MMBZ5221BLT1 Series

Zener Voltage Regulators

225 mW SOT–23 Surface Mount

This series of Zener diodes is offered in the convenient, surface mount plastic SOT–23 package. These devices are designed to provide voltage regulation with minimum space requirement. They are well suited for applications such as cellular phones, hand held portables, and high density PC boards.

Specification Features:

- 225 mW Rating on FR–4 or FR–5 Board
- Zener Voltage Range – 2.4 V to 91 V
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- ESD Rating of Class 3 (>16 KV) per Human Body Model

Mechanical Characteristics:

CASE: Void-free, transfer-molded, thermosetting plastic case
FINISH: Corrosion resistant finish, easily solderable
MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES: 260°C for 10 Seconds
POLARITY: Cathode indicated by polarity band
FLAMMABILITY RATING: UL94 V–0

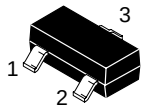
MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Total Power Dissipation on FR–5 Board, (Note 1.) @ T_A = 25°C Derated above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance – Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Power Dissipation on Alumina Substrate, (Note 2.) @ T_A = 25°C Derated above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance – Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	–65 to +150	°C

1. FR–5 = 1.0 X 0.75 X 0.62 in.
2. Alumina = 0.4 X 0.3 X 0.024 in., 99.5% alumina

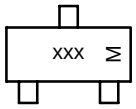
ON Semiconductor™

http://onsemi.com



SOT–23
CASE 318
STYLE 8

MARKING DIAGRAM



xxx = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device †	Package	Shipping
MMBZ52xxBLT1	SOT–23	3000/Tape & Reel
MMBZ52xxBLT3	SOT–23	10,000/Tape & Reel

DEVICE MARKING INFORMATION

See specific marking information in the device marking column of the Electrical Characteristics table on page 3 of this data sheet.

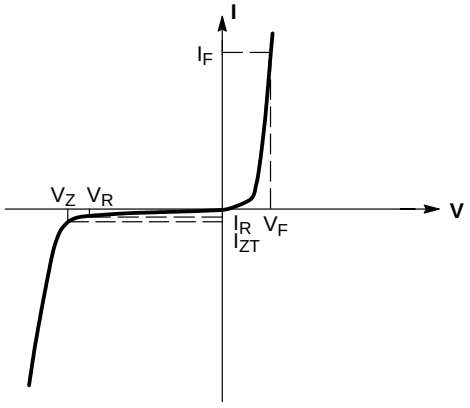
Devices listed in ***bold, italic*** are ON Semiconductor **Preferred** devices. **Preferred** devices are recommended choices for future use and best overall value.

†The "T1" suffix refers to an 8 mm, 7 inch reel.
The "T3" suffix refers to an 8 mm, 13 inch reel.

ELECTRICAL CHARACTERISTICS

(Pinout: 1-Anode, 2-No Connection, 3-Cathode) (T_A = 25°C unless otherwise noted, V_F = 0.95 V Max. @ I_F = 10 mA)

Symbol	Parameter
V_Z	Reverse Zener Voltage @ I_{ZT}
I_{ZT}	Reverse Current
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}
I_R	Reverse Leakage Current @ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_F



Zener Voltage Regulator

ELECTRICAL CHARACTERISTICS (Pinout: 1-Anode, 2-NC, 3-Cathode) (V_F = 0.9 V Max @ I_F = 10 mA for all types.)

Device	Device Marking	Zener Voltage (Note 3.) V_Z (Volts) Min	Nom	Max	@ I_{ZT} mA	Zener Impedance Z_{ZT} @ I_{ZT} Ω	Z_{ZK} @ I_{ZK} Ω	mA	Leakage Current I_R @ V_R μA	Volts
MMBZ5221BLT1	18A	2.28	2.4	2.52	20	30	1200	0.25	100	1
MMBZ5222BLT1	18B	2.37	2.5	2.63	20	30	1250	0.25	100	1
MMBZ5223BLT1	18C	2.56	2.7	2.84	20	30	1300	0.25	75	1
MMBZ5224BLT1	18D	2.66	2.8	2.94	20	30	1400	0.25	75	1
MMBZ5225BLT1	18E	2.85	3	3.15	20	29	1600	0.25	50	1
MMBZ5226BLT1	8A	3.13	3.3	3.47	20	28	1600	0.25	25	1
MMBZ5227BLT1	8B	3.42	3.6	3.78	20	24	1700	0.25	15	1
MMBZ5228BLT1	8C	3.70	3.9	4.10	20	23	1900	0.25	10	1
MMBZ5229BLT1	8D	4.08	4.3	4.52	20	22	2000	0.25	5	1
MMBZ5230BLT1	8E	4.46	4.7	4.94	20	19	1900	0.25	5	2
MMBZ5231BLT1	***8F***	***4.84***	***5.1***	***5.36***	***20***	***17***	***1600***	***0.25***	***5***	***2***
MMBZ5232BLT1	***8G***	***5.32***	***5.6***	***5.88***	***20***	***11***	***1600***	***0.25***	***5***	***3***
MMBZ5233BLT1	8H	5.70	6	6.30	20	7	1600	0.25	5	3.5
MMBZ5234BLT1	***8J***	***5.89***	***6.2***	***6.51***	***20***	***7***	***1000***	***0.25***	***5***	***4***
MMBZ5235BLT1	***8K***	***6.46***	***6.8***	***7.14***	***20***	***5***	***750***	***0.25***	***3***	***5***
MMBZ5236BLT1	8L	7.12	7.5	7.88	20	6	500	0.25	3	6
MMBZ5237BLT1	8M	7.79	8.2	8.61	20	8	500	0.25	3	6.5
MMBZ5238BLT1	8N	8.26	8.7	9.14	20	8	600	0.25	3	6.5
MMBZ5239BLT1	8P	8.64	9.1	9.56	20	10	600	0.25	3	7
MMBZ5240BLT1	***8Q***	***9.50***	***10***	***10.50***	***20***	***17***	***600***	***0.25***	***3***	***8***
MMBZ5241BLT1	8R	10.4	11	11.55	20	22	600	0.25	2	8.4
MMBZ5242BLT1	***8S***	***11.40***	***12***	***12.60***	***20***	***30***	***600***	***0.25***	***1***	***9.1***
MMBZ5243BLT1	8T	12.35	13	13.65	9.5	13	600	0.25	0.5	9.9
MMBZ5244BLT1	8U	13.30	14	14.70	9	15	600	0.25	0.1	10
MMBZ5245BLT1	***8V***	***14.25***	***15***	***15.75***	***8.5***	***16***	***600***	***0.25***	***0.1***	***11***
MMBZ5246BLT1	8W	15.20	16	16.80	7.8	17	600	0.25	0.1	12
MMBZ5247BLT1	8X	16.15	17	17.85	7.4	19	600	0.25	0.1	13
MMBZ5248BLT1	***8Y***	***17.10***	***18***	***18.90***	***7***	***21***	***600***	***0.25***	***0.1***	***14***
MMBZ5249BLT1	8Z	18.05	19	19.95	6.6	23	600	0.25	0.1	14
MMBZ5250BLT1	***81A***	***19.00***	***20***	***21.00***	***6.2***	***25***	***600***	***0.25***	***0.1***	***15***
MMBZ5251BLT1	81B	20.90	22	23.10	5.6	29	600	0.25	0.1	17
MMBZ5252BLT1	81C	22.80	24	25.20	5.2	33	600	0.25	0.1	18
MMBZ5253BLT1	81D	23.75	25	26.25	5	35	600	0.25	0.1	19
MMBZ5254BLT1	***81E***	***25.65***	***27***	***28.35***	***4.6***	***41***	***600***	***0.25***	***0.1***	***21***
MMBZ5255BLT1	81F	26.60	28	29.40	4.5	44	600	0.25	0.1	21
MMBZ5256BLT1	81G	28.50	30	31.50	4.2	49	600	0.25	0.1	23
MMBZ5257BLT1	***81H***	***31.35***	***33***	***34.65***	***3.8***	***58***	***700***	***0.25***	***0.1***	***25***
MMBZ5258BLT1	81J	34.20	36	37.80	3.4	70	700	0.25	0.1	27
MMBZ5259BLT1	81K	37.05	39	40.95	3.2	80	800	0.25	0.1	30
MMBZ5260BLT1	81L	40.85	43	45.15	3	93	900	0.25	0.1	33
MMBZ5261BLT1	81M	44.65	47	49.35	2.7	105	1000	0.25	0.1	36
MMBZ5262BLT1	81N	48.45	51	53.55	2.5	125	1100	0.25	0.1	39
MMBZ5263BLT1	81P	53.20	56	58.80	2.2	150	1300	0.25	0.1	43
MMBZ5264BLT1	81Q	57.00	60	63.00	2.1	170	1400	0.25	0.1	46
MMBZ5265BLT1	81R	58.90	62	65.10	2	185	1400	0.25	0.1	47
MMBZ5266BLT1	81S	64.60	68	71.40	1.8	230	1600	0.25	0.1	52
MMBZ5267BLT1	81T	71.25	75	78.75	1.7	270	1700	0.25	0.1	56
MMBZ5268BLT1	81U	77.90	82	86.10	1.5	330	2000	0.25	0.1	62
MMBZ5269BLT1	81V	82.65	87	91.35	1.4	370	2200	0.25	0.1	68
MMBZ5270BLT1	81W	86.45	91	95.55	1.4	400	2300	0.25	0.1	69

3. Zener voltage is measured with a pulse test current I_Z at an ambient temperature of 25°C

TYPICAL CHARACTERISTICS

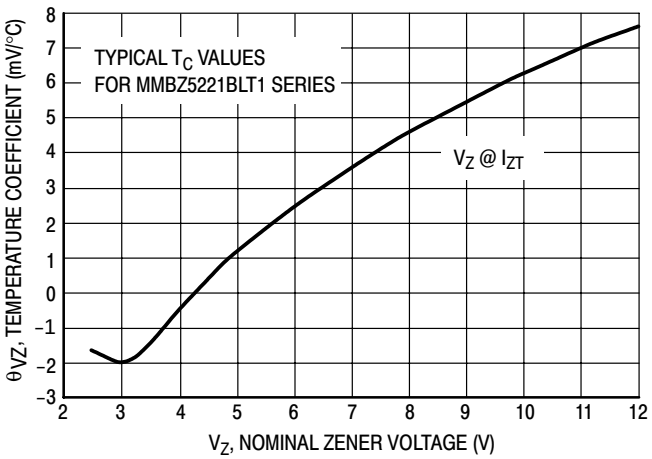


Figure 1. Temperature Coefficients (Temperature Range –55°C to +150°C)

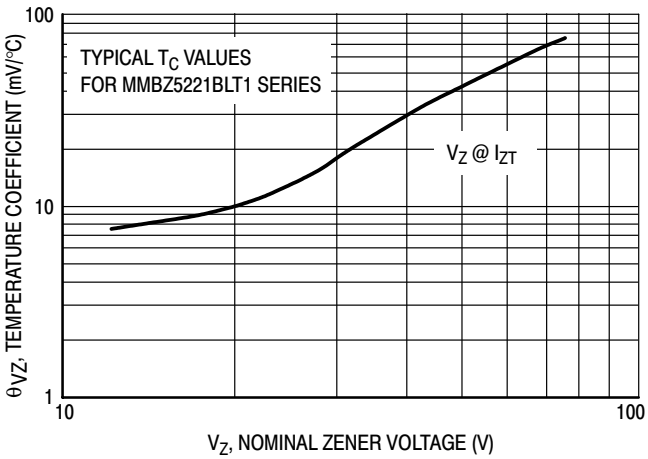


Figure 2. Temperature Coefficients (Temperature Range –55°C to +150°C)

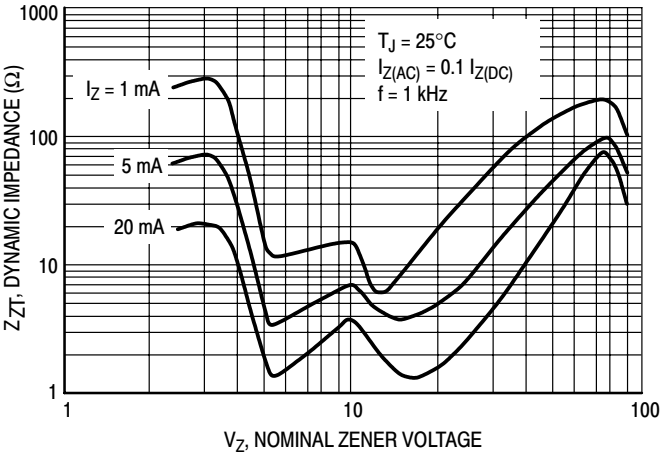


Figure 3. Effect of Zener Voltage on Zener Impedance

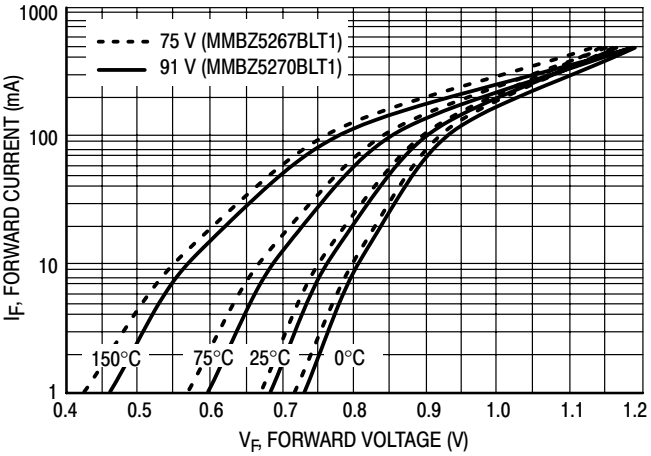


Figure 4. Typical Forward Voltage

TYPICAL CHARACTERISTICS

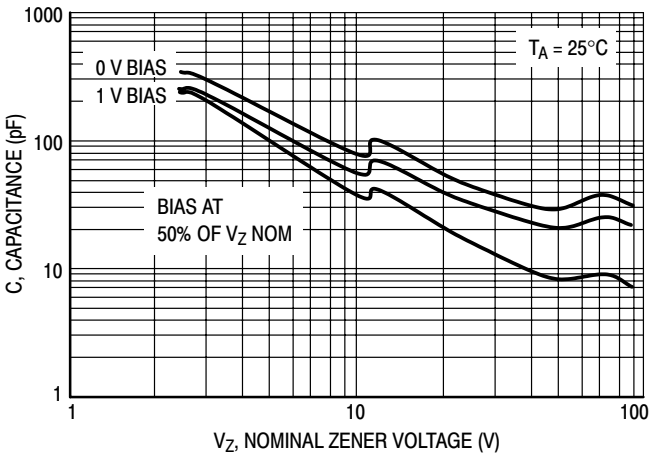


Figure 5. Typical Capacitance

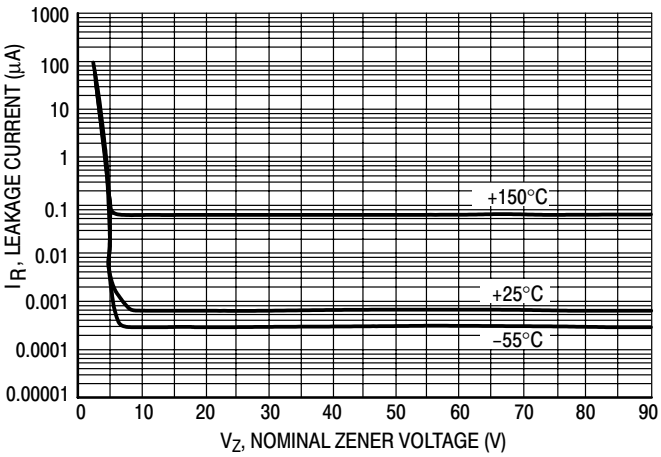


Figure 6. Typical Leakage Current

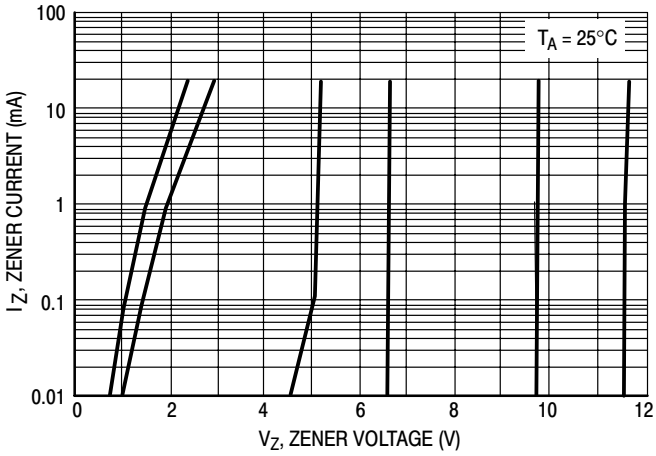


Figure 7. Zener Voltage versus Zener Current (V_Z Up to 12 V)

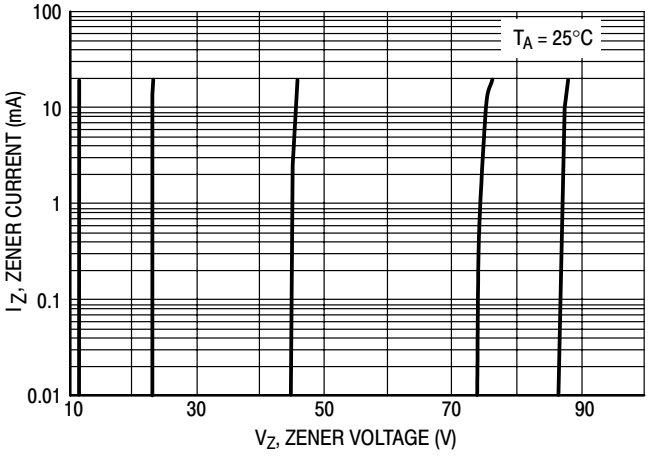
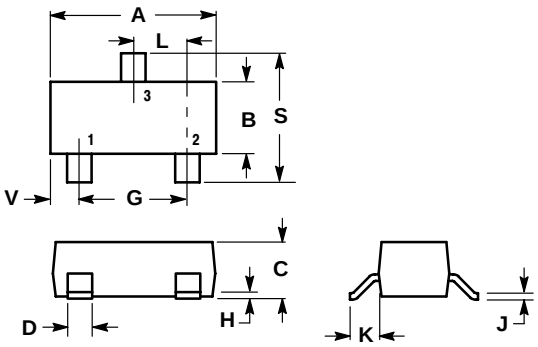


Figure 8. Zener Voltage versus Zener Current (12 V to 91 V)

PACKAGE DIMENSIONS

SOT–23
TO–236AB
CASE 318–08
ISSUE AF



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

STYLE 8:
PIN 1. ANODE
2. NO CONNECTION
3. CATHODE

Notes

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