



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

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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

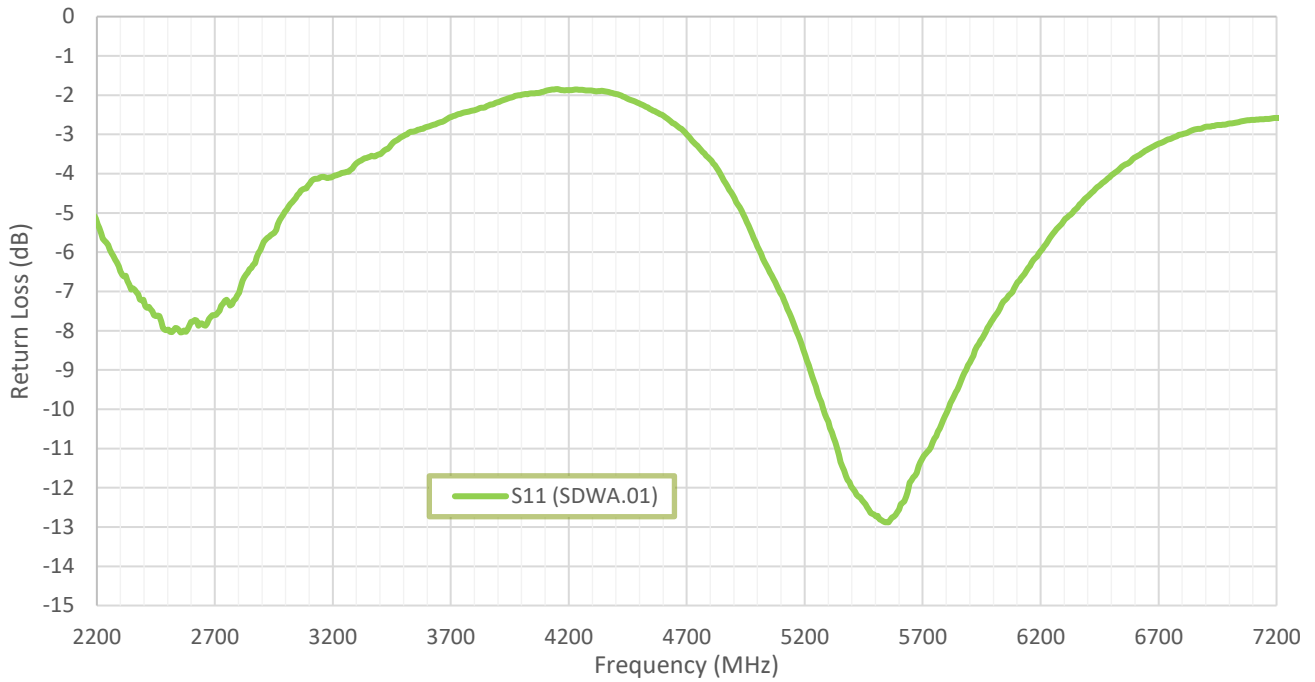
| Wi-Fi Electrical | | | | | | | |
|------------------|-----------------|----------------|-------------------|-----------------|-------------|--------------|-------------------|
| Band | Frequency (MHz) | Efficiency (%) | Average Gain (dB) | Peak Gain (dBi) | Impedance | Polarization | Radiation Pattern |
| 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 |

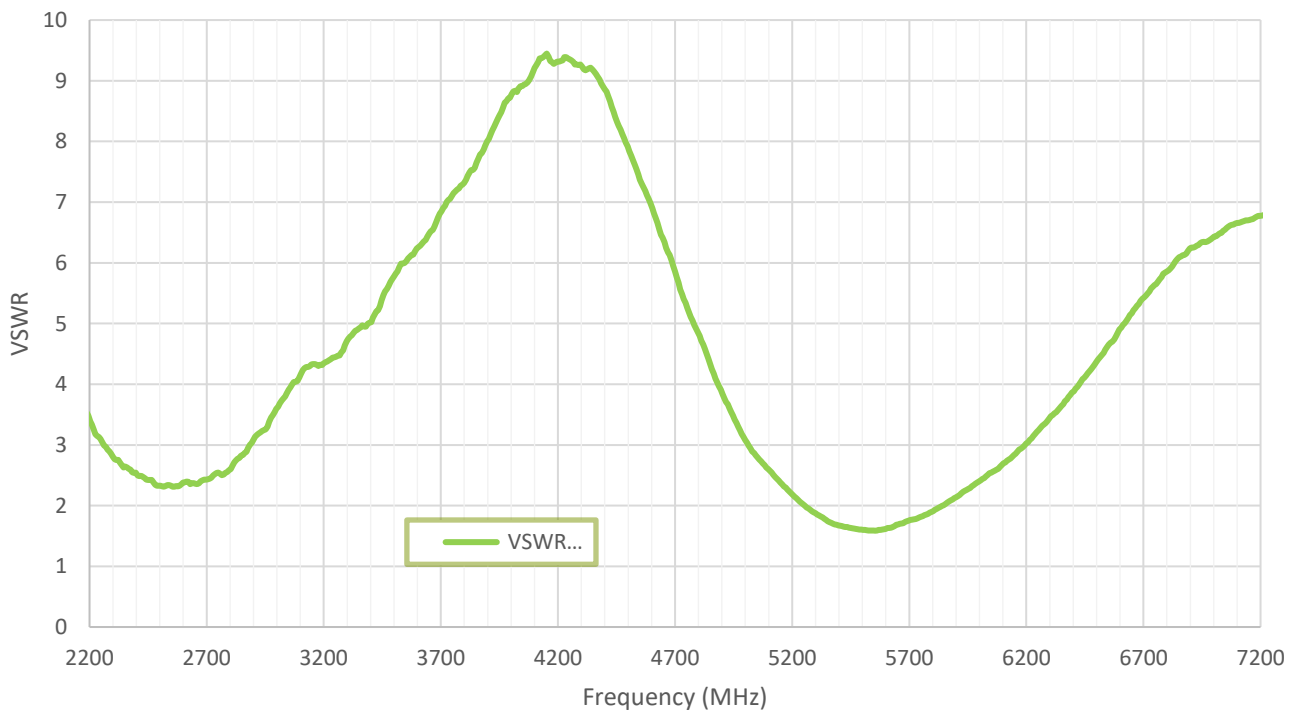
| Environmental | |
|--------------------------------------|---|
| Operation Temperature | -40°C to +85°C |
| Storage Temperature | -40°C to +105°C |
| Temperature Coefficient (τ_f) | 0 \pm 20 ppm @-20°C to +80°C |
| Humidity | Non-condensing 65°C 95% RH |
| Recommended Reel Storage Conditions | 5°C to 40°C Relative Humidity 20% to 70% |
| Moisture Sensitivity Level (MSL) | 3 (168 Hours) |

3. Antenna Characteristics

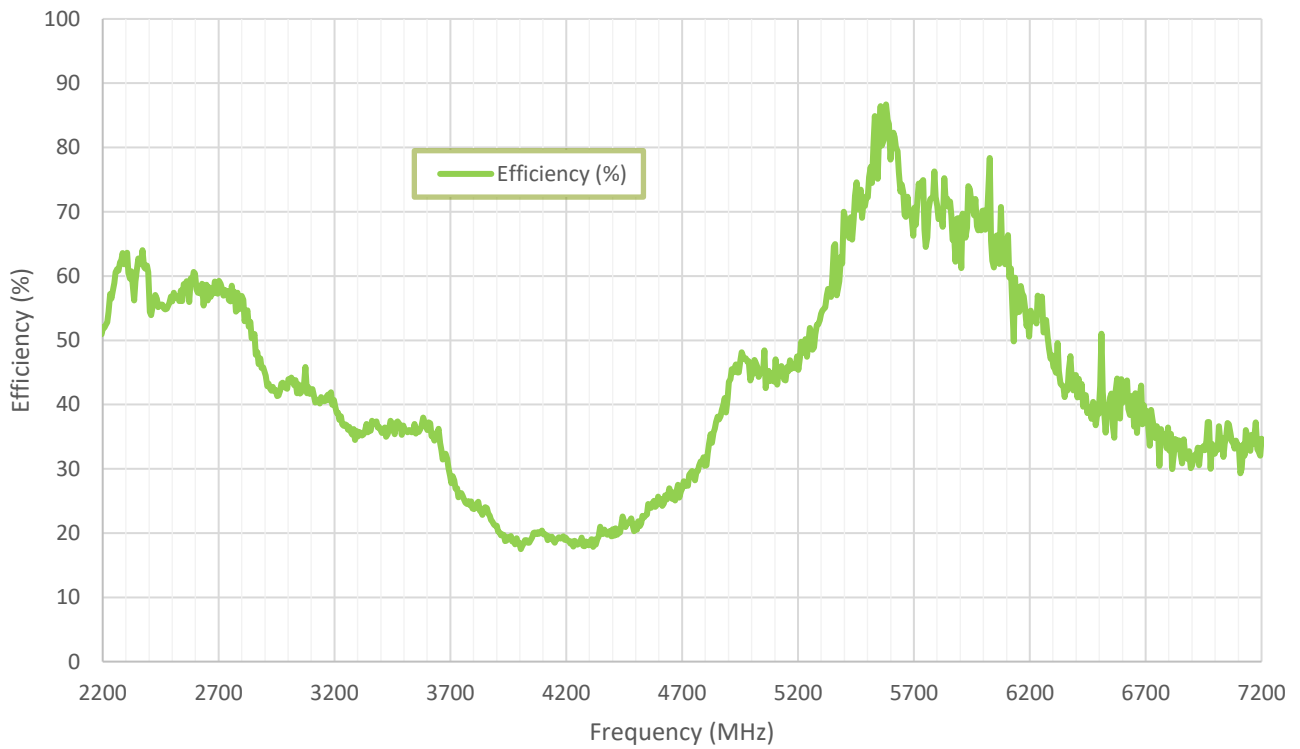
3.1 Return Loss



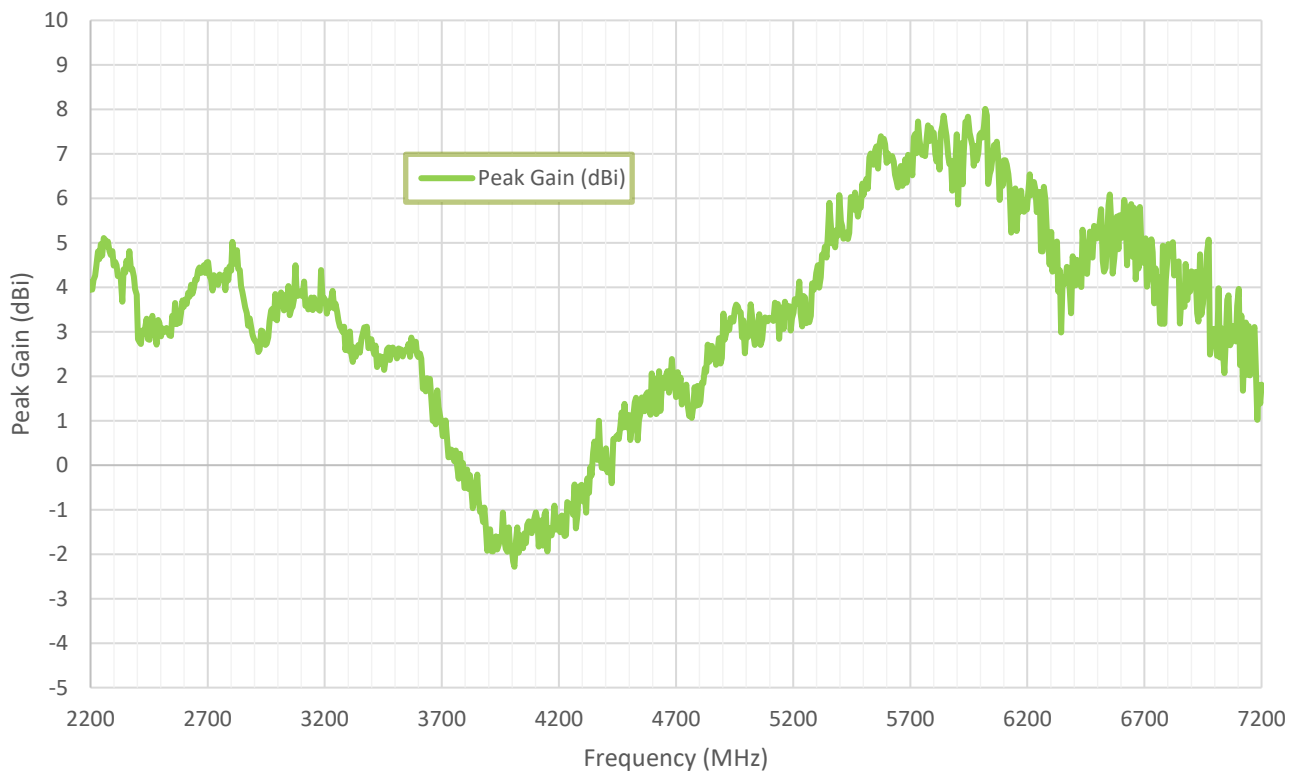
3.2 VSWR



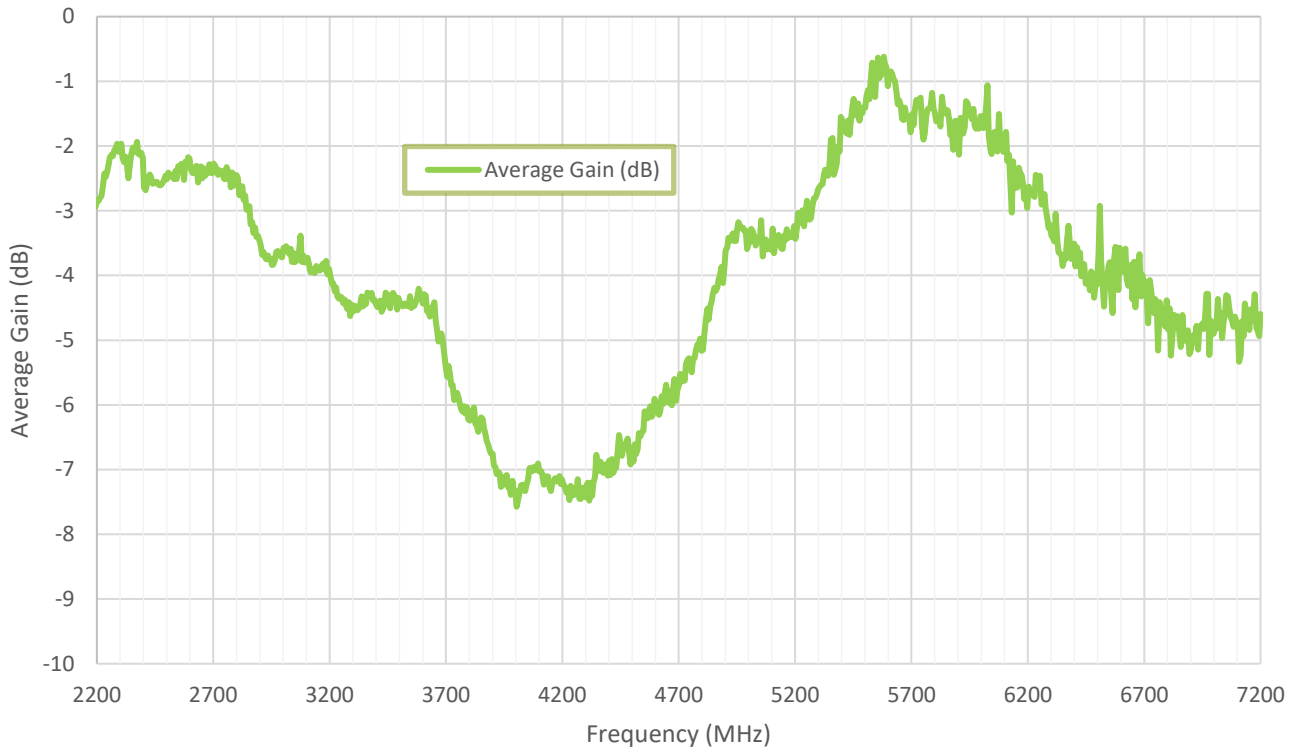
3.3 Efficiency



3.4 Peak Gain



3.5 Average Gain



4. 2D Radiation Patterns

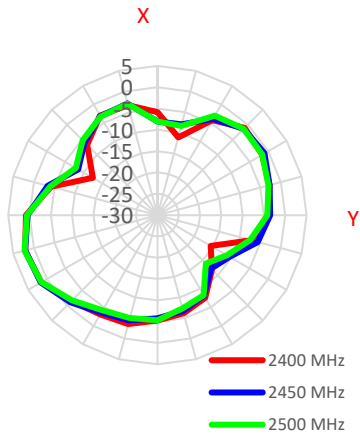
4.1 Test Setup – On Eval Board



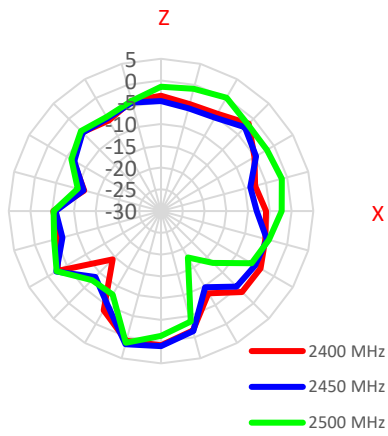
4.2 2D Radiation Patterns

2400-2500MHz

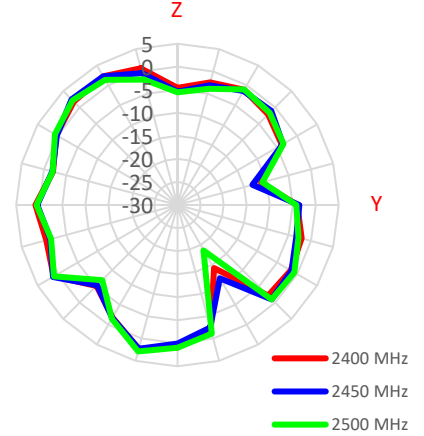
XY Plane



XZ Plane

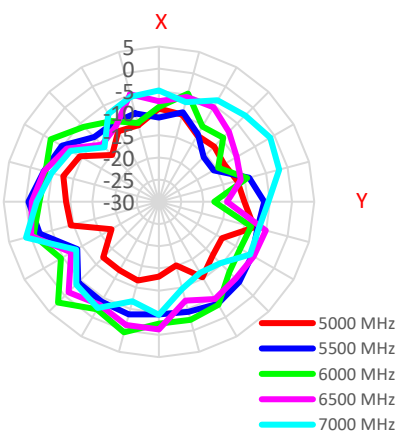


YZ Plane

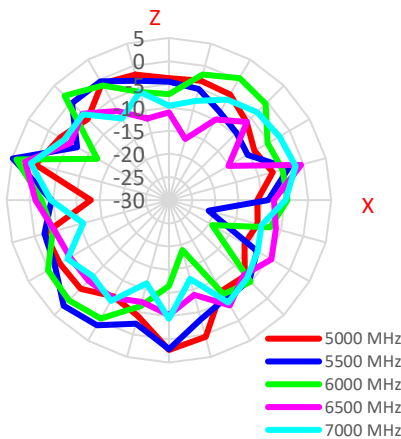


5000-7000MHz

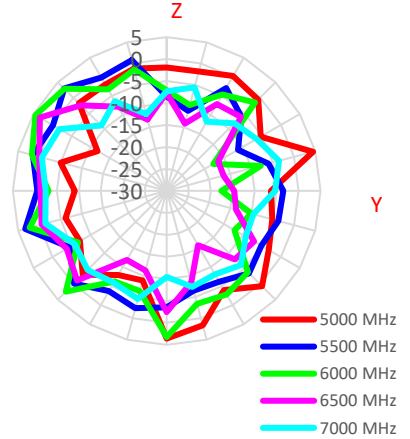
XY Plane



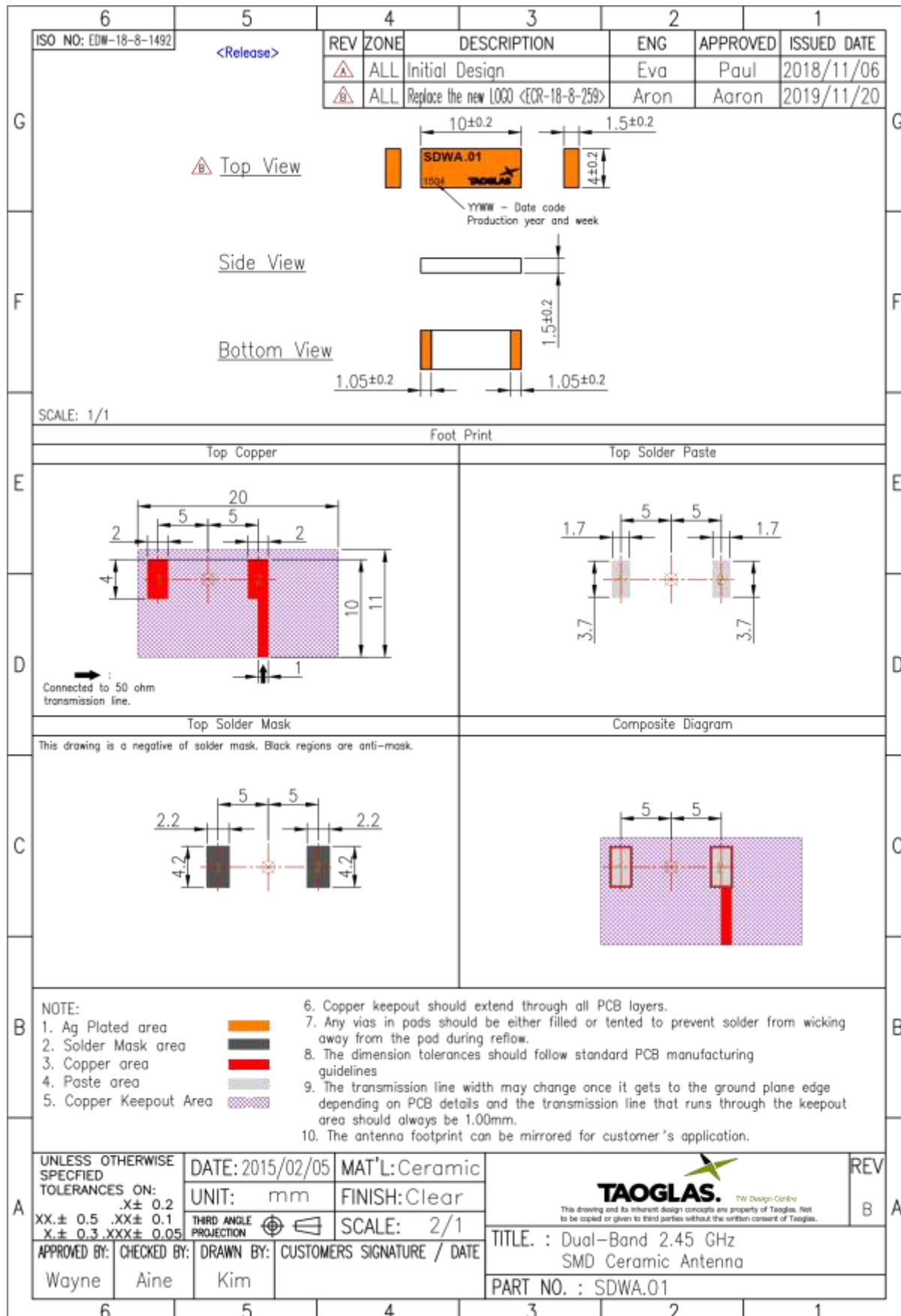
XZ Plane



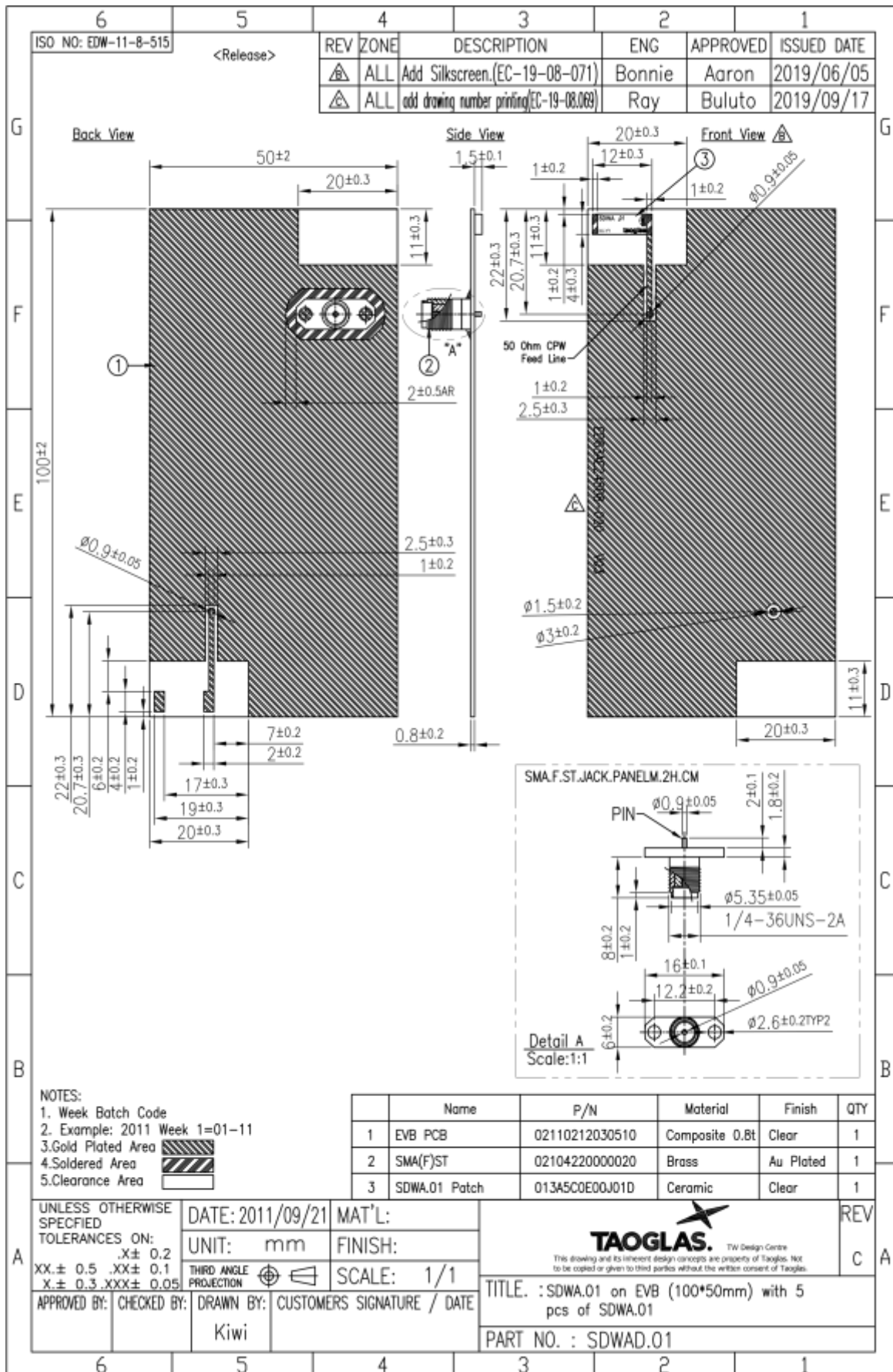
YZ Plane



5. Mechanical Drawing (Units: mm)

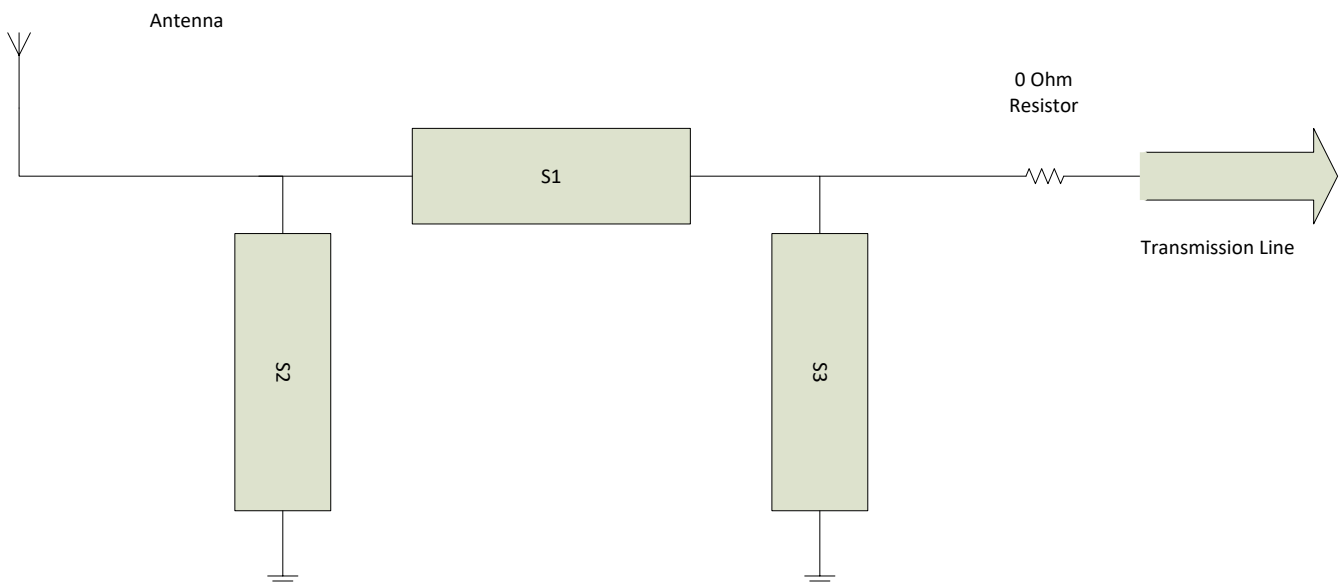


6. Evaluation Board Drawing

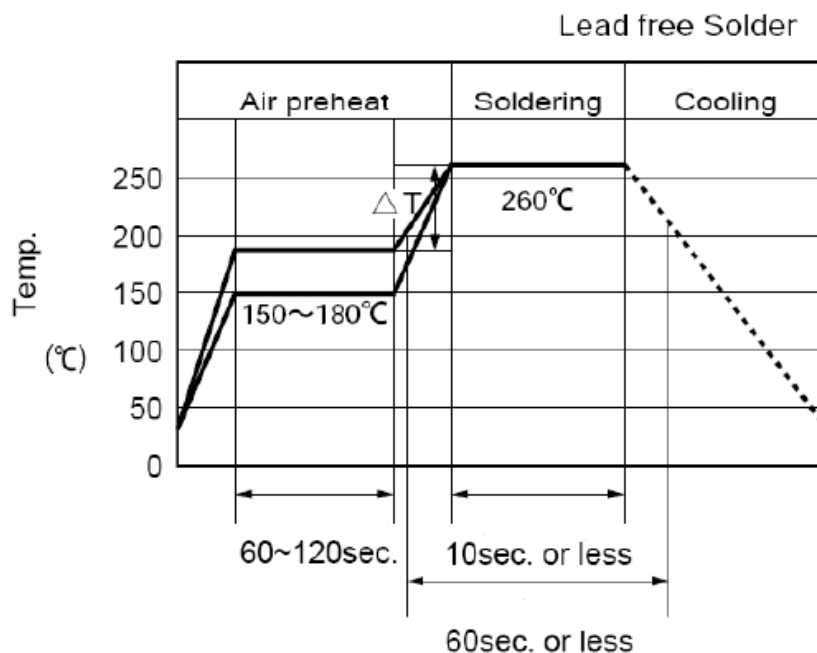


7. Matching Circuit

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.

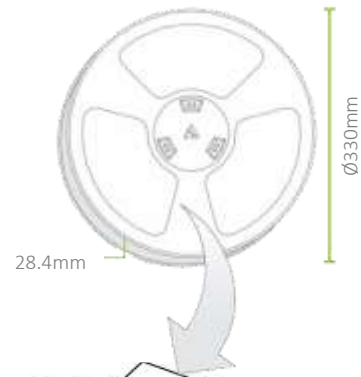
Cleaning:

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.

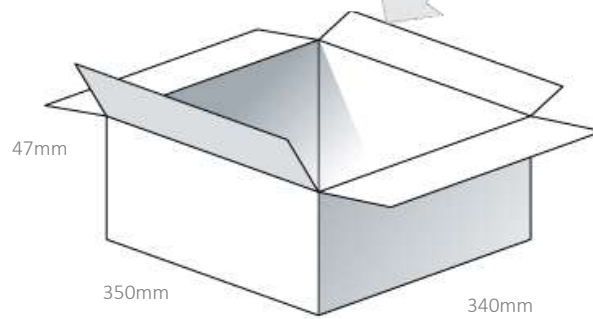
- Frequency: 40 kHz max.
- Output power: 20W/liter
- Cleaning time: 5minutes max.

9. Packaging

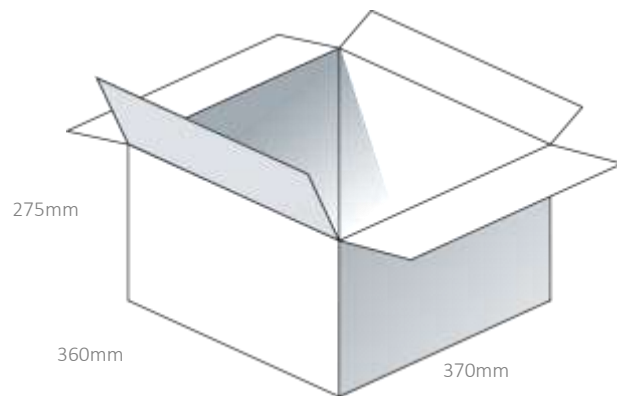
2000pcs SDWA.01 per Tape & Reel
Weight - 1Kg



2000pcs SDWA.01 per carton
Dimensions - 350*340*47mm
Weight - 1.2Kg



10000pcs SDWA.01 per carton
Dimensions - 360*370*275mm
Weight - 6.8Kg



Changelog for the datasheet

SPE-11-8-129 – SDWA.01

Revision: K (Current Version)

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

Previous Revisions

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: F

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

Revision: A (Original First Release)

| | |
|---------|------------------|
| Date: | 2017-10-27 |
| Notes: | |
| Author: | Technical Writer |



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