

Surface-Mount TRANSZORB® Transient Voltage Suppressors


SMA (DO-214AC)
FEATURES

- Low profile package
- Ideal for automated placement
- Available in uni-directional polarity only
- Excellent clamping capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**
LINKS TO ADDITIONAL RESOURCES

[3D Models](#)

| PRIMARY CHARACTERISTICS | |
|-------------------------------|-----------------|
| V_{BR} | 6.4 V to 34.4 V |
| V_{WM} | 5.0 V to 28 V |
| P_{PPM} (10 x 1000 μ s) | 600 W |
| P_{PPM} (8 x 20 μ s) | 4000 W |
| P_D at $T_A = 50$ °C | 4 W |
| I_{FSM} | 50 A |
| T_J max. | 150 °C |
| Polarity | Uni-directional |
| Package | SMA (DO-214AC) |

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive, and telecommunication.

MECHANICAL DATA

Case: SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS-compliant and commercial grade

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

E3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

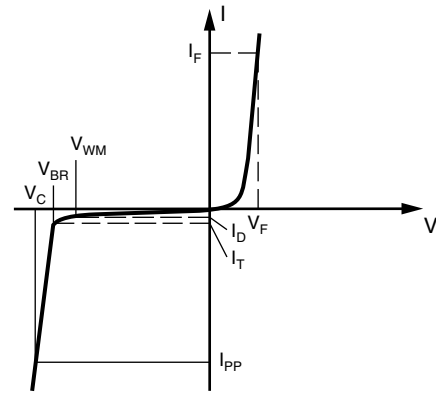
| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | |
|--|----------------|----------------|------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Peak pulse power dissipation with a 10/1000 μ s waveform ⁽¹⁾⁽²⁾ | P_{PPM} | 600 | W |
| Peak pulse power dissipation with a 8/20 μ s waveform | | 4000 | |
| Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾⁽²⁾ | I_{PPM} | See next table | A |
| Peak pulse current with a 8/20 μ s waveform | | | |
| Power dissipation on infinite heatsink, $T_A = 50$ °C | P_D | 4.0 | W |
| Peak forward surge current 8.3 ms single half sine-wave | I_{FSM} | 50 | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | °C |

Notes

⁽¹⁾ Non-repetitive current pulse, per fig. 1 and derated above $T_A = 25$ °C per fig. 2

⁽²⁾ Mounted on PCB with 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal

| INDEX OF SYMBOLS | |
|------------------|---------------------------------|
| SYMBOL | PARAMETER |
| V_{WM} | Stand-off voltage |
| V_{BR} | Breakdown voltage |
| V_C | Clamping voltage |
| I_D | Leakage current at V_{WM} |
| I_{PP} | Peak pulse current |
| αT | Voltage temperature coefficient |
| V_F | Forward voltage drop |
| R_D | Dynamic resistance |



| ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | | | | | | | | | |
|---|---------------------|---|------|----|---|-------|----------------------------|-------------------|-----------------------|-----------|--------------------|-----|-----------|----------------|
| DEVICE TYPE | DEVICE MARKING CODE | BREAKDOWN VOLTAGE V_{BR} AT I_T (1) | | | MAXIMUM REVERSE LEAKAGE I_D AT V_{WM} | | STAND-OFF VOLTAGE V_{WM} | V_C AT I_{PP} | | R_D (2) | V_C AT I_{PP} | | R_D (2) | αT (3) |
| | | MIN. | MAX. | | 25 °C | 85 °C | | MAX. | 10/1000 μs | | 8/20 μs | | MAX. | |
| | | | | | | | | | V | mA | μA | V | | |
| SMA6J5.0A | 6AE | 6.4 | 7.07 | 10 | 150 | 375 | 5.0 | 9.1 | 65.9 | 0.031 | 13.4 | 298 | 0.021 | 5.7 |
| SMA6J6.0A | 6AG | 6.7 | 7.41 | 10 | 600 | 1500 | 6.0 | 9.5 | 63.2 | 0.033 | 13.7 | 290 | 0.022 | 5.9 |
| SMA6J6.5A | 6AK | 7.2 | 7.96 | 10 | 100 | 250 | 6.5 | 10.2 | 58.8 | 0.038 | 14.5 | 276 | 0.024 | 6.1 |
| SMA6J7.5A | 6AP | 8.33 | 9.21 | 1 | 50 | 125 | 7.5 | 11.8 | 50.8 | 0.051 | 17.0 | 235 | 0.033 | 6.5 |
| SMA6J8.0A | 6AR | 8.89 | 9.83 | 1 | 20 | 50 | 8.0 | 12.5 | 48.0 | 0.056 | 18.2 | 220 | 0.038 | 7.0 |
| SMA6J8.5A | 6AT | 9.4 | 10.4 | 1 | 20 | 50 | 8.5 | 13.3 | 45.1 | 0.064 | 18.7 | 205 | 0.040 | 7.3 |
| SMA6J10A | 6AX | 11.1 | 12.3 | 1 | 1 | 5 | 10 | 15.7 | 38.2 | 0.089 | 19.6 | 184 | 0.040 | 7.8 |
| SMA6J11A | 6AZ | 12.2 | 13.5 | 1 | 1 | 5 | 11 | 17.2 | 34.8 | 0.107 | 21.5 | 172 | 0.047 | 8.1 |
| SMA6J12A | 6BE | 13.3 | 14.7 | 1 | 0.2 | 1 | 12 | 18.8 | 31.9 | 0.128 | 23.5 | 157 | 0.056 | 8.3 |
| SMA6J13A | 6BG | 14.4 | 15.9 | 1 | 0.2 | 1 | 13 | 20.4 | 29.4 | 0.153 | 23.9 | 147 | 0.054 | 8.4 |
| SMA6J15A | 6BM | 16.7 | 18.5 | 1 | 0.2 | 1 | 15 | 23.6 | 25.4 | 0.201 | 27.7 | 123 | 0.075 | 8.8 |
| SMA6J16A | 6BP | 17.8 | 19.7 | 1 | 0.2 | 1 | 16 | 25.2 | 23.8 | 0.229 | 29.5 | 119 | 0.083 | 8.8 |
| SMA6J17A | 6BR | 18.9 | 20.9 | 1 | 0.2 | 1 | 17 | 26.7 | 22.5 | 0.259 | 31.4 | 111 | 0.094 | 9.0 |
| SMA6J18A | 6BT | 20.0 | 22.1 | 1 | 0.2 | 1 | 18 | 28.3 | 21.2 | 0.292 | 33.2 | 102 | 0.109 | 9.2 |
| SMA6J20A | 6BV | 22.2 | 24.5 | 1 | 0.2 | 1 | 20 | 31.4 | 19.1 | 0.361 | 36.8 | 93 | 0.132 | 9.4 |
| SMA6J22A | 6BX | 24.4 | 26.9 | 1 | 0.2 | 1 | 22 | 34.5 | 17.4 | 0.437 | 40.4 | 89 | 0.152 | 9.5 |
| SMA6J24A | 6BZ | 26.7 | 29.5 | 1 | 0.2 | 1 | 24 | 37.8 | 15.9 | 0.523 | 44.3 | 80 | 0.185 | 9.6 |
| SMA6J26A | 6CE | 28.9 | 31.9 | 1 | 0.2 | 1 | 26 | 40.9 | 14.7 | 0.614 | 47.9 | 75 | 0.213 | 9.7 |
| SMA6J28A | 6CG | 31.1 | 34.4 | 1 | 0.2 | 1 | 28 | 44.0 | 13.6 | 0.704 | 51.6 | 68 | 0.253 | 9.8 |

Notes

- (1) Pulse test: $t_p \leq 50$ ms
- (2) To calculate maximum clamping voltage at other surge currents, use the following formula: $V_{CLmax.} = R_D \times I_{PP} + V_{BRmax.}$
- (3) To calculate V_{BR} vs. junction temperature, use the following formula: V_{BR} at $T_J = V_{BR}$ at $25^\circ\text{C} \times (1 + \alpha T \times (T_J - 25))$
- (4) $V_F = 3.5$ V at $I_F = 25$ A, pulse test: 300 μs pulse width



| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | |
|---|------------------|-------|------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Typical thermal resistance, junction to ambient ⁽¹⁾ | R _{θJA} | 120 | °C/W |
| Typical thermal resistance, junction to lead | R _{θJL} | 25 | |

Note

⁽¹⁾ Mounted on minimum recommended pad layout

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| SMA6J5.0A-E3/61 | 0.064 | 61 | 1800 | 7" diameter plastic tape and reel |
| SMA6J5.0A-E3/5A | 0.064 | 5A | 7500 | 13" diameter plastic tape and reel |

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

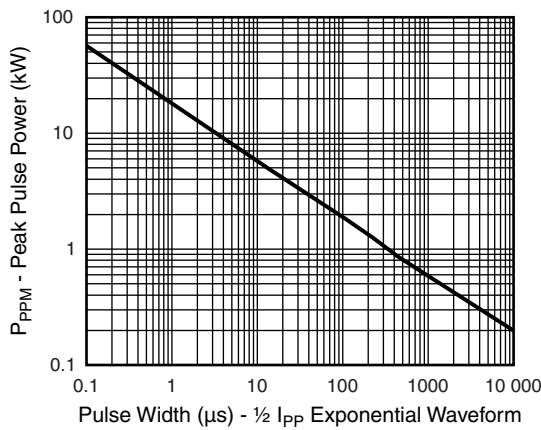


Fig. 1 - Peak Pulse Power Rating Curve

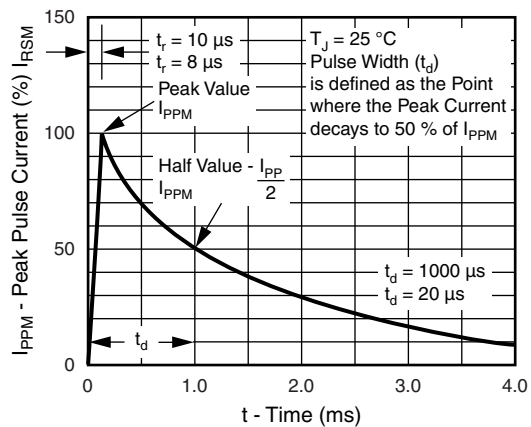


Fig. 3 - Pulse Waveform

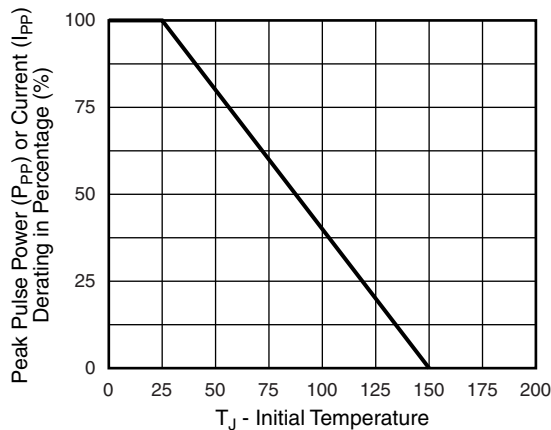


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

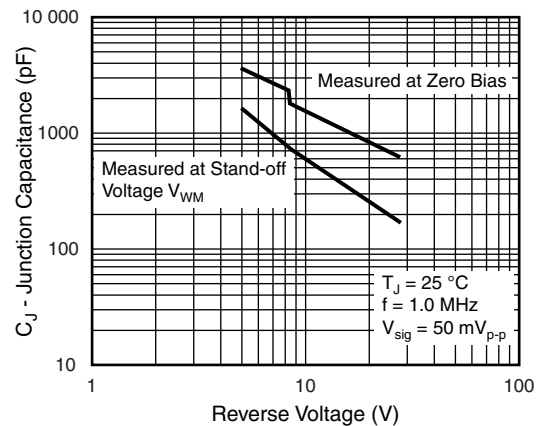


Fig. 4 - Typical Junction Capacitance

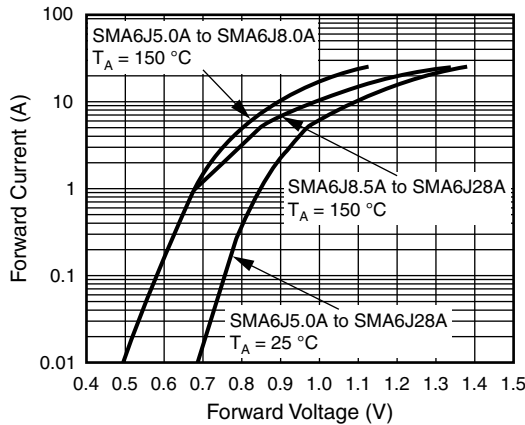


Fig. 5 - Typical Forward Characteristics

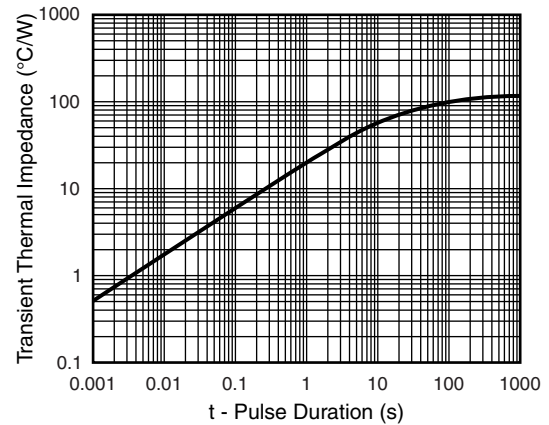
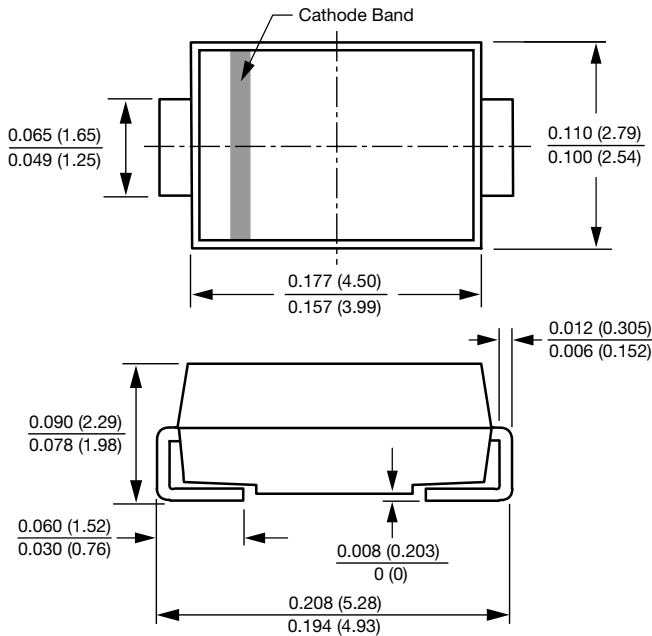


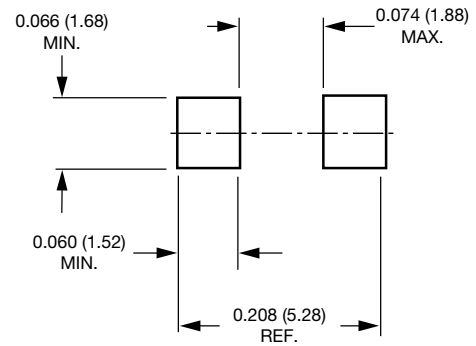
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout





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