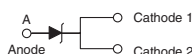


# Surface Mount TRANSZORB® Transient Voltage Suppressors

## eSMP® Series



TO-277A (SMPC)



## FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Uni-direction only
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- Meets MSL level 1, per J-STD-020
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## MECHANICAL DATA

### Case: TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

M3 suffix meets JESD 201 class 1A whisker test

## PRIMARY CHARACTERISTICS

|                          |                  |
|--------------------------|------------------|
| $V_{BR}$ uni-directional | 6.40 V to 44.2 V |
| $V_{WM}$                 | 5.0 V to 36 V    |
| $P_{PPM}$                | 1500 W           |
| $P_D$                    | 6.5 W            |
| $I_{FSM}$                | 200 A            |
| $T_J$ max.               | 150 °C           |
| Polarity                 | Uni-directional  |
| Package                  | DO-277A (SMPC)   |

## 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 and telecommunication. Sensitive equipment against transient overvoltages.

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

| PARAMETER                                                       | SYMBOL             | VALUE          | UNIT |
|-----------------------------------------------------------------|--------------------|----------------|------|
| Peak power dissipation with a 10/1000 $\mu$ s waveform (fig. 3) | $P_{PPM}^{(1)(2)}$ | 1500           | W    |
| Peak pulse current with a 10/1000 $\mu$ s waveform (fig. 1)     | $I_{PPM}^{(1)}$    | See next table | A    |
| Peak forward surge current 8.3 ms single half sine-wave         | $I_{FSM}^{(2)}$    | 200            | A    |
| Power dissipation on infinite heatsink, $T_A = 50$ °C           | $P_D$              | 6.5            | W    |
| Maximum instantaneous forward voltage at 100 A                  | $V_F^{(3)}$        | 3.5            | V    |
| Operating junction and storage temperature range                | $T_J, T_{STG}$     | - 55 to + 150  | °C   |

### Notes

(1) Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25$  °C per fig. 2

(2) Measured on 8.3 ms single half sine-wave, or equivalent square wave, duty cycle = 4 pulses per minute maximum

(3) Pulse test: 300  $\mu$ s pulse width, 1 % duty cycle

**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 CURRENT $I_R$ AT $V_{WM}$ ( $\mu\text{A}$ ) | MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}$ <sup>(2)</sup> (A) | MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V) |
|-------------|---------------------|--------------------------------------------------------|------|-------------------------|--------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------|
|             |                     | MIN.                                                   | MAX. |                         |                                |                                                                     |                                                               |                                                 |
| SMPC5.0A    | GDE                 | 6.40                                                   | 7.07 | 10                      | 5.0                            | 1500                                                                | 150                                                           | 10.0                                            |
| SMPC6.0A    | GDG                 | 6.67                                                   | 7.37 | 10                      | 6.0                            | 1000                                                                | 145.6                                                         | 10.3                                            |
| SMPC6.5A    | GDK                 | 7.22                                                   | 7.98 | 10                      | 6.5                            | 500                                                                 | 133.9                                                         | 11.2                                            |
| SMPC7.0A    | GDM                 | 7.78                                                   | 8.60 | 10                      | 7.0                            | 200                                                                 | 125.0                                                         | 12.0                                            |
| SMPC7.5A    | GDP                 | 8.33                                                   | 9.21 | 1.0                     | 7.5                            | 100                                                                 | 116.3                                                         | 12.9                                            |
| SMPC8.0A    | GDR                 | 8.89                                                   | 9.83 | 1.0                     | 8.0                            | 50                                                                  | 110.3                                                         | 13.6                                            |
| SMPC8.5A    | GDT                 | 9.44                                                   | 10.4 | 1.0                     | 8.5                            | 20                                                                  | 104.2                                                         | 14.4                                            |
| SMPC9.0A    | GDV                 | 10.0                                                   | 11.1 | 1.0                     | 9.0                            | 5.0                                                                 | 97.4                                                          | 15.4                                            |
| SMPC10A     | GDY                 | 11.1                                                   | 12.3 | 1.0                     | 10.0                           | 2.0                                                                 | 88.2                                                          | 17.0                                            |
| SMPC11A     | GDZ                 | 12.2                                                   | 13.5 | 1.0                     | 11.0                           | 2.0                                                                 | 82.4                                                          | 18.2                                            |
| SMPC12A     | GEE                 | 13.3                                                   | 14.7 | 1.0                     | 12.0                           | 2.0                                                                 | 75.4                                                          | 19.9                                            |
| SMPC13A     | GEG                 | 14.4                                                   | 15.9 | 1.0                     | 13.0                           | 1.0                                                                 | 69.8                                                          | 21.5                                            |
| SMPC14A     | GEK                 | 15.6                                                   | 17.2 | 1.0                     | 14.0                           | 1.0                                                                 | 64.7                                                          | 23.2                                            |
| SMPC15A     | GEM                 | 16.7                                                   | 18.5 | 1.0                     | 15.0                           | 1.0                                                                 | 61.5                                                          | 24.4                                            |
| SMPC16A     | GEP                 | 17.8                                                   | 19.7 | 1.0                     | 16.0                           | 1.0                                                                 | 57.7                                                          | 26.0                                            |
| SMPC17A     | GER                 | 18.9                                                   | 20.9 | 1.0                     | 17.0                           | 1.0                                                                 | 54.3                                                          | 27.6                                            |
| SMPC18A     | GET                 | 20.0                                                   | 22.1 | 1.0                     | 18.0                           | 1.0                                                                 | 51.4                                                          | 29.2                                            |
| SMPC20A     | GEV                 | 22.2                                                   | 24.5 | 1.0                     | 20.0                           | 1.0                                                                 | 46.3                                                          | 32.4                                            |
| SMPC22A     | GEX                 | 24.4                                                   | 26.9 | 1.0                     | 22.0                           | 1.0                                                                 | 42.3                                                          | 35.5                                            |
| SMPC24A     | GEZ                 | 26.7                                                   | 29.5 | 1.0                     | 24.0                           | 1.0                                                                 | 38.6                                                          | 38.9                                            |
| SMPC26A     | GFE                 | 28.9                                                   | 31.0 | 1.0                     | 26.0                           | 1.0                                                                 | 35.6                                                          | 42.1                                            |
| SMPC28A     | GFG                 | 31.1                                                   | 34.4 | 1.0                     | 28.0                           | 1.0                                                                 | 33.0                                                          | 45.4                                            |
| SMPC30A     | GFK                 | 33.3                                                   | 36.8 | 1.0                     | 30.0                           | 1.0                                                                 | 31.0                                                          | 48.4                                            |
| SMPC33A     | GFM                 | 36.7                                                   | 40.6 | 1.0                     | 33.0                           | 1.0                                                                 | 28.1                                                          | 53.3                                            |
| SMPC36A     | GFP                 | 40.0                                                   | 44.2 | 1.0                     | 36.0                           | 1.0                                                                 | 25.8                                                          | 58.1                                            |

**Notes**<sup>(1)</sup> Pulse test:  $t \leq 50\text{ ms}$ <sup>(2)</sup> Surge current waveform per fig. 3 and derated per fig. 2<sup>(3)</sup> 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 air | $R_{\theta JA}$ <sup>(1)</sup> | 125   | $^{\circ}\text{C/W}$ |
| Typical thermal resistance, junction to leads       | $R_{\theta JL}$ <sup>(2)</sup> | 15    |                      |

**Notes**<sup>(1)</sup> Mounted on minimum recommended pad layout<sup>(2)</sup> Units mounted on infinite heatsink at  $T_A = 50\text{ }^{\circ}\text{C}$ **ORDERING INFORMATION** (Example)

| PREFERRED P/N   | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|-----------------|-----------------|------------------------|---------------|------------------------------------|
| SMPC5.0A-M3/86A | 0.10            | 86A                    | 1500          | 7" diameter plastic tape and reel  |
| SMPC5.0A-M3/87A | 0.10            | 87A                    | 6500          | 13" diameter plastic tape and reel |

**RATINGS AND CHARACTERISTICS CURVES**

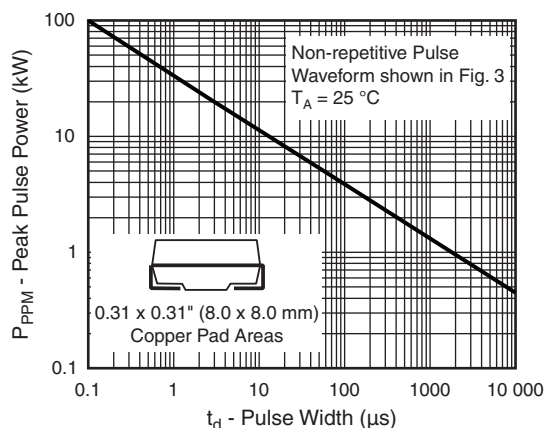
( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Peak Pulse Power Rating Curve

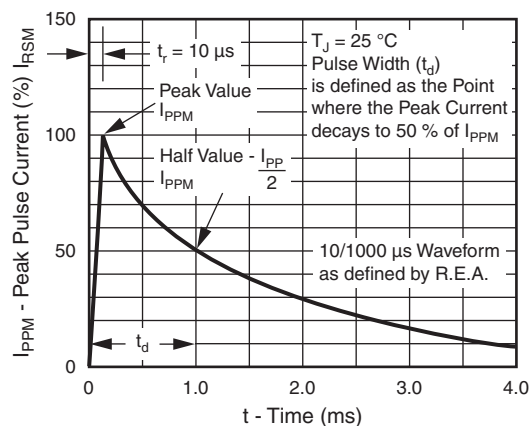


Fig. 3 - Pulse Waveform

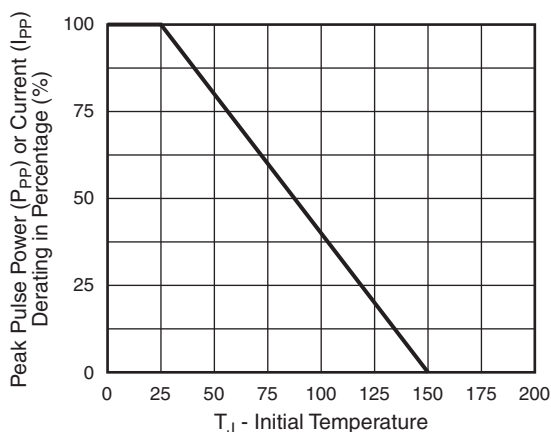


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

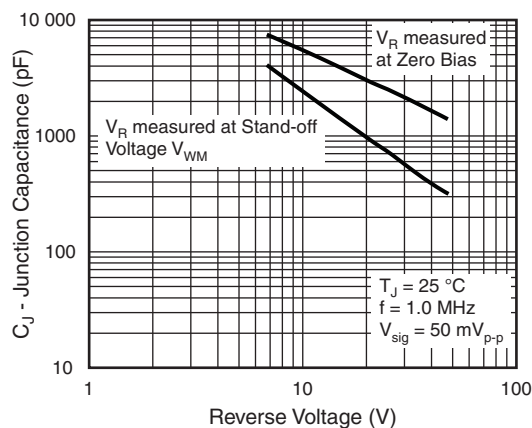
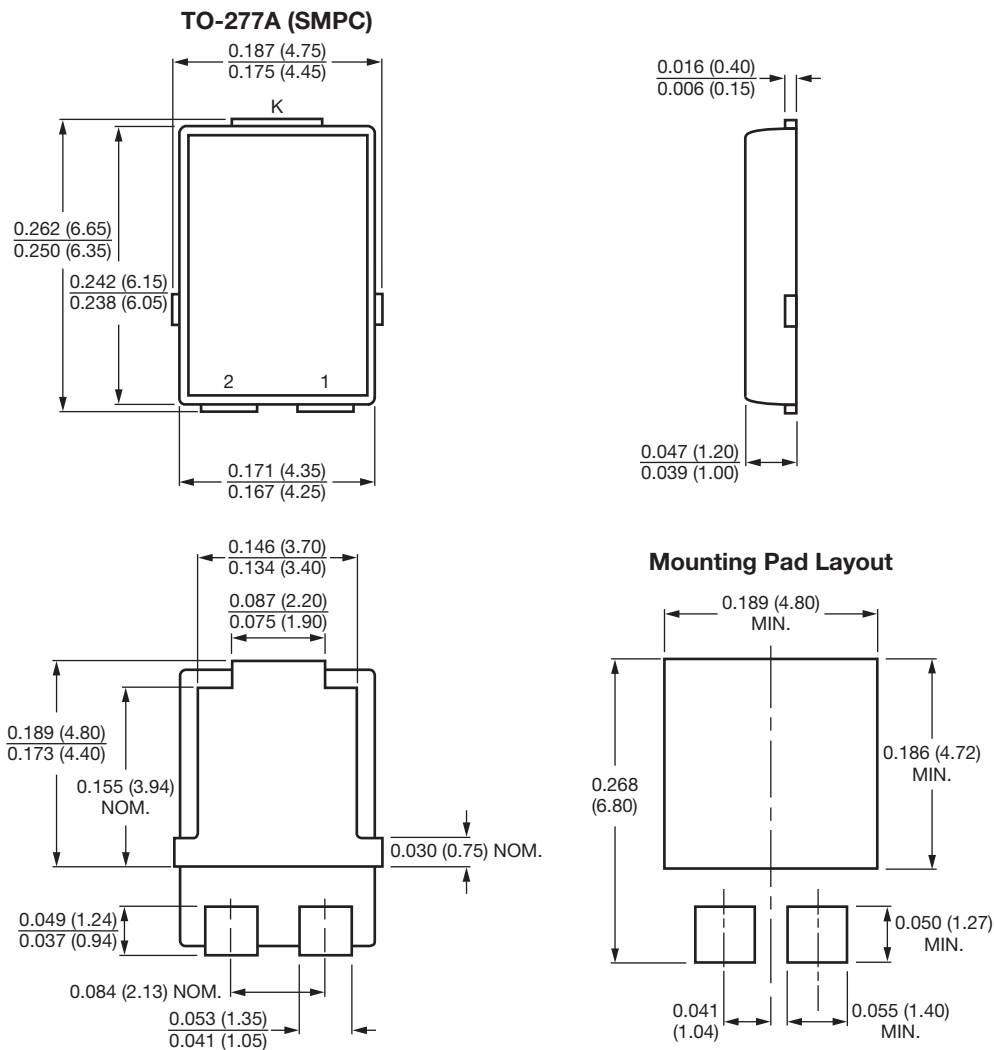


Fig. 4 - Typical Junction Capacitance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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