

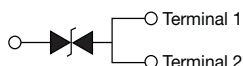
Surface Mount PAR[®] Transient Voltage Suppressors

Bi-directional 1500 W TVS in TO-277 (SMPC) Package

eSMP[®] Series



SMPC (TO-277A)



DESIGN SUPPORT TOOLS

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PRIMARY CHARACTERISTICS

| | |
|---------------------------|-----------------|
| V_{WM} | 9.4 V to 30.8 V |
| V_{BR} (Bi-directional) | 11 V to 36 V |
| P_{PPM} | 1500 W |
| T_J max. | 185 °C |
| Polarity | Bi-directional |
| Package | SMPC (TO-277A) |

Note

- All electrical characteristics are only applicable when two identical polarity terminals are connected.

FEATURES

- Junction passivation optimized PAR[®] design
- $T_J = 185$ °C capability suitable for high reliability and automotive requirement
- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Bi-directional
- Excellent clamping capability
- Low leakage current
- Very fast response time
- AEC-Q101 qualified
 - Automotive ordering code: base P/NHM3
- Meet MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

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 automotive, consumer, computer, industrial, and telecommunication.

MECHANICAL DATA

Case: SMPC (TO-277A)

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: no marking on bi-directional types

MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|----------------|----------------|------|
| Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾ | P_{PPM} | 1500 | W |
| Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾ | I_{PPM} | See next table | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -65 to +185 | °C |

Note

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

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

| DEVICE TYPE | DEVICE MARKING CODE | BREAKDOWN VOLTAGE $V_{BR}^{(1)}$ AT I_T (V) | | TEST CURRENT I_T (mA) | STAND-OFF VOLTAGE V_{WM} (V) | MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (μA) | MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}^{(2)}$ (A) | MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V) |
|-------------|---------------------|---|------|-------------------------|--------------------------------|---|--|---|
| | | MIN. | MAX. | | | | | |
| TPC11CA | BAF | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 96.2 | 15.6 |
| TPC12CA | BAG | 11.4 | 12.6 | 1.0 | 10.2 | 2.0 | 89.8 | 16.7 |
| TPC13CA | BAH | 12.4 | 13.7 | 1.0 | 11.1 | 2.0 | 82.4 | 18.2 |
| TPC15CA | BAI | 14.3 | 15.8 | 1.0 | 12.8 | 1.0 | 70.8 | 21.2 |
| TPC16CA | BAJ | 15.2 | 16.8 | 1.0 | 13.6 | 1.0 | 66.7 | 22.5 |
| TPC18CA | BAK | 17.1 | 18.9 | 1.0 | 15.3 | 1.0 | 59.5 | 25.2 |
| TPC20CA | BAL | 19.0 | 21.0 | 1.0 | 17.1 | 1.0 | 54.2 | 27.7 |
| TPC22CA | BAM | 20.9 | 23.1 | 1.0 | 18.8 | 1.0 | 49.0 | 30.6 |
| TPC24CA | BAN | 22.8 | 25.2 | 1.0 | 20.5 | 1.0 | 45.2 | 33.2 |
| TPC27CA | BAO | 25.7 | 28.4 | 1.0 | 23.1 | 1.0 | 40.0 | 37.5 |
| TPC30CA | BAP | 28.5 | 31.5 | 1.0 | 25.6 | 1.0 | 36.2 | 41.4 |
| TPC33CA | BAQ | 31.4 | 34.7 | 1.0 | 28.2 | 1.0 | 32.8 | 45.7 |
| TPC36CA | BAR | 34.2 | 37.8 | 1.0 | 30.8 | 1.0 | 30.1 | 49.9 |

Notes

- All terms and symbols are consistent with ANSI/IEEE C62.35
- V_{BR} measured after I_T applied for 300 μs , I_T = square wave pulse or equivalent
- Surge current waveform per fig.3

ORDERING INFORMATION (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|-----------------------------|-----------------|------------------------|---------------|------------------------------------|
| TPC11CAHM3/H ⁽¹⁾ | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| TPC11CAHM3/I ⁽¹⁾ | 0.10 | I | 6500 | 13" diameter plastic tape and reel |

Note

- ⁽¹⁾ AEC-Q101 qualified

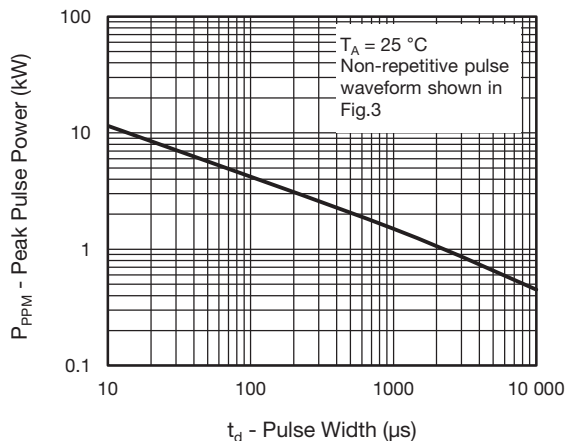
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)


Fig. 1 - Peak Pulse Power Rating Curve

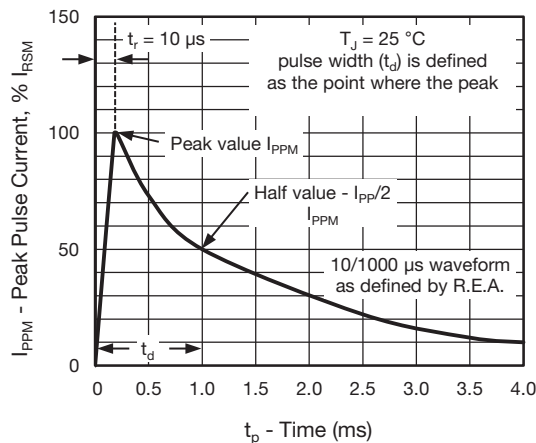


Fig. 3 - Pulse Waveform

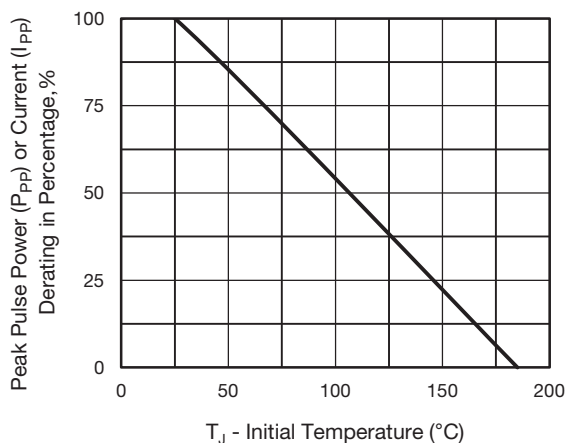


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

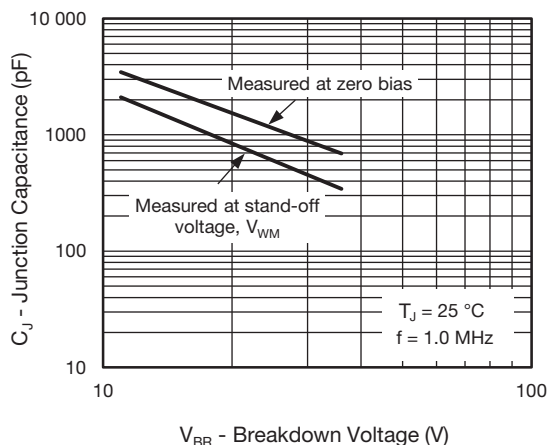


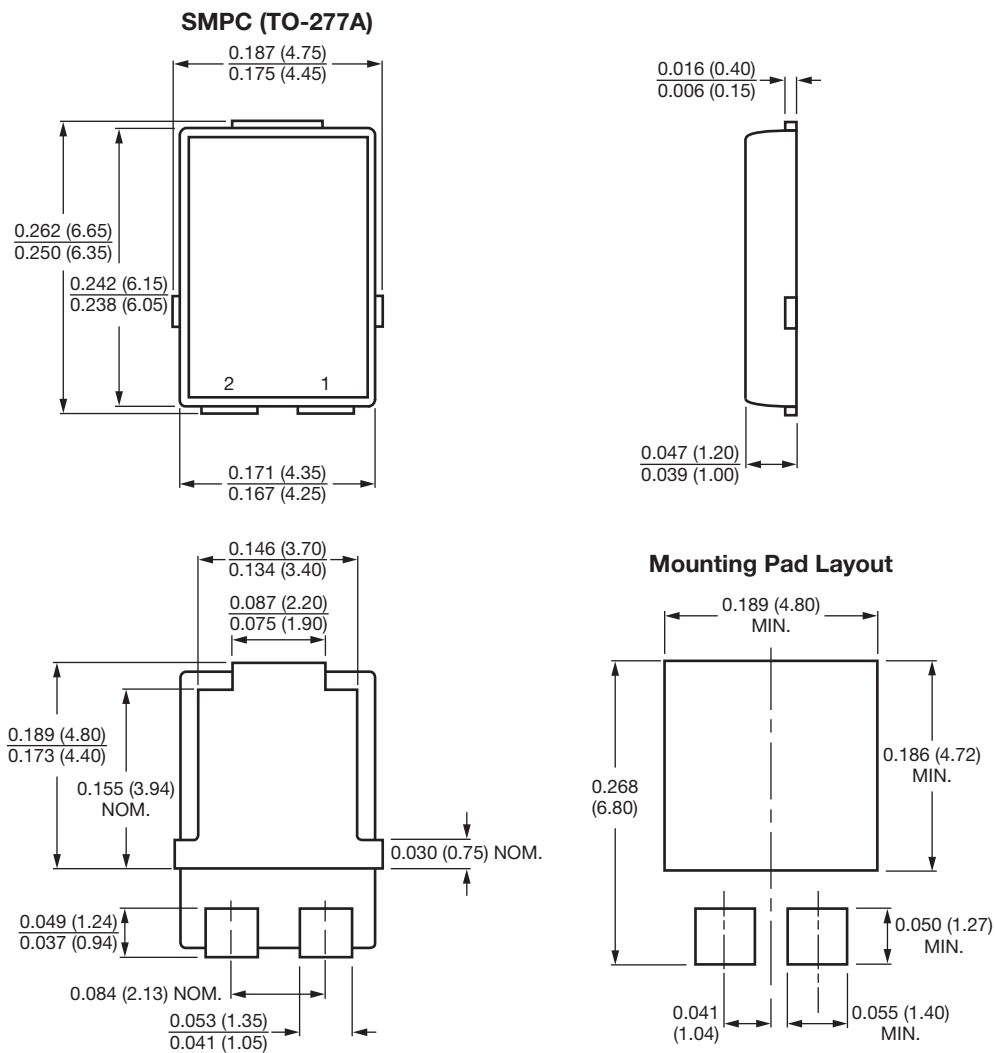
Fig. 4 - Typical Junction Capacitance

Note

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



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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