

Surface Mount Power Voltage-Regulating Diodes

eSMP® Series



DO-220AA (SMP)



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

MECHANICAL DATA

Case: DO-220AA (SMP)

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

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS

V_Z nom.	4.2 V to 38 V
P_{tot} at $T_L = 75\text{ °C}$	1500 mW
P_{tot} at $T_L = 25\text{ °C}$	600 mW
T_J max.	150 °C
V_Z specification	Pulse current
Int. construction	Single

TYPICAL APPLICATIONS

For general purpose regulation and protection applications.

PACKAGE

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

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

PARAMETER	SYMBOL	VALUE	UNIT
Power dissipation at $T_L = 75\text{ °C}$ (fig. 1) ⁽¹⁾	P_{tot}	1500	mW
Power dissipation at $T_A = 25\text{ °C}$ (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** ($T_A = 25\text{ }^{\circ}\text{C}$ 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 ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Typical thermal resistance, junction to lead ⁽¹⁾	$R_{\theta JL}$	50	$^{\circ}\text{C/W}$
Typical thermal resistance, junction to ambient ⁽²⁾	$R_{\theta JA}$	208	$^{\circ}\text{C/W}$

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)

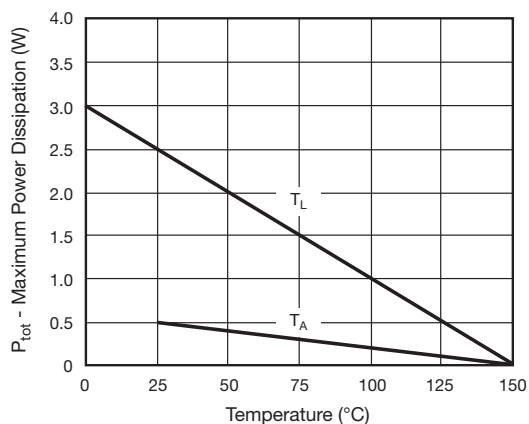


Fig. 1 - Steady State Power During

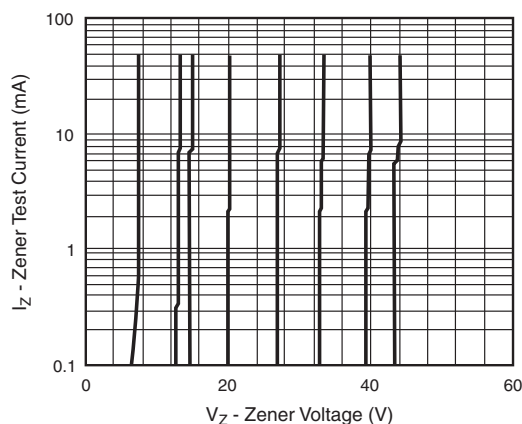


Fig. 3 - Typical Zener Voltage

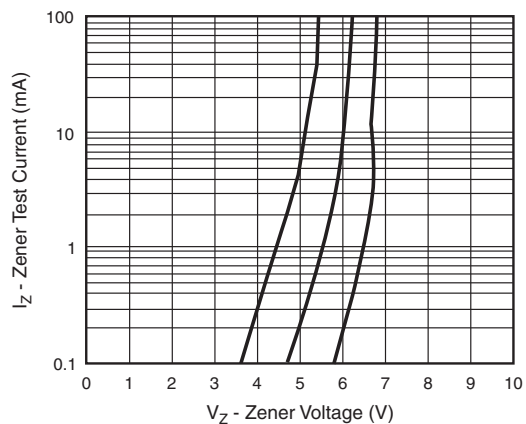
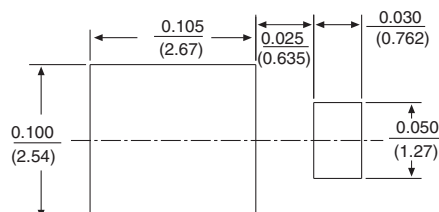
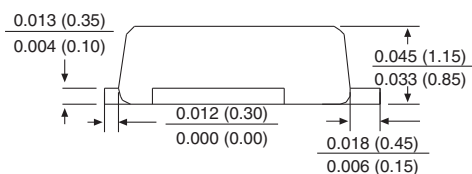
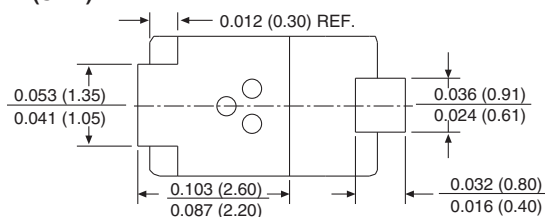
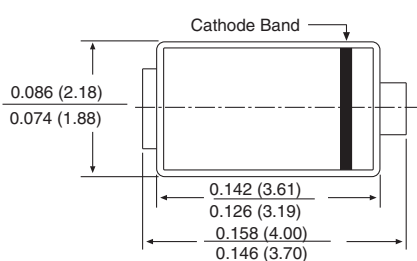


Fig. 2 - Typical Zener Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.