

**Description: FPC Antenna 2.4/5.xGHz/DSRC****Series: Internal Antenna****PART NUMBER: W3334XXXXX****Features:**

- VSWR 2:1
- Mounting with adhesive tape
- Ultra small flexible radiator  
4.3x15.3x0.1mm
- See connector and cable  
options page 2

**Applications:**

- 2.4/5.xGHz radios
- Dualband WiFi
- Bluetooth, BLE, ZigBee
- DSRC 5.85-5.925GHz
- Routers, set top boxes
- IoT, M2M, V2x

All dimensions are in mm / inches

**Issue: 1922**

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99 Huo Ju Road(#29 Bldg, 4<sup>th</sup> Phase  
Suzhou New District  
Jiangsu Province, Suzhou 215009 PR China  
Tel: 86 512 6807 9998



**Description: FPC Antenna 2.4/5.xGHz/DSRC****Series: Internal Antenna****PART NUMBER: W3334XXXXX****This document covers all product variants of the following product family:**

|             |                       |                           |
|-------------|-----------------------|---------------------------|
| W3334B0100  | 100mm 1.13mm OD cable | U.FL compatible connector |
| W3334B0127  | 127mm 1.13mm OD cable | U.FL compatible connector |
| W3334B0150  | 150mm 1.13mm OD cable | U.FL compatible connector |
| W3334B0250  | 250mm 1.13mm OD cable | U.FL compatible connector |
| W3334B0290  | 290mm 1.13mm OD cable | U.FL compatible connector |
| W3334BD0150 | 150mm 0.81mm OD cable | MHF4 compatible connector |

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Series: Internal Antenna

PART NUMBER: W3334XXXXX

### ELECTRICAL SPECIFICATIONS

| Frequency      | Peak gain(dBi) | Efficiency (%) |
|----------------|----------------|----------------|
| 2400~2483.5MHz | 1.17           | 50%            |
| 5150~5250MHz   | 6.09           | 70%            |
| 5250~5350MHz   | 6.09           | 70%            |
| 5470~5725MHz   | 4.32           | 70%            |
| 5725~5850MHz   | 4.32           | 70%            |

***Typical free space performance measured on 1mm thick PC plate***

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Description: FPC Antenna 2.4/5.xGHz/DSRC

Series: Internal Antenna

PART NUMBER: W3334XXXXX

### MECHANICAL SPECIFICATIONS

|                |                                      |          |
|----------------|--------------------------------------|----------|
| FPC size       | 14.3 X 5.3 X0.1[0.56 X 0.21 X 0.004] | mm[inch] |
| Connector type | See Page 2.                          |          |
| Cable type     | See Page 2                           |          |
| Cable length   | Optional                             |          |
| Cable color    | Black                                |          |
| Adhesive       | 3M467                                |          |

### ENVIRONMENTAL SPECIFICATIONS

|                       |             |
|-----------------------|-------------|
| Operating temperature | -40/+85 ° C |
|-----------------------|-------------|

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**Description: FPC Antenna 2.4/5.xGHz/DSRC**

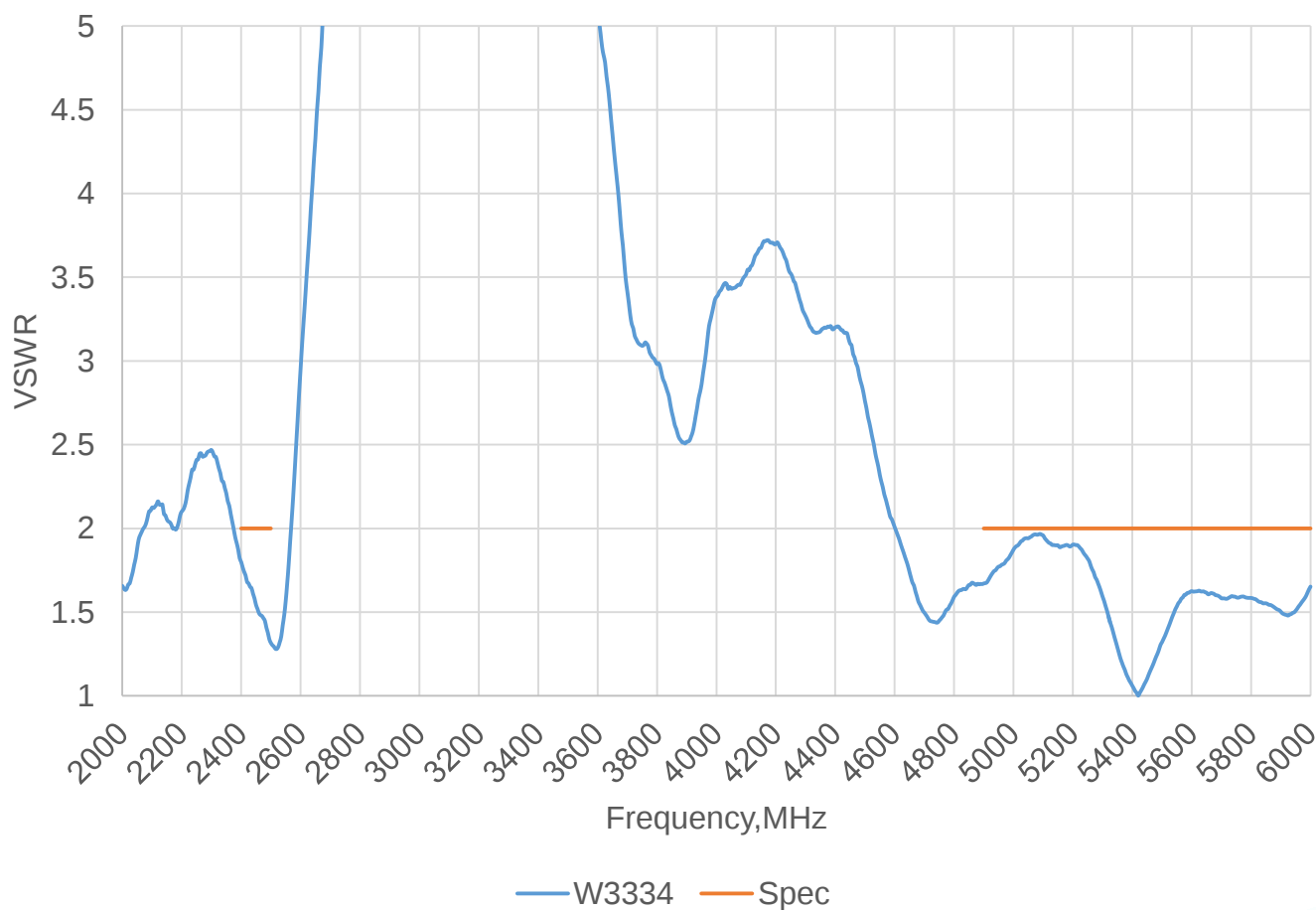
**Series: Internal Antenna**

**PART NUMBER: W3334XXXXX**

## CHARTS

### VSWR

W3334 measured with polycarbonate plate



**Note: Antenna tested on 1mm thickness PC plate with 150mm feed cable**

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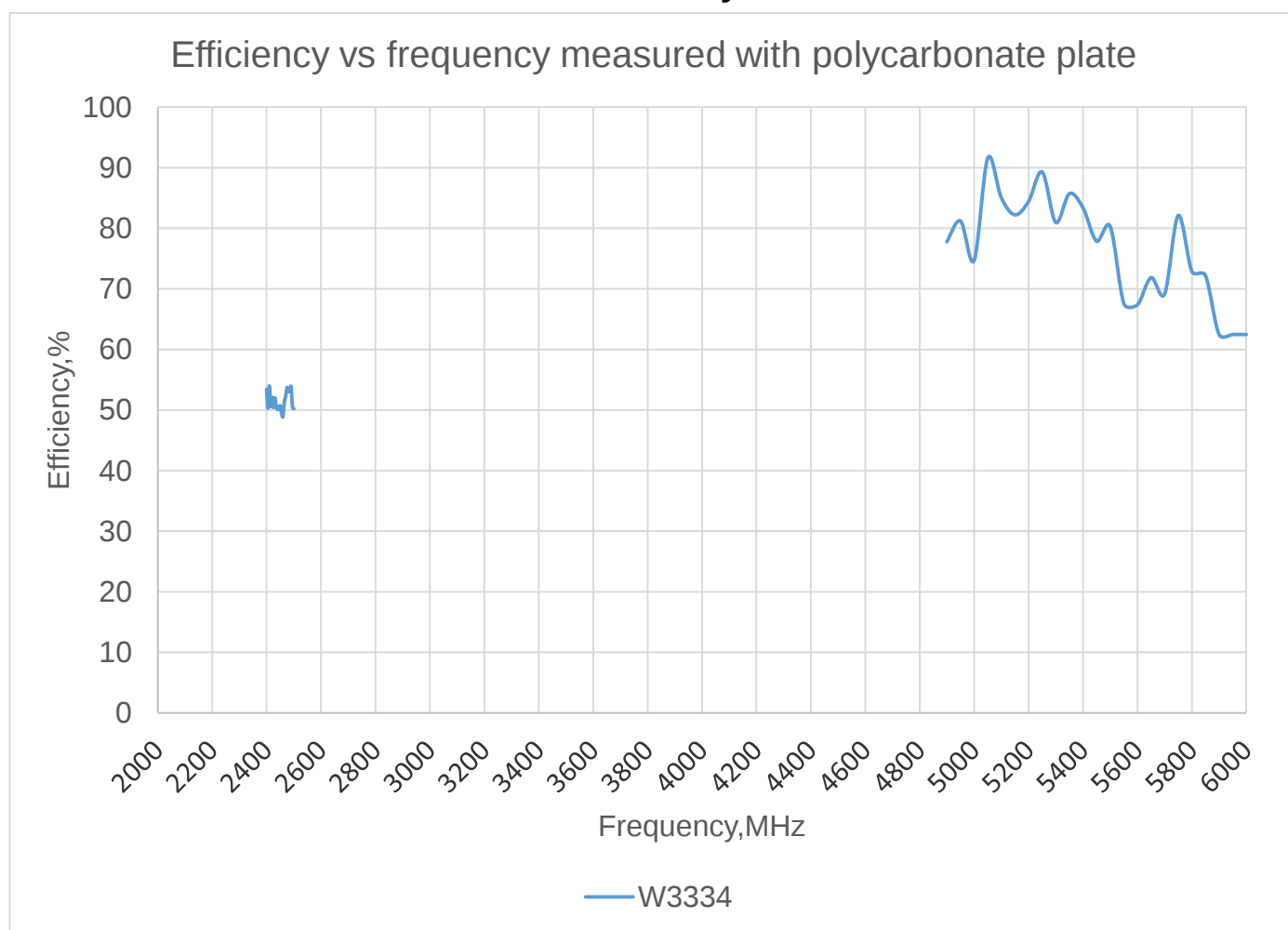
**Description: FPC Antenna 2.4/5.xGHz/DSRC**

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**PART NUMBER: W3334XXXXX**

## CHARTS

### Efficiency



**Note: Antenna tested on 1mm thickness PC plate with 150mm feed cable**

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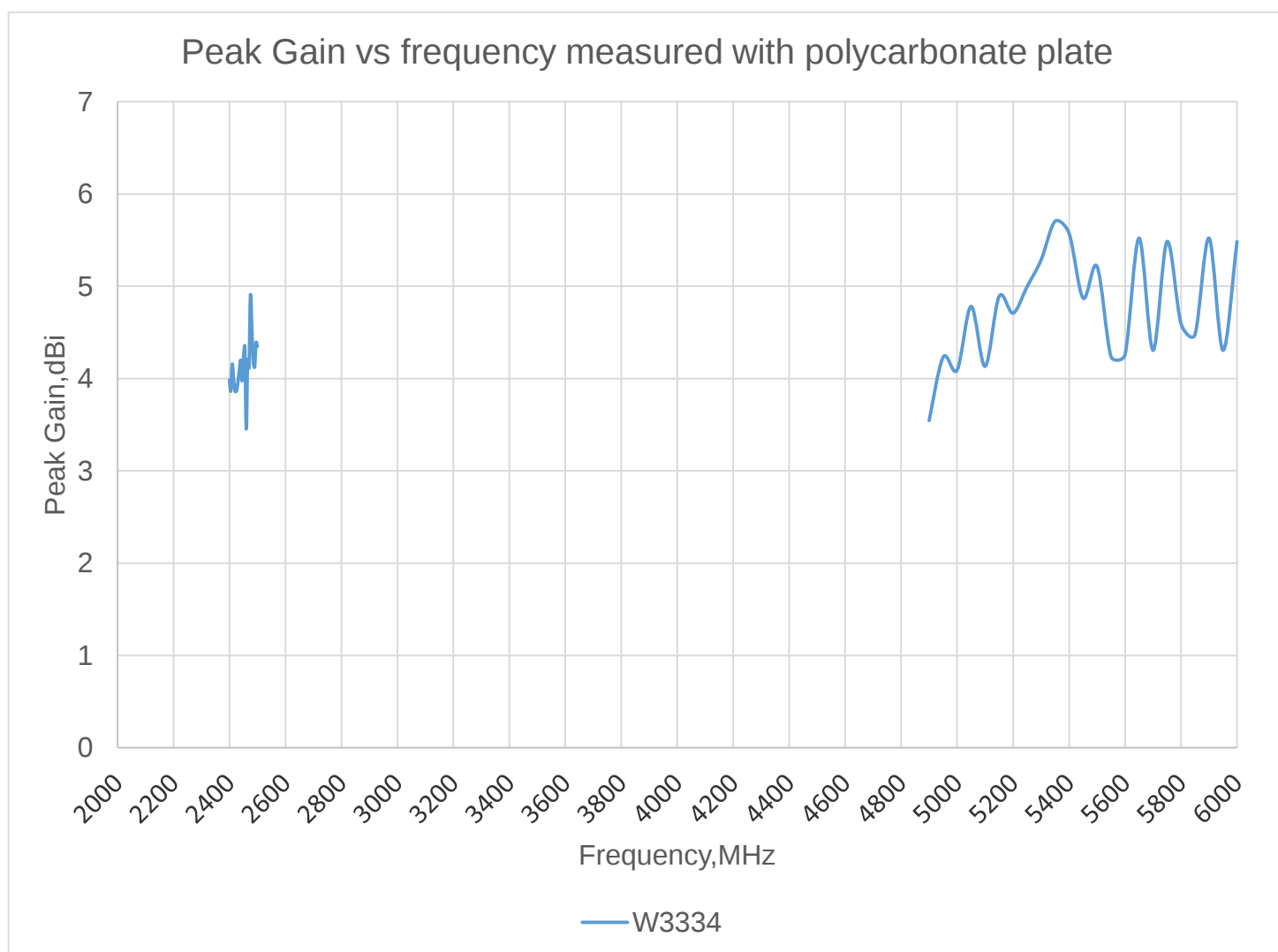
**Description: FPC Antenna 2.4/5.xGHz/DSRC**

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## CHARTS

### Peak Gain



**Note: Antenna tested on 1mm thickness PC plate with 150mm feed cable**

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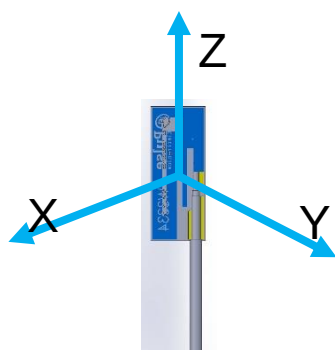
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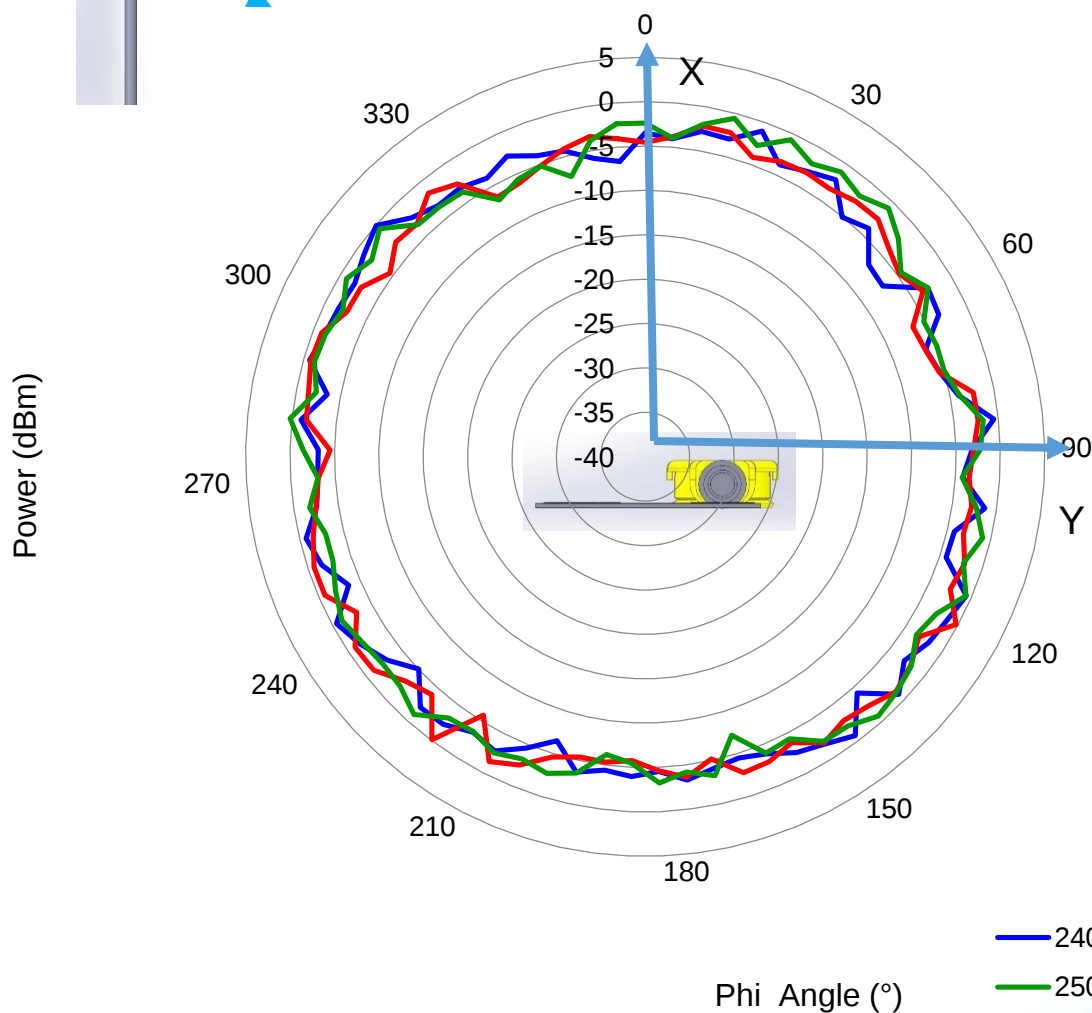
PART NUMBER: W3334XXXXXX

## CHARTS



### Gain Plots

#### XY Plane



2400MHz  
Avg (dBi) = -4.07  
Peak (dBi) = -2.05  
Avg -3 (deg) = 285

2450MHz  
Avg (dBi) = -3.89  
Peak (dBi) = -1.39  
Avg -3 (deg) = 265

2500MHz  
Avg (dBi) = -3.32  
Peak (dBi) = -1.32  
Avg -3 (deg) = 265

**Note: Antenna tested on 1mm thickness PC plate with 150mm feed cable**

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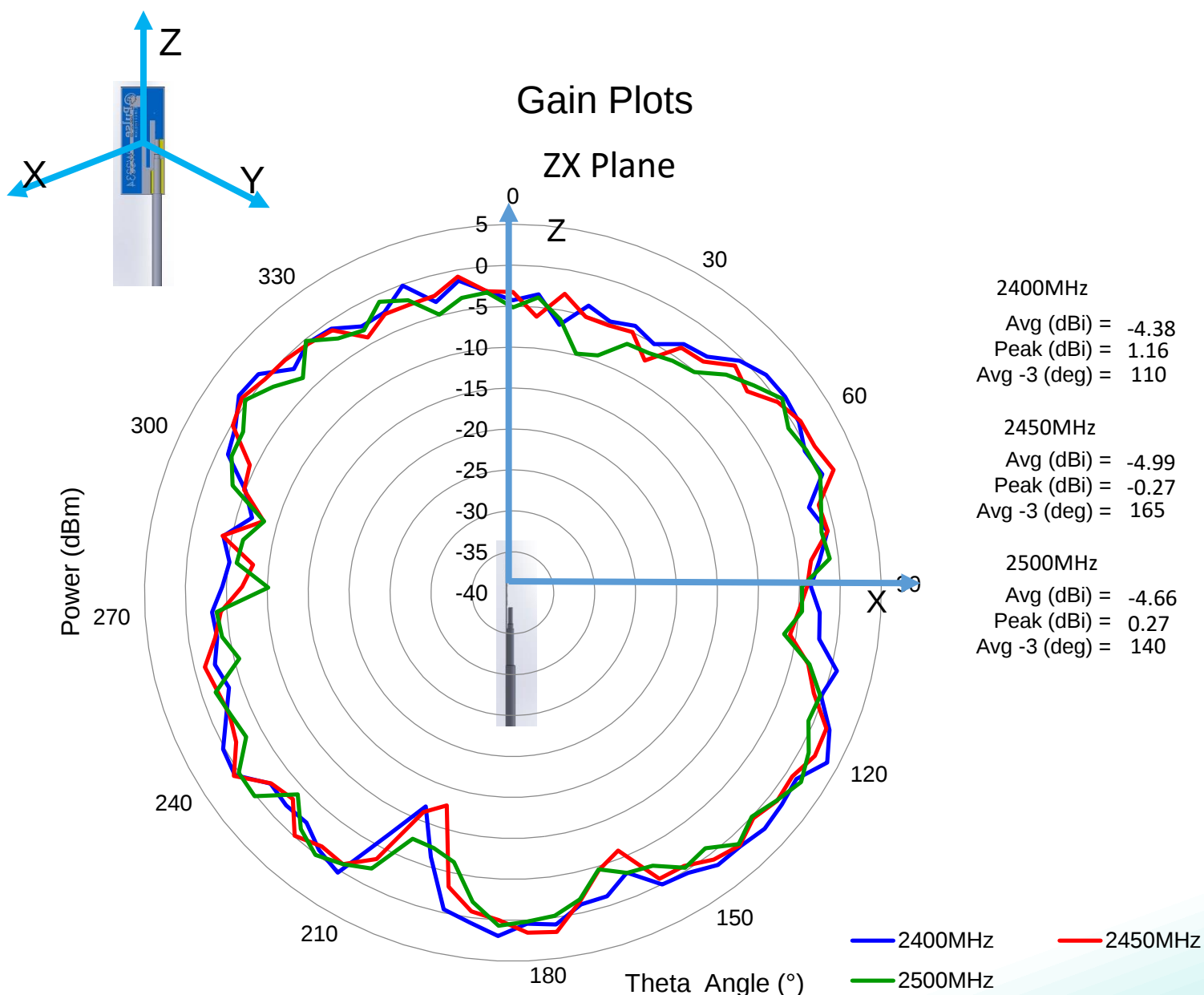
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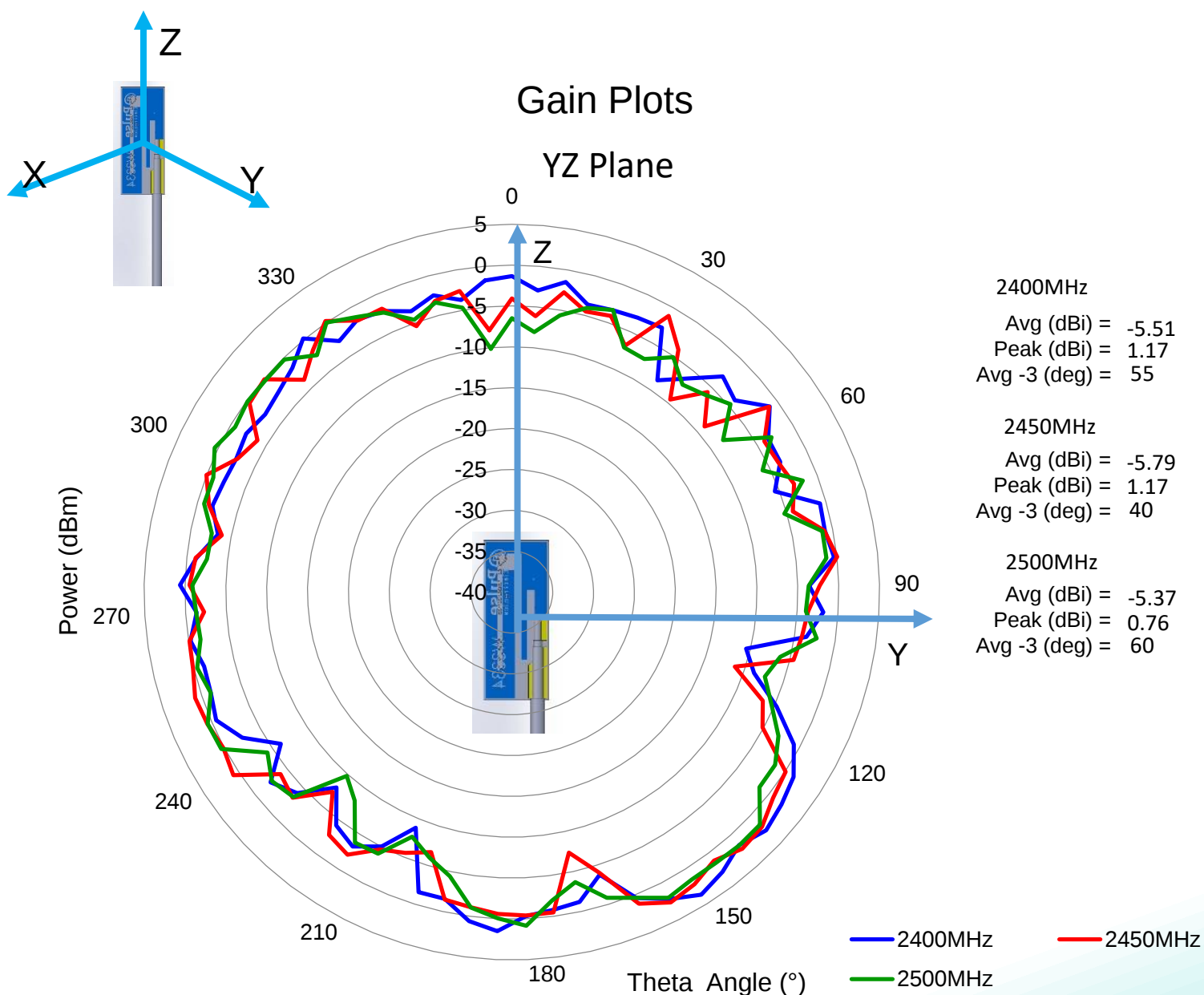
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### CHARTS



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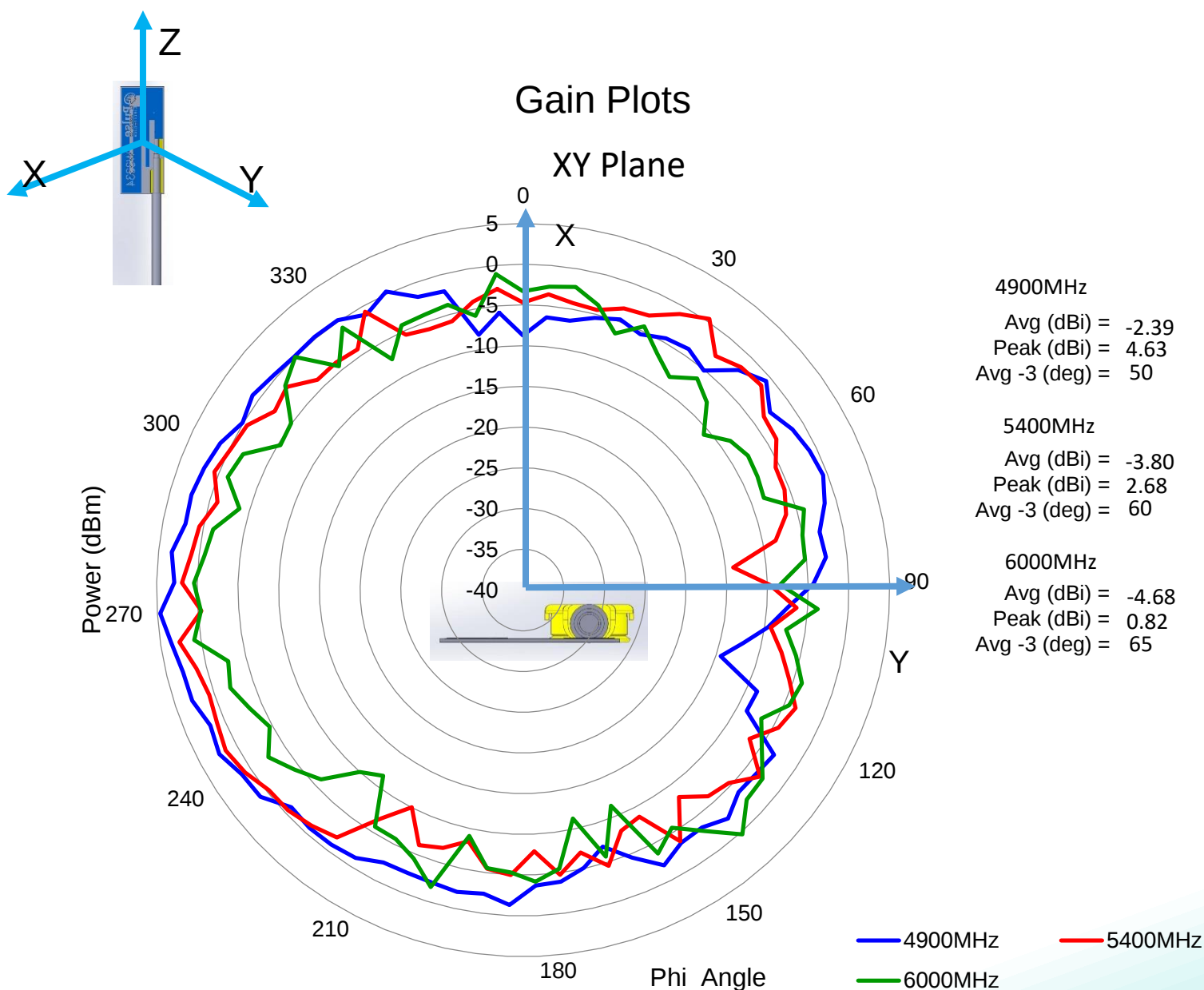
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## CHARTS



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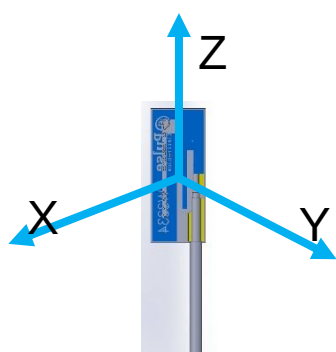
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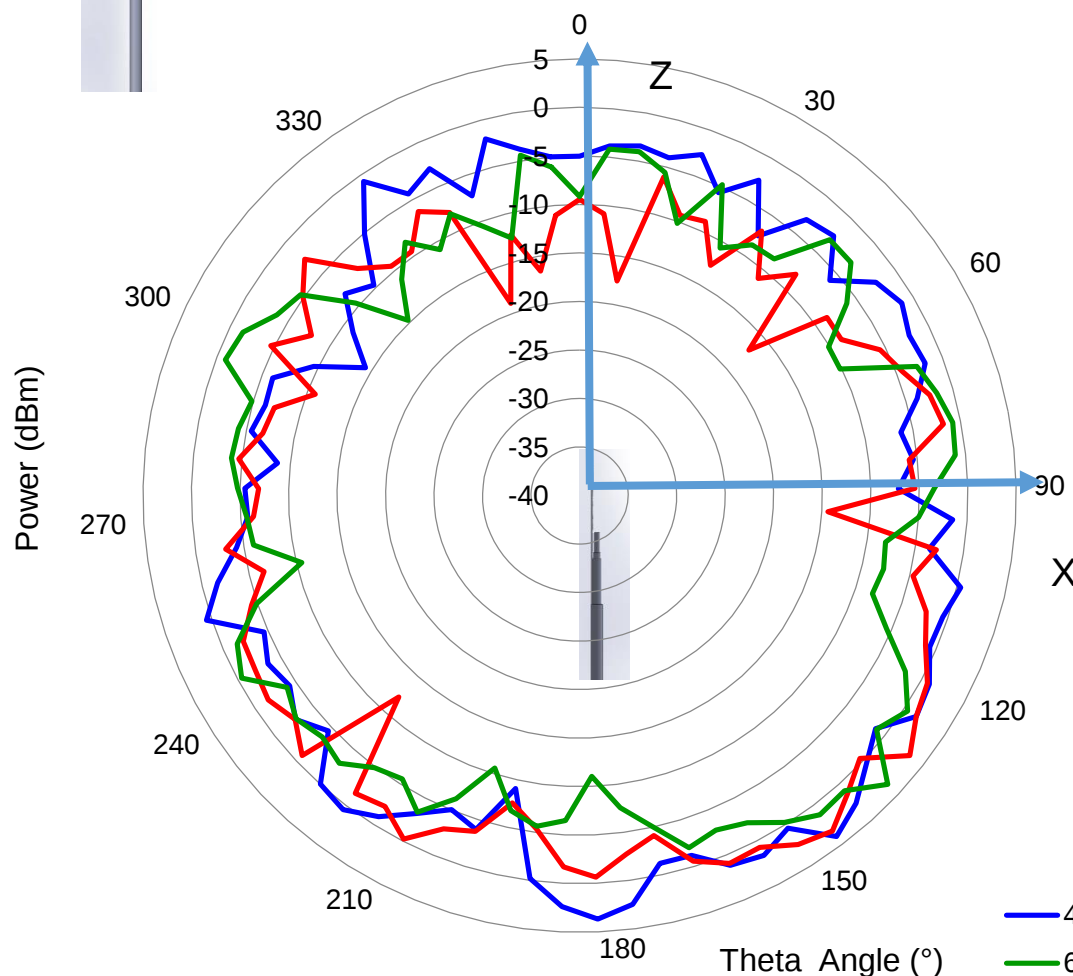
PART NUMBER: W3334XXXXX

## CHARTS



### Gain Plots

#### ZX Plane



4900MHz  
Avg (dBi) = -3.30  
Peak (dBi) = 3.99  
Avg -3 (deg) = 35

5400MHz  
Avg (dBi) = -5.52  
Peak (dBi) = 3.32  
Avg -3 (deg) = 35

6000MHz  
Avg (dBi) = -5.24  
Peak (dBi) = 3.52  
Avg -3 (deg) = 10

— 4900MHz — 5400MHz  
— 6000MHz

**Note: Antenna tested on 1mm thickness PC plate with 150mm feed cable**

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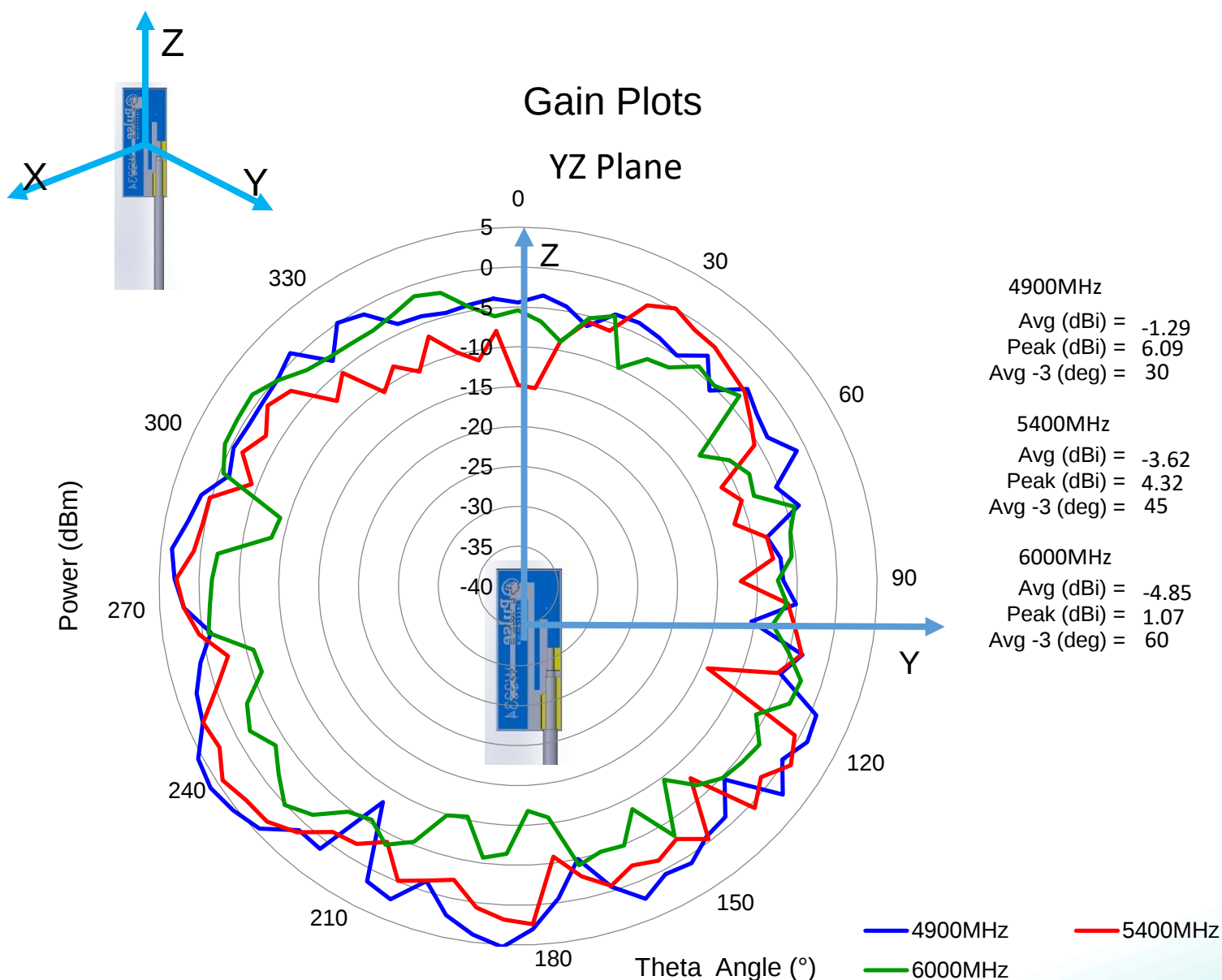
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# TAOGLAS®

# Datasheet

**Part No:**  
**FXC.16.B Series**

**Description:**

NFC Flex Antenna (Ø16\*0.3mm) with a Reverse Ferrite Layer and adhesive backing

**Features:**

13.56 MHz Antenna, Type: Flex

Reverse Ferrite Layer

Flexible Low Profile Embedded

**Dimensions:**

- Diameter: 16mm
- FXC.16.B.dg - NFC with ferrite
- FXC.16.52.0075X.B.dg - NFC with ferrite and 75mm Twisted Pair 28AWG cable with ACH(F) connector

Peel and stick 3M adhesive

RoHS & Reach Compliant

|                        |    |
|------------------------|----|
| 1. Introduction        | 3  |
| 2. Specifications      | 4  |
| 3. Antenna Application | 5  |
| 4. Mechanical Drawing  | 10 |
| 5. Packaging           | 12 |
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| Changelog              | 13 |

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## 1. Introduction



The Taoglas FXR and FXC series of high-performance NFC (Near Field Communications) antennas are ideal for IoT and mobile devices and applications such as contactless payment systems, access control or RFID systems. The compact, flexible NFC antennas are supplied with adhesive backing for quick and easy installation and can be mounted inside a plastic device enclosure or on an internal battery. For any NFC antennas attached to a battery, we offer variants with ferrite flux directors to provide isolation from the battery or other electronic components within the device. Using the antenna on a conductive surface without a ferrite layer could result in a lossy antenna and communication performance issues.

Taking into consideration the many environments that the antenna could be used in, Taoglas offers five versions of each of the FXR and FXC series models. A standard model without ferrite and adhesive backing, two models with adhesive backing and a ferrite layer, one layer facing up, one down and a third model, again with ferrite facing up or down and with an a 75mm Twisted Pair 28AWG cable with ACH(F) connector compatible with ACH(M).

Typical Applications Include:

- Mobile Devices
- Wearable Smart Devices
- Payment Terminals
- Device tracking and ID systems
- Access control

To further optimization your specific device environments and for support on how to integrate and test this antenna's performance in your device, contact your regional Taoglas Customer Services Team.

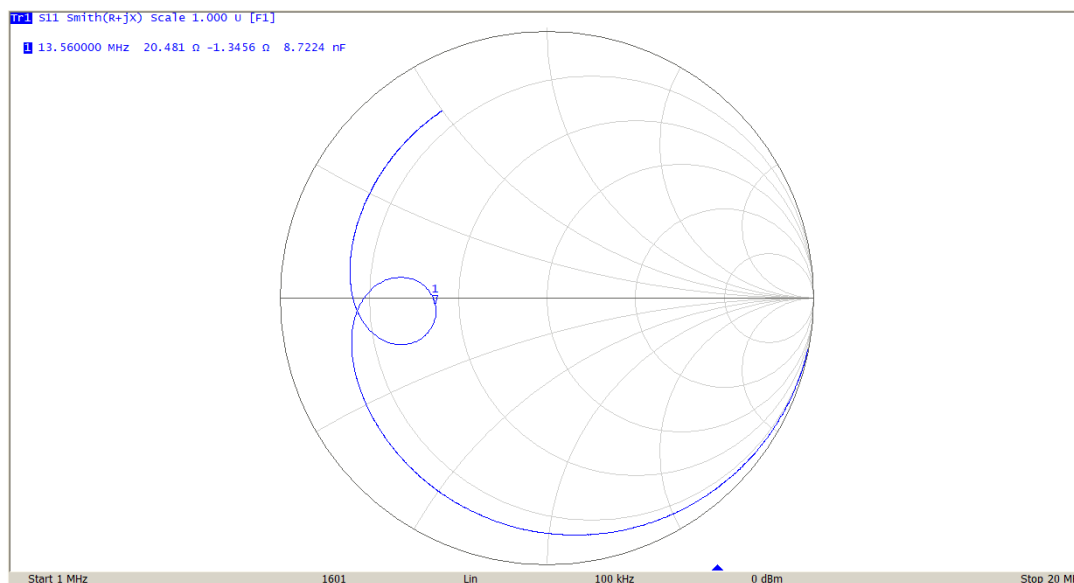
## 2. Specifications

| Electrical               |                            |                            |
|--------------------------|----------------------------|----------------------------|
| Part Number              | FXC.16.B.dg                | FXC.16.52.0075X.B.dg       |
| Frequency                | 13.56 MHz                  | 13.56 MHz                  |
| La                       | 1.03 $\mu$ H               | 1.10 $\mu$ H               |
| Rs                       | 2.83 ohm                   | 2.74 ohm                   |
| Q Factor                 | 30.89                      | 33.90                      |
| Self-Resonance Frequency | 705 MHz                    | 744 MHz                    |
| Rp                       | 96.44 kohm                 | 48.21 kohm                 |
| Mechanical               |                            |                            |
| Antenna Dimensions       | Diameter: 16mm             | Diameter: 16mm             |
| RoHS Compliant           | Yes                        | Yes                        |
| Adhesive                 | 3M467 or 3M9460            | 3M467 or 3M9460            |
| Connector                | n/a                        | ACH(F)                     |
| Cable                    | n/a                        | Twisted Pair 28AWG - PVC   |
| Weight                   | 2.5 g                      | 4 g                        |
| Environmental            |                            |                            |
| Operation Temperature    | -40°C to 85°C              | -40°C to 85°C              |
| Storage Temperature      | -40°C to 85°C              | -40°C to 85°C              |
| Humidity                 | Non-condensing 65°C 95% RH | Non-condensing 65°C 95% RH |

\* Contact pads are gold plated copper. Base material is polyimide which can take heat from soldering for brief periods suitable for attaching wires. Additional wire length will affect read range and result in different performance than that detailed in this document.

### 3.3 Matching

The interrogation distances presented here were taken with the antenna connected directly to the evaluation boards with the optimized matching circuit. For the NXP PN7160 chipset, it is suggested using 20ohm impedance of the NFC antenna. Just like below:



As with any matching network the exact circuit and values for an optimal network depend on the combination of antenna, NFC circuit, any intervening transmission line and the environment presented to the antenna. These factors are specific to the particular end product.

As a starting point, to achieve the read range results presented here, use the matching network detailed in the schematic of the evaluation board for your particular NFC chip and keep the antenna free of any obstruction. Once you can demonstrate successful reads you can then optimize performance as desired.

### 3.4 Read/Write & Card emulation mode

The NFC forum card type 1~5 were used to measure the interrogation distances in Read/write mode. The POS machine ACR122, T6-14443 T6-15693 were used to measure the interrogation distances in Card emulation mode. The results are in the next tables:

| Device                  | Interrogation Distance(mm) |                      |
|-------------------------|----------------------------|----------------------|
|                         | FXC.16.B.dg                | FXC.16.52.0075X.B.dg |
| Topaz512 (Type 1)       | 14                         | 12                   |
| NTAG203 (Type 2)        | 12                         | 10                   |
| Sony Felica (Type 3)    | 10                         | 7                    |
| Mifare DESFire (Type 4) | 2                          | 1                    |
| ISO 15693 (Type 5)      | 36                         | 32                   |
| ACR122                  | 36                         | 30                   |
| T6-14443                | 17                         | 13                   |
| T6-15693                | 31                         | 26                   |

Changelog for the datasheet

SPE-24-8-100 – FXC.16.B Series

| Revision: B (Current Version) |                                                |
|-------------------------------|------------------------------------------------|
| Date:                         | 2024-11-14                                     |
| Notes:                        | Added the application notes to datasheet intro |
| Author:                       | Conor McGrath                                  |

Previous Revisions

| Revision: A (Original First Release) |             |
|--------------------------------------|-------------|
| Date:                                | 2024-06-12  |
| Notes:                               |             |
| Author:                              | Cesar Sousa |

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