

Surface Mount TRANSZORB® Transient Voltage Suppressors



DO-214AA (SMBJ)

FEATURES

- Uni-directional polarity only
- Peak pulse power: 600 W (10/1000 μ s)
- Excellent clamping capability
- Very fast response time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC


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, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/automotive grade (AEC Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS

| | |
|------------|--------|
| V_{WM} | 3.3 V |
| P_{PPM} | 600 W |
| I_{FSM} | 60 A |
| T_J max. | 175 °C |

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

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

Notes:

(1) Non-repetitive current pulse, per Fig. 1

(2) Mounted on 0.2 x 0.2" (5.0 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 V_{BR} AT I_T | | MAXIMUM REVERSE LEAKAGE CURRENT I_R AT V_{WM} | | MAXIMUM CLAMPING VOLTAGE V_C AT I_{PP} 10/1000 μ s | | MAXIMUM CLAMPING VOLTAGE V_C AT I_{PPM} 8/20 μ s | | TYPICAL TEMP. COEFFICIENT OF V_{BR} | TYPICAL JUNCTION CAPACITANCE C_J AT 0 V 1 MHz |
|-------------|---------------------|-------------------------------------|------|---|------|--|------|--|------|---------------------------------------|---|
| | | MIN. | MAX. | MAX. | MAX. | MAX. | MAX. | MAX. | MAX. | | |
| | | V | mA | μ A | V | V | A | V | A | (10 ⁻⁴ /°C) | pF |
| 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 ⁽¹⁾ | $R_{\theta JL}$ | 20 | $^{\circ}\text{C/W}$ |
| Typical thermal resistance, junction to ambient ⁽²⁾ | $R_{\theta JA}$ | 100 | |

Notes:

(1) Thermal resistance from junction to lead - mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal

(2) Thermal resistance from junction to ambient - mounted on the recommended P.C.B. 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 ⁽¹⁾ | 0.096 | 52 | 750 | 7" diameter plastic tape and reel |
| SMBJ3V3HE3/5B ⁽¹⁾ | 0.096 | 5B | 3200 | 13" diameter plastic tape and reel |

Note:

(1) Automotive grade AEC Q101 qualified

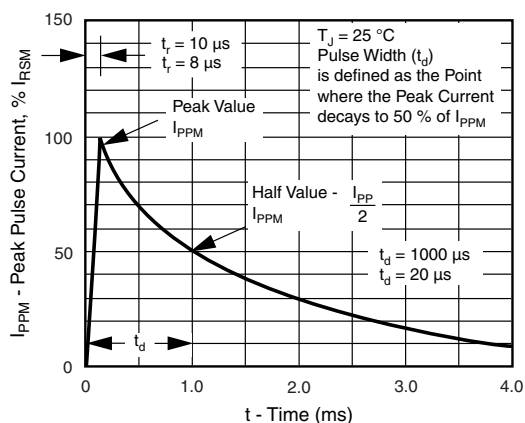
RATINGS AND CHARACTERISTICS CURVES($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Figure 1. Pulse Waveform

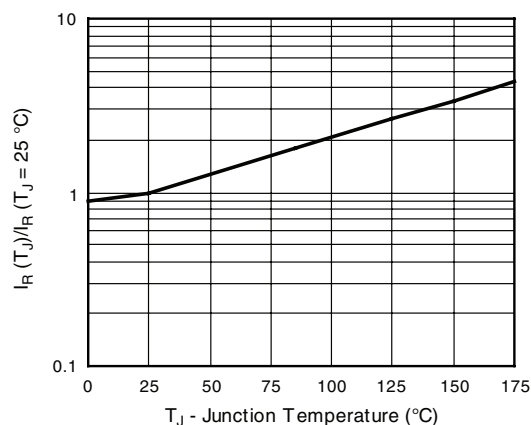


Figure 3. Relative Variation of Leakage Current vs. Junction Temperature

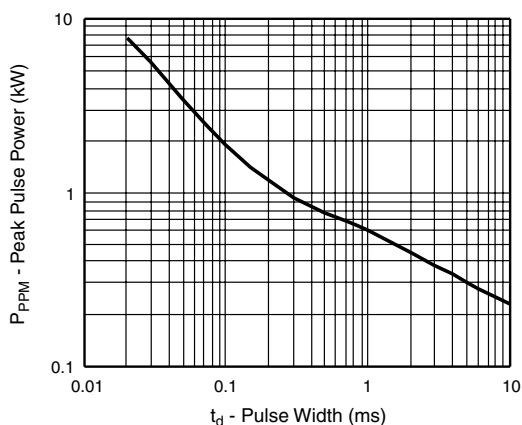
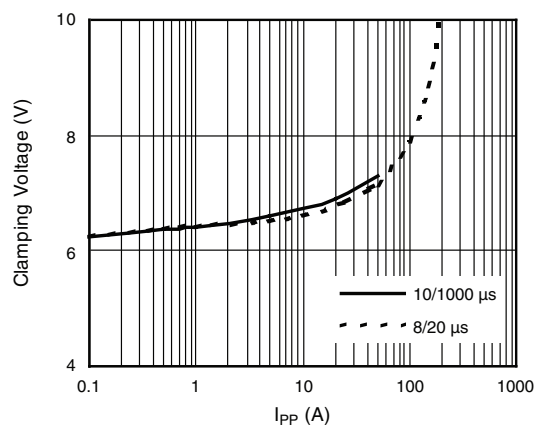


Figure 2. Peak Pulse Power Rating Curve

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

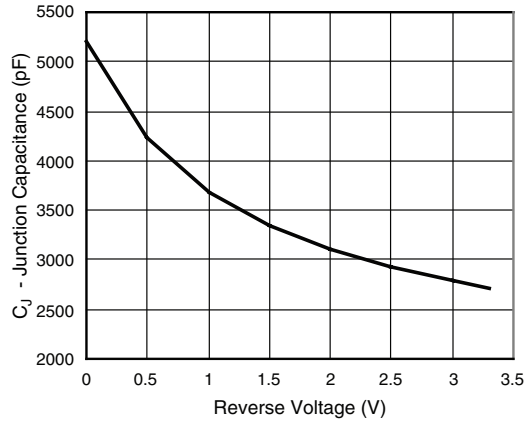


Figure 5. Typical Junction Capacitance

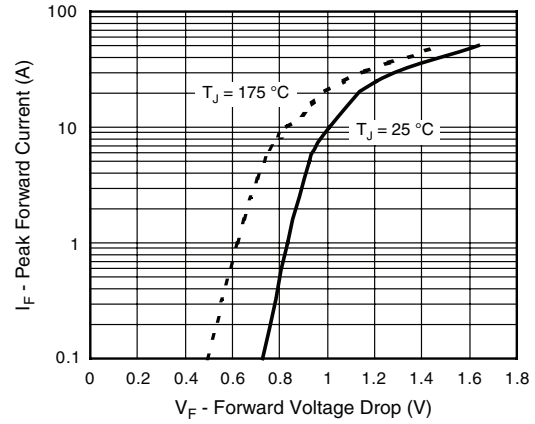


Figure 7. Typical Peak Forward Voltage Drop vs. Peak Forward Current

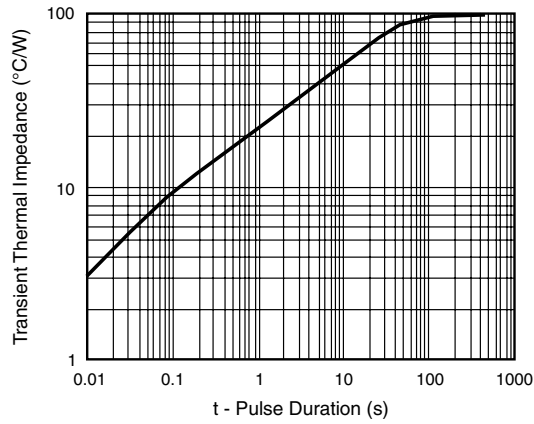
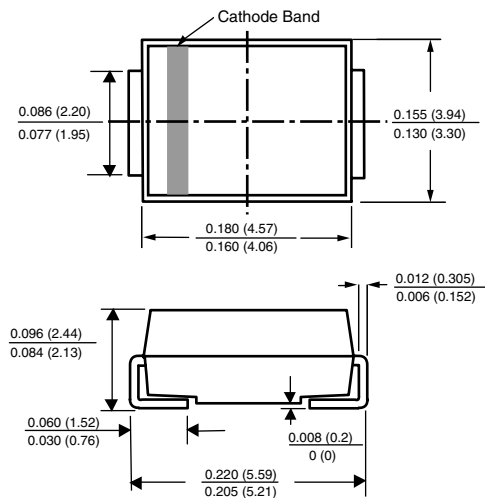


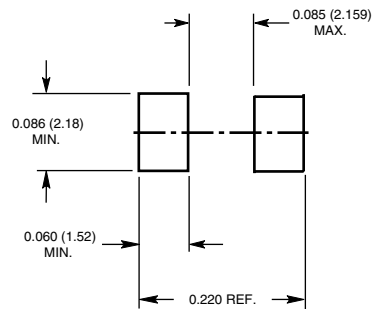
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB-J-Bend)



Mounting Pad Layout





Disclaimer

All product specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.