Datasheet

Hercules Wi-Fi® 6 Permanent Mount Antenna

Part No:
WS.03.B.305151

Description:

Hercules – Low Profile Wi-Fi® 6 Permanent Mount Antenna

Covering Frequencies 2.4 – 2.5 / 5.1 - 5.8 / 5.9 - 7.125GHz

Features:

Low Profile Permanent Mount Antenna

Covers 2.4/5.8GHz as well as Wi-Fi® 6 Frequencies: 5.9-7.125GHz

UV and Vandal Resistant ABS Housing

IP65 Rated Enclosure

Dimensions: Ø49 x 29mm

Connector: RP-SMA Male

Cable: 3m of TGC-200

RoHS & Reach Compliant

1. Introduction

The Hercules WS.03 is a high efficiency, high gain permanent mount antenna designed to cover all Wi-Fi® bands including frequencies for Wi-Fi® 6, up to 7.125GHz. It has omni-directional gain across both bands ensures constant reception and transmission making the WS.03 an ideal solution for varied Wi-Fi® applications.

At only 29mm high, with a diameter of 49mm, the Hercules has been designed as a covert solution, for use in the most challenging of environments. With a durable UV-resistant ASA housing that is IP65 rated, the WS.03 is resistant to vandalism and is supplied with a heavy-duty thread for secure mounting.

Typical Applications Include:

- Remote Monitoring
- Gateways and Routers
- HD Video Streaming
- Smart Cities

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.

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

2. Specifications

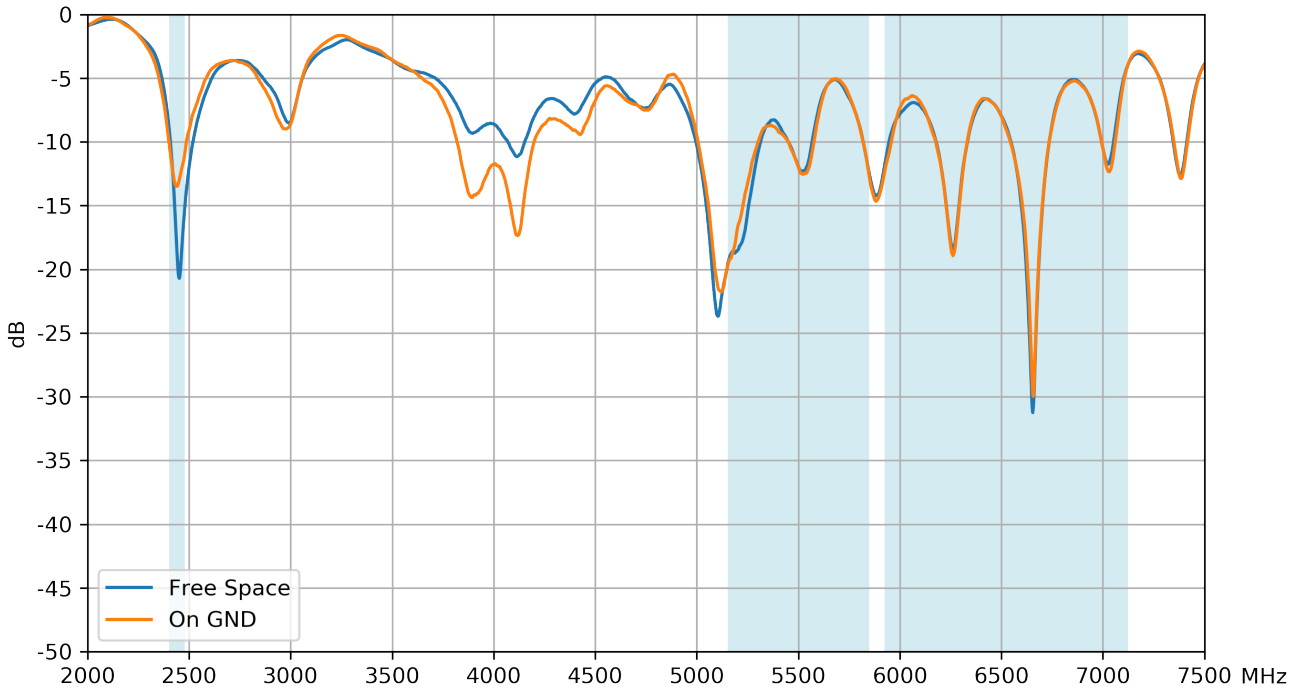
Wi-Fi Electrical									
Band	**Frequency (MHz)**		**Efficiency (%)**	**Average Gain (dB)**	**Peak Gain (dBi)**	**Impedance**	**Polarization**	**Radiation Pattern**	**Max Input Power**
2.4GHz Wi-Fi	2400~2500	Free space	57.9	-2.37	4.85	50 Ω	Linear	Omni-Directional	10W
		30x30cm Ground Plane	58.2	-2.35	3.25				
5.8GHz Wi-Fi	5150~5850	Free space	42.2	-3.74	5.25				
		30x30cm Ground Plane	43.8	-3.59	5.46				
7.1GHz Wi-Fi 6	5925~7125	Free Space	72.5	-2.19	6.00				
		Ground Plane	69.7	-2.07	8.23				

*Tested on a 30x30cm Ground Plane & In Free Space.

Mechanical	
Height	29 mm
Planner Dimension	49 mm
Casing	ASA
Cable	3000mm of TGC-200
Connector	Reverse Polarity SMA Male
Base and Thread	Zinc Alloy
Thread Diameter	M18
Sealant	Silicon Rubber
Weight	130g
Recommended Mounting Torque	24.5N·m
Maximum Mounting Torque	29.4N·m
Environmental	
Temperature Range	-40°C to 85°C
Humidity Level	Non-condensing 65°C 95% RH
Ingress Protection	IP65

3. Antenna Characteristics

3.1 Return Loss



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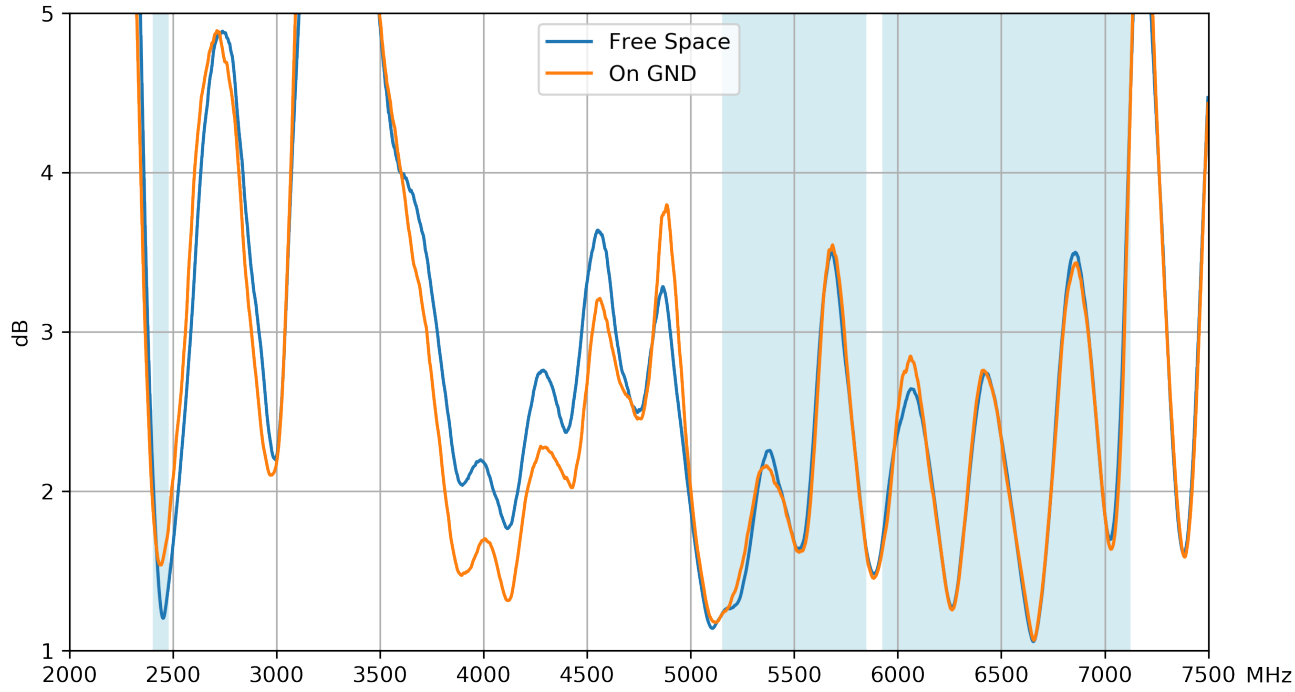
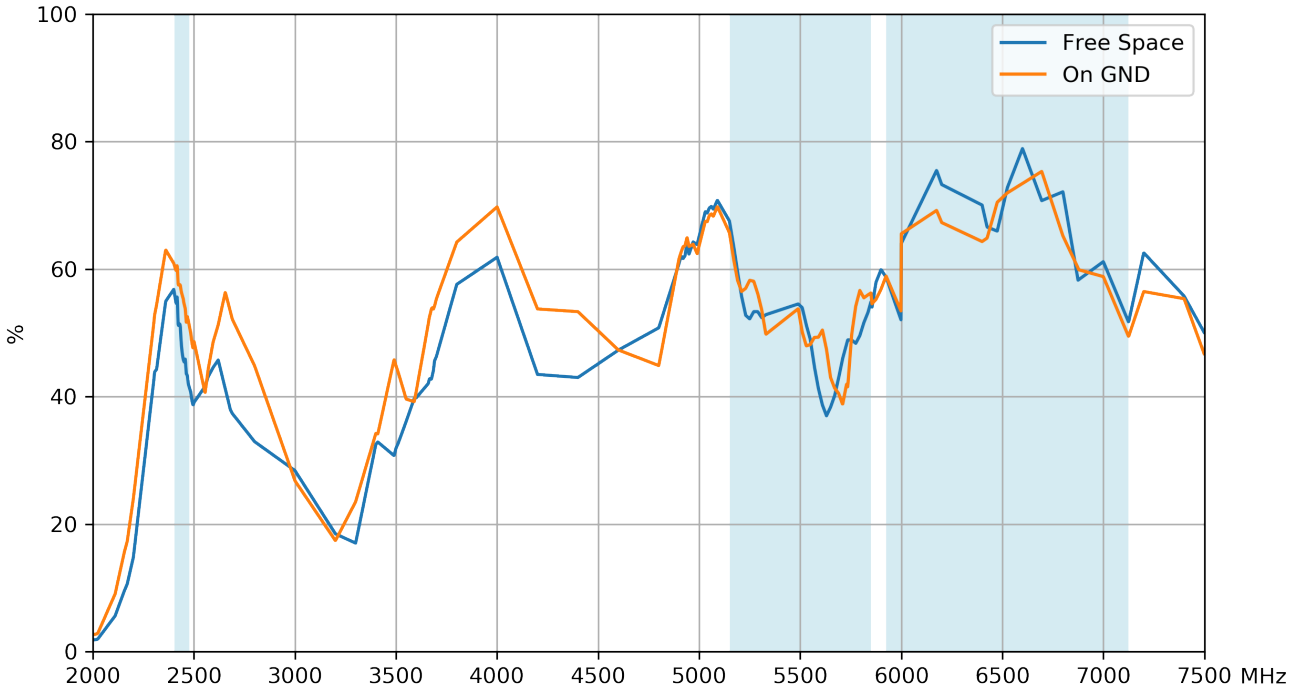
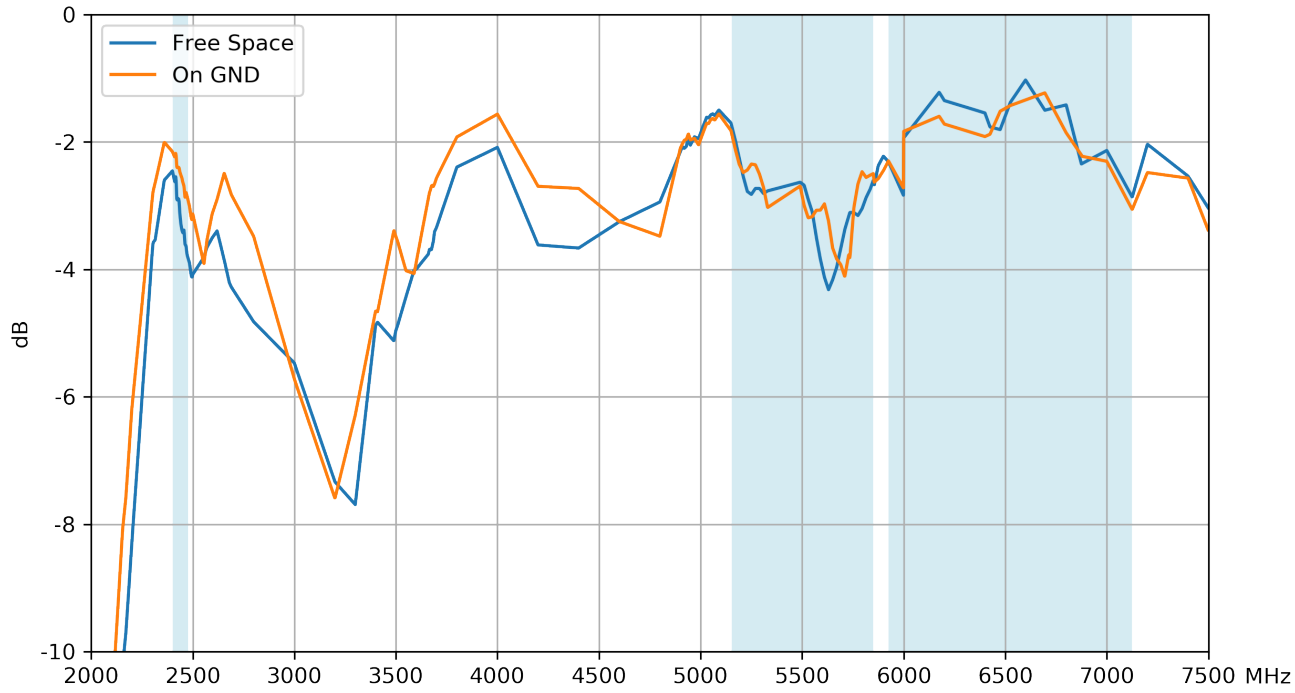


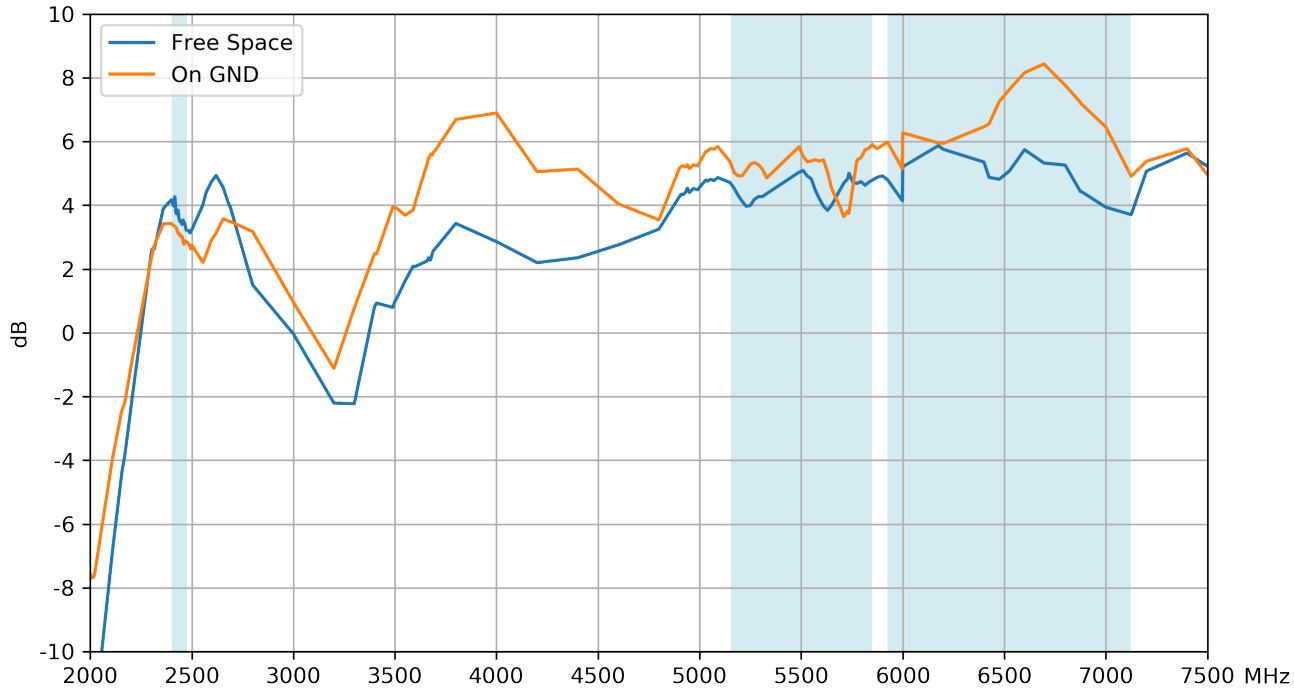
3.3 Efficiency



3.4 Average Gain

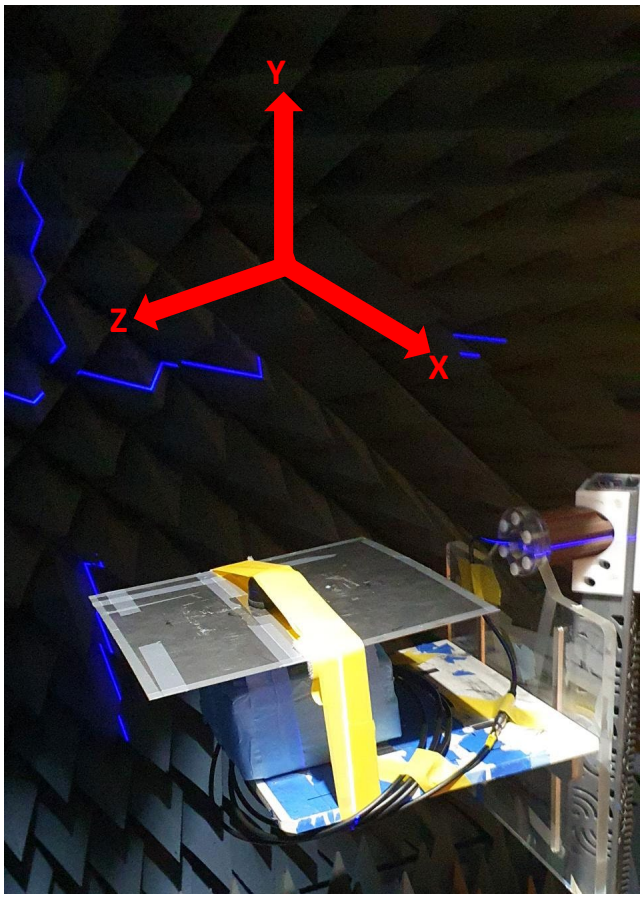


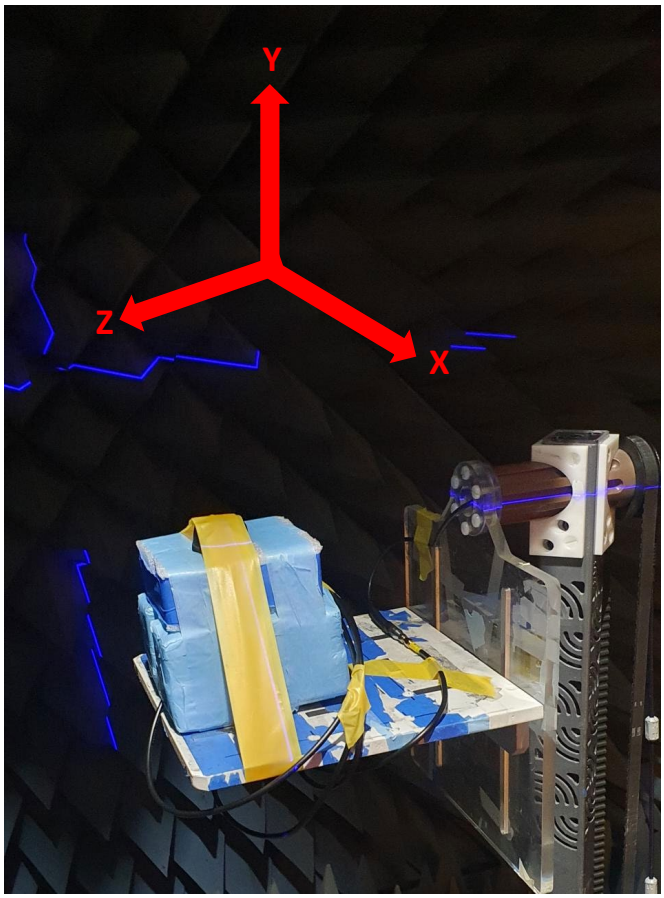
3.5 Peak Gain


Free Space
On GND
dB
10
8
6
4
2
0
-2
-4
-6
-8
-10
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500 MHz

4. Radiation Patterns

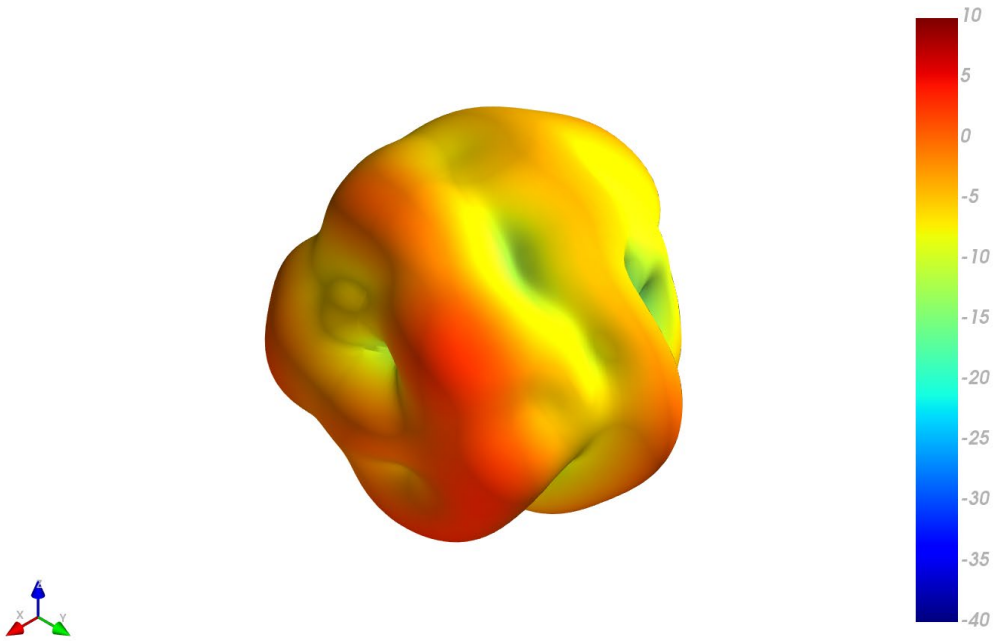
4.1 Test Setups

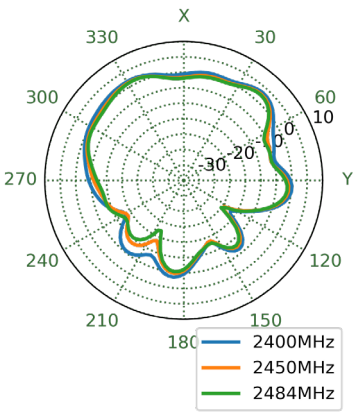
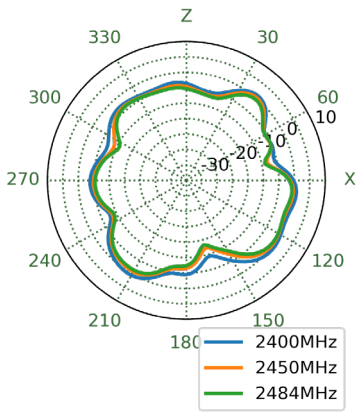
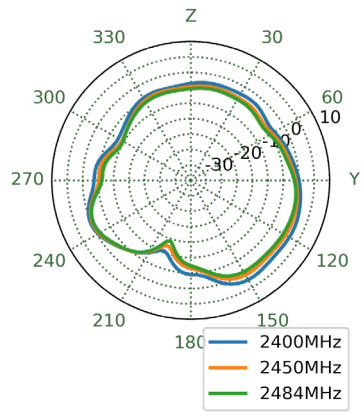




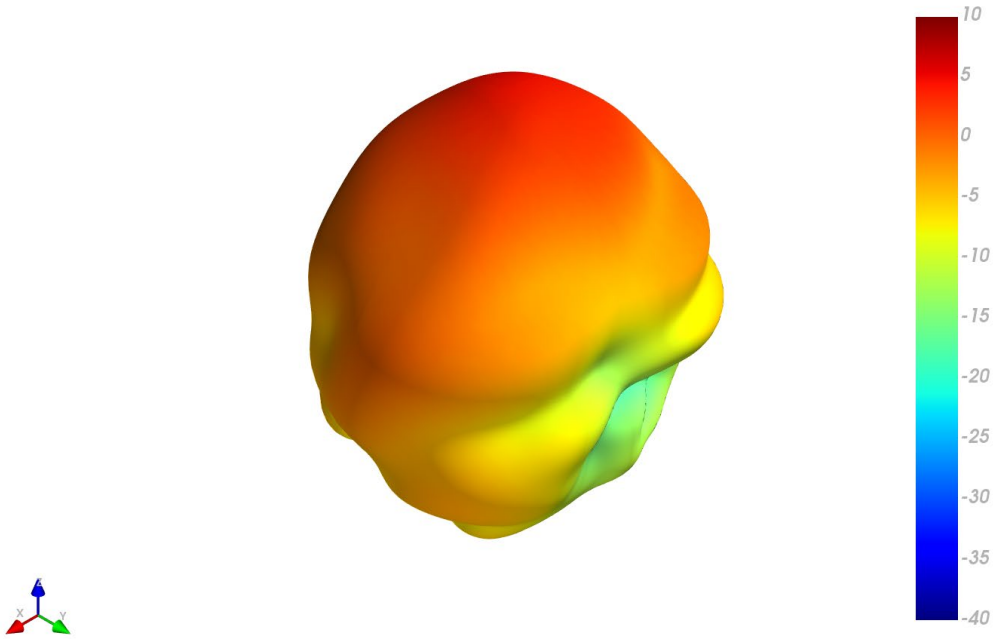
4.2 Free Space 3D and 2D Radiation Patterns

2450MHz

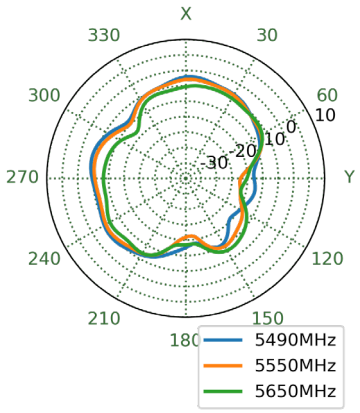


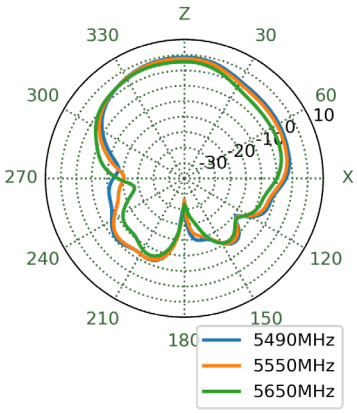
XY Plane	XZ Plane	YZ Plane
		

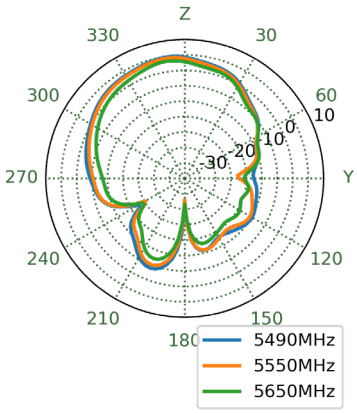
5550MHz



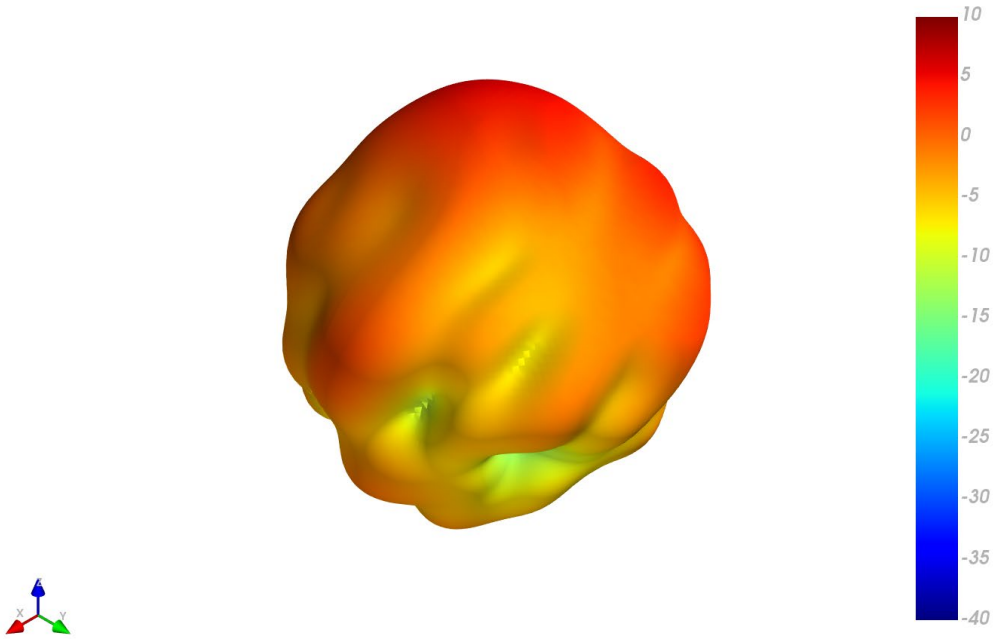
XY Plane	XZ Plane	YZ Plane



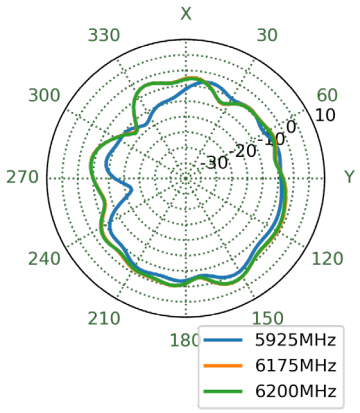


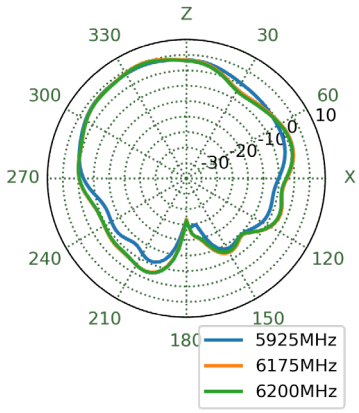


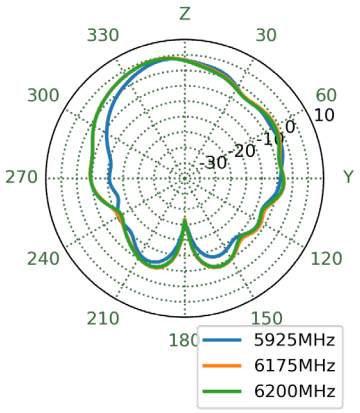
6175MHz



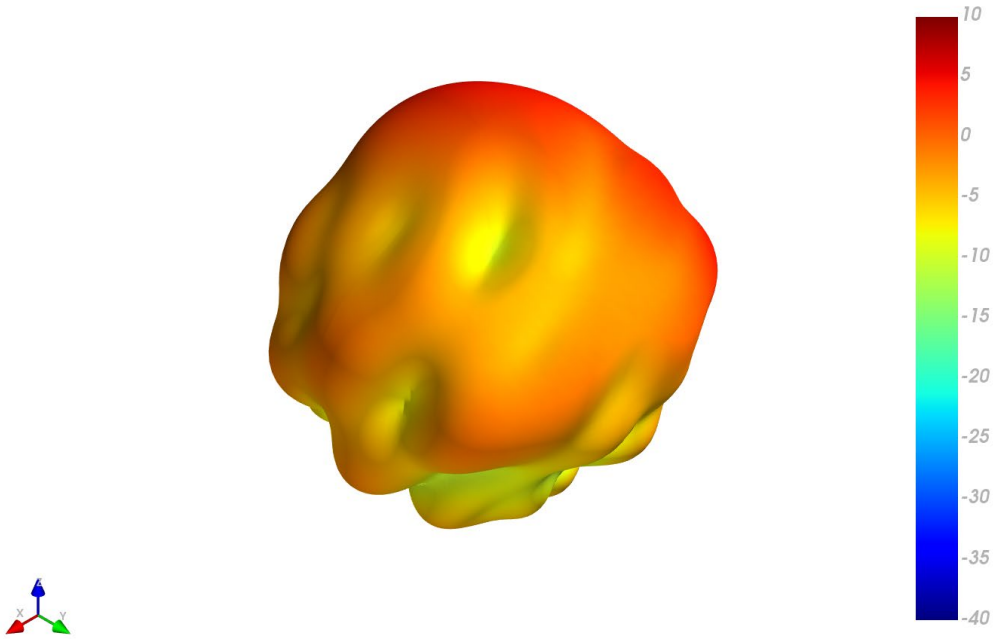
XY Plane	XZ Plane	YZ Plane



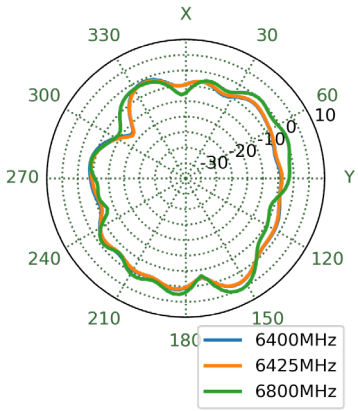


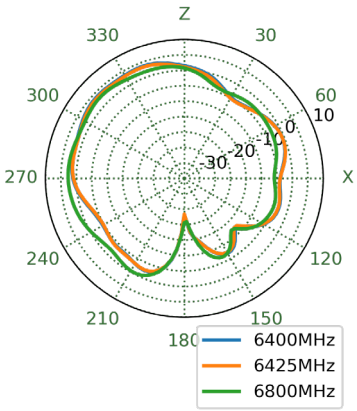


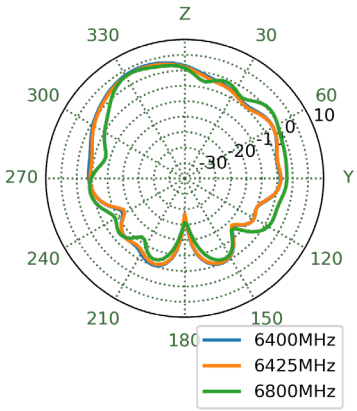
6425MHz



XY Plane	XZ Plane	YZ Plane

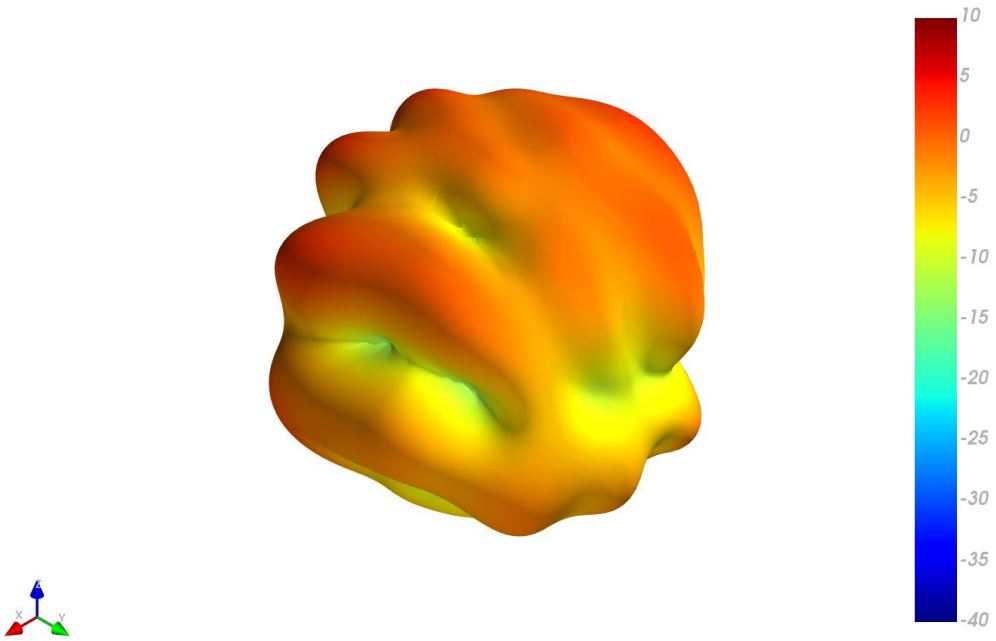


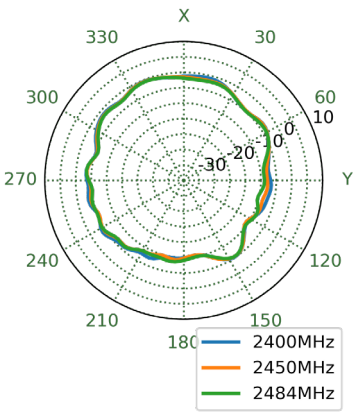
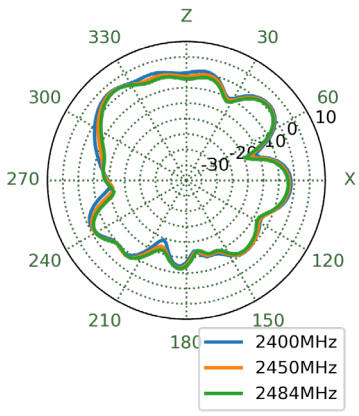
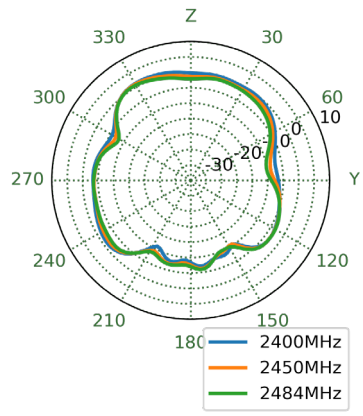




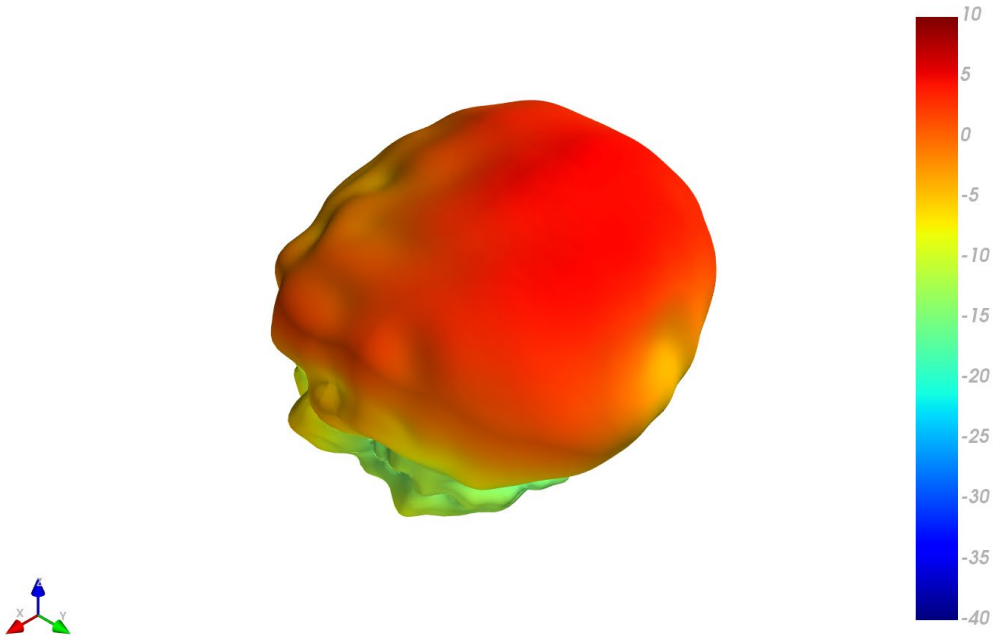
4.3 Ground Plane 3D and 2D Radiation Patterns

2450MHz

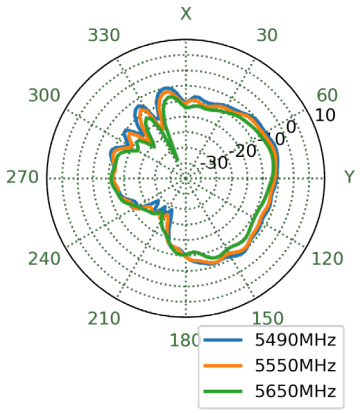


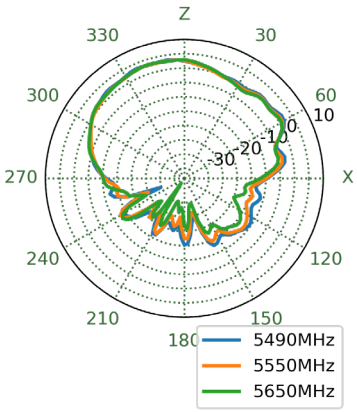
XY Plane	XZ Plane	YZ Plane
		

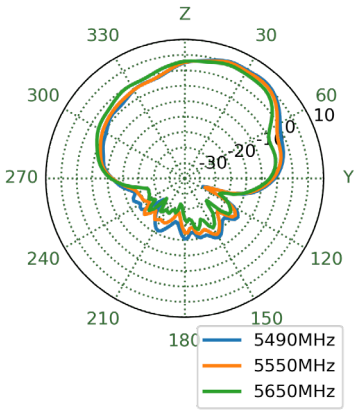
5550MHz



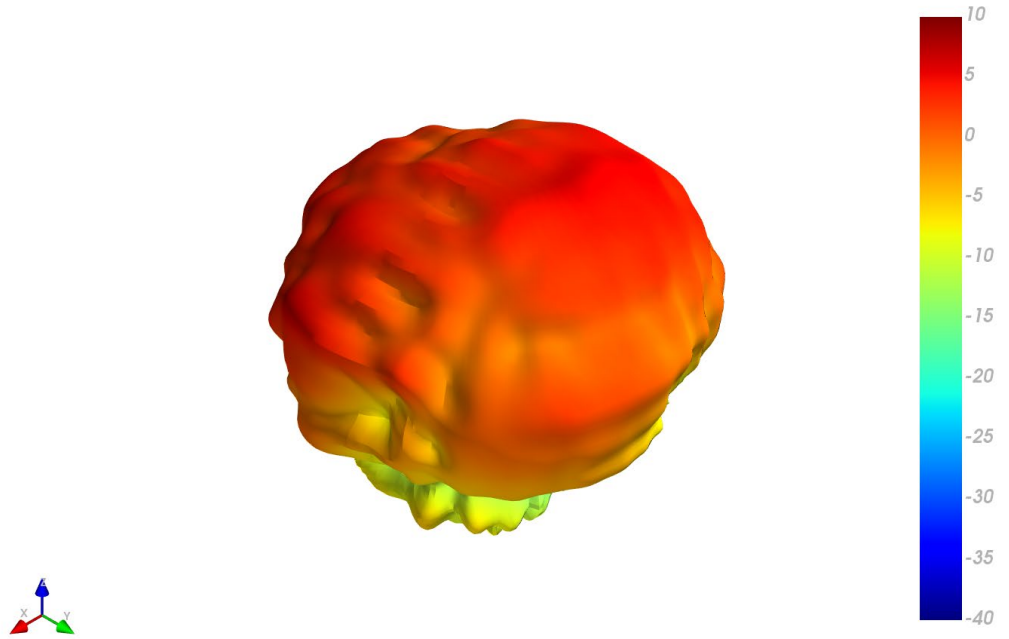
XY Plane	XZ Plane	YZ Plane



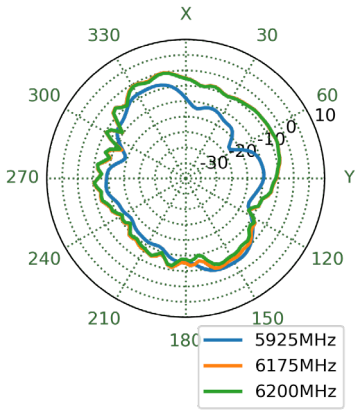


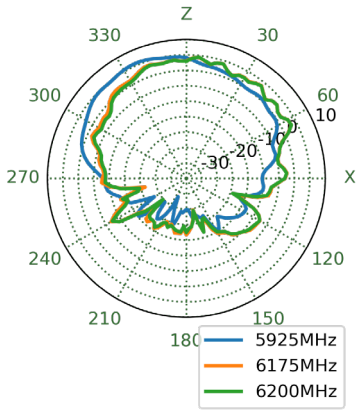


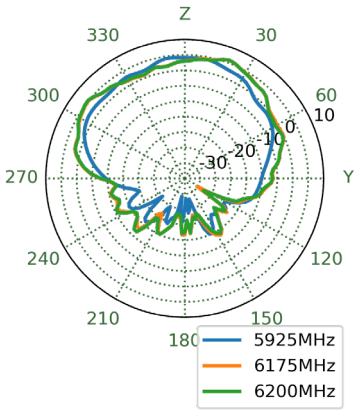
6175MHz



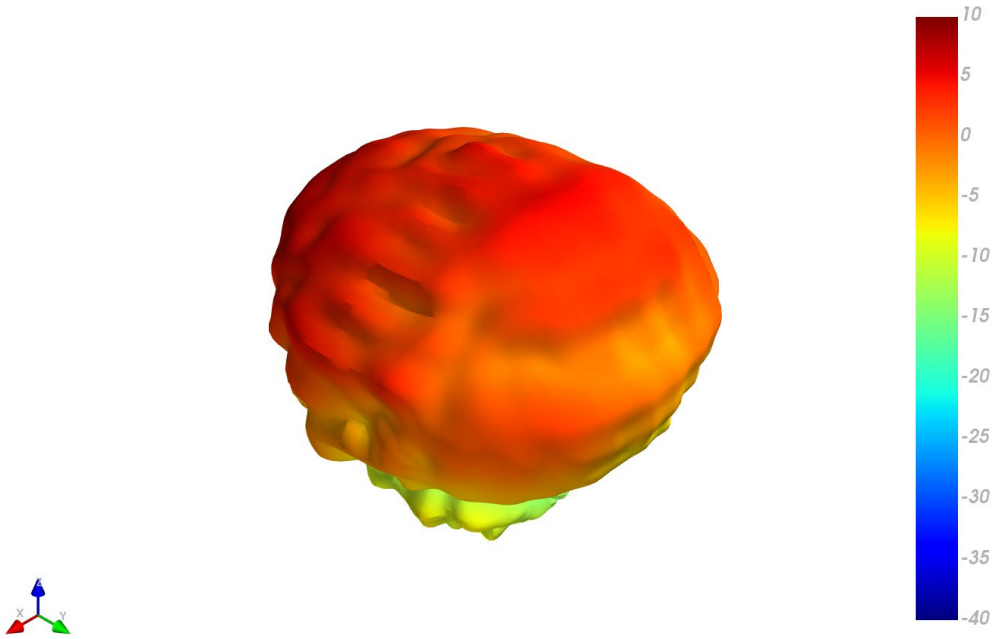
XY Plane	XZ Plane	YZ Plane



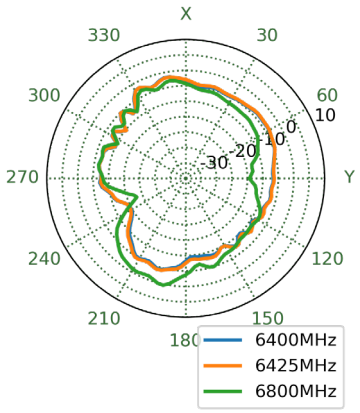


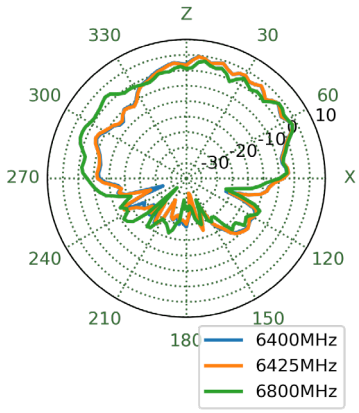


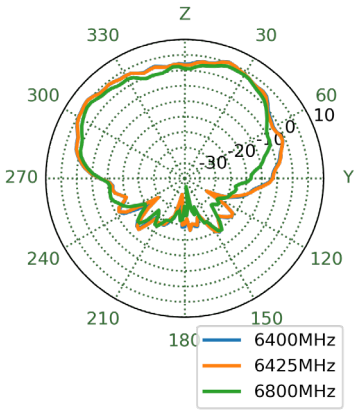
6425MHz



XY Plane	XZ Plane	YZ Plane



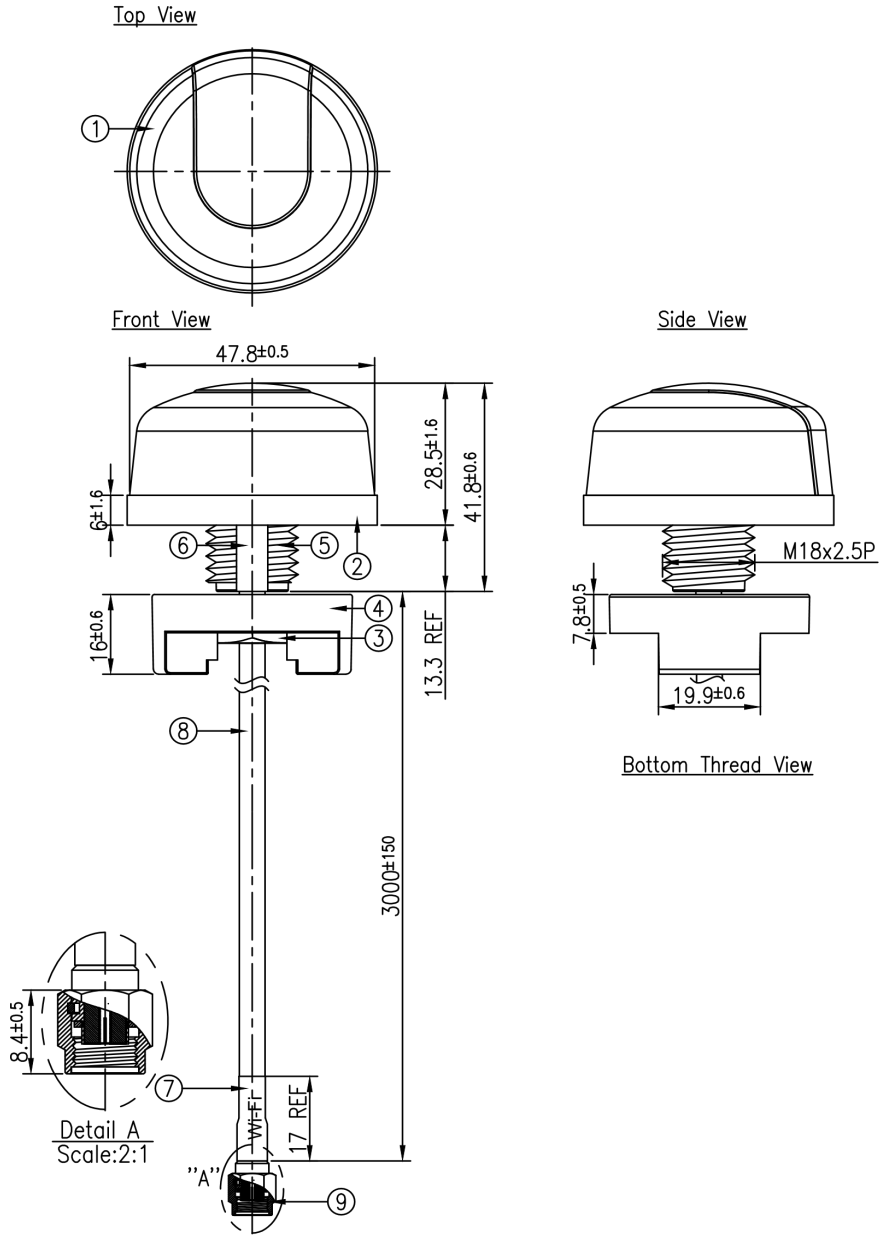




5. Mechanical Drawing (Units: mm)

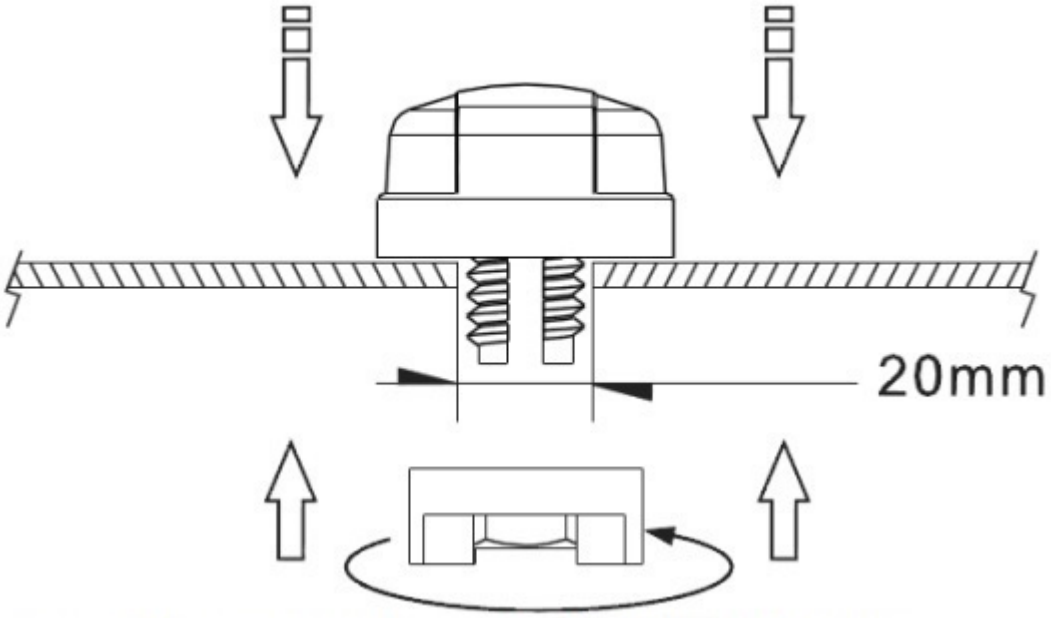
ISO NO.: EDW-21-8-0100
STATE: Release
NOTES:

REV.	DESCRIPTION	ENG.	APPROVED	DATE
D01	Initial Design		Aaron	2021/01/21



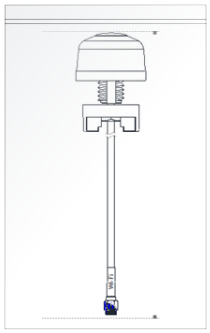
APPROVED BY: Aaron	TAOGLAS. TW Design Centre
CHECK BY:	This drawing and its inherent design concepts are property of Taoglas. Not to be copied or given to third parties without the written consent of Taoglas.
DRAWN BY: Aaron	
DATE: 2021/01/21	TITLE : 2.4/5.1-7.2GHz Hercules Antenna with 3m TGC-200 RP-SMA(M)
UNLESS OTHERWISE SPECFIED TOLERANCES ON: XX:±0.5 X.±0.3 .X±0.2 .XX±0.1 .XXX±0.05	PART NO. : WS.03.B.305151
THIRD ANGLE PROJECTION	UNIT: mm / SCALE: 1:1.25 / PAGES: 1/1 / REV. D01

6. Installation Guidelines

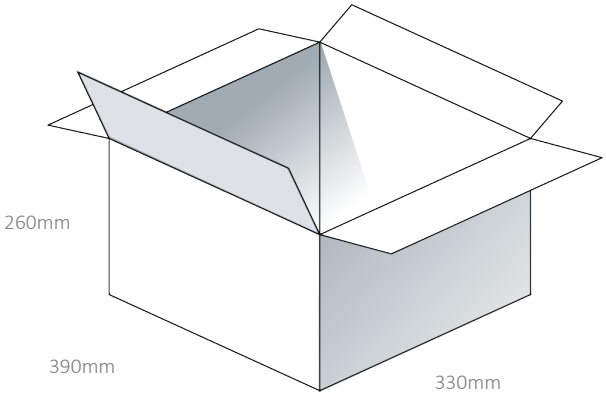


7. Packaging

1pc WS.03.B.305151 per PE Bag
Weight - 130g

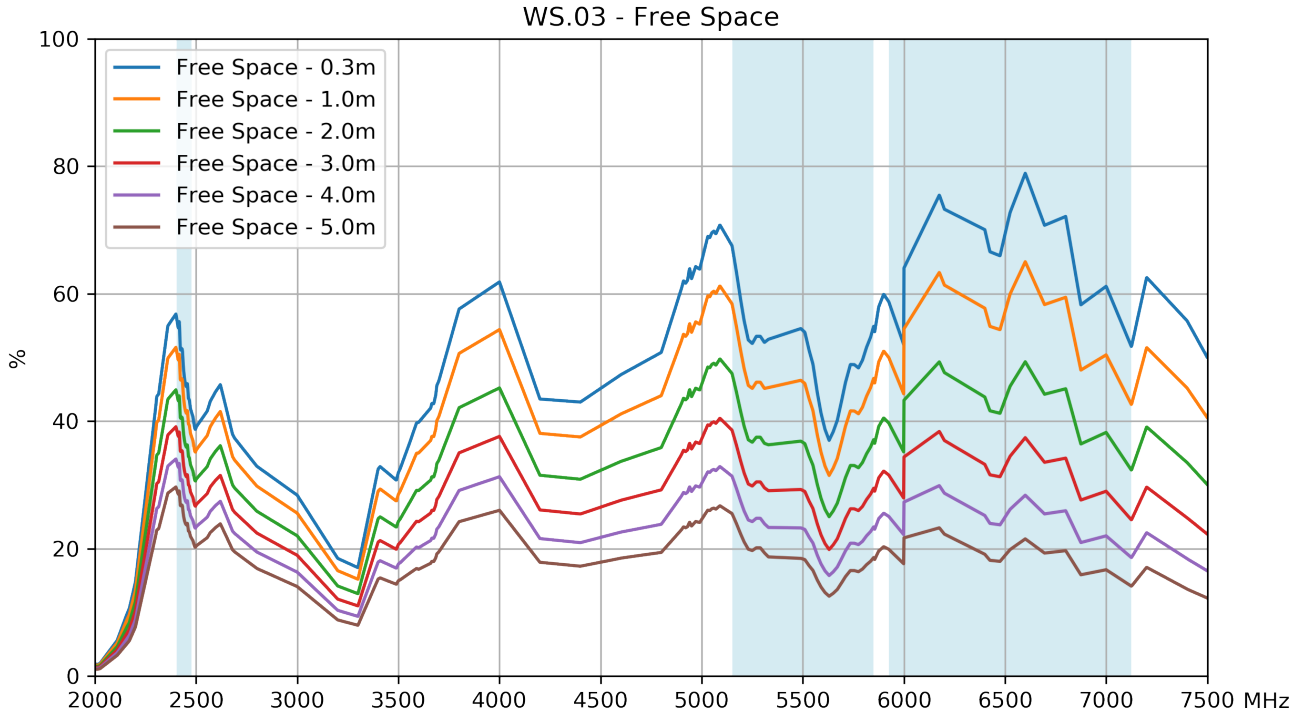


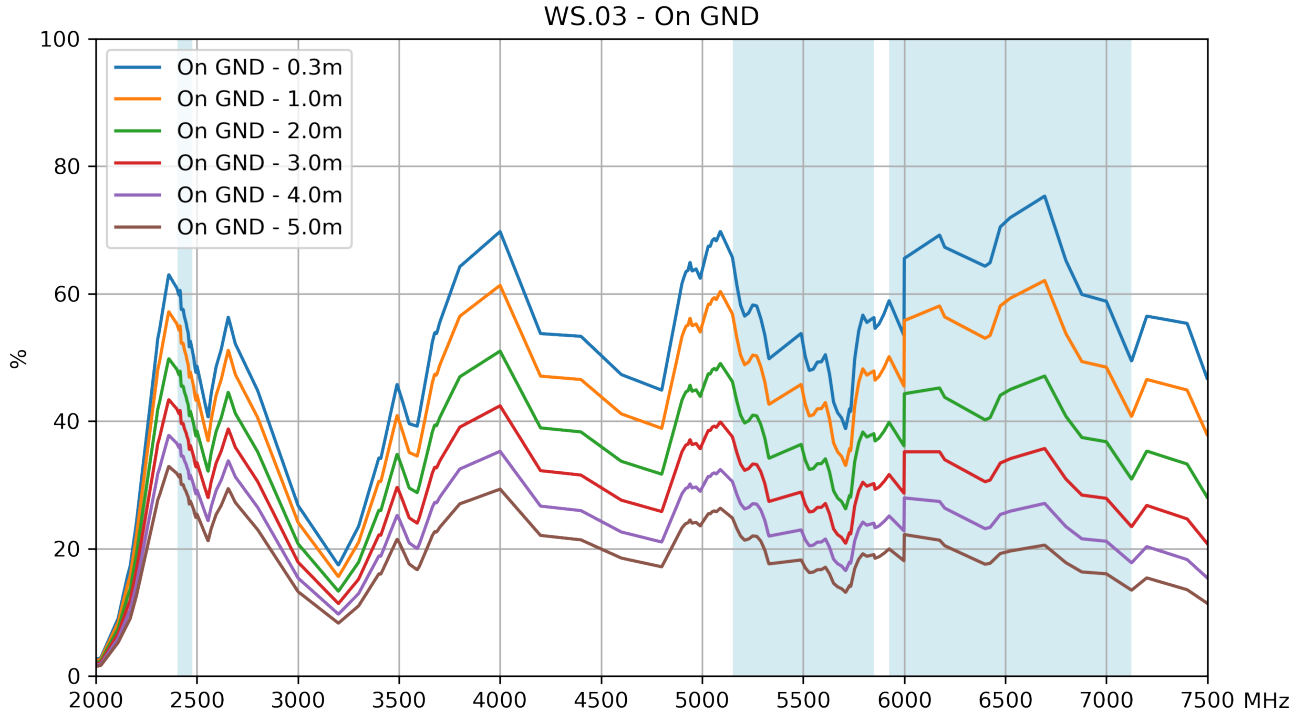
50pcs WS.03.B.305151 per carton
Dimensions - 390*330*260mm
Weight - 6.75Kg



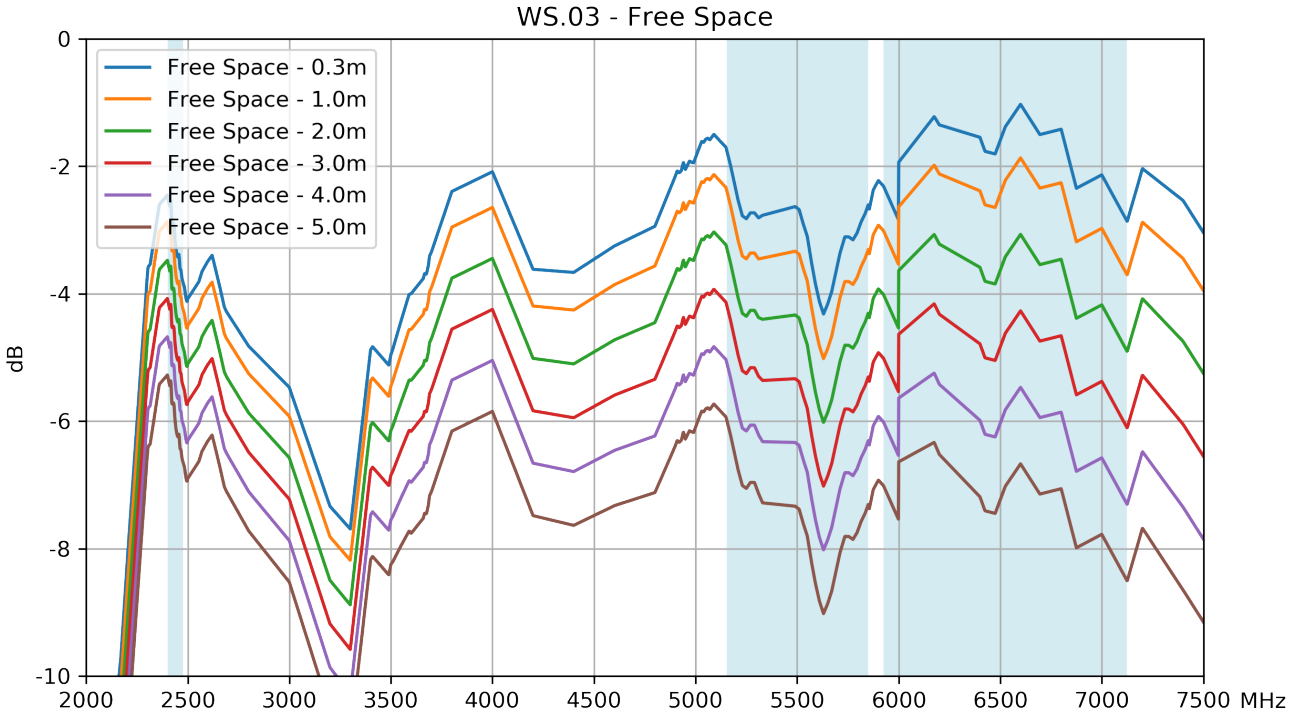
8. Application Note

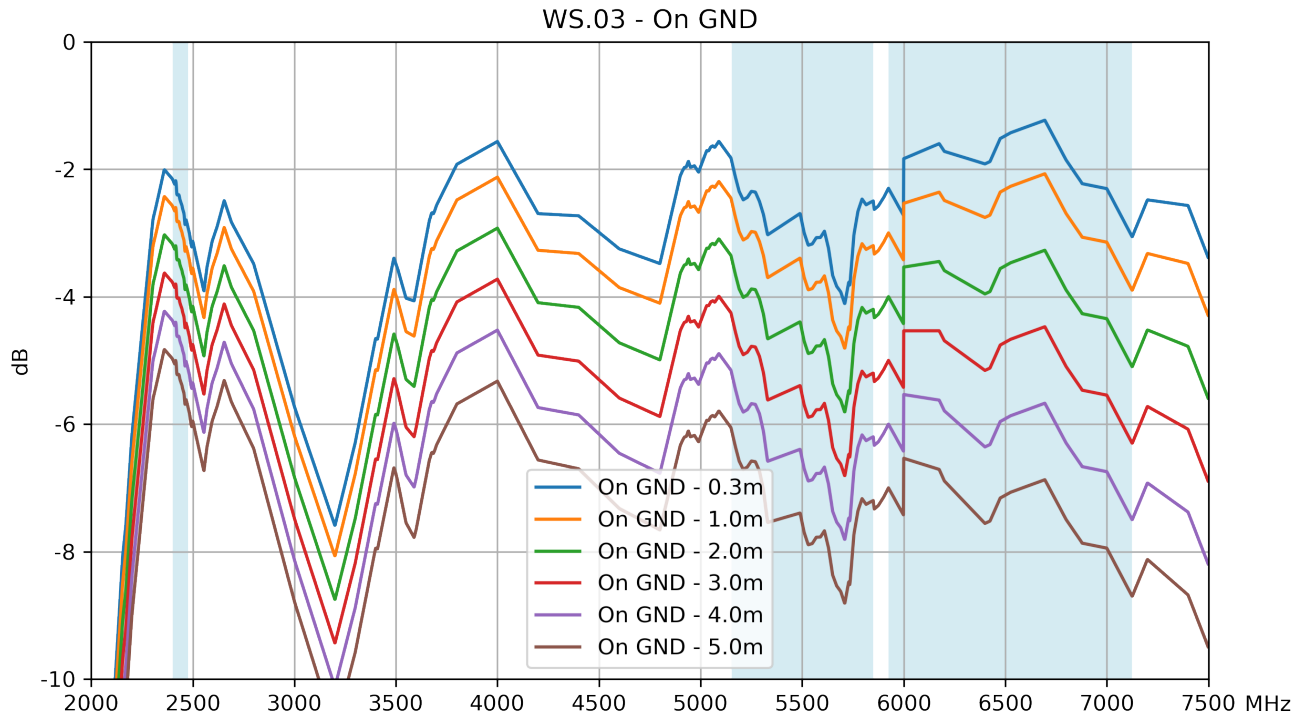
8.1 Efficiency



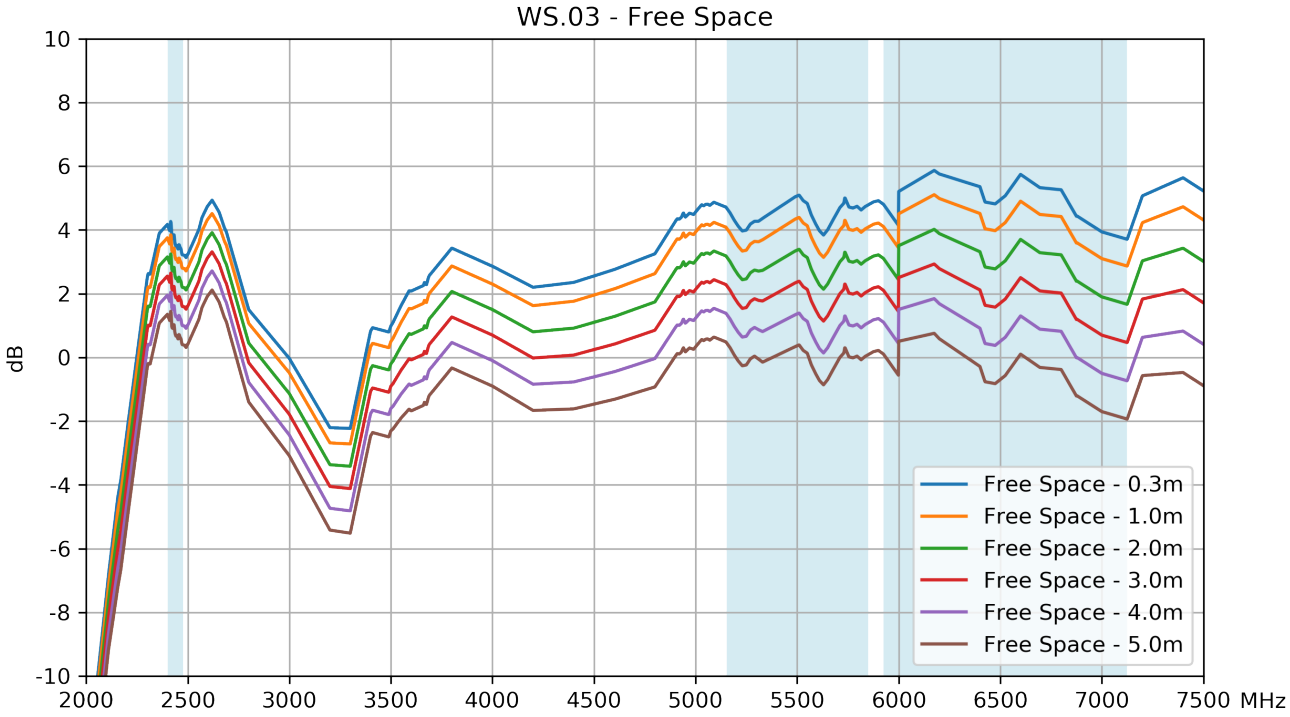


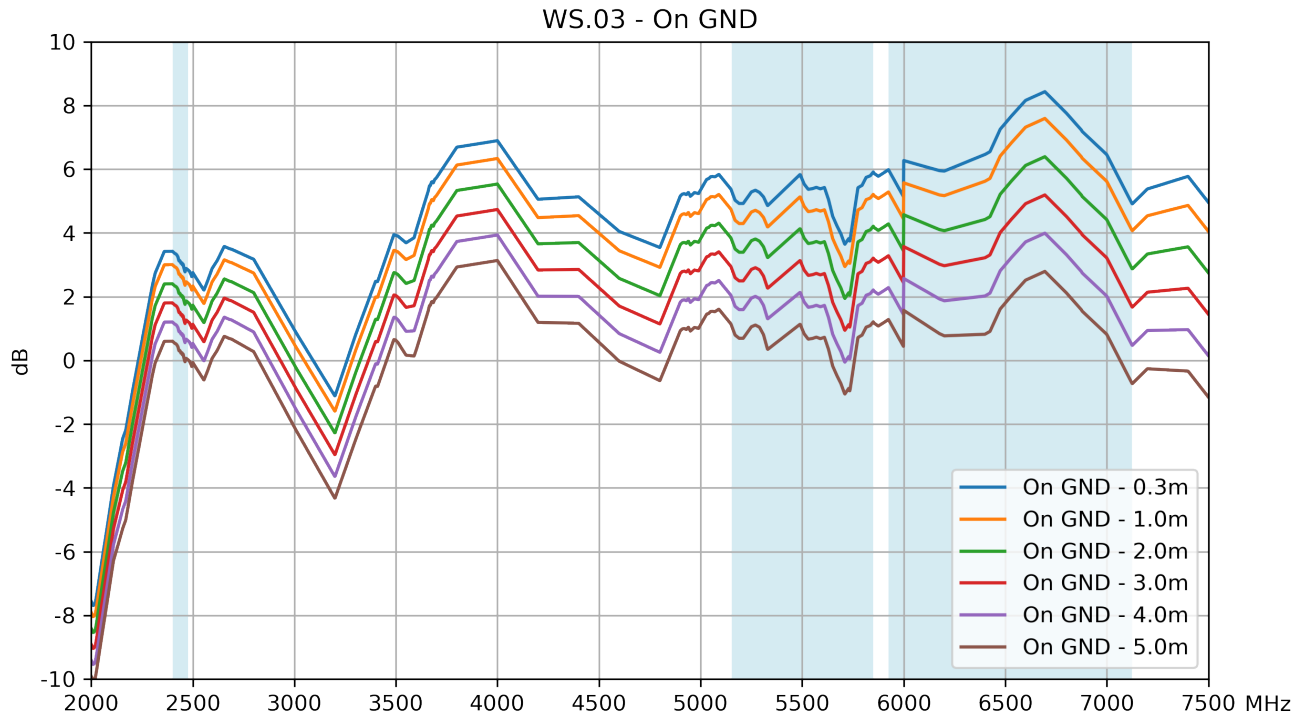
8.2 Average Gain





8.3 Peak Gain


WS.03 - Free Space
dB
10
8
6
4
2
0
-2
-4
-6
-8
-10
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500 MHz
Free Space - 0.3m
Free Space - 1.0m
Free Space - 2.0m
Free Space - 3.0m
Free Space - 4.0m
Free Space - 5.0m


WS.03 - On GND
dB
10
8
6
4
2
0
-2
-4
-6
-8
-10
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500 MHz
On GND - 0.3m
On GND - 1.0m
On GND - 2.0m
On GND - 3.0m
On GND - 4.0m
On GND - 5.0m

Changelog for the datasheet

SPE-21-8-022 – WS.03.B.305151

Revision: C (Current Version)	
Date:	2022-12-14
Notes:	Updated data
Author:	Evan Murphy

Previous Revisions

Revision: B	
Date:	2021-11-22
Notes:	Updated IP65 rating
Author:	Erik Landi

Revision: A (Original First Release)	
Date:	2021-03-31
Notes:	
Author:	Jack Conroy

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