



**THE DATASHEET OF
SMBJ3V3-E3/52**



Surface-Mount TRANSZORB[®] Transient Voltage Suppressors


SMB (DO-214AA)

Cathode Anode

LINKS TO ADDITIONAL RESOURCES


| PRIMARY CHARACTERISTICS | |
|---------------------------------|----------------|
| V_{BR} (unidirectional) | 4.1 V |
| V_{WM} | 3.3 V |
| P_{PPM} | 600 W |
| P_D | 5 W |
| I_{FSM} (unidirectional only) | 60 A |
| T_J max. | 175 °C |
| Polarity | Unidirectional |
| Package | SMB (DO-214AA) |

FEATURES

- Unidirectional 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
- AEC-Q101 qualified available
- Automotive ordering code: base P/NHE3 or base P/NHM3
- Material categorization: for definitions of compliance please see 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 specifically for protecting 3.3 V supplied sensitive equipment against transient overvoltages.

MECHANICAL DATA
Case: SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified

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

E3, M3, HE3, and HM3 suffix meets JESD 201 class 2

whisker test

Polarity: color band denotes cathode end

| 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 μ s waveform (fig. 1) | I_{PPM} | 200 | A |
| Peak forward surge current 8.3 ms single half sine-wave ⁽²⁾ | 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
⁽¹⁾ Non-repetitive current pulse, per fig. 1

⁽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 | | MAXIMUM REVERSE LEAKAGE CURRENT I_R AT V_{WM} | STAND-OFF VOLTAGE V_{WM} | MAXIMUM CLAMPING VOLTAGE V_C AT I_{PP} 10/1000 μs | | MAXIMUM CLAMPING VOLTAGE V_C AT I_{PPM} 8/20 μs | | TYPICAL TEMPERATURE COEFFICIENT OF V_{BR} | TYPICAL JUNCTION CAPACITANCE C_J AT 0 V 1 MHz |
| | | MIN. | | | | V | A | V | A | | |
| | | V | mA | | | | | | | | |
| SMBJ3V3 | KC | 4.1 | 1.0 | 200 | 3.3 | 7.3 | 50 | 10.3 | 200 | $10^{-4}/^\circ\text{C}$ | 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 | $^\circ\text{C}/\text{W}$ |
| 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 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 | 0.106 | 52 | 750 | 7" diameter plastic tape and reel |
| SMBJ3V3-M3/52 | | | | |
| SMBJ3V3-E3/5B | 0.106 | 5B | 3200 | 13" diameter plastic tape and reel |
| SMBJ3V3-M3/5B | | | | |
| SMBJ3V3HE3_B/H ⁽¹⁾ | 0.106 | H | 750 | 7" diameter plastic tape and reel |
| SMBJ3V3HM3_B/H ⁽¹⁾ | | | | |
| SMBJ3V3HE3_B/I ⁽¹⁾ | 0.106 | I | 3200 | 13" diameter plastic tape and reel |
| SMBJ3V3HM3_B/I ⁽¹⁾ | | | | |

Note

- (1) AEC-Q101 qualified

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

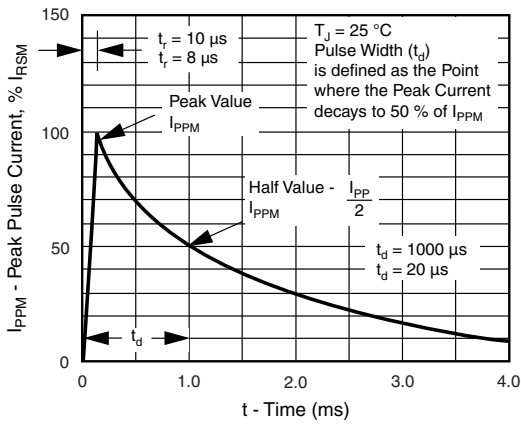


Fig. 1 - Pulse Wave Form

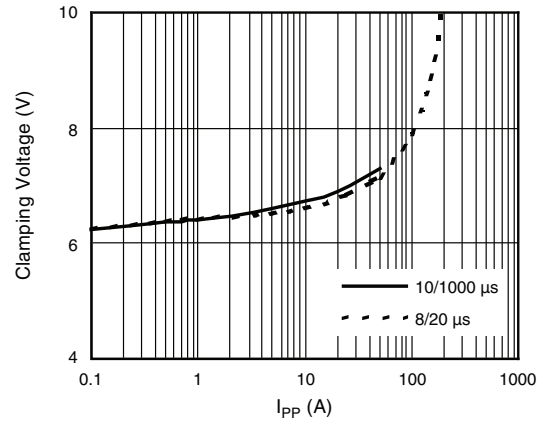


Fig. 4 - Clamping Voltage vs. Peak Pulse Current (T_J initial = $25\text{ }^\circ\text{C}$)

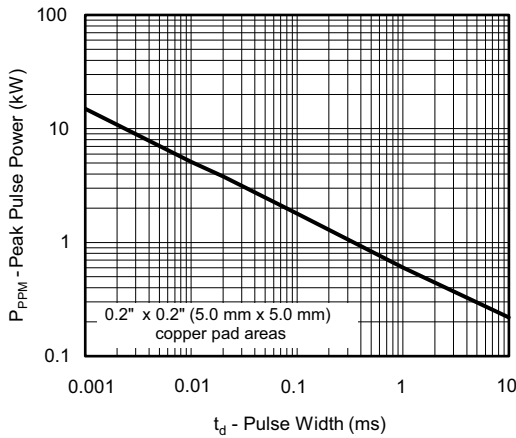


Fig. 2 - Peak Pulse Power Rating Curve

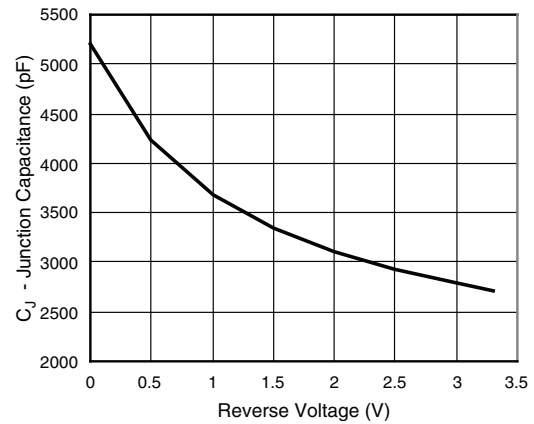


Fig. 5 - Typical Junction Capacitance

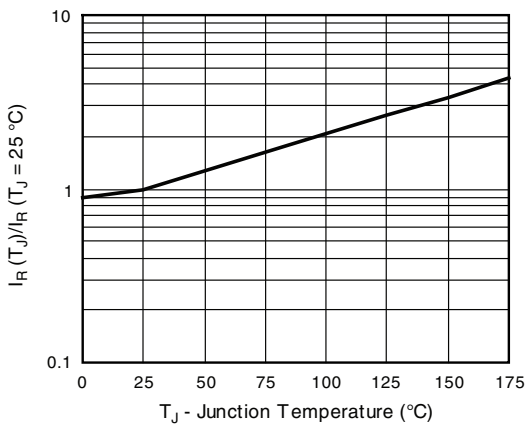


Fig. 3 - Relative Variation of Leakage Current vs. Junction Temperature

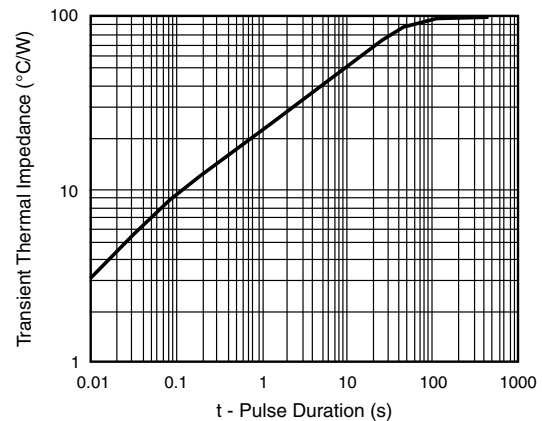


Fig. 6 - Typical Transient Thermal Impedance

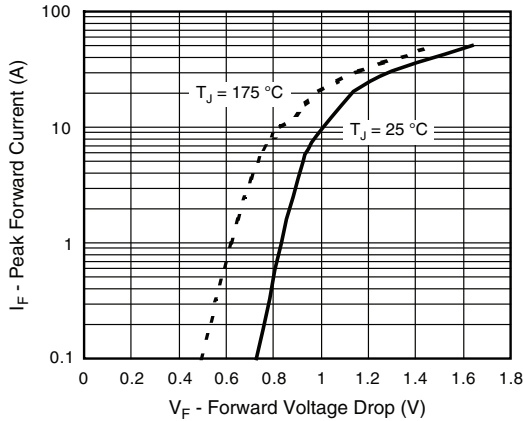
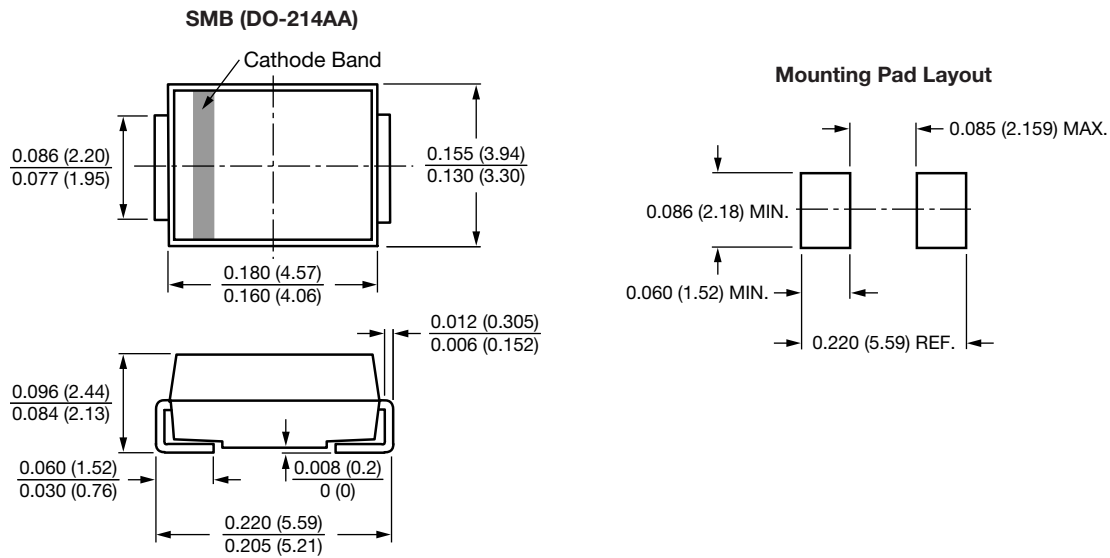


Fig. 7 - Typical Peak Forward Voltage Drop vs. Peak Forward Current

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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