

## 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](http://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 <sub>Z</sub> nom.	4.2 V to 38 V
P <sub>tot</sub> at T <sub>L</sub> = 75 °C	1500 mW
P <sub>tot</sub> at T <sub>L</sub> = 25 °C	600 mW
T <sub>J</sub> max.	150 °C
V <sub>Z</sub> 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 <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Power dissipation at T <sub>L</sub> = 75 °C (fig. 1) <sup>(1)</sup>	P <sub>tot</sub>	1500	mW
Power dissipation at T <sub>A</sub> = 25 °C (fig. 1) <sup>(2)</sup>	P <sub>tot</sub>	600	mW
Maximum instantaneous forward voltage at 200 mA for all types <sup>(3)</sup>	V <sub>F</sub>	1.5	V
Operating junction temperature	T <sub>J</sub>	150	°C
Storage temperature range	T <sub>STG</sub>	-65 to +150	°C

#### Notes

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

<sup>(2)</sup> Mounted on minimum recommended pad layout

<sup>(3)</sup> Pulse test: 300 μs pulse width, 1 % duty cycle



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)								
PART NUMBER	DEVICE MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT	MAXIMUM ZENER DYNAMIC IMPEDANCE	MAXIMUM REVERSE LEAKAGE CURRENT	
		V <sub>Z</sub> AT I <sub>ZT</sub>			I <sub>ZT</sub>	Z <sub>ZT</sub> AT I <sub>ZT</sub>	I <sub>R</sub> at V <sub>R</sub>	
		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 <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Typical thermal resistance, junction to lead <sup>(1)</sup>	R <sub>θJL</sub>	50	°C/W
Typical thermal resistance, junction to ambient <sup>(2)</sup>	R <sub>θJA</sub>	208	°C/W

Notes

- <sup>(1)</sup> Mounted on PCB with 5.0 mm x 5.0 mm copper pad areas attached to each terminal
- <sup>(2)</sup> 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)

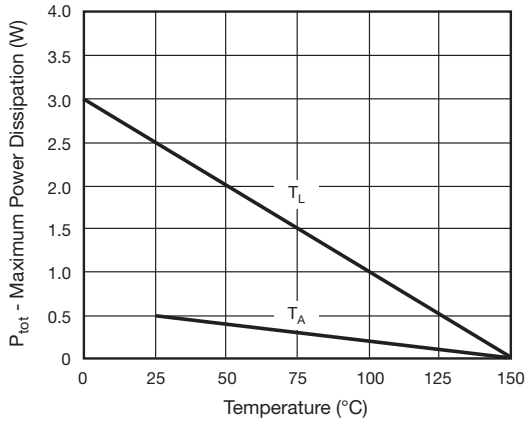


Fig. 1 - Steady State Power Derating

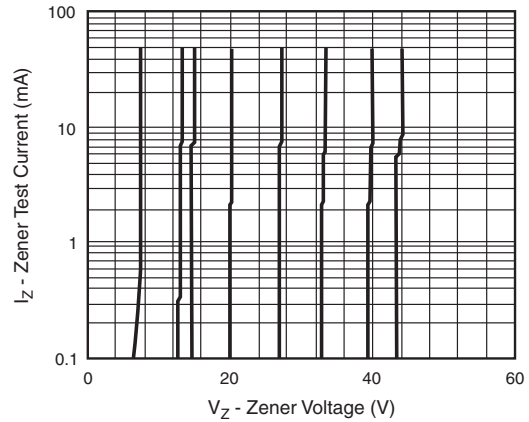


Fig. 3 - Typical Zener Voltage

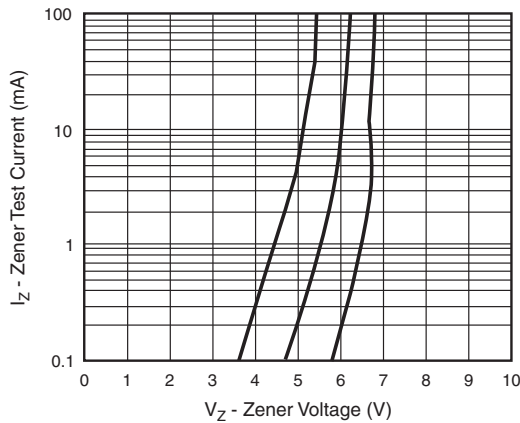
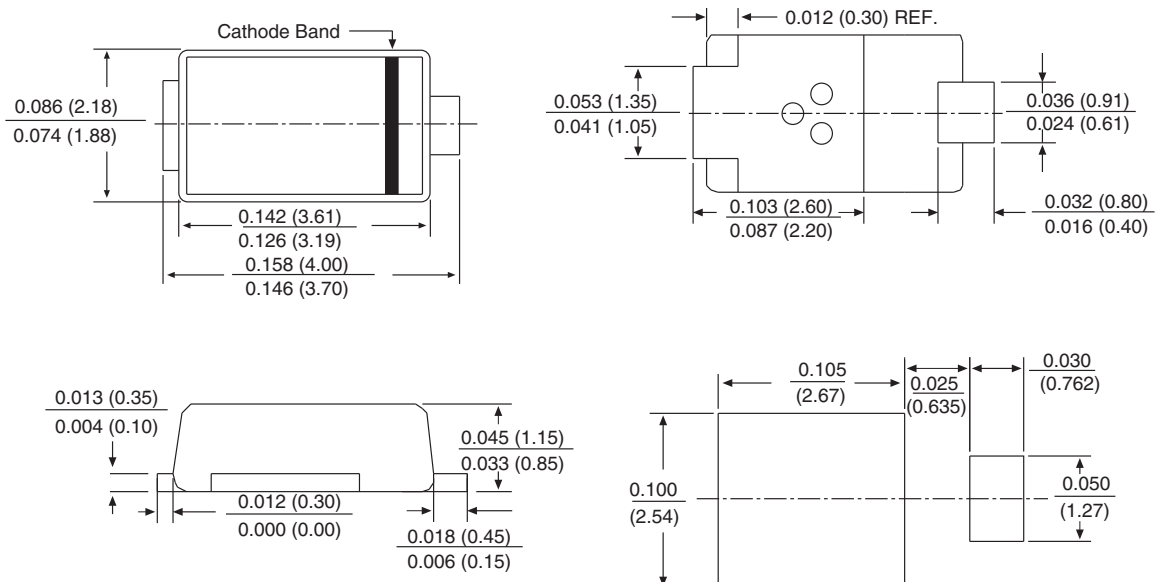


Fig. 2 - Typical Zener Voltage

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SMP (DO-220AA)**





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