Microsemi
SCOTTSDALE DIVISION

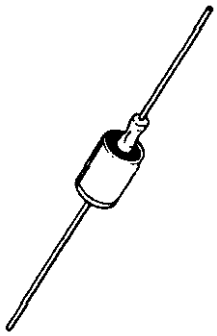
1N3821 thru 1N3830A

1 Watt Metal Case Zener Diodes

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 mm^2 copper pads (1 oz) and track width 1 mm, length 25 mm
- DC Power Dissipation*: 1 Watt at $T_L \leq +125^{\circ}C$ 3/8" (10 mm) from body or 1.0 Watts at $T_L \leq +65^{\circ}C$ 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.

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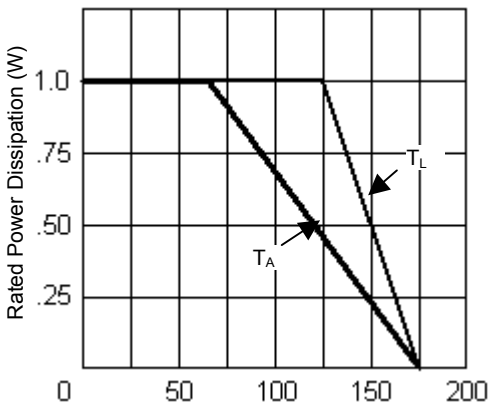
*ELECTRICAL CHARACTERISTICS @ 25°C

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				
	Volts	mA	OHMS	OHMS	mA	µA	Volts	%/°C
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:
1. 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, ¾" from unit body. if tighter tolerance on V_Z is required, consult factory.
2. 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.
3. 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



T_L – Lead Temperature (°C) 3/8" from body or T_A on FR4 PC Board

FIGURE 1
Power Derating

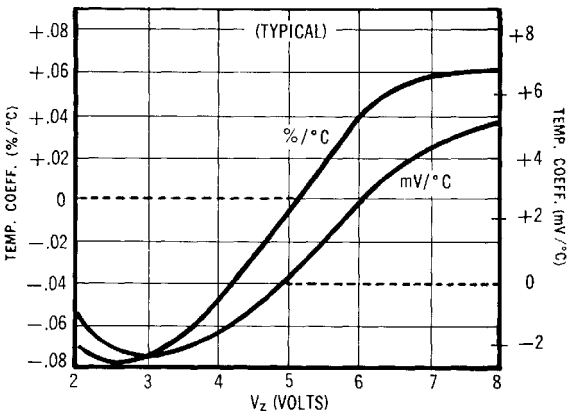


FIGURE 2
Temperature Coeff. vs. Zener Voltage

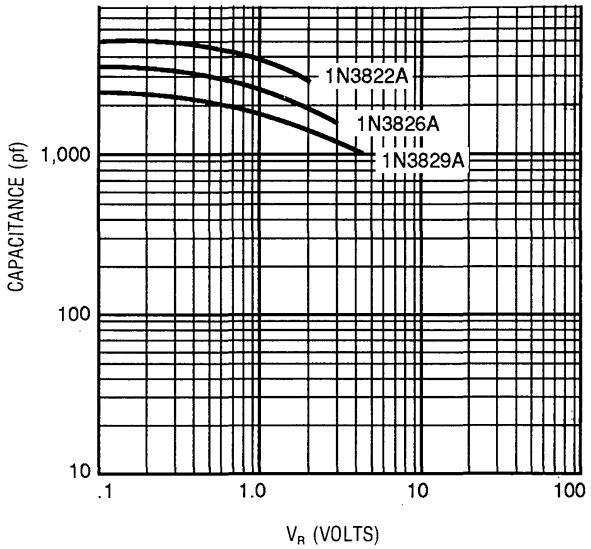
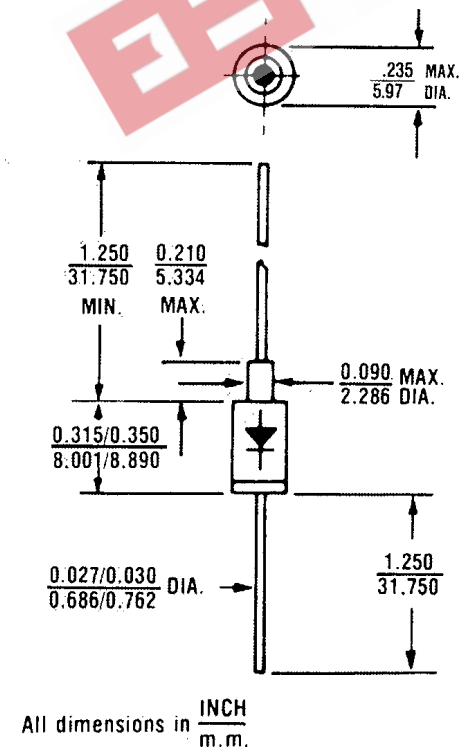


FIGURE 4
Typical Capacitance vs. Reverse Voltage
for 1-Watt Zeners

PACKAGE DIMENSIONS



DO-13