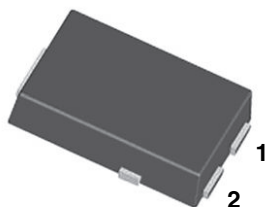
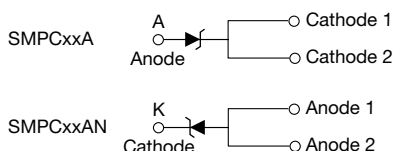


## Surface Mount TRANSZORB® Transient Voltage Suppressors

### eSMP® Series



TO-277A (SMPC)



### PRIMARY CHARACTERISTICS

|                          |                 |
|--------------------------|-----------------|
| $V_{BR}$ uni-directional | 6.40 V to 104 V |
| $V_{WM}$                 | 5.0 V to 85 V   |
| $P_{PPM}$                | 1500 W          |
| $P_D$                    | 6.5 W           |
| $T_J$ max.               | 150 °C          |
| Polarity                 | Uni-directional |
| Package                  | TO-277A (SMPC)  |

#### Note

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

### MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER                                                       | SYMBOL          | VALUE          | UNIT |
|-----------------------------------------------------------------|-----------------|----------------|------|
| Peak power dissipation with a 10/1000 $\mu$ s waveform (fig. 3) | $P_{PPM}^{(1)}$ | 1500           | W    |
| Peak pulse current with a 10/1000 $\mu$ s waveform (fig. 1)     | $I_{PPM}^{(1)}$ | See next table | A    |
| Power dissipation on infinite heatsink, $T_M = 50\text{ °C}$    | $P_D$           | 6.5            | W    |
| Operating junction and storage temperature range                | $T_J, T_{STG}$  | -55 to +150    | °C   |

#### Note

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

### 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

### 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.

### MECHANICAL DATA

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

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

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

M3 suffix meets JESD 201 class 2 whisker test

**Polarity:** the band denotes cathode end



# SMPC5.0A thru SMPC36A, SMPC22AN thru SMPC85AN

[www.vishay.com](http://www.vishay.com)

Vishay General Semiconductor

| ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                     |                     |           |                                               |      |                         |                                |                                                                     |                                                      |                                                 |
|-----------------------------------------------------------------------------------------|---------------------|---------------------|-----------|-----------------------------------------------|------|-------------------------|--------------------------------|---------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------|
| DEVICE TYPE                                                                             |                     | DEVICE MARKING CODE |           | BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T^{(1)}$ (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 $I_{PPM}^{(2)}$ (A) | MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V) |
| ANODE ON HEATSINK                                                                       | CATHODE ON HEATSINK | SUFFIX A            | SUFFIX AN | MIN.                                          | MAX. |                         |                                |                                                                     |                                                      |                                                 |
| SMPC5.0A                                                                                | -                   | GDE                 | -         | 6.40                                          | 7.07 | 10                      | 5.0                            | 1500                                                                | 150.0                                                | 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                                                                                 | SMPC22AN            | GEX                 | PAV       | 24.4                                          | 26.9 | 1.0                     | 22.0                           | 1.0                                                                 | 42.3                                                 | 35.5                                            |
| SMPC24A                                                                                 | SMPC24AN            | GEZ                 | PAW       | 26.7                                          | 29.5 | 1.0                     | 24.0                           | 1.0                                                                 | 38.6                                                 | 38.9                                            |
| SMPC26A                                                                                 | SMPC26AN            | GFE                 | PAX       | 28.9                                          | 31.9 | 1.0                     | 26.0                           | 1.0                                                                 | 35.6                                                 | 42.1                                            |
| SMPC28A                                                                                 | SMPC28AN            | GFG                 | PAY       | 31.1                                          | 34.4 | 1.0                     | 28.0                           | 1.0                                                                 | 33.0                                                 | 45.4                                            |
| SMPC30A                                                                                 | SMPC30AN            | GFK                 | PAZ       | 33.3                                          | 36.8 | 1.0                     | 30.0                           | 1.0                                                                 | 31.0                                                 | 48.4                                            |
| SMPC33A                                                                                 | SMPC33AN            | GFM                 | PBA       | 36.7                                          | 40.6 | 1.0                     | 33.0                           | 1.0                                                                 | 28.1                                                 | 53.3                                            |
| SMPC36A                                                                                 | SMPC36AN            | GFP                 | PBB       | 40.0                                          | 44.2 | 1.0                     | 36.0                           | 1.0                                                                 | 25.8                                                 | 58.1                                            |
| -                                                                                       | SMPC40AN            | -                   | PBC       | 44.4                                          | 49.1 | 1.0                     | 40.0                           | 1.0                                                                 | 23.3                                                 | 64.5                                            |
| -                                                                                       | SMPC43AN            | -                   | PBD       | 47.8                                          | 52.8 | 1.0                     | 43.0                           | 1.0                                                                 | 21.6                                                 | 69.4                                            |
| -                                                                                       | SMPC45AN            | -                   | PBE       | 50.0                                          | 55.3 | 1.0                     | 45.0                           | 1.0                                                                 | 20.6                                                 | 72.7                                            |
| -                                                                                       | SMPC48AN            | -                   | PBF       | 53.3                                          | 58.9 | 1.0                     | 48.0                           | 1.0                                                                 | 19.4                                                 | 77.4                                            |
| -                                                                                       | SMPC51AN            | -                   | PBG       | 56.7                                          | 62.7 | 1.0                     | 51.0                           | 1.0                                                                 | 18.2                                                 | 82.4                                            |
| -                                                                                       | SMPC54AN            | -                   | PBH       | 60.0                                          | 66.3 | 1.0                     | 54.0                           | 1.0                                                                 | 17.2                                                 | 87.1                                            |
| -                                                                                       | SMPC58AN            | -                   | PBK       | 64.4                                          | 71.2 | 1.0                     | 58.0                           | 1.0                                                                 | 16.0                                                 | 93.6                                            |
| -                                                                                       | SMPC60AN            | -                   | PBL       | 66.7                                          | 73.7 | 1.0                     | 60.0                           | 1.0                                                                 | 15.5                                                 | 96.8                                            |
| -                                                                                       | SMPC64AN            | -                   | PBM       | 71.1                                          | 78.6 | 1.0                     | 64.0                           | 1.0                                                                 | 14.6                                                 | 103                                             |
| -                                                                                       | SMPC70AN            | -                   | PBN       | 77.8                                          | 86.0 | 1.0                     | 70.0                           | 1.0                                                                 | 13.3                                                 | 113                                             |
| -                                                                                       | SMPC75AN            | -                   | PBP       | 83.3                                          | 92.1 | 1.0                     | 75.0                           | 1.0                                                                 | 12.4                                                 | 121                                             |
| -                                                                                       | SMPC78AN            | -                   | PBQ       | 86.7                                          | 95.8 | 1.0                     | 78.0                           | 1.0                                                                 | 11.9                                                 | 126                                             |
| -                                                                                       | SMPC85AN            | -                   | PBR       | 94.4                                          | 104  | 1.0                     | 85.0                           | 1.0                                                                 | 10.9                                                 | 137                                             |

## Notes

(1) Pulse test:  $t \leq 50\text{ ms}$

(2) Surge current waveform per fig. 3 and derated per fig. 2

(3) All terms and symbols are consistent with ANSI/IEEE C62.35



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

| PARAMETER                                           | SYMBOL                | VALUE | UNIT               |
|-----------------------------------------------------|-----------------------|-------|--------------------|
| Typical thermal resistance, junction to ambient air | $R_{\theta JA}^{(1)}$ | 100   | $^\circ\text{C/W}$ |
| Typical thermal resistance, junction to mount       | $R_{\theta JM}$       | 15    |                    |

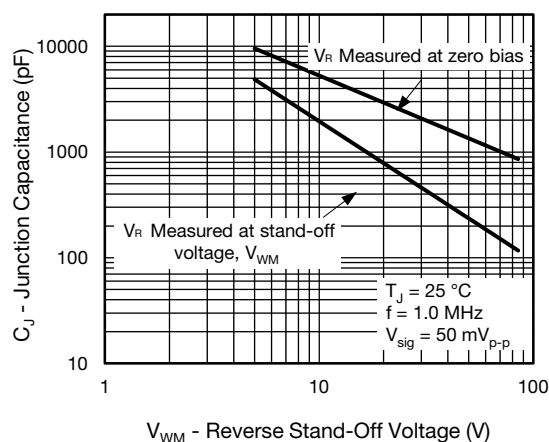
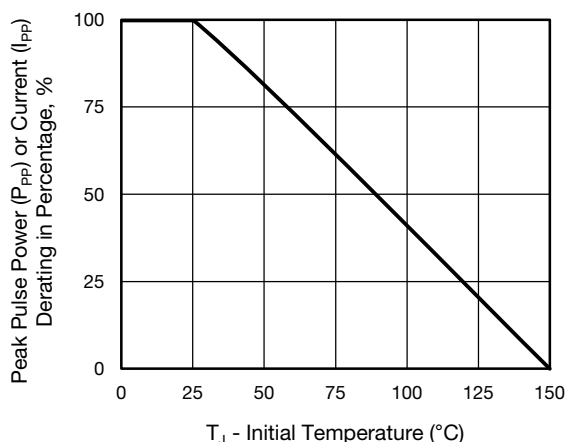
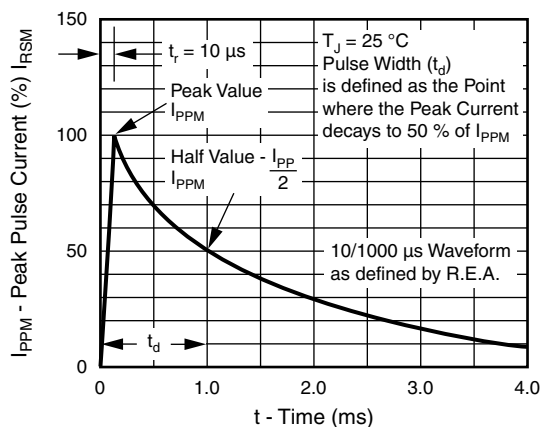
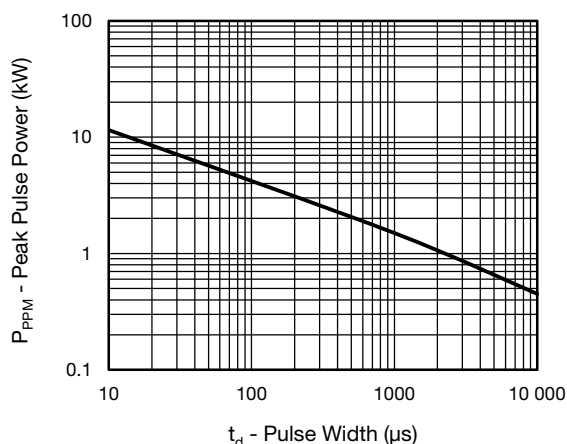
### Note

<sup>(1)</sup> Mounted on minimum recommended pad layout

## 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 |
| SMPC22AN-M3/H   | 0.10            | H                      | 1500          | 7" diameter plastic tape and reel  |
| SMPC22AN-M3/I   | 0.10            | I                      | 6500          | 13" diameter plastic tape and reel |

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



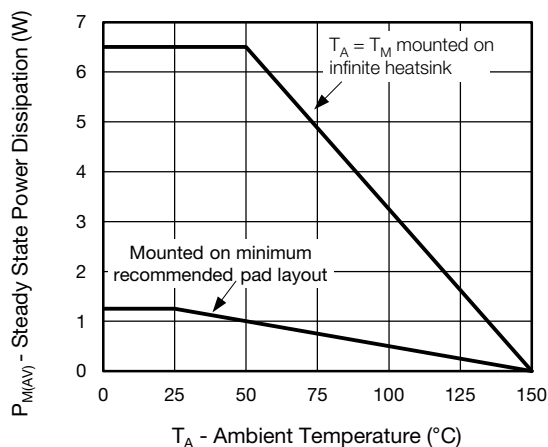
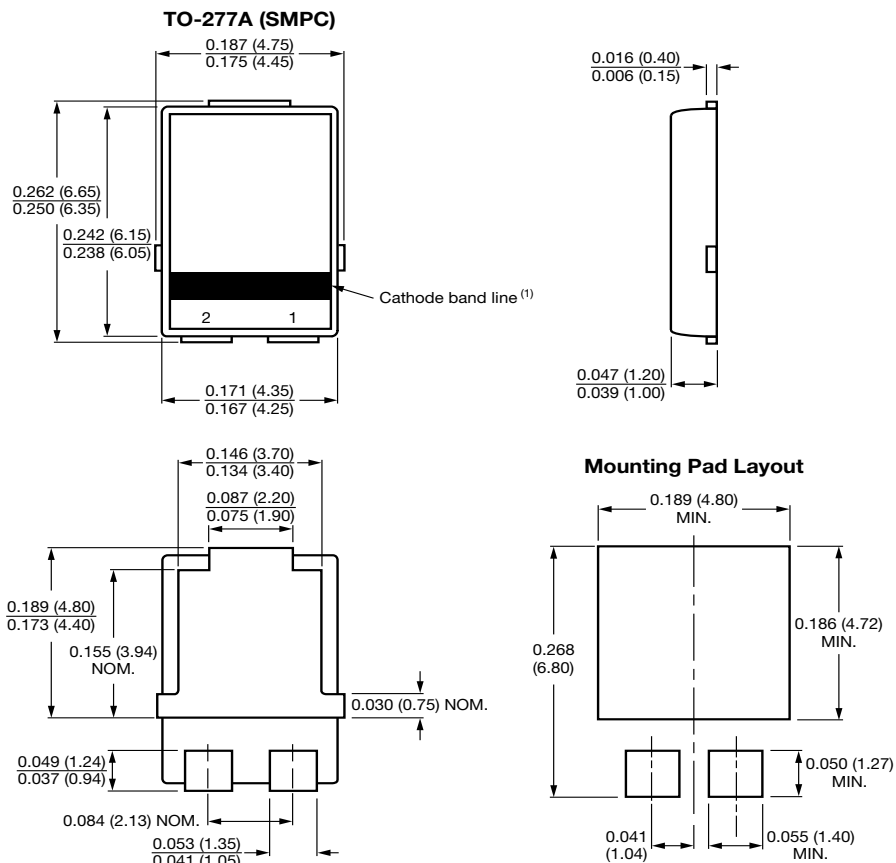


Fig. 5 - Steady State Power Dissipation

## Note

- Fig. 1 - Power calculation is based on  $I_{PPM}$  times defined maximum clamping voltage by pulse width.
- Fig. 1 - 10 000  $\mu$ s  $P_{PPM}$  is actual test for  $V_{WM} \leq 60$  V types, over 60 V types 10 000  $\mu$ s  $P_{PPM}$  is curve extensional value.

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



## Note

(1) Cathode band orientation depends on device actual polarity direction



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