

## SPECIFICATION

Part No. : **AA.171.301111**

Product Name : MagmaX IP67 GPS/GLONASS/GALILEO/BeiDou  
Low Axial Ratio  
External Automotive Antenna 3M RG-174  
SMA(M)-SAW Filter

Feature : Magnetic Mount  
Dual-pin Patch  
Axial Ratio <3 at GPS/GLONASS/GALILEO/BeiDou  
RHCP  
3M RG-174  
SMA(M) Connector  
First Tier Automotive TS16949 Approved  
Cable and connector customizable  
Dimensions: 53mm\*50mm\*17mm  
**RoHS Compliant**



## 1. Introduction

The AA.171 Magma Low Axial Ratio Magma magnetic mount external antenna is ideal for robust, covert installations where durability and small size is paramount. It is used in telematics and M2M applications, for example in commercial vehicle installations for fleet management.

Standard cable and connector version is 3 meter RG174 and SMA(M). Cable length and connector type are customizable upon request.

Using a unique specialist feed structure this antenna delivers best in class axial ratio across all GPS, GLONASS, GALILEO and BeiDou bands. Low axial ratio improves accuracy of GNSS system location and leads to quicker lock times. A front-end SAW reduces out-band interference from any nearby wireless transmitters, helping prevent LNA compression and burnout. Manufactured in a dedicated TS16949 facility, PPAP and IMDS documentation are available on request. Low power consumption lengthens device battery life. Adhesive mount version is available on request.

Contact your regional Taoglas office for support.

## 2. Specification Table

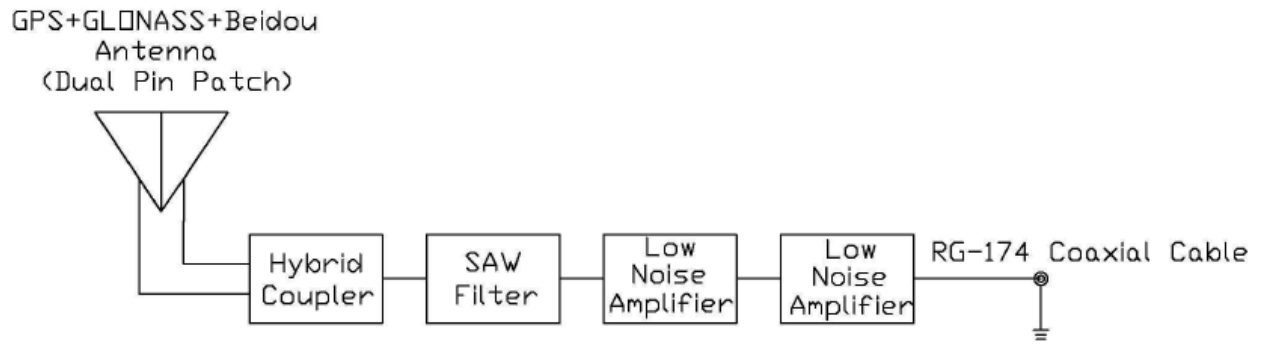
ELECTRICAL			
Center Frequency	1561.098±2.046M Hz	1575.42±1.023 MHz	1602±8 MHz
Antenna Gain	+3.98 dBi(typ.) @zenith XZ-Plane +4.16 dBi(typ.) @zenith YZ-Plane	+1.82 dBi(typ.) @zenith XZ-Plane +2.06 dBi(typ.) @zenith YZ-Plane	+1.10 dBi(typ.) @zenith XZ-Plane +1.43 dBi(typ.) @zenith YZ-Plane
Axial Ratio	1.99 dB(typ) @zenith	1.44 dB(typ) @zenith	2.98 dB(typ) @zenith
Polarization	RHCP		

LNA Electrical Properties			
Frequency	GPS/GALILEO: 1575.42±1.023 MHz GLONASS: 1602±8 MHz Beidou: 1561.098±2.046 MHz		
Impedance	50 Ω		
VSWR	2.0 Max.		
DC input	1.8V (min.)	3.0V (typ.)	5.5V (max.)
LNA Gain	22dB	28dB	30dB
Noise Figure	2.4dB	2.1dB	2.4dB
Power Consumption	3.2mA	7.3mA	8.4mA

MECHANICAL	
Embedded Ceramic Patch Antenna Dimensions	35 x 35 x 6mm
Housing Dimensions	53*50*17mm
Housing Material	ABS
Cable	3M RG174 (fully customizable)
Connector	SMA(M) (fully customizable)
Waterproof	IP67
Weight	92g
Magnetic Pull Force	Pull horizontal max pull force(kgf) : 0.52 Pull vertical max pull force(kgf) : 0.48

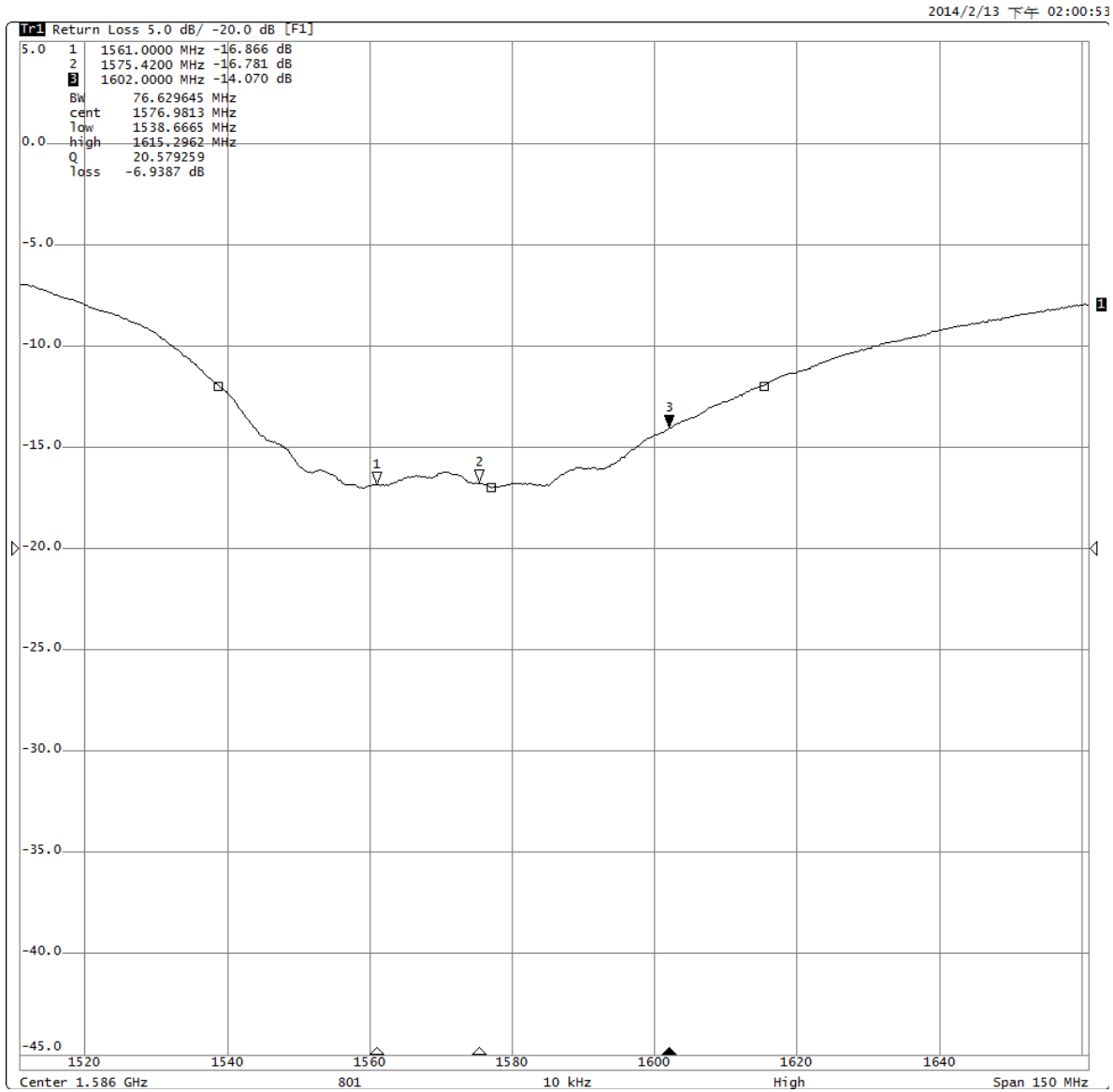
ENVIRONMENTAL	
Operation Temperature	-40°C ~ +85°C
Storage Temperature	-40°C ~ +90°C

### 3. Antenna Block Diagram



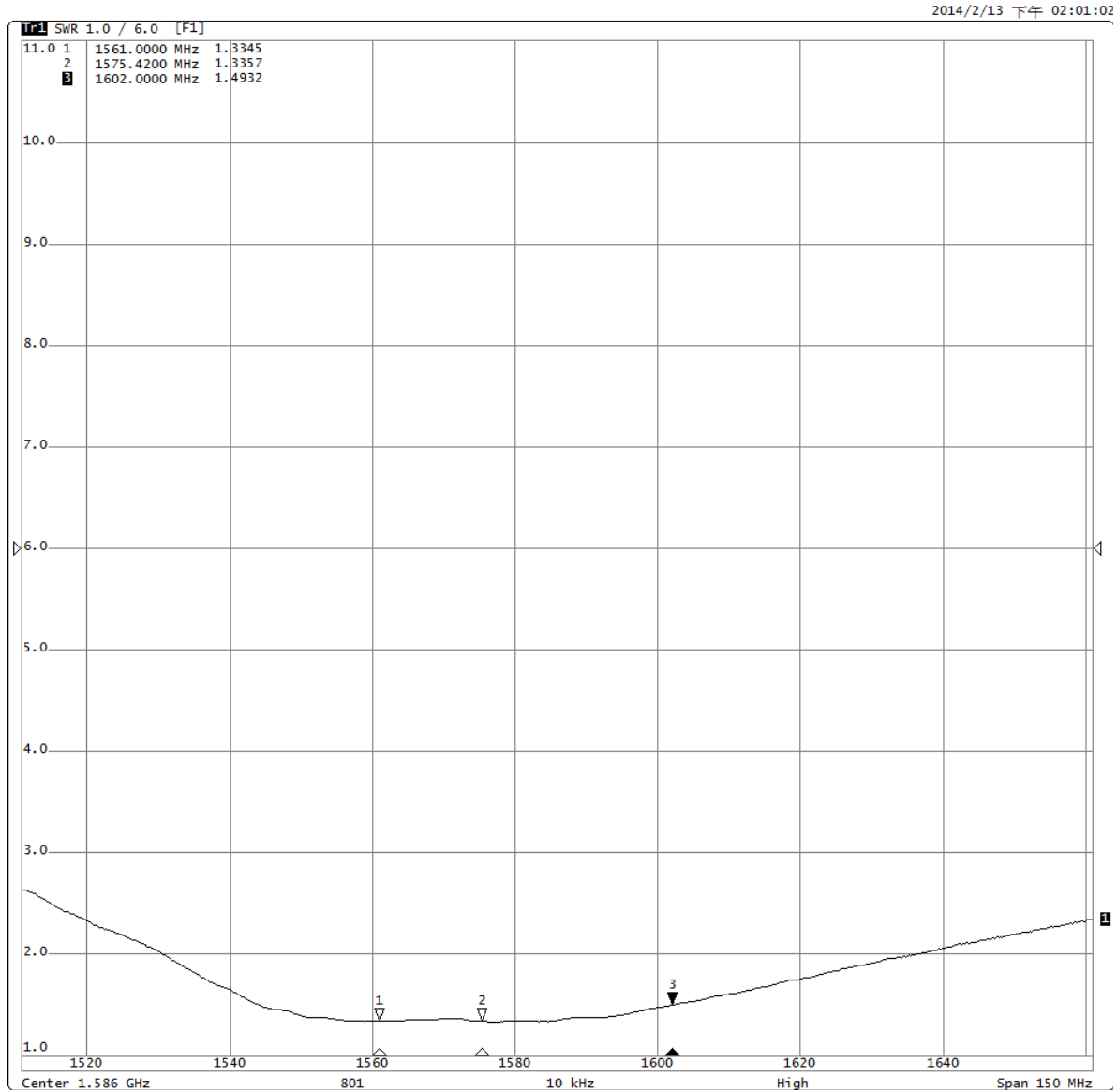
## 4. Antenna Characteristics

### 4.1 Return Loss



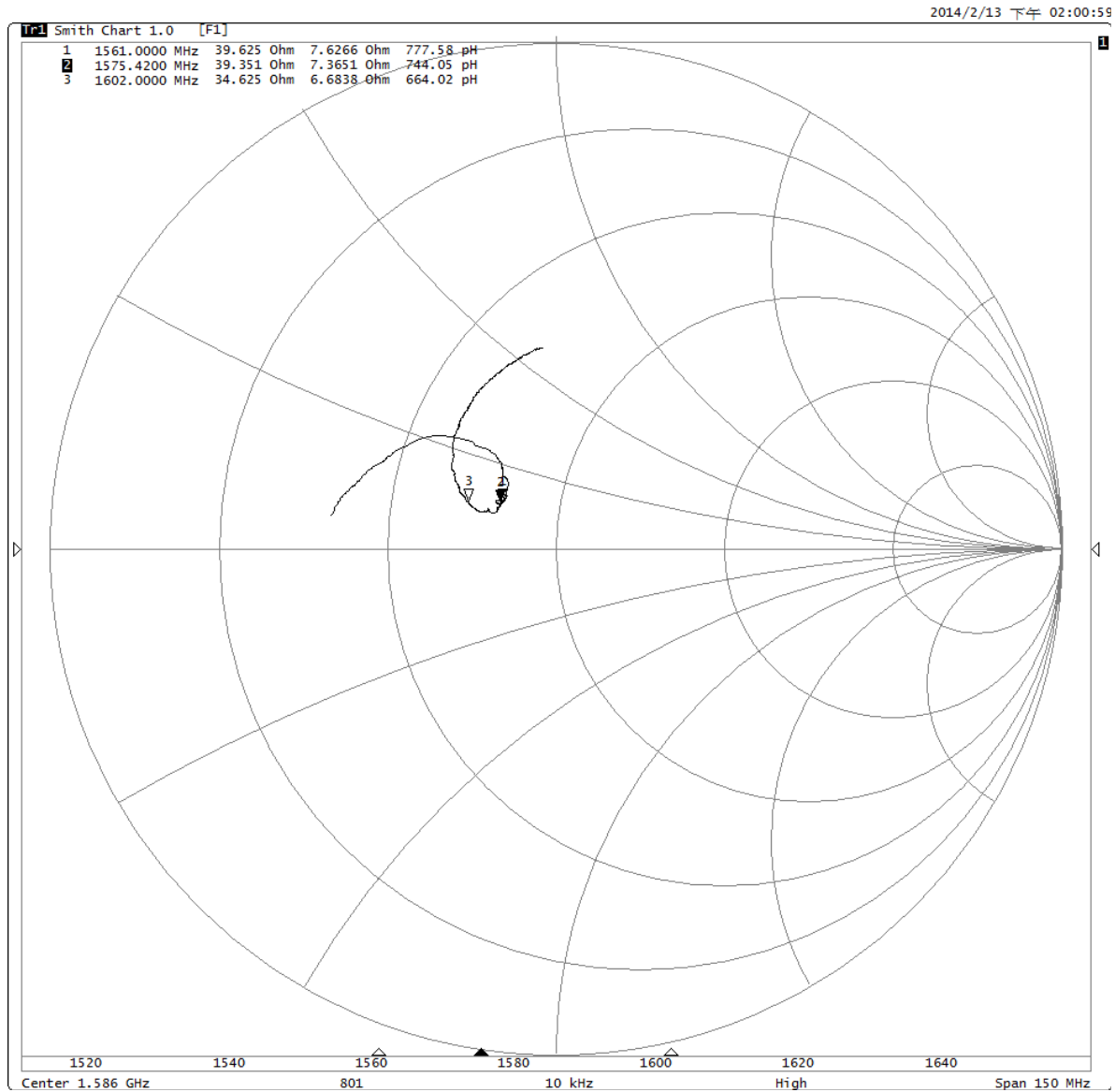
Frequency (MHz)	Return Loss
1561 MHz	-16.78dB
1575 MHz	-16.88dB
1602 MHz	-14.09dB

## 4.2 VSWR



Frequency (MHz)	VSWR
1561 MHz	1.33
1575 MHz	1.33
1602 MHz	1.49

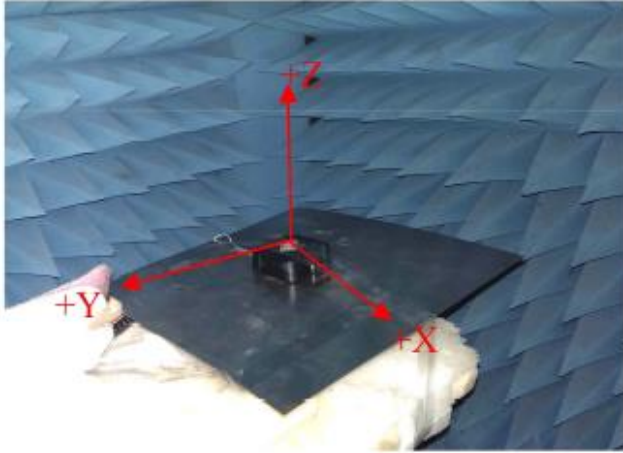
## 4.3 Impedance



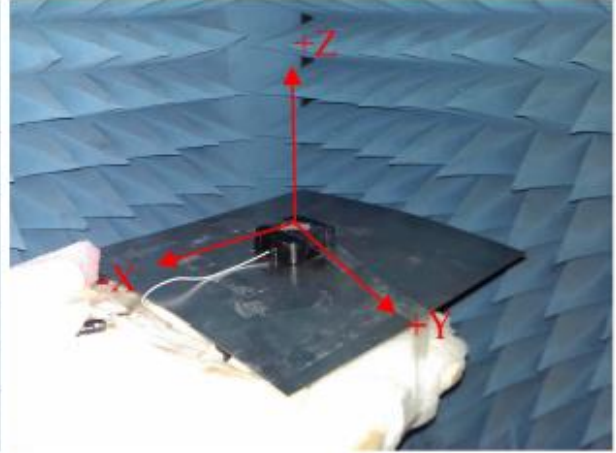
Frequency (MHz)	Impedance
1561 MHz	$39.54 + j07.70$
1575 MHz	$39.36 + j07.32$
1602 MHz	$34.58 - j06.59$

## 4.4 Radiation Pattern

XZ-Plane

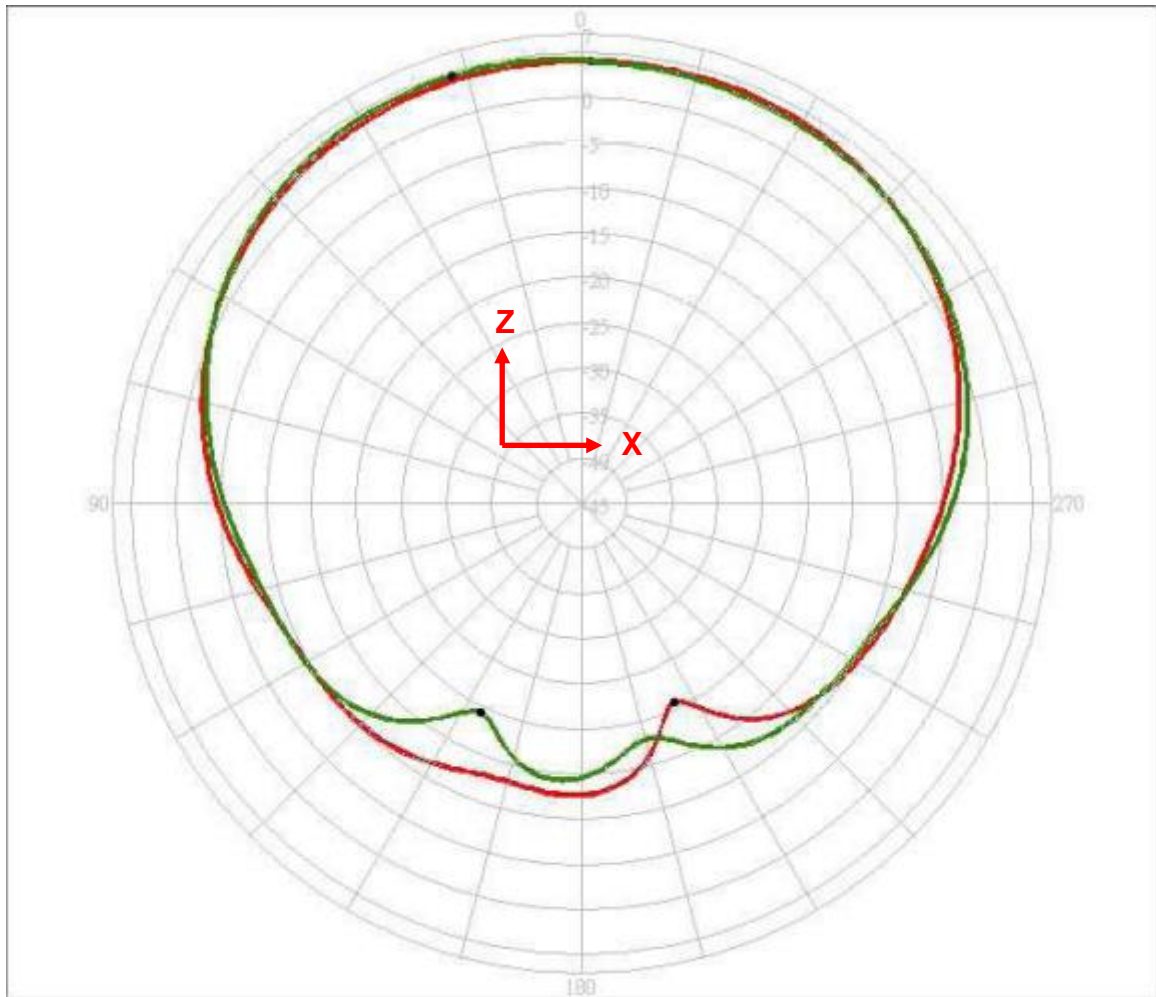


YZ-Plane



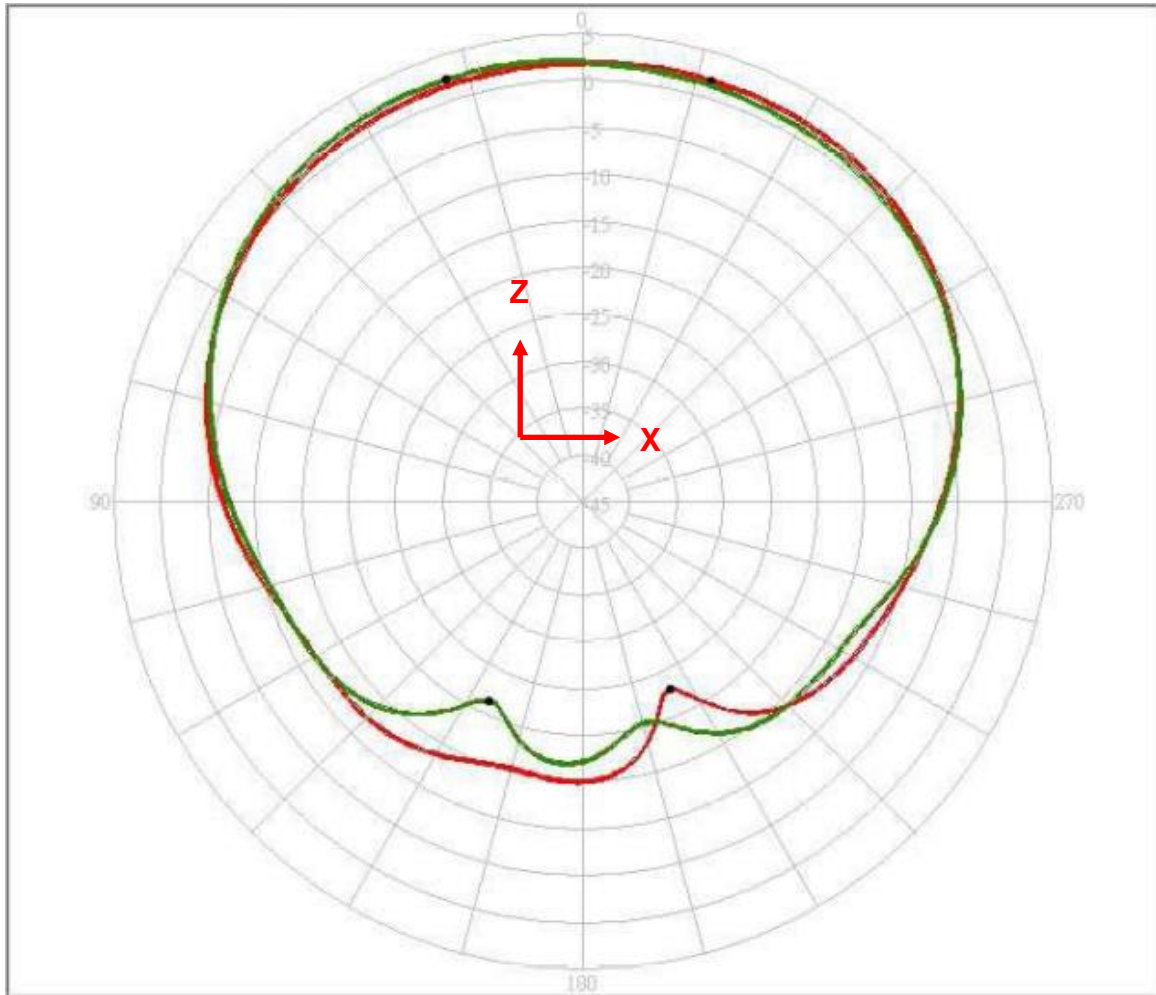


#### 4.4.1 1561MHz



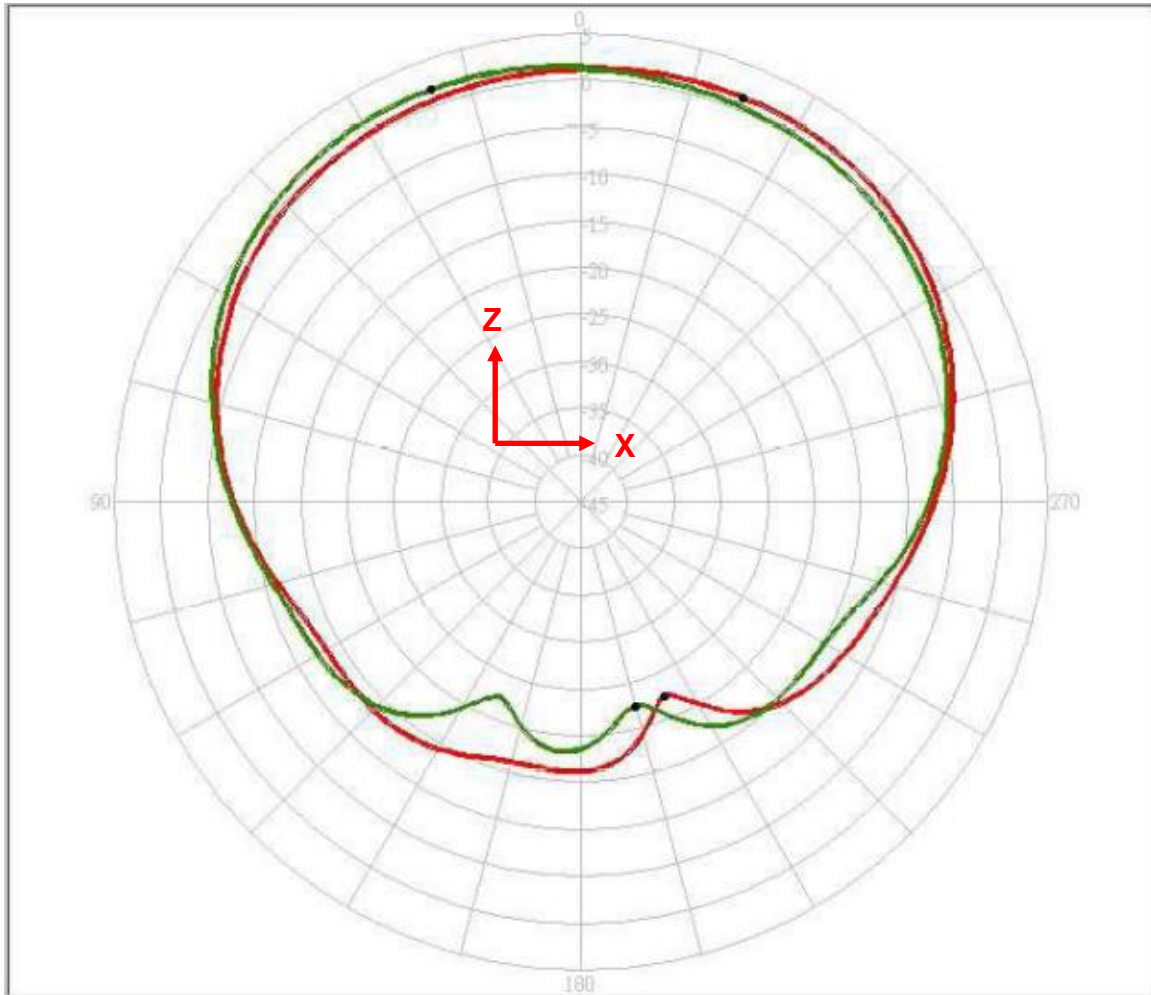
1561MHZ	XZ-Plane	YZ-Plane
At Zenith	3.98 dBi	4.16 dBi

#### 4.4.2 1575.42MHz



1575.42MHZ	XZ-Plane	YZ-Plane
At Zenith	1.82 dBi	2.06 dBi

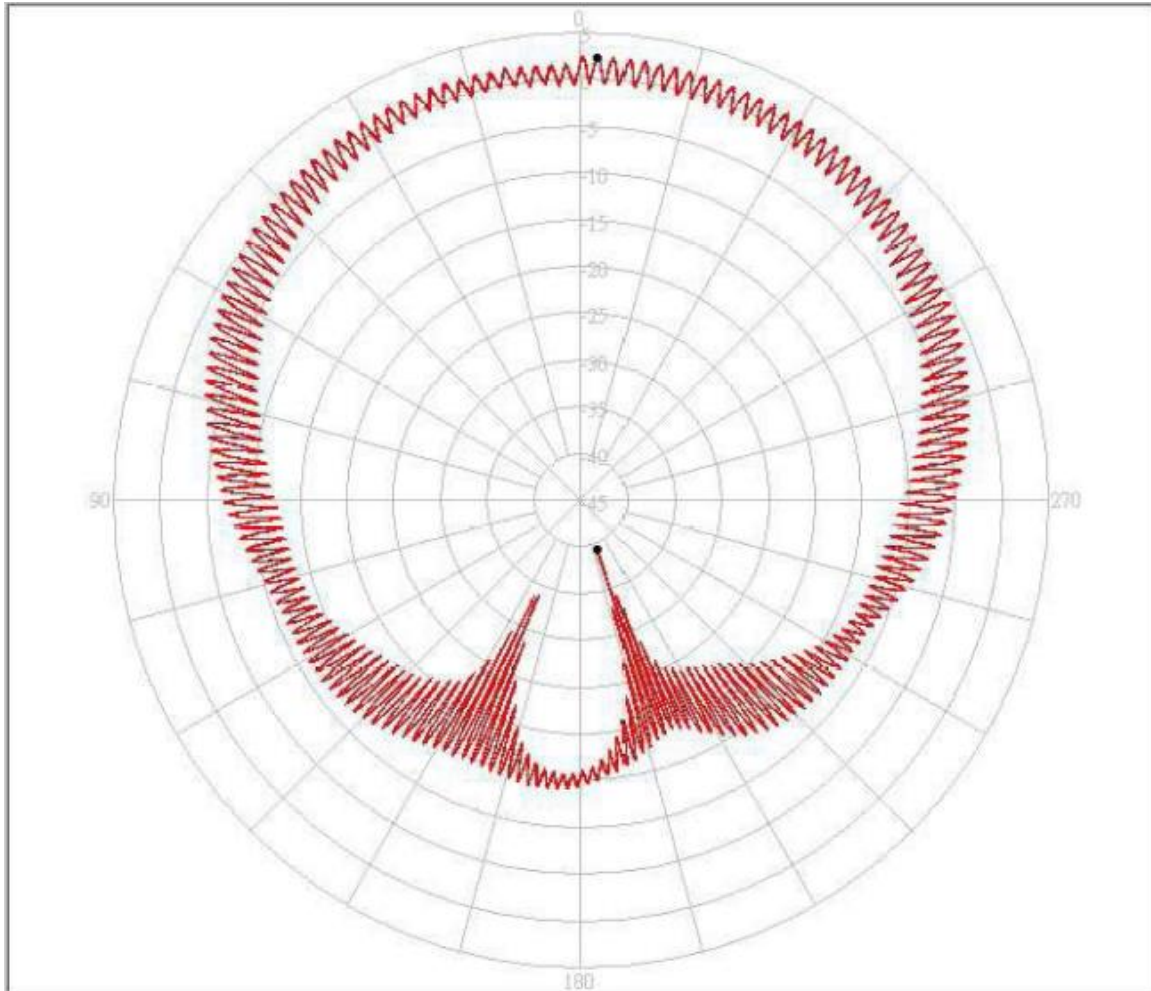
#### 4.4.3 1602MHz



1602MHZ	XZ-Plane	YZ-Plane
At Zenith	1.10 dBi	1.43 dBi

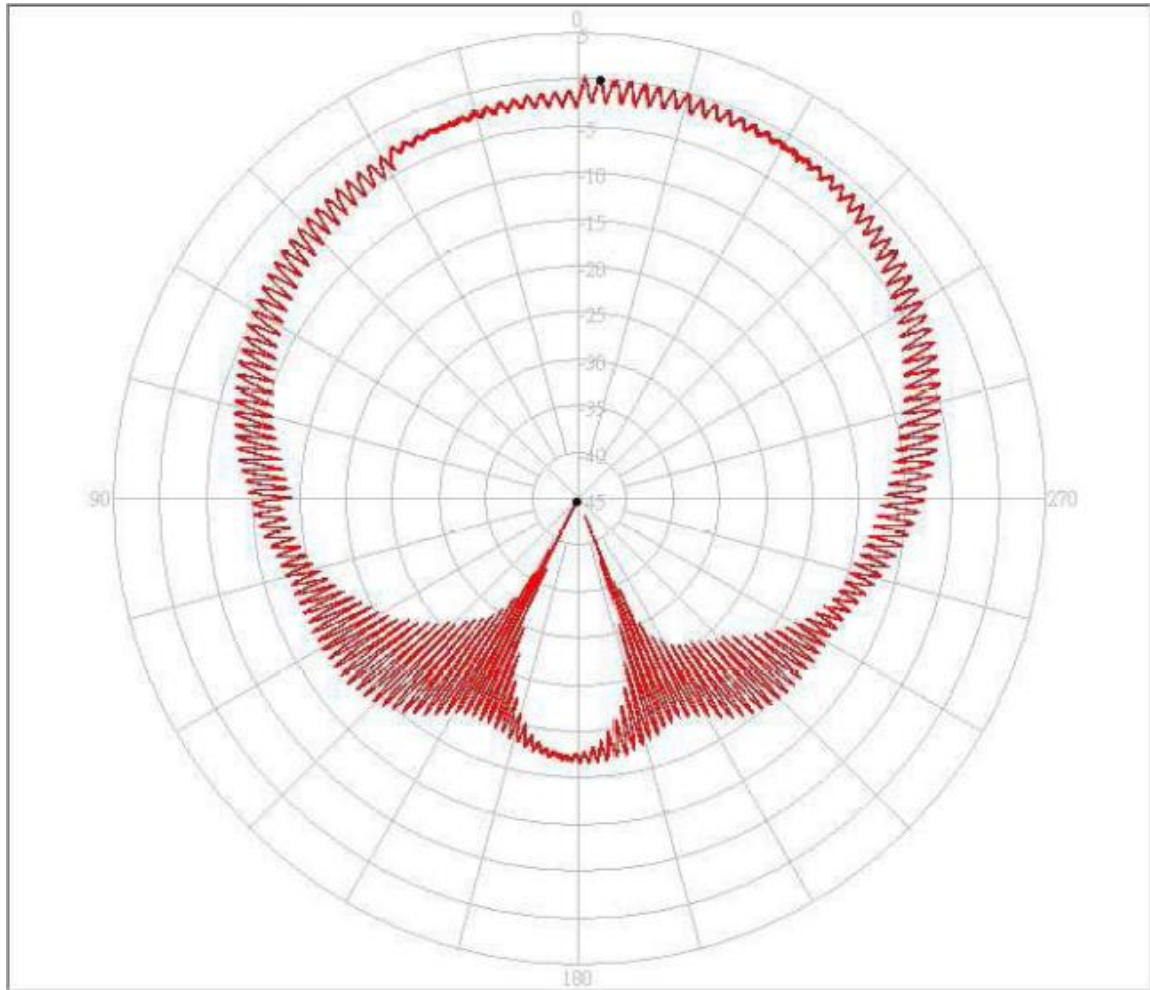
## 4.5 Axial Ratio Pattern (Spin Dipole Method)

### 4.5.1 1561MHz



1561MHZ	Axial Ratio
At Zenith	1.99 dBi

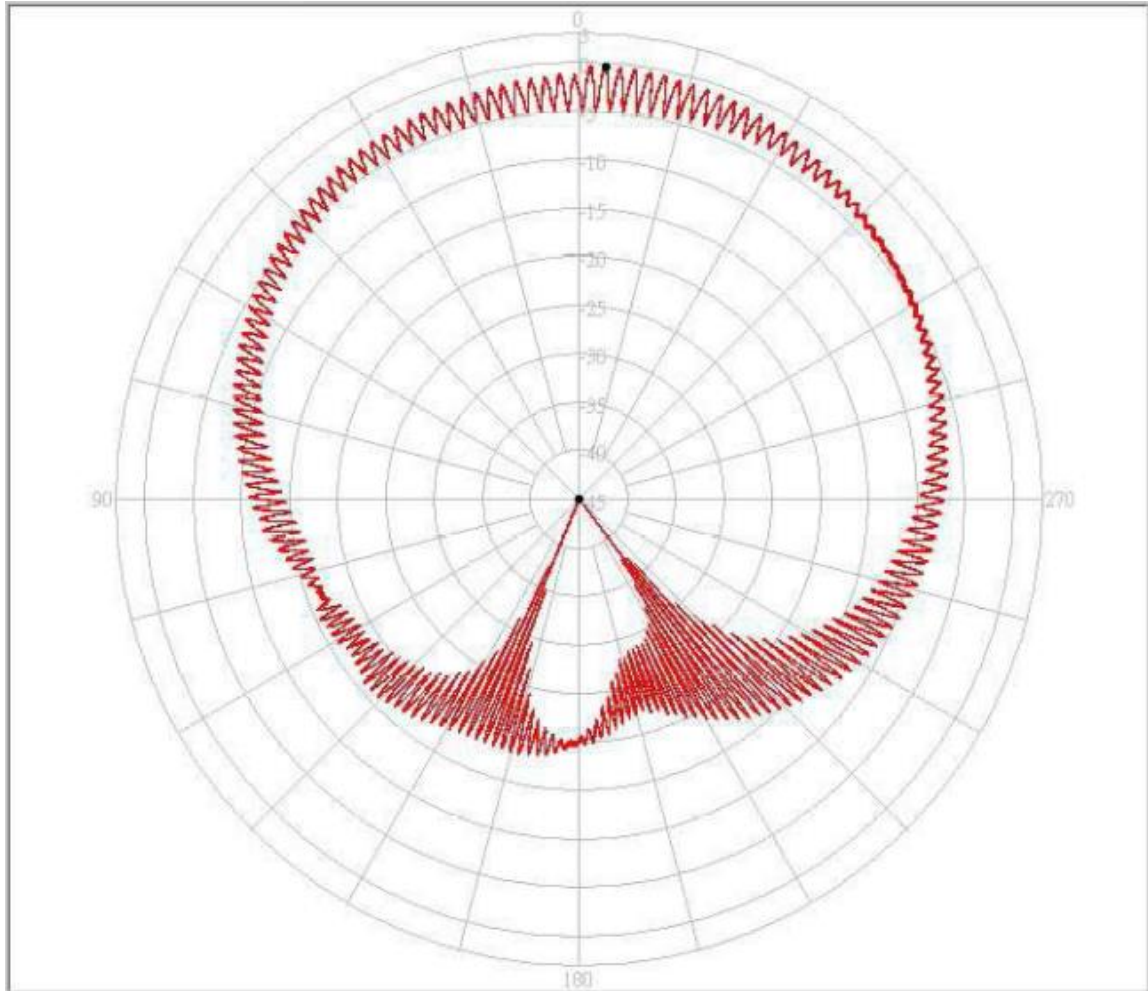
#### 4.5.2 1575.42MHz



1575.42MHZ	Axial Ratio
At Zenith	1.44 dBi



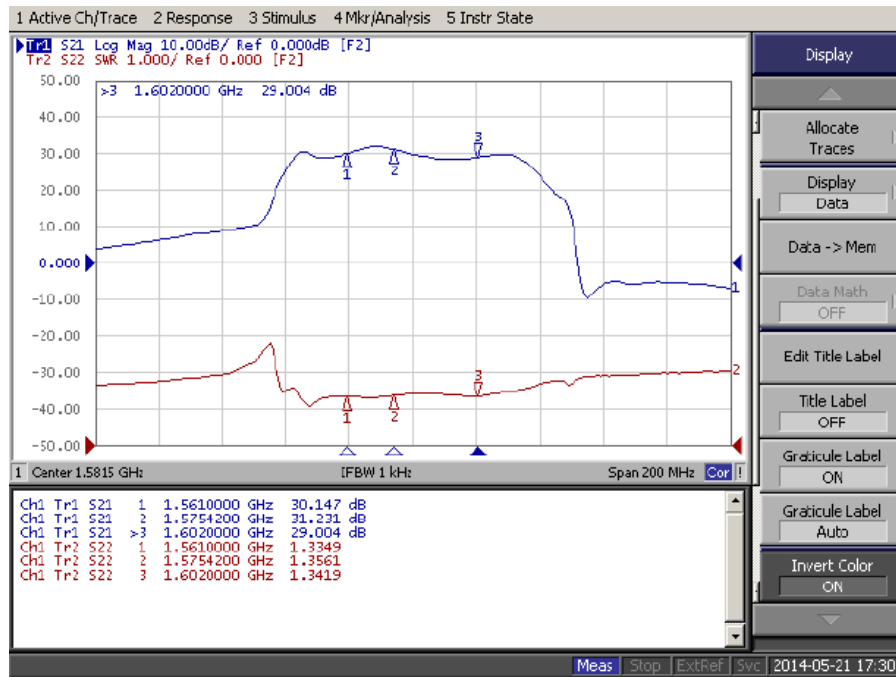
### 4.5.3 1602MHz



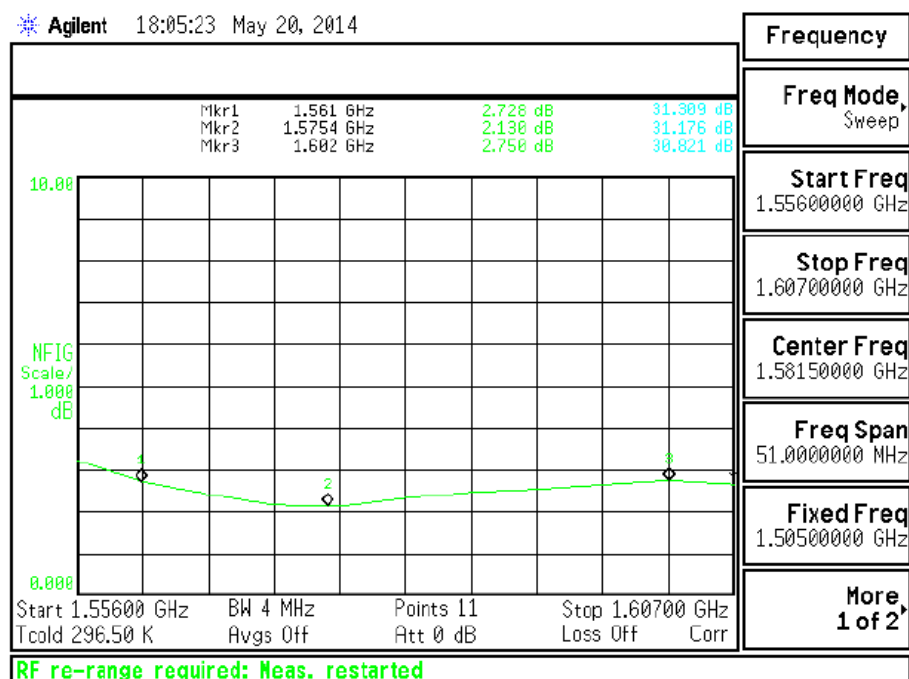
1602MHZ	Axial Ratio
At Zenith	2.98 dBi

## 5. GPS/GLONASS/GALILEO/Beidou LNA

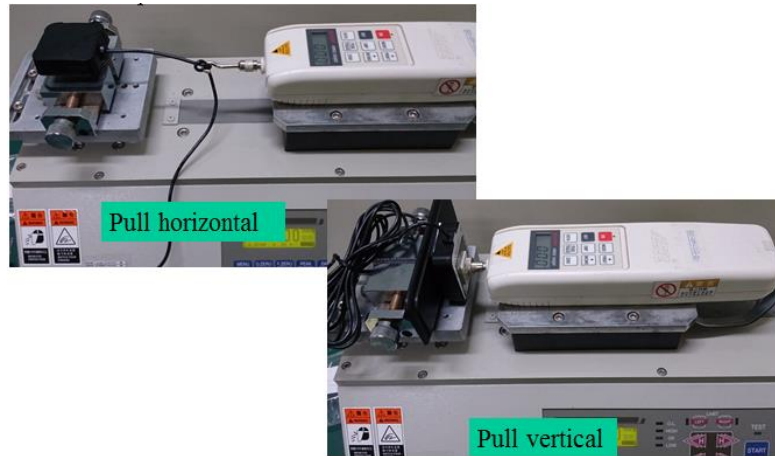
### 5.1 LNA Gain and Output VSWR@3.0V



### 5.2 LNA Noise@3.0V

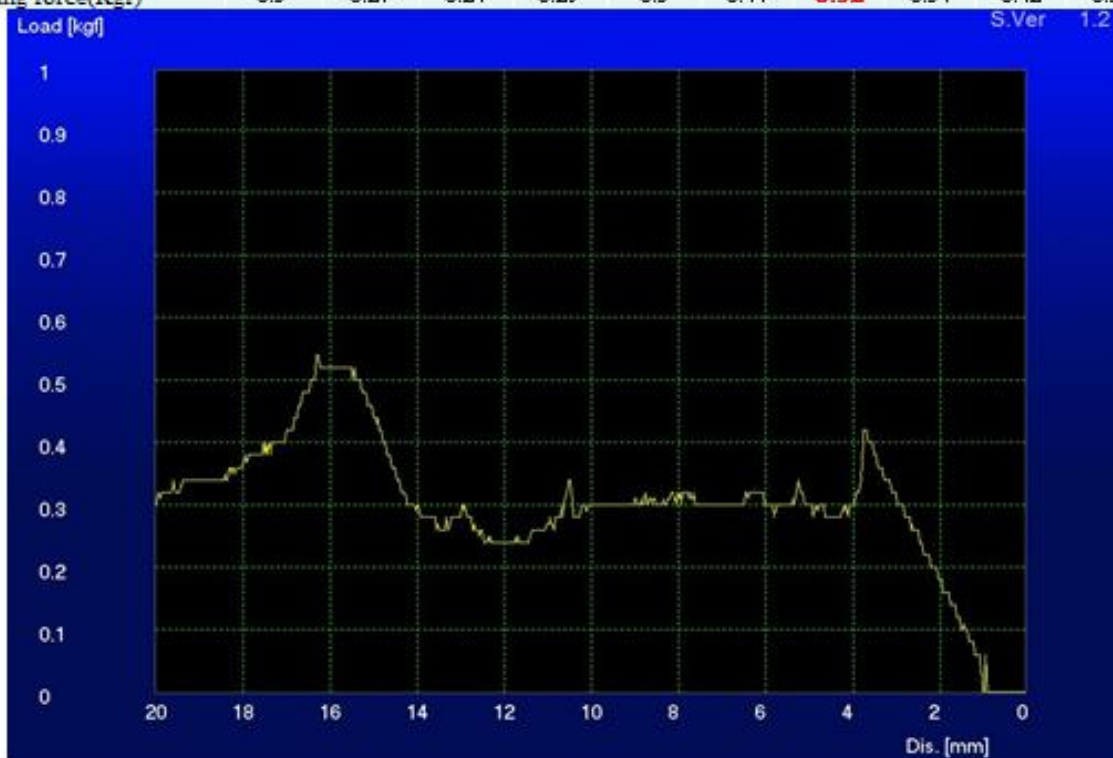


## 6. Magnetic Pull Force (kilogram – force (kgf))



Horizontal Pull Force Breakdown: 0.52kgf

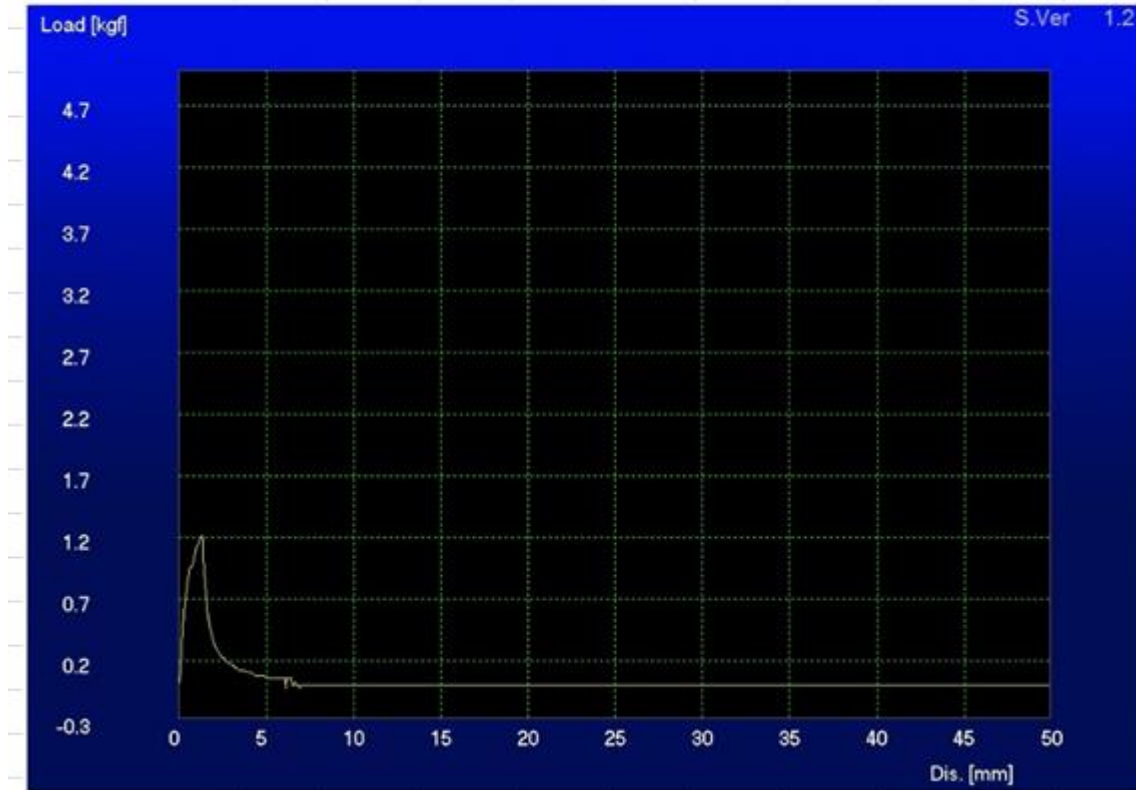
Distance(mm)	0.5	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
Pulling force(Kgf)	0	0	0.18	0.31	0.3	0.3	0.3	0.3	0.3	0.3
Distance(mm)	10.0	11.0	12.0	13.0	14.0	15.0	16.0	16.3	17.0	18.0
Pulling force(Kgf)	0.3	0.27	0.24	0.29	0.3	0.44	0.52	0.54	0.42	0.37



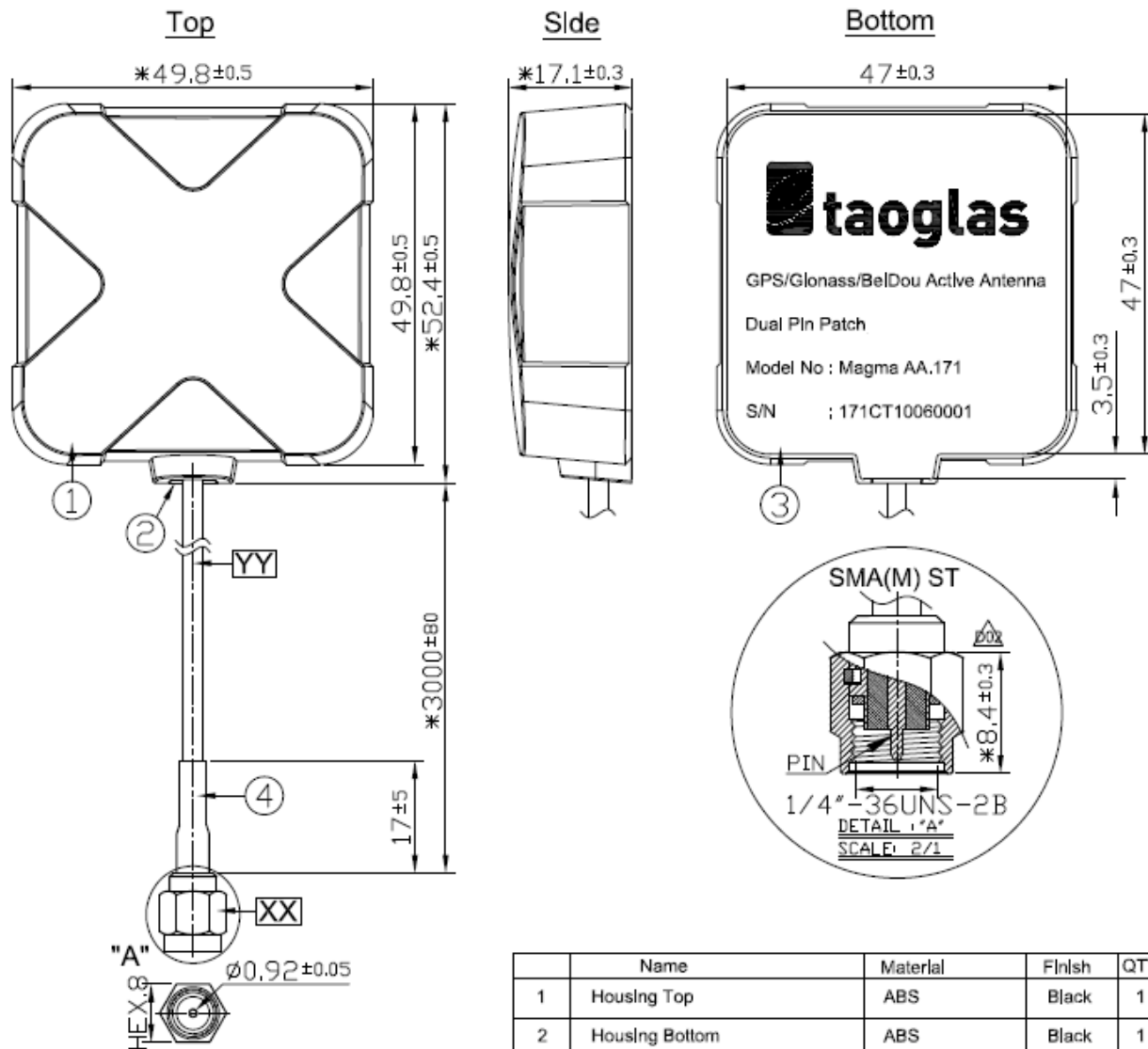


# Vertical Pull Force Breakdown: 1.23 kgf

Distance(mm)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Pulling force (Kgf)	0.96	1.07	1.23	0.84	0.55	0.42	0.38	0.35	0.34	0.32

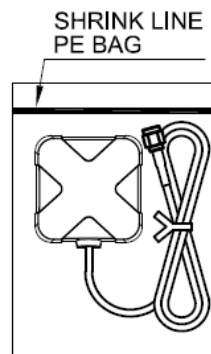


## 7. Mechanical Drawing



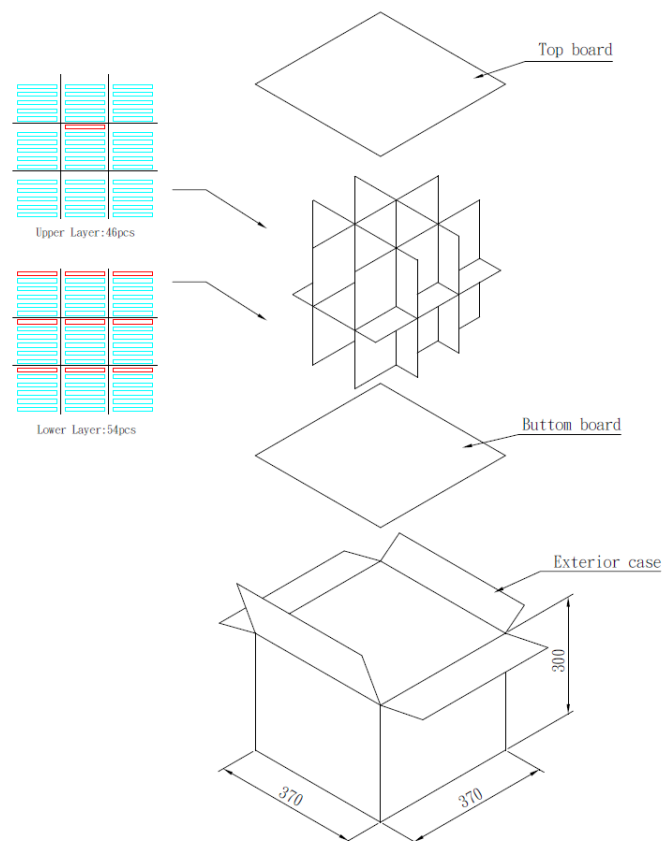
	Name	Material	Finish	QTY
1	Housing Top	ABS	Black	1
2	Housing Bottom	ABS	Black	1
3	Sticker Bottom	PET	Silver	1
4	Heat Shrink Tube	PE	Black	1
	Name	Spec	Finish	QTY
XX	Connector Type	SMA(M) ST	Gold	1
YY	Cable Type	RG174	Black	1

## 8. Packaging



1 piece per bag

100 units per carton



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