

Datasheet

Bolt with Integrated Lightning Induced Surge Protection

Part No:
A.93.A.101111

Description

High-Gain, High-Rejection Active GPS Timing Antenna
With Integrated Lightning Induced Surge Protection

Features:

- 28 dB LNA Gain
- Rejection > 80 dB Between 10 - 1400 MHz
> 60 dB Between 1820 - 3500 MHz
- Ceramic Patch Antenna Element
- Permanent Mount, IP67 Rated Enclosure
- Wide Input voltage +1.9V to +12V
- Lightning Induced Surge Protection IEC 61000-4-5 (Class 4)
- Cable: 1m RG-174
- Connector: SMA(M)
- RoHS & Reach Compliant

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QUALITY MANAGEMENT SYSTEM
IATF16949



1. Introduction



The Bolt Series A.93.A is a best in class high rejection timing antenna featuring high gain, excellent out-of-band rejection and integrated protection against lightning induced surges. It comes in a compact external permanent mount enclosure that is IP67 rated and UV resistant. The A.93.A has greater than 28 dB LNA gain and excellent out-of-band rejection, characteristics that make it ideal for GPS/GLONASS/BeiDou timing applications where the antenna will be placed near transmitters, such as cellular, Wi-Fi, Bluetooth, etc.

The integrated filters feature outstanding rejection across all non-GNSS frequencies to prevent overdriving or damaging the GNSS receiver from nearby transmitters. At the commonly used LTE frequencies between 700MHz-1000MHz, the A.93 provides greater than 80 dB of rejection and between 1820MHz-3500MHz, it has greater than 60 dB of rejection.

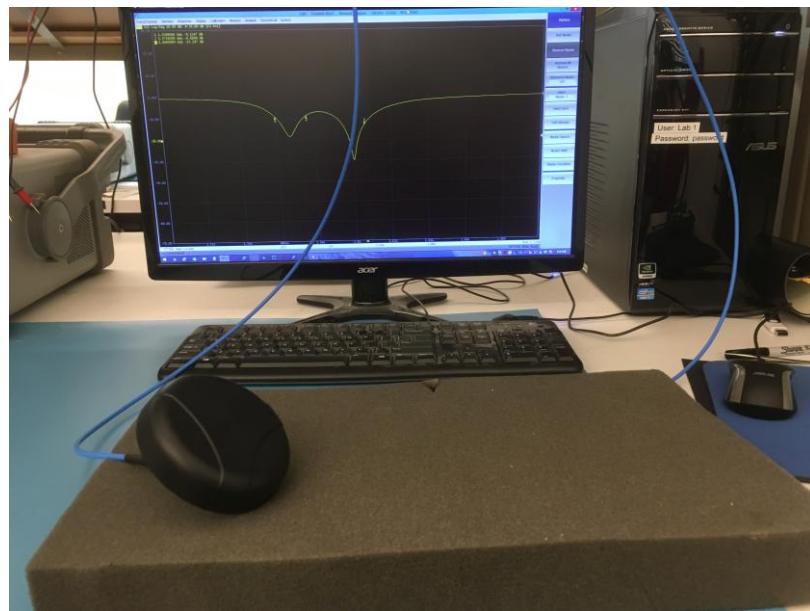
Even with the superb out of band rejection, the A.93 maintains a very low noise figure of less than 2.2 dB. This low noise figure minimizes overall signal quality degradation typically caused by losses in transmission lines. The A.93 includes integrated protection against lightning induced surges (IEC 61000-4-5, Class 4), thus removing the need for expensive external solutions.

Different cable and connector assembly options are available, please contact your regional Taoglas Customer Support Team for more information or advice on integrating with your device.

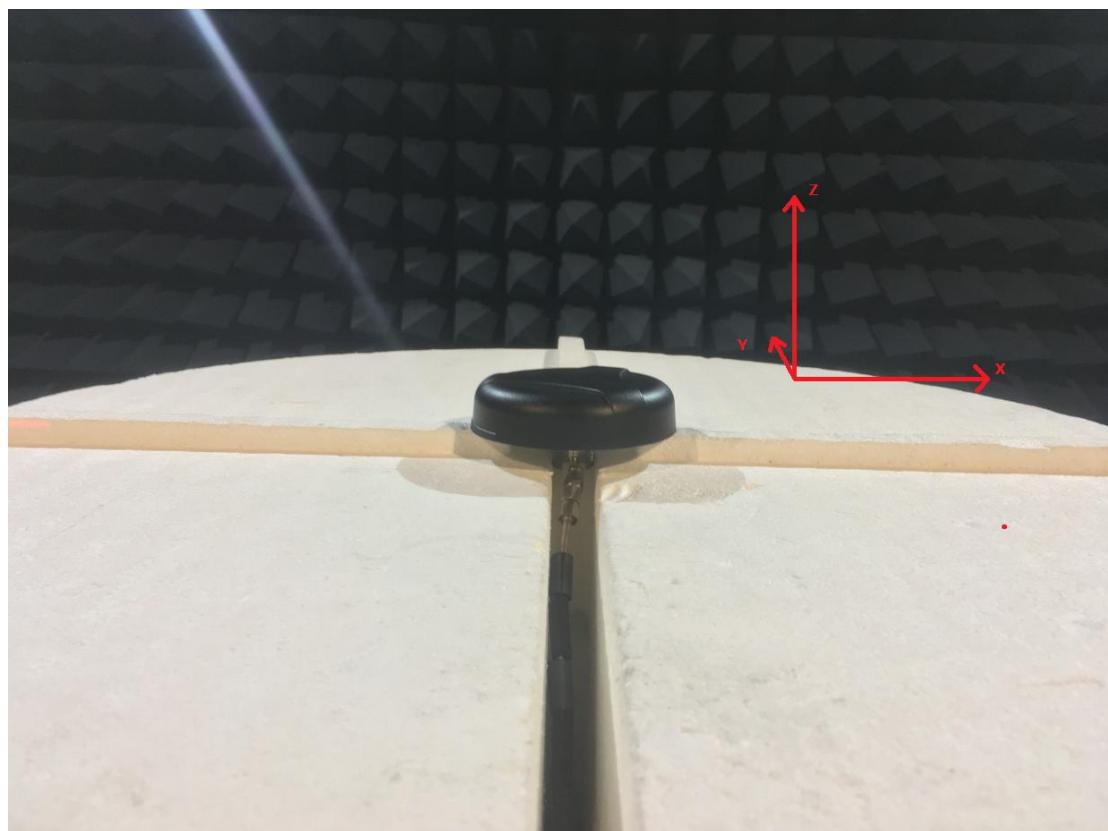
2. Specification

Embedded Ceramic Patch Antenna Specifications *			
Band	BeiDou	GPS/Galileo	GLONASS
Frequency	1561 MHz	1575.42 MHz	1602 MHz
Efficiency (%)	81.6	80.1	88.5
Average Gain (dBi)	-0.88	-0.96	-0.53
Peak Gain (dBi)	4.49	4.84	5.09
Impedance		50Ω	
Polarization		RHCP	
LNA Specification			
Gain (dB)	28 dB Typical		
NF (dB)	<2.2 dB Typical		
Input Voltage	+1.9 to +12 VDC		
Power Consumption	< 9 mA		
Mechanical			
Enclosure Material	UV Protected ASA		
Enclosure Dimensions	Diameter: 94.3mm x 25.4mm		
Connector	SMA(M)		
Cable	1 Meter RG-174		
Weight	233 g		
Environmental			
Operation Temperature	-40°C to 85°C		
Storage Temperature	-40°C to 85°C		
Humidity	Non-condensing 65°C 95% RH		
Ingress Protection	IP67		
Lightning Induced Surge Protection	IEC 61000-4-5 (Class 4) 4kV		

3. Test Setup



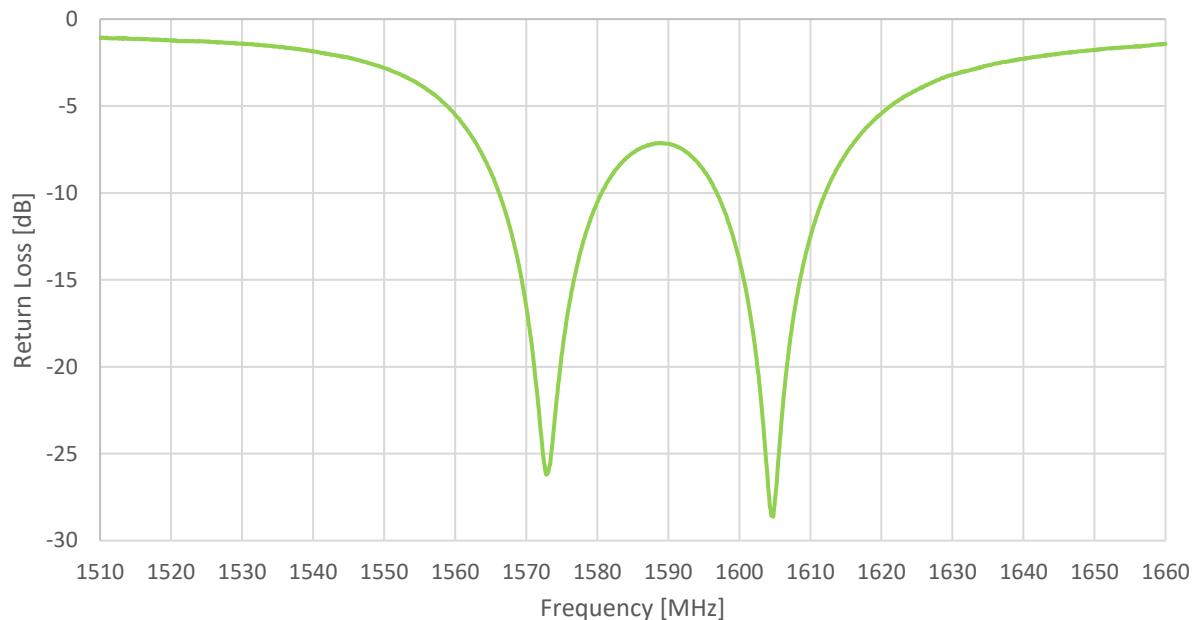
Return Loss measurement of the A.93 ceramic patch element



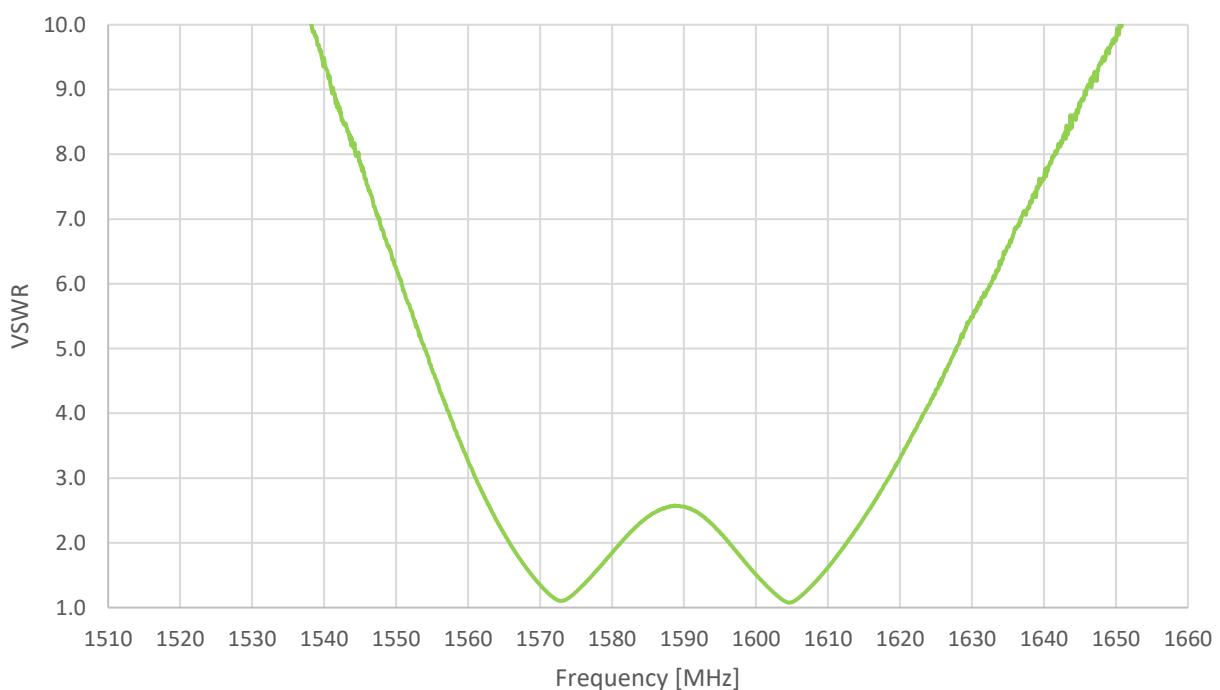
Anechoic Chamber test setup

4. Test Setup

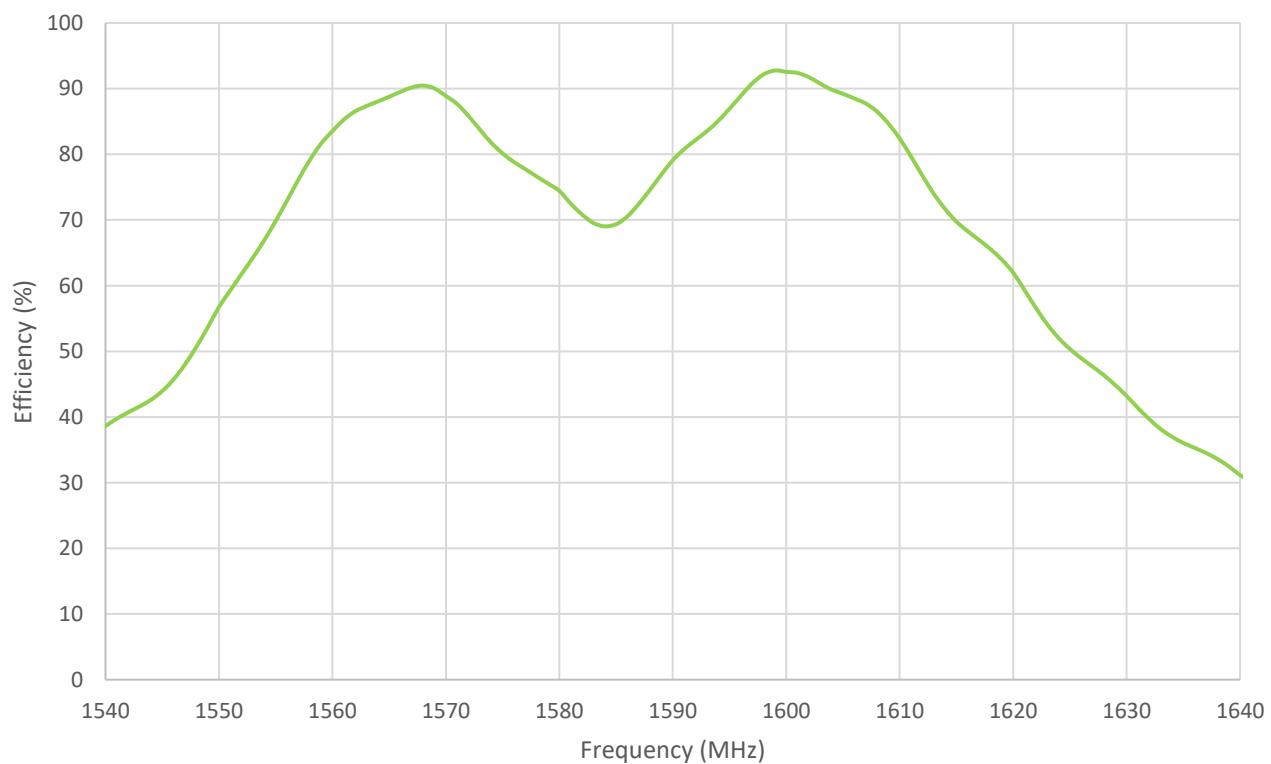
4.1 Return Loss



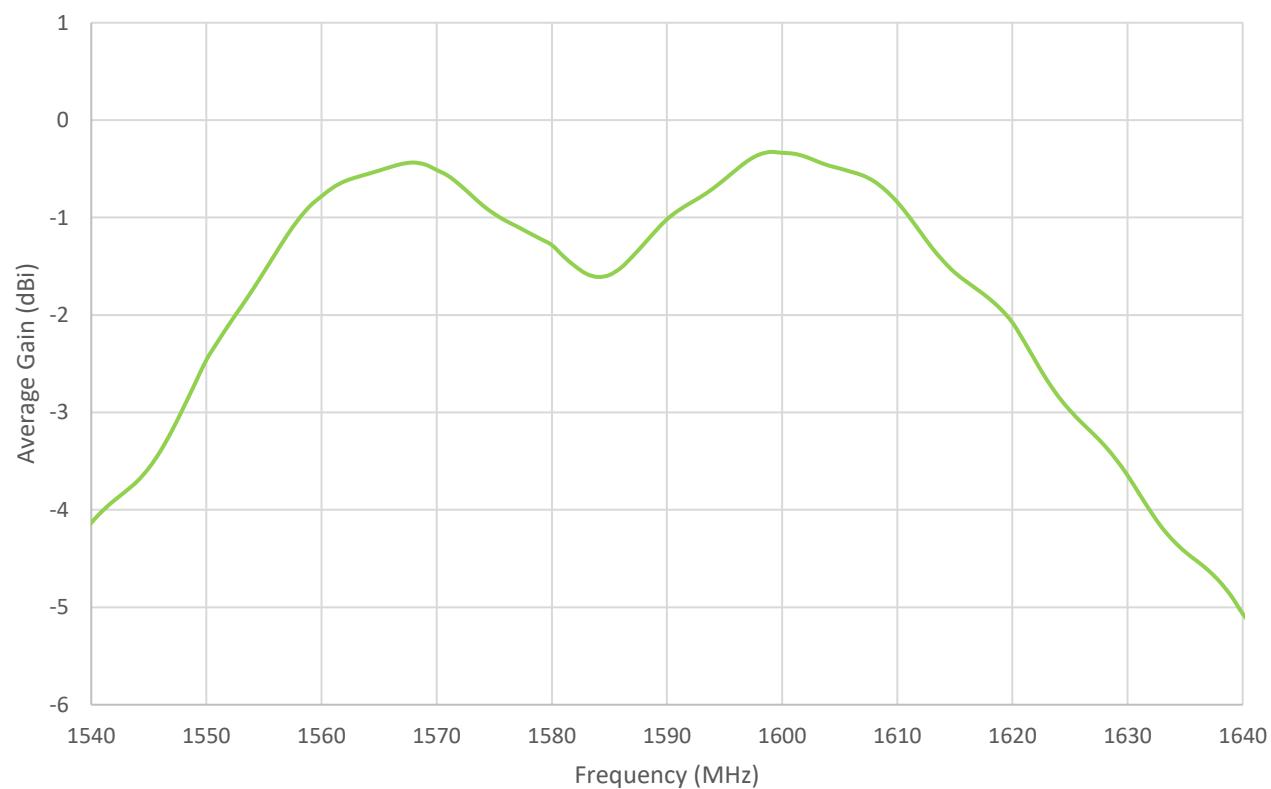
4.2 VSWR



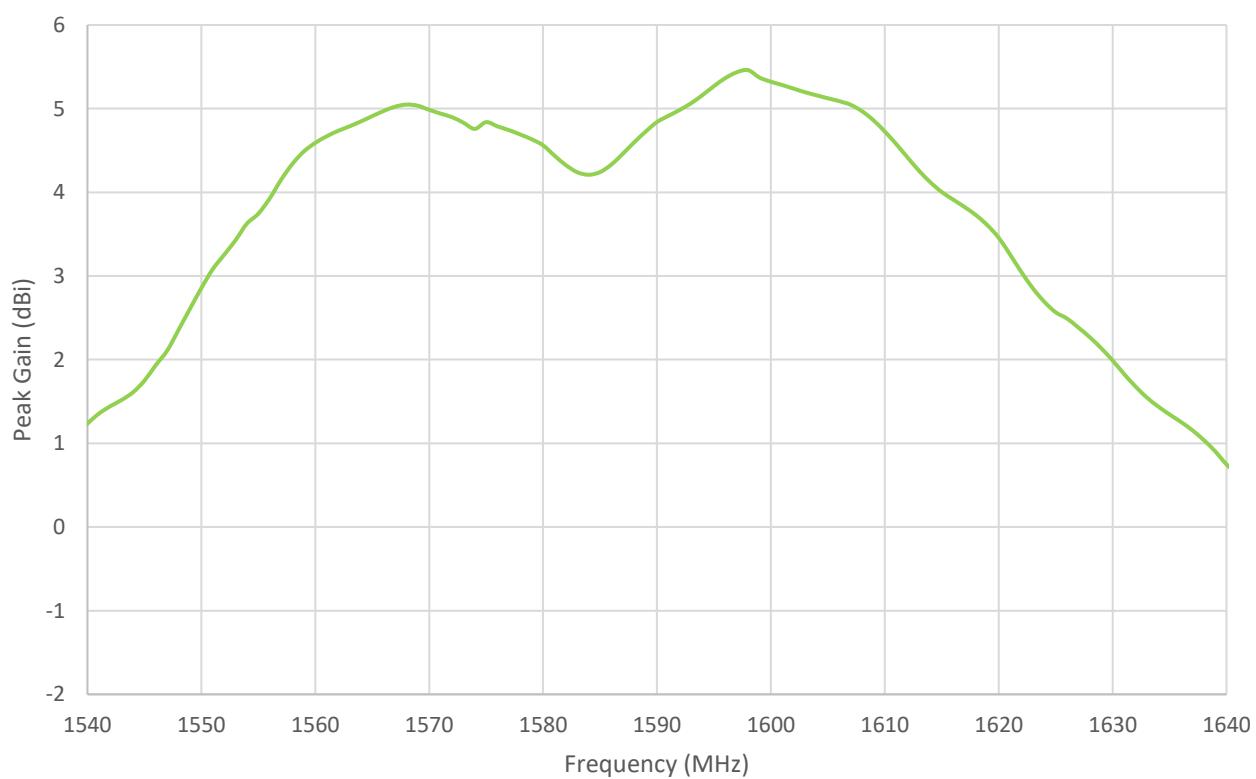
4.3 Efficiency



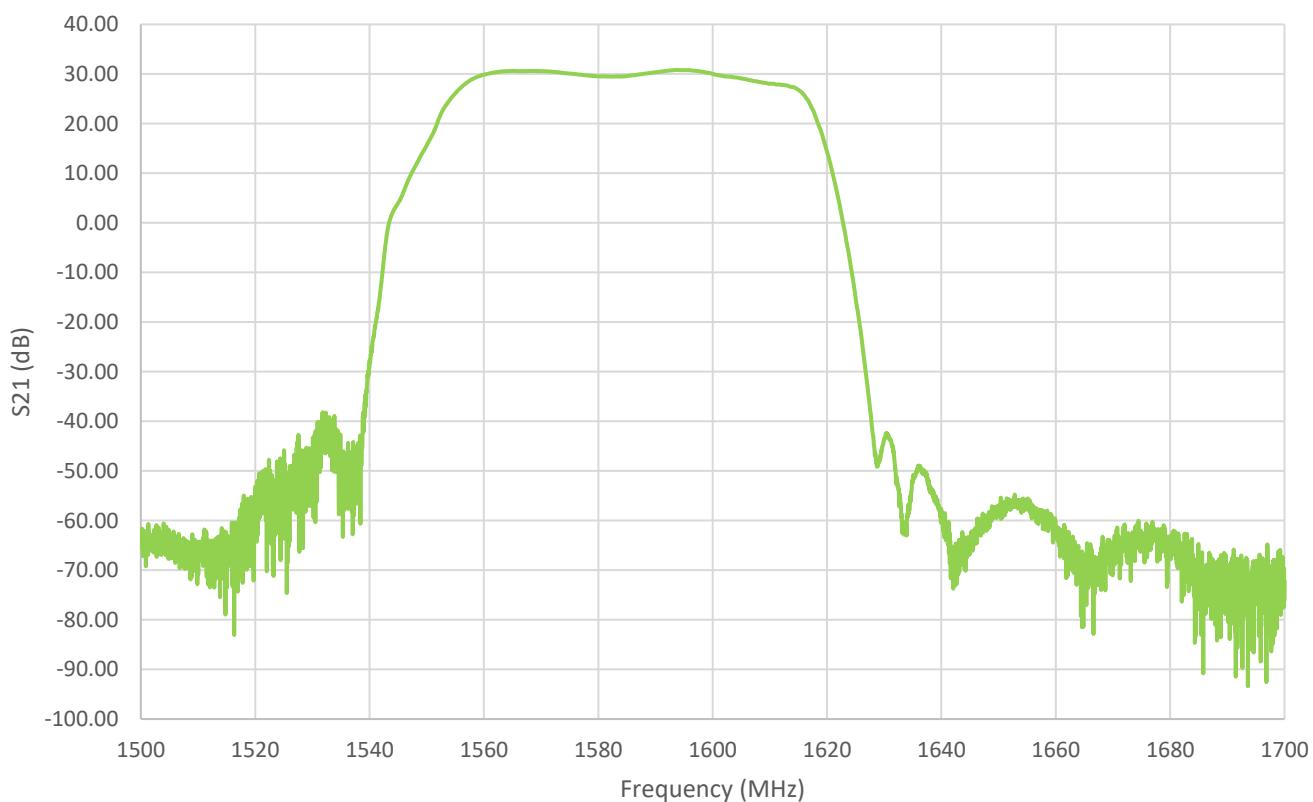
4.4 Average Gain



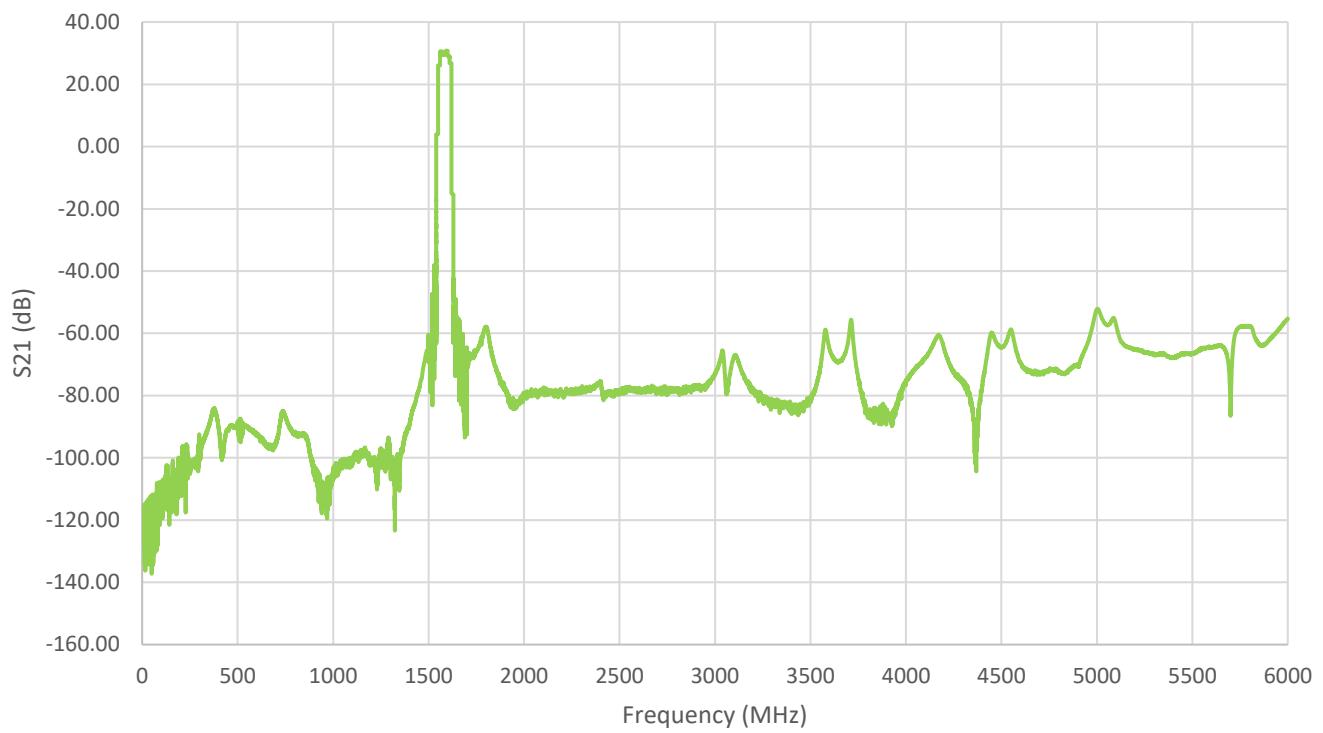
4.5 Peak Gain



4.6 In-Band LNA S21

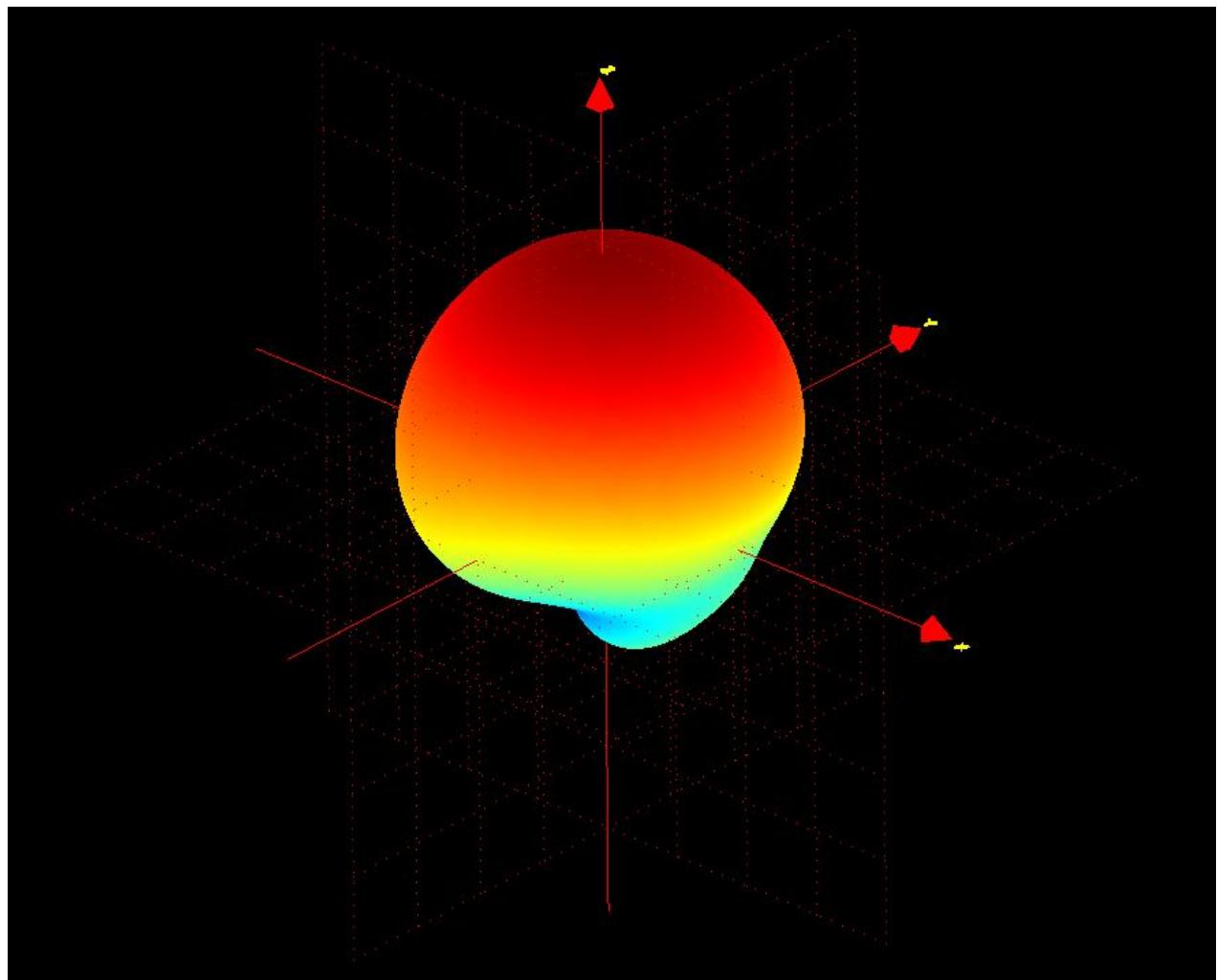


4.7 Wideband LNA S21

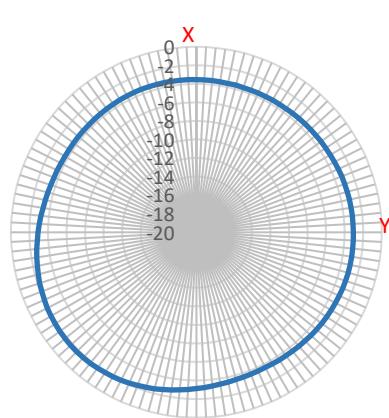


5. Radiation Patterns

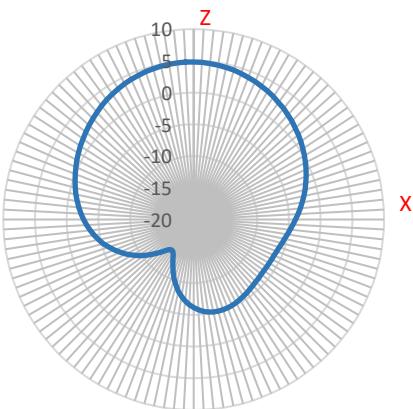
1575.42MHz



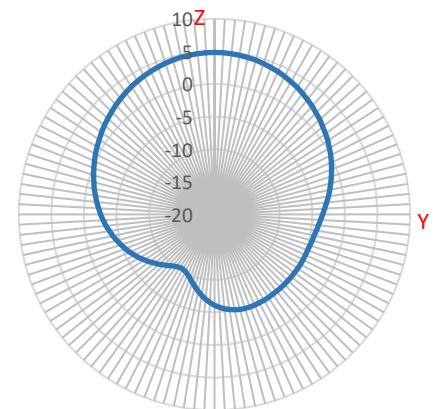
XY Plane



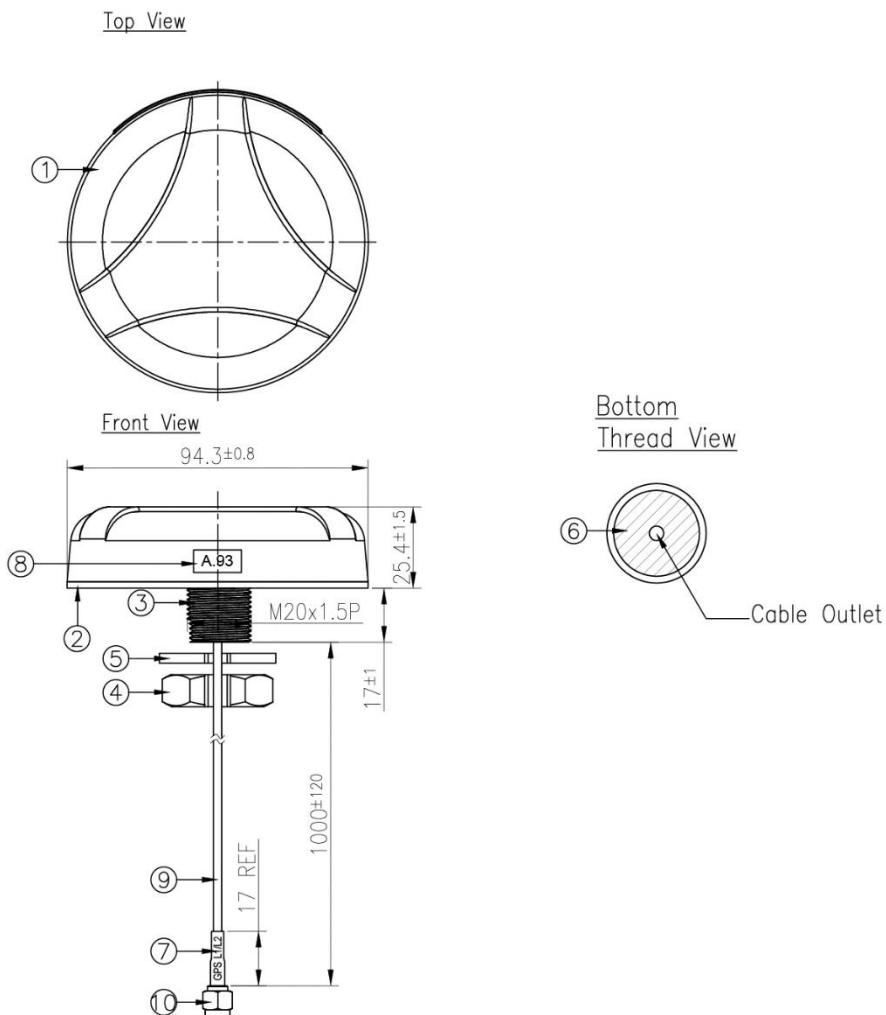
XZ Plane



YZ Plane



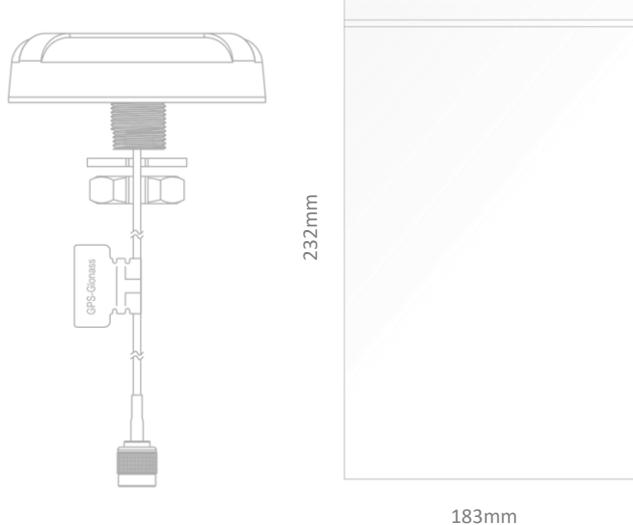
6. Mechanical Drawing



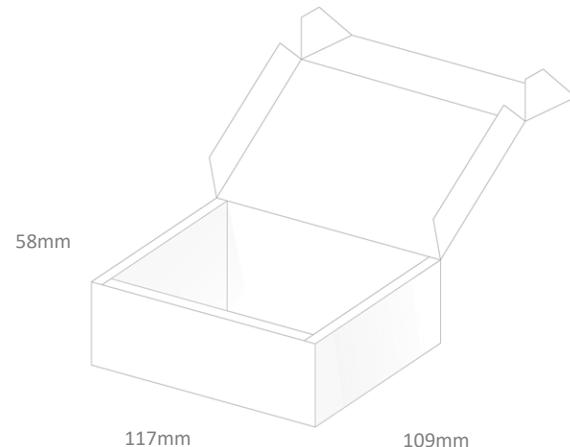
	Name	P/N	Material	Finish	QTY
1	A.90 Housing	000116J030000A	ASA	Black	1
2	Double Sided Adhesive(Block Form)	001015C020000A	3M9448+CR4305	White Liner	1
3	Mini ST Base	000314K000092A	Zinc Alloy	Ni Plated	1
4	Nut_M20x1.5Px10H Cut	000413E030061A	Steel	Zn-Ni Plated	1
5	Washer_Cut	000413E040061A	Steel	Zn-Ni Plated	1
6	Cable Rubber For RG-174	000718F000000A	Silicone Rubber	Black	1
7	Heat Shrink Tube (GPS L1/L2)	001315C020000A	PE	Blue Tube/White Text	1
8	A.93 Label	001019F010000A	PET	White/Black Text	1
9	RG174 Coaxial Cable	301315C000000A	PVC	Black	1
10	SMA(M)ST	200216D00009BA	Brass	Au Plated	1

7. Packaging

1pc A.93.A.101111 per PE Bag
Dimensions: 232*183mm
Weight: 250g



1pc A.93.A.101111 per Carton
Inner Carton Dimensions: 117*109*58mm
Weight: 310g



Changelog for the datasheet

SPE-19-8-105 – A.93.A.101111

Revision: C (Current Version)

Date:	2025-11-13
Changes:	Updated ISO logo on page 1, also removed note from under spec table as it was incorrect.
Changes Made by:	Gary West

Previous Revisions

Revision: B

Date:	2023-05-09
Changes:	Added VSWR Graph and updated datasheet format.
Changes Made by:	Gary West

Revision: A (Original First Release)

Date:	2018-03-27
Notes:	Original Release
Author:	David Connolly / Jon Campbell



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