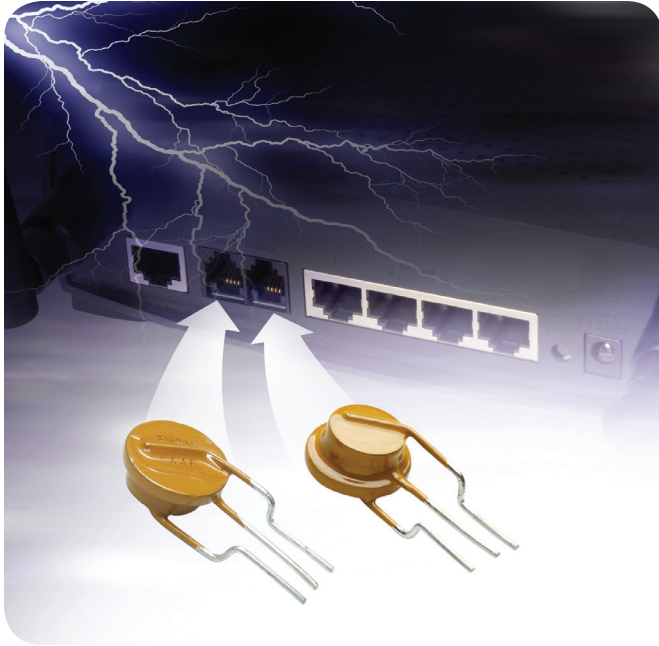


## Integrated Overcurrent/Overvoltage Protection Solutions for Telephony Equipment



The Littelfuse 2Pro device is an integrated overcurrent/overvoltage circuit protection device, designed to help protect cost-sensitive PSTN (Public Switched Telephone Network) and VoIP (Voice over Internet Protocol) telephony equipment from damage caused by lightning and ESD surges, power contact and induction with AC lines. If left unprotected from these hazards, CPE (Customer Premise Equipment) may fail or may pose a safety risk for subscribers and maintenance personnel.

The widespread adaptation of VoIP gateways in homes and enterprise environments has resulted in increasingly stringent safety requirements for CPE. The 2Pro device helps equipment manufacturers comply with UL 60950 and remain operational after specified lightning tests. It also helps equipment comply with surge tests per TIA-968-A, IEC 60950, and ITU-T K.20/K.21. The UL 497A listed protector also helps provide ESD protection.

The RoHS-compliant 2Pro device incorporates PolySwitch PPTC (Polymeric Positive Temperature Coefficient) overcurrent technology with an MOV (Metal Oxide Varistor) component into one innovative, thermally protected device to help provide resettable current limiting during overcurrent events and voltage clamping during overvoltage events. This single-device approach to coordinated circuit protection helps reduce component count and improve equipment reliability.

### Benefits

- Single device helps reduce component count and footprint
- Helps reduce warranty returns
- Helps equipment comply with surge tests per: TIA-968-A, IEC 60950, ITU-T K.20/K.21
- Helps simplify UL 60950 testing
- Helps equipment comply with UL 60950

### Features

- RoHS compliant
- Halogen free  
(refers to: Br $\leq$ 900ppm, Cl $\leq$ 900ppm, Br+Cl $\leq$ 1500ppm)
- Single overcurrent, overvoltage and ESD protection device
- Resettable overcurrent protection
- UL 497A listed protector (#E258475)

### Applications

- Cordless telephones
- VoIP gateways
- Fax machines
- Data modems
- Set-top boxes
- Security systems
- MDF modules
- Analog and ISDN linecards

## Integrated Overcurrent/Overvoltage Protection Solutions for Telephony Equipment

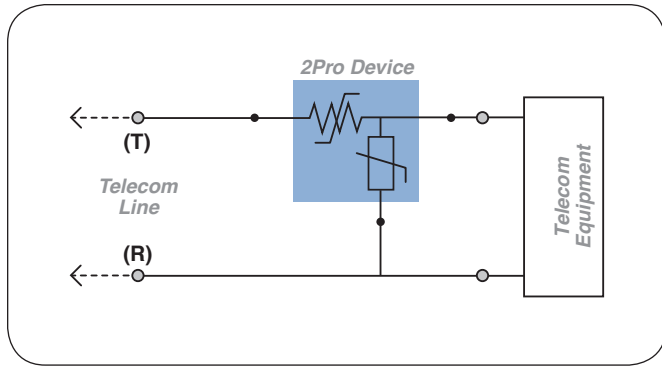


Figure 1. Representative schematic for 2Pro devices in ungrounded system

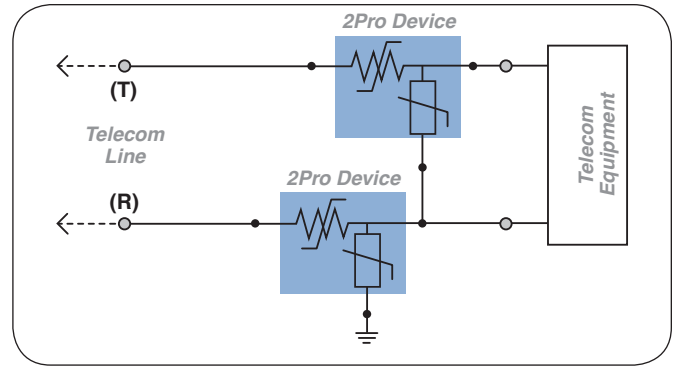


Figure 2. Representative schematic for 2Pro devices in grounded system

### TM2P Electrical Characteristics

#### Overcurrent (terminals 1 - 2) – Performance ratings @ 20°C

Part Number	I <sub>HOLD</sub> (A)	I <sub>TRIP</sub> (A)	Resistance <sup>†</sup> (Ω)			Time to Trip (s) <sup>†</sup> @ 1A	
			R min	R max.	R1 max.*	Typ.	Max.
TM2P-10271	0.15	0.30	6.5	14.0	16.0	0.9	3

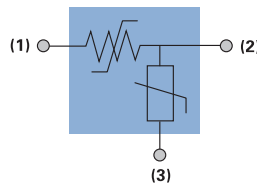
#### Overvoltage (terminals 2 - 3)

Part Number	Varistor Voltage V @ 1mA		DC Resistance @ 100V (MΩ)	Maximum Clamping Voltage @ 25A (V)	Rated Wattage (W)
	(A)	(A)			
TM2P-10271	260	+14% - 7%	>10	455	0.25

\* Maximum device resistance at 20°C measured 1 hour post trip.

† Corresponds to operation below varistor voltages.

### Electrical Schematic



#### Lightning Withstand for the Assembly (terminals 1 - 3) @ 20°C

Parameter	Voltage—open circuit		Current—short circuit		Repetitions
	Voltage (V)	Waveform (Ω)	Current (A)	Waveform (Ω)	
TIA-968 Lightning Type A Metallic	800	10 x 560	100.0	10 x 560	1 ea. Polarity
TIA-968 Lightning Type A Longitudinal	1500	10 x 160	200.0	10 x 160	1 ea. Polarity
TIA-968 Lightning Type B Metallic	1000	9 x 720	25.0	5 x 320	1 ea. Polarity
TIA-968 Lightning Type B Longitudinal	1500	9 x 720	37.5	5 x 320	1 ea. Polarity
ITU-T K.20/K.21	1500	10 x 700	37.5	5 x 310	5 ea. Polarity

## Integrated Overcurrent/Overtoltage Protection Solutions for Telephony Equipment

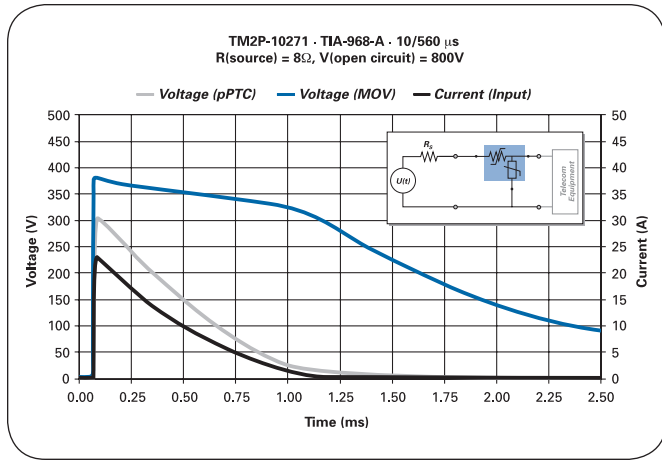


Figure 3. Representative 2Pro device response under TIA-968-A metallic Line Surge A

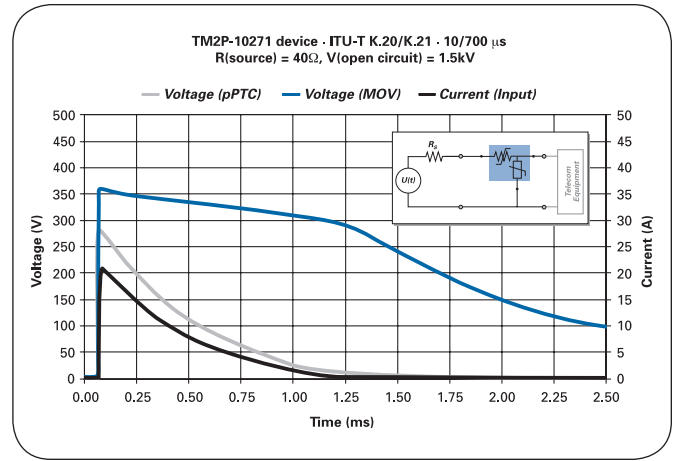


Figure 4. Representative 2Pro device response under ITU-T K.20/K.21 Surge

### Summary

Resettable circuit protection solutions help enable communications equipment to remain operational after electrical fault conditions. The innovative 2Pro device addresses the need for an affordable resettable circuit protection solution option that can help protect equipment from a multitude of overcurrent and overvoltage events.

#### Notice:

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly set forth in applicable Littelfuse product documentation. Warranties granted by Littelfuse shall be deemed void for products used for any purpose not expressly set forth in applicable Littelfuse documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation. The sale and use of Littelfuse products is subject to Littelfuse Terms and Conditions of Sale, unless otherwise agreed by Littelfuse.