



TAOGLAS®



Datasheet

GWLA.01

Description:

GPS L1/GALILEO & Bluetooth/Wi-Fi 2.4GHz
Embedded 2in1 Ceramic Loop Antenna

Features:

- High Efficiency
- Omnidirectional
- Simplifies GPS/GALILEO and 2.4GHz Circuits
- Multi-Band Application
- 1575.42MHz and 2.4GHz
- Two Separate feeds on one antenna
- Low Profile
- 3.2*1.6*0.5mm
- Economical
- Compact Size
- Surface-Mount
- RoHS & Reach Compliant

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1. Introduction



The GWLA.01 GPS/GALILEO / 2.4GHz embedded loop antenna is a high efficiency, miniature SMD, edge mounted ceramic antenna for GPS/GALILEO and 2.4GHz Wi-Fi, WLAN, ZigBee, Bluetooth, and 802.11 applications. It is particularly useful where PCB space is limited. Customers can use this antenna for GPS/GALILEO and 2.4GHz (Wi-Fi or Bluetooth) modules. Rather than using two separate chip antennas for GPS/GALILEO and 2.4GHz, the GWLA.01 has two separate antenna feeds, one for each, making it the ideal choice for applications where there is limited PCB space. The GWLA.01 uses the main PCB as its ground plane, thereby maintaining good efficiency despite its small size. The GWLA.01 can be tuned for different PCB sizes/environments by simply changing the values of the matching circuit. It is ideally mounted on the center edge of a ground-plane.

At 3.2*1.6*0.5mm, the GWLA.01 is one of the smallest combination embedded antennas available worldwide. This antenna is delivered on tape and reel.

Typical Applications – where both GPS/GALILEO and 2.4GHz are required

- Navigation or Position Tracking Systems
- Handheld Devices
- Tablet PCs
- OBD Devices
- Gateways and Routers
- Mobile Cameras
- UAV Communication Systems

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 2 dBi 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 2 dBi peak gain, but you don't need to select an embedded antenna that has a peak gain of less than 2 dBi 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 3 dBi or more if available. Once that antenna gets integrated into your device, performance will degrade below this 2 dBi 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.

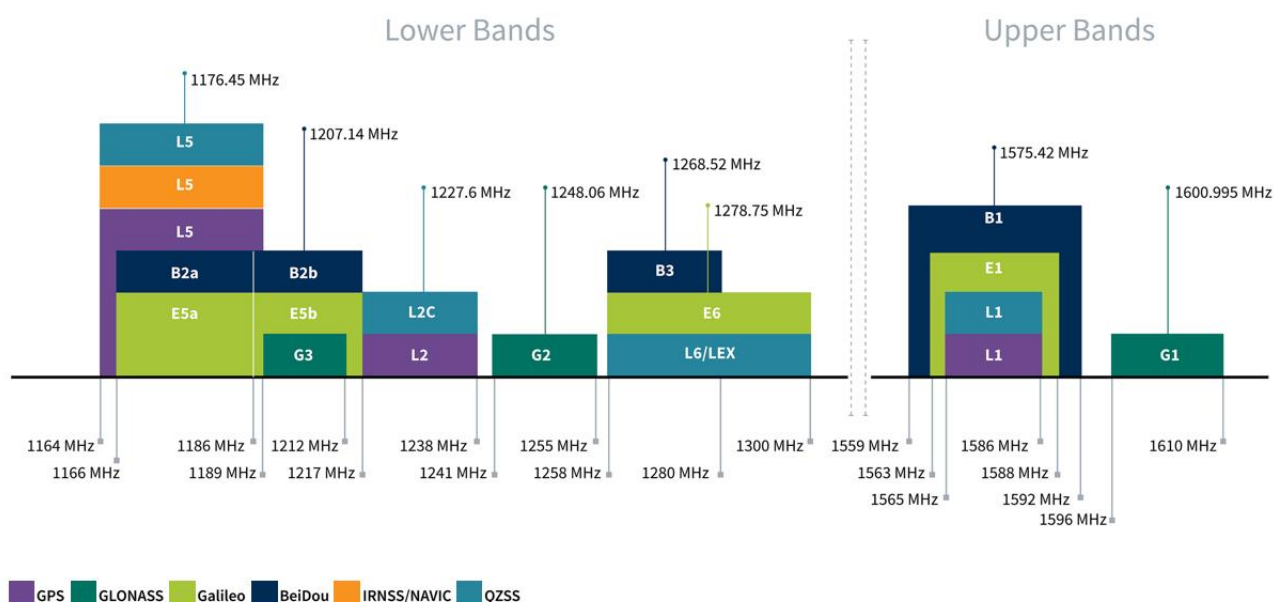
This antenna can be mounted with no performance degradation in either orientation as long as the antenna is soldered correctly via Surface mounting. Please see the integration instructions section for further detail regarding the optimum way to integrate this antenna into your device.

For further optimization to customer-specific device environments and for support to integrate and test this antennas performance in your device, contact your regional Taoglas Customer Services Team.

2. Specifications

GNSS Frequency Bands Covered						
GPS	L1	L2	L5	L6		
	■	■	■	■		
GLONASS	G1	G2	G3			
	■	■	■			
Galileo	E1	E5a	E5b	E6		
	■	■	■	■		
BeiDou	B1	B2a	B2b	B3		
	■	■	■	■		
QZSS (Regional)	L1	L2C	L5	L6		
	■	■	■	■		
IRNSS (Regional)	L5					
	■					
SBAS	L1/E1/B1	L5/B2a/E5a	G1	G2	G3	
	■	■	■	■	■	

*SBAS systems: WASS(L1/L5), EGNOS(E1/E5a), SDGM(G1/G2/G3), SNAS(B1/B2a), GAGAN(L1/L5), QZSS(L1/L5), KAZZ(L1/L5).



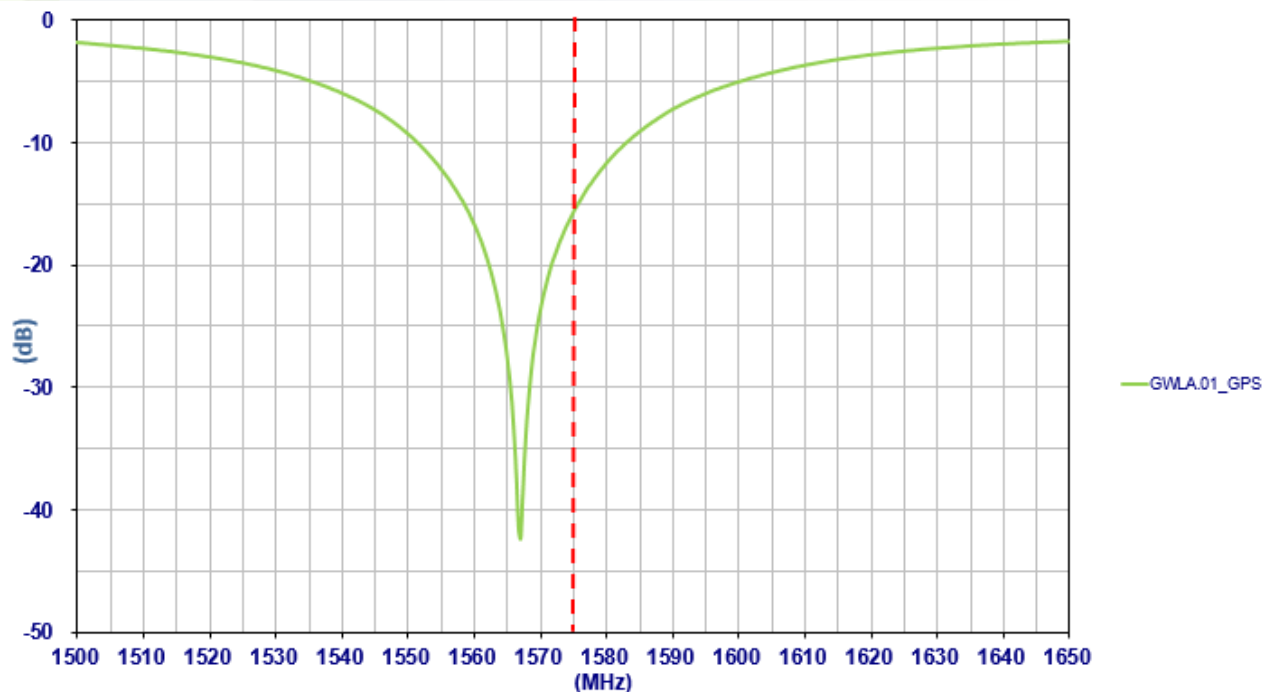
GNSS Bands and Constellations

Electrical*		
Application Bands	GPS/GALILEO Antenna	Wi-Fi/Bluetooth Antenna
Frequency (MHz)	1575.42	2400-2500
Bandwidth (MHz)	32 (RL<-10dB)	100 (RL<-10dB)
Peak Gain (dBi)	1.52	1.43
Efficiency (%)	58.94	67.63
Return Loss (dB)	< -10	< -10
Isolation (dB)	>20	>6
Impedance		50Ω
Polarization		Linear
Input Power		10W
Mechanical		
Dimensions		3.2*1.6*0.5mm
Ground Plane		80*40mm (Standard Evaluation Board)
Weight		0.02g
Environmental		
Operating Temperature		-40°C to 85°C
Storage Temperature		-40°C to 85°C
Relative Humidity		20% to 70%
Moisture Sensitivity Level (MSL)		3 (168 Hours)

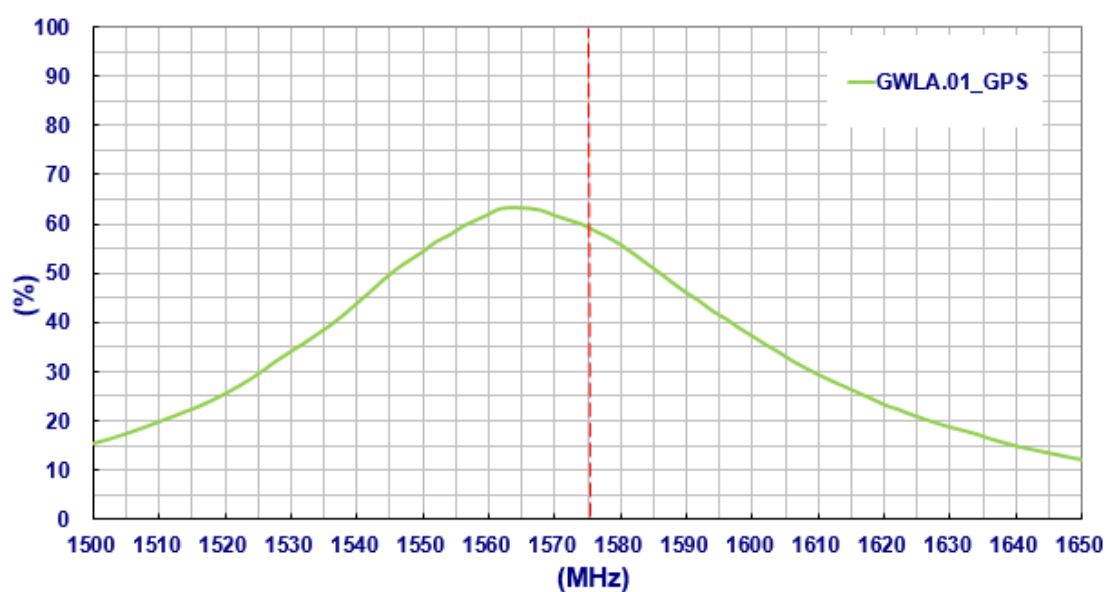
*Tested on 80*40mm evaluation board.

3. Antenna Characteristics

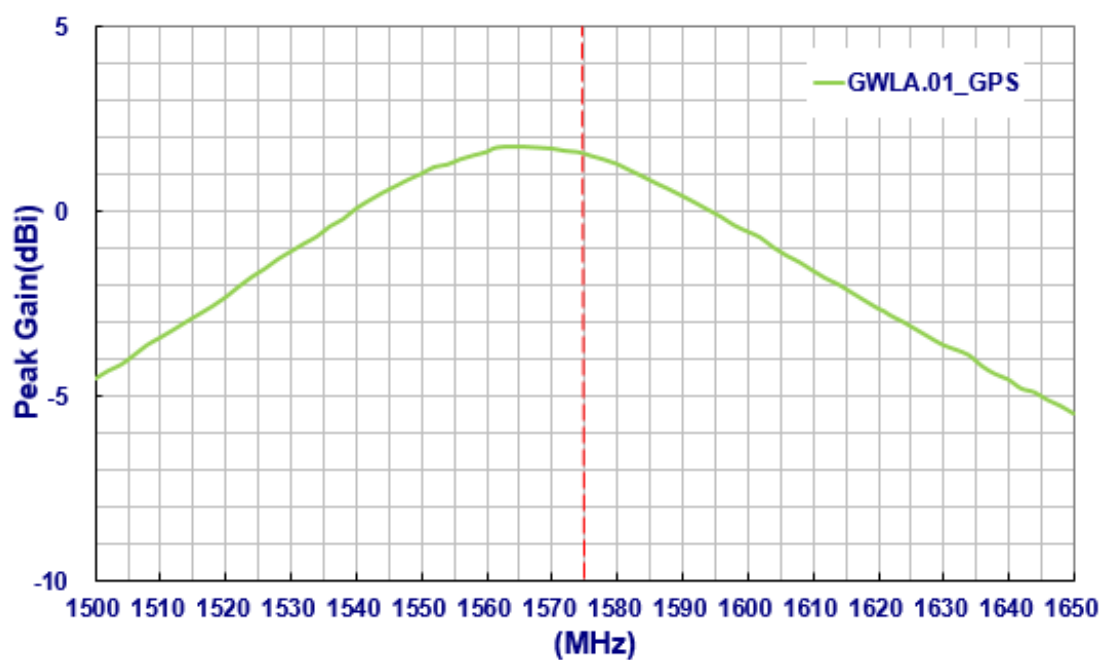
3.1 Return Loss - GPS/GALILEO Band



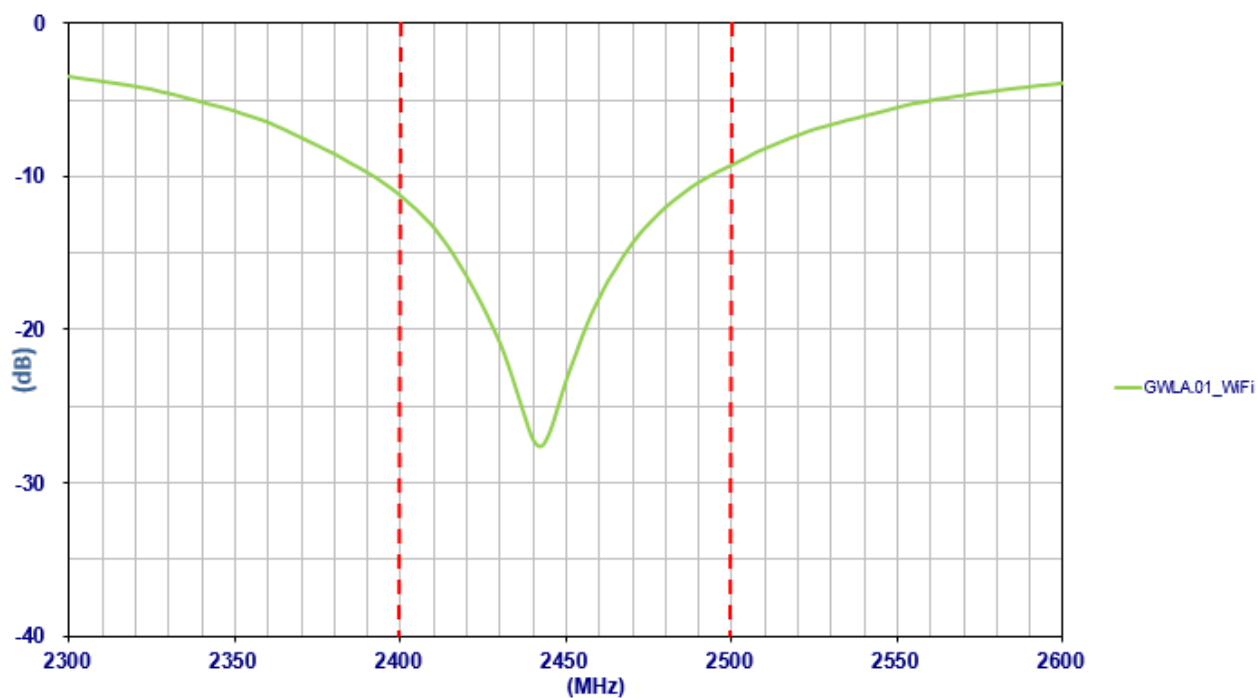
3.2 Efficiency - GPS/GALILEO Band



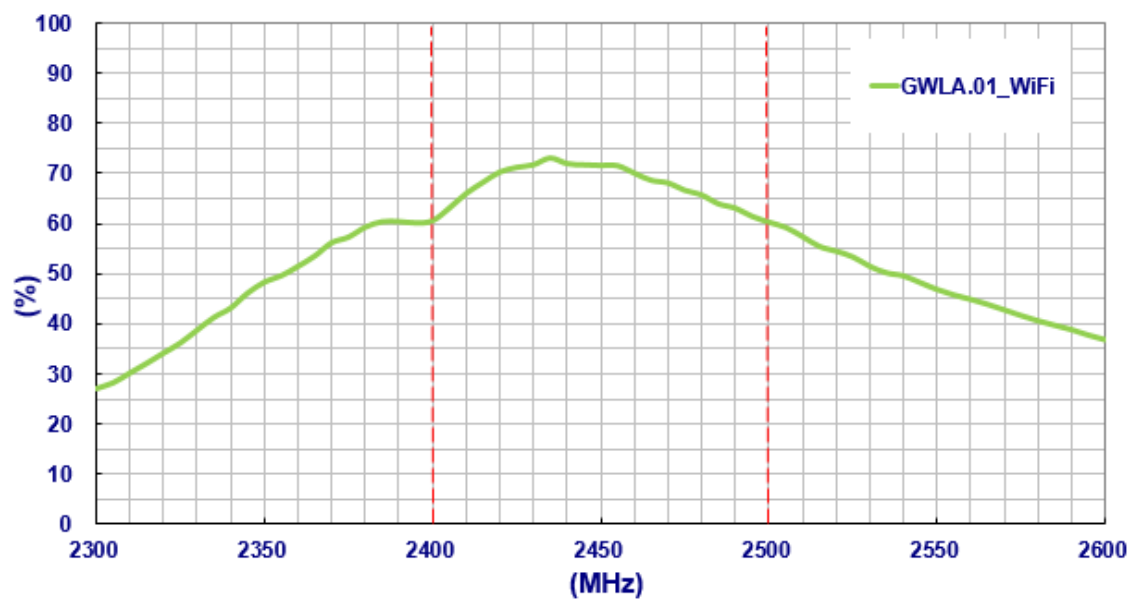
3.3 Peak Gain



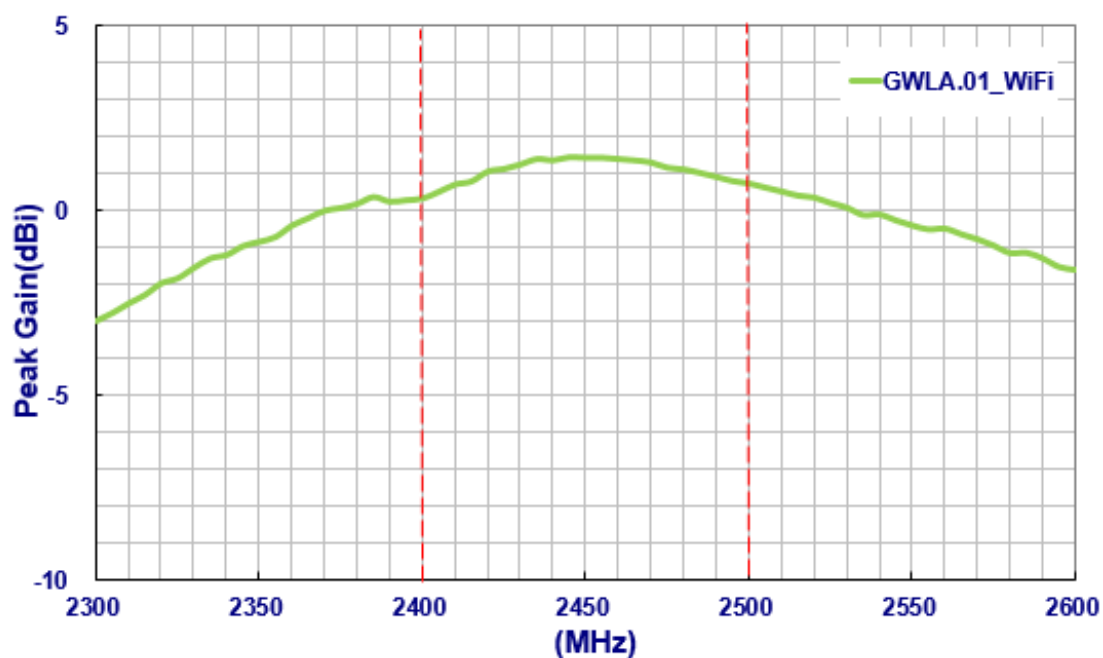
3.4 Return Loss - Wi-Fi



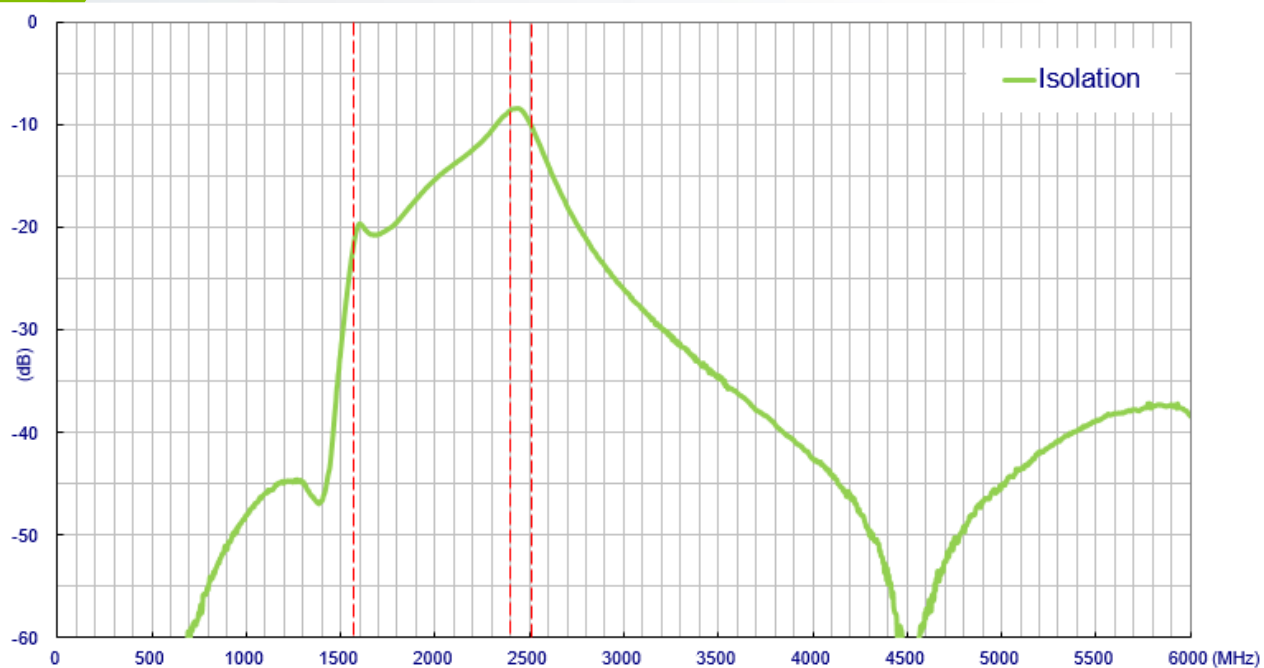
3.5 Efficiency- Wi-Fi Dual-Band



3.6 Peak Gain

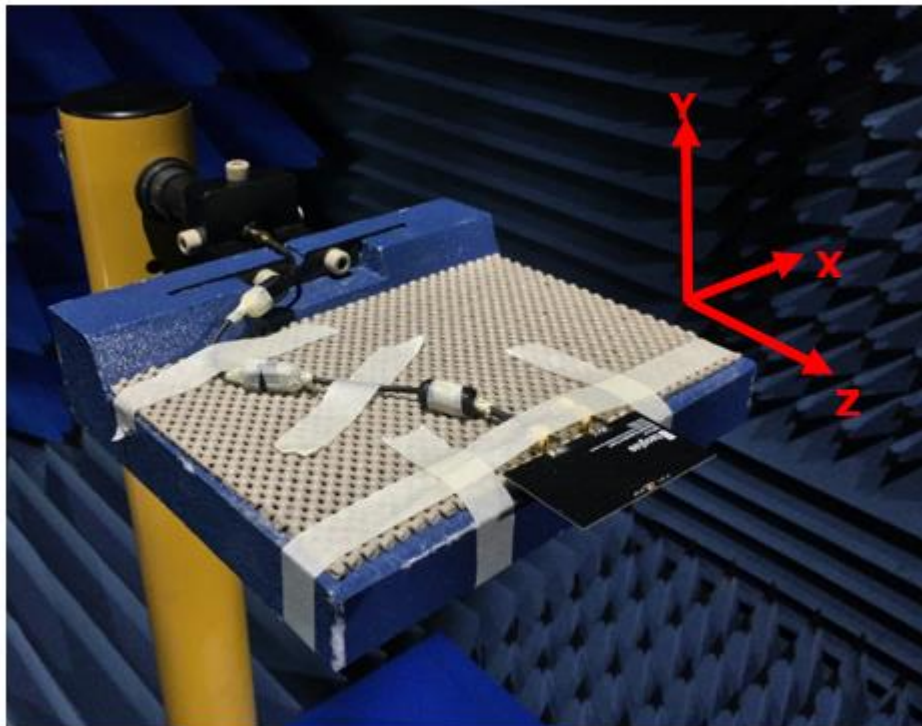


3.7 Isolation between Wi-Fi and GPS/GALILEO Antennas



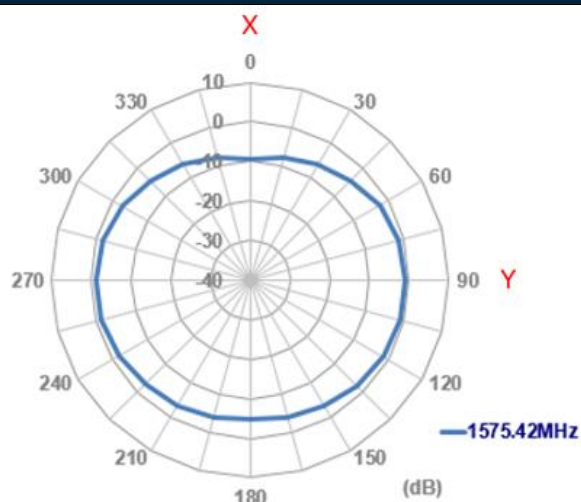
4. 2D Radiation Patterns

4.1 Test Setup

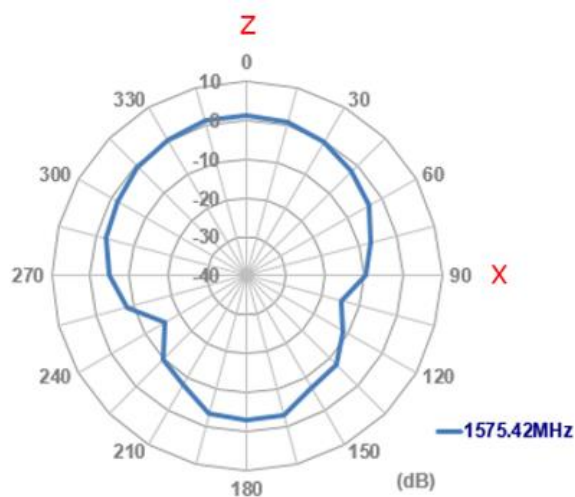


4.2 2D Gain Pattern@ GPS/GALILEO 1575.42MHz

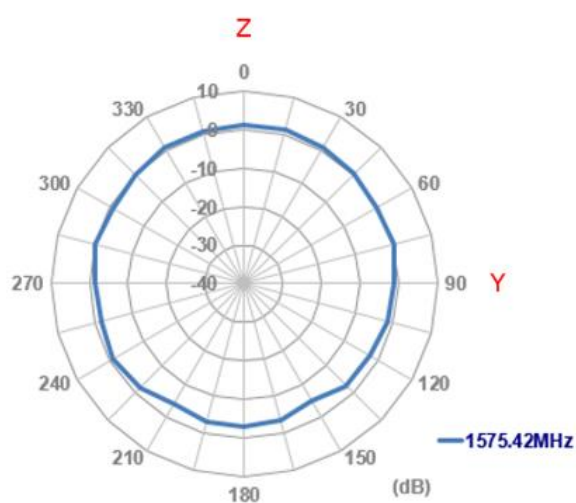
XY Plane



XZ Plane

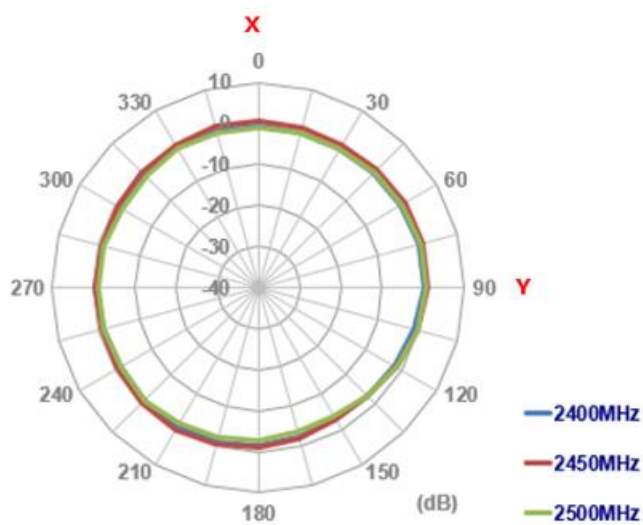


YZ Plane

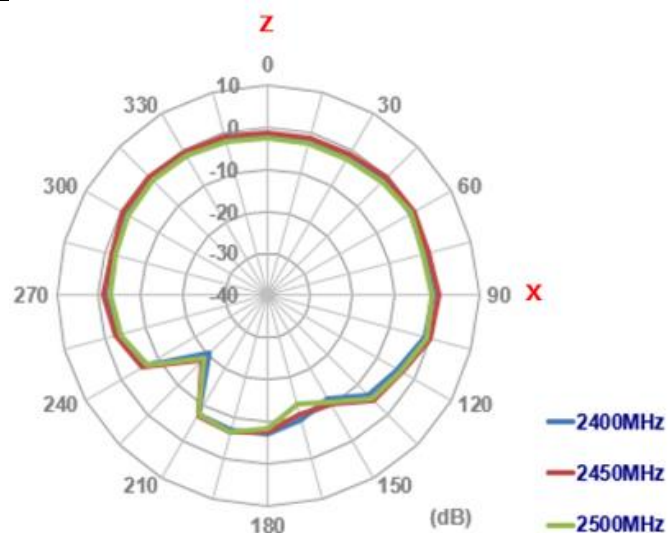


4.3 2D Gain Pattern@ GPS/GALILEO 1575.42MHz

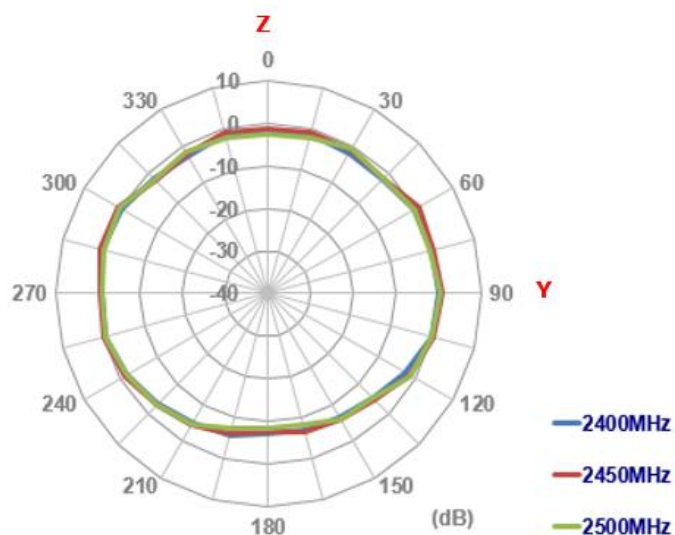
XY Plane



XZ Plane

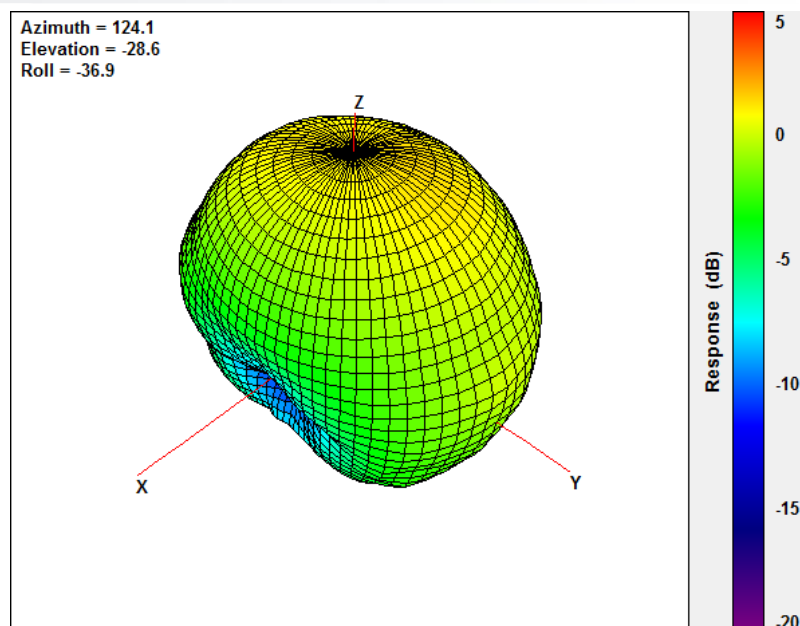


YZ Plane

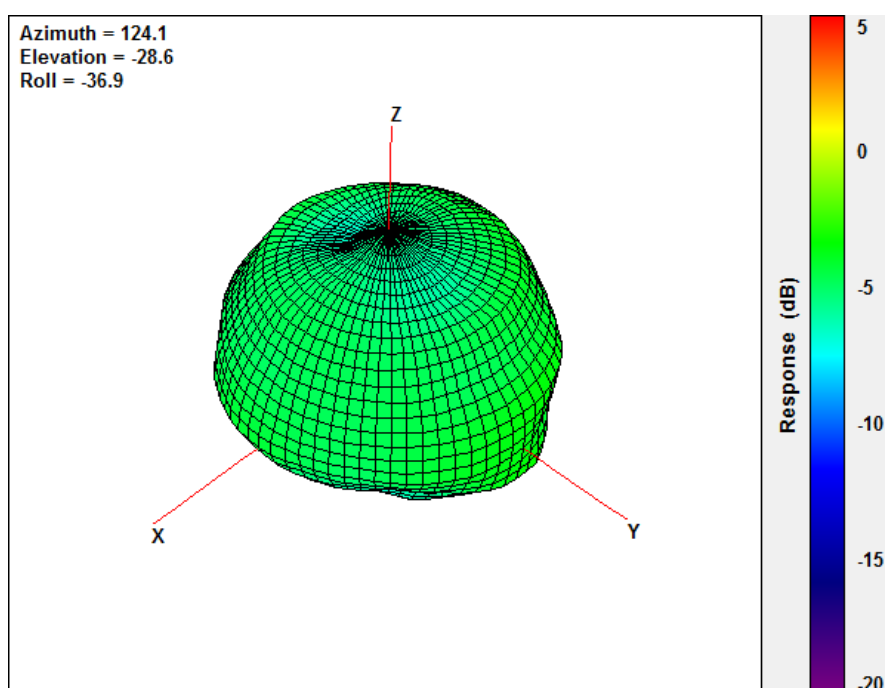


5. 3D Radiation Patterns

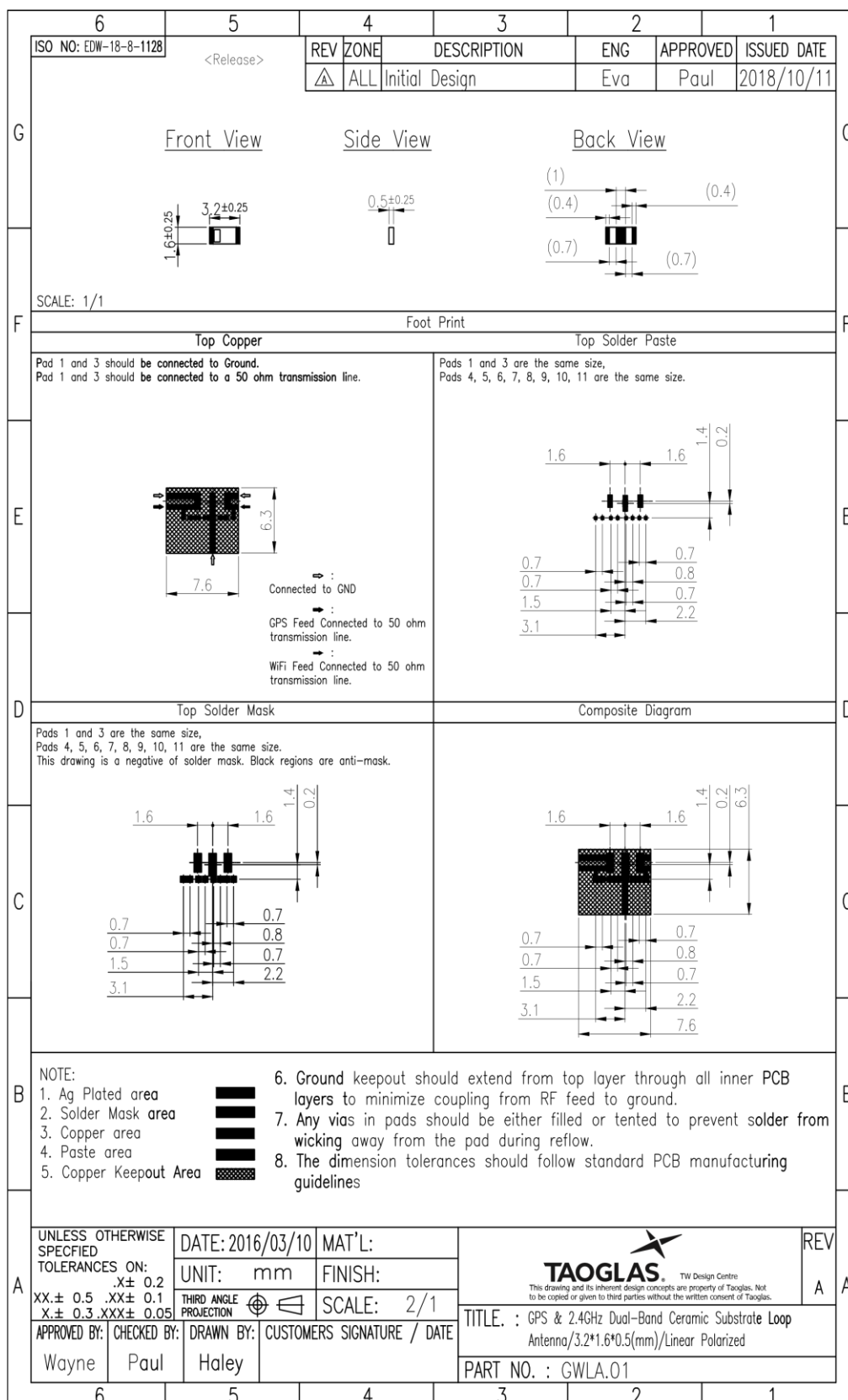
5.1 Gain Pattern@ GPS/GALILEO 1575.42MHz



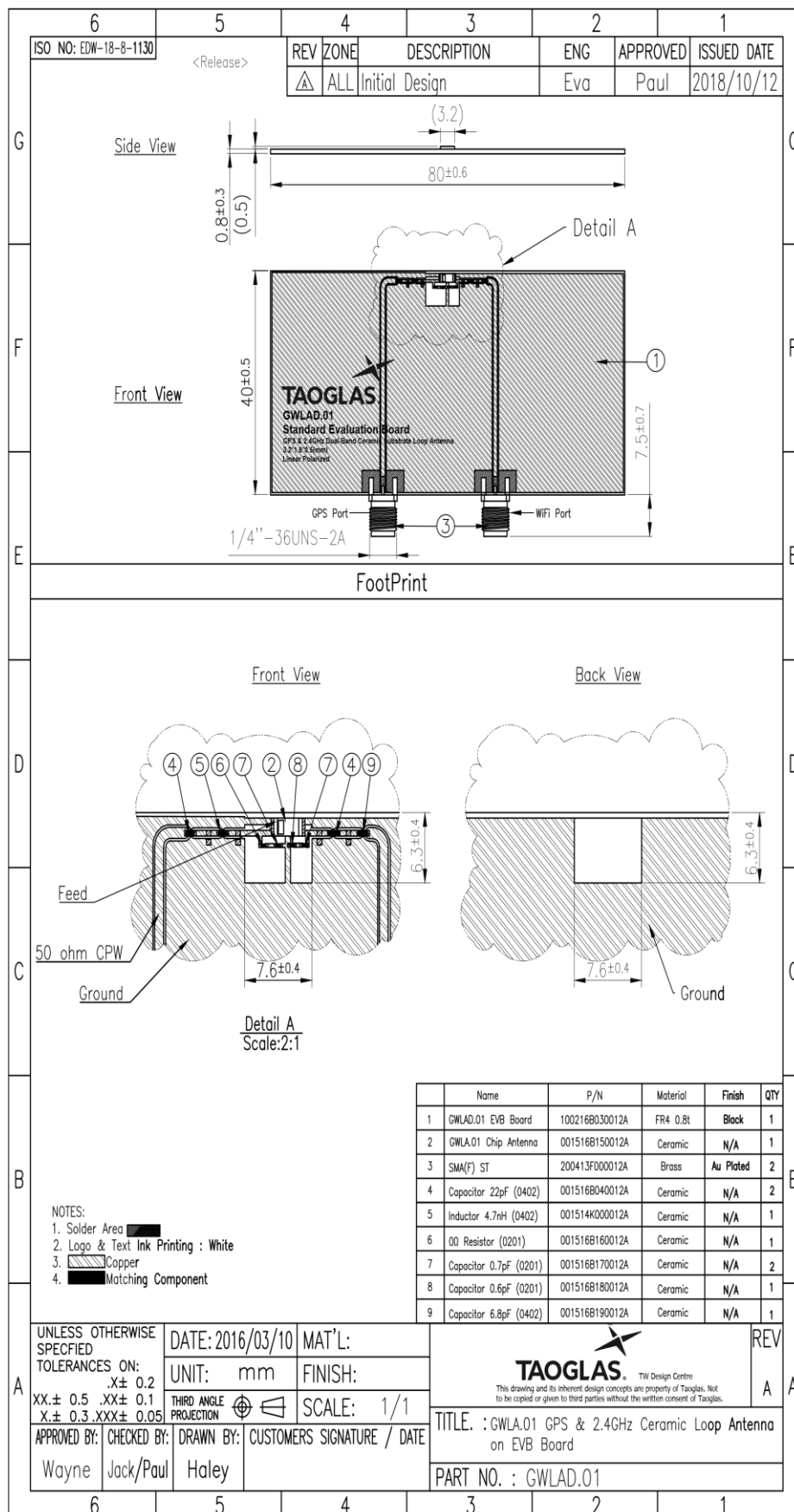
5.2 Gain Pattern@ Wi-Fi Dual Bands



6. Mechanical Drawing (Units: mm)

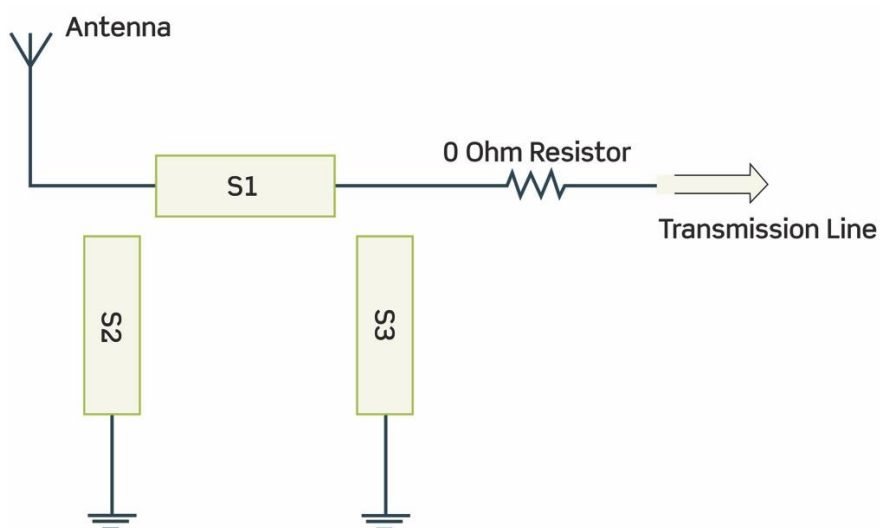


6.2 5.2. GWLAD.01

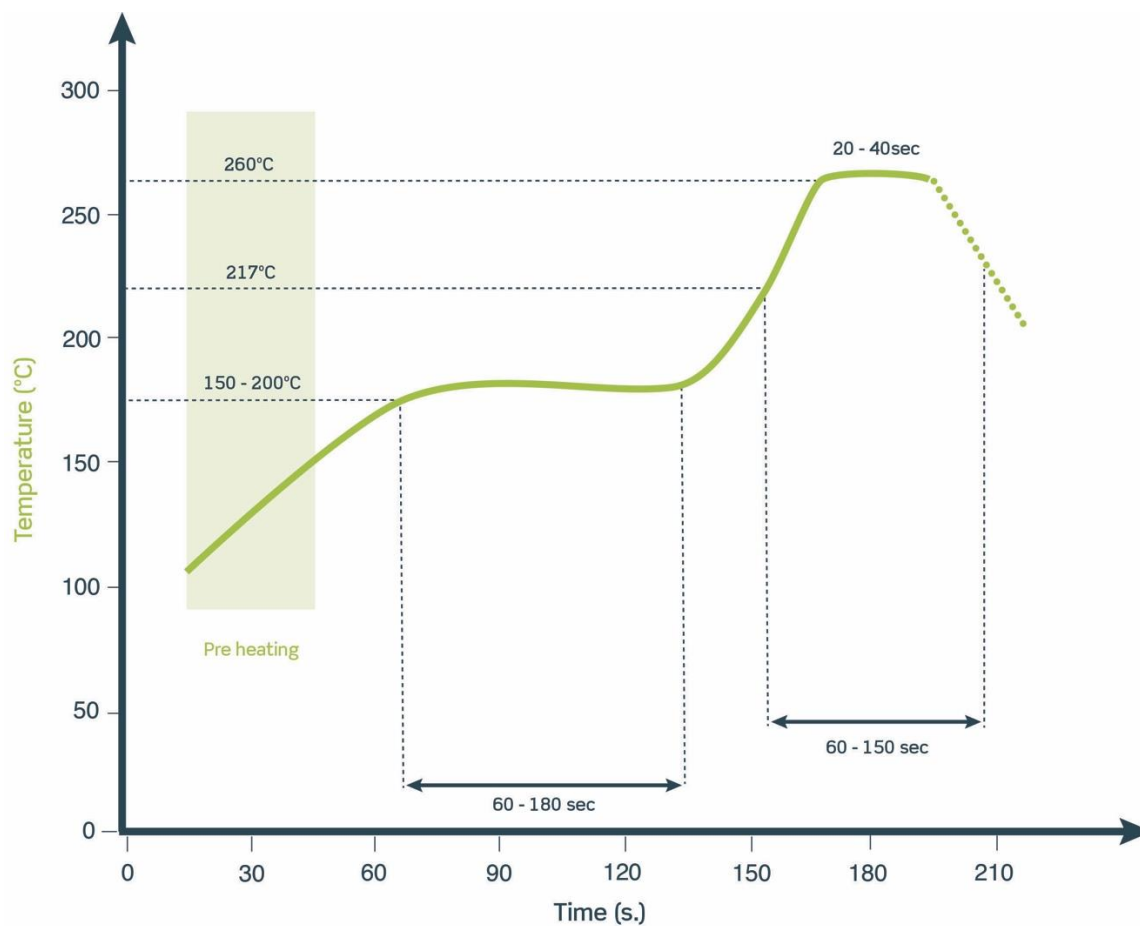


7. Matching Circuit

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 incase adjustments need to be made. The antenna EVB has a similar matching network. The components on the EVB are a good starting point for a new design, but will need to be adjusted upon integration for best performance. The zero ohm resistor is needed to solder down a coax pigtail to make measurements with a vector network analyzer.

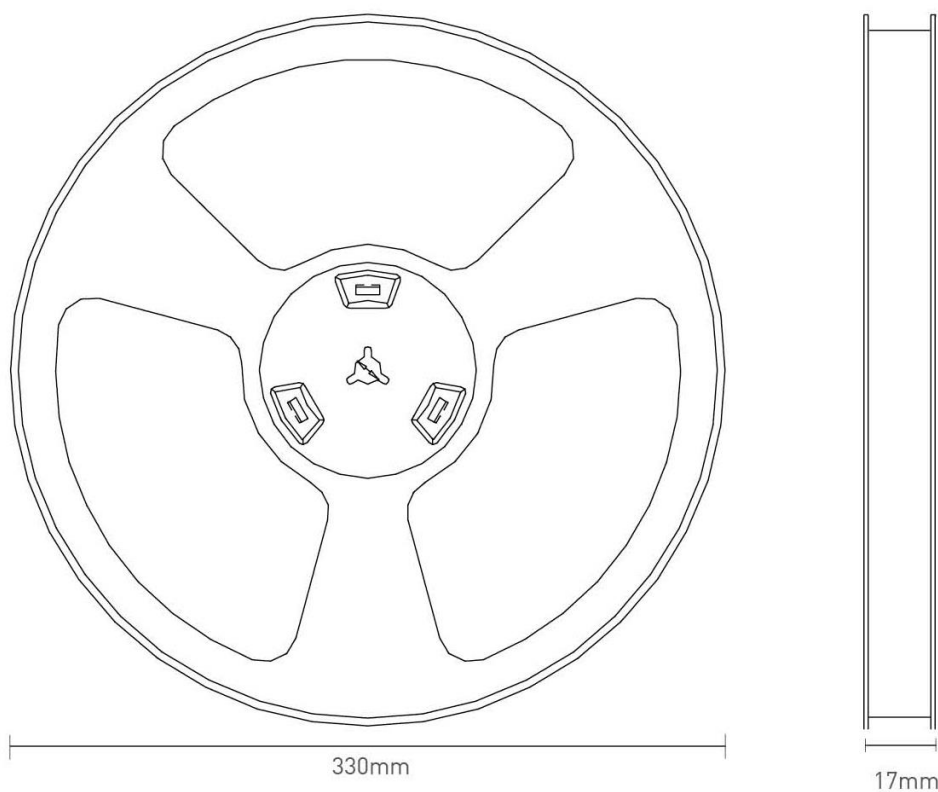


8. Soldering Conditions

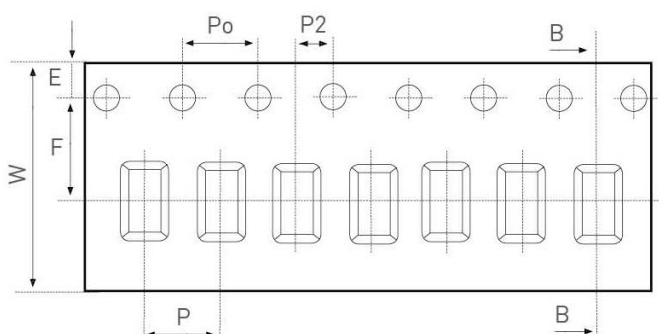


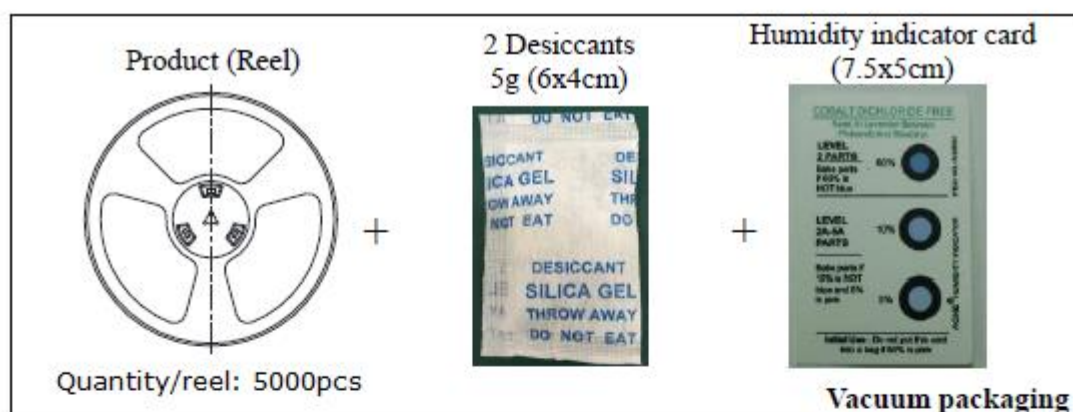
9. Packaging

5000 pcs GWLA.10 per tape & reel
 Dimensions - 330*330*17mm
 Weight - 484g

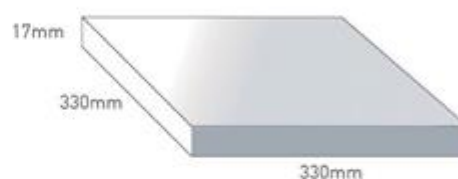


Tape Dimensions (unit: mm)		
Feature	Spec	Tolerances
W	12.00	±0.30
P	4.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
Po	4.00	±0.10
10Po	40.00	±0.10

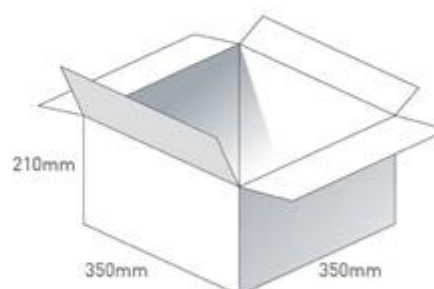




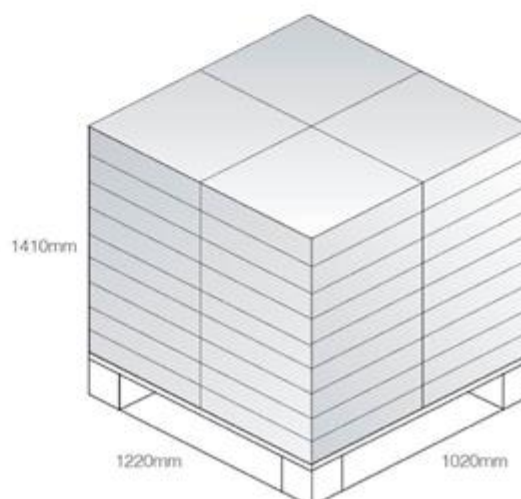
5000 pcs GWLA.01
1 reel in small inner box
Dimensions - 330*330*17
Weight - 484g



9 boxes / 45000 pcs in one carton
Carton Dimensions - 350*350*210mm
Weight - 4.89Kg



Pallet Dimensions 1220*1020*1410mm
36 Cartons per Pallet
4 Cartons per layer
9 Layers



Changelog for the datasheet

SPE-16-8-048– GWLA.01

Revision: B (Current Version)

Date:	2022-06-20
Changes:	Updated Specifications
Changes Made by:	Cesar Sousa

Previous Revisions

Revision: A (Original First Release)

Date:	2017-05-17
Notes:	Initial Specification Release
Author:	Author



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