

**Small Signal Product**

**500mW, 5% Tolerance SMD Zener Diode**

**FEATURES**

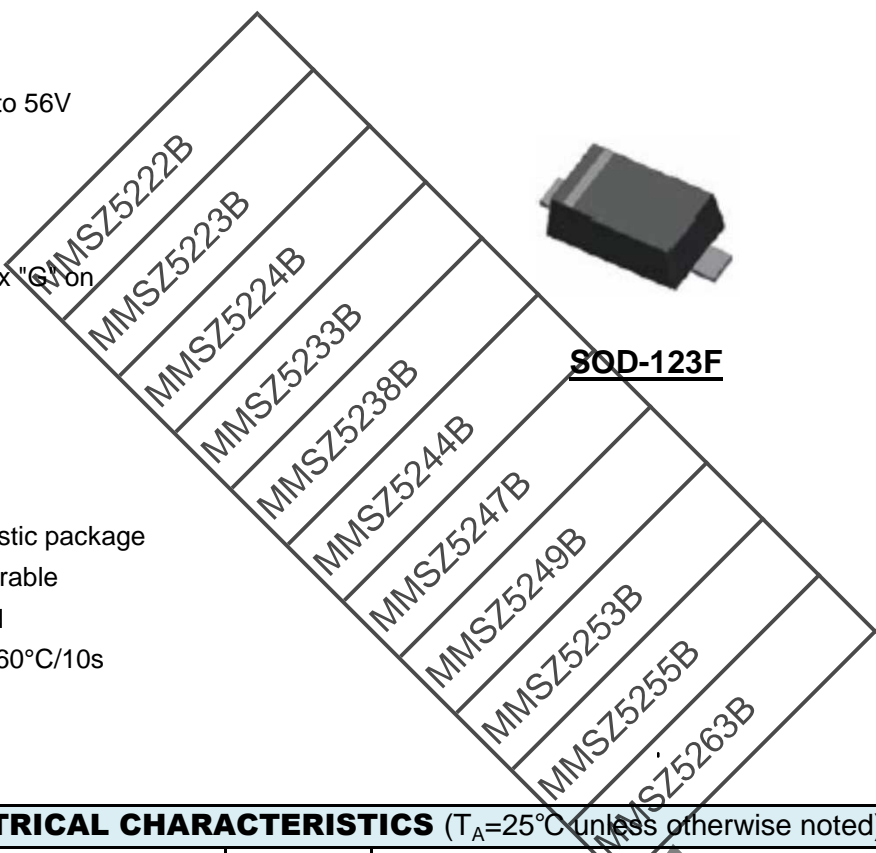
- Wide zener voltage range selection: 2.4V to 56V
- Surface Mount Device Type
- Moisture sensitivity level 1
- Pb free and RoHS compliant
- Green compound (Halogen free) with suffix "G" on packing code and prefix "G" on date code
- $V_Z$  Tolerance Selection of  $\pm 5\%$
- Matte Tin(Sn) lead finish

**MECHANICAL DATA**

- Case: Flat lead SOD-123 small outline plastic package
- Terminal: Matte tin plated, lead free, solderable per MIL-STD-202, Method 208 guaranteed
- High temperature soldering guaranteed: 260°C/10s
- Polarity: Indicated by cathode band
- Weight : 8.85  $\pm$  0.5mg



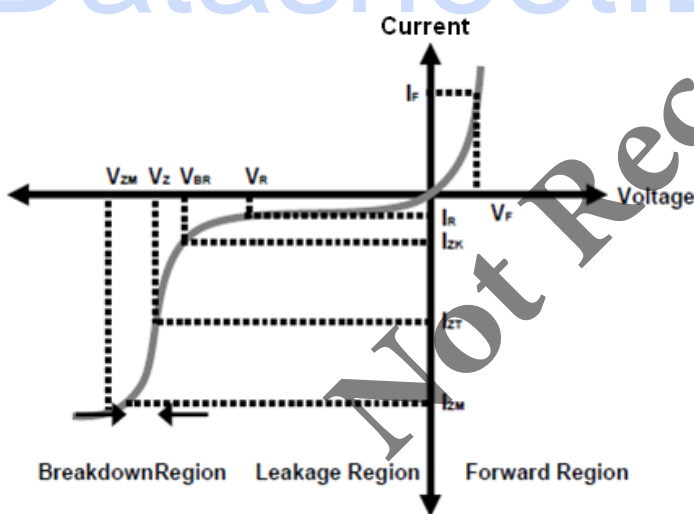
**SOD-123F**



<b>MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS</b> ( $T_A=25^\circ\text{C}$ unless otherwise noted)				
PARAMETER	SYMBOL	VALUE	UNIT	
Forward Voltage	@ $I_F = 10\text{mA}$	$V_F$	0.9	V
Power Dissipation		$P_D$	500	mW
Thermal Resistance from Junction to Ambient	(Note)	$R_{\theta JA}$	330	$^\circ\text{C/W}$
Junction Temperature		$T_J$	150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	- 65 to + 150	$^\circ\text{C}$

Notes: Valid provided that electrodes are kept at ambient temperature

**ZENER I vs. V CHARACTERISTICS**



- $V_{BR}$  : Voltage at  $I_{ZK}$
- $I_{ZK}$  : Test current for voltage  $V_{BR}$
- $Z_{ZK}$  : Dynamic impedance at  $I_{ZK}$
- $I_{ZT}$  : Test current for voltage  $V_Z$
- $V_Z$  : Voltage at current  $I_{ZT}$
- $Z_{ZT}$  : Dynamic impedance at  $I_{ZT}$
- $I_{ZM}$  : Maximum steady state current
- $V_{ZM}$  : Voltage at  $I_{ZM}$

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**ELECTRICAL CHARACTERISTICS** (  $T_A = 25^\circ\text{C}$  unless otherwise noted )

( $V_F$  Forward Voltage = 0.9V Maximum @  $I_F = 10\text{ mA}$  for all part numbers)

Device Type	Marking Code	Zener Voltage Range			Maximum Zener Impedance				Maximum Reverse Current	
		$V_Z @ I_{ZT}$			$I_{ZT}$	$Z_{ZT} @ I_{ZT}$	$Z_{ZK} @ I_{ZK}$	$I_{ZK}$	$I_R$	$V_R$
		Min(V)	Nom(V)	Max(V)	mA	$\Omega$	$\Omega$	mA	$\mu\text{A}$	V
MMSZ5221B	Z2V4	2.28	2.4	2.52	20	30	1200	0.25	100	1
MMSZ5222B	Z2V5	2.38	2.5	2.63	20	30	1250	0.25	100	1
MMSZ5223B	Z2V7	2.57	2.7	2.84	20	30	1300	0.25	75	1
MMSZ5224B	Z2V8	2.66	2.8	2.94	20	30	1400	0.25	75	1
MMSZ5225B	Z3V0	2.85	3.0	3.15	20	28	1600	0.25	50	1
MMSZ5226B	Z3V3	3.14	3.3	3.47	20	28	1600	0.25	25	1
MMSZ5227B	Z3V6	3.42	3.6	3.78	20	24	1700	0.25	15	1
MMSZ5228B	Z3V9	3.71	3.9	4.10	20	23	1900	0.25	10	1
MMSZ5229B	Z4V3	4.09	4.3	4.52	20	22	2000	0.25	5	1
MMSZ5230B	Z4V7	4.47	4.7	4.94	20	19	1900	0.25	3	2
MMSZ5231B	Z5V1	4.85	5.1	5.36	20	17	1600	0.25	5	2
MMSZ5232B	Z5V6	5.32	5.6	5.88	20	11	1600	0.25	5	3
MMSZ5233B	Z6V0	5.70	6.0	6.30	20	7	1600	0.25	5	3.5
MMSZ5234B	Z6V2	5.89	6.2	6.51	20	7	1000	0.25	5	4
MMSZ5235B	Z6V8	6.46	6.8	7.14	20	5	750	0.25	3	5
MMSZ5236B	Z7V5	7.13	7.5	7.88	20	6	500	0.25	3	6
MMSZ5237B	Z8V2	7.79	8.2	8.61	20	8	500	0.25	3	6.5
MMSZ5238B	Z8V7	8.27	8.7	9.14	20	8	600	0.25	3	6.5
MMSZ5239B	Z9V1	8.65	9.1	9.56	20	10	600	0.25	3	7
MMSZ5240B	Z10V	9.50	10	10.50	20	17	600	0.25	3	8
MMSZ5241B	Z11V	10.45	11	11.55	20	22	600	0.25	2	8.4
MMSZ5242B	Z12V	11.40	12	12.60	20	30	600	0.25	1	9.1
MMSZ5243B	Z13V	12.35	13	13.65	9.5	13	600	0.25	0.5	9.9
MMSZ5244B	Z14V	13.30	14	14.70	9.0	15	600	0.25	0.1	10
MMSZ5245B	Z15V	14.25	15	15.75	8.5	16	600	0.25	0.1	11
MMSZ5246B	Z16V	15.20	16	16.80	7.8	17	600	0.25	0.1	12
MMSZ5247B	Z17V	16.15	17	17.85	7.4	19	600	0.25	0.1	13
MMSZ5248B	Z18V	17.10	18	18.90	7.0	21	600	0.25	0.1	14
MMSZ5249B	Z19V	18.05	19	19.95	6.6	23	600	0.25	0.1	14
MMSZ5250B	Z20V	19.00	20	21.00	6.2	25	600	0.25	0.1	15
MMSZ5251B	Z22V	20.90	22	23.10	5.6	29	600	0.25	0.1	17
MMSZ5252B	Z24V	22.80	24	25.20	5.2	33	600	0.25	0.1	18
MMSZ5253B	Z25V	23.75	25	26.25	5.0	35	600	0.25	0.1	19
MMSZ5254B	Z27V	25.65	27	28.35	4.6	41	600	0.25	0.1	21
MMSZ5255B	Z28V	26.60	28	29.40	4.5	44	600	0.25	0.1	21
MMSZ5256B	Z30V	28.50	30	31.50	4.2	49	600	0.25	0.1	23
MMSZ5257B	Z33V	31.35	33	34.65	3.8	58	700	0.25	0.1	25
MMSZ5258B	Z36V	34.20	36	37.80	3.4	70	700	0.25	0.1	27
MMSZ5259B	Z39V	37.05	39	40.95	3.2	80	800	0.25	0.1	30
MMSZ5260B	Z43V	40.85	43	45.15	3.0	93	900	0.25	0.1	33
MMSZ5261B	Z47V	44.65	47	49.35	2.7	105	1000	0.25	0.1	36
MMSZ5262B	Z51V	48.45	51	53.55	2.5	125	1100	0.25	0.1	39
MMSZ5263B	Z56V	53.20	56	58.80	2.2	150	1300	0.25	0.1	43

- Note: 1. The zener Voltage ( $V_Z$ ) is tested under pulse condition of 1ms  
 2. The device numbers listed have a standard tolerance on the nominal zener voltage of  $\pm 5\%$ .  
 3. For detailed information on price, availability and delivery of nominal zener voltages between the voltages shown and tighter voltage tolerances, contact your nearest **Taiwan Semiconductor** representative.  
 4. The zener impedance is derived from the 60-cycle ac voltage, which results when an ac current having an RMS value equal to 10% of the dc zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed to  $I_{ZT}$  or  $I_{ZK}$ .

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**RATINGS AND CHARACTERISTICS CURVES**

( $T_A=25^\circ\text{C}$  unless otherwise noted)

Fig. 1 Typical Forward Voltage

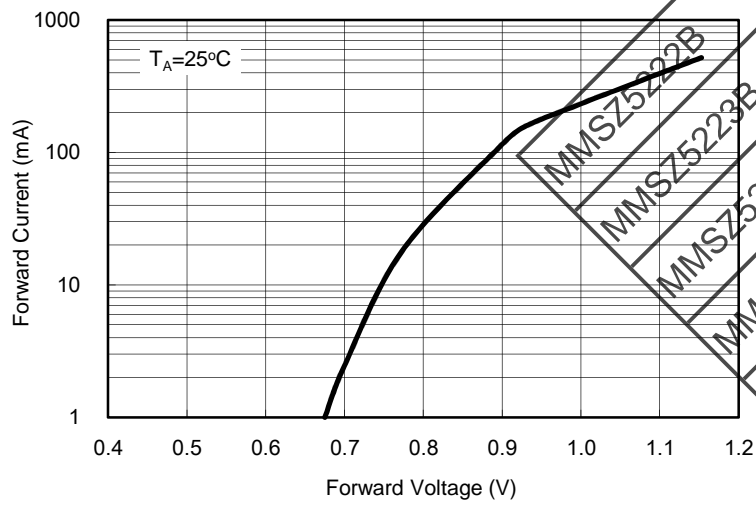


Fig. 2 Zener Breakdown Characteristics

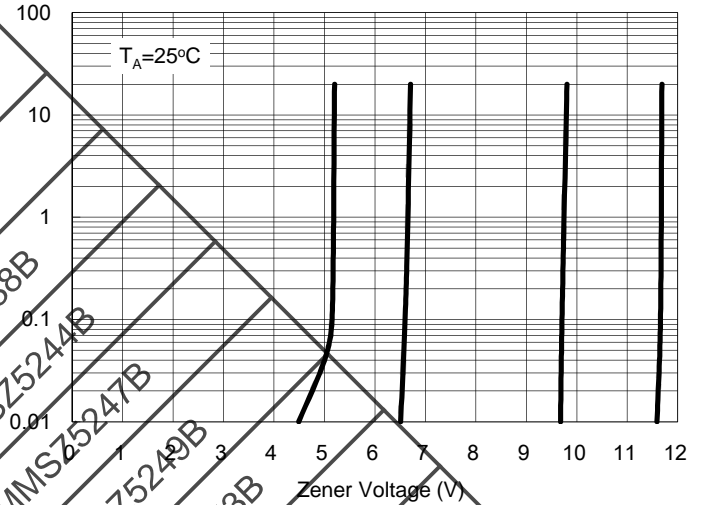


Fig. 3 Zener Breakdown Characteristics

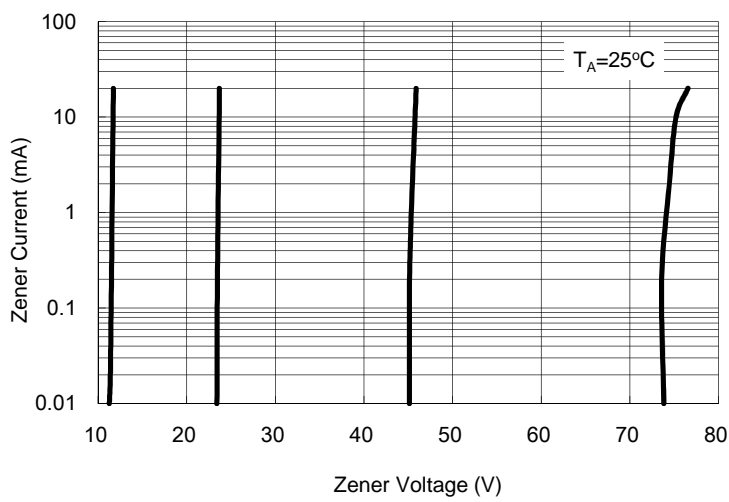


Fig. 4 Admissible Dissipation VS. Ambient Temperature

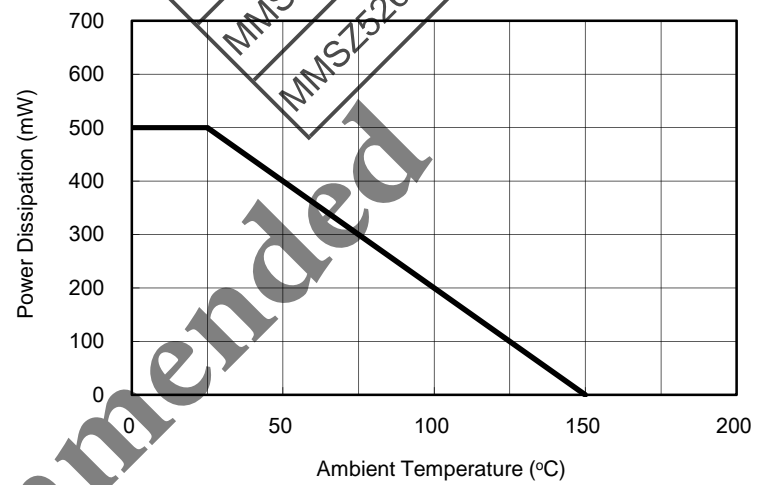


Fig. 5 Typical Capacitance

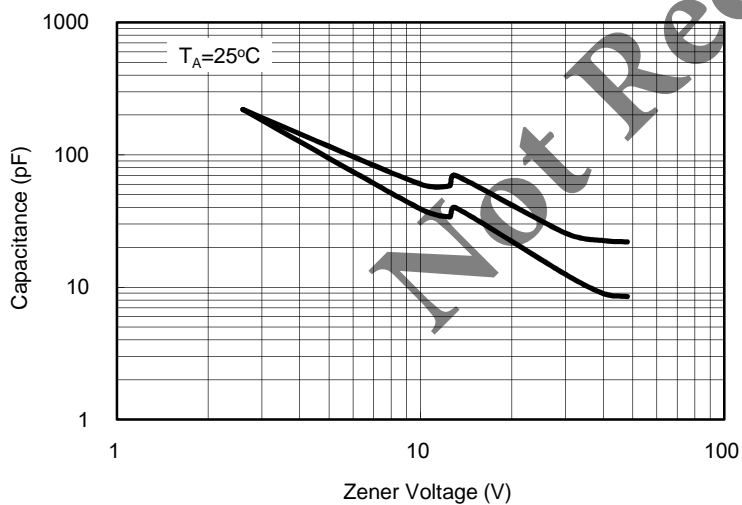
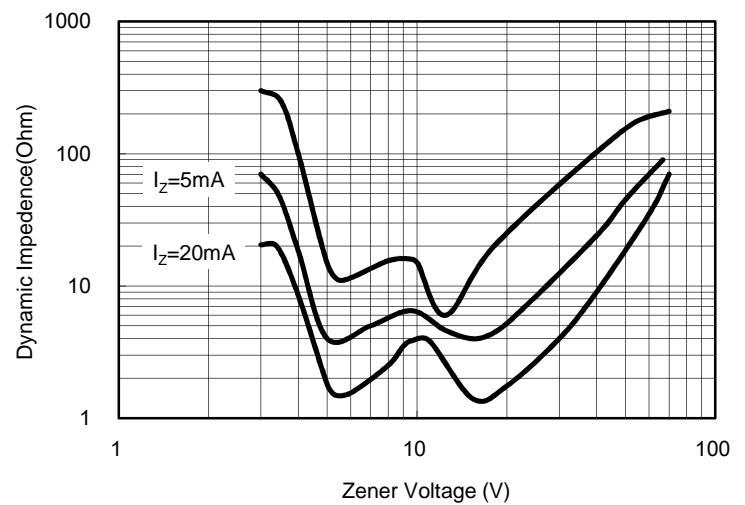


Fig. 6 Effect of Zener Voltage on Impedance



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**ORDERING INFORMATION**

PART NO.	MANUFACTURE CODE (Note1)	PACKING CODE	GREEN COMPOUND CODE	PACKAGE	PACKING
MMSZ52xxB (Note2)		RH	G	SOD-123F	3K / 7" Reel

Note1: Indicator of manufacturing site for manufacture special control, if empty means no special control requirement

Note2: "xx" is Device Code from "21" thru "63", detail could follow the previous page

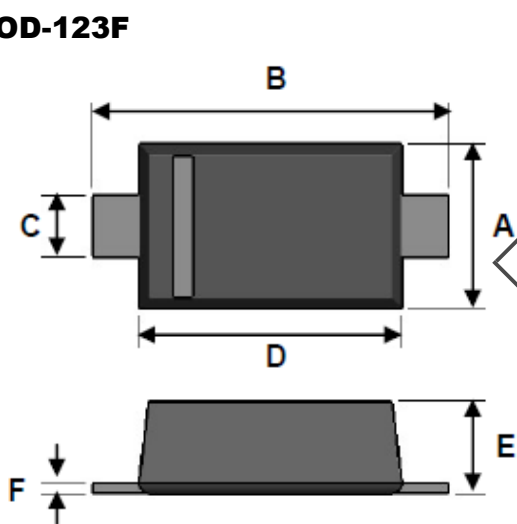
**EXAMPLE**

PREFERRED P/N	PART NO.	MANUFACTURE CODE	PACKING CODE	GREEN COMPOUND CODE	DESCRIPTION
MMSZ5221B RHG	MMSZ5221B		RH	G	Green compound
MMSZ5221B-B0 RHG	MMSZ5221B	B0	RH	G	Green compound
MMSZ5221B-L0 RHG	MMSZ5221B	L0	RH	G	Green compound

Not Recommended

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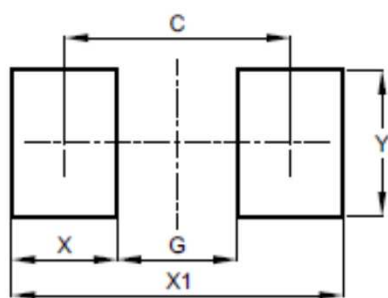
**PACKAGE OUTLINE DIMENSIONS**  
**SOD-123F**



MMSZ5222B
MMSZ5223B
MMSZ5224B
MMSZ5233B
MMSZ5238B
MMSZ5244B
MMSZ5247B
MMSZ5249B
MMSZ5253B
MMSZ5255B
MMSZ5263B

DIM.	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	1.50	1.70	0.059	0.067
B	3.30	3.90	0.130	0.154
C	0.50	0.70	0.020	0.028
D	2.50	2.70	0.098	0.106
E	0.80	1.15	0.031	0.045
F	0.05	0.20	0.002	0.008

**SUGGESTED PAD LAYOUT**



DIM.	Unit (mm)	Unit (inch)
	Typ.	Typ.
C	2.86	0.113
G	1.52	0.060
X	1.34	0.053
X1	4.20	0.165
Y	1.80	0.071

*Not Recommended*

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MMSZ5263B

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