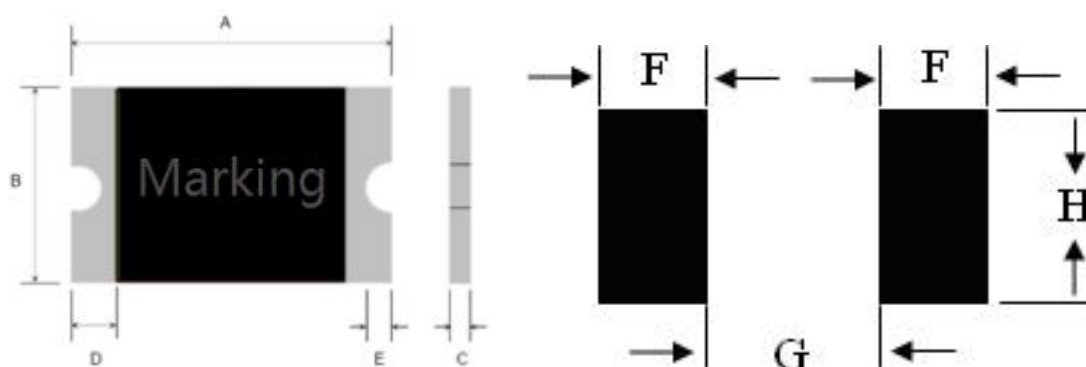


## PPTC SMD1210L Series Surface-mount Devices

### Features:

- RoHS Compliant & Halogen Free
- Faster tripping, 1210 Dimension, Surface mountable, Solid state
- Maximum Voltage: 6V/12Vdc
- Operating Current: 1.5A~7.5A,
- Operating Temperature: -40℃~ 85℃

### Product Dimensions



Unit : mm

| Model            | Dimensions (mm) |        |        |        |        |        |        |        |
|------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|
|                  | A(min)          | A(max) | B(min) | B(max) | C(min) | C(max) | D(min) | E(min) |
| SMD1210L-150-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.3    | 0.7    | 0.25   | 0.1    |
| SMD1210L-150-12V | 3.0             | 3.43   | 2.35   | 2.8    | 0.3    | 0.7    | 0.25   | 0.1    |
| SMD1210L-175-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.3    | 0.7    | 0.25   | 0.1    |
| SMD1210L-175-12V | 3.0             | 3.43   | 2.35   | 2.8    | 0.3    | 0.7    | 0.25   | 0.1    |
| SMD1210L-190-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.3    | 0.7    | 0.25   | 0.1    |
| SMD1210L-190-12  | 3.0             | 3.43   | 2.35   | 2.8    | 0.3    | 0.7    | 0.25   | 0.1    |
| SMD1210L-200-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.3    | 0.7    | 0.25   | 0.1    |
| SMD1210L-200L-12 | 3.0             | 3.43   | 2.35   | 2.8    | 0.3    | 0.7    | 0.25   | 0.1    |
| SMD1210L-260-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.4    | 1.0    | 0.25   | 0.1    |
| SMD1210L-260-12  | 3.0             | 3.43   | 2.35   | 2.8    | 0.4    | 1.0    | 0.25   | 0.1    |
| SMD1210L-300-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.4    | 1.0    | 0.25   | 0.1    |
| SMD1210L-300-12  | 3.0             | 3.43   | 2.35   | 2.8    | 0.4    | 1.0    | 0.25   | 0.1    |
| SMD1210L-350-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.4    | 1.2    | 0.25   | 0.1    |
| SMD1210L-350-12  | 3.0             | 3.43   | 2.35   | 2.8    | 0.4    | 1.2    | 0.25   | 0.1    |
| SMD1210L-380-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.4    | 1.2    | 0.25   | 0.1    |
| SMD1210L-380-12  | 3.0             | 3.43   | 2.35   | 2.8    | 0.4    | 1.2    | 0.25   | 0.1    |
| SMD1210L-400-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.5    | 1.2    | 0.25   | 0.1    |
| SMD1210L-400-12  | 3.0             | 3.43   | 2.35   | 2.8    | 0.5    | 1.2    | 0.25   | 0.1    |
| SMD1210L-450-6V  | 3.0             | 3.43   | 2.35   | 2.8    | 0.5    | 1.4    | 0.25   | 0.1    |
| SMD1210L-450-12  | 3.0             | 3.43   | 2.35   | 2.8    | 0.5    | 1.4    | 0.25   | 0.1    |

|                 |     |      |      |     |     |     |      |     |
|-----------------|-----|------|------|-----|-----|-----|------|-----|
| SMD1210L-500-6V | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.4 | 0.25 | 0.1 |
| SMD1210L-500-12 | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.4 | 0.25 | 0.1 |
| SMD1210L-550-6V | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.4 | 0.25 | 0.1 |
| SMD1210L-550-12 | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.4 | 0.25 | 0.1 |
| SMD1210L-600-6V | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.6 | 0.25 | 0.1 |
| SMD1210L-600-12 | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.6 | 0.25 | 0.1 |
| SMD1210L-650-6V | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.6 | 0.25 | 0.1 |
| SMD1210L-650-12 | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.6 | 0.25 | 0.1 |
| SMD1210L-700-6V | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.6 | 0.25 | 0.1 |
| SMD1210L-700-12 | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.6 | 0.25 | 0.1 |
| SMD1210L-750-6V | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.6 | 0.25 | 0.1 |
| SMD1210L-750-12 | 3.0 | 3.43 | 2.35 | 2.8 | 0.5 | 1.6 | 0.25 | 0.1 |

**Recommended Solder Pad Layout Dimensions (mm)**

| Device       | F            | G            | H            |
|--------------|--------------|--------------|--------------|
|              | Normal Value | Normal Value | Normal Value |
| 1210L Series | 1            | 2            | 2.5          |

**Thermal Derating Chart-IH (A)**

| Model            | Maximum ambient operating temperatures (℃) |      |      |      |      |      |      |      |      |
|------------------|--------------------------------------------|------|------|------|------|------|------|------|------|
|                  | -40                                        | -20  | 0    | 25   | 40   | 50   | 60   | 70   | 85   |
| SMD1210L-150-6V  | 2.25                                       | 2.00 | 1.75 | 1.50 | 1.33 | 1.15 | 1.05 | 0.93 | 0.70 |
| SMD1210L-150-12V | 2.25                                       | 2.00 | 1.75 | 1.50 | 1.33 | 1.15 | 1.05 | 0.93 | 0.70 |
| SMD1210L-175-6V  | 2.55                                       | 2.33 | 2.02 | 1.75 | 1.53 | 1.35 | 1.23 | 1.07 | 0.85 |
| SMD1210L-175-12V | 2.55                                       | 2.33 | 2.02 | 1.75 | 1.53 | 1.35 | 1.23 | 1.07 | 0.85 |
| SMD1210L-190-6V  | 2.81                                       | 2.53 | 2.20 | 1.90 | 1.67 | 1.47 | 1.34 | 1.17 | 0.91 |
| SMD1210L-190-12  | 2.81                                       | 2.53 | 2.20 | 1.90 | 1.67 | 1.47 | 1.34 | 1.17 | 0.91 |
| SMD1210L-200-6V  | 2.96                                       | 2.67 | 2.32 | 2.00 | 1.76 | 1.55 | 1.41 | 1.23 | 0.96 |
| SMD1210L-200L-12 | 2.96                                       | 2.67 | 2.32 | 2.00 | 1.76 | 1.55 | 1.41 | 1.23 | 0.96 |
| SMD1210L-260-6V  | 3.85                                       | 3.47 | 3.02 | 2.60 | 2.29 | 2.01 | 1.84 | 1.59 | 1.25 |
| SMD1210L-260-12  | 3.85                                       | 3.47 | 3.02 | 2.60 | 2.29 | 2.01 | 1.84 | 1.59 | 1.25 |
| SMD1210L-300-6V  | 4.40                                       | 3.98 | 3.45 | 3.00 | 2.64 | 2.30 | 2.15 | 1.83 | 1.42 |
| SMD1210L-300-12  | 4.40                                       | 3.98 | 3.45 | 3.00 | 2.64 | 2.30 | 2.15 | 1.83 | 1.42 |
| SMD1210L-350-6V  | 5.18                                       | 4.67 | 4.06 | 3.50 | 3.08 | 2.71 | 2.47 | 2.15 | 1.68 |
| SMD1210L-350-12  | 5.18                                       | 4.67 | 4.06 | 3.50 | 3.08 | 2.71 | 2.47 | 2.15 | 1.68 |
| SMD1210L-380-6V  | 5.55                                       | 5.02 | 4.35 | 3.80 | 3.32 | 2.92 | 2.65 | 2.30 | 1.81 |
| SMD1210L-380-12  | 5.55                                       | 5.02 | 4.35 | 3.80 | 3.32 | 2.92 | 2.65 | 2.30 | 1.81 |
| SMD1210L-400-6V  | 5.92                                       | 5.33 | 4.64 | 4.00 | 3.52 | 3.09 | 2.83 | 2.45 | 1.92 |
| SMD1210L-400-12  | 5.92                                       | 5.33 | 4.64 | 4.00 | 3.52 | 3.09 | 2.83 | 2.45 | 1.92 |
| SMD1210L-450-6V  | 6.12                                       | 5.39 | 5.16 | 4.50 | 3.85 | 3.35 | 3.00 | 2.36 | 1.56 |

|                 |      |      |      |      |      |      |      |      |      |
|-----------------|------|------|------|------|------|------|------|------|------|
| SMD1210L-450-12 | 6.12 | 5.39 | 5.16 | 4.50 | 3.85 | 3.35 | 3.00 | 2.36 | 1.56 |
| SMD1210L-500-6V | 7.40 | 6.67 | 5.80 | 5.00 | 4.40 | 3.87 | 3.53 | 3.07 | 2.40 |
| SMD1210L-500-12 | 7.40 | 6.67 | 5.80 | 5.00 | 4.40 | 3.87 | 3.53 | 3.07 | 2.40 |
| SMD1210L-550-6V | 8.14 | 7.34 | 6.38 | 5.50 | 4.84 | 4.26 | 3.88 | 3.38 | 2.64 |
| SMD1210L-550-12 | 8.14 | 7.34 | 6.38 | 5.50 | 4.84 | 4.26 | 3.88 | 3.38 | 2.64 |
| SMD1210L-600-6V | 8.65 | 7.91 | 6.93 | 6.00 | 5.23 | 4.45 | 4.00 | 3.63 | 2.85 |
| SMD1210L-600-12 | 8.65 | 7.91 | 6.93 | 6.00 | 5.23 | 4.45 | 4.00 | 3.63 | 2.85 |
| SMD1210L-650-6V | 9.20 | 8.45 | 7.45 | 6.50 | 5.60 | 4.65 | 4.30 | 3.89 | 3.00 |
| SMD1210L-650-12 | 9.20 | 8.45 | 7.45 | 6.50 | 5.60 | 4.65 | 4.30 | 3.89 | 3.00 |
| SMD1210L-700-6V | 9.84 | 9.00 | 7.95 | 7.00 | 5.96 | 4.95 | 4.50 | 4.16 | 3.20 |
| SMD1210L-700-12 | 9.84 | 9.00 | 7.95 | 7.00 | 5.96 | 4.95 | 4.50 | 4.16 | 3.20 |
| SMD1210L-750-6V | 10.5 | 9.65 | 8.50 | 7.50 | 6.40 | 5.30 | 4.80 | 4.45 | 4.42 |
| SMD1210L-750-12 | 10.5 | 9.65 | 8.50 | 7.50 | 6.40 | 5.30 | 4.80 | 4.45 | 4.42 |

## Electrical Characteristic

| Model            | V <sub>max</sub> | I <sub>max</sub> | I <sub>hold</sub> | I <sub>trip</sub> | Pd <sub>Max</sub> | Maximum Time to Trip |          | Resistance (Ω) |       |
|------------------|------------------|------------------|-------------------|-------------------|-------------------|----------------------|----------|----------------|-------|
|                  | (Vdc)            | (A)              | (A)               | (A)               | (W)               | Current (A)          | Time (S) | Rmin           | Rmax  |
| SMD1210L-150-6V  | 6.0              | 50.0             | 1.5               | 3.0               | 0.8               | 8.0                  | 2.0      | 0.010          | 0.060 |
| SMD1210L-150-12V | 12.0             | 50.0             | 1.5               | 3.0               | 0.8               | 8.0                  | 2.0      | 0.010          | 0.060 |
| SMD1210L-175-6V  | 6.0              | 50.0             | 1.75              | 3.5               | 0.8               | 8.0                  | 2.0      | 0.005          | 0.040 |
| SMD1210L-175-12V | 12.0             | 50.0             | 1.75              | 3.5               | 0.8               | 8.0                  | 2.0      | 0.005          | 0.040 |
| SMD1210L-190-6V  | 6.0              | 50.0             | 1.9               | 3.8               | 0.8               | 8.0                  | 3.0      | 0.006          | 0.037 |
| SMD1210L-190-12  | 12.0             | 50.0             | 1.9               | 3.8               | 0.8               | 8.0                  | 3.0      | 0.006          | 0.037 |
| SMD1210L-200-6V  | 6.0              | 50.0             | 2.0               | 4.0               | 0.8               | 8.0                  | 3.0      | 0.006          | 0.035 |
| SMD1210L-200L-12 | 12.0             | 50.0             | 2.0               | 4.0               | 0.8               | 8.0                  | 3.0      | 0.006          | 0.035 |
| SMD1210L-260-6V  | 6.0              | 50.0             | 2.6               | 5.2               | 0.8               | 13.0                 | 2.0      | 0.003          | 0.025 |
| SMD1210L-260-12  | 12.0             | 50.0             | 2.6               | 5.2               | 0.8               | 13.0                 | 2.0      | 0.003          | 0.025 |
| SMD1210L-300-6V  | 6.0              | 50.0             | 3.0               | 6.0               | 0.8               | 15.0                 | 2.0      | 0.003          | 0.02  |
| SMD1210L-300-12  | 12.0             | 50.0             | 3.0               | 6.0               | 0.8               | 15.0                 | 2.0      | 0.003          | 0.02  |
| SMD1210L-350-6V  | 6.0              | 50.0             | 3.5               | 7.0               | 0.8               | 17.5                 | 2.0      | 0.002          | 0.018 |
| SMD1210L-350-12  | 12.0             | 50.0             | 3.5               | 7.0               | 0.8               | 17.5                 | 2.0      | 0.002          | 0.018 |
| SMD1210L-380-6V  | 6.0              | 50.0             | 3.8               | 7.6               | 0.8               | 19.0                 | 2.0      | 0.002          | 0.016 |
| SMD1210L-380-12  | 12.0             | 50.0             | 3.8               | 7.6               | 0.8               | 19.0                 | 2.0      | 0.002          | 0.016 |
| SMD1210L-400-6V  | 6.0              | 50.0             | 4.0               | 8.0               | 0.8               | 20.0                 | 2.0      | 0.002          | 0.014 |
| SMD1210L-400-12  | 12.0             | 50.0             | 4.0               | 8.0               | 0.8               | 20.0                 | 2.0      | 0.002          | 0.014 |
| SMD1210L-450-6V  | 6.0              | 50.0             | 4.5               | 9.0               | 1.0               | 22.5                 | 2.0      | 0.001          | 0.013 |
| SMD1210L-450-12  | 12.0             | 50.0             | 4.5               | 9.0               | 1.0               | 22.5                 | 2.0      | 0.001          | 0.013 |
| SMD1210L-500-6V  | 6.0              | 50.0             | 5.0               | 10.0              | 1.0               | 25.0                 | 2.0      | 0.001          | 0.012 |
| SMD1210L-500-12  | 12.0             | 50.0             | 5.0               | 10.0              | 1.0               | 25.0                 | 2.0      | 0.001          | 0.012 |
| SMD1210L-550-6V  | 6.0              | 50.0             | 5.5               | 11.0              | 1.0               | 27.5                 | 2.0      | 0.001          | 0.011 |
| SMD1210L-550-12  | 12.0             | 50.0             | 5.5               | 11.0              | 1.0               | 27.5                 | 2.0      | 0.001          | 0.011 |
| SMD1210L-600-6V  | 6.0              | 50.0             | 6.0               | 12.0              | 1.2               | 30.0                 | 2.0      | 0.001          | 0.010 |

|                 |      |      |     |      |     |      |     |       |       |
|-----------------|------|------|-----|------|-----|------|-----|-------|-------|
| SMD1210L-600-12 | 12.0 | 50.0 | 6.0 | 12.0 | 1.2 | 30.0 | 2.0 | 0.001 | 0.010 |
| SMD1210L-650-6V | 6.0  | 50.0 | 6.5 | 13.0 | 1.2 | 32.5 | 2.0 | 0.001 | 0.009 |
| SMD1210L-650-12 | 12.0 | 50.0 | 6.5 | 13.0 | 1.2 | 32.5 | 2.0 | 0.001 | 0.009 |
| SMD1210L-700-6V | 6.0  | 50.0 | 7.0 | 14.0 | 1.2 | 35.0 | 2.0 | 0.001 | 0.008 |
| SMD1210L-700-12 | 12.0 | 50.0 | 7.0 | 14.0 | 1.2 | 35.0 | 2.0 | 0.001 | 0.008 |
| SMD1210L-750-6V | 6.0  | 50.0 | 7.5 | 15.0 | 1.2 | 37.5 | 2.0 | 0.001 | 0.007 |
| SMD1210L-750-12 | 12.0 | 50.0 | 7.5 | 15.0 | 1.2 | 37.5 | 2.0 | 0.001 | 0.007 |

## Test Procedures And Requirements

| Test            | Test Conditions                     | Accept/Reject Criteria               |
|-----------------|-------------------------------------|--------------------------------------|
| Resistance      | In still air at 25°C                | $R_{min} \leq R \leq R_{max}$        |
| Time to Trip    | Specified current, $V_{max}$ , 25°C | $T \leq \text{Maximum Time to Trip}$ |
| Hold Current    | 30min, at $I_H$ , 25°C              | No trip                              |
| Trip Cycle Life | $V_{max}$ , $I_{max}$ , 100 cycles  | No arcing or burning                 |
| Trip Endurance  | $V_{max}$ , 1 hour                  | No arcing or burning                 |

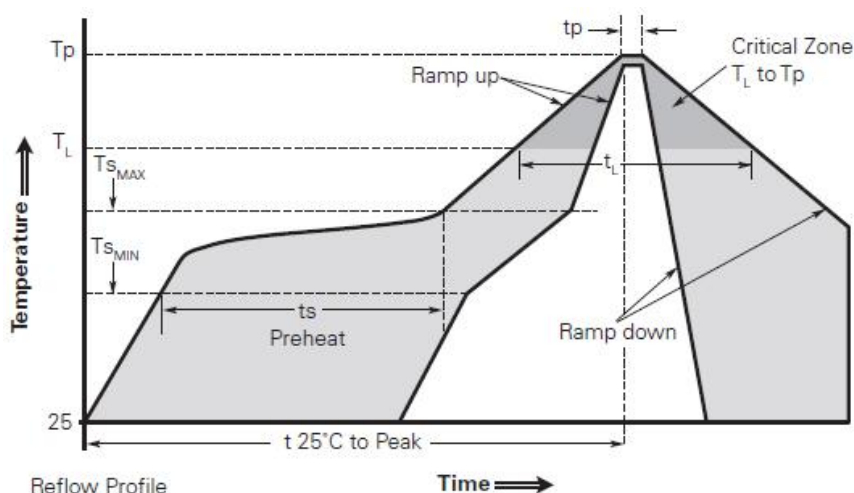
## Physical Characteristics

|                    |                                                                  |
|--------------------|------------------------------------------------------------------|
| Terminal Materials | Tin-Plated Nickle-copper                                         |
| Soldering Zone     | Meets EIA specification RS 186-9E and ANSI/J-STD-002 Category 3. |

## Physical Characteristics and Environmental Specifications

| Test                  | Conditions                                   | Resistance change              |
|-----------------------|----------------------------------------------|--------------------------------|
| Passive aging         | 85°C, 1000hours                              | ±10%                           |
| Humidity aging        | 85°C/85%RH. 1000 hours                       | ±5%                            |
| Thermal shock         | MIL-STD-202, Method 107G+85°C/-40°C, 20times | -30% typical resistance change |
| Resistance to solvent | MIL-STD-202, Method 215                      | no change                      |
| Vibration             | ML-STD-883C, Test Condition A                | No chage                       |

## Solder Reflow Conditions



### Profile Feature

- Average ramp up rate( $T_{S_{MAX}}$  to  $T_P$ )

### Preheat

- Temperature min ( $T_{S_{MIN}}$ )
- Temperature max ( $T_{S_{MAX}}$ )
- Time( $T_{S_{MIN}}$  to  $T_{S_{MAX}}$ )

### Time maintained above:

- Temperature( $T_L$ )
- Time( $T_L$ )
- Peak/Classification temperature( $T_P$ )

### Time within $5^{\circ}\text{C}$ of actual peak temperature

- Time( $T_P$ )
- Ramp down rate
- Time  $25^{\circ}\text{C}$  to peak temperature

Note: All temperatures refer topside of the package.measured on The package body surface

Notes: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements

### Pb-Free Assembly

$3^{\circ}\text{C}/\text{Second}$  max

$150^{\circ}\text{C}$

$200^{\circ}\text{C}$

60-120 Seconds

$217^{\circ}\text{C}$

60-150 Seconds

$260^{\circ}\text{C}$

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free.

- Devices are not designed to be wave soldered to the bottom side of the board.

- Recommended maximum paste thickness is 0.25mm (0.010inch).

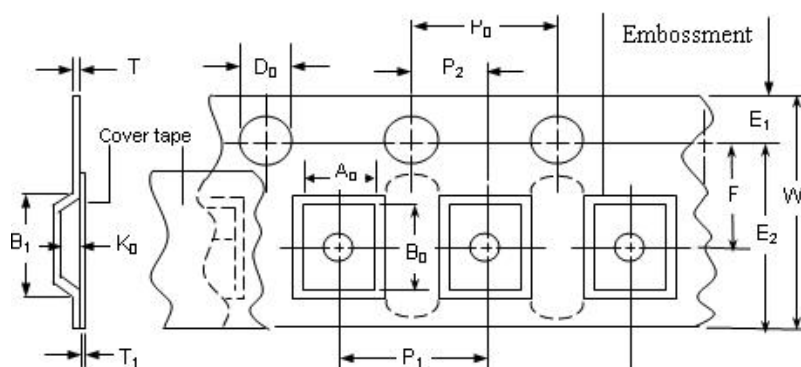
- Devices can be cleaned using standard industry methods and solvents.

- Soldering temprature profile meets RoHs leadfree process.

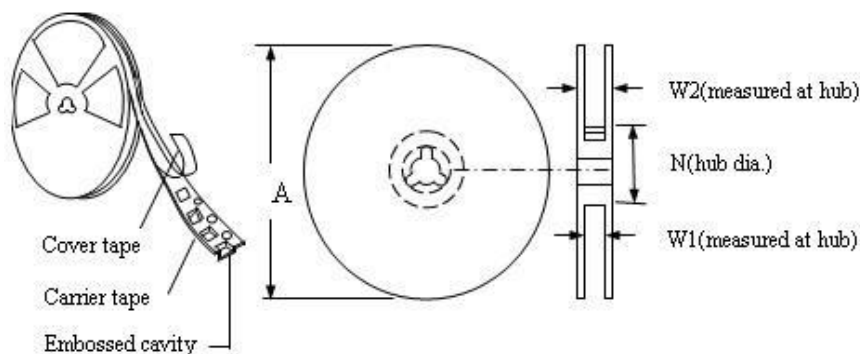
## Tape Specifications and Reel Dimensions

| Covering Specifications EIA 481-1 |                      |
|-----------------------------------|----------------------|
| W                                 | $8.0 \pm 0.3$        |
| P0                                | $4.0 \pm 0.10$       |
| P1                                | $4.0 \pm 0.10$       |
| P2                                | $2.0 \pm 0.05$       |
| A0                                | $2.82 \pm 0.10$      |
| B0                                | $3.46 \pm 0.10$      |
| D0                                | $1.55 \pm 0.05$      |
| F                                 | $3.50 \pm 0.05$      |
| E1                                | $1.75 \pm 0.10$      |
| T                                 | $0.25 \pm 0.10$      |
| Leader min.                       | 390                  |
| Trailer min.                      | 160                  |
| Reel Dimensions                   |                      |
| A                                 | $178 \pm 1.0$        |
| N                                 | $59 \pm 1$           |
| W1                                | $8.5 \pm 1.0 / -0.2$ |
| W2                                | $12.0 \pm 1$         |

### EIA Tape Component Dimentions



### EIA Reel Dimentions



## Electrical Specifications:

$I_H$ =Hold current:maximum current at which the device will not trip at 25°C still air.

$I_T$ =Trip current:minimum current at which the device will trip at 25°C still air.

$V_{max}$ =Maximum voltage device can withstand without damage at rated current.

$I_{max}$ =Maximum fault current device can withstand without damage at rated voltage.

$T_{trip}$ =Maximum time to trip(s) at assigned current.

$P_d$ =Typical power dissipation:typical amount of power dissipated by the device when in state air environment.

$R_{min}$ =Minimum device resistance at 25°C prior to tripping.

$R_{max}$ =Maximum device resistance at 25°C prior to tripping.

## Warning:

PPTC devices are intended for protection against occasional over-current or over-temperature fault conditions,and should not be used when repeated fault conditions are anticipated.Operation beyond maximum ratings of improper use may result in device damage and possible electrical arcing and flame.

## Notes:

The specification is intended to present application,product and technical data to assist the user in selecting PPTC circuit protection devices,However,users should independently evaluate and test the suitability of each product.YINT makes no warranties as to the accuracy or completeness of the information and disclaims any liability resulting from its use,YINT's only obligations are those in the YINT Standard Terms and Conditions of Sale and in no case will YINT be liable for any incidental,indirect,or consequential damages arising from the sale,resale,or misuse of its products.YINT reserves the right to change or update,without notice,any information contained in this specification.