

Positive Temperature Coefficient (PTC) Datasheet

Features

- I Hold: 0.3~7.0A
- Fast responding to fault current
- Size 2920 / 7.5\*5.5mm
- Low resistance
- Low profile
- RoHS compliant & Lead-Free & Halogen Free

I Hold
0.3A to 7.0A

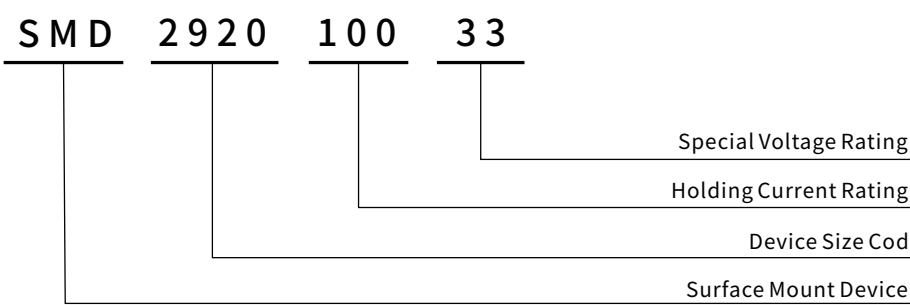
Applications

- USB hubs, ports and peripherals
- Computer, Mobile phones, Multimedia
- General electronics
- Disk drives
- Game machines, Portable electronics, Battery
- Plug and play protection for motherboards and peripherals

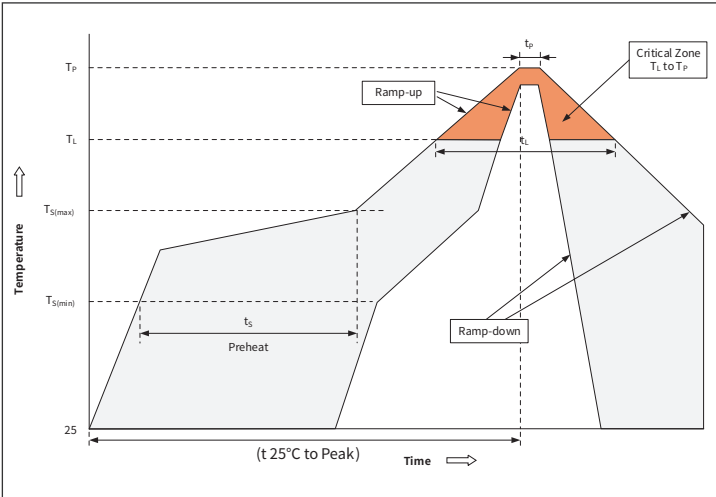
SMD2920



Part Number Code



Recommended Soldering Conditions



| Profile Feature                                    |                            | Pb-Free Assembly |
|----------------------------------------------------|----------------------------|------------------|
| Pre-heat                                           | Temperature Min (Ts(min))  | +150°C           |
|                                                    | Temperature Max(Ts(max))   | +200°C           |
|                                                    | Time (Min to Max) (ts)     | 60-180 secs.     |
| Average ramp up rate (Liquid us Temp (Tl) to peak) |                            | 3°C /sec. Max    |
| Ts(max) to Tl - Ramp-up Rate                       |                            | 3°C /sec. Max    |
| Reflow                                             | Temperature(Tl)(Liquid us) | +217°C           |
|                                                    | Temperature(tL)            | 60-150 secs.     |
| Peak Temp (Tp)                                     |                            | +260(+0/-5)°C    |
| Time within 5°C of actual Peak Temp (tp)           |                            | 20-40secs        |
| Ramp-down Rate                                     |                            | 6°C /sec. Max    |
| Time 25°C to Peak Temp (Tp)                        |                            | 8 min. Max       |
| Do not exceed                                      |                            | +260°C           |

Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free.
Recommended maximum paste thickness is 0.25mm.
Devices can be cleaned using standard industry methods and solvents.
Note 1: All temperature refer to topside of the package, measured on the package body surface.
Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

# SMD2920 SERIES

Surface Mount PTC Device

## ● Electrical Characteristics (Ta=25°C Unless otherwise specified)

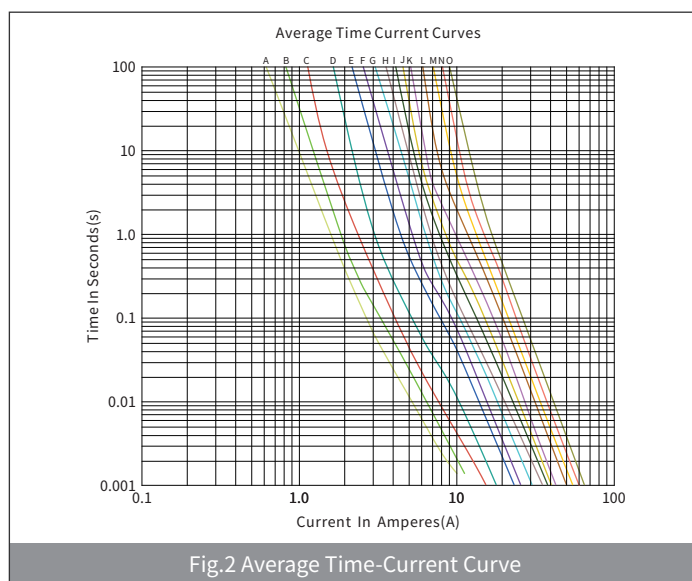
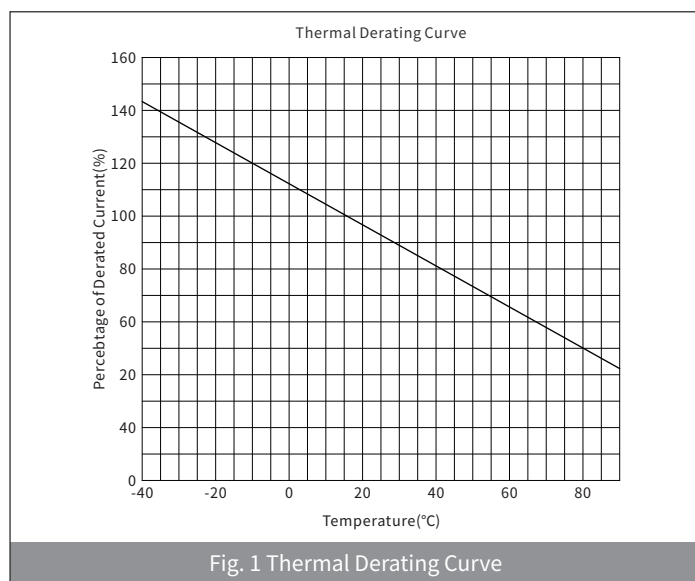
| Part Number    | Marking | Ihold | Itrip | Vmax | Imax | Pdtyp | Max. Time-to-trip |     | Ri min | R1 max |
|----------------|---------|-------|-------|------|------|-------|-------------------|-----|--------|--------|
|                |         | (A)   | (A)   | (V)  | (A)  | (W)   | (A)               | (S) | (Ω)    | (Ω)    |
| SMD2920-030-60 | 03      | 0.30  | 0.60  | 60   | 40   | 1.5   | 1.50              | 3.0 | 0.600  | 4.800  |
| SMD2920-050-60 | 05      | 0.50  | 1.00  | 60   | 40   | 1.5   | 2.50              | 4.0 | 0.180  | 1.400  |
| SMD2920-075-33 | 07      | 0.75  | 1.50  | 33   | 40   | 1.5   | 8.00              | 0.3 | 0.100  | 1.000  |
| SMD2920-075-60 | 07      | 0.75  | 1.50  | 60   | 40   | 1.5   | 8.00              | 0.3 | 0.100  | 1.000  |
| SMD2920-100-33 | 10      | 1.10  | 2.20  | 33   | 40   | 1.5   | 8.00              | 0.5 | 0.065  | 0.410  |
| SMD2920-100-60 | 10      | 1.10  | 2.20  | 60   | 40   | 1.5   | 8.00              | 0.5 | 0.065  | 0.410  |
| SMD2920-125-33 | 12      | 1.25  | 2.50  | 33   | 40   | 1.5   | 8.00              | 2.0 | 0.050  | 0.250  |
| SMD2920-150-33 | 15      | 1.50  | 3.00  | 33   | 40   | 1.5   | 8.00              | 2.0 | 0.035  | 0.230  |
| SMD2920-185-33 | 18      | 1.85  | 3.70  | 33   | 40   | 1.5   | 8.00              | 2.5 | 0.030  | 0.150  |
| SMD2920-200-16 | 20      | 2.00  | 4.00  | 16   | 40   | 1.8   | 8.00              | 4.5 | 0.020  | 0.120  |
| SMD2920-200-24 | 20      | 2.00  | 4.00  | 24   | 40   | 1.8   | 8.00              | 4.5 | 0.020  | 0.120  |
| SMD2920-200-33 | 20      | 2.00  | 4.00  | 33   | 40   | 1.8   | 8.00              | 4.5 | 0.020  | 0.120  |
| SMD2920-250-16 | 25      | 2.50  | 5.00  | 16   | 40   | 1.8   | 8.00              | 10  | 0.020  | 0.085  |
| SMD2920-250-24 | 25      | 2.50  | 5.00  | 24   | 40   | 1.8   | 8.00              | 10  | 0.020  | 0.085  |
| SMD2920-260-6  | 26      | 2.60  | 5.20  | 6    | 40   | 1.8   | 8.00              | 10  | 0.014  | 0.075  |
| SMD2920-260-16 | 26      | 2.60  | 5.20  | 16   | 40   | 1.8   | 8.00              | 10  | 0.014  | 0.075  |
| SMD2920-260-24 | 26      | 2.60  | 5.20  | 24   | 40   | 1.8   | 8.00              | 10  | 0.014  | 0.075  |
| SMD2920-300-6  | 30      | 3.00  | 6.00  | 6    | 40   | 1.8   | 8.00              | 20  | 0.012  | 0.048  |
| SMD2920-300-16 | 30      | 3.00  | 6.00  | 16   | 40   | 1.8   | 8.00              | 20  | 0.012  | 0.048  |
| SMD2920-300-24 | 30      | 3.00  | 6.00  | 24   | 40   | 1.8   | 8.00              | 20  | 0.012  | 0.048  |
| SMD2920-300-30 | 30      | 3.00  | 6.00  | 30   | 40   | 1.8   | 8.00              | 20  | 0.012  | 0.048  |
| SMD2920-300-33 | 30      | 3.00  | 6.00  | 33   | 40   | 1.8   | 8.00              | 20  | 0.012  | 0.048  |
| SMD2920-330-24 | 33      | 3.30  | 6.60  | 24   | 40   | 1.8   | 8.00              | 20  | 0.015  | 0.055  |
| SMD2920-400-6  | 40      | 4.00  | 8.00  | 6    | 40   | 2.5   | 20.0              | 4   | 0.006  | 0.040  |
| SMD2920-400-16 | 40      | 4.00  | 8.00  | 16   | 40   | 2.5   | 20.0              | 4   | 0.006  | 0.040  |
| SMD2920-400-24 | 40      | 4.00  | 8.00  | 24   | 40   | 2.5   | 20.0              | 4   | 0.006  | 0.040  |
| SMD2920-400-30 | 40      | 4.00  | 8.00  | 30   | 40   | 2.5   | 20.0              | 4   | 0.006  | 0.040  |
| SMD2920-500-6  | 50      | 5.00  | 10.00 | 6    | 40   | 2.5   | 25.0              | 5   | 0.004  | 0.031  |
| SMD2920-500-12 | 50      | 5.00  | 10.00 | 12   | 40   | 2.5   | 25.0              | 5   | 0.004  | 0.031  |
| SMD2920-500-16 | 50      | 5.00  | 10.00 | 16   | 40   | 2.5   | 25.0              | 5   | 0.004  | 0.031  |
| SMD2920-500-24 | 50      | 5.00  | 10.00 | 24   | 40   | 2.5   | 25.0              | 5   | 0.004  | 0.031  |
| SMD2920-600-6  | 60      | 6.00  | 12.00 | 6    | 40   | 2.5   | 25.0              | 6   | 0.004  | 0.020  |
| SMD2920-600-12 | 60      | 6.00  | 12.00 | 12   | 40   | 2.5   | 25.0              | 6   | 0.004  | 0.020  |
| SMD2920-600-16 | 60      | 6.00  | 12.00 | 16   | 40   | 2.5   | 25.0              | 6   | 0.004  | 0.020  |
| SMD2920-700-6  | 70      | 7.00  | 14.00 | 6    | 40   | 2.5   | 25.0              | 6   | 0.0025 | 0.010  |
| SMD2920-700-12 | 70      | 7.00  | 14.00 | 12   | 40   | 2.5   | 25.0              | 6   | 0.0025 | 0.010  |

## ● Vocabulary

- $I_{hold}$  = Hold current: maximum current device will pass without tripping in 25°C still air.
- $I_{trip}$  = Trip current: minimum current at which the device will trip in 25°C still air.
- $V_{max}$  = Maximum voltage device can withstand without damage at rated current ( $I_{max}$ ).
- $I_{max}$  = Maximum fault current device can withstand without damage at rated voltage ( $V_{max}$ ).
- $P_{dtyp}$  = Typical power dissipated from device when in the tripped state at 25°C still air.
- $R_{min}$  = Minimum resistance of device in initial (un-soldered) state.
- $R_{1max}$  = Maximum resistance of device at 25°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

Caution: Operation beyond the specified ratings may result in damage and possible arcing and flame.

## ● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



Note: Fig.2 Average Time-Current Curve

A: SMD2920-030 B: SMD2920-050 C: SMD2920-075 D: SMD2920-100 E: SMD2920-125  
F: SMD2920-150 G: SMD2920-185 H: SMD2920-200 I: SMD2920-250 J: SMD2920-260  
K: SMD2920-300 L: SMD2920-400 M: SMD2920-500 N: SMD2920-600 O: SMD2920-700

## ● Thermal Derating Chart

| Part Number | Ambient operating temperature hold current( $I_{hold}$ ) |       |      |      |      |      |      |      |      |
|-------------|----------------------------------------------------------|-------|------|------|------|------|------|------|------|
|             | -40°C                                                    | -20°C | 0°C  | 25°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| SMD2920-030 | 0.45                                                     | 0.40  | 0.35 | 0.30 | 0.25 | 0.23 | 0.20 | 0.17 | 0.14 |
| SMD2920-050 | 0.76                                                     | 0.67  | 0.59 | 0.50 | 0.42 | 0.38 | 0.33 | 0.29 | 0.23 |
| SMD2920-075 | 1.13                                                     | 1.01  | 0.88 | 0.75 | 0.62 | 0.56 | 0.50 | 0.44 | 0.34 |
| SMD2920-100 | 1.66                                                     | 1.47  | 1.29 | 1.10 | 0.91 | 0.83 | 0.73 | 0.64 | 0.50 |
| SMD2920-125 | 1.89                                                     | 1.68  | 1.46 | 1.25 | 1.04 | 0.94 | 0.83 | 0.73 | 0.56 |
| SMD2920-150 | 2.27                                                     | 2.01  | 1.76 | 1.50 | 1.25 | 1.13 | 1.00 | 0.87 | 0.74 |
| SMD2920-185 | 2.80                                                     | 2.47  | 2.17 | 1.85 | 1.54 | 1.39 | 1.22 | 1.07 | 0.85 |
| SMD2920-200 | 3.02                                                     | 2.68  | 2.34 | 2.00 | 1.66 | 1.50 | 1.32 | 1.16 | 0.90 |
| SMD2920-250 | 3.64                                                     | 3.25  | 2.91 | 2.50 | 2.08 | 1.88 | 1.65 | 1.45 | 1.13 |
| SMD2920-260 | 3.78                                                     | 3.35  | 2.93 | 2.60 | 2.26 | 2.08 | 1.95 | 1.74 | 1.18 |
| SMD2920-300 | 4.53                                                     | 4.02  | 3.51 | 3.00 | 2.52 | 2.26 | 1.99 | 1.79 | 1.34 |
| SMD2920-330 | 4.60                                                     | 4.20  | 3.75 | 3.30 | 2.95 | 2.75 | 2.50 | 2.25 | 1.70 |
| SMD2920-400 | 6.04                                                     | 5.36  | 4.68 | 4.00 | 3.36 | 3.01 | 2.65 | 2.33 | 1.79 |
| SMD2920-500 | 7.55                                                     | 6.70  | 5.85 | 5.00 | 4.20 | 3.77 | 3.32 | 2.92 | 2.23 |
| SMD2920-600 | 8.60                                                     | 7.70  | 6.80 | 6.00 | 4.95 | 4.60 | 4.06 | 3.65 | 3.15 |
| SMD2920-700 | 10.03                                                    | 8.98  | 7.93 | 7.00 | 5.77 | 5.36 | 4.73 | 4.26 | 3.68 |

# SMD2920 SERIES

Surface Mount PTC Device

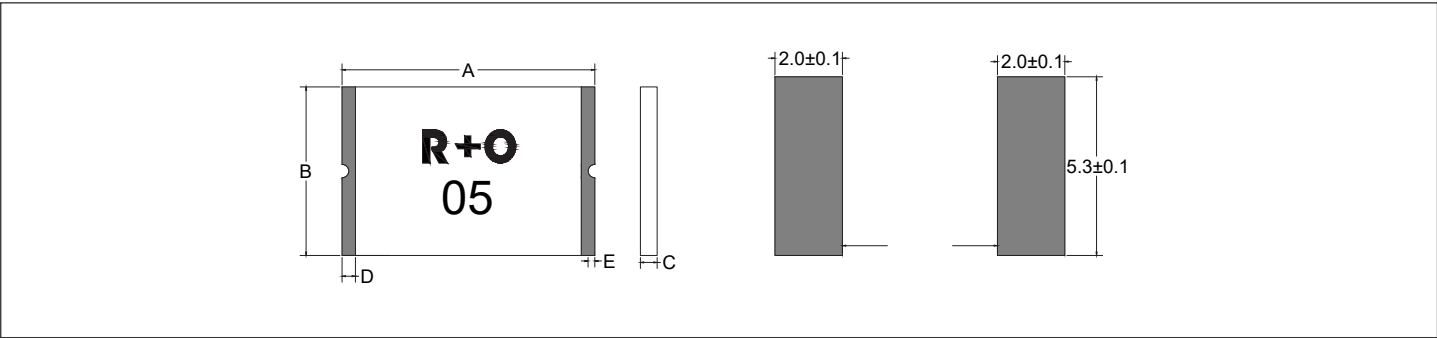
## Environmental Specifications

|                                                       |                                                  |
|-------------------------------------------------------|--------------------------------------------------|
| Operating / Storage temperature:                      | -40°C to +85°C                                   |
| Passive Aging :                                       | +85°C , 1000 hours                               |
| Humidity Aging :                                      | +85°C , 85%R.H. 168 hours                        |
| Thermal Shock :                                       | MIL-STD-202, Method 107G ; +85°C /-40°C 20 times |
| Solvent Resistance:                                   | MIL-STD-202, Method 215 No change                |
| Vibration:                                            | MIL-STD-202,Method 201 No change                 |
| Maximum Device Surface Temperature in Tripped State : | 125°C                                            |
| Storage Conditions:                                   | Light-proof, Hermetically Sealed, Moisture-proof |

## Ordering Information

| PACKAGE | SIZE(mm) | Part Numbe     | DELIVERY MODE | MPQ(PCS) |
|---------|----------|----------------|---------------|----------|
| SMD2920 | 7.5*5.5  | SMD2920-100-60 | 7"REEL        | 1,000    |
|         |          | Others         | 7"REEL        | 1,500    |

## Physical Dimensions & Recommended Pad Layout



| Part Number    | A    |      | B    |      | C    |      | D    | E    |
|----------------|------|------|------|------|------|------|------|------|
|                | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Min. |
| SMD2920-030-60 | 6.73 | 7.98 | 4.80 | 5.44 | 0.60 | 1.20 | 0.30 | 0.25 |
| SMD2920-050-60 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-075-33 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.30 | 0.30 | 0.25 |
| SMD2920-075-60 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-100-33 | 6.73 | 7.98 | 4.80 | 5.44 | 0.40 | 1.00 | 0.30 | 0.25 |
| SMD2920-100-60 | 6.73 | 7.98 | 4.80 | 5.44 | 1.00 | 2.10 | 0.30 | 0.25 |
| SMD2920-125-33 | 6.73 | 7.98 | 4.80 | 5.44 | 0.40 | 1.00 | 0.30 | 0.25 |
| SMD2920-150-33 | 6.73 | 7.98 | 4.80 | 5.44 | 0.50 | 1.30 | 0.30 | 0.25 |
| SMD2920-185-33 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |
| SMD2920-200-16 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |
| SMD2920-200-24 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |
| SMD2920-200-33 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |
| SMD2920-250-16 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |
| SMD2920-250-24 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |
| SMD2920-260-6  | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |
| SMD2920-260-16 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |
| SMD2920-260-24 | 6.73 | 7.98 | 4.80 | 5.44 | 0.70 | 1.40 | 0.30 | 0.25 |

## Physical Dimensions & Recommended Pad Layout

| Part Number    | A    |      | B    |      | C    |      | D    | E    |
|----------------|------|------|------|------|------|------|------|------|
|                | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Min. |
| SMD2920-300-6  | 6.73 | 7.98 | 4.80 | 5.44 | 0.60 | 1.20 | 0.30 | 0.25 |
| SMD2920-300-16 | 6.73 | 7.98 | 4.80 | 5.44 | 0.60 | 1.20 | 0.30 | 0.25 |
| SMD2920-300-24 | 6.73 | 7.98 | 4.80 | 5.44 | 0.60 | 1.20 | 0.30 | 0.25 |
| SMD2920-300-30 | 6.73 | 7.98 | 4.80 | 5.44 | 0.60 | 1.20 | 0.30 | 0.25 |
| SMD2920-300-33 | 6.73 | 7.98 | 4.80 | 5.44 | 0.60 | 1.20 | 0.30 | 0.25 |
| SMD2920-330-24 | 6.73 | 7.98 | 4.80 | 5.44 | 0.60 | 1.20 | 0.30 | 0.25 |
| SMD2920-400-6  | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-400-16 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-400-24 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-400-30 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-500-6  | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-500-12 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-500-16 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-500-24 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-600-6  | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-600-12 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-600-16 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-700-6  | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |
| SMD2920-700-12 | 6.73 | 7.98 | 4.80 | 5.44 | 0.80 | 1.60 | 0.30 | 0.25 |

## Warning

- Users shall independently assess the suitability of these devices for each of their applications.
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire.
- These devices are intended to protect against the effects of temporary over-current or over-temperature conditions and are not intended to perform as protective devices where such conditions are expected to be repetitive or prolonged in duration.
- Exposure to silicon-based oils, solvents, electrolytes, acids, and similar materials can adversely affect the prolonged of these PPTC devices.
- These devices undergo thermal expansion under fault conditions, and thus shall be provided with adequate space and be protected against mechanical stresses.
- Circuits with inductance may generate a voltage ( $L di/dt$ ) above the rated voltage of the PPTC device.