

## PART NUMBER: GA-078

### 1 SCOPE

This specification covers the dielectric antenna for **824~960MHz, 2400~2500 MHz, 5150~5850MHz** application.

### 2 Name of the product

This product is named "Dielectric Antenna".

### 3 Electrical characteristics

#### 3-1 Electrical characteristics of antenna

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

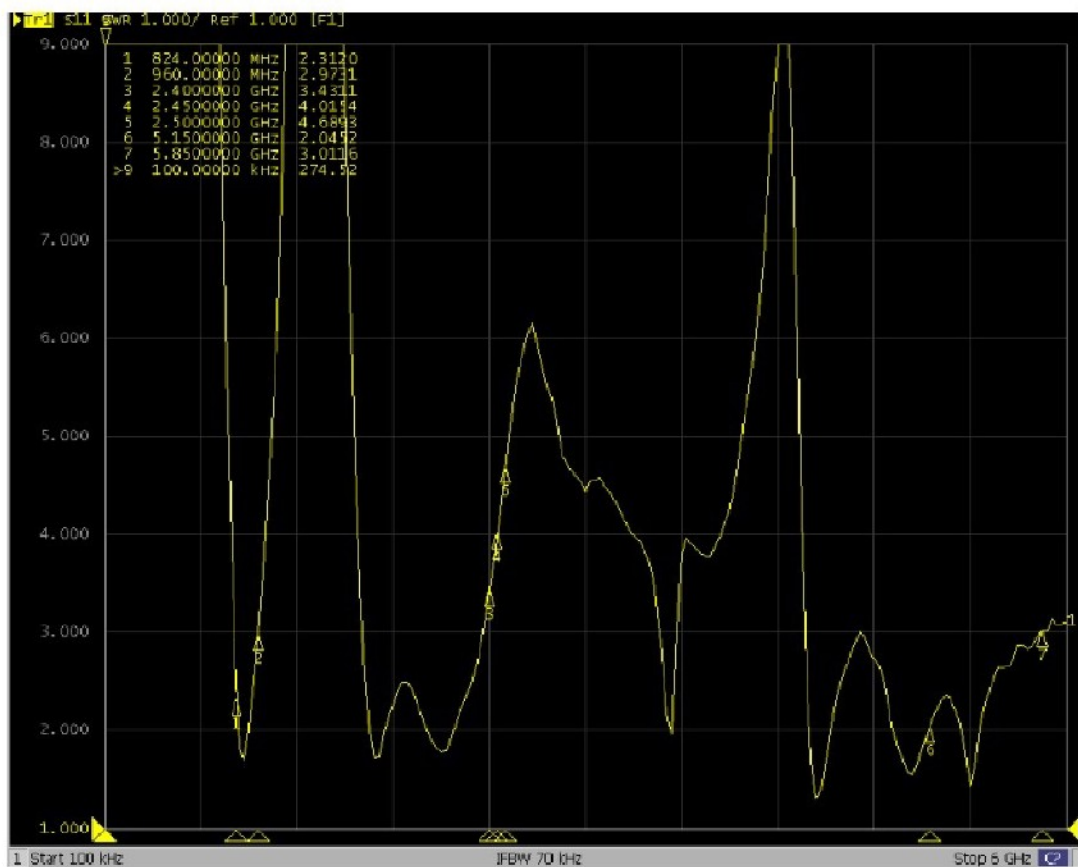
Table 1

No	Parameter	Specification	
1	Working Frequency	824~960 MHz, 2400~2500 MHz, 5150~5850MHz	
2	Dimension	30×5×5 mm	
3	VSWR	<5.0	
4	Polarization	Linear	
5	Impedance	50 Ω	
6	Operating Temperature	-40~85℃	
7	Termination	Ag (Environmentally-Friendly Pb Free)	
8	Efficiency(%)	824~960 MHz	50
		2400~2500 MHz	40
		5150~5850MHz	60

\* Evaluation board size 40X120 mm.

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

## SWR Response curve

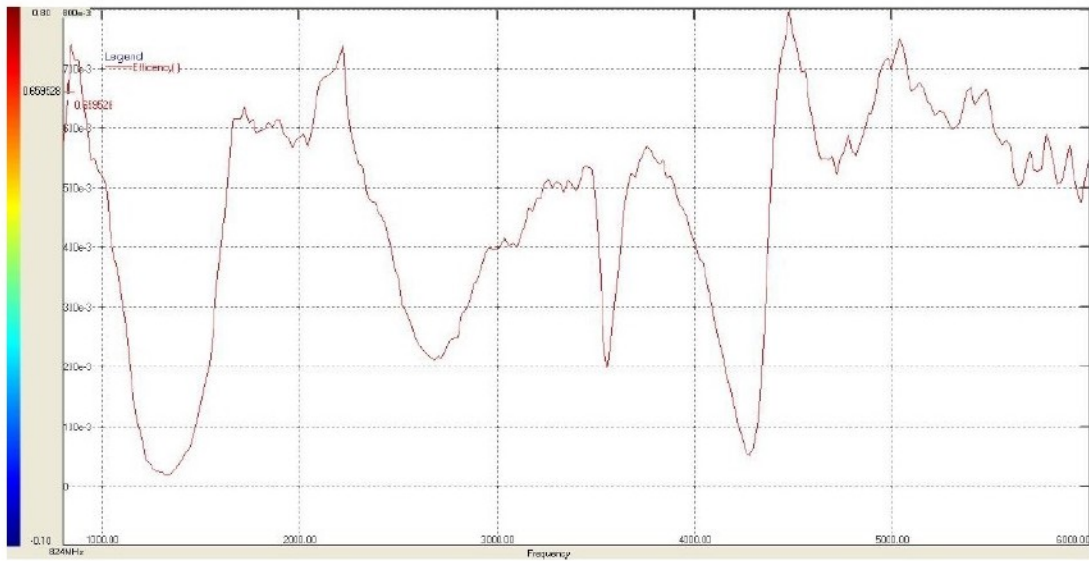


Antenna VSWR							
Frequency (MHz)	824MHz	960MHz	2400MHz	2450MHz	2500MHz	5150MHz	5850MHz
VSWR	2.02	3.39	2.12	2.64	3.27	2.04	3.01

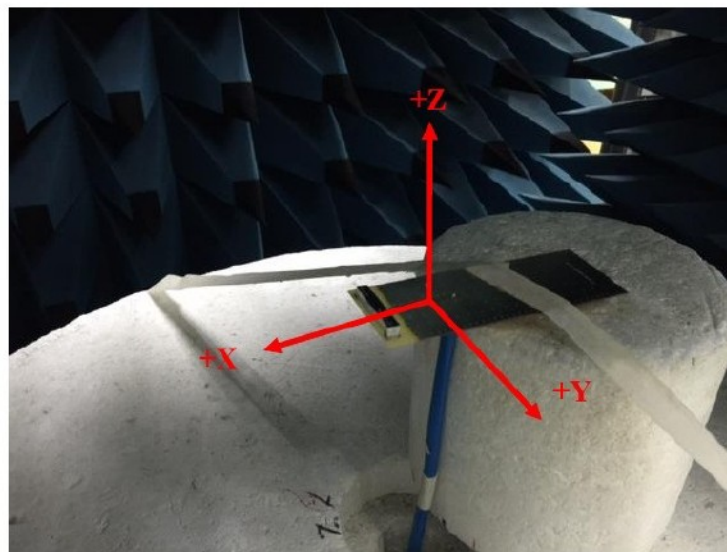
## Gain and Efficiency

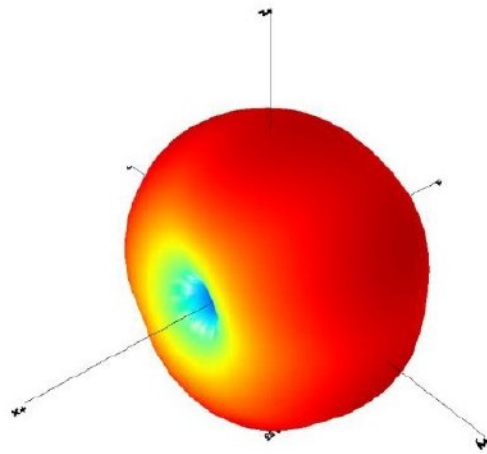
(Ground length: 107mm)

Antenna peak gain parameter summary							
Frequency	824	960	2400	2450	2500	5150	5850
Peak Gain(dBi)	0.84	0.08	2.61	2.20	1.18	3.31	3.42
Efficiency(%)	55.26	47.92	48.05	42.62	35.36	67.06	50.67

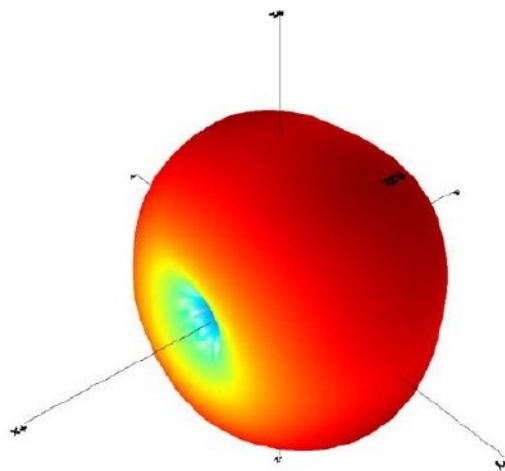


## 3D Radiation Pattern (measure on CHINMORE EVB)示意图

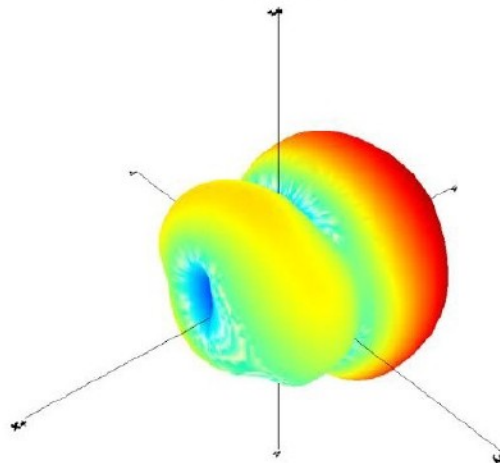




824MHz



960MHz



2450MHz

## **4 Environmental conditions**

### **4-1 Operating conditions**

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

### **4-2 Storage temperature range**

The storage temperature range of product is  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

## **5 Reliability tests**

### **5-1 Low-temperature test**

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

### **5-2 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.

### **5-3 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.

### **5-4 Thermal shock test**

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

### **5-5 Vibration test**

#### **5-5-1 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.

#### **5-5-2 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.

### **5-6 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 corner, three edges and six faces once each, i.e. 10 times in total. After this, check the appearance and functions.

#### 5-7 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.

#### 5-8 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) .

### 6 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.

### 7 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.

### 8 Other

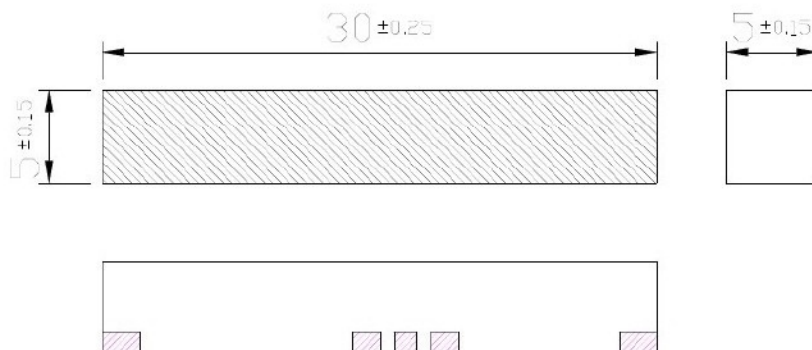
Any question arising from this specification manual shall be solved by arrangement made by both parties.

### 9 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 gold electrode of Antenna pattern.

## 10. Drawings

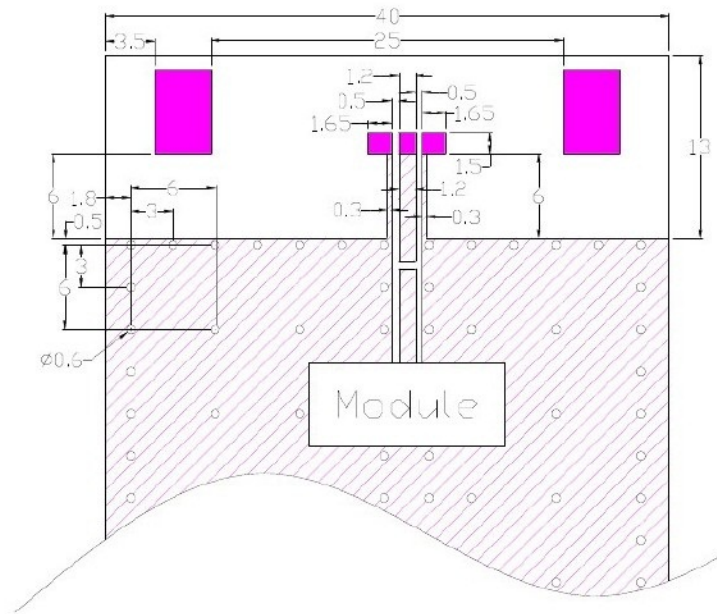
### Shape and Dimension



Unit:mm

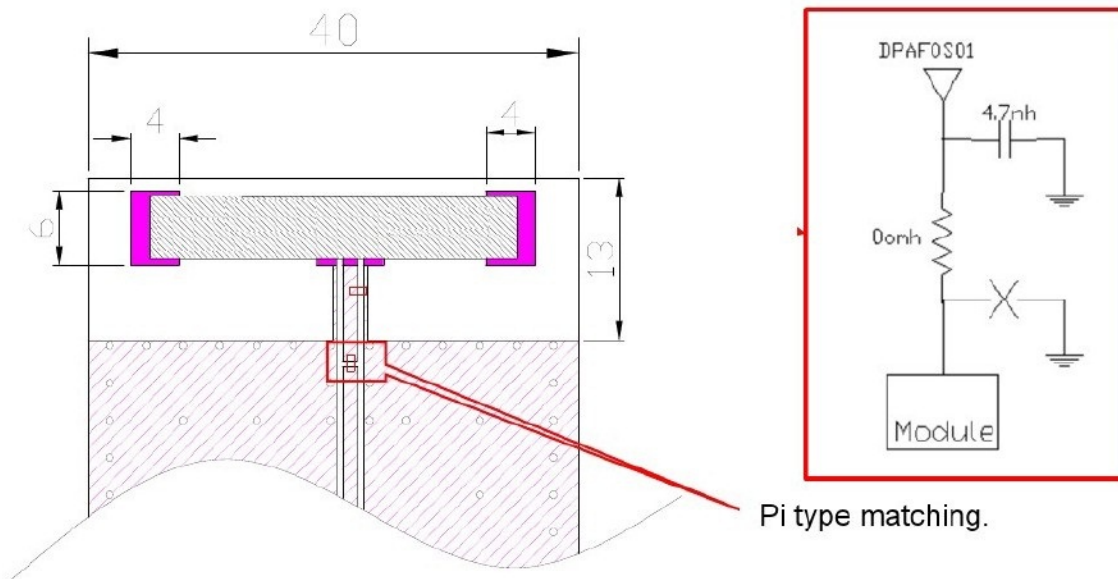


## Customer's Requirement Layout Dimension



## Antenna Environment on Demo Board

### Matching Circuit



**Between antenna and module need a pi type matching circuit.**

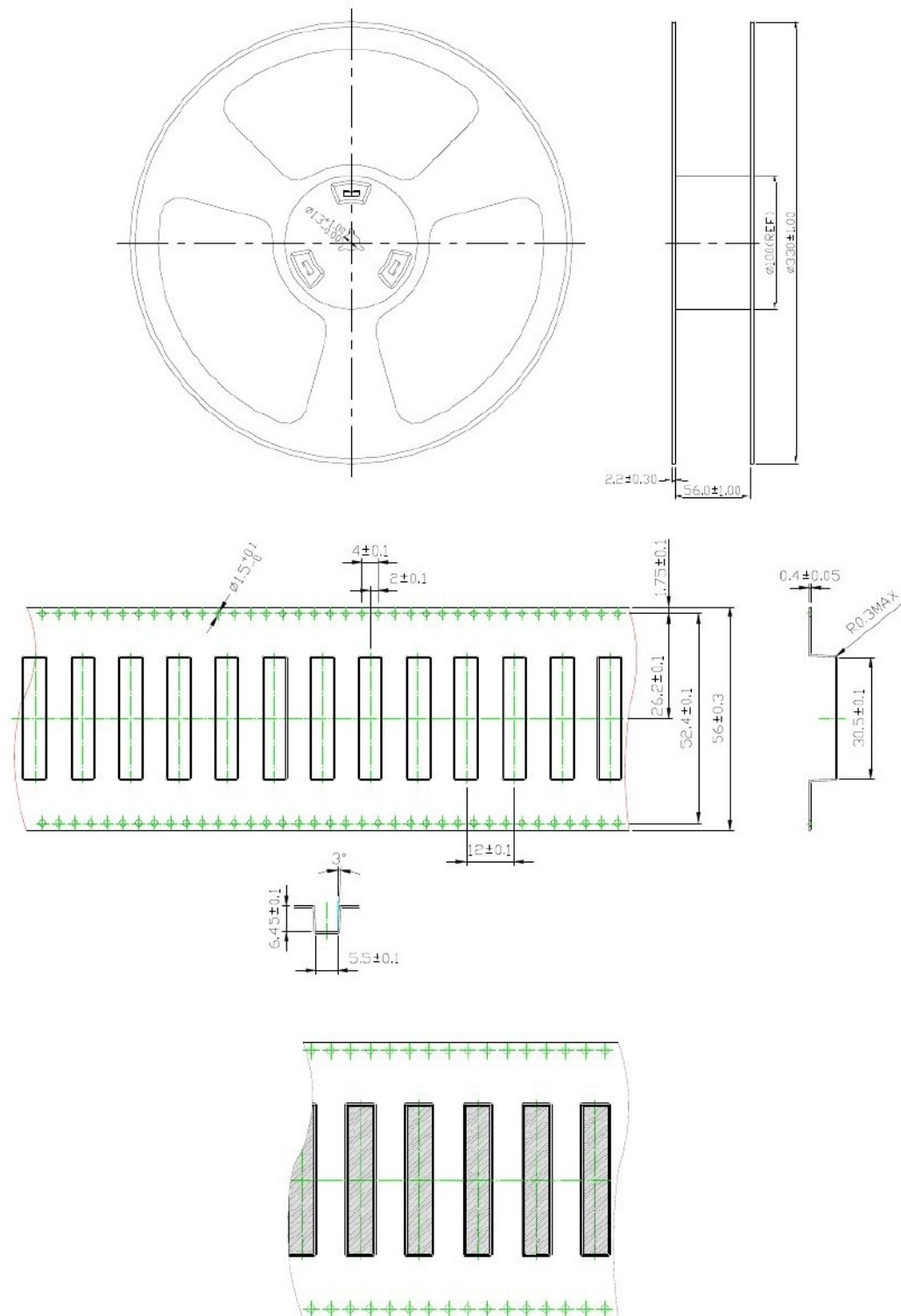




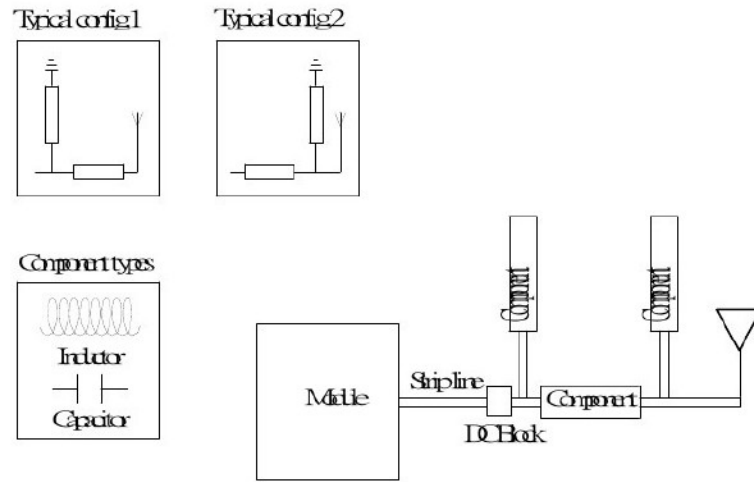
## Delivery mode

1 Blister tape to IEC 286-3 , polyester •

2 Pieces/tape : 450



## Transmission line and matching



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

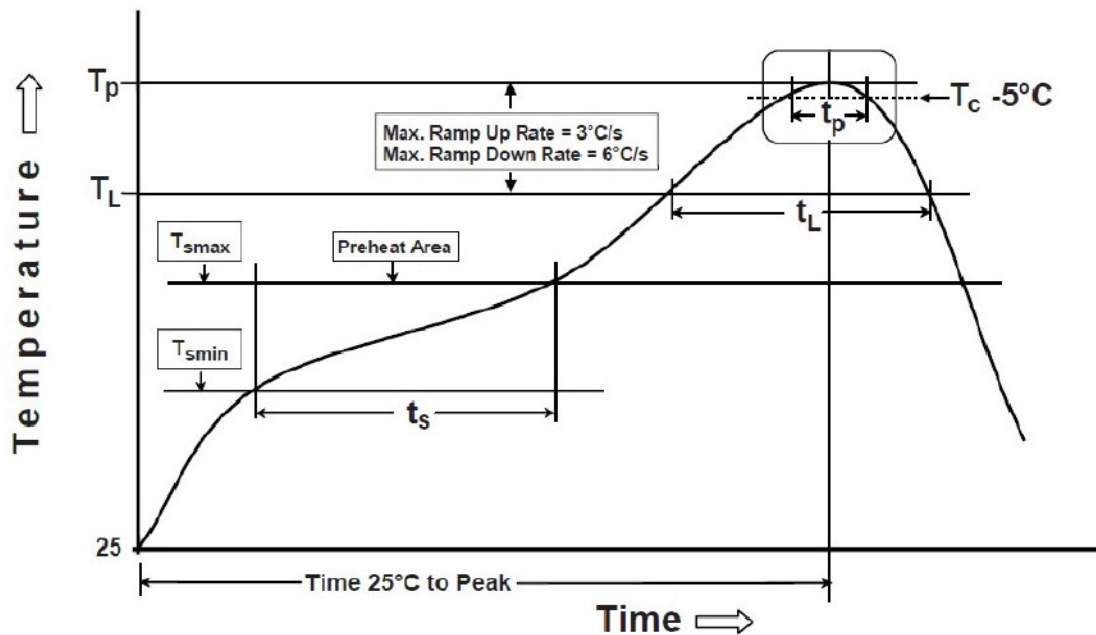
### 11 Recommended Reflow Soldering Profile

Chinmore 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 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  $270 \pm 10^\circ\text{C}$ .

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