TAOGLAS®

Datasheet

Part No:
WPD.2458.25.4.B.02

Description:

Wi-Fi® Dual-band 2.4/5 GHz

Embedded Ceramic Patch Antenna

6dBi+ at 2.4GHz

6dBi+ on 5 to 6 GHz

Features:

Dimensions: 25mm*25mm*4mm

2400MHz to 2500MHz/5150MHz to 5850MHz

Pin Type

Supports IEEE 802.11 Dual-band Wi-Fi® systems

Linear polarization

Tuned for 70x70mm ground plane

RoHS and REACH Compliant

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Taiwan ISO 9001:2015 Certified

IATF16949

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1. Introduction

This unique patent pending high gain, high efficiency embedded ceramic patch antenna is designed for professional Wi-Fi® dual-band IEEE 802.11 applications. It is mounted via pin and double-sided adhesive. The passive patch offers stable high gain response from 4 dBi to 6dBi on the 2.4GHz band and from 5dBi to 8dBi on the 5 ~6 GHz band. Efficiency values are impressive also across the bands with on average 60%+.

The WDP.25's high gain, high efficiency performance is the perfect solution for directional dual-band Wi-Fi® application which need long range but which want to use small compact embedded antennas. The much higher gain and efficiency of the WDP.25 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.

Typical applications are

- Access Points
- Tablets
- High definition high throughput video streaming routers
- High data MIMO bandwidth routers
- Automotive
- Home and industrial in-wall Wi-Fi® automation
- Drones/Quad-copters
- UAV
- Long range Wi-Fi® remote control applications

The WDP patch antenna has two distinct linear polarizations, on the 2.4 and 5GHz bands, increasing isolation between bands.

Custom tuned versions for different ground-planes and housing environments can be made subject to a minimum order quantity.

Contact your regional Taoglas customer support team for further information or to integrate and test this antenna performance in your device.

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2. Specifications

GNSS Electrical		
Frequency Range (MHz)	2400-2500	5150-5850
Return Loss (dB)	Min. -19, -2 at edge	<-5
Antenna Efficiency (%)	Max. 80, 25+ at edge	50+ in bands
Antenna Peak Gain (dBi)	6	8
Antenna Polarization	Linear	
Impedance	50 ohm	
Input Power	10W	
Mechanical		
Height	4 mm	
Planner Dimension	25 x 25 mm	
Environmental		
Frequency Temp Coefficient (Tf)	0±20ppm/°C	
Operating Temperature	-40°C to +105°C	
Humidity	Non-condensing 65°C 95% RH	

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

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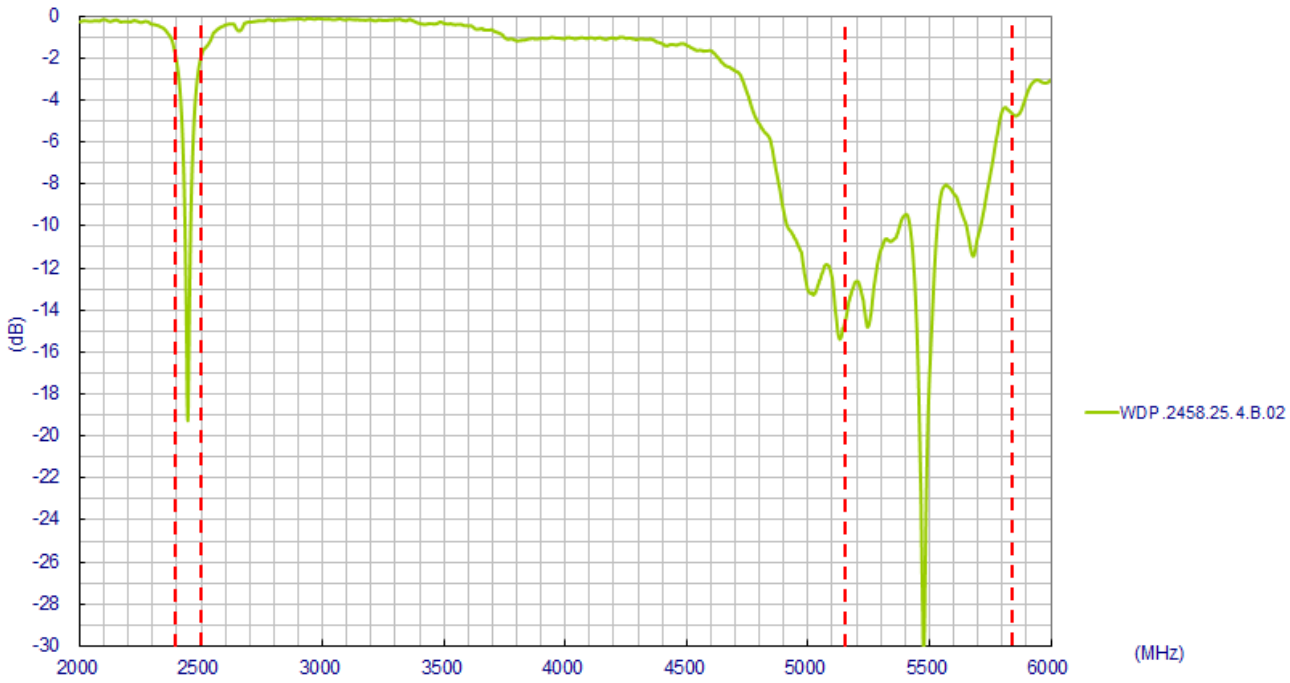
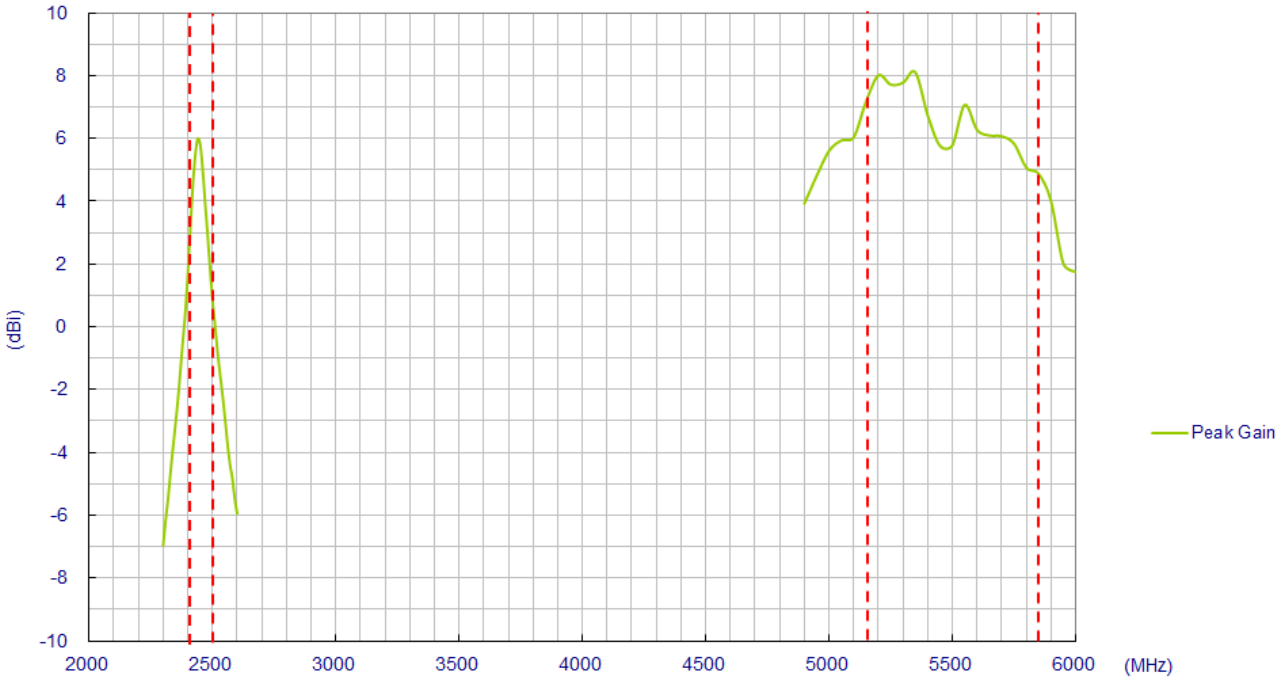
3. Antenna Characteristics

3.1 Return Loss



3.2 Peak Gain



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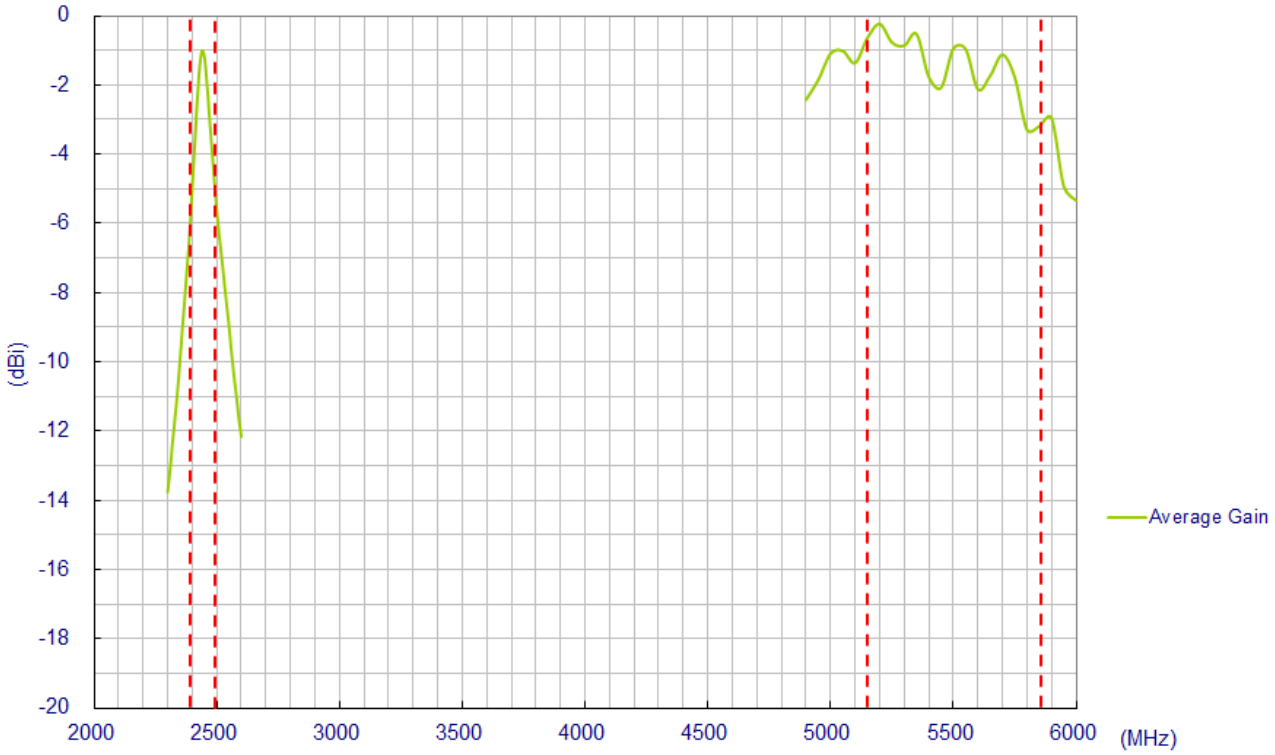
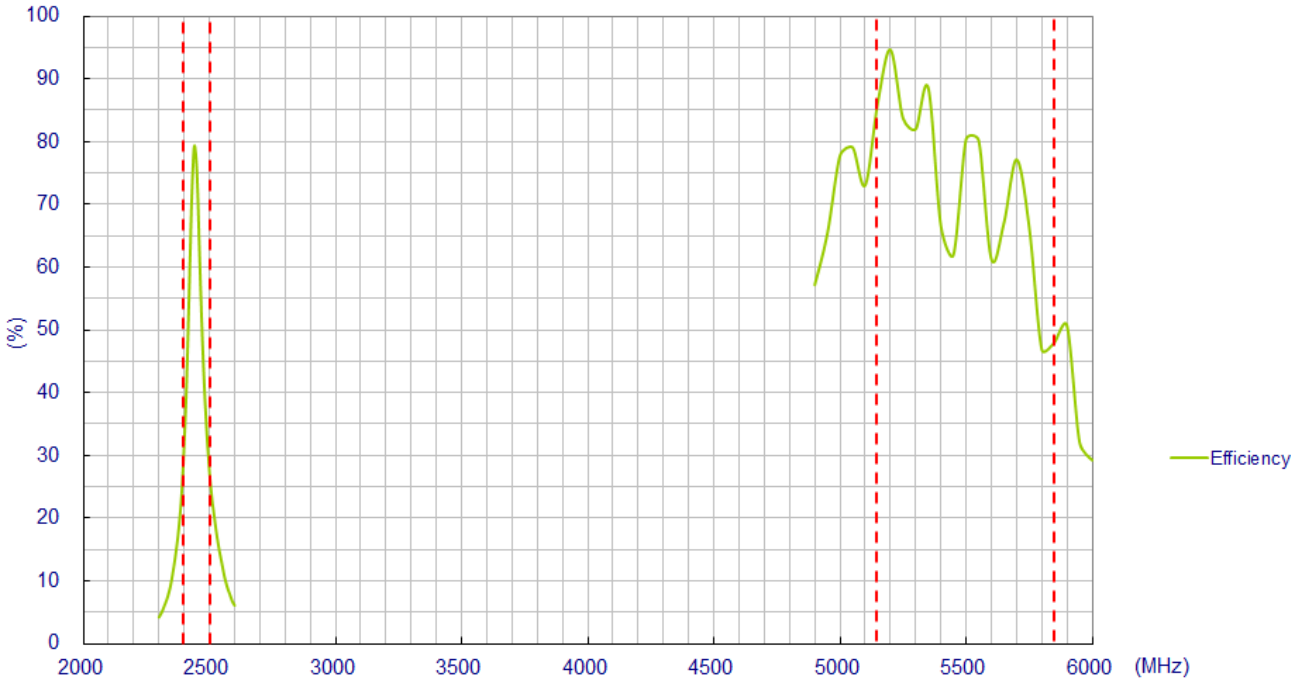
3.3 Average Gain Gain



3.4 Efficiency



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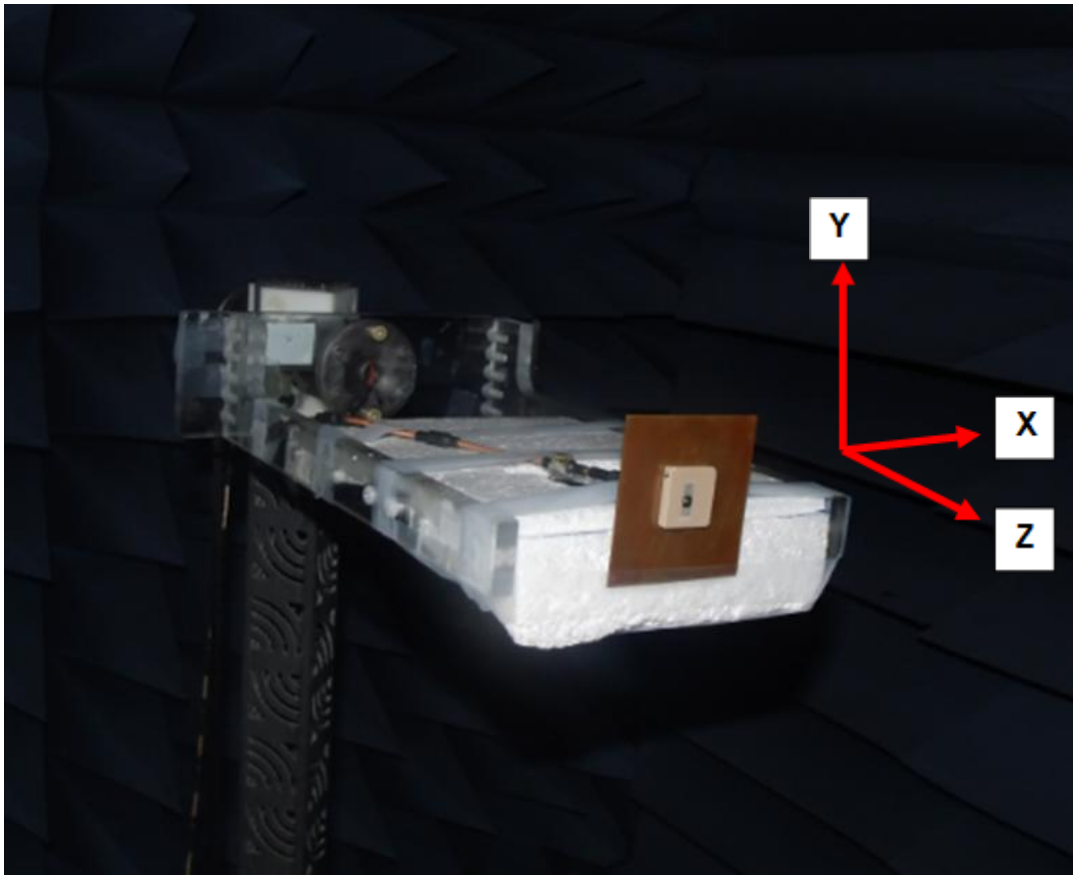
4. Radiation Patterns

4.1 Test Setup



The antenna radiation pattern measurement setup as shown above

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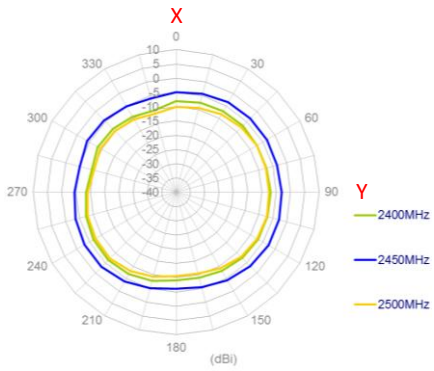
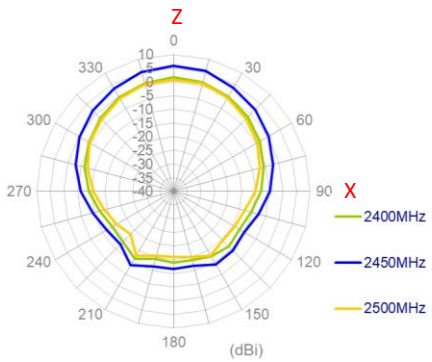
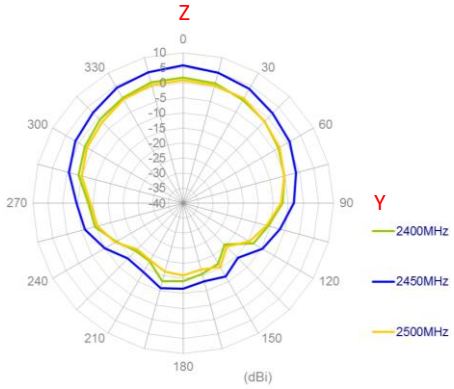
4.2 2400MHz, 2450MHz & 2500MHz 2D Radiation Patterns

XY Plane	XZ Plane	YZ Plane

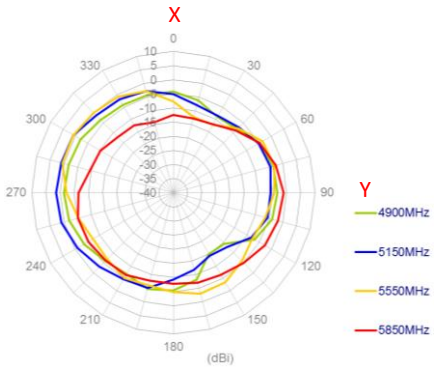


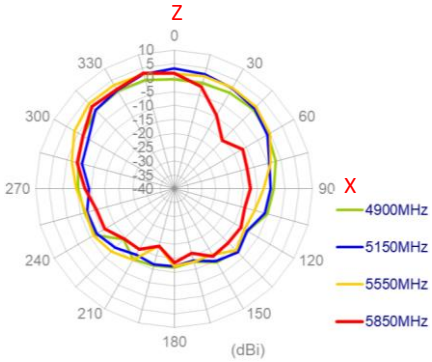


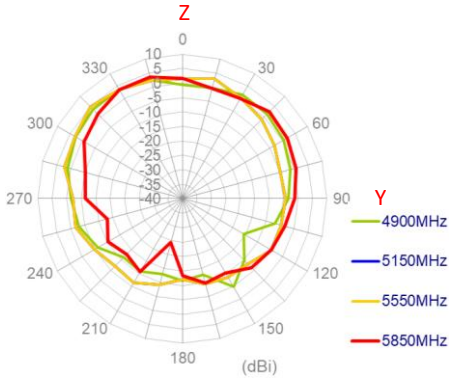


4.3 4900MHz, 5150MHz, 5550MHz & 5850MHz 2D Radiation Patterns

XY Plane	XZ Plane	YZ Plane







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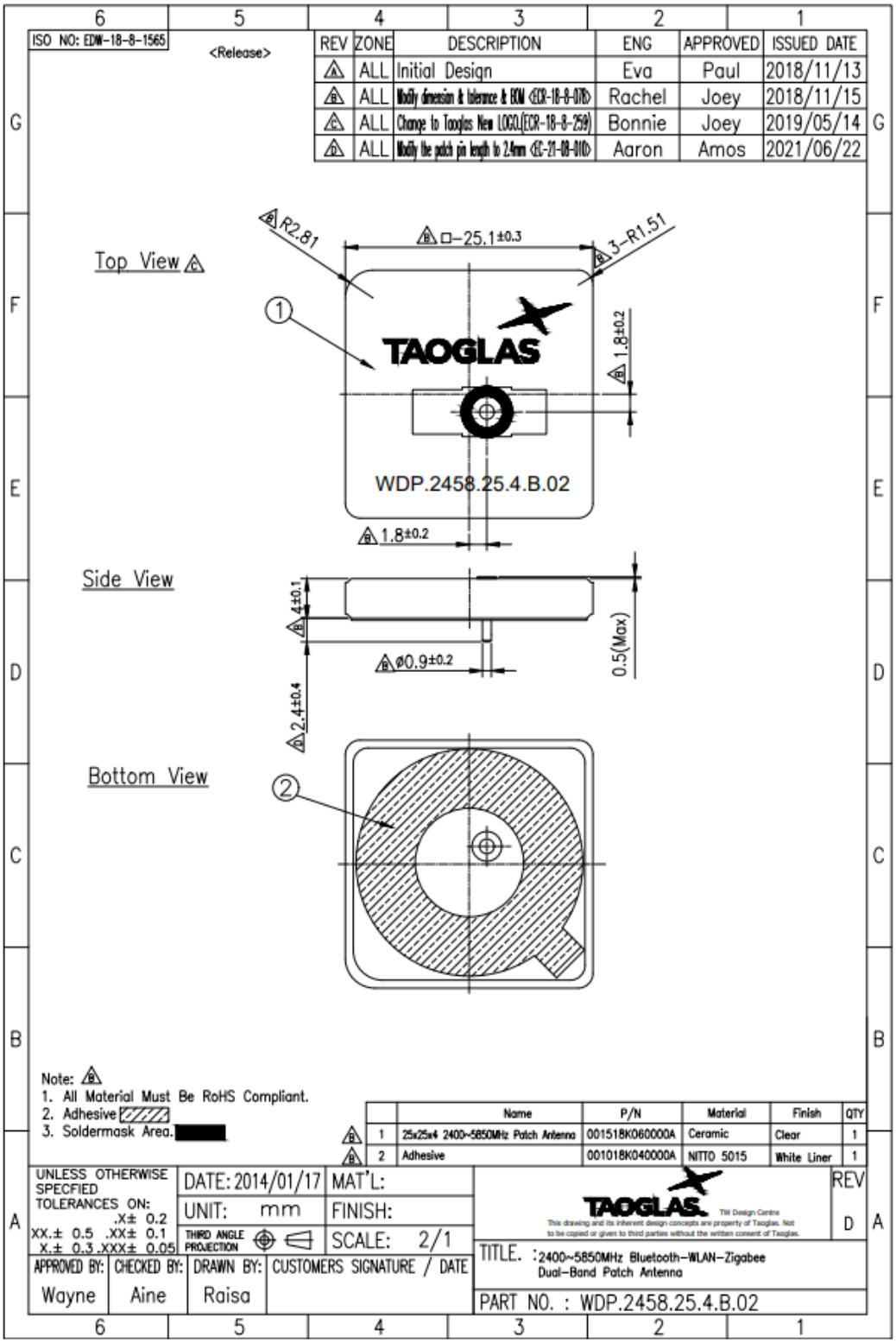
5. Mechanical Drawing (Units: mm)



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6. Antenna Integration Guide

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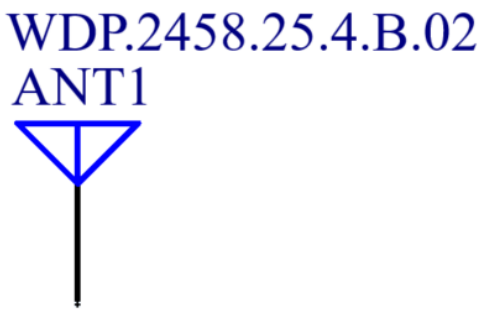
6.1 Schematic Symbol and Pin Definition

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

Pin	Description
1	RF Feed



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6.2 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

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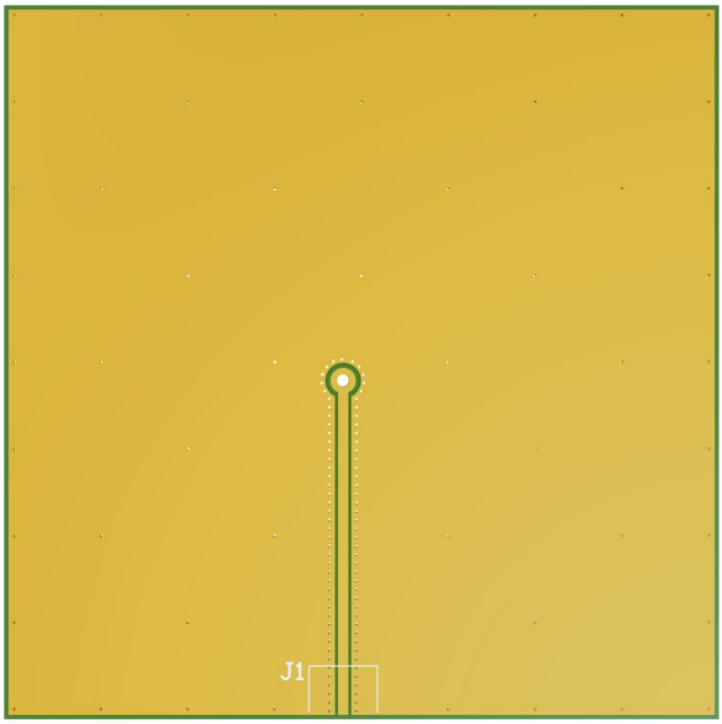
6.3 PCB Layout

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

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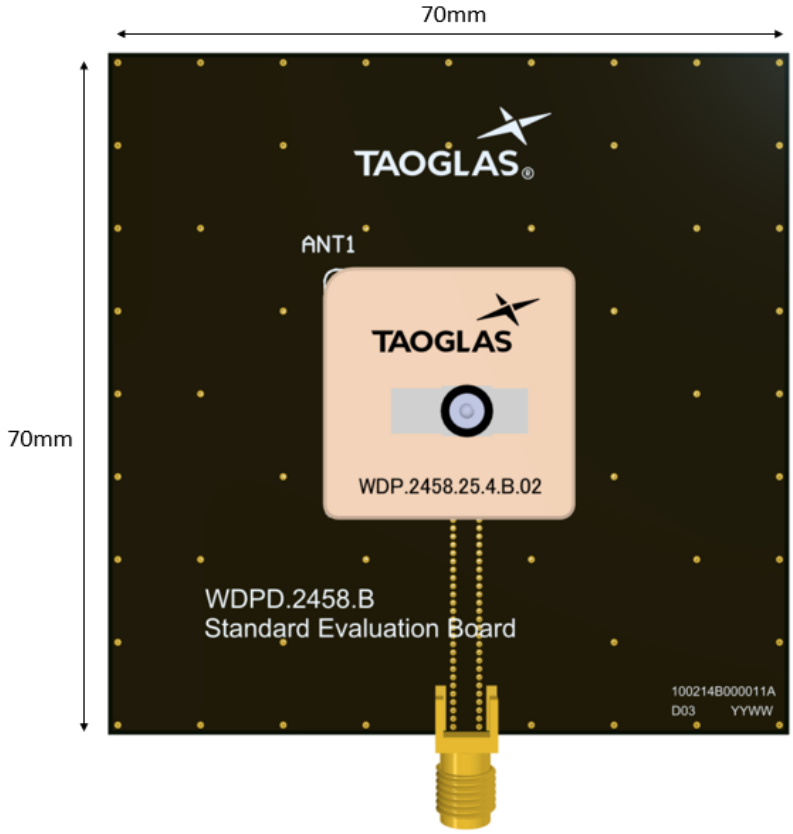
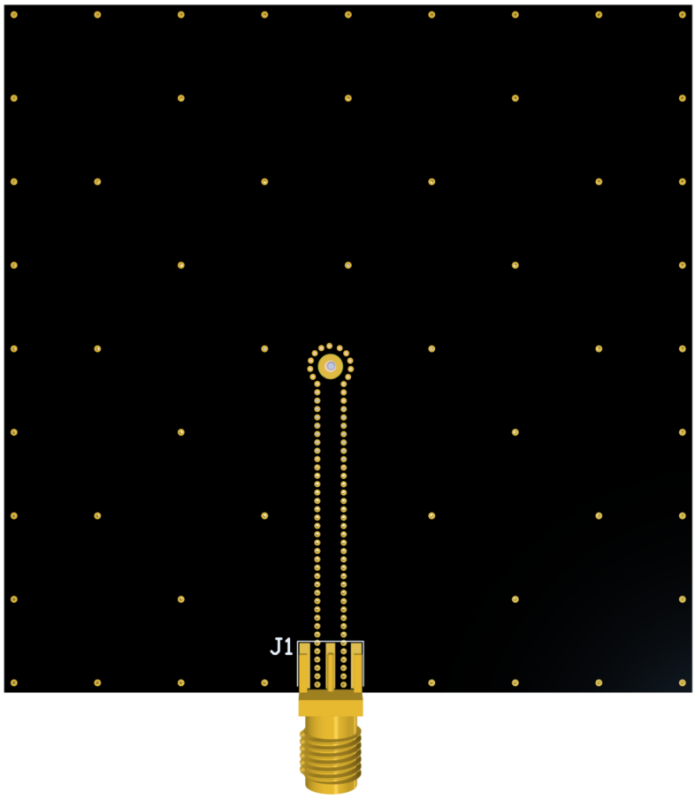
6.5 Evaluation Board



Topside



Bottom Side

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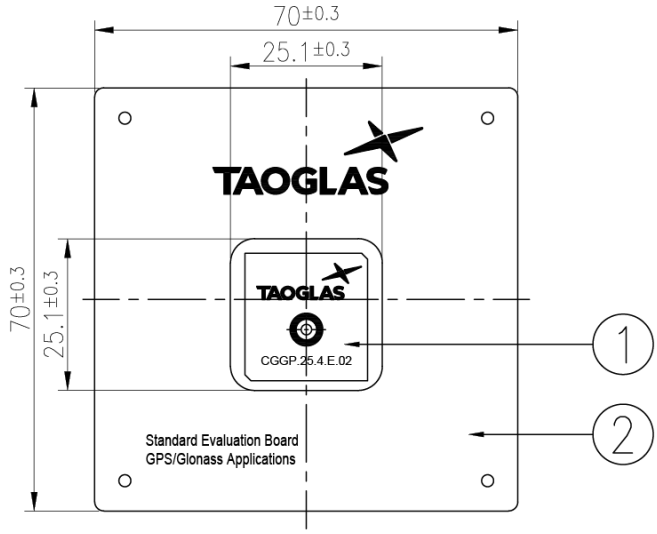
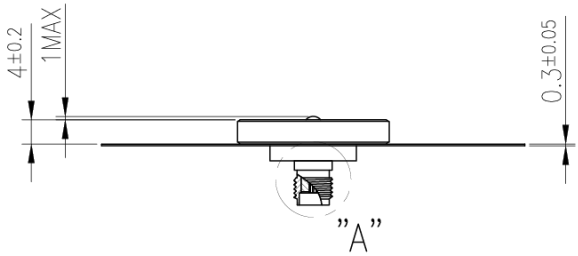
7. Mechanical Drawing – Evaluation Board

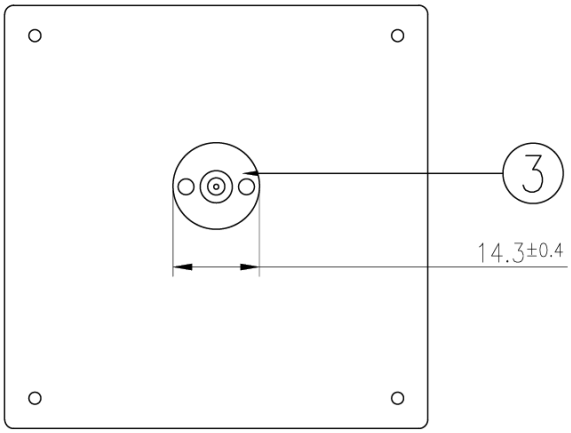
Top View



Side View



Bottom View



NOTE:
1.All material must be RoHS compliant.
2.Open/short QC, VSWR required.
3.Soldermask Area

	Name	P/N	Material	Finish	QTY
1	Patch	001515H040007A	Ceramic	Clear	1
2	Ground–Plane	000514B000007A	SPTE	Silver	1
3	SMA(F)ST	200419A000094A	Brass	Au Plated	1

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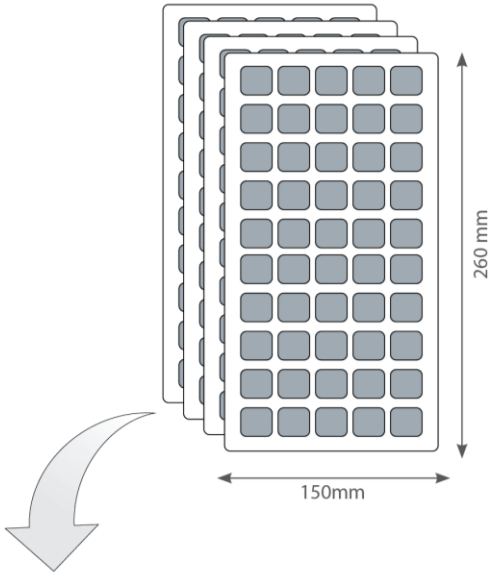
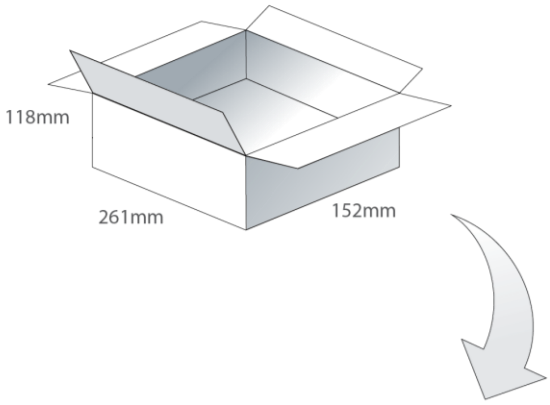
8. Packaging

50 pcs WDP.2458.25.4.B.02 per tray
Tray Dimensions - 260*150mm

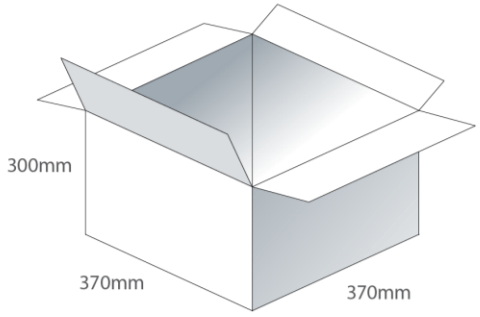
Weight - 220g



200 pcs WDP.2458.25.4.B.02 per Inner Carton
Inner Carton Dimensions - 261*152*118mm



800 pcs WDP.2458.25.4.B.02 per Carton
Carton Dimensions - 370*370*300mm



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Changelog for the datasheet

SPE-14-8-039 – WDP.2458.25.4.B.02

Revision: F (Current Version)	
Date:	2024-05-14
Changes:	Updated Mechanical Drawing
Changes Made by:	Conor McGrath

Previous Revisions

Revision: E	
Date:	2023-03-16
Changes:	Antenna Integration Guide
Changes Made by:	Cesar Sousa

Revision: D	
Date:	2018-03-27
Changes:	Updated Datasheet Template Updated Packaging
Changes Made by:	Paul Doyle

Revision: C	
Date:	2017-03-08
Changes:	Packaging Details Updated
Changes Made by:	Made by Andy Mahoney

Revision: B	
Date:	2017-08-17
Changes:	Packaging Details Updated
Changes Made by:	Andy Mahoney

Revision: A (Original First Release)	
Date:	2017-08-10
Notes:	
Author:	Jack Conroy

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