



TAOGLAS®



Datasheet

SWDP.2458.A

Part No:
SWDP.2458.15.4.A.02

Description:

Embedded 2.4/5.8GHz Dual-Band Wi-Fi® Ceramic Patch Antenna

Features:

- 15mm*15mm*4mm
- 2400MHz to 2500MHz
- 5150MHz to 5850MHz
- SMD Mount
- Lightweight and Robust
- Supports IEEE 802.11 Dual-Band Wi-Fi® systems
- Dual Linear Polarization for Higher Isolation
- Tuned for 70x70mm Ground Plane
- Automotive IATF16949 Production and Quality Approved
- RoHS and REACH compliant

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1. Introduction



This revolutionary patent pending 5dBi, high efficiency, embedded ceramic patch antenna is designed for professional Wi-Fi® dual-band IEEE 802.11 applications. This antenna is the smallest, highest gain off the shelf Wi-Fi® dual-band patch solution in the market today, enabling vastly improved coverage for applications in small devices where a directional antenna is applicable, where options until now have been limited to low gain chip antennas.

The SWDP.15's high gain and high efficiency performance is the perfect solution for directional dual-band Wi-Fi® applications, which need long range, but require small compact embedded antennas. The much higher gain and efficiency of the SWDP.15 over smaller, less efficient, more omni-directional chip antennas (these typically have no more than 2dBi gain, 30% efficiencies) means it can deliver much longer range over a wide sector. At only 3.5 grams, it is lightweight yet robust. SMD mounting allows for high volume manufacturing applications.

Typical applications include:

- Access Points
- Tablets
- High definition, high throughput video streaming routers
- High data MIMO bandwidth routers
- Automotive
- Home and industrial in-wall Wi-Fi® automation
- Long range Wi-Fi® remote control applications

The WDP patch antenna has two distinct linear polarizations on the 2.4 and 5.8GHz bands, increasing isolation between bands, thus reducing interference from neighbouring transmitters.

Custom tuning may be necessary on different ground-planes and in individual device environments. Custom tuned versions for different ground-planes and housing environments can be designed and supplied subject to NRE and a minimum order quantity. Contact your regional Taoglas office for support to integrate and test this antenna performance in your device.

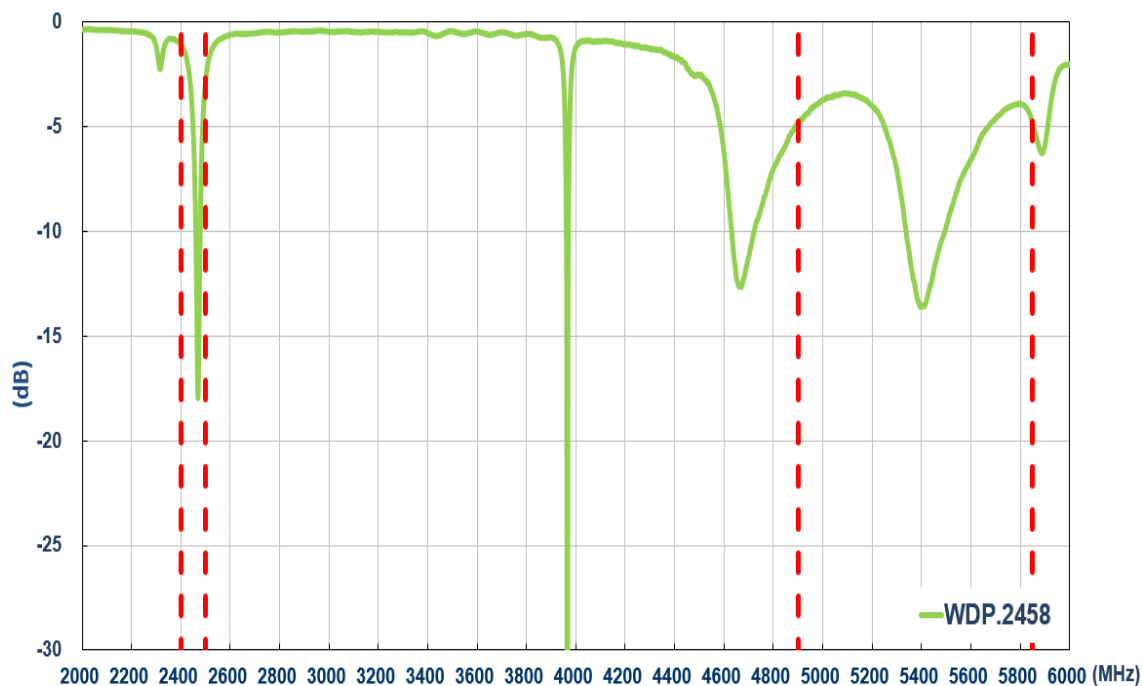
2. Specifications

Electrical			
Frequency	2400~2500MHz	4900~5500MHz	5500~5850MHz
Efficiency (%)	48.45	44.95	42.64
Average Gain(dBi)	-3.15	-3.47	-3.70
Peak Gain(dBi)	5.70	5.29	4.03
Impedance	50Ω		
Polarization	Linear		
Input Power	10W		
Mechanical			
Height	4 mm		
Planner Dimension	15 x 15 mm		
Weight	3.5g		
Environmental			
Operating and Storage Temperature Range	-40°C to 85°C		
Humidity	Non-condensing 65°C 95% RH		
Moisture Sensitivity Level (MSL)	3 (168 Hours)		

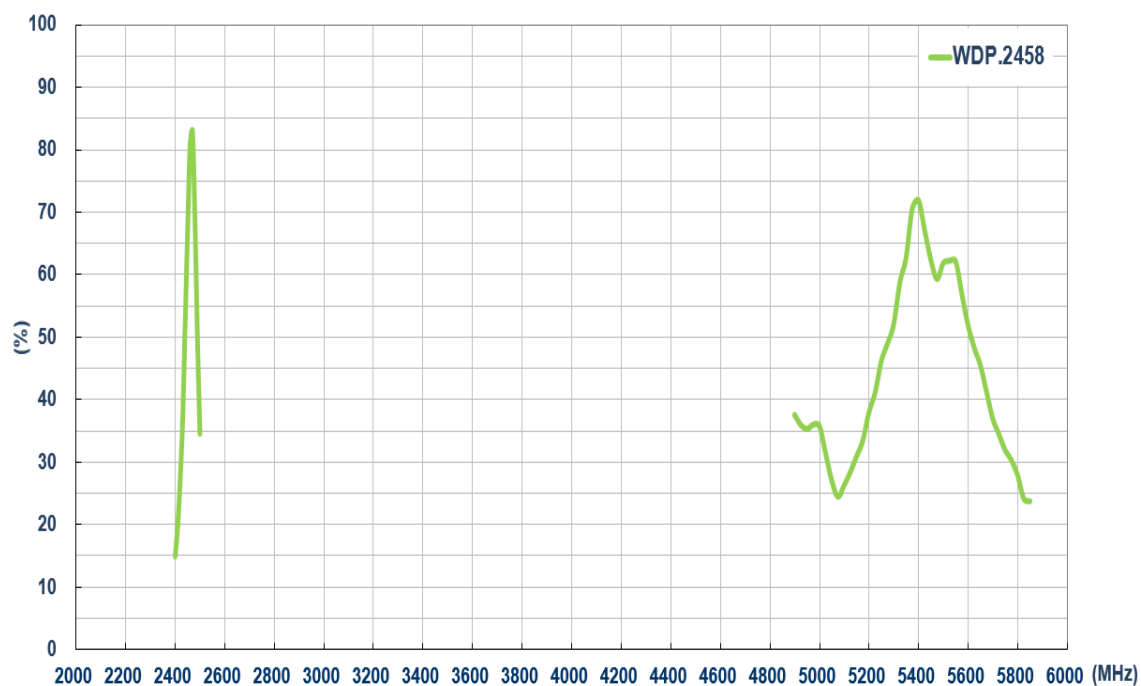
*All tests done on a 70*70mm ground plane

3. Antenna Characteristics

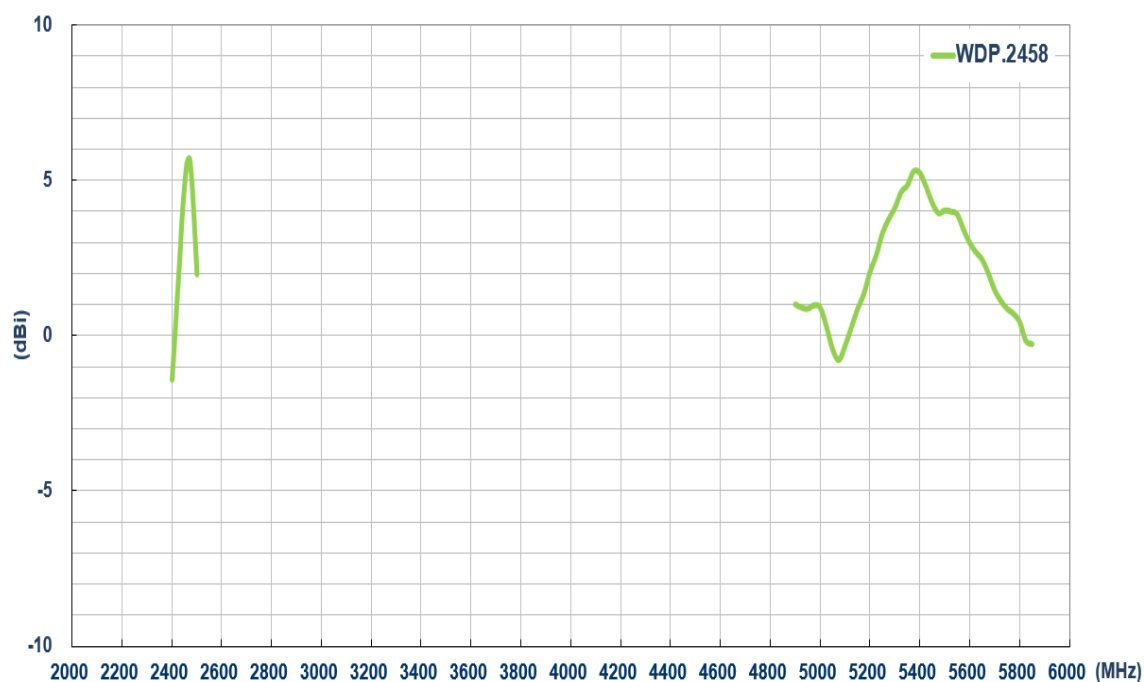
3.1 Return Loss



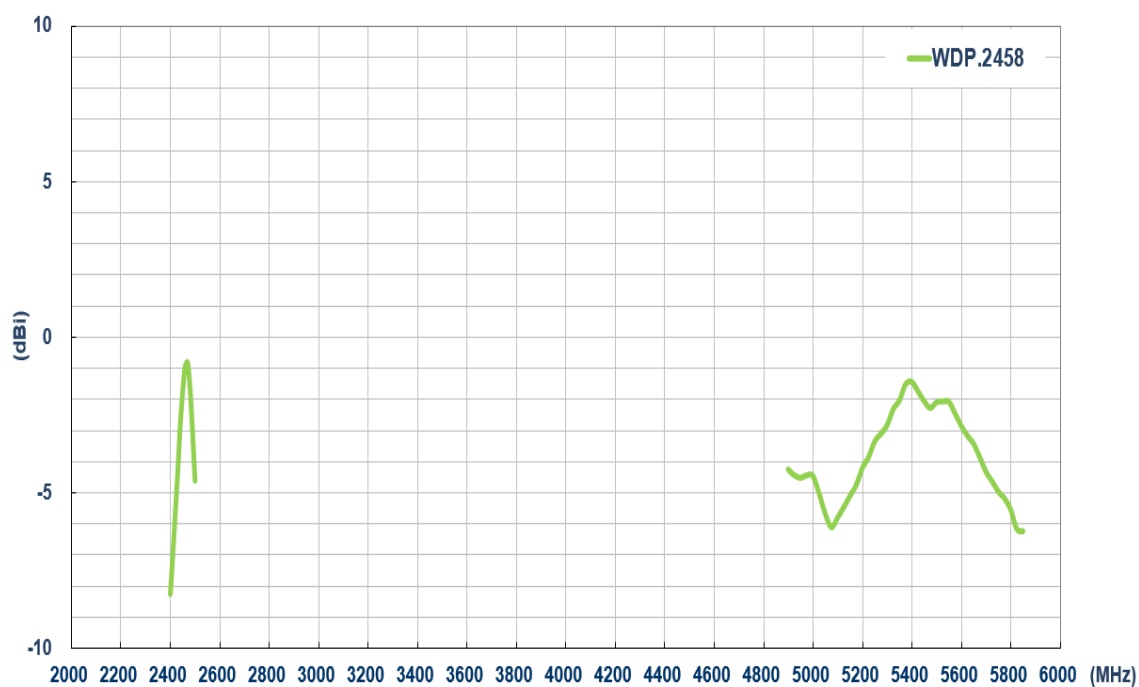
3.2 Efficiency



3.3 Average Gain

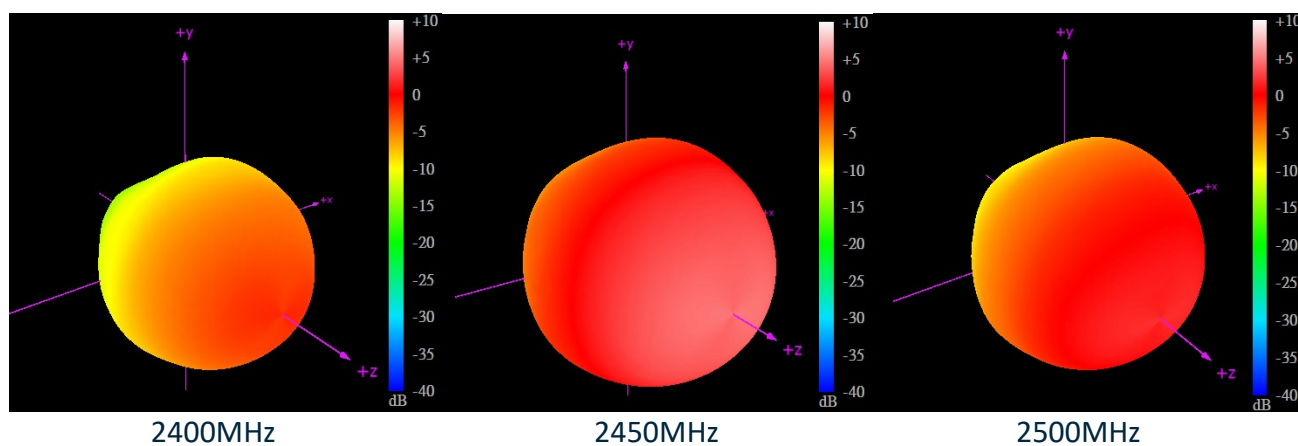


3.4 Peak Gain



4. Radiation Patterns

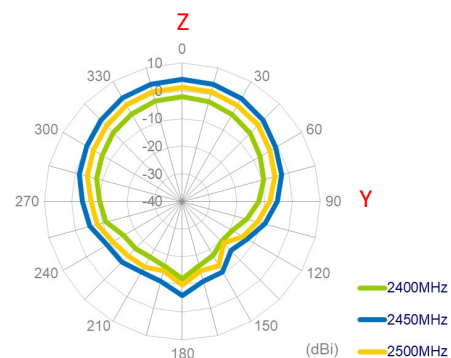
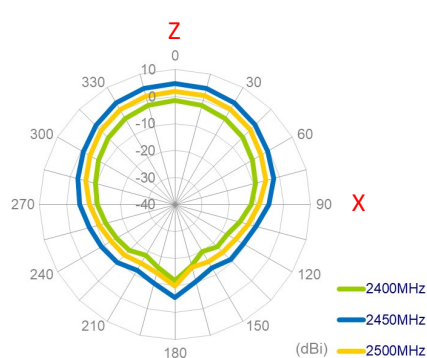
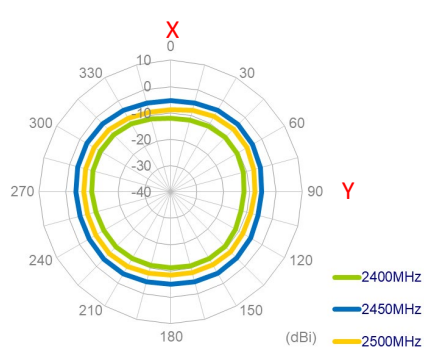
4.1 2400MHz, 2450MHz & 2500MHz 3D and 2D Radiation Patterns



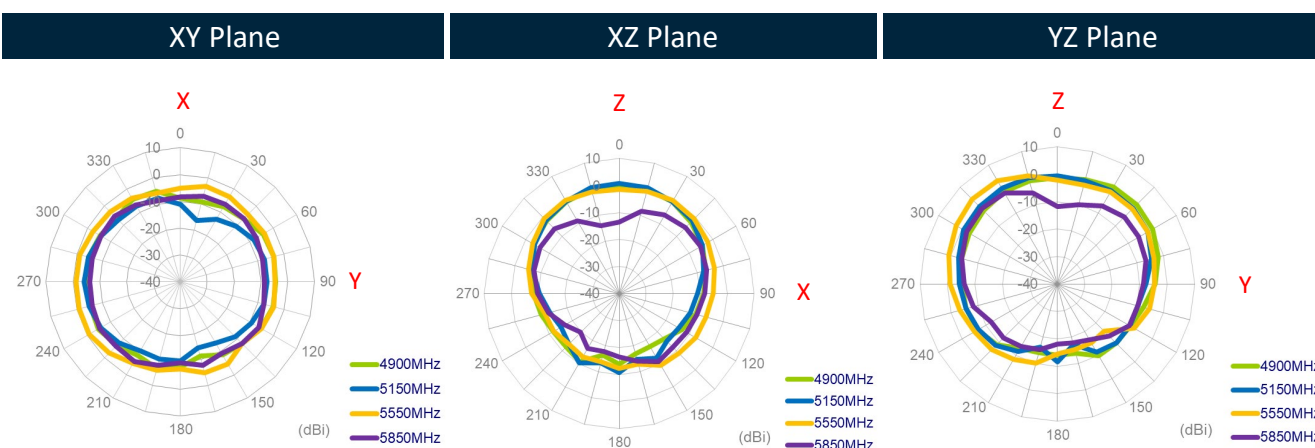
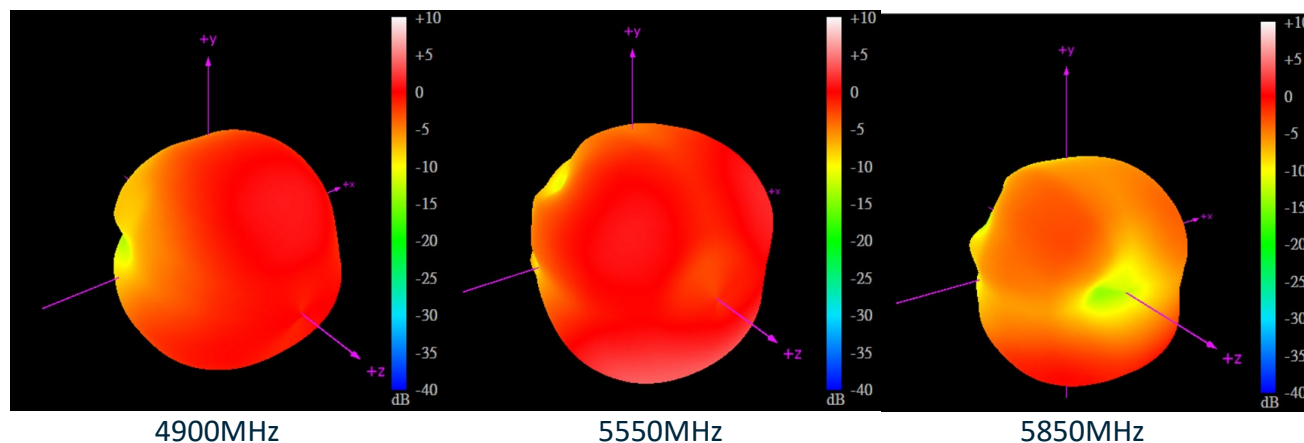
XY Plane

XZ Plane

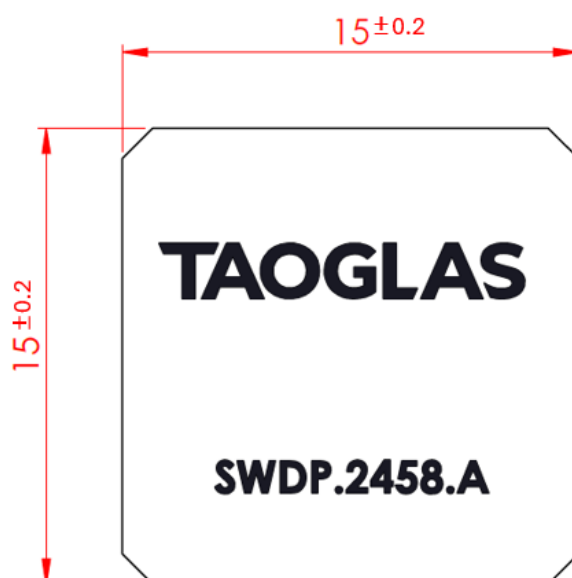
YZ Plane



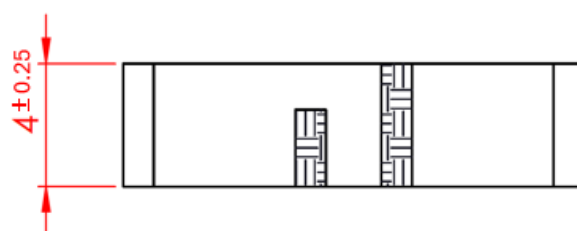
4.2 4900MHz, 5550MHz & 5850MHz 3D and 2D Radiation Patterns



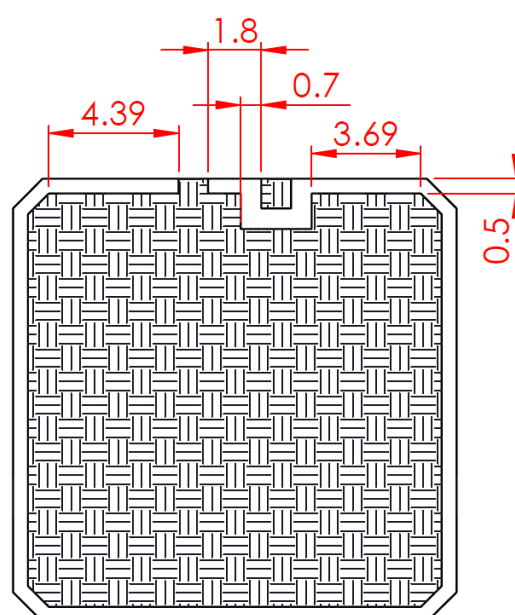
5. Mechanical Drawing (Units: mm)



Top View

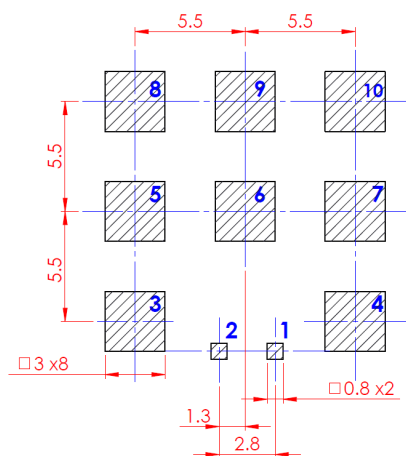


Side View

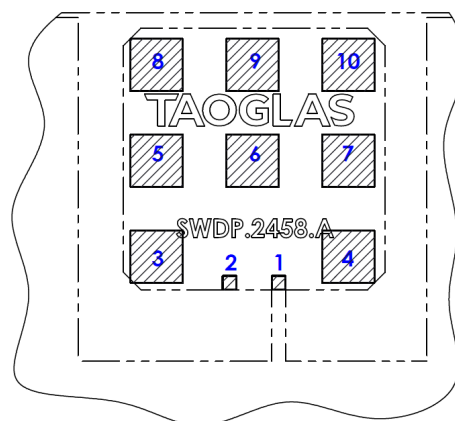


Bottom View

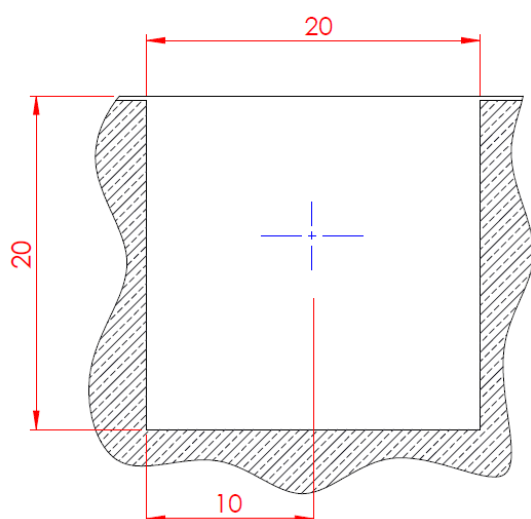
6. Footprint



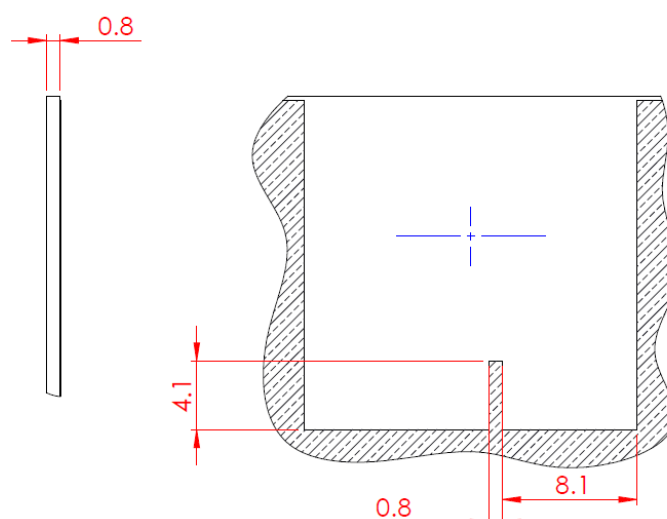
FOOTPRINT PCB
SCALE 5:1



SOLDER PAD FOOTPRINT WITH PCB OUTLINE
SCALE 3:1



GROUND CLEARANCE BOTTOM VIEW
(SILKSCREEN NOT SHOWN)
SCALE 3:1



GROUND CLEARANCE TOP VIEW
(SILKSCREEN NOT SHOWN)
SCALE 3:1

PIN	DESCRIPTION:
1	RF FEED (50 Ohm)
2	GROUND
3	GROUND
4	GROUND
5	GROUND
6	GROUND
7	GROUND
8	GROUND
9	GROUND
10	GROUND

7. Antenna Integration Guide

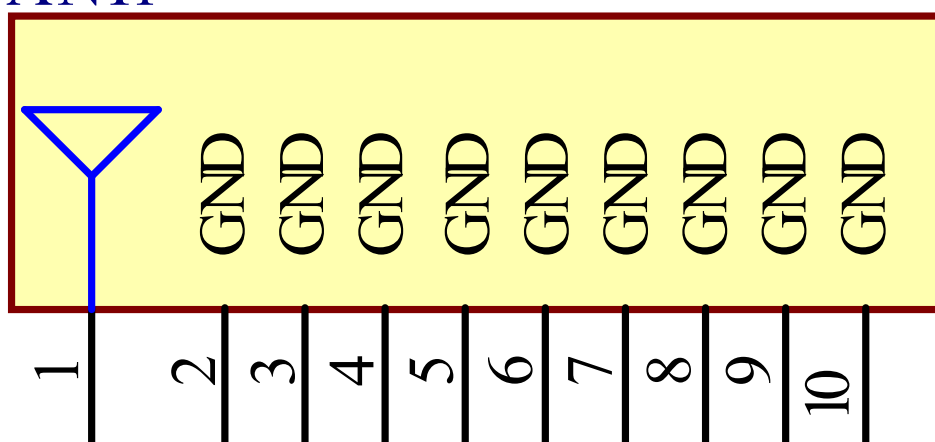


7.1 Schematic Symbol and Pin Definition

The circuit symbol for the antenna is shown below. The antenna has 8 pins as indicated below.

Pin	Description
1	RF Feed
2,3,4,5,6,7,8,9,10	Ground

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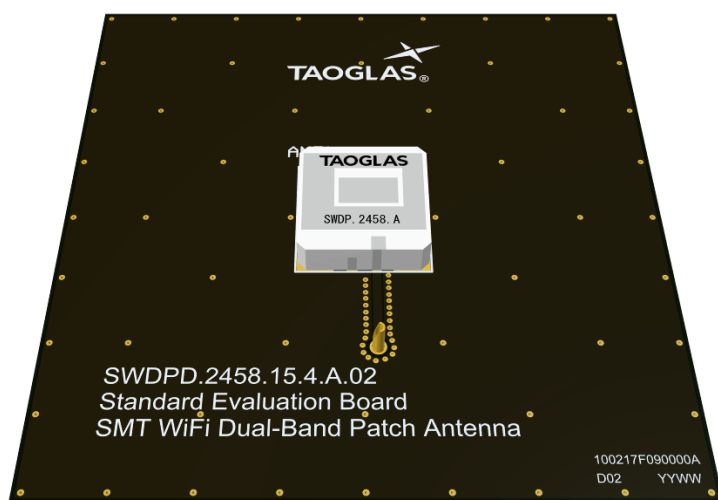


Please note you can download the design files, 3D model, 2D drawings and CST simulation files from the website here:

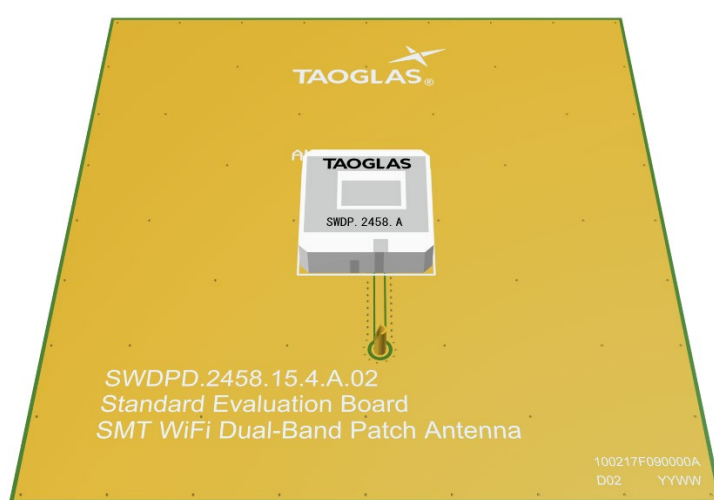
[SWDP.2458.15.4.A.02 - Web Page](#)

7.2 Antenna Integration

The antenna should be placed at the center of the ground plane with a length and width of 70mm. Maintaining a square symmetric ground plane shape and symmetric environment around the antenna is critical to maintaining the excellent axial ratio and phase center performance shown in this datasheet.



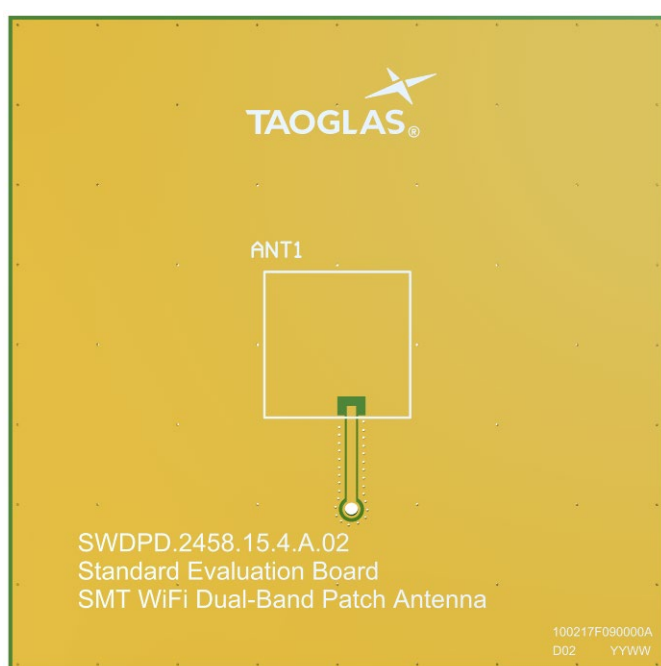
Top Side w/ Solder Mask



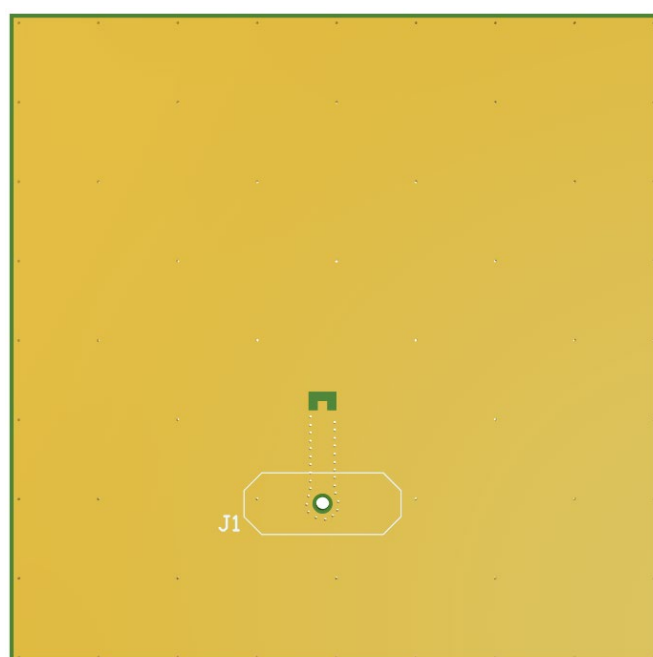
Top Side w/o Solder Mask

7.3 PCB Layout

The footprint and clearance on the PCB must comply with the antenna specification. The PCB layout shown in the diagram below demonstrates the antenna footprint.

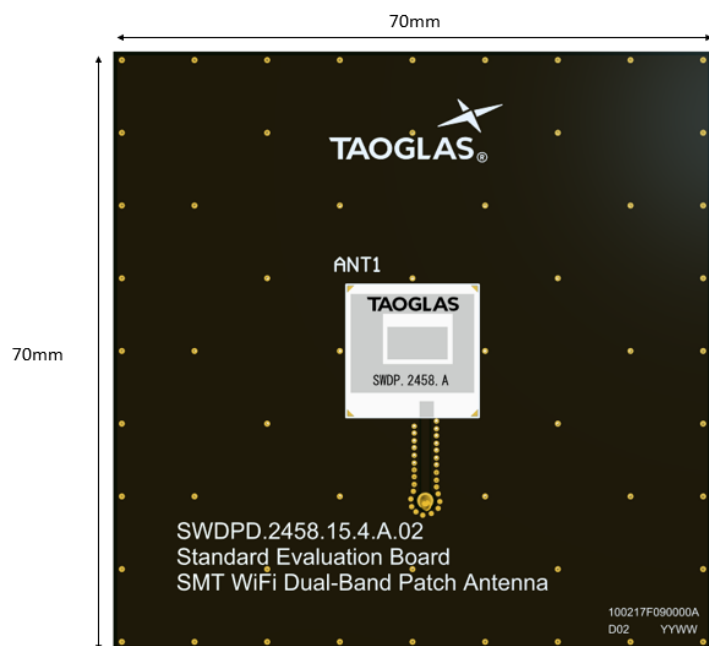


Topside

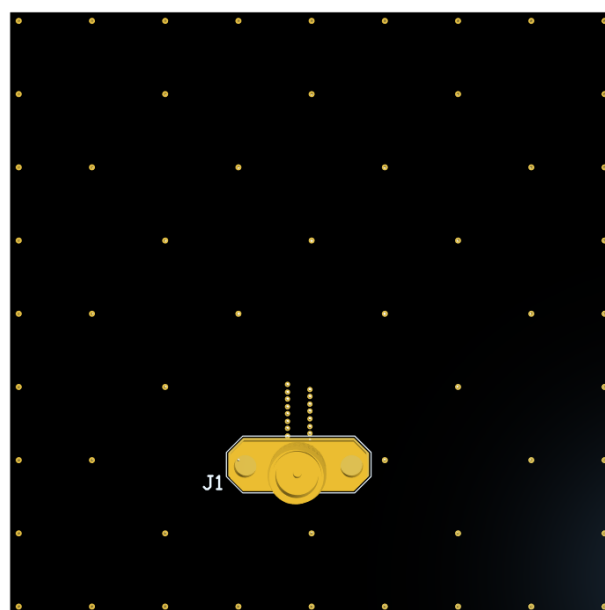


Bottom Side

7.4 Evaluation Board



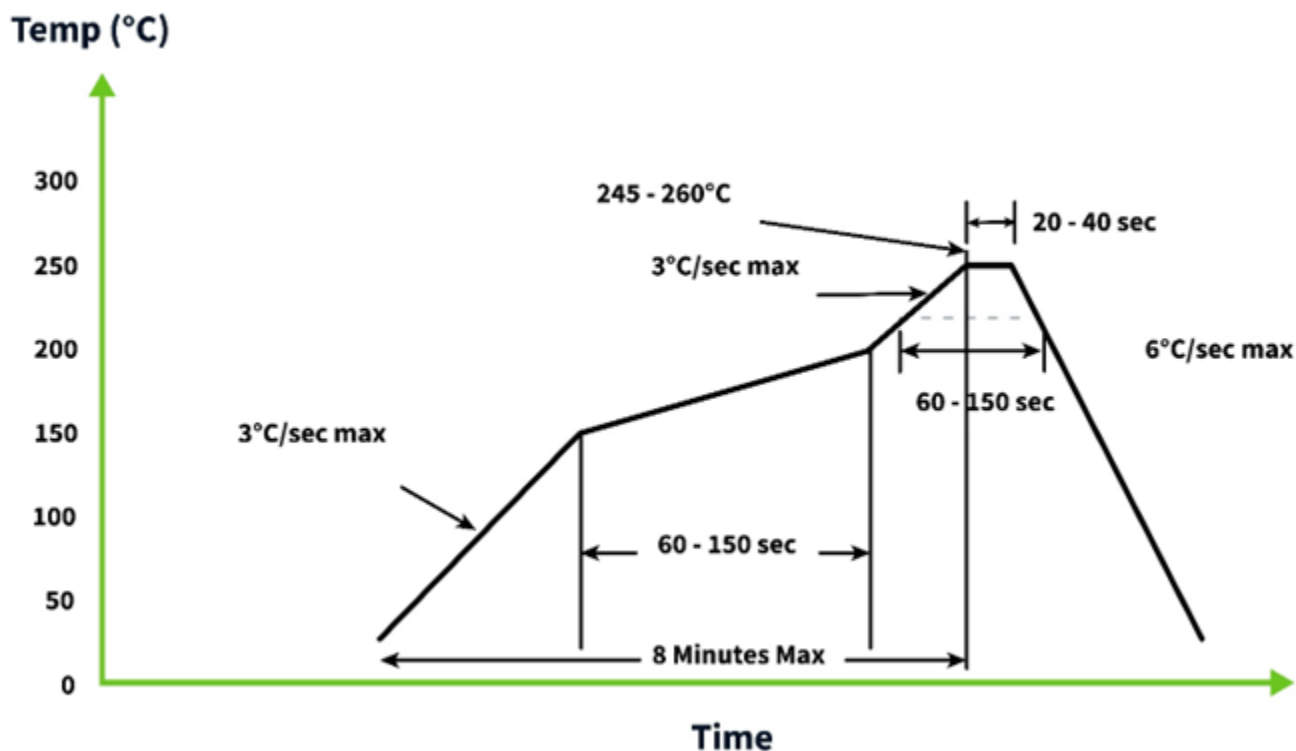
Topside



Bottom Side

8. Solder Reflow Profile

The SWDP.2458.15.4.A.02 can be assembled by following the recommended soldering temperatures are as follows:



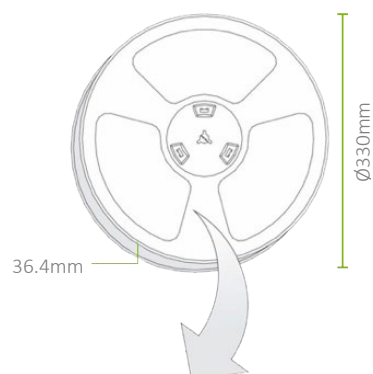
*Temperatures listed within a tolerance of +/- 10° C

Smaller components are typically mounted on the first pass, however, we do advise mounting the SWDP.2458.15.4.A.02 when placing larger components on the board during subsequent reflows.

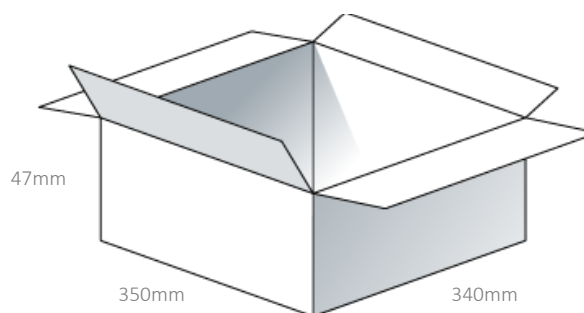
Note: Soldering flux classified ROL0 under IPC J-STD-004 is recommended.

9. Packaging

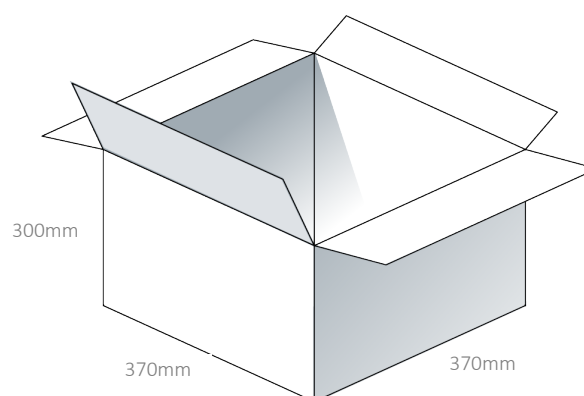
500pcs SWPD.2458.15.4.A.02 per Tape
& Reel
Dimensions - $\varnothing 330 \times 36.4\text{mm}$



1 Tape & Reel per carton
Dimensions - $350 \times 340 \times 47\text{mm}$



2500pcs SWPD.2458.15.4.A.02 per carton
Dimensions - $370 \times 370 \times 300\text{mm}$



Changelog for the datasheet

SPE-17-8-091 - SWDP.2458.15.4.A.02

Revision: E (Current Version)

Date:	2024-08-01
Changes:	Added tolerance of L/W/H in mechanical drawing.
Changes Made by:	Paul Liu

Previous Revisions

Revision: D

Date:	2023-11-01
Changes:	Added solder reflow profile and antenna integration
Changes Made by:	Cesar Sousa

Revision: C

Date:	2022-02-28
Changes:	Updated Datasheet Template Updated Packaging
Changes Made by:	Paul Doyle

Revision: B

Date:	2018-10-15
Changes:	Added IATF16949
Changes Made by:	Sean Hancox

Revision: A (Original First Release)

Date:	2017-12-13
Notes:	
Author:	Jack Conroy

Revision: B

Date:	2018-10-15
Changes:	Added IATF16949
Changes Made by:	Sean Hancox

Revision: A (Original First Release)			
Date:	2017-12-13		
Notes:			
Author:	Jack Conroy		



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