

# Surface-Mount TRANSZORB® Transient Voltage Suppressors



**SMA (DO-214AC)**

Cathode  Anode

## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS         |                |
|---------------------------------|----------------|
| $V_{BR}$ (unidirectional)       | 530 V to 550 V |
| $V_{WM}$                        | 477 V, 495 V   |
| $P_{PPM}$                       | 300 W          |
| $P_D$                           | 2.5 W          |
| $I_{FSM}$ (unidirectional only) | 40 A           |
| $T_J$ max.                      | 150 °C         |
| Polarity                        | Unidirectional |
| Package                         | SMA (DO-214AC) |

## APPLICATION NOTES

- Respect thermal resistance (PCB layout) - as the temperature coefficient also contributes to the clamping voltage
- Select minimum breakdown voltage, so you get acceptable power dissipation and PCB tie point temperature
- Devices with higher breakdown voltage will have a shorter conduction time and will dissipate less power
- Clamping voltage is influenced by internal resistance - design approximation is 7 V per 100 mA slope
- Keep temperature of TVS lower than TOPSwitch® as a recommendation
- Maximum current is determined by the maximum  $T_J$  and can be higher than 300 mA
- Contact supplier for different clamping voltage/ current arrangements
- Minimum breakdown voltage can be customized for other applications. Contact supplier
- TOPSwitch is a registered trademark of Power Integrations, Inc.

## FEATURES

- Glass passivated chip junction
- Available in unidirectional polarity only
- 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
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



## 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-M3 - halogen-free, RoHS-compliant, and industrial grade

Base P/NHM3\_X - halogen-free, 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

M3 and HM3 suffix meet JESD 201 class 2 whisker test

**Polarity:** color band denotes cathode end

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

| PARAMETER  | SYMBOL         | SMAJ530     | SMAJ550 | UNIT               |
|--|----------------|-------------|---------|--------------------|
| Device marking code  |                | HD          | SB      |                    |
| Peak pulse power dissipation <sup>(1)(2)(4)</sup> (fig. 1) | $P_{PPM}$      | 300         |         | W                  |
| Power dissipation on infinite heatsink <sup>(3)</sup>      | $P_D$          | 2.5         |         | W                  |
| Operating junction and storage temperature range           | $T_J, T_{STG}$ | -55 to +150 |         | $^{\circ}\text{C}$ |

**Notes**

- (1) Non-repetitive current pulse, per fig. 3 and derated above  $25\text{ }^{\circ}\text{C}$  per fig. 2  
 (2) Mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal  
 (3) Lead temperature at  $T_L = 75\text{ }^{\circ}\text{C}$   
 (4) Peak pulse power waveform is 10/1000  $\mu\text{s}$

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

| DEVICE TYPE | BREAKDOWN VOLTAGE<br>$V_{BR}$ AT $I_T$<br>(V) | TEST CURRENT<br>$I_T$<br>( $\mu\text{A}$ ) | STAND-OFF VOLTAGE<br>$V_{WM}$<br>(V) |
|-------------|---|--|--------------------------------------|
|             | MIN.  |  |                                      |
| SMAJ530     | 530   | 100  | 477                                  |
| SMAJ550     | 550   | 100  | 495                                  |

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

| PARAMETER                          | TEST CONDITIONS                        | SYMBOL | SMAJ530 | SMAJ550 | UNIT                   |
|------------------------------------|--|--------|---------|---------|------------------------|
| Max. clamping voltage              | 400 mA, 10/1000 $\mu\text{s}$ waveform | $V_C$  | 760     |         | V                      |
| Maximum DC reverse leakage current | $V_{WM}$                               | $I_D$  | 1.0     |         | $\mu\text{A}$          |
| Typical temperature coefficient    | of $V_{BR}$                            |        | 650     |         | mV/ $^{\circ}\text{C}$ |
| Typical capacitance <sup>(1)</sup> | 0 V                                    | $C_J$  | 90      |         | pF                     |
|                                    | 200 V                                  |        | 7.5     |         |                        |

**Note**

- (1) Measured at 1 MHz

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

| PARAMETER  | SYMBOL          | SMAJ530 | SMAJ550 | UNIT                        |
|--|-----------------|---------|---------|-----------------------------|
| Typical thermal resistance, junction to lead                   | $R_{\theta JL}$ | 30      |         | $^{\circ}\text{C}/\text{W}$ |
| Typical thermal resistance, junction to ambient <sup>(1)</sup> | $R_{\theta JA}$ | 120     |         |                             |

**Note**

- (1) Mounted on minimum recommended pad layout

**ORDERING INFORMATION** (Example)

| PREFERRED P/N                 | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|-------------------------------|-----------------|------------------------|---------------|------------------------------------|
| SMAJ530-M3/61                 | 0.064           | 61                     | 1800          | 7" diameter plastic tape and reel  |
| SMAJ530-M3/5A                 | 0.064           | 5A                     | 7500          | 13" diameter plastic tape and reel |
| SMAJ530HM3_B/H <sup>(1)</sup> | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| SMAJ530HM3_B/I <sup>(1)</sup> | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

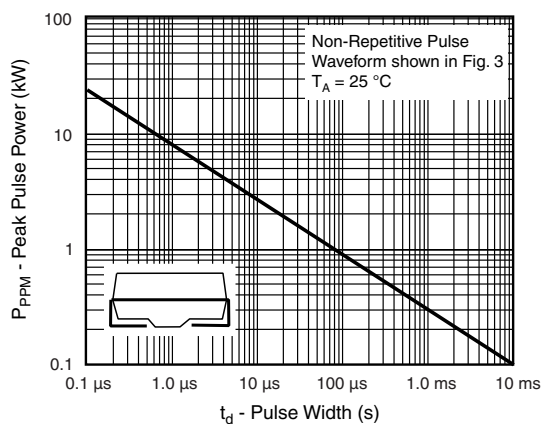
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Peak Pulse Power Rating Curve

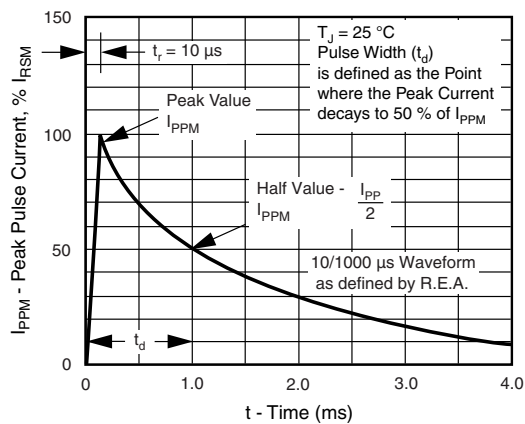


Fig. 3 - Pulse Waveform

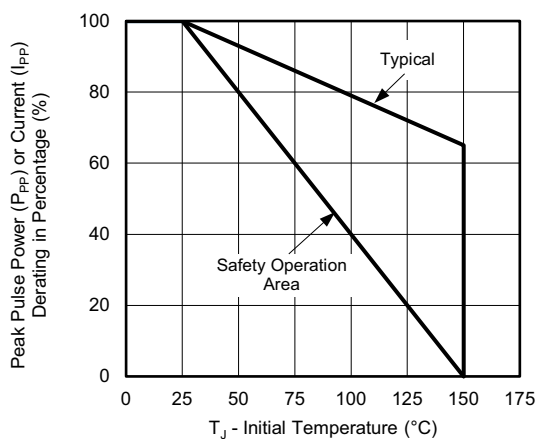
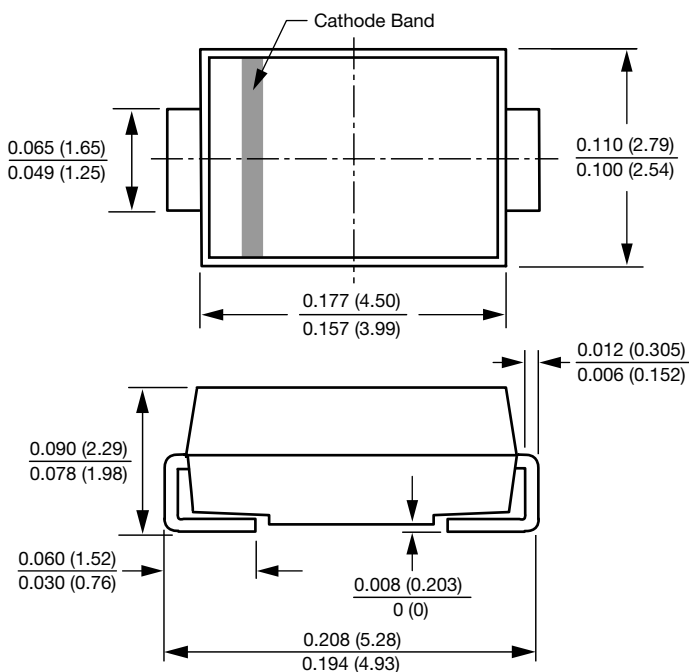


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

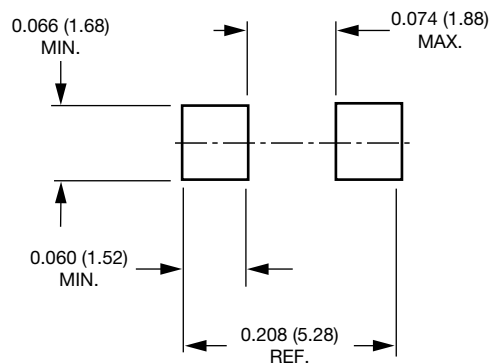


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMA (DO-214AC)



### Mounting Pad Layout





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