



**Microsemi Corp.**  
The diode experts

SCOTTSDALE, AZ  
For more information call:  
(602) 941-6300

**1N5518  
thru  
1N5546**

## FEATURES

- LOW ZENER NOISE SPECIFIED
- LOW ZENER IMPEDANCE
- LOW LEAKAGE CURRENT
- HERMETICALLY SEALED GLASS PACKAGE
- JAN/JANTX/JANTXV AVAILABLE ON 1N5518 THROUGH 1N5546B PER MIL-S-19500/437

## MAXIMUM RATINGS

Operating Temperature: -65°C to +175°C  
Storage Temperature: -65°C to +175°C

## ELECTRICAL CHARACTERISTICS

(TA = 25°C unless otherwise noted. Based on dc measurements at thermal equilibrium;  
VF = 1.1 Max @ IF = 200 mA for all types)

| JEDEC<br>TYPE NO.<br>(Note 1) | NOMINAL<br>ZENER<br>VOLTAGE<br>V <sub>Z</sub> @ I <sub>ZT</sub><br>VOLTS<br>(Note 2) | TEST<br>CURRENT<br>I <sub>ZT</sub><br>mAdc | MAX. ZENER<br>IMPEDANCE<br>B-C-D SUFFIX<br>Z <sub>ZZT</sub> @ I <sub>ZT</sub><br>OHMS<br>(Note 3) | MAX. REVERSE LEAKAGE<br>CURRENT    |                    |                 | B-C-D<br>SUFFIX<br>MAXIMUM<br>DC ZENER<br>CURRENT<br>I <sub>ZM</sub><br>mAdc<br>(Note 5) | B-C-D SUFFIX<br>MAX. NOISE<br>DENSITY<br>AT I <sub>Z</sub> = 250 µA<br>N <sub>D</sub><br>(MICRO-VOLTS<br>PER SQUARE<br>ROOT CYCLE) | REGULATION<br>FACTOR<br>ΔV <sub>Z</sub><br>VOLTS<br>(Note 6) | LOW<br>V <sub>Z</sub><br>CURRENT<br>I <sub>ZL</sub><br>mAdc |
|-------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------|--------------------|-----------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
|                               |                                                                                      |                                            |                                                                                                   | V <sub>R</sub> – VOLTS             |                    |                 |                                                                                          |                                                                                                                                    |                                                              |                                                             |
|                               |                                                                                      |                                            |                                                                                                   | I <sub>R</sub><br>µAde<br>(Note 4) | NON & A-<br>SUFFIX | B-C-D<br>SUFFIX |                                                                                          |                                                                                                                                    |                                                              |                                                             |
| 1N5518                        | 3.3                                                                                  | 20                                         | 26                                                                                                | 5.0                                | 0.90               | 1.0             | 115                                                                                      | 0.5                                                                                                                                | 0.90                                                         | 2.0                                                         |
| 1N5519                        | 3.6                                                                                  | 20                                         | 24                                                                                                | 3.0                                | 0.90               | 1.0             | 105                                                                                      | 0.5                                                                                                                                | 0.90                                                         | 2.0                                                         |
| 1N5520                        | 3.9                                                                                  | 20                                         | 22                                                                                                | 1.0                                | 0.90               | 1.0             | 98                                                                                       | 0.5                                                                                                                                | 0.85                                                         | 2.0                                                         |
| 1N5521                        | 4.3                                                                                  | 20                                         | 18                                                                                                | 3.0                                | 1.0                | 1.5             | 88                                                                                       | 0.5                                                                                                                                | 0.75                                                         | 2.0                                                         |
| 1N5522                        | 4.7                                                                                  | 10                                         | 22                                                                                                | 2.0                                | 1.5                | 2.0             | 81                                                                                       | 0.5                                                                                                                                | 0.60                                                         | 1.0                                                         |
| 1N5523                        | 5.1                                                                                  | 5.0                                        | 26                                                                                                | 2.0                                | 2.0                | 2.5             | 75                                                                                       | 0.5                                                                                                                                | 0.65                                                         | 0.25                                                        |
| 1N5524                        | 5.6                                                                                  | 3.0                                        | 30                                                                                                | 2.0                                | 3.0                | 3.5             | 68                                                                                       | 1.0                                                                                                                                | 0.30                                                         | 0.25                                                        |
| 1N5525                        | 6.2                                                                                  | 1.0                                        | 30                                                                                                | 1.0                                | 4.5                | 5.0             | 61                                                                                       | 1.0                                                                                                                                | 0.20                                                         | 0.01                                                        |
| 1N5526                        | 6.8                                                                                  | 1.0                                        | 30                                                                                                | 1.0                                | 5.5                | 6.2             | 56                                                                                       | 1.0                                                                                                                                | 0.10                                                         | 0.01                                                        |
| 1N5527                        | 7.5                                                                                  | 1.0                                        | 35                                                                                                | 0.5                                | 6.0                | 6.8             | 51                                                                                       | 2.0                                                                                                                                | 0.05                                                         | 0.01                                                        |
| 1N5528                        | 8.2                                                                                  | 1.0                                        | 40                                                                                                | 0.5                                | 6.5                | 7.5             | 46                                                                                       | 4.0                                                                                                                                | 0.05                                                         | 0.01                                                        |
| 1N5529                        | 9.1                                                                                  | 1.0                                        | 45                                                                                                | 0.1                                | 7.0                | 8.2             | 42                                                                                       | 4.0                                                                                                                                | 0.05                                                         | 0.01                                                        |
| 1N5530                        | 10.0                                                                                 | 1.0                                        | 60                                                                                                | 0.05                               | 8.0                | 9.1             | 38                                                                                       | 4.0                                                                                                                                | 0.10                                                         | 0.01                                                        |
| 1N5531                        | 11.0                                                                                 | 1.0                                        | 80                                                                                                | 0.05                               | 9.0                | 9.9             | 35                                                                                       | 5.0                                                                                                                                | 0.20                                                         | 0.01                                                        |
| 1N5532                        | 12.0                                                                                 | 1.0                                        | 90                                                                                                | 0.05                               | 9.5                | 10.8            | 32                                                                                       | 10                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5533                        | 13.0                                                                                 | 1.0                                        | 90                                                                                                | 0.01                               | 10.5               | 11.7            | 29                                                                                       | 15                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5534                        | 14.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 11.5               | 12.6            | 27                                                                                       | 20                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5535                        | 15.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 12.5               | 13.5            | 25                                                                                       | 20                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5536                        | 16.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 13.0               | 14.4            | 24                                                                                       | 20                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5537                        | 17.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 14.0               | 15.3            | 22                                                                                       | 20                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5538                        | 18.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 15.0               | 16.2            | 21                                                                                       | 20                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5539                        | 19.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 16.0               | 17.1            | 20                                                                                       | 20                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5540                        | 20.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 17.0               | 18.0            | 19                                                                                       | 20                                                                                                                                 | 0.20                                                         | 0.01                                                        |
| 1N5541                        | 22.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 18.0               | 19.8            | 17                                                                                       | 20                                                                                                                                 | 0.25                                                         | 0.01                                                        |
| 1N5542                        | 24.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 20.0               | 21.6            | 16                                                                                       | 20                                                                                                                                 | 0.30                                                         | 0.01                                                        |
| 1N5543                        | 25.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 21.0               | 22.4            | 15                                                                                       | 20                                                                                                                                 | 0.35                                                         | 0.01                                                        |
| 1N5544                        | 28.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 23.0               | 25.2            | 14                                                                                       | 20                                                                                                                                 | 0.45                                                         | 0.01                                                        |
| 1N5545                        | 30.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 24.0               | 27.0            | 13                                                                                       | 20                                                                                                                                 | 0.55                                                         | 0.01                                                        |
| 1N5546                        | 33.0                                                                                 | 1.0                                        | 100                                                                                               | 0.01                               | 28.0               | 29.7            | 12                                                                                       | 20                                                                                                                                 | 0.59                                                         | 0.01                                                        |

### NOTE 1 - TOLERANCE AND VOLTAGE DESIGNATION

The JEDEC type numbers shown are ±20% with guaranteed limits for only VZ, IR, and VF. Units with 'A' suffix are ±10% with guaranteed limits for VZ, IR, and VF. Units with guaranteed limits for all six parameters are indicated by a 'B' suffix for ±5.0% units, 'C' suffix for ±2.0% and 'D' suffix for ±1.0%.

### NOTE 2 - ZENER VOLTAGE (VZ) MEASUREMENT

Nominal zener voltage is measured with the device junction in thermal equilibrium with ambient temperature of 25°C.

### NOTE 3 - ZENER IMPEDANCE (ZZ) DERIVATION

The zener impedance is derived from the 60 Hz ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current (IZT) is superimposed on IZT.

### NOTE 4 - REVERSE LEAKAGE CURRENT (IR)

Reverse leakage currents are guaranteed and are measured at VR as shown on the table.

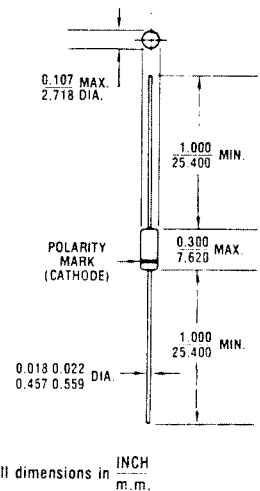
### NOTE 5 - MAXIMUM REGULATOR CURRENT (IZM)

The maximum current shown is based on the maximum voltage of a 5.0% type unit, therefore, it applies only to the 'B' suffix device. The actual IZM for any device may not exceed the value of 400 milliwatts divided by the actual VZ of the device.

### NOTE 6 - MAXIMUM REGULATION FACTOR (ΔVZ)

ΔVZ is the maximum difference between VZ at IZT and VZ at IZL measured with the device junction in thermal equilibrium.

**LOW VOLTAGE  
AVALANCHE  
DIODES  
DO-7**



**FIGURE 1  
DO-7**

## MECHANICAL CHARACTERISTICS

CASE: Hermetically sealed glass case, DO-7.

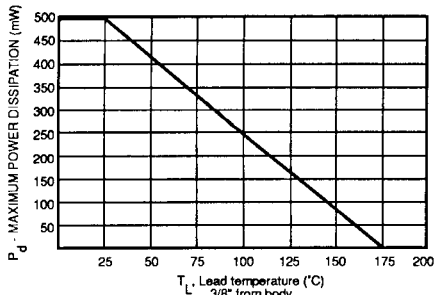
FINISH: Corrosion resistant. Leads are solderable.

MARKING: Body painted, alpha numeric.

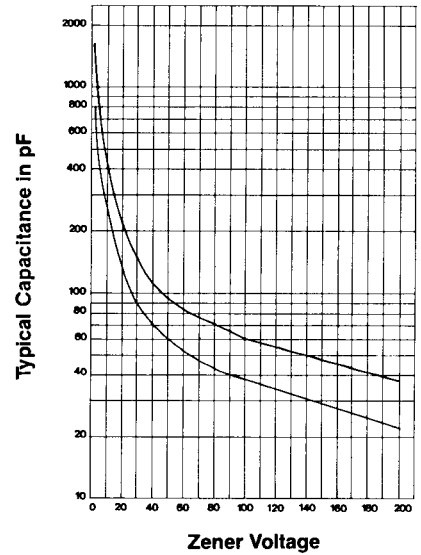
POLARITY: Diode to be operated with the banded end positive with respect to the opposite end.

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

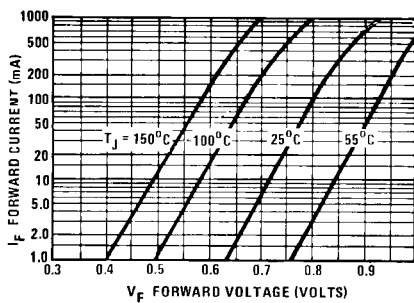
# 1N5518 thru 1N5546 DO-7



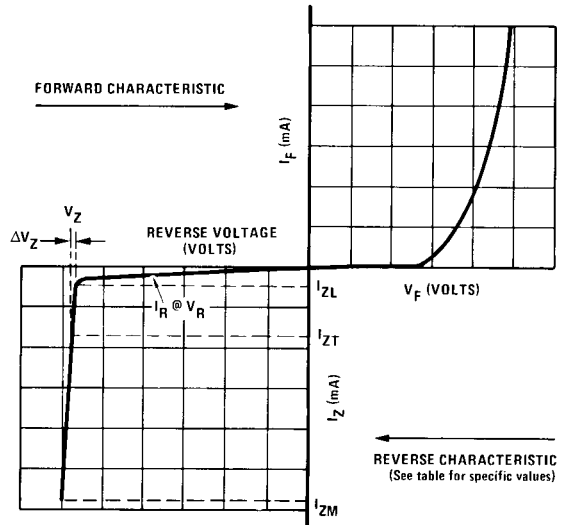
**FIGURE 2**  
POWER-TEMPERATURE  
DERATING CURVE



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



**FIGURE 4**  
TYPICAL FORWARD  
CHARACTERISTICS



**FIGURE 5**  
ZENER DIODE CHARACTERISTICS  
AND SYMBOL IDENTIFICATION