

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 μ s 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 μ s waveform ⁽¹⁾⁽²⁾ (Fig. 1) | P_{PPM} | 600 | W |
| Peak power pulse current with a 10/1000 μ s 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 ($T_A = 25\text{ }^{\circ}\text{C}$ 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 | | α_T Max 0-4/ $^{\circ}\text{C}$ |
| | 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 $V_R = 10\text{ V}$ or under, the I_T limit is doubled

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) | | | |
|---|-----------------|-------|----------------------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Thermal resistance, junction to ambient air ⁽¹⁾ | $R_{\theta JA}$ | 100 | $^{\circ}\text{C/W}$ |
| Thermal resistance, junction to leads | $R_{\theta JL}$ | 20 | $^{\circ}\text{C/W}$ |

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

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

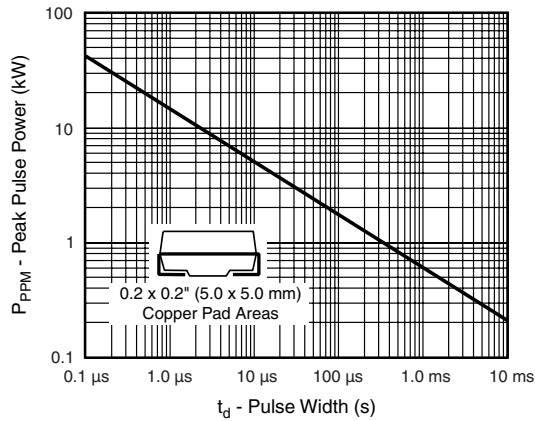


Figure 1. Peak Pulse Power Rating Curve

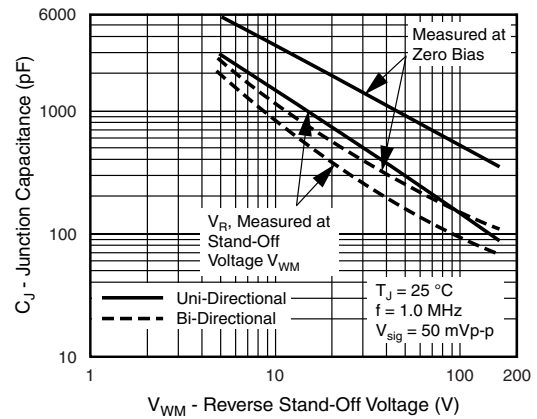


Figure 4. Typical Junction Capacitance

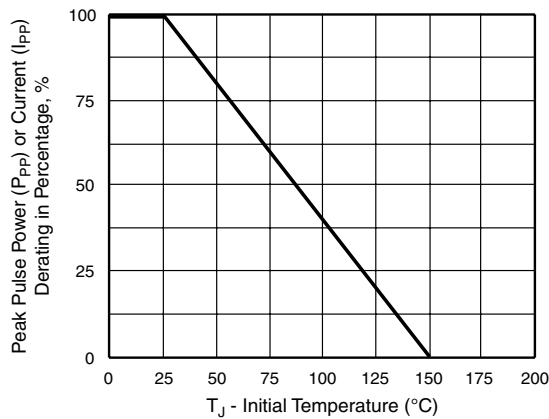


Figure 2. Pulse Power or Current vs. Initial Junction Temperature

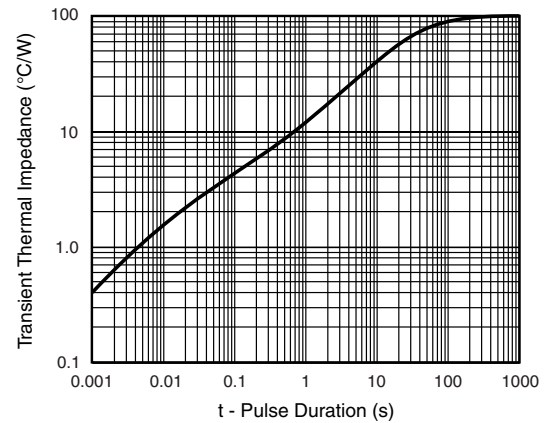


Figure 5. Typical Transient Thermal Impedance

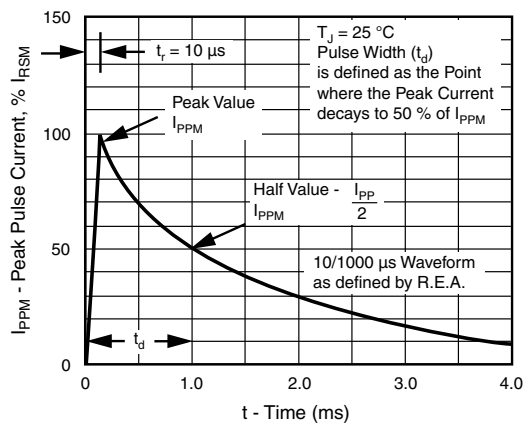


Figure 3. Pulse Waveform

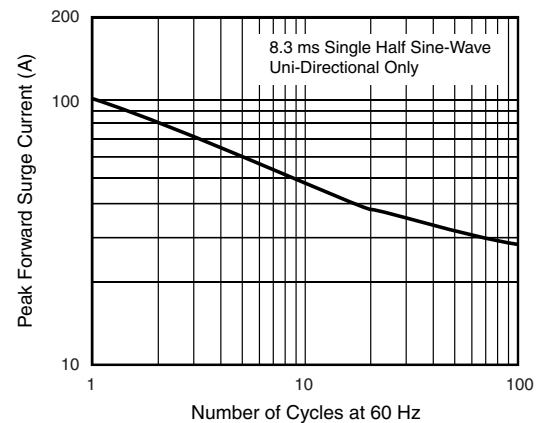
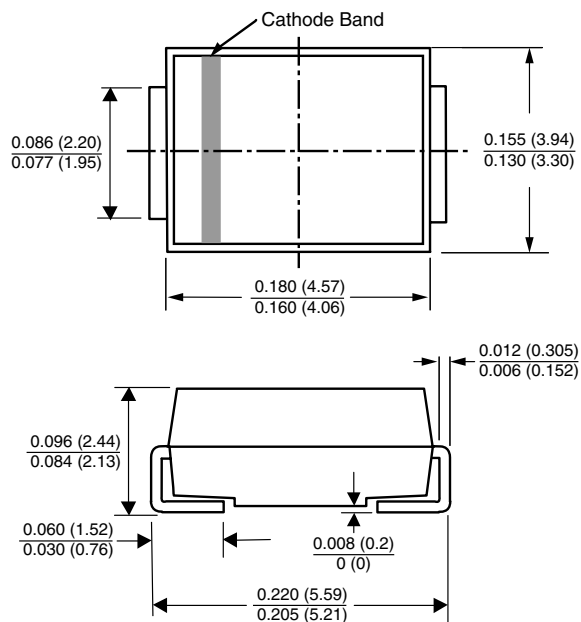


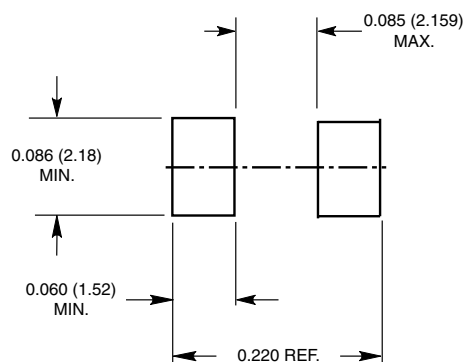
Figure 6. Maximum Non-Repetitive Peak Forward Surge Current

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB)



Mounting Pad Layout





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.