

1SMB5913B THRU 1SMB5956B

ZENER DIODES

Zener Voltage: 3.3-200V Peak Pulse Power:3.0W

Specification Features:

- ◆ 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

Mechanical Characteristics:

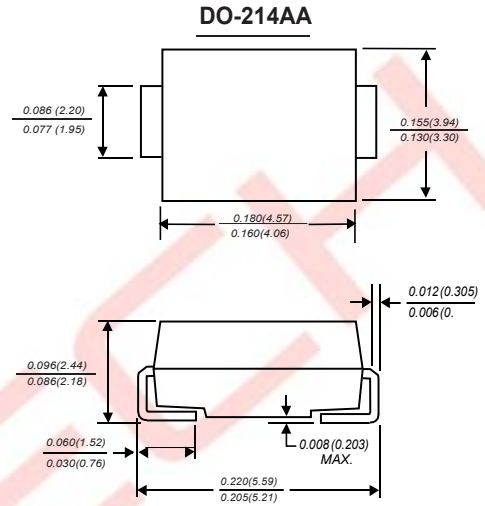
CASE: Void-free, transfer-molded plastic

MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES: 260°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



Dimensions in inches and (millimeters)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Power Dissipation @ $T_L = 75^\circ\text{C}$, Measured at Zero Lead Length Derate above 75°C	P_D	3 40	Watts $\text{mW}/^\circ\text{C}$
DC Power Dissipation @ $T_A = 25^\circ\text{C}^*$ Derate above 25°C	P_D	830 6.6	mW $\text{mW}/^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	- 65 to +150	$^\circ\text{C}$

*FR4 Board, within 1" to device, using Motorola minimum recommended footprint, as shown in case 403A outline dimensions spec.

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 (Note 1)	Test Current I_{ZT} mA	Max Zener Impedance (Note 2)			Max Reverse Leakage Current		Maximum DC Zener Current I_{ZM} mAdc	Device Marking
			Z_{ZT} @ I_{ZT} Ohms	Z_{ZK} @ Ohms	I_{ZK} mA	I_R @ V_R μA Volts			
1SMB5913B	3.3	113.6	10	500	1	100	1	454	913B
1SMB5914B	3.6	104.2	9	500	1	75	1	416	914B
1SMB5915B	3.9	96.1	7.5	500	1	25	1	384	915B
1SMB5916B	4.3	87.2	6	500	1	5	1	348	916B
1SMB5917B	4.7	79.8	5	500	1	5	1.5	319	917B
1SMB5918B	5.1	73.5	4	350	1	5	2	294	918B
1SMB5919B	5.6	66.9	2	250	1	5	3	267	919B
1SMB5920B	6.2	60.5	2	200	1	5	4	241	920B
1SMB5921B	6.8	55.1	2.5	200	1	5	5.2	220	921B
1SMB5922B	7.5	50	3	400	0.5	5	6.8	200	922B
1SMB5923B	8.2	45.7	3.5	400	0.5	5	6.5	182	923B
1SMB5924B	9.1	41.2	4	500	0.5	5	7	164	924B
1SMB5925B	10	37.5	4.5	500	0.25	5	8	150	925B
1SMB5926B	11	34.1	5.5	550	0.25	1	8.4	136	926B
1SMB5927B	12	31.2	6.5	550	0.25	1	9.1	125	927B
1SMB5928B	13	28.8	7	550	0.25	1	9.9	115	928B

*TOLERANCE AND VOLTAGE DESIGNATION Tolerance designation — The type numbers listed indicate a tolerance of $\pm 5\%$.

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ELECTRICAL CHARACTERISTICS continued ($T_L = 30^\circ\text{C}$ 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 (Note 1)	Test Current I _{ZT} mA	Max Zener Impedance (Note 2)			Max Reverse Leakage Current		Maximum DC Zener Current I _{ZM} mAdc	Device Marking
			Z _{ZT} @ I _{ZT} Ohms	Z _{ZK} @ Ohms	I _{ZK} mA	I _R @ V _R μA Volts			
1SMB5929B	15	25	9	600	0.25	1	11.4	100	929B
1SMB5930B	16	23.4	10	600	0.25	1	12.2	93	930B
1SMB5931B	18	20.8	12	650	0.25	1	13.7	83	931B
1SMB5932B	20	18.7	14	650	0.25	1	15.2	75	932B
1SMB5933B	22	17	17.5	650	0.25	1	16.7	68	933B
1SMB5934B	24	15.6	19	700	0.25	1	18.2	62	934B
1SMB5935B	27	13.9	23	700	0.25	1	20.6	55	935B
1SMB5936B	30	12.5	26	750	0.25	1	22.8	50	936B
1SMB5937B	33	11.4	33	800	0.25	1	25.1	45	937B
1SMB5938B	36	10.4	38	850	0.25	1	27.4	41	938B
1SMB5939B	39	9.6	45	900	0.25	1	29.7	38	939B
1SMB5940B	43	8.7	53	950	0.25	1	32.7	34	940B
1SMB5941B	47	8	67	1000	0.25	1	35.8	31	941B
1SMB5942B	51	7.3	70	1100	0.25	1	38.8	29	942B
1SMB5943B	56	6.7	86	1300	0.25	1	42.6	26	943B
1SMB5944B	62	6	100	1500	0.25	1	47.1	24	944B
1SMB5945B	68	5.5	120	1700	0.25	1	51.7	22	945B
1SMB5946B	75	5	140	2000	0.25	1	56	20	946B
1SMB5947B	82	4.6	160	2500	0.25	1	62.2	18	947B
1SMB5948B	91	4.1	200	3000	0.25	1	69.2	16	948B
1SMB5949B	100	3.7	250	3100	0.25	1	76	15	949B
1SMB5950B	110	3.4	300	4000	0.25	1	83.6	13	950B
1SMB5951B	120	3.1	380	4500	0.25	1	91.2	12	951B
1SMB5952B	130	2.9	450	5000	0.25	1	98.8	11	952B
1SMB5953B	150	2.5	600	6000	0.25	1	114	10	953B
1SMB5954B	160	2.3	700	6500	0.25	1	121.6	9	954B
1SMB5955B	180	2.1	900	7000	0.25	1	136.8	8	955B
1SMB5956B	200	1.9	1200	8000	0.25	1	152	7	956B

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Typical Characteristics Curves

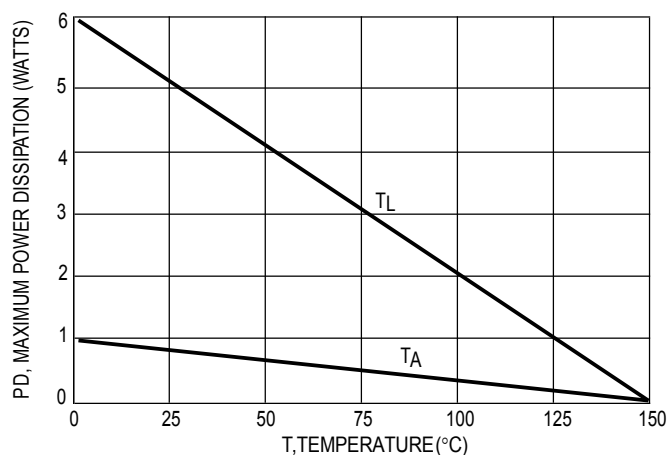


Figure 1. Steady State Power Derating

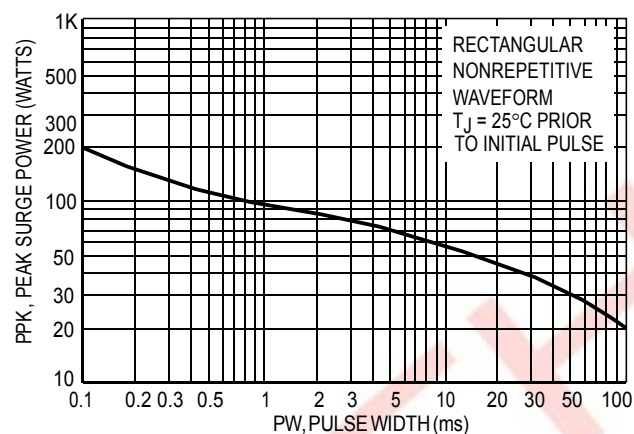


Figure 2. Maximum Surge Power

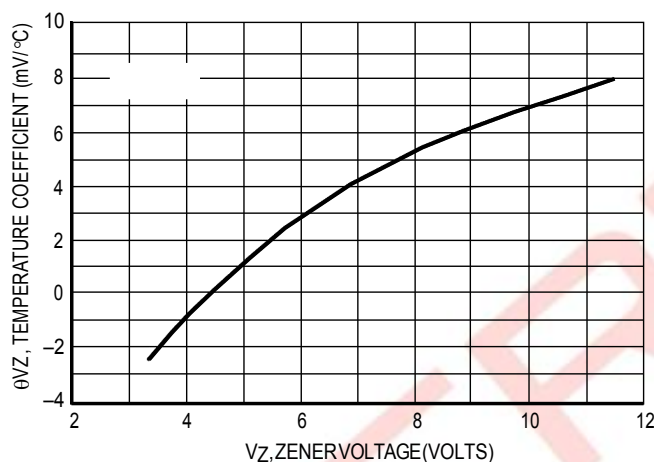


Figure 3. Zener Voltage — To 12 Volts

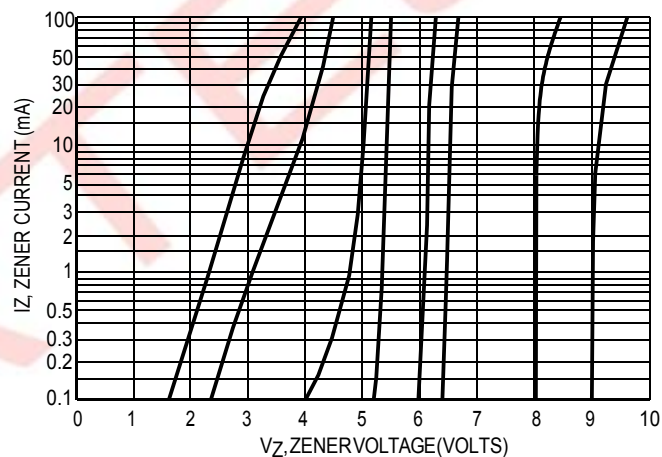


Figure 4. $V_Z = 3.3$ thru 10 Volts

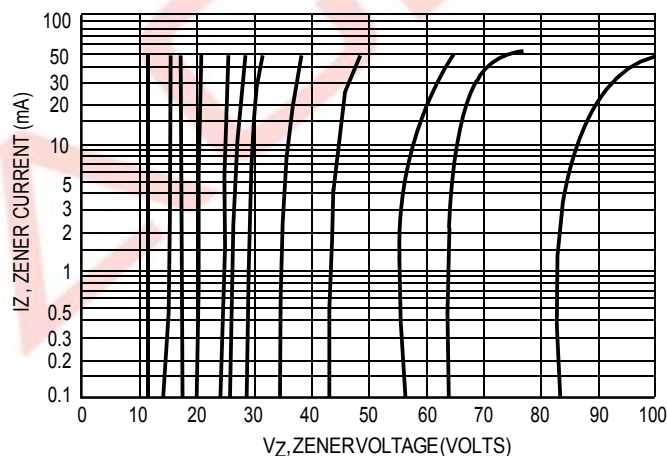


Figure 5. $V_Z = 12$ thru 82 Volts

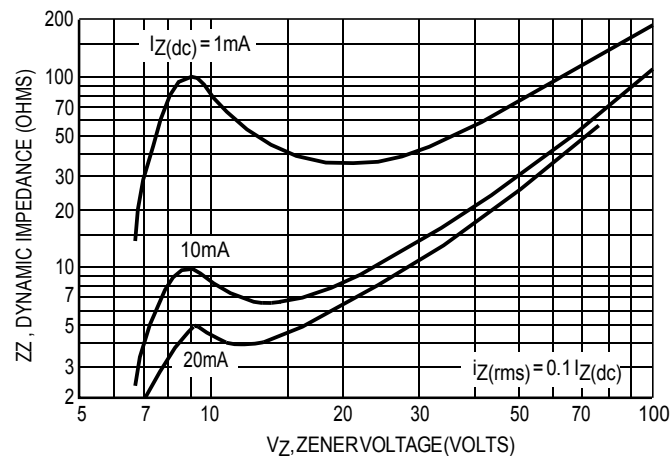


Figure 6. Effect of Zener Voltage

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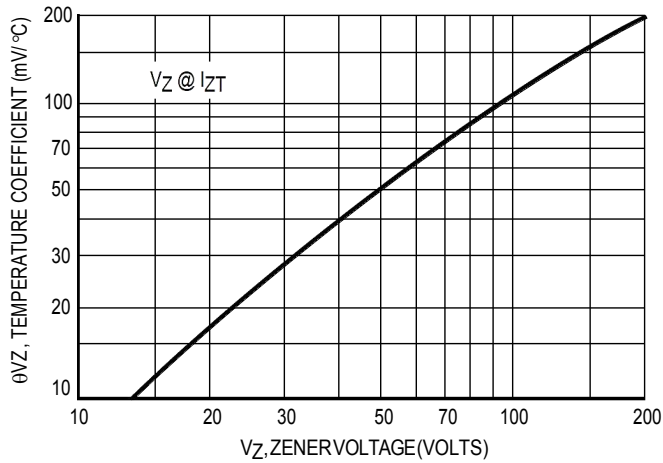


Figure 7. Zener Voltage — 14 To 200 Volts

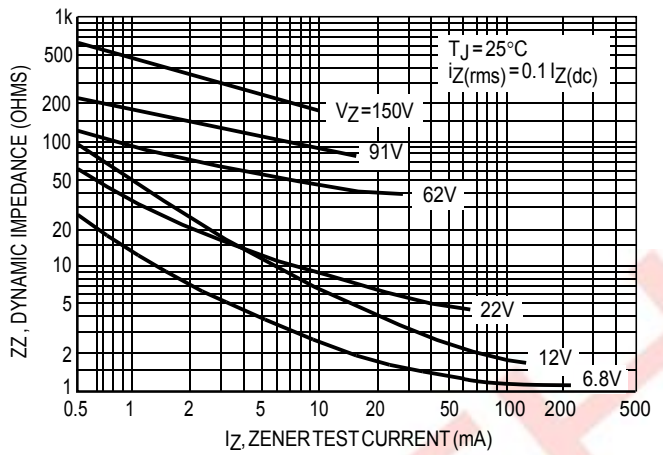


Figure 8. Effect of Zener Current

NOTE 1. ZENER VOLTAGE (V_Z) MEASUREMENT

Nominal zener voltage is measured with the device junction in thermal equilibrium with ambient temperature at 25°C.

NOTE 2. ZENER IMPEDANCE (Z_Z) DERIVATION

Z_{ZT} and Z_{ZK} are measured by dividing the ac voltage drop across the device by the ac current applied. The specified limits are for $I_Z(ac) = 0.1 I_Z(dc)$ with the ac frequency = 60 Hz.