TAOGLAS

Datasheet

Part No:
PCS.62.A

Description

Low Profile Wideband SMD Antenna 617-6000MHz 38mm x 10.3mm x 3mm

Features:

Low Profile Wideband SMD Antenna
Covering 617-6000MHz
High efficiency across all bands
Dims: 38mm x 10.3mm x 3mm
RoHS & Reach Compliant

1. Introduction

The Taoglas PCS.62.A is a revolutionary cellular, low profile, small footprint, patent pending, SMD mount PCB ultra wide-band antenna. The PCS.62.A has been designed to cover global cellular bands across the 600MHz to 6000MHz spectrum in a very small footprint of just 38 x 10.3mm. The low-profile height of just 3mm makes it ideal for installations where space is at a premium.

Typical applications include

- Smart Metering
- Smart City Infrastructure
- Automotive Systems
- Wearable and Medical Devices
- Surveillance Systems

The unique design uses printed circuit board material and innovative design techniques to deliver high efficiency at all bands when mounted to the device PCB. The PCS.62.A is suitable for lower cost cellular applications, especially IoT projects requiring wide bandwidth and comes supplied on tape and reel to allow it to be mounted via 'pick & place' onto the PCB.

If tuning is required, it can also be tuned specifically depending on device environment. Contact your local Taoglas customer support team for advice on integrating the PCS.62.A into your device.

2. Specification

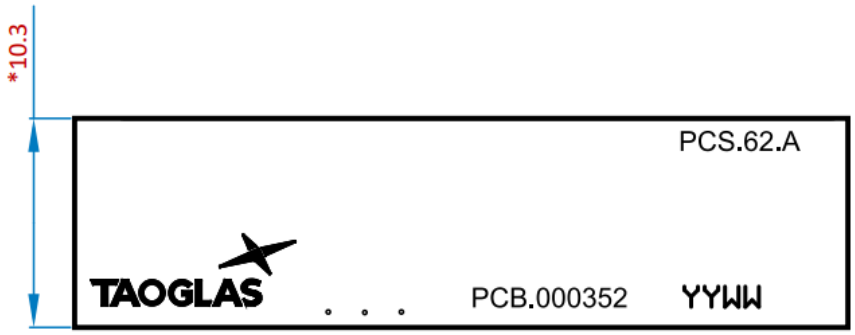
LTE Electrical								
Band	Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
5GNR/4G Band71	617-698	31.6	-5.01	-1.14	50 Ω	Linear	Omni directional	10W
4G/3G Band 12,13,14,17,28	698-894	66.7	-1.76	2.56				
GSM, UMTS, LTE Band 5,8	880-960	60.1	-2.21	2.78				
LTE, 5G NR (L-band) Band 32,42, 43	1427-1661	29.9	-5.24	2.30				
5GNR/4G Band 2,4,10,25,66	1695-2200	60.0	-2.22	4.44				
LTE, 5G NR Band 40	2300-2400	58.4	-2.33	3.83				
LTE, 5G NR Band 7,38,41	2484-2690	47.4	-3.24	4.42				
5G NR Band 77,78	3300-4200	61.0	-2.15	7.47				
5G NR Band 79	4400-5000	58.4	-2.34	6.63				
Wi-Fi (5 GHz band) Band 46,96	5150-5925	53.7	-2.70	5.63				

Mechanical	
Dimensions	38mm x 10.3mm x 3mm
Weight	2.5g
Material	FR4
Termination	Solder Pad

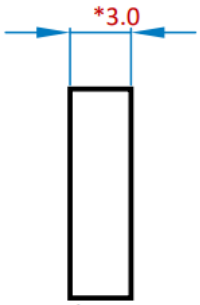
Environmental	
Operation Temperature	-40 to 85°C
Storage Temperature	-40 to 85°C
Moisture Sensitivity Level	3
Relative Humidity	Non-condensing 65°C 95% RH

5G/4G 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 to 2200	✓

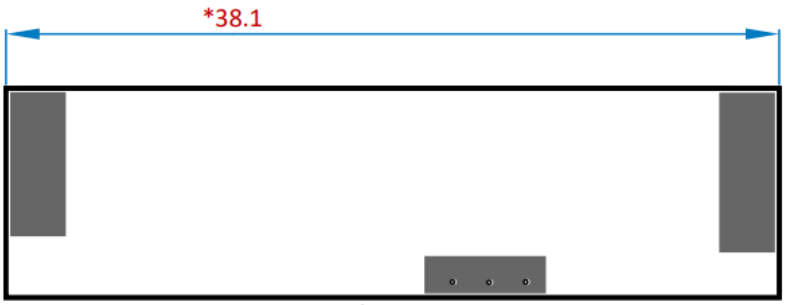
3. Mechanical Drawing



Front View



Side View



Back View

4. Antenna Integration Guide

The following is an example on how to integrate the PCS.62.A into a design. This antenna has 3 pins, where one pin is used for the RF Feed. Taoglas recommends using a minimum of 133 x 38mm ground plane (PCB) to ensure optimal performance.

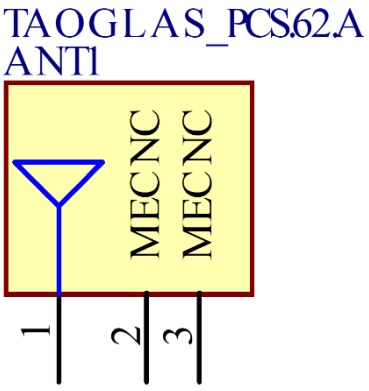
Top view of PCB.

4.1 Schematic Symbol and Pin Definitions

Above is a 3D model of the PCS.62.A on a PCB.

The circuit symbol for the PCS.62.A is shown below. The antenna has 3 pins as indicated below.

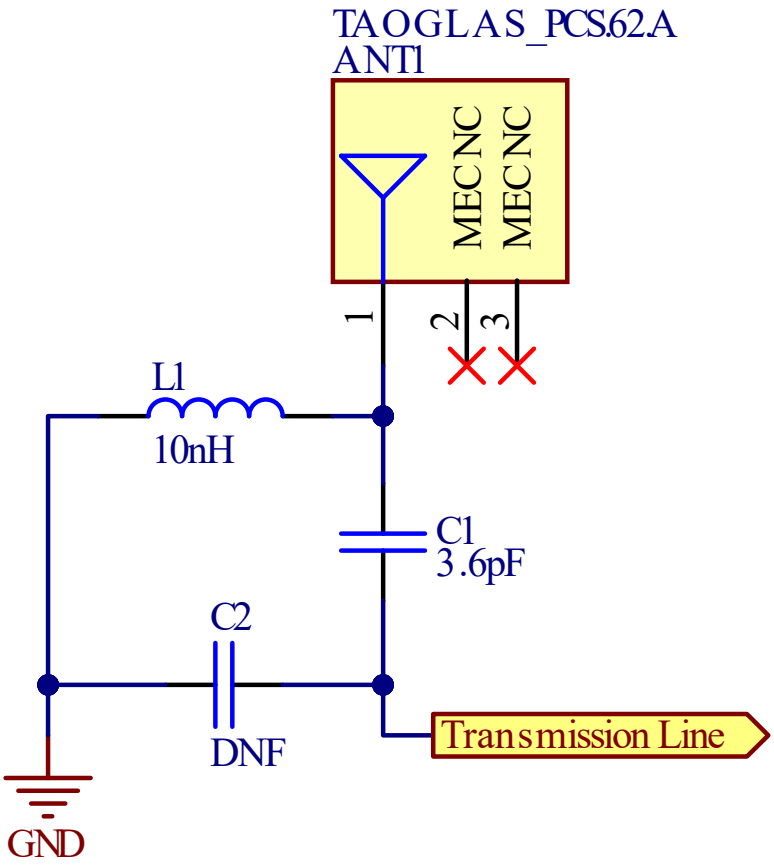
Pin	Description
1	RF Feed
2, 3	Mechanical, No Connection



Above is a schematic symbol of PCS.62.A and a table of the pin definitions.

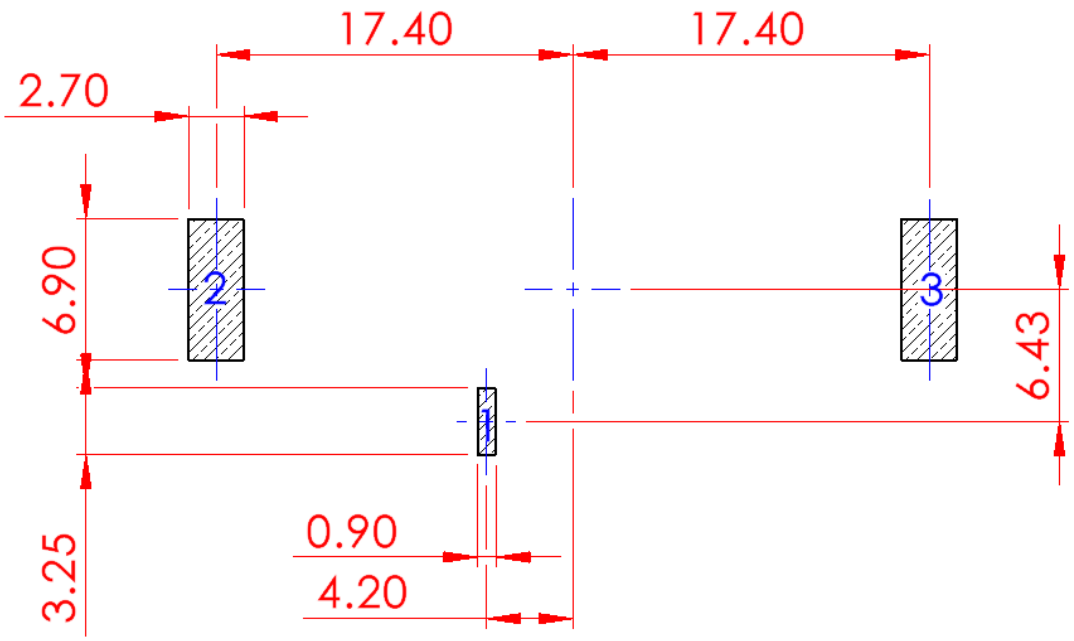
4.2 Schematic Layout

Matching components with the PCS.62.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 PCS.62.A.



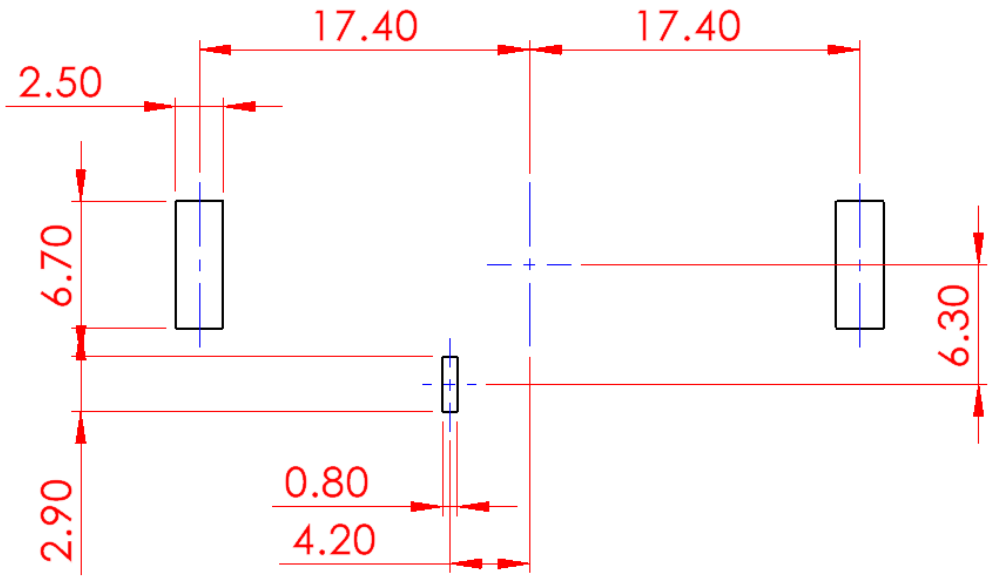
Designator	Type	Value	Manufacturer	Manufacturer Part Number
C1	Capacitor	3.6pF	Murata	GRM1555C1H3R6CA01D
C2	Capacitor	Not Fitted	-	-
L1	Inductor	10nH	TDK	MHQ1005P10NJT000

4.3 Antenna Footprint

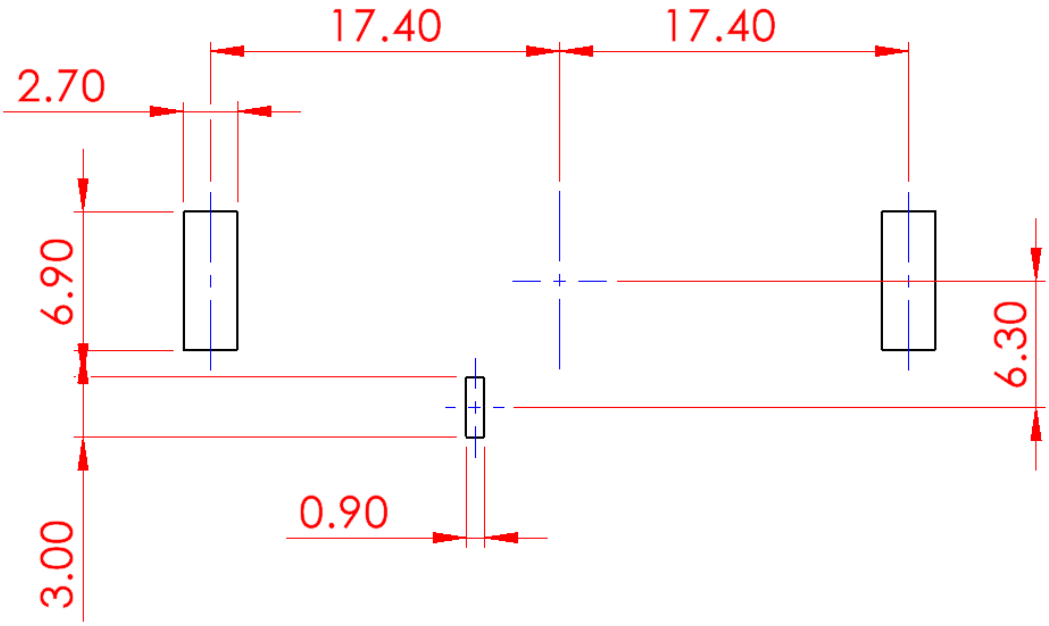


Pin	Description
1	RF Feed
2, 3	Mechanical, No Connection

4.4 Top Solder Paste

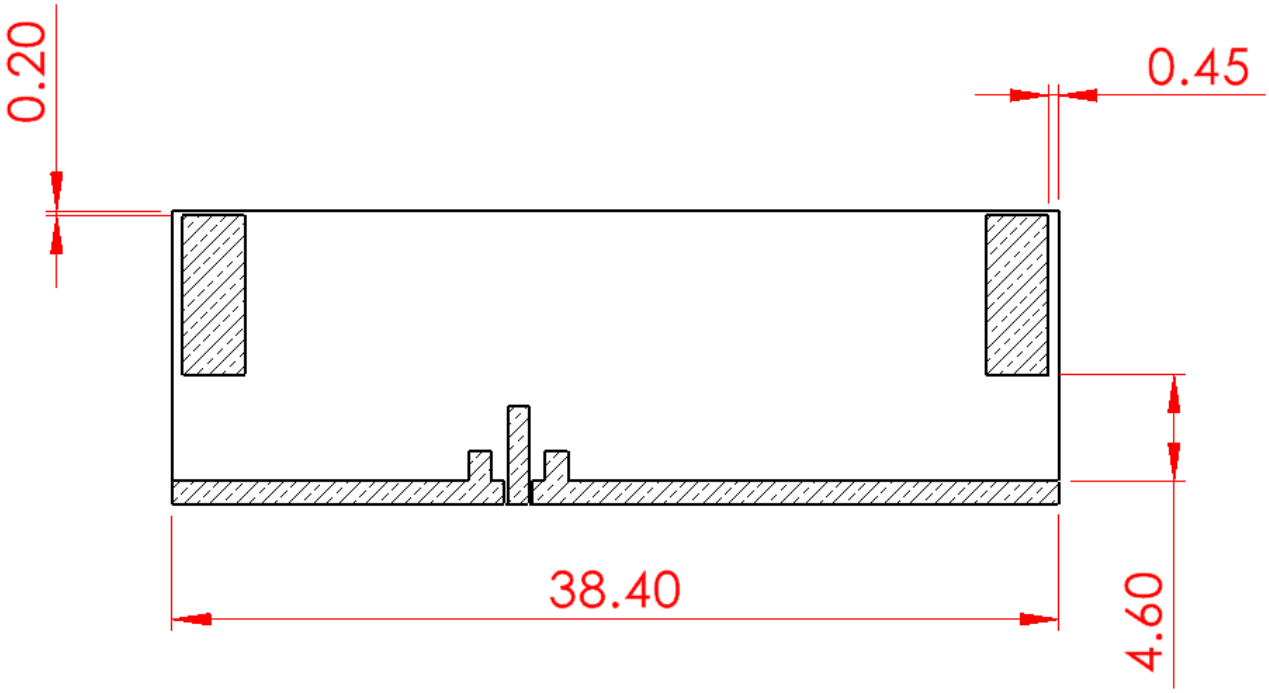


4.5 Top Solder Mask



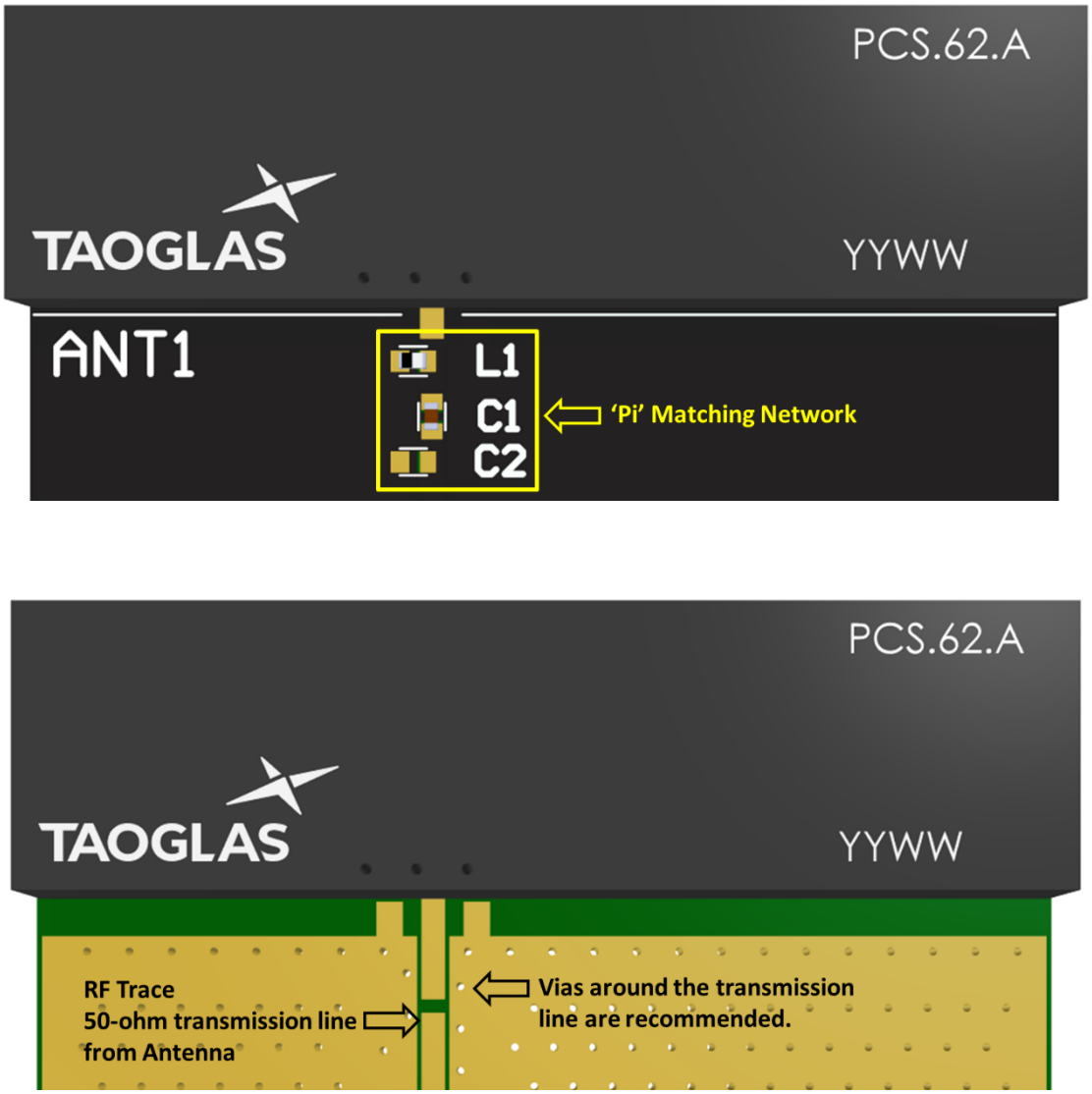
4.6 Copper Clearance

The footprint and clearance on the PCB must comply with the antenna's specification. The PCB layout shown in the diagrams below demonstrates the PCS.62.A clearance area. The copper keep out area applies to all layers that are below the PCS.62.A.
There should be a copper clearance area between the PCB edge and the ground plane of 11.7mm. The ground plane should be 4.6mm from the mechanical pads. The PCB Edge Clearance should be 0.2mm.



4.7 Antenna Integration

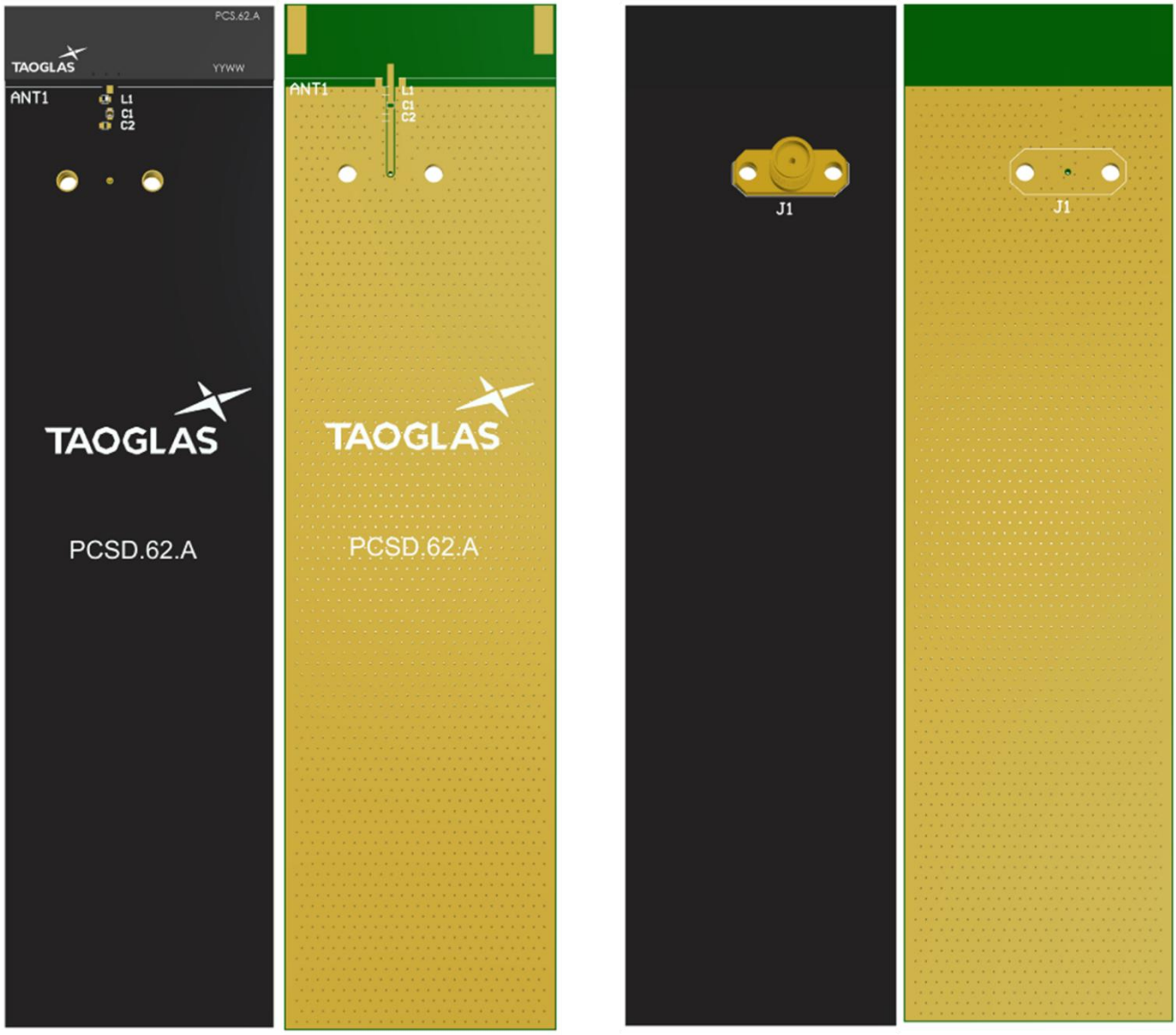
The PCS.62.A should be placed in the centre, as close to the edge on the long side of the PCB as possible, to take advantage of the ground plane. The RF trace must maintain a 50 Ohm transmission line. A “Pi” Matching Network is recommended for the RF transmission line, the values and components for the matching circuit will depend on the tuning needed. Ground vias should be placed around the transmission line and the copper clearance area.



PCS.62.A antenna mounted on a PCB reference board, showing transmission lines and integration notes.

4.8 Final Integration

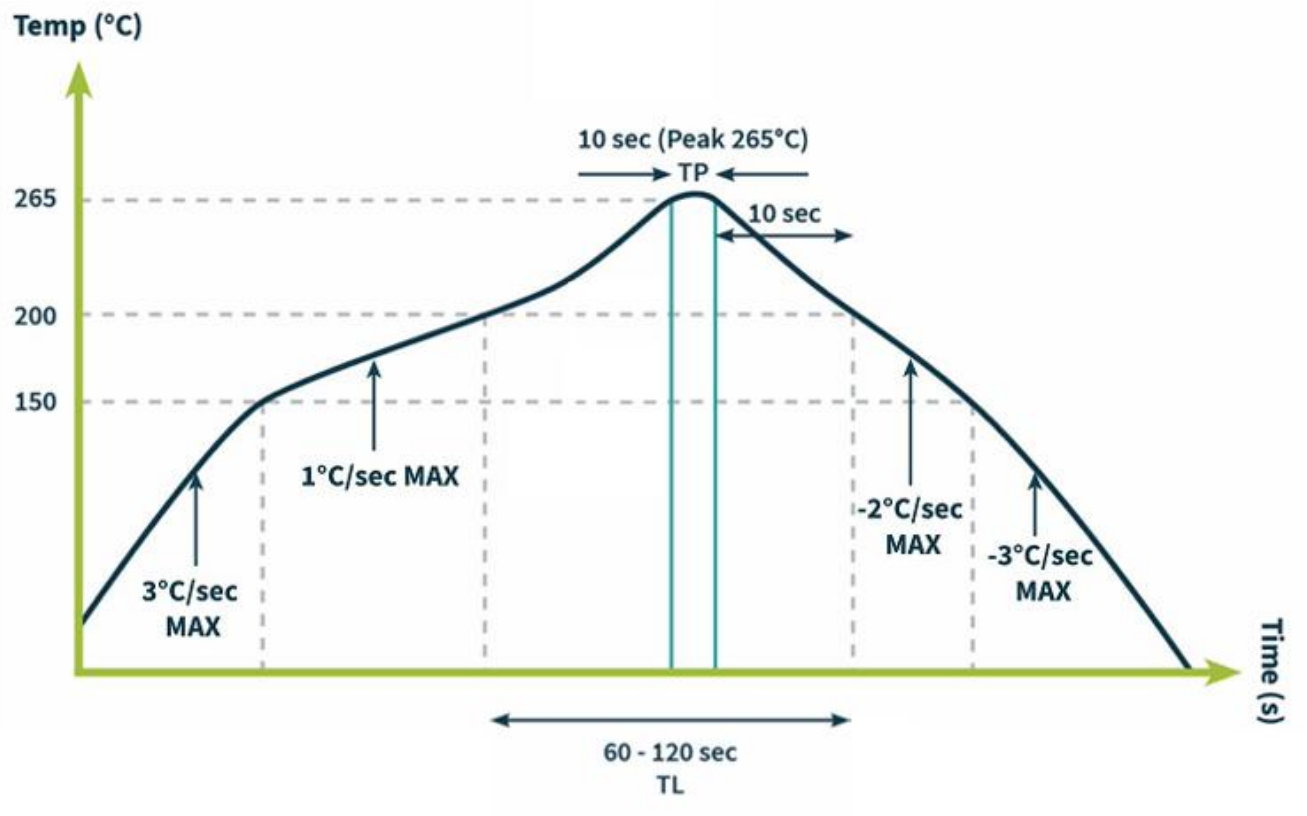
The top side image shown below highlights the antenna transmission line. Taoglas recommends using a minimum of 133x38mm ground plane (PCB) to ensure optimal performance.



Top Side (PCS.62.A placement on 133x38mm PCB reference design)

5. Soldering Conditions

The PCS.62.A can be assembled by following the recommended soldering temperatures are as follows:

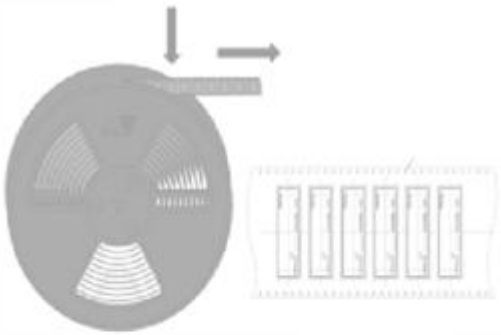


Smaller components are typically mounted on the first pass, however, we do advise mounting the PCS.62.A when placing larger components on the board during subsequent reflows.

Note: Soldering flux classified ROL0 under IPC J-STD-004 is recommended.

6. Packaging

1000pcs PCS.62.A per reel
(1) Humidity indicator card
(2) 3g Desiccant



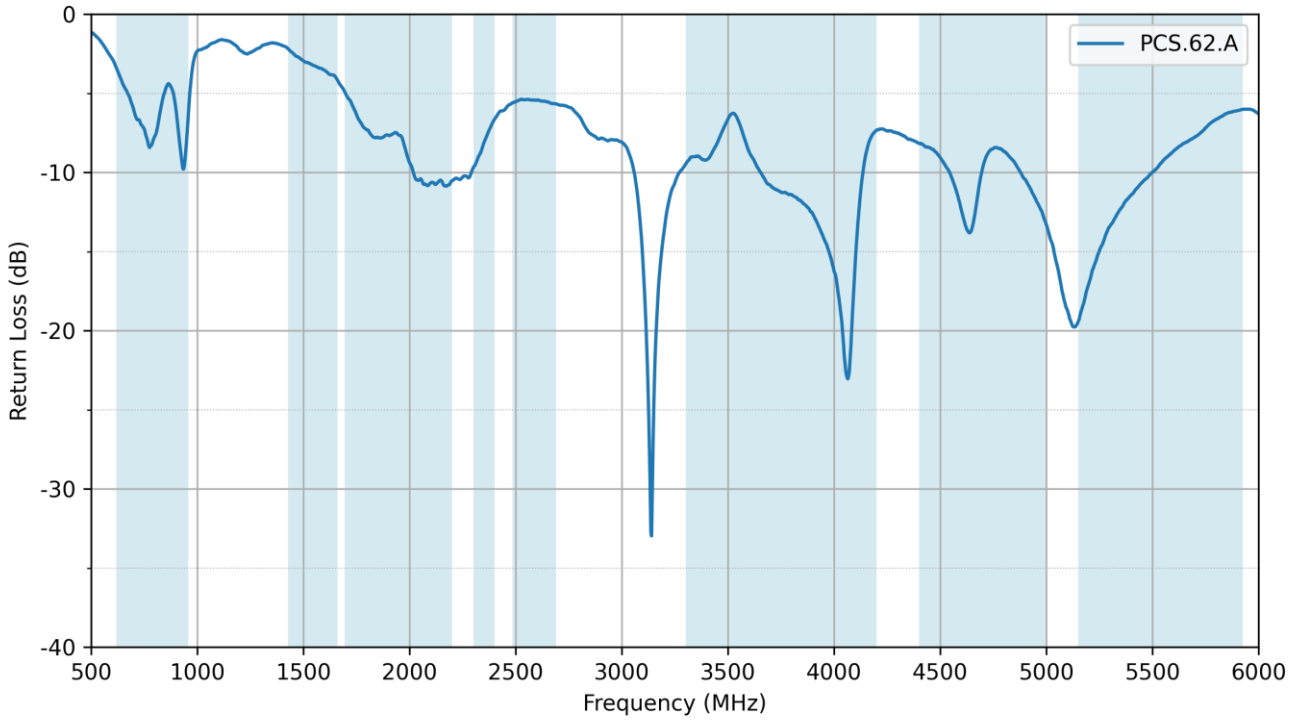
1000pcs PCS.62.A per Vacuum bag
MSL Label
Caution label

1000pcs PCS.62.A per box
Dimensions 335x335x85mm
Weight: 2.5Kg

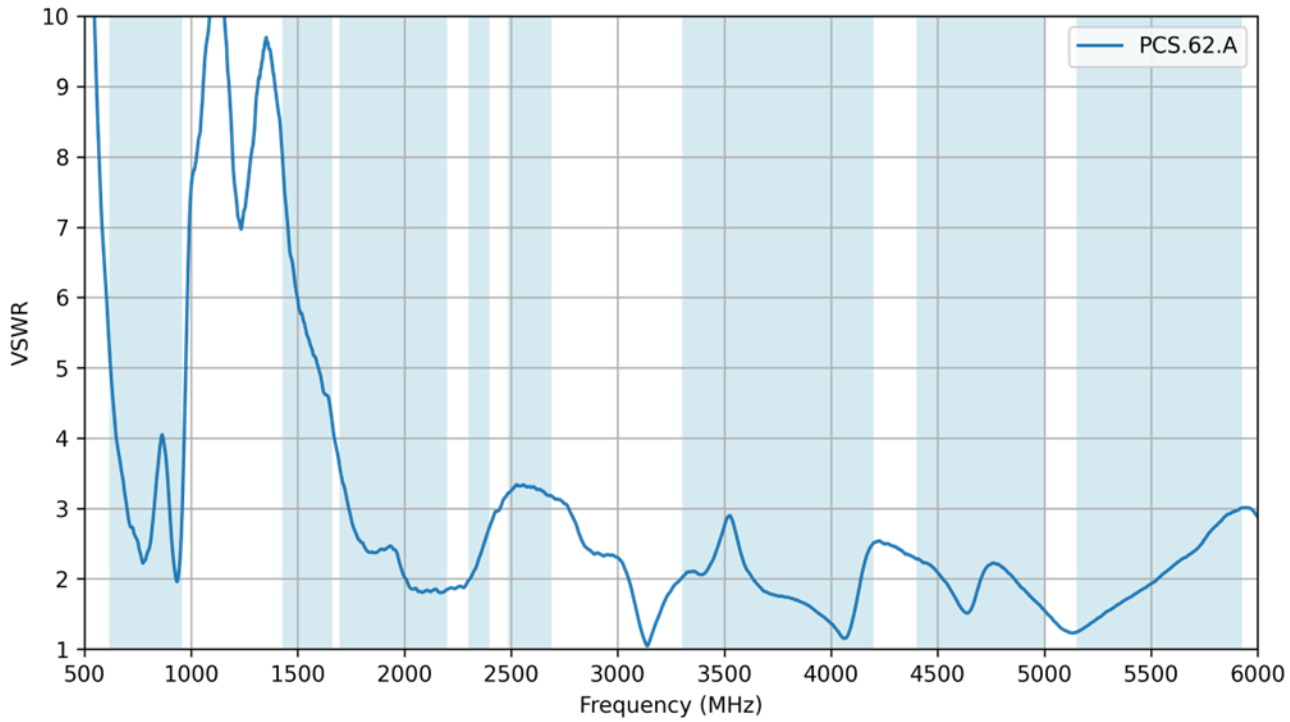
3000 pcs PCS.62.A per carton
Carton dimensions: 370x370x300mm
Weight: 8Kg

7. Antenna Characteristics

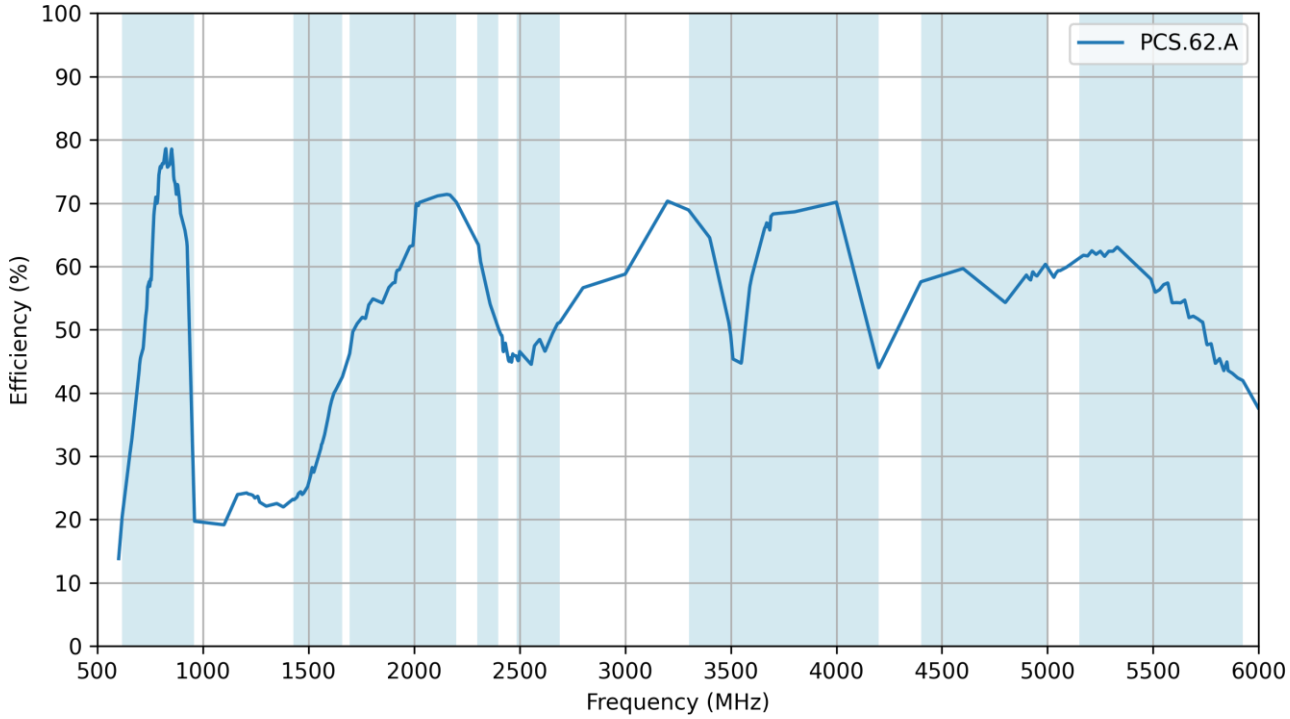
7.1 Return Loss



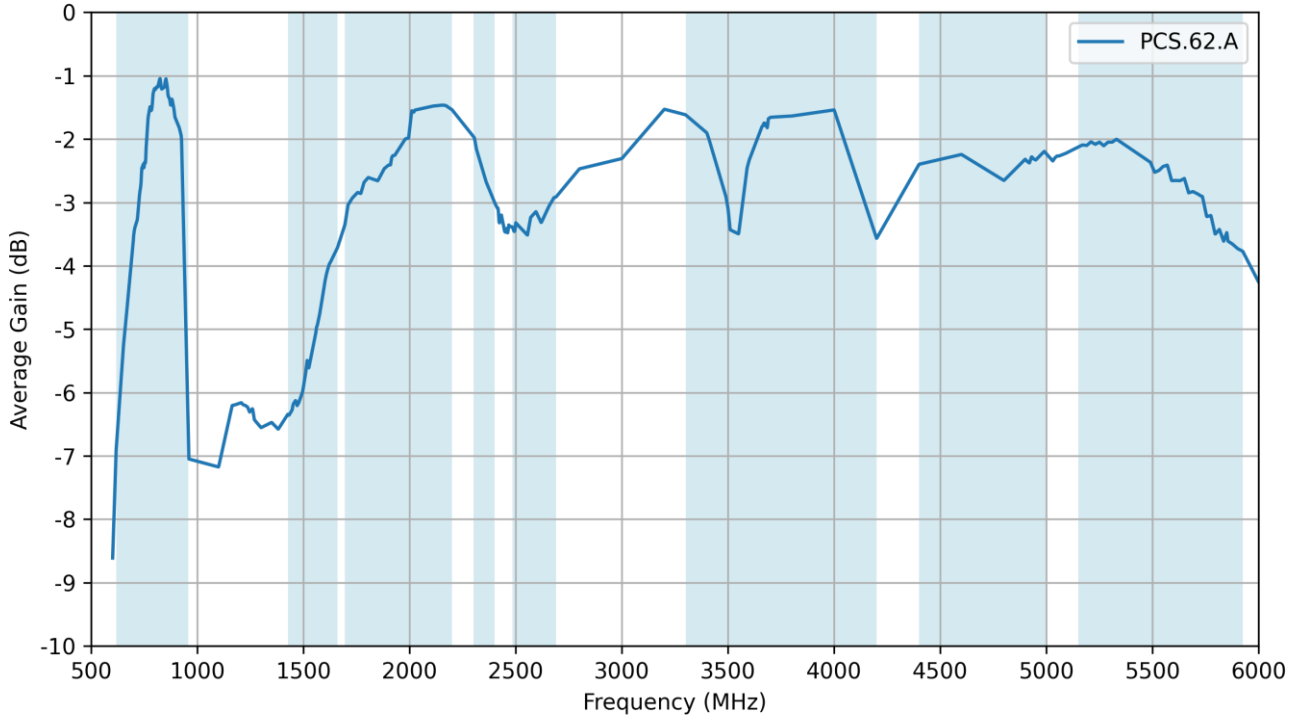
7.2 VSWR



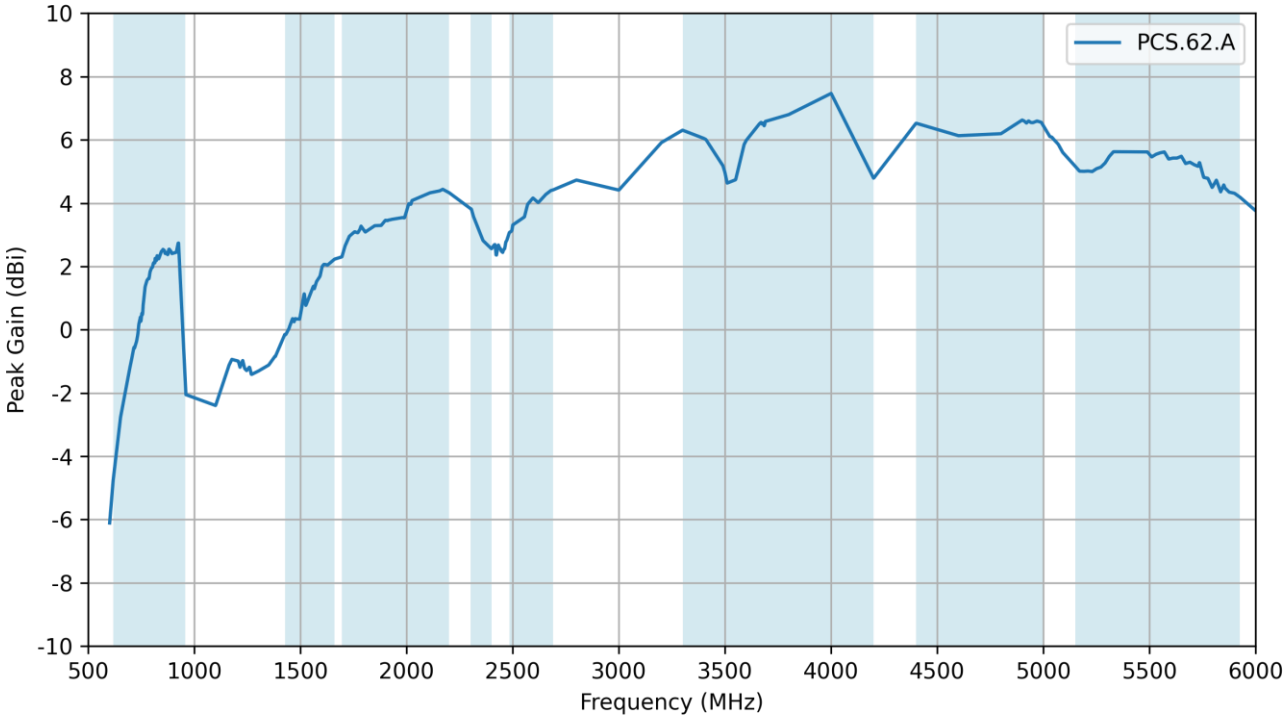
7.3 Efficiency



7.4 Average Gain

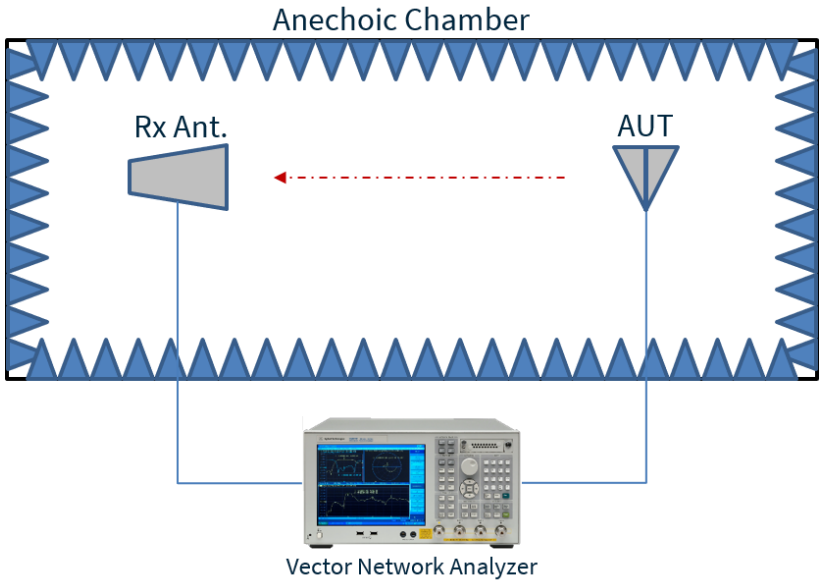


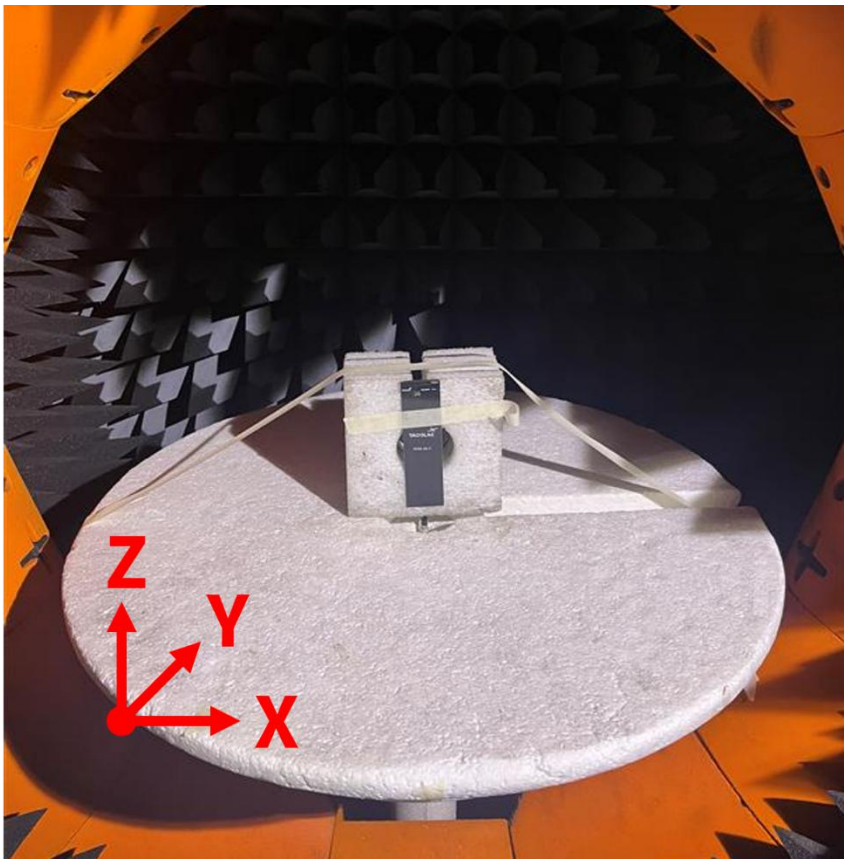
7.5 Peak Gain


PCS.62.A
Peak Gain (dBi)
Frequency (MHz)
10
8
6
4
2
0
-2
-4
-6
-8
-10
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000

8. Radiation Patterns

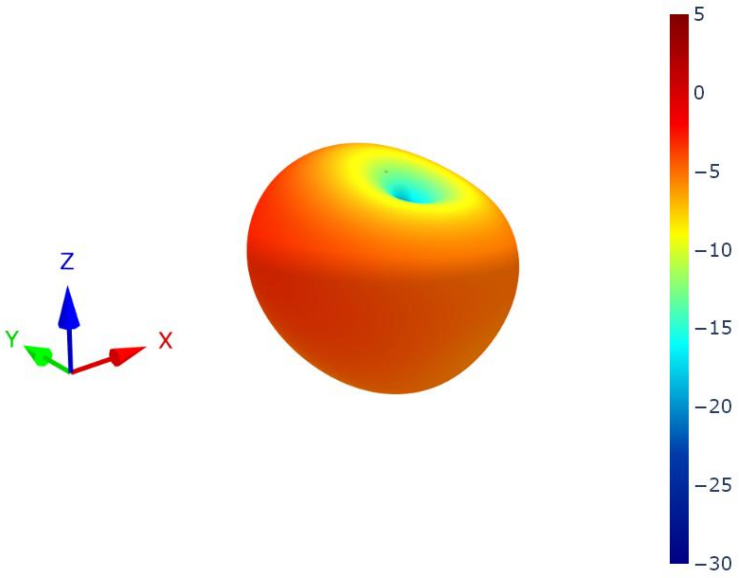
8.1 Test Setup

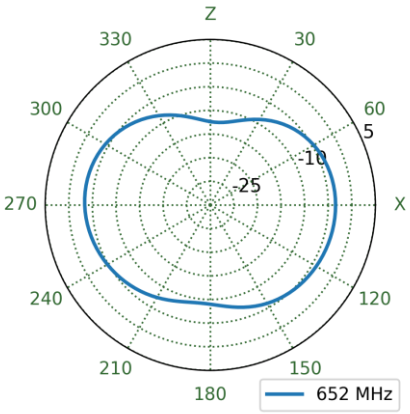
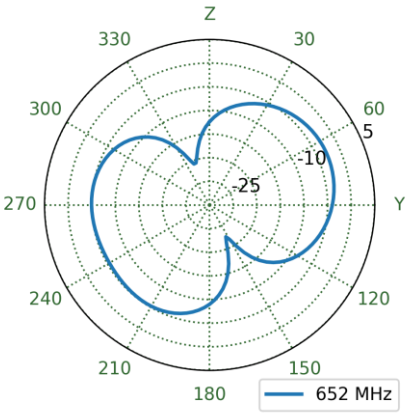
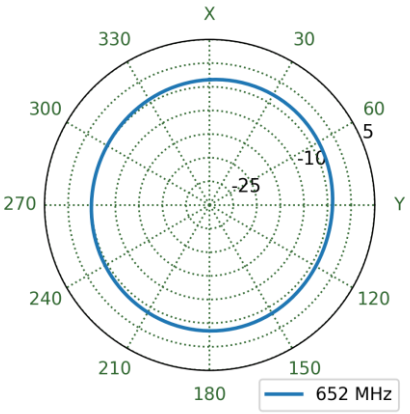




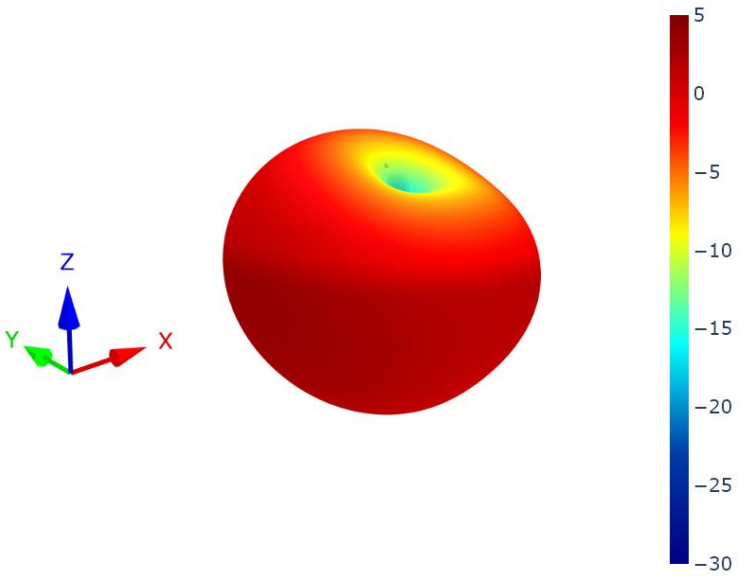
Chamber Test Set-up

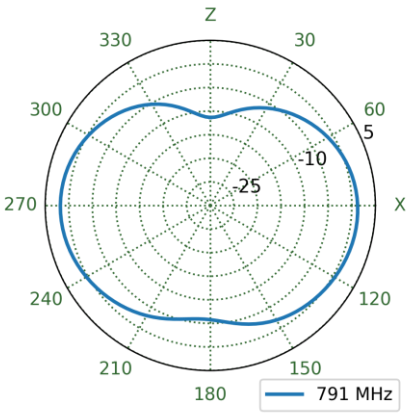
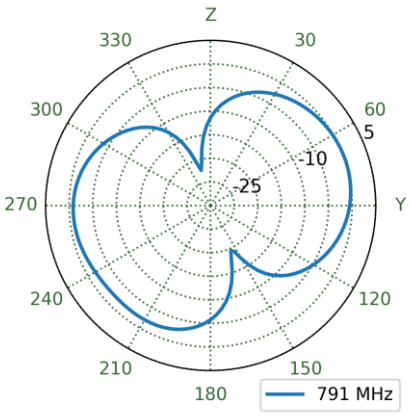
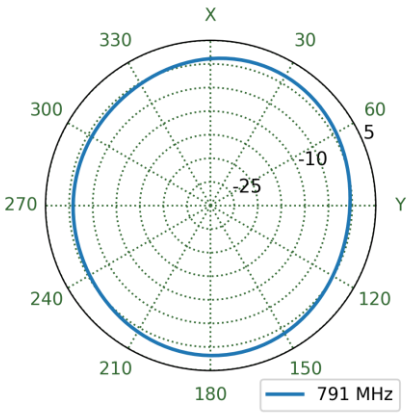
8.2 Patterns at 652 MHz



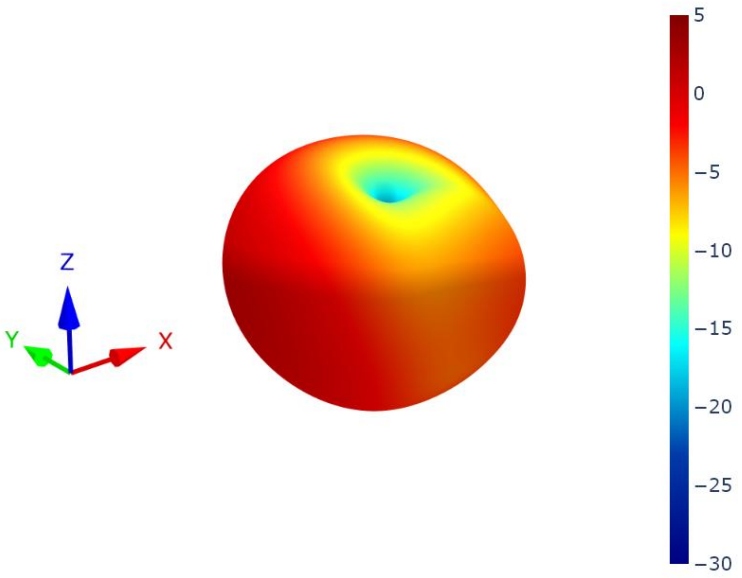
XZ Plane	YZ Plane	XY Plane
		

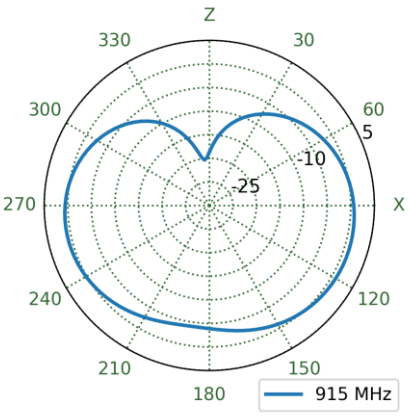
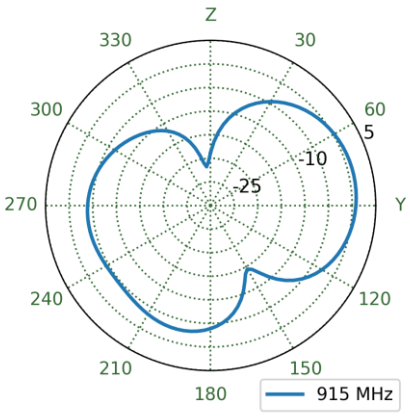
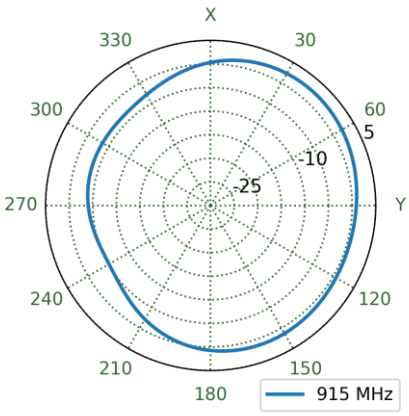
8.3 Patterns at 791 MHz



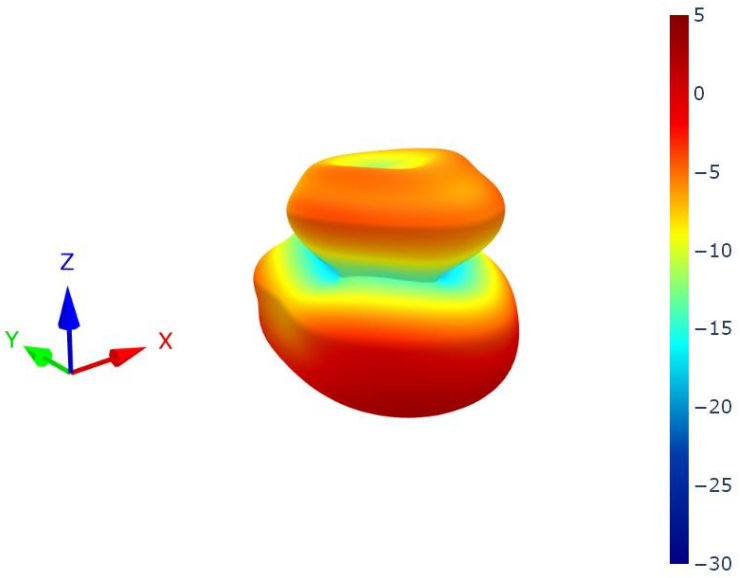
XZ Plane	YZ Plane	XY Plane
		

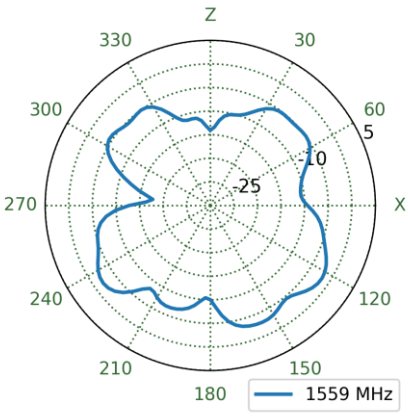
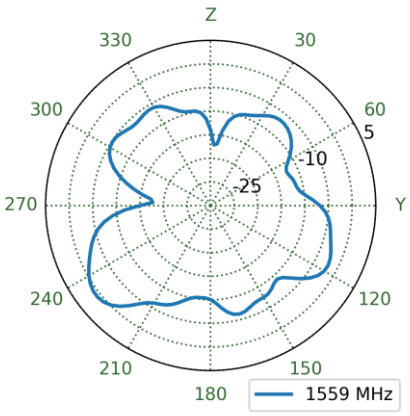
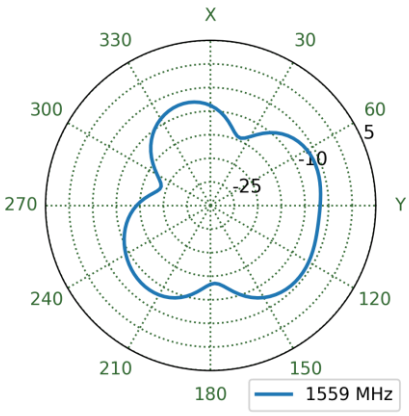
8.4 Patterns at 915 MHz



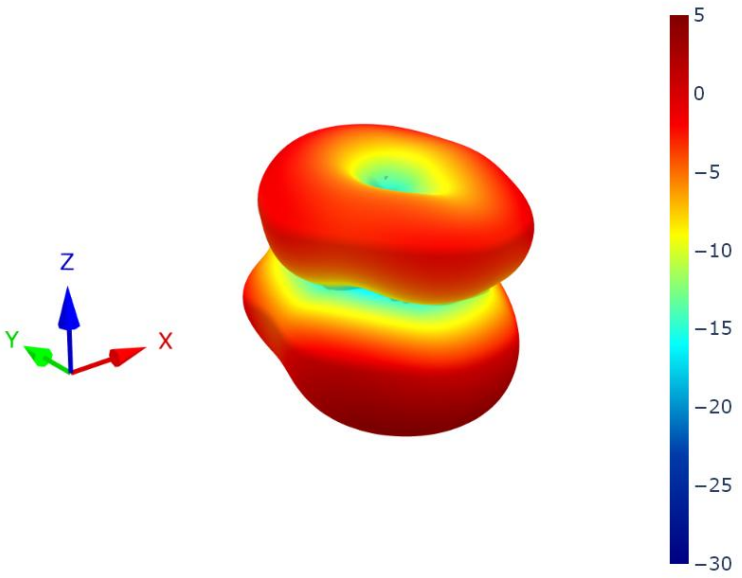
XZ Plane	YZ Plane	XY Plane
		

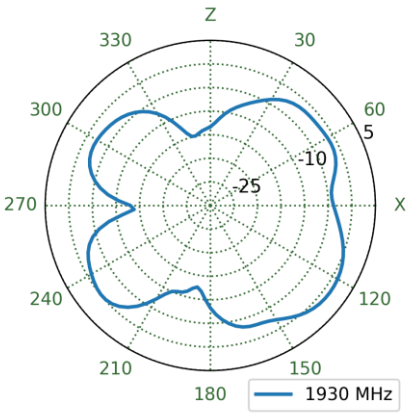
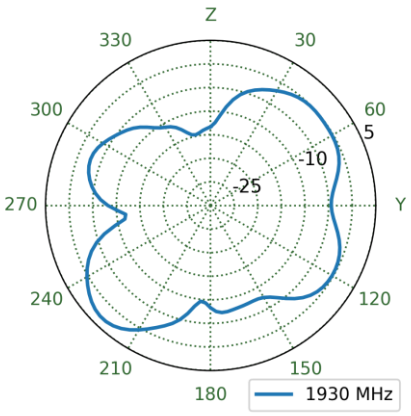
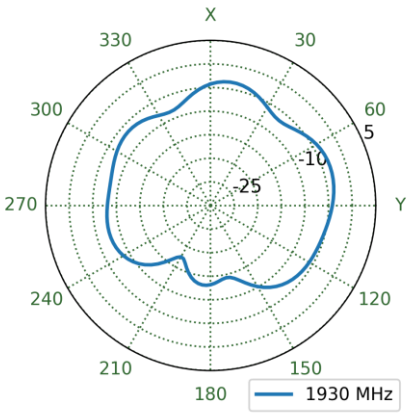
8.5 Patterns at 1559 MHz



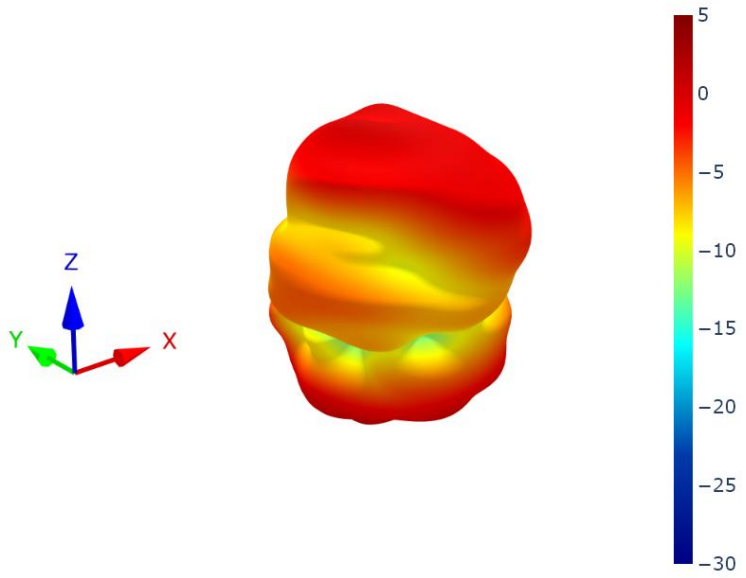
XZ Plane	YZ Plane	XY Plane
		

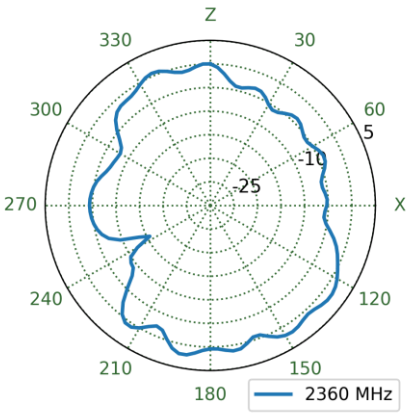
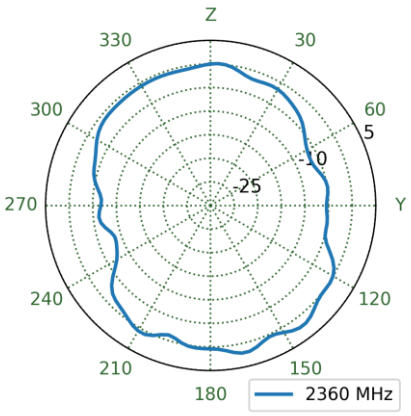
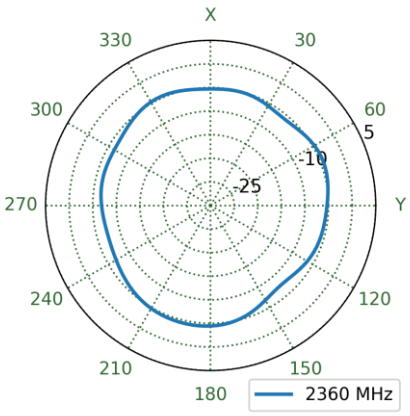
8.6 Patterns at 1930 MHz



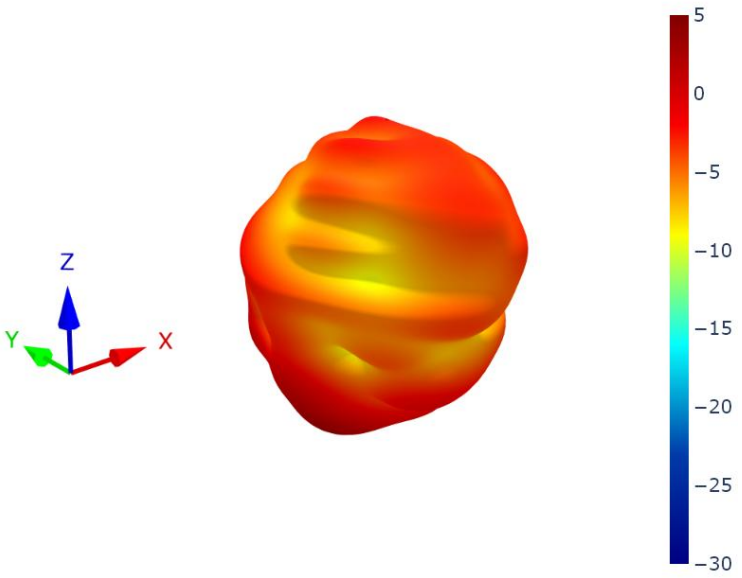
XZ Plane	YZ Plane	XY Plane
		

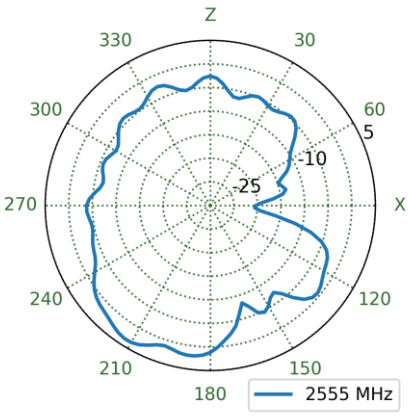
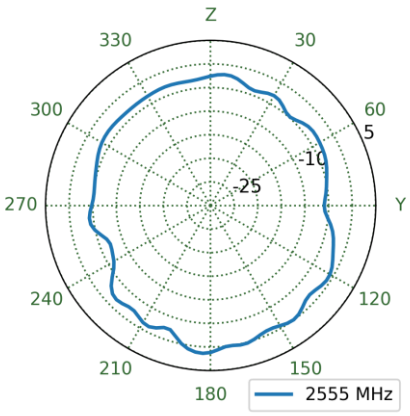
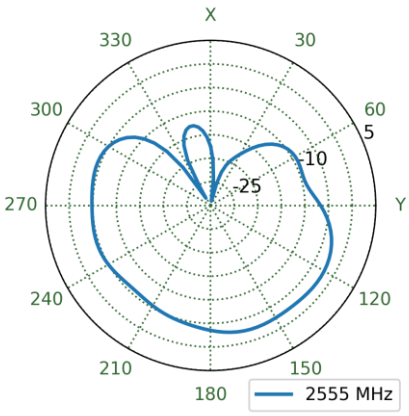
8.7 Patterns at 2360 MHz



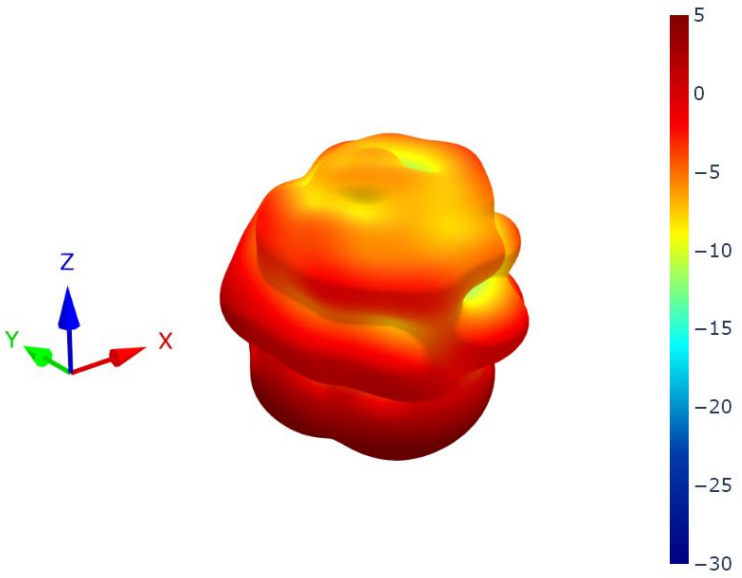
XZ Plane	YZ Plane	XY Plane
		

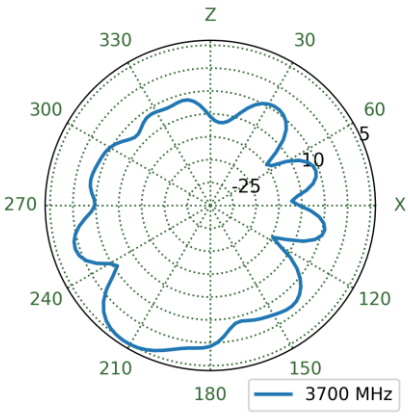
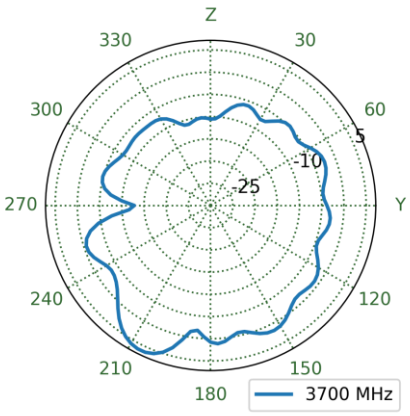
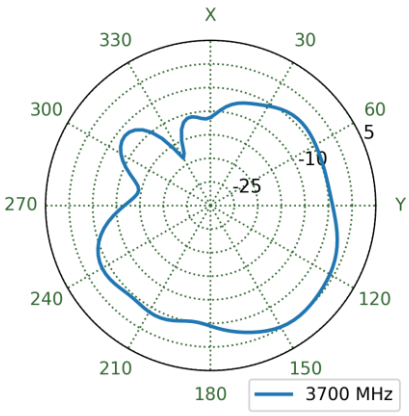
8.8 Patterns at 2555 MHz



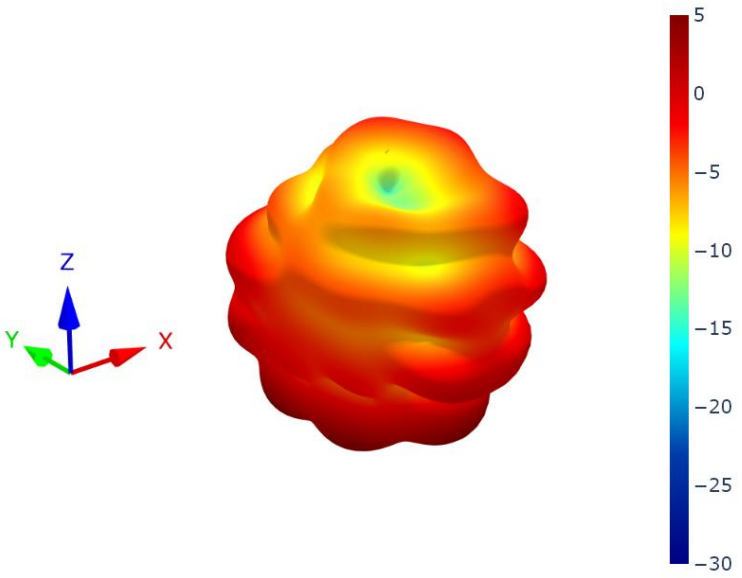
XZ Plane	YZ Plane	XY Plane
		

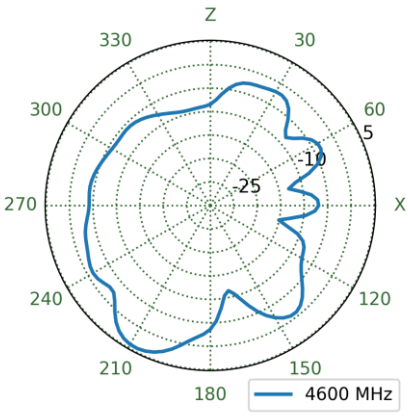
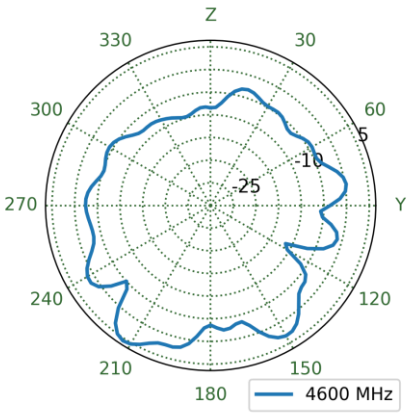
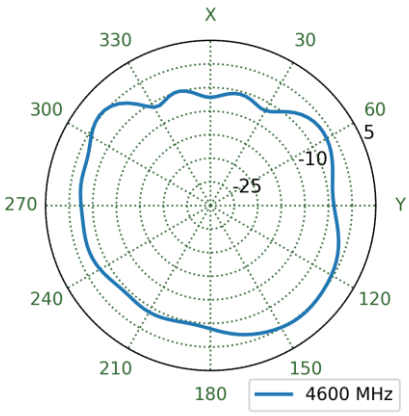
8.9 Patterns at 3700 MHz



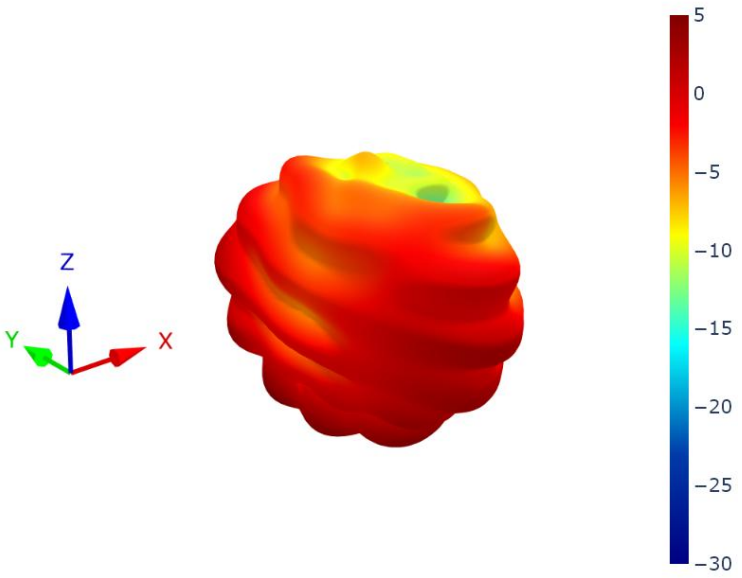
XZ Plane	YZ Plane	XY Plane
		

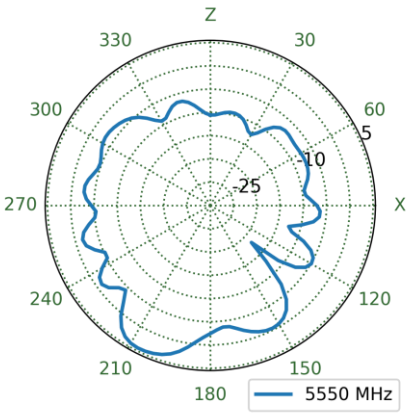
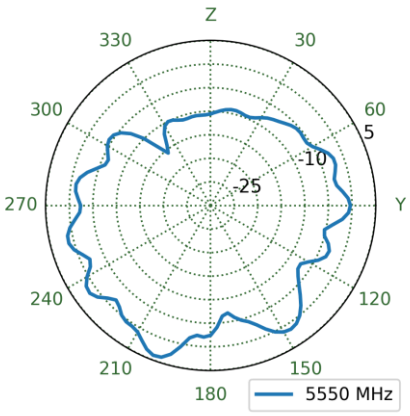
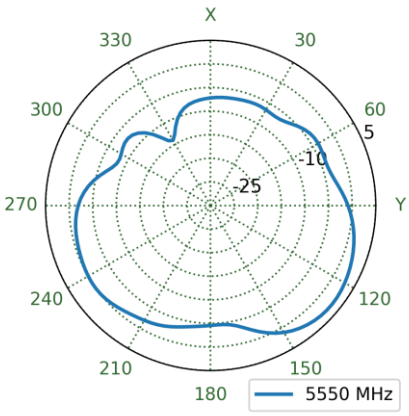
8.10 Patterns at 4600 MHz



XZ Plane	YZ Plane	XY Plane
		

8.11 Patterns at 5550 MHz

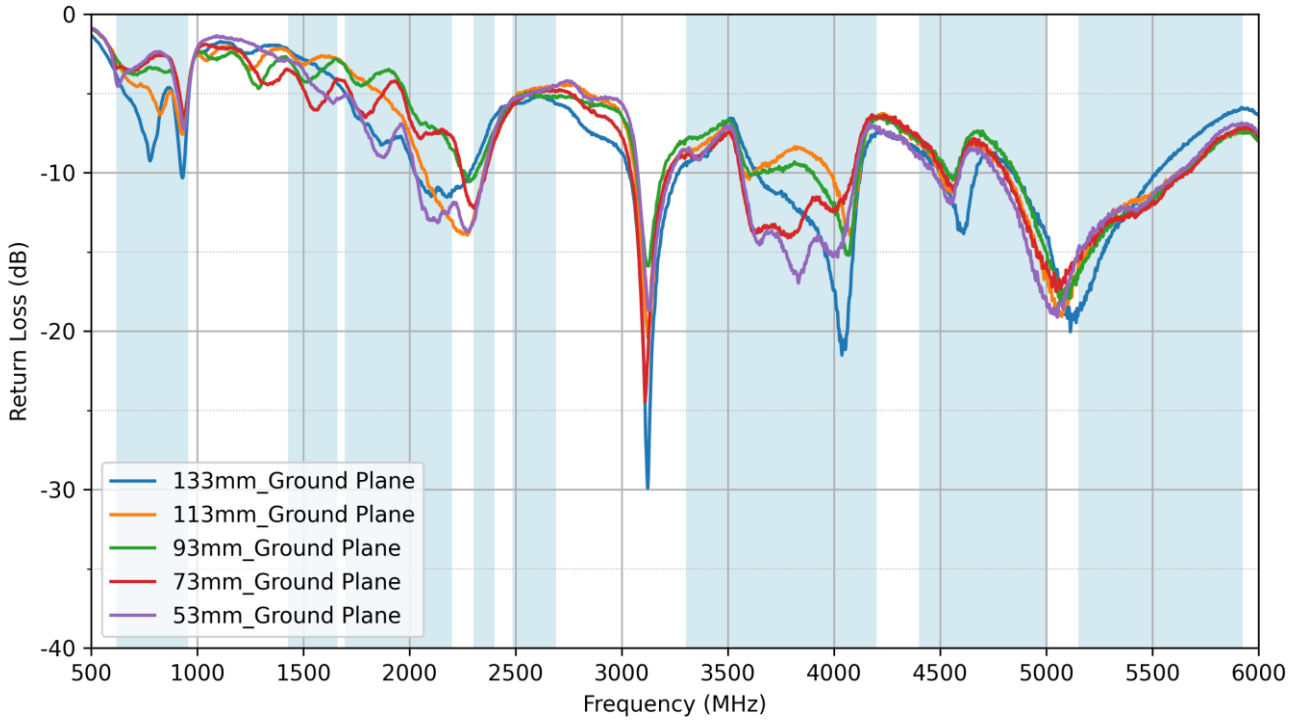


XZ Plane	YZ Plane	XY Plane
		

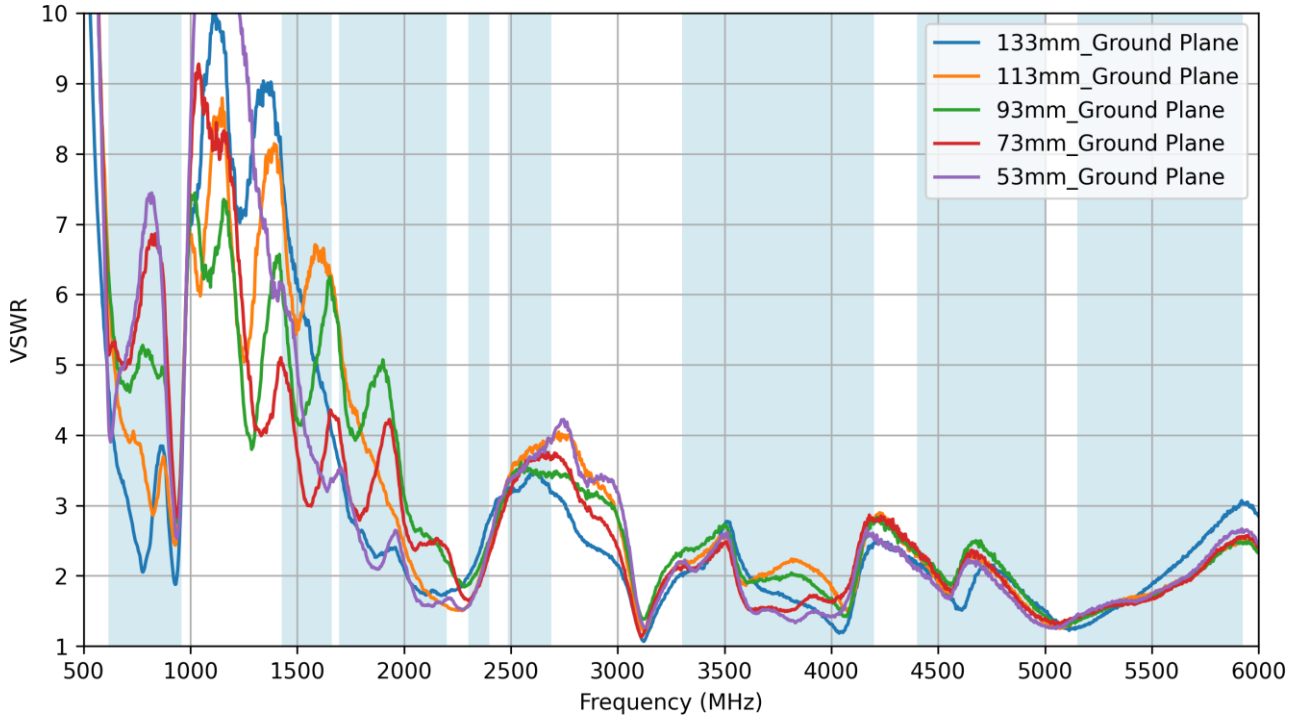
9. Application Note

This application note shows how changing the ground plane length effects the antenna performance.

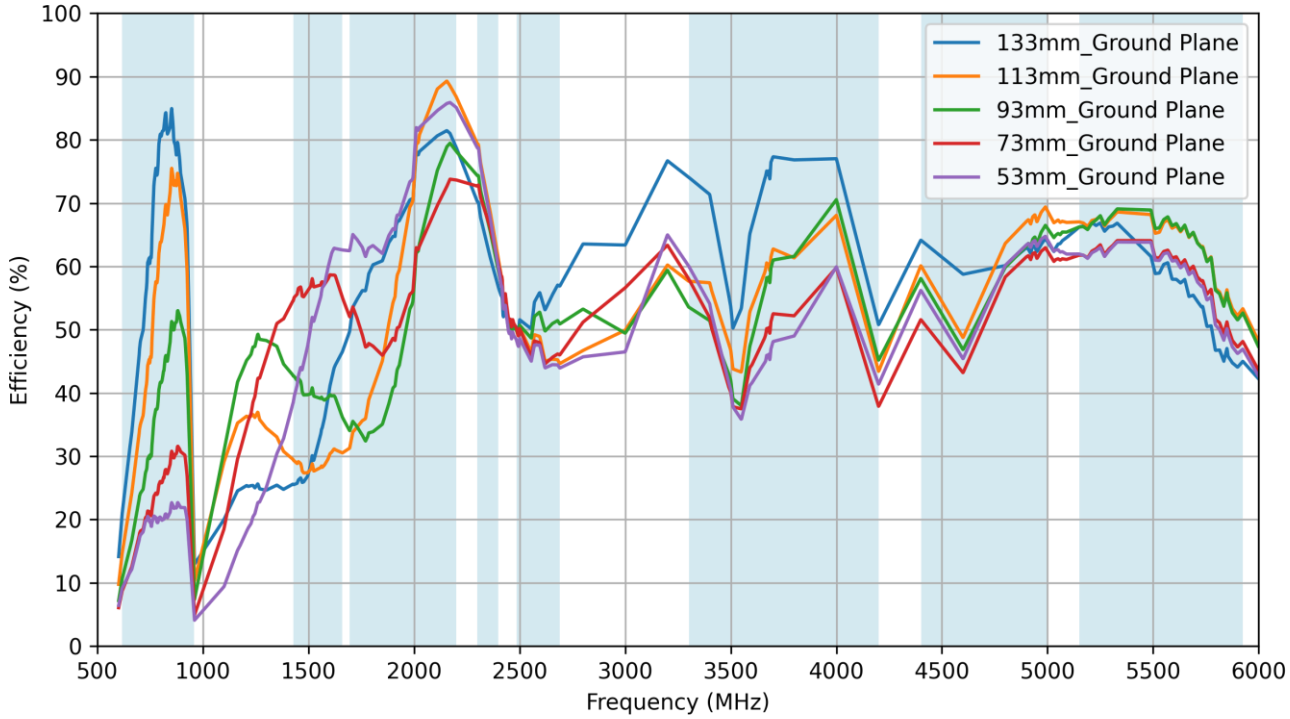
9.1 Return Loss



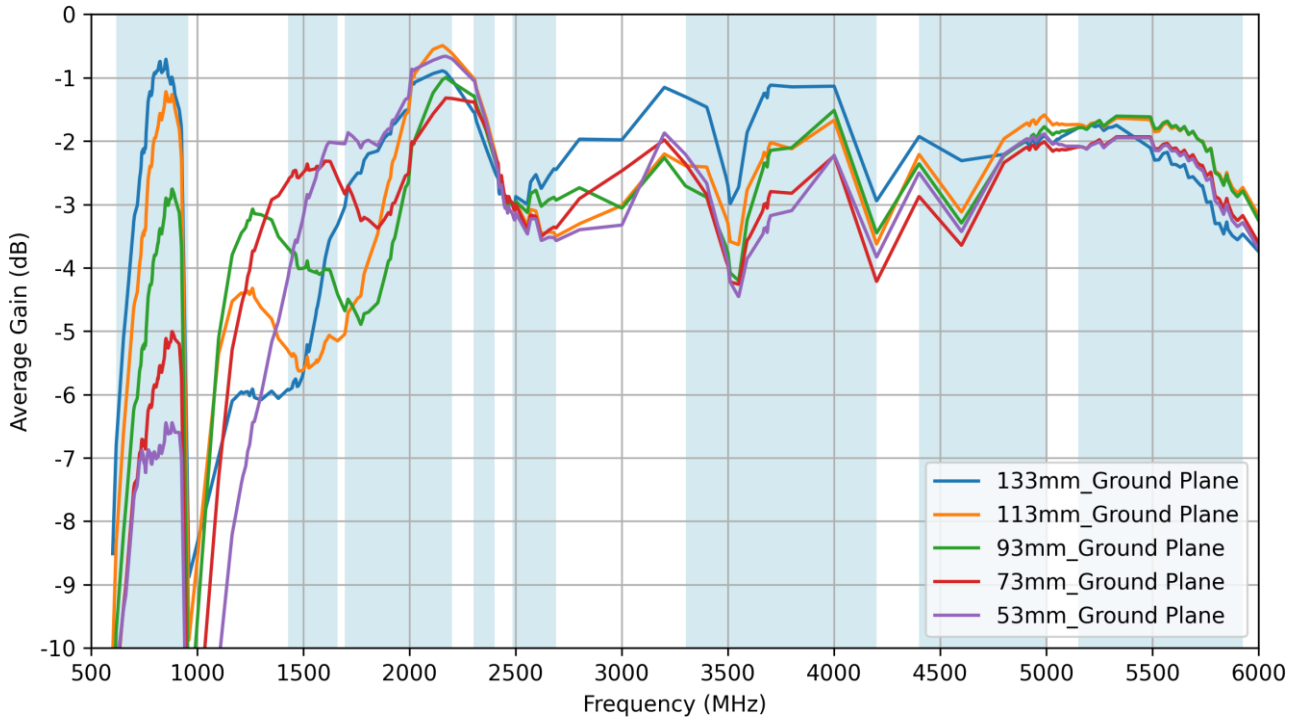
9.2 VSWR



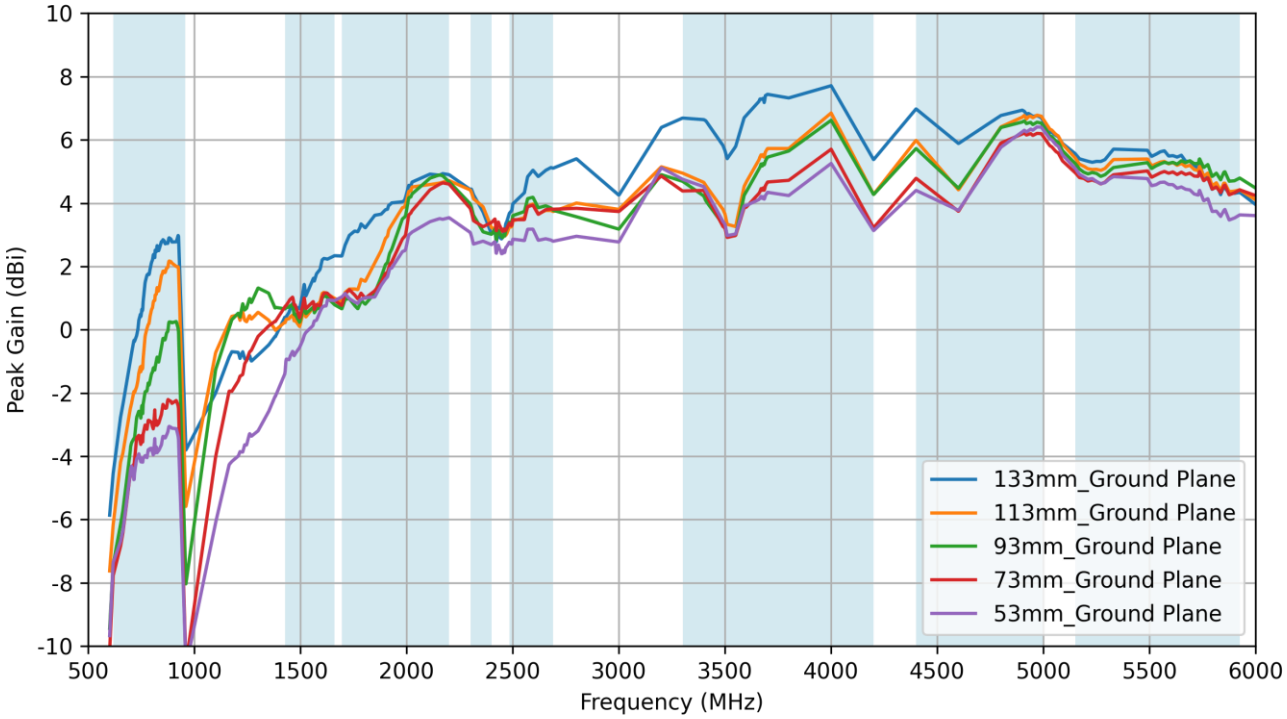
9.3 Efficiency



9.4 Average Gain



9.5 Peak Gain


Peak Gain (dBi)
Frequency (MHz)
133mm_Ground Plane
113mm_Ground Plane
93mm_Ground Plane
73mm_Ground Plane
53mm_Ground Plane

Changelog for the datasheet

SPE-25-8-085 – PCS.62.A

Revision: B (Current Version)	
Date:	2025-07-14
Notes:	Updated mechanical drawing to update antenna width to 10.3mm from 10mm
Author:	Conor McGrath

Previous Revisions

Revision: A (Original First Release)	
Date:	2025-03-14
Notes:	Initial Release
Author:	Gary West

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