

200W, 5V - 100V Surface Mount Transient Voltage Suppressor

FEATURES

- Photo Glass passivated junction
- Low power loss, high efficiency
- Ideal for automated placement
- Excellent clamping capability
- Typical I_R less than $1\mu A$ above 10V
- Meets ISO 7637-2 (Pulse 1/2a/2b/3a/3b)
- 200 watts peak pulse power capability with a 10/1000 μs waveform ($V_{WM} \geq 60V$, $P_{PPM} = 175W$)
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
V_{WM}	5 - 100	V
V_{BR} (uni-directional)	6.8 - 117	V
P_{PPM}	200	W
T_{JMAX}	175	°C
Package	SOD-123W	
Configuration	Single die	



APPLICATIONS

- Protect sensitive circuit from damage by high voltage transients
- Lighting, ESD transient voltage protection of IC, system
- Inductive switching load protection of IC, system
- Electrical Fast Transient Immunity protection of IC, system

MECHANICAL DATA

- Case: SOD-123W
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.016g (approximately)



SOD-123W



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Non-repetitive peak impulse power dissipation with 10/1000 μs waveform ⁽¹⁾	P_{PPM}	200	W
Steady state power dissipation at $T_L = 25^\circ C$ ⁽²⁾	P_{tot}	1	W
Forward Voltage @ $I_F = 12A$ for Uni-directional only ⁽³⁾	V_F	3.5	V
Junction temperature	T_J	-55 to +175	°C
Storage temperature	T_{STG}	-55 to +175	°C

Notes:

1. Non-repetitive Current Pulse Per Fig.3 and derated above $T_A = 25^\circ C$ Per Fig.2
2. Units mounted on PCB (5mm x 5mm Cu pad test board)
3. Pulse test with $PW = 0.3ms$

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\theta JL}$	33	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	100	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	34	°C/W

Thermal Performance Note: Units mounted on PCB (5mm x 5mm Cu pad test board)

ORDERING INFORMATION		
ORDERING CODE⁽¹⁾	PACKAGE	PACKING
SMFxA	SOD-123W	10,000 / Tape & Reel

Notes:

1. “x” defines voltage from 5V (SMF5.0A) to 100V (SMF100A)

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Part number	Marking code	Breakdown voltage $V_{BR}@I_T$ (V) (Note 1)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Maximum reverse leakage current $I_R@V_{WM}$ (μA) (Note 1)	Maximum peak impulse current I_{PPM} (A) $t_p = 10/1000\mu\text{s}$	Maximum clamping voltage $V_C@I_{PPM}$ (V) $t_p = 10/1000\mu\text{s}$
		Min	Max					
SMF5.0A	2W5P0	6.4	7.0	10	5	800	21.7	9.2
SMF6.0A	2W6P0	6.67	7.37	10	6	800	19.4	10.3
SMF6.5A	2W6P5	7.22	7.98	10	6.5	500	17.9	11.2
SMF7.0A	2W7P0	7.78	8.6	10	7.0	200	16.7	12.0
SMF7.5A	2W7P5	8.33	9.21	1	7.5	100	15.5	12.9
SMF8.0A	2W8P0	8.89	9.83	1	8.0	50	14.7	13.6
SMF8.5A	2W8P5	9.44	10.5	1	8.5	10	13.9	14.4
SMF9.0A	2W9P0	10.0	11.1	1	9.0	5	13.0	15.4
SMF10A	2W010	11.1	12.3	1	10	5	11.8	17.0
SMF11A	2W011	12.2	13.5	1	11	1	11.0	18.2
SMF12A	2W012	13.3	14.7	1	12	1	10.1	19.9
SMF13A	2W013	14.4	15.9	1	13	1	9.3	21.5
SMF14A	2W014	15.6	17.2	1	14	1	8.6	23.2
SMF15A	2W015	16.7	18.5	1	15	1	8.2	24.4
SMF16A	2W016	17.8	19.7	1	16	1	7.7	26.0
SMF17A	2W017	18.9	20.9	1	17	1	7.2	27.6
SMF18A	2W018	20.0	22.1	1	18	1	6.8	29.2
SMF20A	2W020	22.2	24.5	1	20	1	6.2	32.4
SMF22A	2W022	24.4	26.9	1	22	1	5.6	35.5
SMF24A	2W024	26.7	29.5	1	24	1	5.1	38.9
SMF26A	2W026	28.9	31.9	1	26	1	4.8	42.1
SMF28A	2W028	31.1	34.4	1	28	1	4.4	45.4
SMF30A	2W030	33.3	36.8	1	30	1	4.1	48.4
SMF33A	2W033	36.7	40.6	1	33	1	3.8	53.3
SMF36A	2W036	40.0	44.2	1	36	1	3.4	58.1
SMF40A	2W040	44.4	49.1	1	40	1	3.1	64.5
SMF43A	2W043	47.8	52.8	1	43	1	2.9	69.4
SMF45A	2W045	50.0	55.3	1	45	1	2.8	72.7
SMF48A	2W048	53.3	58.9	1	48	1	2.6	77.4
SMF51A	2W051	56.7	62.7	1	51	1	2.4	82.4
SMF54A	2W054	60.0	66.3	1	54	1	2.3	87.1
SMF58A	2W058	64.4	71.2	1	58	1	2.1	95
SMF60A	2W060	66.7	73.7	1	60	1	1.8	96.8
SMF64A	2W064	71.1	78.6	1	64	1	1.7	103
SMF70A	2W070	77.8	86	1	70	1	1.55	113
SMF75A	2W075	83.3	92.1	1	75	1	1.45	121
SMF78A	2W078	86.7	95.8	1	78	1	1.4	126
SMF85A	2W085	94.4	104	1	85	1	1.3	137
SMF90A	2W090	100	111	1	90	1	1.2	146
SMF100A	2W100	111	123	1	100	1	1.08	162

Notes:

1. Pulse test with $PW = 30\text{ms}$

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 Pulse Power or Current vs. Initial Junction Temperature

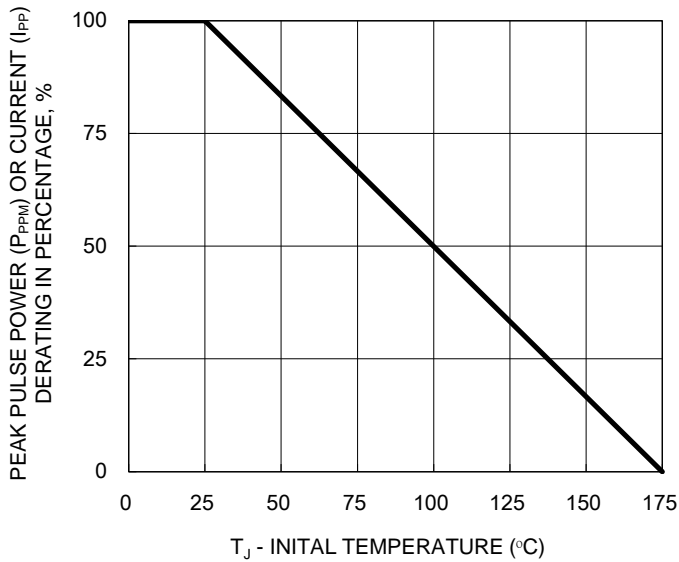


Fig.2 Steady State Power Derating

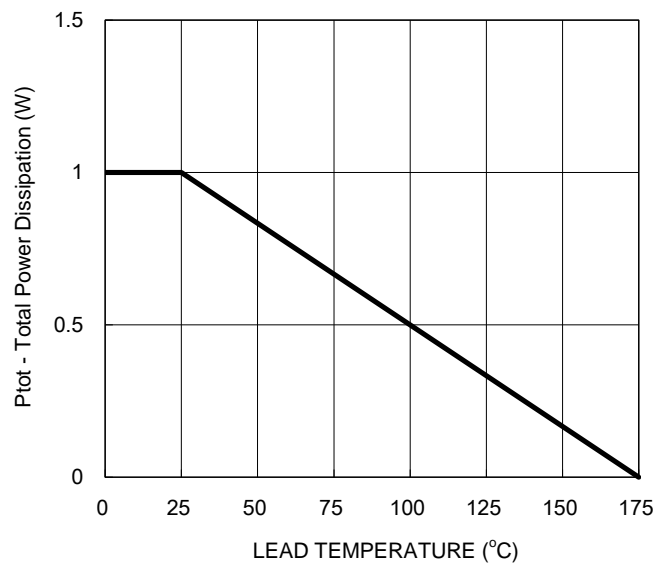


Fig.3 Clamping Power Pulse Waveform

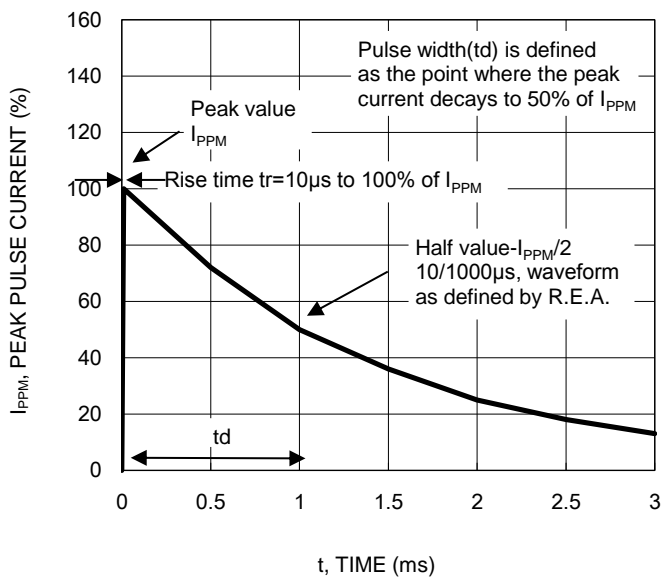
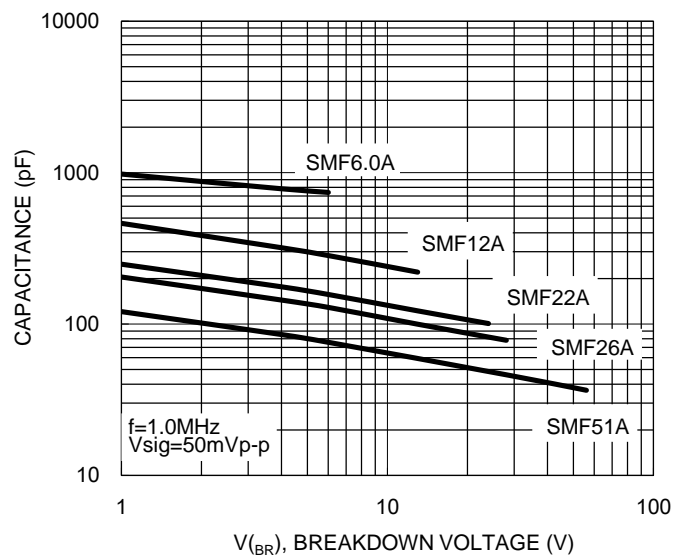
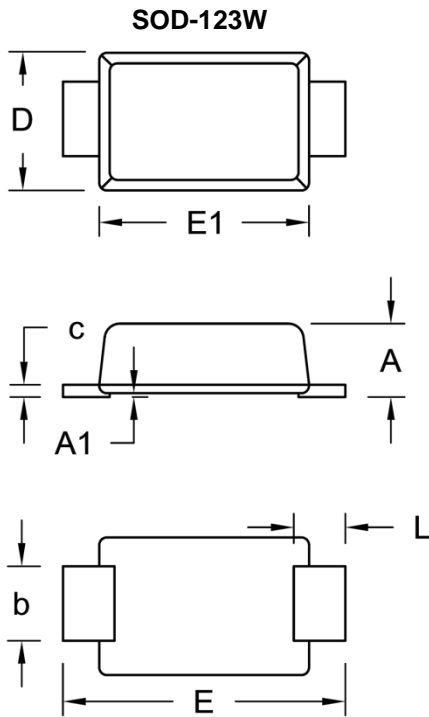


Fig.4 Typical Junction Capacitance

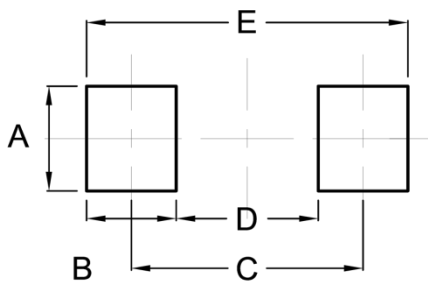


PACKAGE OUTLINE DIMENSIONS



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	0.90	1.02	0.035	0.040
A1	0.00	0.10	0.000	0.004
b	0.90	1.05	0.035	0.041
c	0.10	0.22	0.004	0.009
D	1.70	1.90	0.067	0.075
E	3.60	3.80	0.142	0.150
E1	2.60	2.90	0.102	0.114
L	0.50	0.85	0.020	0.033

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	1.40	0.055
B	1.20	0.047
C	3.10	0.122
D	1.90	0.075
E	4.30	0.169

MARKING DIAGRAM



P/N = Marking Code
 YW = Date Code
 F = Factory Code