



### Description

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



### Features

- RoHS compliant and lead-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
	E183209
	R50119118

### Electrical Characteristics

Part Number	Marking	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	V <sub>max</sub> (Vdc)	I <sub>max</sub> (A)	P <sub>d</sub> max. (W)	Maximum Time To Trip		Resistance			Agency Approvals	
							Current (A)	Time (Sec.)	R <sub>min</sub> (Ω)	R <sub>typ</sub> (Ω)	R <sub>1max</sub> (Ω)		
1210L005	A	0.05	0.15	30	10	0.60	0.25	1.50	3.600	25.00	50.00	X	X
1210L010	B	0.10	0.30	30	10	0.60	0.50	1.50	1.600	7.000	15.00	X	X
1210L020	C	0.20	0.40	30	10	0.60	8.00	0.02	0.800	2.900	5.000	X	X
1210L035	E	0.35	0.70	6	100	0.60	8.00	0.20	0.320	0.810	1.300	X	X
1210L050	F	0.50	1.00	13.2	100	0.60	8.00	0.10	0.250	0.550	0.900	X	X
1210L075	G	0.75	1.50	6	100	0.60	8.00	0.10	0.130	0.290	0.400	X	X
1210L110	H	1.10	2.20	6	100	0.60	8.00	0.30	0.060	0.140	0.210	X	X
1210L150	K	1.50	3.00	6	100	0.80	8.00	0.50	0.040	0.070	0.110	X	X

I<sub>hold</sub> = Hold current: maximum current device will pass without tripping in 20°C still air.

I<sub>trip</sub> = Trip current: minimum current at which the device will trip in 20°C still air.

V<sub>max</sub> = Maximum voltage device can withstand without damage at rated current (I<sub>max</sub>)

I<sub>max</sub> = Maximum fault current device can withstand without damage at rated voltage (V<sub>max</sub>)

P<sub>d</sub> = Power dissipated from device when in the tripped state at 20°C still air.

R<sub>min</sub> = Minimum resistance of device in initial (un-soldered) state.

R<sub>typ</sub> = Typical resistance of device in initial (un-soldered) state.

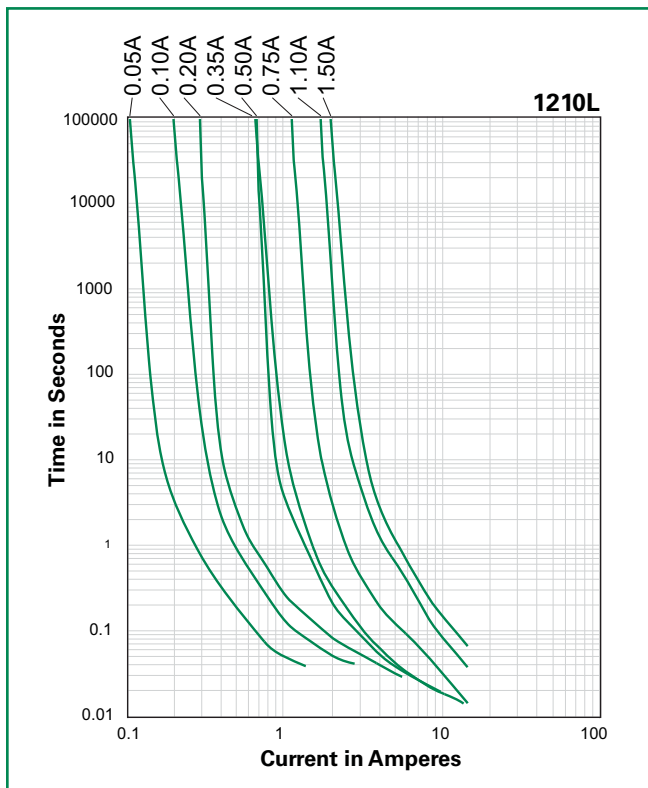
R<sub>1max</sub> = Maximum resistance of device at 20°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

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

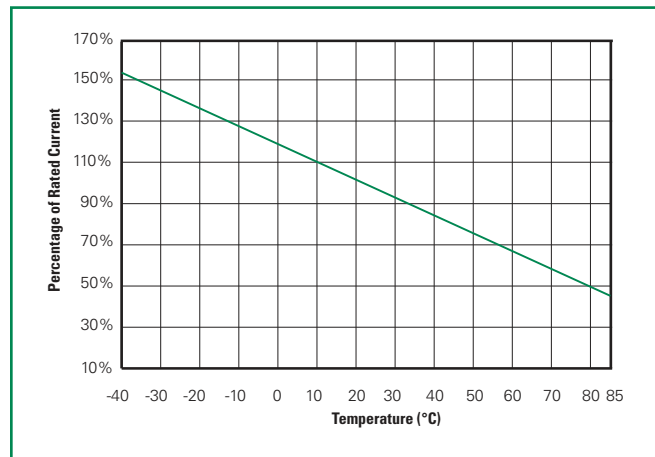
**Temperature Derating**

Part Number	Ambient Operation Temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
	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
1210L050	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
1210L110	1.69	1.48	1.29	1.10	0.88	0.76	0.65	0.57	0.43
1210L150	2.13	1.92	1.71	1.50	1.26	1.14	1.01	0.89	0.71

**Average Time Current Curves**



**Temperature Derating Curve**



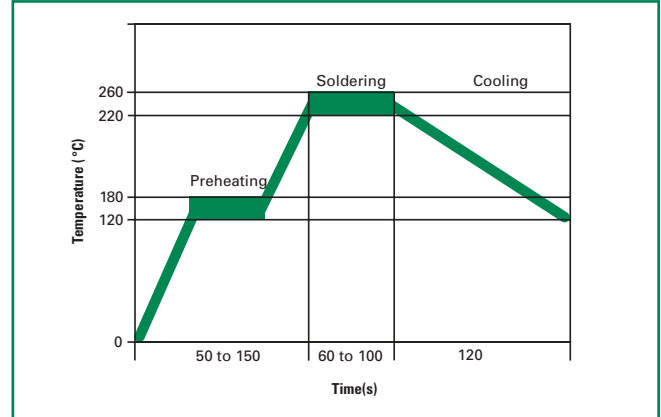
The average time current curves and Temperature Derating curve performance is affected by a number of variables, and these curves provided as guidance only. Customer must verify the performance in their application.

### Soldering Parameters

Condition	Reflow
Peak Temp/ Duration Time	260°C / 10 Sec
Time above liquids (TAL) 220°C	60 Sec ~ 100 Sec
Preheat 120°C~ 180°C	50 Sec ~ 150 Sec
Storage Condition	0°C~35°C, ≤70%RH

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N<sub>2</sub> environment for lead-free
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Devices can be cleaned using standard industry methods and solvents.

**Note:** If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.



### Physical Specifications

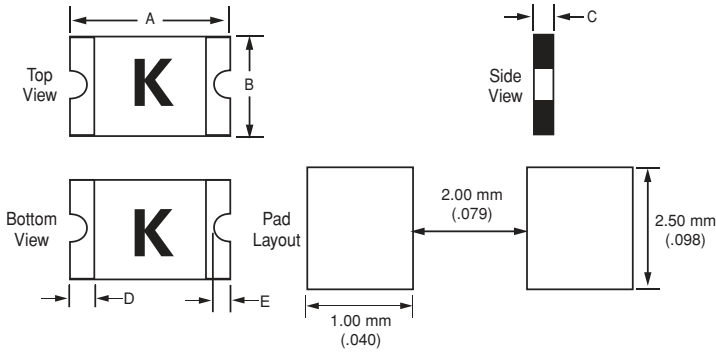
<b>Terminal Material</b>	Solder-Plated Copper (Solder Material: Matte Tin (Sn))
<b>Lead Solderability</b>	Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3.

### Environmental Specifications

<b>Operating/Storage Temperature</b>	-40°C to +85°C
<b>Maximum Device Surface Temperature in Tripped State</b>	125°C
<b>Passive Aging</b>	+85°C, 1000 hours -/+5% typical resistance change
<b>Humidity Aging</b>	+85°C, 85, R.H., 1000 hours -/+5% typical resistance change
<b>Thermal Shock</b>	MIL-STD-202, Method 107G +85°C/-40°C, 20 times -30% typical resistance change
<b>Solvent Resistance</b>	MIL-STD-202, Method 215 No change
<b>Vibration</b>	MIL-STD-883C, Method 2007.1, Condition A No change
<b>Moisture Level Sensitivity</b>	Level 2, J-STD-020C

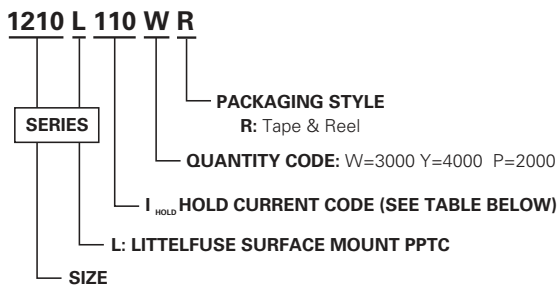
**Dimensions**

MARKING CODE VARIES WITH AMPERAGE RATING (See Electrical Characteristics Table) SHOWN IS 1.5AMP RATING



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.	Min.	Min.	Max.	Min.	Max.
1210L005	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	0.25	0.008	0.02	0.20	0.50
1210L010	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	0.25	0.008	0.02	0.20	0.50
1210L020	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.02	0.04	0.60	1.00	0.01	0.25	0.008	0.02	0.20	0.50
1210L035	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.02	0.03	0.50	0.85	0.01	0.25	0.008	0.02	0.20	0.50
1210L050	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.02	0.03	0.50	0.85	0.01	0.25	0.008	0.02	0.20	0.50
1210L075	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.02	0.03	0.50	0.85	0.01	0.25	0.008	0.02	0.20	0.50
1210L110	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.04	0.05	0.90	1.30	0.01	0.25	0.008	0.02	0.20	0.50
1210L150	0.12	0.14	3.00	3.43	0.09	0.11	2.35	2.80	0.03	0.07	0.80	1.80	0.01	0.25	0.008	0.02	0.20	0.50

**Part Ordering Number System**



**Packaging**

Part Number	Ordering Number	$I_{hold}$ (A)	$I_{hold}$ Code	Packaging Option	Quantity	Quantity & Packaging Codes
1210L005	1210L005WR	0.05	005	Tape and Reel	3000	WR
1210L010	1210L010WR	0.10	010	Tape and Reel	3000	WR
1210L020	1210L020WR	0.20	020	Tape and Reel	3000	WR
1210L035	1210L035YR	0.35	035	Tape and Reel	4000	YR
1210L050	1210L050YR	0.50	050	Tape and Reel	4000	YR
1210L075	1210L075YR	0.75	075	Tape and Reel	4000	YR
1210L110	1210L110WR	1.10	110	Tape and Reel	3000	WR
1210L150	1210L150PR	1.50	150	Tape and Reel	2000	PR

**Tape and Reel Specifications**

TAPE SPECIFICATIONS: EIA-481-1 (mm)			
	1210L035, 1210L050, 1210L075	1210L005, 1210L010, 1210L020, 1210L110	1210L150
<b>W</b>	8.0+/-0.30	8.0+/-0.30	8.0+/-0.30
<b>F</b>	3.5+/-0.05	3.5+/-0.05	3.5+/-0.05
<b>E<sub>1</sub></b>	1.75+/-0.10	1.75+/-0.10	1.75+/-0.10
<b>D<sub>0</sub></b>	1.55+/-0.05	1.55+/-0.05	1.55+/-0.05
<b>D<sub>1</sub></b>	1.0 (min)	1.0 (min)	1.0 (min)
<b>P<sub>0</sub></b>	4.0+/-0.10	4.0+/-0.10	4.0+/-0.10
<b>P<sub>1</sub></b>	4.0+/-0.10	4.0+/-0.10	4.0+/-0.10
<b>P<sub>2</sub></b>	2.0+/-0.05	2.0+/-0.05	2.0+/-0.05
<b>A<sub>0</sub></b>	2.82+/-0.10	2.82+/-0.10	2.67+/-0.10
<b>B<sub>0</sub></b>	3.46+/-0.10	3.46+/-0.10	3.36+/-0.10
<b>T</b>	0.25+/-0.10	0.25+/-0.10	0.25+/-0.10
<b>K<sub>0</sub></b>	1.00+/-0.10	1.30+/-0.10	1.65+/-0.10
Leader min.	390	390	390
Trailer min.	160	160	160

REEL DIMENSIONS: EIA-481-1 (mm)	
<b>H</b>	12.0+/-0.05
<b>W</b>	9.0+/-0.5
<b>D</b>	Ø 60+0.5
<b>F</b>	Ø 13.0+/-0.2
<b>C</b>	Ø 178+/-1.0
<b>H<sub>1</sub></b>	11+/-0.5
<b>W<sub>1</sub></b>	2.2+/-0.5
<b>W<sub>2</sub></b>	3.0+0.5
<b>W<sub>3</sub></b>	4.0+0.5
<b>W<sub>4</sub></b>	5.5+0.5

1210L Series

**Tape and Reel Diagram**

