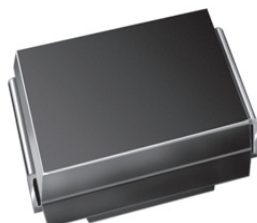


# Surface Mount TRANSZORB® Transient Voltage Suppressors



DO-214AA (SMBJ)

## FEATURES

- Uni-directional polarity only
- Peak pulse power: 600 W (10/1000  $\mu$ s)
- Excellent clamping capability
- Very fast response time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


RoHS  
COMPLIANT

## 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 specifically for protecting 3.3 V supplied sensitive equipment against transient overvoltages.

## MECHANICAL DATA

**Case:** DO-214AA (SMBJ)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant and commercial grade  
Base P/NHE3 - RoHS-compliant and AEC-Q101 qualified

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

E3 suffix meets JESD 201 class 2 whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

## PRIMARY CHARACTERISTICS

|                                  |                 |
|----------------------------------|-----------------|
| $V_{BR}$ (uni-directional)       | 4.1 V           |
| $V_{WM}$                         | 3.3 V           |
| $P_{PPM}$                        | 600 W           |
| $P_D$                            | 5 W             |
| $I_{FSM}$ (uni-directional only) | 60 A            |
| $T_J$ max.                       | 175 °C          |
| Polarity                         | Uni-directional |
| Package                          | DO-214AA (SMBJ) |

## MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

| PARAMETER                                                              | SYMBOL         | VALUE       | UNIT |
|------------------------------------------------------------------------|----------------|-------------|------|
| Peak pulse power dissipation <sup>(1)(2)</sup>                         | $P_{PPM}$      | 600         | W    |
| Peak pulse current with a 10/1000 $\mu$ s waveform (fig. 1)            | $I_{PP}$       | 50          | A    |
| Peak pulse current with a 8/20 $\mu$ s waveform (fig. 1)               | $I_{PPM}$      | 200         | A    |
| Peak forward surge current 8.3 ms single half sine-wave <sup>(2)</sup> | $I_{FSM}$      | 60          | A    |
| Power dissipation on infinite heatsink, $T_A = 75$ °C                  | $P_D$          | 5           | W    |
| Operating junction and storage temperature range                       | $T_J, T_{STG}$ | -65 to +175 | °C   |

### Notes

<sup>(1)</sup> Non-repetitive current pulse, per fig. 1

<sup>(2)</sup> Mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal

## ELECTRICAL CHARACTERISTICS ( $T_A = 25$ °C unless otherwise noted)

| DEVICE TYPE | DEVICE MARKING CODE | BREAKDOWN VOLTAGE<br>V <sub>BR</sub> AT I <sub>T</sub> |     | MAXIMUM REVERSE LEAKAGE CURRENT<br>I <sub>R</sub> AT V <sub>WM</sub> | STAND-OFF VOLTAGE<br>V <sub>WM</sub> | MAXIMUM CLAMPING VOLTAGE<br>V <sub>C</sub> AT I <sub>PP</sub><br>10/1000 μs |    | MAXIMUM CLAMPING VOLTAGE<br>V <sub>C</sub> AT I <sub>PPM</sub><br>8/20 μs |     | TYPICAL TEMPERATURE COEFFICIENT<br>OF V <sub>BR</sub> | TYPICAL JUNCTION CAPACITANCE<br>C <sub>J</sub> AT 0 V<br>1 MHz |
|-------------|---------------------|--------------------------------------------------------|-----|----------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------|----|---------------------------------------------------------------------------|-----|-------------------------------------------------------|----------------------------------------------------------------|
|             |                     | MIN.                                                   |     |                                                                      |                                      |                                                                             |    |                                                                           |     |                                                       |                                                                |
|             |                     | V                                                      | mA  |                                                                      |                                      | μA                                                                          | V  | V                                                                         | A   |                                                       |                                                                |
| SMBJ3V3     | KC                  | 4.1                                                    | 1.0 | 200                                                                  | 3.3                                  | 7.3                                                                         | 50 | 10.3                                                                      | 200 | -5.3                                                  | 5200                                                           |

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

| PARAMETER                                                      | SYMBOL          | VALUE | UNIT                        |
|----------------------------------------------------------------|-----------------|-------|-----------------------------|
| Typical thermal resistance, junction to lead <sup>(1)</sup>    | $R_{\theta JL}$ | 20    | $^{\circ}\text{C}/\text{W}$ |
| Typical thermal resistance, junction to ambient <sup>(2)</sup> | $R_{\theta JA}$ | 100   |                             |

**Notes**

- (1) Thermal resistance from junction to lead - mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal  
(2) Thermal resistance from junction to ambient - mounted on the recommended PCB pad layout

**ORDERING INFORMATION** (Example)

| PREFERRED P/N                | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|------------------------------|-----------------|------------------------|---------------|------------------------------------|
| SMBJ3V3-E3/52                | 0.096           | 52                     | 750           | 7" diameter plastic tape and reel  |
| SMBJ3V3-E3/5B                | 0.096           | 5B                     | 3200          | 13" diameter plastic tape and reel |
| SMBJ3V3HE3/52 <sup>(1)</sup> | 0.096           | 52                     | 750           | 7" diameter plastic tape and reel  |
| SMBJ3V3HE3/5B <sup>(1)</sup> | 0.096           | 5B                     | 3200          | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

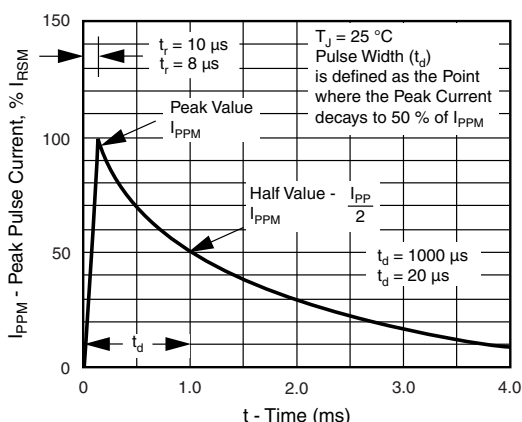
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Pulse Wave Form

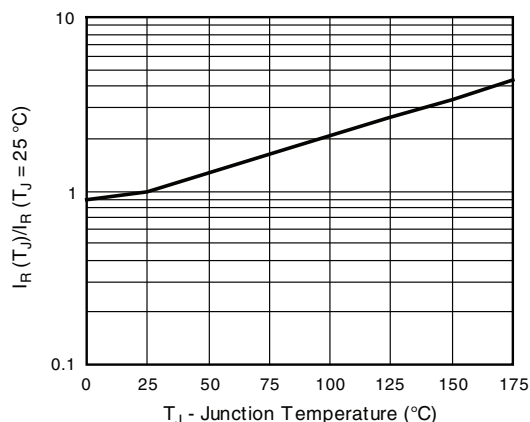


Fig. 3 - Relative Variation of Leakage Current vs. Junction Temperature

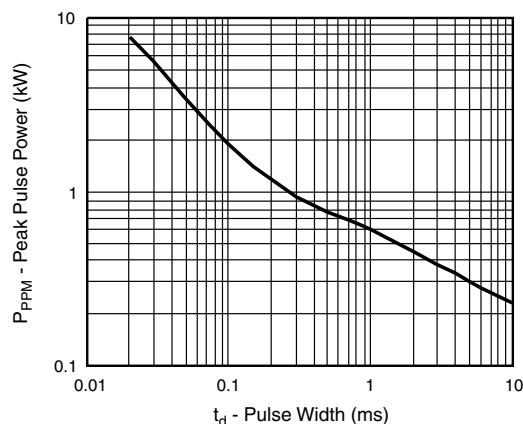
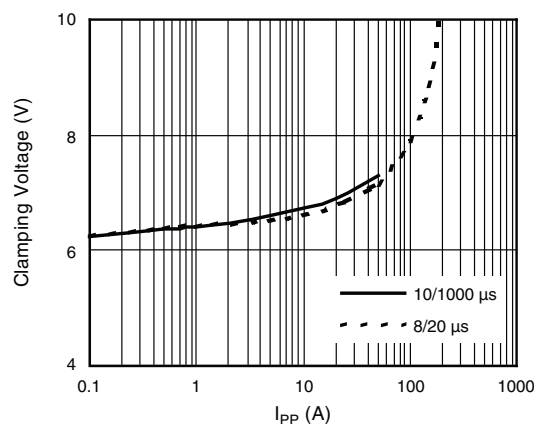


Fig. 2 - Peak Pulse Power Rating Curve


Fig. 4 - Clamping Voltage vs. Peak Pulse Current ( $T_J$  initial =  $25\text{ }^{\circ}\text{C}$ )

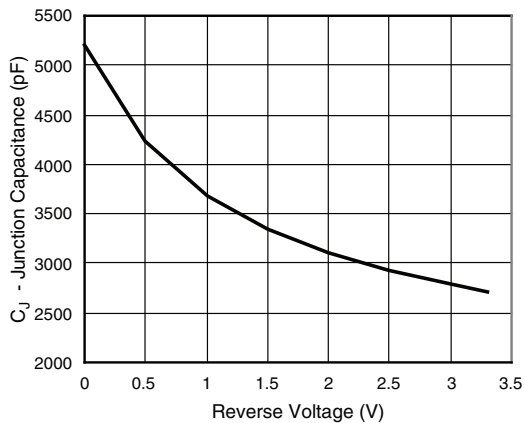


Fig. 5 - Typical Junction Capacitance

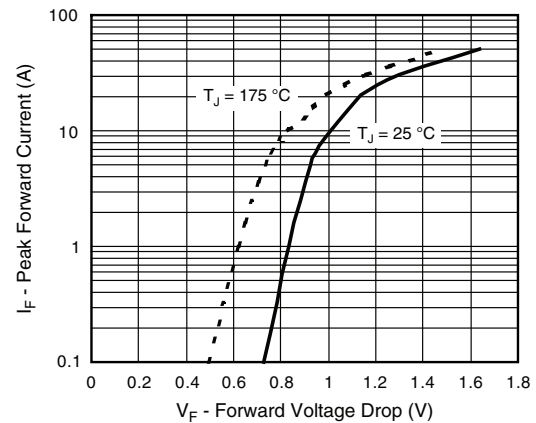


Fig. 7 - Typical Peak Forward Voltage Drop vs. Peak Forward Current

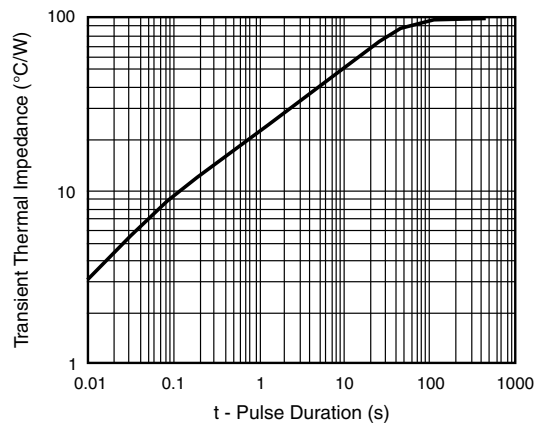
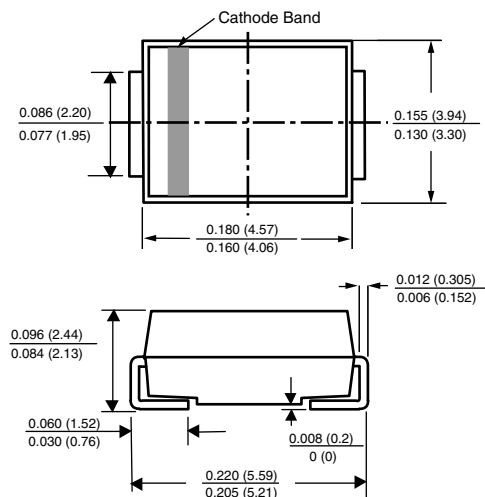


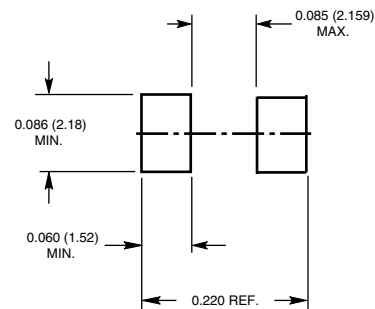
Fig. 6 - Typical Transient Thermal Impedance

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### DO-214AA (SMB-J-Bend)



#### Mounting Pad Layout





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