# Surface Mount TRANSZORB® Transient Voltage Suppressors

**DO-214AA (SMB)**

| PRIMARY CHARACTERISTICS | |
|---|---|
| $V_{BR}$ | 6.8 V to 220 V |
| $P_{PPM}$ | 600 W |
| $P_D$ | 5.0 W |
| $I_{FSM}$ (uni-directional only) | 100 A |
| $T_J$ max. | 150 °C |

## DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional devices use CA suffix (e.g. SM6T12CA).

Electrical characteristics apply in both directions.

## FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- 600 W peak pulse power capability with a 10/1000 µs waveform
- Available in uni-directional and bi-directional
- Excellent clamping capability
- Low inductance
- Meets MSL level 1, per J-STD-020C, LF max peak of 260 °C
- Solder dip 260 °C, 40 seconds
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

## 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:** DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D

E3 suffix for commercial grade, HE3 suffix for high reliability grade (AEC Q101 qualified)

**Polarity:** For uni-directional types the band denotes cathode end, no marking on bi-directional types

| MAXIMUM RATINGS ($T_A$ = 25 °C unless otherwise noted) | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **VALUE** | **UNIT** |
| Peak pulse power dissipation on 10/1000 µs waveform (1)(2) (Fig. 1) | $P_{PPM}$ | 600 | W |
| Peak power pulse current with a 10/1000 µs waveform (1) (Fig. 3) | $I_{PPM}$ | See next table | A |
| Power dissipation on infinite heatsink $T_A$ = 50 °C | $P_D$ | 5.0 | W |
| Peak forward surge current 10 ms single half sine-wave uni-directional only (2) | $I_{FSM}$ | 100 | A |
| Operating junction and storage temperature range | $T_J$, $T_{STG}$ | - 65 to +150 | °C |

**Notes:**

(1) Non-repetitive current pulse, per Fig. 3 and derated above $T_A$ = 25 °C per Fig. 2

(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)

| TYPE (1) | DEVICE MARKING CODE | | BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ (2) (V) | | TEST CURRENT (mA) | STAND-OFF VOLTAGE $V_{RM}$ (V) | LEAKAGE CURRENT (3) $I_{RM}$ AT $V_{RM}$ (µA) | CLAMPING VOLTAGE $V_C$ AT $I_{PP}$ 10/1000 µs | | CLAMPING VOLTAGE $V_C$ AT $I_{PP}$ 8/20 µs | | $\alpha_T$ Max $0^{-4}$/°C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNI | BI | MIN | MAX | | | | (V) | (A) | (V) | (A) | |
| SM6T6V8A | KE7 | KE7 | 6.45 | 7.14 | 10 | 5.80 | 1000 | 10.5 | 57.0 | 13.4 | 298 | 5.7 |
| SM6T7V5A | KK7 | AK7 | 7.13 | 7.88 | 10 | 6.40 | 500 | 11.3 | 53.0 | 14.5 | 276 | 6.1 |
| SM6T10A | KT7 | AT7 | 9.50 | 10.5 | 1.0 | 8.55 | 10.0 | 14.5 | 41.0 | 18.6 | 215 | 7.3 |
| SM6T12A | KX7 | AX7 | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 16.7 | 36.0 | 21.7 | 184 | 7.8 |
| SM6T15A | LG7 | LG7 | 14.3 | 15.8 | 1.0 | 12.8 | 1.0 | 21.2 | 28.0 | 27.2 | 147 | 8.4 |
| SM6T18A | LM7 | BM7 | 17.1 | 18.9 | 1.0 | 15.3 | 1.0 | 25.2 | 24.0 | 32.5 | 123 | 8.8 |
| SM6T22A | LT7 | BT7 | 20.9 | 23.1 | 1.0 | 18.8 | 1.0 | 30.6 | 20.0 | 39.3 | 102 | 9.2 |
| SM6T24A | LV7 | LV7 | 22.8 | 25.2 | 1.0 | 20.5 | 1.0 | 33.2 | 18.0 | 42.8 | 93 | 9.4 |
| SM6T27A | LX7 | BX7 | 25.7 | 28.4 | 1.0 | 23.1 | 1.0 | 37.5 | 16.0 | 48.3 | 83 | 9.6 |
| SM6T30A | ME7 | CE7 | 28.5 | 31.5 | 1.0 | 25.6 | 1.0 | 41.5 | 14.5 | 53.5 | 75 | 9.7 |
| SM6T33A | MG7 | MG7 | 31.4 | 34.7 | 1.0 | 28.2 | 1.0 | 45.7 | 13.1 | 59.0 | 68 | 9.8 |
| SM6T36A | MK7 | CK7 | 34.2 | 37.8 | 1.0 | 30.8 | 1.0 | 49.9 | 12.0 | 64.3 | 62 | 9.9 |
| SM6T39A | MM7 | CM7 | 37.1 | 41.0 | 1.0 | 33.3 | 1.0 | 53.9 | 11.1 | 69.7 | 57 | 10.0 |
| SM6T68A | NG7 | NG7 | 64.6 | 71.4 | 1.0 | 58.1 | 1.0 | 92.0 | 6.50 | 121 | 33 | 10.4 |
| SM6T100A | NV7 | NV7 | 95.0 | 105 | 1.0 | 85.5 | 1.0 | 137 | 4.40 | 178 | 22.5 | 10.6 |
| SM6T150A | PK7 | PK7 | 143 | 158 | 1.0 | 128 | 1.0 | 207 | 2.90 | 265 | 15 | 10.8 |
| SM6T200A | PR7 | PR7 | 190 | 210 | 1.0 | 171 | 1.0 | 274 | 2.20 | 353 | 11.3 | 10.8 |
| SM6T220A | PR8 | PR8 | 209 | 231 | 1.0 | 188 | 1.0 | 328 | 2.00 | 388 | 10.3 | 10.8 |

**Notes:**

(1) For bi-directional devices add suffix “CA”

(2) $V_{BR}$ measured after $I_T$ applied for 300 µs square wave pulse

(3) For bipolar devices with $V_R$ = 10 V or under, the $I_T$ limit is doubled

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

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Thermal resistance, junction to ambient air (1) | $R_{\theta JA}$ | 100 | °C/W |
| Thermal resistance, junction to leads | $R_{\theta JL}$ | 20 | °C/W |

**Note:**

(1) Mounted on minimum recommended pad layout

## ORDERING INFORMATION (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|---|---|---|---|---|
| SM6T10A-E3/52 | 0.096 | 52 | 750 | 7" diameter plastic tape and reel |
| SM6T10A-E3/5B | 0.096 | 5B | 3200 | 13" diameter plastic tape and reel |
| SM6T10AHE3/52 (1) | 0.096 | 52 | 750 | 7" diameter plastic tape and reel |
| SM6T10AHE3/5B (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 °C unless otherwise noted)

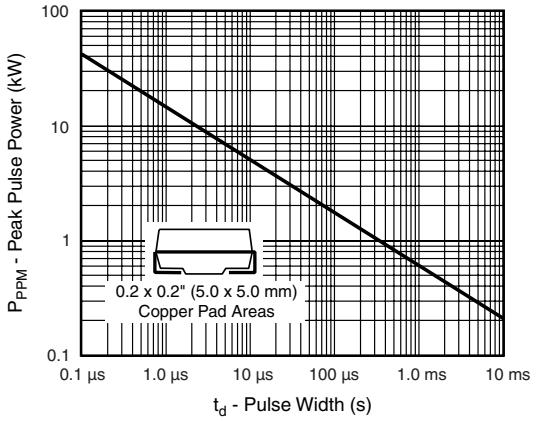



Figure 1. Peak Pulse Power Rating Curve

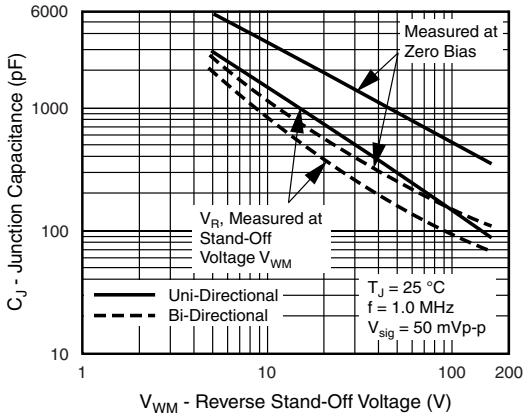



Figure 4. Typical Junction Capacitance

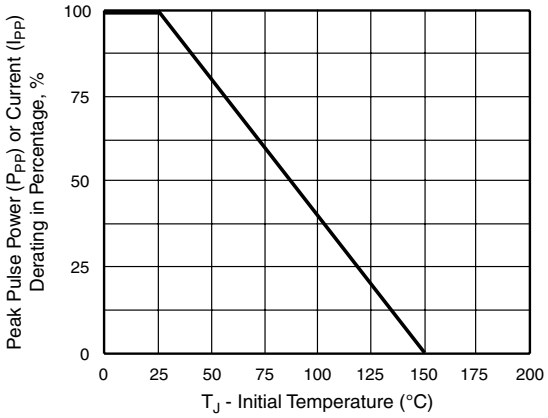



Figure 2. Pulse Power or Current vs. Initial Junction Temperature

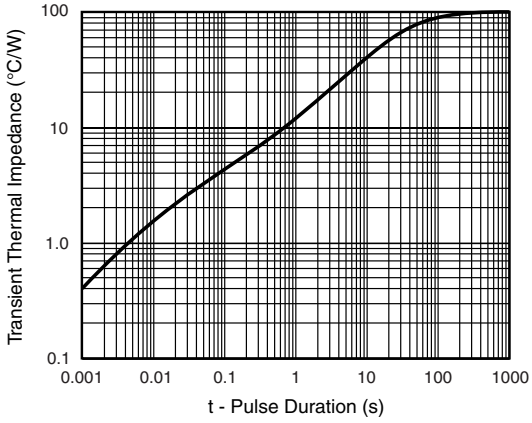



Figure 5. Typical Transient Thermal Impedance

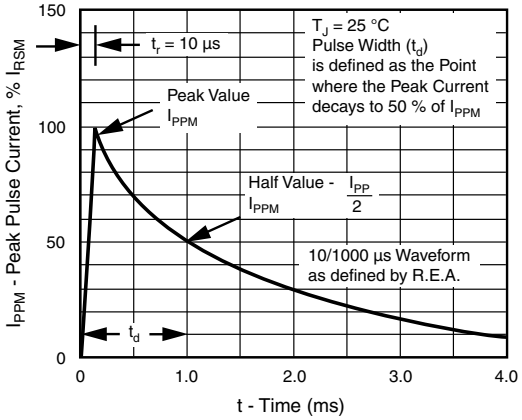



Figure 3. Pulse Waveform

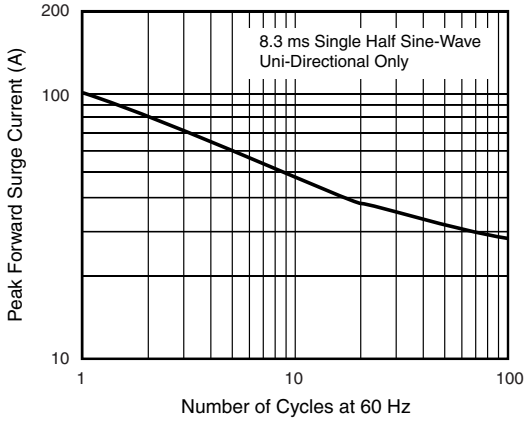
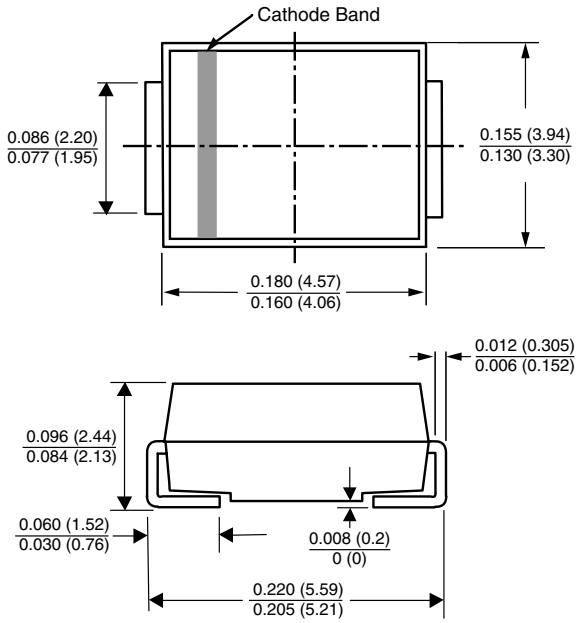


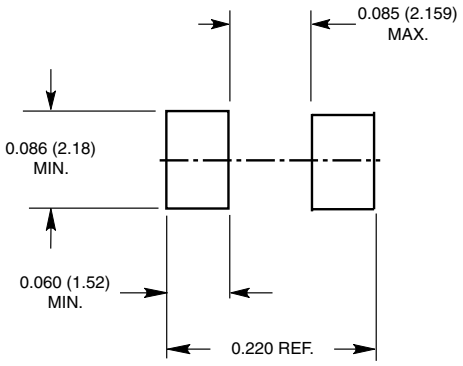

Figure 6. Maximum Non-Repetitive Peak Forward Surge Current

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-214AA (SMB)




### Mounting Pad Layout



# Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.