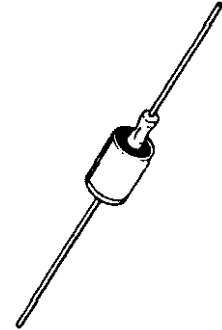


DESCRIPTION

This well established zener diode series for the 1N3821 thru 1N3830A JEDEC registration in the glass hermetic sealed DO-13 package provides a low voltage selection for 3.3 to 7.5 volts. It is also well suited for high-reliability applications where it is available in JAN, JANTX, and JANTXV military qualifications. Higher voltages are also available in the 1N3016 thru 1N3051 series (6.8 V to 200 V) in the same package (see separate data sheet). Microsemi also offers numerous other Zener diode products for a variety of other packages including surface mount.

APPEARANCE



IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

FEATURES

- Zener Voltage Range: 3.3 V to 7.5 V
- Hermetically sealed DO-13 metal package
- Internally solder-bonded construction.
- Also available in JAN, JANTX, JANTXV qualifications per MIL-PRF19500/115 by adding the JAN, JANTX, or JANTXV prefixes to part numbers for desired level of screening, e.g. JANTX1N3821, JANTXV1N3051A, etc.
- Surface mount also available with 1N3821UR-1 thru 1N30330AUR-1 series on separate data sheet

APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- Low voltage selection from 3.3 to 7.5 V
- Tight voltage tolerances available
- Low reverse (leakage) currents
- Nonsensitive to ESD
- Hermetically sealed metal package
- Inherently radiation hard as described in Microsemi MicroNote 050

MAXIMUM RATINGS

- Operating Junction and Storage Temperatures: -65°C to +175°C
- THERMAL RESISTANCE: 50°C/W* junction to lead at 0.375 inches (10 mm) from body or 110 °C/W junction to ambient when leads are mounted on FR4 PC board with 4 mm² copper pads (1 oz) and track width 1 mm, length 25 mm
- DC Power Dissipation*: 1 Watt at T_L ≤ +125°C 3/8" (10 mm) from body or 1.0 Watts at T_L ≤ +65°C when mounted on FR4 PC board as described for thermal resistance above (also see Fig 1)
- Forward Voltage @ 200 mA: 1.5 Volts.
- Solder Temperatures: 260 °C for 10 s (maximum)

MECHANICAL AND PACKAGING

- CASE: DO-13 (DO-202AA), welded, hermetically sealed metal and glass
- FINISH: All external surfaces are Tin-Lead (Pb/Sn) plated and solderable per MIL-STD-750 method 2026
- POLARITY: Cathode connected case.
- WEIGHT: 1.4 grams.
- Tape & Reel option: Standard per EIA-296 (add "TR" suffix to part number)
- See package dimensions on last page

* For further mounting reference, thermal resistance from junction to metal case may be reduced to ≤20 °C/W when mounting DO-13 metal case directly on heat sink.

***ELECTRICAL CHARACTERISTICS @ 25°C**

| JEDEC TYPE NUMBER | NOMINAL ZENER VOLTAGE $V_Z @ I_{ZT}$ (Note 1) | ZENER TEST CURRENT I_{ZT} | MAXIMUM ZENER IMPEDANCE (Note 2) | | MAXIMUM ZENER CURRENT I_{ZM} (Note 3) | MAXIMUM REVERSE LEAKAGE CURRENT $I_R @ V_R$ | | TYPICAL TEMP. COEFF. OF ZENER VOLTAGE α_{VZ} |
|-------------------|---|-----------------------------|----------------------------------|-------------------------|---|---|-------|---|
| | | | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK} = 1mA$ | | μA | Volts | |
| | | | OHMS | OHMS | | | | |
| 1N3821 | 3.3 | 76 | 10 | 400 | 276 | 100 | 1 | -.066 |
| 1N3821A | 3.3 | 76 | 10 | 400 | 276 | 100 | 1 | -.066 |
| 1N3822 | 3.6 | 69 | 10 | 400 | 252 | 100 | 1 | -.058 |
| 1N3822A | 3.6 | 69 | 10 | 400 | 252 | 100 | 1 | -.058 |
| 1N3823 | 3.9 | 64 | 9 | 400 | 238 | 50 | 1 | -.046 |
| 1N3823A | 3.9 | 64 | 9 | 400 | 238 | 50 | 1 | -.046 |
| 1N3824 | 4.3 | 58 | 9 | 400 | 213 | 10 | 1 | -.033 |
| 1N3824A | 4.3 | 58 | 9 | 400 | 213 | 10 | 1 | -.033 |
| 1N3825 | 4.7 | 53 | 8 | 500 | 194 | 10 | 1 | -.015 |
| 1N3825A | 4.7 | 53 | 8 | 500 | 194 | 10 | 1 | -.015 |
| 1N3826 | 5.1 | 49 | 7 | 550 | 178 | 10 | 1 | +/- .010 |
| 1N3826A | 5.1 | 49 | 7 | 550 | 178 | 10 | 1 | +/- .010 |
| 1N3827 | 5.6 | 45 | 5 | 600 | 162 | 10 | 2 | + .030 |
| 1N3827A | 5.6 | 45 | 5 | 600 | 162 | 10 | 2 | + .030 |
| 1N3828 | 6.2 | 41 | 2 | 700 | 146 | 10 | 3 | + .049 |
| 1N3828A | 6.2 | 41 | 2 | 700 | 146 | 10 | 3 | + .049 |
| 1N3829 | 6.8 | 37 | 1.5 | 500 | 133 | 10 | 3 | + .053 |
| 1N3829A | 6.8 | 37 | 1.5 | 500 | 133 | 10 | 3 | + .053 |
| 1N3830 | 7.5 | 34 | 1.5 | 250 | 121 | 10 | 3 | + .057 |
| 1N3830A | 7.5 | 34 | 1.5 | 250 | 121 | 10 | 3 | + .057 |

*JEDEC Registered Data.

- NOTES:**
- The JEDEC type numbers shown with suffix A have a standard tolerance of +/-5% on the nominal zener voltage. V_Z measured with device in thermal equilibrium in 25°C still air and mounted in test clips, 3/4" from unit body. If tighter tolerance on V_Z is required, consult factory.
 - The zener impedance is derived when a 60 cycle ac current having an rms value equal to 10% of the dc zener current (I_{ZT} or I_{ZK}) is superimposed on I_{ZT} or I_{ZK} . Zener impedance is measured at 2 points to ensure a sharp knee on the breakdown curve and to eliminate unstable units. See MicroNote 202 for variation in dynamic impedance with different zener currents.
 - Allowance has been made for the increase in V_Z due to Z_Z and for the increase in junction temperature as the unit approaches thermal equilibrium at the power dissipation of 1 watt.

GRAPHS

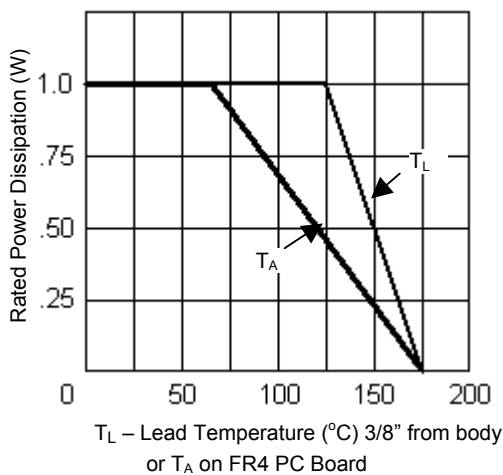


FIGURE 1
Power Derating

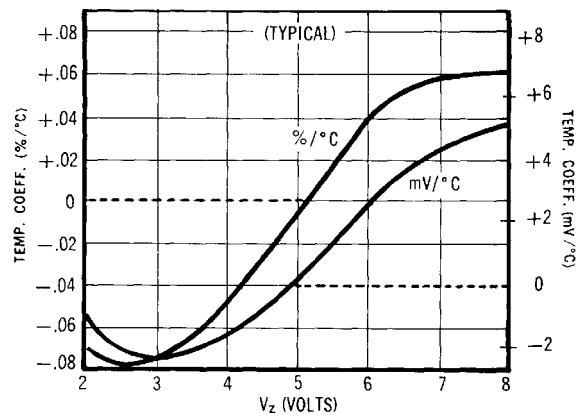


FIGURE 2
Temperature Coeff. vs. Zener Voltage

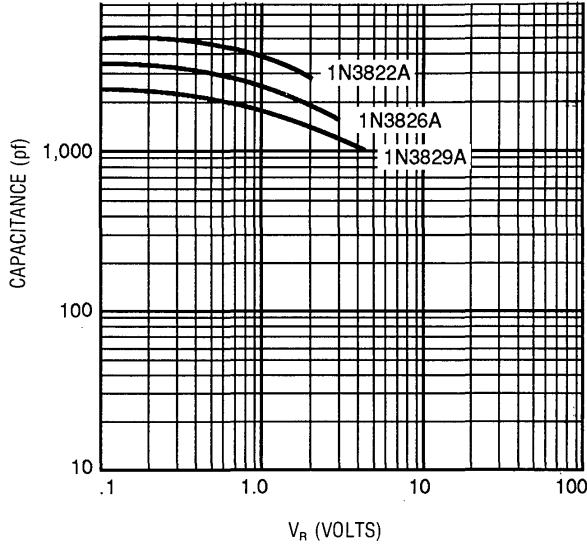
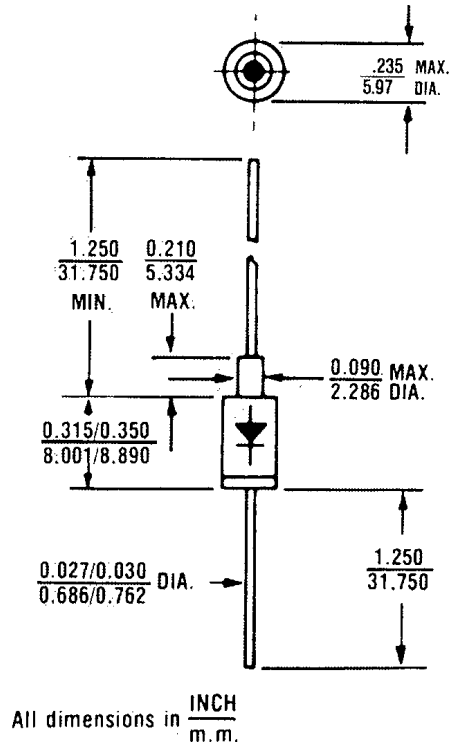


FIGURE 4
Typical Capacitance vs. Reverse Voltage
for 1-Watt Zeners

PACKAGE DIMENSIONS



DO-13