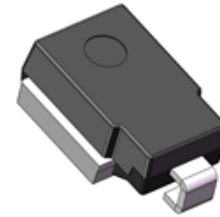


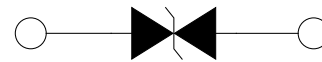
## Automotive Protection Surface Mount Transient Voltage Suppressors

### Features

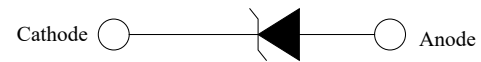
- Chip produced by chemical method
- Junction passivated by high temperature resistant insulating adhesive
- $T_J = 175\text{ }^{\circ}\text{C}$  capability suitable for high reliability and automotive requirement
- Low leakage current
- Low forward voltage drop
- High surge capability
- Meets ISO 16750-2 surge specification (varied by test condition)
- LF maximum peak of  $245\text{ }^{\circ}\text{C}$
- AEC-Q101 qualified



DO-218AB



Bi-directional



Uni-directional

### Mechanical Data

**Case:** DO-218AB

Molding compound meets UL 94 V-0 flammability rating Base P/NHE3\_X - RoHS-compliant and AEC-Q101 qualified ("X" denotes revision code e.g. A, B, ...)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

**Polarity:** heatsink is anode

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

| Parameter                                                                             |                                       | Symbol                 | Value          | Unit               |
|---------------------------------------------------------------------------------------|---------------------------------------|------------------------|----------------|--------------------|
| Peak pulse power dissipation                                                          | with 10/1000 $\mu\text{s}$ waveform   | $P_{\text{PPM}}$       | 6600           | W                  |
|                                                                                       | with 10/10 000 $\mu\text{s}$ waveform |                        | 5200           |                    |
| Power dissipation on infinite heatsink at $T_C = 25\text{ }^{\circ}\text{C}$ (fig. 1) |                                       | $P_D$                  | 8.0            | W                  |
| Peak pulse current with 10/1000 $\mu\text{s}$ waveform                                |                                       | $I_{\text{PPM}}^{(1)}$ | See next table | A                  |
| Peak forward surge current 8.3 ms single half sine-wave                               |                                       | $I_{\text{FSM}}^{(2)}$ | 700            | A                  |
| Operating junction and storage temperature range                                      |                                       | $T_J, T_{\text{STG}}$  | -55 to +175    | $^{\circ}\text{C}$ |

**Note**

- (1) Non-repetitive current pulse derated above  $T_A = 25\text{ }^{\circ}\text{C}$   
 (2) IFSM only for uni-directional production

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

| Parameter                                    | Symbol                | Value | Unit                 |
|----------------------------------------------|-----------------------|-------|----------------------|
| Typical thermal resistance, junction to case | $R_{\theta\text{JC}}$ | 0.90  | $^{\circ}\text{C/W}$ |

### Ordering Information (Example)

| Part Number | Unit Weight (g) | Package  | Quantity | Delivery Mode                       |
|-------------|-----------------|----------|----------|-------------------------------------|
| SM8S Series | 2.85            | DO-218AB | 750 pcs  | According to customer's requirement |



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

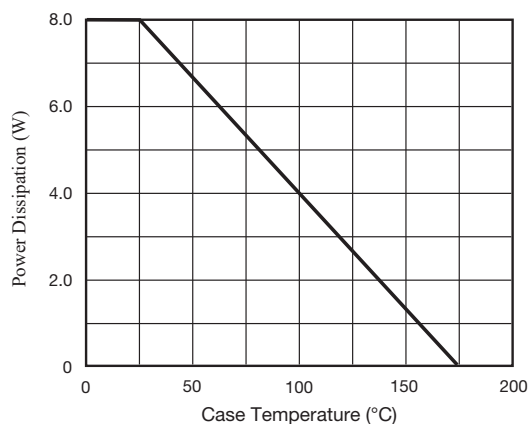


Fig. 1 - Power Derating Curve

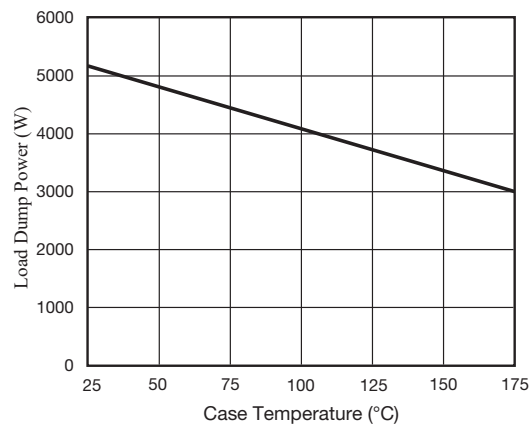


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

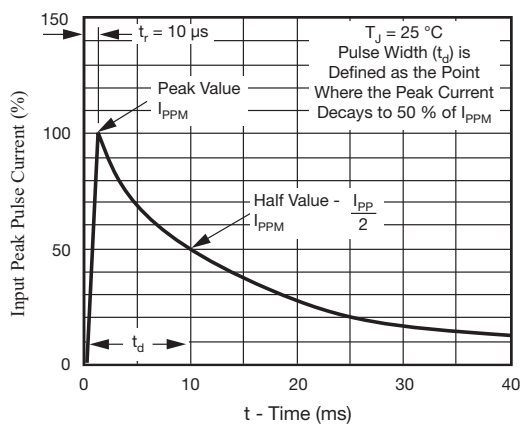


Fig. 3 - Pulse Waveform

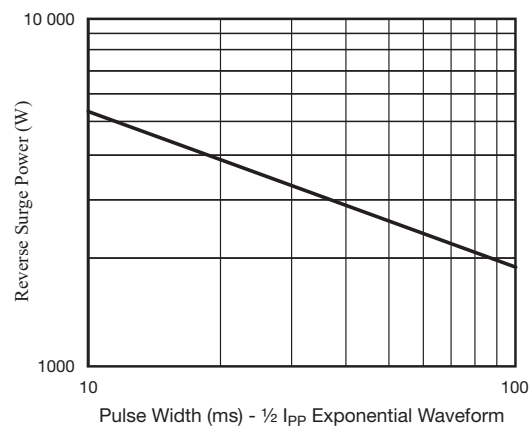


Fig. 4 - Reverse Power Capability

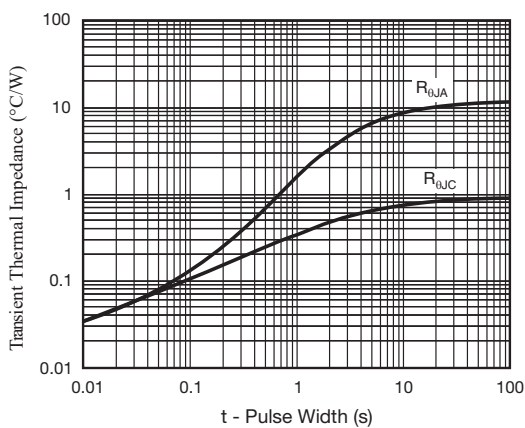


Fig. 5 - Typical Transient Thermal Impedance

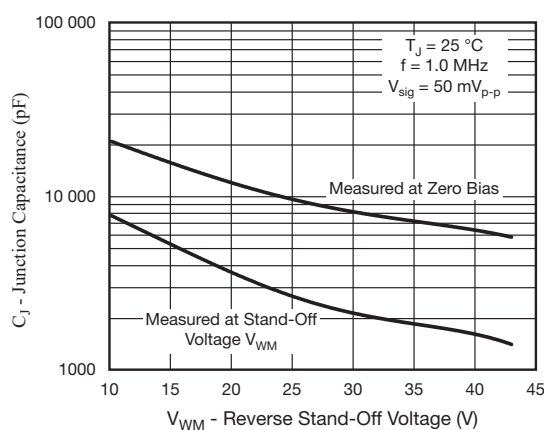


Fig. 6 - Typical Junction Capacitance

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

| Part Number |          | Breakdown Voltage $V_{BR}$ (V) |      |      | Test Current $I_T$ (mA) | Stand-off Voltage $V_{RWM}$ (V) | Reverse Leakage $I_R$ @ $V_{RWM}$ ( $\mu\text{A}$ ) | Reverse Leakage $I_R$ @ $V_{RWM}$ $T_J=175^{\circ}\text{C}$ ( $\mu\text{A}$ ) | Reverse Surge Current $I_{PP}$ (A) | Clamping Voltage $V_C$ @ $I_{PP}$ (V) | Coefficient OF $V_{BR}$ $\alpha T$ (%/ $^{\circ}\text{C}$ ) |
|-------------|----------|--------------------------------|------|------|-------------------------|---------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------|---------------------------------------|-------------------------------------------------------------|
| Uni         | Bi       | Min.                           | Nom. | Max. |                         |                                 |                                                     |                                                                               |                                    |                                       |                                                             |
| SM8S10A     | SM8S10CA | 11.1                           | 11.7 | 12.3 | 5.0                     | 10.0                            | 10                                                  | 150                                                                           | 388                                | 17.0                                  | 0.069                                                       |
| SM8S11A     | SM8S11CA | 12.2                           | 12.9 | 13.5 | 5.0                     | 11.0                            | 10                                                  | 150                                                                           | 363                                | 18.2                                  | 0.072                                                       |
| SM8S12A     | SM8S12CA | 13.3                           | 14.0 | 14.7 | 5.0                     | 12.0                            | 10                                                  | 150                                                                           | 332                                | 19.9                                  | 0.074                                                       |
| SM8S13A     | SM8S13CA | 14.4                           | 15.2 | 15.9 | 5.0                     | 13.0                            | 10                                                  | 150                                                                           | 307                                | 21.5                                  | 0.076                                                       |
| SM8S14A     | SM8S14CA | 15.6                           | 16.4 | 17.2 | 5.0                     | 14.0                            | 10                                                  | 150                                                                           | 284                                | 23.2                                  | 0.078                                                       |
| SM8S15A     | SM8S15CA | 16.7                           | 17.6 | 18.5 | 5.0                     | 15.0                            | 10                                                  | 150                                                                           | 270                                | 24.4                                  | 0.080                                                       |
| SM8S16A     | SM8S16CA | 17.8                           | 18.8 | 19.7 | 5.0                     | 16.0                            | 10                                                  | 150                                                                           | 254                                | 26.0                                  | 0.081                                                       |
| SM8S17A     | SM8S17CA | 18.9                           | 19.9 | 20.9 | 5.0                     | 17.0                            | 10                                                  | 150                                                                           | 239                                | 27.6                                  | 0.082                                                       |
| SM8S18A     | SM8S18CA | 20.0                           | 21.1 | 22.1 | 5.0                     | 18.0                            | 10                                                  | 150                                                                           | 226                                | 29.2                                  | 0.083                                                       |
| SM8S20A     | SM8S20CA | 22.2                           | 23.4 | 24.5 | 5.0                     | 20.0                            | 10                                                  | 150                                                                           | 204                                | 32.4                                  | 0.085                                                       |
| SM8S22A     | SM8S22CA | 24.4                           | 25.7 | 26.9 | 5.0                     | 22.0                            | 10                                                  | 150                                                                           | 186                                | 35.5                                  | 0.086                                                       |
| SM8S24A     | SM8S24CA | 26.7                           | 28.1 | 29.5 | 5.0                     | 24.0                            | 10                                                  | 150                                                                           | 170                                | 38.9                                  | 0.087                                                       |
| SM8S26A     | SM8S26CA | 28.9                           | 30.4 | 31.9 | 5.0                     | 26.0                            | 10                                                  | 150                                                                           | 157                                | 42.1                                  | 0.088                                                       |
| SM8S28A     | SM8S28CA | 31.1                           | 32.8 | 34.4 | 5.0                     | 28.0                            | 10                                                  | 150                                                                           | 145                                | 45.4                                  | 0.089                                                       |
| SM8S30A     | SM8S30CA | 33.3                           | 35.1 | 36.8 | 5.0                     | 30.0                            | 10                                                  | 150                                                                           | 136                                | 48.4                                  | 0.090                                                       |
| SM8S33A     | SM8S33CA | 36.7                           | 38.7 | 40.6 | 5.0                     | 33.0                            | 10                                                  | 150                                                                           | 124                                | 53.3                                  | 0.091                                                       |
| SM8S36A     | SM8S36CA | 40.0                           | 42.1 | 44.2 | 5.0                     | 36.0                            | 10                                                  | 150                                                                           | 114                                | 58.1                                  | 0.091                                                       |
| SM8S40A     | SM8S40CA | 44.4                           | 46.8 | 49.1 | 5.0                     | 40.0                            | 10                                                  | 150                                                                           | 102                                | 64.5                                  | 0.092                                                       |
| SM8S43A     | SM8S43CA | 47.8                           | 50.3 | 52.8 | 5.0                     | 43.0                            | 10                                                  | 150                                                                           | 95.1                               | 69.4                                  | 0.093                                                       |
| SM8S45A     | SM8S45CA | 50.0                           | 52.7 | 55.3 | 5.0                     | 45.0                            | 10                                                  | 150                                                                           | 90.8                               | 72.7                                  | 0.094                                                       |
| SM8S48A     | SM8S48CA | 53.3                           | 56.1 | 58.9 | 5.0                     | 48.0                            | 10                                                  | 150                                                                           | 85.3                               | 77.4                                  | 0.095                                                       |
| SM8S51A     | SM8S51CA | 56.7                           | 59.7 | 62.7 | 5.0                     | 51.0                            | 10                                                  | 150                                                                           | 80.1                               | 82.4                                  | 0.096                                                       |
| SM8S54A     | SM8S54CA | 60.0                           | 63.1 | 66.3 | 5.0                     | 54.0                            | 10                                                  | 150                                                                           | 75.8                               | 87.1                                  | 0.097                                                       |
| SM8S58A     | SM8S58CA | 64.4                           | 67.8 | 71.2 | 5.0                     | 58.0                            | 10                                                  | 150                                                                           | 70.5                               | 93.6                                  | 0.098                                                       |
| SM8S60A     | SM8S60CA | 66.7                           | 70.2 | 73.7 | 5.0                     | 60.0                            | 10                                                  | 150                                                                           | 68.2                               | 96.8                                  | 0.099                                                       |

**Notes**

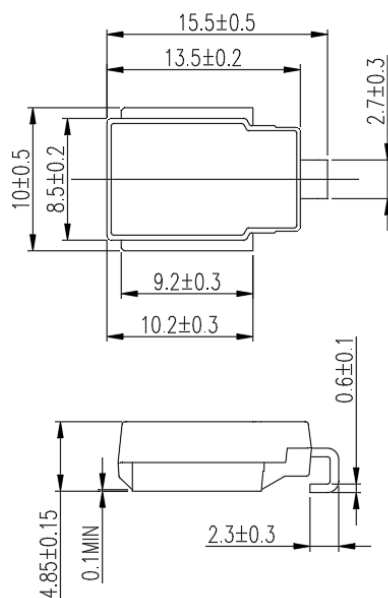
- For all uni-directional types maximum  $V_F = 1.8\text{ V}$  at  $I_F = 100\text{ A}$  measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

(1) To calculate  $V_{BR}$  vs. junction temperature, use the following formula:  $V_{BR}$  at  $T_J = V_{BR}$  at  $25^{\circ}\text{C} \times (1 + \alpha T \times (T_J - 25))$



Package Outline Dimensions (millimeters)

DO-218AB



Mounting Pad Layout

