



Surface Mount TRANSZORB® Transient Voltage Suppressors



SMA (DO-214AC)

PRIMARY CHARACTERISTICS

| | |
|------------|-----------------|
| V_{BR} | 130 V to 220 V |
| P_{PPM} | 200 W |
| P_D | 0.5 W |
| V_{WM} | 111 V to 185 V |
| 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.

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Available in uni-directional 200 W peak pulse power capability with a 10/1000 μ s waveform
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- 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
HALOGEN
FREE

MECHANICAL DATA

Case: SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

M3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes the 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 (fig. 1) | $P_{PPM}^{(1)(2)}$ | 200 | W |
| Peak pulse current with a 10/1000 μ s waveform (fig. 3) | $I_{PPM}^{(1)}$ | See next table | A |
| Power dissipation at $T_A = 25$ °C (fig. 6) | P_D | 0.5 | W |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | °C |

Notes

(1) Non-repetitive current pulse, per fig. 3 and derated above $T_A = 25$ °C per fig. 2

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

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

| DEVICE TYPE | DEVICE MARKING CODE | BREAKDOWN VOLTAGE V_{BR} AT I_T ⁽¹⁾ (V) | | TEST CURRENT I_T (mA) | STAND-OFF VOLTAGE V_{WM} (V) | MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (μA) ⁽¹⁾ | MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} (A) ⁽²⁾ | MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V) | MAXIMUM TEMPERATURE OF V_{BR} ($^{\circ}\text{C}$) |
|-------------|---------------------|--|------|-------------------------|--------------------------------|--|---|---|--|
| | | MIN. | MAX. | | | | | | |
| P2SMA130A | 2VK | 124 | 137 | 1.0 | 111 | 1.0 | 1.11 | 179 | 0.140 |
| P2SMA140A | 2VL | 133 | 147 | 1.0 | 119 | 1.0 | 1.04 | 192 | 0.140 |
| P2SMA150A | 2VM | 143 | 158 | 1.0 | 128 | 1.0 | 0.97 | 207 | 0.140 |
| P2SMA170A | 2VN | 162 | 179 | 1.0 | 145 | 1.0 | 0.85 | 234 | 0.150 |
| P2SMA180A | 2VP | 171 | 189 | 1.0 | 154 | 1.0 | 0.81 | 246 | 0.150 |
| P2SMA200A | 2VQ | 190 | 210 | 1.0 | 171 | 1.0 | 0.73 | 274 | 0.150 |
| P2SMA220A | 2VR | 209 | 231 | 1.0 | 185 | 1.0 | 0.61 | 328 | 0.150 |

Notes(1) Pulse test: $t_p \leq 50\text{ ms}$

(2) Surge current waveform per fig. 3 and derate per fig. 2

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

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|--------------------------------|-------|----------------------|
| Thermal resistance, junction to ambient air | $R_{\theta JA}$ ⁽¹⁾ | 250 | $^{\circ}\text{C/W}$ |
| Thermal resistance, junction to mount | $R_{\theta JM}$ ⁽¹⁾ | 50 | $^{\circ}\text{C/W}$ |

Note

(1) Mounted on minimum recommended pad layout

ORDERING INFORMATION (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|------------------|-----------------|------------------------|---------------|------------------------------------|
| P2SMA130A-M3/61T | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| P2SMA130A-M3/5AT | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |

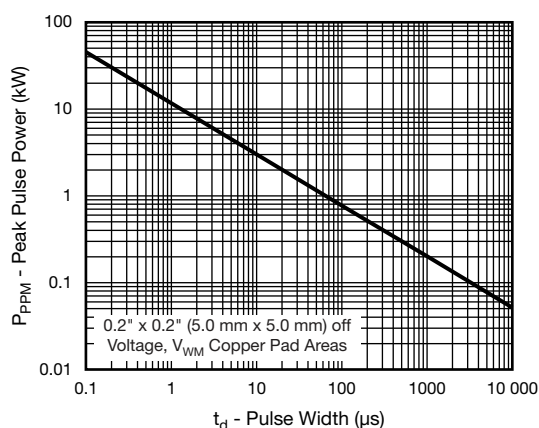
RATINGS AND CHARACTERISTICS CURVES($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Fig. 1 - Peak Pulse Power Rating Curve

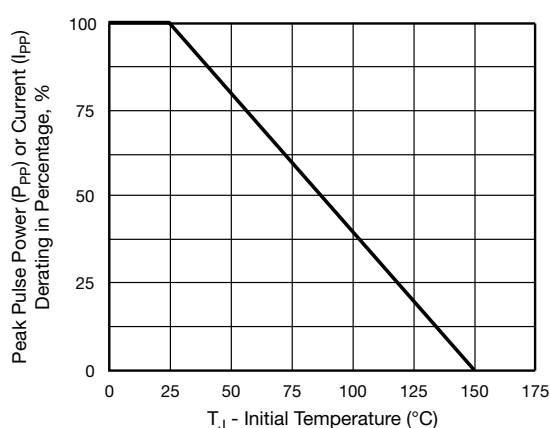


Fig. 2 - Pulse Derating Curve

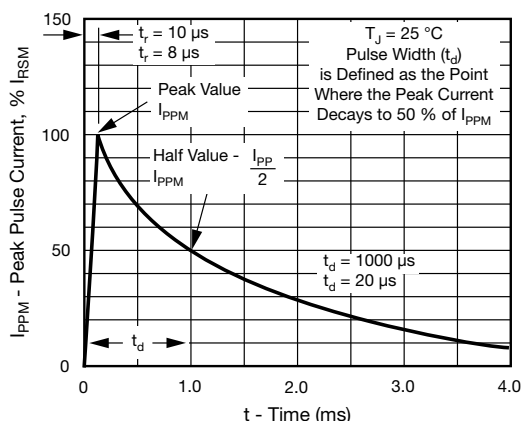


Fig. 3 - Pulse Waveform

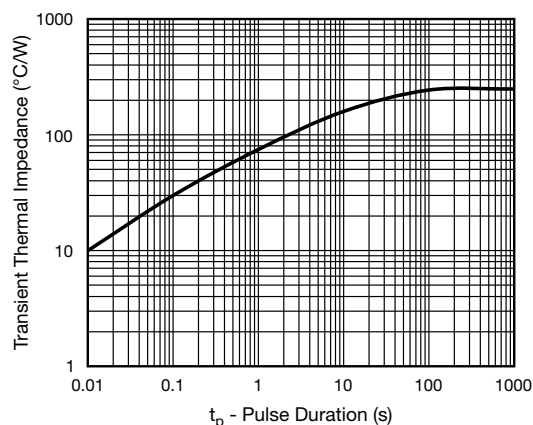


Fig. 5 - Typical Transient Thermal Impedance

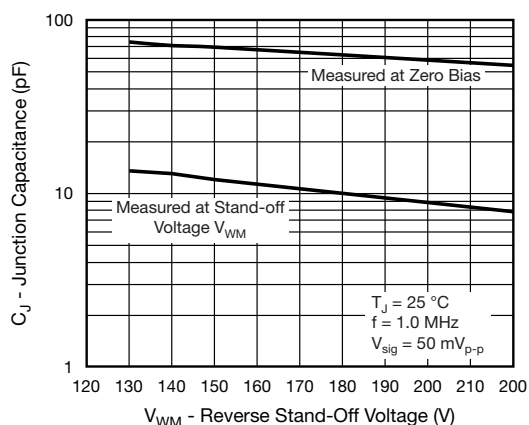


Fig. 4 - Typical Junction Capacitance

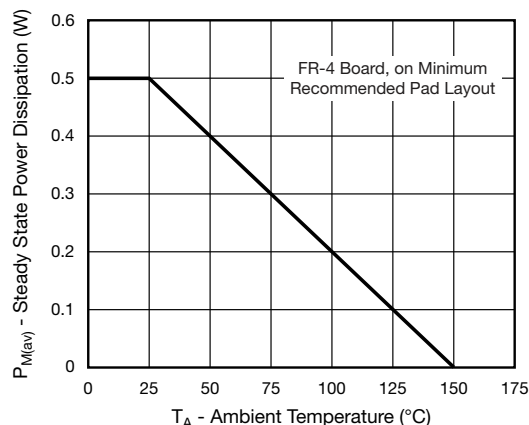
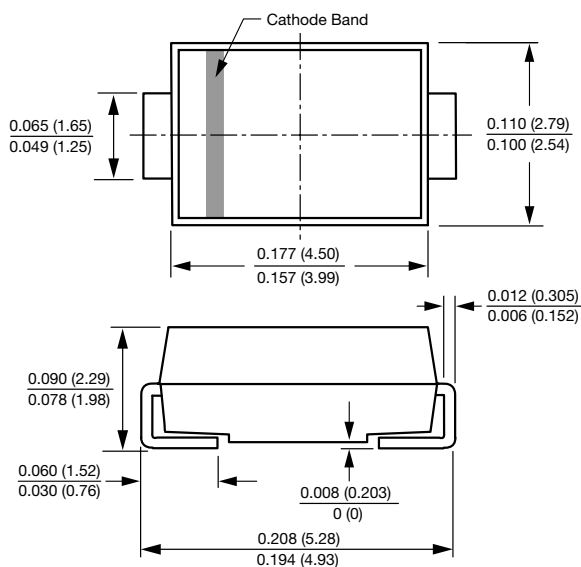


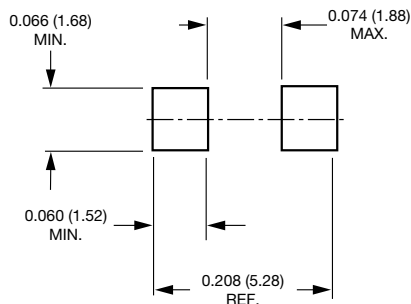
Fig. 6 - Power Derating Curve

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout





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| | | | | |
|---|---|---|---|---|
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| <u>P2SMA150A-E3/5AT</u> | <u>P2SMA220A-M3/5AT</u> | <u>P2SMA140A-M3/5AT</u> | <u>P2SMA140A-E3/5AT</u> | <u>P2SMA150A-M3/5AT</u> |
| <u>P2SMA130A-M3/5AT</u> | <u>P2SMA130A-E3/5AT</u> | <u>P2SMA140A-E3/61T</u> | <u>P2SMA140A-M3/61T</u> | <u>P2SMA180A-M3/61T</u> |
| <u>P2SMA200A-M3/5AT</u> | <u>P2SMA170A-M3/61T</u> | <u>P2SMA220A-M3/61T</u> | <u>P2SMA150A-E3/61T</u> | <u>P2SMA150A-M3/61T</u> |