



TAOGLAS®



Datasheet

Part No:
SDWA.01

Description

2.4/5-7.125GHz Wi-Fi® (Including Wi-Fi® 6) Ceramic SMD Antenna

Features:

Low Profile Ceramic SMD Wi-Fi® Antenna

Covering: 2400-2500MHz, 5150-5825MHz, 5925-7125MHz Wi-Fi®

Covers Wi-Fi® 6 spectrum for future proof design

Dims: 10.0 x 4.0 x 1.5mm

RoHS & Reach Compliant

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1. Introduction



The SDWA.01 is a high-efficiency SMD ceramic embedded antenna designed for Wi-Fi® applications requiring high data rates and wide coverage. It supports operation in the 2.4 GHz, 5.8 GHz and 7.125 GHz bands, covering the latest Wi-Fi® 6 spectrum for future-proof designs. The antenna offers high peak gain and reliable RF performance in compact devices.

Optimized for corner mounting on a device PCB, the SDWA.01 delivers consistent performance and can be used in pairs to support MIMO configurations. Its ultra-low profile of just 1.5 mm enables integration into extremely thin products while maintaining excellent electrical characteristics. The antenna is supplied on tape and reel for standard SMD assembly.

Typical applications include:

- Wi-Fi® 6 enabled devices
- Smart home and consumer electronics
- Industrial and commercial IoT equipment
- Set-top boxes and gateways
- Compact networking and connectivity devices

The SDWA.01 provides a robust embedded antenna solution for space-constrained designs requiring high throughput and wide-area wireless coverage. For optimal performance and regulatory compliance, Taoglas offers integration support, testing, and optimization services.

2. Specification

Electrical								
Band	Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
Wi-Fi - 2GHz	2400-2500	55.3	-2.57	3.36	50 Ω	Linear	Omni directional	10W
Wi-Fi - 5GHz	5150-5850	64.9	-1.88	7.73				
Wi-Fi - 6GHz	5925-7125	44.0	-3.57	8.01				

Mechanical	
Dimensions	10.0 x 4.0 x 1.5 mm
Weight	1g
Material	Ceramic
Antenna Type	SMD
Eval Board Dimensions	100 x 50 mm

Environmental	
Operation Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Relative Humidity	Non-condensing 65°C 95% RH
Temperature Coefficient (τf)	0 $\pm$ 20 ppm @ -20°C to +80°C
Recommended Reel Storage Conditions	5°C to 40°C
Moisture Sensitivity Level (MSL)	3 (168 Hours)

3. Mechanical Drawing

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4. Integration Guide

The following is an example on how to integrate the SDWA.01 into a design. This antenna has 2 pins, where one pin is used for the RF Feed. Taoglas recommends using a minimum of 100x50mm ground plane (PCB) to ensure optimal performance.



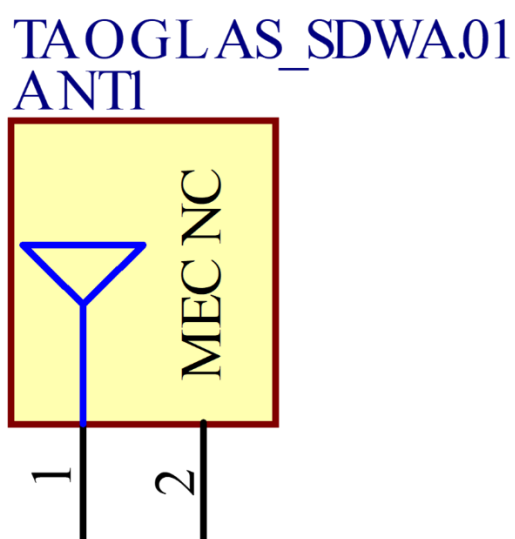
Top view of PCB reference design

Please find the Integration files in Altium, 2D formats and the 3D model for the SDWA.01 here:
<https://www.taoglas.com/product/sdwa-01-24002500-49005850-smd-mount-antenna/>

4.1 Schematic and Symbol Definition

The circuit symbol for the SDWA.01 is shown below. The antenna has 2 pins as indicated below.

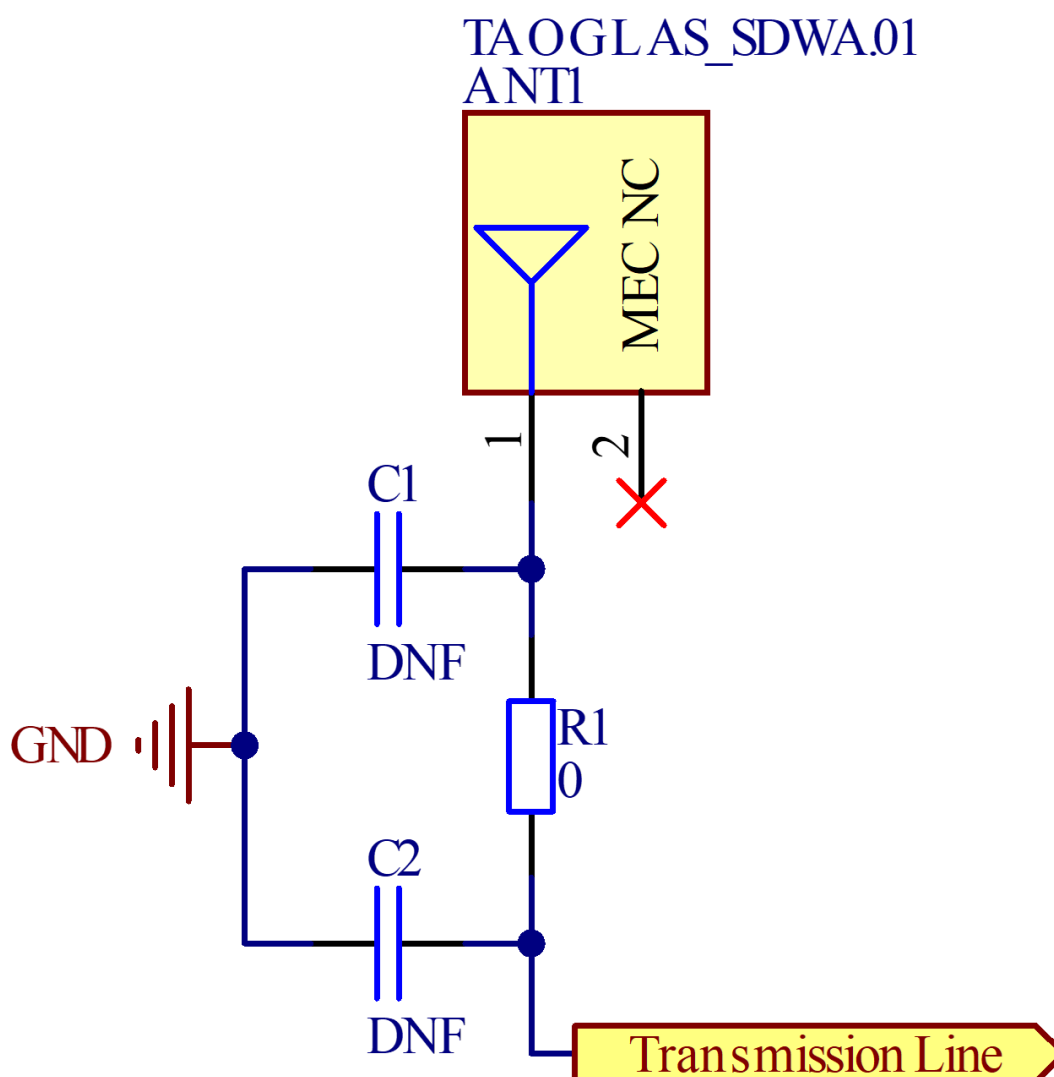
Pin	Description
1	RF Feed
2	Mechanical, No Connection



Above is a schematic symbol of SDWA.01 and a table of the pin definitions.

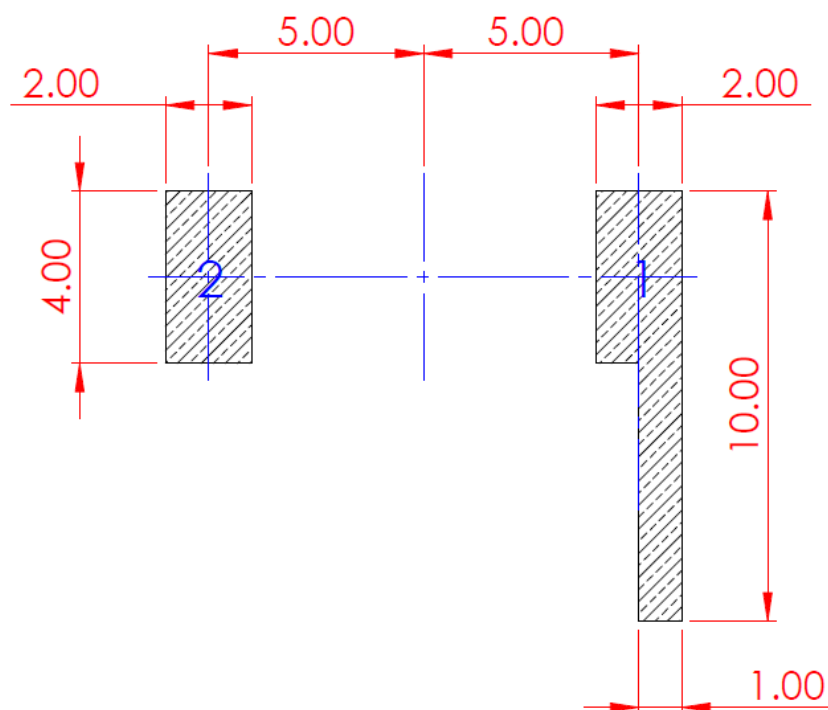
4.2 Schematic Layout

Matching components with the SDWA.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 SDWA.01.



Designator	Type	Value	Manufacturer	Manufacturer Part Number
C1, C2	Capacitor	Not Fitted	-	-
R1	Resistor	0 Ohm	Murata	RC0402JR-070RL

4.3 Footprint

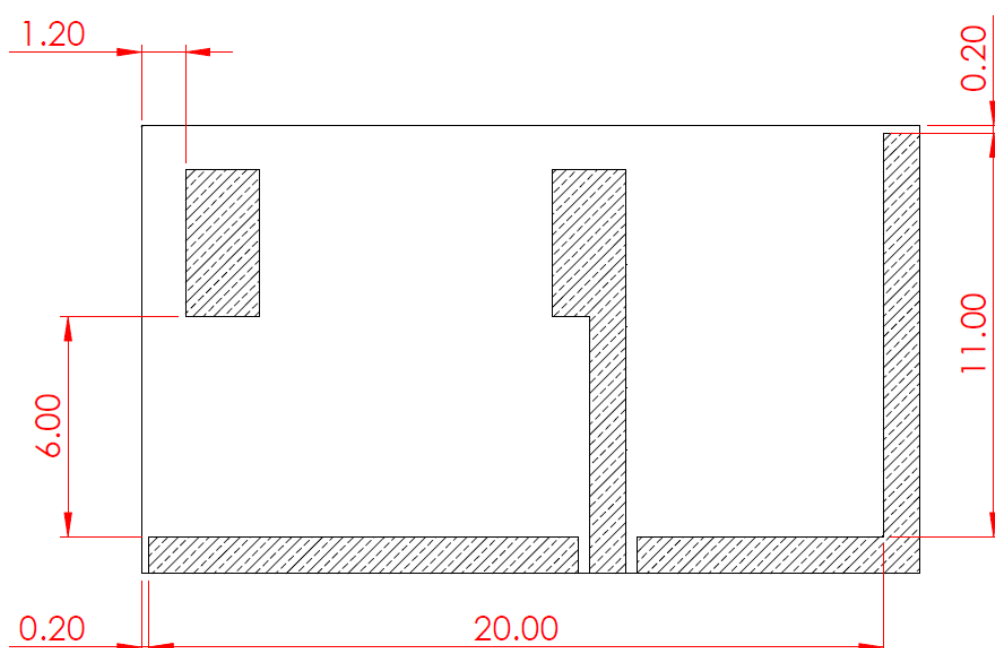


Pin	Description
1	RF Feed
2	Mechanical, No Connection

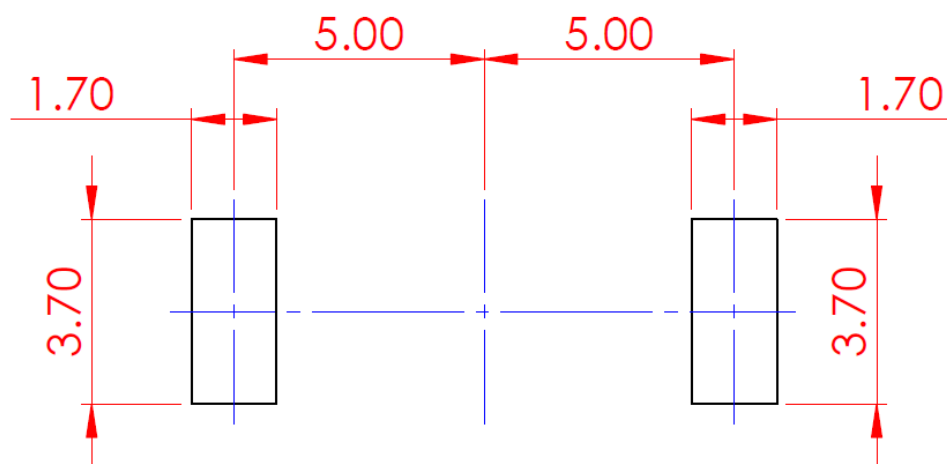
4.4 Copper Clearance

The footprint and clearance on the PCB must comply with the antenna's specification. The PCB layout shown in the diagrams below demonstrates the SDWA.01 clearance area. The copper keep out area applies to all layers that are below the SDWA.01.

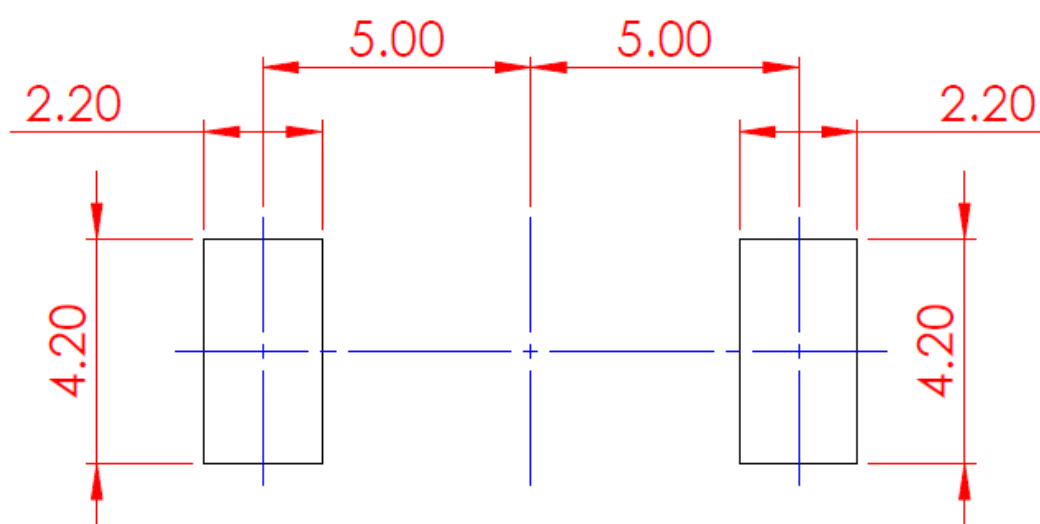
The copper clearance area should extend to 20mm in width and 11mm in length from the corner of the PCB. The PCB edge clearance should be at least 0.1mm.



4.5 Top Solder Paste

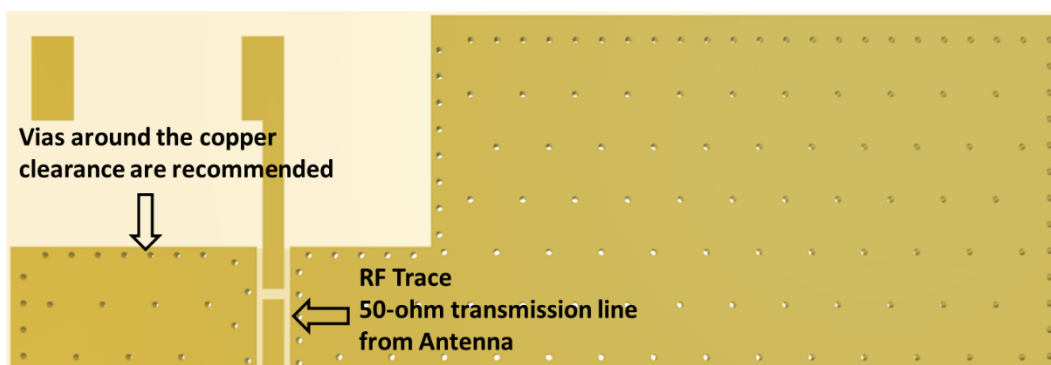
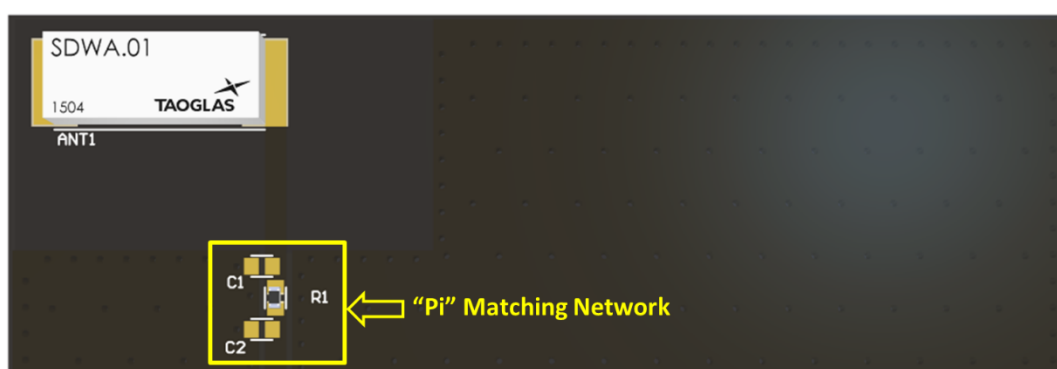


4.6 Top Solder Mask



4.7 Antenna Integration

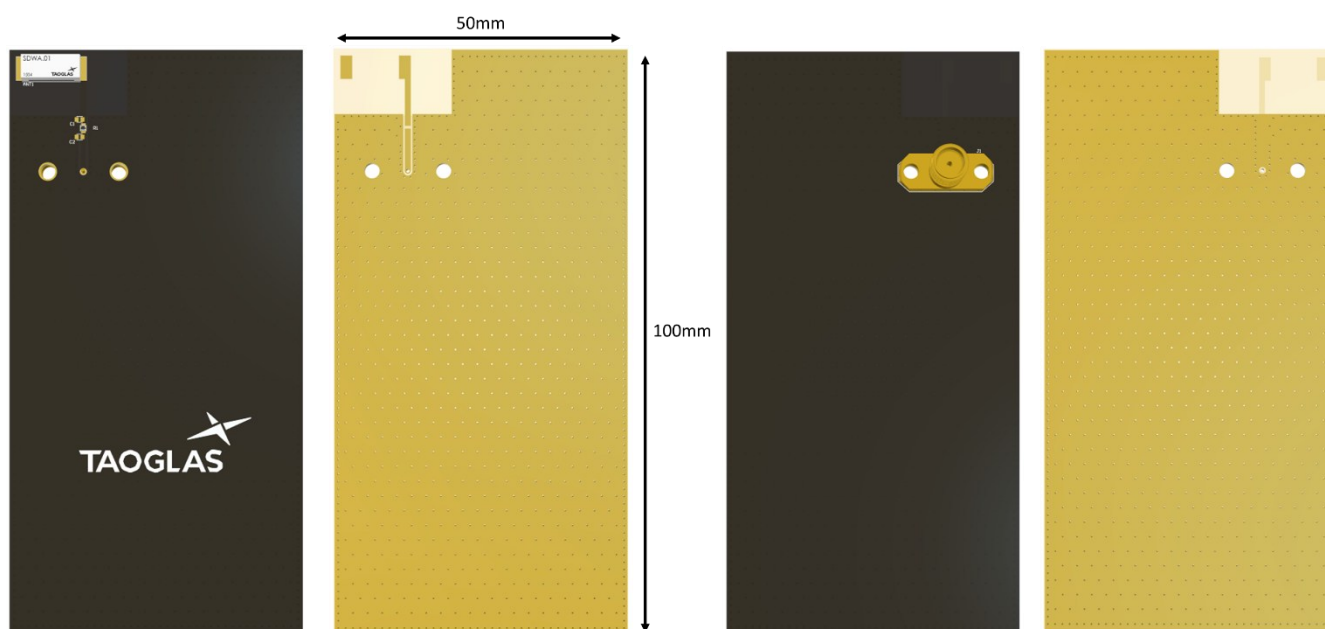
The SDWA.01 should be placed in the corner of the PCB, to take advantage of the ground plane. The RF trace must maintain a 50 Ohm transmission line. A “pi” Matching Network is recommended for the RF transmission line, the values and components for the matching circuit will depend on the tuning needed. Ground vias should be placed around the transmission line and the copper clearance area.



SDWA.01 antenna mounted on a PCB Reference Board, 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 100x50mm ground plane (PCB) to ensure optimal performance.

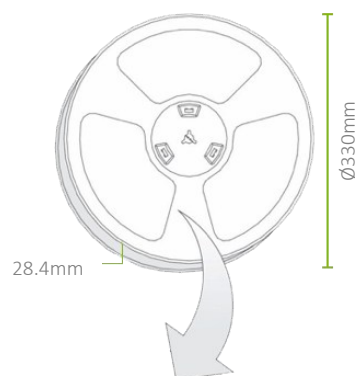


Top Side (SDWA.01 placement on 100x50mm PCB Reference Board)

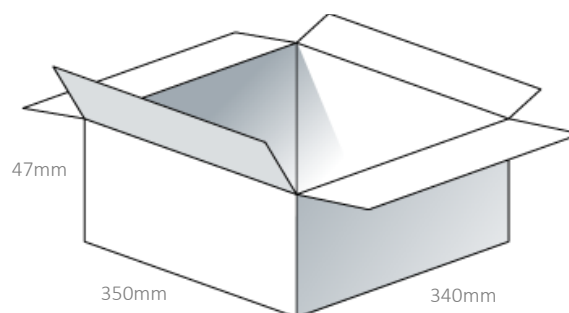
Bottom Side

5. Packaging

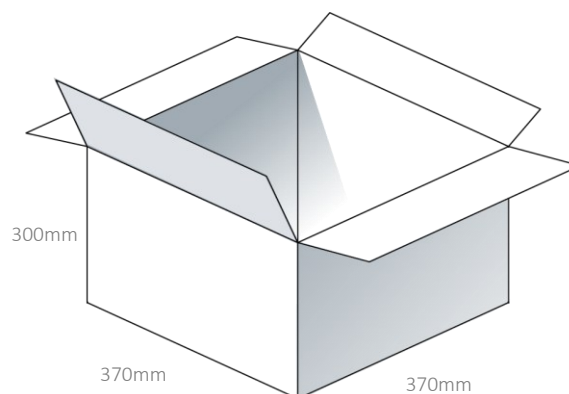
1000pcs SDWA.01 per Tape & Reel



1000pcs SDWA.01 per carton
Dimensions - 350*340*47mm

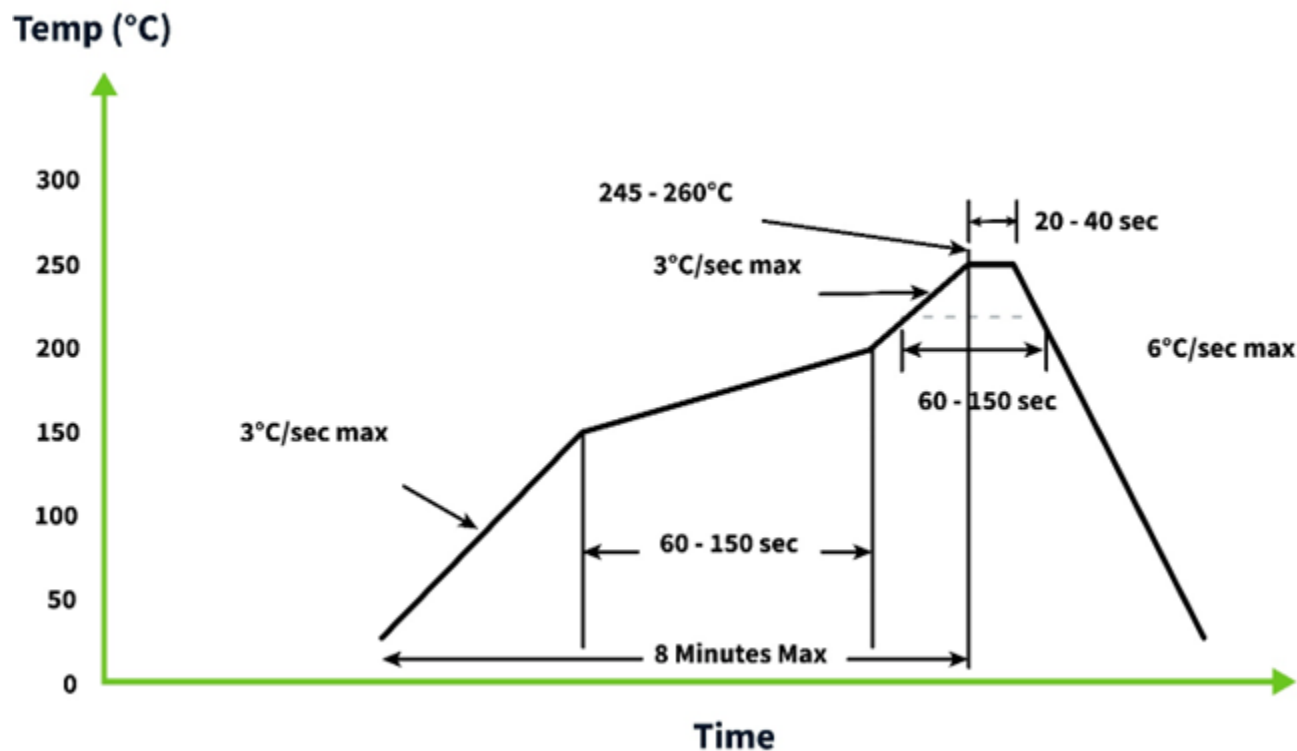


5000pcs SDWA.01 per carton
Dimensions - 370*370*300mm



6. Recommended Solder Reflow Profile

The SDWA.01 can be assembled by following the recommended soldering temperatures are as follows:



*Temperatures listed within a tolerance of +/- 10° C

Smaller components are typically mounted on the first pass, however, we do advise mounting the SDWA.01 when placing larger components on the board during subsequent reflows.

7. Antenna Characteristics

7.1 Test Setup

AUT

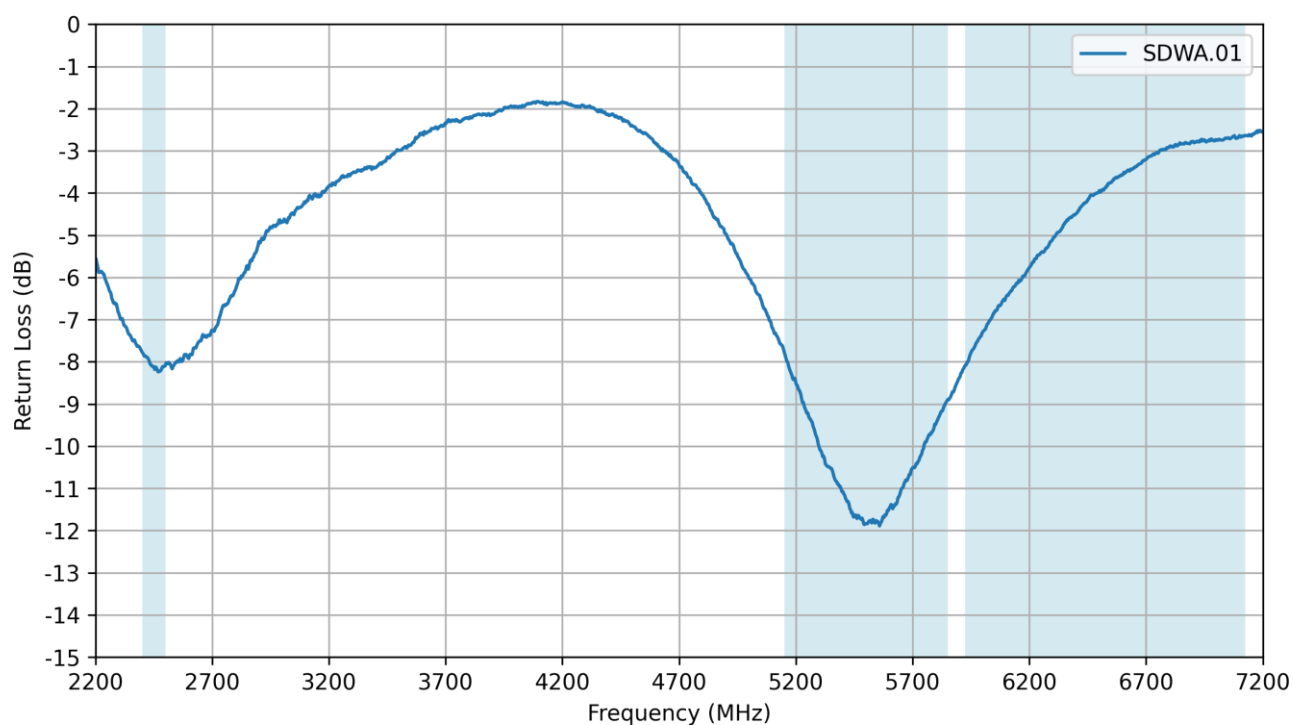


Vector Network Analyzer

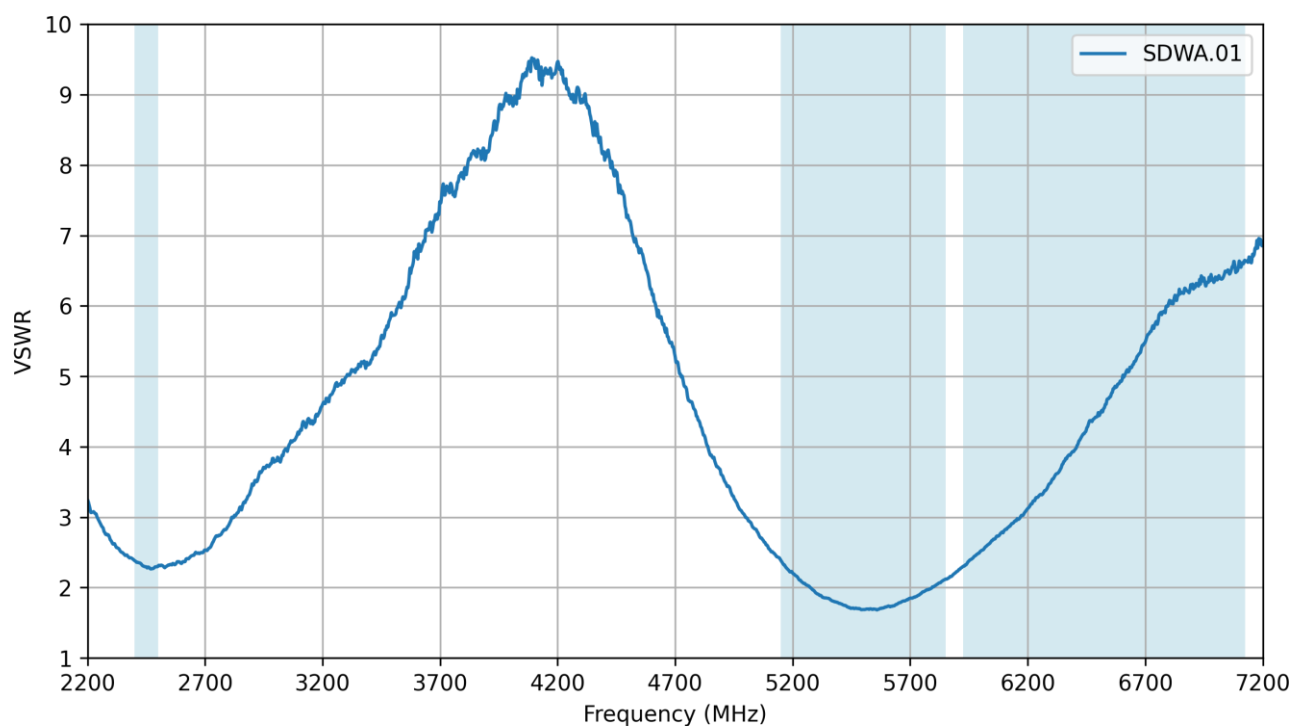


VNA Test Setup on 100 x 50 mm Eval Board

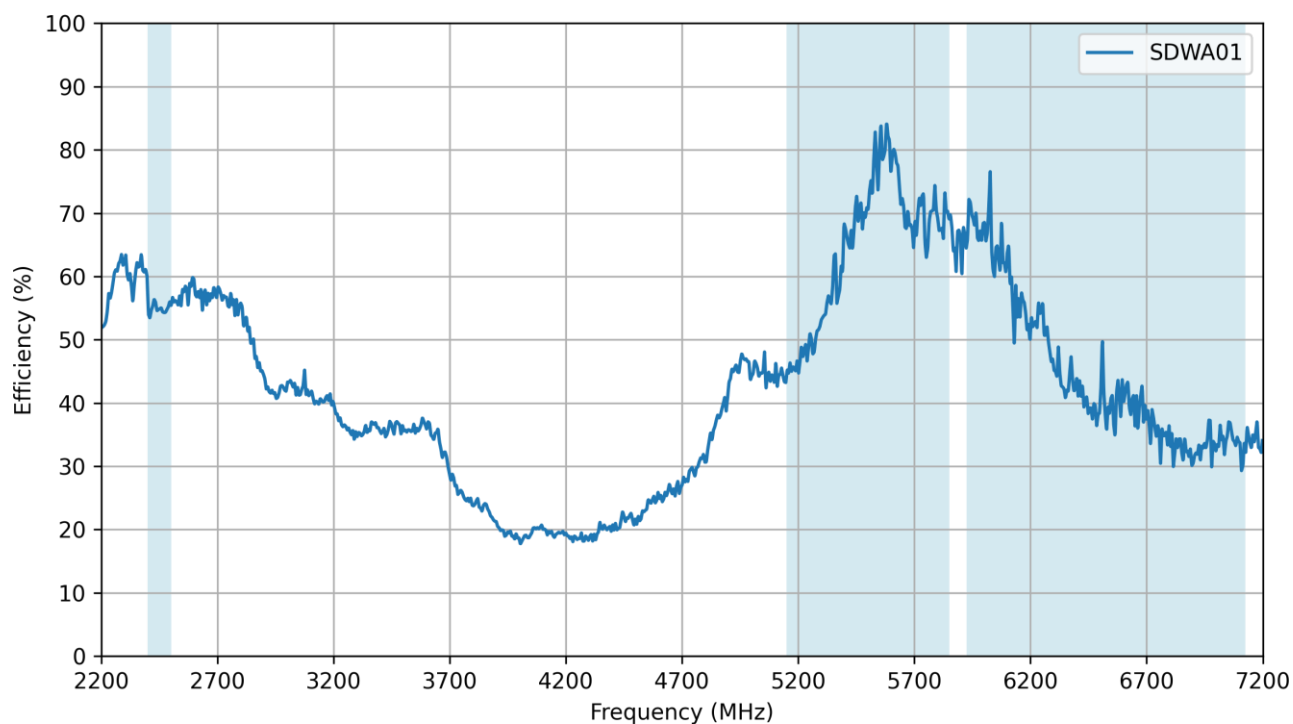
7.2 Return Loss



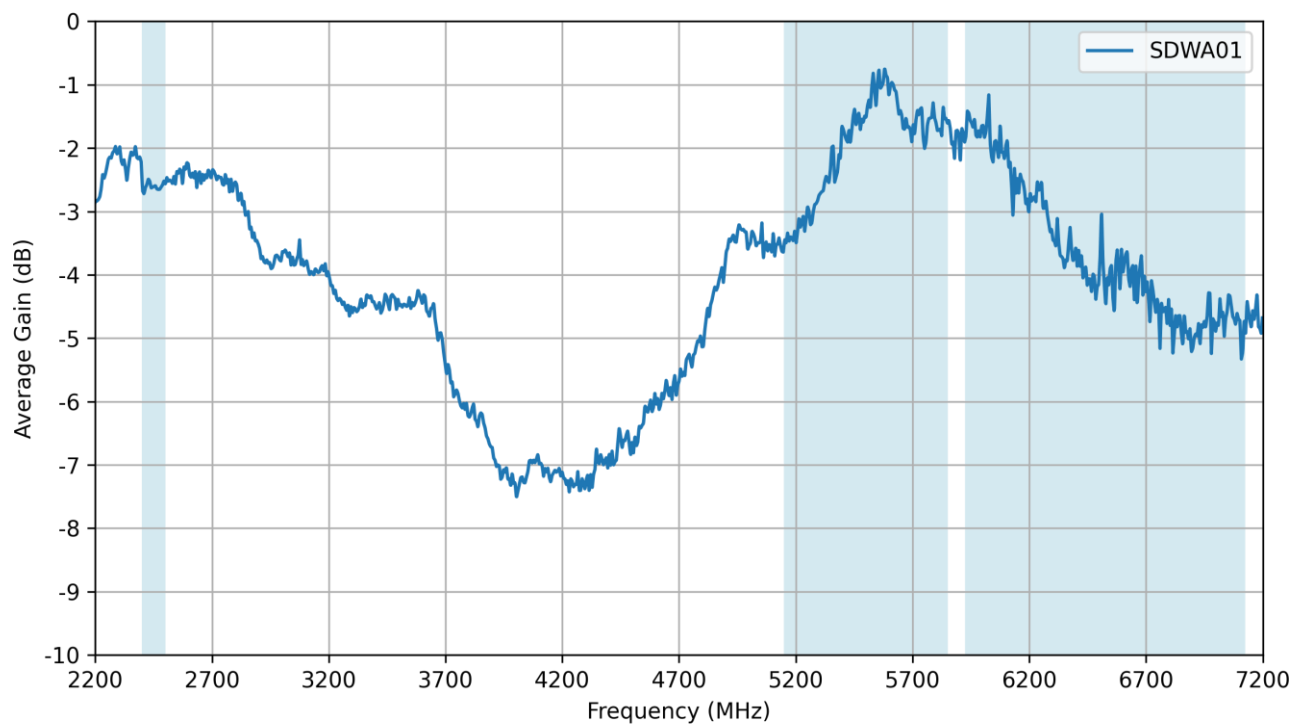
7.3 VSWR



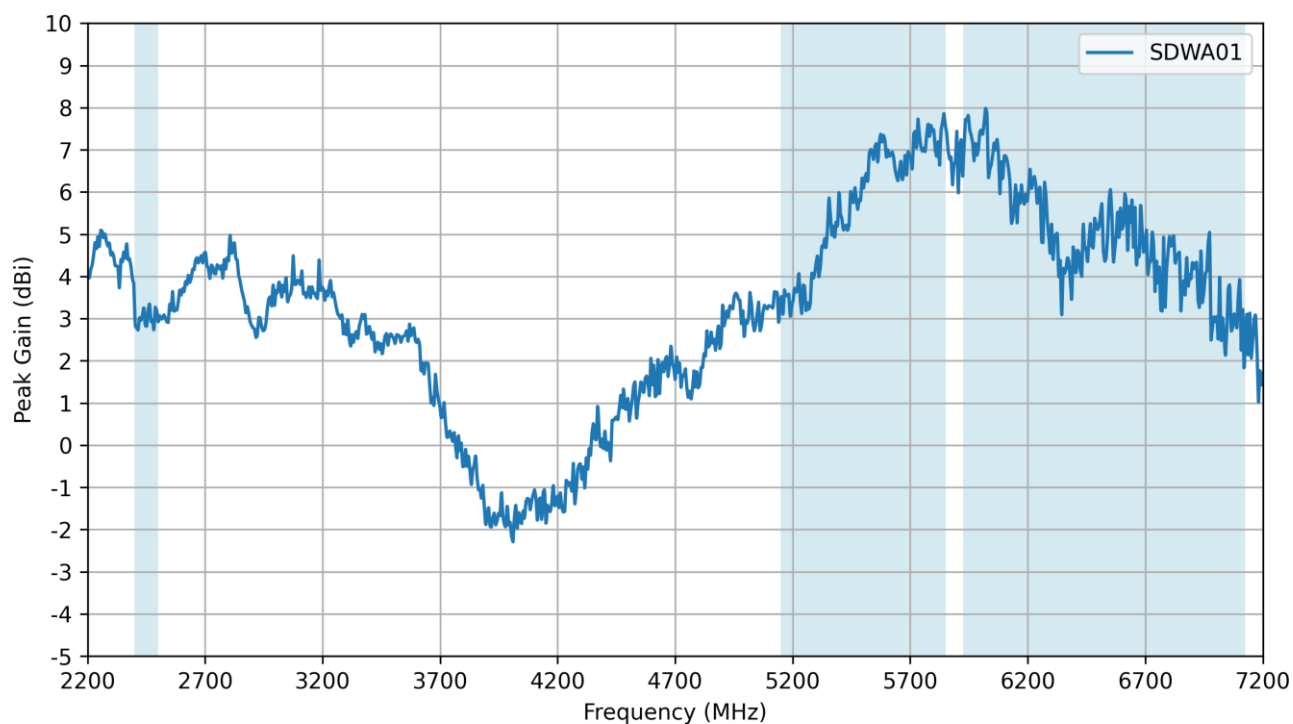
7.4 Efficiency



7.5 Average Gain

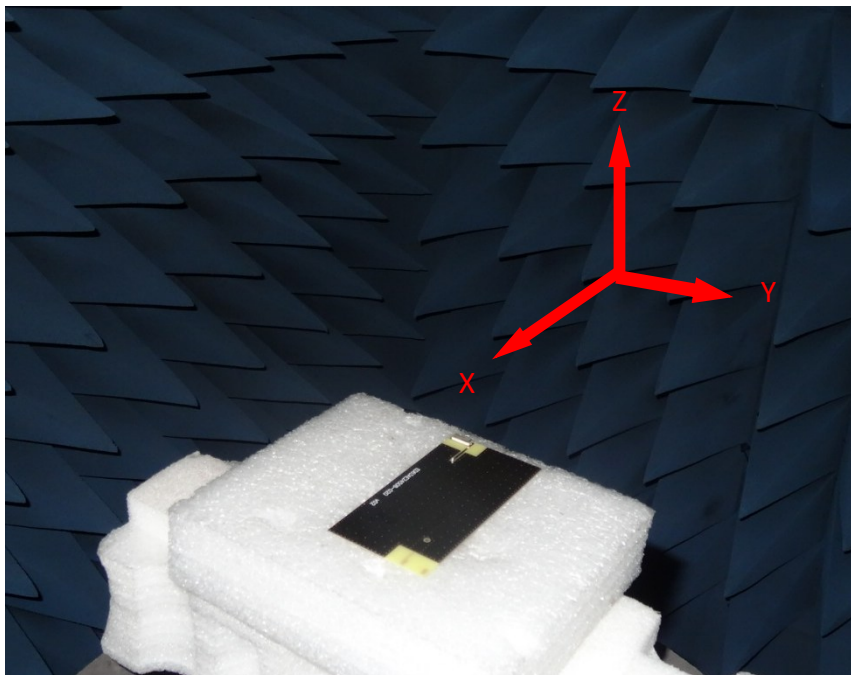
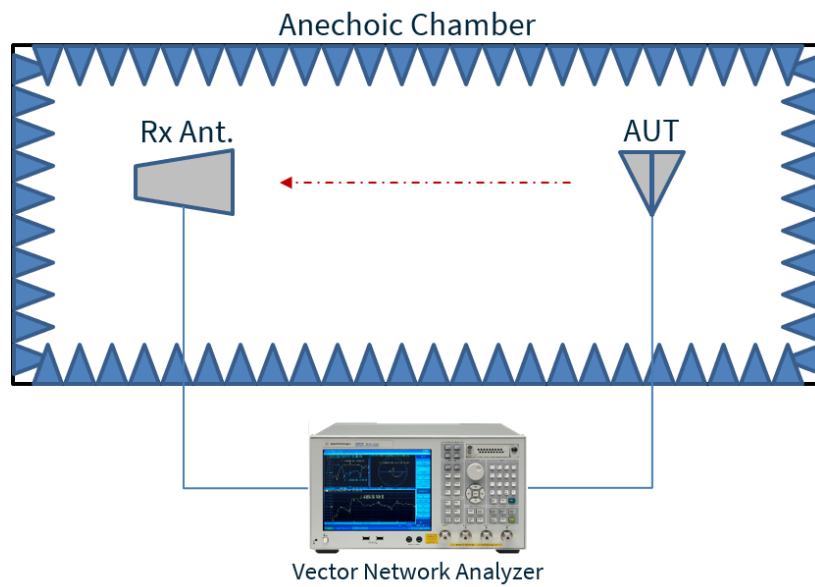


7.6 Peak Gain



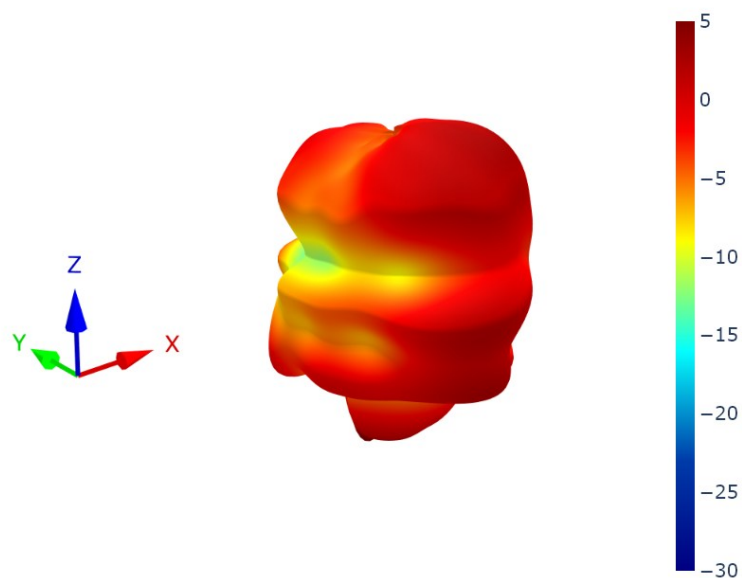
8. Radiation Patterns

8.1 Test Setup

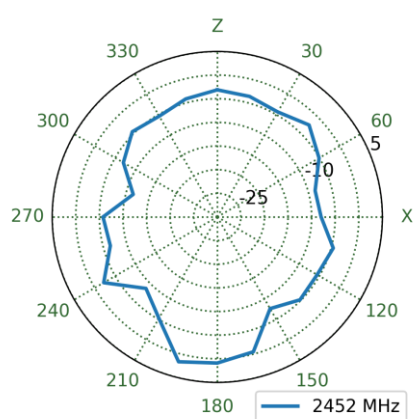


Chamber Test Setup on 100 x 50 mm Eval Board

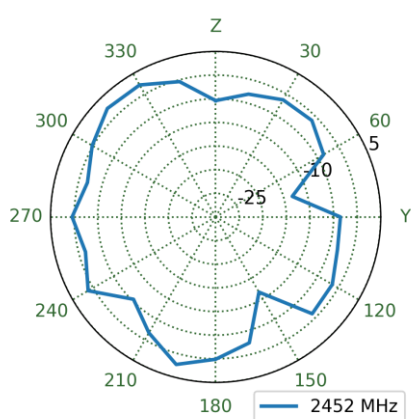
8.2 Patterns at 2452 MHz



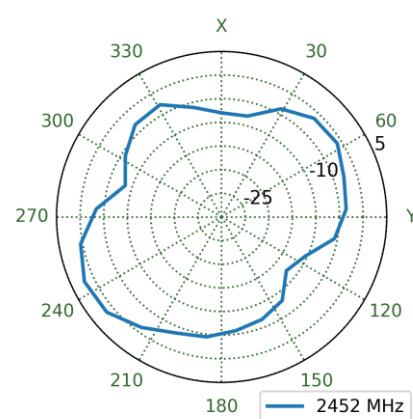
XZ Plane



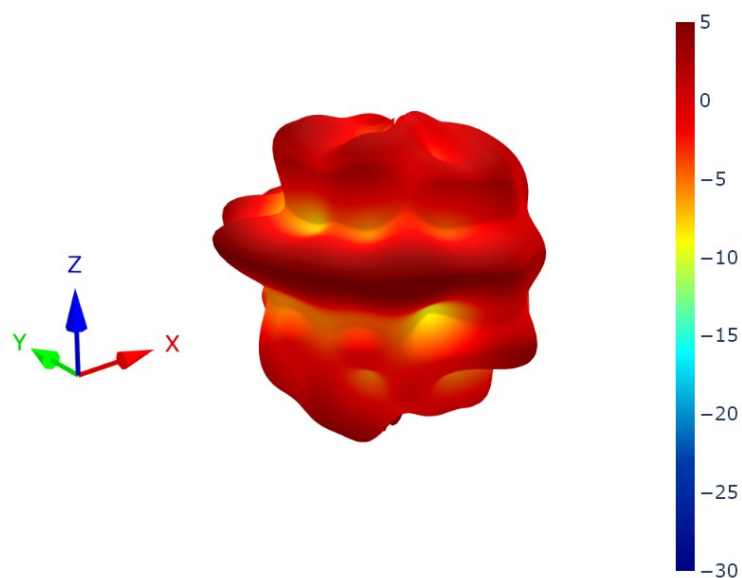
YZ Plane



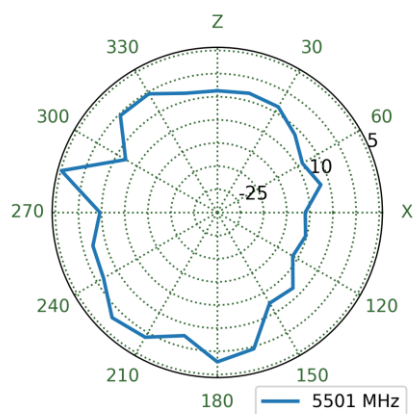
XY Plane



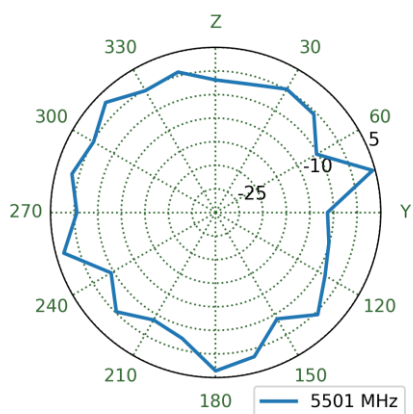
8.3 Patterns at 5501 MHz



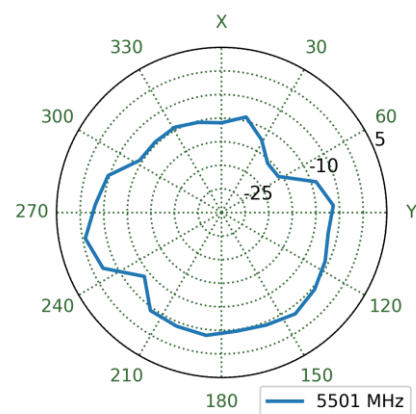
XZ Plane



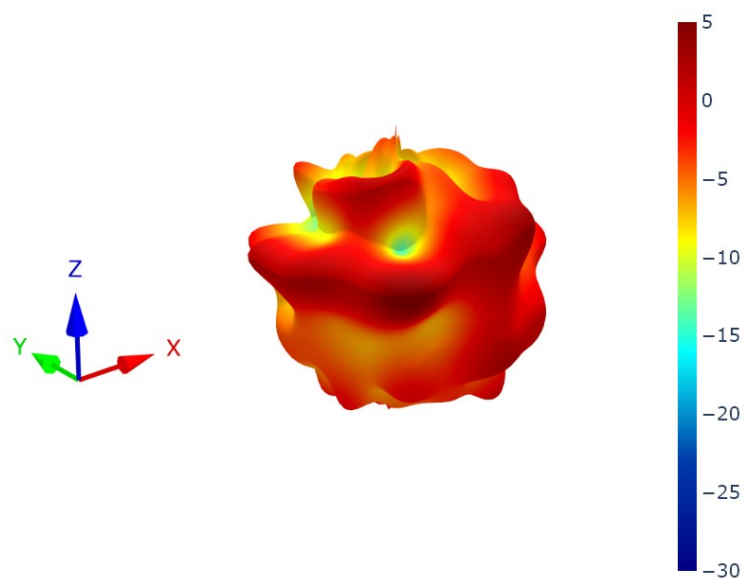
YZ Plane



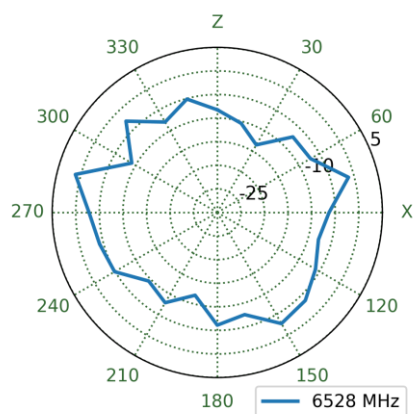
XY Plane



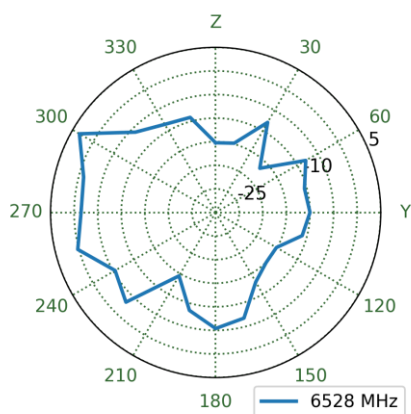
8.4 Patterns at 6528 MHz



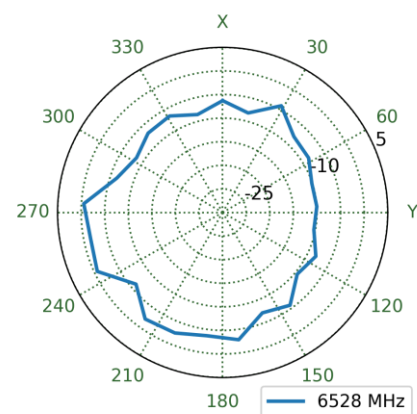
XZ Plane



YZ Plane



XY Plane



Changelog for the datasheet

SPE-11-8-129 – SDWA.01

Revision: P (Current Version)

Date:	2026-02-05
Changes:	Updated antenna integration guide.
Changes Made by:	Gary West

Previous Revisions

Revision: O

Date:	2025-03-14
Changes:	Revised pin definition.
Changes Made by:	Paul Liu

Revision: J

Date:	2019-06-11
Changes:	Evaluation Board Drawing Updated
Changes Made by:	Jack Conroy

Revision: N (Current Version)

Date:	2024-09-13
Changes:	Updated product photos
Changes Made by:	Cesar Sousa

Revision: I

Date:	2019-08-26
Changes:	EC-19-8-071
Changes Made by:	Jack Conroy

Revision: M

Date:	2023-03-16
Changes:	Antenna Integration Guide Added
Changes Made by:	Cesar Sousa

Revision: H

Date:	2018-03-08
Changes:	Packaging Details Updated
Changes Made by:	Made by Andy Mahoney

Revision: L

Date:	2022-05-13
Changes:	Updated Packaging
Changes Made by:	Jack Conroy

Revision: G

Date:	2017-03-08
Changes:	Packaging Details Updated
Changes Made by:	Aine Doyle

Revision: K (Current Version)

Date:	2020-09-03
Changes:	Added Wi-Fi 6 test data
Changes Made by:	Jack Conroy

Revision: F

Date:	2016-03-08
Changes:	Amended SPQ
Changes Made by:	Aine Doyle

Revision: E	
Date:	2015-08-20
Changes:	Packaging Details Updated
Changes Made by:	Aine Doyle

Revision: D	
Date:	2015-03-02
Changes:	Amended Drawing
Changes Made by:	Aine Doyle

Revision: C	
Date:	2013-11-08
Changes:	Amended Reel Quantity
Changes Made by:	Aine Doyle

Revision: B	
Date:	2013-08-19
Changes:	Packaging Details Updated
Changes Made by:	Aine Doyle

Revision: A (Original First Release)	
Date:	2017-10-27
Notes:	
Author:	Technical Writer



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