



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 |
|---|--------------------|
|  | 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 |
| 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 |
| 1210L050 | F | 0.50 | 1.00 | 13.2 | 100 | 0.60 | 8.00 | 0.05 | 0.250 | 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 |
| 1210L110TH | H | 1.10 | 2.20 | 8 | 100 | 0.60 | 8.00 | 0.10 | 0.060 | 0.210 | 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.

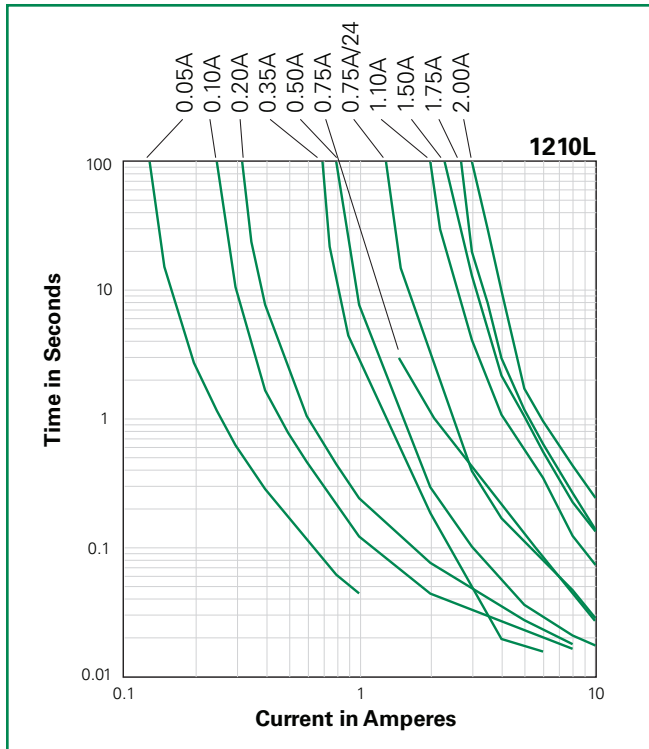
R_{1max} = Maximum resistance of device at 20°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

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

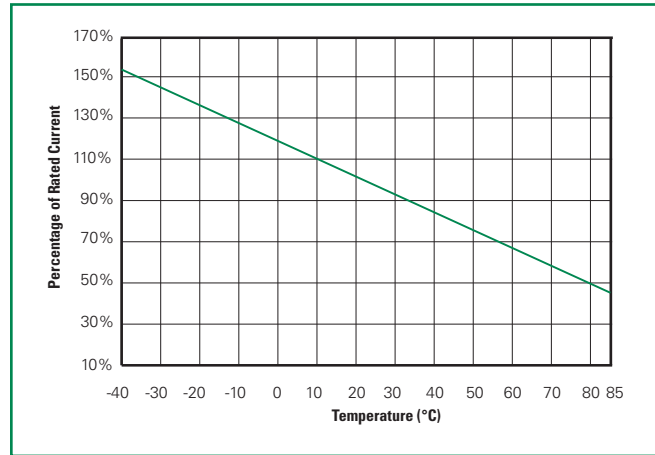
Temperature Derating

| 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 |
| 1210L075/24 | 1.13 | 1.00 | 0.88 | 0.75 | 0.61 | | 0.47 | 0.41 | 0.35 |
| 1210L110TH | 1.69 | 1.48 | 1.29 | 1.10 | 0.88 | 0.76 | 0.65 | 0.57 | 0.43 |
| 1210L150TH | 2.13 | 1.92 | 1.71 | 1.50 | 1.26 | 1.14 | 1.01 | 0.89 | 0.71 |
| 1210L175 | 2.42 | 2.22 | 1.98 | 1.75 | 1.52 | 1.35 | 1.23 | 1.05 | 0.84 |
| 1210L200 | 2.60 | 2.44 | 2.35 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.10 |

Average Time Current Curves



Temperature Derating Curve



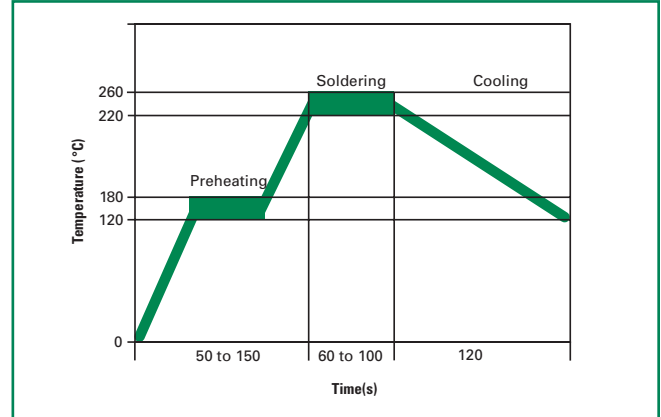
The average time current curves and Temperature Derating curve performance is affected by a number of variables, and these curves provided as guidance only. Customer must verify the performance in their application.

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, N₂ 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

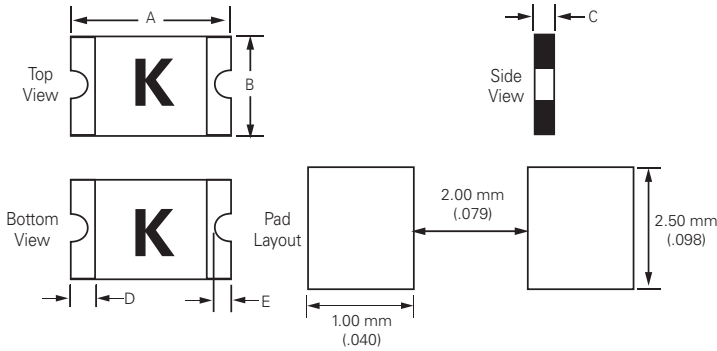
| | |
|---------------------------|--|
| Terminal Material | Solder-Plated Copper (Solder Material: Matte Tin (Sn)) |
| Lead Solderability | Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3. |

Environmental Specifications

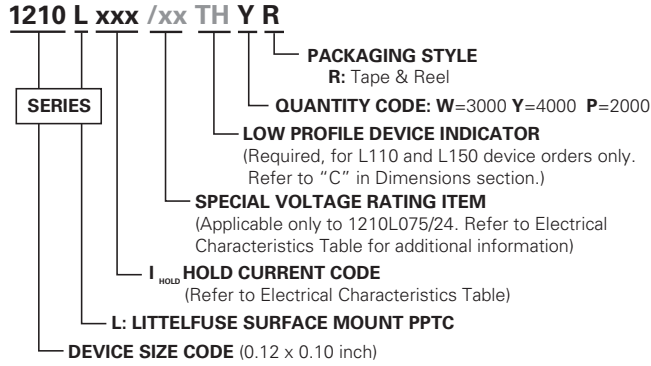
| | |
|--|---|
| Operating/Storage Temperature | -40°C to +85°C |
| Maximum Device Surface Temperature in Tripped State | 125°C |
| Passive Aging | +85°C, 1000 hours -/+5% typical resistance change |
| Humidity Aging | +85°C, 85, R.H., 1000 hours -/+5% typical resistance change |
| Thermal Shock | MIL-STD-202, Method 107G +85°C/-40°C, 20 times -30% typical resistance change |
| Solvent Resistance | MIL-STD-202, Method 215 No change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A No change |
| Moisture Level Sensitivity | Level 1, 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 | 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.1 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |
| 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 | 0.008 | 0.02 | 0.2 | 0.5 |

Part Ordering Number System

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 |
| 1210L050 | 1210L050YR | Yes | 0.50 | 050 | Tape and Reel | 4000 | YR |
| 1210L075 | 1210L075YR | Yes | 0.75 | 075 | Tape and Reel | 4000 | YR |
| 1210L075/24 | 1210L075/24PR | Yes | 0.75 | 075 | Tape and Reel | 2000 | PR |
| 1210L110TH | 1210L110THYR | Yes | 1.10 | 110 | Tape and Reel | 4000 | YR |
| 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 1210L150TH 1210L175 | Packaging Code "PR": 1210L075/24 1210L200 |
| W | 8.0+/-0.30 | 8.0+/-0.30 | 8.0+/-0.30 |
| F | 3.5+/-0.05 | 3.5+/-0.05 | 3.5+/-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 | 1.0 (min) | 1.0 (min) | 1.0 (min) |
| P₀ | 4.0+/-0.10 | 4.0+/-0.10 | 4.0+/-0.10 |
| P₁ | 4.0+/-0.10 | 4.0+/-0.10 | 4.0+/-0.10 |
| P₂ | 2.0+/-0.05 | 2.0+/-0.05 | 2.0+/-0.05 |
| A₀ | 2.82+/-0.10 | 2.82+/-0.10 | 2.67+/-0.10 |
| B₀ | 3.46+/-0.10 | 3.46+/-0.10 | 3.36+/-0.10 |
| T | 0.25+/-0.10 | 0.25+/-0.10 | 0.25+/-0.10 |
| K₀ | 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) | |
|------------------------------------|--------------|
| H | 12.0+/-0.05 |
| W | 9.0+/-0.5 |
| D | Ø 60+0.5 |
| F | Ø 13.0+/-0.2 |
| C | Ø 178+/-1.0 |
| H₁ | 11+/-0.5 |
| W₁ | 2.2+/-0.5 |
| W₂ | 3.0+0.5 |
| W₃ | 4.0+0.5 |
| W₄ | 5.5+0.5 |

