## 1. Part No. Expression

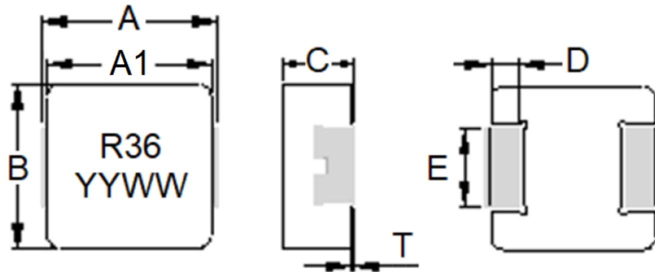
**P I A 1 0 0 5 S R 3 6 M N**

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

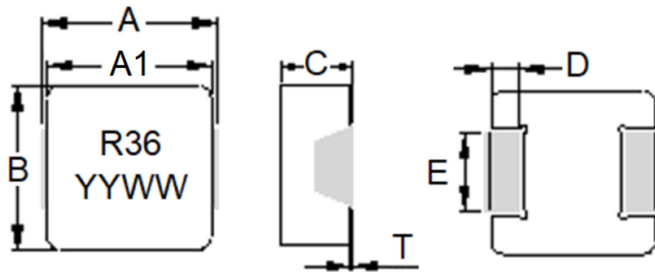
(a) Series Code
(b) Dimension Code
(c) Material Code
(d) Inductance Code
(e) Tolerance Code
(f) Special Code

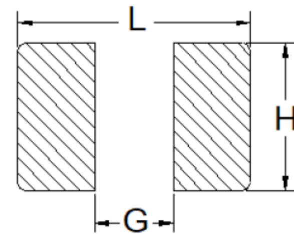
## 2. Configuration & Dimensions (Unit: mm)

**Lead Frame**




**Non Lead Frame**



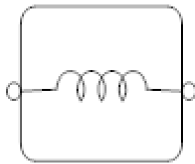

Recommended PCB Layout

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

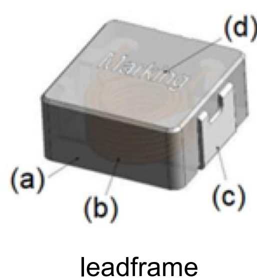
<table>
<tr><th>Inductance</th><th>A</th><th>A1</th><th>B</th><th>C</th><th>D</th><th>E</th><th>T</th><th>L</th><th>G</th><th>H</th></tr>
<tr><td>Between 0.68~1.50uH</td><td rowspan="2">11.0±0.5</td><td rowspan="2">10.0±0.5</td><td rowspan="2">10.0±0.3</td><td rowspan="2">4.8±0.2</td><td rowspan="2">2.0±0.3</td><td>2.5±0.3</td><td rowspan="2">0.0~0.2</td><td rowspan="2">12.5 Ref</td><td rowspan="2">5.4 Ref</td><td rowspan="2">3.5 Ref</td></tr>
<tr><td>0.47uH and below<br>2.20uH and above</td><td>3.0±0.3</td></tr>
</table>

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

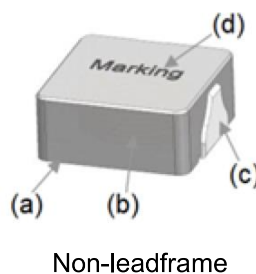
## 3. Schematic



## 4. Material List




leadframe




Non-leadframe

(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 ΔT of 40°C. (keep 1min)
(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: 75V
(i) Storage Condition (Component in its packaging)
  i) Temperature: Less than 40°C
  ii) Humidity: Less than 60% RH



Proprietary and Confidential
Document of Superworld

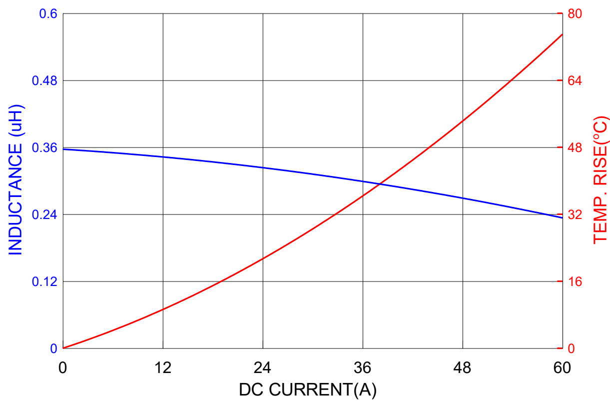
## 6. Electrical Characteristics

| Part Number | Inductance (μH) @0A ±20% | Irms (A) | | Isat (A) | | DCR (mΩ) | | Type |
|---|---|---|---|---|---|---|---|---|
| | | Typ | Max | Typ | Max | Typ | Max | |
| PIA1005SR36MN | 0.36 | 34.0 | 30.0 | 52.0 | 46.0 | 0.82 | 0.92 | Non lead frame |
| PIA1005SR47MN | 0.47 | 33.0 | 29.0 | 46.0 | 40.0 | 1.15 | 1.32 | Non lead frame |
| PIA1005SR68MN | 0.68 | 28.0 | 25.0 | 35.0 | 32.0 | 1.6 | 1.9 | Non lead frame |
| PIA1005S1R0MN | 1.00 | 25.0 | 23.0 | 33.0 | 30.0 | 2.6 | 3.0 | Non lead frame |
| PIA1005S1R5MN | 1.50 | 23.0 | 21.0 | 27.0 | 24.0 | 3.4 | 3.8 | Non lead frame |
| PIA1005S2R2MN | 2.20 | 19.5 | 17.5 | 20.0 | 18.0 | 5.1 | 5.6 | Lead frame |
| PIA1005S3R3MN | 3.30 | 17.0 | 15.0 | 17.5 | 15.5 | 8.1 | 9.1 | Lead frame |
| PIA1005S4R7MN | 4.70 | 15.0 | 13.0 | 16.0 | 14.0 | 9.3 | 10.5 | Lead frame |
| PIA1005S5R6MN | 5.60 | 13.0 | 11.0 | 15.0 | 12.5 | 12.8 | 14.4 | Lead frame |
| PIA1005S6R8MN | 6.80 | 12.0 | 10.0 | 14.0 | 12.0 | 15.0 | 17.3 | Lead frame |
| PIA1005S100MN | 10.0 | 7.6 | 7.2 | 13.0 | 11.0 | 18.9 | 21.8 | Lead frame |
| PIA1005S101MN | 100.0 | 2.2 | 2.0 | 2.8 | 2.4 | 242.0 | 290.0 | Lead frame |

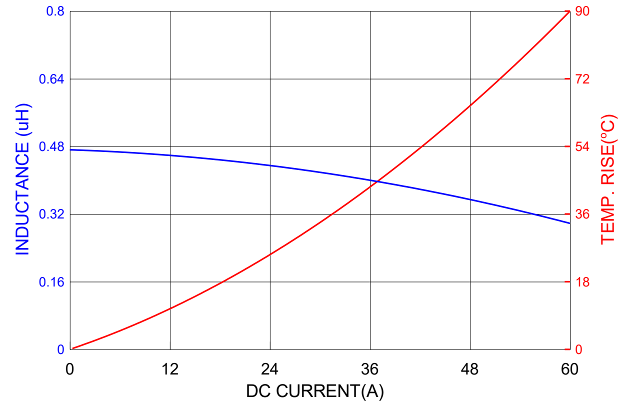
Test Frequency: 1.0V/100KHz

## 7. Characteristics Curve

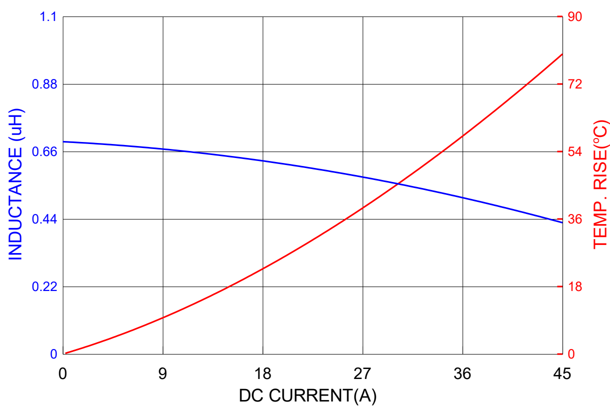
PIA1005SR36MN



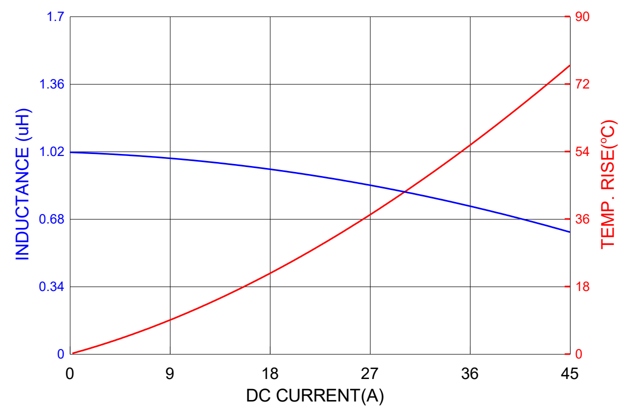

PIA1005SR47MN



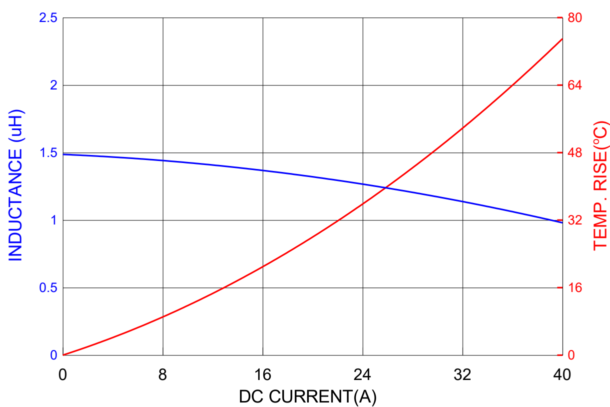

PIA1005SR68MN



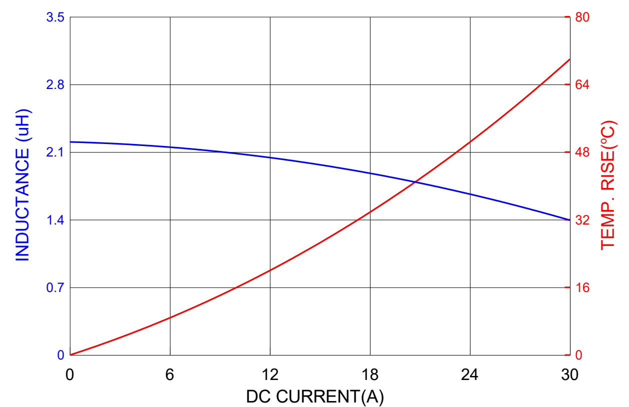

PIA1005S1R0MN



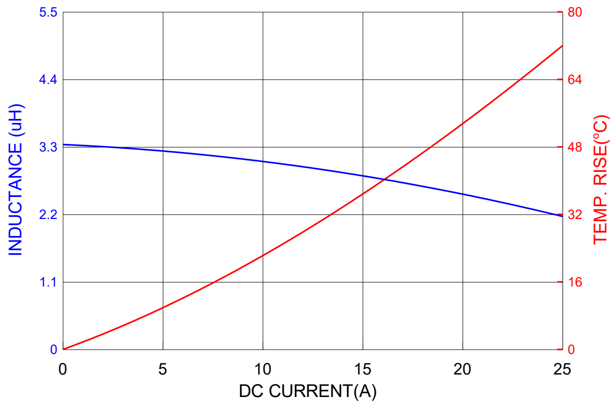

PIA1005S1R5MN

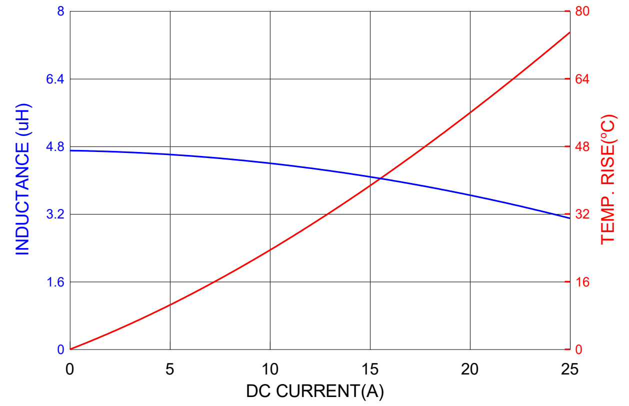


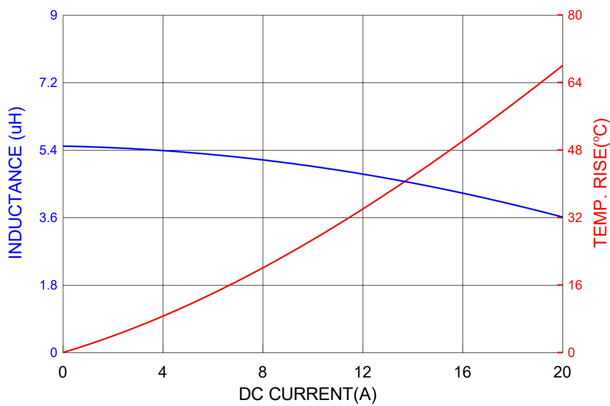

PIA1005S2R2MN

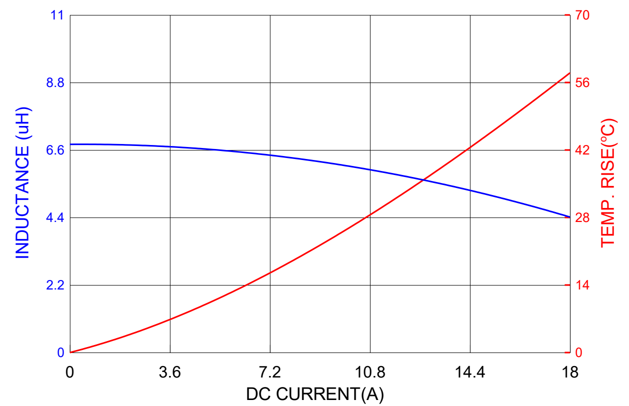


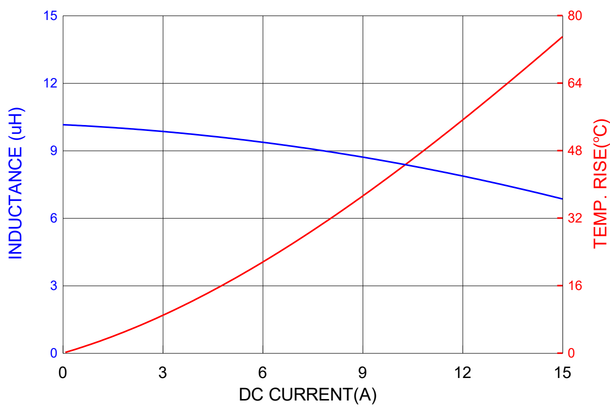

NOTE: Specifications subject to change without notice. Please check our website for latest information.

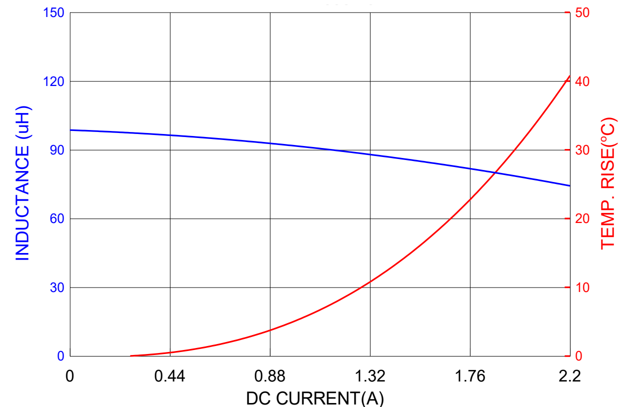




NOTE: Specifications subject to change without notice. Please check our website for latest information.

## 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.

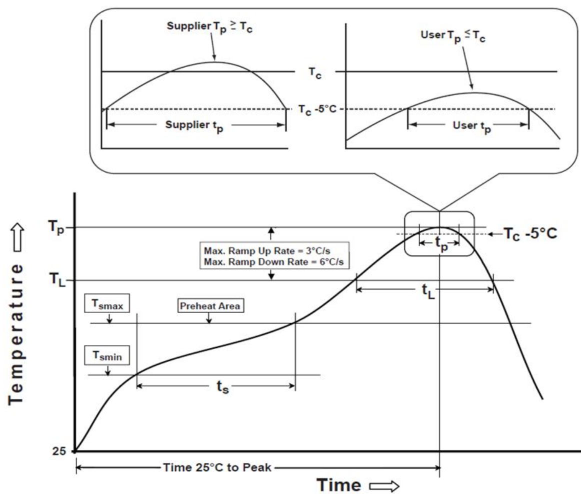
(b) 350°C tip temperature (Max.)

(c) Never contact the ceramic with the iron tip

(d) 1.0mm tip diameter (Max.)

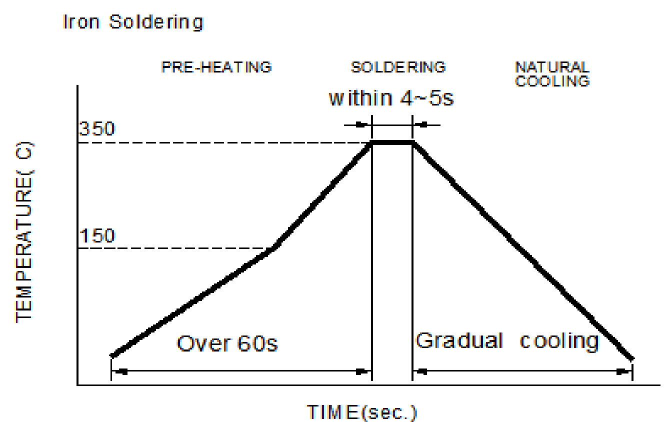
(e) Use a 20 watt soldering iron with tip diameter of 1.0mm

(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

**Table (1.1) Reflow Profiles**

| Profile Type: | Pb-Free Assembly |
|---|---|
| Preheat<br>-Temperature Min ($T_{smin}$)<br>-Temperature Max ($T_{smax}$)<br>-Time ($t_s$) from ($T_{smin}$ to $T_{smax}$) | <br>150°C<br>200°C<br>60-120seconds |
| Ramp-up rate ($T_L$to $T_p$) | 3°C /second max. |
| Liquids temperature ($T_L$)<br>Time ($t_L$) maintained above $T_L$ | 217°C<br>60-150 seconds |
| Classification temperature ($T_c$) | See Table (1.2) |
| Time ($t_p$) at Tc- 5°C (Tp should be equal to or less than Tc.) | < 30 seconds |
| Ramp-down rate ($T_p$ to $T_L$) | 6°C /second max. |
| Time 25°C to peak temperature | 8 minutes max. |

**Tp**: maximum peak package body temperature, **Tc**: the classification temperature.

For user (customer) **Tp** should be equal to or less than **Tc.**

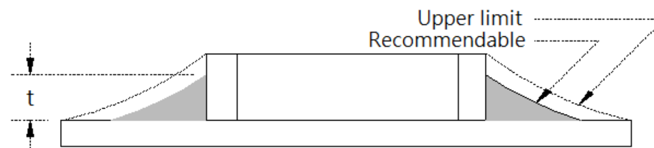
**Table (1.2) Package Thickness/Volume and Classification Temperature ($T_c$)**

| | 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-020F.

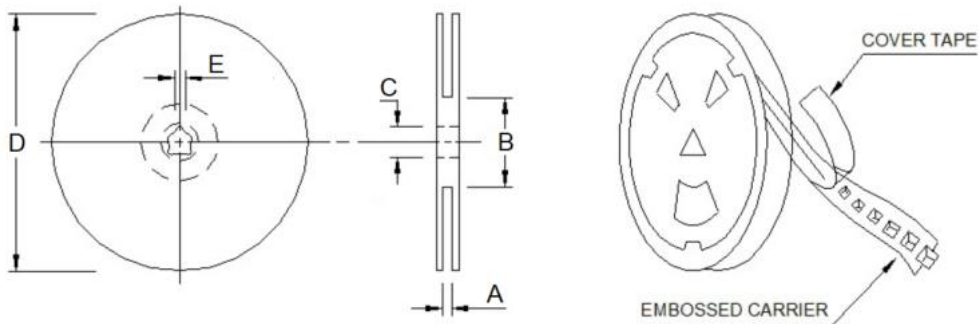
**8-3. Soldering Volume**

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.



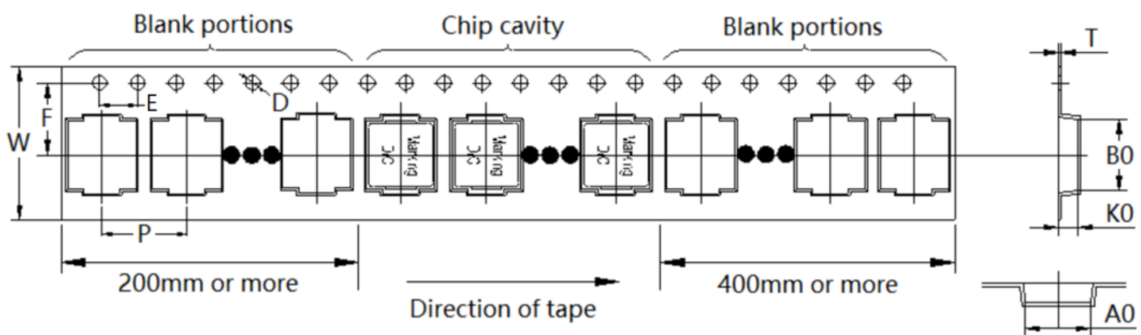
## 9. Packaging Information

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




| Type | A | B | C | D | E |
|---|---|---|---|---|---|
| 13”x24mm | 24.4 Ref | 100.0 Ref | 13.0 Ref | 330.0 Ref | 2.0 Ref |

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

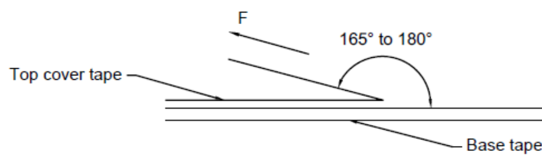



| B0 | A0 | K0 | P | W |
|---|---|---|---|---|
| 11.60±0.10 | 10.40±0.10 | 5.30±0.10 | 16.00±0.10 | 24.00±0.30 |
| F | T | D | E | - |
| 11.50±0.10 | 0.35±0.10 | 1.50±0.10 | 4.00 Ref | - |

### 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) Products meet IPC/JEDEC J-STD-020F standard-MSL, level 1.

   (b) Recommended products should be used within 12 months from the time of delivery.

   (c) 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.