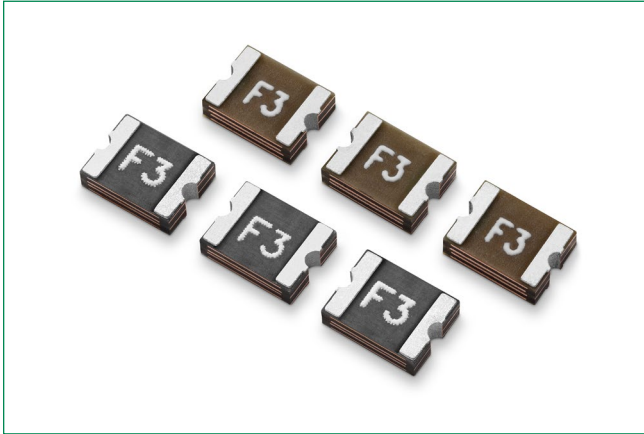


1210L Series

Surface Mount



Description

The 1210L Series PTC provides surface mount overcurrent protection for applications where space is at a premium and resettable protection is desired.

Features

- RoHS compliant, lead-free and halogen-free
- Fast response to fault currents
- Compact design saves board space
- Low resistance
- Low-profile
- Compatible with high temperature solders

Applications

- USB peripherals
- Disk drives
- CD-ROMs
- PC motherboards - plug and play protection
- Mobile phones - battery and port protection
- PDAs / digital cameras
- Game console port protection

Web Resources



Download ECAD models, order samples, and find technical resources at www.littelfuse.com

Agency Approvals

Agency	Agency File Number
	E183209
	R50119118

Electrical Characteristics

Part Number	Marking	I _{hold} (A)	I _{trip} (A)	V _{max} (Vdc)	I _{max} (A)	P _d typ. (W)	Maximum Time To Trip		Resistance		Agency Approvals	
							Current (A)	Time (Sec.)	R _{min} (Ω)	R _{1max} (Ω)		
1210L005	A	0.05	0.15	30	10	0.60	0.25	1.50	3.600	50.00	X	X
1210L005/90	A9	0.05	0.15	90	10	1.50	8.00	0.20	3.600	50.00	X	X
1210L010	B	0.10	0.30	30	10	0.60	0.50	1.50	1.600	15.00	X	X
1210L010/90	B9	0.10	0.25	90	10	1.50	8.00	0.30	1.500	15.00	X	X
1210L020	C	0.20	0.40	30	10	0.60	8.00	0.02	0.800	5.000	X	X
1210L020/72	C7	0.20	0.40	72	10	1.50	8.00	0.50	0.800	5.000	X	X
1210L035	E	0.35	0.70	6	100	0.60	8.00	0.20	0.320	1.300	X	X
1210L035/30	E3	0.35	0.70	30	40	0.60	8.00	0.20	0.320	1.300	X	X
1210L035/60	E6	0.35	0.70	60	10	1.50	8.00	1.00	0.320	1.500	X	X
1210L050	F	0.50	1.00	13.2	100	0.60	8.00	0.05	0.250	0.900	X	X
1210L050/30	F3	0.50	1.00	30	40	0.60	8.00	0.15	0.220	0.900	X	X
1210L075	G	0.75	1.50	6	100	0.60	8.00	0.10	0.130	0.400	X	X
1210L075/24	G2	0.75	1.50	24	100	0.60	8.00	0.10	0.130	0.400	X	X
1210L110/12	H1	1.10	2.20	12	100	0.6	8.00	0.10	0.060	0.210	X	X
1210L110/16	HF	1.10	2.20	16	100	0.6	8.00	0.10	0.060	0.210	X	X
1210L110TH	H	1.10	2.20	8	100	0.60	8.00	0.10	0.060	0.210	X	X
1210L150/16	KF	1.50	3.00	16	100	0.80	8.00	0.30	0.040	0.110	X	X
1210L150TH	K	1.50	3.00	6	100	0.80	8.00	0.30	0.040	0.110	X	X
1210L175	V	1.75	3.50	6	100	0.80	8.00	0.60	0.020	0.080	X	X
1210L200	L	2.00	4.00	6	100	0.80	8.00	1.00	0.015	0.070	X	X

I_{hold} = Hold current: maximum current device will pass without tripping in 20°C still air.

I_{trip} = Trip current: minimum current at which the device will trip in 20°C still air.

V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max})

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})

P_d = Power dissipated from device when in the tripped state at 20°C still air.

R_{min} = Minimum resistance of device in initial (un-soldered) state.

R_{typ} = Typical resistance of device in initial (un-soldered) state.

R_{1max} = Maximum resistance of device at 20°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.

1210L Series

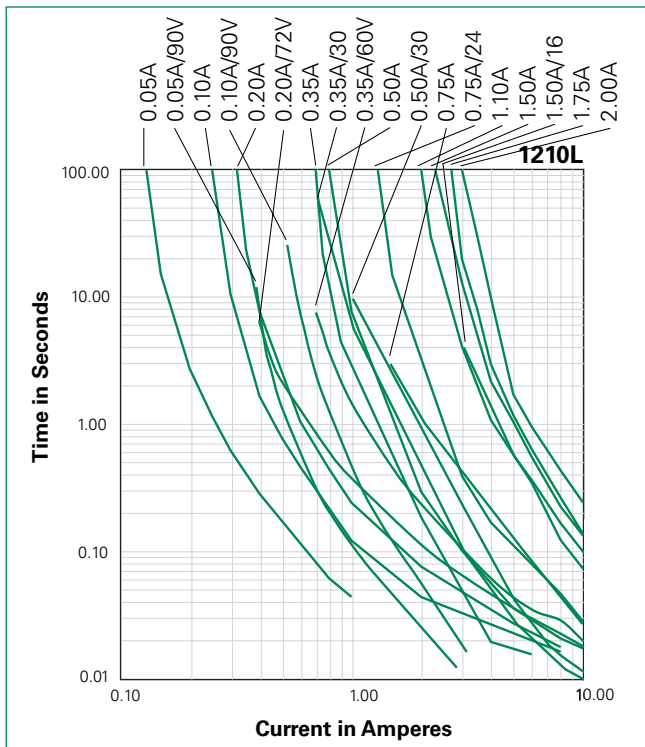
Surface Mount

Temperature Derating

Part Number	Ambient Operation Temperature								
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	85°C
1210L005	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
1210L005/90	0.078	0.070	0.060	0.050	0.044	0.038	0.034	0.029	0.023
1210L010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.05
1210L010/90	0.157	0.139	0.121	0.100	0.084	0.075	0.066	0.057	0.043
1210L020	0.29	0.26	0.22	0.20	0.16	0.14	0.13	0.11	0.08
1210L020/72	0.311	0.275	0.240	0.200	0.170	0.153	0.135	0.117	0.091
1210L035	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
1210L035/30	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
1210L035/60	0.54	0.48	0.42	0.35	0.30	0.27	0.24	0.21	0.16
1210L050	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
1210L050/30	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
1210L075	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
1210L075/24	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
1210L110/12	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
1210L110/16	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
1210L110TH	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
1210L150/16	2.30	2.02	1.76	1.50	1.24	1.11	1.00	0.86	0.65
1210L150TH	2.30	2.02	1.76	1.50	1.24	1.11	1.00	0.85	0.65
1210L175	2.45	2.22	2.01	1.75	1.45	1.26	1.10	0.98	0.80
1210L200	2.60	2.44	2.35	2.00	1.78	1.67	1.50	1.45	1.10

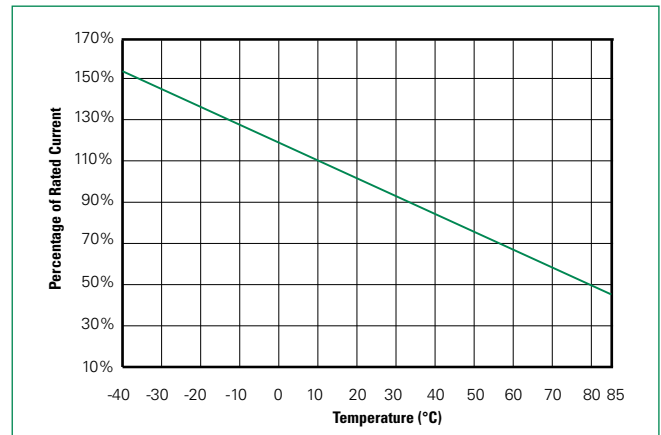
Note: The temperature derating data is only for reference, please contact Littelfuse technical support for detail temperature derating information.

Average Time Current Curves



The average time current curves and Temperature Derating curve performance is affected by a number of variables, and these curves provided as guidance only. Customer must verify the performance in their application.

Temperature Derating Curve



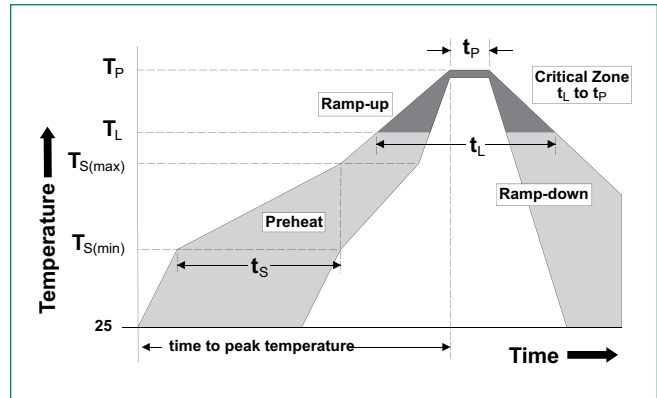
Note: Typical Temperature derating curve, refer to table for derating data

1210L Series

Surface Mount

Soldering Parameters

Profile Feature		Pb-Free Assembly
Average Ramp-Up Rate ($T_{S(max)}$ to T_p)		3°C/second max
Pre Heat:	Temperature Min ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (Min to Max) (t_s)	60 – 180 secs
Time Maintained Above:	Temperature (T_L)	217°C
	Temperature (t_L)	60 – 150 seconds
Peak / Classification Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes Max.



Physical Specifications

Terminal Material	Solder-Plated Copper (Solder Material: Matte Tin (Sn))
Lead Solderability	Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3.

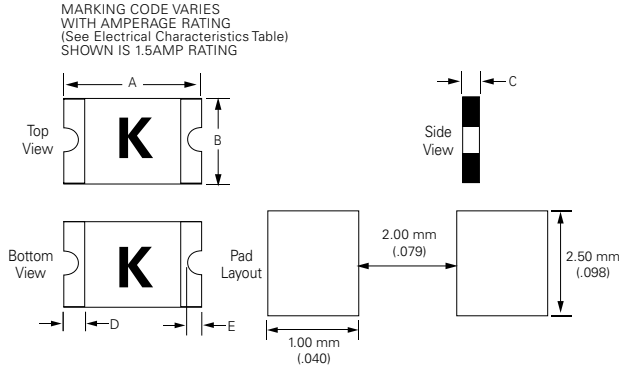
Environmental Specifications

Operating Temperature	-40°C to +85°C
Maximum Device Surface Temperature in Tripped State	125°C
Passive Aging	+85°C, 1000 hours -/+5% typical resistance change
Humidity Aging	+85°C, 85, R.H., 1000 hours -/+5% typical resistance change
Thermal Shock	MIL-STD-202, Method 107 +85°C/-40°C, 20 times -30% typical resistance change
Solvent Resistance	MIL-STD-202, Method 215 No change
Vibration	MIL-STD-883, Method 2007, Condition A No change
Moisture Level Sensitivity	Level 1, J-STD-020

1210L Series

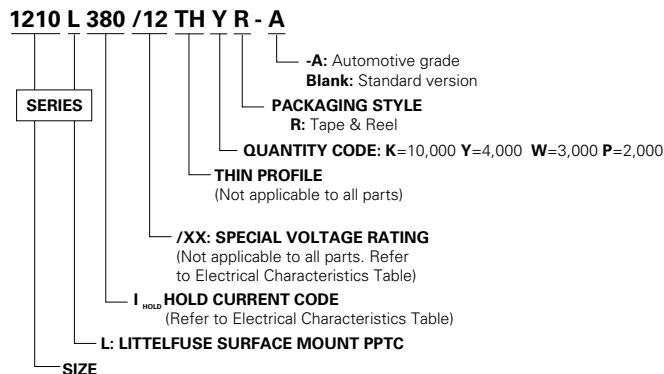
Surface Mount

Dimensions



Part Number	A				B				C				D				E			
	Inches		mm		Inches		mm		Inches		mm		Inches		mm		Inches		mm	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1210L005	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L005/90	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L010	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L010/90	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L020	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.02	0.04	0.60	1.00	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L020/72	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.02	0.04	0.60	1.00	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L035	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.02	0.03	0.50	0.85	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L035/30	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L035/60	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.06	0.75	1.50	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L050	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.02	0.03	0.50	0.85	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L050/30	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L075	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.02	0.03	0.50	0.85	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L075/24	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.05	0.07	1.20	1.80	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L110/12	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L110/16	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L110TH	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.01	0.03	0.30	0.71	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L150/16	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.03	0.05	0.75	1.25	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L150TH	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.04	0.75	1.07	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L175	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.02	0.04	0.60	1.00	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50
1210L200	0.12	0.14	3.0	3.43	0.09	0.11	2.35	2.80	0.03	0.06	0.80	1.60	0.01	0.03	0.25	0.75	0.004	0.02	0.10	0.50

Part Ordering Number System



1210L Series

Surface Mount

Packaging Options

Part Number	Ordering Number	Halogen Free	I _{hold} (A)	I _{hold} Code	Packaging Option	Quantity	Quantity & Packaging Codes
1210L005	1210L005WVR	Yes	0.05	005	Tape and Reel	3,000	WR
1210L005/90	1210L005/90WVR	Yes	0.05	005	Tape and Reel	3,000	WR
1210L010	1210L010WVR	Yes	0.10	010	Tape and Reel	3,000	WR
1210L010/90	1210L010/90WVR	Yes	0.10	010	Tape and Reel	3,000	WR
1210L020	1210L020WVR	Yes	0.20	020	Tape and Reel	3,000	WR
1210L020/72	1210L020/72WVR	Yes	0.20	020	Tape and Reel	3,000	WR
1210L035	1210L035YR	Yes	0.35	035	Tape and Reel	4,000	YR
1210L035/30	1210L035/30WVR	Yes	0.35	035	Tape and Reel	3,000	WR
1210L035/60	1210L035/60PR	Yes	0.35	035	Tape and Reel	2,000	PR
1210L050	1210L050YR	Yes	0.50	050	Tape and Reel	4,000	YR
1210L050/30	1210L050/30WVR	Yes	0.50	050	Tape and Reel	3,000	WR
1210L075	1210L075YR	Yes	0.75	075	Tape and Reel	4,000	YR
1210L075/24	1210L075/24PR	Yes	0.75	075	Tape and Reel	2,000	PR
1210L110/12	1210L110/12WVR	Yes	1.10	110	Tape and Reel	3,000	WR
1210L110/16	1210L110/16WVR	Yes	1.10	110	Tape and Reel	3,000	WR
1210L110TH	1210L110THYR	Yes	1.10	110	Tape and Reel	4,000	YR
1210L150/16	1210L150/16WVR	Yes	1.50	150	Tape and Reel	3,000	WR
1210L150TH	1210L150THWVR	Yes	1.50	150	Tape and Reel	3,000	WR
1210L175	1210L175WVR	Yes	1.75	175	Tape and Reel	3,000	WR
1210L200	1210L200PR	Yes	2.00	200	Tape and Reel	2,000	PR

Tape and Reel Specifications

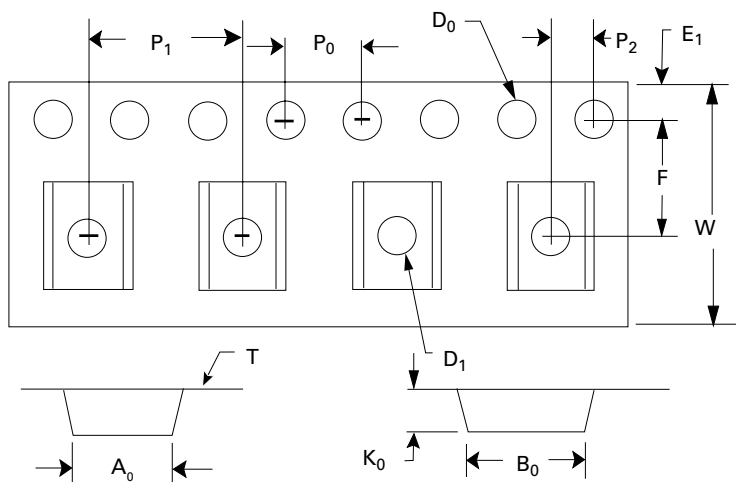
TAPE SPECIFICATIONS: EIA-481-1 (mm)			
	1210L035 1210L050 1210L075 1210L110TH	1210L005 1210L005/90 1210L010 1210L010/90 1210L020 1210L020/72 1210L035/30 1210L050/30 1210L110/12 1210L110/16 1210L150/16 1210L150TH 1210L175	1210L035/60 1210L200 1210L075/24
W	8.00+/-0.30	8.00+/-0.30	8.00+/-0.30
F	3.50+/-0.05	3.50+/-0.05	3.50+/-0.05
E₁	1.75+/-0.10	1.75+/-0.10	1.75+/-0.10
D₀	1.55+/-0.05	1.55+/-0.05	1.55+/-0.05
D₁	1.00 (min)	1.00 (min)	1.00 (min)
P₀	4.00+/-0.10	4.00+/-0.10	4.00+/-0.10
P₁	4.00+/-0.10	4.00+/-0.10	4.00+/-0.10
P₂	2.00+/-0.05	2.00+/-0.05	2.00+/-0.05
A₀	2.82+/-0.10	2.82+/-0.10	2.80+/-0.10
B₀	3.46+/-0.10	3.50+/-0.10	3.50+/-0.10
T	0.25+/-0.10	0.20+/-0.10	0.25+/-0.10
K₀	1.00+/-0.10	1.30+/-0.10	1.60+/-0.10
Leader min.	390	390	390
Trailer min.	160	160	160

REEL DIMENSIONS: EIA-481-1 (mm)	
C	Ø178+/- 1.0
D	Ø60.2+/-0.5
H	11.0+/-0.05
W	9.0+/- 1.5

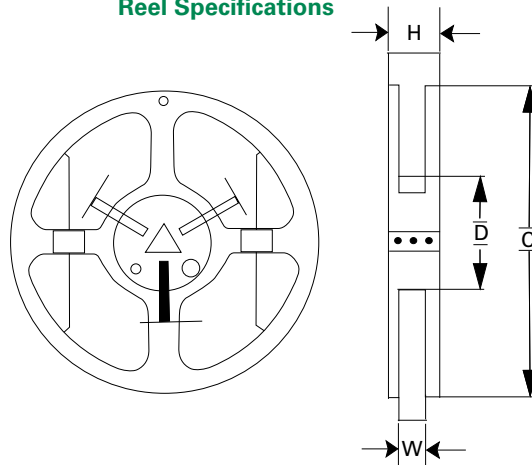
1210L Series

Surface Mount

Tape Specifications



Reel Specifications



Warning

- Users should independently evaluate the suitability of and test each product selected for their own application.
- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- These devices are intended for protection against damage caused by occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicone-based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- PPTC devices are not recommended for installation in applications where the device is constrained such that its PTC properties are inhibited, for example in rigid potting materials or in rigid housings, which lack adequate clearance to accommodate device expansion.
- Operation in circuits with a large inductance can generate a circuit voltage (Ldi/dt) above the rated voltage of the device.

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