

Description

The 1206L 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
- Plug and play protection for motherboards and peripherals
- Mobile phones - battery and port protection
- Disk drives
- 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) |  |  |
| 1206L012 | A | 0.125 | 0.29 | 30 | 100 | 0.6 | 1.00 | 0.20 | 1.500 | 6.00 | X | X |
| 1206L016 | B | 0.16 | 0.37 | 30 | 100 | 0.6 | 1.00 | 0.30 | 1.200 | 4.50 | X | X |
| 1206L020 ¹ | C | 0.20 | 0.42 | 24 | 100 | 0.6 | 8.00 | 0.10 | 0.650 | 2.60 | X | X |
| 1206L025 ¹ | D | 0.25 | 0.50 | 16 | 100 | 0.6 | 8.00 | 0.08 | 0.550 | 2.30 | X | X |
| 1206L035 ¹ | E | 0.35 | 0.75 | 6 | 100 | 0.6 | 8.00 | 0.10 | 0.300 | 1.20 | X | X |
| 1206L035/16 | J | 0.35 | 0.75 | 16 | 100 | 0.6 | 8.00 | 0.10 | 0.300 | 1.20 | X | X |
| 1206L050 ¹ | F | 0.50 | 1.00 | 6 | 100 | 0.6 | 8.00 | 0.10 | 0.150 | 0.70 | X | X |
| 1206L050/15 | M | 0.50 | 1.00 | 15 | 100 | 0.6 | 8.00 | 0.10 | 0.150 | 0.75 | X | X |
| 1206L075/13.2 | G1 | 0.75 | 1.50 | 13.2 | 100 | 0.6 | 8.00 | 0.20 | 0.090 | 0.35 | X | X |
| 1206L075TH ¹ | G | 0.75 | 1.50 | 8 | 100 | 0.6 | 8.00 | 0.20 | 0.090 | 0.29 | X | X |
| 1206L110TH ¹ | H | 1.10 | 2.20 | 8 | 100 | 0.8 | 8.00 | 0.10 | 0.040 | 0.18 | X | X |
| 1206L150TH ¹ | K | 1.50 | 3.00 | 8 | 100 | 0.8 | 8.00 | 0.30 | 0.040 | 0.12 | X | X |
| 1206L175 | V | 1.75 | 3.50 | 6 | 100 | 0.8 | 8.00 | 0.50 | 0.020 | 0.09 | X | X |
| 1206L200 | L | 2.00 | 3.50 | 6 | 100 | 0.8 | 8.00 | 1.50 | 0.018 | 0.08 | 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.

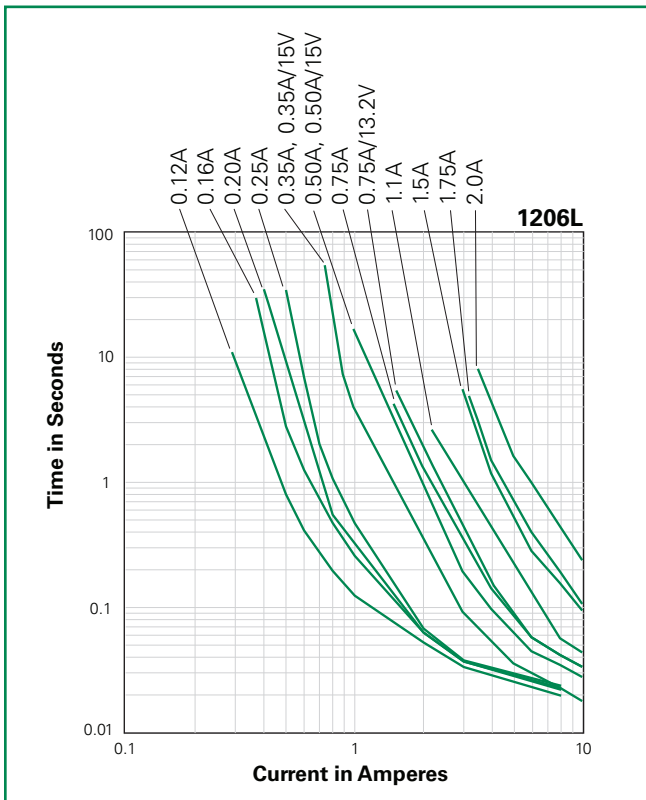
Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.

1 Some older references to these devices may include “-C” in the Part Number. The “-C” should be omitted when placing new orders for the device.

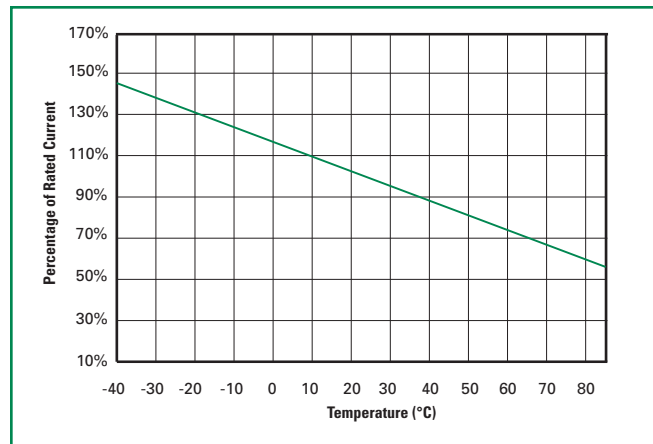
Temperature Derating

| Part Number | Ambient Operation Temperature | | | | | | | | |
|---------------|-------------------------------|-------|------|-------|------|------|------|------|------|
| | -40°C | -20°C | 0°C | 23°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| 1206L012 | 0.18 | 0.16 | 0.14 | 0.125 | 0.10 | 0.09 | 0.08 | 0.07 | 0.05 |
| 1206L016 | 0.22 | 0.20 | 0.18 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 |
| 1206L020 | 0.28 | 0.25 | 0.23 | 0.20 | 0.17 | 0.15 | 0.14 | 0.12 | 0.09 |
| 1206L025 | 0.37 | 0.33 | 0.29 | 0.25 | 0.22 | 0.20 | 0.17 | 0.15 | 0.12 |
| 1206L035 | 0.50 | 0.45 | 0.40 | 0.35 | 0.30 | 0.27 | 0.24 | 0.21 | 0.15 |
| 1206L035/16 | 0.50 | 0.45 | 0.40 | 0.35 | 0.30 | 0.27 | 0.24 | 0.21 | 0.15 |
| 1206L050 | 0.71 | 0.64 | 0.57 | 0.50 | 0.42 | 0.39 | 0.35 | 0.31 | 0.25 |
| 1206L050/15 | 0.71 | 0.64 | 0.57 | 0.50 | 0.42 | 0.39 | 0.35 | 0.31 | 0.25 |
| 1206L075/13.2 | 1.14 | 1.04 | 0.88 | 0.75 | 0.65 | 0.59 | 0.54 | 0.49 | 0.41 |
| 1206L075TH | 1.14 | 1.01 | 0.88 | 0.75 | 0.65 | 0.59 | 0.54 | 0.49 | 0.41 |
| 1206L110TH | 1.52 | 1.37 | 1.25 | 1.10 | 0.92 | 0.82 | 0.75 | 0.64 | 0.52 |
| 1206L150TH | 2.18 | 1.94 | 1.72 | 1.50 | 1.28 | 1.17 | 1.06 | 0.96 | 0.77 |
| 1206L175 | 2.50 | 2.25 | 2.00 | 1.75 | 1.55 | 1.45 | 1.35 | 1.25 | 1.10 |
| 1206L200 | 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



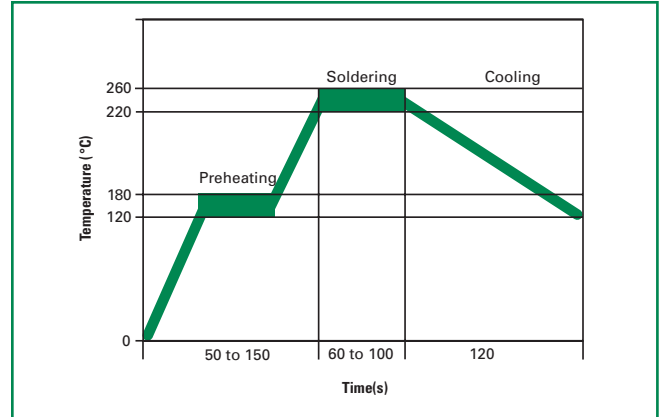
The average time current curves and Temperature Derating curve performance is affected by a number of variables, and these curves provided as guidance only. Customer must verify the performance in their application.

Soldering Parameters

| | |
|--------------------------------|------------------|
| Condition | Reflow |
| Peak Temp/ DurationTime | 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

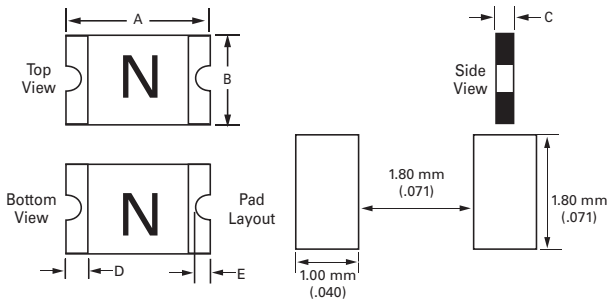
| | |
|---------------------------|--|
| Terminal Material | Solder-Plated Copper (Solder Material: Matte Tin (Sn)) |
| Lead Solderability | Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3. |

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 Sensivity Level | Level 1, J-STD-020C |

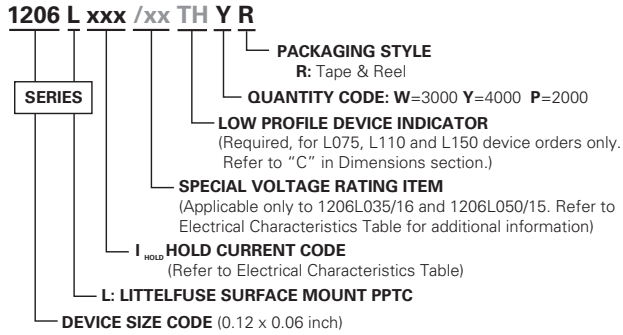
Dimensions

MARKING CODE VARIES
WITH AMPERAGE RATING
(SEE ELECTRICAL CHARACTERISTICS CHART)
SHOWN IS 1.0 AMP 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 | | | | | | | | | | |
| 1206L012 | 0.12 | 0.14 | 3 | 3.5 | 0.06 | 0.07 | 1.5 | 1.8 | 0.03 | 0.06 | 0.65 | 1.45 | 0.01 | 0.03 | 0.25 | 0.75 | 0.004 | 0.02 | 0.1 | 0.45 |
| 1206L016 | | | | | | | | | 0.03 | 0.06 | 0.65 | 1.45 | | | | | | | | |
| 1206L020 | | | | | | | | | 0.02 | 0.04 | 0.5 | 1 | | | | | | | | |
| 1206L025 | | | | | | | | | 0.02 | 0.04 | 0.5 | 1 | | | | | | | | |
| 1206L035 | | | | | | | | | 0.02 | 0.03 | 0.45 | 0.75 | | | | | | | | |
| 1206L035/16 | | | | | | | | | 0.02 | 0.03 | 0.45 | 0.75 | | | | | | | | |
| 1206L050 | | | | | | | | | 0.02 | 0.03 | 0.45 | 0.75 | | | | | | | | |
| 1206L050/15 | | | | | | | | | 0.02 | 0.03 | 0.45 | 0.75 | | | | | | | | |
| 1206L075/13.2 | | | | | | | | | 0.03 | 0.05 | 0.75 | 1.25 | | | | | | | | |
| 1206L075TH | | | | | | | | | 0.02 | 0.03 | 0.45 | 0.75 | | | | | | | | |
| 1206L110TH | | | | | | | | | 0.01 | 0.02 | 0.30 | 0.60 | | | | | | | | |
| 1206L150TH | | | | | | | | | 0.02 | 0.04 | 0.50 | 1 | | | | | | | | |
| 1206L175 | 0.03 | 0.08 | 0.80 | 1.8 | | | | | | | | | | | | | | | | |
| 1206L200 | 0.03 | 0.07 | 0.80 | 1.6 | | | | | | | | | | | | | | | | |

Part Ordering Number System



Packaging Options

| Part Number | Ordering Number | Halogen Free | I _{hold} (A) | I _{hold} Code | Packaging Option | Quantity | Quantity/Pack Code |
|---------------|-----------------|--------------|-----------------------|------------------------|------------------|----------|--------------------|
| 1206L012 | 1206L012WR | Yes | 0.125 | 012 | Tape and Reel | 3000 | WR |
| 1206L016 | 1206L016WR | Yes | 0.16 | 016 | Tape and Reel | 3000 | WR |
| 1206L020 | 1206L020YR | Yes | 0.20 | 020 | Tape and Reel | 4000 | YR |
| 1206L025 | 1206L025YR | Yes | 0.25 | 025 | Tape and Reel | 4000 | YR |
| 1206L035 | 1206L035YR | Yes | 0.35 | 035 | Tape and Reel | 4000 | YR |
| 1206L035/16 | 1206L035/16YR | Yes | 0.35 | 035 | Tape and Reel | 4000 | YR |
| 1206L050 | 1206L050YR | Yes | 0.50 | 050 | Tape and Reel | 4000 | YR |
| 1206L050/15 | 1206L050/15YR | Yes | 0.50 | 050 | Tape and Reel | 4000 | YR |
| 1206L075/13.2 | 1206L075/13.2WR | Yes | 0.75 | 075 | Tape and Reel | 3000 | WR |
| 1206L075TH | 1206L075THYR | Yes | 0.75 | 075 | Tape and Reel | 4000 | YR |
| 1206L110TH | 1206L110THYR | Yes | 1.10 | 110 | Tape and Reel | 4000 | YR |
| 1206L150TH | 1206L150THWR | Yes | 1.50 | 150 | Tape and Reel | 3000 | WR |
| 1206L175 | 1206L175PR | Yes | 1.75 | 175 | Tape and Reel | 2000 | PR |
| 1206L200 | 1206L200PR | Yes | 2.00 | 200 | Tape and Reel | 2000 | PR |

Tape and Reel Specifications

TAPE SPECIFICATIONS: EIA-481-1 (mm)

| | Packaging Code "YR": 1206L020 1206L025 1206L035 1206L035/16 1206L050 1206L050/15 1206L075TH | Packaging Code "WR": 1206L012 1206L016 1206L110TH | Packaging Code "PR": 1206L150TH 1206L160 1206L175 1206L200 |
|----------------------|--|--|--|
| W | 8.15+0.15-0.30 | 8.00+/-0.30 | 8.15+0.15-0.30 |
| 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 | 1.95+/-0.10 | 1.95+/-0.10 | 1.95+/-0.10 |
| B₀ | 3.65+/-0.10 | 3.65+/-0.10 | 3.65+/-0.10 |
| T | 0.25+/-0.10 | 0.25+/-0.10 | 0.25+/-0.10 |
| K₀ | 0.87+/-0.10 | 1.30+/-0.10 | 1.70+/-0.10 |
| Leader min. | 390 | 390 | 390 |
| Trailer min. | 160 | 160 | 160 |

REEL DIMENSIONS:
EIA-481-1 (mm)

| | |
|----------------------|--------------|
| H | 16.0+/-0.2 |
| W | 9+/-0.5 |
| D | Ø 60.2+/-0.5 |
| F | Ø 13.0+/-0.5 |
| C | Ø 178+/-1.0 |
| H₁ | 11+/-0.5 |
| W₁ | 2.5+0.5 |
| W₂ | 3.0+0.5 |
| W₃ | 4.0+0.5 |
| W₄ | 5.0+0.5 |

