

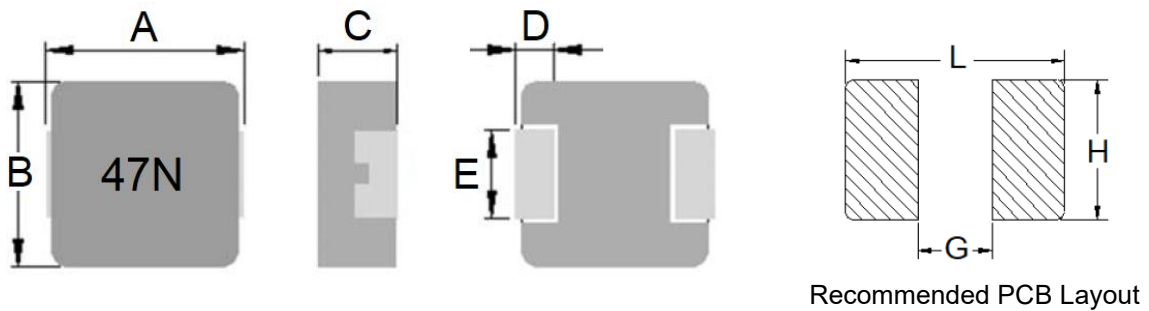
## 1. Part No. Expression

**P I C Q 0 4 1 5 H P 4 7 N 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)

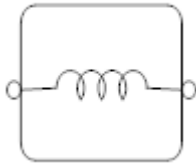


- Note:
1. The above PCB layout reference only.
  2. Recommend solder paste thickness at 0.12 mm and above.
  3. Marking: Inductance Code, Black

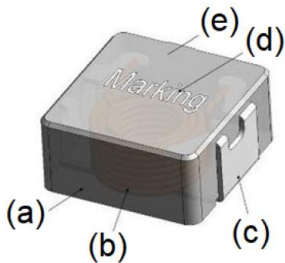
A	B	C	D	E	L	G	H
4.45±0.25	4.06±0.25	1.30±0.20	0.76±0.30	2.00±0.20	5.20 Ref	2.20 Ref	2.30 Ref

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: 40V
- (j) Storage Condition (Component in its packaging)
  - i) Temperature: Less than 40°C
  - ii) Humidity: Less than 60% RH

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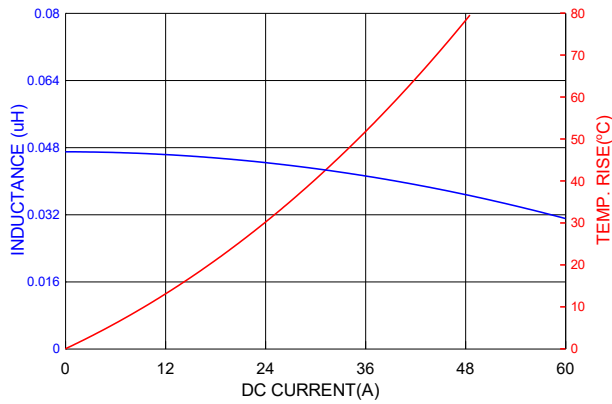
## 6. Electrical Characteristics

Part Number	Inductance ( $\mu$ H) @0A $\pm 20\%$	Test Frequency	I <sub>rms</sub> (A) Typ	I <sub>sat</sub> (A) Typ	DCR (m $\Omega$ )	
					Typ	Max
PICQ0415HP47NMF	0.047	1.0V/100KHz	20.5	48.0	2.1	2.5
PICQ0415HPR22MF	0.22	1.0V/100KHz	10.0	20.0	6.5	7.8
PICQ0415HPR47MF	0.47	1.0V/100KHz	8.0	11.0	15.0	19.0
PICQ0415HPR68MF	0.68	1.0V/100KHz	6.5	8.5	19.0	21.5
PICQ0415HP1R0MF	1.00	1.0V/100KHz	5.0	7.0	34.0	40.0
PICQ0415HP2R2MF	2.20	1.0V/100KHz	3.2	4.0	63.0	72.0
PICQ0415HP4R7MF	4.70	1.0V/100KHz	2.2	2.8	120	140
PICQ0415HP6R8MF	6.80	1.0V/100KHz	1.7	2.3	230	276
PICQ0415HP100MF	10.0	1.0V/100KHz	1.5	1.9	345	400

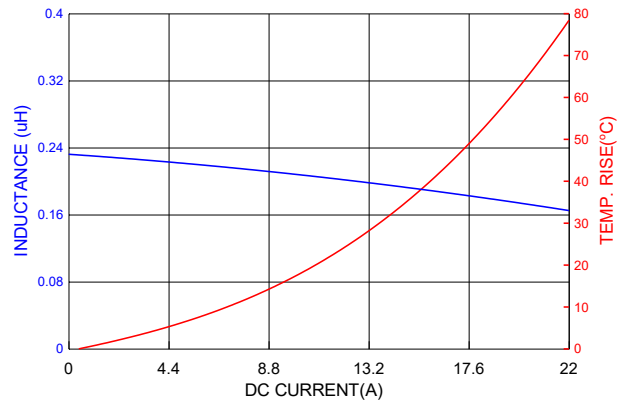
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## 7. Characteristics Curve

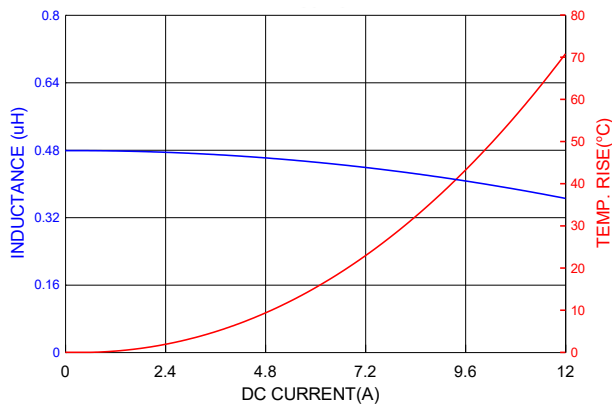
PICQ0415HP47NMF



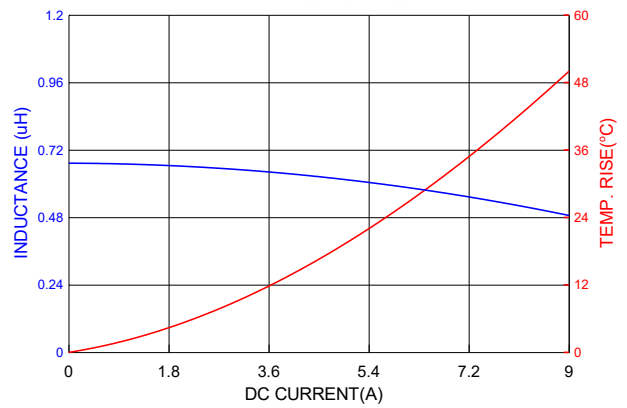
PICQ0415HPR22MF



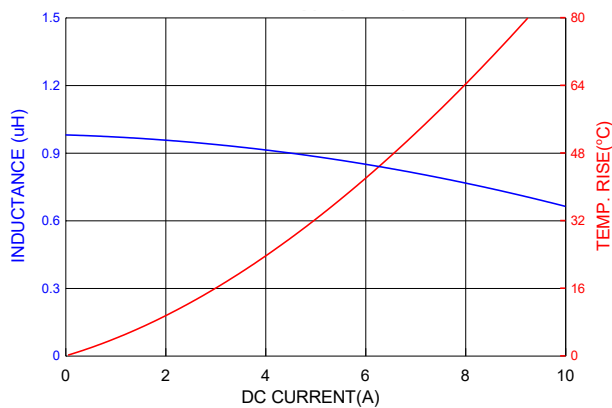
PICQ0415HPR47MF



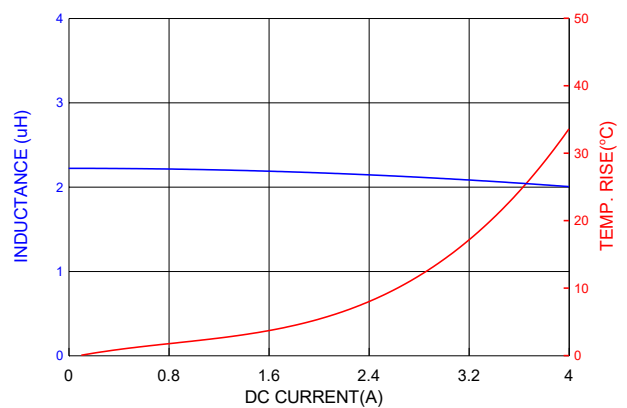
PICQ0415HPR68MF



PICQ0415HP1R0MF

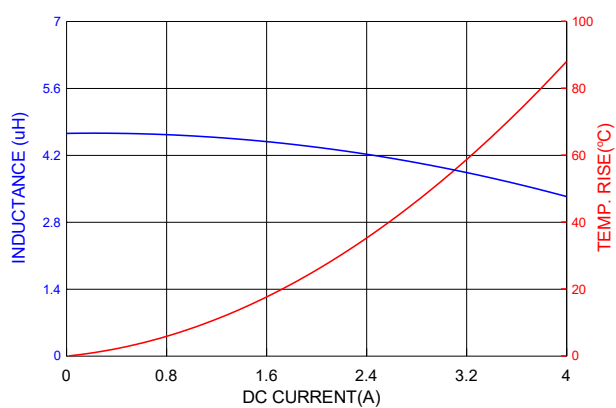


PICQ0415HP2R2MF

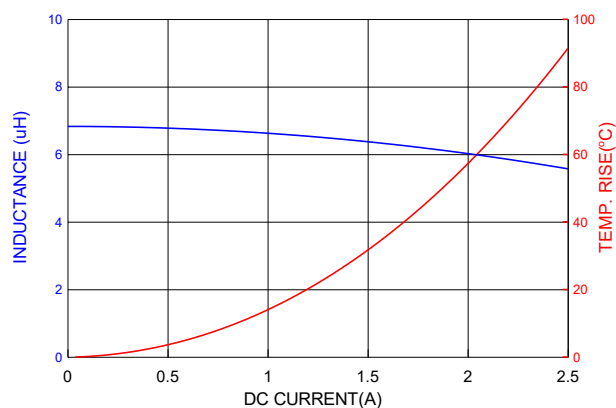


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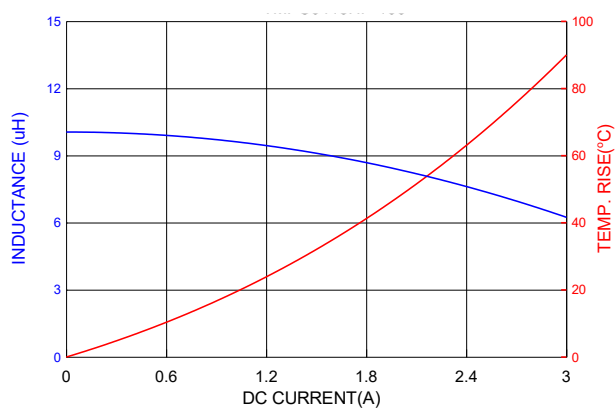
PICQ0415HP4R7MF



PICQ0415HP6R8MF



PICQ0415HP100MF



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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

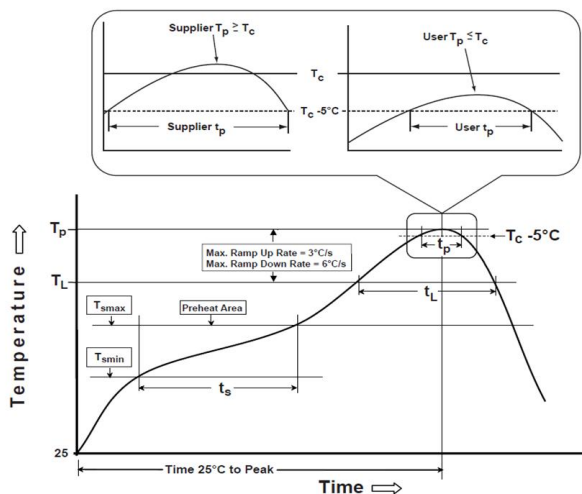
Recommended temperature profiles for lead free re-flow soldering in Figure 1, Table 1.1 & 1.2 (J-STD-020E).

### 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).

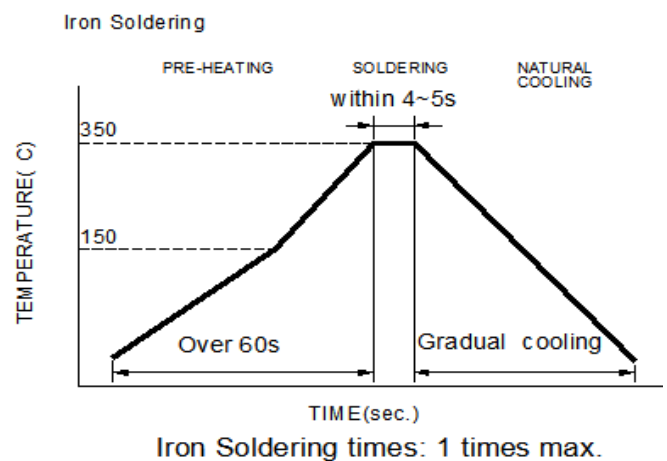
Note:

- 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

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**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 ( $T_c$ )**

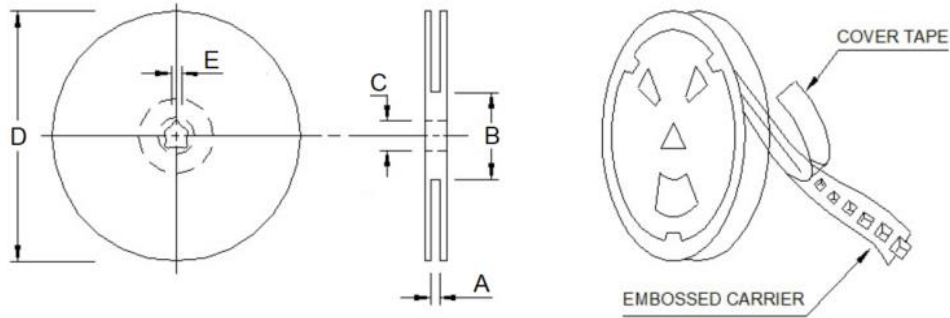
	Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

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

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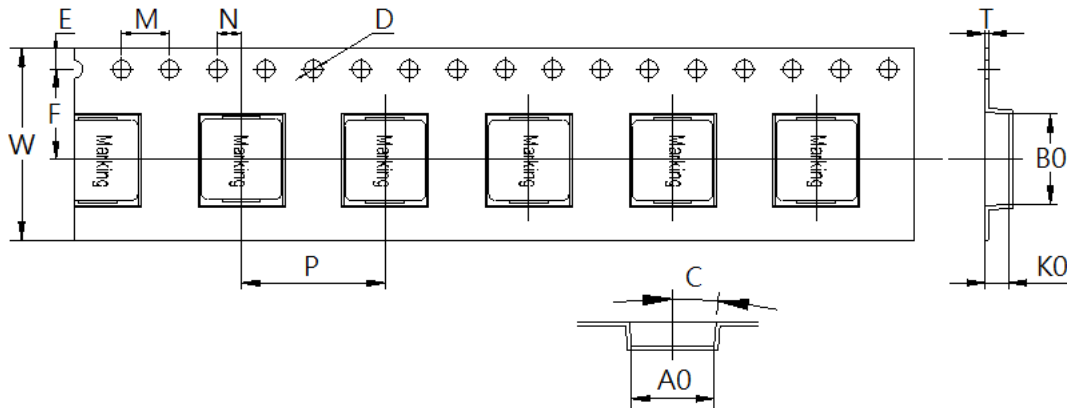
## 9. Packaging Information

### 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
5.00±0.10	4.40±0.10	1.80±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°

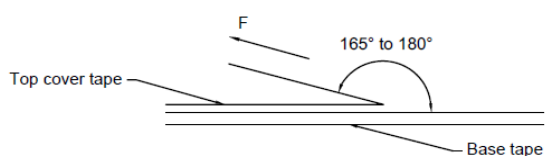
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## 9-3. Packaging Quantity (Unit: Pcs)

Chip/ Reel	3,500
Inner box	7,000
Carton	28,000

## 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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