TAOGLAS

Datasheet

Magma X

Part No:
AA.178.301111

Description:

Magma X IP67 Magnetic Mount GPS L1/L5, External Antenna with 3m RG-174 SMA(M)

Features:

GPS L1 & L5/IRNSS Band Operation
Magnetic Mount
Low Noise Figure
Excellent Out-Of-Band Rejection
Low Axial Ratio
Cable: 3m RG-174
Connector: SMA(M)
RoHS & Reach Compliant

1. Introduction

The Taoglas Magma X AA.178.301111 is an active, external magnetic mount, GPS antenna supporting both L1 and L5 bands. The L5 band also operates at the same frequency as IRNSS, so the Magma X can be used to operate on this constellation. It is a dual-band, high performance, economical solution for the highest accuracy centimeter-level tracking applications.

Typical applications include:

- RTK Applications
- Precision Agriculture
- Navigation

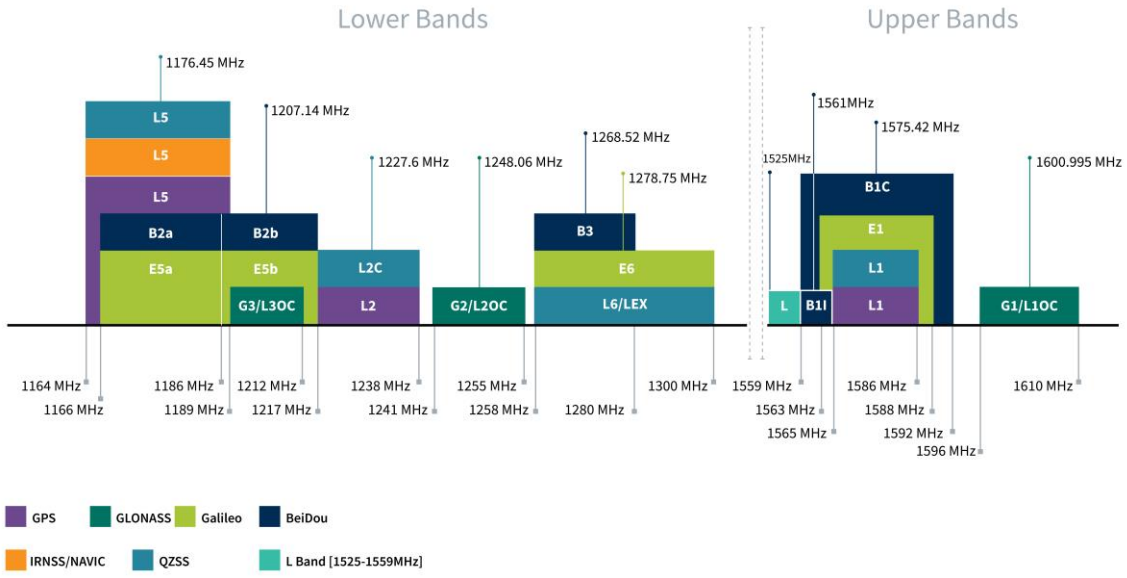
This compact antenna exhibits excellent radiation patterns on both L1 and L5 bands and with a low noise figure to preserve signal quality helps minimize time to first fix. It also features excellent out-of-band rejection to prevent out-of-band signals from overdriving or damaging its LNAs.

This antenna has been tuned and tested on a 70 x 70 mm ground plane, working at GPS L1, 1575.42 MHz and IRNSS / L5, 1176MHz, with a 2 stage LNA ensuring good signal strength. It can operate with an input voltage ranging from 1.8 to 5 volts.

Cable length and connectors are fully customizable. Contact your regional Taoglas customer support team to request these services or additional support to integrate and test this antenna's performance in your device.

2. Specifications

GNSS Frequency Bands					
GPS	L1 1575.42 MHz	L2 1227.6 MHz	L5 1176.45 MHz		
	■	□	■		
GLONASS	G1 1602 MHz	G2 1248 MHz	G3 1207 MHz		
	□	□	□		
Galileo	E1 1575.24 MHz	E5a 1176.45 MHz	E5b 1201.5 MHz	E6 1278.75 MHz	
	■	■	□	□	
BeiDou	B1C 1575.42 MHz	B1I 1561 MHz	B2a 1176.45 MHz	B2b 1207.14 MHz	B3 1268.52 MHz
	■	■	■	□	□
L-Band	L-Band 1542 MHz				
	□				
QZSS (Regional)	L1 1575.42 MHz	L2C 1227.6 MHz	L5 1176.45 MHz	L6 1278.75e6	
	■	□	■	□	
IRNSS (Regional)	L5 1176.45 MHz				
	■				
SBAS	L1/E1/B1 1575.42 MHz	L5/B2a/E5a 1176.45 MHz	G1 1602 MHz	G2 1248 MHz	G3 1207 MHz
	■	■	□	□	□



GNSS Bands and Constellations

GNSS Electrical		
Frequency (MHz)	**1176.45**	**1575.42**
VSWR	<2	<2
Efficiency (%)	62.25	55.28
Peak Gain (dBi)	1.1	1.36
Average Gain (dB)	-2.06	-2.57
Axial Ratio at Zenith	1.74	1.70
Polarization	RHCP	
Impedance	50 Ω	

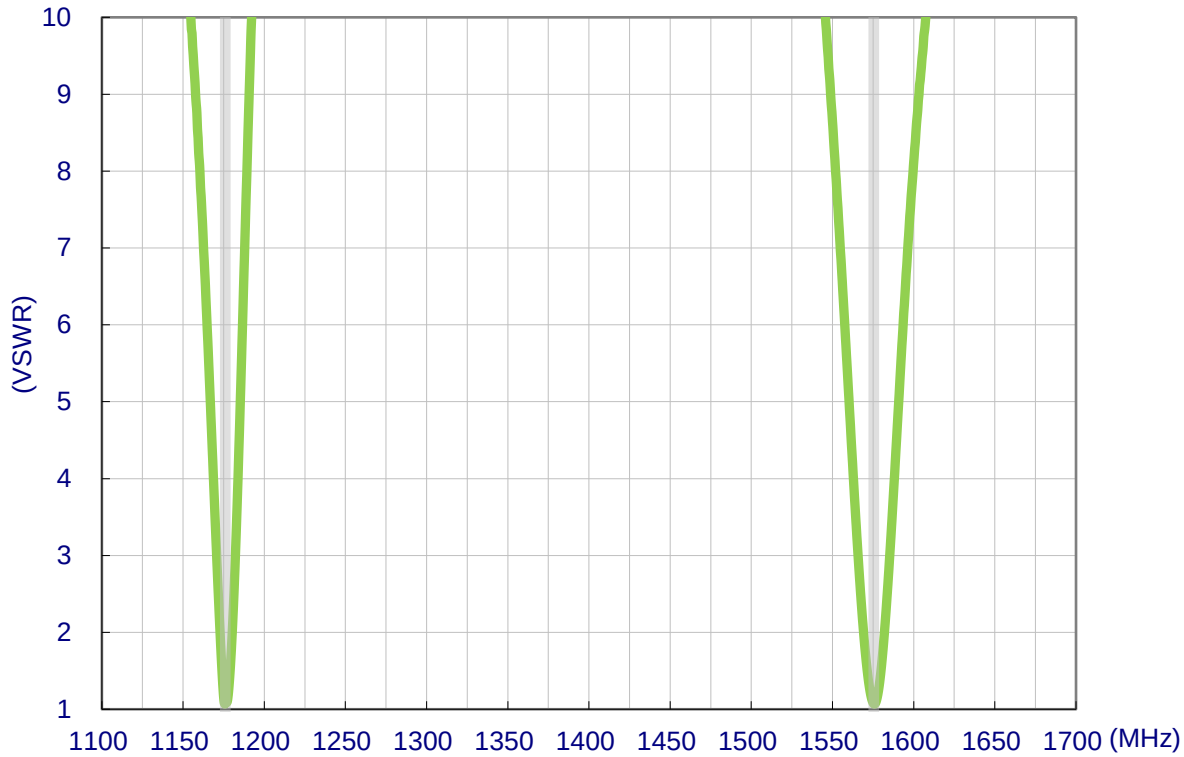
LNA and Filter Electrical Properties		
Frequency (MHz)	**1176.45**	**1575.42**
Compression Point 1dB Gain	0	2
Return Loss (dB)	10	10
Gain@1.8V (Typ.) (dB)	11	11
Gain@3.0V (Typ.) (dB)	19	18
Gain@5.5V (Typ.) (dB)	25	22
Noise@3.0V (Typ.) (dB)	1.5	1.4
Power consumption@3.0V (Typ.)	12mA	
Output Impedance	50 Ω	

Mechanical	
Housing Dimensions	49.8*52.4*17.1mm
Housing Material	ABS
Cable	3m RG-174 (fully customizable)
Connector	SMA(M) (fully customizable)
Waterproof	IP67
Weight	98g
Magnetic Pull Force	Pull horizontal max pull force(kgf): 0.52 Pull vertical max pull force(kgf): 0.48

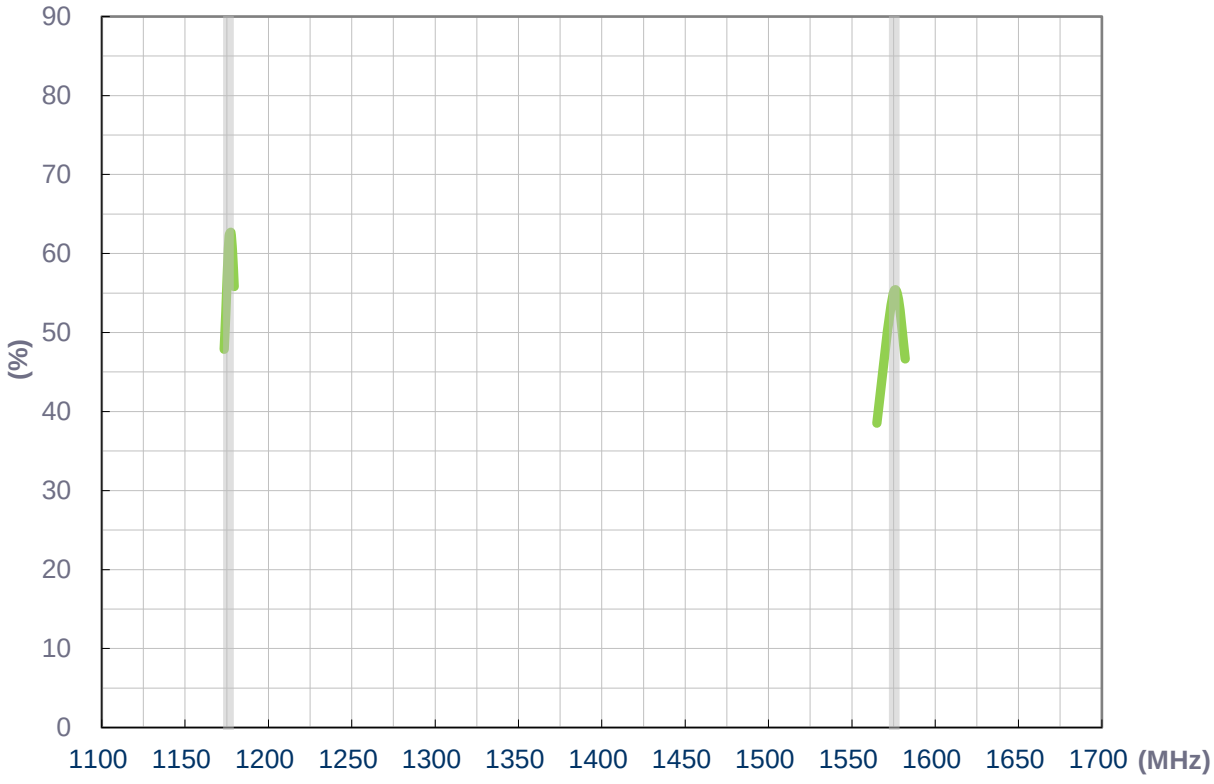
Environmental	
Operation Temperature	-40°C ~ +85°C
Storage Temperature	-40°C ~ +90°C
Humidity	Non-condensing 65°C 95% RH

3. Antenna Characteristics

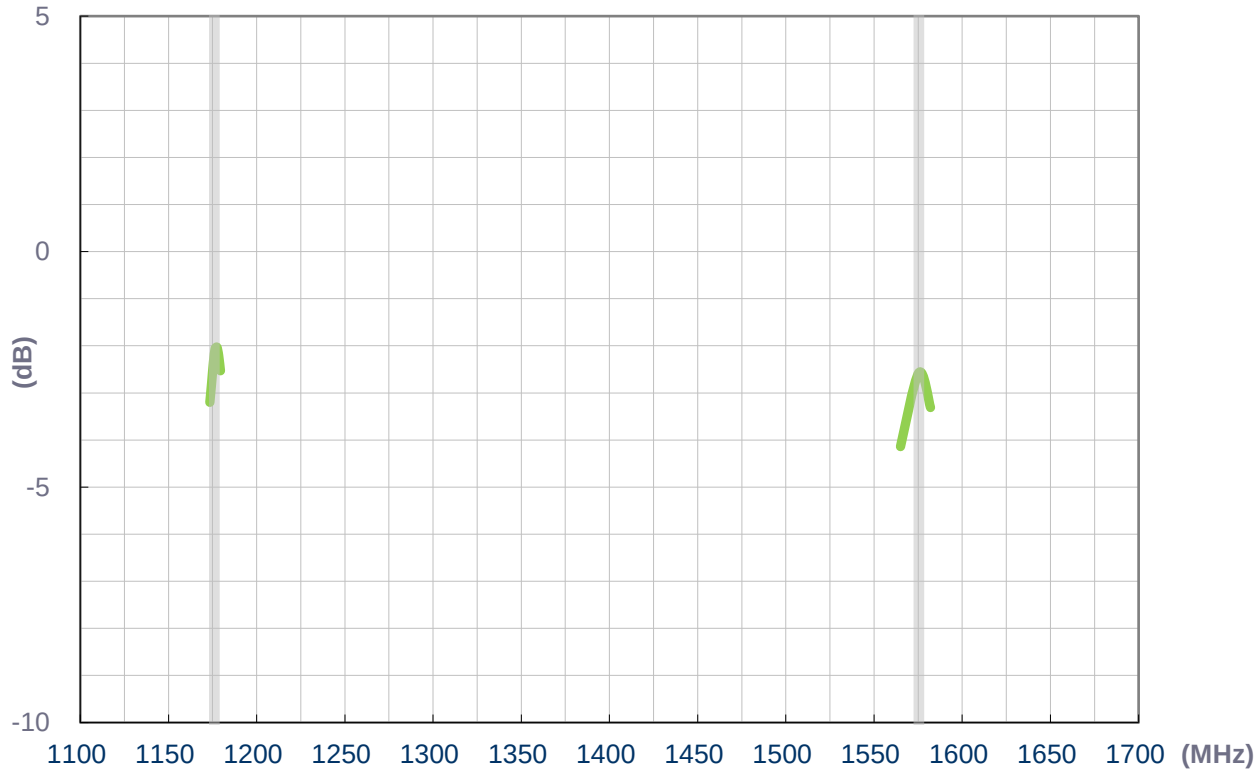
3.1 VSWR



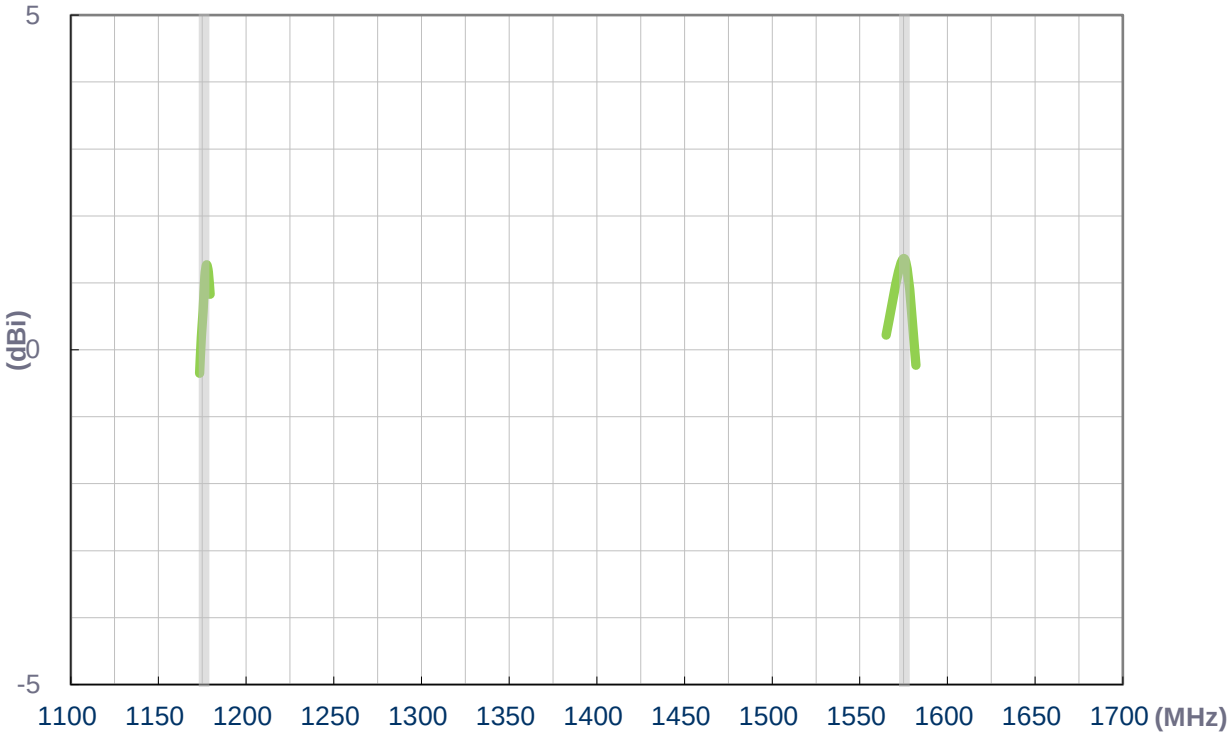
3.2 Efficiency



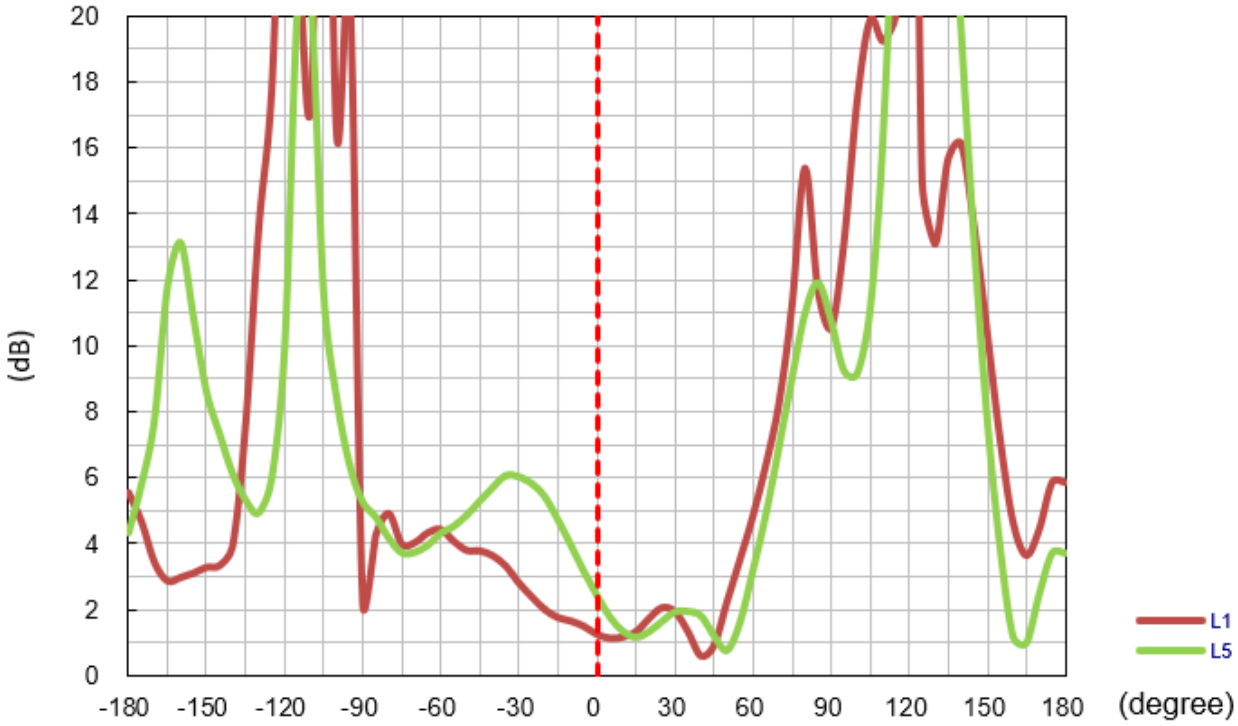
3.3 Average Gain



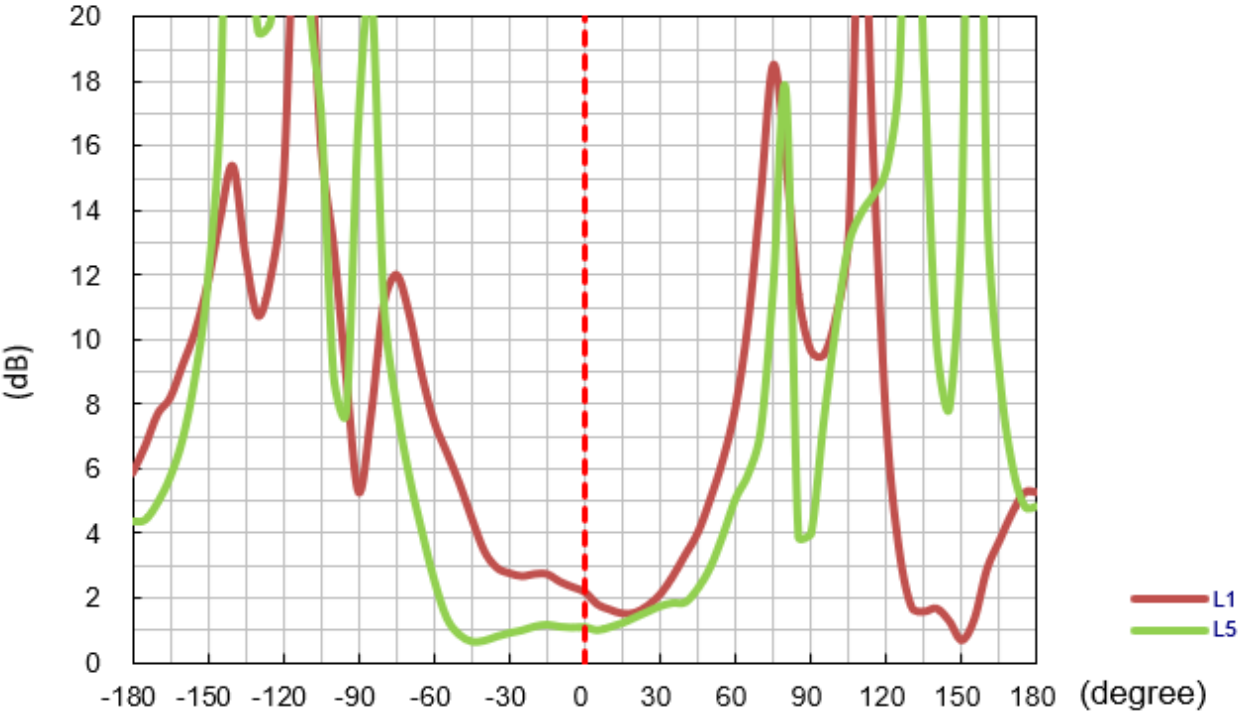
3.4 Peak Gain



3.5 Axial Ratio XZ

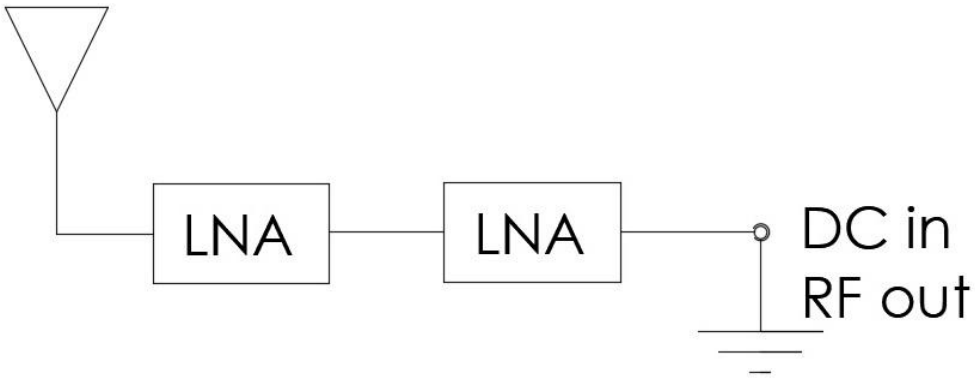


3.6 Axial Ratio YZ

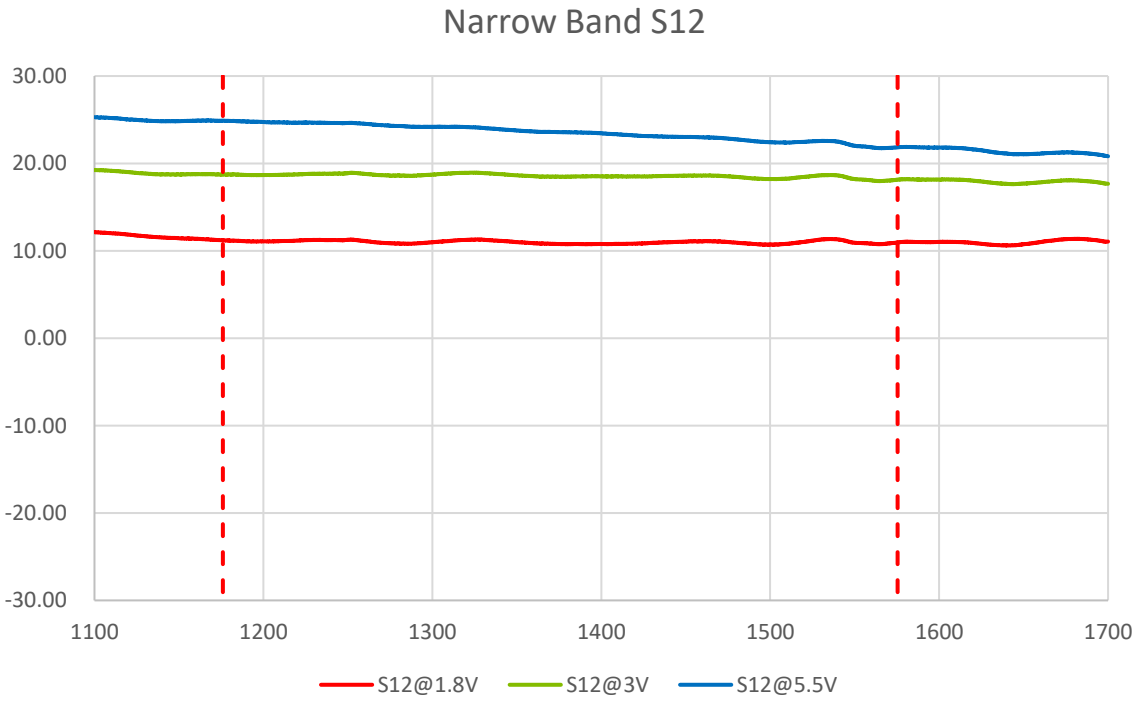


4. Active Antenna Characteristics

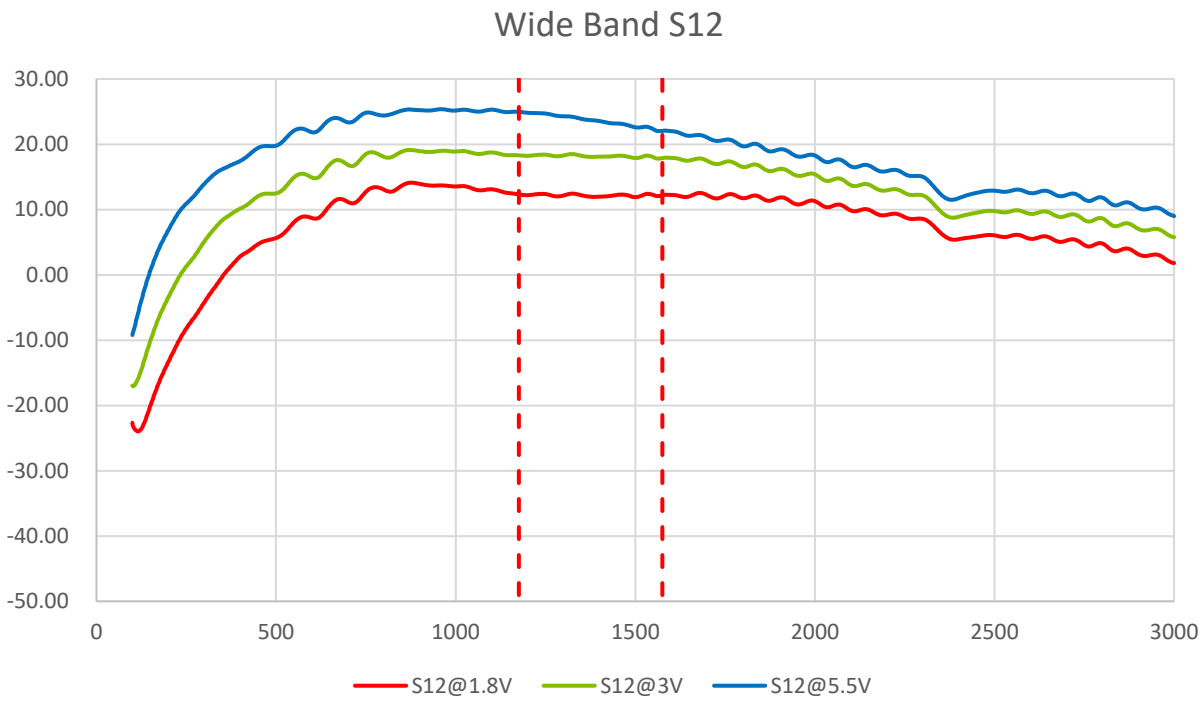
4.1 LNA Block Diagram



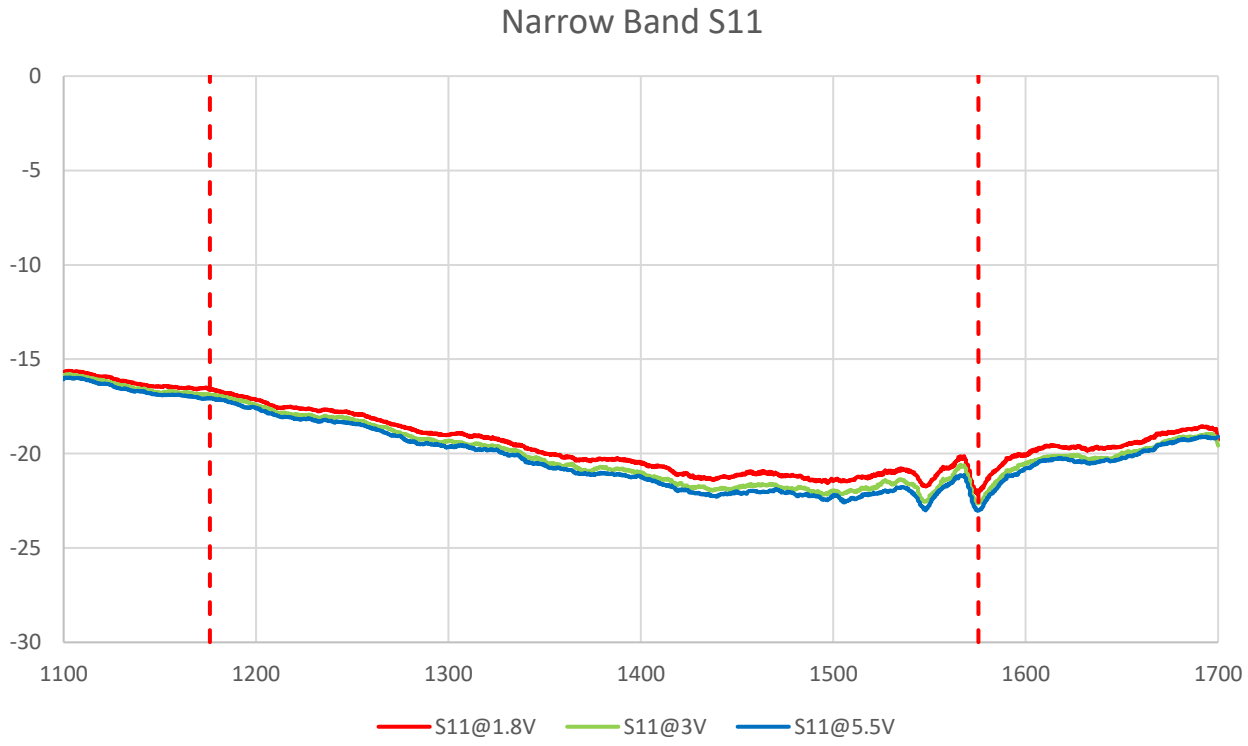
4.2 LNA Gain Narrow Band



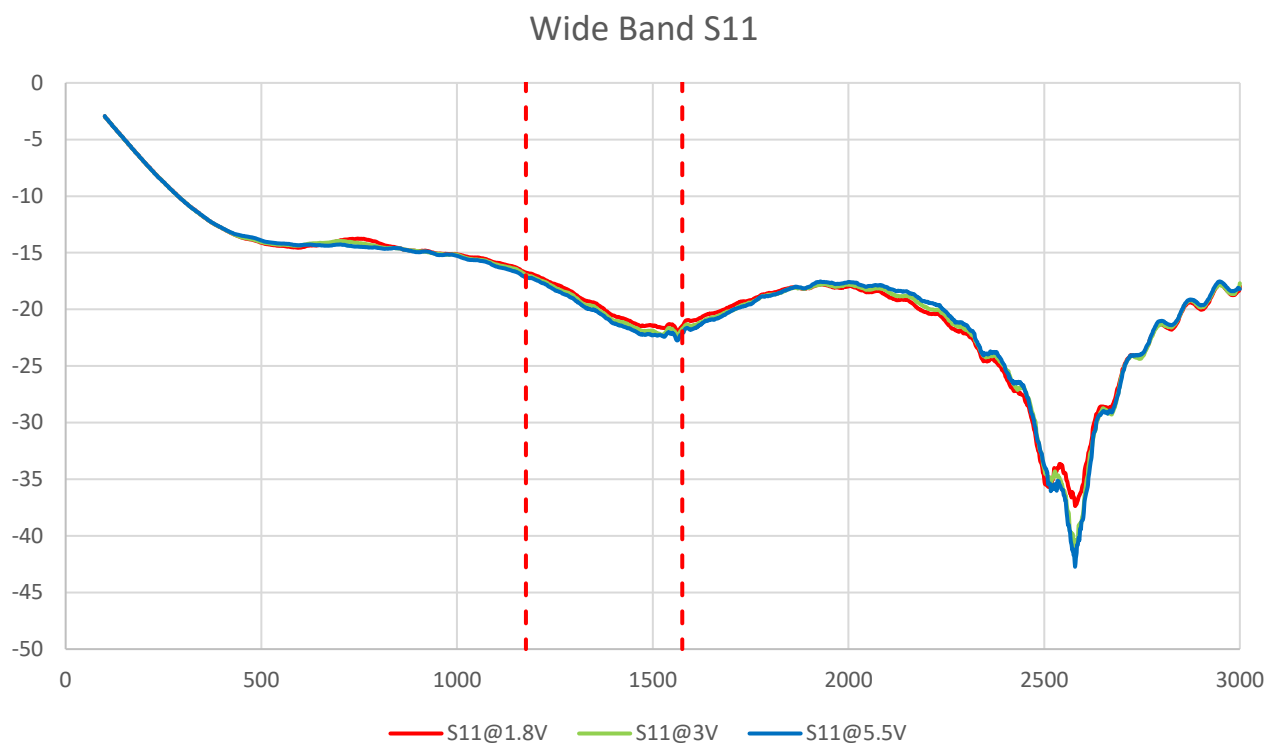
4.3 LNA Gain Wide Band



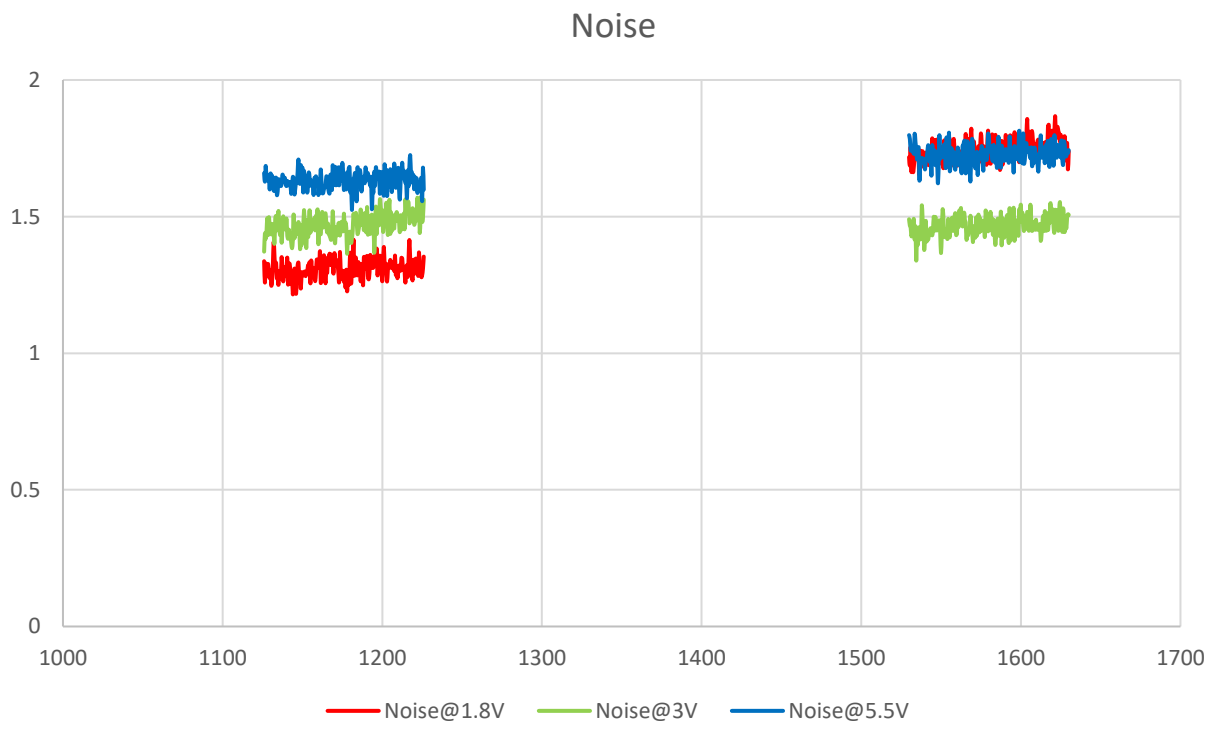
4.4 S11 Narrow Band



4.5 S11 Wide Band

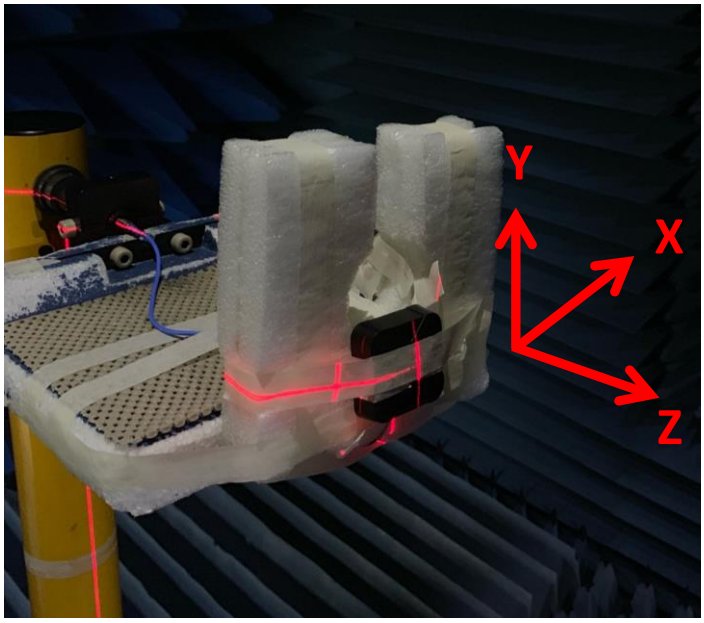


4.6 LNA Noise Wide Band



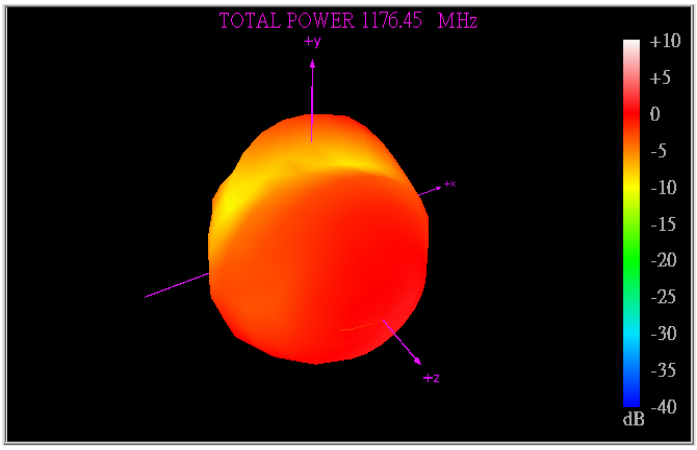
5. Radiation Patterns

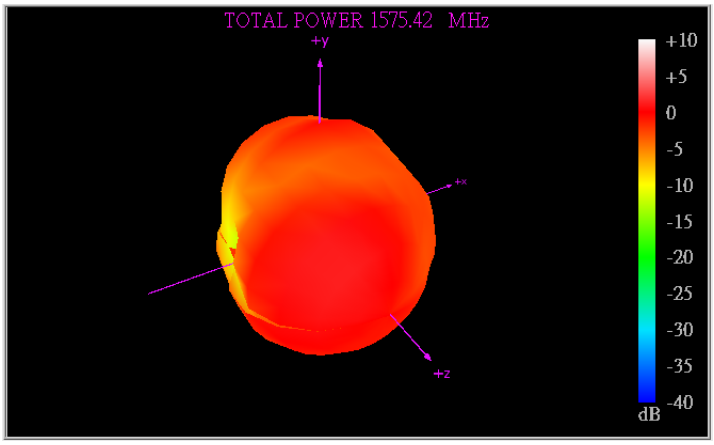
5.1 Test Setup



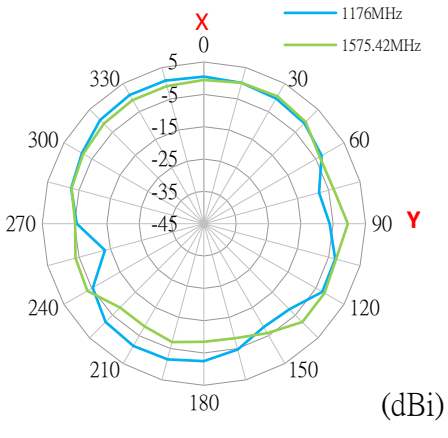
5.2 3D and 2D Radiation Patterns

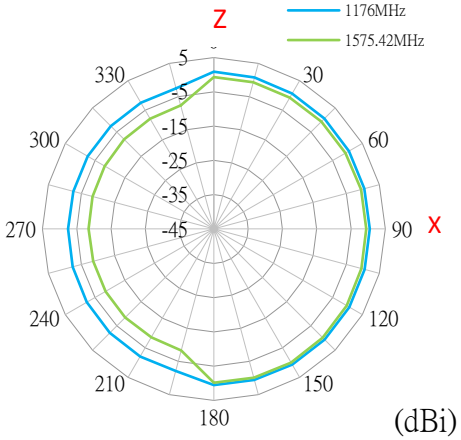
1176.45MHz	1575.42MHz

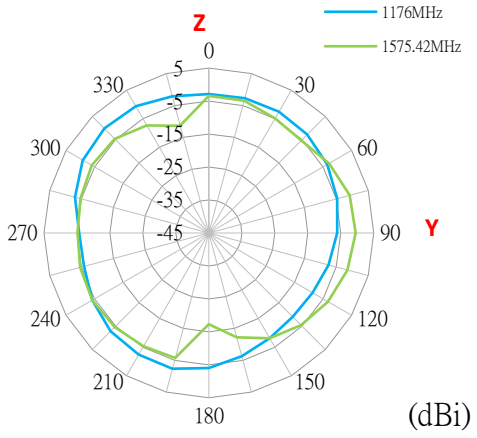




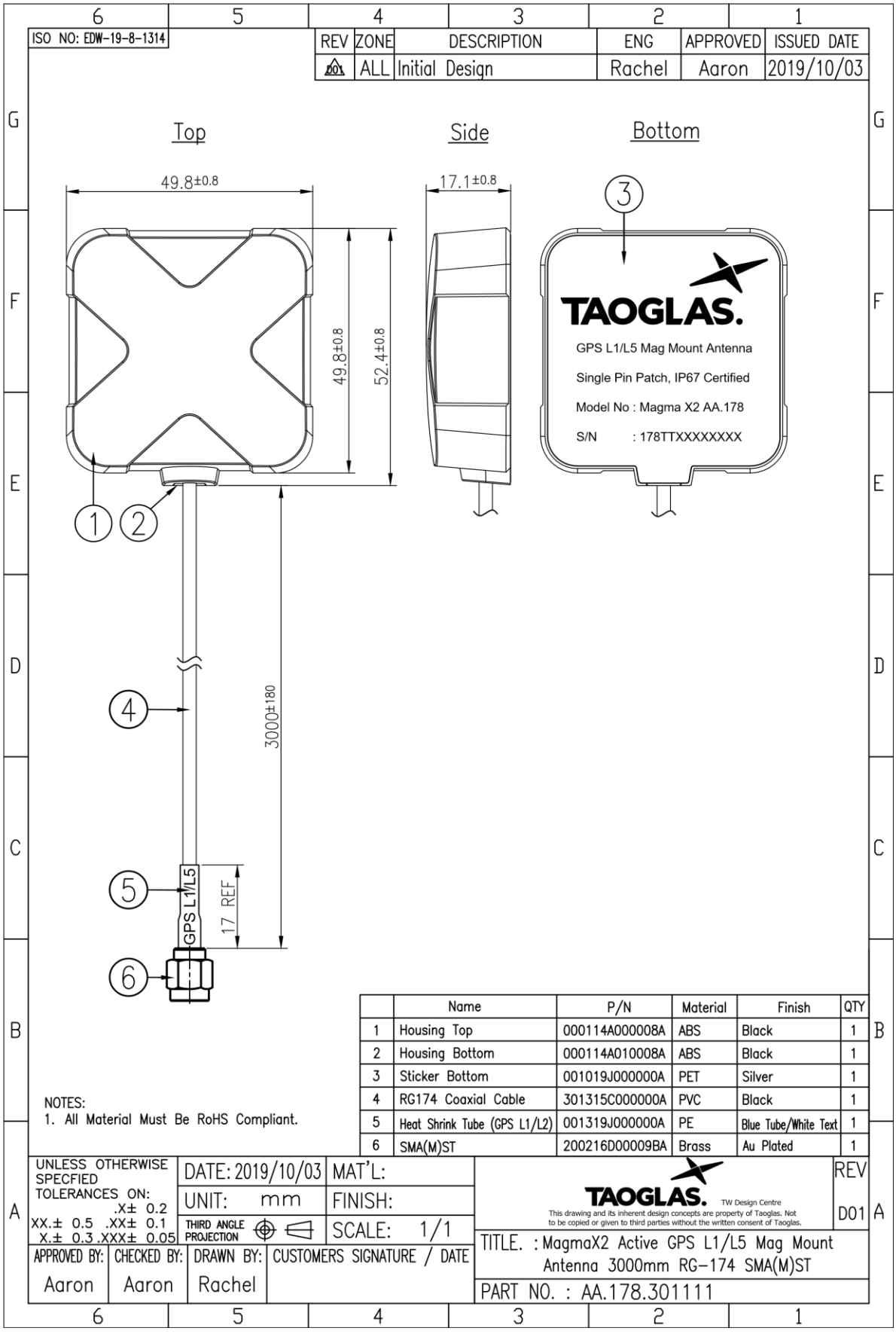
XY Plane	XZ Plane	YZ Plane



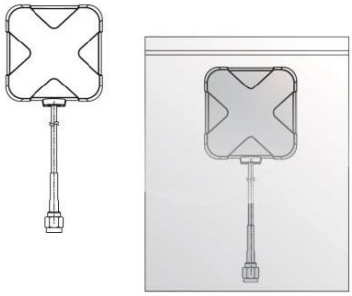




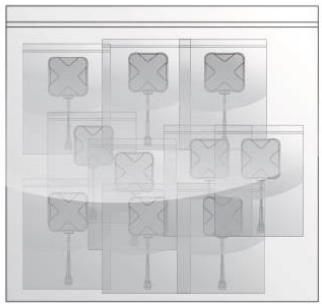
6. Mechanical Drawing (Units: mm)



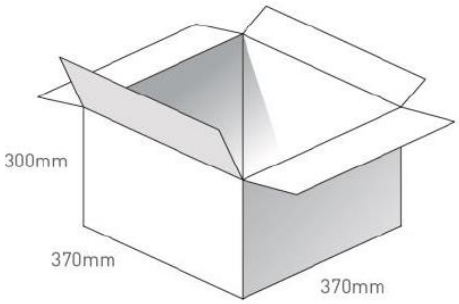
7. Packaging



1 pcs AA.178.301111 per PE Bag
SPQ: 10pcs AA.178.301111 PE Bag
Weight: 1.1Kg



100pcs AA.178.301111 per Carton
Carton Dimensions-370*370*300mm
Weight: 10.3Kg



Changelog for the datasheet

SPE-20-8-089 – AA.178.301111

Revision: C (Current Version)	
Date:	2023-07-07
Changes:	Updated GNSS Frequency Bands Table.
Changes Made by:	Gary West

Previous Revisions

Revision: B	
Date:	2022-02-22
Changes:	Updated GNSS Bands & Constellations Graphics
Changes Made by:	Cesar Sousa

Revision: A (Original First Release)	
Date:	2020-08-14
Notes:	Initial Release
Author:	Jack Conroy

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