TAOGLAS

Datasheet

Part No:
MPA.66.A

Description

600~7125MHz SMD Stamp Metal PIFA Antenna

Features:

Wideband frequency support: 600 MHz to 7125 MHz
High-performance SMD PIFA (Planar Inverted-F Antenna) design
Compact metal stamp construction for durable integration
Dims: 50.6mm x 10.6mm x 7.3mm
Patent pending
RoHS & Reach Compliant

1. Introduction

The Taoglas MPA.66.A is a patent pending high-performance SMD stamp metal PIFA antenna designed to support ultra-wideband operation across a frequency range of 600 MHz to 6000 MHz. Engineered for next-generation wireless applications, this compact antenna offers consistent performance across a wide array of cellular, IoT, and wireless data bands, including 5G NR, LTE, Wi-Fi®, and NB-IoT.

With a durable stamped metal structure and compact 50.6 x 10.6 x 7.3mm form factor, the MPA.66.A ensures ease of integration into space-constrained designs while maintaining excellent radiation efficiency and gain characteristics. Its Monopole Antenna topology offers effective impedance matching, minimal interference and minimizing the dimension, making it a versatile choice for a wide variety of high-performance wireless devices.

Typical Applications Include:

- Consumer Electronics
- Smart Cities and Infrastructure
- Automotive and Transportation
- Healthcare and Medical Devices
- Public Safety and Emergency Services
- Point-of-Sale (POS) and Kiosks

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

2. Specification

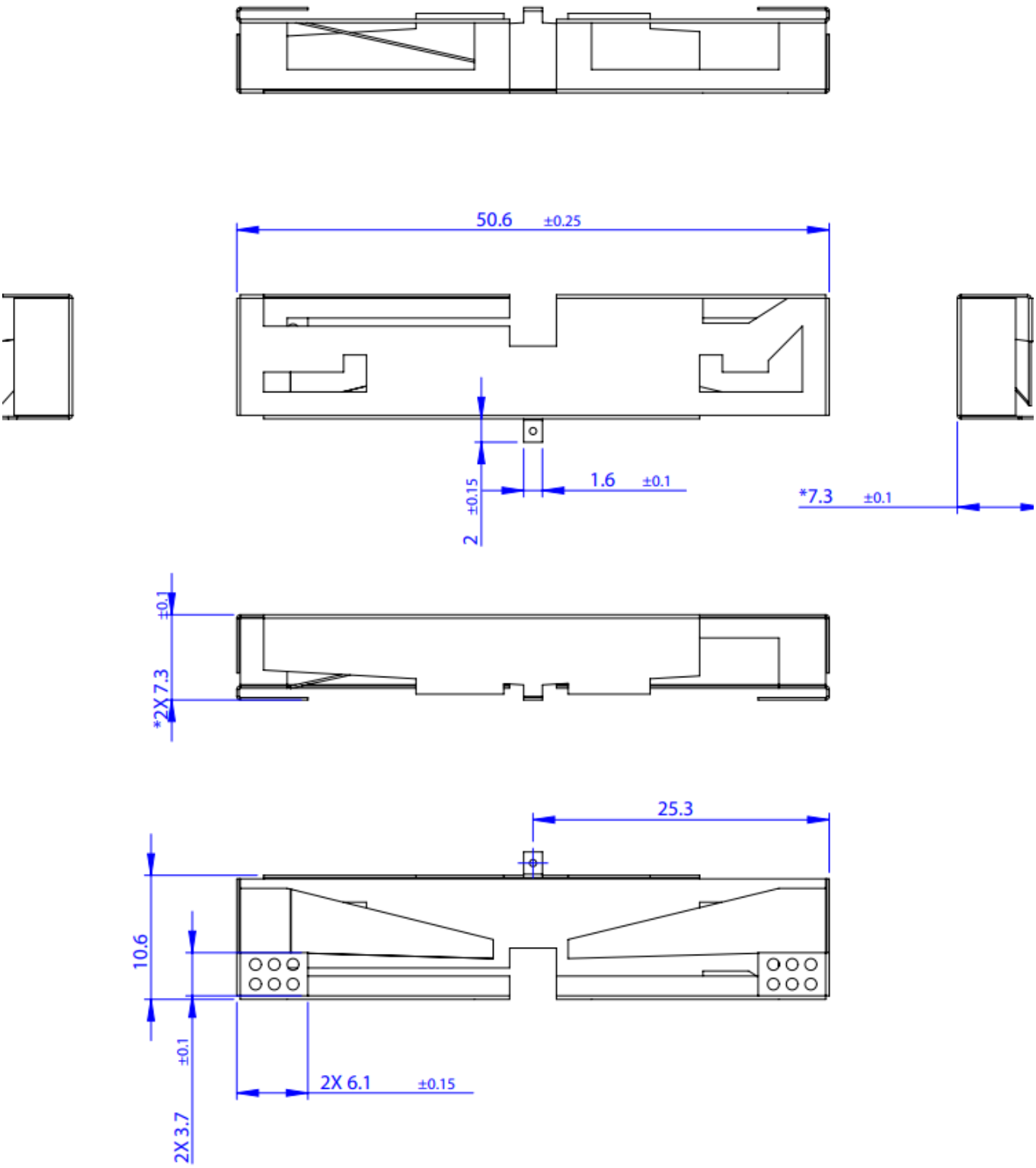
Electrical								
Band	Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
5GNR/4G Band71	617-698	51.4	-2.89	0.13	50 Ω	Linear	Omni directional	10W
4G/3G Band 12,13,14,17,28,29	698-806	64.0	-1.94	1.34				
4G/3G/NB-IoT/Cat M Band 5,8,18,19,20,26,27	824-960	66.7	-1.76	1.81				
5GNR/4G Band 21,32,74,75,76	1427-1518	32.5	-4.89	2.32				
4G/3G Band 1,2,3,4,9,23,25,35,39,66	1710-2200	63.9	-1.94	3.96				
4G/3G Band 7,30,38,40,41	2300-2690	43.4	-3.63	2.11				
5GNR/4G Band 22,42,48,77,78,79	3300-5000	57.6	-2.40	6.73				
LTE5200/Wi-Fi5800	5150-5925	60.5	-2.18	4.06				
WiFi - 6GHz	5925-7125	66.9	-1.75	4.35				

Mechanical	
Dimensions	50.6mm x 10.6mm x 7.3mm
Weight	1.76g
Material	SPTE Tin Plated
Antenna Type	SMD

Environmental	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Relative Humidity	Non-condensing 65°C 95% RH
Moisture Sensitivity Level	3 (168 Hours)

Bands			
Band Number	5GNR / FR1 / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA / NTN		
	Uplink	Downlink	Covered
B1	1920 to 1980	2110 to 2170	✓
B2	1850 to 1910	1930 to 1990	✓
B3	1710 to 1785	1805 to 1880	✓
B4	1710 to 1755	2110 to 2155	✓
B5	824 to 849	869 to 894	✓
B7	2500 to 2570	2620 to 2690	✓
B8	880 to 915	925 to 960	✓
B9*	1749.9 to 1784.9	1844.9 to 1879.9	✓
B11	1427.9 to 1447.9	1475.9 to 1495.9	✓
B12	699 to 716	729 to 746	✓
B13	777 to 787	746 to 756	✓
B14	788 to 798	758 to 768	✓
B17	704 to 716	734 to 746	✓
B18	815 to 830	860 to 875	✓
B19	830 to 845	875 to 890	✓
B20	832 to 862	791 to 821	✓
B21	1447.9 to 1462.9	1495.9 to 1510.9	✓
B22*	3410 to 3490	3510 to 3590	✓
B23 / n23	2000 to 2020	2180 to 2200	✓
B24 / n255	1626.5 to 1660.5	1525 to 1559	✓
B25	1850 to 1915	1930 to 1995	✓
B26	814 to 849	859 to 894	✓
B27*	807 to 824	852 to 869	✓
B28	703 to 748	758 to 803	✓
B29	717 to 728		✓
B30	2305 to 2315	2350 to 2360	✓
B31	452.5 to 457.5	462.5 to 467.5	✗
B32	1452 to 1496		✓
B34	2010 to 2025		✓
B35	1850 to 1910		✓
B36	1930 to 1990		✓
B37	1910 to 1930		✓
B38	2570 to 2620		✓
B39	1880 to 1920		✓
B40	2300 to 2400		✓
B41	2496 to 2690		✓
B42	3400 to 3600		✓
B43	3600 to 3800		✓
B45	1447 to 1467		✓
B46	5150 to 5925		✓
B47	5855 to 5925		✓
B48	3550 to 3700		✓
B49	3550 to 3700		✓
B50	1432 to 1517		✓
B51	1427 to 1432		✓
B52	3300 to 3400		✓
B53	2483.5 to 2495		✓
B65	1920 to 2010	2110 to 2200	✓
B66	1710 to 1780	2110 to 2200	✓
B68	698 to 728	753 to 783	✓
B69	2570 to 2620		✓
B70	1695 to 1710	1995 to 2020	✓
B71	663 to 698	617 to 652	✓
B72	451 to 456	461 to 466	✗
B73	450 to 455	460 to 465	✗
B74	1427 to 1470	1475 to 1518	✓
B75	1432 to 1517		✓
B76	1427 to 1432		✓
B77	3300 to 4200		✓
B78	3300 to 3800		✓
B79	4400 to 5000		✓
B85	698 to 716	728 to 746	✓
B87	410 to 415	420 to 425	✗
B88	412 to 417	422 to 427	✗
n256	1980 to 2010	2170 2200	✓

3. Mechanical Drawing



4. Antenna Integration Guide

The following is an example on how to integrate the MPA.66.A into a design. This antenna has 3 pins, where one pin is used for the RF Feed. Taoglas recommends using a minimum of 125x25mm ground plane (PCB) to ensure optimal performance.

Top view of PCB

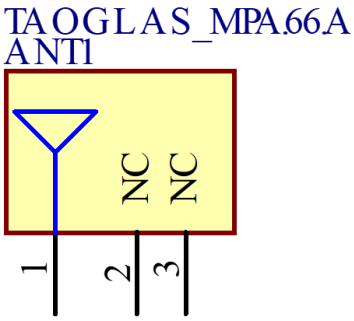
Please find the Integration files in Altium, 2D formats and the 3D model for the MPA.66.A here:
NEED LINK

4.1 Schematic Symbol and Pin Definitions

Above is a 3D model of the MPA.66.A on a PCB

The circuit symbol for the MPA.66.A is shown below. The antenna has 3 pins as indicated below.

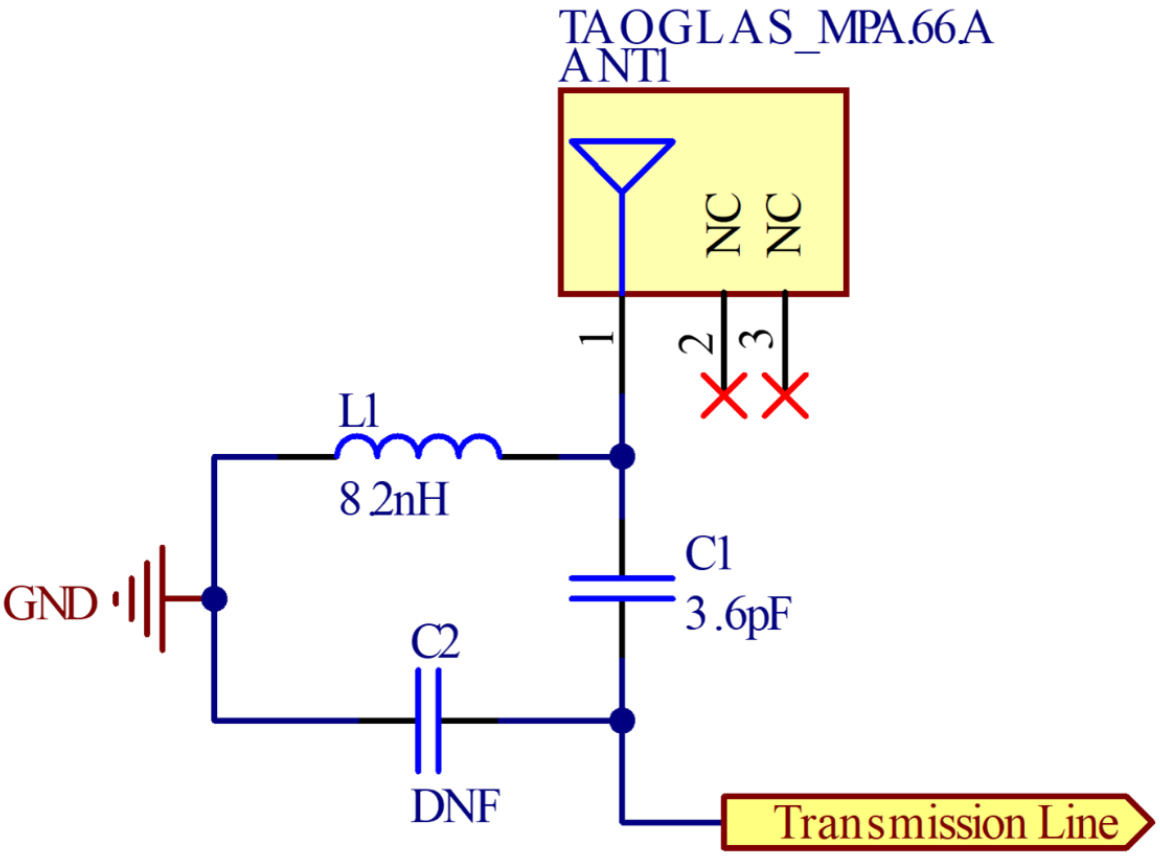
Pin	Description
1	RF Feed
2,3	No Connection



Above is a schematic symbol of MPA.66.A and a table of the pin definitions.

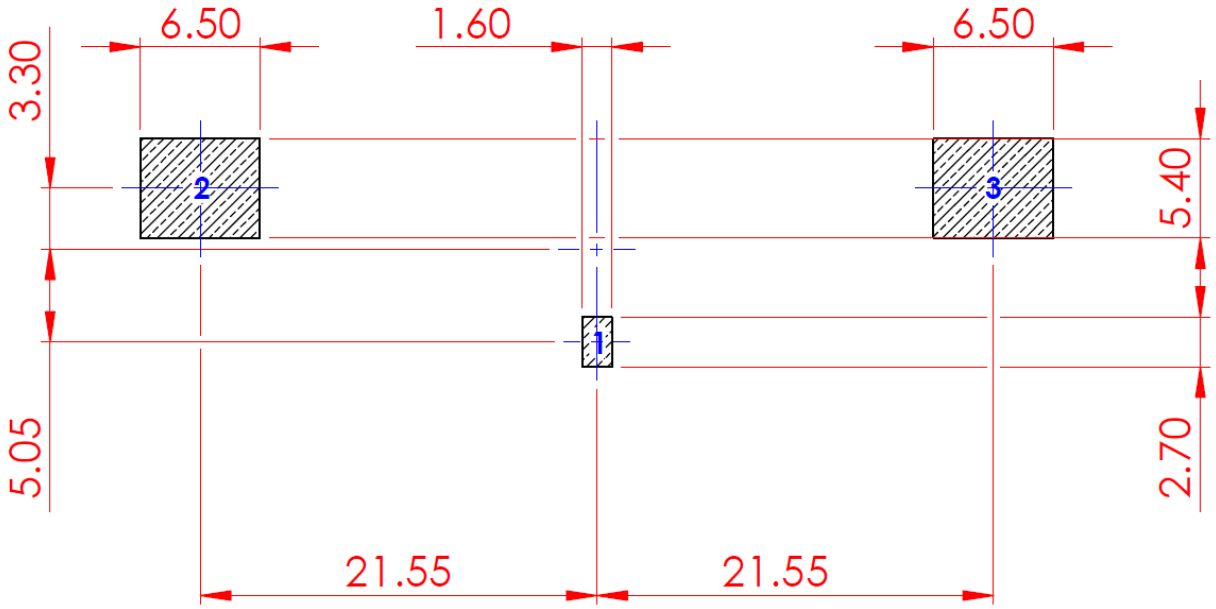
4.2 Schematic Layout

Matching components with the MPA.66.A are required for the antenna to have optimal performance in the spaces specified in the schematic below. Additional matching components may be necessary for your device, Taoglas recommends incorporating extra component footprints, forming a “pi” network, for the MPA.66.A.

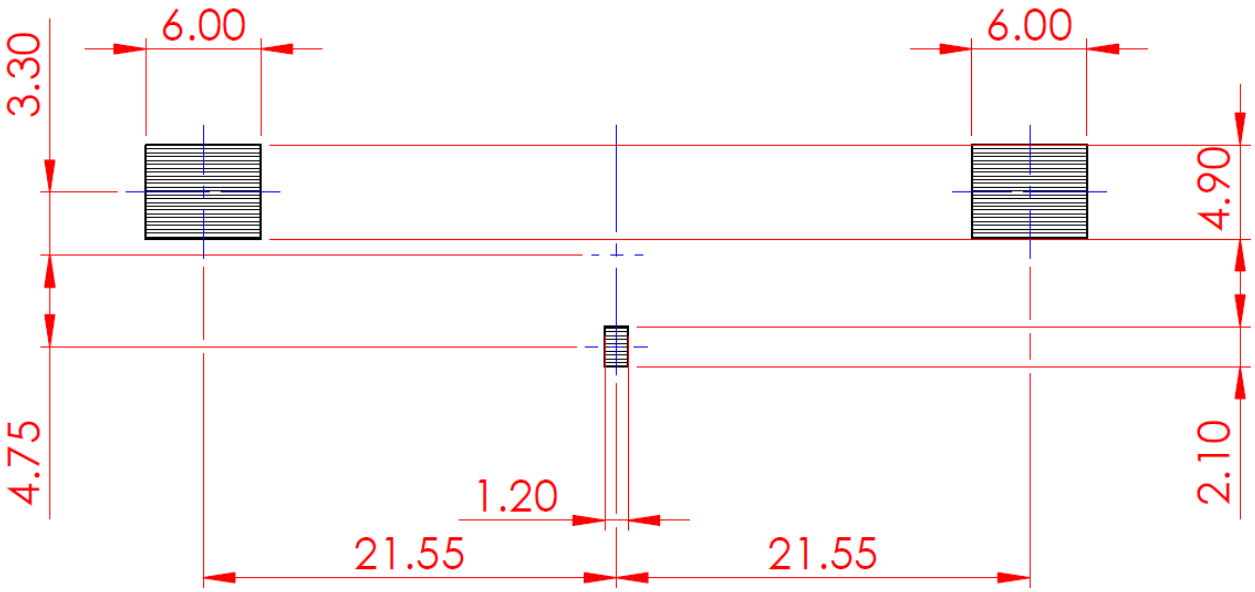


Designator	Type	Value	Manufacturer	Manufacturer Part Number
C1	Capacitor	3.6pF	Murata	GRM1555C1H3R6CA01D
C2	Capacitor	Not Fitted	-	-
L1	Inductor	8.2nH	TDK	MLK1005S8N2DT000

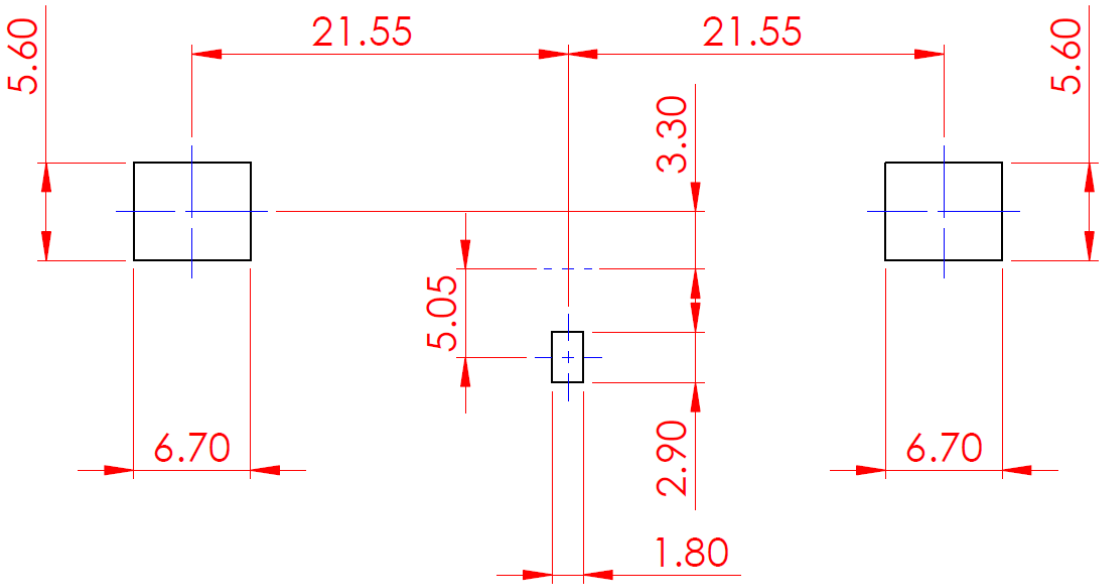
4.3 Antenna Footprint



4.4 Top Solder Paste



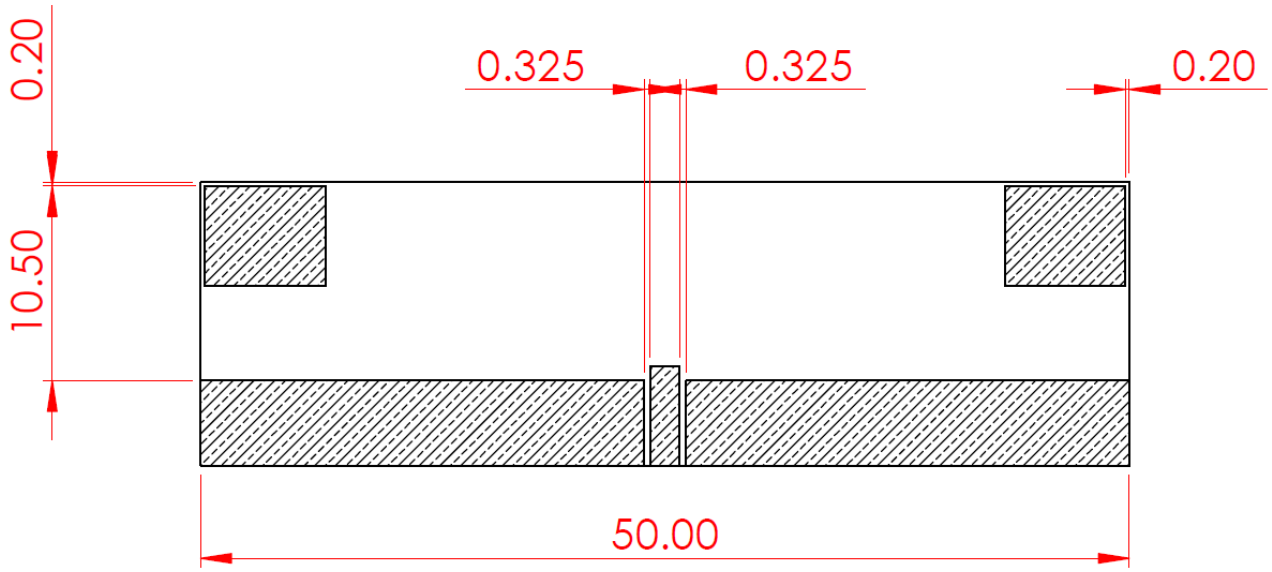
4.5 Top Solder Mask



4.6 Copper Clearance

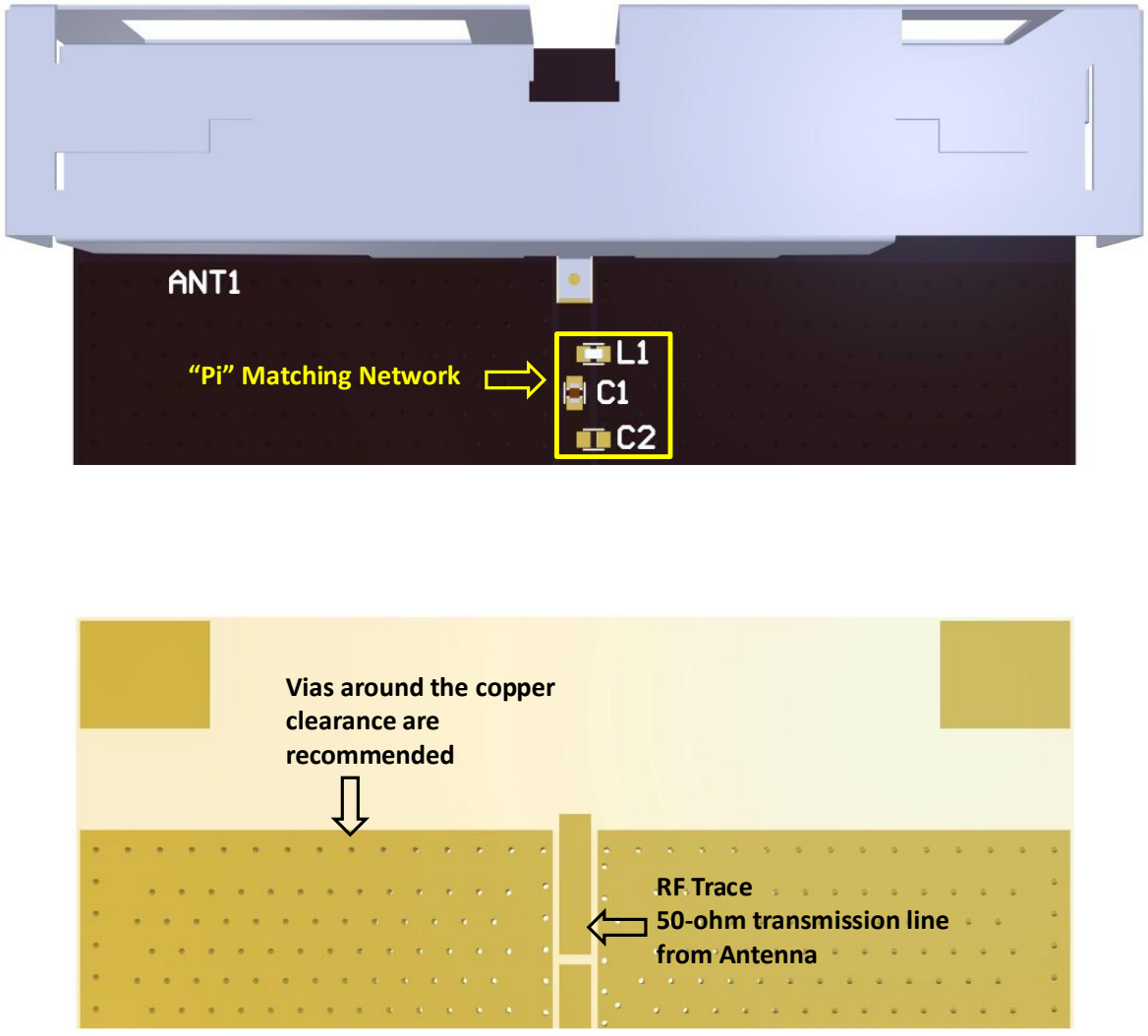
The footprint and clearance on the PCB must comply with the antenna's specification. The PCB layout shown in the diagrams below demonstrates the MPA.66.A clearance area. The copper keep out area applies to all layers that are below the MPA.66.A.

The copper clearance area should extend to 5.1mm from the mechanical pads to the ground plane. The PCB edge clearance should be 0.2mm.



4.7 Antenna Integration

The MPA.66.A should be placed in the centre, as close to the edge on the long side of the PCB as possible, to take advantage of the ground plane. The RF trace must maintain a 50 Ohm transmission line. A “pi” Matching Network is recommended for the RF transmission line, the values and components for the matching circuit will depend on the tuning needed. Ground vias should be placed around the transmission line and the copper clearance area.



MPA.66.A antenna mounted on a PCB, showing transmission lines and integration notes.

4.8 Final Integration

The top side image shown below highlights the antenna transmission line. Taoglas recommends using a minimum of 125x25mm ground plane (PCB) to ensure optimal performance.

Top Side (MPA.66.A placement on 50x50mm PCB)

Bottom Side (MPA.66.A placement on 50x50mm PCB)

5. Packaging

400 PCS / Reel
SPQ Label

400 PCS / Vacuum bag
1 PCS / Humidity test paper
2 PCS / 3g Desiccant

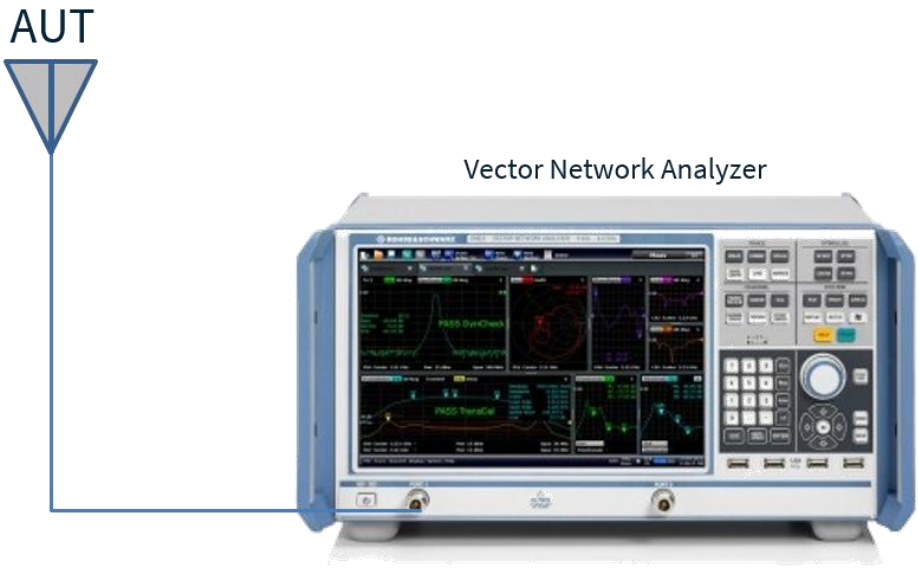
MSL Label
Caution Label
SPQ Label

400 PCS / White box
Box(mm): 335x335x85
SPQ Label
Weight (kg): 0.77 ±3%

1200 PCS / Carton
Carton(mm): 370x360x275
Carton Label
Weight (kg): 3 ±3%

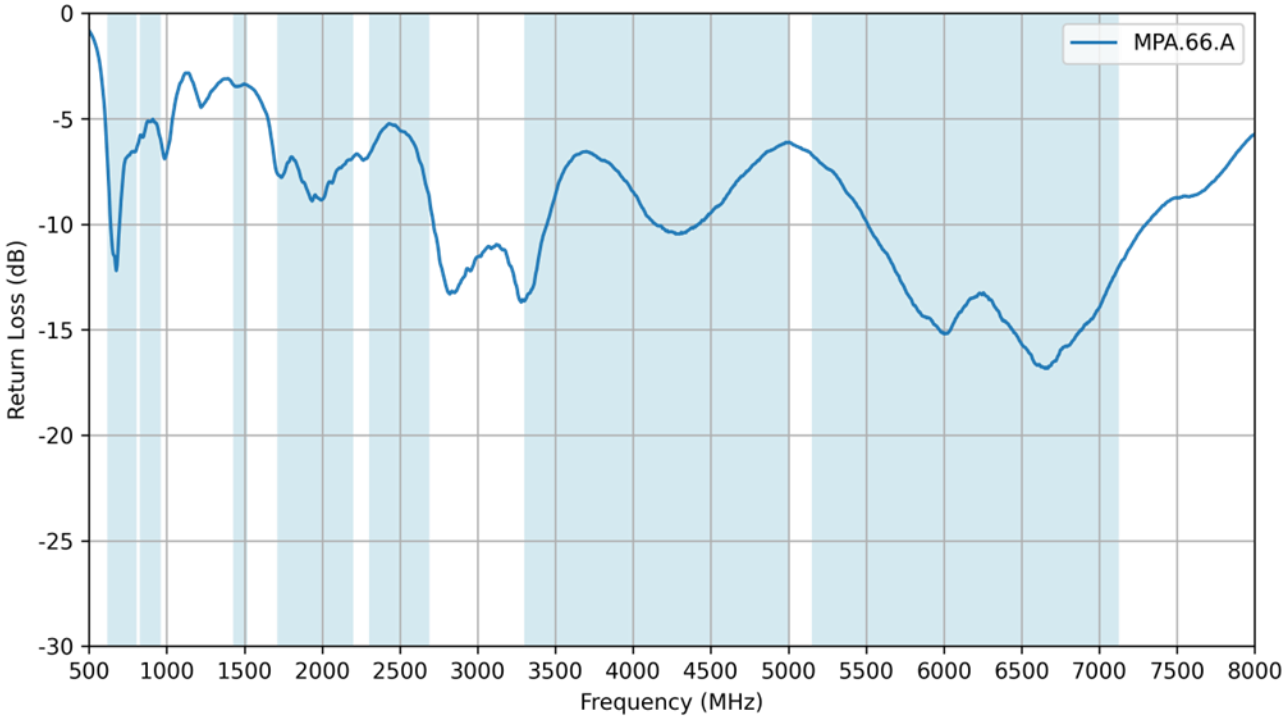
6. Antenna Characteristics

6.1 Test Setup

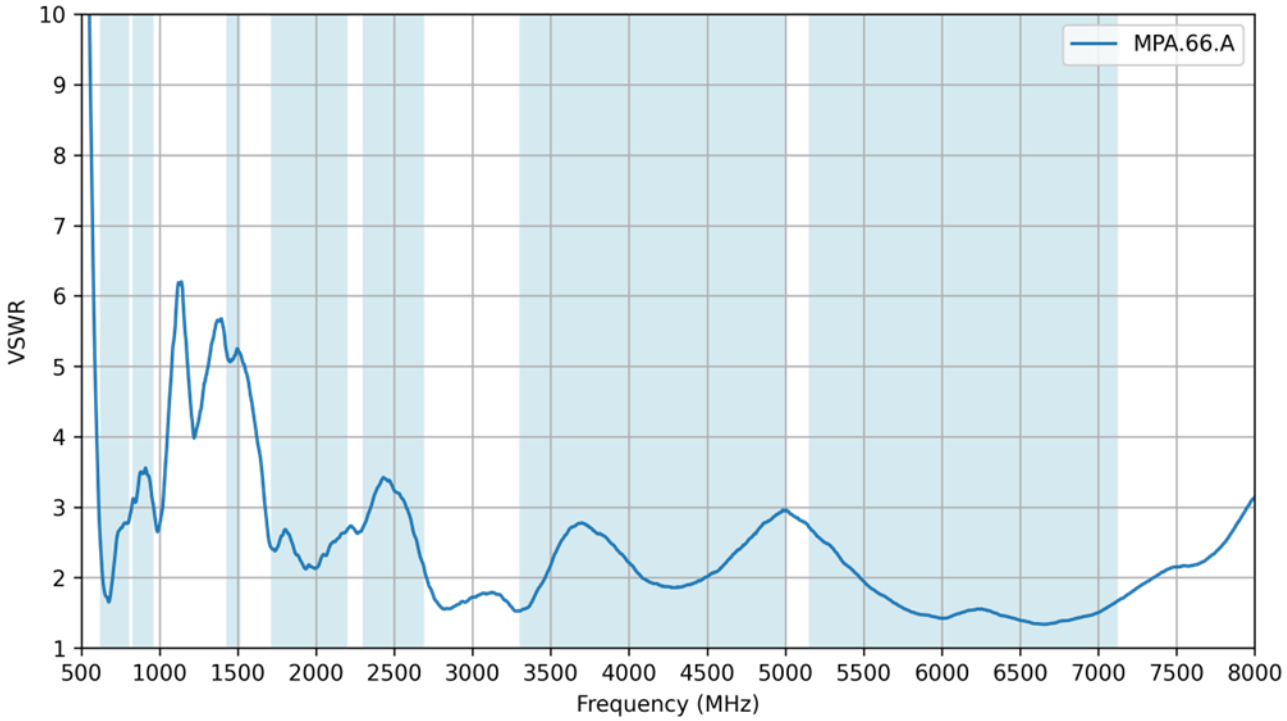


VNA Test Set-up

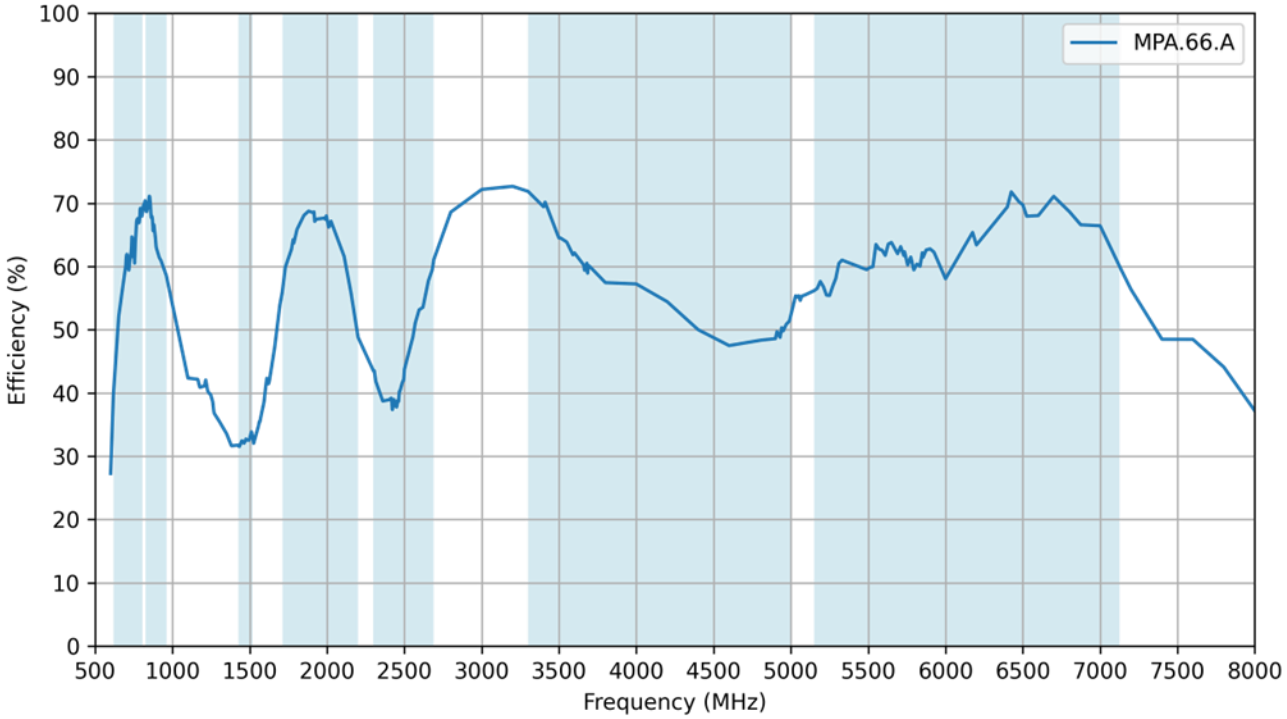
6.2 Return Loss



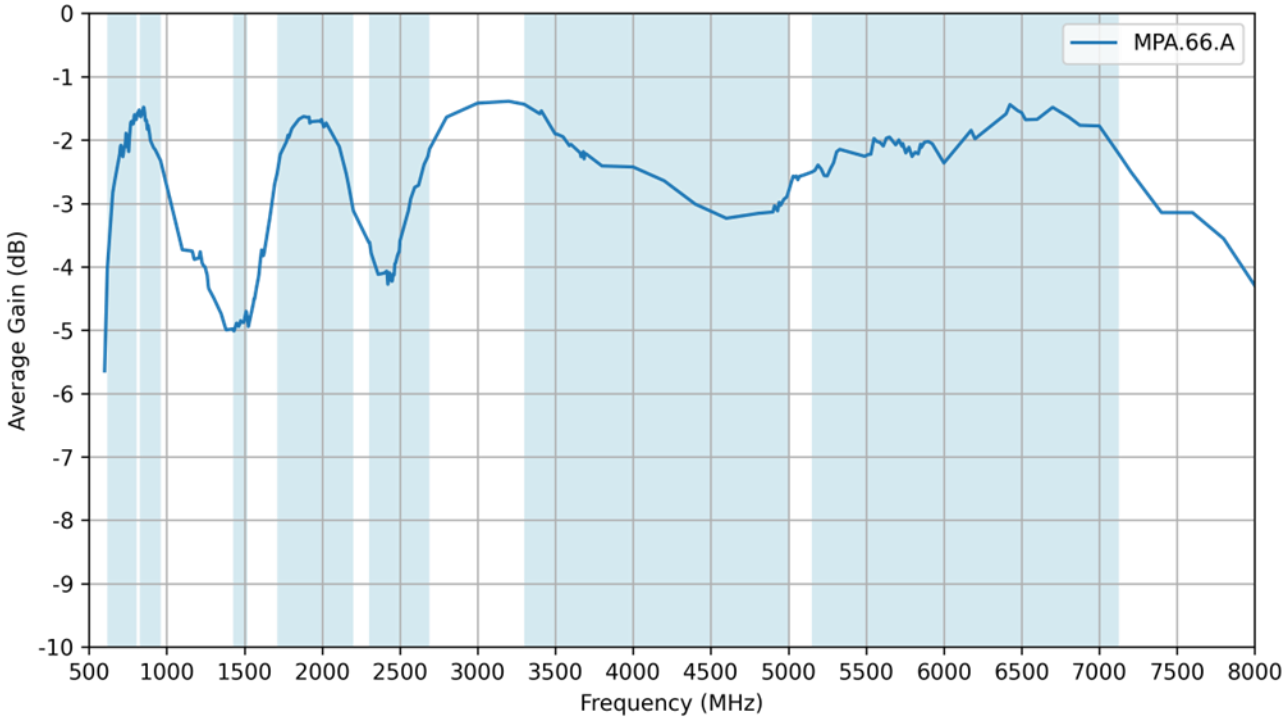
6.3 VSWR



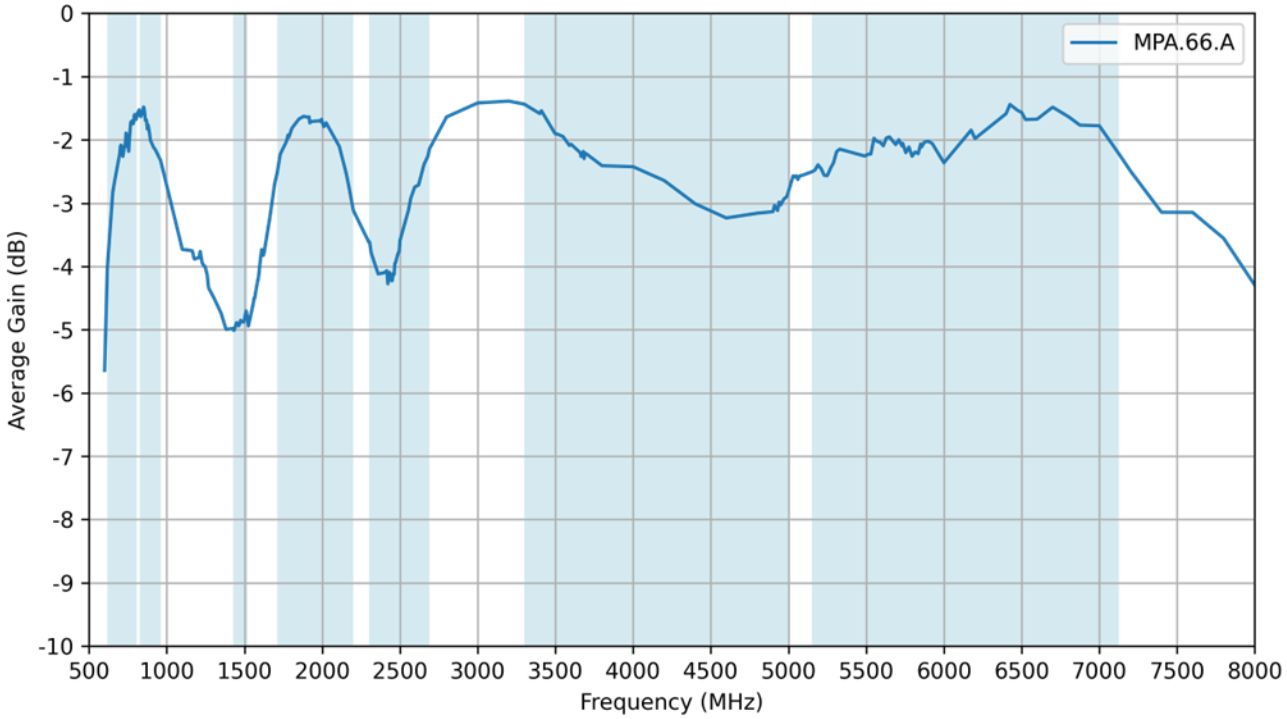
6.4 Efficiency



6.5 Average Gain

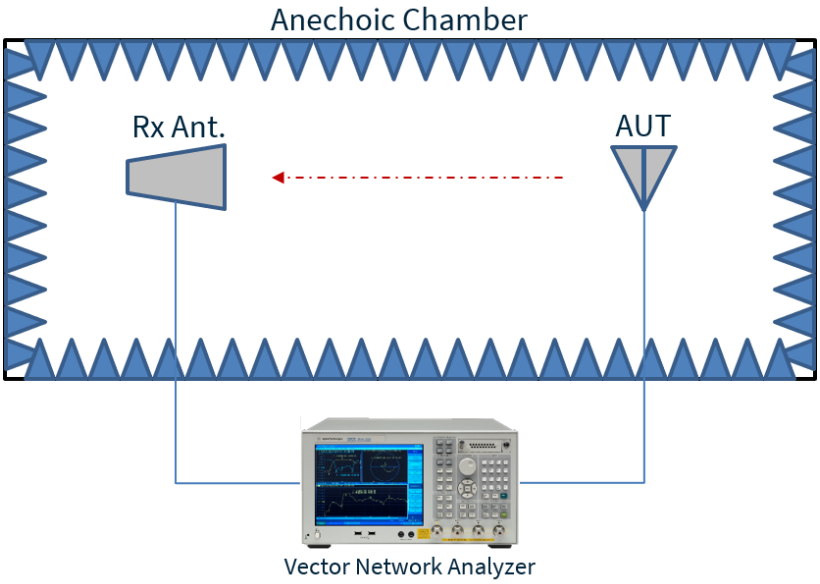


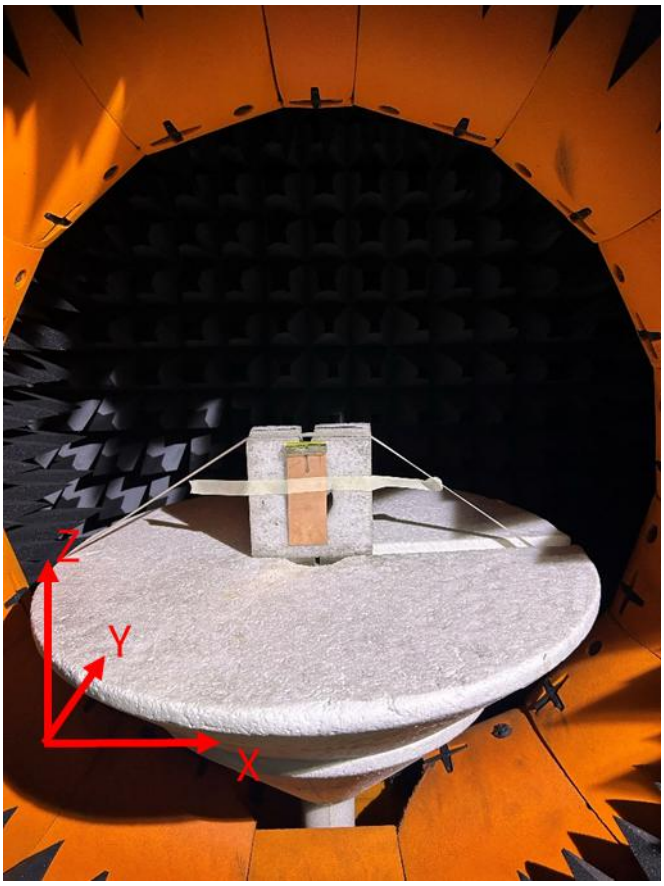
6.6 Peak Gain


MPA.66.A
Average Gain (dB)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Frequency (MHz)

7. Radiation Patterns

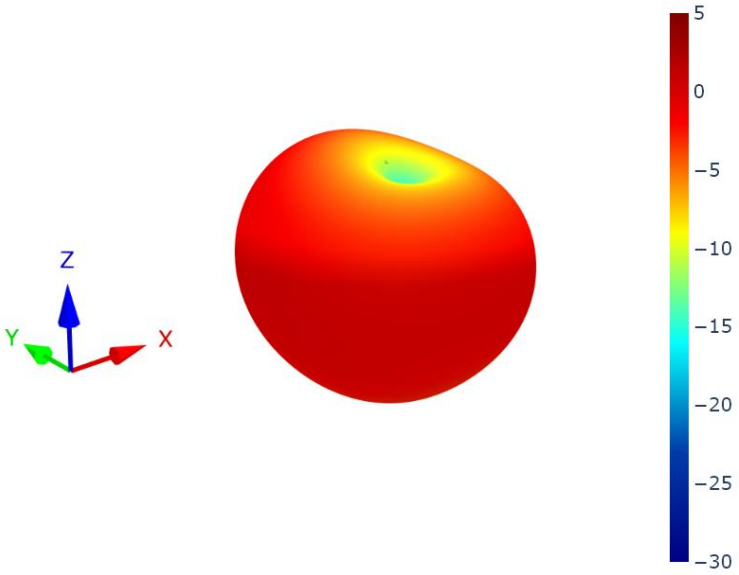
7.1 Test Setup



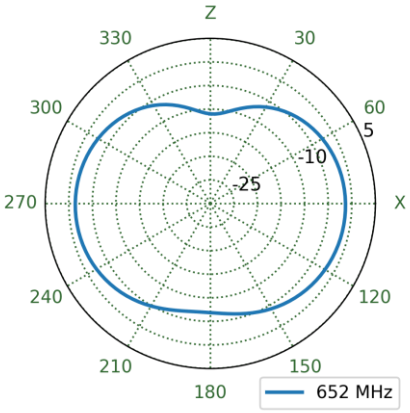


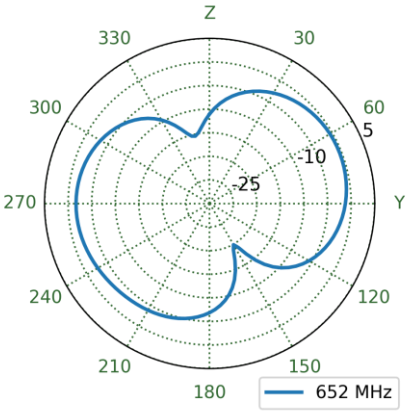
Chamber Test Set-up

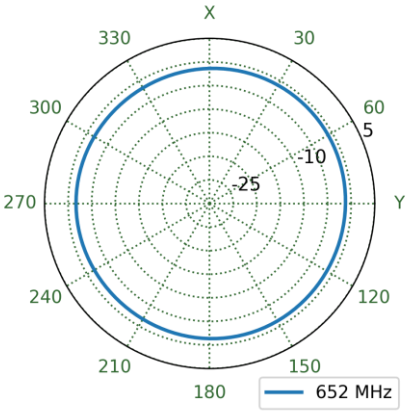
7.2 Patterns at 652 MHz



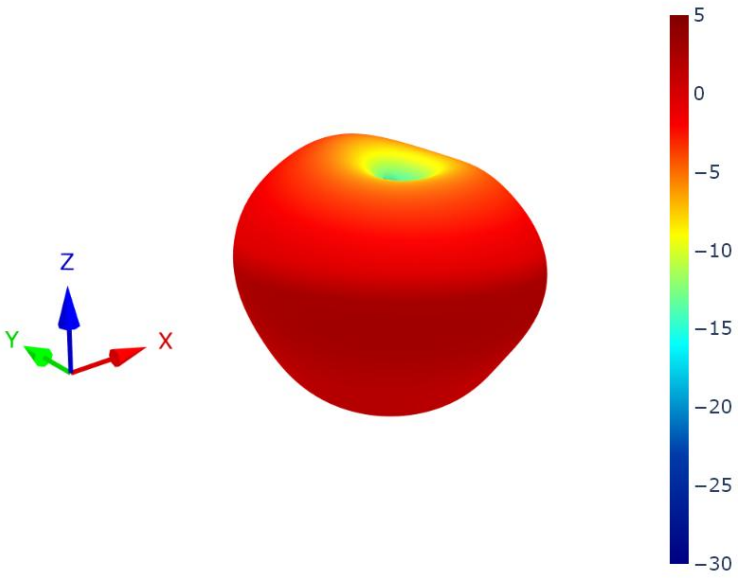
XZ Plane	YZ Plane	XY Plane



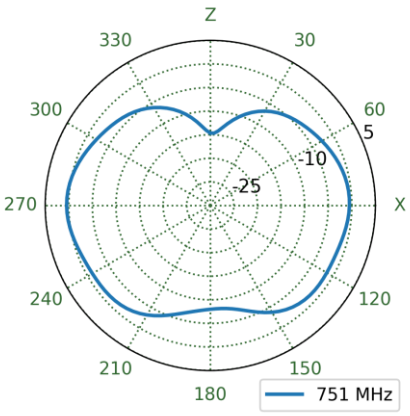


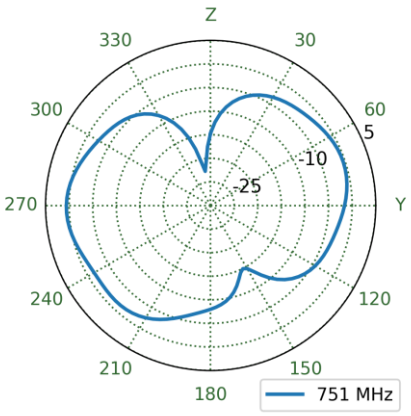


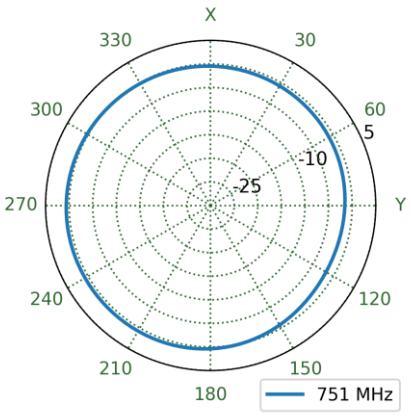
7.3 Patterns at 751 MHz



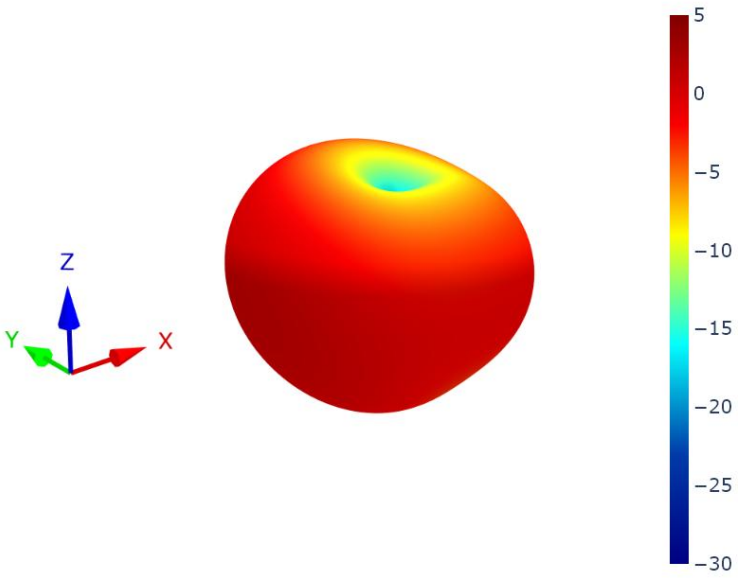
XZ Plane	YZ Plane	XY Plane

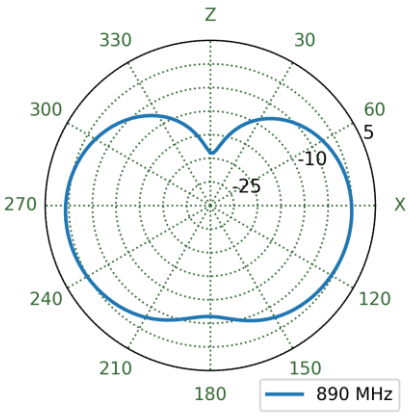
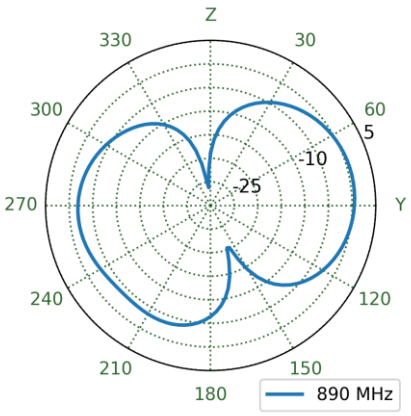
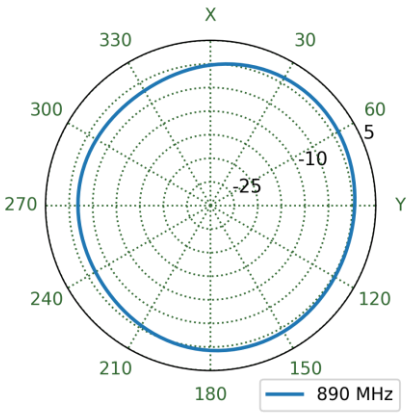




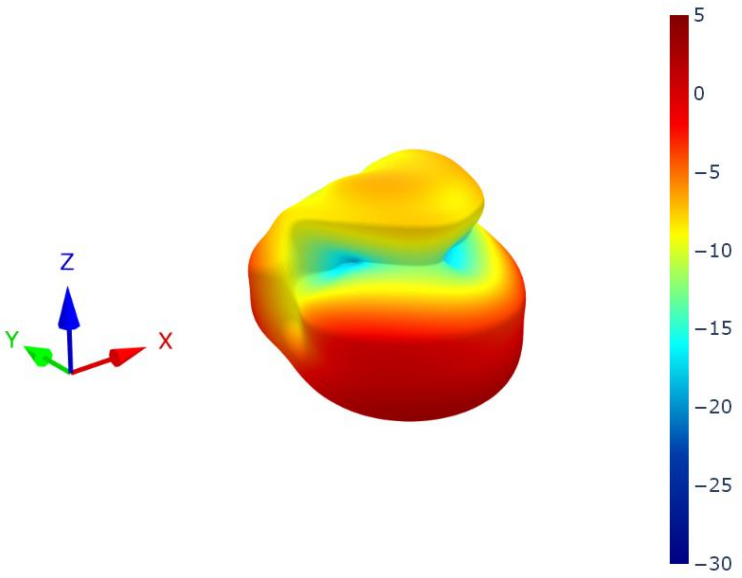


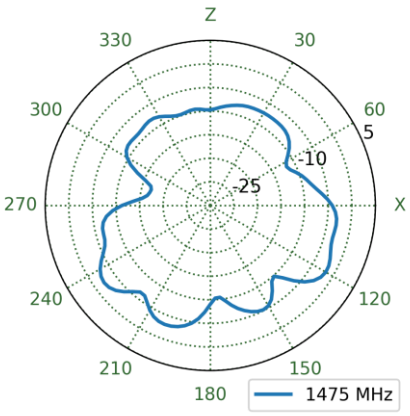
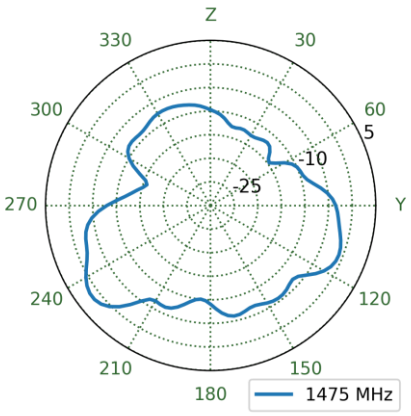
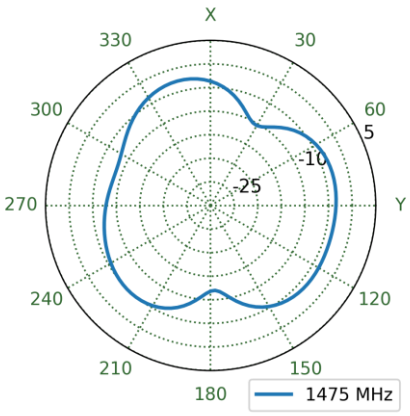
7.4 Patterns at 890 MHz



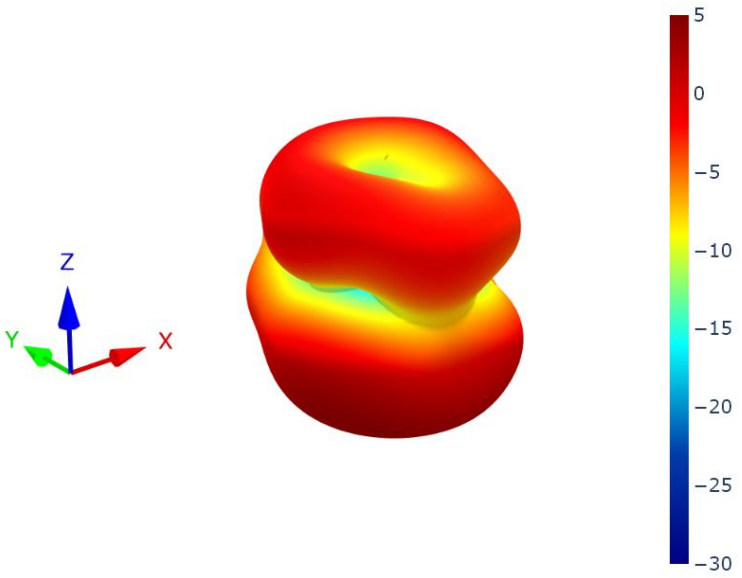
XZ Plane	YZ Plane	XY Plane
		

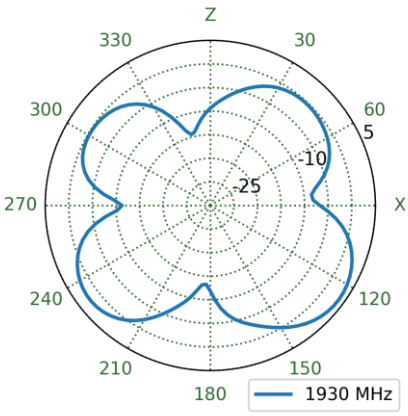
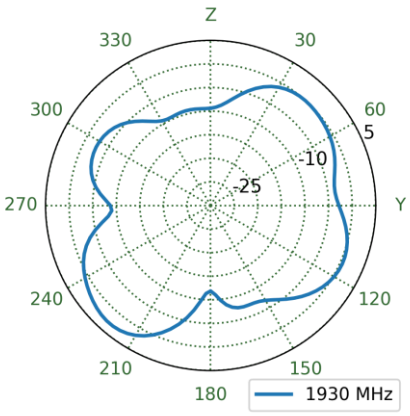
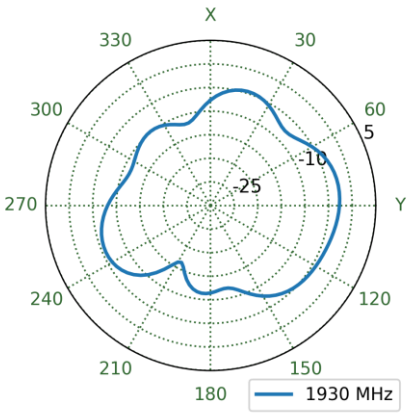
7.5 Patterns at 1475 MHz



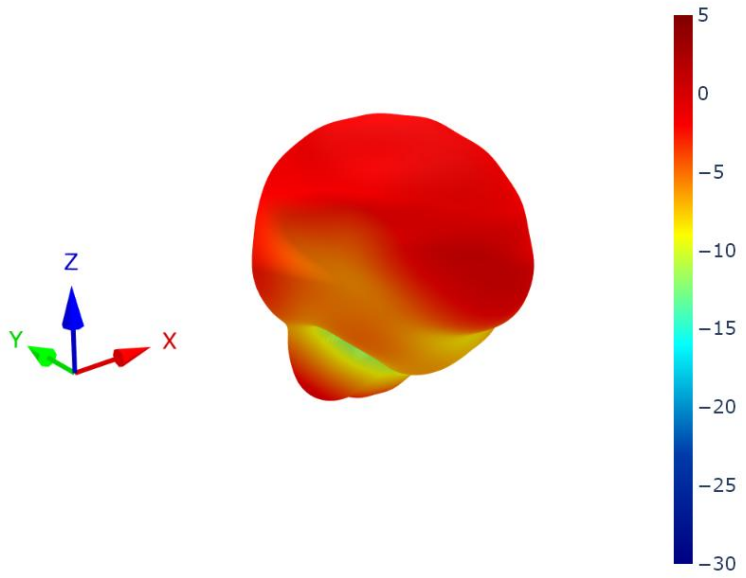
XZ Plane	YZ Plane	XY Plane
		

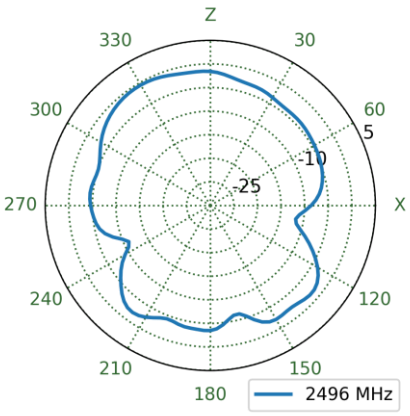
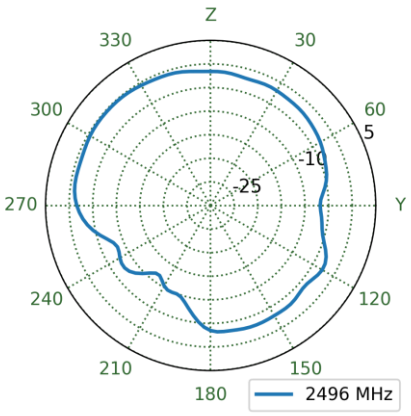
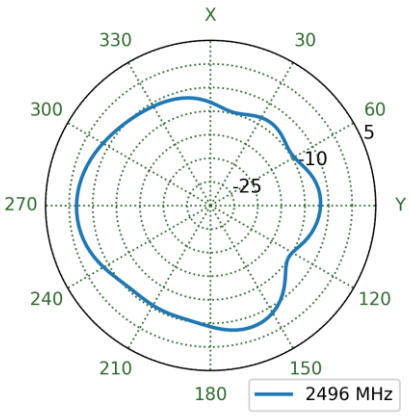
7.6 Patterns at 1930 MHz



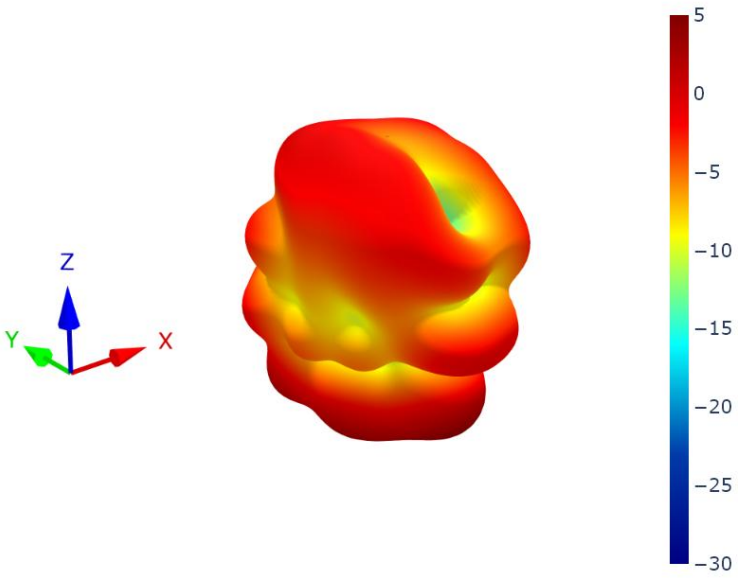
XZ Plane	YZ Plane	XY Plane
		

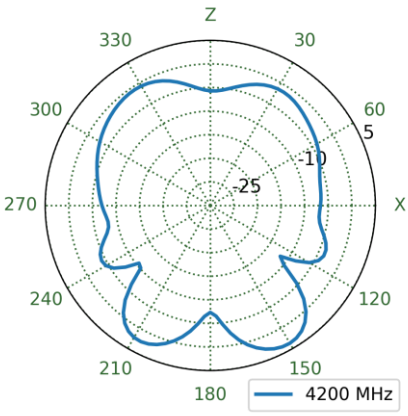
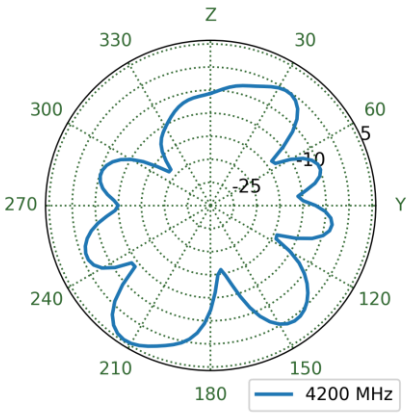
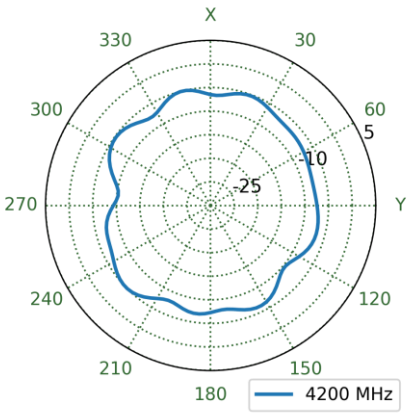
7.7 Patterns at 2496 MHz



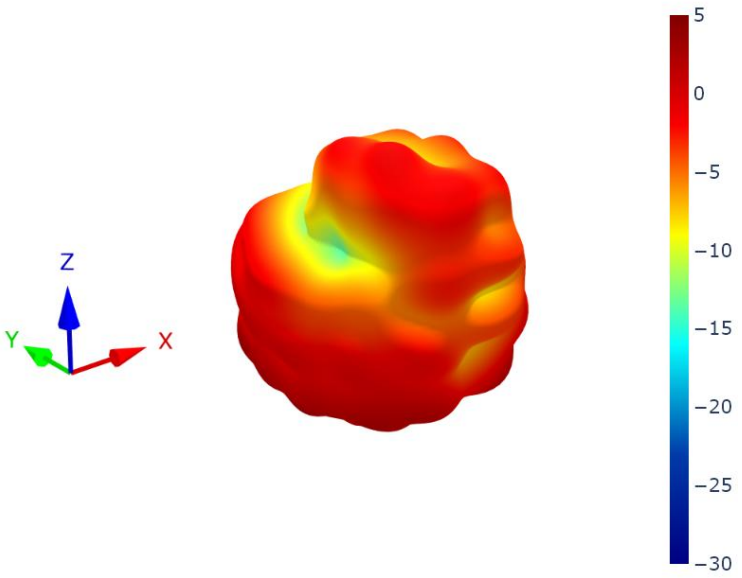
XZ Plane	YZ Plane	XY Plane
		

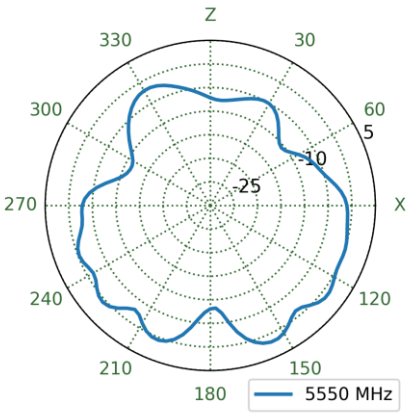
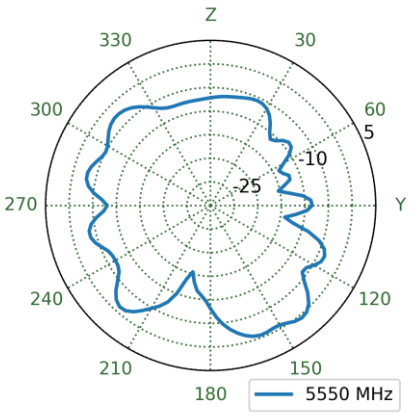
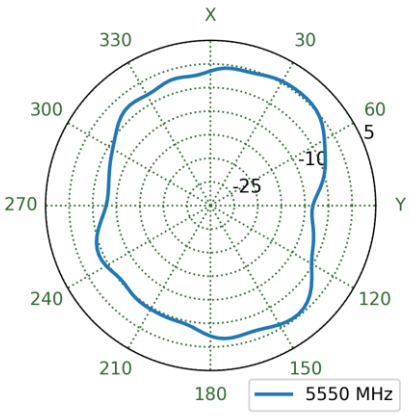
7.8 Patterns at 4200 MHz



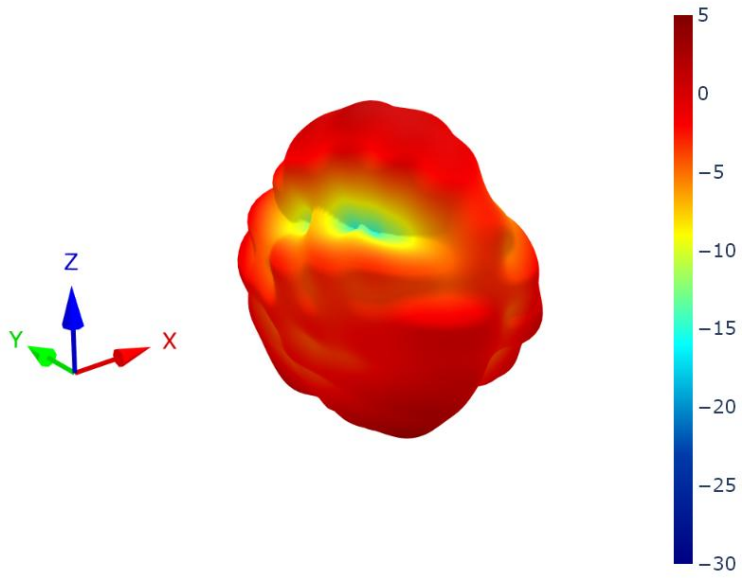
XZ Plane	YZ Plane	XY Plane
		

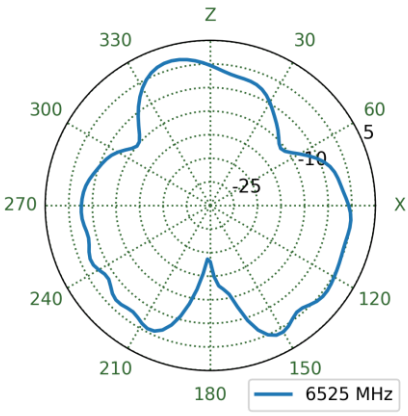
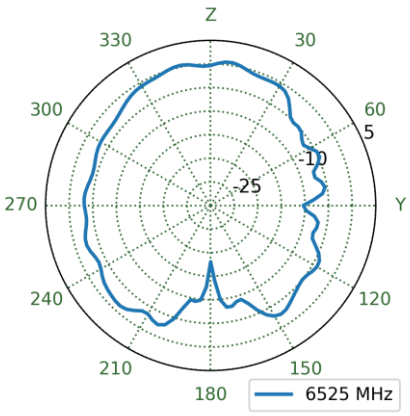
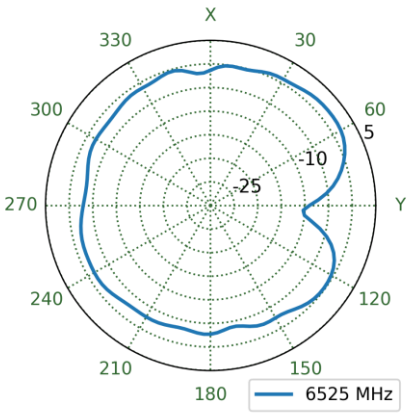
7.9 Patterns at 5550 MHz



XZ Plane	YZ Plane	XY Plane
		

7.10 Patterns at 6525 MHz



XZ Plane	YZ Plane	XY Plane
		

Changelog for the datasheet

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Date:	2025-06-11
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Author:	Gary West

Previous Revisions

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