# PTC OVER-CURRENT PROTECTORS

**PTC Over-current Protector Features**

- Fast Switching
- No Electrical Noise
- Virtually Unlimited Life
- Self Resetting
- No Contacts
- Automatic Operation
- Efficient

**Options:**

- Encapsulation
- Special Lead Configuration
- Non-Standard Values

## PTC OVER-CURRENT PROTECTORS

The PTC over-current protector is connected in series with the load which is to be protected. During normal operating conditions, the PTC remains in its low resistance state resulting in negligible attenuation to current flow. When a short circuit or over current condition occurs, the PTC will switch into its high resistance state thereby limiting the current flow in the circuit to a point well below the normal operating level. When the fault condition is removed, the PTC will return to its low resistance state allowing the current flow to recover to its normal level. RTI Electronics produces over-current protectors for a wide range of load protection applications.

### Typical Applications

Some of the most popular applications of over-current protectors include:

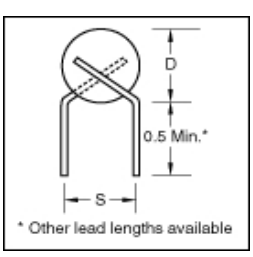
- Telephone Line Fault Protection
- Transformer Protection
- FHP Protection
- Transistor Protection
- Speaker Protection

- **Maximum Continuous Current (Icc)** - One of the first considerations is the (Icc), the maximum amount of current. The PTC must be capable of conducting without switching into its high resistance state. See the over-current protectors specification sheet.
- **Minimum Switching Current (Is)** - The second consideration is to determine the (Is), the minimum amount of current required to switch the PTC into its high resistance state. See the over-current protectors specifications.
- **Maximum Operating Voltage (Vmax)** - Next calculate or estimate the voltage that will be across the tentatively selected thermistor when the device is switched into its high resistance mode (the thermistor's resistance in its high resistance mode will typically be greater by two to three orders of magnitude than its R@25°C value). If the voltage estimated is greater than the Vmax rating of the selected part then another selection with a higher Vmax rating must be made.

During normal operating conditions the PTC remains in its low resistance state resulting in negligible attenuation to current flow. When a fault such as short circuit or over-current condition occurs, the PTC will switch into its high resistance state which limits the current in the circuit to a point well below the normal operating level, therefore, protecting the load circuit components. When the fault condition is removed. The PTC will return to its low resistance state allowing the current flow to recover to its normal level.

### PTC Over-Current Protector Specifications

| Part Number | Base resistance (ohm) | Tolerance (±) | Maximum Operating Voltage Vmax | Maximum Continuous Current (Amps) | Minimum Switching Current (Amps) | Switch Temp. (Ref.) (ºC) | Heat Capacity (Watt-Sec./ºC) | Dissipation Constant (mW/ºC) | Reference Dimensions D Max. Dia. (In.) | Lead Dia. (In.) | S Ref. (In.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SP5504D-1R0-120 | 1 | 20% | 15 | 0.600 | 1.300 | 120 | 0.48 | 13 | 0.60 | 0.032 | 0.3 |
| SP5004D-2R0-120 | 2 | 20% | 25 | 0.440 | 0.900 | 120 | 0.39 | 12 | 0.55 | 0.032 | 0.3 |
| SP4004D-3R3-120 | 3.3 | 30% | 25 | 0.300 | 0.690 | 120 | 0.25 | 10 | 0.45 | 0.025 | 0.3 |
| SP6709D-4R7-110 | 4.7 | 20% | 132 | 0.290 | 0.650 | 110 | 1.59 | 16 | 0.70 | 0.032 | 0.0 |
| SP4004D-5R0-110 | 5 | 20% | 25 | 0.220 | 0.500 | 110 | 0.25 | 10 | 0.45 | 0.025 | 0.3 |
| SP3505D-7R5-120 | 7.5 | 30% | 50 | 0.180 | 0.400 | 120 | 0.24 | 8 | 0.40 | 0.020 | 0.2 |
| SP5510D-100-110 | 10 | 30% | 132 | 0.170 | 0.430 | 110 | 1.19 | 13 | 0.60 | 0.025 | 0.3 |
| SP3505D-100-120 | 10 | 30% | 50 | 0.150 | 0.350 | 120 | 0.24 | 8 | 0.40 | 0.020 | 0.2 |
| SP2505D-200-120 | 20 | 30% | 50 | 0.095 | 0.215 | 120 | 0.12 | 6 | 0.30 | 0.020 | 0.2 |
| SP3510D-300-110 | 30 | 30% | 132 | 0.075 | 0.190 | 110 | 0.48 | 8 | 0.40 | 0.020 | 0.2 |
| SP3010D-500-110 | 50 | 30% | 132 | 0.055 | 0.140 | 110 | 0.35 | 7 | 0.35 | 0.020 | 0.2 |
| SP3010D-101-110 | 100 | 30% | 132 | 0.040 | 0.100 | 110 | 0.35 | 7 | 0.35 | 0.020 | 0.2 |
| SP2008D-251-120 | 250 | 30% | 150 | 0.028 | 0.070 | 120 | 0.13 | 7 | 0.25 | 0.020 | 0.2 |
| SP2010D-501-120 | 500 | 30% | 250 | 0.020 | 0.050 | 120 | 0.16 | 7 | 0.25 | 0.020 | 0.2 |
| SP2010D-102-110 | 1000 | 30% | 300 | 0.012 | 0.032 | 110 | 0.16 | 7 | 0.25 | 0.020 | 0.2 |
| SP2012D-152-110 | 1500 | 30% | 350 | 0.010 | 0.026 | 110 | 0.19 | 7 | 0.25 | 0.020 | 0.2 |




*Maximum Continuous Current (Icc) - The maximum amount of current, expressed in AMPS, the PTC must be capable of conducting without switching into its high resistance state.

**Minimum Switching Current (Is) - The minimum amount of current, expressed in AMPS, required to switch the PTC into its high resistance state.

Note - The values for minimum switching current and maximum continuous current are for reference only. Mounting method and environmental conditions can affect these parameters. Please contact RTI Electronics Inc. for specific applications engineering assistance.

Back to PTC Thermistor

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