

# TCP1.25, TCP500 & TCP2

## Telecom circuit protector



### TCP1.25

#### Product features

- The first and most reliable surface mount telecom circuit protector designed to protect against power cross faults and comply with all surge requirements.
- Allows compliance with telecom regulatory standards including Bellcore GR 1089, UL 1950/60950, and FCC part 68. Application circuit testing is recommended.
- Eliminates the need for a current limiting resistor.
- Protects against overcurrent conditions found in telecom Subscriber Line Interface Cards (SLICs), xDSL Modem Applications, Set-Top Boxes, and Consumer Premises Equipment (CPE).
- TCP1.25-R tested and confirmed compatible with Eaton's Thyristor surge protector (listed below)

<b>Eaton P/N's</b>
<a href="#">SMCPxxxxSC</a>

#### General specifications

- Life test: MIL-STD-202, Method 108A, Test Condition D
- Load humidity: MIL-STD-202, Method 103B
- Moisture resistance: MIL-STD-202, Method 106E
- Thermal shock: MIL-STD-202, Method 107D, air-to-air
- Case resistance: EIA/IS-722
- Resistance to dissolution of metallization: ANSI J-STD-002, Test D
- Mechanical shock: MIL-STD-202, Method 213B, Test Condition A
- High frequency vibration: MIL-STD-202, Method 204D, Test Condition D
- Resistance to solvents: MIL-STD-202, Method 215A

#### Agency information

- UL Recognition card: JDYX2/E19180
- CSA Component certification record and class No.: 053787C000, 1422 30

#### Ordering code

- Specify packaging, product and option code (i.e., TR2-TCP1-25-R)

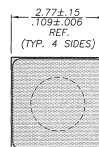
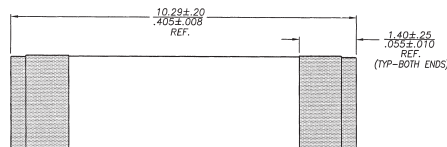
#### Soldering method

- Wave Immersion: +260 °C, 10 sec max.
- Infrared: +260°C, 30 sec max.

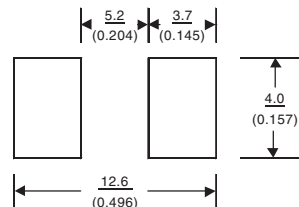
Electrical Characteristics	
% of Amp rating	Opening time
100%	4 Hours minimum
250%	1 Second minimum
250%	4-10 Seconds typical
250%*	120 Seconds maximum
300%	10 Seconds maximum

\* If the device does not open at 250% within 120 seconds, increase current to 300% of amp rating. Device must open in 10 seconds max.

#### Dimensions mm/(inches)



#### Land pattern



Powering Business Worldwide

### Lightning surge specifications

Surge specification	Surge	Repetitions	Waveform (µsec.)	Current (A)	Voltage (V)	Performance requirement
FCC 47 Part 68	Longitudinal Type A	2	10x160	100 per fuse	1500	Fuse cannot open
FCC 47 Part 68	Metallic Type B	2	10x560	100	800	Fuse cannot open
Bellcore GR-1089-CORE	First Level Lightning	50	10x1000	100	1000	Fuse cannot open
Bellcore GR-1089-CORE	First Level Lightning	50	2x10	500	2500	Fuse cannot open
Surge out		1	10x160	160	N/A	Fuse cannot open
Surge out		1	10x560	115	N/A	Fuse cannot open

### Electrical and power cross specifications

Part number	Voltage rating AC	Interrupting rating*		DC Cold resistance** (ohms)			Typical melting I <sup>2</sup> t†	Maximum total clearing	Typical voltage drop‡	Alpha code marking	
		250Vac	600Vac	min.	typ.	max.				1st Code	2nd Code
TCP1.25-R	250 V	50 A	60 A	0.070	0.090	0.110	22.2 A <sup>2</sup> s	100 A <sup>2</sup> s	150mV	J	R

\* AC Interrupting rating (Measured at designated voltage, 100% power factor)

\*\* DC Cold resistance (Measured at 10% of rated current)

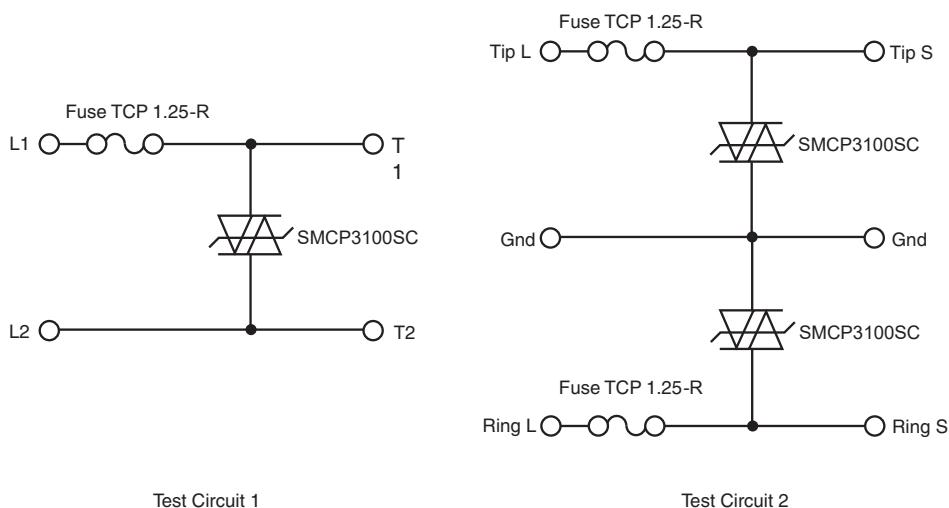
† Typical melting I<sup>2</sup>t (Measured with a battery bank at 60 Vdc, 10x-rated current, time constant of calibrated circuit less than 50 microseconds)

‡ Typical voltage drop (Measured at rated current after temperature stabilizes)

### Special Investigation

The TCP1.25-R is designed to provide overcurrent protection for telecom SLIC, xDSL modem, and set-top box applications regardless of the overvoltage device selected. To provide an easier specification experience, Eaton has tested the TCP1.25A and Eaton SMCP3100SC thyristor devices.

### TEST CIRCUITS



### Test program

Test	Standard	Results
<b>Lightning Surge Tests</b>		
10/1000 µs + and -1kV 100A (25 pulses of each polarity)	Bellcore GR-1089	Passed
2/10µs + and -2.5 and 5kV 500A (10 pulses of each polarity)	Bellcore GR-1089	Passed
10/560µs + and -800V 100A (1 pulse of each polarity)	FCC Part 68	Passed
10/160µs + and -1.5kV 200A (1 pulse of each polarity)	FCC Part 68	Passed
10/700µs + and -1.5kV 37.5A (5 pulses of each polarity)	K20	Passed
<b>Electrical and Power Cross Tests</b>		
600V 3A 1.1s (first level)	Bellcore GR-1089	Passed
277V 25A (second level)	Bellcore GR-1089	Passed
600V 60A 5s(second level)	Bellcore GR-1089	Passed
600V 40A 1.5s	UL 60950	Passed
600V 2.2A 30min	UL 60950	Passed
600V 1A 0.2s (A criteria)	K20	Passed
230V 1.44A/0.77A/0.38A 15min (A criteria)	K20	Passed
230V 23A 15min (A criteria)	K20	Passed

## TCP500 & TCP2

### Product features

- Designed to protect Consumer Premises Equipment from harmful overcurrents.
- Allows compliance with telecom regulatory standards including UL 1950/60950, and FCC part 68. Application circuit testing is recommended.
- Eliminates the need for a current limiting resistor.

### General specifications

- Life test: MIL-STD-202, Method 108A, Test Condition D
- Load humidity: MIL-STD-202, Method 103B
- Moisture resistance: MIL-STD-202, Method 106E
- Thermal shock: MIL-STD-202, Method 107D, air-to-air
- Case resistance: EIA/IS-722
- Resistance to dissolution of metallization: ANSI J-STD-002, Test D
- Mechanical shock: MIL-STD-202, Method 213B, Test Condition A
- High frequency vibration: MIL-STD-202, Method 204D, Test condition D
- Resistance to solvents: MIL-STD-202, Method 215A

### Agency information

- UL Recognition card: JDYX2/E19180
- CSA Component certification record and class No.: 053787C000, 1422 30

### Ordering

- Specify packaging, product and option code (i.e., TR2-TCP500-R)

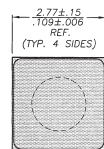
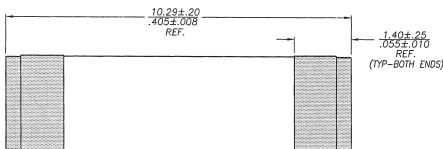
### Soldering method

- Wave Immersion: 260°C, 10 sec max.
- Infrared: 260°C, 30 sec max.

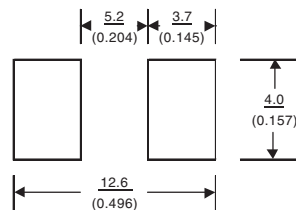
Electrical characteristics	
% of Amp rating	Opening time
100%	4 Hours minimum
250%	1 Second minimum
250%	4-10 Seconds typical
250%*	120 Seconds maximum
300%	10 Seconds maximum

\* If the device does not open at 250% within 120 seconds, increase current to 300% of amp rating. Device must open in 10 seconds max.

### Dimensions mm/(inches)



### Land pattern



### Lightning surge specifications

Surge specification	Surge	Repetitions	Waveform (µsec.)	Current (A)	Voltage (V)	Performance requirement
<b>TCP 500mA tested</b>						
FCC 47 Part 68	Longitudinal Type B	2	5x320	37.5	N/A	Fuse cannot open
FCC 47 Part 68	Metallic Type A	2	10x560	100	800	Fuse must open safely
Surge out		25	10x160	65	N/A	Fuse cannot open
<b>TCP2A tested</b>						
FCC 47 Part 68	Longitudinal Type A	2	10x160	100 per fuse	1500	Fuse cannot open
FCC 47 Part 68	Metallic Type B	2	10x560	100	800	Fuse cannot open
Bellcore GR-1089-CORE	First Level Lightning	50	10x1000	100	1000	Fuse cannot open
Bellcore GR-1089-CORE	First Level Lightning	50	2x10	500	2500	Fuse cannot open
Surge out		1	10x160	160	N/A	Fuse cannot open
Surge out		1	10x560	115	N/A	Fuse cannot open

### Electrical and power cross specifications

Part number	Voltage rating AC	Interrupting rating*		DC Cold resistance** (ohms)			Typical melting I <sup>2</sup> t†	Maximum total clearing	Typical voltage drop‡	Alpha code marking	
		250Vac	600Vac	min.	typ.	max.				1st Code	2nd Code
TCP500-R	250 V	50 A	40 A	0.420	0.530	0.640	1.3 A <sup>2</sup> s	100 A <sup>2</sup> s	471mV	F	R
TCP2-R	250 V	50 A	60 A	0.050	0.075	0.100	30 A <sup>2</sup> s	100 A <sup>2</sup> s	205mV	N	

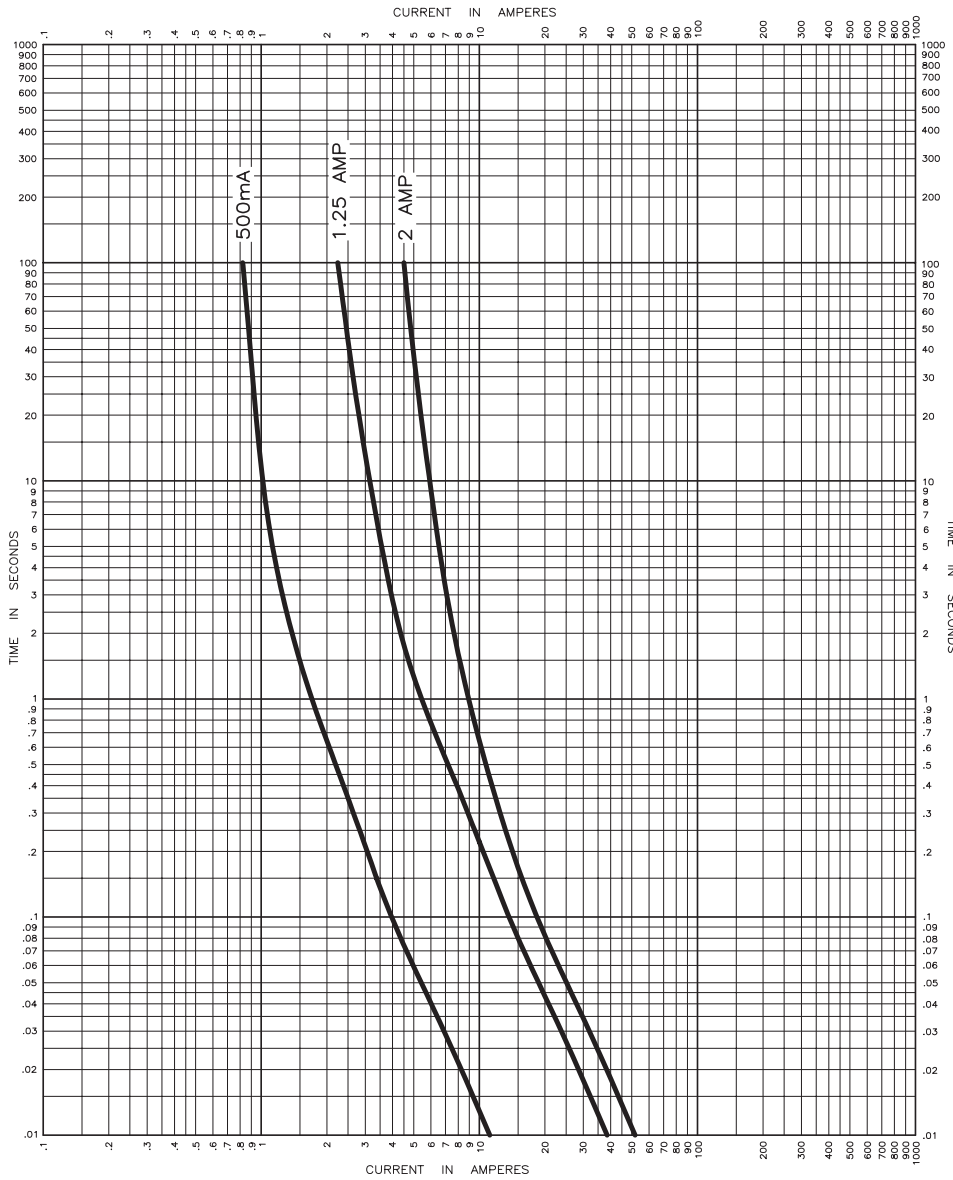
\* AC Interrupting rating (Measured at designated voltage, 100% power factor)

\*\* DC Cold resistance (Measured at 10% of rated current)

† Typical melting I<sup>2</sup>t (Measured with a battery bank at 60 Vdc, 10x-rated current, time constant of calibrated circuit less than 50 microseconds)

‡ Typical voltage drop (Measured at rated current after temperature stabilizes)

**TIME CURRENT CURVE**



Packaging code	
<b>Packaging code</b>	<b>Description</b>
TR2	2,500 pieces of fuses on 24mm tape-and-reel on 13 inch (330mm) reel per EIA Standard 481, 8 mm pitch

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