

Surface Mount Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218AB

FEATURES

- Chip produced by chemical method
- Junction passivated by high temperature resistant insulating adhesive
- $T_J = 175\text{ }^{\circ}\text{C}$ capability suitable for high reliability and automotive requirement
- SM8SXXA Available in Uni-directional polarity only
- SM8SXXCA Available in Bi-directional polarity only
- Low leakage current
- Low forward voltage drop for uni-directional production
- High surge capability
- Meets ISO16750-2 surge specification (varied by test condition)
- LF maximum peak of $245\text{ }^{\circ}\text{C}$

PRIMARY CHARACTERISTICS

V_{BR}	11.1 V to 104.0 V
V_{WM}	10 V to 85 V
P_{PPM} (10/1000 μs)	6600 W
P_{PPM} (10/10 000 μs)	5200 W
P_D	8 W
I_{FSM} (Only for uni-direction)	700 A
T_J max.	$175\text{ }^{\circ}\text{C}$
Polarity	Uni/Bi-directional
Package	DO-218AB

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump protection application.

MECHANICAL DATA

Case: DO-218AB

Molding compound meets UL 94 V-0 flammability rating
Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified
("X" denotes revision code e.g. A, B, ...)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

Polarity: For uni-directional production heatsink is anode

MAXIMUM RATINGS ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation	P_{PPM}	6600	W
		5200	
Power dissipation on infinite heatsink at $T_C = 25\text{ }^{\circ}\text{C}$ (fig. 1)	P_D	8.0	W
Peak pulse current with 10/1000 μs waveform	$I_{PPM}^{(1)}$	See next table	A
Peak forward surge current 8.3 ms single half sine-wave	$I_{FSM}^{(2)}$	700	A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	$^{\circ}\text{C}$

Note

⁽¹⁾ Non-repetitive current pulse derated above $T_A = 25\text{ }^{\circ}\text{C}$

⁽²⁾ I_{FSM} only for uni-directional production

ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)										
DEVICE TYPE	BREAKDOWN VOLTAGE V_{BR} (V)			TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (μA)	MAXIMUM REVERSE LEAKAGE AT V_{WM} $T_J = 175\text{ }^{\circ}\text{C}$ I_D (μA)	MAX. PEAK PULSE CURRENT AT 10/1000 μs WAVEFORM (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	TYPICAL TEMP. COEFFICIENT OF V_{BR} αT ($\%/^{\circ}\text{C}$)
	MIN.	NOM.	MAX.							
SM8S10A/CA	11.1	11.7	12.3	5.0	10.0	10	150	388	17.0	0.069
SM8S11A/CA	12.2	12.9	13.5	5.0	11.0	10	150	363	18.2	0.072
SM8S12A/CA	13.3	14.0	14.7	5.0	12.0	10	150	332	19.9	0.074
SM8S13A/CA	14.4	15.2	15.9	5.0	13.0	10	150	307	21.5	0.076
SM8S14A/CA	15.6	16.4	17.2	5.0	14.0	10	150	284	23.2	0.078
SM8S15A/CA	16.7	17.6	18.5	5.0	15.0	10	150	270	24.4	0.080
SM8S16A/CA	17.8	18.8	19.7	5.0	16.0	10	150	254	26.0	0.081
SM8S17A/CA	18.9	19.9	20.9	5.0	17.0	10	150	239	27.6	0.082
SM8S18A/CA	20.0	21.1	22.1	5.0	18.0	10	150	226	29.2	0.083
SM8S20A/CA	22.2	23.4	24.5	5.0	20.0	10	150	204	32.4	0.085
SM8S22A/CA	24.4	25.7	26.9	5.0	22.0	10	150	186	35.5	0.086
SM8S24A/CA	26.7	28.1	29.5	5.0	24.0	10	150	170	38.9	0.087
SM8S26A/CA	28.9	30.4	31.9	5.0	26.0	10	150	157	42.1	0.088
SM8S28A/CA	31.1	32.8	34.4	5.0	28.0	10	150	145	45.4	0.089
SM8S30A/CA	33.3	35.1	36.8	5.0	30.0	10	150	136	48.4	0.090
SM8S33A/CA	36.7	38.7	40.6	5.0	33.0	10	150	124	53.3	0.091
SM8S36A/CA	40.0	42.1	44.2	5.0	36.0	10	150	114	58.1	0.091
SM8S40A/CA	44.4	46.8	49.1	5.0	40.0	10	150	102	64.5	0.092
SM8S43A/CA	47.8	50.3	52.8	5.0	43.0	10	150	95.1	69.4	0.093
SM8S45A/CA	50.0	52.7	55.3	5.0	45.0	10	150	90.8	72.7	0.094
SM8S48A/CA	53.3	56.1	58.9	5.0	48.0	10	150	85.3	77.4	0.095
SM8S51A/CA	56.7	59.7	62.7	5.0	51.0	10	150	80.1	82.4	0.096
SM8S54A/CA	60.0	63.1	66.3	5.0	54.0	10	150	75.8	87.1	0.097
SM8S58A/CA	64.4	67.8	71.2	5.0	58.0	10	150	70.5	93.6	0.098
SM8S60A/CA	66.7	70.2	73.7	5.0	60.0	10	150	68.2	96.8	0.099
SM8S64A/CA	71.1	74.9	78.6	5.0	64.0	10	150	64.1	103	0.100
SM8S70A/CA	77.8	81.9	86.0	5.0	70.0	10	150	58.4	113	0.101
SM8S75A/CA	83.3	87.7	92.1	5.0	75.0	10	150	54.5	121	0.102
SM8S78A/CA	86.7	91.3	95.8	5.0	78.0	10	150	52.4	126	0.103
SM8S85A/CA	94.4	99.2	104.0	5.0	85.0	10	150	48.2	137	0.104

Notes

- For all uni-directional types maximum $V_F = 1.8\text{ V}$ at $I_F = 100\text{ A}$ measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

(1) To calculate V_{BR} vs. junction temperature, use the following formula: V_{BR} at $T_J = V_{BR}$ at $25\text{ }^{\circ}\text{C} \times (1 + \alpha T \times (T_J - 25))$

THERMAL CHARACTERISTICS ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to case	$R_{\theta JC}$	0.90	$^{\circ}\text{C/W}$

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

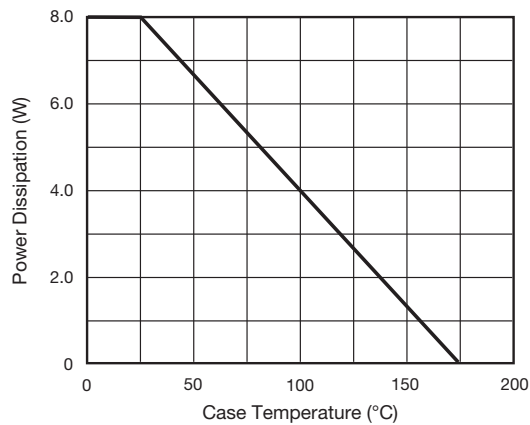


Fig. 1 - Power Derating Curve

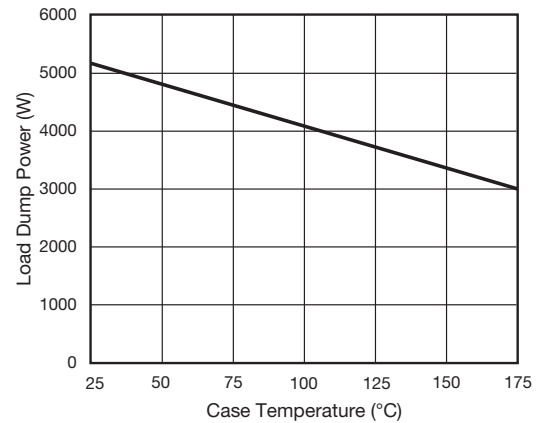


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

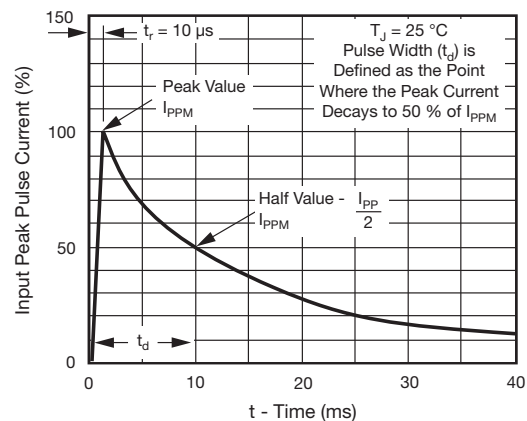


Fig. 3 - Pulse Waveform

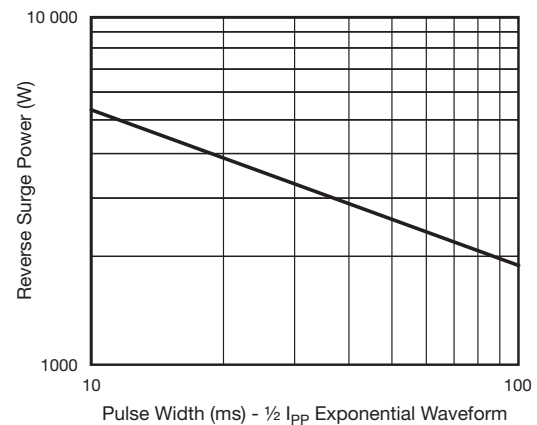


Fig. 4 - Reverse Power Capability

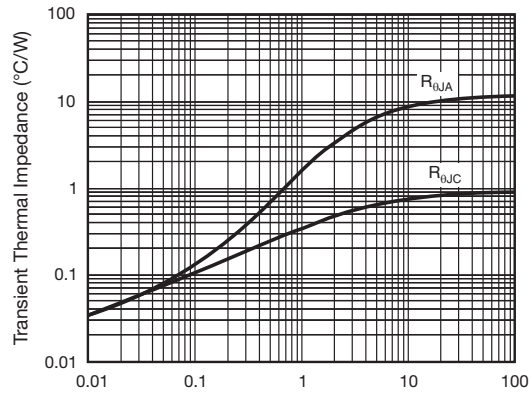


Fig. 5 - Typical Transient Thermal Impedance

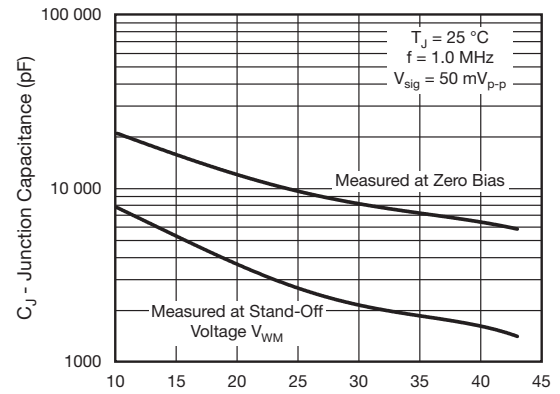
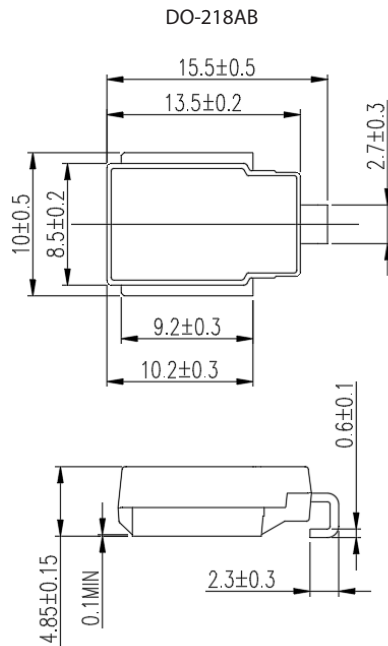


Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS (millimeters)



Mounting Pad Layout

