Pulse | LARSEN Antennas
A YAGEO Company

TECHNICAL DATA SHEET

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

RoHS COMPLIANT

For more information:

Pulse Worldwide Headquarters
15255 Innovation Drive #100
San Diego, CA 92128
USA
Tel:1-858-674-8100

Pulse/Larsen Antennas
18110 SE 34th St Bldg 2 Suite 250
Vancouver, WA 98683
USA
Tel: 1-360-944-7551

Europe Headquarters
Pulse GmbH & Do, KG
Zeppelinstrasse 15
Herrenberg, Germany
Tel: 49 7032 7806 0

Pulse (Suzhou) Wireless Products Co, Inc.
99 Huo Ju Road(#29 Bldg,4th Phase
Suzhou New District
Jiangsu Province, Suzhou 215009 PR China
Tel: 86 512 6807 9998

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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

Issue: 1922

RoHS COMPLIANT

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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

RoHS COMPLIANT

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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

Description: FPC Antenna 2.4/5.xGHz/DSRC

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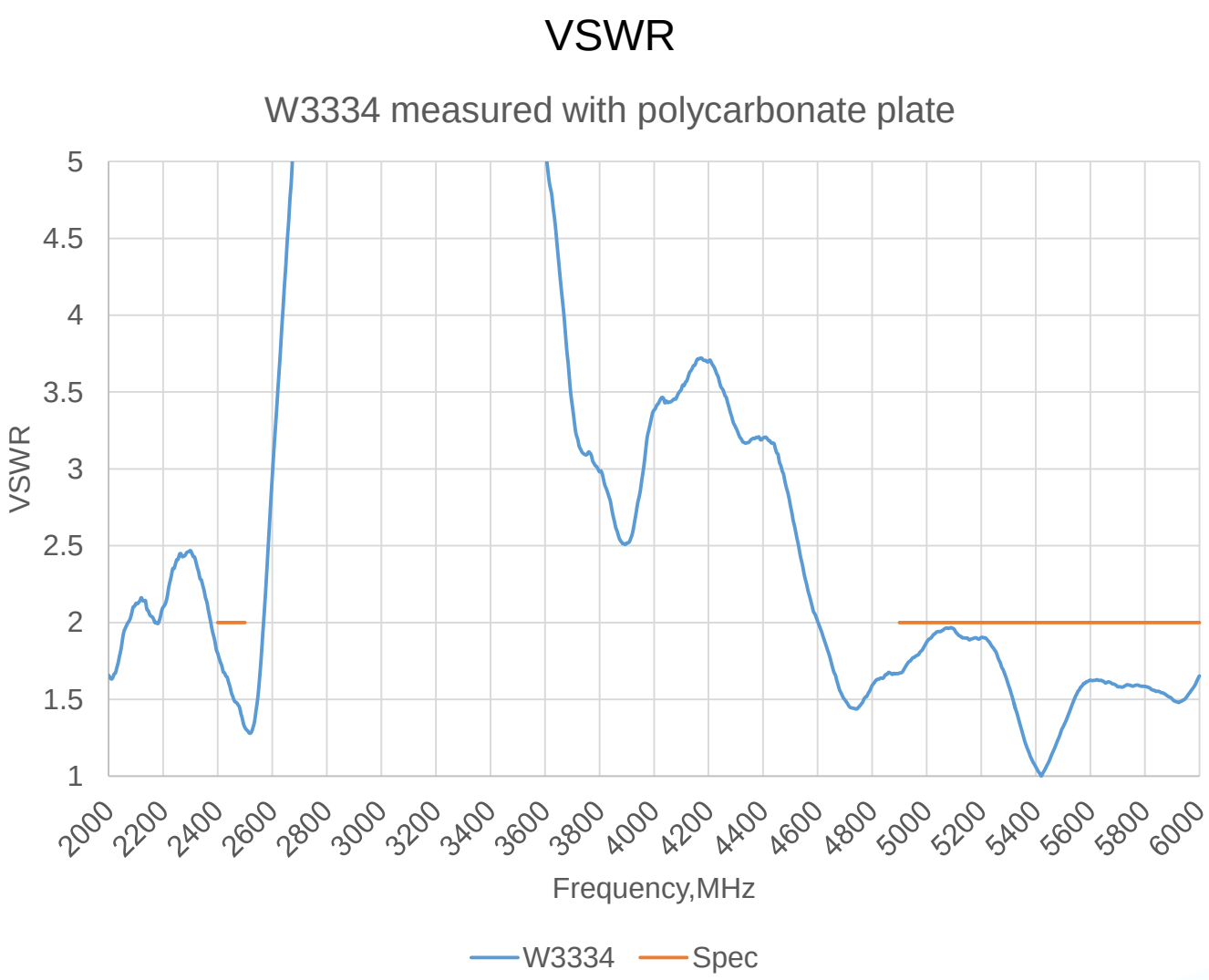
CHARTS



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

RoHS COMPLIANT

Description: FPC Antenna 2.4/5.xGHz/DSRC

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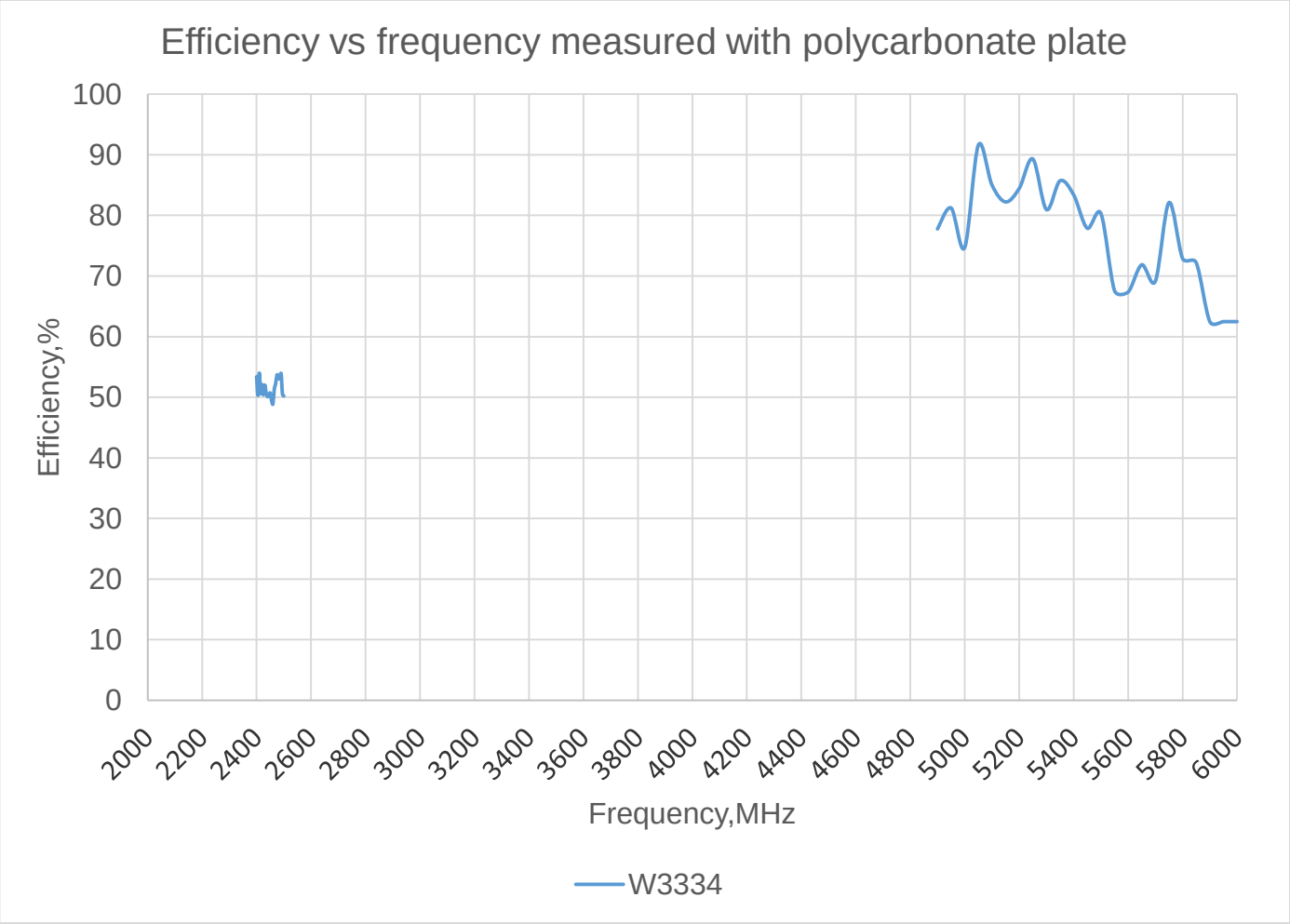
PART NUMBER: W3334XXXXX

CHARTS

Efficiency



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RoHS COMPLIANT

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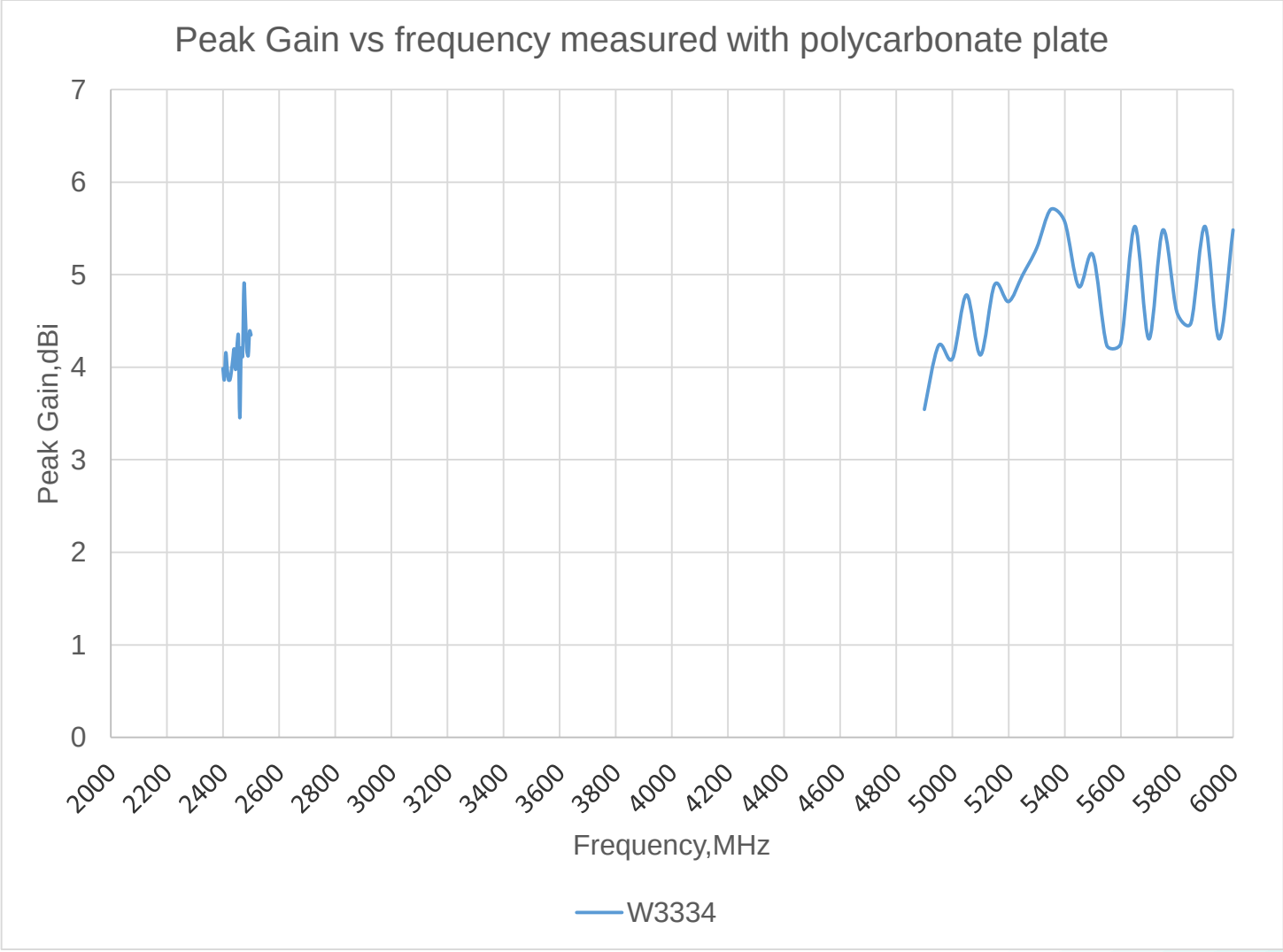
CHARTS

Peak Gain



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

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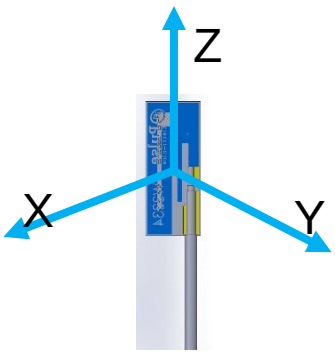
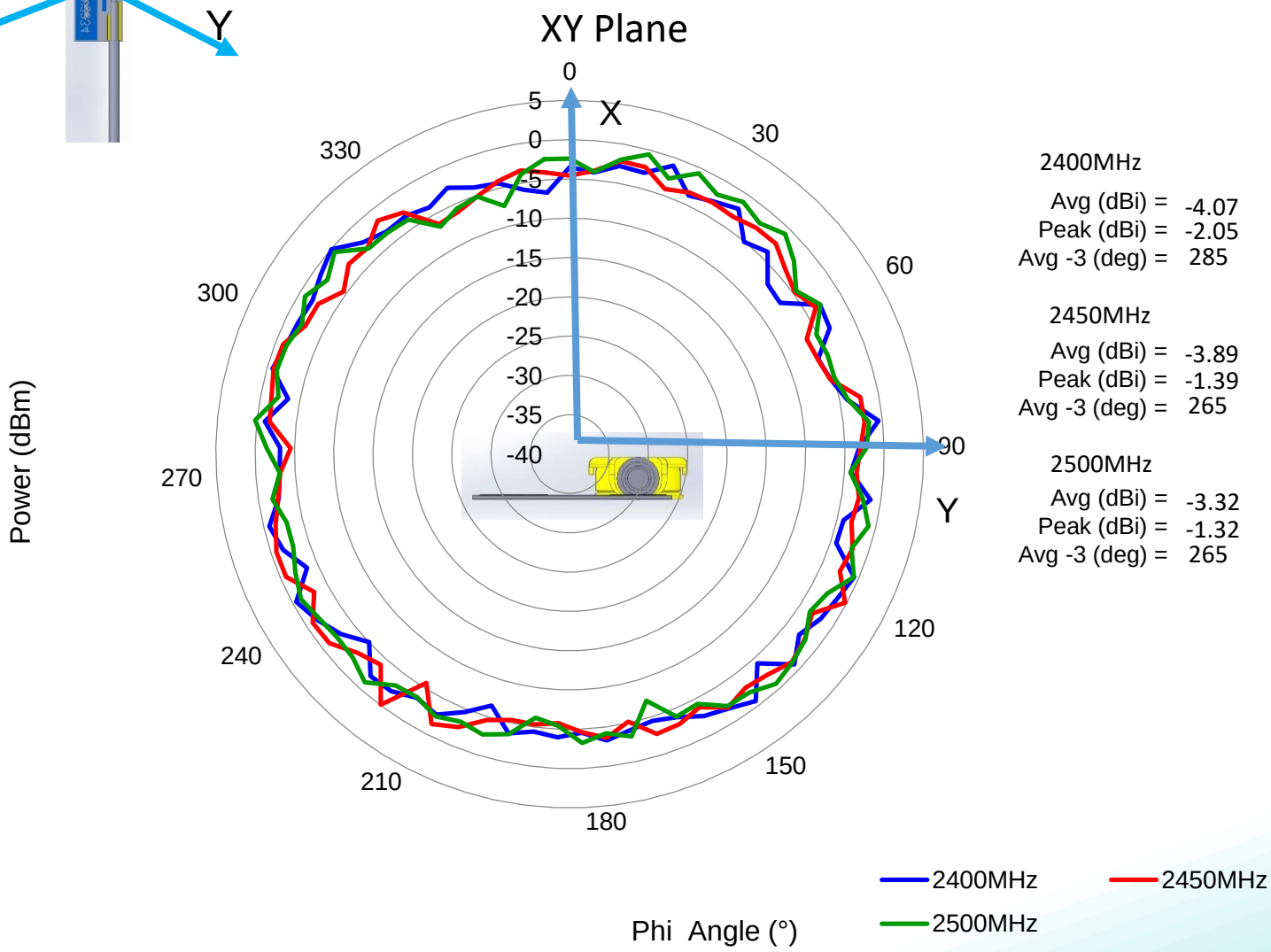


Gain Plots



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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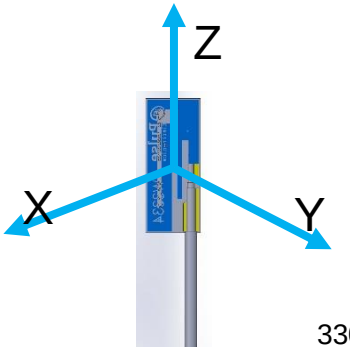
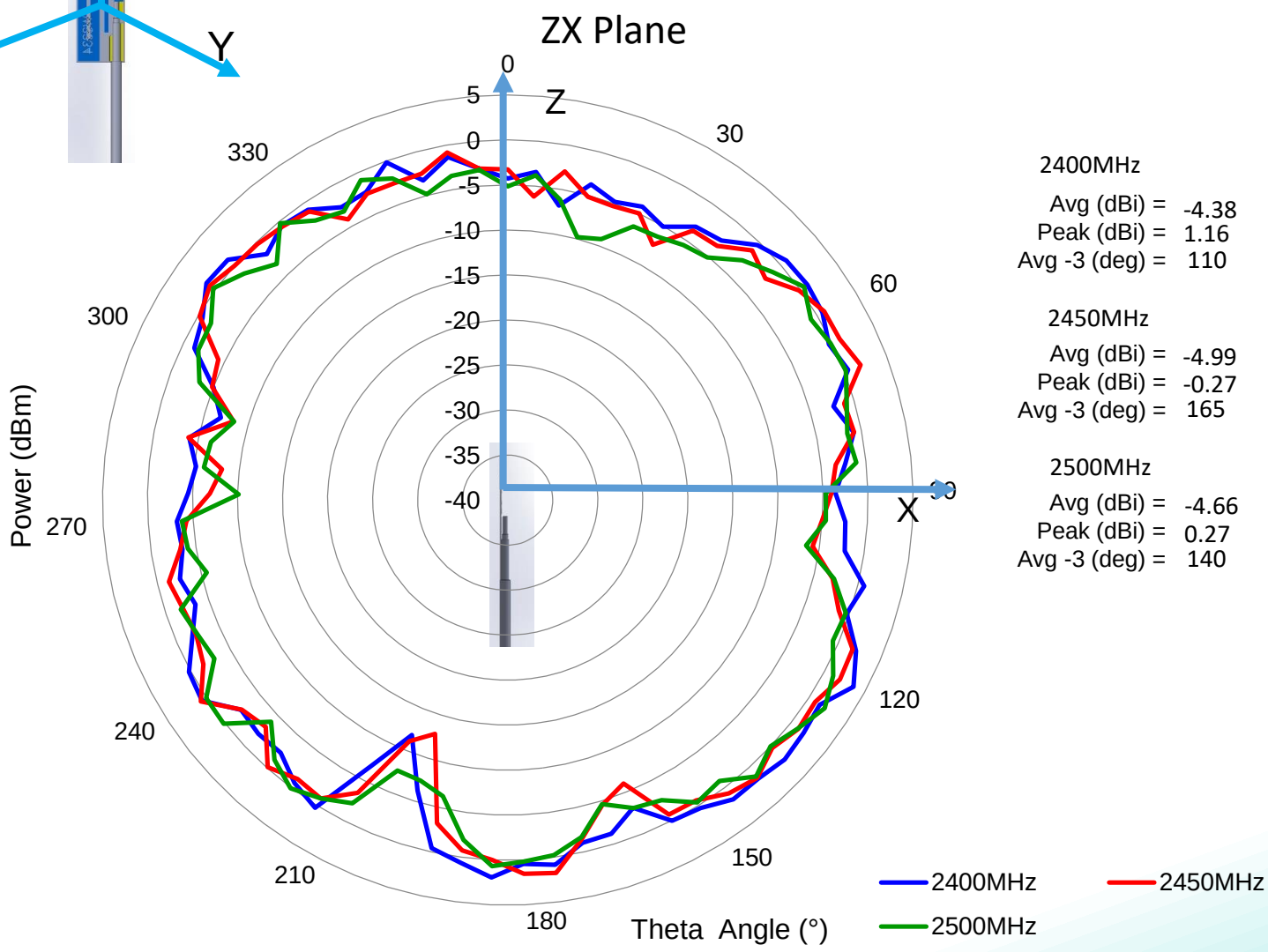


Gain Plots



2400MHz

Avg (dBi) =	-4.38
Peak (dBi) =	1.16
Avg -3 (deg) =	110

2450MHz

Avg (dBi) =	-4.99
Peak (dBi) =	-0.27
Avg -3 (deg) =	165

2500MHz

Avg (dBi) =	-4.66
Peak (dBi) =	0.27
Avg -3 (deg) =	140

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

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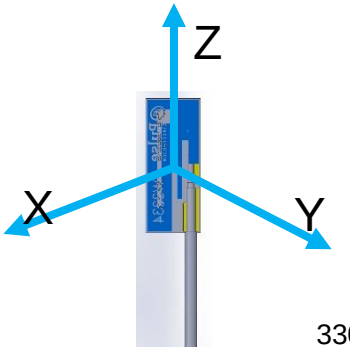
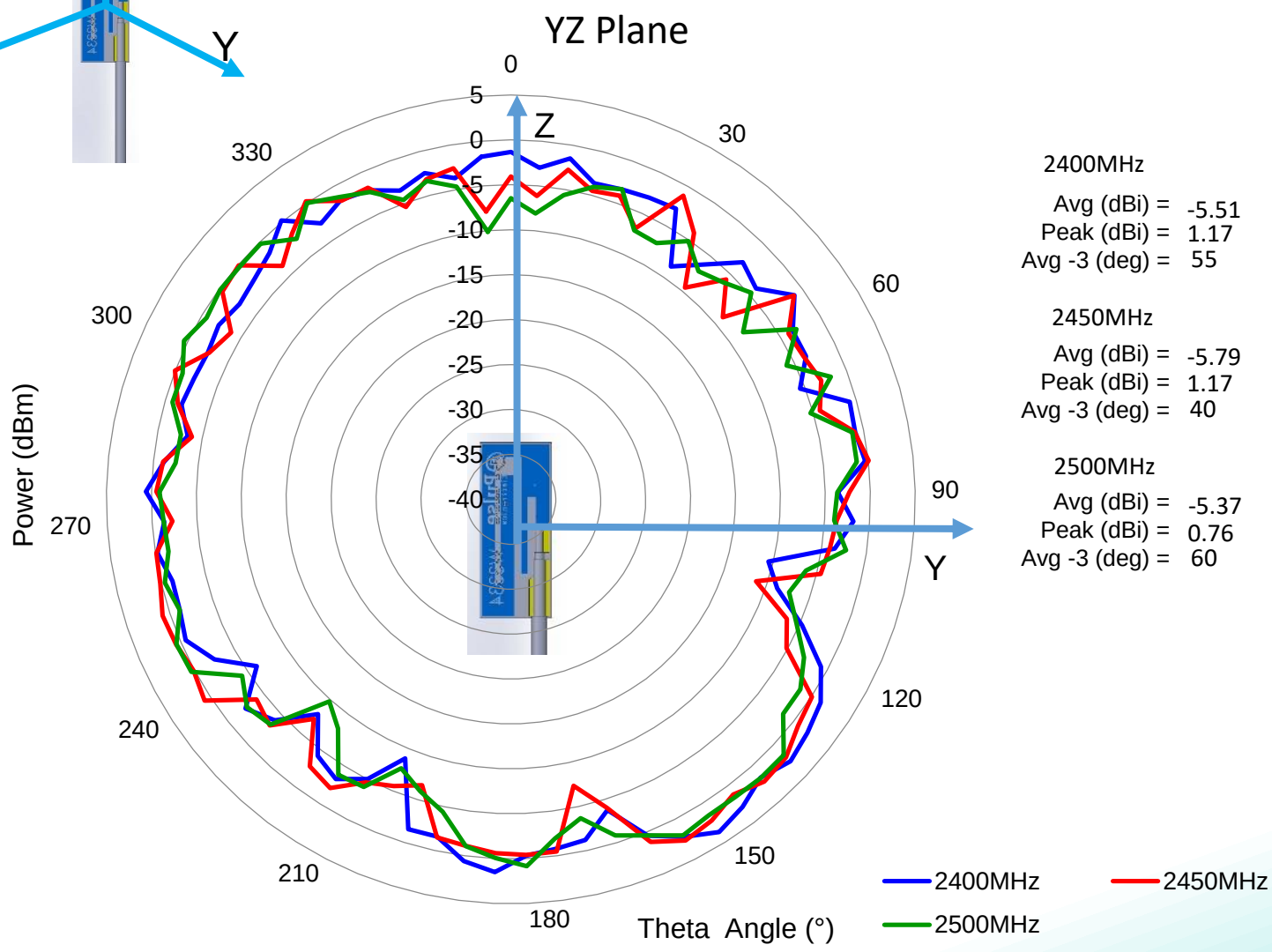


Gain Plots



2400MHz

Avg (dBi) =	-5.51
Peak (dBi) =	1.17
Avg -3 (deg) =	55

2450MHz

Avg (dBi) =	-5.79
Peak (dBi) =	1.17
Avg -3 (deg) =	40

2500MHz

Avg (dBi) =	-5.37
Peak (dBi) =	0.76
Avg -3 (deg) =	60

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

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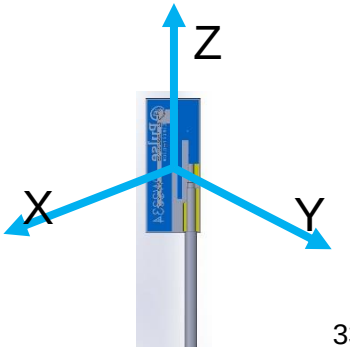
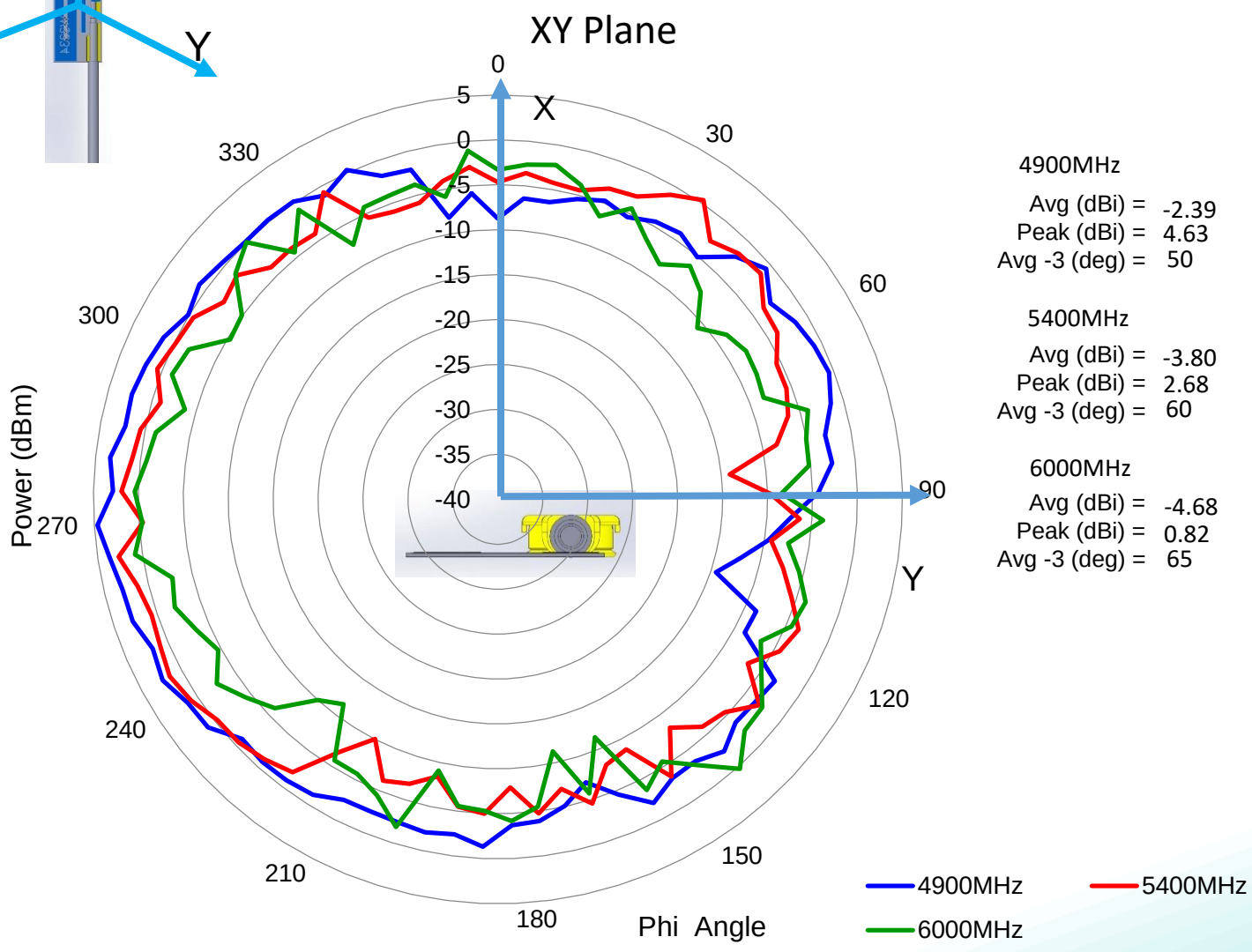


Gain Plots



4900MHz

Avg (dBi) =	-2.39
Peak (dBi) =	4.63
Avg -3 (deg) =	50

5400MHz

Avg (dBi) =	-3.80
Peak (dBi) =	2.68
Avg -3 (deg) =	60

6000MHz

Avg (dBi) =	-4.68
Peak (dBi) =	0.82
Avg -3 (deg) =	65

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

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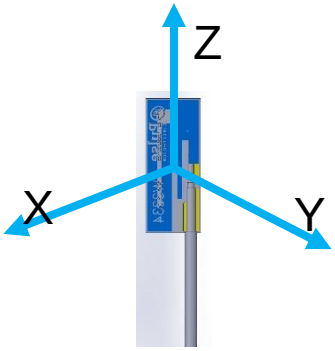
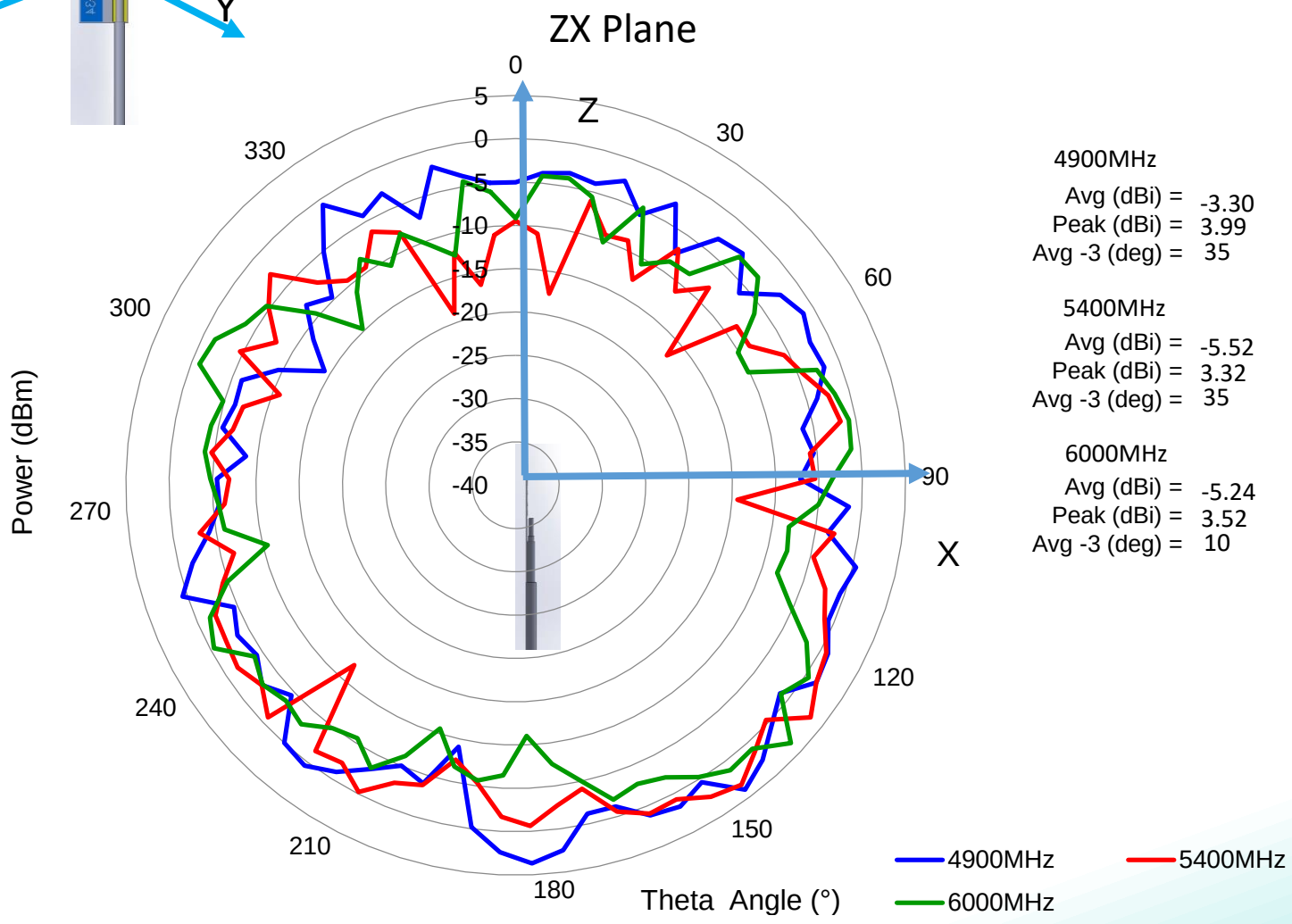


Gain Plots



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

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

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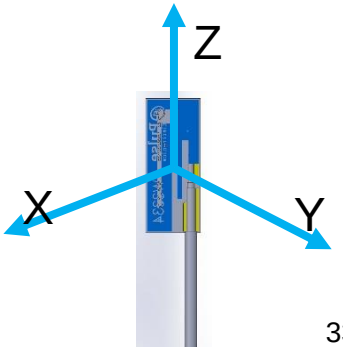
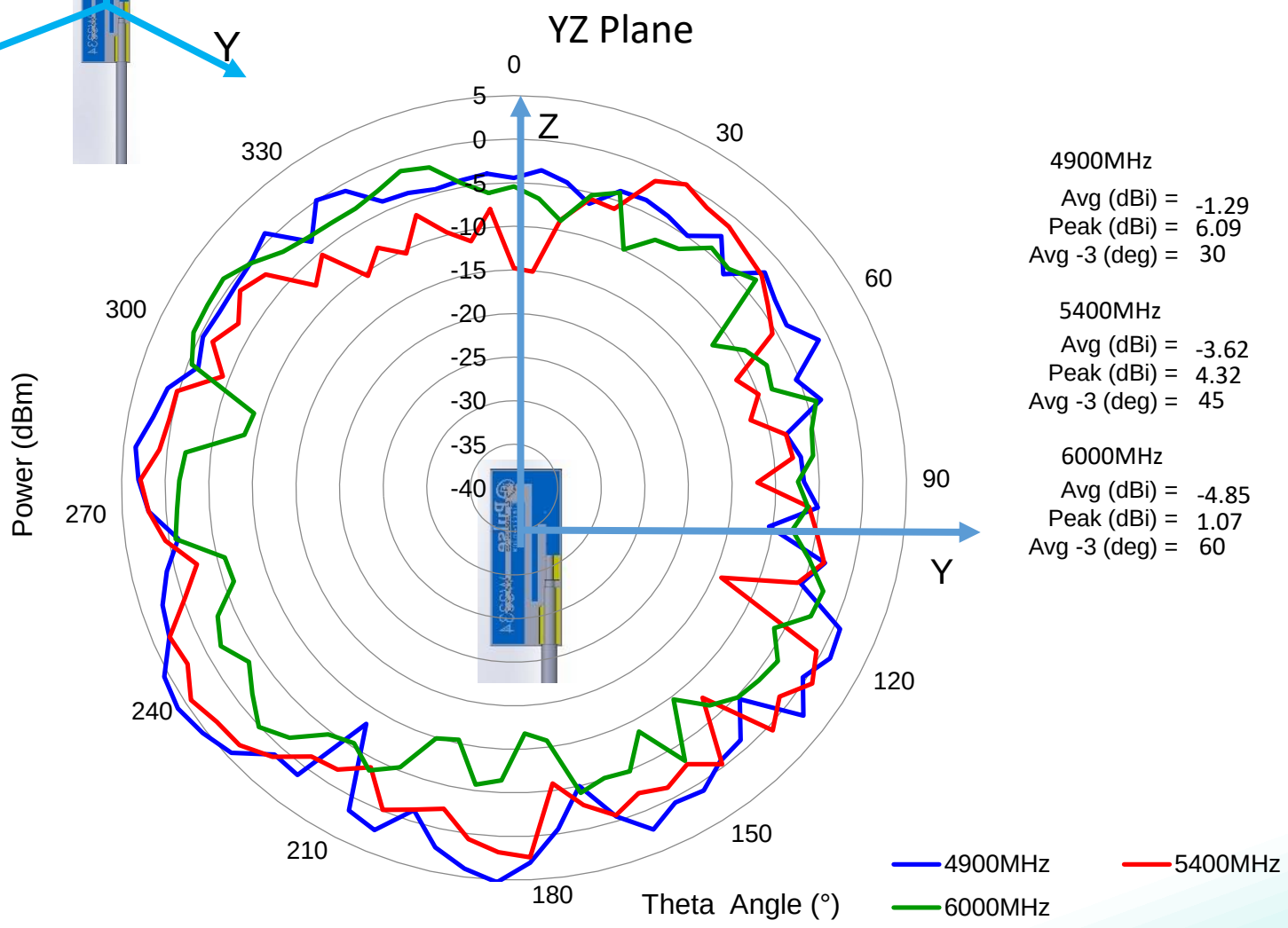


Gain Plots



4900MHz

Avg (dBi) =	-1.29
Peak (dBi) =	6.09
Avg -3 (deg) =	30

5400MHz

Avg (dBi) =	-3.62
Peak (dBi) =	4.32
Avg -3 (deg) =	45

6000MHz

Avg (dBi) =	-4.85
Peak (dBi) =	1.07
Avg -3 (deg) =	60

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

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

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.

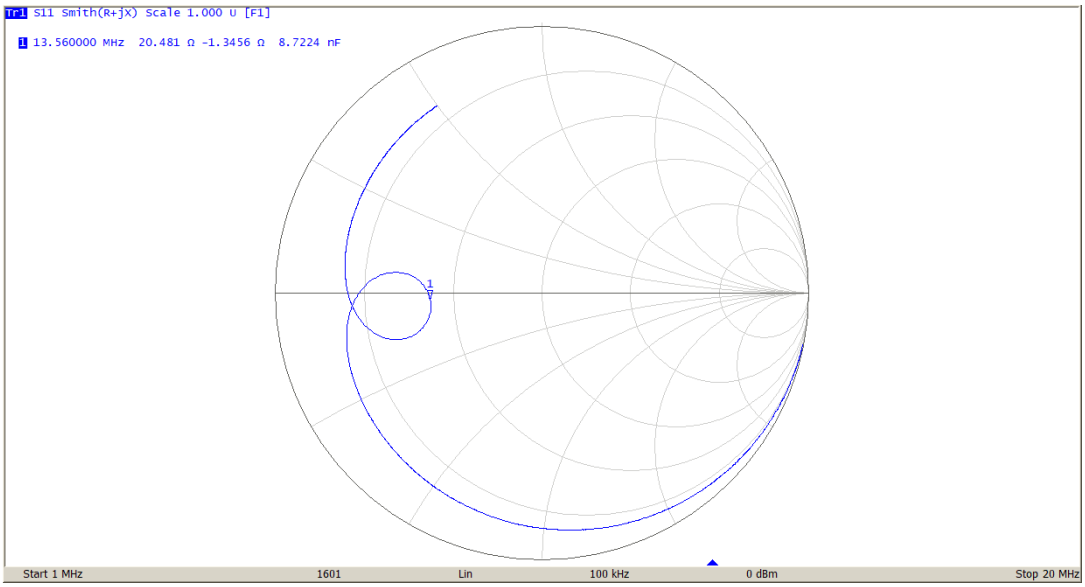
2. Specifications

Electrical		
Part Number	**FXC.16.B.dg**	**FXC.16.52.0075X.B.dg**
Frequency	13.56 MHz	13.56 MHz
La	1.03 µH	1.10 µH
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 optimzed matching circuit. For the NXP PN7160 chipset, it is suggested using 20ohm impendence 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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