

## 1. Part No. Expression

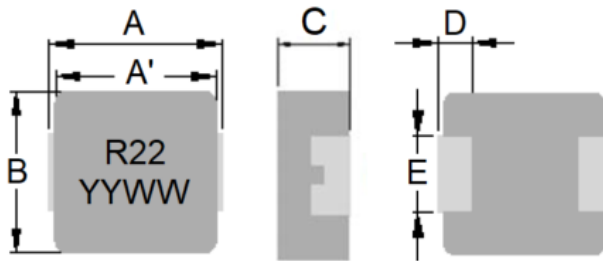
**P I C Q 1 0 0 5 H R 2 2 M F**

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

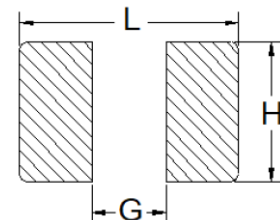
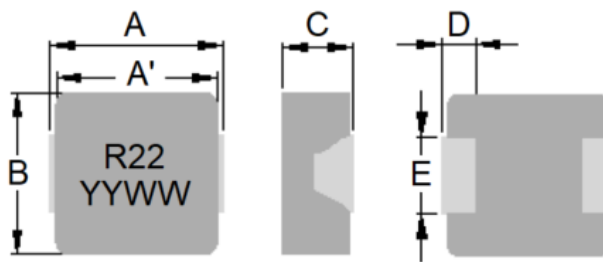
- |                    |                     |
|--------------------|---------------------|
| (a) Series Code    | (d) Inductance Code |
| (b) Dimension Code | (e) Tolerance Code  |
| (c) Material Code  | (f) Packaging Code  |

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

leadframe



non-leadframe



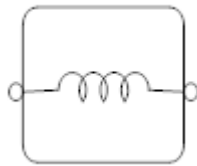
Recommended PCB Layout

- Note:
1. The above PCB layout reference only.
  2. Recommend solder paste thickness at 0.15 mm and above.
  3. Marking: Top= Inductance Code, Bottom=YYWW (Year/World week), Black

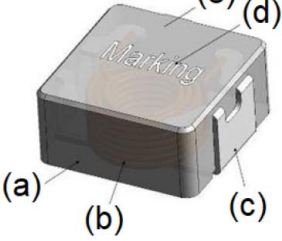
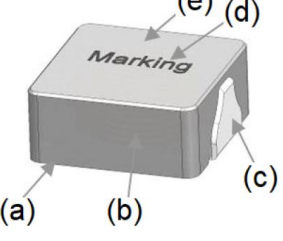
| Type          | A        | A'       | B        | C       | D       | E       | L        | G       | H       |
|---------------|----------|----------|----------|---------|---------|---------|----------|---------|---------|
| Leadframe     | 11.0±0.5 | 10.0±0.3 | 10.0±0.3 | 4.8±0.2 | 2.3±0.3 | 3.0±0.3 | 13.6 Ref | 5.4 Ref | 3.5 Ref |
| Non-Leadframe |          |          |          |         |         |         |          |         |         |

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

## 3. Schematic



## 4. Material List

| <br>Lead Frame | NO  | Items | <br>Non-Lead Frame | NO  | Items  |
|--------------------------------------------------------------------------------------------------|-----|-------|-------------------------------------------------------------------------------------------------------|-----|--------|
|                                                                                                  | (a) | Core  |                                                                                                       | (a) | Core   |
|                                                                                                  | (b) | Wire  |                                                                                                       | (b) | Wire   |
|                                                                                                  | (c) | Clip  |                                                                                                       | (c) | Solder |
|                                                                                                  | (d) | Ink   |                                                                                                       | (d) | Ink    |
|                                                                                                  | (e) | Paint |                                                                                                       | (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: 75V
- (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

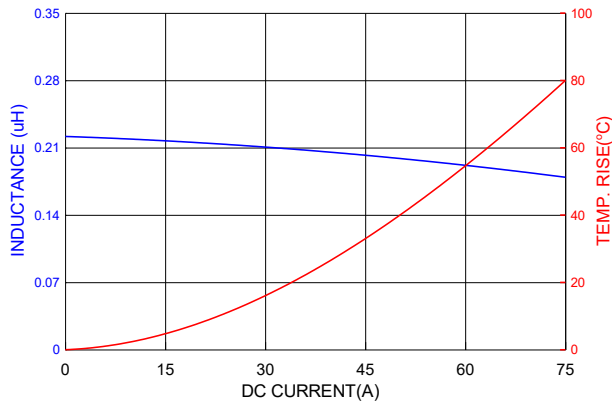
| Part Number    | Inductance<br>( $\mu$ H) @0A<br>$\pm 20\%$ | Irms<br>(A)<br>Typ | Isat<br>(A)<br>Typ | DCR<br>(m $\Omega$ ) |      | Type          |
|----------------|--------------------------------------------|--------------------|--------------------|----------------------|------|---------------|
|                |                                            |                    |                    | Typ                  | Max  |               |
| PICQ1005HR22MF | 0.22                                       | 45.0               | 70.0               | 0.45                 | 0.5  | Non-Leadframe |
| PICQ1005HR30MF | 0.30                                       | 38.0               | 65.0               | 0.57                 | 0.61 | Non-Leadframe |
| PICQ1005HR56MF | 0.56                                       | 26.5               | 43.0               | 1.3                  | 1.5  | Non-Leadframe |
| PICQ1005HR90MF | 0.90                                       | 25.0               | 32.0               | 2.2                  | 3.0  | Non-Leadframe |
| PICQ1005H1R0MF | 1.00                                       | 22.0               | 30.0               | 2.8                  | 3.5  | Non-Leadframe |
| PICQ1005H1R2MF | 1.20                                       | 20.0               | 28.0               | 2.9                  | 3.5  | Non-Leadframe |
| PICQ1005H1R3MF | 1.30                                       | 20.0               | 28.0               | 3.2                  | 3.7  | Non-Leadframe |
| PICQ1005H1R5MF | 1.50                                       | 19.0               | 27.0               | 3.5                  | 4.1  | Non-Leadframe |
| PICQ1005H1R8MF | 1.80                                       | 17.5               | 25.5               | 3.7                  | 4.7  | Non-Leadframe |
| PICQ1005H2R2MF | 2.20                                       | 16.0               | 24.0               | 5.4                  | 6.0  | Leadframe     |
| PICQ1005H3R3MF | 3.30                                       | 14.0               | 22.0               | 9.0                  | 10.4 | Leadframe     |
| PICQ1005H4R7MF | 4.70                                       | 13.0               | 19.0               | 10.0                 | 12.5 | Leadframe     |
| PICQ1005H5R0MF | 5.0                                        | 12.0               | 18.0               | 12.2                 | 15.0 | Leadframe     |
| PICQ1005H5R6MF | 5.60                                       | 10.0               | 16.0               | 14.0                 | 16.8 | Leadframe     |
| PICQ1005H8R2MF | 8.20                                       | 9.0                | 14.5               | 18.5                 | 24.0 | Leadframe     |
| PICQ1005H100MF | 10.0                                       | 8.0                | 13.5               | 25.0                 | 29.0 | Leadframe     |
| PICQ1005H120MF | 12.0                                       | 6.0                | 10.0               | 30.0                 | 35.0 | Leadframe     |
| PICQ1005H220MF | 22.0                                       | 5.0                | 9.0                | 50.0                 | 60.0 | Leadframe     |
| PICQ1005H330MF | 33.0                                       | 4.3                | 7.5                | 80.0                 | 92.0 | Leadframe     |
| PICQ1005H470MF | 47.0                                       | 3.8                | 6.5                | 125                  | 145  | Leadframe     |
| PICQ1005H680MF | 68.0                                       | 2.5                | 4.0                | 176                  | 205  | Leadframe     |
| PICQ1005H101MF | 100                                        | 2.0                | 3.0                | 315                  | 380  | Leadframe     |

Test frequency: 1.0V/100KHz

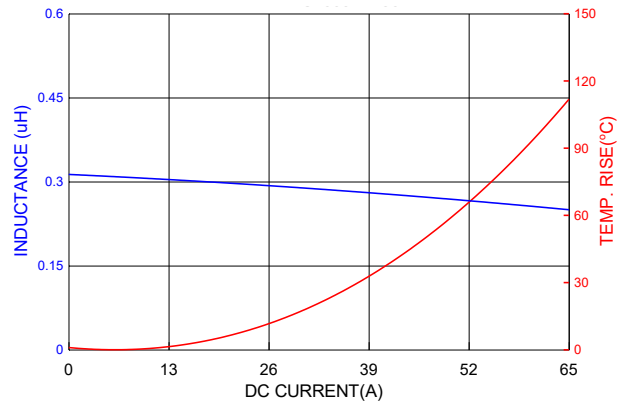
NOTE: Specifications subject to change without notice. Please check our website for latest information.

## 7. Characteristics Curve

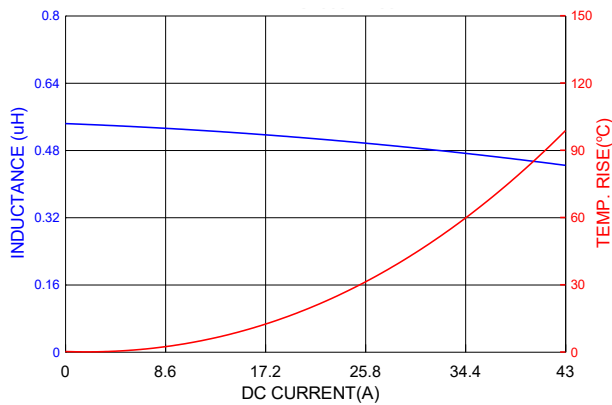
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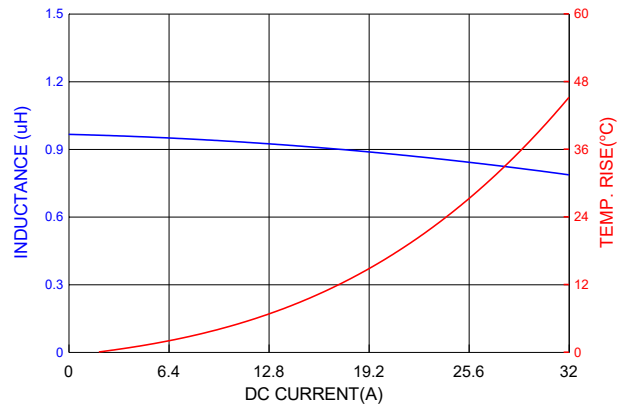
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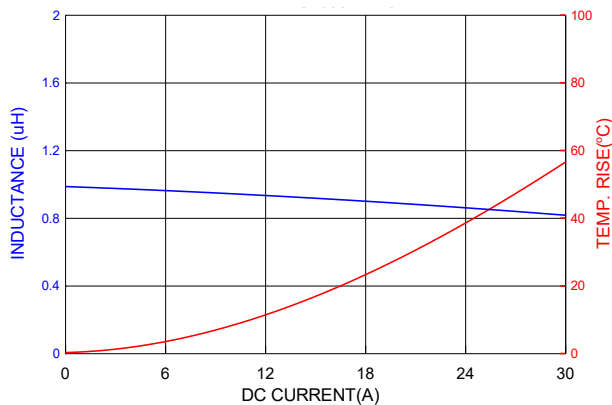
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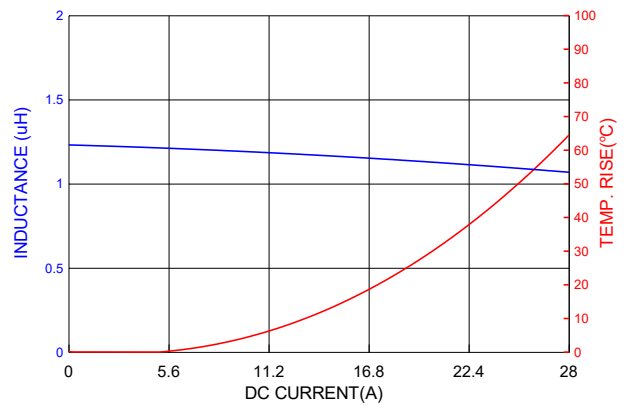
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PICQ1005H1R0MF

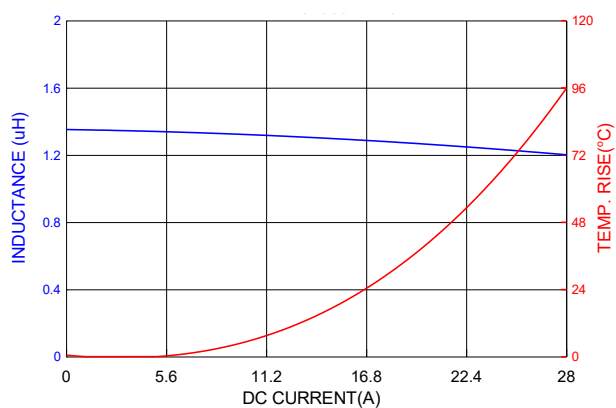


PICQ1005H1R2MF

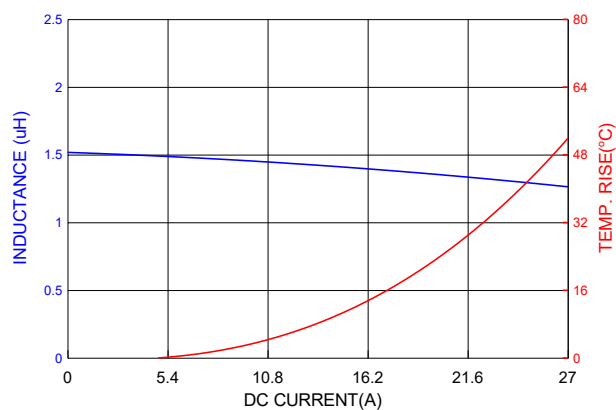


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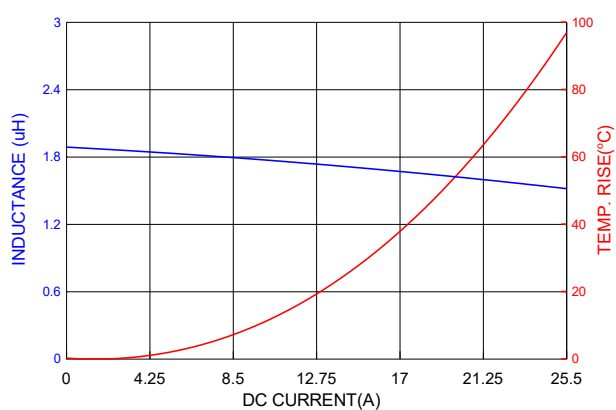
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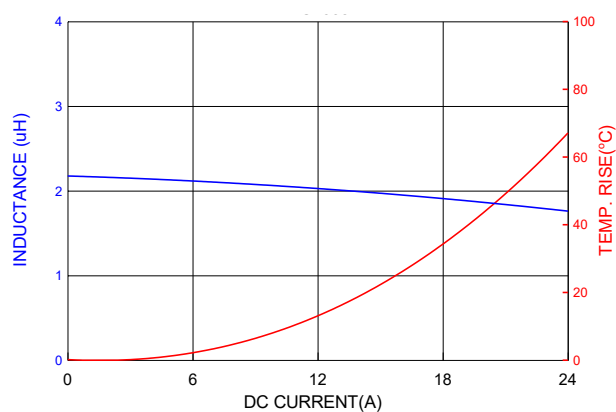
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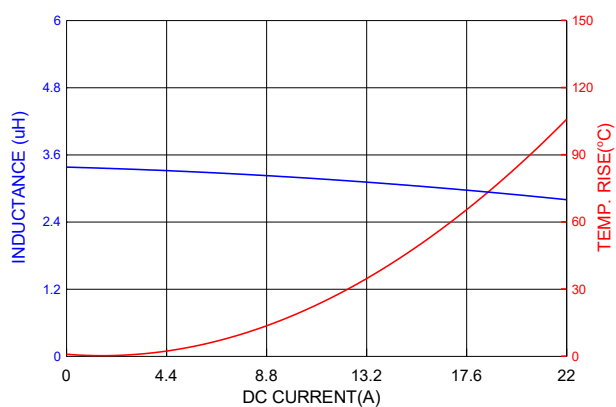
PICQ1005H1R8MF



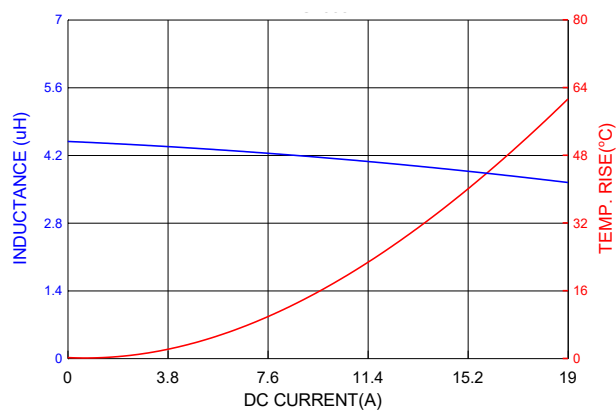
PICQ1005H2R2MF



PICQ1005H3R3MF

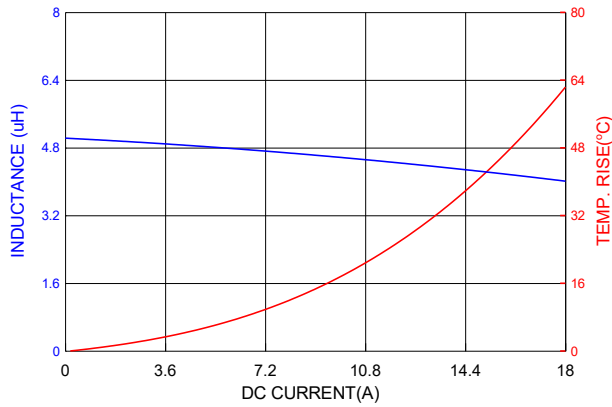


PICQ1005H4R7MF

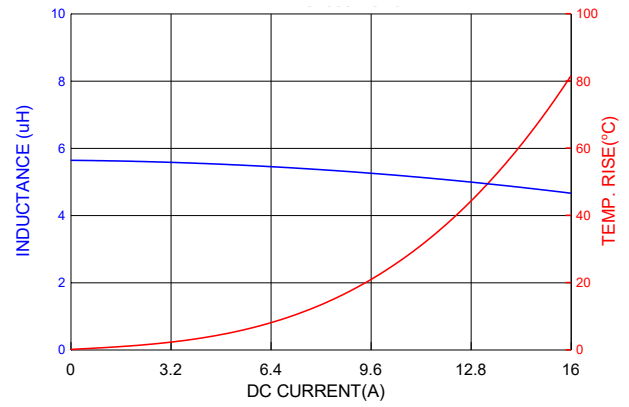


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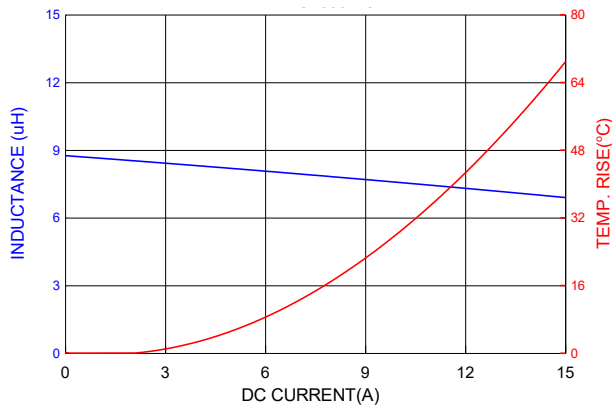
PICQ1005H5R0MF



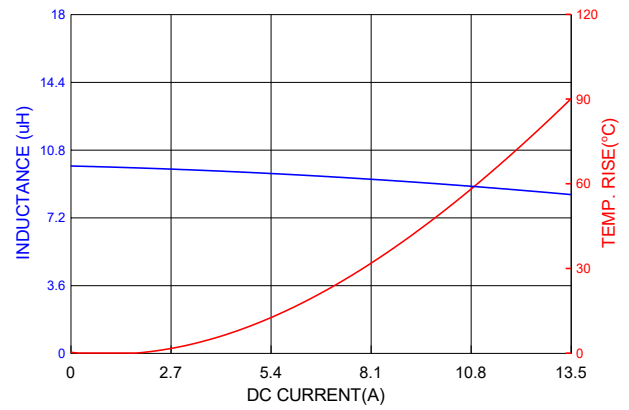
PICQ1005H5R6MF



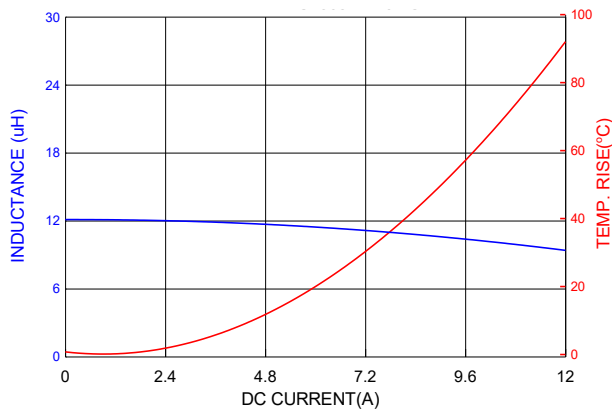
PICQ1005H8R2MF



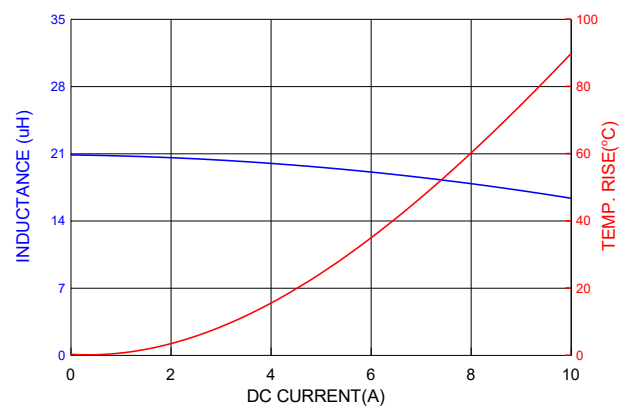
PICQ1005H100MF



PICQ1005H120MF

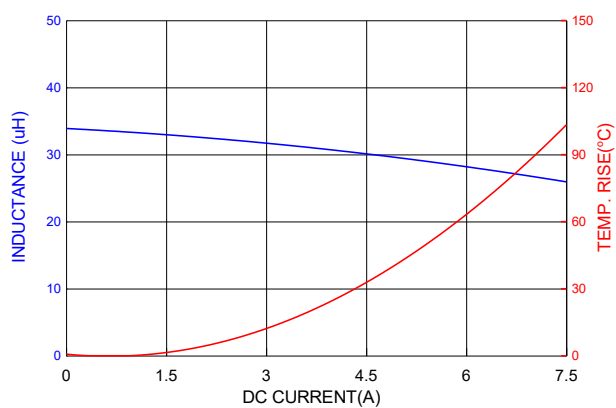


PICQ1005H220MF

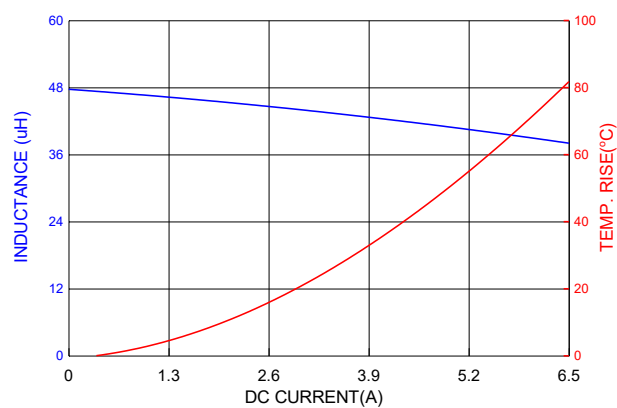


NOTE: Specifications subject to change without notice. Please check our website for latest information.

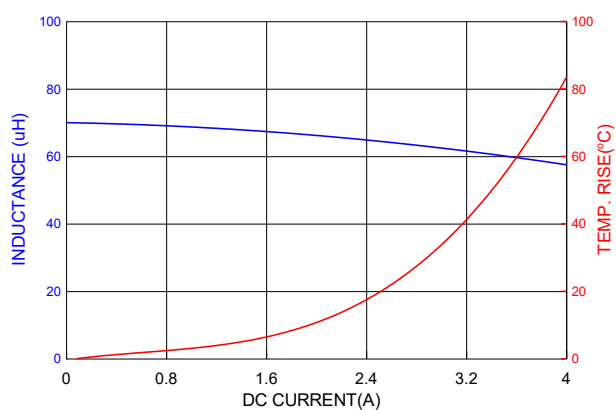
PICQ1005H330MF



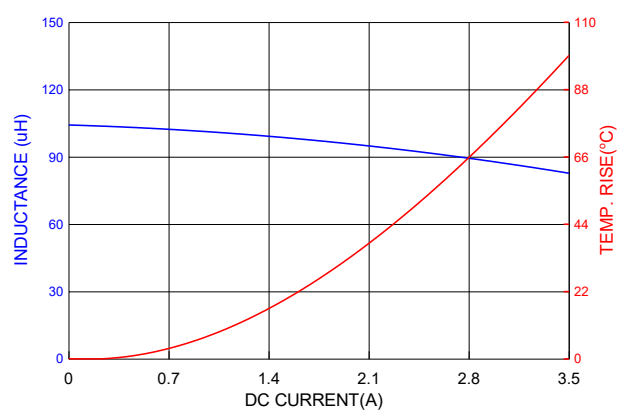
PICQ1005H470MF



PICQ1005H680MF



PICQ1005H101MF



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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

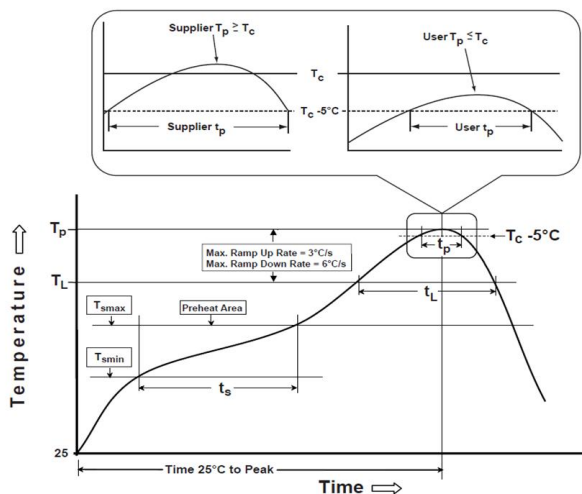
Recommended temperature profiles for lead free re-flow soldering in Figure 1, Table 1.1 & 1.2 (J-STD-020E).

### 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).

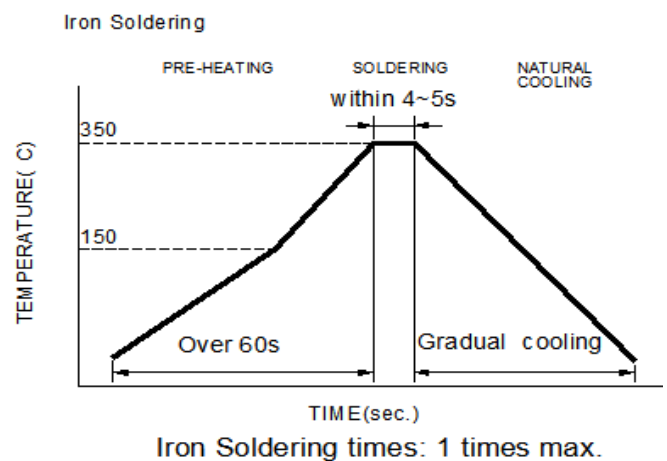
Note:

- 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 ( $T_c$ )**

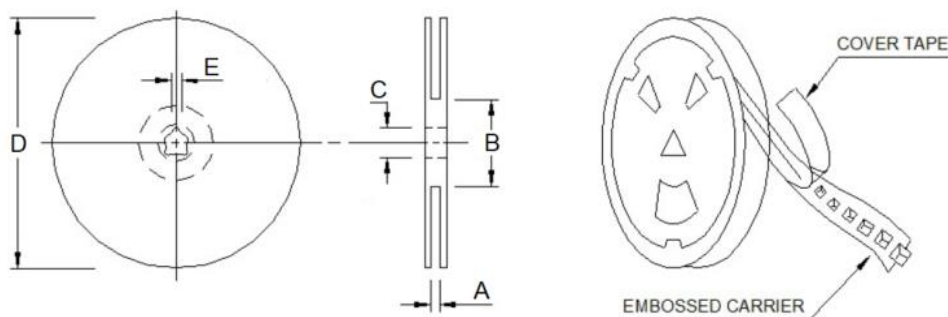
|                  | Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> 350-2000 | Volume mm <sup>3</sup> >2000 |
|------------------|-------------------|-----------------------------|---------------------------------|------------------------------|
| PB-Free Assembly | <1.6mm            | 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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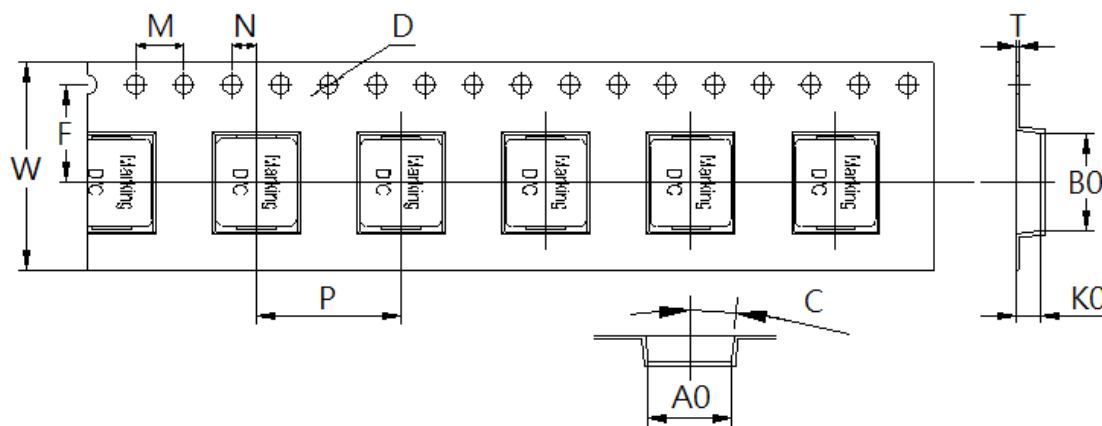
## 9. Packaging Information

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



| Type     | A             | B         | C             | D     | E       |
|----------|---------------|-----------|---------------|-------|---------|
| 13"x24mm | 24.4+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)



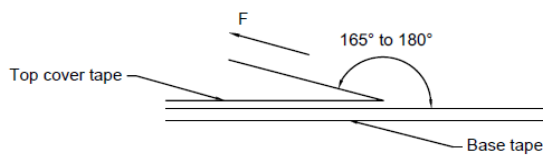
| B0         | A0         | K0        | P          | W          | F          |
|------------|------------|-----------|------------|------------|------------|
| 11.60±0.10 | 10.40±0.10 | 5.30±0.10 | 16.00±0.10 | 24.00±0.30 | 11.50±0.10 |
| T          | M          | N         | D          | C          | -          |
| 0.35±0.05  | 4.00       | 2.00      | 1.50±0.10  | 3°         | -          |

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

|            |       |
|------------|-------|
| Chip/ Reel | 500   |
| Inner box  | 1,000 |
| Carton     | 4,000 |

## 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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