



Transient Voltage Suppressor High Temperature Stability and High Reliability Conditions SM5Z Series

1. 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
- 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)
- LF maximum peak of $245\text{ }^{\circ}\text{C}$
- AEC-Q101 qualified

DO-218AB



Uni-directional



Bi-directional

2. Applications

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

3. 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

4. Maximum Ratings ($T_c=25^{\circ}\text{C}$)

Parameter	Symbol	Value	Units
Peak pulse power dissipation with 10/1000 μs waveform with 10/10000 μs waveform	PPPM	3600	W
		2800	W
Power dissipation on infinite heatsink at $T_c = 25\text{ }^{\circ}\text{C}$ (fig. 1)	P_D	5.0	W
Peak pulse current with 10/1000 μs waveform	IPPM ⁽¹⁾	See next table	A
Peak forward surge current 8.3 ms single half sine-wave	IFSM	500	A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	$^{\circ}\text{C}$

Notes :

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



5. Electrical Characteristics (T_c=25°C)

Part Number		Breakdown Voltage			Test Current	Stand-off Voltage	Maximum Reverse Leakage at V _{WM}	Maximum Reverse Leakage at V _{WM} T _J = 175 °C	Max. Peak Pulse Current at 10/1000 μs Waveform	Maximum Clamping Voltage at I _{PPM}	Typical Temp. Coefficient of V _{BR} ⁽¹⁾
		V _{BR} (V)			I _T (mA)	V _{WM} (V)	I _D (μA)	I _D (μA)	(A)	V _C (V)	αT (%/°C)
Uni	Bi	Min.	Nom.	Max.							
SM5Z10A	SM5Z10CA	11.1	11.7	12.3	5	10	10	150	212	17.0	0.069
SM5Z11A	SM5Z11CA	12.2	12.9	13.5	5	11	10	150	198	18.2	0.072
SM5Z12A	SM5Z12CA	13.3	14.0	14.7	5	12	10	150	181	19.9	0.074
SM5Z13A	SM5Z13CA	14.4	15.2	15.9	5	13	10	150	167	21.5	0.076
SM5Z14A	SM5Z14CA	15.6	16.4	17.2	5	14	10	150	155	23.2	0.078
SM5Z15A	SM5Z15CA	16.7	17.6	18.5	5	15	10	150	148	24.4	0.080
SM5Z16A	SM5Z16CA	17.8	18.8	19.7	5	16	10	150	138	26.0	0.081
SM5Z17A	SM5Z17CA	18.9	19.9	20.9	5	17	10	150	130	27.6	0.082
SM5Z18A	SM5Z18CA	20.0	21.1	22.1	5	18	10	150	123	29.2	0.083
SM5Z20A	SM5Z20CA	22.2	23.4	24.5	5	20	10	150	111	32.4	0.085
SM5Z22A	SM5Z22CA	24.4	25.7	26.9	5	22	10	150	101	35.5	0.086
SM5Z24A	SM5Z24CA	26.7	28.1	29.5	5	24	10	150	93	38.9	0.087
SM5Z26A	SM5Z26CA	28.9	30.4	31.9	5	26	10	150	86	42.1	0.088
SM5Z28A	SM5Z28CA	31.1	32.8	34.4	5	28	10	150	79	45.4	0.089
SM5Z30A	SM5Z30CA	33.3	35.1	36.8	5	30	10	150	74	48.4	0.090
SM5Z33A	SM5Z33CA	36.7	38.7	40.6	5	33	10	150	68	53.3	0.091
SM5Z36A	SM5Z36CA	40.0	42.1	44.2	5	36	10	150	62	58.1	0.091
SM5Z40A	SM5Z40CA	44.4	46.8	49.1	5	40	10	150	56	64.5	0.092
SM5Z43A	SM5Z43CA	47.8	50.3	52.8	5	43	10	150	52	69.4	0.093

Notes

For all 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 _{θJC}	1.0	°C/W

NOTE : Specification subject to change without notice.

2025/8/11 Y



6. Ratings and Characteristic Curves ($T_A=25^{\circ}\text{C}$)

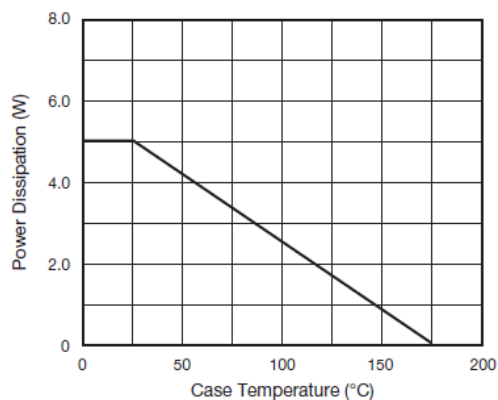


Fig. 1 - Power Derating Curve

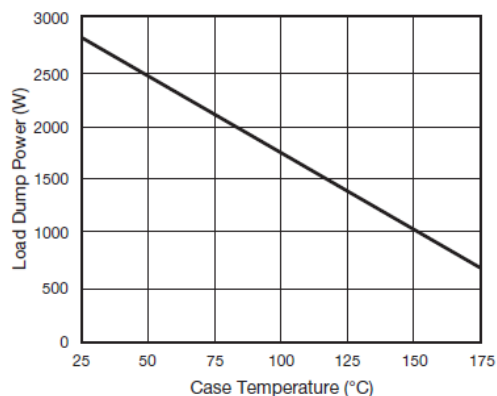


Fig. 2 - Load Dump Power Characteristics
(10 ms Exponential Waveform)

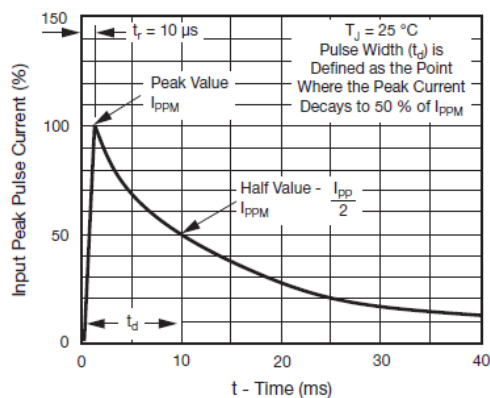


Fig. 3 - Pulse Waveform

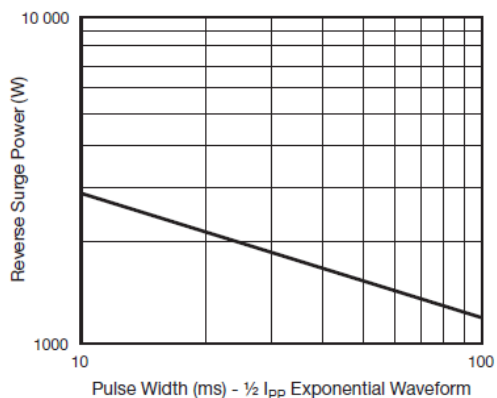


Fig. 4 - Reverse Power Capability

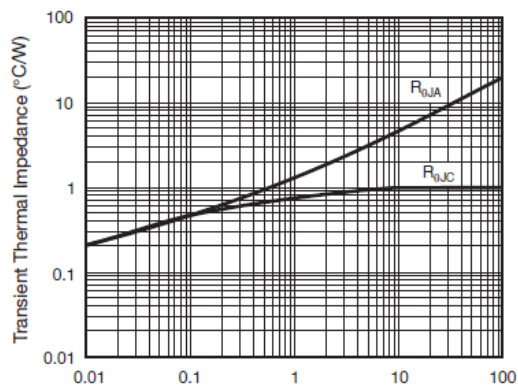


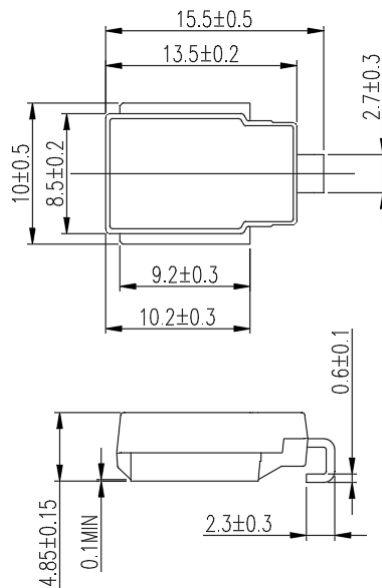
Fig. 5 - Typical Transient Thermal Impedance

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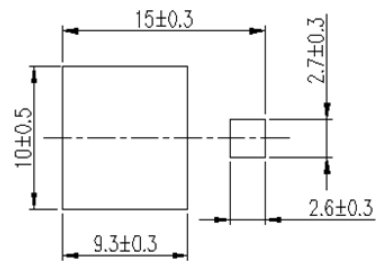


7. Package Outline Dimensions (millimeters)

DO-218AB

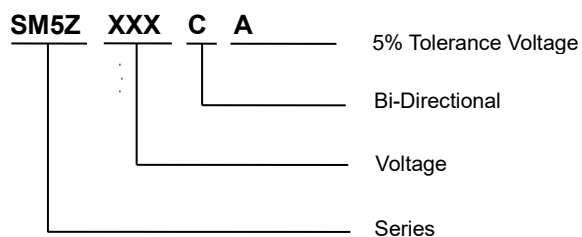


Mounting Pad Layout



8. Part Numbering and Marking System

Part Numbering System



Marking System

