



0603L Series



Agency Approvals

| AGENCY | AGENCY FILE NUMBER |
|---|--------------------|
|  | E183209 |
|  | R50119118 |

Description

The 0603L 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
- PDAs / digital cameras
- Game console port protection

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) |  |  |
| 0603L004 | - | 0.04 | 0.12 | 24 | 20 | 0.5 | 0.20 | 1.00 | 4.00 | 40.00 | X | X |
| 0603L010 | C | 0.10 | 0.30 | 15 | 40 | 0.5 | 0.50 | 1.00 | 0.900 | 6.000 | X | X |
| 0603L020 | H | 0.20 | 0.50 | 9 | 40 | 0.5 | 1.00 | 0.60 | 0.550 | 3.500 | X | X |
| 0603L025 | I | 0.25 | 0.55 | 9 | 40 | 0.5 | 8.00 | 0.08 | 0.500 | 3.000 | X | X |
| 0603L035 | F | 0.35 | 0.75 | 6 | 40 | 0.5 | 8.00 | 0.10 | 0.200 | 1.000 | X | X |
| 0603L050 | J | 0.50 | 1.00 | 6 | 40 | 0.5 | 8.00 | 0.10 | 0.100 | 0.680 | 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_{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.

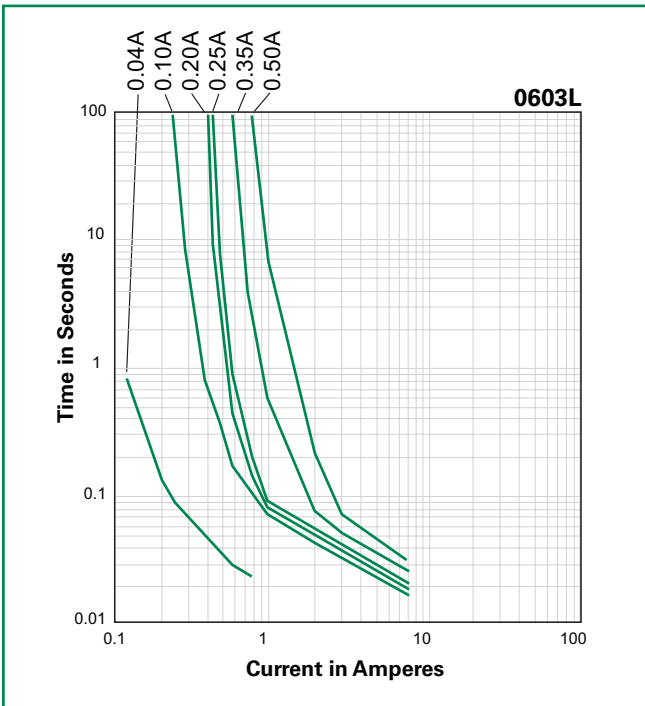
WARNING

- 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.

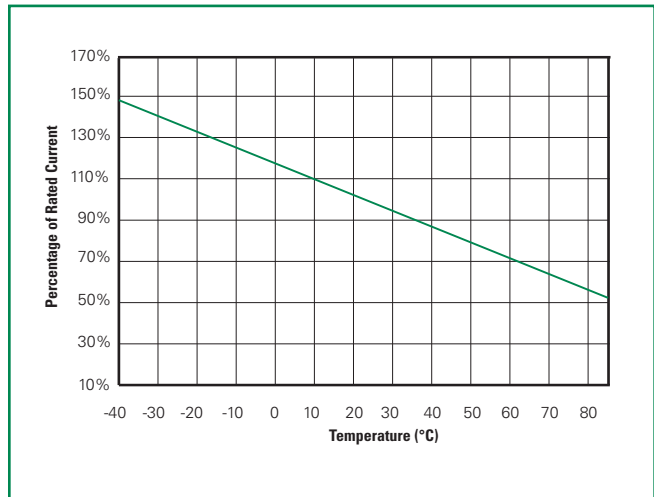
Temperature Rating

| Part Number | Ambient Operation Temperature | | | | | | | | |
|-------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | -40°C | -20°C | 0°C | 20°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| 0603L004 | 0.052 | 0.048 | 0.044 | 0.040 | 0.032 | 0.028 | 0.024 | 0.020 | 0.012 |
| 0603L010 | 0.13 | 0.12 | 0.11 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.03 |
| 0603L020 | 0.27 | 0.25 | 0.23 | 0.20 | 0.17 | 0.14 | 0.12 | 0.10 | 0.07 |
| 0603L025 | 0.32 | 0.29 | 0.27 | 0.25 | 0.21 | 0.18 | 0.16 | 0.14 | 0.10 |
| 0603L035 | 0.47 | 0.41 | 0.38 | 0.35 | 0.29 | 0.26 | 0.24 | 0.20 | 0.14 |
| 0603L050 | 0.67 | 0.59 | 0.54 | 0.50 | 0.41 | 0.37 | 0.34 | 0.29 | 0.20 |

Average Time Current Curves



Temperature Rating Curve

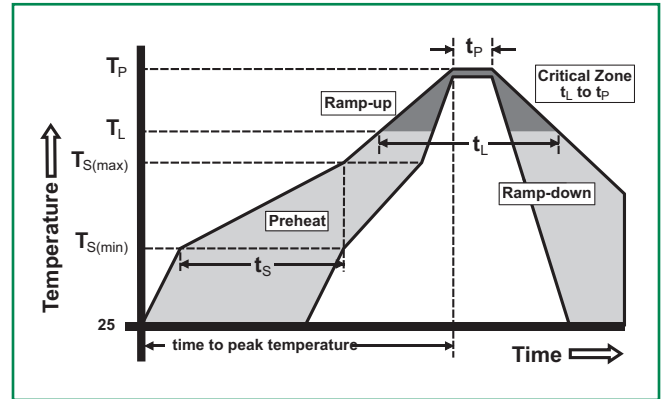


Note:
Typical Temperature derating curve, refer to table for derating data

The average time current curves and Temperature Rating 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 ^{+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, N₂ 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

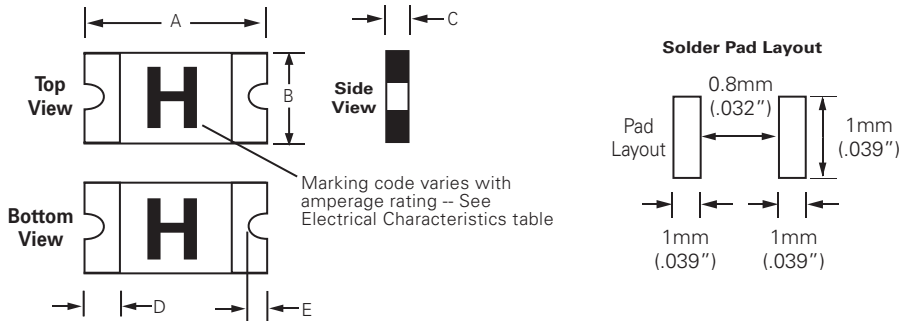
Physical Specifications

| | |
|---------------------------|--|
| 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 -/+10% typical resistance change |
| Humidity Aging | +85°C, 85% R.H., 100 hours -/+15% 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 Sensitivity Level | Level 1, J-STD-020 |

Dimensions



| Part Number | A | | | | B | | | | C | | | | D | | | | E | | | |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | Inch | | mm | | Inch | | mm | | Inch | | mm | | Inch | | mm | | Inch | | mm | |
| | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| 0603L004 | .055 | .071 | 1.40 | 1.80 | .024 | .039 | 0.60 | 1.00 | .016 | .030 | 0.40 | 0.75 | .006 | .020 | 0.15 | 0.50 | .004 | .016 | 0.10 | 0.40 |
| 0603L010 | .055 | .071 | 1.40 | 1.80 | .024 | .039 | 0.60 | 1.00 | .016 | .030 | 0.40 | 0.75 | .006 | .020 | 0.15 | 0.50 | .004 | .016 | 0.10 | 0.40 |
| 0603L020 | .055 | .071 | 1.40 | 1.80 | .024 | .039 | 0.60 | 1.00 | .016 | .030 | 0.40 | 0.75 | .006 | .020 | 0.15 | 0.50 | .004 | .016 | 0.10 | 0.40 |
| 0603L025 | .055 | .071 | 1.40 | 1.80 | .024 | .039 | 0.60 | 1.00 | .016 | .030 | 0.40 | 0.75 | .006 | .020 | 0.15 | 0.50 | .004 | .016 | 0.10 | 0.40 |
| 0603L035 | .055 | .071 | 1.40 | 1.80 | .024 | .039 | 0.60 | 1.00 | .030 | .061 | 0.75 | 1.55 | .006 | .020 | 0.15 | 0.50 | .004 | .016 | 0.10 | 0.40 |
| 0603L050 | .055 | .071 | 1.40 | 1.80 | .024 | .039 | 0.60 | 1.00 | .030 | .061 | 0.75 | 1.55 | .006 | .020 | 0.15 | 0.50 | .004 | .016 | 0.10 | 0.40 |

Part Ordering Number System



Packaging

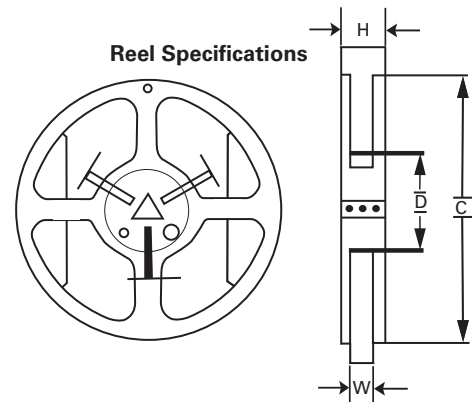
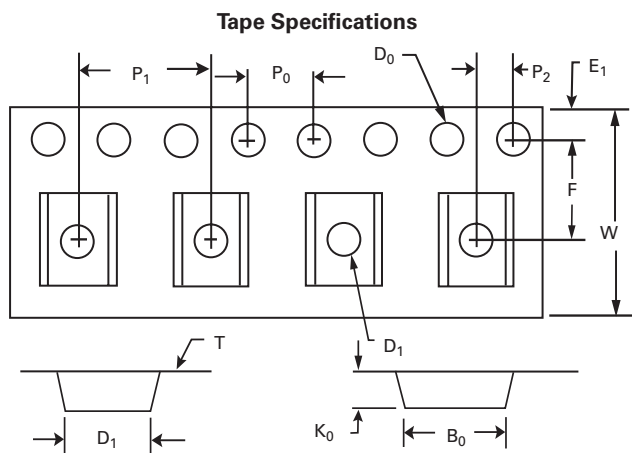
| Part Number | Ordering Number | Halogen Free | I _{hold} (A) | I _{hold} Code | Packaging Option | Quantity | Quantity & Packaging Codes |
|-------------|-----------------|--------------|-----------------------|------------------------|------------------|----------|----------------------------|
| 0603L004 | 0603L004YR | Yes | 0.04 | 004 | Tape and Reel | 4000 | YR |
| 0603L010 | 0603L010YR | Yes | 0.10 | 010 | Tape and Reel | 4000 | YR |
| 0603L020 | 0603L020YR | Yes | 0.20 | 020 | Tape and Reel | 4000 | YR |
| 0603L025 | 0603L025YR | Yes | 0.25 | 025 | Tape and Reel | 4000 | YR |
| 0603L035 | 0603L035YR | Yes | 0.35 | 035 | Tape and Reel | 4000 | YR |
| 0603L050 | 0603L050YR | Yes | 0.50 | 050 | Tape and Reel | 4000 | YR |

Tape and Reel Specifications

| TAPE SPECIFICATIONS: EIA-481-1 (mm) | | |
|-------------------------------------|--|----------------------|
| | 0603L004 0603L010 0603L020 0603L025 | 0603L035 0603L050 |
| W | 8.0+/- 0.30 | 8.0+/- 0.30 |
| F | 3.5+/- 0.05 | 3.5+/- 0.05 |
| E₁ | 1.75+/- 0.10 | 1.75+/- 0.10 |
| D₀ | 1.55+/- 0.05 | 1.55+/- 0.05 |
| T | 0.20+/- 0.10 | 0.20+/- 0.10 |
| K₀ | 0.72+/- 0.10 | 0.96+/- 0.10 |
| Leader min. | 390 | 390 |
| Trailer min. | 160 | 160 |

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

Tape and Reel Diagram



Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

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- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
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- Наличие сертификата ISO.

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Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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