



**Microsemi Corp.**  
The diode experts

SCOTTSDALE, AZ  
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(602) 941-6300

**1N4099 thru  
1N4135  
and  
1N4614 thru  
1N4627  
DO-35**

## FEATURES

- ZENER VOLTAGE 1.8 TO 100 V
- ALL HAVE JAN, JANTX AND JANTXV-I QUALIFICATIONS TO MIL-S-19500/435
- LOW NOISE
- LOW REVERSE LEAKAGE

## MAXIMUM RATINGS

Junction and Storage Temperatures: -65°C to +200°C

DC Power Dissipation: 500mW

Power Derating: 4.0 mW/°C\* above 50°C in DO-35

Forward Voltage @ 200 mA: 1.1 Volts 1N4099-1N4135

@ 100 mA: 1.0 Volts 1N4614-1N4627

## \* ELECTRICAL CHARACTERISTICS @ 25°C

| JEDEC<br>TYPE<br>NO. | NOMINAL<br>ZENER<br>VOLTAGE<br>V <sub>Z</sub> @ I <sub>ZT</sub><br>(Note 1) | ZENER<br>TEST<br>CURRENT<br>I <sub>ZT</sub> | MAXIMUM<br>ZENER<br>IMPEDANCE<br>Z <sub>ZT</sub><br>(Note 2) | MAXIMUM<br>REVERSE<br>CURRENT<br>I <sub>Z</sub> @ V <sub>R</sub> |       | MAXIMUM<br>NOISE<br>DENSITY<br>N <sub>D</sub> @ I <sub>ZT</sub> | MAXIMUM<br>ZENER<br>CURRENT<br>I <sub>ZM</sub><br>(Note 3) | MAXIMUM<br>TEMP. COEFF.<br>OF<br>ZENER<br>VOLTAGE<br>α <sub>VZ</sub> |
|----------------------|-----------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------|-------|-----------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------|
|                      | VOLTS                                                                       | μA                                          | OHMS                                                         | μA                                                               | VOLTS | μV/√Hz                                                          | mA                                                         | %/°C                                                                 |
| 1N4614               | 1.8                                                                         | 250                                         | 1200                                                         | 7.5                                                              | 1     | 1                                                               | 120                                                        | -0.075                                                               |
| 1N4615               | 2.0                                                                         | 250                                         | 1250                                                         | 5.0                                                              | 1     | 1                                                               | 110                                                        | -0.075                                                               |
| 1N4616               | 2.2                                                                         | 250                                         | 1300                                                         | 4.0                                                              | 1     | 1                                                               | 100                                                        | -0.075                                                               |
| 1N4617               | 2.4                                                                         | 250                                         | 1400                                                         | 2.0                                                              | 1     | 1                                                               | 95                                                         | -0.075                                                               |
| 1N4618               | 2.7                                                                         | 250                                         | 1500                                                         | 1.0                                                              | 1     | 1                                                               | 90                                                         | -0.075                                                               |
| 1N4619               | 3.0                                                                         | 250                                         | 1600                                                         | 0.8                                                              | 1     | 1                                                               | 87                                                         | -0.075                                                               |
| 1N4620               | 3.3                                                                         | 250                                         | 1650                                                         | 7.5                                                              | 1.5   | 1                                                               | 85                                                         | -0.075                                                               |
| 1N4621               | 3.6                                                                         | 250                                         | 1700                                                         | 7.5                                                              | 2     | 1                                                               | 83                                                         | -0.065                                                               |
| 1N4622               | 3.9                                                                         | 250                                         | 1650                                                         | 5.0                                                              | 2     | 1                                                               | 80                                                         | -0.060                                                               |
| 1N4623               | 4.3                                                                         | 250                                         | 1600                                                         | 4.0                                                              | 2     | 1                                                               | 77                                                         | -0.050                                                               |
| 1N4624               | 4.7                                                                         | 250                                         | 1550                                                         | 10.0                                                             | 3     | 1                                                               | 75                                                         | -0.050 + 0.020                                                       |
| 1N4625               | 5.1                                                                         | 250                                         | 1500                                                         | 10.0                                                             | 3     | 2                                                               | 70                                                         | -0.045 + 0.030                                                       |
| 1N4626               | 5.6                                                                         | 250                                         | 1400                                                         | 10.0                                                             | 4     | 4                                                               | 65                                                         | -0.020 + 0.040                                                       |
| 1N4627               | 6.2                                                                         | 250                                         | 1200                                                         | 10.0                                                             | 5     | 5                                                               | 61                                                         | -0.010 + 0.050                                                       |
| 1N4099               | 6.8                                                                         | 250                                         | 200                                                          | 10.0                                                             | 5.17  | 40                                                              | 56                                                         | 0.060                                                                |
| 1N4100               | 7.5                                                                         | 250                                         | 200                                                          | 10.0                                                             | 5.70  | 40                                                              | 51                                                         | 0.065                                                                |
| 1N4101               | 8.2                                                                         | 250                                         | 200                                                          | 1.0                                                              | 6.24  | 40                                                              | 46                                                         | 0.070                                                                |
| 1N4102               | 8.7                                                                         | 250                                         | 200                                                          | 1.0                                                              | 6.61  | 40                                                              | 44                                                         | 0.075                                                                |
| 1N4103               | 9.1                                                                         | 250                                         | 200                                                          | 1.0                                                              | 6.92  | 40                                                              | 42                                                         | 0.080                                                                |
| 1N4104               | 10                                                                          | 250                                         | 200                                                          | 1.0                                                              | 7.60  | 40                                                              | 38                                                         | 0.080                                                                |
| 1N4105               | 11                                                                          | 250                                         | 200                                                          | .05                                                              | 8.44  | 40                                                              | 35                                                         | 0.080                                                                |
| 1N4106               | 12                                                                          | 250                                         | 200                                                          | .05                                                              | 9.12  | 40                                                              | 32                                                         | 0.080                                                                |
| 1N4107               | 13                                                                          | 250                                         | 200                                                          | .05                                                              | 9.87  | 40                                                              | 29                                                         | 0.080                                                                |
| 1N4108               | 14                                                                          | 250                                         | 200                                                          | .05                                                              | 10.65 | 40                                                              | 27                                                         | 0.085                                                                |
| 1N4109               | 15                                                                          | 250                                         | 100                                                          | .05                                                              | 11.40 | 40                                                              | 25                                                         | 0.085                                                                |
| 1N4110               | 16                                                                          | 250                                         | 100                                                          | .05                                                              | 12.15 | 40                                                              | 24                                                         | 0.085                                                                |
| 1N4111               | 17                                                                          | 250                                         | 100                                                          | .05                                                              | 12.92 | 40                                                              | 22                                                         | 0.090                                                                |
| 1N4112               | 18                                                                          | 250                                         | 100                                                          | .05                                                              | 13.67 | 40                                                              | 21                                                         | 0.090                                                                |
| 1N4113               | 19                                                                          | 250                                         | 150                                                          | .05                                                              | 14.44 | 40                                                              | 20                                                         | 0.090                                                                |
| 1N4114               | 20                                                                          | 250                                         | 150                                                          | .01                                                              | 15.20 | 40                                                              | 19                                                         | 0.090                                                                |
| 1N4115               | 22                                                                          | 250                                         | 150                                                          | .01                                                              | 16.72 | 40                                                              | 17                                                         | 0.090                                                                |
| 1N4116               | 24                                                                          | 250                                         | 150                                                          | .01                                                              | 18.25 | 40                                                              | 16                                                         | 0.090                                                                |
| 1N4117               | 25                                                                          | 250                                         | 150                                                          | .01                                                              | 19.00 | 40                                                              | 15                                                         | 0.090                                                                |
| 1N4118               | 27                                                                          | 250                                         | 150                                                          | .01                                                              | 20.45 | 40                                                              | 14                                                         | 0.090                                                                |
| 1N4119               | 28                                                                          | 250                                         | 200                                                          | .01                                                              | 21.28 | 40                                                              | 14                                                         | 0.095                                                                |
| 1N4120               | 30                                                                          | 250                                         | 200                                                          | .01                                                              | 22.80 | 40                                                              | 13                                                         | 0.095                                                                |
| 1N4121               | 33                                                                          | 250                                         | 200                                                          | .01                                                              | 25.08 | 40                                                              | 12                                                         | 0.095                                                                |
| 1N4122               | 36                                                                          | 250                                         | 200                                                          | .01                                                              | 27.38 | 40                                                              | 11                                                         | 0.095                                                                |
| 1N4123               | 39                                                                          | 250                                         | 200                                                          | .01                                                              | 29.65 | 40                                                              | 9.8                                                        | 0.095                                                                |
| 1N4124               | 43                                                                          | 250                                         | 250                                                          | .01                                                              | 32.65 | 40                                                              | 8.9                                                        | 0.095                                                                |
| 1N4125               | 47                                                                          | 250                                         | 250                                                          | .01                                                              | 35.75 | 40                                                              | 8.1                                                        | 0.095                                                                |
| 1N4126               | 51                                                                          | 250                                         | 300                                                          | .01                                                              | 38.76 | 40                                                              | 7.5                                                        | 0.100                                                                |
| 1N4127               | 56                                                                          | 250                                         | 300                                                          | .01                                                              | 42.80 | 40                                                              | 6.7                                                        | 0.100                                                                |
| 1N4128               | 60                                                                          | 250                                         | 400                                                          | .01                                                              | 45.60 | 40                                                              | 6.4                                                        | 0.100                                                                |
| 1N4129               | 62                                                                          | 250                                         | 500                                                          | .01                                                              | 47.10 | 40                                                              | 6.1                                                        | 0.100                                                                |
| 1N4130               | 68                                                                          | 250                                         | 700                                                          | .01                                                              | 51.68 | 40                                                              | 5.6                                                        | 0.100                                                                |
| 1N4131               | 75                                                                          | 250                                         | 700                                                          | .01                                                              | 57.00 | 40                                                              | 5.1                                                        | 0.100                                                                |
| 1N4132               | 82                                                                          | 250                                         | 800                                                          | .01                                                              | 62.32 | 40                                                              | 4.6                                                        | 0.100                                                                |
| 1N4133               | 87                                                                          | 250                                         | 1000                                                         | .01                                                              | 66.12 | 40                                                              | 4.4                                                        | 0.100                                                                |
| 1N4134               | 91                                                                          | 250                                         | 1200                                                         | .01                                                              | 69.16 | 40                                                              | 4.2                                                        | 0.100                                                                |
| 1N4135               | 100                                                                         | 250                                         | 1500                                                         | .01                                                              | 76.00 | 40                                                              | 3.8                                                        | 0.100                                                                |

\*JEDEC Registered Data.

**SILICON  
500 mW  
LOW NOISE  
ZENER DIODES**

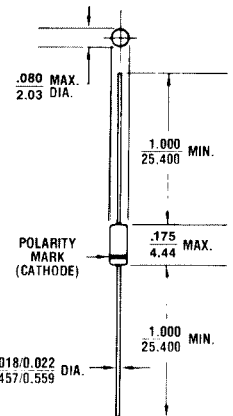


FIGURE 1

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 in DO-35. Metallurgically bonded DO-35's exhibit less than 100°C/W at zero distance from body.

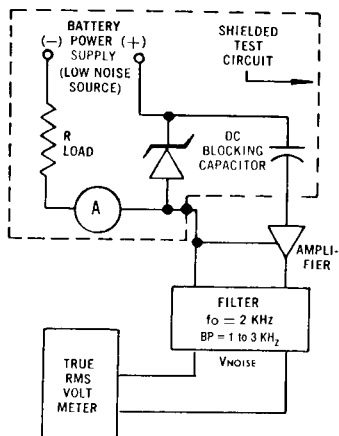
POLARITY: Diode to be operated with the banded end positive with respect to the opposite end.

WEIGHT: 0.2 grams.

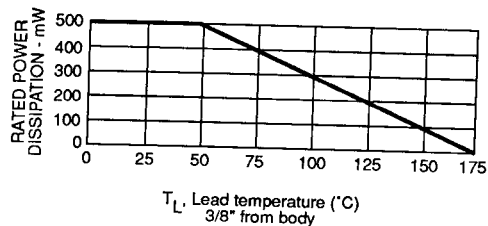
MOUNTING POSITION: Any.

# 1N4099 thru 1N4135, 1N4614 thru 1N4627 DO-35

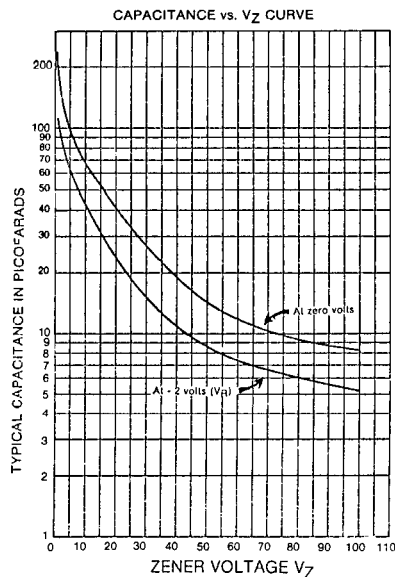
Noise density, ( $N_D$ ) is specified in microvolts-rms per square-root-hertz. Actual measurement is performed using a 1 KHz to 3 KHz frequency bandpass filter at a constant Zener test current ( $I_{ZT}$ ) at 25°C ambient temperature.  $N_D$  is calculated from the formula.



**FIGURE 2** NOISE DENSITY MEASUREMENT CIRCUIT



**FIGURE 3** POWER DERATING CURVE



**FIGURE 4**

## CAPACITANCE VS. ZENER VOLTAGE (TYPICAL)

**NOTE 1** The JEDEC type numbers shown above have a standard tolerance of  $\pm 5\%$  on the nominal Zener voltage. Also available in 2% and 1% tolerance, suffix C and D respectively.  $V_Z$  is measured with the diode in thermal equilibrium in 25°C still air.

**NOTE 2** Zener impedance is derived by superimposing on  $I_{ZT}$ , a 60 Hz rms a.c. current equal to 10% of  $I_{ZT}$  (25  $\mu\text{A}$  a.c.).

**NOTE 3** Based upon 400 mW maximum power dissipation at 75°C lead temperature, allowance has been made for the higher voltage associated with operation at higher currents.