SPECIFICATION

Part No.	:	**MA605.A.ABC.001**
Product Name	:	Spartan Antenna 3in1 MA.605 Low Profile Screw-Mount (Permanent Mount) GPS/GLONASS/ Cellular/ 2.4GHz ~ 5GHz combination antenna
Features	:	Cellular 850/900/1700/1800/2100MHz GSM/CDMA/UMTS/HSPA GPS/GLONASS – 4 dBic 2.4GHz~5GHz 4dBi (incl. 3m cable) IP67 Waterproof High Efficiency / Peak Gain Outdoor Antenna Advanced RF Design and Materials Heavy Duty – Integrated Metal Base/ Ground-plane ABS High Isolation Gasket Custom cables and connectors available RoHS Compliant

1. Introduction

The Spartan MA.605 antenna is a low profile, heavy-duty, fully IP67 waterproof external M2M antenna for use in telematics, transportation and remote monitoring applications.

The Spartan MA.605 antenna is unique in the market because it combines 3in1 GPS/GLONASS, Cellular (2G and 3G) and Wi-Fi 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.

Antenna includes a high isolation gasket to reduce risk of high voltage current on the mounting area, which prevents metal area short circuiting through the cable.

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.

Custom designed integrated wall mounted and pole mounted brackets are available for the Spartan antennas. These patent pending mounts allow for 180 degrees freedom of movement of the antennas for ease of positioning while also preventing access to the cables so they cannot be cut by vandals or thieves and also protecting the cables from long term weather exposure. The removal of unsightly cables also leads to a cleaner more professional installation and look, and makes the antenna less identifiable and more unobtrusive. Customized cable sleeves can be supplied for extra protection where required.

2. Specification

GPS-GLONASS						
Centre Frequency	1575.42MHz / 1602MHz					
Bandwidth	10MHz					
Radiation Efficiency	50(without cable)					
Passive Gain @ Zenith	4.0 typ(with ψ=140mm ground)					
VSWR	2					
Impedance	50Ω					
DC Power Input Range	3 ~ 5V					
DC input	**3.3V**		**4.0V**		**5.5V**	
MHz	**1575.42**	**1602**	**1575.42**	**1602**	**1575.42**	**1602**
VSWR	2	2	2	2	2	2
LNA Gain	29.2	29	31	31	32.3	32
Noise Figure	3.1	3.1	3.2	3.2	3.4	3.4
Power Consumption	7.5	7.5	9.4	9.4	15	15
Band Attenuation	1520MHz: -20dB 1642MHz: -20dB		1520MHz: -20dB 1642MHz: -20dB		1520MHz: -20dB 1642MHz: -20dB	
Cable	3m RG-174 standard, fully customizable					
Connector	SMA(M) standard, fully customizable					

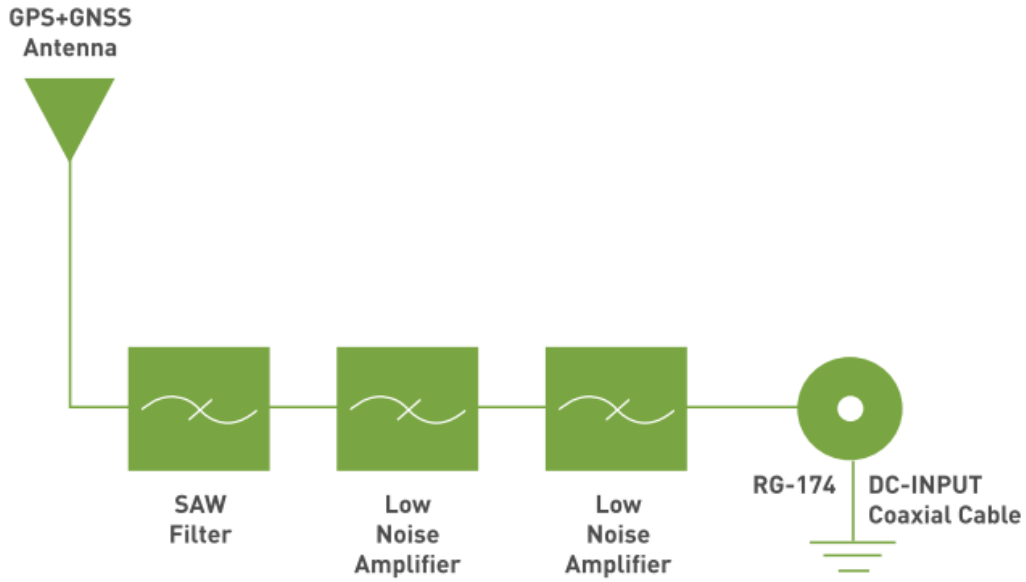
CELLULAR					
Frequency (MHz)	824 ~ 896	880 ~ 960	1710 ~ 1880	1850 ~ 1990	1710 ~ 2170
Peak Gain (dBi) *	3.4	3.2	3.8	3.0	3.8
Average Gain (dBi) *	1.2	1.5	0.4	-0.1	-0.2
Efficiency *	62%	50%	44%	38%	35%
Impedance	50Ω				
Polarization	Linear				
Radiation Pattern	Omni				
Cable	3m CFD200 standard, fully customizable				
Connector	SMA(M) standard, fully customizable				

WIFI				
Frequency (GHz)	2.4~2.5	4.7 ~ 5.0	5.0 ~ 5.4	5.4 ~ 5.9
Peak Gain (dBi) *	2.1	3.2	4.5	4.4
Average Gain (dBi) *	1.4	2.5	3.2	1.75
Efficiency *	57%	38%	42%	40%
VSWR	<=1.6:1			
Impedance	50Ω			
Polarization	Linear			
Radiation Pattern	Omni			
Cable	3m CFD200 standard, fully customizable			
Connector	RP-SMA(M) standard, standard, fully customizable			
MECHANICAL				
Dimensions	Height 50mm x Diameter 150mm			
Casing	UV resistant ABS			
Base and thread	Zinc			
Thread diameter	30mm			
Waterproof	IP67			
ENVIRONMENTAL				
Temperature Range	-40°C to 85°C			
Humidity	Non-condensing 65°C 95% RH			

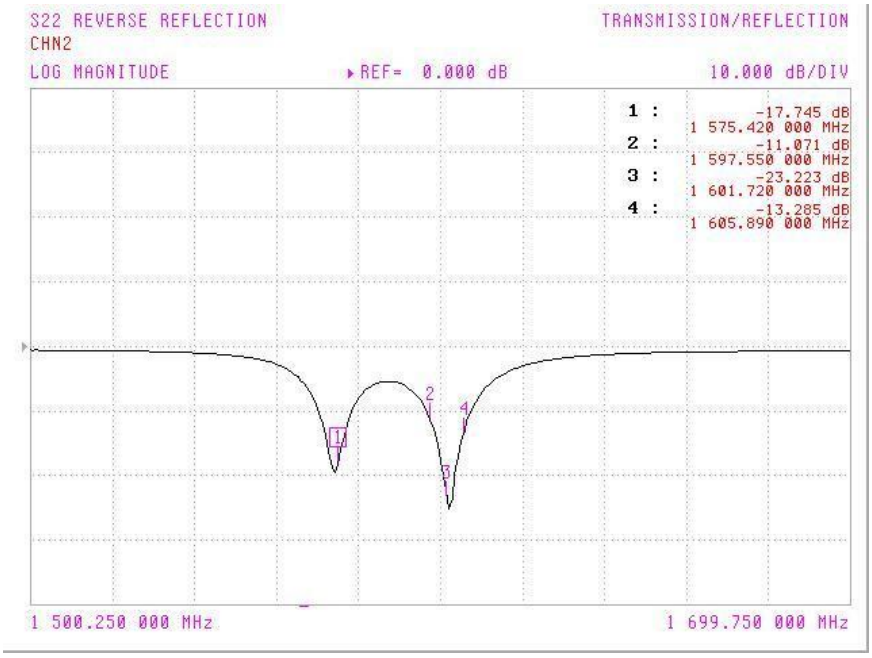
* Including 3 meters cable loss

3. GPS/GLONASS Antenna Characteristics

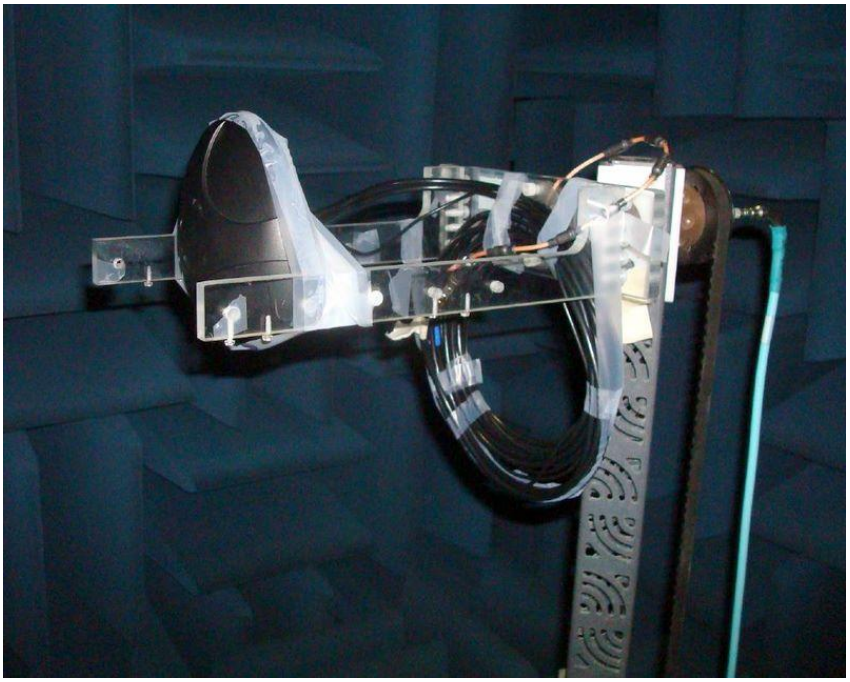
3.1 Block diagram



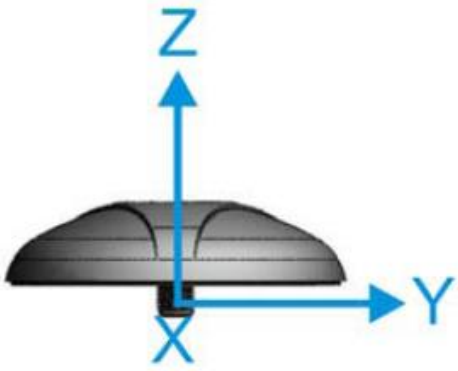
3.2 Return Loss



3.3 GPS/GLONASS Antenna Radiation Pattern



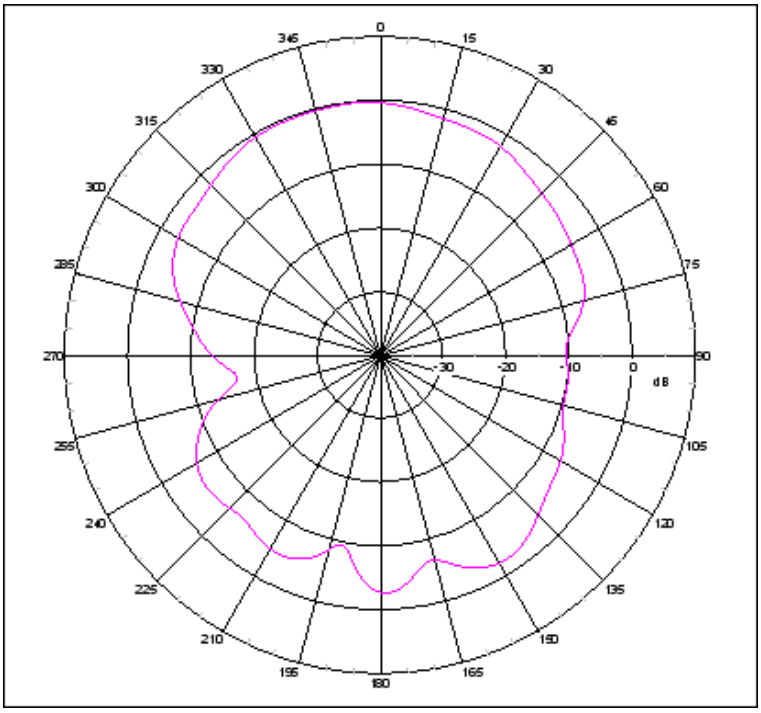
MA.600 tested in CTIA approved 3D chamber



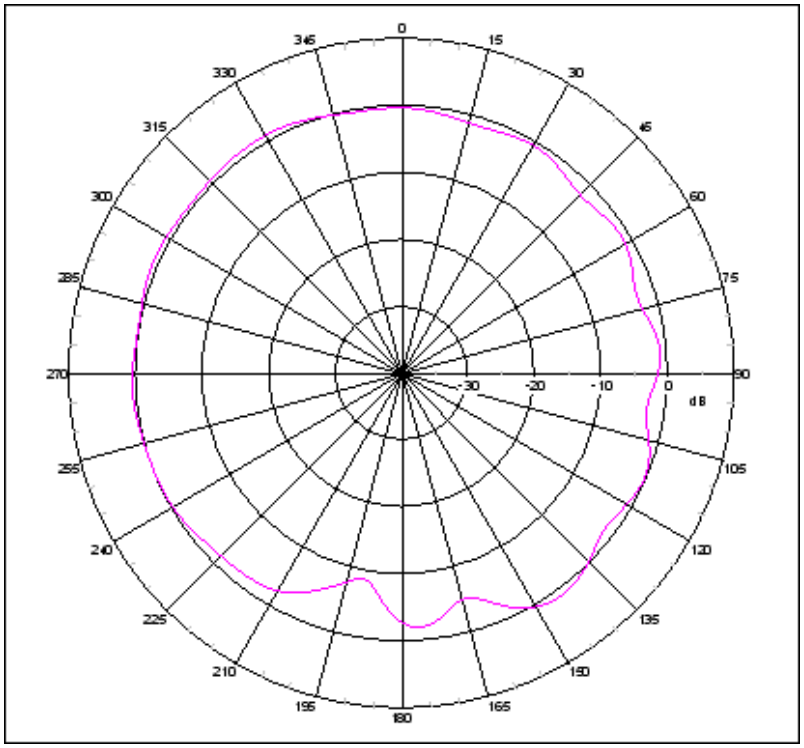
XYZ co-ordinate for reference.

3.4 Radiation Pattern

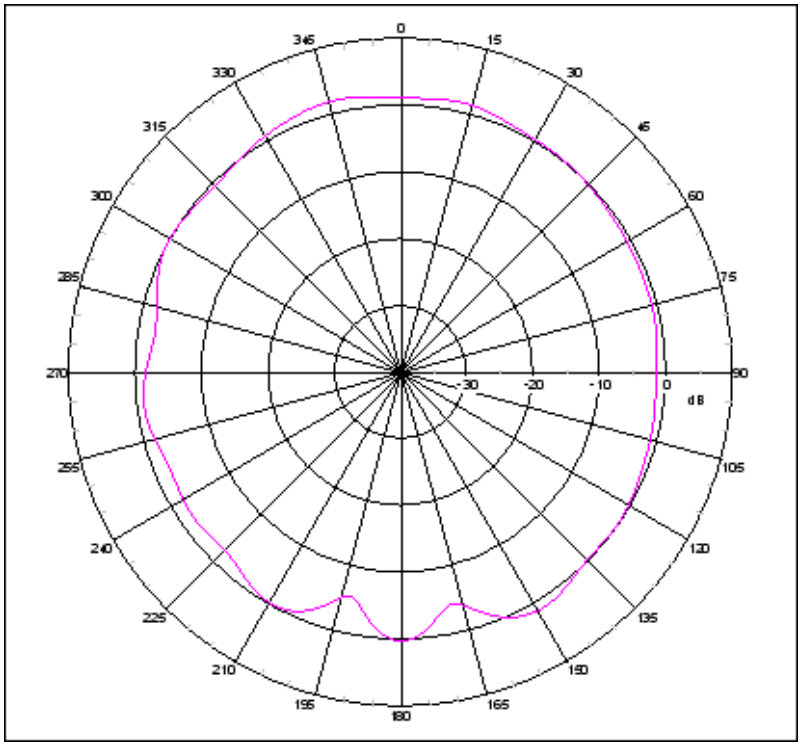
XZ-plane Free Space @1575.42MHz



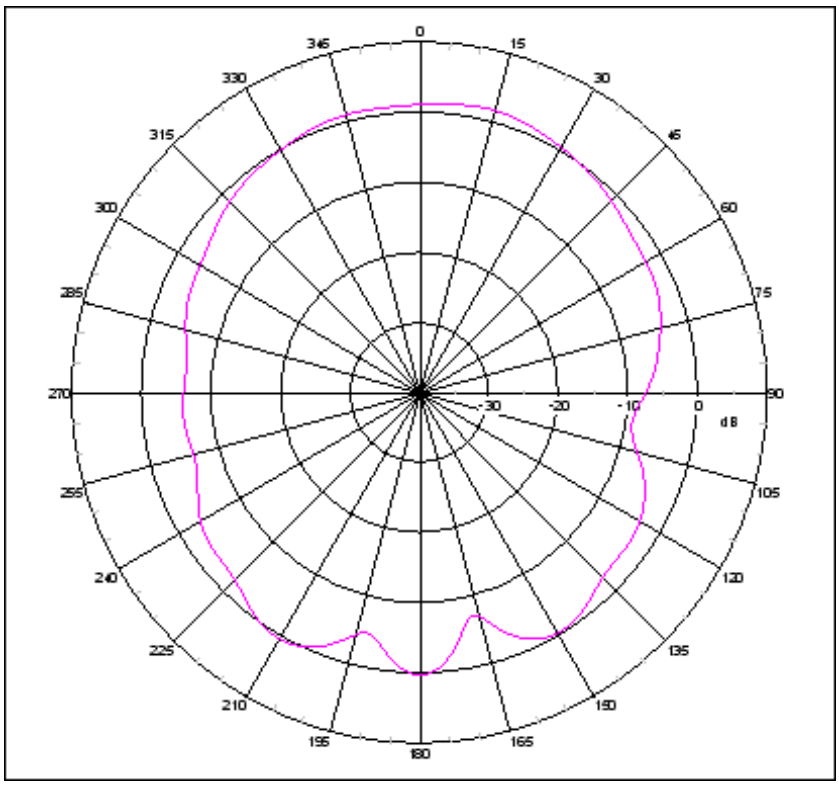
YZ-plane Free Space @1575.42MHz



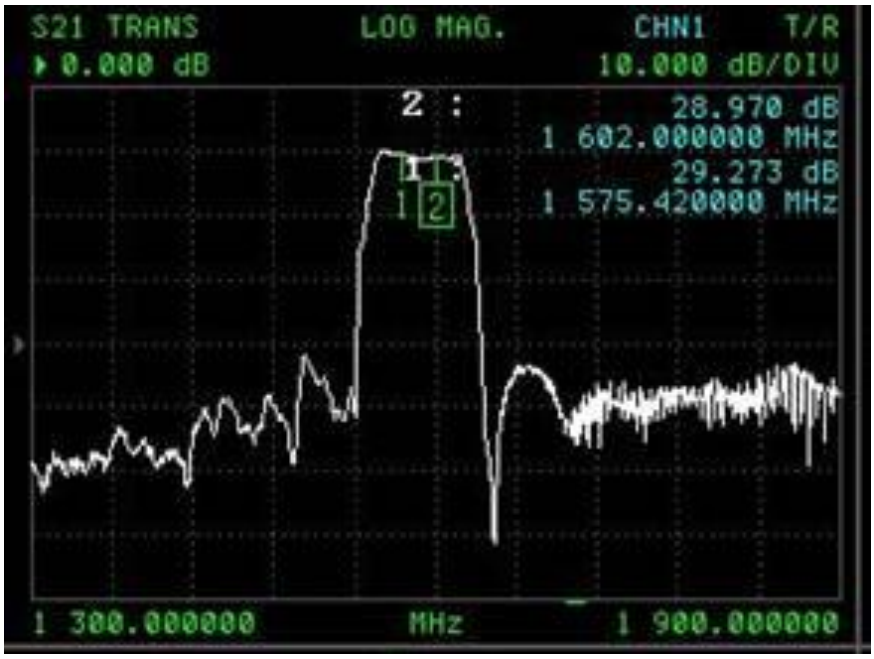
XZ-plane Free Space @1602MHz

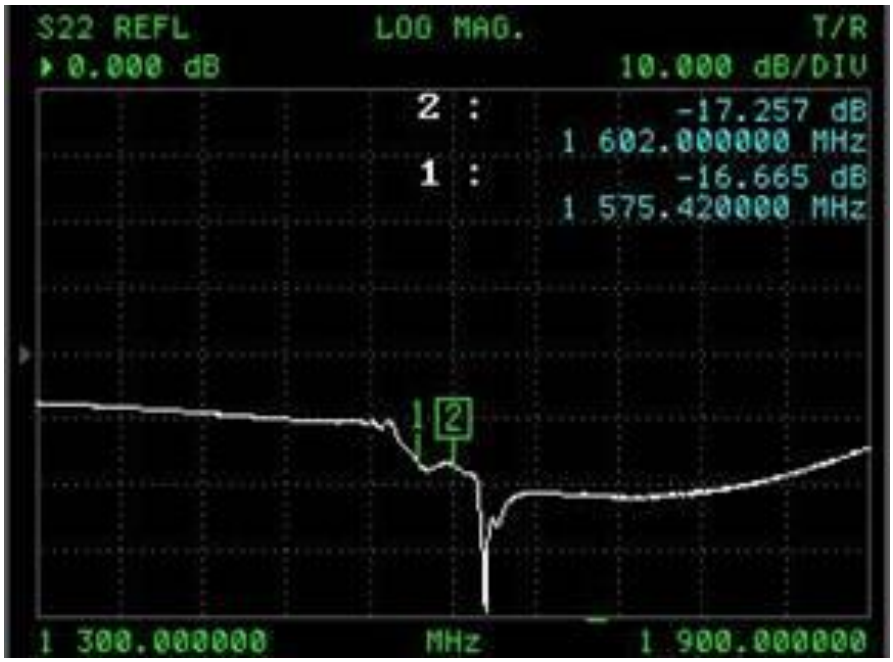


YZ-plane Free Space @1602MHz



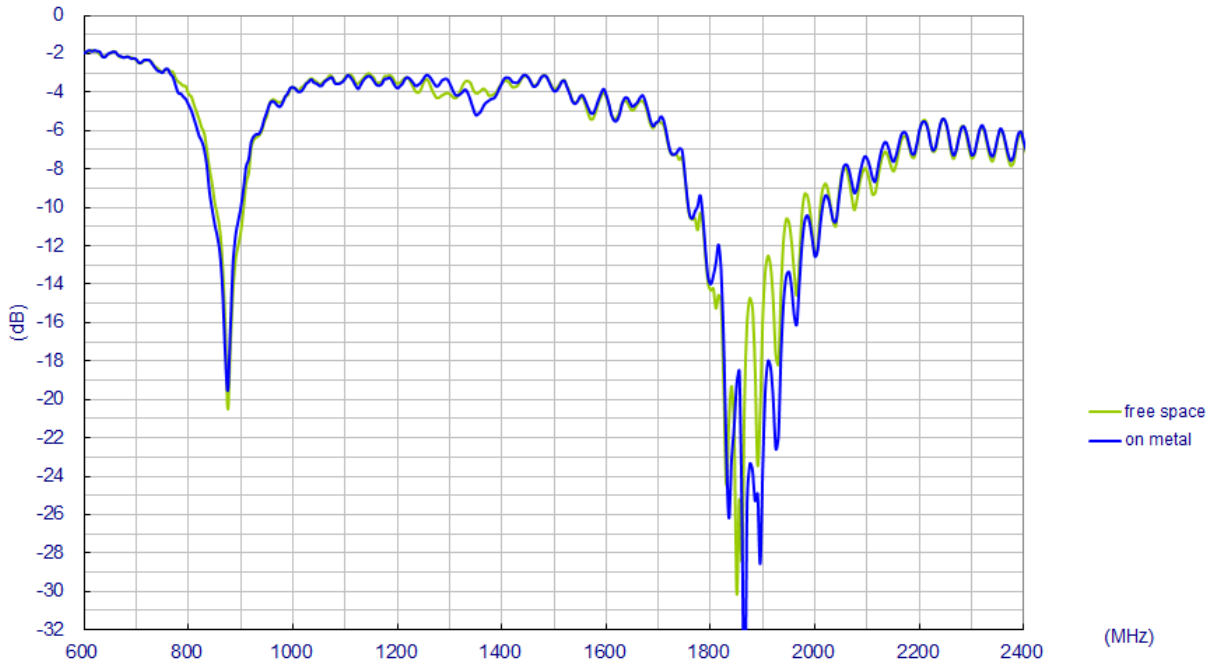
3.5 GPS/GLONASS LNA



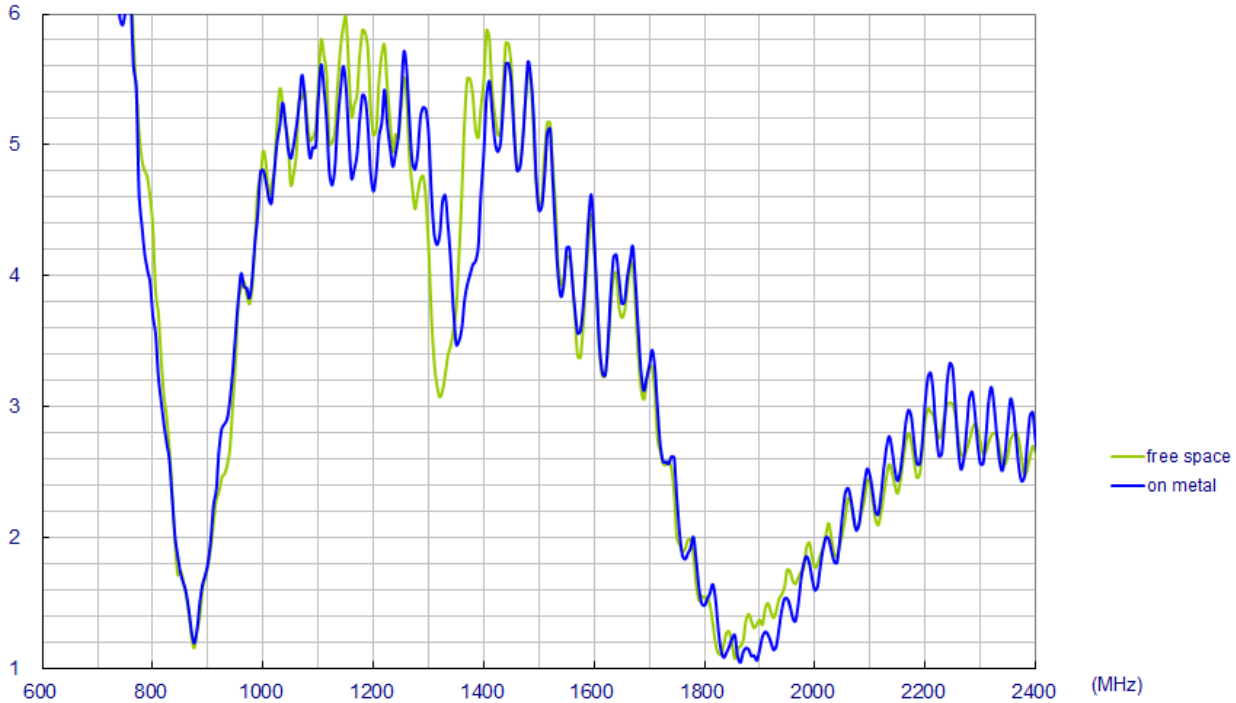


4. Cellular Antenna Characteristics

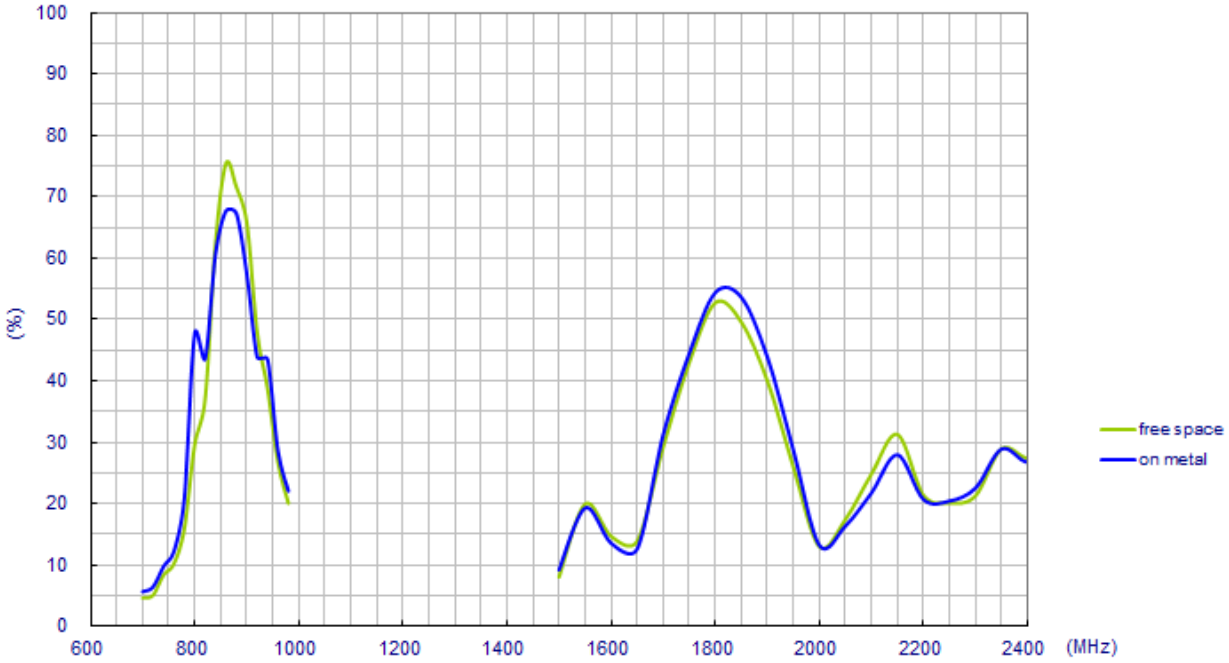
4.1 Return Loss



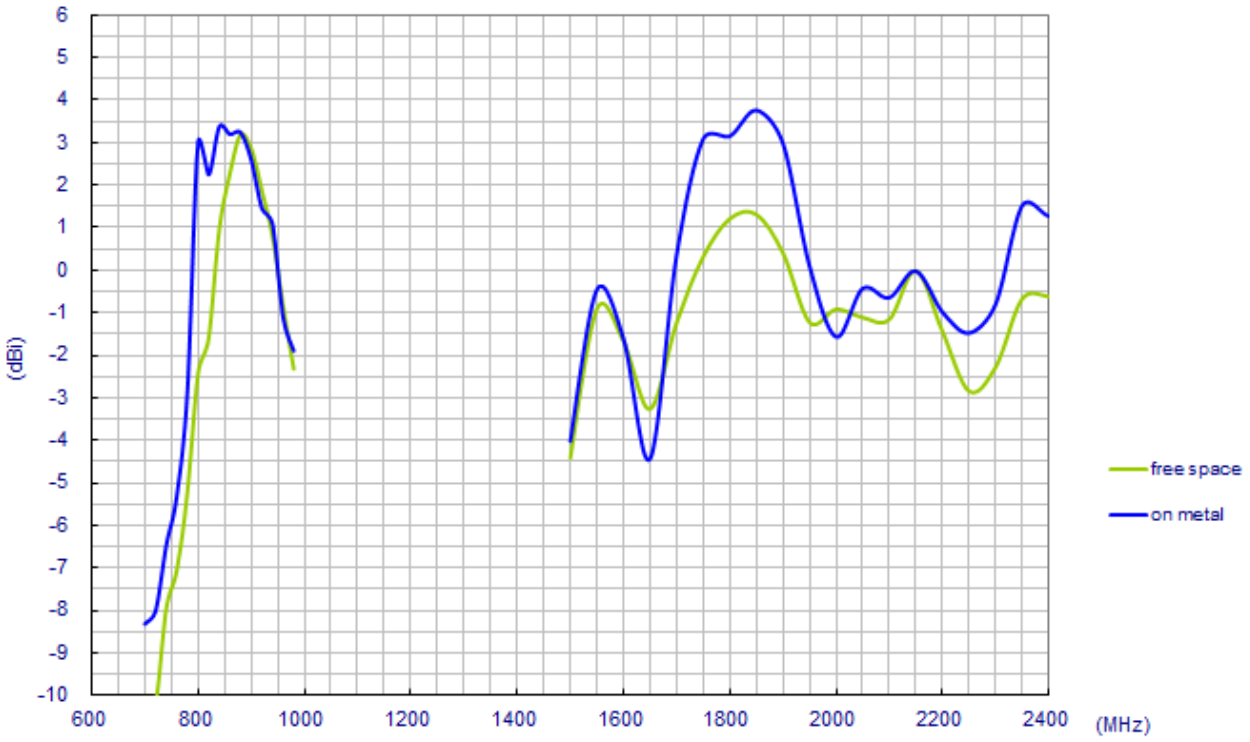
4.2 VSWR



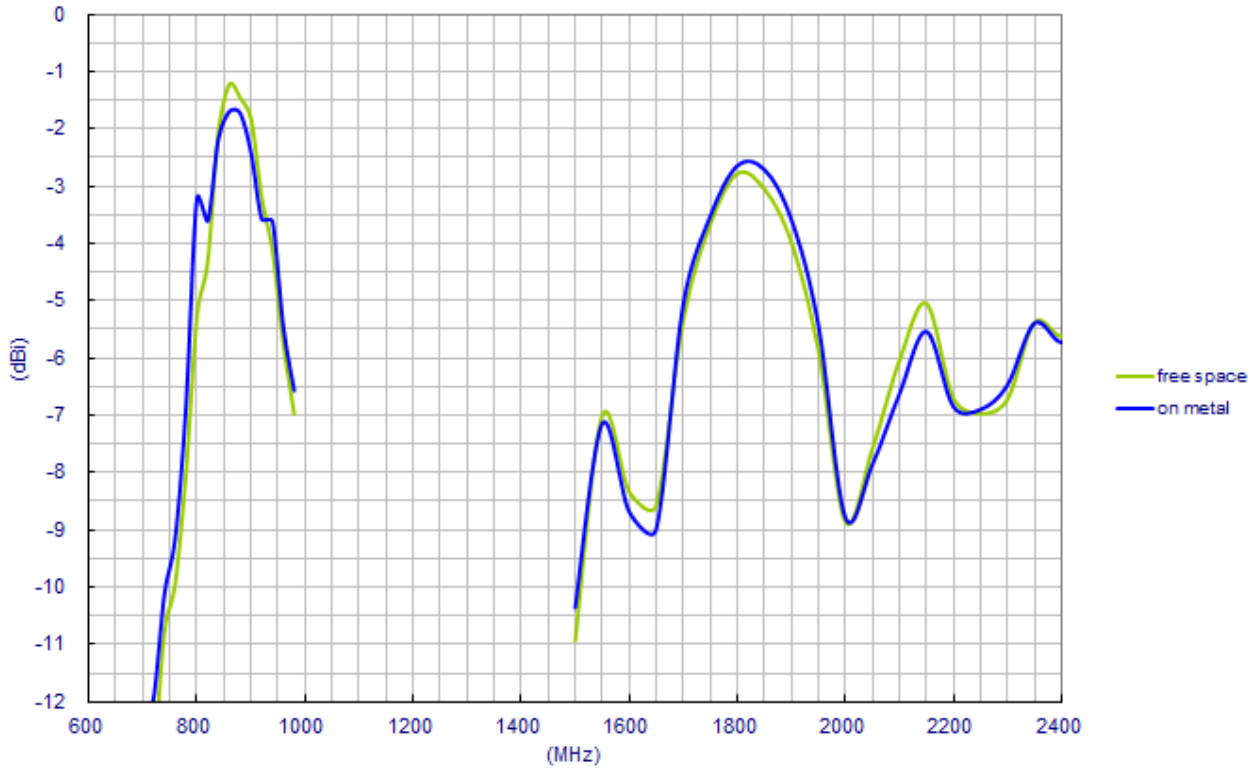
4.3 Cellular Antenna Efficiency



4.4 Cellular Antenna Peak Gain

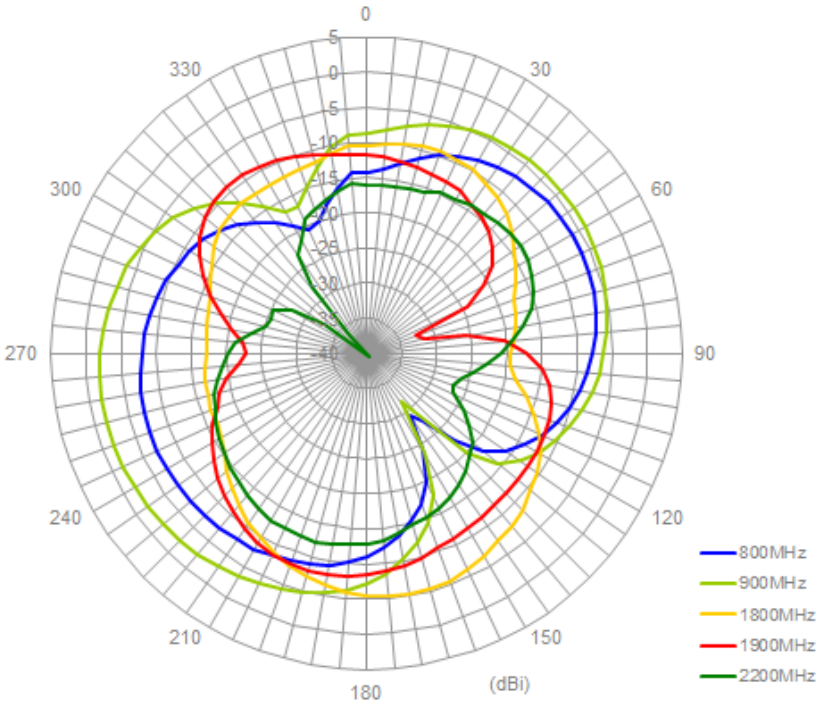


4.5 Cellular Antenna 3D Average Gain

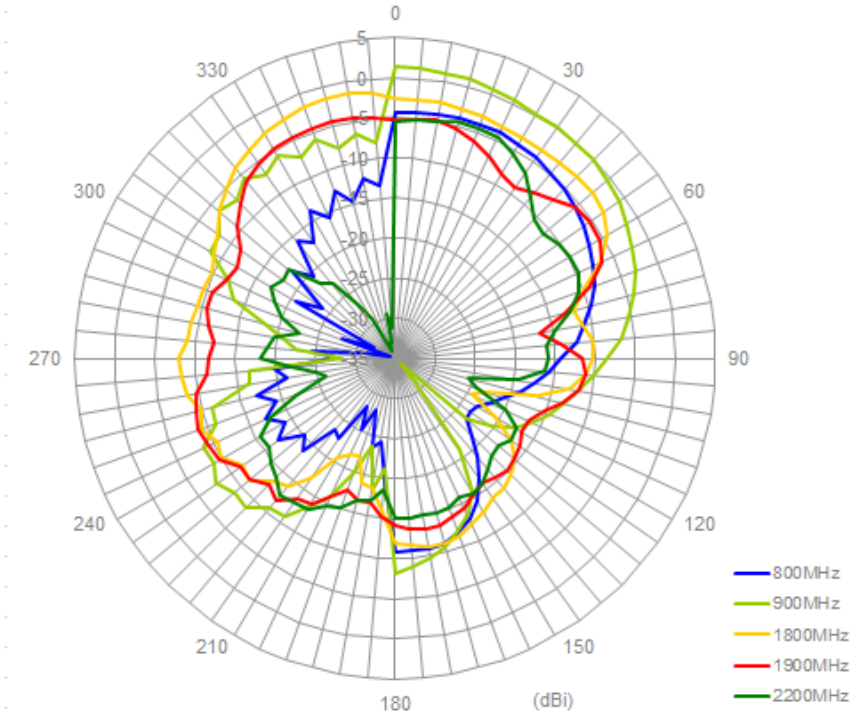


4.6 Cellular Antenna Radiation Pattern in Free Space

XY-plane

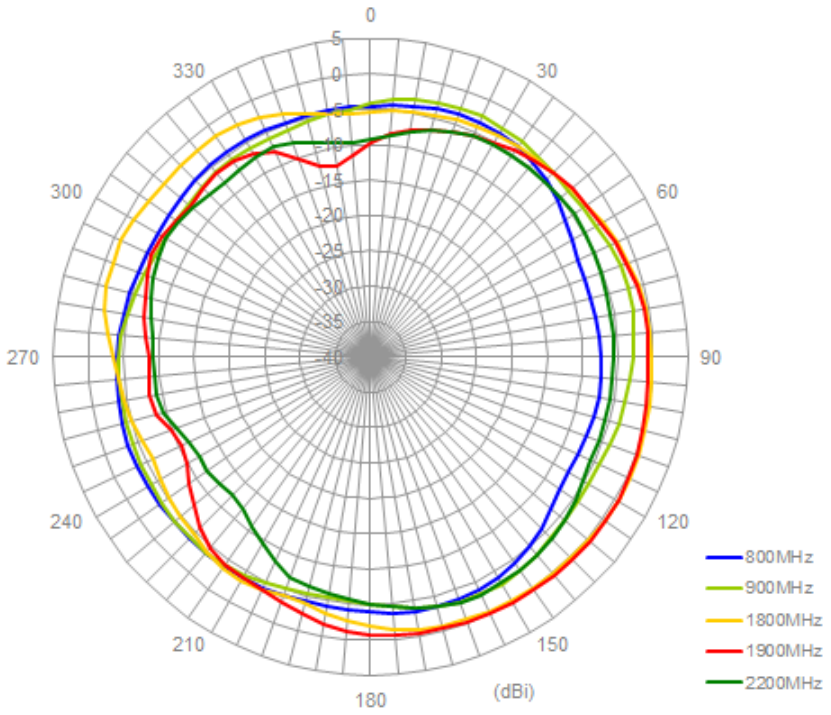


XZ-plane

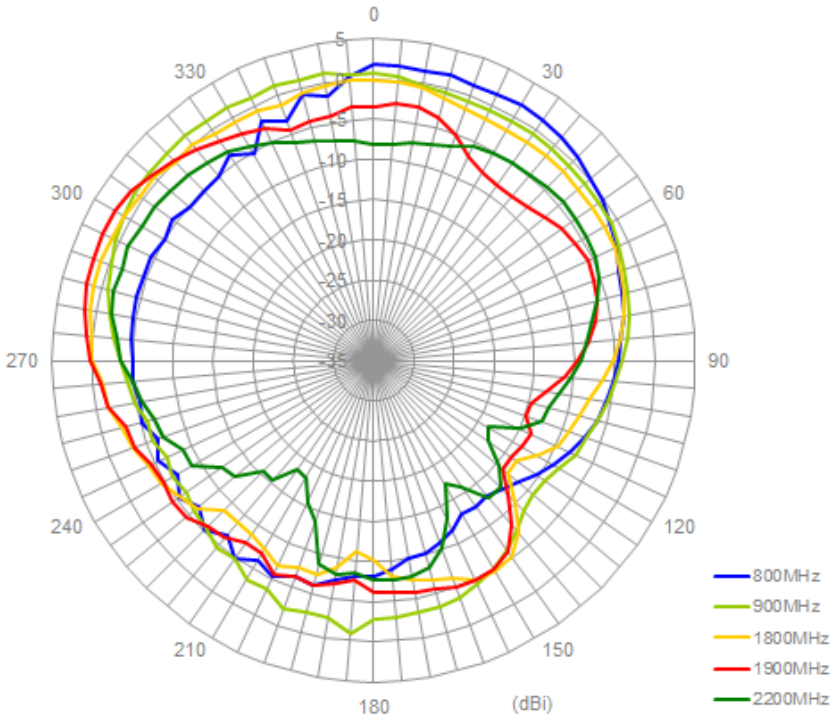


4.7 Cellular Antenna Radiation Pattern on Metal ground plane

XY-plane

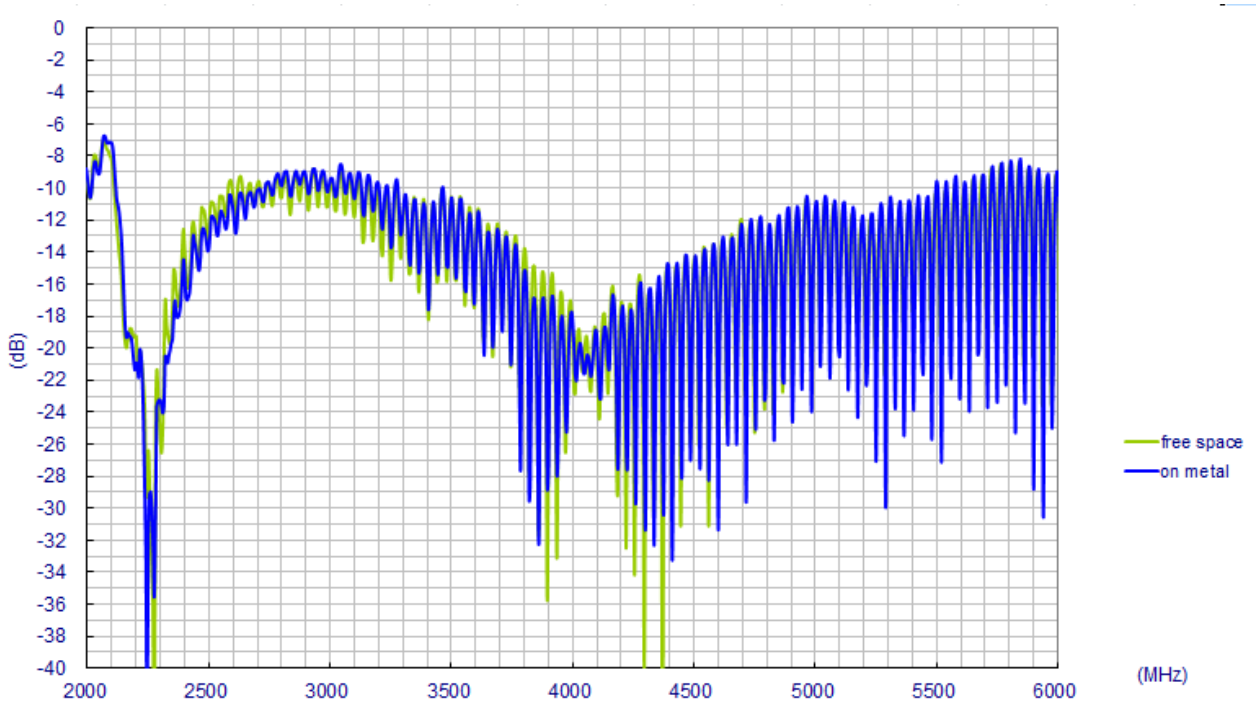


XZ-plane

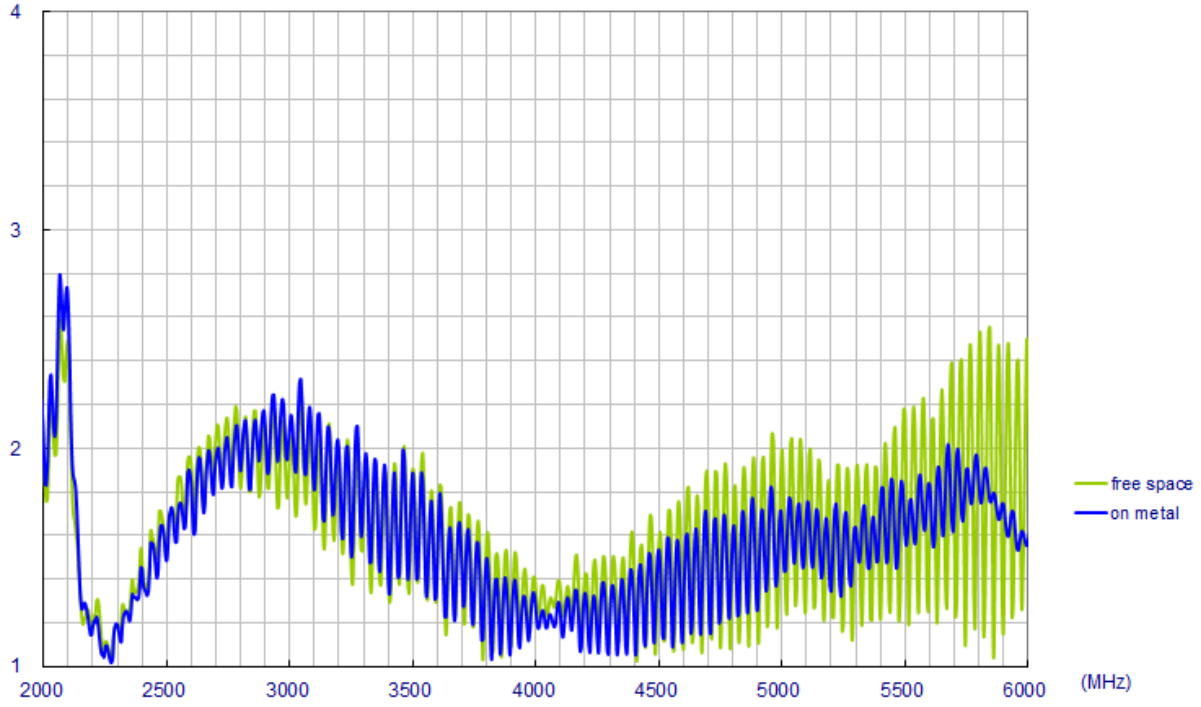


5. 2.4/5GHz Antenna Characteristics

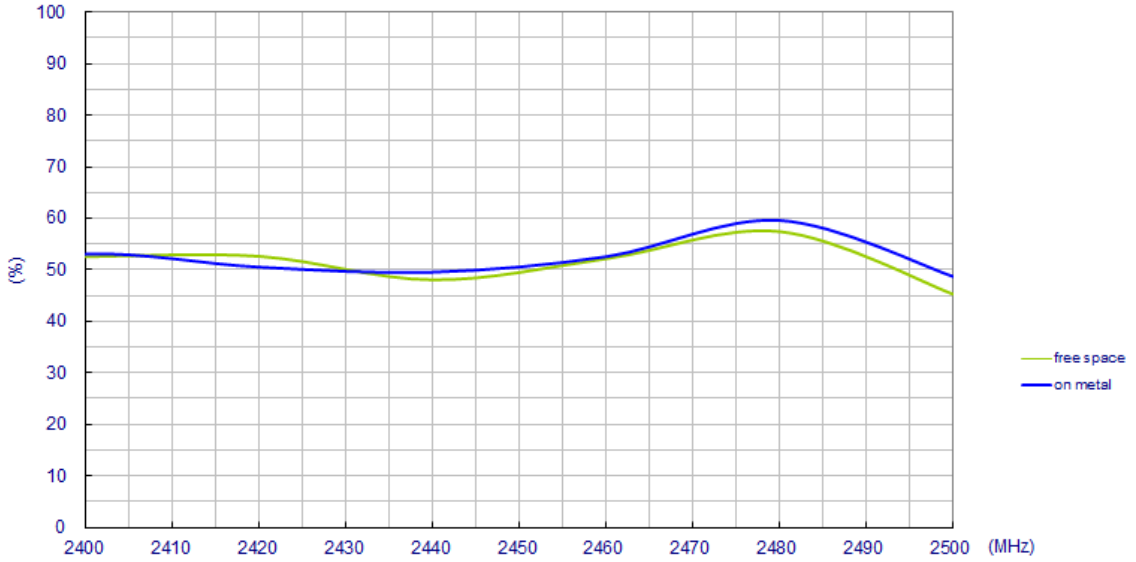
5.1 Return Loss

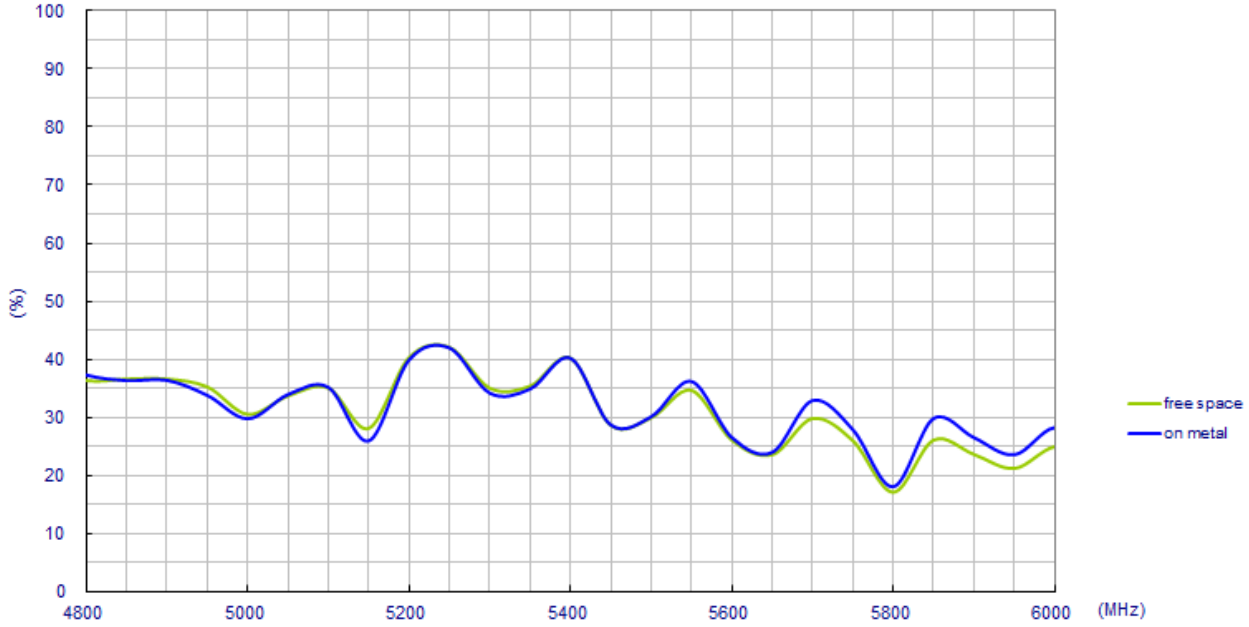


5.2 VSWR

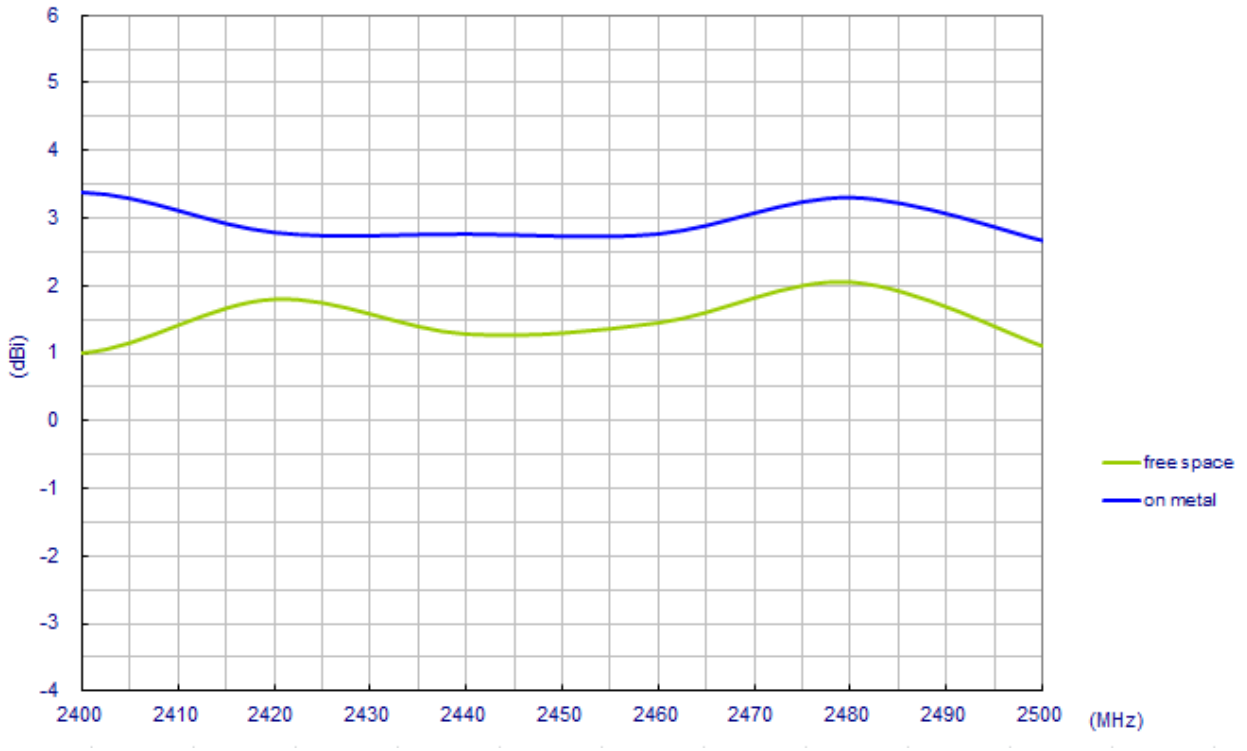


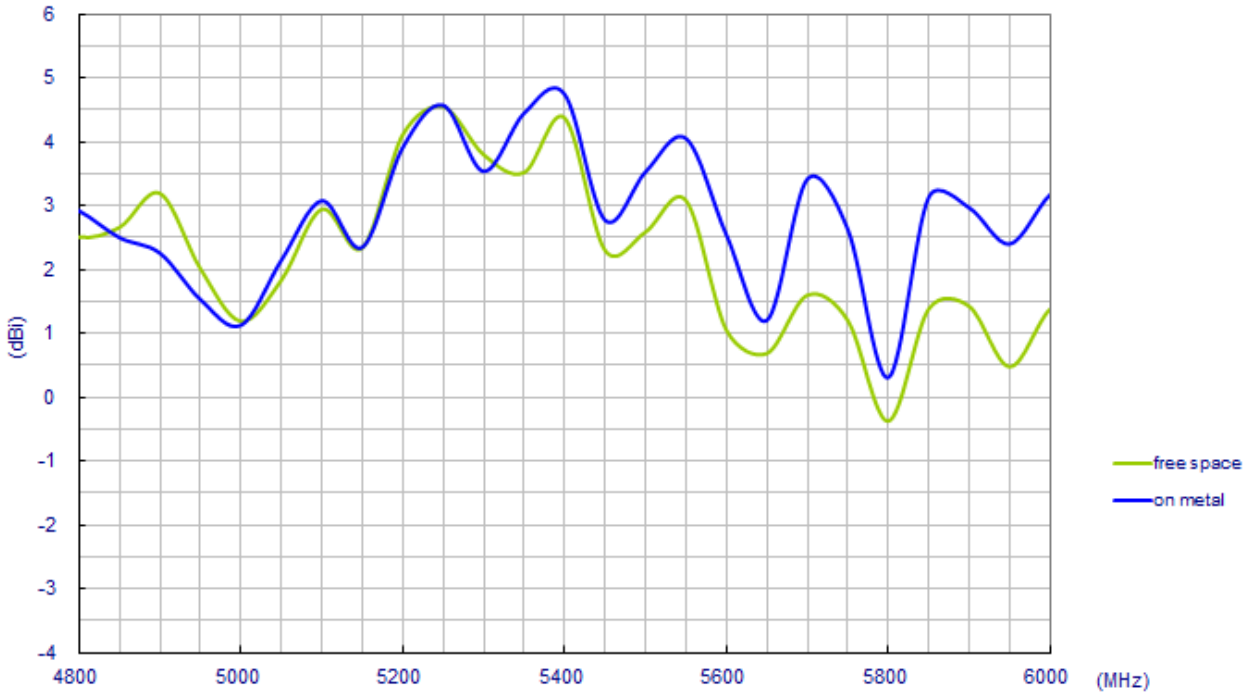
5.3 2.4/5GHz Antenna Efficiency



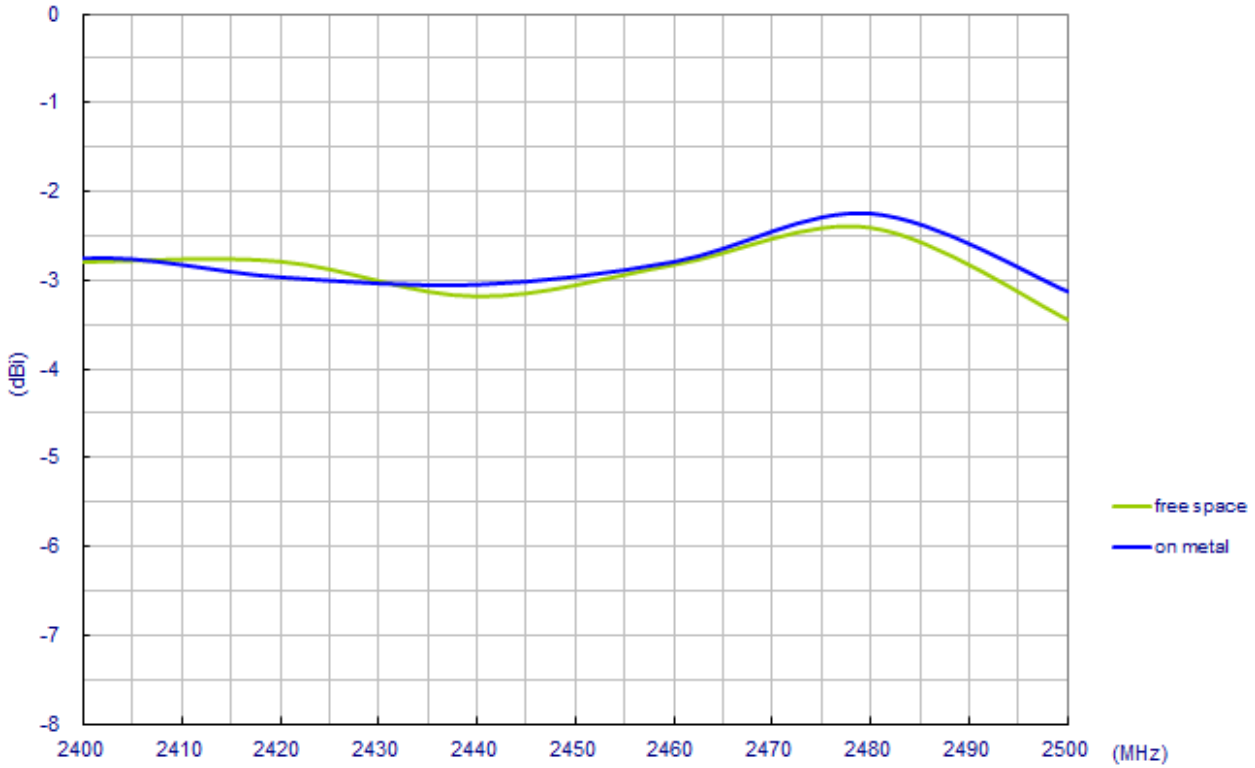


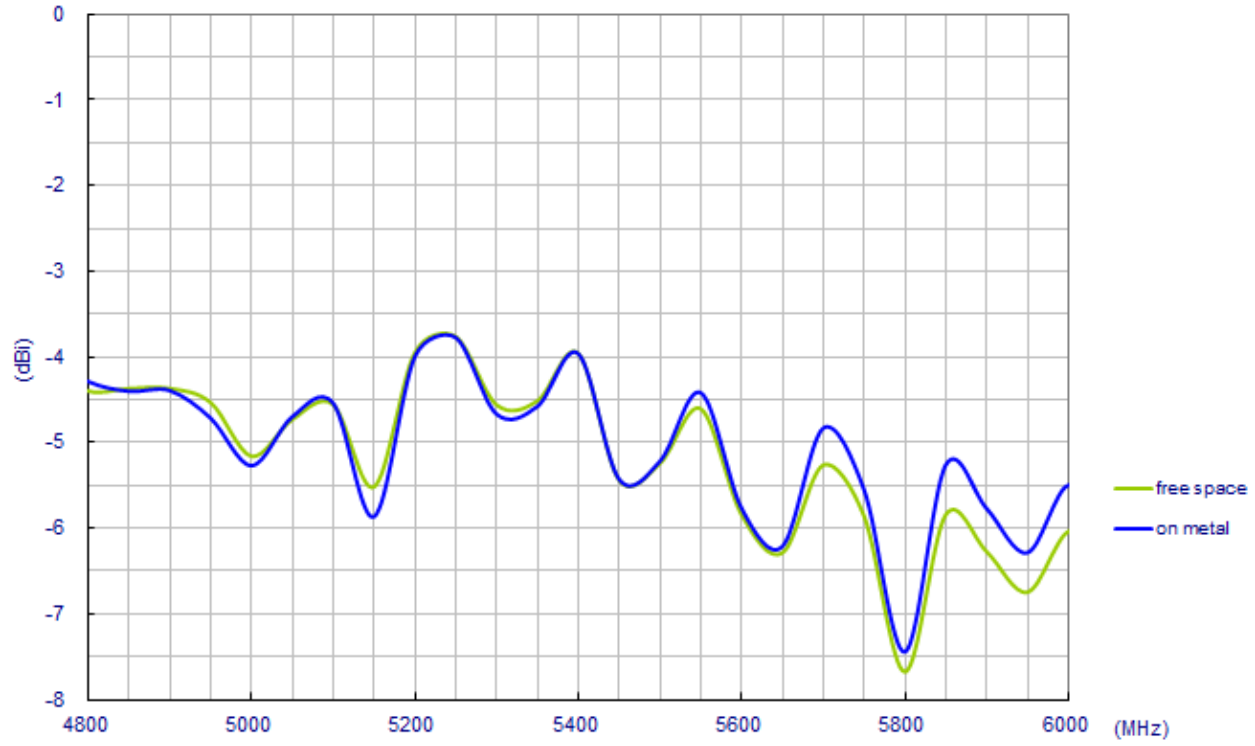
5.4 2.4/5GHz Antenna Peak Gain





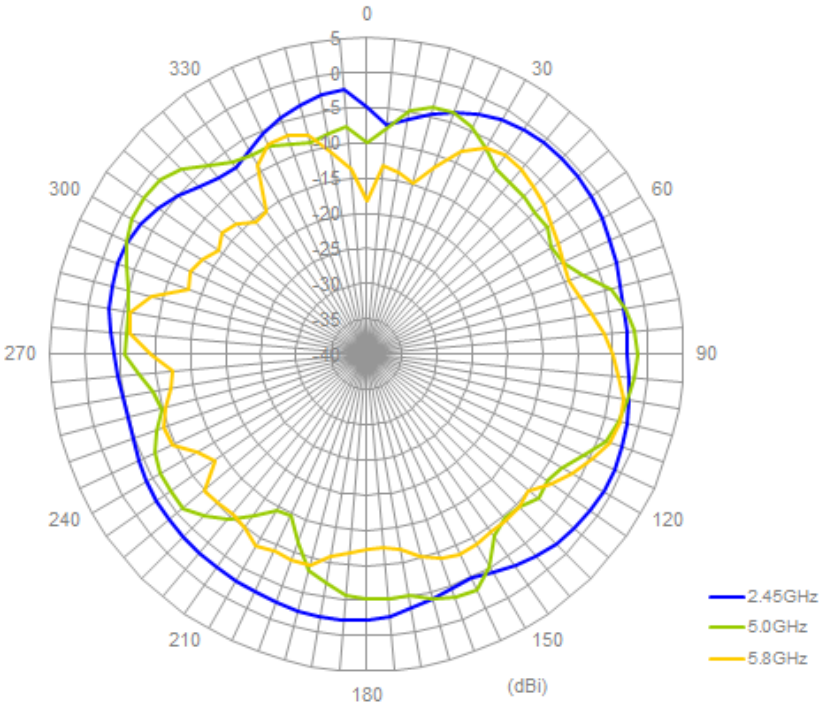
5.5 2.4/5GHz Antenna 3D Average Gain



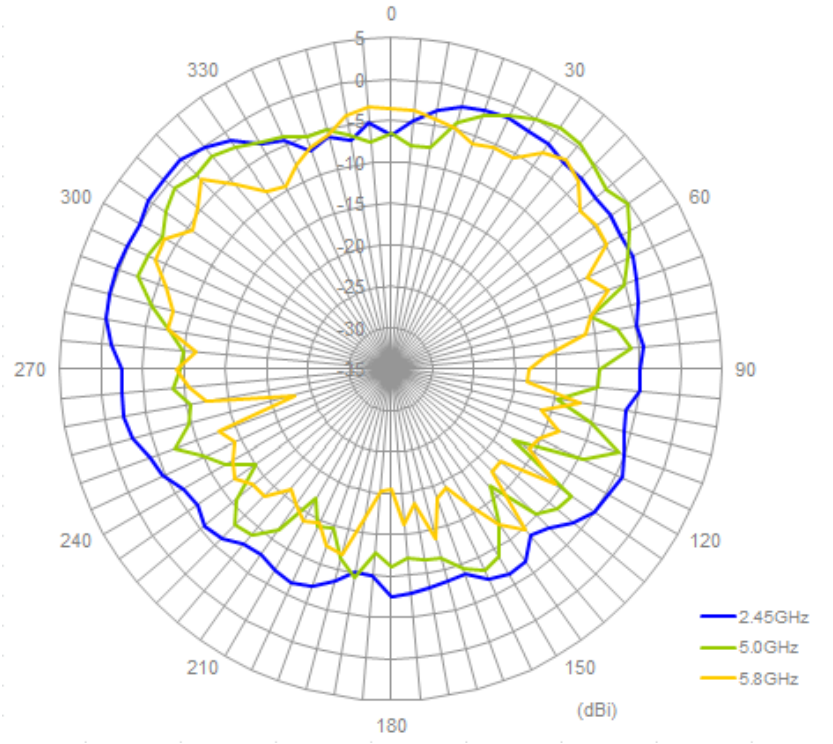


5.6 2.4/5GHz Antenna Radiation Pattern in Free Space

XY-plane

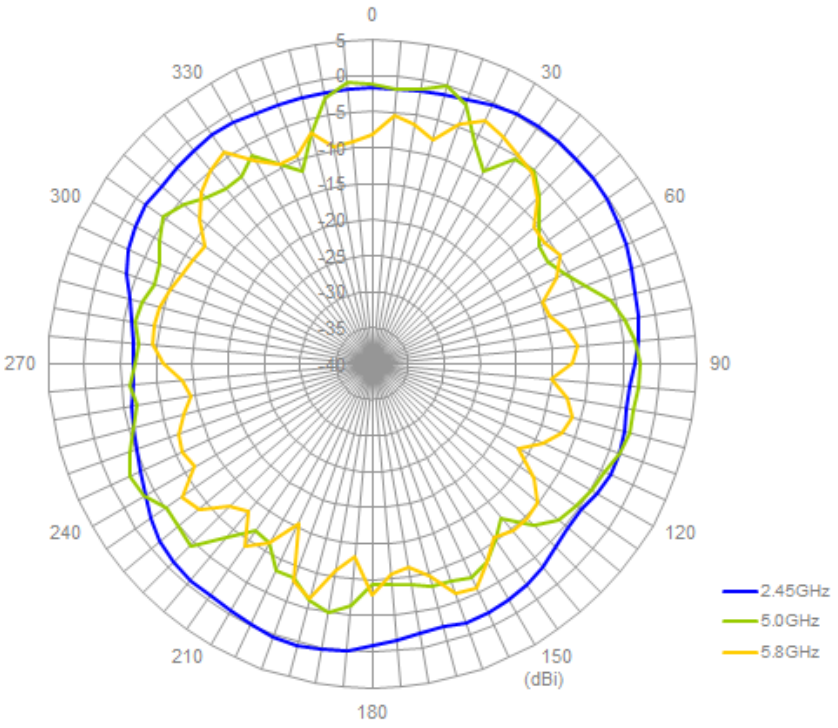


XZ-plane

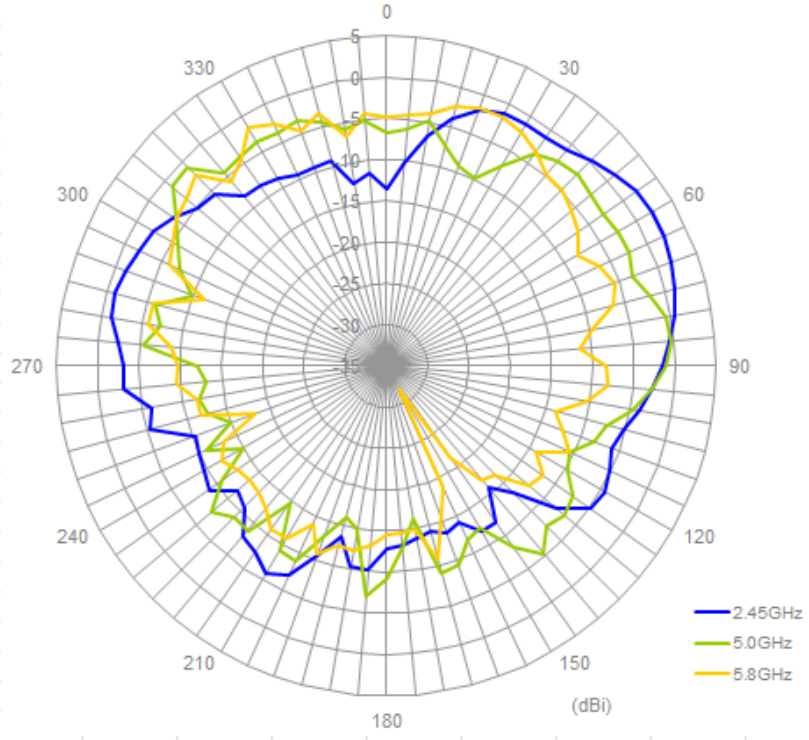


5.7 2.4/5GHz Antenna Radiation Pattern on Metal ground plane

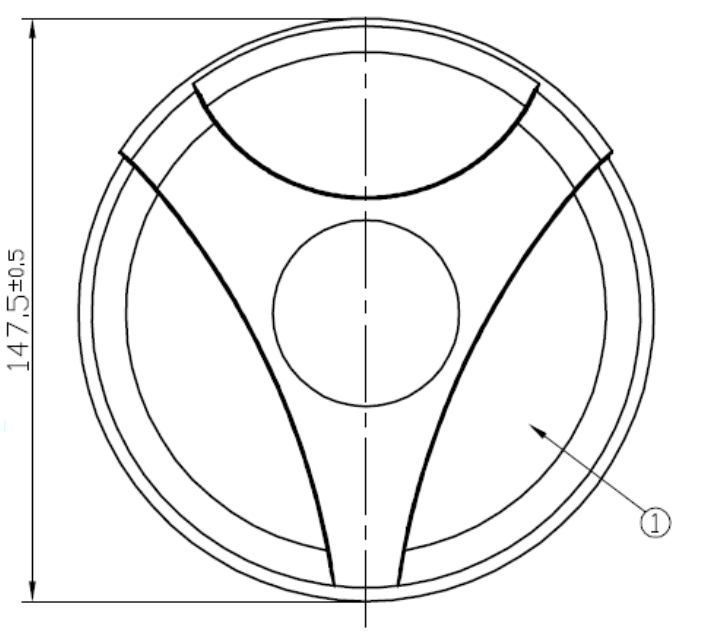
XY-plane

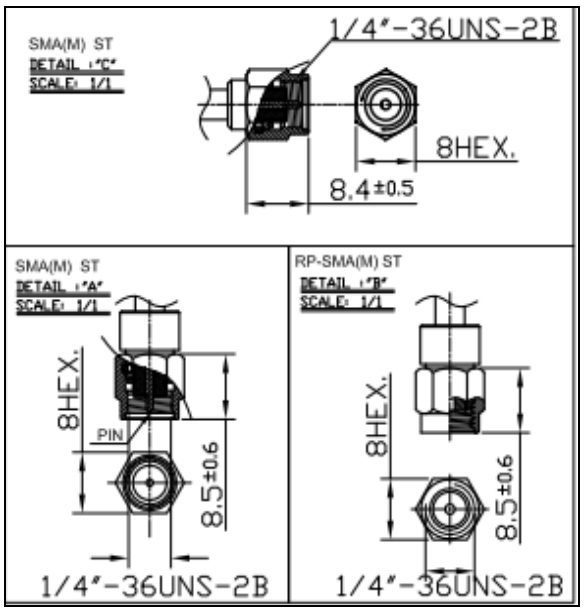


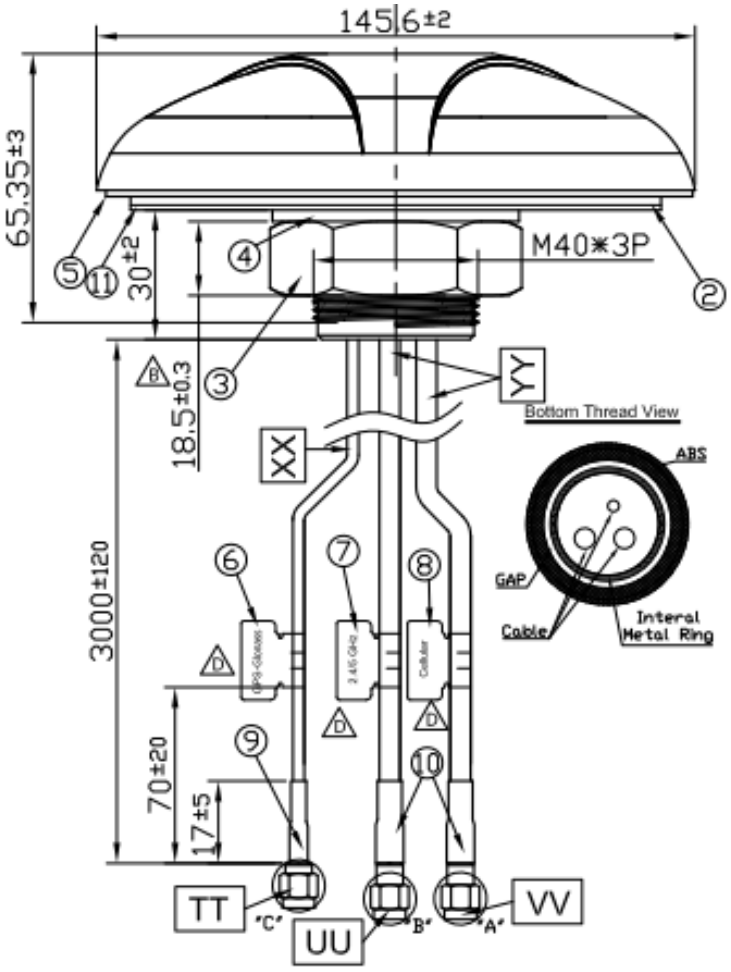
XZ-plane



6. Mechanical Drawing



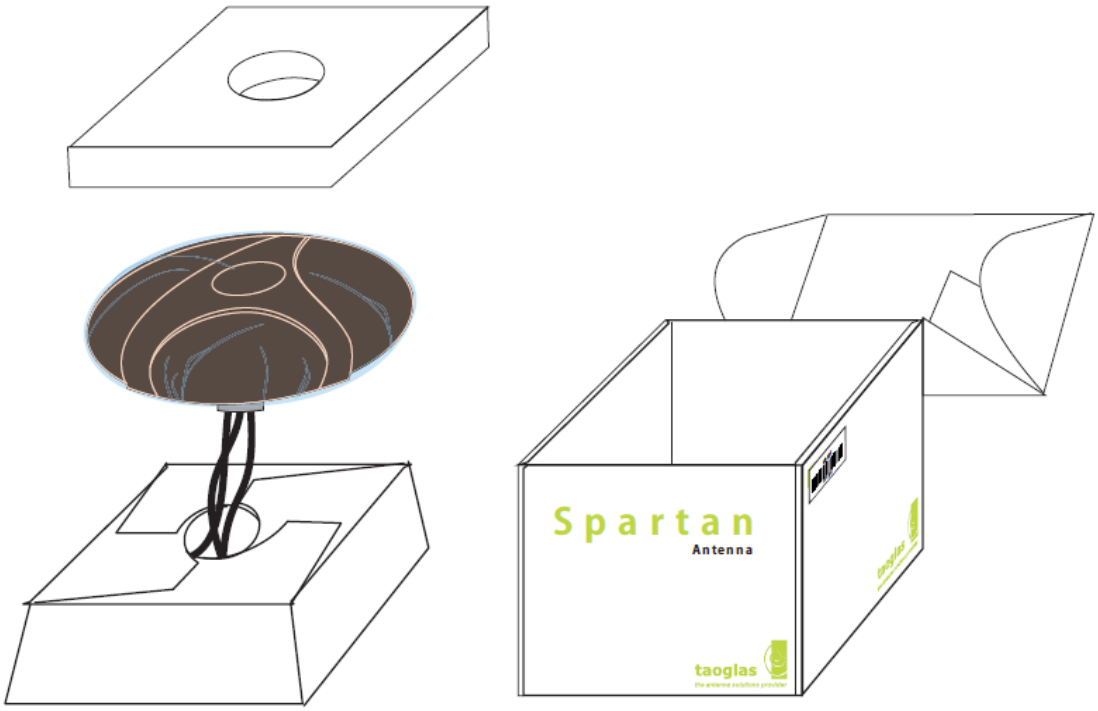


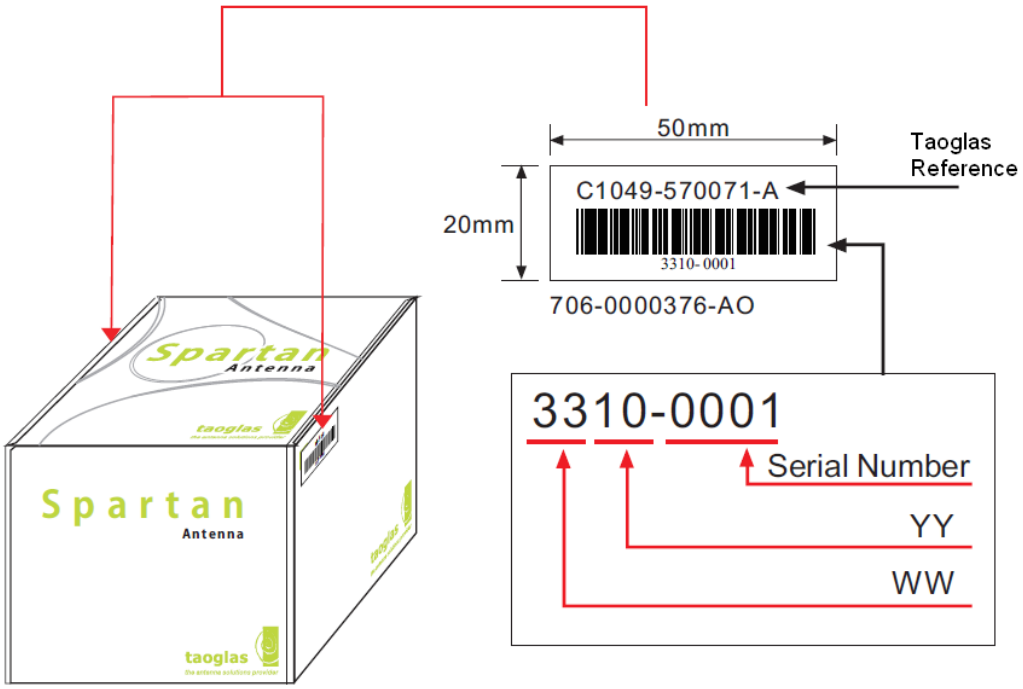


	Name	Material	Finish	QTY
1	Housing	PC 540	Black	1
2	M40_Thread_Insulation	ABS PA709	Black	1
3	M40_Plastic_NUT	ABS PA709	Black	1
4	M40_Plastic_Washer	ABS PA709	Black	1
5	Waterproof Rubber	Silicon	Black	1
6	GPS-Glonass Label	Coated Paper	Orange	1
7	2.4/5GHz Label	Coated Paper	Green	1
8	Cellular Label	Coated Paper	Blue	1
9	Heat Shrink Tube(RG174)	PE	Black	1
10	Heat Shrink Tube(CFD200)	PE	Black	2
11	3M Double Adhesive	3M 9448 HK	White Liner	1

	Name	Spec	Finish	QTY
TT	Connector Type	SMA(M) ST	Gold	1
UU	Connector Type	RP-SMA(M) ST	Gold	1
VV	Connector Type	SMA(M) ST	Gold	1
XX	Cable Type	RG174	Black	1
YY	Cable Type	CFD 200	Black	2

7. Packaging


Spartan
Antenna
taoglas


50mm
Taoglas
Reference
20mm
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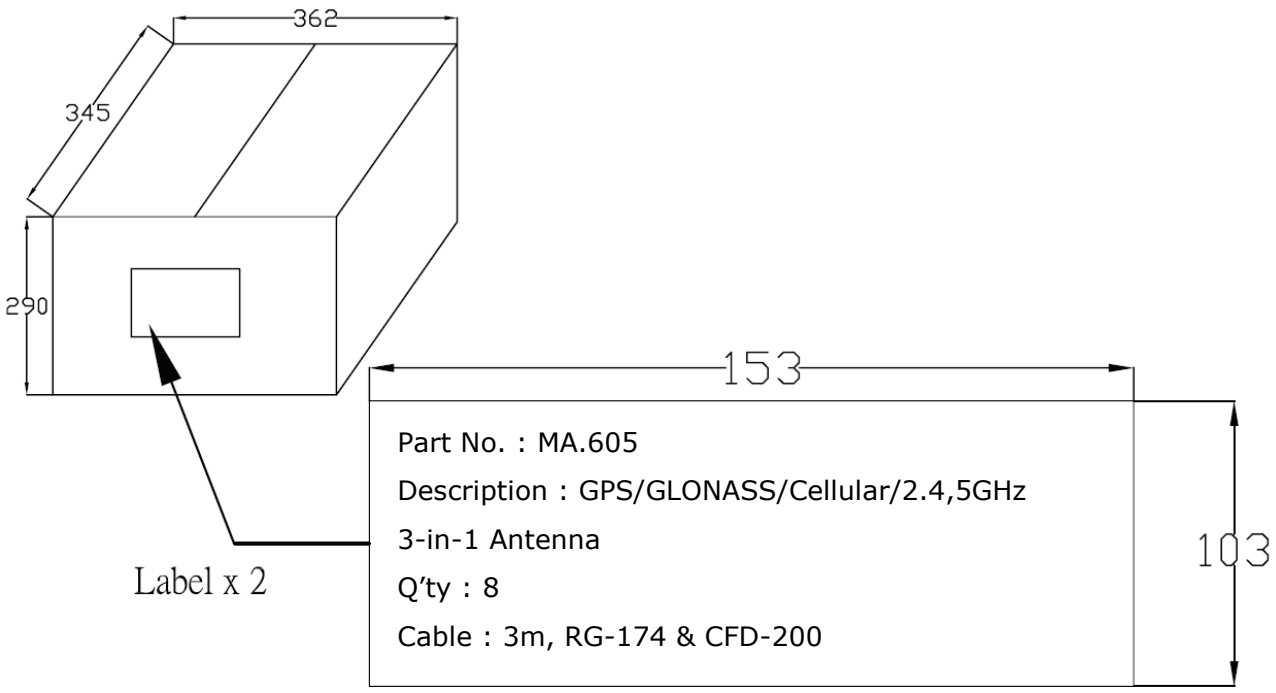
3310-0001
706-0000376-AO
Spartan
Antenna
taoglas
3310-0001
Serial Number
YY
WW


362
345
290
153
103
Label x 2
Part No. : MA.605
Description : GPS/GLONASS/Cellular/2.4,5GHz
3-in-1 Antenna
Q'ty : 8
Cable : 3m, RG-174 & CFD-200