

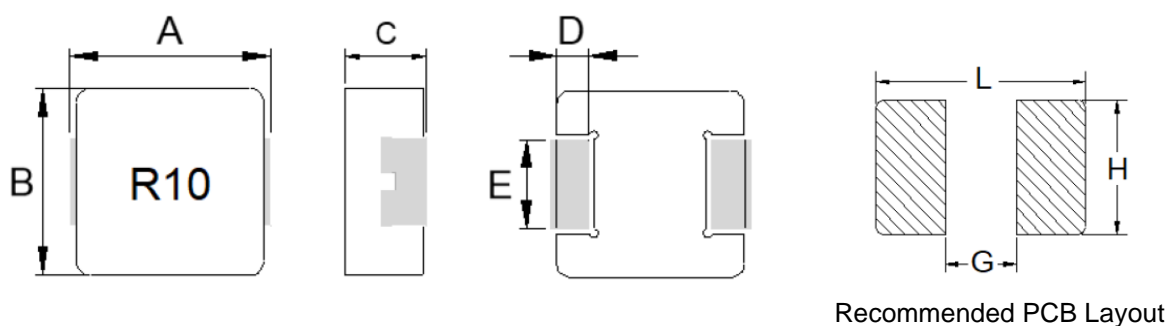
## 1. Part No. Expression

**PIA 0 4 0 2 S P R 1 0 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)

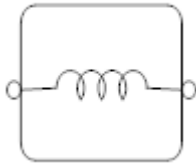


- Note:
1. The above PCB layout reference only.
  2. Recommend solder paste thickness at 0.12 mm and above.
  3. Marking: Inductance Code, Black

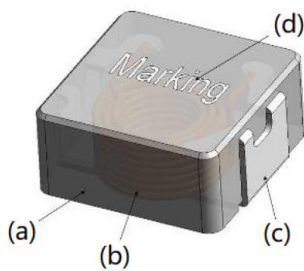
A	B	C	D	E	L	G	H
4.45±0.25	4.10±0.20	1.80±0.20	0.80±0.25	2.00±0.20	5.20 Ref	2.20 Ref	2.50 Ref

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

### 3. Schematic



### 4. Material List



- (a) Core
- (b) Wire
- (c) Terminal
- (d) Ink

### 5. General Specifications

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

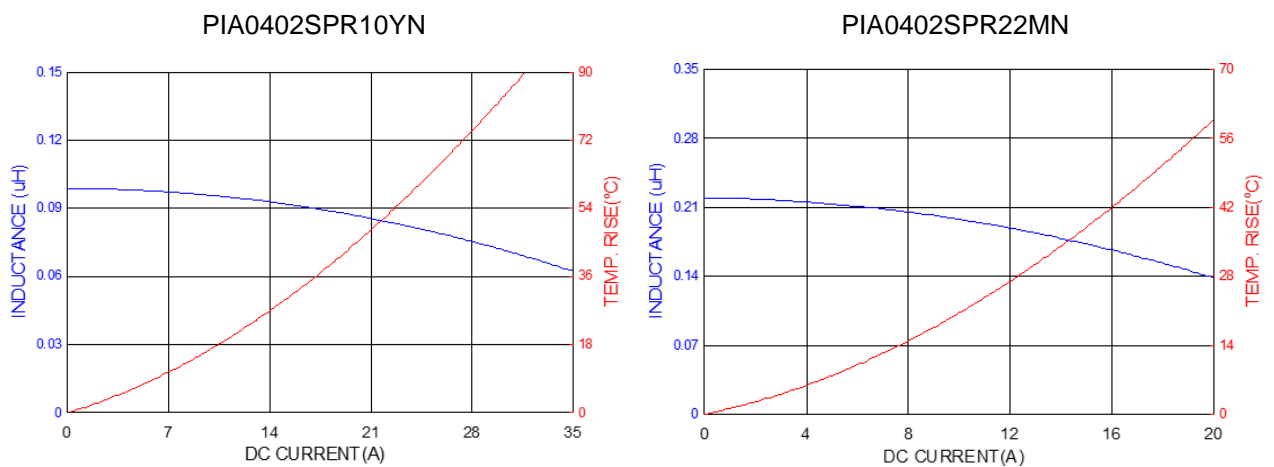
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## 6. Electrical Characteristics

Part Number	Inductance ( $\mu$ H) @0A	Test Frequency	Irms (A)		Isat (A)		DCR (m $\Omega$ )	
			Typ	Max	Typ	Max	Typ	Max
PIA0402SPR10YN	0.10	1.0V/100KHz	16.0	14.0	26.0	22.	2.9	3.2
PIA0402SPR22MN	0.22	1.0V/100KHz	14.0	12.5	15.0	13.0	4.8	5.5
PIA0402SPR47MN	0.47	1.0V/100KHz	10.0	9.0	9.0	8.0	9.5	11.0
PIA0402SPR68MN	0.68	1.0V/100KHz	9.0	8.0	7.6	6.6	11.6	13.5
PIA0402SPR82MN	0.82	1.0V/100KHz	8.0	7.0	6.0	5.5	16.3	18.8
PIA0402SP1R0MN	1.00	1.0V/100KHz	7.5	6.5	5.5	5.0	19.0	22.0
PIA0402SP1R5MN	1.50	1.0V/100KHz	6.7	5.8	5.2	4.8	27.0	31.0
PIA0402SP2R2MN	2.20	1.0V/100KHz	5.5	5.0	4.5	4.0	41.0	48.0
PIA0402SP3R3MN	3.30	1.0V/100KHz	4.5	3.5	3.1	2.7	65.0	75.0
PIA0402SP4R7MN	4.70	1.0V/100KHz	3.8	3.2	2.8	2.5	84.0	95.0
PIA0402SP5R6MN	5.60	1.0V/100KHz	3.2	2.8	2.6	2.3	97.0	115
PIA0402SP6R8MN	6.80	1.0V/100KHz	2.9	2.5	2.4	2.1	131	157
PIA0402SP8R2MN	8.20	1.0V/100KHz	2.6	2.3	2.2	2.0	140	168
PIA0402SP100MN	10.0	1.0V/100KHz	2.4	2.2	2.1	1.9	165	215

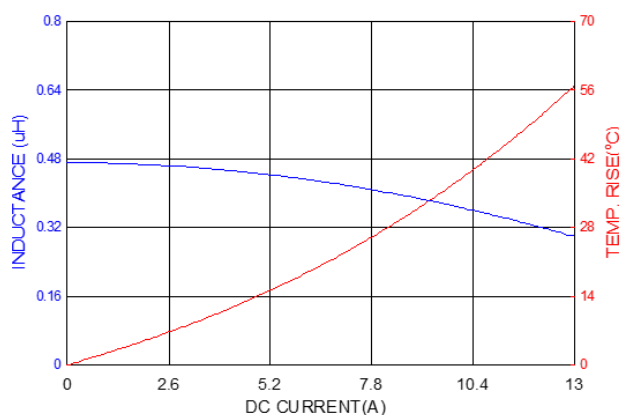
Tolerance Code: M=  $\pm$ 20%; Y=  $\pm$ 30%

## 7. Characteristics Curve

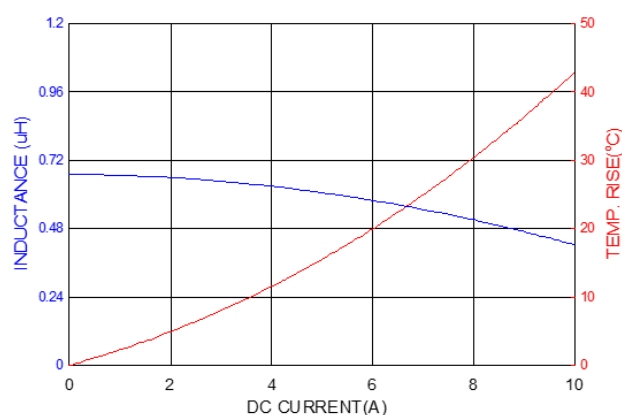


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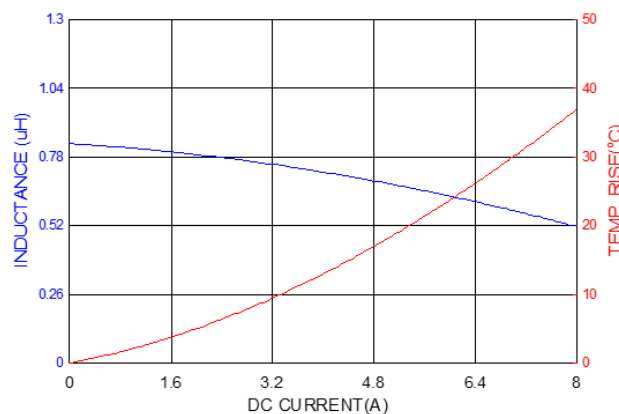
PIA0402SPR47MN



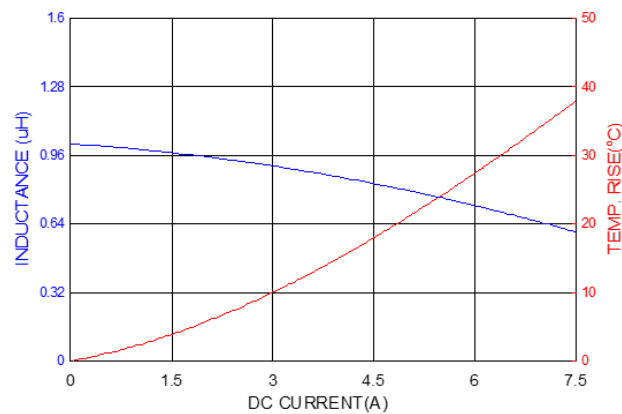
PIA0402SPR68MN



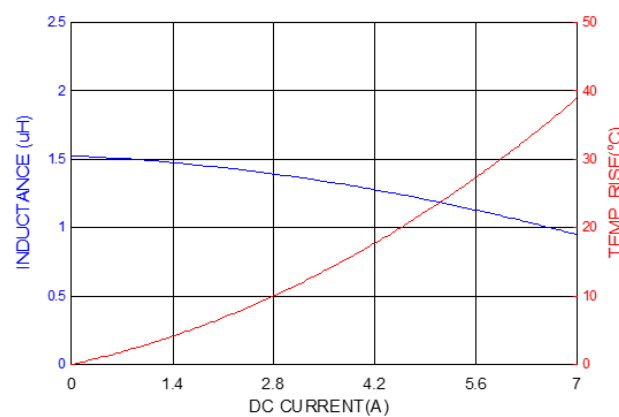
PIA0402SPR82MN



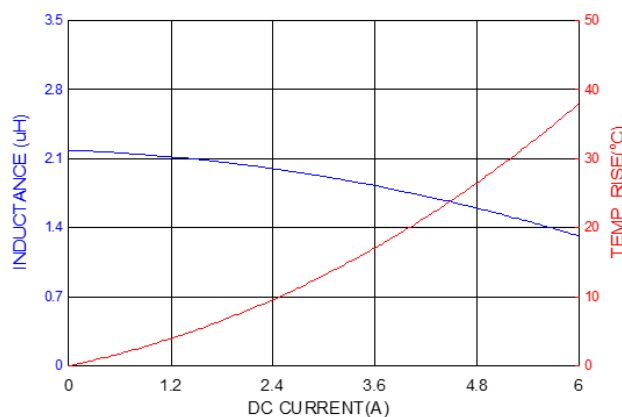
PIA0402SP1R0MN



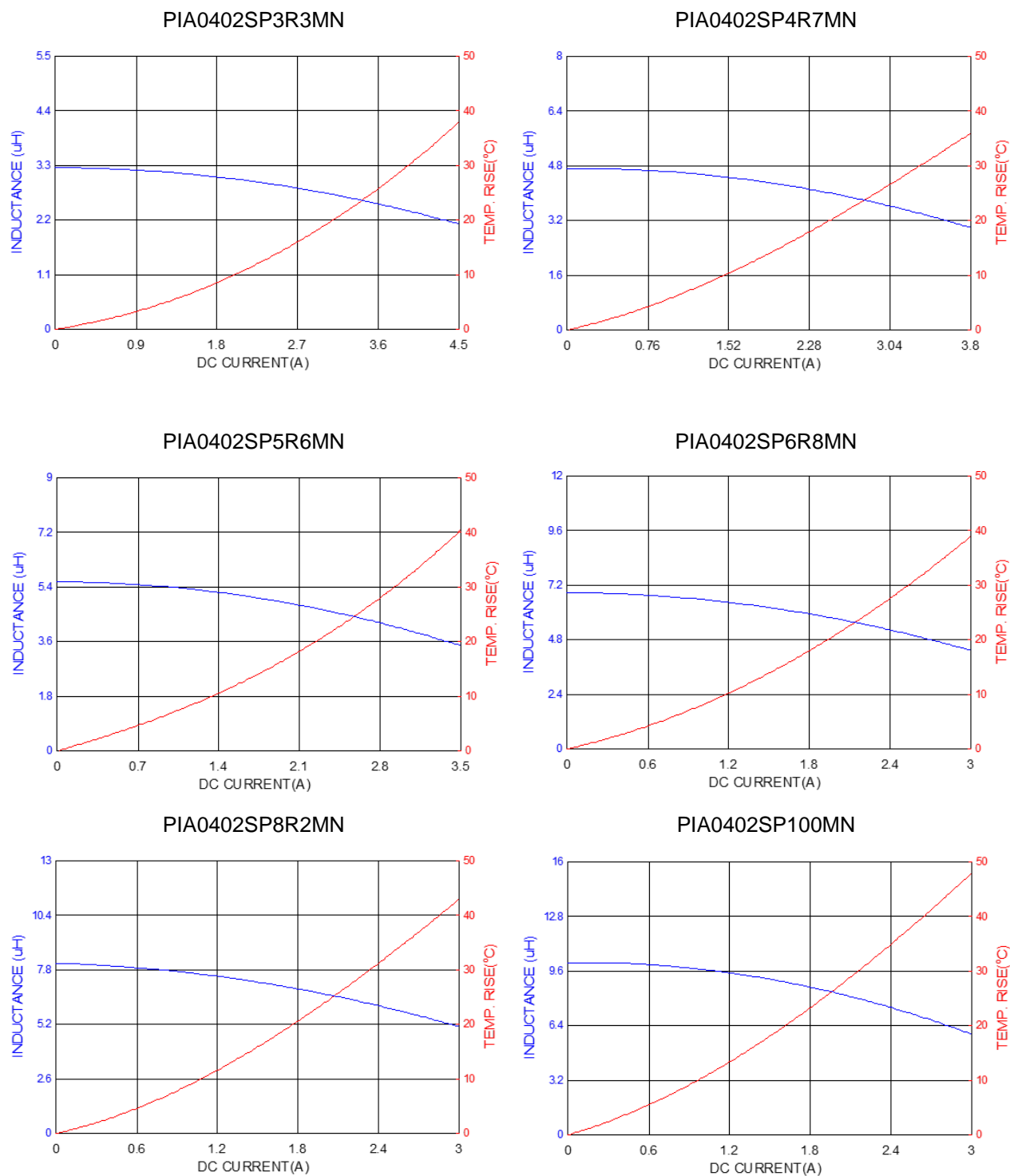
PIA0402SP1R5MN



PIA0402SP2R2MN



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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

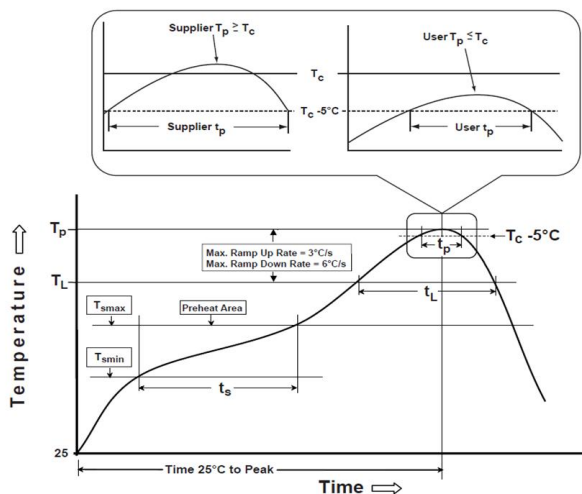
Recommended temperature profiles for lead free re-flow soldering in Figure 1, Table 1.1 & 1.2 (J-STD-020E).

### 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).

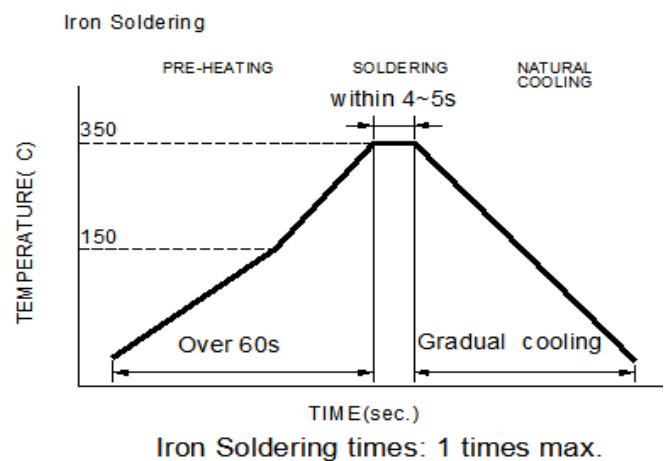
Note:

- 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 ( $T_c$ )**

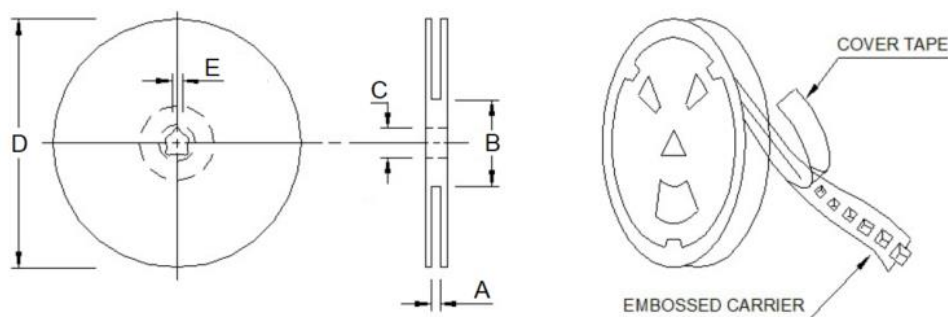
	Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

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

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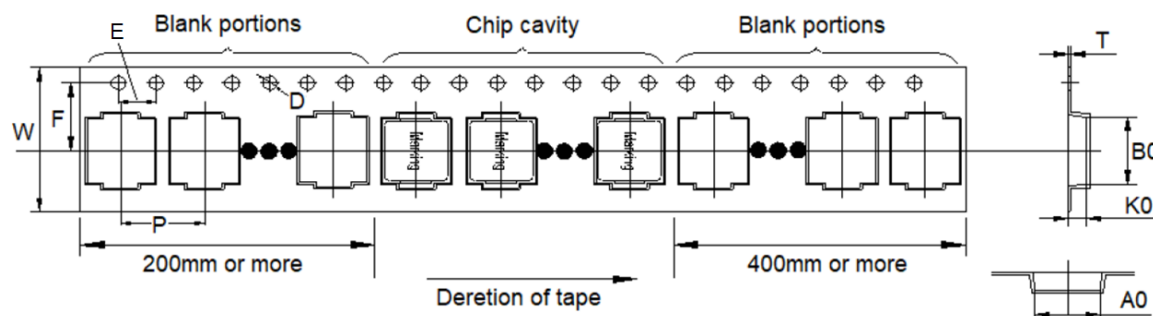
## 9. Packaging Information

### 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
5.00±0.10	4.40±0.10	2.30±0.10	8.00±0.10	12.00±0.30
F	T	D	E	-
5.50±0.10	0.35±0.05	1.50±0.10	4.00	-

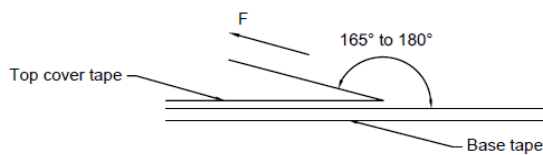
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## 9-3. Packaging Quantity (Unit: Pcs)

Chip/ Reel	3,000
Inner box	6,000
Carton	24,000

## 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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