

### 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.) | $R_{min}$ ( $\Omega$ ) | $R_{1max}$ ( $\Omega$ ) |  |  |
| 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 <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

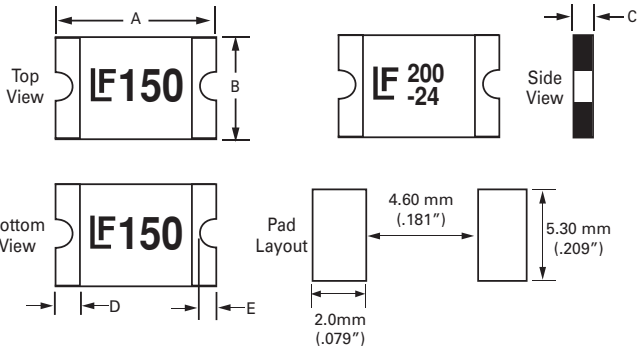
|                           |  |
|---------------------------|--|
| <b>Terminal Material</b>  | Solder-Plated Copper (Solder Material: Matte Tin(Sn))        |
| <b>Lead Solderability</b> | Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3. |

### 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-20 2, Method 107<br>+85°C/-40°C 20 times<br>-30% typical resistance change |
| <b>Solvent Resistance</b>                                  | MIL-STD-202, Method 215  |
| <b>Vibration</b>   | MIL-STD-883, Method 2007, Condition A  |
| <b>Moisture Sensitivity Level</b>                          | 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 <sub>hold</sub> (A) | I <sub>hold</sub> 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<br>2920L075, 2920L150<br>2920L185, 2920L200<br>2920L200/24<br>2920L250, 2920L300<br>2920L300/15 | 2920L100,<br>2920L125,<br>2920L260 | 2920L075/60<br>2920L500/16 |
| <b>W</b>                            | 16.0+/-0.30  | 16.0+/-0.30                        | 16.0+/-0.30                |
| <b>F</b>                            | 7.50+/-0.10  | 7.50+/-0.05                        | 7.50+/-0.10                |
| <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                        | 1.50+/-0.05                |
| <b>D<sub>1</sub></b>                | 1.50+/-0.10  | 1.50+/-0.10                        | 1.50 (min)                 |
| <b>P<sub>0</sub></b>                | 4.00+/-0.10  | 4.00+/-0.10                        | 4.00+/-0.10                |
| <b>P<sub>1</sub></b>                | 8.00+/-0.10  | 8.00+/-0.10                        | 8.00+/-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>                | 5.74+/-0.10  | 5.74+/-0.10                        | 5.45+/-0.10                |
| <b>B<sub>0</sub></b>                | 8.02+/-0.10  | 8.02+/-0.10                        | 7.80+/-0.10                |
| <b>T</b>                            | 0.30+/-0.10  | 0.30+/-0.10                        | 0.30+/-0.10                |
| <b>K<sub>0</sub></b>                | 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:<br>EIA-481-1 (mm) |              |
|------------------------------------|--------------|
| <b>C</b>                           | Ø180.0+/-3.0 |
| <b>D</b>                           | Ø60+/-0.5    |
| <b>H</b>                           | 19.5+/-1.0   |
| <b>W</b>                           | 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 «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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