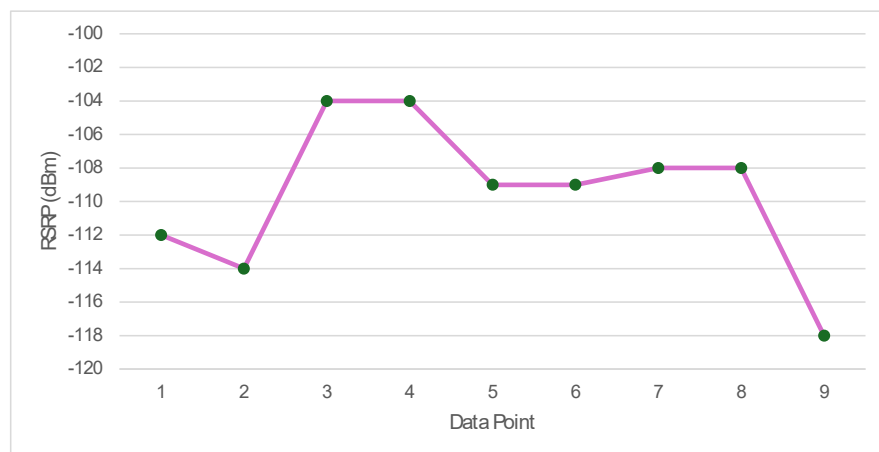
## SATELLITE IOT D2D COMMUNICATIONS

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 L001258-01 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 & BENEFITS

- Validated for use on satcom D2D networks
- Dual-Mode TN and NTN capable
- One single-hole mount/fixing reduces vehicle damage and the cost of installation
- Attractive IP67 low profile aerodynamic housing
- Multi-band/MIMO operation
- Operates well on a ground plane and without a ground plane.

## APPLICATIONS

- Non-Terrestrial and Terrestrial Networks
- Satellite IoT D2D (Direct to Device) applications
- FirstNet/Public Safety
- Transportation
- Rugged LTE Gateways
- Remote monitoring
- Remote device control

## CONFIGURATION

| PART NUMBER | CABLE LENGTH |               | CONNECTORS   |              |              | COLOR |
|-------------|--------------|---------------|--------------|--------------|--------------|-------|
|             | PIGTAIL      | JUMPER        | LTE/CELL     | WIFI         | GNSS         |       |
| L001258-01  | 0.3 m (1 ft) | 4.9 m (16 ft) | 2 x SMA-male | 2 x SMA-male | 1 x SMA-male | Black |

| ELECTRICAL SPECIFICATIONS                          |                                  |           |           |           |                   |           |
|----------------------------------------------------|----------------------------------|-----------|-----------|-----------|-------------------|-----------|
| Number of Ports                                    | 5                                |           |           |           |                   |           |
| Port Configuration                                 | 2x- 3G/4G/5G/ISM/CBRS (LTE/CELL) |           |           |           | 2x- Wi-Fi (WI-FI) |           |
| Operating Frequency (MHz)                          | 698-806                          | 824-894   | 880-960   | 1690-3800 | 2400-2500         | 4900-6000 |
| Avg. Peak Gain* (dBi) – Gnd. Plane [No Gnd. Plane] | 0.4 [1.5]                        | 0.8 [2.1] | 1.2 [1.7] | 4.0 [1.8] | 2.6 [0.4]         | 6.6 [3.8] |
| Max Peak Gain* (dBi) – Gnd. Plane [No Gnd. Plane]  | 1.6 [2.5]                        | 1.4 [2.8] | 1.5 [2.0] | 7.2 [4.8] | 3.1 [1.7]         | 7.5 [4.9] |
| VSWR** – Avg, Gnd. Plane [No Gnd. Plane]           | 1.7 [1.8]                        | 1.8 [1.8] | 1.9 [1.8] | 1.5 [1.5] | 1.5 [1.5]         | 1.2 [1.2] |
| VSWR** – Max, Gnd. Plane [No Gnd. Plane]           | 2.5 [2.5]                        | 2.1 [2.5] | 2.2 [2.5] | 2.1 [2.1] | 2.0 [2.0]         |           |

## ELECTRICAL SPECIFICATIONS

|                                            |                           |           |           |           |           |           |
|--------------------------------------------|---------------------------|-----------|-----------|-----------|-----------|-----------|
| Isolation (dB)– Gnd. Plane [No Gnd. Plane] |                           |           |           |           |           |           |
| LTE1 to LTE2                               | -11 [-11]                 | -13 [-13] | -14 [-14] | -18 [-18] | -24 [-24] | -33 [-33] |
| LTE1 to WIFI                               | -36 [-30]                 | -37 [-31] | -39 [-32] | -14 [-14] | -14 [-14] | -32 [-32] |
| LTE1 to WIFI 2                             | -39 [-40]                 | -38 [-40] | -38 [-40] | -14 [-25] | -14 [-25] | -35 [-35] |
| LTE2 to WFI 1                              | -39 [-40]                 | -42 [-42] | -40 [-42] | -14 [-25] | -14 [-25] | -32 [-35] |
| LTE2 to WIFI 2                             | -34 [-32]                 | -36 [-32] | -38 [-32] | -14 [-14] | -14 [-14] | -33 [-31] |
| WIFI 1 to WIFI 2                           | -74 [-70]                 | -75 [-75] | -71 [-71] | -30 [-28] | -30 [-28] | -38 [-40] |
| GNSS to LTE 1                              | -68 [-68]                 | -69 [-69] | -71 [-71] | -52 [-52] | -55 [-55] | -52 [-52] |
| GNSS to LTE 2                              | -43 [-43]                 | -41 [-41] | -41 [-41] | -46 [-46] | -51 [-51] | -54 [-54] |
| GNSS to WIFI 1                             | -65 [-62]                 | -68 [-66] | -71 [-69] | -47 [-45] | -47 [-45] | -52 [-49] |
| GNSS to WIFI 2                             | -68 [-66]                 | -69 [-66] | -71 [-69] | -52 [-50] | -55 [-50] | -52 [-50] |
| Azimuth Plane 3 dB Beamwidth               | 360°, Omnidirectional     |           |           |           |           |           |
| Nominal Impedance (Ohms)                   | 50                        |           |           |           |           |           |
| Polarization                               | Linear Vertical           |           |           |           |           |           |
| Max Power - Ambient 25°C (W)               | 30 (LTE/CELL) /10 (Wi-Fi) |           |           |           |           |           |

## GNSS ANTENNA SPECIFICATIONS

|                                                    |                     |                     |                     |
|----------------------------------------------------|---------------------|---------------------|---------------------|
| Frequency of Operation (MHz)                       | 1559 - 1606         |                     |                     |
| Band                                               | BEIDOU              | GPS                 | G1                  |
| Frequency Band (MHz)                               | 1559.052 - 1563.144 | 1574.42 - 1576.42   | 1598.0625 - 1605.89 |
| Absolute Gain (dBi) – Gnd. Plane [No Gnd. Plane]   | 2 [3.2]             | 2 [5.0]             | 2 [5.3]             |
| LNA Gain, Typ. @ room temp. (dBi)                  | 28 ± 3              |                     |                     |
| Noise Figure @ room temp., Max (dB)                | ≤ 2.5 @ 1575 MHz    |                     |                     |
| Max VSWR @ room temp.                              | 2.0                 |                     |                     |
| Polarization                                       | RHCP                |                     |                     |
| Nominal Impedance (Ohms)                           | 50                  |                     |                     |
| DC Voltage (Vdc)                                   | 2.5- 7.0            |                     |                     |
| Current Consumption, Max @ room temp (mA)          | 8.5 ± 3 @ 3.0V      |                     |                     |
| Out-of-band Signal Rejection Min @ room temp (dBc) | 80 (@698-960MHz)    | 80 (@1428-2700 MHz) | 70 (@4900-5800 MHz) |
| Input Max Power (dBm)                              | -10                 |                     |                     |
| Cable Type                                         | RG174               |                     |                     |

| MECHANICAL SPECIFICATIONS            |                                           |
|--------------------------------------|-------------------------------------------|
| Dimensions – L x W x H – mm (inches) | 179 x 63 x 48 (7.04 x 2.48 x 1.69)        |
| Weight – kg (lbs.)                   | 1.1 kg (2.42 lbs)                         |
| Cable Type                           | LMR 100- pigtails, LMR 195- jumper cables |
| Mounting                             | P-Mount                                   |
| Radome Material                      | PC, UL94-V0                               |
| Baseplate Material                   | Aluminum                                  |

| ENVIRONMENTAL SPECIFICATIONS    |                                                    |
|---------------------------------|----------------------------------------------------|
| Operating Environment           | Outdoor Vehicle                                    |
| 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 Rating       | IP67                                               |
| Rail Compliance Standards       | EN61373 (Shock & Vibration), EN50155 (Temperature) |
| Material Substance Compliance   | RoHS                                               |

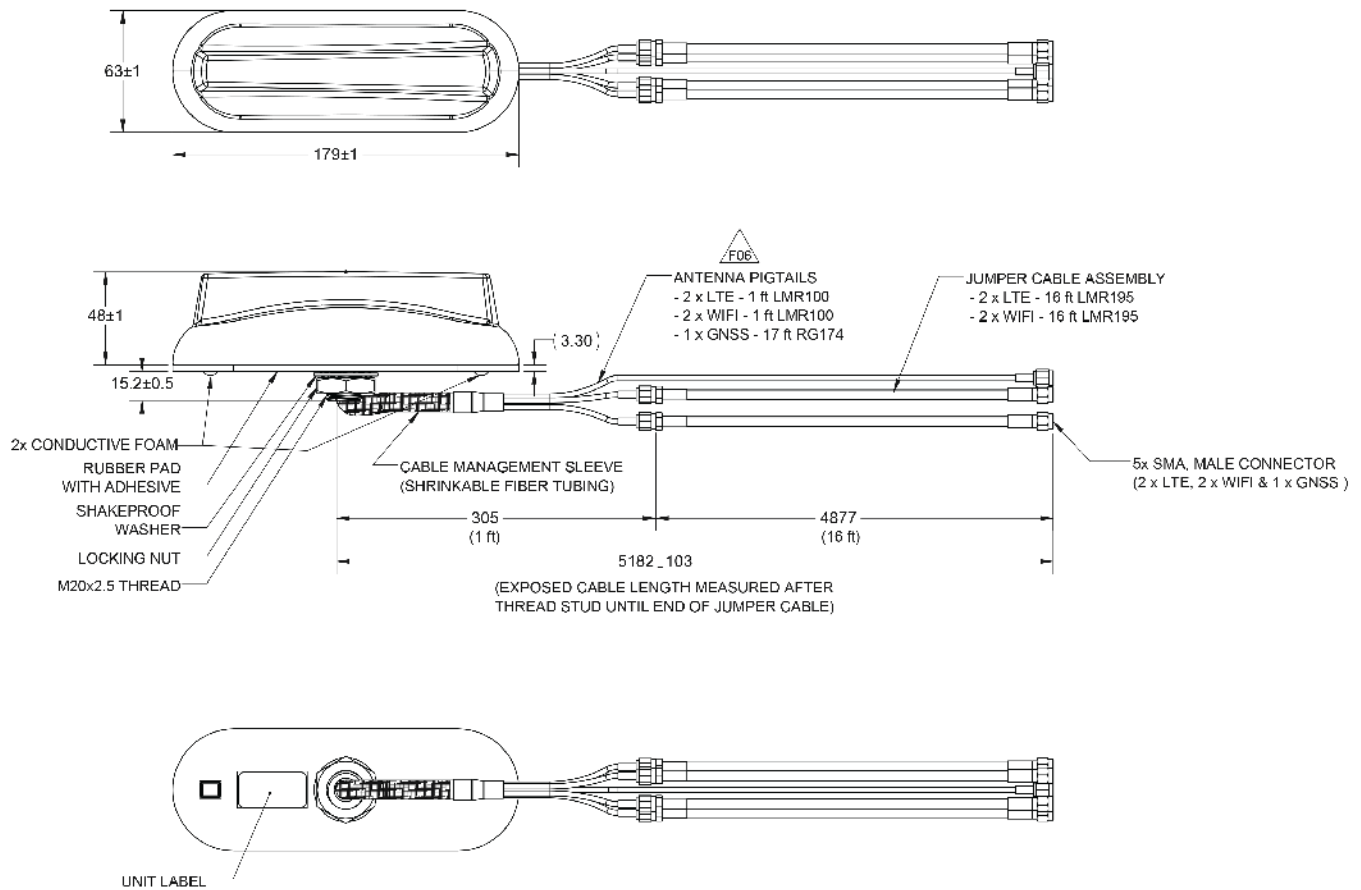
**Notes:** (\*) – This parameter is based on a 30cm (1ft) cable length. For the ground plane measurement, a 30cm (1ft) ground plane was used.

(\*\*) – This parameter is based on a 518cm (17ft) cable length. For the ground plane measurement, a 30cm (1ft) ground plane was used.

Antenna specifications are subject to change according to the ground plane size.



## MECHANICAL DRAWINGS



The L001258-01 antenna can create an IP67 water-tight seal when installed on vehicles. Certain vehicles such as a Ford Explorer Interceptor have more narrow roof ridges that are tightly spaced together. For this type, vehicle special adapters are available.

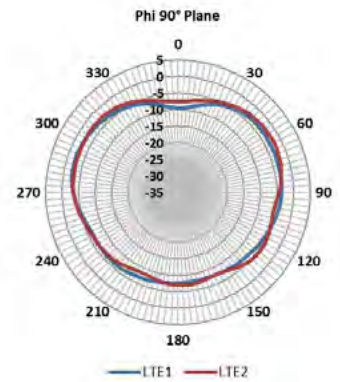
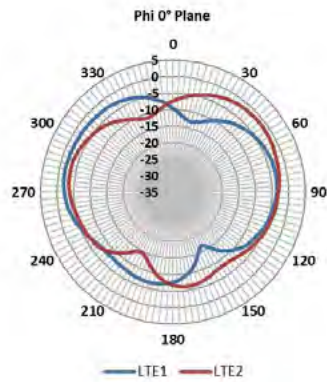
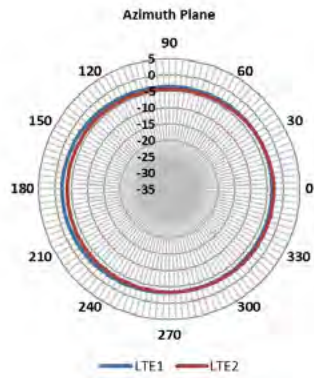
See parts **BKIT-VFX69383-001** (between ridges installation) and **BKIT-VFX69383-003** (atop ridge installation) for product details.

## PACKAGING INFORMATION

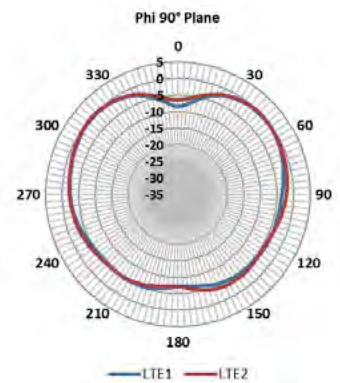
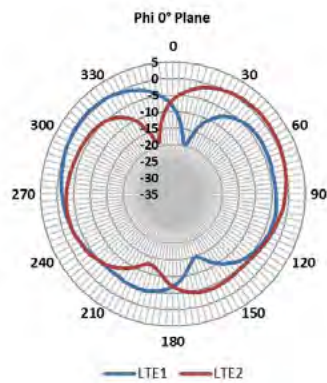
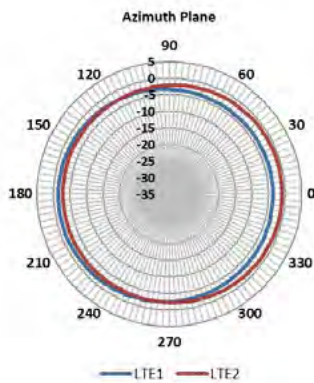
| PACKAGED DIMENSIONS        | CARTON      | MASTER CARTON | AIR PALLET   | OCEAN PALLET |
|----------------------------|-------------|---------------|--------------|--------------|
| Number of Antennas         | 1           | 4             | 140          | 196          |
| Height - mm (in.)          | 130 (5.12)  | 235 (9.25)    | 1335 (52.56) | 1813 (71.38) |
| Length - mm (in.)          | 222 (8.74)  | 543 (21.38)   | 1200 (47.24) | 1200 (47.24) |
| Width - mm (in.)           | 222 (8.74)  | 232 (9.13)    | 800 (31.5)   | 800 (31.5)   |
| Shipping Weight - kg (lb.) | 1.35 (2.98) | 5.85 (12.89)  | 217 (478.4)  | 299 (659.18) |

## RADIATION PATTERNS WITH GROUND PLANE - LTE ANTENNAS

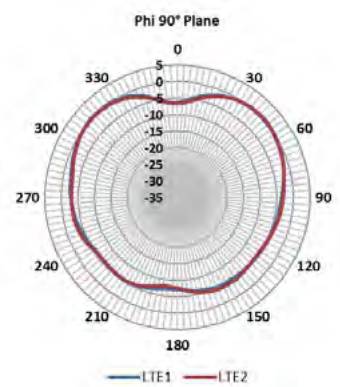
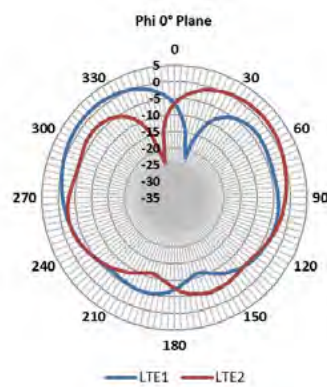
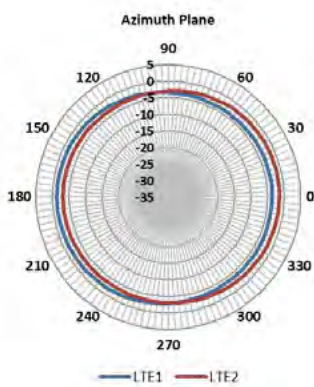
### 698 MHz



### 880 MHz

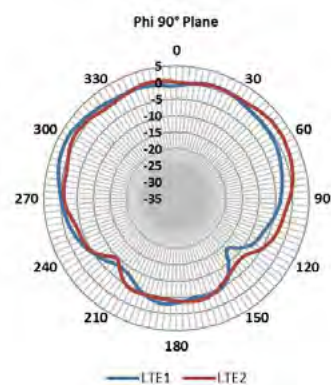
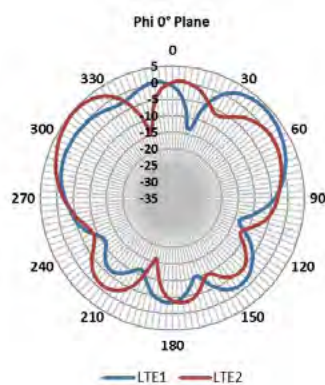
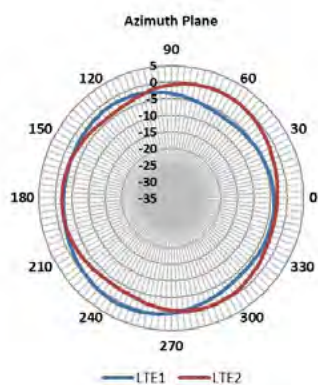


### 960 MHz

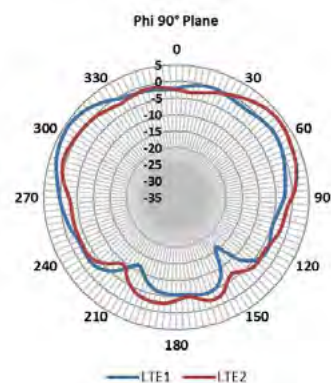
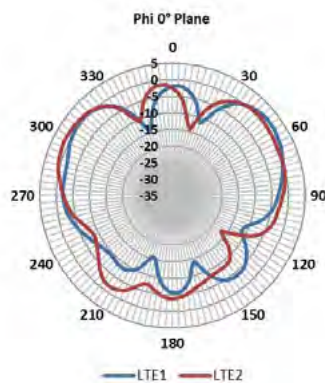
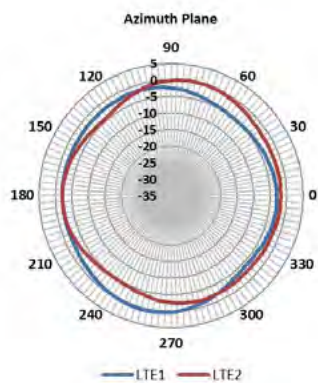


## RADIATION PATTERNS WITH GROUND PLANE - LTE ANTENNAS

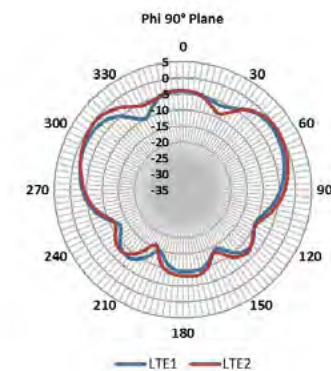
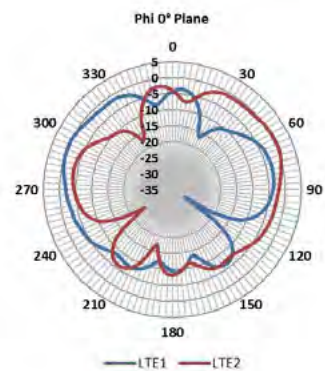
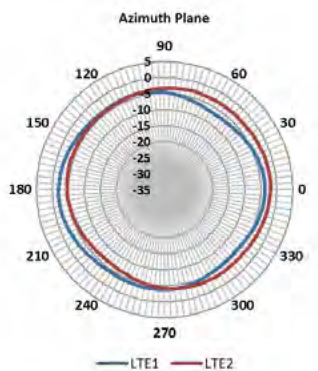
### 1690 MHz



### 1850 MHz



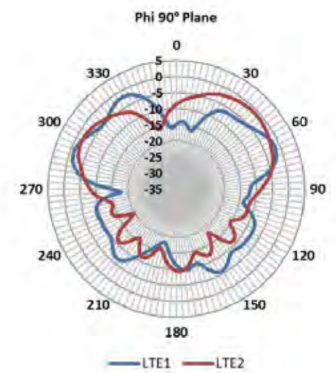
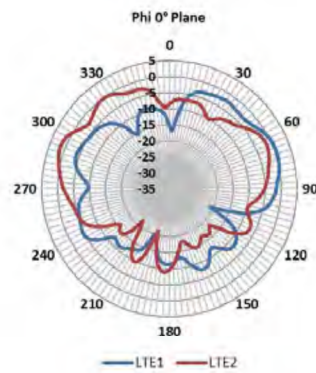
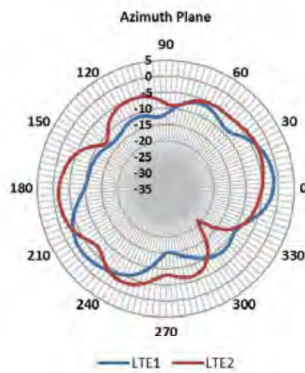
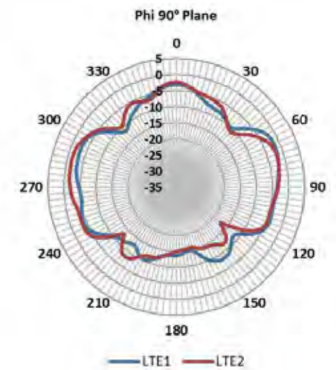
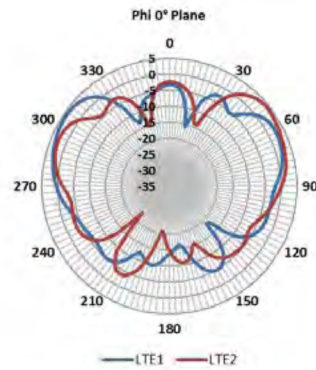
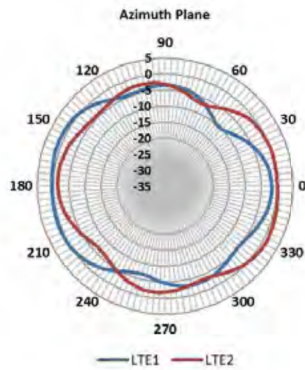
### 2170 MHz





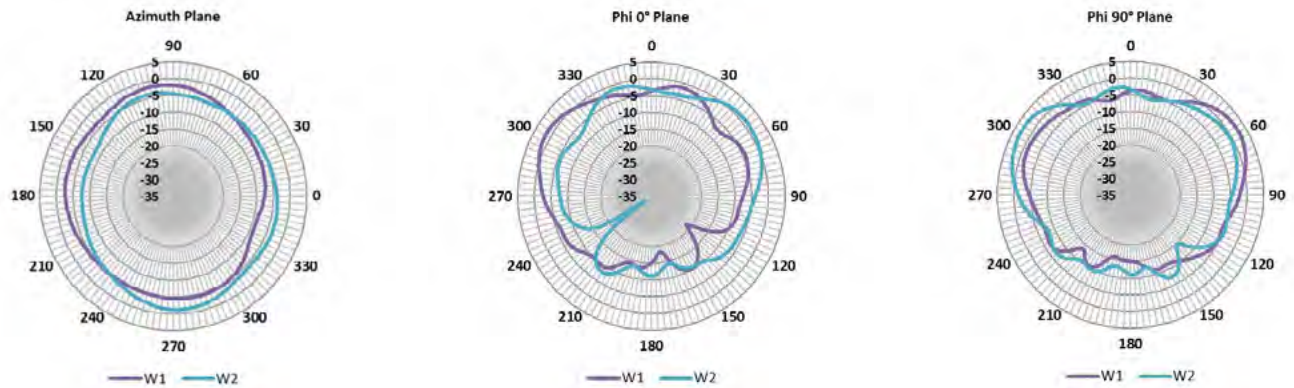
## RADIATION PATTERNS WITH GROUND PLANE - LTE ANTENNAS

2700 MHz

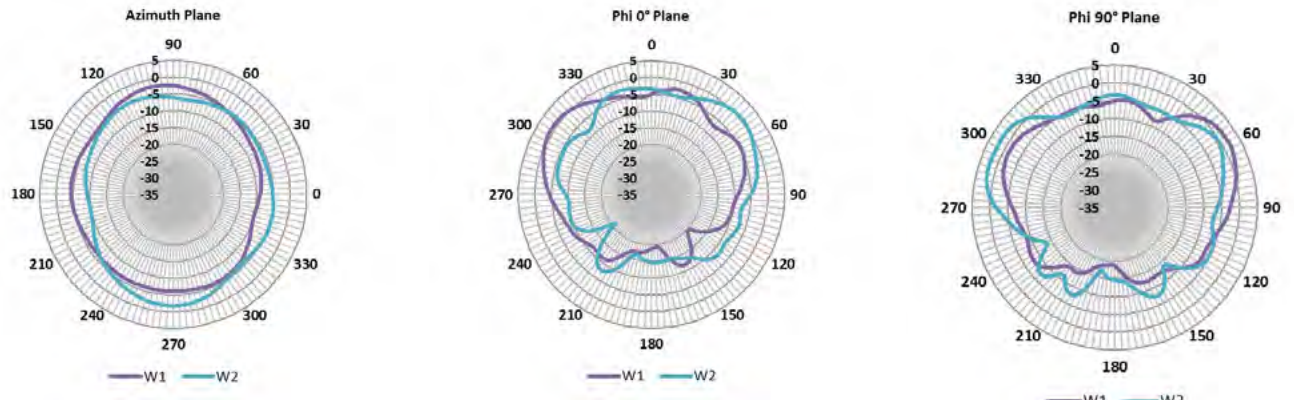


## RADIATION PATTERNS with Ground Plane - WiFi ANTENNAS

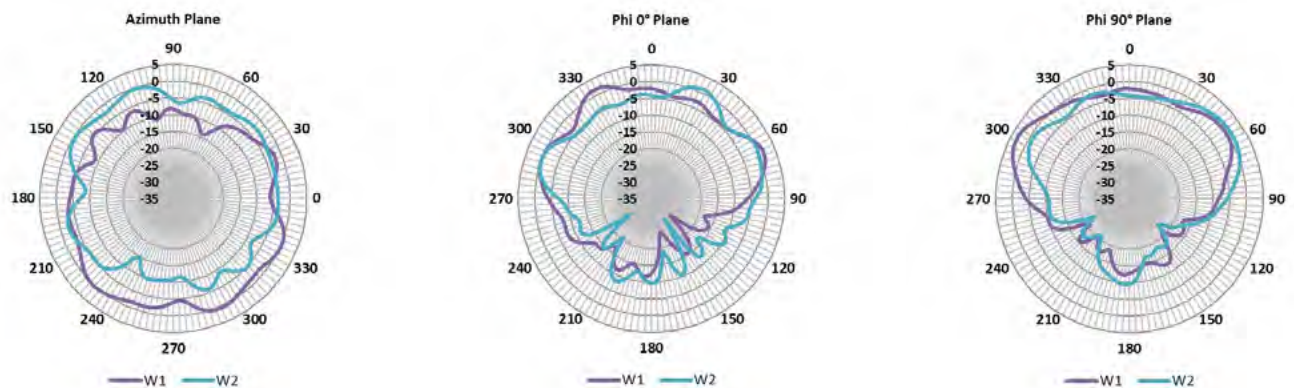
### 2400 MHz



### 2500 MHz

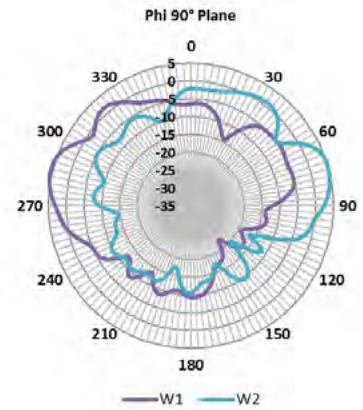
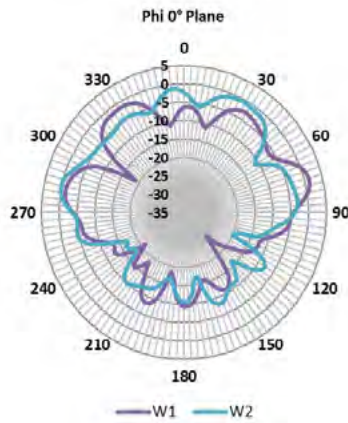
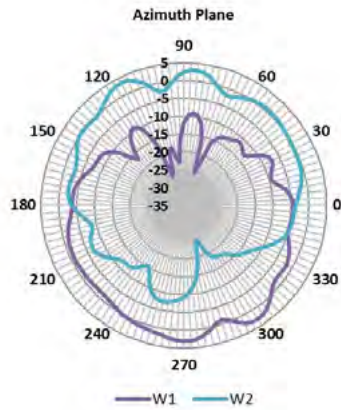


### 4900 MHz



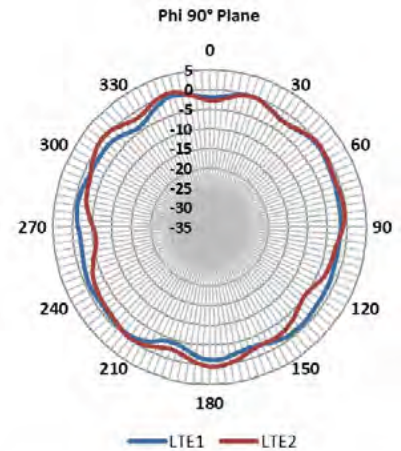
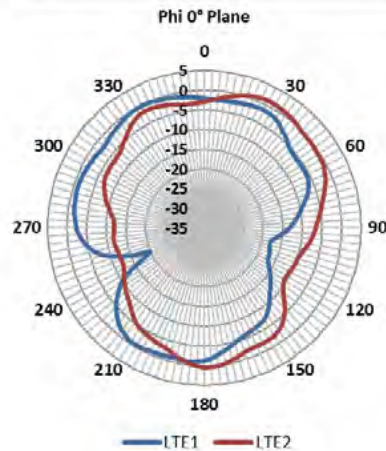
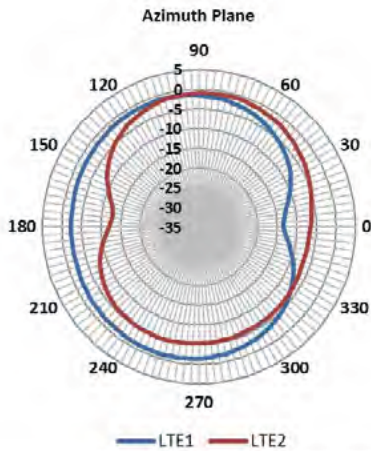


## 5900 MHz

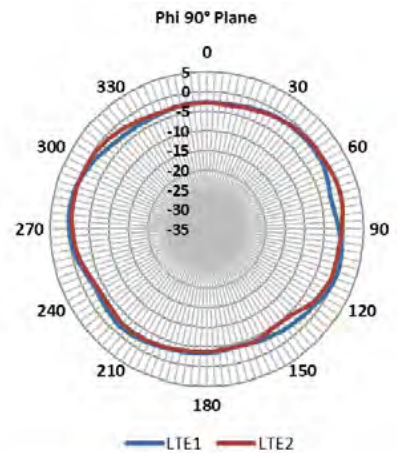
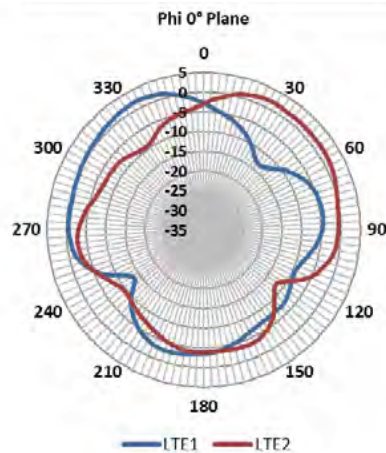
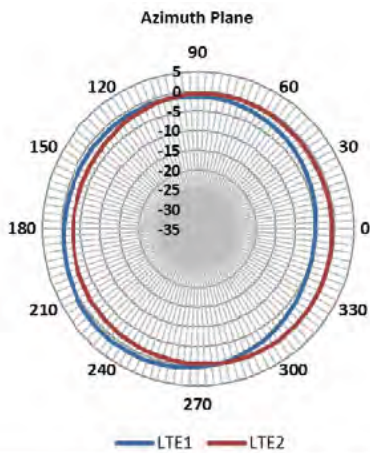


## RADIATION PATTERNS *without Ground Plane* - LTE ANTENNAS

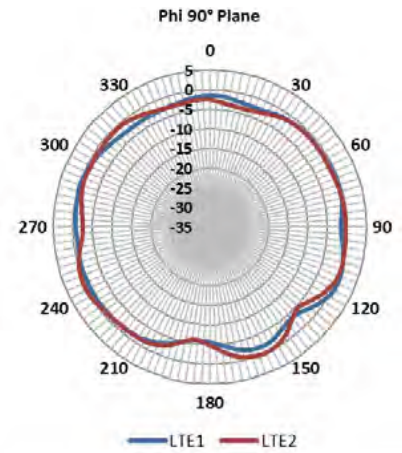
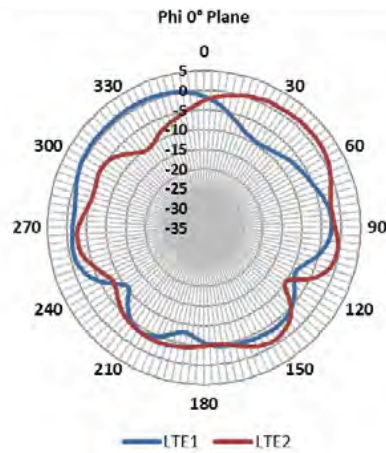
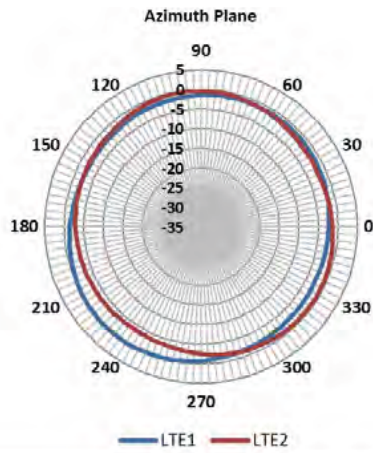
### 698 MHz



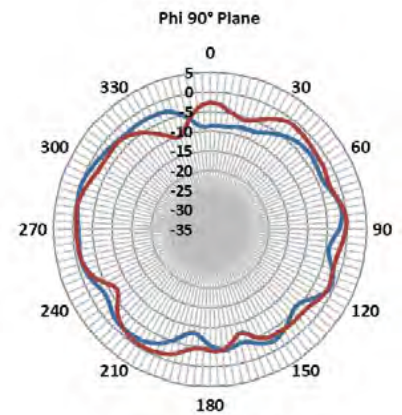
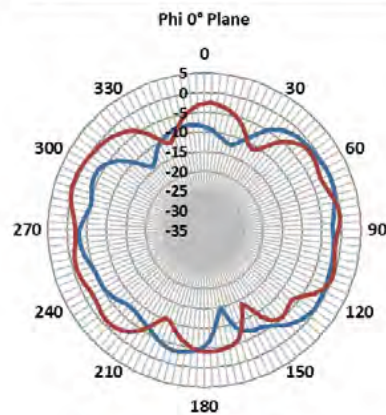
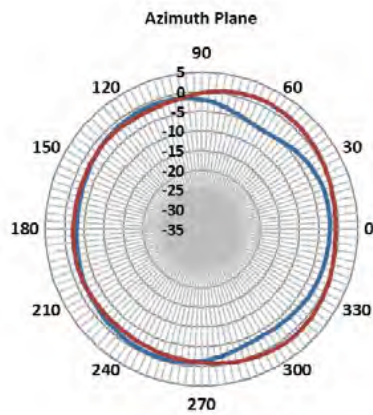
### 880 MHz



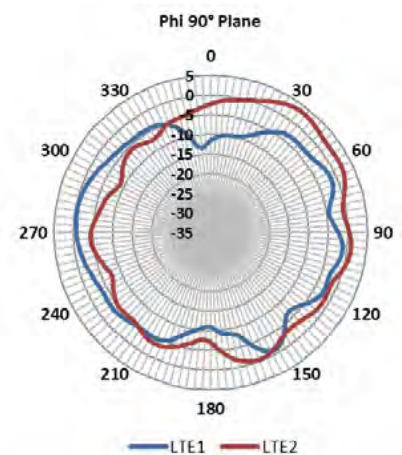
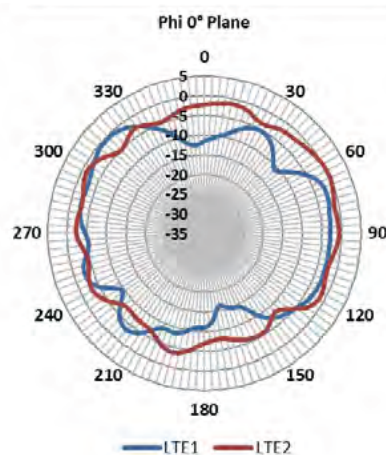
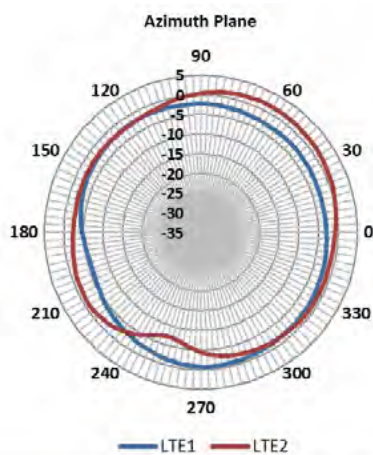
## 960 MHz



## 1690 MHz

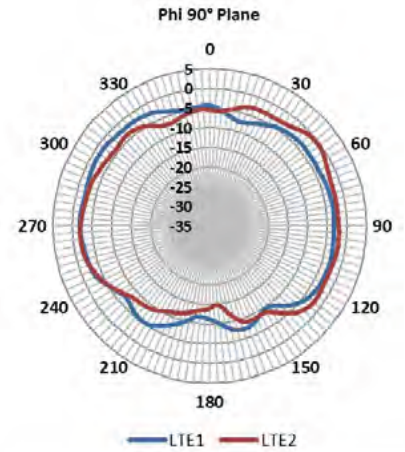
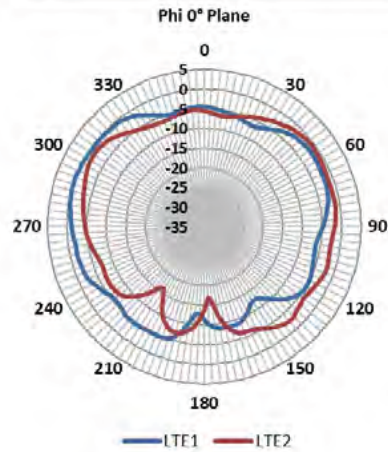
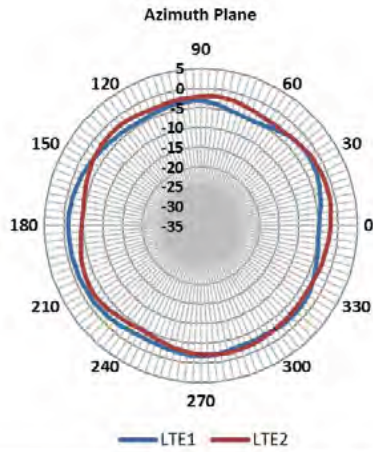


## 1850 MHz

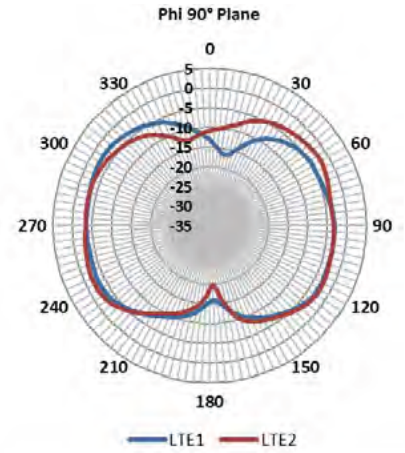
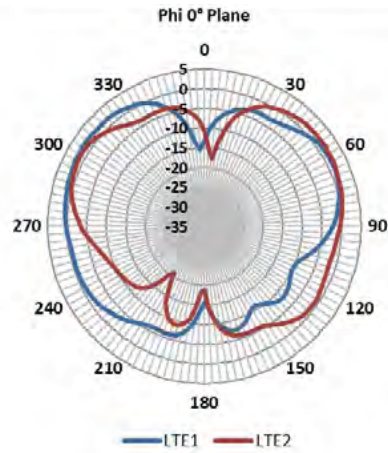
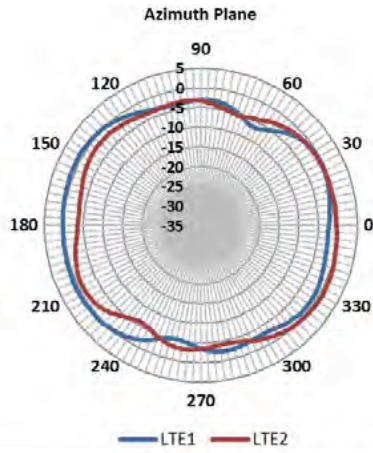




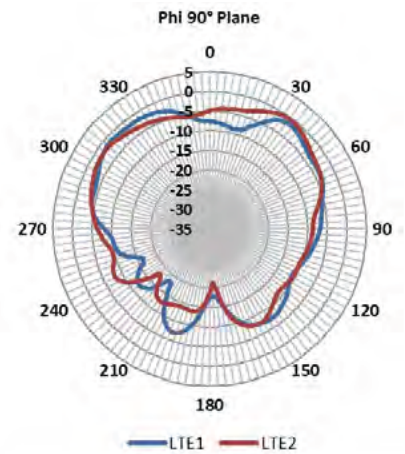
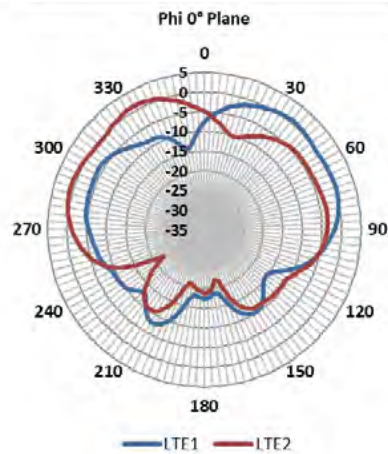
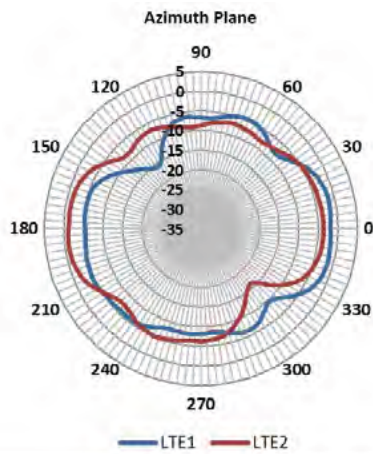
## 2170 MHz



## 2700 MHz



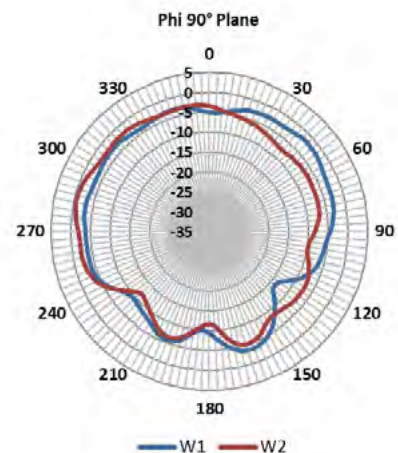
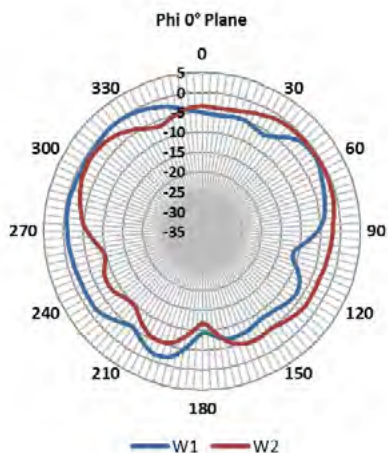
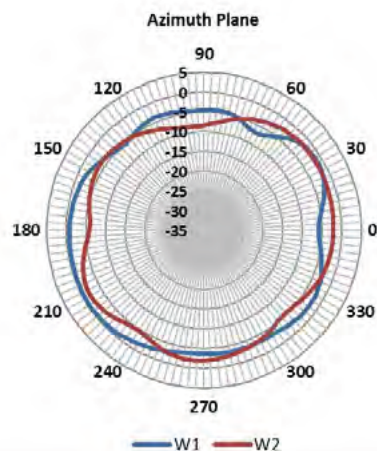
## 3800 MHz



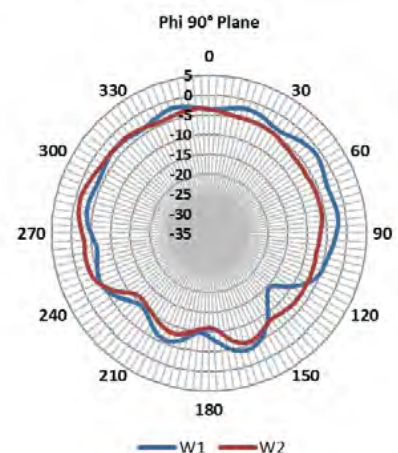
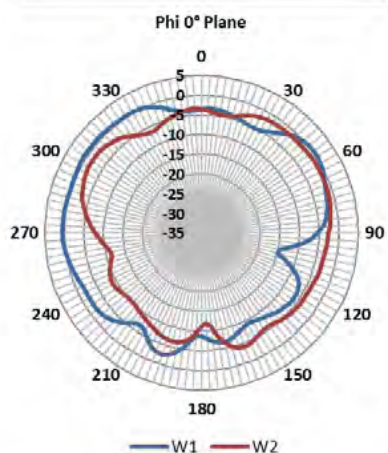
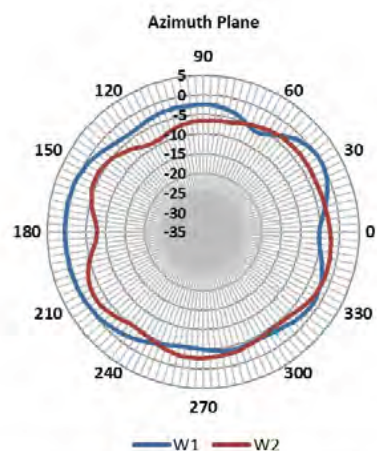


## RADIATION PATTERNS *without Ground Plane* - LTE ANTENNAS

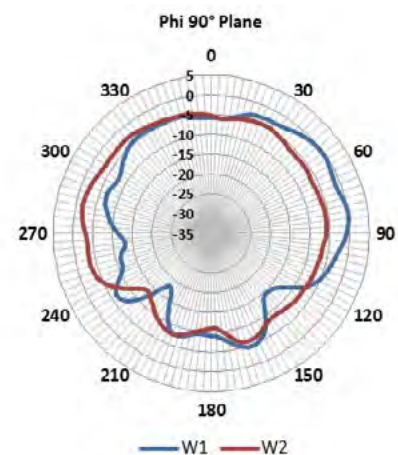
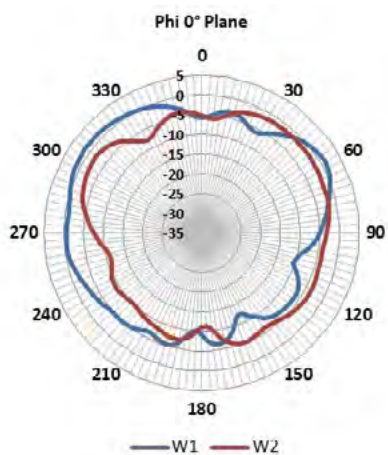
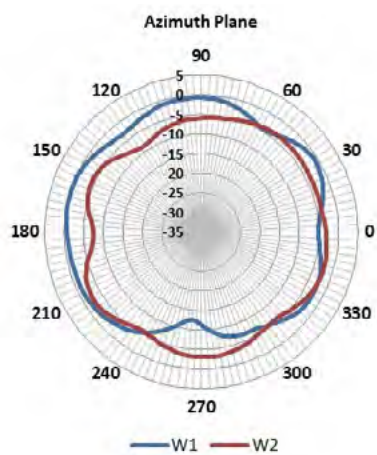
### 2400 MHz



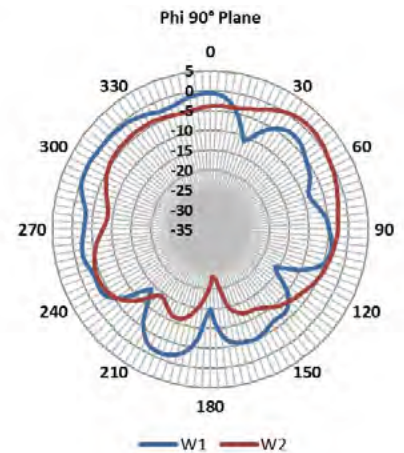
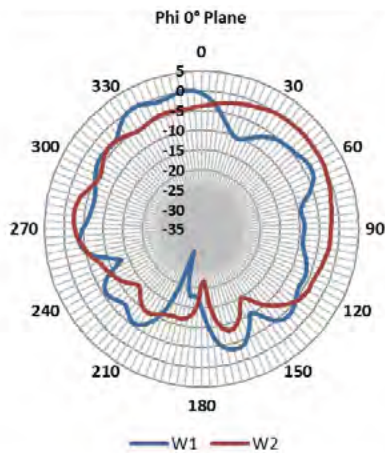
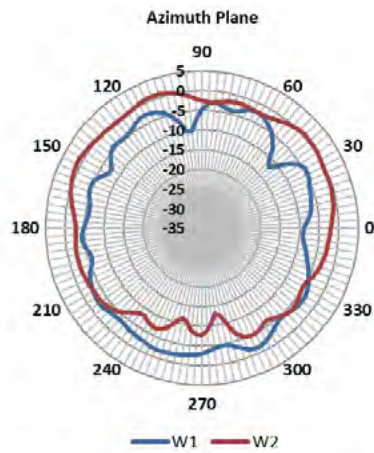
### 2450 MHz



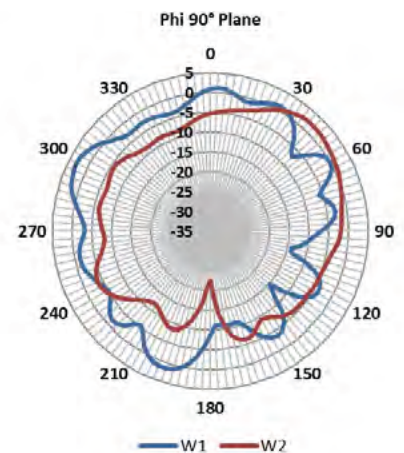
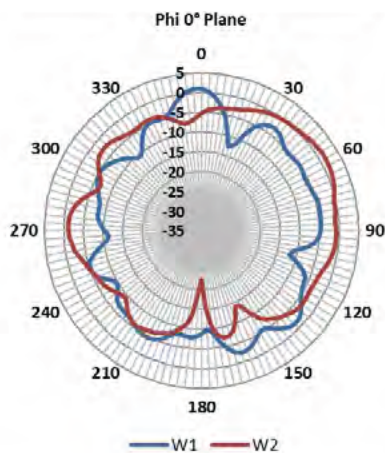
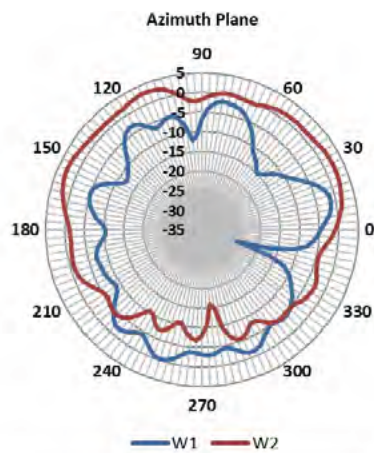
### 2500 MHz



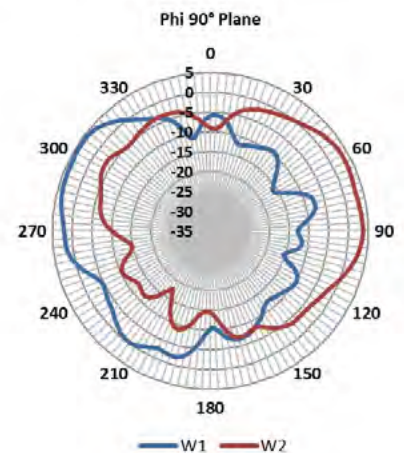
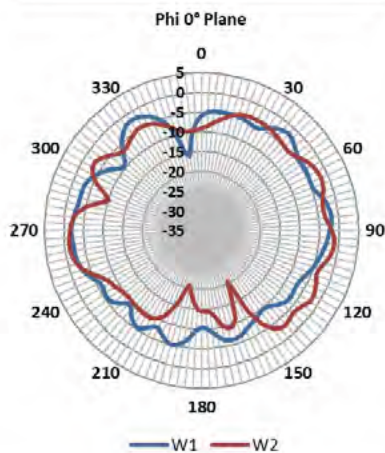
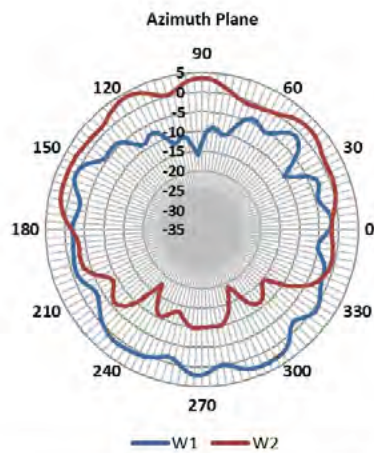
## 4900 MHz



## 5250 MHz



## 5950 MHz





---

## TE TECHNICAL SUPPORT CENTER

|                   |                       |
|-------------------|-----------------------|
| USA:              | +1 (800) 522-6752     |
| Canada:           | +1 (905) 475-6222     |
| Mexico:           | +52 (0) 55-1106-0800  |
| Latin/S. America: | +54 (0) 11-4733-2200  |
| Germany:          | +49 (0) 6251-133-1999 |
| UK:               | +44 (0) 800-267666    |
| France:           | +33 (0) 1-3420-8686   |
| Netherlands:      | +31 (0) 73-6246-999   |
| China:            | +86 (0) 400-820-6015  |

## te.com

TE, TE Connectivity, TE connectivity (logo), and EVERY CONNECTION COUNTS are trademarks owned or licensed by the TE Connectivity plc family of companies. Other product names, logos, and company names mentioned herein may be trademarks of their respective owners.

While TE has made every reasonable effort to ensure the accuracy of the information in this document, TE does not guarantee that it is error-free, nor does TE make any other representation, warranty or guarantee that the information is accurate, complete, correct, reliable or current. TE reserves the right to make any adjustments to the information contained herein at any time without notice. TE EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES REGARDING THE INFORMATION CONTAINED HEREIN, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. In no event will TE be liable for any direct, indirect, incidental, special or consequential damages arising from or related to recipient's use of the information. It is the sole responsibility of recipient of this information to verify the results of this information using their engineering and product environment. Recipient assumes any and all risks associated with the use of the information. Antenna performance may vary. TE is a component manufacturer, and customer and/or end-user is responsible for all end-use compliance and regulatory requirements.

©2025 TE Connectivity. All Rights Reserved.

08/25 Original