



## Features

- Surface Mount SOD-123FL package
- Standoff Voltage: 5 to 85 volts
- Power Dissipation: 400 watts
- RoHS compliant\*



Shaded models are currently available but not recommended for new designs.

# 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 5 V up to 85 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.

## Additional Information

Click these links for more information:



## Absolute Maximum Ratings (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Maximum Peak Pulse Power Dissipation (10/1000 μs) <sup>1</sup>	P <sub>PPM</sub>	400	W
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method)	I <sub>FSM</sub>	50	A
Operating Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

<sup>1</sup> Non-repetitive current pulse, per Pulse Waveform graph and derated above T<sub>A</sub> = 25 °C.

## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Unidirectional Device		Breakdown Voltage V <sub>BR</sub> (Volts)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ V <sub>RWM</sub>	Maximum Reverse Voltage @ I <sub>RSM</sub>	Maximum Reverse Surge Current
Part No.	Marking	Min.	Max.	@ I <sub>T</sub> (mA)	V <sub>RWM</sub> (V)	I <sub>R</sub> (μA)	V <sub>RSM</sub> (V)	I <sub>RSM</sub> (A)
SMF4L5.0A	KE	6.4	7.00	10	5	400	9.2	21.7
SMF4L6.0A	KG	6.67	7.37	10	6	400	10.3	19.4
SMF4L6.5A	KK	7.22	7.98	10	6.5	250	11.2	17.9
SMF4L7.0A	KM	7.78	8.6	10	7	100	12.0	16.7
SMF4L7.5A	KP	8.33	9.21	1.0	7.5	50	12.9	15.5
SMF4L8.0A	KR	8.89	9.83	1.0	8	25	13.6	14.7
SMF4L8.5A	KT	9.44	10.4	1.0	8.5	10	14.4	13.9
SMF4L9.0A	KV	10	11.1	1.0	9	5	15.4	13.0
SMF4L10A	KX	11.1	12.3	1.0	10	2.5	17.0	11.8
SMF4L11A	KZ	12.2	13.5	1.0	11	2.5	18.2	11.0
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

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**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

Specifications are subject to change without notice. Users should verify actual device performance in their specific applications.

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## Applications

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



Shaded models are currently available but not recommended for new designs.

## SMF4L Transient Voltage Suppressor Diode Series

# BOURNS®

### Electrical Characteristics - Continued (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Unidirectional Device		Breakdown Voltage V <sub>BR</sub> (Volts)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ V <sub>RWM</sub>	Maximum Reverse Voltage @ I <sub>RSM</sub>	Maximum Reverse Surge Current
Part No.	Marking	Min.	Max.	@ I <sub>T</sub> (mA)	V <sub>RWM</sub> (V)	I <sub>R</sub> (μA)	V <sub>RSM</sub> (V)	I <sub>RSM</sub> (A)
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
SMF4L60A	NK	66.7	73.7	1.0	60	1.0	96.8	3.6
SMF4L64A	NM	71.1	78.6	1.0	64	1.0	103.0	3.4
SMF4L70A	NP	77.8	86.0	1.0	70	1.0	113.0	3.0
SMF4L75A	NR	83.3	92.1	1.0	75	1.0	121.0	2.8
SMF4L78A	NT	86.7	95.8	1.0	78	1.0	126.0	2.8
SMF4L85A	NV	94.4	104.0	1.0	85	1.0	137.0	2.6

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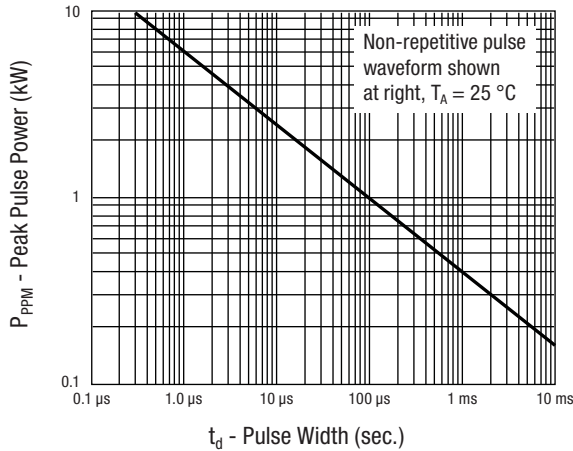
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# SMF4L Transient Voltage Suppressor Diode Series

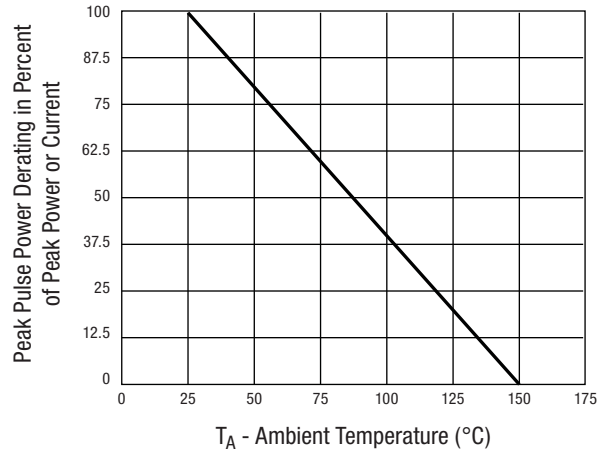


## Performance Graphs

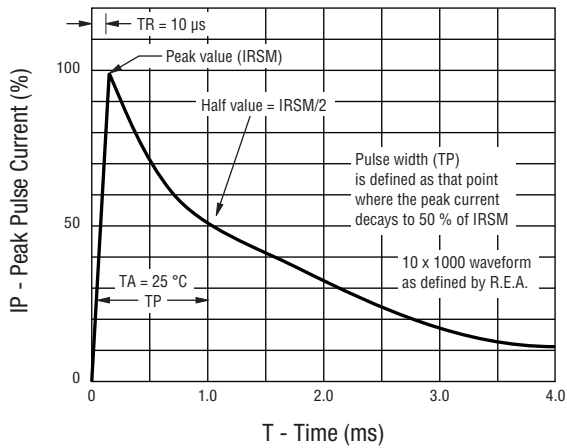
### Peak Pulse Power Derating Curve



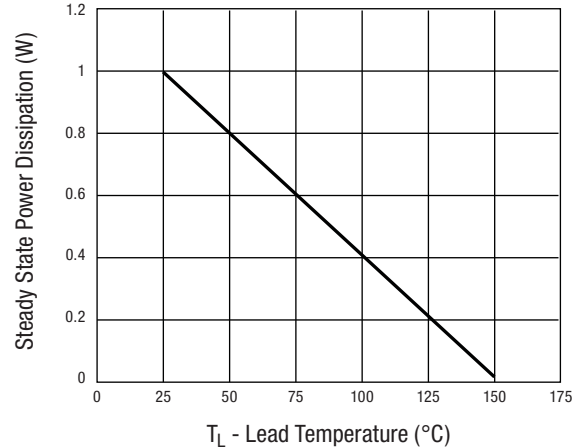
### Maximum Non-Repetitive Surge Current



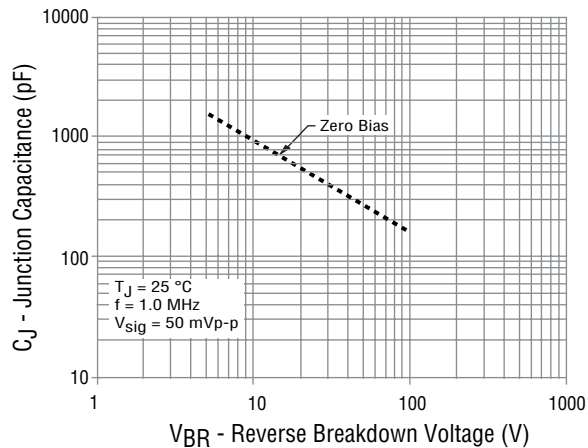
### Pulse Waveform



### Steady State Power Derating Curve



### Typ. Junction Capacitance vs. Reverse Breakdown Voltage

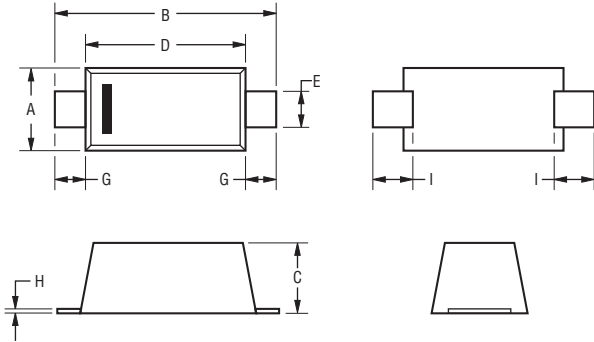


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# SMF4L Transient Voltage Suppressor Diode Series



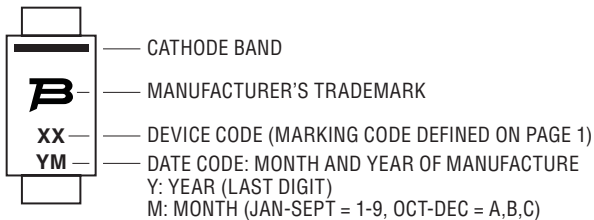
## Product Dimensions



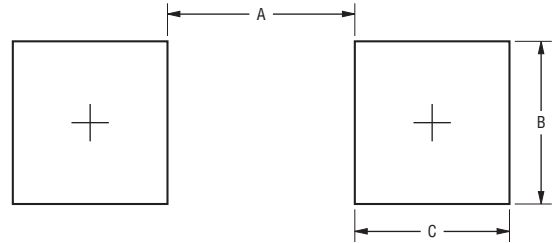
Dimension	SMF (SOD-123FL)
A	$\frac{1.65 \pm 0.25}{(0.065 \pm 0.01)}$
B	$\frac{3.70 \pm 0.15}{(0.146 \pm 0.006)}$
C	$\frac{1.125 \pm 0.225}{(0.044 \pm 0.009)}$
D	$\frac{2.825 \pm 0.275}{(0.111 \pm 0.011)}$
E	$\frac{0.775 \pm 0.275}{(0.031 \pm 0.011)}$
G	$\frac{0.400 \pm 0.15}{(0.016 \pm 0.006)}$
H	$\frac{0.175 \pm 0.075}{(0.007 \pm 0.003)}$
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 5.0 A  
 SMF4L = 400 W SMF/SOD-123FL Package  
 Working Peak Reverse Voltage 5.0  
 5.0 = 5 V<sub>RWM</sub> (Volts)  
 Suffix A  
 A = 5 % Tolerance Unidirectional Device

## Environmental Specifications

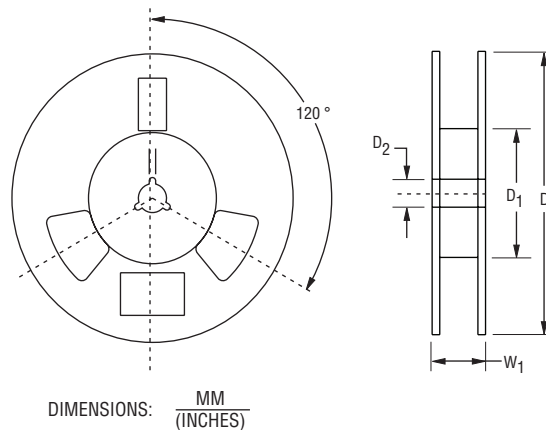
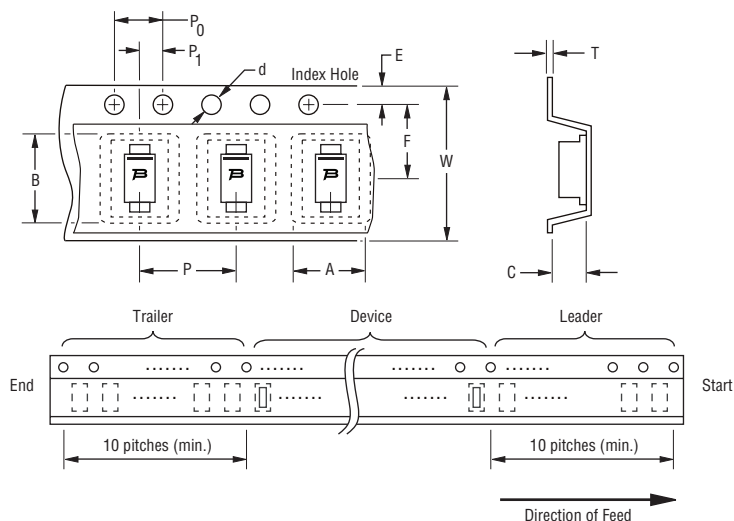
Moisture Sensitivity Level..... 1  
 ESD Classification (HBM)..... 3B

# SMF4L Transient Voltage Suppressor Diode Series



## 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 Series
Carrier Width	A	$1.9 \pm 0.20$ ( $0.075 \pm 0.008$ )
Carrier Length	B	$4.01 \pm 0.20$ ( $0.158 \pm 0.008$ )
Carrier Depth	C	$1.32 \pm 0.20$ ( $0.052 \pm 0.008$ )
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 <sub>1</sub>	$50.0$ ( $1.969$ ) MIN.
Feed Hole Diameter	D <sub>2</sub>	$13.0 + 0.50 / - 0.20$ ( $0.512 + 0.020 / - 0.008$ )
Sprocket Hole Position	E	$1.75 \pm 0.10$ ( $0.069 \pm 0.004$ )
Punch Hole Position	F	$3.50 \pm 0.05$ ( $0.138 \pm 0.002$ )
Punch Hole Pitch	P	$4.00 \pm 0.10$ ( $0.157 \pm 0.004$ )
Sprocket Hole Pitch	P <sub>0</sub>	$4.00 \pm 0.10$ ( $0.157 \pm 0.004$ )
Embossment Center	P <sub>1</sub>	$2.00 \pm 0.05$ ( $0.079 \pm 0.002$ )
Overall Tape Thickness	T	$0.40$ ( $0.016$ ) MAX.
Tape Width	W	$8.00 \pm 0.30$ ( $0.315 \pm 0.012$ )
Reel Width	W <sub>1</sub>	$14.4$ ( $5.669$ ) MAX.
Quantity per Reel	--	2,500



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