



## 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 (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

| Parameter                                                                                            | Symbol    | Value       | Unit             |
|------------------------------------------------------------------------------------------------------|-----------|-------------|------------------|
| Maximum Peak Pulse Power Dissipation (10/1000 $\mu\text{s}$ ) <sup>1</sup>                           | $P_{PPM}$ | 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 | $^\circ\text{C}$ |
| Storage Temperature Range                                                                            | $T_{STG}$ | -55 to +150 | $^\circ\text{C}$ |

<sup>1</sup> Non-repetitive current pulse, per Pulse Waveform graph and derated above  $T_A = 25^\circ\text{C}$ .

## Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ 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)                | $I_R$ ( $\mu\text{A}$ )             | $V_{RSM}$ (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            | LTV     | 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](http://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.

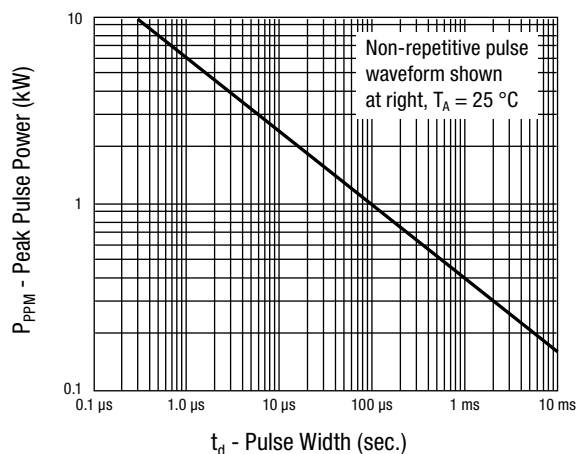
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# SMF4L-Q Transient Voltage Suppressor Diode Series

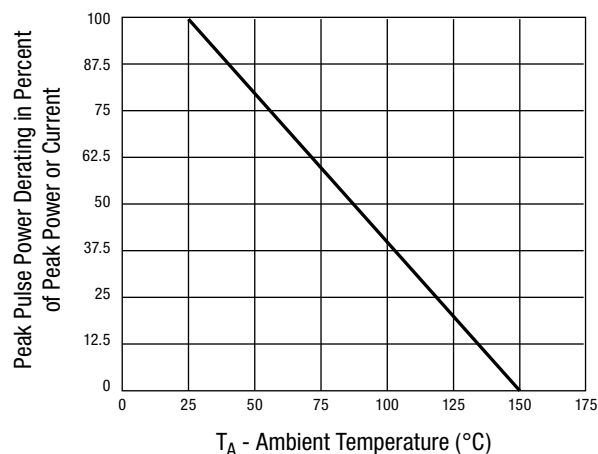
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## Performance Graphs

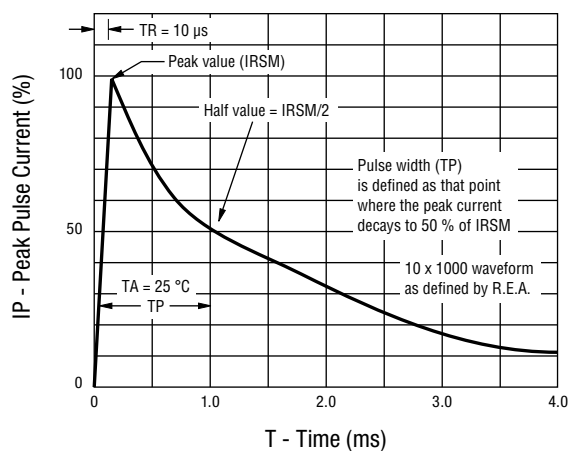
### Peak Pulse Power Derating Curve



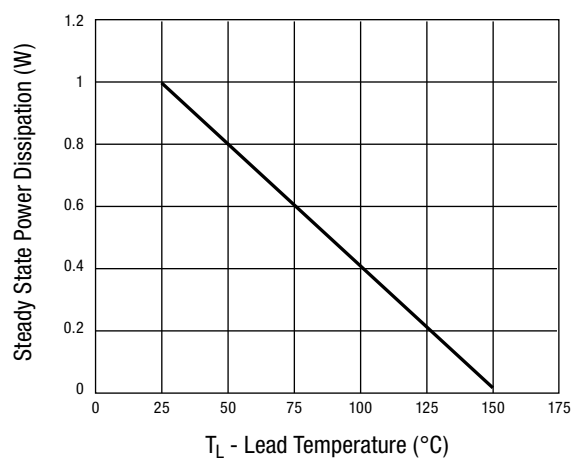
### Maximum Non-Repetitive Surge Current



### Pulse Waveform



### Steady State Power Derating Curve



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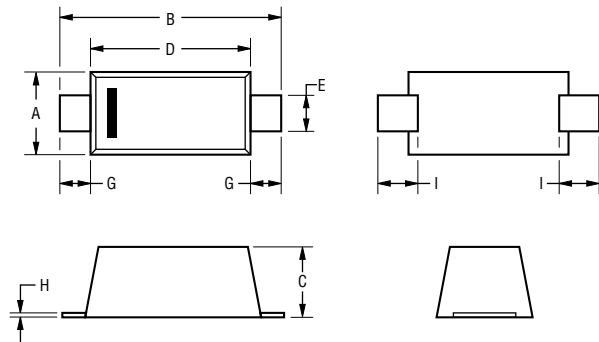
Users should verify actual device performance in their specific applications.

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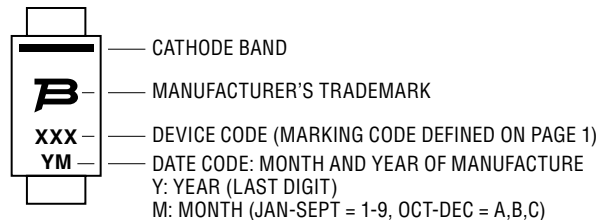
## Product Dimensions



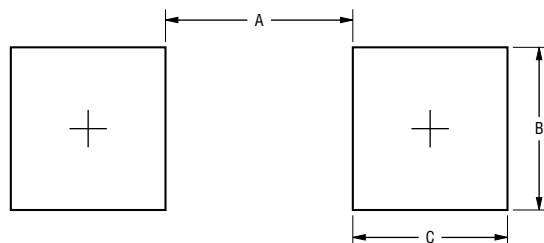
| Dimension | SMF (SOD-123FL)                             |
|-----------|---------------------------------------------|
| A         | $\frac{1.65 \pm 0.25}{(0.065 \pm 0.01)}$    |
| B         | $\frac{3.70 \pm 0.15}{(0.146 \pm 0.006)}$   |
| C         | $\frac{1.125 \pm 0.225}{(0.044 \pm 0.009)}$ |
| 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<sub>RWM</sub> (Volts)  
 Suffix .....  
 A = 5 % Tolerance Unidirectional Device  
 AEC-Q101 Suffix .....  
 Q = AEC-Q101 Compliant

## Environmental Specifications

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

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

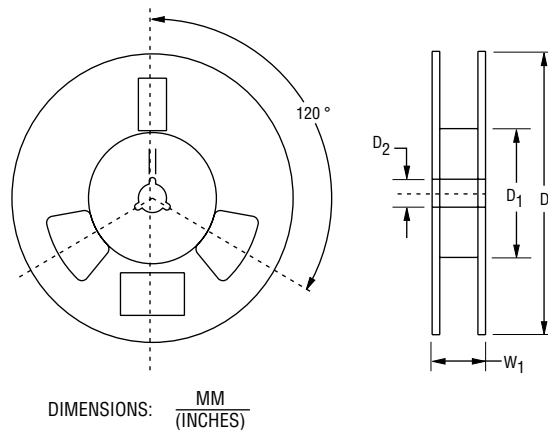
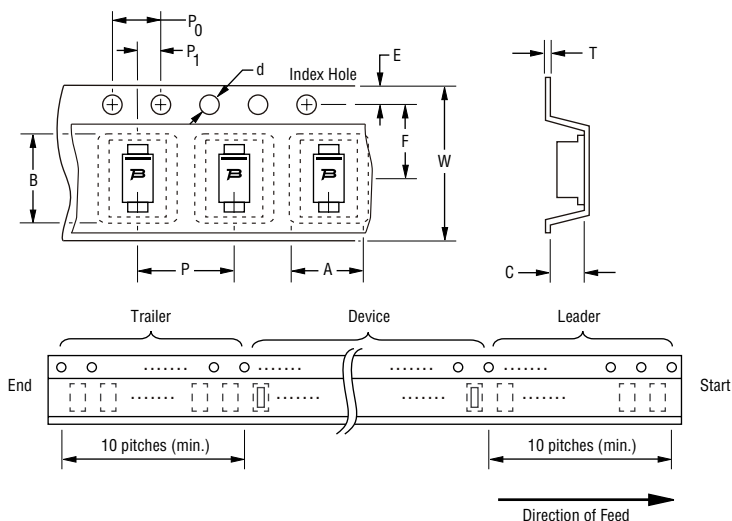
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# SMF4L-Q Transient Voltage Suppressor Diode Series

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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      | $1.9 \pm 0.20$<br>(0.075 ± 0.008)                   |
| Carrier Length         | B      | $4.01 \pm 0.20$<br>(0.158 ± 0.008)                  |
| Carrier Depth          | C      | $1.32 \pm 0.20$<br>(0.052 ± 0.008)                  |
| Sprocket Hole          | d      | $1.50 + 0.10 / - 0.00$<br>(0.059 + 0.004 / - 0.00)  |
| Reel Outside Diameter  | D      | $178$<br>(7.008)                                    |
| Reel Inner Diameter    | D1     | $50.0$<br>(1.969) MIN.                              |
| Feed Hole Diameter     | D2     | $13.0 + 0.50 / - 0.20$<br>(0.512 + 0.020 / - 0.008) |
| Sprocket Hole Position | E      | $1.75 \pm 0.10$<br>(0.069 ± 0.004)                  |
| Punch Hole Position    | F      | $3.50 \pm 0.05$<br>(0.138 ± 0.002)                  |
| Punch Hole Pitch       | P      | $4.00 \pm 0.10$<br>(0.157 ± 0.004)                  |
| Sprocket Hole Pitch    | P0     | $4.00 \pm 0.10$<br>(0.157 ± 0.004)                  |
| Embossment Center      | P1     | $2.00 \pm 0.05$<br>(0.079 ± 0.002)                  |
| Overall Tape Thickness | T      | $0.40$<br>(0.016) MAX.                              |
| Tape Width             | W      | $8.00 \pm 0.30$<br>(0.315 ± 0.012)                  |
| Reel Width             | W1     | $14.4$<br>(5.669) MAX.                              |
| Quantity per Reel      | --     | 2,500                                               |

**BOURNS®**

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- 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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