

## Specification

Part No.	:	<b>AQHA.50.A.301111</b>
Product Name	:	GPS L1/L2/L5 Active Antenna
Features	:	Permanent Mount GPS L1/L2/L5 Active Antenna Gain (18dB~27dB) IP-67 Waterproof 3M RG-174 Outline Size $\varnothing 94.3 \times 57.4 \text{mm}$ SMA(M)ST RoHS Compliant



## 1. Introduction

Our AQHA.50.A.301111 L1/L2/L5 GPS active antenna is a permanent Mount antenna and has been carefully designed to work well on L1/L2/L5 bands, leading to higher location accuracy and stability of tracking in urban environments. The quad helix antenna has an even gain across the top hemisphere giving almost perfect axial ratio making it resilient across multipath rejection. The torpedo provides excellent positioning stability. The robust, screwmount IP67 rated housing provides easy installation and can be mounted on any surface. The AQHA.50.A.301111 and is the latest external addition to an ongoing product road map of high precision antennas by Taoglas.

Typical Applications Include:

- Autonomous Driving
- Precision Positioning for Robotics
- Precisions Agriculture
- Inventory Management & Container tracking
- Telematics
- Timing

For RTK applications when used on the base and/or the rover, the AQHA.50 can achieve genuine centimetre level accuracy.

Cable and connectors are customizable. Please contact your regional Taoglas office for support.

## 2. Electrical Specifications

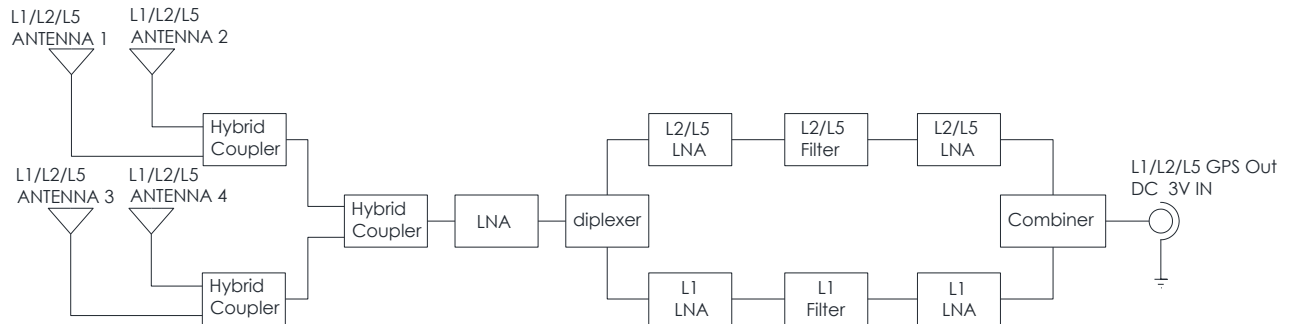
PCB ANTENNA Specification			
Frequency	1176MHz	1227MHz	1575.42MHz
Impedance	50Ω	50Ω	50Ω
Return Loss	< -10	< -10	< -10
Axial ratio	1.2@ 0°	1.0@ 210°	0.5@ 210°
Peak Gain @ Zenith 30cm*30cm	1.6dB	3.5dB	0.8dB
Impedance	50Ω		
Polarization	RHCP		

### Not with cable loss

LNA Specification			
Frequency	1176MHz	1227MHz	1575.42MHz
Impedance	50Ω		
Return Loss	< -10	-5 typ.	< -10
Gain @3.0V	24dB typ.	18dB typ.	27dB typ.
DC Power Input	3.0V typ.		
Noise Figure	2.4dB Typ.	2.1dB Typ.	1.8dB Typ.
Power Consumption	21mA Typ.		
Operating temp	-30°C ~ +80°C		
Storage Temp	-30°C ~ +80°C		

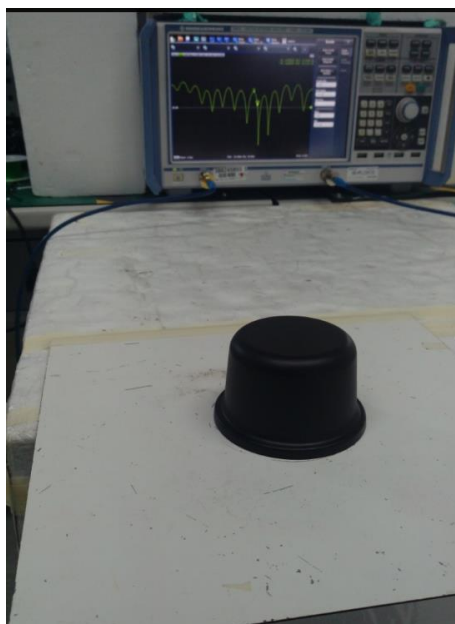
## 3. Antenna Characteristics

### 3.1 Block Diagram (Active antenna)



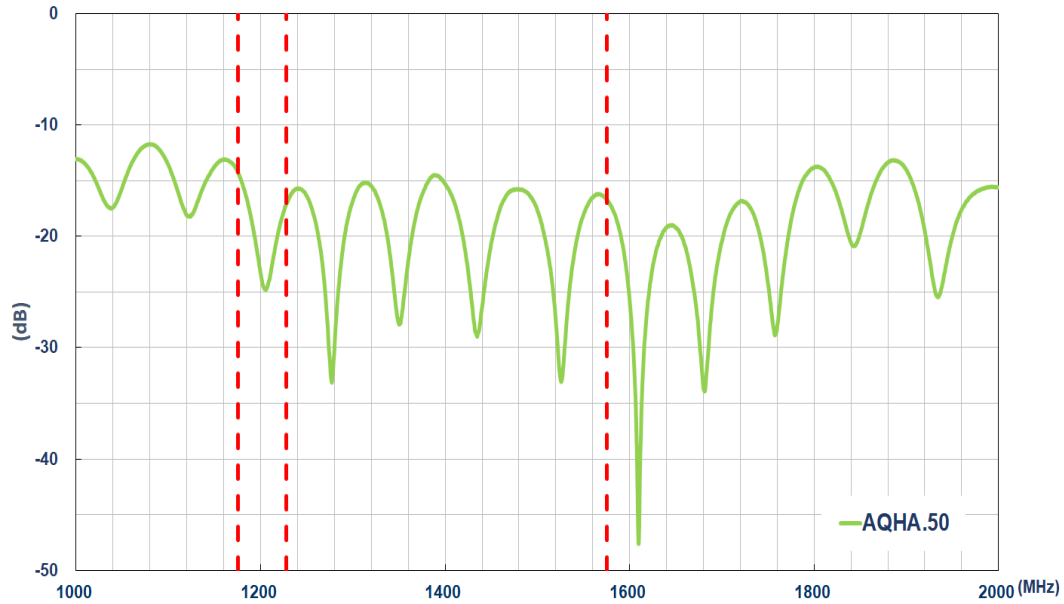
## 4. Antenna Characteristics

### 4.1 Testing setup

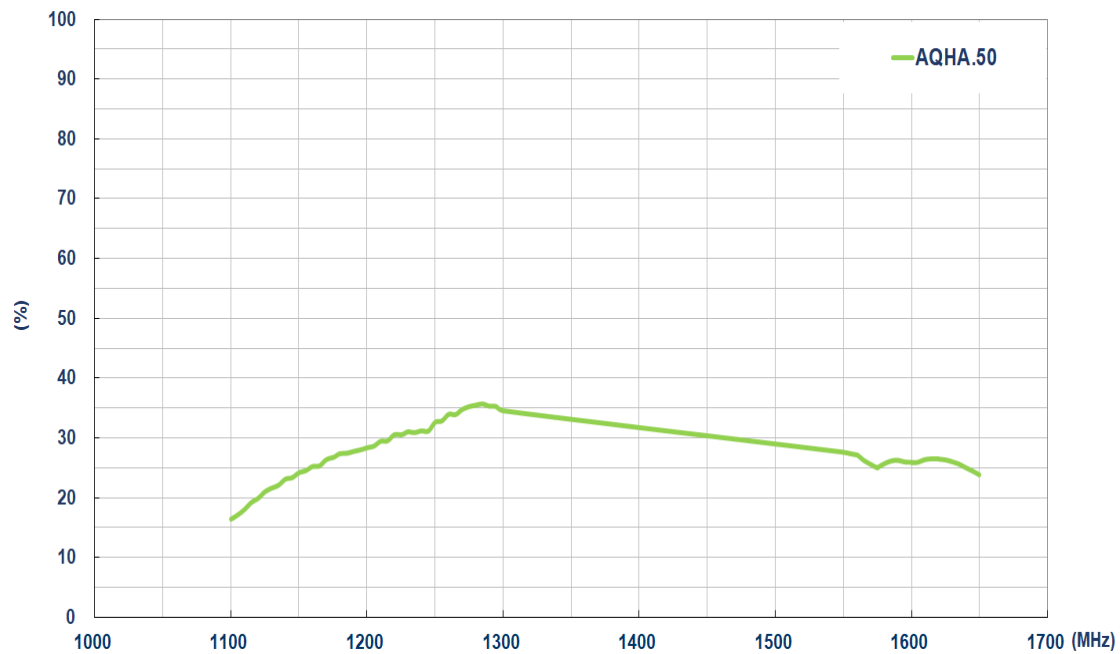


On 30x30cm round plane

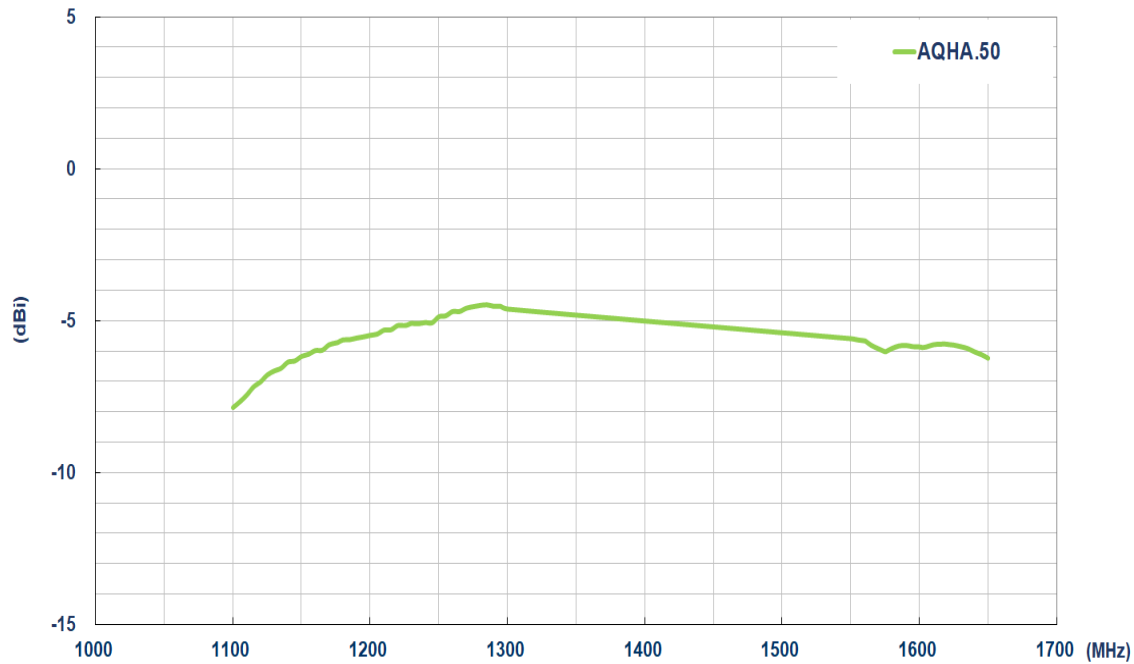
## 4.2 Return Loss (Passive antenna)



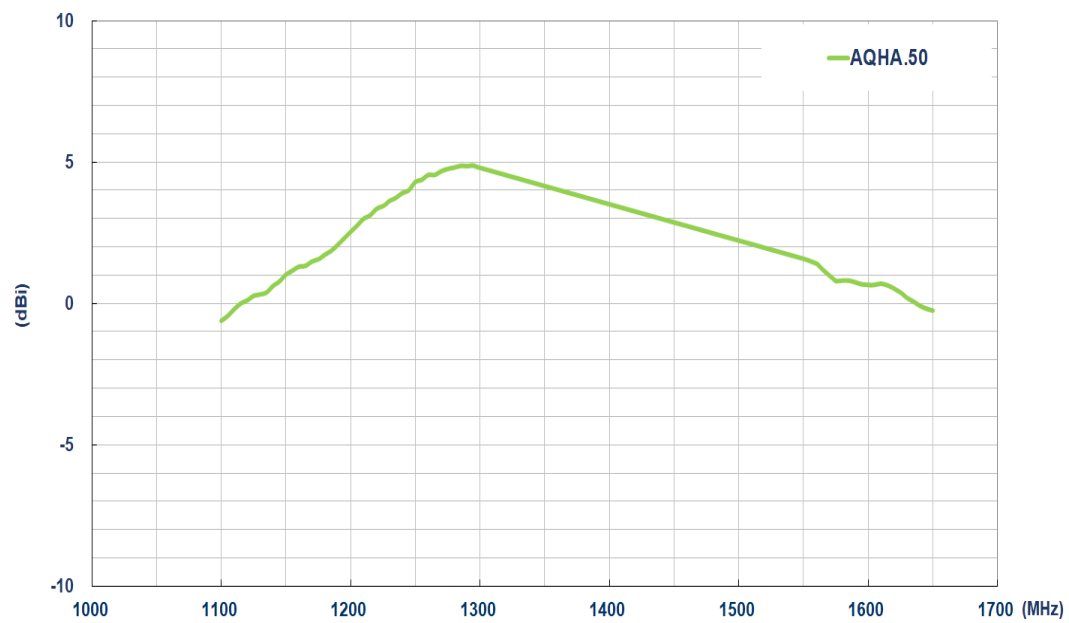
## 4.3 Efficiency



## 4.4 Average Gain

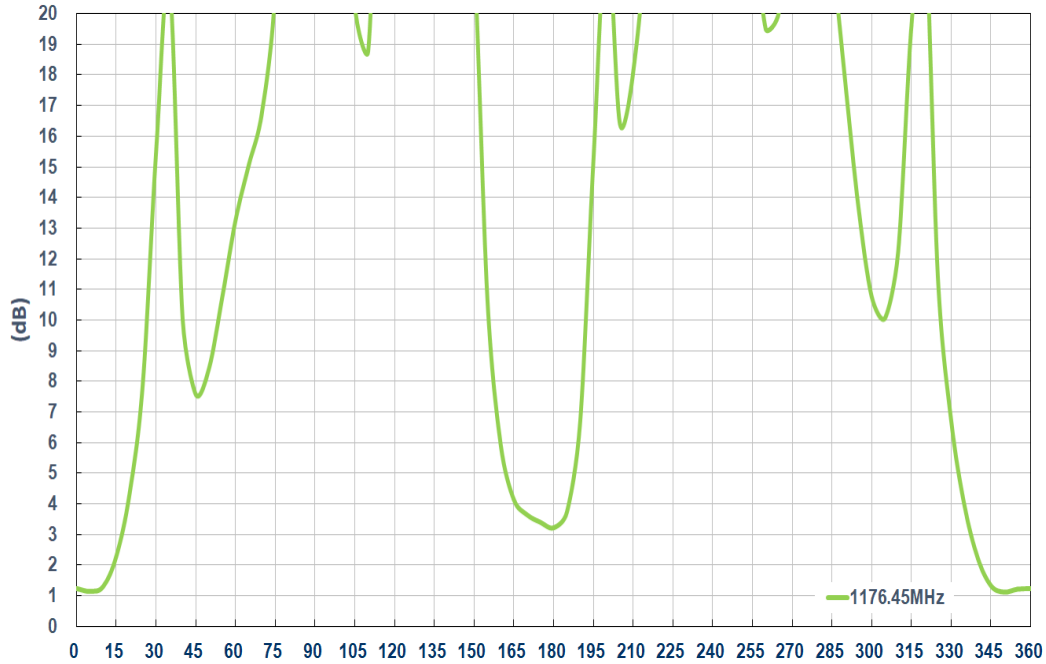


## 4.5 Peak Gain

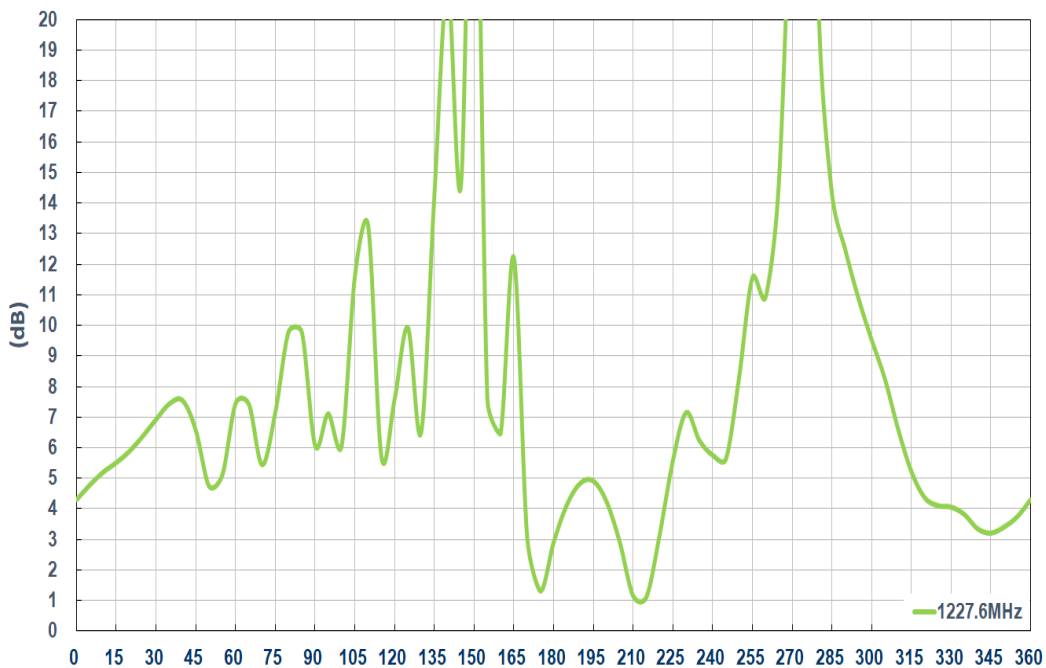


## 4.6 Axial ratio

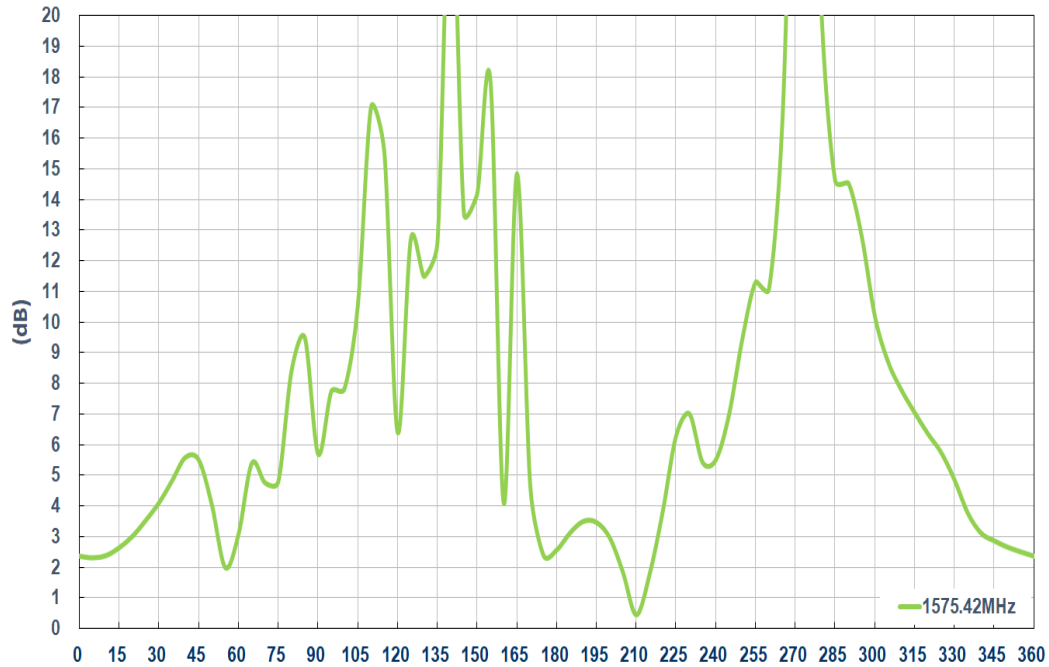
**(X-Z cut)@1176MHz**



**(X-Z cut)@1227MHz**

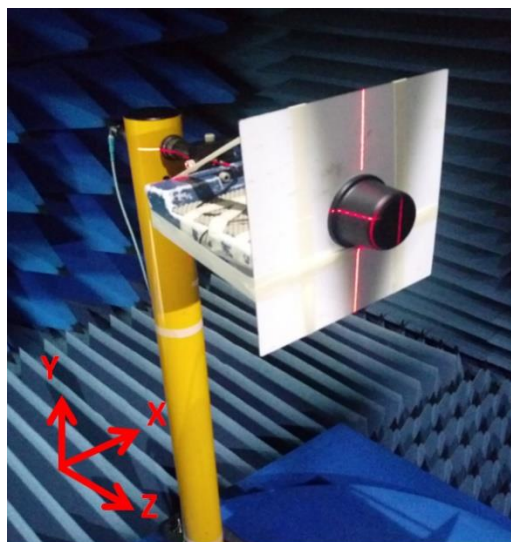


**(X-Z cut)@1575.42MHz**



**Antenna Radiation Pattern Measurement**

The antenna radiation patterns were measured in Anechoic Chamber. The measurement setup as below,

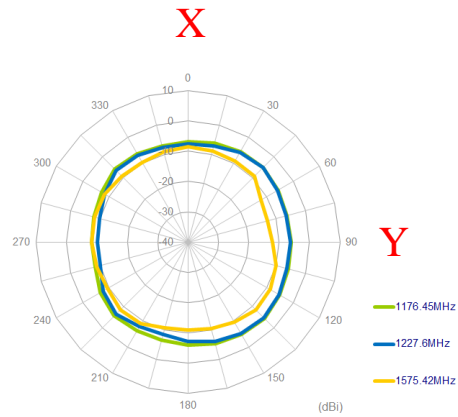


On 30x30cm ground plane

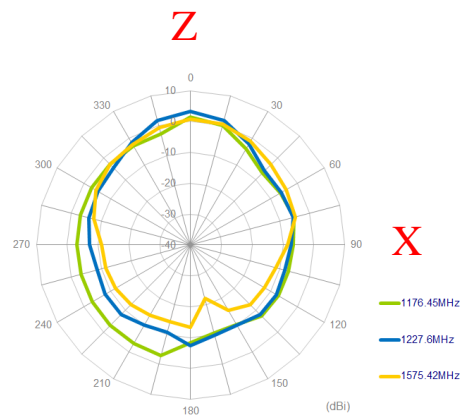


## 4.7 Antenna 2D Radiation Patterns \_On 30x30cm ground plane.

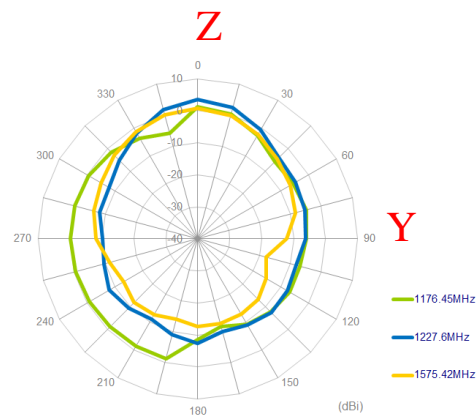
**X-Y plane**



**X-Z plane**



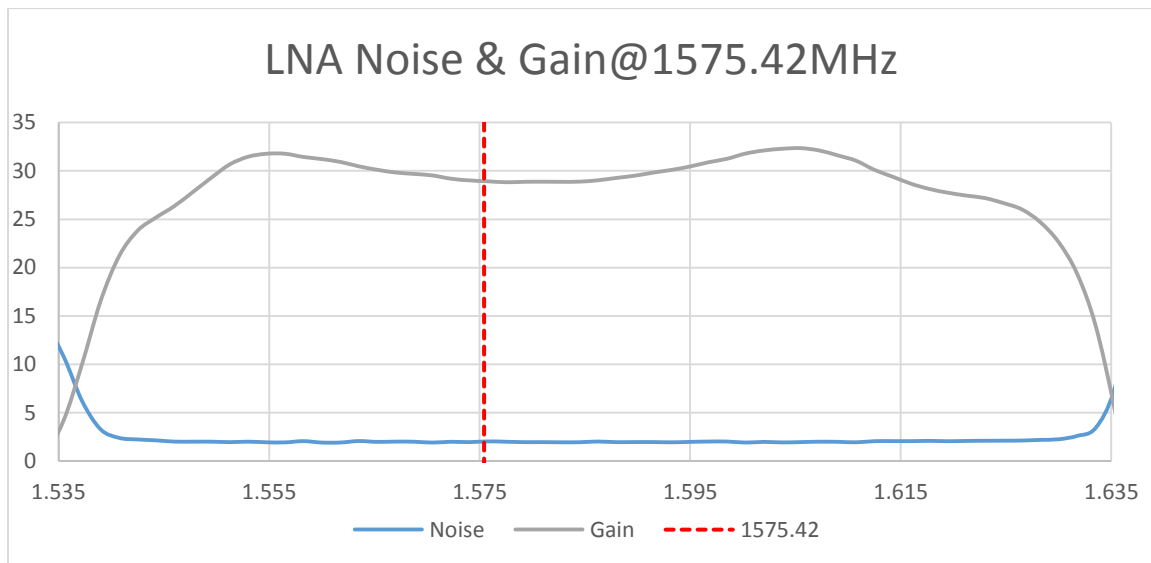
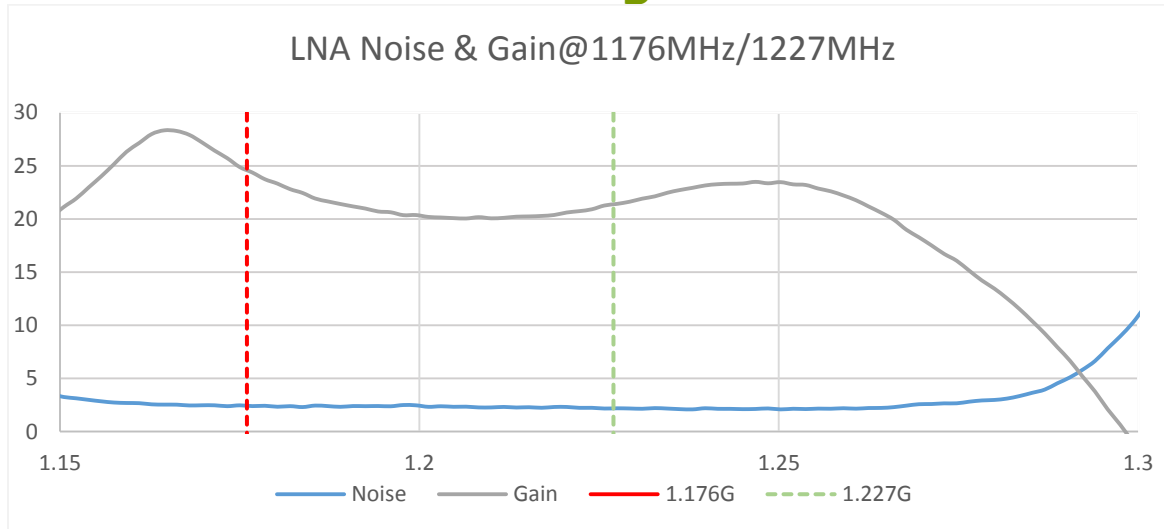
**Y-Z plane**



## 4.8 Performance table

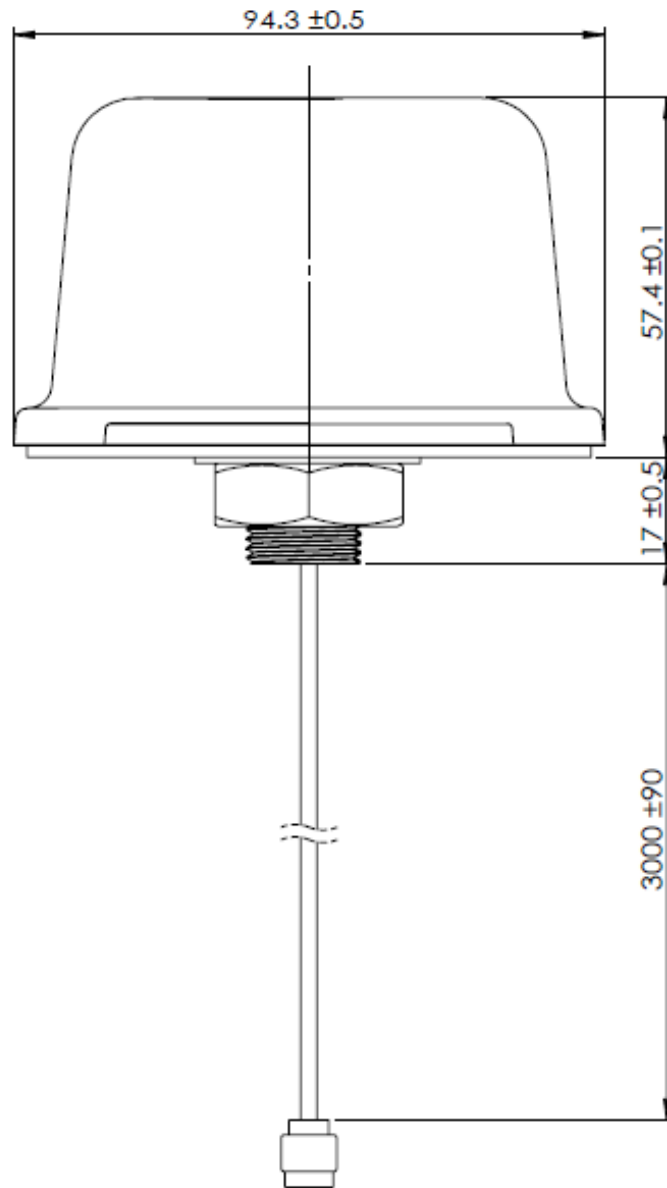
Electrical			
Standard	L5	L2	L1
Frequency (MHz)	1176.45MHz	1227.6MHz	1575.42MHz
Efficiency (%)			
On 30x30cm ground plane	26.87	30.72	25.03
Average Gain(dB)			
On 30x30cm ground plane	-5.71	-5.13	-6.02
Peak Gain(dB)			
On 30x30cm ground plane	1.6	3.52	0.79

## 5.0 LNA Gain and Noise Figure



@ DC 3.0V

## 6.0 Drawing



## 7.0 Packaging

Still pending – will update ASAP



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