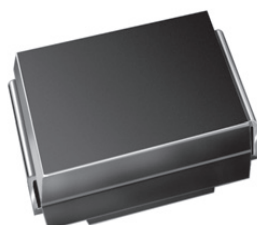


# Surface Mount TRANSZORB® Transient Voltage Suppressors



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

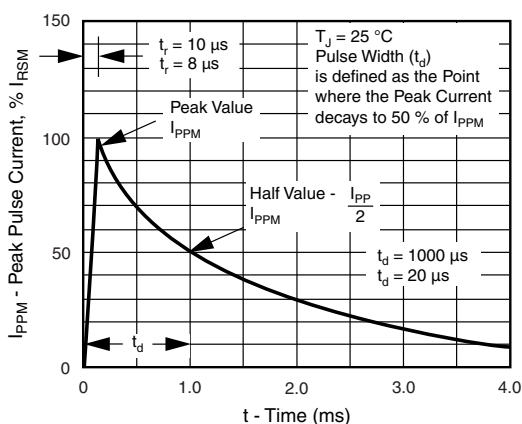
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Pulse Wave Form

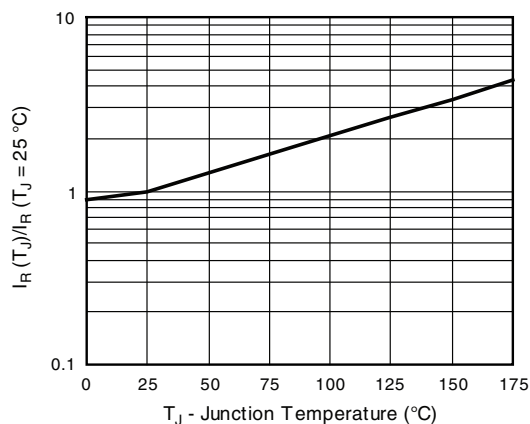


Fig. 3 - Relative Variation of Leakage Current vs. Junction Temperature

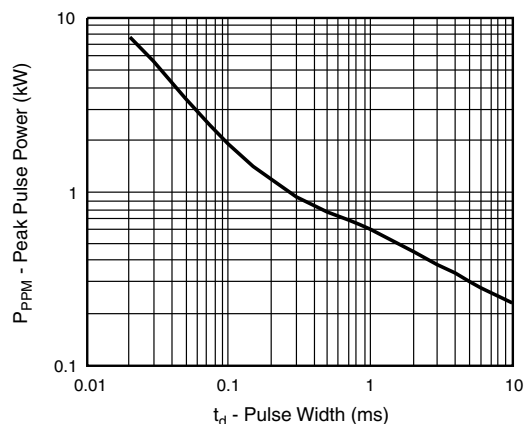
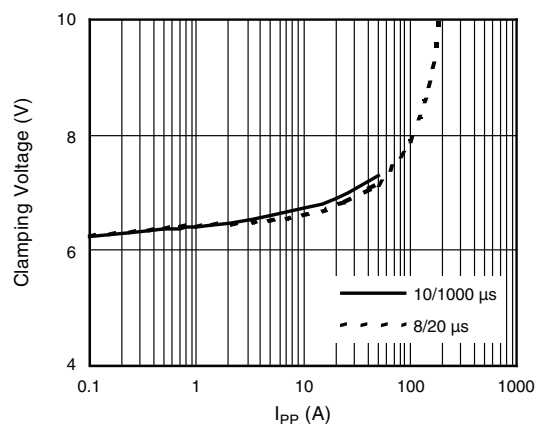


Fig. 2 - Peak Pulse Power Rating Curve

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

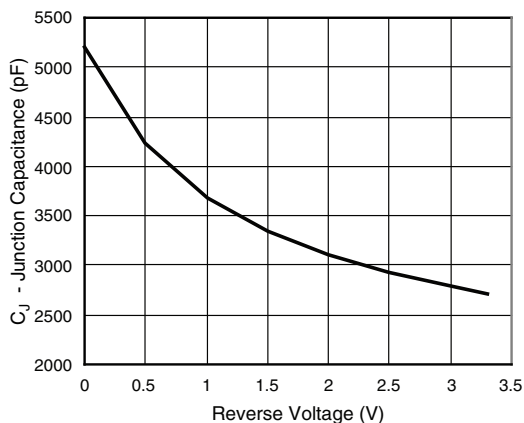


Fig. 5 - Typical Junction Capacitance

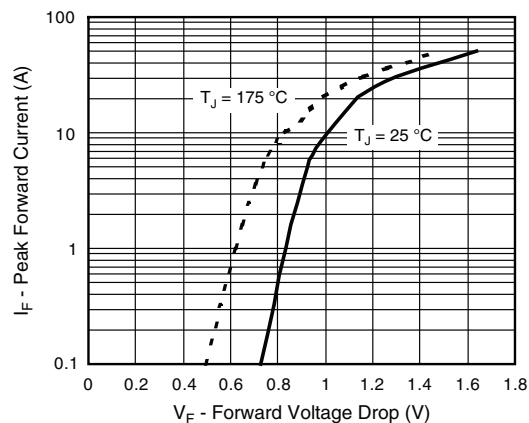


Fig. 7 - Typical Peak Forward Voltage Drop vs. Peak Forward Current

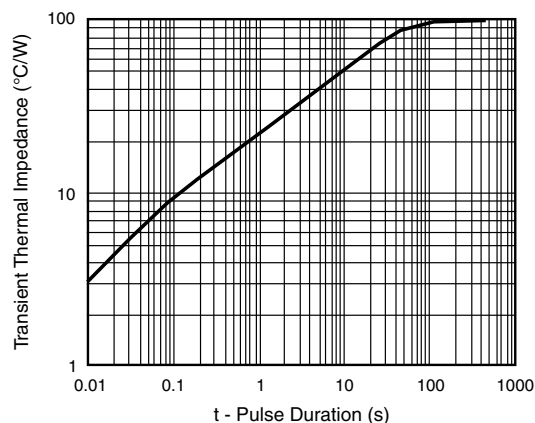
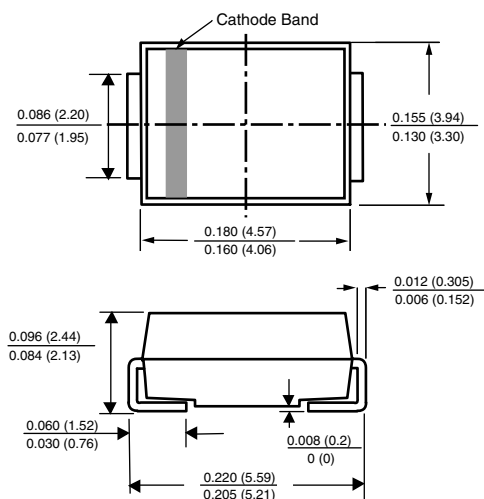


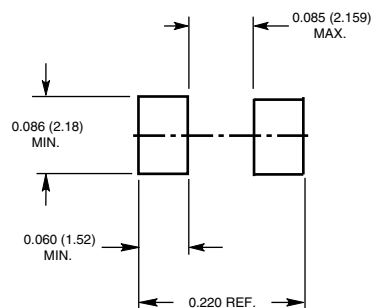
Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

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



### Mounting Pad Layout





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.