BORN SEMICONDUCTOR

SM8S Series

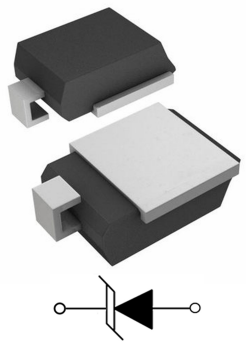
Transient Voltage Suppressor

Features

- Excellent clamping capability
- Low leakage current
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Will not fatigue
- RoHS Compliant
- AEC-Q101 qualified
- IEC 61000-4-2 ±30kV contact ; ±30kV air
- Meets ISO7637-2、16750-2 surge specifiation
- ISO 7637-2 P5a:
  12V System (65-87V 0.5-4Ω 40-400ms)
  24V System (123-174V 1-8Ω 100-350ms)

Package

DO-218 (DO-218AB)



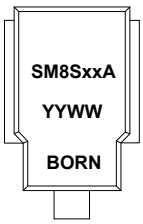
Mechanical Characteristics

- Package: DO-218AB plastic package
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Auto powers system
- Can-bus
- ABS powers
- Automotive instrument
- Car GPS

Making Code



Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
DO-218AB	Tape/Reel,13” reel	750	EIA-481-1

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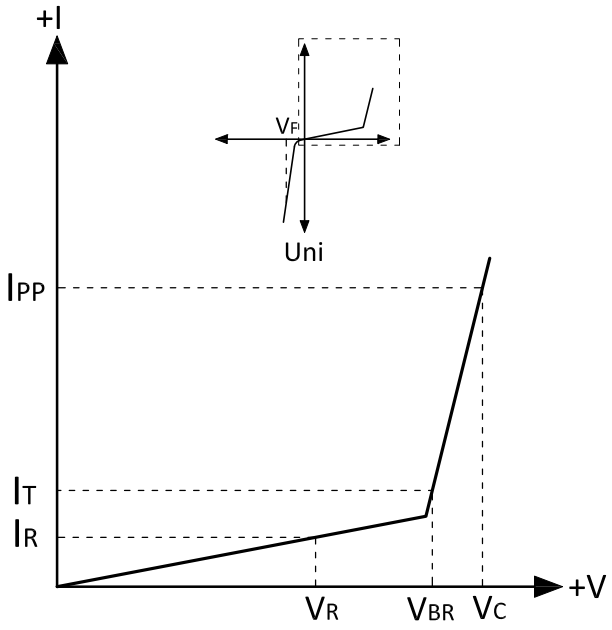
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Transient Voltage Suppressor

Electrical Parameters

Parameter	Definition
C_J	Junction Capacitance - typical capacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified Ippm
V_{BR}	Breakdown Voltage - Maximum voltage that flows though the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state



Absolute Maximum Ratings (T_A=+25°C, unless otherwise noted)

Parameter	Symbol	Value	Units
Peak Pulse Power Dissipation (Note1)	P_{PPM}	6600	W
Peak Pulse Power Dissipation (Note2)	P_{PPM1}	5200	W
Steady State Power Dissipation (Note3)	P_D	8	W
Peak Forward Surge Current (Note4)	I_{FSM}	700	A
Maximum Instantaneous Forward Voltage at 100A	V_{FM}	3.5	V
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	0.9	°C/W
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	11	°C/W
Operating Temperature Range	T_J	-55 to 175	°C
Storage Temperature Range	T_{STG}	-55 to 175	°C

Notes:

(1) Non-repetitive current pulse , 10/1000us Waveform.

(2) Non-repetitive current pulse , 10/10000us Waveform.

(3) Infinite HeatSink at T_C=25°C.

(4) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.

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Electrical Characteristics (T_A=+25°C, unless otherwise noted)

Part Number	Reverse Stand-Off Votage V_R	Breakdown Voltage V_{BR}@I_T		Test Current I_T	Maximum Clamping Voltage V_C @ I_{IPP}	Maximum Peak Pulse Current I_{IPP}	Maximun Reverse Leakage I_R @V_R
(Uni)	(V)	Min.(V)	Max.(V)	(mA)	(V)	(A)	(uA)
SM8S10A	10	11.1	12.3	5	17	388	15
SM8S11A	11	12.1	13.5	5	18.2	362	10
SM8S12A	12	13.3	14.7	5	19.9	332	10
SM8S13A	13	14.4	15.9	5	21.5	307	10
SM8S14A	14	15.6	17.2	5	23.2	284	10
SM8S15A	15	16.7	18.5	5	24.4	270	10
SM8S16A	16	17.8	19.7	5	26	254	10
SM8S17A	17	18.9	20.9	5	27.6	239	10
SM8S18A	18	20	22.1	5	29.2	226	10
SM8S20A	20	22.2	24.5	5	32.4	204	10
SM8S22A	22	24.4	26.9	5	35.5	186	10
SM8S24A	24	26.7	29.5	5	38.9	170	10
SM8S26A	26	28.9	31.9	5	42.1	157	10
SM8S28A	28	31.1	34.4	5	45.4	145	10
SM8S30A	30	33.3	36.8	5	48.4	136	10
SM8S33A	33	36.7	40.6	5	53.3	124	10
SM8S36A	36	40	44.2	5	58.1	114	10
SM8S40A	40	44.4	49.1	5	64.5	102	10
SM8S43A	43	47.8	52.8	5	69.4	95.1	10

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Ratings and Characteristic Curves (T_A=+25°C, unless otherwise noted)

Figure 1: Peak Pulse Power Rating

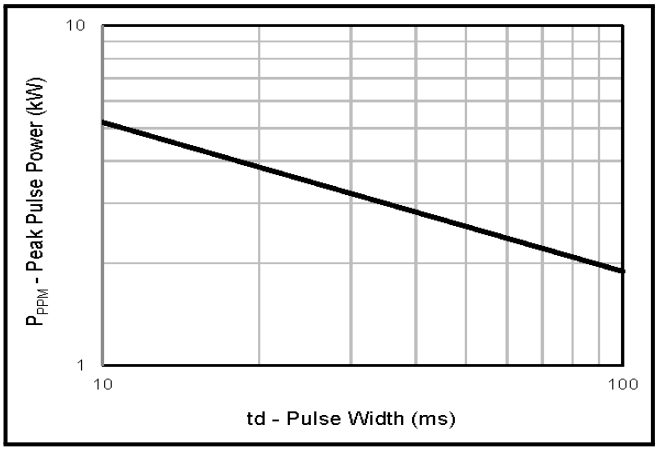


Figure 2: Pulse Derating Curve

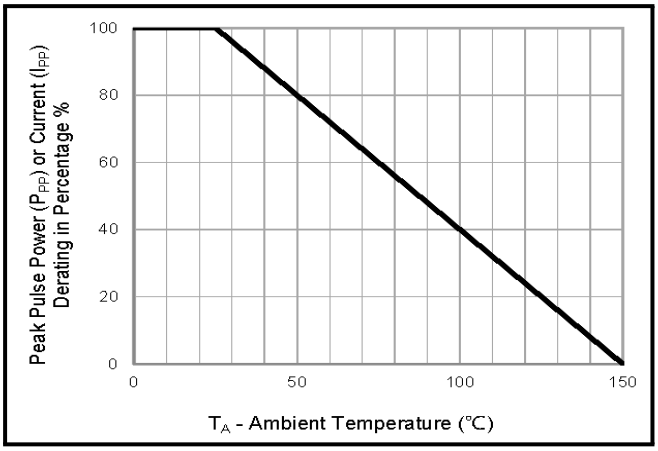


Figure 3: Pulse Waveform

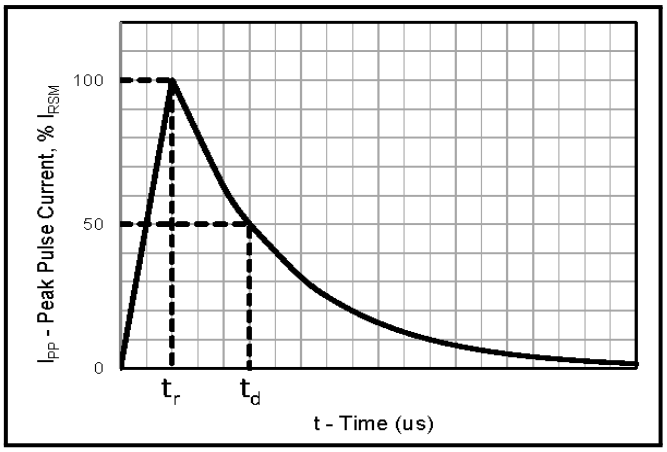


Figure 4 : Typical Junction Capacitance

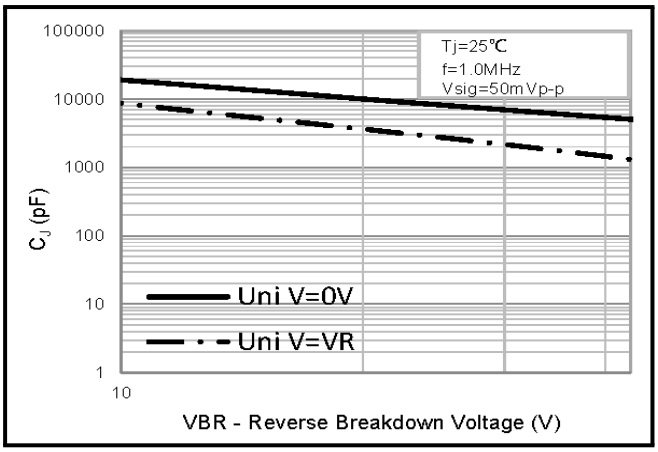


Figure 5: Steady State Power Dissipation Derating Curve

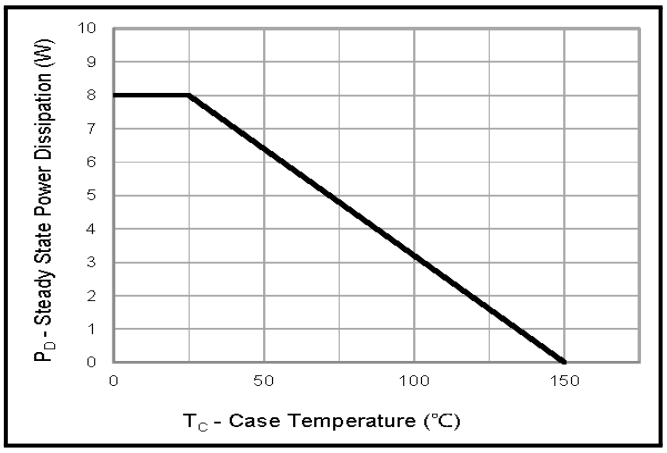
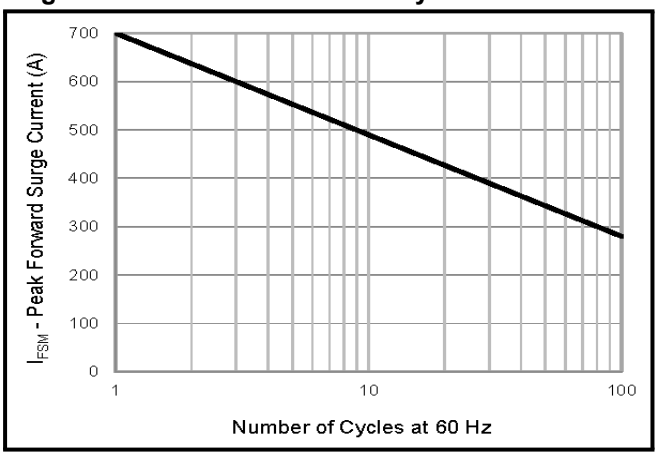


Figure 6 : Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only



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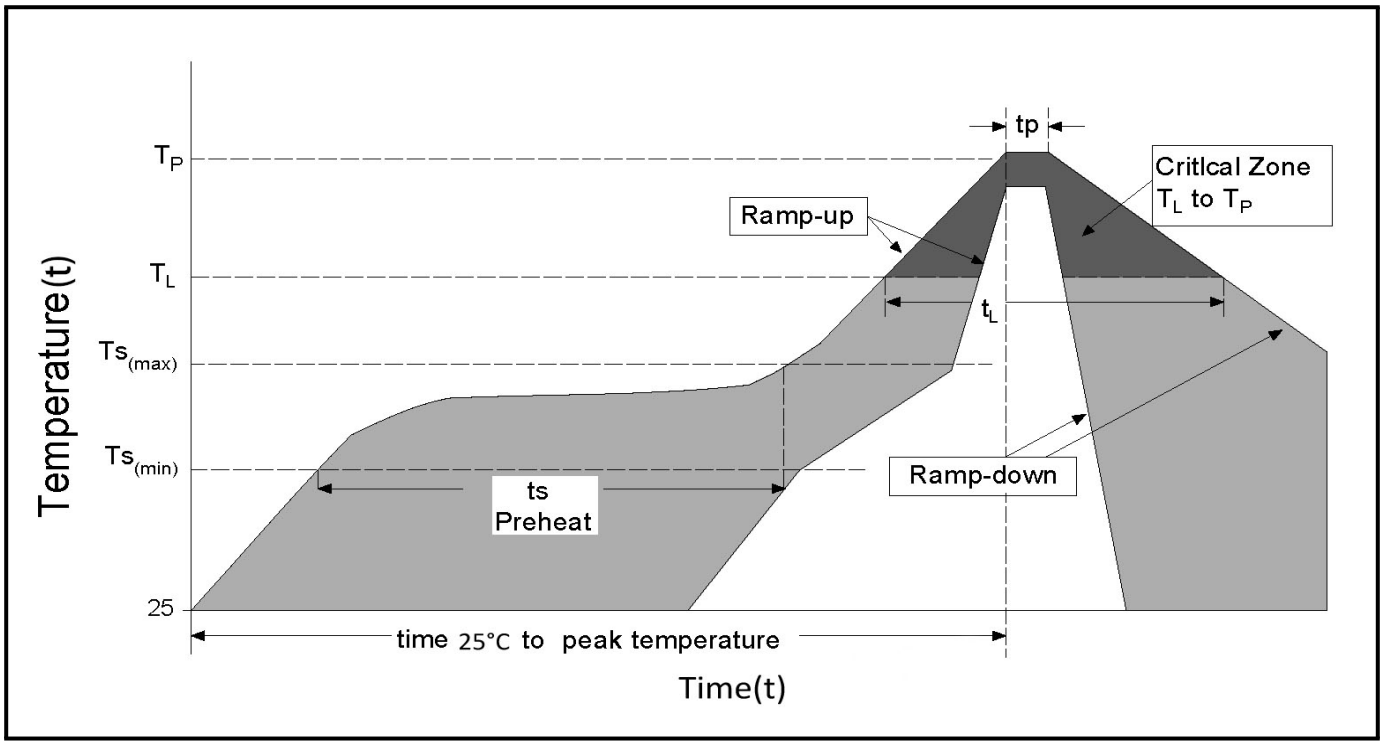
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Transient Voltage Suppressor

Soldering Parameters



Reflow Condition		Lead-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 (Liquidus Temp (T_L) to peak)		3°C/second max
T_S(max) to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 -150 secs
Peak Temperature (T_P)		$260^{+0/-5°C}$
Time within 5°C of actual peak Temperature (t_p)		20 - 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C

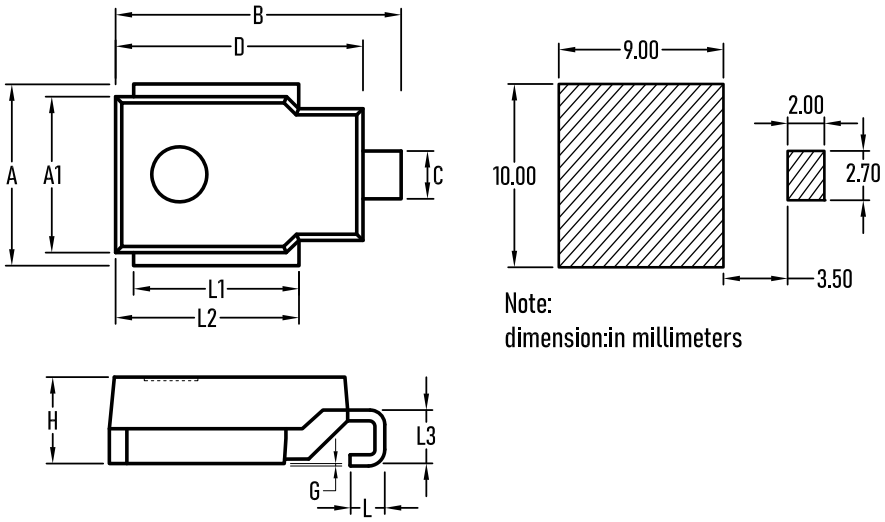
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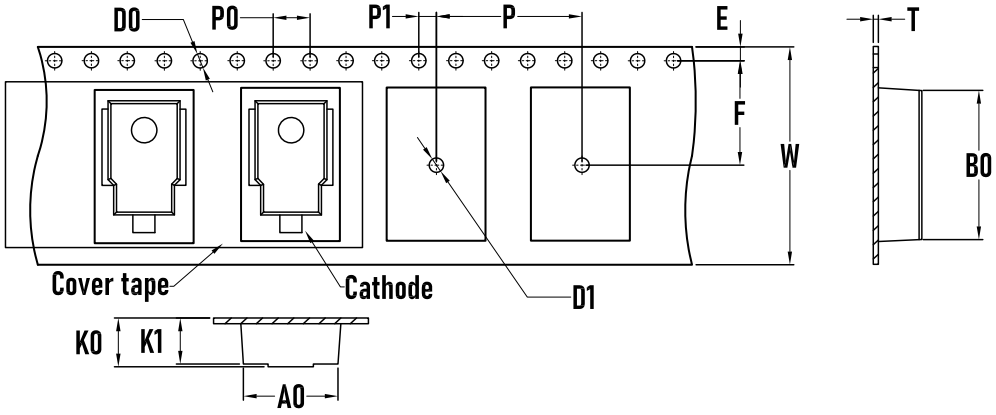
Outline Drawing –DO-218AB



Note:
dimension:in millimeters

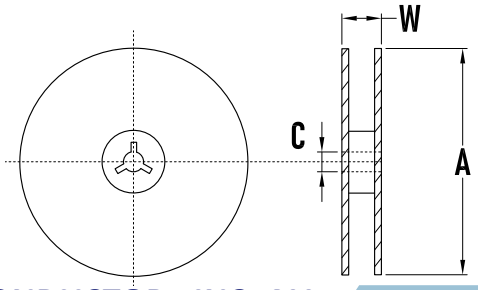
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	9.5	9.9	10.3
A1	8.3	8.5	8.7
B	15	15.6	16
C	2.3	2.6	2.9
D	13.3	13.5	13.7
G	–	–	0.12
H	4.7	4.85	5
L	1.5	2	2.5
L1	8.7	9	9.3
L2	9.7	10	10.3
L3	2.5	3.0	3.5

Packaging Tape - DO-218AB



SYMBOL	MILLIMETER
A0	11.00±0.1
B0	16.70±0.1
D0	1.55±0.1
D1	1.50±0.1
E	1.75±0.1
F	13.250±0.1
K0	5.90±0.1
K1	5.60±0.1
P	16.00±0.1
P0	4.00±0.1
P1	2.00±0.1
W	24.00±0.1
T	0.40±0.01

Packaging Reel



SYMBOL	MILLIMETER
A	330±2.0
C	13.5±0.5
W	29.0±2
Quantity	750PCS

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