佳邦科技股份有限公司
INPAQ TECHNOLOGY CO., LTD.

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Title: Business Manager

# VGAP-CLP-AS-A1

# Specification

| | |
|---|---|
| Product Name | INPAQ RF Chip Antenna |
| Series/PN | VGAP-CLP-AS-A1 |
| Size | EIAJ 5036 |

# PN：VGAP-CLP-AS-A1 Specification

## 1. Features and Application：

(1) This product is manufactured in ISO/TS16949 certified production factory.
(2) This product is qualified according to AEC-Q200.
(3) This product is for 6 GHz to 9 GHz,

## 2. Explanation of Part Number：

| VGAP | - | C | LP | - | A | S | - | A1 |
|---|---|---|---|---|---|---|---|---|
| | | (1) | (2) | | (3) | (4) | | (5) |

(1) Product Type：Chip Antenna
(2) Center Frequency/Band Code：6 GHz to 9 GHz
(3) Size Code：5.0*3.6 mm (Length * Width)
(4) Special Code：RoHS Compliant
(5) Design Revision Code：Rev.1

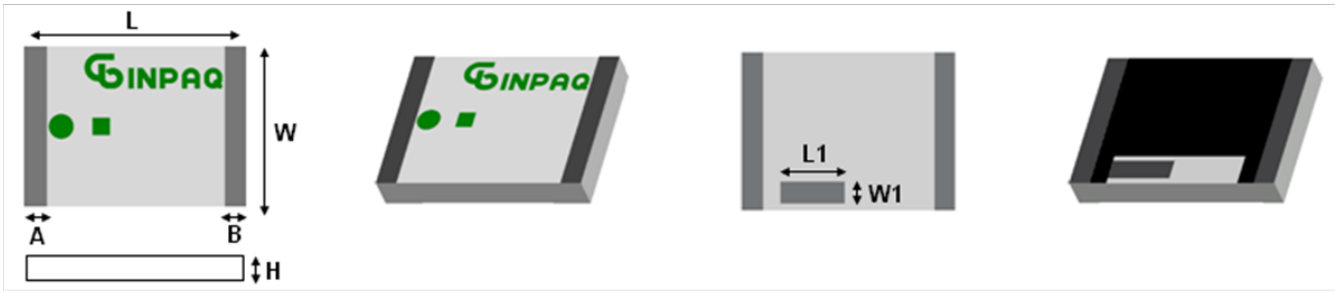
## 3. Electrical Specification：

| Item | Specification |
|---|---|
| Frequency Band | 6000 ~ 9000 MHz |
| Polarization | Linear |
| Impedance | 50 ohm Typ. |
| VSWR | Less than 2.5 |
| *Peak Gain | 3.71 dBi Typ. |
| *Peak Efficiency | 91.31 % Typ. |

* Test condition：Test board size 50*40 mm
Matching circuit may be required

## 4. Physical Dimension：

**Top View** **Bottom View**




**Marking is Green**

| | |
|---|---|
| **L** | 5.20 ± 0.30 |
| **W** | 3.70 ± 0.30 |
| **H** | 0.70 ± 0.15 |
| **A** | 0.45 ± 0.25 |
| **B** | 0.45 ± 0.25 |
| **L1** | 1.55 ± 0.20 |
| **W1** | 0.55 ± 0.20 |
| **X** | 0.85 ± 0.25 |
| **Y** | 0.12 ± 0.06 |

(Unit: mm)

## 5. Recommend PCB Layout：

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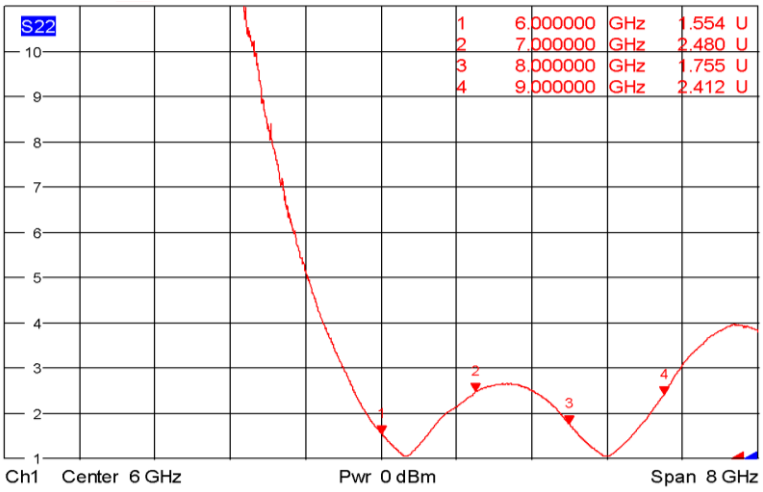
## 6. Electrical Characteristics：

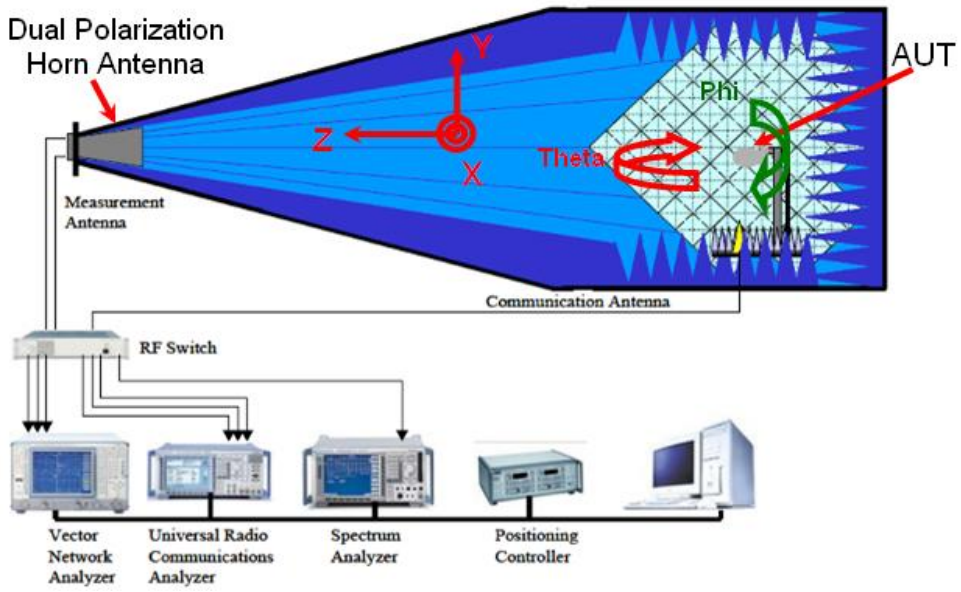
**VSWR**




| Mark | Frequency (MHz) | VSWR |
|---|---|---|
| 1 | 6000 | 1.554 |
| 2 | 7000 | 2.480 |
| 3 | 8000 | 1.755 |
| 4 | 9000 | 2.412 |

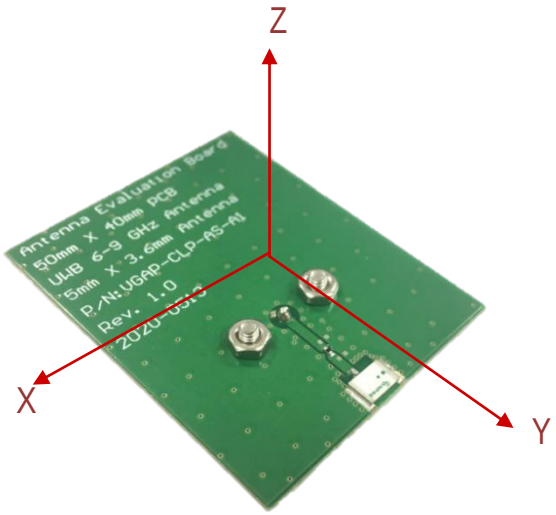
## Radiation Pattern

The Gain pattern is measured in INPAQ's FAR-field chamber. DUT is placed on the table of rotator, a standard horn antenna and Vector Network Analyzer is used to collect data.

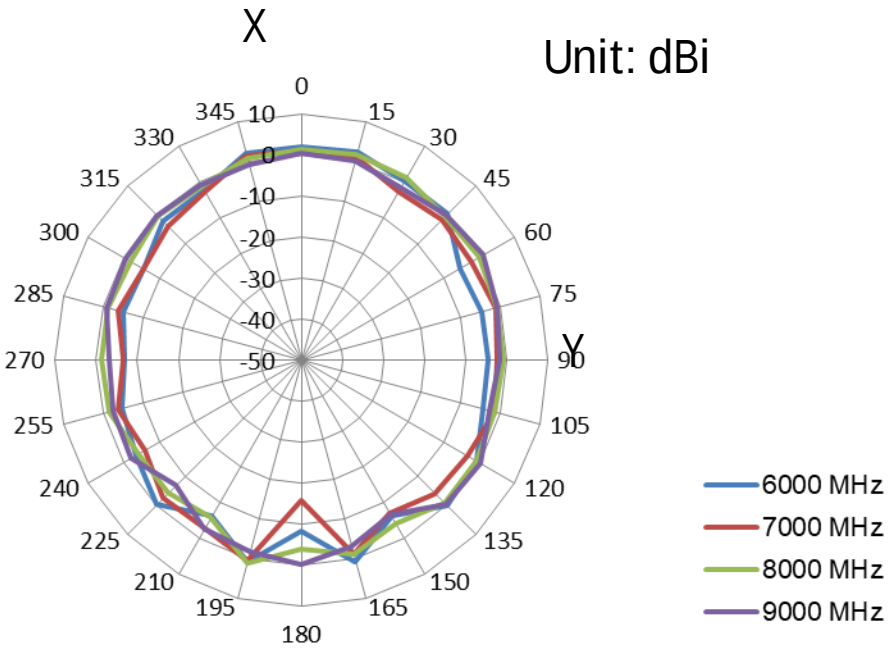



3D Chamber Definition

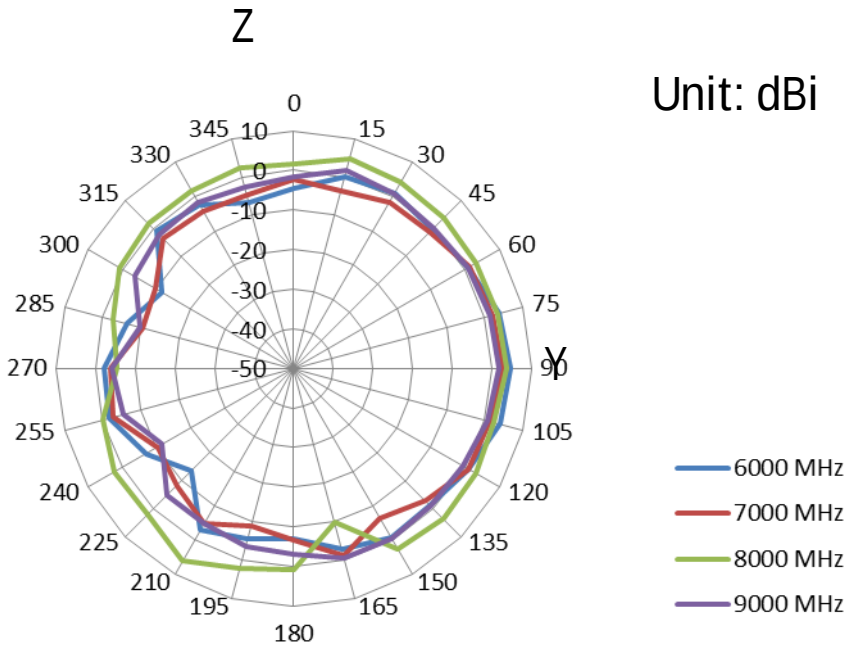
## 2D Gain Pattern



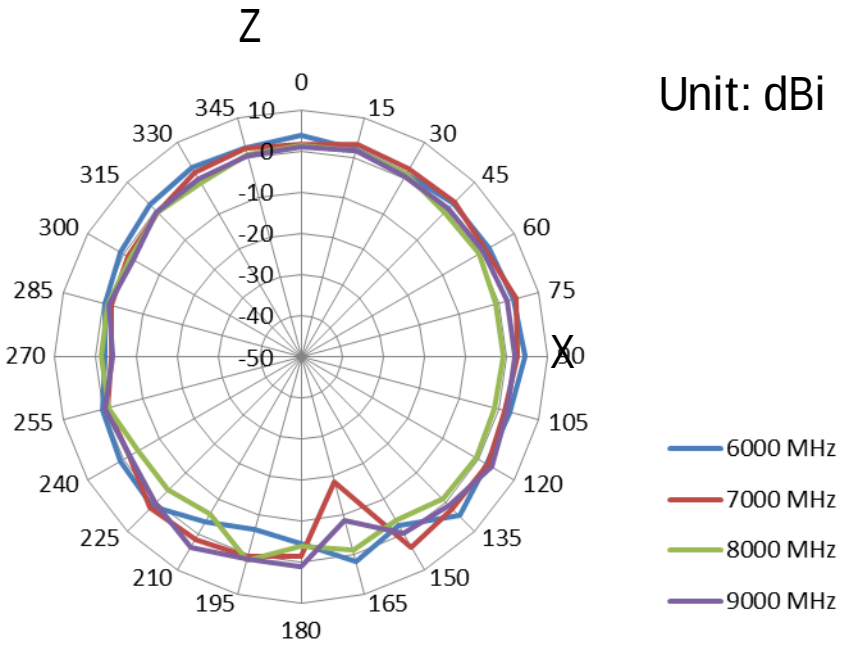

## XY-Plane



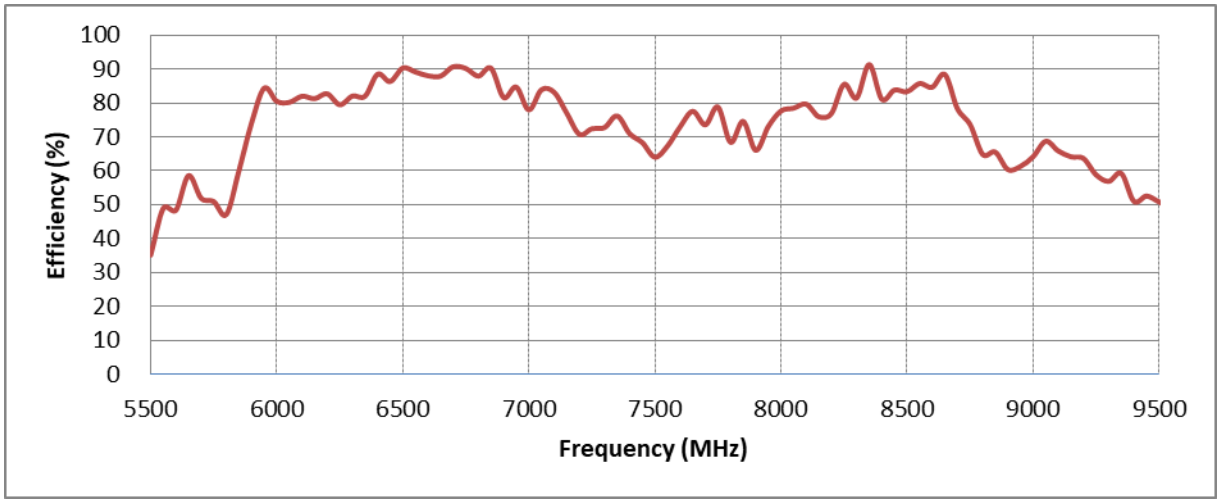
**YZ-Plane**



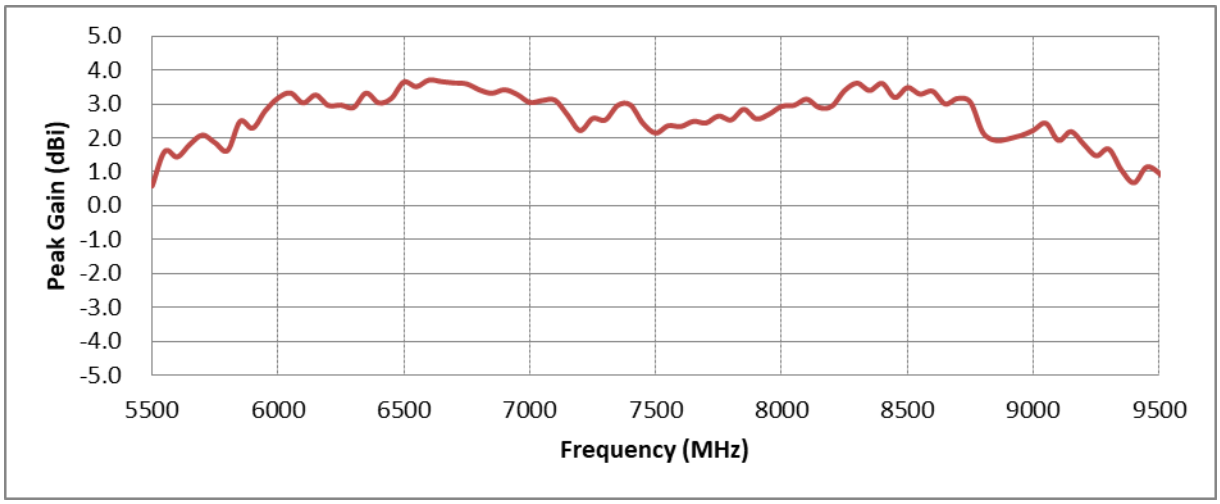

**XZ-Plane**



## Efficiency




## Peak Gain

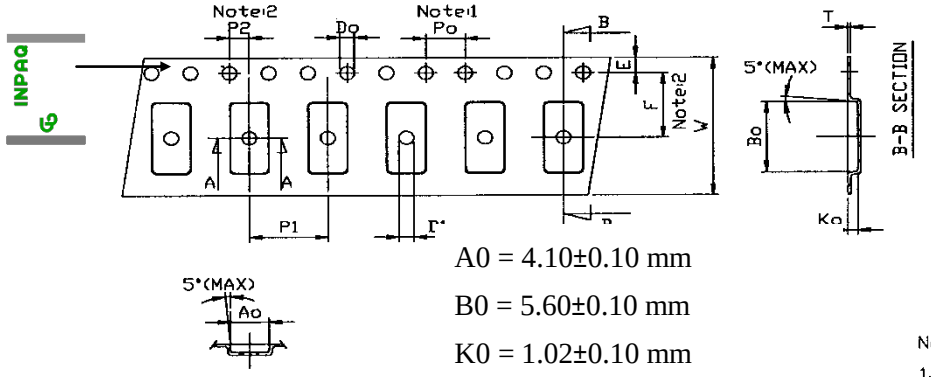



| Frequency (MHz) | Efficiency (%) | Peak Gain (dBi) |
|---|---|---|
| 6000 | 80.48 | 3.17 |
| 7000 | 77.92 | 3.04 |
| 8000 | 77.62 | 2.93 |
| 9000 | 64.14 | 2.22 |

# 7. Taping Package and Label Marking：

## (1) Quantity/Reel：2000pcs/Reel

## (2) Carrier tape dimensions




A0 = 4.10±0.10 mm

B0 = 5.60±0.10 mm

K0 = 1.02±0.10 mm

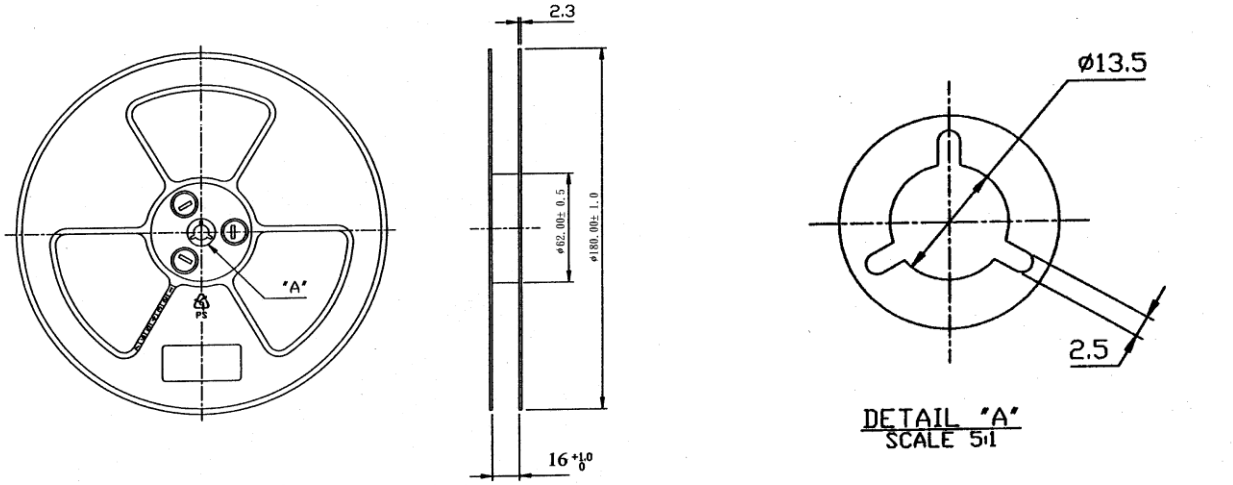
(Unit：mm)

| Symbol | Spec. |
|---|---|
| Po | 4.00±0.1 |
| P1 | 8.00±0.1 |
| P2 | 2.00±0.05 |
| Do | 1.55±0.05 |
| D1 | 1.50(MIN) |
| E | 1.75±0.1 |
| F | 5.50±0.05 |
| 10Po | 40.00±0.2 |
| W | 12.00±0.1 |
| T | 0.25±0.05 |

Notice:

1. 10 Sprocket hole pitch cumulative tolerance is ±0.1mm.
2. Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
3. Ao & Bo measured on a place 0.3mm above the bottom of the pocket to top surface of the carrier.
4. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5. Carrier camber shall be not than 1mm per 100mm through a length of 250mm.

## (3) Taping reel dimensions



## 8. Environmental Characteristics：

**This product is qualified according to AEC-Q200.**

**(1) Reliability Test**

| Item | Condition | Specification |
|---|---|---|
| **High Temperature Storage** | 150℃，1000hours | No Damaged |
| **Temperature Cycling** | -55℃ 30min/125℃ 30min，1000 cycle | No Damaged |
| **Biased Humidity** | 85℃、85% RH，1000hours | No Damaged |
| **Resistance to Solvent** | Add Aqueous wash chemical OKEMCLEAN for 5 min | No Damaged |
| **Mechanical Shock** | 1500G 0.5 ms , X,Y,Z axis 3 time | No Damaged |
| **Vibration** | 1. Frequency：10 to 2000 Hz<br>2. 5g's for 20 min<br>3. Duration time：2hr for each in X ,Y,Z | No Damaged |
| **Resistance to Soldering Heat** | Brush flux and put the board into solder bath 260℃ , 10sec. | No Damaged |
| **Solderability Test** | 1. 8 hours ± 15 min. steam conditioning<br>2. Put the sample on board by tape.<br>3. Brush flux and put the board into solder bath 260±5℃ , 5±1 sec | No Damaged |
| **Board Flex** | 2mm for 60sec. | No Damaged |
| **Termination strength (SMD)** | 1.8Kgf，60sec | No Damaged |

**(2) Storage condition**

**(a) At warehouse**：

The temperature should be within 0 ~ 30°C and humidity should be less than 60% RH.

The product should be used within 1 year from the time of delivery.

**(b) On board**：

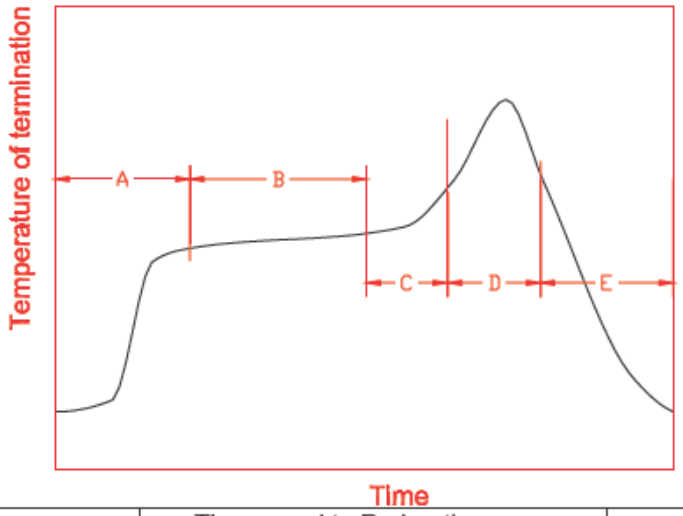
The temperature should be within -40 ~ 85°C and humidity should be less than 85% RH.

**(3) Operating temperature range**

Operating temperature range：-40 ~ +125°C.

## 9. Recommended reflow soldering：

**Reference：J-STD-020C**




| | | | |
|---|---|---|---|
| A | 1st rising temperature | The normal to Preheating temperature | 30s to 60s |
| B | Preheating | 140℃ to 160℃ | 60s to 120s |
| C | 2nd rising temperature | Preheating to 200℃ | 20s to 40s |
| D | Main heating | if 220℃ | 50s～60s |
| | | if 230℃ | 40s～50s |
| | | if 240℃ | 30s～40s |
| | | if 250℃ | 20s～40s |
| | | if 260℃ | 20s～40s |
| E | Regular cooling | 200℃ to 100℃ | 1℃/s ～ 4℃/s |

### (1) Soldering gun procedure

Note the follows, in case of using solder gun for replacement.

(a) The tip temperature must be less than 350°C for the period within 3 seconds by using soldering gun under 30 W.

**(b) The soldering gun tip shall not touch this product directly.**

### (2) Soldering volume

Note that excess of soldering volume will easily get crack the body of this product.