



**THE DATASHEET OF
SWDP.2458.15.4.A.02**





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 WiFi 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.

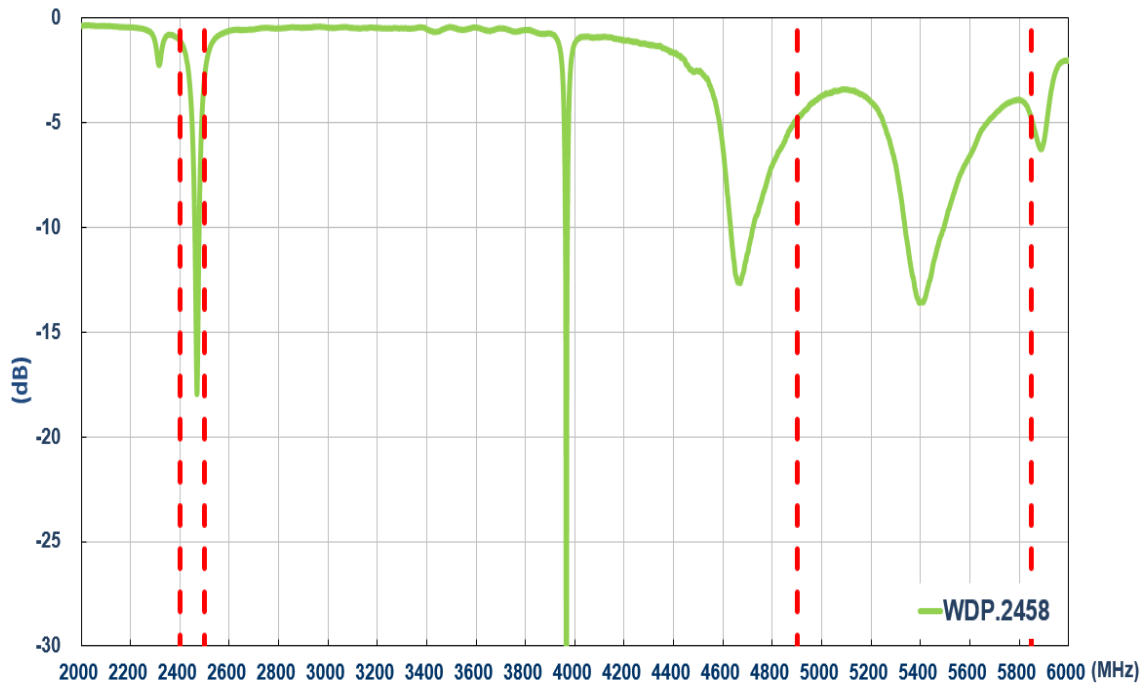
2. Specifications

| 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) | | |

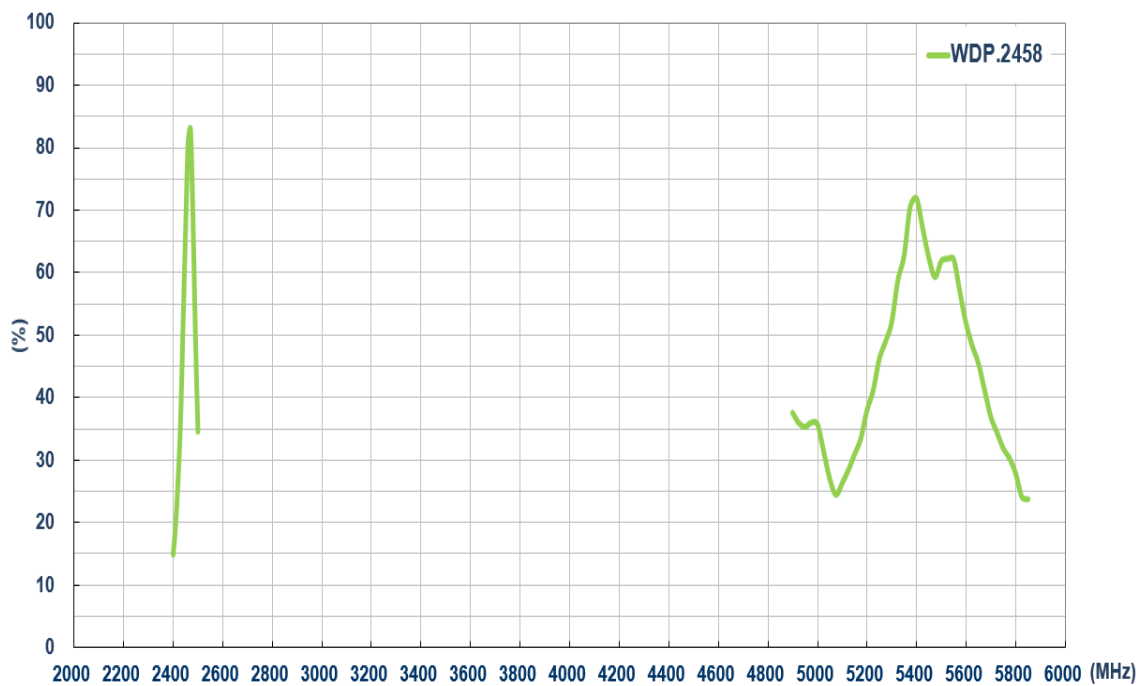
*All tests done on a 70*70mm ground plane

3. Antenna Characteristics

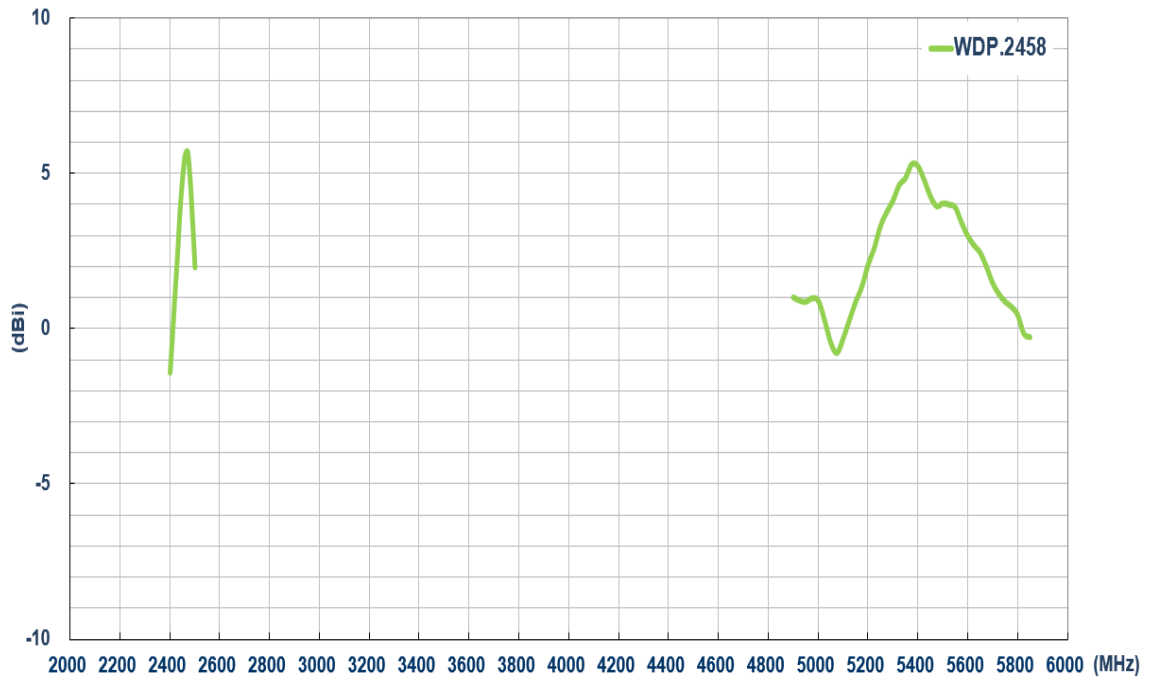
3.1 Return Loss



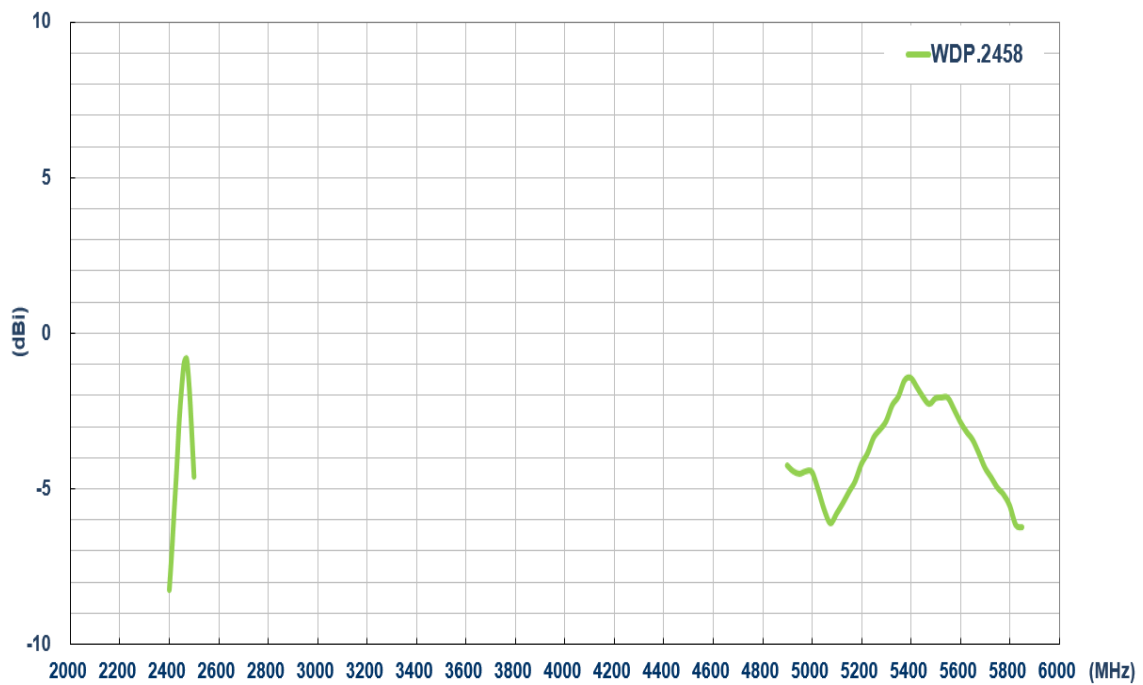
3.2 Efficiency



3.3 Average Gain

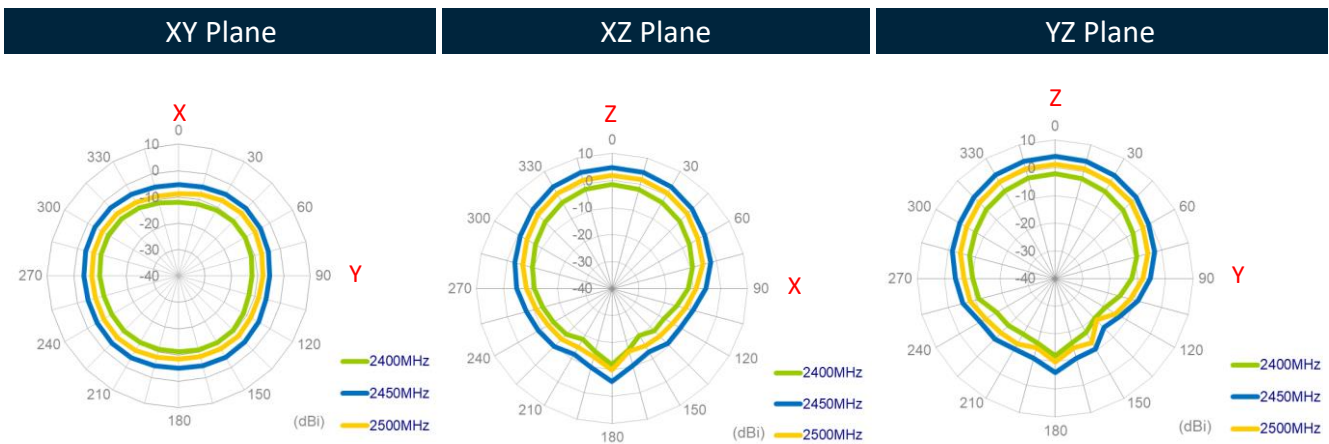
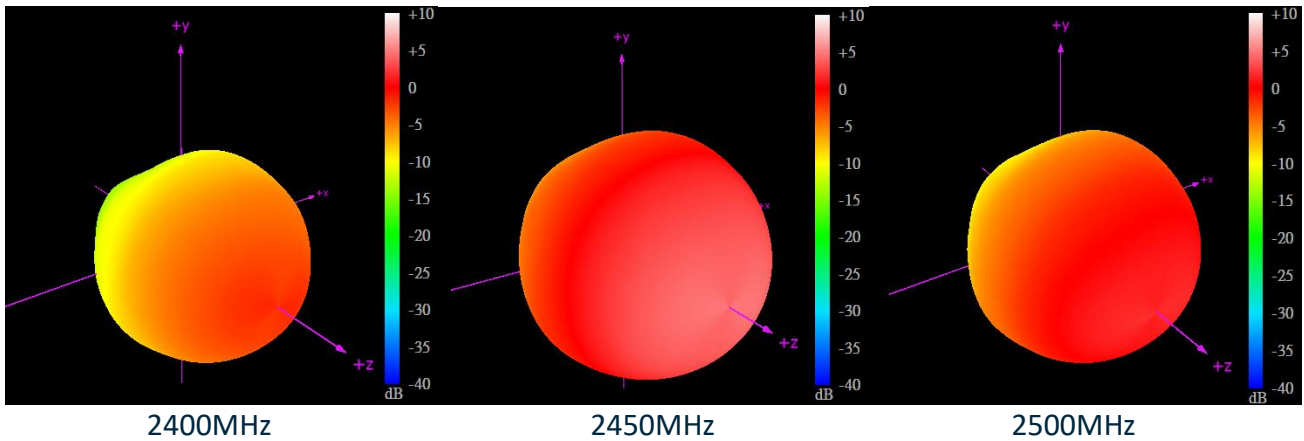


3.4 Peak Gain

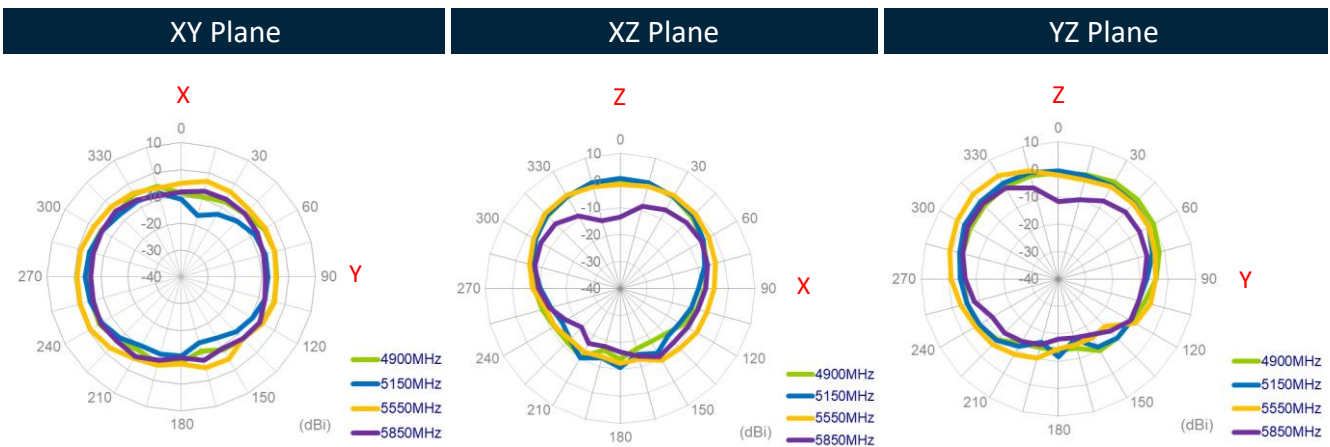
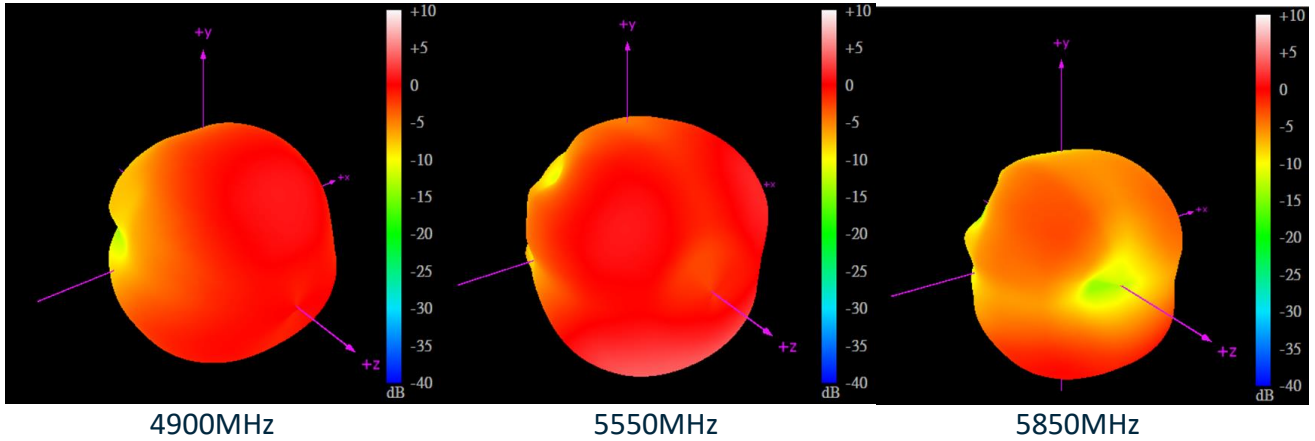


4. Radiation Patterns

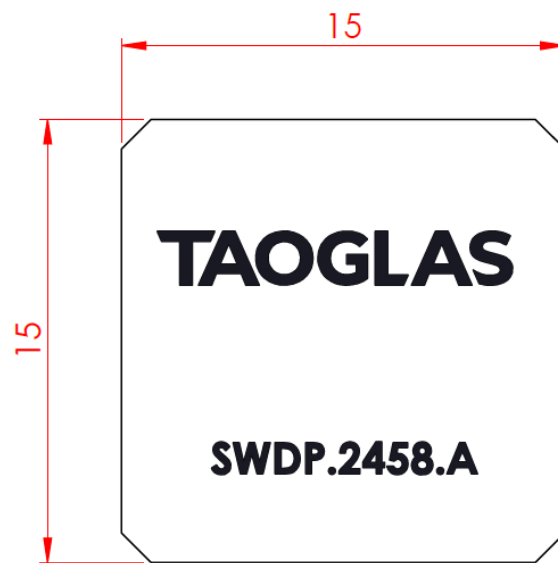
4.1 2400MHz, 2450MHz & 2500MHz 3D and 2D Radiation Patterns



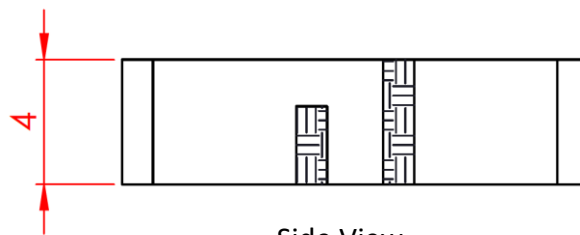
4.2 4900MHz, 5550MHz & 5850MHz 3D and 2D Radiation Patterns



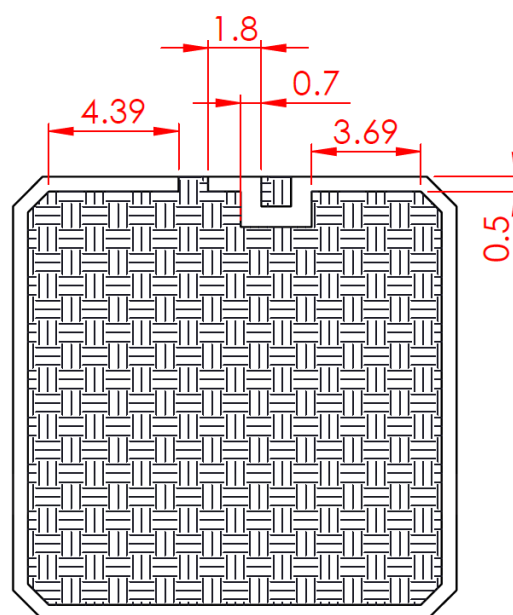
5. Mechanical Drawing (Units: mm)



Top View

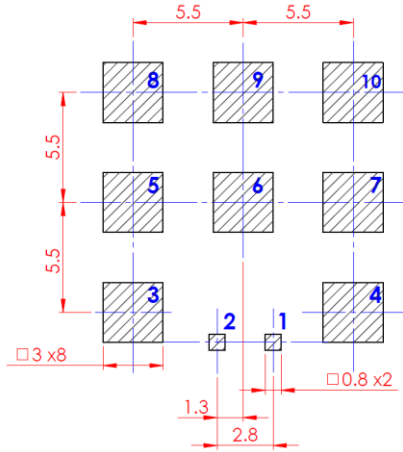


Side View

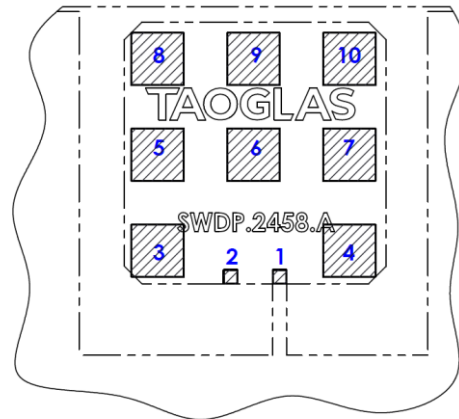


Bottom View

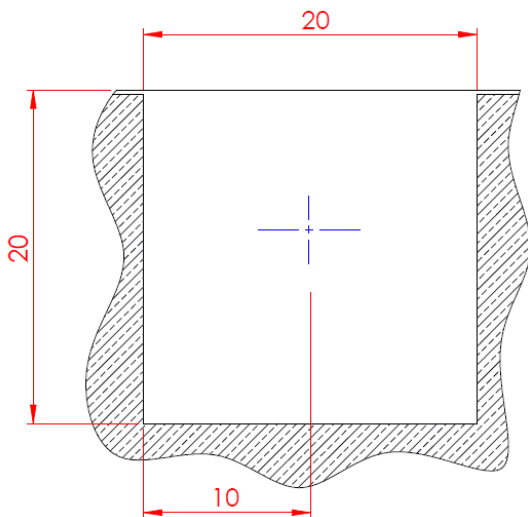
6. Footprint



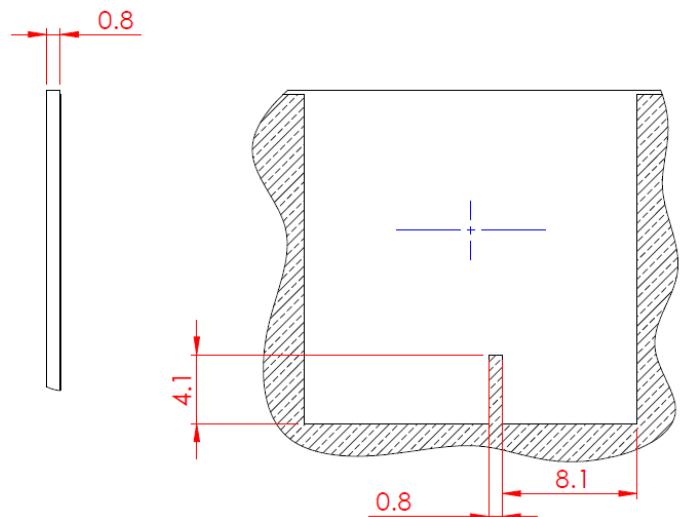
FOOTPRINT PCB
SCALE 5:1



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

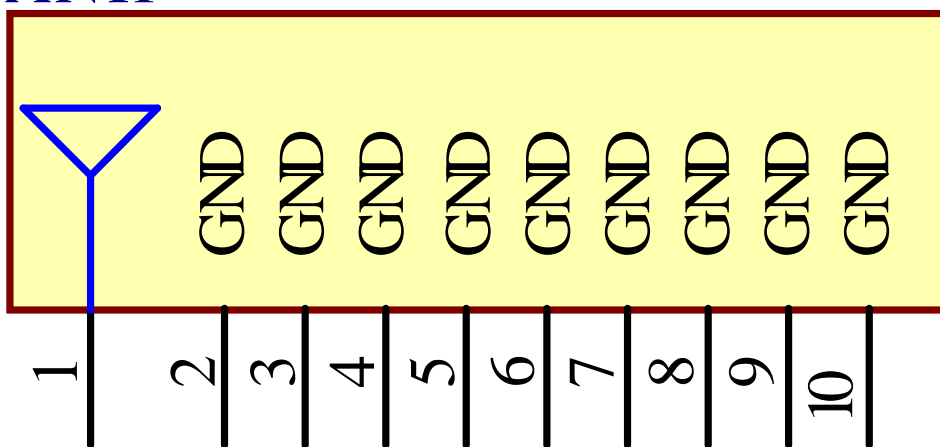


7.1 Schematic Symbol and Pin Definition

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 |

SWDP.2458.15.4.A.02
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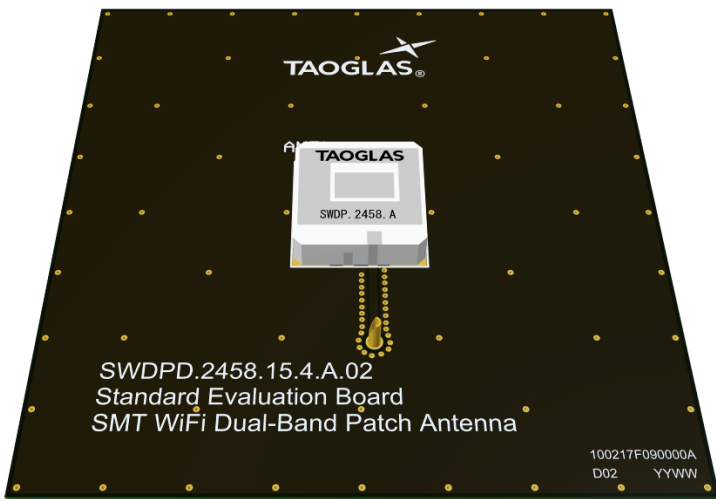


Please note you can download the design files, 3D model, 2D drawings and CST simulation files from the website here:

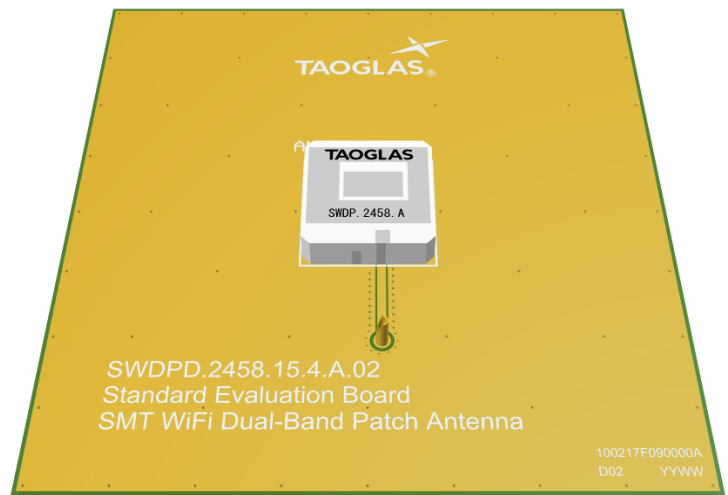
[SWDP.2458.15.4.A.02 - Web Page](#)

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.



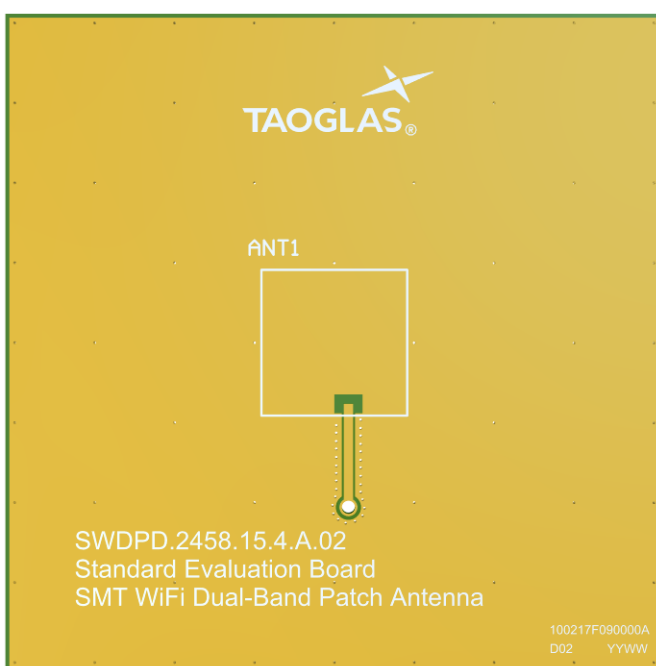
Top Side w/ Solder Mask



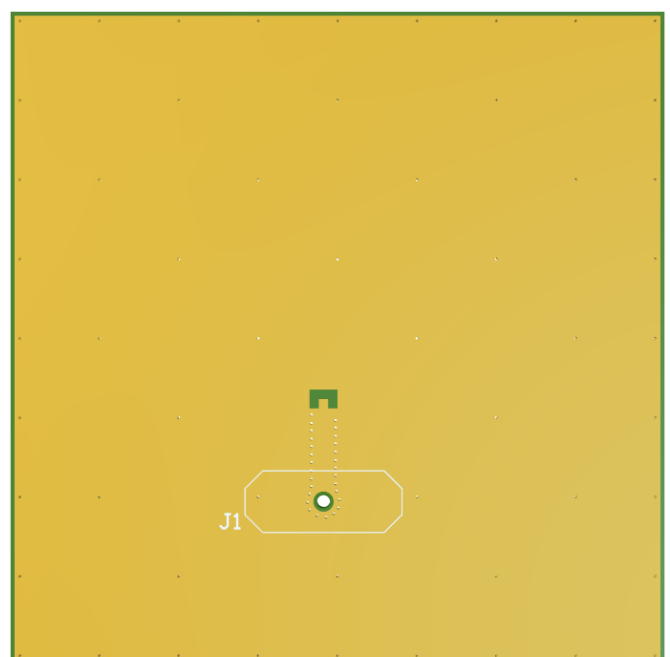
Top Side w/o Solder Mask

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.

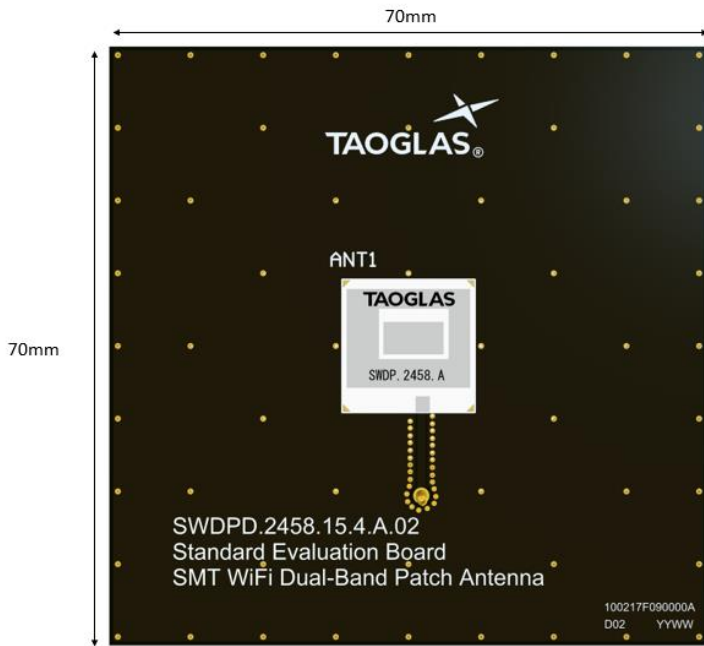


Topside

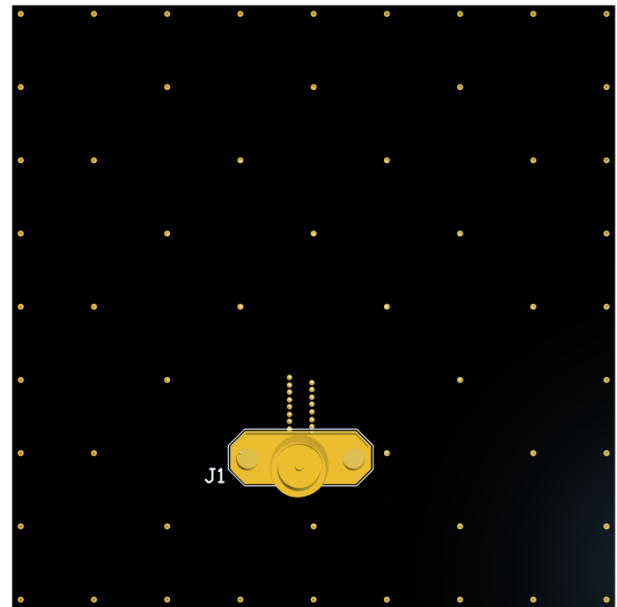


Bottom Side

7.4 Evaluation Board



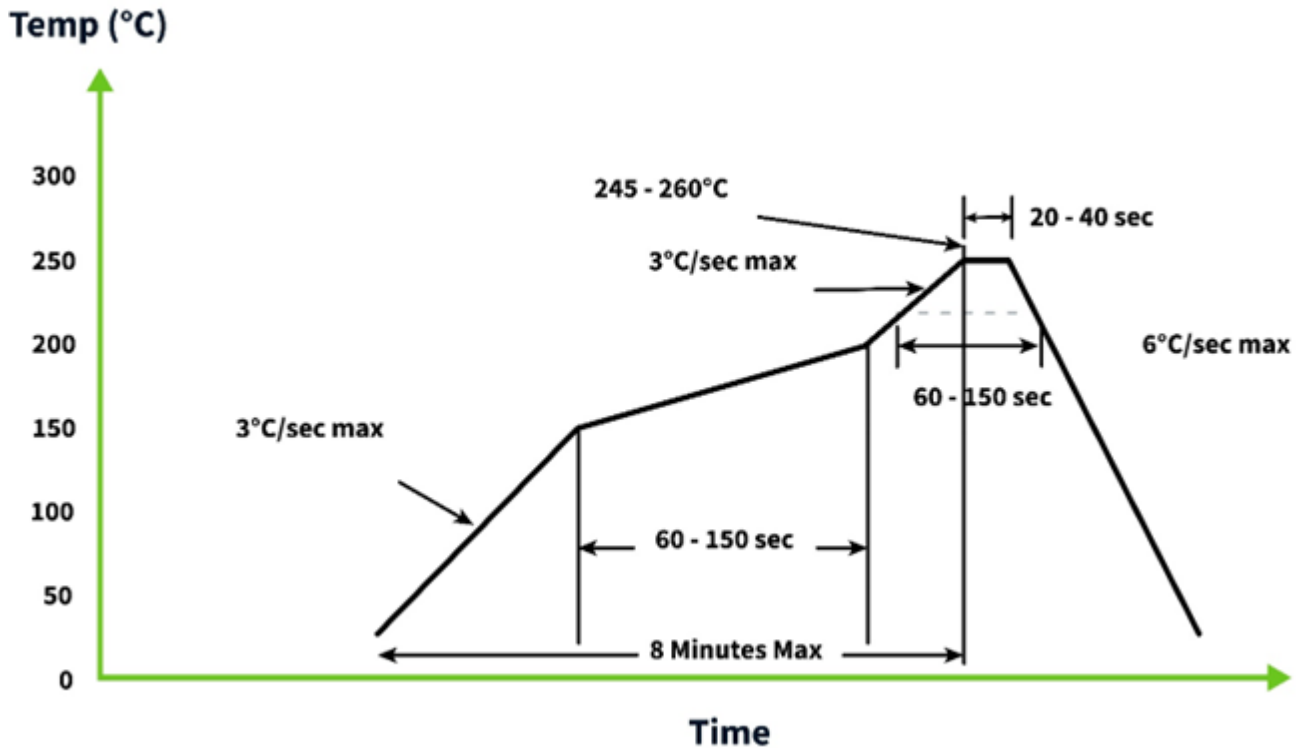
Topside



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:



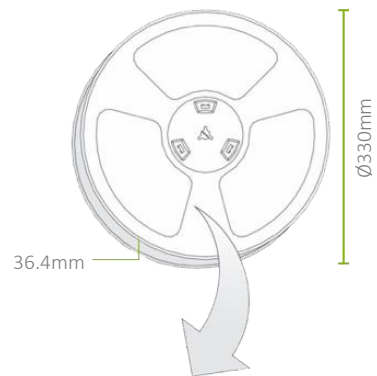
*Temperatures listed within a tolerance of +/- 10° C

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.

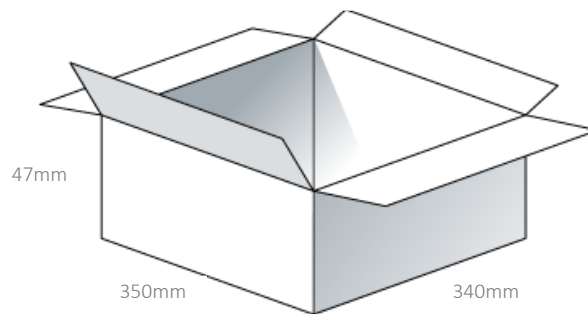
Note: Soldering flux classified ROL0 under IPC J-STD-004 is recommended.

9. Packaging

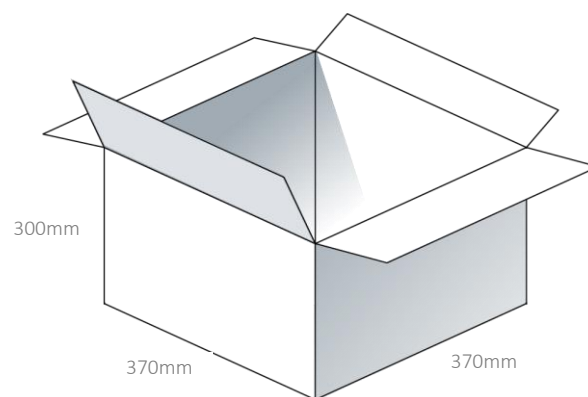
500pcs SWPD.2458.15.4.A.02 per Tape & Reel
 Dimensions - $\varnothing 330 \times 36.4 \text{mm}$



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



2500pcs SWDP.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: D (Current Version)

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

Previous Revisions

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 |



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