

Surface Mount Power Voltage-Regulating Diodes

eSMP® Series


SMP (DO-220AA)

Anode Cathode


RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low Zener impedance
- Meets 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

TYPICAL APPLICATIONS

For general purpose regulation, industrial, and protection applications.

MECHANICAL DATA

Case: SMP (DO-220AA)

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 1A whisker test

Polarity: color band denotes cathode end

DESIGN SUPPORT TOOLS

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| PRIMARY CHARACTERISTICS | |
|--|----------------|
| V _Z nom. | 4.2 V to 38 V |
| P _{tot} at T _L = 75 °C | 1500 mW |
| P _{tot} at T _L = 25 °C | 600 mW |
| T _J max. | 150 °C |
| V _Z specification | Pulse current |
| Package | SMP (DO-220AA) |
| Circuit configuration | Single |

| PACKAGE | | | | |
|----------------|--------|--------------------------------------|-----------------------------------|--------------------------|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
| SMP (DO-220AA) | 24 mg | UL 94 V-0 | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |

| MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted) | | | |
|--|------------------|-------------|------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Power dissipation at T _L = 75 °C (fig. 1) ⁽¹⁾ | P _{tot} | 1500 | mW |
| Power dissipation at T _A = 25 °C (fig. 1) ⁽²⁾ | P _{tot} | 600 | mW |
| Maximum instantaneous forward voltage at 200 mA for all types ⁽³⁾ | V _F | 1.5 | V |
| Operating junction temperature | T _J | 150 | °C |
| Storage temperature range | T _{STG} | -65 to +150 | °C |

Notes

⁽¹⁾ Mounted on PCB with 5.0 mm x 5.0 mm copper pads attached to each terminal

⁽²⁾ Mounted on minimum recommended pad layout

⁽³⁾ Pulse test: 300 μs pulse width, 1 % duty cycle



| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | |
|--|---------------------|-----------------------------------|------|------|-----------------|------------------------------------|----------------------------------|------|
| PART NUMBER | DEVICE MARKING CODE | ZENER VOLTAGE RANGE | | | TEST CURRENT | MAXIMUM ZENER DYNAMIC IMPEDANCE | MAXIMUM REVERSE LEAKAGE CURRENT | |
| | | V _Z AT I _{ZT} | | | I _{ZT} | Z _{ZT} AT I _{ZT} | I _R at V _R | |
| | | V | | | mA | Ω | μA | V |
| | | MIN. | NOM. | MAX. | | MAX. | MAX. | |
| PTV 3.9B | VB | 3.9 | 4.2 | 4.4 | 40 | 15 | 20 | 1.0 |
| PTV 4.3B | VC | 4.3 | 4.6 | 4.8 | 40 | 15 | 20 | 1.0 |
| PTV 4.7B | VD | 4.7 | 5.0 | 5.2 | 40 | 10 | 20 | 1.0 |
| PTV 5.1B | VE | 5.1 | 5.4 | 5.7 | 40 | 8 | 20 | 1.0 |
| PTV 5.6B | VF | 5.6 | 6.0 | 6.3 | 40 | 8 | 20 | 1.5 |
| PTV 6.2B | VG | 6.2 | 6.6 | 7.0 | 40 | 6 | 20 | 3.0 |
| PTV 6.8B | VH | 6.8 | 7.3 | 7.7 | 40 | 6 | 50 | 3.5 |
| PTV 7.5B | VI | 7.5 | 8.0 | 8.4 | 40 | 4 | 20 | 4.0 |
| PTV 8.2B | VJ | 8.2 | 8.8 | 9.3 | 40 | 4 | 20 | 5.0 |
| PTV 9.1B | VK | 9.1 | 9.7 | 10.2 | 40 | 6 | 20 | 6.0 |
| PTV 10B | VL | 10.0 | 10.6 | 11.2 | 40 | 6 | 10 | 7.0 |
| PTV 11B | VM | 11.0 | 11.7 | 12.3 | 20 | 8 | 10 | 8.0 |
| PTV 12B | VN | 12.0 | 12.8 | 13.5 | 20 | 8 | 10 | 9.0 |
| PTV 13B | VO | 13.3 | 14.2 | 15.0 | 20 | 10 | 10 | 10.0 |
| PTV 15B | VP | 14.7 | 15.6 | 16.5 | 20 | 10 | 10 | 11.0 |
| PTV 16B | VQ | 16.2 | 17.3 | 18.3 | 20 | 12 | 10 | 12.0 |
| PTV 18B | VR | 18.0 | 19.2 | 20.3 | 20 | 12 | 10 | 13.0 |
| PTV 20B | VS | 20.0 | 21.2 | 22.4 | 20 | 14 | 10 | 15.0 |
| PTV 22B | VT | 22.0 | 23.3 | 24.5 | 10 | 14 | 10 | 17.0 |
| PTV 24B | VU | 24.0 | 25.8 | 27.6 | 10 | 16 | 10 | 19.0 |
| PTV 27B | VV | 27.0 | 28.9 | 30.8 | 10 | 16 | 10 | 21.0 |
| PTV 30B | VX | 30.0 | 32.0 | 34.0 | 10 | 18 | 10 | 23.0 |
| PTV 33B | VY | 33.0 | 35.0 | 37.0 | 10 | 18 | 10 | 25.0 |
| PTV 36B | VZ | 36.0 | 38.0 | 40.0 | 10 | 20 | 10 | 27.0 |

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | |
|---|------------------|-------|------|
| PARAMETER | SYMBOL | LIMIT | UNIT |
| Typical thermal resistance, junction to lead ⁽¹⁾ | R _{θJL} | 50 | °C/W |
| Typical thermal resistance, junction to ambient ⁽²⁾ | R _{θJA} | 208 | °C/W |

Notes

- ⁽¹⁾ Mounted on PCB with 5.0 mm x 5.0 mm copper pad areas attached to each terminal
- ⁽²⁾ Mounted on minimum recommended pad layout

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| PTV7.5B-M3/84A | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| PTV7.5B-M3/85A | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |

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

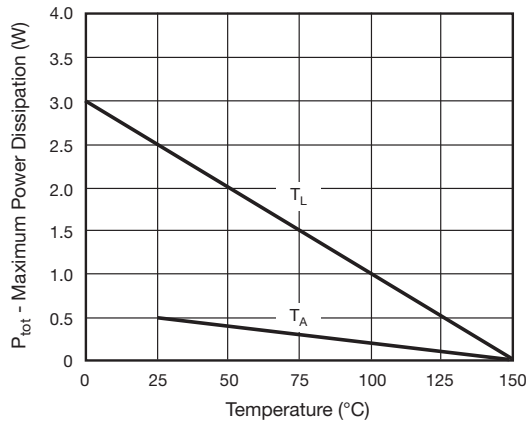


Fig. 1 - Steady State Power Derating

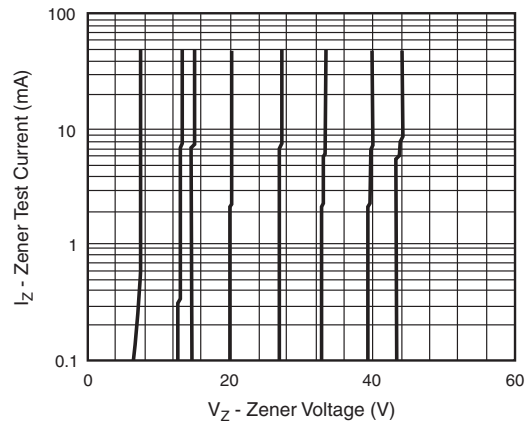


Fig. 3 - Typical Zener Voltage

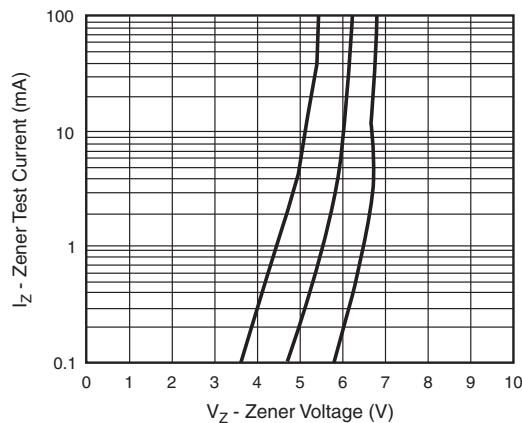
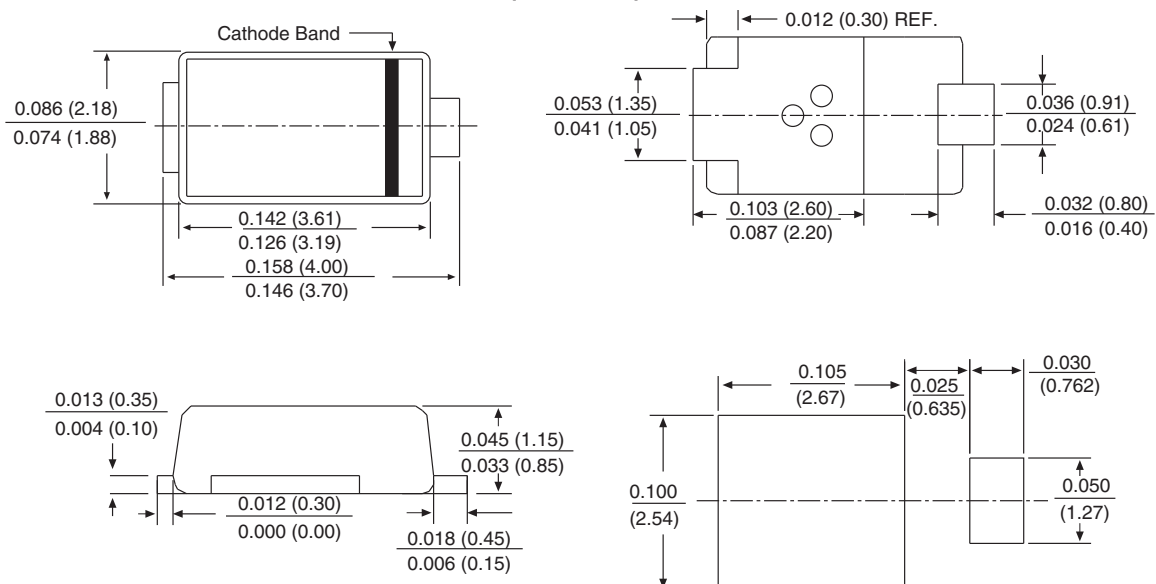


Fig. 2 - Typical Zener Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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