

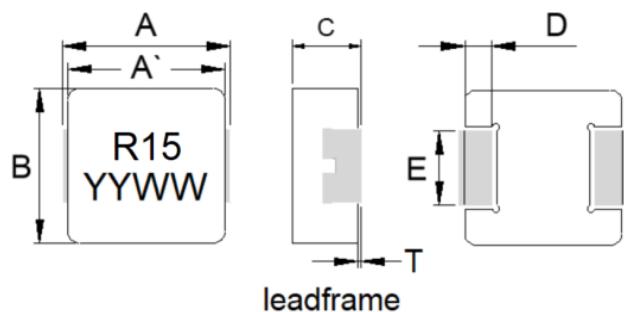
## 1. Part No. Expression

**PIAQ 1004 S R15 Y N**

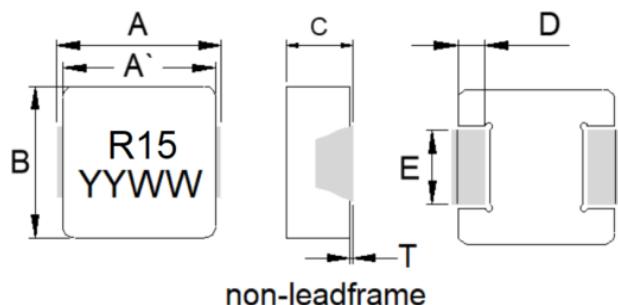
(a) (b) (c) (d) (e) (f)

(a) Series Code	(d) Inductance Code
(b) Dimension Code	(e) Tolerance Code
(c) Material Code	(f) Special Code

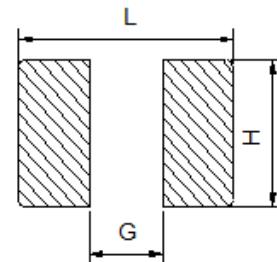
## 2. Configuration & Dimensions (Unit: mm)



leadframe



non-leadframe



Recommended PCB Layout

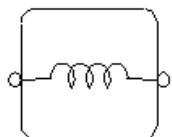
Note:

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

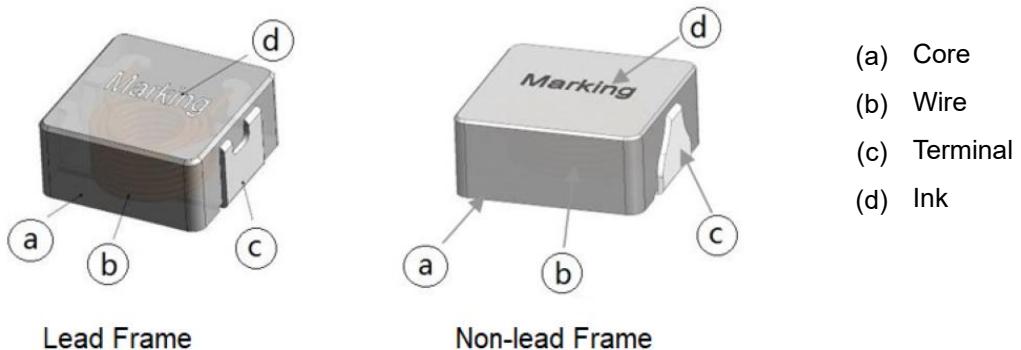
Inductance	A	A'	B	C	D	E	T	L	G	H
0.56~1.50uH among						2.5±0.3				
0.47uH and below	11.0±0.3	10.0±0.3	10.0±0.3	3.8±0.2	2.0±0.3		0.0~0.2	12.5 Ref	5.4 Ref	3.5 Ref
2.20uH and above						3.0±0.3				

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

## 3. Schematic



## 4. Material List



## 5. General Specifications

- (a) Reliability test for this part meets AEC-Q200 standard.
- (b) Operating Temp.: -55°C to +155°C (including self-temperature rise)
- (c) Storage Temp.: -55°C to +155°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. (keep 1min)
- (f) Saturation Current (Isat) will cause inductance L0 to drop approximately 30%.
- (g) Rated Current: The lower value of Isat and Irms.
- (h) Part Temperature (Ambient + Temp. Rise): Should not exceed 155°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 Lo (uH) @ 0A	Irms (A)		Isat (A)		DCR (mΩ)		Type
		Typ	Max	Typ	Max	Typ	Max	
PIAQ1004SR15YN	0.15	44	38	82	75	0.5	0.6	Non lead frame
PIAQ1004SR22MN	0.22	36	33	70	60	0.72	0.83	Non lead frame
PIAQ1004SR36MN	0.36	33	29	51	45	1.05	1.18	Non lead frame
PIAQ1004SR42MN	0.42	32.5	28.5	50	42	1.15	1.3	Non lead frame
PIAQ1004SR47MN	0.47	32	28	46	40	1.3	1.5	Non lead frame
PIAQ1004SR56MN	0.56	25	23	34	29	1.6	1.8	Non lead frame
PIAQ1004SR68MN	0.68	23	20	31	28	1.9	2.2	Non lead frame
PIAQ1004S1R0MN	1.00	20	18	29	26	2.9	3.25	Non lead frame
PIAQ1004S1R5MN	1.50	17.5	16	26	22	3.7	4.2	Non lead frame
PIAQ1004S2R2MN	2.20	15	13	20	16	5.8	6.7	Lead frame
PIAQ1004S3R3MN	3.30	11	10	17.5	14	10.5	11.8	Lead frame
PIAQ1004S4R7MN	4.70	8.8	8.0	15.2	13	15.8	19	Lead frame
PIAQ1004S5R6MN	5.60	8.0	7.2	14.1	11.5	19	22.8	Lead frame
PIAQ1004S6R8MN	6.80	7.8	6.8	12.2	11	22	24.5	Lead frame
PIAQ1004S8R2MN	8.20	7.6	6.5	9.5	8.5	25	28	Lead frame
PIAQ1004S100MN	10.0	7.5	6.1	8.6	7.5	27	30	Lead frame
PIAQ1004S150MN	15.0	6.25	5.0	7.0	6.0	41	45	Lead frame
PIAQ1004S220MN	22.0	5.0	4.1	6.2	5.5	58	66	Lead frame
PIAQ1004S330MN	33.0	4.4	3.5	5.5	5.0	84	91	Lead frame
PIAQ1004S470MN	47.0	3.5	3.0	4.0	3.7	125	143	Lead frame
PIAQ1004S680MN	68.0	2.6	2.4	3.2	3.0	184	210	Lead frame
PIAQ1004S820MN	82.0	2.3	2.1	3	2.8	240	270	Lead frame
PIAQ1004S101MN	100.0	2.0	1.8	2.7	2.4	270	310	Lead frame

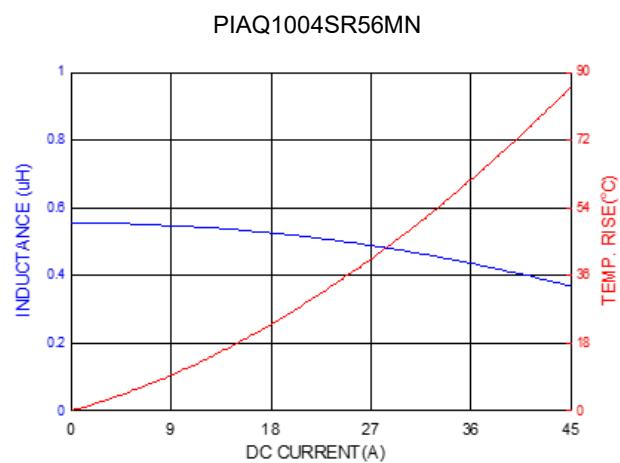
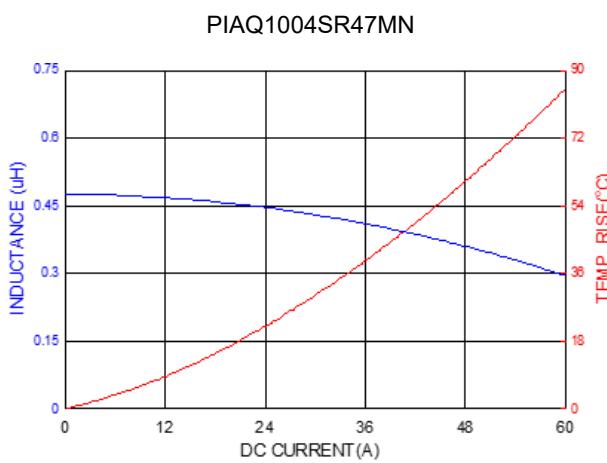
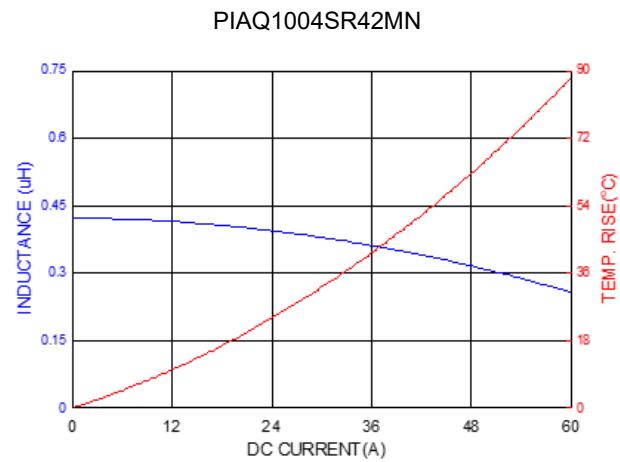
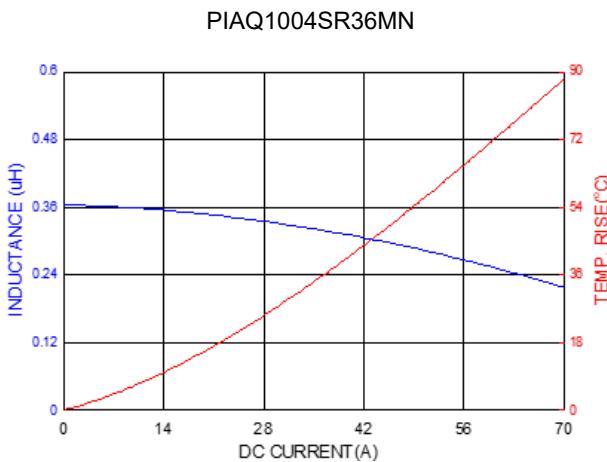
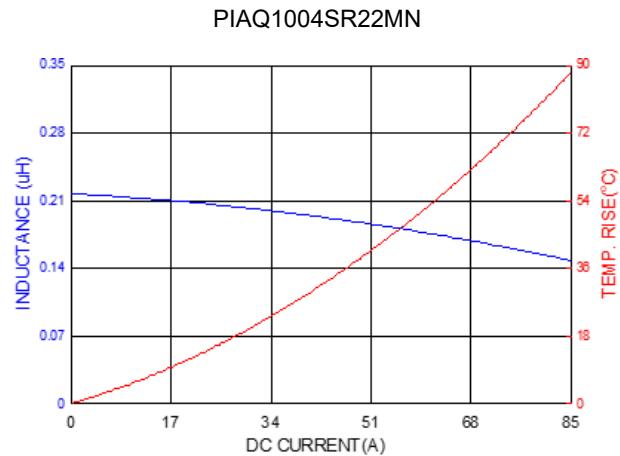
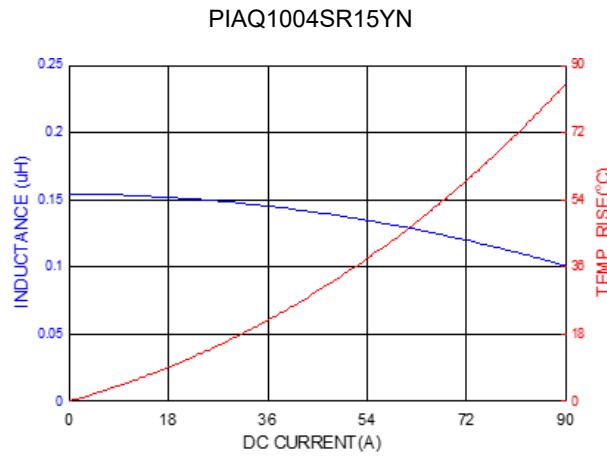
Note:

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

Test Frequency: 1.0V/100KHz

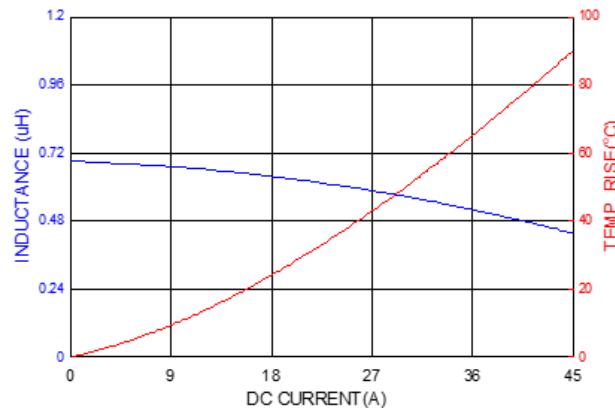
NOTE: Specifications subject to change without notice. Please check our website for latest information.

## 7. Characteristics Curve

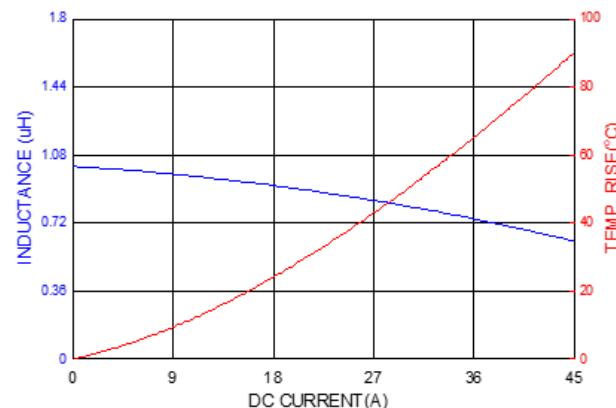


NOTE: Specifications subject to change without notice. Please check our website for latest information.

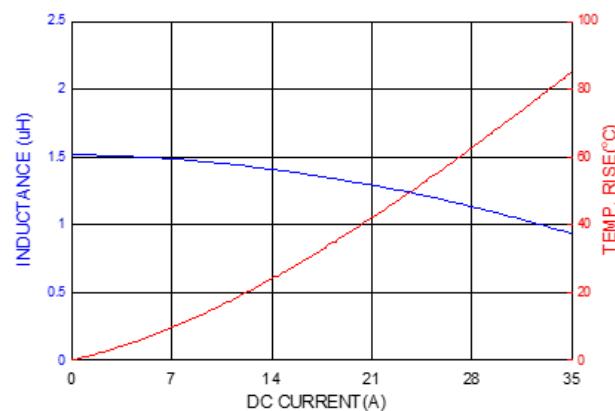
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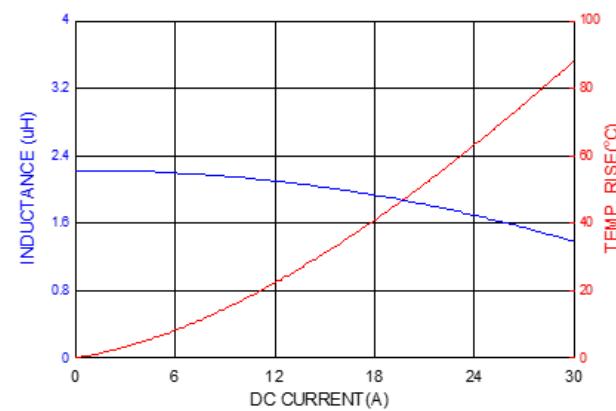
PIAQ1004S1R0MN



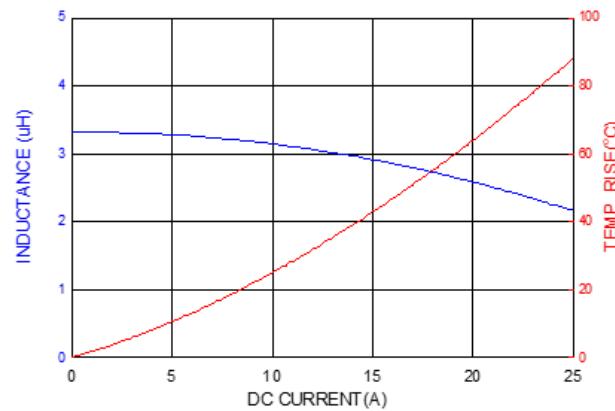
PIAQ1004S1R5MN



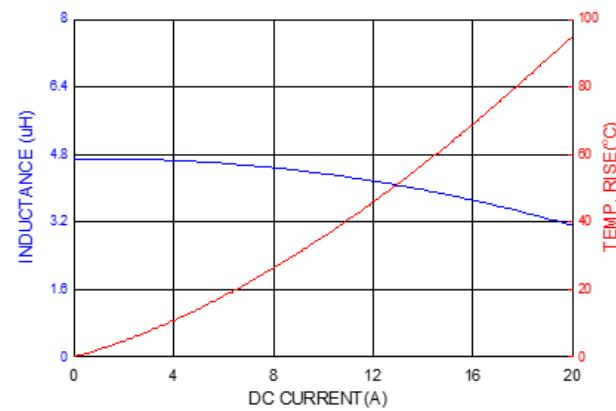
PIAQ1004S2R2MN



PIAQ1004S3R3MN

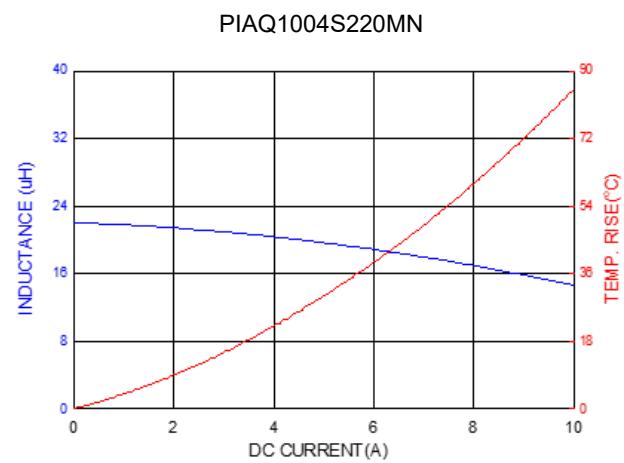
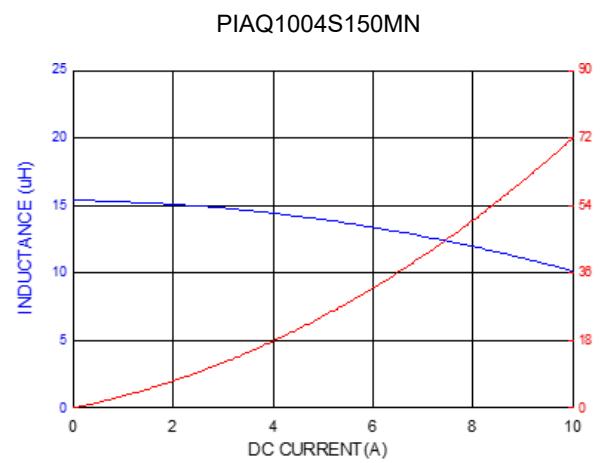
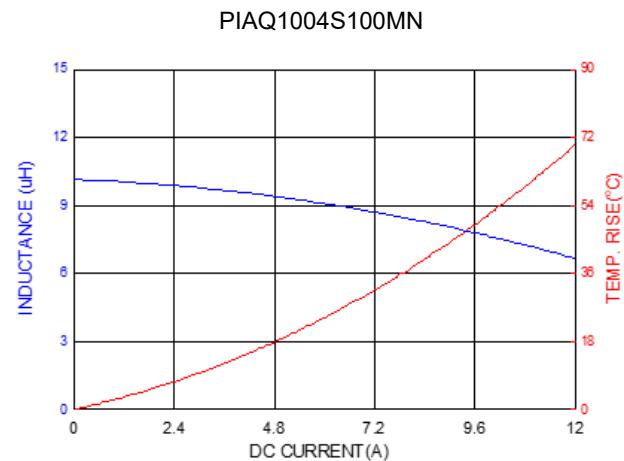
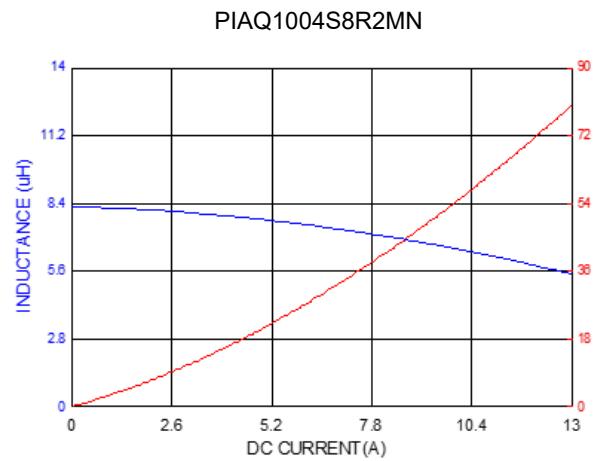
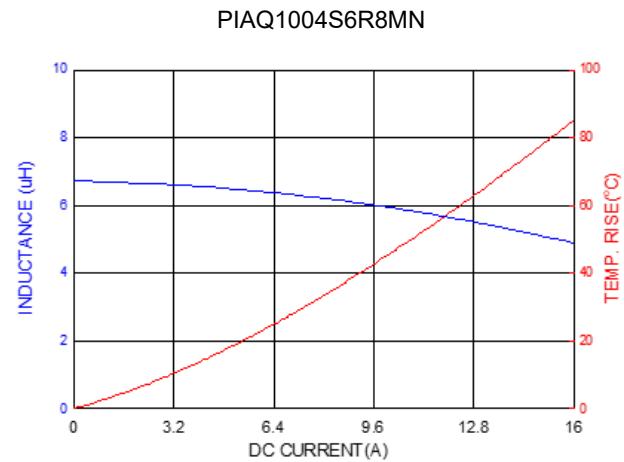
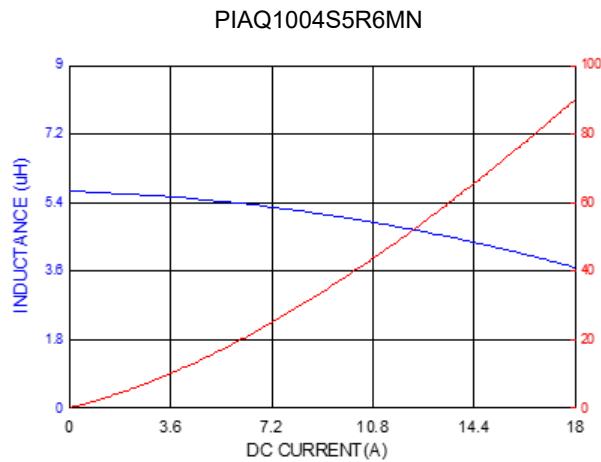


PIAQ1004S4R7MN



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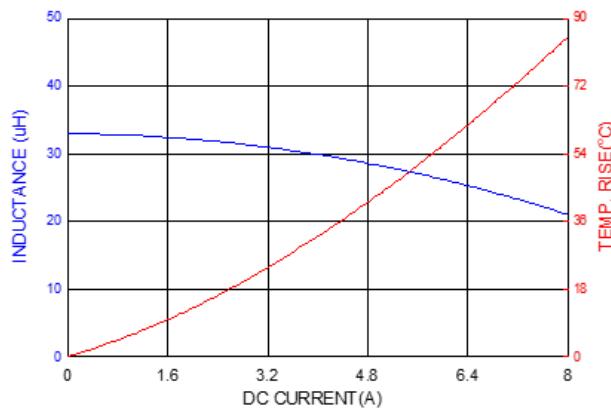




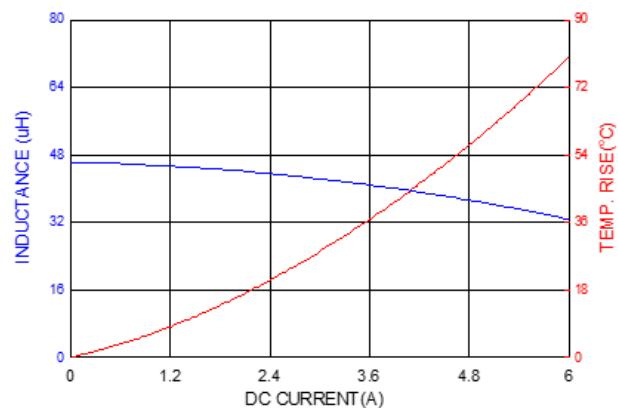
NOTE: Specifications subject to change without notice. Please check our website for latest information.



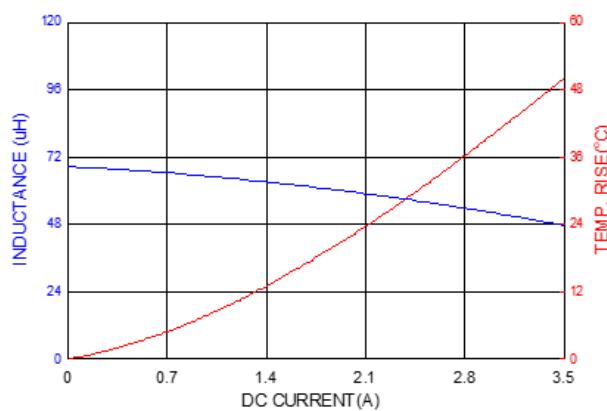
PIAQ1004S330MN



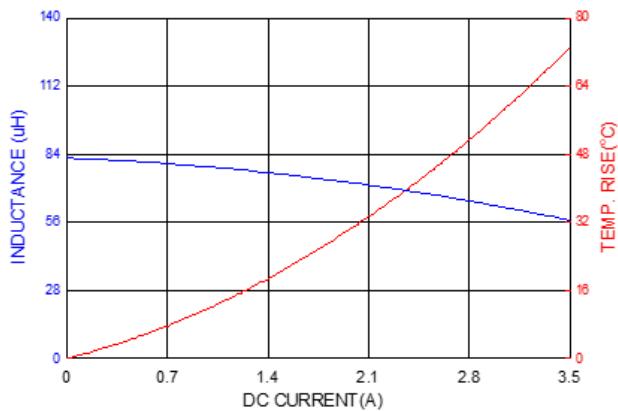
PIAQ1004S470MN



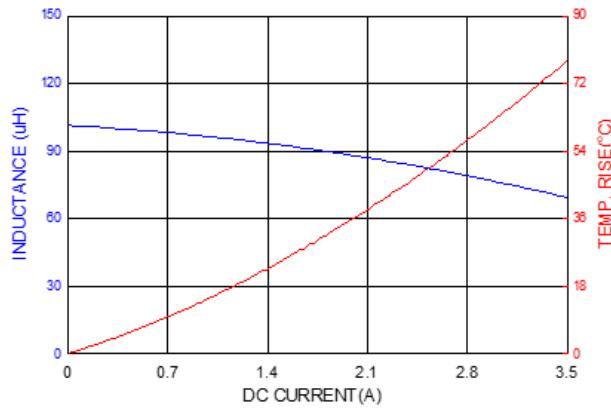
PIAQ1004S680MN



PIAQ1004S820MN



PIAQ1004S101MN



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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

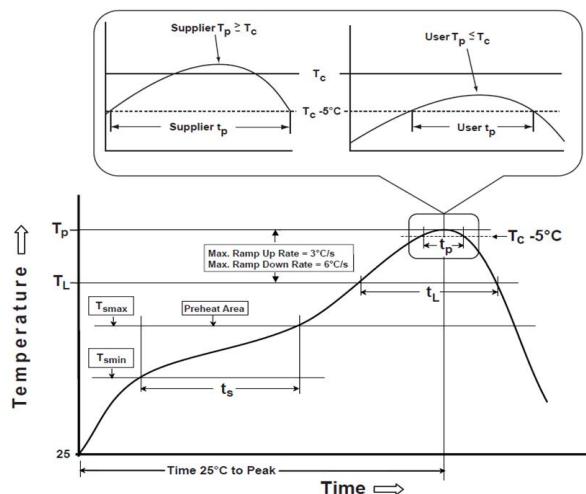
Recommended temperature profiles for lead free re-flow soldering in Figure 1, Table 1.1 & 1.2 (J-STD-020F).

### 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).

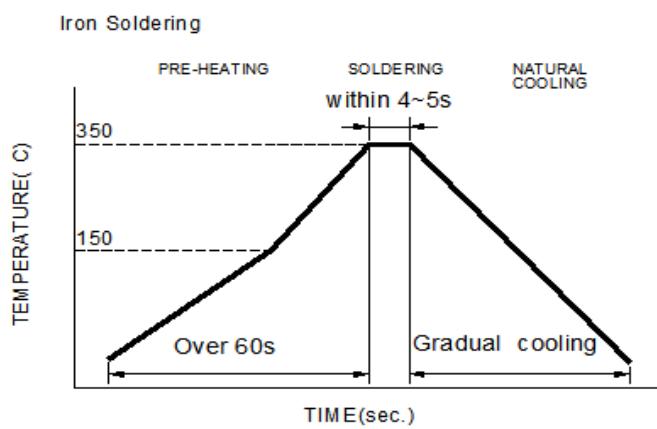
Note:

- (a) Preheat circuit and products to 150°C.
- (b) 350°C tip temperature (Max.)
- (c) Never contact the ceramic with the iron tip
- (d) 1.0mm tip diameter (Max.)
- (e) Use a 20 watt soldering iron with tip diameter of 1.0mm
- (f) Limit soldering time to 4~5 sec.



Reflow times: 3 times Max

Figure 1: IR Soldering Reflow



Iron Soldering times : 1 times 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>**.

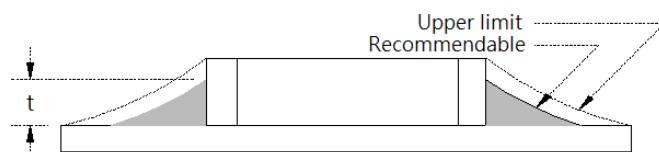
**Table (1.2) Package Thickness/Volume and Classification Temperature ( $T_c$ )**

	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-020F.

### 8-3. Soldering Volume

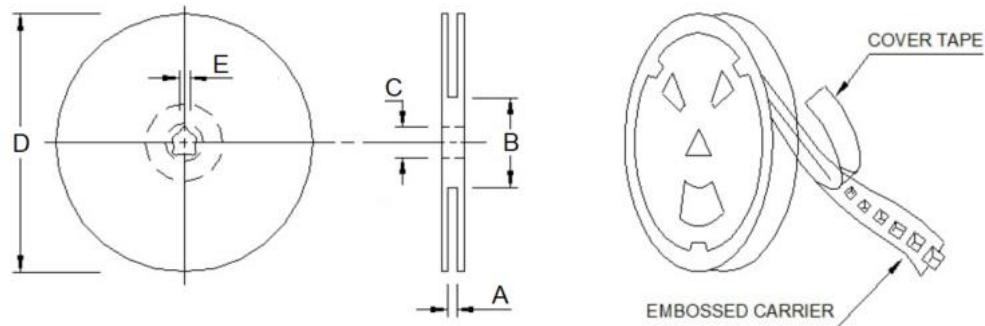
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceeded as shown in the Figure below. Minimum fillet height = soldering thickness + 25% product height.



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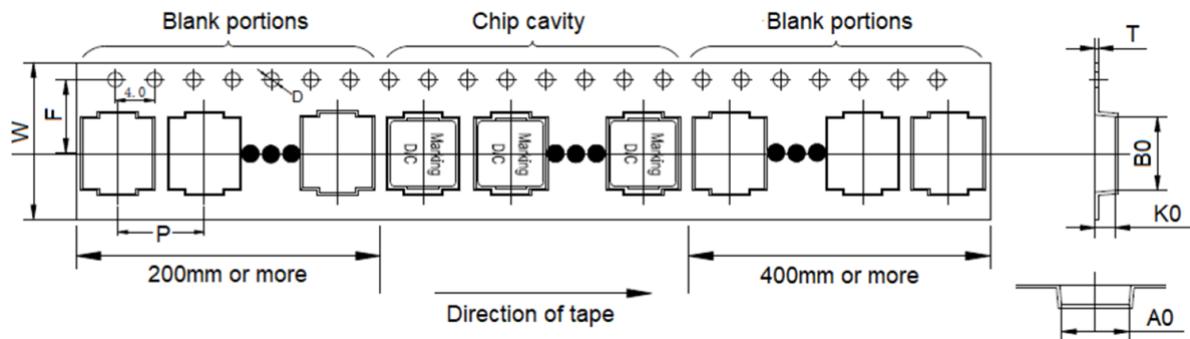
## 9. Packaging Information

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



Type	A	B	C	D	E
13"x24mm	24.4 Ref	100.0 Ref	13.5 Ref	330.0 Ref	2.0 Ref

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



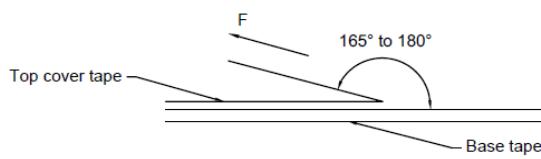
B0	A0	K0	P
$11.60 \pm 0.10$	$10.40 \pm 0.10$	$4.50 \pm 0.10$	$16.00 \pm 0.10$
W	F	T	D
$24.00 \pm 0.30$	$11.50 \pm 0.10$	$0.35 \pm 0.05$	$1.50 \pm 0.10$

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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:

- Products meet IPC/JEDEC J-STD-020F standard-MSL, level 1.
- Recommended products should be used within 12 months from the time of delivery.
- The packaging material should be kept where no chlorine or sulfur exists in the air.

### 2. Transportation

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

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