SELECTING A POLYMER PTC FUSE

1. Determine the following operating parameters of the circuit:

- Normal Operating Current (I_{hold})
- Maximum Circuit Voltage (V_{max})
- Maximum Interrupt Current (I_{max})
- Normal Operating Temperature (min°C / max°C)

2. Select the form factor of PPTC

- Surface Mount Device (SMD)
- Radial Leaded Device (RLD)
- Axial Leaded Device (ALD)
- DISC Device
- Other Customized Form Factors

3. Confirm that the maximum and minimum temperatures surrounding the device in the application are within the typical operating temperature range of EVERFUSE® PTC, which will be between -40°C and 85°C in most of the cases.

4. Refer to the following Thermal Derating table and choose the temperature closest to the operating temperature, and find the multiple to be applied on the normal Ihold in order to get the Ihold under the operating temperature.

Ex. Operating temperature = 50°C, I_{hold} = 1 A.

Thus, I_{hold} (50°C) = I_{hold} x the multiple corresponding to 50°C = 1 x 0.80 = 0.8 A.

Temperature (°C)	-40	-30	-20	-10	0	10	20	25	30	40	50	60	70	80	85
Multiple	1.57	1.48	1.40	1.31	1.22	1.14	1.05	1.00	0.96	0.88	0.80	0.72	0.64	0.56	0.53

*Please check respective datasheet of each device for detailed I_{hold} under the thermal derating effect.

5. Compare V_{max} and I_{max} of the PPTC device with that of the circuit in application and make sure the circuit's requirement does not exceed the device rating.

6. Refer to the Maximum Time-to-trip in the Electrical Characteristics Table to determine if the device's Time-to-trip is appropriate to protect the components at expected fault levels.

Time-to-trip is the time it takes for a PPTC device to switch to a high-resistance state when a fault condition occurs. Confirming the time-to-trip of the EVERFUSE PPTC is important to reach the expected protection effect. If the chosen PPTC device trips too fast, undesired or nuisance tripping may take place. If the device trips too slowly, the components being protected may be damaged before the device trips and limits the current.

7. Verify the performance and suitability of the chosen PPTC device in the application.

ELECTRICAL CHARACTERISTICS VOCABULARY

I_{hold} = Hold Current
Maximum current the device will pass without tripping in 23°C still air.

I_{trip} = Trip Current
Minimum current at which the device will trip in 23°C still air.

V_{max} = Maximum Voltage
Maximum voltage that device can withstand without damage at rated current (I_{max}).

I_{max} = Maximum Current
Maximum fault current device can withstand without damage at rated voltage (V_{max}).

$P_{d\ typ}$ = Typical Power Dissipation
Typical power dissipated from device when in the tripped state at 23°C still air.

R_{min} = Minimum Initial Resistance
Minimum resistance of device in initial (un-soldered or un-tripped) state at 23°C still air.

R_{1max} = Maximum resistance after tripping 1 time
Maximum resistance of device at 23°C measured one hour after tripping or reflow soldering of 260 °C for 20 seconds.

TtT = Time-to-Trip
The time needed for a PPTC device to switch to a high-resistance state when a fault condition occurs. Time-to-trip of PPTC depends on the fault current and the ambient temperature. Greater the fault current or higher the ambient temperature is, shorter the Time-to-trip becomes