

## SPECIFICATION

- Part No. : **MA.203.A.AB.045**
- Product Name : GPS/GALILEO/Penta-band/ Cellular Adhesive Antenna
- Feature : High gain LNA up to 32dB  
(GSM/CDMA/PCS/DCS/UMTS/GPRS/EDGE/HSPA)  
Height 10.8mm Diameter 55.1mm  
IP65 Waterproof  
Fakra Connector  
**ROHS Compliant**



## 1. Introduction

This is a combination high performance GPS/GALILEO and Penta-band Cellular (GSM/CDMA/PCS/DCS/ / UMTS / GPRS / EDGE/ HSPA) antenna to simplify AVL or Fleet management antenna systems worldwide. Its high quality low profile covert housing can be attached onto the glass or even out of sight under the dashboard. This combination of a high gain GPS/GALILEO antenna and a leading edge Penta band cellular antenna is ideal for those applications that require durability, small size and covert installation, and reliable reception and transmission crossing through different mobile networks.

### 1.1. Features

#### **GPS/GALILEO**

- High LNA Gain up to 32 dB
- Antenna Gain  $30 \pm 2$  dB
- Miniaturized to 55.15x12mm
- Low Noise 1.5 dB max

#### **Cellular**

Advanced Penta-band cellular antenna  
(GSM/CDMA/PCS/DCS/UMTS/GPRS/EDGE/ HSPA)

#### **Other**

- Water Resistant IP 65(IP 67 MA.203 version also available)
- Quality textured covert design. Low profile
- UV resistant ABS housing
- Comes with high grade 3M double sided tape for quick and easy mounting
- Fakra code C (blue) on GPS/GALILEO and code D( violet) on GSM . Optional cables and connectors

## 2. Specification

### 2.1. GPS/GALILEO Antenna

| GPS/GALILEO          |   |
|----------------------|---|
| Centre Frequency     | 1575.42MHz                                    |
| Bandwidth            | 10MHz   |
| Average Gain         | 28dBic typ. (@DC 3V)                          |
| Radiation Efficiency | 50%   |
| Gain @ Zenith        | 4.0dBic typ.                                  |
| Axial Ratio          | 3.0dB max.                                    |
| Polarization         | Right Hand Circular                           |
| VSWR                 | ≤2.0  |
| Impedance            | 50Ω   |
| DC Power Input Range | 3 ~ 5 V                                       |
| DC input             | 3V  |
| LNA Gain(Typ.)       | 28dB  |
| Noise Figure(Typ.)   | 1.5dB   |
| Power Consumption    | 7~9mA   |
| Band Attenuation     | ±50MHz  |
|                      | 40dB  |
| Cable                | 1M RG174 standard, fully customizable         |
| Connector            | SMA(M) standard, standard, fully customizable |

### 2.2. Cellular Antenna

| CELLULAR        |  |         |           |           |           |
|-----------------|--|---------|-----------|-----------|-----------|
| Frequency (MHz) | 824~894                                | 880~960 | 1710~1880 | 1850~1990 | 2110~2170 |
| Peak gain (dBi) | >2.5                                   | >0.0    | >1.5      | >2.5      | >0.5      |
| Efficiency      | >60%                                   | >45%    | >40%      | >45%      | >50%      |
| Impedance       | 50Ω                                    |         |           |           |           |
| Polarization    | Linear                                 |         |           |           |           |
| VSWR            | 3 max.                                 |         |           |           |           |
| Cable           | 1M RG-174 standard, fully customizable |         |           |           |           |
| Connector       | SMA(M) standard, fully customizable    |         |           |           |           |

### 3. Test Setup

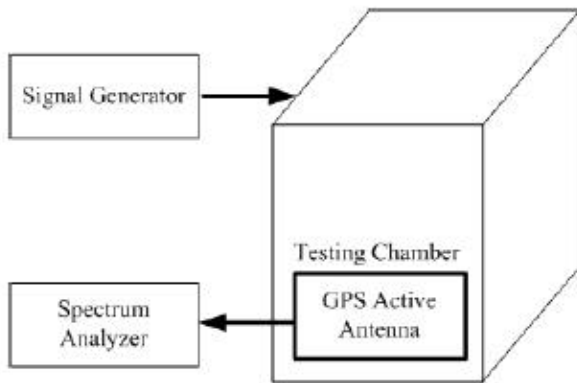
#### 3.1. Configuration of SATIMO



Agilent E5071B Network Analyzer



Anritsu 68147C Signal Generator



Testing Chamber

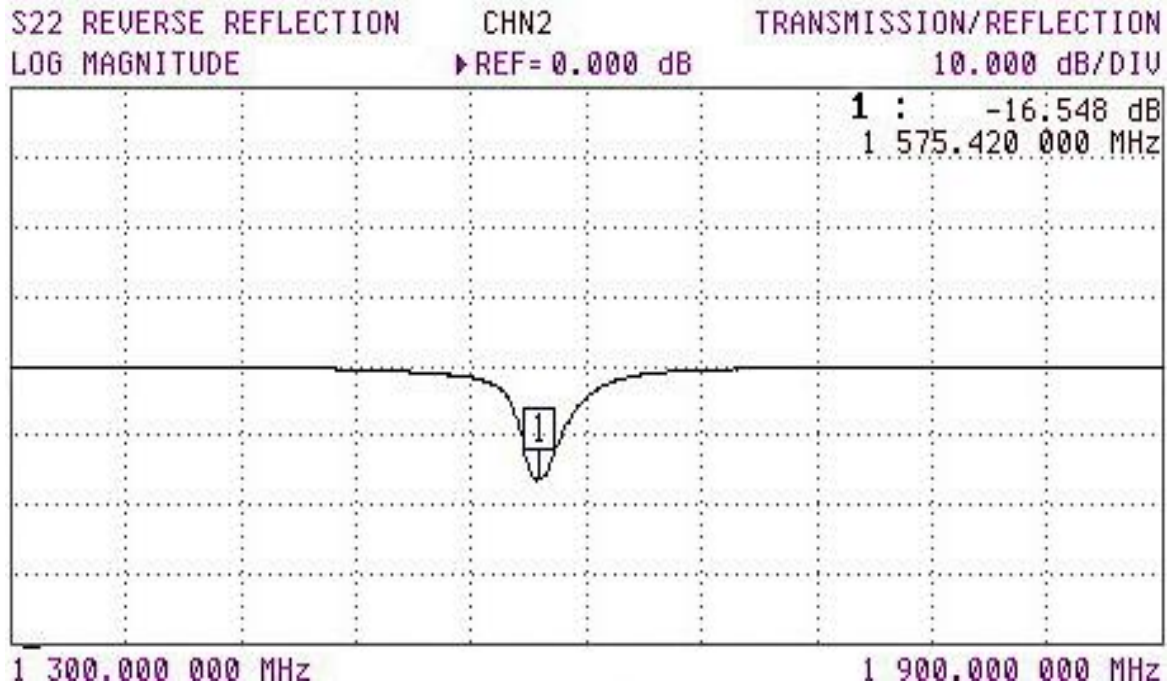


Anritsu MS2721A Spectrum

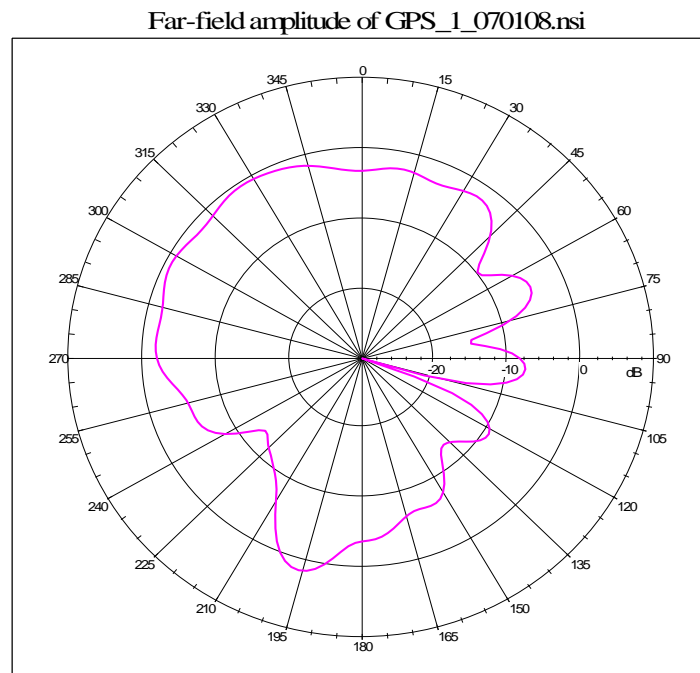
| Cable attenuation(dB/100mm) |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| GHz                         | 0.5 | 1   | 1.5 | 2   | 2.5 | 3   | 3.5 | 4   | 4.5 | 5   | 5.5 | 6   |
| RG-174                      | 67  | 100 | 127 | 153 | 138 | 183 | 207 | 229 | 252 | 272 | 291 | 311 |
| CFD-200                     | 26  | 39  | 49  | 58  | 66  | 73  |     | 86  |     | 98  |     | 109 |

## 4. GPS/GALILEO Antenna Characteristics

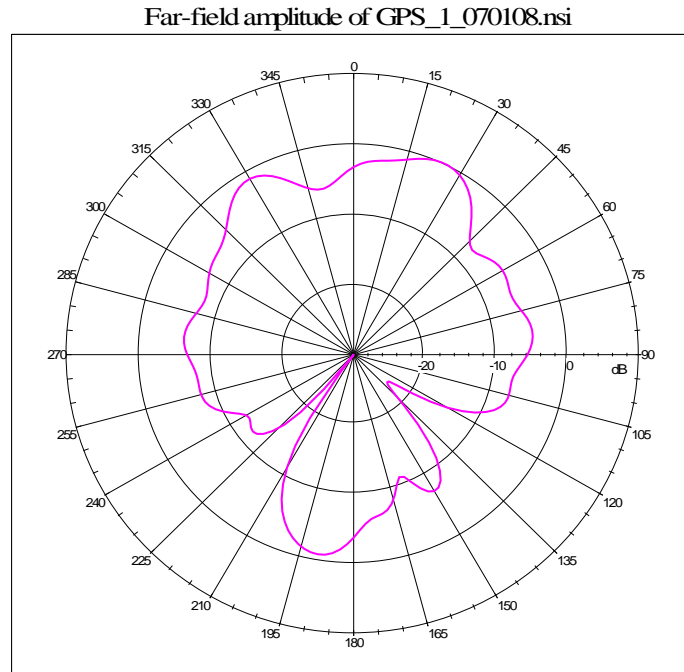
### 4.1. Patch antenna S11



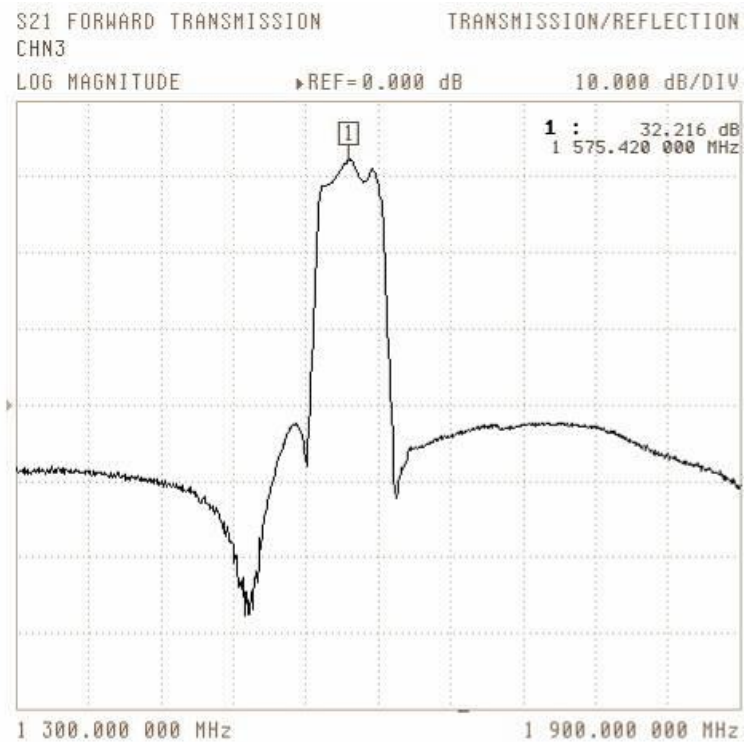
### 4.2. GPS/GALILEO Antenna Pattern( XZ Plane)



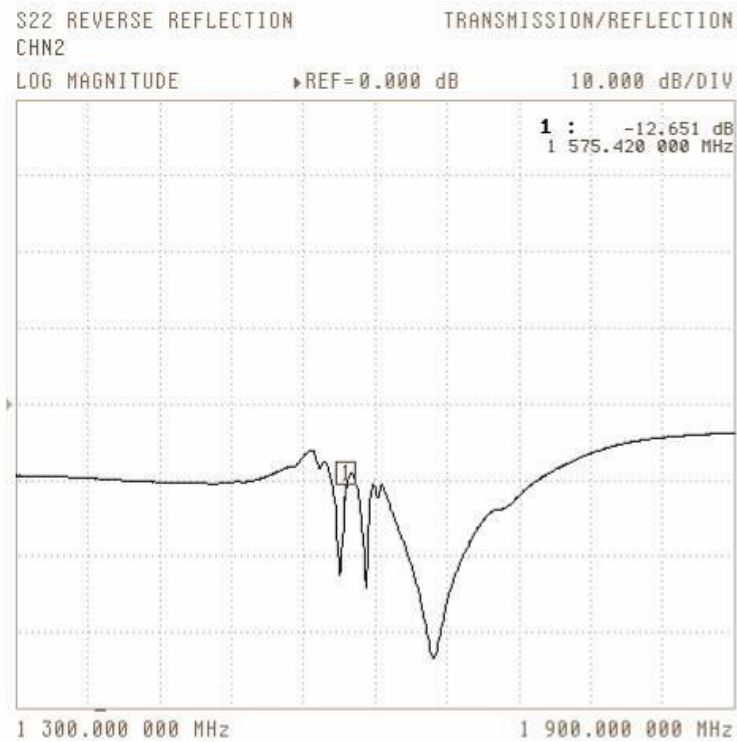
### 4.3. GPS/GALILEO Antenna Pattern (YZ Plane)



### 4.4. GPS/GALILEO Antenna Gain (with LNA)



## 4.5. GPS/GALILEO antenna return loss (With LNA)



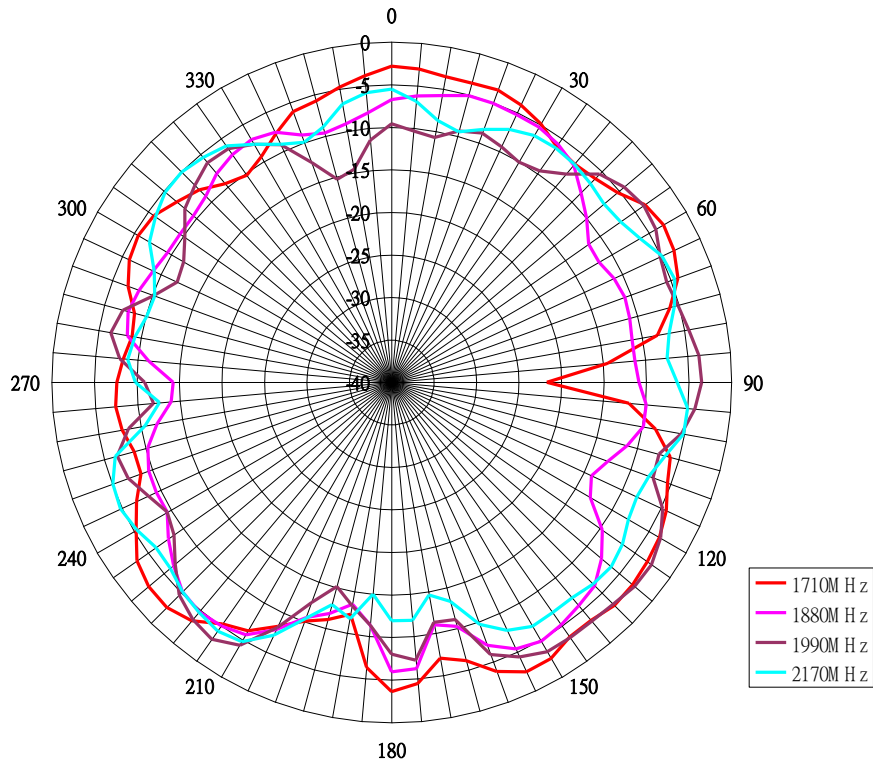
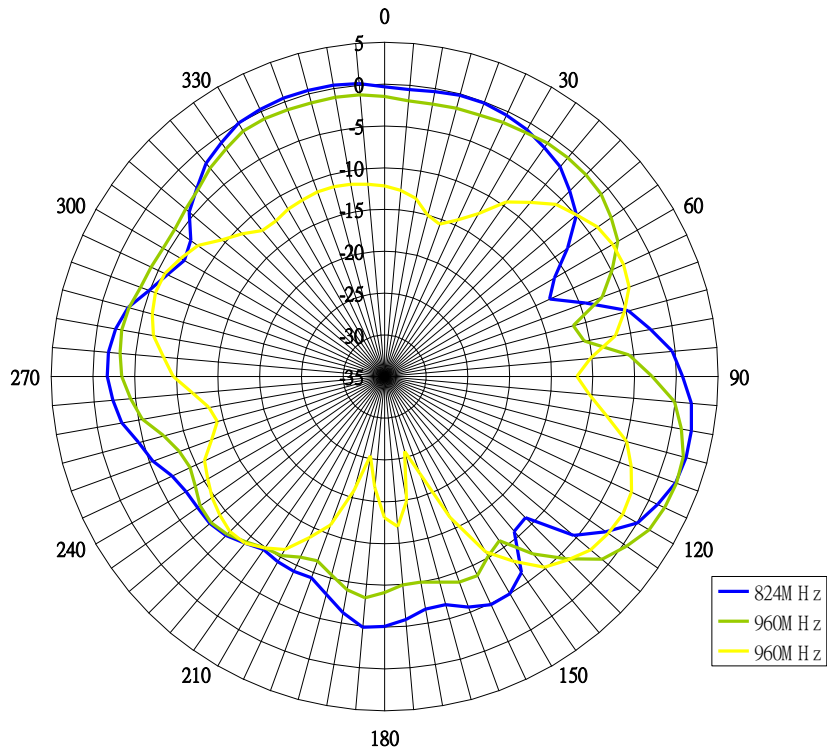
## 5. Cellular antenna

### 5.1. Return loss (with 1M RG-174 cable)



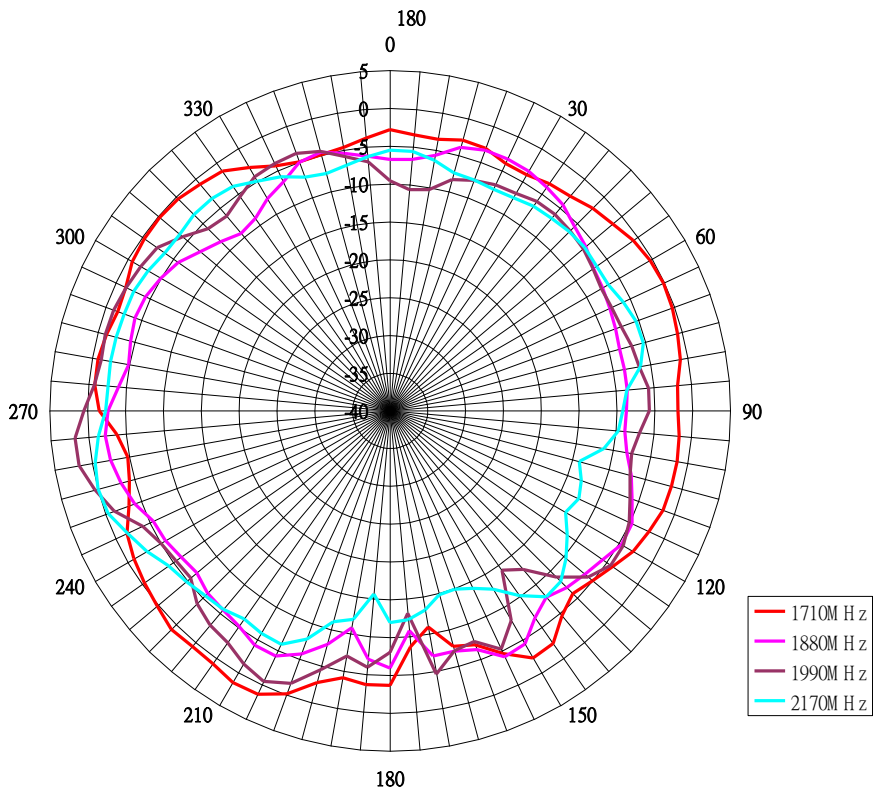
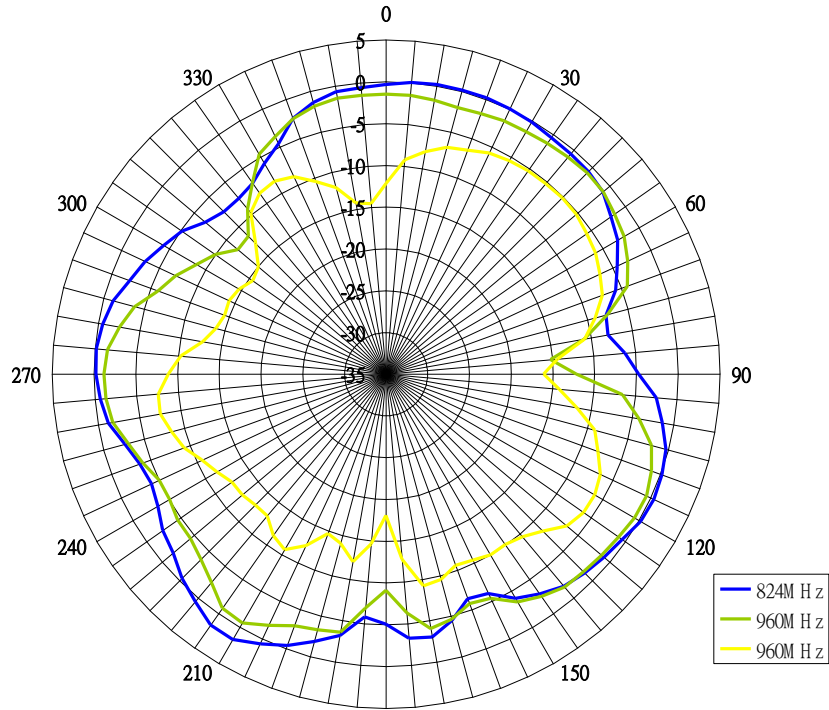
# 6. Radiation Pattern

## 6.1.1. XZ Plane

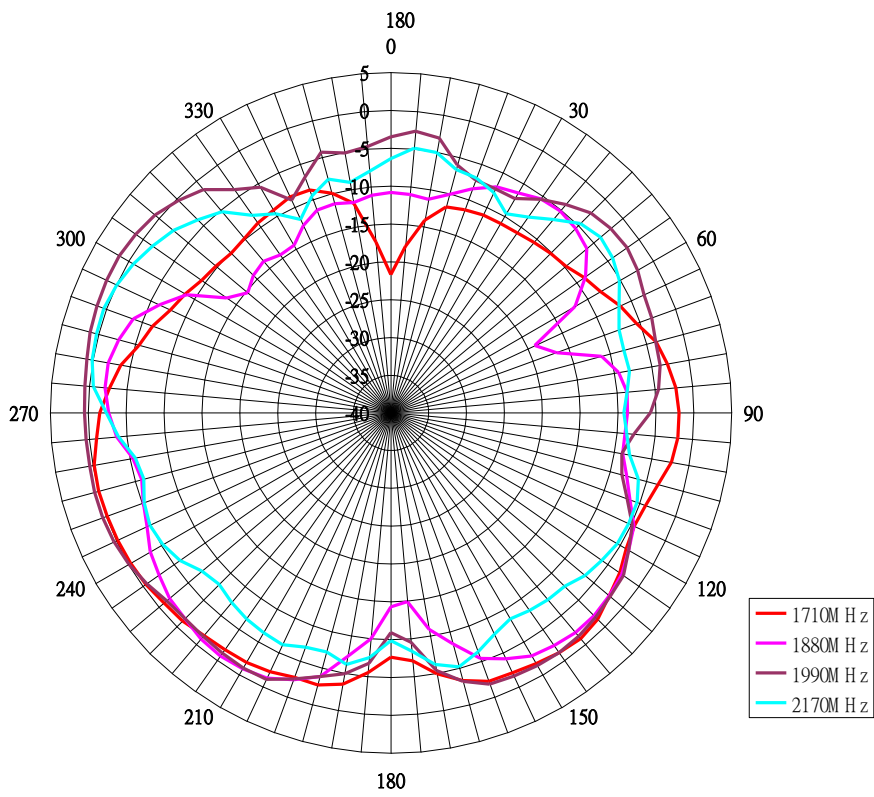
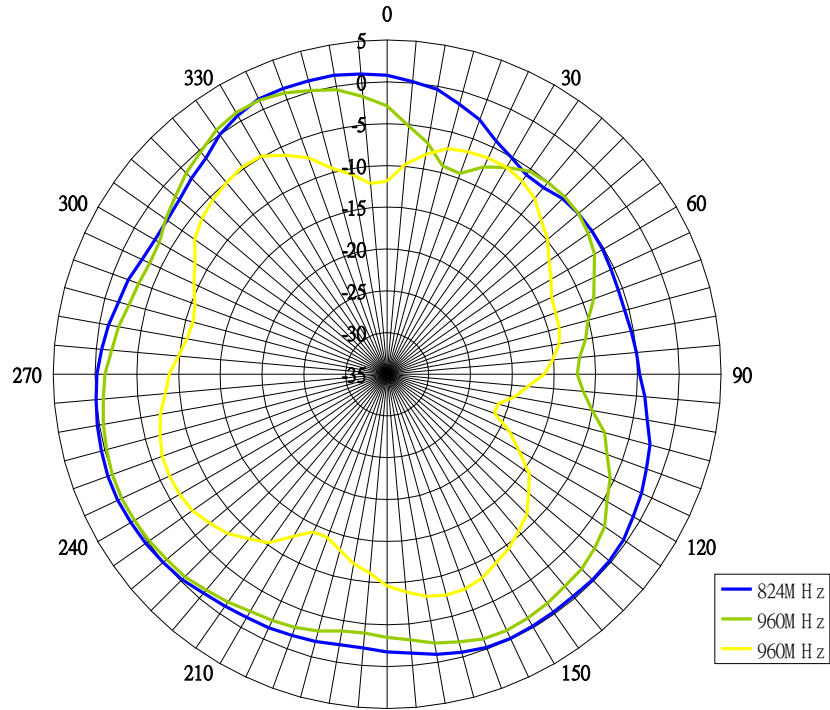




### 6.1.2. YZ Plane

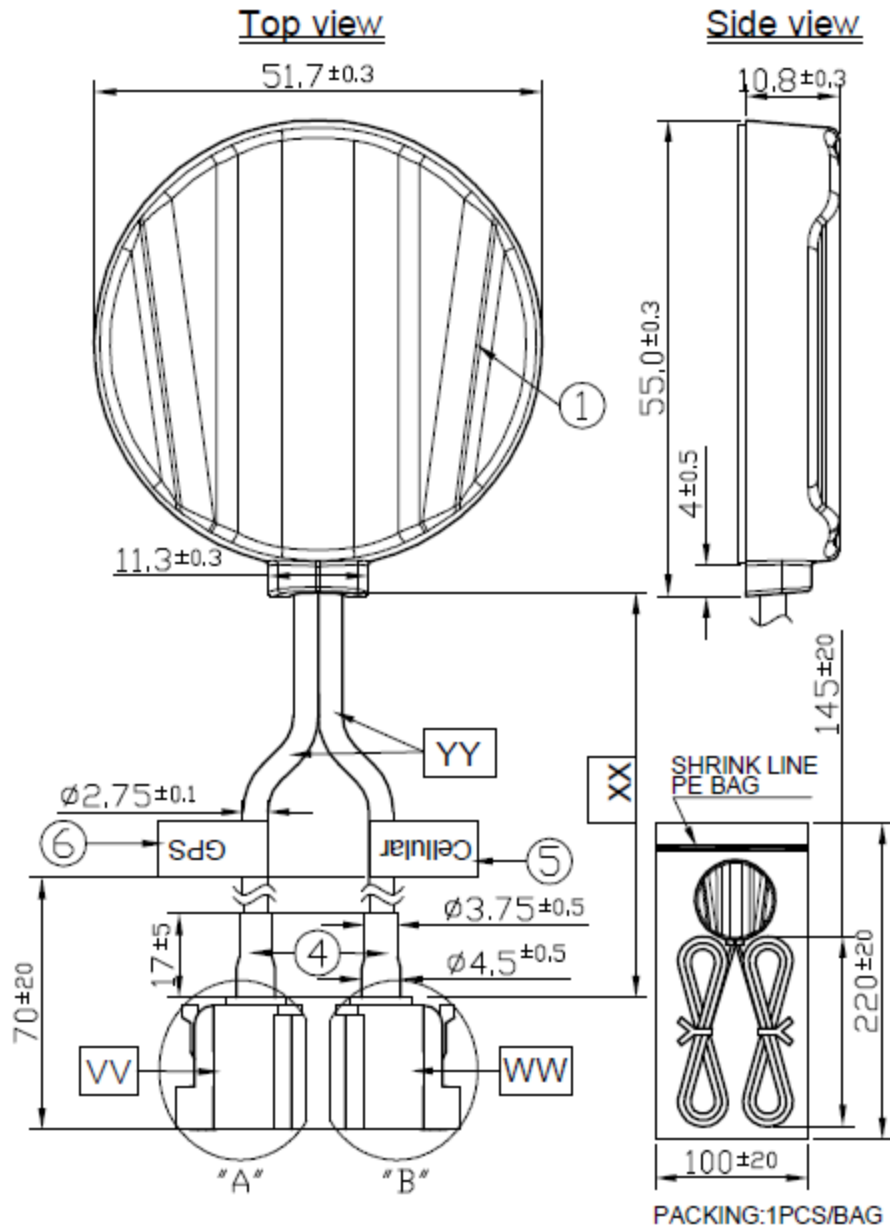


### 6.1.3. XY Plane

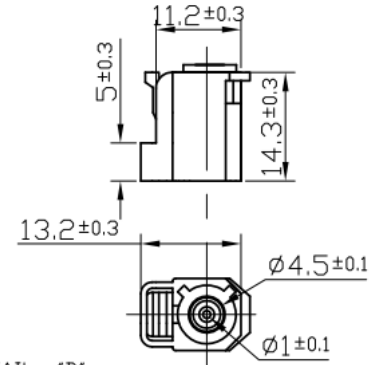
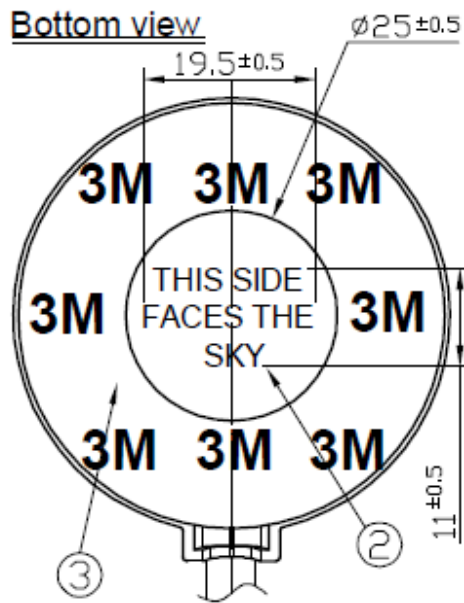


## 7. Mechanical Drawings

### 7.1. Unit

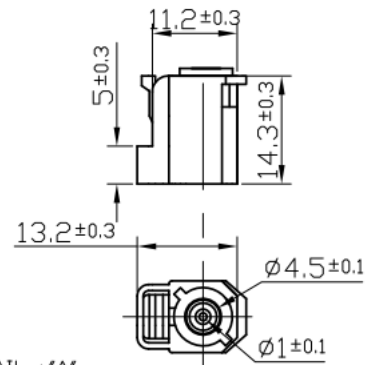


FAKRA Code D Violet



DETAIL : "B"  
SCALE: 1/1

FAKRA Code C Blue

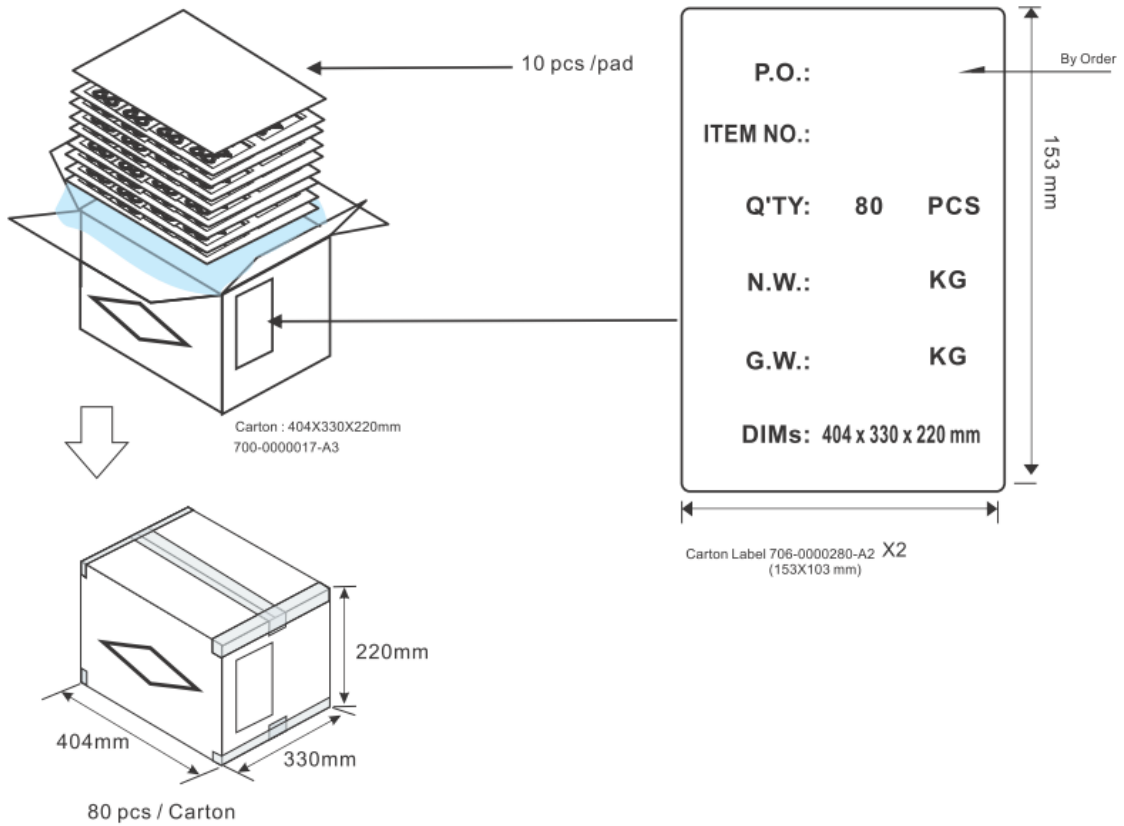


DETAIL : "A"  
SCALE: 1/1

|   | Name                           | Material     | Finish      | QTY |
|---|--------------------------------|--------------|-------------|-----|
| 1 | Housing                        | ABS          | Black       | 1   |
| 2 | Round Label                    | Art Paper    | White       | 1   |
| 3 | Scotch Brand Acrylic Foam Tape | 3M 4812      | White Liner | 1   |
| 4 | Heat Shrink tube               | PE           | Black       | 2   |
| 5 | Cellular Label                 | Coated Paper | Blue        | 1   |
| 6 | GPS Label                      | Coated Paper | Orange      | 1   |

|    | Name           | Spec              | Finish | QTY |
|----|----------------|-------------------|--------|-----|
| VV | Connector Type | FAKRA Code C GEN2 | Blue   | 1   |
| WW | Connector Type | FAKRA Code D GEN2 | Violet | 1   |
| XX | Cable Length   | 3000mm ±30mm      | Black  | 1   |
| YY | Cable Type     | RG174             | Black  | 2   |

## 7.2. Carton



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