



**Microsemi Corp.**  
The diode experts

SCOTTSDALE, AZ

For more information call:  
(602) 941-6300

**1N4099 thru  
1N4135  
and  
1N4614 thru  
1N4627  
DO-7**

## FEATURES

- ZENER VOLTAGE 1.8V to 100V
- ALL HAVE JAN, JANTX and JANTXV - 1 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: 400 mW

Power Derating: 2.66 mW/°C above 50°C in DO-7

Forward Voltage @ 200 mA: 1.0 Volts 1N4099-1N4135

@ 100 mA: 1.0 Volts 1N4614-1N4627

**SILICON  
400 mW  
LOW NOISE  
ZENER DIODES**

## \* 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>KT</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><br>(Figure 2) | 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                                                     | %/°C                                                                 |
| 1N4614              | 1.8                                                                         | 250                                         | 1200                                                         | 7.5                                                              | 1                                                                             | 1                                                          | -0.075                                                               |
| 1N4615              | 2.0                                                                         | 250                                         | 1250                                                         | 5.0                                                              | 1                                                                             | 110                                                        | -0.075                                                               |
| 1N4616              | 2.2                                                                         | 250                                         | 1300                                                         | 4.0                                                              | 1                                                                             | 100                                                        | -0.075                                                               |
| 1N4617              | 2.4                                                                         | 250                                         | 1400                                                         | 2.0                                                              | 1                                                                             | 95                                                         | -0.075                                                               |
| 1N4618              | 2.7                                                                         | 250                                         | 1500                                                         | 1.0                                                              | 1                                                                             | 90                                                         | -0.075                                                               |
| 1N4619              | 3.0                                                                         | 250                                         | 1600                                                         | 0.8                                                              | 1                                                                             | 87                                                         | -0.075                                                               |
| 1N4620              | 3.3                                                                         | 250                                         | 1650                                                         | 7.5                                                              | 1.5                                                                           | 85                                                         | -0.075                                                               |
| 1N4621              | 3.6                                                                         | 250                                         | 1700                                                         | 7.5                                                              | 2                                                                             | 83                                                         | -0.065                                                               |
| 1N4622              | 3.9                                                                         | 250                                         | 1650                                                         | 5.0                                                              | 2                                                                             | 80                                                         | -0.060                                                               |
| 1N4623              | 4.3                                                                         | 250                                         | 1600                                                         | 4.0                                                              | 2                                                                             | 77                                                         | -0.050                                                               |
| 1N4624              | 4.7                                                                         | 250                                         | 1550                                                         | 10.0                                                             | 3                                                                             | 75                                                         | -0.050 +0.020                                                        |
| 1N4625              | 5.1                                                                         | 250                                         | 1500                                                         | 10.0                                                             | 3                                                                             | 70                                                         | -0.045 +0.030                                                        |
| 1N4626              | 5.6                                                                         | 250                                         | 1400                                                         | 10.0                                                             | 4                                                                             | 65                                                         | -0.020 +0.040                                                        |
| 1N4627              | 6.2                                                                         | 250                                         | 1200                                                         | 10.0                                                             | 5                                                                             | 61                                                         | -0.010 +0.050                                                        |
| 1N4099              | 6.8                                                                         | 250                                         | 200                                                          | 10.0                                                             | 5.17                                                                          | 40                                                         | 0.060                                                                |
| 1N4100              | 7.5                                                                         | 250                                         | 200                                                          | 10.0                                                             | 5.70                                                                          | 40                                                         | 0.065                                                                |
| 1N4101              | 8.2                                                                         | 250                                         | 200                                                          | 1.0                                                              | 6.24                                                                          | 40                                                         | 0.070                                                                |
| 1N4102              | 8.7                                                                         | 250                                         | 200                                                          | 1.0                                                              | 6.61                                                                          | 40                                                         | 0.075                                                                |
| 1N4103              | 9.1                                                                         | 250                                         | 200                                                          | 1.0                                                              | 6.92                                                                          | 40                                                         | 0.080                                                                |
| 1N4104              | 10                                                                          | 250                                         | 200                                                          | 1.0                                                              | 7.60                                                                          | 40                                                         | 0.080                                                                |
| 1N4105              | 11                                                                          | 250                                         | 200                                                          | .05                                                              | 8.44                                                                          | 40                                                         | 0.080                                                                |
| 1N4106              | 12                                                                          | 250                                         | 200                                                          | .05                                                              | 9.12                                                                          | 40                                                         | 0.080                                                                |
| 1N4107              | 13                                                                          | 250                                         | 200                                                          | .05                                                              | 9.87                                                                          | 40                                                         | 0.080                                                                |
| 1N4108              | 14                                                                          | 250                                         | 200                                                          | .05                                                              | 10.65                                                                         | 40                                                         | 0.085                                                                |
| 1N4109              | 15                                                                          | 250                                         | 100                                                          | .05                                                              | 11.40                                                                         | 40                                                         | 0.085                                                                |
| 1N4110              | 16                                                                          | 250                                         | 100                                                          | .05                                                              | 12.15                                                                         | 40                                                         | 0.085                                                                |
| 1N4111              | 17                                                                          | 250                                         | 100                                                          | .05                                                              | 12.92                                                                         | 40                                                         | 0.090                                                                |
| 1N4112              | 18                                                                          | 250                                         | 100                                                          | .05                                                              | 13.67                                                                         | 40                                                         | 0.090                                                                |
| 1N4113              | 19                                                                          | 250                                         | 150                                                          | .05                                                              | 14.44                                                                         | 40                                                         | 0.090                                                                |
| 1N4114              | 20                                                                          | 250                                         | 150                                                          | .01                                                              | 15.20                                                                         | 40                                                         | 0.090                                                                |
| 1N4115              | 22                                                                          | 250                                         | 150                                                          | .01                                                              | 16.72                                                                         | 40                                                         | 0.090                                                                |
| 1N4116              | 24                                                                          | 250                                         | 150                                                          | .01                                                              | 18.25                                                                         | 40                                                         | 0.090                                                                |
| 1N4117              | 25                                                                          | 250                                         | 150                                                          | .01                                                              | 19.00                                                                         | 40                                                         | 0.090                                                                |
| 1N4118              | 27                                                                          | 250                                         | 150                                                          | .01                                                              | 20.45                                                                         | 40                                                         | 0.090                                                                |
| 1N4119              | 28                                                                          | 250                                         | 200                                                          | .01                                                              | 21.28                                                                         | 40                                                         | 0.095                                                                |
| 1N4120              | 30                                                                          | 250                                         | 200                                                          | .01                                                              | 22.80                                                                         | 40                                                         | 0.095                                                                |
| 1N4121              | 33                                                                          | 250                                         | 200                                                          | .01                                                              | 25.08                                                                         | 40                                                         | 0.095                                                                |
| 1N4122              | 36                                                                          | 250                                         | 200                                                          | .01                                                              | 27.38                                                                         | 40                                                         | 0.095                                                                |
| 1N4123              | 39                                                                          | 250                                         | 200                                                          | .01                                                              | 29.65                                                                         | 40                                                         | 0.095                                                                |
| 1N4124              | 43                                                                          | 250                                         | 250                                                          | .01                                                              | 32.65                                                                         | 40                                                         | 0.095                                                                |
| 1N4125              | 47                                                                          | 250                                         | 250                                                          | .01                                                              | 35.75                                                                         | 40                                                         | 0.095                                                                |
| 1N4126              | 51                                                                          | 250                                         | 300                                                          | .01                                                              | 38.76                                                                         | 40                                                         | 0.100                                                                |
| 1N4127              | 56                                                                          | 250                                         | 300                                                          | .01                                                              | 42.60                                                                         | 40                                                         | 0.100                                                                |
| 1N4128              | 60                                                                          | 250                                         | 400                                                          | .01                                                              | 45.60                                                                         | 40                                                         | 0.100                                                                |
| 1N4129              | 62                                                                          | 250                                         | 500                                                          | .01                                                              | 47.70                                                                         | 40                                                         | 0.100                                                                |
| 1N4130              | 68                                                                          | 250                                         | 700                                                          | .01                                                              | 51.68                                                                         | 40                                                         | 0.100                                                                |
| 1N4131              | 75                                                                          | 250                                         | 700                                                          | .01                                                              | 57.00                                                                         | 40                                                         | 0.100                                                                |
| 1N4132              | 82                                                                          | 250                                         | 800                                                          | .01                                                              | 62.32                                                                         | 40                                                         | 0.100                                                                |
| 1N4133              | 87                                                                          | 250                                         | 1000                                                         | .01                                                              | 66.12                                                                         | 40                                                         | 0.100                                                                |
| 1N4134              | 91                                                                          | 250                                         | 1200                                                         | .01                                                              | 69.16                                                                         | 40                                                         | 0.100                                                                |
| 1N4135              | 100                                                                         | 250                                         | 1500                                                         | .01                                                              | 76.00                                                                         | 40                                                         | 0.100                                                                |

\* JEDEC Registered Data.

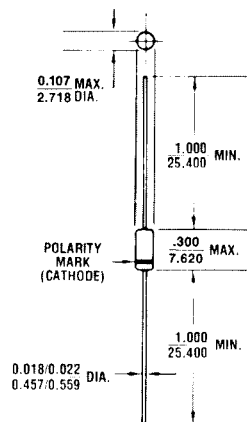


FIGURE 1

All dimensions in INCH  
m.m.

## MECHANICAL CHARACTERISTICS

CASE: Hermetically sealed glass case. DO-7.

FINISH: All external surfaces are corrosion resistant and leads solderable.

THERMAL RESISTANCE: 300°C/W (Typical) junction to lead at 0.375-inches from body on DO-7.

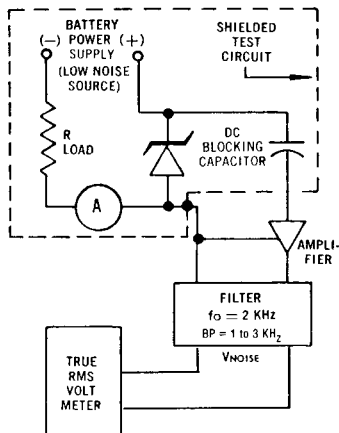
POLARITY: Diode to be operated with the banded end positive with respect to the opposite end.

WEIGHT: 0.2 grams.

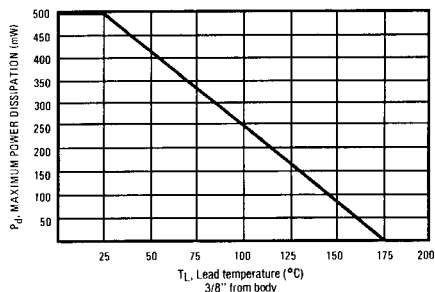
MOUNTING POSITION: Any.

# 1N4099 thru 1N4135, 1N4614 thru 1N4627 DO-7

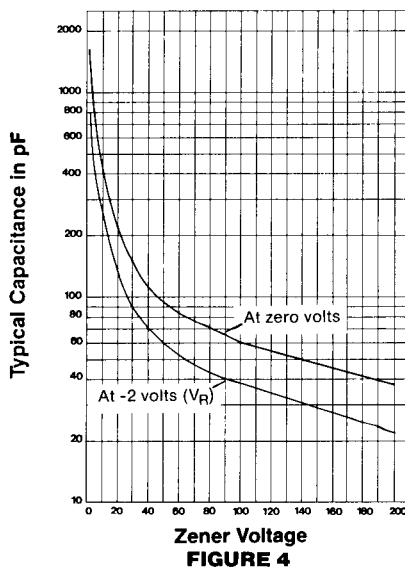
Noise density, ( $N_D$ ) is specified in microvolts-rms per square-root-hertz. Actual measurement is performed using a 1 KHz to 3 KHz frequency bandpass filter at a constant Zener test current ( $I_{ZT}$ ) at 25°C ambient temperature.  $N_D$  is calculated from the formula.



**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 with no suffix have a standard tolerance of  $\pm 5\%$  on the nominal Zener voltage; suffix C is used to identify  $\pm 2\%$ ; and suffix D is used to identify  $\pm 1\%$  tolerance.  $V_Z$  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 25°C ambient temperature, allowance has been made for the higher voltage associated with operation at higher currents.