Surface Mount Transient Voltage Suppressors

FEATURES

- 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
- 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 °C
- AEC-Q101 qualified

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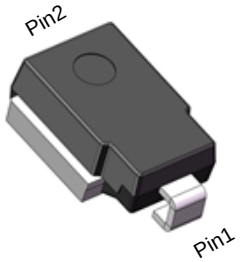

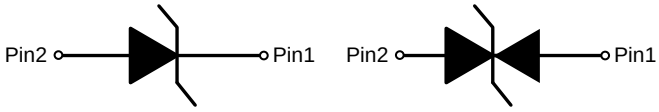

Unidirectional **Bidirectional**

Circuit diagram

TYPICAL APPLICATIONS

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

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} (2)	700	A
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +155	°C

Note

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

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

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ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	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} αT (%/°C)
		MIN.	NOM.	MAX.							
SM6S10UC	SM6S10BC	11.1	11.7	12.3	5.0	10.0	10	150	388	17.0	0.069
SM6S11UC	SM6S11BC	12.2	12.9	13.5	5.0	11.0	10	150	363	18.2	0.072
SM6S12UC	SM6S12BC	13.3	14.0	14.7	5.0	12.0	10	150	332	19.9	0.074
SM6S13UC	SM6S13BC	14.4	15.2	15.9	5.0	13.0	10	150	307	21.5	0.076
SM6S14UC	SM6S14BC	15.6	16.4	17.2	5.0	14.0	10	150	284	23.2	0.078
SM6S15UC	SM6S15BC	16.7	17.6	18.5	5.0	15.0	10	150	270	24.4	0.080
SM6S16UC	SM6S16BC	17.8	18.8	19.7	5.0	16.0	10	150	254	26.0	0.081
SM6S17UC	SM6S17BC	18.9	19.9	20.9	5.0	17.0	10	150	239	27.6	0.082
SM6S18UC	SM6S18BC	20.0	21.1	22.1	5.0	18.0	10	150	226	29.2	0.083
SM6S20UC	SM6S20BC	22.2	23.4	24.5	5.0	20.0	10	150	204	32.4	0.085
SM6S22UC	SM6S22BC	24.4	25.7	26.9	5.0	22.0	10	150	186	35.5	0.086
SM6S24UC	SM6S24BC	26.7	28.1	29.5	5.0	24.0	10	150	170	38.9	0.087
SM6S26UC	SM6S26BC	28.9	30.4	31.9	5.0	26.0	10	150	157	42.1	0.088
SM6S28UC	SM6S28BC	31.1	32.8	34.4	5.0	28.0	10	150	145	45.4	0.089
SM6S30UC	SM6S30BC	33.3	35.1	36.8	5.0	30.0	10	150	136	48.4	0.090
SM6S33UC	SM6S33BC	36.7	38.7	40.6	5.0	33.0	10	150	124	53.3	0.091
SM6S36UC	SM6S36BC	40.0	42.1	44.2	5.0	36.0	10	150	114	58.1	0.091
SM6S40UC	SM6S40BC	44.4	46.8	49.1	5.0	40.0	10	150	102	64.5	0.092
SM6S43UC	SM6S43BC	47.8	50.3	52.8	5.0	43.0	10	150	95.1	69.4	0.093
SM6S45UC	SM6S45BC	50.0	52.7	55.3	5.0	45.0	10	150	90.8	72.7	0.094
SM6S48UC	SM6S48BC	53.3	56.1	58.9	5.0	48.0	10	150	85.3	77.4	0.095
SM6S51UC	SM6S51BC	56.7	59.7	62.7	5.0	51.0	10	150	80.1	82.4	0.096
SM6S54UC	SM6S54BC	60.0	63.1	66.3	5.0	54.0	10	150	75.8	87.1	0.097
SM6S58UC	SM6S58BC	64.4	67.8	71.2	5.0	58.0	10	150	70.5	93.6	0.098
SM6S60UC	SM6S60BC	66.7	70.2	73.7	5.0	60.0	10	150	68.2	96.8	0.099
SM6S64UC	SM6S64BC	71.1	74.9	78.6	5.0	64.0	10	150	64.1	103	0.100
SM6S70UC	SM6S70BC	77.8	81.9	86.0	5.0	70.0	10	150	58.4	113	0.101
SM6S75UC	SM6S75BC	83.3	87.7	92.1	5.0	75.0	10	150	54.5	121	0.102
SM6S78UC	SM6S78BC	86.7	91.3	95.8	5.0	78.0	10	150	52.4	126	0.103
SM6S85UC	SM6S85BC	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 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))

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

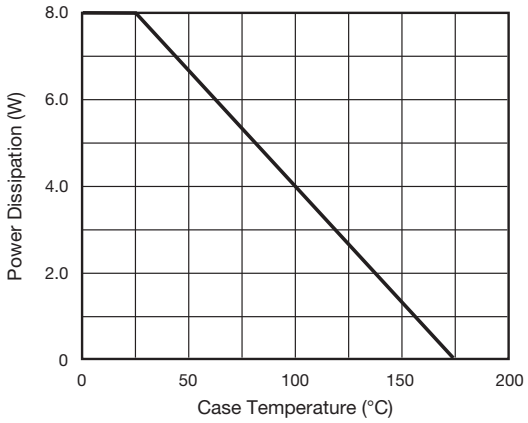

Fig. 1 - Power Derating Curve

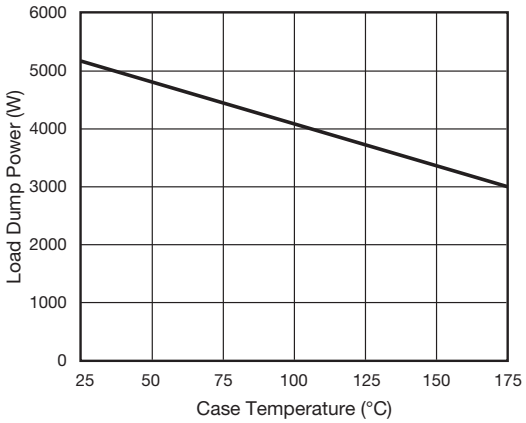

Fig. 2 - Load Dump Power Characteristics
(10 ms Exponential Waveform)

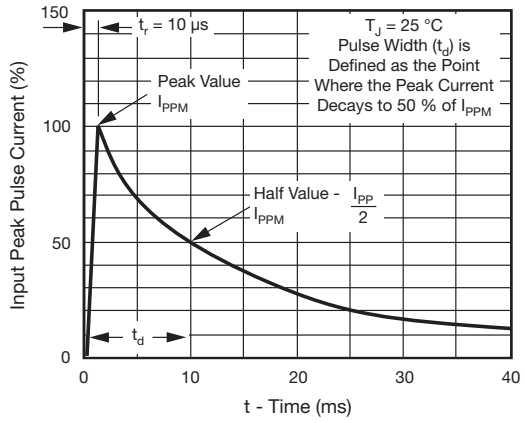

Fig. 3 - Pulse Waveform

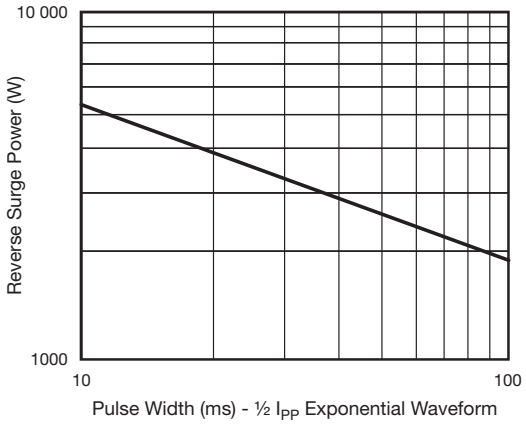

Fig. 4 - Reverse Power Capability

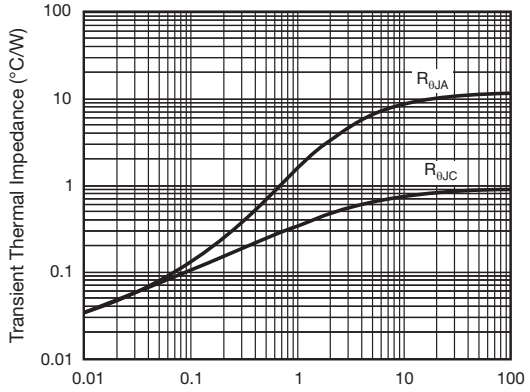

Fig. 5 - Typical Transient Thermal Impedance

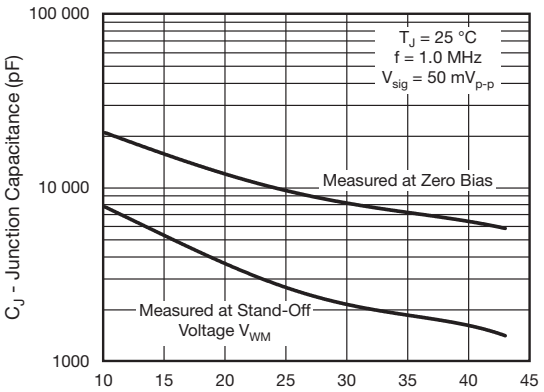

Fig. 6 - Typical Junction Capacitance

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PACKAGE OUTLINE DIMENSIONS (millimeters)

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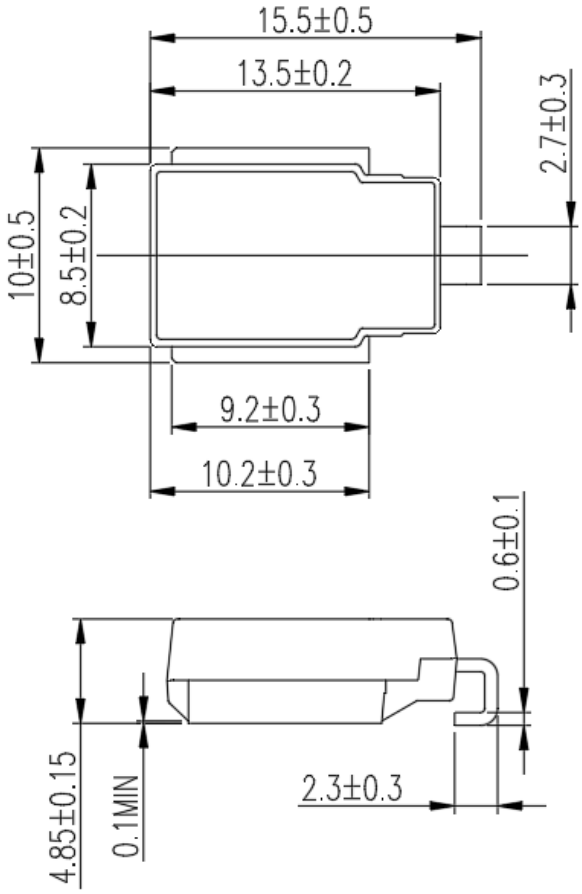

■ **Suggested pad layout**