3 Watt Plastic Surface Mount Silicon Zener Diodes

1SMB5913BT3 through 1SMB5956BT3

PLASTIC SURFACE MOUNT ZENER DIODES 3 WATTS 3.3–200 VOLTS

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

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

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

Devices listed in bold, italic are Motorola preferred devices.

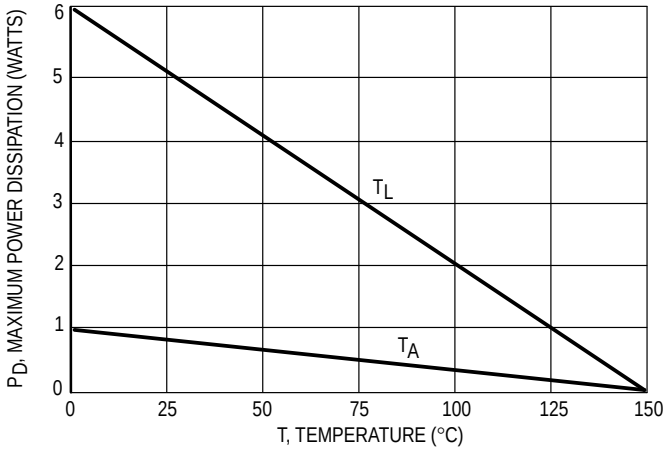


Figure 1. Steady State Power Derating

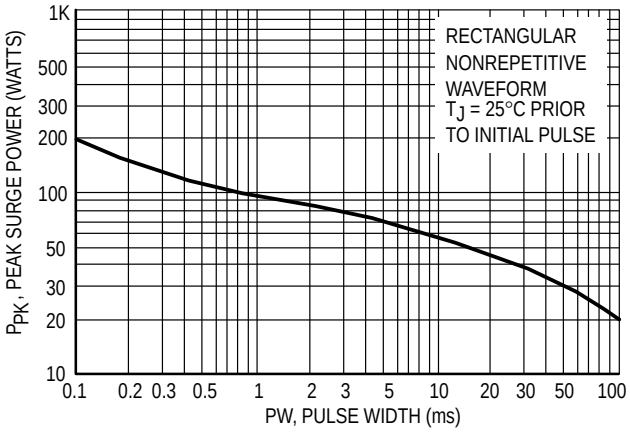


Figure 2. Maximum Surge Power

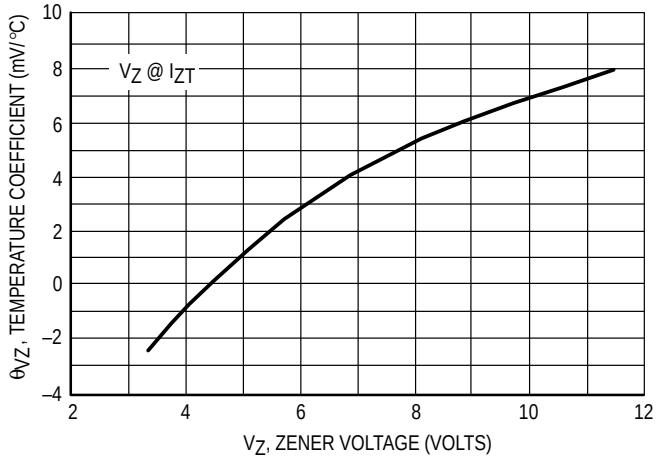


Figure 3. Zener Voltage — To 12 Volts

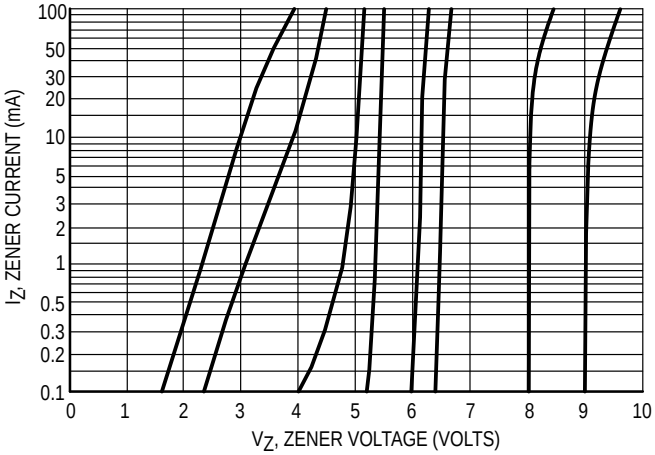


Figure 4. V_Z = 3.3 thru 10 Volts

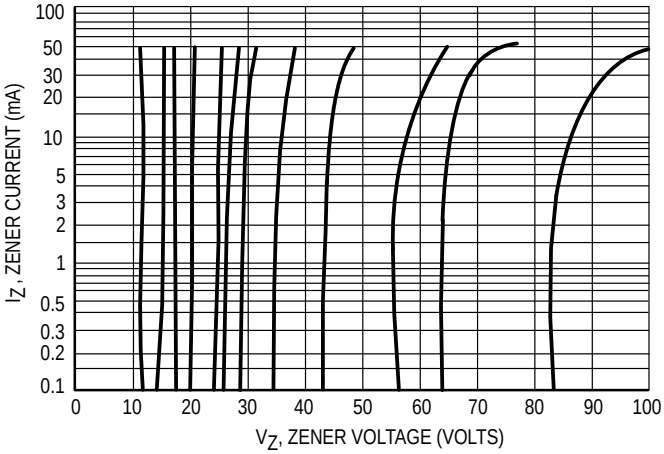


Figure 5. V_Z = 12 thru 82 Volts

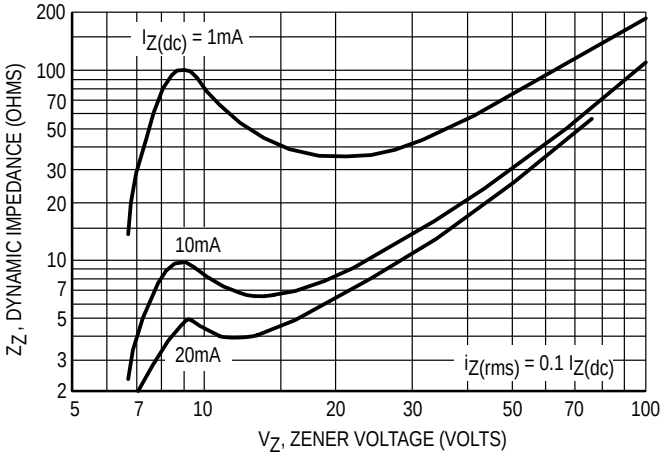


Figure 6. Effect of Zener Voltage

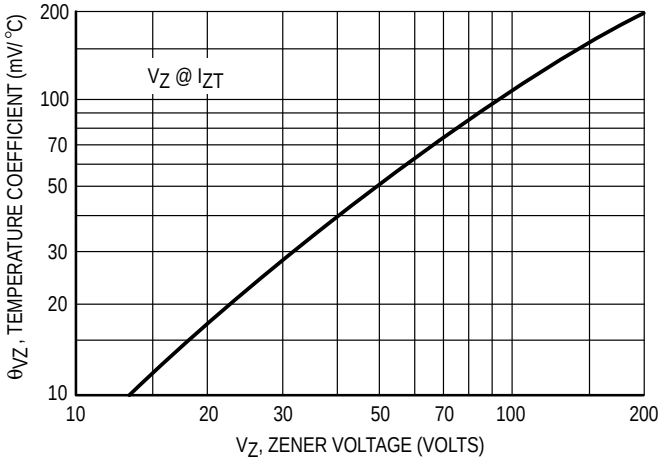


Figure 7. Zener Voltage — 14 To 200 Volts

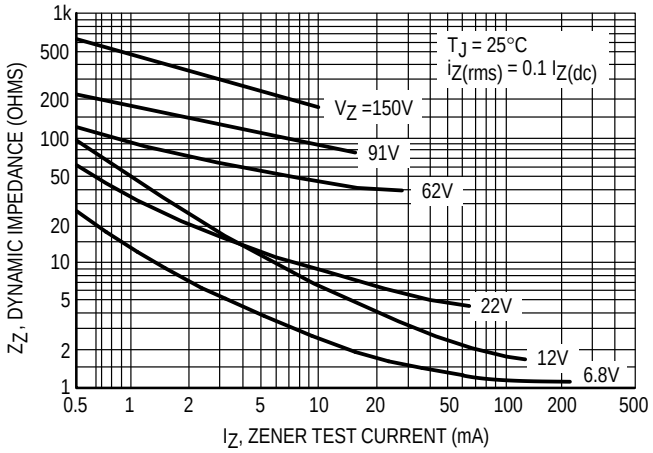


Figure 8. Effect of Zener Current

NOTE 1. ZENER VOLTAGE (V_Z) MEASUREMENT

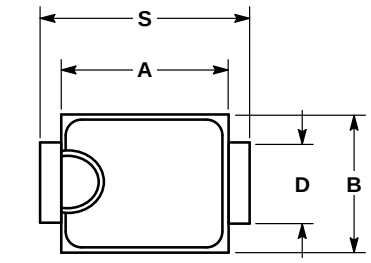
Nominal zener voltage is measured with the device junction in thermal equilibrium with ambient temperature at 25°C.

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.

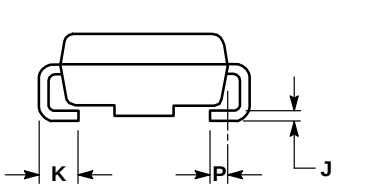
Zener Voltage Regulator Diodes — Surface Mounted

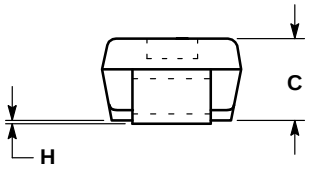
3 Watt DC Power



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.130	0.150	3.30	3.81
C	0.075	0.095	1.90	2.41
D	0.077	0.083	1.96	2.11
H	0.0020	0.0060	0.051	0.152
J	0.006	0.012	0.15	0.30
K	0.030	0.050	0.76	1.27
P	0.020 REF		0.51 REF	
S	0.205	0.220	5.21	5.59





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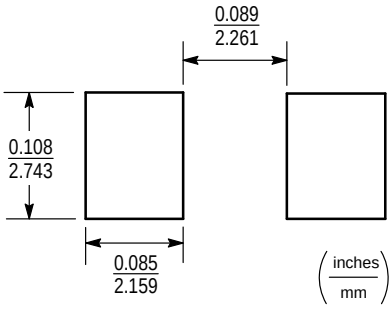

SMB Footprint

(Refer to Section 10 for Surface Mount, Thermal Data and Footprint Information.)

MULTIPLE PACKAGE QUANTITY (MPQ) REQUIREMENTS

Package Option	Type No. Suffix	MPQ (Units)
Tape and Reel	T3 (13 inch)	2.5K

(Refer to Section 10 for more information on Packaging Specifications.)

Devices listed in bold, italic are Motorola preferred devices.