TAOGLAS

Datasheet

Part No:
SDWA.01

Description:

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

Features:

High Efficiency/ High Peak Gain

2400-2500MHz, 5150-5825MHz, 5925-7125MHz Wi-Fi coverage

Covers newly established Wi-Fi 6 spectrum for future proof design

Small Footprint

Low Profile

Dimensions: 10*4*1.5mm

RoHS & Reach Compliant

1. Introduction

The SDWA.01 SMD ceramic antenna is an embedded, high efficiency, high peak gain solution for Wi-Fi applications which require high-speed data rates and wide coverage areas. Designed for the 2.4 GHz, 5.8 GHz and 7.125GHz bands. The antenna covers the newly established Wi-Fi 6 spectrum for future proof design. It is designed to perform optimally mounted in the corner of a device PCB. Two SDWA.01 antennas can be used for MIMO applications. The antenna's low profile, at only 1.5mm, allows for use on extremely thin devices while still maintaining excellent performance characteristics. This antenna is delivered on Tape and Reel for SMD application.

Many module manufacturers specify peak gain limits for any antennas that are to be connected to that module. Those peak gain limits are based on free-space conditions. In practice, the peak gain of an antenna tested in free space can degrade by at least 1 or 2dBi when put inside a device. So ideally you should go for a slightly higher peak gain antenna than mentioned on the module specification to compensate for this effect, giving you better performance.

Upon testing of any of our antennas with your device and a selection of appropriate layout, integration technique, or cable, Taoglas can make sure any of our antennas' peak gain will be below the peak gain limits. Taoglas can then issue a specification and/or report for the selected antenna in your device that will clearly show it complying with the peak gain limits, so you can be assured you are meeting regulatory requirements for that module.

For example, a module manufacturer may state that the antenna must have less than 2dBi peak gain, but you don't need to select an embedded antenna that has a peak gain of less than 2dBi in free space. This will give you a less optimized solution. It is better to go for a slightly higher free-space peak gain of 3dBi or more if available. Once that antenna gets integrated into your device, performance will degrade below this 2dBi peak gain due to the effects of GND plane, surrounding components, and device housing. If you want to be absolutely sure, contact Taoglas and we will test. Choosing a Taoglas antenna with a higher peak gain than what is specified by the module manufacturer and enlisting our help will ensure you are getting the best performance possible without exceeding the peak gain limits.

For further information, please contact your regional Taoglas customer support team.

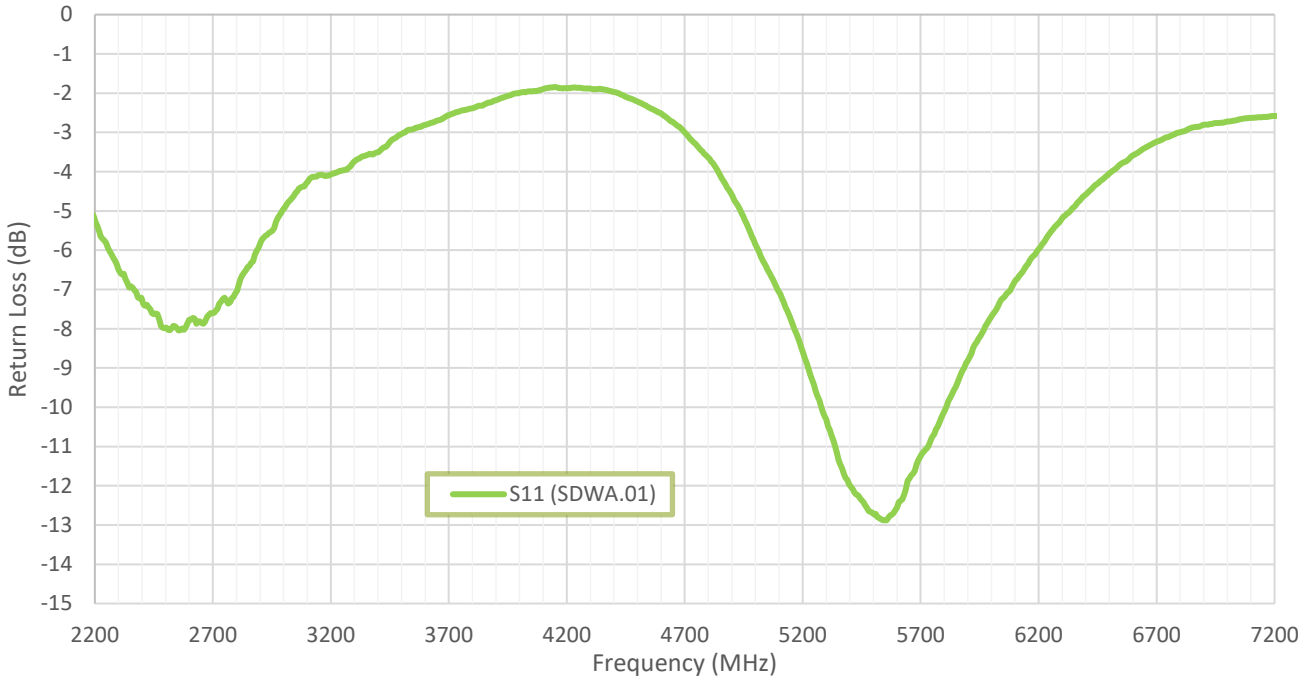
2. Specifications

Wi-Fi Electrical							
Band	**Frequency (MHz)**	**Efficiency (%)**	**Average Gain (dB)**	**Peak Gain (dBi)**	**Impedance**	**Polarization**	**Radiation Pattern**
2.4GHz Wi-Fi	2400~2500	55.7	-2.5	3	50 Ω	Linear	Omni-Directional
5.8GHz Wi-Fi	5150~5850	66.2	-1.9	5.9			
7.1GHz Wi-Fi 6	5925~7125	44.7	-3.6	4.9			

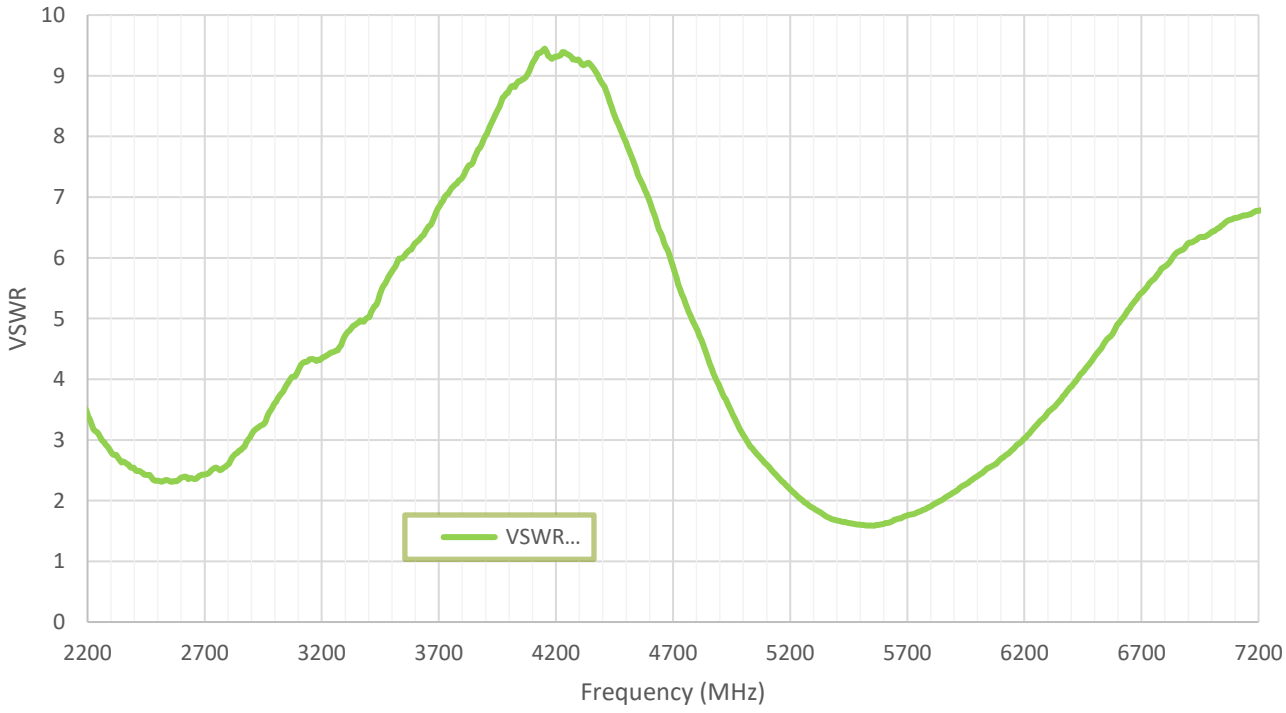
Mechanical	
Height	1.5 mm
Planner Dimension	10 x 4 mm
Material	Ceramic
Evaluation Board Dimensions	100mm*50mm
Weight	1g
Environmental	
Operation Temperature	-40°C to +85°C
Storage Temperature	-40°C to +105°C
Temperature Coefficient （τf）	0 ± 20 ppm @-20ºC to +80ºC
Humidity	Non-condensing 65°C 95% RH
Recommended Reel Storage Conditions	5°C to 40°C Relative Humidity 20% to 70%
Moisture Sensitivity Level (MSL)	3 (168 Hours)

3. Antenna Characteristics

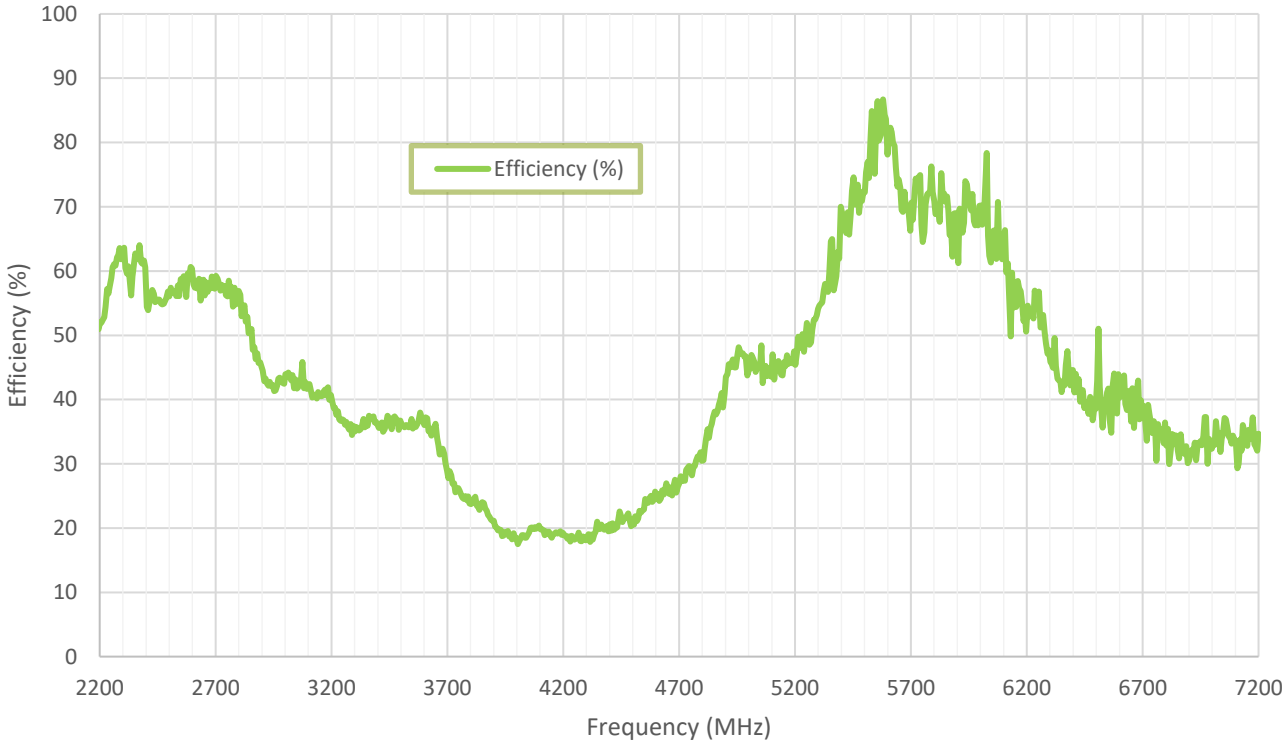
3.1 Return Loss



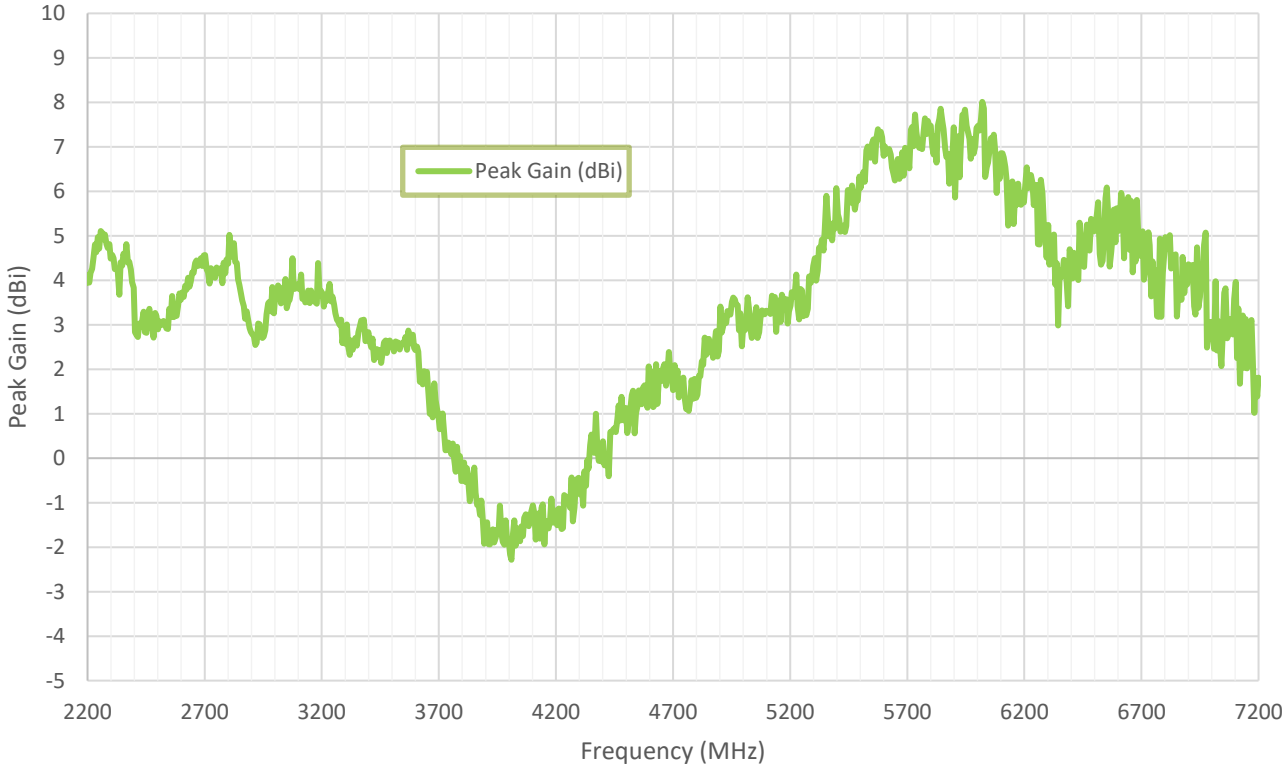
3.2 VSWR



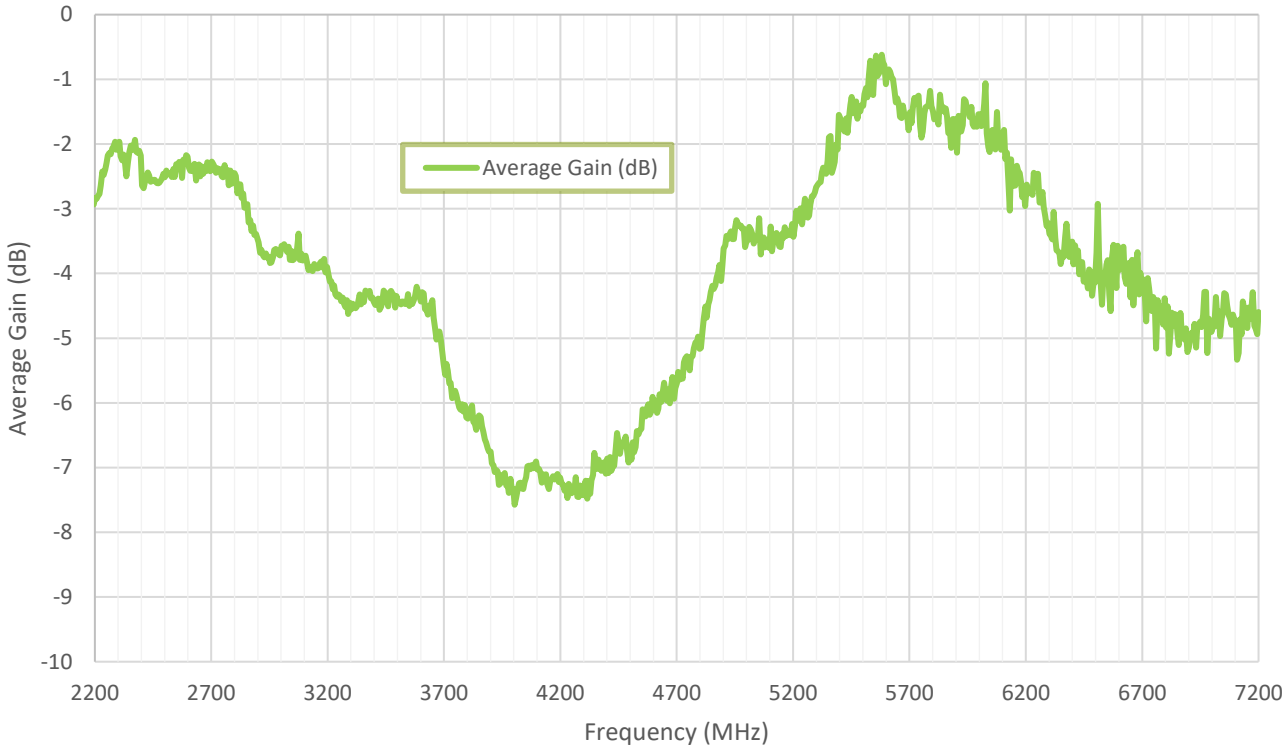
3.3 Efficiency



3.4 Peak Gain

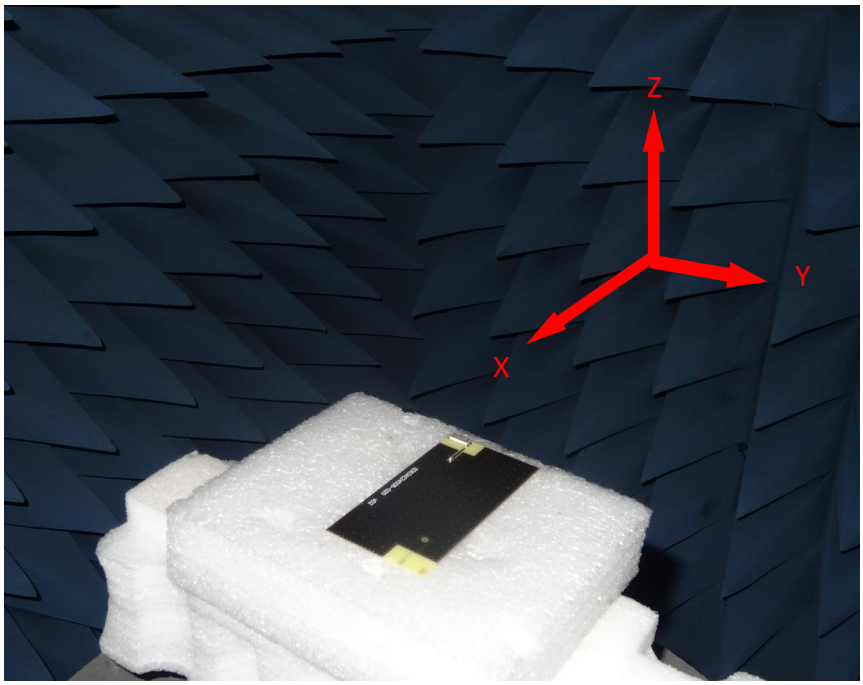


3.5 Average Gain



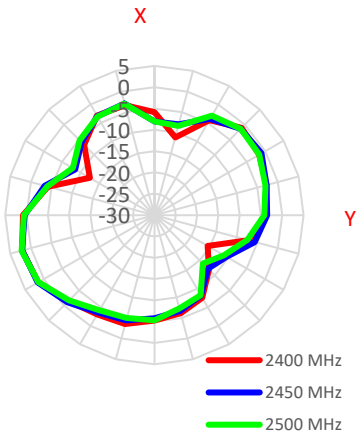
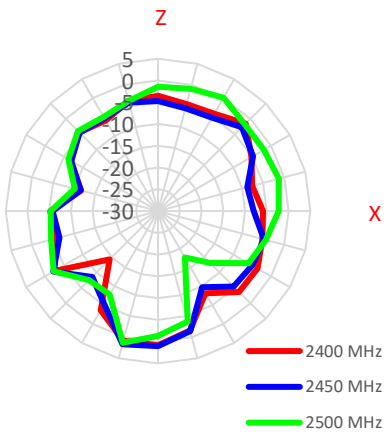
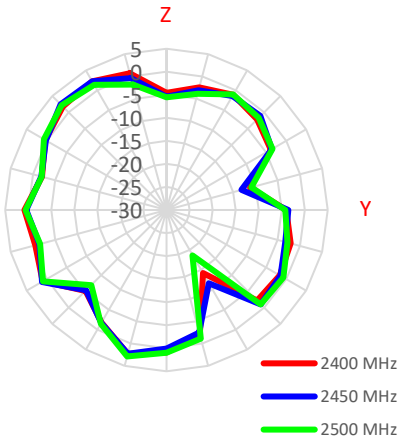
4. 2D Radiation Patterns

4.1 Test Setup – On Eval Board

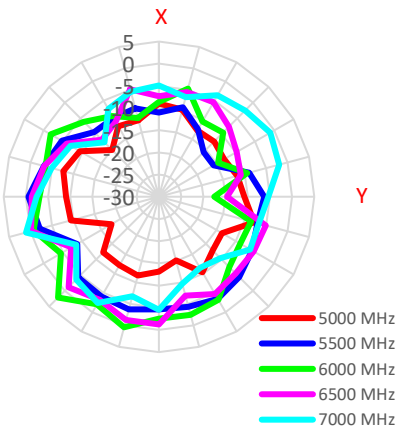
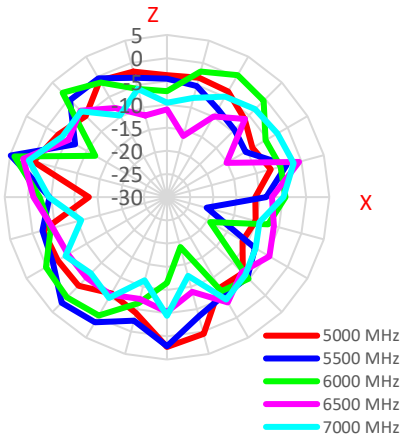
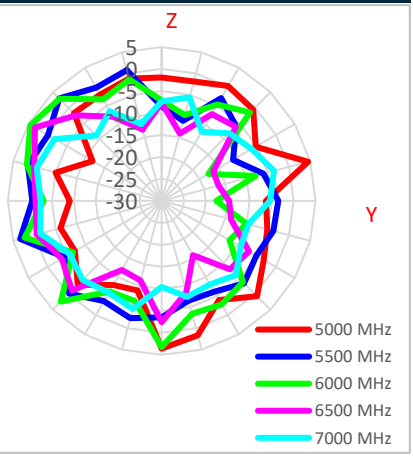


4.2 2D Radiation Patterns

2400-2500MHz

XY Plane	XZ Plane	YZ Plane
		

5000-7000MHz

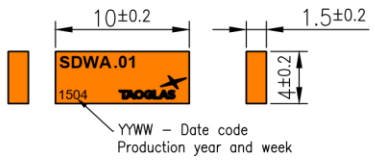
XY Plane	XZ Plane	YZ Plane
		

5. Mechanical Drawing (Units: mm)

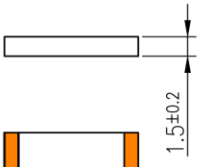
ISO NO: EDW-18-8-1492 <Release>

REV	ZONE	DESCRIPTION	ENG	APPROVED	ISSUED DATE
A	ALL	Initial Design	Eva	Paul	2018/11/06
B	ALL	Replace the new LOGO <ECR-18-8-259>	Aron	Aaron	2019/11/20

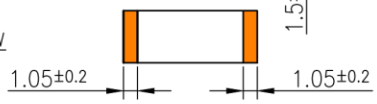
B Top View



Side View



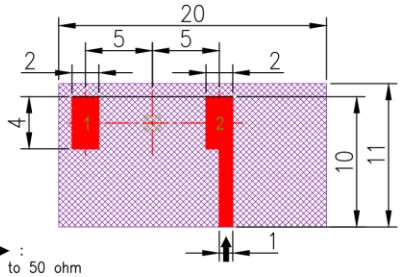
Bottom View



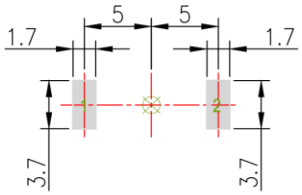
SCALE: 1/1

Foot Print

Top Copper

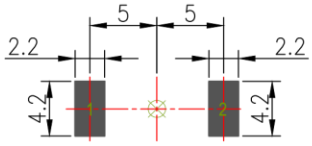


Top Solder Paste

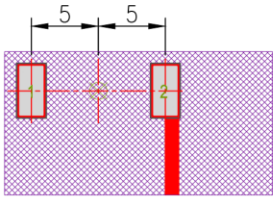


Top Solder Mask

This drawing is a negative of solder mask. Black regions are anti-mask.



Composite Diagram



NOTE:
1. Ag Plated area
2. Solder Mask area
3. Copper area
4. Paste area
5. Copper Keepout Area
6. Copper keepout should extend through all PCB layers.
7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow.
8. The dimension tolerances should follow standard PCB manufacturing guidelines
9. The transmission line width may change once it gets to the ground plane edge depending on PCB details and the transmission line that runs through the keepout area should always be 1.00mm.
10. The antenna footprint can be mirrored for customer's application.

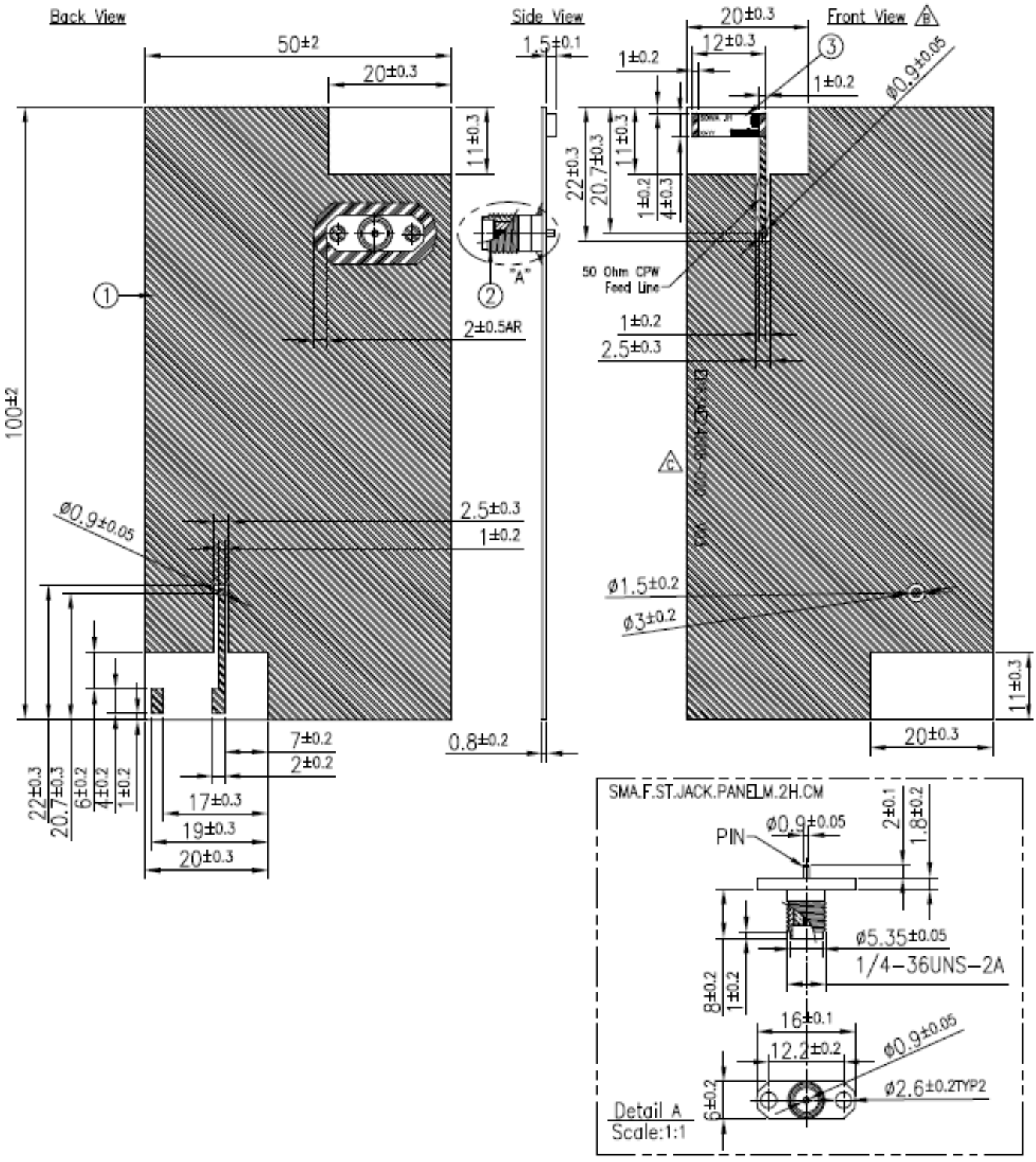
UNLESS OTHERWISE SPECFIED TOLERANCES ON: .X± 0.2 XX.± 0.5 .XX± 0.1 X.± 0.3 .XXX± 0.05	DATE: 2015/02/05	MAT'L: Ceramic	REV B
	UNIT: mm	FINISH: Clear	
	THIRD ANGLE PROJECTION	SCALE: 2/1	
APPROVED BY: Wayne	CHECKED BY: Aine	DRAWN BY: Kim	CUSTOMERS SIGNATURE / DATE

TAOGLAS. TW Design Centre

TITLE. : Dual-Band 2.45 GHz SMD Ceramic Antenna

PART NO. : SDWA.01

6. Evaluation Board Drawing

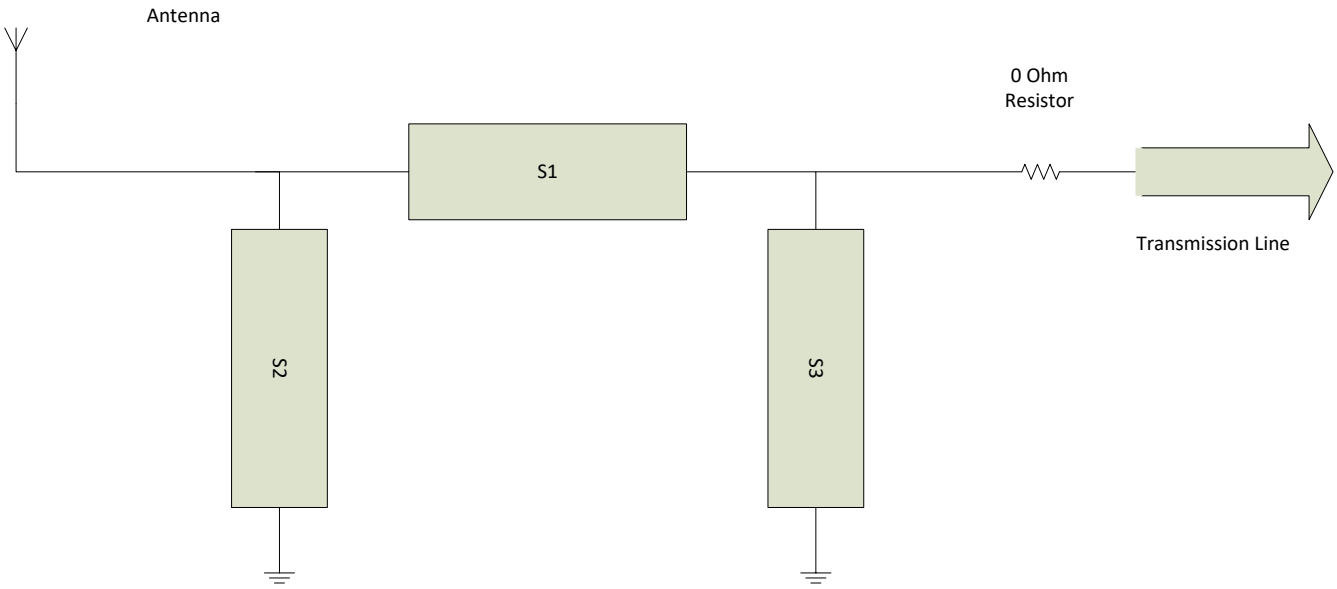


NOTES:
1. Week Batch Code
2. Example: 2011 Week 1=01-11
3.Gold Plated Area
4.Soldered Area
5.Clearance Area

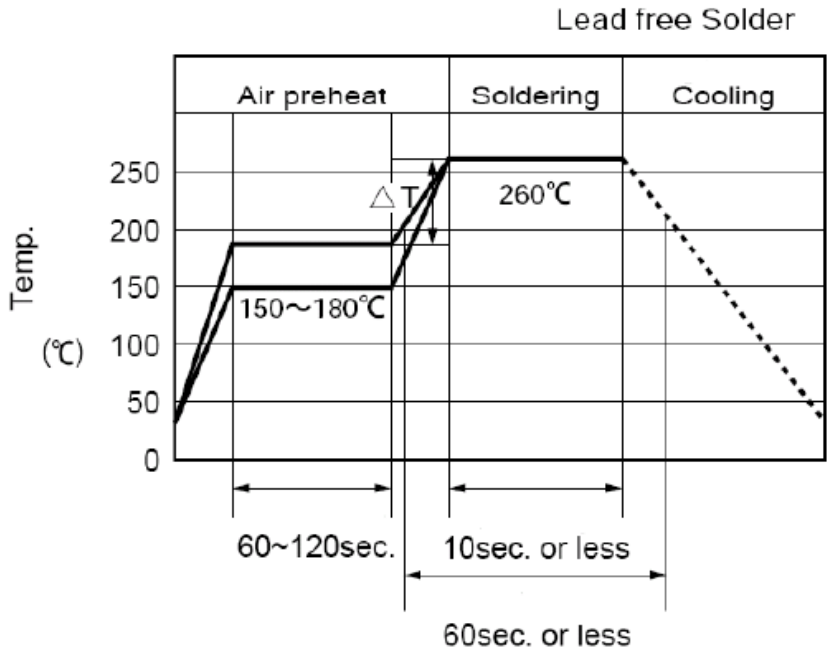
	Name	P/N	Material	Finish	QTY
1	EVB PCB	02110212030510	Composite 0.8t	Clear	1
2	SMA(F)ST	02104220000020	Brass	Au Plated	1
3	SDWA.01 Patch	013A5C0E00J01D	Ceramic	Clear	1

7. Matching Circuit

Like all antennas, surrounding components, enclosures, and changes to the GND plane dimensions can alter performance. A pi-matching network like the one shown below is required in case adjustments need to be made. Make S1 a zero ohm resistor and leave S2 and S3 unpopulated when building first prototypes. These components will likely need to be adjusted upon integration to provide the best match between the antenna and transmission line. The additional zero ohm resistor in the diagram is needed for the ability to solder down a coax pigtail to make measurements with a vector network analyzer.



8. Recommended Soldering Conditions



1. Time shown in the above figures is measured from the point when chip surface reaches temperature.
2. Temperature difference in high temperature part should be within 110°C.
3. After soldering, do not force cool, allow the parts to cool gradually.

*General attention to soldering:

- High soldering temperatures and long soldering times can cause leaching of the termination, decrease in adherence strength, and the change of characteristic may occur.
- for soldering, please refer to the soldering curves above. However, please Keep exposure to temperatures exceeding 200°C to under 50 seconds.
- please use a mild flux (containing less than 0.2wt% Cl). Also, if the flux is water soluble, be sure to wash thoroughly to remove any residue from the underside of components that could affect resistance.

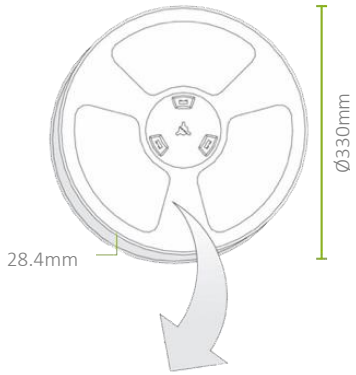
Cleaning:

When using ultrasonic cleaning, the board may resonate if the output power is too high.
Since this vibration can cause cracking or a decrease in the adherence of the termination, we recommend that you use the conditions below.

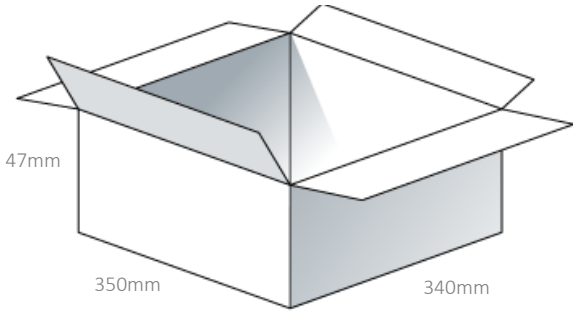
Frequency: 40 kHz max.
Output power: 20W/liter
Cleaning time: 5minutes max.

9. Packaging

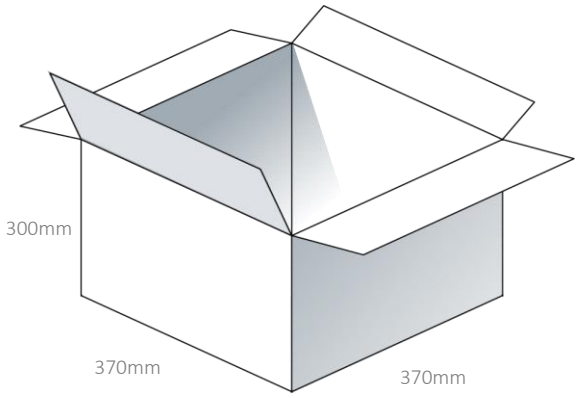
1000pcs SDWA.01 per Tape & Reel



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



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



Changelog for the datasheet

SPE-11-8-129 – SDWA.01

Revision: L (Current Version)	
Date:	2022-05-13
Changes:	Updated Packaging
Changes Made by:	Jack Conroy

Previous Revisions

Revision: K (Current Version)	
Date:	20208-09-03
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: J	
Date:	2019-06-11
Changes:	Evaluation Board Drawing Updated
Changes Made by:	Jack Conroy

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

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

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

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

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

Revision: G	
Date:	2017-03-08
Changes:	Packaging Details Updated
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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