SM8S10A/CA thru SM8S60A/CA

Surface Mount Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions

DO-218AB

Unipolar

Bipolar

FEATURES

- Round chip produced by chemical method
- Junction passivated by high temperature resistant insulating adhesive
- T_J = 175 °C capability suitable for high reliability and automotive requirement
- Available in uni-directional polarity only
- Low leakage current
- Low forward voltage drop
- High surge capability
- Meets ISO7637-2 surge specification (varied by test condition)
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- AEC-Q101 qualified

PRIMARY CHARACTERISTICS	
V_{BR}	11.1 V to 52.8 V
V_{WM}	10 V to 43 V
P_{PPM} (10 x 1000 µs)	6600 W
P_{PPM} (10 x 10 000 µs)	5200 W
P_D	8 W
I_{FSM}	700 A
T_J max.	175 °C
Polarity	Uni-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: heatsink is anode

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**VALUE**	**UNIT**
Peak pulse power dissipation	with 10/1000 µs waveform	P_{PPM}	6600	W
	with 10/10 000 µs waveform		5200	
Power dissipation on infinite heatsink at T_C = 25 °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}	700	A
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +175	°C

Note

(1) Non-repetitive current pulse derated above T_A = 25 °C

SM8S10A/CA thru SM8S60A/CA

ELECTRICAL CHARACTERISTICS (T_C = 25 °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 °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} (1) αT (%/°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

Notes

- For all uni-directional types maximum V_F = 1.8 V at I_F = 100 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 °C x (1 + αT x (T_J - 25))

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to case	$R_{\theta JC}$	0.90	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE	BASE QUANTITY	DELIVERY MODE
SM8SXXA	2.85	DO-218AB	NA	According to customer's requirement

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

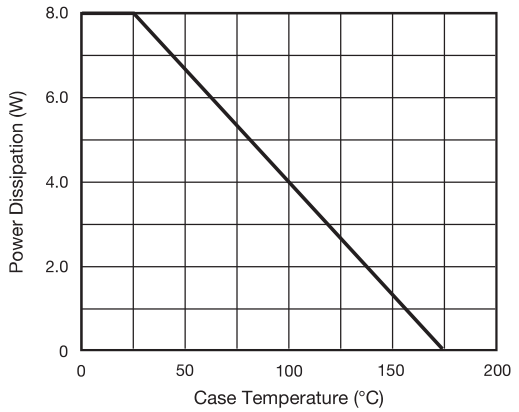


Fig. 1 - Power Derating Curve

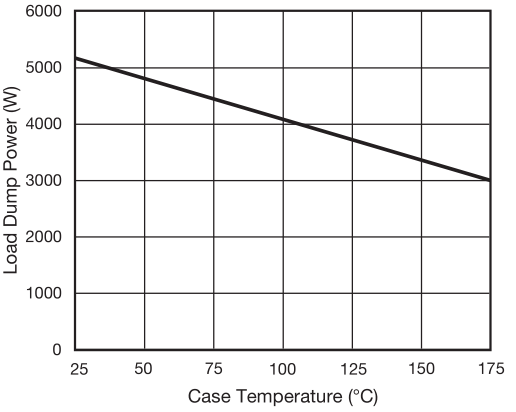


Fig. 2 - Load Dump Power Characteristics
(10 ms Exponential Waveform)

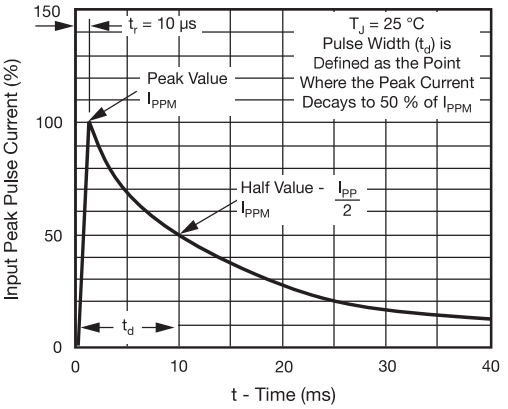


Fig. 3 - Pulse Waveform

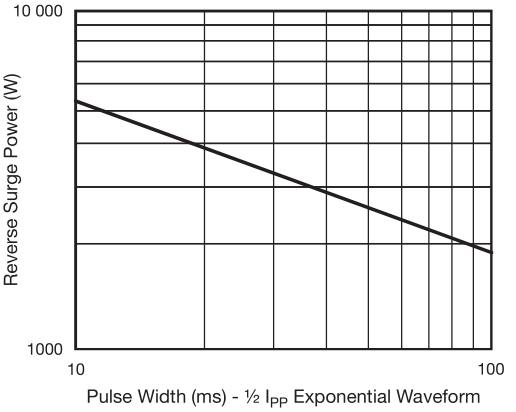


Fig. 4 - Reverse Power Capability

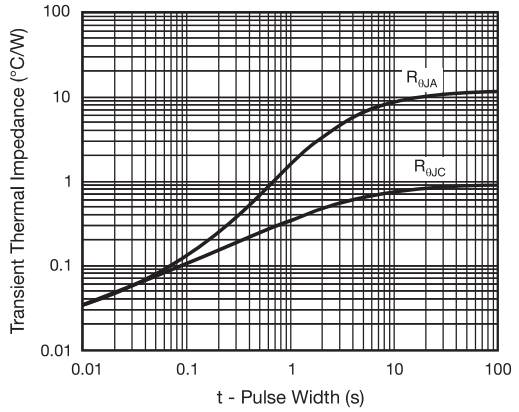


Fig. 5 - Typical Transient Thermal Impedance

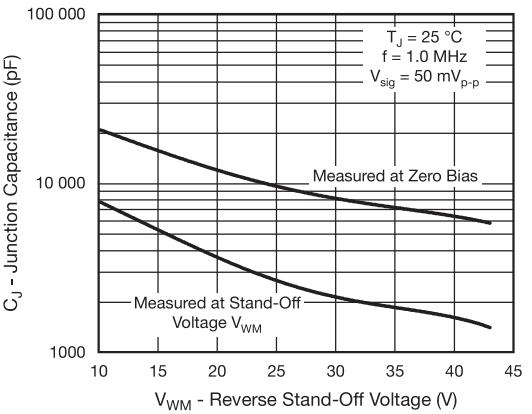
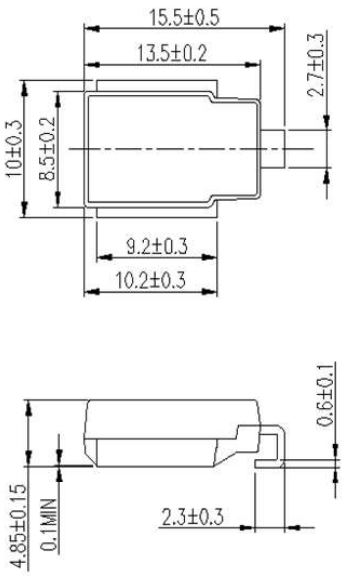
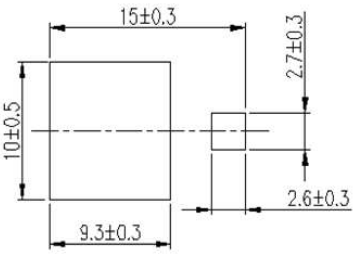


Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS (millimeters)

DO-218AB



Mounting Pad Layout