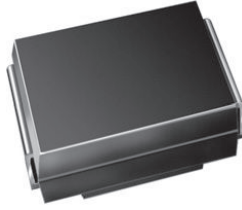




## Surface-Mount PAR<sup>®</sup> Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



SMB (DO-214AA)



| PRIMARY CHARACTERISTICS |                  |
|-------------------------|------------------|
| V <sub>BR</sub>         | 12 V to 51 V     |
| V <sub>WM</sub>         | 10.2 V to 43.6 V |
| P <sub>PPM</sub>        | 1500 W           |
| T <sub>J</sub> max.     | 185 °C           |
| Polarity                | Unidirectional   |
| Package                 | SMB (DO-214AA)   |

### TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lightning on ICs, MOSFET, signal lines of sensor units for automotive.

### FEATURES

- Junction passivation optimized design passivated anisotropic rectifier technology
- T<sub>J</sub> = 185 °C capability suitable for high reliability and automotive requirement
- 1500 W peak pulse power capability with a 10/1000 µs waveform
- Unidirectional
- Excellent clamping capability
- Very fast response time
- 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)



### MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** color band denotes cathode end

| MAXIMUM RATINGS (T <sub>A</sub> = 25 °C, unless otherwise noted)               |                                   |                     |      |
|--------------------------------------------------------------------------------|-----------------------------------|---------------------|------|
| PARAMETER                                                                      | SYMBOL                            | VALUE               | UNIT |
| Peak pulse power dissipation with a 10/1000 µs waveform (fig.1) <sup>(1)</sup> | P <sub>PPM</sub>                  | 1500                | W    |
| Peak pulse current with a 10/1000 µs waveform (fig.3) <sup>(1)</sup>           | I <sub>PPM</sub>                  | See table next page | A    |
| Operating junction and storage temperature range                               | T <sub>J</sub> , T <sub>STG</sub> | -65 to +185         | °C   |

### Note

<sup>(1)</sup> Non-repetitive current pulse, per fig.3 and derated above T<sub>A</sub> = 25 °C per fig.2



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C, unless otherwise noted) |                     |                                                                        |      |      |                                  |                                       |                                                                |                                                                                           |                                                       |                                                                 |                                                                                   |
|-----------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------|------|------|----------------------------------|---------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------|
| DEVICE TYPE                                                                 | DEVICE MARKING CODE | BREAKDOWN VOLTAGE V <sub>BR</sub> <sup>(1)</sup> AT I <sub>T</sub> (V) |      |      | TEST CURRENT I <sub>T</sub> (mA) | STAND-OFF VOLTAGE V <sub>WM</sub> (V) | MAXIMUM REVERSE LEAKAGE AT V <sub>WM</sub> I <sub>R</sub> (μA) | MAXIMUM REVERSE LEAKAGE AT V <sub>WM</sub> I <sub>D</sub> (μA)<br>T <sub>J</sub> = 150 °C | MAXIMUM PEAK PULSE SURGE CURRENT I <sub>PPM</sub> (A) | MAXIMUM CLAMPING VOLTAGE AT I <sub>PPM</sub> V <sub>C</sub> (V) | TYPICAL TEMP. COEFFICIENT OF V <sub>BR</sub> <sup>(2)</sup> α <sub>T</sub> (%/°C) |
|                                                                             |                     | MIN.                                                                   | NOM. | MAX. |                                  |                                       |                                                                |                                                                                           |                                                       |                                                                 |                                                                                   |
| T15B12A                                                                     | KX5                 | 11.4                                                                   | 12.0 | 12.6 | 1.0                              | 10.2                                  | 2.0                                                            | 12.0                                                                                      | 91.2                                                  | 17.0                                                            | 0.070                                                                             |
| T15B13A                                                                     | KZ5                 | 12.4                                                                   | 13.0 | 13.7 | 1.0                              | 11.1                                  | 2.0                                                            | 10.0                                                                                      | 83.8                                                  | 18.5                                                            | 0.072                                                                             |
| T15B15A                                                                     | LG5                 | 14.3                                                                   | 15.0 | 15.8 | 1.0                              | 12.8                                  | 1.0                                                            | 10.0                                                                                      | 73.1                                                  | 21.2                                                            | 0.076                                                                             |
| T15B16A                                                                     | LK5                 | 15.2                                                                   | 16.0 | 16.8 | 1.0                              | 13.6                                  | 1.0                                                            | 10.0                                                                                      | 68.9                                                  | 22.5                                                            | 0.078                                                                             |
| T15B18A                                                                     | LM5                 | 17.1                                                                   | 18.0 | 18.9 | 1.0                              | 15.3                                  | 1.0                                                            | 10.0                                                                                      | 60.8                                                  | 25.5                                                            | 0.080                                                                             |
| T15B20A                                                                     | LR5                 | 19.0                                                                   | 20.0 | 21.0 | 1.0                              | 17.1                                  | 1.0                                                            | 10.0                                                                                      | 56.0                                                  | 27.7                                                            | 0.082                                                                             |
| T15B22A                                                                     | LS5                 | 20.9                                                                   | 22.0 | 23.1 | 1.0                              | 18.8                                  | 1.0                                                            | 10.0                                                                                      | 50.7                                                  | 30.6                                                            | 0.084                                                                             |
| T15B24A                                                                     | LV5                 | 22.8                                                                   | 24.0 | 25.2 | 1.0                              | 20.5                                  | 1.0                                                            | 10.0                                                                                      | 46.7                                                  | 33.2                                                            | 0.085                                                                             |
| T15B27A                                                                     | LW5                 | 25.7                                                                   | 27.0 | 28.4 | 1.0                              | 23.1                                  | 1.0                                                            | 10.0                                                                                      | 41.3                                                  | 37.5                                                            | 0.087                                                                             |
| T15B30A                                                                     | ME5                 | 28.5                                                                   | 30.0 | 31.5 | 1.0                              | 25.6                                  | 1.0                                                            | 10.0                                                                                      | 37.4                                                  | 41.4                                                            | 0.088                                                                             |
| T15B33A                                                                     | MG5                 | 31.4                                                                   | 33.0 | 34.7 | 1.0                              | 28.2                                  | 1.0                                                            | 10.0                                                                                      | 33.9                                                  | 45.7                                                            | 0.089                                                                             |
| T15B36A                                                                     | MJ5                 | 34.2                                                                   | 36.0 | 37.8 | 1.0                              | 30.8                                  | 1.0                                                            | 15.0                                                                                      | 31.1                                                  | 49.9                                                            | 0.090                                                                             |
| T15B39A                                                                     | MM5                 | 37.1                                                                   | 39.0 | 41.0 | 1.0                              | 33.3                                  | 1.0                                                            | 15.0                                                                                      | 28.8                                                  | 53.9                                                            | 0.091                                                                             |
| T15B43A                                                                     | MN5                 | 40.9                                                                   | 43.0 | 45.2 | 1.0                              | 36.8                                  | 1.0                                                            | 20.0                                                                                      | 26.1                                                  | 59.3                                                            | 0.092                                                                             |
| T15B47A                                                                     | MR5                 | 44.7                                                                   | 47.0 | 49.4 | 1.0                              | 40.2                                  | 1.0                                                            | 20.0                                                                                      | 23.9                                                  | 64.8                                                            | 0.092                                                                             |
| T15B51A                                                                     | MT5                 | 48.5                                                                   | 51.0 | 53.6 | 1.0                              | 43.6                                  | 1.0                                                            | 20.0                                                                                      | 22.1                                                  | 70.1                                                            | 0.093                                                                             |

**Notes**

- (1) V<sub>BR</sub> measured after I<sub>T</sub> applied for 300 μs, I<sub>T</sub> = square wave pulse or equivalent
- (2) To calculate V<sub>BR</sub> vs. junction temperature, use the following formula: V<sub>BR</sub> at T<sub>J</sub> = V<sub>BR</sub> at 25 °C x (1 + α<sub>T</sub> x (T<sub>J</sub> - 25))
- (3) All terms and symbols are consistent with ANSI/IEEE C62.35

| IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS<br>(T <sub>A</sub> = 25 °C unless otherwise noted) |                   |                       |        |       |
|-----------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|--------|-------|
| STANDARD                                                                                                              | TEST TYPE         | TEST CONDITIONS       | SYMBOL | VALUE |
| IEC 61000-4-2                                                                                                         | Contact discharge | C = 150 pF, R = 330 Ω | ESD    | 30 kV |
|                                                                                                                       | Air discharge     |                       |        | 30 kV |

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| T15B12AHM3/H <sup>(1)</sup>    | 0.107           | H                      | 750           | 7" diameter plastic tape and reel  |
| T15B12AHM3/I <sup>(1)</sup>    | 0.107           | I                      | 3200          | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified



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

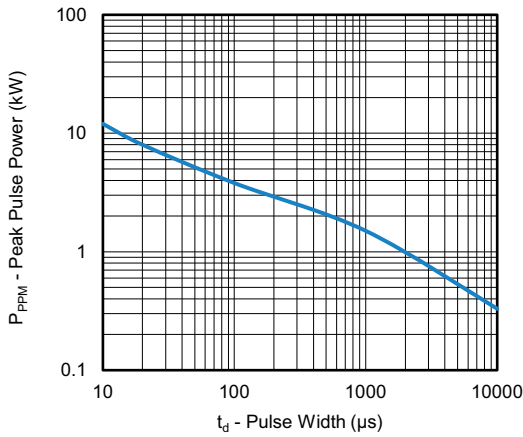


Fig. 1 - Peak Pulse Power Rating Curve

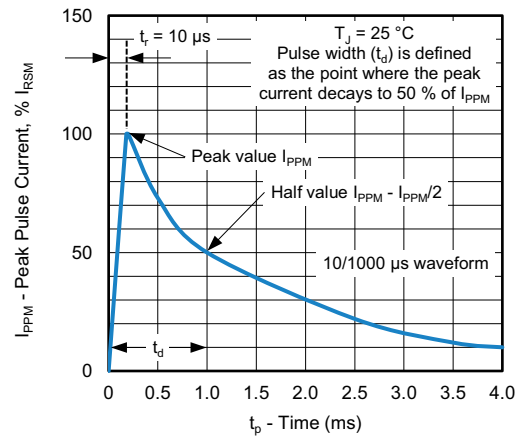


Fig. 3 - Pulse Waveform

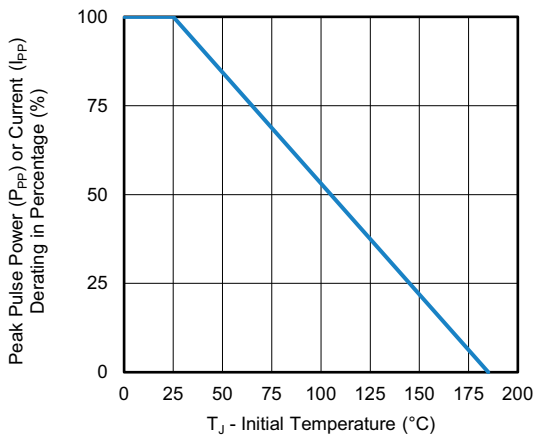


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

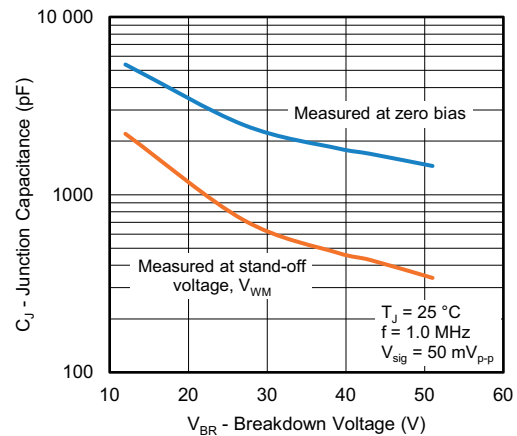


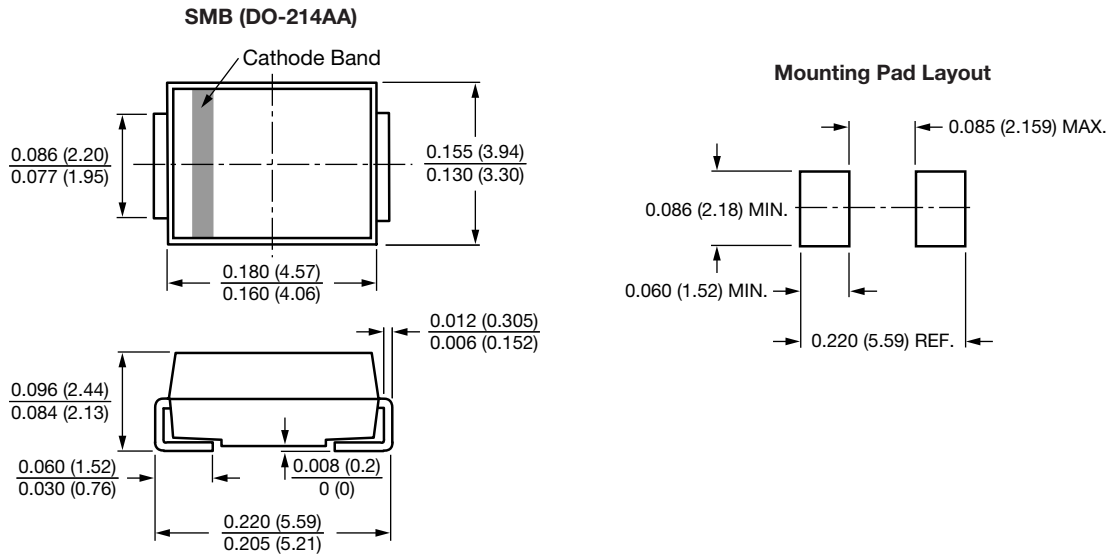
Fig. 4 - Typical Junction Capacitance

### Note

- Fig.1, power calculations is based on  $I_{PPM}$  times defined maximum clamping voltage by pulse width



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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