

**Microsemi Corp.**  
Scottsdale

8700 E. Thomas Road • P.O. Box 1390 • Scottsdale, AZ 85252  
(602) 941-6300 • (602) 947-1503 Fax

# MLL4099 thru MLL4135 and MLL4614 thru MLL4627

## Description / Features

- ZENER VOLTAGE 1.8 TO 100V
- JAN, JANTX AND JANTXV-1 QUALIFICATIONS AVAILABLE IN METALLURGICALLY BONDED CONSTRUCTION TO MIL-S-19500/435 (Designated by "UR-1" suffix.)
- LOW NOISE
- LOW REVERSE LEAKAGE
- TIGHT TOLERANCE AVAILABLE

## Maximum Ratings

Junction and Storage temperatures: -65°C to +200°C  
DC Power Dissipation: 400 mW standard (no suffix), and  
500 mW military qualified ("-1" suffix).

Forward Voltage @ 200 mA: 1.1 Volts 1N4099 - 1N4135  
@ 100 mA: 1.0 Volts 1N4614 - 1N4627  
(All military qualified @ 200 mA with V<sub>F</sub> of 1.1 Volts.)

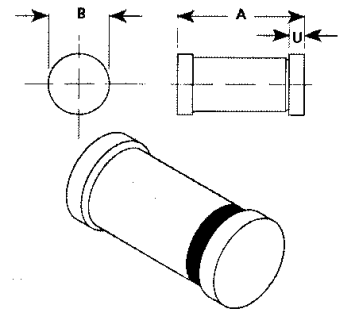
## \*Electrical Characteristics @ 25° C

MICROSEMI NUMBER	NOMINAL ZENER VOLTAGE V <sub>Z</sub> @ I <sub>ZT</sub> (MIL-19500-435)	ZENER TEST CURRENT I <sub>ZT</sub>	MAXIMUM ZENER IMPEDANCE Z <sub>Z</sub> (MIL-19500-435)	MAXIMUM REVERSE CURRENT I <sub>R</sub> @ V <sub>R</sub>	MAXIMUM NOISE DENSITY N <sub>D</sub> @ 10 <sup>12</sup> Hz	MAXIMUM ZENER CURRENT I <sub>M</sub> (MIL-19500-435)	TYPICAL TEMP. COEFF. OF ZENER VOLTAGE α <sub>VZ</sub>
	VOLTS	μA	OHMS	μA	VOLTS	mA	%/°C
** Please see ordering information below							
MLL4614	1.8	250	1200	7.5	1.0	1	-0.075
MLL4615	2.0	250	1250	5.0	1.0	1	-0.075
MLL4616	2.2	250	1300	4.0	1.0	1	-0.075
MLL4617	2.4	250	1400	2.0	1.0	1	-0.075
MLL4618	2.7	250	1500	1.0	1.0	1	-0.075
MLL4619	3.0	250	1600	0.8	1.0	1	-0.075
MLL4620	3.3	250	1650	7.5	1.5	1	-0.075
MLL4621	3.6	250	1700	7.5	2.0	1	-0.065
MLL4622	3.9	250	1650	5.0	2.0	1	-0.060
MLL4623	4.3	250	1600	4.0	2.0	1	-0.050
MLL4624	4.7	250	1550	10.0	3.0	1	-0.040, +0.020
MLL4625	5.1	250	1500	10.0	3.0	2	-0.045, +0.030
MLL4626	5.6	250	1400	10.0	4.0	4	-0.020, +0.040
MLL4627	6.2	250	1200	10.0	5.0	5	-0.010, +0.050
MLL4099	6.8	250	200	10.0	5.17	40	0.040
MLL4100	7.5	250	200	10.0	5.70	40	0.045
MLL4101	8.2	250	200	1.0	6.24	40	0.048
MLL4102	8.7	250	200	1.0	6.61	40	0.049
MLL4103	9.1	250	200	1.0	6.92	40	0.050
MLL4104	10	250	200	1.0	7.60	40	0.055
MLL4105	11	250	200	.05	8.44	40	0.060
MLL4106	12	250	200	.05	9.12	40	0.065
MLL4107	13	250	200	.05	9.87	40	0.065
MLL4108	14	250	200	.05	10.65	40	0.070
MLL4109	15	250	100	.05	11.40	40	0.070
MLL4110	16	250	100	.05	12.15	40	0.070
MLL4111	17	250	100	.05	12.92	40	0.075
MLL4112	18	250	100	.05	13.67	40	0.075
MLL4113	19	250	150	.05	14.44	40	0.075
MLL4114	20	250	150	.01	15.20	40	0.075
MLL4115	22	250	150	.01	16.72	40	0.080
MLL4116	24	250	150	.01	18.25	40	0.080
MLL4117	25	250	150	.01	19.00	40	0.080
MLL4118	27	250	150	.01	20.45	40	0.085
MLL4119	28	250	200	.01	21.28	40	0.085
MLL4120	30	250	200	.01	22.80	40	0.085
MLL4121	33	250	200	.01	25.08	40	0.085
MLL4122	36	250	200	.01	27.38	40	0.090
MLL4123	39	250	200	.01	29.65	40	0.090
MLL4124	43	250	250	.01	32.65	40	0.090
MLL4125	47	250	250	.01	35.75	40	0.090
MLL4126	51	250	300	.01	38.76	40	0.090
MLL4127	56	250	300	.01	42.60	40	0.090
MLL4128	60	250	400	.01	45.60	40	0.090
MLL4129	62	250	500	.01	47.10	40	0.090
MLL4130	68	250	700	.01	51.68	40	0.095
MLL4131	75	250	700	.01	57.00	40	0.095
MLL4132	82	250	800	.01	62.32	40	0.095
MLL4133	87	250	1000	.01	66.12	40	0.095
MLL4134	91	250	1200	.01	69.16	40	0.095
MLL4135	100	250	1500	.01	76.00	40	0.095

\* JEDEC Registered Data

\*\* Ordering information: 1) Commercial: MLL4614 - MLL4627, MLL4099 - MLL4135  
2) Military: JAN, JANTX, or JANTXV 1Nxxxx UR-1  
3) Tight tolerance: "C" suffix = 2%, "D" suffix = 1% (MLL4099C, JANTXVIN4099CUR-1)

## LEADLESS GLASS ZENER DIODES



	MILLIMETERS		INCHES	
DIM.	MIN.	MAX.	MIN.	MAX.
A	3.30	3.70	0.130	0.146
B	1.60	1.70	0.063	0.067
U	0.41	0.55	0.016	0.022

DO-213AA

Figure 1

## Mechanical Characteristics

**CASE:** Hermetically sealed glass with solder contact tabs at each end.

**FINISH:** All external surfaces are corrosion resistant, readily solderable.

**POLARITY:**  
Banded end is cathode.

**THERMAL RESISTANCE:**  
100°C/W maximum junction to end caps for "-1" construction and 150°C/W maximum junction to end caps for commercial.

**MOUNTING POSITION:**  
Any.

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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.

## NOTE 1:

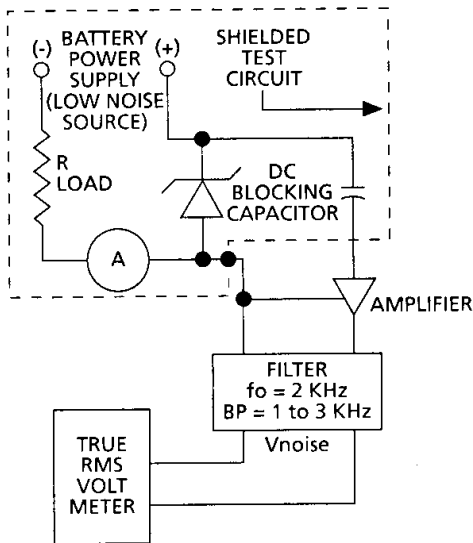
The JEDEC type numbers shown above have a standard tolerance of  $\pm 5\%$  on the nominal Zener voltage. Also available in 2% and 1% tolerance, suffix C and D respectively.  $V_Z$  is measured with the diode in thermal equilibrium in 25°C still air.

## NOTE 2:

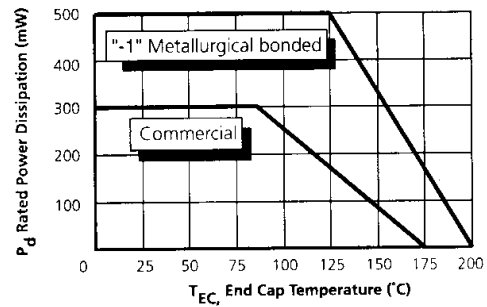
Zener impedance is derived by superimposing on  $I_{ZT}$ , a 60 Hz rms a.c. current equal to 10% of  $I_{ZT}$  (25 $\mu$ A a.c.).

## NOTE 3:

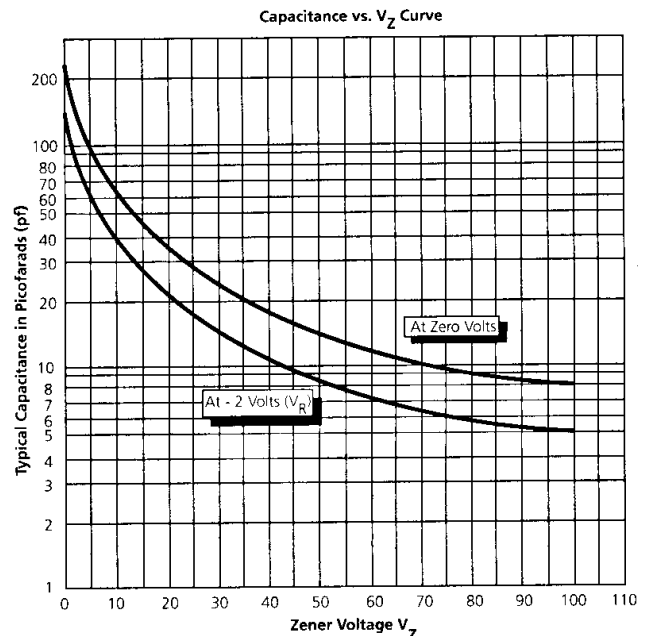
Based upon 400 mW maximum power dissipation at 75°C, allowance has been made for the higher voltage associated with operation at higher currents.



**FIGURE 2** Noise Density Measurement Circuit



**FIGURE 3** Power Derating Curve



**FIGURE 4** Capacitance vs. Zener Voltage (Typical)