



TAOGLAS®



Datasheet

Freedom

Part No:
FXP831.07.0050C

Description

FXP.831 Freedom 2.4/5.8/7.125GHz Ground Coupled Antenna

Features:

Flexible Polymer Antenna
Covers: Wi-Fi® 2.4/5.8/7.125GHz
Cable: 50mm 1.37 Coaxial
Connector: I-PEX MHF® I (U.FL comp)
Dims: 45 x 7.0 x 0.1mm
RoHS & Reach Compliant

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1. Introduction



The FXP831 is a high efficiency, small, dual-band, dipole antenna for 2.4/4.9-6GHz band including DSRC, V2V, Wi-Fi®, Bluetooth®, Zigbee® and other applications in these bands. The FXP.831 has a peak gain of 2.7dBi at 2.4GHz and efficiencies of 49%, and 5.5-7.2dBi and 54-61% along bands 5.8GHz to 7.125GHz.

This Taoglas patent granted antenna is unique in the market because it is made from poly-flexible material, has a tiny form factor (45 x 7 x .01mm) and has double-sided 3M tape for easy “peel and stick” mounting. The cable routes conveniently directly out of the bottom of the antenna, reducing the volume the antenna takes up in the device to an absolute minimum compared to other designs. The FXP.831 is the ideal all-round antenna solution for squeezing into narrow spaces and still maintaining high performance, for example on the inside top or adjacent side applied directly to the plastic housing of LCD devices.

Many module manufacturers specify peak gain limits for any antennas that are to be connected to that module. Those peak gain limits are based on free-space conditions. In practice, the peak gain of an antenna tested in free-space can degrade by at least 1 or 2dBi when put inside a device. So ideally you should go for a slightly higher peak gain antenna than mentioned on the module specification to compensate for this effect, giving you better performance. Upon testing of any of our antennas with your device and a selection of appropriate layout, integration technique, or cable, Taoglas can make sure any of our antennas’ peak gain will be below the peak gain limits. Taoglas can then issue a specification and/or report for the selected antenna in your device that will clearly show it complying with the peak gain limits, so you can be assured you are meeting regulatory requirements for that module.

For example, a module manufacturer may state that the antenna must have less than 2dBi peak gain, but you don’t need to select an embedded antenna that has a peak gain of less than 2dBi in free space. This will give you a less optimized solution. It is better to go for a slightly higher free-space peak gain of 3dBi or more if available. Once that antenna gets integrated into your device, performance will degrade below this 2dBi peak gain due to the effects of GND plane, surrounding components, and device housing. If you want to be absolutely sure, contact Taoglas and we will test. Choosing a Taoglas antenna with a higher peak gain than what is specified by the module manufacturer and enlisting our help will ensure you are getting the best performance possible without exceeding the peak gain limits.

The cable and connector are fully customizable, for further information contact your regional Taoglas customer support team.

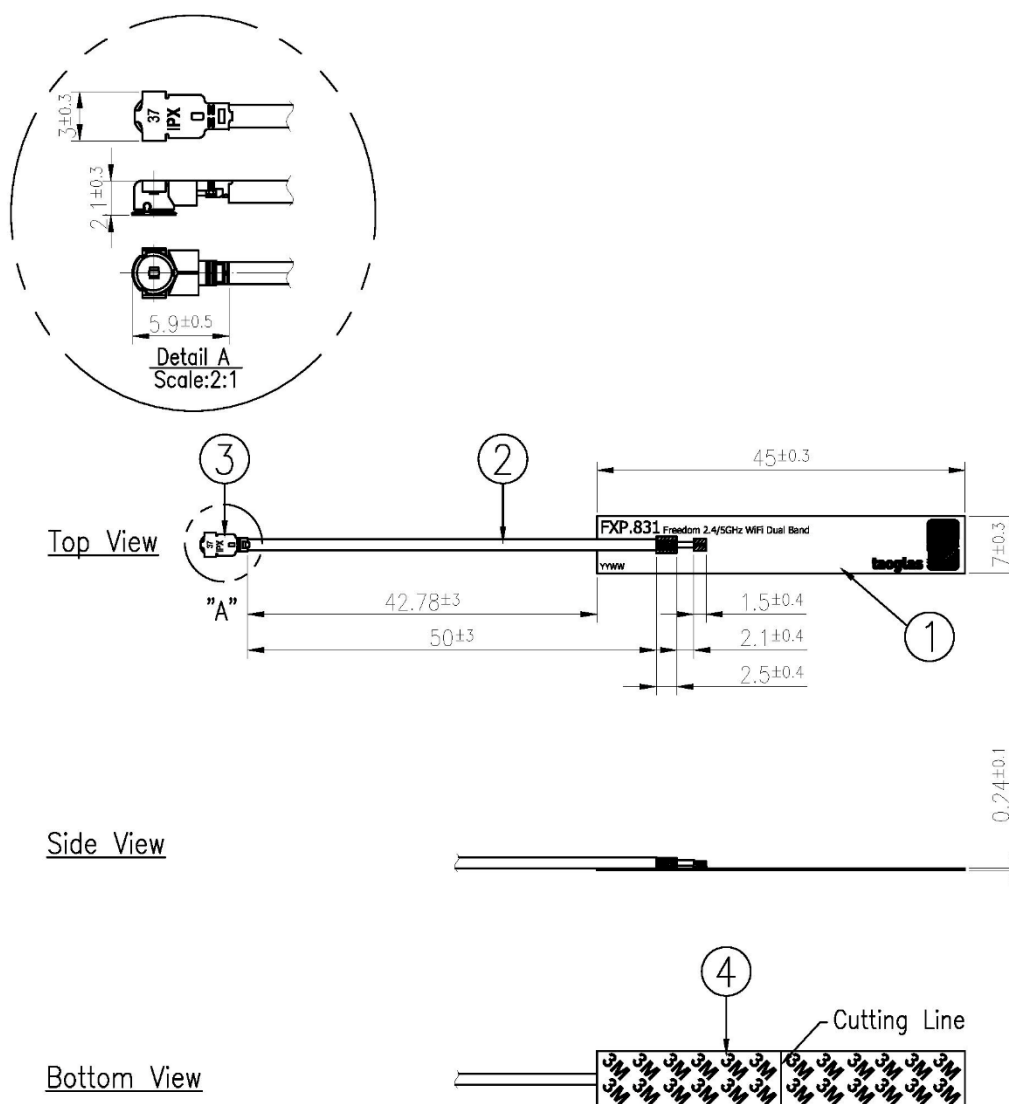
2. Specification

Wi-Fi Electrical									
Band	Frequency (MHz)	Measurement	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
Wi-Fi - 2GHz	2400-2500	2mm ABS	49.5	-3.05	2.74	50 Ω	Linear	Omni directional	10W
		Free Space	57.0	-2.44	3.28				
Wi-Fi - 5GHz	5150-5850	2mm ABS	61.0	-2.15	7.24				
		Free Space	49.1	-3.09	5.49				
Wi-Fi - 6GHz	5925-7125	2mm ABS	50.9	-2.93	5.55				
		Free Space	54.0	-2.68	7.76				

Mechanical	
Dimensions	45mm x 7mm
Antenna Body Material	Polymer
Cable	Gray 50mm 1.37 co-axial
Connector	IPEX MHFHT
Dimensions	45mm x 7mm

Environmental	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Relative Humidity	Non-condensing 65°C 95% RH

3. Mechanical Drawing



	Name	P/N	Material	Finish	QTY
1	FXP831 PCB	100111B021111A	Polymer 0.24t	Black	1
2	1.37 Coaxial Cable	300415C000000A	FEP	Gray	1
3	IPEX MHFHT	204511G000013A	Brass	Au Plated	1
4	Double-Sided Adhesive	100111B021111A	3M 467	Brown Liner	1

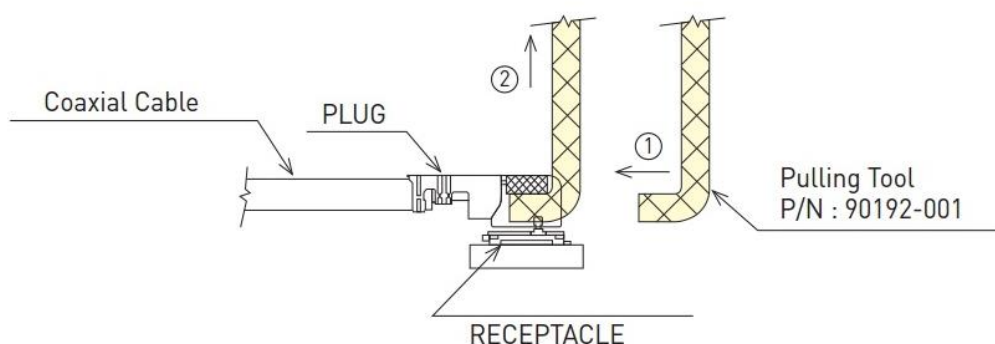
4. Precautions for usage

Mating / unmating

(1) To disconnect connectors, insert the end portion of I-PEX under the connector flanges and pull off vertically, in the direction of the connector mating axis.

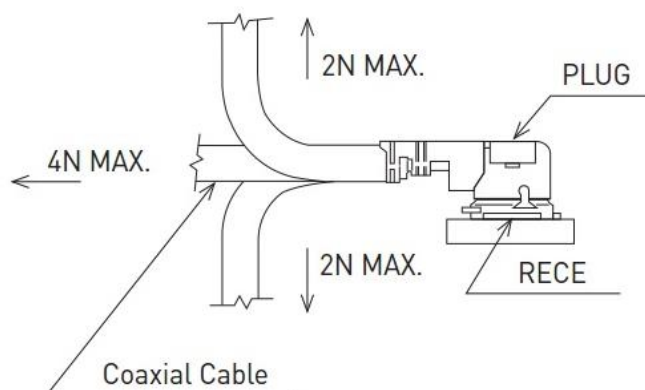
(2) To mate the connectors, the mating axes of both connectors must be aligned and the connectors can be mated. The "click" will confirm fully mated connection.

Do not attempt to insert on an extreme angle.



Pull forces on the cable after connectors are mated

After the connectors are mated, do not apply a load to the cable in excess of the values indicated in the diagram below.

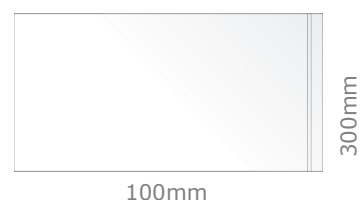
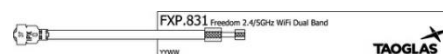


5. Packaging

100pc FXP831.07.0050C per Small PE Bag

Dimensions: 300 x 100mm

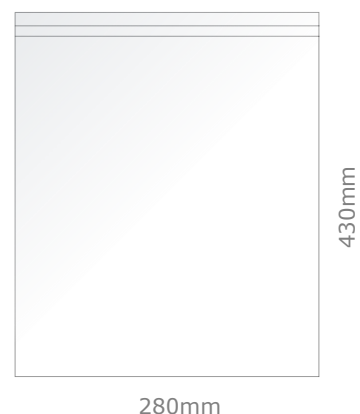
Weight: 70g



1000pcs FXP831.07.0050C per Large PE Bag

Dimensions: 430 x 280mm

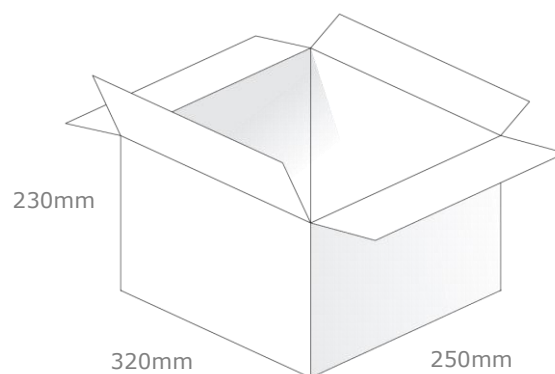
Weight: 807g



5000pcs FXP831.07.0050C per Carton

Carton Dimensions: 320 x 250 x 230 mm

Weight: 4.5Kg

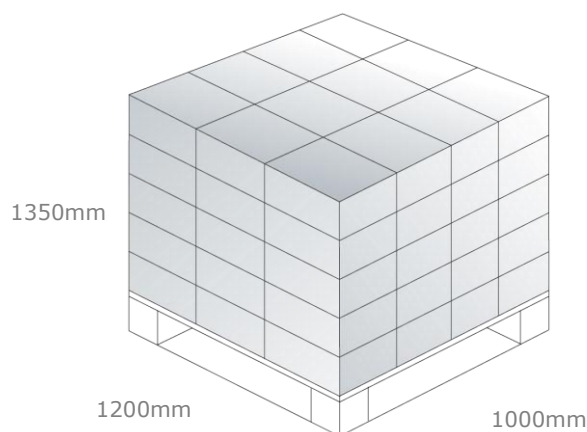


Pallet Dimensions:

1200 x 1000 x 1350mm

60 Cartons per Pallet

12 Cartons per layer, 5 Layers

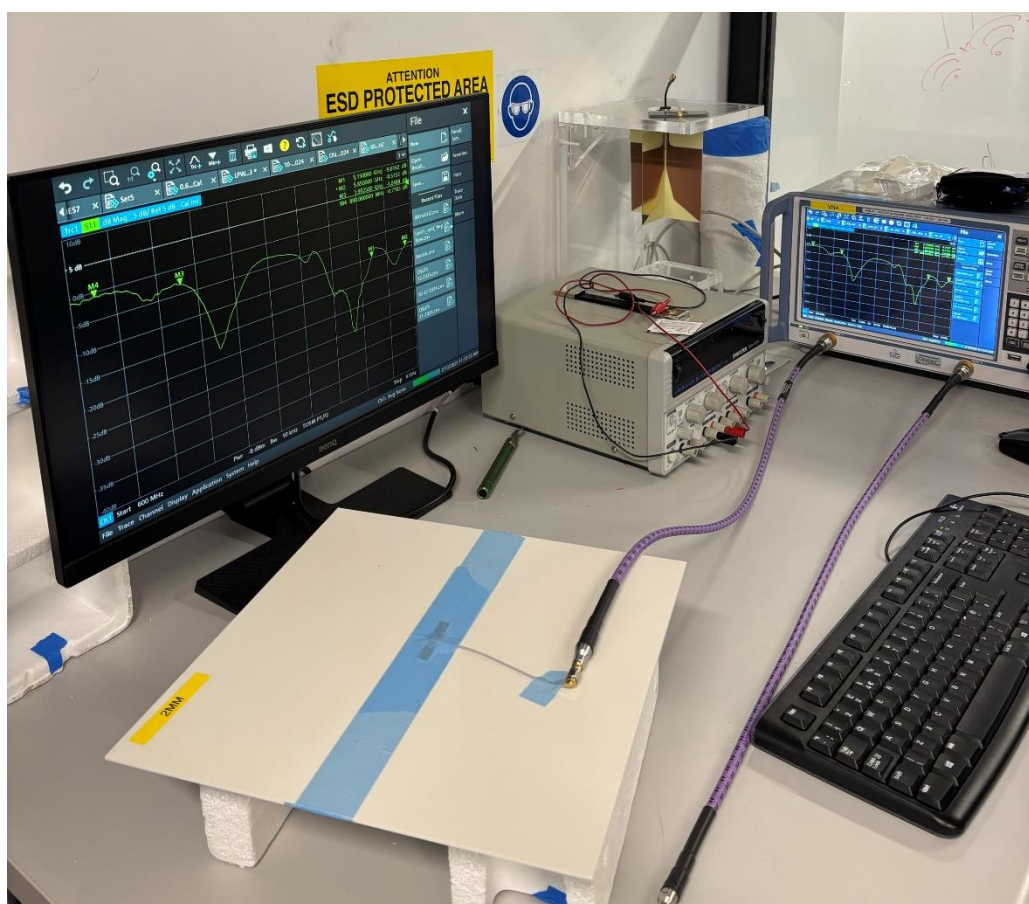


6. Antenna Characteristics

6.1 Test Setup

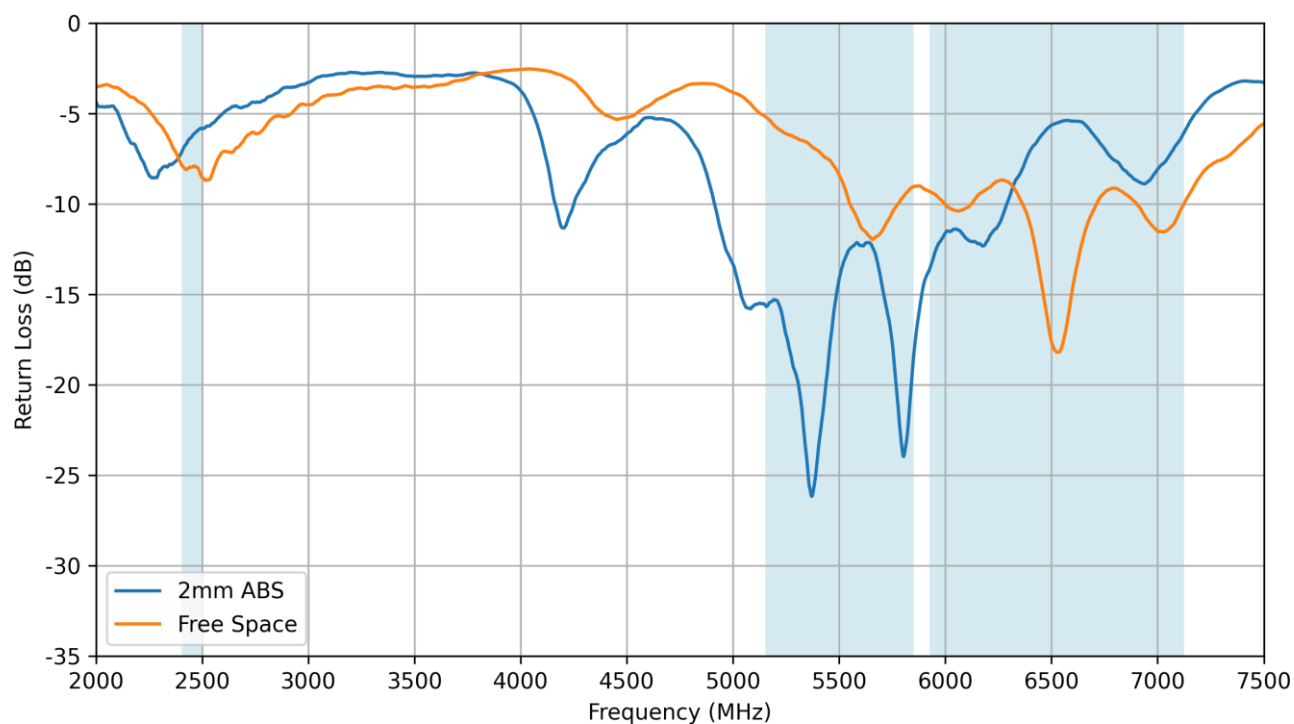


Vector Network Analyzer

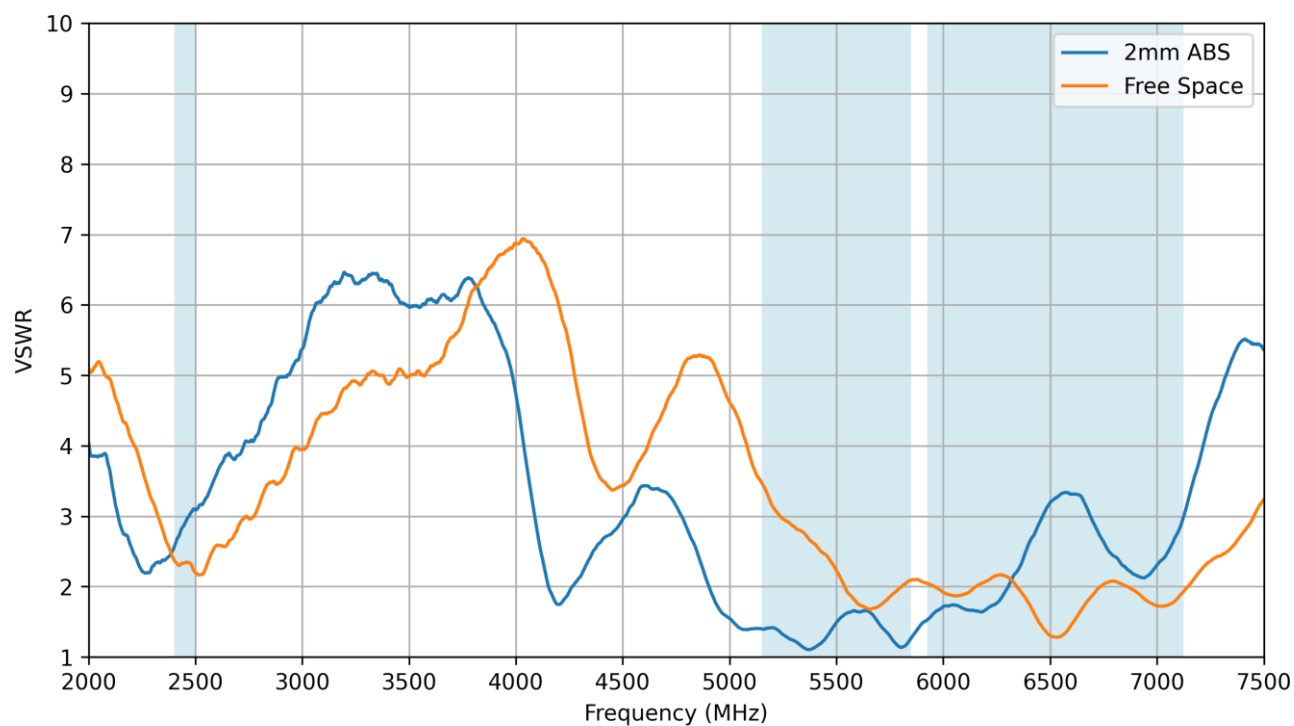


VNA Test Set-up on 2mm ABS

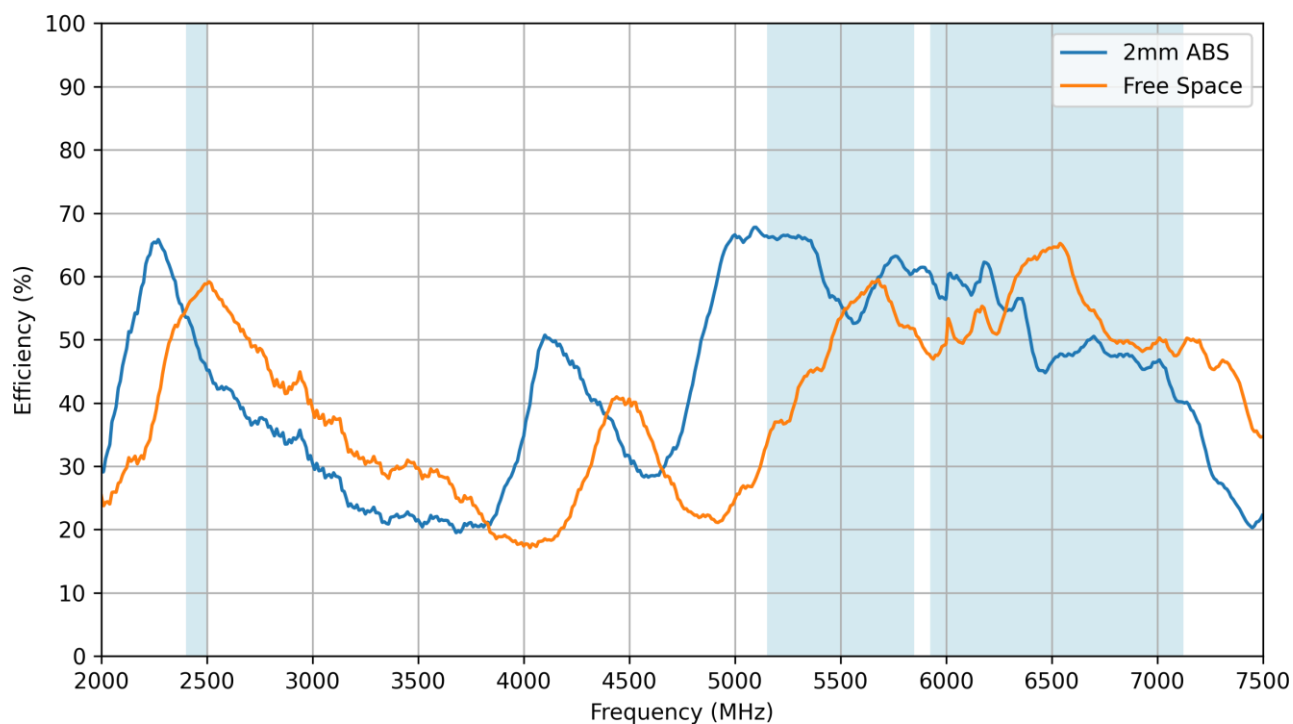
6.2 Return Loss



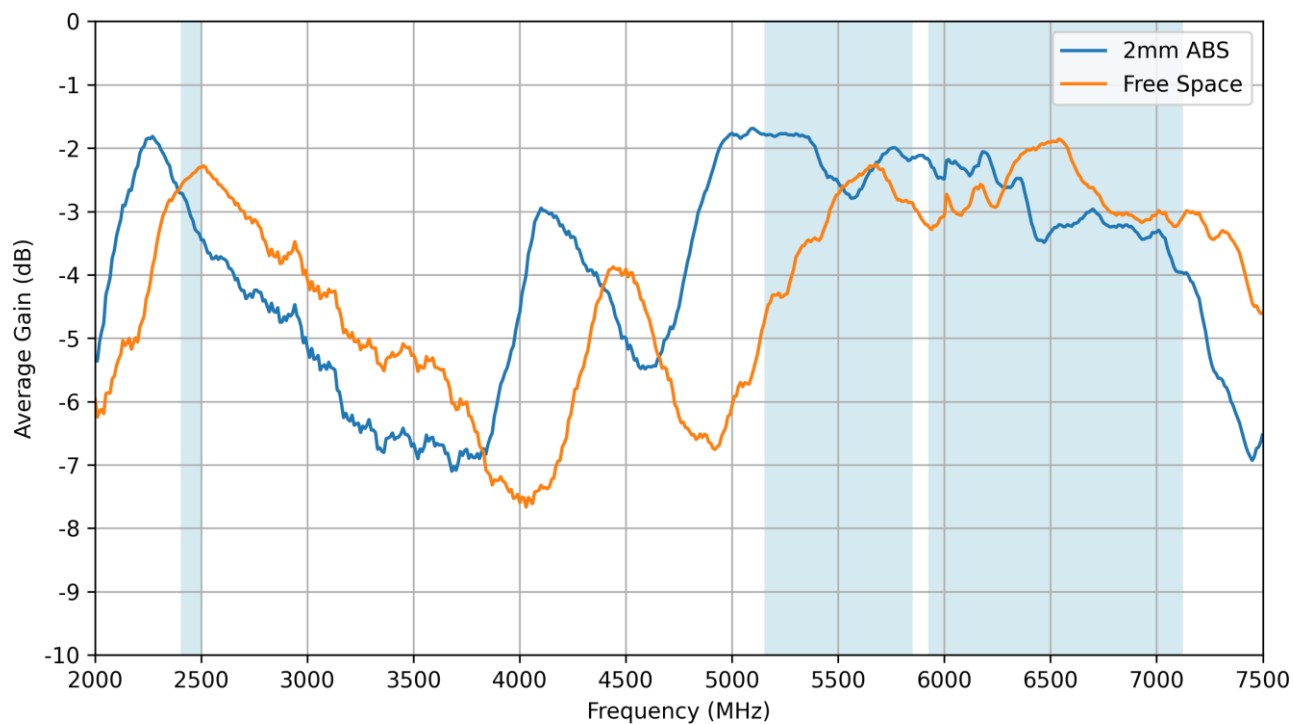
6.3 VSWR



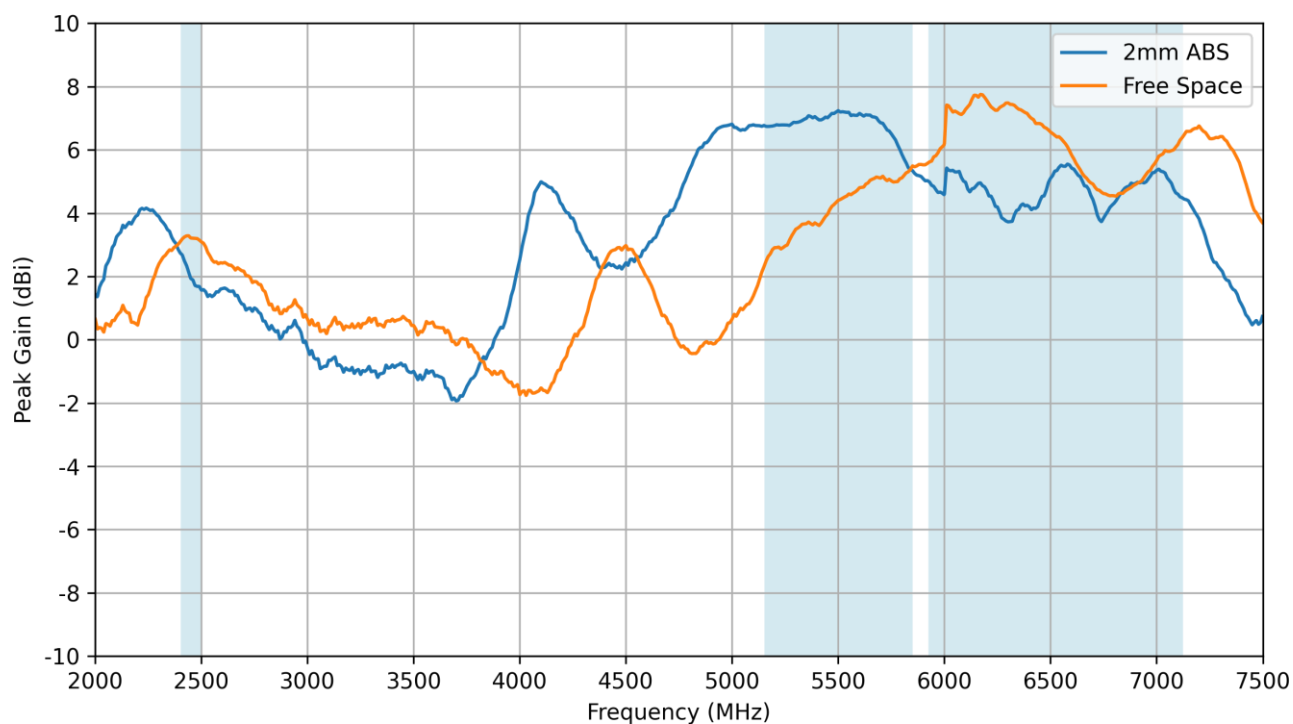
6.4 Efficiency



6.5 Average Gain

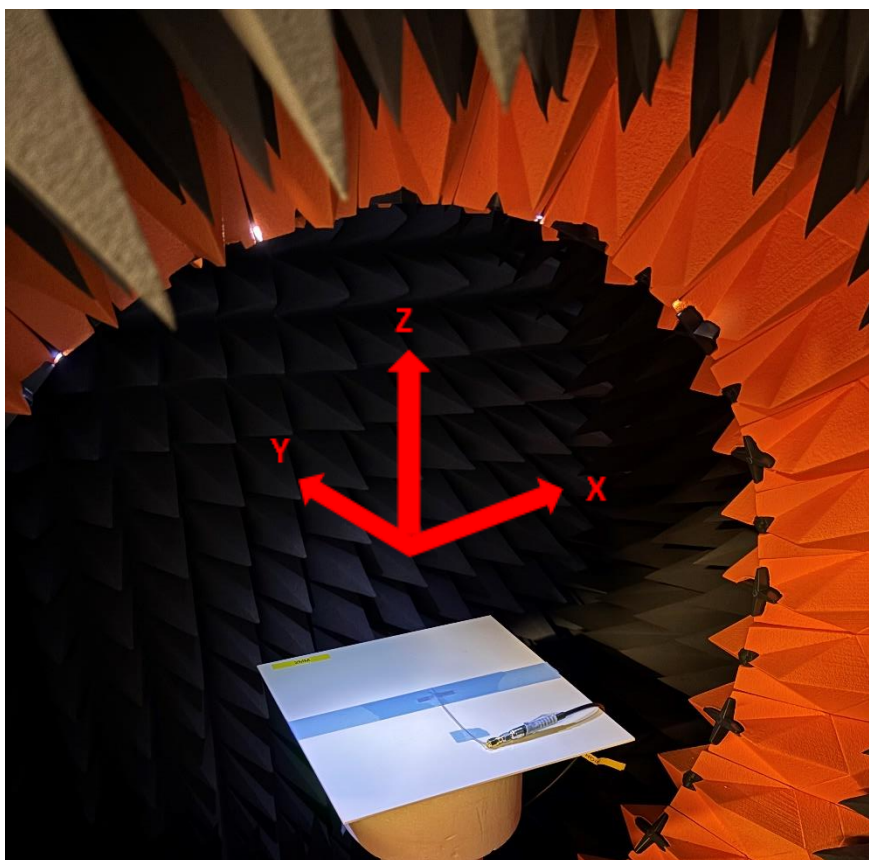


6.6 Peak Gain



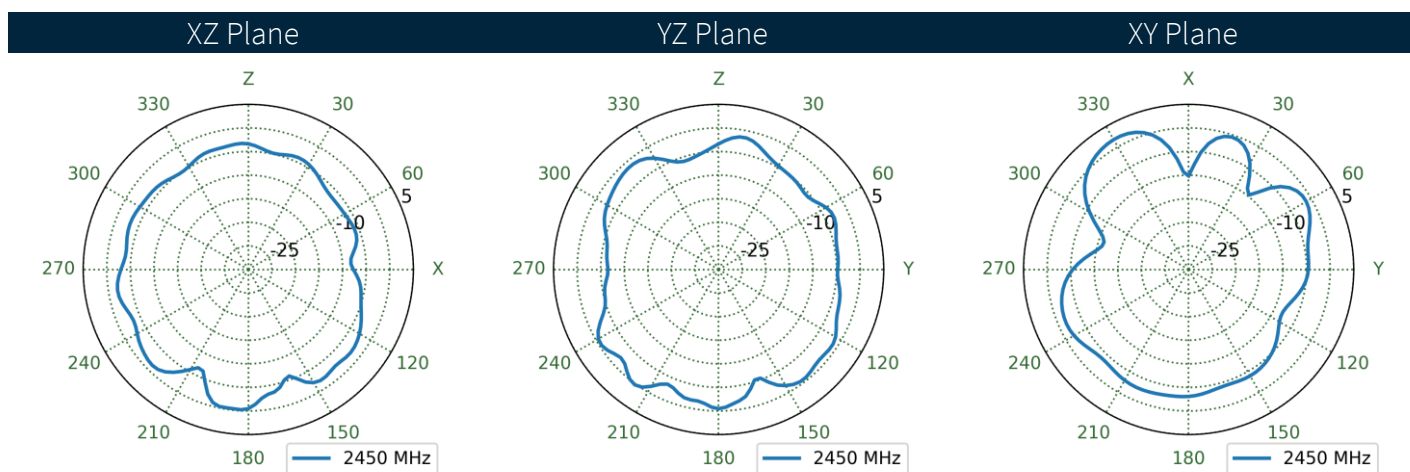
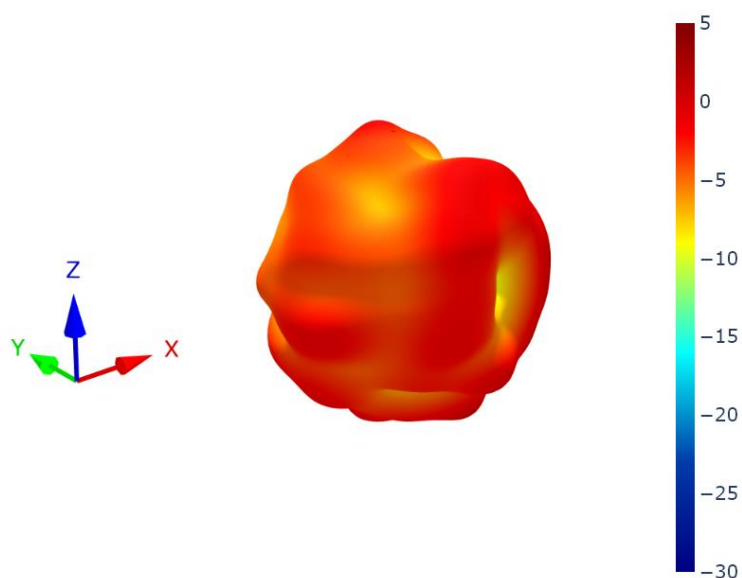
7. Radiation Patterns

7.1 Test Setup

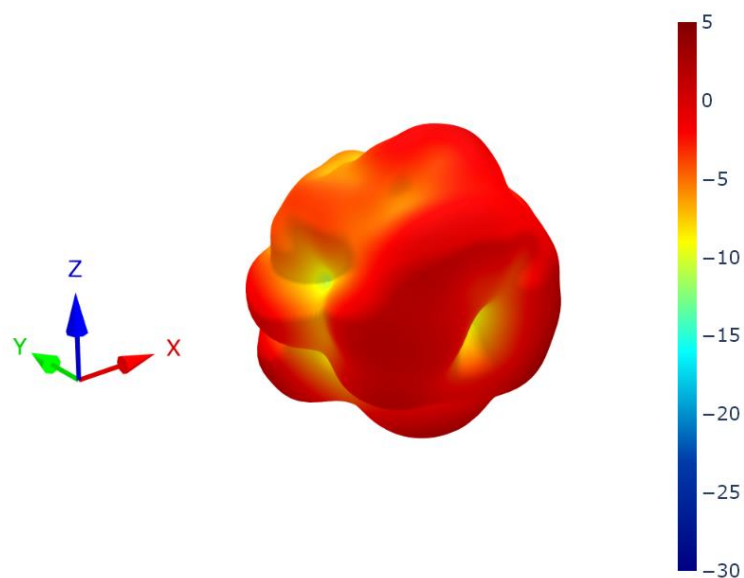


Chamber Test Set-up on 2mm ABS

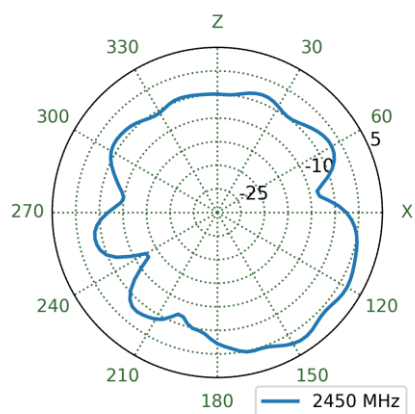
7.2 2mm ABS Patterns at 2450 MHz



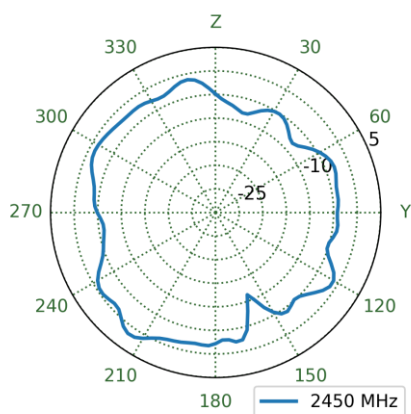
7.3 Free Space Patterns at 2450 MHz



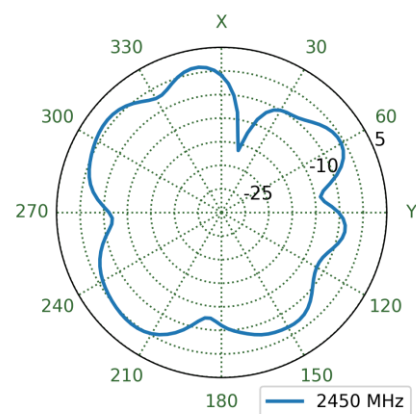
XZ Plane



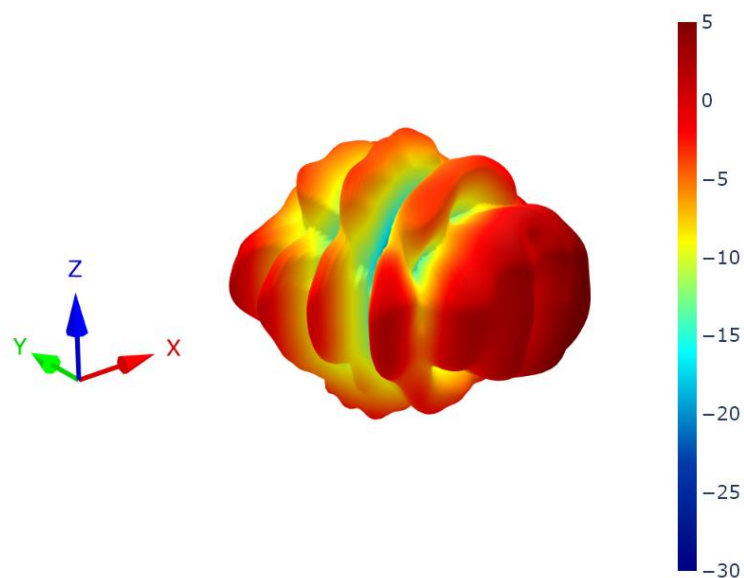
YZ Plane



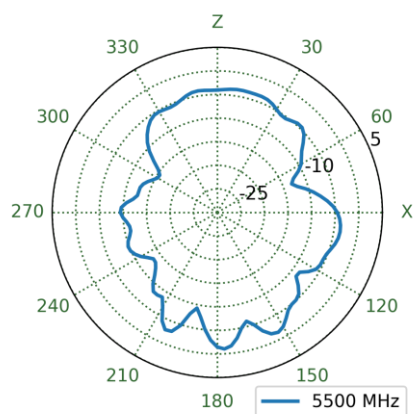
XY Plane



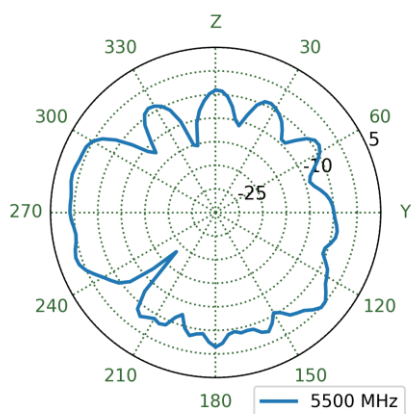
7.4 2mm ABS Patterns at 5500 MHz



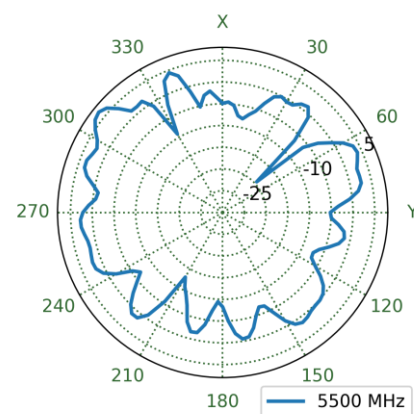
XZ Plane



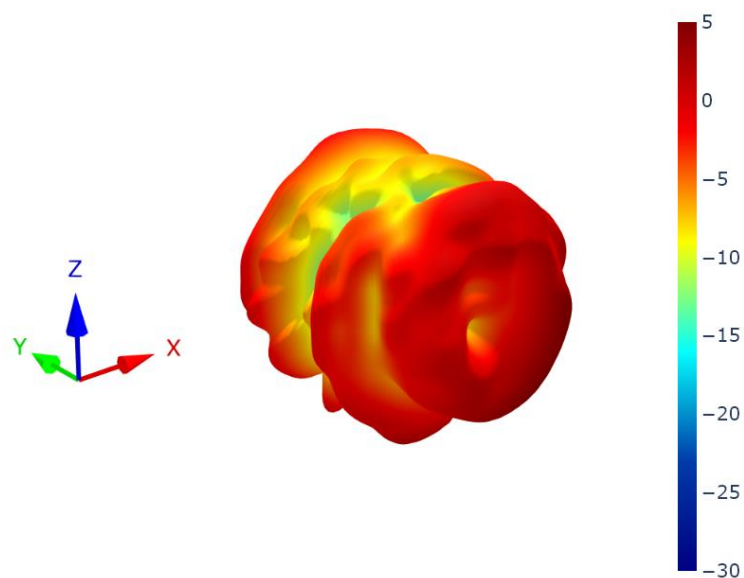
YZ Plane



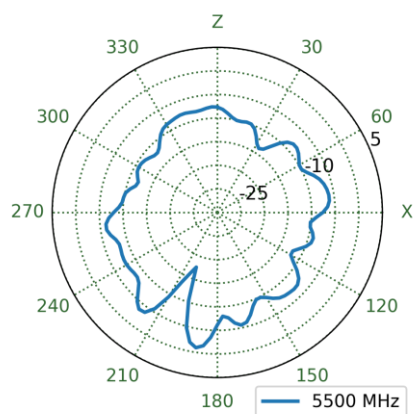
XY Plane



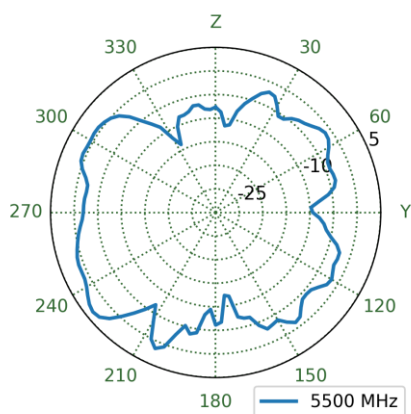
7.5 Free Space Patterns at 5500 MHz



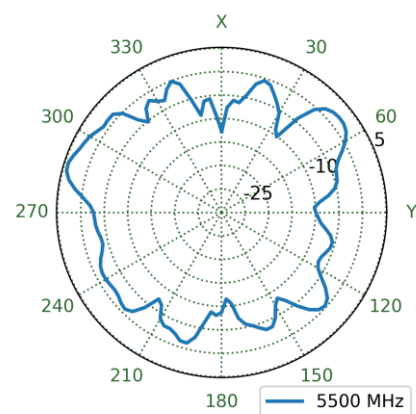
XZ Plane



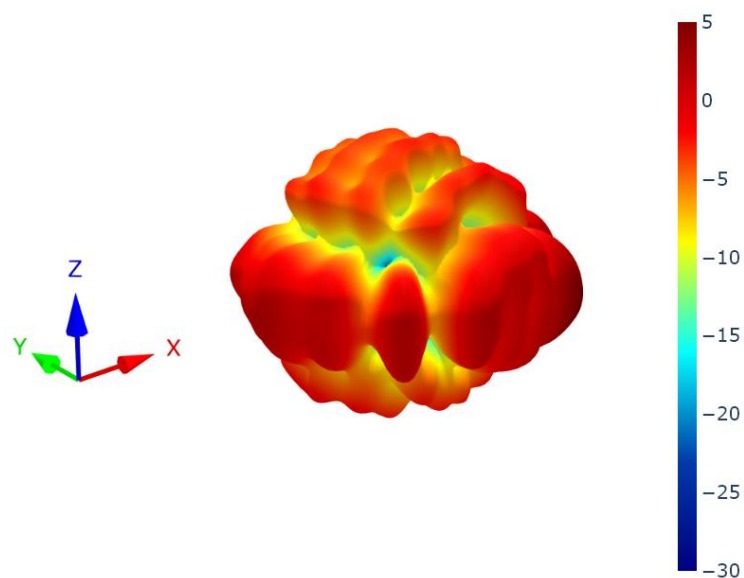
YZ Plane



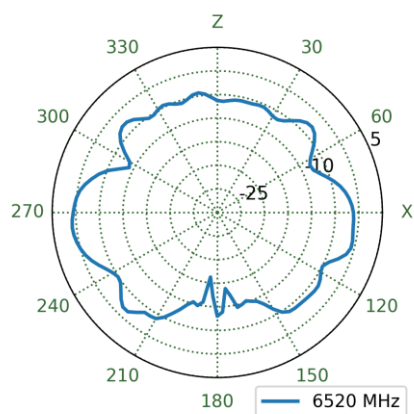
XY Plane



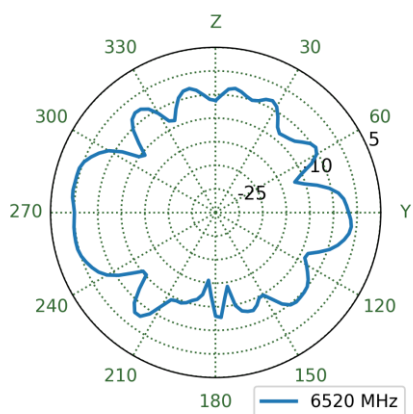
7.6 2mm ABS Patterns at 6520 MHz



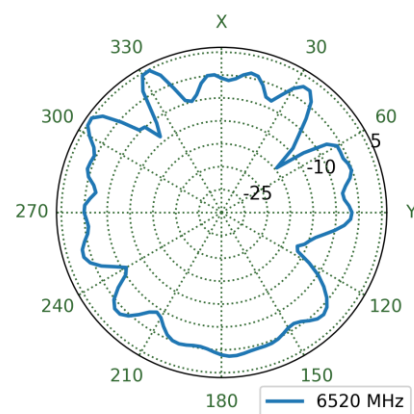
XZ Plane



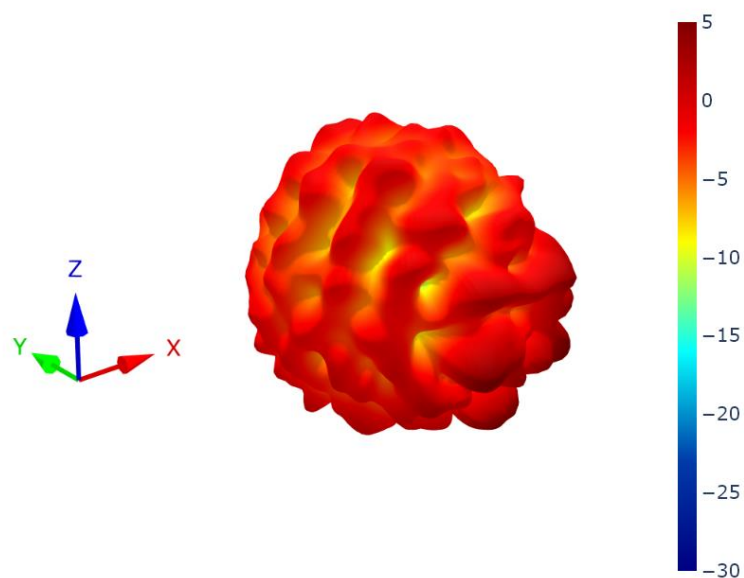
YZ Plane



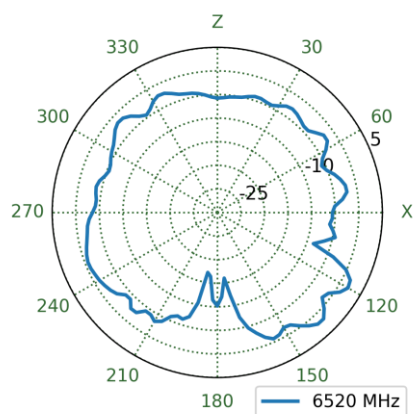
XY Plane



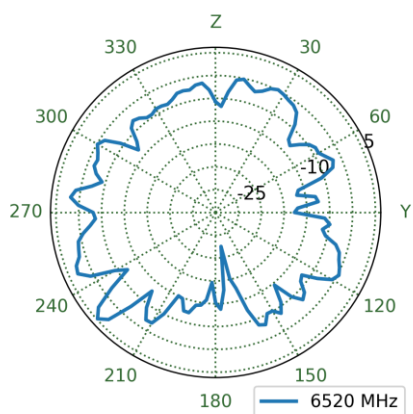
7.7 Free Space Patterns at 6520 MHz



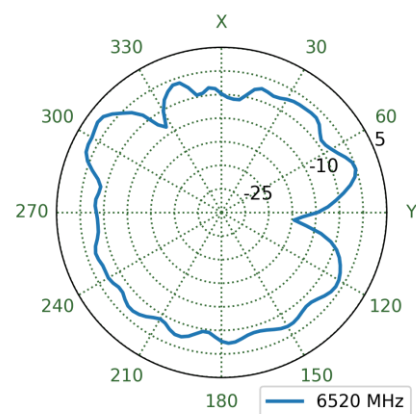
XZ Plane



YZ Plane



XY Plane



Changelog for the datasheet

SPE-25-8-058 – FXP831.07.0050C

Revision: A (Original First Release)

Date:	2025-02-18
Notes:	Initial Release
Author:	Gary West

Previous Revisions



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