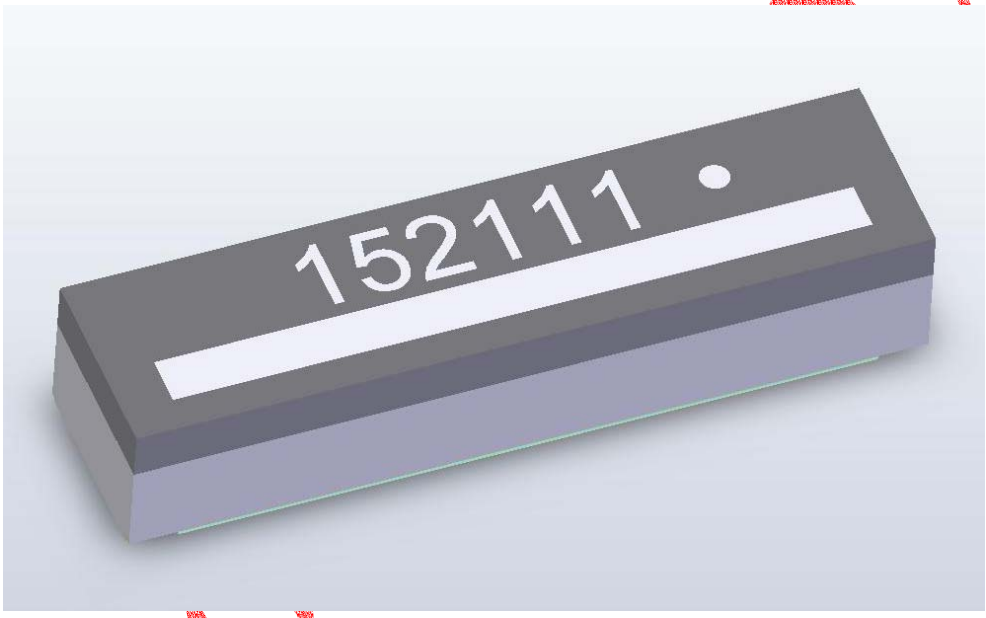
1.575 GHz GPS Band
<Patent Protection>

Approval Sheet

GPS Chip Antenna



922D03E15X11113

Ver. 1.02

2006/06/07

CHANT SINCERE CO., LTD.

DESCRIPTIONS

The exciting **922D03E15X11113** is one of the world's high-performance 1.575GHz band small antennas. It is for navigation system, aero plane servicing, automotive application, and other portable communication devices, etc.

This GPS chip antenna comprises a radiating structure of multiple meandered conducting strips, which are developed on a tiny piece of Printed Circuit Board (PCB) and packed with a Liquid Crystal Polymer (LCP) dielectric composite material to achieve size, performance characteristics and cost effectiveness superior to other designs.

The incredibly compact surface mountable package measures a merely 8.0 mm (L) x 2.0 mm (W) x 1.5 mm (H) in dimensions and is fully compatible with handmade and reflow attachment processes. The antenna's favorable electrical specifications, stability and cost-effectiveness make it the logical choice for a wide variety of applications in the 1.575GHz GPS band.

FEATURES

- Low Profile, Ultra-Thin, Light Weight (0.06g)
- Miniaturized Size (8.0×2.0×1.5 mm^3)
- Omni-Directional Antenna Patterns
- Wide Bandwidth
- High efficiency (Gain~1dBi)
- 50Ω Characteristic Impedance
- Elliptically Polarization (1:3)
- Fully Manual and Surface Mount Compatible
- Incredibly Compact SMD Package
- LCP Insert Molding Technology
- Cost-Effective

APPLICATIONS

- PDA/Mobile Phone/Smart Phone
- Automotive Industry
- Navigation System
- Aeroplane Servicing
- Satellite
- Positioning Device
- Tracker
- Radar

SPECIFICATIONS

- **922D03E15X11113**

KEY FEATURES:

- Low Profile, Ultra-Thin, Light Weight (0.06g)
- Miniaturized Size (8.0×2.0×1.5mm^3)
- Cost-Effective

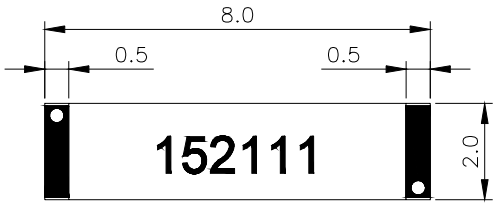
MAIN APPLICATIONS:

- PDA/Mobile Phone
- Automotive application

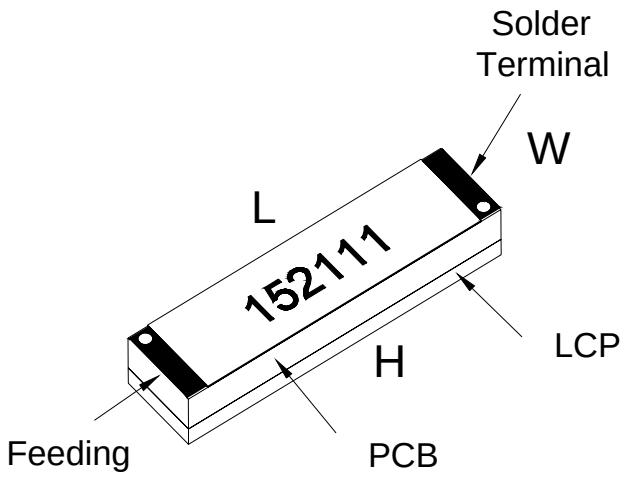
	GPS Chip Antenna
Dimension (mm^3)	8.0×2.0×1.5
Central Frequency (MHz)	1575
Bandwidth (MHz)	> 60
Gain (dBi) (Typical)	1
VSWR	2 (max.)
Return Loss (dB)	-10 (max.)
Polarization	Elliptically (1:3)
Pattern	Omni-Directional
Impedance (Ω)	50
Operating Temperature (℃)	-25~+85
Construction	LCP Insert Molding

CHARACTERISTICS

Pad Layout (unit：mm)



Construction



Antenna size：8.0 mm (L) x 2.0 mm (W) x 1.5 mm (H)

Notice:

When a satellite signal reflects off building and other objects, creating multiple paths to the receiver, results its polarization inverted from right hand circular to left hand circular. Our GPS Antenna has Elliptically Polarization and the Axis Ratio is about 1:3, therefore, when place our GPS Antenna on Top of PCB then should choose right hand circular polarization (RHCP) type, on the other hand, when place our GPS Antenna on Bottom of PCB then should choose left hand circular polarization (LHCP) type.

For best results, the chip antenna 922D03E15X11113 should be mounted on one corner of 0.8 mm thick FR4 PCB with 10×17 mm^2 empty area and 50Ω micro strip-line input.

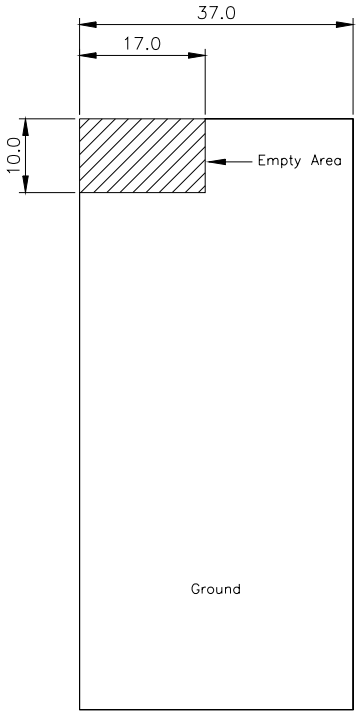
For another condition, the chip antenna 922D03E15X11113 also could be mounted on one corner of 0.8 mm thick FR4 PCB with 8.0×4.0 mm^2 empty area and 50Ω microstrip-line input and still maintain well elliptically polarization (the axial ratio is about 1:3) but it must be utilized that the first parallel winding 1pF capacitor and then series winding 1.5pF capacitor as matching circuit component in order to improve the return loss of chip antenna at 1.575 GHz central frequency. Consequently, we can use the method of Pi circuit to tune central frequency of chip antenna. As regard, it can achieve excellent performance and desire different customer demands.

About above the results are mentioned as shown belows：

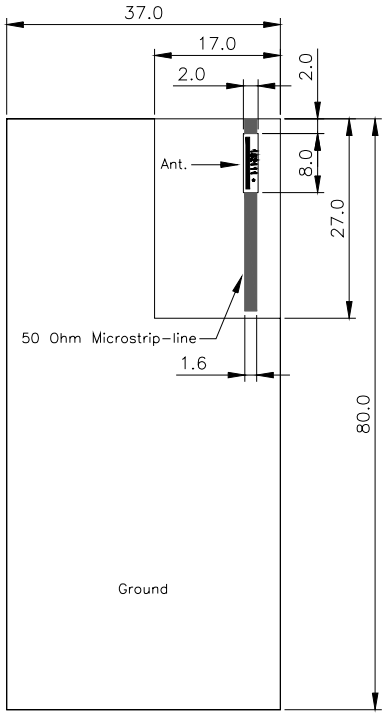
Land Pattern (unit：mm)

Condition (1)：

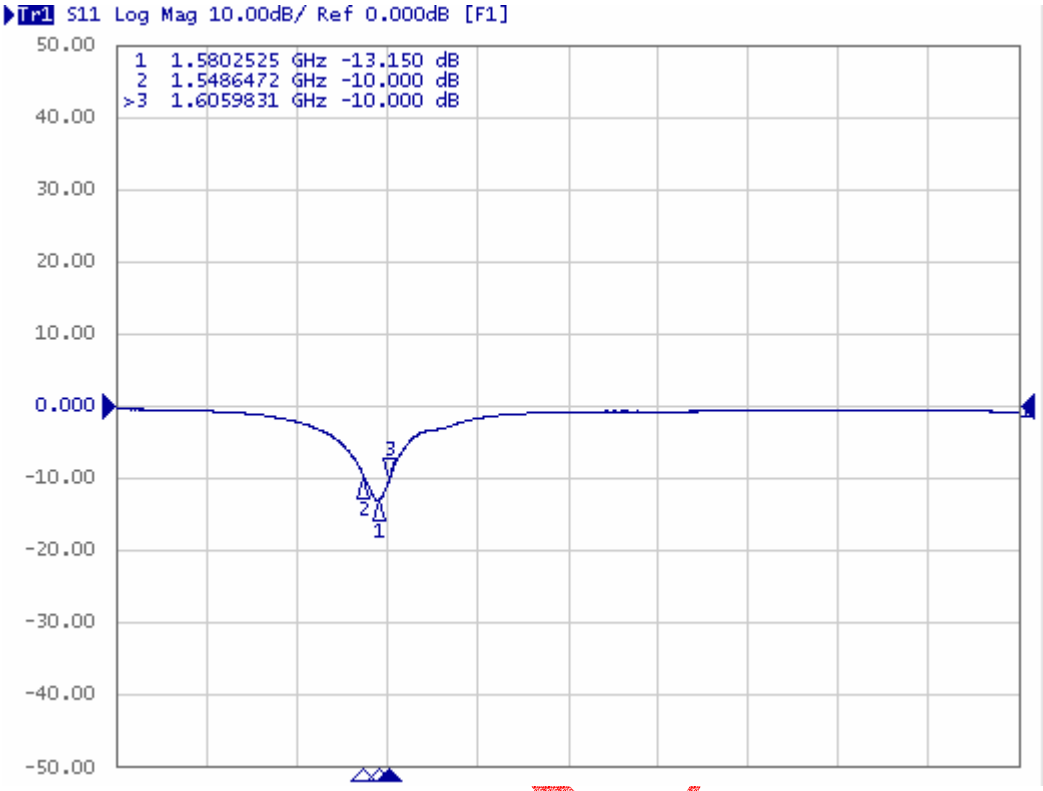
Bottom view



Top View

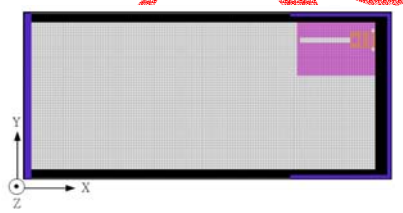


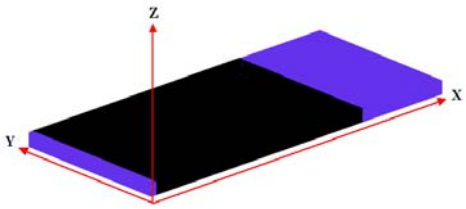
Return loss and Bandwidth

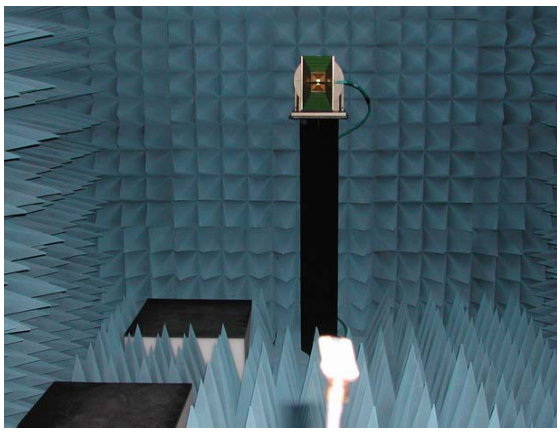


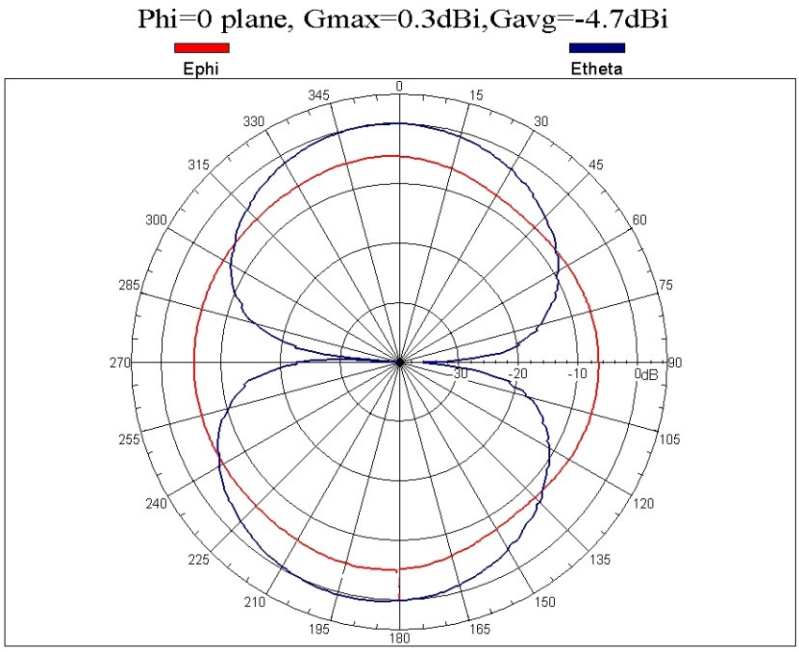
Radiation Pattern

(unit：dBi)

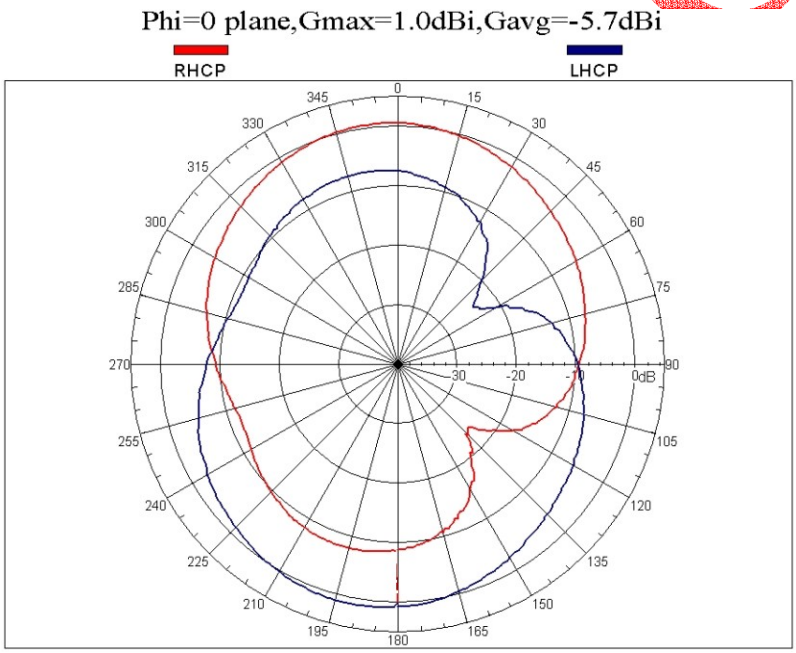




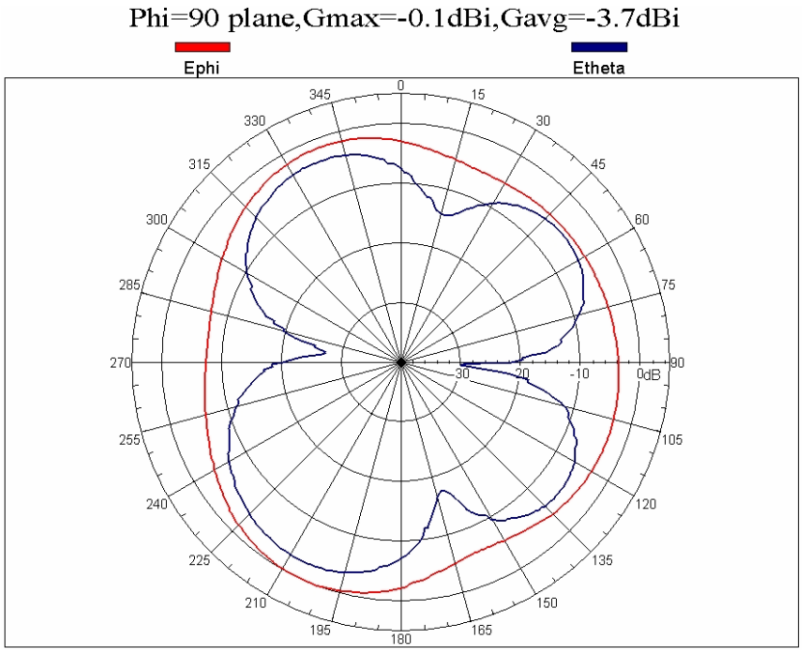


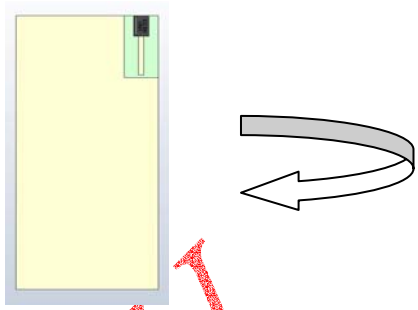


Phi=0 Plane (X-Z Plane) for 1.575 GHz (Linear Polarization)

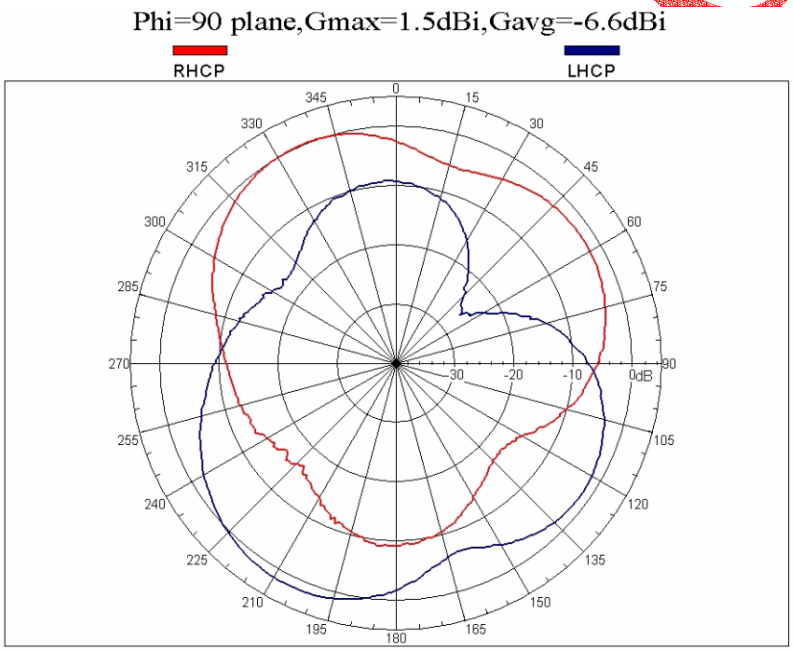


Phi=0 Plane (X-Z Plane) for 1.575 GHz (Circular Polarization)

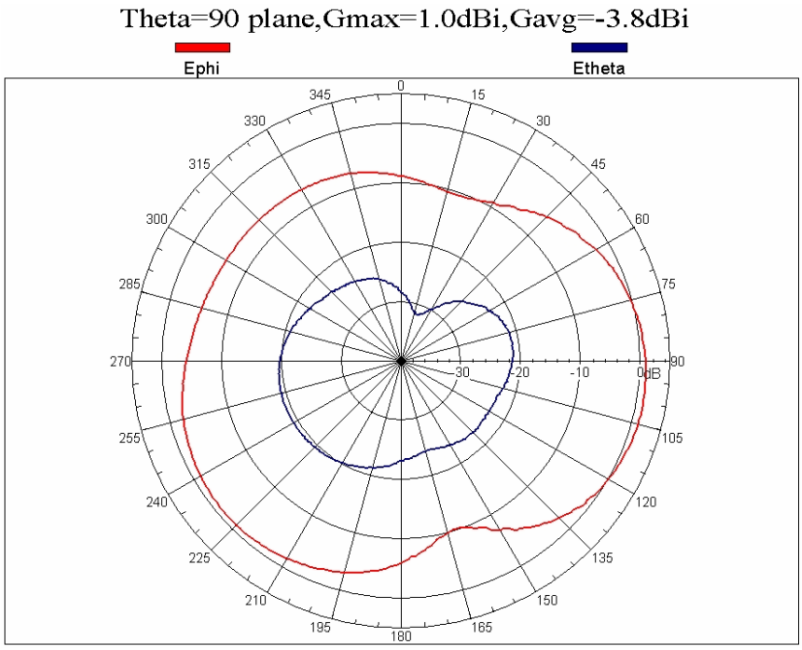


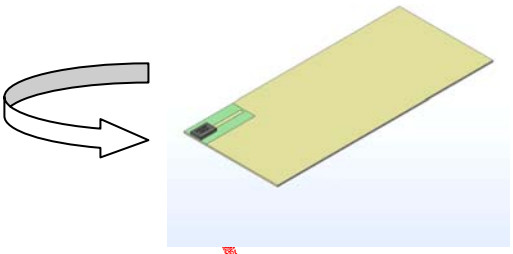


Phi=90 Plane (Y-Z Plane) for 1.575 GHz (Linear Polarization)

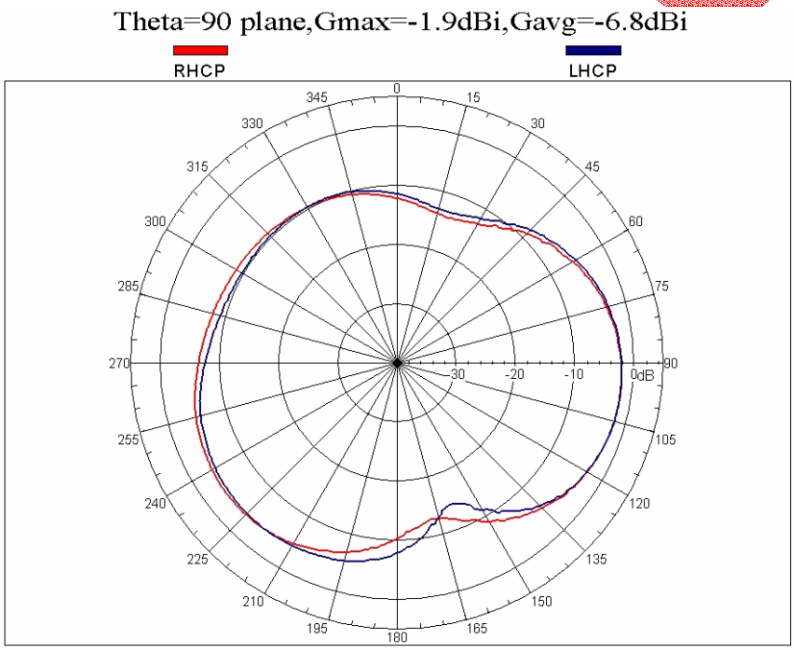


Phi=90 Plane (Y-Z Plane) for 1.575 GHz (Circular Polarization)



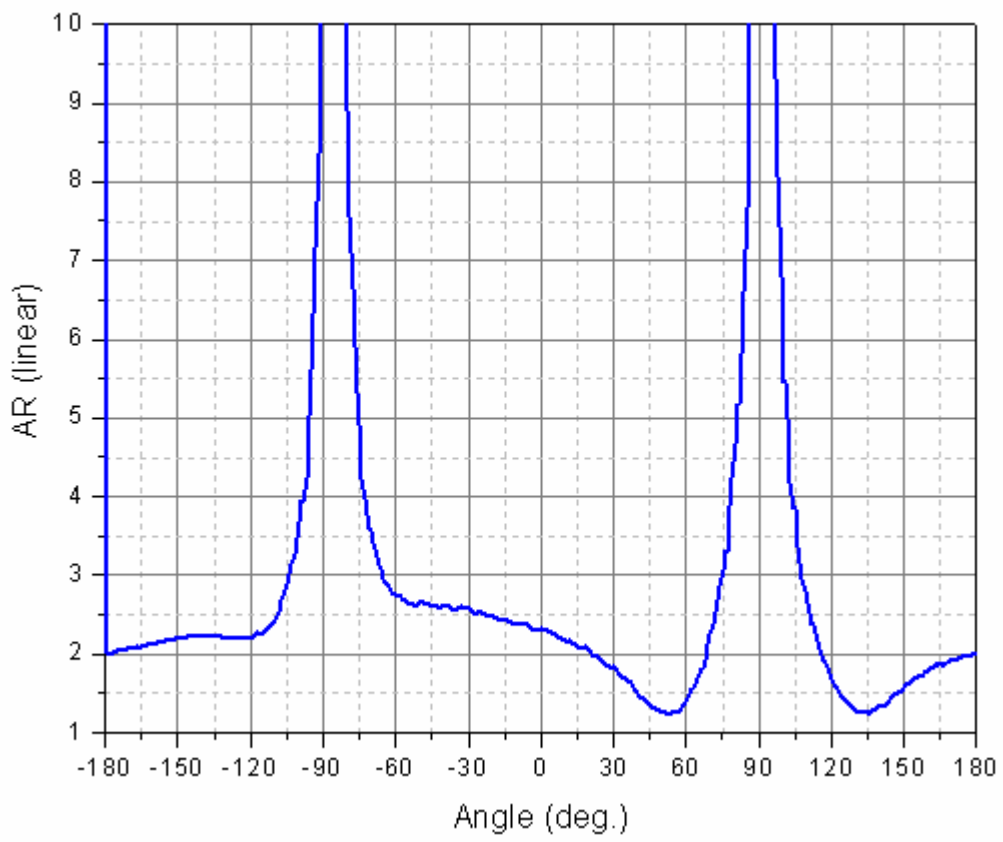


Theta=90 Plane (X-Y Plane) for 1.575 GHz (Linear Polarization)

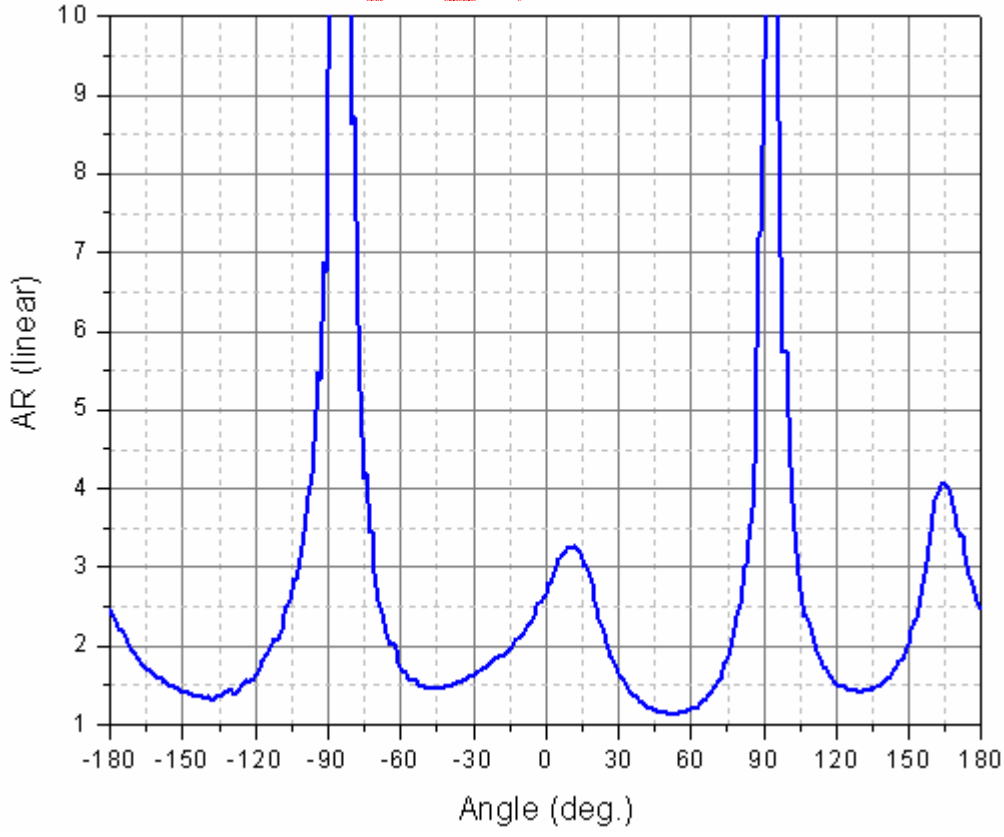


Theta=90 Plane (X-Y Plane) for 1.575 GHz (Circular Polarization)

Axial Ratio



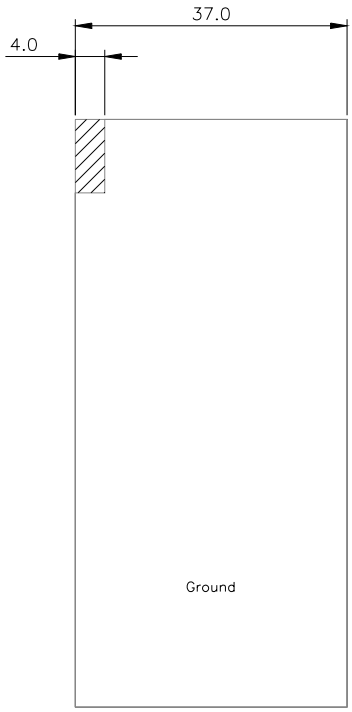
AR at 1.575GHz for phi=0˚(X-Z plane) (scale：linear)



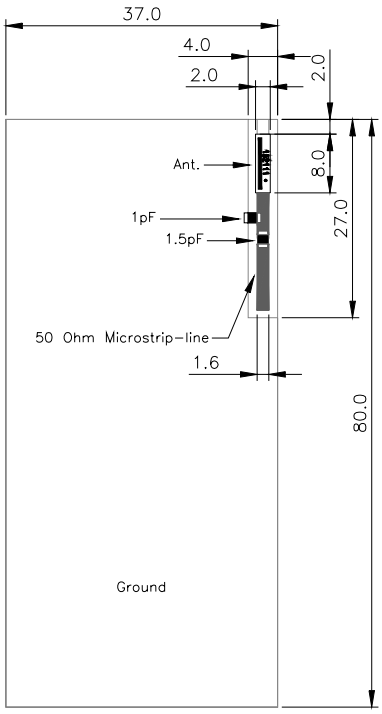
AR at 1.575GHz for phi=90˚(Y-Z plane) (scale：linear)

Condition (2)：

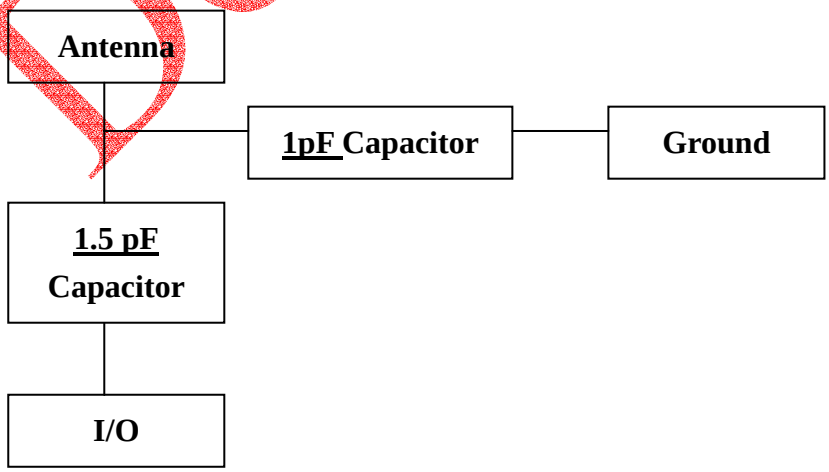
Bottom view



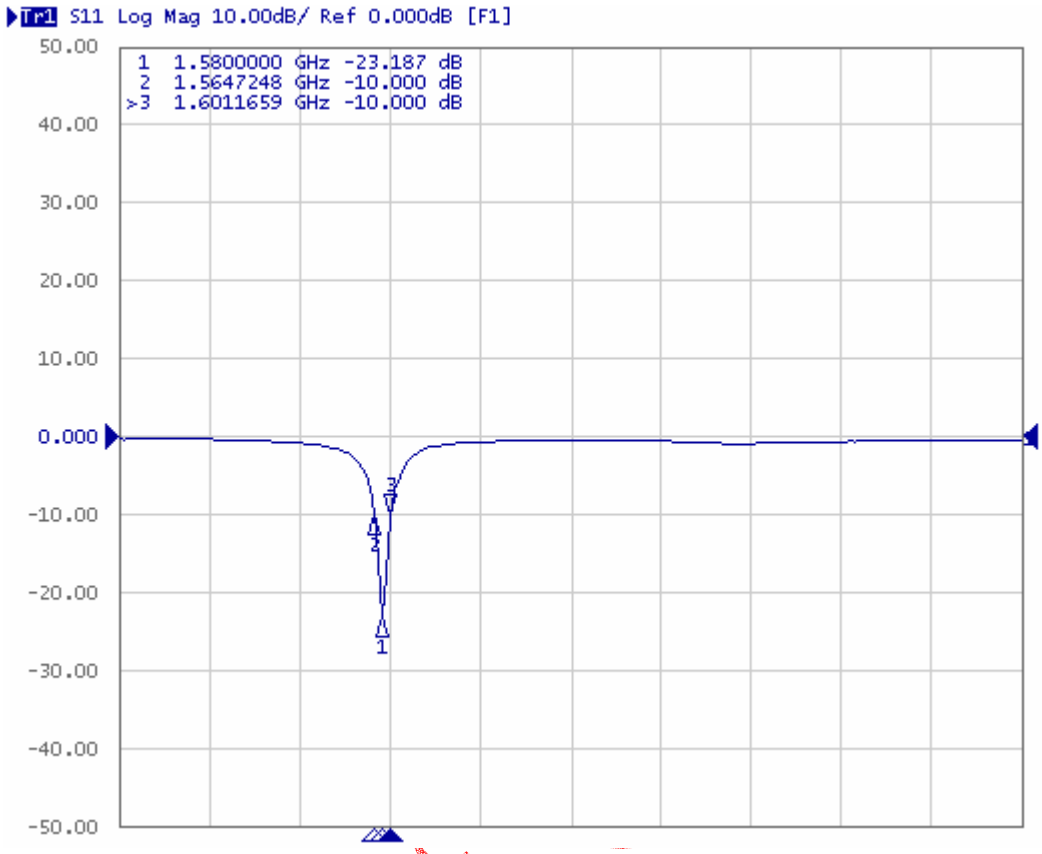
Top View



Matching Circuit

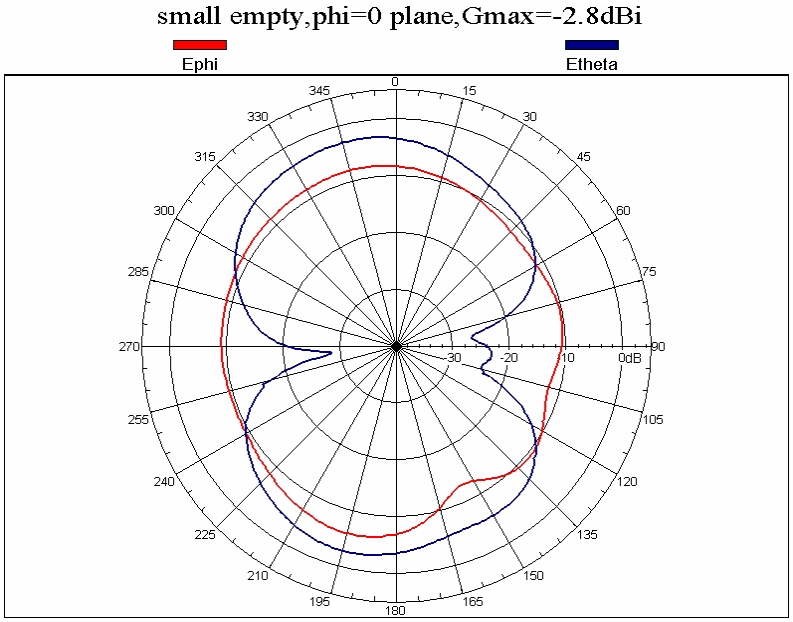


Return loss and Bandwidth

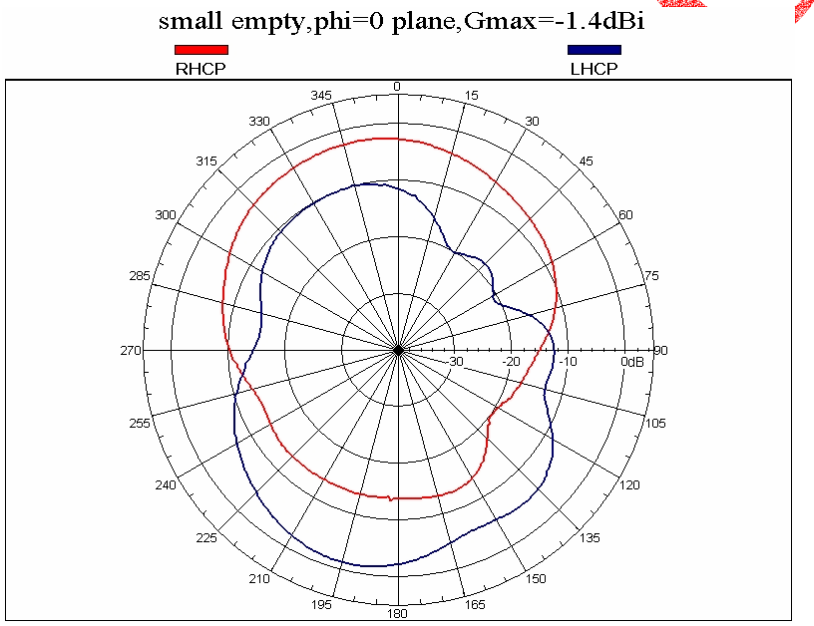


Radiation Pattern

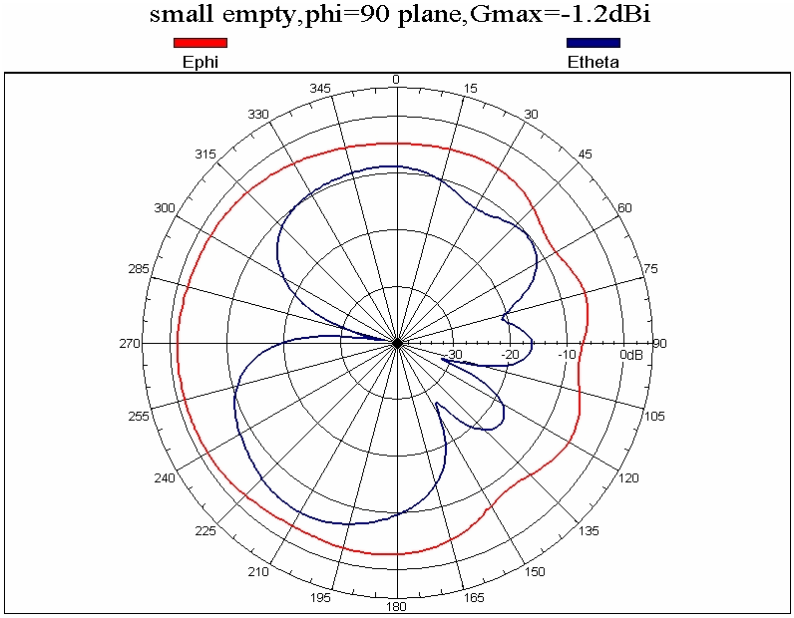
(unit：dBi)

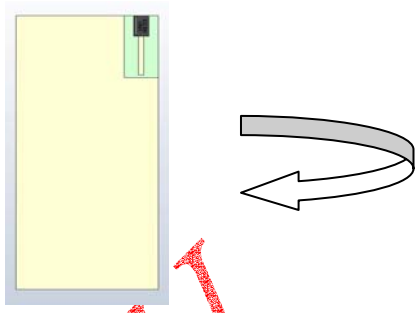


Phi=0 Plane (X-Z Plane) for 1.575 GHz (Linear Polarization)

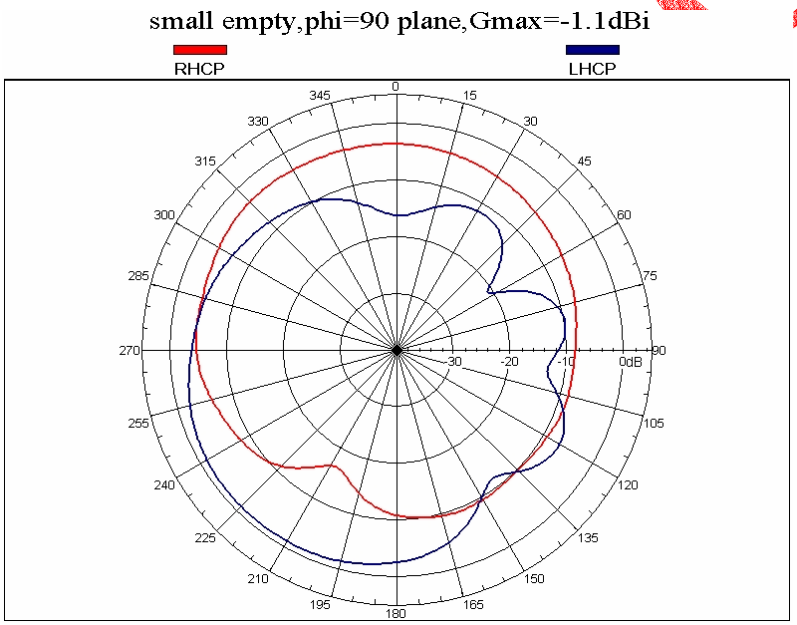


Phi=0 Plane (X-Z Plane) for 1.575 GHz (Circular Polarization)

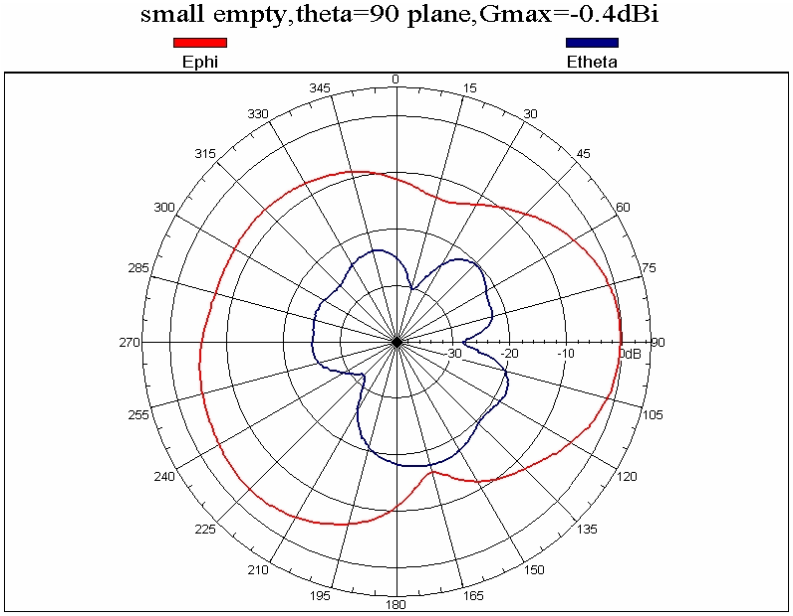


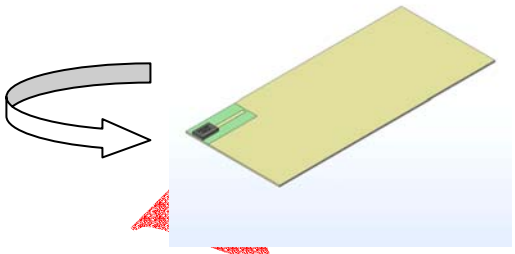


Phi=90 Plane (Y-Z Plane) for 1.575 GHz (Linear Polarization)

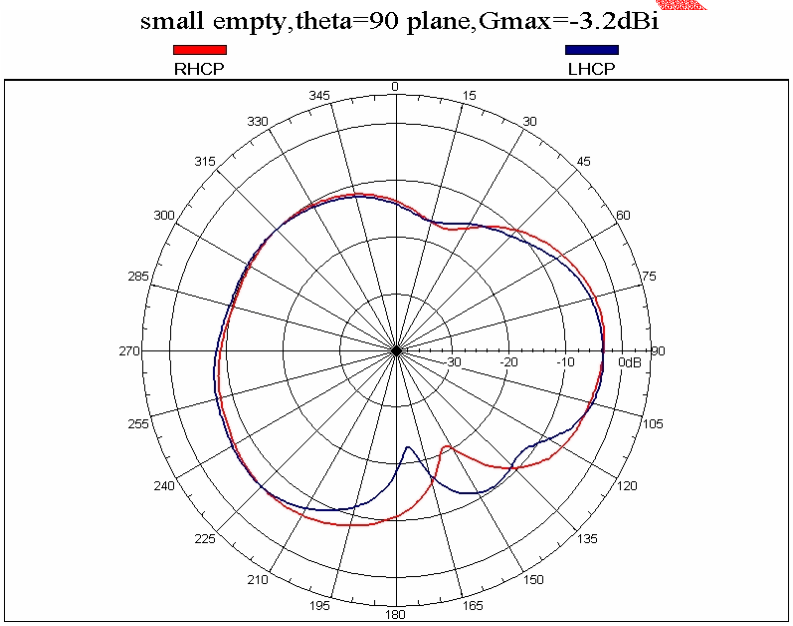


Phi=90 Plane (Y-Z Plane) for 1.575 GHz (Circular Polarization)



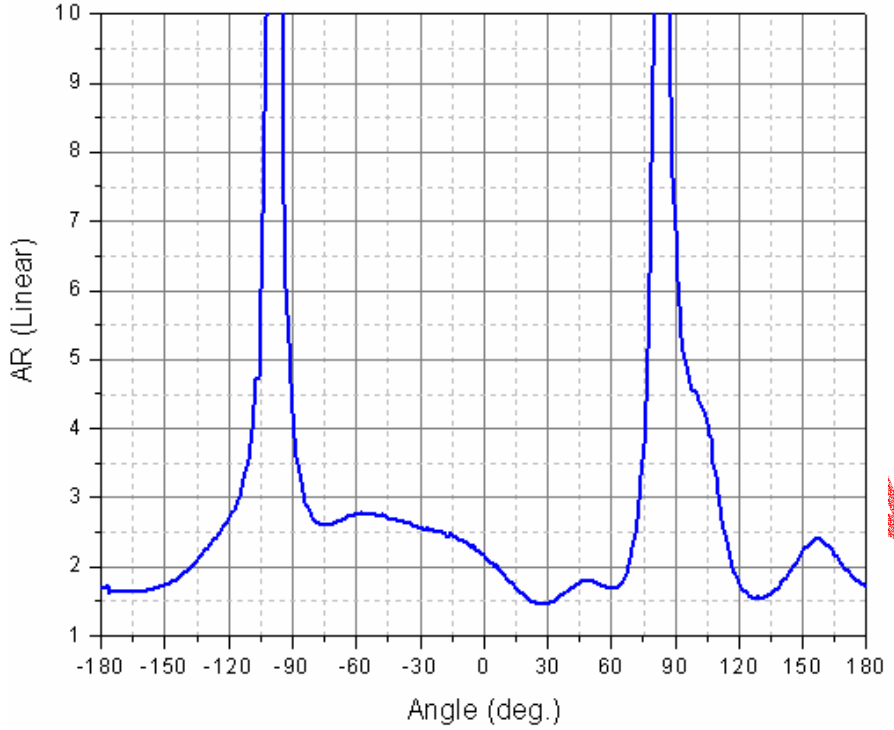


Theta=90 Plane (X-Y Plane) for 1.575 GHz (Linear Polarization)

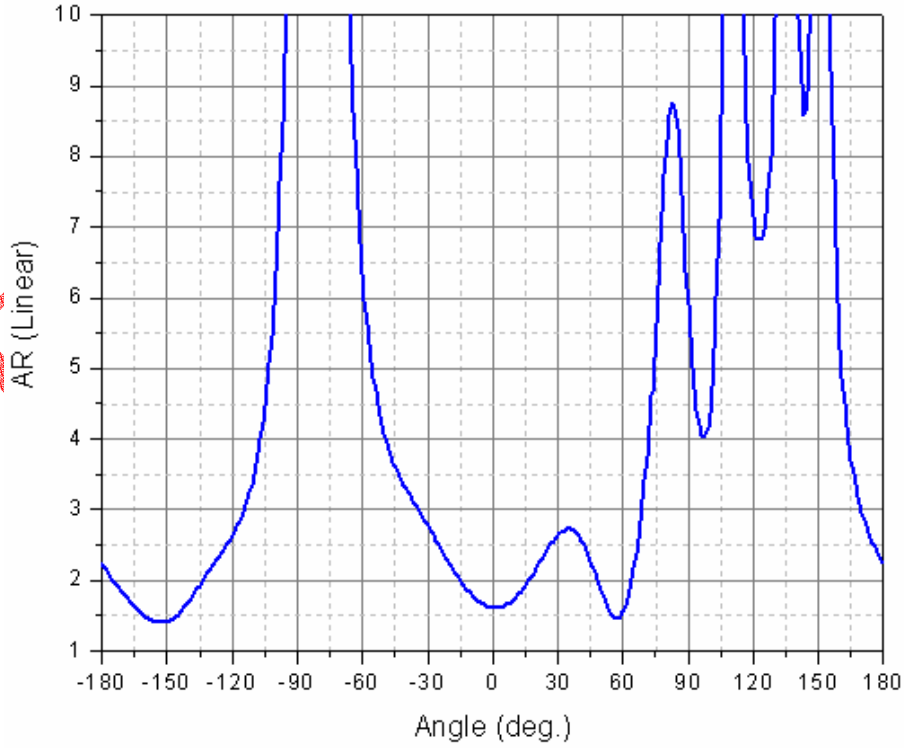


Theta=90 Plane (X-Y Plane) for 1.575 GHz (Circular Polarization)

Axial Ratio



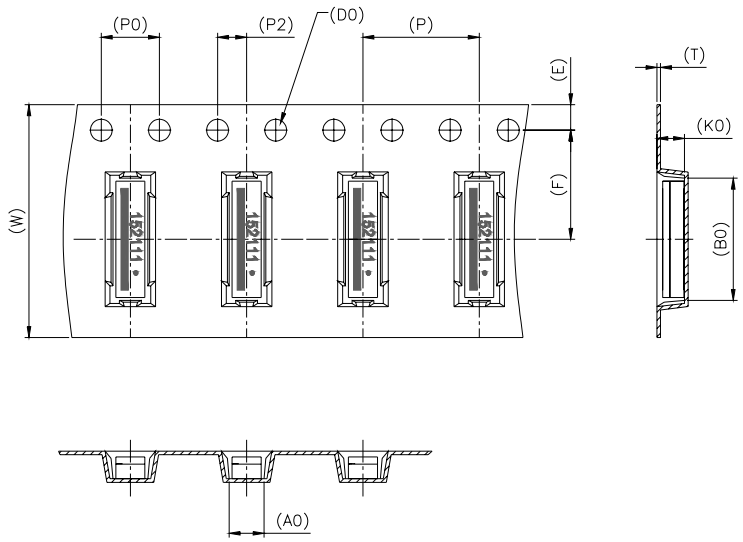
AR at 1.575GHz for phi=0˚(X-Z plane) (scale：linear)



AR at 1.575GHz for phi=90˚(Y-Z plane) (scale：linear)

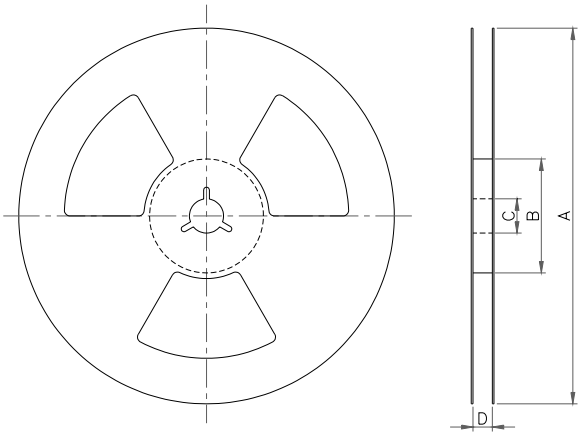
PACKING

Plastic Tape Specification (unit: mm)



Index	W	E	F	T	P	K0
Dimension(mm)	16.00 ± 0.30	1.75 ± 0.10	7.50 ± 0.10	0.25 ± 0.05	8.00 ± 0.10	1.90± 0.10
Index	P0	P2	D0	A0	B0	
Dimension(mm)	4.00 ± 0.10	2.00 ± 0.10	Φ1.50	2.40 ± 0.10	8.40 ± 0.15	

REEL DIMENSIONS (unit: mm)



Index	A	B	C	D
Dimension(mm)	Φ330	Φ100	Φ13.5	17.0 ± 0.5

Taping Quantity: MOQ=2K pieces per 13” reel.

HOW TO ORDER

922 D03 E 15 X 1 11 13

1 2 3 4 5 6

1. SERIED NO.

922= GPS Chip Antenna

2. TYPE

D03=2x8 mm^2

3. ENVIRONMENT PROTECTION MATERIAL

E=RoHS

4. THICKNESS

15=1.5mm

5. FREQUENCY

0=<1.575GHz

1= 1.575GHz

2=>1.575GHz

6. MOUTING SIDE

11=TOP MOUNT (RHCP)

CHANGE :

1. Revised Feed Direction of construction.

CHANT SINCERE CO., LTD.
7F.-2, No.188, Datong Rd., Sec. 3
Sijhih City, Taipei County 221, Taiwan
TEL：886-2-8647-1251
FAX：886-2-8647-1744
E-MAIL：aaron.hu@coxoc.com.tw
www.coxoc.com.tw ; www.co-linkwireless.com