

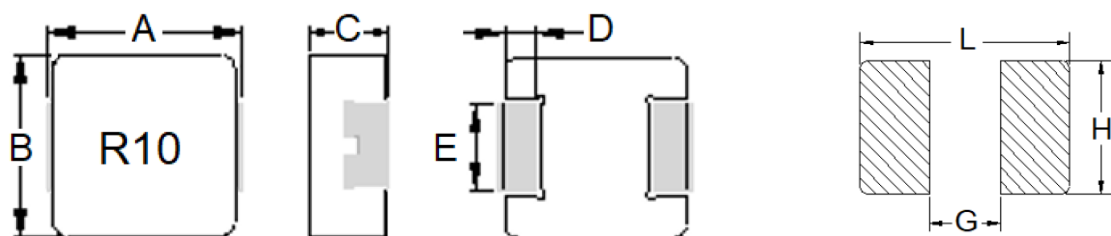
1. Part No. Expression

PIAQ0402SPR10MN

(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)



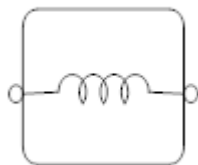
Recommended PCB Layout

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

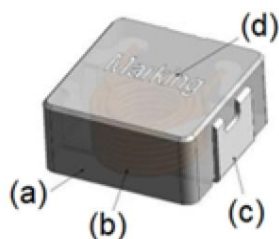
A	B	C	D	E	L	G	H
4.45±0.25	4.10±0.20	1.80±0.20	0.80±0.25	2.00±0.20	5.20 Ref	2.20 Ref	2.50 Ref

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

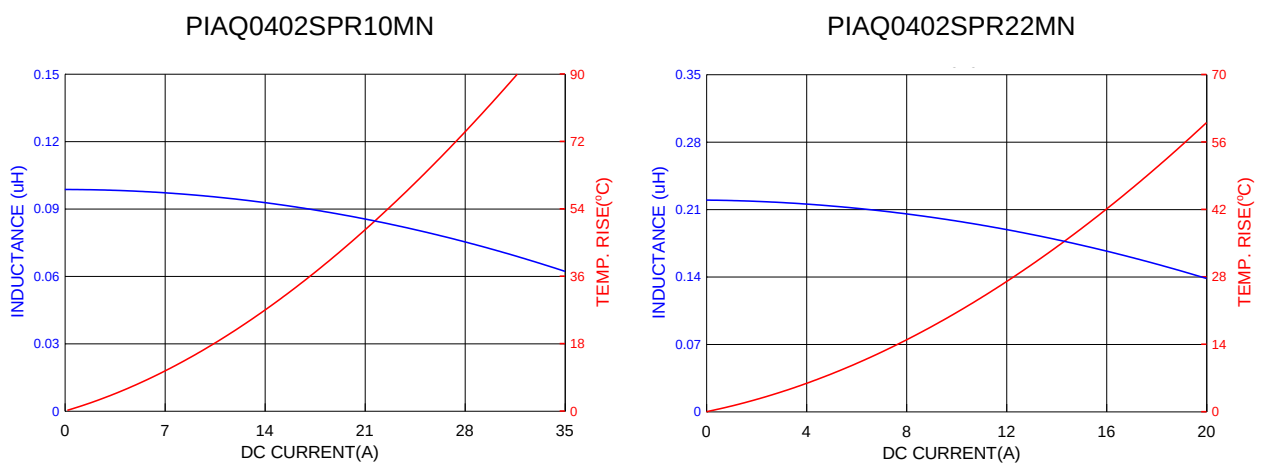
- (a) Reliability test for this part meets AEC-Q200 standard.
- (b) Operating Temp.: - 55°C to + 155°C (including self-temperature rise)
- (c) Storage Temp.: - 55°C to + 155°C (on board)
- (d) All test data referenced to 25°C ambient.
- (e) Heat Rated Current (Irms) will cause the coil temperature rise approximately ΔT 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 155°C under worst case operating conditions.
- (i) Maximum Operating Voltage: 25V
- (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

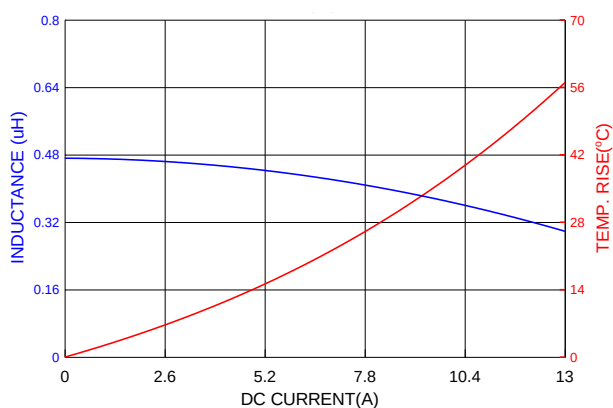
Part Number	Inductance (μ H) @0A $\pm 20\%$	Test Frequency	I _{rms} (A)		I _{sat} (A)		DCR (m Ω)	
			Typ	Max	Typ	Max	Typ	Max
PIAQ0402SPR10MN	0.10	1.0V/100KHz	16.0	14.0	26.0	22.0	2.9	3.2
PIAQ0402SPR22MN	0.22	1.0V/100KHz	14.0	12.5	15.0	13.0	4.8	5.5
PIAQ0402SPR47MN	0.47	1.0V/100KHz	10.0	9.0	9.0	8.0	9.5	11.0
PIAQ0402SPR68MN	0.68	1.0V/100KHz	9.0	8.0	7.6	6.6	11.6	13.5
PIAQ0402SPR82MN	0.82	1.0V/100KHz	8.0	7.0	6.0	5.5	16.3	18.8
PIAQ0402SP1R0MN	1.00	1.0V/100KHz	7.5	6.5	5.5	5.0	19.0	22.0
PIAQ0402SP1R5MN	1.50	1.0V/100KHz	6.7	5.8	5.2	4.8	27.0	31.0
PIAQ0402SP2R2MN	2.20	1.0V/100KHz	5.5	5.0	4.5	4.0	41.0	48.0
PIAQ0402SP3R3MN	3.30	1.0V/100KHz	4.5	3.5	3.1	2.7	65.0	75.0
PIAQ0402SP4R7MN	4.70	1.0V/100KHz	3.8	3.2	2.8	2.5	84.0	95.0
PIAQ0402SP5R6MN	5.60	1.0V/100KHz	3.2	2.8	2.6	2.3	97.0	115
PIAQ0402SP6R8MN	6.80	1.0V/100KHz	2.9	2.5	2.4	2.1	131	157
PIAQ0402SP8R2MN	8.20	1.0V/100KHz	2.6	2.3	2.2	2.0	140	168
PIAQ0402SP100MN	10.0	1.0V/100KHz	2.4	2.2	2.1	1.9	165	215

7. Characteristics Curve

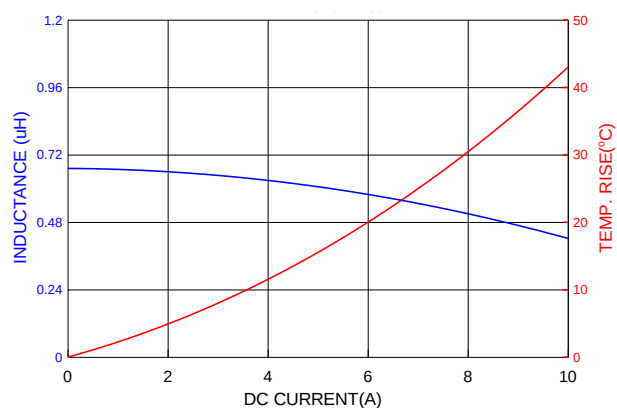


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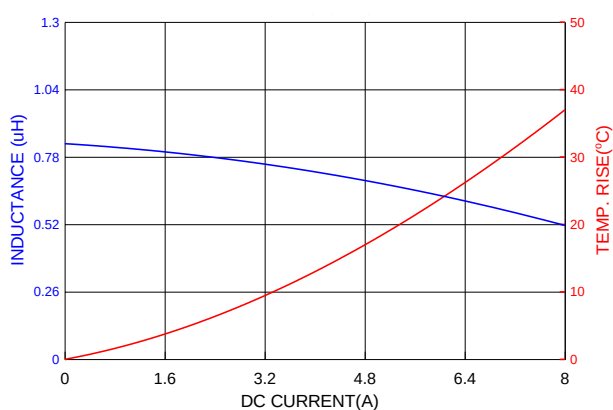
PIAQ0402SPR47MN



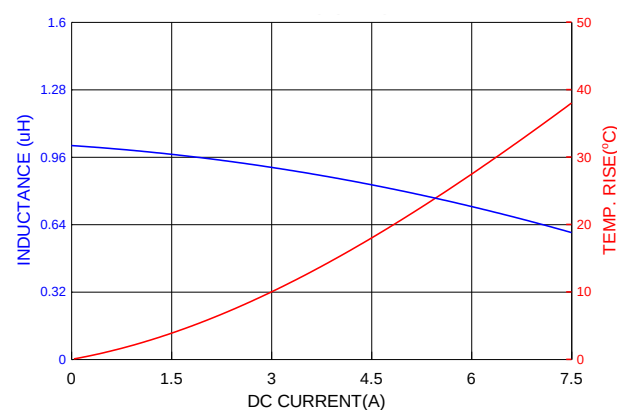
PIAQ0402SPR68MN



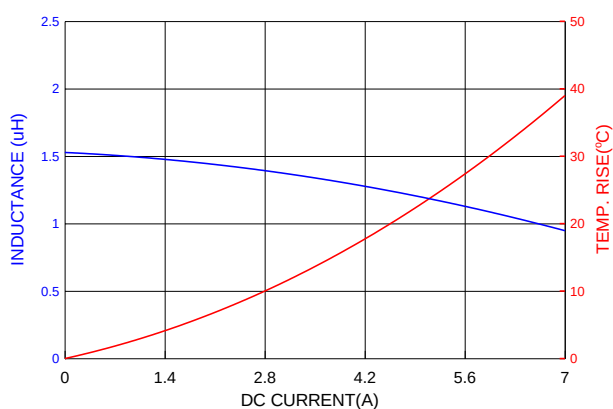
PIAQ0402SPR82MN



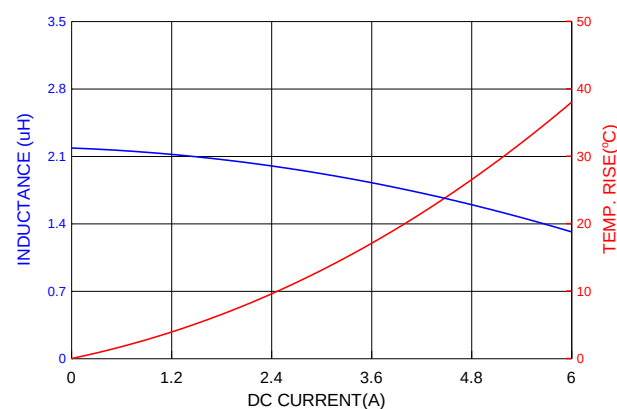
PIAQ0402SP1R0MN



PIAQ0402SP1R5MN

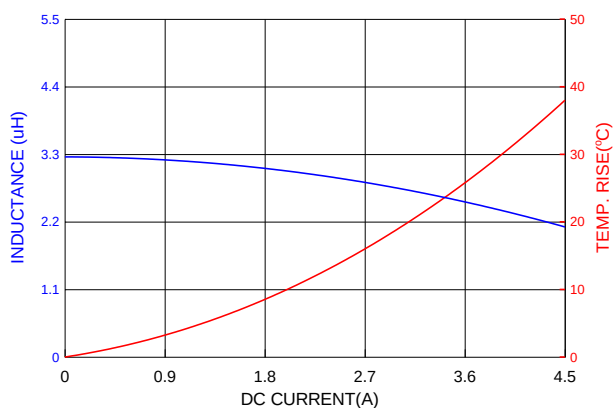


PIAQ0402SP2R2MN

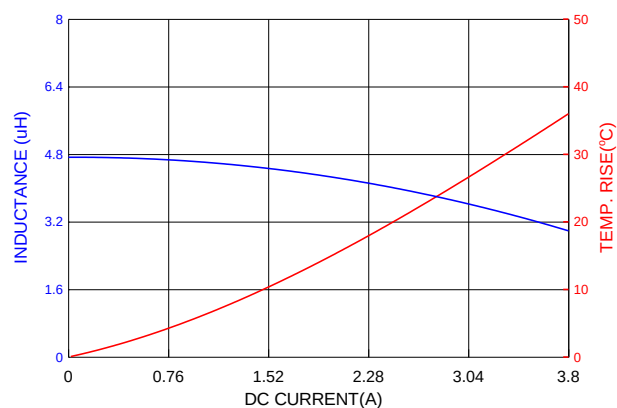


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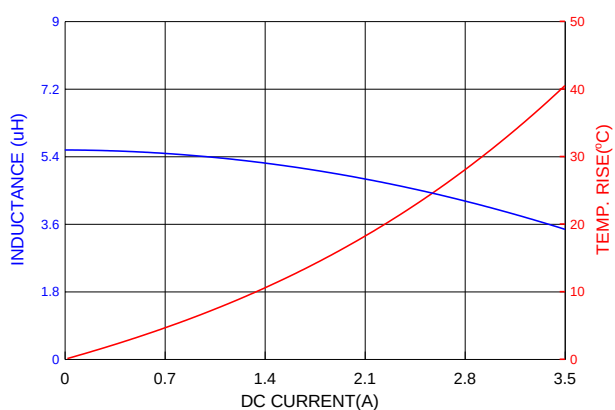
PIAQ0402SP3R3MN



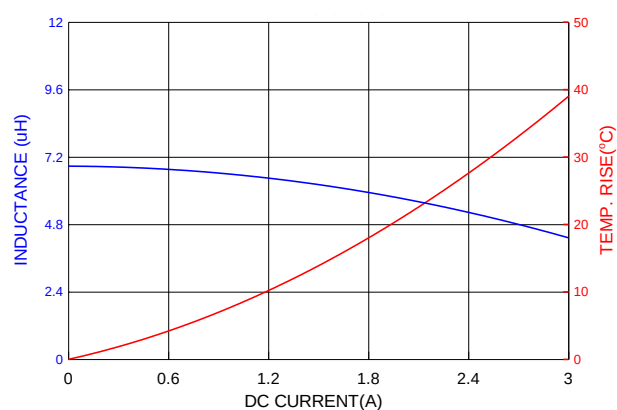
PIAQ0402SP4R7MN



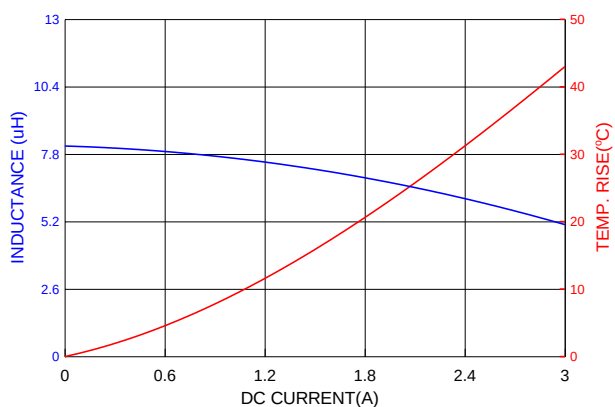
PIAQ0402SP5R6MN



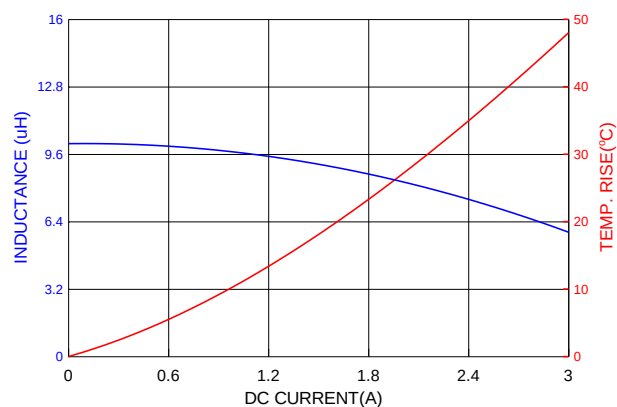
PIAQ0402SP6R8MN



PIAQ0402SP8R2MN



PIAQ0402SP100MN



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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

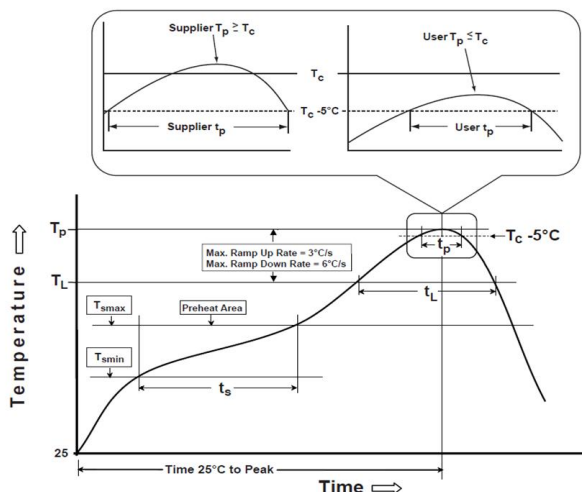
Recommended temperature profiles for lead free re-flow soldering in Figure 1, Table 1.1 & 1.2 (J-STD-020E).

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).

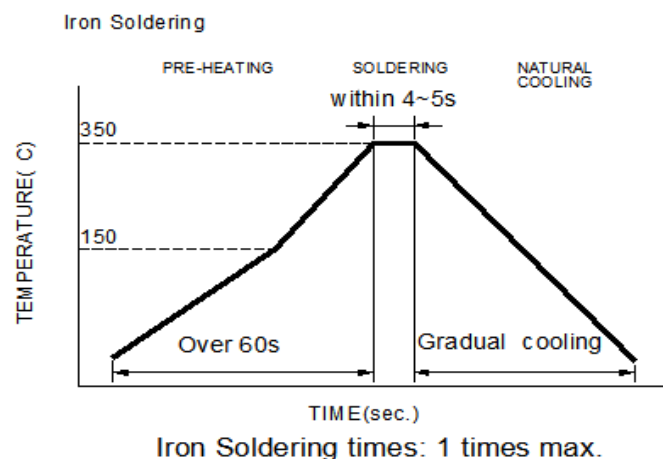
Note:

- 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_p: maximum peak package body temperature, **T_c**: the classification temperature.

For user (customer) **T_p** should be equal to or less than **T_c**.

*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)

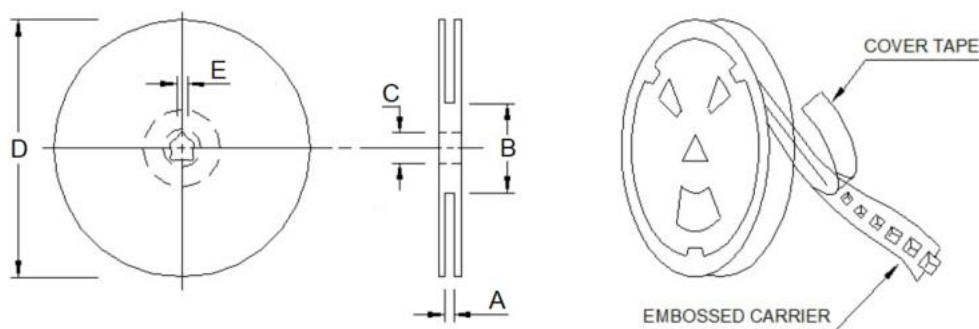
	Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

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

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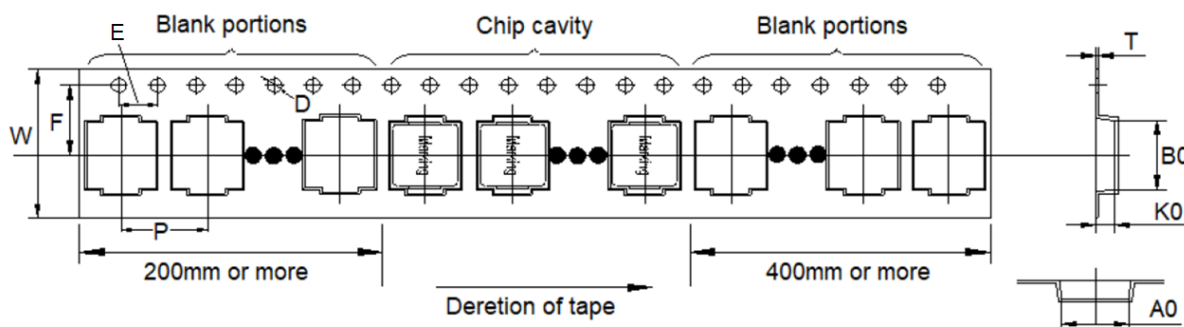
9. Packaging Information

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)



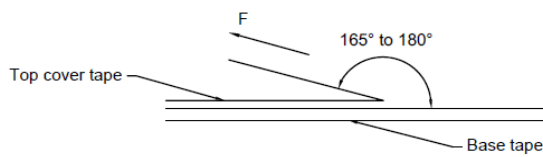
B0	A0	K0	P	W
5.00±0.10	4.40±0.10	2.30±0.10	8.00±0.10	12.00±0.30
F	T	D	E	-
5.50±0.10	0.35±0.05	1.50±0.10	4.00	-

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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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