SPECIFICATION

Part No. : **MA705.A.ABC.001**

Product Name : Pantheon Antenna 3in1 MA.705
Screw-Mount (Permanent Mount)
GPS/GLONASS/ LTE Cellular/ 2.4GHz/5GHz
Combination antenna

Features : Cellular

- 700/850/900/1700/1800/2100MHz
- LTE/GSM/CDMA/UMTS/HSPA

GPS/GLONASS 1575~1602MHz – 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 Pantheon MA705 antenna is an omni-directional heavy-duty, fully IP67 waterproof external M2M antenna for use in telematics, transportation and remote monitoring applications. The Pantheon series is designed for RF professionals who accept no performance compromises whatsoever. The MA705 combines a 3in1 GPS/GLONASS, Cellular 700MHz to 2200MHz (2G/3G/4G) and 2.4GHz/5GHz antenna with the highest efficiency and peak gain possible. Unlike our competitors who don't measure cable loss the specification is measured at 3 meters (10ft) to show real performance in the field. 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.

All while still maintaining 20dB isolation between antennas. It uses high-shielded PTFE dielectric ultra low-loss cables that maintain low attenuation at all frequency bands, and high noise rejection, with an average loss of only 0.3dB per meter (0.1dB per foot), compared to 0.7dB for RG58 and 1.2dB for RG174. Because of this, the Pantheon maximizes chances of passing PTCRB and network approvals first time. The Pantheon also has excellent performance without need to attach to an external ground-plane due to its internal antennas coupling to its unique super strong integrated metal base. The antenna comes with a 3M adhesive waterproof layer to prevent water leaking under the antenna into the mounting hole. The Pantheon can also be supplied in single GPS/GLONASS, Cellular, Wi-Fi only versions, or at other frequencies.

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					

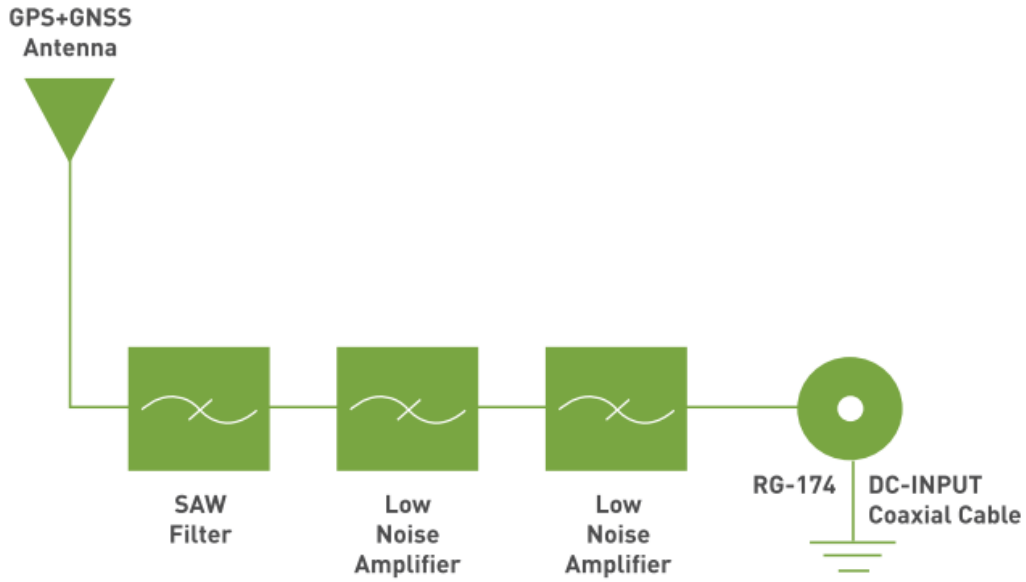
CELLULAR						
Frequency (MHz)	700~800	824 ~ 896	880 ~ 960	1710~1880	1850~1990	1710~2170
Peak Gain (dBi) *	2.1	2.5	3.1	2.3	1.6	2.3
Average Gain (dBi) *	1.5	1.8	2.0	1.5	0.5	0.0
Efficiency *	78%	76%	57%	47%	37%	36%
Impedance	50Ω					
Polarization	Linear					
Radiation Pattern	Omni					
Cable	3m CFD200 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) *	1.8	3.9	5.9	5.4
Average Gain (dBi) *	1.5	2.3	4.1	4.1
Efficiency *	54%	30%	33%	35%
VSWR	<=1.7:1			
Impedance	50Ω			
Polarization	Linear			
Radiation Pattern	Omni			
Cable	3m CFD200 standard, fully customizable			
Connector	RP-SMA(M) standard, standard, fully customizable			
MECHANICAL				
Dimensions	Height 85.7mm x Diameter 145.6m			
Casing	Wonderloy PC-540 PC/ABS Alloy			
Base and thread	CAN10 Zinc Alloy			
Thread diameter	M30 x 2 (30mm)			
Nut	Nickel Plated Iron			
Foam	3M 9448H			
Waterproof	IP67			
ENVIRONMENTAL				
Temperature Range	-40°C to 85°C			
Storage Temperature	-40°C to 90°C			
Humidity	Non-condensing 65°C 95% RH			

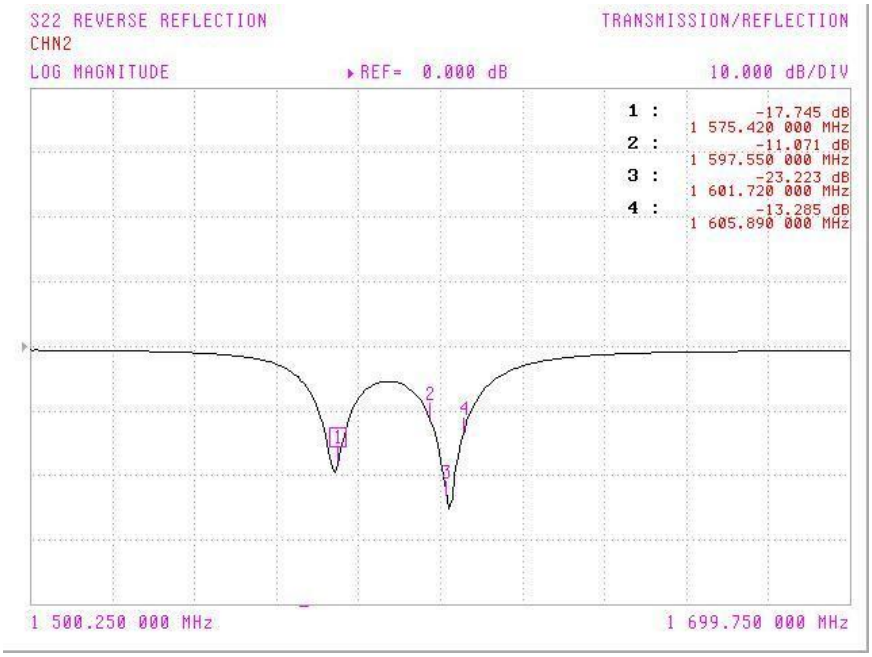
* Including 3 meters cable loss

3. GPS/GLONASS Antenna Characteristics

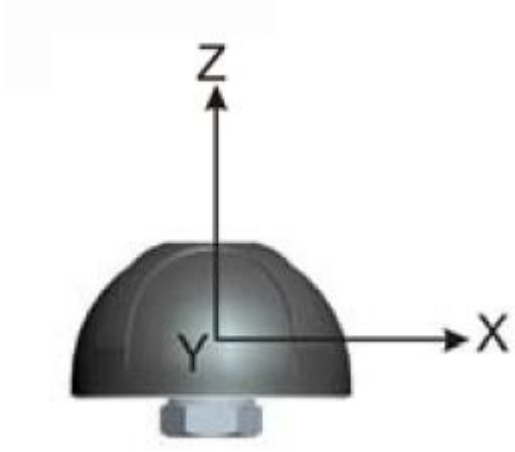
3.1 Block diagram



3.2 Return Loss

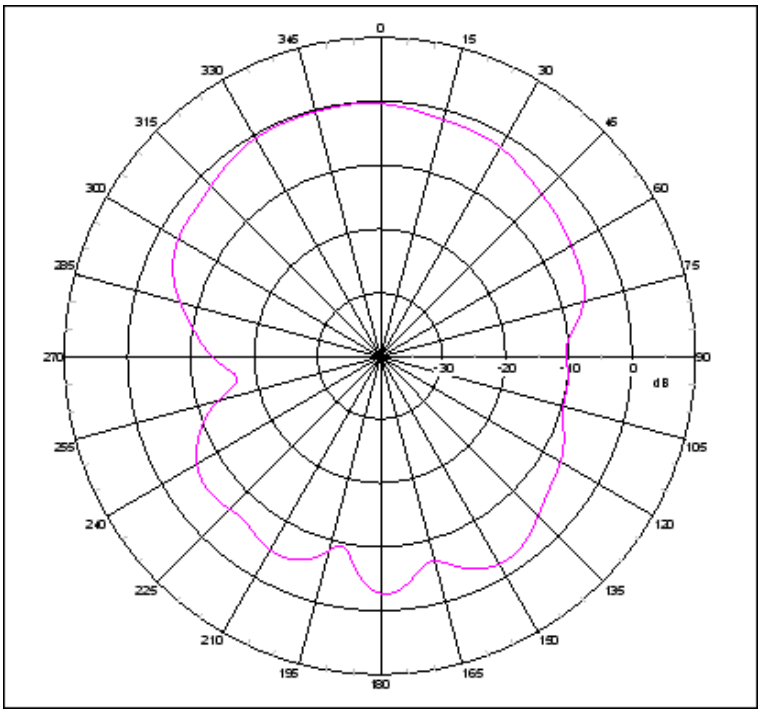


3.3 GPS/GLONASS Antenna Radiation Pattern

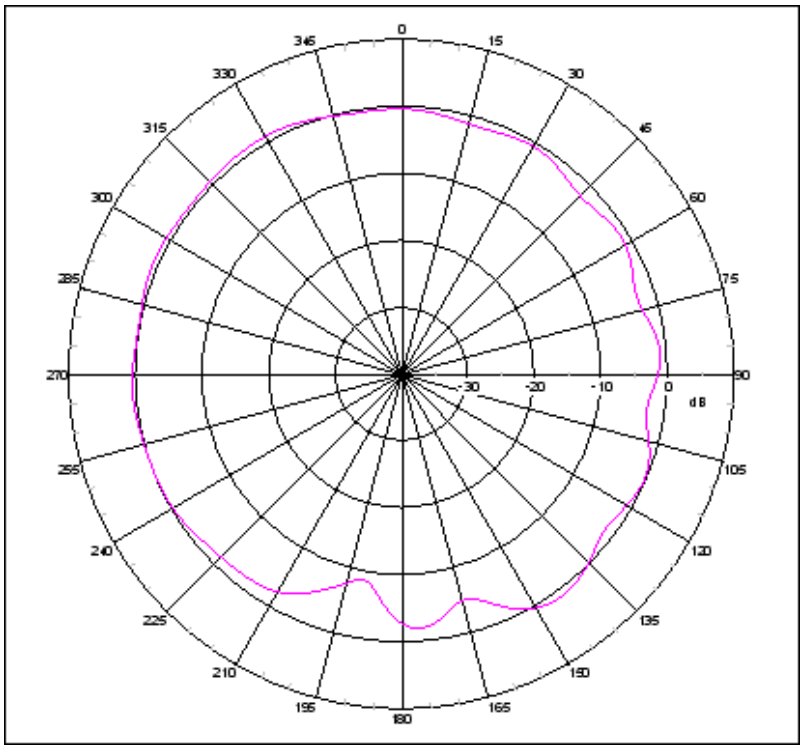


XYZ co-ordinate for reference.

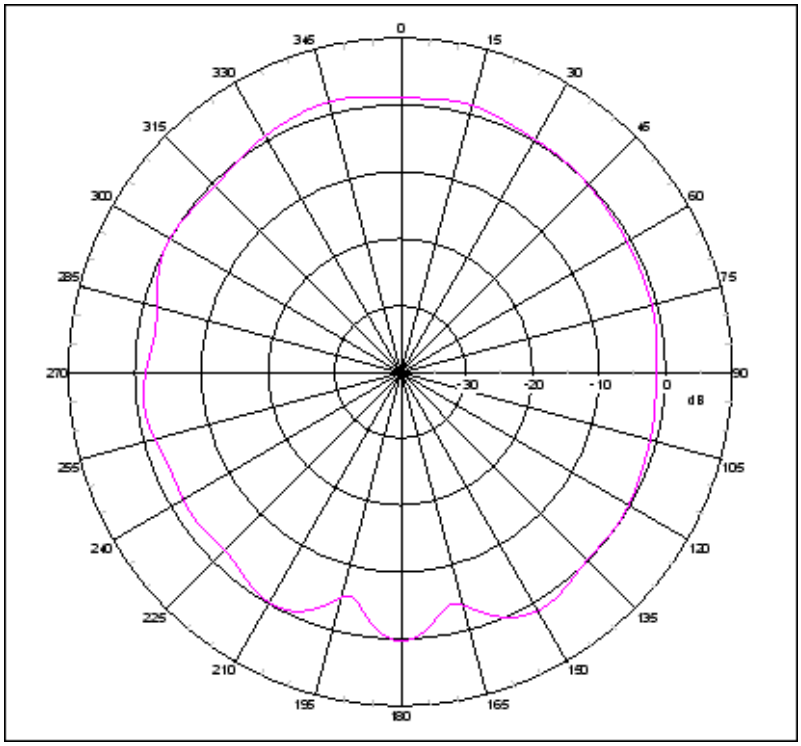
XZ-plane Free Space @1575.42MHz



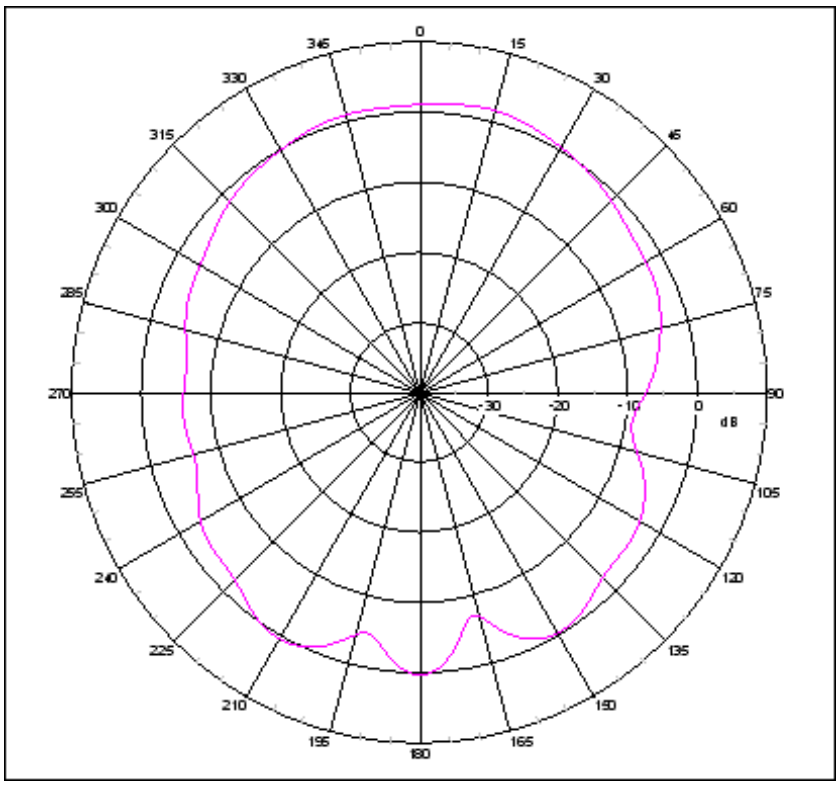
YZ-plane Free Space @1575.42MHz



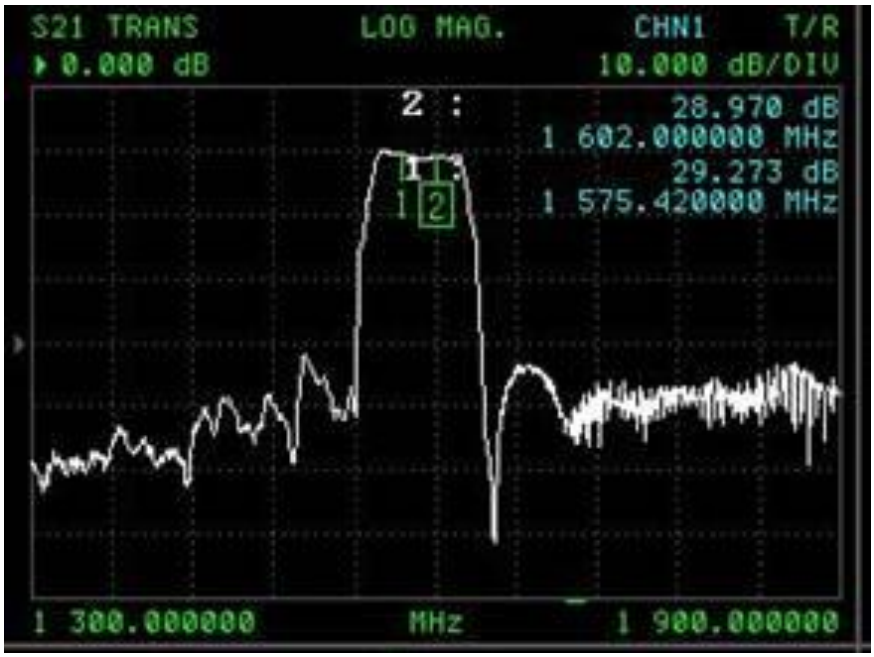
XZ-plane Free Space @1602MHz

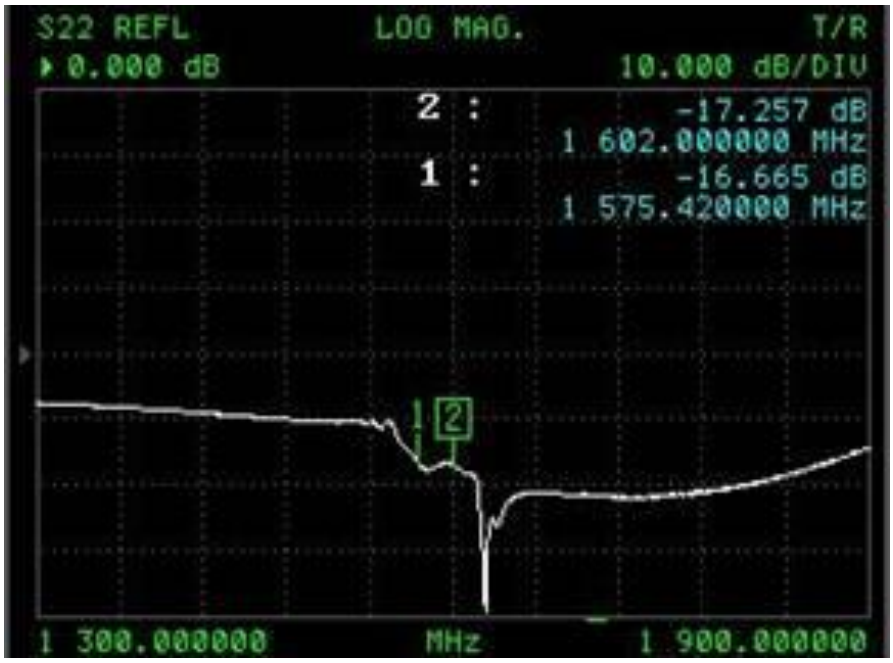


YZ-plane Free Space @1602MHz



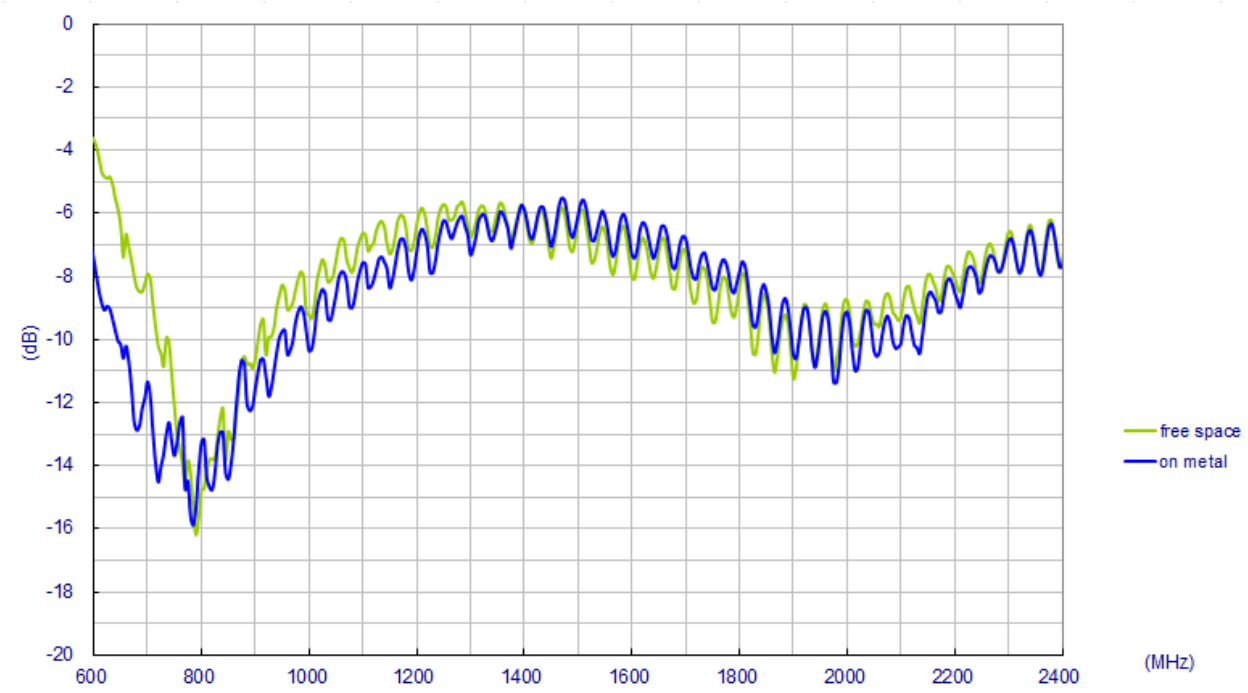
3.4 GPS/GLONASS LNA



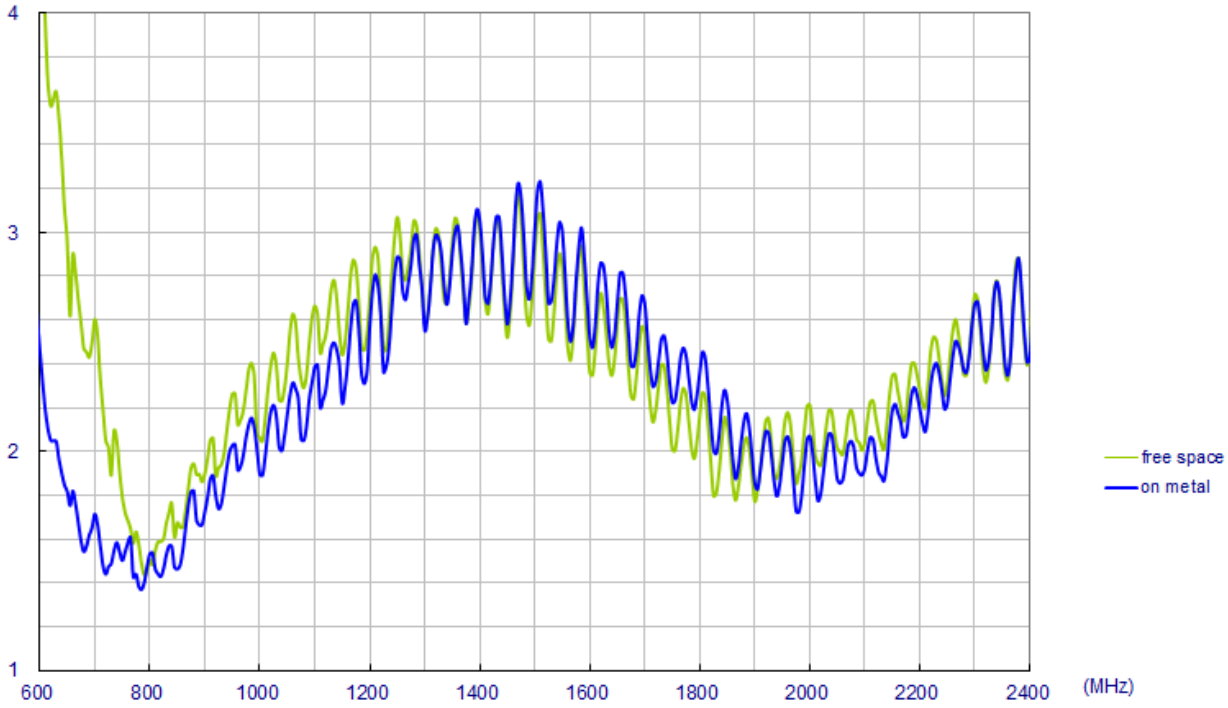

S22 REFL
LOG MAG.
T/R
0.000 dB
10.000 dB/DIV
2 :
-17.257 dB
1 602.000000 MHz
1 :
-16.665 dB
1 575.420000 MHz
1 300.000000
MHz
1 900.000000

Cellular Antenna Characteristics

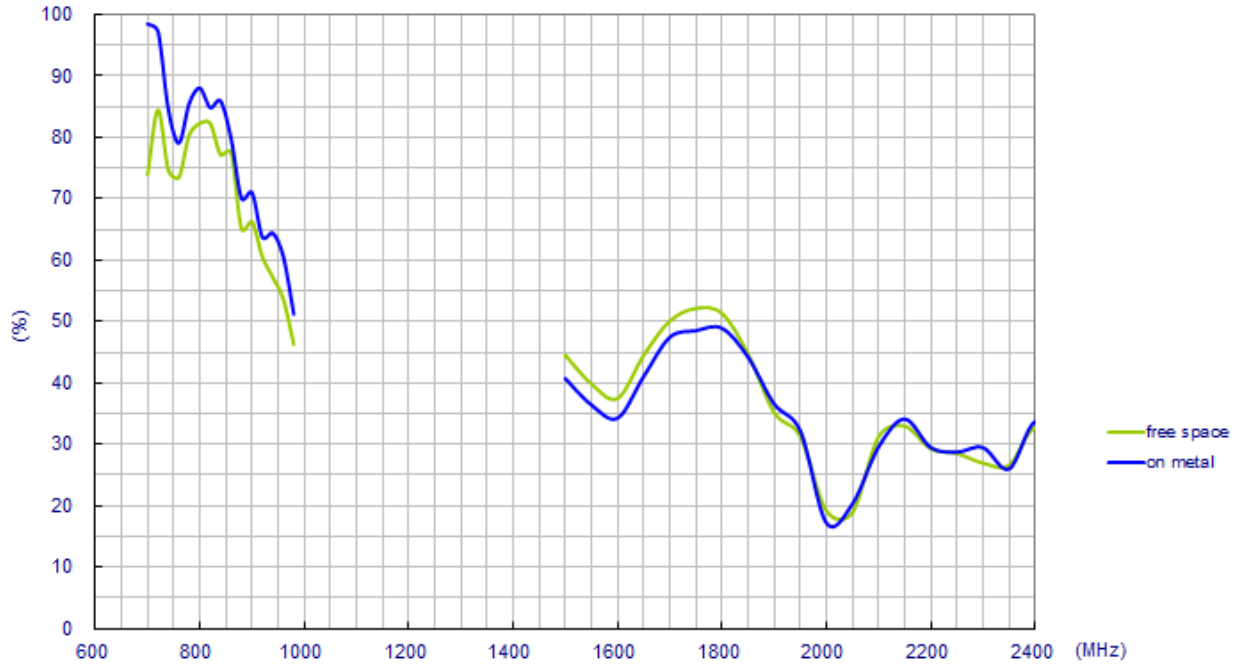
4.1 Return Loss



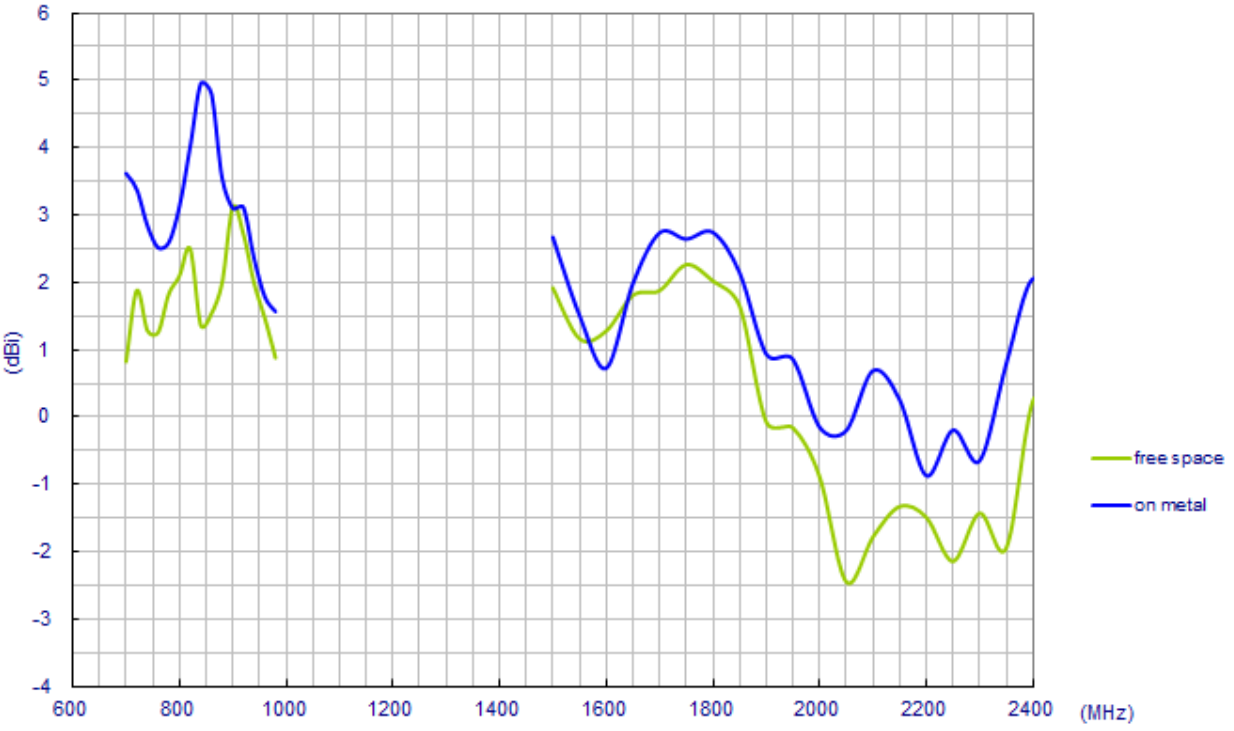
4.2 VSWR



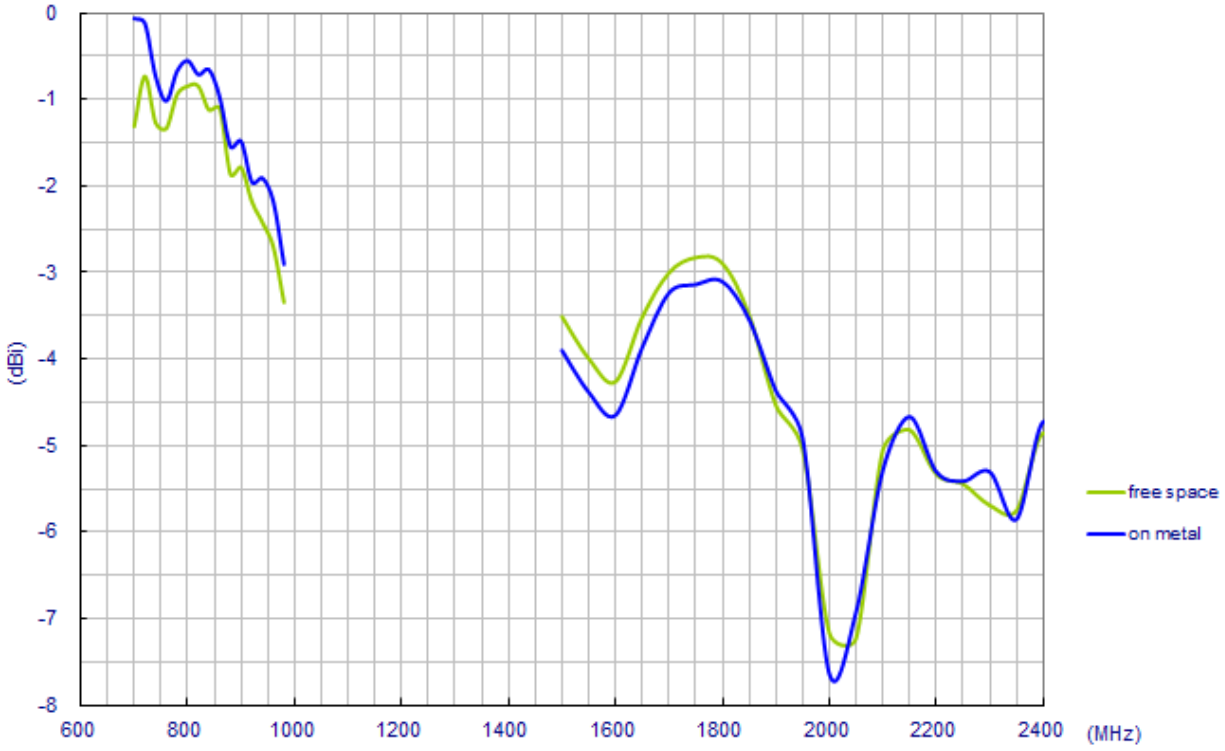
4.3 Cellular Antenna Efficiency



4.4 Cellular Antenna Peak Gain

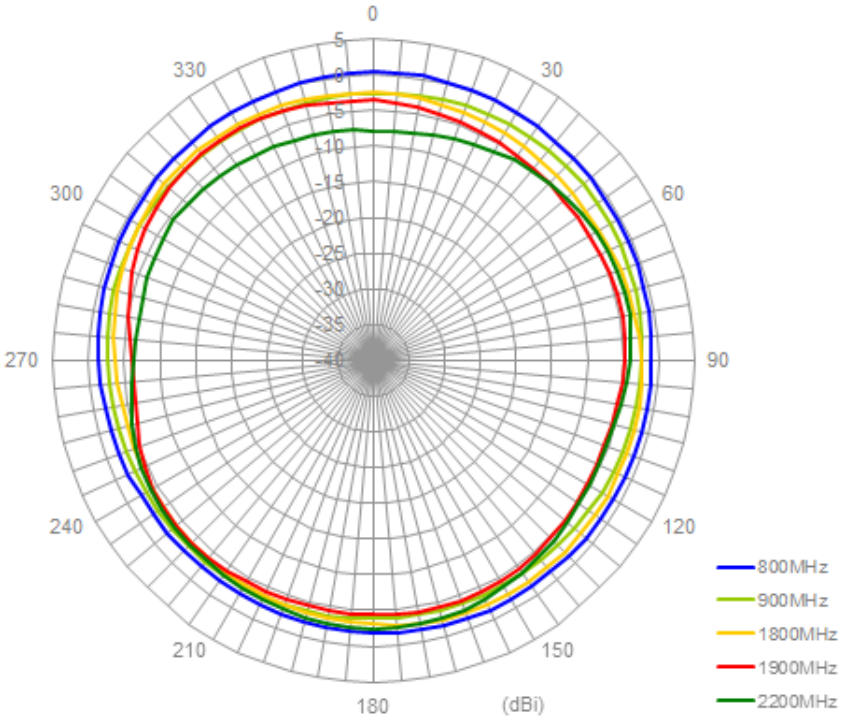


4.5 Cellular Antenna 3D Average Gain

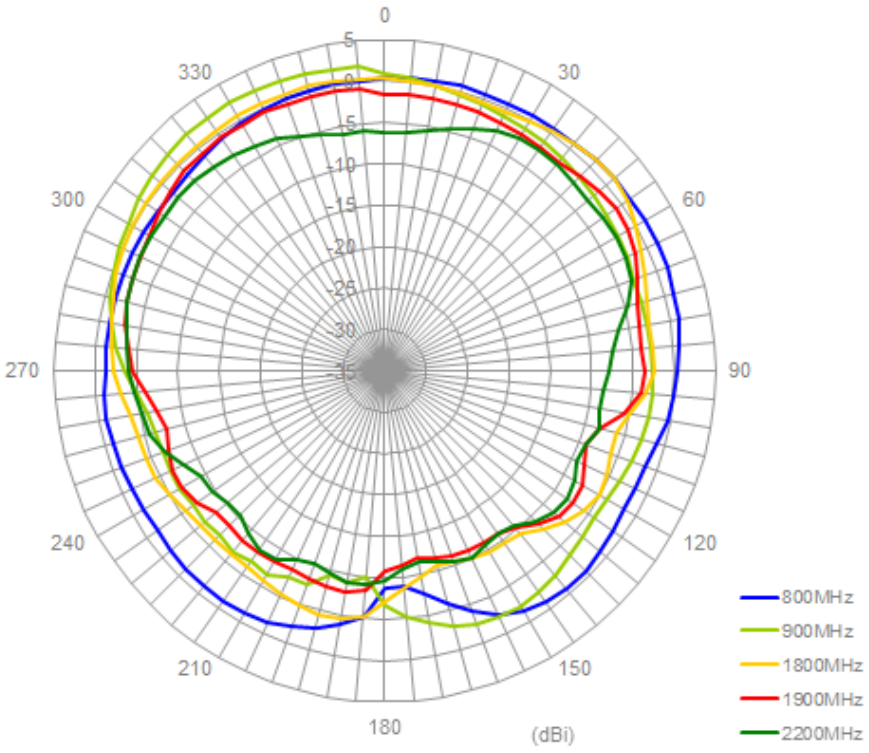


4.6 Cellular Antenna Radiation Pattern in Free Space

XY-plane

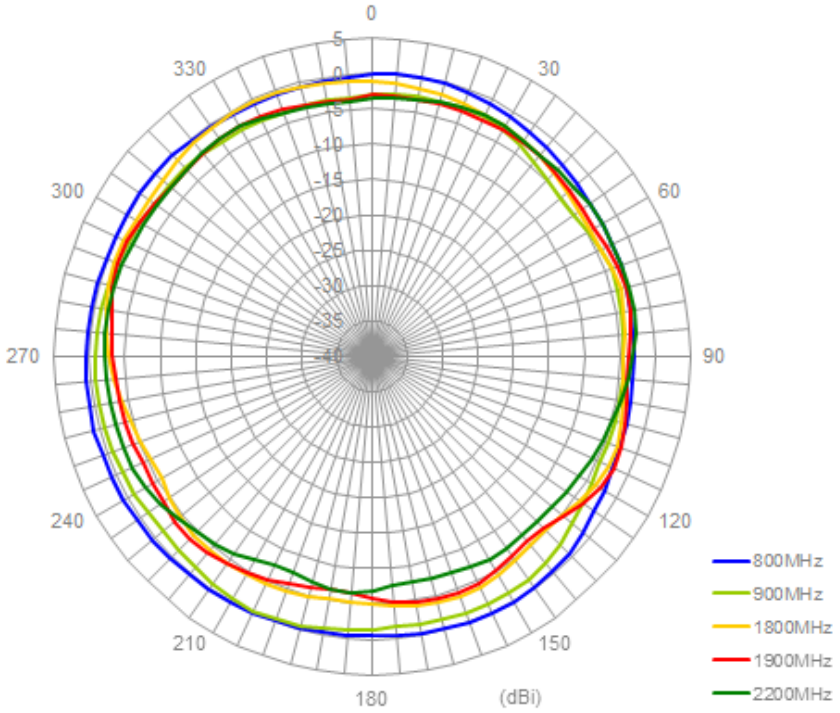


XZ-plane

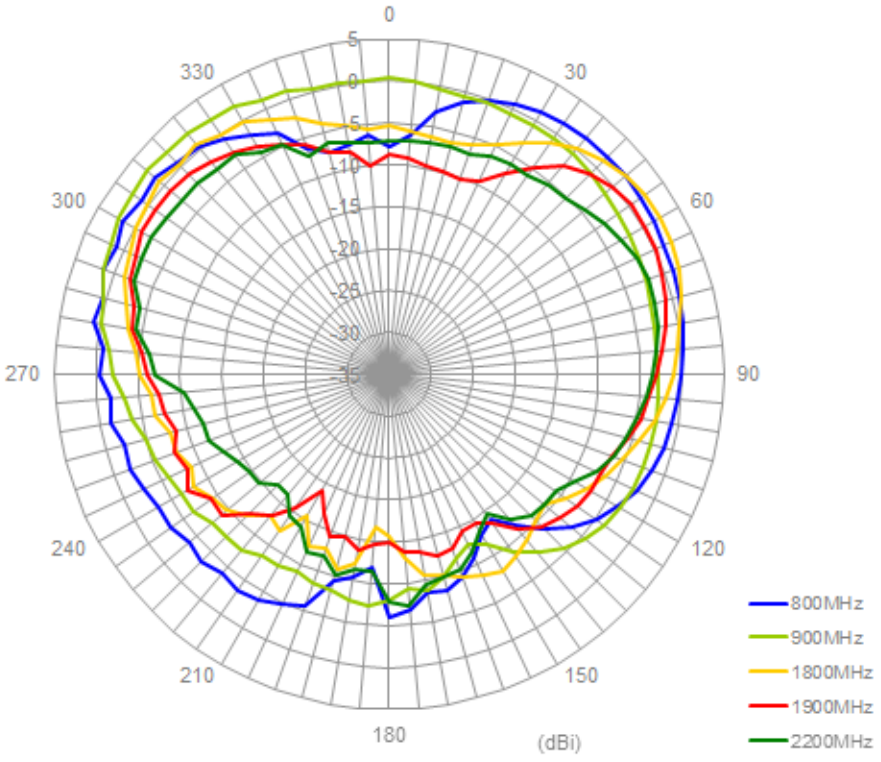


4.7 Cellular Antenna Radiation Pattern on Metal ground plane

XY-plane

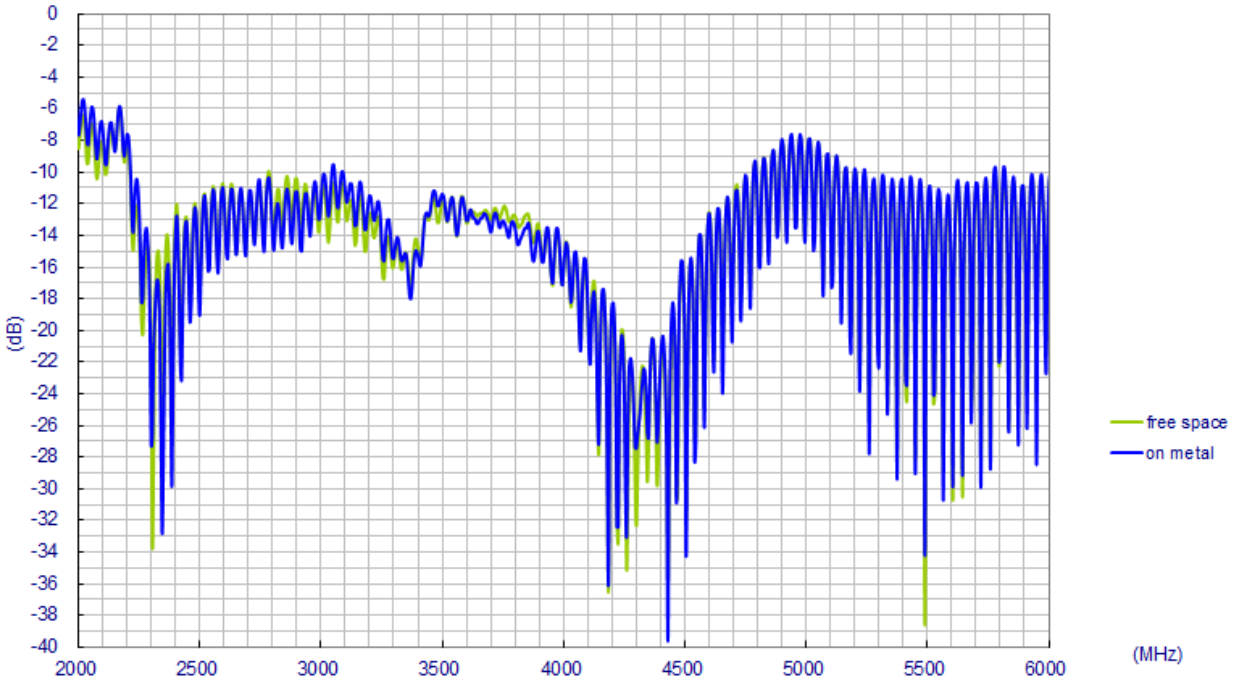


XZ-plane

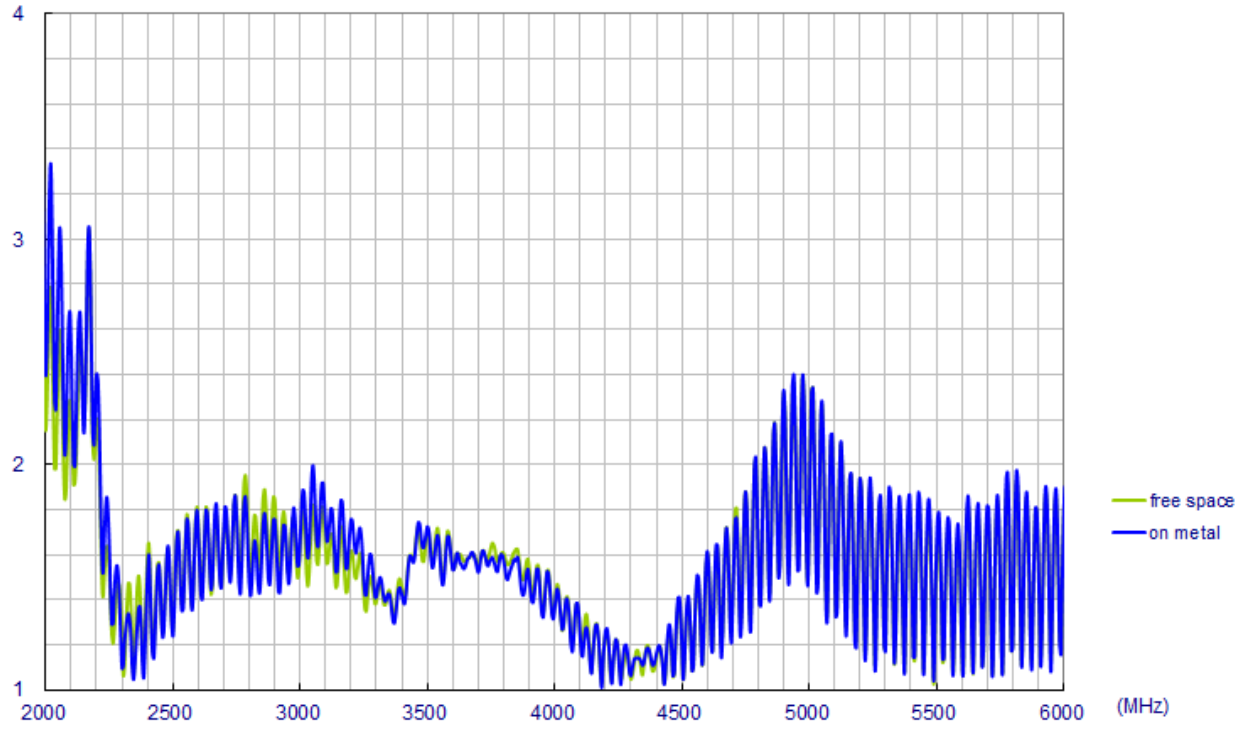


3.2.4/5GHz Antenna Characteristics

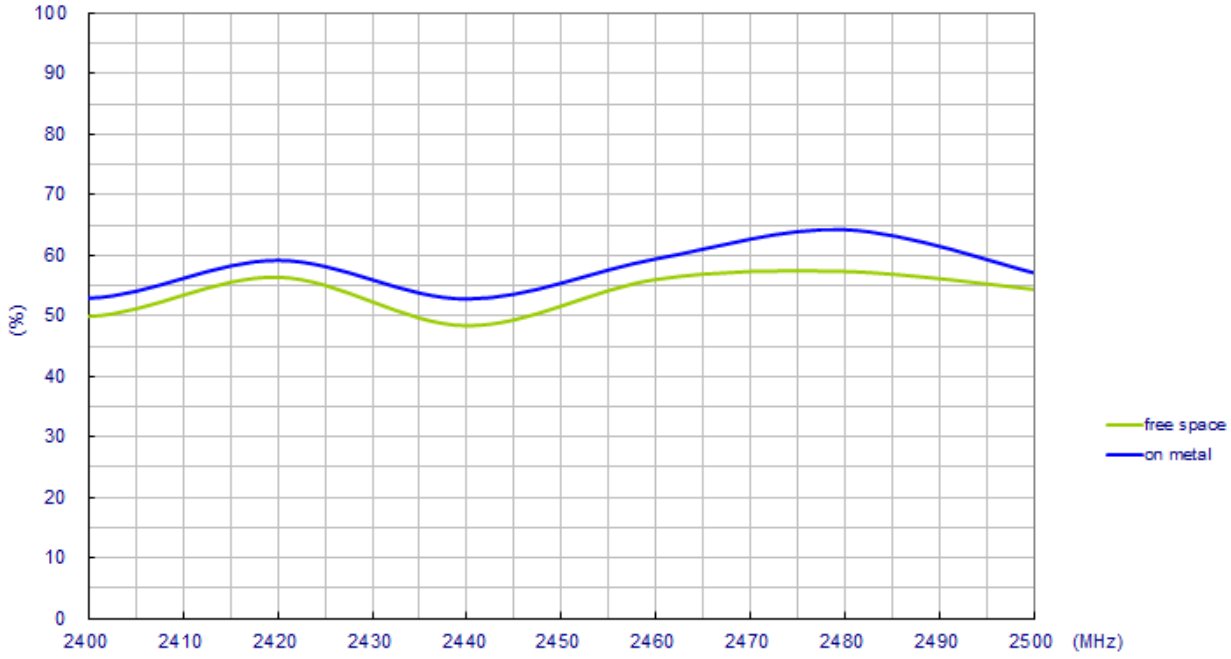
5.1 Return Loss

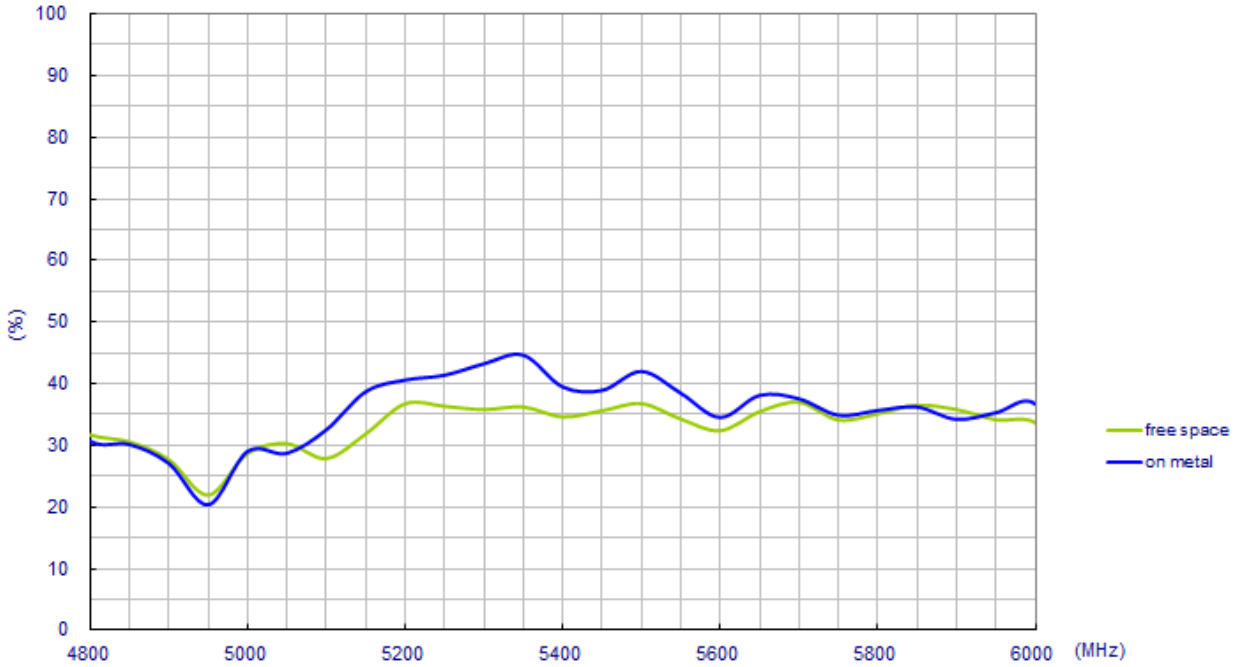


5.2 VSWR

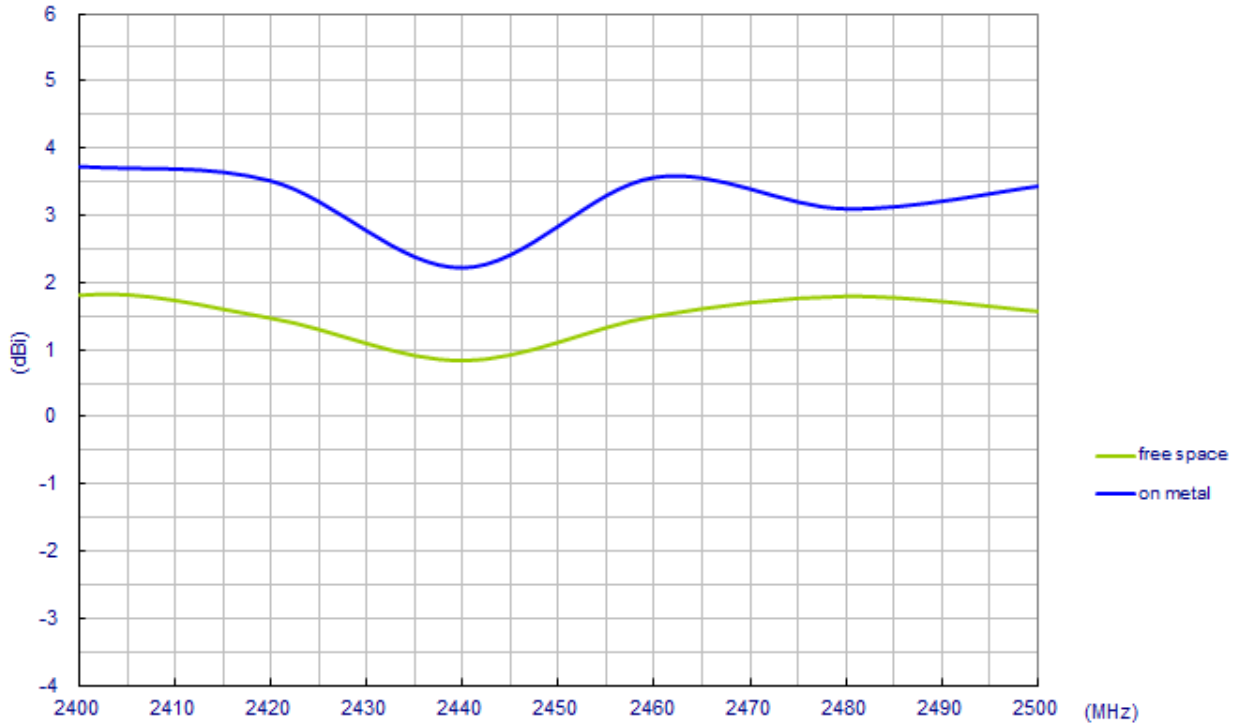


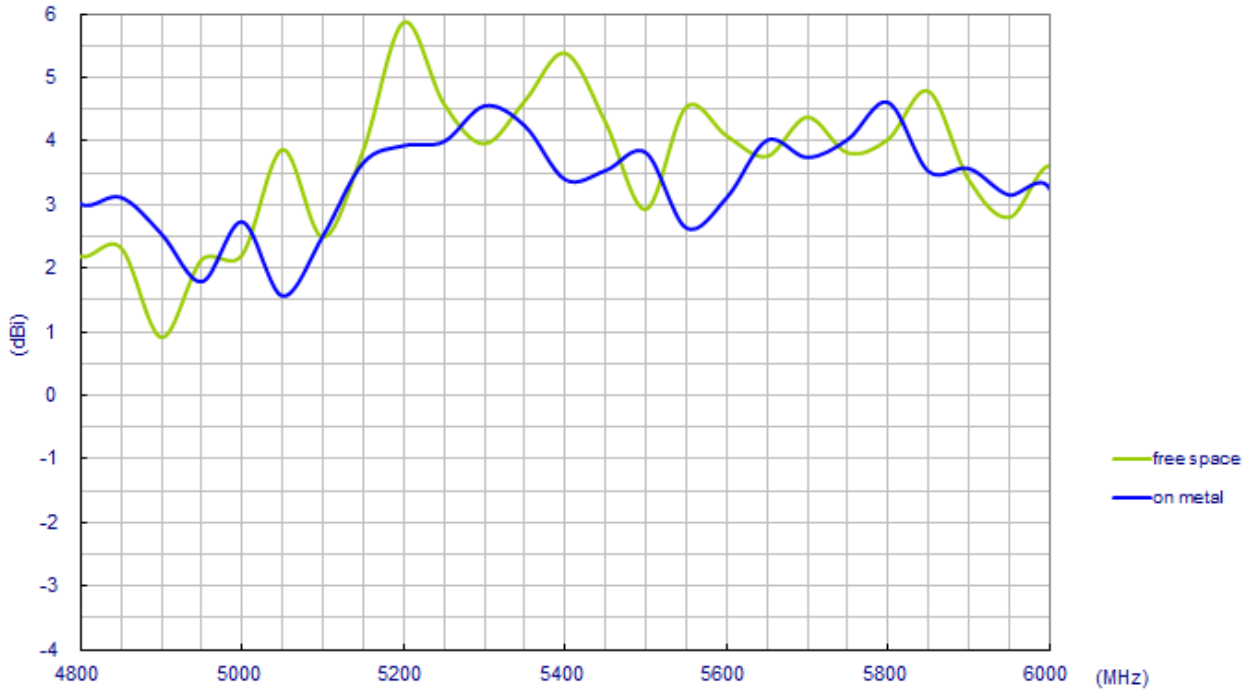
5.3 2.4/5GHz Antenna Efficiency



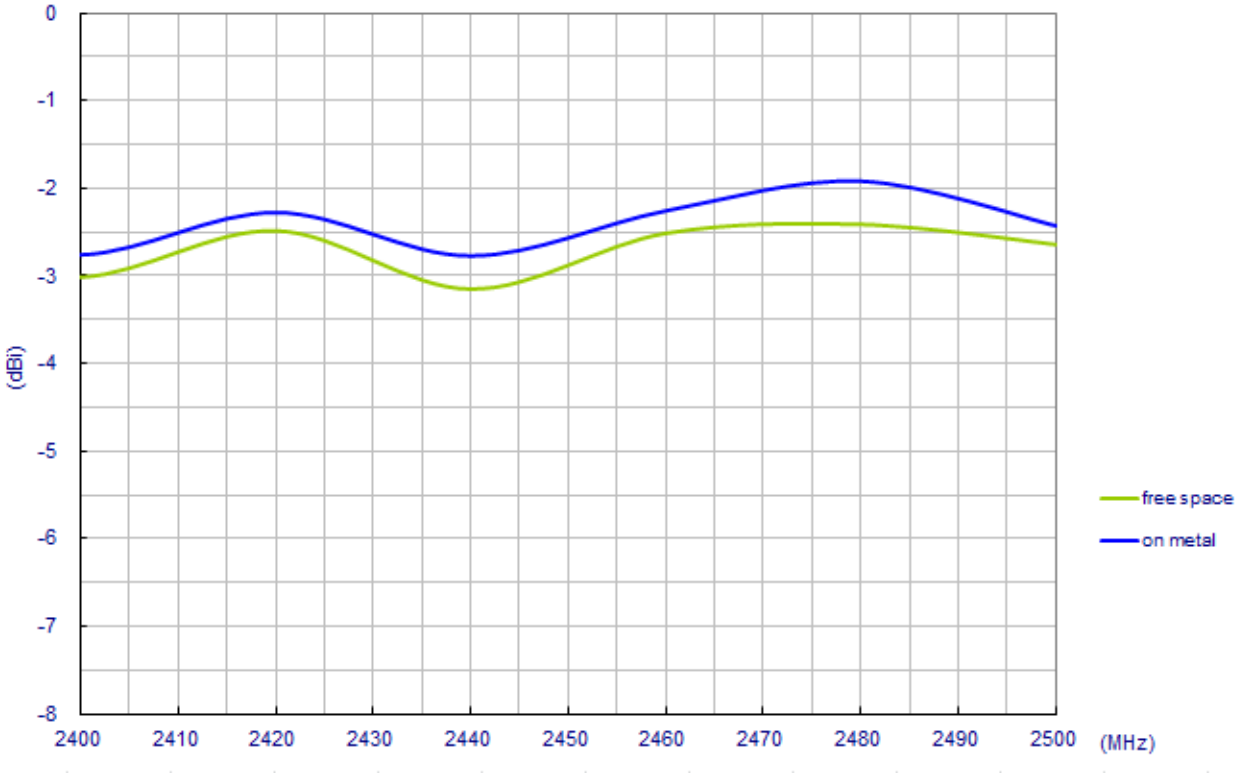


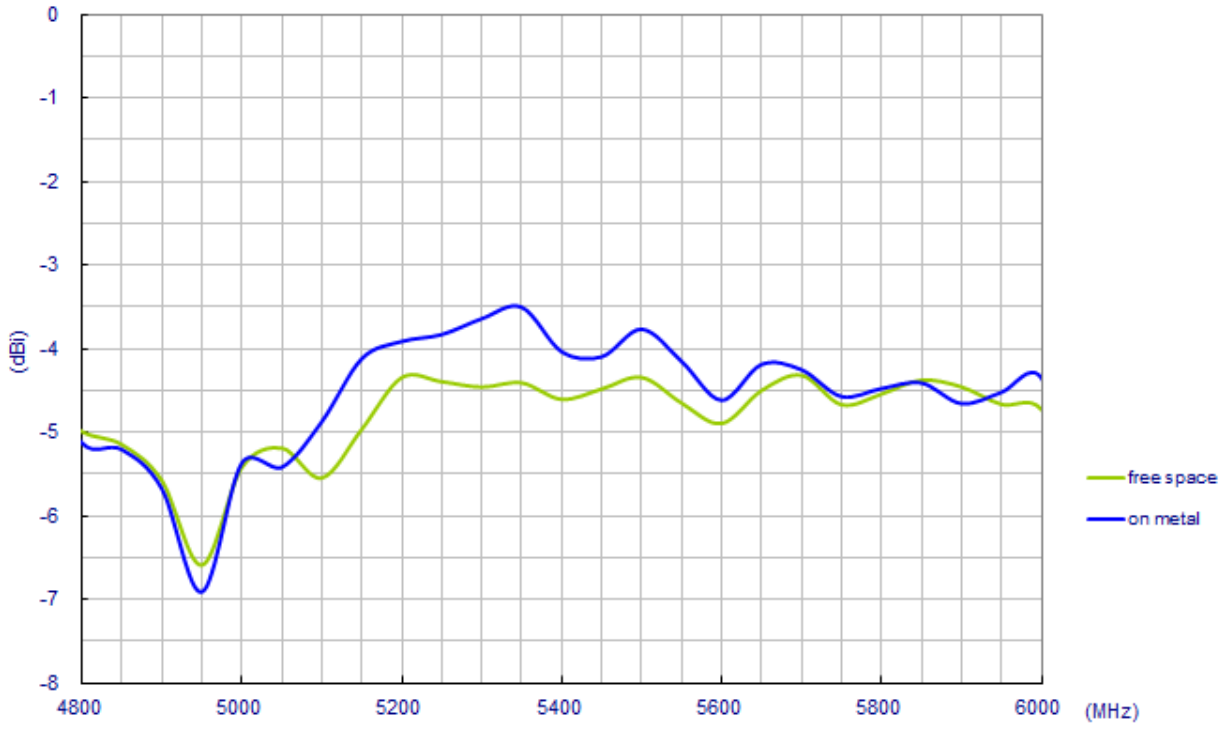
5.4 2.4/5GHz Antenna Peak Gain





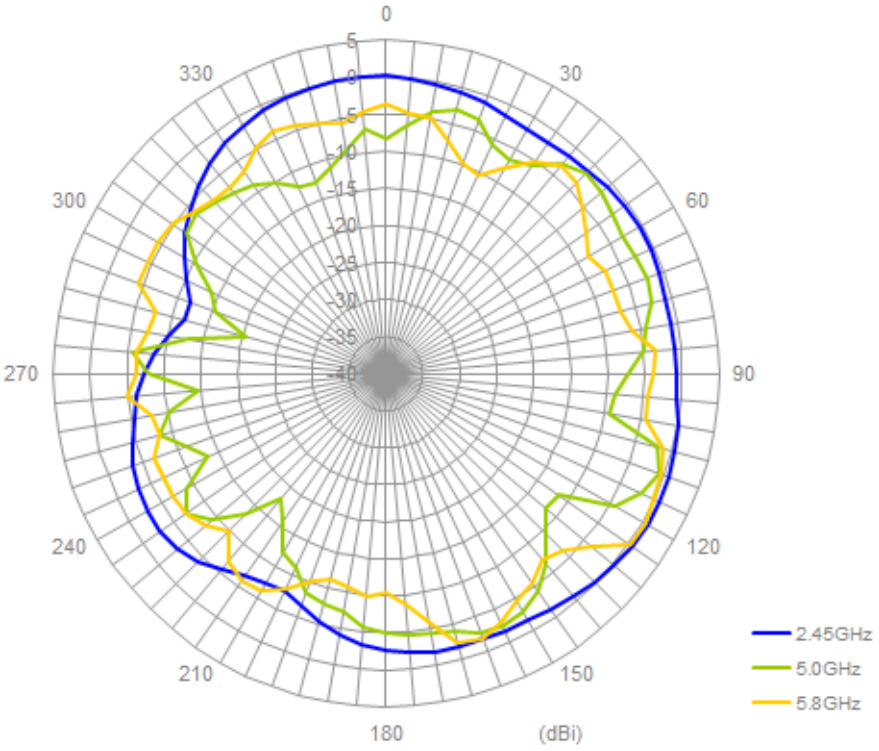
5.5 2.4/5GHz Antenna 3D Average Gain



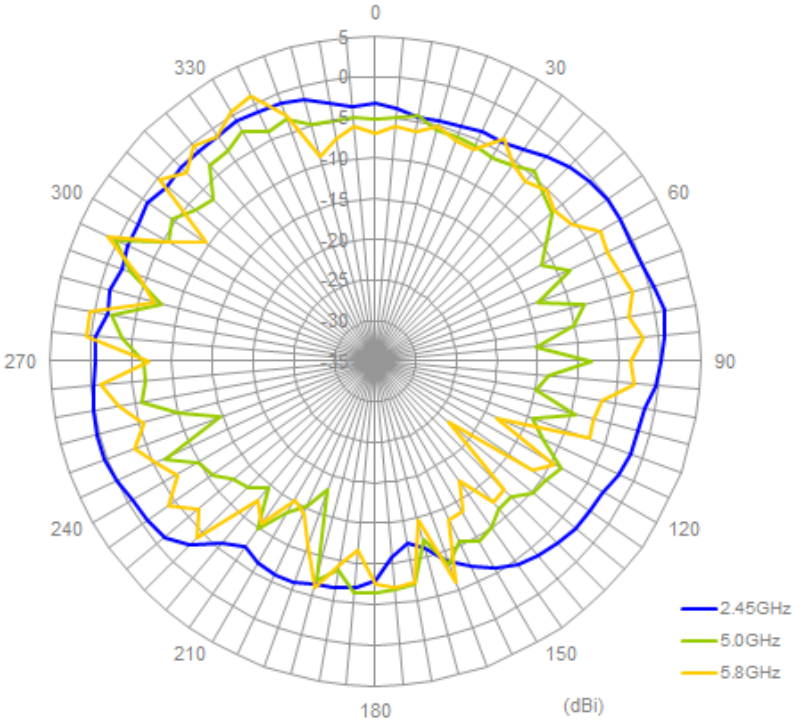


5.6 2.4/5GHz Antenna Radiation Pattern in Free Space

XY-plane

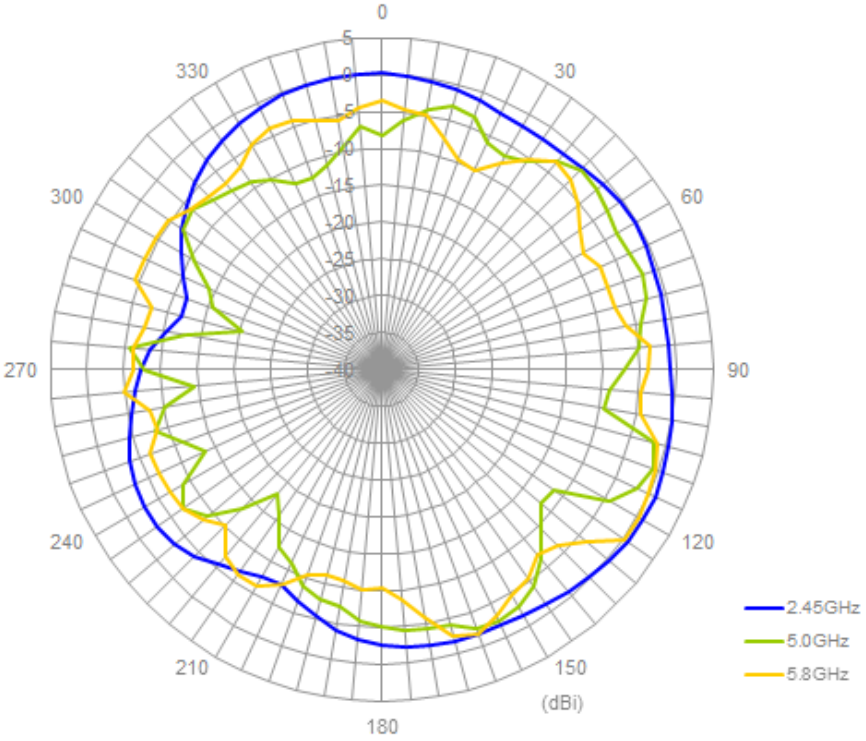


XZ-plane

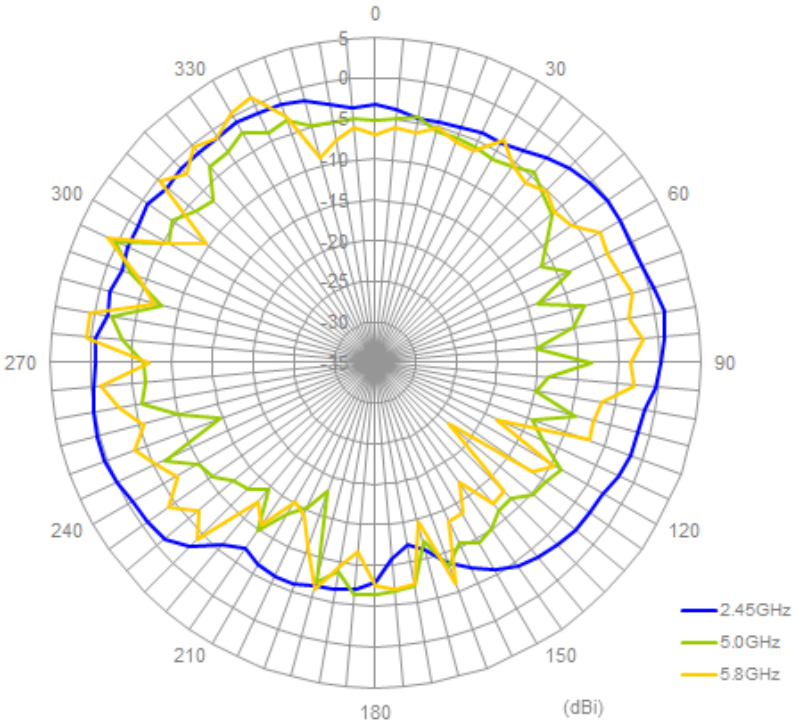


5.7 2.4/5GHz Antenna Radiation Pattern on Metal ground plane

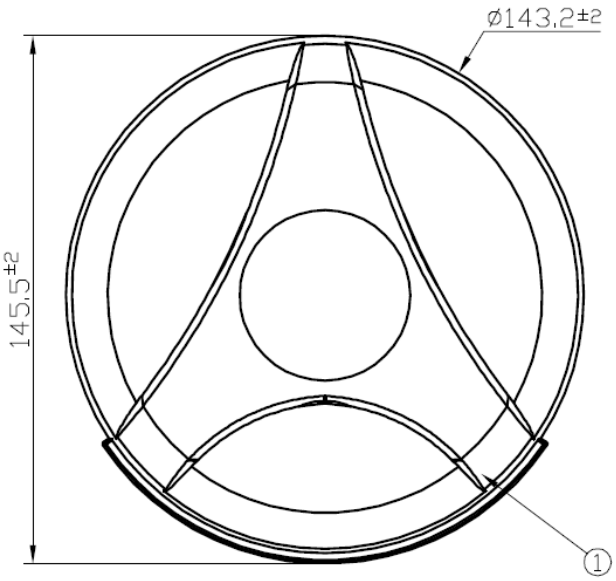
XY-plane

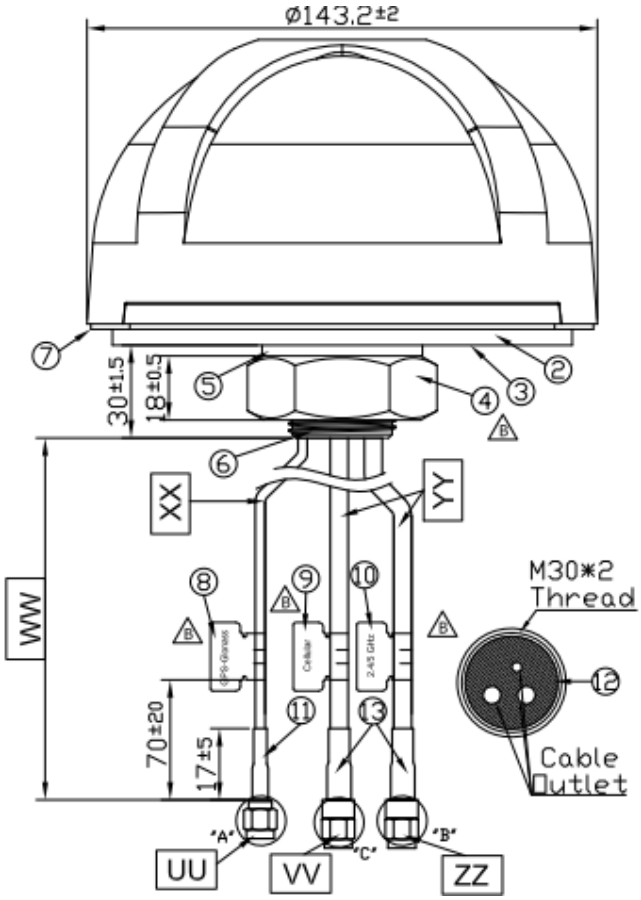


XZ-plane



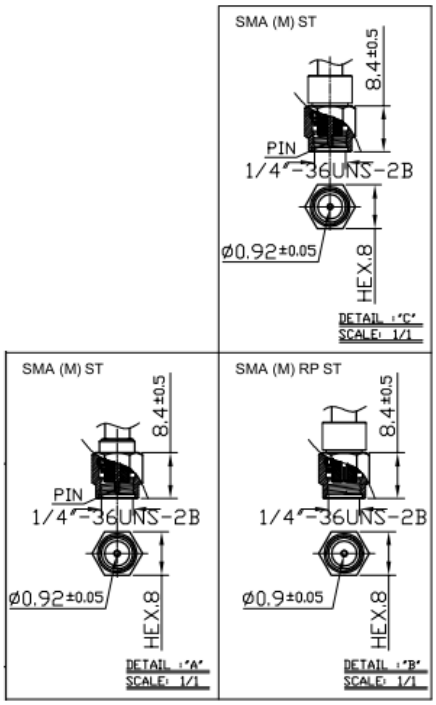
4. Mechanical Drawing



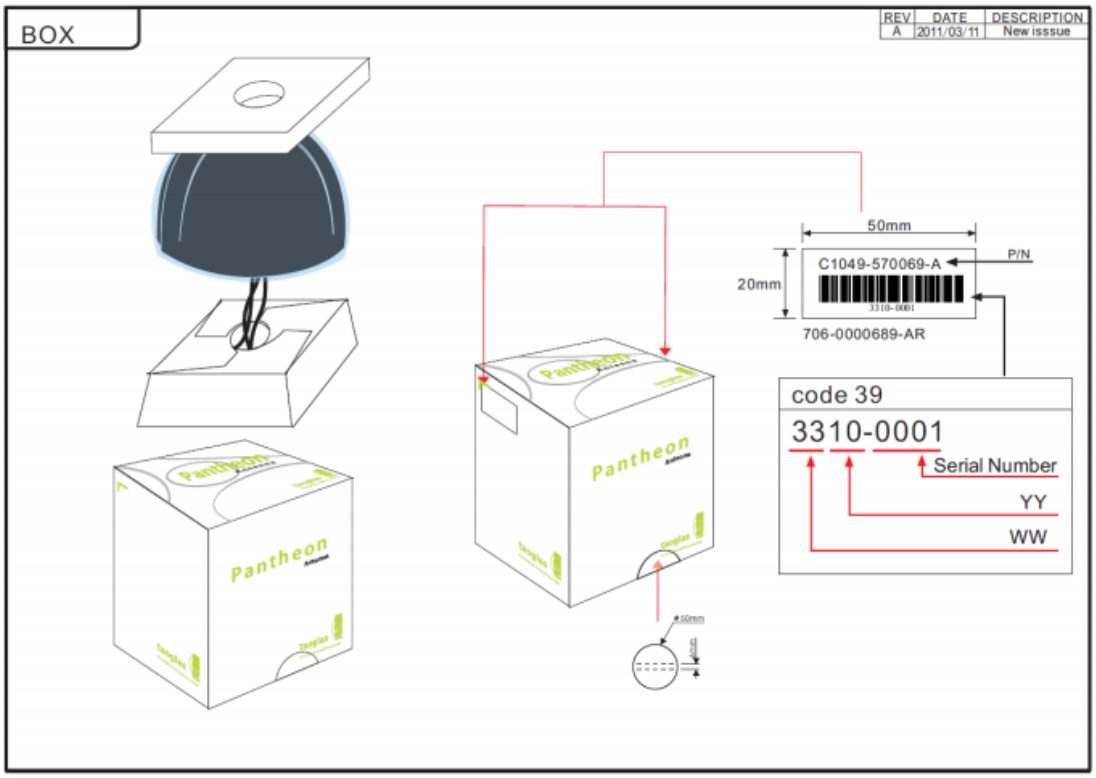


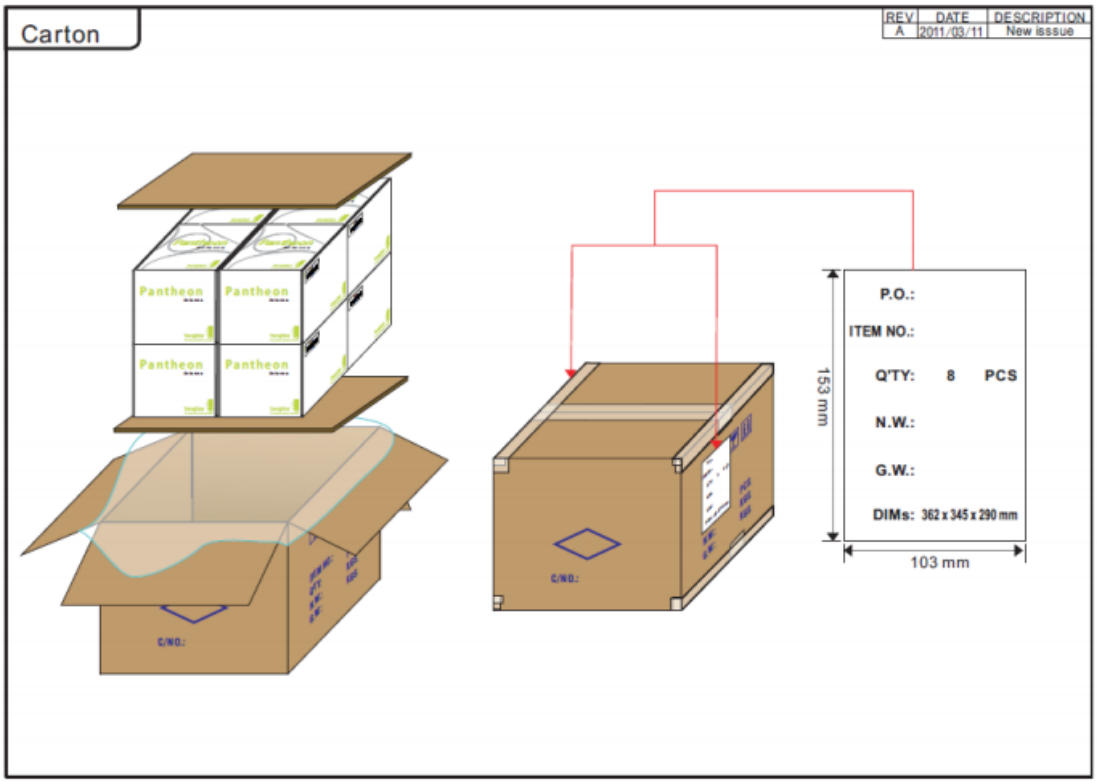
	Name	Material	Finish	QTY
1	Housing	PC 540	Black	1
2	Closed Cell Foam	CR 4305	Black	1
3	3M Double Adhesive	3M 9448 HK	White Liner	1
4	M30 Nut	Steel AISI 1215	Ni Plated	1
5	Washer	Steel AISI 1215	Ni Plated	1
6	M30x 2 Thread 32L	Zinc Alloy	Ni Plated	1
7	Waterproof Gasket	Silicon Rubber	White	1
8	GPS-Glonass Label	Coated Paper	Orange	1
9	2.4/5 GHz Label	Coated Paper	Green	1
10	Cellular Label	Coated Paper	Blue	1
11	Heat Shrink Tube(RG-174)	PE	Black	1
12	Rubber Stopper	Silicone Rubber	Black	1
13	Heat Shrink Tube(CFD200)	PE	Black	2

	Name	Spec	Finish	QTY
UU	Connector Type	SMA(M) ST RG174	Gold	1
VV	Connector Type	SMA(M) ST CFD200	Gold	1
ZZ	Connector Type	SMA(M) RP ST CFD200	Gold	1
WW	Cable Length	3000±120mm		
XX	Cable Type	RG174	Black	1
YY	Cable Type	CFD 200	Black	2



5. Packaging


BOX
REV
DATE
DESCRIPTION
A
2011/03/11
New isssue
50mm
20mm
C1049-570069-A
P/N
706-0000689-AR
code 39
3310-0001
Serial Number
YY
WW
Pantheon


Carton
REV
DATE
DESCRIPTION
A
2011/03/11
New isssue
Pantheon
P.O.:
ITEM NO.:
Q'TY: 8 PCS
N.W.:
G.W.:
DIMs: 362 x 345 x 290 mm
153 mm
103 mm
C/NO.: