

## V. Transient Voltage Suppressor

### 200W Surface Mount TVS (Stand-off Voltage: 5.0~170 Volts)

#### SMF Series

(Package: SOD-123FL)

<p><u>FEATURES</u></p> <ul style="list-style-type: none"> <li>• 200W Peak Pulse Power Dissipation</li> <li>• 5.0V~170V Standoff Voltages</li> <li>• Glass Passivated Die Construction</li> <li>• Uni and Bi-directional versions available</li> <li>• Excellent clamping capability</li> <li>• Fast response time</li> <li>• Plastic material : UL Flammability Classification Rating 94V-0</li> </ul> <p><u>MECHANICAL DATA</u></p> <ul style="list-style-type: none"> <li>• Case : JEDEC SOD-123FL molded plastic body</li> <li>• Terminals : Solderable per MIL-STD-750, Method 2026</li> <li>• Polarity : Color band denotes cathode except for bi-directional types</li> <li>• Weight : 0.064 grams (approx.)</li> </ul>	<p>The drawing shows three views of the SOD-123FL package. The top view shows a rectangular package with a cathode band on the left side. Dimensions include a width of 1.70-1.90 mm, a height of 0.80-1.20 mm, and a length of 2.70-2.90 mm. The side view shows a height of 1.15-1.45 mm and a thickness of 0.10-0.30 mm. The bottom view shows a width of 0.35-0.85 mm and a length of 3.50-3.90 mm.</p> <p>Case: SOD-123FL Dimensions in inches and (millimetres)</p>
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### Devices for Bi-Directional Applications

For bi-directional devices use suffix "CA" for types SMF5.0CA thru SMF170CA (e.g. SMF28CA)

Electrical characteristics apply in both directions.

### Maximum Ratings & Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Ratings	Symbol	Value	Units
Peak pulse power dissipation (Non repetitive current pulse derated above $T_a = 25^\circ\text{C}$ ) (Note 1)	$P_{PK}$	200	Watts
Peak forward surge current, 8.3ms single half sine wave superimposed on rated load (JEDEC Method) (Notes 1, 2 & 3)	$I_{FSM}$	20	Amps
Steady state power dissipation @ $T_L = 75^\circ\text{C}$	$P_{M(AV)}$	0.5	Watts
Instantaneous forward voltage @ $I_{PPM} = 25\text{A}$ (Notes 1, 2 & 3)	$V_F$	3.5	Volts
Operating temperature range	$T_J$	-55 to +150	°C
Storage temperature range	$T_{stg}$	-55 to +175	°C

Note:

1. Valid provided that terminals are kept at ambient temperature.
2. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
3. Unidirectional units only.

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Device Type	Device Marking Code		Stand-off Voltage $V_{WM}$ (V)	Breakdown Voltage $V_{(BR)}$ @ $I_T$ <sup>(1)</sup>		Test Current $I_T$ (mA)	Max. Reverse Leakage @ $V_{WM}$ <sup>(2)</sup> $I_R$ (μA)	Max. Clamping Voltage @ $I_{PPM}$ $V_C$ (V)	Max. Peak Pulse Current $I_{PPM}$ (A)
	BI-	UNI-		Min (V)	Max (V)				
SMF5.0(C)A	TE	KE	5.0	6.40	7.25	10	800	9.2	21.7
SMF6.0(C)A	TG	KG	6.0	6.67	7.37	10	800	10.3	19.4
SMF6.5(C)A	TK	KK	6.5	7.22	7.98	10	500	11.2	17.9
SMF7.0(C)A	TM	KM	7.0	7.78	8.60	10	200	12.0	16.7
SMF7.5(C)A	TP	KP	7.5	8.33	9.21	1.0	100	12.9	15.5
SMF8.0(C)A	TR	KR	8.0	8.89	9.83	1.0	50	13.6	14.7
SMF8.5(C)A	TT	KT	8.5	9.44	10.4	1.0	10	14.4	13.9
SMF9.0(C)A	TV	KV	9.0	10.0	11.1	1.0	5.0	15.4	13.0
SMF10(C)A	TX	KX	10	11.1	12.3	1.0	5.0	17.0	11.8
SMF11(C)A	TZ	KZ	11	12.2	13.5	1.0	5.0	18.2	11.0
SMF12(C)A	UE	LE	12	13.3	14.7	1.0	5.0	19.9	10.1
SMF13(C)A	UG	LG	13	14.4	15.9	1.0	5.0	21.5	9.3
SMF14(C)A	UK	LK	14	15.6	17.2	1.0	5.0	23.2	8.6
SMF15(C)A	UM	LM	15	16.7	18.5	1.0	5.0	24.4	8.2
SMF16(C)A	UP	LP	16	17.8	19.7	1.0	5.0	26.0	7.7
SMF17(C)A	UR	LR	17	18.9	20.9	1.0	5.0	27.6	7.2
SMF18(C)A	UT	LT	18	20.0	22.1	1.0	5.0	29.2	6.8
SMF20(C)A	UV	LV	20	22.2	24.5	1.0	5.0	32.4	6.2
SMF22(C)A	UX	LX	22	24.4	26.9	1.0	5.0	35.5	5.6
SMF24(C)A	UZ	LZ	24	26.7	29.5	1.0	5.0	38.9	5.1
SMF26(C)A	VE	ME	26	28.9	31.9	1.0	5.0	42.1	9.5
SMF28(C)A	VG	MG	28	31.1	34.4	1.0	5.0	45.4	8.8
SMF30(C)A	VK	MK	30	33.3	36.8	1.0	5.0	48.4	8.3
SMF33(C)A	VM	MM	33	36.7	40.6	1.0	5.0	53.3	7.5
SMF36(C)A	VP	MP	36	40.0	44.2	1.0	5.0	58.1	6.9
SMF40(C)A	VR	MR	40	44.4	49.1	1.0	5.0	64.5	6.2
SMF43(C)A	VT	MT	43	47.8	52.8	1.0	5.0	69.4	5.7
SMF45(C)A	VV	MV	45	50.0	55.3	1.0	5.0	72.7	5.5
SMF48(C)A	VX	MX	48	53.3	58.9	1.0	5.0	77.4	5.2
SMF51(C)A	VZ	MZ	51	56.7	62.7	1.0	5.0	82.4	4.9
SMF54(C)A	WE	NE	54	60.0	66.3	1.0	5.0	87.1	4.6
SMF58(C)A	WG	NG	58	64.4	71.2	1.0	5.0	93.6	4.3
SMF60(C)A	WK	NK	60	66.7	73.7	1.0	5.0	96.8	4.1
SMF64(C)A	WM	NM	64	71.1	78.6	1.0	5.0	103	3.9
SMF70(C)A	WP	NP	70	77.8	86.0	1.0	5.0	113	3.5
SMF75(C)A	WR	NR	75	83.3	92.1	1.0	5.0	121	3.3
SMF78(C)A	WT	NT	78	86.7	95.8	1.0	5.0	126	2.2
SMF85(C)A	WV	NV	85	94.4	104	1.0	5.0	137	2.9
SMF90(C)A	WX	NX	90	100	111	1.0	5.0	146	2.7
SMF100(C)A	WZ	NZ	100	111	123	1.0	5.0	162	2.5
SMF110(C)A	XE	PE	110	122	135	1.0	5.0	177	2.3
SMF120(C)A	XG	PG	120	133	147	1.0	5.0	193	2.0
SMF130(C)A	XK	PK	130	144	159	1.0	5.0	209	1.9
SMF150(C)A	XM	PM	150	167	185	1.0	5.0	243	1.6
SMF160(C)A	XP	PP	160	178	197	1.0	5.0	259	1.5
SMF170(C)A	XR	PR	170	189	209	1.0	5.0	275	1.4

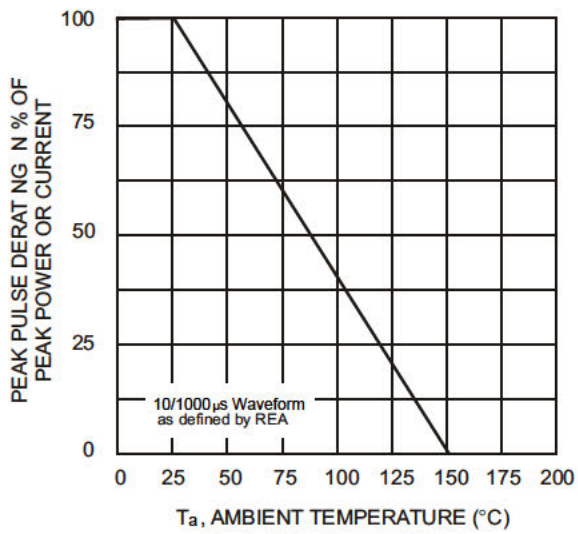
Note:

1.  $V_{(BR)}$  measured with  $I_T$  current pulse = 300μs

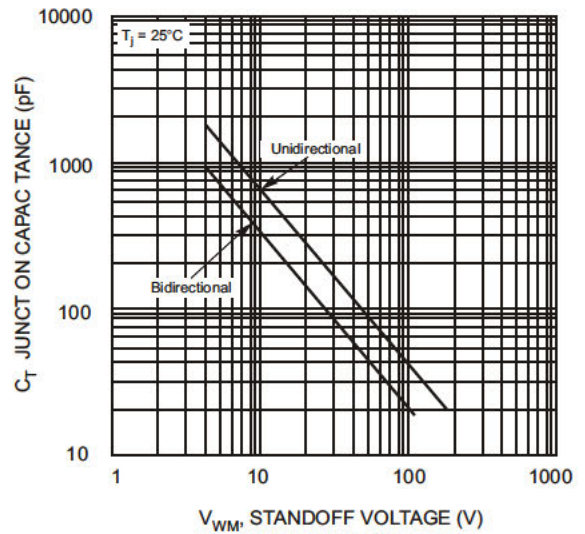
2. For bi-directional types having  $V_{WM}$  of 10Volts and less, the  $I_R$  limit is doubled.

<http://patron-components.com/>

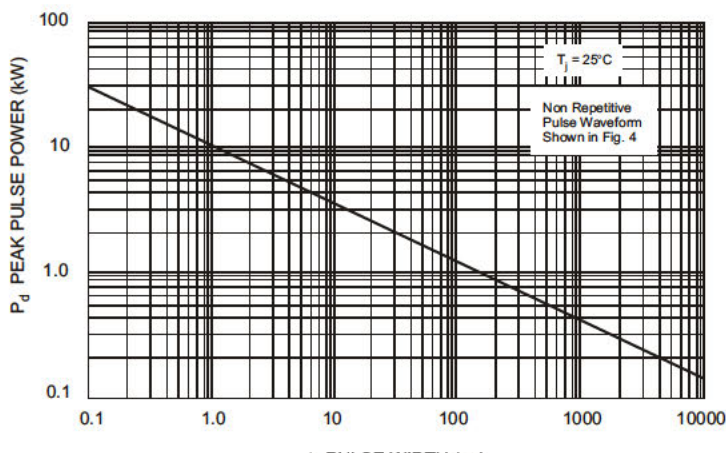
# Ratings and Characteristic Curves of SMF Series



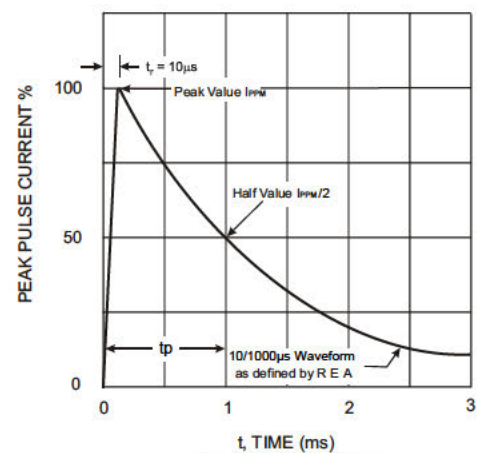
$T_a$ , AMBIENT TEMPERATURE ( $^{\circ}C$ )  
Fig. 1 Pulse Derating Curve



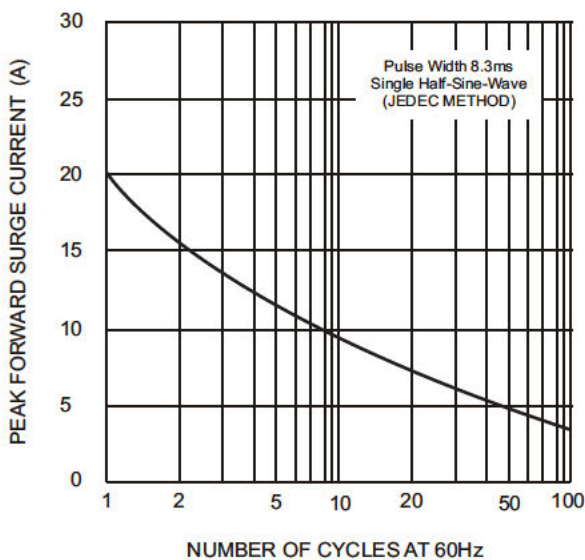
$V_{WM}$ , STANDOFF VOLTAGE (V)  
Fig. 2 Typical Total Capacitance



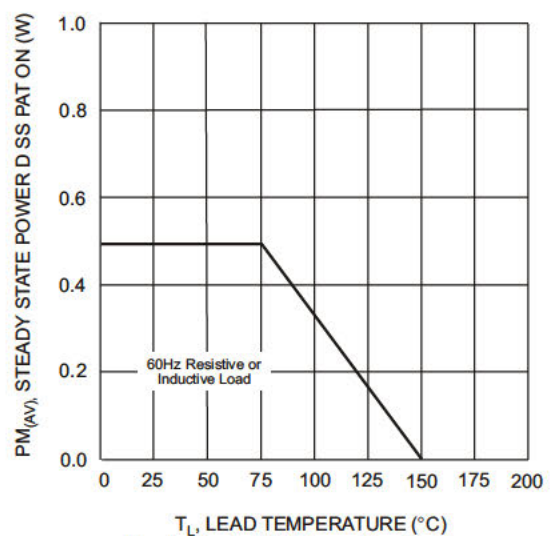
$t_p$  PULSE WIDTH ( $\mu s$ )  
Fig. 3 Pulse Rating Curve



t, TIME (ms)  
Fig. 4 Pulse Waveform



NUMBER OF CYCLES AT 60Hz  
Fig. 5 Maximum Non Repetitive Surge Current



$T_L$ , LEAD TEMPERATURE ( $^{\circ}C$ )  
Fig. 6 Steady State Power Derating Curve