



TAOGLAS®



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	3
2. Specifications	4
3. Antenna Characteristics	5
4. Radiation Patterns	8
5. Mechanical Drawing	17
6. Footprint	18
7. Packaging	19
8. Application Note	20
<hr/>	
Changelog	24

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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.

The Hercules has been designed for the most robust of use in challenging environments, with durable UV-resistant ASA housing that is IP65 rated, resistant to vandalism and with heavy duty work with extra thick thread for secure mounting.

At only 29mm high, with a diameter of 49mm, it is a covert

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

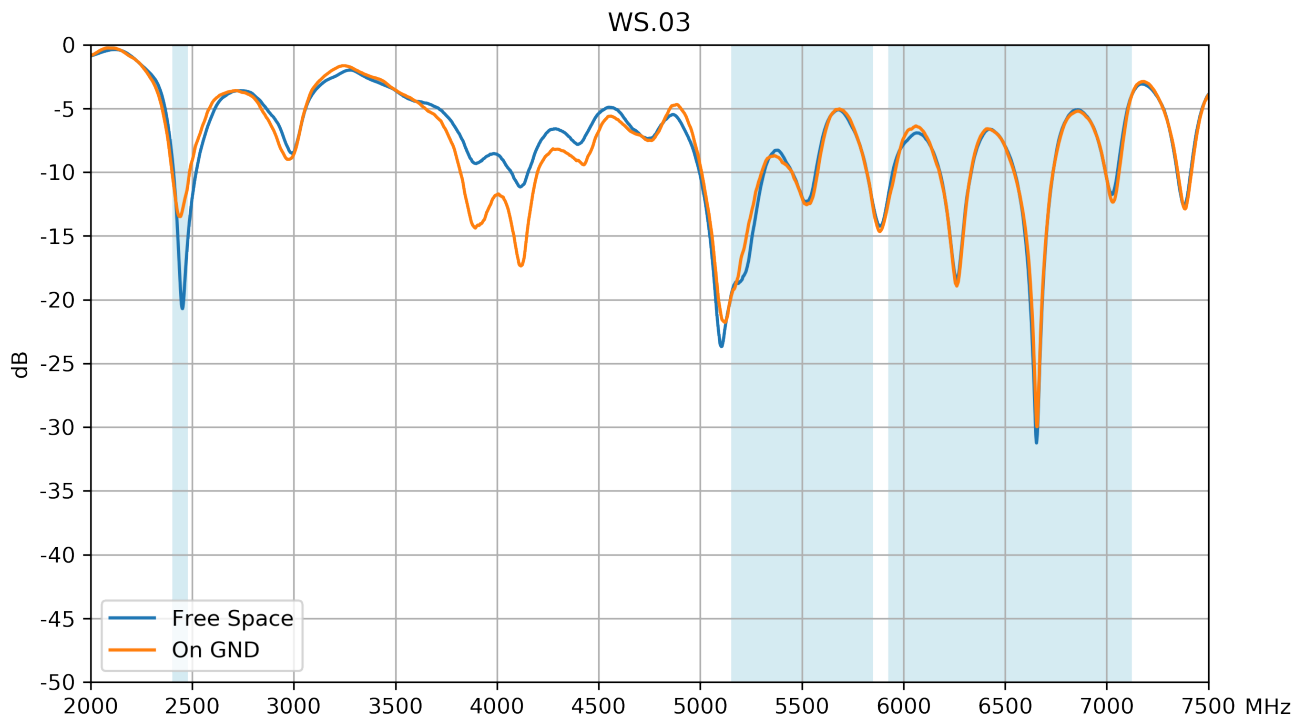
Wi-Fi Electrical									
Band	Frequency (MHz)		Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max Input Power
2.4GHz Wi-Fi	2400~2500	Free Space	33	-4.8	2.7	50 Ω	Linear	Omni-Directional	10W
		Ground Plane	39	-4.1	1.8				
5.8GHz Wi-Fi	5150~5850	Free Space	27.5	-5.6	2.4				
		Ground Plane	28.3	-5.5	3.2				
7.1GHz Wi-Fi 6	5925~7125	Free Space	32	-5	2.2				
		Ground Plane	31	-5.1	4.3				

*30x30cm Ground Plane

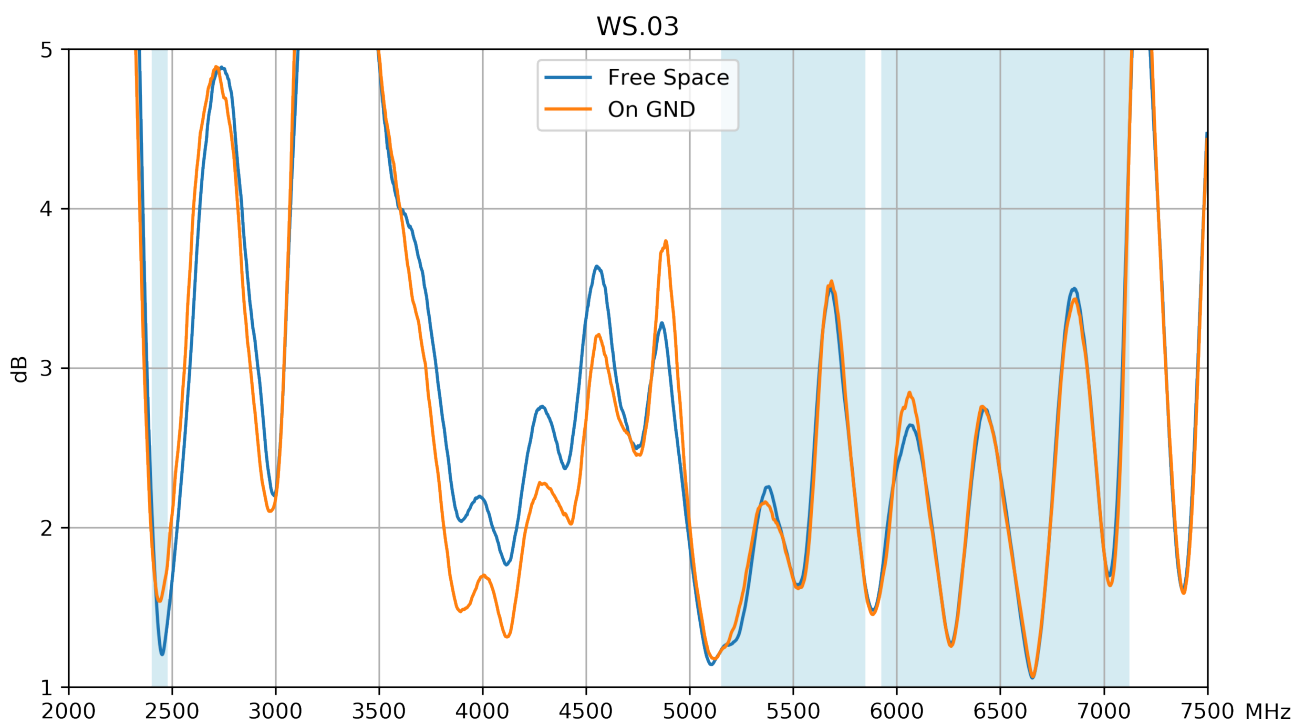
Mechanical	
Height	29 mm
Planner Dimension	49 mm
Casing	ASA
Cable	3000mm of TGC-200
Connector	Reverse Polarity SMA Male
Base and Thread	Zinc Alloy
Thread Diameter	M18
Sealant	Silicon Rubber
Weight	130g
Recommended Mounting Torque	24.5N·m
Maximum Mounting Torque	29.4N·m
Environmental	
Temperature Range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

3. Antenna Characteristics

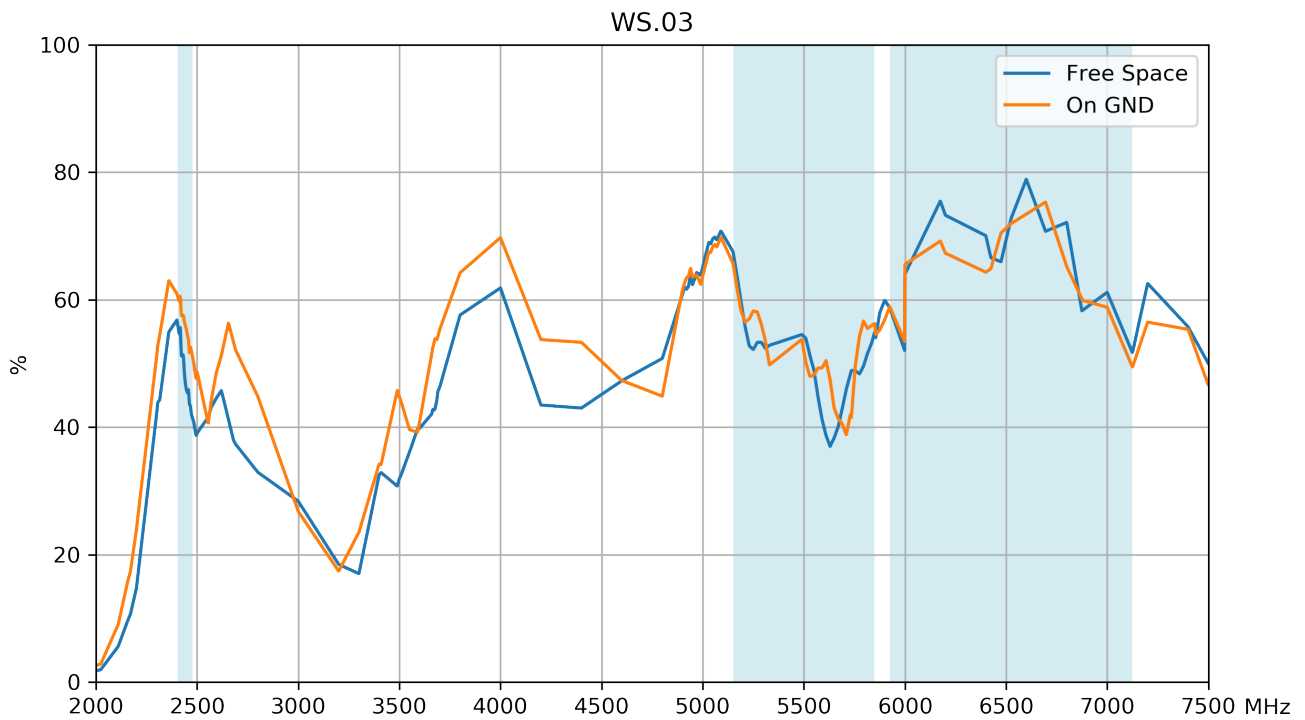
3.1 Return Loss



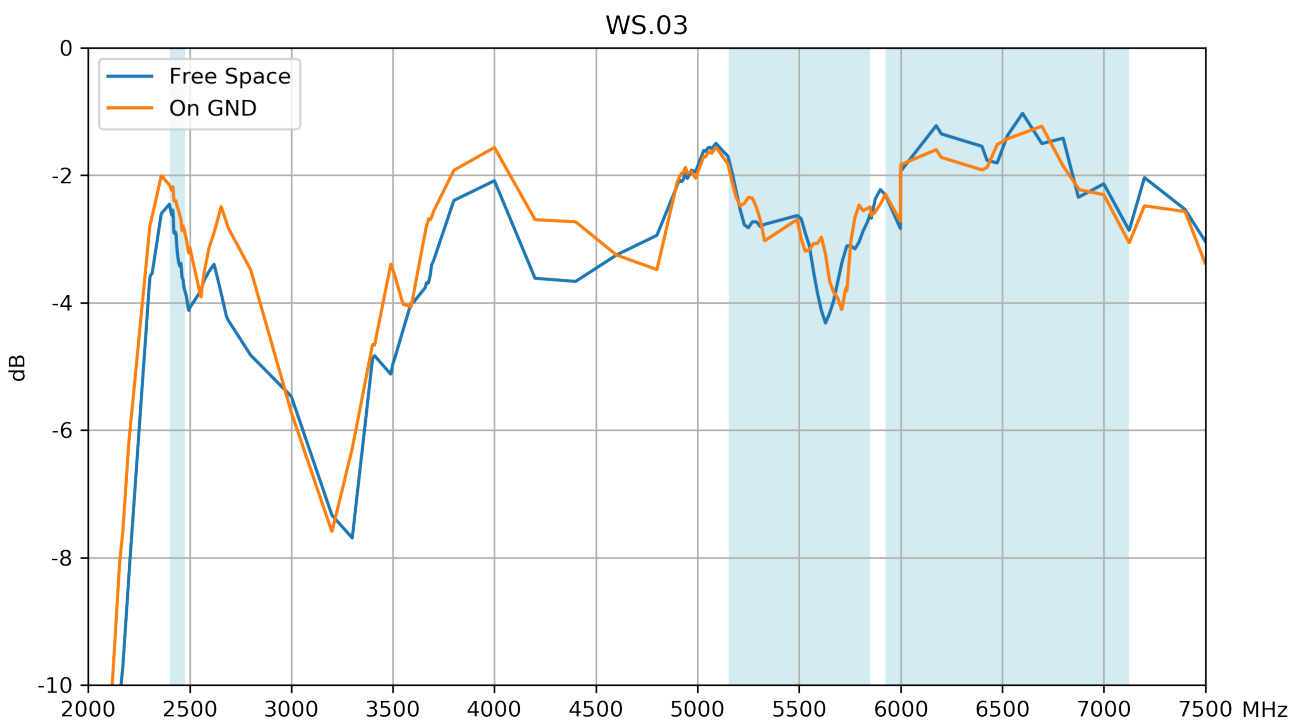
3.2 VSWR



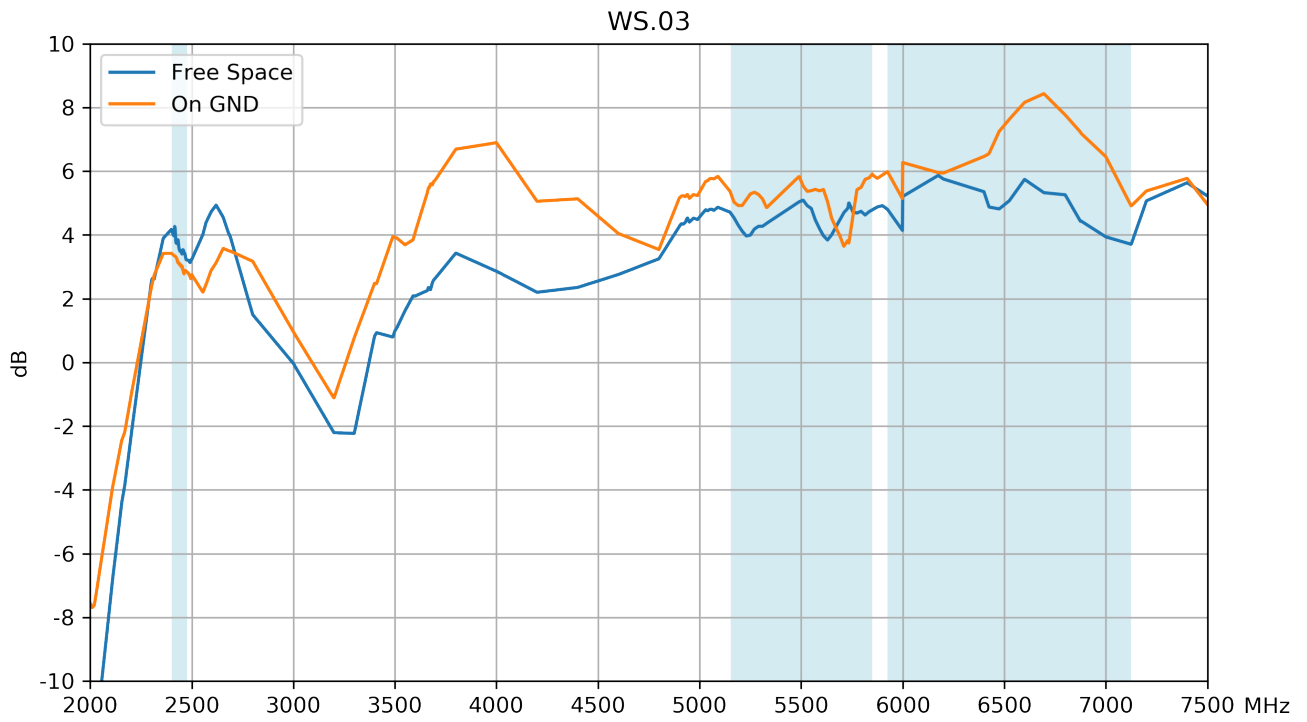
3.3 Efficiency



3.4 Average Gain

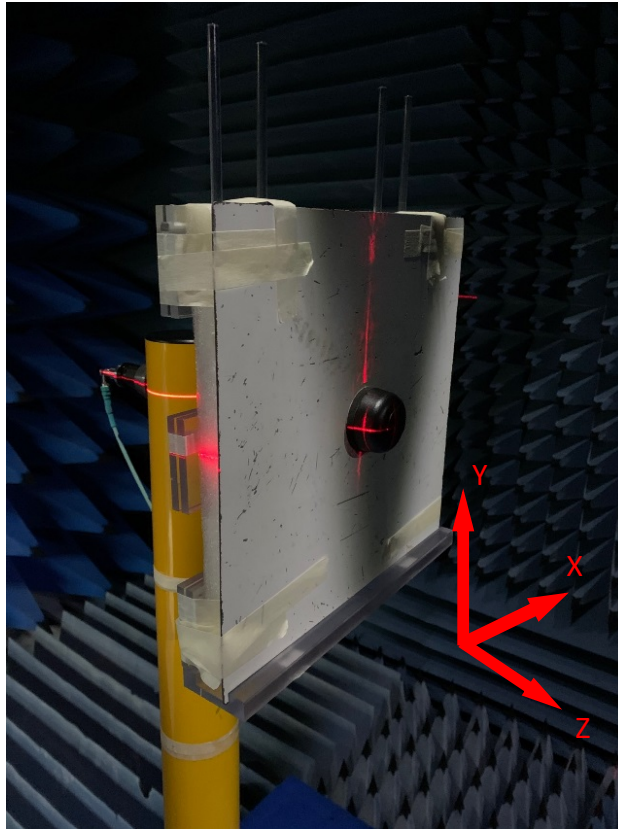


3.5 Peak Gain



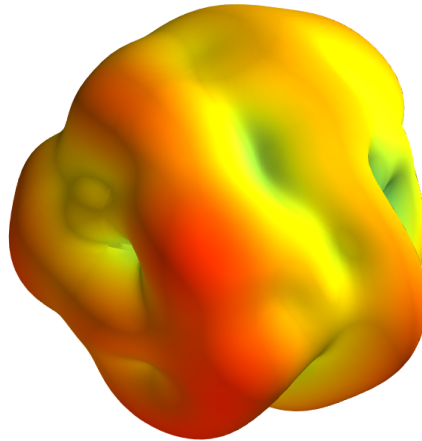
4. Radiation Patterns

4.1 Test Setup – on 30*30cm Ground Plane

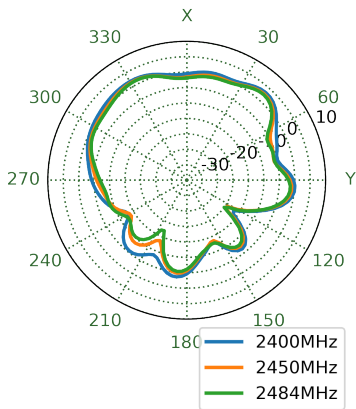


4.2 Free Space 3D and 2D Radiation Patterns

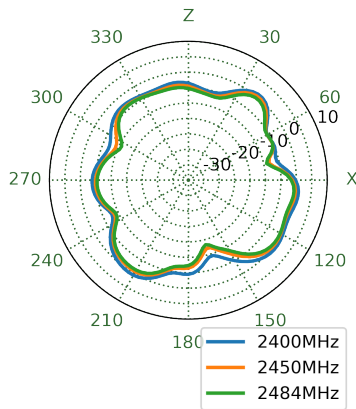
2450MHz



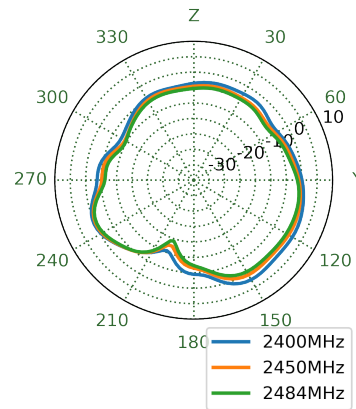
XY Plane



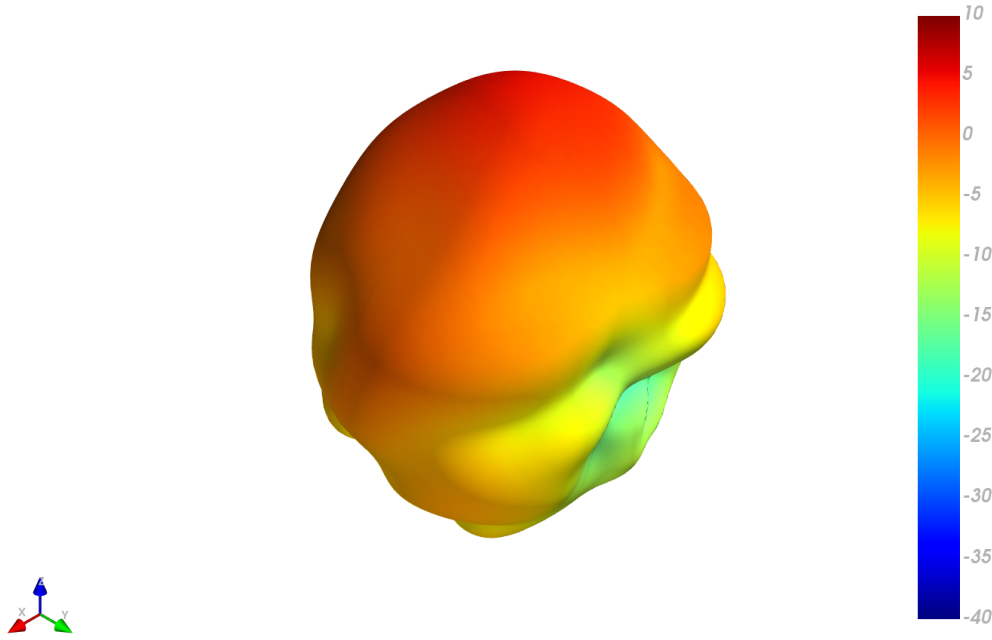
XZ Plane



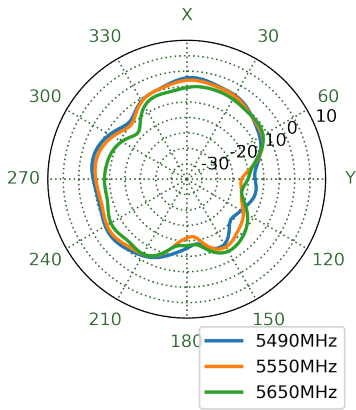
YZ Plane



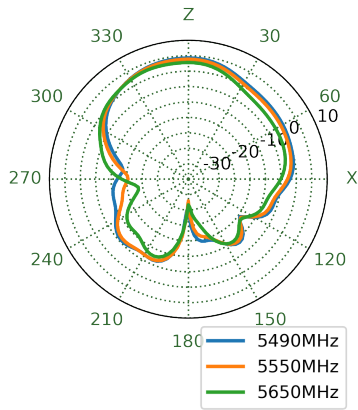
5550MHz



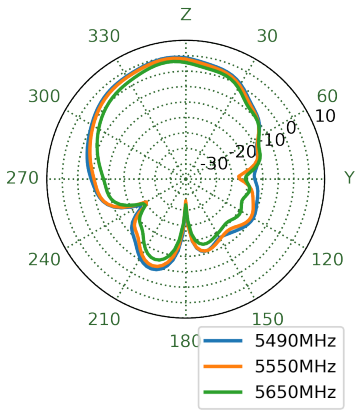
XY Plane



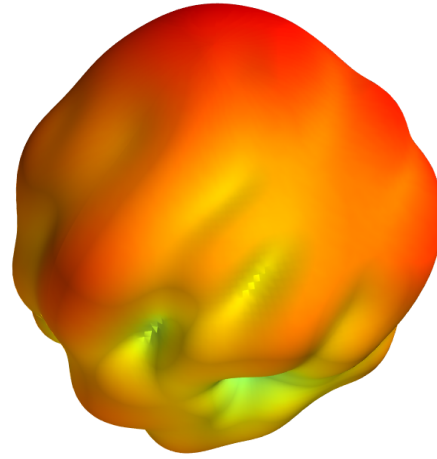
XZ Plane



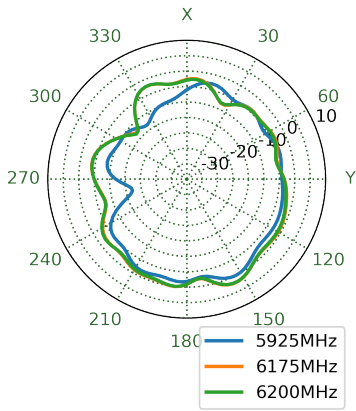
YZ Plane



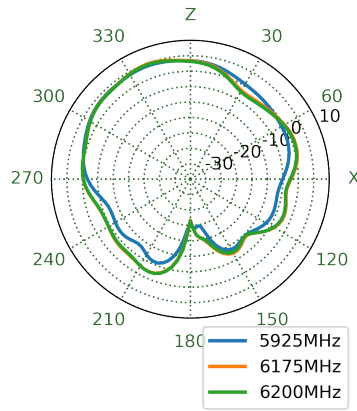
6175MHz



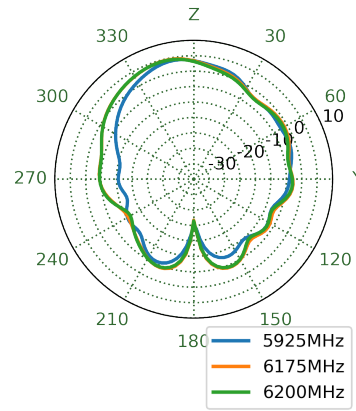
XY Plane



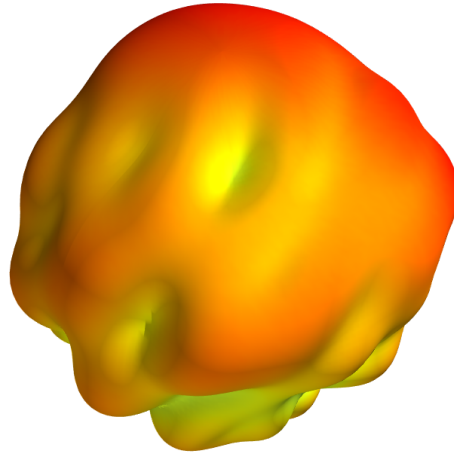
XZ Plane



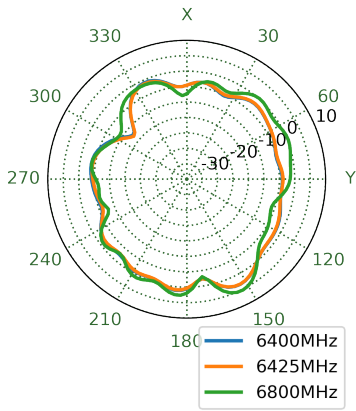
YZ Plane



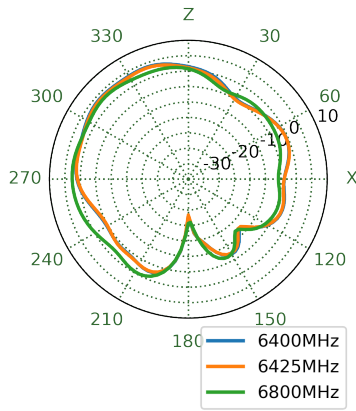
6425MHz



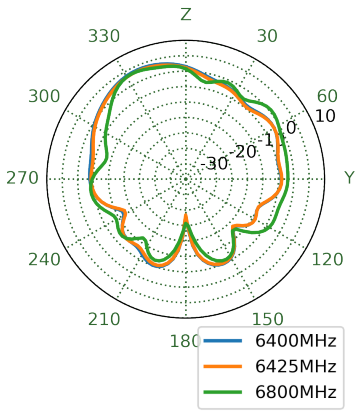
XY Plane



XZ Plane

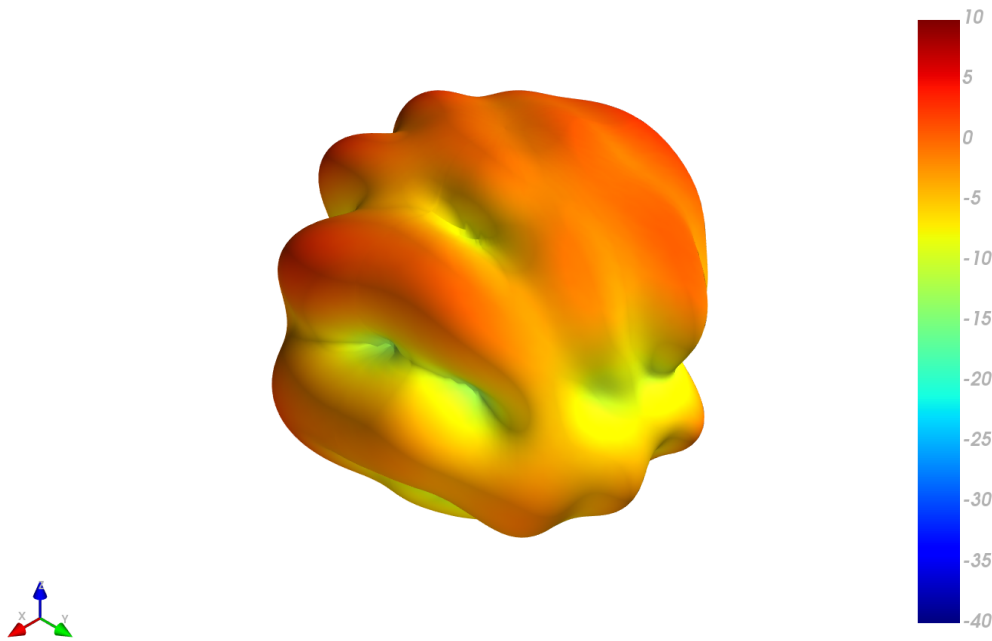


YZ Plane

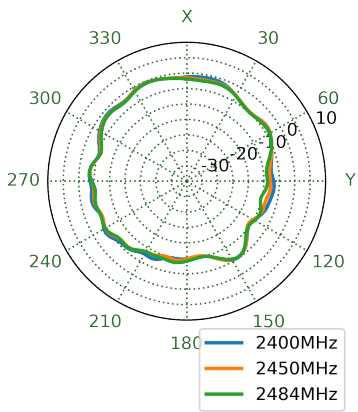


4.3 Ground Plane 3D and 2D Radiation Patterns

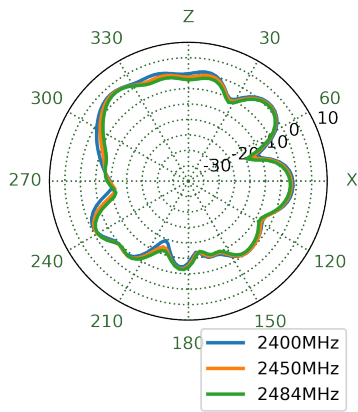
2450MHz



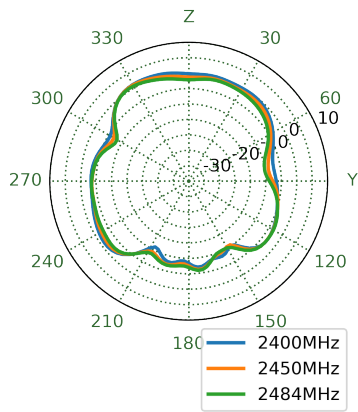
XY Plane



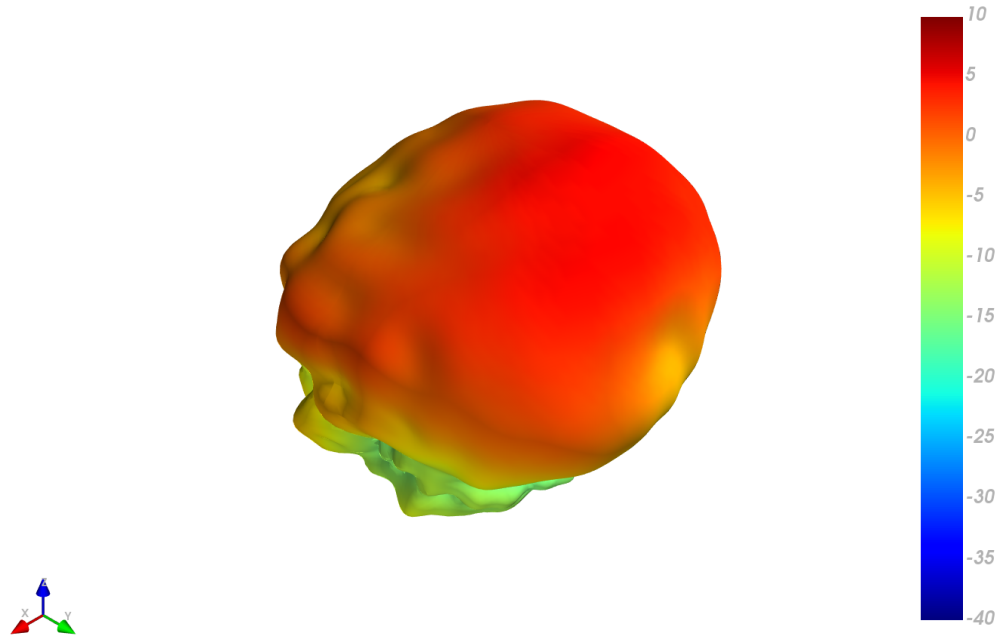
XZ Plane



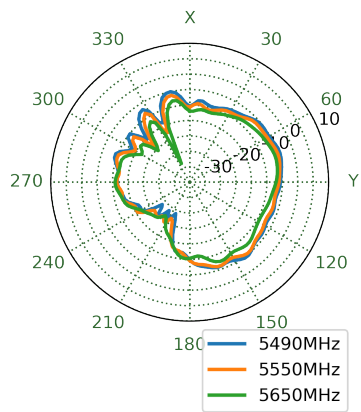
YZ Plane



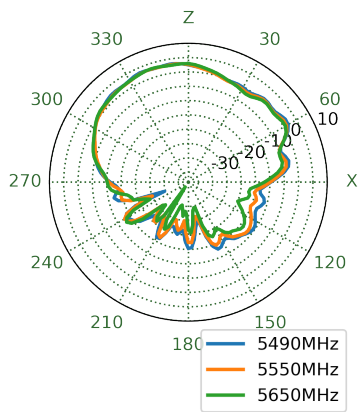
5550MHz



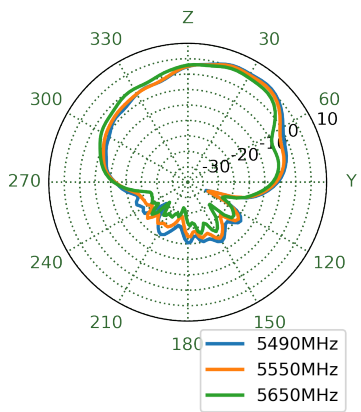
XY Plane



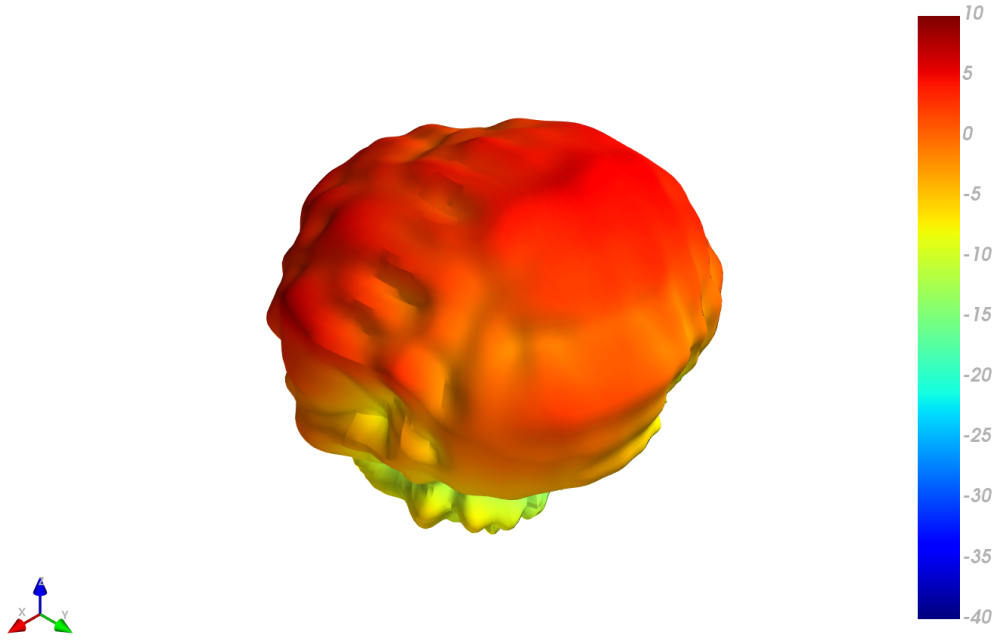
XZ Plane



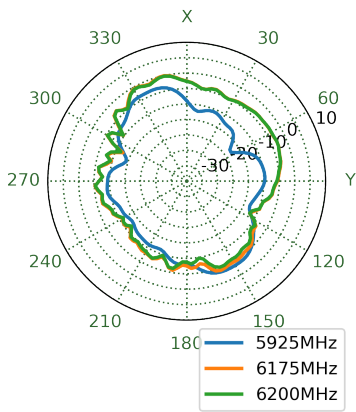
YZ Plane



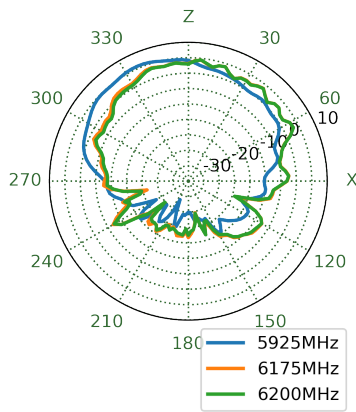
6175MHz



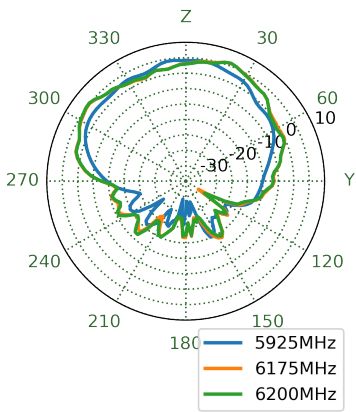
XY Plane



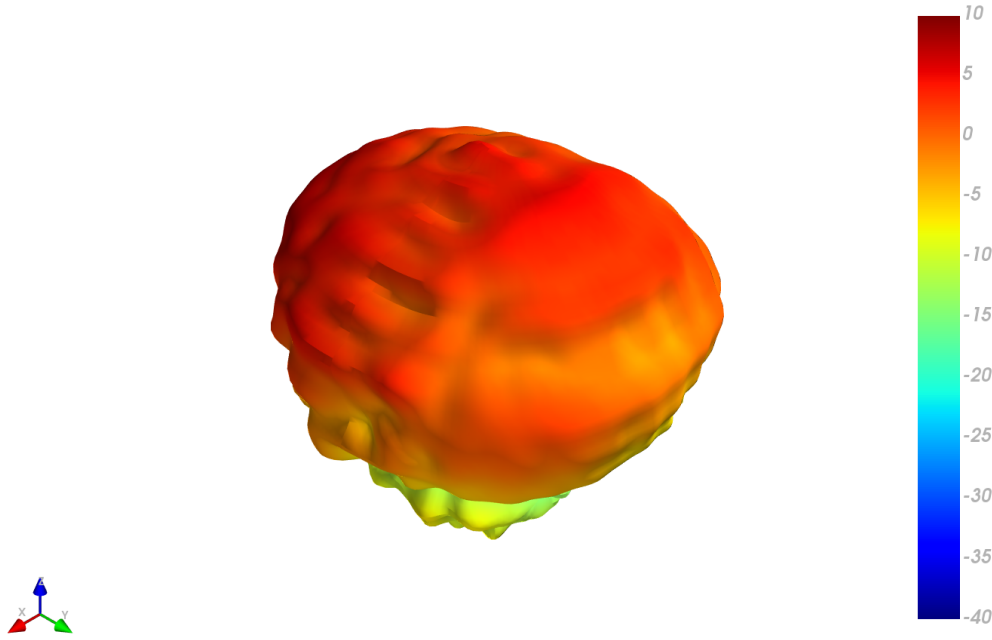
XZ Plane



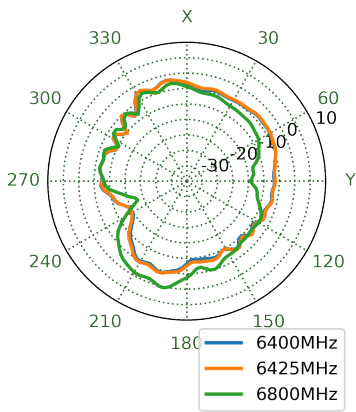
YZ Plane



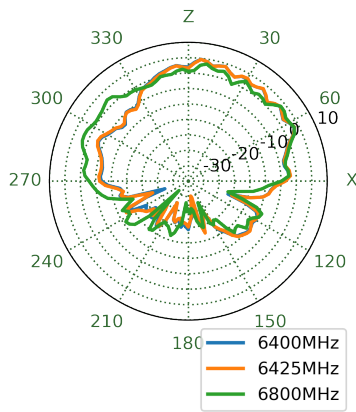
6425MHz



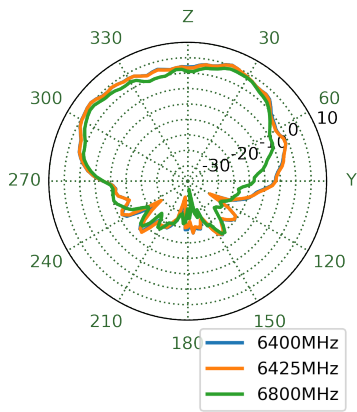
XY Plane



XZ Plane



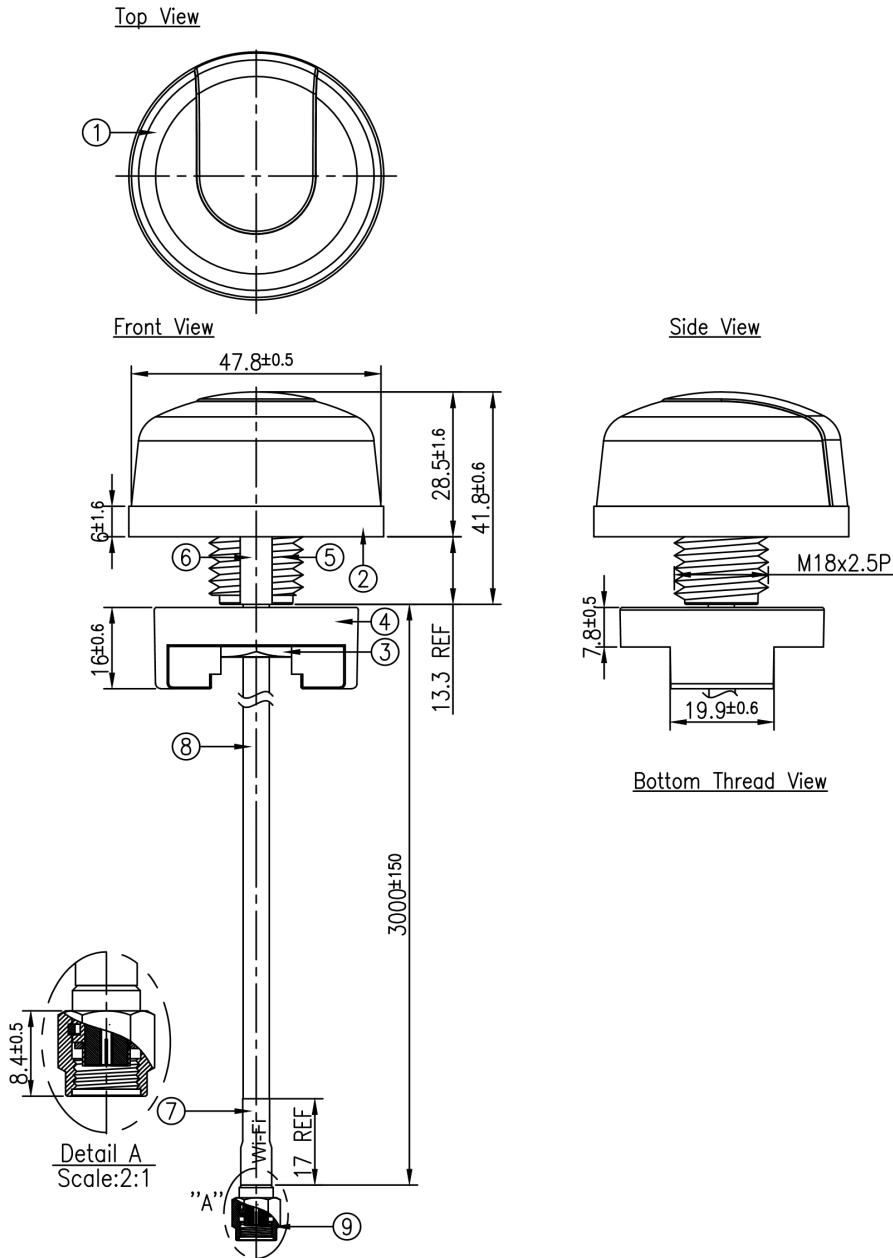
YZ Plane



5. Mechanical Drawing (Units: mm)

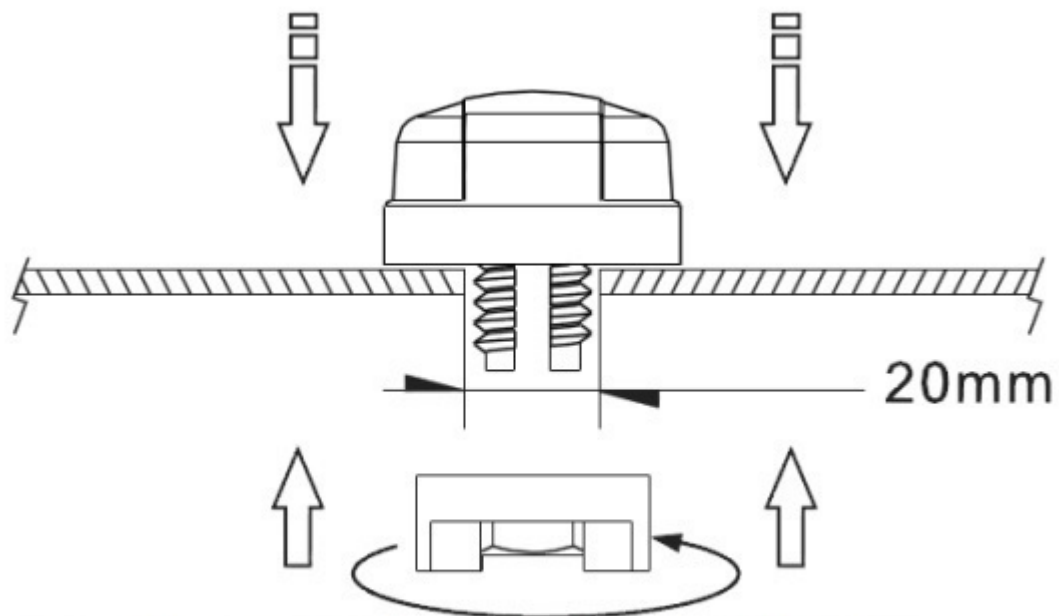
ISO NO.: EDW-21-8-0100
 STATE: Release
 NOTES:

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



APPROVED BY: Aaron	 <small>TW Design Centre</small> <small>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.</small>
CHECK BY:	
DRAWN BY: Aaron	
DATE: 2021/01/21	
<small>UNLESS OTHERWISE SPECIFIED TOLERANCES ON:</small> <small>XX±0.5</small> <small>X±0.3</small> <small>±0.2</small> <small>XX±0.1</small> <small>XXX±0.05</small>	TITLE : 2.4/5.1-7.2GHz Hercules Antenna with 3m TGC-200 RP-SMA(M) PART NO. : WS.03.B.305151
<small>THIRD ANGLE PROJECTION</small>	UNIT: mm SCALE: 1:1.25 PAGES: 1/1 REV. D01

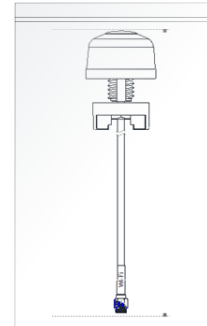
6. Installation Guidelines



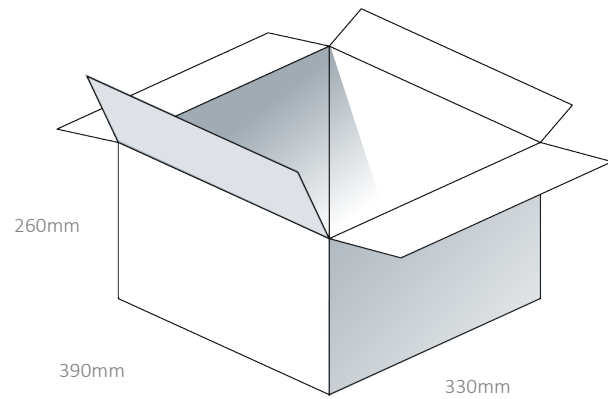
Recommended torque for Mounting is 24.5N·m
 Maximum torque for mounting is 29.4N·m

7. Packaging

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



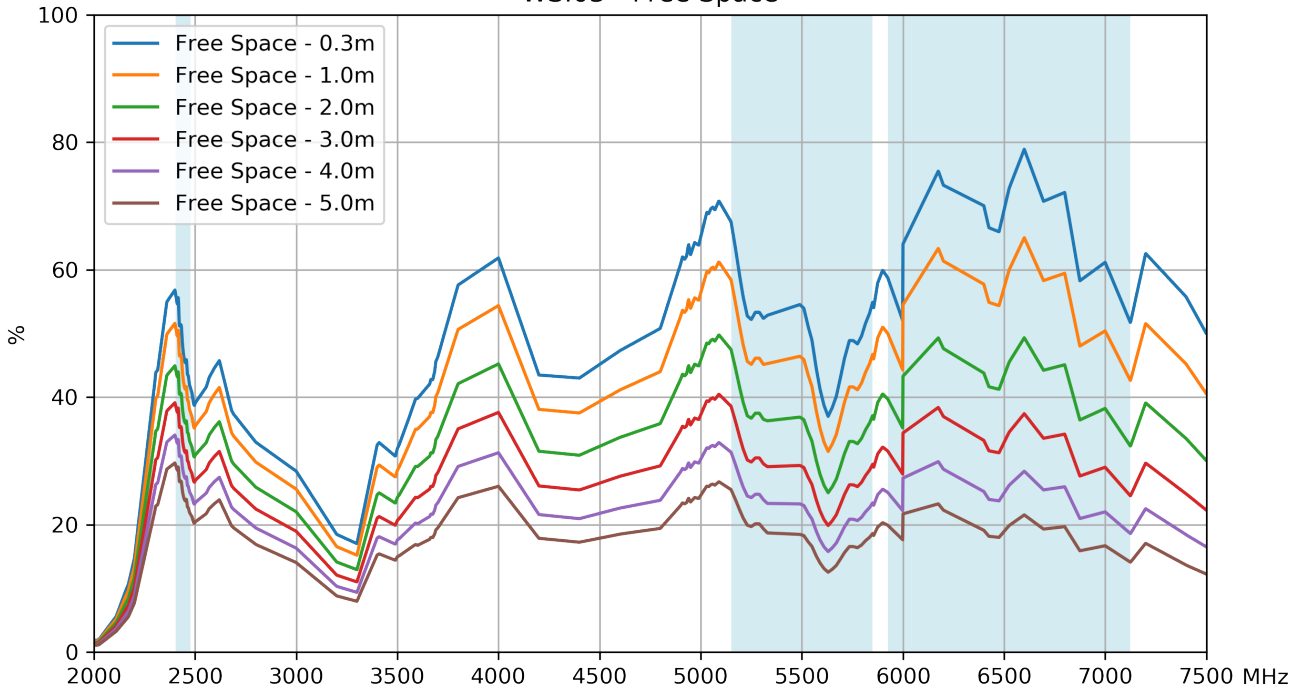
50pcs WS.03.B.305151 per carton
 Dimensions - 390*330*260mm
 Weight - 6.75Kg



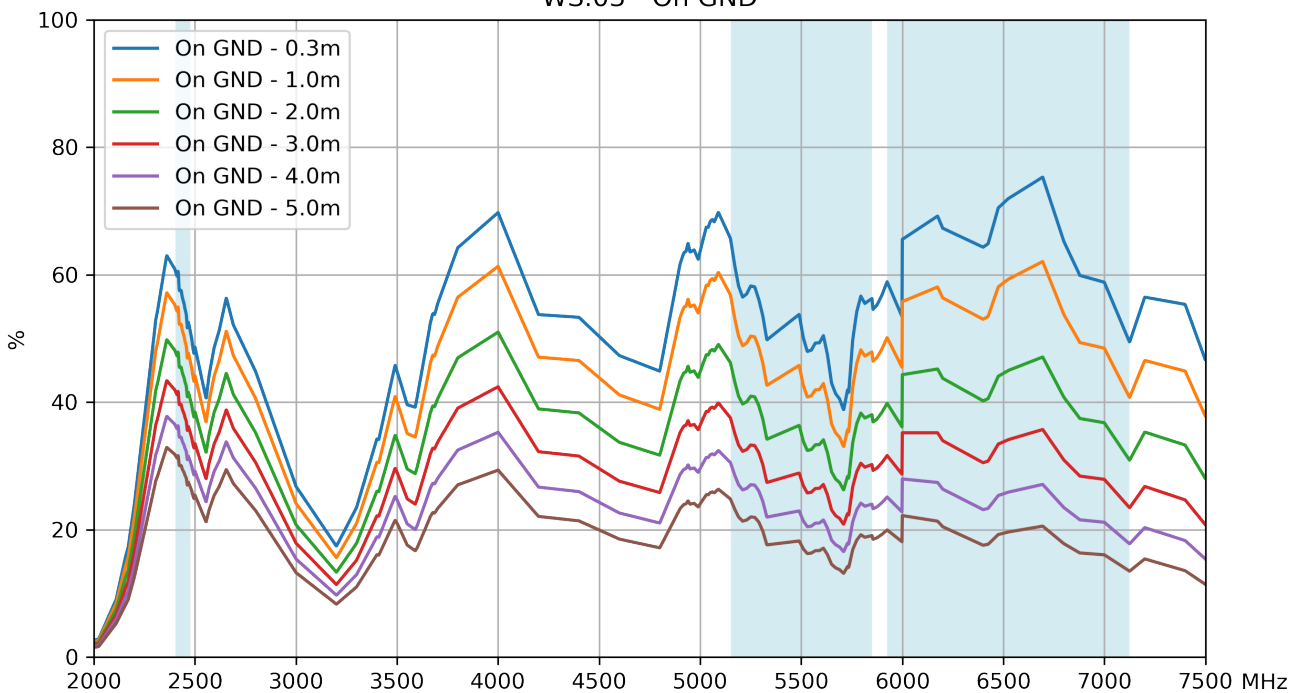
8. Application Note

8.1 Efficiency

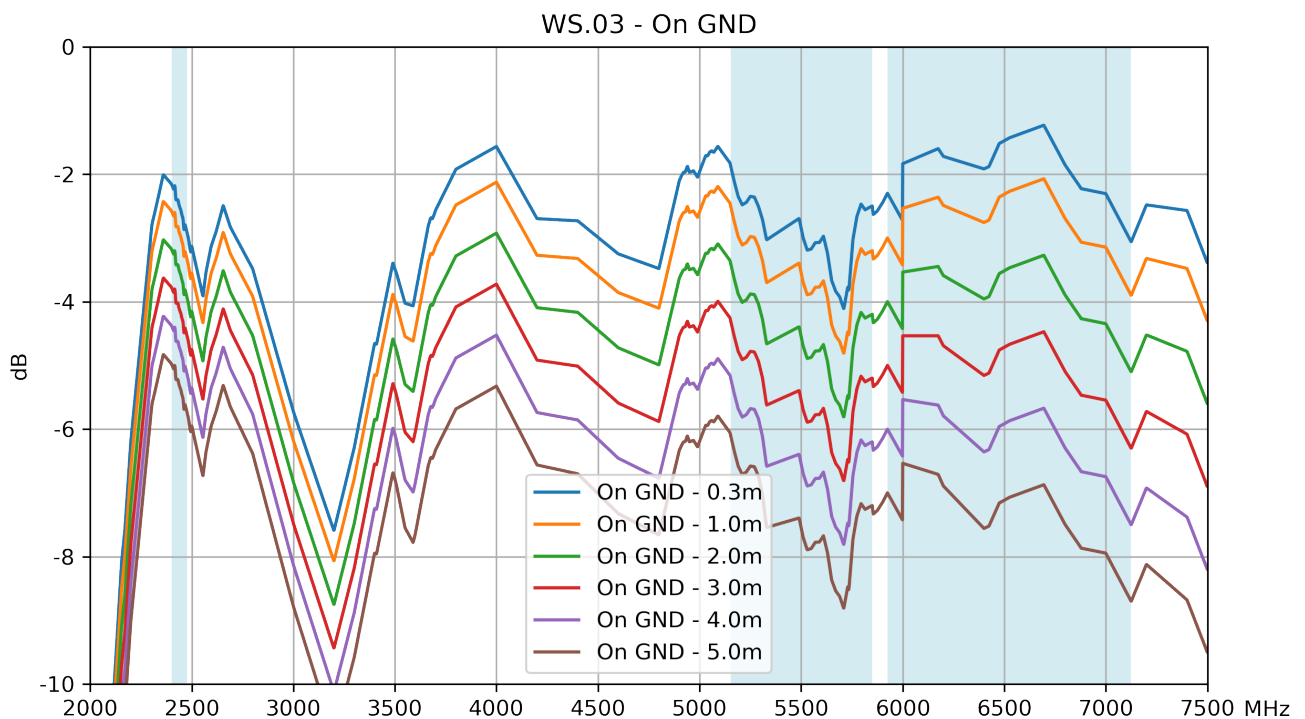
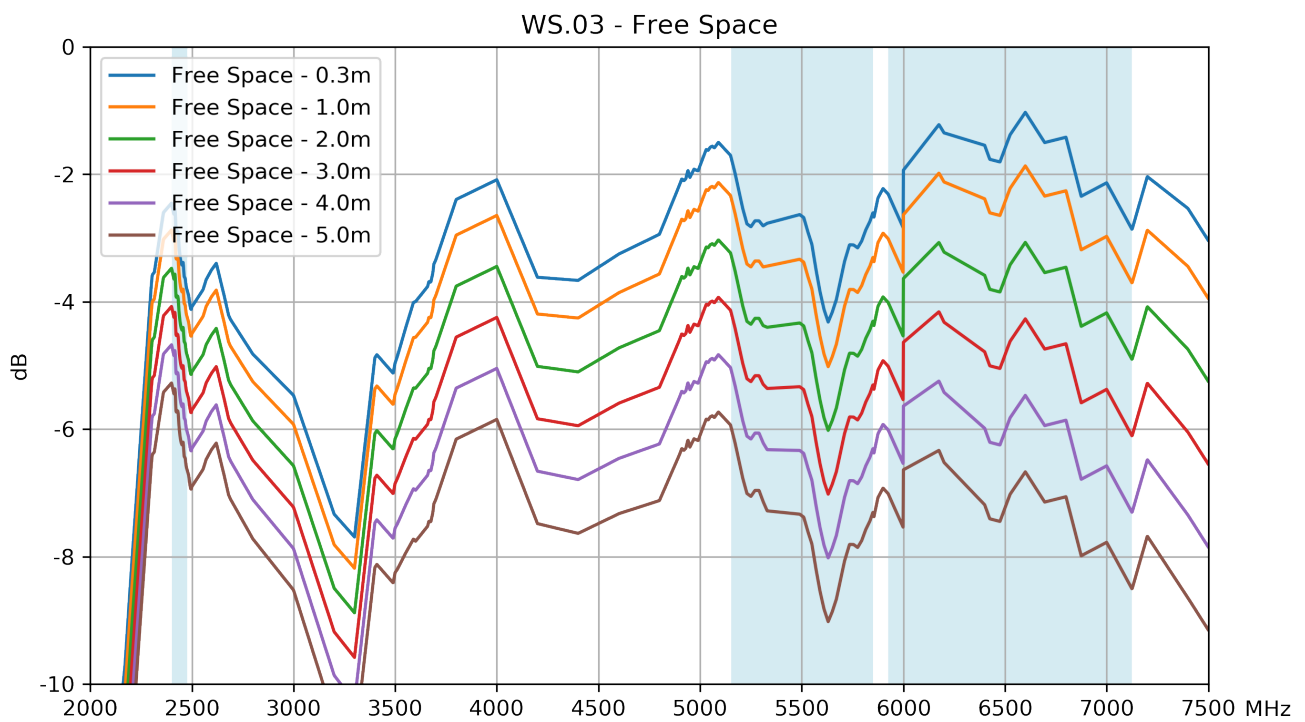
WS.03 - Free Space



WS.03 - On GND

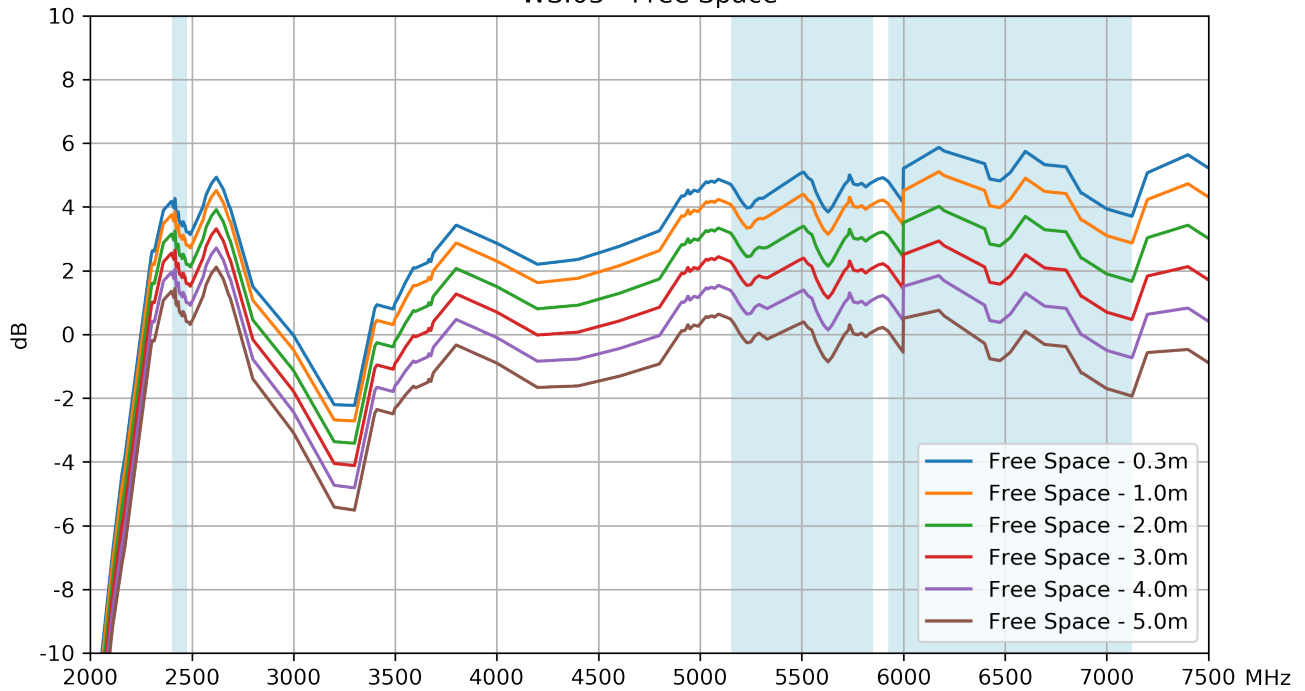


8.2 Average Gain

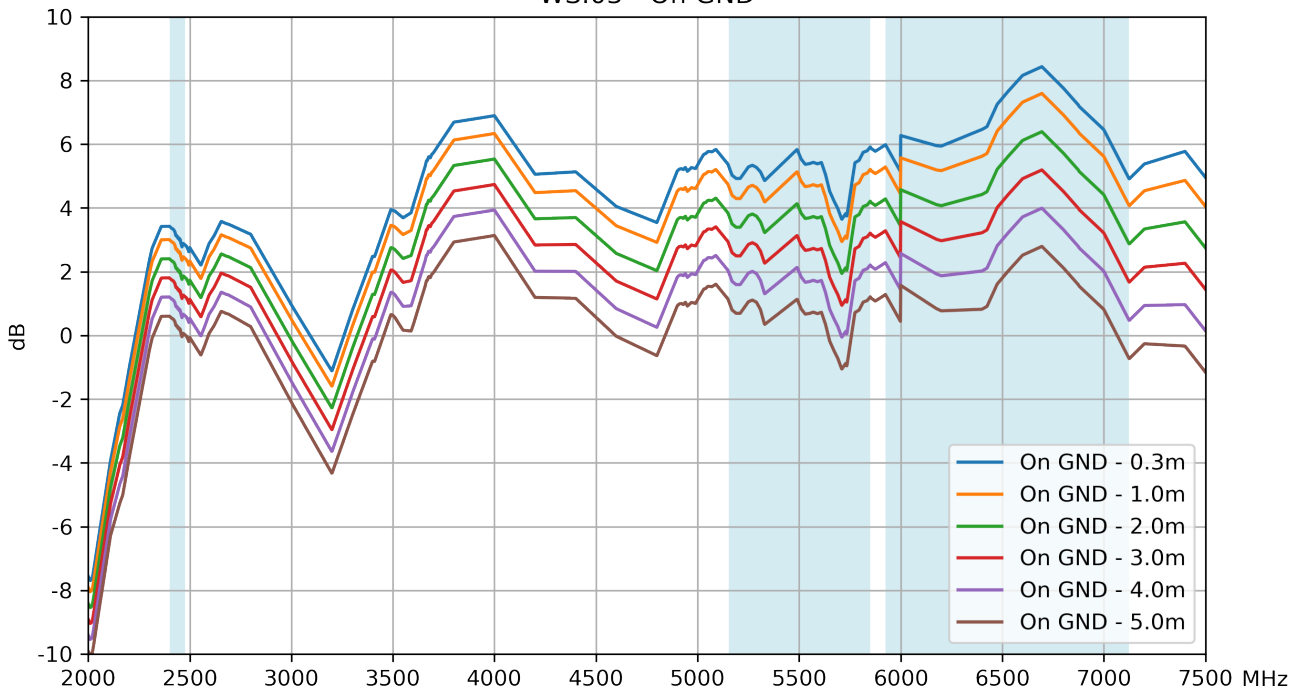


8.3 Peak Gain

WS.03 - Free Space



WS.03 - On GND



8.4 Performance Table

WS.03.B.305151							
Frequency (MHz)		2.4GHz	5GHz	6.175GHz	6.475GHz	6.7GHz	7GHz
		2400-2480	5150-5850	5925-6425	6425-6525	6525-6875	6875-7125
Efficiency (%)							
Free Space	0.3m	48.5	50.1	65.7	68.4	70.5	57.3
	1.0m	44.0	42.9	55.1	56.4	58.1	47.3
	2.0m	38.3	34.4	42.9	42.8	44.1	35.9
	3.0m	33.4	27.5	33.4	32.5	33.5	27.2
	4.0m	29.1	22.0	26.0	24.6	25.4	20.6
	5.0m	25.3	17.7	20.3	18.7	19.3	15.6
On 30x30 cm GND Plane	0.3m	56.0	51.6	63.3	69.1	69.2	57.1
	1.0m	50.9	44.1	53.2	56.9	57.0	47.0
	2.0m	44.3	35.3	41.4	43.2	43.3	35.7
	3.0m	38.6	28.3	32.3	32.8	32.8	27.1
	4.0m	33.6	22.7	25.2	24.9	24.9	20.5
	5.0m	29.3	18.2	19.6	18.9	18.9	15.6
Average Gain (dB)							
Free Space	0.3m	-3.14	-3.00	-1.82	-1.65	-1.52	-2.41
	1.0m	-3.56	-3.67	-2.59	-2.49	-2.36	-3.25
	2.0m	-4.16	-4.64	-3.67	-3.69	-3.56	-4.45
	3.0m	-4.76	-5.60	-4.76	-4.89	-4.76	-5.65
	4.0m	-5.36	-6.57	-5.84	-6.09	-5.96	-6.85
	5.0m	-5.96	-7.53	-6.93	-7.29	-7.16	-8.05
On 30x30 cm GND Plane	0.3m	-2.52	-2.88	-1.98	-1.61	-1.60	-2.44
	1.0m	-2.94	-3.55	-2.74	-2.45	-2.44	-3.28
	2.0m	-3.54	-4.52	-3.83	-3.65	-3.64	-4.48
	3.0m	-4.14	-5.48	-4.91	-4.85	-4.84	-5.68
	4.0m	-4.74	-6.45	-5.99	-6.05	-6.04	-6.88
	5.0m	-5.34	-7.41	-7.08	-7.25	-7.24	-8.08
Peak Gain (dBi)							
Free Space	0.3m	4.33	5.09	5.87	5.07	5.74	4.44
	1.0m	3.91	4.39	5.11	4.23	4.90	3.60
	2.0m	3.31	3.39	4.02	3.03	3.70	2.40
	3.0m	2.71	2.39	2.93	1.83	2.50	1.20
	4.0m	2.11	1.39	1.84	0.63	1.30	-0.00
	5.0m	1.51	0.48	0.76	-0.57	0.10	-1.20
On 30x30 cm GND Plane	0.3m	3.42	5.91	6.55	7.63	8.43	7.23
	1.0m	3.00	5.21	5.71	6.79	7.59	6.39
	2.0m	2.40	4.21	4.57	5.59	6.39	5.19
	3.0m	1.80	3.21	3.57	4.39	5.19	3.99
	4.0m	1.20	2.21	2.57	3.19	3.99	2.79
	5.0m	0.60	1.21	1.57	1.99	2.79	1.59

Changelog for the datasheet

SPE-21-8-022 – WS.03.B.305151

Revision: B (Current Version)

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

Previous Revisions

Revision: A (Original First Release)

Date:	2021-03-31
Notes:	
Author:	Jack Conroy



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