Microsemi
SCOTTSDALE DIVISION

1N3821UR-1 thru 1N3830AUR-1, e3 or MLL3821 thru MLL3830A, e3

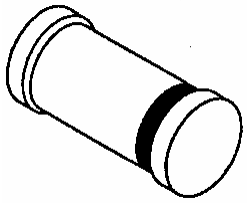
LEADLESS GLASS ZENER DIODES

DESCRIPTION

This surface mountable zener diode series is similar to the lower voltage 1N3821 thru 1N3830 JEDEC registration except it is in a surface mount DO-213AB package outline. It is an ideal selection for applications of high density and low parasitic requirements. Due to its glass hermetic qualities and enhanced metallurgical bonded internal construction, it is also well suited for high reliability applications. This can be acquired by a source control drawing (SCD), or simply by ordering device types with a MQ, MX or MV prefix for equivalent screening to JAN, JANTX or JANTXV respectively.

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

APPEARANCE



DO-213AB

FEATURES

- Leadless package for surface mount equivalent to 1N3821 thru 1N3830A.
- Ideal for high-density mounting
- Lower voltage selections of 3.3 V to 7.5 V
- Hermetically sealed, double-slug glass construction
- Metallurgically enhanced contact construction
- Options for screening in accordance with MIL-PRF-19500/115 for JAN, JANTX, and JANTXV with MQ, MX or MV prefixes respectively for part numbers, e.g. MX1N3821AUR-1, MV1N3828AUR-1, etc.
- Axial lead "thru-hole" DO-13 packages per JEDEC registration available as 1N3821A thru 1N3830A (see separate data sheet with MIL-PRF-19500/115 qualification)
- RoHS Compliant devices available by adding "e3" suffix

APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- Leadless package for surface mounting
- Tight voltage tolerances available
- Ideal for high-density mounting
- Metallurgically enhanced internal contact design for greater reliability and lower thermal resistance
- Nonsensitive to ESD
- Hermetically sealed glass package
- Specified capacitance (see Figure 2)
- Inherently radiation hard as described in Microsemi MicroNote 050

MAXIMUM RATINGS

- Power dissipation at 25°C: 1.5 watts (also see derating in Figure 1).
- Operating and Storage temperature: -65°C to +175°C
- Thermal Resistance: 40 °C/W junction to end cap, or 120°C/W junction to ambient when mounted on FR4 PC board (1 oz Cu) with recommended footprint (see last page)
- Steady-State Power: 1.50 watts at end-cap temperature $T_{EC} \leq 115^{o}$C, or 1.25 watts at $T_A = 25^{o}$C when mounted on FR4 PC board and recommended footprint as described for thermal resistance (also see Figure 1)
- Forward voltage @200 mA: 1.2 volts (maximum)
- Solder Temperatures: 260 °C for 10 s (max)

MECHANICAL AND PACKAGING

- CASE: Hermetically sealed glass MELF package
- TERMINALS: Tin-Lead (SN/Pb) or RoHS compliant annealed matte-Tin (Sn) plating solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band. Diode to be operated with the banded end positive with respect to the opposite end for Zener regulation
- MARKING: Cathode band only
- TAPE & REEL optional: Standard per EIA-481-1-A with 12 mm tape, 1500 per 7 inch reel or 5000 per 13 inch reel (add "TR" suffix to part number)
- WEIGHT: 0.05 grams
- See package dimensions on last page

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*ELECTRICAL CHARACTERISTICS @ 25°C

INDUSTRY TYPE NUMBER** (NOTE 1)	MICROSEMI PART NUMBER (NOTE 3)	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 CURRENT		TYPICAL TEMP.COEFF. OF ZENER VOLTAGE α_{VZ}
				Z_{ZT} @ I_{ZT}	Z_{ZK}@ I_{ZK}= 1 mA		I_R @ V_R		
		VOLTS	mA	OHMS	OHMS	mA	µA	Volts	%/°C
1N3821UR-1	MLL3821	3.3	76	10	400	414	100	1	-.066
1N3821AUR-1	MLL3821A	3.3	76	10	400	414	100	1	-.066
1N3822UR-1	MLL3822	3.6	69	10	400	378	100	1	-.058
1N3822AUR-1	MLL3822A	3.6	69	10	400	378	100	1	-.058
1N3823UR-1	MLL3823	3.9	64	9	400	357	50	1	-.046
1N3823AUR-1	MLL3823A	3.9	64	9	400	357	50	1	-.046
1N3824UR-1	MLL3824	4.3	58	9	400	320	10	1	-.033
1N3824AUR-1	MLL3824A	4.3	58	9	400	320	10	1	-.033
1N3825UR-1	MLL3825	4.7	53	8	500	291	10	1	-.015
1N3825AUR-1	MLL3825A	4.7	53	8	500	291	10	1	-.015
1N3826UR-1	MLL3826	5.1	49	7	550	267	10	1	+/-.010
1N3826AUR-1	MLL3826A	5.1	49	7	550	267	10	1	+/-.010
1N3827UR-1	MLL3827	5.6	45	5	600	243	10	2	+.030
1N3827AUR-1	MLL3827A	5.6	45	5	600	243	10	2	+.030
1N3828UR-1	MLL3828	6.2	41	2	700	219	10	3	+.049
1N3828AUR-1	MLL3828A	6.2	41	2	700	219	10	3	+.049
1N3829UR-1	MLL3829	6.8	37	1.5	500	200	10	3	+.053
1N3829AUR-1	MLL3829A	6.8	37	1.5	500	200	10	3	+.053
1N3830UR-1	MLL3830	7.5	34	1.5	250	182	10	3	+.057
1N3830AUR-1	MLL3830A	7.5	34	1.5	250	182	10	3	+.057

* JEDEC registered data for 1N3821 thru 3830A equivalents except for lower reverse (leakage) current I_R and higher maximum zener current I_{ZM}.
** When applicable, add MQ, MX, or MV prefix to the 1N3821AUR-1 thru 1N3828AUR-1 part numbers for screening options in accordance with MIL-PRF-19500/115.

NOTE 1: Suffix A signifies a +/-5% tolerance on nominal zener voltage. No suffix designates +/-10% tolerance. If tighter tolerance is required, suffix C is used to identify +/-2%; and suffix D is to identify +/-1% tolerance. V_Z is measured with the diode in thermal equilibrium in 25°C still air. The test currents (I_{ZT}) at the listed nominal zener voltages provide a constant 0.25 watts for this device series per JEDEC registration.

NOTE 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.

NOTE 3: This product series has been previously identified as MLL3821 thru MLL3830A by Microsemi. This alternate name may still be used, however the Industry name of 1N3821UR-1 thru 1N3830UR-1 is preferred.

OUTLINE AND CIRCUIT

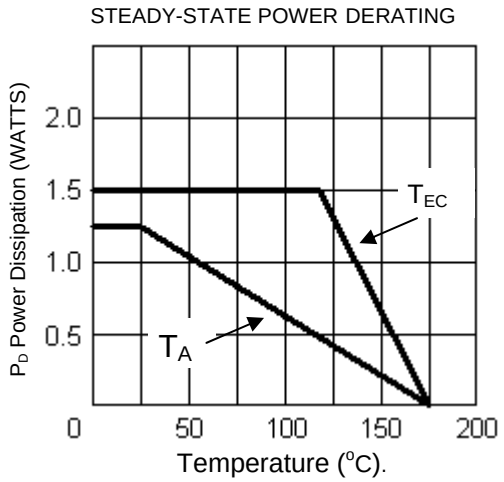


FIGURE 1 Typical Zener Impedance vs Zener Current for Types Shown

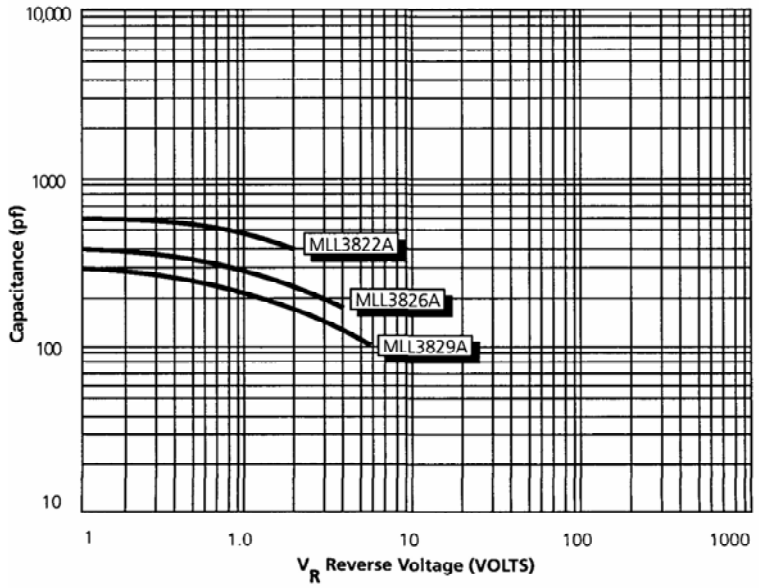


FIGURE 2 Typical Capacitance vs. Reverse Voltage

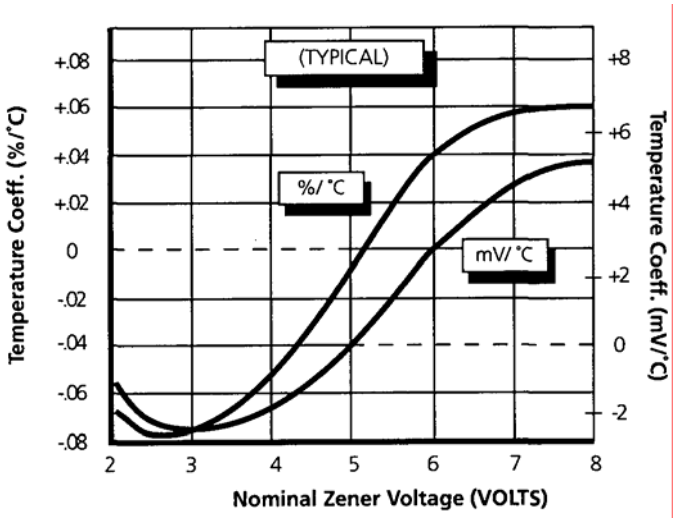
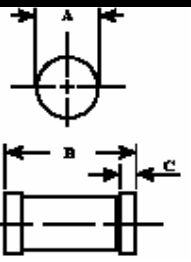
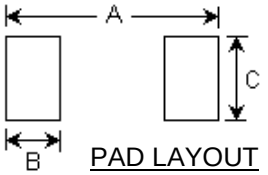


FIGURE 3 Typical Zener Voltage Temperature Coeff. vs. Zener Voltage

PACKAGE DIMENSIONS



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.094	0.105	2.39	2.66
B	0.189	0.205	4.80	5.20
C	0.016	0.022	0.41	0.55



PAD LAYOUT

	INCHES	mm
A	.276	7.00
B	0.070	1.8
C	0.110	2.8