



**THE DATASHEET OF  
SMBZ5928B-E3/5B**





## Surface Mount Power Voltage-Regulating Diodes



SMB (DO-214AA)

### DESIGN SUPPORT TOOLS AVAILABLE



PRIMARY CHARACTERISTICS	
$V_Z$	5.6 V to 85 V
$P_{tot}$ at $T_L = 75\text{ }^\circ\text{C}$	3000 mW
$P_{tot}$ at $T_A = 25\text{ }^\circ\text{C}$	550 mW
$T_J$ max.	150 $^\circ\text{C}$
$V_Z$ specification	Pulse current
Circuit configuration	Single

### TYPICAL APPLICATIONS

For general purpose regulation, industrial, and protection applications.

### FEATURES

- Low profile package
- Ideal for automated placement
- Low Zener impedance
- Low regulation factor
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260  $^\circ\text{C}$
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

### MECHANICAL DATA

Case: SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant and industrial grade

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

E3 suffix meets JESD 201 class 1A whisker test

**Polarity:** color band denotes cathode end

MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Maximum steady state power dissipation at $T_L = 75\text{ }^\circ\text{C}$ (fig. 1)	$P_{tot}$	3000	mW
Maximum steady state power dissipation at $T_A = 25\text{ }^\circ\text{C}$ (fig. 1) <sup>(1)</sup>	$P_{tot}$	550	mW
Maximum instantaneous forward voltage at 200 mA for all types <sup>(2)</sup>	$V_F$	1.5	V
Operating junction and storage temperature range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

### Notes

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

<sup>(2)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle



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 $V_R$
$V_R$	Reverse voltage
$I_F$	Forward current
$V_F$	Forward voltage at $I_F$
$I_{ZM}$	Maximum DC Zener current



Zener Voltage Regulator

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)											
PART NUMBER	DEVICE MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT		MAXIMUM ZENER IMPEDANCE		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		$\Omega$		$\mu\text{A}$	V	mA
		MIN.	NOM.	MAX.			MAX.	MAX.	MAX.		MAX.
SMBZ5919B	19B	5.32	5.6	5.88	66.9	1.0	5.0	700	200	3.0	267
SMBZ5920B	20B	5.89	6.2	6.51	60.5	1.0	2.0	700	200	4.0	241
SMBZ5921B	21B	6.46	6.8	7.14	55.1	1.0	2.5	400	200	5.2	220
SMBZ5924B	24B	8.64	9.1	9.56	41.2	0.5	4.0	1000	25	7.0	164
SMBZ5925B	25B	9.5	10	10.5	37.5	0.25	4.5	1000	25	8.0	150
SMBZ5926B	26B	10.5	11	11.6	34.1	0.25	5.5	550	5	8.4	136
SMBZ5927B	27B	11.4	12	12.6	31.2	0.25	6.5	550	1	9.1	125
SMBZ5928B	28B	12.4	13	13.7	28.8	0.25	7.0	550	1	9.9	115
SMBZ5929B	29B	14.3	15	15.8	25.0	0.25	9.0	600	1	11.4	100
SMBZ5930B	30B	15.2	16	16.8	23.4	0.25	10.0	600	1	12.2	93
SMBZ5931B	31B	17.1	18	18.9	20.8	0.25	12.0	650	1	13.7	83
SMBZ5932B	32B	19.0	20	21.0	18.7	0.25	14.0	650	1	15.2	75
SMBZ5933B	33B	20.9	22	23.1	17.0	0.25	17.5	650	1	16.7	68
SMBZ5934B	34B	22.8	24	25.2	15.6	0.25	19.0	700	1	18.2	62
SMBZ5935B	35B	25.7	27	28.4	13.9	0.25	23.0	700	1	20.6	55
SMBZ5936B	36B	28.5	30	31.5	12.5	0.25	28.0	750	1	22.8	50
SMBZ5937B	37B	31.4	33	34.7	11.4	0.25	33.0	800	1	25.1	45
SMBZ5938B	38B	34.2	36	37.8	10.4	0.25	38.0	850	1	27.4	41
SMBZ5939B	39B	37.1	39	41.0	9.6	0.25	45.0	900	1	29.7	38
SMBZ5940B	40B	40.9	43	45.2	8.7	0.25	53.0	950	1	32.7	34
SMBZ5941B	41B	44.6	47	49.4	8.0	0.25	67.0	1000	1	35.8	31
SMBZ5942B	42B	48.4	51	53.6	7.3	0.25	70.0	1100	1	38.8	29
SMBZ5943B	43B	53.2	56	58.8	6.7	0.25	86.0	1300	1	42.6	26
SMBZ5944B	44B	58.9	62	65.1	6.0	0.25	100	1500	1	47.1	24
SMBZ5945B	45B	64.6	68	71.4	5.5	0.25	120	1700	1	51.7	22



THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Typical thermal resistance, junction to lead	$R_{\theta JL}$	25	$^\circ\text{C/W}$
Typical thermal resistance, junction to ambient <sup>(1)</sup>	$R_{\theta JA}$	226	$^\circ\text{C/W}$

**Note**

(1) Mounted on minimum recommended pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMBZ5935B-E3/52	0.096	52	750	7" diameter plastic tape and reel
SMBZ5935B-E3/5B	0.096	5B	3200	13" diameter plastic tape and reel

**RATINGS AND CHARACTERISTICS CURVES**

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

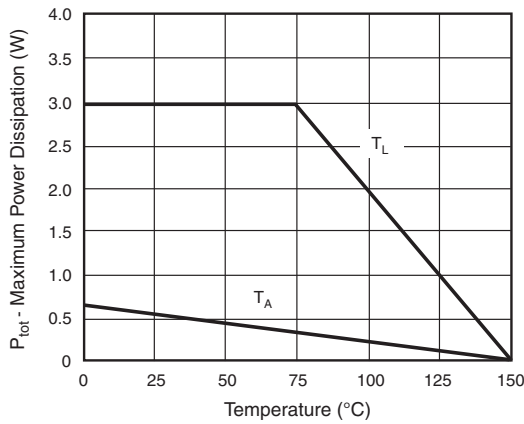


Fig. 1 - Steady State Power DURING

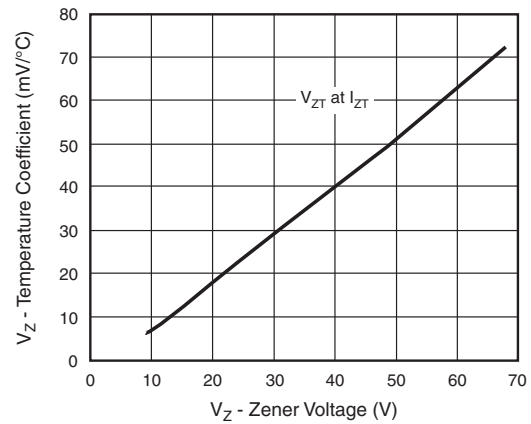


Fig. 3 - Typical Temperature Coefficients

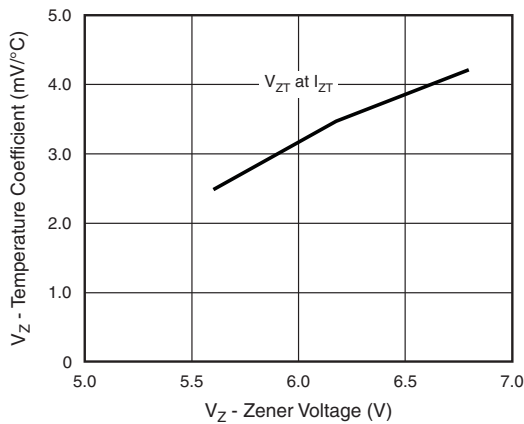


Fig. 2 - Typical Temperature Coefficients

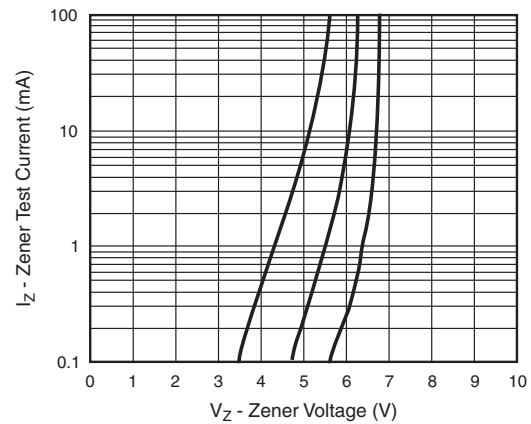


Fig. 4 - Typical Zener Voltage

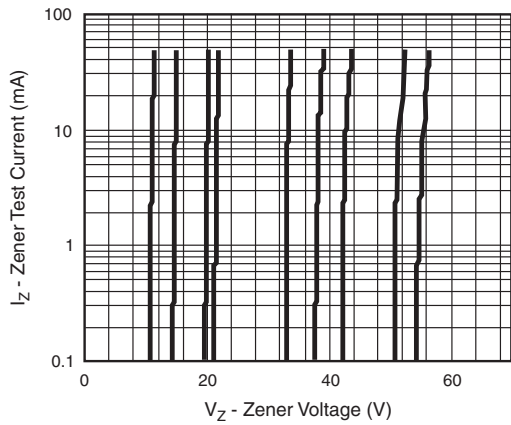


Fig. 5 - Typical Zener Voltage

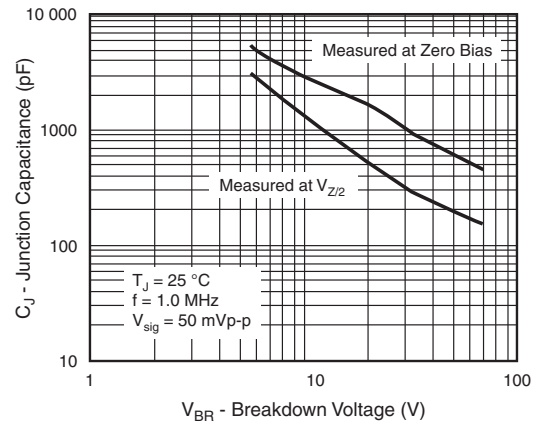
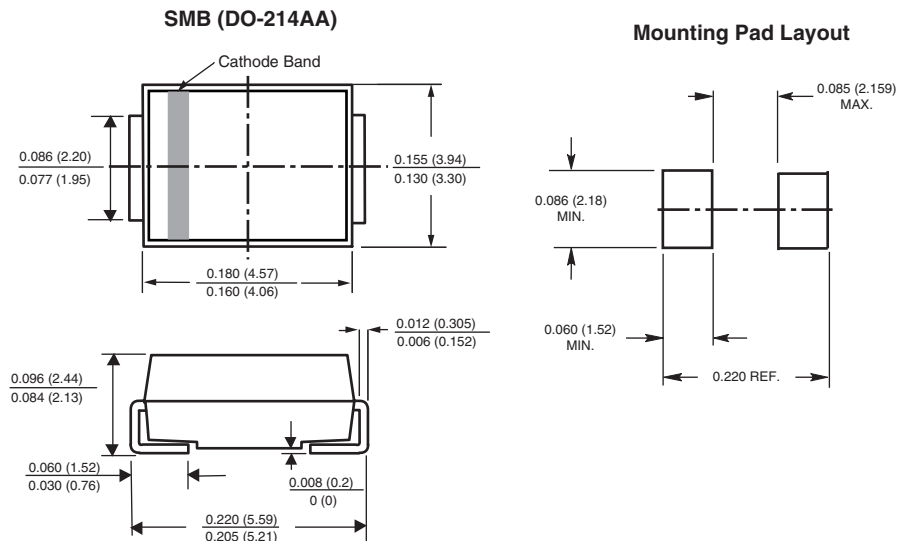


Fig. 7 - Typical Junction Capacitance



Fig. 6 - Typical Zener Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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