SPECIFICATION

SPEC NO. : **SP03AE24425-0020**

PART NO. : **03A40D5M00J0210**

PRODUCT NAME : **DCAK0012**

DESCRIPTION : **Dielectric Chip Antenna (3.05x1.6x0.55 mm) RoHS Compliant Product**

REVISION STATUS

VERSION	DATE	PAGE	REVISION DESCRIPTION	PREPARED	CHECKED	APPROVED
01	2010.11.15	Whole	New Issued	徐嫚君	黃信嘉	徐偉泓
02	2011.03.16	Whole	Modify P3 Antenna Dimension	徐嫚君	黃信嘉	黃信嘉
03	2011.03.23	Whole	Modify P3 Antenna Dimension	徐嫚君	黃信嘉	黃信嘉
04	2011.05.27	Whole	Modify P4 Position 1 Matching Circuit	徐嫚君	吳佳宗	黃信嘉
05	2011.05.30	Whole	Modify P3 Antenna Dimension	徐嫚君	吳佳宗	黃信嘉
06	2012.01.18	Whole	Modify P17 Delivery mode	徐嫚君	曾建華	黃信嘉
07	2018.07.13	Whole P.7	2D Radiation Pattern Up data. Add MSL:1	翁秀惠	呂秉群	吳佳宗
08	2018.11.28	P.17	Add Marking direction.	翁秀惠	呂秉群	吳佳宗
09	2022.09.30	P.18~19	Add Reflow Chart.	翁秀惠	馬得淞	張敦信、吳佳宗
10	2023.03.10	P.18	Add Packing Quantity.	翁秀惠	陳勇廷	張敦信、吳佳宗
11	2023.07.27	P.4/7/10	Modify Matching Circuit.	翁秀惠	陳勇廷	張敦信、吳佳宗

Prepared By	Checked By	Approved By
翁秀惠	陳勇廷	張敦信 吳佳宗

CIROCOMM TECHNOLOGY .

PART NUMBER : 03A40D5M00J0210

1. SCOPE

This specification covers the dielectric chip antenna for WiFi

2. Name of the product

This product is named “Dielectric Chip Antenna”.

3. Electrical characteristics

3-1 Electrical characteristics of antenna

The antenna has the electrical characteristics given in Table 1 under the *cirocomm* standard installation conditions shown in the figure of Evaluation Board.

Table 1

No	Parameter	Specification
1	Working Frequency	2442 MHz
2	Dimension	3.05x1.6x0.55 mm
3	Return Loss	< -10dB
4	VSWR	2.0max
5	Peak Gain	1.0 dBi (typ)
6	Polarization	Linear
7	Azimuth	Omni-directional
8	Impedance	50 Ω
9	Operating Temperature	-40~105℃

・Data is measured on Cirocomm STD PCB.

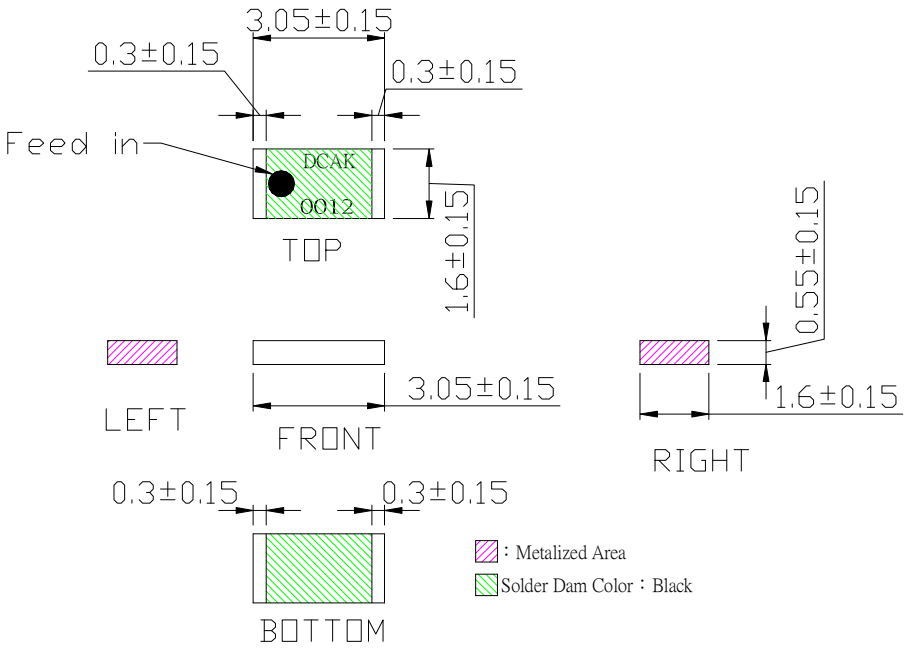
4. Antenna Manufacturer information:

CIROCOMM TECHNOLOGY CORP.

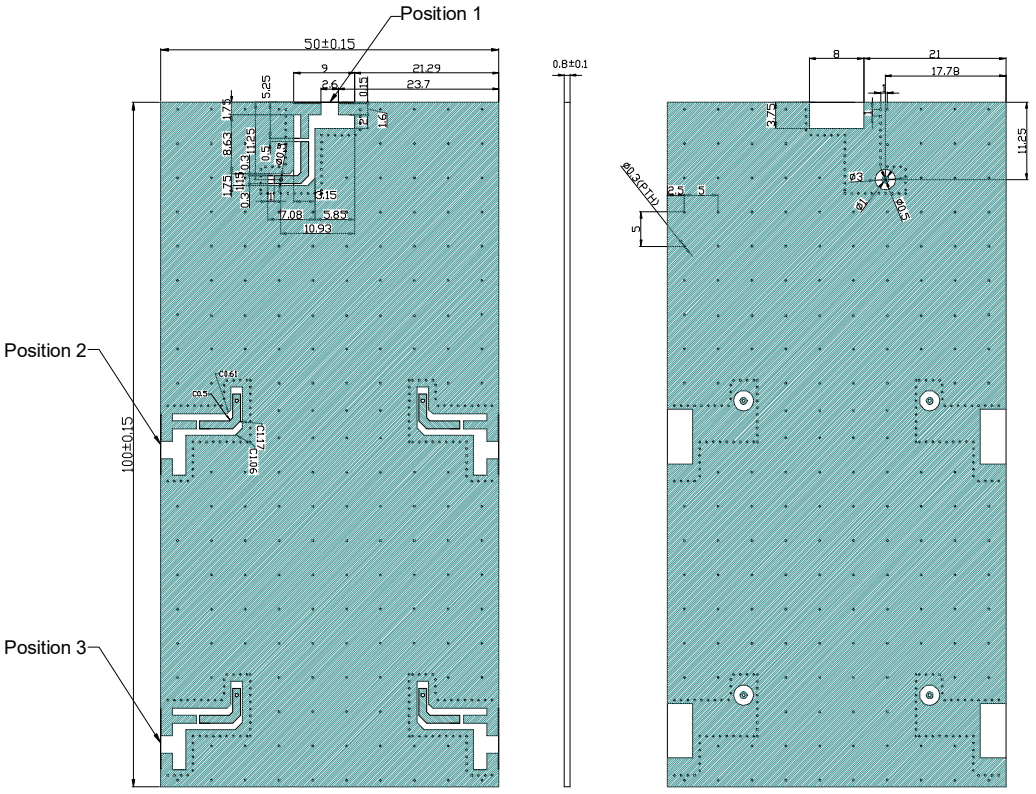
No.5, Industrial 2nd Road, PingZhen Dist., Taoyuan City 324, Taiwan (R.O.C.)

4. Antenna & Demo Board Dimension

4-1 Antenna Dimension

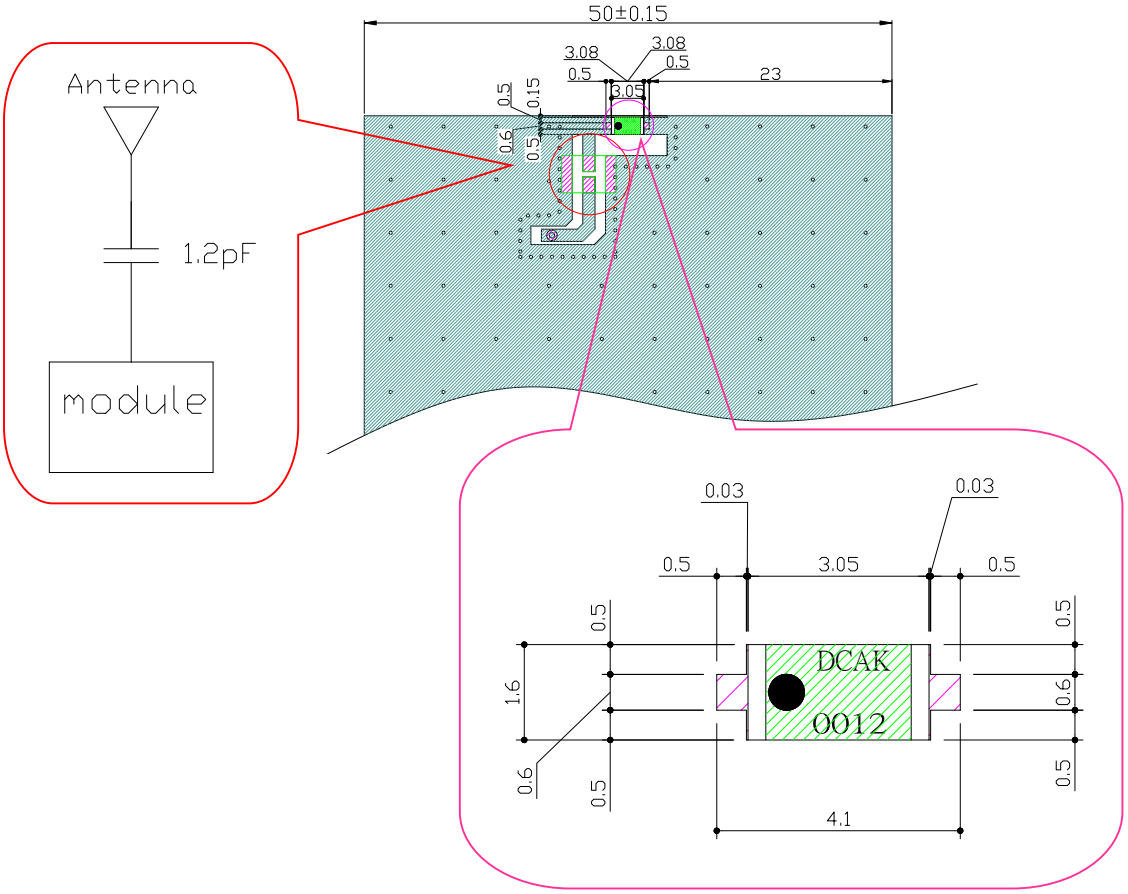


4-2 Demo Board Dimension

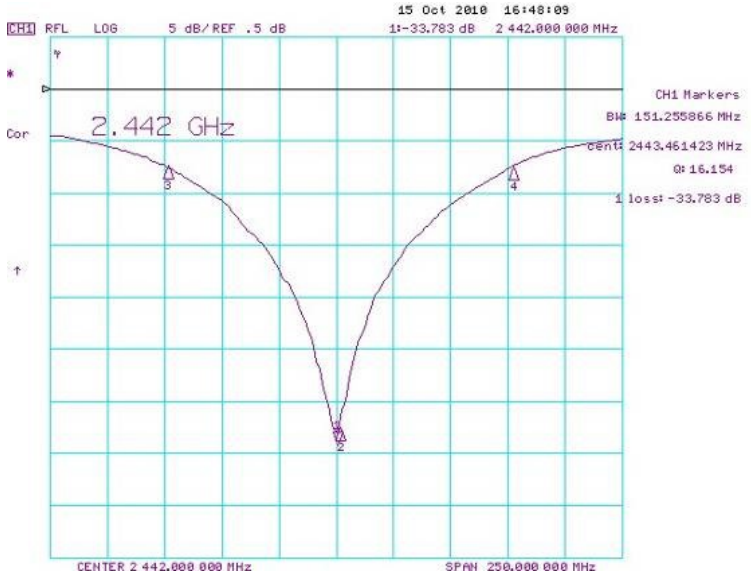


5. Antenna Measurement on Demo Board

5-1 Position 1 Matching Circuit

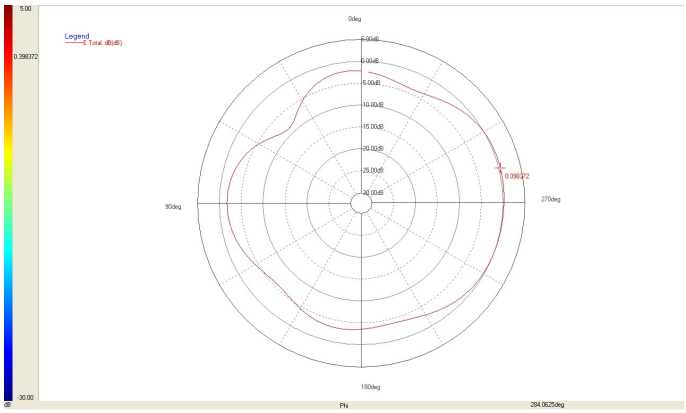


5-1-1 S11 Response curve (Work Frequency)

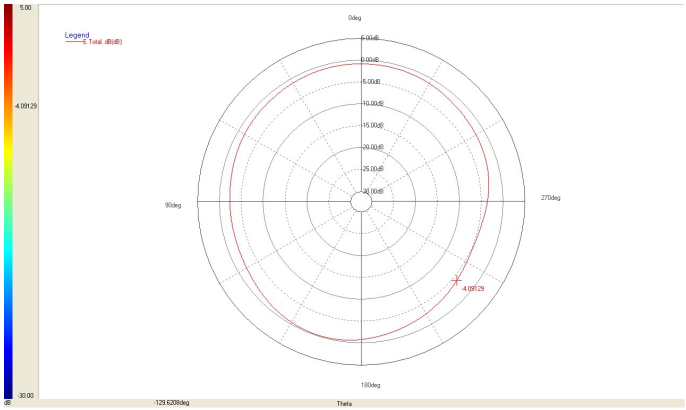


Item	Frequency	Return Loss	Bandwidth
Value	2442 MHz	-33.78dB	151.25 MHz

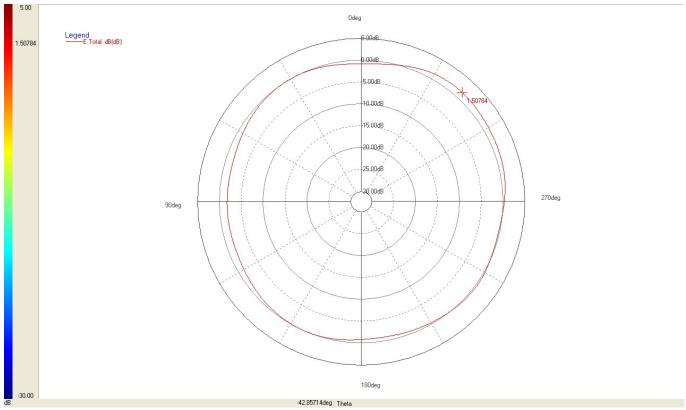
5-1-2 Electrical performance



XY-Plane 2442MHz



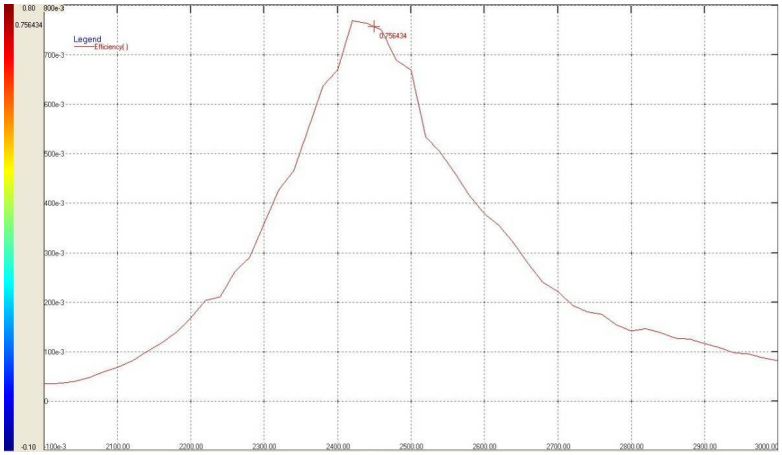
XZ-Plane 2442MHz



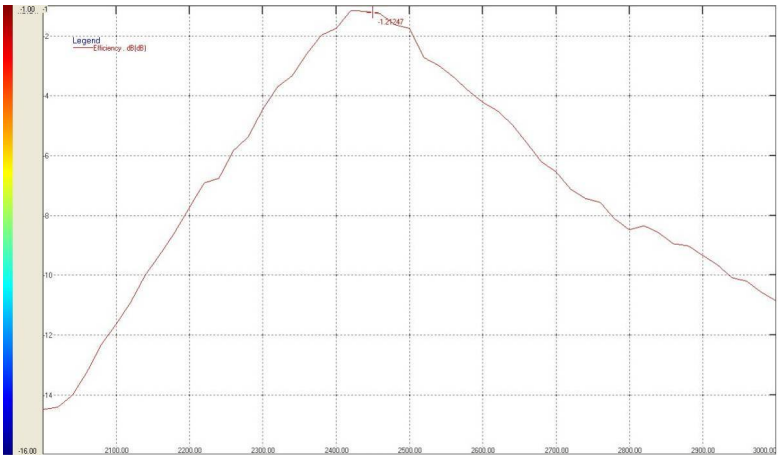
YZ-Plane 2442MHz

2442MHz	Peak Gain
XY-Plane	0.39
XZ-Plane	-4.09
YZ-Plane	1.50

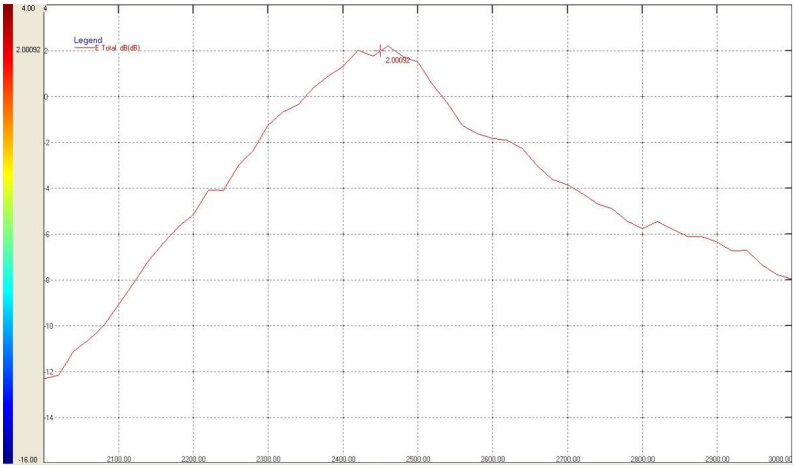
(Unit : dBi)



Efficiency



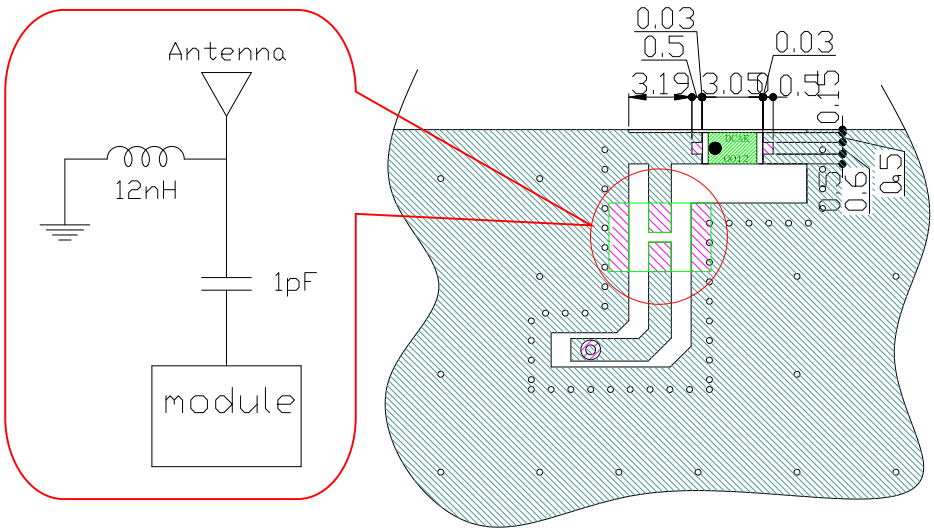
Average Gain



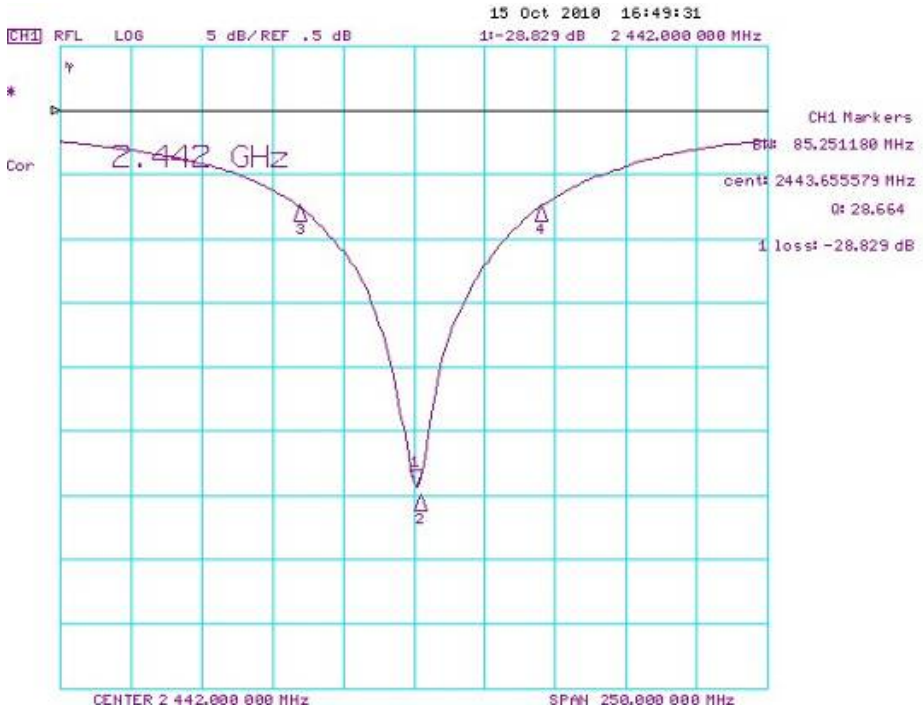
Peak Gain

Item	Efficiency	Average	Peak Gain
Value	75.64%	-1.21dBi	2.00dBi

5-2 Position 2 Matching Circuit

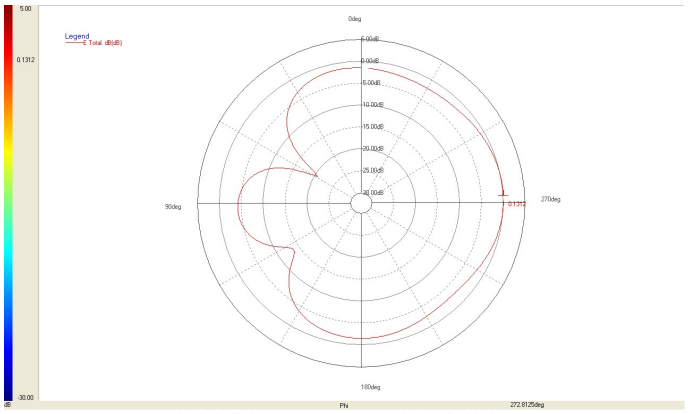


5-2-1 S11 Response curve (Work Frequency)

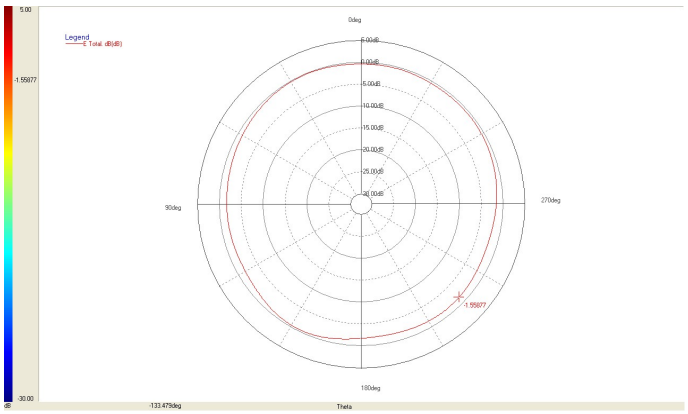


Item	Frequency	Return Loss	Bandwidth
Value	2442 MHz	-28.82 dB	85.25 MHz

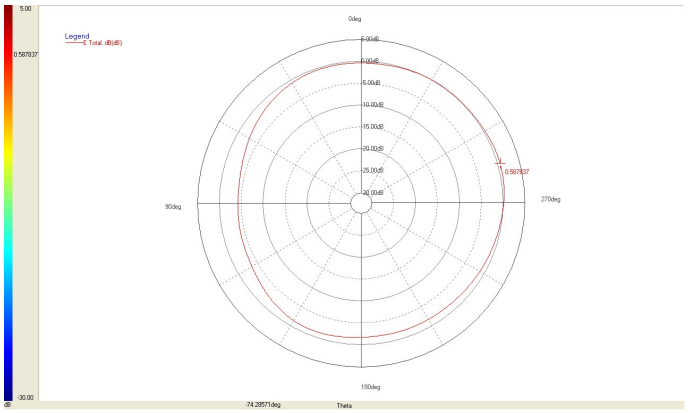
5-2-2 Electrical performance



XY-Plane 2442MHz



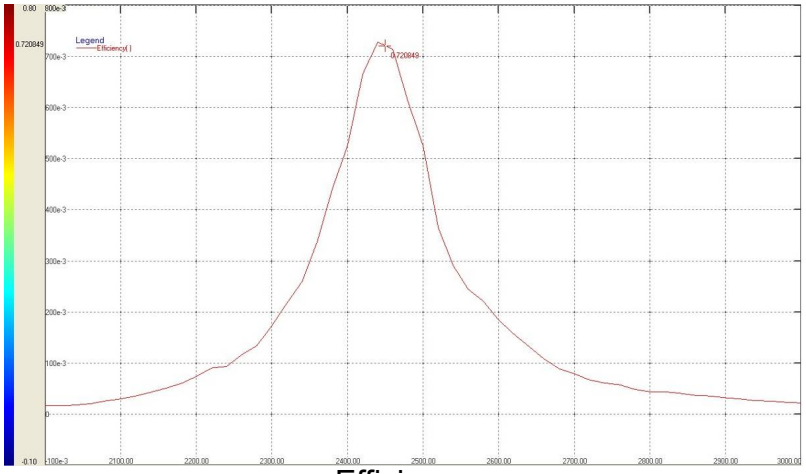
XZ-Plane 2442MHz



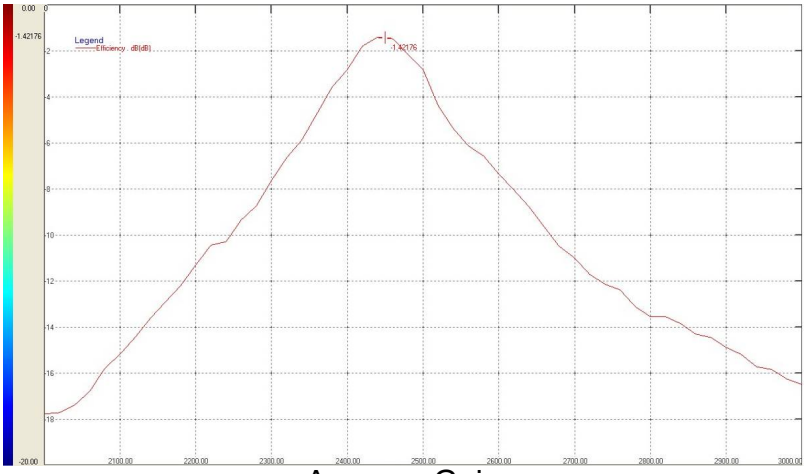
YZ-Plane 2442MHz

2442MHz	Peak Gain
XY-Plane	0.13
XZ-Plane	-1.55
YZ-Plane	0.58

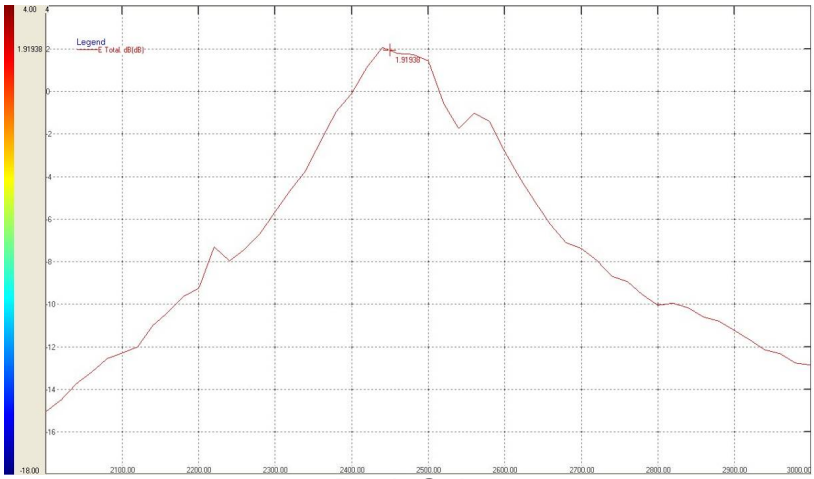
(Unit：dBi)



Efficiency



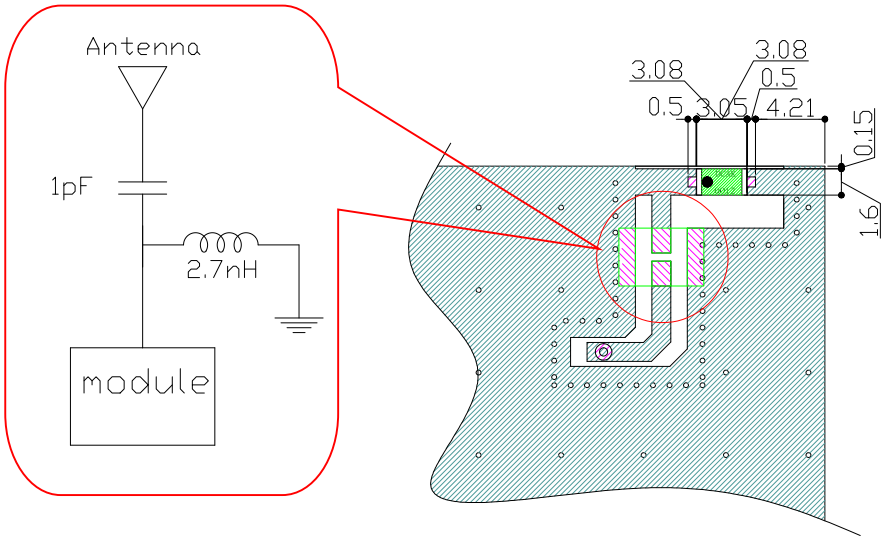
Average Gain



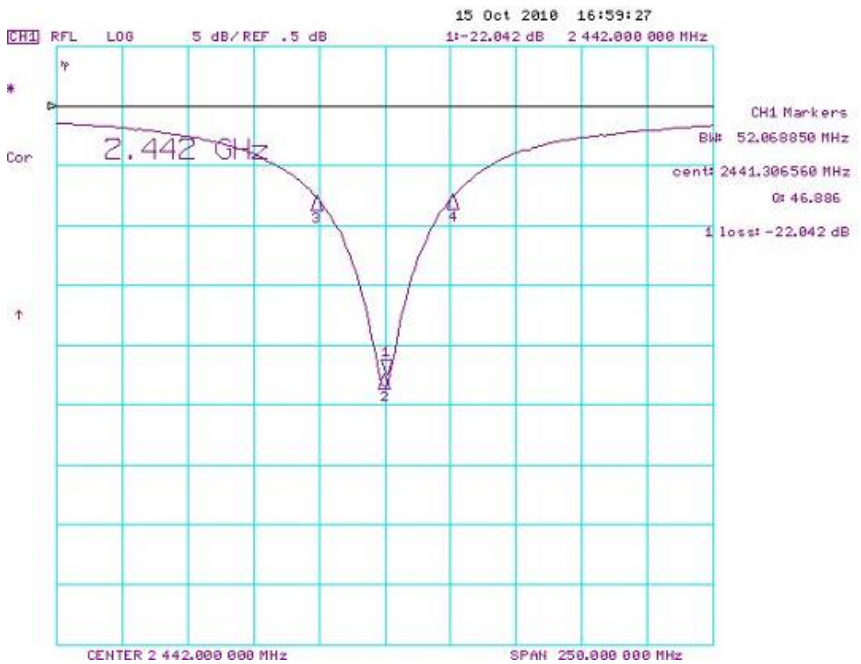
Peak Gain

Item	Efficiency	Average	Peak Gain
Value	72.08%	-1.42dBi	1.91dBi

5-3 Position 3 Matching Circuit

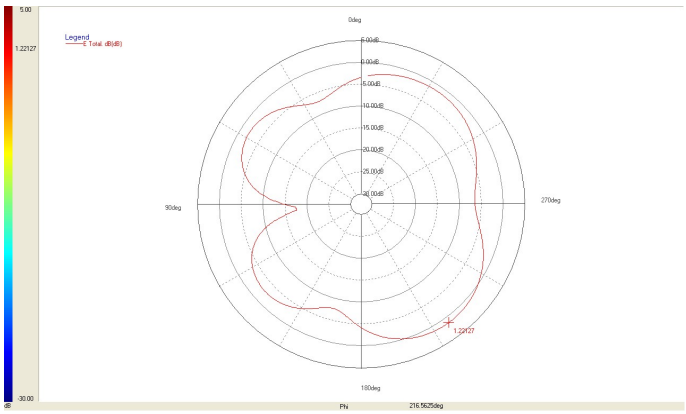


5-3-1 S11 Response curve (Work Frequency)

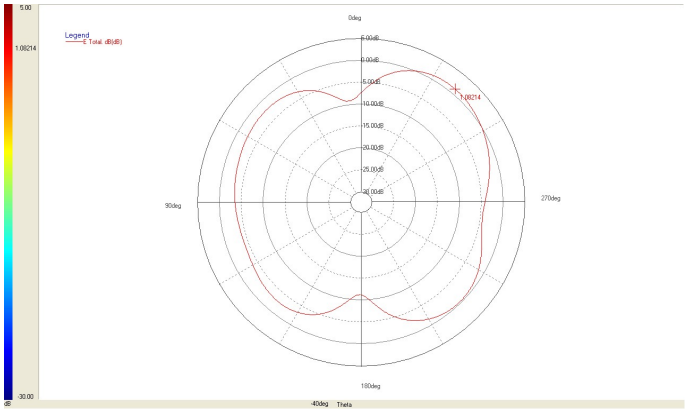


Item	Frequency	Return Loss	Bandwidth
Value	2442 MHz	-22.04 dB	52.06 MHz

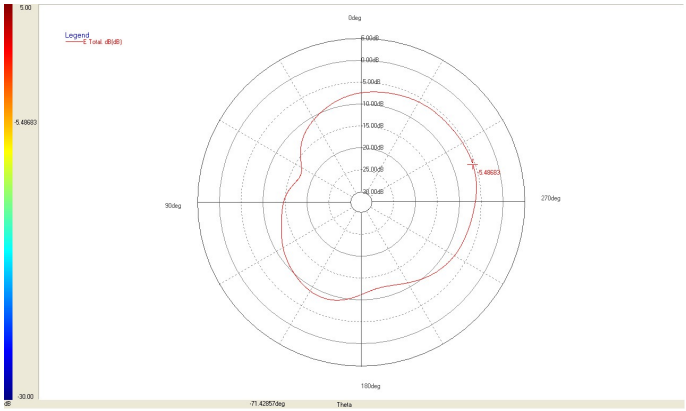
5-3-2 Electrical performance



XY-Plane 2442MHz



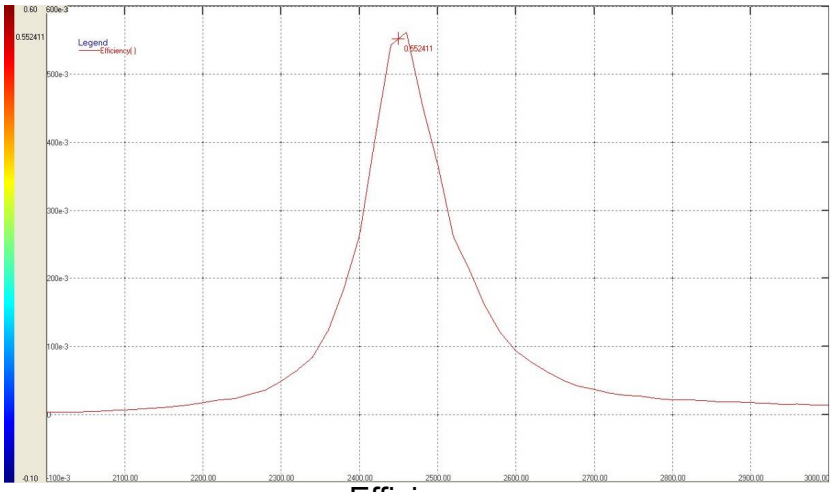
XZ-Plane 2442MHz



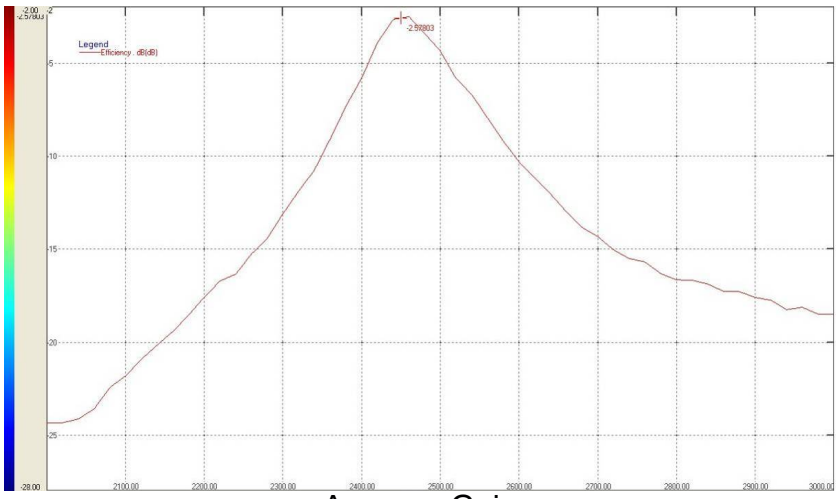
YZ-Plane 2442MHz

2450MHz	Peak Gain
XY-Plane	1.22
XZ-Plane	1.08
YZ-Plane	-5.48

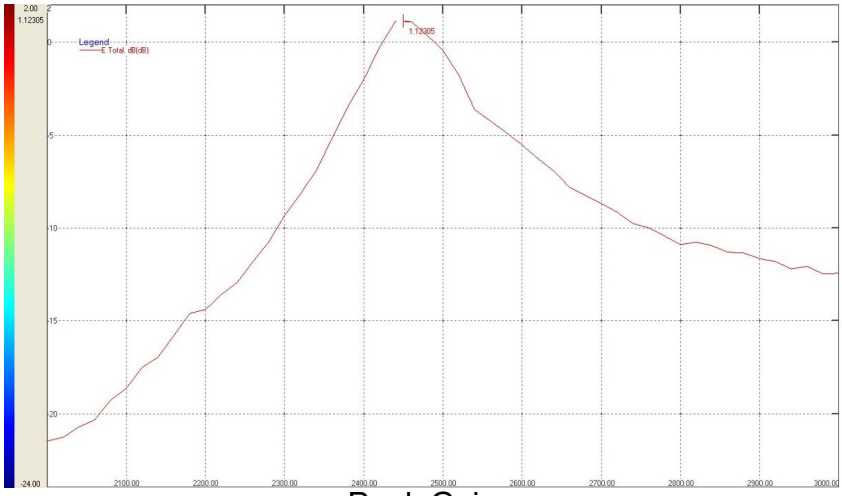
(Unit：dBi)



Efficiency



Average Gain

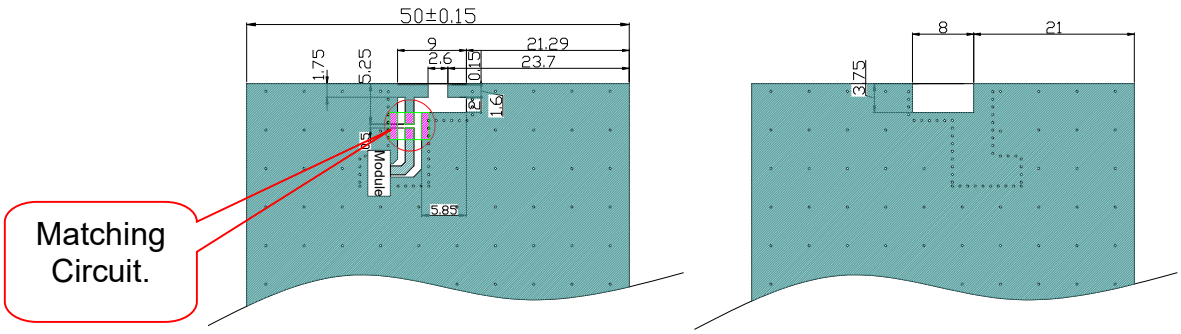


Peak Gain

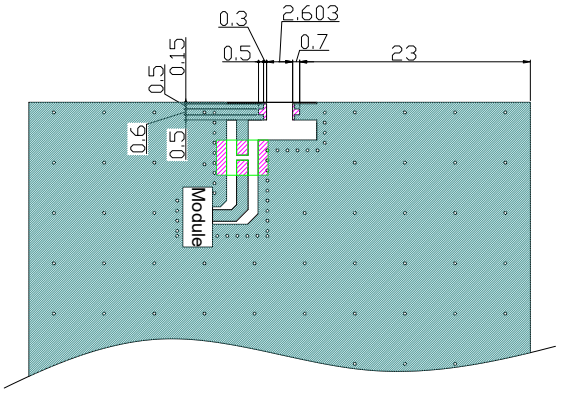
Item	Efficiency	Average	Peak Gain
Value	55.24%	-2.57dBi	1.12dBi

6. Customer's Requirement Layout Dimension

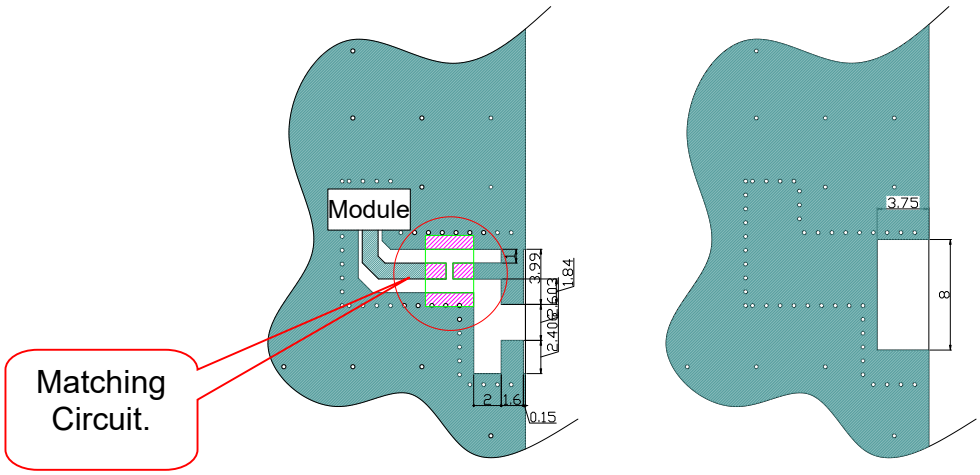
6-1 Layout 1 Dimension



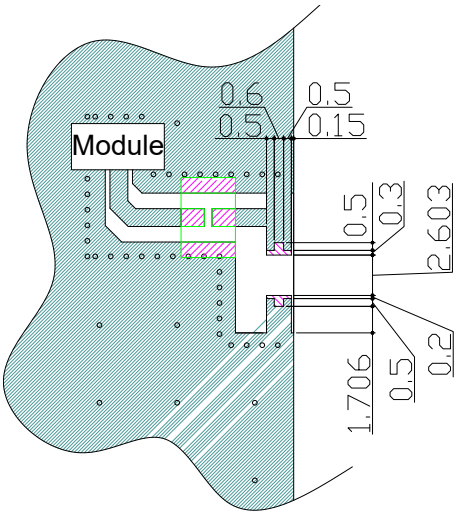
6-1-1 Single and Pad Layout Dimension



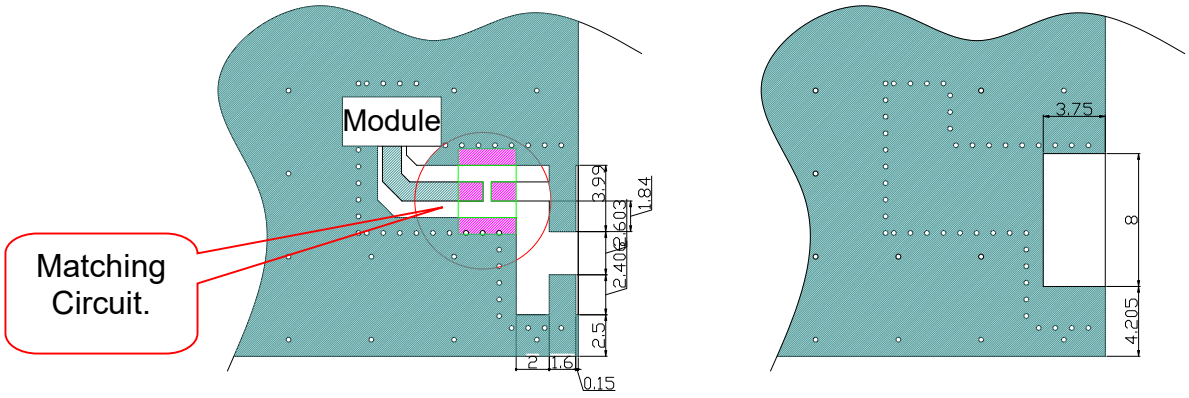
6-2 Layout 2 Dimension



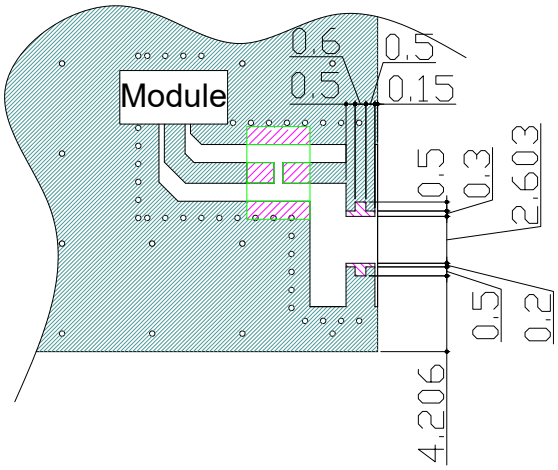
6-2-1 Single and Pad Layout Dimension



6-3 Layout 3 Dimension



6-3-1 Single and Pad Layout Dimension



7. Environmental conditions

7-1 Operating conditions

The antenna has the electrical characteristics given in Tables 1 in the temperature range of -40℃ to +85℃ and under the environmental conditions of +40°C and 0-95% relative humidity.

7-2 Storage temperature range

The storage temperature range of product is -40°C to +85°C.

8. Reliability tests

8-1 Low-temperature test

Expose the specimen to -40°C for 16 hours and then to normal temperature/ humidity for 24 hours or more. After this test, examine its appearance and functions.

8-2 High-temperature test

Expose the specimen to +85°C for 16 hours and then to normal temperature /humidity for 24 hours or more. After this test, examine its appearance and functions.

8-3 High-temperature/high-humidity test

Subject the object to the environmental conditions of +85°C and 90-95% relative humidity for 96 hours, then expose it to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

8-4 Thermal shock test

Subject the object to cyclic temperature change (-40°C, 30 minutes ⇔ +85°C, 30 minutes) for 5 cycles, then expose to normal temperature/ humidity for 24 hours or more.

8-5 Vibration test

8-5-1 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.

8-5-2 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.

8-6 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 comer, three edges and six faces once each, i.e. 10 times in total. After this test, examine its appearance and functions.

8-7 Soldering heat resistance test

The lead pins of the unit are soaked in solder bath at 260 ± 5°C for 10 seconds. After this test, examine its appearance and functions.

8-8 Adhesion test

The device is subjected to be soldered on test PCB. Then apply 0.5Kg (5N) of force for 5±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).

9. Warranty

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

10. Other

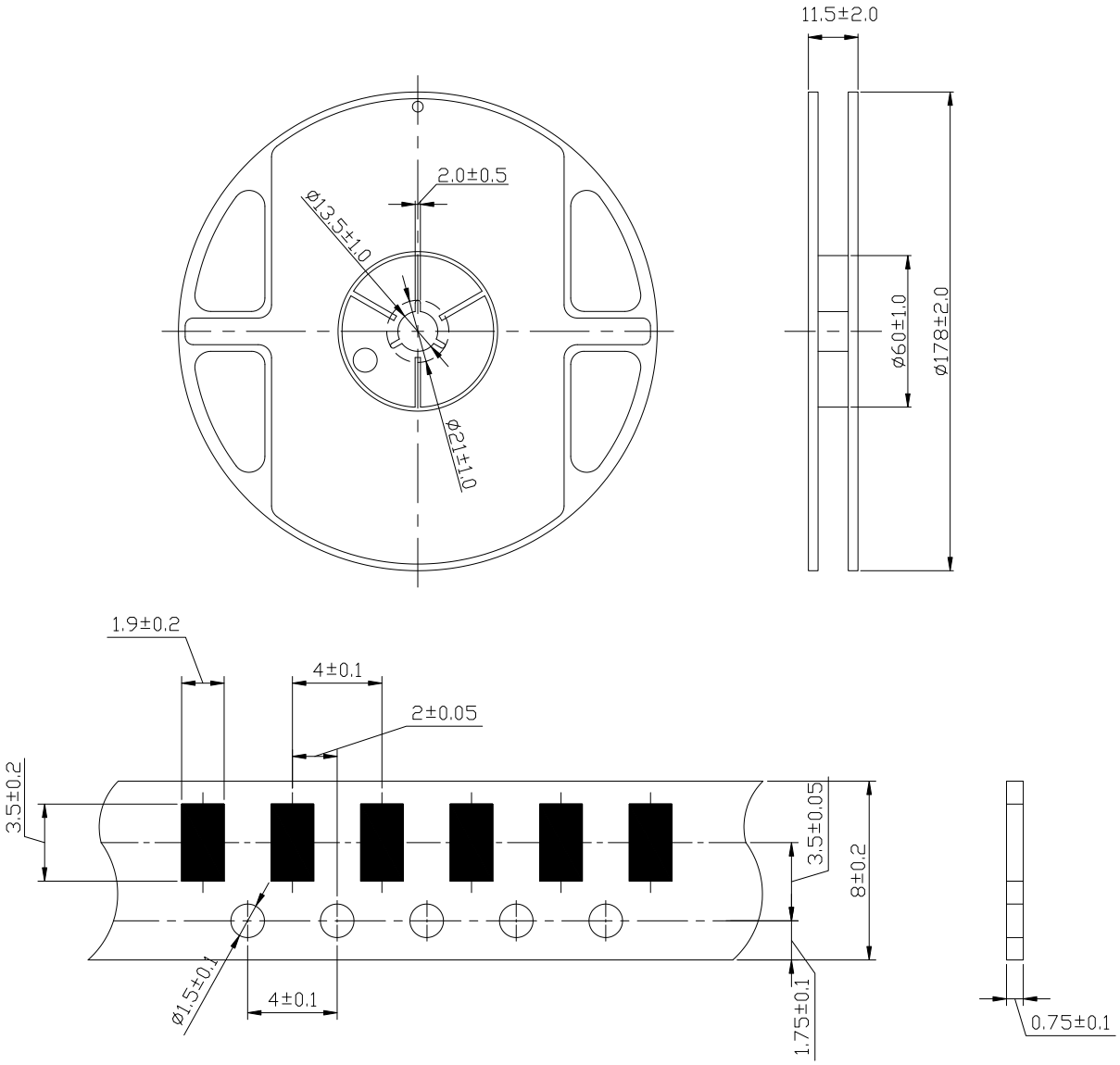
Any question arising from this specification manual shall be solved by arrangement made by both parties.

11. Precautions for use

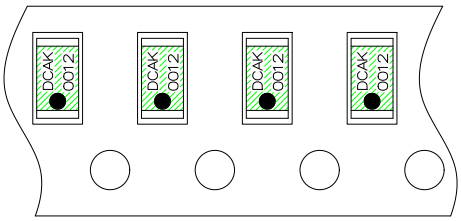
- Antenna pattern use an Ag / Ni / Sn electrode.
- Please don’t use the corrosion gas (sulfur gas, chlorine gas) in the atmosphere.
- Please don’t direct solder onto the silver electrode of antenna pattern.

Delivery mode

1.Blister tape to IEC 286-3,polyester.
2.Pieces/tape:5000 pcs.
3.Moisture sensitivity level: Level 1



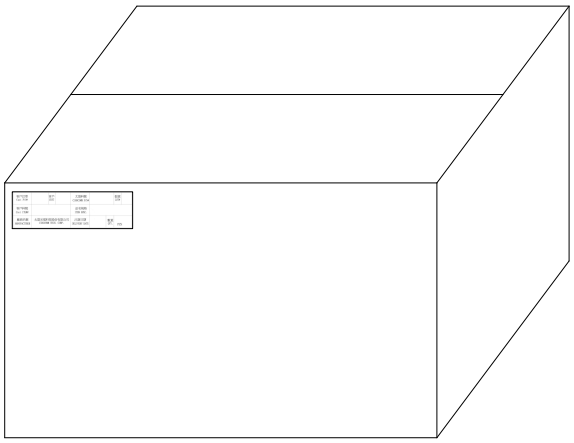
Marking direction



Packing

25,000 Pcs / Bag

150,000 Units / Carton-Outside

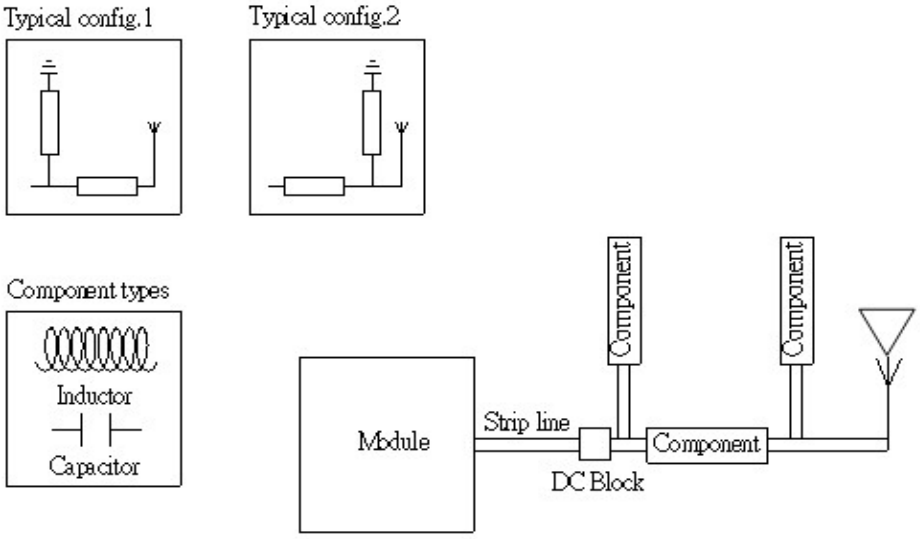


Size:330*280*270mm

Shipping Label

客戶訂單 Cust P/O#		客戶 Cust		太盟料號 CIROCOMM P/N#		批號 LOT#	
客戶料號 Cust Item#				品名規格 Item SPEC			
廠商名稱 MANUFACTURER	太盟光電科技股份有限公司 CIROCOMM TECH . CORP.			出貨日期 DELIVERY DATE		數量 QTY.	

12. Transmission line and matching



The matching network has to be individually designed using one,two or three components.

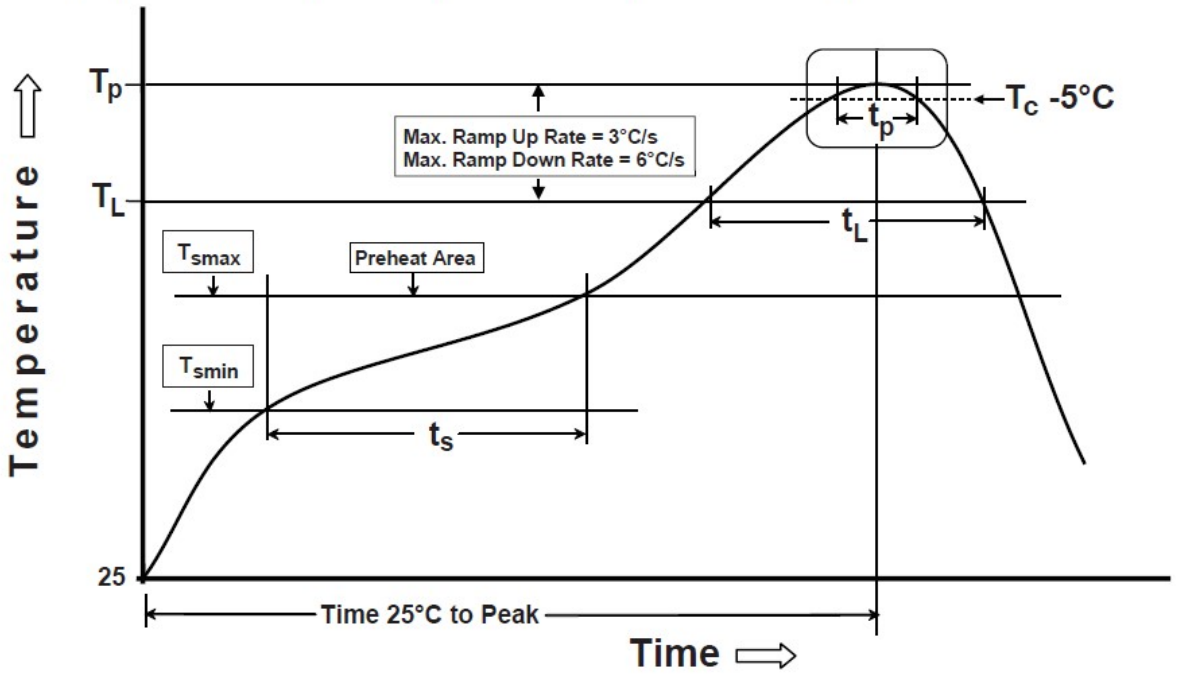
13. Recommended Reflow Soldering Profile

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(Tsmin) -Temperature Max(Tsmax) -Time(ts) form (Tsmin to Tsmax)	150°C 200°C 60-120 seconds
RAMP-UP	Avg. Ramp-up Rate (Tsmax to TP)	3°C /second(max)
REFLOW	-Temperature(TL) -Total Time above TL (t L)	217°C 30-100 seconds
PEAK	-Temperature(TP) -Time(tp)	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±10°C.
Apply preheating at 120°C for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron over temperature 270±10°C or 3 seconds, it will make component surface peeling or damage.
Soldering iron can not leakage of electricity.