

# PolySwitch LVR Series Resettable Protection Devices

**LVR Line Voltage Series of PolySwitch devices for overcurrent and overtemperature protection for 100V<sub>AC</sub> - 240V<sub>AC</sub> applications**

Raychem Circuit Protection, a unit of Tyco Electronics Corporation, introduces the LVR series of PolySwitch® resettable devices. Designed for use in line voltage applications, the LVR series PPTC (polymeric positive temperature coefficient) devices are rated at 240V<sub>AC</sub>, permitting maximum voltages of up to 265V<sub>AC</sub>, and are available in hold currents from 50 to 400mA.

The LVR series extends the proven PolySwitch technology of resettable overcurrent protection into higher voltage applications. When installed in proximity to potential heat generating components such as magnetics, FETs, or power resistors, the thermally active devices can help protect against both overcurrent and overtemperature faults in power supplies, transformers and control circuits.

The properties of the LVR device can offer distinct benefits in transformer protection designs. The surface temperature of the LVR device in the high resistance state is well within the range of most transformer winding insulation ratings. This low temperature operation, combined with small size, low resistance and good thermal shock tolerance, can allow the LVR device to be mounted in direct contact with the transformer windings for a faster response to potential fault conditions.

## Benefits:

- Helps provide overcurrent and overtemperature protection
- Low surface temperature in high resistance state helps provide an effective solution for protection of transformer windings
- Helps reduce warranty, service and repair costs
- Assists in meeting regulatory requirements
- Compatible with high-volume electronics assembly

## Features:

- Maximum operating voltage of 240V<sub>AC</sub>
- Maximum interrupt voltage of 265V<sub>AC</sub>
- Hold currents from 50mA – 400mA
- Agency: UL and TÜV (IEC) recognized, CSA pending
- Solid-state—able to withstand mechanical shock and thermal stress
- Low off state resistance

## Target Applications:

- Cell phone chargers
- Appliance (range, washing machine, HVAC) control boards
- Cordless phone and answering machine power supplies
- Metering, industrial control boards
- Switching power supplies
- Transformers
- Lighting dimmers, ballasts

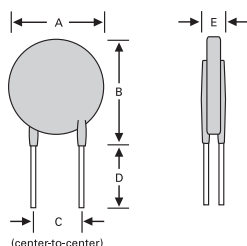
## Electrical Characteristics (at 20° C)

| Part number | Hold current (A) | Voltage rating (V <sub>AC</sub> ) | Max. interrupt voltage (V <sub>AC</sub> ) | Max. interrupt current (A) | Current ratings (A) |      | Max. time-to-trip Current (A) | T-t-T (s) | Resistance (Ω) |       | Post-trip resistance standard trip (Ω) Max. | Typical power dissipation in the tripped state (W) |
|-------------|------------------|-----------------------------------|---|----------------------------|---------------------|------|-------------------------------|-----------|----------------|-------|---|--|
|             |                  |                                   |   |                            | Hold                | Trip |                               |           | Min.           | Max.  |   |  |
| LVR005      | 0.05             | 240                               | 265                                       | 1.0                        | 0.05                | 0.12 | 0.25                          | 15.0      | 18.5           | 31.00 | 65.0  | 0.7  |
| LVR008      | 0.08             | 240                               | 265                                       | 1.2                        | 0.08                | 0.19 | 0.40                          | 15.0      | 7.4            | 12.00 | 26.0  | 0.8  |
| LVR012      | 0.12             | 240                               | 265                                       | 1.2                        | 0.12                | 0.30 | 0.60                          | 15.0      | 3.0            | 6.50  | 12.0  | 1.0  |
| LVR016      | 0.16             | 240                               | 265                                       | 2.0                        | 0.16                | 0.37 | 0.80                          | 15.0      | 2.5            | 4.10  | 7.8   | 1.4  |
| LVR025      | 0.25             | 240                               | 265                                       | 3.5                        | 0.25                | 0.56 | 1.25                          | 18.5      | 1.3            | 2.10  | 3.8   | 1.5  |
| LVR040      | 0.40             | 240                               | 265                                       | 5.5                        | 0.40                | 0.90 | 2.00                          | 26.0      | 0.6            | 0.97  | 1.9   | 2.0  |

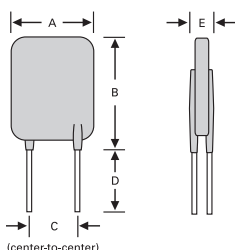
## Product Notes:

1. A PTC device is not a fuse—it is a nonlinear thermistor that limits current. Because under a fault condition all PTC devices go into a high resistance state but not open circuit, hazardous voltage may be present at PTC locations.
2. The devices are intended for protection against occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
3. Please refer to the SCD for complete information and applications limitations, which can be obtained from product management (650-361-6900) or the web: [www.circuitprotection.com/lvr/](http://www.circuitprotection.com/lvr/)

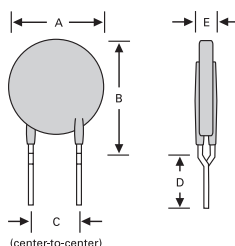
**Figure A**



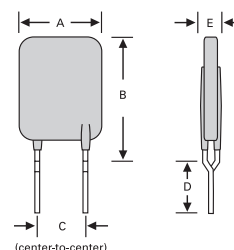
**Figure B**



**Figure C**



**Figure D**

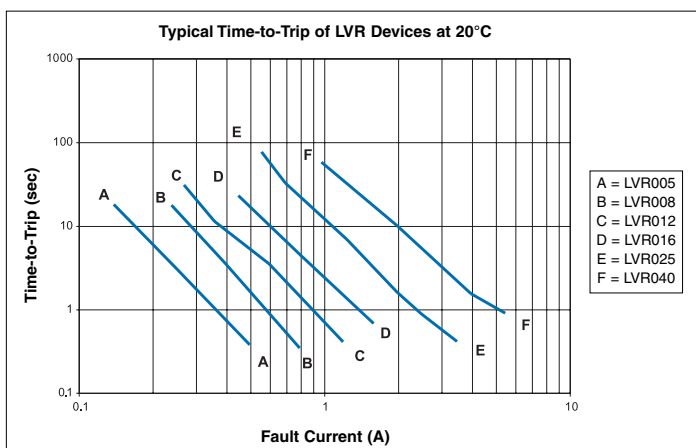


**Dimensions in millimeters (inches)**

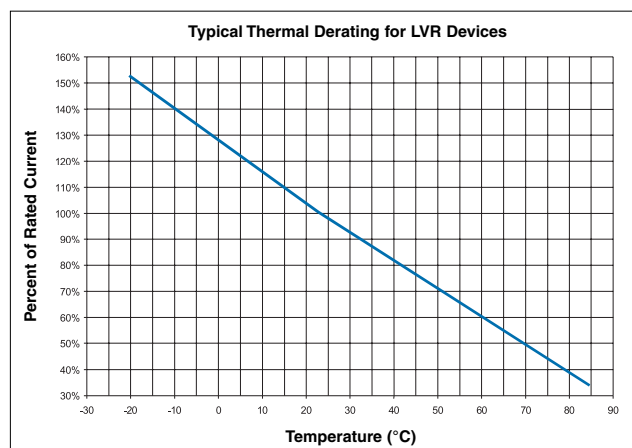
| Part number | Fig. | Min. | Max.        | Min. | Max.        | Min.       | Max.       | Min.       | Max. | Min. | Max. | Min.       | Max. |
|-------------|------|------|-------------|------|-------------|------------|------------|------------|------|------|------|------------|------|
| LVR005S     | A    | --   | 8.3 (0.33)  | --   | 10.7 (0.43) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR005K     | C    | --   | 8.3 (0.33)  | --   | 12.9 (0.51) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR008S     | A    | --   | 8.3 (0.33)  | --   | 10.7 (0.43) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR008K     | C    | --   | 8.3 (0.33)  | --   | 12.9 (0.51) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR012S     | A    | --   | 8.3 (0.33)  | --   | 10.7 (0.43) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR012K     | C    | --   | 8.3 (0.33)  | --   | 12.9 (0.51) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR016S     | A    | --   | 9.9 (0.39)  | --   | 12.5 (0.50) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR016K     | C    | --   | 9.9 (0.39)  | --   | 13.8 (0.54) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR025S     | B    | --   | 9.6 (0.38)  | --   | 17.4 (0.69) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR025K     | D    | --   | 9.6 (0.38)  | --   | 18.8 (0.74) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR040S     | B    | --   | 11.5 (0.46) | --   | 19.5 (0.77) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |
| LVR040K     | D    | --   | 11.5 (0.46) | --   | 20.9 (0.82) | 4.3 (0.17) | 5.8 (0.23) | 7.6 (0.30) | --   | --   | --   | 3.8 (0.15) |      |

**Installation Notes:** LVR parts are not recommended for reflow soldering. Installation where the LVR part is constrained may inhibit proper device function. Visit our web site or contact your local representative for additional information.

**Typical Time-to-Trip Characteristics**



**Thermal Derating Curve**



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