6 Lake Street, Lawrence, MA 01841
1-800-446-1158 / (978) 620-2600 / Fax: (978) 689-0803
Website: http: //www.microsemi.com

50 WATT ZENER DIODES

Qualified per MIL-PRF-19500/114

APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- Standard voltage tolerances are +/- 5% with B suffix
- Consult factory for +/-10% with an A suffix, +/-20% with no suffix, +/-2% with a C suffix and +/-1% with a D suffix respectively
- Reverse polarity available
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Inherently radiation hard as described in Microsemi MicroNote 050

MAXIMUM RATINGS

- Junction Temperatures: -65°C to +175°C
- Storage Temperatures: -65°C to +200°C
- DC Power Dissipation: 50 watts at T_C < 75°C
- Power Derating: 0.5W/°C above 75°C
- Forward Voltage @ 10A: 1.5 Volts
- THERMAL RESISTANCE: 2.0°C/W maximum junction to base (1.5°C/W typical)
- Solder temperatures: 260°C for 10 s (max)

MECHANICAL AND PACKAGING

- CASE: Industry Standard TO-3 (TO-204AD), hermetically sealed, 0.052 inch diameter pins.
- FINISH: All external surfaces are corrosion resistant and terminal solderable.
- POLARITY: Standard Polarity units are connected anode to case. Reverse polarity (cathode to case) is indicated by suffix R. In either example, both pins are common with one another as anode or cathode (see circuit on last page).
- WEIGHT: 15 grams.
- MOUNTING HARDWARE: Consult factory for optional insulator and sheet metal screws
- See package dimensions on last page

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ELECTRICAL CHARACTERISTICS @ 30°C Case Temperature

JEDEC TYPE NO. (Note 1)	NOMINAL ZENER VOLTAGE V_Z @ I_{ZT} (Note 2)	ZENER TEST CURRENT (I_{ZT})	MAX. DYNAMIC IMPEDANCE (Note 3)		MAX. DC ZENER CURRENT (I_{ZM}) @ 75°C Stud Temp. (Note 4)	TYPICAL TEMP. COEFF. α_{VZ}	MAX** REVERSE CURRENT I_R @ V_R		POLARITY
			Z_{ZT} @ I_{ZT} OHMS	Z_{ZK} @ 1mA (I_{ZK}) OHMS					
	Volts	mA			mA	%/°C	µA	Volts	
†1N4557B	3.9	3200	0.16	400	11,900	-0.046	150	0.5	
†1N4558B	4.3	2900	0.16	500	10,650	-0.033	150	0.5	
†1N4559B	4.7	2650	0.12	600	9,700	-0.015	100	1	
†1N4560B	5.1	2450	0.12	650	8,900	+/-0.010	20	1	
†1N4561B	5.6	2250	0.12	900	8,100	+0.03	20	1	
†1N4562B	6.2	2000	0.14	1000	7,300	+0.049	20	2	
1N4563B	6.8	1850	0.16	200	6,650	+0.053	10	2	
1N4564B	7.5	1650	0.24	100	6,050	+0.057	10	3	
†1N2804B	6.8	1850	0.2	70	7,400	.040	150	4.5	
†1N2805B	7.5	1700	0.3	70	6,600	.045	100	5	
†1N2806B	8.2	1500	0.4	70	5,800	.048	50	5.4	
†1N2807B	9.1	1370	0.5	70	5,300	.050	25	6.1	
†1N2808B	10	1200	0.6	80	4,800	.055	25	6.7	
†1N2809B	11	1100	0.8	80	4,300	.060	10	8.4	
†1N2810B	12	1000	1.0	80	4,000	.065	10	9.1	
†1N2811B	13	960	1.1	80	3,700	.065	10	9.9	
1N2812B	14	890	1.2	80	3,400	.070	10	10.6	
†1N2813B	15	830	1.4	80	3,100	.070	10	11.4	
†1N2814B	16	780	1.6	80	2,950	.070	10	12.2	
1N2815B	17	740	1.8	80	2,750	.075	10	13.0	
†1N2816B	18	700	2.0	80	2,550	.075	10	13.7	
1N2817B	19	660	2.2	80	2,450	.075	10	14.4	
†1N2818B	20	630	2.4	80	2,350	.075	10	15.2	
†1N2819B	22	570	2.5	80	2,100	.080	10	16.7	
†1N2820B	24	520	2.6	80	1,950	.080	10	18.2	
1N2821B	25	500	2.7	90	1,850	.080	10	19	
†1N2822B	27	460	2.8	90	1,650	.085	10	20.6	
†1N2823B	30	420	3.0	90	1,550	.085	10	22.8	
†1N2824B	33	380	3.2	90	1,450	.085	10	25.1	
†1N2825B	36	350	3.5	90	1,300	.085	10	27.4	
†1N2826B	39	320	4.0	90	1,175	.090	10	29.7	
†1N2827B	43	290	4.5	90	1,075	.090	10	32.7	
1N2828B	45	280	4.5	100	1,030	.090	10	34.2	
†1N2829B	47	270	5.0	100	980	.090	10	35.8	
1N2830B	50	250	5.0	100	935	.090	10	38	
†1N2831B	51	245	5.2	100	925	.090	10	38.8	
†1N2832B	56	220	6	110	825	.090	10	42.6	
†1N2833B	62	200	7	120	735	.090	10	47.1	
†1N2834B	68	180	8	140	670	.090	10	51.7	
†1N2835B	75	170	9	150	600	.090	10	56	
†1N2836B	82	150	11	160	550	.090	10	62.2	
†1N2837B	91	140	15	180	470	.090	10	69.2	
†1N2838B	100	120	20	200	450	.090	10	76	
1N2839B	105	120	25	210	430	.095	10	79.8	
†1N2840B	110	110	30	220	410	.095	10	83.6	
†1N2841B	120	100	40	240	375	.095	10	91.2	
†1N2842B	130	95	50	275	345	.095	10	98.8	
†1N2843B	150	85	75	400	300	.095	10	114.0	
†1N2844B	160	80	80	450	285	.095	10	121.6	
†1N2845B	180	68	90	525	250	.095	10	136.8	
†1N2846B	200	65	100	600	220	.100	10	152.0	

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* JEDEC Registered Data.

** Not JEDEC Data.

† Have JAN, JANTX and JANTXV Qualifications to MIL-S-19500/114.

See further notes on following page.

NOTES:

1. The JEDEC type numbers shown (B suffix) have a +/- 5% tolerance on nominal zener voltage. If other tolerance is required consult factory. The suffix A is used to identify +/-10% tolerance; no suffix or just R indicates +/-20% tolerance: C suffix indicates +/-2% tolerance; and D suffix indicates +/-1%.
2. Standard polarity units have the anode connected to the case. Reverse polarity (cathode-to-case) units are available and are indicated by suffix R in the part number.
3. Zener Voltage (VZ) is measured with junction in thermal equilibrium with 30°C base temperature. The test currents (IZT) have been selected so that at nominal voltages the dissipation is a constant 12.5 watts. This results in a nominal junction temperature rise of 18.75°C.
4. The zener impedance is derived from the 60 cycle ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current (IZT or IZK) is superimposed on IZT or IZK. Zener impedance is measured at 2 points to ensure a sharp knee on the breakdown curve and to eliminate unstable units. A curve showing the variation of zener impedance vs. zener current for six representative types is shown in Figure 3. Also see MicroNote 202 for further information.
5. The values of IZM are calculated for a +/-5% tolerance on nominal zener voltage. Allowance has been made for the rise in zener voltage above VZT that results from zener impedance and the increase in junction temperature as power dissipation approaches 50 watts. In the case of individual diodes, IZM is that value of current that results in a dissipation of 50 watts.

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GRAPHS

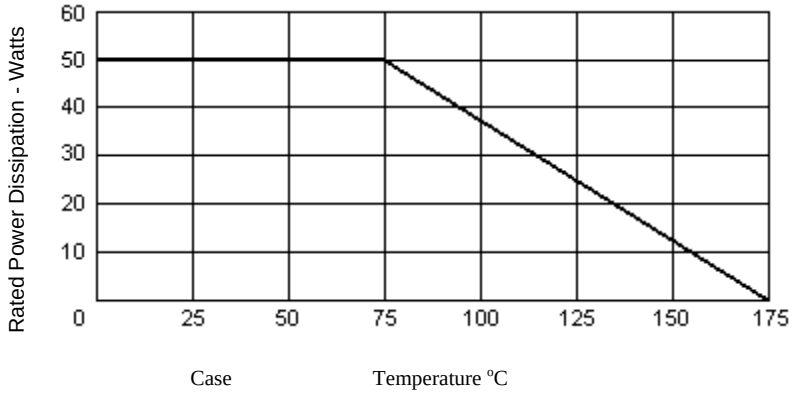
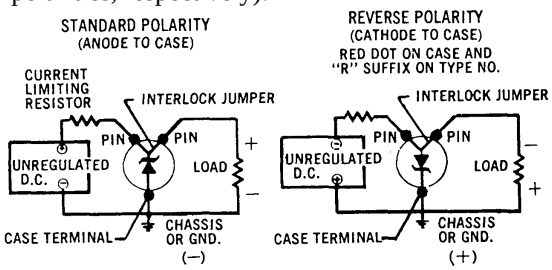
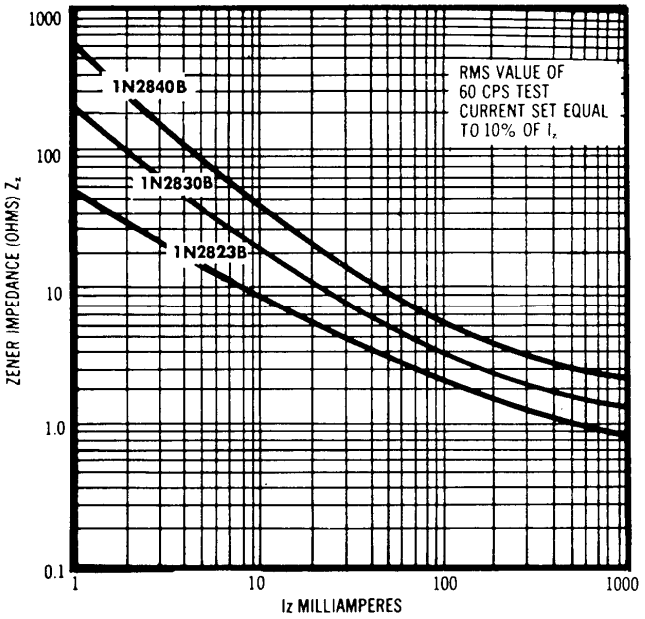


FIGURE 2
POWER DERATING CURVE

Typical circuit connections for anode-to-case and cathode-to-case polarities (standard and reverse polarities, respectively).





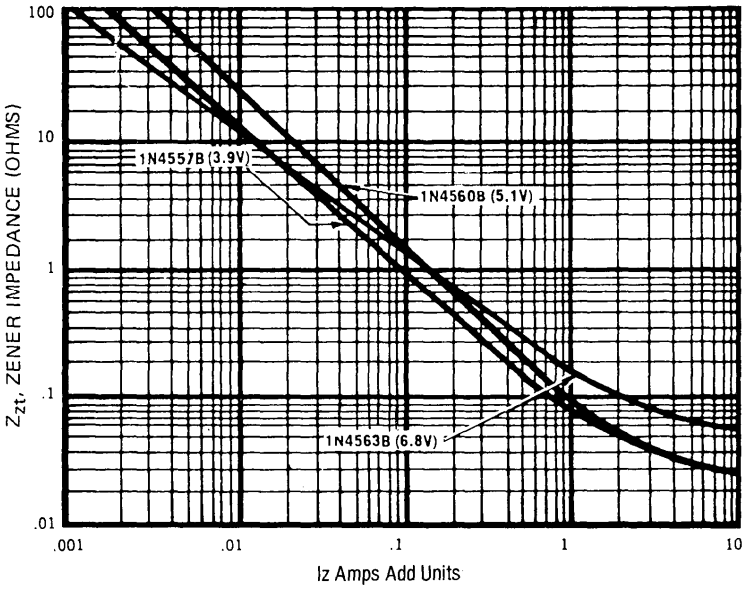


FIGURE GROUP 3
TYPICAL ZENER IMPEDANCE vs. ZENER CURRENT FOR TYPES SHOWN

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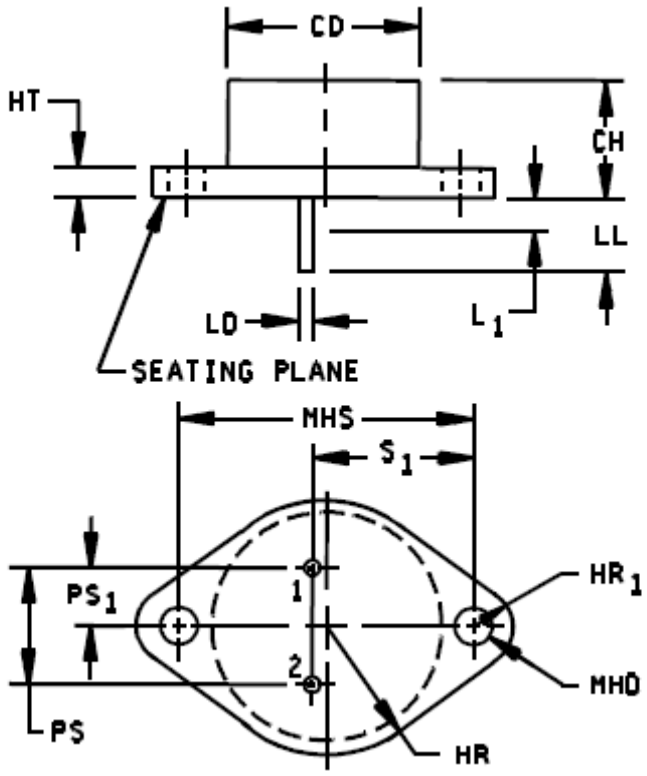
PACKAGE DIMENSIONS



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CH	.270	.380	6.86	9.65	
LD	.048	.053	0.97	1.35	
CD		.875		22.23	
PS	.420	.440	10.67	11.18	3
PS_1	.205	.225	5.21	5.72	3
HT	.060	.135	1.52	3.42	
LL	.312	.500	7.92	12.70	
L_1		.050		1.27	
MHD	.151	.165	3.84	4.09	
MHS	1.177	1.197	29.90	30.40	
HR	.495	.525	12.57	13.34	
HR_1	.131	.188	3.33	4.78	
S_1	.655	.675	16.64	17.15	

NOTES:

1. Dimensions are in inches.
2. Milimeter equivalents are given for general information only.
3. These dimensions should be measured at points .050 inch (1.27mm) + .005 inch (0.13mm) -.000 inch (0.00mm) below seating plane.
4. The seating plane of the header shall be flat within .001 (0.03mm) concave to .004 inch (0.10mm) convex .001 inch (0.003mm) cocave to .006 inch (0.15mm) convex overall.
5. Pins 1 and 2 are internally connected with an internal jumper.
6. Devices wih B suffix have the anode internally connected to the case and devices with RB suffix (reverse polarity) have the cathode internally connected to the case.
7. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

FIGURE 1. Physical dimensions (similar to TO-3)