ETS·LINDGREN®
An ESCO Technologies Company

Dual-Polarized Dual-Vivaldi Array Antenna

3165 Series Antenna User Manual

399322 Rev F

September, 2023

Revision Record
MANUAL, PRODUCT | Part #399322 Rev F

Revision	Description	Date
A	Initial Release	January, 2011
B	Added Model 3165-02 content	October, 2013
C	Added Model 3165-04 content	November, 2020
D	Corrected Model 3165-04 range	February, 2022
E	Added 3165-05; removed 3165-02	May, 2023
F	Added mounting instructions	September, 2023

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Notes, Cautions, Warnings

	**Note:** Denotes helpful information intended to provide tips for better use of the product.
CAUTION	**CAUTION:** Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.
WARNING	**WARNING:** Denotes a hazard. Failure to follow instructions could result in **SEVERE** personal injury and/or property damage. Included text gives proper procedures.

*All notes, cautions, and warnings will be located on the left column area of the page.

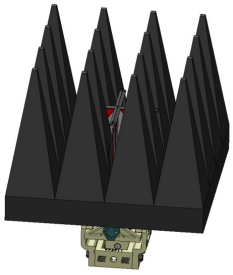
See the ETS-Lindgren **Product Information Bulletin** for safety, regulatory, and other product marking information.

1.0 Introduction

Product Introduction

The **ETS-Lindgren 3165 Series Absorber Nested Dual Polarized Dual Vivaldi Array Antenna** is designed for applications that require minimum effect from the source antenna, such as in chambers where the Device Under Test (DUT) is illuminated from different directions. Each antenna in the 3165 Series is dual-linearly polarized and capable of simultaneously measuring two orthogonal components in the field.

The 3165 Series possesses low VSWR while maintaining high directivity. This allows use in the illumination of the DUT without affecting adjacent antennas in a multi-antenna installation.



3165-01-SQ

Model 3165-01

The Model 3165-01 has a frequency range of 600 MHz to 6 GHz, which covers most of the current wireless technologies e.g. 4G LTE, 5G FR1 and WiFi. It is designed to be nested in the anechoic absorber lining of a chamber, and when installed in this configuration, will exhibit very low reflectivity, even when the input ports are mismatched. The normal incidence reflectivity is below 30 dB for most of the frequency range.

Model 3165-04

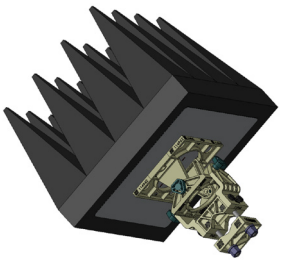
The Model 3165-04 has a frequency range of 600 MHz to 10.6 GHz, which covers most of the current wireless technologies e.g. 4G LTE, 5G FR1, WiFi and UWB. It is designed to be nested in the anechoic absorber lining of a chamber, and when installed in this configuration, will exhibit very low reflectivity, even when the input ports are mismatched. The normal incidence reflectivity is below 30 dB for most of the frequency range.

Model 3165-05

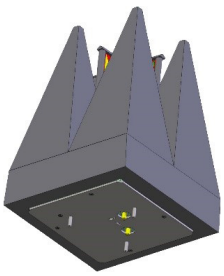
The Model 3165-05 has a frequency range of 400 MHz to 7.2 GHz, which covers all of the current wireless technologies e.g. 4G LTE, 5G FR1 and WiFi. It is designed to be nested in the anechoic absorber lining of a chamber, and when installed in this configuration, will exhibit very low reflectivity, even when the input ports are mismatched. The normal incidence reflectivity is below 30 dB for most of the frequency range.

Mounting Options

Following are the mounting options available for the 3165-01/3165-04/3165-05; for more information on mounting, contact ETS-Lindgren Technical Support.



3165-01-RD



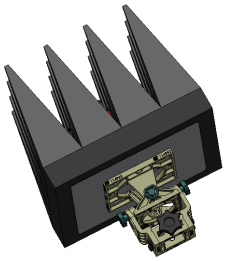
3165-04-MG

MG Series

The MG Series allows you to magnetically attach the antenna to a positioning system, existing bracket, or shielding.

SQ Series

The SQ Series includes brackets that allow you to manually adjust the pan and tilt of the antenna. These brackets mount to a 50mm square tube.



3165-01-SQ

RD Series

The RD Series includes a fixture that allows you to manually adjust the pan and tilt of the antenna. The fixture is designed to be attached to a round tube adjustable up to 50 mm (diameter).

ETS-Lindgren Product Information Bulletin

See the ETS-Lindgren *Product Information Bulletin* included with your shipment for the following:

- Safety, regulatory, and other product marking information
- Steps to receive your shipment
- Steps to return a component for service
- ETS-Lindgren calibration service
- ETS-Lindgren contact information

2.0 Maintenance

CAUTION	Before performing any maintenance, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.
	Maintenance of the 3165-01, 3165-04, and 3165-05 is limited to external components such as cables or connectors. If you have any questions concerning maintenance, contact ETS-Lindgren Technical Support.

Annual Calibration

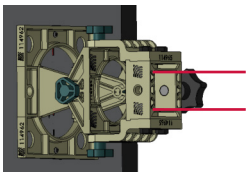
See the *Product Information Bulletin* included with your shipment for information on ETS-Lindgren calibration services.

Optional Configurations

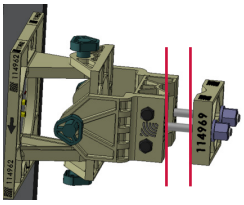
ETS-Lindgren may substitute a similar part or new part number with the same functionality for another part/part number. Contact ETS-Lindgren for questions about part numbers and ordering parts.

Following are the part numbers for ordering optional parts for the 3165 Series Absorber Nested Dual-Polarized Dual Vivaldi Array Antenna.

Description	3165-01	3165-04	3165-05
Magnetic Attachment Mounting Option	3165-01-MG	3165-04-MG	3165-05-MG
Pan and Tilt Manual Adjustment Brackets (50mm Square Tube Mounting Option)	3165-01-SQ	3165-04-SQ	3165-05-SQ
Pan and Tilt Manual Adjustment Fixture (adjustable up to 50mm Round Tube Mounting Option)	3165-01-RD	3165-04-RD	3165-05-RD



SQ Mount at end of square tube



RD Mount to vertical round tube with adjustable bolts

Service Procedures

For the steps to return a system or system component to ETS-Lindgren for service, see the *Product Information Bulletin* included with your shipment.

3.0 Specifications

Electrical Specifications

	Model 3165-01	Model 3165-04	Model 3165-05
Frequency Range:	700 MHz–6 GHz	600 MHz-10 GHz	400 MHz to 7.2 GHz
Cross Polarization Isolation:	>25 dB		
Maximum Continuous Power:	5 Watts		
Impedance (Nominal):	50 Ω		
Connectors:	SMA female (2)		

Physical Specifications

3165-01 Series Antennas with Absorber

Length:	17.80 cm (7.00 in)
Height:	18.82 cm (7.41 in)
Width:	17.80 cm (7.00 in)
Weight:	1.36 kg (3.00 lb)

3165-04 Series

Length:	27.20 cm (10.72 in)
Height:	40.60 cm (16.0 in)
Width:	27.90 cm (11.00 in)
Weight:	0.86 kg (1.9 lb)

3165-05 Series

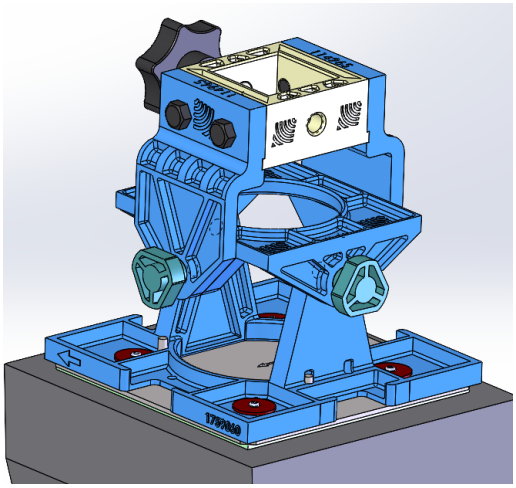
Length:	27.20 cm (9.10 in)
Height:	27.20 cm (9.10 in)
Width:	22.30 cm (8.82 in)
Weight:	1.81 kg (4.00 lb)

Mounts

	MG	SQ	RD
Length:	17.50 cm (6.75 in)	17.48 cm (6.88 in)	17.48 cm (6.88 in)
Height:	0.32 cm (0.13 in)	17.75 cm (6.99 in)	23.5 0 cm (9.25 in)
Width:	17.50 cm (6.75 in)	17.48 cm (6.88 in)	17.48 cm (6.88 in)
Weight:	0.45 kg (1.00 lb)	0.91 kg (2.00 lb)	0.91 kg (2.00 lb)

4.0 Mounting Instructions

There are three mounting options for each 3165 Series antenna. Both the RD and SQ mounts offer angular adjustability.The magnetic mounts attach magnetically.

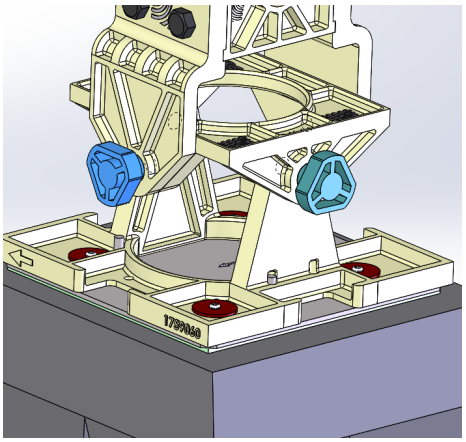


Everything highlighted in blue is common to both the RD and SQ mounting styles.

Adjusting Angles

The knobs highlighted in blue and teal are used to adjust the angle in both directions. There is a knob on each side of the structure. The countersunk parts come into contact with the knobs first. The further part is threaded.

1. Loosen the knobs by turning them counterclockwise.
2. When the correct angle is reached, tighten the knobs by turning them clockwise.
3. Repeat the process on the other sides of the structure (not shown)

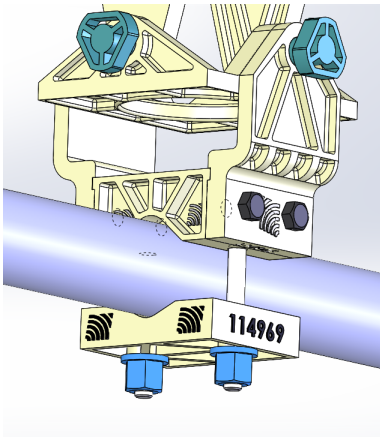


Use the highlighted knobs on each side of the mount to adjust the angle.

RD Series Mounts

To adjust pan and tilt, RD Series mounts include a fixture that can accommodate tubes up to a diameter of 50 mm.

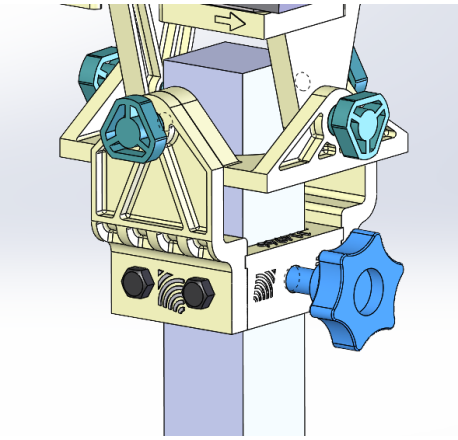
1. Loosen the nuts highlighted in blue.
2. Slide antenna into position.
3. Re-tighten nuts.



Use the highlighted knobs on each side of the mount to adjust the angle.

SQ Mounts

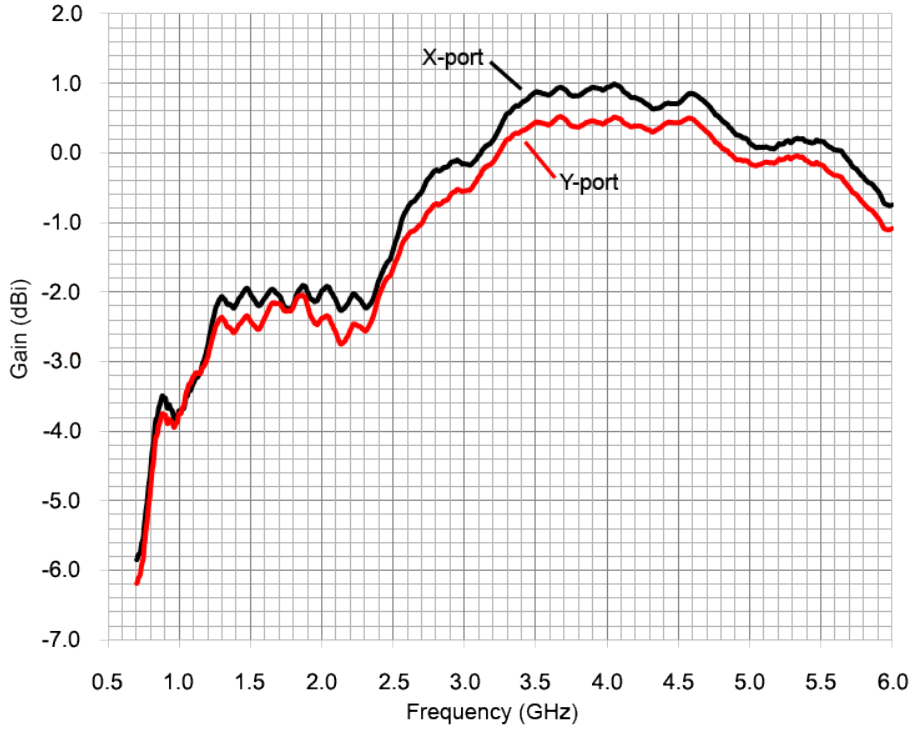
To manually adjust pan and tilt, SQ Series mounts include brackets that mount to a 50 mm square tube (not interchangeable with tubes from the RD mount).Use the knob highlighted in blue to secure the tube in place.



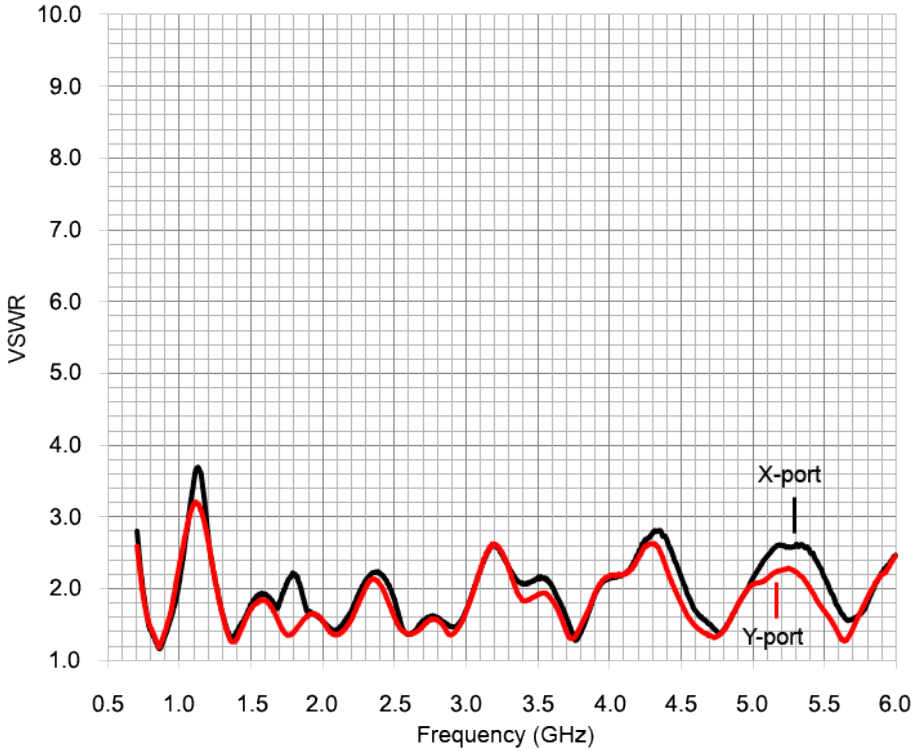
To manually adjust pan and tilt, use the knob highlighted in blue.

5.0 3165-01 Typical Data

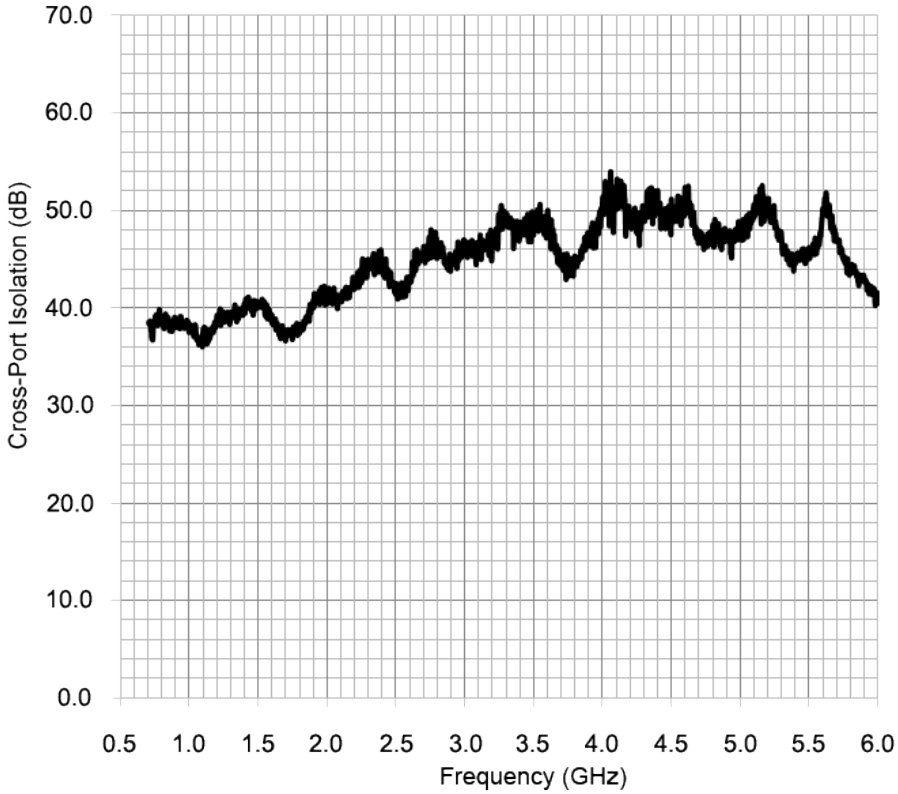
3165-01 Typical Gain



3165-01 Typical VSWR

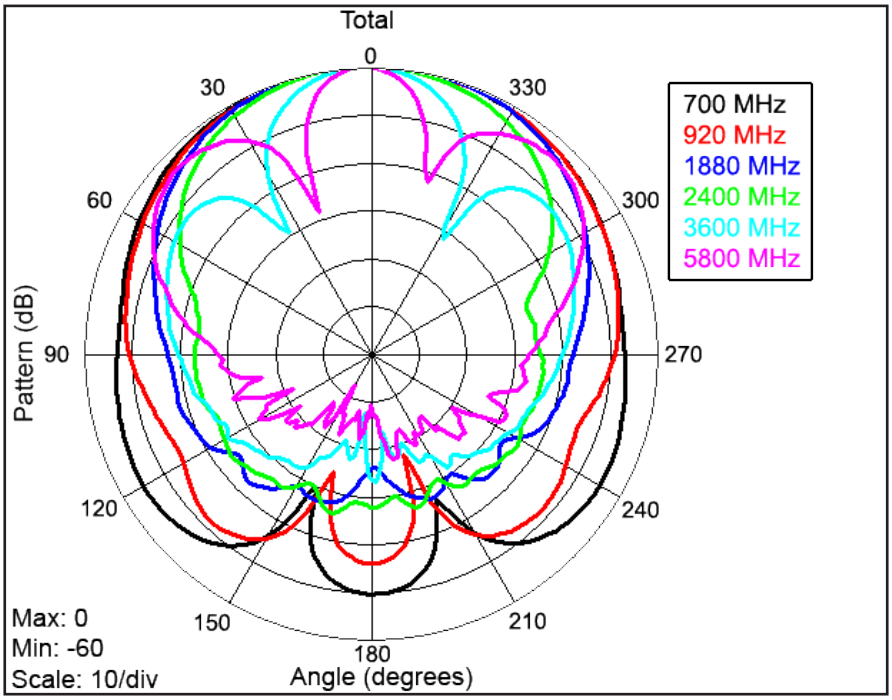


3165-01 Typical Cross-Port Isolation

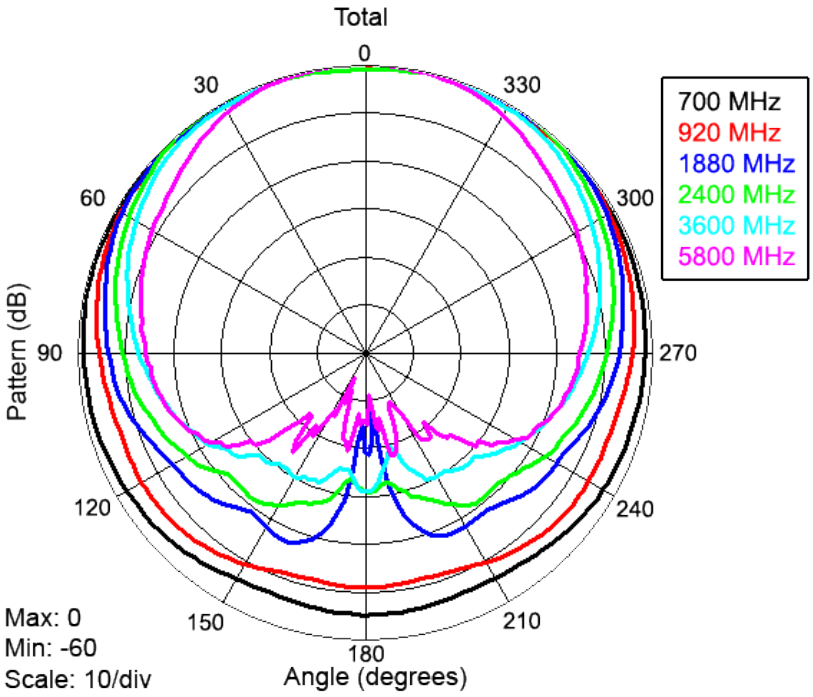


3165-01Typical Radiation Patterns

3165-01 Typical E-Plane

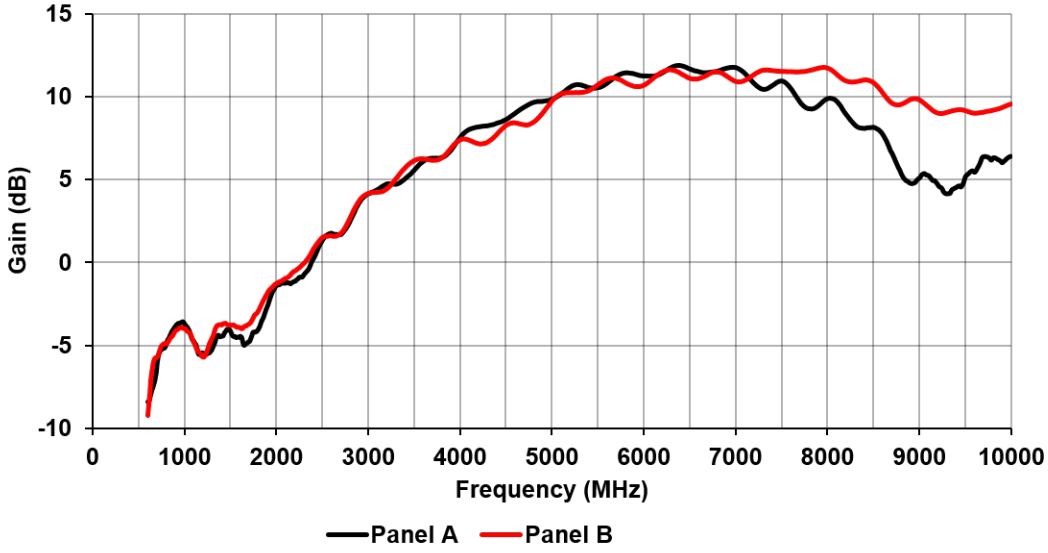


3165-01 Typical H-Plane

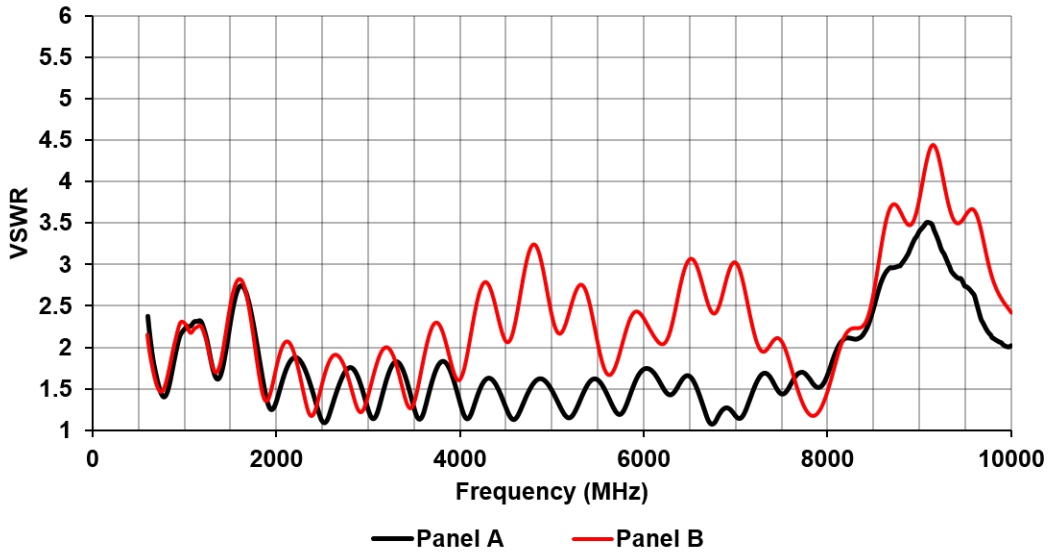


6.0 3165-04 Typical Data

3165-04 Typical Gain

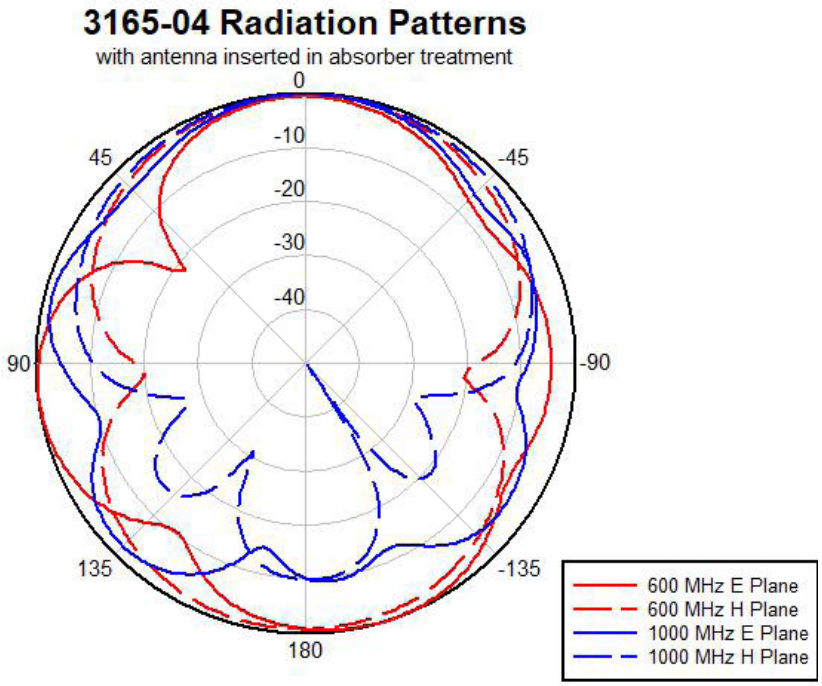


3165-04 Typical VSWR

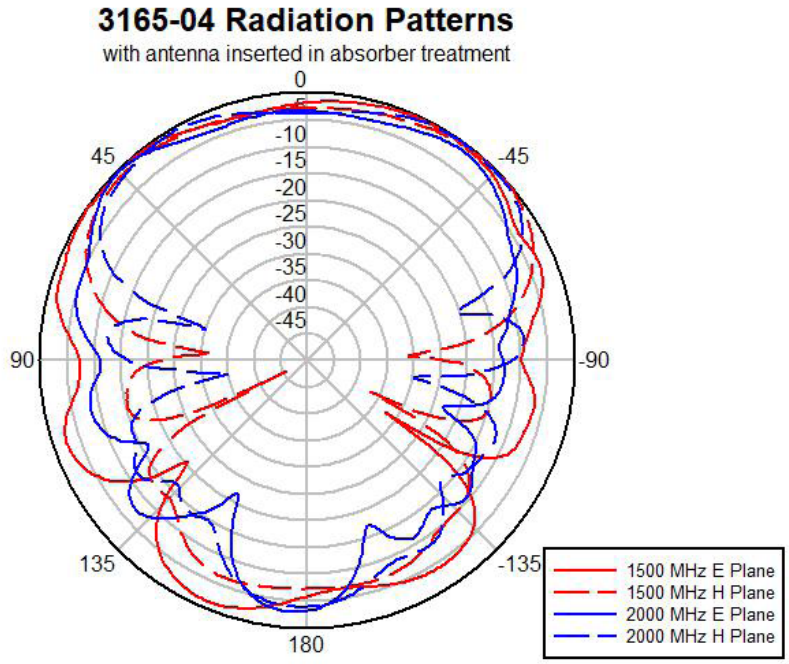


3165-04 Typical Radiation Patterns

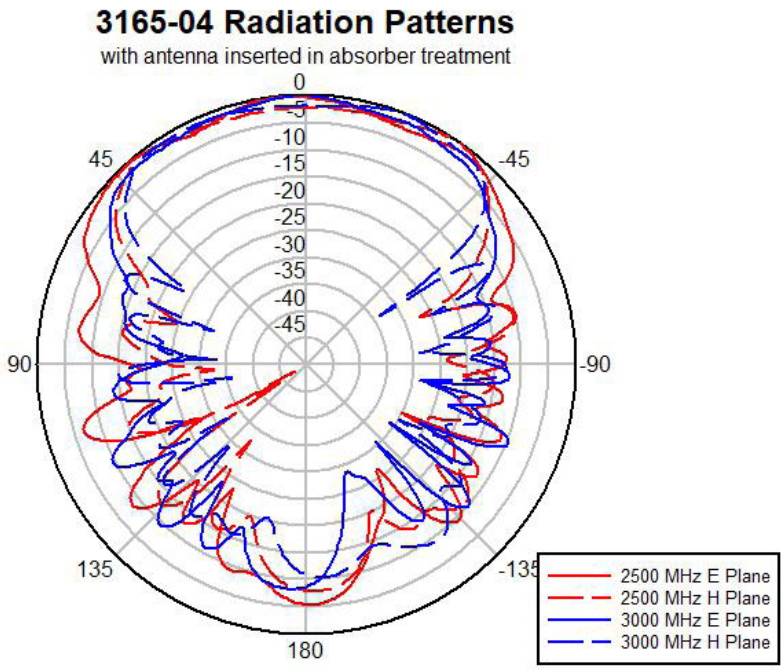
3165-04 at 600 MHz and 1000MHz



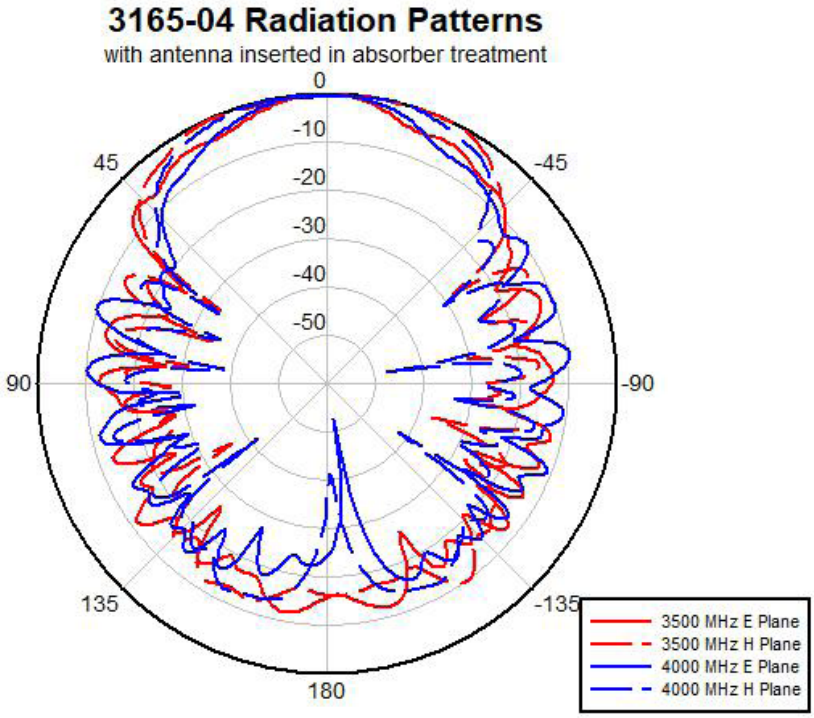
3165-04 at 1500 MHz and 2000MHz



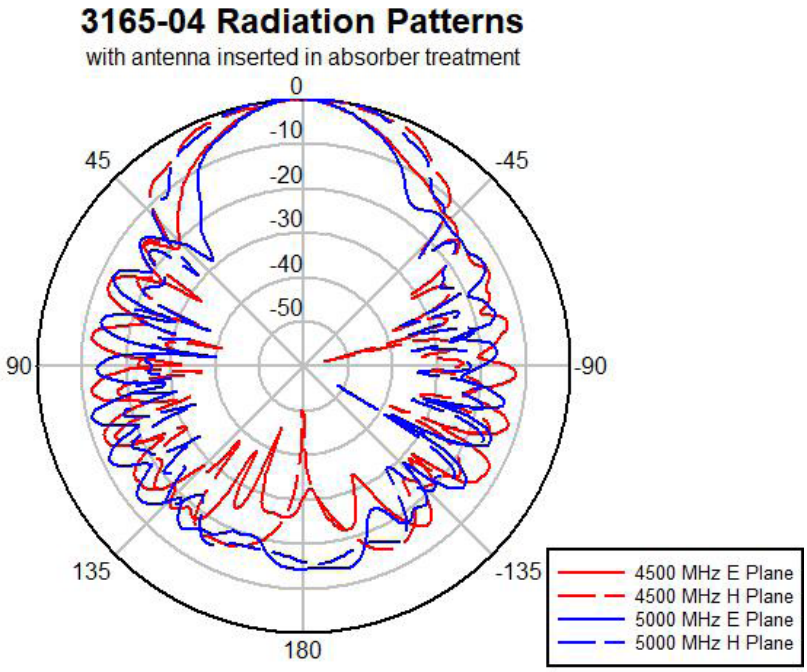
3165-04 at 2500 MHz and 3000MHz



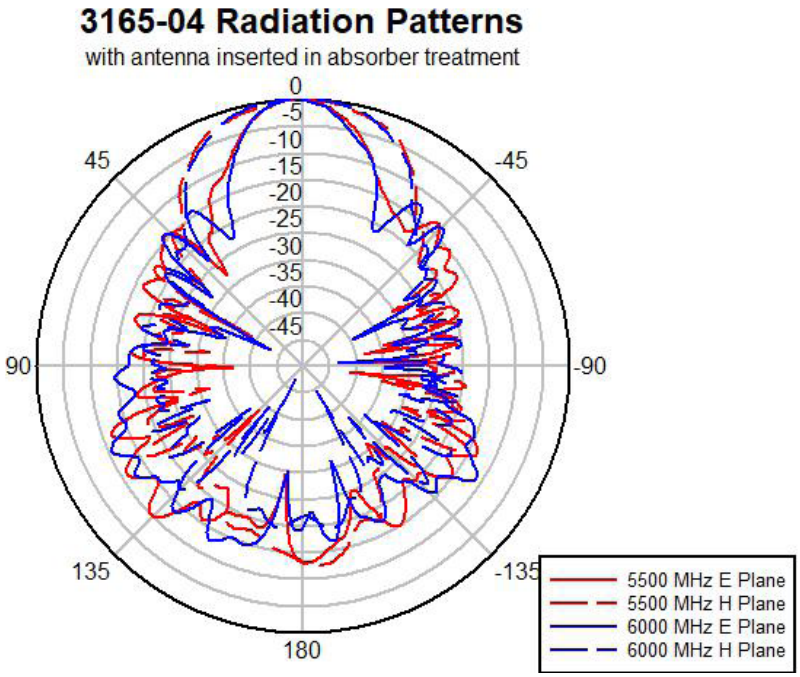
3165-04 at 3500 MHz and 4000MHz



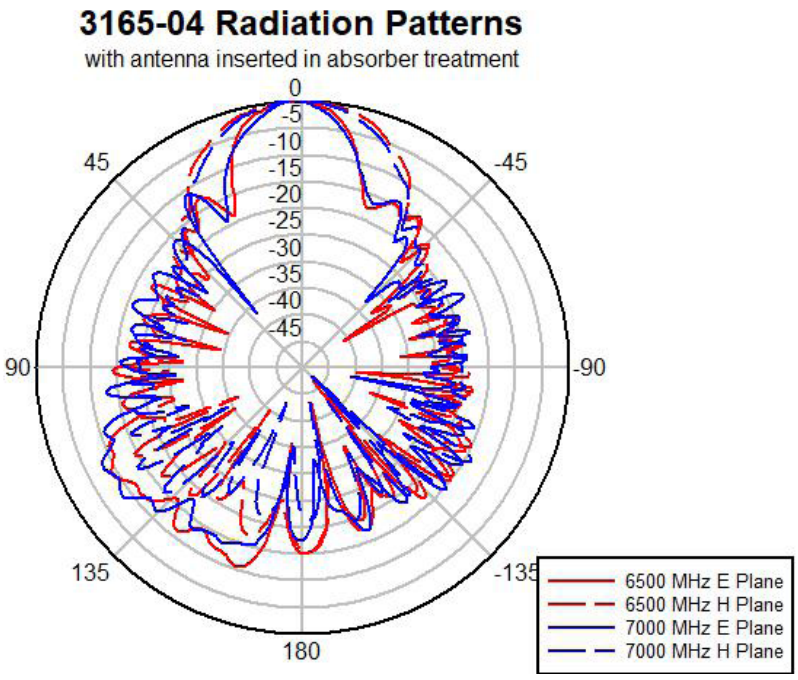
3165-04 at 4500 MHz and 5000MHz



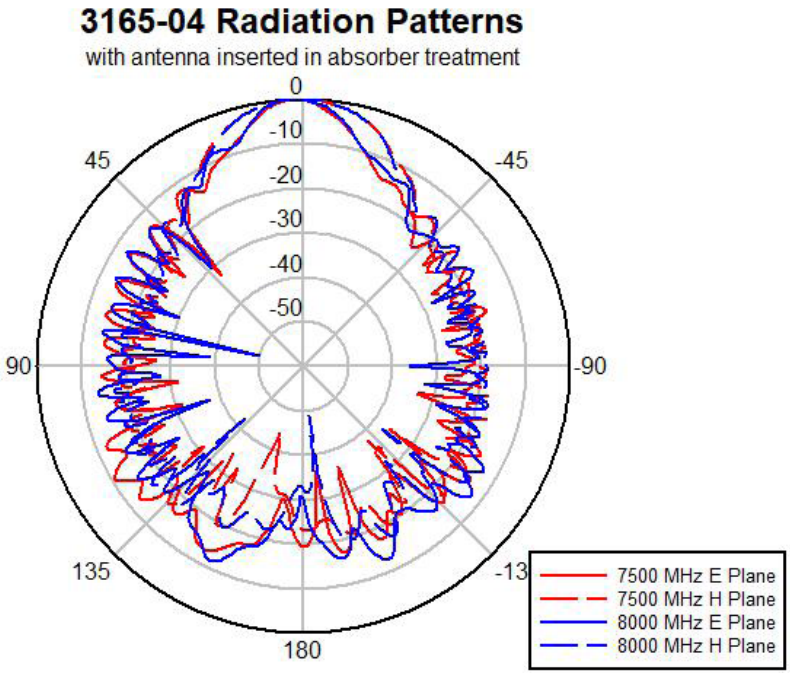
3165-04 at 5500 MHz and 6000MHz



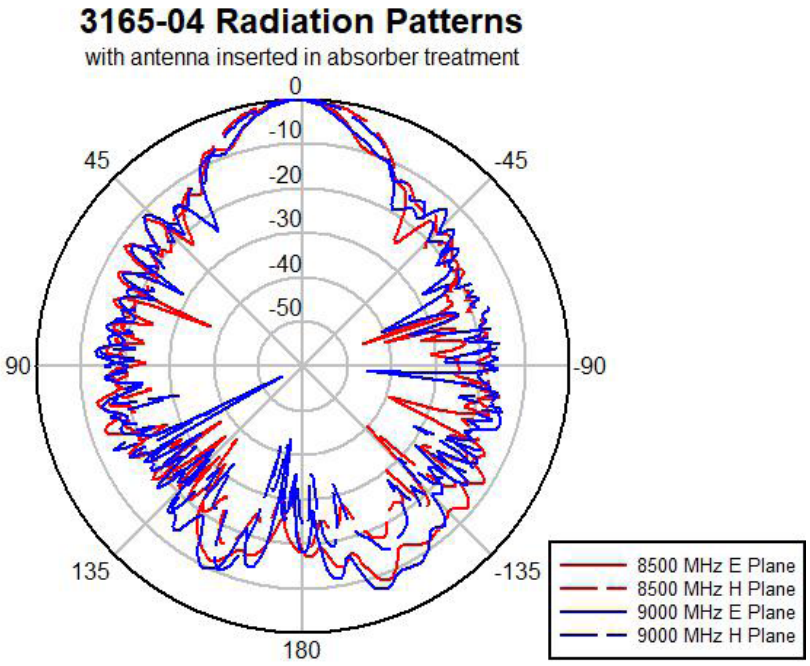
3165-04 at 6500 MHz and 7000MHz



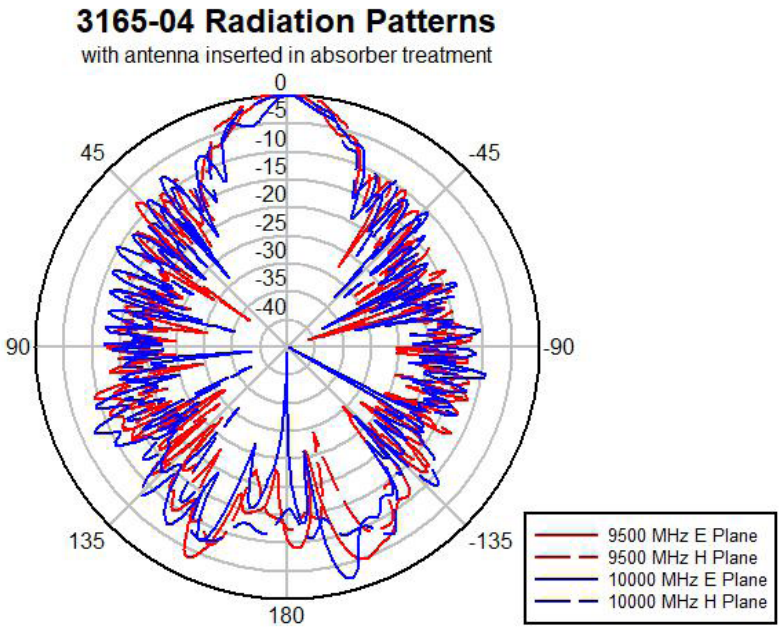
3165-04 at 7500 MHz and 8000MHz



3165-04 at 8500 MHz and 9000MHz

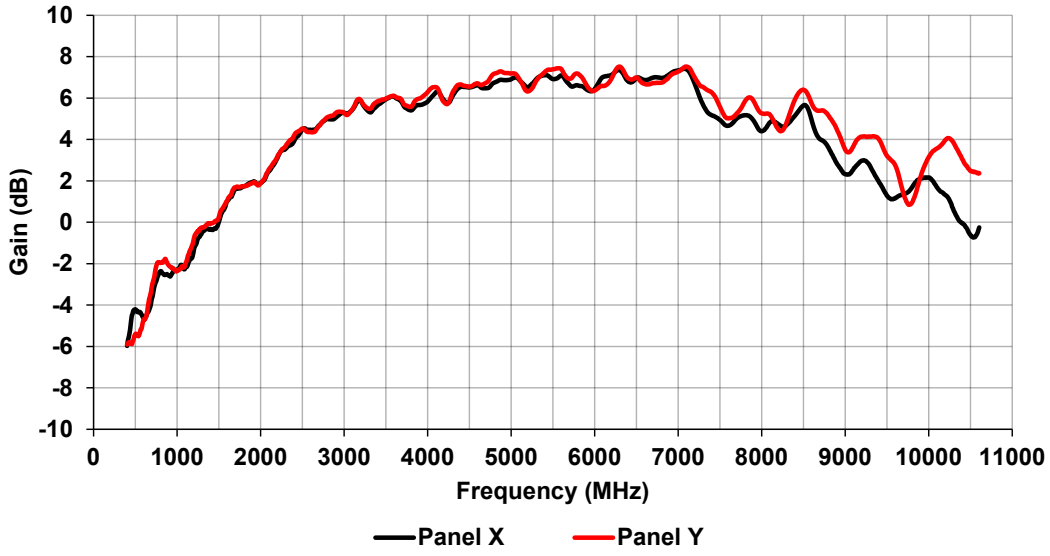


3165-04 at 9500 MHz and 10000MHz

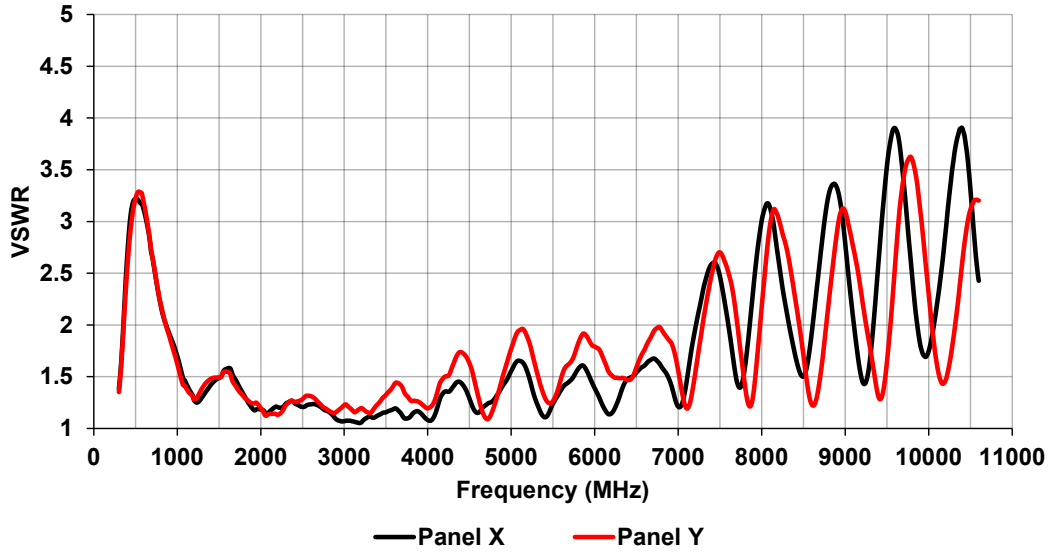


7.0 3165-05 Typical Data

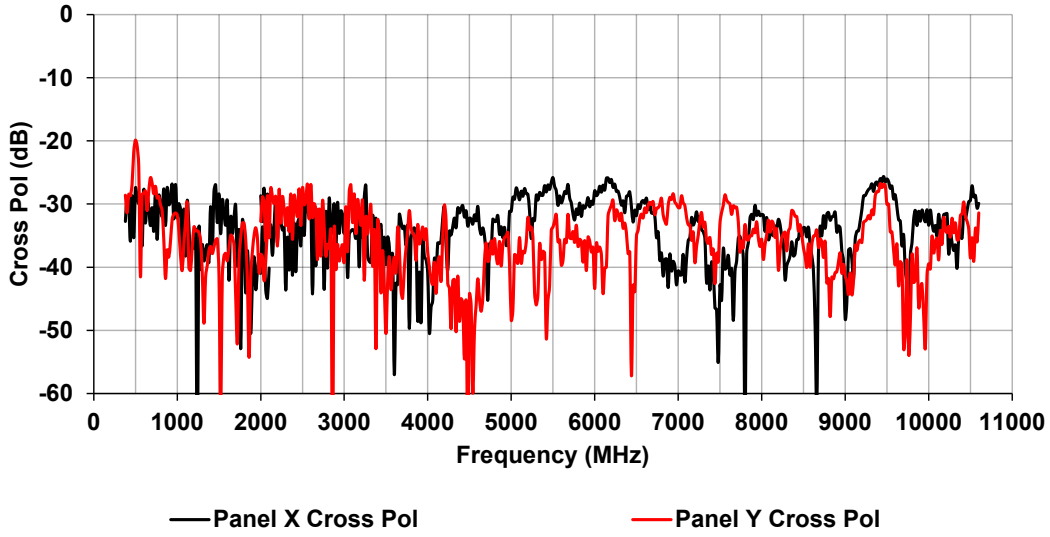
3165-05 Typical Gain



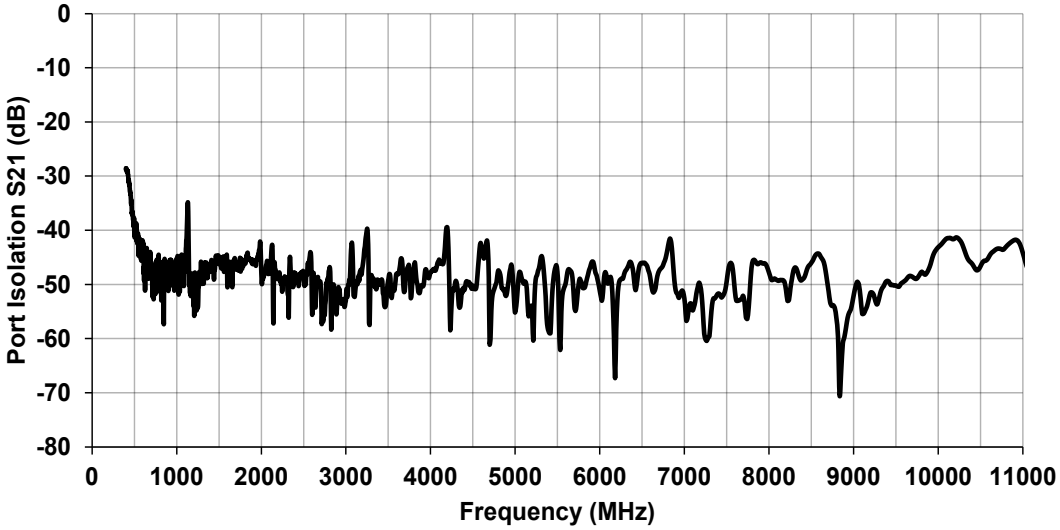
3165-05 Typical VSWR



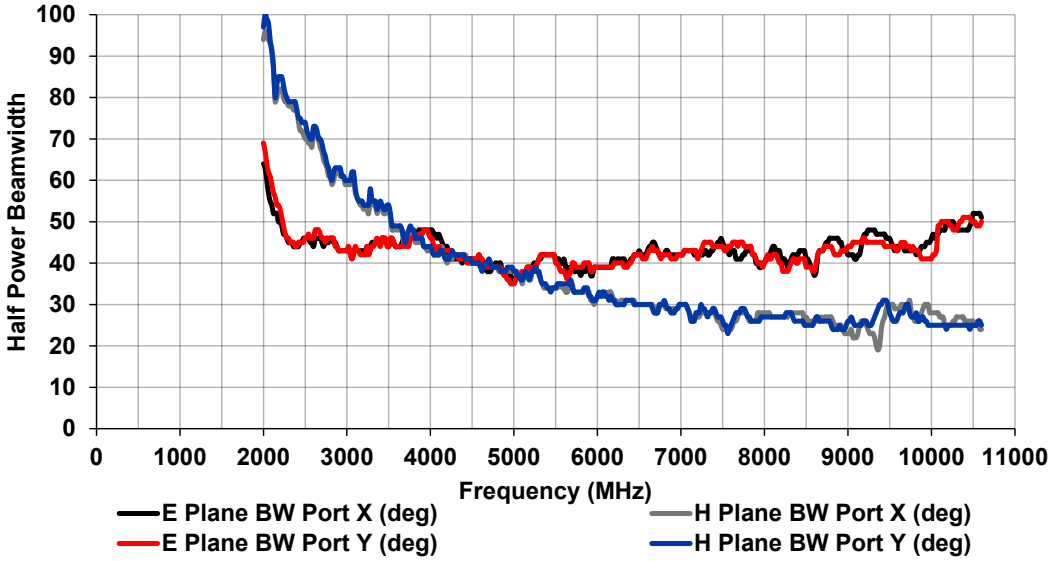
3165-05 Cross Pol



3165-05 Port Isolation

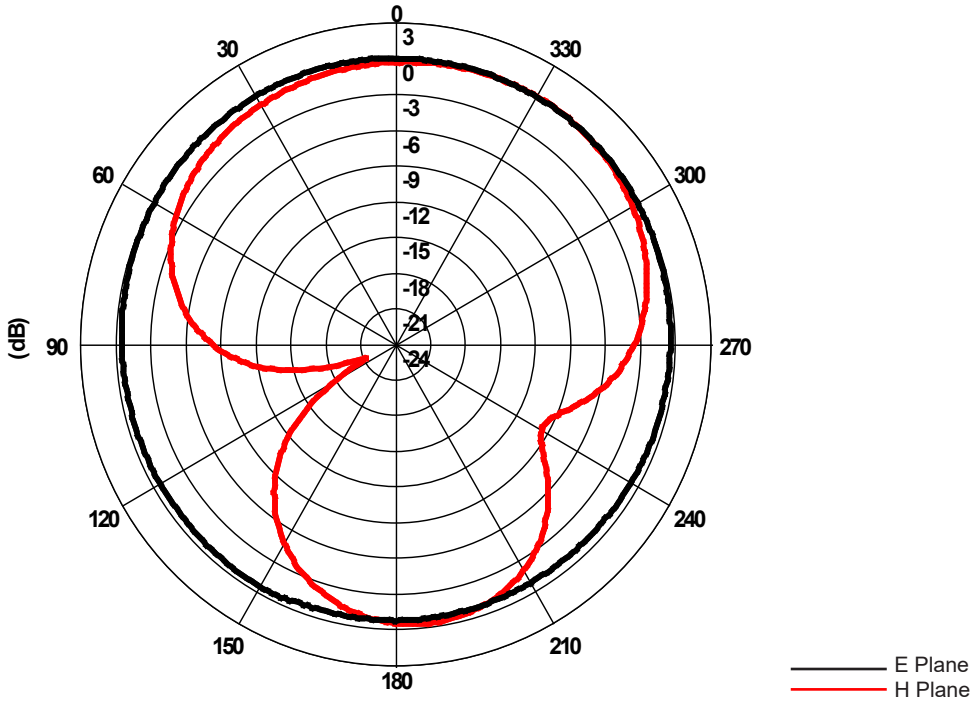


3165-05 Half Power Beamwidth

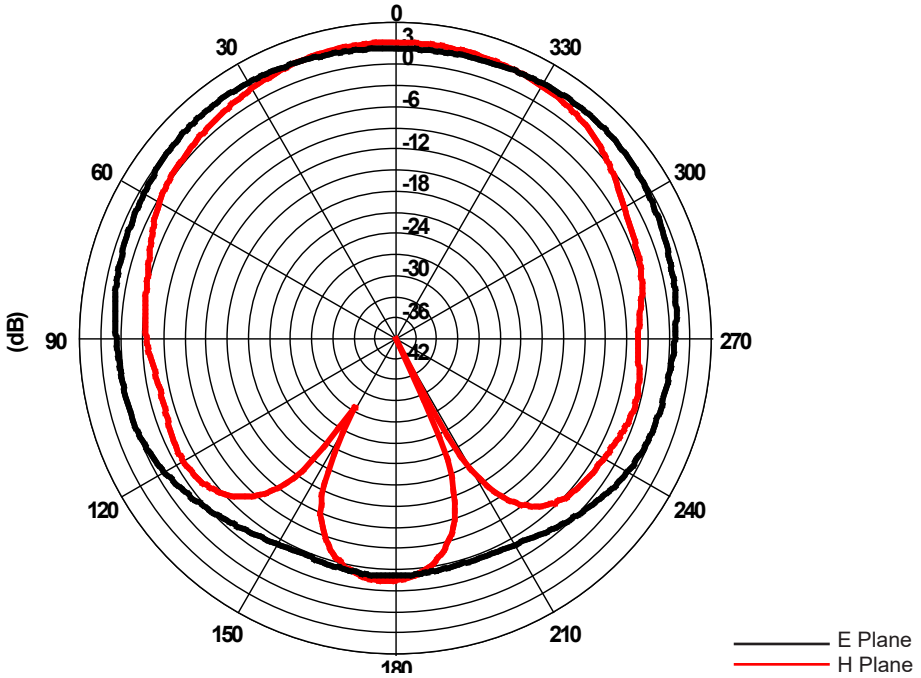


3165-05 Typical Radiation Patterns

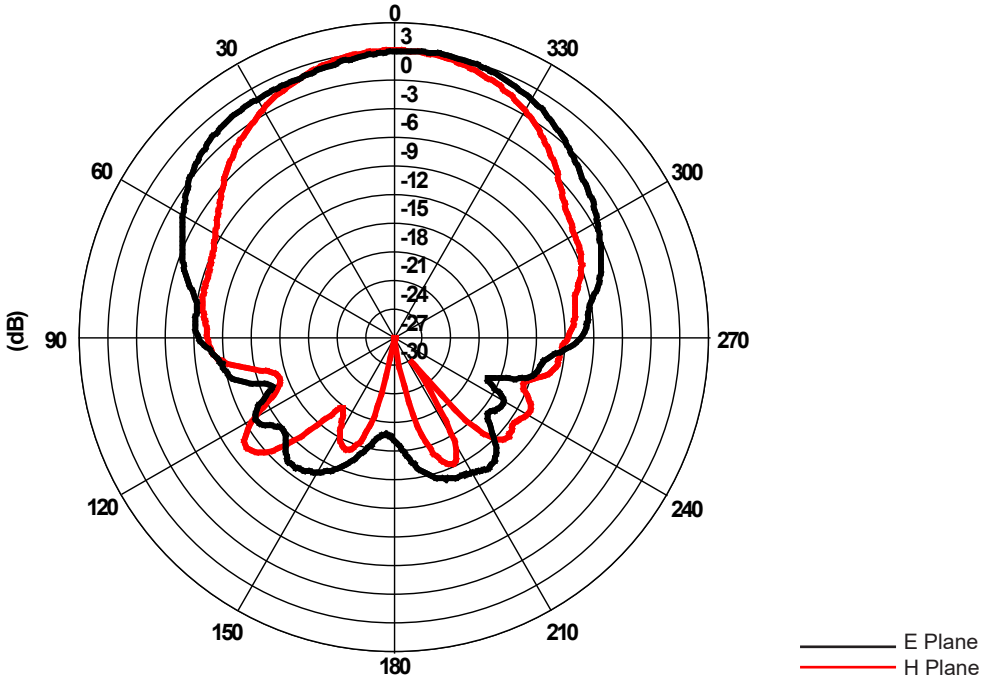
400 MHz E-Plane H-Plane



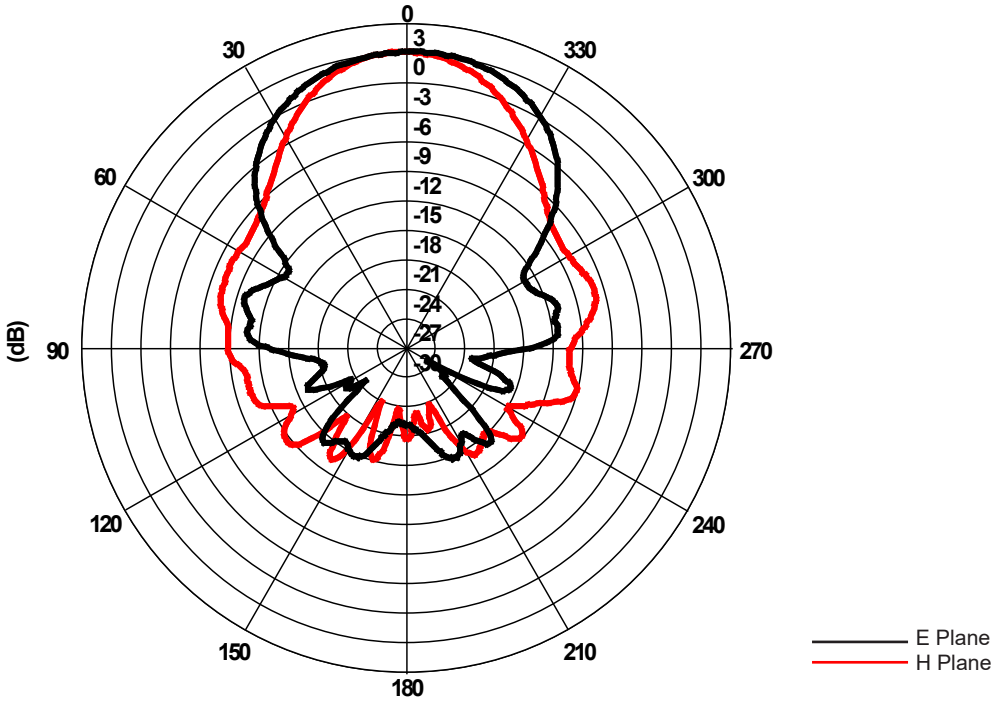
1000 MHz E-Plane H-Plane



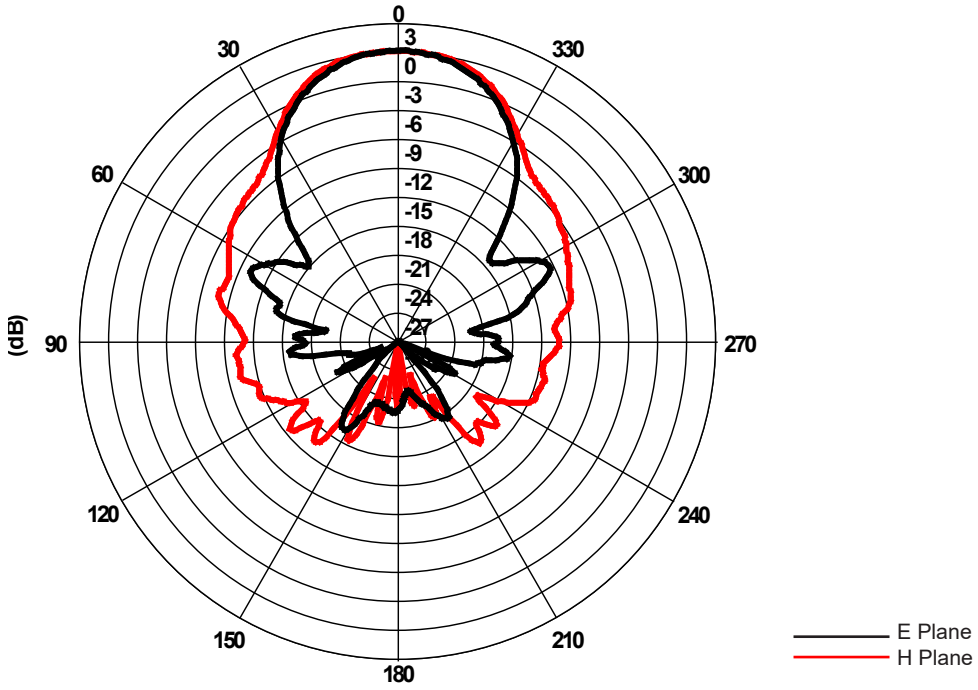
2000 MHz E-Plane H-Plane



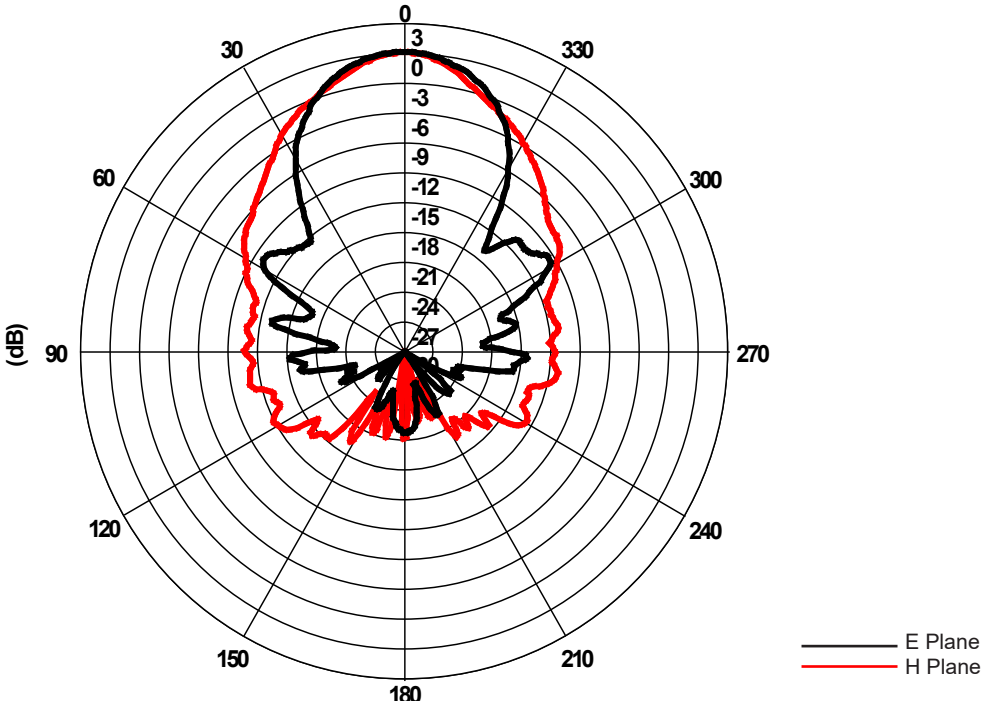
3000 MHz E-Plane H-Plane



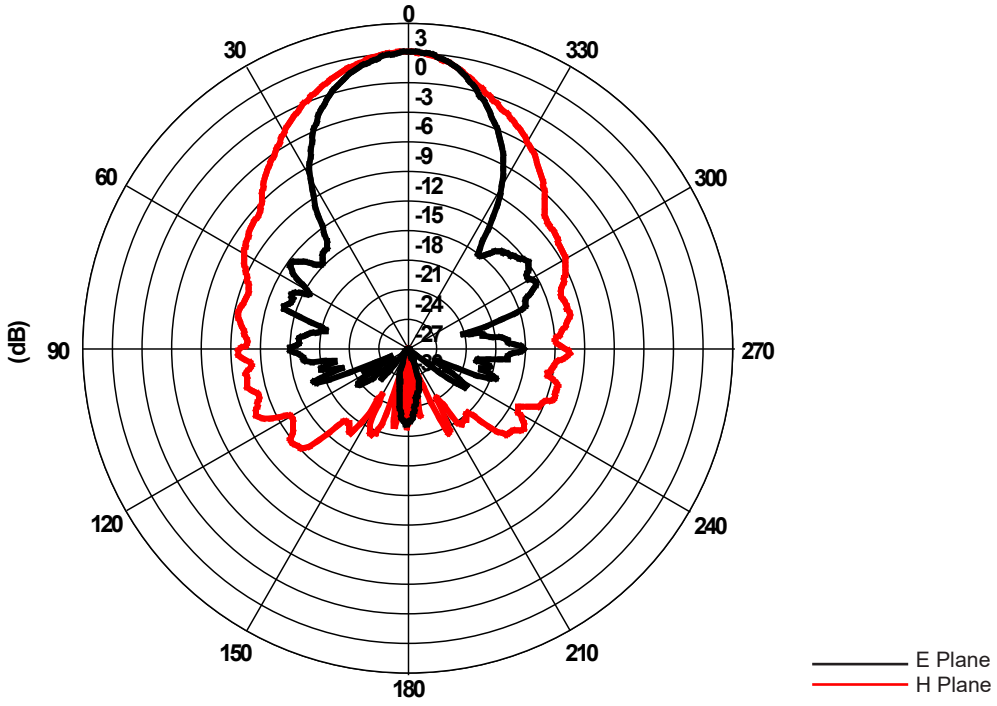
4000 MHz E-Plane H-Plane



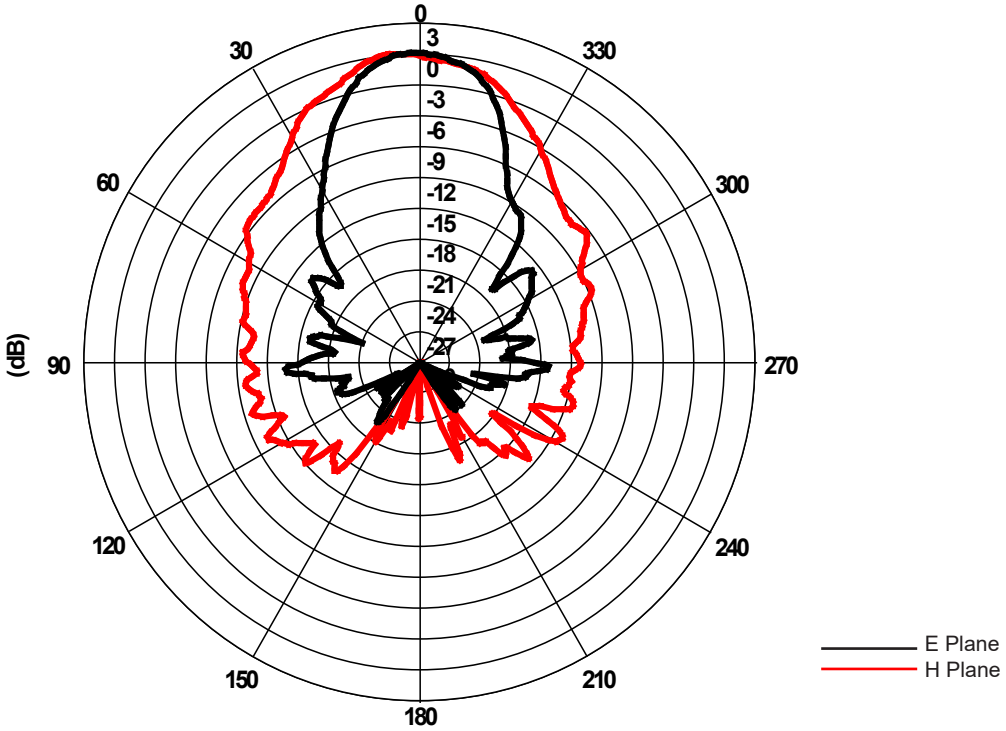
5000 MHz E-Plane H-Plane



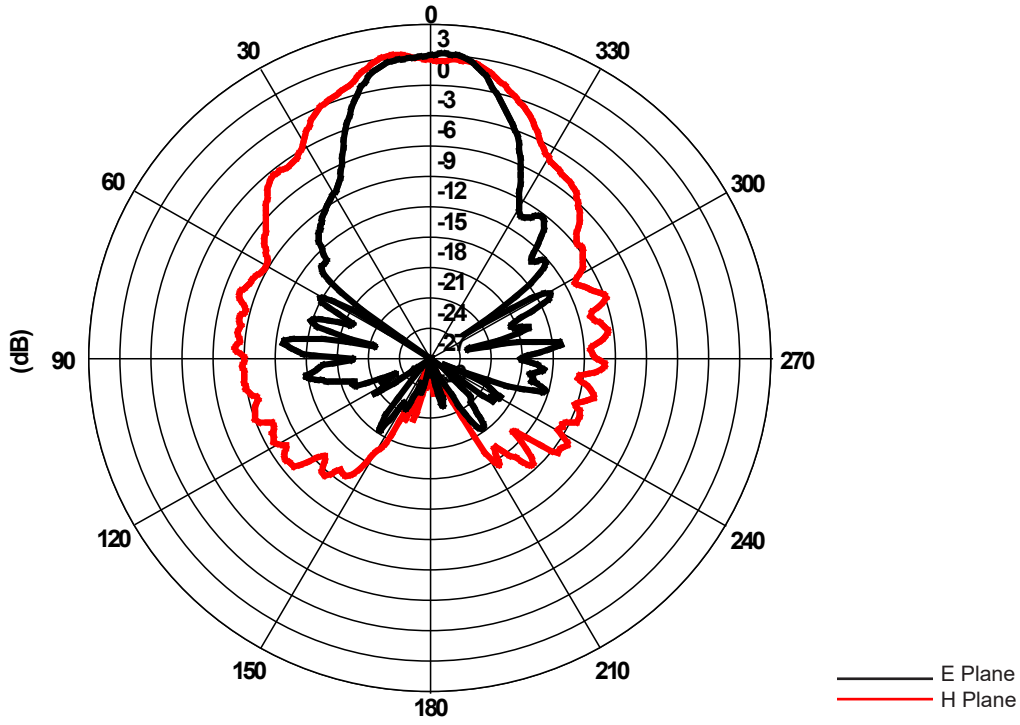
6000 MHz E-Plane H-Plane



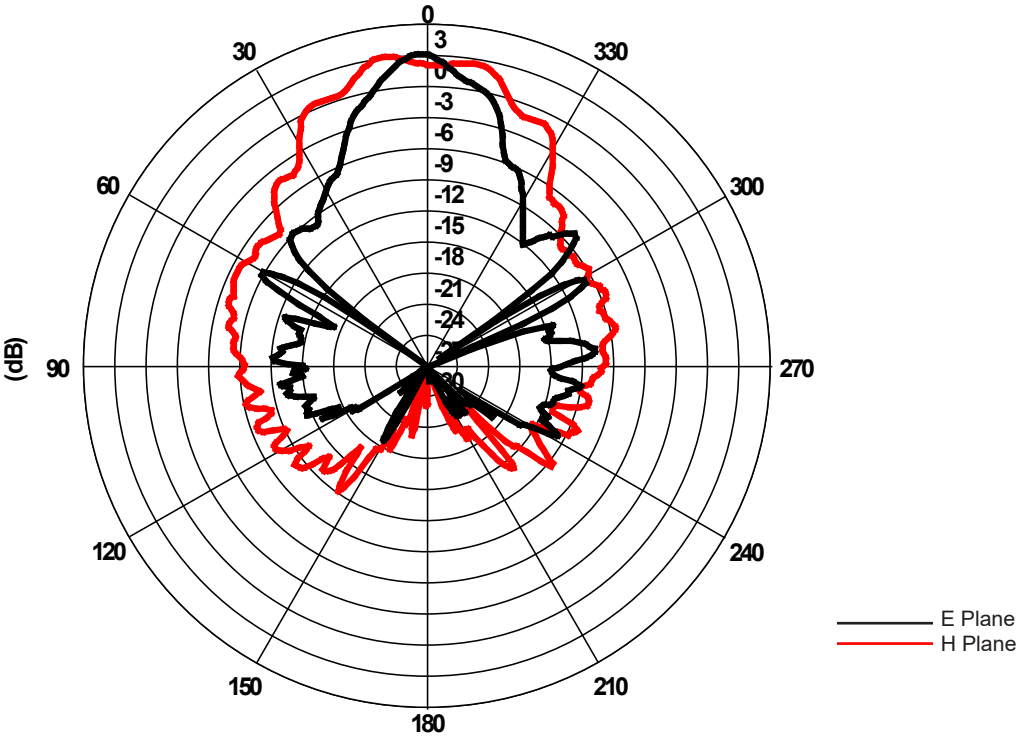
7000 MHz E-Plane H-Plane



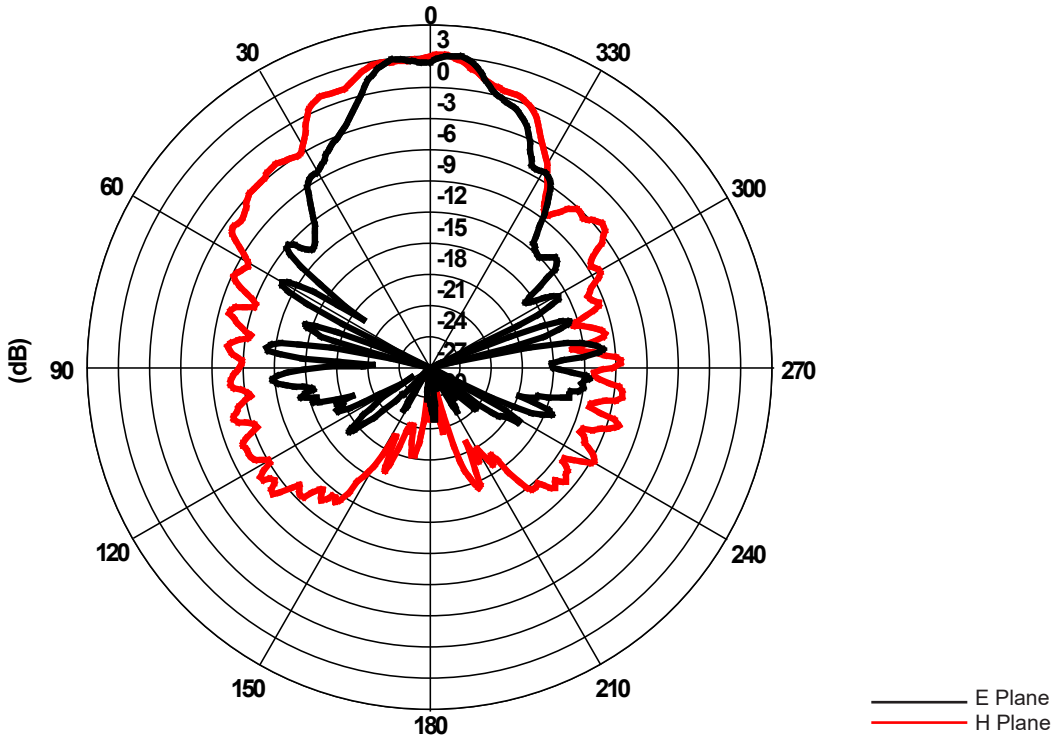
8000 MHz E-Plane H-Plane



9000 MHz E-Plane H-Plane



10000 MHz E-Plane H-Plane



10600 MHz E-Plane H-Plane