# TPSMB-EVR Series
## Surface Mount – 600 W

AUTOMOTIVE GRADE RoHS




## Description

Littelfuse TPSMB-EVR Series of Transient Voltage Suppression (TVS) Diodes can provide secondary transient voltage protection from transients induced by load dump and other transient voltage events for sensitive electronics. The TPSMB-EVR Series offers superior electrical performance in a small footprint DO-214AA package, allowing designers to upgrade their circuit protection without altering their existing design footprint or provide more robust protection in new circuit layouts.

## Features

- AEC-Q101 qualified
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Meets ESD HBM: 8 kV and M4 machine model: 400 V
- Low profile package
- Ideal for automated placement
- 600 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Available in uni-directional and bi-directional
- Solder dip 260 °C, 10s
- Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC
- Manufacturing Location: This product is manufactured, assembled, and tested outside mainland China and Taiwan.

### Agency Approvals

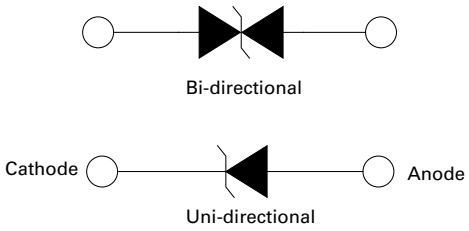
| Agency | Agency File Number |
|---|---|
| | E230531 |

### Maximum Ratings and Thermal Characteristics
($T_A$=25 °C unless otherwise noted)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Peak Pulse Power Dissipation with 10/1000 µs exponential pulse | | $P_{PPM}$ | 600 | W |
| Peak Forward Surge Current 8.3 ms. (Jedec Method) (Note 1) (Note 2) | | $I_{FSM}$ | 100 | A |
| Max. Forward Voltage Drop at $I_F$ = 50 A (Note 1) | | $V_F$ | 3.5 | V |
| Operating Junction Temperature Range | $V_{BR} \leq 43$ V | $T_J$ | -65 to 175 | °C |
| | $V_{BR} > 43$ V | | -65 to 150 | |
| Storage Temperature Range | | $T_{STG}$ | -65 to 175 | °C |

**Notes:**
**1.** Only for Unidorectional
**2.** Mounted on 0.31 x 0.31" (8.0 x 8.0 mm) copper pads to each terminal

### Functional Diagram




## Applications

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

### Physical Specifications

| | |
|---|---|
| **Weight** | 0.0082 grams |
| **Case** | DO-214AA (SMB). Epoxy meets UL 94V-0 flammability rating. |
| **Polarity** | For unidirectional types color band denotes cathode end. No marking on bidirectional types. |
| **Terminal** | Matte tin plated leads, solderable per MIL-STD-750 Method 2026, J-STD-002 and JESD22-B102. Consumer grade, meets JESD 201 class 1A whisker test. |

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## Surface Mount – 600 W

**Electrical Characteristics** ($T_A$=25 °C unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Marking | | Maximum Reverse Leakage Current $I_{RM}$ at $V_{RM}$ | | Breakdown Voltage $V_{BR}$ at $I_R$ (V) (1) | | | Max. Clamping Voltage $V_{CL}$ at $I_{PP}$ max. 1ms. Expo. | | Agency Approval |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Uni | Bi | (µA) | (V) | Min. | Max. | (mA) | (V) | (A) | |
| TPSMB5.0A-EVR | TPSMB5.0CA-EVR | JF | OK | 800 | 5.0 | 6.40 | 7.07 | 10 | 9.20 | 65.20 | - |
| TPSMB6.0A-EVR | TPSMB6.0CA-EVR | JK | OL | 800 | 6.0 | 6.67 | 7.37 | 10 | 10.30 | 58.30 | - |
| TPSMB6.5A-EVR | TPSMB6.5CA-EVR | JL | OM | 500 | 6.5 | 7.22 | 7.98 | 10 | 11.20 | 53.60 | X |
| TPSMB7.0A-EVR | TPSMB7.0CA-EVR | C1 | E1 | 200 | 7.0 | 7.78 | 8.60 | 10 | 12.00 | 50.00 | X |
| TPSMB7.5A-EVR | TPSMB7.5CA-EVR | C2 | E2 | 100 | 7.5 | 8.33 | 9.21 | 1 | 12.90 | 46.50 | X |
| TPSMB8.0A-EVR | TPSMB8.0CA-EVR | C3 | E3 | 50 | 8.0 | 8.89 | 9.83 | 1 | 13.60 | 44.10 | X |
| TPSMB8.5A-EVR | TPSMB8.5CA-EVR | JM | ON | 20 | 8.5 | 9.44 | 10.40 | 1 | 14.40 | 41.70 | X |
| TPSMB9.0A-EVR | TPSMB9.0CA-EVR | C4 | E4 | 5 | 9.0 | 10.00 | 11.10 | 1 | 15.40 | 39.00 | X |
| TPSMB10A-EVR | TPSMB10CA-EVR | JN | OO | 5 | 10 | 11.10 | 12.30 | 1 | 17.00 | 35.30 | X |
| TPSMB11A-EVR | TPSMB11CA-EVR | C5 | E5 | 5 | 11 | 12.20 | 13.50 | 1 | 18.20 | 33.00 | X |
| TPSMB12A-EVR | TPSMB12CA-EVR | JO | OP | 5 | 12 | 13.30 | 14.70 | 1 | 19.90 | 30.20 | X |
| TPSMB13A-EVR | TPSMB13CA-EVR | JP | OR | 1 | 13 | 14.40 | 15.90 | 1 | 21.50 | 27.90 | X |
| TPSMB14A-EVR | TPSMB14CA-EVR | C6 | E6 | 1 | 14 | 15.60 | 17.20 | 1 | 23.20 | 25.90 | X |
| TPSMB15A-EVR | TPSMB15CA-EVR | JR | OS | 1 | 15 | 16.70 | 18.50 | 1 | 24.40 | 24.60 | X |
| TPSMB16A-EVR | TPSMB16CA-EVR | C7 | E7 | 1 | 16 | 17.80 | 19.70 | 1 | 26.00 | 23.10 | X |
| TPSMB17A-EVR | TPSMB17CA-EVR | C8 | E8 | 1 | 17 | 18.90 | 20.90 | 1 | 27.60 | 21.70 | X |
| TPSMB18A-EVR | TPSMB18CA-EVR | JS | OT | 1 | 18 | 20.00 | 22.10 | 1 | 29.20 | 20.50 | X |
| TPSMB20A-EVR | TPSMB20CA-EVR | JT | OU | 1 | 20 | 22.20 | 24.50 | 1 | 32.40 | 18.50 | X |
| TPSMB22A-EVR | TPSMB22CA-EVR | JU | OV | 1 | 22 | 24.40 | 26.90 | 1 | 35.50 | 16.90 | X |
| TPSMB24A-EVR | TPSMB24CA-EVR | JV | OW | 1 | 24 | 26.70 | 29.50 | 1 | 38.90 | 15.40 | X |
| TPSMB26A-EVR | TPSMB26CA-EVR | JW | OX | 1 | 26 | 28.90 | 31.90 | 1 | 42.10 | 14.30 | X |
| TPSMB28A-EVR | TPSMB28CA-EVR | JX | OY | 1 | 28 | 31.10 | 34.40 | 1 | 45.40 | 13.20 | X |
| TPSMB30A-EVR | TPSMB30CA-EVR | JY | OZ | 1 | 30 | 33.30 | 36.80 | 1 | 48.40 | 12.40 | X |
| TPSMB33A-EVR | TPSMB33CA-EVR | JZ | UL | 1 | 33 | 36.70 | 40.60 | 1 | 53.30 | 11.30 | X |
| TPSMB36A-EVR | TPSMB36CA-EVR | KA | UM | 1 | 36 | 40.00 | 44.20 | 1 | 58.10 | 10.30 | X |
| TPSMB40A-EVR | TPSMB40CA-EVR | KB | UN | 1 | 40 | 44.40 | 49.10 | 1 | 64.50 | 9.30 | X |
| TPSMB43A-EVR | TPSMB43CA-EVR | KC | UO | 1 | 43 | 47.80 | 52.80 | 1 | 69.40 | 8.60 | X |
| TPSMB48A-EVR | TPSMB48CA-EVR | OA | UP | 1 | 48 | 53.30 | 58.90 | 1 | 77.40 | 7.80 | X |
| TPSMB51A-EVR | TPSMB51CA-EVR | OB | UR | 1 | 51 | 56.70 | 62.70 | 1 | 82.40 | 7.30 | X |
| TPSMB54A-EVR | TPSMB54CA-EVR | C9 | E9 | 1 | 54 | 60.00 | 66.30 | 1 | 87.10 | 6.90 | X |
| TPSMB58A-EVR | TPSMB58CA-EVR | OC | US | 1 | 58 | 64.40 | 71.20 | 1 | 93.60 | 6.40 | X |
| TPSMB60A-EVR | TPSMB60CA-EVR | D1 | F1 | 1 | 60 | 66.70 | 73.70 | 1 | 96.80 | 6.20 | X |
| TPSMB64A-EVR | TPSMB64CA-EVR | D2 | F2 | 1 | 64 | 71.10 | 78.60 | 1 | 103.00 | 5.80 | X |
| TPSMB70A-EVR | TPSMB70CA-EVR | OD | UT | 1 | 70 | 77.80 | 86.00 | 1 | 113.00 | 5.30 | X |
| TPSMB75A-EVR | TPSMB75CA-EVR | D3 | F3 | 1 | 75 | 83.30 | 92.10 | 1 | 121.00 | 5.00 | X |
| TPSMB78A-EVR | TPSMB78CA-EVR | D4 | F4 | 1 | 78 | 86.70 | 95.80 | 1 | 126.00 | 4.80 | X |
| TPSMB85A-EVR | TPSMB85CA-EVR | OE | UU | 1 | 85 | 94.40 | 104.00 | 1 | 137.00 | 4.40 | X |
| TPSMB90A-EVR | TPSMB90CA-EVR | D5 | F5 | 1 | 90 | 100.00 | 111.00 | 1 | 146.00 | 4.10 | X |
| TPSMB100A-EVR | TPSMB100CA-EVR | OF | UV | 1 | 100 | 111.00 | 123.00 | 1 | 162.00 | 3.70 | X |
| TPSMB110A-EVR | TPSMB110CA-EVR | D6 | F6 | 1 | 110 | 122.00 | 135.00 | 1 | 177.00 | 3.40 | X |
| TPSMB120A-EVR | TPSMB120CA-EVR | D7 | F7 | 1 | 120 | 133.00 | 147.00 | 1 | 193.00 | 3.10 | X |
| TPSMB130A-EVR | TPSMB130CA-EVR | OG | UW | 1 | 130 | 144.00 | 159.00 | 1 | 209.00 | 2.90 | X |
| TPSMB150A-EVR | TPSMB150CA-EVR | D8 | F8 | 1 | 150 | 167.00 | 185.00 | 1 | 243.00 | 2.50 | X |
| TPSMB154A-EVR | TPSMB154CA-EVR | OH | UX | 1 | 154 | 171.00 | 189.00 | 1 | 246.00 | 2.40 | X |
| TPSMB160A-EVR | TPSMB160CA-EVR | D9 | F9 | 1 | 160 | 178.00 | 197.00 | 1 | 259.00 | 2.30 | X |
| TPSMB170A-EVR | TPSMB170CA-EVR | OI | UY | 1 | 170 | 189.00 | 209.00 | 1 | 275.00 | 2.20 | X |
| TPSMB188A-EVR | TPSMB188CA-EVR | OJ | UZ | 1 | 188 | 209.00 | 231.00 | 1 | 328.00 | 2.00 | X |

**Notes:**

**1.** Pulses test: tp ≤ 50 ms, δ < 2%

**2.** For bi-directional types having $V_{WM}$ of 10 V and less, the $I_D$ limit is doubled

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### Ratings and Characteristic Curves ($T_A$=25 °C unless otherwise noted)

**Figure 1 - Pulse Waveform**

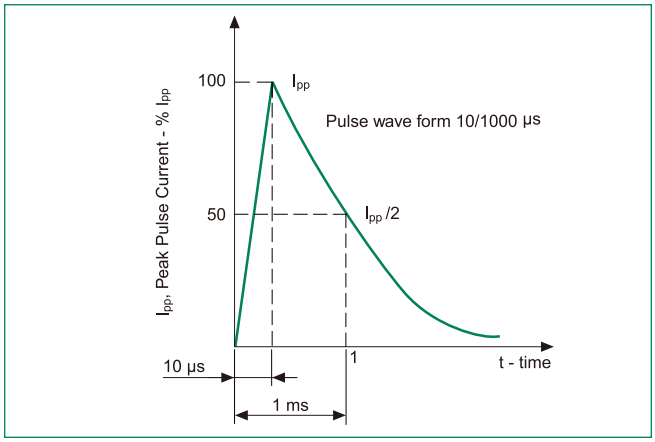



**Figure 2 - Pulse Power or Current vs. Initial Junction Temperature**

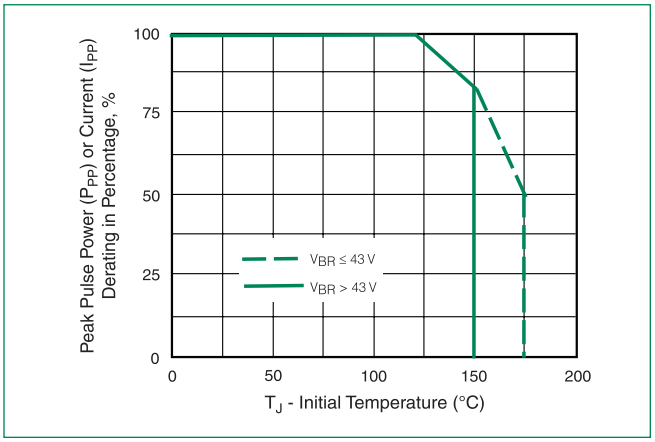
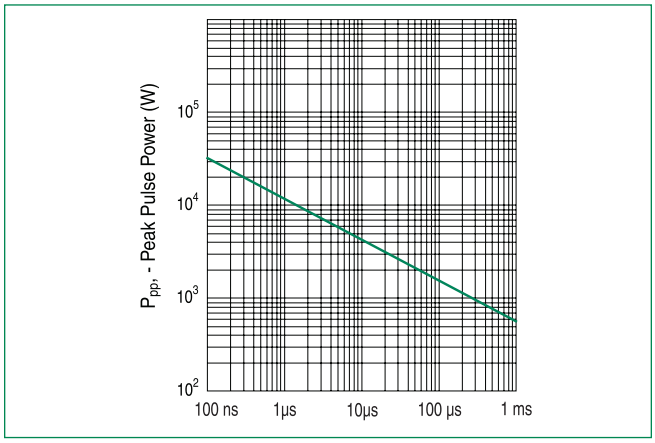
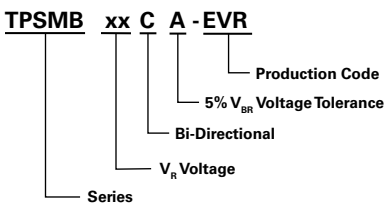


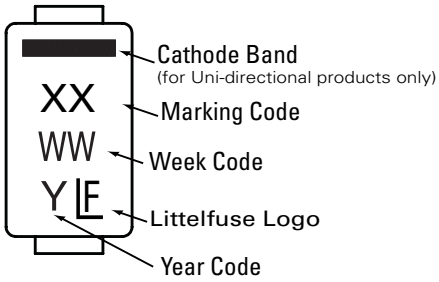

**Figure 3 - Peak Pulse Power Rating Curve**




### Part Numbering System



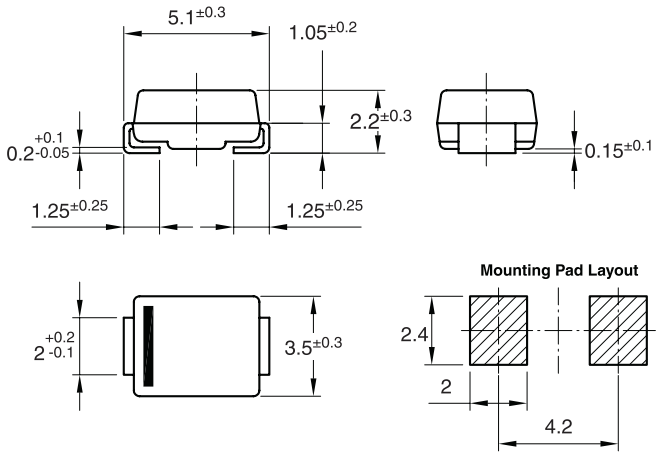

### Part Marking System




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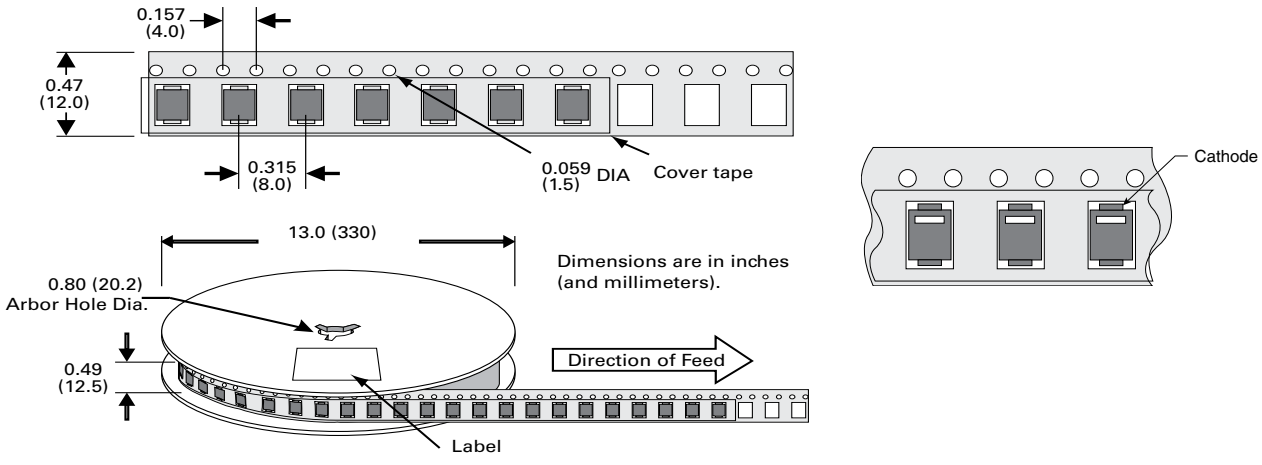
### Dimensions - DO-214AA Package




### Packaging Options

| Part number | Component Package | Quantity | Packaging Option | Packaging Specification |
|---|---|---|---|---|
| TPSMBxxXX-EVR | DO-214AA | 3200 | 13" diameter tape andreel | EIA RS-481 |

### Tape and Reel Specification




**Disclaimer Notice -** Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at http://www.littelfuse.com/disclaimer-electronics.

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