

### 1206L Series



#### 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 <sub>hold</sub> (A) | I <sub>trip</sub> (A) | V <sub>max</sub> (Vdc) | I <sub>max</sub> (A) | P <sub>d</sub> typ. (W) | Maximum Time To Trip |             | Resistance           |                       | Agency Approvals  |   |
|-------------------------|---------|-----------------------|-----------------------|------------------------|----------------------|-------------------------|----------------------|-------------|----------------------|-----------------------|---|---|
|                         |         |                       |                       |                        |                      |                         | Current (A)          | Time (Sec.) | R <sub>min</sub> (Ω) | R <sub>1max</sub> (Ω) |  |  |
| 1206L012                | A       | 0.125                 | 0.29                  | 30                     | 100                  | 0.6                     | 1.00                 | 0.20        | 1.500                | 6.000                 | X   | X   |
| 1206L016                | B       | 0.16                  | 0.37                  | 30                     | 100                  | 0.6                     | 1.00                 | 0.30        | 1.200                | 4.500                 | X   | X   |
| 1206L020 <sup>1,2</sup> | C       | 0.20                  | 0.42                  | 24                     | 100                  | 0.6                     | 8.00                 | 0.10        | 0.650                | 2.600                 | X   | X   |
| 1206L025 <sup>1</sup>   | D       | 0.25                  | 0.50                  | 16                     | 100                  | 0.6                     | 8.00                 | 0.08        | 0.550                | 2.300                 | X   | X   |
| 1206L035 <sup>1</sup>   | E       | 0.35                  | 0.75                  | 6                      | 100                  | 0.6                     | 8.00                 | 0.10        | 0.300                | 1.200                 | X   | X   |
| 1206L035/16             | J       | 0.35                  | 0.75                  | 16                     | 100                  | 0.6                     | 8.00                 | 0.10        | 0.300                | 1.200                 | X   | X   |
| 1206L050 <sup>1</sup>   | F       | 0.50                  | 1.00                  | 6                      | 100                  | 0.6                     | 8.00                 | 0.10        | 0.150                | 0.700                 | X   | X   |
| 1206L050/15             | M       | 0.50                  | 1.00                  | 15                     | 100                  | 0.6                     | 8.00                 | 0.10        | 0.150                | 0.750                 | X   | X   |
| 1206L075/13.2           | G1      | 0.75                  | 1.50                  | 13.2                   | 100                  | 0.6                     | 8.00                 | 0.20        | 0.090                | 0.350                 | X   | X   |
| 1206L075/16             | GF      | 0.75                  | 1.50                  | 16                     | 100                  | 0.6                     | 8.00                 | 0.20        | 0.090                | 0.2900                | X   | X   |
| 1206L075TH <sup>1</sup> | G       | 0.75                  | 1.50                  | 8                      | 100                  | 0.6                     | 8.00                 | 0.20        | 0.090                | 0.290                 | X   | X   |
| 1206L110TH <sup>1</sup> | H       | 1.10                  | 2.20                  | 8                      | 100                  | 0.8                     | 8.00                 | 0.10        | 0.040                | 0.210                 | X   | X   |
| 1206L150TH              | K       | 1.50                  | 3.00                  | 8                      | 100                  | 0.8                     | 8.00                 | 0.30        | 0.040                | 0.120                 | X   | X   |
| 1206L175                | V       | 1.75                  | 3.50                  | 6                      | 100                  | 0.8                     | 8.00                 | 0.50        | 0.020                | 0.090                 | X   | X   |
| 1206L200                | L       | 2.00                  | 3.50                  | 6                      | 100                  | 0.8                     | 8.00                 | 1.50        | 0.018                | 0.080                 | 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.

**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.

**2** Part Number tested and complied with AEC-Q200.

**Temperature Rerating**

| Part Number   | Ambient Operation Temperature |       |      |       |      |      |      |      |      |
|---------------|-------------------------------|-------|------|-------|------|------|------|------|------|
|               | -40°C                         | -20°C | 0°C  | 20°C  | 40°C | 50°C | 60°C | 70°C | 85°C |
|               | Hold Current (A)              |       |      |       |      |      |      |      |      |
| 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 |
| 1206L075/16   | 1.01                          | 0.94  | 0.86 | 0.75  | 0.65 | 0.60 | 0.54 | 0.46 | 0.37 |
| 1206L075TH    | 1.14                          | 1.01  | 0.88 | 0.75  | 0.65 | 0.59 | 0.54 | 0.49 | 0.41 |
| 1206L110TH    | 1.64                          | 1.46  | 1.30 | 1.10  | 0.92 | 0.83 | 0.80 | 0.65 | 0.52 |
| 1206L150TH    | 2.20                          | 1.99  | 1.77 | 1.50  | 1.34 | 1.23 | 1.10 | 1.01 | 0.84 |
| 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 |

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

**Average Time Current Curves**



**Temperature Rerating Curve**



The average time current curves and Temperature Rerating 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**

|  |                                  |                         |
|--|----------------------------------|-------------------------|
| 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 <sup>+0/-5</sup> °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<sub>2</sub> 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**

|                           |  |
|---------------------------|--|
| <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<br>-/+5% typical resistance change                              |
| <b>Humidity Aging</b>                                      | +85°C, 85%, R.H., 1000 hours<br>-/+5% typical resistance change                   |
| <b>Thermal Shock</b>                                       | MIL-STD-202, Method 107<br>+85°C/-40°C 20 times<br>-30% typical resistance change |
| <b>Solvent Resistance</b>                                  | MIL-STD-202, Method 215<br>No change  |
| <b>Vibration</b>   | MIL-STD-883, Method 2007, Condition A<br>No change                                |
| <b>Moisture Sensivity Level</b>                            | Level 1, J-STD-020  |

**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  |  |
| 1206L012      |        |      |      |      |        |      |      |      | 0.03   | 0.06 | 0.65 | 1.45 |        |      |      |      |        |       |      |      |  |
| 1206L016      |        |      |      |      |        |      |      |      | 0.03   | 0.06 | 0.65 | 1.45 |        |      |      |      |        |       |      |      |  |
| 1206L020      |        |      |      |      |        |      |      |      | 0.02   | 0.04 | 0.50 | 1.00 |        |      |      |      |        |       |      |      |  |
| 1206L025      |        |      |      |      |        |      |      |      | 0.02   | 0.04 | 0.5  | 1.00 |        |      |      |      |        |       |      |      |  |
| 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   | 0.12   | 0.13 | 3.00 | 3.40 | 0.06   | 0.07 | 1.50 | 1.80 | 0.02   | 0.03 | 0.45 | 0.75 | 0.01   | 0.03 | 0.25 | 0.75 | 0.002  | 0.018 | 0.05 | 0.45 |  |
| 1206L075/13.2 |        |      |      |      |        |      |      |      | 0.03   | 0.05 | 0.75 | 1.25 |        |      |      |      |        |       |      |      |  |
| 1206L075/16   |        |      |      |      |        |      |      |      | 0.03   | 0.05 | 0.75 | 1.25 |        |      |      |      |        |       |      |      |  |
| 1206L075TH    |        |      |      |      |        |      |      |      | 0.02   | 0.03 | 0.40 | 0.75 |        |      |      |      |        |       |      |      |  |
| 1206L110TH    |        |      |      |      |        |      |      |      | 0.01   | 0.02 | 0.30 | 0.60 |        |      |      |      |        |       |      |      |  |
| 1206L150TH    |        |      |      |      |        |      |      |      | 0.02   | 0.04 | 0.50 | 1.00 |        |      |      |      |        |       |      |      |  |
| 1206L175      |        |      |      |      |        |      |      |      | 0.03   | 0.08 | 0.80 | 1.80 |        |      |      |      |        |       |      |      |  |
| 1206L200      |        |      |      |      |        |      |      |      | 0.03   | 0.07 | 0.80 | 1.60 |        |      |      |      |        |       |      |      |  |

**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.

### Part Ordering Number System



### Packaging Options

| Part Number   | Ordering Number | Halogen Free | I <sub>hold</sub> (A) | I <sub>hold</sub> 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                 |
| 1206L075/16   | 1206L075/16WR   | Yes          | 0.08                  | 75                     | Tape and Reel    | 3,000    | 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":<br>1206L020<br>1206L025<br>1206L035<br>1206L035/16<br>1206L050<br>1206L050/15<br>1206L075TH<br>1206L110TH | Packaging Code "WR":<br>1206L012<br>1206L016<br>1206L050/15<br>1206L075/13.6<br>1206L150TH | Packaging Code "PR":<br>1206L175<br>1206L200 |
| <b>W</b>                            | 8.20+0.10/-0.30  | 8.15+0.15/-0.30  | 8.20+0.10/-0.30                              |
| <b>F</b>                            | 3.50+/-0.05  | 3.50+/-0.05  | 3.50+/-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>                | 1.00+/-0.10  | 1.00+/-0.10  | 1.00+/-0.10                                  |
| <b>P<sub>0</sub></b>                | 4.00+/-0.10  | 4.00+/-0.10  | 4.00+/-0.10                                  |
| <b>P<sub>1</sub></b>                | 4.00+/-0.10  | 4.00+/-0.10  | 4.00+/-0.10                                  |
| <b>P<sub>2</sub></b>                | 2.00+/-0.05  | 2.00+/-0.05  | 2.00+/-0.05                                  |
| <b>A<sub>0</sub></b>                | 1.95+/-0.10  | 1.95+/-0.10  | 1.95+/-0.10                                  |
| <b>B<sub>0</sub></b>                | 3.65+/-0.10  | 3.65+/-0.10  | 3.65+/-0.10                                  |
| <b>T</b>                            | 0.25+/-0.10  | 0.25+/-0.10  | 0.25+/-0.10                                  |
| <b>K<sub>0</sub></b>                | 0.87+/-0.10  | 1.30+/-0.10  | 1.70+/-0.10                                  |
| Leader min.                         | 390  | 390  | 390  |
| Trailer min.                        | 160  | 160  | 160  |

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



Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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