



**Microsemi Corp.**  
The diode experts

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**1N957B, -1  
thru  
1N992B, -1  
DO-35**

**SILICON  
500 mW  
ZENER DIODES**

**FEATURES**

- 6.8 TO 200 V ZENER VOLTAGE RANGE
- 1N962B-1 THRU 1N992B-1 AVAILABLE IN JAN, JANTX AND JANTXV QUALIFICATIONS TO MIL-S-19500/117. DIE ALSO AVAILABLE AS JANHC FOR HYBRIDS.
- METALLURGICALLY BONDED DEVICE TYPES
- CONSULT FACTORY FOR VOLTAGES ABOVE 200 V

**MAXIMUM RATINGS**

Steady State Power Dissipation: 500 mW  
Operating and Storage Temperature: -65°C to +175°C  
Derating Factor Above 50°C: 4.0 mW/°C  
Forward Voltage @ 200 mA: 1.5 Volts

**\* ELECTRICAL CHARACTERISTICS @ 25°C**

JEDEC TYPE NUMBER (Note 1)	NOMINAL ZENER VOLTAGE (Note 2) Vz	ZENER TEST CURRENT IzT	MAX. ZENER IMPEDANCE (Note 3)			MAX. DC ZENER CURRENT (Note 4) IzM	MAX. SURGE CURRENT (RECURRENT) (Note 5) Iz (SURGE)	MAX. REVERSE LEAKAGE CURRENT		MAX. TEMP. COEFFICIENT αVz
			Zz1 @ IzT	Zzk @ Izk	Iz			Vz	%/°C	
	VOLTS	mA	OHMS	OHMS	mA	mA	μA	VOLTS	%/°C	
1N957B	6.8	18.5	4.5	700	1.0	55	300	150	5.2	+0.05
1N958B	7.5	16.5	5.5	700	.5	50	275	75	5.7	+0.058
1N959B	8.2	15.0	6.5	700	.5	45	250	50	6.2	+0.065
1N960B	9.1	14.0	7.5	700	.5	41	225	25	6.9	+0.068
1N961B	10	12.5	8.5	700	.25	38	200	10	7.6	+0.075
1N962B	11	11.5	9.5	700	.25	32	175	5	8.4	+0.076
1N963B	12	10.5	11.5	700	.25	31	160	5	9.1	+0.077
1N964B	13	9.5	13.0	700	.25	28	150	5	9.9	+0.079
1N965B	15	8.5	16	700	.25	25	130	5	11.4	+0.082
1N966B	16	7.8	17	700	.25	24	120	5	12.2	+0.083
1N967B	18	7.0	21	750	.25	20	110	5	13.7	+0.085
1N968B	20	6.2	25	750	.25	18	100	5	15.2	+0.086
1N969B	22	5.6	29	750	.25	16	90	5	16.7	+0.087
1N970B	24	5.2	33	750	.25	15	80	5	18.2	+0.088
1N971B	27	4.6	41	750	.25	13	70	5	20.6	+0.090
1N972B	30	4.2	49	1000	.25	12	65	5	22.8	+0.091
1N973B	33	3.8	58	1000	.25	11	60	5	25.1	+0.092
1N974B	36	3.4	70	1000	.25	10	55	5	27.4	+0.093
1N975B	39	3.2	80	1000	.25	9.5	46	5	29.7	+0.094
1N976B	43	3.0	93	1500	.25	8.8	44	5	32.7	+0.095
1N977B	47	2.7	105	1500	.25	7.9	40	5	35.8	+0.095
1N978B	51	2.5	125	1500	.25	7.4	37	5	38.8	+0.096
1N979B	56	2.2	150	2000	.25	6.8	35	5	42.6	+0.096
1N980B	62	2.0	185	2000	.25	6.0	30	5	47.1	+0.097
1N981B	68	1.8	230	2000	.25	5.5	28	5	51.7	+0.097
1N982B	75	1.7	270	2000	.25	5.0	26	5	56.0	+0.098
1N983B	82	1.5	330	3000	.25	4.6	23	5	62.2	+0.098
1N984B	91	1.4	400	3000	.25	4.1	21	5	69.2	+0.099
1N985B	100	1.3	500	3000	.25	3.7	18	5	76.0	+0.11
1N986B	110	1.1	750	4000	.25	3.3	16	5	83.6	+0.11
1N987B	120	1.0	900	4500	.25	3.1	15	5	91.2	+0.11
1N988B	130	0.95	1100	5000	.25	2.7	13	5	98.8	+0.11
1N989B	150	0.85	1500	6000	.25	2.4	12	5	114.0	+0.11
1N990B	160	0.80	1700	6500	.25	2.2	11	5	121.6	+0.11
1N991B	180	0.68	2200	7100	.25	2.0	10	5	136.8	+0.11
1N992B	200	0.65	2500	8000	.25	1.8	9	5	152.0	+0.11

\*JEDEC Registered Data

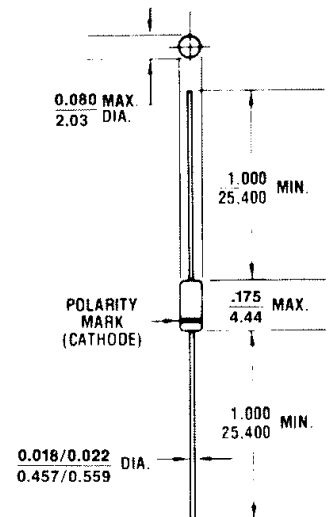


FIGURE 1

All dimensions in INCH m.m.

**MECHANICAL CHARACTERISTICS**

- CASE: Hermetically sealed glass case. DO-35.
- FINISH: All external surfaces are corrosion resistant and leads solderable.
- THERMAL RESISTANCE: 200°C/W (Typical) junction to lead at 0.375-inches from body. Metallurgically bonded DO-35's exhibit less than 100°C/W at zero distance from body.
- POLARITY: Diode to be operated with the banded end positive with respect to the opposite end.
- WEIGHT: 0.2 grams.
- MOUNTING POSITION: Any.

# 1N957B, -1 thru 1N992B, -1 DO-35

**NOTE 1** The JEDEC type numbers shown (B suffix) have a  $\pm 5\%$  tolerance on nominal zener voltage. The suffix A is used to identify  $\pm 10\%$  tolerance; suffix C is used to identify  $\pm 2\%$ ; and suffix D is used to identify  $\pm 1\%$  tolerance; no suffix indicates  $\pm 20\%$  tolerance.

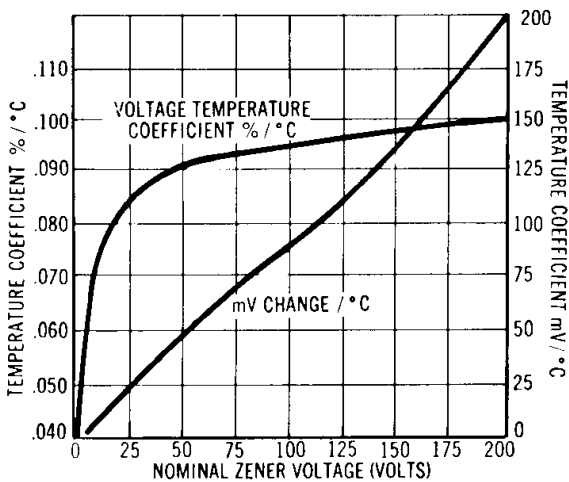
**NOTE 2** Zener voltage ( $V_Z$ ) is measured after the test current has been applied for  $20 \pm 5$  seconds. The device shall be suspended by its leads with the inside edge of the mounting clips between .375" and .500" from the body. Mounting clips shall be maintained at a temperature of  $25 \pm 8 / -2^\circ\text{C}$ .

**NOTE 3** The zener impedance is derived from the 60 cycle A.C. voltage, which results when an A.C. current

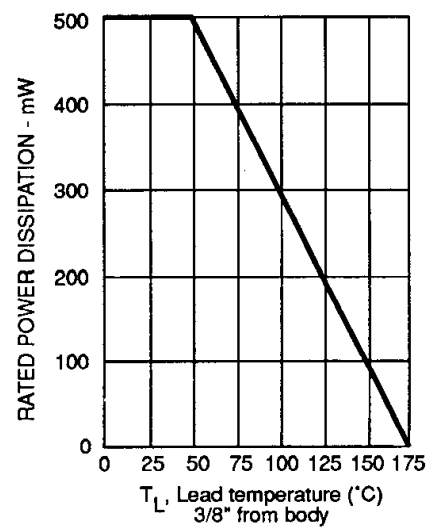
having an R.M.S. value equal to 10% of the D.C. zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed on  $I_{ZT}$  or  $I_{ZK}$ . Zener impedance is measured at 2 points to insure a sharp knee on the breakdown curve and to eliminate unstable units.

**NOTE 4** The values of  $I_{ZM}$  are calculated for a  $\pm 5\%$  tolerance on nominal zener voltage. Allowance has been made for the rise in zener voltage above  $V_{ZT}$  which results from zener impedance and the increase in junction temperature as power dissipation approaches 400 mW. In the case of individual diodes  $I_{ZM}$  is that value of current which results in a dissipation of 400 mW at  $75^\circ\text{C}$  lead temperature at 3/8" from body.

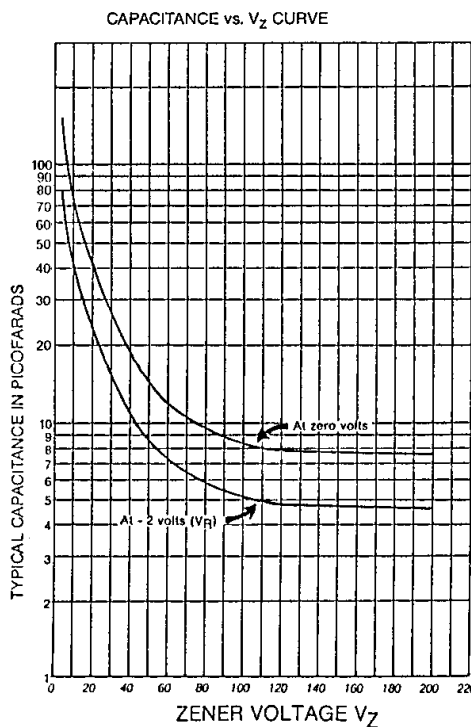
**NOTE 5** Surge is 1/2 square wave or equivalent sine wave pulse of 1/120 sec. duration.



**FIGURE 2**  
ZENER VOLTAGE TEMPERATURE  
COEFF. vs. ZENER VOLTAGE



**FIGURE 3**  
POWER DERATING CURVE



**FIGURE 4**  
CAPACITANCE VS. ZENER VOLTAGE  
(TYPICAL)