



TAOGLAS®



Datasheet

Part No:
WDMP.2458.A

Description

5dBi Embedded Dual-Band Wi-Fi® Circular Polarized 50*50mm Patch Antenna
SMA(F) Straight Connector

Features:

- High efficiency Wi-Fi® Patch Antenna including Wi-Fi® 6 bands
- Covers Wi-Fi® at bands 2.4GHz/5.8/7.1GHz
- Right Hand Circularly Polarized (RHCP)
- Military grade dielectrics & low loss substrates
- High Gain, greater than 5dBi
- Dimensions (with connector): 50 x 50 x 16.57 mm
- Dimensions (without connector): 50 x 50 x 7.07 mm
- Screw mount with SMA(F) Straight connector
- RoHS & Reach Compliant

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1. Introduction



The WDMF.2458.A antenna with SMA(F) connector is a circularly polarized Wi-Fi® antenna also covering the 7.1GHz Wi-Fi® 6 band which consists of an advanced composite dielectric structure, providing better performance at greater distance and a broader band frequency range in the smallest package in the market.

Using military grade substrates, the WDMF.2458.A is aimed at unmanned systems, such as unmanned aerial/ground vehicles (UAVs/UGVs), robotics, and ground controllers/stations, applicable in different sectors from civilian, law enforcement, to defence.

Taking advantage of substrates of low dielectric constant and low dissipation factor, the WDMF.2458.A uses glass microfiber reinforced PTFE substrates to minimize signal transmission loss in order to achieve high efficiency. It performs with high gain of at least over 5dBi at Wi-Fi® bands from 2400~2500MHz, 5150~5850MHz and 5925~7125MHz. Using circular polarized signals means the link is more stable for devices where the direction of orientation is unknown or where multipath is an issue.

The WDMF.2458.A's low profile design, equipped with a SMA(F) connector, is easy to install inside a housing or directly onto a PCB mainboard. It has four thru-holes at the patch corners, allowing users to fix the antenna with screws. The antenna has passed ISO 16750 high/low-temperature test and random vibration reliability testing.

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. In that case it will be 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.

The connector can be customized subject to MOQ, for more information please contact your regional Taoglas customer support team.



2. Specification

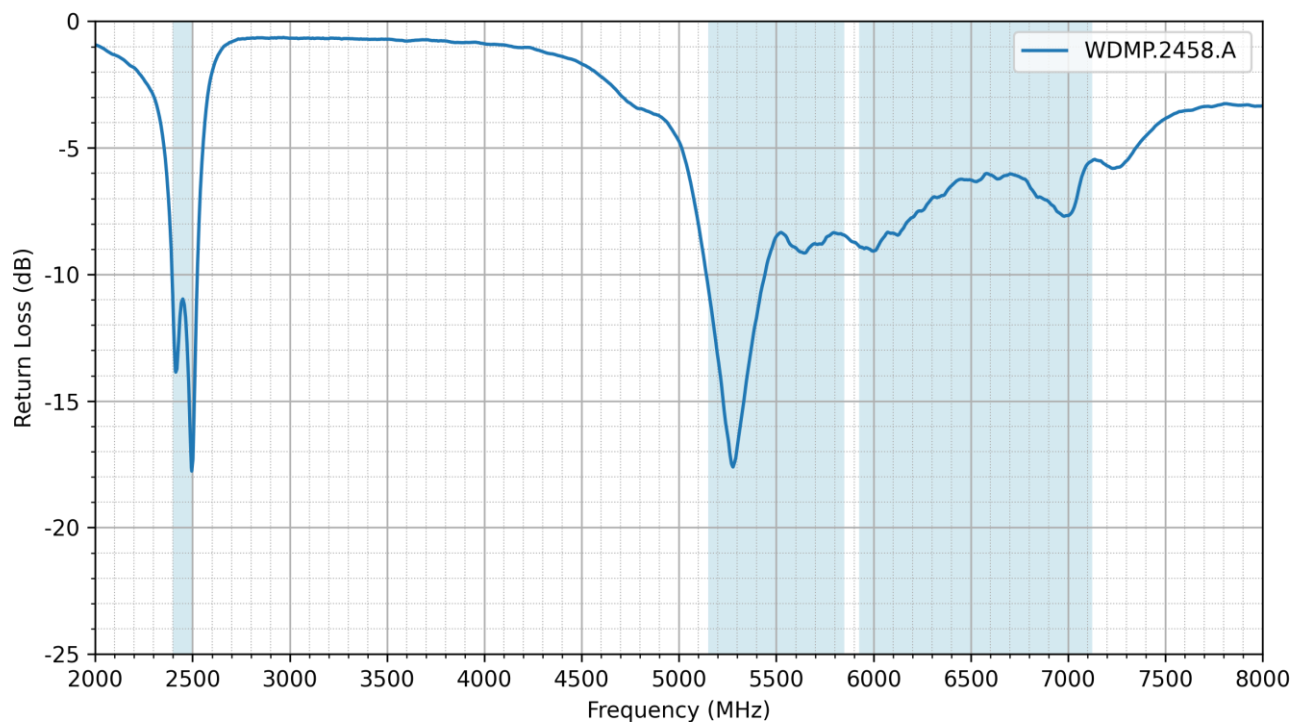
Wi-Fi Electrical								
Band	Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
Wi-Fi – 2.4GHz	2400-2500	82.5	-0.84	5.74	50 Ω	Circular	Directional	2W
Wi-Fi – 5.8GHz	5150-5850	84.4	-0.74	7.46				
Wi-Fi – 7.1GHz	5925-7125	76.8	-1.15	8.32				

Mechanical	
Dimension (mm)	50 x 50 x 7.07 (without connector) 50 x 50 x 16.57 (with connector)
Antenna Patch Material	PTFE composites
Connector	SMA(F) Straight
Weight (g)	32.5

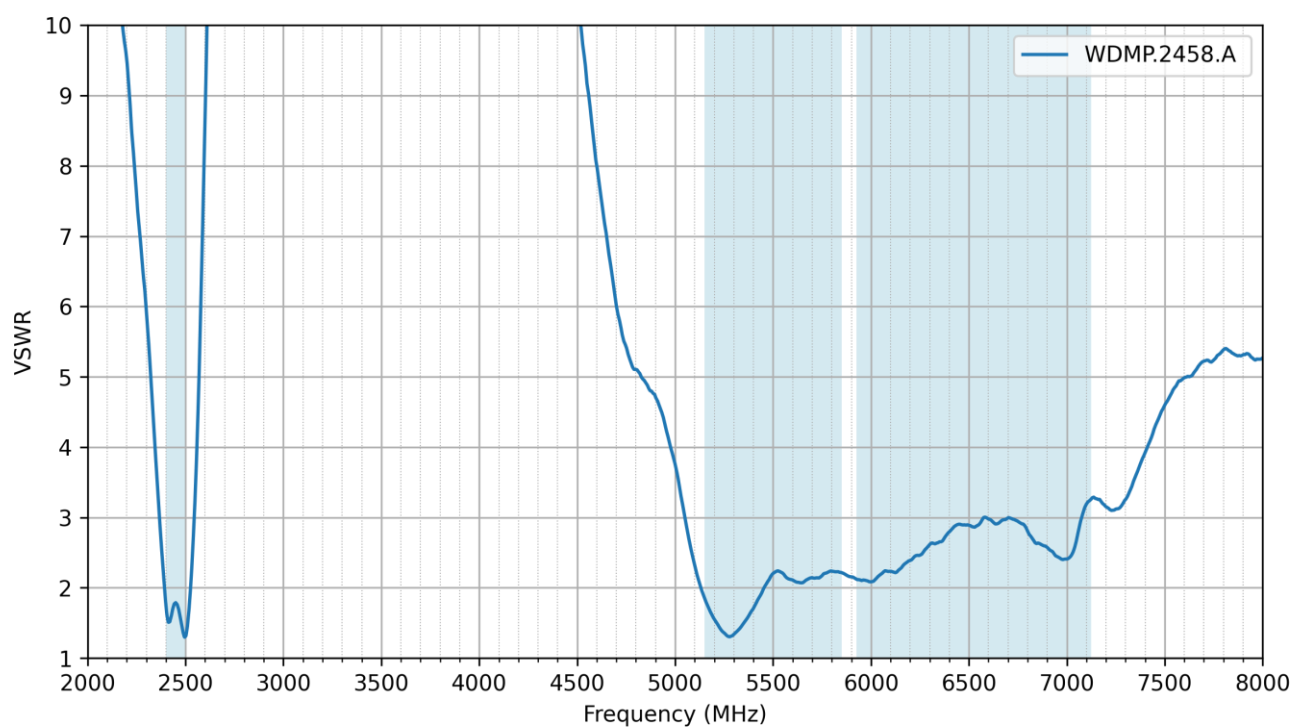
Environmental	
Temperature Range	-40°C to 85°C

3. Antenna Characteristics

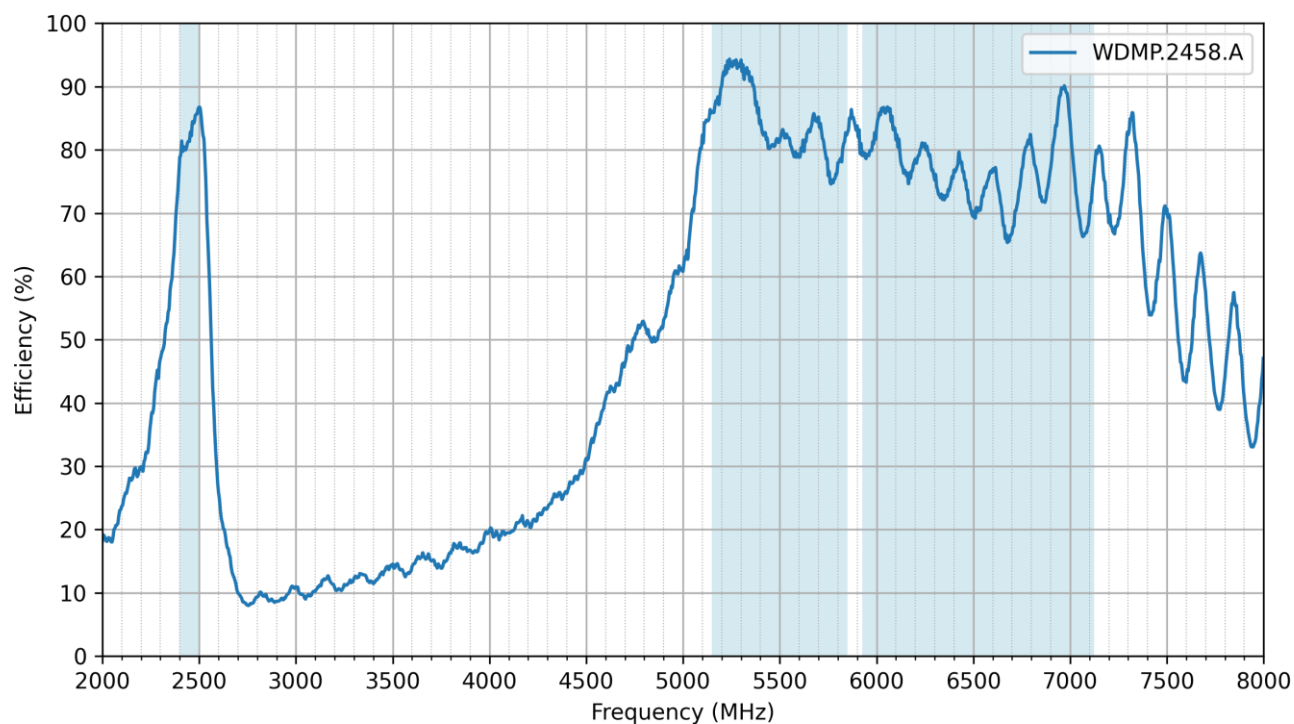
3.1 Return Loss



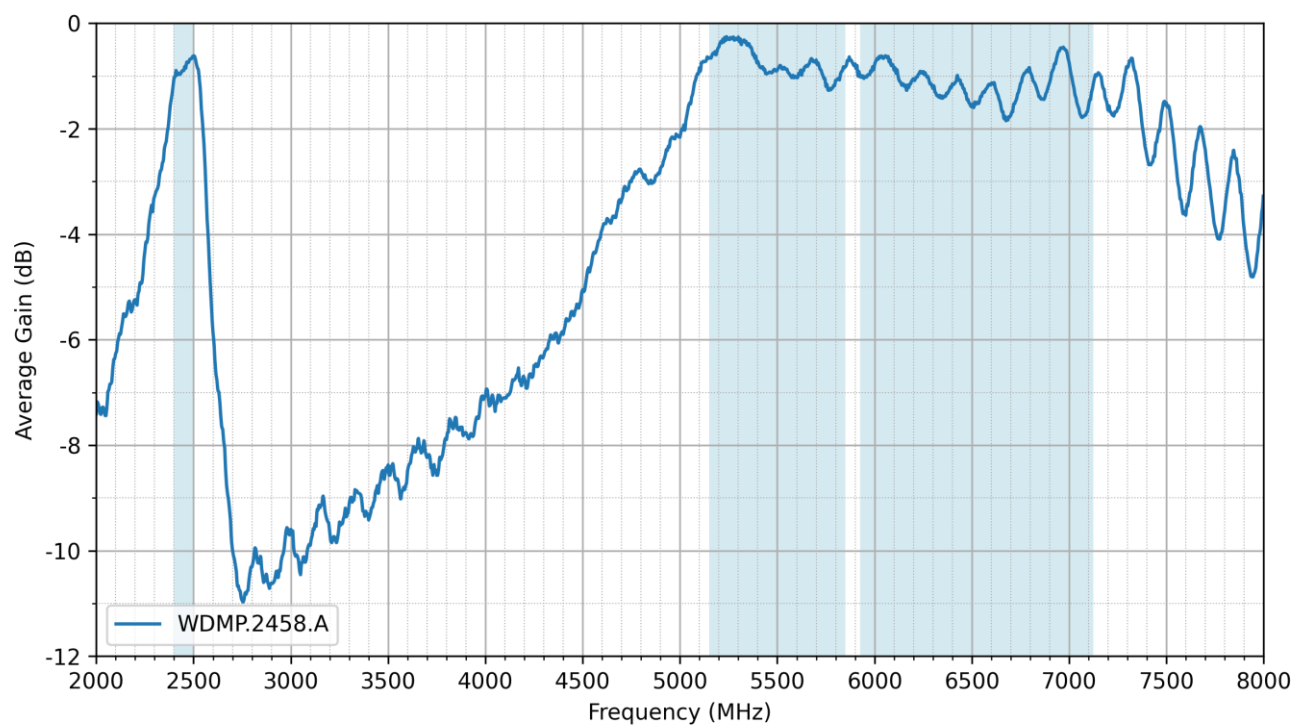
3.2 VSWR



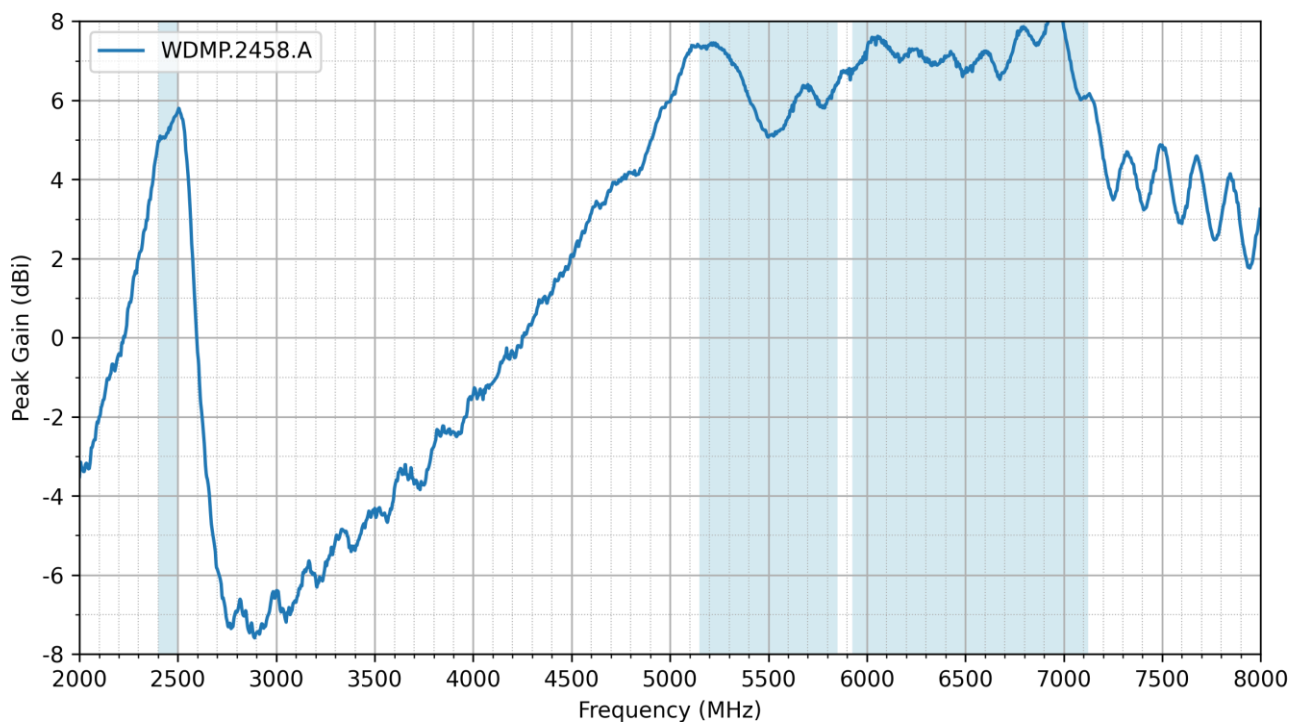
3.3 Efficiency



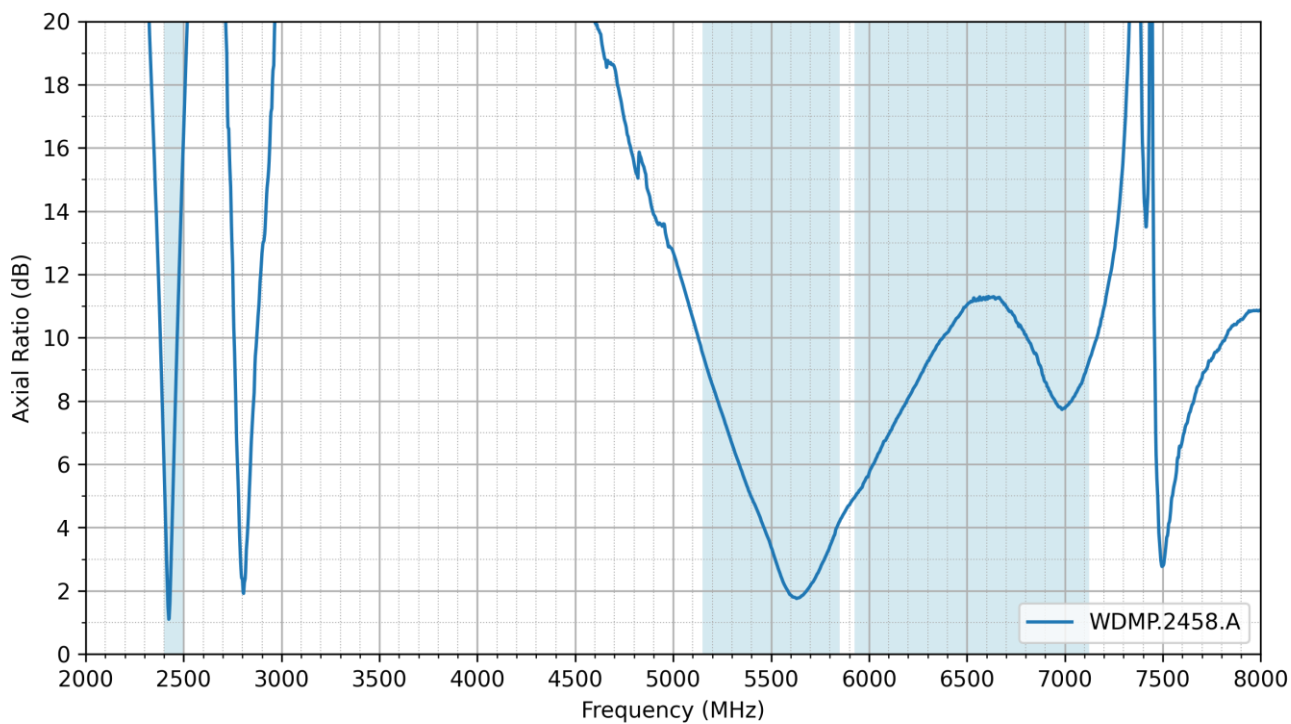
3.4 Average Gain



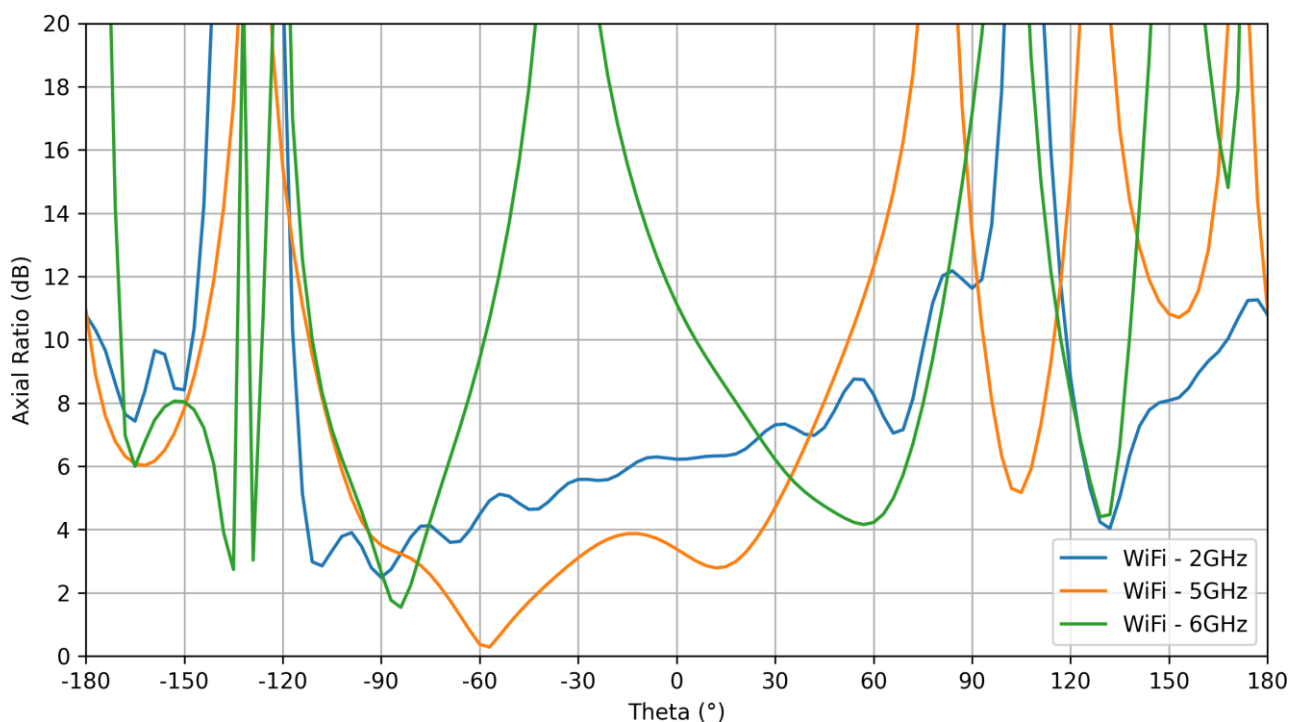
3.5 Peak Gain



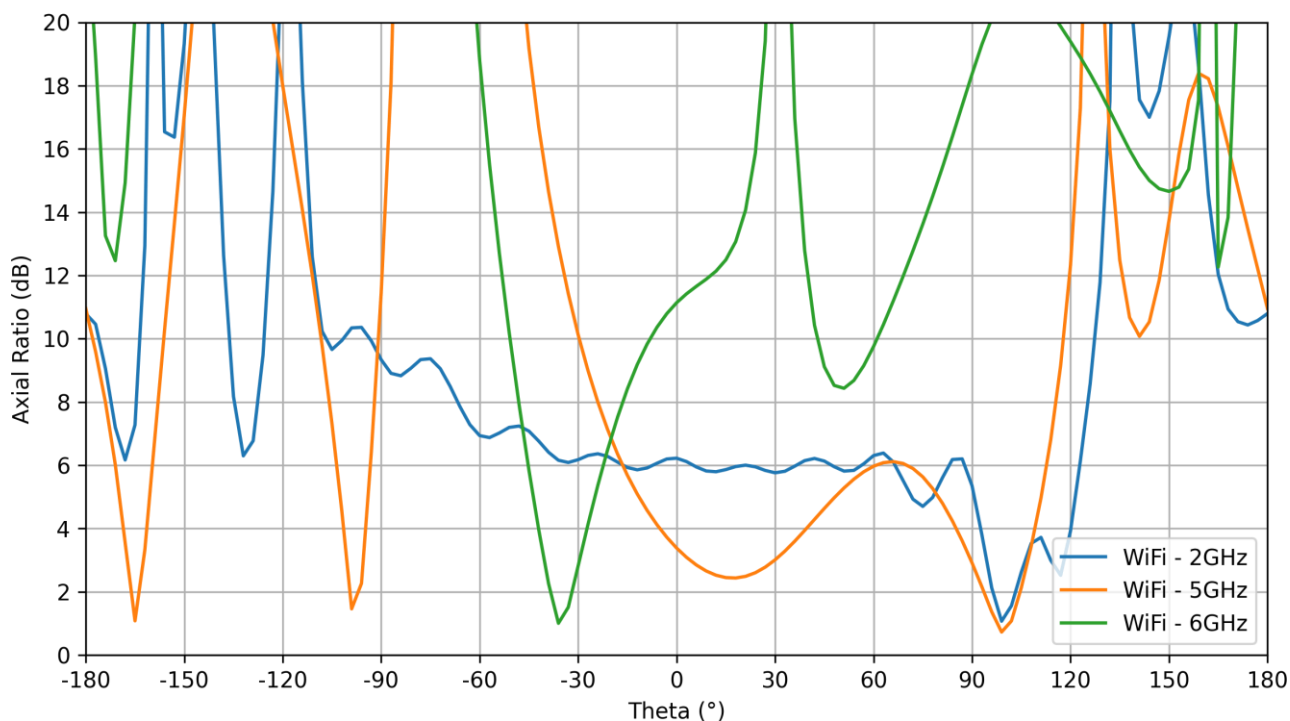
3.6 Axial Ratio



3.7 Axial Ratio vs Angle for Phi=0

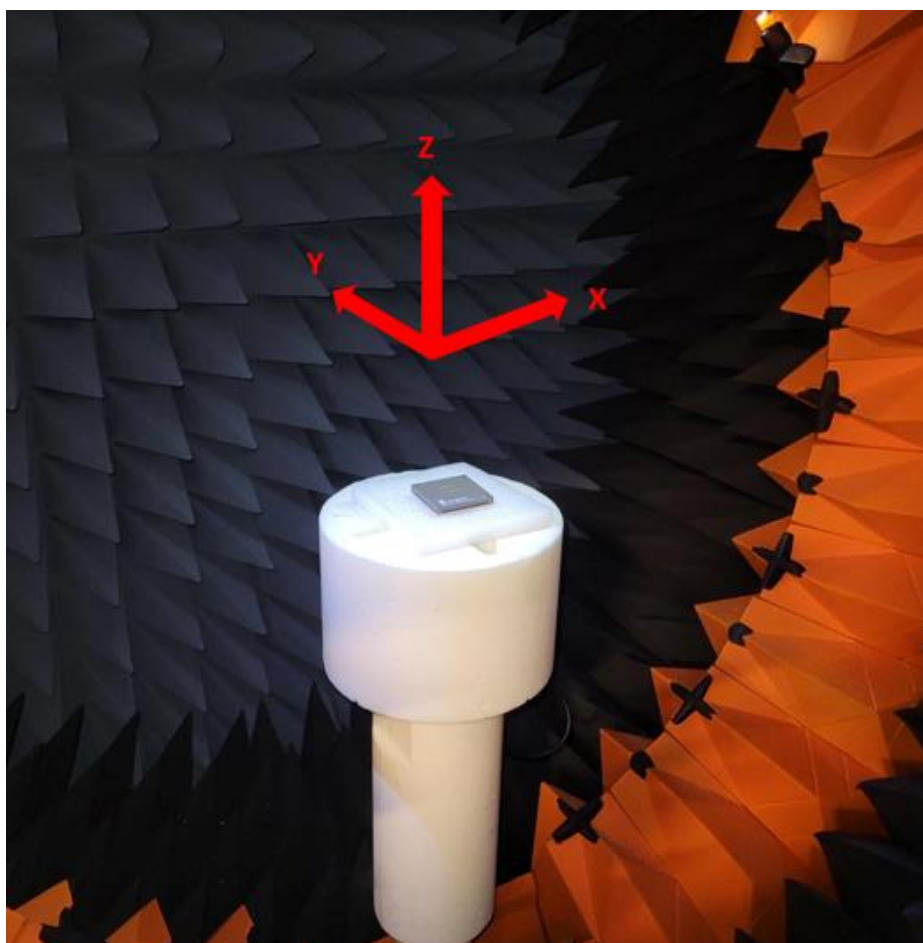


3.8 Axial Ratio vs Angle for Phi=90

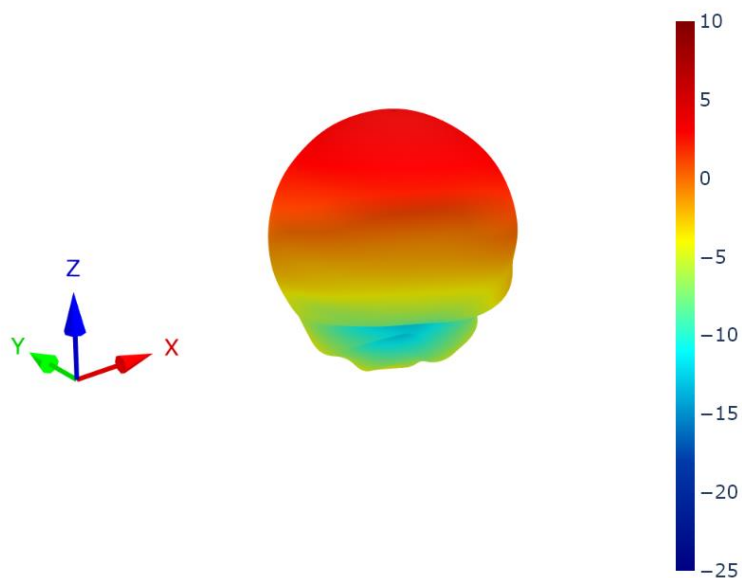


4. Radiation Patterns

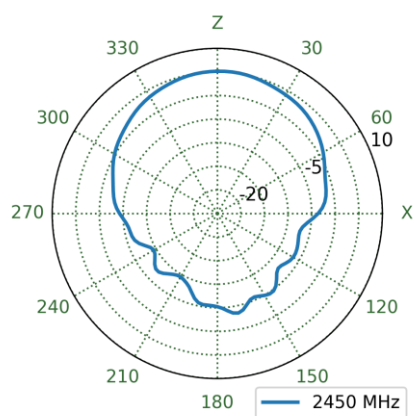
4.1 Test Setup



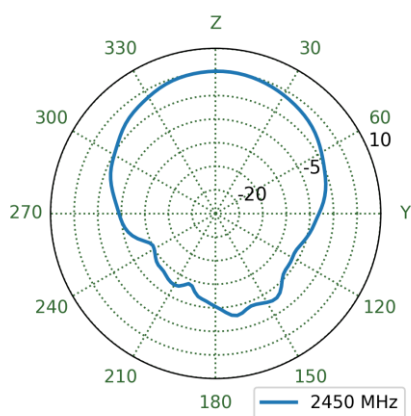
4.2 Patterns at 2450 MHz



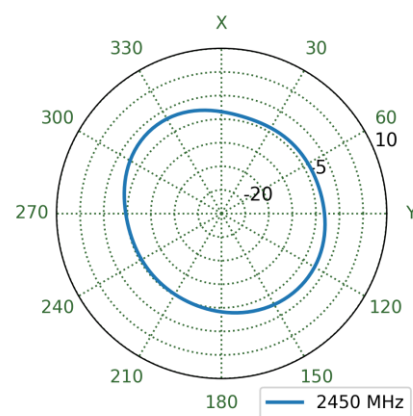
XZ Plane



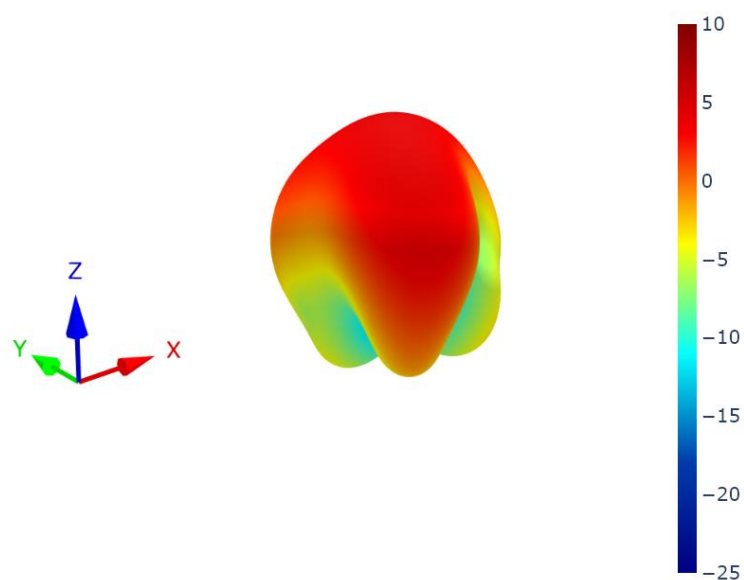
YZ Plane



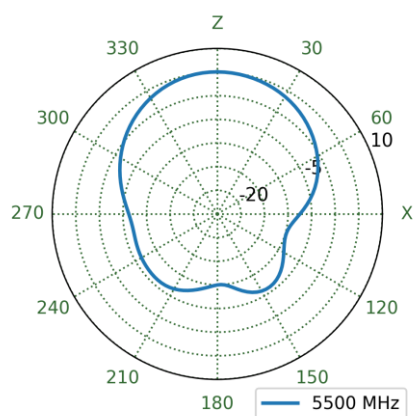
XY Plane



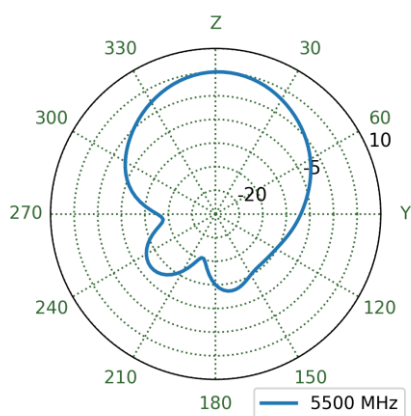
4.3 Patterns at 5500 MHz



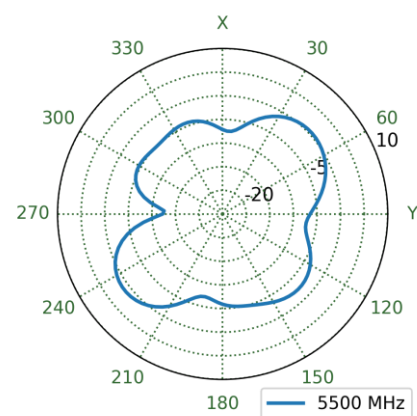
XZ Plane



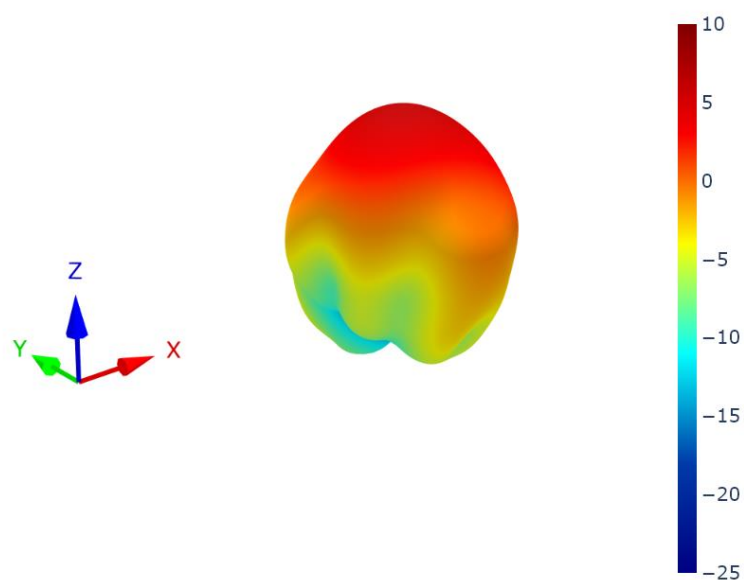
YZ Plane



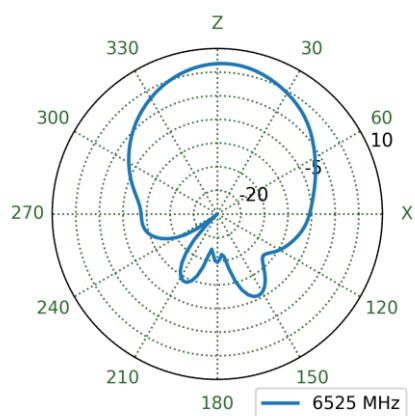
XY Plane



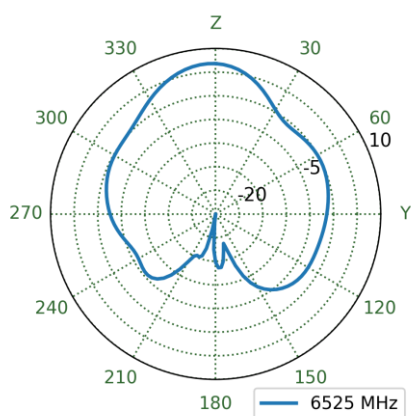
4.4 Patterns at 6525 MHz



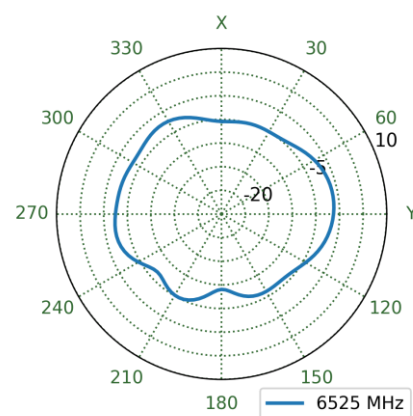
XZ Plane



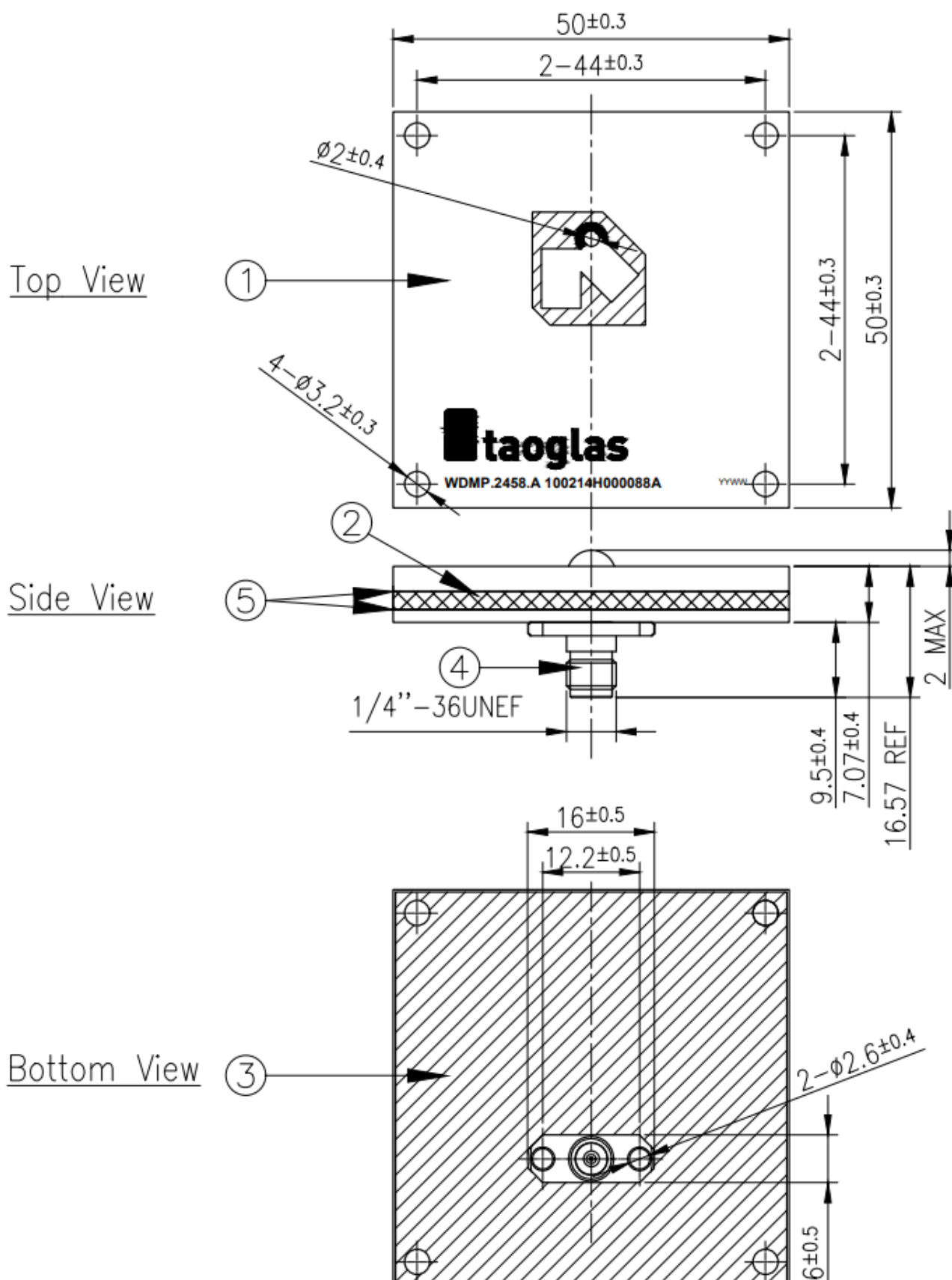
YZ Plane



XY Plane

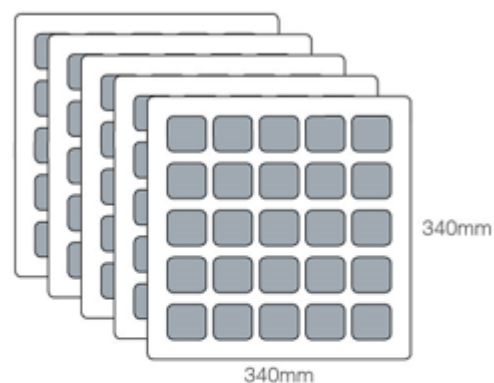


5. Mechanical Drawing

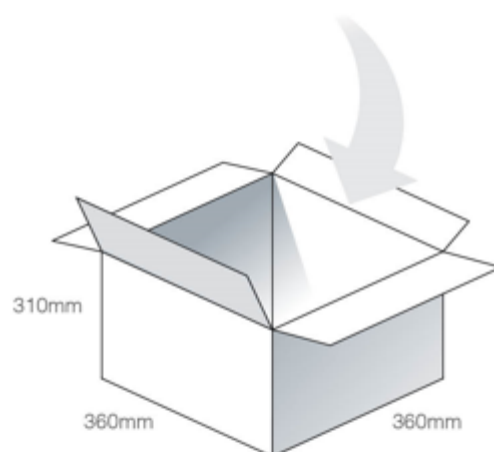


6. Packaging

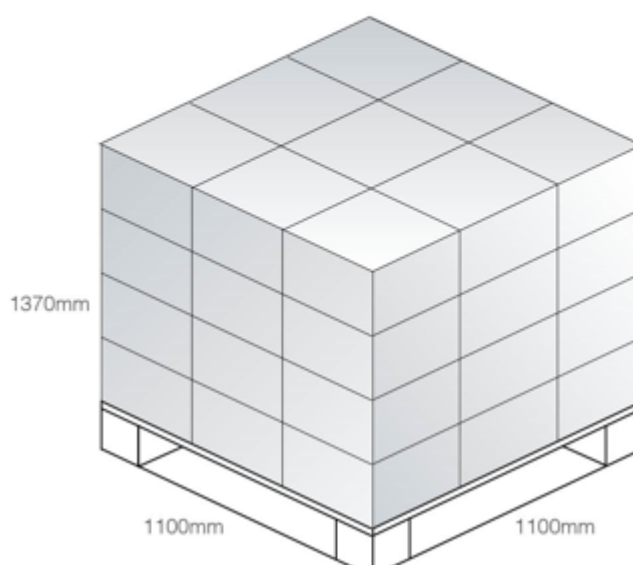
25 pcs WDMF.2458.A per tray
Each tray in vacuumed PE bag
Tray Dimensions - 340*340*27mm
Weight - .91Kg per tray



10 Trays per Carton - 250 pcs
Carton Dimensions - 360*360*310mm
Weight - 9.93Kg



Pallet Dimensions 1100*1100*1370mm
36 Cartons per Pallet
9 Cartons per layer
4 Layers



7. Installation Guidelines

There might be situations where the WDMP.2458.A needs to sit firmly on the device board, either a plastic or a metal board. The patch provides four screw holes for this purpose.

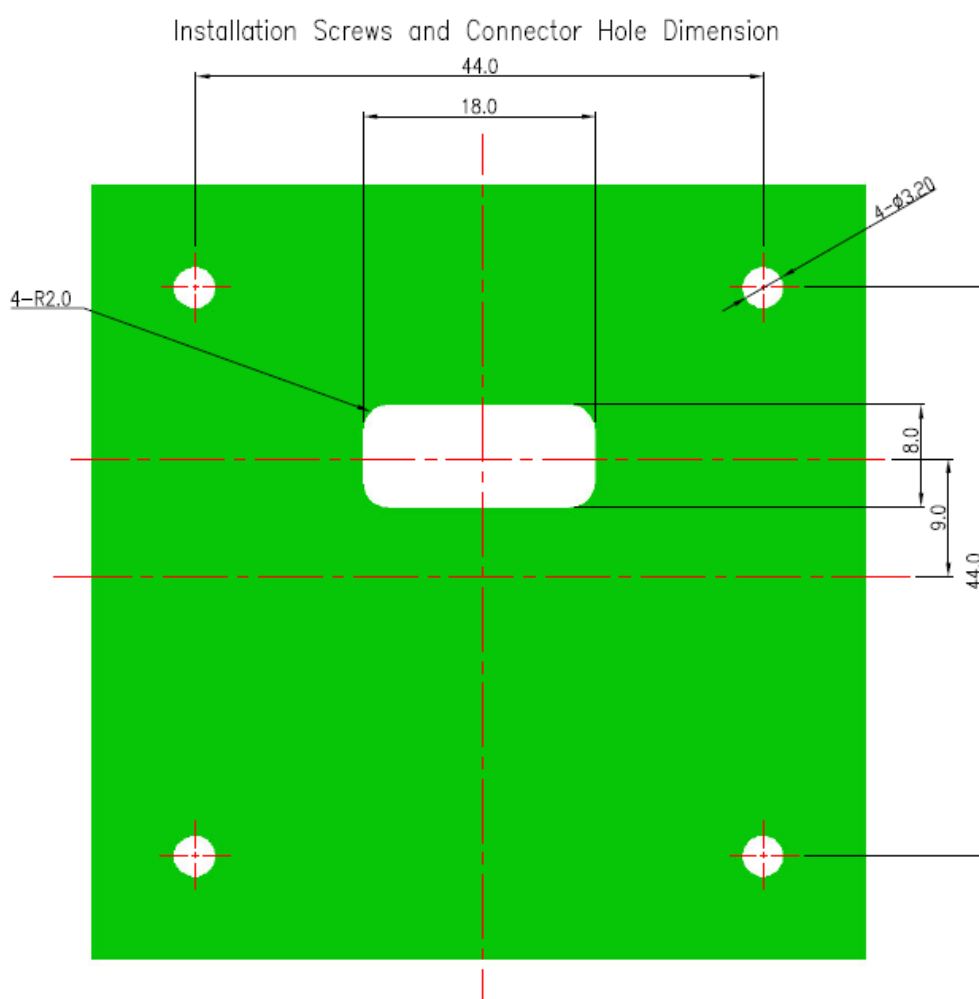
This section illustrates the type of screw and screw/connector holes dimension should be considered for installation.

Screw type: Non-conductive M3 screw

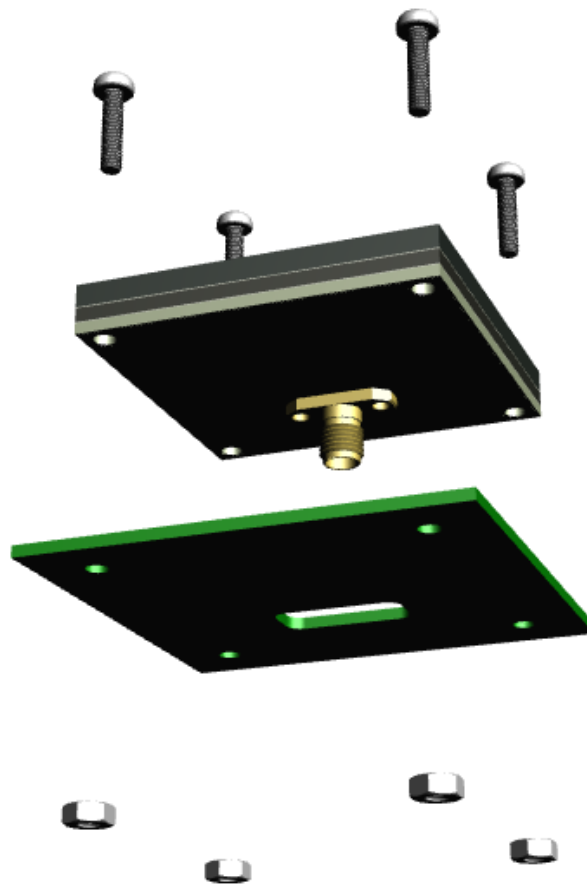
Nut type: Non-conductive HEX M3 nut

On-board screw holes dimension: \varnothing 3.2mm

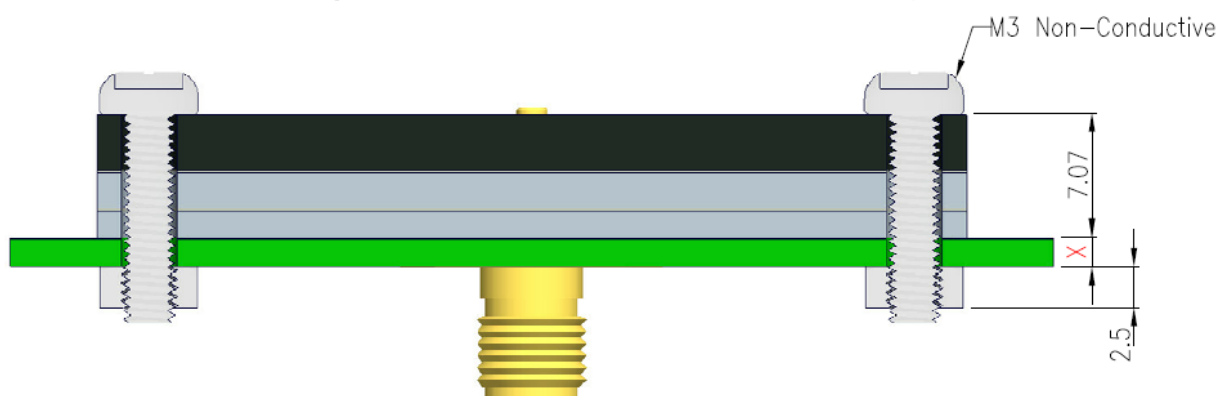
On-board connector holes dimension: 18 x 8 mm



7.1 Exploded View



Screw Length $\geq 7.07 + X + 2.5(\text{M3 Nut Thickness})$



Screw Length Calculation
X = implemented board thickness

Changelog for the datasheet

SPE-15-8-046 – WDMP.2458.A

Revision: E (Current Version)

Date:	2025-05-13
Changes:	Updated radiation pattern scale, updated from Omni directional to Directional and removed EDW boarder.
Changes Made by:	Gary West

Previous Revisions

Revision: D

Date:	2024-01-29
Changes:	Added axial ratio data.
Changes Made by:	Gary West

Revision: C

Date:	2023-04-13
Changes:	Retested to verify antenna performance.
Changes Made by:	Gary West

Revision: B

Date:	2020-05-25
Changes:	Updated to include W-Fi 6 data
Changes Made by:	Jack Conroy

Revision: A (Original First Release)

Date:	2015-08-11
Notes:	
Author:	Technical Writer



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