

## SPECIFICATION

Part No.	:	<b>MA301.A.AB.010</b>
Product Name	:	MA.301 GPS/Penta-band Cellular Magnetic Antenna
Features	:	IP65 - Waterproof GPS - High gain LNA up to 32dB Penta-band 850/900/1800/1900/2100 MHz GSM/CDMA/PCS/DCS/UMTS/HSPA Low Profile Height 10.8mm Diameter 55.1mm RoHS Compliant



3D View  
(This side faces the sky)



Underside View  
(Magnet)

## 1. Introduction

The MA.301 is a combination small form factor high performance GPS and Penta-band Cellular (GSM/CDMA/PCS/DCS/ WCDMA/UMTS) antenna to simplify AVL or Fleet management antenna systems worldwide. It comes with magnet mount as standard. An internal O-ring meets IP-65 waterproof standards. With the strongest GPS and Cellular antenna design team in the industry and rigorous testing Taoglas offers guaranteed performance with your system and your environment.

The standard version comes with 3 metres RG174 cable and Fakra connectors for both GPS and Cellular feeds. Cables and connectors are customizable upon request.

## 2. Features

### GPS

- High LNA Gain up to 32 dB
- Antenna Gain  $28 \pm 2$  dB
- Miniaturized to 56.3 x 17.3 mm
- Low Noise 1.5 dB max
- Ultra-Low Power Consumption 6mA typ ( at 2.7V~3.3V dc)

### Cellular

- Advanced penta-band cellular antenna (GSM/CDMA/PCS/DCS/WCDMA/UMTS)

### Other

- IP65 Water Resistant due to Internal O-Ring Structure
- Quality textured covert design. Low profile
- UV resistant ABS housing
- Optional - high grade 3M double sided tape for quick and easy mounting
- Optional cables and connectors
- ROHS Compliant

### 3. Performance Specifications

Performance Specifications		
Items	GPS Antenna	Cellular Antenna
Features	High performance GPS ceramic patch antenna with cutting edge low noise amplifier	CDMA: 824~896 MHz GSM: 880~960 MHz PCS: 1850~1990 MHz DCS: 1710~1880 MHz UMTS/WCDMA
Frequency	1575.42 MHz $\pm$ 2MHz	As above
Gain	28 dB typ.	As patterns
	Gain at Zenith : - 3 dBi min	-
	Axial Ratio : 3.0 dB typ	
Noise Figure	1.5 dB max.	-
Polarization	RHCP	Linear
Bandwidth	10 MHz min @ -10dB	As S11
VSWR	1.92 max	$\leq$ 2.5
Impedance	50 $\Omega$	50 $\Omega$
Power Consumption	6mA ( at 2.7 ~ 3.3V dc)	-
Cable / Connector	Standard 2/3/5m RG-174 Cables and Connectors Fully Customizable	Standard 2/3/5m RG-174 Cables and Connectors fully Customizable
Operating Temperature	-40 $^{\circ}$ C ~ +85 $^{\circ}$ C	
Storage Temperature	-40 $^{\circ}$ C ~ +90 $^{\circ}$ C	
Size	56.3mm * 17.3 mm	
O-Ring	Embedded	
Housing	UV resistant ABS	

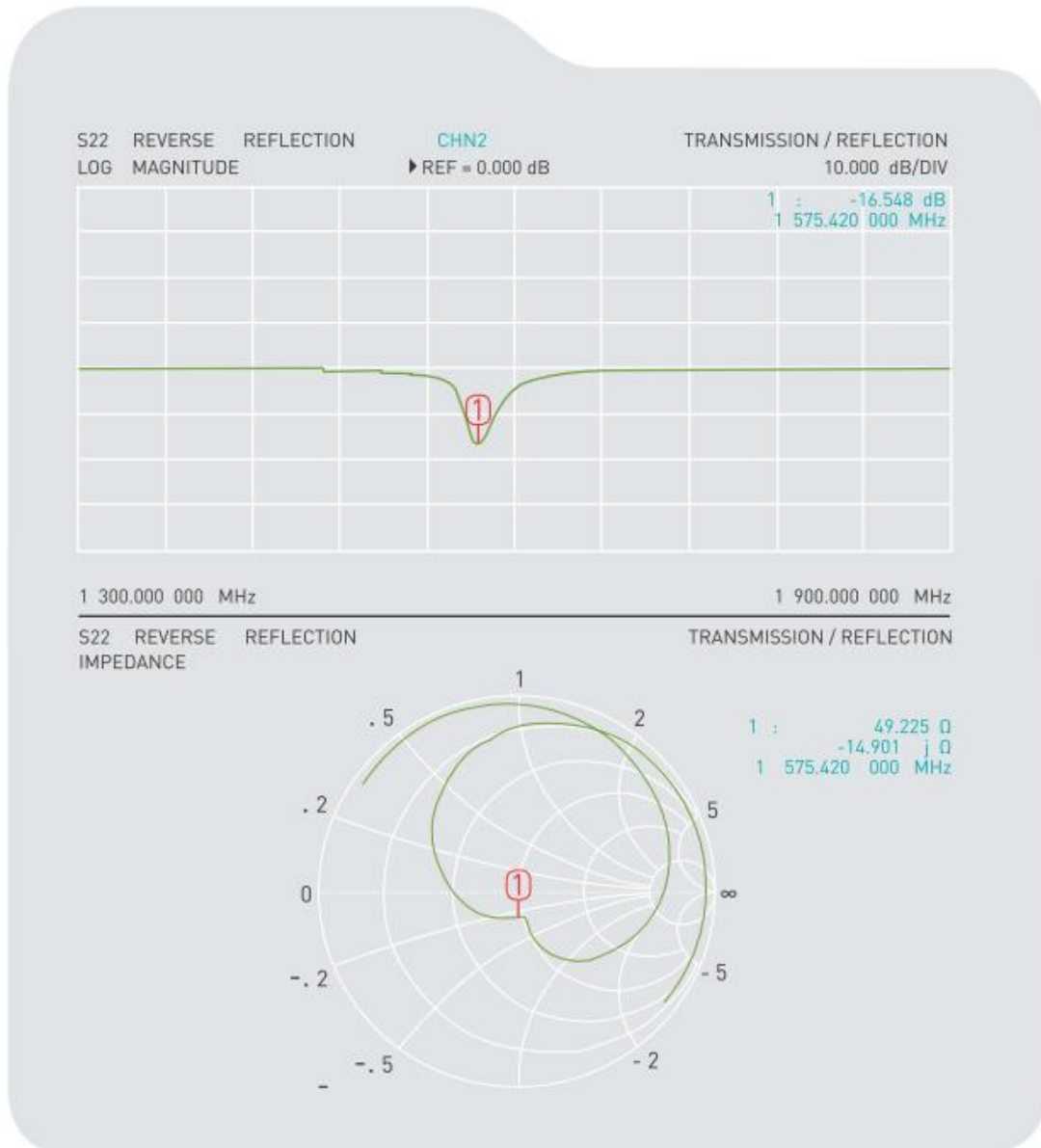
**\*note: specifications may be subject to change**

**Note**

1. The antenna is measured mounted on a 39(L) $\times$ 34.5(W) cm metal ground
2. All data are measured with RG-174 cable (length=3 M), excluding the LNA data
3. RG-174 cable attenuation (dB/100m)

GHz	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
RG-174	67	110	127	153	168	183	207	229	252	272	291	311

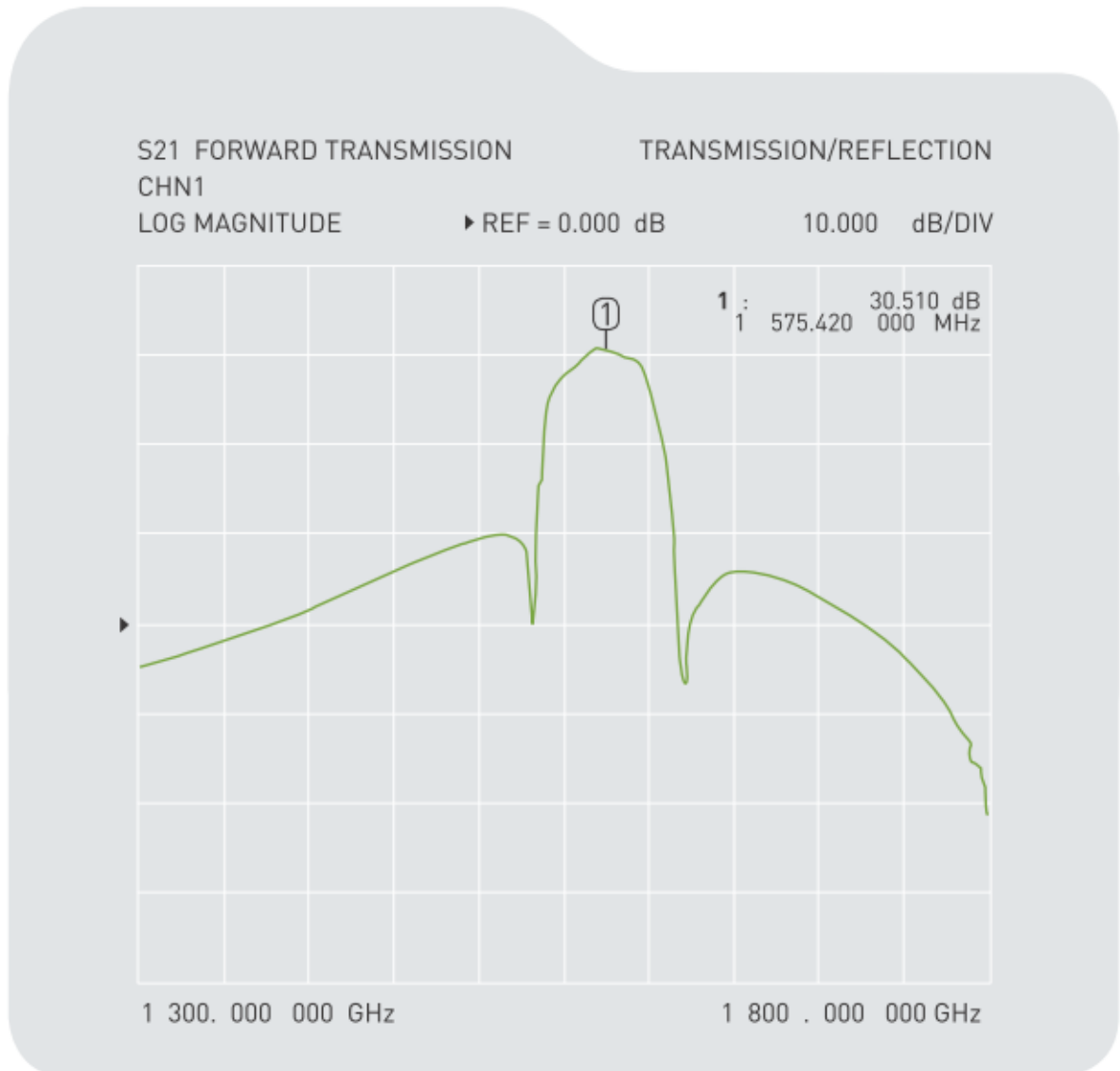
## 4. GPS Ceramic Antenna



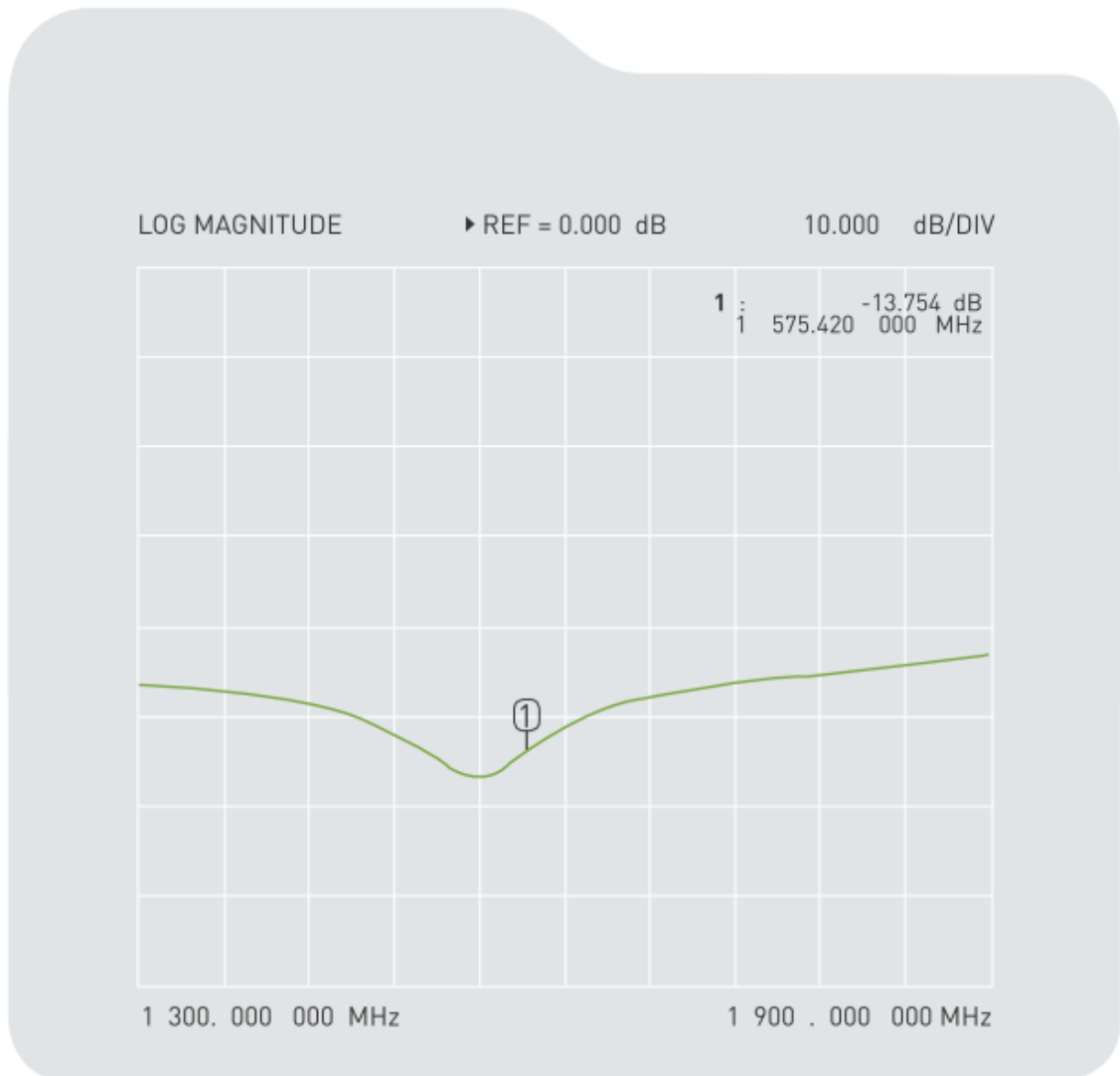
## 5. GSM Antenna



## 6. LNA Gain



## 7. LNA S22

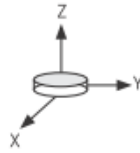


## 8. GSM Antenna Radiation Pattern

Frequency

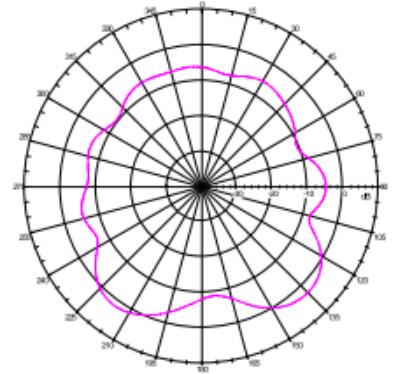
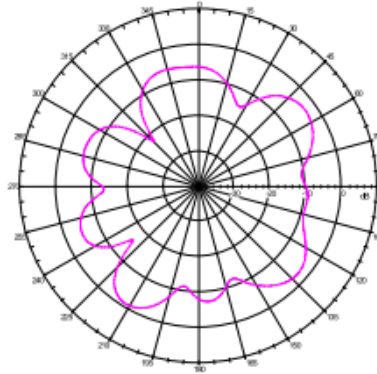
XZ Plane

YZ Plane



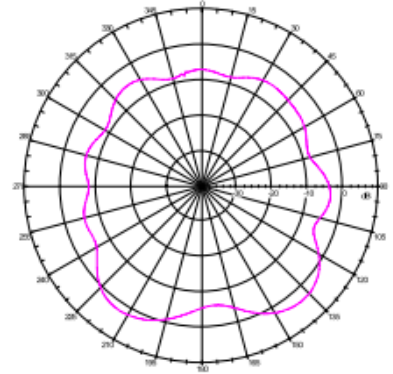
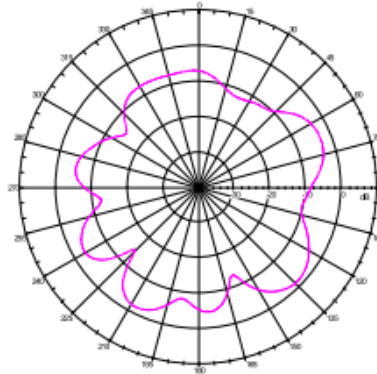
**824 MHz**

**Peak Gain: 1.526 dBi**



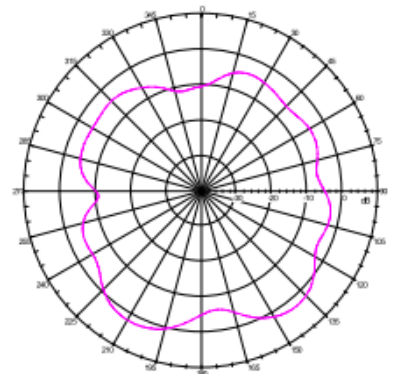
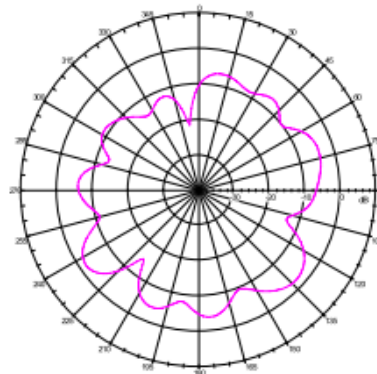
**880 MHz**

**Peak Gain: 1.996 dBi**



**960 MHz**

**Peak Gain: 1.133 dBi**

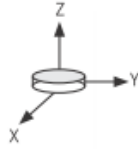




Frequency

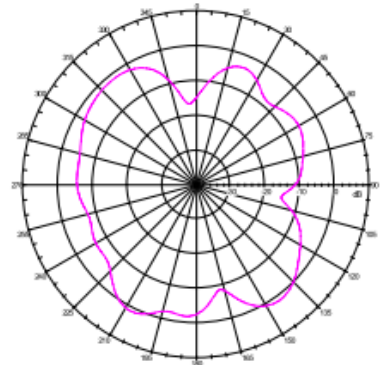
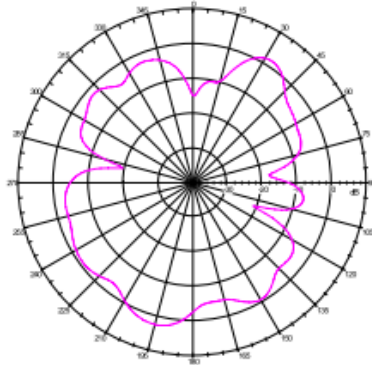
XZ Plane

YZ Plane



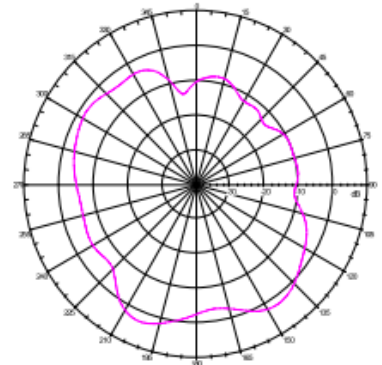
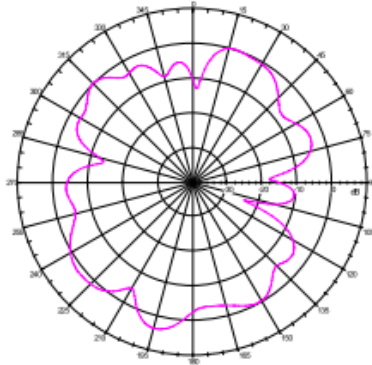
**1710 MHz**

**Peak Gain: 1.946 dBi**



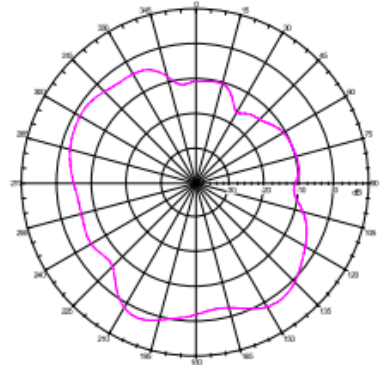
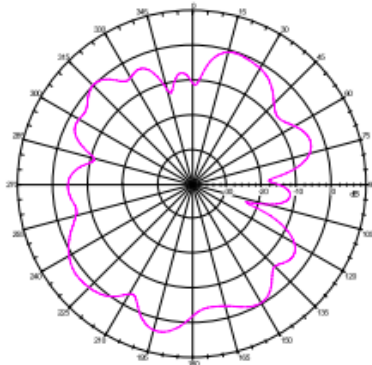
**1850 MHz**

**Peak Gain: 3.0 dBi**



**1880 MHz**

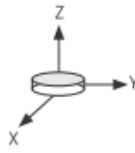
**Peak Gain: 3 dBi**



Frequency

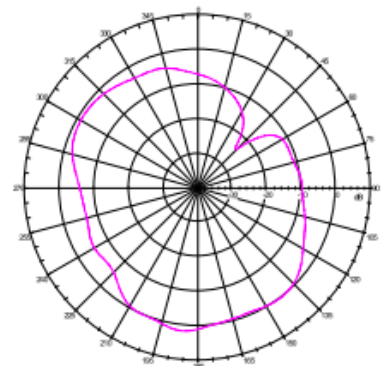
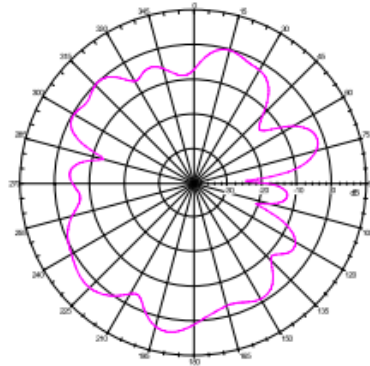
XZ Plane

YZ Plane



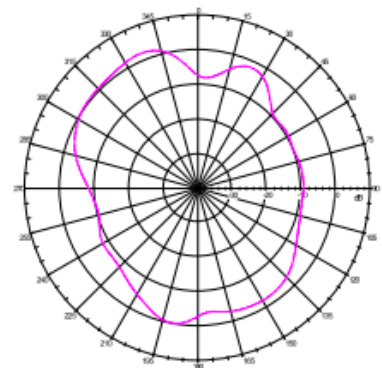
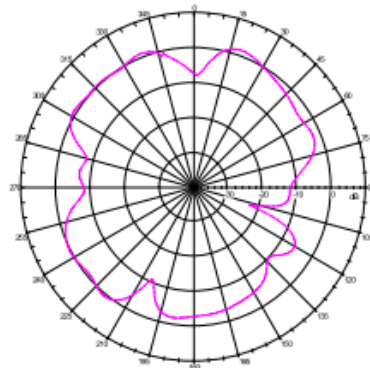
**1990 MHz**

**Peak Gain: 3.27 dBi**



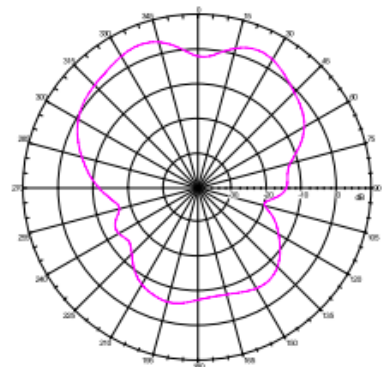
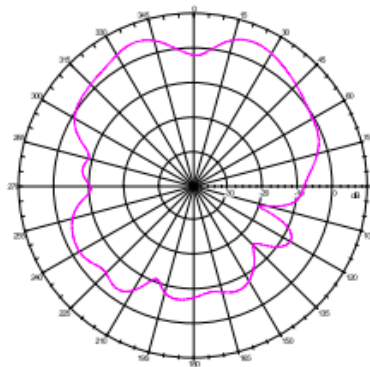
**2110 MHz**

**Peak Gain: 3.78 dBi**

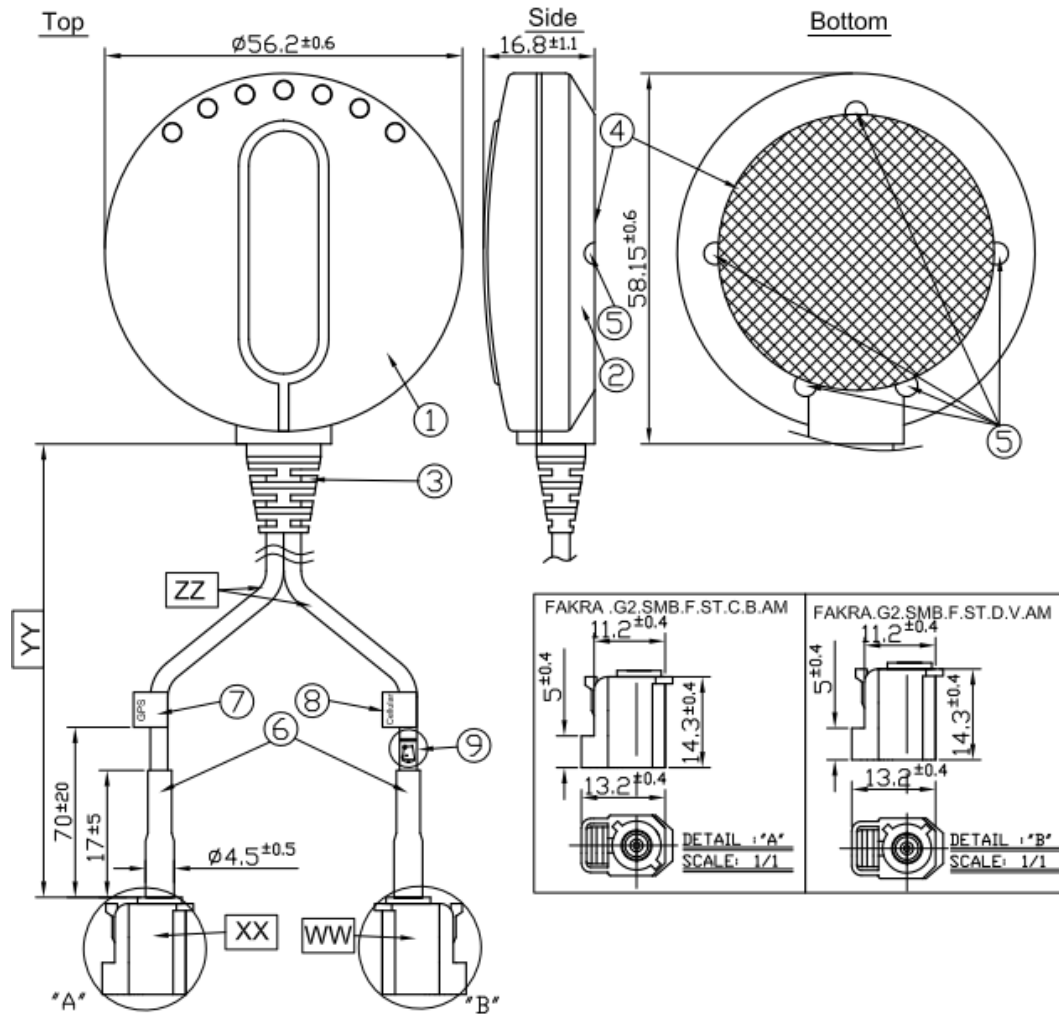


**2170 MHz**

**Peak Gain: 5.82 dBi**



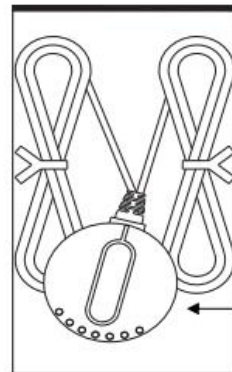
## 9. Drawing



	Name	Material	Finish	Quantity
1	Top Housing	ABS	Black	1
2	Bottom Housing	ABS	Black	1
3	SR	PVC	Black	1
4	Sticker	Matte Silver PET	Silver	1
5	2.6L Screw	Stainless Steel	Clear	5
6	Heat Shrink Tube	PE	Black	2
7	GPS Label	Coated Paper	Orange	1
8	Cellular Label	Coated Paper	Blue	1
9	WEEEE Label	Coated Paper	White	1
WW	Connector Type	Fakra Code D	Violet	1
XX	Connector Type	Fakra Code C	Blue	1
YY	Cable length	3000+/-60mm		
ZZ	Cable Type	RG-174		

## 10. Packaging

1pcs antenna per small PE bag  
80 small PE bag per box



MA301

Unit : mm

