

Features

- Surface Mount SOD-123FL package
- Standoff Voltage: 5 to 85 volts
- Power Dissipation: 400 watts
- RoHS compliant*
- AEC-Q101 compliant**



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

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 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

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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)
SMF4L5.0A-Q	KEQ	6.4	7.00	10	5	400	9.2	21.7
SMF4L6.0A-Q	KGQ	6.67	7.37	10	6	400	10.3	19.4
SMF4L6.5A-Q	KKQ	7.22	7.98	10	6.5	250	11.2	17.9
SMF4L7.0A-Q	KMQ	7.78	8.6	10	7	100	12.0	16.7
SMF4L7.5A-Q	KPQ	8.33	9.21	1.0	7.5	50	12.9	15.5
SMF4L8.0A-Q	KRQ	8.89	9.83	1.0	8	25	13.6	14.7
SMF4L8.5A-Q	KTQ	9.44	10.4	1.0	8.5	10	14.4	13.9
SMF4L9.0A-Q	KVQ	10.0	11.1	1.0	9	5	15.4	13.0
SMF4L10A-Q	KXQ	11.1	12.3	1.0	10	2.5	17.0	11.8
SMF4L11A-Q	KZQ	12.2	13.5	1.0	11	2.5	18.2	11.0
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

~ Continued on next page ~



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. The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

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-Q Transient Voltage Suppressor Diode Series

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Electrical Characteristics - Continued (@ 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)
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
SMF4L60A-Q	NKQ	66.7	73.7	1.0	60	1.0	96.8	3.6
SMF4L64A-Q	NMQ	71.1	78.6	1.0	64	1.0	103.0	3.4
SMF4L70A-Q	NPQ	77.8	86.0	1.0	70	1.0	113.0	3.0
SMF4L75A-Q	NRQ	83.3	92.1	1.0	75	1.0	121.0	2.8
SMF4L78A-Q	NTQ	86.7	95.8	1.0	78	1.0	126.0	2.8
SMF4L85A-Q	NVQ	94.4	104.0	1.0	85	1.0	137.0	2.6

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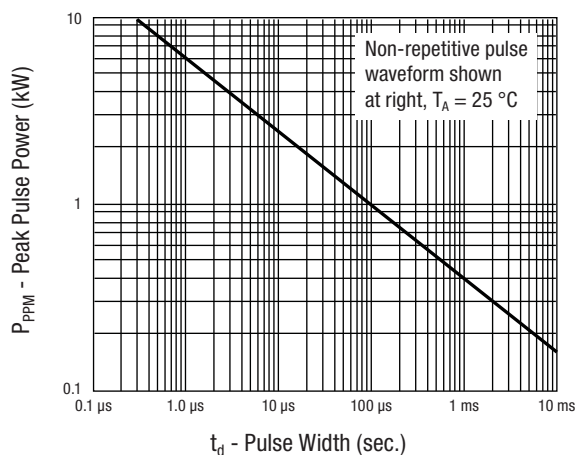
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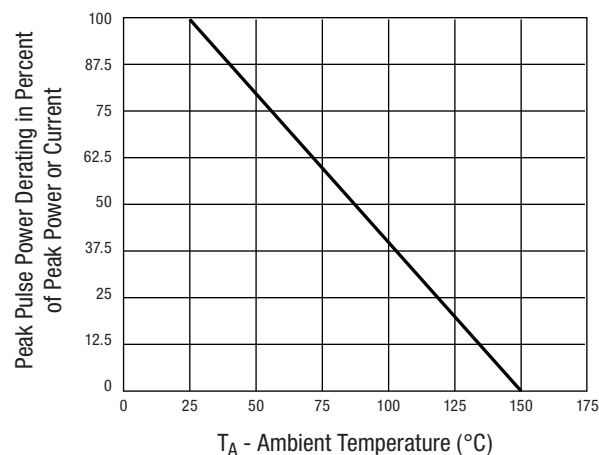
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Performance Graphs

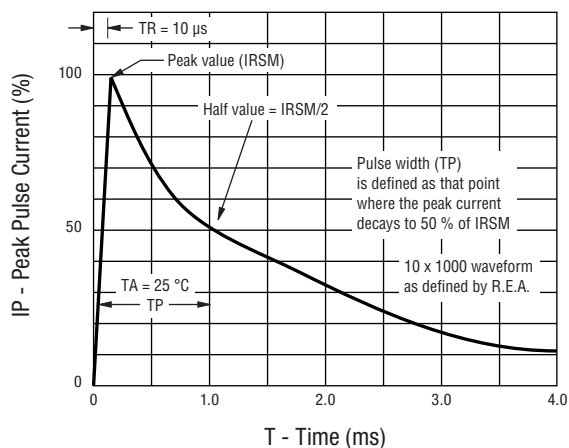
Peak Pulse Power Derating Curve



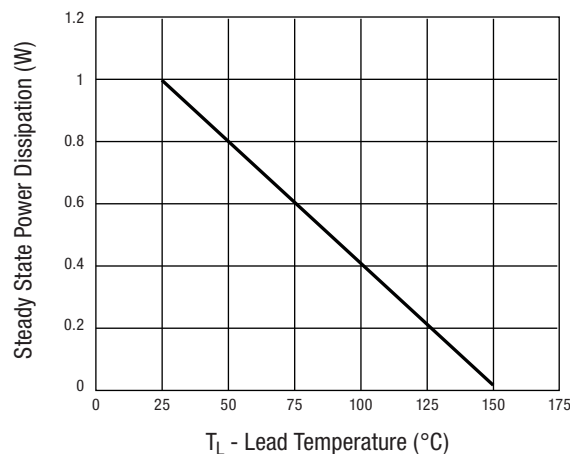
Maximum Non-Repetitive Surge Current



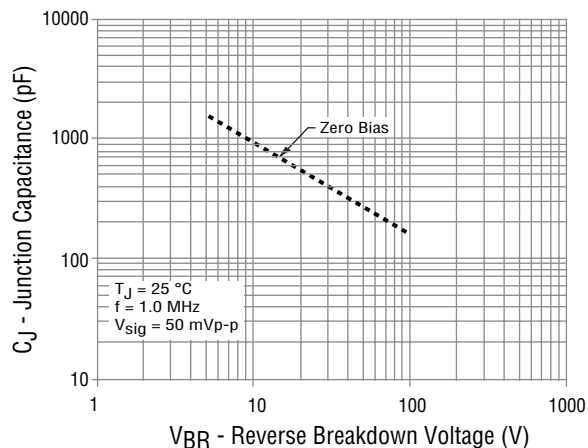
Pulse Waveform



Steady State Power Derating Curve



Typ. Junction Capacitance vs. Reverse Breakdown Voltage

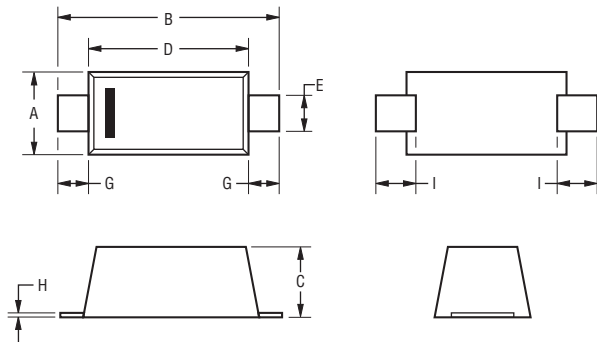


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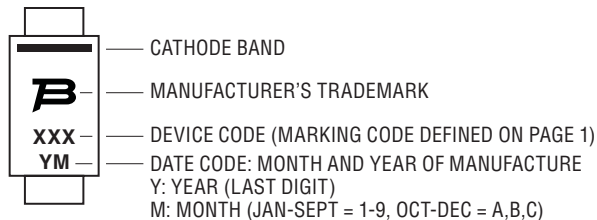
Product Dimensions



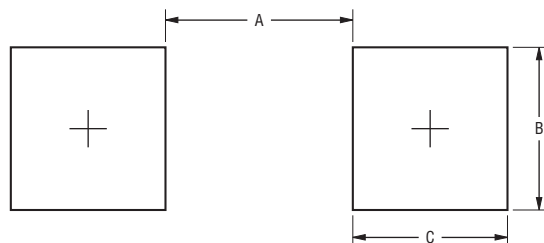
Dimension	SMF (SOD-123FL)
A	$\frac{1.65 \pm 0.25}{(0.065 \pm 0.01)}$
B	$\frac{3.70 \pm 0.15}{(0.146 \pm 0.006)}$
C	$\frac{1.125 \pm 0.225}{(0.044 \pm 0.009)}$
D	$\frac{2.825 \pm 0.275}{(0.111 \pm 0.011)}$
E	$\frac{0.775 \pm 0.275}{(0.031 \pm 0.011)}$
G	$\frac{0.400 \pm 0.15}{(0.016 \pm 0.006)}$
H	$\frac{0.175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

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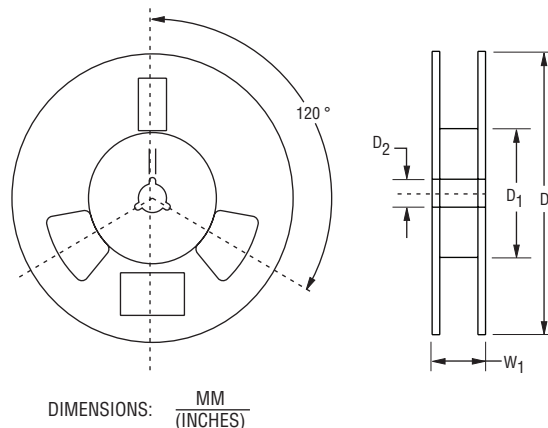
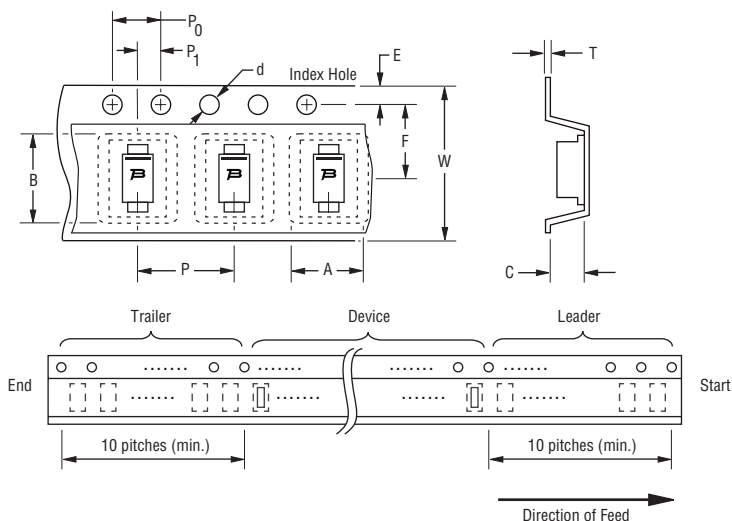
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Packaging Information

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 ± 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	D1	50.0 (1.969) MIN.
Feed Hole Diameter	D2	$13.0 + 0.50 / - 0.20$ (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	P0	4.00 ± 0.10 (0.157 ± 0.004)
Embossment Center	P1	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	W1	14.4 (5.669) MAX.
Quantity per Reel	--	2,500

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[SMF4L8.5A-Q](#) [SMF4L85A-Q](#) [SMF4L9.0A-Q](#) [SMF4L64A-Q](#) [SMF4L7.0A-Q](#) [SMF4L7.5A-Q](#) [SMF4L70A-Q](#) [SMF4L75A-Q](#) [SMF4L78A-Q](#)