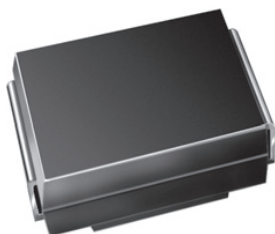




## High Power Density Surface Mount TRANSZORB® Transient Voltage Suppressors



DO-214AA (SMB J-Bend)

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Available in uni-directional and bi-directional
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- 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 for consumer, computer, industrial, automotive, and telecommunication.

### MECHANICAL DATA

**Case:** DO-214AA (SMB J-Bend)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant, industrial grade  
Base P/NHE3 - RoHS-compliant, 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:** For uni-directional types the color band denotes cathode end, no marking on bi-directional types

| PRIMARY CHARACTERISTICS          |                                 |
|----------------------------------|---------------------------------|
| $V_{BR}$ (uni-directional)       | 6.4 V to 49.1 V                 |
| $V_{BR}$ (bi-directional)        | 6.4 V to 49.1 V                 |
| $V_{WM}$                         | 5.0 V to 40 V                   |
| $P_{PPM}$ (uni-directional)      | 1000 W                          |
| $P_{PPM}$ (bi-directional)       | 800 W                           |
| $I_{FSM}$ (uni-directional only) | 100 A                           |
| $T_J$ max.                       | 150 °C                          |
| Polarity                         | Uni-directional, bi-directional |
| Package                          | DO-214AA (SMB J-Bend)           |

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)               |                             |                |      |
|------------------------------------------------------------------------------|-----------------------------|----------------|------|
| PARAMETER                                                                    | SYMBOL                      | VALUE          | UNIT |
| Peak pulse power dissipation with a 10/1000 $\mu$ s waveform (fig. 1)        | $P_{PPM}$ <sup>(1)(2)</sup> | 1000           | W    |
|                                                                              |                             | 800            |      |
| Peak pulse current with a 10/1000 $\mu$ s waveform                           | $I_{PPM}$ <sup>(1)</sup>    | See next table | A    |
| Peak forward surge current 8.3 ms single half sine-wave uni-directional only | $I_{FSM}$ <sup>(2)</sup>    | 100            | A    |
| Operating junction and storage temperature range                             | $T_J, T_{STG}$              | -55 to +150    | °C   |

#### Notes

<sup>(1)</sup> Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25\text{ °C}$  per fig. 2

<sup>(2)</sup> Mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal



## UNI-DIRECTIONAL

| ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                     |                                                        |      |                         |                                |                                                             |                                                               |                                                 |
|-----------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------|------|-------------------------|--------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------|
| DEVICE TYPE                                                                             | DEVICE MARKING CODE | BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ <sup>(1)</sup> (V) |      | TEST CURRENT $I_T$ (mA) | STAND-OFF VOLTAGE $V_{WM}$ (V) | MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu\text{A}$ ) | MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}$ <sup>(2)</sup> (A) | MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V) |
|                                                                                         |                     | MIN.                                                   | MAX. |                         |                                |                                                             |                                                               |                                                 |
| SMB10J5.0A                                                                              | 1AE                 | 6.40                                                   | 7.07 | 10                      | 5.0                            | 1000                                                        | 108.7                                                         | 9.2                                             |
| SMB10J6.0A                                                                              | 1AG                 | 6.67                                                   | 7.37 | 10                      | 6.0                            | 1000                                                        | 97.1                                                          | 10.3                                            |
| SMB10J6.5A                                                                              | 1AK                 | 7.22                                                   | 7.98 | 10                      | 6.5                            | 500                                                         | 89.3                                                          | 11.2                                            |
| SMB10J7.0A                                                                              | 1AM                 | 7.78                                                   | 8.60 | 10                      | 7.0                            | 200                                                         | 83.3                                                          | 12.0                                            |
| SMB10J7.5A                                                                              | 1AP                 | 8.33                                                   | 9.21 | 1.0                     | 7.5                            | 100                                                         | 77.5                                                          | 12.9                                            |
| SMB10J8.0A                                                                              | 1AR                 | 8.89                                                   | 9.83 | 1.0                     | 8.0                            | 50                                                          | 73.5                                                          | 13.6                                            |
| SMB10J8.5A                                                                              | 1AT                 | 9.44                                                   | 10.4 | 1.0                     | 8.5                            | 20                                                          | 69.4                                                          | 14.4                                            |
| SMB10J9.0A                                                                              | 1AV                 | 10.0                                                   | 11.1 | 1.0                     | 9.0                            | 10                                                          | 64.9                                                          | 15.4                                            |
| SMB10J10A                                                                               | 1AX                 | 11.1                                                   | 12.3 | 1.0                     | 10                             | 5.0                                                         | 58.8                                                          | 17.0                                            |
| SMB10J11A                                                                               | 1AZ                 | 12.2                                                   | 13.5 | 1.0                     | 11                             | 5.0                                                         | 54.9                                                          | 18.2                                            |
| SMB10J12A                                                                               | 1BE                 | 13.3                                                   | 14.7 | 1.0                     | 12                             | 5.0                                                         | 50.3                                                          | 19.9                                            |
| SMB10J13A                                                                               | 1BG                 | 14.4                                                   | 15.9 | 1.0                     | 13                             | 1.0                                                         | 46.5                                                          | 21.5                                            |
| SMB10J14A                                                                               | 1BK                 | 15.6                                                   | 17.2 | 1.0                     | 14                             | 1.0                                                         | 43.1                                                          | 23.2                                            |
| SMB10J15A                                                                               | 1BM                 | 16.7                                                   | 18.5 | 1.0                     | 15                             | 1.0                                                         | 41.0                                                          | 24.4                                            |
| SMB10J16A                                                                               | 1BP                 | 17.8                                                   | 19.7 | 1.0                     | 16                             | 1.0                                                         | 38.5                                                          | 26.0                                            |
| SMB10J17A                                                                               | 1BR                 | 18.9                                                   | 20.9 | 1.0                     | 17                             | 1.0                                                         | 36.2                                                          | 27.6                                            |
| SMB10J18A                                                                               | 1BT                 | 20.0                                                   | 22.1 | 1.0                     | 18                             | 1.0                                                         | 34.2                                                          | 29.2                                            |
| SMB10J20A                                                                               | 1BV                 | 22.2                                                   | 24.5 | 1.0                     | 20                             | 1.0                                                         | 30.9                                                          | 32.4                                            |
| SMB10J22A                                                                               | 1BX                 | 24.4                                                   | 26.9 | 1.0                     | 22                             | 1.0                                                         | 28.2                                                          | 35.5                                            |
| SMB10J24A                                                                               | 1BZ                 | 26.7                                                   | 29.5 | 1.0                     | 24                             | 1.0                                                         | 25.7                                                          | 38.9                                            |
| SMB10J26A                                                                               | 1CE                 | 28.9                                                   | 31.9 | 1.0                     | 26                             | 1.0                                                         | 23.8                                                          | 42.1                                            |
| SMB10J28A                                                                               | 1CG                 | 31.1                                                   | 34.4 | 1.0                     | 28                             | 1.0                                                         | 22.0                                                          | 45.4                                            |
| SMB10J30A                                                                               | 1CK                 | 33.3                                                   | 36.8 | 1.0                     | 30                             | 1.0                                                         | 20.7                                                          | 48.4                                            |
| SMB10J33A                                                                               | 1CM                 | 36.7                                                   | 40.6 | 1.0                     | 33                             | 1.0                                                         | 18.8                                                          | 53.3                                            |
| SMB10J36A                                                                               | 1CP                 | 40.0                                                   | 44.2 | 1.0                     | 36                             | 1.0                                                         | 17.2                                                          | 58.1                                            |
| SMB10J40A                                                                               | 1CR                 | 44.4                                                   | 49.1 | 1.0                     | 40                             | 1.0                                                         | 15.5                                                          | 64.5                                            |

## Notes

- (1) Pulse test:  $t_p \leq 50\text{ ms}$   
 (2) Surge current waveform per fig. 3 and derate per fig. 2  
 (3) All terms and symbols are consistent with ANSI/IEEE C62.35  
 (4)  $V_F = 3.5\text{ V}$  at  $I_F = 50\text{ A}$  (uni-directional only)



## BI-DIRECTIONAL

| ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                     |                                                        |      |                         |                                |                                                             |                                                               |                                                 |
|-----------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------|------|-------------------------|--------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------|
| DEVICE TYPE                                                                             | DEVICE MARKING CODE | BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ <sup>(1)</sup> (V) |      | TEST CURRENT $I_T$ (mA) | STAND-OFF VOLTAGE $V_{WM}$ (V) | MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu\text{A}$ ) | MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}$ <sup>(2)</sup> (A) | MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V) |
|                                                                                         |                     | MIN.                                                   | MAX. |                         |                                |                                                             |                                                               |                                                 |
| SMB8J5.0CA                                                                              | 1AE                 | 6.40                                                   | 7.25 | 10                      | 5.0                            | 2000                                                        | 87.0                                                          | 9.2                                             |
| SMB8J6.0CA                                                                              | 1AG                 | 6.67                                                   | 7.37 | 10                      | 6.0                            | 2000                                                        | 77.7                                                          | 10.3                                            |
| SMB8J6.5CA                                                                              | 1AK                 | 7.22                                                   | 7.98 | 10                      | 6.5                            | 1000                                                        | 71.4                                                          | 11.2                                            |
| SMB8J7.0CA                                                                              | 1AM                 | 7.78                                                   | 8.60 | 10                      | 7.0                            | 400                                                         | 66.7                                                          | 12.0                                            |
| SMB8J7.5CA                                                                              | 1AP                 | 8.33                                                   | 9.21 | 1.0                     | 7.5                            | 200                                                         | 62.0                                                          | 12.9                                            |
| SMB8J8.0CA                                                                              | 1AR                 | 8.89                                                   | 9.83 | 1.0                     | 8.0                            | 100                                                         | 58.8                                                          | 13.6                                            |
| SMB8J8.5CA                                                                              | 1AT                 | 9.44                                                   | 10.4 | 1.0                     | 8.5                            | 40                                                          | 55.6                                                          | 14.4                                            |
| SMB8J9.0CA                                                                              | 1AV                 | 10.0                                                   | 11.1 | 1.0                     | 9.0                            | 20                                                          | 51.9                                                          | 15.4                                            |
| SMB8J10CA                                                                               | 1AX                 | 11.1                                                   | 12.3 | 1.0                     | 10                             | 10                                                          | 47.1                                                          | 17.0                                            |
| SMB8J11CA                                                                               | 1AZ                 | 12.2                                                   | 13.5 | 1.0                     | 11                             | 5.0                                                         | 44.0                                                          | 18.2                                            |
| SMB8J12CA                                                                               | 1BE                 | 13.3                                                   | 14.7 | 1.0                     | 12                             | 5.0                                                         | 40.2                                                          | 19.9                                            |
| SMB8J13CA                                                                               | 1BG                 | 14.4                                                   | 15.9 | 1.0                     | 13                             | 1.0                                                         | 37.2                                                          | 21.5                                            |
| SMB8J14CA                                                                               | 1BK                 | 15.6                                                   | 17.2 | 1.0                     | 14                             | 1.0                                                         | 34.5                                                          | 23.2                                            |
| SMB8J15CA                                                                               | 1BM                 | 16.7                                                   | 18.5 | 1.0                     | 15                             | 1.0                                                         | 32.8                                                          | 24.4                                            |
| SMB8J16CA                                                                               | 1BP                 | 17.8                                                   | 19.7 | 1.0                     | 16                             | 1.0                                                         | 30.8                                                          | 26.0                                            |
| SMB8J17CA                                                                               | 1BR                 | 18.9                                                   | 20.9 | 1.0                     | 17                             | 1.0                                                         | 29.0                                                          | 27.6                                            |
| SMB8J18CA                                                                               | 1BT                 | 20.0                                                   | 22.1 | 1.0                     | 18                             | 1.0                                                         | 27.4                                                          | 29.2                                            |
| SMB8J20CA                                                                               | 1BV                 | 22.2                                                   | 24.5 | 1.0                     | 20                             | 1.0                                                         | 24.7                                                          | 32.4                                            |
| SMB8J22CA                                                                               | 1BX                 | 24.4                                                   | 26.9 | 1.0                     | 22                             | 1.0                                                         | 22.5                                                          | 35.5                                            |
| SMB8J24CA                                                                               | 1BZ                 | 26.7                                                   | 29.5 | 1.0                     | 24                             | 1.0                                                         | 20.6                                                          | 38.9                                            |
| SMB8J26CA                                                                               | 1CE                 | 28.9                                                   | 31.9 | 1.0                     | 26                             | 1.0                                                         | 19.0                                                          | 42.1                                            |
| SMB8J28CA                                                                               | 1CG                 | 31.1                                                   | 34.4 | 1.0                     | 28                             | 1.0                                                         | 17.6                                                          | 45.4                                            |
| SMB8J30CA                                                                               | 1CK                 | 33.3                                                   | 36.8 | 1.0                     | 30                             | 1.0                                                         | 16.5                                                          | 48.4                                            |
| SMB8J33CA                                                                               | 1CM                 | 36.7                                                   | 40.6 | 1.0                     | 33                             | 1.0                                                         | 15.0                                                          | 53.3                                            |
| SMB8J36CA                                                                               | 1CP                 | 40.0                                                   | 44.2 | 1.0                     | 36                             | 1.0                                                         | 13.8                                                          | 58.1                                            |
| SMB8J40CA                                                                               | 1CR                 | 44.4                                                   | 49.1 | 1.0                     | 40                             | 1.0                                                         | 12.4                                                          | 64.5                                            |

## Notes

- (1) Pulse test:  $t_p \leq 50\text{ ms}$   
 (2) Surge current waveform per fig. 3 and derate per fig. 2  
 (3) All terms and symbols are consistent with ANSI/IEEE C62.35

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |       |                      |
|--------------------------------------------------------------------------------------|-----------------|-------|----------------------|
| PARAMETER                                                                            | SYMBOL          | VALUE | UNIT                 |
| Typical thermal resistance, junction to ambient <sup>(1)</sup>                       | $R_{\theta JA}$ | 72    | $^{\circ}\text{C/W}$ |
| Typical thermal resistance, junction to lead                                         | $R_{\theta JL}$ | 20    |                      |

## Note

- (1) Mounted on minimum recommended pad layout

| ORDERING INFORMATION (Example)  |                 |                        |               |                                    |
|---------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                   | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| SMB10J5.0A-E3/52                | 0.106           | 52                     | 750           | 7" diameter plastic tape and reel  |
| SMB10J5.0A-E3/5B                | 0.106           | 5B                     | 3200          | 13" diameter plastic tape and reel |
| SMB10J5.0AHE3/52 <sup>(1)</sup> | 0.106           | 52                     | 750           | 7" diameter plastic tape and reel  |
| SMB10J5.0AHE3/5B <sup>(1)</sup> | 0.106           | 5B                     | 3200          | 13" diameter plastic tape and reel |

## Note

- (1) AEC-Q101 qualified



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

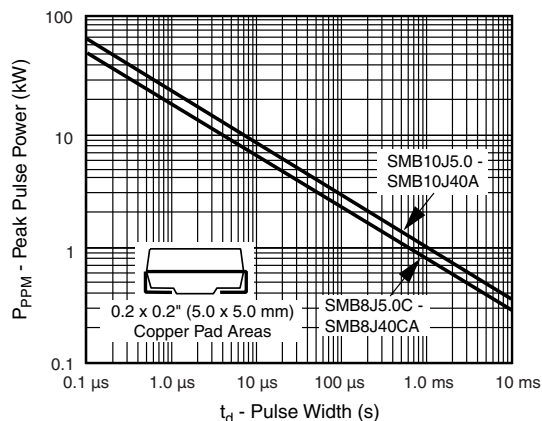


Fig. 1 - Peak Pulse Power Rating Curve

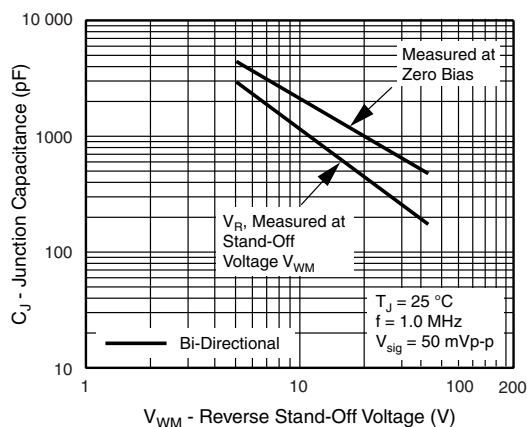


Fig. 4 - Typical Junction Capacitance

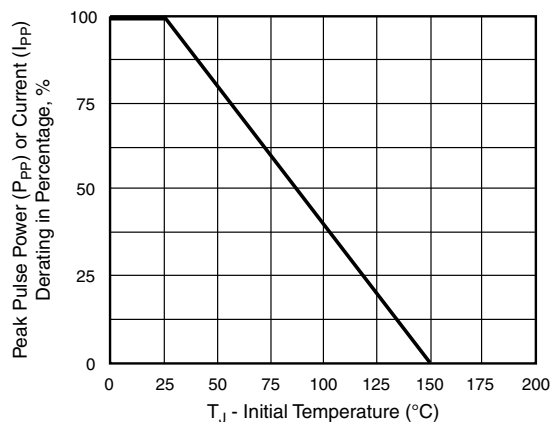


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

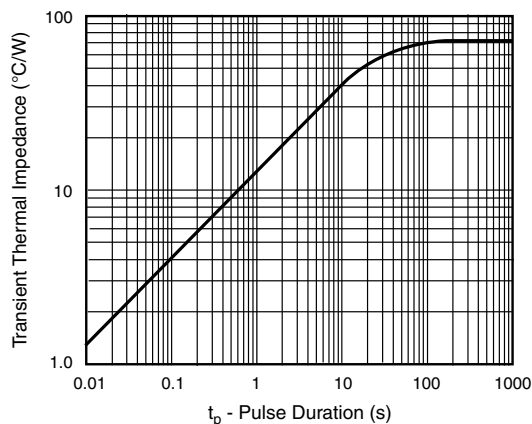


Fig. 5 - Typical Transient Thermal Impedance

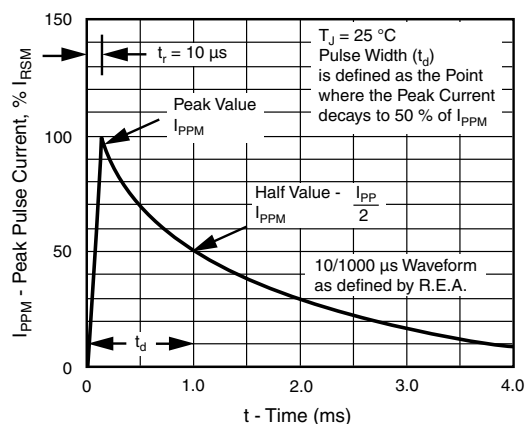


Fig. 3 - Pulse Waveform

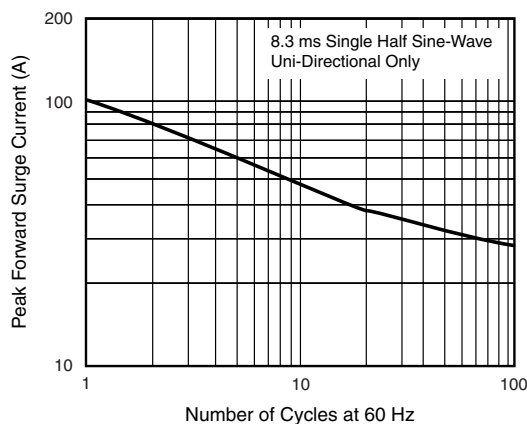
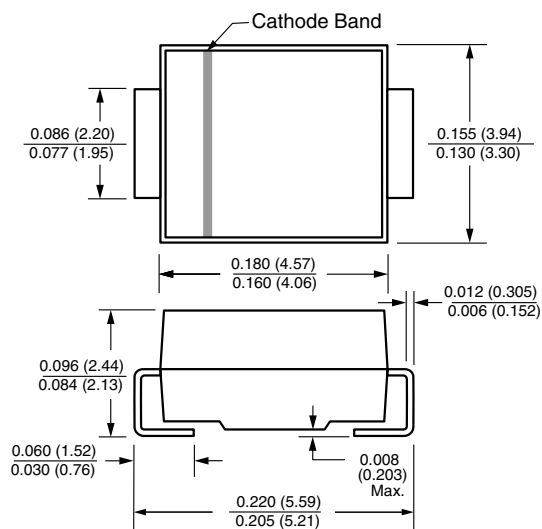


Fig. 6 - Maximum Non-Repetitive Forward Surge Current

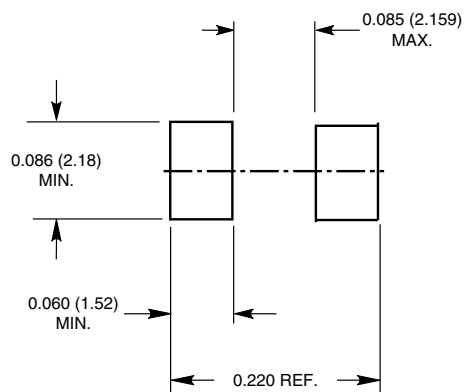


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

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



### Mounting Pad Layout





## Disclaimer

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