

SPECIFICATION

Part No.	: MA111.C.LB.001
Product Name	: 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 Standard is GPS/GLONASS/GALILEO - 3M RG174 SMA(M) Cellular – 3M CFD200 SMA(M) Customizable ROHS Compliant



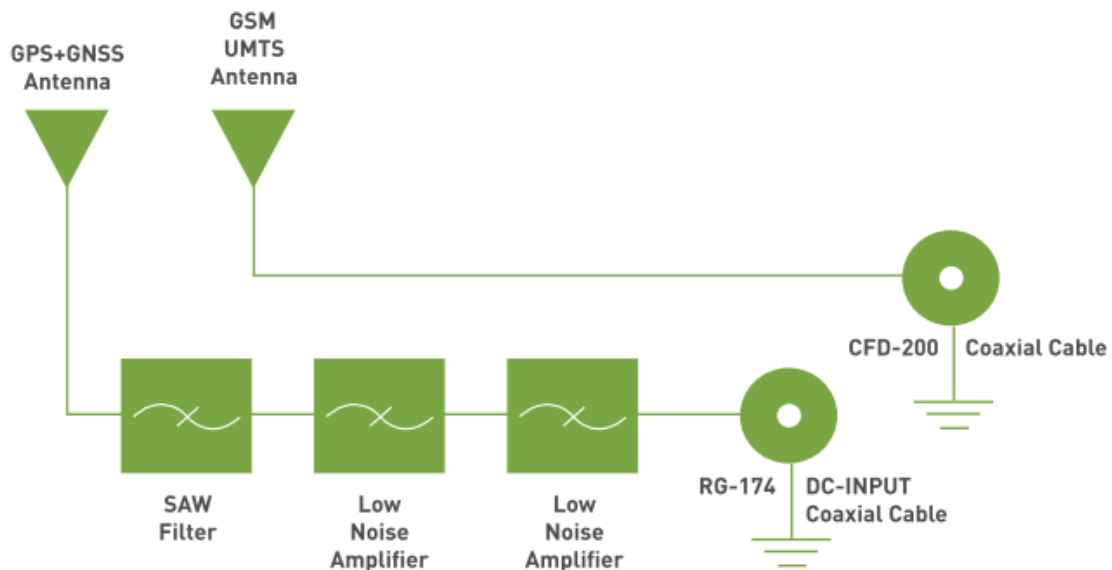
1. Introduction

The MA.111 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.

2. System Configuration



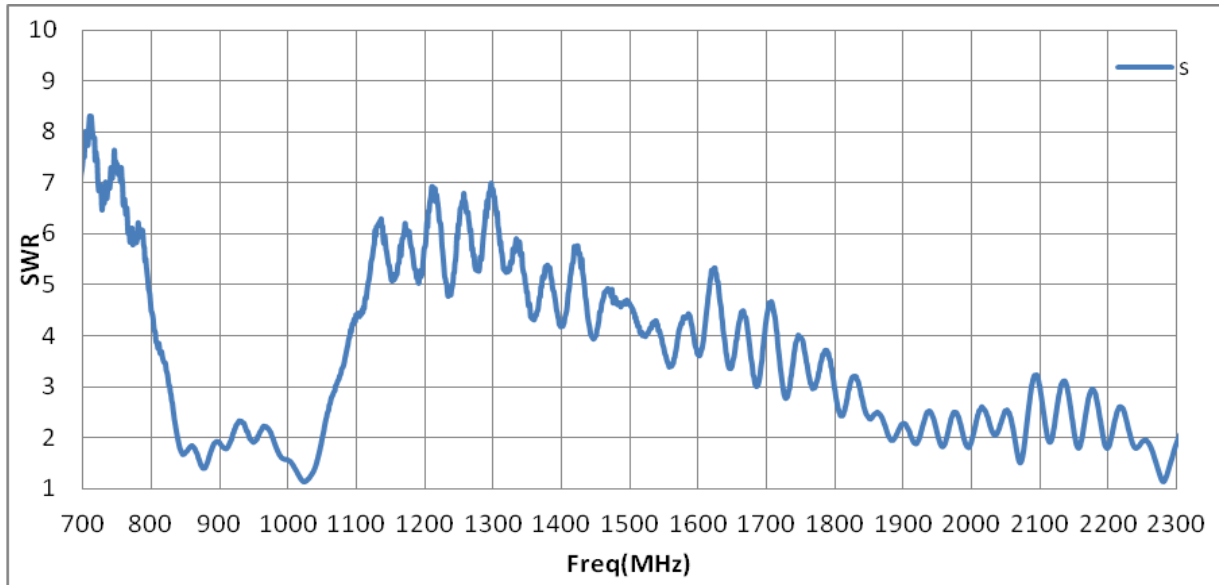
3. Specification

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				

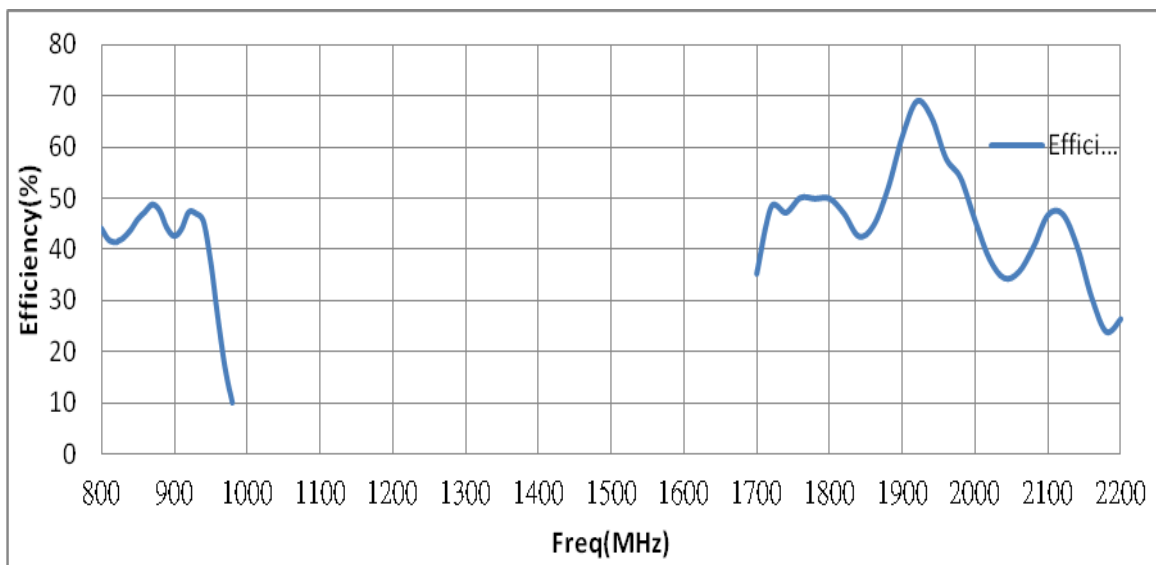
VSWR	2.0 max
Axial ratio	3.0dB max
Polarization	RHCP
Out Band Rejection	fo = 1575.42MHz fo ± 30 MHz 5dB Min. fo ± 50 MHz 20dB Min. fo ± 100 MHz 25dB Min.
Input Voltage(V)	Typ. 2.5~5.5V
Total Gain @ Zenith	27dB typical at 3.0V
Current consumption(mA)	10mA typical at 3.0V
Noise figure	1.3dB typical
MECHANICAL	
Dimensions	Φ55±2mm , Height 30±2 mm
Cable type	Cellular : CFD200 GPS/GLONASS/GALILEO : RG174
Cable length	3000±30mm
Casing	ABS
Connector	SMA Male
ENVIRONMENTAL	
Temperature Range	-40°C to 85°C
Waterproof	IP-67
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

4. Antenna Characteristics Cellular

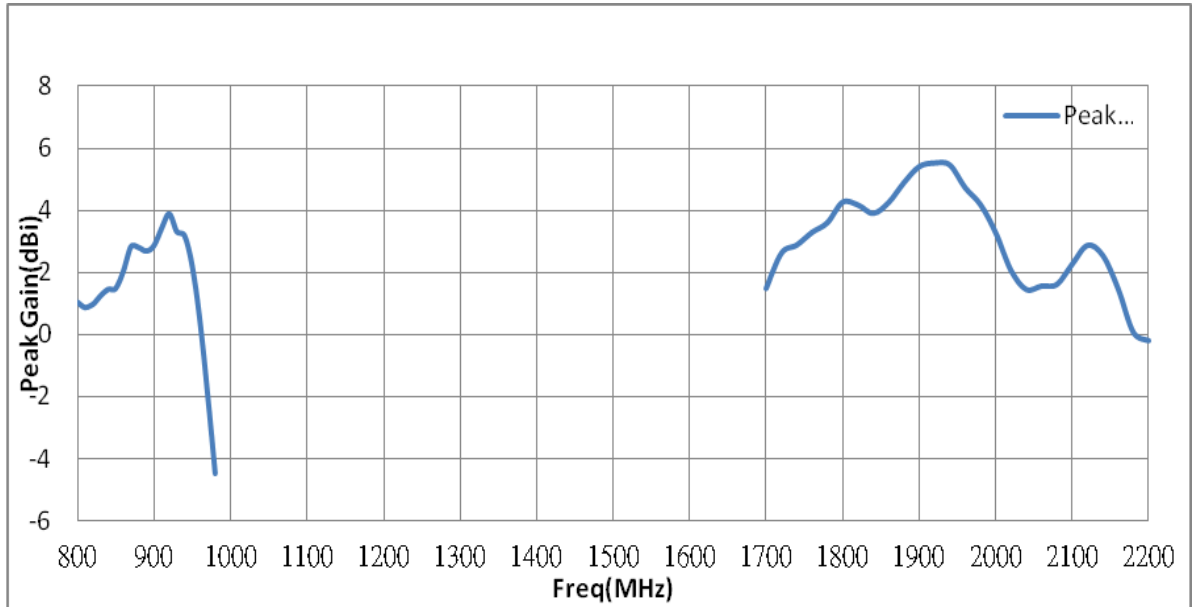
4.1 Cellular antenna Return loss (with 300x300mmGround plane)



4.2 Antenna Efficiency (with 300x300mmGround plane)



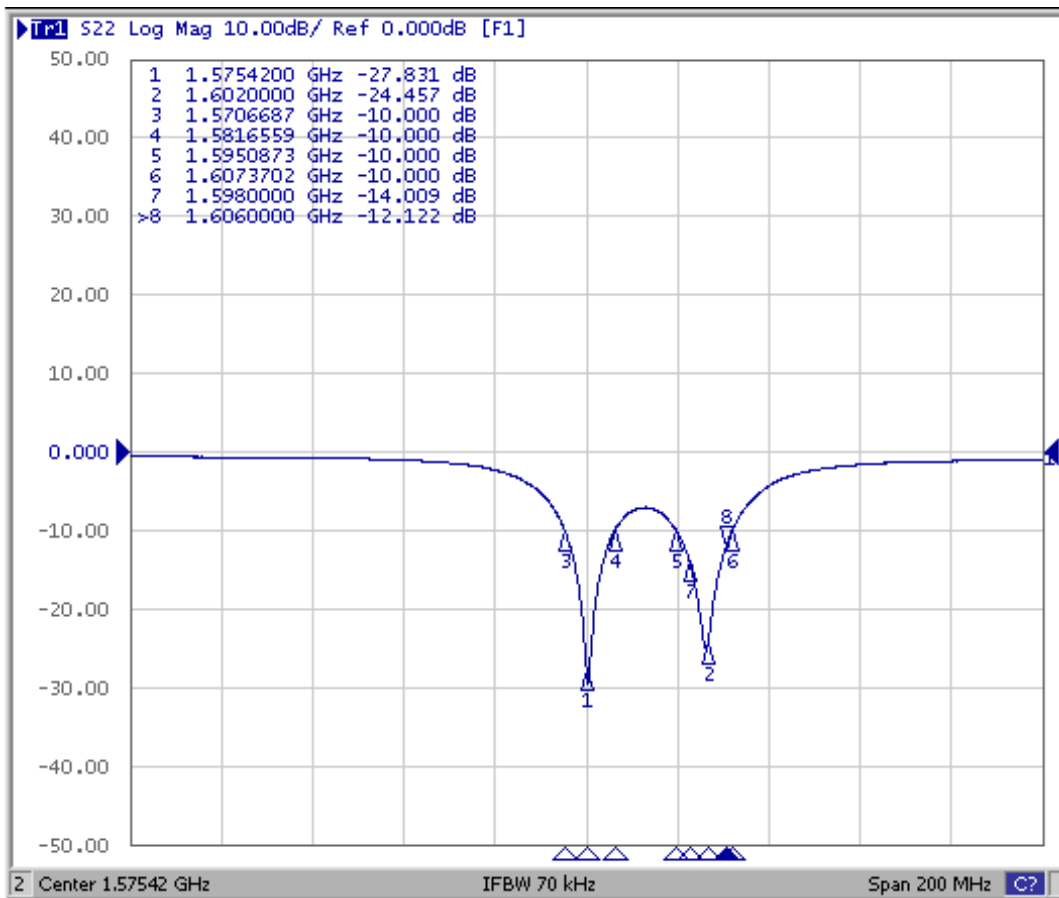
4.3 Peak Gain (with 300x300mm Ground plane)



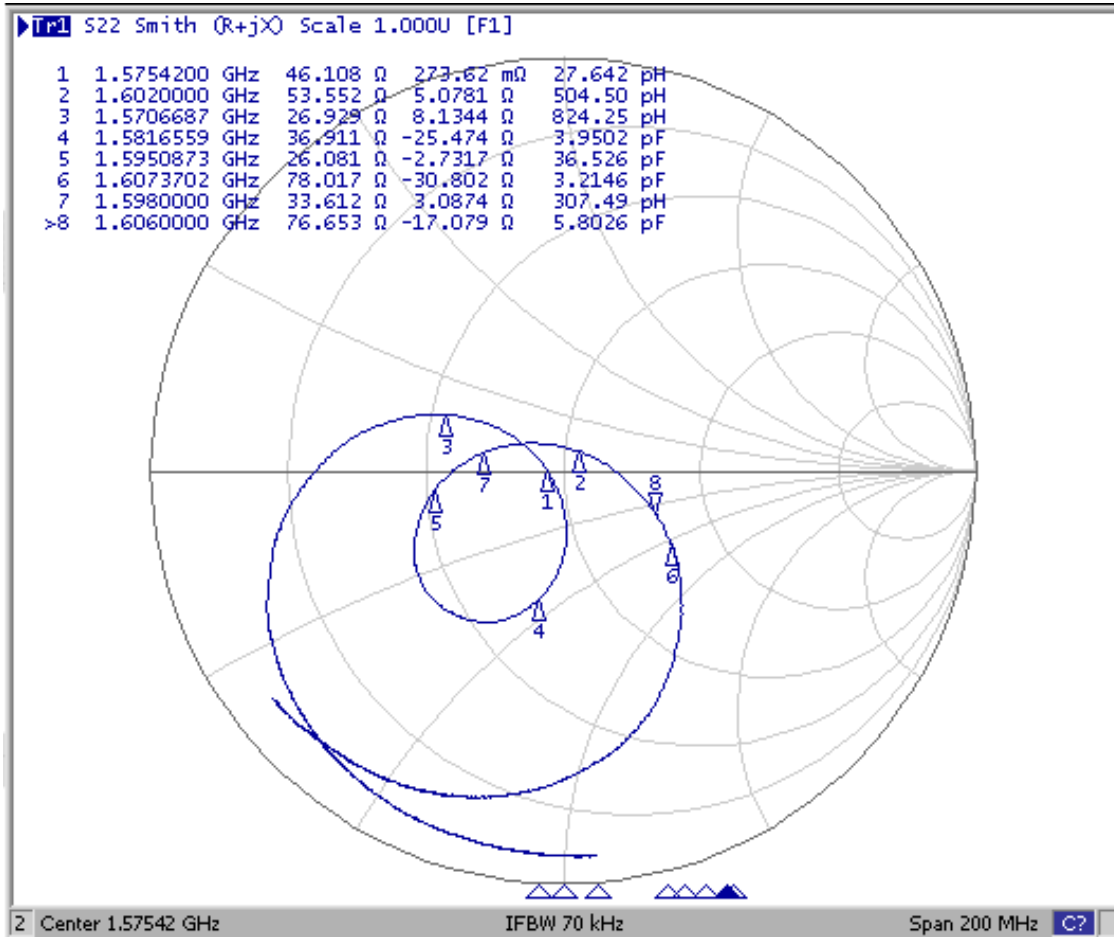
5. Antenna Characteristics

GPS/GLONASS/GALILEO

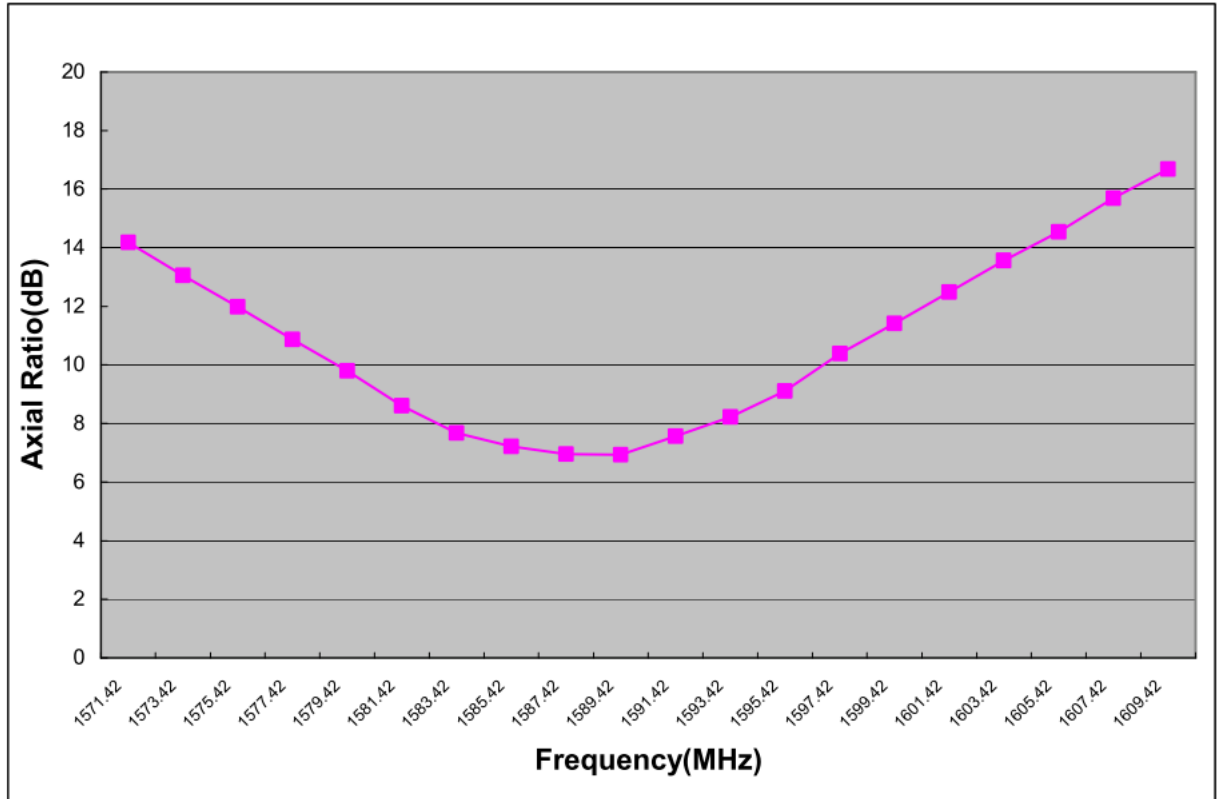
5.1 Return Loss



5.2 Smith Chart - Impedance

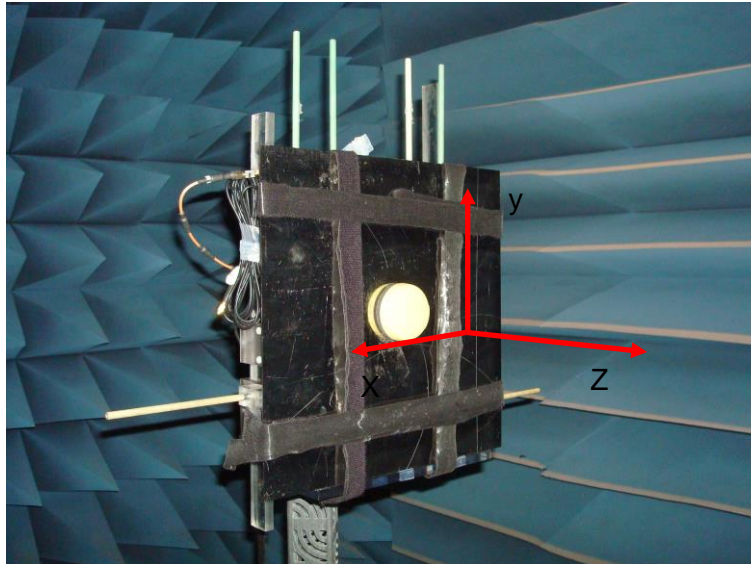


5.3 Axial ratio (AR)



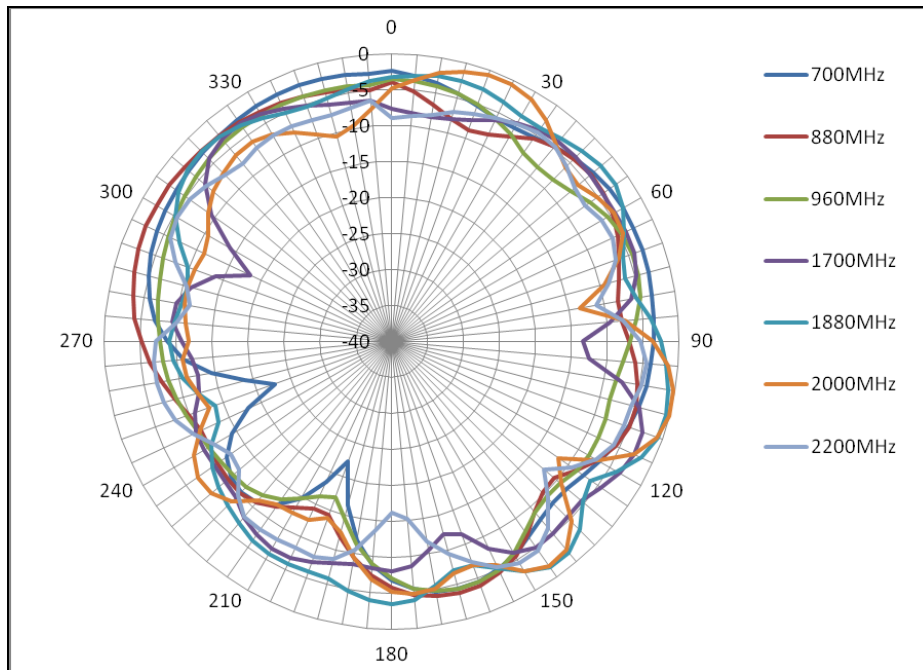
6 Antenna Radiation Pattern-Cellular

6.1 Antenna Setup (cellular)

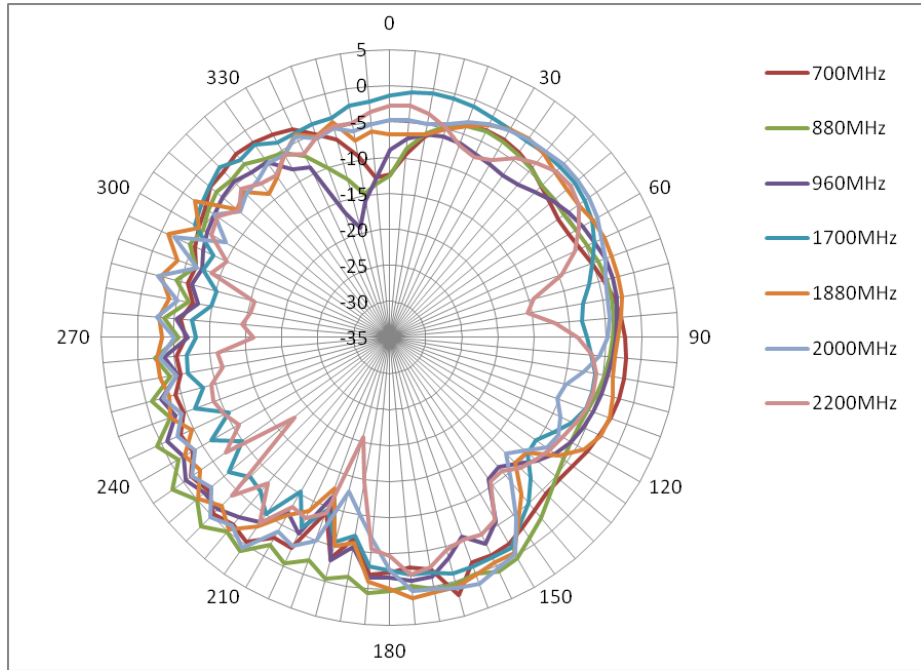


6.2 Radiation Pattern

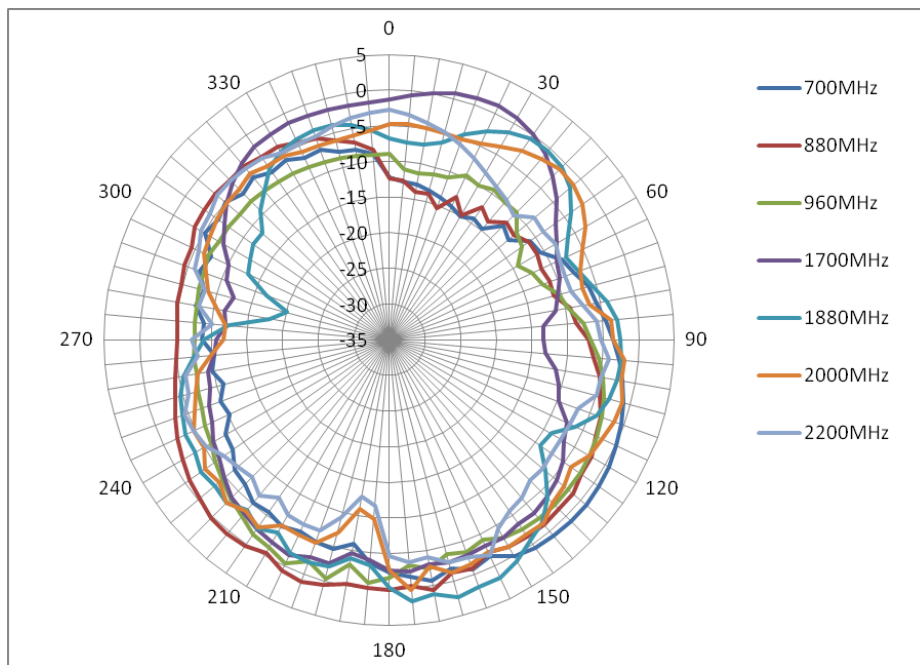
6.2.1 X-Y plane (dBi)



6.2.2 XZ plane (dBi)



6.2.3 YZ plane (dBi)



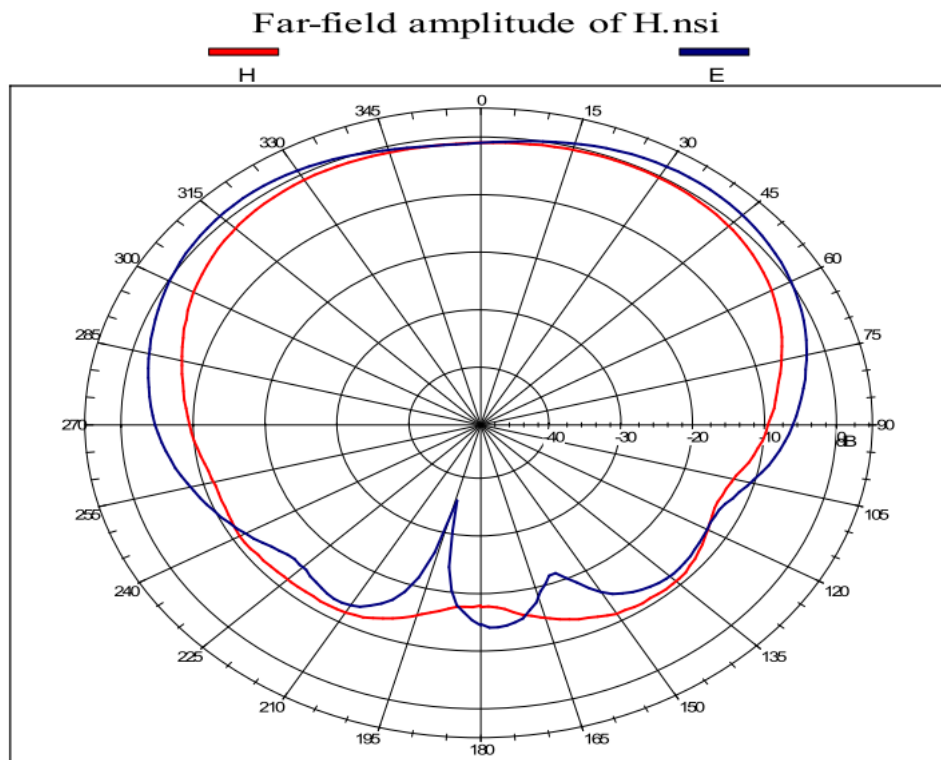
7 Antenna Radiation Pattern – GPS/GLONASS/GALILEO

H-Plane

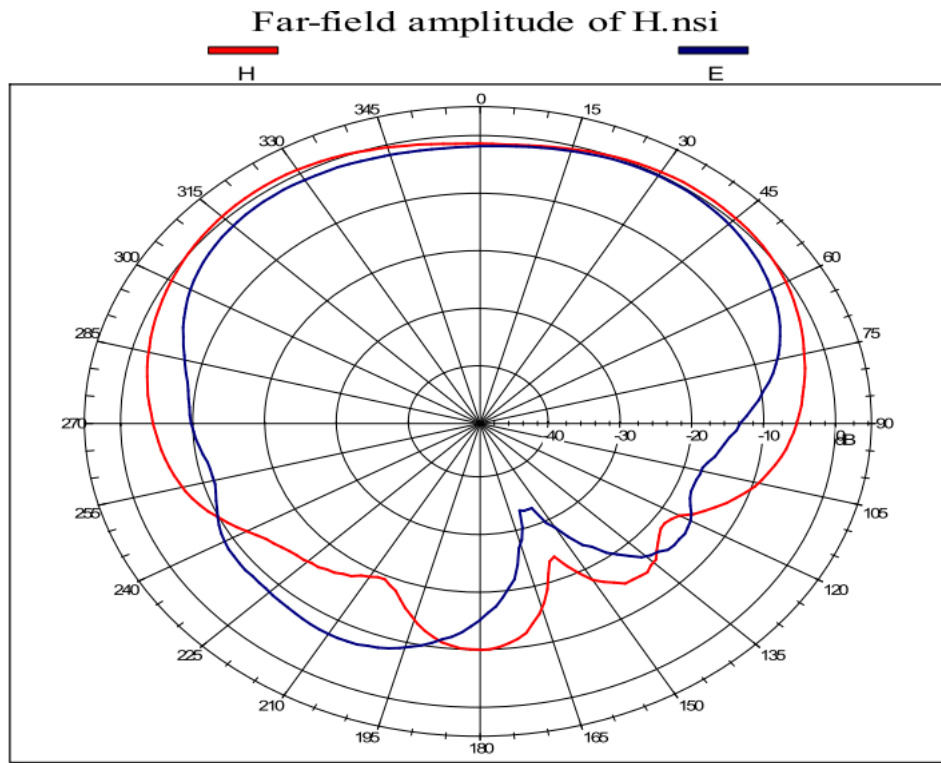
E-Plane



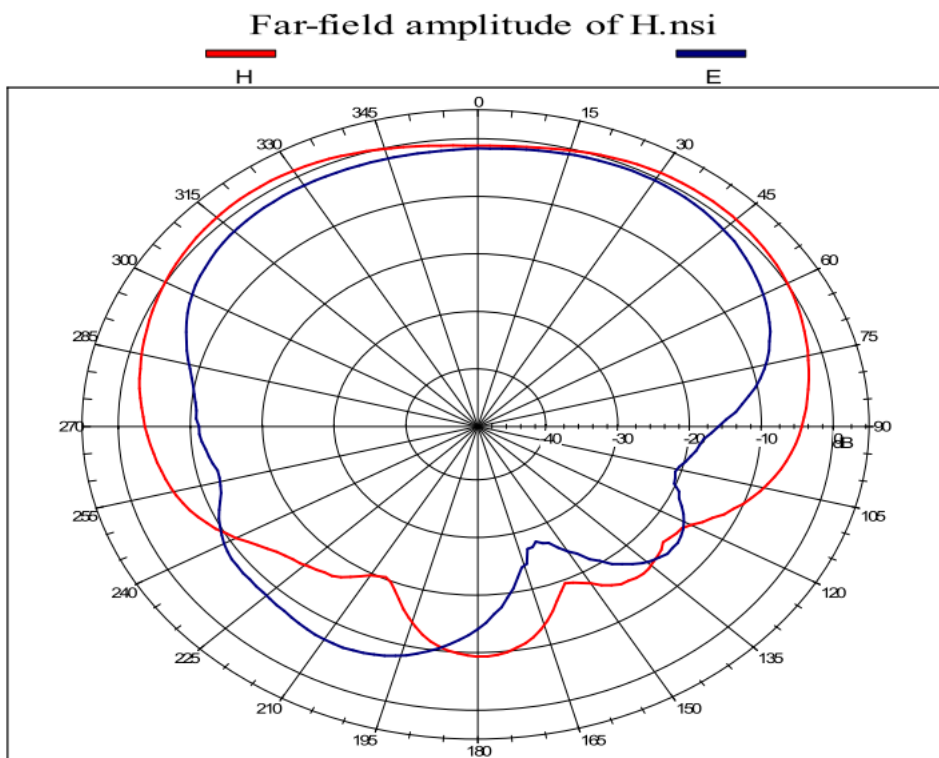
7.1 1575.42MHz



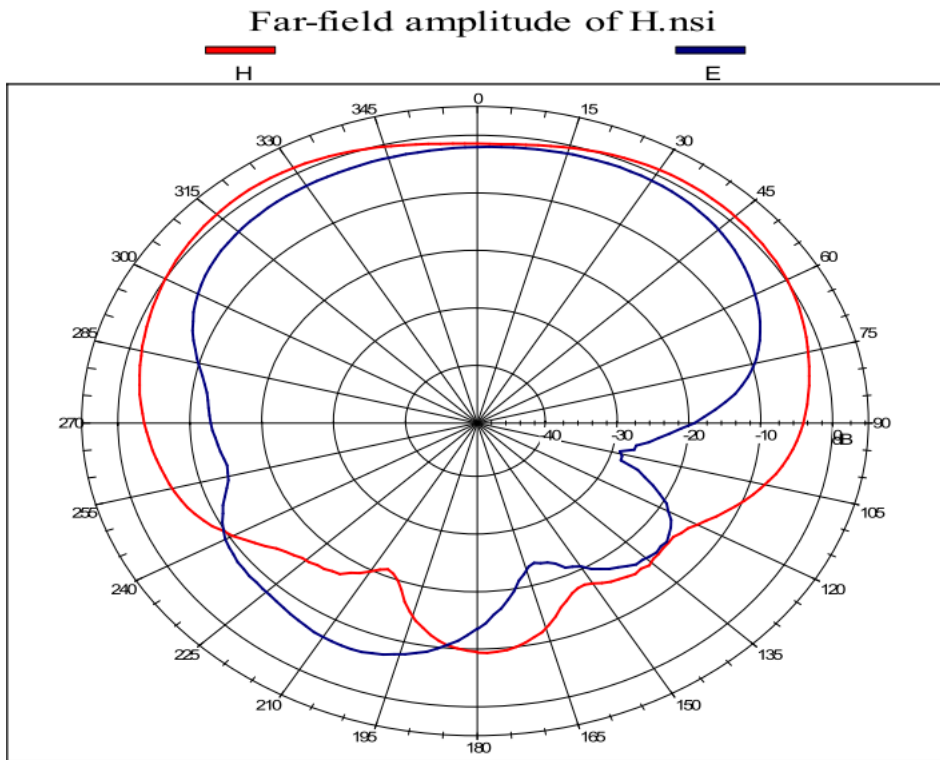
7.2 1598MHz



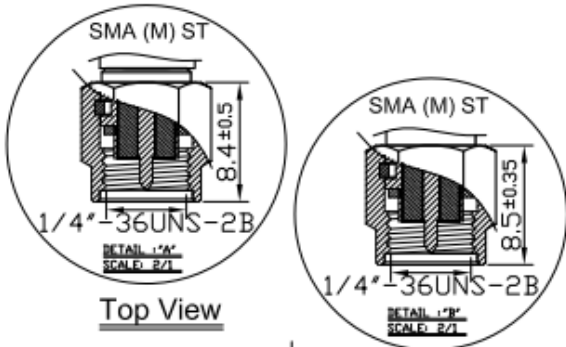
7.3 1602MHz



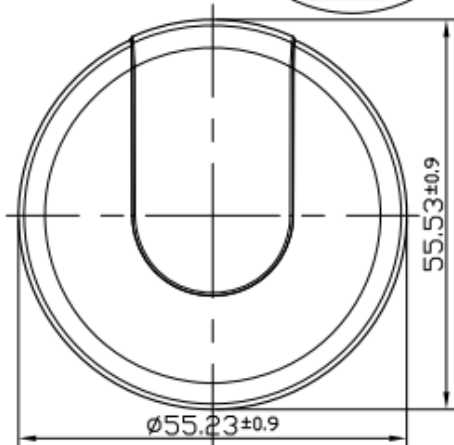
7.4 1606MHz



8 Drawing



Top View

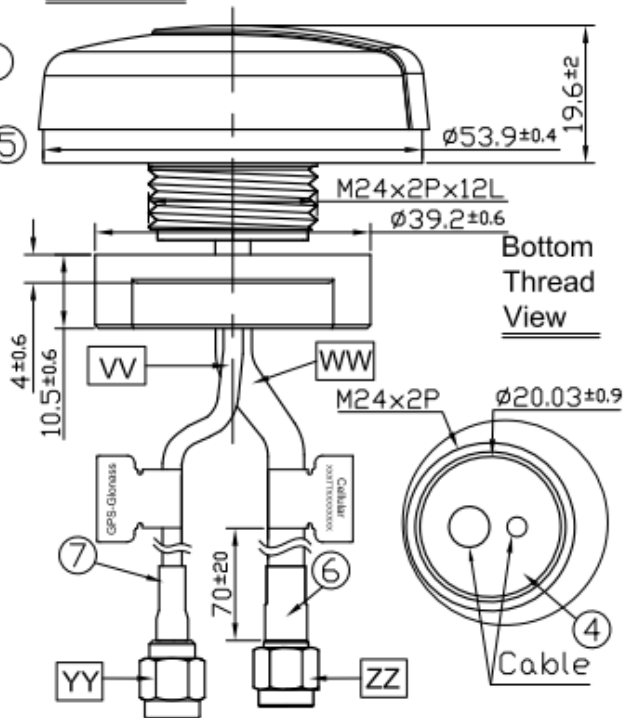
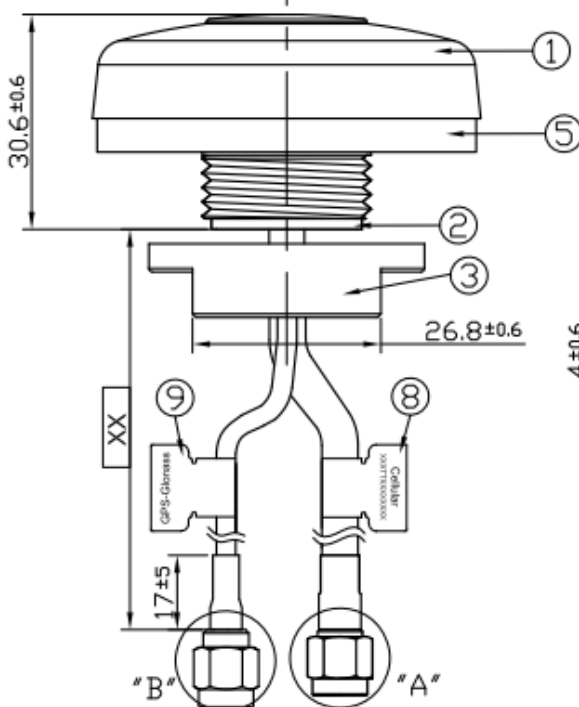


Front View

	Name	P/N	Material	Finish	QTY
1	Housing Top	000112A000020A	ABS	Black	1
2	Housing bottom	000112A010020A	ABS	Black	1
3	M20 Nut	000112A020020A	ABS	Black	1
4	Silicon Rubber	000712A000020A	Silicon Rubber	Black	1
5	Foam	001013A000020A	CR4305+3M9448	Black	1
6	Heat Shrink Tube CFD200	001311F010013A	PE	Black	1
7	Heat Shrink Tube RG174	001311F000013A	PE	Black	1
8	Cellular Label	001013A000051A	Coated Paper	Blue	1
9	GPS-Glonass Label	001012K010051A	Coated Paper	Orange	1

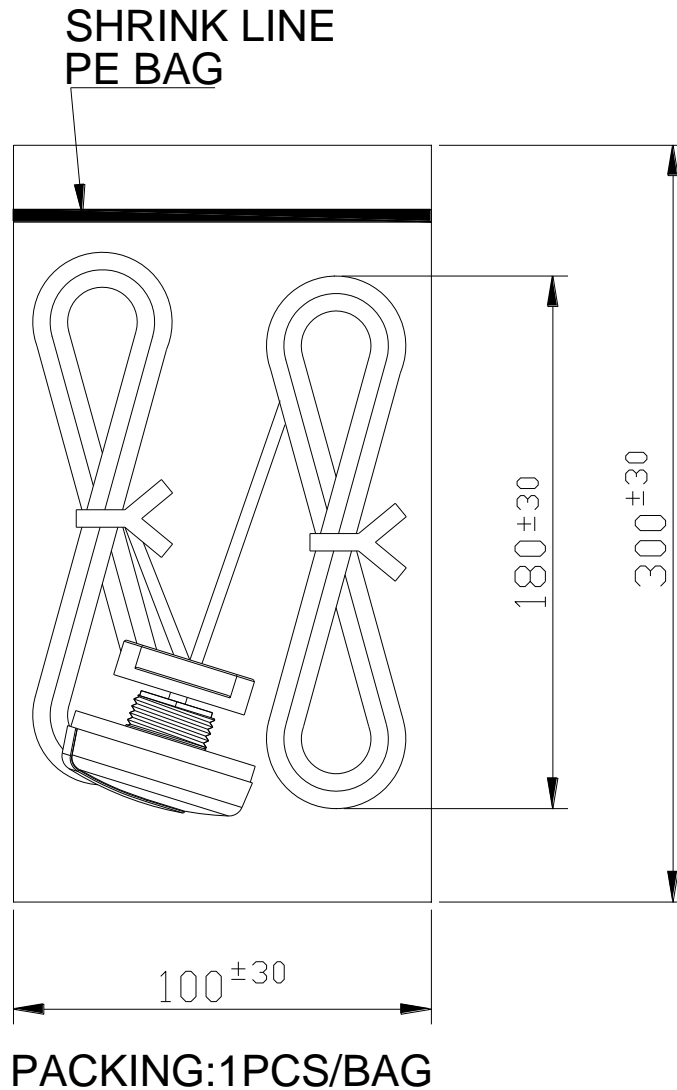
	Name	P/N	Spec	Finish	QTY
VV	Cable Type	301313A000013A	RG 174	Black	1
WW	Cable Type	301413A000013A	CFD 200	Black	1
XX	Cable Length		3000±60 mm		
YY	Connector Type	301313A000013A	SMA(M)ST	Gold	1
ZZ	Connector Type	301413A000013A	SMA(M)ST	Gold	1

Side View



Bottom Thread View

9 Packaging



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