



Features

- Surface Mount SOD-123FL package
- Standoff Voltage: 12 to 58 volts
- Power Dissipation: 400 watts
- RoHS compliant*
- AEC-Q101 compliant**

Applications

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

SMF4L-Q 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 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-Q | LEQ | 13.3 | 14.7 | 1.0 | 12 | 1.0 | 19.9 | 20.1 |
| SMF4L13A-Q | LGQ | 14.4 | 15.9 | 1.0 | 13 | 1.0 | 21.5 | 18.6 |
| SMF4L14A-Q | LKQ | 15.6 | 17.2 | 1.0 | 14 | 1.0 | 23.2 | 17.2 |
| SMF4L15A-Q | LMQ | 16.7 | 18.5 | 1.0 | 15 | 1.0 | 24.4 | 16.4 |
| SMF4L16A-Q | LPQ | 17.8 | 19.7 | 1.0 | 16 | 1.0 | 26.0 | 15.4 |
| SMF4L17A-Q | LRQ | 18.9 | 20.9 | 1.0 | 17 | 1.0 | 27.6 | 14.5 |
| SMF4L18A-Q | LTQ | 20.0 | 22.1 | 1.0 | 18 | 1.0 | 29.2 | 13.7 |
| SMF4L20A-Q | LVQ | 22.2 | 24.5 | 1.0 | 20 | 1.0 | 32.4 | 12.3 |
| SMF4L22A-Q | LXQ | 24.4 | 26.9 | 1.0 | 22 | 1.0 | 35.5 | 11.3 |
| SMF4L24A-Q | LZQ | 26.7 | 29.5 | 1.0 | 24 | 1.0 | 38.9 | 10.3 |
| SMF4L26A-Q | MEQ | 28.9 | 31.9 | 1.0 | 26 | 1.0 | 42.1 | 9.5 |
| SMF4L28A-Q | MGQ | 31.1 | 34.4 | 1.0 | 28 | 1.0 | 45.4 | 8.8 |
| SMF4L30A-Q | MKQ | 33.3 | 36.8 | 1.0 | 30 | 1.0 | 48.4 | 8.3 |
| SMF4L33A-Q | MMQ | 36.7 | 40.6 | 1.0 | 33 | 1.0 | 53.3 | 7.5 |
| SMF4L36A-Q | MPQ | 40.0 | 44.2 | 1.0 | 36 | 1.0 | 58.1 | 6.9 |
| SMF4L40A-Q | MRQ | 44.4 | 49.1 | 1.0 | 40 | 1.0 | 64.5 | 6.2 |
| SMF4L43A-Q | MTQ | 47.8 | 52.8 | 1.0 | 43 | 1.0 | 69.4 | 5.8 |
| SMF4L45A-Q | MVQ | 50.0 | 55.3 | 1.0 | 45 | 1.0 | 72.7 | 5.5 |
| SMF4L48A-Q | MXQ | 53.3 | 58.9 | 1.0 | 48 | 1.0 | 77.4 | 5.2 |
| SMF4L51A-Q | MZQ | 56.7 | 62.7 | 1.0 | 51 | 1.0 | 82.4 | 4.9 |
| SMF4L54A-Q | NEQ | 60.0 | 66.3 | 1.0 | 54 | 1.0 | 87.1 | 4.6 |
| SMF4L58A-Q | NGQ | 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.

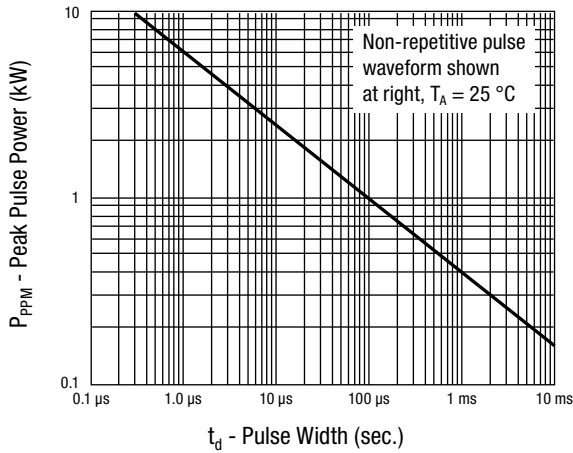
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SMF4L-Q Transient Voltage Suppressor Diode Series

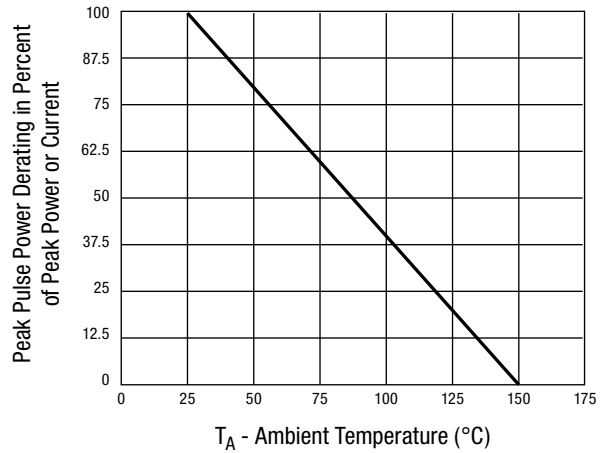


Performance Graphs

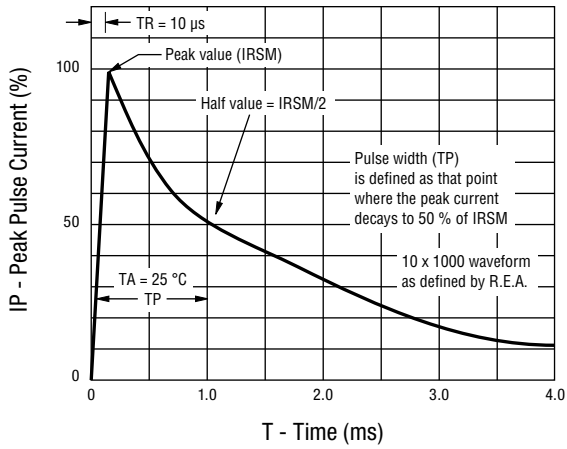
Peak Pulse Power Derating Curve



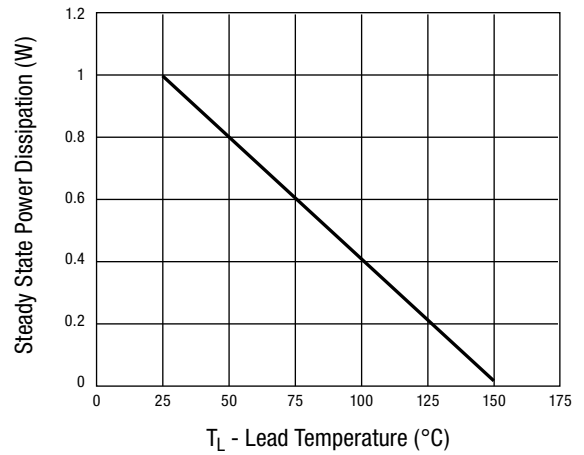
Maximum Non-Repetitive Surge Current



Pulse Waveform



Steady State Power Derating Curve



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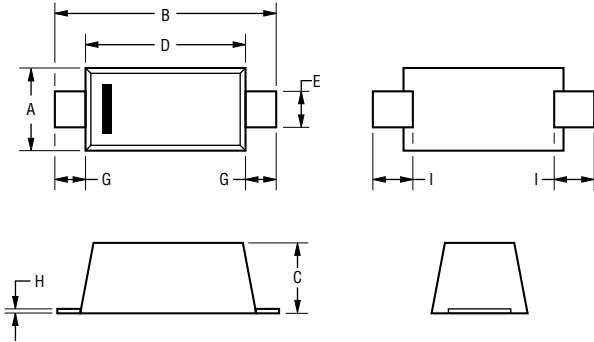
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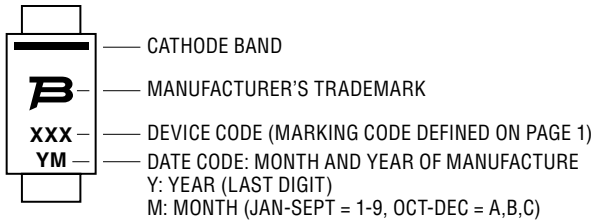
Product Dimensions



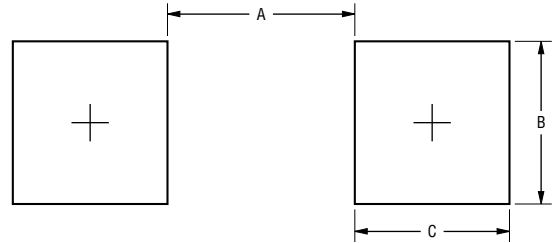
| Dimension | SMF (SOD-123FL) |
|-----------|---|
| A | $\frac{1.65 \pm 0.25}{(0.065 \pm 0.01)}$ |
| B | $\frac{3.70 \pm 0.15}{(0.146 \pm 0.006)}$ |
| C | $\frac{1.125 \pm 0.225}{(0.044 \pm 0.009)}$ |
| D | $\frac{2.825 \pm 0.275}{(0.111 \pm 0.011)}$ |
| E | $\frac{0.775 \pm 0.275}{(0.031 \pm 0.011)}$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

DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

Typical Part Marking



Recommended Footprint



| Dimension | SMF (SOD-123FL) |
|-----------|------------------------|
| A (Max.) | $\frac{2.36}{(0.093)}$ |
| B (Min.) | $\frac{1.22}{(0.048)}$ |
| C (Min.) | $\frac{0.91}{(0.036)}$ |

DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

Physical Specifications

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

How to Order

Package SMF4L 12 A - Q
 SMF4L = 400W SMF/SOD-123FL Package
 Working Peak Reverse Voltage 12 = 12 V_{RWM} (Volts)
 Suffix A = 5 % Tolerance Unidirectional Device
 AEC-Q101 Suffix Q = AEC-Q101 Compliant

Environmental Specifications

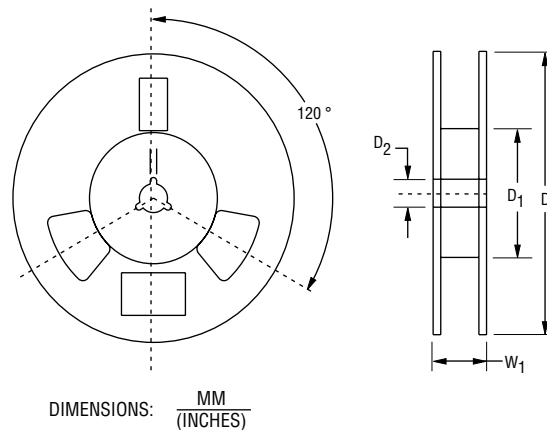
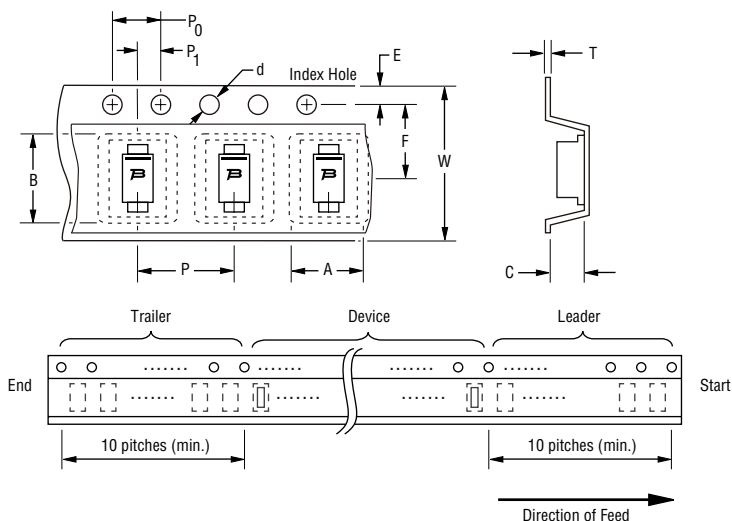
Moisture Sensitivity Level 1
 ESD Classification (HBM) 3B

SMF4L-Q Transient Voltage Suppressor Diode Series

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Packaging Information

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



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

| Item | Symbol | SMF4L-Q Series |
|------------------------|----------------|--|
| Carrier Width | A | $\frac{1.9 \pm 0.20}{(0.075 \pm 0.008)}$ |
| Carrier Length | B | $\frac{4.01 \pm 0.20}{(0.158 \pm 0.008)}$ |
| Carrier Depth | C | $\frac{1.32 \pm 0.20}{(0.052 \pm 0.008)}$ |
| Sprocket Hole | d | $\frac{1.50 + 0.10 / - 0.00}{(0.059 + 0.004 / - 0.00)}$ |
| Reel Outside Diameter | D | $\frac{178}{(7.008)}$ |
| Reel Inner Diameter | D ₁ | $\frac{50.0}{(1.969)}$ MIN. |
| Feed Hole Diameter | D ₂ | $\frac{13.0 + 0.50 / - 0.20}{(0.512 + 0.020 / - 0.008)}$ |
| Sprocket Hole Position | E | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ |
| Punch Hole Position | F | $\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$ |
| Punch Hole Pitch | P | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ |
| Sprocket Hole Pitch | P ₀ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ |
| Embossment Center | P ₁ | $\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$ |
| Overall Tape Thickness | T | $\frac{0.40}{(0.016)}$ MAX. |
| Tape Width | W | $\frac{8.00 \pm 0.30}{(0.315 \pm 0.012)}$ |
| Reel Width | W ₁ | $\frac{14.4}{(5.669)}$ MAX. |
| Quantity per Reel | -- | 2,500 |

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