

SPECIFICATION

- Part No. : **MA650.A.AB.002**
- Product Name : Spartan Antenna 2in1 MA.650 with 10M cable length
Low Profile Screw-Mount (Permanent Mount)
GPS/GLONASS/GALILEO Cellular combination antenna
- Feature : Cellular 850/900/1700/1800/2100MHz
GSM/CDMA/UMTS/HSPA
GPS/GLONASS/GALILEO – 5dBiC
IP67 Waterproof
High Efficiency / Peak Gain Outdoor Antenna
Advanced RF Design and Materials
Heavy Duty – Integrated Metal Base/
Ground-plane
Standard 10 meters low loss cables
Custom cables and connectors available
RoHS Compliant



1. Introduction

The Spartan MA.650 antenna is a low profile, heavy-duty, fully IP67 waterproof external M2M antenna for use in telematics, transportation and remote monitoring applications. With a standard length of 10 meters of very low loss cable it is specially designed suitable for e-Bus or train telematics applications where long cable lengths are needed.

The Spartan MA.650 antenna is unique in the market because it combines 2in1 GPS/GALILEO, Cellular (3G and 2G) antennas in a heavy-duty structure with high efficiency in a low profile compact format. The antenna screws down permanently onto a roof or metal panel and can be pole or wall-mounted. The antennas are designed to be isolated from each other to prevent cross-interference.

For industries such as commercial vehicle telematics, remote monitoring, smart meter systems, construction equipment, at only 40mm high, the Spartan provides an unobtrusive, robust, rugged antenna that is durable even in extreme environments.

2. Specification Table

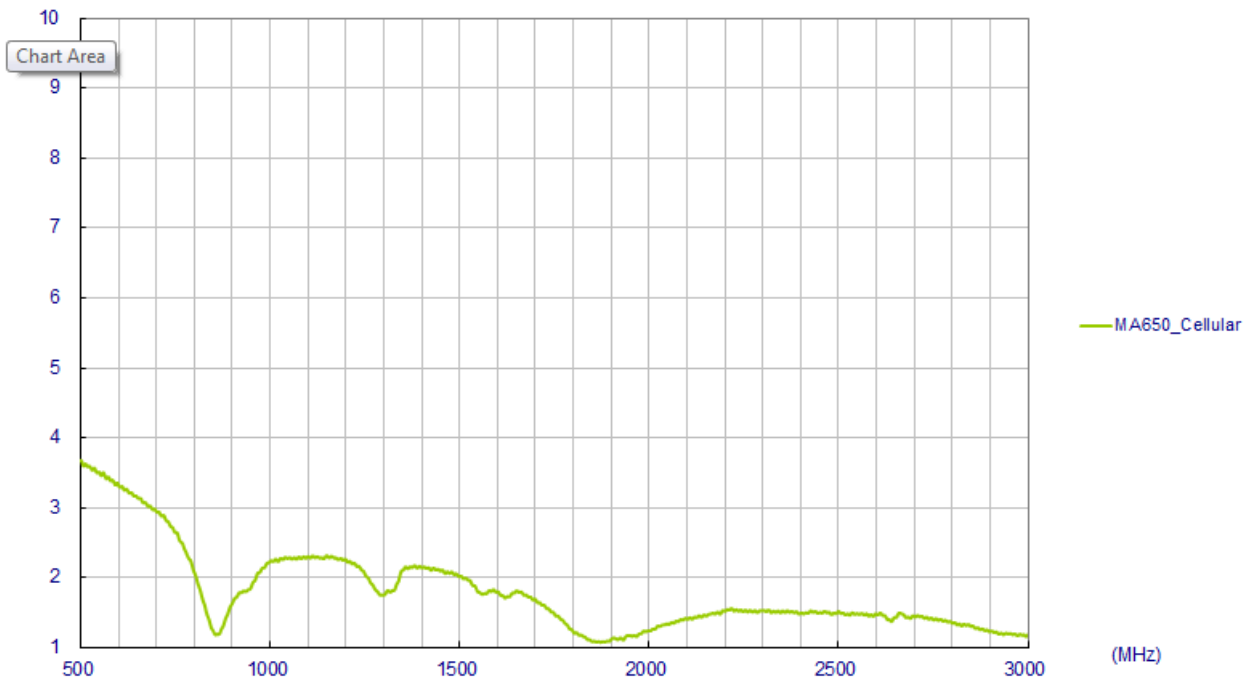
ELECTRICAL – GPS/GLONASS/GALILEO Passive Antenna	
Frequency	1575.42 ± 3MHz 1602 ± 3MHz
Radiation Efficiency	50%
Peak Gain	4 ±1 dBic typ.
VSWR	2:1 Max
Polarization	Linear
Impedance	50Ω

ELECTRICAL - LNA			
Frequency	1575.42 ± 3MHz 1602 ± 3MHz		
Impedance	50 Ω		
VSWR	2:1 Max		
DC Power Input	3.3V	4V	5V
Gain @3.3V	28dB	28dB	28dB
Noise Figure	1.50dB	1.55dB	1.62dB
Power Consumption	8mA	10mA	13mA
Band Attenuation	±50MHz	±70MHz	±100MHz
	30dB	30dB	30dB

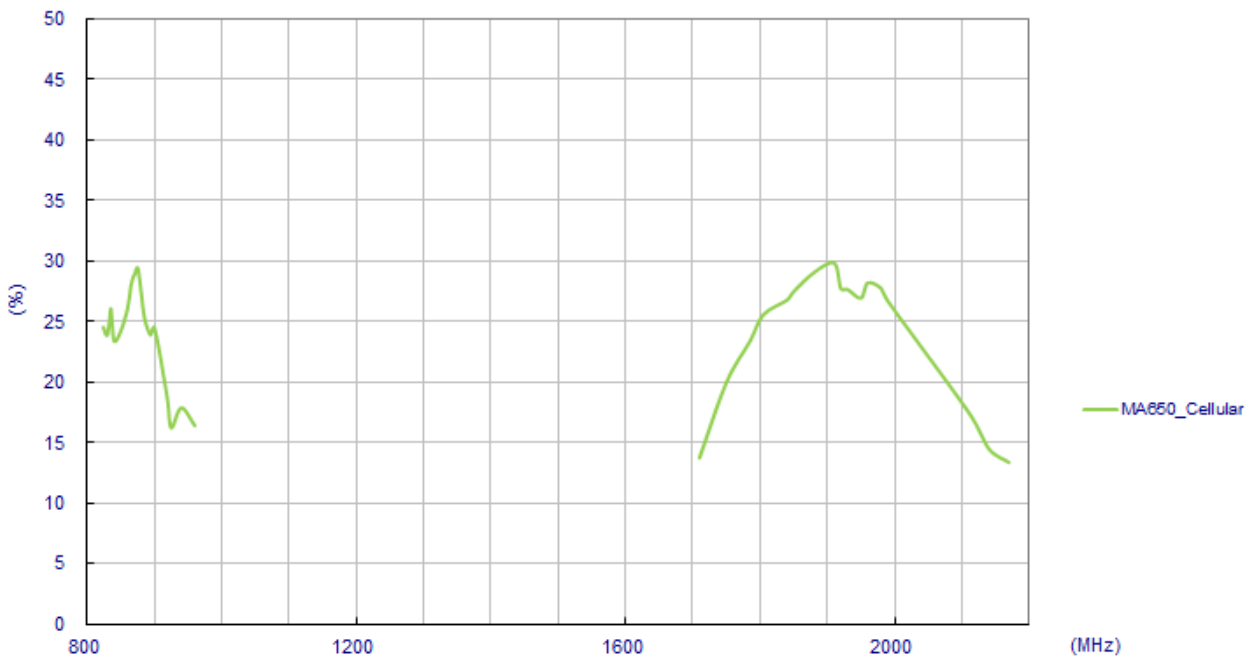
ELECTRICAL – Cellular Antenna					
Frequency (GHz)	824~896	880~960	1710~1880	1850~1990	1920~2170
Peak Gain (dBi) *	-0.5	-0.5	-1.0	-0.5	-0.8
Avg. Gain (dBi) *	-5.8	-5.6	-5.4	-5.3	-5.5
Efficiency (%) *	29	28	30	27.9	28
VSWR	3 Max				
Polarization	Linear				
Radiation pattern	Omni				
*Including 10 meters cable loss					
MECHANICAL					
Antenna Dimensions	Height 50mm x Diameter 150mm				
Housing	PC				
Base and thread	Nickel plated Zinc				
Waterproof	IP67				
ENVIRONMENTAL					
Operating Temperature	-40°C to 85°C				
Storage Temperature	-40°C to 80°C				
Humidity	Non-condensing 65°C 95% RH				

3. Cellular Antenna Characteristics

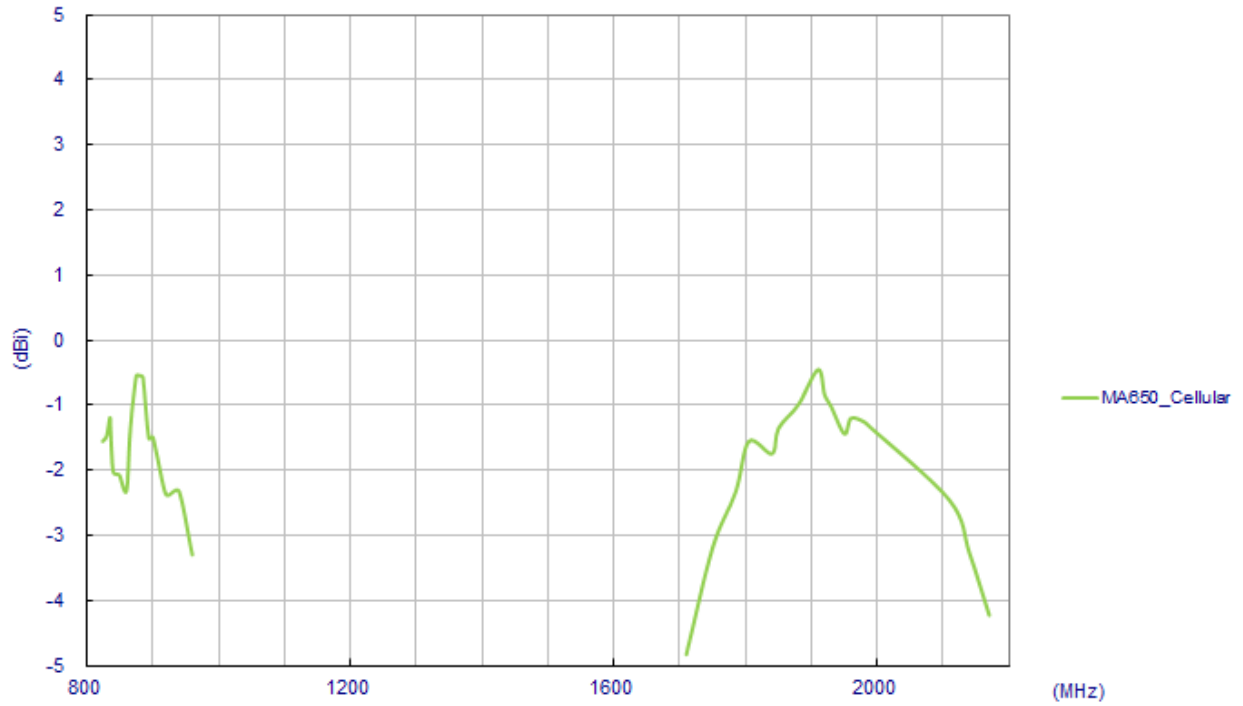
3.1. VSWR



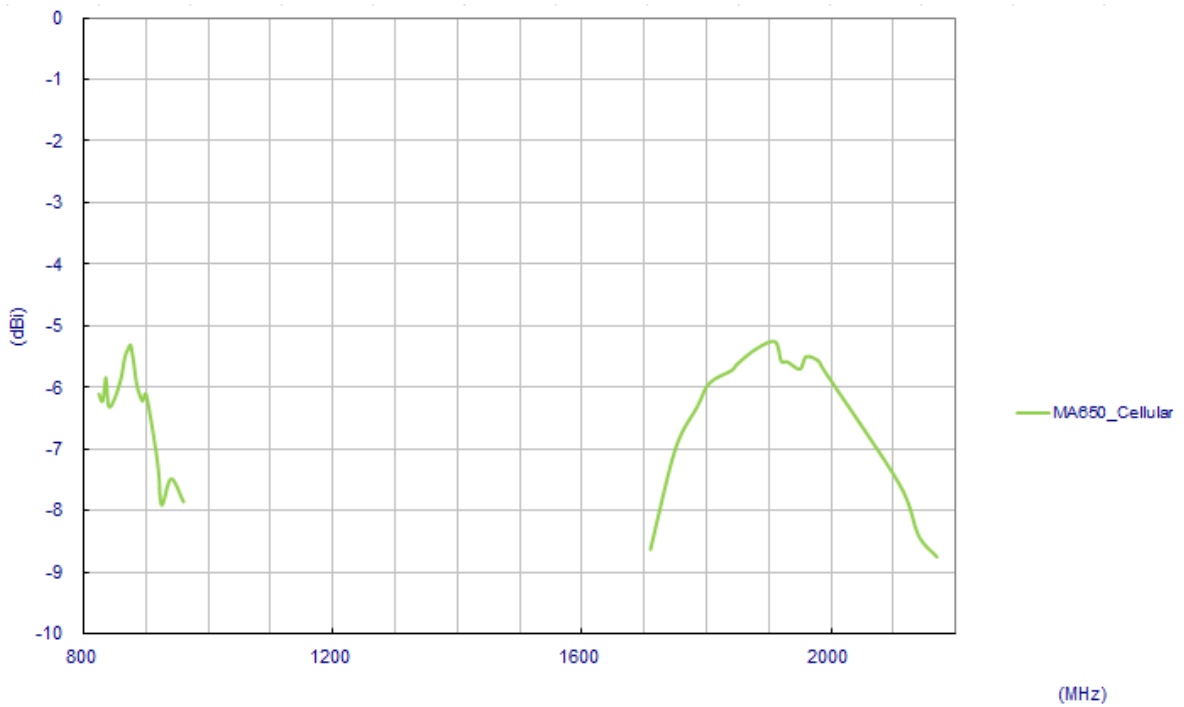
3.2. Efficiency



3.3. Peak Gain

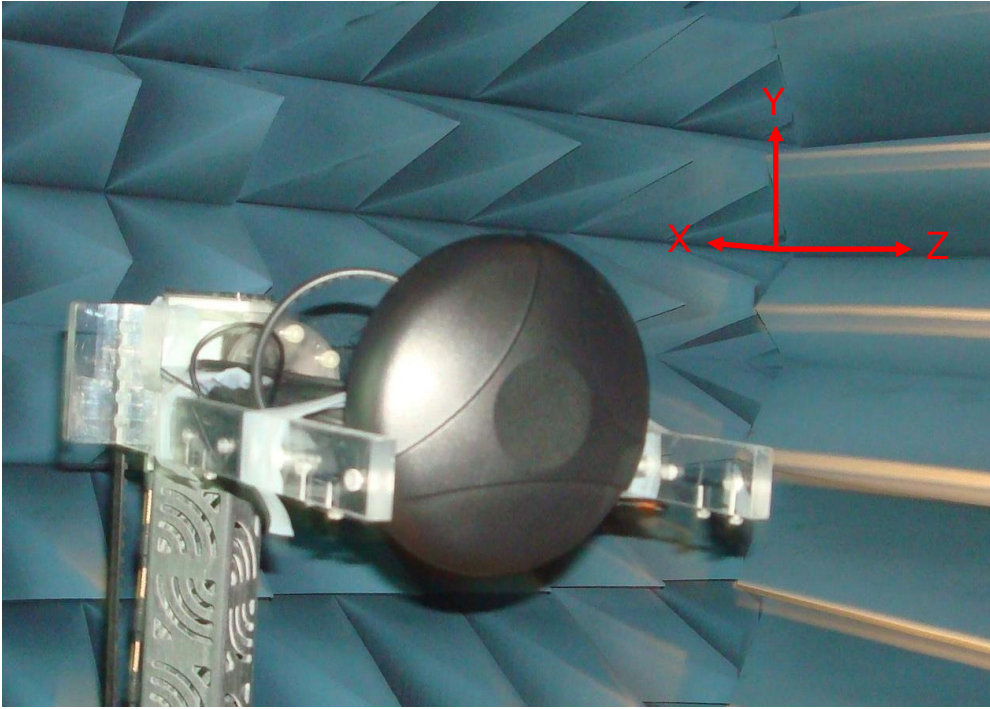


3.4. Average Gain

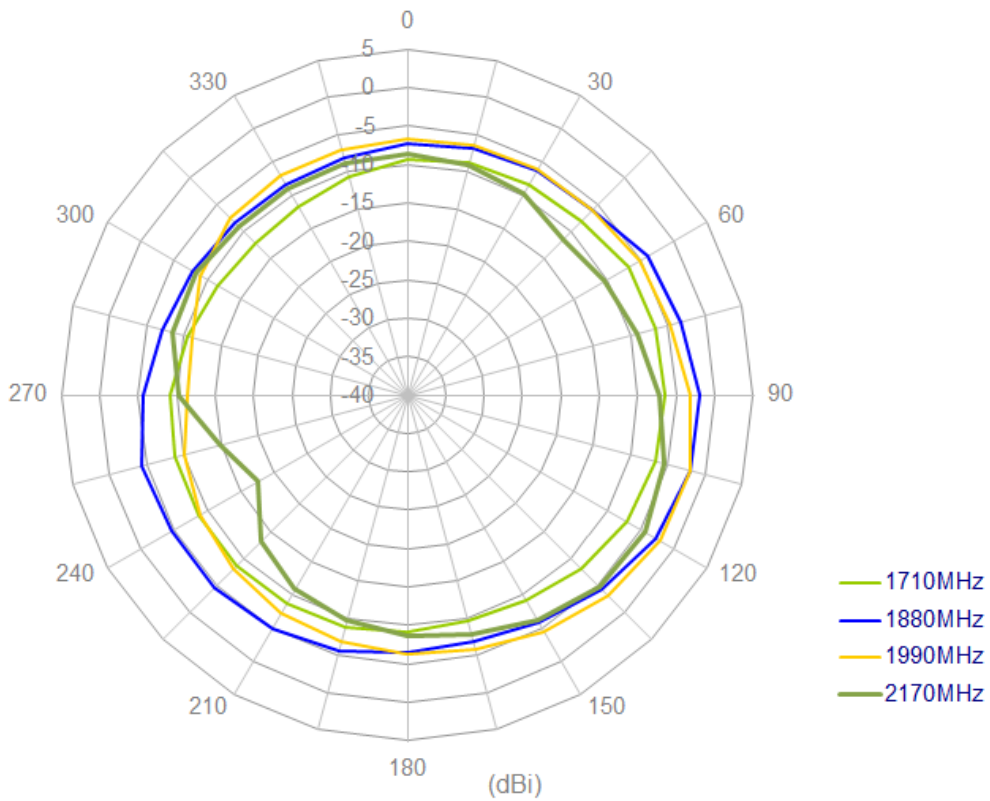
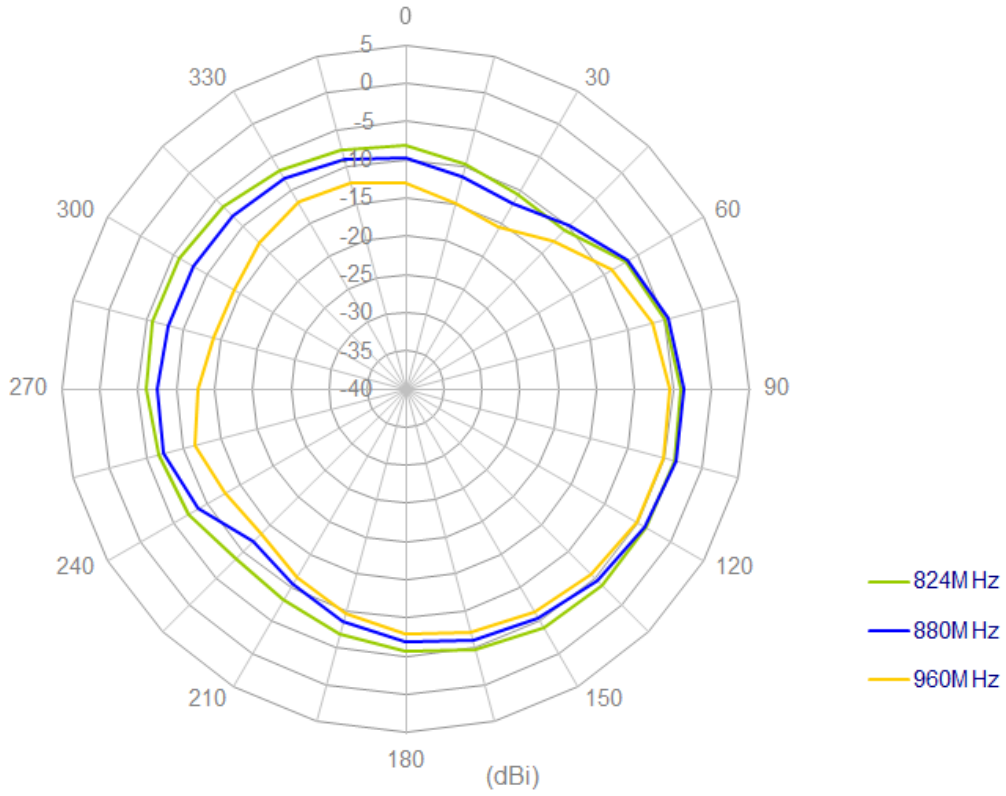


4. Radiation Patterns - Cellular

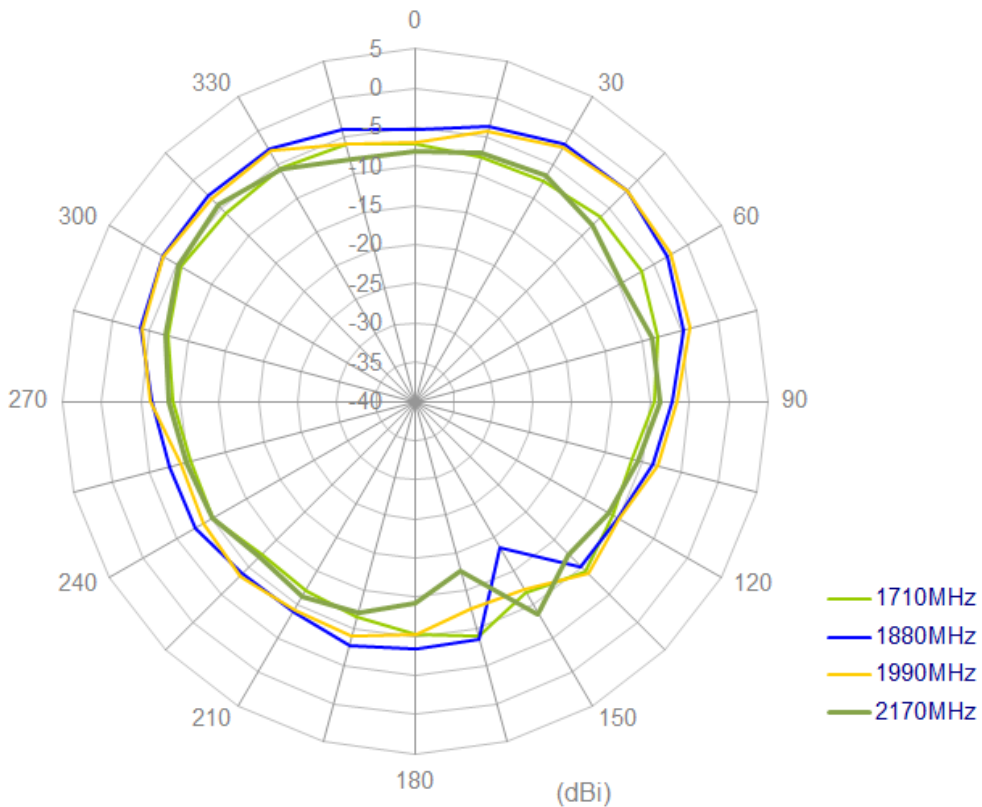
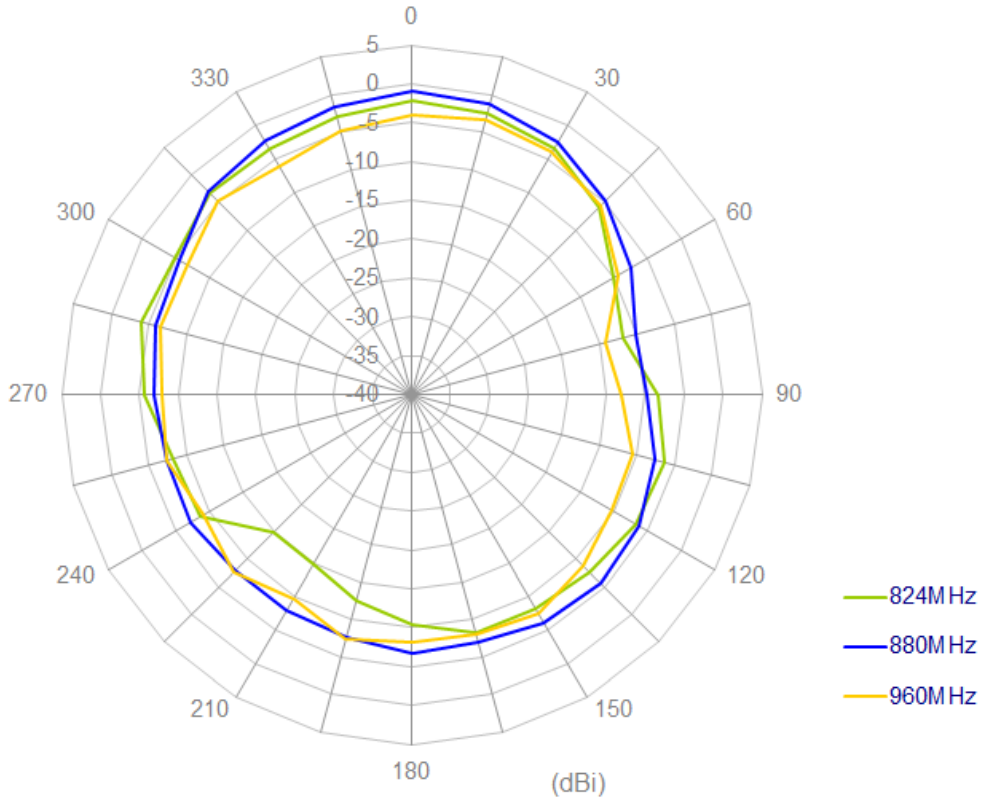
4.1. Antenna Setup



4.2. XY Plane

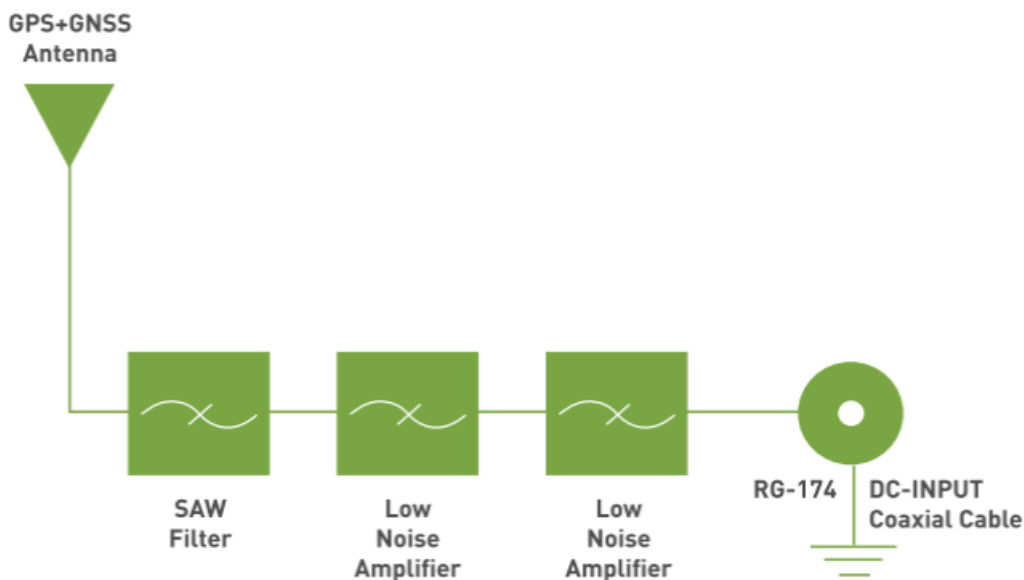


4.3. XZ Plane



5. GPS/GLONASS/GALILEO Antenna Characteristics

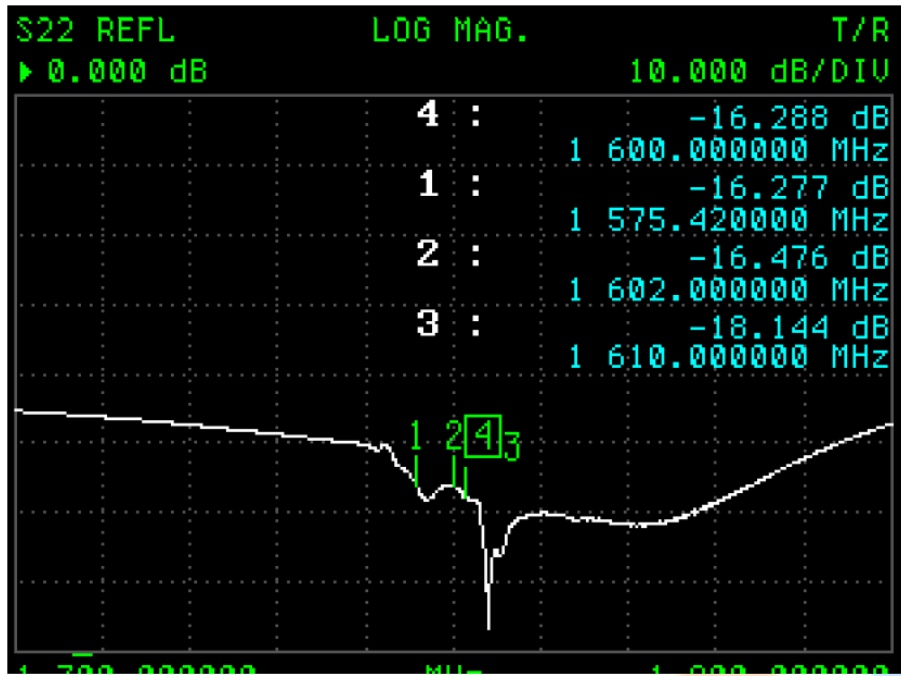
5.1. Block Diagram



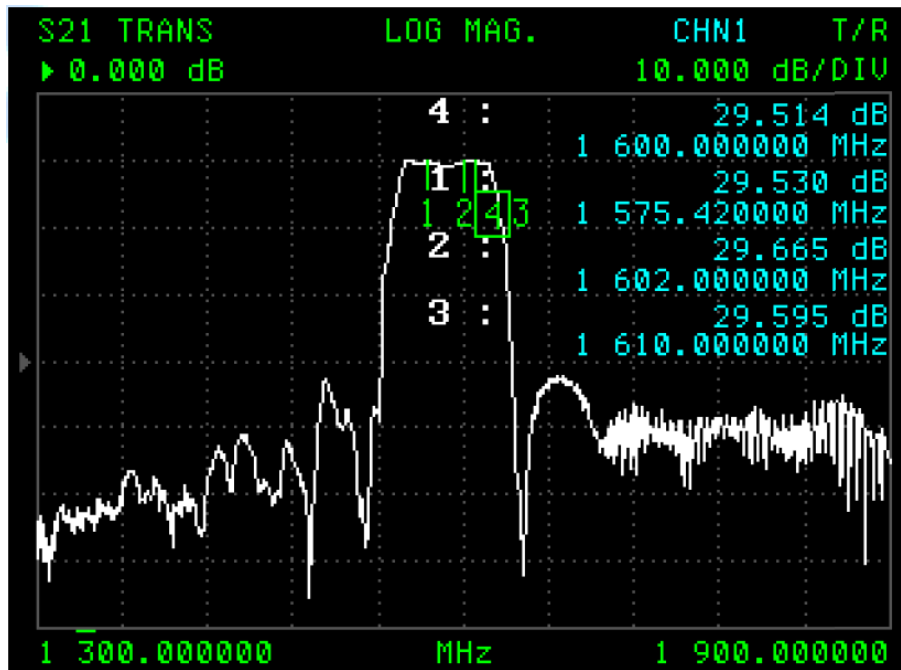
5.2. Return Loss



5.3. LNA S 22

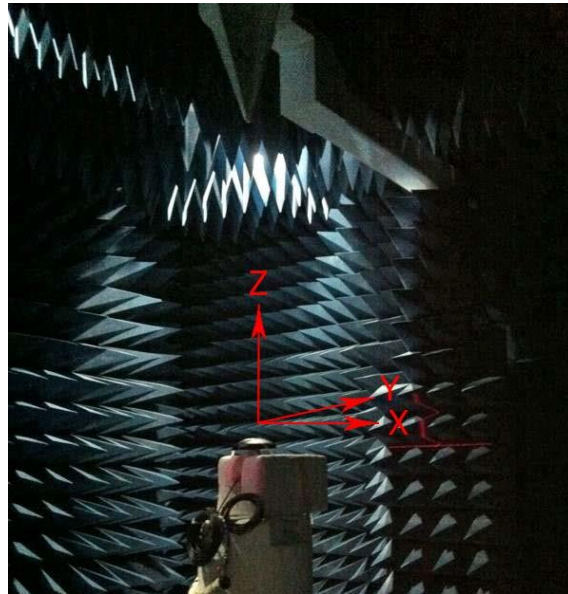


5.4. LNA S 21



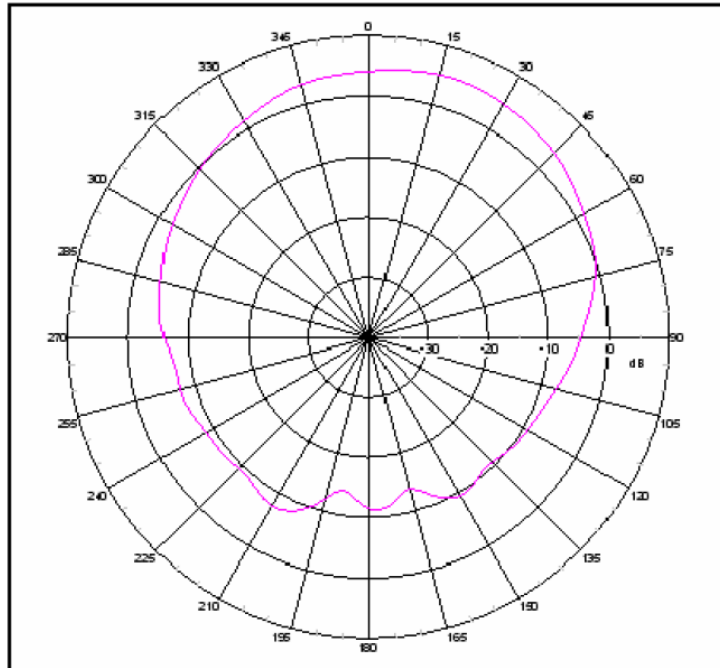
6. GPS/GLONASS/GALILEO Radiation patterns

6.1. Antenna Setup

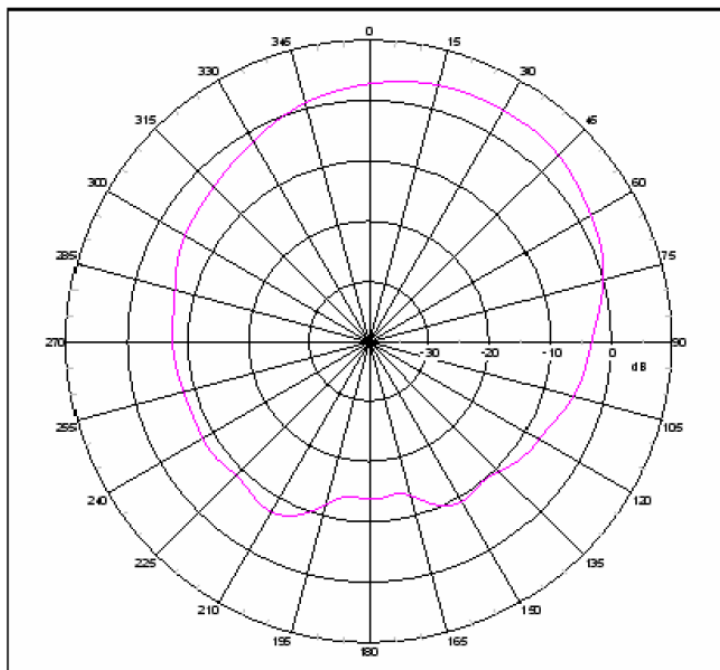


6.2. XZ Plane

6.2.1. 1575MHz

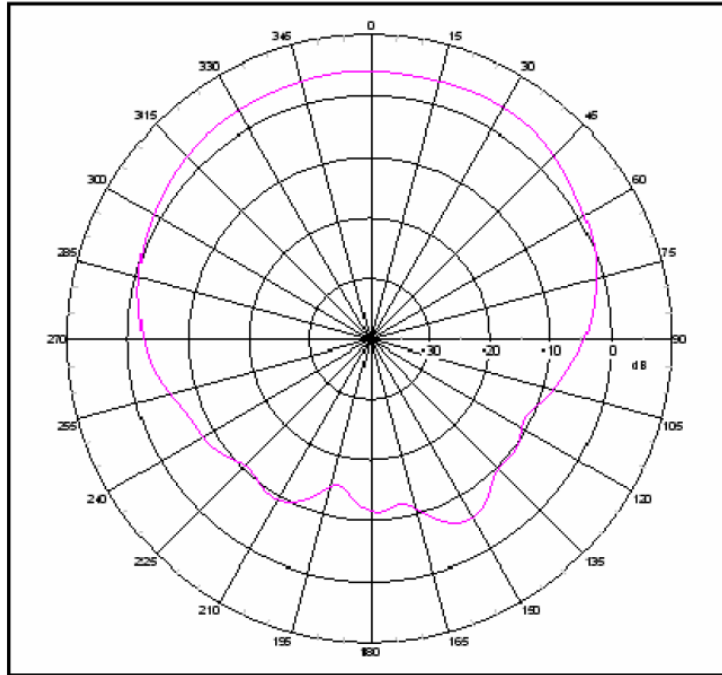


6.2.2. 1602MHz

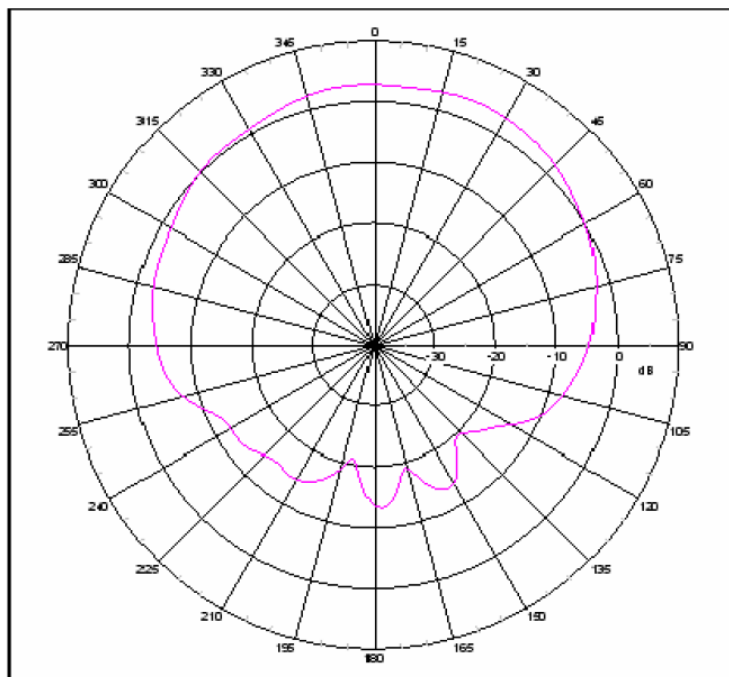


6.3. YZ Plane

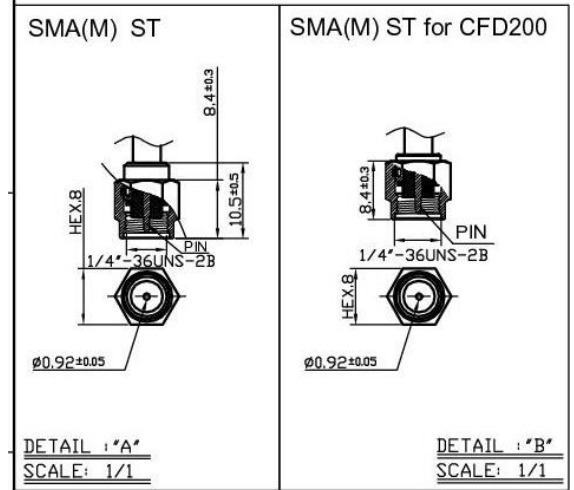
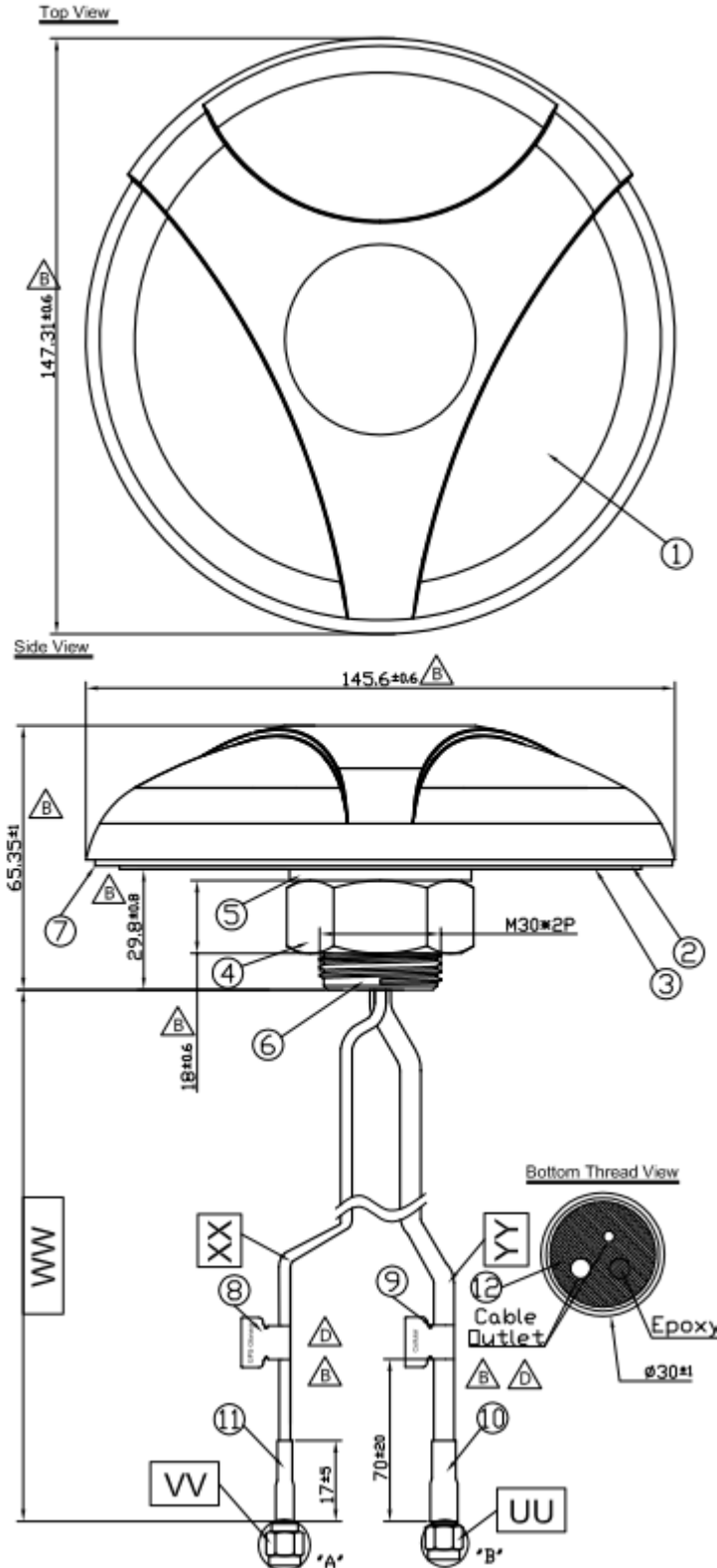
6.3.1. 1575MHz



6.3.2. 1602MHz



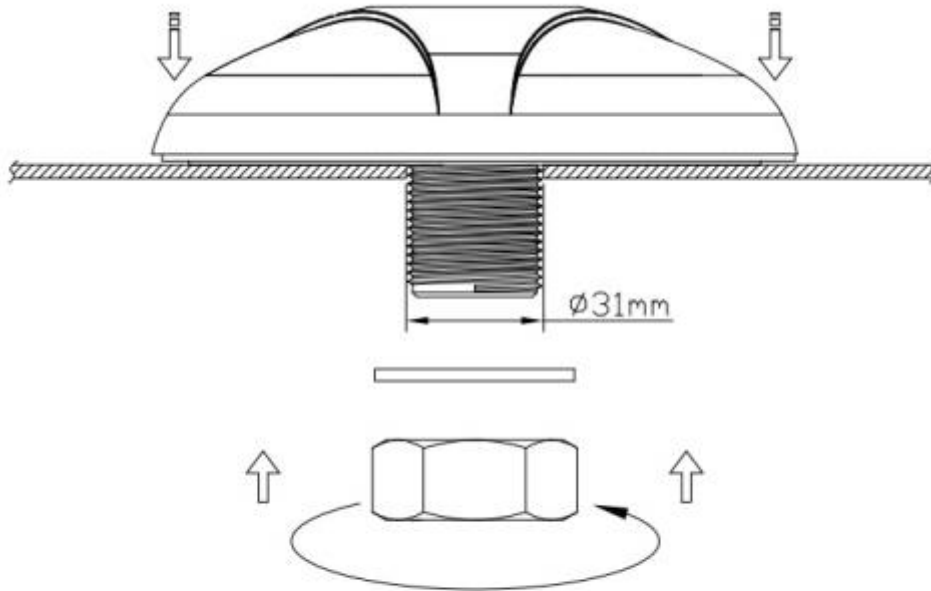
7. Drawing



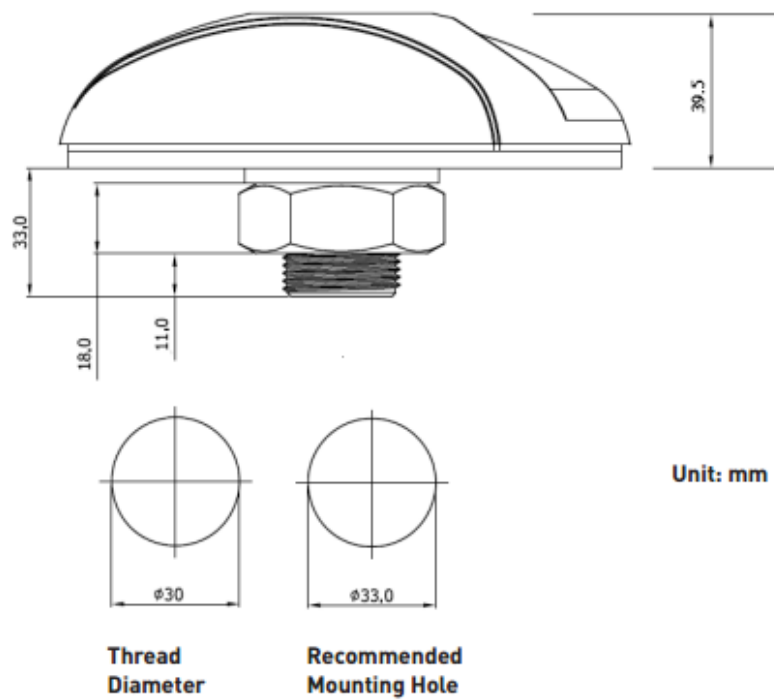
	Name	Material	Finish	QTY
1	Housing	PC 540	Black	1
2	Closed Cell Foam	CR 4305	Black	1
3	3M Double Adhesive	3M 9448 HK	White Liner	1
4	M30 Nut	Steel AISI 1215	Ni Plated	1
5	Washer	Steel AISI 1215	Ni Plated	1
6	M30x 2 Thread 32L	Zinc Alloy	Ni Plated	1
7	Waterproof Rubber	Silicon	Black	1
8	GPS/Glonass Label	Coated Paper	Orange	1
9	Cellular Label	Coated Paper	Blue	1
10	Heat Shrink Tube	PE	Black	1
11	Heat Shrink Tube	PE	Black	1
12	Cable Rubber	Silicone Rubber	Black	1

	Name	Spec	Finish	QTY
UU	Connector Type	SMA(M) ST for CFD200	Gold	1
VV	Connector Type	SMA(M) ST	Gold	1
WW	Cable Length	10000±250mm		1
XX	Cable Type	RG174	Black	1
YY	Cable Type	CFD 200	Black	1

8. Installation

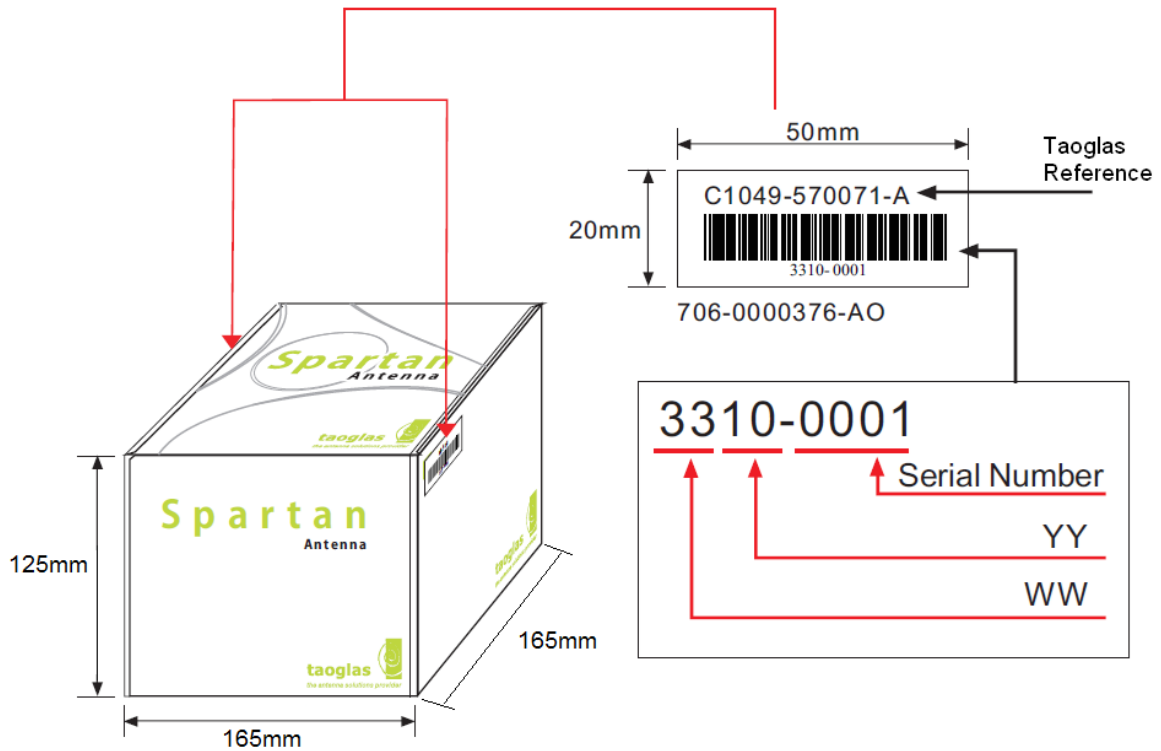


Recommended Torque for Mounting 49 N·m
 Maximum Torque for Mounting 58.8 N·m



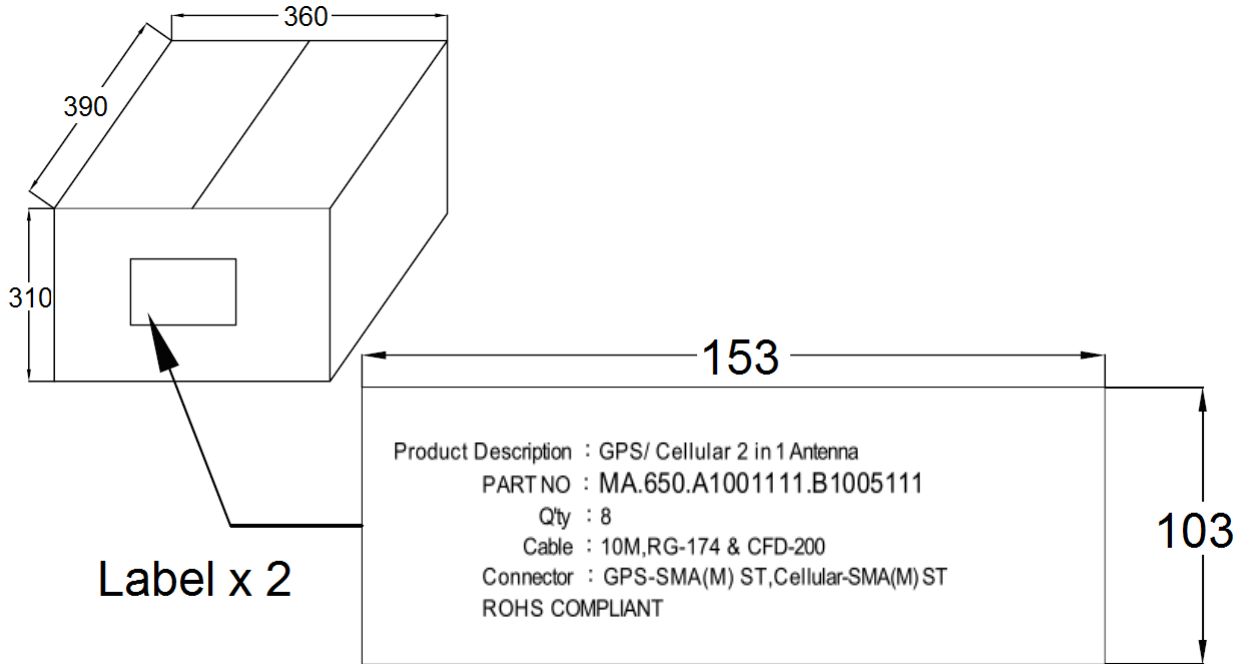
9. Packaging

- 1 Antenna per Individual Box (L:165mm:B:165mm:H:125mm)
- Weight 1.5kg



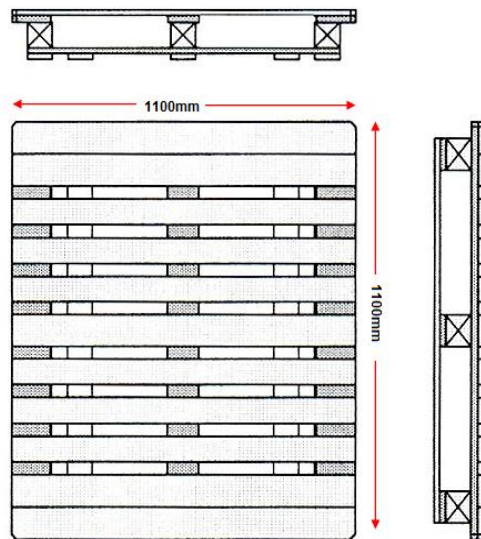
• **8 Individual Boxes per Carton (L:390mm:B:360mm:H:310mm)**

• **Weight 12.5kg**



• **32 Cartons per pallet(110*110cm)**

• **256 Pieces per Pallet**



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