SingIFuse™ SF-3812TM-T Series Features

- Replacement for Bourns® Telefuse™ models B0500T, B1250T and B2000T
- For use in telecommunication circuit applications requiring low current protection with high surge tolerance
- Overcurrent protection to Telcordia GR-1089-CORE Issue 7 & UL 60950
- EIA 3812 (10030 metric) footprint
- UL 248-14 listed
- Surface mount packaging for automated assembly
- RoHS compliant* and halogen free**

SF-3812TM-T Series – SingIFuse™ Telefuse™ Telecom Protectors

Electrical Characteristics

Model	Rated Current (Amps)	Fusing Time	Resistance (Ω) Typ.***	Rated Voltage	Interrupting Rating	Typical I^2t (A^2s) ****	Max. Power Dissipation (W)
SF-3812TM050T-2	0.50	Open within 1~120 sec. at 250 % rated current	0.480	600 VAC	60 A @ 600 VAC 60 A @ 250 VAC 50 A @ 250 VDC 100 A @ 125 VDC	1.4	0.4
SF-3812TM125T-2	1.25		0.100			22	0.6
SF-3812TM200T-2	2.00		0.055			24	0.8

*** Resistance value measured with ≤10 % rated current at 25 °C ambient. Tolerance ±30 %.
**** Melting I^2t calculated at 10 times rated current.

Reliability Testing

No.	Test	Test Condition	Requirement	Test Reference
1	Solderability	Temperature setup: 235 ±5 °C Time setup: 10 ±1 sec.	After test terminal electrode wetting area must be greater than 95 %	IEC 60068-2-58
2	Resistance to soldering heat	Temperature setup: 235 ±5 °C Time setup: 30 ± 5 sec.	DCR change ≤ ±15 %	IEC 60068-2-58
3	Thermal shock	Temperature setup: 25 °C ~ -65 °C ~ 25 °C ~ 125 °C Time setup: -65 °C (30 min) ~ 25 °C (5 min) ~ 125 °C (30 min) ~ 25 °C (5 min), 5 cycles	DCR change ≤ ±15 % No mechanical damage	MIL-STD-202G Method 107G Test Condition B
4	Humidity unload	Heat (85 ±0.5 °C) High Humidity (85 ±1 % RH) 240 hours	DCR change ≤ ±15 % No mechanical damage	MIL-STD-202G Method 103B Test Condition A
5	Salt spray	Salt spray concentration: 5 ±1 % Test liquid temperature: 35 ±0.5 °C 96 hours	DCR change ≤ ±15 % No mechanical damage	MIL-STD-202G Method 101E Test Condition A
6	Bending	The board shall be bent by 1 mm at a rate of 1 mm/sec.	DCR change ≤ ±15 %	IEC 60127-4
7	Vibration	Frequency setup: 10 ~ 55 ~ 10 Hz Time setup: 1 Minute/cycle (X-Y-Z, 120 cycles, 6 hours)	DCR change ≤ ±15 % No mechanical damage	MIL-STD-202G Method 201A

Agency Recognition

UL File Number E198545

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WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

* RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.
** Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

SinglFuse™ SF-3812TM-T Series Applications

- Telecom and networking equipment surge protection
- T1/E1/J1
- 10/100/1000BaseT Ethernet
- xDSL (VDSL/VDSL2+, ADSL/ADSL2+)
- Fiber to the Curb (FTTC) SLIC
- Fiber to the Premises (FTTP) SLIC
- POTS systems

SF-3812TM-T Series – SinglFuse™ Telefuse™ Telecom Protectors

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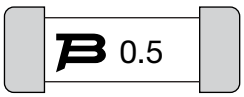
Environmental Characteristics

Operating Temperature ..... -55 °C to +125 °C
Storage Conditions
- Temperature ..... +15 °C to +30 °C
- Humidity ..... 20 % to 70 %
- Shelf Life ..... 2 years from manufacturing date

Moisture Sensitivity Level 1
ESD Classification (HBM) ..... Class 6

Typical Part Marking

Represents total content. Layout may vary.



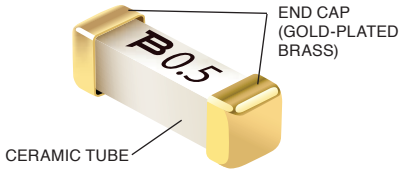
Rated Current	Part Marking
0.5 A	0.5
1.25 A	1.25
2.0 A	2.0

How to Order

SF - 3812 TM 050 T - 2

- SinglFuse™ Product Designator
- SMD Footprint
  - 3812 = EIA 3812 (10030 metric)
- Fuse Blow Type
  - TM = Time Lag, Telecom
- Rated Current
  - 050 ~ 200 (0.50 A ~ 2.00 A)
- Structure Type
  - T = Ceramic Tube
- Packaging Type
  - - 2 = Tape & Reel

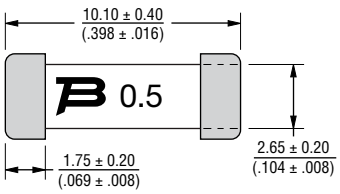
Construction

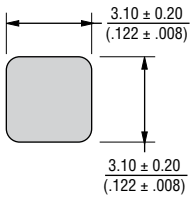


Packaging Quantity

2,500 pieces per 13-inch reel

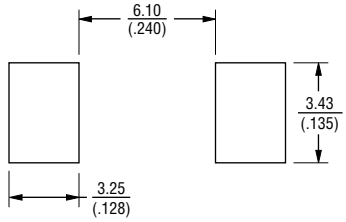
Product Dimensions





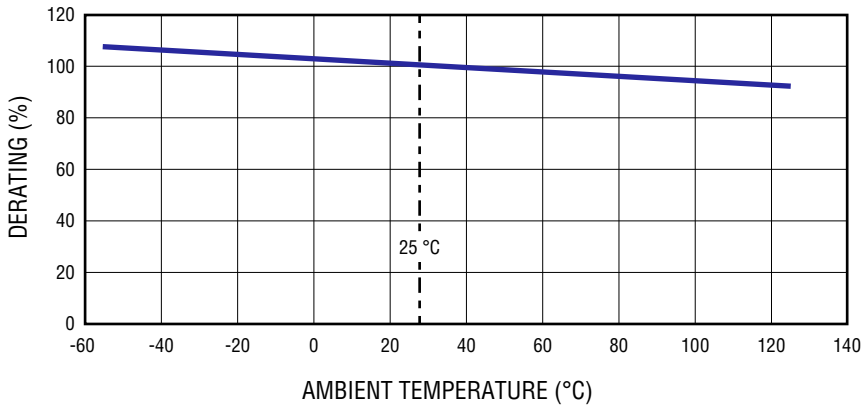
DIMENSIONS: MM / (INCHES)

Recommended Pad Layout

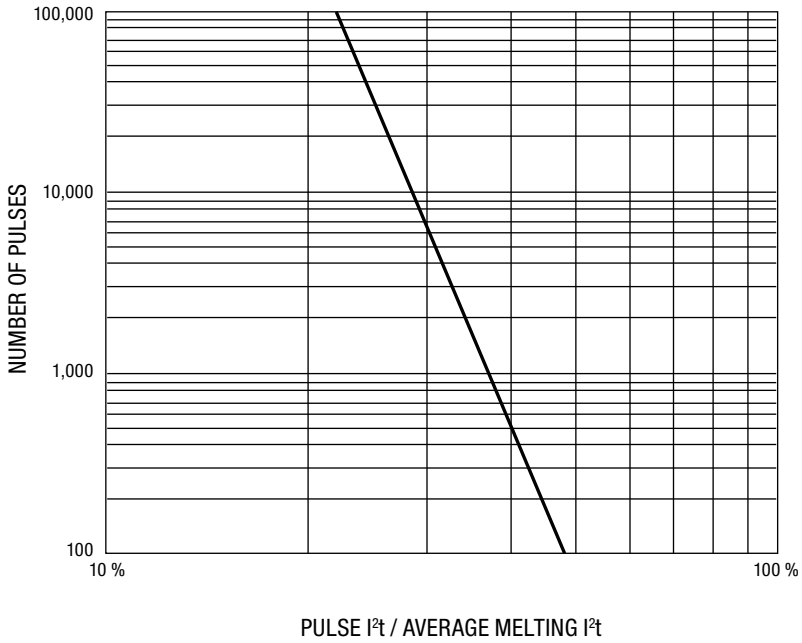


DIMENSIONS: MM / (INCHES)

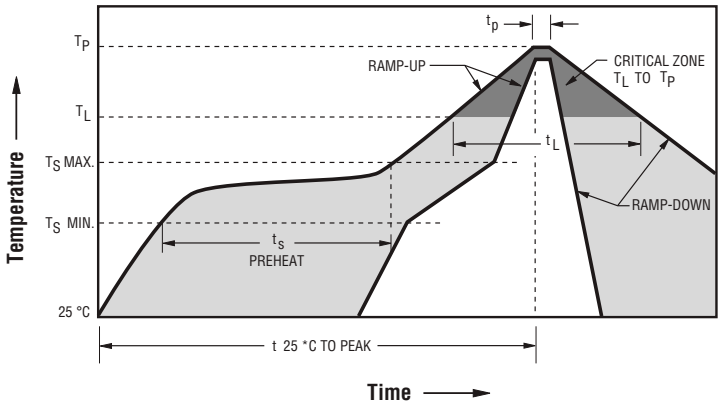
Current Rating Thermal Derating Curve



Pulse Cycle Withstand Capability



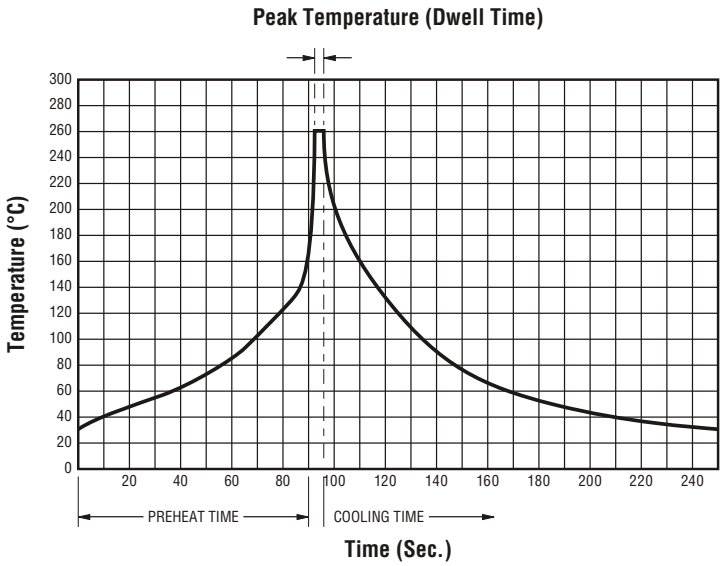
Solder Reflow Recommendations



Profile Feature	Pb-Free Assembly
Preheat / Soak: Temperature Min. (T_{smin}) Temperature Max. (T_{smax}) Time (t_s) from (T_{smin} to T_{smax})	 150 °C 200 °C 60~180 seconds
Ramp Up Rate (T_L to T_p)	3 °C / second max.
Ramp Up Rate (T_{smax} to T_L)	5 °C / second max.
Liquidous Temperature (T_L) Time (t_L) maintained above T_L	217 °C 60~90 seconds
Peak Package Body Temperature (T_p)	235 °C ± 5 °C
Time within 5 °C of actual peak temperature (T_p)	20~30 seconds*
Ramp Down Rate (T_p to T_L)	6 °C / second max.
Time 25 °C to Peak Temperature	8 minutes max.
Do not exceed	240 °C

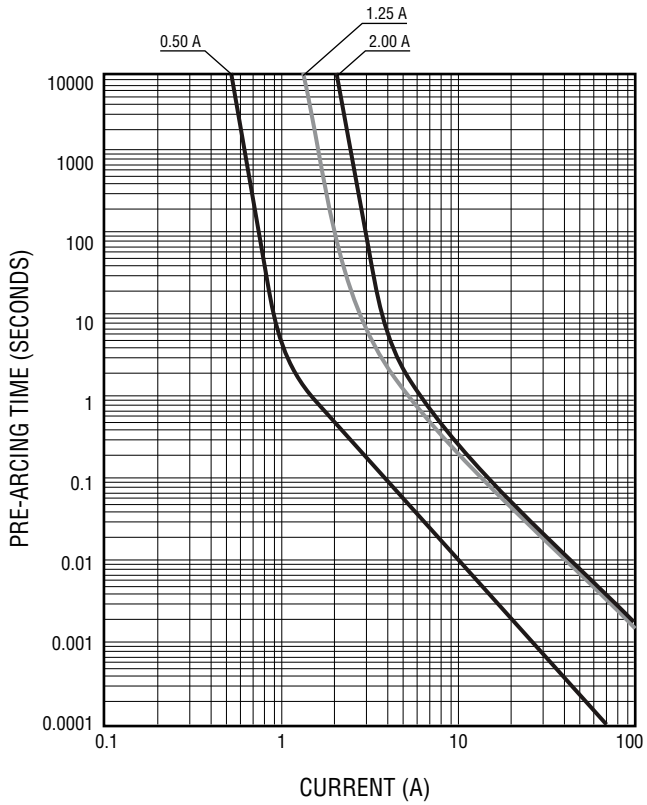
* Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.

Solder Wave Recommendations

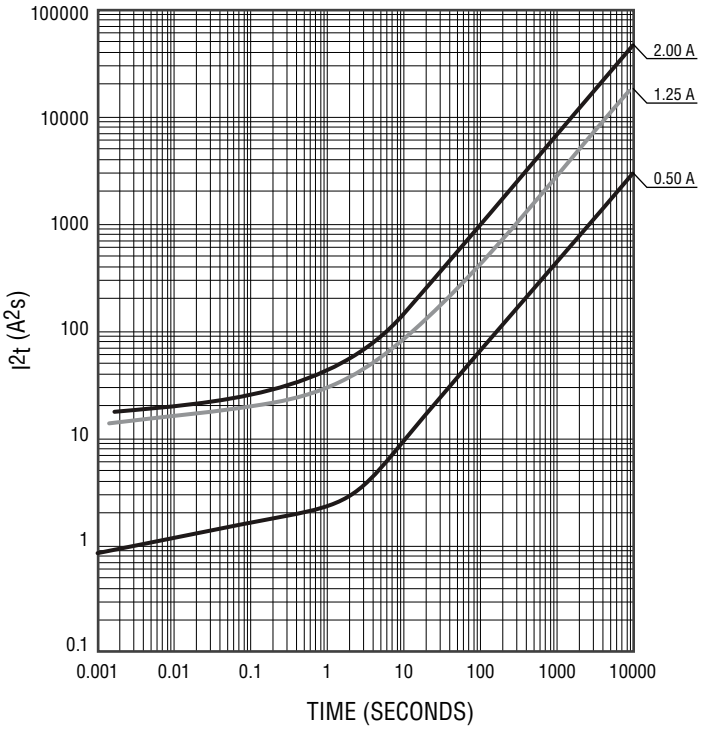


Profile Feature	Pb-Free Assembly
Preheat: Temperature Max. (T_{smax}) Time (Min. to Max.)	 150 °C 60~90 seconds
Solder Pot Temperature	260 °C max.
Solder Dwell Time	2~3 seconds

Average Pre-Arcing Time vs. Current Curves



Average I^2t vs. t Curves



Lightning Surge Specifications (Fuse Not Allowed to Open)

Surge Specification	Max. Rise / Min. Decay (μ sec.)	Min. Peak Current (A)	Min. Peak Voltage (V)	Repetitions Each Polarity	Recommended Fuse
Telcordia GR-1089	10 / 1000	100	600	25	1.25 A / 2 A
		100	1000	25	1.25 A / 2 A
		100*	2000	5	1.25 A / 2 A
	10 / 700	160	4000	5	1.25 A / 2 A
	10 / 360	100	1000	25	1.25 A / 2 A
		25	1000	5	0.5 A / 1.25 A / 2 A
	10 / 250	200*	4000	5	1.25 A / 2 A
	8 / 20	750*	6000	1	1.25 A / 2 A
		600*	6000	5	1.25 A / 2 A
		300	5000	5	1.25 A / 2 A
		800*	2000	5	1.25 A / 2 A
		750	1500	5	1.25 A / 2 A
		400	800	5	1.25 A / 2 A
		300	600	5	1.25 A / 2 A
	2 / 10	500	5000	1	1.25 A / 2 A
		500	2500	10	1.25 A / 2 A
		300	1500	10	1.25 A / 2 A
		200	1000	5	1.25 A / 2 A
		100	800	5	1.25 A / 2 A

* Additional impedance devices utilized for the test.

Surge Specification	Surge	Waveform (μ sec.)	Current (A)	Voltage (V)	Repetitions (Each)	Recommended Fuse
FCC Part 68 (TIA-968-A)	Metallic A	10 x 560	100	800	1	1.25 A / 2 A
	Longitudinal A	10 x 160	200	1500	1	1.25 A / 2 A

Surge Specification	Surge	Waveform (μ sec.)	Current (A)	Voltage (V)	Repetitions (Each)	Recommended Fuse
UL / EN 60950 (ITU-T K20)	Non-handheld	10 x 700	37.5	1500	5	0.5 A / 1.25 A / 2 A
	Handheld Units		62.5	2500	5	0.5 A / 1.25 A / 2 A

AC Power Fault Tests (Fuse Not Allowed to Open)

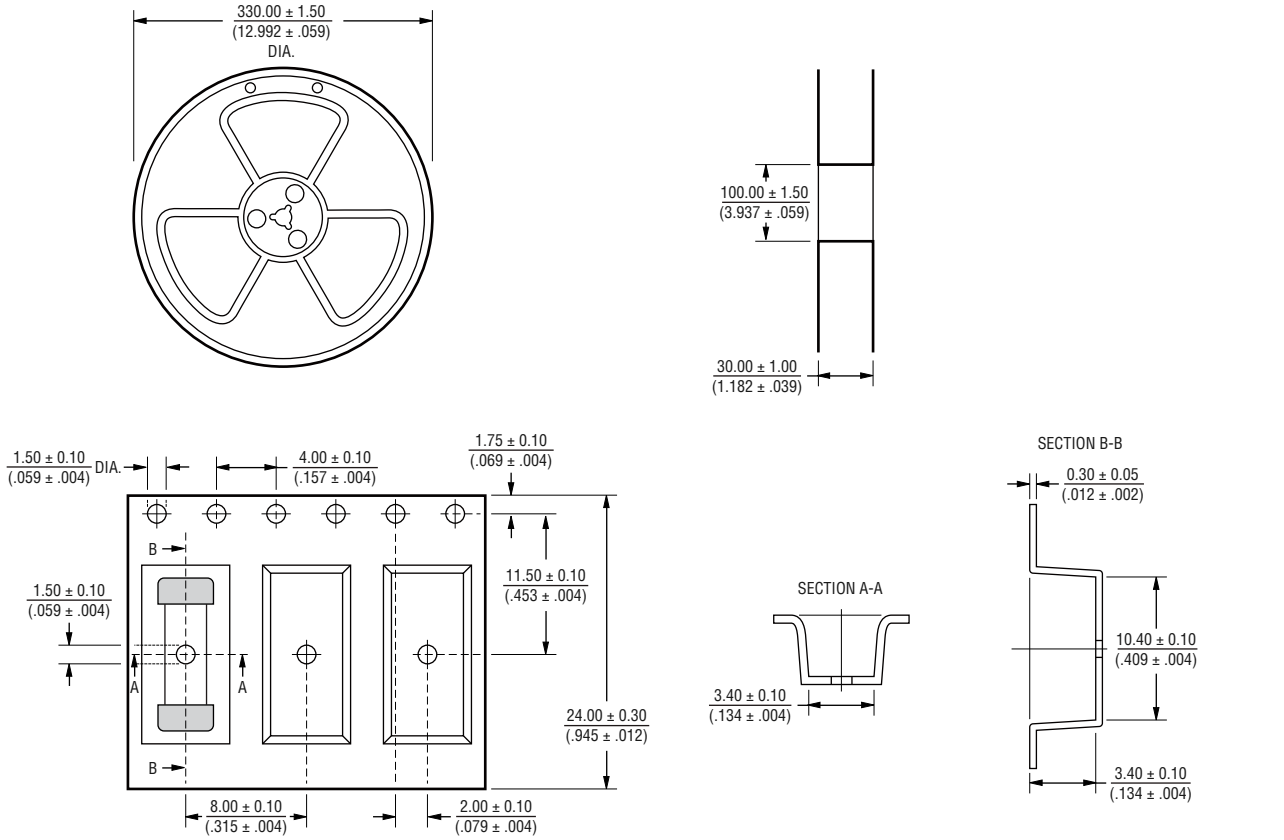
GR-1089 1st Level Test	Voltage (Vrms)	Short Circuit Current (A)	Hits	Duration	Recommended Fuse
1	50	0.33	1	15 min.	0.5 A / 1.25 A / 2 A
2	100	0.17	1	15 min.	0.5 A / 1.25 A / 2 A
3	600	0.5	1	30 sec.	0.5 A / 1.25 A / 2 A
4	1000	1	60	1 sec.	0.5 A / 1.25 A / 2 A
5	200	0.47	60	1 sec.	0.5 A / 1.25 A / 2 A
6	425	0.71	5	2 sec.	0.5 A / 1.25 A / 2 A
7	440	2.2	5	2 sec.	1.25 A / 2 A
8	600	3	1	1.1 sec.	1.25 A / 2 A
9	1000	5	1	0.4 sec.	1.25 A / 2 A

Note: These tests can be performed at a higher voltage, but the current must be as specified.

AC Current Limiting Protector Tests / Fusing Coordination Tests

Voltage (V_{AC})	Current (A)	Duration	Maximum Time For Fuse to Open (seconds)		
			0.50 A	1.25 A	2.00 A
600	2.20	up to 15 min.	1.0	will not open	will not open
	2.60		0.8	900	will not open
	3.00		0.5	20	will not open
	3.75		0.3	10	20
	5.00		0.2	4	10
	7.00		0.1	2	4
	10.00		0.05	1	1.2
	12.50		0.03	0.40	0.6
	20.00		0.01	0.14	0.2
	25.00		0.008	0.08	0.14
	30.00		0.006	0.04	0.10

Packaging Specifications



DIMENSIONS: MM / (INCHES)

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