

## SM8S Series Datasheet

### Description

The SM8S series is designed specifically to use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump pulse protection.

### Features

- Ideally suited for load dump protection
- Flammability Classification 94V-0
- 6600W peak pulse power capability at 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- Integrally molded heatsink provides a very low thermal resistance for maximum heat dissipation
- Low leakage current at  $T_J = 150^\circ\text{C}$  &  $T_J = 175^\circ\text{C}$
- High temperature soldering guaranteed 260 $^\circ\text{C}$  for 10 seconds at terminals
- Meets ISO7637-2 surge spec.
- Low forward voltage drop
- Meets RoHS2.0 (2011/65/EU) but Halogen
- Meets MSL level 1, per J-STD-020
- Meets AEC-Q101 requirement
- Unit Weight: 2.59g/PCS

### Maximum Ratings and Characteristics

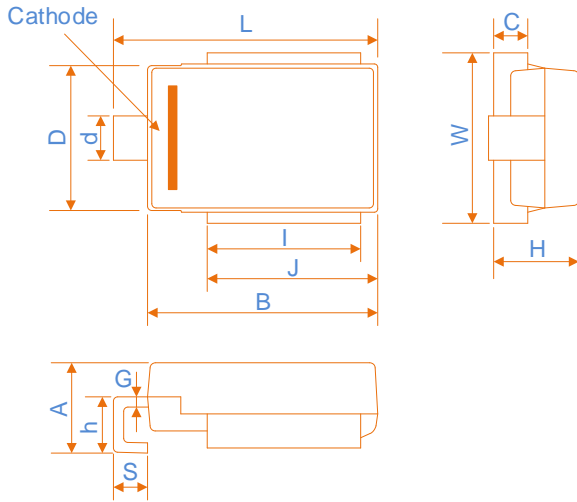
Ratings at 25 $^\circ\text{C}$  ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 $\mu$ s waveform (Note1, Note2, Fig.1)	$P_{PPM}$	Minimum 6600	Watts
Peak pulse current of at 10/1000 $\mu$ s waveform (Note 1, Fig.3)	$I_{PPM}$	See Table	Amps
Steady state power dissipation at $T_A=25^\circ\text{C}$ (Fig.5)	$P_{M(AV)}$	8.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2, Fig.6)	$I_{FSM}$	700	Amps
Operating junction and Storage Temperature Ranges.	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$
Typical thermal resistance junction to Case	$R_{\theta JC}$	0.9	$^\circ\text{C}/\text{W}$

Notes: 1. Non-repetitive current pulse, per Fig.3 and Derating above  $T_A=25^\circ\text{C}$  per Fig.2.

2. 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minutes maximum.

### Dimensions (DO-218)



Dimensions	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.8	5.8	0.189	0.228
B	13.3	13.7	0.524	0.540
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	4.9	5.2	0.193	0.205
h	2.5	3.9	0.098	0.154
I	8.7	9.3	0.342	0.366
J	9.7	10.3	0.382	0.406
W	9.5	10.5	0.374	0.414
S	1.5	2.5	0.059	0.099
L	15	16	0.591	0.630

### Electrical Characteristics (TA=25°C)

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>		Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>R</sub>
Unidirectional	Bidirectional	V <sub>R</sub> (V)	Min(V)	Max(V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
SM8S18A	SM8S18CA	18.0	20.00	22.10	5	29.2	226.0	2
SM8S20A	SM8S20CA	20.0	22.20	24.50	5	32.4	204.0	2
SM8S22A	SM8S22CA	22.0	24.40	26.90	5	35.5	186.0	2
SM8S24A	SM8S24CA	24.0	26.70	29.50	5	38.9	170.0	2
SM8S26A	SM8S26CA	26.0	28.90	31.90	5	42.1	157.0	2
SM8S28A	SM8S28CA	28.0	31.10	34.40	5	45.4	145.0	2
SM8S30A	SM8S30CA	30.0	33.30	36.80	5	48.4	136.0	2
SM8S33A	SM8S33CA	33.0	36.70	40.60	5	53.3	124.0	2
SM8S36A	SM8S36CA	36.0	40.00	44.20	5	58.1	114.0	2
SM8S40A	SM8S40CA	40.0	44.4	49.1	5	64.5	102.0	2
SM8S43A	SM8S43CA	43.0	47.80	52.80	5	69.4	95.1	2
SM8S48A	SM8S48CA	48.0	53.30	58.90	5	77.4	85.3	2
SM8S58A	SM8S58CA	58.0	64.40	71.20	5	93.6	70.5	2

**Ratings and Characteristic Curves (Ta=25°C unless otherwise noted)**

Figure 1. Peak Pulse Power Rating Curve

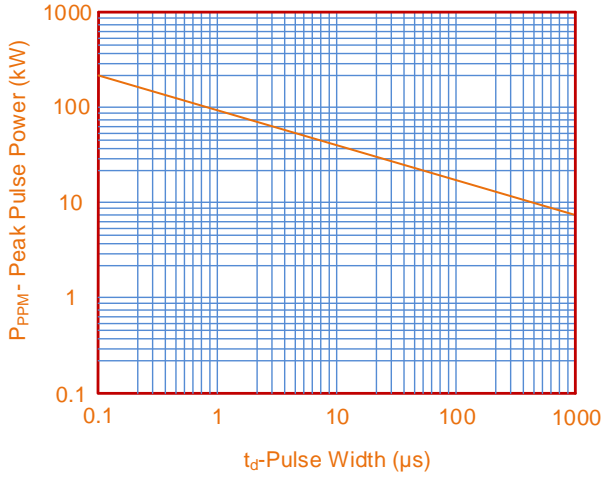


Figure 2. Pulse Derating Curve

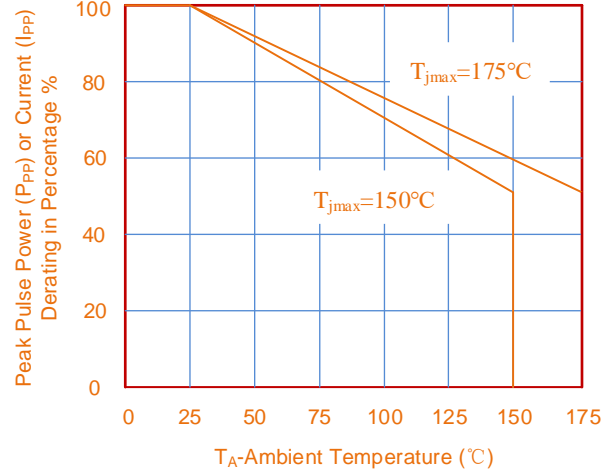


Figure 3. Pulse Waveform

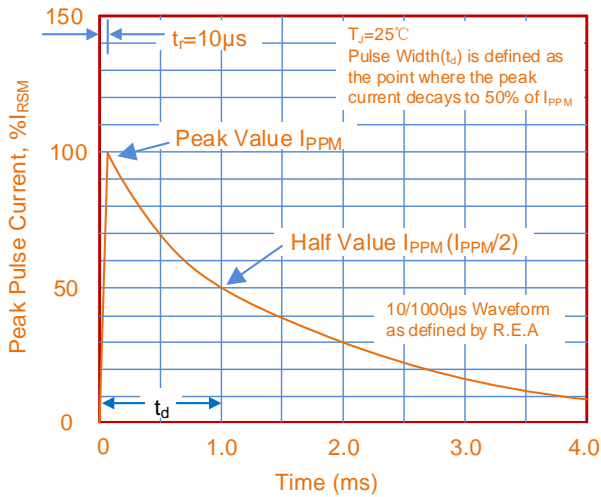
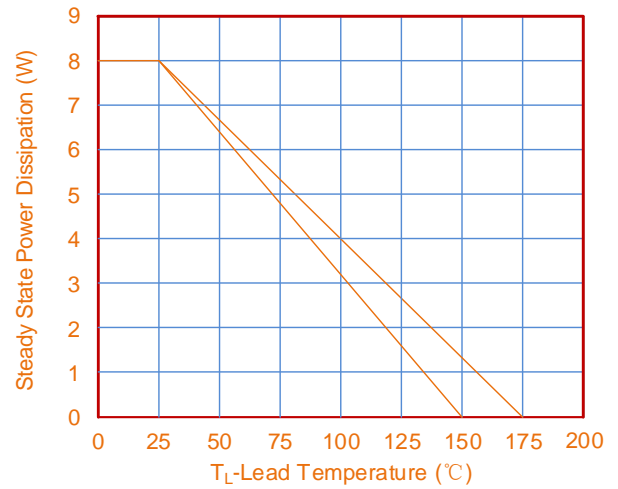
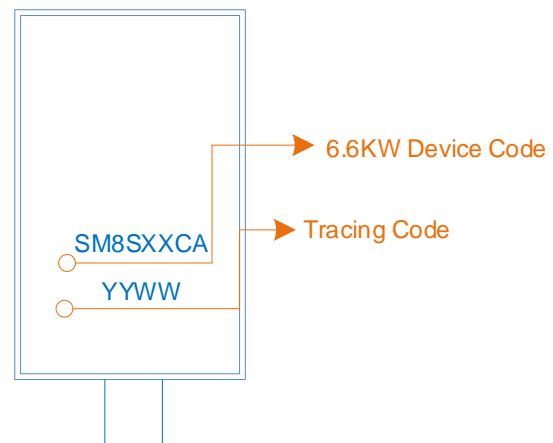
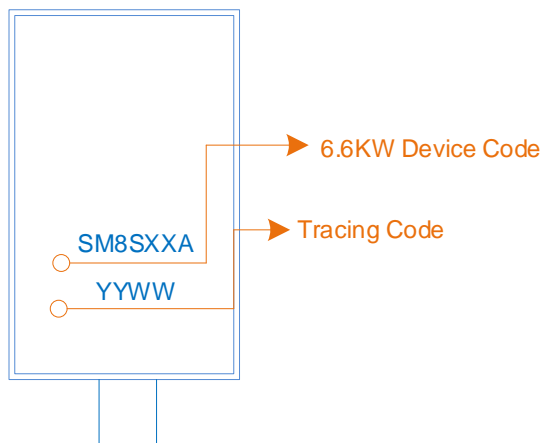


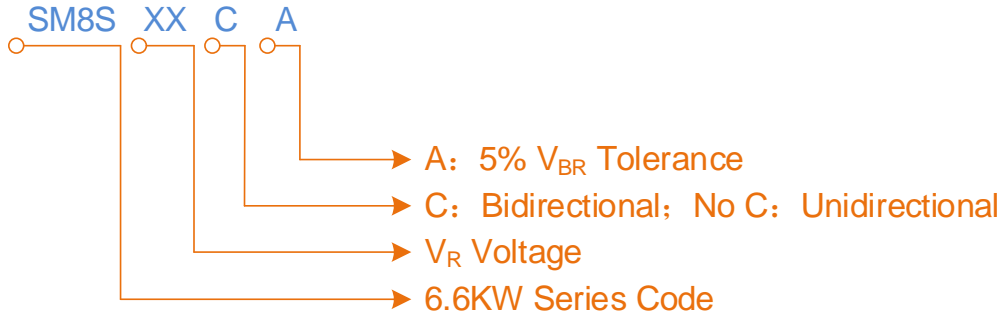
Figure 4. Steady State Power Dissipation Derating



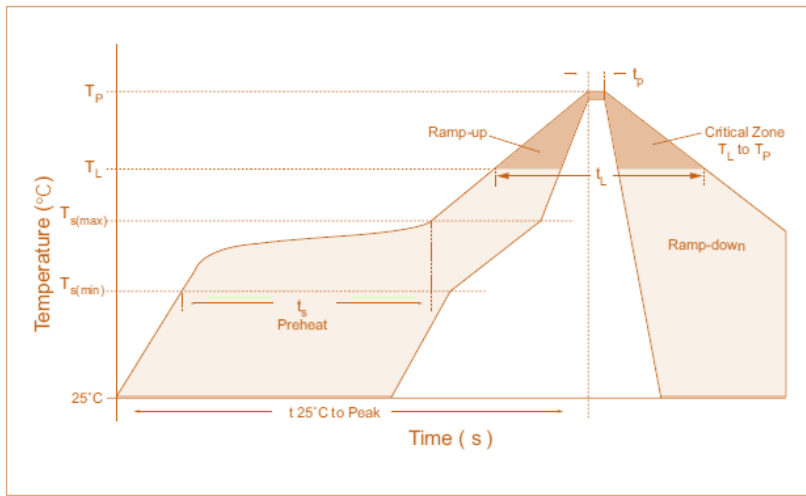
**Marking Code**



### Part Number Code



### Soldering Parameters



Reflow Condition		Lead-free Soldering
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 ( $T_A$ ) to peak)		3°C/second max
$T_{s(max)}$ to $T_A$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_A$ )	217°C
	- Time (min to max) ( $t_r$ )	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 ( $T_p$ )		8 minutes Max.
Do not exceed Temperature		260°C

## Packaging Specification

