

# SM8S Series

## Surface Mount – 600W



### Additional Information



Resources



Accessories



Samples

### Maximum Ratings and Thermal Characteristics

(T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000µs Test Waveform(Fig.1) (Note1)-Single Die Parts)	P <sub>PPM</sub>	6600	W
Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =25°C	P <sub>D</sub>	8	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave	I <sub>FSM</sub>	700	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only	V <sub>F</sub>	3.5	V
Operating Temperature Range	T <sub>J</sub>	-55 to 150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C
Typical Thermal Resistance Junction to Lead	R <sub>θJC</sub>	0.9	°C/W

#### Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>J</sub> (initial) =25°C per Fig.2..

### Description

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

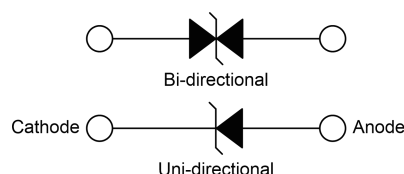
### Features

- High reliability application and automotive grade AEC-Q101 qualified
- Meet ISO7637-2 5a/5b protection and ISO16750 load dump test (refer to APP note for details)
- $V_B @ T_J = V_B @ 25^\circ\text{C} \times (1 + \alpha T_x (T_J - 25))$  ( $\alpha T$ : Temperature Coefficient, typical value is 0.1%)
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air), 30kV(Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Fast response time: typically less than 1.0ps from 0 Volts to V<sub>B</sub> min
- Excellent clamping capability
- Low incremental surge resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C
- For surface mounted applications to optimize board space
- Low profile package
- High temperature to reflow soldering guaranteed: 260°C/10sec at terminals
- Matte tin lead-free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin (Sn) (IPC/JEDEC J-STD - 609 A.01)

### Applications

TVS devices are ideal for the protection of I/O Interfaces, V<sub>CC</sub> bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

### Functional Diagram



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

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @ $I_T$		Test Current	Maximum Clamping Voltage @ $I_{PP}$	Peak Pulse Current	Reverse Leakage @ $V_R$
Uni.	Bi.	Uni.	Bi.	$V_R(V)$	$V_{B Min.}(V)$	$V_{B Max.}(V)$	$I_T(mA)$	$V_c(V)$	$I_{PP}(A)$	$I_R(\mu A)$
SM8S18A	SM8S18CA	SM8S18A	SM8S18C	18.0	20.00	22.10	5	29.2	226.0	2
SM8S20A	SM8S20CA	SM8S20A	SM8S20C	20.0	22.20	24.50	5	32.4	204.0	2
SM8S22A	SM8S22CA	SM8S22A	SM8S22C	22.0	24.40	26.90	5	35.5	186.0	2
SM8S24A	SM8S24CA	SM8S24A	SM8S24C	24.0	26.70	29.50	5	38.9	170.0	2
SM8S26A	SM8S26CA	SM8S26A	SM8S26C	26.0	28.90	31.90	5	42.1	157.0	2
SM8S28A	SM8S28CA	SM8S28A	SM8S28C	28.0	31.10	34.40	5	45.4	145.0	2
SM8S30A	SM8S30CA	SM8S30A	SM8S30C	30.0	33.30	36.80	5	48.4	136.0	2
SM8S33A	SM8S33CA	SM8S33A	SM8S33C	33.0	36.70	40.60	5	53.3	124.0	2
SM8S36A	SM8S36CA	SM8S36A	SM8S36C	36.0	40.00	44.20	5	58.1	114.0	2
SM8S40A	SM8S40CA	SM8S40A	SM8S40C	40.0	44.40	49.10	5	64.5	102.0	2
SM8S43A	SM8S43CA	SM8S43A	SM8S43C	43.0	47.80	52.80	5	69.4	95.1	2
SM8S48A	SM8S48CA	SM8S48A	SM8S48C	48.0	53.30	58.90	5	77.4	85.3	2
SM8S58A	SM8S58CA	SM8S58A	SM8S58C	58.0	64.40	71.20	5	93.6	70.5	2

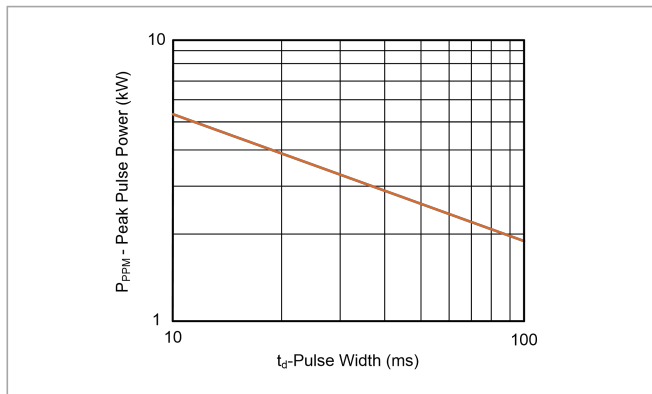
#### Notes:

For bidirectional type having  $V_R$  of 10 volts and less, the  $I_R$  limit is double.

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

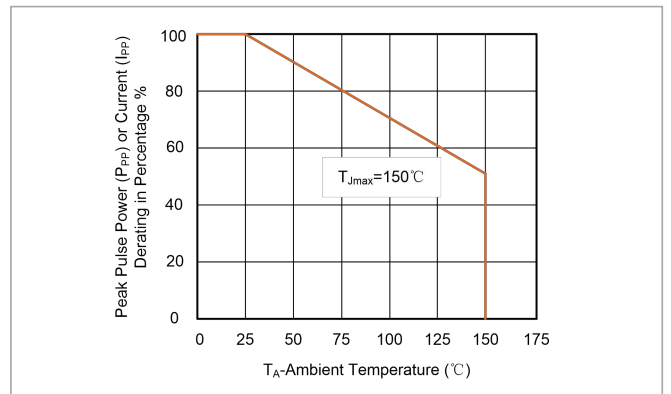
**Figure 1:**

Peak Pulse Power Rating Curve



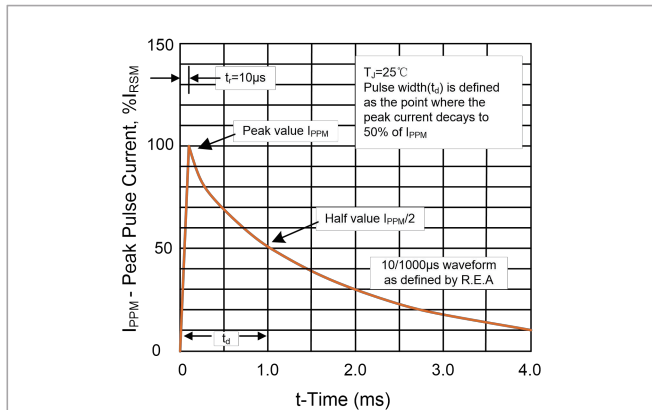
**Figure 2:**

Pulse Derating Curve



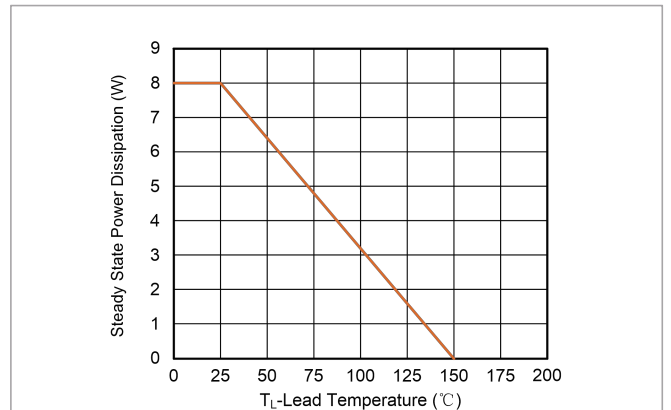
**Figure 3:**

Pulse Waveform



**Figure 4:**

Typical Junction Capacitance

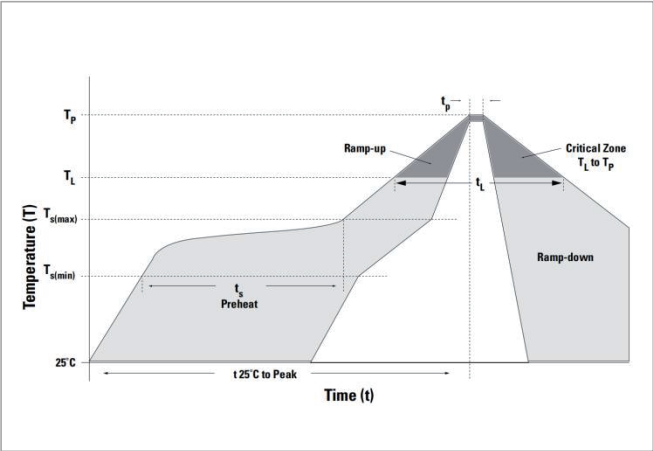


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Surface Mount – 600W

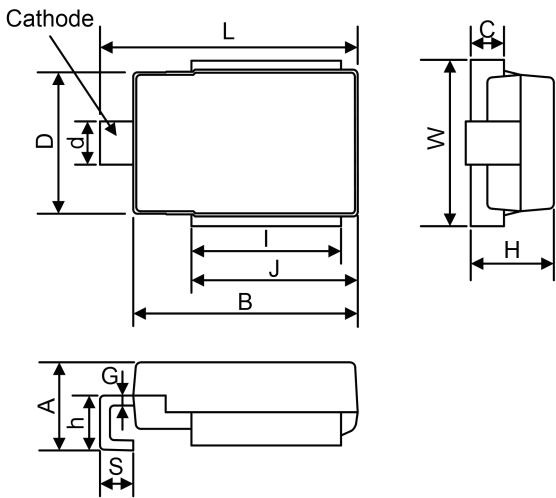
## Soldering Parameters

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 (min to max) ( $t_L$ )	60-150 seconds
Peak Temperature ( $T_P$ )		260°C
Time within 5°C of actual Peak Temperature ( $t_P$ )		20-40 seconds
Ramp-down Rate		6°C/second max.
Time 25°C to Peak Temperature		8 minutes max.
Do not exceed		260°C



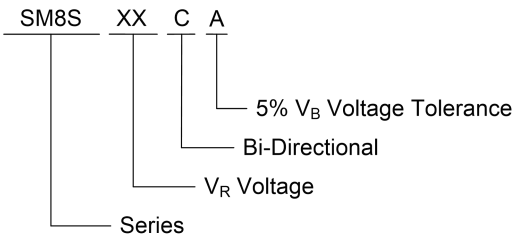
## Dimensions

### DO-218AB

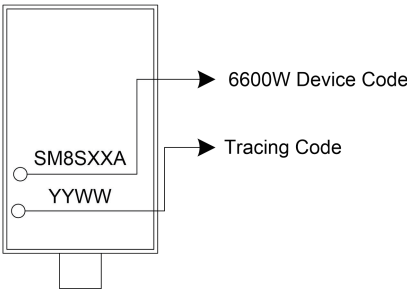


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.8	5.8	0.189	0.228
B	13.3	13.7	0.524	0.539
C	1.7	2.3	0.067	0.091
D	8.3	8.7	0.327	0.343
d	2.3	3.1	0.091	0.122
G	0.5	0.7	0.020	0.028
H	4.7	5.2	0.185	0.205
h	2.5	3.9	0.098	0.154
I	8.7	9.5	0.343	0.374
J	9.7	10.5	0.382	0.413
W	9.5	10.5	0.374	0.414
S	1.5	2.5	0.059	0.099
L	15.0	16.0	0.591	0.630

## Part Numbering System



## Part Marking System



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Packaging

Part number	Component Package	Quantity	Packaging Option	Packaging Specification
SM8SxxXX	DO-218AB	750	Tape & Reel - 24mm tape/13" reel	EIA STD RS-481

Tape and Reel Specification

