ZMM5221B - ZMM5267B

500mW SURFACE MOUNT ZENER DIODE

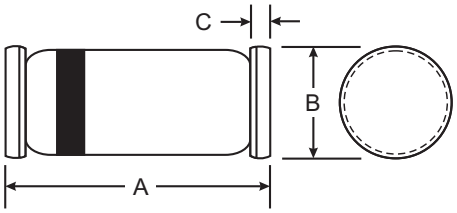
Features

NOT RECOMMENDED FOR NEW DESIGN
SUGGESTED REPLACEMENT MMSZ52xx

- 500mW Power Dissipation
- Outline Similar to JEDEC DO-213AA
- Hemetic Glass Package
- **Lead Free Finish, RoHS Compliant (Note 3)**

Mechanical Data

- Case: MiniMELF
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Sn97.5Ag2.5. Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band
- Ordering Information: See Last Page
- Marking: Cathode Band Only
- Weight: 0.034 grams (approximate)



MiniMELF		
Dim	**Min**	**Max**
A	3.30	3.70
B	1.30	1.60
C	0.28	0.50
All Dimensions in mm		

Maximum Ratings and Electrical Characteristics @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 1)	P_d	500	mW
Thermal Resistance, Junction to Ambient Air	(Note 1)	$R_{\theta JA}$	300	°C /W
Forward Voltage	@ I_F = 200mA	V_F	1.5	V
Operating and Storage Temperature Range		T_j, T_{STG}	-65 to +175	°C

Notes:
1. Valid provided that electrodes are kept at ambient temperature.
2. Tested with pulses, $T_p \leq 100$ms.
3. EC Directive 2002/95/EC (RoHS) revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied where applicable, see *EU Directive Annex Notes 5 and 7.*

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Electrical Characteristics @ T_A = 25°C unless otherwise specified

Type Number	Zener Voltage Range (Note 2)				Maximum Zener Impedance		Maximum Reverse Current		Typical Temperature Coefficient @ I_{ZT}
	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	Ω	μA	V	%/ °C
ZMM5221B	2.4	2.28	2.52	20	30	1200	100	1.0	-0.085
ZMM5222B	2.5	2.38	2.63	20	30	1250	100	1.0	-0.085
ZMM5223B	2.7	2.57	2.84	20	30	1300	75	1.0	-0.080
ZMM5224B	2.8	2.66	2.94	20	30	1400	75	1.0	-0.080
ZMM5225B	3.0	2.85	3.15	20	29	1600	50	1.0	-0.075
ZMM5226B	3.3	3.14	3.47	20	28	1600	25	1.0	-0.070
ZMM5227B	3.6	3.42	3.78	20	24	1700	15	1.0	-0.065
ZMM5228B	3.9	3.71	4.10	20	23	1900	10	1.0	-0.060
ZMM5229B	4.3	4.09	4.52	20	22	2000	5.0	1.0	-0.055
ZMM5230B	4.7	4.47	4.94	20	19	1900	5.0	2.0	±0.030
ZMM5231B	5.1	4.85	5.36	20	17	1600	5.0	2.0	±0.030
ZMM5232B	5.6	5.32	5.88	20	11	1600	5.0	3.0	+0.038
ZMM5233B	6.0	5.70	6.30	20	7.0	1600	5.0	3.5	+0.038
ZMM5234B	6.2	5.89	6.51	20	7.0	1000	5.0	4.0	+0.045
ZMM5235B	6.8	6.46	7.14	20	5.0	750	3.0	5.0	+0.050
ZMM5236B	7.5	7.13	7.88	20	6.0	500	3.0	6.0	+0.058
ZMM5237B	8.2	7.79	8.61	20	8.0	500	3.0	6.5	+0.062
ZMM5238B	8.7	8.27	9.14	20	8.0	600	3.0	6.5	+0.065
ZMM5239B	9.1	8.65	9.56	20	10	600	3.0	7.0	+0.068
ZMM5240B	10	9.50	10.50	20	17	600	3.0	8.0	+0.075
ZMM5241B	11	10.45	11.55	20	22	600	2.0	8.4	+0.076
ZMM5242B	12	11.40	12.60	20	30	600	1.0	9.1	+0.077
ZMM5243B	13	12.35	13.65	9.5	13	600	0.5	9.9	+0.079
ZMM5244B	14	13.30	14.70	9.0	15	600	0.1	10	+0.082
ZMM5245B	15	14.25	15.75	8.5	16	600	0.1	11	+0.082
ZMM5246B	16	15.20	16.80	7.8	17	600	0.1	12	+0.083
ZMM5247B	17	16.15	17.85	7.4	19	600	0.1	13	+0.084
ZMM5248B	18	17.10	18.90	7.0	21	600	0.1	14	+0.085
ZMM5249B	19	18.05	19.95	6.6	23	600	0.1	14	+0.086
ZMM5250B	20	19.00	21.00	6.2	25	600	0.1	15	+0.086
ZMM5251B	22	20.90	23.10	5.6	29	600	0.1	17	+0.087
ZMM5252B	24	22.80	25.20	5.2	33	600	0.1	18	+0.087
ZMM5253B	25	23.75	26.25	5.0	35	600	0.1	19	+0.089
ZMM5254B	27	25.65	28.35	4.6	41	600	0.1	21	+0.090
ZMM5255B	28	26.60	29.40	4.5	44	600	0.1	21	+0.091
ZMM5256B	30	28.50	31.50	4.2	49	600	0.1	23	+0.091
ZMM5257B	33	31.35	34.65	3.8	58	700	0.1	25	+0.092
ZMM5258B	36	34.20	37.80	3.4	70	700	0.1	27	+0.093
ZMM5259B	39	37.05	40.95	3.2	80	800	0.1	30	+0.094
ZMM5260B	43	40.85	45.15	3.0	93	900	0.1	33	+0.095
ZMM5261B	47	44.65	49.35	2.7	105	1000	0.1	36	+0.095
ZMM5262B	51	48.45	53.55	2.5	125	1100	0.1	39	+0.096
ZMM5263B	56	53.20	58.80	2.2	150	1300	0.1	43	+0.096
ZMM5264B	60	57.00	63.00	2.1	170	1400	0.1	46	+0.097
ZMM5265B	62	58.90	65.10	2.0	185	1400	0.1	47	+0.097
ZMM5266B	68	64.60	71.40	1.8	230	1600	0.1	52	+0.097
ZMM5267B	75	71.25	78.75	1.7	270	1700	0.1	56	+0.098

Notes: 2. Tested with pulses, $T_p \leq 100$ms.

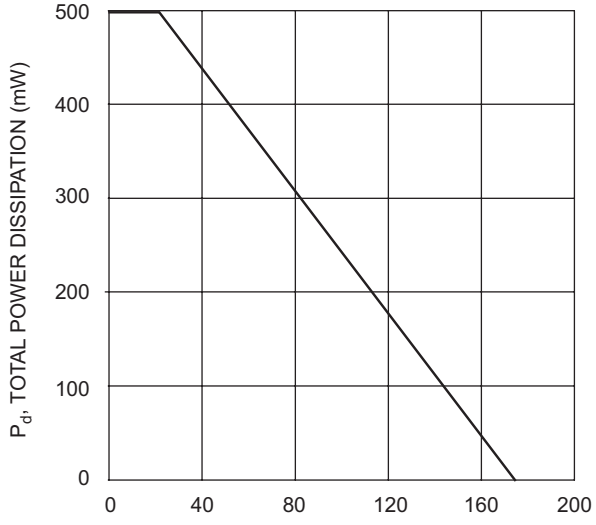

Fig.1 Power Dissipation vs Ambient Temperature

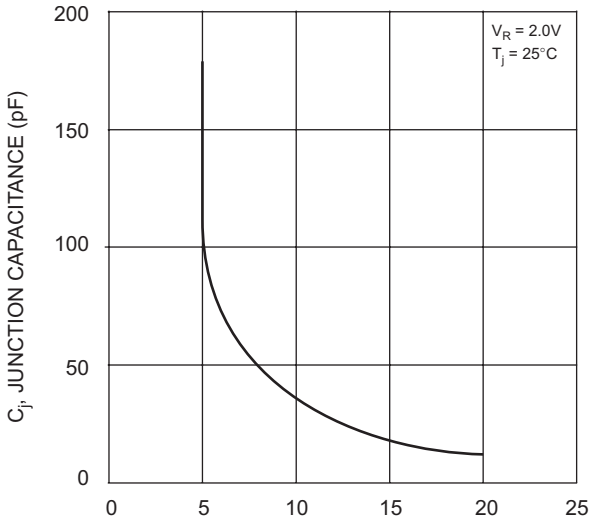

Fig. 2 Junction Capacitance vs Zener Voltage

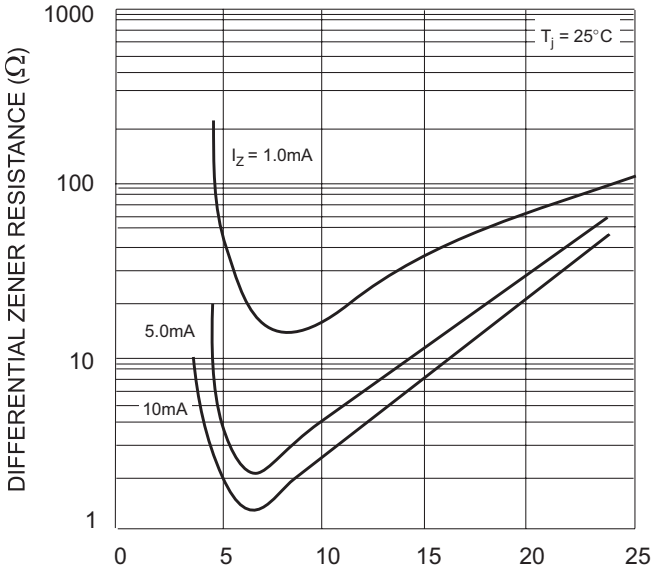

Fig. 3 Differential Zener Impedance

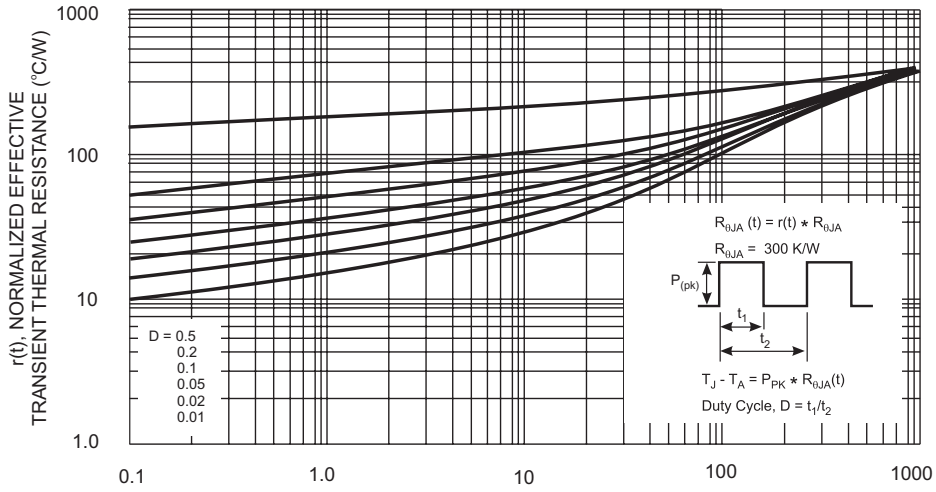

Fig. 4 Typical Normalized Transient Thermal Impedance Curves

Ordering Information (Note 4)

Device	Packaging	Shipping
ZMM5221B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5221B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5222B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5222B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5223B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5223B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5224B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5224B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5225B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5225B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5226B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5226B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5227B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5227B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5228B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5228B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5229B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5229B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5230B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5230B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5231B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5231B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5232B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5232B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5233B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5233B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5234B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5234B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5235B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5235B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5236B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5236B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5237B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5237B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5238B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5238B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5239B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5239B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5240B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5240B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5241B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5241B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5242B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5242B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5243B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5243B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5244B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5244B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5245B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5245B-13	MiniMELF	10K/Tape & Reel, 13-inch

Ordering Information (Note 4) (continued)

Device	Packaging	Shipping
ZMM5246B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5246B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5247B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5247B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5248B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5248B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5249B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5249B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5250B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5250B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5251B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5251B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5252B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5252B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5253B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5253B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5254B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5254B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5255B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5255B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5256B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5256B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5257B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5257B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5258B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5258B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5259B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5259B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5260B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5260B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5261B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5261B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5262B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5262B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5263B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5263B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5264B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5264B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5265B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5265B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5266B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5266B-13	MiniMELF	10K/Tape & Reel, 13-inch
ZMM5267B-7	MiniMELF	2.5K/Tape & Reel, 7-inch
ZMM5267B-13	MiniMELF	10K/Tape & Reel, 13-inch

Notes: 4. For packaging details, visit our website at http://www.diodes.com/datasheets/ap02007.pdf