TAOGLAS

Datasheet

Part No:
PA.11

Description

2.4GHz Band Dielectric Ceramic PIFA

SMT Antenna for Bluetooth/WLAN/ZigBee Applications

Features:

2400-2484Mhz, 1.5dBi Peak Gain

Size: 10mm*4mm*3mm

Designed for the top right hand corner edge of the Component side of the board (bottom left corner edge)

SMT Mount

RoHS & Reach Compliant

1. Introduction

This specification covers the Dielectric PIFA Antenna for 2400-2484MHz, covering such applications as Wi-Fi, Bluetooth and Zigbee. A ceramic dielectric

PIFA antenna offers smallest footprint, superior gain characteristics and improved isolation over traditional PCB based antennas. This antenna has been developed for the top right hand corner edge of the component side of the Board (bottom left corner edge), the antenna has to be positioned on a non-ground (copper/metal free) area with the feed-point matched direct to the module. Please refer to Recommended Foot print Diagram (8.0 Page 14).

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.

2. Specification

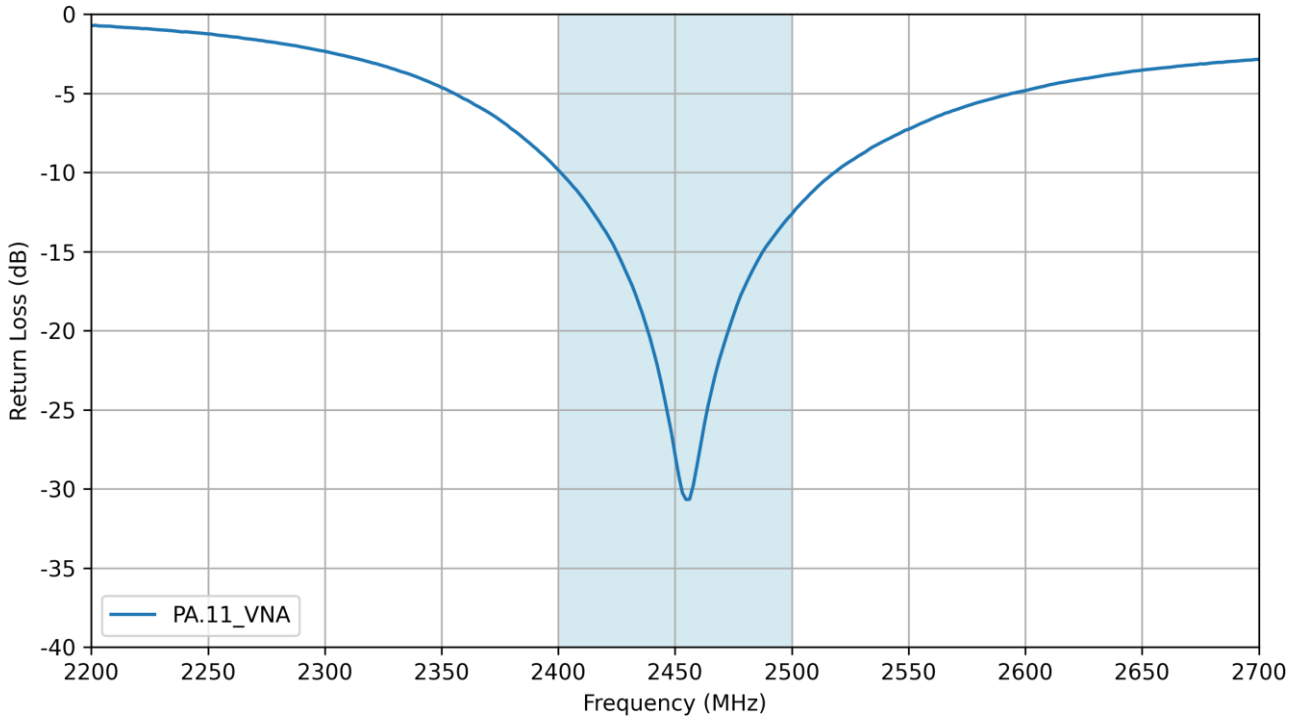
Wi-Fi Electrical								
Band	Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	VSWR
Wi-Fi - 2GHz	2400-2500	79.1	-1.02	5.02	50 Ω	Linear	Omni	2.0 Max

Mechanical	
Dimensions	10*4*3mm
Termination	Ag (Environmentally Friendly Lead-Free)

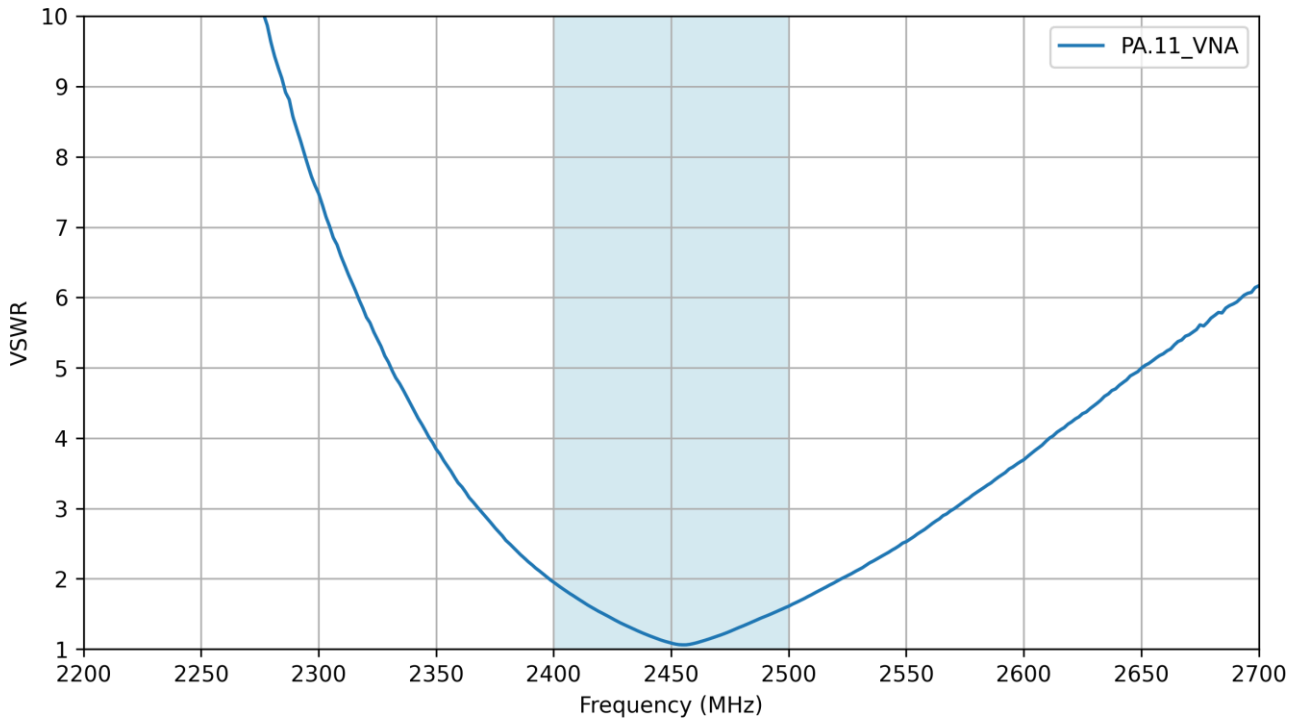
Environmental	
Operating Temperature	-40~+85°C
Moisture Sensitivity Level (MSL)	3 (168 Hours)

3. Antenna Characteristics

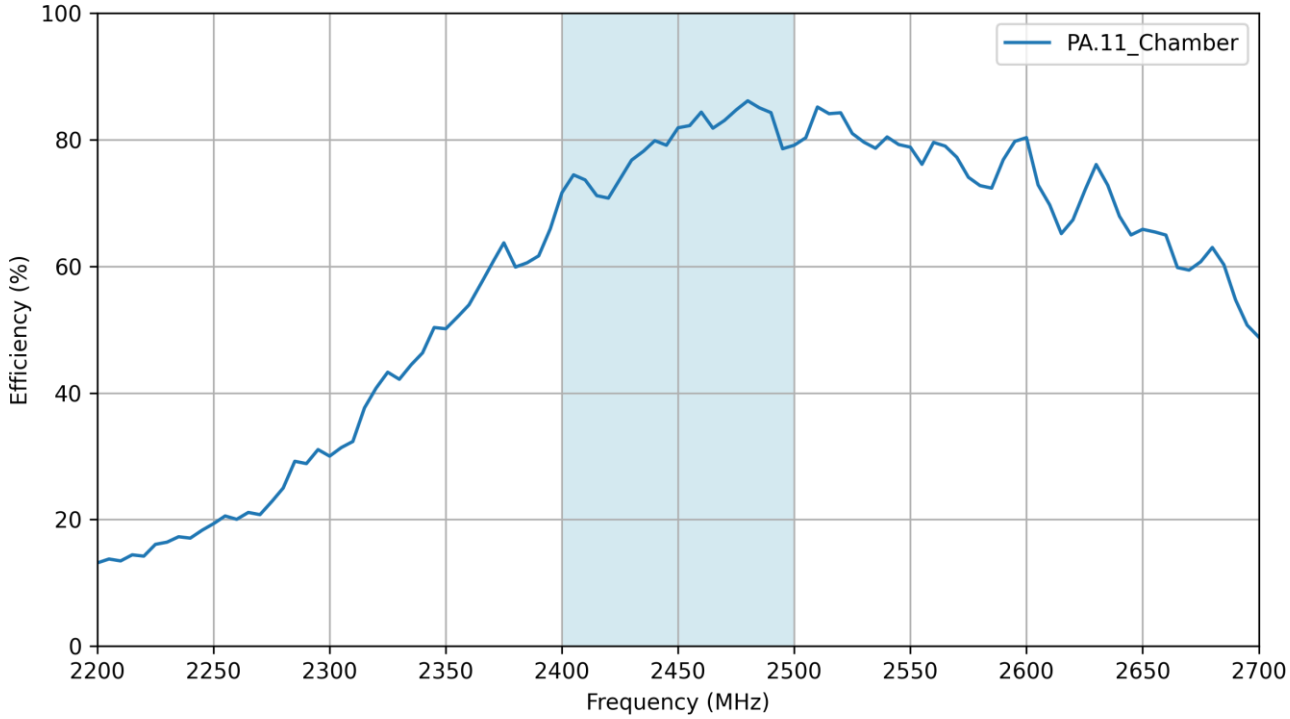
3.1 Return Loss



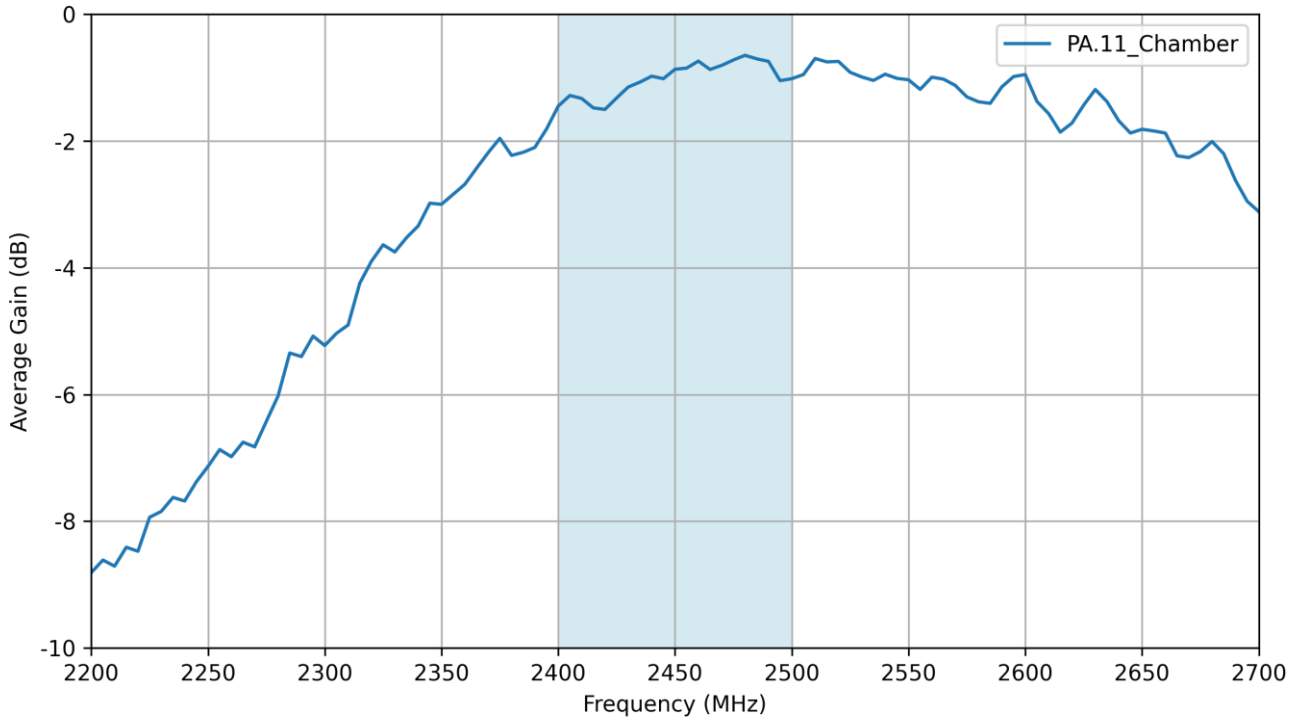
3.2 VSWR



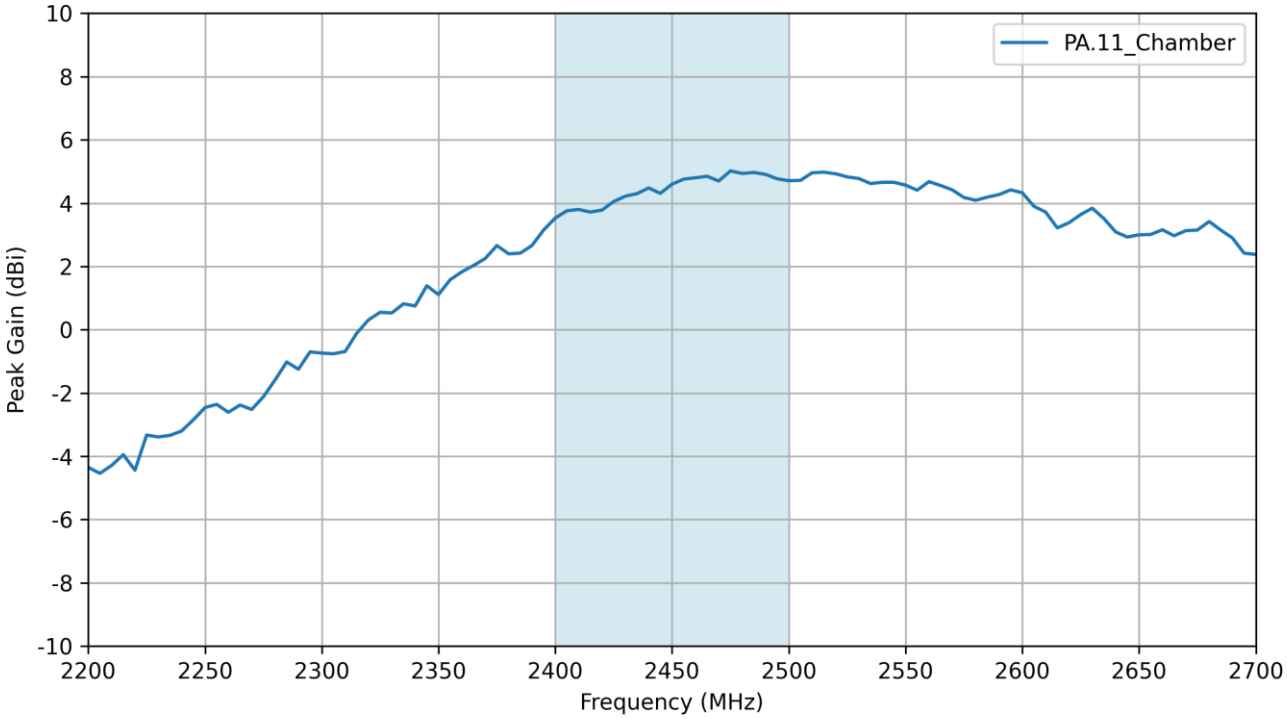
3.3 Efficiency



3.4 Average Gain

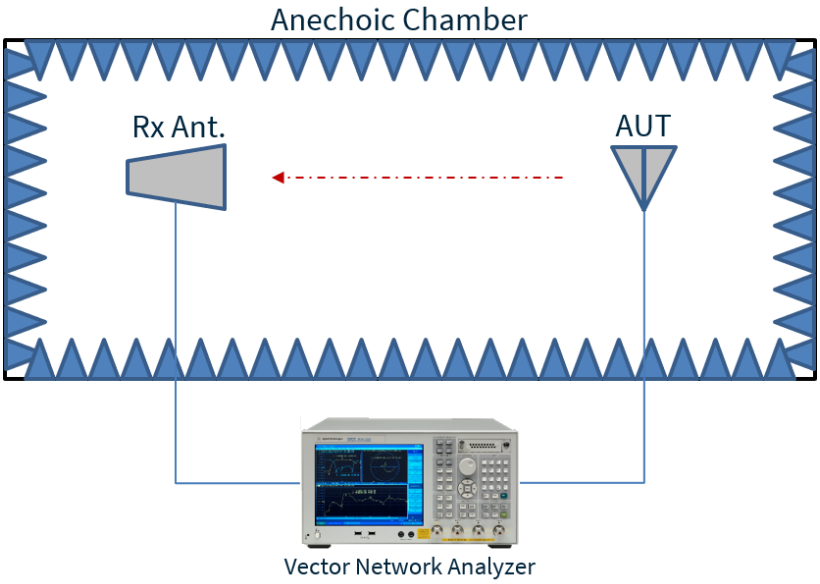


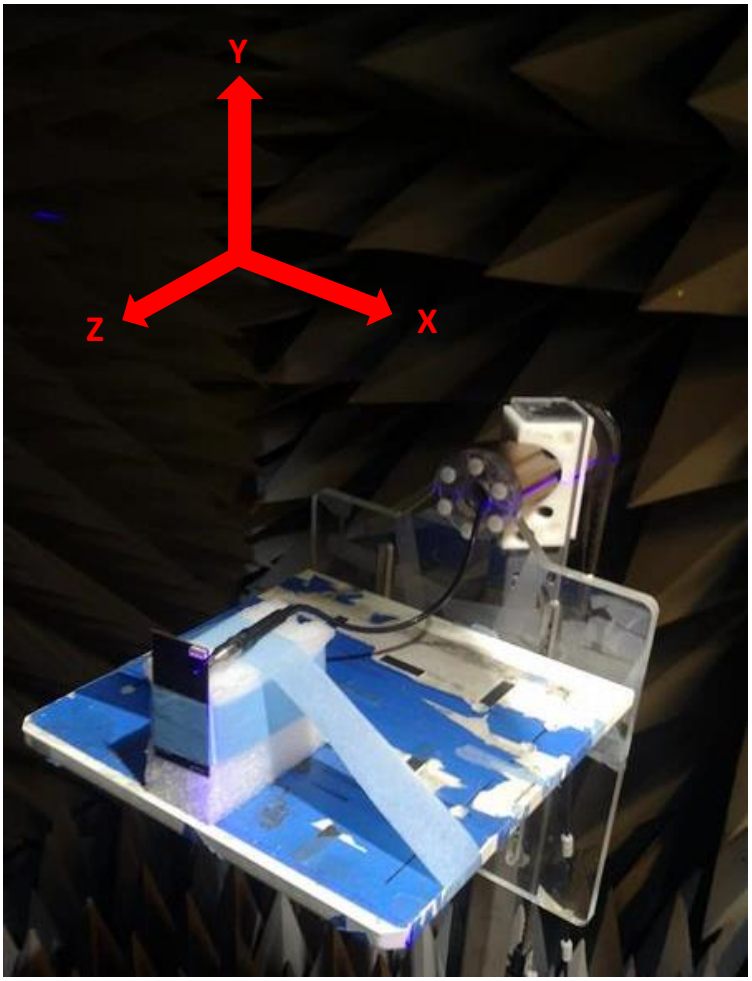
3.5 Peak Gain


PA.11_Chamber
Peak Gain (dBi)
Frequency (MHz)
10
8
6
4
2
0
-2
-4
-6
-8
-10
2200
2250
2300
2350
2400
2450
2500
2550
2600
2650
2700

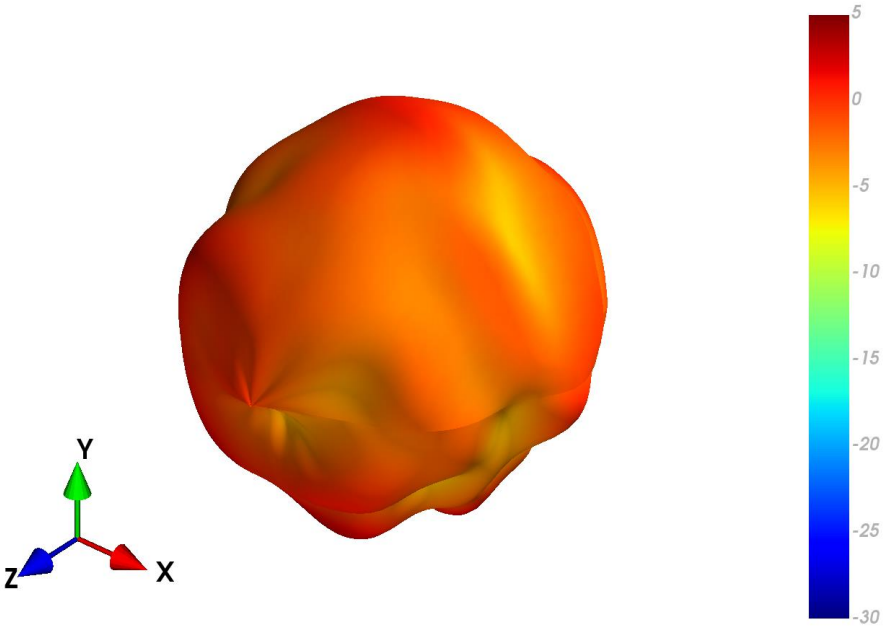
4. Radiation Patterns

4.1 Test Setup

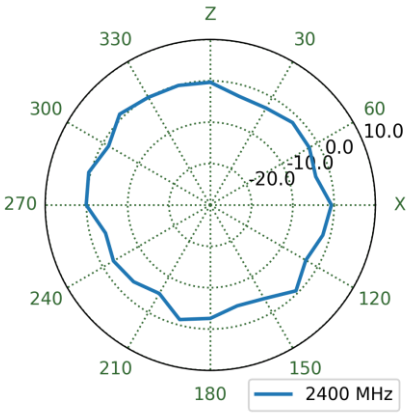


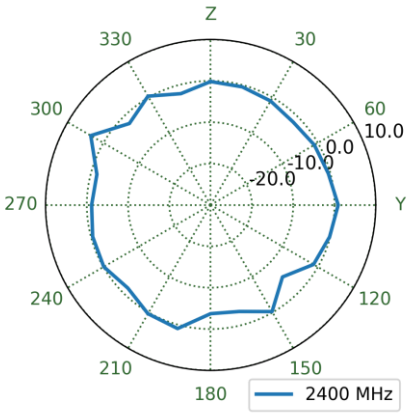


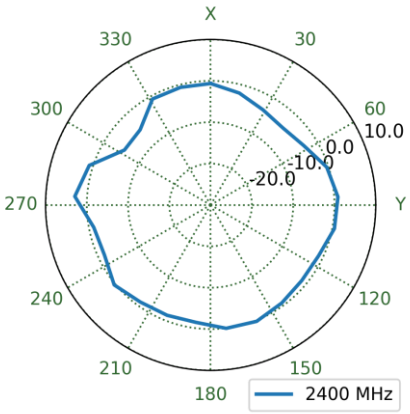
4.2 PA.11_Chamber Patterns at 2400 MHz



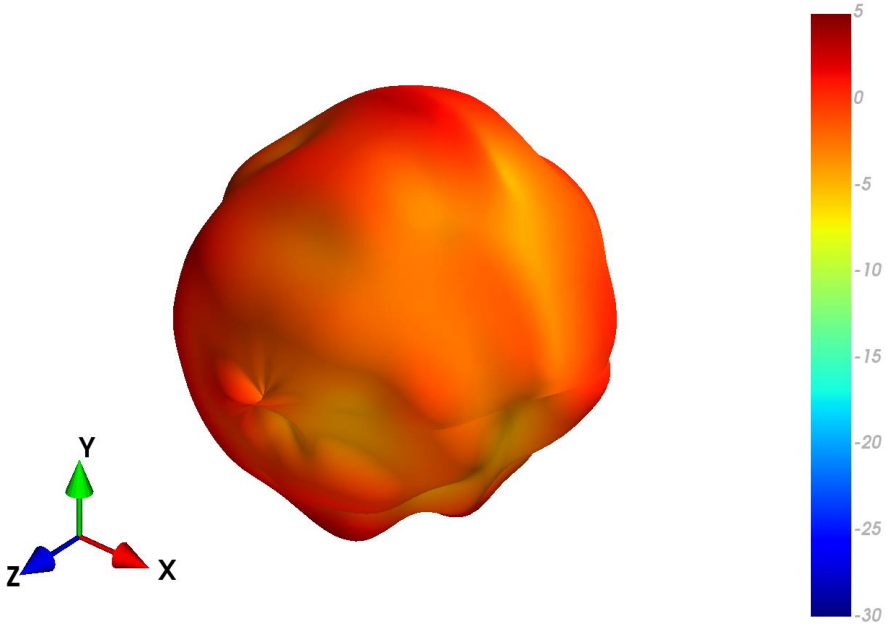
XZ Plane	YZ Plane	XY Plane



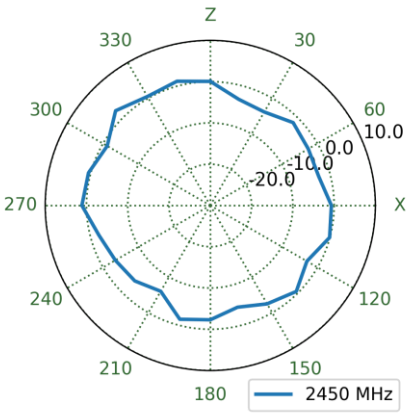


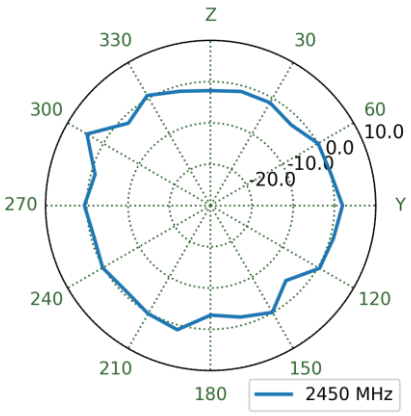


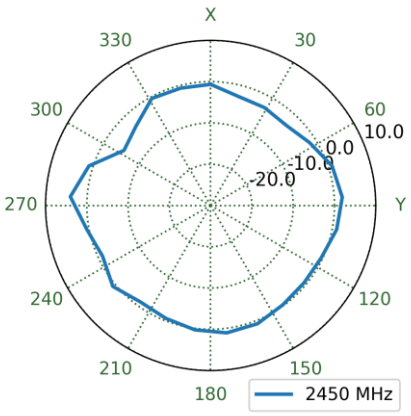
4.3 PA.11_Chamber Patterns at 2450 MHz



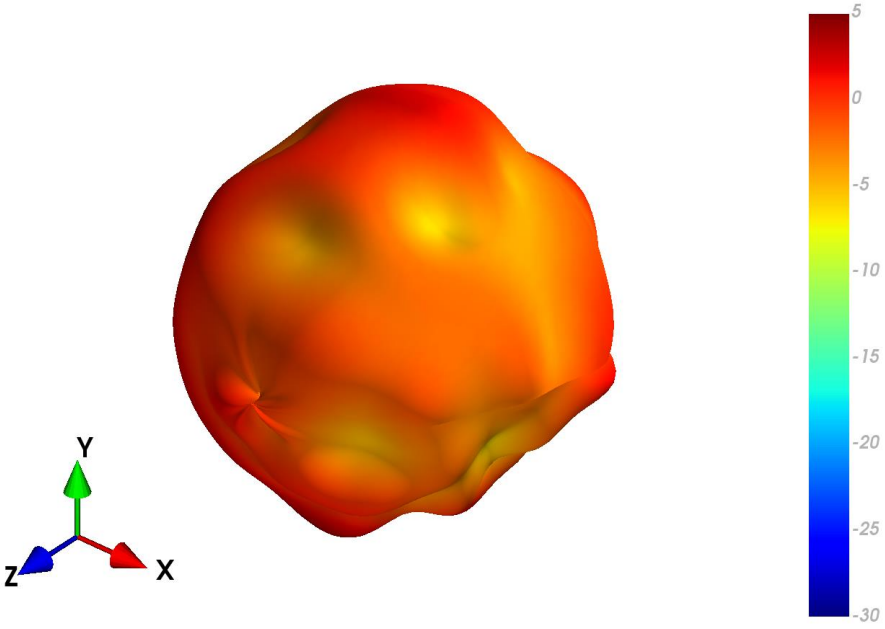
XZ Plane	YZ Plane	XY Plane

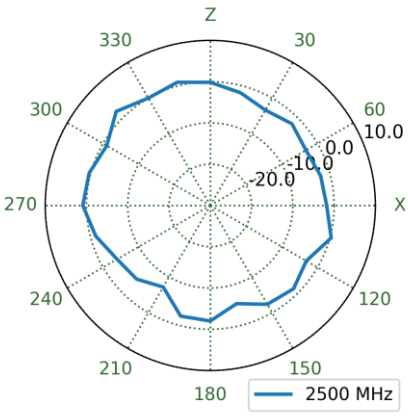
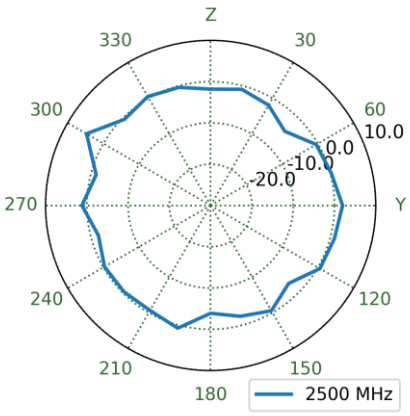
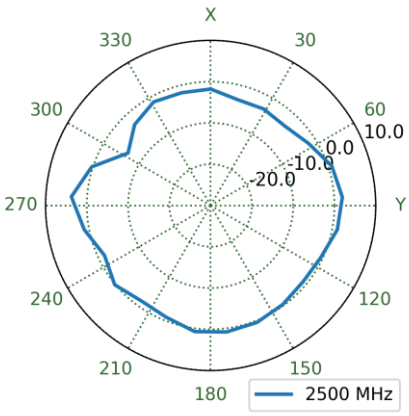




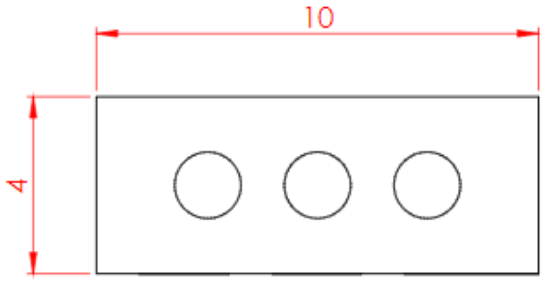


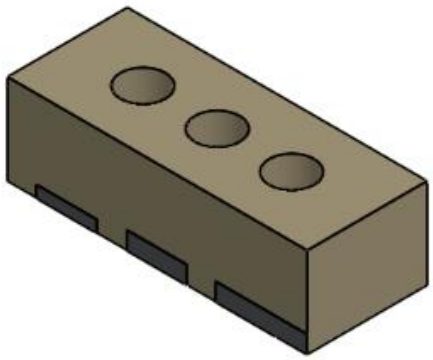
4.4 PA.11_Chamber Patterns at 2500 MHz



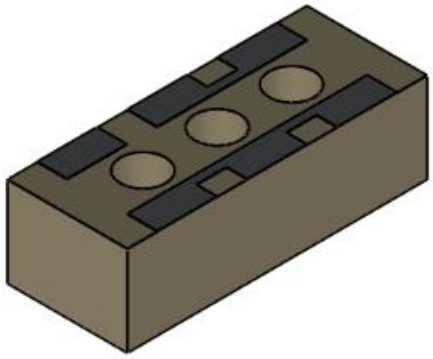
XZ Plane	YZ Plane	XY Plane
		

5. Mechanical Drawing

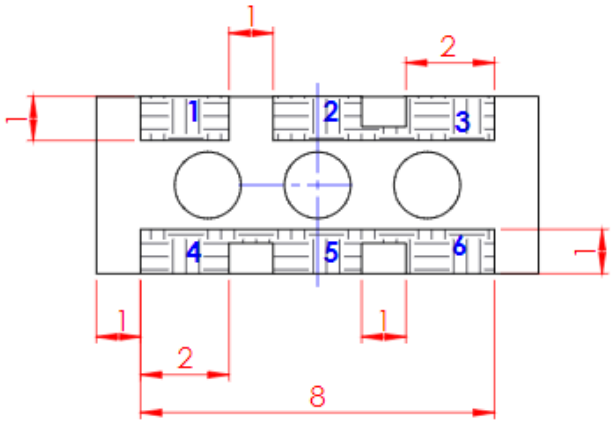


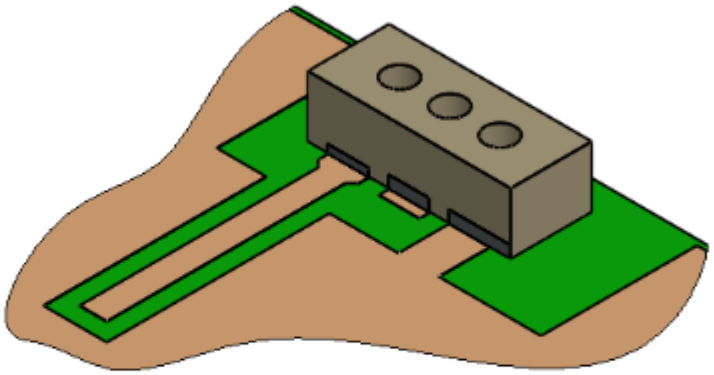


MODEL VIEW



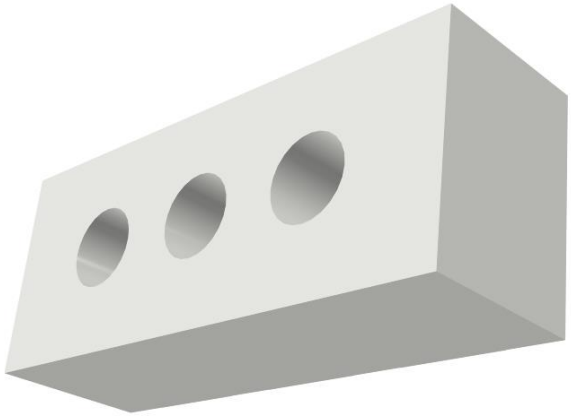
MODEL VIEW

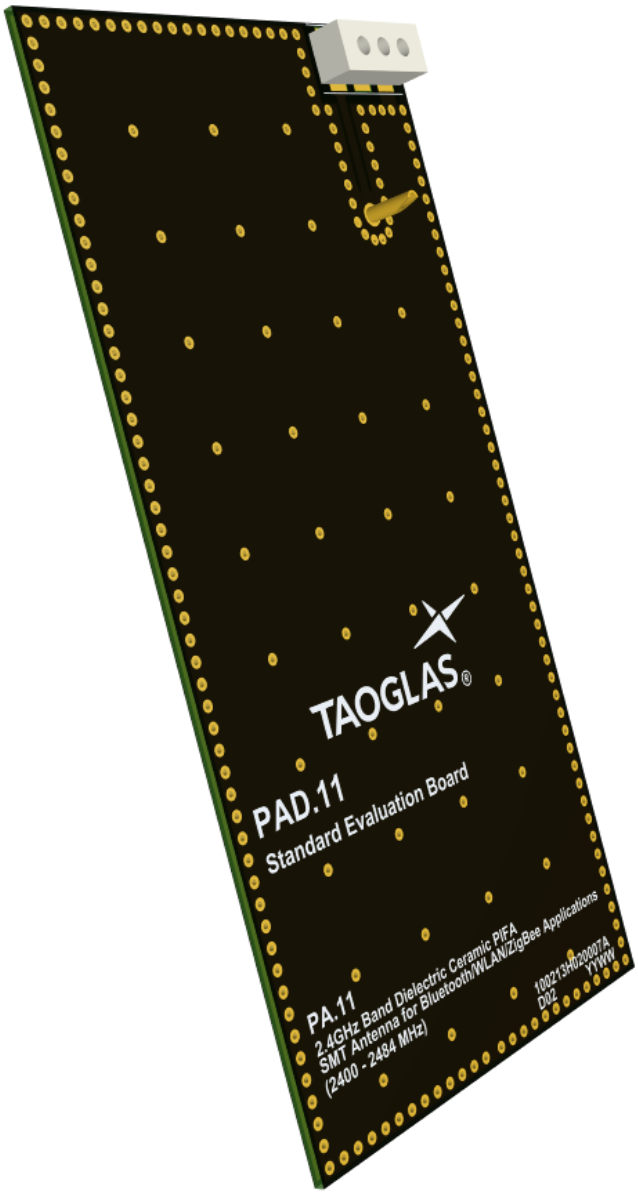




ANTENNA ON FOOTPRINT PCB VIEW
SCALE 4:1

6. Antenna Integration Guide

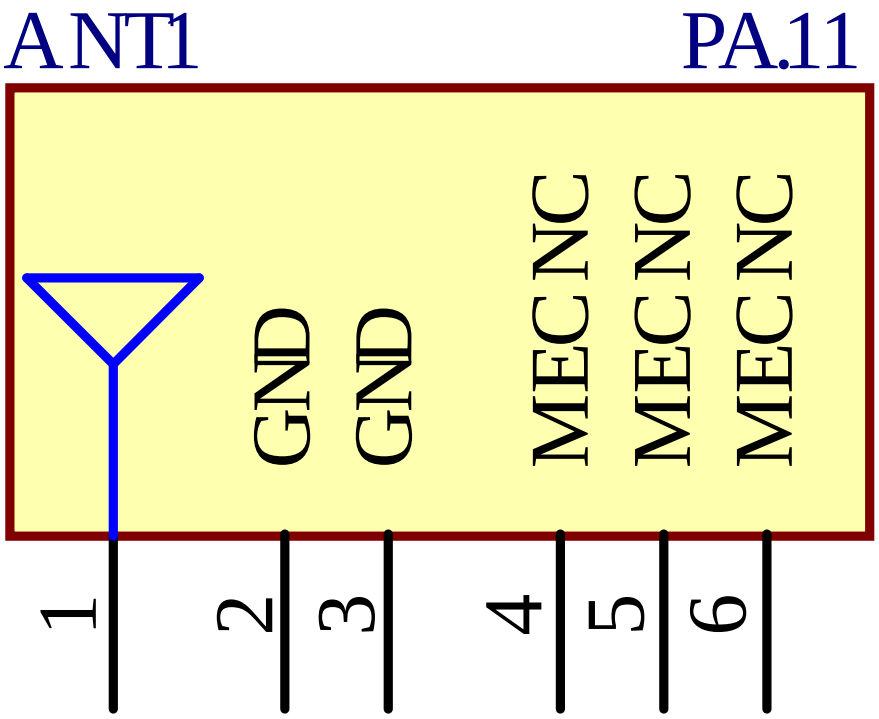




6.1 Schematic and Symbol Definition

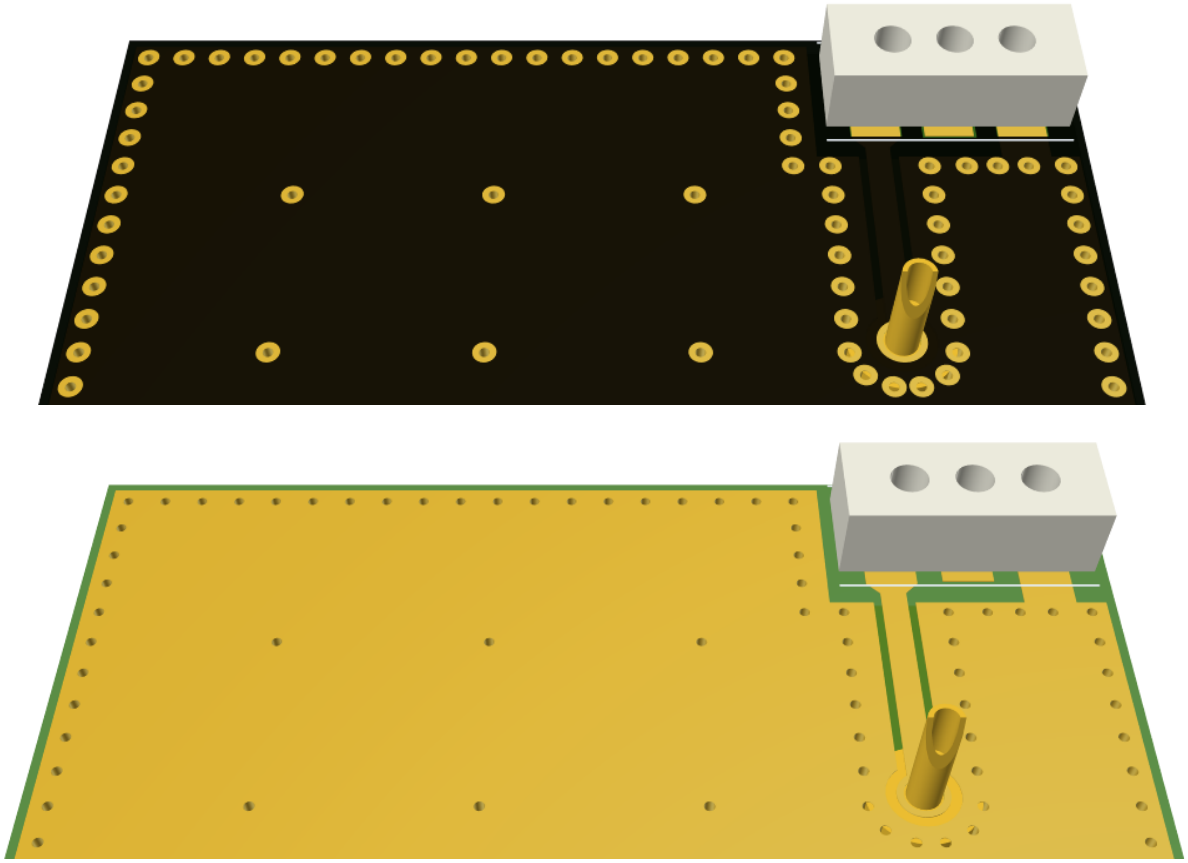
The circuit symbol for the antenna is shown below. The antenna has 6 pins with only three pins (Pin 1, Pin 2 and Pin 3) as functional. Pins 4, 5 and 6 are for mechanical strength.

Pin	Description
1	RF Feed
2, 3	Ground
4, 5, 6	Mechanical, Not Connected



6.2 Antenna Integration

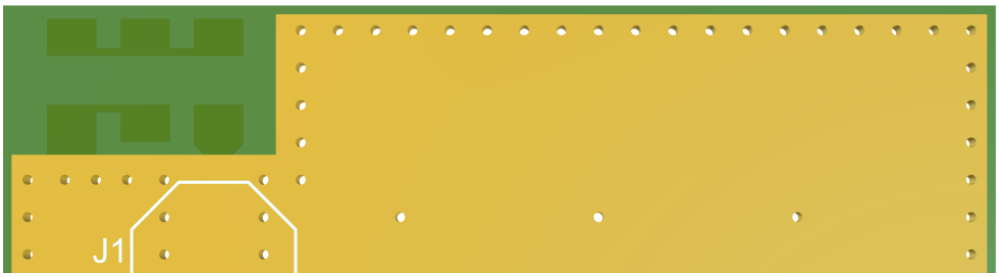
For any given PCB size, the antenna should ideally be placed on the PCB's shortest side in the corner, to take advantage of the ground plane. Optimized matching components can be placed as shown.



6.3 PCB Layout

The footprint and clearance on the PCB must meet the layout drawing in (Footprint Drawing).

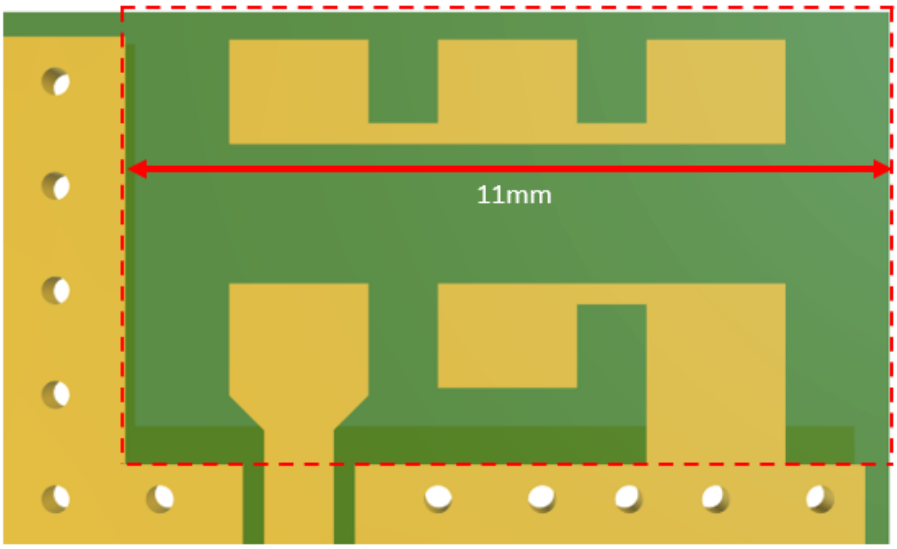
Topside



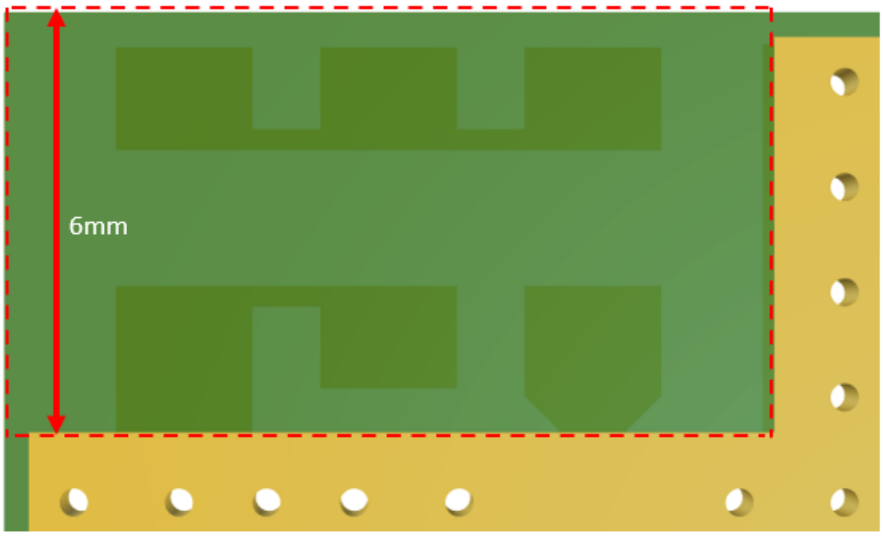
Bottom Side

6.4 PCB Keep-out

Below shows the antenna footprint and clearance through ALL layers on the PCB. Only the antenna pads and connections to feed and GND are present within this clearance area (marked RED). The clearance area extends to 11mm in width and 6.5mm in length on the topside with 6mm in length on the bottom from the top right corner of the PCB. This clearance area includes the bottom side and ALL internal layers on the PCB.



Topside



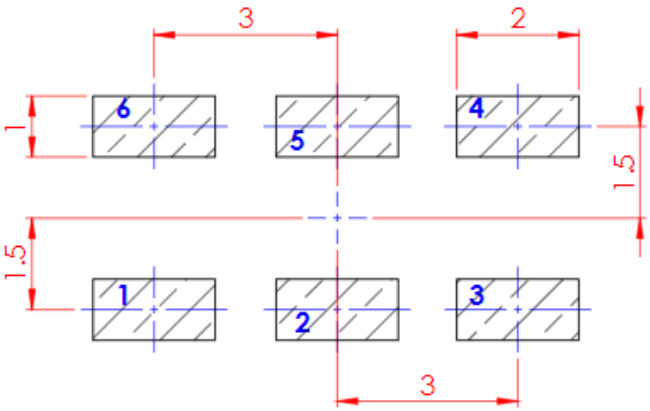
Bottom Side

6.6 Evaluation Board

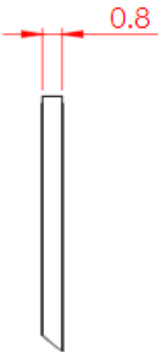
Topside

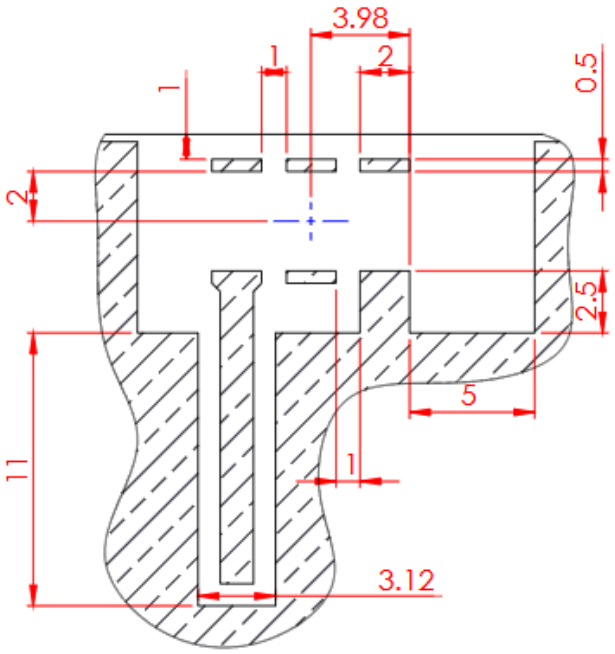
Bottom Side

6.7 Footprint

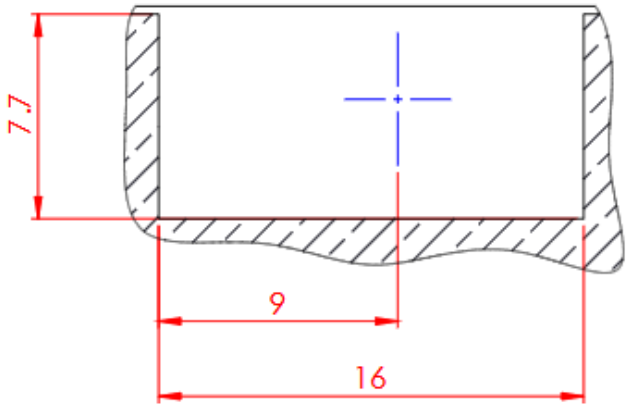


FOOTPRINT PCB





GROUND CLEARANCE TOP VIEW
(SILKSCREEN NOT SHOWN)

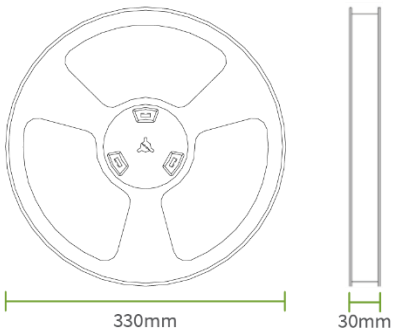


GROUND CLEARANCE BOTTOM VIEW
(SILKSCREEN NOT SHOWN)

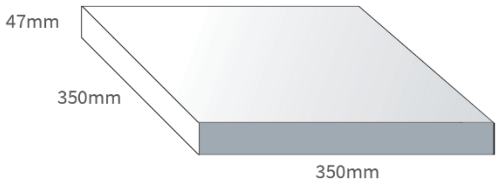
PIN	DESCRIPTION
1	RF FEED (50 Ohm)
2	MECHANICAL, NC
3	GROUND
4	MECHANICAL, NC
5	MECHANICAL, NC
6	MECHANICAL, NC

7. Packaging

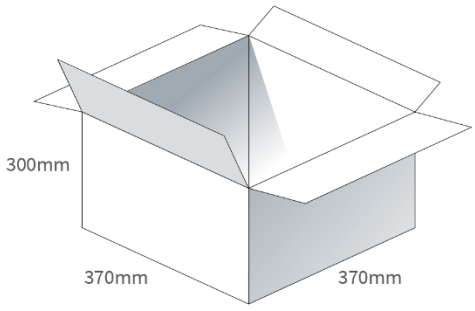
1000 pcs PA.11
1 reel in small inner box
Dimensions - 350*350*70



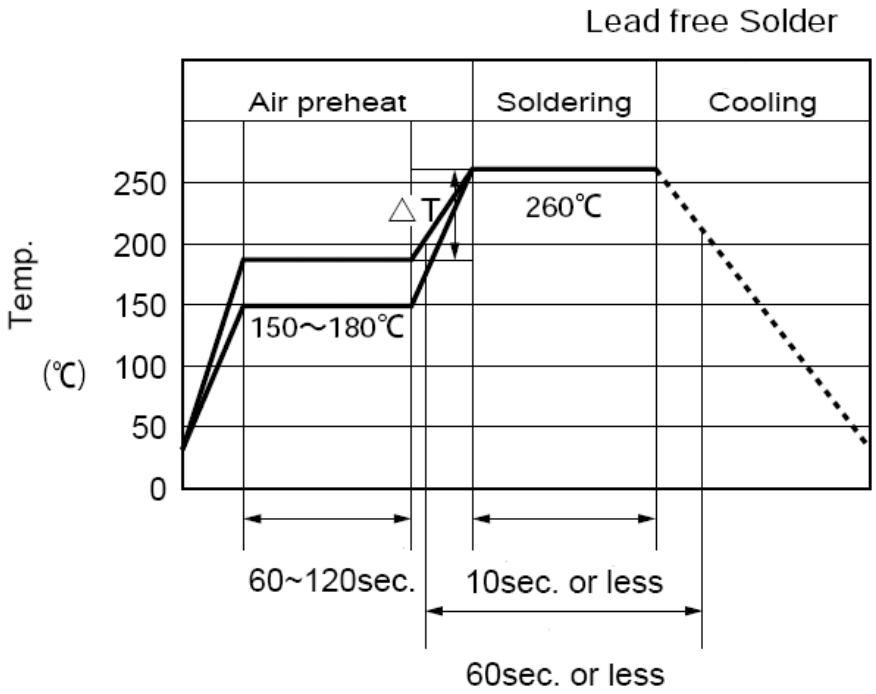
1000 pcs PA.11
1 reel in small inner box
Dimensions - 350*350*47



5 boxes / 5000 pcs in one carton
Carton Dimensions - 370*360*275mm



8. Solder Reflow Profile



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:	40kHz
Output Power:	20W
Cleaning Time:	5 minutes max

Changelog for the datasheet

SPE-11-8-091 – PA.11

Revision: E (Current Version)	
Date:	2022-12-06
Changes:	Full datasheet update.
Changes Made by:	Gary West

Previous Revisions

Revision: D	
Date:	2022-05-12
Changes:	Updated Packaging Specifications
Changes Made by:	Paul Doyle

Revision: D	
Date:	2020-11-10
Changes:	Updated to new format
Changes Made by:	Dan Cantwell

Revision: C	
Date:	2016-01-06
Changes:	Added Packaging
Changes Made by:	Jack Conroy

Revision: B	
Date:	2015-08-24
Changes:	Amended note on Gain
Changes Made by:	Aine Doyle

Revision: A (Original First Release)	
Date:	2011-05-09
Notes:	
Author:	Technical Writer

TAOGLAS®

www.taoglas.com

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Antennas ***category:***

Click to view products by Taoglas ***manufacturer:***

Other Similar products are found below :

930-033-R EXE902SM APAMPG-117 MAF94383 108-00014-50 66089-2406 SPDA17RP918 A09-F5NF-M RGFRA1903041A1T 108-00016-050 SIMNA-868 SIMNA-915 SIMNA-433 W1049B090 TRABT1560 W3118A WTL2449CQ1-FRSMM CPL9C 0600-00060 Y4503 GD5W-28P-NF PAL90209H-FNF MA9-7N GD53-25 C37 MAF94051 S9025PLSMF EXD420PL B1322NR MAF94300 FG4403 MIKROE-2393 DA5-32RADOME BB1442NR 5200227 GPSCPMM00 ANTDOM-05-01-WPM ANT-WP868SMA-Y EXW30BNX OSCAR1A/5M/SMAM/S/S/31 ALPHA4A/1M/SMAM/S/S/26 OSCAR1A/10M/SMAM/S/S/31 OSCAR40/5M/LL/SMAM/S/S/33 OSCAR40/10M/LL/SMAM/S/S/33 TANGO41/1M/SMAM/S/S/32 ANTX100ETBAB24553 S4908WBFNM FXR.01.07.0100C.A GD57-21 001-0016