



# 1N957B THRU 1N992B

## 0.5W SILICON ZENER DIODES

**FEATURES**

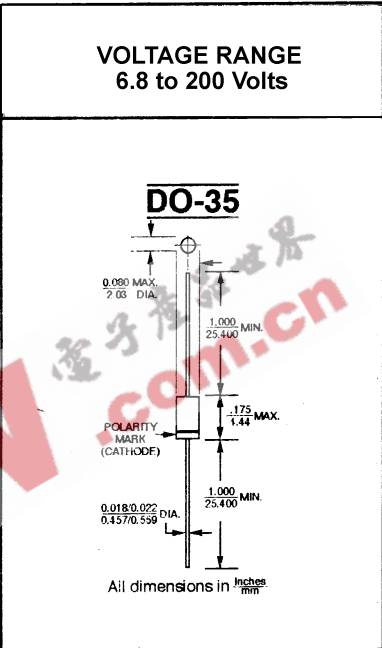
- \* 6.8 to 200V zener voltage range
- \* Metallurgically bonded device types
- \* Consult factory for voltages above 200V

**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, exhibit less than 100°C/W at zero distance from body.
- \* POLARITY: banded end is cathode.
- \* WEIGHT: 0.2 grams
- \* MOUNTING POSITIONS: Any

**MAXIMUM RATINGS**

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



### ELECTRICAL CHARACTERISTICS @ 25°C

| JEDEC TYPE NO. (Note 1) | NOMINAL ZENER VOLTAGE (Note 2) V <sub>Z</sub> | ZENER TEST CURRENT I <sub>ZT</sub> | MAX. ZENER IMPEDANCE (Note 3)     |                                   |      | MAX. DC ZENER CURRENT (Note 4) I <sub>ZM</sub> | MAX. SURGE CURRENT (RECURRENT) (Note 5) I <sub>Z</sub> (SURGE) | MAX. REVERSE LEAKAGE CURRENT I <sub>R</sub> @ I <sub>R</sub> |       | MAX. TEMP. COEFFICIENT %/°C |
|-------------------------|---|------------------------------------|-----------------------------------|-----------------------------------|------|--|--|--|-------|-----------------------------|
|                         |   |                                    | Z <sub>ZT</sub> @ Z <sub>ZT</sub> | Z <sub>ZK</sub> @ Z <sub>ZK</sub> | OHMS |  |  | OHMS   | μA    |                             |
| 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   | 0.068                       |
| 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                              | 0.25 | 1.8  | 9  | 5  | 152.0 | +0.11                       |

**\* JEDEC Registered Data**

**NOTE 4** The values of I<sub>ZM</sub> are calculated for a ± 5% tolerance on nominal zener voltage. Allowance has been made for the rise in zener voltage above V<sub>ZT</sub> which results from zener impedance and the increase in junction temperature as power dissipation approaches 400mW. In the case of individual diodes I<sub>ZM</sub> is that value of current which results in a dissipation of 400 mW at 75°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.

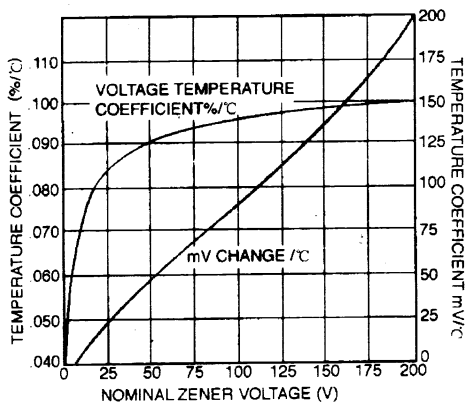
**NOTE 1** The JEDEC type numbers shown (B suffix) have a ± 5% tolerance on nominal zener voltage. The suffix A is used to identify ± 10% tolerance; suffix C is used to identify ± 2%; and suffix D is used to identify ± 1% tolerance; no suffix indicates ± 20% tolerance.

**NOTE 2** Zener voltage (V<sub>Z</sub>) is measured after the test current has been applied for 20 ± 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 + 8/ - 2°C.

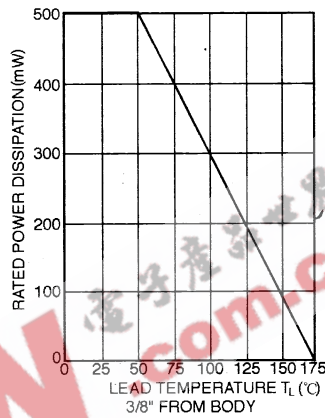
**NOTE 3** The zener impedance is derived from the 60 cycle A. C. voltage, which results when an A. C. current having an R. M. S. value equal to 10% of the D. C. zener current (I<sub>ZT</sub> or I<sub>ZK</sub>) is superimposed on I<sub>ZT</sub> or I<sub>ZT</sub>. Zener impedance is measured at 2 points to insure a sharp knee on the breakdown curve and to eliminate unstable units.



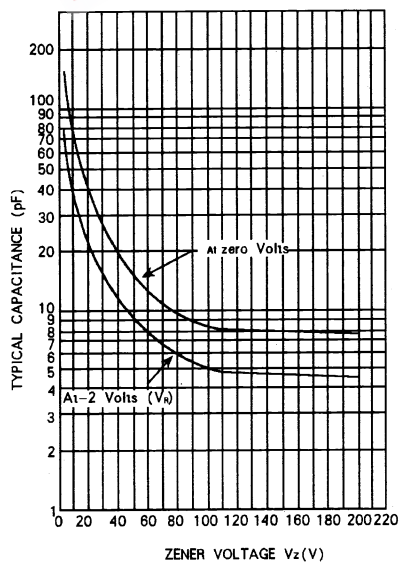
**RATINGS AND CHARACTERISTIC CURVES (1N957B THRU 1N992B)**



**FIGURE 1**  
ZENER VOLTAGE TEMPERATURE COEFF. vs.  
ZENER VOLTAGE



**FIGURE 2** POWER DERATING CURVE



**FIGURE 3**  
CAPACITANCE vs. ZENER VOLTAGE  
(TYPICAL)