3 Watt Plastic Surface Mount Silicon Zener Diodes

1SMB5913BT3 through 1SMB5956BT3

This complete new line of 3 Watt Zener Diodes offers the following advantages.

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
WEIGHT: Modified L-Bend providing more contact area to bond pad
WAFER FAB LOCATION: Phoenix, Arizona
ASSEMBLY/TEST LOCATION: Seremban, Malaysia

PLASTIC SURFACE MOUNT ZENER DIODES 3 WATTS 3.3–200 VOLTS

CASE 403A PLASTIC

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Power Dissipation @ T_L = 75°C, Measured at Zero Lead Length Derate above 75°C	P_D	3 40	Watts mW/°C
DC Power Dissipation @ T_A = 25°C* Derate above 25°C	P_D	830 6.6	mW mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	– 65 to +150	°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°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 µA	@ V_R Volts		
1SMB5913BT3	3.3	113.6	10	500	1	100	1	454	913B
1SMB5914BT3	3.6	104.2	9	500	1	75	1	416	914B
1SMB5915BT3	***3.9***	***96.1***	***7.5***	***500***	***1***	***25***	***1***	***384***	***915B***
1SMB5916BT3	***4.3***	***87.2***	***6***	***500***	***1***	***5***	***1***	***348***	***916B***
1SMB5917BT3	***4.7***	***79.8***	***5***	***500***	***1***	***5***	***1.5***	***319***	***917B***
1SMB5918BT3	***5.1***	***73.5***	***4***	***350***	***1***	***5***	***2***	***294***	***918B***
1SMB5919BT3	***5.6***	***66.9***	***2***	***250***	***1***	***5***	***3***	***267***	***919B***
1SMB5920BT3	***6.2***	***60.5***	***2***	***200***	***1***	***5***	***4***	***241***	***920B***
1SMB5921BT3	6.8	55.1	2.5	200	1	5	5.2	220	921B
1SMB5922BT3	7.5	50	3	400	0.5	5	6.8	200	922B
1SMB5923BT3	***8.2***	***45.7***	***3.5***	***400***	***0.5***	***5***	***6.5***	***182***	***923B***
1SMB5924BT3	9.1	41.2	4	500	0.5	5	7	164	924B
1SMB5925BT3	***10***	***37.5***	***4.5***	***500***	***0.25***	***5***	***8***	***150***	***925B***
1SMB5926BT3	***11***	***34.1***	***5.5***	***550***	***0.25***	***1***	***8.4***	***136***	***926B***
1SMB5927BT3	***12***	***31.2***	***6.5***	***550***	***0.25***	***1***	***9.1***	***125***	***927B***
1SMB5928BT3	13	28.8	7	550	0.25	1	9.9	115	928B

(continued)

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

Devices listed in bold, italic are Motorola preferred devices.

ELECTRICAL CHARACTERISTICS — continued (T_L = 30°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 µA	@ V_R Volts		
1SMB5929BT3	***15***	***25***	***9***	***600***	***0.25***	***1***	***11.4***	***100***	***929B***
1SMB5930BT3	16	23.4	10	600	0.25	1	12.2	93	930B
1SMB5931BT3	***18***	***20.8***	***12***	***650***	***0.25***	***1***	***13.7***	***83***	***931B***
1SMB5932BT3	20	18.7	14	650	0.25	1	15.2	75	932B
1SMB5933BT3	22	17	17.5	650	0.25	1	16.7	68	933B
1SMB5934BT3	***24***	***15.6***	***19***	***700***	***0.25***	***1***	***18.2***	***62***	***934B***
1SMB5935BT3	***27***	***13.9***	***23***	***700***	***0.25***	***1***	***20.6***	***55***	***935B***
1SMB5936BT3	***30***	***12.5***	***26***	***750***	***0.25***	***1***	***22.8***	***50***	***936B***
1SMB5937BT3	33	11.4	33	800	0.25	1	25.1	45	937B
1SMB5938BT3	***36***	***10.4***	***38***	***850***	***0.25***	***1***	***27.4***	***41***	***938B***
1SMB5939BT3	39	9.6	45	900	0.25	1	29.7	38	939B
1SMB5940BT3	43	8.7	53	950	0.25	1	32.7	34	940B
1SMB5941BT3	47	8	67	1000	0.25	1	35.8	31	941B
1SMB5942BT3	51	7.3	70	1100	0.25	1	38.8	29	942B
1SMB5943BT3	56	6.7	86	1300	0.25	1	42.6	26	943B
1SMB5944BT3	62	6	100	1500	0.25	1	47.1	24	944B
1SMB5945BT3	68	5.5	120	1700	0.25	1	51.7	22	945B
1SMB5946BT3	75	5	140	2000	0.25	1	56	20	946B
1SMB5947BT3	82	4.6	160	2500	0.25	1	62.2	18	947B
1SMB5948BT3	91	4.1	200	3000	0.25	1	69.2	16	948B
1SMB5949BT3	***100***	***3.7***	***250***	***3100***	***0.25***	***1***	***76***	***15***	***949B***
1SMB5950BT3	110	3.4	300	4000	0.25	1	83.6	13	950B
1SMB5951BT3	120	3.1	380	4500	0.25	1	91.2	12	951B
1SMB5952BT3	130	2.9	450	5000	0.25	1	98.8	11	952B
1SMB5953BT3	150	2.5	600	6000	0.25	1	114	10	953B
1SMB5954BT3	160	2.3	700	6500	0.25	1	121.6	9	954B
1SMB5955BT3	180	2.1	900	7000	0.25	1	136.8	8	955B
1SMB5956BT3	200	1.9	1200	8000	0.25	1	152	7	956B

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Devices listed in bold, italic are Motorola preferred devices.

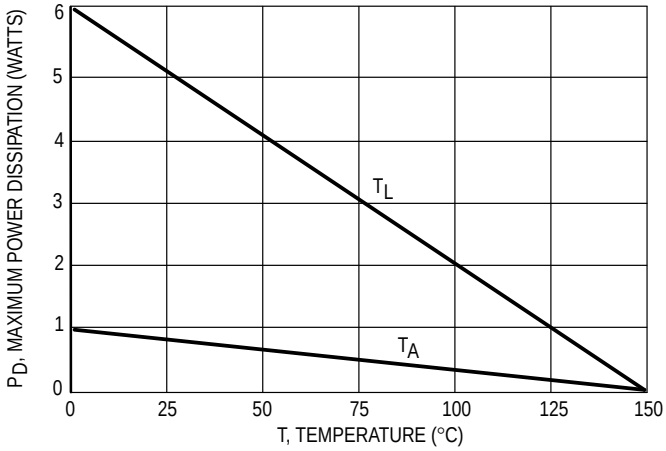

Figure 1. Steady State Power Derating

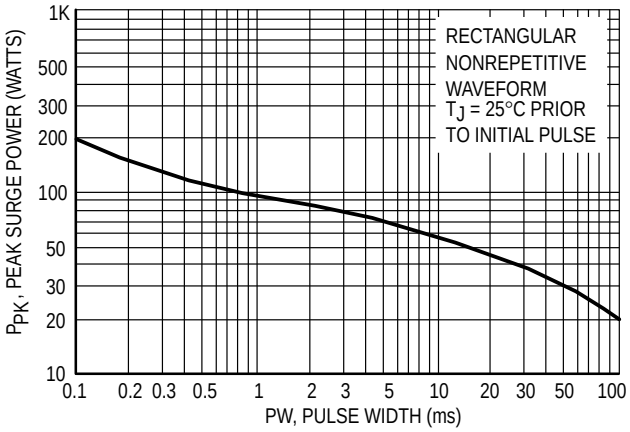

Figure 2. Maximum Surge Power

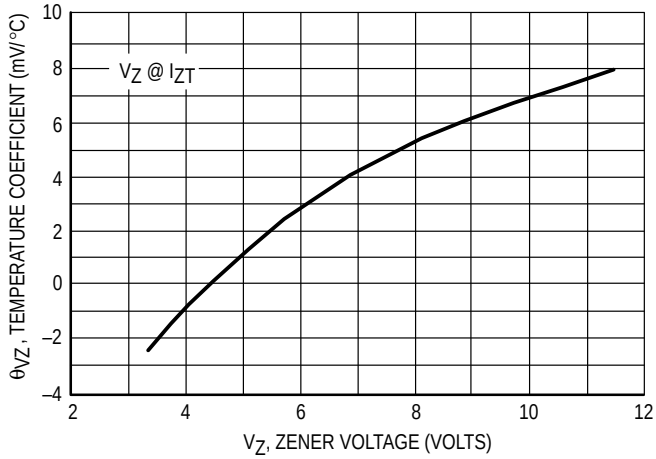

Figure 3. Zener Voltage — To 12 Volts

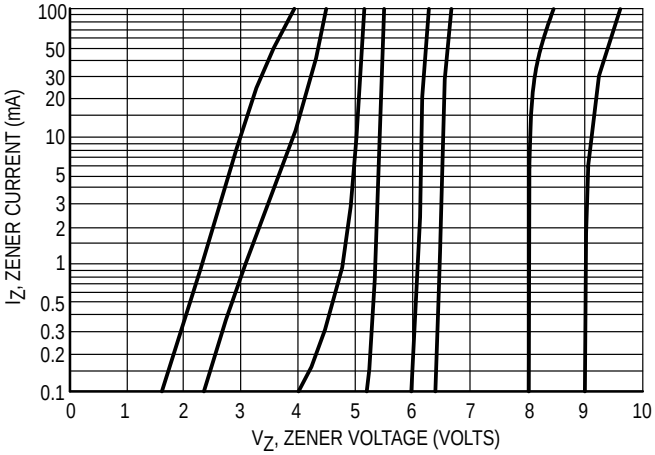

Figure 4. V_Z = 3.3 thru 10 Volts

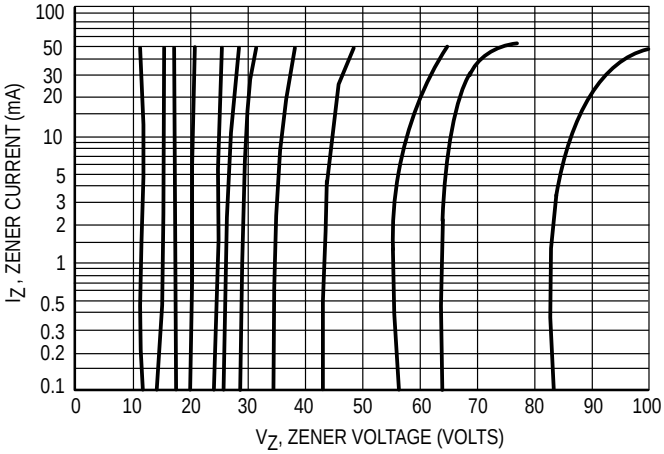

Figure 5. V_Z = 12 thru 82 Volts

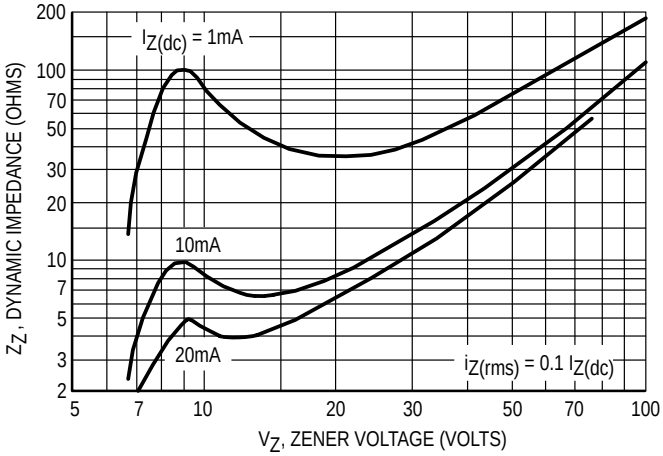

Figure 6. Effect of Zener Voltage

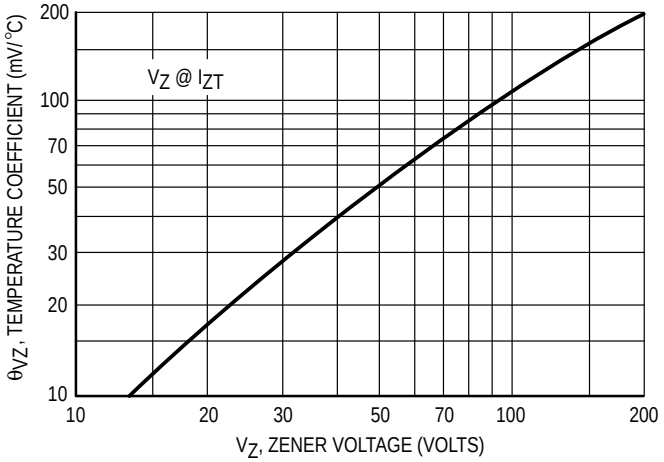

Figure 7. Zener Voltage — 14 To 200 Volts

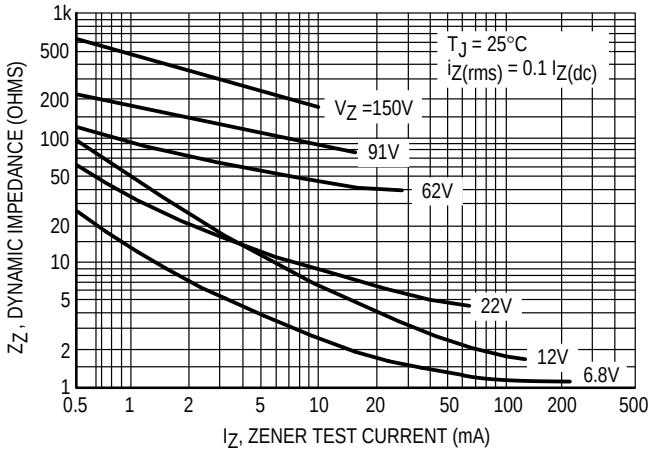

Figure 8. Effect of Zener Current

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.