MMSZ5221B - MMSZ5259B

500mW SURFACE MOUNT ZENER DIODE

Features

- 500mW Power Dissipation
- General Purpose, Medium Current
- Ideally Suited for Automated Assembly Processes
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3 & 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOD123
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band
- Weight: 0.01 grams (Approximate)

SOD123



Top View

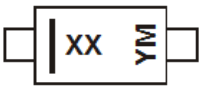
Ordering Information (Note 5)

Part Number	Qualification	Case	Packaging
(Type Number)-7-F*	Commercial	SOD123	3,000/Tape & Reel
(Type Number)Q-7-F*	Automotive	SOD123	3,000/Tape & Reel
(Type Number)-13-F*	Commercial	SOD123	10,000/Tape & Reel
(Type Number)Q-13-F*	Automotive	SOD123	10,000/Tape & Reel

*For (Type Number), please see the Electrical Characteristics Table. Example: 6.2V Zener = MMSZ5234B-7-F.

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Product manufactured with Date Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb_2O_3 Fire Retardants.
5. For packaging details, go to our website at http://www.diodes.com.

Marking Information



xx = Product Type Marking Code
(See Electrical Characteristics Table)
YM = Date Code Marking
Y = Year (ex: E = 2017)
M = Month (ex: 9 = September)

Date Code Key

Year	2013	2014	2015	2016	2017	…	2020	2021	2022	2023	2024
Code	A	B	C	D	E	…	H	I	J	K	L

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Forward Voltage	@ I_F = 10mA	V_F	0.9	V

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) @T_L = +75°C	P_D	500	mW
Power Dissipation (Note 5) @T_A = +25°C	P_D	370	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	338	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Type Number	Type Code	Zener Voltage Range (Note 6)			Test Current	Maximum Zener Impedance f = 1KHz		Maximum Reverse Leakage Current (Note 6)	
		V_Z @ I_{ZT}			I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK} = 0.25mA	I_R	@ V_R
		Nom (V)	Min (V)	Max (V)	mA	Ω		µA	V
MMSZ5221B	C1	2.4	2.28	2.52	20	30	1,200	100	1.0
MMSZ5223B	C3	2.7	2.57	2.84	20	30	1,300	75	1.0
MMSZ5225B	C5	3.0	2.85	3.15	20	30	1,600	50	1.0
MMSZ5226B	G1	3.3	3.14	3.47	20	28	1,600	25	1.0
MMSZ5227B	G2	3.6	3.42	3.78	20	24	1,700	15	1.0
MMSZ5228B	G3	3.9	3.71	4.10	20	23	1,900	10	1.0
MMSZ5229B	G4	4.3	4.09	4.52	20	22	2,000	5.0	1.0
MMSZ5230B	G5	4.7	4.47	4.94	20	19	1,900	5.0	2.0
MMSZ5231B	E1	5.1	4.85	5.36	20	17	1,600	5.0	2.0
MMSZ5232B	E2	5.6	5.32	5.88	20	11	1,600	5.0	3.0
MMSZ5233B	E3	6.0	5.70	6.30	20	7	1,600	5.0	3.5
MMSZ5234B	E4	6.2	5.89	6.51	20	7	1,000	5.0	4.0
MMSZ5235B	E5	6.8	6.46	7.14	20	5	750	3.0	5.0
MMSZ5236B	F1	7.5	7.13	7.88	20	6	500	3.0	6.0
MMSZ5237B	F2	8.2	7.79	8.61	20	8	500	3.0	6.5
MMSZ5238B	F3	8.7	8.27	9.14	20	8	600	3.0	6.5
MMSZ5239B	F4	9.1	8.65	9.56	20	10	600	3.0	7.0
MMSZ5240B	F5	10	9.50	10.50	20	17	600	3.0	8.0
MMSZ5241B	H1	11	10.45	11.55	20	22	600	2.0	8.4
MMSZ5242B	H2	12	11.40	12.60	20	30	600	1.0	9.1
MMSZ5243B	H3	13	12.35	13.65	9.5	13	600	0.5	9.9
MMSZ5245B	H5	15	14.25	15.75	8.5	16	600	0.1	11
MMSZ5246B	J1	16	15.20	16.80	7.8	17	600	0.1	12
MMSZ5248B	J3	18	17.10	18.90	7.0	21	600	0.1	14
MMSZ5250B	J5	20	19.00	21.00	6.2	25	600	0.1	15
MMSZ5251B	K1	22	20.90	23.10	5.6	29	600	0.1	17
MMSZ5252B	K2	24	22.80	25.20	5.2	33	600	0.1	18
MMSZ5254B	K4	27	25.65	28.35	5.0	41	600	0.1	21
MMSZ5255B	K5	28	26.60	29.40	4.5	44	600	0.1	21
MMSZ5256B	M1	30	28.50	31.50	4.2	49	600	0.1	23
MMSZ5257B	M2	33	31.35	34.65	3.8	58	700	0.1	25
MMSZ5258B	M3	36	34.20	37.80	3.4	70	700	0.1	27
MMSZ5259B	M4	39	37.05	40.95	3.2	80	800	0.1	30

Notes: 4. $R_{\Theta JL}$ = 132°C/W
5. Device mounted on FR-4 PCB with 1 inch copper pad layout.
6. Short duration pulse test used to minimize self-heating effect.

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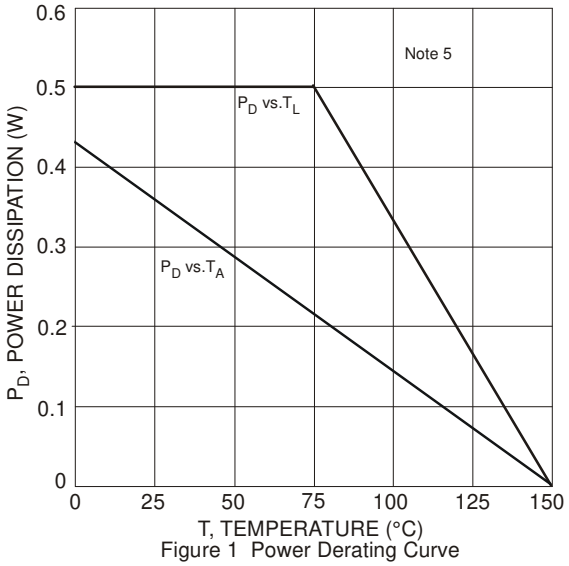


Figure 1 Power Derating Curve

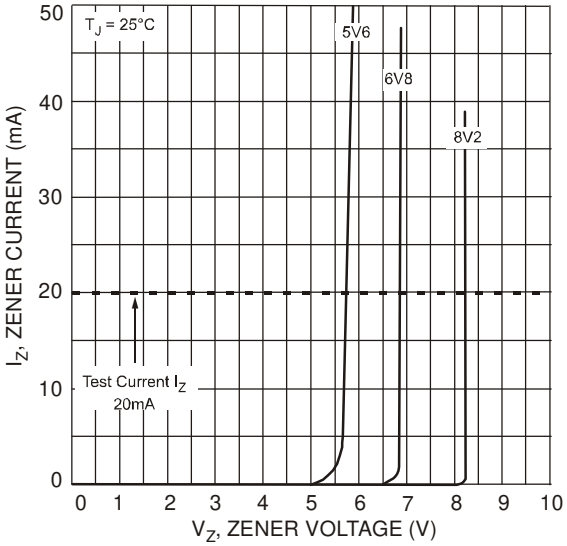


Figure 2 Typical Zener Breakdown Characteristics

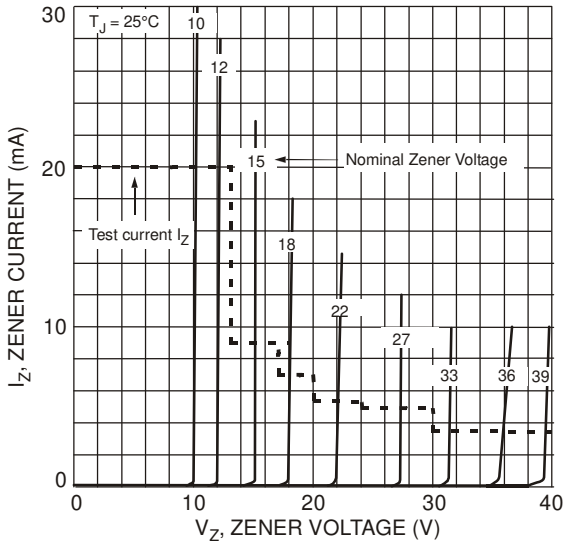


Figure 3 Typical Zener Breakdown Characteristics

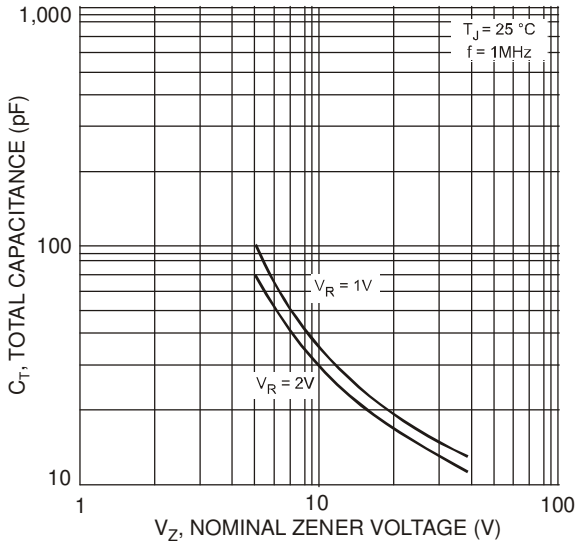


Figure 4 Typical Total Capacitance vs. Nominal Zener Voltage

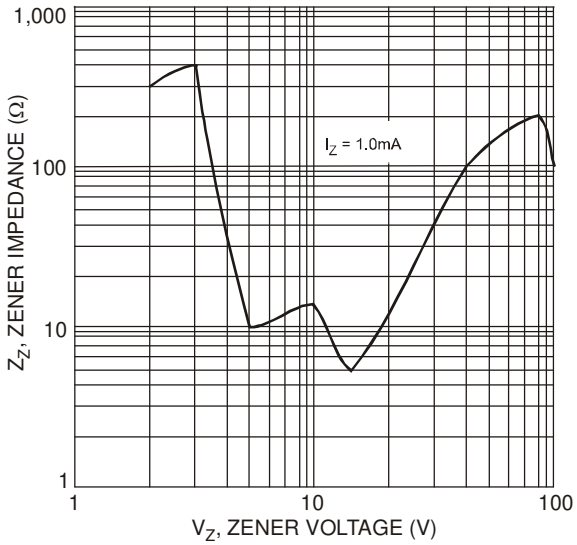


Figure 5 Typical Zener Impedance Characteristics

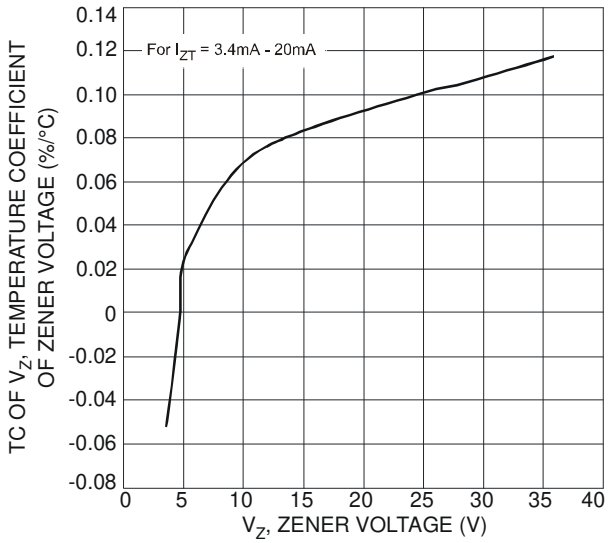


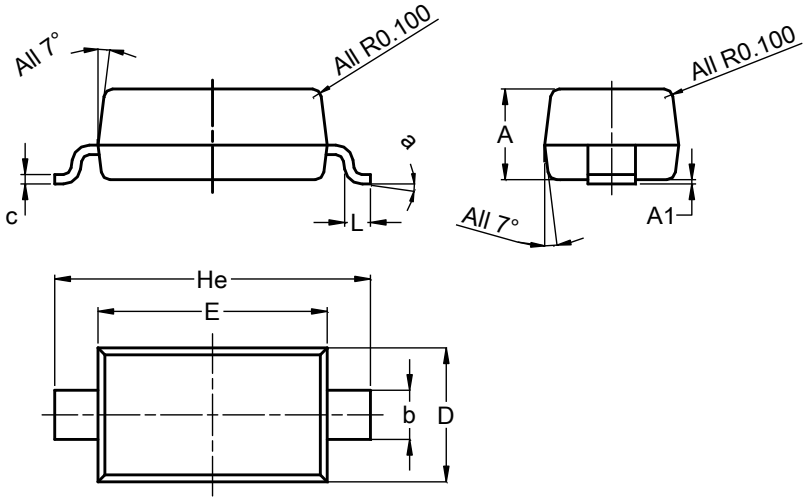
Figure 6 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage (MMSZ5227B - MMSZ5258B)

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Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOD123

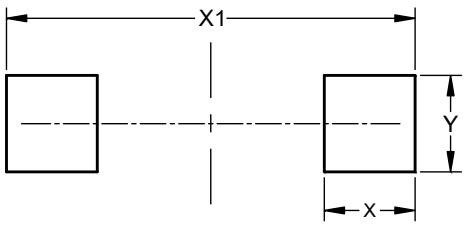


SOD123			
Dim	**Min**	**Max**	**Typ**
A	1.00	1.35	1.05
A1	0.00	0.10	0.05
b	0.52	0.62	0.57
c	0.10	0.15	0.11
D	1.40	1.70	1.55
E	2.55	2.85	2.65
He	3.55	3.85	3.65
L	0.25	0.40	0.30
a	0º	8º	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOD123



Dimensions	Value (in mm)
X	0.900
X1	4.050
Y	0.950

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