

Surface Mount Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218AB

FEATURES

- Chip produced by chemical method
- Junction passivated by high temperature resistant insulating adhesive
- $T_J = 175\text{ °C}$ capability suitable for high reliability and automotive requirement
- Available in Bi-directional polarity only
- Low leakage current
- Low forward voltage drop
- High surge capability
- Meets ISO16750-2 surge specification (varied by test condition)
- Meets MSL level 1, LF maximum peak of 245 °C
- AEC-Q101 qualified

PRIMARY CHARACTERISTICS

| | |
|---------------------------------|------------------|
| V_{BR} | 11.1 V to 52.8 V |
| V_{WM} | 10 V to 43 V |
| P_{PPM} (10 x 1000 μ s) | 6600 W |
| P_{PPM} (10 x 10 000 μ s) | 5200 W |
| P_D | 8 W |
| T_J max. | 175 °C |
| Polarity | Bi-directional |
| Package | DO-218AB |

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump protection application.

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 ($T_C = 25\text{ °C}$ unless otherwise noted)

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|-----------------|---------------------------------|-------------|
| Peak pulse power dissipation | P_{PPM} | with 10/1000 μ s waveform | 6600 |
| | | with 10/10 000 μ s waveform | 5200 |
| Power dissipation on infinite heatsink at $T_C = 25\text{ °C}$ (fig. 1) | P_D | 8.0 | W |
| Peak pulse current with 10/1000 μ s waveform | $I_{PPM}^{(1)}$ | See next table | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +175 | °C |

Note

⁽¹⁾ Non-repetitive current pulse derated above $T_A = 25\text{ °C}$

SM8S10CA thru SM8S43CA

| ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | | | | | |
|--|--------------------------------|------|------|-------------------------|--------------------------------|---|---|---|---|--|
| DEVICE TYPE | BREAKDOWN VOLTAGE V_{BR} (V) | | | TEST CURRENT I_T (mA) | STAND-OFF VOLTAGE V_{WM} (V) | MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (μA) | MAXIMUM REVERSE LEAKAGE AT V_{WM} $T_J = 175\text{ }^\circ\text{C}$ I_D (μA) | MAX. PEAK PULSE CURRENT AT 10/1000 μs WAVEFORM (A) | MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V) | TYPICAL TEMP. COEFFICIENT OF V_{BR} α_T ($\%/^\circ\text{C}$) |
| | MIN. | NOM. | MAX. | | | | | | | |
| SM8S10CA | 11.1 | 11.7 | 12.3 | 5.0 | 10.0 | 10 | 150 | 388 | 17.0 | 0.069 |
| SM8S11CA | 12.2 | 12.9 | 13.5 | 5.0 | 11.0 | 10 | 150 | 363 | 18.2 | 0.072 |
| SM8S12CA | 13.3 | 14.0 | 14.7 | 5.0 | 12.0 | 10 | 150 | 332 | 19.9 | 0.074 |
| SM8S13CA | 14.4 | 15.2 | 15.9 | 5.0 | 13.0 | 10 | 150 | 307 | 21.5 | 0.076 |
| SM8S14CA | 15.6 | 16.4 | 17.2 | 5.0 | 14.0 | 10 | 150 | 284 | 23.2 | 0.078 |
| SM8S15CA | 16.7 | 17.6 | 18.5 | 5.0 | 15.0 | 10 | 150 | 270 | 24.4 | 0.080 |
| SM8S16CA | 17.8 | 18.8 | 19.7 | 5.0 | 16.0 | 10 | 150 | 254 | 26.0 | 0.081 |
| SM8S17CA | 18.9 | 19.9 | 20.9 | 5.0 | 17.0 | 10 | 150 | 239 | 27.6 | 0.082 |
| SM8S18CA | 20.0 | 21.1 | 22.1 | 5.0 | 18.0 | 10 | 150 | 226 | 29.2 | 0.083 |
| SM8S20CA | 22.2 | 23.4 | 24.5 | 5.0 | 20.0 | 10 | 150 | 204 | 32.4 | 0.085 |
| SM8S22CA | 24.4 | 25.7 | 26.9 | 5.0 | 22.0 | 10 | 150 | 186 | 35.5 | 0.086 |
| SM8S24CA | 26.7 | 28.1 | 29.5 | 5.0 | 24.0 | 10 | 150 | 170 | 38.9 | 0.087 |
| SM8S26CA | 28.9 | 30.4 | 31.9 | 5.0 | 26.0 | 10 | 150 | 157 | 42.1 | 0.088 |
| SM8S28CA | 31.1 | 32.8 | 34.4 | 5.0 | 28.0 | 10 | 150 | 145 | 45.4 | 0.089 |
| SM8S30CA | 33.3 | 35.1 | 36.8 | 5.0 | 30.0 | 10 | 150 | 136 | 48.4 | 0.090 |
| SM8S33CA | 36.7 | 38.7 | 40.6 | 5.0 | 33.0 | 10 | 150 | 124 | 53.3 | 0.091 |
| SM8S36CA | 40.0 | 42.1 | 44.2 | 5.0 | 36.0 | 10 | 150 | 114 | 58.1 | 0.091 |
| SM8S40CA | 44.4 | 46.8 | 49.1 | 5.0 | 40.0 | 10 | 150 | 102 | 64.5 | 0.092 |
| SM8S43CA | 47.8 | 50.3 | 52.8 | 5.0 | 43.0 | 10 | 150 | 95.1 | 69.4 | 0.093 |

Notes

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

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|----------|---------------|-------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE | BASE QUANTITY | DELIVERY MODE |
| SM8SXXCA | 2.85 | DO-218AB | NA | According to customer's requirement |

SM8S10CA thru SM8S43CA

RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

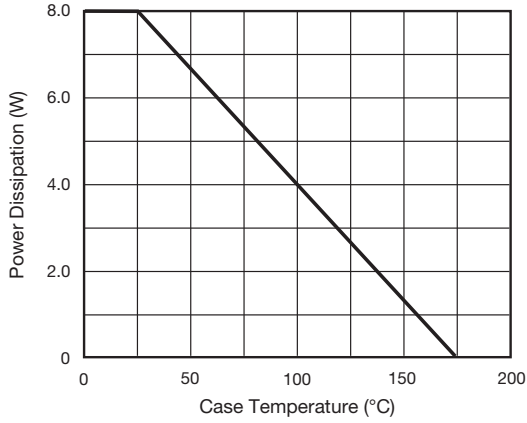


Fig. 1 - Power Derating Curve

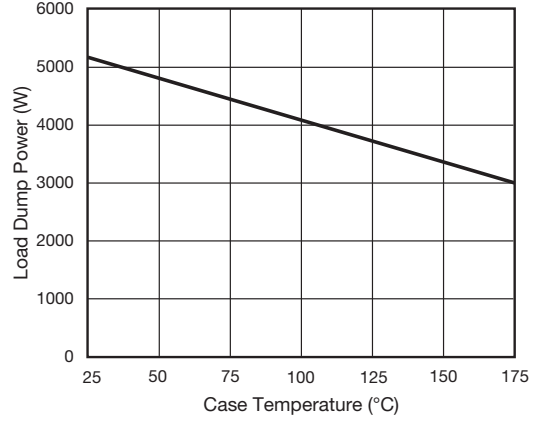


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

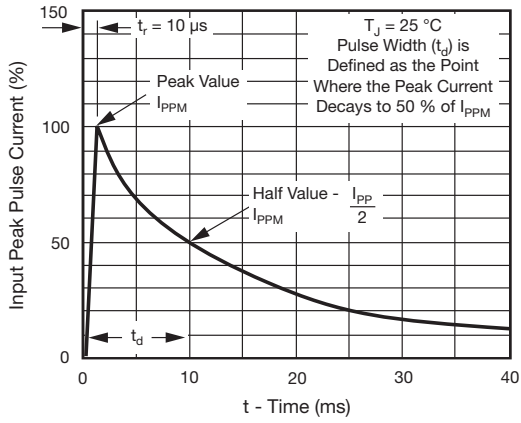


Fig. 3 - Pulse Waveform

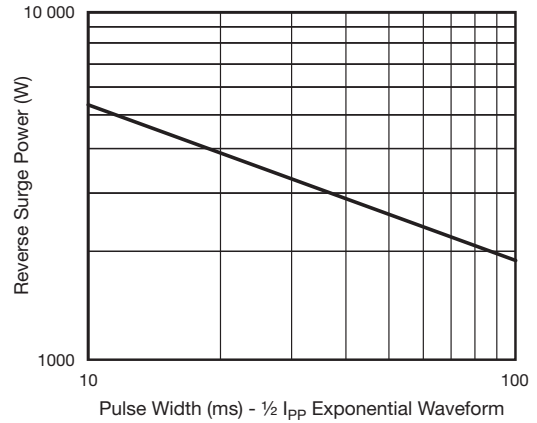
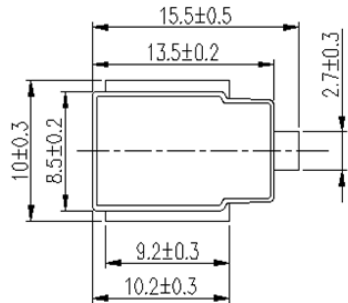


Fig. 4 - Reverse Power Capability

PACKAGE OUTLINE DIMENSIONS (millimeters)

DO-218AB



Mounting Pad Layout

