



## FEATURES AND BENEFITS

- Quick and easy installation
- Adhesive holds to surface during humidity exposure and hot/cold cycles
- RoHS-compliant
- Patent Number: 9450307
- Can be installed in the following ways:
  - On different non-conductive surfaces and thicknesses
  - On flat or semi-curved surfaces
  - Near metals or the human body

SPECIFICATIONS	
Frequency (MHz)	902-928
Peak Gain (dBi)	-0.1
Average Efficiency (dB)	> -3.6
VSWR (MHz)	< 2.5:1
Impedance ( $\Omega$ )	50
Polarization	Linear

MECHANICAL SPECIFICATIONS	
Antenna Type	Flexible Planar Inverted F Antenna (FlexPIFA)
Dimensions – mm (inches)	88 x 40 x 6.2 (3.47 x 1.58 x 0.25)
Weight – g (oz.)	11 (0.38)
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
EFB9020A3S-15MHF1	150 mm	MHF1
EFB9020A3S-15MH4L	150 mm	MHF4L

**Note:** Specifications are based on the 150mm 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 EFB9020A with a 150 mm Long Cable

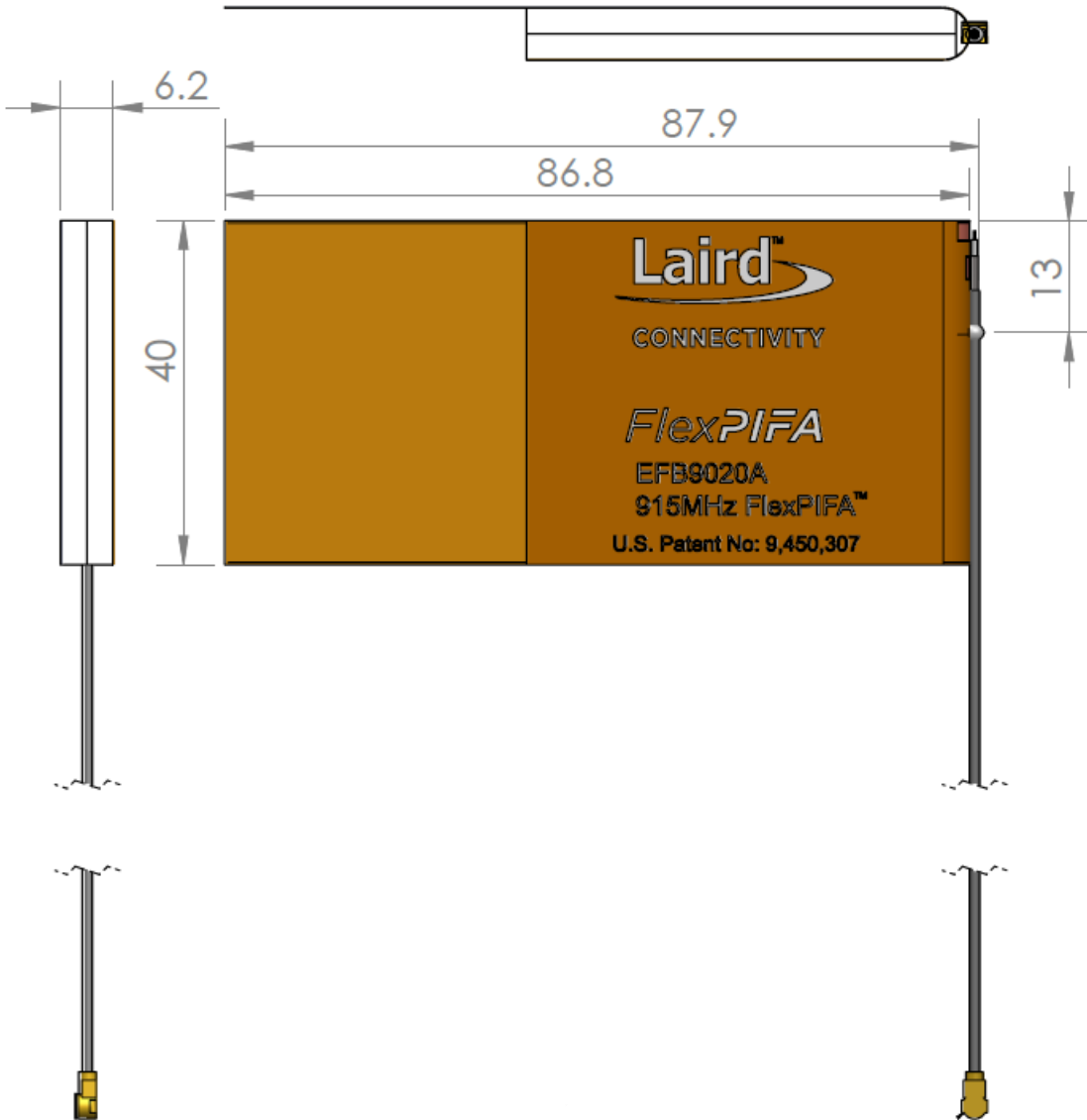


Figure 1: 9-FlexPIFA mechanical drawing of EFB9020A Antenna

## FLAT SURFACE ANTENNA MEASUREMENTS

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

### VSWR

9-FlexPIFA VSWR - 1.5mm PolyCarbonate

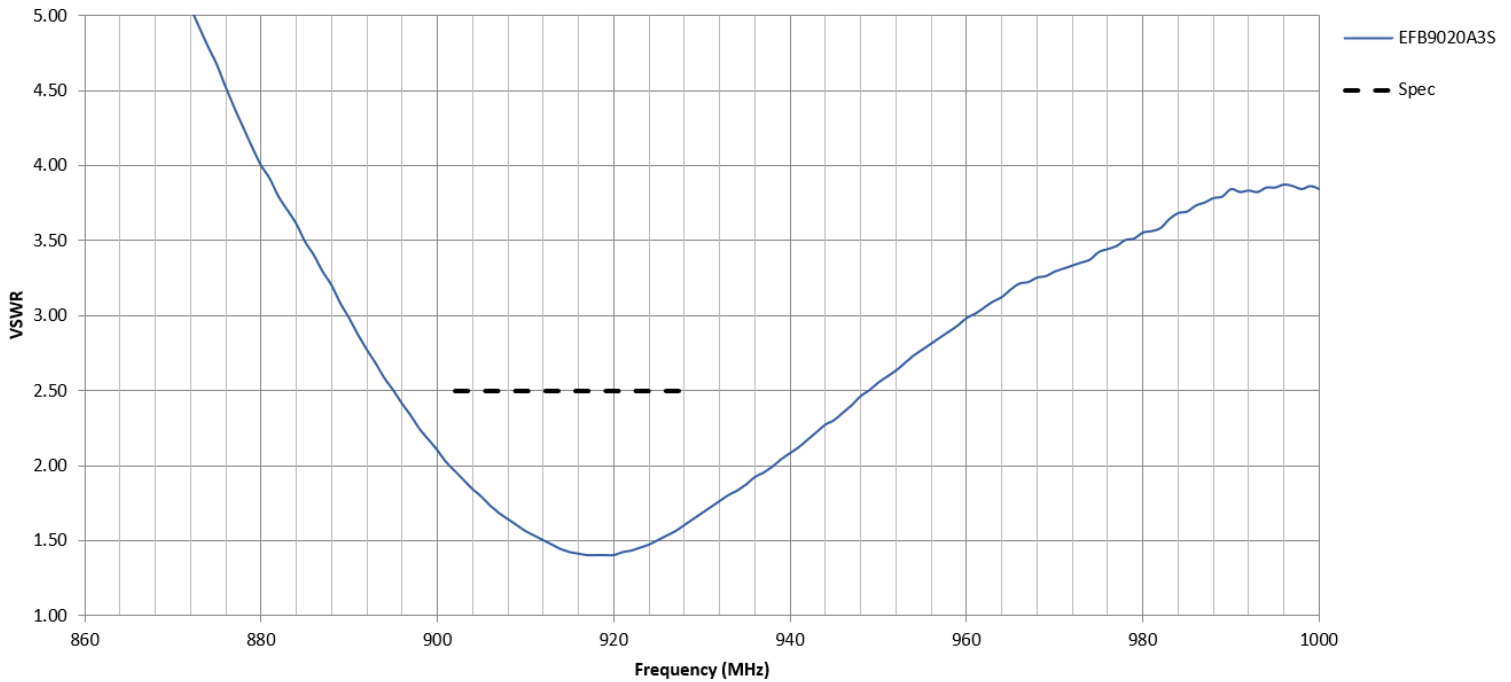


Figure 2: Antenna VSWR measured on a 1.5 mm-thick plate of polycarbonate with a nominal value of 1.56

### RETURN LOSS

S11, LOGMAG - 9-FlexPIFA - 1.5mm PolyCarbonate

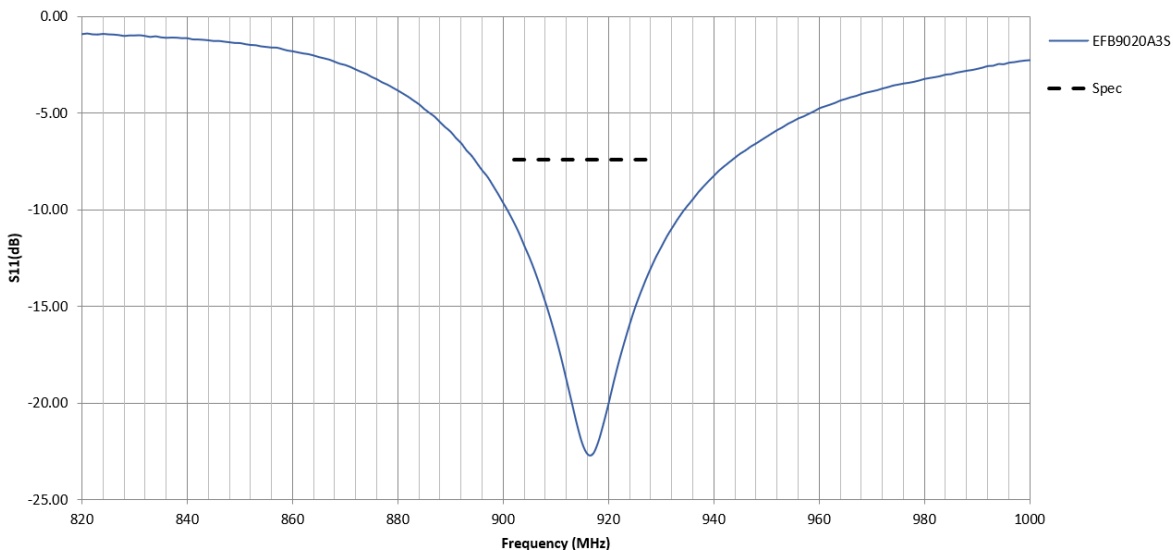


Figure 3: Antenna Return Loss measured on a 1.5 mm-thick plate of polycarbonate with a nominal value of -16.8dB

## 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.

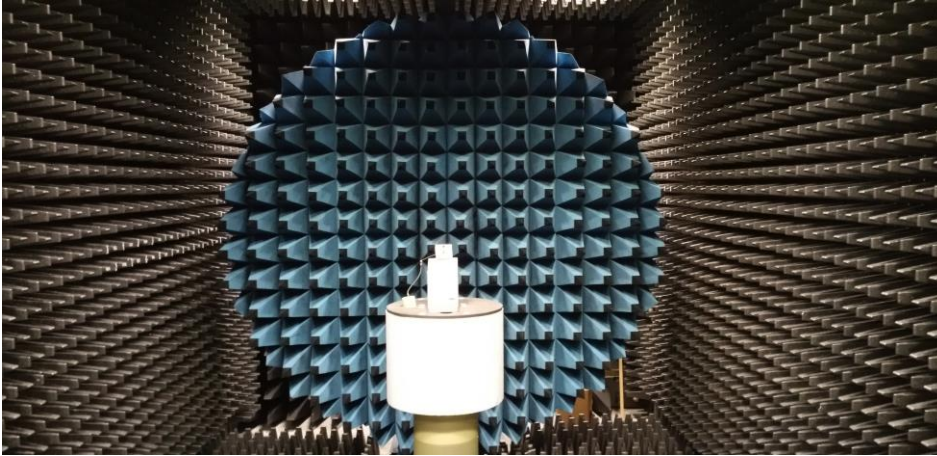


Figure 4: Howland Company 3100 Antenna chamber

## ANTENNA RADIATION PERFORMANCE

9-FlexPIFA centered on a 1.5 mm-thick plate of polycarbonate

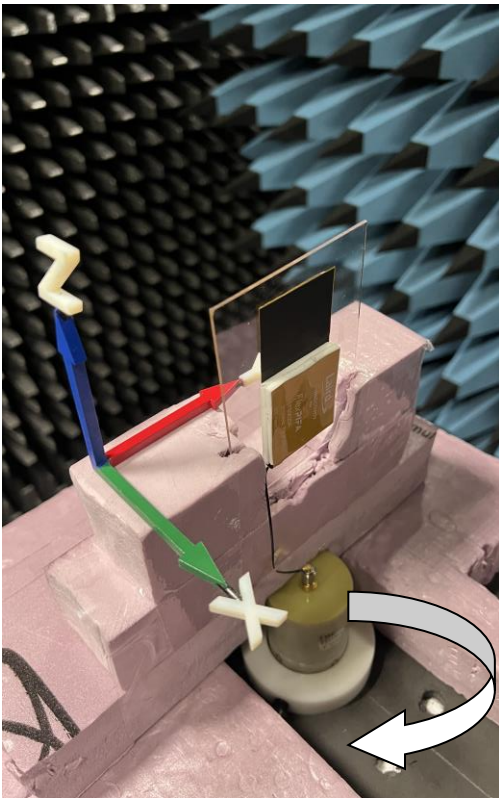


Figure 5: Flat surface setup

EFFICIENCY

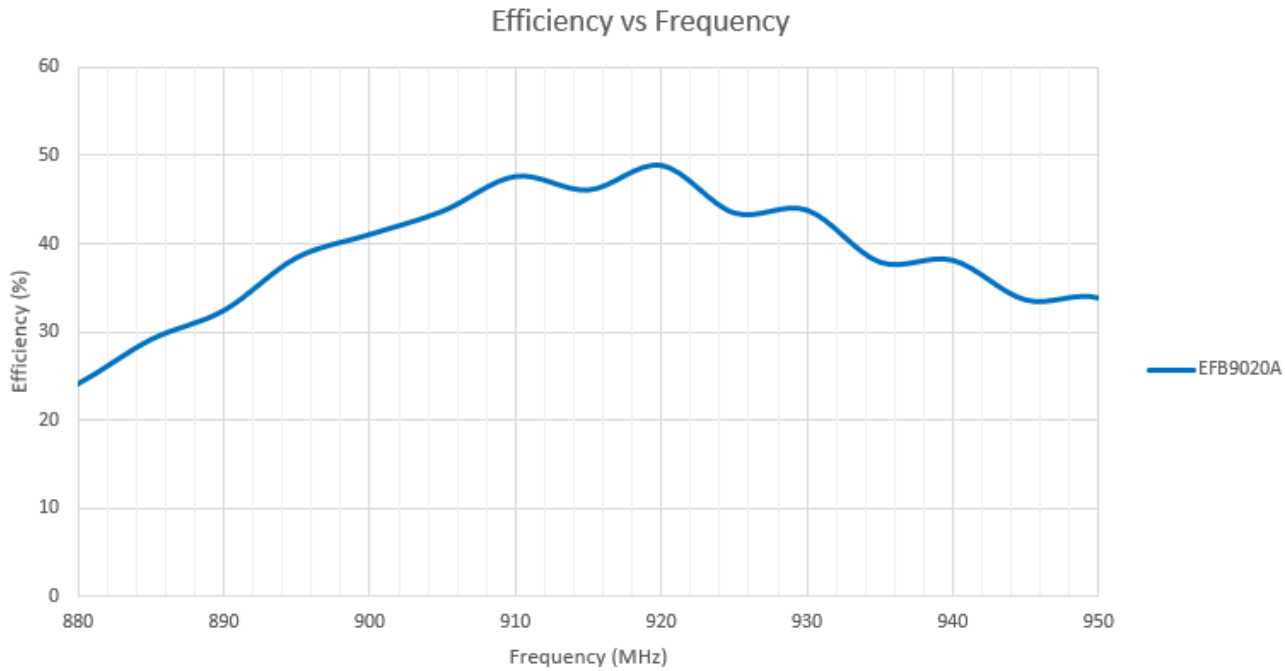


Figure 6: Antenna Efficiency measured on a 1.5 mm-thick plate of polycarbonate with a nominal value of -3.4dB across the operating frequency

ANTENNA GAIN

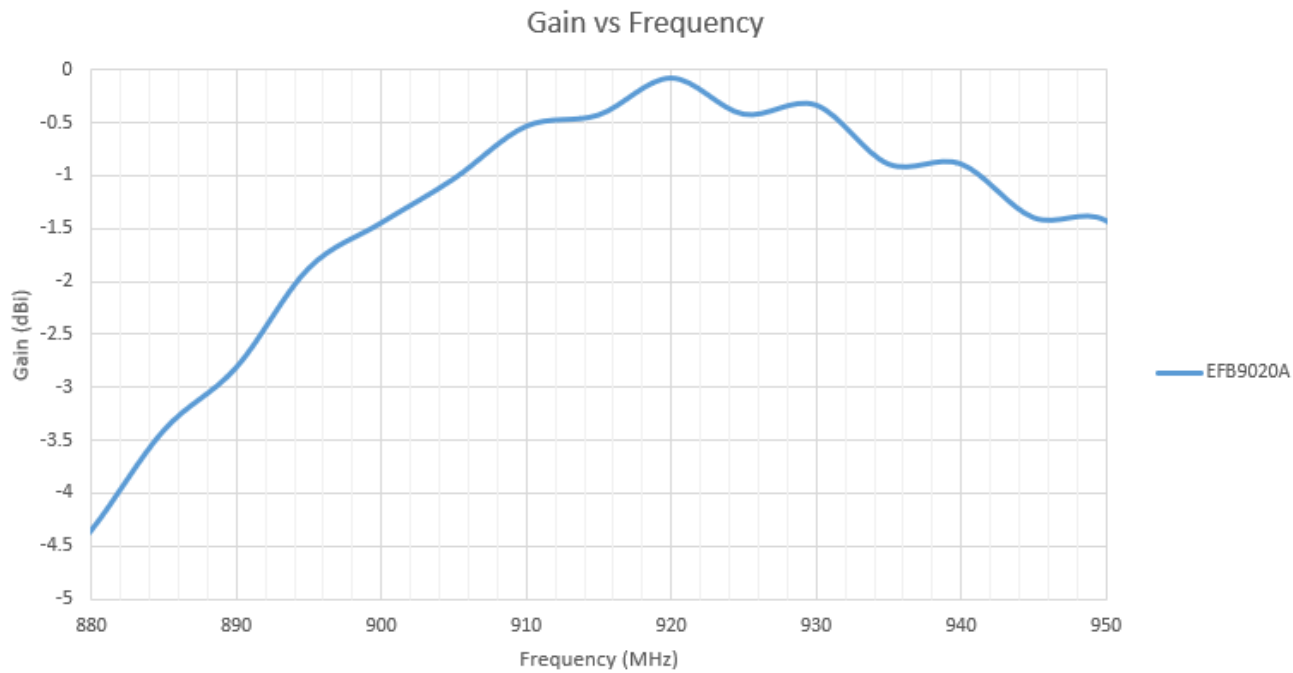
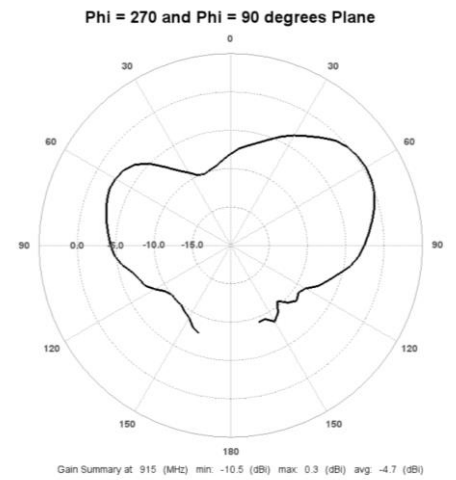
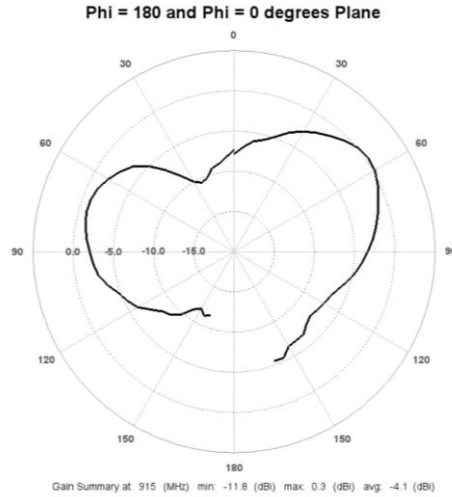
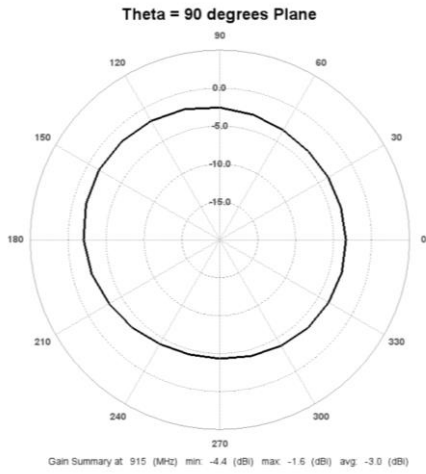


Figure 7: Antenna Gain measured on a 1.5 mm-thick plate of polycarbonate with a nominal value of -0.6dBi across the operating frequency

RADIATION PATTERNS – 2D Plots

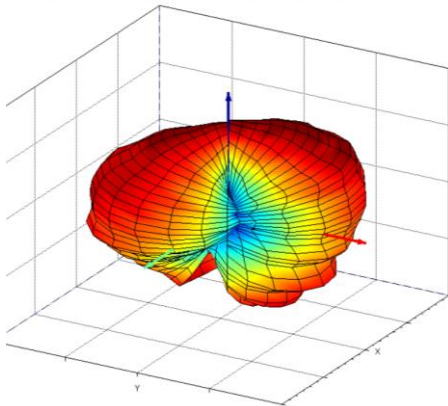
2D Plots at 915 MHz



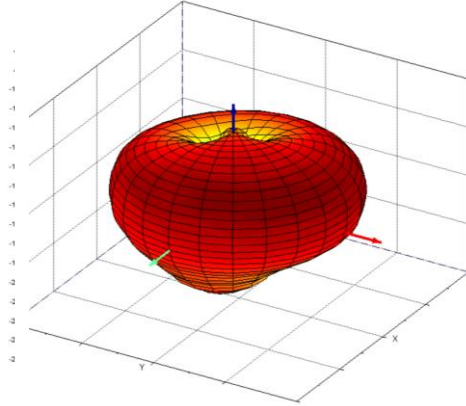
RADIATION PATTERNS – 3D Plots

3D Plots at 915 MHz

3D Radiation Pattern - Phi Polarization Gain at 915 MHz



3D Radiation Pattern - Theta Polarization Gain at 915 MHz



3D Radiation Pattern - Total Gain at 915 MHz

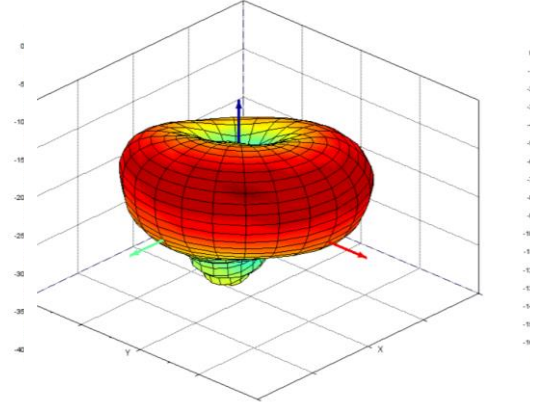
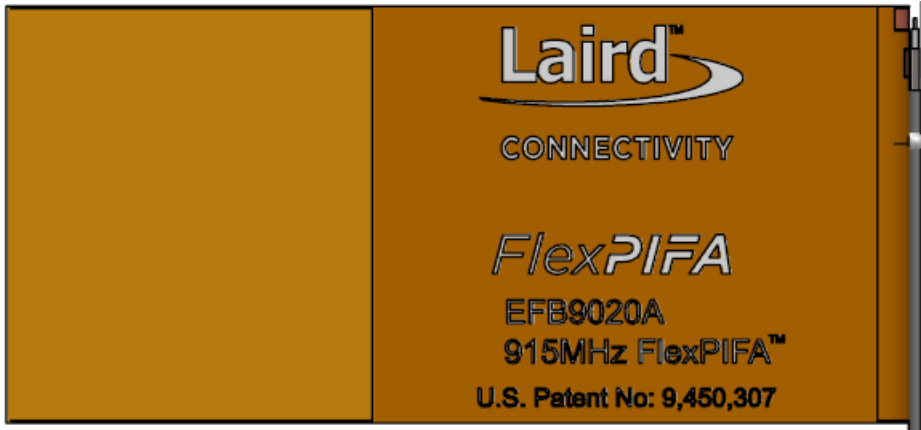


Figure 8: Phi polarization, Theta polarization and, and total gain plots – 915 MHz

Rev 5.0 - Initial Production Release



## ADDITIONAL ASSISTANCE

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