Surface Mount Power Voltage-Regulating Diodes

eSMP® Series



SMP (DO-220AA)

Anode ○—▶|—○ Cathode

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
V_Z	5.6 V to 43 V
P_{tot} at T_L = 75 °C	1500 mW
P_{tot} at T_L = 25 °C	500 mW
T_J max.	150 °C
V_Z specification	Pulse current
Package	SMP (DO-220AA)
Circuit configuration	Single

FEATURES

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

RoHS COMPLIANT
HALOGEN FREE

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

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}	500	mW
Maximum instantaneous forward voltage at 200 mA for all types (3)	V_F	1.5	V
Operating junction and storage temperature range	T_J, 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

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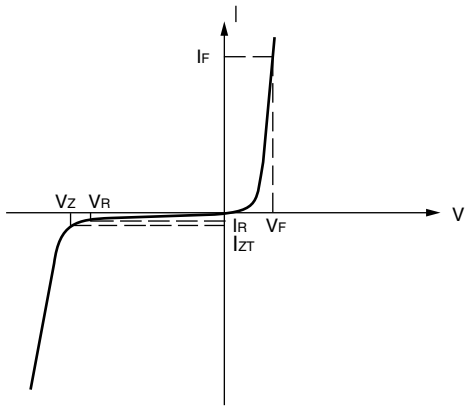
ELECTRICAL CHARACTERISTICS	
SYMBOL	**PARAMETER**
V_Z	Reverse Zener voltage at I_{ZT}
I_{ZT}	Reverse current
Z_{ZT}	Maximum Zener impedance at I_{ZT}
I_{ZK}	Reverse current
Z_{ZK}	Maximum Zener impedance at I_{ZK}
I_R	Reverse leakage current at V_R
VR	Reverse voltage
I_F	Forward current
V_F	Forward voltage at I_F
I_{ZM}	Maximum DC Zener current



Zener Voltage Regulator

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PART NUMBER	DEVICE MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT		MAXIMUM ZENER IMPEDANCE		MAXIMUM REVERSE LEAKAGE CURRENT		MAXIMUM ZENER CURRENT
		V_Z at I_{ZT}			I_{ZT}	I_{ZK}	Z_{ZT} AT I_{ZT}	Z_{ZK} AT I_{ZK}	I_R AT V_R		I_{ZM}
		V			mA		Ω		µA	V	mA
		MIN.	NOM.	MAX.			MAX.	MAX.	MAX.		MAX.
SMPZ3919B	19B	5.32	5.6	5.88	66.9	1.0	5.0	700	200	3.0	268
SMPZ3920B	20B	5.89	6.2	6.51	60.5	1.0	2.0	700	200	4.0	242
SMPZ3921B	21B	6.46	6.8	7.14	55.1	1.0	2.5	400	200	5.2	221
SMPZ3922B	22B	7.12	7.5	7.88	50.0	0.5	3.0	400	150	6.0	200
SMPZ3923B	23B	7.79	8.2	8.61	45.7	0.5	3.5	400	50	6.5	183
SMPZ3924B	24B	8.64	9.1	9.56	41.2	0.5	4.0	500	10	7.0	165
SMPZ3925B	25B	9.5	10	10.5	37.5	0.25	4.5	500	2.5	8.0	150
SMPZ3926B	26B	10.5	11	11.6	34.1	0.25	5.5	550	0.5	8.4	136
SMPZ3927B	27B	11.4	12	12.6	31.2	0.25	6.5	550	0.5	9.1	125
SMPZ3928B	28B	12.4	13	13.7	28.8	0.25	7.0	550	0.5	9.9	115
SMPZ3929B	29B	14.3	15	15.8	25	0.25	9.0	600	0.5	11.4	100
SMPZ3930B	30B	15.2	16	16.8	23.4	0.25	10.0	600	0.5	12.2	94
SMPZ3931B	31B	17.1	18	18.9	20.8	0.25	12.0	650	0.5	13.7	83
SMPZ3932B	32B	19.0	20	21	18.7	0.25	14.0	650	0.5	15.2	75
SMPZ3933B	33B	20.9	22	23.1	17.0	0.25	17.5	650	0.5	16.7	68
SMPZ3934B	34B	22.8	24	25.2	15.6	0.25	19.0	700	0.5	18.2	63
SMPZ3935B	35B	25.7	27	28.4	13.9	0.25	23.0	700	0.5	20.6	56
SMPZ3936B	36B	28.5	30	31.5	12.5	0.25	26.0	750	0.5	22.8	50
SMPZ3937B	37B	31.4	33	34.7	11.4	0.25	33.0	800	0.5	25.1	45
SMPZ3938B	38B	34.2	36	37.8	10.4	0.25	38.0	850	0.5	27.4	42
SMPZ3939B	39B	37.1	39	41	9.6	0.25	45.0	900	0.5	29.7	38
SMPZ3940B	40B	40.9	43	45.2	8.7	0.25	53.0	950	0.5	32.7	35

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Typical thermal resistance, junction to lead (1)	$R_{\theta JL}$	50	°C/W
Typical thermal resistance, junction to ambient (2)	$R_{\theta JA}$	250	°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

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ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMPZ3919B-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SMPZ3919B-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

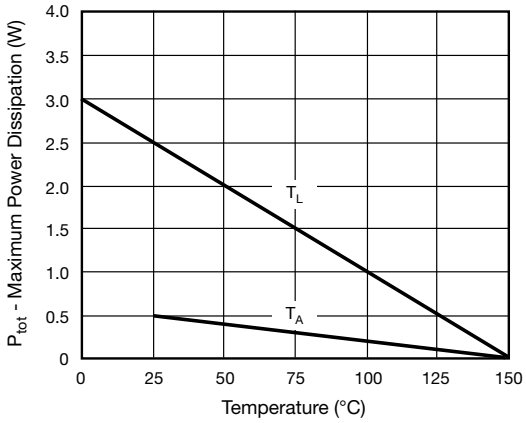

Fig. 1 - Steady State Power Derating

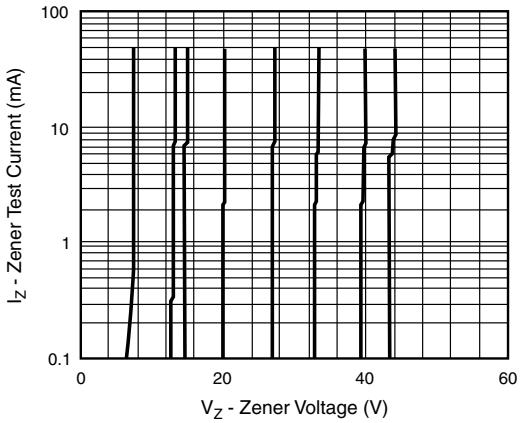

Fig. 3 - Typical Zener Voltage

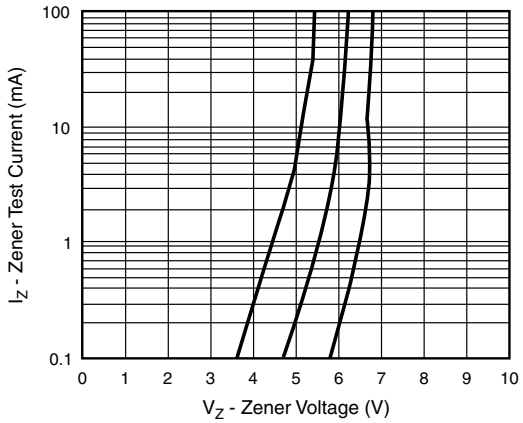

Fig. 2 - Typical Zener Voltage

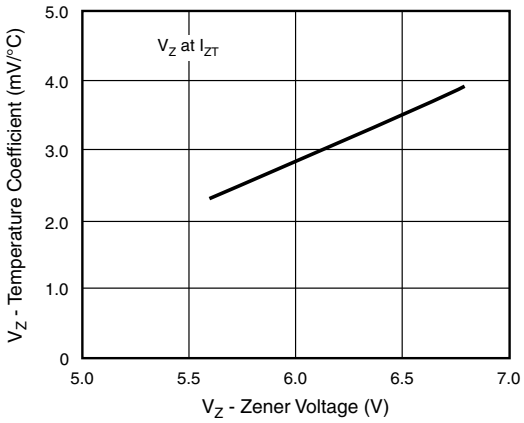

Fig. 4 - Typical temperature Coefficients

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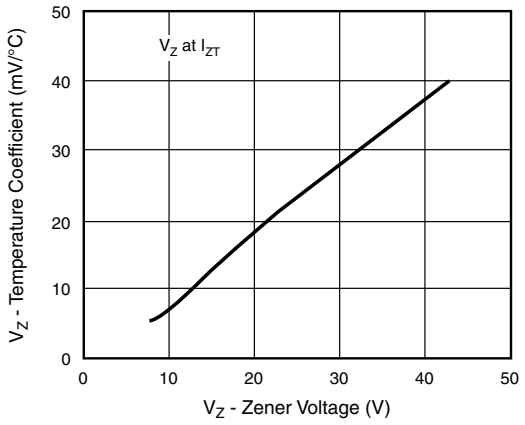

Fig. 5 - Typical Transient Temperature Coefficients

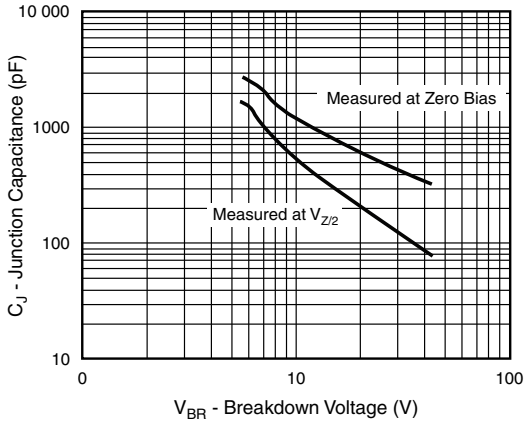

Fig. 6 - Typical Junction Capacitance

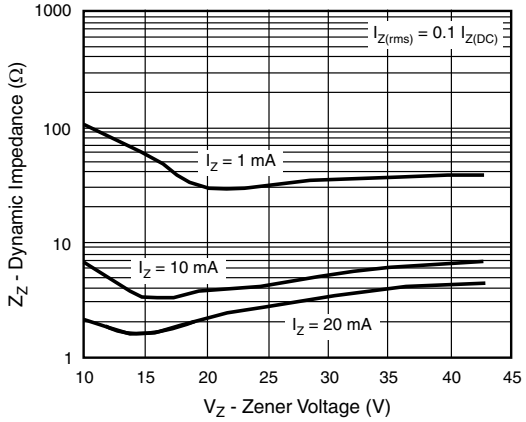

Fig. 7 - Typical Zener Impedance

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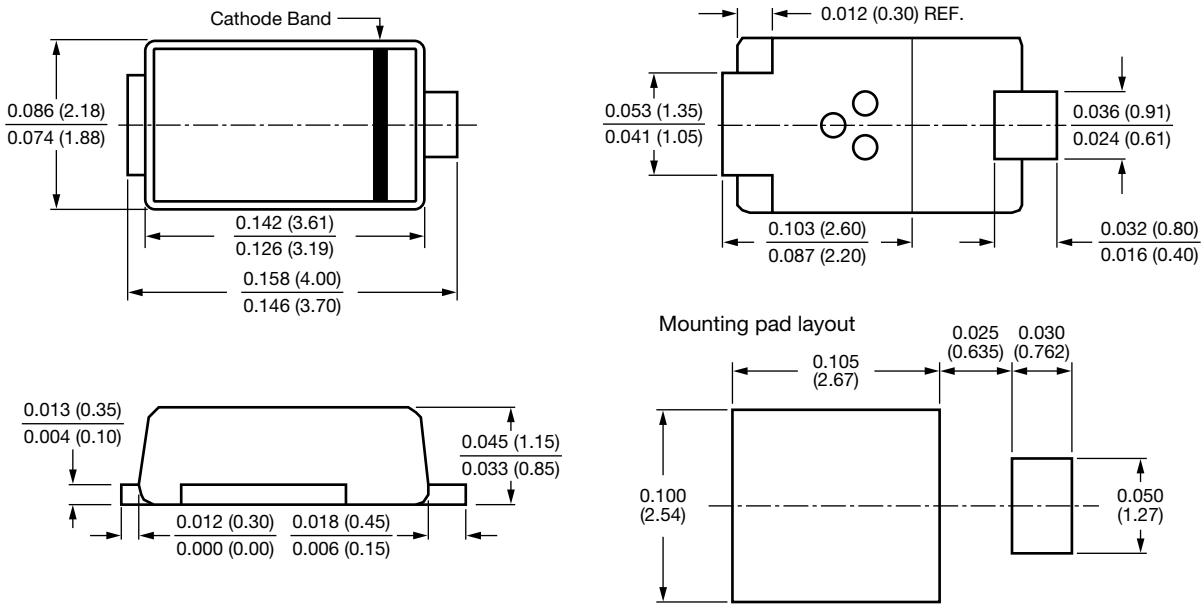
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)



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