



## FEATURES AND BENEFITS

- Quick and easy installation
- Adhesive holds to surface during humidity exposure and hot/cold cycles
- RoHS-compliant
- Radiation direction maximized on adhesive side for outward-facing orientation
- Patent Number: 9450307
- Can be installed in the following ways:
  - On different non-conductive surfaces and thicknesses
  - On flat or curved surfaces
  - MIMO array element
  - On the front or top face of an enclosure interior (alternative placement to FlexPIFA)

### SPECIFICATIONS

Frequency (MHz)	2400 - 2480
Peak Gain (dBi)	+3.1
Average Efficiency (dB)	> -2.1
VSWR (MHz)	< 2.5:1
Impedance (Ω)	50
Polarization	Linear

### MECHANICAL SPECIFICATIONS

Antenna Type	Inverted Ground Flexible Planar Inverted F Antenna (i-FlexPIFA)	
Dimensions – mm (inches)	40.9 x 11.0 x 2.9 (1.61 x 0.43 x 0.114)	
Weight – g (oz.)	1.13 (0.040)	
Color	Clear yellow	
Adhesive	3M 100MP	
Connector Mating Height (max) – mm	MHF1 (U.FL)	2.5
	MHF4L	1.4

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature – °C (°F)	-40 to +85°C (-40 to +185°F)
Material Substance Compliance	RoHS

## CONFIGURATION

PART NUMBER	CABLE LENGTH	CONNECTOR
EFG2400A3S-10MHF1	100 mm	MHF1
EFG2400A3S-10MHF4	100 mm	MHF4

**Note:** Specifications are based on the 100mm cable length, standard antenna version with MHF1 / U.FL connector. Varying the cable length or type or connector will cause variations in these antenna specifications.

## MECHANICAL DRAWING

Physical Dimensions (in mm) of the EFG2400A with a 100mm Long Cable

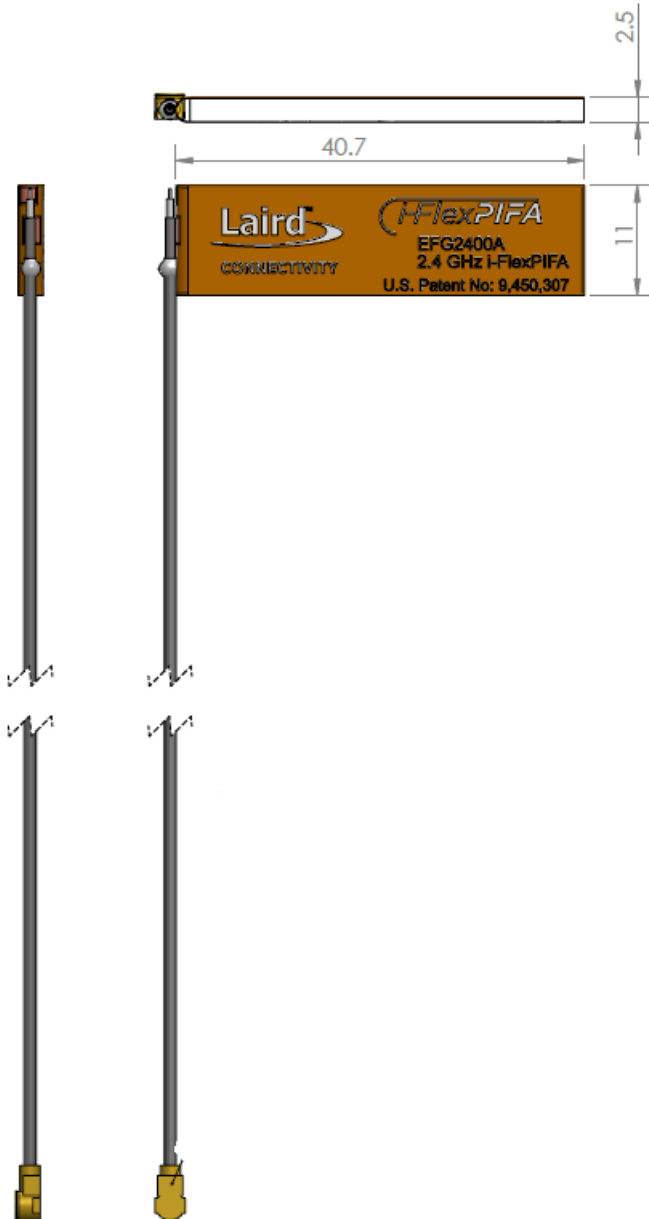


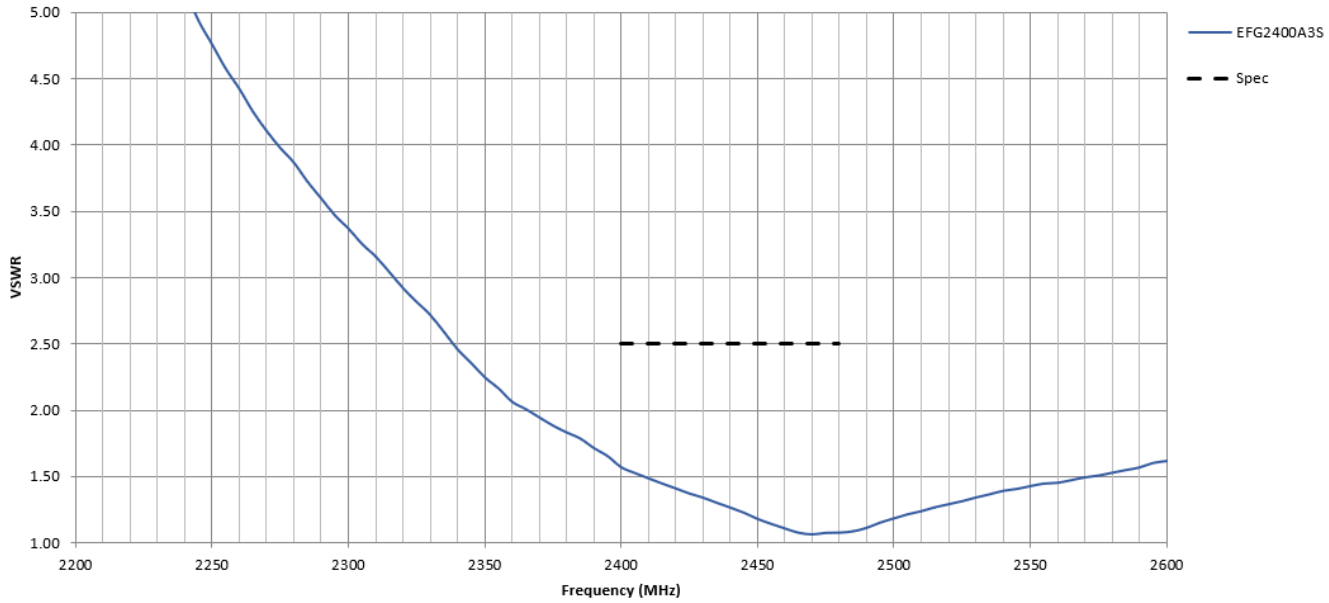
Figure 1: i-FlexPIFA mechanical drawing of EFG2400A Antenna

## FLAT SURFACE ANTENNA MEASUREMENTS

Flat surface measurements were performed with the antenna centered on a 1.5 mm-thick plate of polycarbonate.

### VSWR

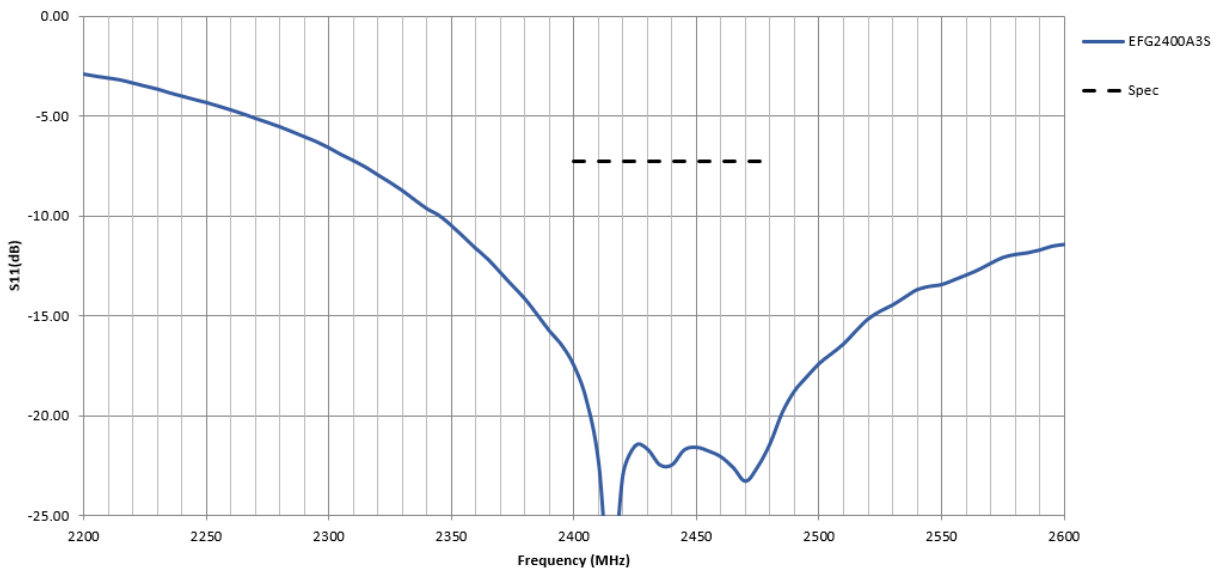
**i-FlexPIFA VSWR - 1.5mm PolyCarbonate**



**Figure 2: Antenna VSWR measured on a 1.5 mm-thick plate of polycarbonate with a nominal value of 1.45 across a sample size mounted on 1mm-3mm polycarbonate and both MHF1/MHF4 connector options**

### RETURN LOSS

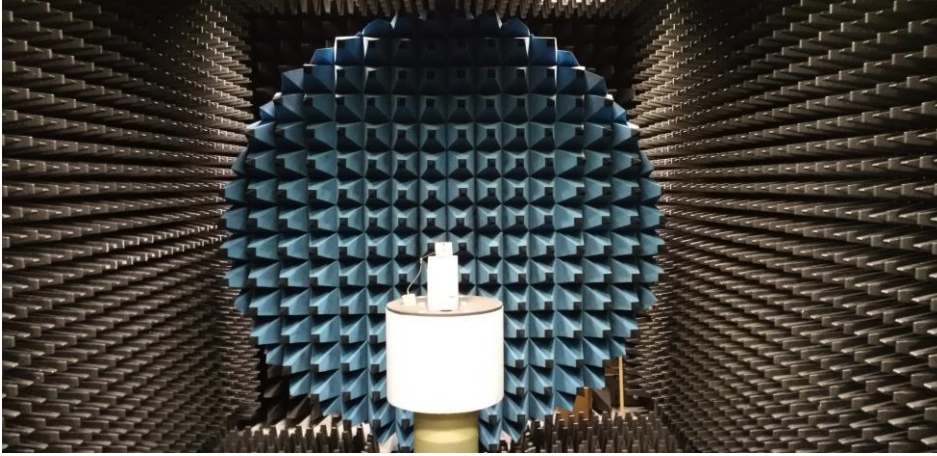
**S11, LOGMAG - i-FlexPIFA - 1.5mm PolyCarbonate**



**Figure 3: Antenna Return Loss measured on a 1.5 mm-thick plate of polycarbonate with a nominal value of -22.3dB**

## ANTENNA CHAMBER TEST SETUP

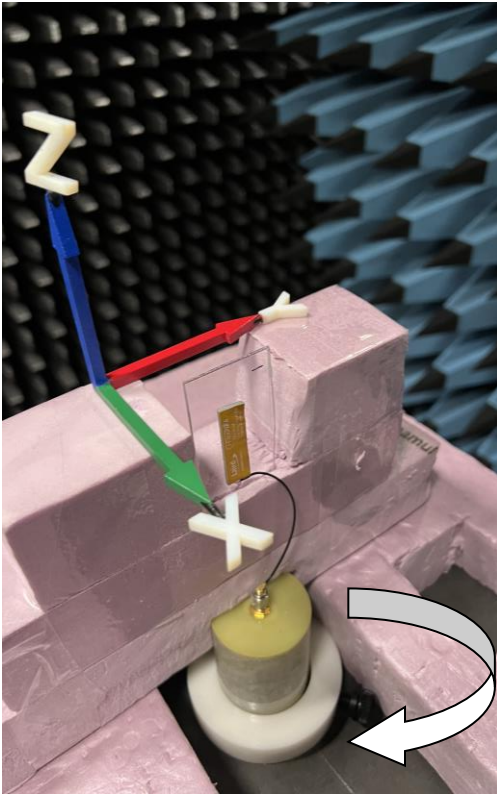
Antenna measurements such as VSWR and S11 were measured with an Agilent E5071C vector network analyzer. Radiation patterns were measured with a Rohde & Schwarz ZNB8-4PORT vector network analyzer in a Howland Company 3100 chamber equivalent. Phase center is nine inches above the Phi positioner.



*Figure 4: Howland Company 3100 Antenna chamber*

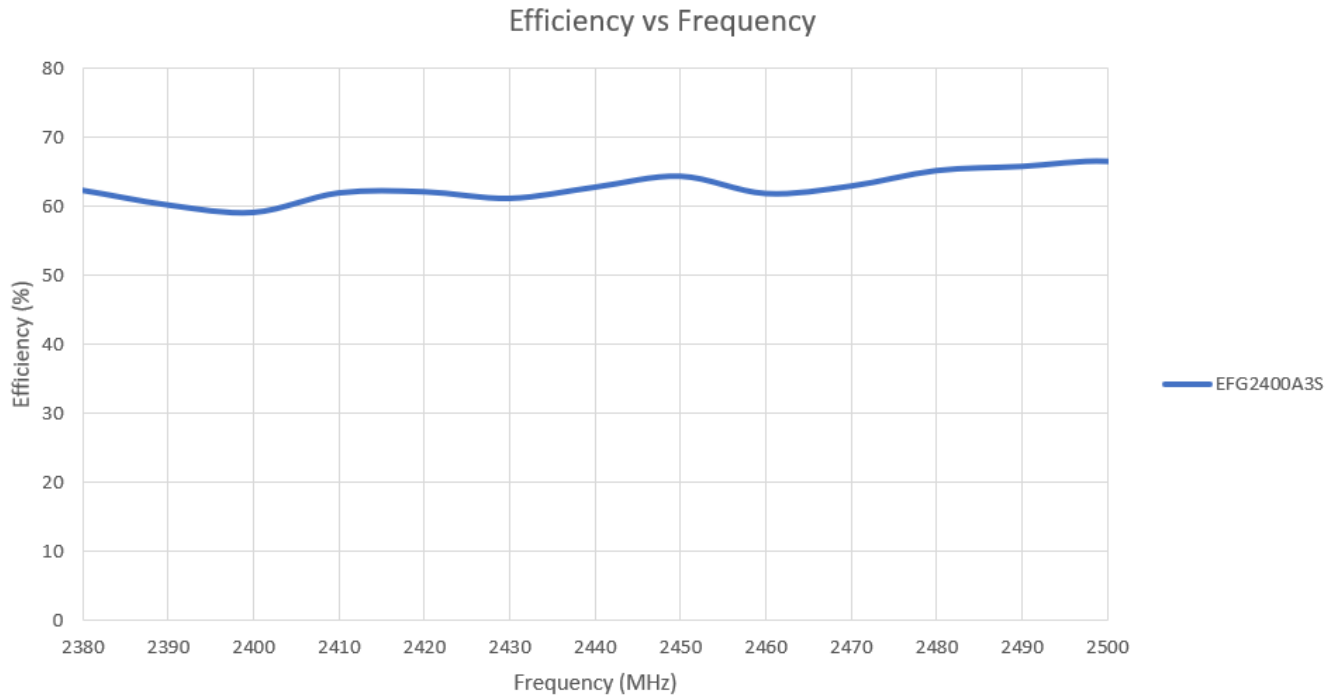
## ANTENNA RADIATION PERFORMANCE

FlexPIFA centered on a 1.5 mm-thick plate of polycarbonate



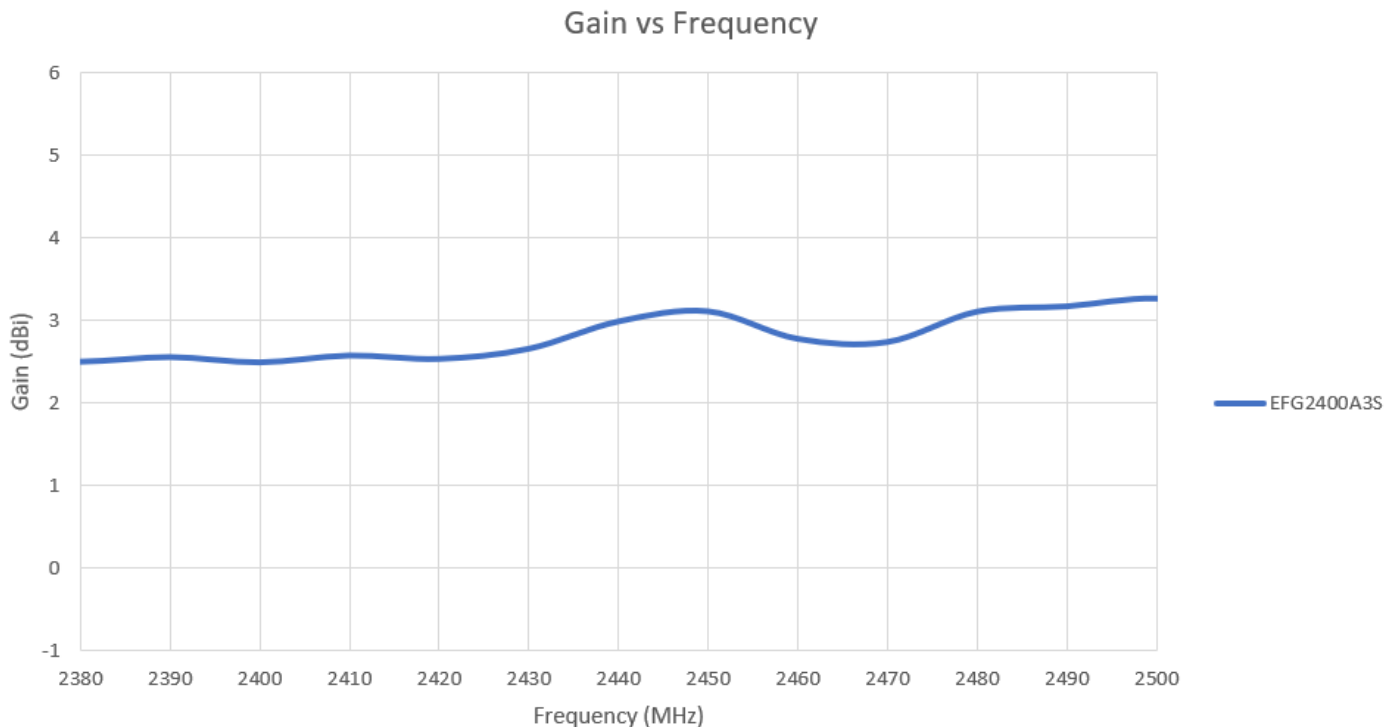
*Figure 5: Flat surface setup*

## EFFICIENCY



**Figure 6: Antenna Efficiency measured on a 1.5 mm-thick plate of polycarbonate with a nominal value of -2.0dB across the operating frequency**

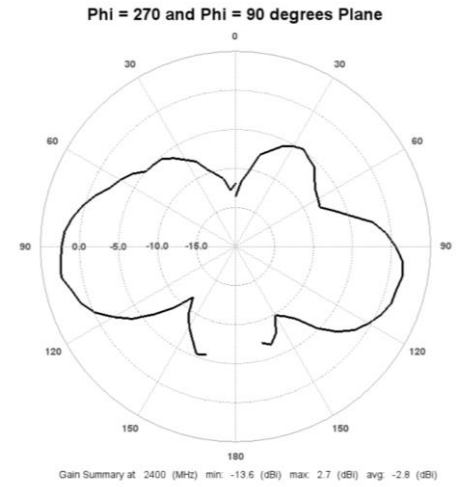
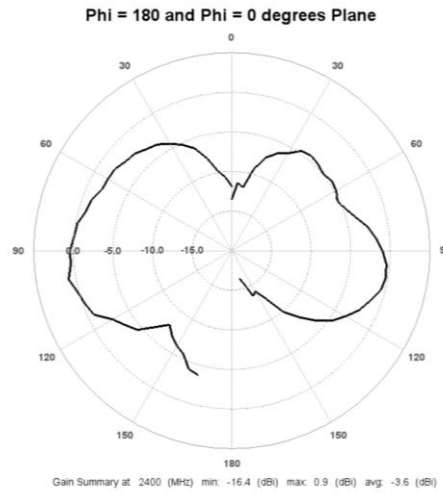
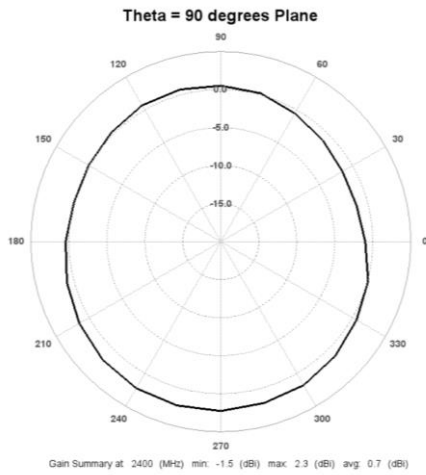
## ANTENNA GAIN



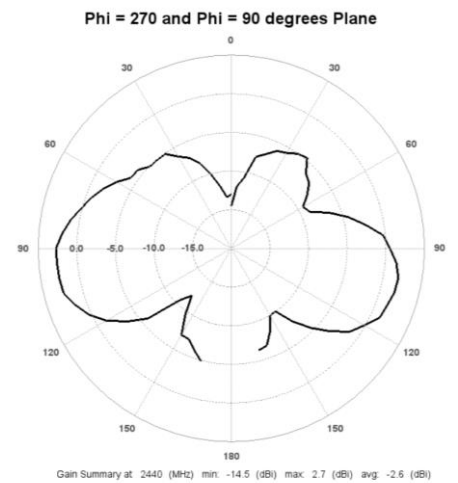
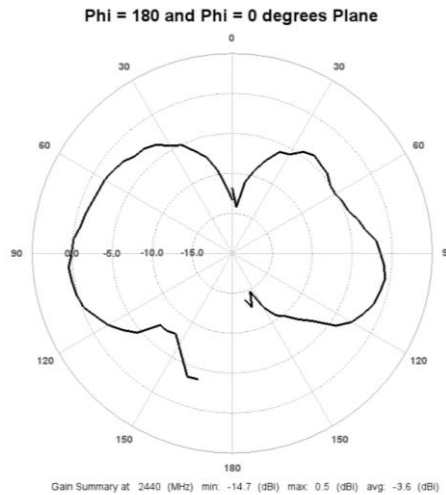
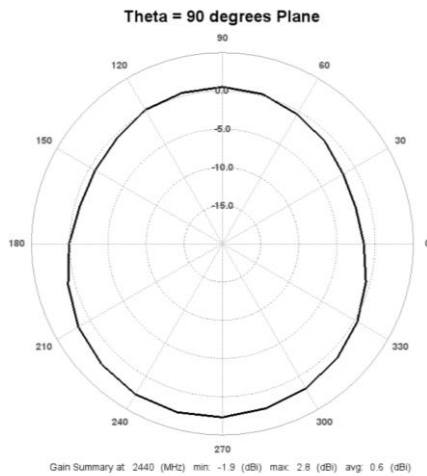
**Figure 7: Antenna Gain measured on a 1.5 mm-thick plate of polycarbonate with a nominal value of 2.8dBi across the operating frequency**

## RADIATION PATTERNS – 2D Plots

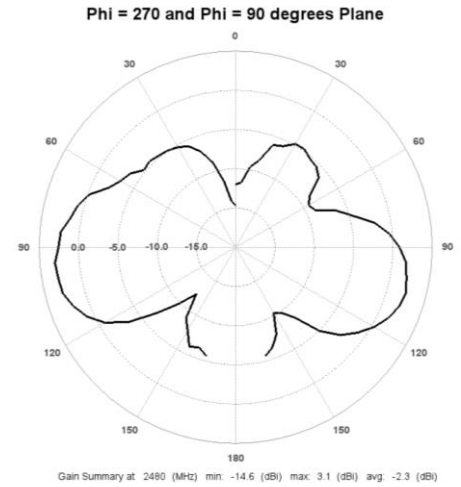
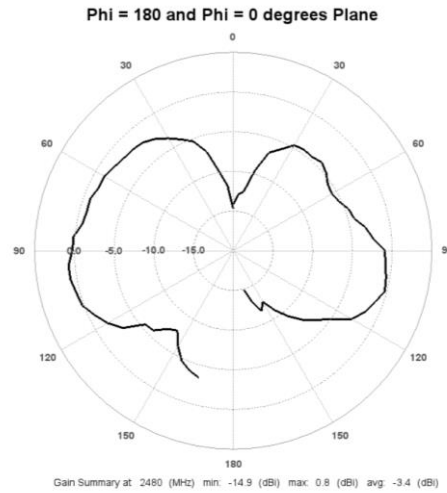
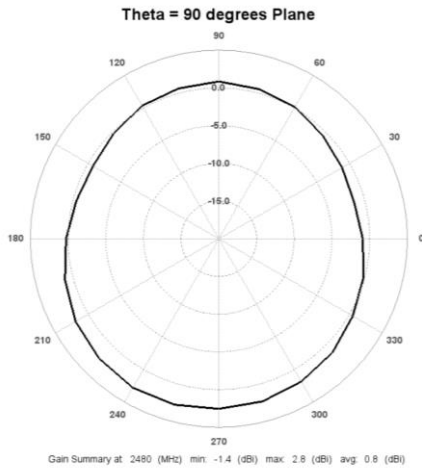
### 2D Plots at 2400 MHz



### 2D Plots at 2440 MHz



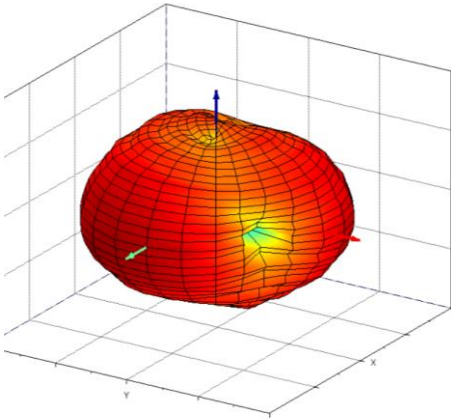
## 2D Plots at 2480 MHz



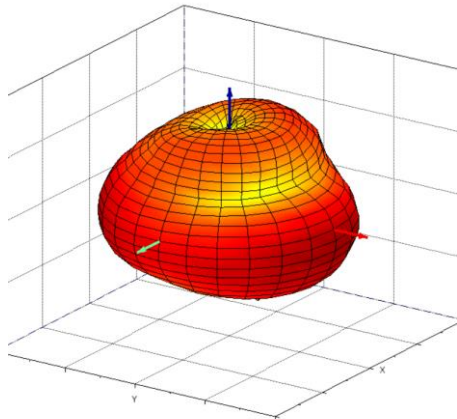
## RADIATION PATTERNS – 3D Plots

### 3D Plots at 2400 MHz

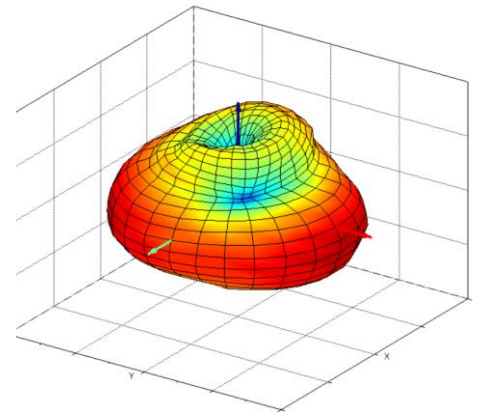
1) Radiation Pattern - Phi Polarization Gain at 2400 MHz



2) Radiation Pattern - Theta Polarization Gain at 2400 MHz



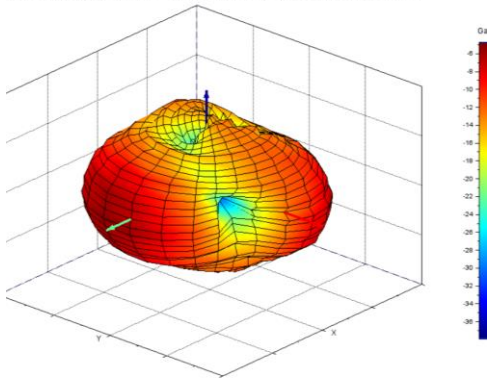
3D Radiation Pattern - Total Gain at 2400 MHz



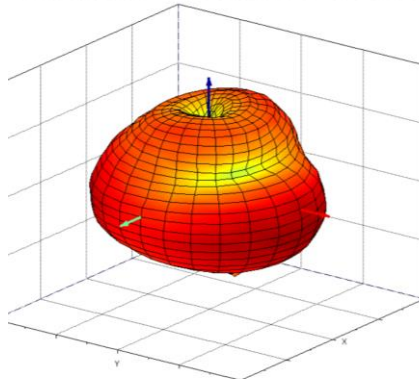
**Figure 8: Phi polarization, Theta polarization and, and total gain plots – 2400 MHz**

### 3D Plots at 2440 MHz

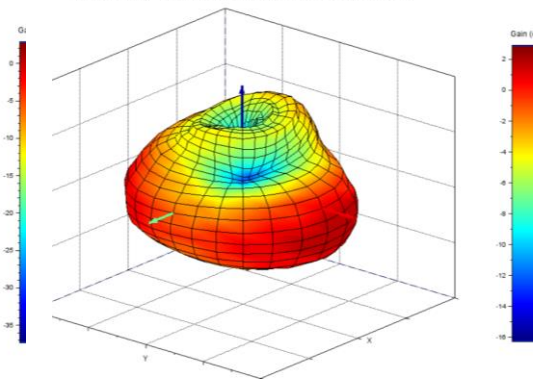
3D Radiation Pattern - Phi Polarization Gain at 2440 MHz



Radiation Pattern - Theta Polarization Gain at 2440 MHz



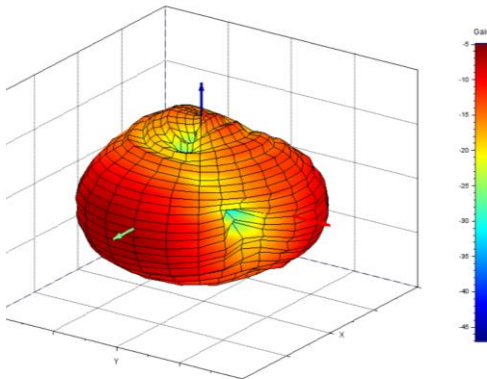
3D Radiation Pattern - Total Gain at 2440 MHz



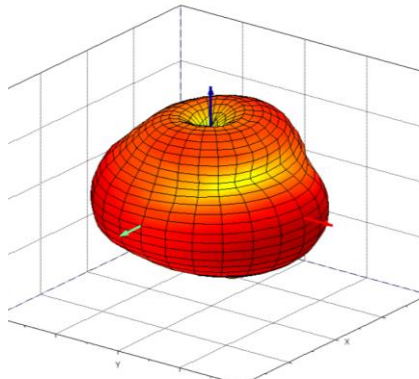
**Figure 9: Phi polarization, Theta polarization and, and total gain plots – 2440 MHz**

### 3D Plots at 2480 MHz

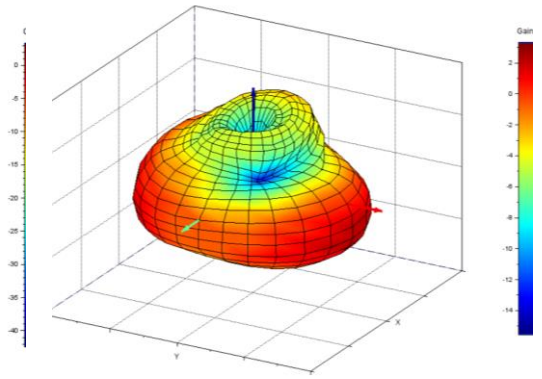
3D Radiation Pattern - Phi Polarization Gain at 2480 MHz



Radiation Pattern - Theta Polarization Gain at 2480 MHz



3D Radiation Pattern - Total Gain at 2480 MHz



**Figure 10: Phi polarization, Theta polarization and, and total gain plots – 2480 MHz**

Rev 2.0 - Initial Production Release



## ADDITIONAL ASSISTANCE

Please contact your local Laird Connectivity sales representative or our support team for further assistance:

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**Phone**

Americas:	+1-800-492-2320
Europe:	+44-1628-858-940
Hong Kong:	+852 2762 4823

**Web**     <https://www.lairdconnect.com/internal-antennas>

**Address**

Laird Connectivity  
50 S. Main Street, Ste 1100  
Akron, OH 44308

[sales@lairdconnect.com](mailto:sales@lairdconnect.com)  
[support@lairdconnect.com](mailto:support@lairdconnect.com)  
[www.lairdconnect.com](http://www.lairdconnect.com)

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