

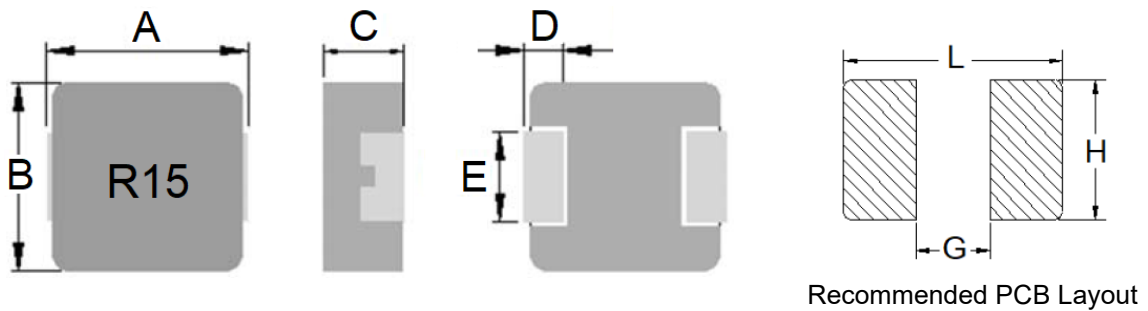
## 1. Part No. Expression

**P I C Q 0 3 1 2 H R 1 5 Y F**

(a) (b) (c) (d) (e) (f)

- |                    |                     |
|--------------------|---------------------|
| (a) Series Code    | (d) Inductance Code |
| (b) Dimension Code | (e) Tolerance Code  |
| (c) Material Code  | (f) Packaging Code  |

## 2. Configuration & Dimensions (Unit: mm)

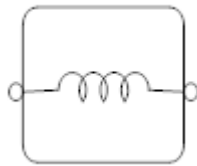


- Note:
1. The above PCB layout reference only.
  2. Recommend solder paste thickness at 0.12 mm and above.
  3. Marking: Inductance Code, Black

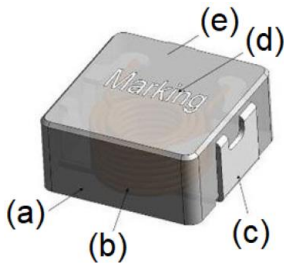
| A         | B         | C         | D         | E         | L        | G        | H        |
|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|
| 3.50±0.20 | 3.20±0.20 | 1.00±0.20 | 0.70±0.20 | 1.20±0.20 | 4.10 Ref | 1.90 Ref | 1.45 Ref |

NOTE: Specifications subject to change without notice. Please check our website for latest information.

## 3. Schematic



## 4. Material List



| NO  | Items |
|-----|-------|
| (a) | Core  |
| (b) | Wire  |
| (c) | Clip  |
| (d) | Ink   |
| (e) | Paint |

## 5. General Specifications

- (a) Reliability test for this part meets AEC-Q200 standard.
- (b) Operating Temp.: - 55°C to + 125°C (including self-temperature rise)
- (c) Storage Temp.: - 55°C to + 125°C (on board)
- (d) All test data referenced to 25°C ambient.
- (e) Heat Rated Current (Irms) will cause the coil temperature rise approximately  $\Delta T$  of 40°C.
- (f) Saturation Current (Isat) will cause inductance L0 to drop approximately 30%.
- (g) Rated DC Current: The lower value of Irms and Isat.
- (h) Part Temperature (Ambient + Temp. Rise): Should not exceed 125°C under worst case operating conditions.
- (i) Maximum Operating Voltage: 20V
- (j) Storage Condition (Component in its packaging)
  - i) Temperature: Less than 40°C
  - ii) Humidity: Less than 60% RH

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## 6. Electrical Characteristics

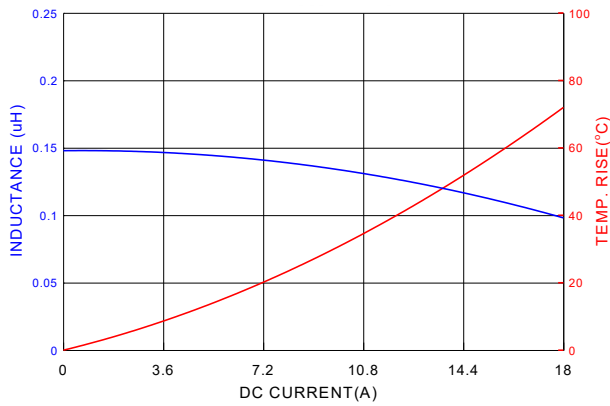
| Part Number    | Inductance<br>( $\mu$ H) @0A | Test<br>Frequency | I <sub>rms</sub><br>(A)<br>Typ | I <sub>sat</sub><br>(A)<br>Typ | DCR<br>(m $\Omega$ ) |      |
|----------------|------------------------------|-------------------|--------------------------------|--------------------------------|----------------------|------|
|                |                              |                   |                                |                                | Typ                  | Max  |
| PICQ0312HR15YF | 0.15                         | 1.0V/100KHz       | 10.0                           | 14.0                           | 9.6                  | 11.0 |
| PICQ0312HR22MF | 0.22                         | 1.0V/100KHz       | 6.5                            | 10.0                           | 14.0                 | 17.0 |
| PICQ0312HR33MF | 0.33                         | 1.0V/100KHz       | 6.2                            | 9.2                            | 16.0                 | 20.0 |
| PICQ0312HR36MF | 0.36                         | 1.0V/100KHz       | 6.0                            | 8.5                            | 18.5                 | 23.0 |
| PICQ0312HR47MF | 0.47                         | 1.0V/100KHz       | 5.0                            | 7.2                            | 25.0                 | 30.0 |
| PICQ0312HR56MF | 0.56                         | 1.0V/100KHz       | 4.5                            | 6.6                            | 31.0                 | 36.0 |
| PICQ0312HR68MF | 0.68                         | 1.0V/100KHz       | 4.0                            | 6.1                            | 34.0                 | 40.0 |
| PICQ0312HR82MF | 0.82                         | 1.0V/100KHz       | 3.5                            | 5.8                            | 41.0                 | 48.0 |
| PICQ0312H1R0MF | 1.00                         | 1.0V/100KHz       | 3.3                            | 5.5                            | 50.0                 | 60.0 |
| PICQ0312H1R5MF | 1.50                         | 1.0V/100KHz       | 3.0                            | 4.0                            | 71.0                 | 85.0 |
| PICQ0312H2R2MF | 2.20                         | 1.0V/100KHz       | 2.7                            | 3.4                            | 98.0                 | 115  |
| PICQ0312H3R3MF | 3.30                         | 1.0V/100KHz       | 2.0                            | 3.1                            | 191                  | 210  |
| PICQ0312H4R7MF | 4.70                         | 1.0V/100KHz       | 1.6                            | 2.8                            | 266                  | 293  |
| PICQ0312H5R6MF | 5.60                         | 1.0V/100KHz       | 1.5                            | 2.2                            | 310                  | 360  |
| PICQ0312H6R8MF | 6.80                         | 1.0V/100KHz       | 1.4                            | 2.0                            | 360                  | 400  |
| PICQ0312H8R2MF | 8.20                         | 1.0V/100KHz       | 1.2                            | 1.7                            | 420                  | 463  |
| PICQ0312H100MF | 10.0                         | 1.0V/100KHz       | 1.0                            | 1.4                            | 498                  | 550  |

Tolerance Code: M=  $\pm$ 20%, Y=  $\pm$ 30%

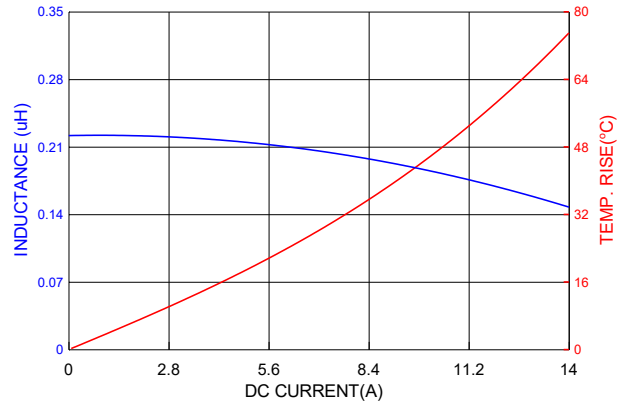
NOTE: Specifications subject to change without notice. Please check our website for latest information.

## 7. Characteristics Curve

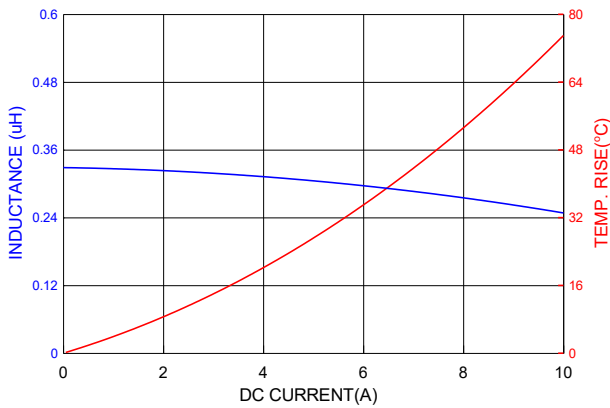
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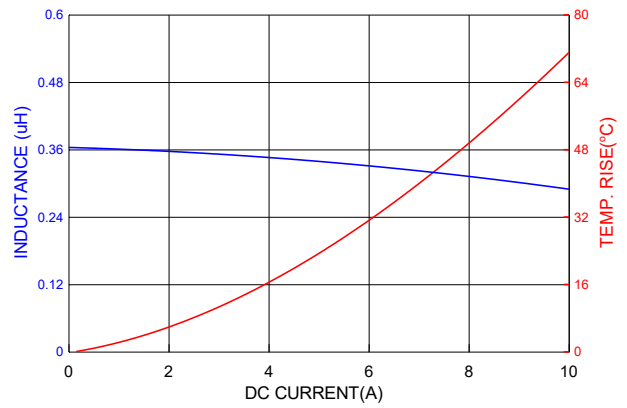
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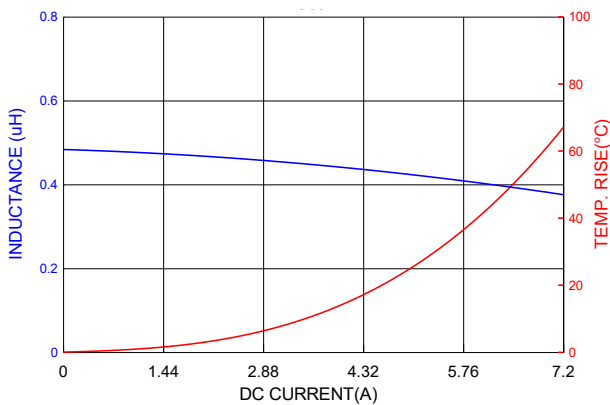
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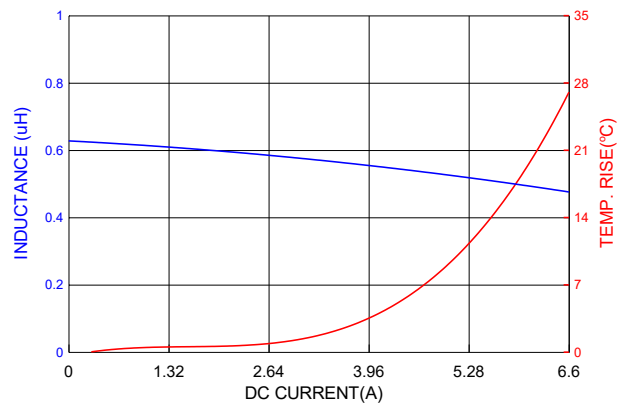
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PICQ0312HR47MF

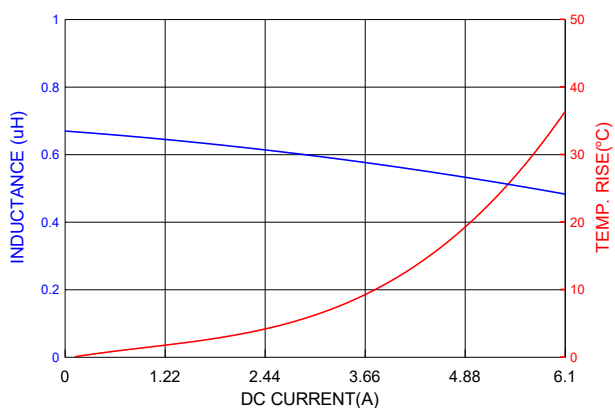


PICQ0312HR56MF

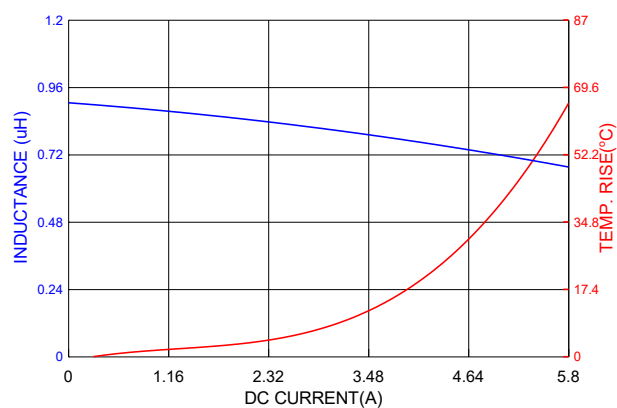


NOTE: Specifications subject to change without notice. Please check our website for latest information.

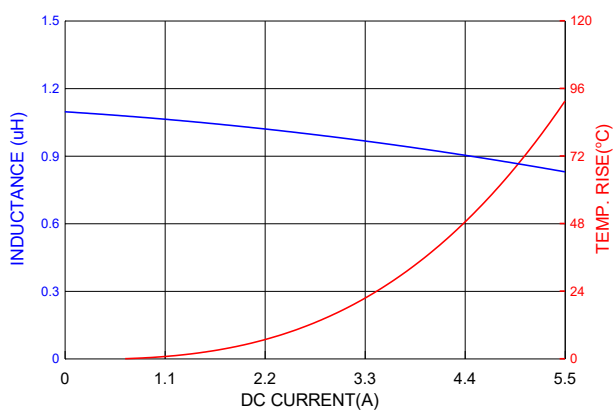
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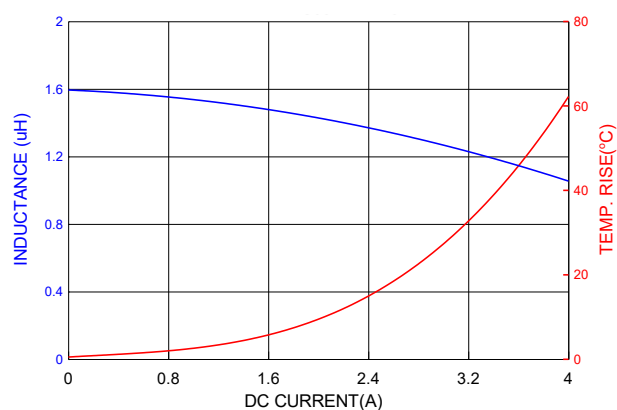
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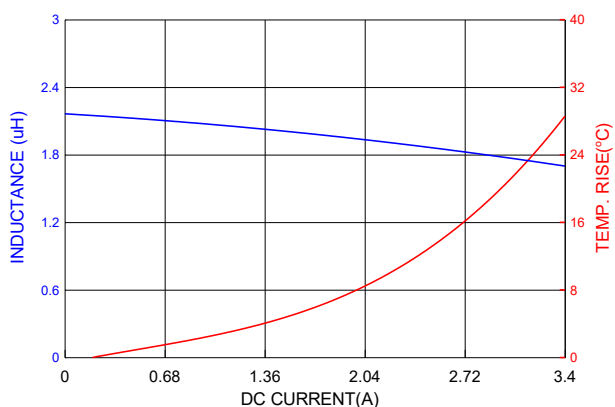
PICQ0312H1R0MF



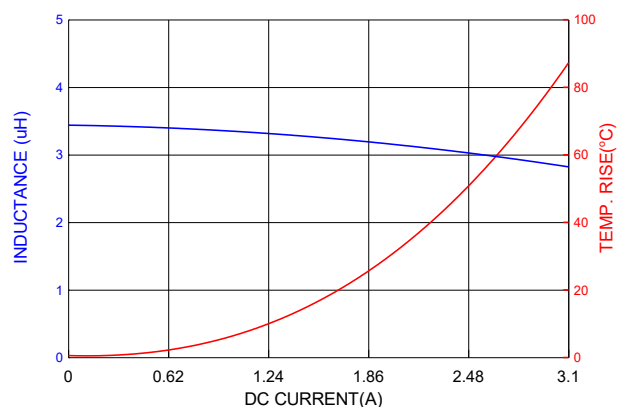
PICQ0312H1R5MF



PICQ0312H2R2MF

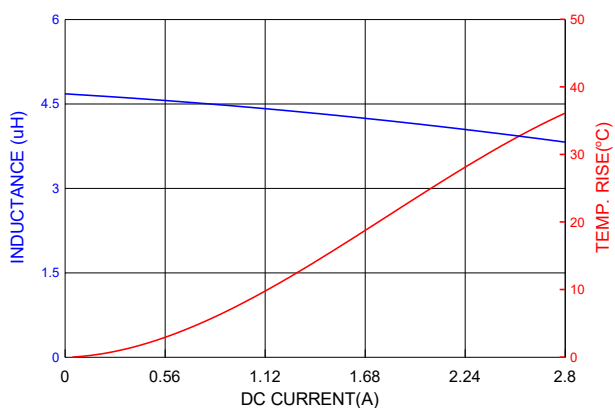


PICQ0312H3R3MF

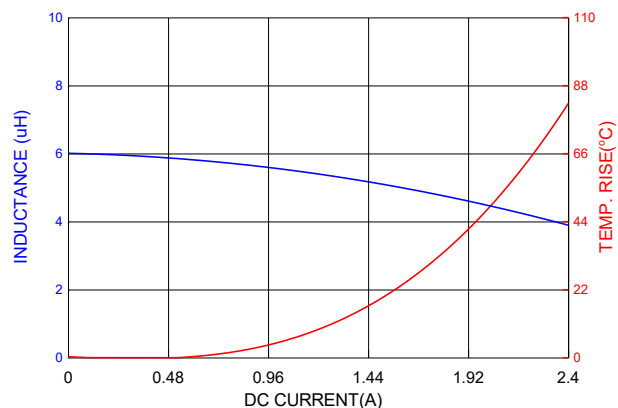


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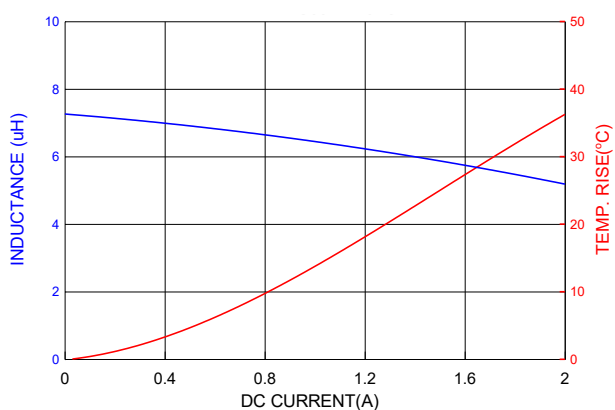
PICQ0312H4R7MF



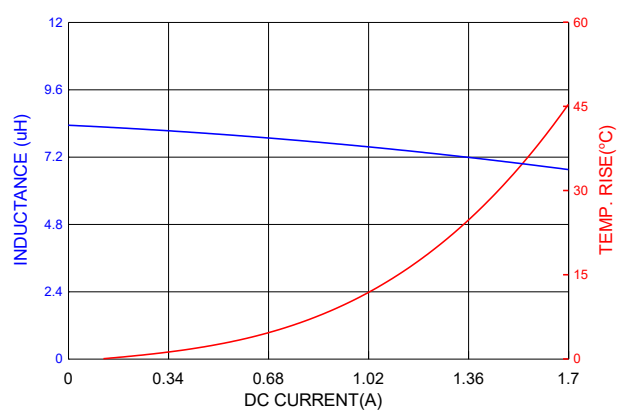
PICQ0312H5R6MF



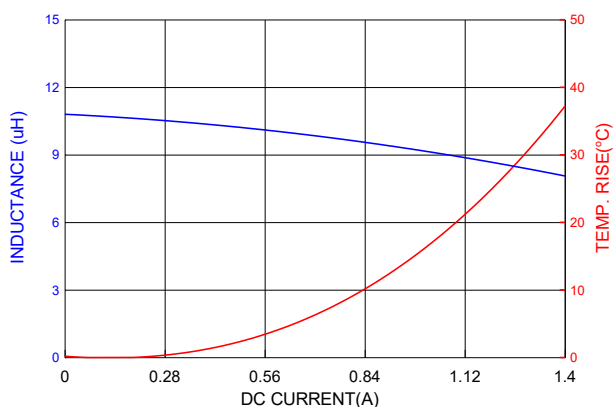
PICQ0312H6R8MF



PICQ0312H8R2MF



PICQ0312H100MF



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## 8. Soldering Specification

Mildly activated rosin fluxes are preferred. Our terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

### 8-1. IR Soldering Reflow

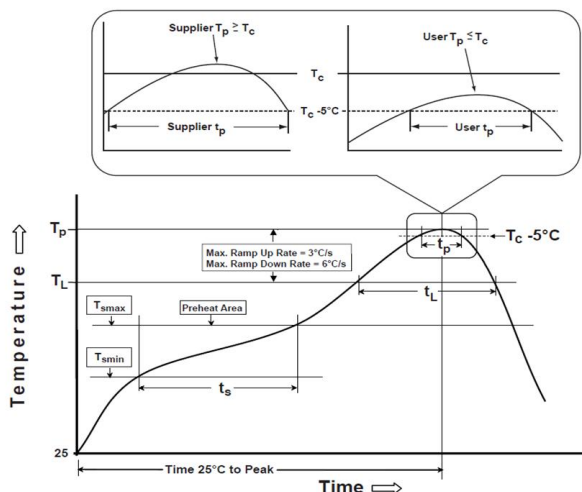
Recommended temperature profiles for lead free re-flow soldering in Figure 1, Table 1.1 & 1.2 (J-STD-020E).

### 8-2. Iron Reflow

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended (Figure 2).

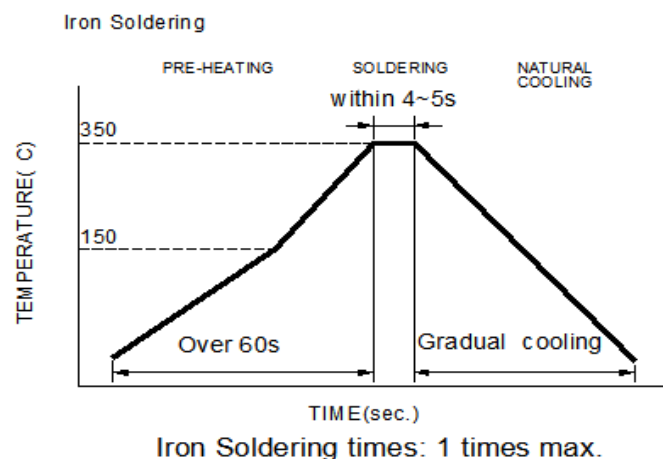
Note:

- Preheat circuit and products to 150°C.
- 355°C tip temperature (Max.)
- Never contact the ceramic with the iron tip
- 1.0mm tip diameter (Max.)
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- Limit soldering time to 4~5 sec.



Reflow times: 3 times Max

Figure 1: IR Soldering Reflow



Soldering iron method: 350±5°C Max

Figure 2: Iron soldering temperature profiles

NOTE: Specifications subject to change without notice. Please check our website for latest information.

**Table (1.1) Reflow Profiles**

|                                                                                            |                  |
|--------------------------------------------------------------------------------------------|------------------|
| Profile Type:                                                                              | Pb-Free Assembly |
| Preheat                                                                                    |                  |
| -Temperature Min ( $T_{smin}$ )                                                            | 150°C            |
| -Temperature Max ( $T_{smax}$ )                                                            | 200°C            |
| -Time ( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )                                          | 60-120seconds    |
| Ramp-up rate ( $T_L$ to $T_p$ )                                                            | 3°C /second max. |
| Liquids temperature ( $T_L$ )                                                              | 217°C            |
| Time ( $t_L$ ) maintained above $T_L$                                                      | 60-150 seconds   |
| Classification temperature ( $T_c$ )                                                       | See Table (1.2)  |
| Time ( $t_p$ ) at $T_c - 5^\circ\text{C}$ ( $T_p$ should be equal to or less than $T_c$ .) | * < 30 seconds   |
| Ramp-down rate ( $T_p$ to $T_L$ )                                                          | 6°C /second max. |
| Time 25°C to peak temperature                                                              | 8 minutes max.   |

**T<sub>p</sub>**: maximum peak package body temperature, **T<sub>c</sub>**: the classification temperature.

For user (customer) **T<sub>p</sub>** should be equal to or less than **T<sub>c</sub>**.

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

**Table (1.2) Package Thickness/Volume and Classification Temperature ( $T_c$ )**

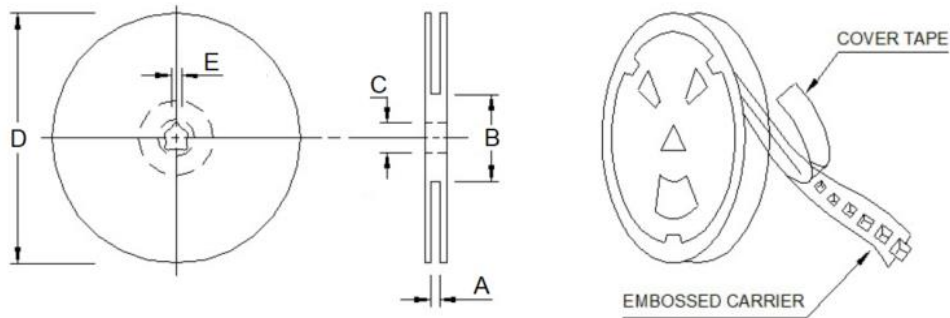
|                  | Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> 350-2000 | Volume mm <sup>3</sup> >2000 |
|------------------|-------------------|-----------------------------|---------------------------------|------------------------------|
| PB-Free Assembly | <1.6mm            | 260°C                       | 260°C                           | 260°C                        |
|                  | 1.6-2.5mm         | 260°C                       | 250°C                           | 245°C                        |
|                  | ≥2.5mm            | 250°C                       | 245°C                           | 245°C                        |

Reflow is referred to standard IPC/JEDEC J-STD-020E.

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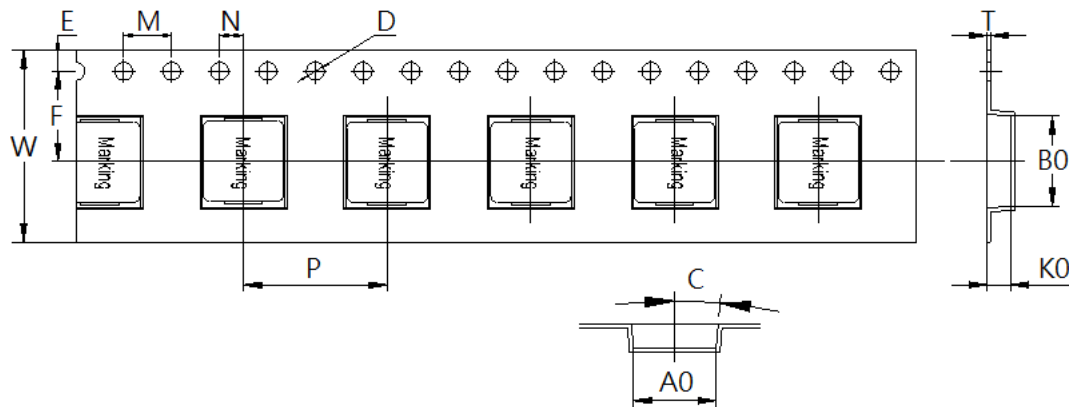
## 9. Packaging Information

### 9-1. Reel Dimension (Unit: mm)



| Type     | A             | B         | C             | D     | E       |
|----------|---------------|-----------|---------------|-------|---------|
| 13"x12mm | 12.4+2.0/-0.0 | 100.0±2.0 | 13.0+0.5/-0.2 | 330.0 | 2.0±0.5 |

### 9-2. Tape Dimension (Unit: mm)



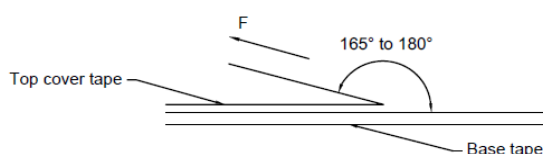
| B0        | A0        | K0        | P         | W          | F         |
|-----------|-----------|-----------|-----------|------------|-----------|
| 3.80±0.10 | 3.50±0.10 | 1.50±0.10 | 8.00±0.10 | 12.00±0.30 | 5.50±0.10 |
| T         | E         | M         | N         | D          | C         |
| 0.35±0.05 | 1.75      | 4.00      | 2.00      | 1.50       | 3°        |

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## 9-3. Packaging Quantity (Unit: Pcs)

|            |        |
|------------|--------|
| Chip/ Reel | 4,000  |
| Inner box  | 8,000  |
| Carton     | 32,000 |

## 9-4. Tearing Off Force



The force for tearing off cover tape is according to the follow table, in the arrow direction under the following conditions.

(Referenced ANSI/EIA-481-D-2008 of 4.11 standard)

| Room Temp. (°C) | Room Humidity (%) | Room atm (hPa) | Tearing Speed (mm/min) |
|-----------------|-------------------|----------------|------------------------|
| 5~35            | 45~85             | 860~1060       | 300±10                 |

| Tape Size                 | 8 mm   | 12 to 56 mm | 72 mm or Wider |
|---------------------------|--------|-------------|----------------|
| Tearing Off Force (grams) | 10~100 | 10~130      | 10~150         |

## Application Notice

### 1. Storage Conditions

To maintain the solderability of terminal electrodes:

- (a) Recommended products should be used within 12 months from the time of delivery.
- (b) The packaging material should be kept where no chlorine or sulfur exists in the air.

### 2. Transportation

- (a) Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
- (b) Vacuum pick up is strongly recommended for individual components.
- (c) Bulk handling should ensure that abrasion and mechanical shock are minimized.

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