

VGAP-CLK-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 3-4GHz.

2. Explanation of Part Number :

VGAP - $\frac{\text{C}}{(1)}$ $\frac{\text{LK}}{(2)}$ - $\frac{\text{A}}{(3)}$ $\frac{\text{S}}{(4)}$ - $\frac{\text{A1}}{(5)}$

- (1) Product Type : Chip Antenna
- (2) Center Frequency/Band Code : 3 - 4 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 :

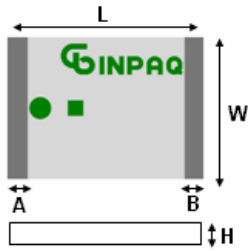
| Item | Specification |
|------------------|-----------------|
| Frequency Band | 3000 ~ 4000 MHz |
| VSWR | Less than 3.5 |
| Polarization | Linear |
| *Peak Gain | 3.2 dBi Typ. |
| *Peak Efficiency | 69 % Typ. |
| Impedance | 50 ohm Typ. |

* Test condition : Test board size 53*31 mm
Matching circuit may be required

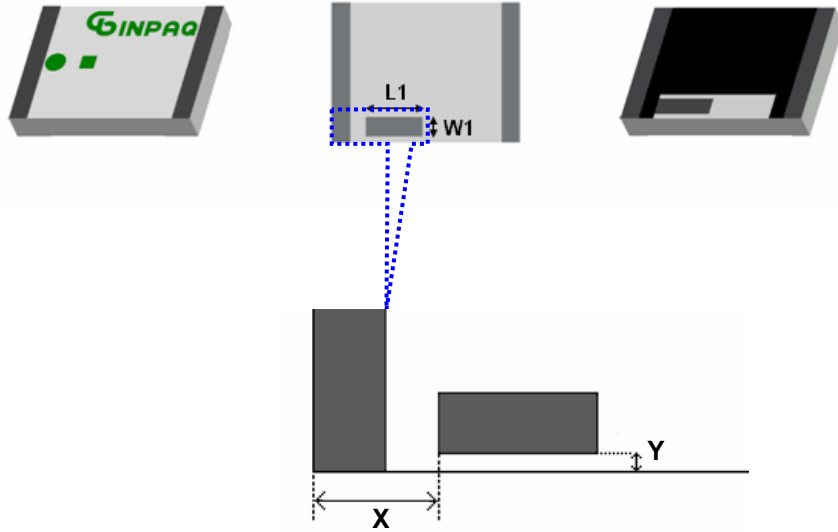
| | | | | |
|--|------------------------|---|-----------------------------------|------------------------|
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| DRAWN BY:林豪建 Stan | CHECKED BY:吳柏青 David | | | |
| DESIGNED BY:林豪建 Stan | APPROVED BY:黃月碧 Yuebia | | | |
| TITLE : VGAP-CLK-AS-A1 Specification | | DOCUMENT NO. | ENS000062850 | SPEC REV. A0 |

4. Physical Dimension :

Top View



Bottom View



Marking is Green

(Unit: mm)

| Chip Antenna | L | W | A | B | L1 | W1 | H | X | Y |
|----------------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| VGAP-CLK-AS-A1 | 5.2±0.3 | 3.7±0.3 | 0.45±0.25 | 0.45±0.25 | 1.55±0.20 | 0.55±0.20 | 0.70±0.15 | 0.85±0.25 | 0.12±0.06 |

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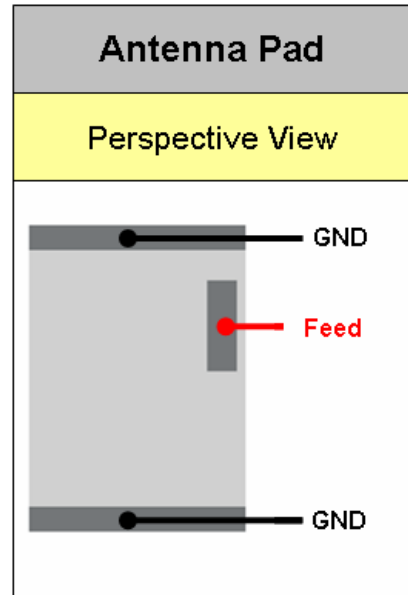
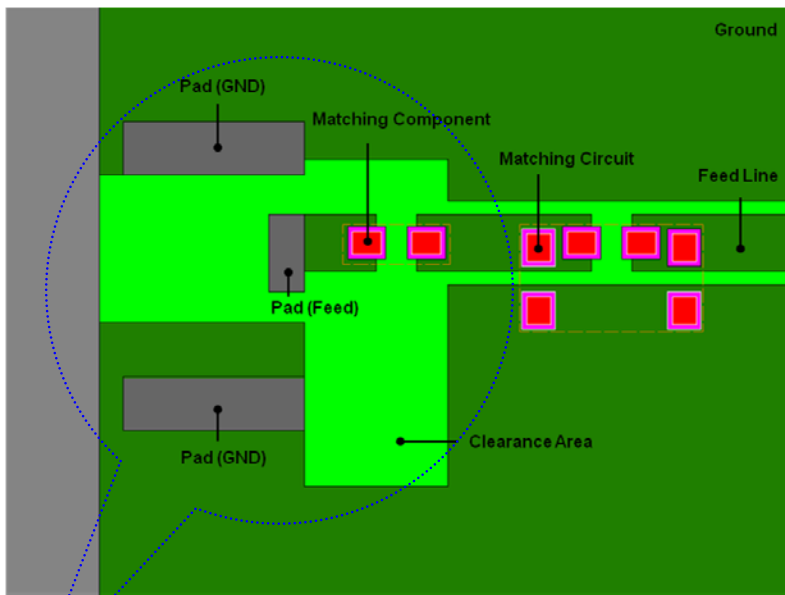
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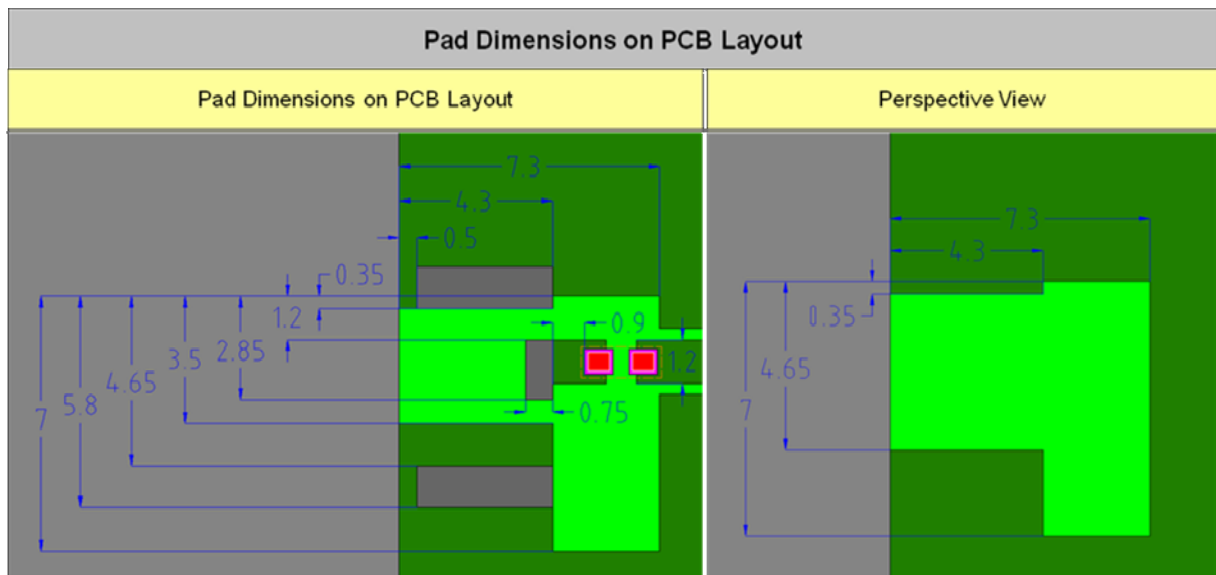
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5. Recommend PCB Layout :



(Unit : mm)



PCB pad dimensions Tolerance : ± 2

| Terminal Name | Terminal Dimensions |
|---------------|---------------------|
| Pad (Feed) | 1.65*0.75 |
| Pad (GND) | 3.8*1.15 |
| Pad (GND) | 3.8*1.15 |

Antenna pad dimensions

| Terminal Name | Terminal Dimensions |
|---------------|---------------------|
| Feed | 1.55*0.55 |
| GND | 3.7*0.45 |
| GND | 3.7*0.45 |

UNLESS OTHER SPECIFIED TOLERANCES ON :

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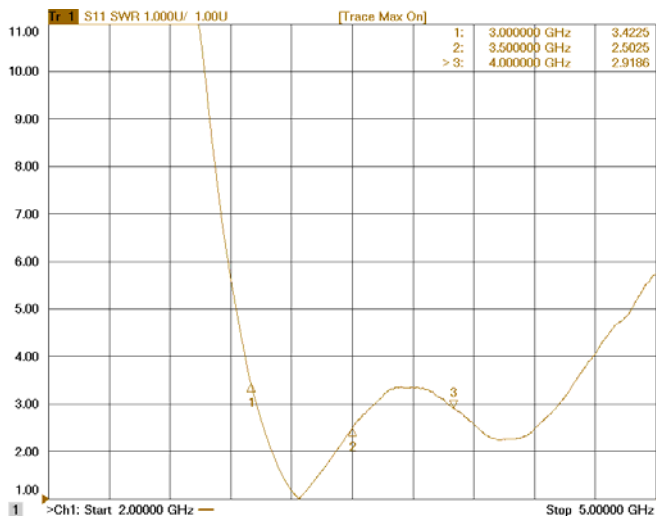
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6. Electrical Characteristics :

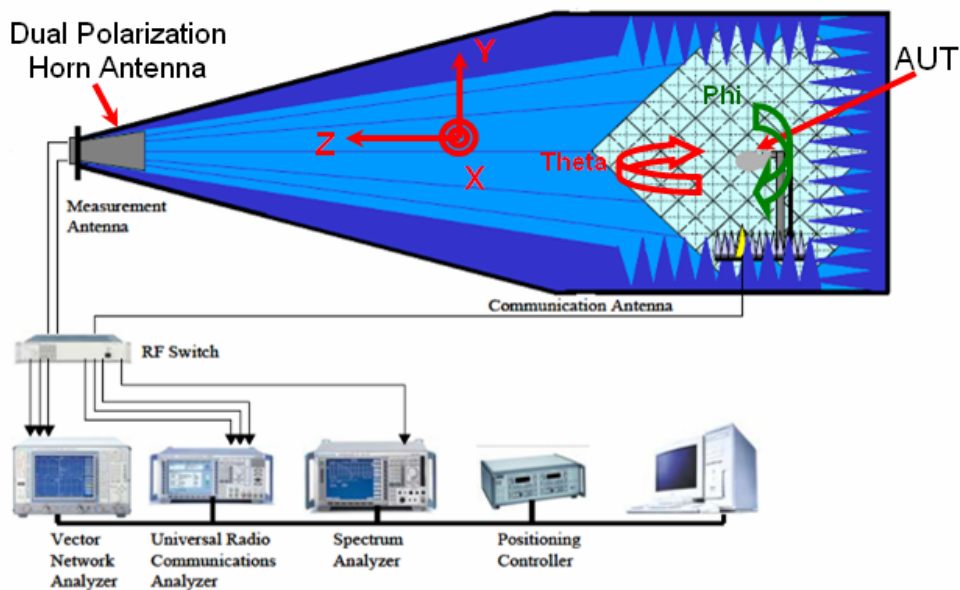
VSWR



| Mark | Frequency (MHz) | VSWR |
|------|-----------------|------|
| 1 | 3000 | 3.4 |
| 2 | 3500 | 2.5 |
| 3 | 4000 | 2.9 |

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

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SCALE : -----

UNIT : mm

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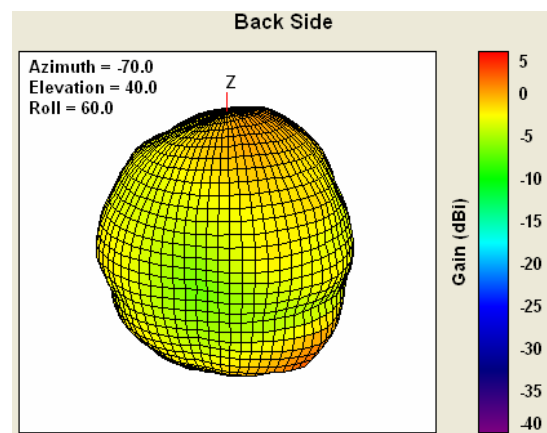
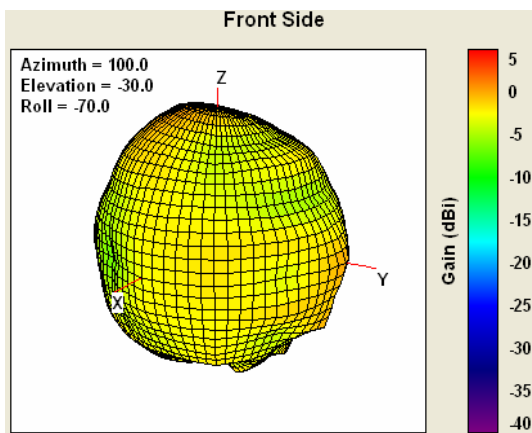
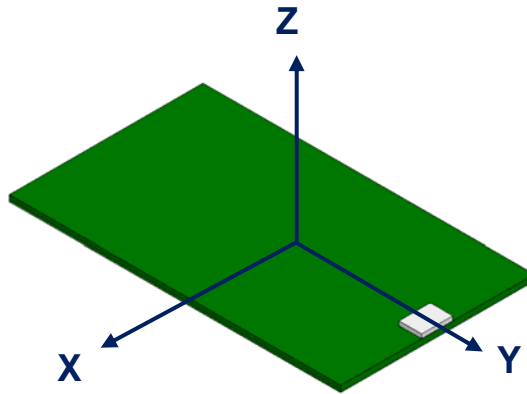
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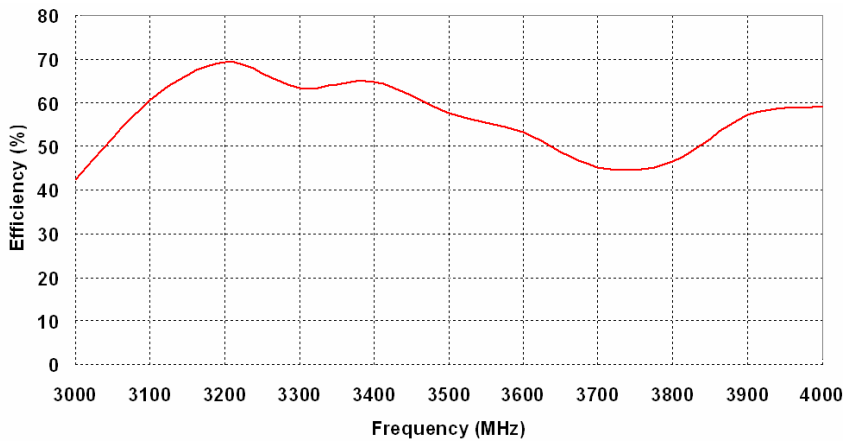
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3D Gain Pattern (3500 MHz)



Efficiency



| Frequency (MHz) | Efficiency (%) |
|-----------------|----------------|
| 3000 | 42.3 |
| 3500 | 57.5 |
| 4000 | 59.2 |

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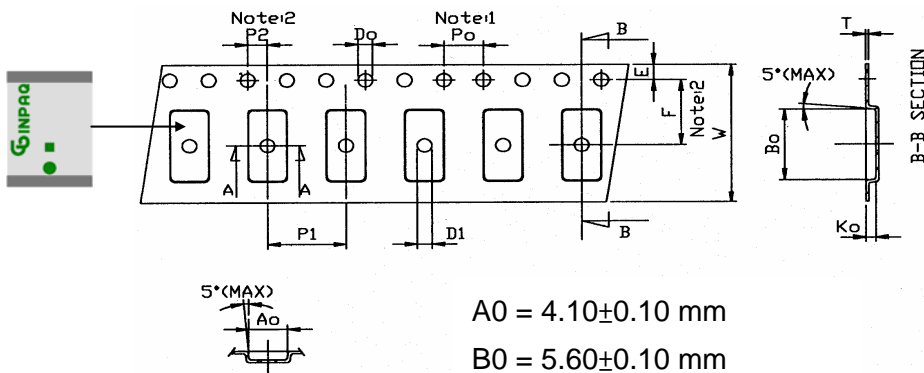
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7. Taping Package and Label Marking :

- (1) Quantity/Reel : 2000pcs/Reel
- (2) Carrier tape dimensions

(Unit : mm)



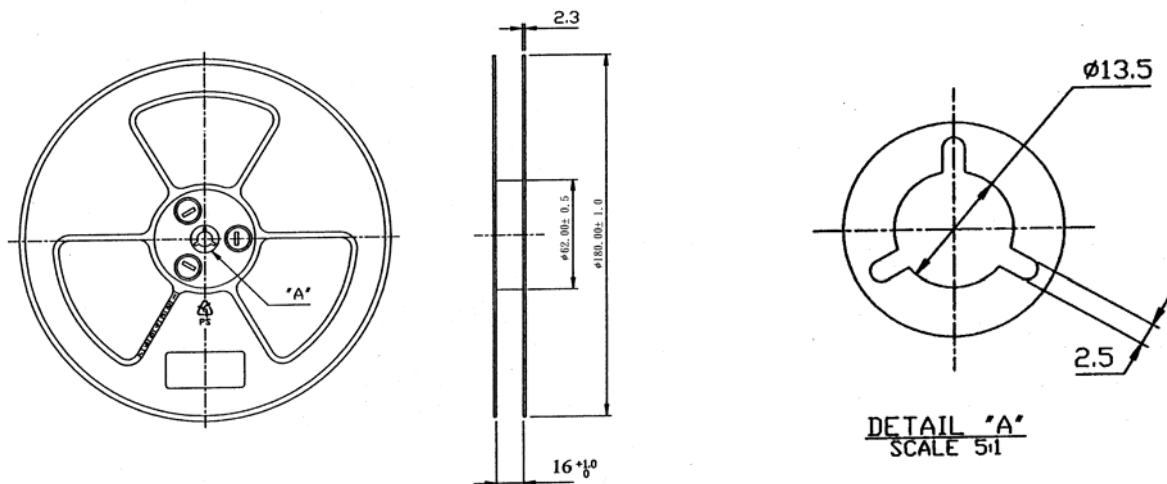
| Symbol | Spec. |
|--------|-----------|
| Po | 4.00±0.1 |
| P1 | 8.00±0.1 |
| P2 | 2.00±0.05 |
| Do | 1.55±0.05 |
| D1 | 1.50(MIN) |
| E | 1.75±0.1 |
| F | 5.50±0.05 |
| 10Po | 40.00±0.2 |
| W | 12.00±0.1 |
| T | 0.25±0.05 |

$A0 = 4.10 \pm 0.10 \text{ mm}$
 $B0 = 5.60 \pm 0.10 \text{ mm}$
 $K0 = 1.02 \pm 0.10 \text{ mm}$

Notice:

1. 10 Sprocket hole pitch cumulative tolerance is $\pm 0.1 \text{ mm}$
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



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8. Environmental Characteristics :

This product is qualified according to AEC-Q200.

(1) Reliability Test

| Item | Condition | Specification |
|-----------------------------|--|---------------|
| Thermal shock | 1. 30±3 minutes at -40°C±5°C, 2. Convert to +105°C (5 minutes) 3. 30±3 minutes at +105°C±5°C, 4. Convert to -40°C (5 minutes) 5. Total 100 continuous cycles | No damage |
| Humidity resistance | 1. Humidity: 85% R.H. 2. Temperature: 85±5°C 3. Time: 1000 hours. | No damage |
| High temperature resistance | 1. Temperature: 150°C±5°C 2. Time: 1000 hours. | No damage |
| Low temperature resistance | 1. Temperature: -40°C±5°C 2. Time: 1000 hours. | No damage |
| Soldering heat resistance | 1. Solder bath temperature: 260±5°C 2. Bathing time: 10±1 seconds | No damage |
| Solderability | The dipped surface of the terminal shall be at least 95% covered with solder after dipped in solder bath of 245±5°C for 3±1 seconds. | No damage |

(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.

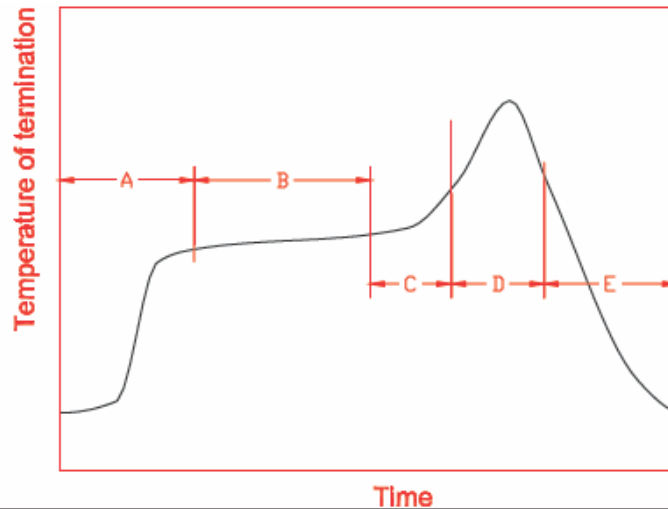
(3) Operating temperature range

Operating temperature range : -40 ~ +105°C.

| | | | | |
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9. Recommended reflow soldering :

Reference : J-STD-020C



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


(1) Soldering gun procedure

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

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

| | | | | |
|---|------------------------|---|-----------------------------------|-----------------|
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