

**MOTOROLA**  
**SEMICONDUCTOR**  
**TECHNICAL DATA**

T-11-15

**1.5 Watt Plastic Surface Mount  
Silicon Zener Diodes****1SMB5913A, B  
thru  
1SMB5956A, B**

... a completely new line of 1.5 Watt Zener Diodes offering the following advantages:

- A Complete Voltage Range — 3.3 to 200 Volts
- Flat Handling Surface for Accurate Placement
- Package Design for Top Side or Bottom Circuit Board Mounting
- Available in Tape and Reel

**PLASTIC SURFACE MOUNT  
ZENER DIODES  
1.5 WATTS  
3.3-200 VOLTS****Mechanical Characteristics:****CASE:** Void-free transfer-molded plastic**MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:** 230°C for 10 seconds**FINISH:** All external surfaces are corrosion resistant with readily solderable leads**POLARITY:** Cathode indicated by molded polarity notch. When operated in zener mode, cathode will be positive with respect to anode.**MOUNTING POSITION:** Any**LEADS:** Modified L-Bend providing more contact area to bond pad**CASE 403A-01****MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
DC Power Dissipation @ $T_L = 75^\circ\text{C}$ , Measured at Zero Lead Length Derate above $75^\circ\text{C}$	$P_D$	1.5 12	Watts $\text{mW}/^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +175	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS** ( $T_L = 30^\circ\text{C}$  unless otherwise noted.) ( $V_F = 1.5$  Volts Max @  $I_F = 200$  mAdc for all types.)

Device*	Nominal Zener Voltage $V_Z$ @ $I_{ZT}$ Volts	Test Current $I_{ZT}$ mA	Max. Zener Impedance			Max. Reverse Leakage Current $I_R$ @ $V_R$ $\mu\text{A}$ Volts		Maximum DC Zener Current $I_{ZM}$ mAdc	Device Marking
			$Z_{ZT}$ @ $I_{ZT}$ Ohms	$Z_{ZK}$ Ohms	@ $I_{ZK}$ mA				
1SMB5913A	3.3	113.6	10	500	1.0	100	1.0	454	13A
1SMB5914A	3.6	104.2	9.0	500	1.0	75	1.0	416	14A
1SMB5915A	3.9	96.1	7.5	500	1.0	25	1.0	384	15A
1SMB5916A	4.3	87.2	6.0	500	1.0	5.0	1.0	348	16A
1SMB5917A	4.7	79.8	5.0	500	1.0	5.0	1.5	319	17A
1SMB5918A	5.1	73.5	4.0	350	1.0	5.0	2.0	294	18A
1SMB5919A	5.6	66.9	2.0	250	1.0	5.0	3.0	267	19A
1SMB5920A	6.2	60.5	2.0	200	1.0	5.0	4.0	241	20A
1SMB5921A	6.8	55.1	2.5	200	1.0	5.0	5.2	220	21A
1SMB5922A	7.5	50.0	3.0	400	0.5	5.0	6.8	200	22A
1SMB5923A	8.2	45.7	3.5	400	0.5	5.0	6.5	182	23A
1SMB5924A	9.1	41.2	4.0	500	0.5	5.0	7.0	164	24A

\*TOLERANCE AND VOLTAGE DESIGNATION Tolerance designation — The type numbers listed indicate a tolerance of  $\pm 10\%$ .  
Device tolerances of  $\pm 5\%$  are indicated by a "B" suffix.

(continued)

**MOTOROLA**

**ELECTRICAL CHARACTERISTICS — continued** ( $T_L = 30^\circ\text{C}$  unless otherwise noted.) ( $V_F = 1.5$  Volts Max @  $I_F = 200$  mA dc for all types.)

Device*	Nominal Zener Voltage $V_Z$ @ $I_{ZT}$ Volts	Test Current $I_{ZT}$ mA	Max. Zener Impedance			Max. Reverse Leakage Current $I_R$ @ $V_R$ $\mu\text{A}$ Volts		Maximum DC Zener Current $I_{ZM}$ mA dc	Device Marking
			$Z_{ZT}$ @ $I_{ZT}$ Ohms	$Z_{ZK}$ @ $I_{ZK}$ Ohms	$I_{ZK}$ mA				
1SMB5925A	10	37.5	4.5	500	0.25	5.0	8.0	150	25A
1SMB5926A	11	34.1	5.5	550	0.25	1.0	8.4	136	26A
1SMB5927A	12	31.2	6.5	550	0.25	1.0	9.1	125	27A
1SMB5928A	13	28.8	7.0	550	0.25	1.0	9.9	115	28A
1SMB5929A	15	25.0	9.0	600	0.25	1.0	11.4	100	29A
1SMB5930A	16	23.4	10	600	0.25	1.0	12.2	93	30A
1SMB5931A	18	20.8	12	650	0.25	1.0	13.7	83	31A
1SMB5932A	20	18.7	14	650	0.25	1.0	15.2	75	32A
1SMB5933A	22	17.0	17.5	650	0.25	1.0	16.7	68	33A
1SMB5934A	24	15.6	19	700	0.25	1.8	18.2	62	34A
1SMB5935A	27	13.9	23	700	0.25	1.0	20.6	55	35A
1SMB5936A	30	12.5	26	750	0.25	1.0	22.8	50	36A
1SMB5937A	33	11.4	33	800	0.25	1.0	25.1	45	37A
1SMB5938A	36	10.4	38	850	0.25	1.0	27.4	41	38A
1SMB5939A	39	9.6	45	900	0.25	1.0	29.7	38	39A
1SMB5940A	43	8.7	53	950	0.25	1.0	32.7	34	40A
1SMB5941A	47	8.0	67	1000	0.25	1.0	35.8	31	41A
1SMB5942A	51	7.3	70	1100	0.25	1.0	38.8	29	42A
1SMB5943A	56	6.7	86	1300	0.25	1.0	42.6	26	43A
1SMB5944A	62	6.0	100	1500	0.25	1.0	47.1	24	44A
1SMB5945A	68	5.5	120	1700	0.25	1.0	51.7	22	45A
1SMB5946A	75	5.0	140	2000	0.25	1.0	56.0	20	46A
1SMB5947A	82	4.6	160	2500	0.25	1.0	62.2	18	47A
1SMB5948A	91	4.1	200	3000	0.25	1.0	69.2	16	48A
1SMB5949A	100	3.7	250	3100	0.25	1.0	76.0	15	49A
1SMB5950A	110	3.4	300	4000	0.25	1.0	83.6	13	50A
1SMB5951A	120	3.1	380	4500	0.25	1.0	91.2	12	51A
1SMB5952A	130	2.9	450	5000	0.25	1.0	98.8	11	52A
1SMB5953A	150	2.5	600	6000	0.25	1.0	114	10	53A
1SMB5954A	160	2.3	700	6500	0.25	1.0	121.6	9.0	54A
1SMB5955A	180	2.1	900	7000	0.25	1.0	136.8	8.0	55A
1SMB5956A	200	1.9	1200	8000	0.25	1.0	152	7.0	56A

\*TOLERANCE AND VOLTAGE DESIGNATION — The type numbers listed indicate a tolerance of  $\pm 10\%$ .  
Device tolerances of  $\pm 5\%$  are indicated by a "B" suffix.

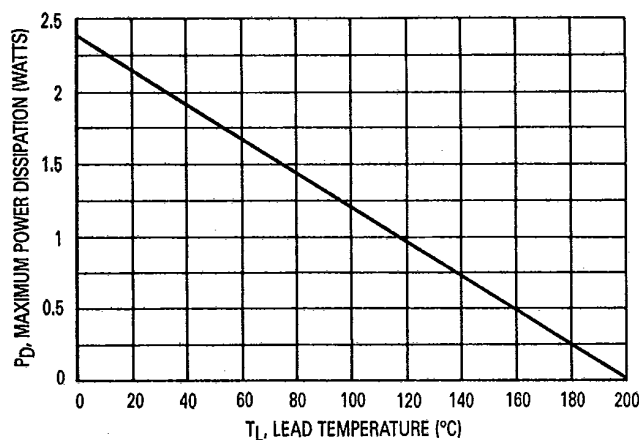


Figure 1. Steady State Power Derating

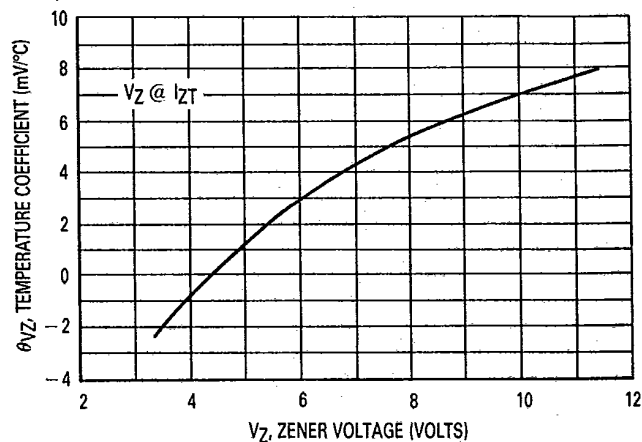


Figure 2. Zener Voltage — To 12 Volts

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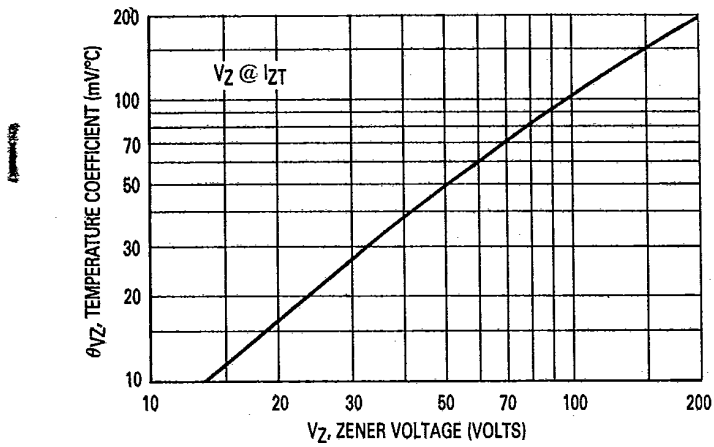


Figure 3. Zener Voltage — 14 To 200 Volts

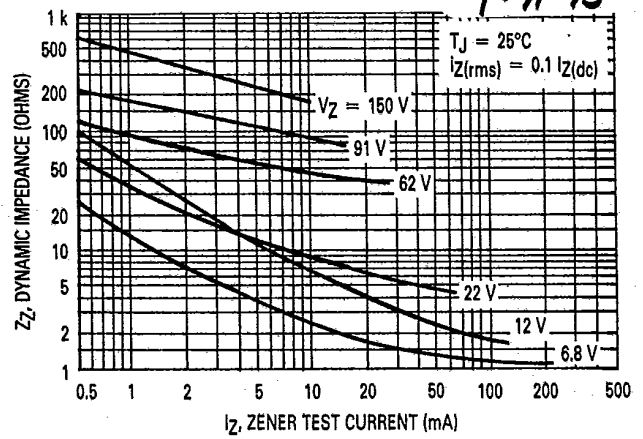


Figure 4. Effect of Zener Current

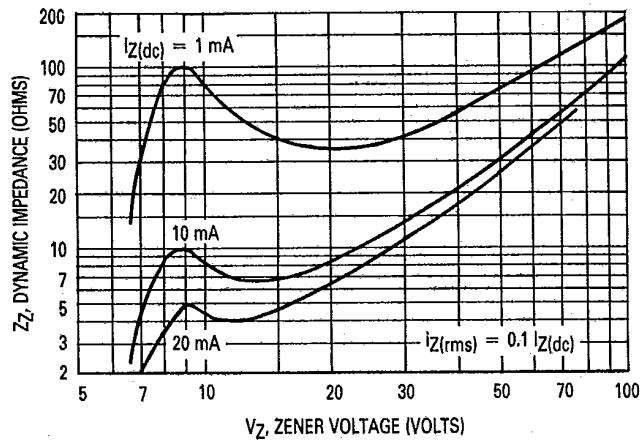
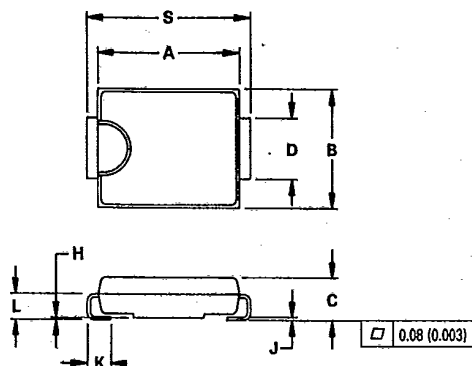


Figure 5. Effect of Zener Voltage

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## OUTLINE DIMENSIONS




## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.20	4.44	0.165	0.175
B	3.43	3.68	0.135	0.145
C	2.01	2.26	0.079	0.089
D	1.91	2.15	0.075	0.085
H	0.013	0.101	0.0005	0.0040
J	0.11	0.25	0.004	0.010
K	1.02	1.27	0.040	0.050
L	1.22	1.47	0.048	0.058
S	5.29	5.53	0.208	0.218

CASE 403A-01

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