

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

SM8SXXA-MS

Product specification

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
- Available in uni-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 $245\text{ }^\circ\text{C}$
- AEC-Q101 qualified

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

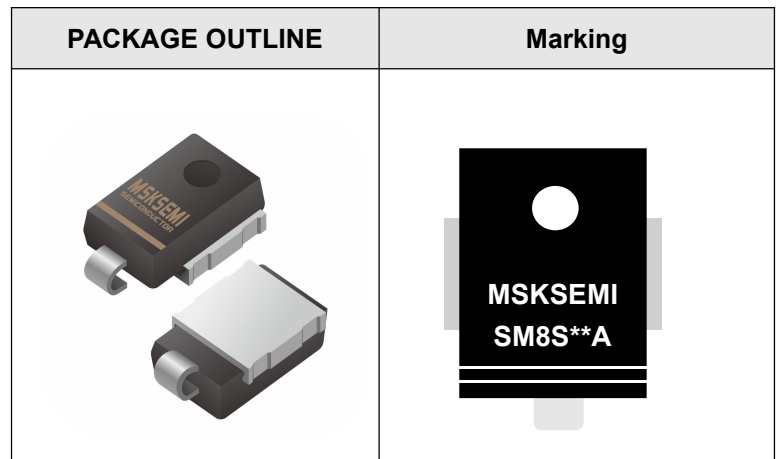
Molding compound meets UL 94 V-0 flammability rating
 Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified
 ("X" denotes revision code e.g. A, B, ...)

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

Polarity: heatsink is anode

PRIMARY CHARACTERISTICS

| | |
|--|-----------------------------|
| VBR | 11.1 V to 52.8 V |
| VWM | 10 V to 43 V |
| PPPM (10 x 1000 μs) | 6600 W |
| PPPM (10 x 10 000 μs) | 5200 W |
| PD | 8 W |
| IFSM | 700 A |
| T_J max. | $175\text{ }^\circ\text{C}$ |
| Polarity | Uni-directional |
| Package | DO-218AB |



Note

- **Representative voltage STAND-OFF VOLTAGE

MAXIMUM RATINGS (TC = 25 °C unless otherwise noted)

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|----------------|---------------------------------------|------------------|
| Peak pulse power dissipation | PPPM | with 10/1000 μs waveform | 6600 |
| | | with 10/10 000 μs waveform | 5200 |
| Power dissipation on infinite heatsink at $T_C = 25\text{ }^\circ\text{C}$ (fig. 1) | PD | 8.0 | W |
| Peak pulse current with 10/1000 μs waveform | IPPM (1) | See next table | A |
| Peak forward surge current 8.3 ms single half sine-wave | IFSM | 700 | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +175 | $^\circ\text{C}$ |

Note

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

ELECTRICAL CHARACTERISTICS (TC = 25 °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 °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} ⁽¹⁾ aT (%/°C) |
|-------------|---------------------------------------|------|------|----------------------------------|---------------------------------------|--|--|--|---|---|
| | MIN. | NOM. | MAX. | | | | | | | |
| SM8S10A-MS | 11.1 | 11.7 | 12.3 | 5.0 | 10.0 | 10 | 150 | 388 | 17.0 | 0.069 |
| SM8S11A-MS | 12.2 | 12.9 | 13.5 | 5.0 | 11.0 | 10 | 150 | 363 | 18.2 | 0.072 |
| SM8S12A-MS | 13.3 | 14.0 | 14.7 | 5.0 | 12.0 | 10 | 150 | 332 | 19.9 | 0.074 |
| SM8S13A-MS | 14.4 | 15.2 | 15.9 | 5.0 | 13.0 | 10 | 150 | 307 | 21.5 | 0.076 |
| SM8S14A-MS | 15.6 | 16.4 | 17.2 | 5.0 | 14.0 | 10 | 150 | 284 | 23.2 | 0.078 |
| SM8S15A-MS | 16.7 | 17.6 | 18.5 | 5.0 | 15.0 | 10 | 150 | 270 | 24.4 | 0.080 |
| SM8S16A-MS | 17.8 | 18.8 | 19.7 | 5.0 | 16.0 | 10 | 150 | 254 | 26.0 | 0.081 |
| SM8S17A-MS | 18.9 | 19.9 | 20.9 | 5.0 | 17.0 | 10 | 150 | 239 | 27.6 | 0.082 |
| SM8S18A-MS | 20.0 | 21.1 | 22.1 | 5.0 | 18.0 | 10 | 150 | 226 | 29.2 | 0.083 |
| SM8S20A-MS | 22.2 | 23.4 | 24.5 | 5.0 | 20.0 | 10 | 150 | 204 | 32.4 | 0.085 |
| SM8S22A-MS | 24.4 | 25.7 | 26.9 | 5.0 | 22.0 | 10 | 150 | 186 | 35.5 | 0.086 |
| SM8S24A-MS | 26.7 | 28.1 | 29.5 | 5.0 | 24.0 | 10 | 150 | 170 | 38.9 | 0.087 |
| SM8S26A-MS | 28.9 | 30.4 | 31.9 | 5.0 | 26.0 | 10 | 150 | 157 | 42.1 | 0.088 |
| SM8S28A-MS | 31.1 | 32.8 | 34.4 | 5.0 | 28.0 | 10 | 150 | 145 | 45.4 | 0.089 |
| SM8S30A-MS | 33.3 | 35.1 | 36.8 | 5.0 | 30.0 | 10 | 150 | 136 | 48.4 | 0.090 |
| SM8S33A-MS | 36.7 | 38.7 | 40.6 | 5.0 | 33.0 | 10 | 150 | 124 | 53.3 | 0.091 |
| SM8S36A-MS | 40.0 | 42.1 | 44.2 | 5.0 | 36.0 | 10 | 150 | 114 | 58.1 | 0.091 |
| SM8S40A-MS | 44.4 | 46.8 | 49.1 | 5.0 | 40.0 | 10 | 150 | 102 | 64.5 | 0.092 |
| SM8S43A-MS | 47.8 | 50.3 | 52.8 | 5.0 | 43.0 | 10 | 150 | 95.1 | 69.4 | 0.093 |

Notes

• For all types maximum V_F = 1.8 V at I_F = 100 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 °C x (1 + T x (T_J - 25))

THERMAL CHARACTERISTICS (TC = 25 °C unless otherwise noted)

| PARAMETER | SYMBOL | VALUE | UNIT |
|--|------------------|-------|------|
| Typical thermal resistance, junction to case | R _{θJC} | 0.90 | °C/W |

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

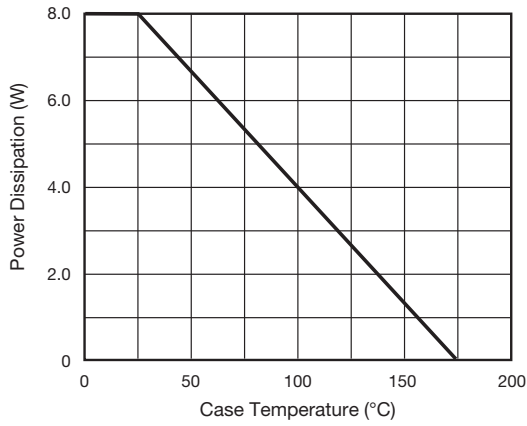


Fig. 1 - Power Derating Curve

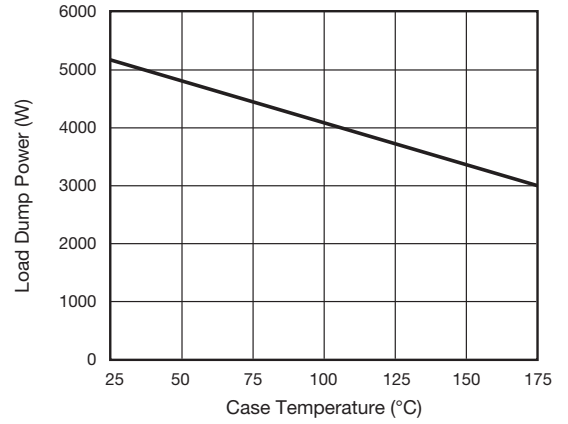


Fig. 2 - Load Dump Power Characteristics (10 ms Exponential Waveform)

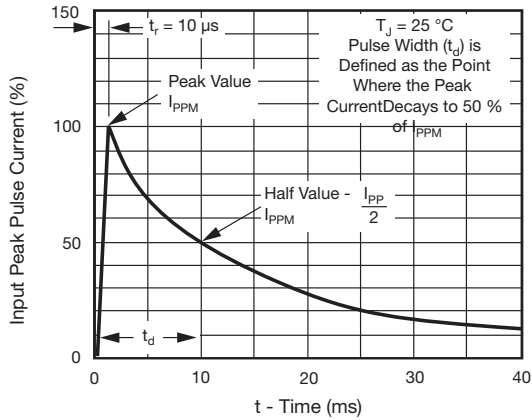


Fig. 3 - Pulse Waveform

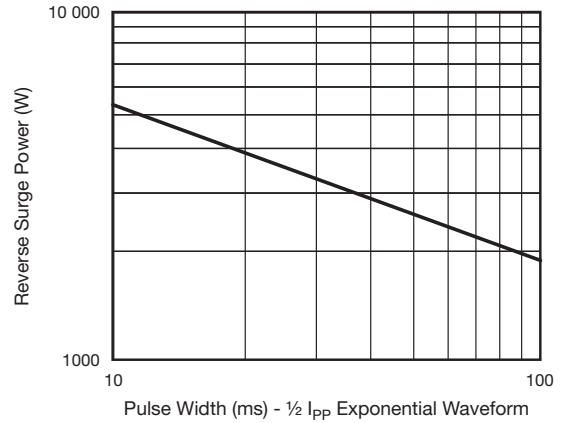


Fig. 4 - Reverse Power Capability

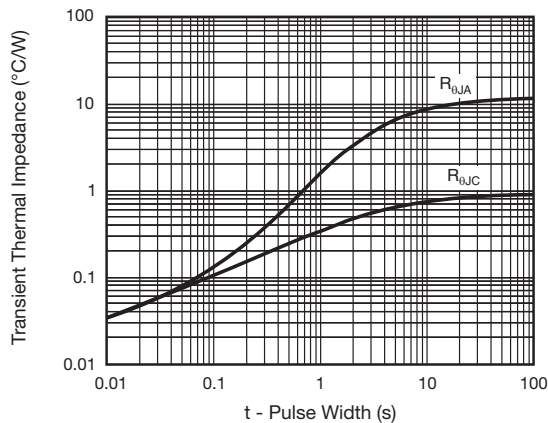


Fig. 5 - Typical Transient Thermal Impedance

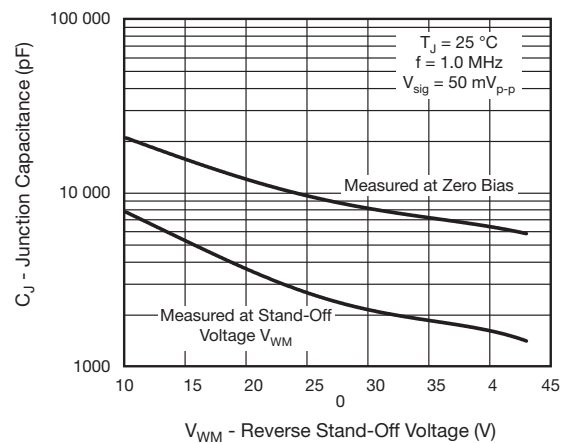
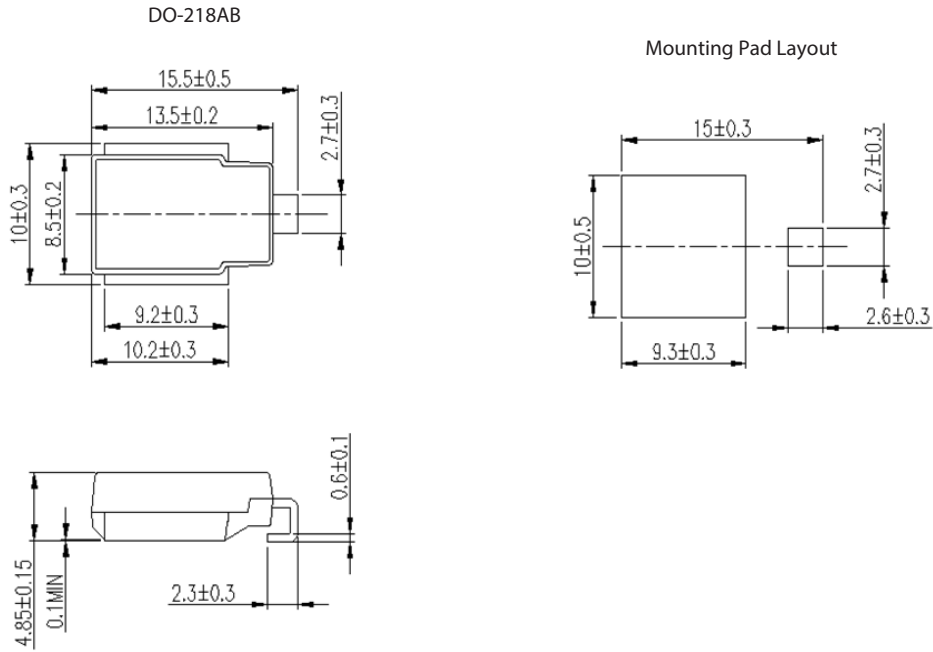


Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS (millimeters)



REEL SPECIFICATION

| P/N | PKG | QTY |
|------------|----------|-----|
| SM8SXXA-MS | DO-218AB | 750 |

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