

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/ Cellular combination antenna
- Feature : Cellular 850/900/1700/1800/2100MHz
GSM/CDMA/UMTS/HSPA
GPS – 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, Cellular (2G and 3G) 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 Antenna	
Frequency	1575.42 ± 2 MHz
Radiation Efficiency	50%
Peak Gain	4 ±1 dBic typ.
VSWR	1.92:1 Max
Polarization	RHCP
Impedance	50Ω
Axial Ratio	3 dB Max

ELECTRICAL - LNA			
Frequency	1575.4 MHz		
Impedance	50 Ω		
VSWR	1.92:1 Max		
DC Power Input	3.3	4	5
Gain @3.3V	30	31	32
Noise Figure	1.50	1.55	1.62
Power Consumption	8	10	13
Band Attenuation	±50	±70	±100
	40	40	50
Operating Temperature	-40~+85°C		
Storage Temperature	-40~+90°C		

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

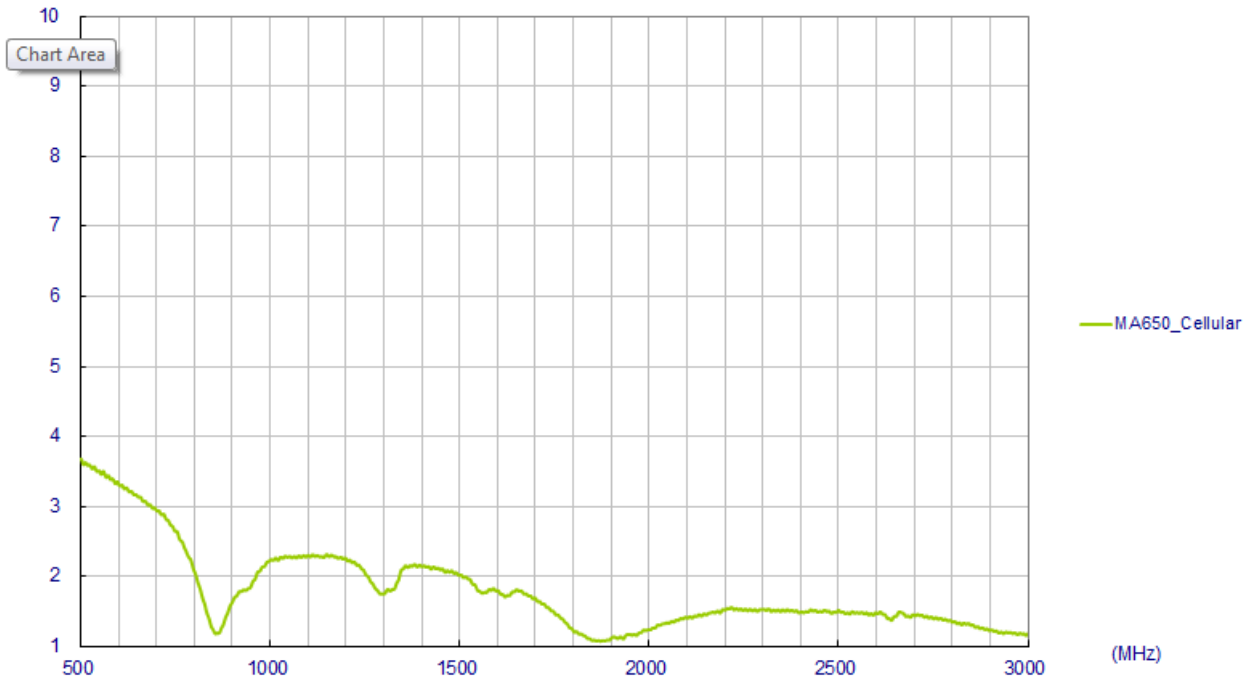
MECHANICAL	
Antenna Dimensions	Height 50mm x Diameter 150mm
Housing	PC
Base and thread	Nickel plated Zinc
Waterproof	IP67



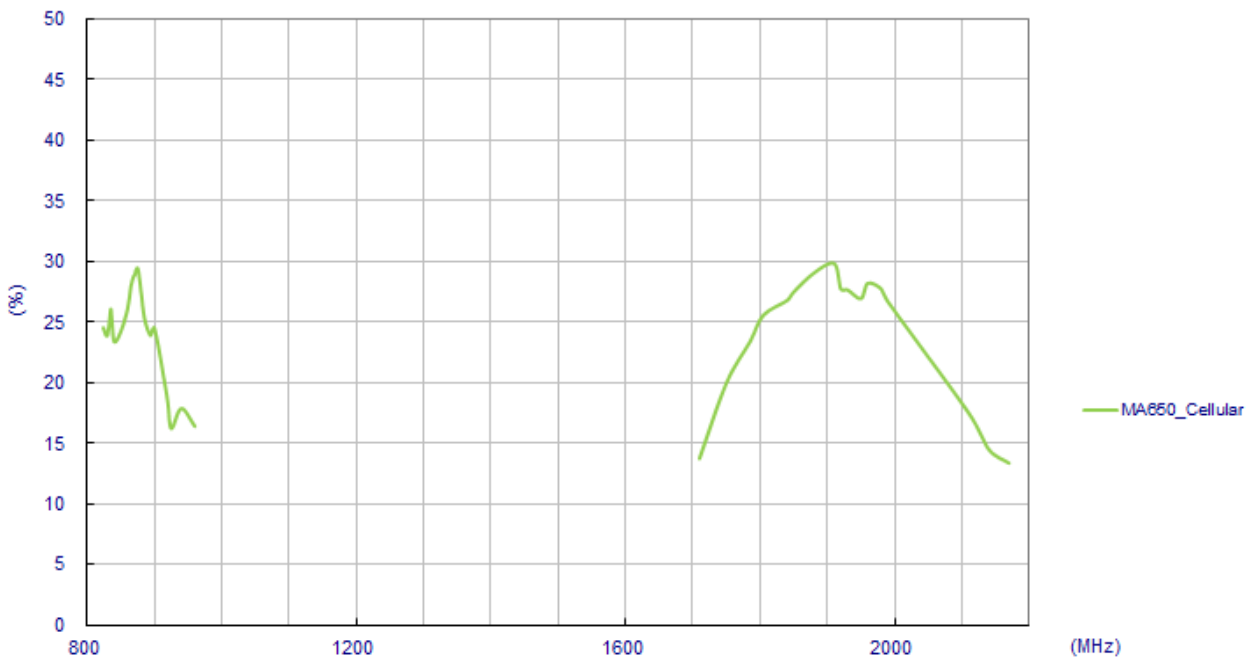
ENVIRONMENTAL	
Operating Temperature	-40°C to 85°C
Storage Temperature	-40°C to 80°C
Humidity	Non-condensing 65°C 95% RH

3. Antenna Characteristics Cellular antenna

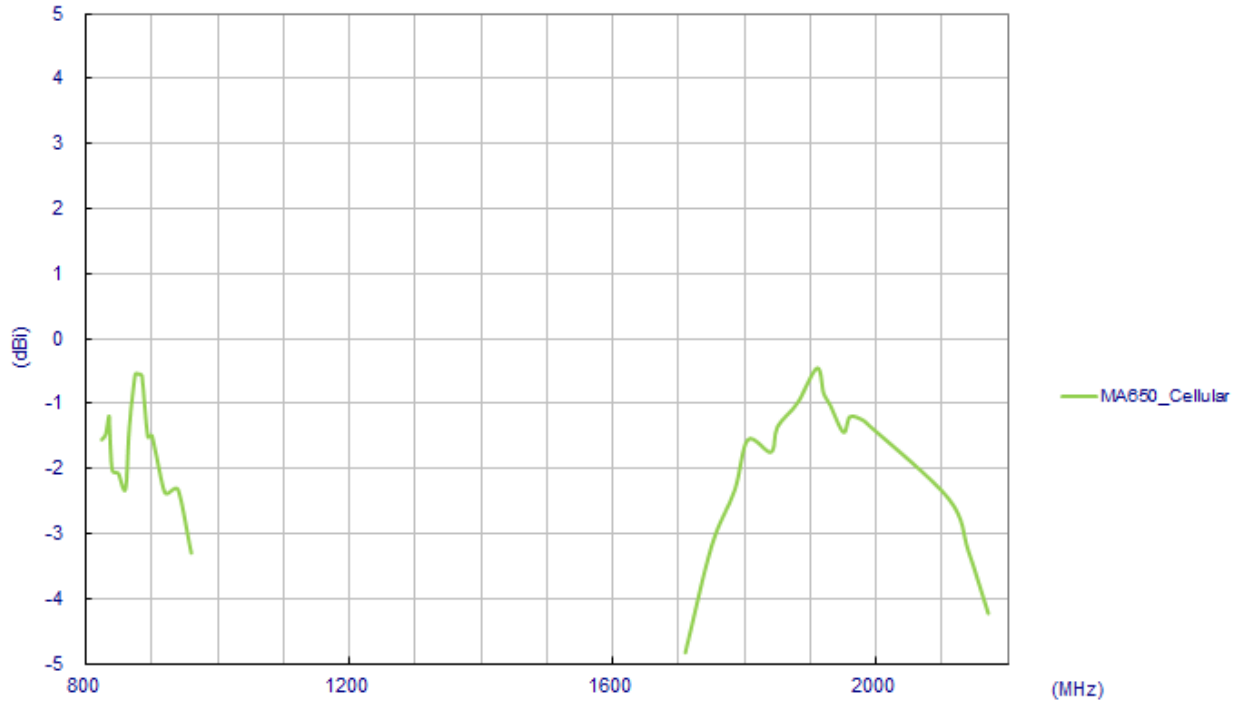
3.1 VSWR



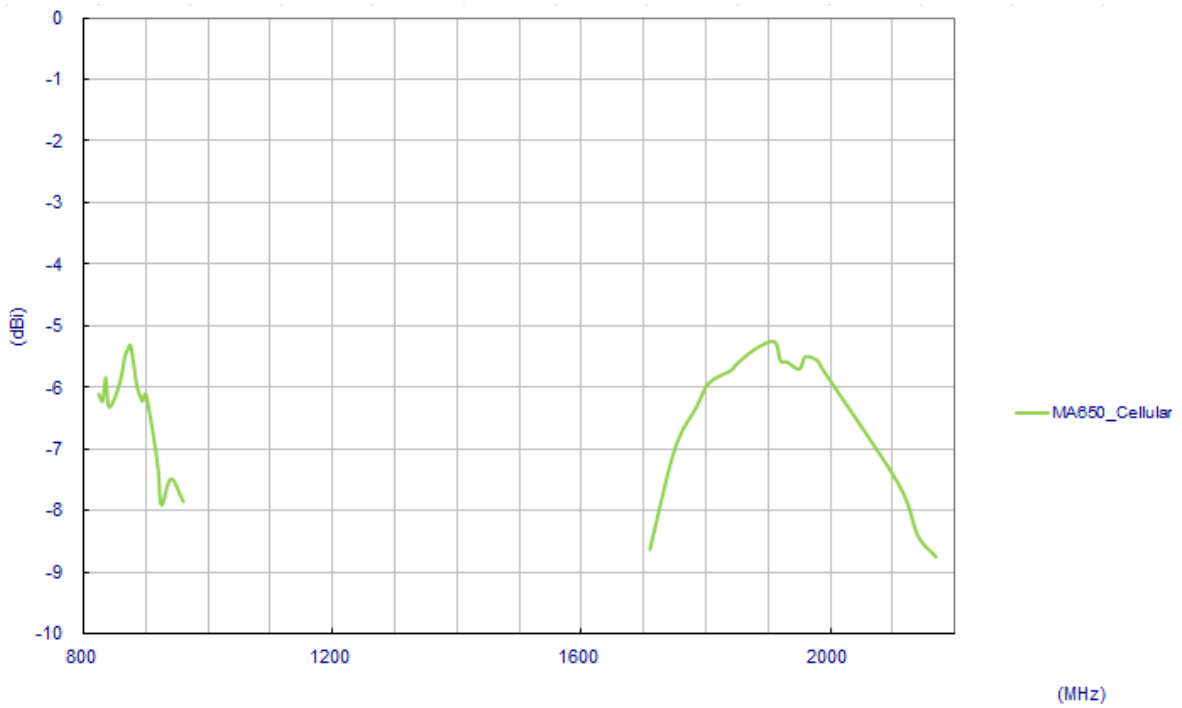
3.2 Efficiency



3.3 Peak Gain

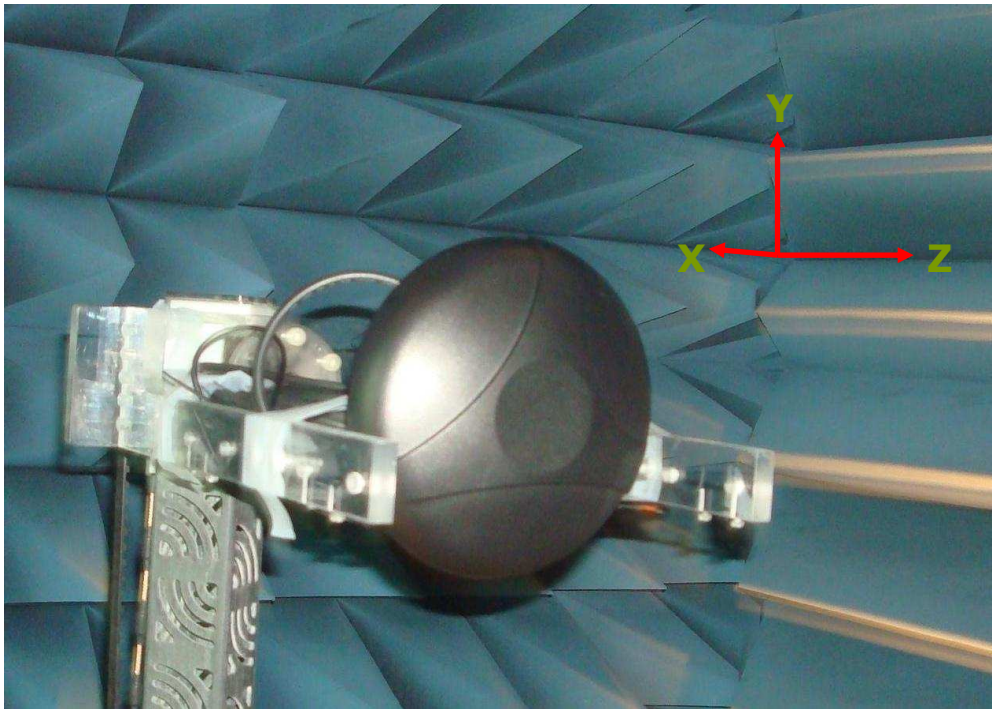


3.4 Average Gain

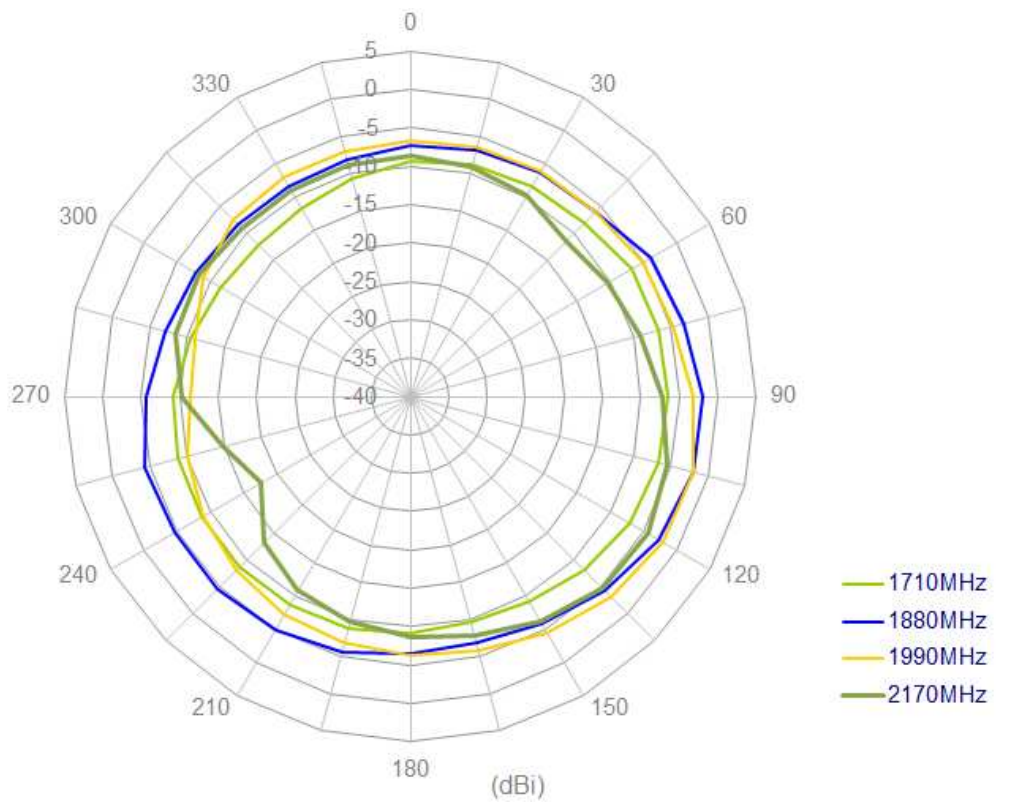
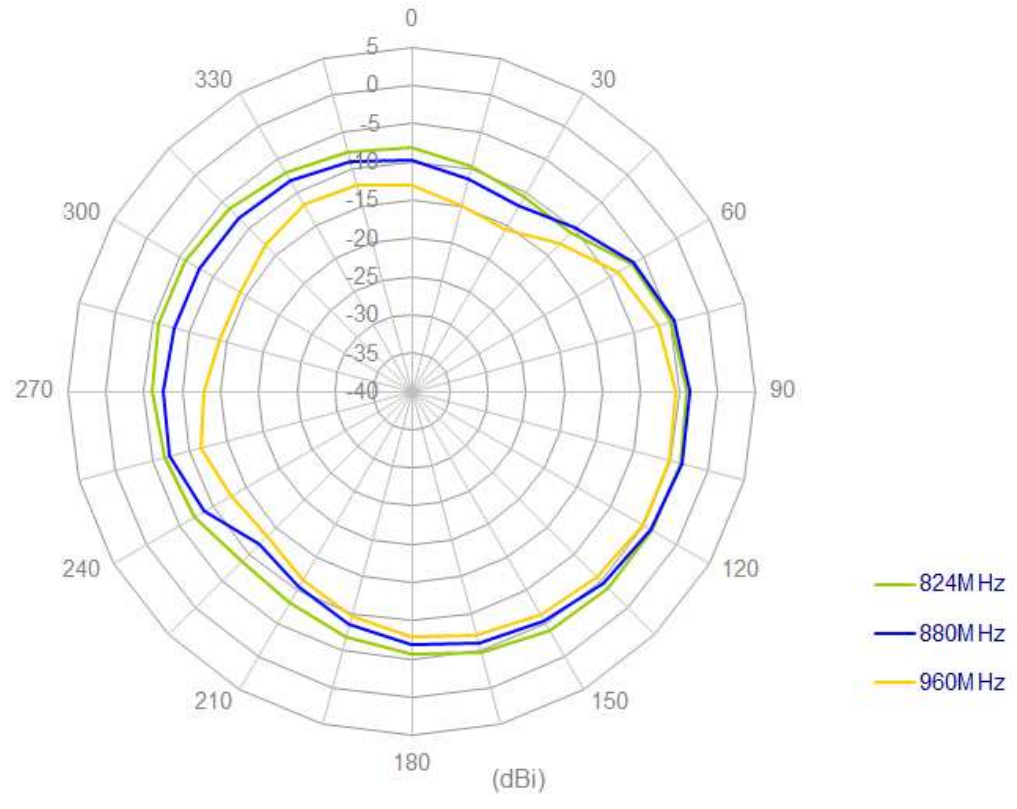


4. Radiation Patterns - Cellular

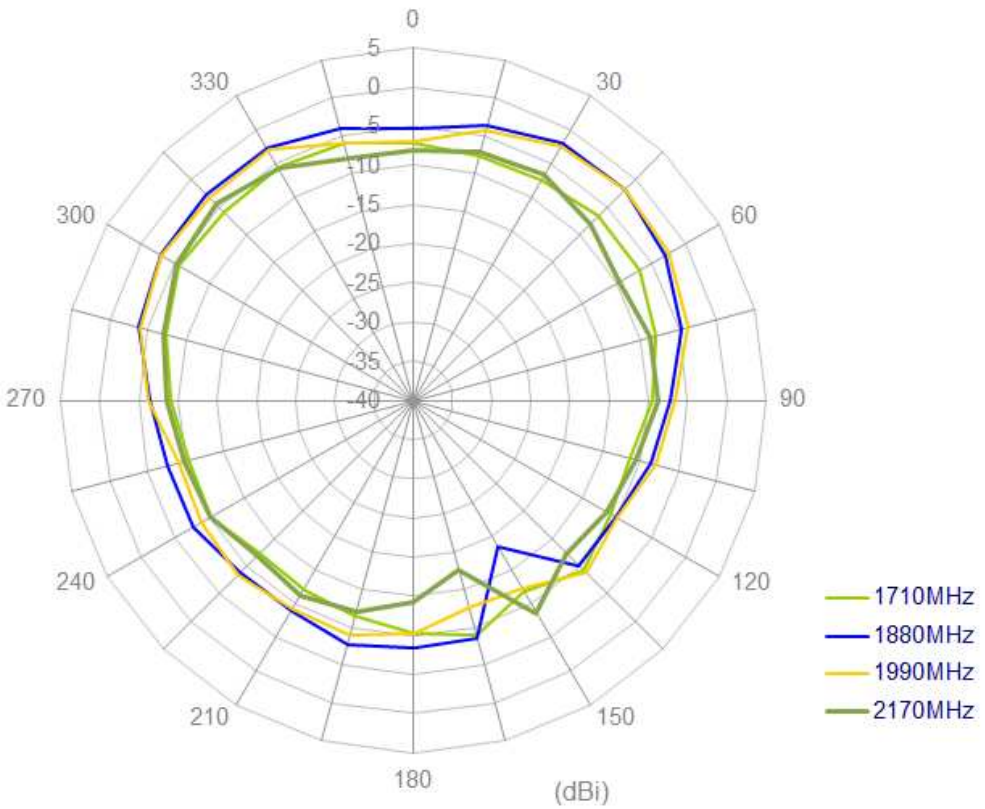
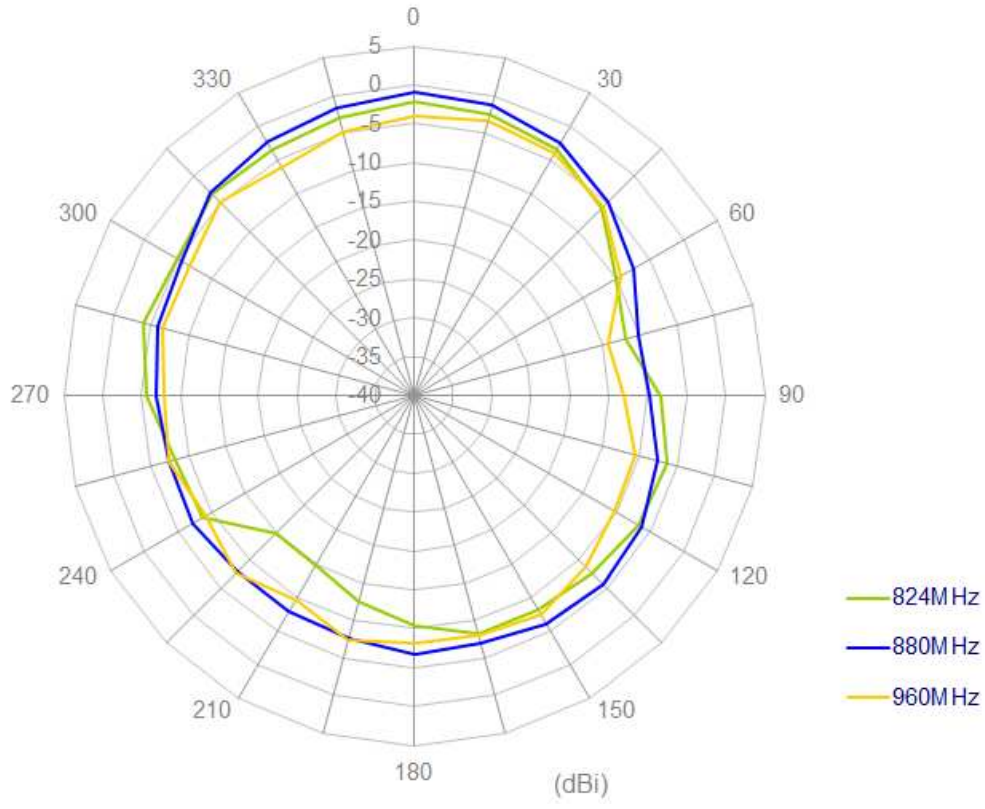
4.1 Antenna Setup



4.2 XY plane

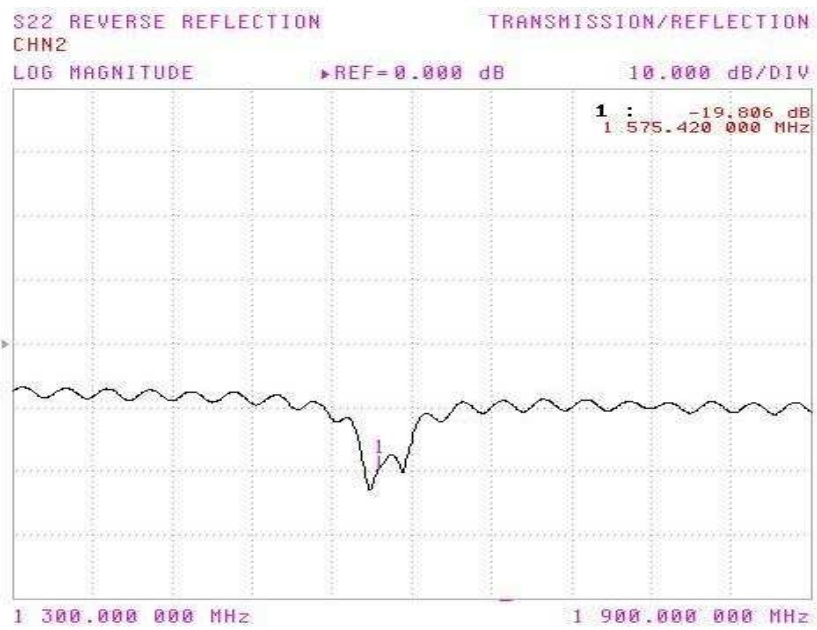


4.3 XZ plane

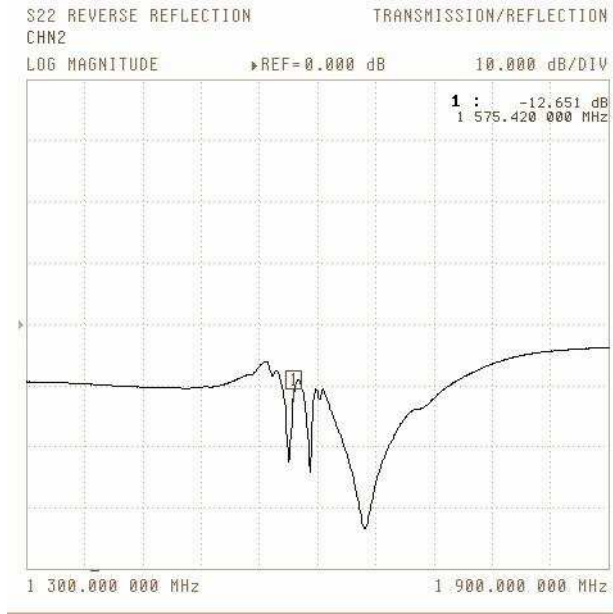


5. Antenna Characteristics GPS antenna

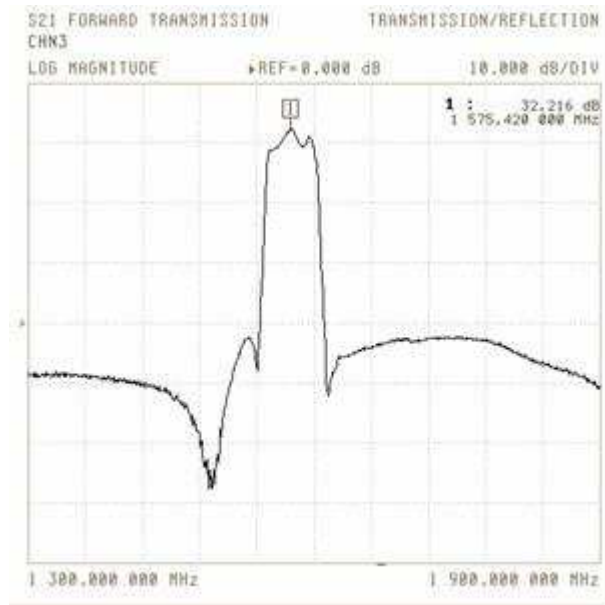
5.1 Return Loss



5.2 LNA S 22

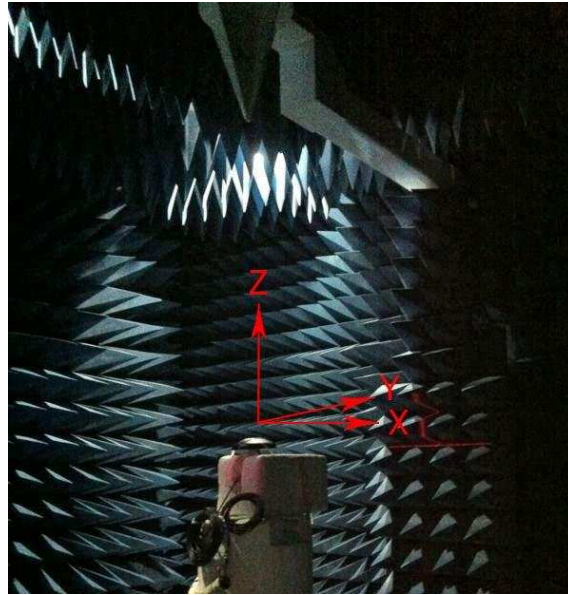


5.3 LNA S 21

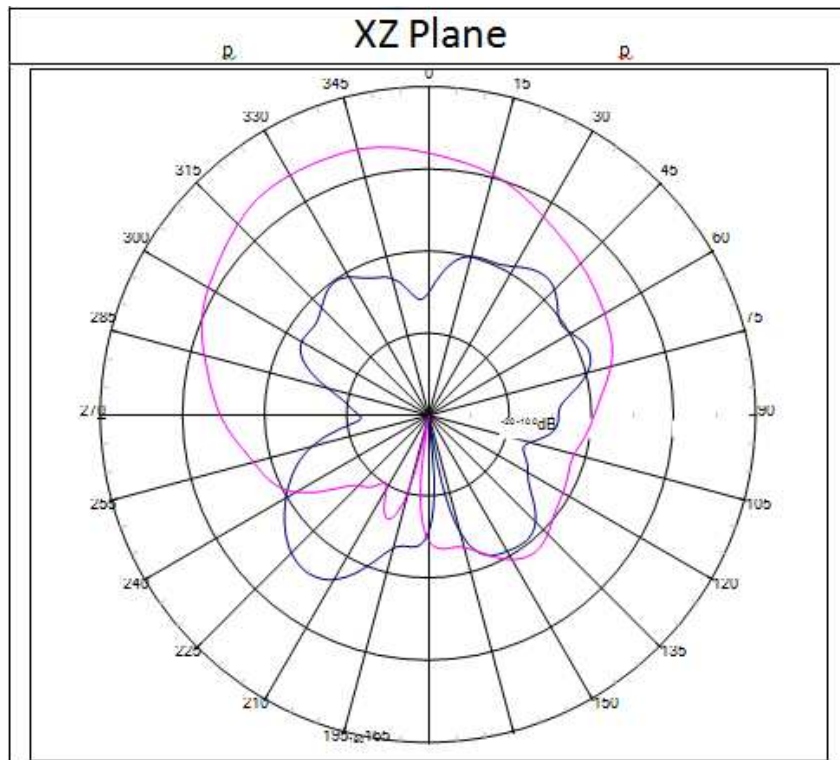


6. Radiation patterns – GPS

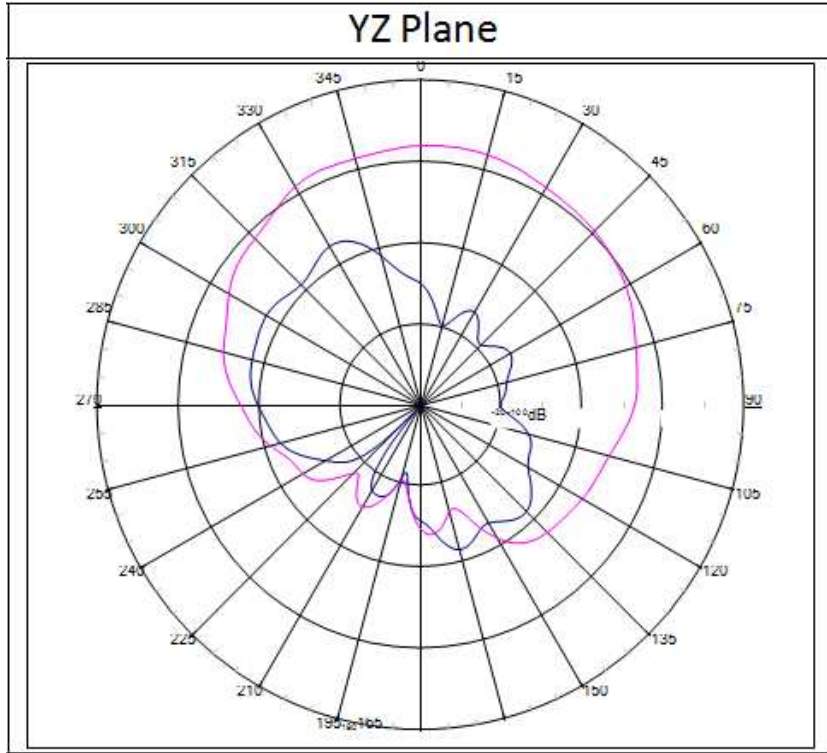
6.1 Antenna Setup



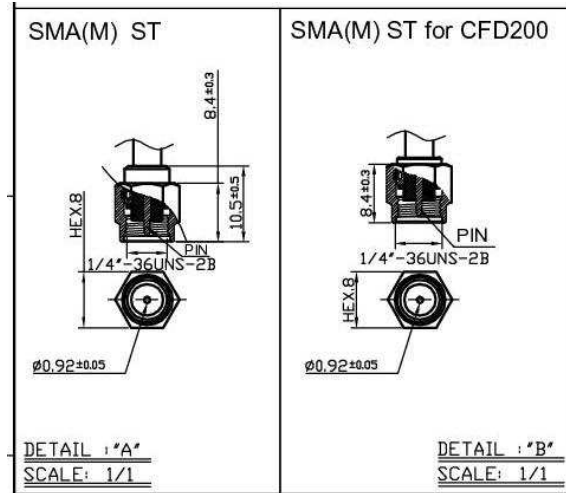
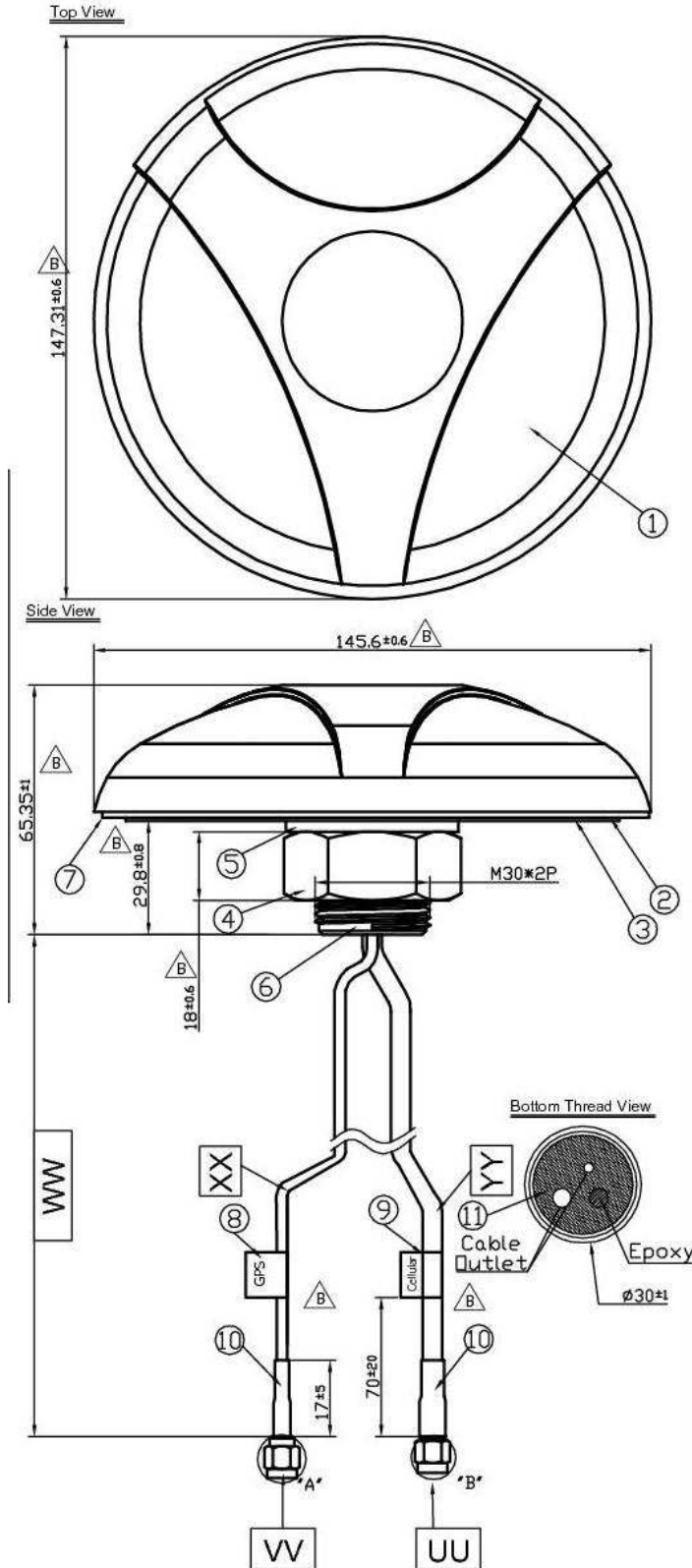
6.2 XZ Plane



6.3 YZ Plane



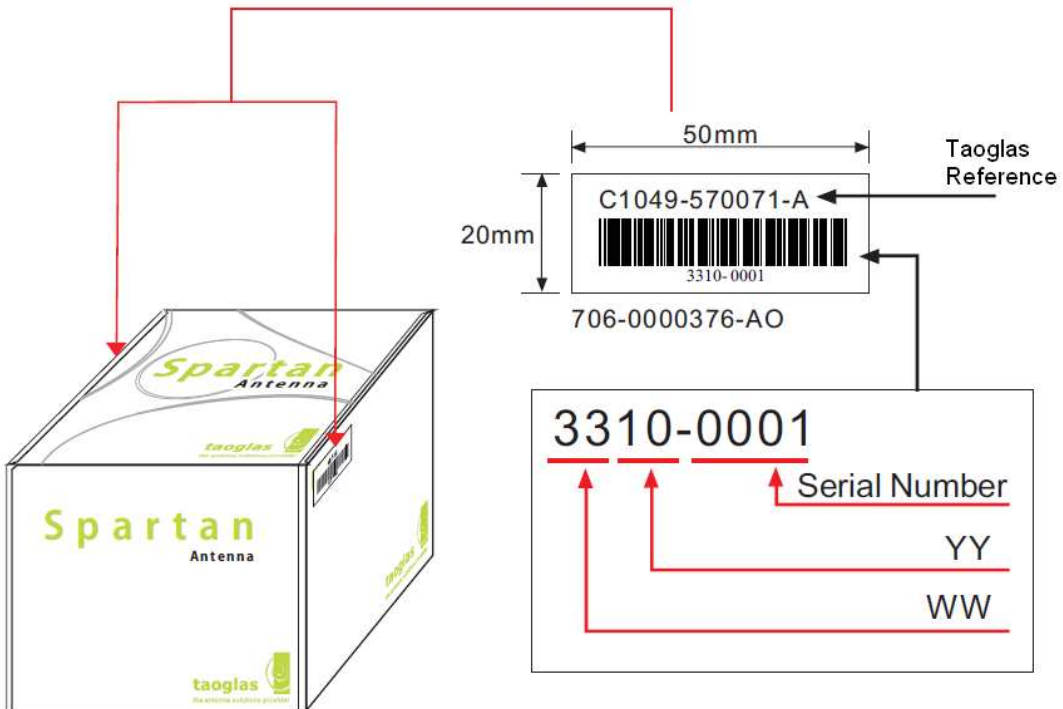
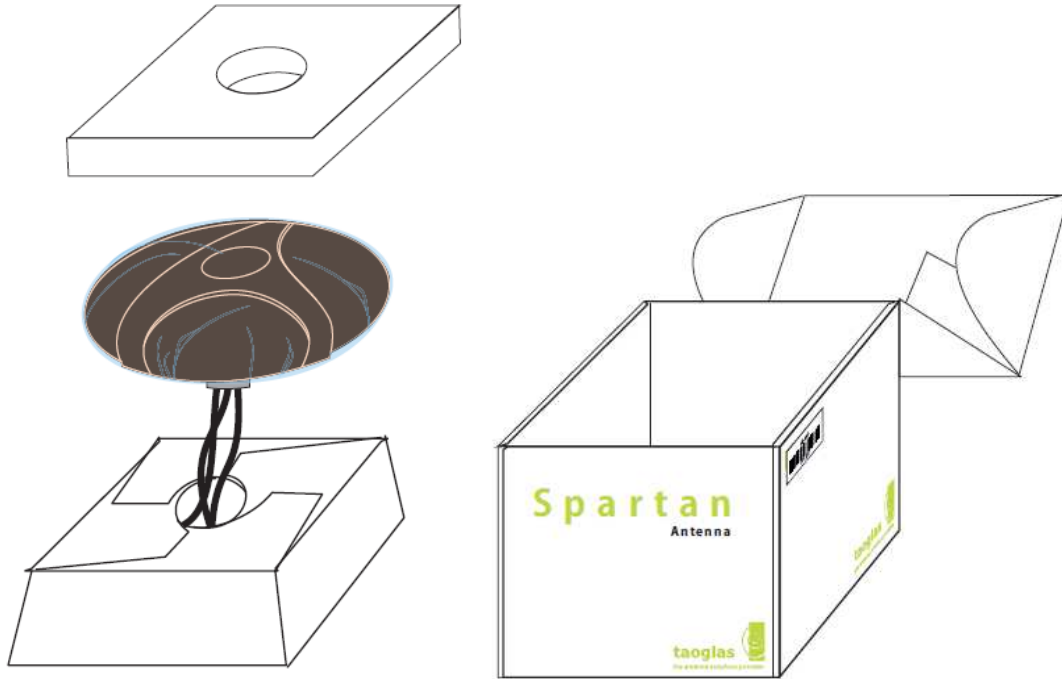
7. Drawing



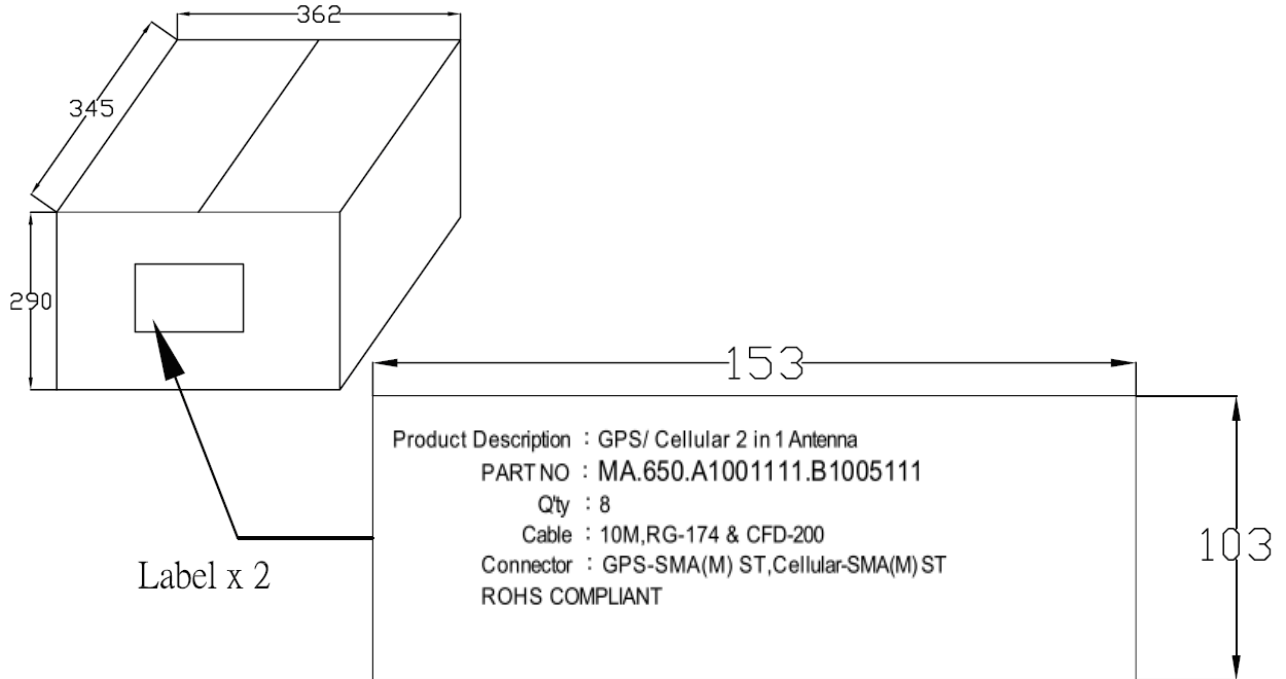
Name	P/N	Material	Finish	QTY
1 Housing	000111F0000XXA	PC 540	Black	1
2 Closed Cell Foam	001011F03000XXA	CR 4305	Black	1
3 3M Double Adhesive	001011F03000XXA	3M 9448 HK	White Liner	1
4 M30 Nut	000411F0000XXA	Steel AISI 1215	Ni Plated	1
5 Washer	000411F01000XXA	Steel AISI 1215	Ni Plated	1
6 M30x 2 Thread 32L	000311F0000XXA	Zinc Alloy	Ni Plated	1
7 Waterproof Rubber	000711F0000XXA	Silicon	Black	1
8 GPS Label	001011F0000XXA	Coated Paper	Orange	1
9 CellularLabel	001011F02000XXA	Coated Paper	Blue	1
10 Heat Shrink Tube	001311F01000XXA	PE	Black	2
11 Cable Rubber	000711F0000XXA	Silicone Rubber	Black	1

Name	P/N	Spec	Finish	QTY
UU Connector Type	SMA.M.ST.PLUG.G.J	SMA(M) ST for CFD200	Ni Plated	1
VV Connector Type	200211F0000XXA	SMA(M) ST	Gold	1
WW Cable Length		10000±280mm		1
XX Cable Type	301311F0000XXA	RG174	Black	1
YY Cable Type	031311F01000XXA	CFD 200	Black	1

8. Packaging



8 boxes per carton



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