

2920L Series



Description

The 2920L Series PTC provides surface mount overcurrent protection for medium voltage ($\leq 60V$) applications where resettable protection is desired.



Features

- RoHS compliant, lead-free and halogen-free
- High voltage
- Fast response to fault currents
- Low-profile



Applications

- IEE1394 port protection
- Powered ethernet port protection (IEEE 802.3 af)
- Automotive electronic control module protection
- Low voltage telecom equipment 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) |  |  |
| 2920L030 | LF030 | 0.30 | 0.60 | 60 | 10 | 1.50 | 1.50 | 3.00 | 1.200 | 4.800 | X | X |
| 2920L050 | LF050 | 0.50 | 1.00 | 60 | 10 | 1.50 | 2.50 | 4.00 | 0.350 | 1.400 | X | X |
| 2920L075 | LF075 | 0.75 | 1.50 | 30 | 40 | 1.50 | 8.00 | 0.30 | 0.350 | 1.000 | X | X |
| 2920L075/60 | LF075-60 | 0.75 | 1.50 | 60 | 10 | 1.50 | 8.00 | 0.30 | 0.300 | 0.950 | X | X |
| 2920L100 | LF100 | 1.10 | 2.20 | 33 | 40 | 1.50 | 8.00 | 0.50 | 0.120 | 0.410 | X | X |
| 2920L125 | LF125 | 1.25 | 2.50 | 15 | 40 | 1.50 | 8.00 | 2.00 | 0.070 | 0.250 | X | X |
| 2920L150 | LF150 | 1.50 | 3.00 | 33 | 40 | 1.50 | 8.00 | 2.00 | 0.080 | 0.230 | X | X |
| 2920L185 | LF185 | 1.85 | 3.70 | 33 | 40 | 1.50 | 8.00 | 2.50 | 0.050 | 0.150 | X | X |
| 2920L200 | LF200 | 2.00 | 4.00 | 15 | 40 | 1.50 | 8.00 | 5.00 | 0.050 | 0.125 | X | X |
| 2920L200/24 | LF200-24 | 2.00 | 4.00 | 24 | 40 | 1.50 | 8.00 | 5.00 | 0.050 | 0.125 | X | X |
| 2920L250 | LF250 | 2.50 | 5.00 | 15 | 40 | 1.50 | 8.00 | 10.00 | 0.035 | 0.085 | X | X |
| 2920L260 | LF260 | 2.60 | 5.00 | 6 | 40 | 1.50 | 8.00 | 10.00 | 0.025 | 0.075 | X | X |
| 2920L260/24 | LF260-24 | 2.60 | 5.00 | 24 | 40 | 1.50 | 8.00 | 10.00 | 0.025 | 0.075 | X | X |
| 2920L300 | LF300 | 3.00 | 5.00 | 6 | 40 | 1.50 | 8.00 | 20.00 | 0.015 | 0.048 | X | X |
| 2920L300/15 | LF300-15 | 3.00 | 5.00 | 15 | 40 | 1.50 | 8.00 | 20.00 | 0.015 | 0.048 | X | X |
| 2920L500/16 | LF500-16 | 5.00 | 10.00 | 16 | 40 | 2.0 | 20.00 | 5.00 | 0.005 | 0.025 | 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 | 20°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| 2920L030 | 0.45 | 0.40 | 0.35 | 0.30 | 0.25 | 0.23 | 0.20 | 0.17 | 0.14 |
| 2920L050 | 0.76 | 0.67 | 0.59 | 0.50 | 0.42 | 0.38 | 0.33 | 0.29 | 0.23 |
| 2920L075 | 1.13 | 1.01 | 0.88 | 0.75 | 0.62 | 0.56 | 0.50 | 0.44 | 0.34 |
| 2920L075/60 | 1.13 | 1.01 | 0.88 | 0.75 | 0.62 | 0.56 | 0.50 | 0.44 | 0.34 |
| 2920L100 | 1.66 | 1.47 | 1.29 | 1.10 | 0.91 | 0.83 | 0.73 | 0.64 | 0.50 |
| 2920L125 | 1.89 | 1.68 | 1.46 | 1.25 | 1.04 | 0.94 | 0.83 | 0.73 | 0.56 |
| 2920L150 | 2.27 | 2.01 | 1.76 | 1.50 | 1.25 | 1.13 | 1.00 | 0.87 | 0.74 |
| 2920L185 | 2.80 | 2.47 | 2.17 | 1.85 | 1.54 | 1.39 | 1.22 | 1.07 | 0.85 |
| 2920L200 | 3.02 | 2.68 | 2.34 | 2.00 | 1.66 | 1.50 | 1.32 | 1.16 | 0.90 |
| 2920L200/24 | 3.14 | 2.77 | 2.42 | 2.00 | 1.73 | 1.56 | 1.38 | 1.20 | 0.98 |
| 2920L250 | 3.78 | 3.35 | 2.93 | 2.50 | 2.08 | 1.88 | 1.65 | 1.45 | 1.13 |
| 2920L260 | 3.64 | 3.25 | 2.91 | 2.60 | 2.26 | 2.08 | 1.95 | 1.74 | 1.48 |
| 2920L260/24 | 3.64 | 3.25 | 2.91 | 2.60 | 2.26 | 2.08 | 1.95 | 1.74 | 1.48 |
| 2920L300 | 4.53 | 4.02 | 3.51 | 3.00 | 2.52 | 2.26 | 1.99 | 1.75 | 1.34 |
| 2920L300/15 | 4.20 | 3.85 | 3.44 | 3.00 | 2.69 | 2.50 | 2.31 | 2.12 | 1.83 |
| 2920L500/16 | 6.85 | 6.25 | 5.65 | 5.00 | 4.25 | 3.88 | 3.50 | 2.80 | 2.25 |

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

Average Time Current Curves



Temperature Derating Curve



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

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

| | | |
|--|----------------------------------|------------------|
| 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

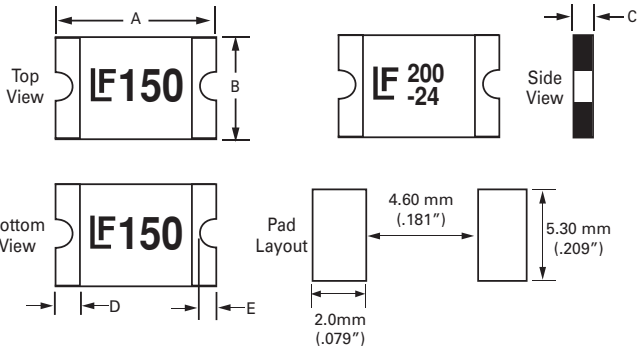
| | |
|---------------------------|--|
| Terminal Material | Solder-Plated Copper (Solder Material: Matte Tin(Sn)) |
| Lead Solderability | Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3. |

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 -/+5% typical resistance change |
| Humidity Aging | +85°C, 85%, R.H., 1000 hours -/+5% typical resistance change |
| Thermal Shock | MIL-STD-20 2, Method 107 +85°C/-40°C 20 times -30% typical resistance change |
| Solvent Resistance | MIL-STD-202, Method 215 |
| Vibration | MIL-STD-883, Method 2007, Condition A |
| Moisture Sensitivity Level | Level 1, J-STD-020 |

Dimensions (mm)

MARKING CODE VARIES
WITH AMPERAGE AND VOLTAGE RATING
(SEE ELECTRICAL CHARACTERISTIC TABLE)
SHOWN ARE:
- 1.5A/33V RATING (LEFT)
- 2.0A/24V RATING (RIGHT)



| 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 |
| 2920L030 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L050 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L075 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L075/60 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.05 | 0.06 | 1.20 | 1.80 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L100 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.02 | 0.04 | 0.55 | 1.00 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L125 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.02 | 0.04 | 0.55 | 1.00 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L150 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L185 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L200 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L200/24 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L250 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L260 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.02 | 0.04 | 0.55 | 1.00 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L260/24 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L300 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L300/15 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.8 | 5.44 | 0.03 | 0.05 | 0.75 | 1.25 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |
| 2920L500/16 | 0.26 | 0.31 | 6.73 | 7.98 | 0.19 | 0.21 | 4.80 | 5.44 | 0.80 | 1.60 | 0.80 | 1.60 | 0.01 | 0.1 | 0.3 | 2.5 | 0.01 | 0.08 | 0.25 | 2.0 |

Part Ordering Number System



Packaging

| Part Number | Ordering Number | Halogen Free | I _{hold} (A) | I _{hold} Code | Voltage Option | Packaging Option | Quantity | Quantity & Packaging Codes |
|-------------|-----------------|--------------|-----------------------|------------------------|----------------|------------------|----------|----------------------------|
| 2920L030 | 2920L030DR | Yes | 0.30 | 030 | | Tape and Reel | 1500 | DR |
| 2920L050 | 2920L050DR | Yes | 0.50 | 050 | | Tape and Reel | 1500 | DR |
| 2920L075 | 2920L075DR | Yes | 0.75 | 075 | | Tape and Reel | 1500 | DR |
| 2920L075/60 | 2920L075/60MR | Yes | 0.75 | 075 | /60 | Tape and Reel | 1000 | MR |
| 2920L100 | 2920L100PR | Yes | 1.10 | 100 | | Tape and Reel | 2000 | PR |
| 2920L125 | 2920L125PR | Yes | 1.25 | 125 | | Tape and Reel | 2000 | PR |
| 2920L150 | 2920L150DR | Yes | 1.50 | 150 | | Tape and Reel | 1500 | DR |
| 2920L185 | 2920L185DR | Yes | 1.85 | 185 | | Tape and Reel | 1500 | DR |
| 2920L200 | 2920L200DR | Yes | 2.00 | 200 | | Tape and Reel | 1500 | DR |
| 2920L200/24 | 2920L200/24DR | Yes | 2.00 | 200 | /24 | Tape and Reel | 1500 | DR |
| 2920L250 | 2920L250DR | Yes | 2.50 | 250 | | Tape and Reel | 1500 | DR |
| 2920L260/24 | 2920L260/24DR | Yes | 2.60 | 260 | /24 | Tape and Reel | 1500 | DR |
| 2920L260 | 2920L260PR | Yes | 2.60 | 260 | | Tape and Reel | 2000 | PR |
| 2920L300 | 2920L300DR | Yes | 3.00 | 300 | | Tape and Reel | 1500 | DR |
| 2920L300/15 | 2920L300/15DR | Yes | 3.00 | 300 | /15 | Tape and Reel | 1500 | DR |
| 2920L500/16 | 2920L500/16MR | Yes | 5.00 | 500 | | Tape and Reel | 1,000 | MR |

Tape and Reel Specifications

| TAPE SPECIFICATIONS: EIA-481-1 (mm) | | | |
|-------------------------------------|--|------------------------------------|----------------------------|
| | 2920L030, 2920L050 2920L075, 2920L150 2920L185, 2920L200 2920L200/24 2920L250, 2920L300 2920L300/15 | 2920L100, 2920L125, 2920L260 | 2920L075/60 2920L500/16 |
| W | 16.0+/-0.30 | 16.0+/-0.30 | 16.0+/-0.30 |
| F | 7.50+/-0.10 | 7.50+/-0.05 | 7.50+/-0.10 |
| E₁ | 1.75+/-0.10 | 1.75+/-0.10 | 1.75+/-0.10 |
| D₀ | 1.55+/-0.05 | 1.55+/-0.05 | 1.50+/-0.05 |
| D₁ | 1.50+/-0.10 | 1.50+/-0.10 | 1.50 (min) |
| P₀ | 4.00+/-0.10 | 4.00+/-0.10 | 4.00+/-0.10 |
| P₁ | 8.00+/-0.10 | 8.00+/-0.10 | 8.00+/-0.10 |
| P₂ | 2.00+/-0.05 | 2.00+/-0.05 | 2.00+/-0.05 |
| A₀ | 5.74+/-0.10 | 5.74+/-0.10 | 5.45+/-0.10 |
| B₀ | 8.02+/-0.10 | 8.02+/-0.10 | 7.80+/-0.10 |
| T | 0.30+/-0.10 | 0.30+/-0.10 | 0.30+/-0.10 |
| K₀ | 1.30+/-0.10 | 0.91+/-0.10 | 2.00+/-0.10 |
| <i>Leader min.</i> | 390 | 390 | 390 |
| <i>Trailer min.</i> | 160 | 160 | 160 |

| REEL DIMENSIONS: EIA-481-1 (mm) | |
|------------------------------------|--------------|
| C | Ø180.0+/-3.0 |
| D | Ø60+/-0.5 |
| H | 19.5+/-1.0 |
| W | 17+/-0.2 |

Tape and Reel Diagram



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.

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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