

Surface Mount Transient Voltage Suppressors (TVS)

SM8S Series
10 To 43 V
6600W
DO-218AB

Description

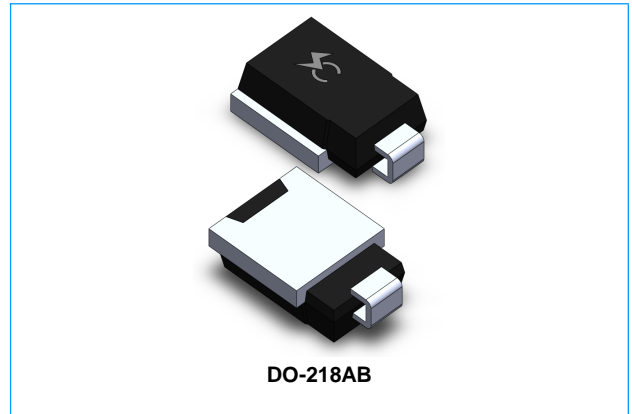
The SM8S series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Features

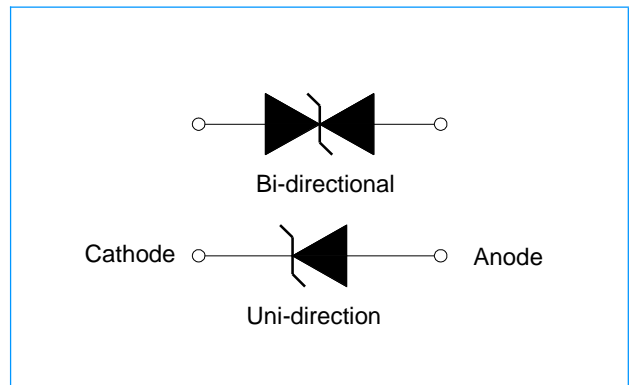
- u Optimized glass passivated chip
- u $T_J=175^{\circ}\text{C}$ capability suitable for high reliability and automotive requirement
- u 6600W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle):0.01 %
- u Meet ISO7637-2 5a/5b and ISO 16750 load dump test (varied by test condition)
- u Meet AEC-Q101 qualified
- u Low leakage current
- u Low forward voltage drop
- u Excellent clamping capability
- u Very fast response time
- u RoHS compliant

Mechanical Data

- u Case: DO-218AB
- u Molding compound: UL94V-0 flammability



Functional Diagram



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

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation with a 10/1000 μs waveform ①	P_{PP}	6600	W
Peak Pulse Current with a 10/1000 μs waveform ①	I_{PP}	See Next Table	A
Power Dissipation on Infinite Heatsink at $T_L=25^{\circ}\text{C}$	P_D	8.0	W
Operating junction and Storage Temperature Range	T_J, T_{STG}	- 55 to + 175	$^{\circ}\text{C}$
Peak Forward Surge Current 8.3ms Single Half Sine-wave	I_{FSM}	700	A

Notes:

1. Non-repetitive current pulse per Fig.2 and derated above $T_A=25^{\circ}\text{C}$ per Fig.1.

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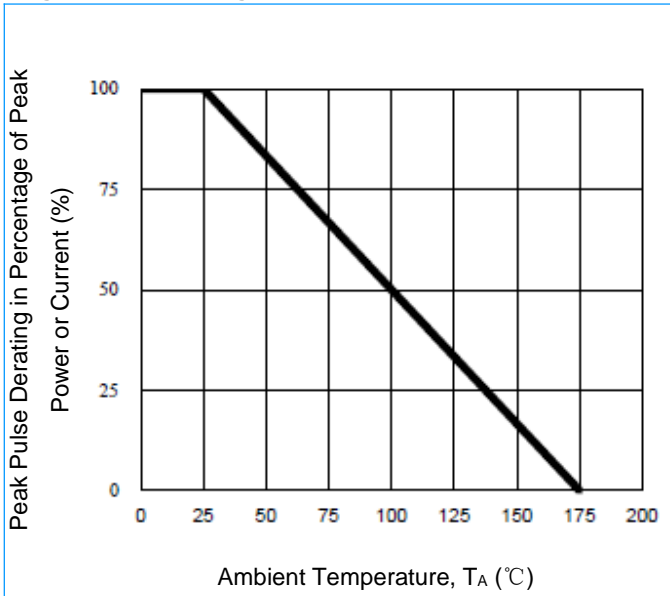
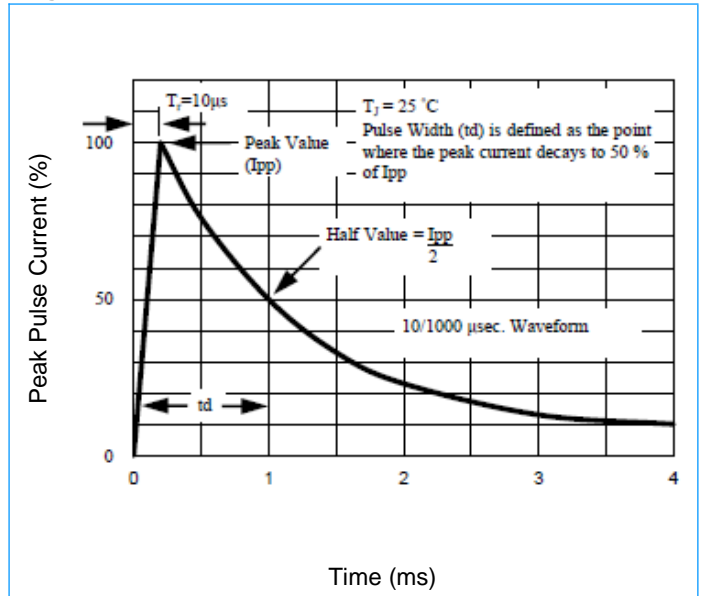
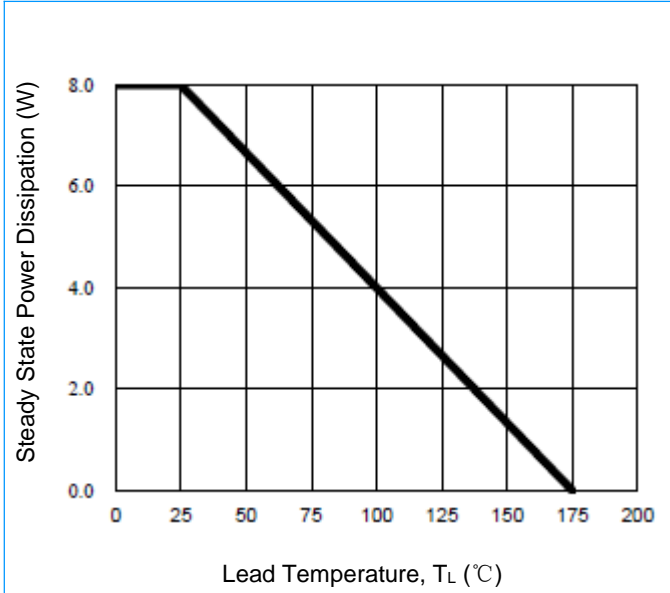
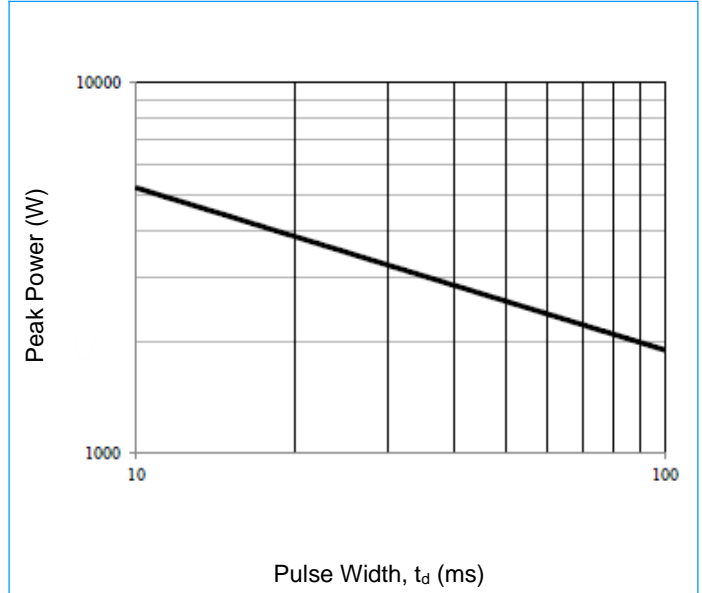
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Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Part Number		Working Peak Reverse Voltage V_{RWM} (V)	Breakdown Voltage V_{BR} (V)		Test Current I_T (mA)	Maximum Reverse Leakage I_R @ V_{RWM} (μA)	Maximum I_R @ V_{RWM} $T_J=175^\circ\text{C}$ (μA)	Maximum Reverse Surge Current I_{PP} (A) ①	Maximum Clamping Voltage V_C @ I_{PP} (V)
Uni	Bi		Min.	Max.					
SM8S10AD	SM8S10CAD	10.0	11.1	12.3	5.0	15	250	388	17.0
SM8S11AD	SM8S11CAD	11.0	12.2	13.5	5.0	10	150	363	18.2
SM8S12AD	SM8S12CAD	12.0	13.3	14.7	5.0	10	150	332	19.9
SM8S13AD	SM8S13CAD	13.0	14.4	15.9	5.0	10	150	307	21.5
SM8S14AD	SM8S14CAD	14.0	15.6	17.2	5.0	10	150	284	23.2
SM8S15AD	SM8S15CAD	15.0	16.7	18.5	5.0	10	150	270	24.4
SM8S16AD	SM8S16CAD	16.0	17.8	19.7	5.0	10	150	254	26.0
SM8S17AD	SM8S17CAD	17.0	18.9	20.9	5.0	10	150	239	27.6
SM8S18AD	SM8S18CAD	18.0	20.0	22.1	5.0	10	150	226	29.2
SM8S20AD	SM8S20CAD	20.0	22.2	24.5	5.0	10	150	204	32.4
SM8S22AD	SM8S22CAD	22.0	24.4	26.9	5.0	10	150	186	35.5
SM8S24AD	SM8S24CAD	24.0	26.7	29.5	5.0	10	150	170	38.9
SM8S26AD	SM8S26CAD	26.0	28.9	31.9	5.0	10	150	157	42.1
SM8S28AD	SM8S28CAD	28.0	31.1	34.4	5.0	10	150	145	45.4
SM8S30AD	SM8S30CAD	30.0	33.3	36.8	5.0	10	150	136	48.4
SM8S33AD	SM8S33CAD	33.0	36.7	40.6	5.0	10	150	124	53.3
SM8S36AD	SM8S36CAD	36.0	40.0	44.2	5.0	10	150	114	58.1
SM8S40AD	SM8S40CAD	40.0	44.4	49.1	5.0	10	150	102	64.5
SM8S43AD	SM8S43CAD	43.0	47.8	52.8	5.0	10	150	95.1	69.4

Notes:

- Surge current waveform is defined at 10/1000 μs waveform.
- For all 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.

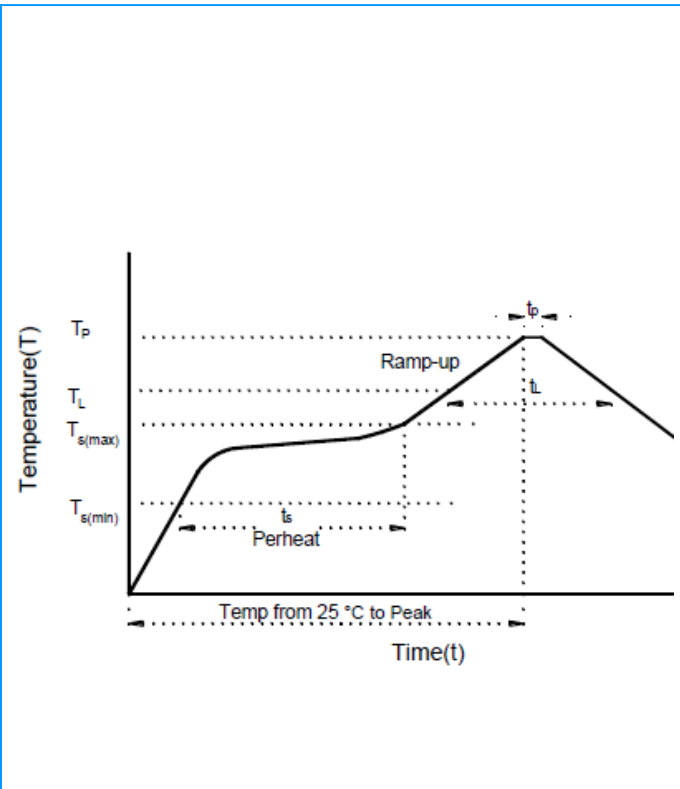
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Ratings and Characteristics Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)
Fig1. Pulse Derating Curve

Fig2. Pulse Waveform

Fig3. Steady State Power Derating Curve

Fig4. Peak Pulse Power Rating Curve


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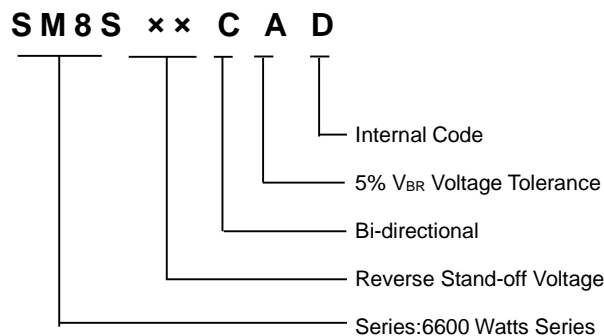
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Recommended Soldering Parameters



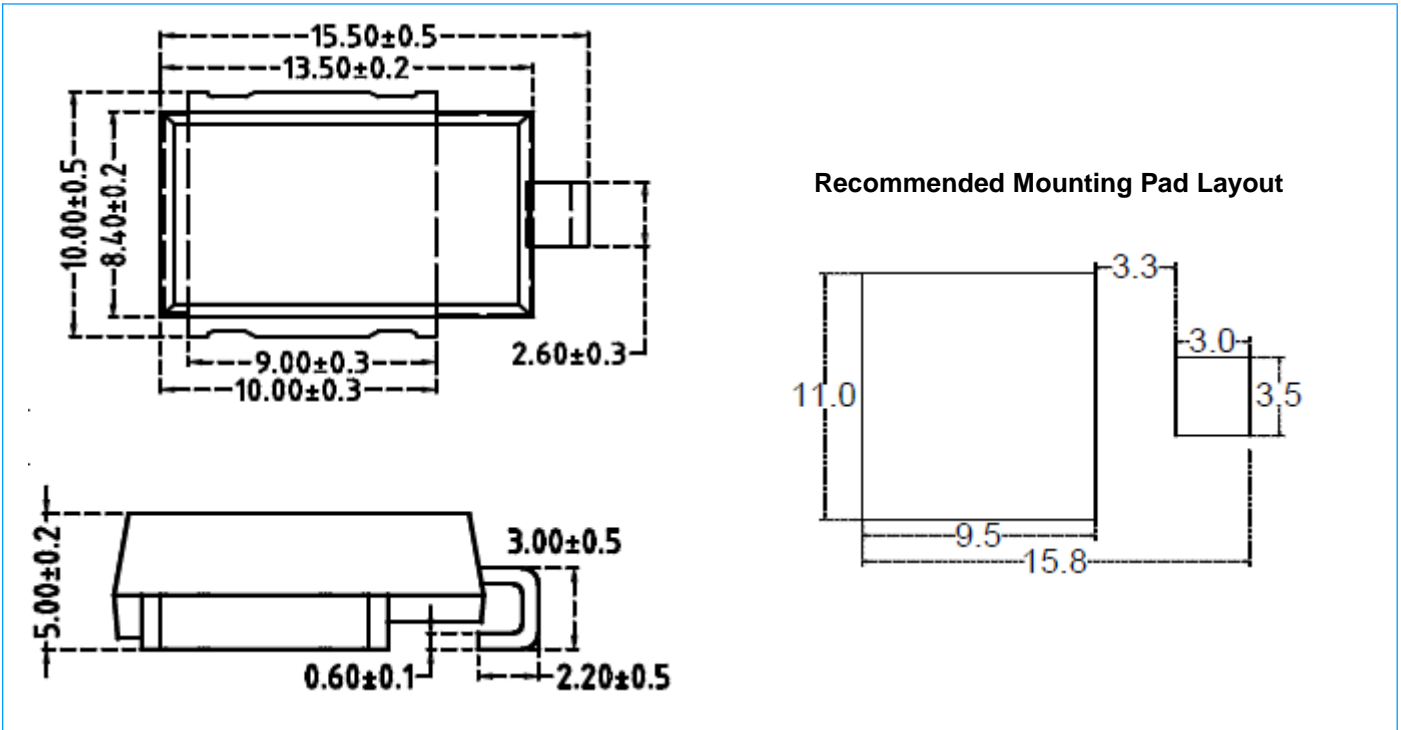
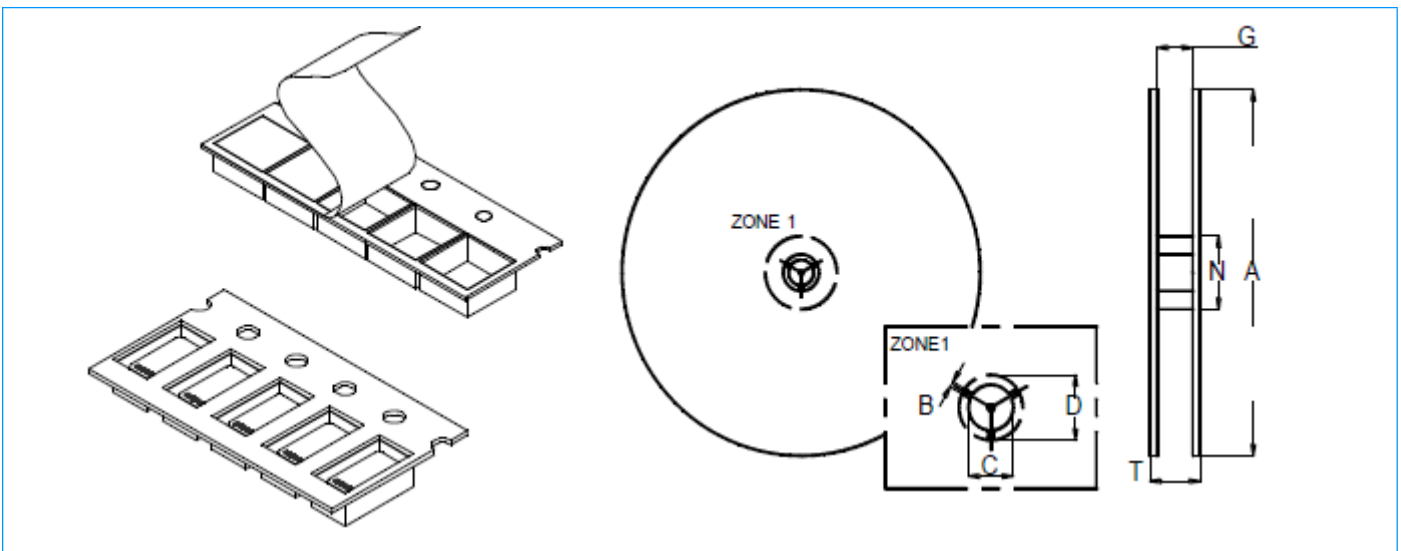
IR - Reflow Condition		Pb-Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max ($T_{s(max)}$)	+200°C
	- Time (Min to Max) (T_s)	60 -180 secs.
Average ramp up rate (Liquid μs Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate (220 - 200°C)		3°C/sec. Max
Reflow	- Temperature (T_L) (Liquid μ s)	>220°C
	- Time (t_L)	60 -150 secs.
Peak Temperature (T_P)		+245°C
Time within 5°C of actual peak Temperature (t_p)		10 - 30 secs.
Ramp-down Rate		5°C/sec. Max
Time 25°C to Peak Temperature (T_P)		6 min. Max
Do not exceed		+280°C

Part Numbering



Packaging

Part Number	Component Package	Quantity	Packaging Option
SM8S Series	DO-218AB	500 PCS	13" diameter plastic tape and reel, anode towards the sprocket hole

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Package Outline Dimensions (Unit: millimeters)

Surface Mount Tape and Reel Packaging (Unit: millimeters(inches))


Type Size	A (Max.)	B (Min.)	C	D (Min.)	N (Min.)	G (Max.)	T (Max.)
24 (0.945)	330 ± 2.0 (13.0± 0.079)	1.5 (0.059)	13.5 ± 0.50 (0.53 ± 0.02)	20.2 (0.795)	50 (1.97)	26.4 (1.039)	30.4 (1.197)