

## Features

- Planar Die Construction
- 350mW Power Dissipation on FR-4 PCB
- 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**

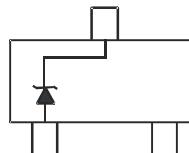
## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.008 grams (approximate)

SOT23



Top View



Device Schematic

## Ordering Information (Notes 5 & 6)

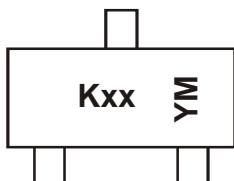
Device	Qualification	Packaging	Shipping
(Type Number)-7-F*	Commercial	SOT23	3000/Tape & Reel
(Type Number)Q-7-F*	Automotive	SOT23	3000/Tape & Reel
(Type Number)-13-F*	Commercial	SOT23	10000/Tape & Reel
(Type Number)Q-13-F*	Automotive	SOT23	10000/Tape & Reel

\* Add "-7-F" to the appropriate type number in Electrical Characteristics Table from Page 2. Example: 6.2V Zener = MMBZ5234B-7-F.

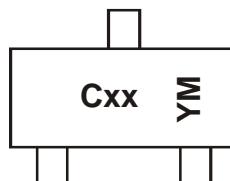
Notes:

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 OW (week 42, 2009) and newer are built with Green Molding Compound. Product manufactured prior to Date Code OW are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.
5. For Packaging Details, go to our website at <http://www.diodes.com>.
6. Selected voltages are available on 13" reels (10,000 devices per reel). Add "-13-F" to the appropriate type number in Electrical Characteristics Table from Page 2. Example: 6.2V Zener = MMBZ5234B-13-F. Please contact your Diodes Inc. sales representative for availability.

## Marking Information



K = SAT (Shanghai Assembly / Test site)  
 xx = Product Type Marking Code  
 See Electrical Characteristics Table  
 YM = Date Code Marking  
 Y = Year (ex: Z = 2012)  
 M = Month (ex: 9 = September)



C = CAT (Chengdu Assembly / Test site)  
 xx = Product Type Marking Code  
 See Electrical Characteristics Table  
 YM = Date Code Marking  
 Y = Year (ex: Z = 2012)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	1998	...	2002	2003	2004	...	2010	2011	2012	2013	2014	2015	2016	2017	2018
Code	J	...	N	P	R	...	X	Y	Z	A	B	C	D	E	F
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			

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Forward Voltage @ $I_F = 10\text{mA}$	$V_F$	0.9	V

**Thermal Characteristics**

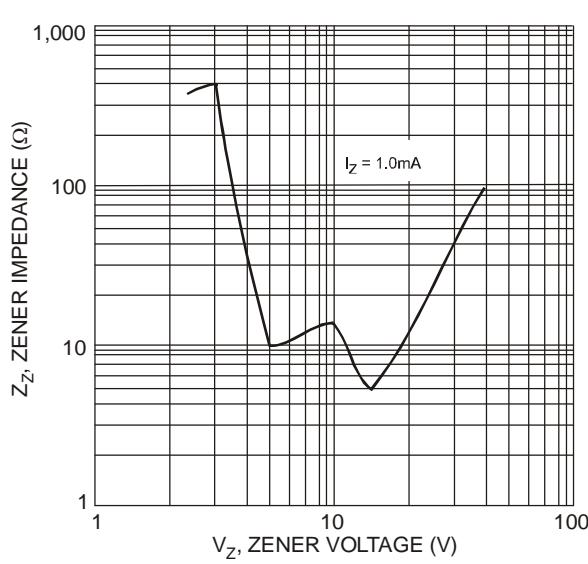
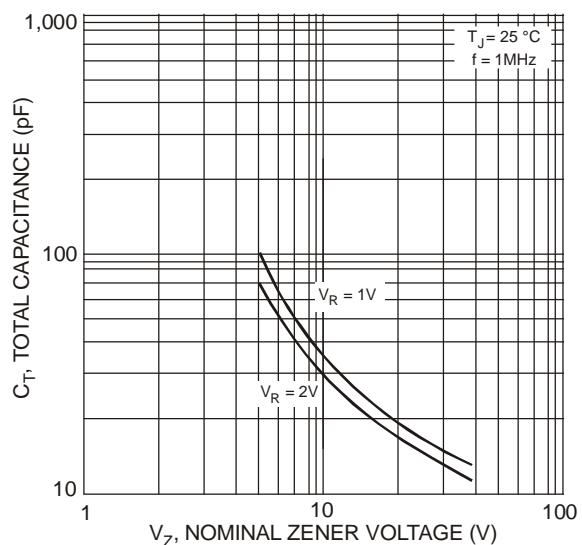
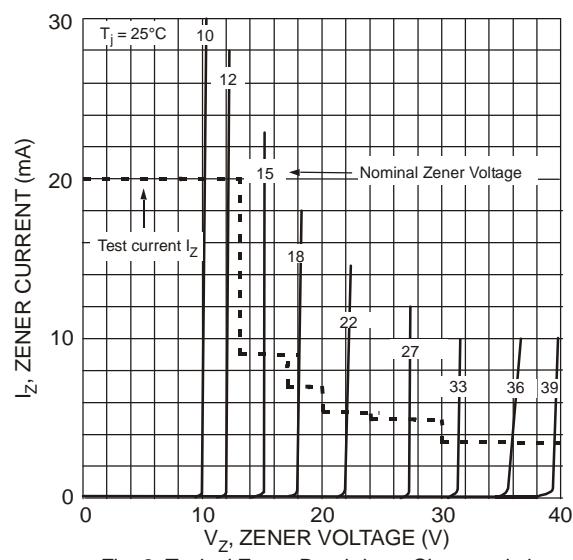
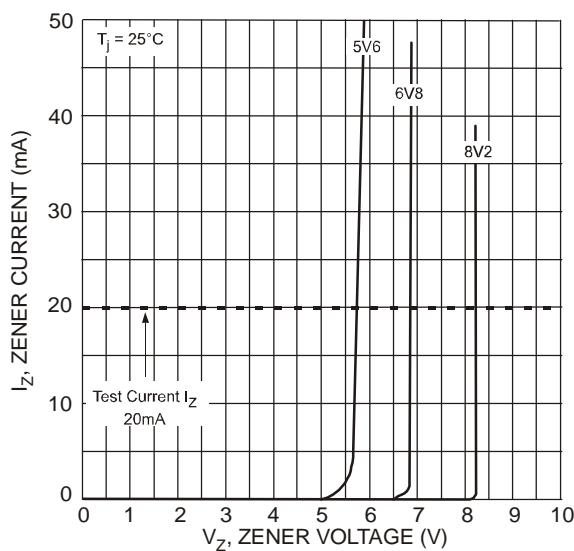
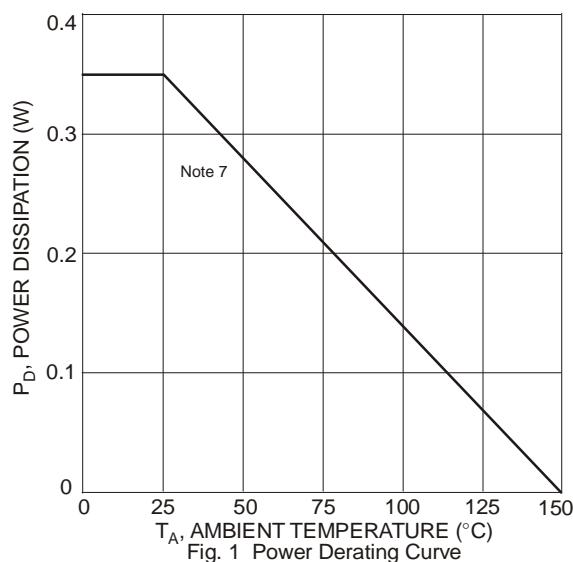
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	$P_D$	350	mW
Thermal Resistance, Junction to Ambient Air (Note 7)	$R_{\theta JA}$	357	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	°C

Notes: 7. Mounted on FR4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com>.

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

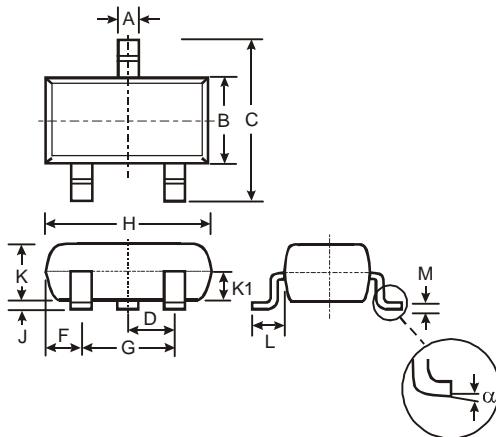
Type Number	Type Code	Zener Voltage Range (Note 8)			Maximum Zener Impedance $f = 1\text{kHz}$		Maximum Reverse Leakage Current (Note 8)		
		$V_Z @ I_{ZT}$			$I_{ZT}$	$Z_{ZT} @ I_{ZT}$	$Z_{ZK} @ I_{ZK} = 0.25\text{mA}$	$I_R$	
		Nom (V)	Min (V)	Max (V)	mA	$\Omega$		$\mu\text{A}$	
MMBZ5221B	C1	2.4	2.28	2.52	20	30	1200	100	1.0
MMBZ5222B	C2	2.5	2.38	2.63	20	30	1200	100	1.0
MMBZ5223B	C3	2.7	2.57	2.84	20	30	1300	75	1.0
MMBZ5225B	C5	3.0	2.85	3.15	20	30	1600	50	1.0
MMBZ5226B	G1	3.3	3.14	3.47	20	28	1600	25	1.0
MMBZ5227B	G2	3.6	3.42	3.78	20	24	1700	15	1.0
MMBZ5228B	G3	3.9	3.71	4.10	20	23	1900	10	1.0
MMBZ5229B	G4	4.3	4.09	4.52	20	22	2000	5.0	1.0
MMBZ5230B	G5	4.7	4.47	4.94	20	19	1900	5.0	2.0
MMBZ5231B	E1	5.1	4.85	5.36	20	17	1600	5.0	2.0
MMBZ5232B	E2	5.6	5.32	5.88	20	11	1600	5.0	3.0
MMBZ5233B	E3	6.0	5.70	6.30	20	7	1600	5.0	3.5
MMBZ5234B	E4	6.2	5.89	6.51	20	7	1000	5.0	4.0
MMBZ5235B	E5	6.8	6.46	7.14	20	5	750	3.0	5.0
MMBZ5236B	F1	7.5	7.13	7.88	20	6	500	3.0	6.0
MMBZ5237B	F2	8.2	7.79	8.61	20	8	500	3.0	6.5
MMBZ5238B	F3	8.7	8.27	9.14	20	8	600	3.0	6.5
MMBZ5239B	F4	9.1	8.65	9.56	20	10	600	3.0	7.0
MMBZ5240B	F5	10	9.50	10.50	20	17	600	3.0	8.0
MMBZ5241B	H1	11	10.45	11.55	20	22	600	2.0	8.4
MMBZ5242B	H2	12	11.40	12.60	20	30	600	1.0	9.1
MMBZ5243B	H3	13	12.35	13.65	9.5	13	600	0.5	9.9
MMBZ5244B	H4	14	13.30	14.70	9.0	15	600	0.1	10
MMBZ5245B	H5	15	14.25	15.75	8.5	16	600	0.1	11
MMBZ5246B	J1	16	15.20	16.80	7.8	17	600	0.1	12
MMBZ5248B	J3	18	17.10	18.90	7.0	21	600	0.1	14
MMBZ5250B	J5	20	19.00	21.00	6.2	25	600	0.1	15
MMBZ5251B	K1	22	20.90	23.10	5.6	29	600	0.1	17
MMBZ5252B	K2	24	22.80	25.20	5.2	33	600	0.1	18
MMBZ5254B	K4	27	25.65	28.35	5.0	41	600	0.1	21
MMBZ5255B	K5	28	26.60	29.40	4.5	44	600	0.1	21
MMBZ5256B	M1	30	28.50	31.50	4.2	49	600	0.1	23
MMBZ5257B	M2	33	31.35	34.65	3.8	58	700	0.1	25
MMBZ5258B	M3	36	34.20	37.80	3.4	70	700	0.1	27
MMBZ5259B	M4	39	37.05	40.95	3.2	80	800	0.1	30

Notes: 8. Short duration pulse test used to minimize self-heating effect.



## Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

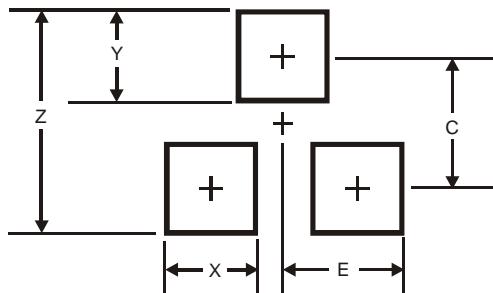


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
$\alpha$	0°	8°	-

All Dimensions in mm

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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