
## Features

- Surface Mount SOD-123FL package
- Standoff Voltage: 12 to 58 volts
- Power Dissipation: 400 watts
- RoHS compliant*

## Applications

- Protection of power buses
- Protection of I/O interfaces
- Overvoltage transient protection
- Telecom, computer, industrial and consumer electronics applications

# SMF4L Transient Voltage Suppressor Diode Series

## General Information

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package SOD-123FL size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 12 V up to 58 V. Typical fast response times are less than 1.0 picosecond from 0 V to Breakdown Voltage.

Bourns® Chip Diodes conform to JEDEC standards, are easy to handle with standard pick and place equipment and the flat configuration minimizes roll away.

## Absolute Maximum Ratings (@ $T_A$ = 25 °C Unless Otherwise Noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Maximum Peak Pulse Power Dissipation (10/1000 μs)[1] | $P_{PPM}$ | 400 | W |
| Peak Forward Surge Current<br>8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) | $I_{FSM}$ | 50 | A |
| Operating Temperature Range | $T_J$ | -55 to +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |

1 Non-repetitive current pulse, per Pulse Waveform graph and derated above $T_A$ = 25 °C.

## Electrical Characteristics (@ $T_A$ = 25 °C Unless Otherwise Noted)

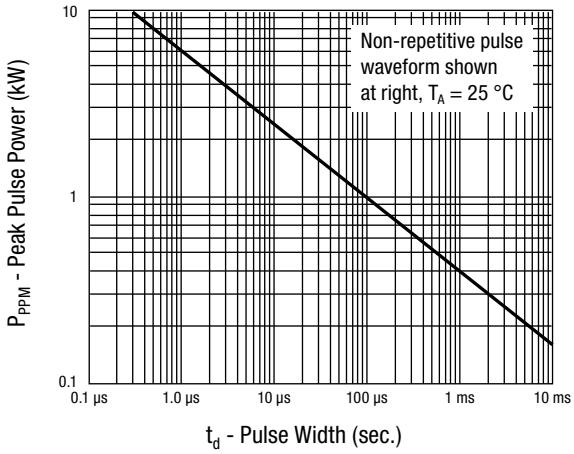
| Unidirectional Device | | Breakdown Voltage $V_{BR}$ (Volts) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ $V_{RWM}$ | Maximum Reverse Voltage @ $I_{RSM}$ | Maximum Reverse Surge Current |
|---|---|---|---|---|---|---|---|---|
| Part No. | Marking | Min. | Max. | @ $I_T$ (mA) | $V_{RWM}$ (V) | $I_R$ (μA) | $V_{RSM}$ (V) | $I_{RSM}$ (A) |
| SMF4L12A | LE | 13.3 | 14.7 | 1.0 | 12 | 1.0 | 19.9 | 20.1 |
| SMF4L13A | LG | 14.4 | 15.9 | 1.0 | 13 | 1.0 | 21.5 | 18.6 |
| SMF4L14A | LK | 15.6 | 17.2 | 1.0 | 14 | 1.0 | 23.2 | 17.2 |
| SMF4L15A | LM | 16.7 | 18.5 | 1.0 | 15 | 1.0 | 24.4 | 16.4 |
| SMF4L16A | LP | 17.8 | 19.7 | 1.0 | 16 | 1.0 | 26.0 | 15.4 |
| SMF4L17A | LR | 18.9 | 20.9 | 1.0 | 17 | 1.0 | 27.6 | 14.5 |
| SMF4L18A | LT | 20.0 | 22.1 | 1.0 | 18 | 1.0 | 29.2 | 13.7 |
| SMF4L20A | LV | 22.2 | 24.5 | 1.0 | 20 | 1.0 | 32.4 | 12.3 |
| SMF4L22A | LX | 24.4 | 26.9 | 1.0 | 22 | 1.0 | 35.5 | 11.3 |
| SMF4L24A | LZ | 26.7 | 29.5 | 1.0 | 24 | 1.0 | 38.9 | 10.3 |
| SMF4L26A | ME | 28.9 | 31.9 | 1.0 | 26 | 1.0 | 42.1 | 9.5 |
| SMF4L28A | MG | 31.1 | 34.4 | 1.0 | 28 | 1.0 | 45.4 | 8.8 |
| SMF4L30A | MK | 33.3 | 36.8 | 1.0 | 30 | 1.0 | 48.4 | 8.3 |
| SMF4L33A | MM | 36.7 | 40.6 | 1.0 | 33 | 1.0 | 53.3 | 7.5 |
| SMF4L36A | MP | 40.0 | 44.2 | 1.0 | 36 | 1.0 | 58.1 | 6.9 |
| SMF4L40A | MR | 44.4 | 49.1 | 1.0 | 40 | 1.0 | 64.5 | 6.2 |
| SMF4L43A | MT | 47.8 | 52.8 | 1.0 | 43 | 1.0 | 69.4 | 5.8 |
| SMF4L45A | MV | 50.0 | 55.3 | 1.0 | 45 | 1.0 | 72.7 | 5.5 |
| SMF4L48A | MX | 53.3 | 58.9 | 1.0 | 48 | 1.0 | 77.4 | 5.2 |
| SMF4L51A | MZ | 56.7 | 62.7 | 1.0 | 51 | 1.0 | 82.4 | 4.9 |
| SMF4L54A | NE | 60.0 | 66.3 | 1.0 | 54 | 1.0 | 87.1 | 4.6 |
| SMF4L58A | NG | 64.4 | 71.2 | 1.0 | 58 | 1.0 | 93.6 | 4.3 |

**WARNING Cancer and Reproductive Harm -** www.P65Warnings.ca.gov

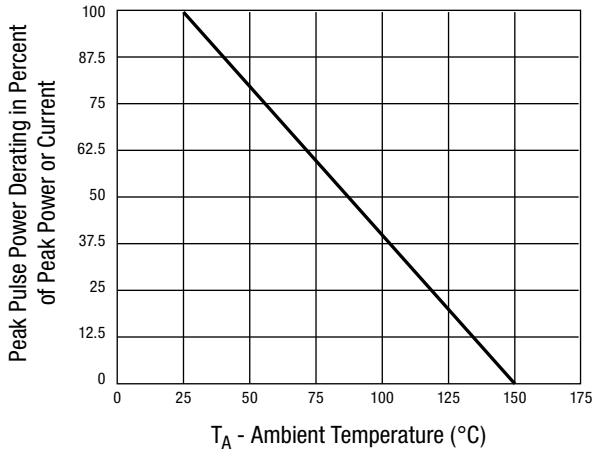
*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
**"Q" part number suffix for automotive and other applications requiring appropriate AEC-Q101 compliance.
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.

## Performance Graphs

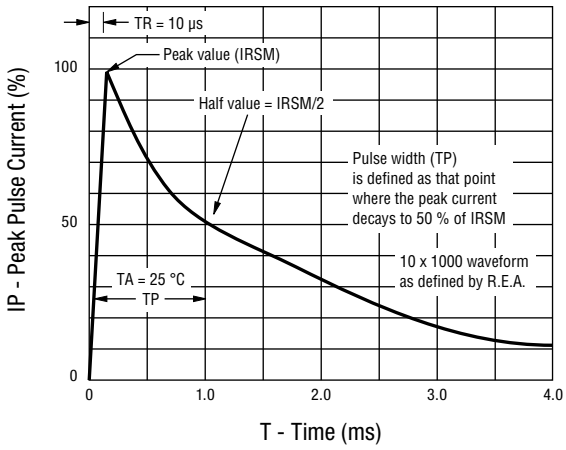
### Peak Pulse Power Derating Curve



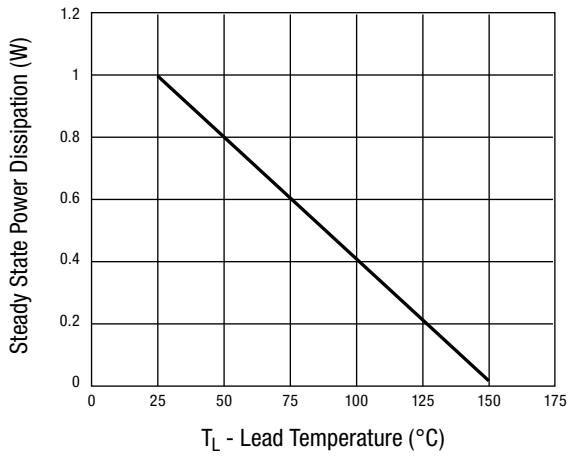

### Maximum Non-Repetitive Surge Current




### Pulse Waveform



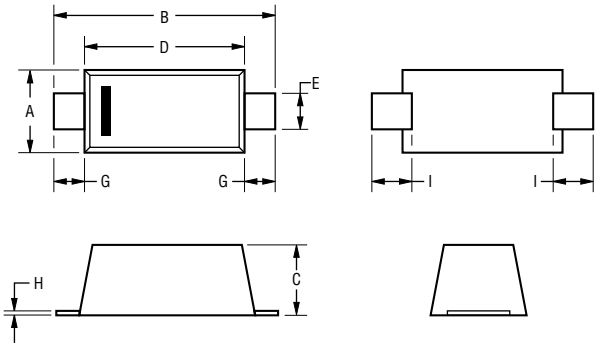

### Steady State Power Derating Curve



# SMF4L Transient Voltage Suppressor Diode Series

BOURNS®

## Product Dimensions




| Dimension | SMF (SOD-123FL) |
|---|---|
| A | 1.65 ± 0.25<br>(0.065 ± 0.01) |
| B | 3.70 ± 0.15<br>(0.146 ± 0.006) |
| C | 1.125 ± 0.225<br>(0.044 ± 0.009) |
| D | 2.825 ± 0.275<br>(0.111 ± 0.011) |
| E | 0.775 ± 0.275<br>(0.031 ± 0.011) |
| G | 0.400 ± 0.15<br>(0.016 ± 0.006) |
| H | 0.175 ± 0.075<br>(0.007 ± 0.003) |
| I | 0.550 ± 0.15<br>(0.022 ± 0.006) |

DIMENSIONS: MM / (INCHES)

## Typical Part Marking

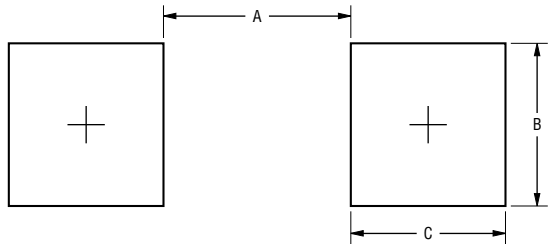

CATHODE BAND

MANUFACTURER'S TRADEMARK

XX — DEVICE CODE (MARKING CODE DEFINED ON PAGE 1)

YM — DATE CODE: MONTH AND YEAR OF MANUFACTURE
Y: YEAR (LAST DIGIT)
M: MONTH (JAN-SEPT = 1-9, OCT-DEC = A,B,C)

## Recommended Footprint




| Dimension | SMF (SOD-123FL) |
|---|---|
| A (Max.) | 2.36<br>(0.093) |
| B (Min.) | 1.22<br>(0.048) |
| C (Min.) | 0.91<br>(0.036) |

DIMENSIONS: MM / (INCHES)

## Physical Specifications

Case ..... Molded plastic per UL Class 94V-0
Polarity..... Cathode band indicates unidirectional device

## How to Order

**SMF4L 12 A**

Package
SMF4L = 400 W SMF/SOD-123FL Package

Working Peak Reverse Voltage
12 = 12 $V_{RWM}$ (Volts)

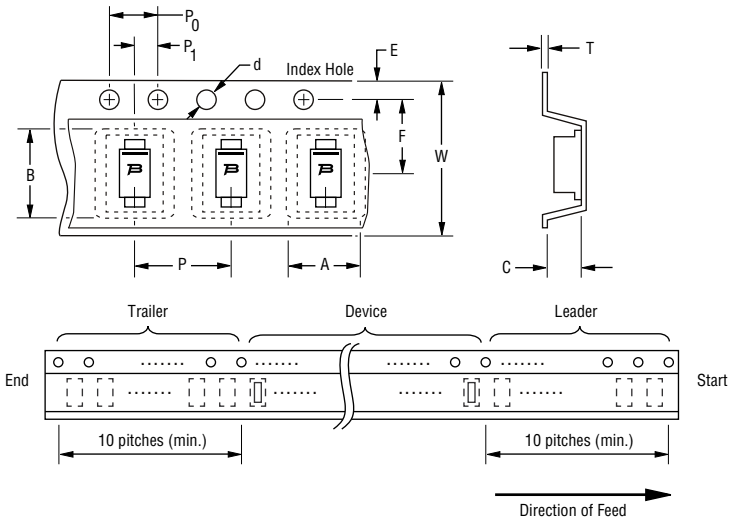
Suffix
A = 5 % Tolerance Unidirectional Device

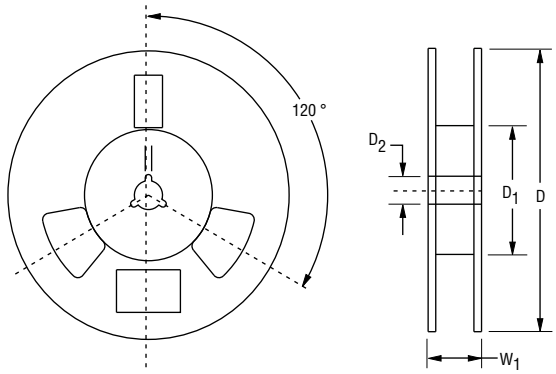
## Environmental Specifications

Moisture Sensitivity Level .....1
ESD Classification (HBM)..... 3B

## Packaging Information

The product will be dispensed in tape and reel format (see diagram below).




DIMENSIONS: MM / (INCHES)

Devices are packed in accordance with EIA 481 standard specifications shown here.

| Item | Symbol | SMF4L Series |
|---|---|---|
| Carrier Width | A | 1.9 ± 0.20 (0.075 ± 0.008) |
| Carrier Length | B | 4.01 ± 0.20 (0.158 ± 0.008) |
| Carrier Depth | C | 1.32 ± 0.20 (0.052 ± 0.008) |
| Sprocket Hole | d | 1.50 + 0.10 / - 0.00 (0.059 + 0.004 / - 0.00) |
| Reel Outside Diameter | D | 178 (7.008) |
| Reel Inner Diameter | $D_1$ | 50.0 (1.969) MIN. |
| Feed Hole Diameter | $D_2$ | 13.0 + 0.50 / - 0.20 (0.512 + 0.020 / - 0.008) |
| Sprocket Hole Position | E | 1.75 ± 0.10 (0.069 ± 0.004) |
| Punch Hole Position | F | 3.50 ± 0.05 (0.138 ± 0.002) |
| Punch Hole Pitch | P | 4.00 ± 0.10 (0.157 ± 0.004) |
| Sprocket Hole Pitch | $P_0$ | 4.00 ± 0.10 (0.157 ± 0.004) |
| Embossment Center | $P_1$ | 2.00 ± 0.05 (0.079 ± 0.002) |
| Overall Tape Thickness | T | 0.40 (0.016) MAX. |
| Tape Width | W | 8.00 ± 0.30 (0.315 ± 0.012) |
| Reel Width | $W_1$ | 14.4 (5.669) MAX. |
| Quantity per Reel | -- | 2,500 |

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