

## SPECIFICATION

- Part No. : **MA700.A.ABC.001**
- Product Name : Pantheon Antenna 3in1 MA.700  
Screw-Mount (Permanent Mount)  
GPS/GLONASS / LTE Cellular / 2.4GHz / 5GHz  
Combination Antenna
- Features : Highest Efficiency/Peak Gain  
Omni-directional Outdoor IP67 Antenna  
Advanced RF Design and Materials  
Heavy Duty – Integrated Metal  
Base/Ground-plane  
Custom cables and connectors available  
RoHS ✓



## 1. Introduction

The Pantheon MA700 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 MA700 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.

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.

Custom designed integrated wall mounted and pole mounted brackets are available for the Pantheon 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.



Note: for ground-isolation antennas use the MA.705 version with Isolation Gaskets.

## 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<br>1642MHz: -20dB       |      | 1520MHz: -20dB<br>1642MHz: -20dB |      | 1520MHz: -20dB<br>1642MHz: -20dB |      |
| Cable                 | 3m RG-174 standard, fully customizable |      |                                  |      |                                  |      |
| Connector             | SMA(M) standard, fully customizable    |      |                                  |      |                                  |      |

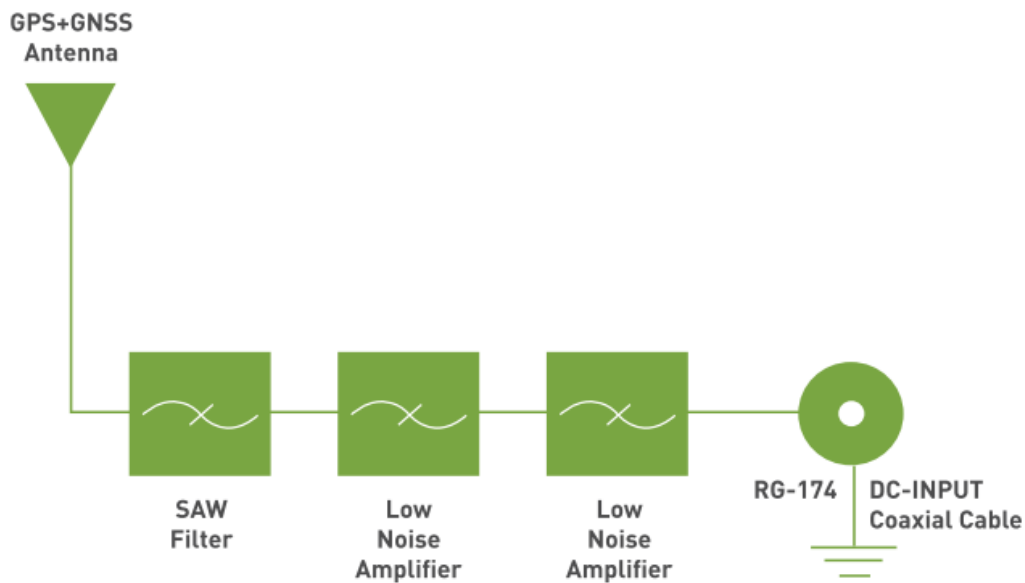
| CELLULAR ANTENNA   |                                               |           |           |            |            |            |
|--------------------|-----------------------------------------------|-----------|-----------|------------|------------|------------|
| Frequency (MHz)    | 700~ 800                                      | 824 ~ 896 | 880 ~ 960 | 1710~ 1880 | 1850~19 90 | 1710~21 70 |
| Peak Gain (dBi)    | 2.4                                           | 1.6       | 1.7       | 2.1        | 2.4        | 2.4        |
| Average Gain (dBi) | -1.3                                          | -2.0      | -2.3      | -2.8       | -2.7       | -2.7       |
| Efficiency         | 73%                                           | 61%       | 58%       | 52%        | 52%        | 52%        |
| Impedance          | 50 $\Omega$                                   |           |           |            |            |            |
| Polarization       | Linear                                        |           |           |            |            |            |
| Radiation Pattern  | Omni                                          |           |           |            |            |            |
| Cable              | 3m CFD200 standard, fully customizable        |           |           |            |            |            |
| Connector          | SMA(M) standard, standard, fully customizable |           |           |            |            |            |

| 2.4GHz / 5GHz ANTENNA |                                               |           |           |           |
|-----------------------|-----------------------------------------------|-----------|-----------|-----------|
| Frequency (GHz)       | 2.4 ~ 2.5                                     | 4.7 ~ 5.0 | 5.0 ~ 5.4 | 5.4 ~ 5.9 |
| Peak Gain (dBi)       | 2.1                                           | 2.9       | 3.8       | 2.8       |
| Average Gain (dBi)    | -2.3                                          | -3.6      | -3.3      | -3.8      |
| Efficiency            | 60%                                           | 44%       | 46%       | 42%       |
| VSWR                  | <=1.7:1                                       |           |           |           |
| Impedance             | 50Ω                                           |           |           |           |
| Polarization          | Linear                                        |           |           |           |
| Radiation Pattern     | Omni                                          |           |           |           |
| Cable                 | 3m CFD200 standard, fully customizable        |           |           |           |
| Connector             | SMA(M) standard, standard, fully customizable |           |           |           |
| MECHANICAL            |                                               |           |           |           |
| Dimensions            | Height 85.7mm x Diameter 145.6mm              |           |           |           |
| 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 9448HK                                     |           |           |           |
| Waterproof            | IP67                                          |           |           |           |
| ENVIRONMENTAL         |                                               |           |           |           |
| Operation Temperature | -30°C to 85°C                                 |           |           |           |
| Storage Temperature   | -40°C to 90°C                                 |           |           |           |
| Humidity              | Non-condensing 65°C 95% RH                    |           |           |           |

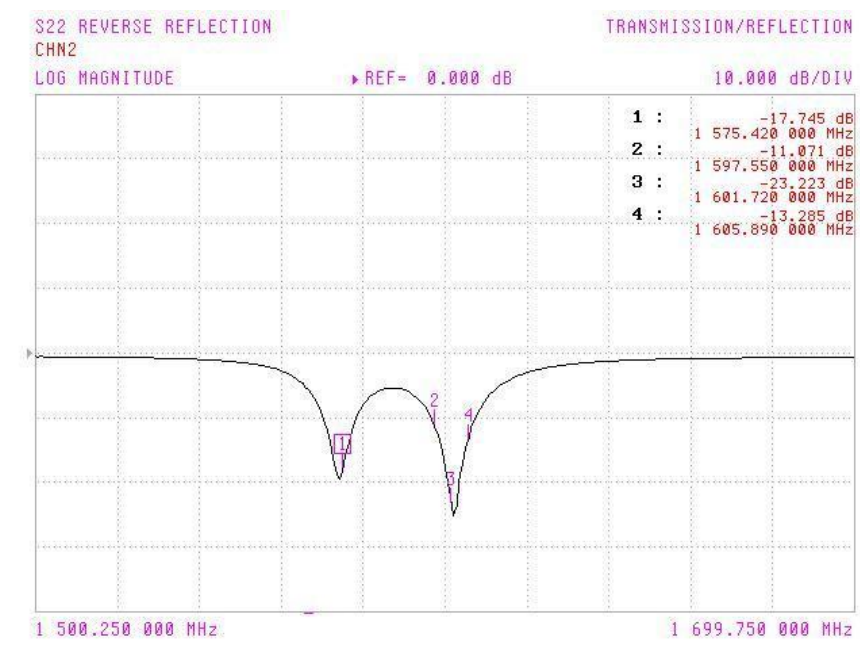
\* all measurement are done in free space with 3m standard cable

## 3. GPS/GLONASS Antenna Characteristics

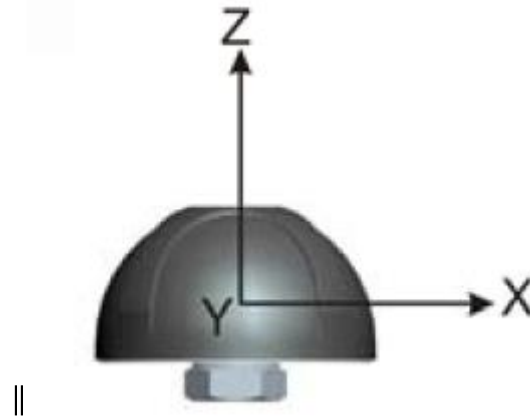
### 3.1 Block diagram



### 3.2 Return Loss

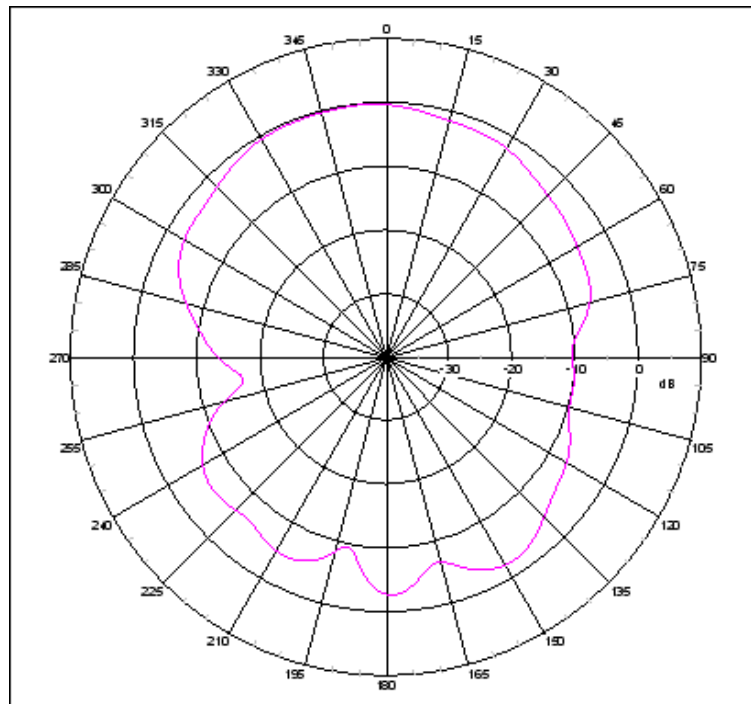


### 3.3 GPS/GLONASS Antenna Radiation Pattern

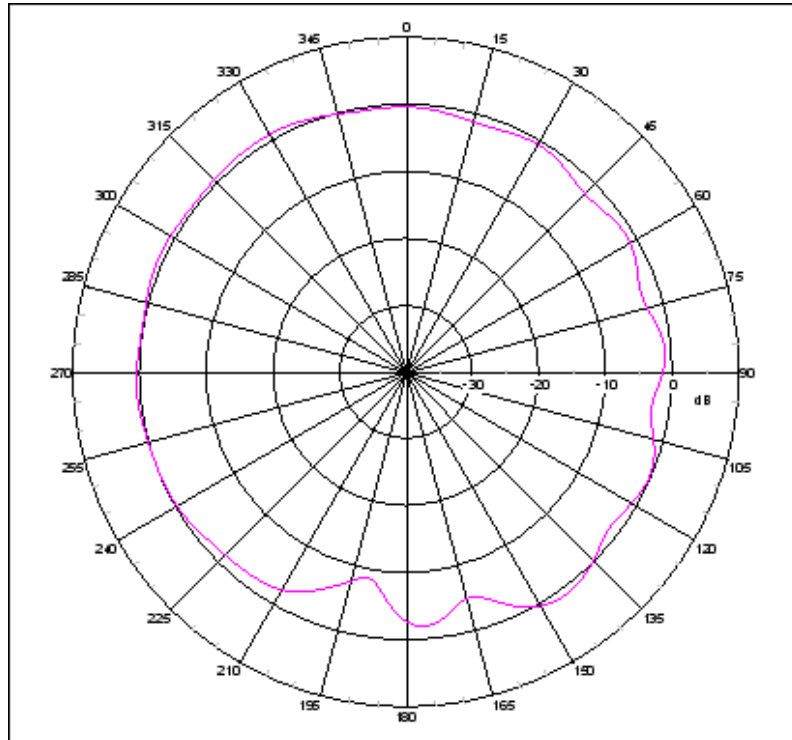


XYZ co-ordinate for reference.

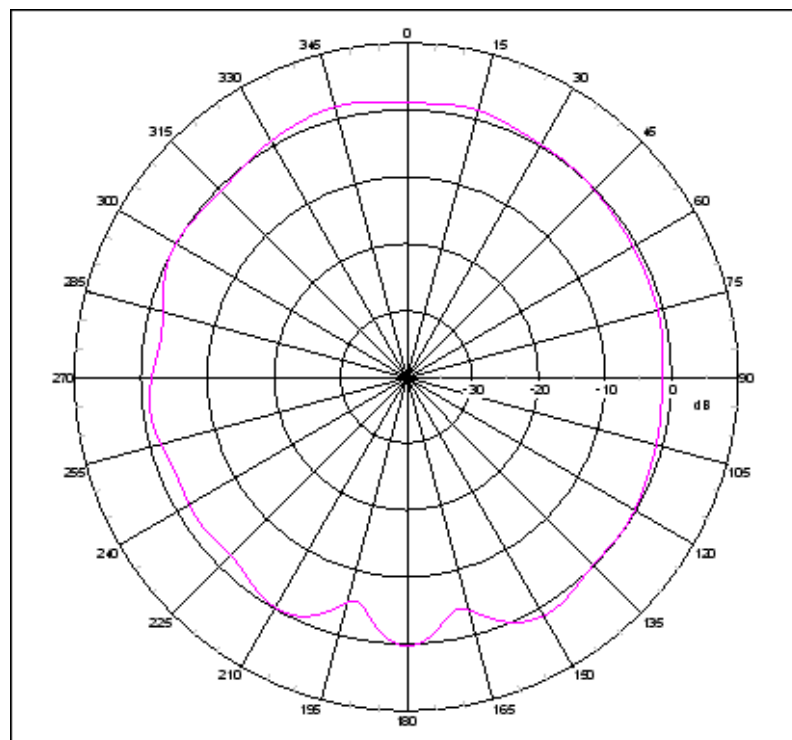
XZ-plane Free Space @1575.42MHz



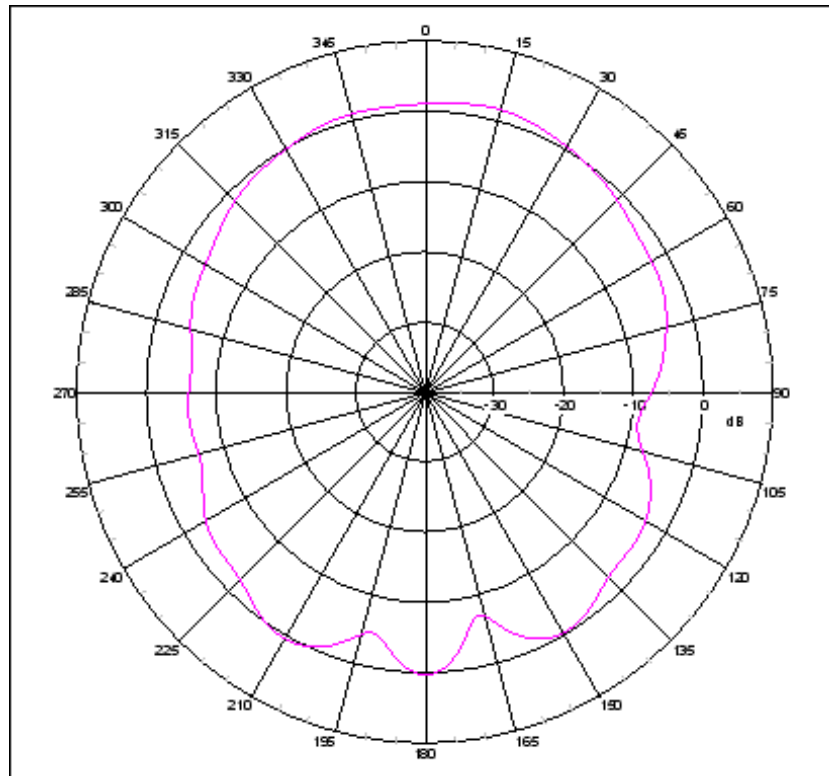
# YZ-plane Free Space @1575.42MHz



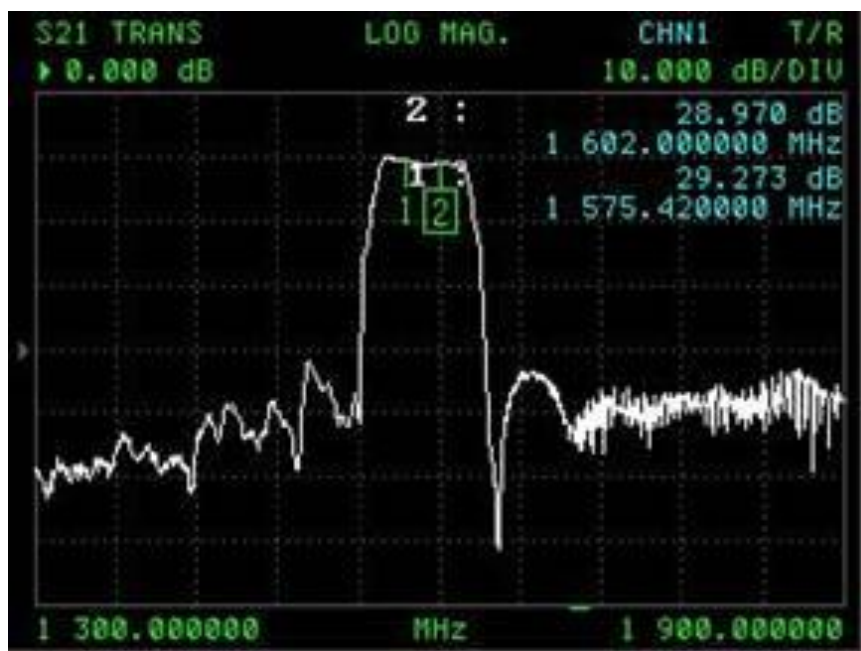
# XZ-plane Free Space @1602MHz



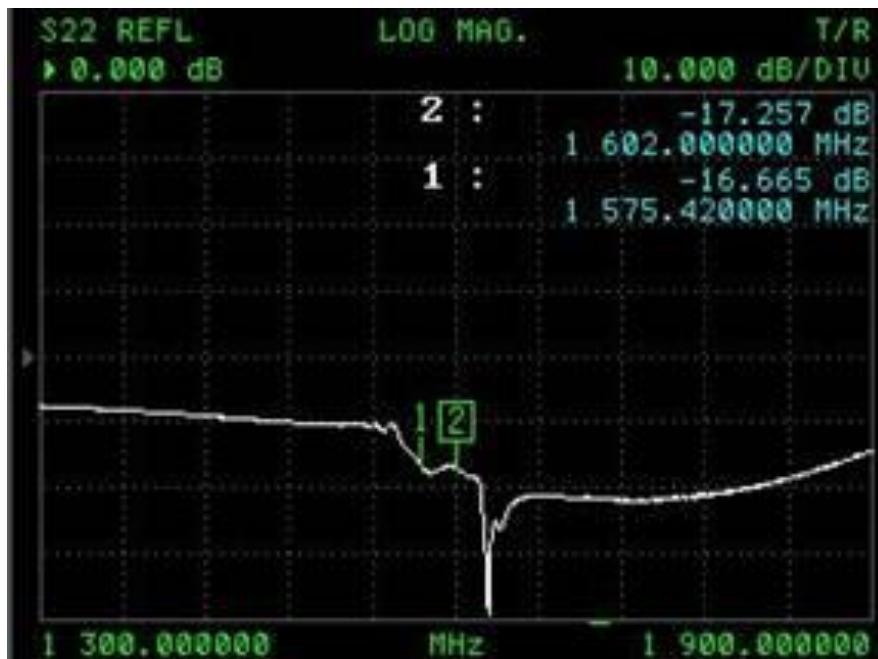
YZ-plane Free Space @1602MHz



### 3.4 GPS/GLONASS LNA

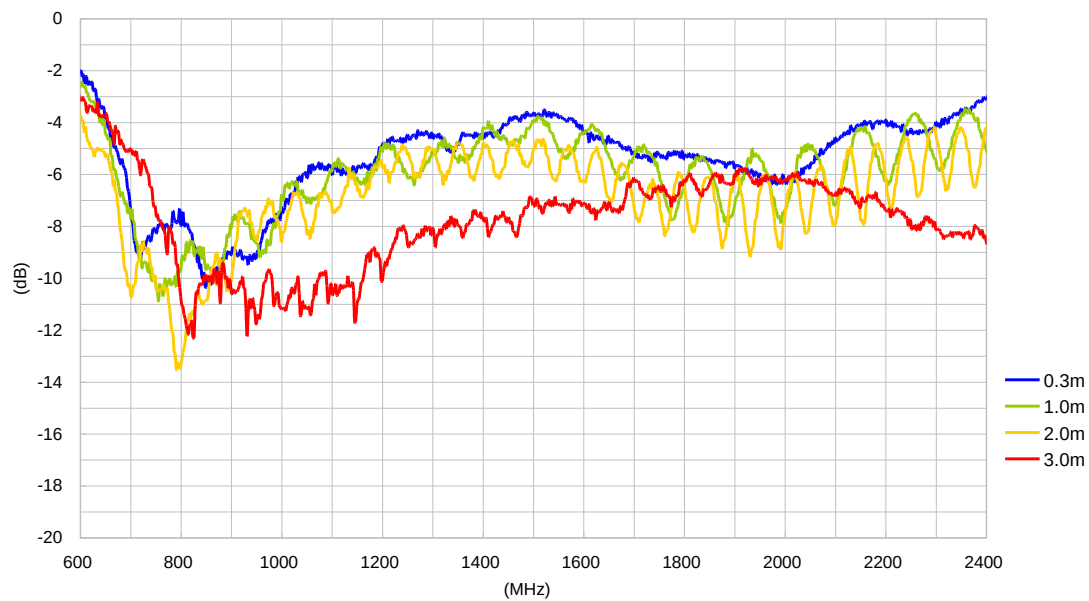




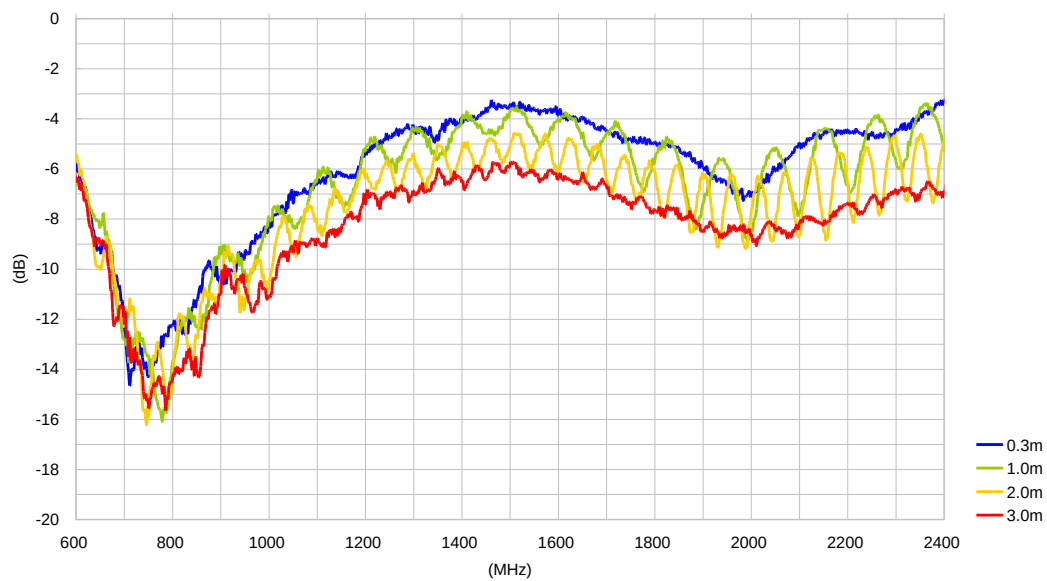


## 4. Cellular Antenna Characteristics

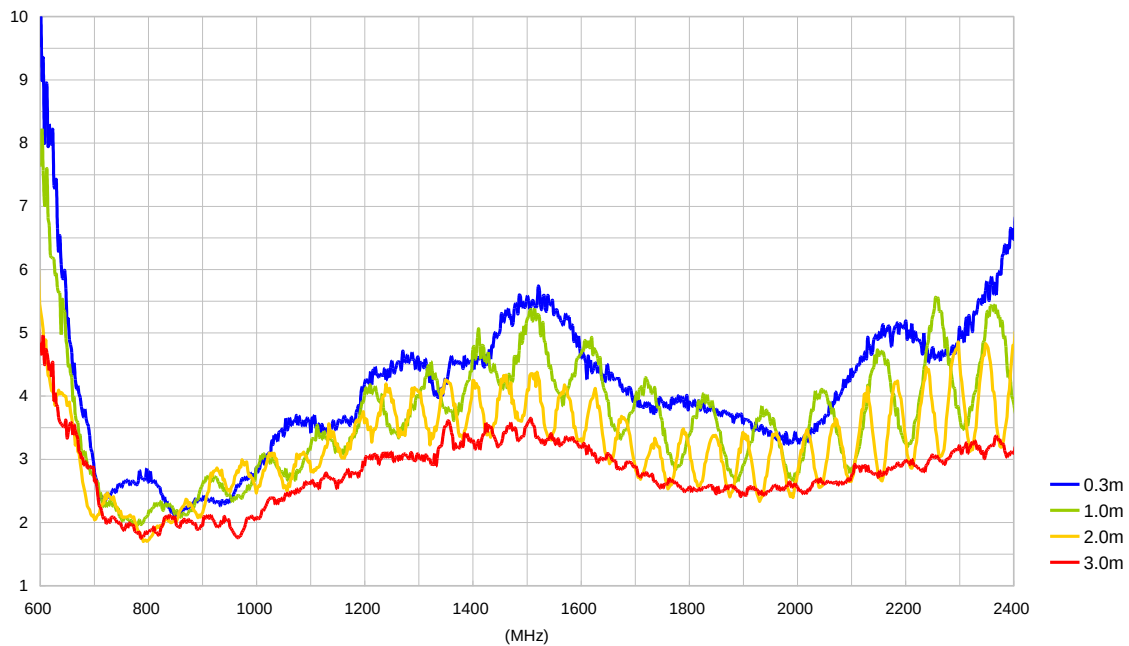
### 4.1 Return Loss (Free Space)



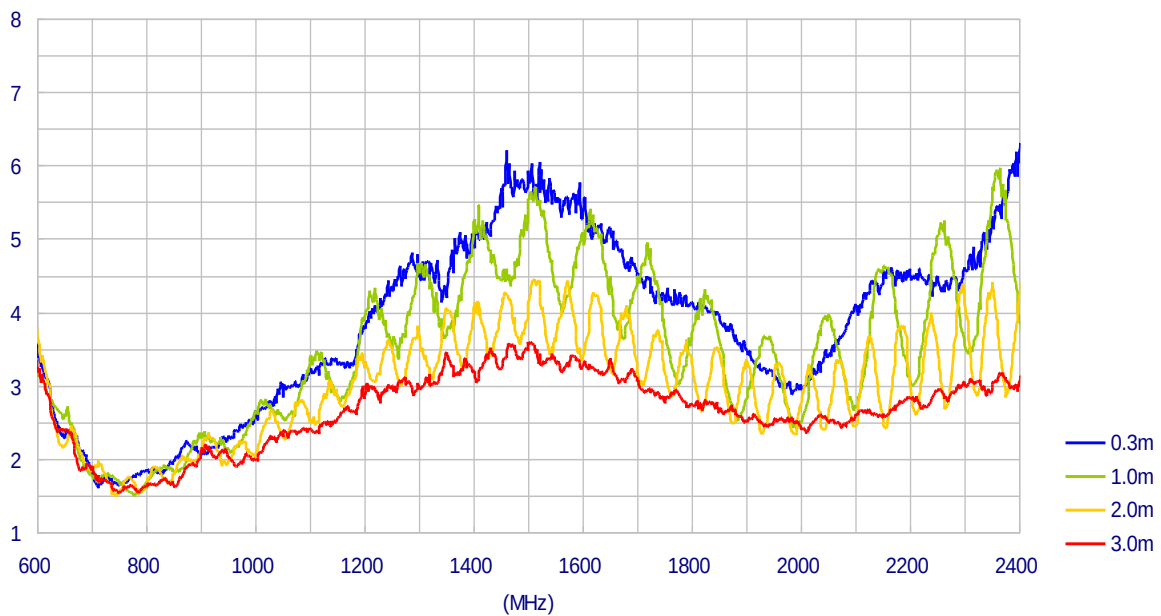
### 4.2 Return Loss (45 x 30cm Ground Plane)



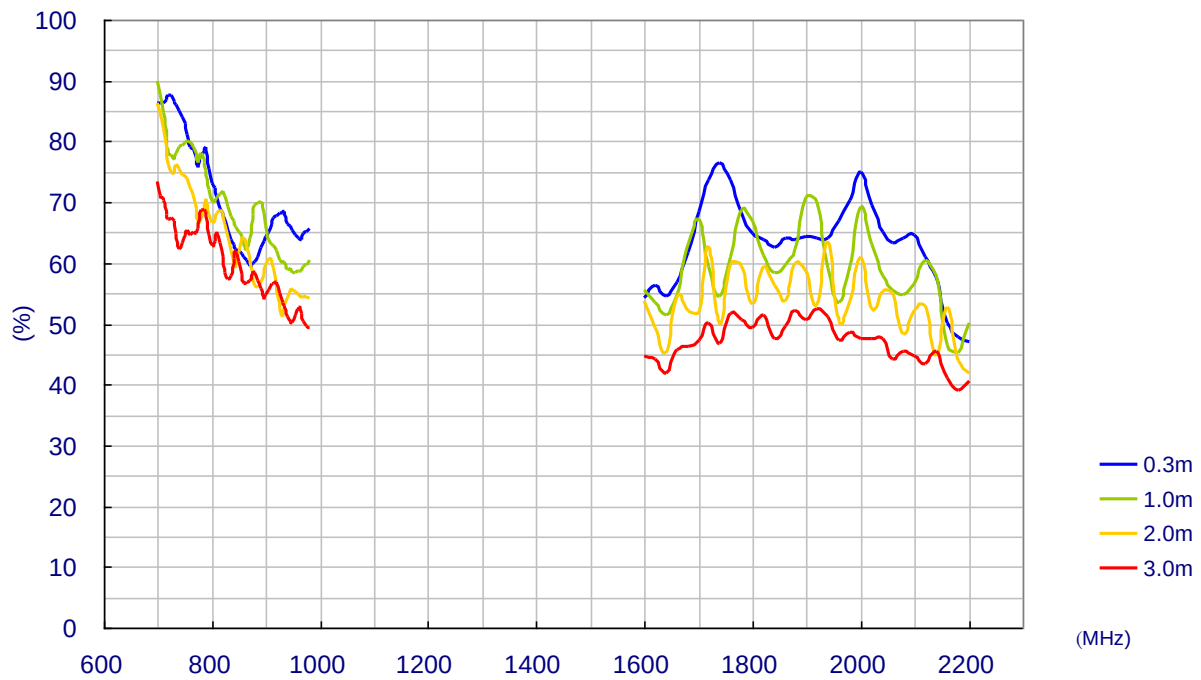
### 4.3 VSWR (Free Space)



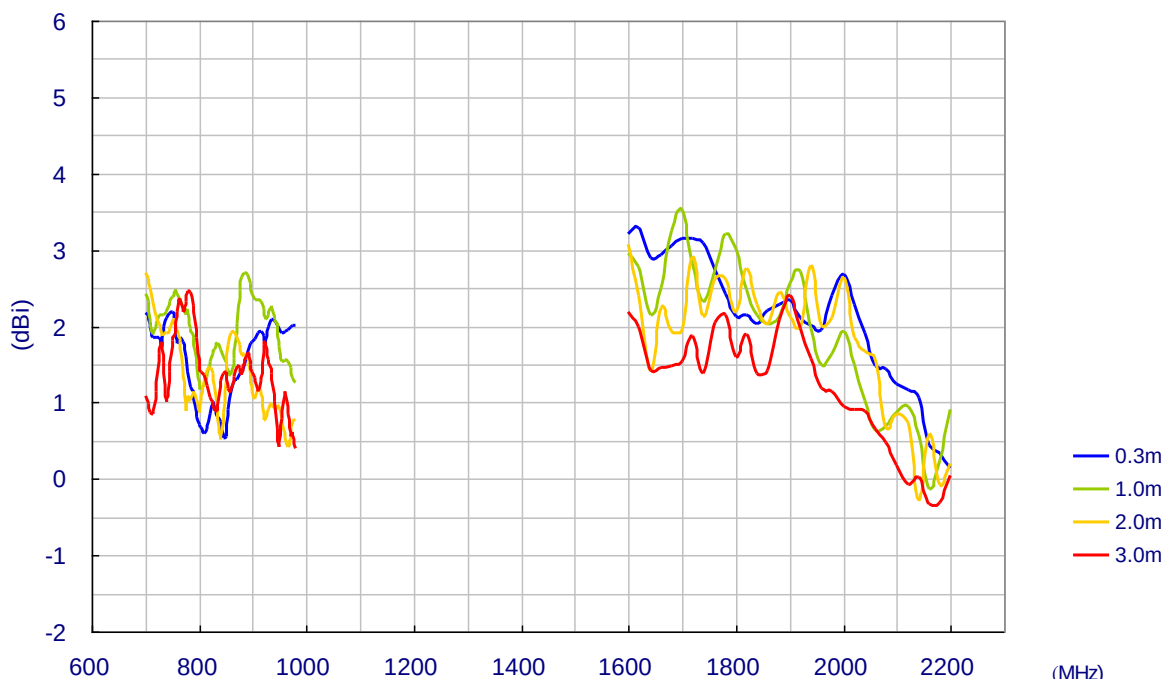
### 4.4 VSWR (45cm x 30cm Ground Plane)



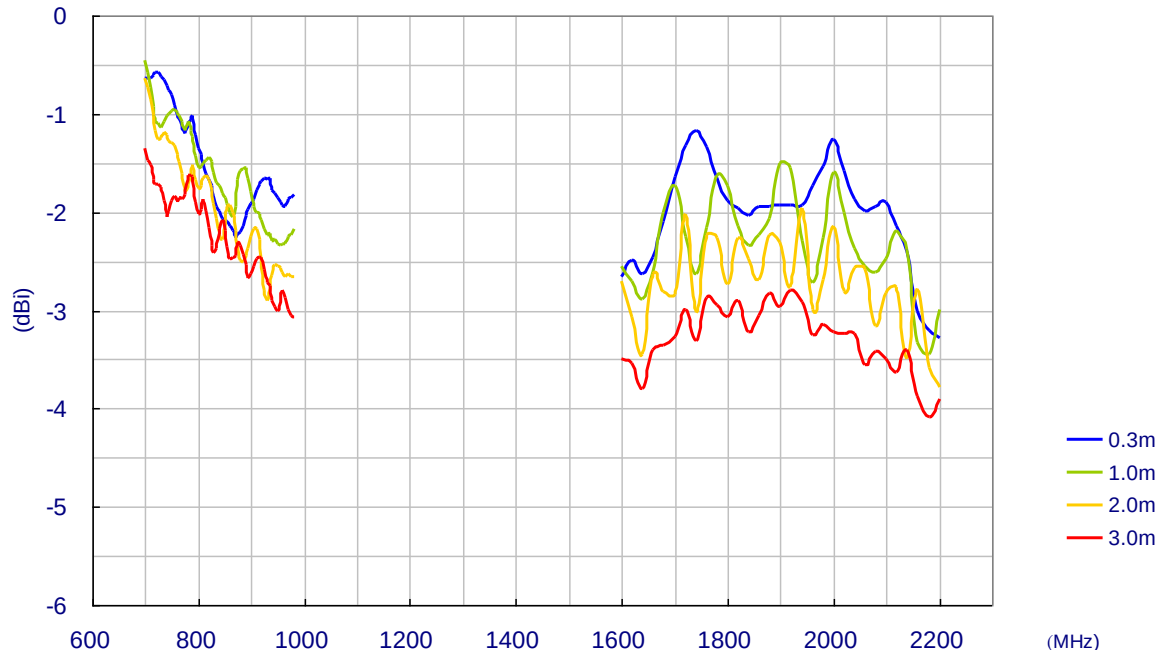
## 4.5 Cellular Antenna Free Space Efficiency



## 4.6 Cellular Antenna Free Space Peak Gain

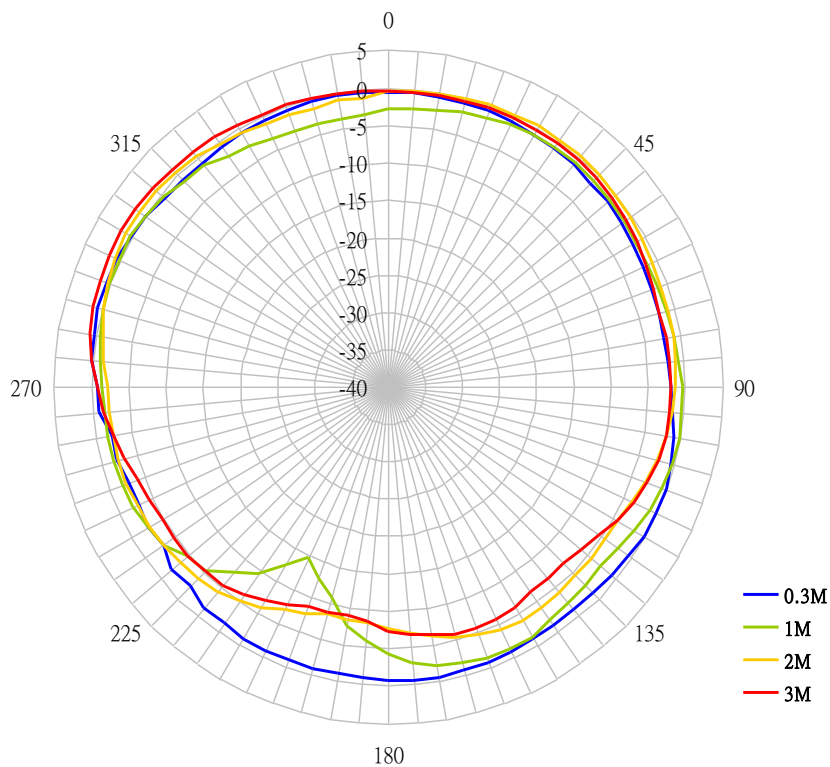


## 4.7 Cellular Antenna Free Space 3D Average Gain

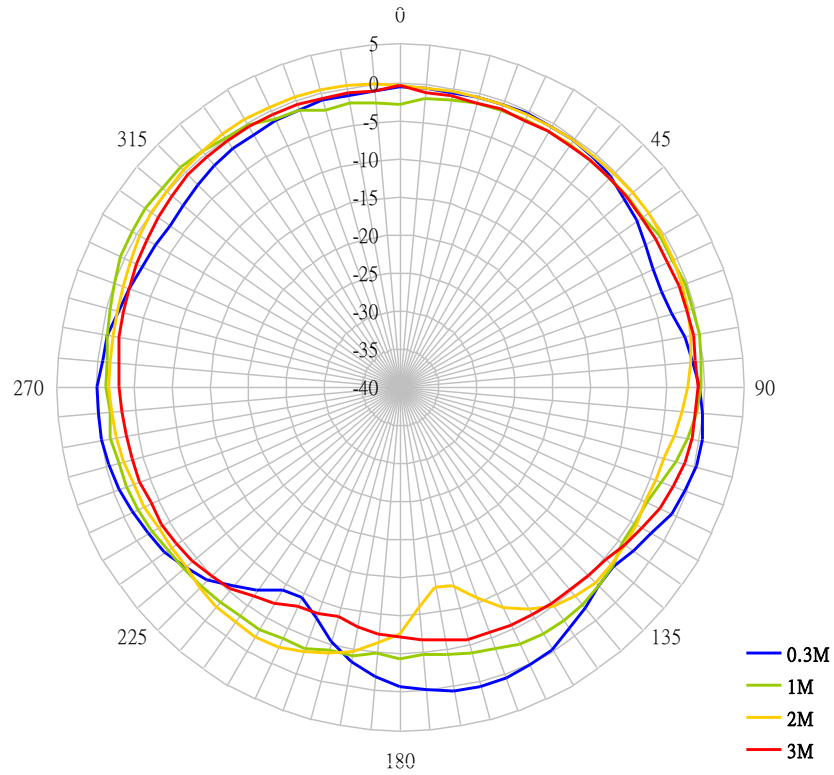


## 4.8 Cellular Antenna Free Space Radiation

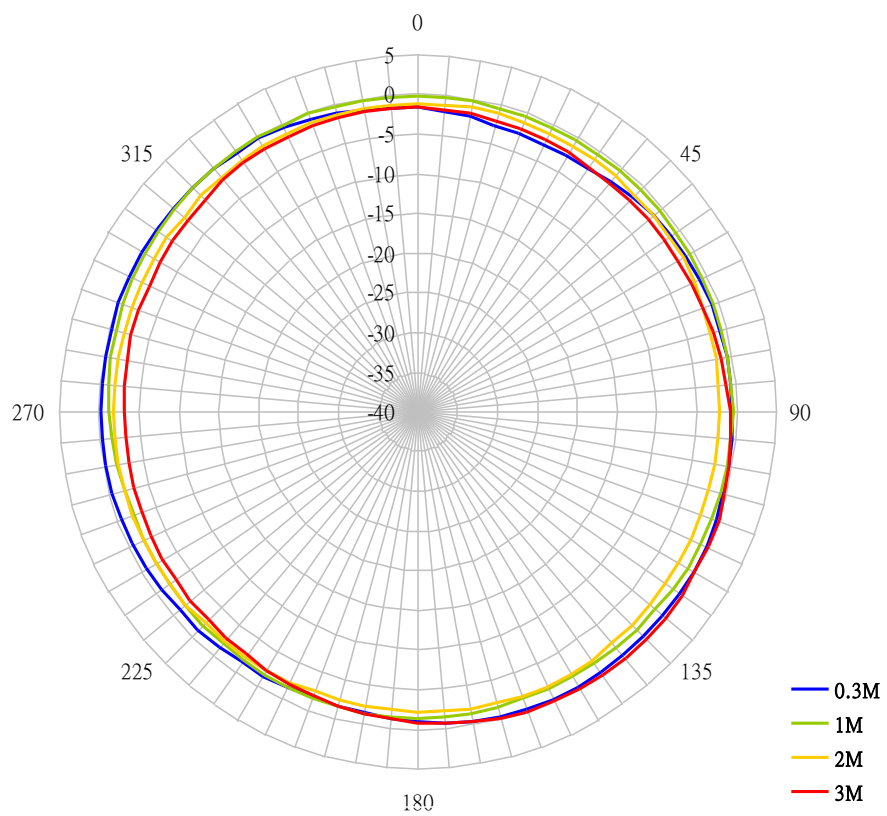
### X-Z Plane at 800MHz



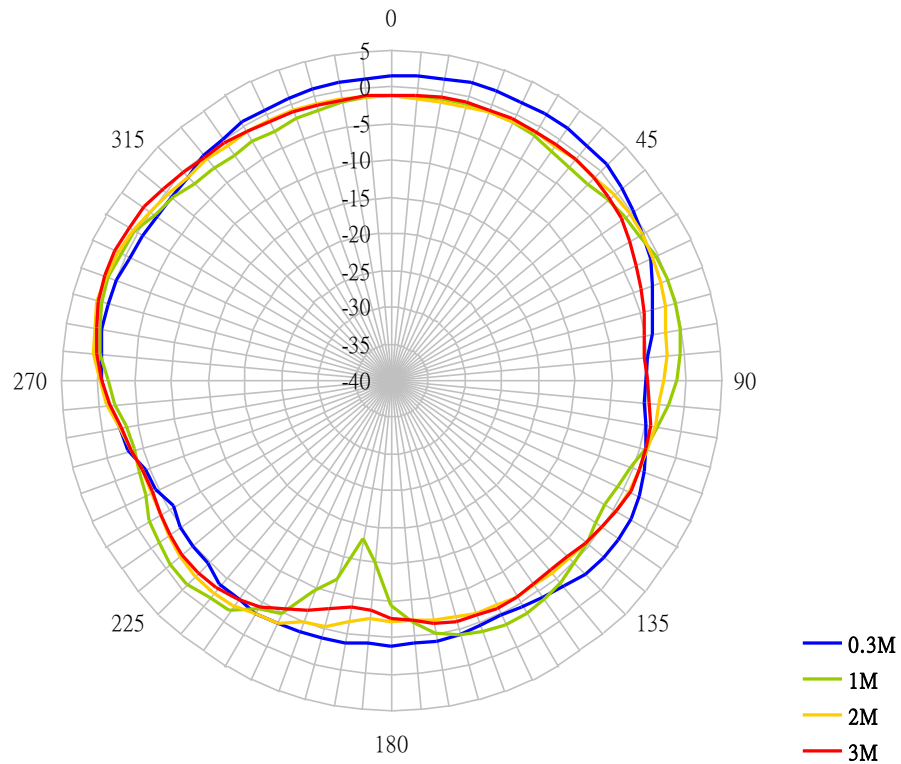
## Y-Z Plane at 800MHz



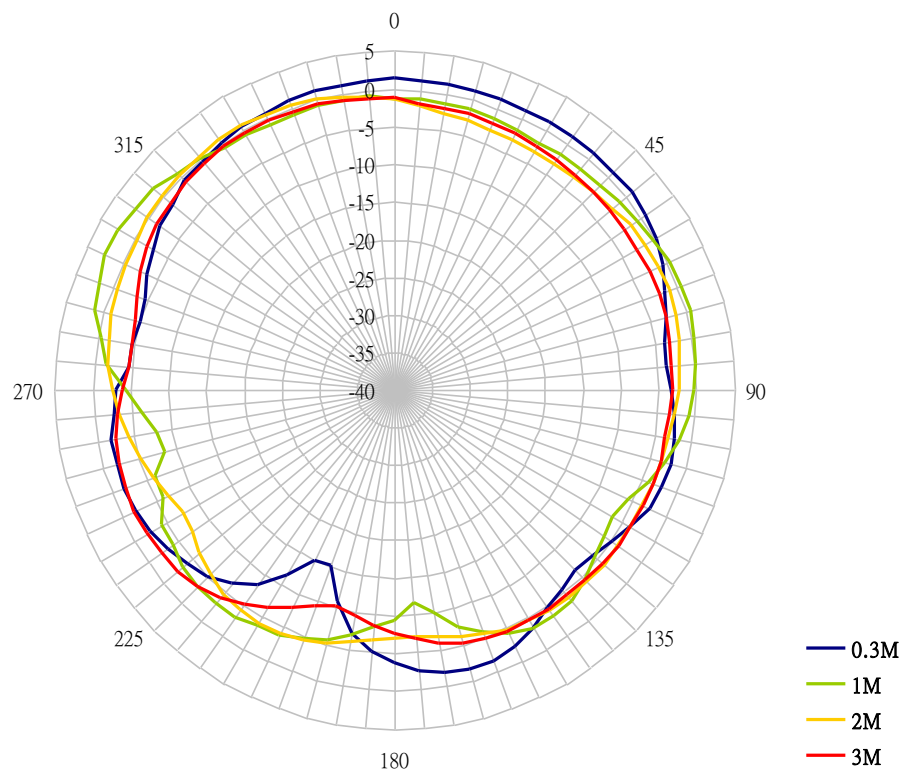
## X-Y Plane at 800MHz



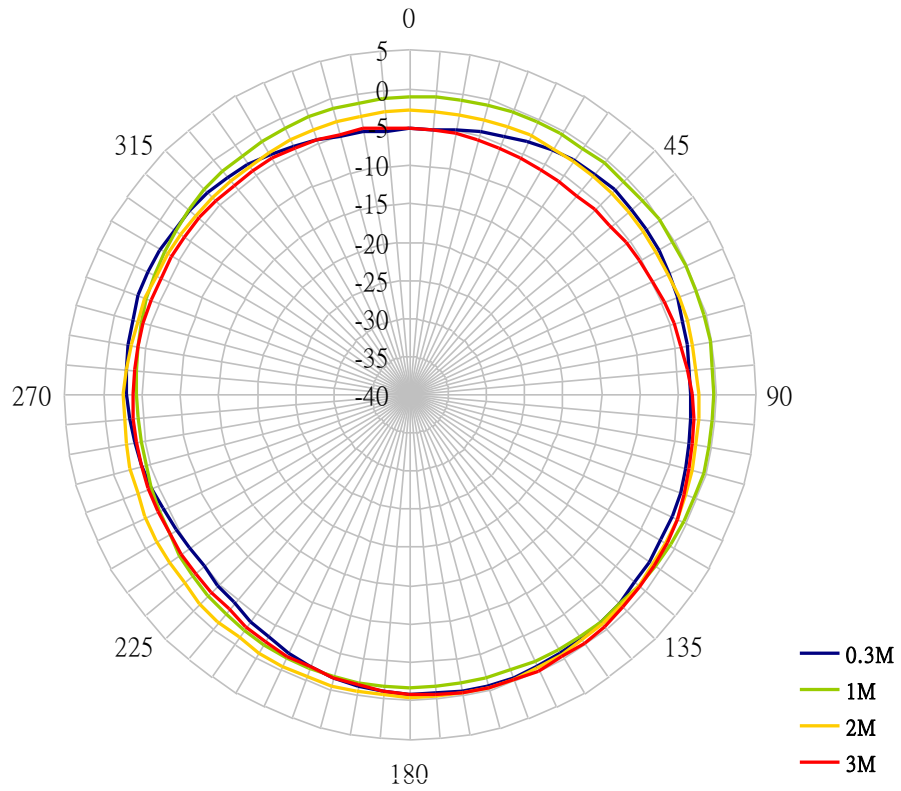
## X-Z Plane at 900MHz



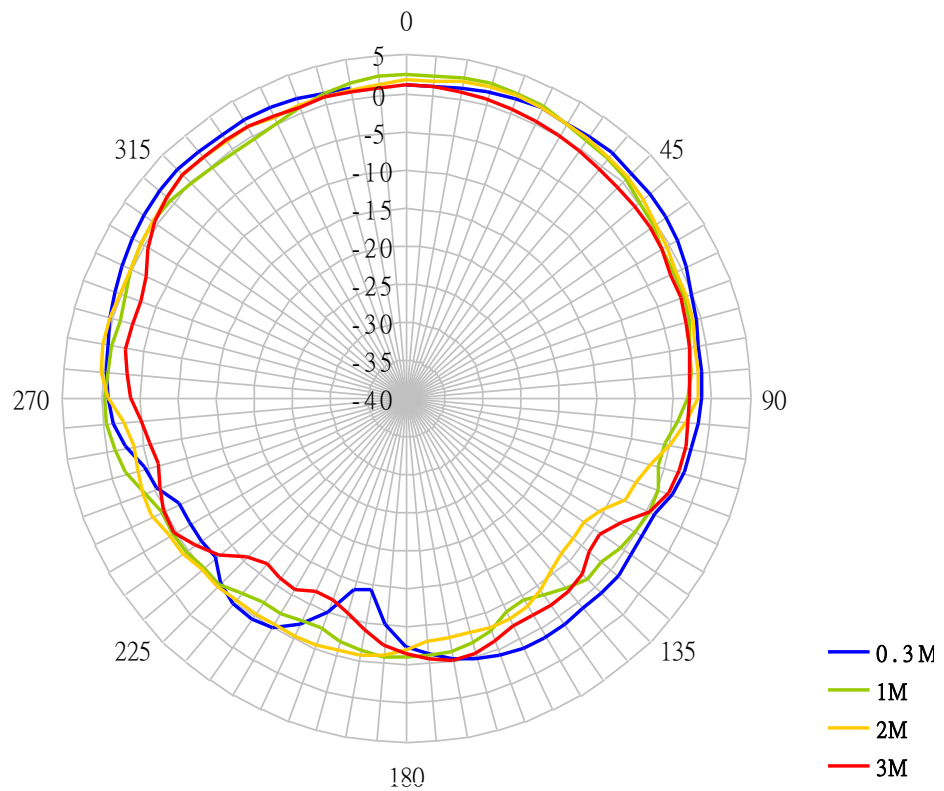
## Y-Z Plane at 900MHz



## X-Y Plane at 900MHz

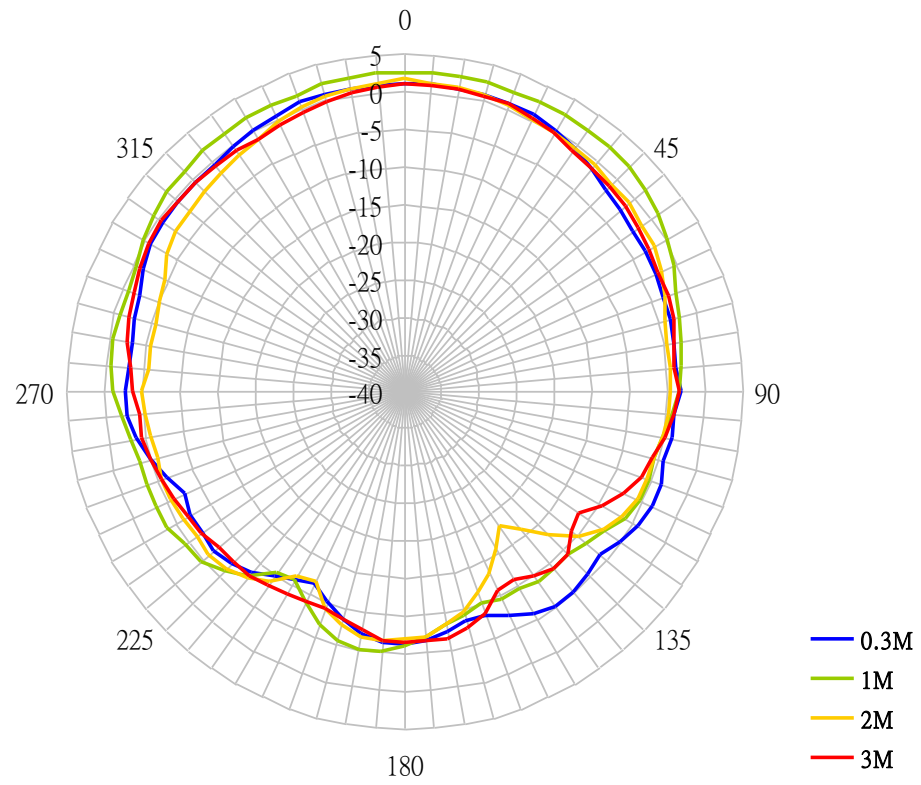


## X-Z Plane at 1800MHz

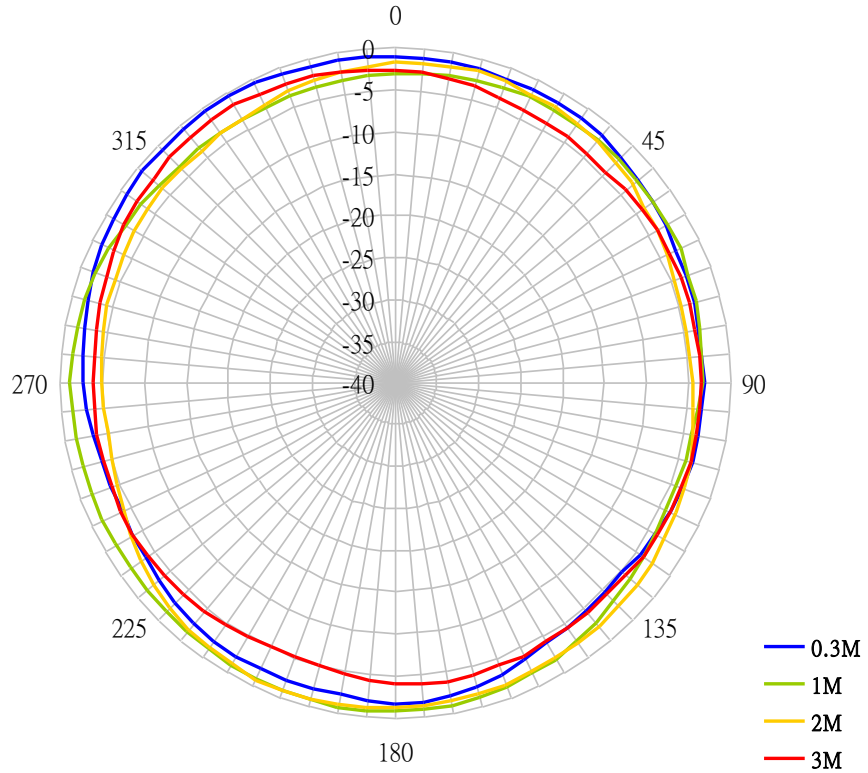




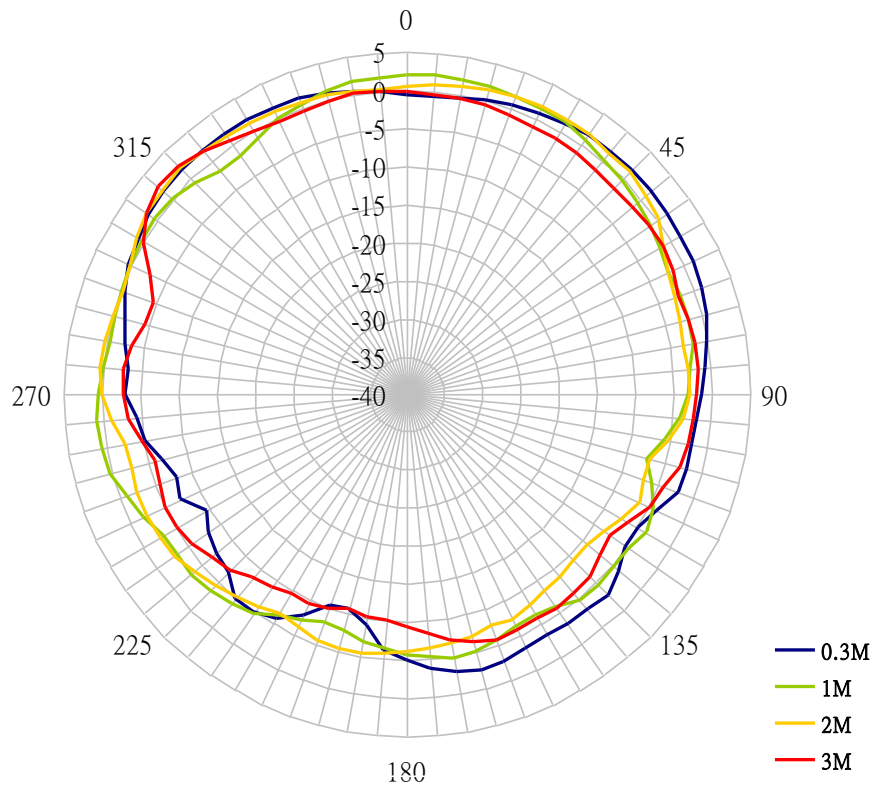
## Y-Z Plane at 1800MHz



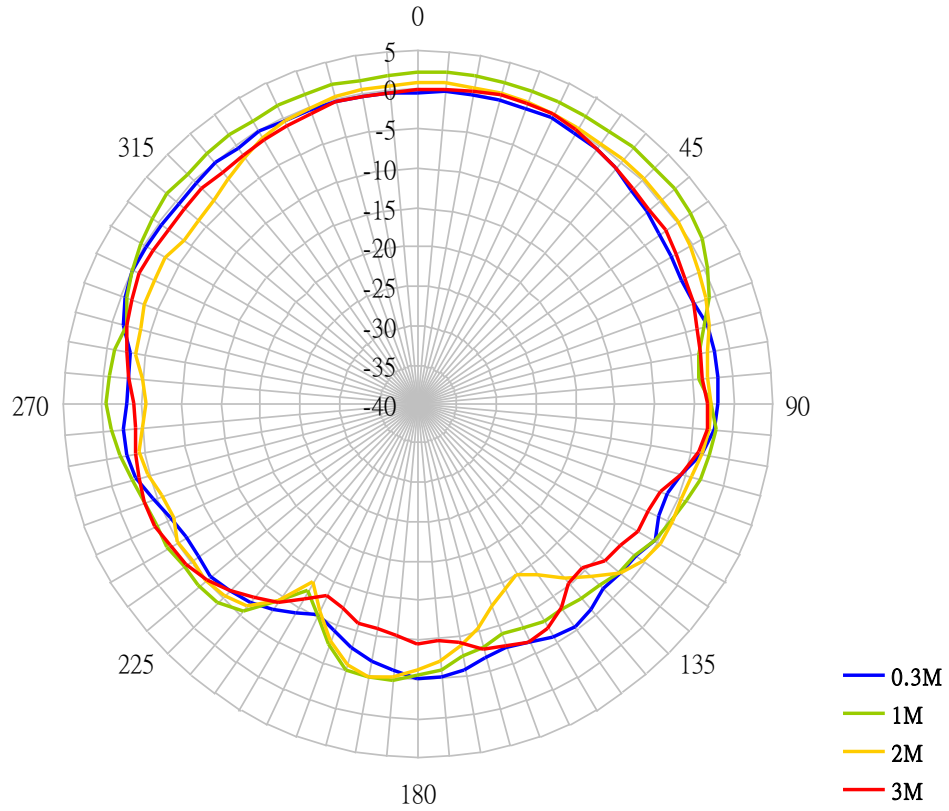
## X-Y Plane at 1800MHz



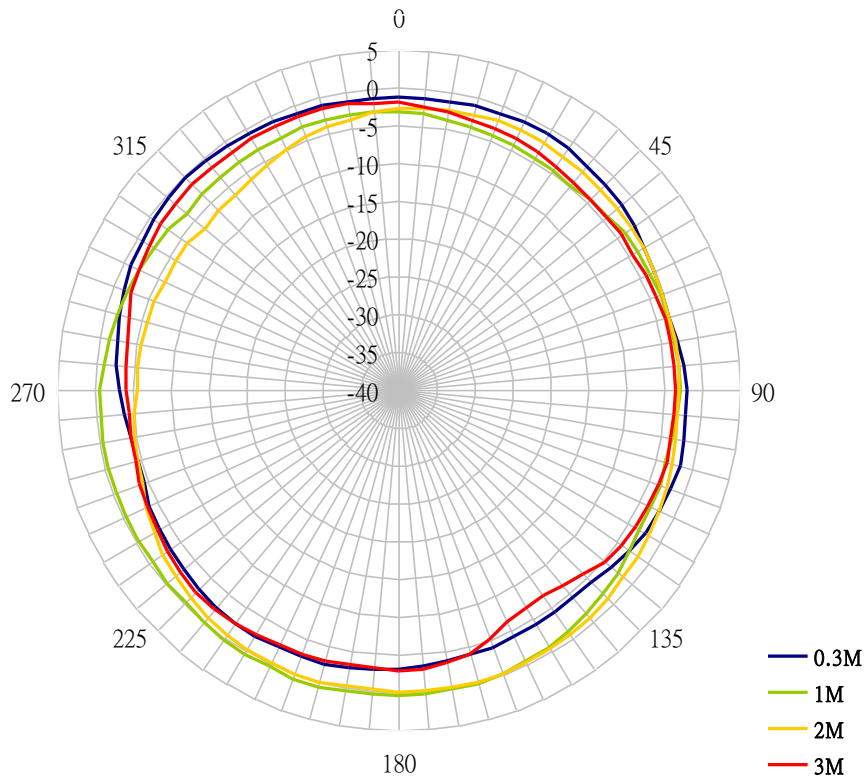
## X-Z Plane at 1900MHz



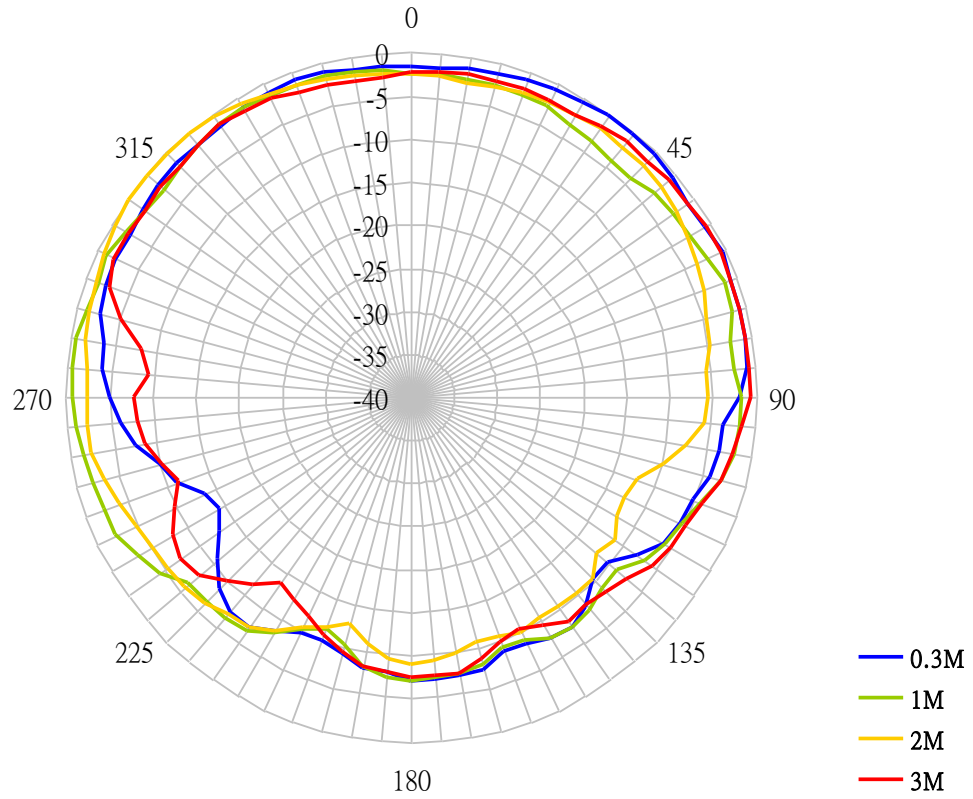
## Y-Z Plane at 1900MHz



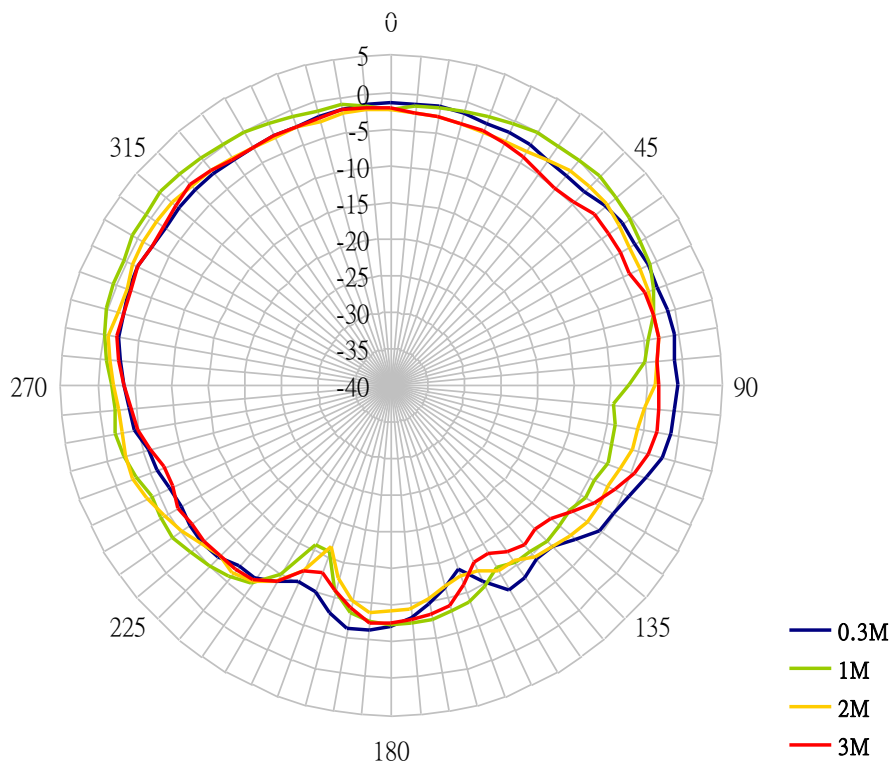
## X-Y Plane at 1900MHz



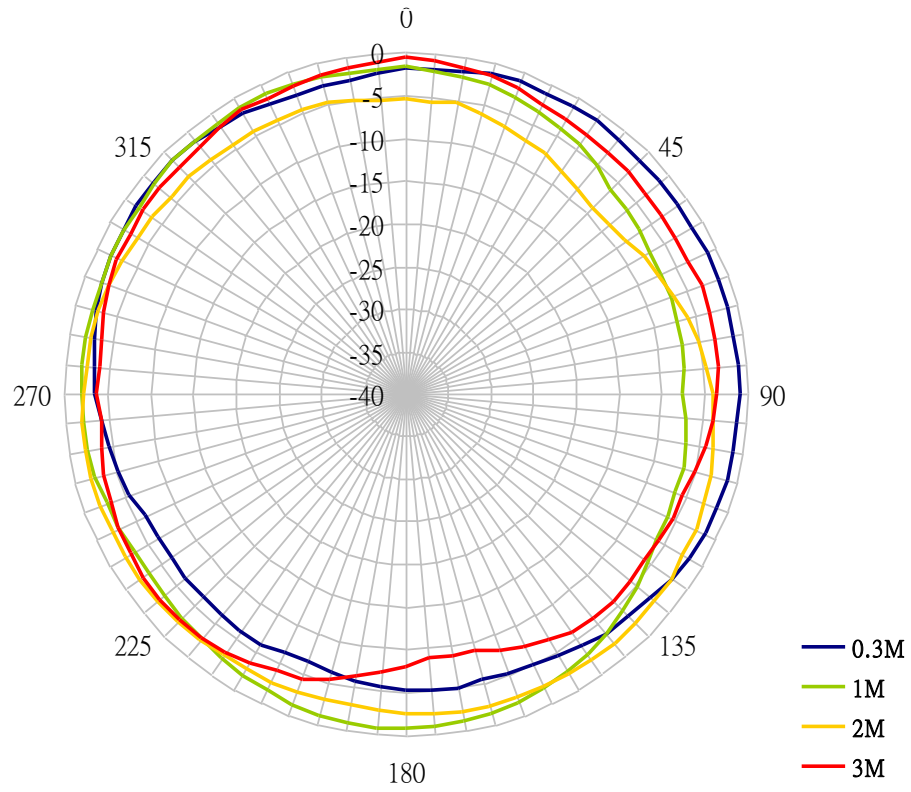
## X-Z Plane at 2200MHz



## Y-Z Plane at 2200MHz

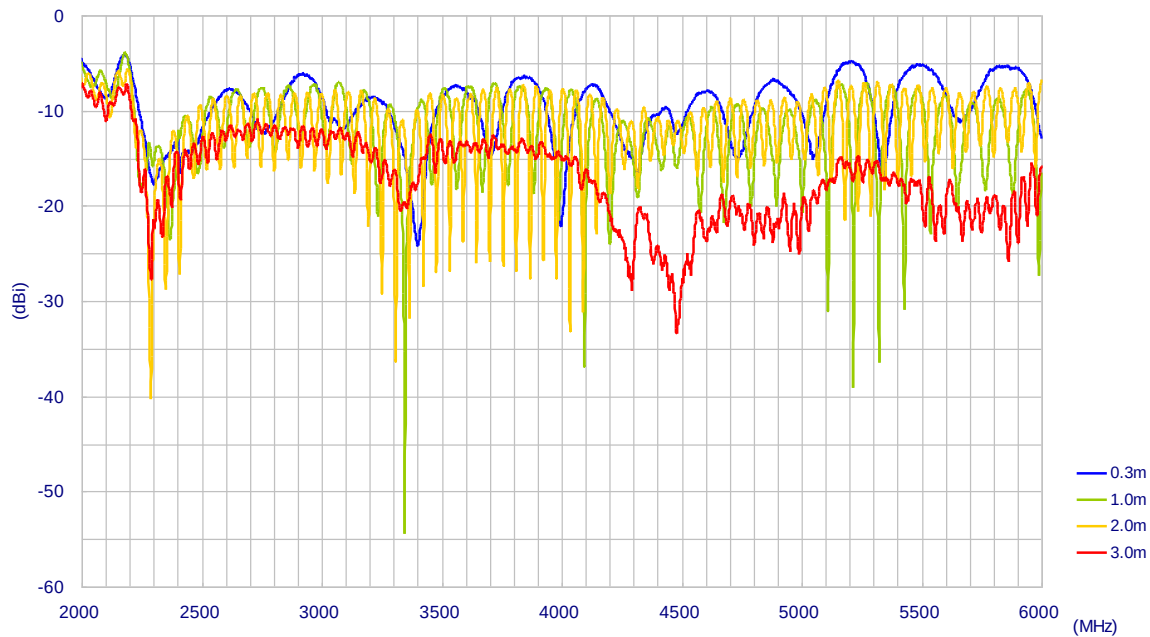


## X-Y Plane at 2200MHz

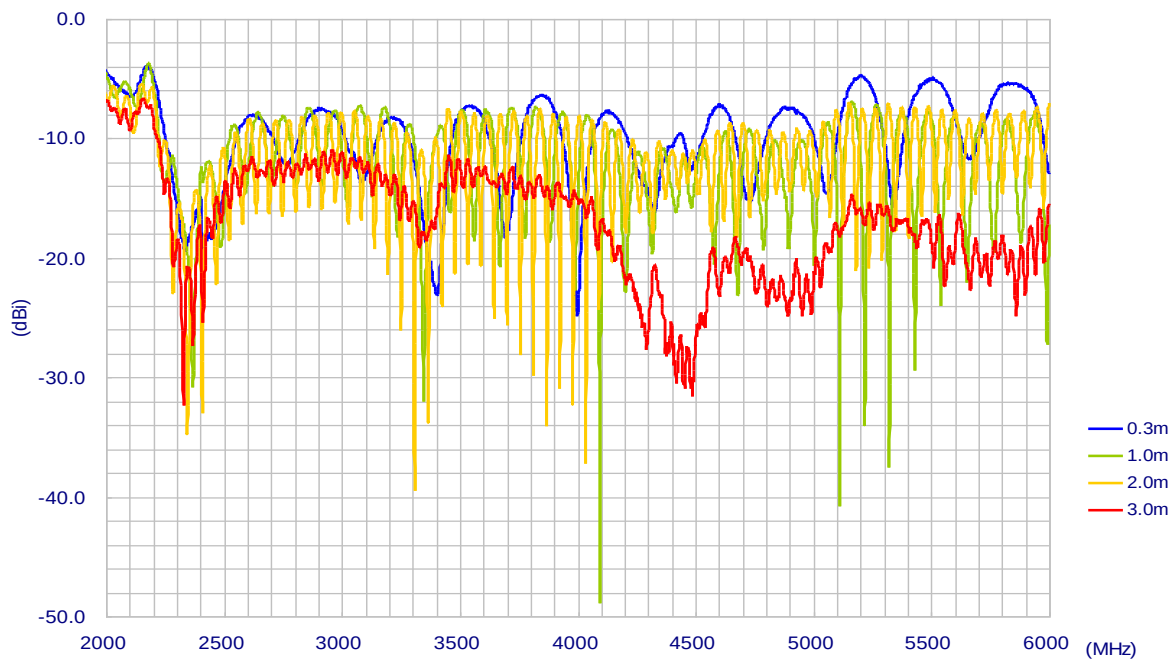


## 5 2.4/5GHz Antenna Characteristics

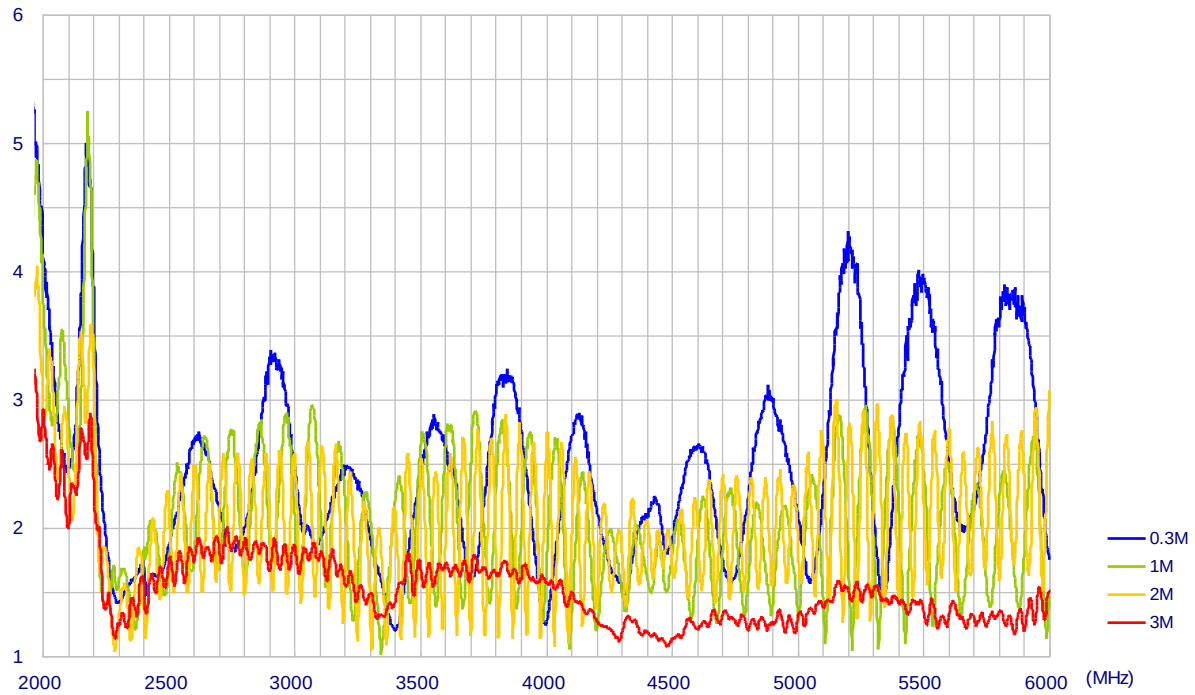
### 5.1 S11 Return Loss (Free Space)



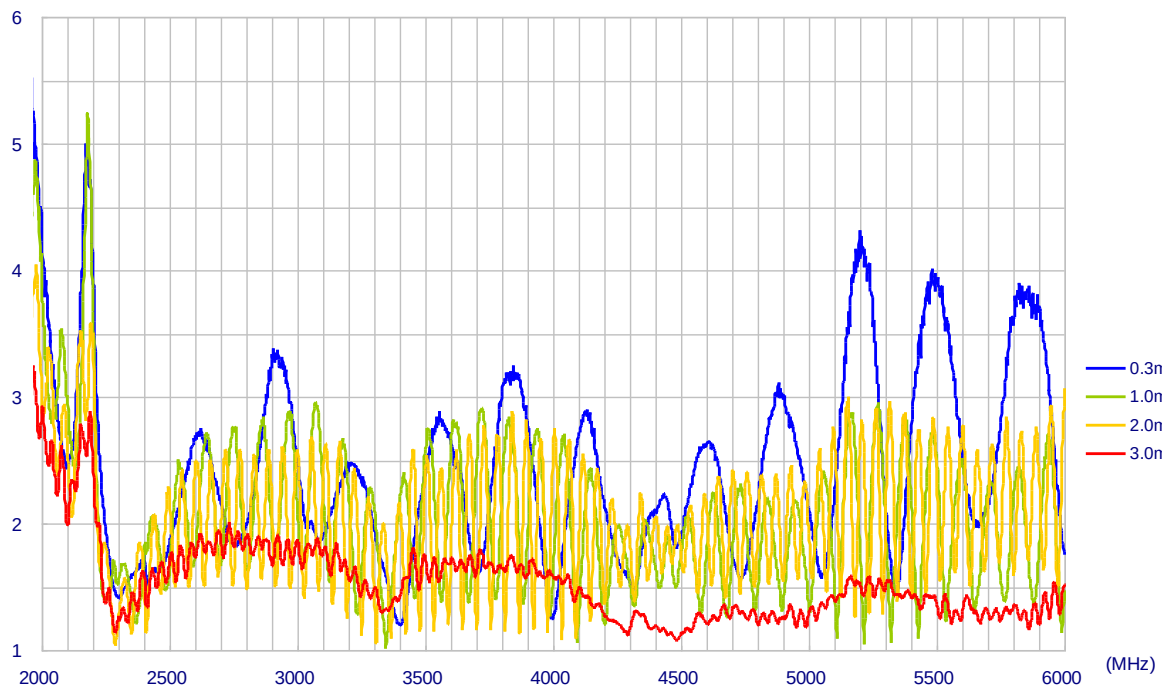
### 5.2 S11 Return Loss ( 45cm x 30cm Ground Plane)



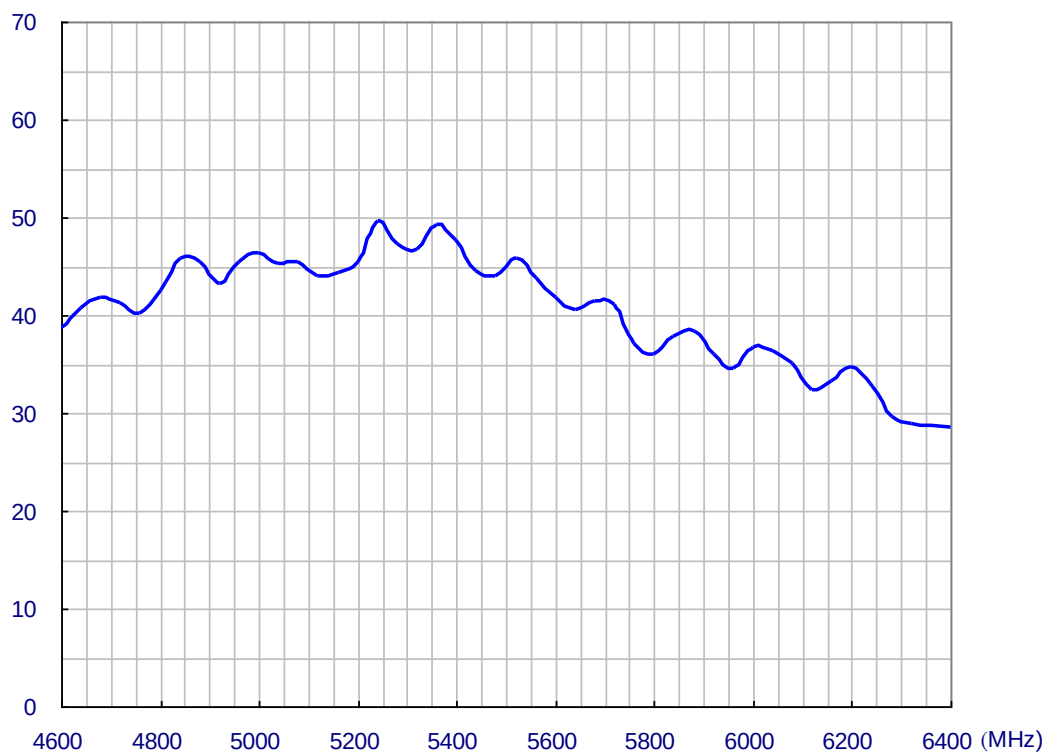
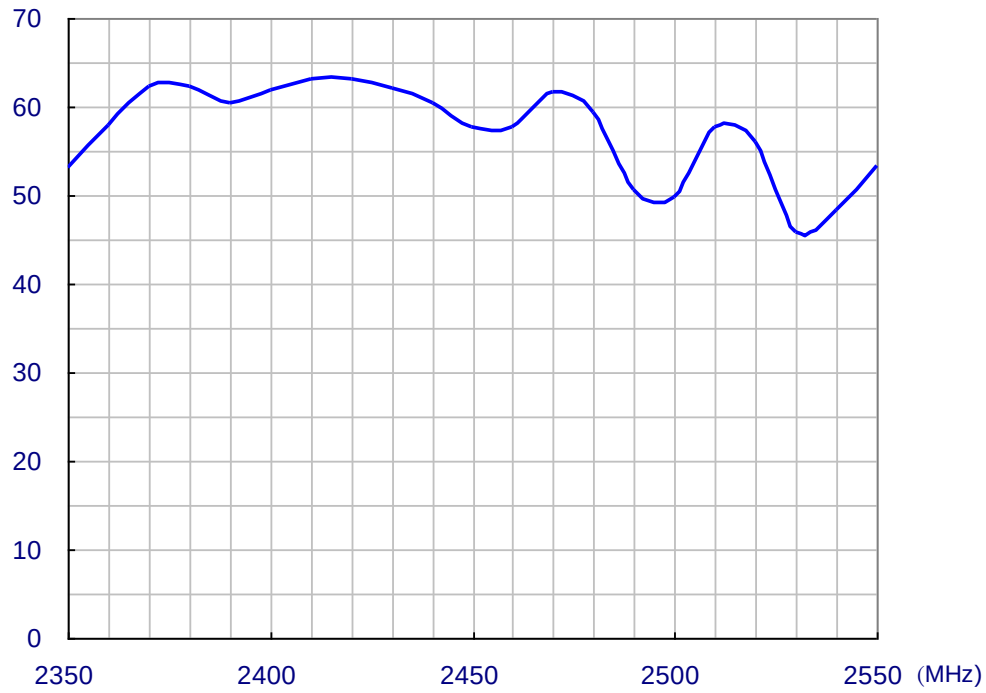
### 5.3 VSWR (Free Space)



### 5.4 VSWR ( 45cm x 30cm Ground Plane)

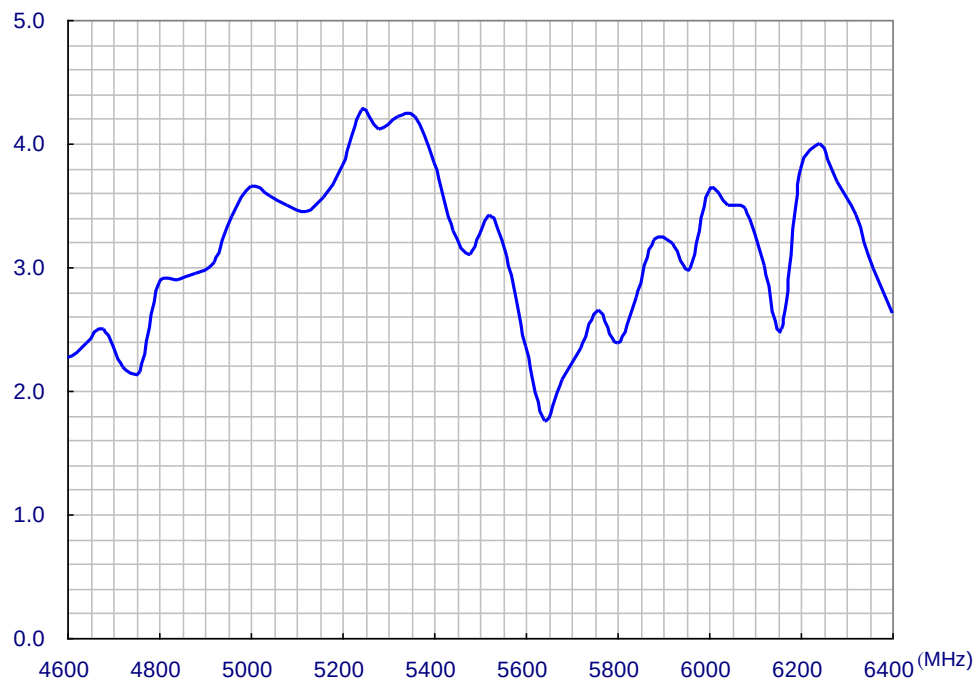
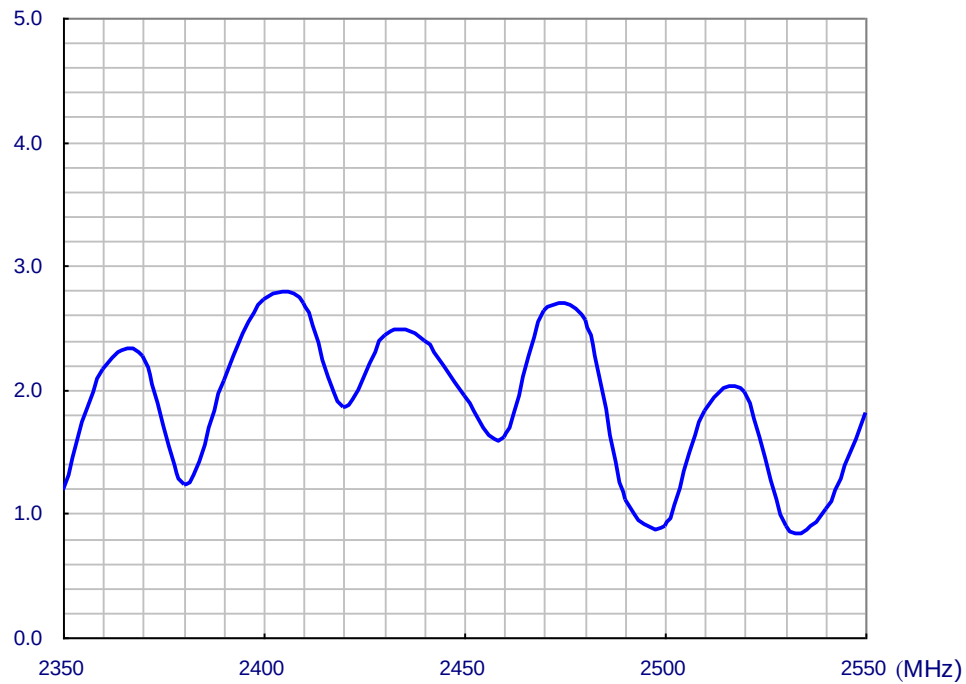


## 5.5 2.4/5GHz Antenna Free Space Efficiency (3m Cable)

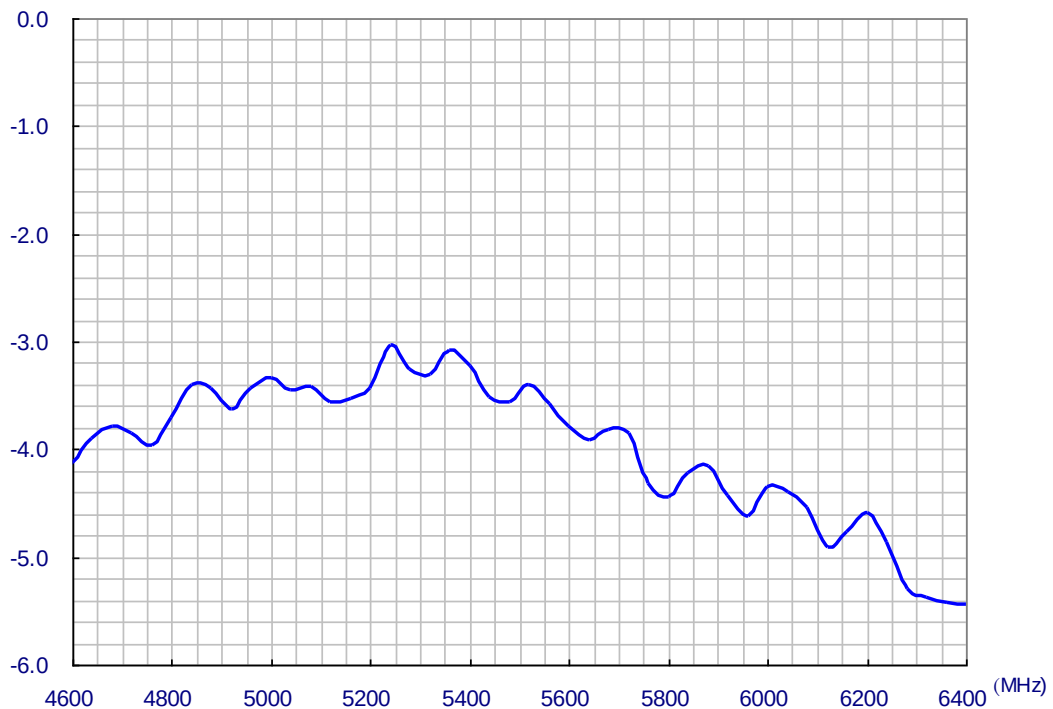
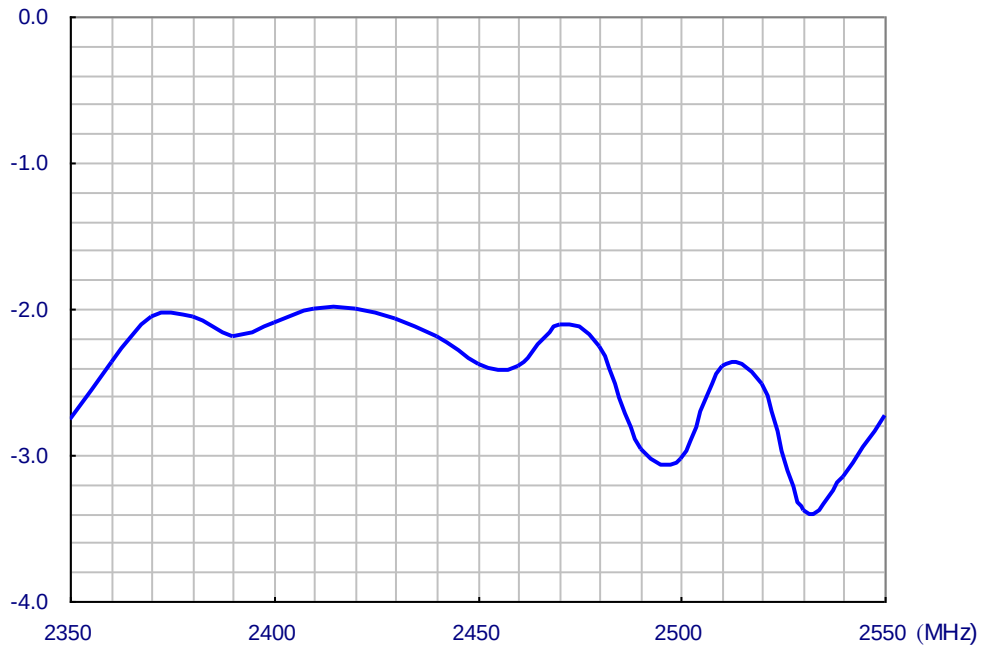




## 5.6 2.4/5GHz Antenna Free Space Peak Gain (3m Cable)

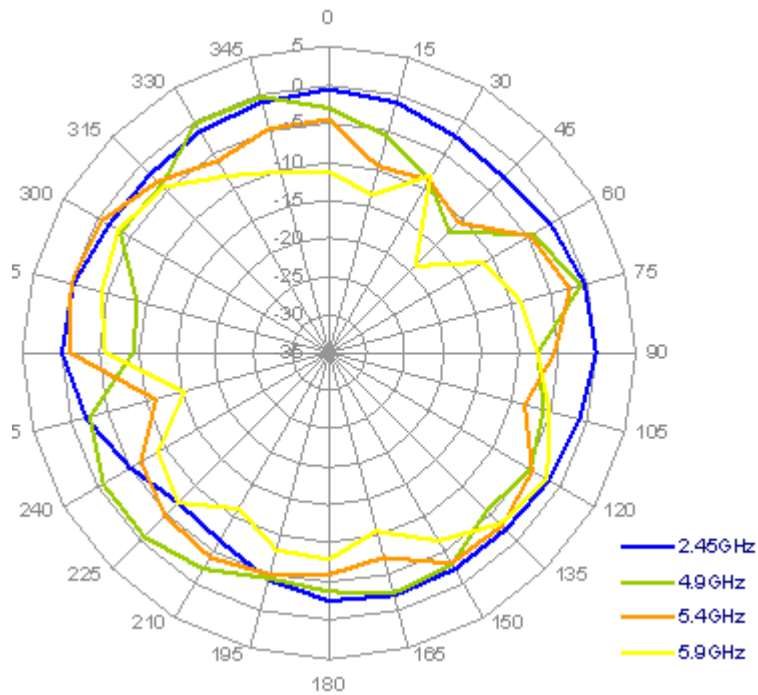


## 5.7 2.4/5GHz Antenna Free Space 3D Average Gain (3m Cable)

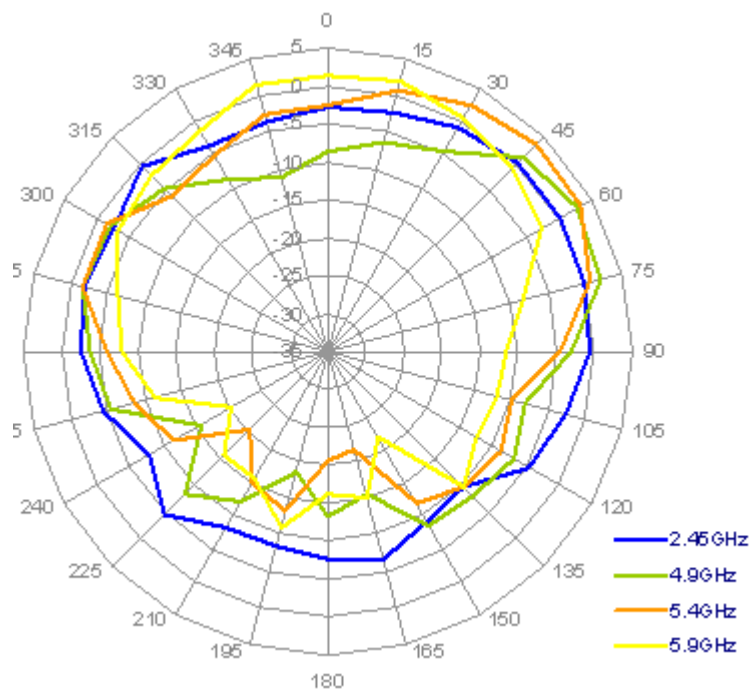


## 5.8 2.4/5GHz Antenna Free Space Radiation (3m Cable)

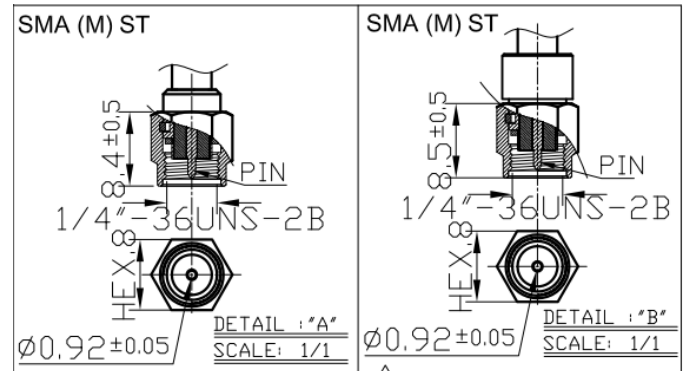
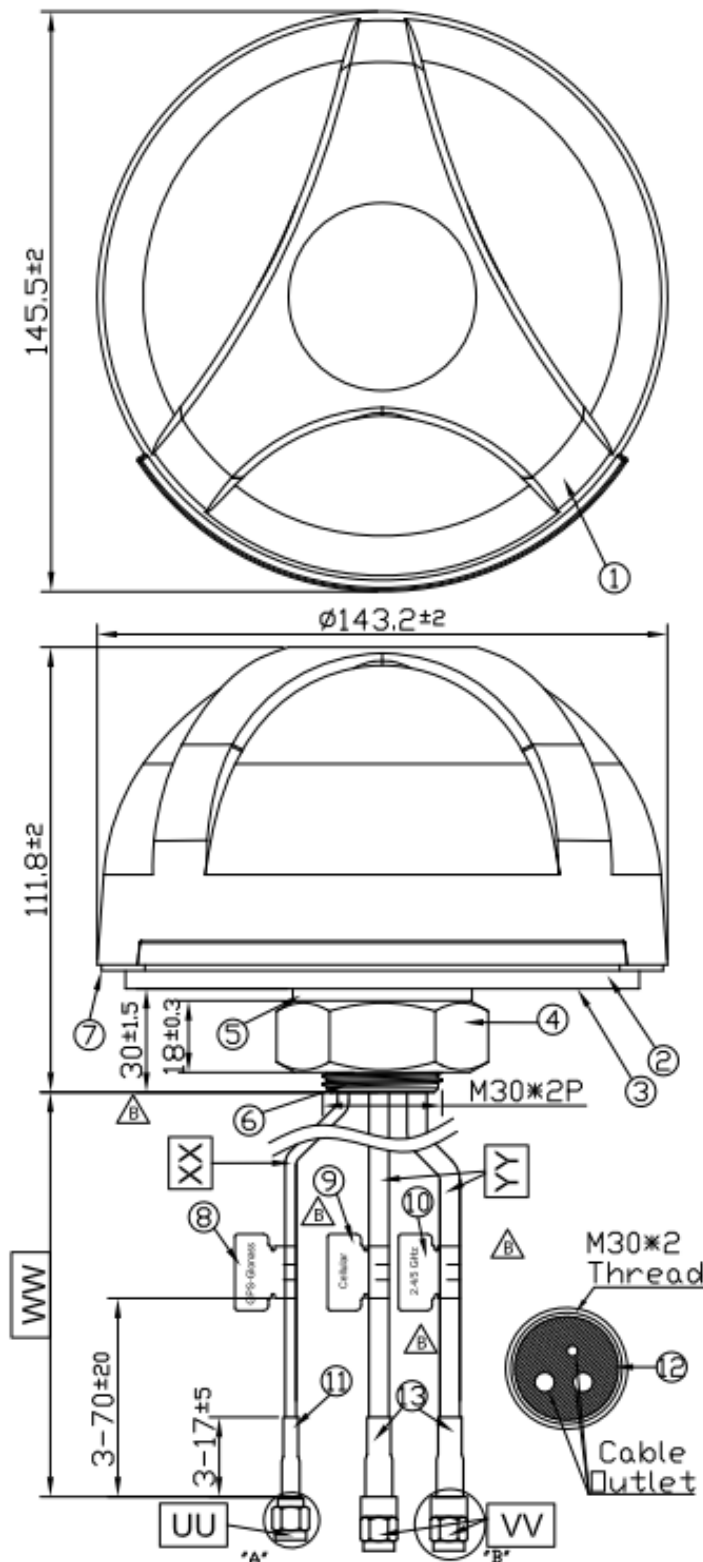
### X-Y Plane



### X-Z Plane



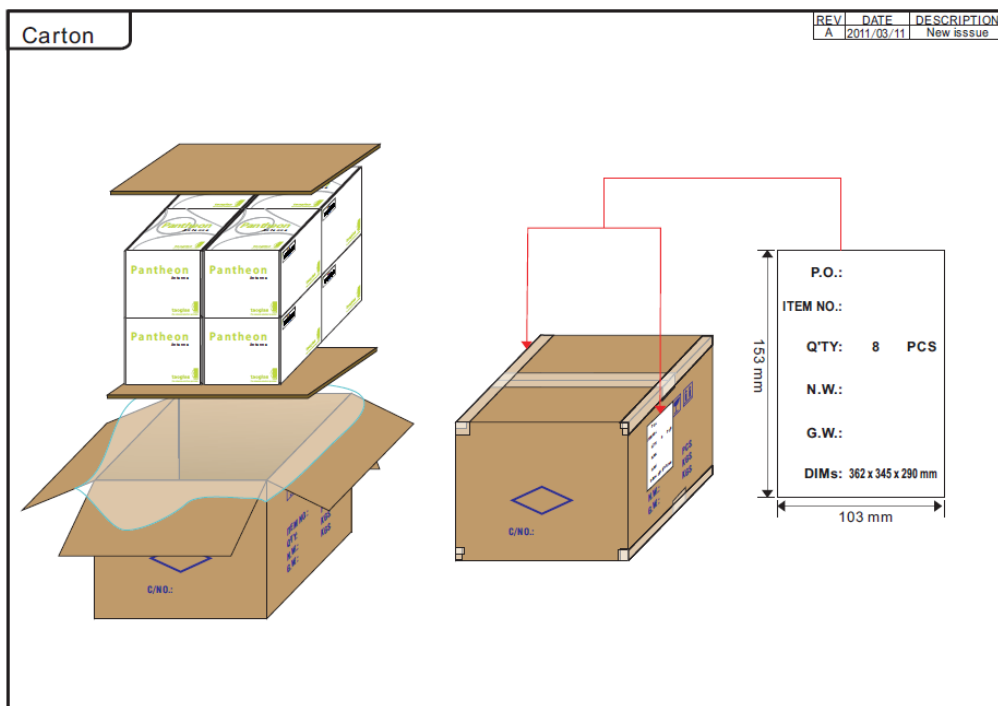
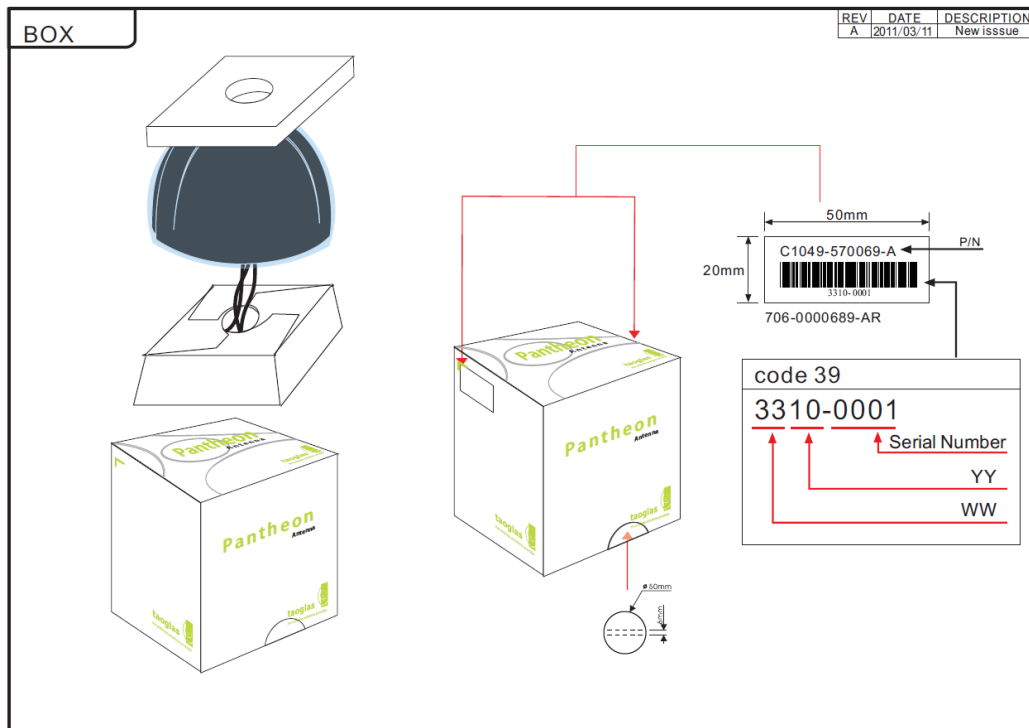
## 6 Mechanical Drawing



|    | 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   | 2   |
| WW | Cable Length   | 3000 $\pm$ 120mm |        |     |
| XX | Cable Type     | RG174            | Black  | 1   |
| YY | Cable Type     | CFD 200          | Black  | 2   |

## 7 Packing



# AMEYA360

## Components Supply Platform

### Authorized Distribution Brand :



### Website :

Welcome to visit [www.ameya360.com](http://www.ameya360.com)

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