

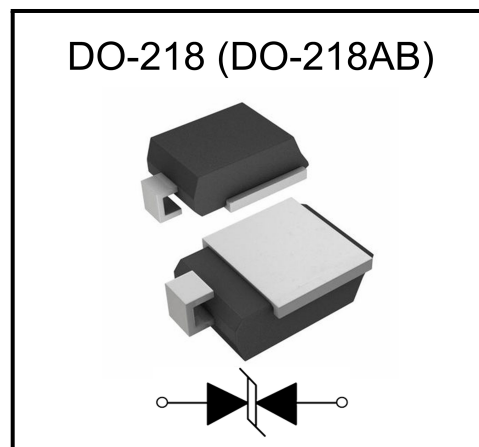
# SM8S Series

Transient Voltage Suppressor

## Features

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

## Package



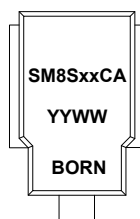
## Mechanical Characteristics

- Package: DO-218 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-218	Tape/Reel, 13" reel	750	EIA-481-1

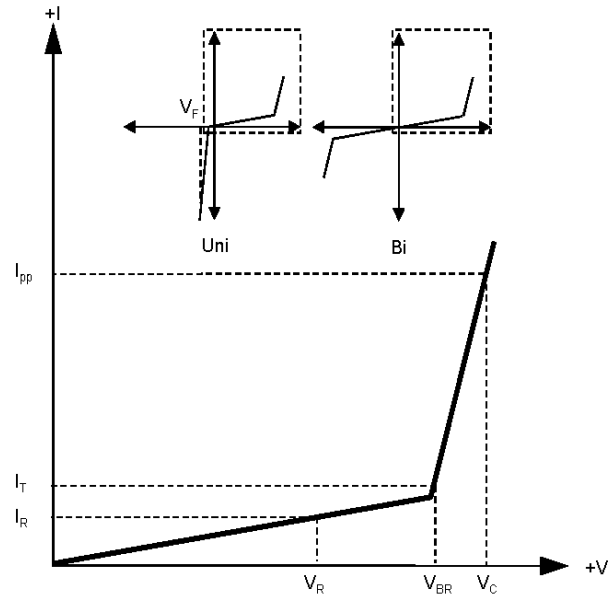


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## Electrical Parameters

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 $I_{ppm}$
$V_{BR}$	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 ( $T_A=+25^{\circ}\text{C}$ , 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 Lead	$R_{\theta JL}$	0.9	$^{\circ}\text{C/W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	11	$^{\circ}\text{C/W}$
Operating Temperature Range	$T_J$	-55 to 175	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to 175	$^{\circ}\text{C}$

Notes:

- (1) Non-repetitive current pulse , 10/1000us Waveform.
- (2) Non-repetitive current pulse , 10/10000us Waveform.
- (3) Infinite HeatSink at  $T_A = 50^{\circ}\text{C}$ .
- (4) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.



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

Part Number	Reverse Stand-Off Voltage $V_R$	Breakdown Voltage $V_{BR}@I_T$		Test Current $I_T$	Maximum Clamping Voltage $V_C @ I_{IPP}$	Maximum Peak Pulse Current $I_{IPP}$	Maximum Reverse Leakage $I_R @ V_R$
		Min.(V)	Max.(V)				
(Uni)	(V)			(mA)	(V)	(A)	( $\mu\text{A}$ )
SM8S10CA	10	11.1	12.3	5	17	388	15
SM8S11CA	11	12.1	13.5	5	18.2	362	10
SM8S12CA	12	13.3	14.7	5	19.9	332	10
SM8S13CA	13	14.4	15.9	5	21.5	307	10
SM8S14CA	14	15.6	17.2	5	23.2	284	10
SM8S15CA	15	16.7	18.5	5	24.4	270	10
SM8S16CA	16	17.8	19.7	5	26	254	10
SM8S17CA	17	18.9	20.9	5	27.6	239	10
SM8S18CA	18	20	22.1	5	29.2	226	10
SM8S20CA	20	22.2	24.5	5	32.4	204	10
SM8S22CA	22	24.4	26.9	5	35.5	186	10
SM8S24CA	24	26.7	29.5	5	38.9	170	10
SM8S26CA	26	28.9	31.9	5	42.1	157	10
SM8S28CA	28	31.1	34.4	5	45.4	145	10
SM8S30CA	30	33.3	36.8	5	48.4	136	10
SM8S33CA	33	36.7	40.6	5	53.3	124	10
SM8S36CA	36	40	44.2	5	58.1	114	10
SM8S40CA	40	44.4	49.1	5	64.5	102	10
SM8S43CA	43	47.8	52.8	5	69.4	95.1	10



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Ratings and Characteristic Curves ( $T_A = +25^\circ\text{C}$ , unless otherwise noted)

Figure 1: Peak Pulse Power Rating

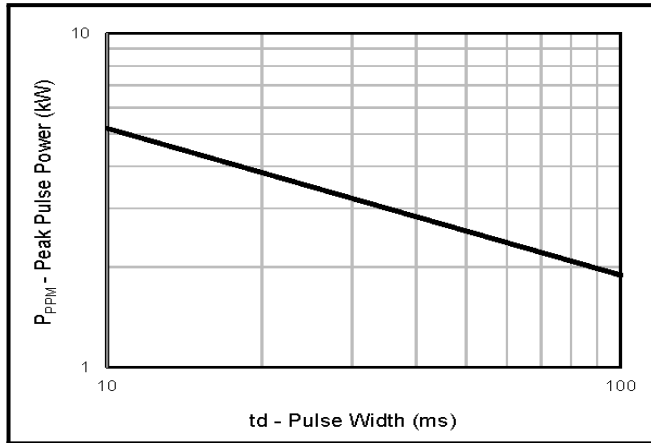


Figure 2: Pulse Derating Curve

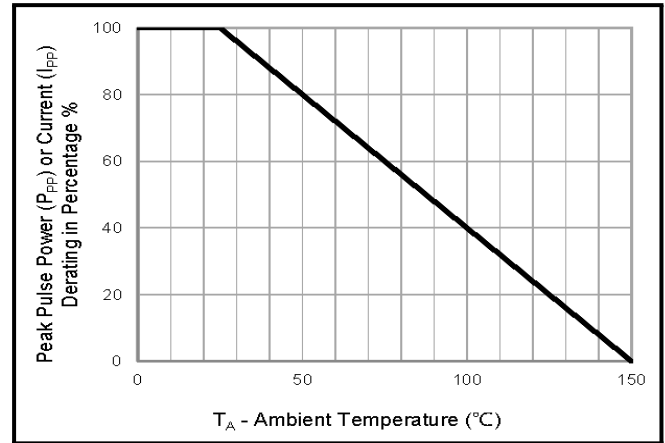


Figure 3: Pulse Waveform

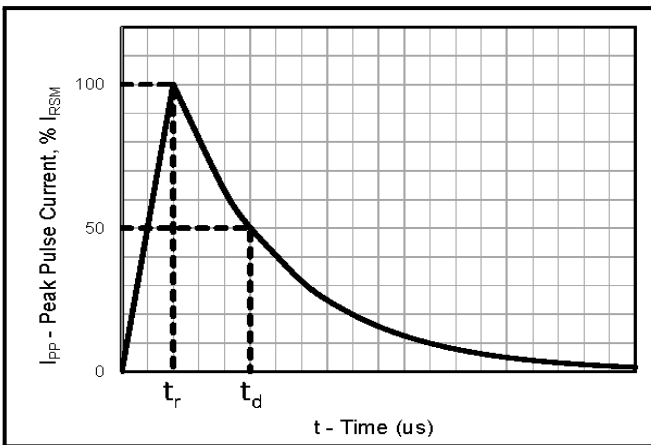


Figure 4: Typical Junction Capacitance

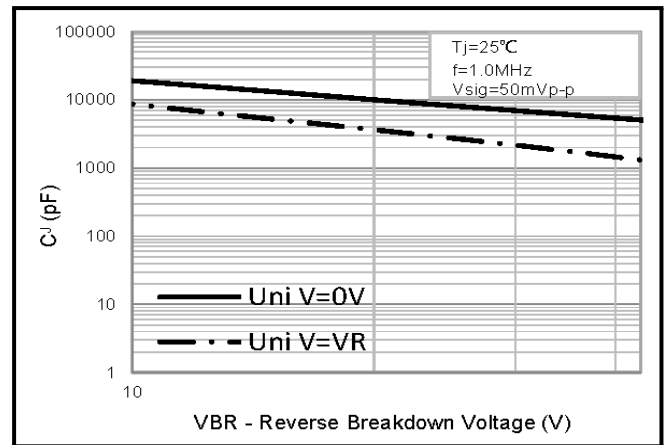


Figure 5: Steady State Power Dissipation Derating Curve

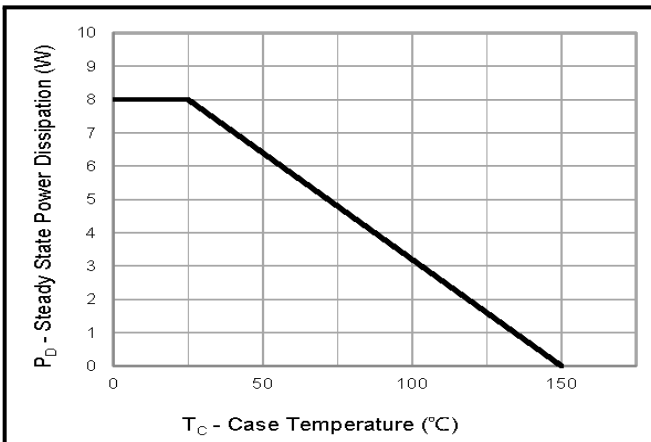
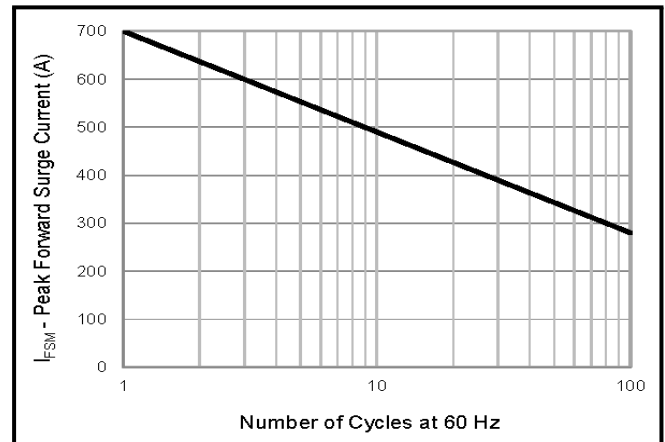


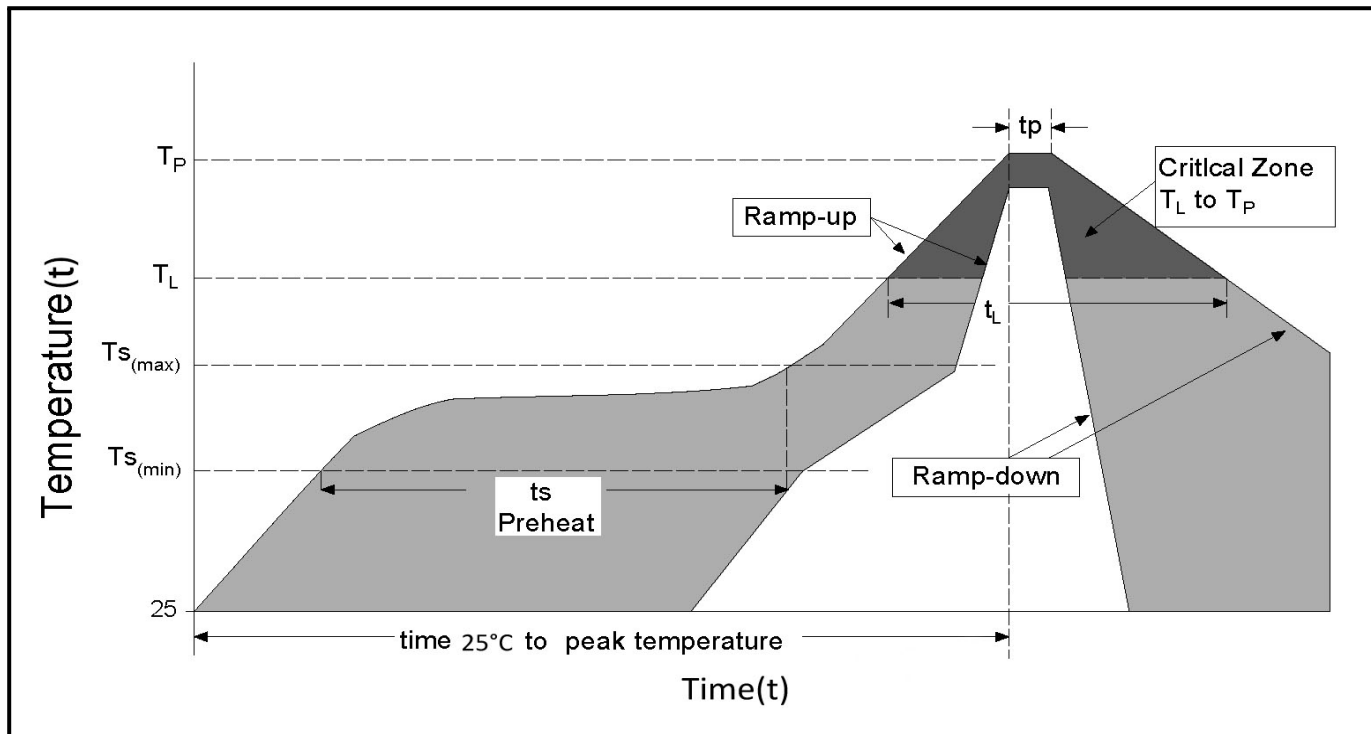
Figure 6: Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only



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## Soldering Parameters



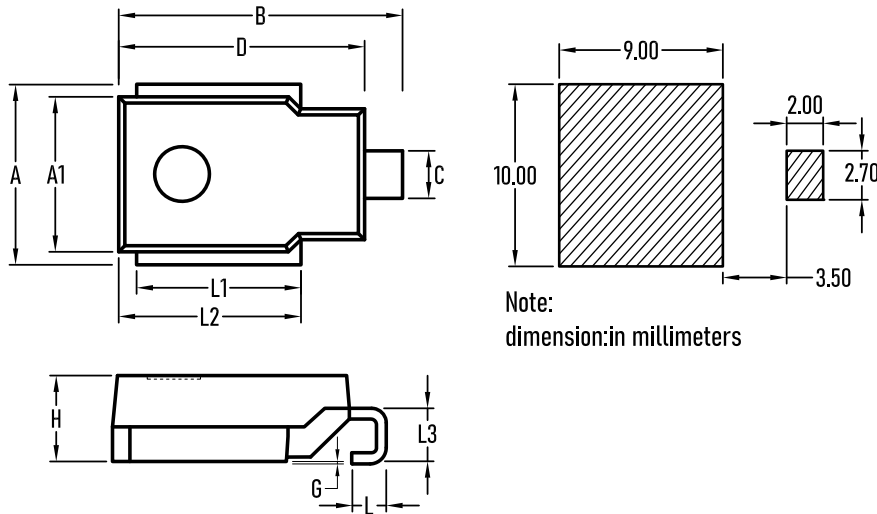
Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ( $T_{S(min)}$ )	150°C
	- Temperature Max ( $T_{S(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 - 180 secs
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/second max
$T_{S(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Time ( $t_L$ )	60 - 150 secs
Peak Temperature ( $T_P$ )		260 <sup>+0/-5</sup> °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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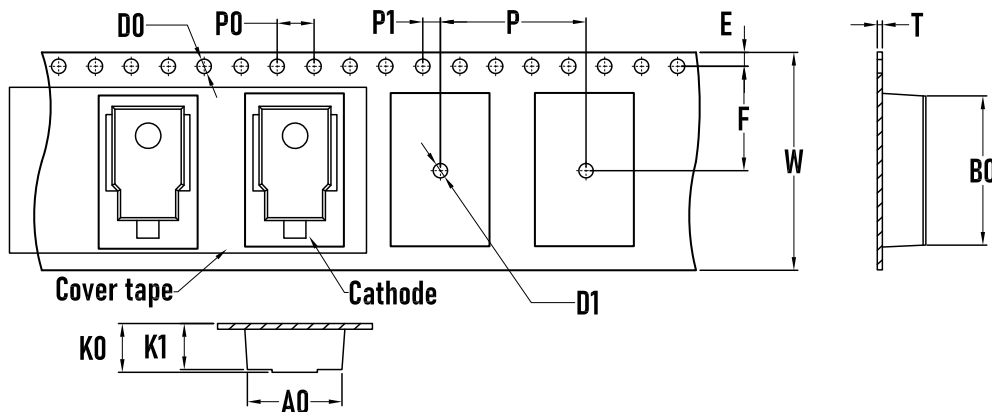
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Outline Drawing –DO-218



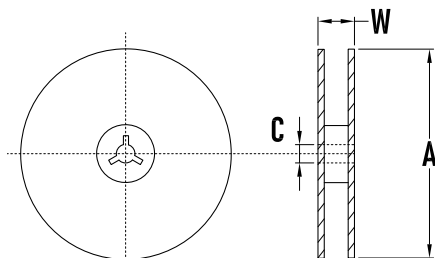
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	9.5	9.9	10.3
A1	8.3	8.5	8.7
B	15	15.6	16
C	2.3	2.6	2.9
D	13.3	13.5	13.7
G	—	—	0.12
H	4.7	4.85	5
L	1.5	2	2.5
L1	8.7	9	9.3
L2	9.7	10	10.3
L3	2.5	3.0	3.5

Packaging Tape - DO-218



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	700PCS

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Specifications are subject to change without notice.

Please refer to <http://www.born-tw.com> for current information. Revision: 2022-Jan-1-A

