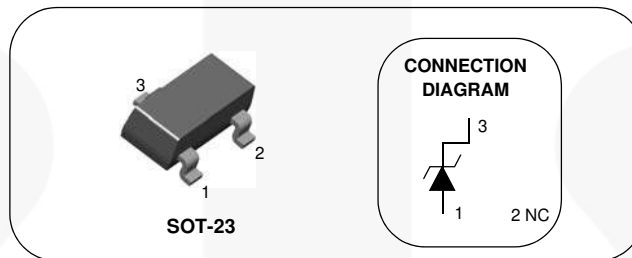


MMBZ5221B - MMBZ5257B

Zener Diodes

Tolerance = 5%



Absolute Maximum Ratings^(1, 2)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Value	Unit
P_D	Power Dissipation	Referencing $R_{\theta JA}$, $T_A = 25^\circ\text{C}$	250
		Referencing ψ_{JL} , $T_L = 25^\circ\text{C}$	550
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance ⁽³⁾	465	$^\circ\text{C}/\text{W}$
ψ_{JL}	Junction-to-Lead Thermal Characteristics (with reference to Cathode)	220	$^\circ\text{C}/\text{W}$
T_{STG}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_J	Operating Junction Temperature	+150	$^\circ\text{C}$

Note:

1. These ratings are based on a maximum junction temperature of 150°C .
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
3. Device mounted on FR-4 PCB, board size = 76.2 mm x 114.3 mm

Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Device	Mark	$V_Z(\text{V}) @ I_Z(\text{mA})$				$Z_Z(\Omega) @ I_Z(\text{mA})$		$Z_{ZK}(\Omega) @ I_{ZK}(\text{mA})$		$I_R(\mu\text{A}) @ V_R(\text{V})$	
		Min.	Nor.	Max.	$I_Z(\text{mA})$						
MMBZ5221B	18A	2.28	2.4	2.52	20	30	20	1,200	0.25	100	1.0
MMBZ5223B	18C	2.565	2.7	2.835	20	30	20	1,300	0.25	75	1.0
MMBZ5226B	8A	3.135	3.3	3.465	20	28	20	1,600	0.25	25	1.0
MMBZ5227B	8B	3.42	3.6	3.78	20	24	20	1,700	0.25	15	1.0
MMBZ5228B	8C	3.705	3.9	4.095	20	23	20	1,900	0.25	10	1.0
MMBZ5229B	8D	4.085	4.3	4.515	20	22	20	1,000	0.25	5.0	1.0
MMBZ5230B	8E	4.465	4.7	4.935	20	19	20	1,900	0.25	5.0	2.0
MMBZ5231B	8F	4.845	5.1	5.355	20	17	20	1,600	0.25	5.0	2.0
MMBZ5232B	8G	5.32	5.6	5.88	20	11	20	1,600	0.25	5.0	3.0
MMBZ5233B	8H	5.7	6.0	6.3	20	7.0	20	1,600	0.25	5.0	3.5
MMBZ5234B	8J	5.89	6.2	6.51	20	7.0	20	1,000	0.25	5.0	4.0
MMBZ5235B	8K	6.46	6.8	7.14	20	5.0	20	750	0.25	3.0	5.0
MMBZ5236B	8L	7.125	7.5	7.875	20	6.0	20	500	0.25	3.0	6.0
MMBZ5237B	8M	7.79	8.2	8.61	20	8.0	20	500	0.25	3.0	6.5
MMBZ5238B	8N	8.265	8.7	9.135	20	8.0	20	600	0.25	3.0	6.5
MMBZ5239B	8P	8.645	9.1	9.555	20	10	20	600	0.25	3.0	7.0
MMBZ5240B	8Q	9.5	10	10.5	20	17	20	600	0.25	3.0	8.0
MMBZ5241B	8R	10.45	11	11.55	20	22	20	600	0.25	2.0	8.4
MMBZ5242B	8S	11.4	12	12.6	20	30	20	600	0.25	1.0	9.1
MMBZ5243B	8T	12.35	13	13.65	9.5	13	9.5	600	0.25	0.5	9.9
MMBZ5244B	8U	13.3	14	14.7	9.0	15	9.0	600	0.25	0.1	10
MMBZ5245B	8V	14.25	15	15.75	8.5	16	8.5	600	0.25	0.1	11
MMBZ5246B	8W	15.2	16	16.8	7.8	17	7.8	600	0.25	0.1	12
MMBZ5247B	8X	16.15	17	17.85	7.4	19	7.4	600	0.25	0.1	13
MMBZ5248B	8Y	17.1	18	18.9	7.0	21	7.0	600	0.25	0.1	14
MMBZ5249B	8Z	18.05	19	19.95	6.6	23	6.6	600	0.25	0.1	14
MMBZ5250B	81A	19	20	21	6.2	25	6.2	600	0.25	0.1	15
MMBZ5251B	81B	20.9	22	23.1	5.6	29	5.6	600	0.25	0.1	17
MMBZ5252B	81C	22.8	24	25.2	5.2	33	5.2	600	0.25	0.1	18
MMBZ5253B	81D	23.75	25	26.25	5.0	35	5.0	600	0.25	0.1	19
MMBZ5254B	81E	25.65	27	28.35	4.6	41	4.6	600	0.25	0.1	21
MMBZ5255B	81F	26.6	28	29.4	4.5	44	4.5	600	0.25	0.1	21
MMBZ5256B	81G	28.5	30	31.5	4.2	49	4.2	600	0.25	0.1	23
MMBZ5257B	81H	31.35	33	34.65	3.8	58	3.8	600	0.25	0.1	25

V_F Forward Voltage = 0.9 V Maximum at $I_F = 10 \text{ mA}$ for all MMBZ5200 series

Typical Performance Characteristics

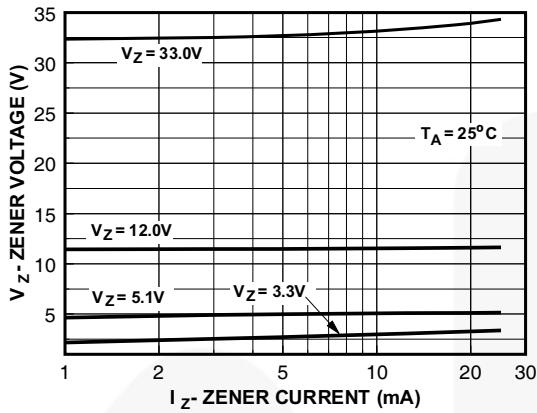


Figure 1. Zener Current vs. Zener Voltage

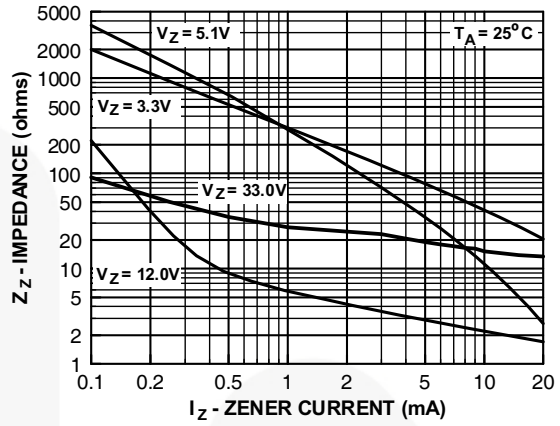


Figure 2. Zener Current vs. Zener Impedance

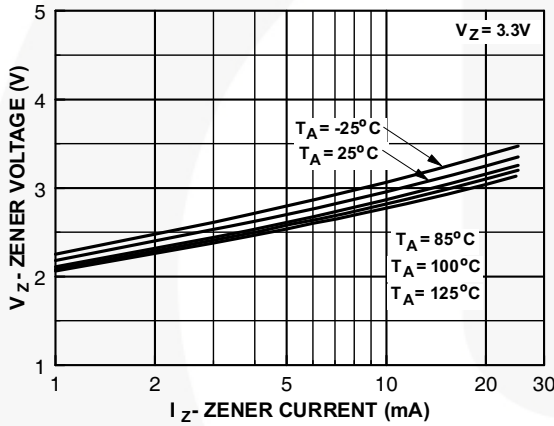


Figure 3. 3.3 Zener Voltage vs. Temperature

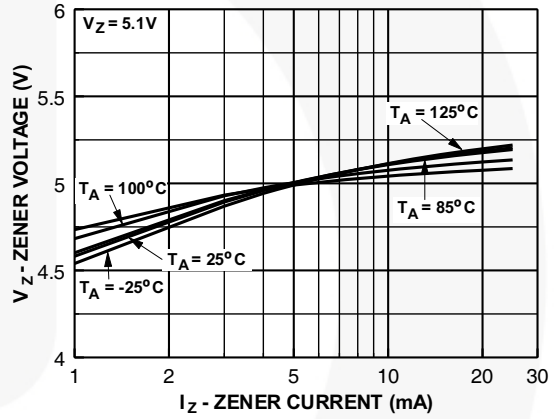


Figure 4. 5.1 Zener Voltage vs. Temperature

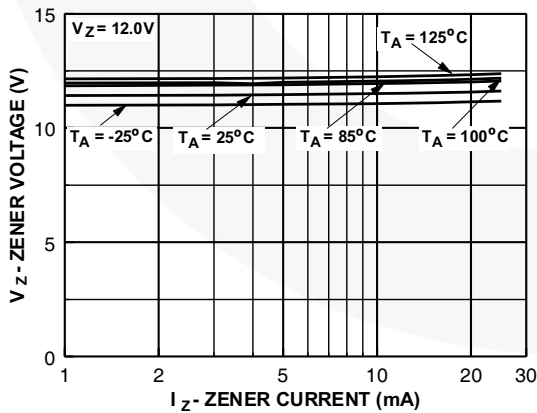


Figure 5. 12 Zener Voltage vs. Zener Temperature

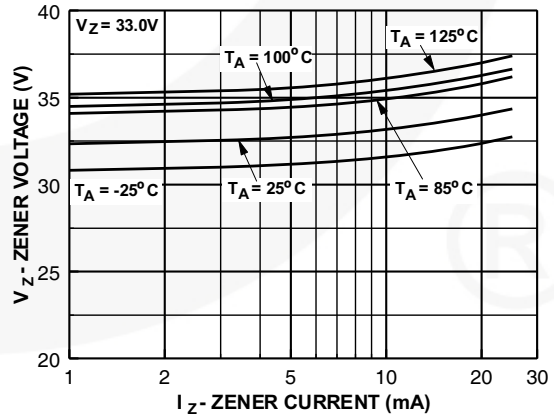
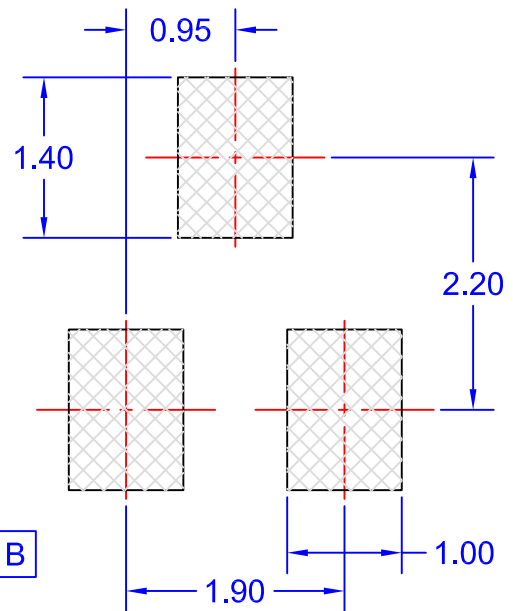
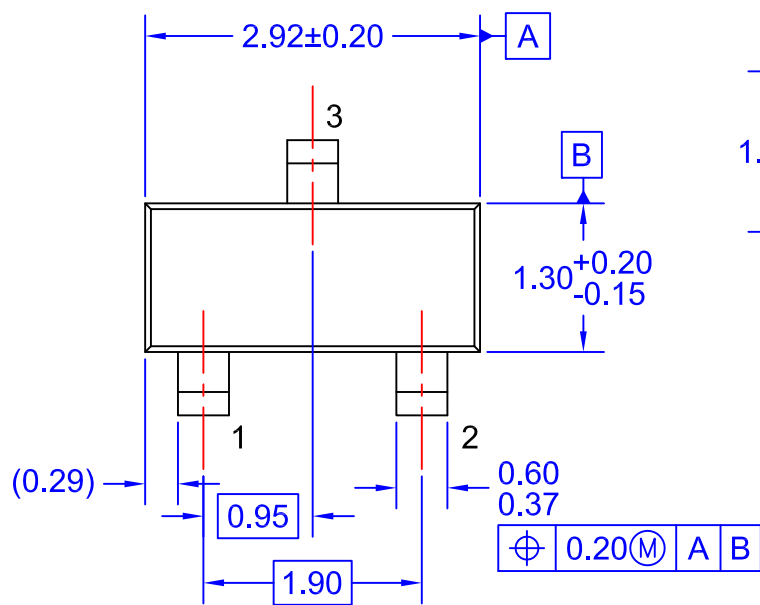
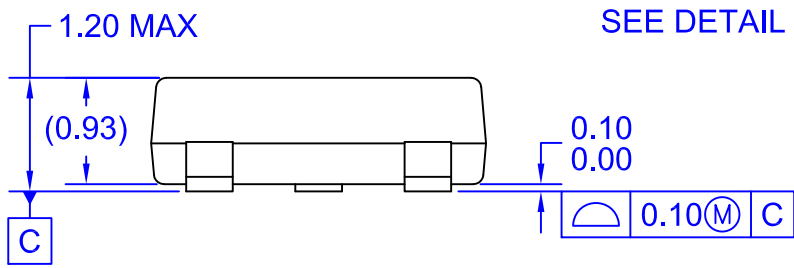


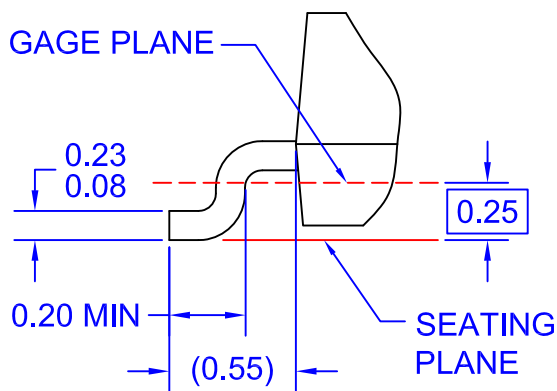
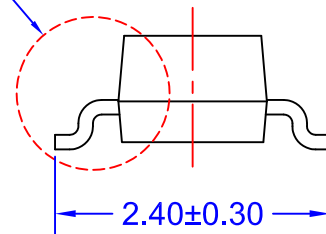
Figure 6. 33 Zener Voltage vs. Zener Temperature



LAND PATTERN
RECOMMENDATION



SEE DETAIL A



DETAIL A
SCALE: 2X

NOTES: UNLESS OTHERWISE SPECIFIED

- A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 2009.
- E) DRAWING FILE NAME: MA03DREV12





TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

AccuPower™
AttitudeEngine™
Awinda®
AX-CAP®*
BitSiC™
Build it Now™
CorePLUS™
CorePOWER™
CROSSVOL™
CTL™
Current Transfer Logic™
DEUXPEED®
Dual Cool™
EcoSPARK®
EfficientMax™
ESBC™
F™
Fairchild®
Fairchild Semiconductor®
FACT Quiet Series™
FACT®
FastvCore™
FETBench™
FPS™

F-PFS™
FRFET®
Global Power Resource™
GreenBridge™
Green FPS™
Green FPS™ e-Series™
Gmax™
GTO™
IntelliMAX™
ISOPLANAR™
Making Small Speakers Sound Louder and Better™
MegaBuck™
MICROCOUPLER™
MicroFET™
MicroPak™
MicroPak2™
MillerDrive™
MotionMax™
MotionGrid®
MTi®
MTX®
MVN®
mWSaver®
OptoHiT™
OPTOLOGIC®

OPTOPLANAR®
Power Supply WebDesigner™
PowerTrench®
PowerXS™
Programmable Active Droop™
QFET®
QS™
Quiet Series™
RapidConfigure™
Saving our world, 1mW/W/kW at a time™
SignalWise™
SmartMax™
SMART START™
Solutions for Your Success™
SPM®
STEALTH™
SuperFET®
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SupreMOS®
SyncFET™
Sync-Lock™

SYSTEM GENERAL®
TinyBoost®
TinyBuck®
TinyCalc™
TinyLogic®
TINYOPTO™
TinyPower™
TinyPWM™
TinyWire™
TranSiC™
TriFault Detect™
TRUECURRENT®*
µSerDes™
SerDes®
UHC®
Ultra FRFET™
UniFET™
VCX™
VisualMax™
VoltagePlus™
XS™
Xsens™
仙童®

* Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. TO OBTAIN THE LATEST, MOST UP-TO-DATE DATASHEET AND PRODUCT INFORMATION, VISIT OUR WEBSITE AT [HTTP://WWW.FAIRCHILDSEMI.COM](http://www.fairchildsemi.com). FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

AUTHORIZED USE

Unless otherwise specified in this data sheet, this product is a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability. This product may not be used in the following applications, unless specifically approved in writing by a Fairchild officer: (1) automotive or other transportation, (2) military/aerospace, (3) any safety critical application – including life critical medical equipment – where the failure of the Fairchild product reasonably would be expected to result in personal injury, death or property damage. Customer's use of this product is subject to agreement of this Authorized Use policy. In the event of an unauthorized use of Fairchild's product, Fairchild accepts no liability in the event of product failure. In other respects, this product shall be subject to Fairchild's Worldwide Terms and Conditions of Sale, unless a separate agreement has been signed by both Parties.

ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Terms of Use

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

Rev. I77