

SPECIFICATION

- Part No. : **MA111.W.C.LB.001**
- Product Name : White MA.111 **Ultima** Series – 2in1 Super Low Profile
Combination GPS/GLONASS/GALILEO and Penta Band
Cellular Antenna Screw-mount (Permanent mount)
- Feature : Height 19.6mm (0.77")
Diameter 55mm (2.17")
Heavy duty screw mount
UV and vandal resistant ABS housing and thread
IP67 compliance
GPS/GLONASS/GALILEO - 3M RG174 SMA(M)
Cellular – 3M CFD200 SMA(M)
Customizable
ROHS Compliant



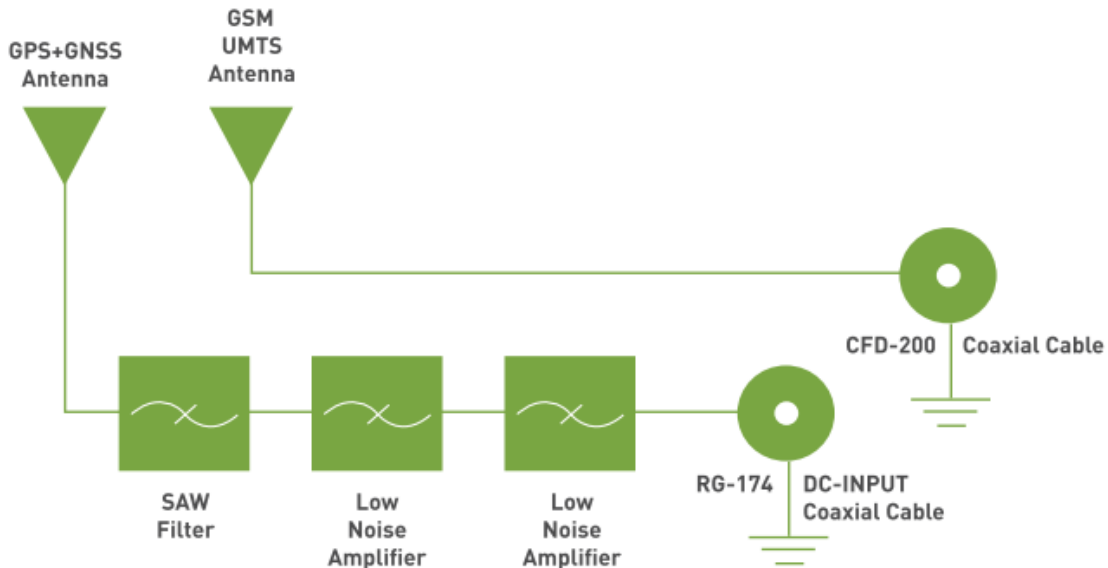
1. Introduction

The MA111 Ultima Series 2in1 GPS/GLONASS/GALILEO & Cellular Combination Antenna is an extremely low profile combination high performance GPS/GLONASS/GALILEO and penta-band cellular antenna solution for professional telematics applications. At only 22 mm height it is the lowest profile antenna in the market, with a diameter of 55 mm. It is designed to be mounted and couple to the metal structures it attaches to radiate. Durable UV ABS housing, thread and nut is resistant to vandalism and direct attack.

The IP67 waterproof robust plastic body makes it extremely light, economical for shipping and minimum weight impact on vehicles. This also makes it ideal for use in humid environments such as water pits or marine applications as there are no external metal parts to corrode. The closed cell foam with double-sided adhesive provides a permanent waterproof seal and can adjust to different curvatures, stopping water from leaking under the antenna into the mounting hole.

For applications that require mounting on non-metal structures we recommend the Hercules MA.105.

1.1. System Configuration



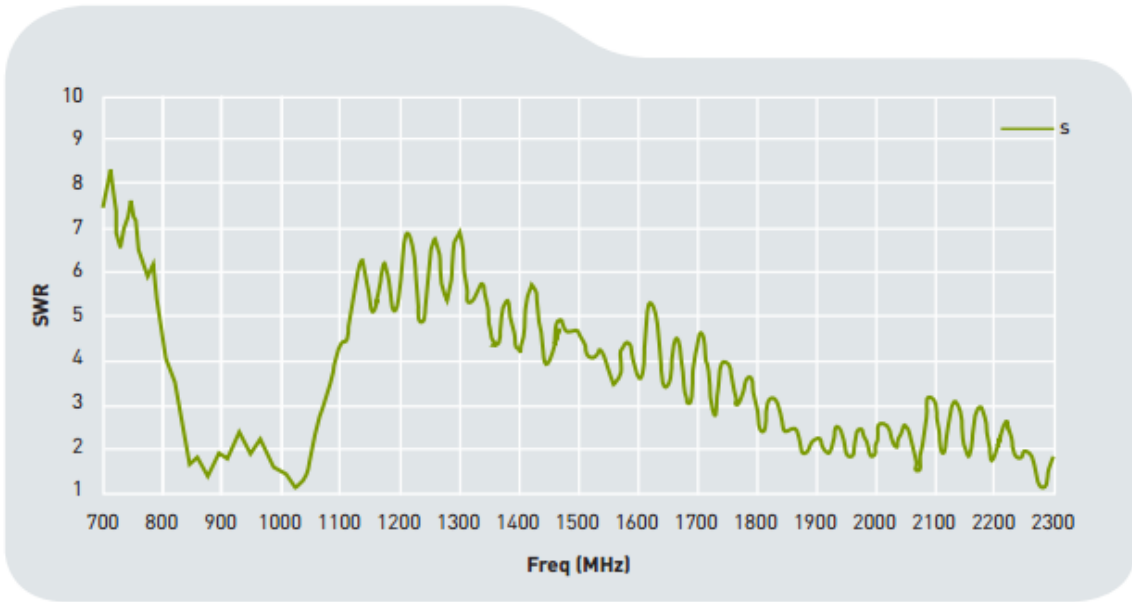
2. Specification

CELLULAR					
Frequency (MHz)	824 ~ 896	880 ~ 960	1710 ~ 1880	1850 ~ 1990	1710 ~ 2170
Peak Gain (dBi)	>1.5	> 3.0	> 2.0	> 4.0	>2.5
Average Gain (dBi)	-0.39	-0.39	-0.39	-0.30	-0.45
Efficiency (%)	>40	>40	>40	>50	>35
SWR	< 2.5	< 2.0	< 3.5	< 3.0	< 3.0
Polarization	Linear				
Radiation Pattern	Omni				
Input Power	50Ω				

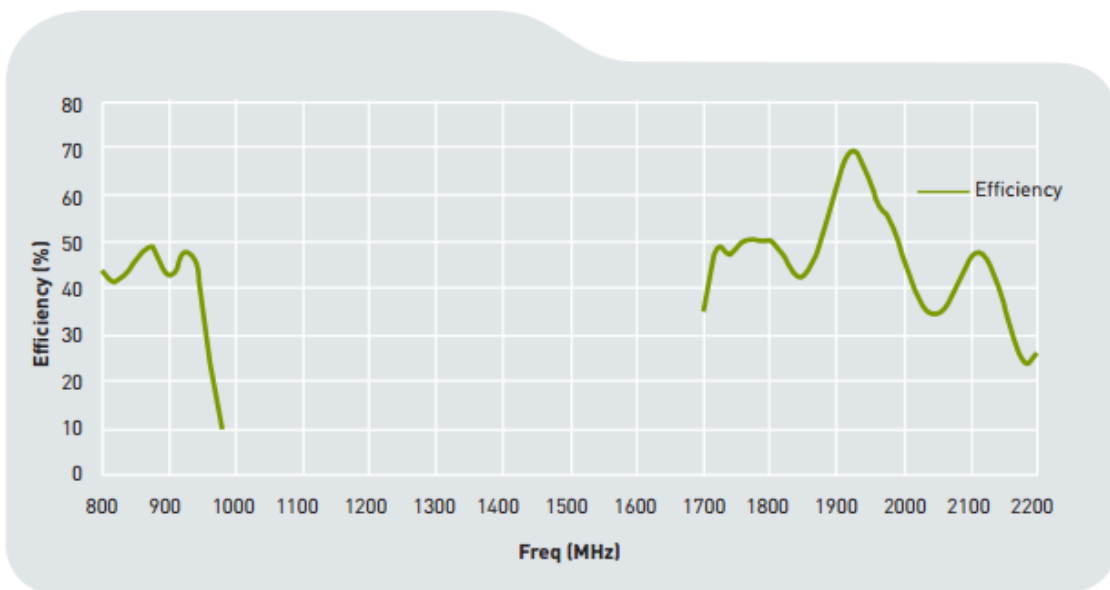
ELECTRICAL GPS/GLONASS/GALILEO	
Frequency(MHz)	1574~1606MHz
Impedance(Ohm)	50Ω
GPS/GALILEO Patch Gain@ Zenith	-1.4dB Passive Gain @ Zenith
GLONASS Patch Gain@ Zenith	-1.3dBi Gain @ Zenith
VSWR	2.0 max
Axial ratio	3.0dB max
Polarization	RHCP
Out Band Rejection	fo = 1575.42MHz fo ± 30 MHz 5dB Min. fo ± 50 MHz 20dB Min. fo ± 100 MHz 25dB Min.
Input Voltage(V)	Typ. 2.5~5.5V
Total Gain @ Zenith	27dB typical at 3.0V
Current consumption(mA)	10mA typical at 3.0V
Noise figure	1.3dB typical
MECHANICAL	
Dimensions	Φ55±2mm , Height 30±2 mm
Cable type	Cellular : CFD200 GPS/GLONASS/GALILEO : RG174
Cable length	3000±30mm
Casing	ABS
Connector	SMA Male
Recommended Mounting Torque	3.92Nm
Maximum Mounting Torque	4.9Nm
Weight	202.5g
ENVIRONMENTAL	
Temperature Range	-40°C to 85°C
Waterproof	IP-67 & IP69K
Thermal Shock	100 cycles -40°C to +80°C
Shock (drop test)	1m drop on concrete 6 axes
Humidity	Non-condensing 65°C 95% RH

3. Antenna Characteristics Cellular

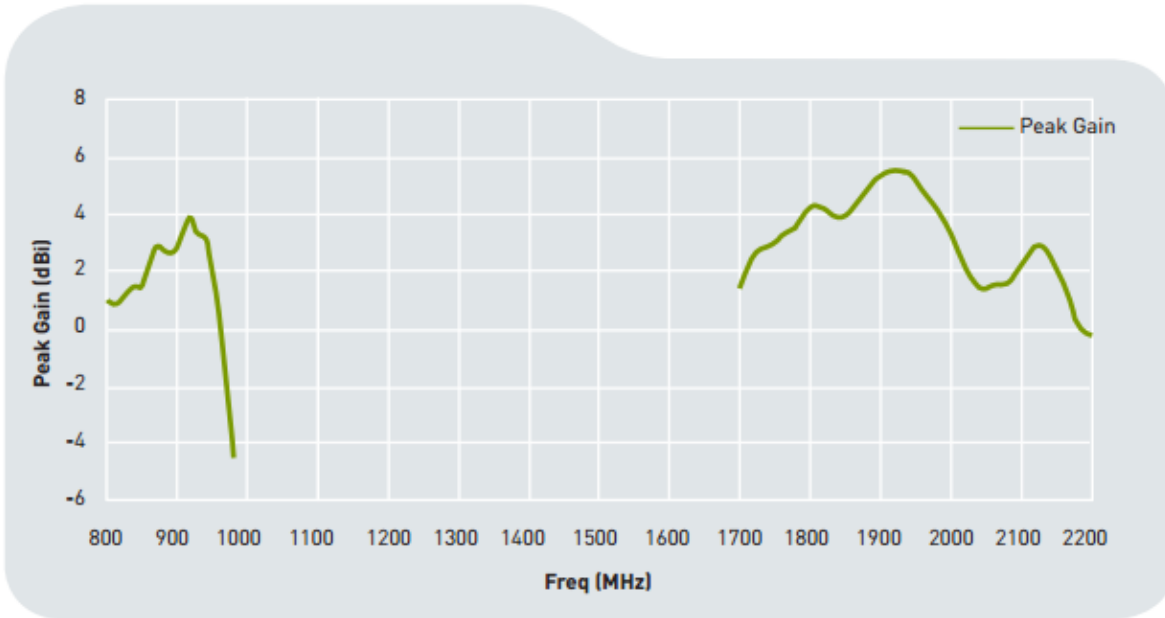
3.1. Cellular antenna Return loss (with 300x300mmGround plane)



3.2. Antenna Efficiency (with 300x300mmGround plane)



3.3. Peak Gain (with 300x300mm Ground plane)



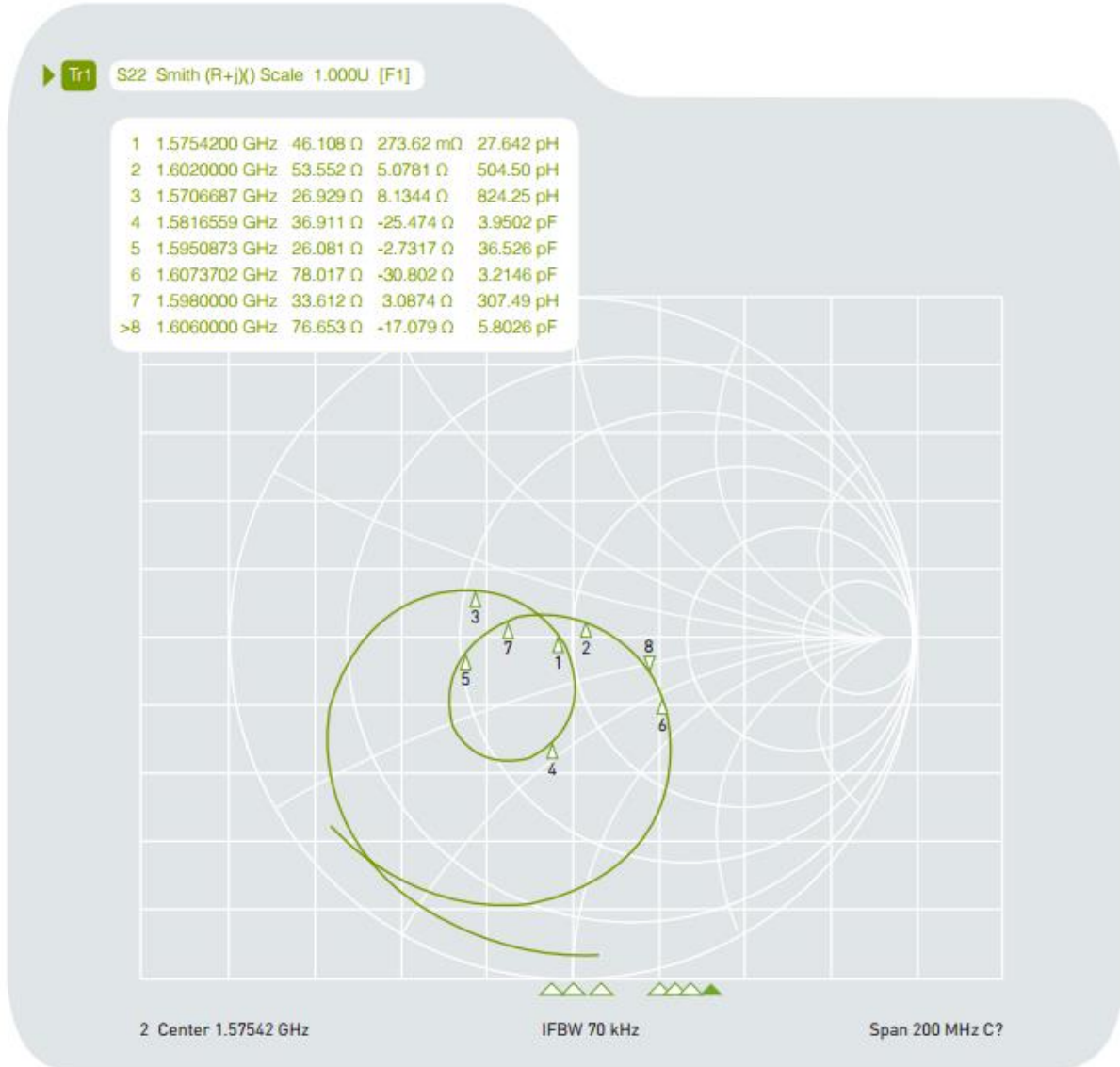
4. Antenna Characteristics

GPS/GLONASS/GALILEO

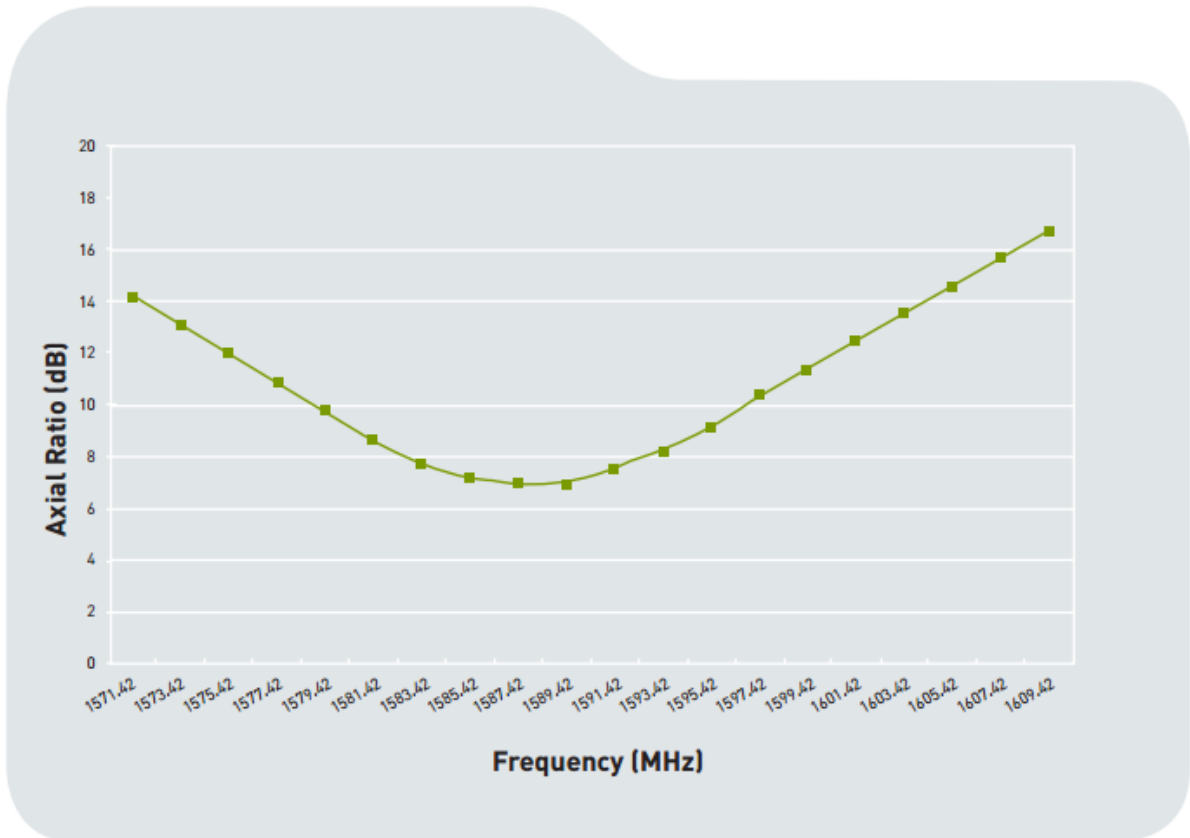
4.1. Return Loss



4.2. Smith Chart - Impedance

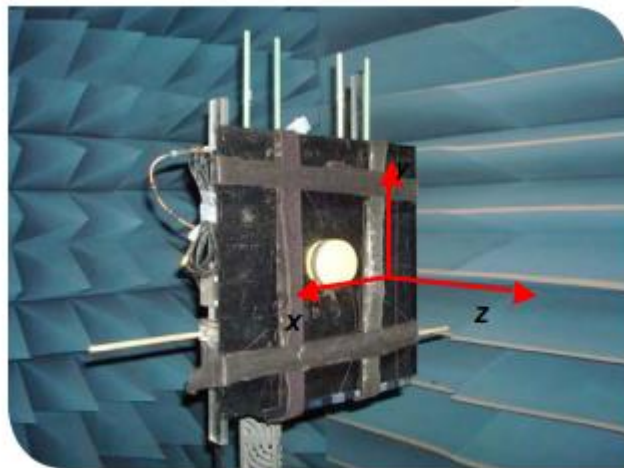


4.3. Axial ratio (AR)



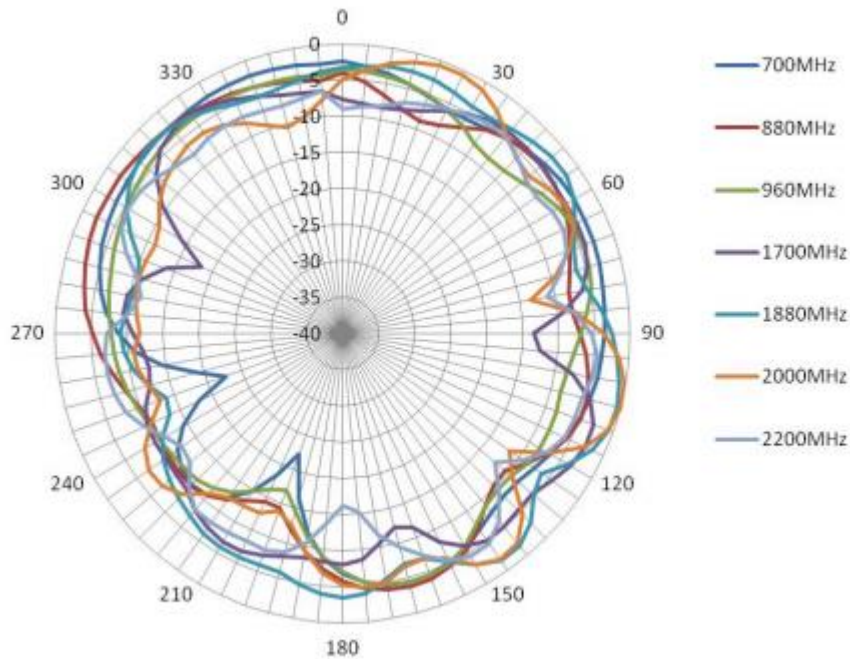
5. Antenna Radiation Pattern-Cellular

5.1. Antenna Setup (cellular)

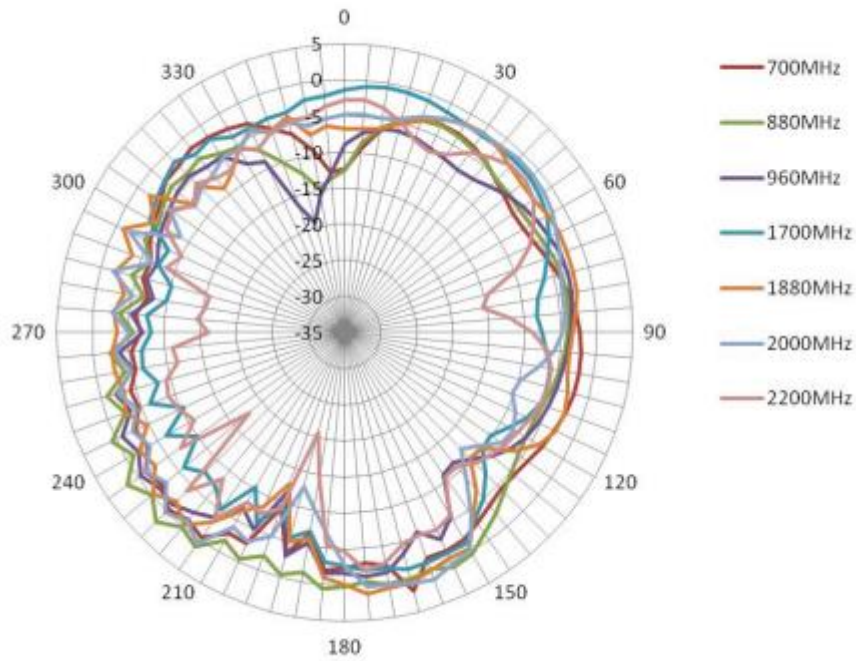


5.2. Radiation Pattern

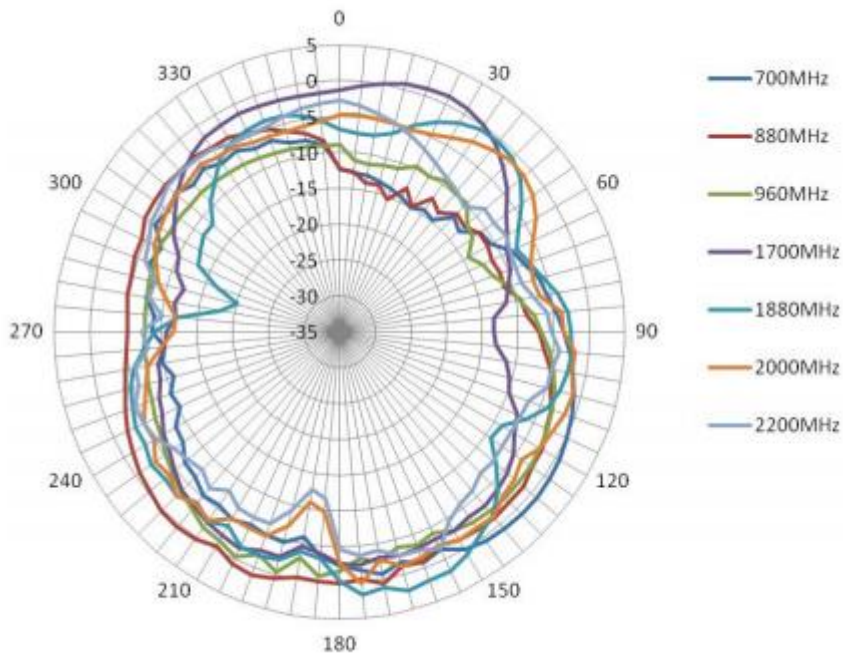
5.2.1. X-Y plane (dBi)



5.2.2. X-Z plane (dBi)



5.2.3. Y-Z plane (dBi)



6. Antenna Radiation Pattern – GPS/GLONASS/GALILEO

H-Plane

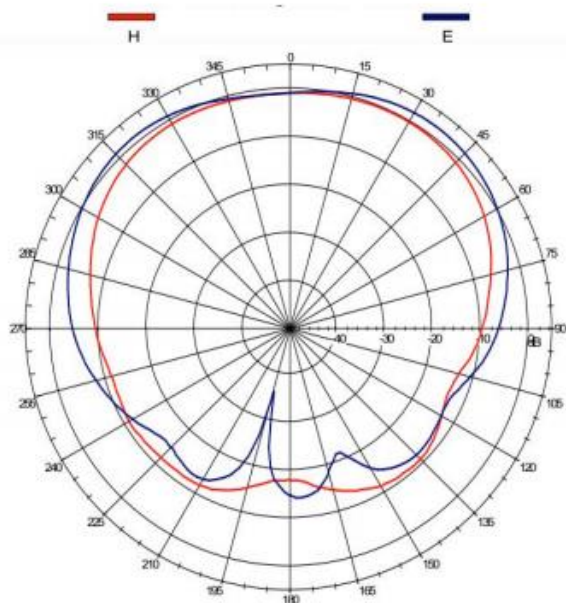


E-Plane



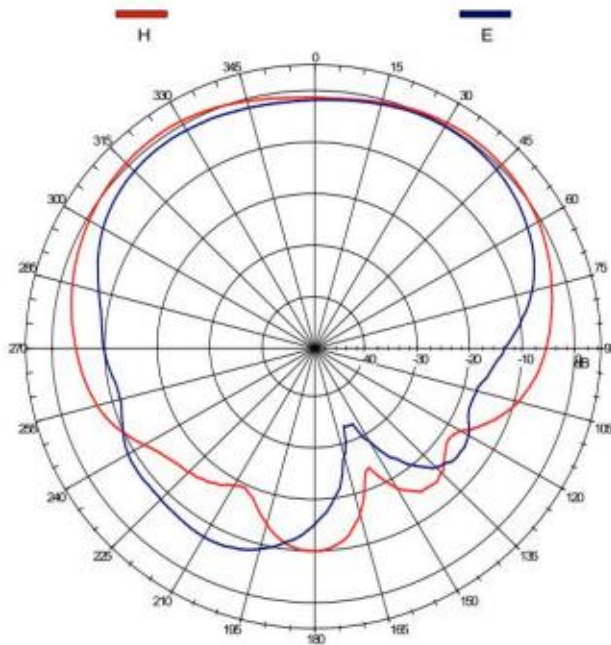
6.1.1. 1575.42MHz

Far-field amplitude of H.nsi

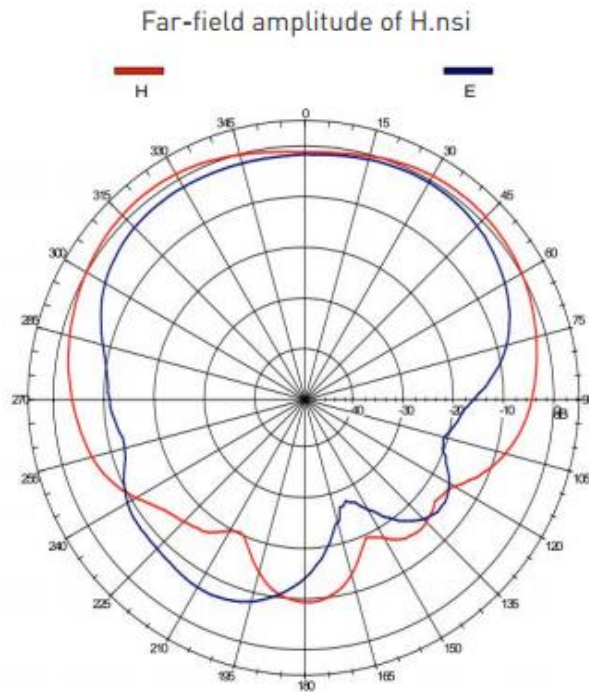


6.1.2. 1598MHz

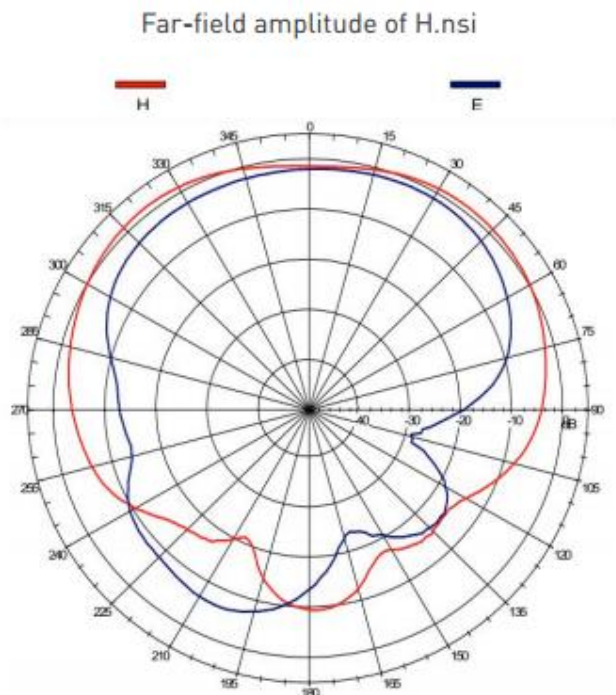
Far-field amplitude of H.nsi



6.1.3. 1602MHz

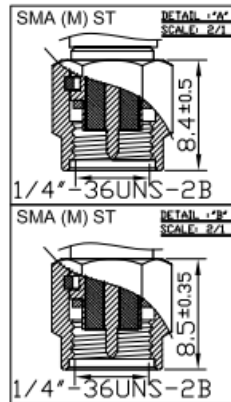
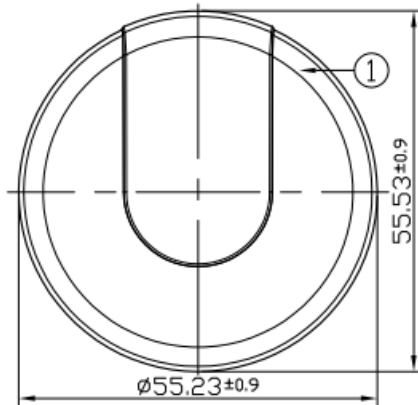


6.1.4. 1606MHz

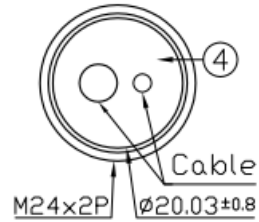


7. Drawing

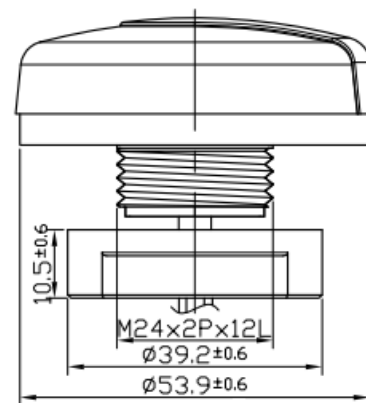
Top View



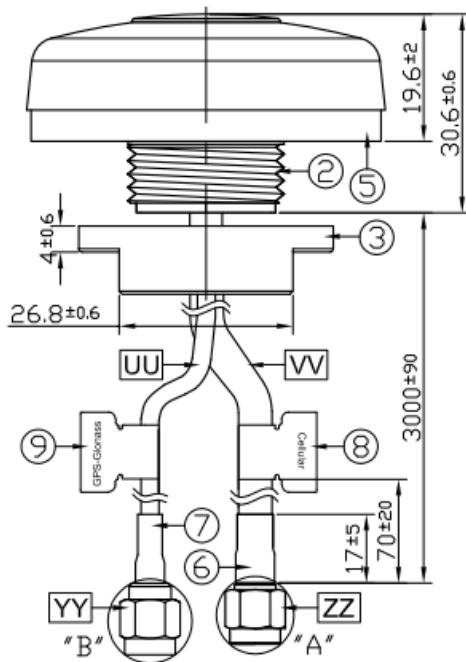
Bottom Thread View



Side View



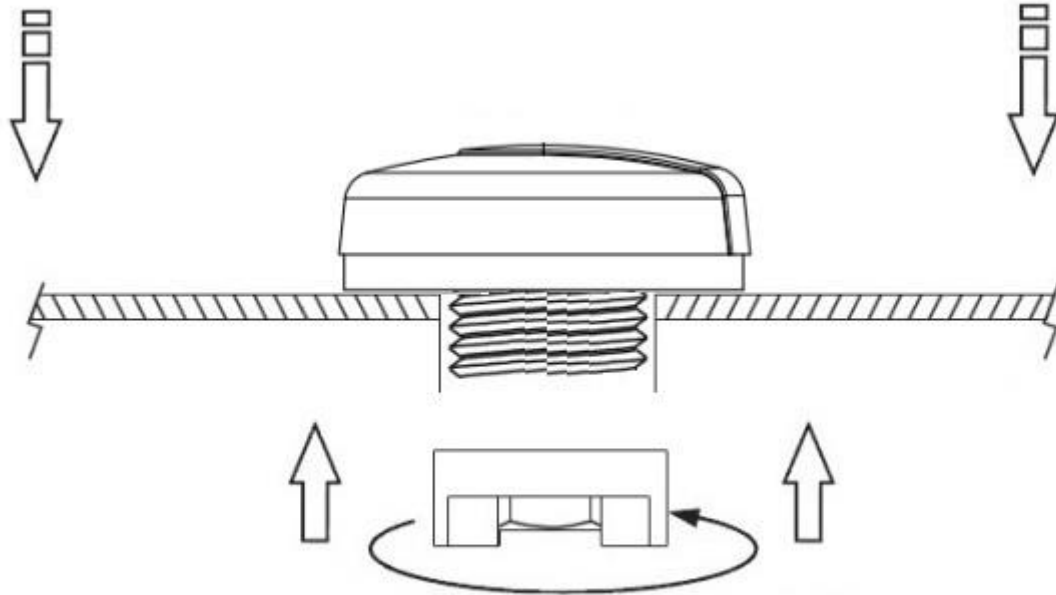
Front View



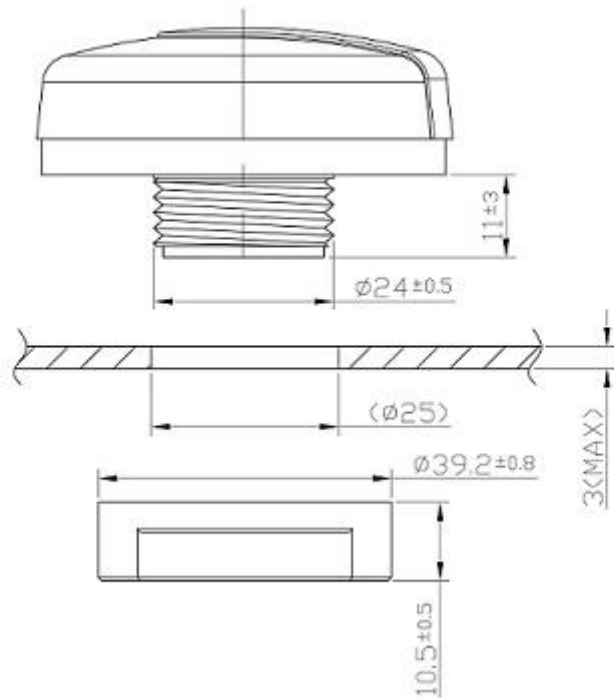
Name	Material	Finish	QTY	
1	Housing Top	PC	White	1
2	Housing bottom	PC	White	1
3	M24 Nut	ABS	White	1
4	Silicon Rubber	Silicon Rubber	Black	1
5	PE Foam	DP3060W+3M9448	White	1
6	Heat Shrink Tube NFC200	PE	Black	1
7	Heat Shrink Tube RG174	PE	Black	1
8	Cellular Label	Coated Paper	Blue	1
9	GPS-Glonass Label	Coated Paper	Orange	1

Name	Spec	Finish	QTY	
UU	Cable Type	RG 174	Black	1
VV	Cable Type	CFD-200	Black	1
YY	Connector Type	SMA(M)ST	Gold	1
ZZ	Connector Type	SMA(M)ST	Gold	1

8. Installation

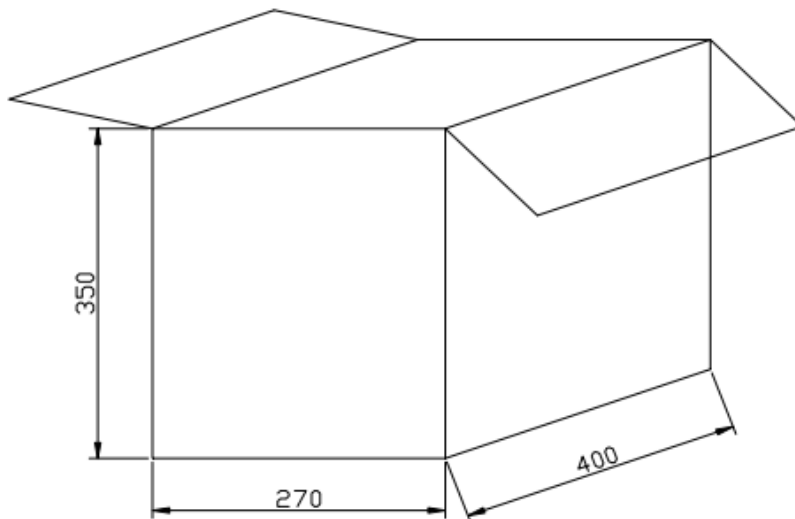
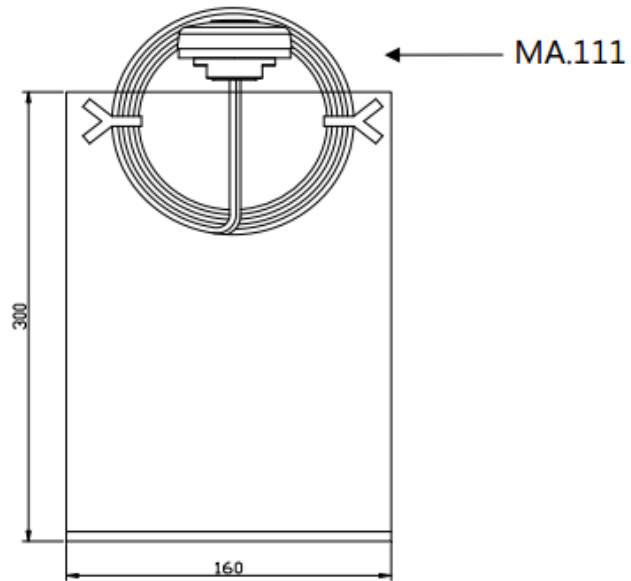


Recommended torque for Mounting is 3.92N·m
 Maximum torque for Mounting is 4.9N·m



9. Packaging

1 pcs antenna per small PE bag
40 small PE bags per box



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