



**THE DATASHEET OF
MMBZ5248BQ-7-F**



Features

- Planar Die Construction
- 350mW Power Dissipation on FR-4 PCB
- Ideally Suited for Automated Assembly Processes
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

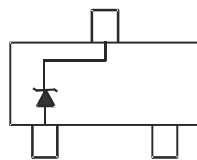
Mechanical Data

- Package: SOT23
- Package 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
- Weight: 0.008 grams (Approximate)

SOT23



Top View



Device Schematic

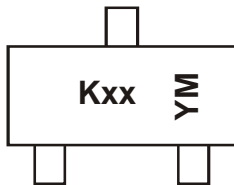
Ordering Information (Notes 4, 5)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
(Type Number)-7-F*	SOT23	3,000	Tape & Reel
(Type Number)Q-7-F*	SOT23	3,000	Tape & Reel
(Type Number)-13-F*	SOT23	10,000	Tape & Reel
(Type Number)Q-13-F*	SOT23	10,000	Tape & Reel

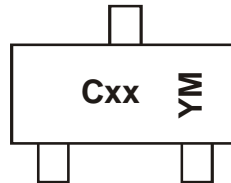
* Add "-7-F" to the appropriate type number in Electrical Characteristics Table from Page 2. Example: 6.2V Zener = MMBZ5234B-7-F.

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.
 5. 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 Incorporated sales representative for availability.

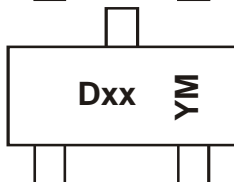
Marking Information



K/D = SAT (Shanghai Assembly / Test site)
 xx = Product Type Marking Code
 See Electrical Characteristics Table
 YM = Date Code Marking
 Y = Year (ex: I = 2021)
 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: K = 2023)
 M = Month (ex: 9 = September)



For MMBZ5234B-7-F & MMBZ5245B-7-F only:
 Assembly/Test in Shanghai or Chuzhou
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2014	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	B	I	J	K	L	M	N	O	P	R	S
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

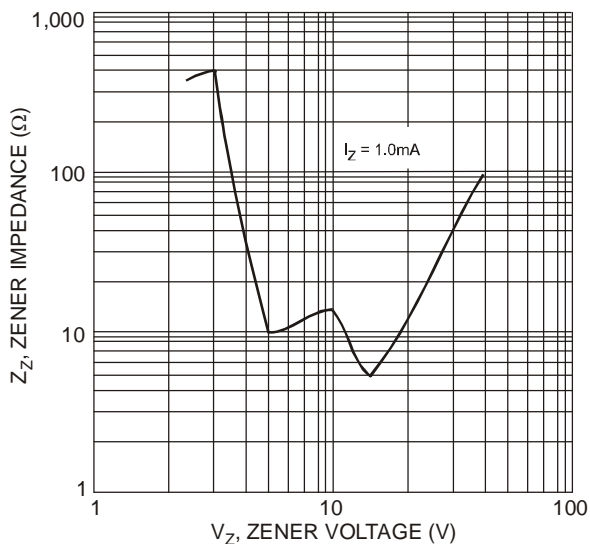
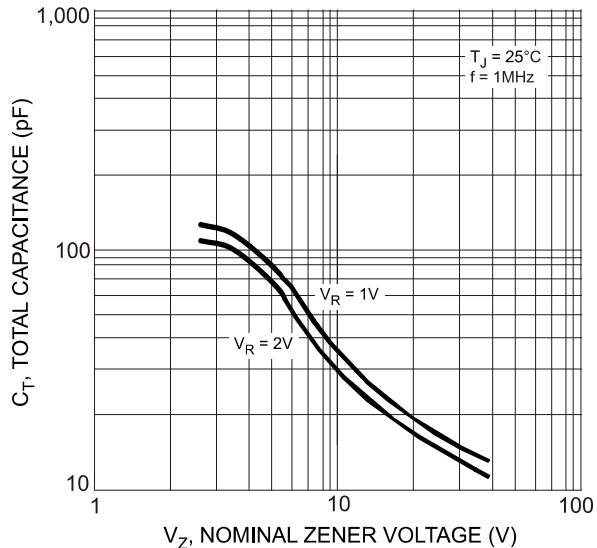
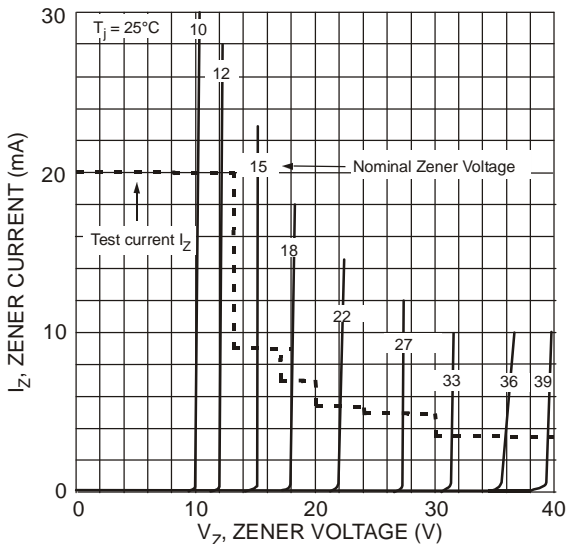
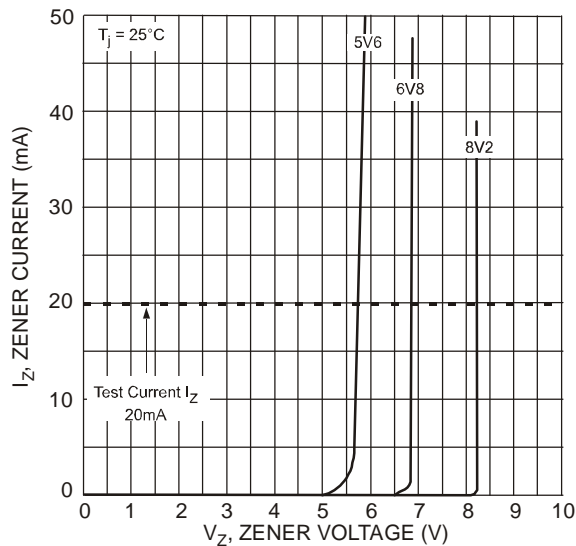
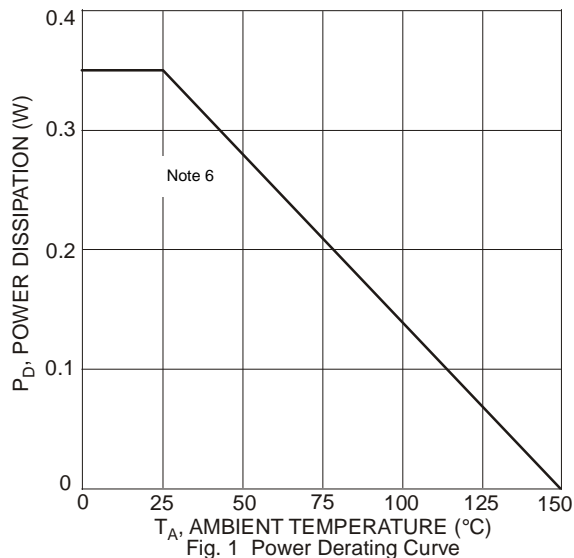
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	350	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

Note: 6. Mounted on FR4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com/package-outlines.html>.

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

Type Number	Type Code	Zener Voltage Range (Note 7)				Maximum Zener Impedance f = 1kHz		Maximum Reverse Leakage Current (Note 7)	
		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
MMBZ5221B	C1	2.4	2.28	2.52	20	30	1,200	100	1.0
MMBZ5222B	C2	2.5	2.38	2.63	20	30	1,200	100	1.0
MMBZ5223B	C3	2.7	2.57	2.84	20	30	1,300	75	1.0
MMBZ5225B	C5	3.0	2.85	3.15	20	30	1,600	50	1.0
MMBZ5226B	G1	3.3	3.14	3.47	20	28	1,600	25	1.0
MMBZ5227B	G2	3.6	3.42	3.78	20	24	1,700	15	1.0
MMBZ5228B	G3	3.9	3.71	4.10	20	23	1,900	10	1.0
MMBZ5229B	G4	4.3	4.09	4.52	20	22	2,000	5.0	1.0
MMBZ5230B	G5	4.7	4.47	4.94	20	19	1,900	5.0	2.0
MMBZ5231B	E1	5.1	4.85	5.36	20	17	1,600	5.0	2.0
MMBZ5232B	E2	5.6	5.32	5.88	20	11	1,600	5.0	3.0
MMBZ5233B	E3	6.0	5.70	6.30	20	7	1,600	5.0	3.5
MMBZ5234B	E4	6.2	5.89	6.51	20	7	1,000	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

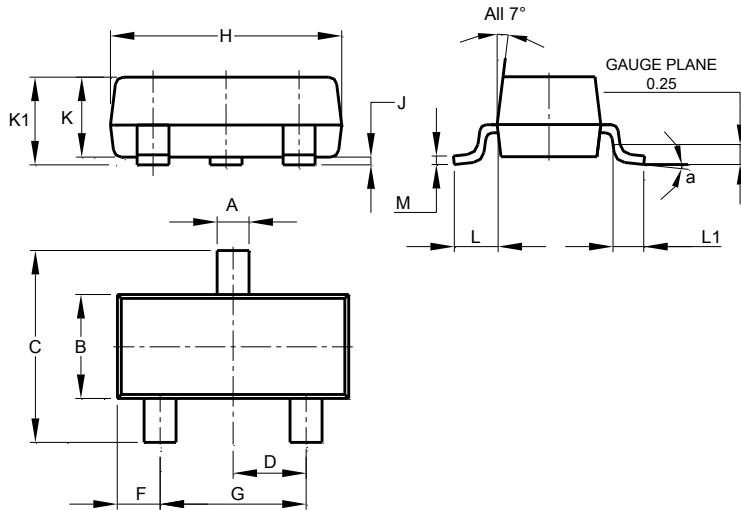
Note: 7. Short duration pulse test used to minimize self-heating effect.



Package Outline Dimensions

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

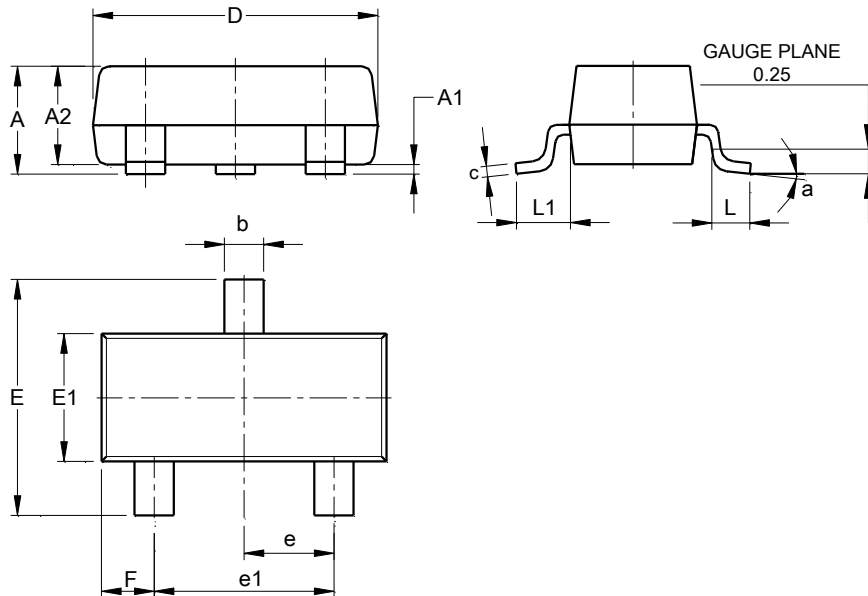
SOT23



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	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

For MMBZ5234B-7-F & MMBZ5245B-7-F only:

SOT23 (Standard)

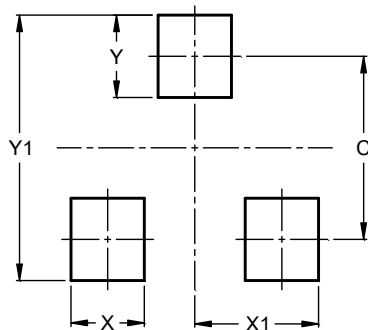


SOT23 (Standard)			
Dim	Min	Max	Typ
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

IMPORTANT NOTICE



1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).
2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.
3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.
4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.
5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (<https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/>) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.
6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.
7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.
8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.
9. This Notice may be periodically updated with the most recent version available at <https://www.diodes.com/about/company/terms-and-conditions/important-notice>

The Diodes logo is a registered trademark of Diodes Incorporated in the United States and other countries.
All other trademarks are the property of their respective owners.
© 2023 Diodes Incorporated. All Rights Reserved.

www.diodes.com

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View MMBZ5248BQ-7-F on WIN SOURCE](#)
-  [Diodes Incorporated Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management