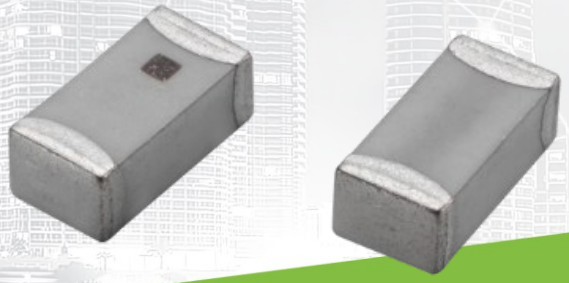
TAOGLAS



Datasheet

LTCC Chip Antenna

Part No:
ILA.68

Description

LTCC UWB Antenna Covering 6-8.5GHz

Features:

UWB coverage: 6–8.5 GHz
Dimensions: 3.2 × 1.6 × 1.1 mm
High efficiency up to 67.8%, peak gain 3.98 dBi
RoHS & Reach Compliant

1. Introduction

The Taoglas ILA.68 is a compact, high-performance LTCC (Low Temperature Co-fired Ceramic) antenna specifically designed for Ultra-Wideband (UWB) applications operating across the 6GHz to 8.5GHz frequency range. With a miniature footprint of just 3.2 × 1.6 × 1.1 mm, this antenna offers an ideal solution for space-constrained wireless devices that demand high efficiency, stable gain, and reliable omnidirectional radiation patterns.

Leveraging advanced LTCC technology, the ILA.68 provides robust performance and thermal stability in harsh environmental conditions, making it well-suited for industrial, consumer electronics, and automotive applications. It features peak gain up to 3.98 dBi and efficiency as high as 67.8%, supporting dependable UWB connectivity for high-data-rate wireless communication, precise location tracking, and radar-based sensing.

Typical Applications Include:

- Indoor Accuracy Positioning Systems
- Consumer Electronics
- Automotive Applications (key less etc)
- Internet of Things (IoT) Devices
- Security and Access Control
- Augmented and Virtual Reality (AR/VR)

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

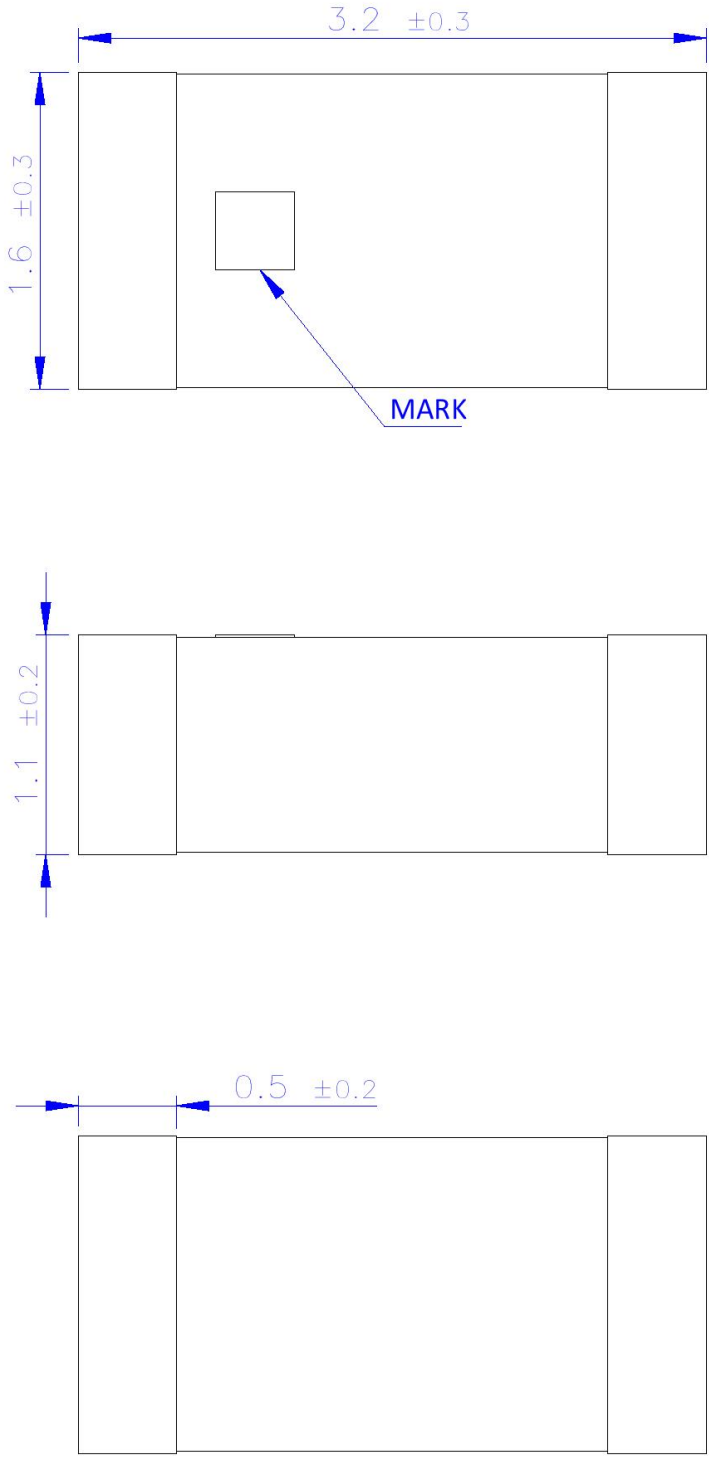
2. Specification

Electrical								
Band	Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
LRP CH 0	6200-6800	64.2	-1.92	3.98	50 Ω	Linear	Omni directional	3W
LRP CH 4	6400-7000	64.9	-1.88	3.98				
HRP CH6/LRP CH 1	6700-7300	65.2	-1.86	3.44				
LRP CH 5	7000-7600	64.3	-1.91	2.79				
HRP CH 8	7200-7800	64.4	-1.91	2.49				
HRP CH 9/LRP CH 6	7700-8300	67.8	-1.68	2.57				

Mechanical	
Dimensions	3.2mm x 1.6mm x 1.1mm
Material	Ceramic

Environmental	
Operation Temperature	-40°C to 85°C
Storage Temperature	-10°C to 40°C
Relative Humidity	Non-condensing 40°C 75% RH
Moisture Sensitivity Level	1

3. Mechanical Drawing



4. Antenna Integration Guide

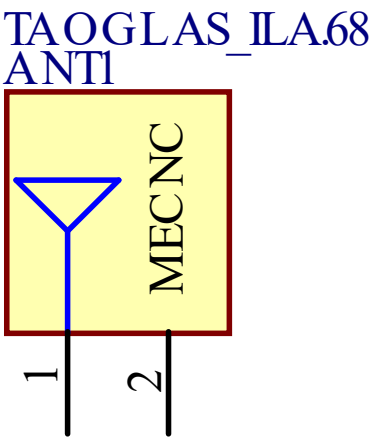
The following is an example on how to integrate the ILA.68 into a design. This antenna has 2 pins, where one pin is used for the RF Feed. Taoglas recommends using a minimum of 35x31mm ground plane (PCB) to ensure optimal performance.

Please find the Integration files in Altium, 2D formats and the 3D model for the ILA.68 here:
(Link Needed)

4.1 Schematic Symbol and Pin Definition

Above is a 3D model of the ILA.68 on a PCB reference design.

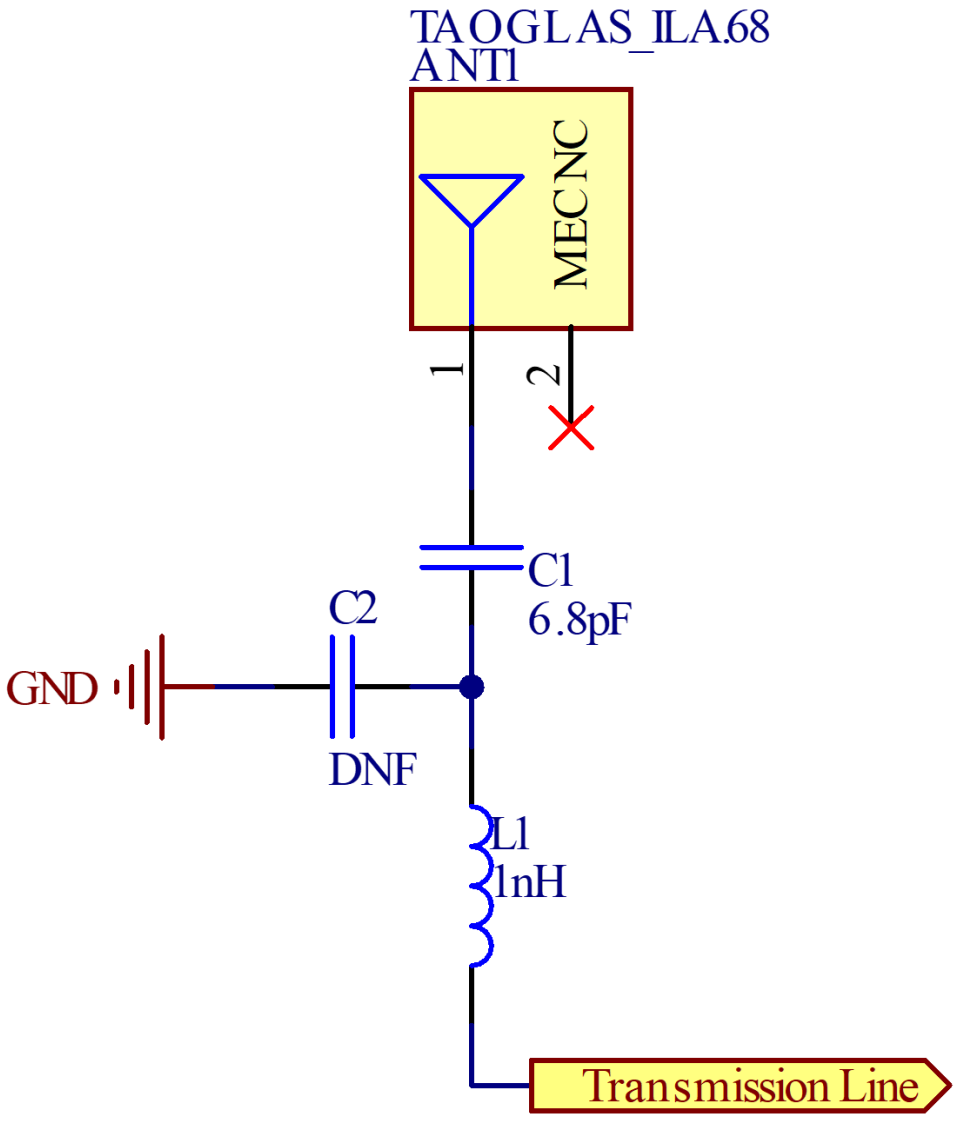
The circuit symbol for the ILA.68 is shown below. The antenna has 2 pins as indicated below.



Pin	Description
1	RF Feed
2	Mechanical, No Connection

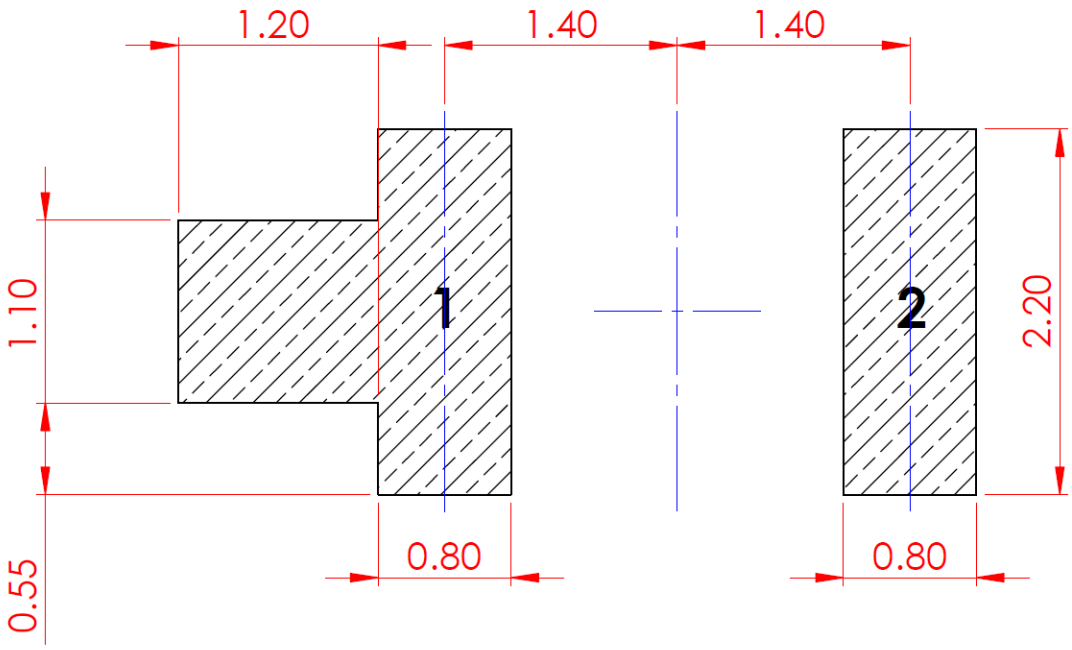
4.2 Schematic Layout

Matching components with the ILA.68 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 “T” network, for the ILA.68.



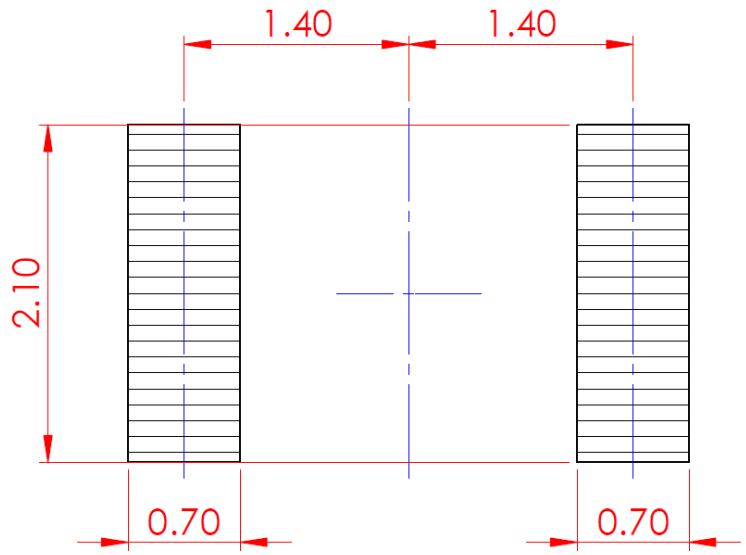
Designator	Type	Value	Manufacturer	Manufacturer Part Number
C1	Capacitor	6.8pF	Murata	GRM1555C1H6R8CA01D
C2	Capacitor	Not Fitted	-	-
L1	Inductor	1nH	Murata	LQG15HN1N0B02D

4.3 Footprint

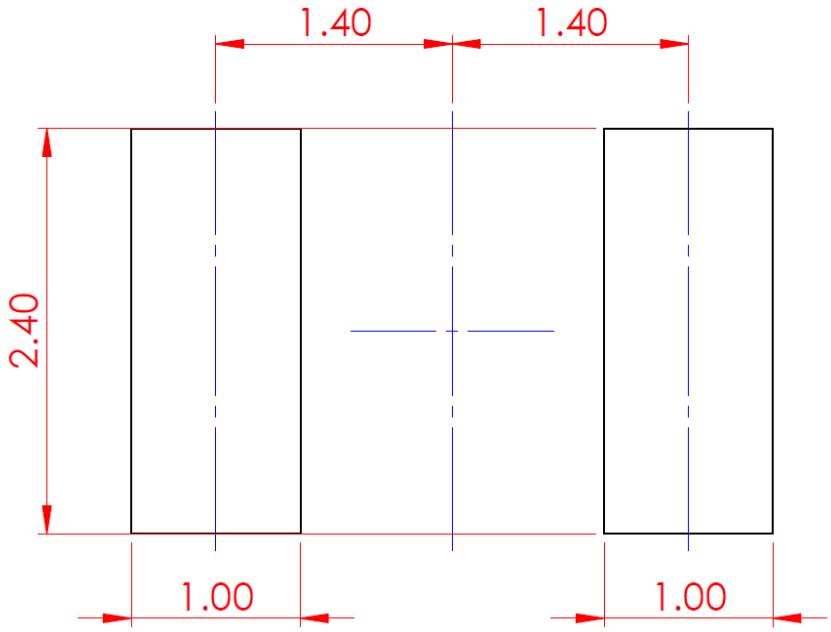


Pin	Description
1	RF Feed
2	Mechanical, No Connection

4.4 Top Solder Paste



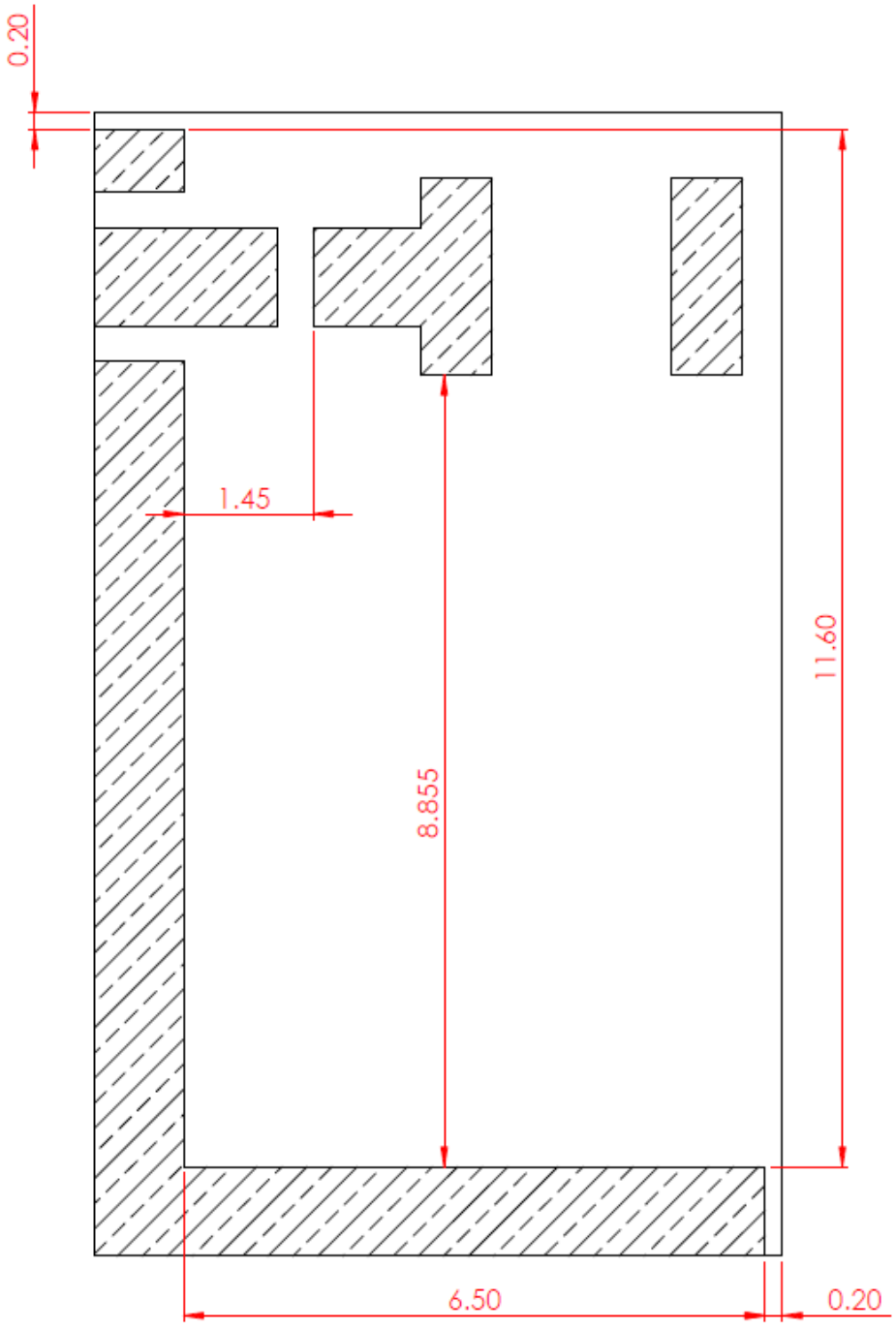
4.5 Top Solder Mask



4.6 Copper Clearance for ILA.257

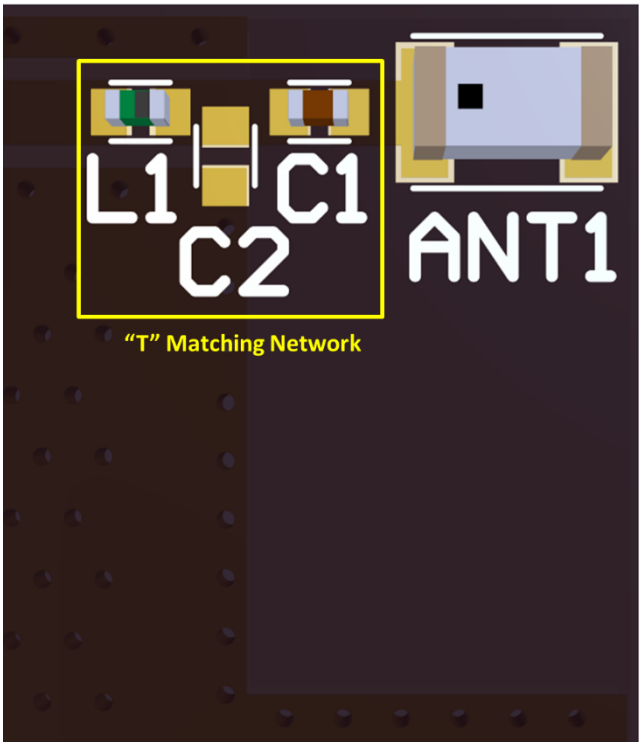
The footprint and clearance on the PCB must comply with the antenna's specification. The PCB layout shown in the diagrams below demonstrates the ILA.68 clearance area. The copper keep out area applies to all layers that are below the ILA.68.

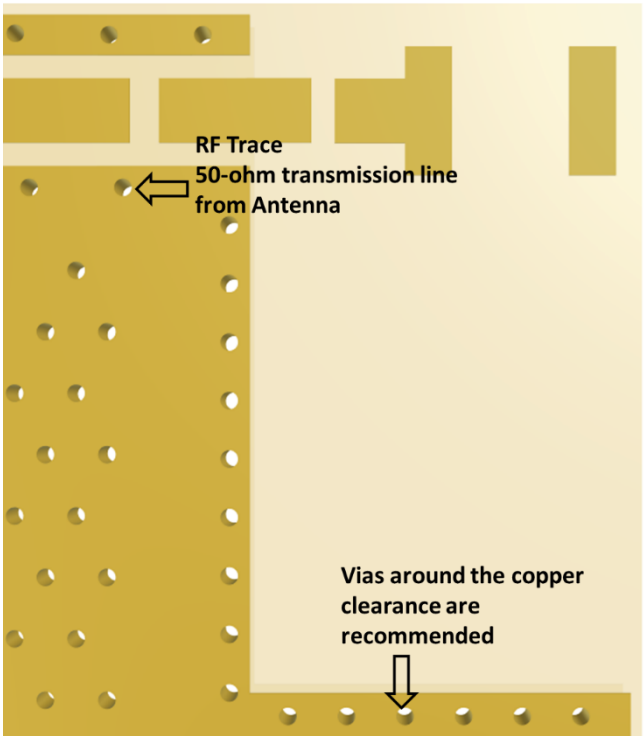
The copper clearance area should extend to 11.6mm in length and 6.5mm in width around antenna in the area indicated below. The PCB edge clearance below is 0.2mm.



4.7 Antenna Integration

The ILA.257 should be placed in the corner of the PCB 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.

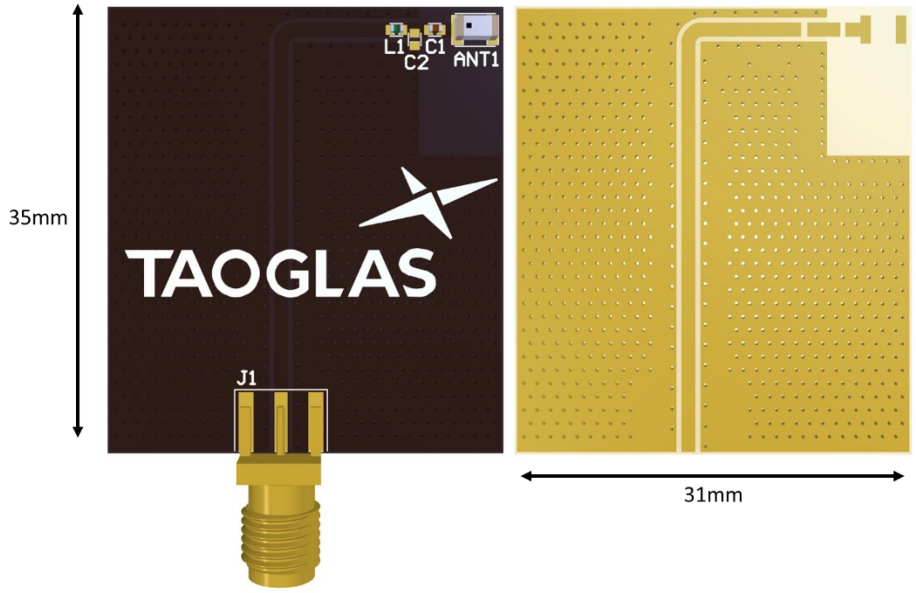




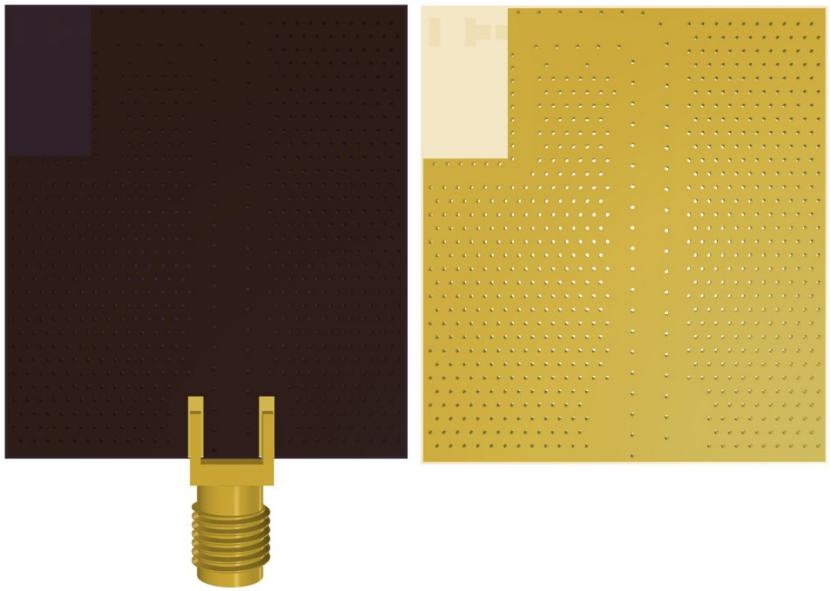
ILA.68 antenna mounted on a PCB reference design, showing the transmission line and integration notes.

4.8 Final Integration

The top side image shown below highlights the antenna transmission line. Taoglas recommends using a minimum of 35x31mm ground plane (PCB) to ensure optimal performance.



Top Side (ILA.68 placement on 35x31mm PCB reference design)



Bottom Side

5. Packaging

☑ 3000 PCS / Reel

☑ 2 PCS / 3g Desiccant

☑ 1 PCS / Humidity test paper

☑ SPQ Label

☑ 3000 PCS / Vacuum bag

☑ MSL Label

☑ SPQ Label

☑ Weight (Kg): 0.7 ±3%

☑ 60000 PCS / Carton

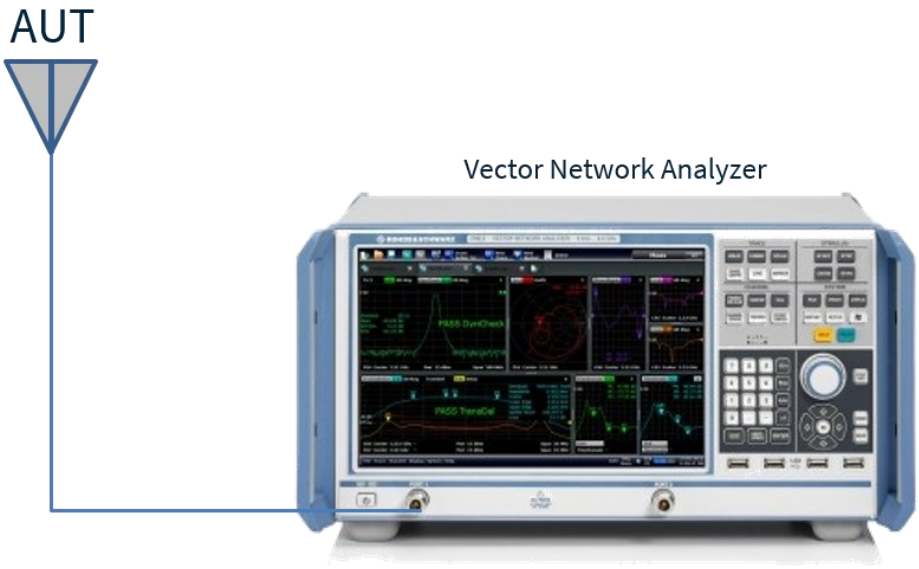
☑ Carton(mm): 327x280x218

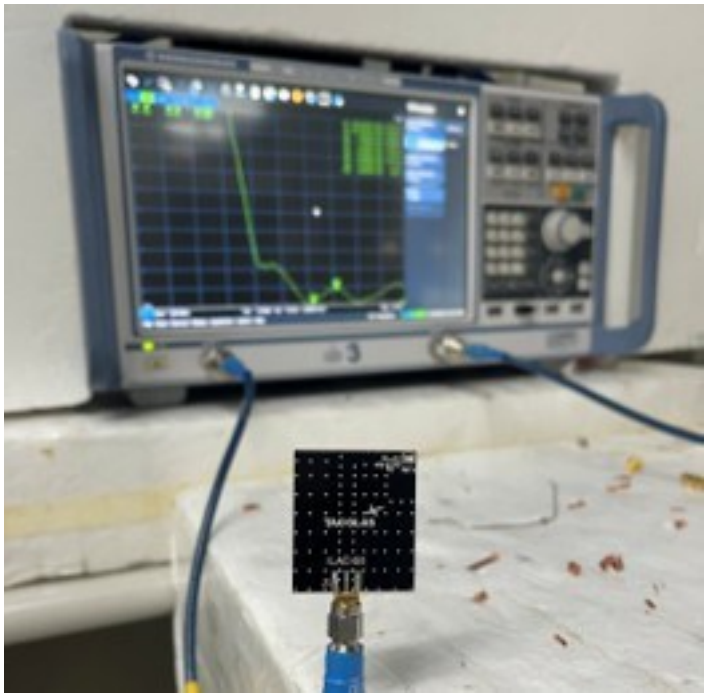
☑ Carton Label

☑ Weight (Kg): 14.5 ±3%

6. Antenna Characteristics

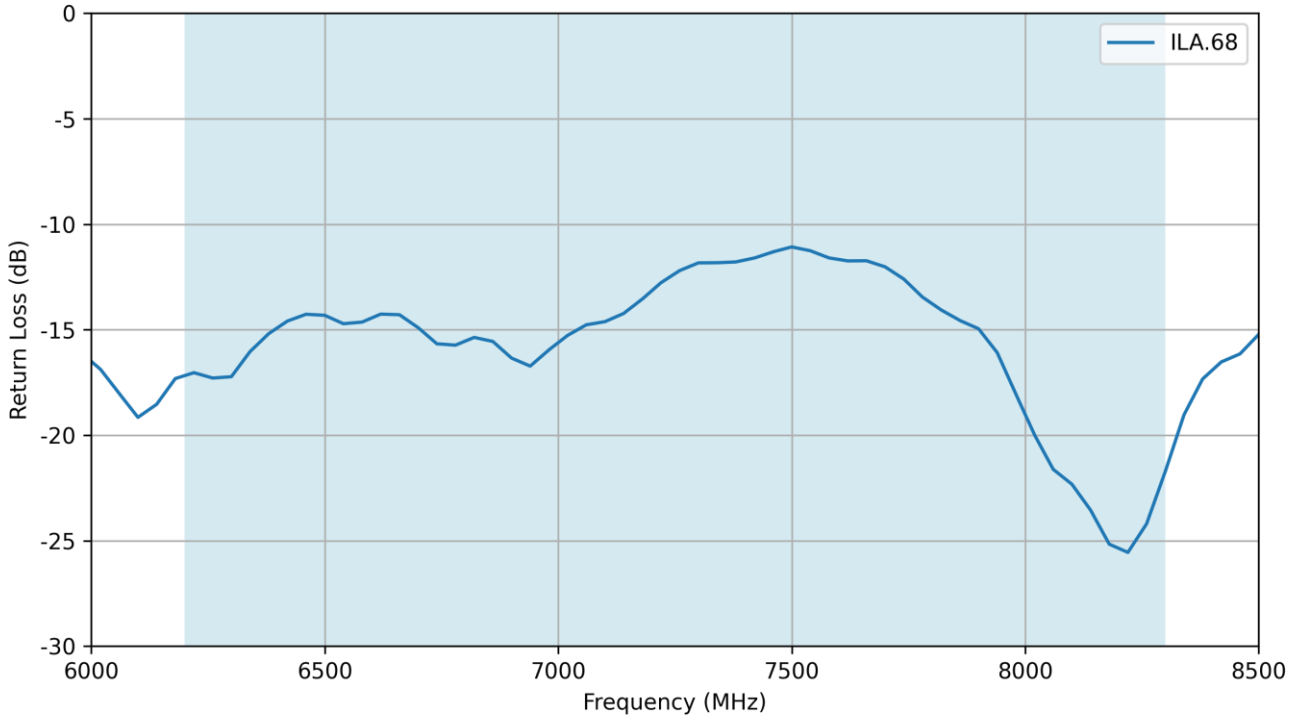
6.1 Test Setup



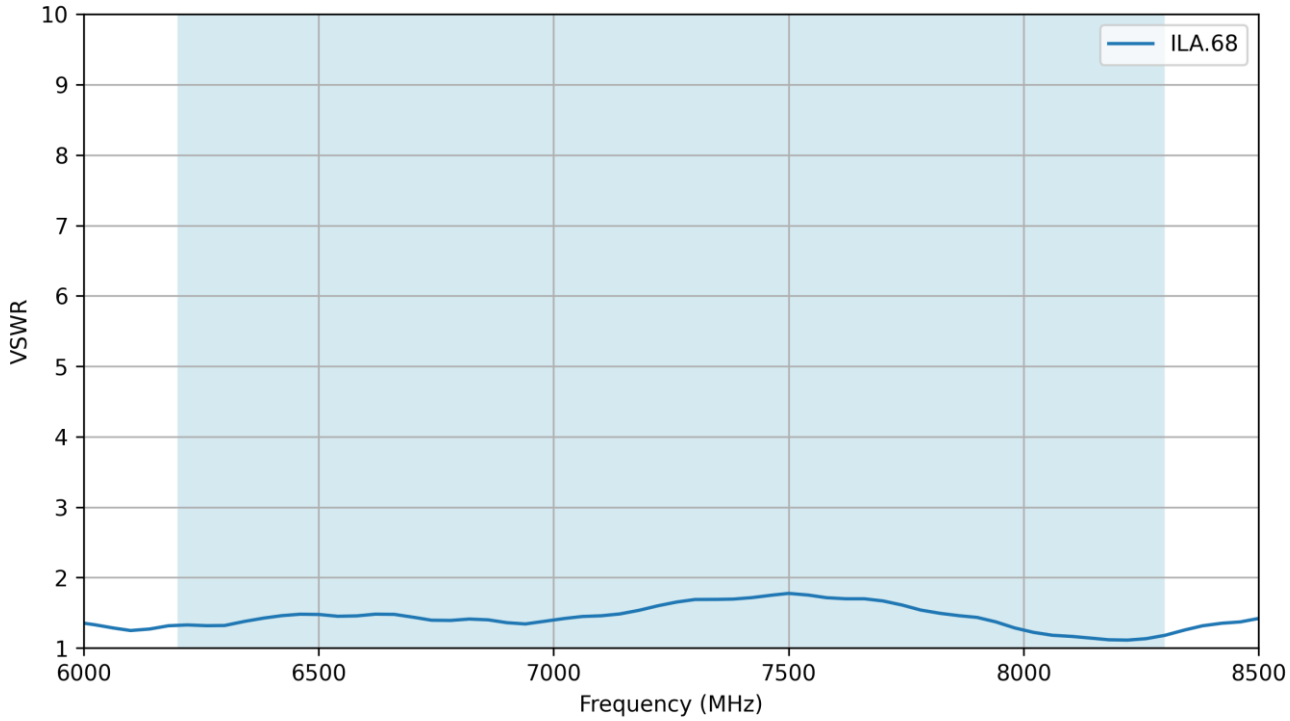


VNA Test Set-up

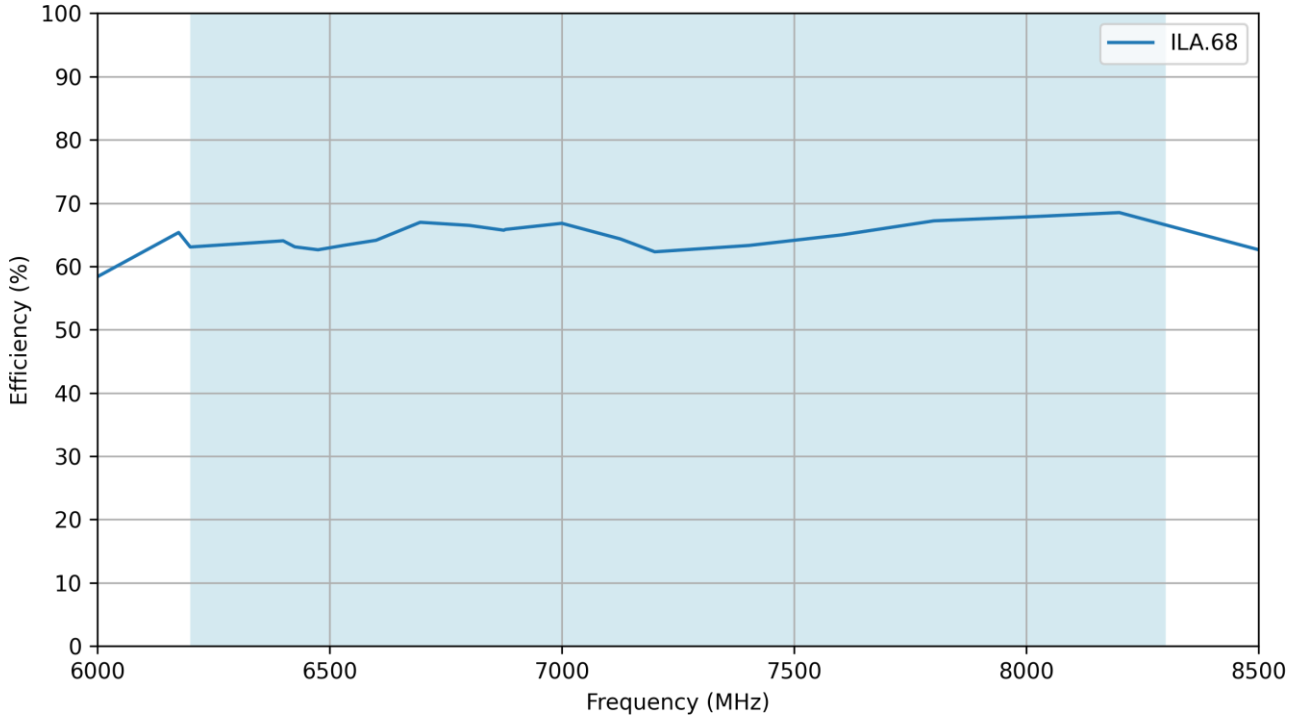
6.2 Return Loss



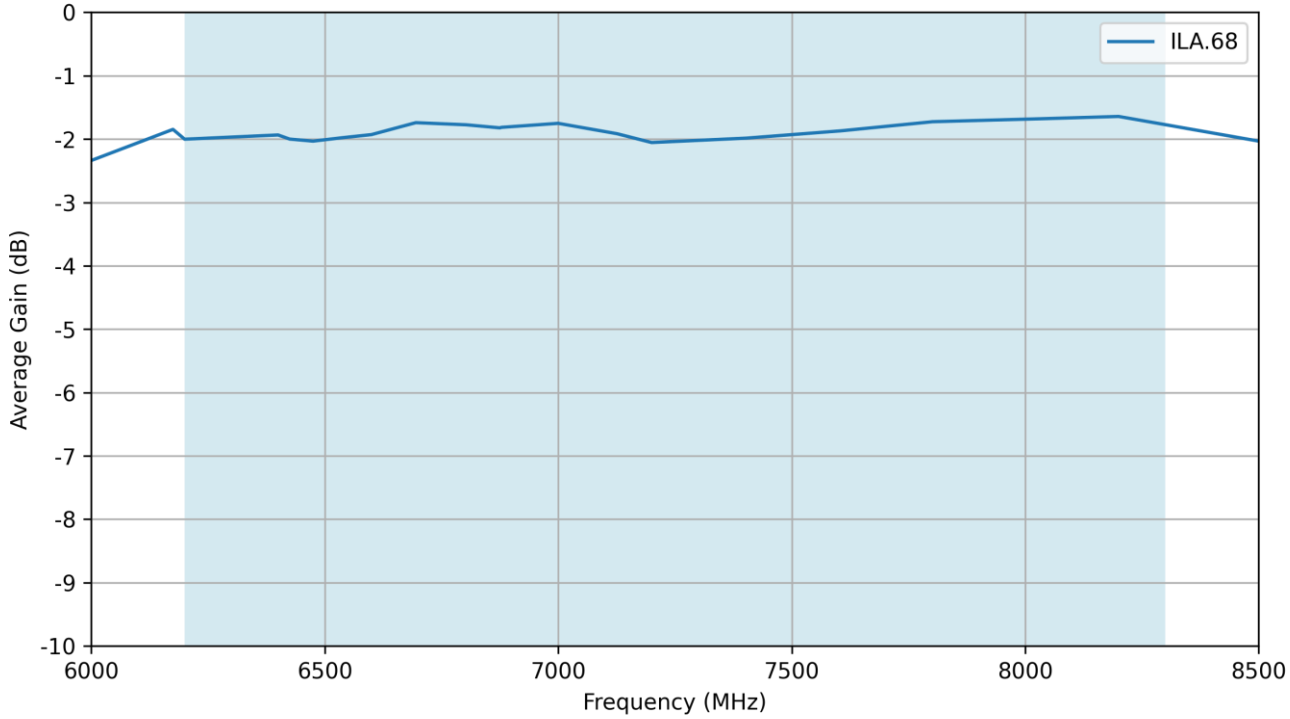
6.3 VSWR



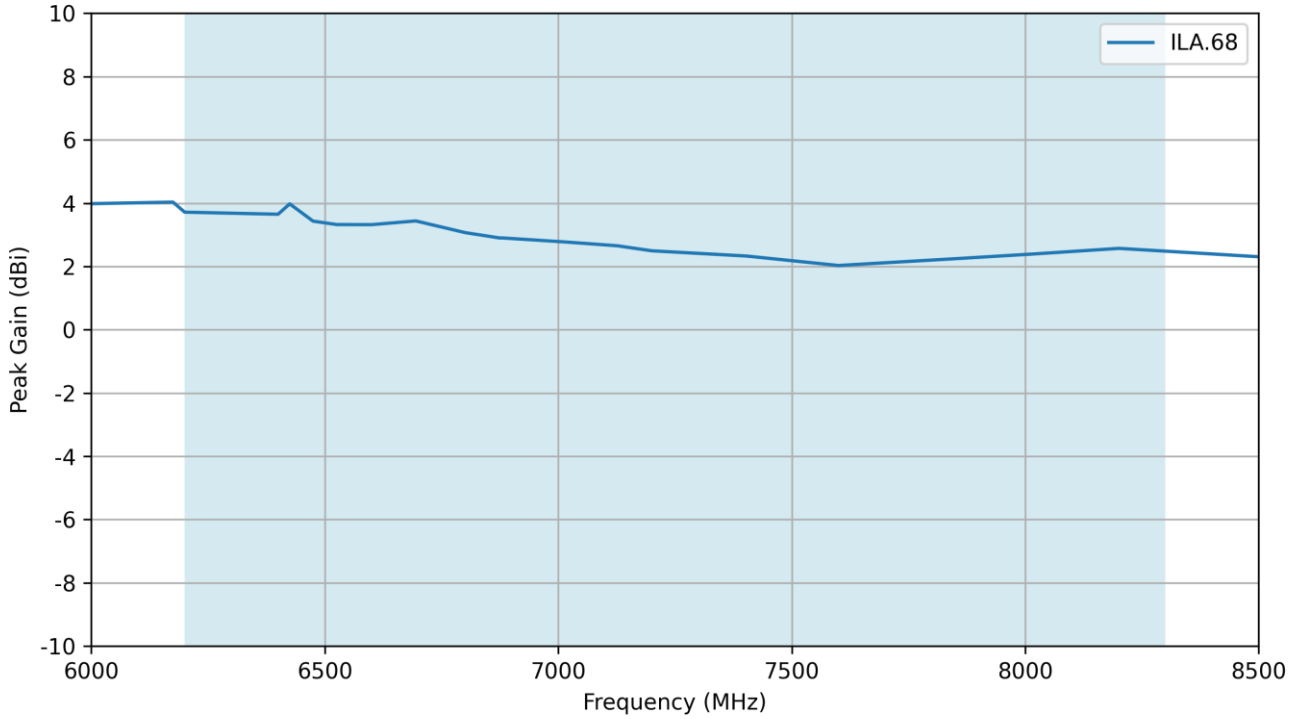
6.4 Efficiency



6.5 Average Gain

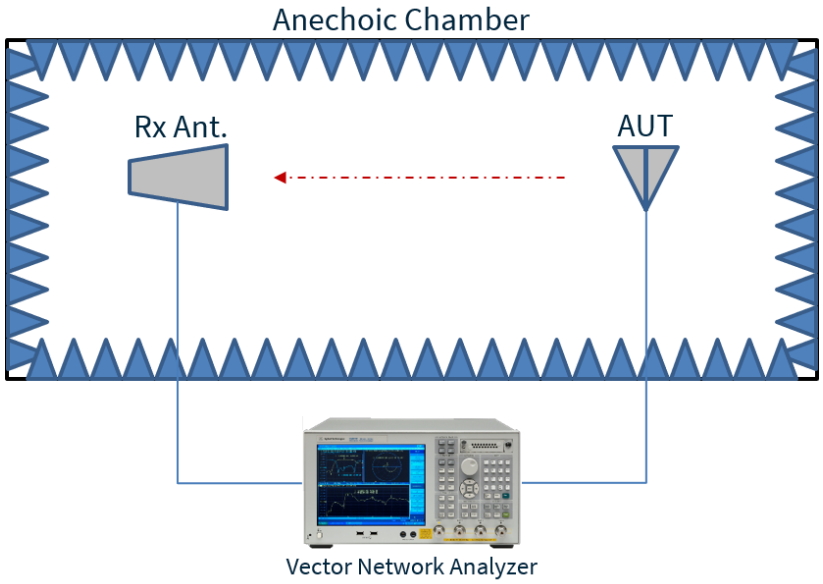


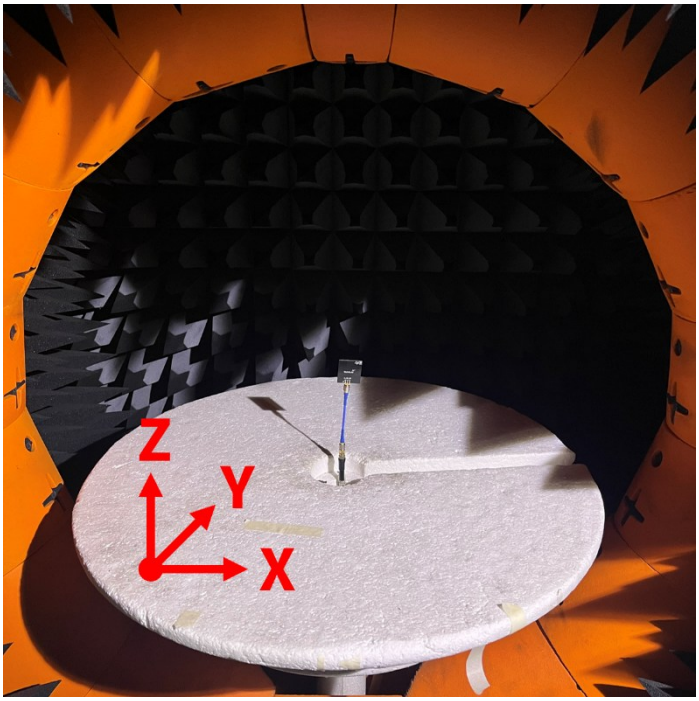
6.6 Peak Gain


ILA.68
Peak Gain (dBi)
10
8
6
4
2
0
-2
-4
-6
-8
-10
6000
6500
7000
7500
8000
8500
Frequency (MHz)

7. Radiation Patterns

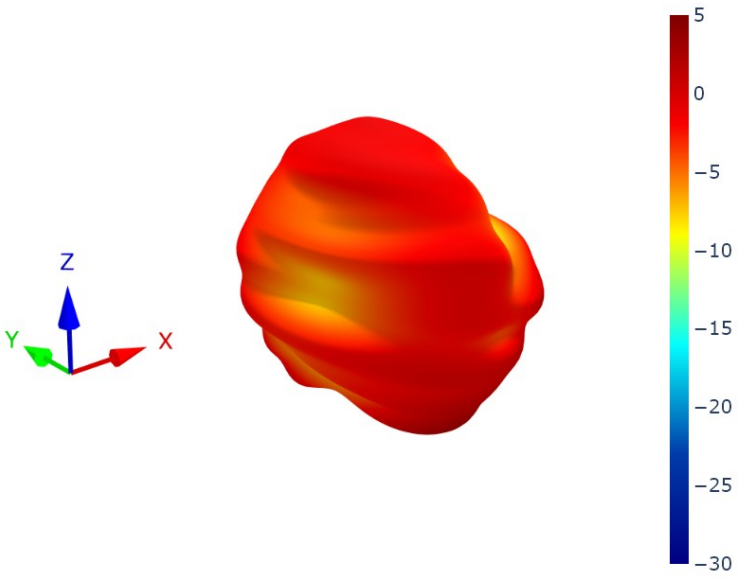
7.1 Test Setup

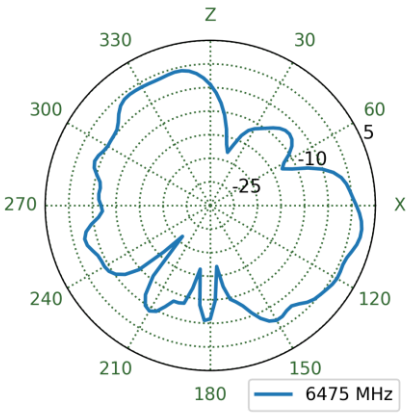
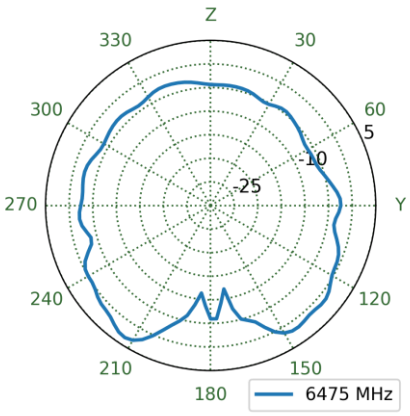
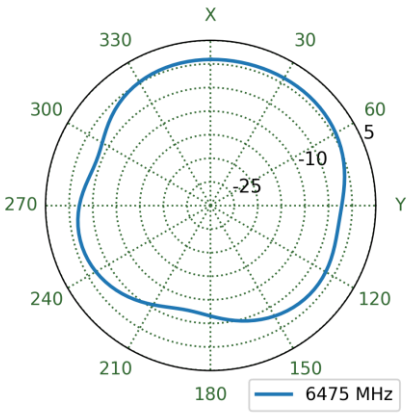




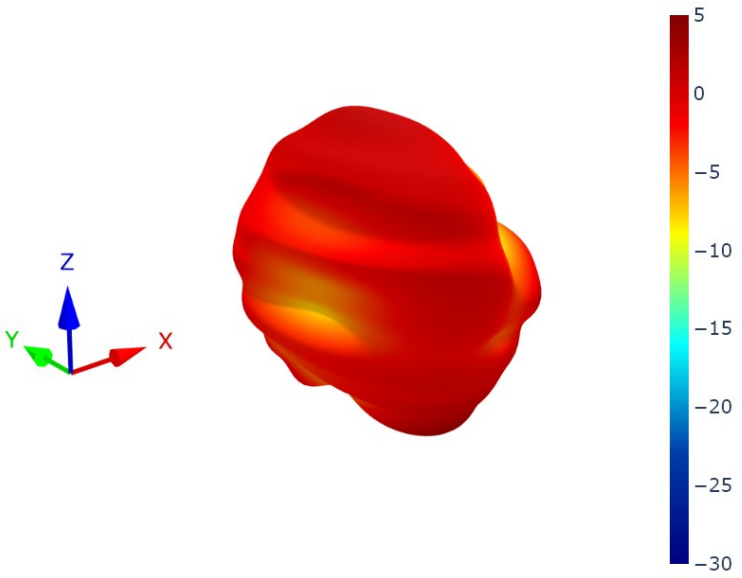
Chamber Test Set-up

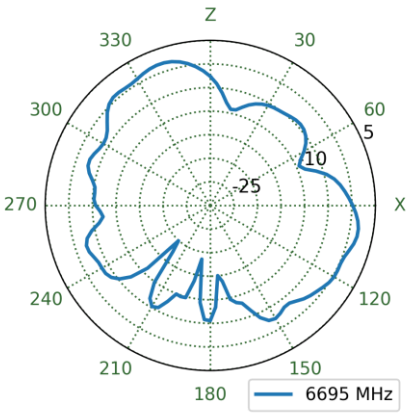
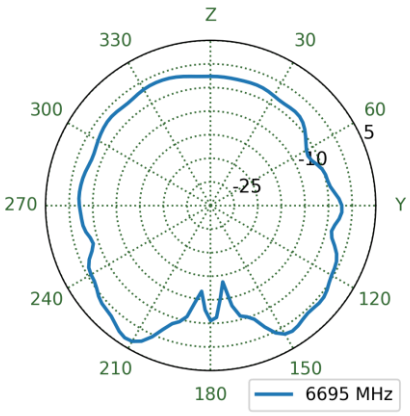
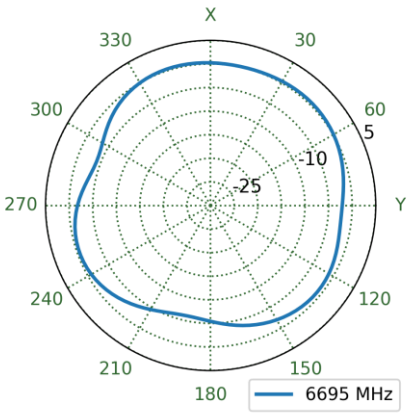
7.2 Patterns at 6500 MHz



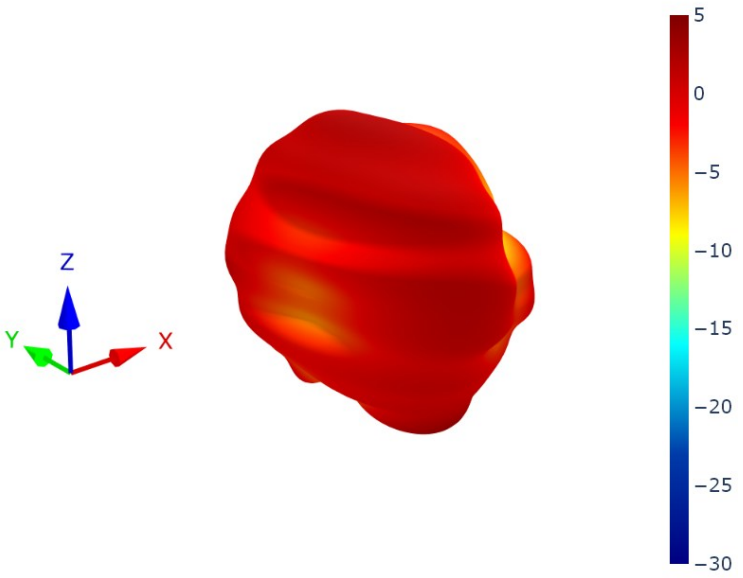
XZ Plane	YZ Plane	XY Plane
		

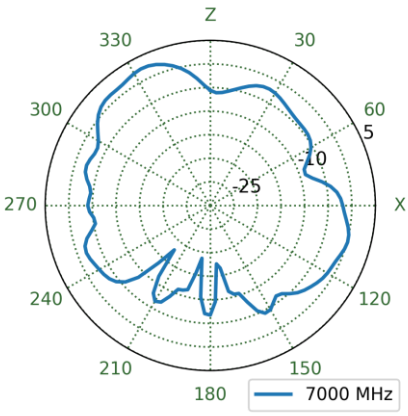
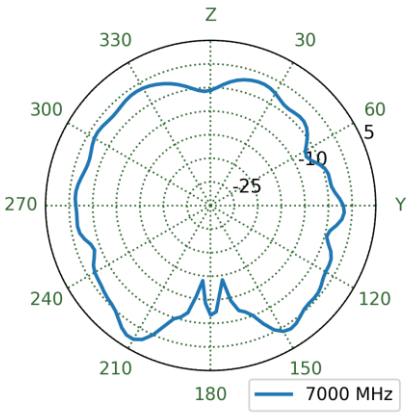
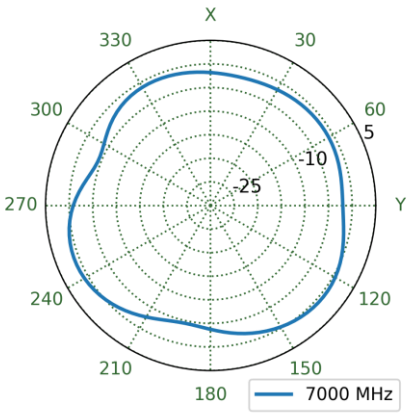
7.3 Patterns at 6700 MHz



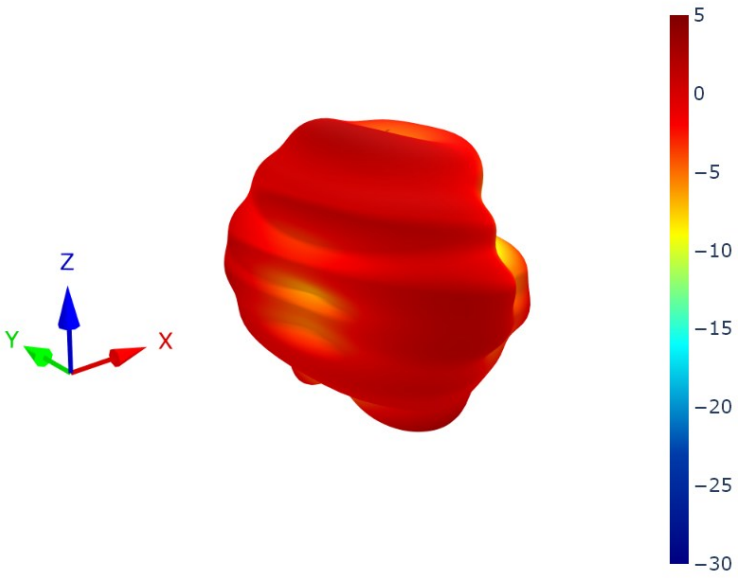
XZ Plane	YZ Plane	XY Plane
		

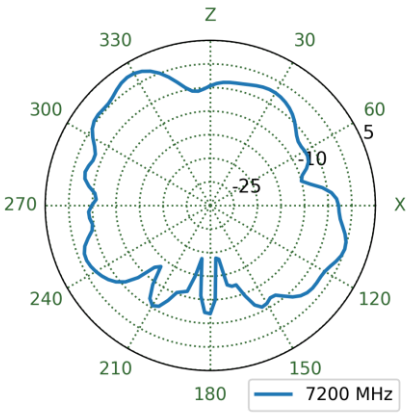
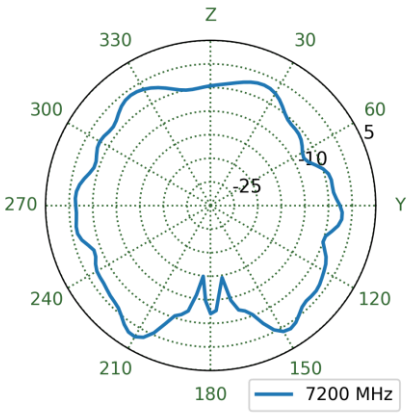
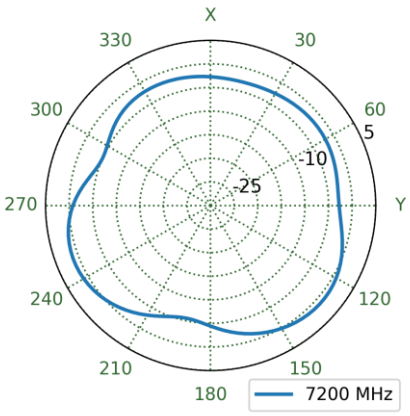
7.4 Patterns at 7000 MHz



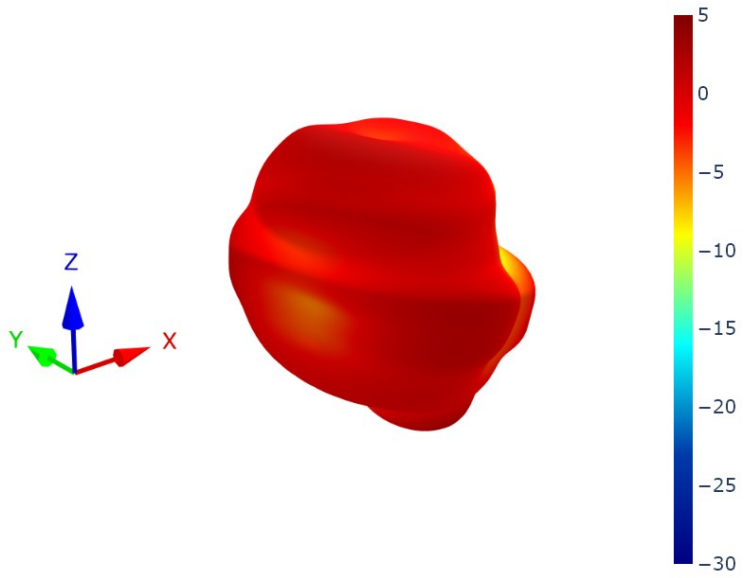
XZ Plane	YZ Plane	XY Plane
		

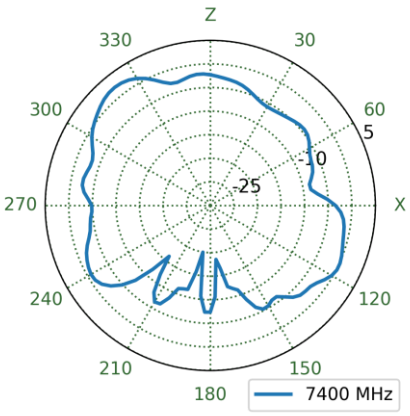
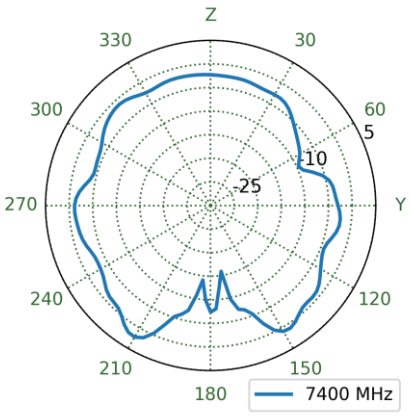
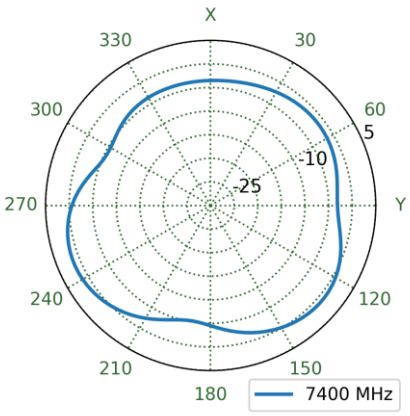
7.5 Patterns at 7300 MHz



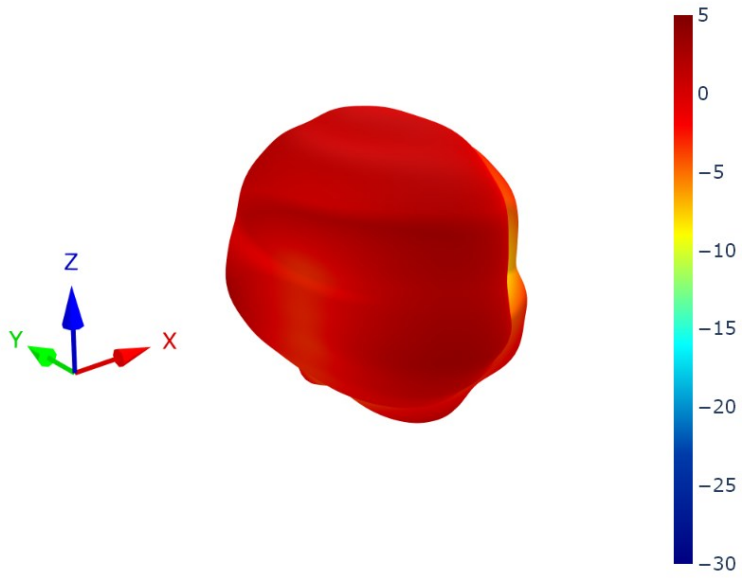
XZ Plane	YZ Plane	XY Plane
		

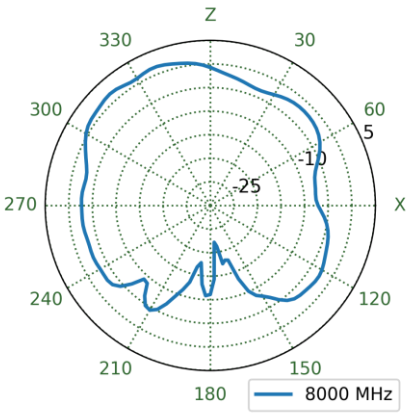
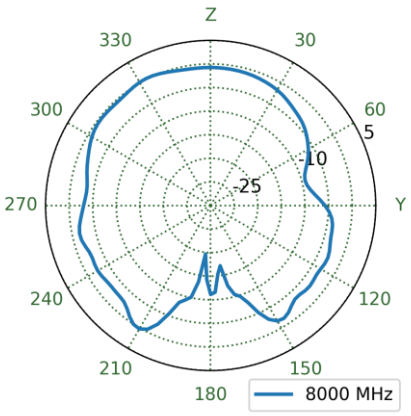
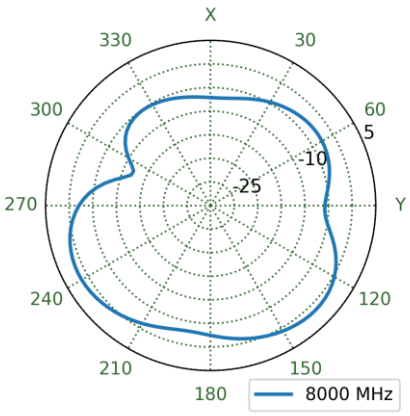
7.6 Patterns at 7500 MHz



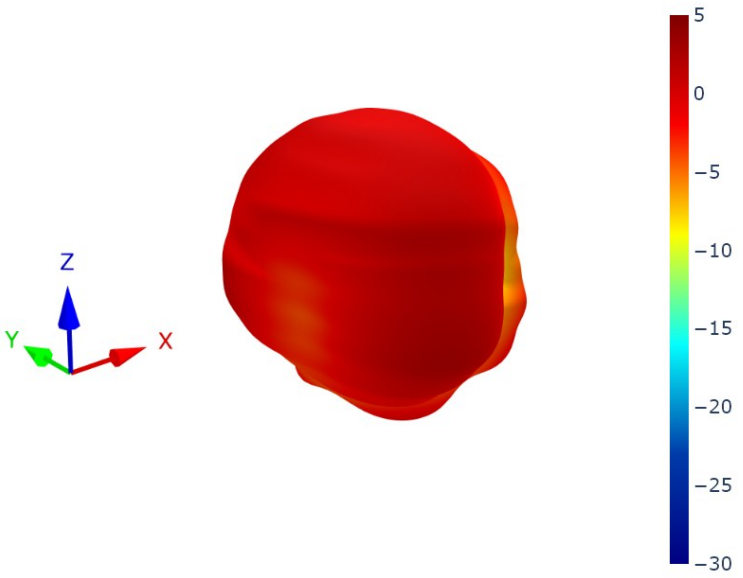
XZ Plane	YZ Plane	XY Plane
		

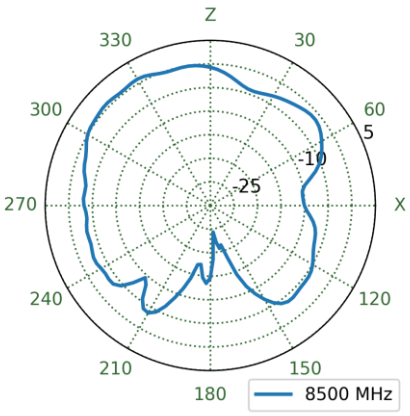
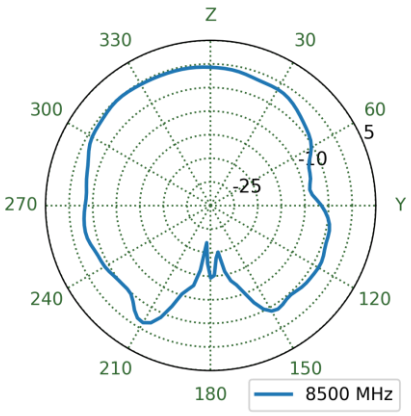
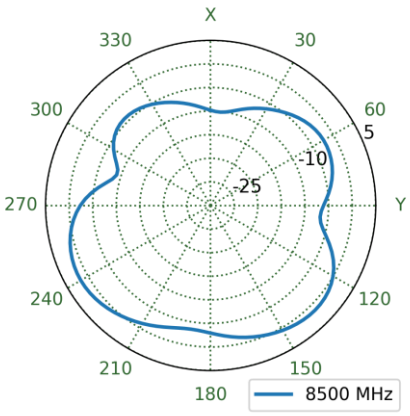
7.7 Patterns at 8000 MHz



XZ Plane	YZ Plane	XY Plane
		

7.8 Patterns at 8500 MHz



XZ Plane	YZ Plane	XY Plane
		

Changelog for the datasheet

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