

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

taoglas

SWDP.2458.A

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 BoHS 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.



	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	1	5x15 mm	
Weight		3.5g	
	Environmental		
Operating and Storage Temperature Range	-2	10°C to 85°C	
Humidity	Non-cond	ensing 65°C 95% RH	
Moisture Sensitivity Level (MSL)	3	(168 Hours)	

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



3.



3.2 Efficiency













XY Plane XZ Plane YZ Plane Ζ **Z** 0 **X** 0 0 10 10 10 330 330 30 330 300 300 60 300 60 -20 270 270 Х 240 240 120 240 2400MHz 2400MHz 2400MHz 210 150 2450MHz 2450MHz 210 150 -2450MHz 210 150 180 (dBi) 👝 2500MHz (dBi) 2500MHz (dBi) ____2500MHz 180 180

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4.



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



4900MHz

5550MHz

5850MHz



SPE-17-8-091-D



Mechanical Drawing (Units: mm) 5.



Top View



Side View



Bottom View



Footprint

6.



7

8

9

10

GROUND GROUND

GROUND

GROUND







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
SWI ANT)P.245 1	58.15.4A.02
Y		
	C1 (C	0 4 v 0 L 8 0 0

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.





Bottom Side



Evaluation Board



70mm



Topside



Bottom Side



Solder Reflow Profile

8.

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 +/- 10º 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 - Ø330*36.4mm



1 Tape & Reel per carton Dimensions - 350*340*47mm



2500pcs SWDP.2458.15.4.A.02 per carton Dimensions - 370*370*300mm





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 (Origina	l 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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