



**INPAQ**

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# **PRODUCT SPECIFICATION**

**DOCUMENT NO. ENS000091970**

<b>DESCRIPTION</b>	<b>DRAWN BY</b>	<b>DESIGNED BY</b>	<b>CHECKED BY</b>	<b>APPROVED BY</b>
<b>WIPC252010P L Series</b>	<b>Yishan</b>	<b>Phil Yu</b>	<b>Wiley</b>	<b>LSC</b>



# WIPC252010P L Series Engineering Specification

## 1. Scope

### Feature

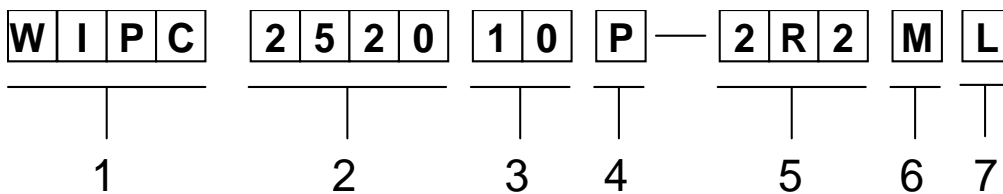
- AEC-Q200 compliance
- High saturation current realized by material properties and structure design
- Low DC resistance to achieve high conversion efficiency and lower temperature rising
- Low Profile: 2.5 mm x 2.0 mm x 1.0 mm.
- Magnetically shielded structure to accomplish high resolution in EMC protection.
- Halogen free, Lead Free, RoHS Compliance.

### Applications

WIPC252010P series is generic applied in portable DC to DC converter line.

- Automotive industry
- Smart phone, PAD
- DC/DC converter
- Thin-type power supply module,

## 2. Explanation of Part Number

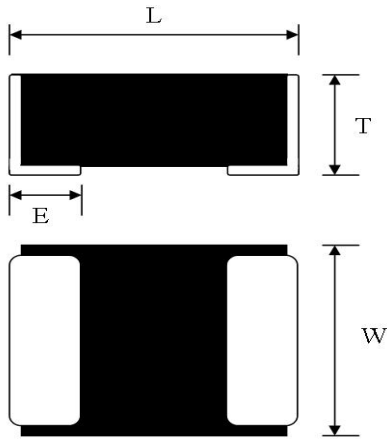


- ◆ 1 : Series Name: Wire-wound type power inductor
- ◆ 2 : Size Code: The first two digitals: length(mm), The last two digitals: width(mm)
- ◆ 3 : Thickness in mm
- ◆ 4 : Material code: Iron powder
- ◆ 5 : Initial inductance value: 2R2 = 2.2 μH
- ◆ 6 : Model code, Tolerance of Inductance ±20%.
- ◆ 7 : Electrode type.

### 3. Construction & Dimensions

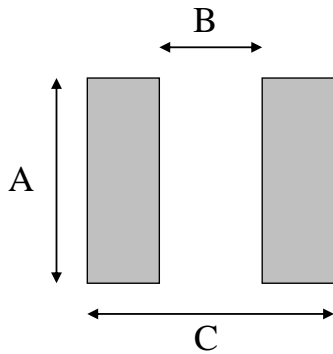
#### 3.1. End termination: Ni/Sn

#### 3.2. Construction & Dimension :



L [mm]	W [mm]	T [mm]	E [mm]
2.5±0.2	2.0±0.2	1.0 max.	0.6±0.3

#### 3.3. Construction & Dimension :



A [mm]	B [mm]	C [mm]
2.0	1.2	2.8.

### 4. General specifications

#### 4.1. Temperature Specifications

Operating Temperature range : -40°C to +125°C  
 Storage Temperature range : -50°C to +125°C

\* The detail operating temperature describing can refer to 5.1 (7).

## 5. Performance Characteristics

### 5.1. Specifications

INPAQ Part Number	Li [ $\mu$ H] Initial inductance @ 1mA	RDC [ $m\Omega$ ] DC Resistance		Isat [A] Saturation Current		Irms [A] Heat Rating Current	
		Typical	Maximum	Typical	Maximum	Typical	Maximum
WIPC252010P-R22ML	0.22	9	12.5	7.9	7.2	5.9	5.3
WIPC252010P-R33ML	0.33	21	26	6.6	6	4.4	4.0
WIPC252010P-R47ML	0.47	27	32	5	4.50	3.9	3.51
WIPC252010P-R68ML	0.68	37	44	4.3	3.87	3.4	3.06
WIPC252010P-1R0ML	1.0	45	54	3.5	3.15	3.0	2.70
WIPC252010P-1R5ML	1.5	76	91	2.6	2.34	2.5	2.25
WIPC252010P-2R2ML	2.2	99	119	2.4	2.16	2.3	2.07
WIPC252010P-4R7ML	4.7	220	262	1.8	1.62	1.36	1.22

Note 1: Customized design is available, please contact us.

Note 2: All test referenced to 26°C ambient

Note 3: Inductance tolerance +/- 20%

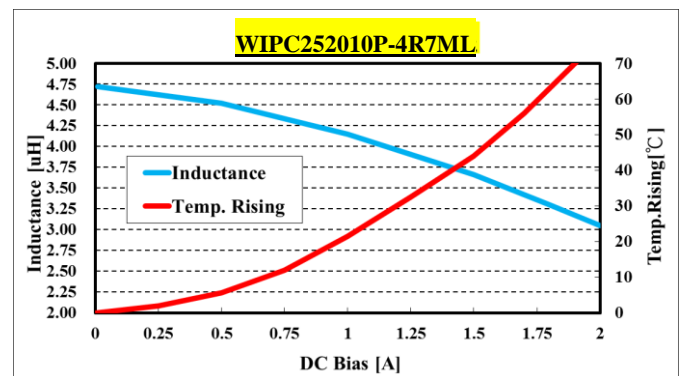
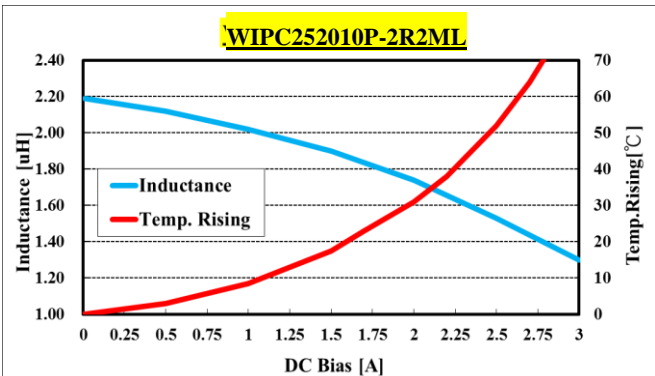
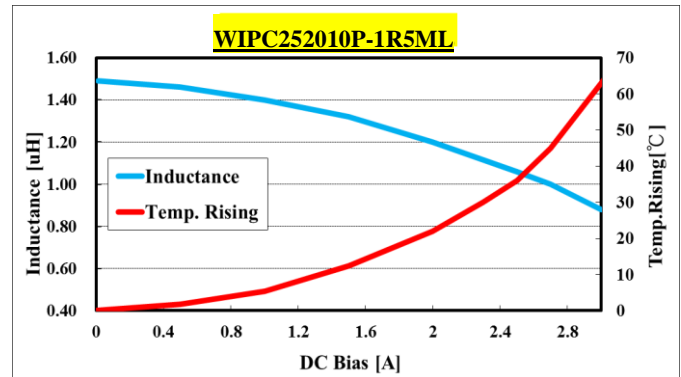
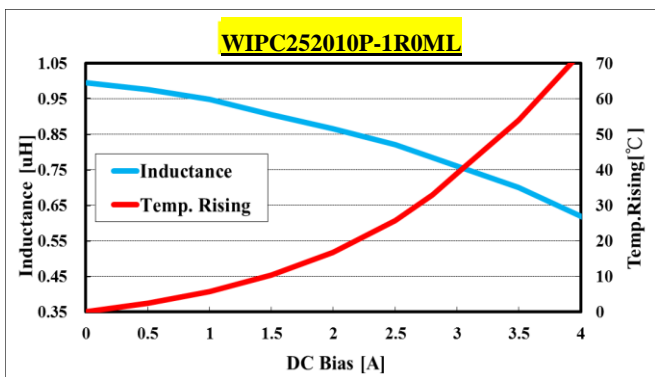
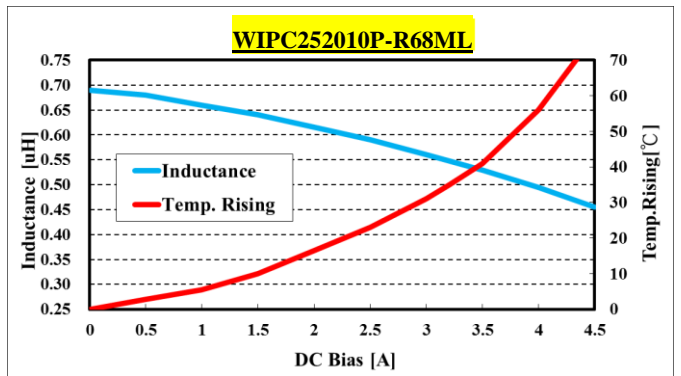
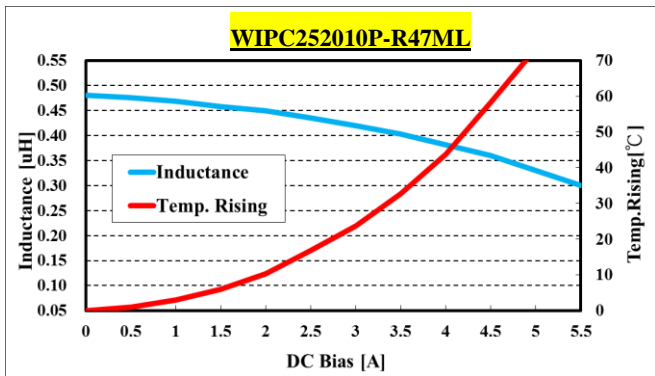
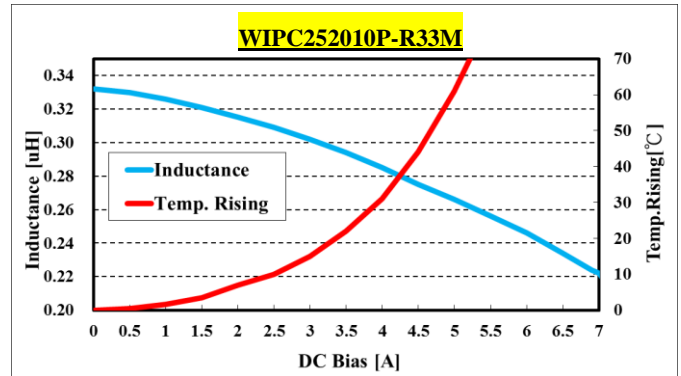
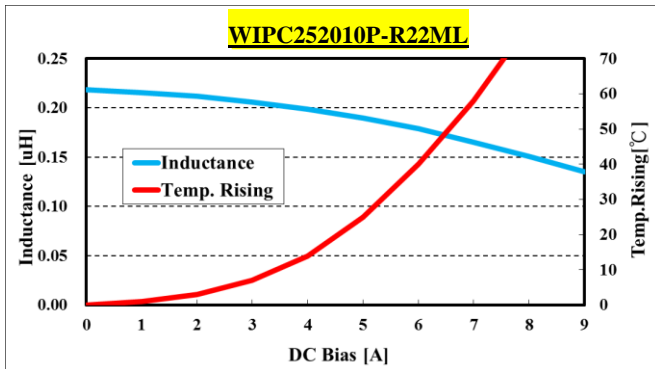
Note 4: Inductance is measured with Agilent<sup>®</sup> LCR meter 4285A. Test frequency at 1MHz.

Note 5: DC resistance is measured with HIOKI<sup>®</sup> micro-ohm meter RM3542-01.

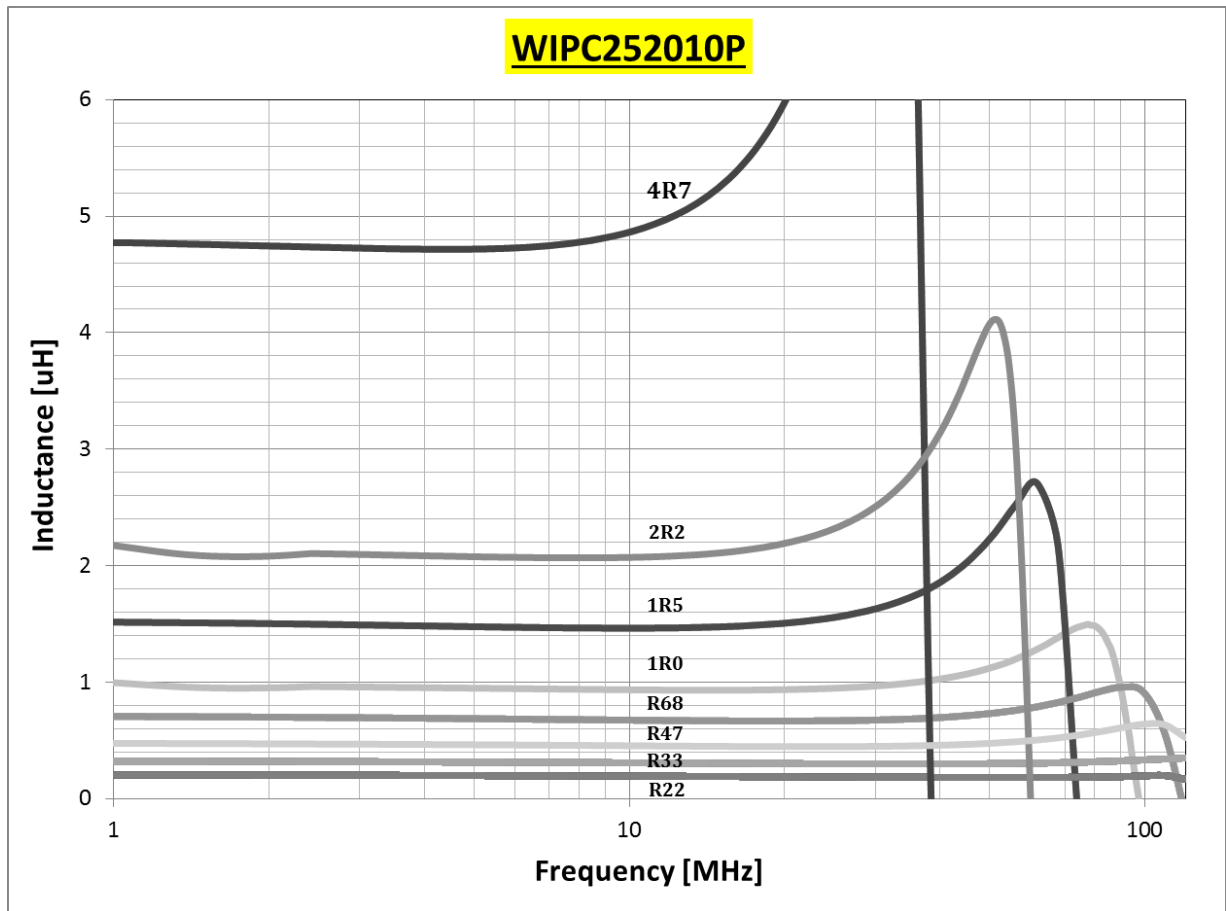
Note 6: Isat means that DC current will cause a 30% inductance reduction form initial value.

Note 7: Irms means that DC current will cause coil temp. rising to 40°C whichever is smaller.

5.2. Current Characteristic



5.3. Frequency Characteristic

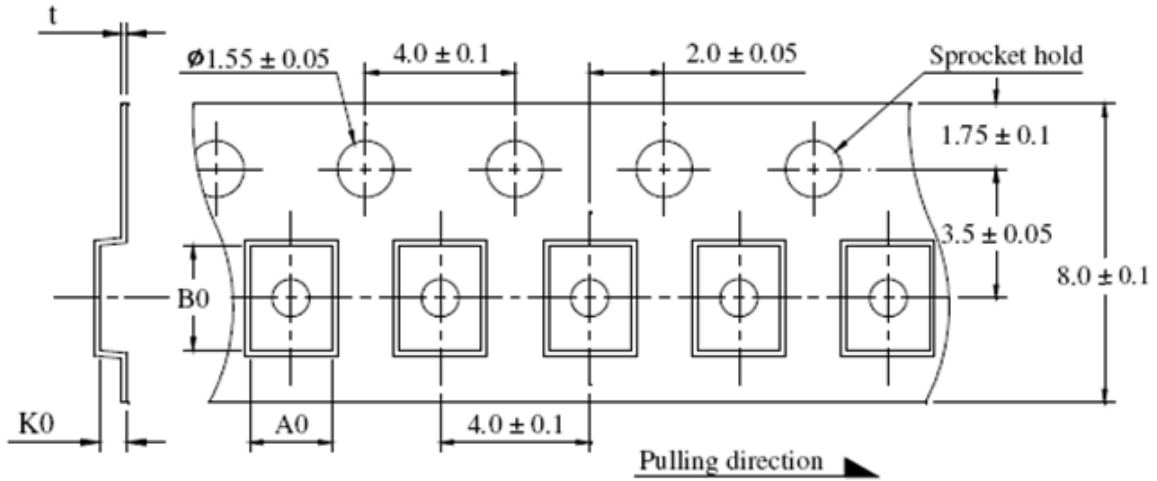


## 6. Reliability and Test Condition

Test item	Test condition	Criteria
<b>Resistance to Solder Heat</b>	1. Solder temperature : $260 \pm 5^{\circ}\text{C}$ 2. Flux : Rosin 3. DIP time : $10 \pm 1$ sec	1. More than 95 % of terminal electrode should be covered with new solder 2. No mechanical damage 3. Inductance value should be within $\pm 20$ % of the initial value
<b>Adhesive Test</b>	1. Reflow temperature : $245^{\circ}\text{C}$ It shall be Soldered on the substrate applying direction parallel to the substrate 2. Apply force(F) : 5 N 3. Test time : 10 sec	1. No mechanical damage 2. Soldering the products on PCB after the pulling test force $> 5$ N
<b>Temperature Cycle</b>	1. Temperature: $-50 \sim 125^{\circ}\text{C}$ For 30 minutes each 2. Cycle: 500 cycles 3. Measurement: At ambient temperature 24 hours after test completion	1. No mechanical damage 2. Inductance should be within $\pm 20\%$ of the initial value
<b>Dry Heat Test</b>	1. Temperature: $85 \pm 2^{\circ}\text{C}$ 2. Testing time: 500 hrs 3. Applied current: Full rated current 4. Measurement: At ambient temperature 24 hours after test completion	1. No mechanical damage 2. Inductance should be within $\pm 20\%$ of the initial value
<b>Humidity Test</b>	1. Temperature: $60 \pm 2^{\circ}\text{C}$ 2. Humidity: 90-95 % RH 3. Applied current: Full rated current 4. Testing time: 500 hrs 5. Measurement: At ambient temperature 24 hours after test completion	1. No mechanical damage 2. Inductance should be within $\pm 20\%$ of the initial value

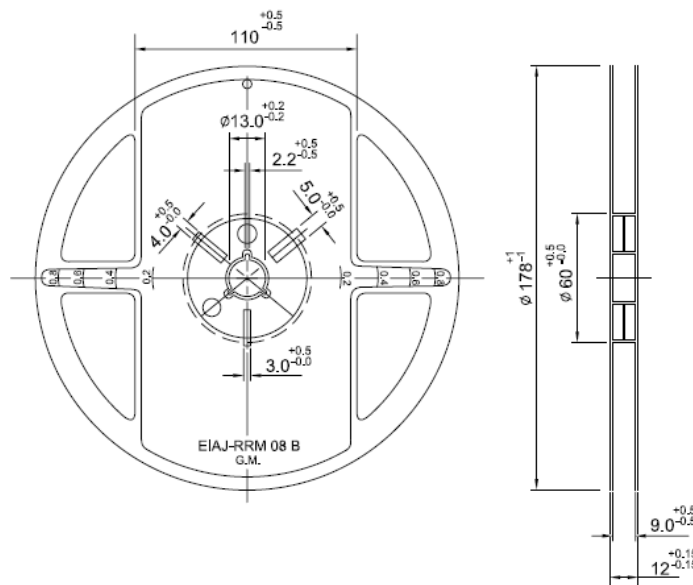
## 7. Taping Package and Label Marking

### 7.1. Carrier tape dimensions



	A0	B0	K0	t
mm	2.25±0.05	2.80±0.1	1.35±0.1	0.22±0.05

### 7.2. Taping reel dimensions



PART SIZE (EIA SIZE)	<b>2520 (1008)</b>
Qty.(pcs)	3,000
BOX	5 reels / inner box



**7.3. Taping specifications**

There shall be the portion having no product in both the head and the end of taping, and there shall be the cover tape in the head of taping.

**7.4. Label Marking**

The label specified as follows shall be put on the side of reel.

(1) Part No.

(2) Quantity

(3) Lot No.

\* Part No. And Quantity shall be marked on outer packaging.

**7.5. Quantity of products in the taping package**

(1) Standard quantity : 3000pcs/Reel

(2) Shipping quantity is a multiple of standard quantity.

## 8. Precautions for Handling

### 8.1. Precaution for handling of substrate

Do not exceed to bend the board after soldering this product extremely.  
(reference examples)

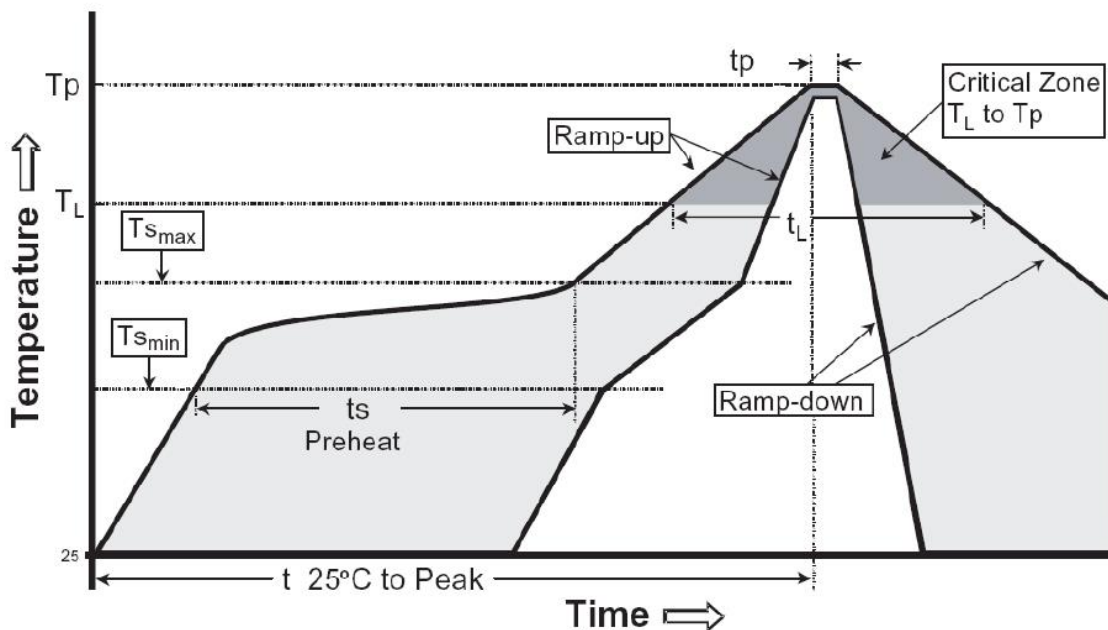
- Mounting place must be as far as possible from the position, which is close to the break line of board, or on the line of large holes of board.
- Do not bend extremely the board, in mounting another components.  
If necessary, use back-up pin (support pin) to prevent from bending extremely.
- Do not break the board by hand. We recommend to use the machine or the jig to break it.

### 8.2. Precaution for soldering

Note that this product will be easily damaged by rapid heating, rapid cooling or local heating.

Do not give heat shock over 100°C in the process of soldering. We recommend to take preheating and gradual cooling.

### 8.3. Recommendable reflow soldering



Reference IPC-020c-5-1

Profile Feature	Pb free Assembly
Average Ramp Rate (Ts max to Tp)	3 °C/second max
Preheat - Temperature Min (Ts <sub>min</sub> ) - Temperature Min (Ts <sub>max</sub> ) - Time(ts <sub>min</sub> to ts <sub>min</sub> )	150°C 200°C 60-180 seconds
Time maintained above: - Temperature (TL) - Time (tL)	217°C 60-150 seconds
Peak Temperature (Tp)	260°C +0/-5 °C
Time within 5 °C of actual Peak Temperature (Tp)	20-40 seconds
Ramp-Down Rate	6 °C/second max.
Time 25°C to Peak Temperature	8 minutes max

#### 8.4. Soldering gun procedure

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

- (1) The tip temperature must be less than 280°C for the period within 3 seconds by using soldering gun under 30 W.
- (2) The soldering gun tip shall not touch this product directly.

#### 8.5. Soldering volume

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

#### 8.6. Taping Package Storage Condition

Storage Temperature : 5 to 40 °C

Relative Humidity: < 65%RH