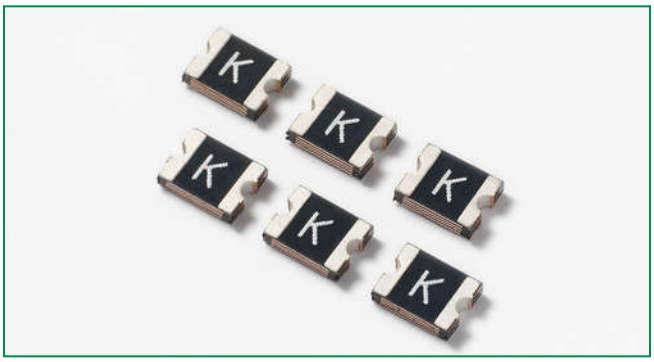
POLY-FUSE® Resettable PTCs

Surface Mount > 1210L Series

1210L Series



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

Agency Approvals

AGENCY	AGENCY FILE NUMBER
c UL us	E183209
	R50119118

Additional Information

Datasheet | Resources | Samples

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)	c UL us	
1210L005	A	0.05	0.15	30	10	0.60	0.25	1.50	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
1210L020	C	0.20	0.40	30	10	0.60	8.00	0.02	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		
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		
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		
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.

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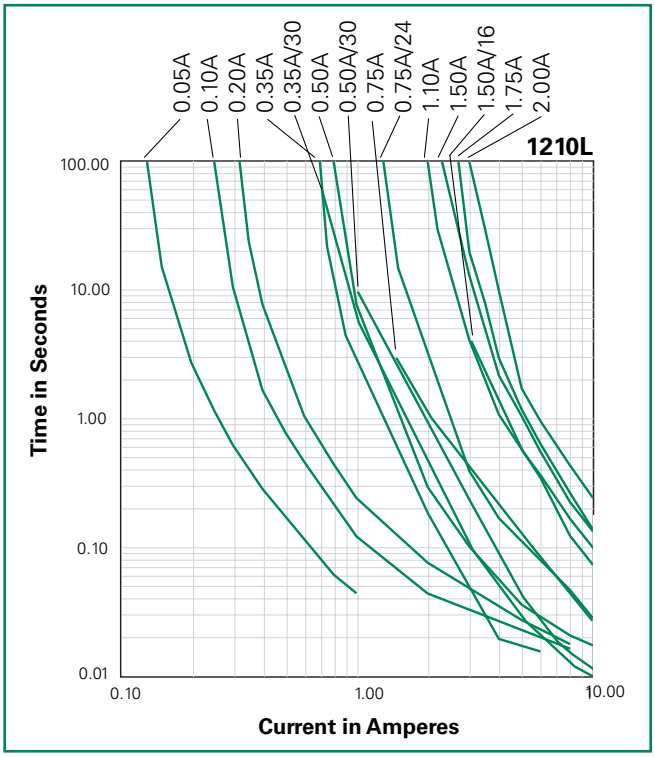
Temperature Rerating

	Ambient Operation Temperature								
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	85°C
Part Number	Hold Current (A)								
1210L005	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
1210L010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
1210L020	0.29	0.26	0.22	0.20	0.16	0.14	0.13	0.11	0.08
1210L035	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
1210L035/30	0.53	0.46	0.42	0.35	0.30	0.26	0.25	0.22	0.19
1210L050	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
1210L050/30	0.75	0.67	0.59	0.50	0.42	0.39	0.36	0.31	0.25
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	1.65	1.47	1.27	1.10	0.92	0.83	0.73	0.63	0.52
1210L110/16	1.65	1.47	1.27	1.10	0.92	0.83	0.73	0.63	0.52
1210L110TH	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
1210L150/16	2.19	1.97	1.74	1.50	1.31	1.17	1.05	0.93	0.78
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

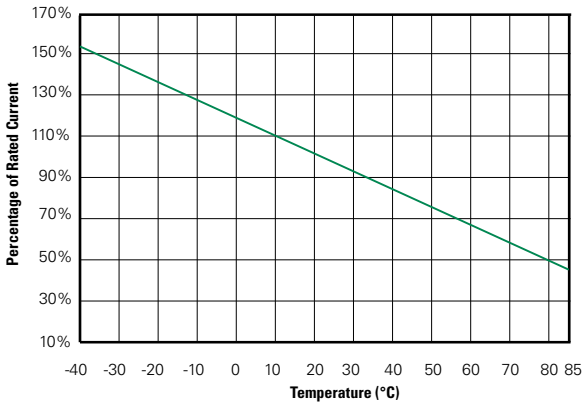
Note:
The temperature rerating data is only for reference, please contact Littelfuse technical support for detail temperature rerating information.

Average Time Current Curves



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

Temperature Rerating Curve



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

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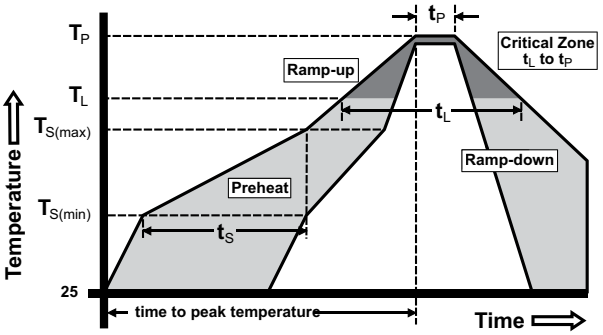
Soldering Parameters

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.



- All temperature refer to topside of the package, measured on the package body surface
- If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements
- Recommended reflow methods: IR, vapor phase oven, hot air oven, N_2 environment for lead
- Recommended maximum paste thickness is 0.25mm (0.010inch)
- Devices can be cleaned using standard industry methods and solvents
- Devices can be reworked using the standard industry practices

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/Storage 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

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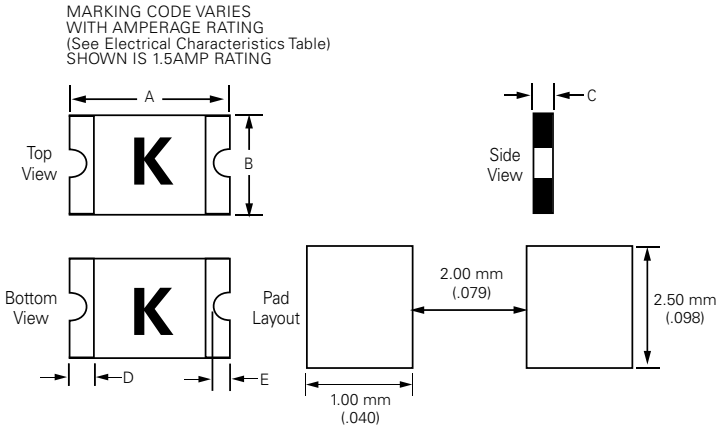
Dimensions



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
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
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
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
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	0.04	0.05	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	0.07	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

1210 L 380 /12 TH Y R - A

- **SIZE**
- **L: LITTELFUSE SURFACE MOUNT PPTC**
- **I_{HOLD} HOLD CURRENT CODE** (Refer to Electrical Characteristics Table)
- **/XX: SPECIAL VOLTAGE RATING** (Not applicable to all parts. Refer to Electrical Characteristics Table)
- **THIN PROFILE** (Not applicable to all parts)
- **QUANTITY CODE: K**=10,000 **Y**=4,000 **W**=3,000 **P**=2,000
- **PACKAGING STYLE** **R:** Tape & Reel
- **-A:** Automotive grade **Blank:** Standard version

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Packaging Options

Part Number	Ordering Number	Halogen Free	I_{hold} (A)	I_{hold} Code	Packaging Option	Quantity	Quantity & Packaging Codes
1210L005	1210L005WR	Yes	0.05	005	Tape and Reel	3000	WR
1210L010	1210L010WR	Yes	0.10	010	Tape and Reel	3000	WR
1210L020	1210L020WR	Yes	0.20	020	Tape and Reel	3000	WR
1210L035	1210L035YR	Yes	0.35	035	Tape and Reel	4000	YR
1210L035/30	1210L035/30WR	Yes	0.35	035	Tape and Reel	3,000	WR
1210L050	1210L050YR	Yes	0.50	050	Tape and Reel	4000	YR
1210L050/30	1210L050/30WR	Yes	0.50	050	Tape and Reel	3,000	WR
1210L075	1210L075YR	Yes	0.75	075	Tape and Reel	4000	YR
1210L075/24	1210L075/24PR	Yes	0.75	075	Tape and Reel	2000	PR
1210L110/12	1210L110/12WR	Yes	1.10	110	Tape and Reel	3,000	WR
1210L110/16	1210L110/16WR	Yes	1.10	110	Tape and Reel	3,000	WR
1210L110TH	1210L110THYR	Yes	1.10	110	Tape and Reel	4000	YR
1210L150/16	1210L150/16WR	Yes	1.50	150	Tape and Reel	3,000	WR
1210L150TH	1210L150THWR	Yes	1.50	150	Tape and Reel	3000	WR
1210L175	1210L175WR	Yes	1.75	175	Tape and Reel	3000	WR
1210L200	1210L200PR	Yes	2.00	200	Tape and Reel	2000	PR

Tape and Reel Specifications

TAPE SPECIFICATIONS: EIA-481-1 (mm)				
	Packaging Code "YR": 1210L035, 1210L050, 1210L075, 1210L110TH	**Packaging Code "WR":** 1210L005, 1210L010, 1210L020, 1210L035/30, 1210L050/30, 1210L110/12, 1210L110/16, 1210L150/16, 1210L150TH, 1210L175	**Packaging Code "PR":** 1210L200	**Packaging Code "PR":** 1210L075/24
W	8.00+/-0.30	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	3.50+/-0.05
E_1	1.75+/-0.10	1.75+/-0.10	1.75+/-0.10	1.75+/-0.10
D_0	1.55+/-0.05	1.55+/-0.05	1.55+/-0.05	1.55+/-0.05
D_1	1.00 (min)	1.00 (min)	1.00 (min)	1.00+0.25/-0
P_0	4.00+/-0.10	4.00+/-0.10	4.00+/-0.10	4.00+/-0.10
P_1	4.00+/-0.10	4.00+/-0.10	4.00+/-0.10	4.00+/-0.10
P_2	2.00+/-0.05	2.00+/-0.05	2.00+/-0.05	2.00+/-0.05
A_0	2.82+/-0.10	2.82+/-0.10	2.80+/-0.10	2.80+/-0.10
B_0	3.46+/-0.10	3.50+/-0.10	3.50+/-0.10	3.55+/-0.10
T	0.25+/-0.10	0.20+/-0.10	0.25+/-0.10	0.25+/-0.10
K_0	1.00+/-0.10	1.30+/-0.10	1.60+/-0.10	1.75+/-0.10
Leader min.	390	390	390	390
Trailer min.	160	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

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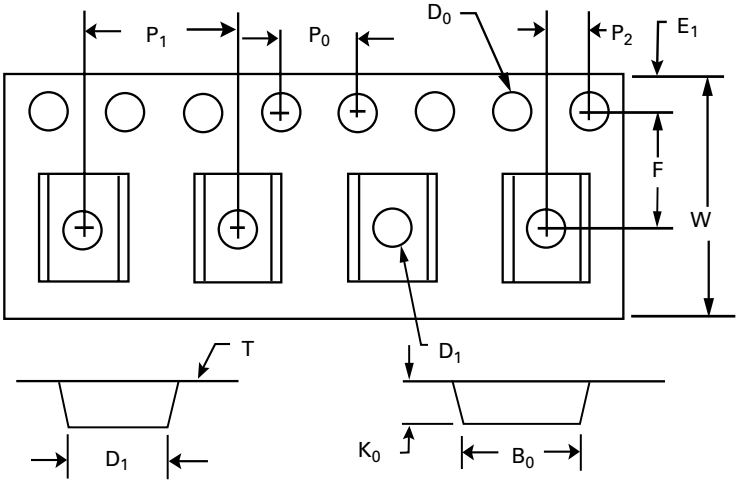
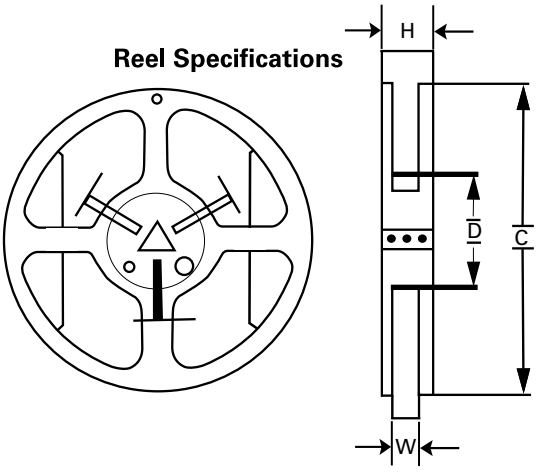
Tape Specifications



Reel Specifications



WARNING

- Users shall independently assess the suitability of these devices for each of their applications
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire
- These devices are intended to protect against the effects of temporary over-current or over-temperature conditions and are not intended to perform as protective devices where such conditions are expected to be repetitive or prolonged in duration
- Exposure to silicon-based oils, solvents, electrolytes, acids, and similar materials can adversely affect the performance of these PPTC devices
- These devices undergo thermal expansion under fault conditions, and thus shall be provided with adequate space and be protected against mechanical stresses
- Circuits with inductance may generate a voltage (L di/dt) above the rated voltage of the PPTC device.

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