



# TAOGLAS®



# Datasheet

## Freedom

**Part No:**  
FXP831.07.0100C

## 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: 100mm 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.

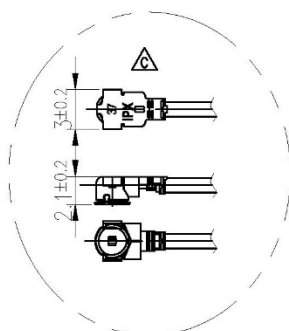
## 2. Specification

| 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 $\Omega$ | 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            |             |              |                   |                  |

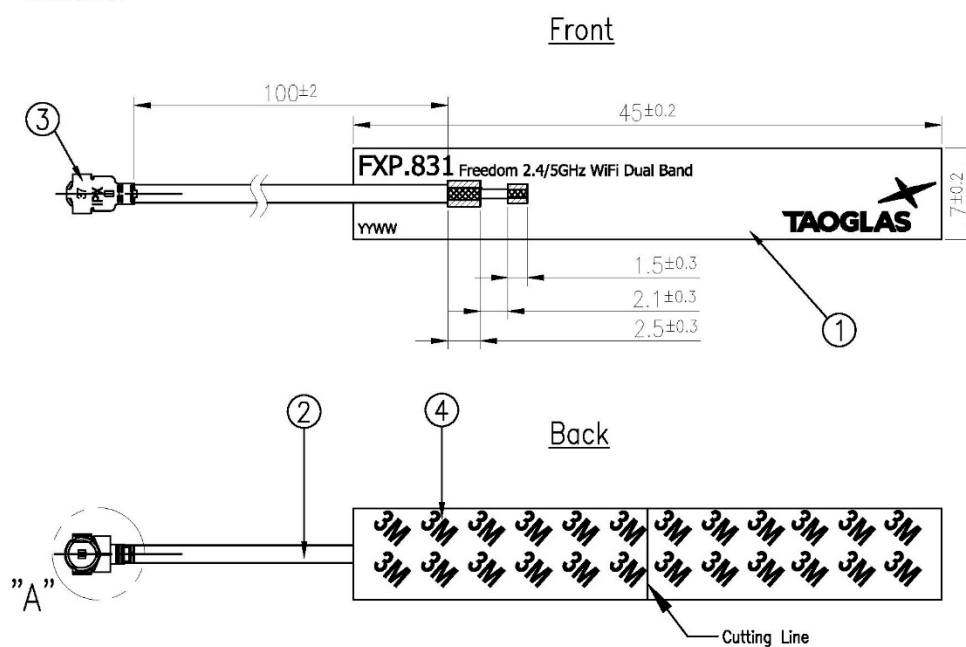
| Mechanical            |                          |
|-----------------------|--------------------------|
| Dimensions            | 45mm x 7mm               |
| Antenna Body Material | Polymer                  |
| Cable                 | Gray 100mm 1.37 co-axial |
| Connector             | IPEX MHFHT               |
| 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



Detail A  
Scale:1:1



|   | Name                 | P/N            | Material      | Finish      | QTY |
|---|----------------------|----------------|---------------|-------------|-----|
| 1 | FXP831 FPCB          | 100111B021111A | Polymer 0.24t | Black       | 1   |
| 2 | 1.37 Coaxial Cable   | 300415C000000A | FEP           | Gray        | 1   |
| 3 | IPEX MHFHT           | 204511G000000A | Brass         | Au Plated   | 1   |
| 4 | Double Side Adhesive | 100111B021111A | 3M 467        | Brown Liner | 1   |

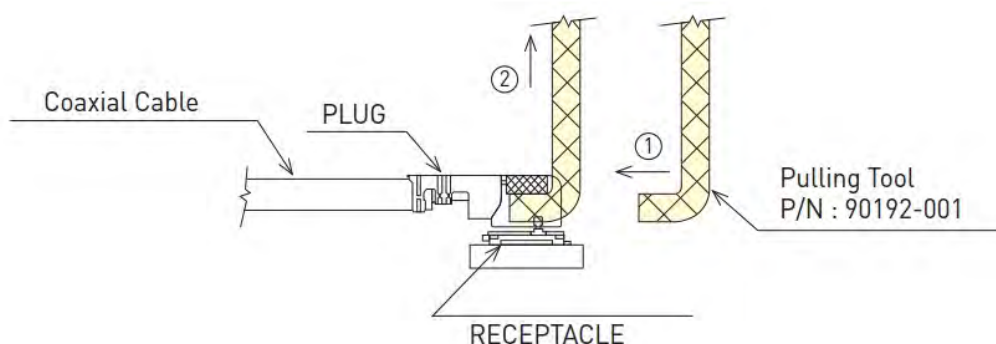
## 4. Precautions for usage

### 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.

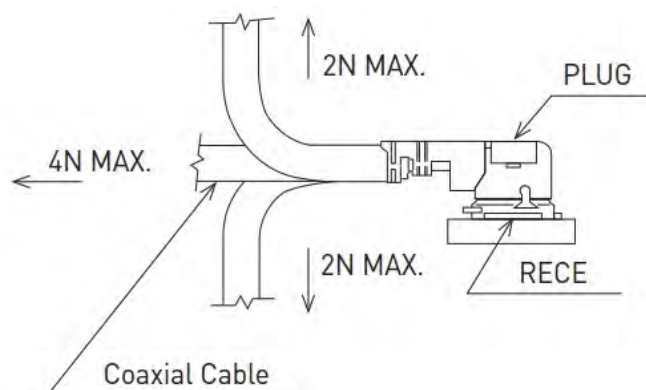
(2) To mate the connectors, the mating axes of both connectors must be aligned and the connectors can be mated. The "click" will confirm fully mated connection.

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.

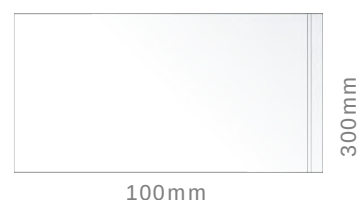


## 5. Packaging

100pc FXP831.07.0100C per Small PE Bag

Dimensions: 300 x 100mm

Weight: 70g



1000pcs FXP831.07.0100C per Large PE Bag

Dimensions: 430 x 280mm

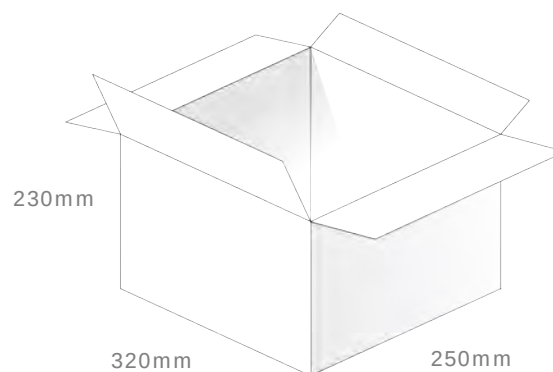
Weight: 807g



5000pcs FXP831.07.0100C per Carton

Carton Dimensions: 320 x 250 x 230 mm

Weight: 4.5Kg

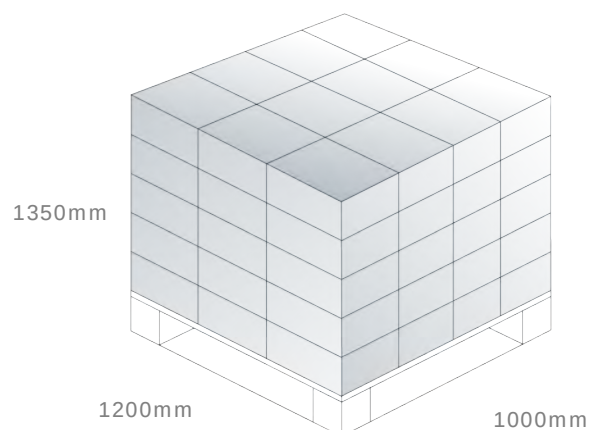


### Pallet Dimensions:

1200 x 1000 x 1350mm

60 Cartons per Pallet

12 Cartons per layer, 5 Layers

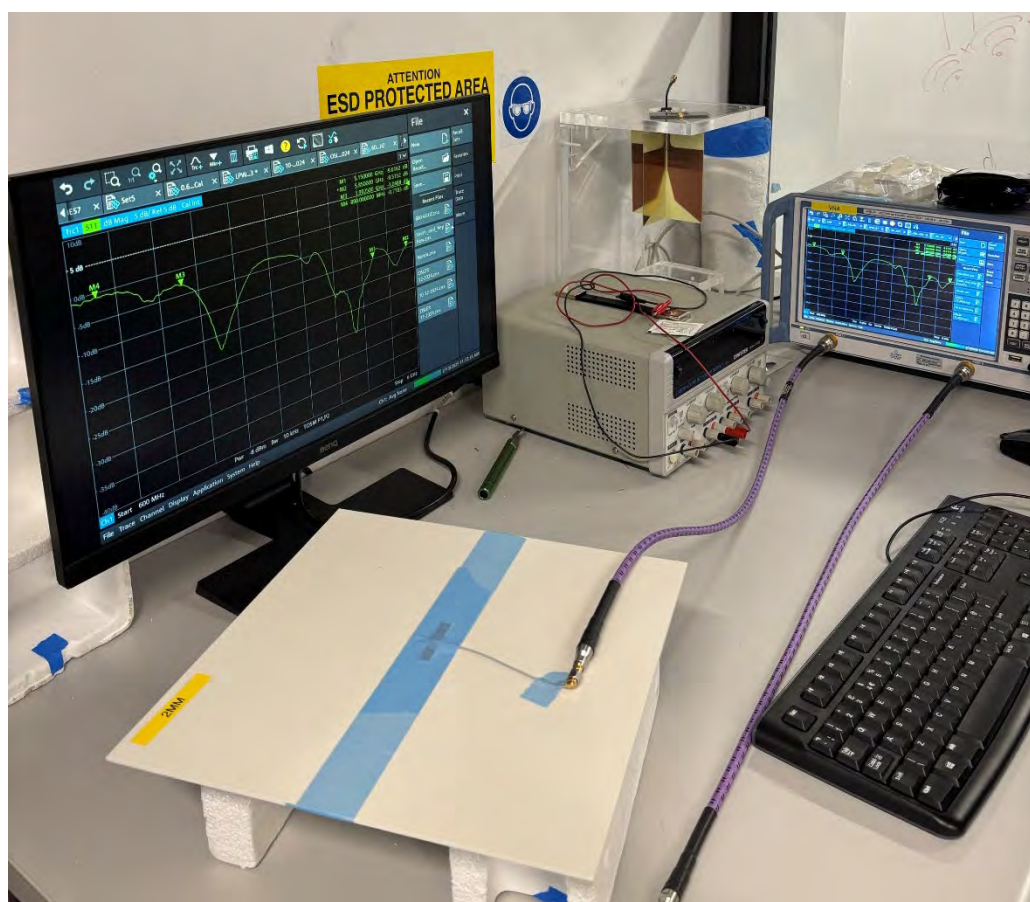


## 6. Antenna Characteristics

### 6.1 Test Setup

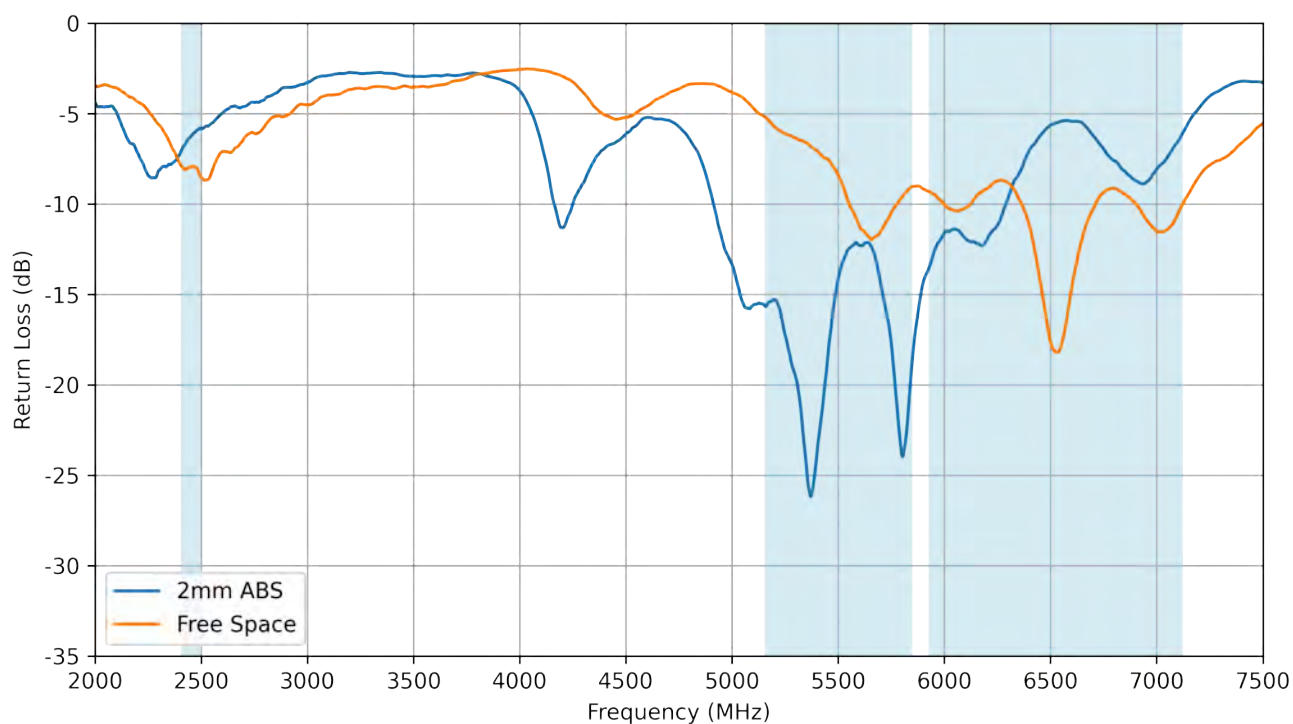


Vector Network Analyzer

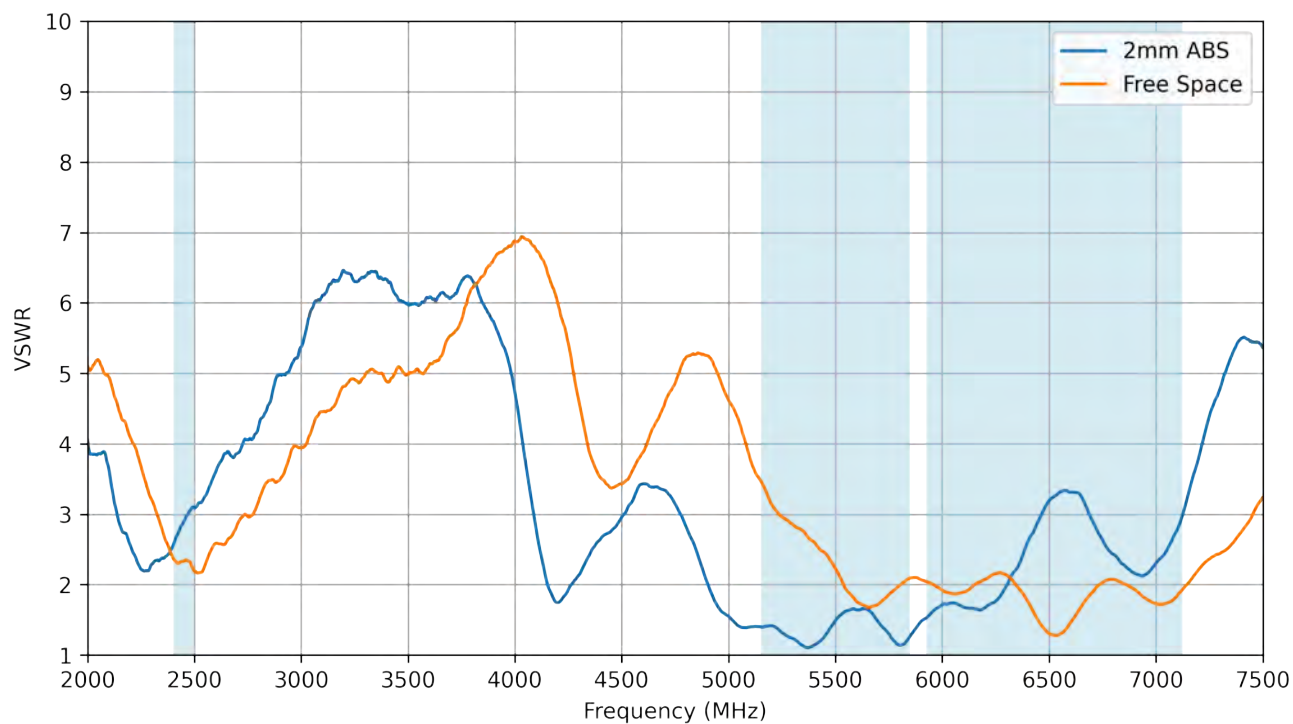


VNA Test Set-up on 2mm ABS

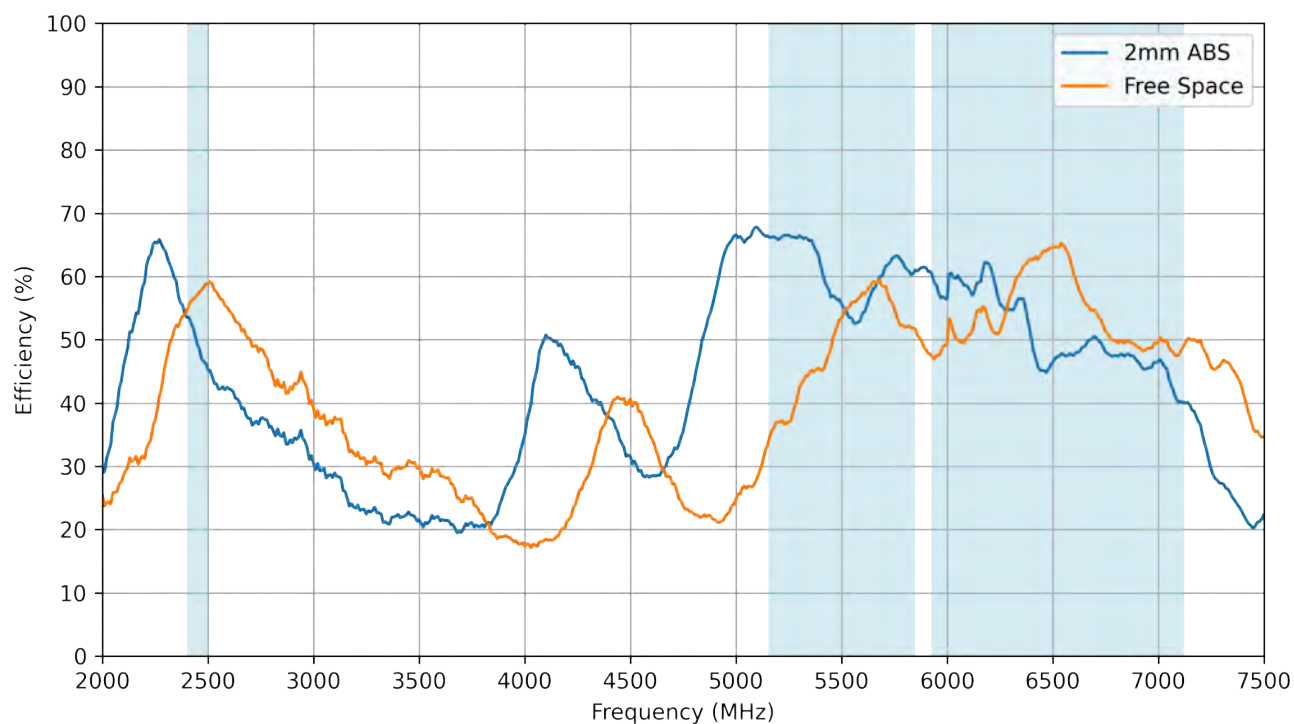
## 6.2 Return Loss



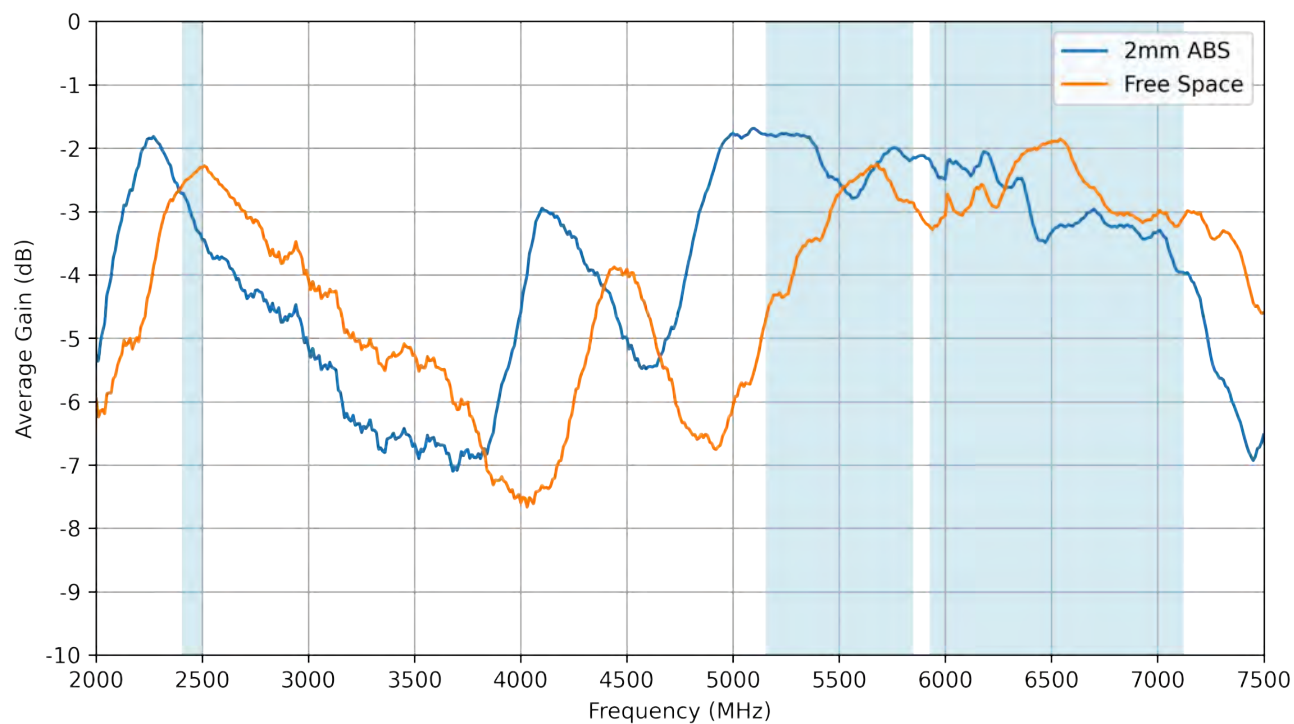
## 6.3 VSWR



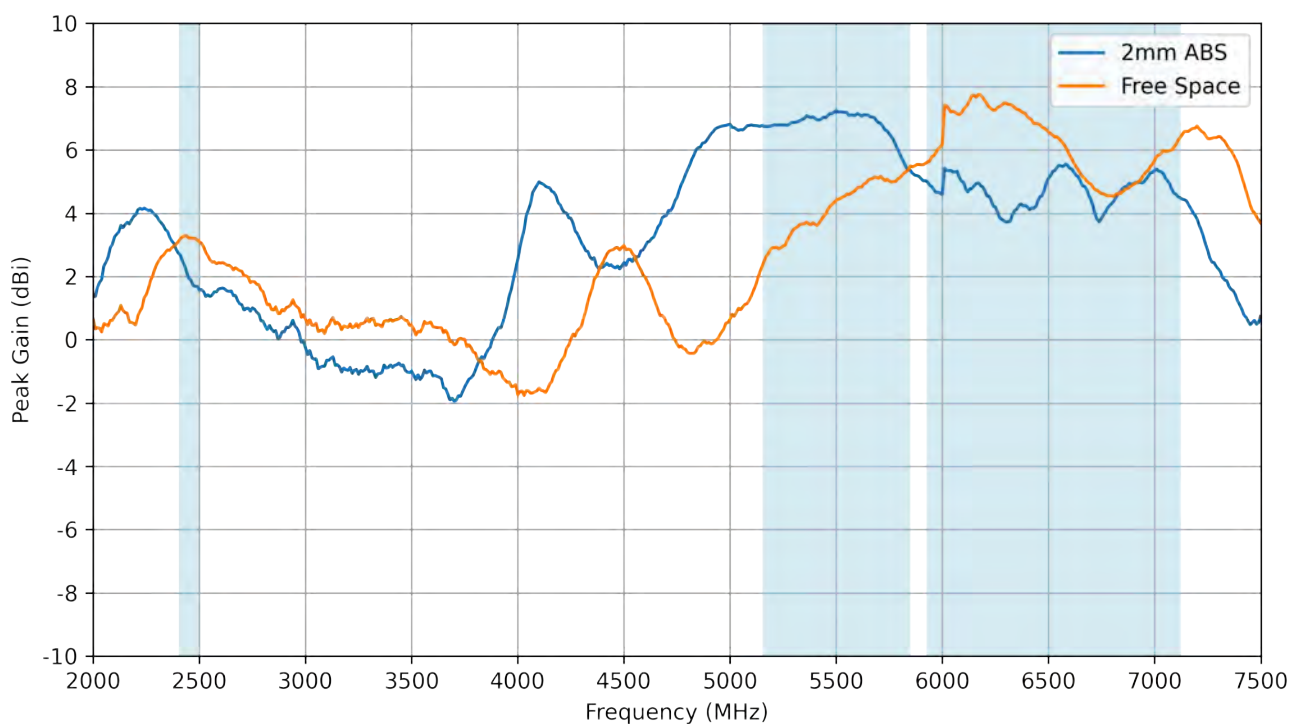
## 6.4 Efficiency



## 6.5 Average Gain

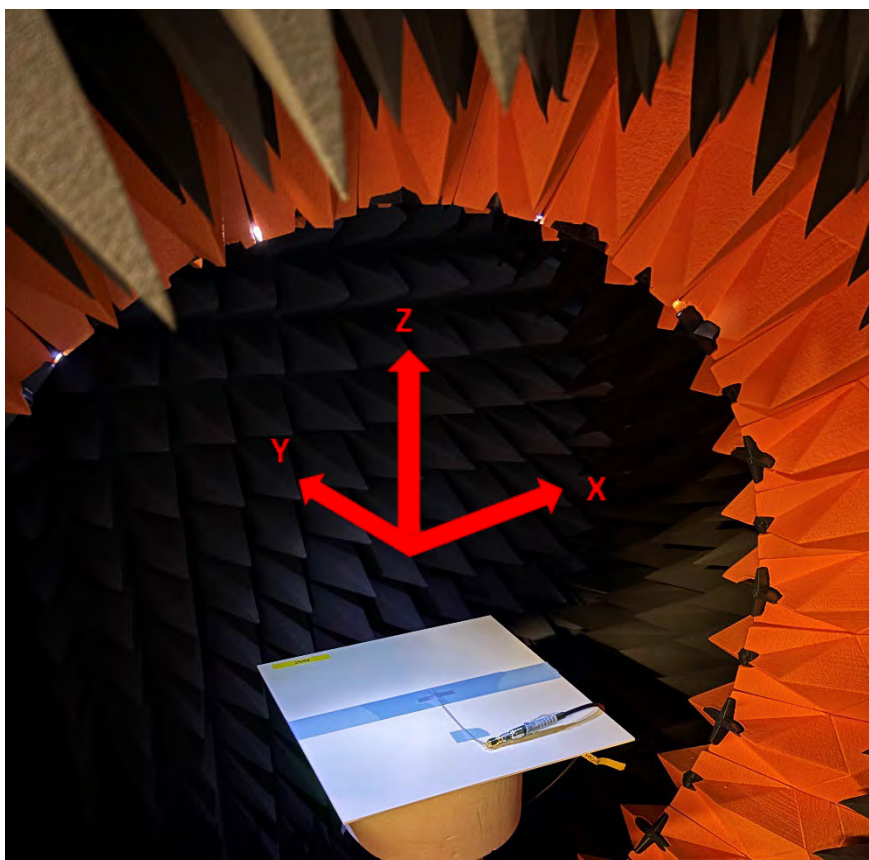
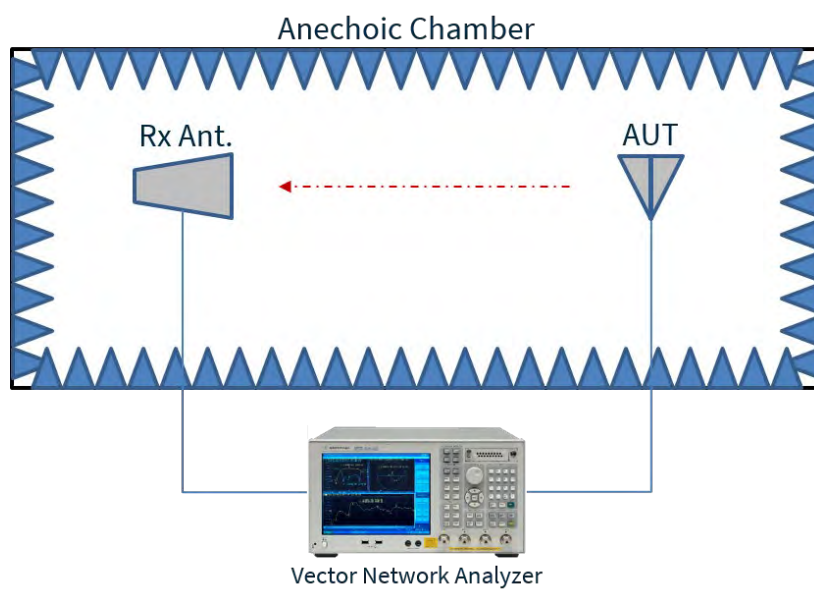


## 6.6 Peak Gain



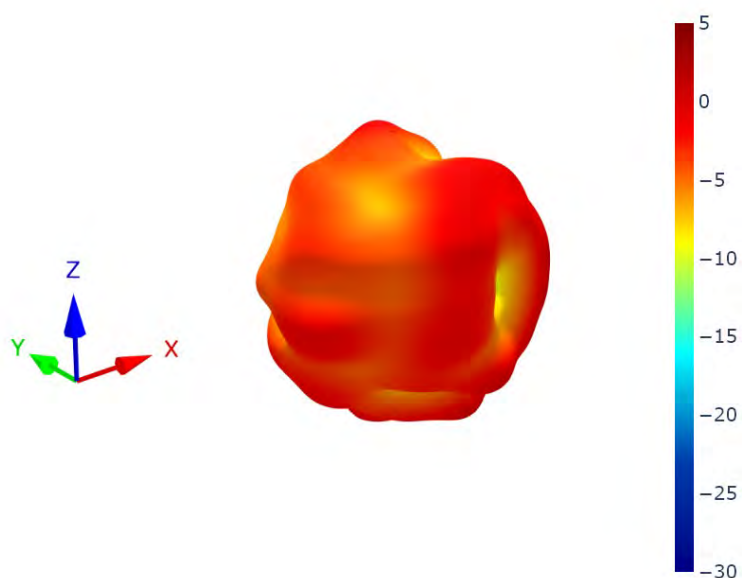
## 7. Radiation Patterns

### 7.1 Test Setup

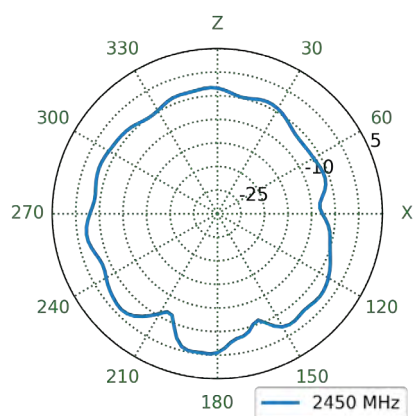


Chamber Test Set-up on 2mm ABS

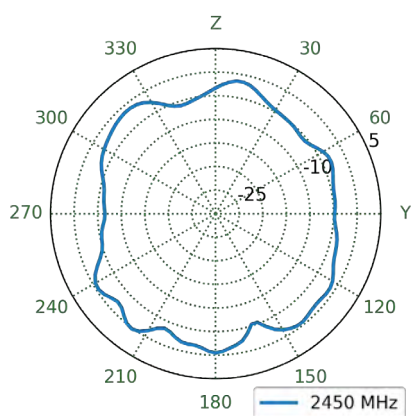
## 7.2 2mm ABS Patterns at 2450 MHz



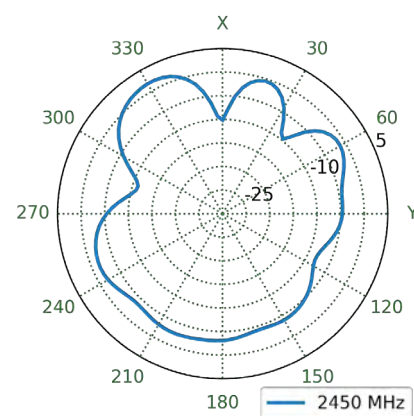
XZ Plane



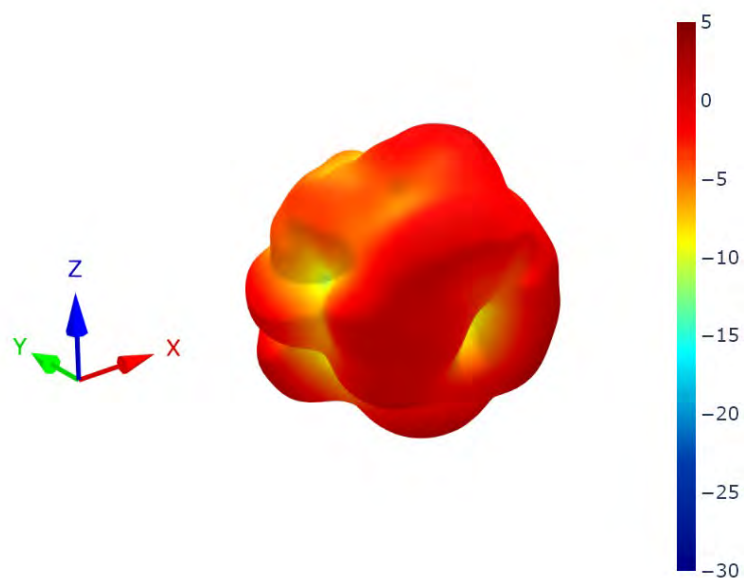
YZ Plane



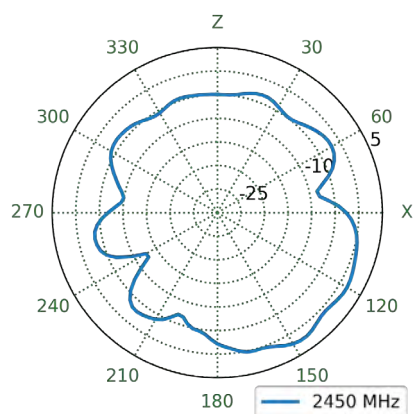
XY Plane



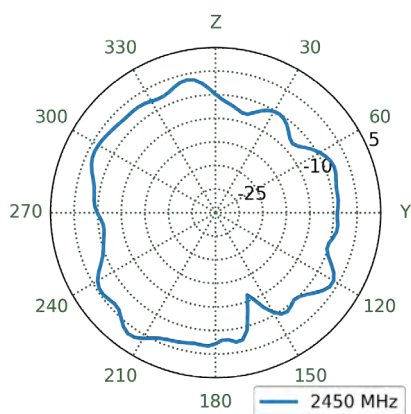
## 7.3 Free Space Patterns at 2450 MHz



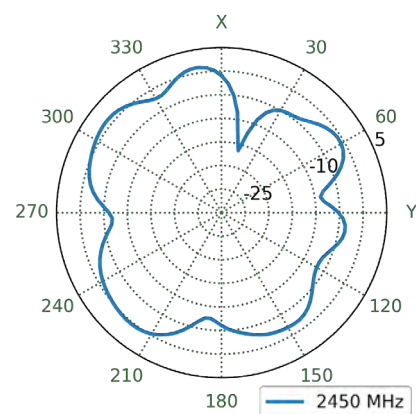
XZ Plane



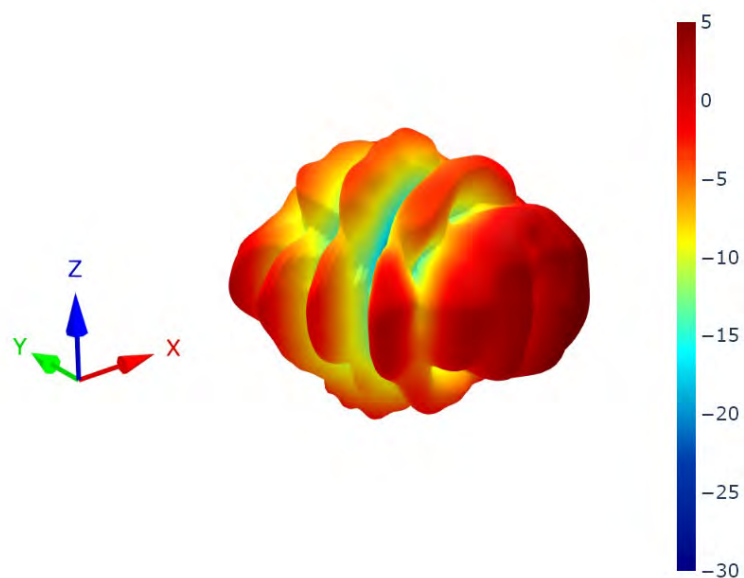
YZ Plane



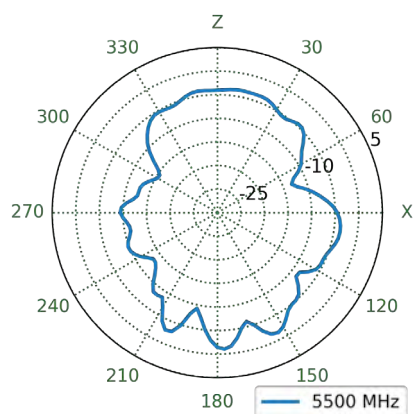
XY Plane



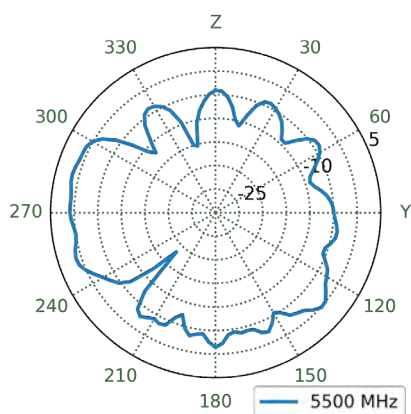
## 7.4 2mm ABS Patterns at 5500 MHz



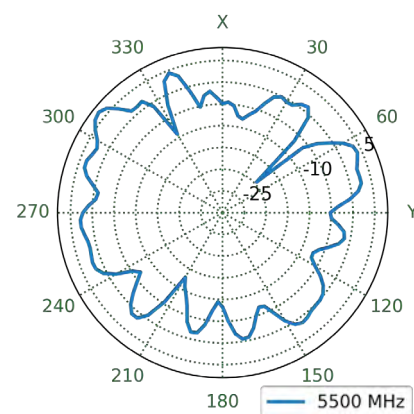
XZ Plane



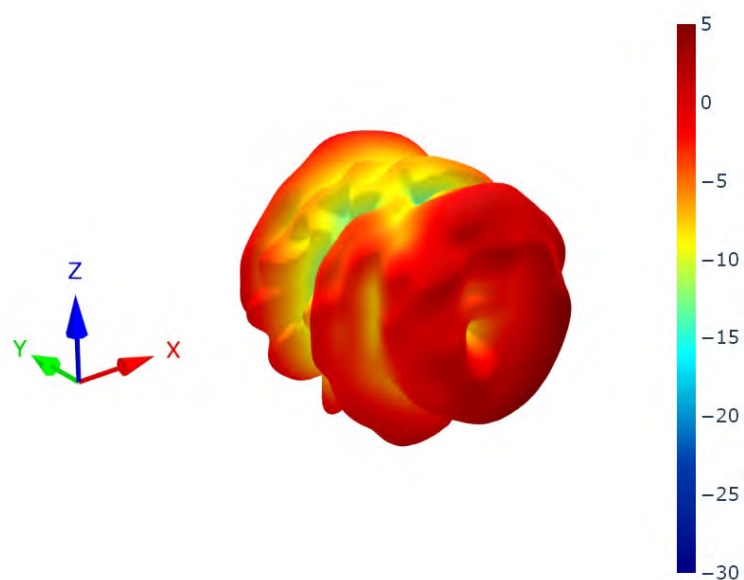
YZ Plane



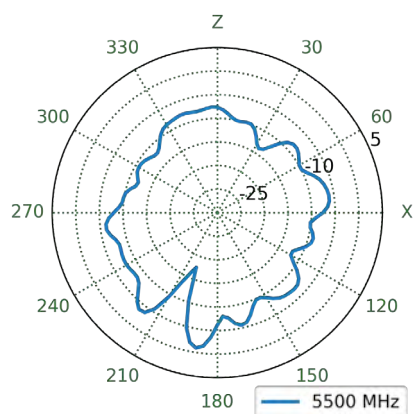
XY Plane



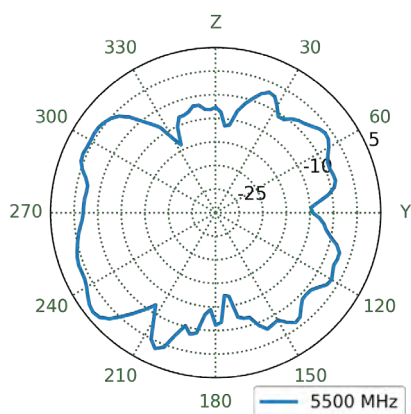
## 7.5 Free Space Patterns at 5500 MHz



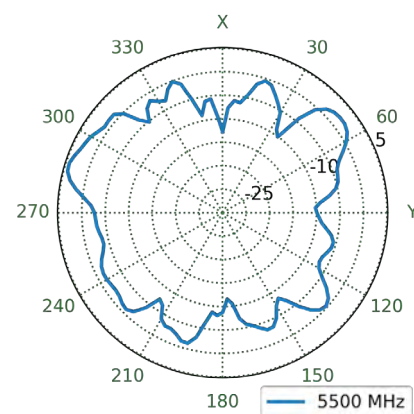
XZ Plane



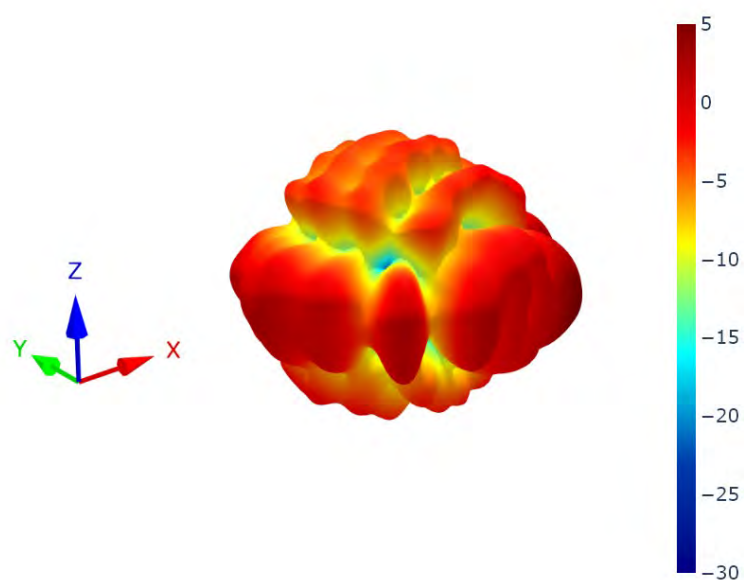
YZ Plane



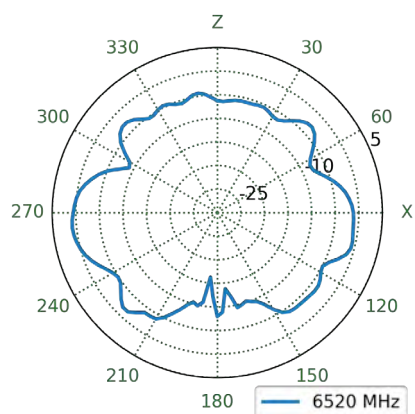
XY Plane



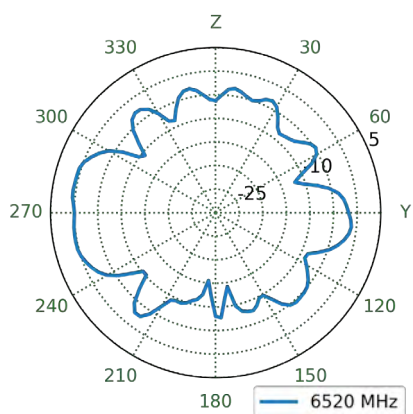
## 7.6 2mm ABS Patterns at 6520 MHz



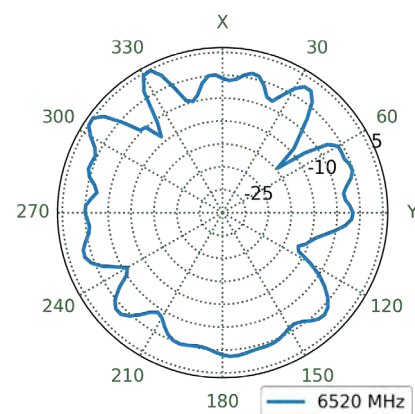
XZ Plane



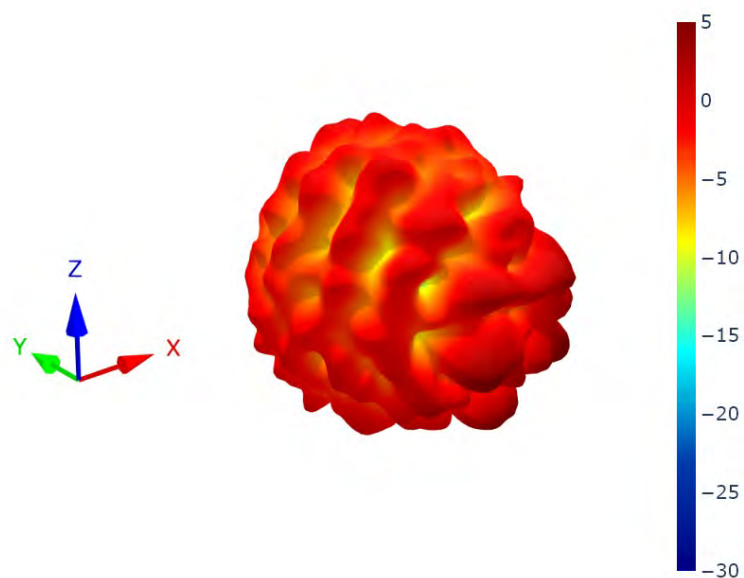
YZ Plane



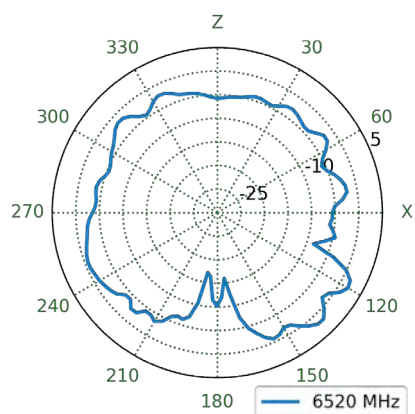
XY Plane



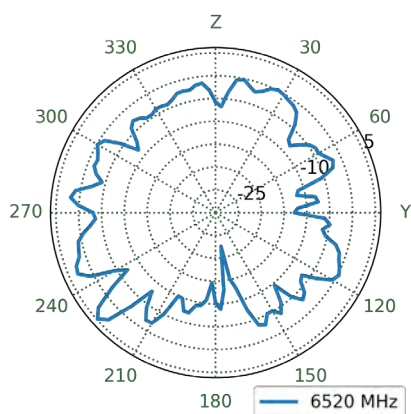
## 7.7 Free Space Patterns at 6520 MHz



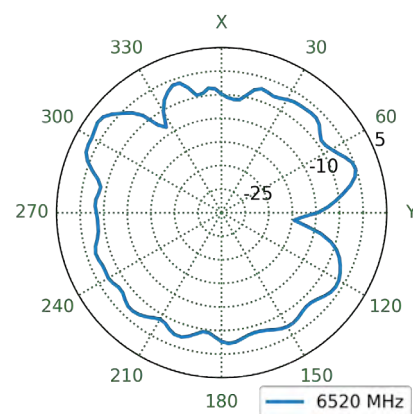
XZ Plane



YZ Plane



XY Plane



## Changelog for the datasheet

### SPE-11-8-026 – FXP831.07.0100C

#### Revision: K (Current Version)

|                  |                                                                        |
|------------------|------------------------------------------------------------------------|
| Date:            | 2025-02-18                                                             |
| Changes:         | Full datasheet update including Wi-Fi, Bluetooth, ZigBee Trademarking. |
| Changes Made by: | Gary West                                                              |

#### Previous Revisions

##### Revision: J

|                  |                        |
|------------------|------------------------|
| Date:            | 2019-03-01             |
| Changes:         | Updated specifications |
| Changes Made by: | Cesar Sousa            |

##### Revision: E

|                  |                     |
|------------------|---------------------|
| Date:            | 2015-02-15          |
| Changes:         | Added note on Intro |
| Changes Made by: | Aine Doyle          |

##### Revision: I

|                  |                |
|------------------|----------------|
| Date:            | 2019-05-14     |
| Changes:         | Images Updated |
| Changes Made by: | David Connolly |

##### Revision: D

|                  |                     |
|------------------|---------------------|
| Date:            | 2014-10-04          |
| Changes:         | Added in Batch code |
| Changes Made by: | Aine Doyle          |

##### Revision: H

|                  |              |
|------------------|--------------|
| Date:            | 2016-06-22   |
| Changes:         | Added patent |
| Changes Made by: | Aine Doyle   |

##### Revision: C

|                  |               |
|------------------|---------------|
| Date:            | 2012-01-14    |
| Changes:         | Updated intro |
| Changes Made by: | Aine Doyle    |

##### Revision: G

|                  |                       |
|------------------|-----------------------|
| Date:            | 2015-07-09            |
| Changes:         | Specification Updated |
| Changes Made by: | Aine Doyle            |

##### Revision: B

|                  |            |
|------------------|------------|
| Date:            | 2011-07-14 |
| Changes:         |            |
| Changes Made by: | Aine Doyle |

##### Revision: F

|                  |               |
|------------------|---------------|
| Date:            | 2015-06-30    |
| Changes:         | Added in DSRC |
| Changes Made by: | Aine Doyle    |

##### Revision: A (Original First Release)

|         |            |
|---------|------------|
| Date:   | 2011-07-01 |
| Notes:  |            |
| Author: | Aine Doyle |



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