TAOGLAS®

Datasheet

25 x 25 x 4.5mm Wi-Fi®/Bluetooth® Patch

Part No:
WLP.2450.25.4.A.02

Description

25*25*4.5mm Wi-Fi®/Bluetooth® 2450MHz Patch

Features:

2.4GHz Wi-Fi®/Bluetooth®

5dBi Peak gain

Pin Type with adhesive for ease of mounting

Automotive IATF16949 Production and Quality Approved

Dimensions: 25*25*4.5mm

RoHS & Reach Compliant

1. Introduction

This WLP.25 patch antenna for ISM, Wi-Fi®, Bluetooth® and Zigbee® is based on smart XtremeGain™ technology. It is mounted via pin and double-sided adhesive and has been selected as optimal solution for the 50 x 50mm ground plane. This passive patch offers typical gain response from 5 dBi and a higher gain can be achieved, depending on the Ground Plane, the space available and clearance afforded. The WLP.25's high gain makes it a perfect solution for metering and remote monitoring applications; it can deliver longer range than smaller chip antennas.

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 in the module specification to compensate for this effect, giving you better performance.

Upon testing 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 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.

This antenna can be tuned for a custom device environment, subject to NRE and MOQ. For further information please contact your regional Taoglas customer support team.

2. Specification

Wi-Fi Electrical								
Band	**Frequency (MHz)**	**Efficiency (%)**	**Average Gain (dB)**	**Peak Gain (dBi)**	**Impedance**	**Polarization**	**Radiation Pattern**	**Max. input power**
Wi-Fi – 2.4GHz	2400-2500	90.5	-0.39	5.77	50 Ω	Linear	Omni	2W

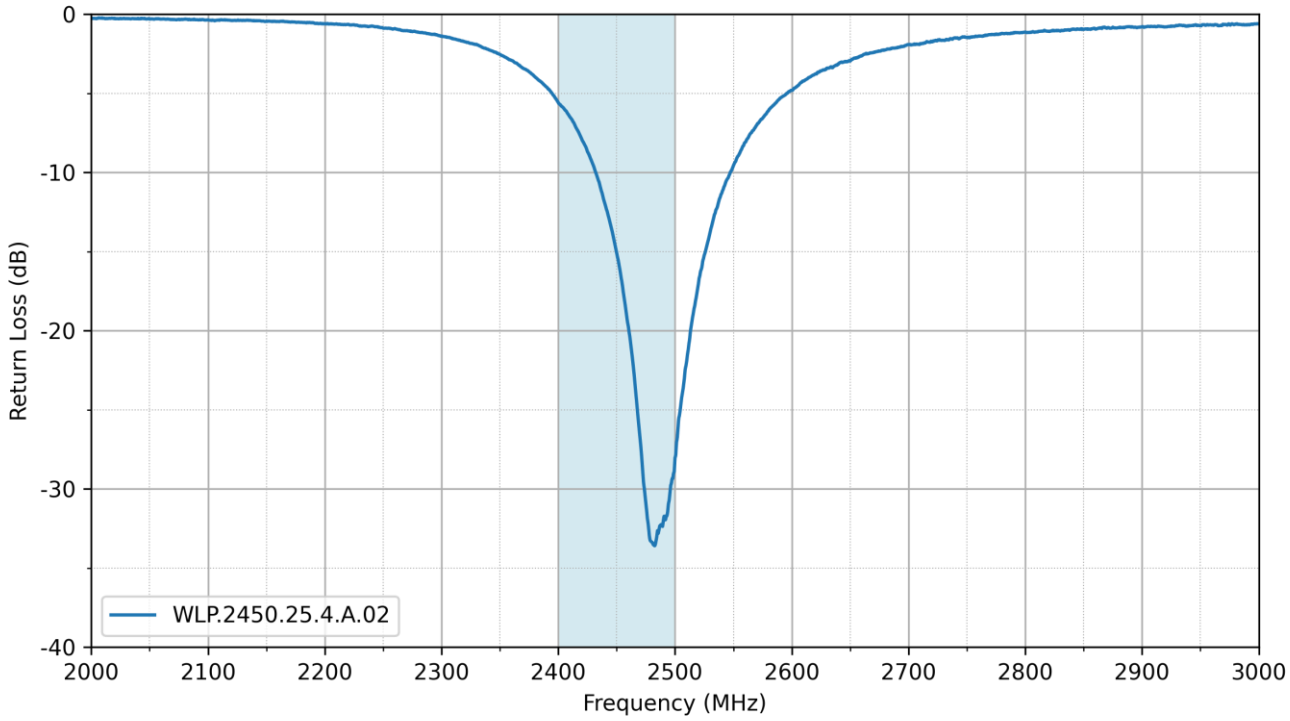
Mechanical	
Dimensions	25 x 25 x 4.5 mm
Pin Length	2.4 mm
Material	Ceramic
Ground Plane size	50 x 50 mm

Environmental	
Temperature Range	-40°C to +105°C
Humidity	Non-condensing 65°C 95% RH

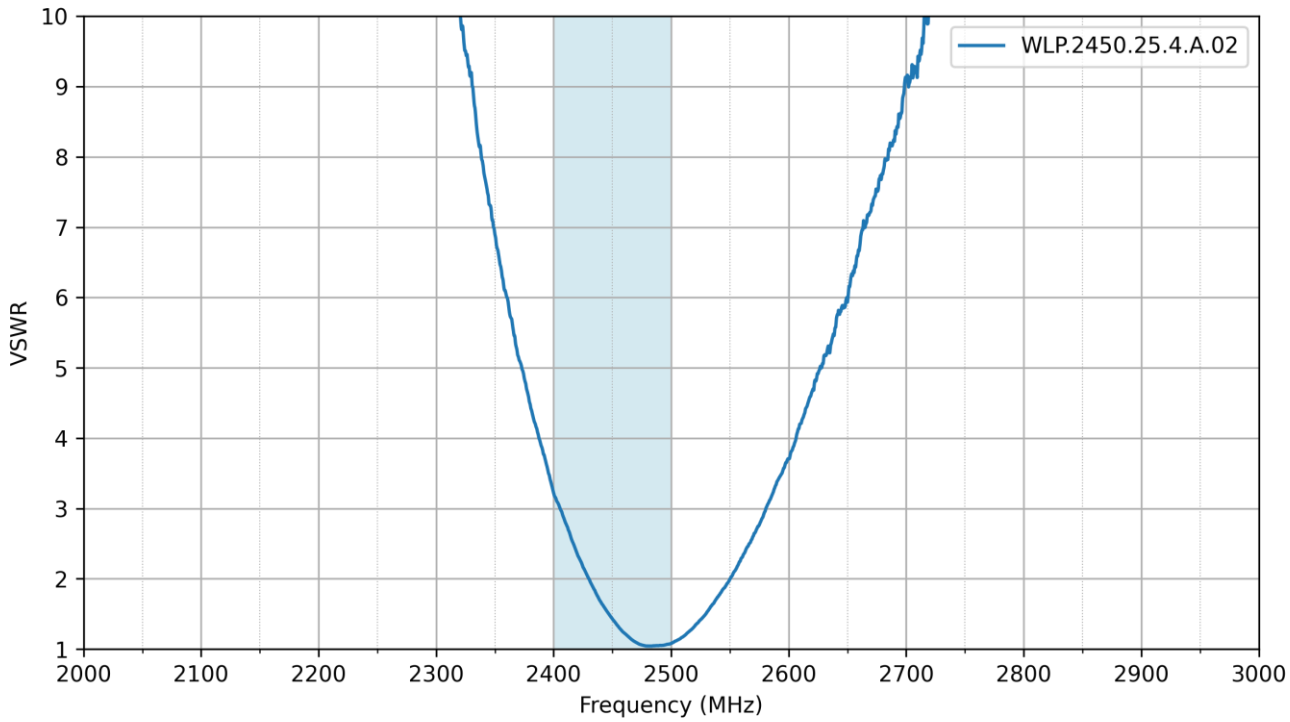
*Tested on a 50x50mm Ground Plane

3. Antenna Characteristics

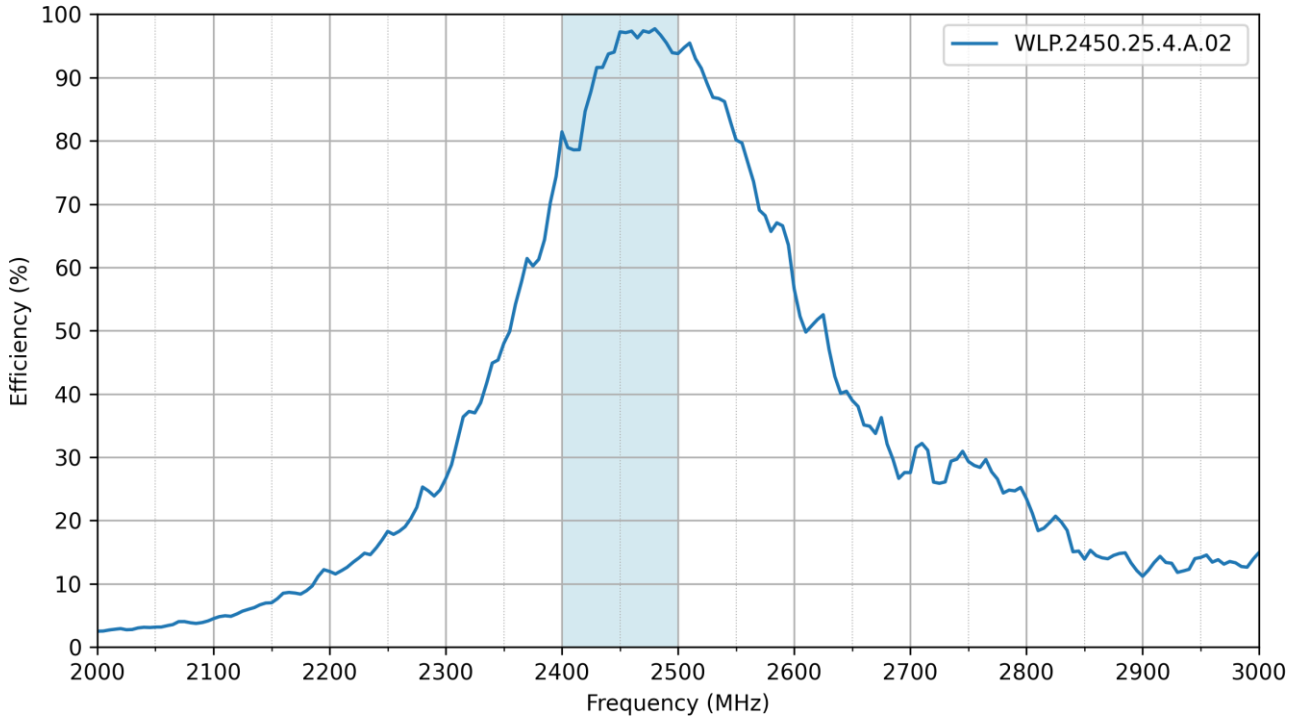
3.1 Return Loss



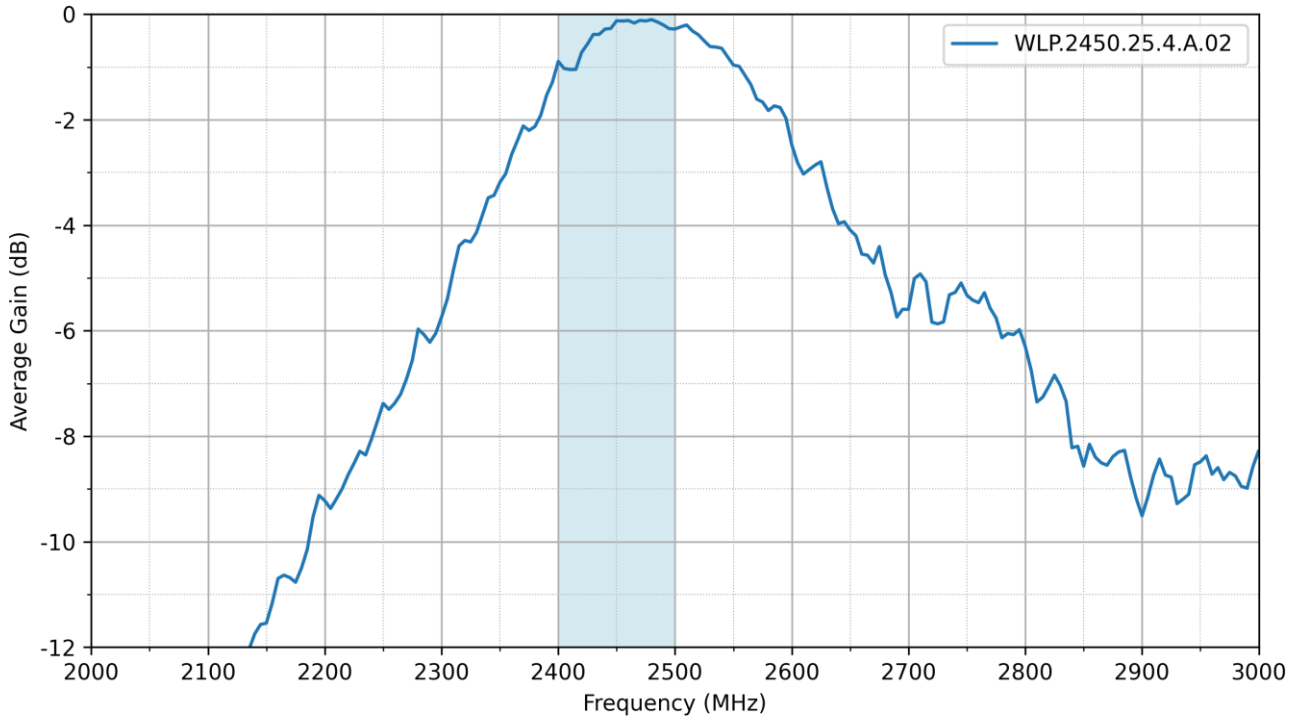
3.2 VSWR



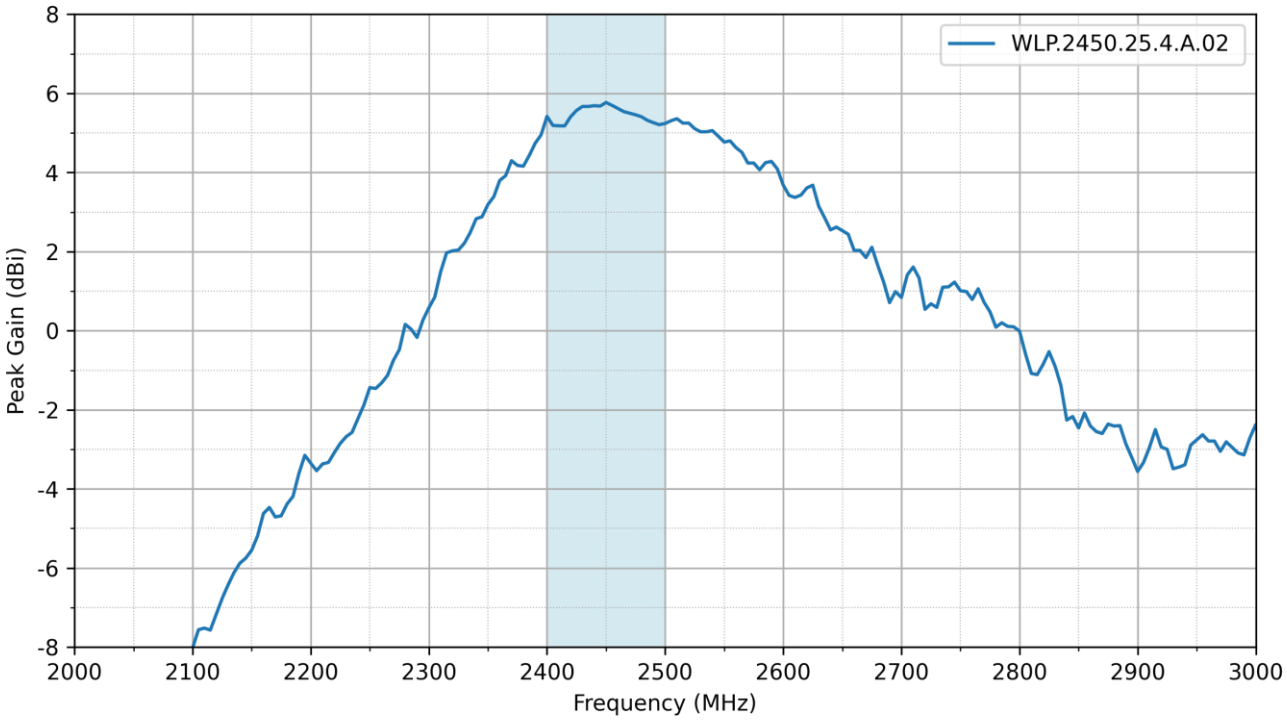
3.3 Efficiency



3.4 Average Gain

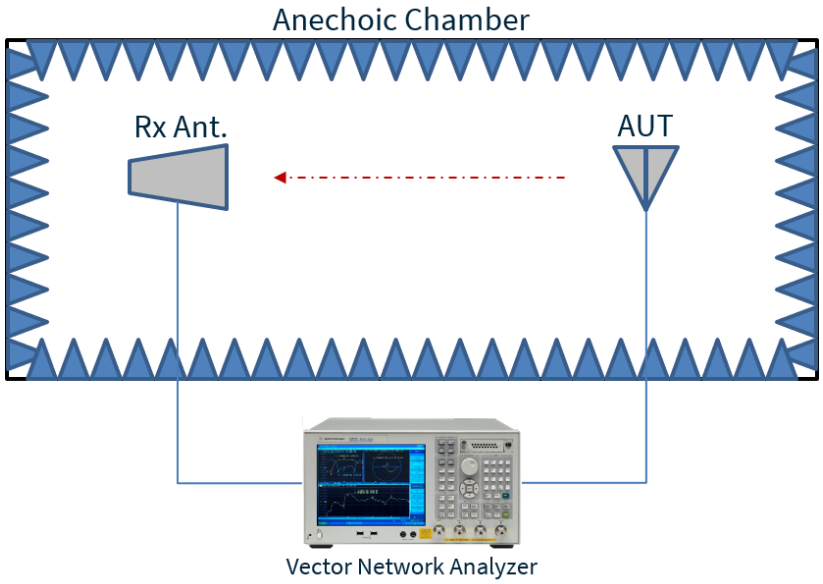


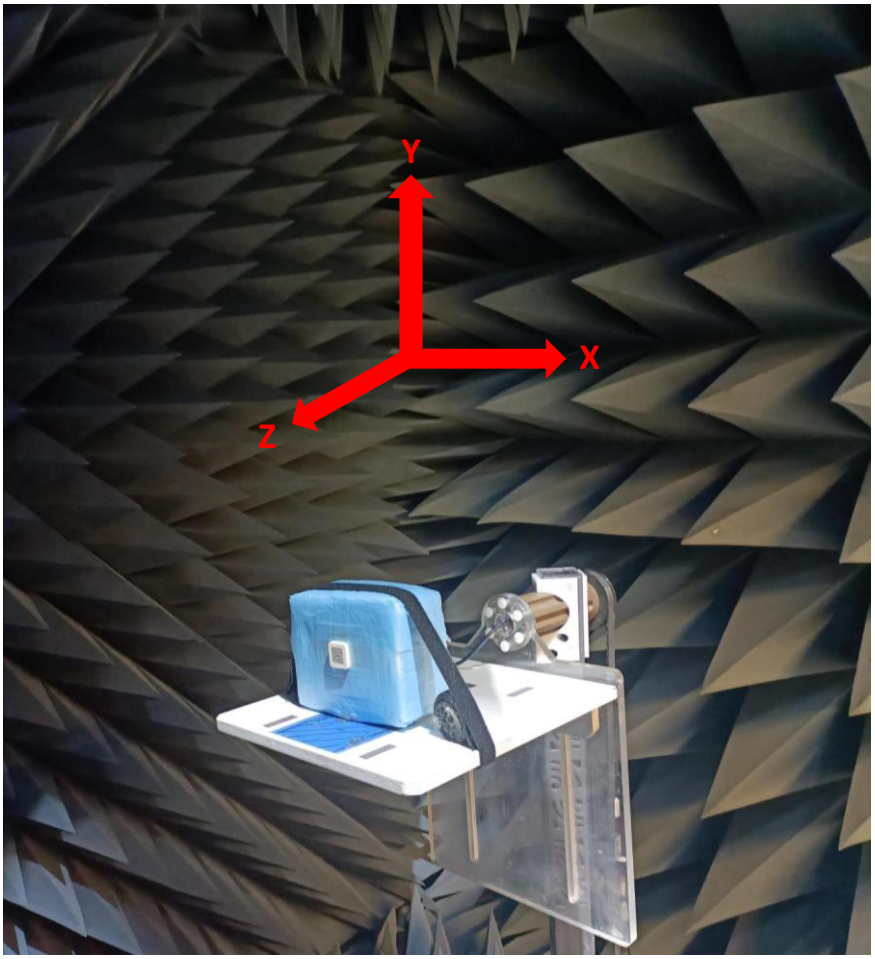
3.5 Peak Gain


WLP.2450.25.4.A.02
Peak Gain (dBi)
Frequency (MHz)
8
6
4
2
0
-2
-4
-6
-8
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000

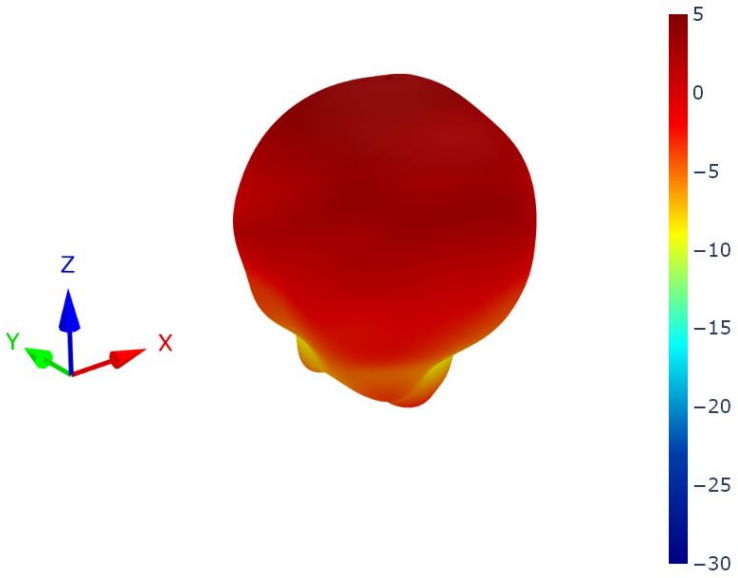
4. Radiation Patterns

4.1 Test Setup

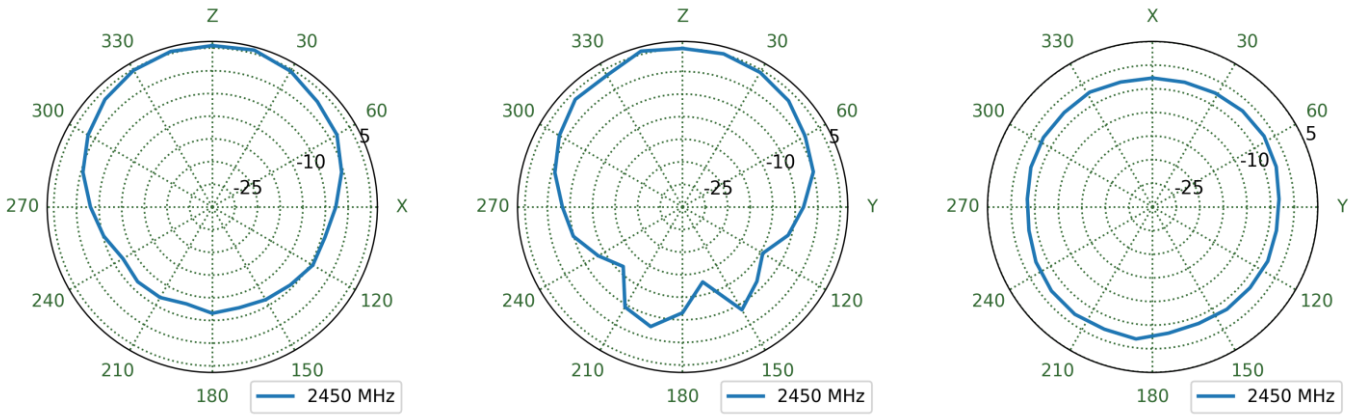




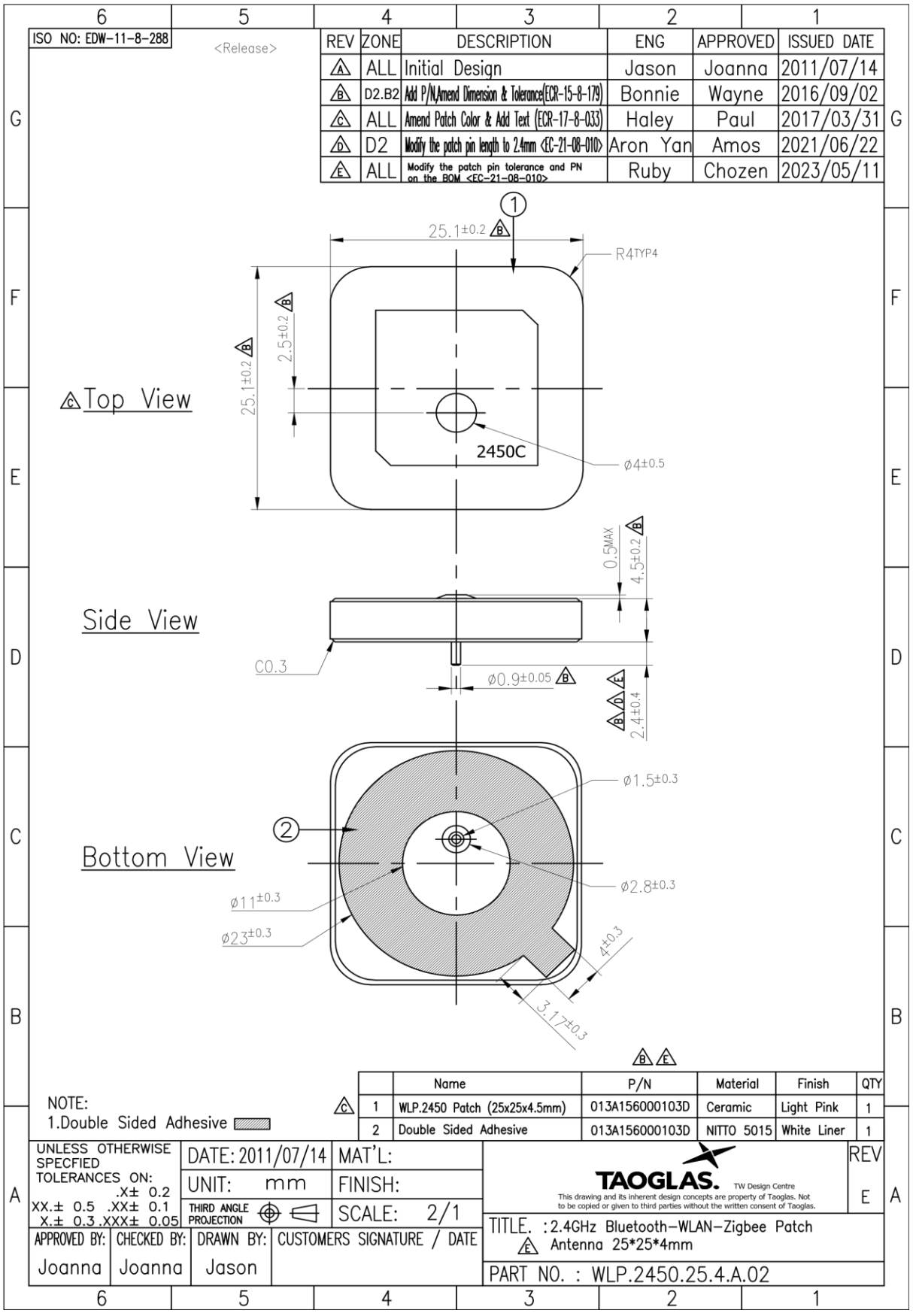
4.2 WLP.2450.25.4.A.02 Patterns at 2450 MHz for Gtotal



XZ Plane	YZ Plane	XY Plane



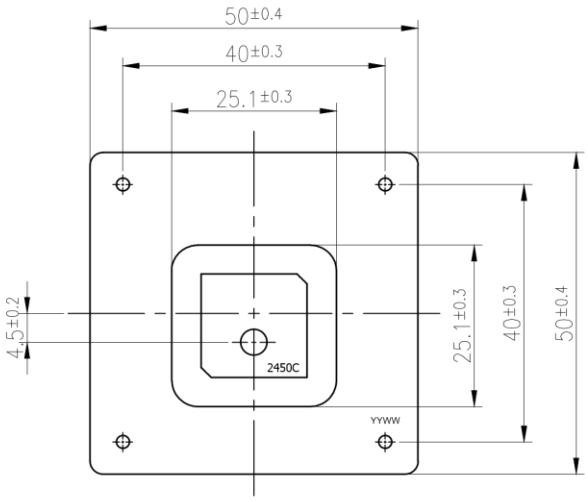
5. Mechanical Drawing



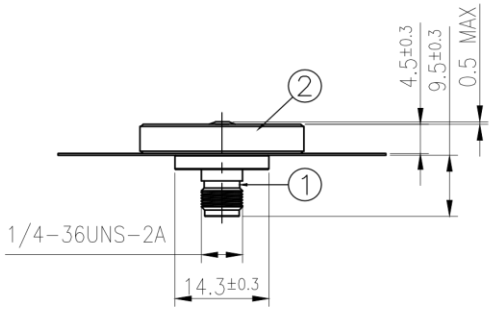
6. Evaluation Board Mechanical Drawing

ISO NO: EDW-18-8-1571	<Release>	REV	ZONE	DESCRIPTION	ENG	APPROVED	ISSUED DATE
		A	ALL	Initial Design	Eva	Paul	2018/11/13

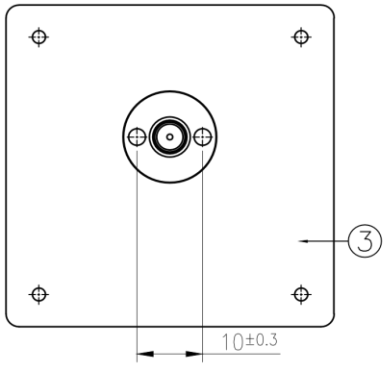
Top View



Side View



Bottom View



	Name	P/N	Material	Finish	QTY
1	PCB SMA(F)ST	02104220000010	Brass	Au Plated	1
2	WLP.2450.25.4.A.02 Patch	013A1560001032	Ceramic	Light Pink	1
3	Brass Ground-Plane	000514C000007A	Brass 0.3t	Silver	1

UNLESS OTHERWISE SPECFIED TOLERANCES ON:
.X± 0.2
XX.± 0.5 .XX± 0.1
X.± 0.3 .XXX± 0.05

DATE: 2014/06/26 | MAT'L:
UNIT: mm | FINISH:
THIRD ANGLE PROJECTION | SCALE: 1/1

APPROVED BY:	CHECKED BY:	DRAWN BY:	CUSTOMERS SIGNATURE / DATE
Wayne	Aine	Ophelia	

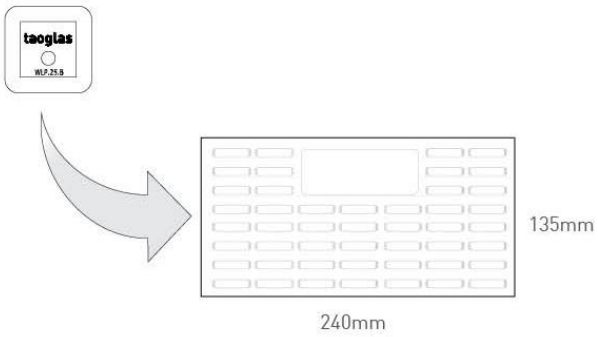
taoglas antenna solutions TW Design Centre

REV A

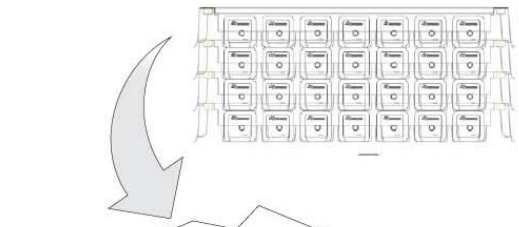
TITLE. : WLPD.2450.25.4.A.02 2.4GHz Bluetooth-WLAN-Zigbee Patch Antenna on EVB

PART NO. : WLPD.2450.25.4.A.02

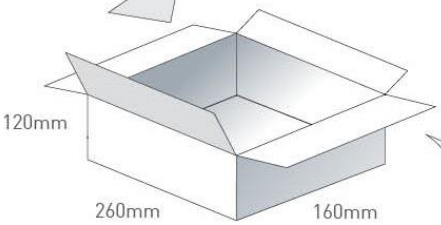
7. Packaging



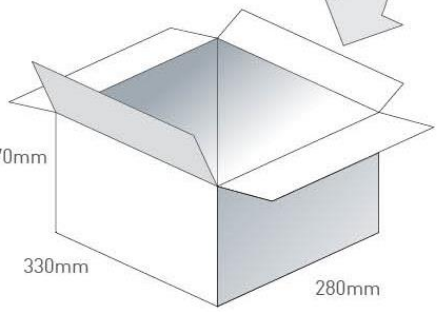
50 pcs WLP.2450.25.4.A.02 per tray
Tray Dimensions - 240*135mm
Total Weight - 625g



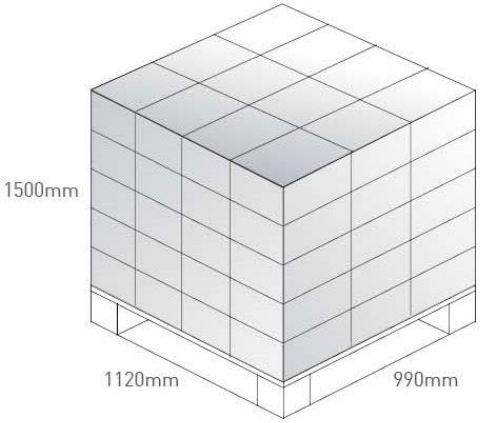
4 trays / 200 pcs per box
Box Dimensions - 260*160*120
Weight - 2.5Kg



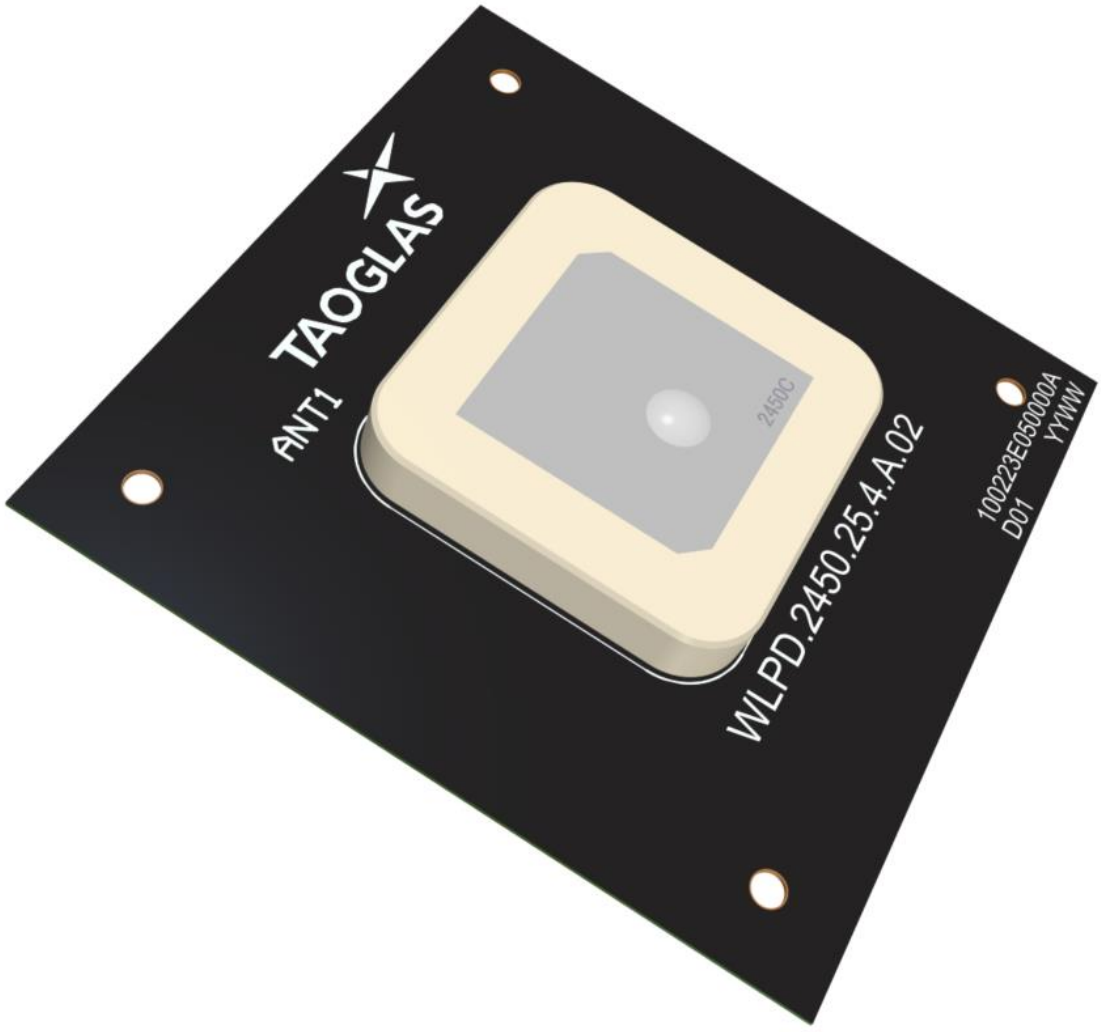
4 boxes / 800 pcs per carton
Carton Dimensions - 330*280*270
Weight - 10Kg



Pallet Dimensions 1120mm*990mm*1500mm
60 Cartons per pallet
12 Cartons per layer
5 Layers



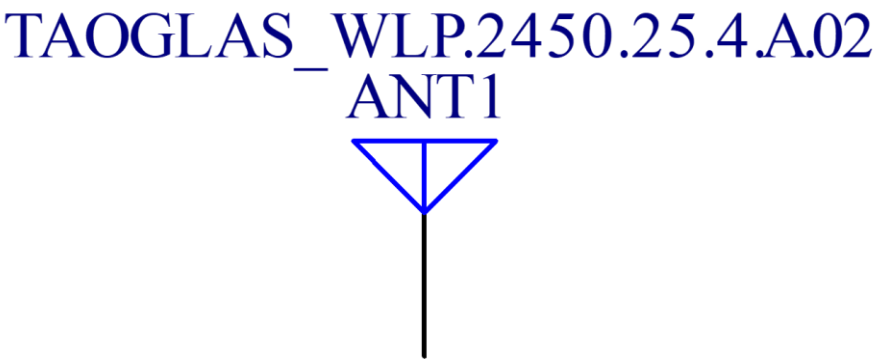
8. Antenna Integration Guide



8.1 Schematic and Symbol Definition

The circuit symbol for the antenna is shown below. The antenna has 1 pin as indicated below.

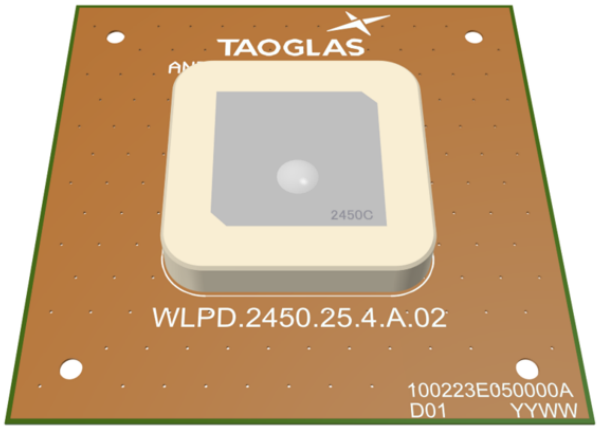
Pin	Description
1	RF Feed



8.2 Antenna Integration

The antenna should be placed at the center of the ground plane with a length and width of 50mm. Maintaining a square symmetric ground plane shape and symmetric environment around the antenna is critical to maintaining this antenna's high performance.

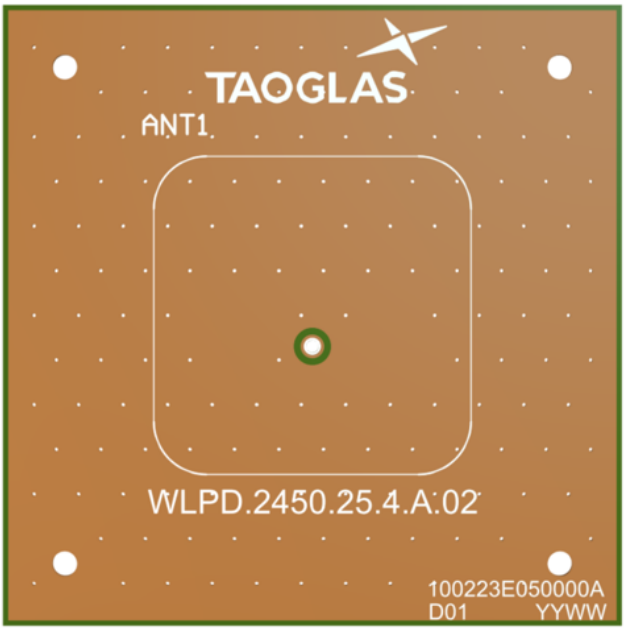
Top Side w/ Solder Mask



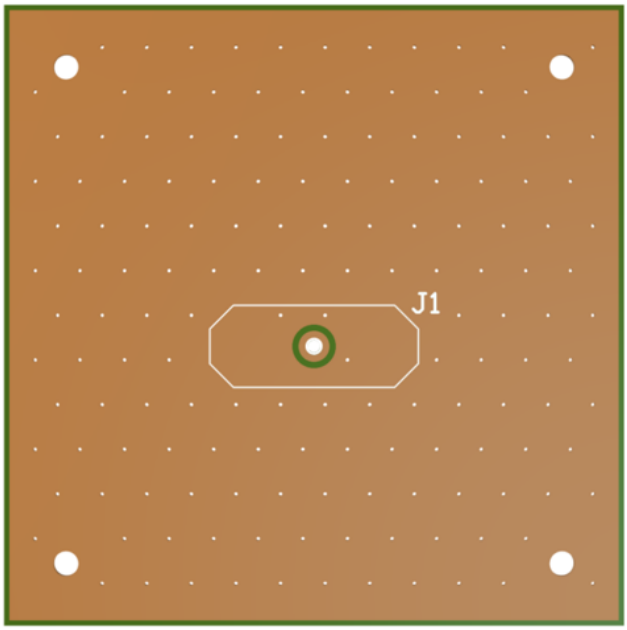
Top Side w/o Solder Mask

8.3 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.

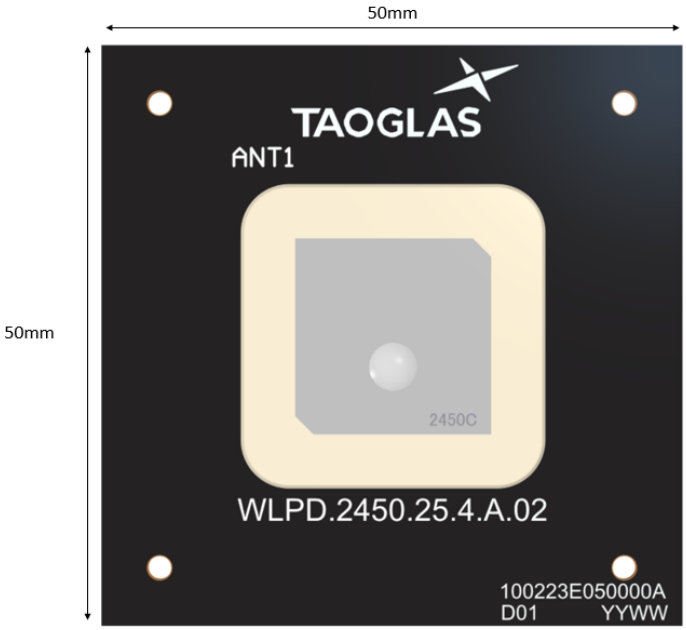


Topside

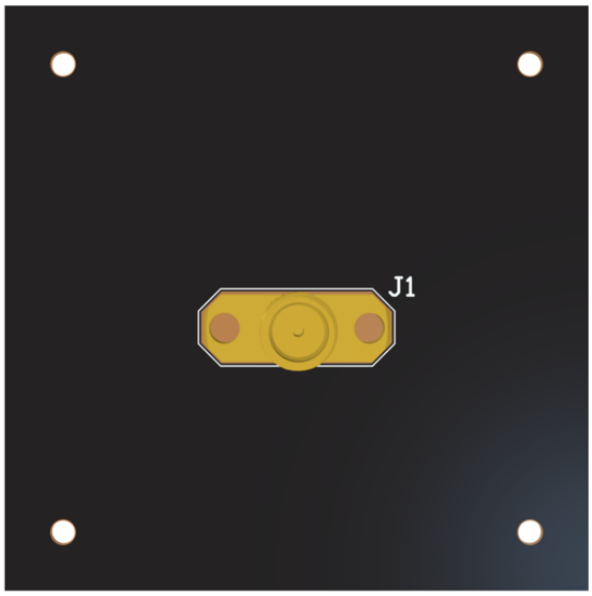


Bottom Side

8.4 Evaluation Board



Topside



Bottom Side

Changelog for the datasheet

SPE-11-8-033 – WLP.2450.25.4.A.02

Revision: M (Current Version)	
Date:	2023-05-18
Changes:	Full datasheet Update
Changes Made by:	Gary West

Previous Revisions

Revision: L (Current Version)	
Date:	2021-08-23
Changes:	MSL removed form spec table
Changes Made by:	Gary West

Revision: G	
Date:	2016-08-16
Changes:	Amended Pin Length
Changes Made by:	Andy Mahoney

Revision: K	
Date:	2021-07-13
Changes:	Added Moisture Sensitivity Level
Changes Made by:	Gary West

Revision: F	
Date:	2015-12-08
Changes:	Amended Polarization
Changes Made by:	Aine Doyle

Revision: J	
Date:	2021-07-01
Changes:	Updated data table
Changes Made by:	Jack Conroy

Revision: E	
Date:	2015-03-04
Changes:	Added Note on Gain
Changes Made by:	Aine Doyle

Revision: I	
Date:	2020-03-27
Changes:	Updated Template and polarization
Changes Made by:	Jack Conroy

Revision: D	
Date:	2013-04-24
Changes:	Packaging Details Updated
Changes Made by:	Technical Writer

Revision: H	
Date:	2017-03-23
Changes:	Drawing updated
Changes Made by:	Andy Mahoney

Revision: C	
Date:	2012-02-04
Changes:	Packaging Details Updated
Changes Made by:	Technical Writer

Previous Revisions

Revision: B	
Date:	2011-07-11
Changes:	Updated Data
Changes Made by:	Technical Writer

Revision: A (Original First Release)	
Date:	2007-03-01
Notes:	
Author:	Technical Writer

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