



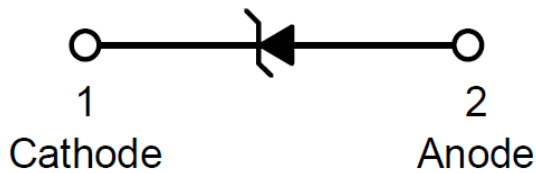
## DESCRIPTION

Three complete series of Zener diodes are offered in the convenient, surface mount plastic SOD-123 package.

These devices provide a convenient alternative to the leadless 34-package style.

The MSZ5221B~MSZ5272B are available in SOD-123 Package.

## PIN DESCRIPTION



## FEATURES

- 500mW Rating on FR-4 or FR-5 Board
- Wide Zener Reverse Voltage Range: 2.4V to 110V
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- General Purpose, Medium Current
- ESD Rating of Class3 (>16kV) per Human Body Model
- Available in SOD-123 Package

## MECHANICAL CHARACTERISTICS

Case: Void-free, transfer-molded, thermosetting plastic case

Finish: Corrosion resistant finish, easily solderable

Maximum Case Temperature For Soldering Purposes: 260°C for 10 Seconds

Polarity: Cathode indicated by polarity band

Flammability Rating: UL94 V-0



## ORDERING INFORMATION

Package Type	Part Number
SOD-123	MSZ5221B
	MSZ5222B
	MSZ5223B
	MSZ5224B
	MSZ5225B
	MSZ5226B
	MSZ5227B
	MSZ5228B
	MSZ5229B
	MSZ5230B
	MSZ5231B
	MSZ5232B
	MSZ5233B
	MSZ5234B
	MSZ5235B
	MSZ5236B
	MSZ5237B
	MSZ5238B
	MSZ5239B
	MSZ5240B
	MSZ5241B
	MSZ5242B
	MSZ5243B
MSZ5244B	
MSZ5245B	

Package Type	Part Number
SOD-123	MSZ5246B
	MSZ5247B
	MSZ5248B
	MSZ5250B
	MSZ5251B
	MSZ5252B
	MSZ5253B
	MSZ5254B
	MSZ5255B
	MSZ5256B
	MSZ5257B
	MSZ5258B
	MSZ5259B
	MSZ5260B
	MSZ5261B
	MSZ5262B
	MSZ5263B
	MSZ5264B
	MSZ5265B
	MSZ5266B
	MSZ5267B
	MSZ5268B
	MSZ5269B
MSZ5270B	
MSZ5272B	
Note	SPQ: 3,000pcs /Reel
AiT provides all RoHS Compliant Products	



## ABSOLUTE MAXIMUM RATINGS

$P_D$ , Total Power Dissipation on FR-5 Board, <sup>NOTE1</sup>	
@ $T_L = 75^\circ\text{C}$	500mW
Derated above $75^\circ\text{C}$	6.7mW/ $^\circ\text{C}$
$R_{\theta JA}$ , Thermal Resistance, Junction-to-Ambient <sup>NOTE2</sup>	340 $^\circ\text{C}/\text{W}$
$R_{\theta JL}$ , Thermal Resistance, Junction-to-Lead <sup>NOTE2</sup>	150 $^\circ\text{C}/\text{W}$
$T_J, T_{STG}$ , Junction and Storage Temperature Range	-55 $^\circ\text{C} \sim +150^\circ\text{C}$

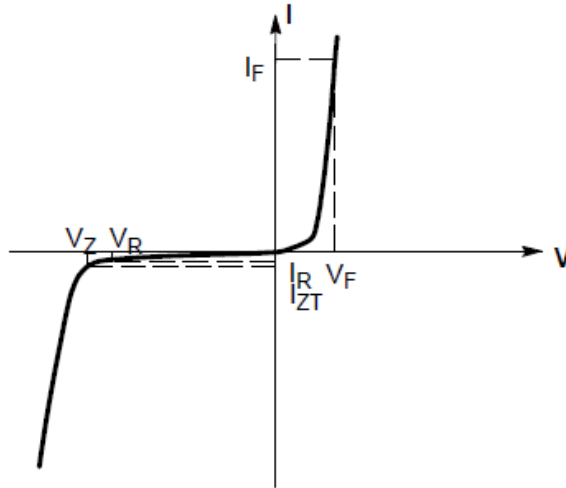
Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: FR-5 = 3.5 x 1.5 inches, using the minimum recommended footprint.

NOTE2: Thermal Resistance measurement obtained via infrared Scan Method.



## ELECTRICAL PARAMETER



Zener Voltage Regulator

$T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 0.9\text{V Max.}$  @  $I_F = 10\text{mA}$

Symbol	Parameter
$V_Z$	Reverse Zener Voltage @ $I_{ZT}$
$I_{ZT}$	Reverse Current
$Z_{ZT}$	Maximum Zener Impedance @ $I_{ZT}$
$I_{ZK}$	Reverse Current
$Z_{ZK}$	Maximum Zener Impedance @ $I_{ZK}$
$I_R$	Reverse Leakage Current @ $V_R$
$V_R$	Reverse Voltage
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C unless otherwise noted, V<sub>F</sub> = 0.9V Max. @I<sub>F</sub> = 10mA

Part Number	Zener Voltage <sup>NOTE3,4</sup>			Zener Impedance <sup>NOTE5</sup>			Leakage Current		
	V <sub>Z</sub> (Volts)			@I <sub>ZT</sub>	Z <sub>ZT</sub> @I <sub>ZT</sub>	Z <sub>ZK</sub> @I <sub>ZK</sub>	I <sub>R</sub> @V <sub>R</sub>		
	Min	Nom	Max	mA	Ω	Ω	mA	μA	Volts
MSZ5221B	2.28	2.4	2.52	20	30	1200	0.25	100	1
MSZ5222B	2.38	2.5	2.63	20	30	1250	0.25	100	1
MSZ5223B	2.57	2.7	2.84	20	30	1300	0.25	75	1
MSZ5224B	2.66	2.8	2.94	20	30	1400	0.25	75	1
MSZ5225B	2.85	3.0	3.15	20	29	1600	0.25	50	1
MSZ5226B	3.14	3.3	3.47	20	28	1600	0.25	25	1
MSZ5227B	3.42	3.6	3.78	20	24	1700	0.25	15	1
MSZ5228B	3.71	3.9	4.10	20	23	1900	0.25	10	1
MSZ5229B	4.09	4.3	4.52	20	22	2000	0.25	5	1
MSZ5230B	4.47	4.7	4.94	20	19	1900	0.25	5	2
MSZ5231B	4.85	5.1	5.36	20	17	1600	0.25	5	2
MSZ5232B	5.32	5.6	5.88	20	11	1600	0.25	5	3
MSZ5233B	5.70	6.0	6.30	20	7	1600	0.25	5	3.5
MSZ5234B	5.89	6.2	6.51	20	7	1000	0.25	5	4
MSZ5235B	6.46	6.8	7.14	20	5	750	0.25	3	5
MSZ5236B	7.13	7.5	7.88	20	6	500	0.25	3	6
MSZ5237B	7.79	8.2	8.61	20	8	500	0.25	3	6.5
MSZ5238B	8.27	8.7	9.14	20	8	600	0.25	3	6.5
MSZ5239B	8.65	9.1	9.56	20	10	600	0.25	3	7
MSZ5240B	9.50	10	10.50	20	17	600	0.25	3	8
MSZ5241B	10.45	11	11.55	20	22	600	0.25	2	8.4
MSZ5242B	11.40	12	12.60	20	30	600	0.25	1	9.1
MSZ5243B	12.35	13	13.65	9.5	13	600	0.25	0.5	9.9
MSZ5244B	13.30	14	14.70	9.0	15	600	0.25	0.1	10
MSZ5245B	14.25	15	15.75	8.5	16	600	0.25	0.1	11
MSZ5246B	15.20	16	16.80	7.8	17	600	0.25	0.1	12
MSZ5247B	16.15	17	17.85	7.4	19	600	0.25	0.1	13
MSZ5248B	17.10	18	18.90	7.0	21	600	0.25	0.1	14
MSZ5250B	19.00	20	21.00	6.2	25	600	0.25	0.1	15
MSZ5251B	20.90	22	23.10	5.6	29	600	0.25	0.1	17
MSZ5252B	22.80	24	25.20	5.2	33	600	0.25	0.1	18
MSZ5253B	23.75	25	26.25	5.0	35	600	0.25	0.1	19
MSZ5254B	25.65	27	28.35	4.6	41	600	0.25	0.1	21
MSZ5255B	26.60	28	29.40	4.5	44	600	0.25	0.1	21



T<sub>A</sub> = 25°C unless otherwise noted, V<sub>F</sub> = 0.9V Max. @I<sub>F</sub> = 10mA

Part Number	Zener Voltage <sup>NOTE3+NOTE4</sup>				Zener Impedance <sup>NOTE5</sup>			Leakage Current	
	V <sub>Z</sub> (Volts)			@I <sub>ZT</sub>	Z <sub>ZT</sub> @I <sub>ZT</sub>	Z <sub>ZK</sub> @I <sub>ZK</sub>		I <sub>R</sub> @V <sub>R</sub>	
	Min	Nom	Max	mA	Ω	Ω	mA	μA	Volts
MSZ5256B	28.50	30	31.50	4.2	49	600	0.25	0.1	23
MSZ5257B	31.35	33	34.65	3.8	58	700	0.25	0.1	25
MSZ5258B	34.20	36	37.80	3.4	70	700	0.25	0.1	27
MSZ5259B	37.05	39	40.95	3.2	80	800	0.25	0.1	30
MSZ5260B	40.85	43	45.15	3.0	93	900	0.25	0.1	33
MSZ5261B	44.65	47	49.35	2.7	105	1000	0.25	0.1	36
MSZ5262B	48.45	51	53.55	2.5	125	1100	0.25	0.1	39
MSZ5263B	53.20	56	58.80	2.2	150	1300	0.25	0.1	43
MSZ5264B	57.00	60	63.00	2.1	170	1400	0.25	0.1	46
MSZ5265B	58.90	62	65.10	2.0	185	1400	0.25	0.1	47
MSZ5266B	64.60	68	71.40	1.8	230	1600	0.25	0.1	52
MSZ5267B	71.25	75	78.75	1.7	270	1700	0.25	0.1	56
MSZ5268B	77.90	82	86.10	1.5	330	2000	0.25	0.1	62
MSZ5269B	82.65	87	91.35	1.4	370	2200	0.25	0.1	68
MSZ5270B	86.45	91	95.55	1.4	400	2300	0.25	0.1	69
MSZ5272B	104.5	110	115.5	1.1	750	3000	0.25	0.1	84

NOTE3: The type numbers shown have a standard tolerance of ±5% on the nominal Zener voltage.

NOTE4: Nominal Zener voltage is measured with the device junction in thermal equilibrium at T<sub>L</sub> = 30°C ± 1°C.

NOTE5: Z<sub>ZT</sub> and Z<sub>ZK</sub> are measured by dividing the AC voltage drop across the device by the ac current applied.

The specified limits are for I<sub>Z(AC)</sub> = 0.1 I<sub>Z(dc)</sub> with the AC frequency = 1kHz.



## TYPICAL CHARACTERISTICS

Figure 1. Temperature Coefficients

(Temperature Range -55°C to +150°C)

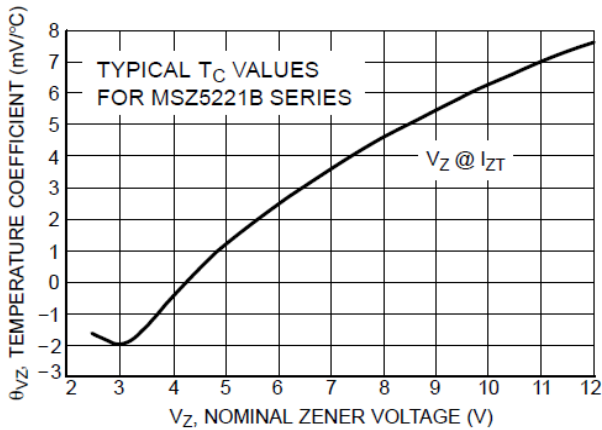


Figure 2. Temperature Coefficients

(Temperature Range -55°C to +150°C)

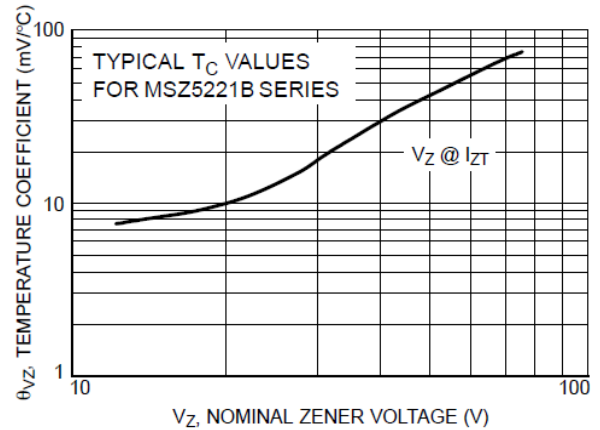


Figure 3. Steady State Power Derating

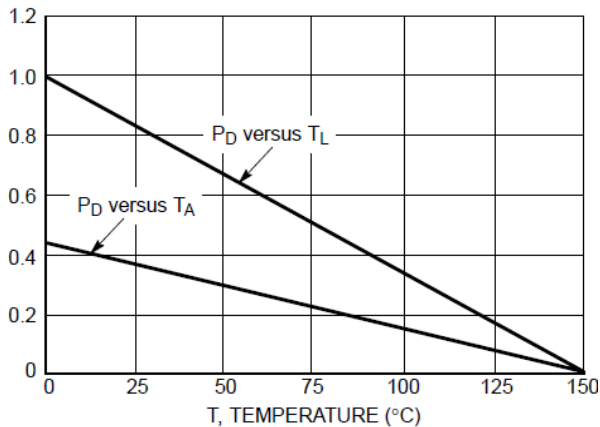


Figure 4. Maximum Nonrepetitive Surge Power

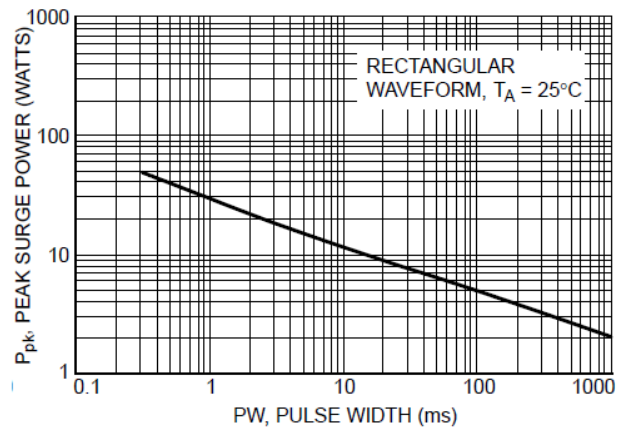


Figure 5. Effect of Zener Voltage on Zener Impedance

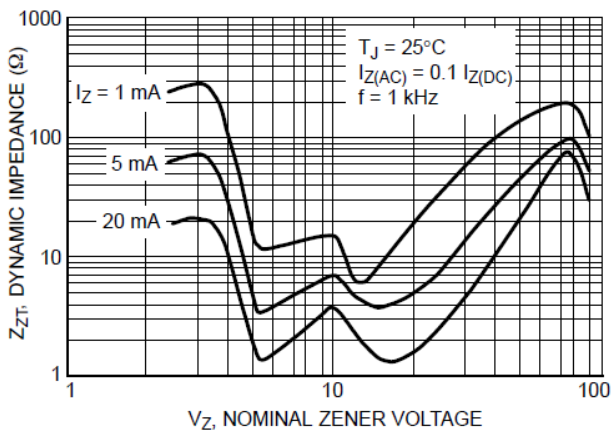


Figure 6. Typical Forward Voltage

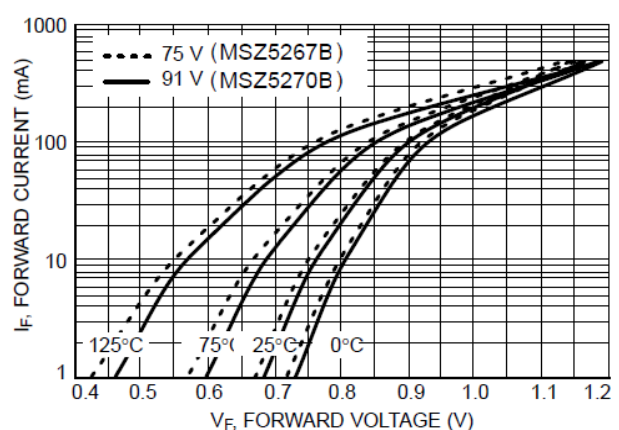




Figure 7. Typical Capacitance

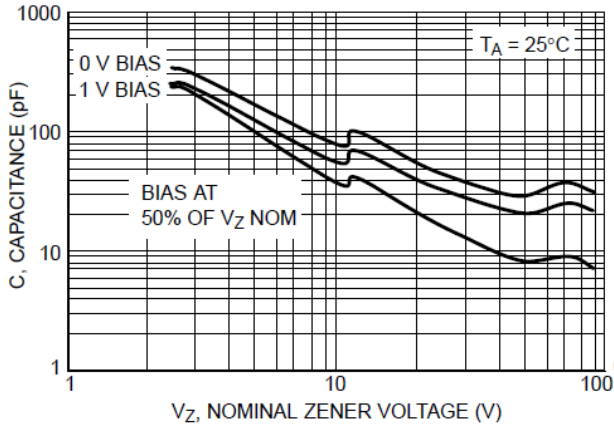


Figure 8. Typical Leakage Current

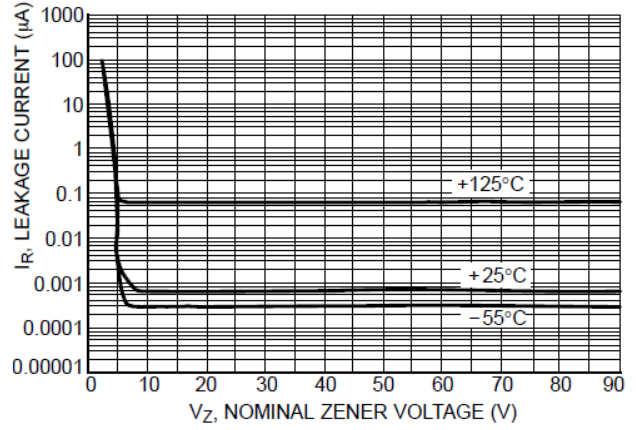


Figure 9. Zener Voltage versus Zener Current  
( $V_Z$  Up to 12 V)

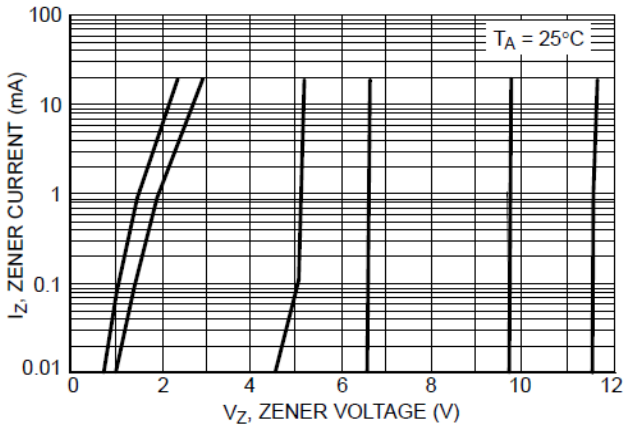
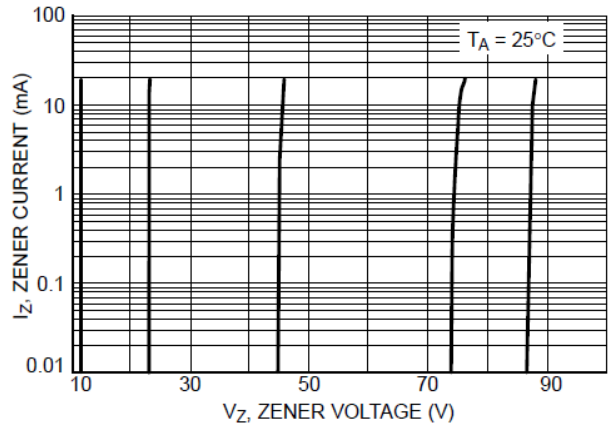


Figure 10. Zener Voltage versus Zener Current  
(12 V to 91 V)

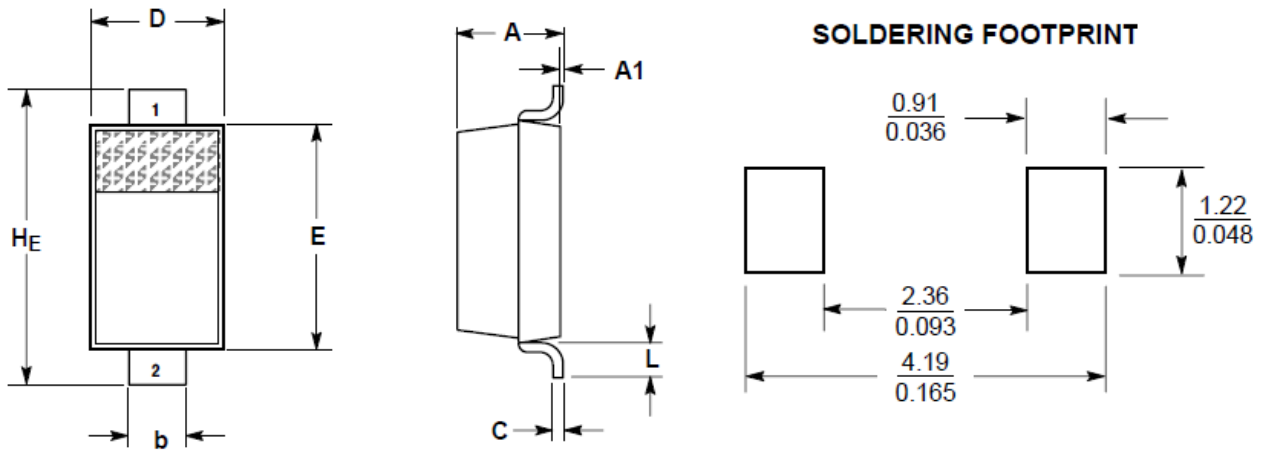






**PACKAGE INFORMATION**

Dimension in SOD-123 Package (Unit: mm)



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.94	1.35	0.037	0.053
A1	0.00	0.10	0.000	0.004
b	0.51	0.71	0.020	0.028
c	-	0.15	-	0.006
D	1.40	1.80	0.055	0.071
E	2.54	2.84	0.100	0.112
HE	3.56	3.86	0.140	0.152
L	0.25	-	0.010	-



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