



TAOGLAS®



Datasheet

Low Profile and High Efficiency 915 MHz ISM Band Loop Antenna

Part No:
ILA.01

Description

915 MHz ISM Band Loop Antenna

Features:

- Small size antenna, low profile, and high efficiency
- 915 MHz ISM Band
- Dimensions: 10 x 3.2 x 0.5 mm
- SMT Compatible
- RoHS & REACH Compliant

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ISO 9001:2015
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1. Introduction



The ILA.01 is a 915 MHz ISM band antenna with excellent efficiency, 60% at the center frequency and 35% at the band edges. This antenna works the best when placed at the center of the board edge. The antenna, at 10 x 3.2 x 0.5 mm, is low profile and would be suitable for devices with space constraints. The ILA.01 is delivered on tape and reel and now allows M2M customers to use an omni-directional SMT antenna. The omni-directional radiation characteristics allow for excellent performance regardless of device orientation. This is especially useful for devices that are not fixed in one particular spot during use. When there is little PCB space available for antenna placement, but high performance is required, the ILA.01 is the ideal choice.

This antenna can be mounted with no performance degradation in either orientation as long as the antenna is soldered correctly via Surface mounting. Please see the integration instructions section for further detail regarding the optimum way to integrate this antenna into your device.

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.

Applications:

- Automated Meter Reading (AMR)
- Radio Frequency Identification (RFID)
- Remote Monitoring
- Healthcare
- Sensing
- 915 MHz Applications

2. Specification

LTE Electrical

Band	Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
915MHz	902-928	45.6	-3.41	1.37	50Ω	Linear	Omni-directional	5W

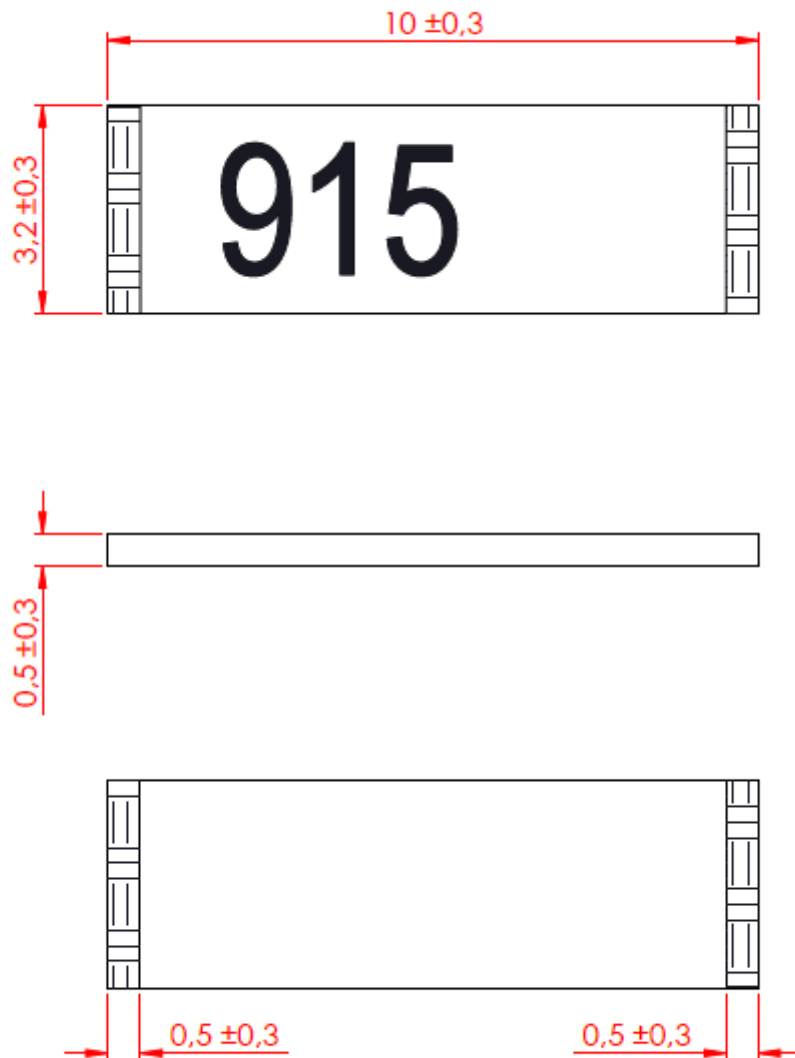
Mechanical

Dimensions (mm)	10 x 3.2 x 0.5
Required Space (mm)	11 x 10.4
Material	Ceramic
EVB Connector	SMA(F)

Environmental

Temperature Range	-40°C to 85°C
Storage Temperature	-40°C to 105°C
Humidity	40% to 95%
Moisture Sensitivity Level	3(168 Hours)

3. Mechanical Drawing



4. Antenna Integration Guide

The following is an example on how to integrate the ILA.01 into a design. This antenna has 3 pins, where one pin is used for the RF Feed. Taoglas recommends using a minimum of 80x40mm ground plane (PCB) to ensure optimal performance.

The antenna should be placed mid-point on the long side of the PCB to take advantage of the ground plane on each side of the antenna.



Top view of PCB.

Please find the Integration files in Altium, 2D formats and the 3D model for the ILA.01 here:
<https://www.taoglas.com/product/ila-01-915mhz-ceramic-loop-antenna/>

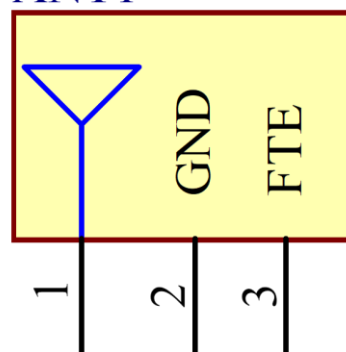
4.1 Schematic Symbol and Pin Definitions



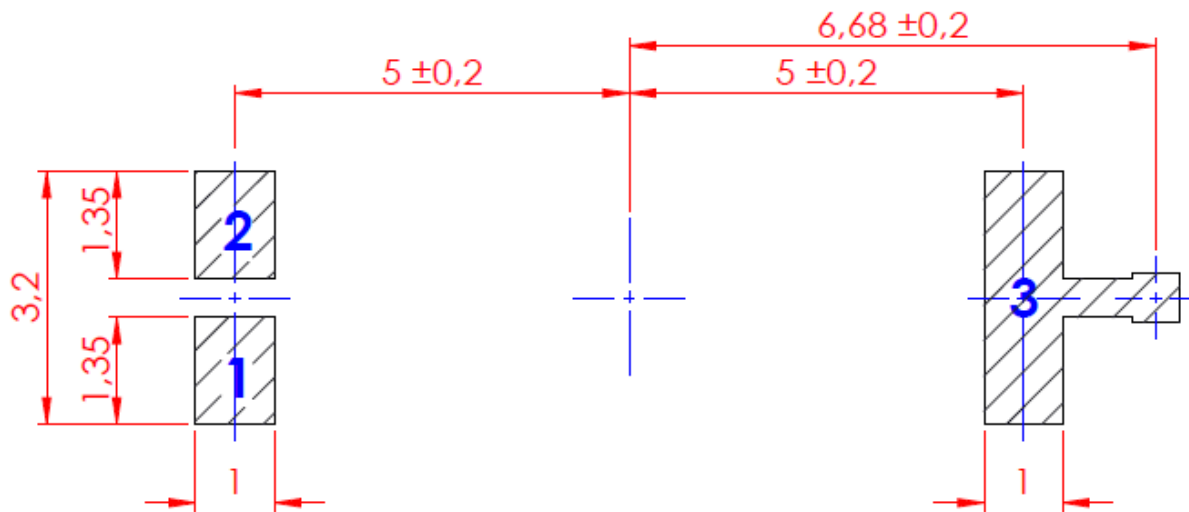
Above is a 3D model of the ILA.01 on a PCB.

Pin	Description
1	RF Feed
2	GND
3	FTE

TAOGLAS_ILA.01
ANT1

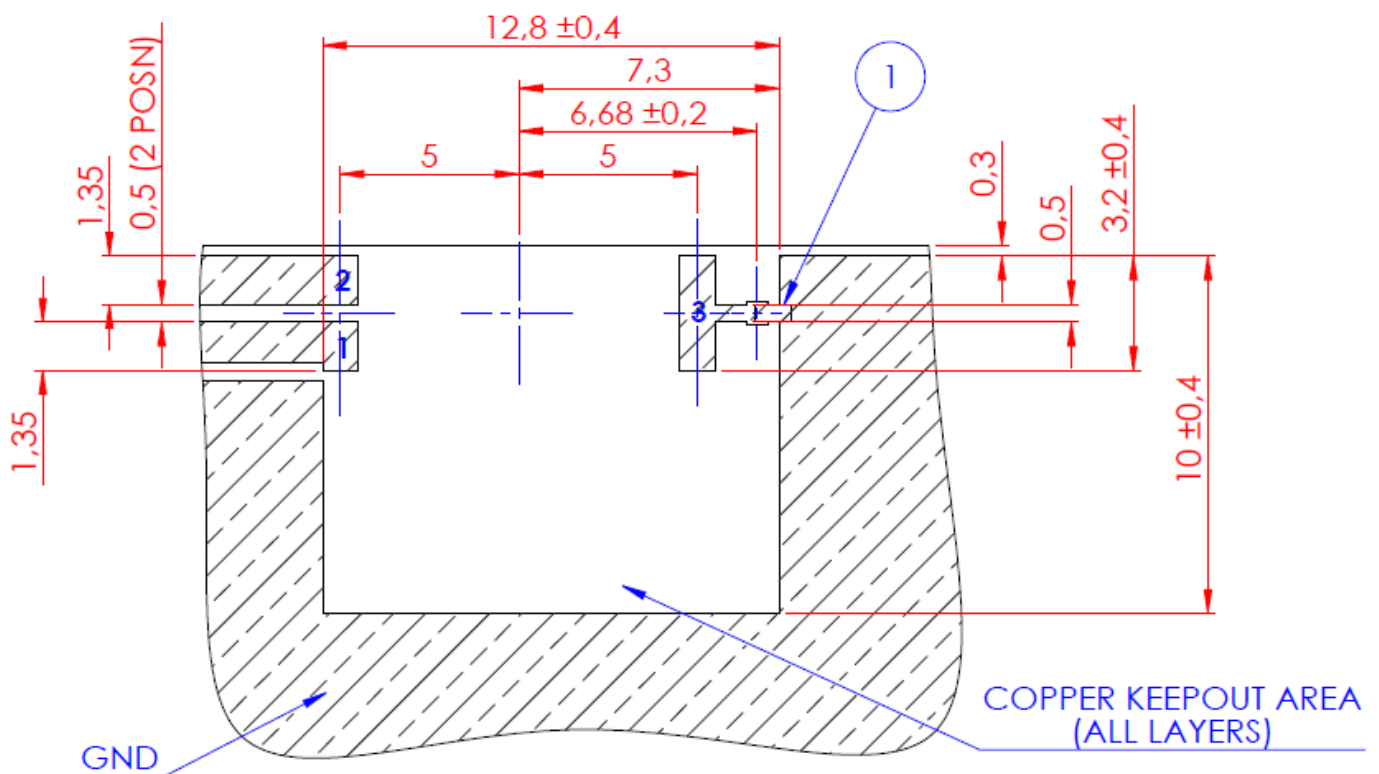


4.2 Antenna Copper Footprint

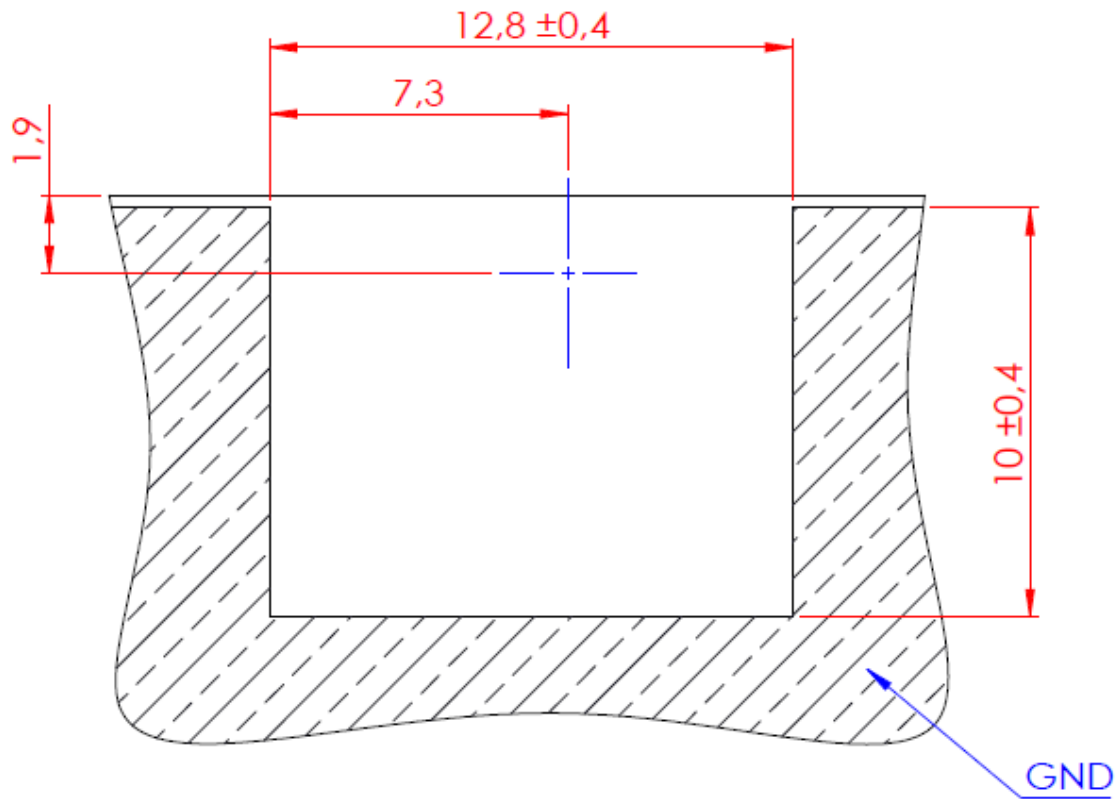


4.3 Ground Clearance Top View

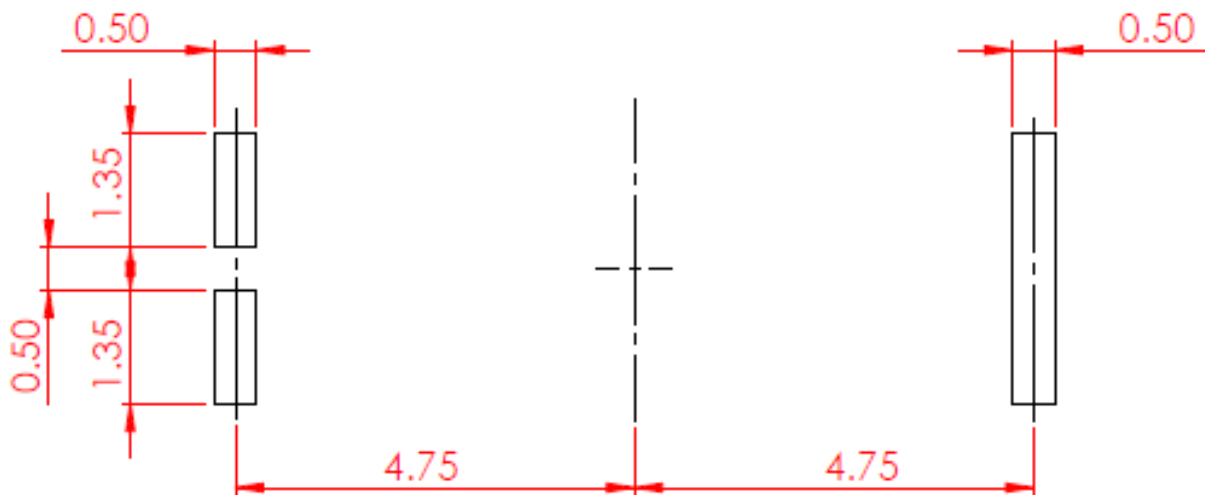
ITEM NO.	DESCRIPTION	QTY
1	CAPACITOR 10 pF (0402)	1



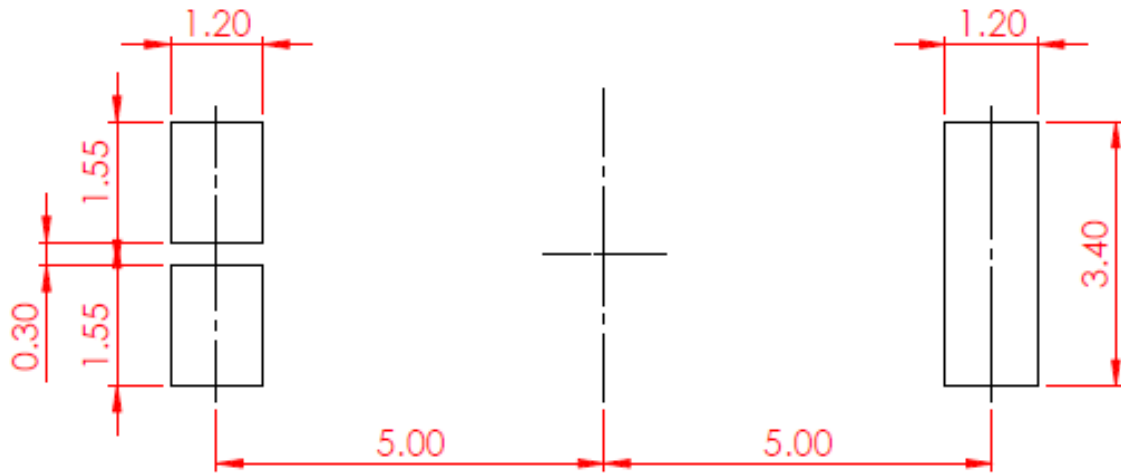
4.4 Ground Clearance Bottom View



4.5 Top Solder Paste

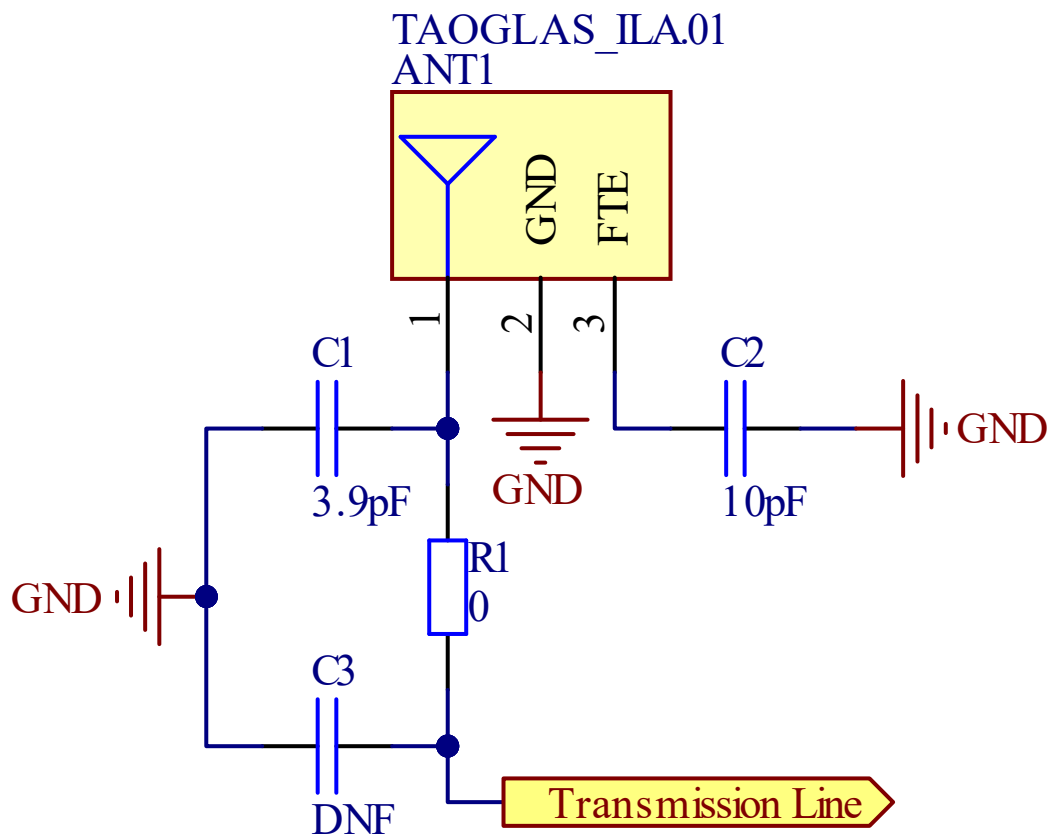


4.6 Top Solder Mask



4.7 Schematic Layout

Matching components with the ILA.01 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 ILA.01.

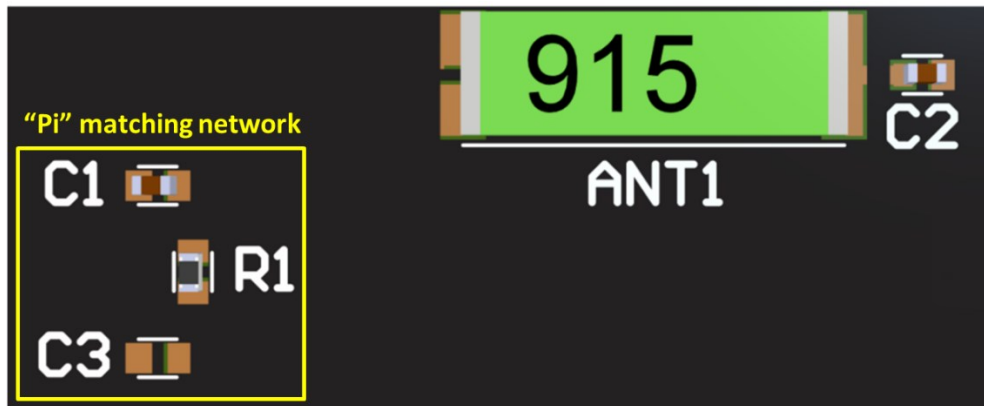


Designator	Type	Value	Manufacturer	Manufacturer Part Number
C1	Capacitor	3.9 pF	Murata	GRM1555C1H3R9CA01D
C2	Capacitor	10 pF	Murata	GRM1555C1H100JA01D
C3	Capacitor	Not Fitted	-	-
R1	Resistor	0Ω	YAGEO	RC0402JR-070RL

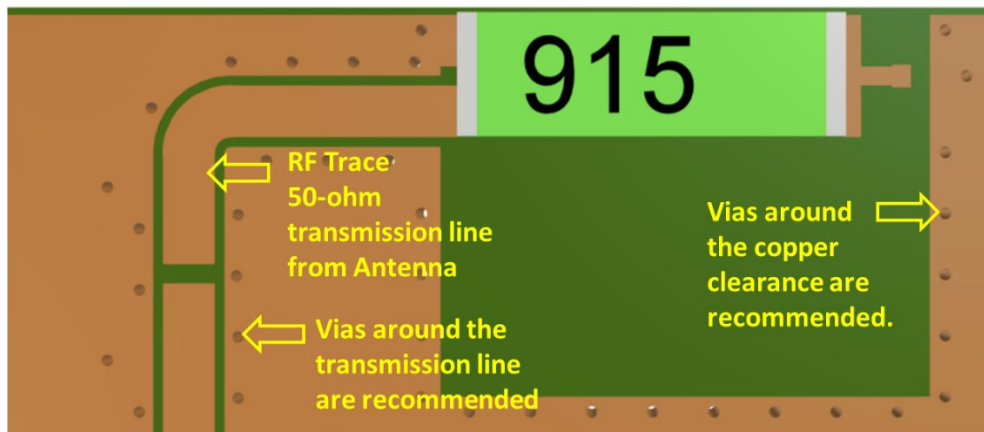
4.8 Antenna Integration

The ILA.01 should be placed mid-point on the long side of the PCB to take advantage of the ground plane extending from each side of the antenna.

The RF trace must maintain a 50Ω 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.01 antenna mounted on a PCB, showing “Pi” matching network.



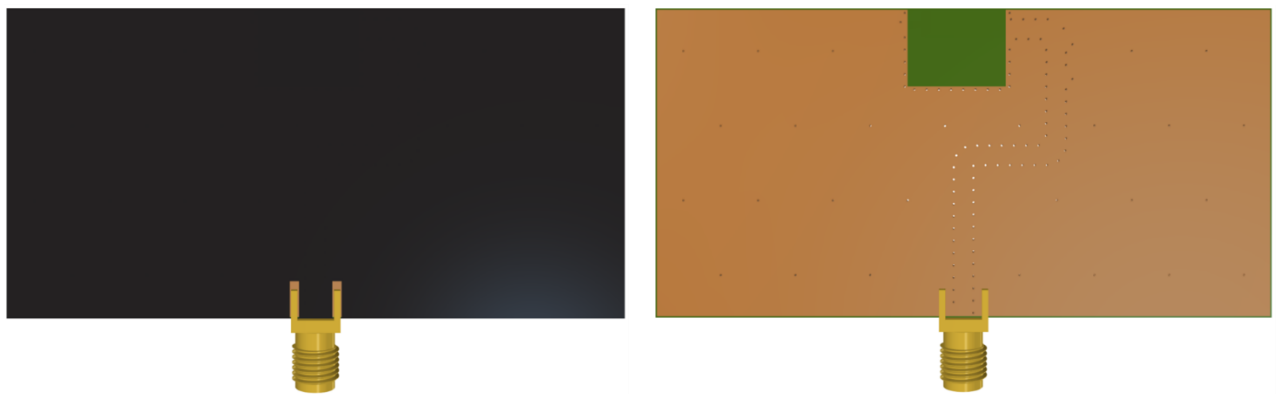
ILA.01 antenna mounted on a PCB, showing transmission line and integration notes.

4.9 Final Integration

The top side image shown below highlights the antenna transmission line. Taoglas recommends using a minimum of 80x40mm ground plane (PCB) to ensure optimal performance.



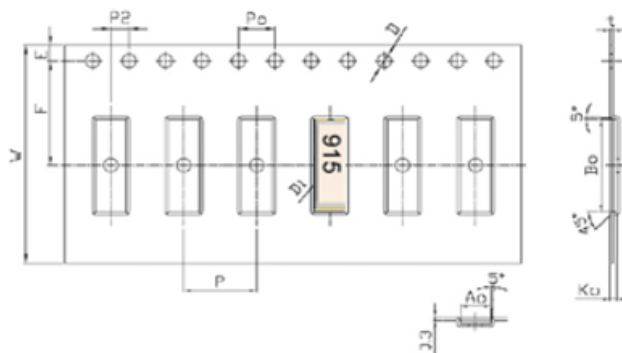
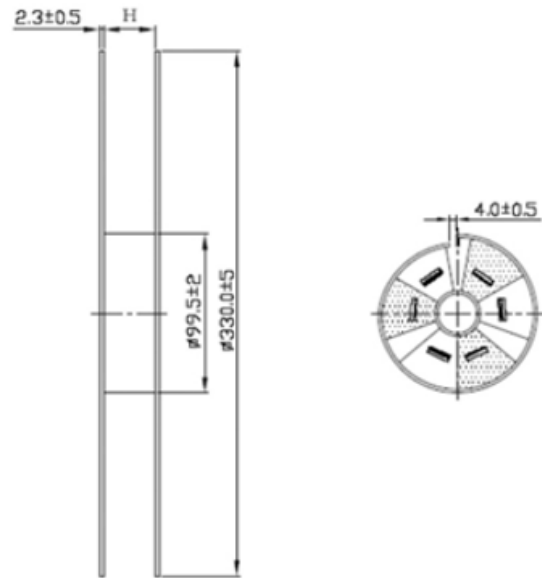
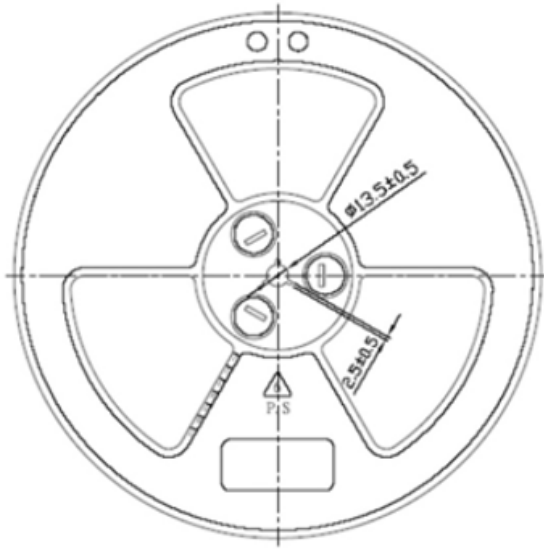
Top Side (ILA.01 placement on 80x40mm PCB)



Bottom Side (80x40mm PCB)

5. Packaging

6000pcs ILA.001 per reel
 Dimensions – 420*380mm
 Weight – 1050g



Tape Dimensions(unit: mm)

Feature	Specifications	Tolerances
W	24.00	± 0.30
P	8.00	± 0.10
E	1.75	± 0.10
F	11.50	± 0.10
P2	2.00	± 0.10
D	1.50	+0.10 0.00
D1	1.50	± 0.10
Po	4.00	± 0.10
10Po	40.00	± 0.20

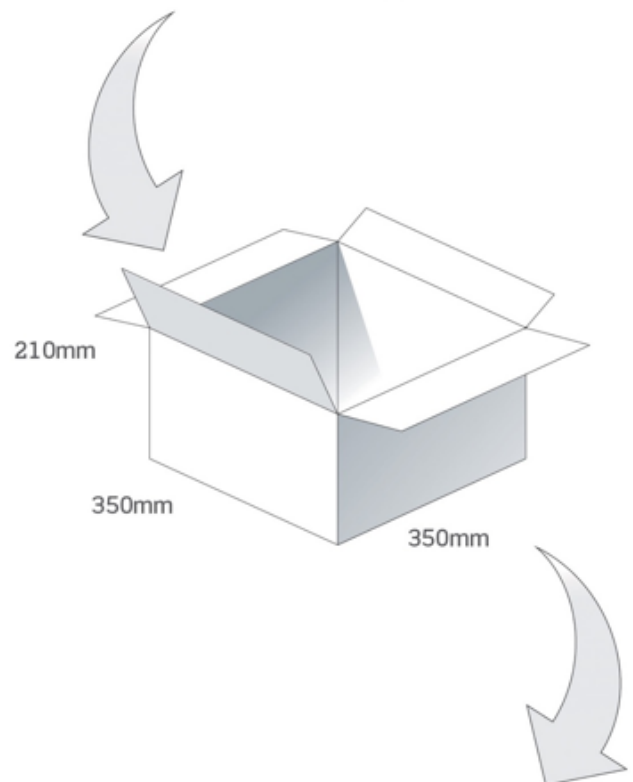
Pocket Dimensions(unit: mm)

Feature	Specifications	Tolerances
Ao	3.40	± 0.10
Bo	10.20	± 0.10
Ko	0.70	± 0.10
t	0.30	± 0.05

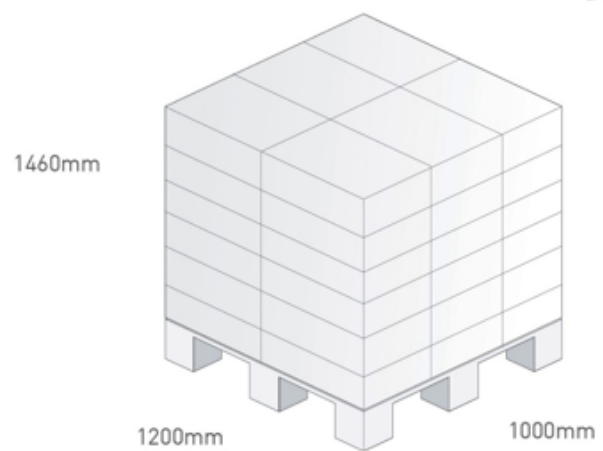
6000Pcs ILA.001 Per Reel
Dimensions – 420*380mm
Weight – 1050g



6 Reels, 36000 Pcs
In One Carton
Carton Dimensions – 350*350*210mm
Weight – 7.1Kg



Pallet Dimensions 1200*1000*1460mm
36 Cartons Per Pallet
6 Cartons Per Layer
6 Layers



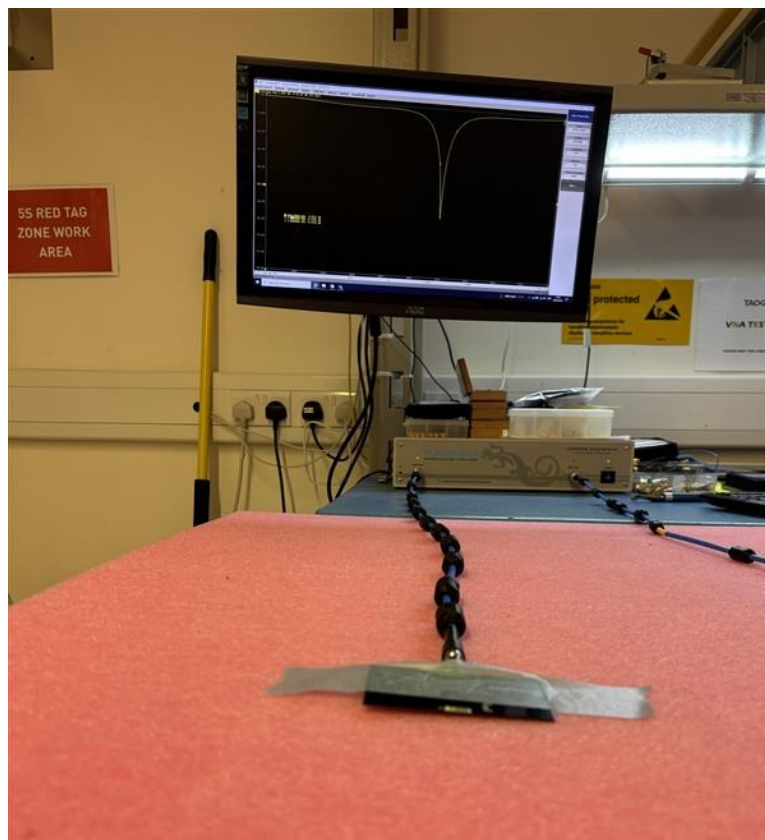
6. Antenna Characteristics

6.1 Test Setup

AUT

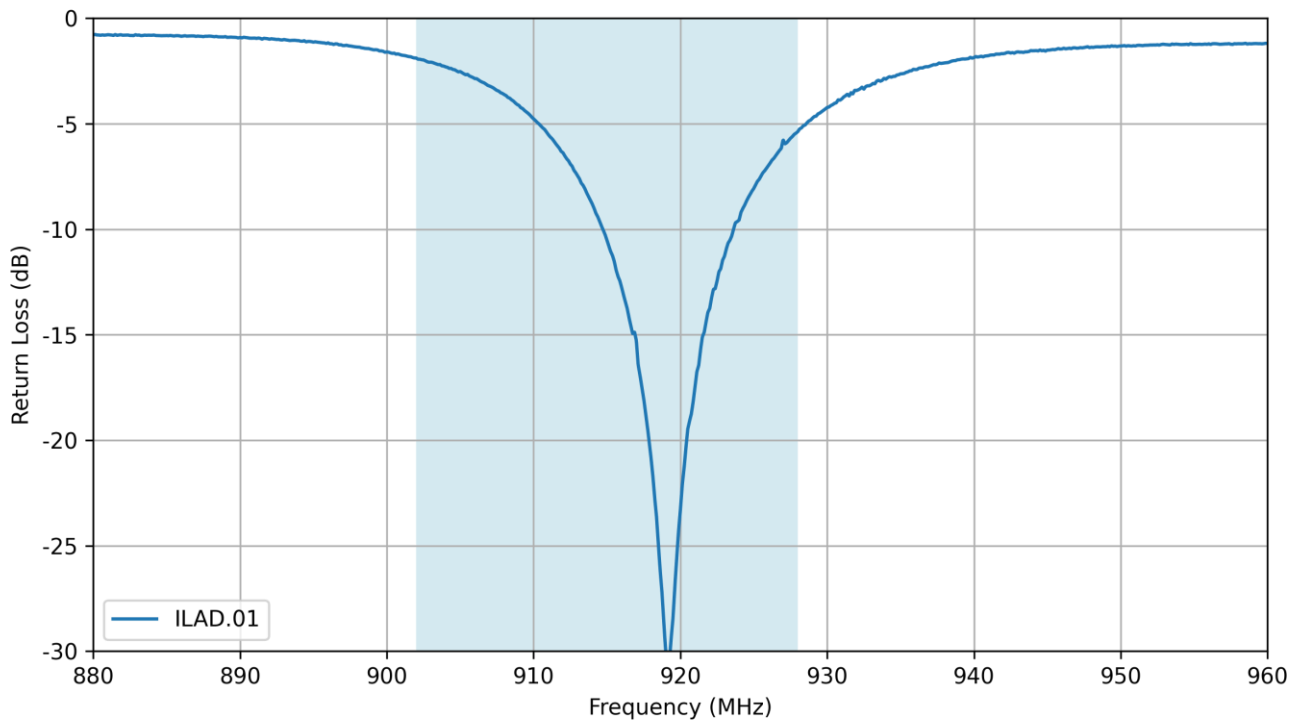


Vector Network Analyzer

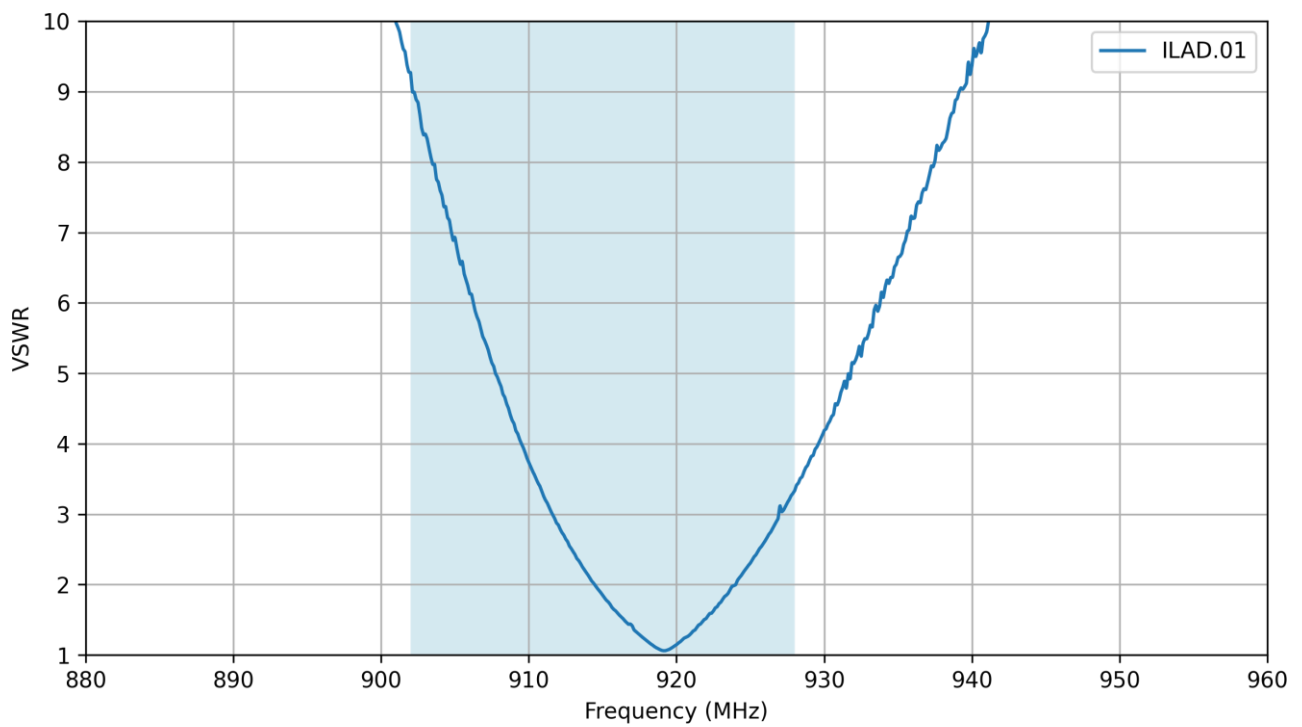


VNA Test Set-up

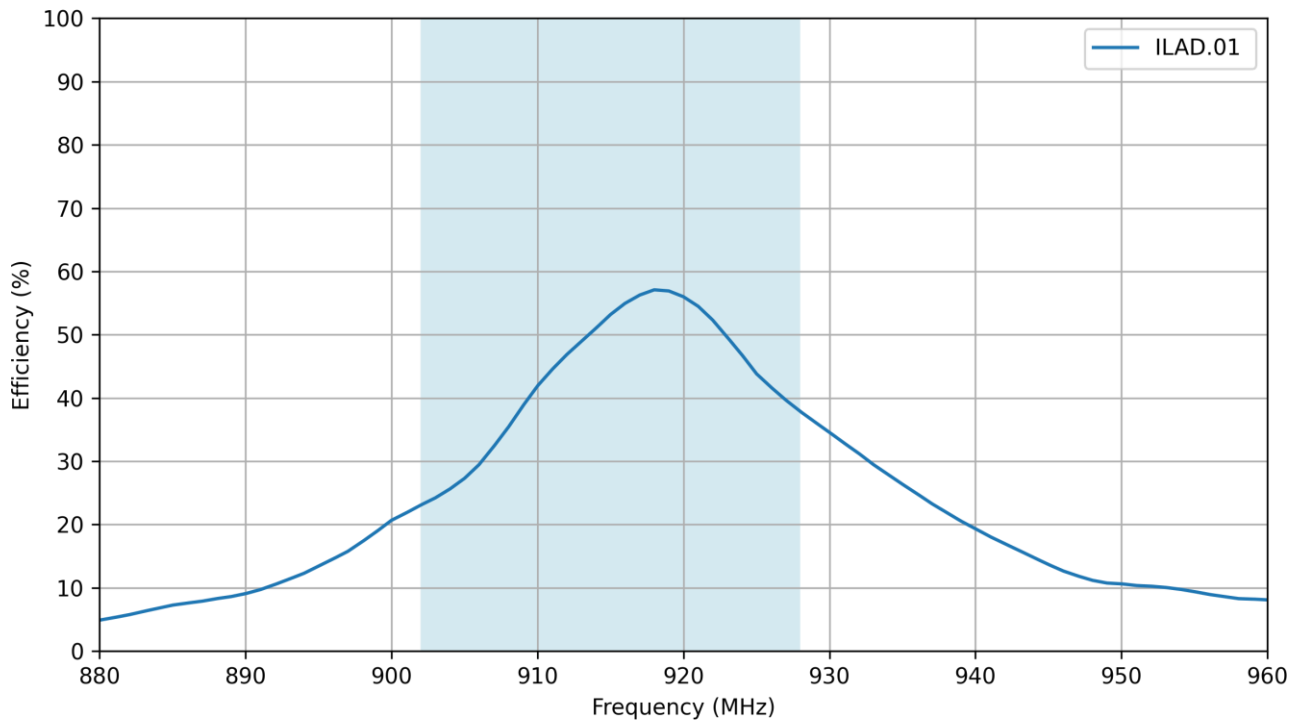
6.2 Return Loss



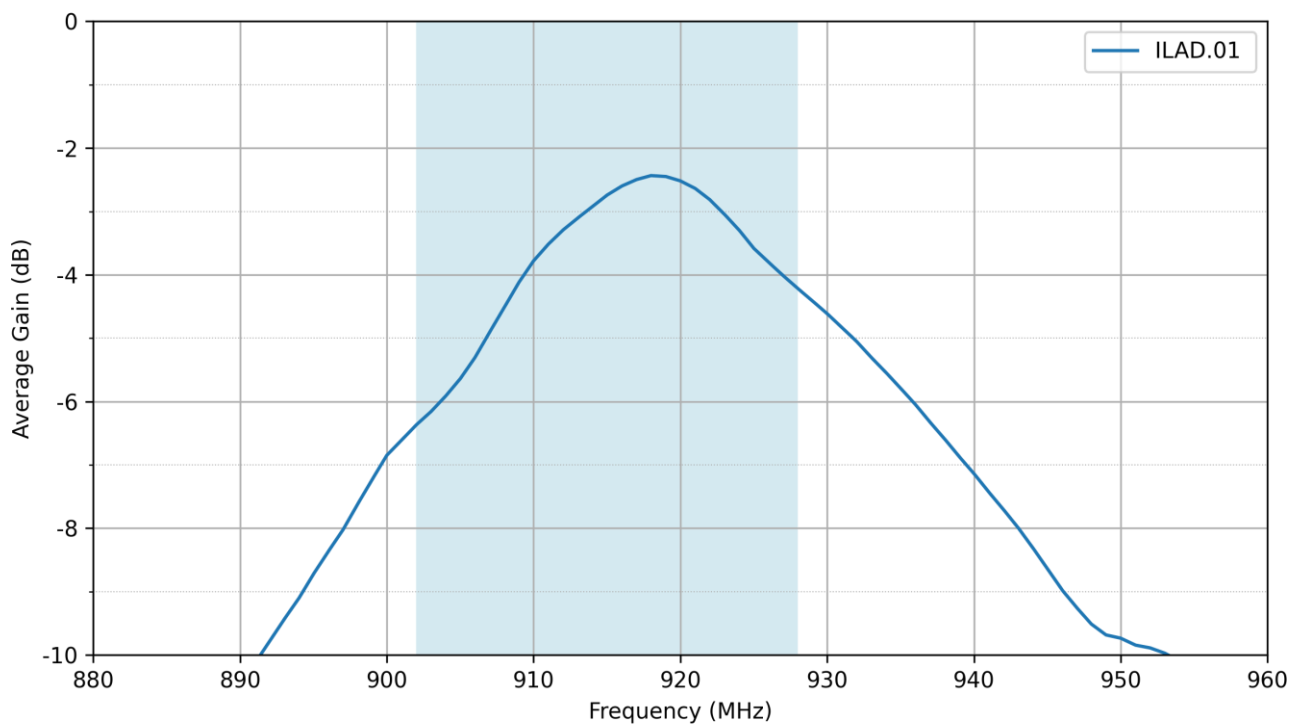
6.3 VSWR



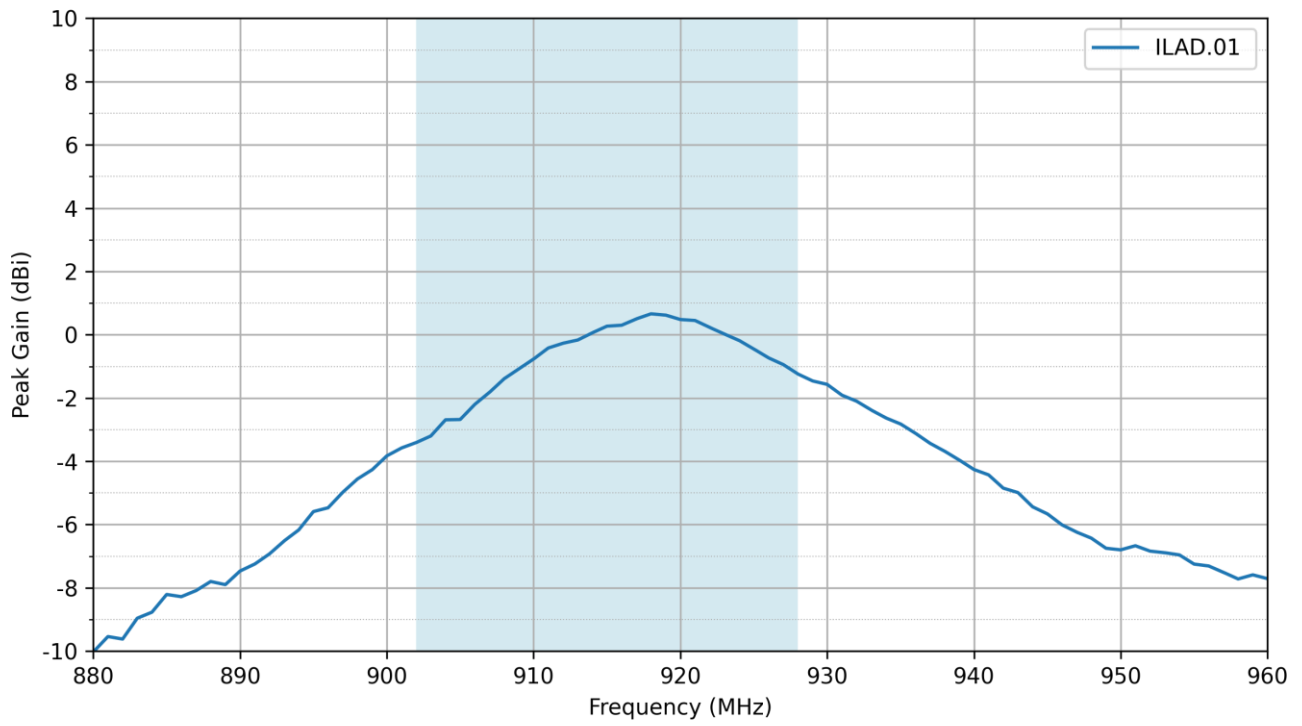
6.4 Efficiency



6.5 Average Gain

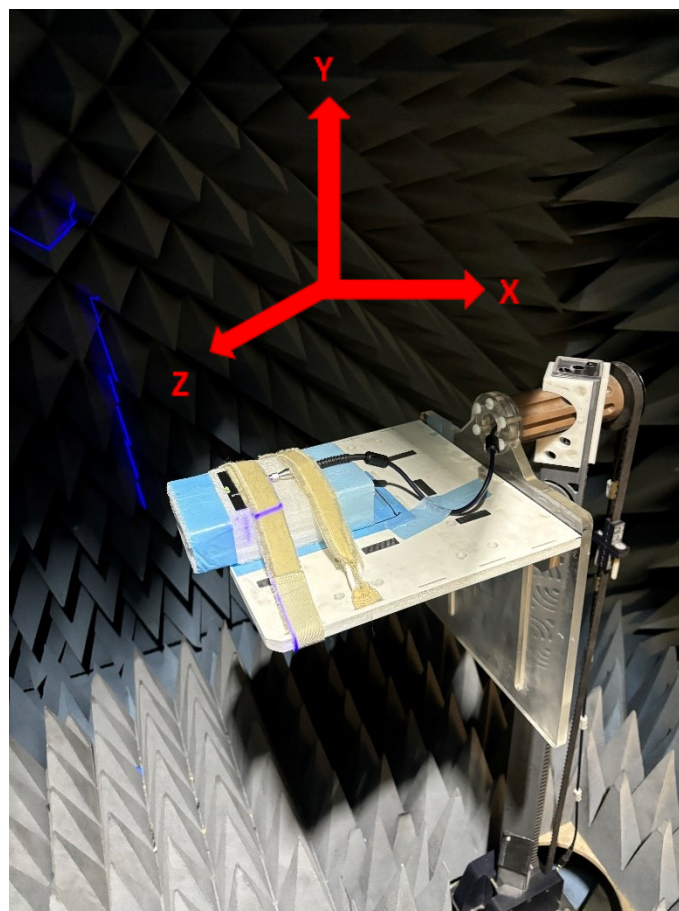
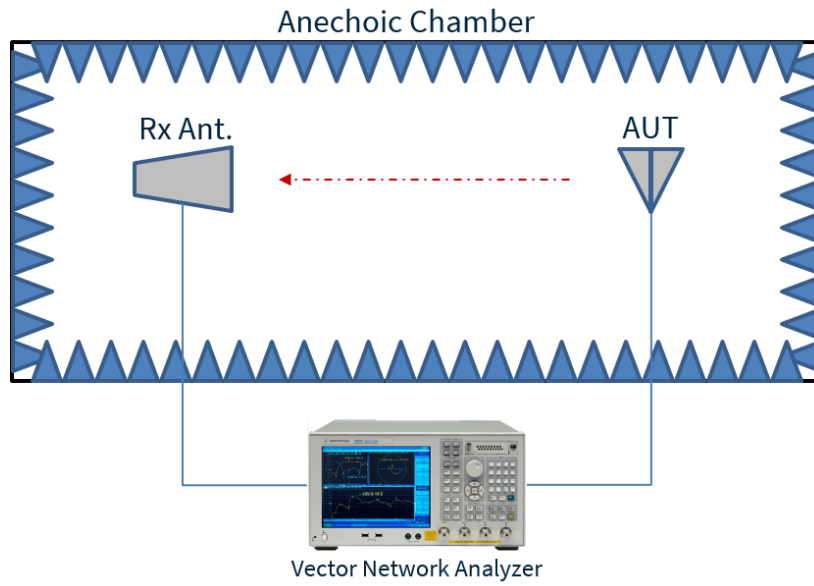


6.6 Peak Gain



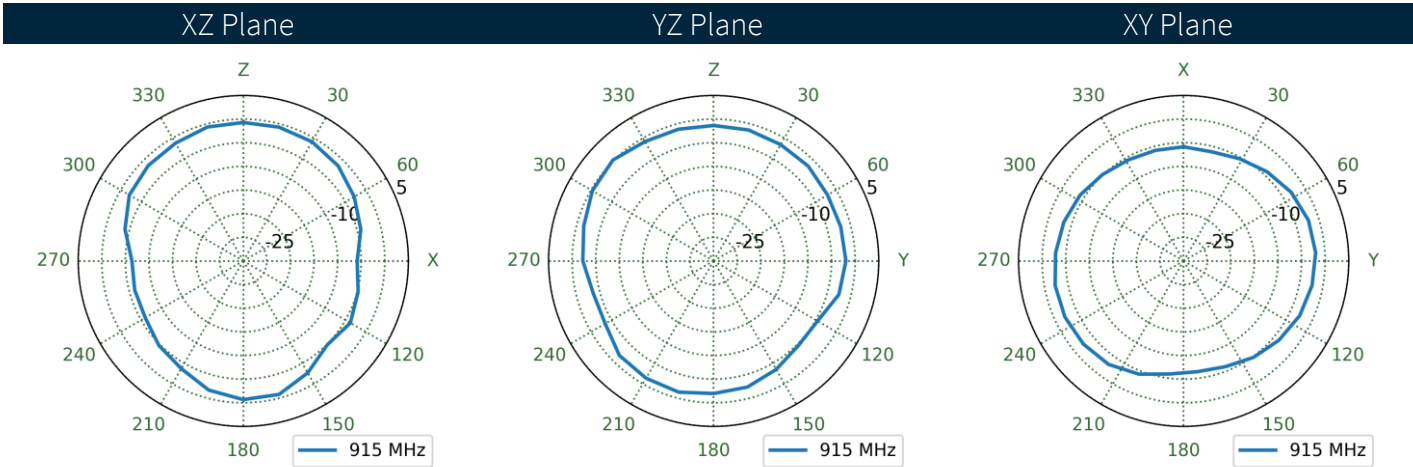
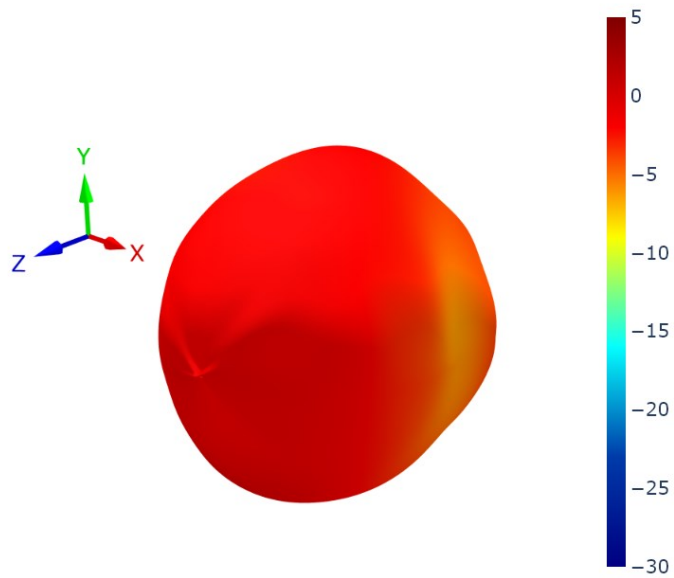
7. Radiation Patterns

7.1 Test Setup



Chamber Test Set-up

7.2 Patterns at 915 MHz



Changelog for the datasheet

SPE-12-8-079 – ILA.01

Revision:K (Current Version)

Date:	2024-08-29
Changes:	Updated antenna integration guide.
Changes Made by:	Gary West

Previous Revisions

Revision: J

Date:	2023-09-05
Changes:	Updated solder reflow information
Changes Made by:	Cesar Sousa

Revision: E

Date:	2017-04-21
Changes:	
Changes Made by:	Technical Writer

Revision: I

Date:	2023-01-17
Changes:	Updated product image
Changes Made by:	Cesar Sousa

Revision: D

Date:	2016-09-12
Changes:	
Changes Made by:	Technical Writer

Revision: H

Date:	2022-06-23
Changes:	Updated antenna integration guide, radiation patterns and graphs
Changes Made by:	Evan Murphy

Revision: C

Date:	2014-08-19
Changes:	EVB & Footprint
Changes Made by:	Aine Doyle

Revision: G

Date:	2021-10-28
Changes:	Format Change, MSL
Changes Made by:	Erik Landi

Revision: B

Date:	2012-06-27
Changes:	
Changes Made by:	Technical Writer

Revision: F

Date:	2017-10-23
Changes:	Packing drawing updated
Changes Made by:	Carol Faughnan

Revision: A (Original First Release)

Date:	2012-05-08
Notes:	Initial Release
Author:	Technical Writer



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