

DPA 1575A

Dielectric PIFA Antenna (10*4.0*3.0mm) ROHS



This specification covers the dielectric PIFA antenna for GPS or GPS+GLONASS

Product Specifications

Frequency(MHz): 1575.42MHz±1.023MHz

Configuration: EG PIFA

Polarization: Linear

Mode: $\lambda / 4$

Band width(MHz): 20 (Typ)

Size (m/m): 10*4.0*3.0

Weight (g): 0.5

SMD: SMD

Removed GND area: 11*6.0

Ex-Matching circuit: Non

Peak Gain: 1.5dBic

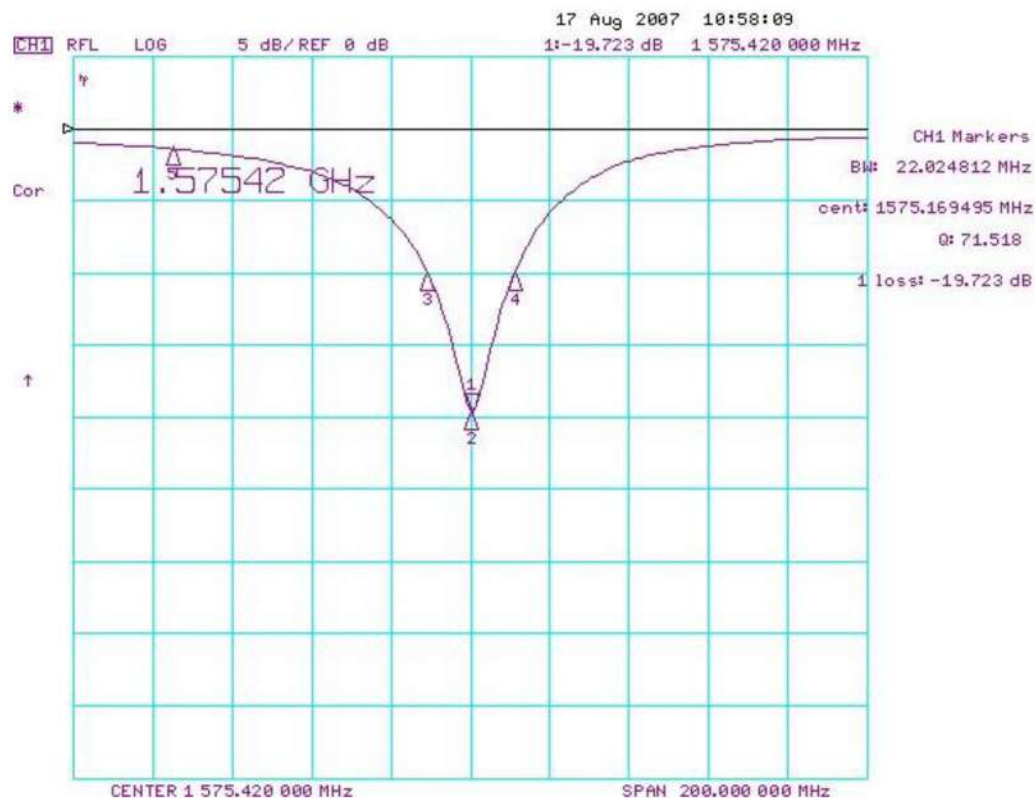
Average Gain: -4.5dBic

VSWR: 2.0

Axial Ratio(dB): --

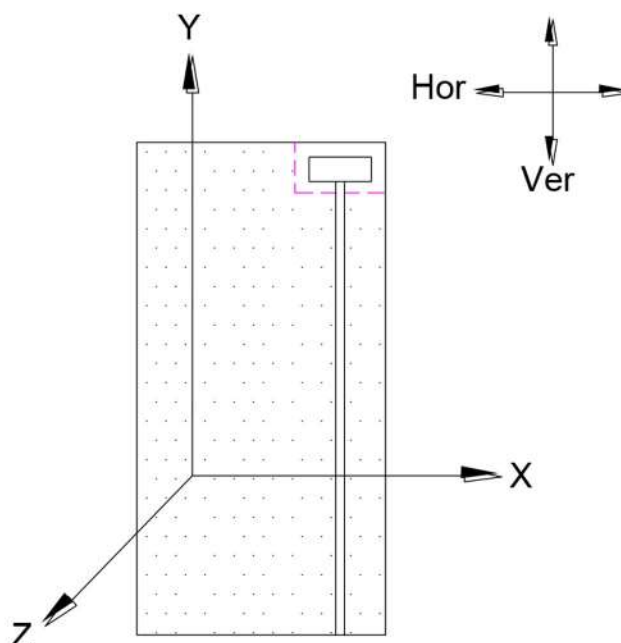
- Data is measured on Cirocomm STD PCB.
- PIFA: Planer Inverted F Antenna.
- EG PIFA: External Ground PIFA.

Reflection Characteristics



Horizontal Orientation Shown

- * Gain is measured at CIROCOMM PCB (50*100*0.8mm)
- * Ant position: Right side · Horizontal





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Gain and Efficiency

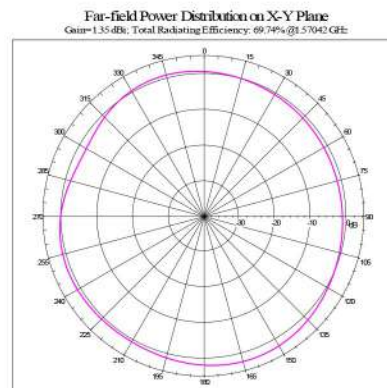
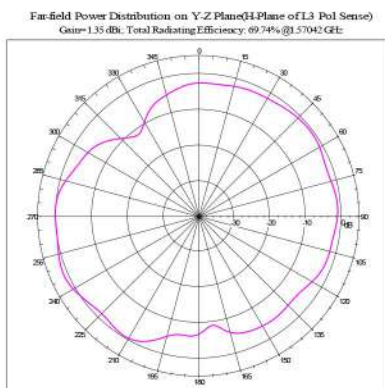
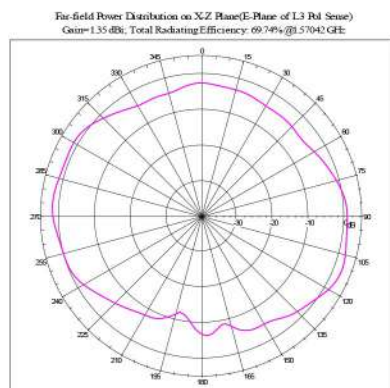
	Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
1	1570.42	1.35	69.74
2	1571.42	1.34	69.75
3	1572.42	1.32	69.58
4	1573.42	1.28	69.18
5	1574.42	1.24	68.70
6	1575.42	1.19	68.18
7	1576.42	1.14	67.64
8	1577.42	1.09	67.14
9	1578.42	1.07	66.84
10	1579.42	1.04	66.44
11	1580.42	0.96	65.43

Power Average Gain

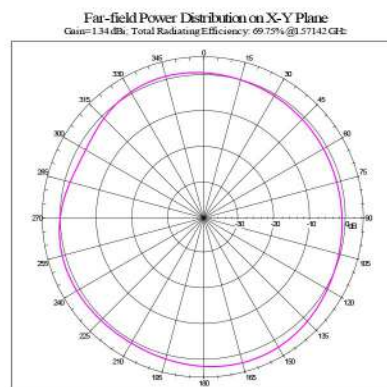
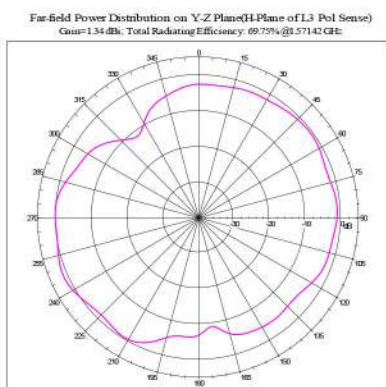
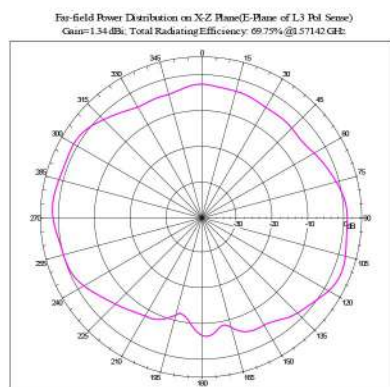
Frequency(GHz)		Plane	Average Gain(dBi)
1	1570.42	XY plane	0.052
		YZ plane	-2.859
		XZ plane	-2.446
2	1571.42	XY plane	0.061
		YZ plane	-2.864
		XZ plane	-2.460
3	1572.42	XY plane	0.056
		YZ plane	-2.880
		XZ plane	-2.486
4	1573.42	XY plane	0.036
		YZ plane	-2.911
		XZ plane	-2.527
5	1574.42	XY plane	0.012
		YZ plane	-2.945
		XZ plane	-2.574
6	1575.42	XY plane	-0.016
		YZ plane	-2.981
		XZ plane	-2.624
7	1576.42	XY plane	-0.046
		YZ plane	-3.016
		XZ plane	-2.674
8	1577.42	XY plane	-0.073
		YZ plane	-3.049
		XZ plane	-2.724
9	1578.42	XY plane	-0.086
		YZ plane	-3.073
		XZ plane	-2.762
10	1579.42	XY plane	-0.103
		YZ plane	-3.107
		XZ plane	-2.814
11	1580.42	XY plane	-0.160
		YZ plane	-3.182
		XZ plane	-2.902

Antenna Pattern for Bluetooth

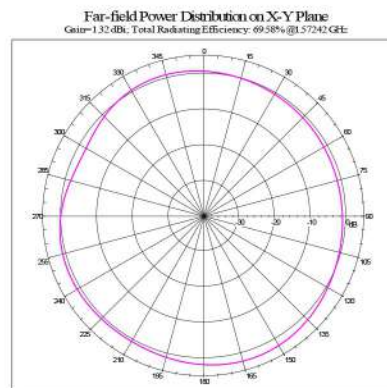
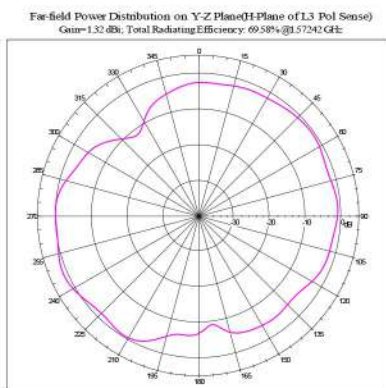
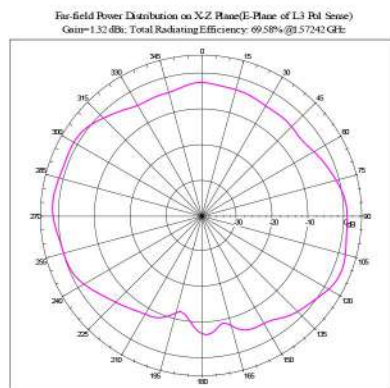
Frequency :1570.42 MHz



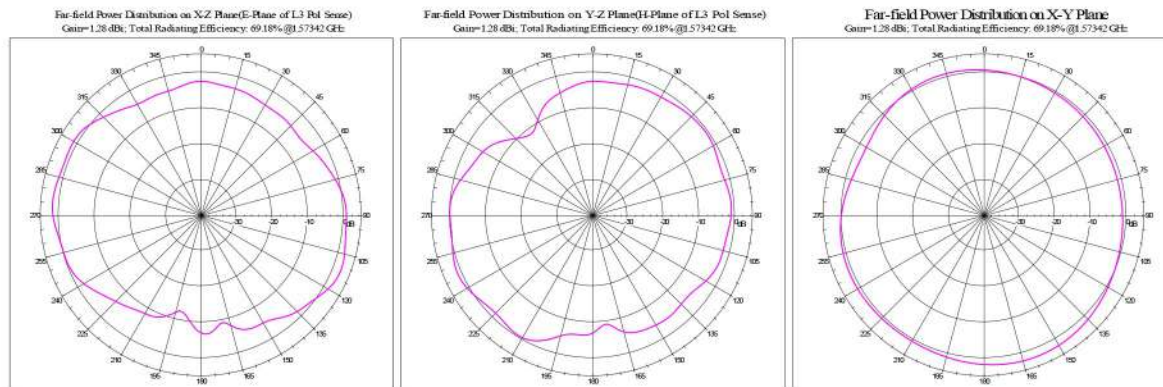
Frequency :1571.42 MHz



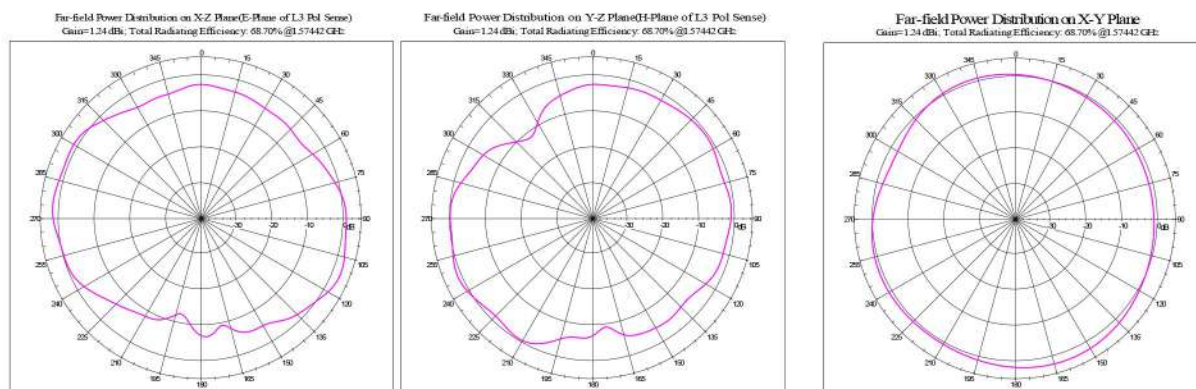
Frequency :1572.42 MHz



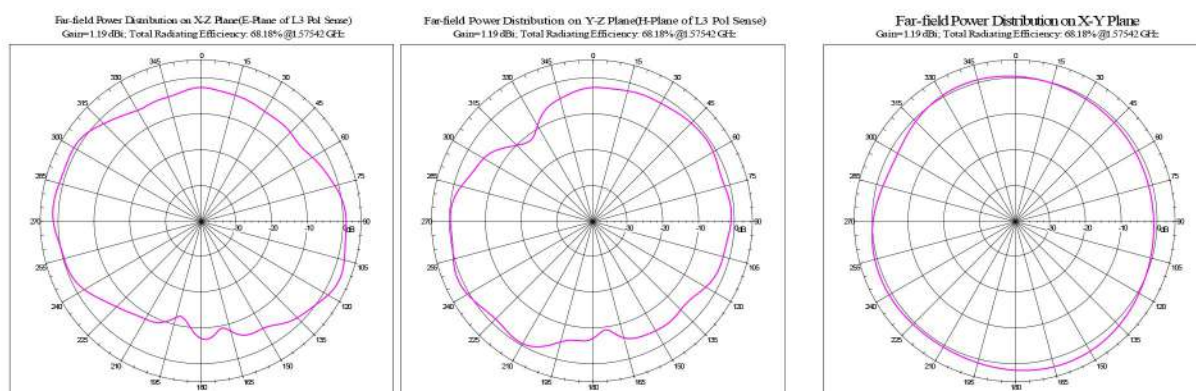
Frequency :1573.42 MHz



Frequency :1574.42 MHz

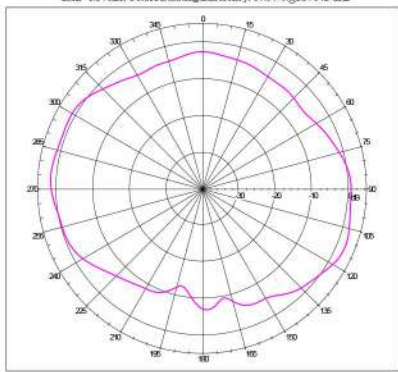


Frequency :1575.42 MHz

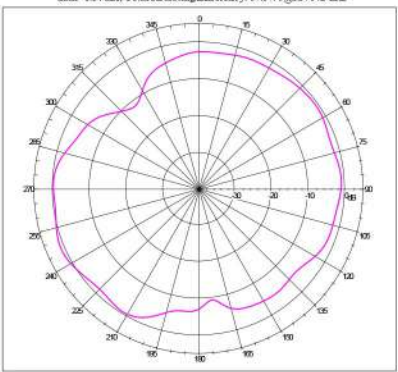


Frequency :1576.42 MHz

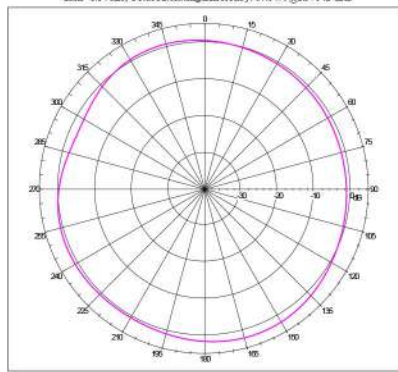
Far-field Power Distribution on X-Z Plane(E-Plane of L3 Pol Sense)
Gain=1.14 dB; Total Radiating Efficiency: 67.64% @1.57642 GHz



Far-field Power Distribution on Y-Z Plane(H-Plane of L3 Pol Sense)
Gain=1.14 dB; Total Radiating Efficiency: 67.64% @1.57642 GHz

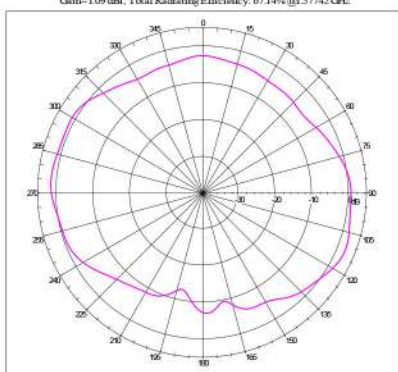


Far-field Power Distribution on X-Y Plane
Gain=1.14 dB; Total Radiating Efficiency: 67.64% @1.57642 GHz

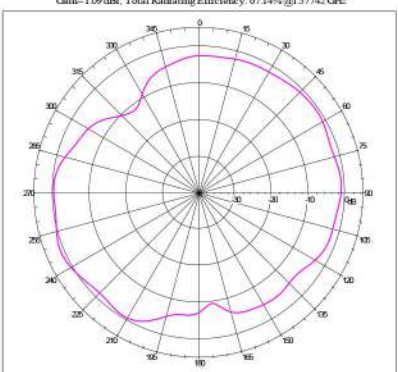


Frequency :1577.42 MHz

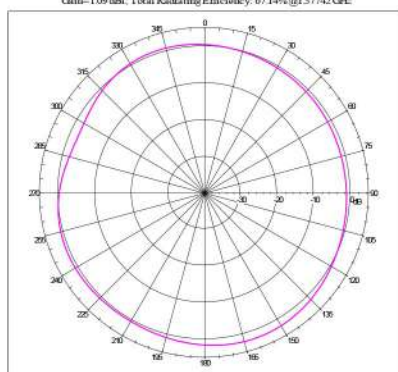
Far-field Power Distribution on X-Z Plane(E-Plane of L3 Pol Sense)
Gain=1.09 dB; Total Radiating Efficiency: 67.14% @1.57742 GHz



Far-field Power Distribution on Y-Z Plane(H-Plane of L3 Pol Sense)
Gain=1.09 dB; Total Radiating Efficiency: 67.14% @1.57742 GHz

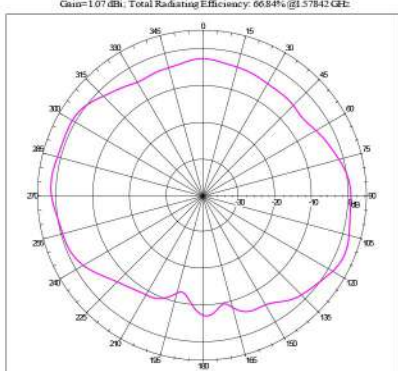


Far-field Power Distribution on X-Y Plane
Gain=1.09 dB; Total Radiating Efficiency: 67.14% @1.57742 GHz

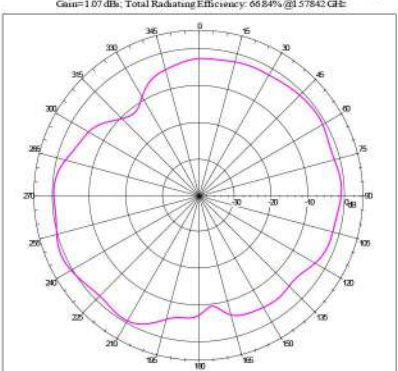


Frequency :1578.42 MHz

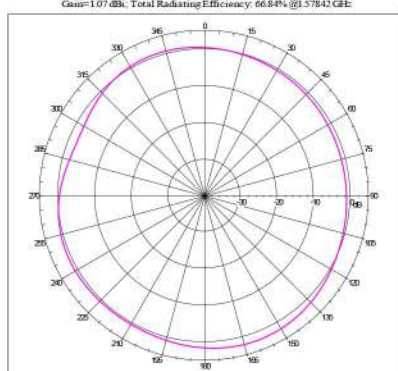
Far-field Power Distribution on X-Z Plane(E-Plane of L3 Pol Sense)
Gain=1.07 dB; Total Radiating Efficiency: 66.84% @1.57842 GHz



Far-field Power Distribution on Y-Z Plane(H-Plane of L3 Pol Sense)
Gain=1.07 dB; Total Radiating Efficiency: 66.84% @1.57842 GHz

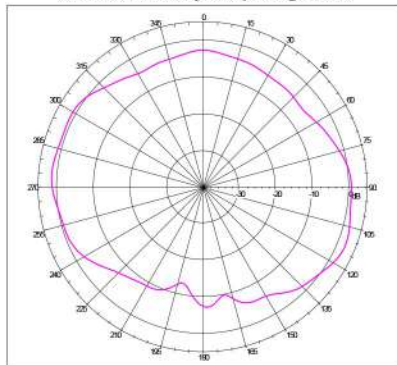


Far-field Power Distribution on X-Y Plane
Gain=1.07 dB; Total Radiating Efficiency: 66.84% @1.57842 GHz

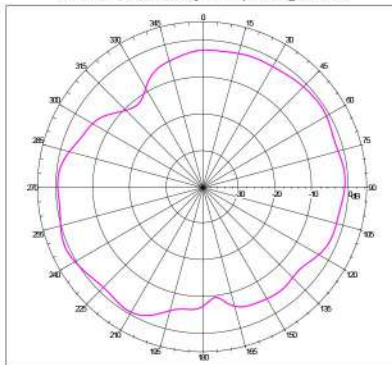


Frequency :1579.42 MHz

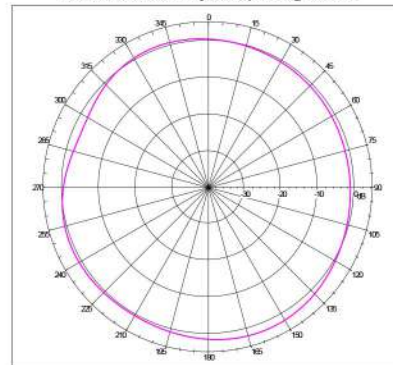
Far-field Power Distribution on X-Z Plane(E-Plane of L3 Pol Sense)
Gain=1.04 dB, Total Radiating Efficiency: 66.44% @1.57942 GHz



Far-field Power Distribution on Y-Z Plane(H-Plane of L3 Pol Sense)
Gain=1.04 dB, Total Radiating Efficiency: 66.44% @1.57942 GHz

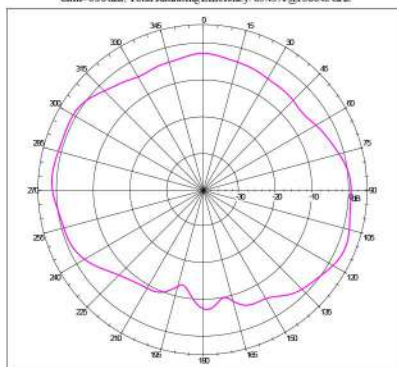


Far-field Power Distribution on X-Y Plane
Gain=1.04 dB, Total Radiating Efficiency: 66.44% @1.57942 GHz

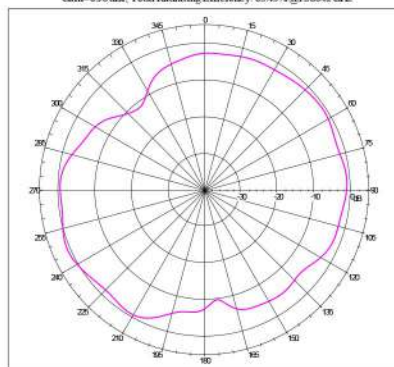


Frequency :1580.42 MHz

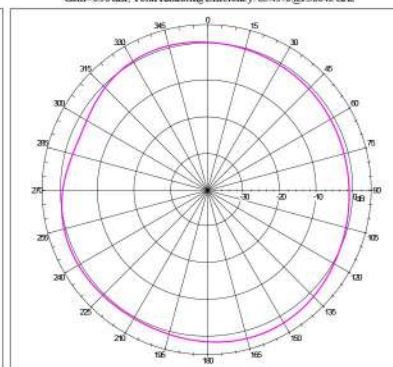
Far-field Power Distribution on X-Z Plane(E-Plane of L3 Pol Sense)
Gain=0.96 dB, Total Radiating Efficiency: 65.43% @1.58042 GHz



Far-field Power Distribution on Y-Z Plane(H-Plane of L3 Pol Sense)
Gain=0.96 dB, Total Radiating Efficiency: 65.43% @1.58042 GHz



Far-field Power Distribution on X-Y Plane
Gain=0.96 dB, Total Radiating Efficiency: 65.43% @1.58042 GHz



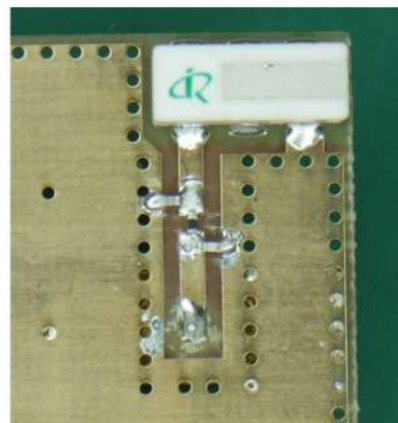
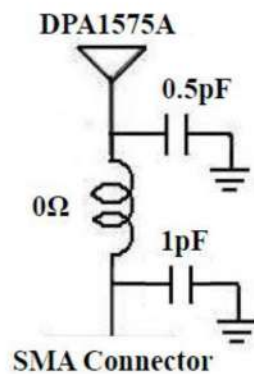
Electrical Characteristics of Antenna for GPS & GLONASS

Model	DPA 1575 application
Frequency(MHz)	1575.42MHz±1.023MHz 1602~1615MHz
Configuration	EG PIFA
Polarization	Linear
Mode	$\lambda / 4$
Band width(MHz)	40
Size (m/m)	10*4.0*3.0
Weight (g)	0.5

SMD	SMD
Removed GND area	11*6.0
Ex-Matching circuit	See below
Peak Gain	1575.42MHz : 0.02dBic 1608.5MHz : -0.16dBic
Average Gain	1575.42MHz : -3.33dBic 1608.5MHz : -3.10dBic
VSWR	2.0
Axial Ratio(dB)	--

- Data is measured on Cirocomm STD PCB.
- PIFA: Planer Inverted F Antenna.
- EG PIFA : External Ground PIFA.

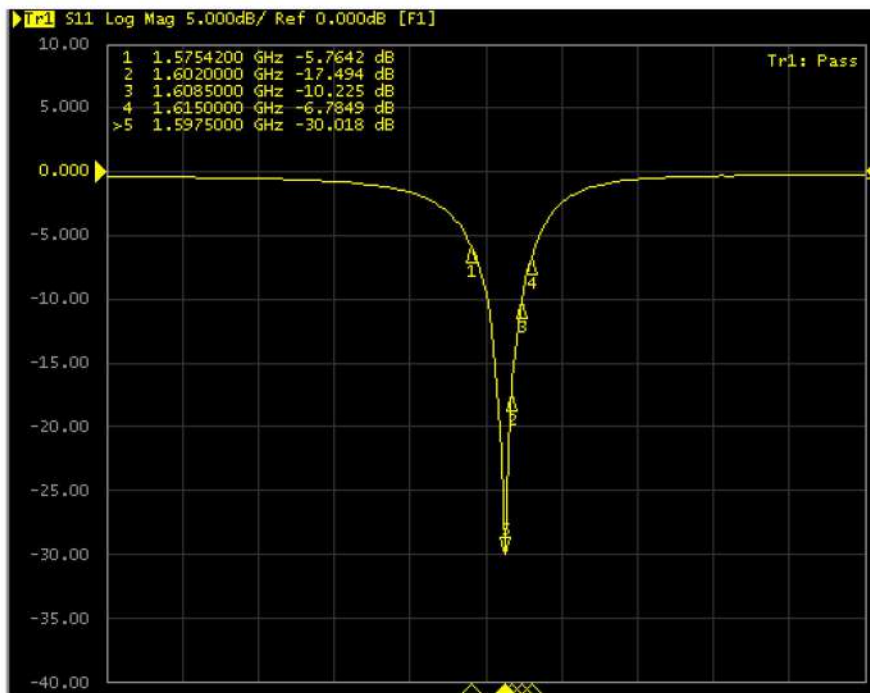
Matching circuit



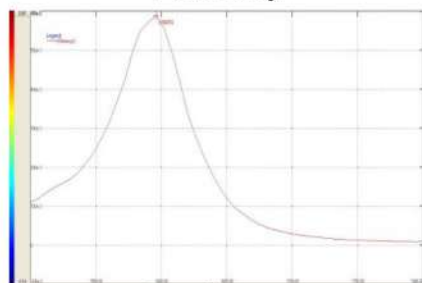
Summary of Electrical Characteristics

Frequency (MHz)	1575.42	1602	1608.5	1615
Return Loss (dB)	-5.76	-17.49	-10.22	-6.78
Efficiency (%)	46.5	55.64	49.83	40.69
Peak Gain (dBi)	0.02	0.36	-0.16	-0.95
Average Gain (dBi)	-3.33	-2.54	-3.1	-3.91
XZ Plane/Peak Gain (dBi)	-0.89	-	-0.32	-
YZ Plane/Peak Gain (dBi)	-0.08	-	-0.25	-
XY Plane/Peak Gain (dBi)	-1.73	-	-1.17	-

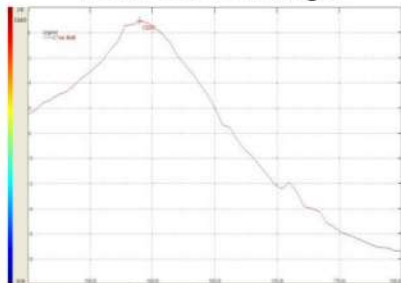
Return Loss



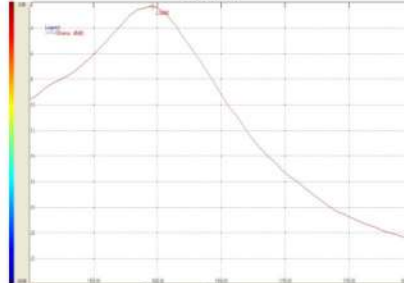
Efficiency



Peak Gain Average

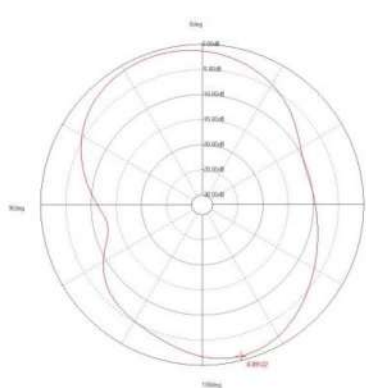


Gain

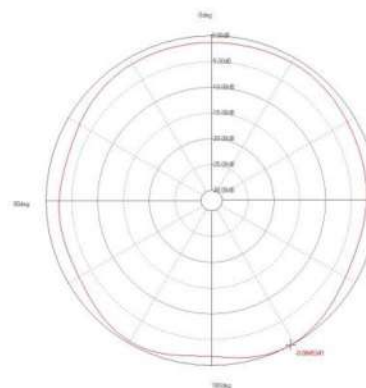


Frequency : 1575.42MHz

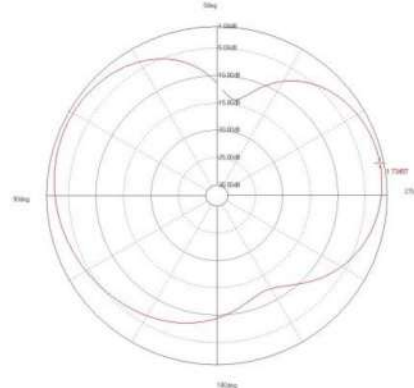
XZ Plane



YZ Plane

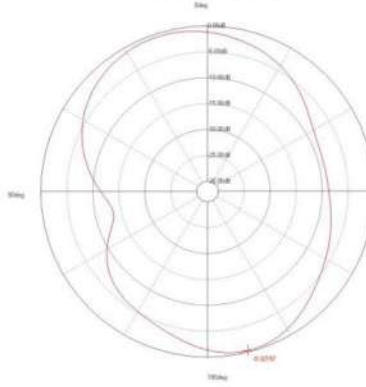


XY Plane

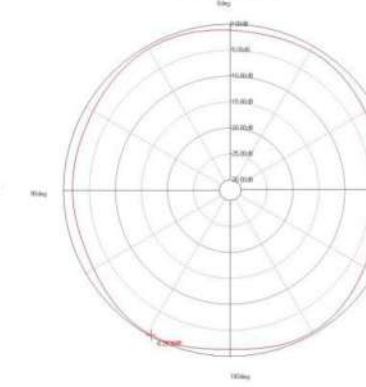


Frequency : 1608.5MHz

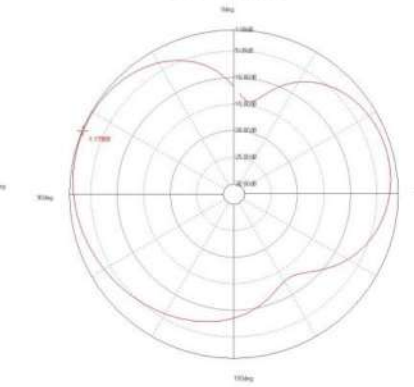
XZ Plane



YZ Plane



XY Plane



Environmental Conditions

Operating conditions

The antenna has the electrical characteristics given in Tables 1 in the temperature range of -30°C to $+85^{\circ}\text{C}$ and under the environmental conditions of $+40^{\circ}\text{C}$ and 0-95 % r.h..

Storage temperature range

The storage temperature range of product is -40°C to $+100^{\circ}\text{C}$

Reliability Tests

Low-temperature test

Expose the specimen to -30°C for 500 hours and then to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

High-temperature test

Expose the specimen to $+85^{\circ}\text{C}$ for 500 hours and then to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

High-temperature/high-humidity test

Subject the object to the environmental conditions of $+85^{\circ}\text{C}$ and 90-95% r.h. for 96 hours, then expose to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

Thermal shock test

Subject the object to cyclic temperature change (-30°C , 30 minutes \leftrightarrow $+85^{\circ}\text{C}$, 30 minutes) for 5 cycles, the expose to normal temperature/humidity for 24 hours or more.

Vibration Test

Sinusoidal vibration test

Subject the object to vibrations of 5 to 200 to 5Hz swept in 10 minutes, 4.5G at maximum (2mm amplitude), in X and Y directions for two hours each and in Z direction for four hours. After this test, examine its appearance functions.

Vibration test in packaged condition

Subject the object, which is packaged as illustrated, to vibrations of 15 to 60 to 15Hz swept in 6 minutes, 4G at maximum (2mm amplitude at maximum), applied in X, Y and Z directions for two hours each, i.e. six hours in total. After this test, examine its appearance and functions.

Free fall test in packaged condition

Drop the object, which is packaged as illustrated, to a concrete surface from the height of 90 cm, on one corner, three edges and six faces once each, i.e. 10 times in total. After this test, examine its appearance and functions.

. Soldering Heat Resistance Test:

After the lead pins of the unit are soaked in solder bath at $270 \pm 5^{\circ}\text{C}$ for 10 ± 0.5 seconds and then be left for more than 1 hour at $25 \pm 5^{\circ}\text{C}$ in less than 65% relative humidity.

. Adhesion Test

The device is subjected to be soldered on test PCB. Then apply 0.5Kg(5N) of force for 10 ± 1 seconds in the direction of parallel to the substrate. (the soldering should be done by reflow and be conducted with care so that the soldering is uniform and free of defect by stress such as heat shock) .

Inspection

As for the examination in the mass production, the receiving character of the ratio wave sent in a shield box from the standard antenna and VSWR are confirmed in the picking out examination.

Warranty

If any defect occurs from the product during proper use within a year after delivery, it will be repaired or replaced free of charge.

Other

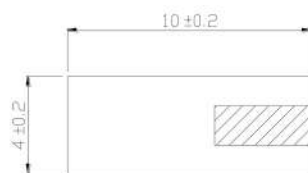
Any question arising from this specification manual shall be solved by arrangement made by both parties.

Precautions for use

- Antenna pattern use a Ag electrode.
- Please don't use the corrosion gas (sulfur gas, chlorine gas) in the atmosphere.
- Please don't direct solder onto the electrode of Antenna pattern.

Drawings

Shape and Dimension

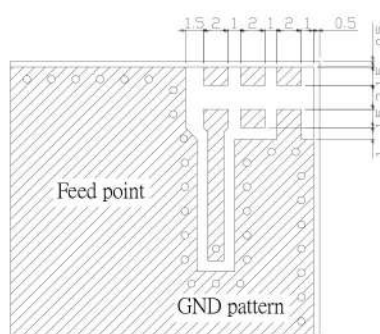


(Top view)

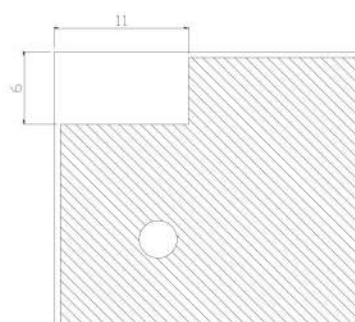


(Bottom view)

Recommended foot print for Evaluation Board



Front view



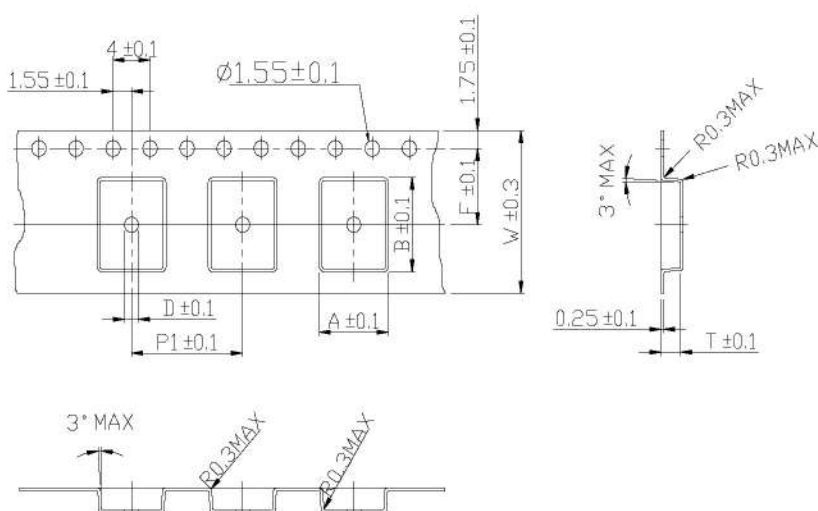
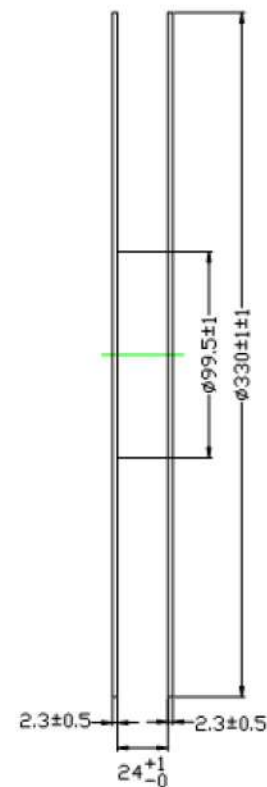
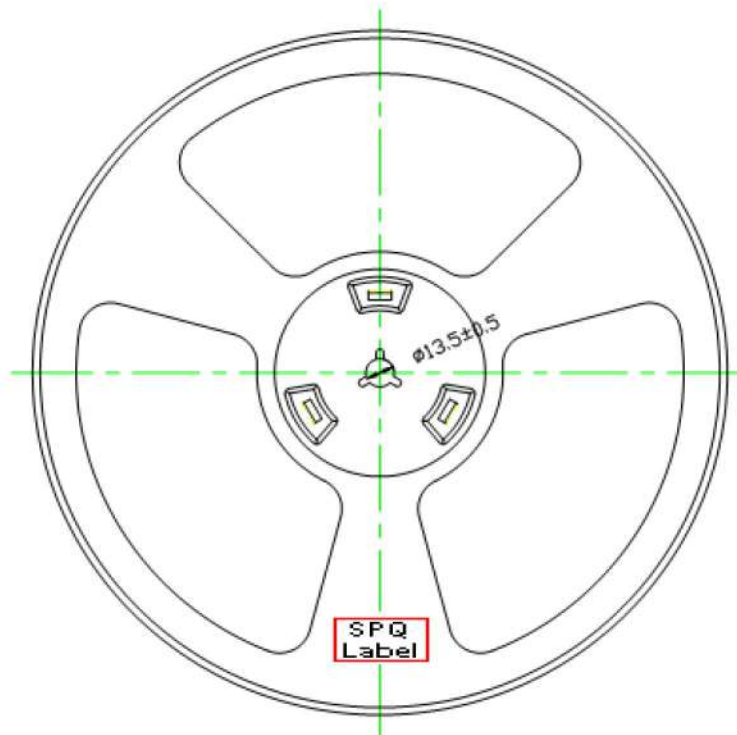
Back & Inside layer

Delivery Mode

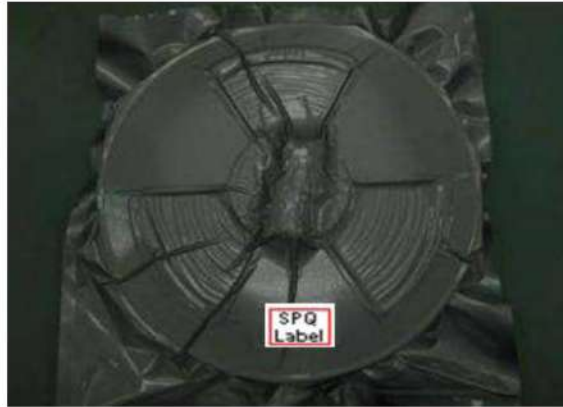
2.Pieces /tape : 1000 pcs (Vacuum packing).

3.Pieces /Carton-Inside : 1000 pcs.

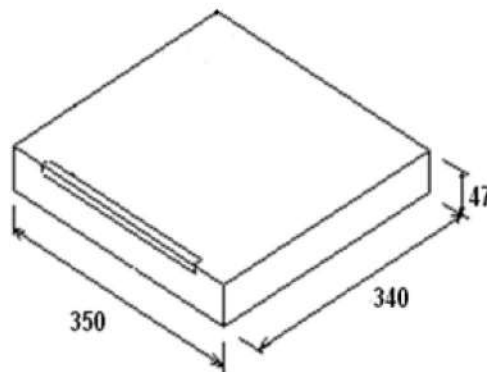
4.Pieces /Carton-Outside : 5000 pcs.



No	Index	Spec. (mm)
1	A	4.6
2	B	10.6
3	P1	12
4	W	24
5	F	8.5
6	T	3.5
7	D	1.5

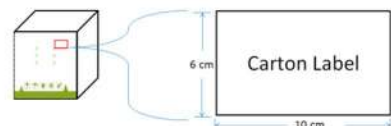
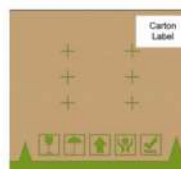
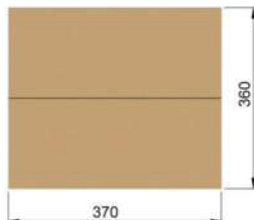


Carton-Inside



Unit: mm

Carton-Outside



(Schematic diagram)

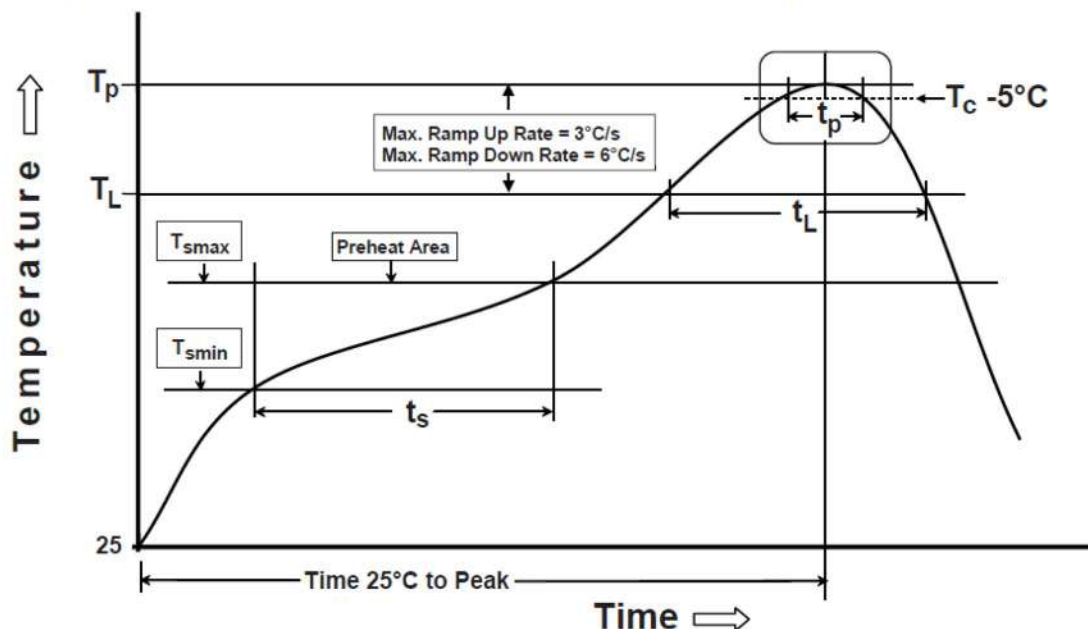
Unit: mm

Cirocomm products can be assembled following Pb-free assembly. According to the Standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follow:

Phase	Profile features	Pb-Free Assembly (SnAgCu)
PREHEAT	-Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(t_s) from (T_{smin} to T_{smax})	150°C 200°C 60-120 seconds
RAMP-UP	Avg. Ramp-up Rate (T_{smax} to TP)	3°C/second(max)
REFLOW	-Temperature(T_L) -Total Time above T_L (t_L)	217°C 30-100 seconds
PEAK	-Temperature(T_P) -Time(t_p)	260°C 5-10 second
RAMP-DOWN	Rate	6°C / second max.
Time from 25°C to Peak Temperature		8 minutes max.
Composition of solder paste		96.5Sn/3Ag/0.5Cu
Solder Paste Model		SHENMAO PF606-P26

Note : All the temperature measure point is on top surface of the component, if temperature over recommend, it will make component surface peeling or damage.

The graphic shows temperature profile for component assembly process in reflow ovens



Soldering With Iron:

Soldering condition : Soldering iron temperature $270 \pm 10^\circ\text{C}$.

Apply preheating at 120°C for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron over temperature $270 \pm 10^\circ\text{C}$ or 3 seconds, it will make component surface peeling or damage. Soldering iron can not leakage of electricity.