



RFM Integrated Device, Inc.

## PRODUCT SPECIFICATION

Part Number: ANT1001

Antenna, Dielectric PIFA for  
WLAN a, b, g

2400~2500 MHz 4900~5850 MHz

## 1. SCOPE

This specification covers the dielectric antenna for **WLAN a 、 b 、 g**.

## 2. Name of the product

This product is named "Dielectric PIFA Antenna" .

## 3. Electrical characteristics

### 3-1 Electrical characteristics of antenna

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

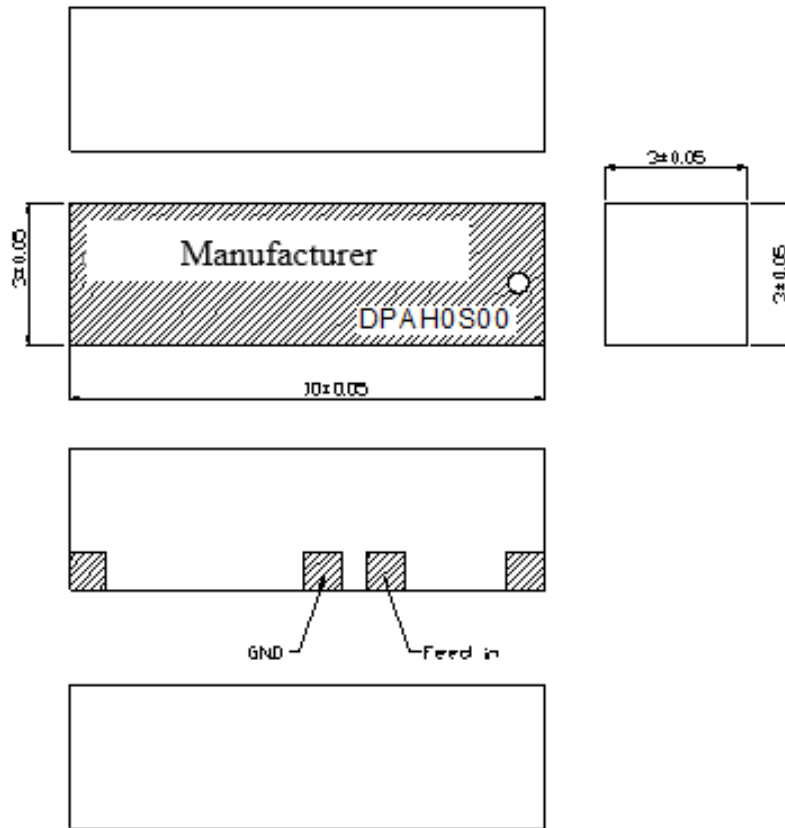
Table 1

No	Parameter	Specification
1	Working Frequency	2400~2500 MHz 4900~5850 MHz
2	Dimension	10×3.0×3.0 mm
3	VSWR	2.5 max @2400~2500MHz 3.0 max @4900~5850MHz
4	Polarization	Linear
5	Impedance	50 Ohm
6	Operating Temperature	-30~85°C
7	Termination	Ag (Environmentally-Friendly Pb Free )

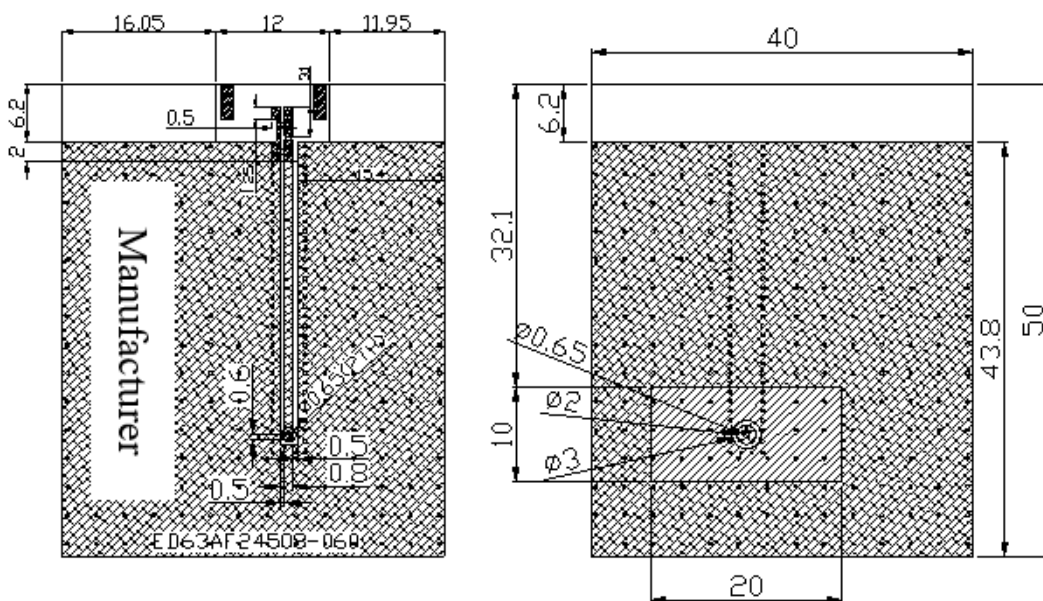
\* Actual value will depend on customer ground plane size.

## 4. Shape & Demo Board Dimension

### 4-1 Shape and Dimension

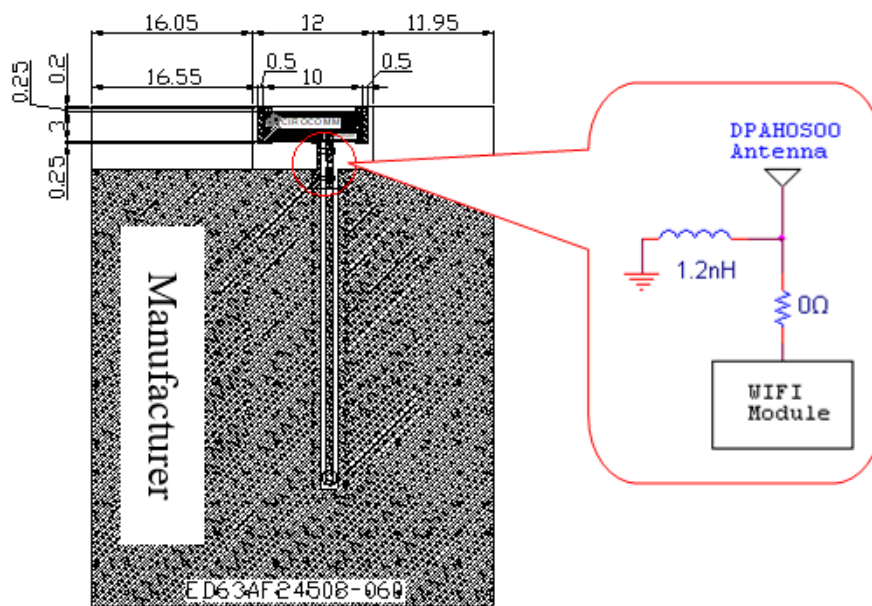


### 4-2 Demo Board

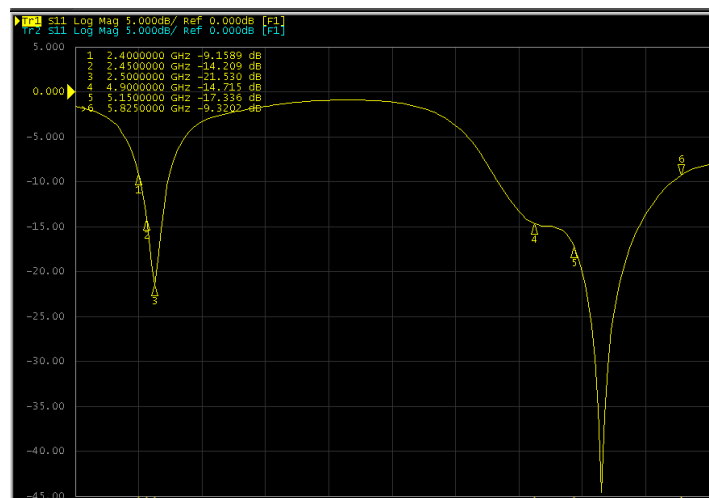


## 5. Antenna Measurement on Demo Board

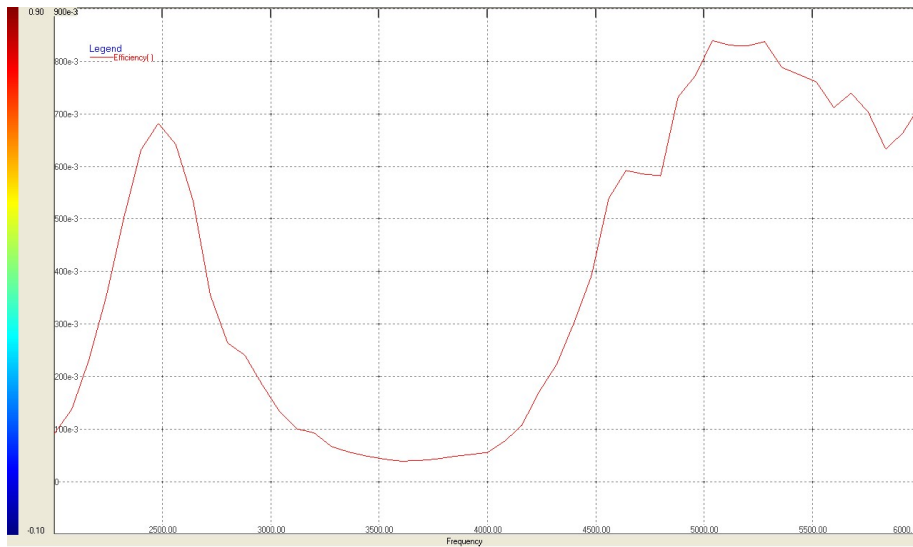
### 5-1 Matching Circuit



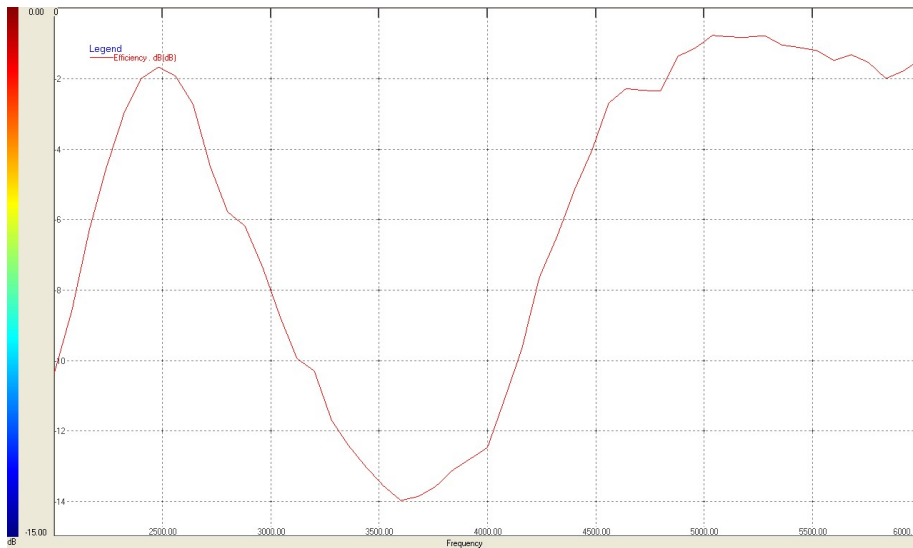
### 5-2 S11 Response curve ( Work Frequency )



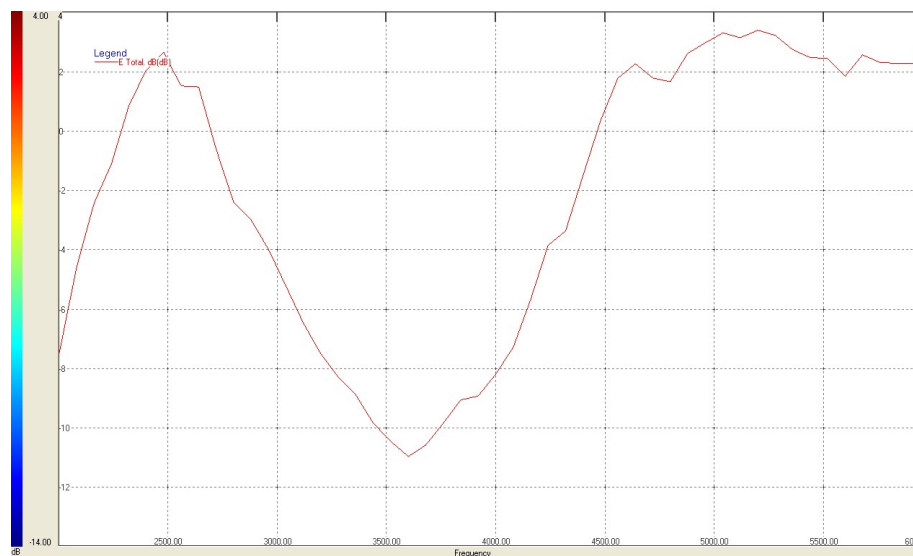
Band	WIFI (MHz) (free space)					
	2400	2450	2500	4900	5150	5825
<b>Efficiency (%)</b>	63.1	66.2	67.1	74.1	82.9	64.5
<b>Average Gain (dBi)</b>	-1.99	-1.78	-1.72	-1.29	-0.81	-1.90
<b>Peak Gain (dBi)</b>	2.05	2.43	2.38	2.71	3.24	2.28



**Efficiency**

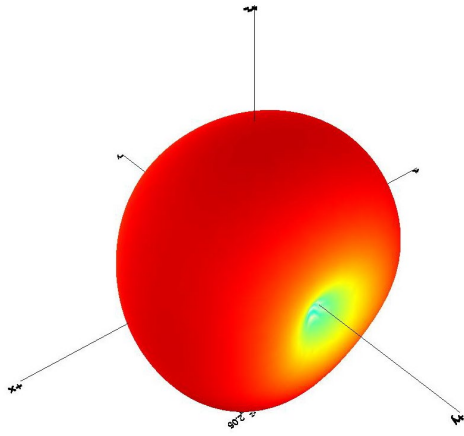


**Average Gain**

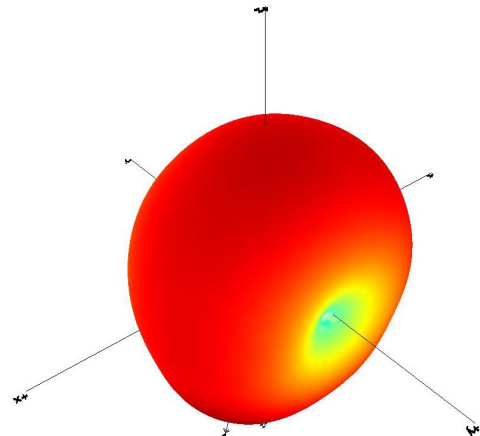


**Peak Gain**

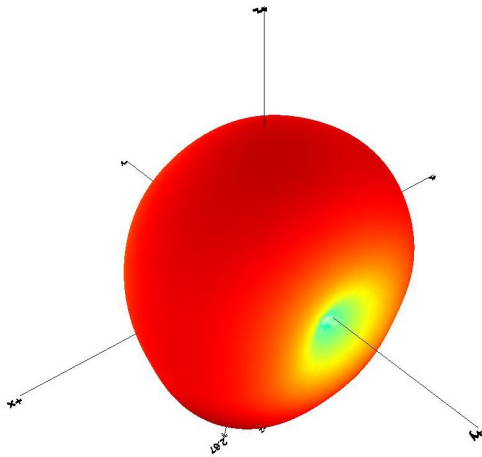
### 5-3 3D Radiation Pattern (measure on manufacturer's EVB)



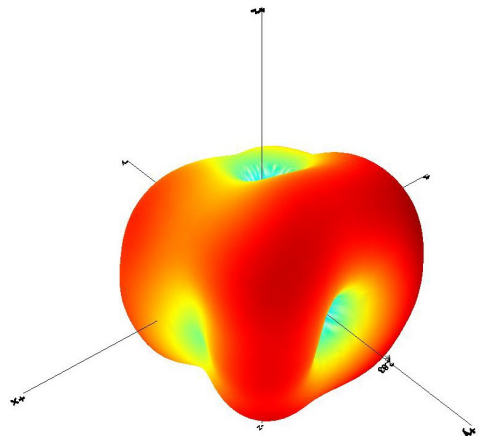
**2400MHz**



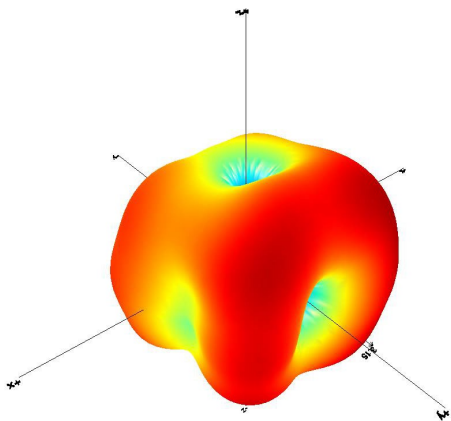
**2450MHz**



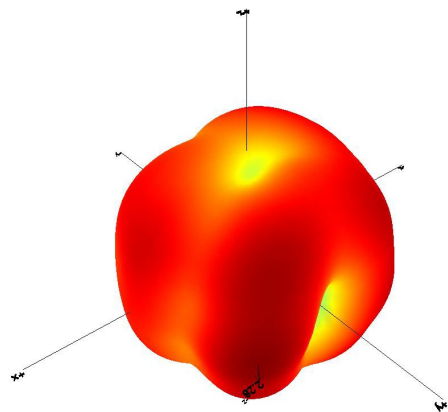
**2500MHz**



**4900MHz**

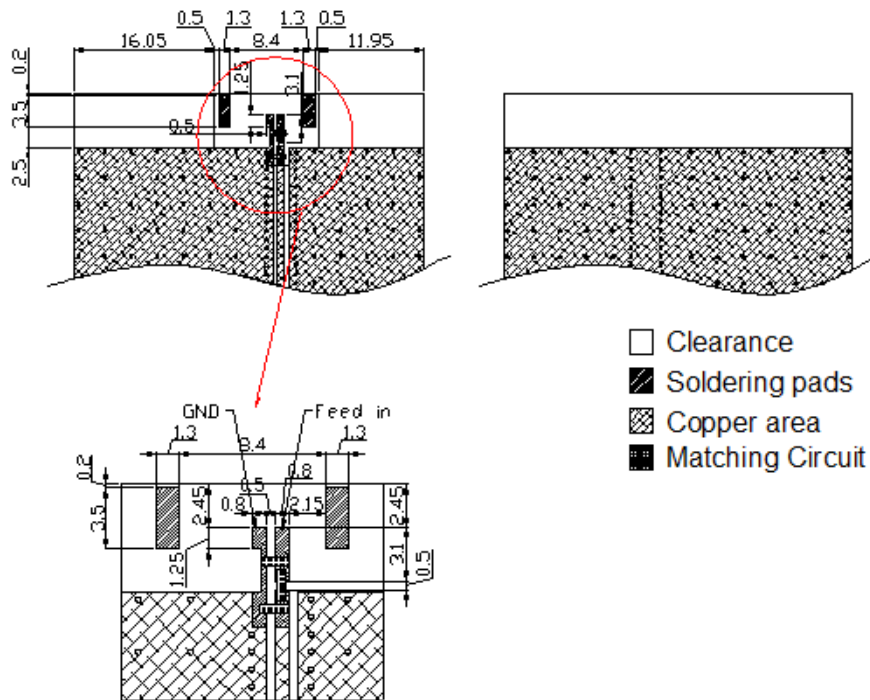


**5150MHz**



**5825MHz**

## 6. Customer's Requirement Layout Dimension



## 7. Environmental conditions

### 7-1 Operating conditions

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

### 7-2 Storage temperature range

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

## 8. Reliability tests

### 8-1 Low-temperature test

Expose the specimen to  $-30^{\circ}\text{C}$  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  $+85^{\circ}\text{C}$  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 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 (-30°C, 30 minutes↔+85°C, 30 minutes ) for 5 cycles, the 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:

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

### 8-8 Adhesion Test:

The device is subjected to be soldered on test PCB. Then apply 0.5Kg(5N) of force for  $10 \pm 1$  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 from 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.

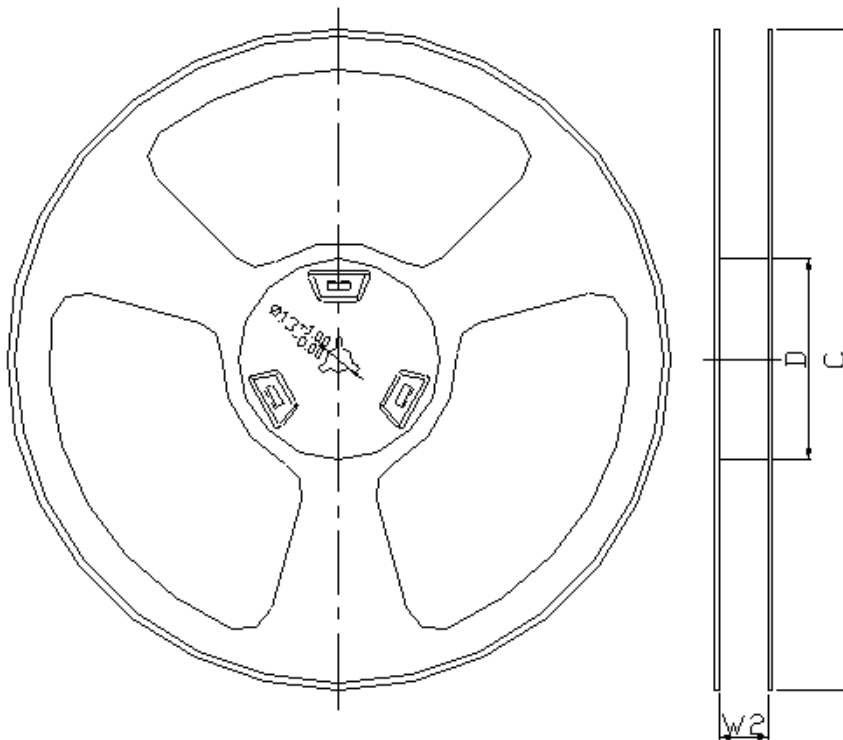
## 11. Precautions for use

Antenna pattern use a Ag electrode.

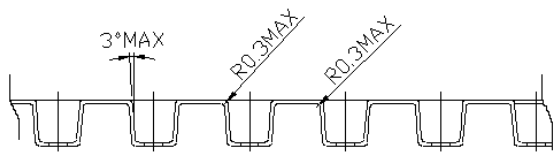
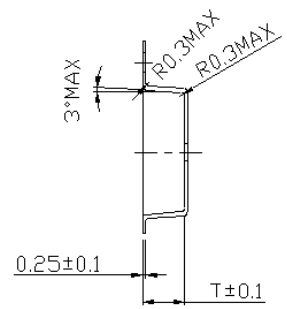
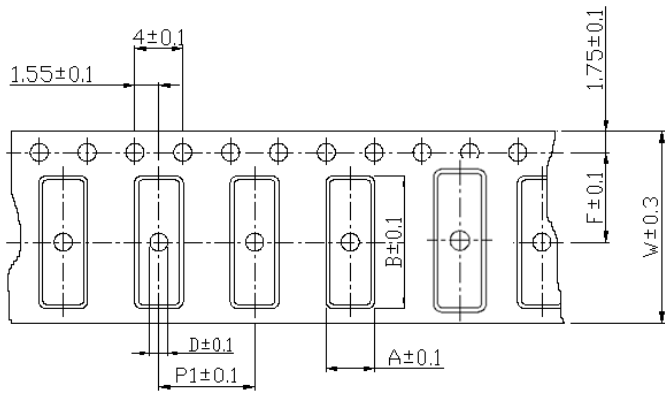
Please don't use the corrosion gas (sulfur gas, chlorine gas) in the atmosphere.

### Delivery mode

1 Blister tape to IEC 286-3 , polyester ◦



Product code	Units per Reel	C (mm)	D (mm)	W2 (mm)
Antenna	1000	330±1.0	100±0.5	24.5±1.0



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

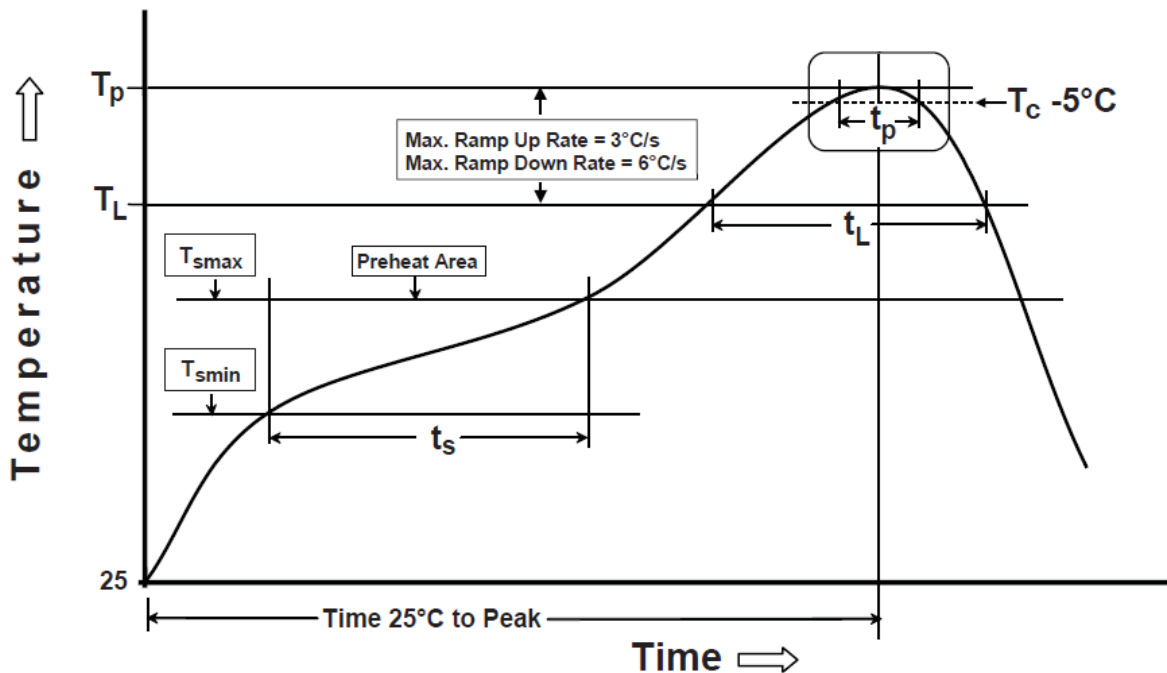
## 12. Recommended Reflow Soldering Profile

The 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( $t_s$ ) form ( $T_{smin}$ to $T_{smax}$ )	150°C 200°C 60-120 seconds
RAMP-UP	Avg. Ramp-up Rate ( $T_{smax}$ to $T_P$ )	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 20-30 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  $270\pm 10$  °C.

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