



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





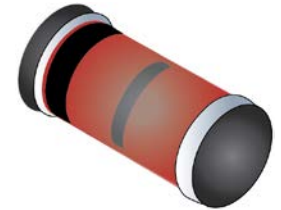
500 mW Metallurgically Bonded Glass Surface Mount Zener Diodes

Qualified per MIL-PRF-19500/435

*Qualified Levels:
JAN, JANTX,
JANTXV and JANS*

DESCRIPTION

The 1N4099UR-1 through 1N4135UR-1 and 1N4614UR-1 through 1N4627UR-1 series are 500 mW, Zener voltage regulators in the surface mount, glass DO-213AA package. Voltages from 1.8 to 100V in 5%, 2%, and 1% tolerances are available. They are constructed with an internal metallurgical bond and are mil-qualified up to the JANS level for high reliability applications.




**DO-213AA
Package**


Important: For the latest information, visit our website <http://www.microsemi.com>.

FEATURES

- Surface mount equivalent to JEDEC registered 1N4099 through 1N4135 and 1N4614 through 1N4627 series.
- Internal metallurgical bond.
- Max noise density 40 $\mu\text{V} / \sqrt{\text{Hz}}$ for 6.8 V and up. Falls quickly to 1 $\mu\text{V} / \sqrt{\text{Hz}}$ at lower voltages.
- JAN, JANTX, JANTXV and JANS qualifications are available per MIL-PRF-19500/435.
- This series is also available commercially with the CDLL prefix (CDLL4099-1 – CDLL4135-1 and CDLL4614-1 – CDLL4627-1). This CDLL prefix also replaces the MLL prefix on prior devices.
- RoHS compliant versions available (commercial grade only).

Also available in:

 **DO-35 package**
(axial-leaded)
[1N4099-1 – 1N4135-1 and](#)
[1N4614-1 – 1N4627-1](#)

 **DO-216 package**
(tabbed surface mount)
[1PMT4099 – 1PMT4135 and](#)
[1PMT4614 – 1PMT4627](#)

APPLICATIONS / BENEFITS

- Regulates voltage over broad ranges of current and temperature.
- Extensive selection from 1.8 to 100 volts.
- Voltage tolerances of 5% (standard), 2% and 1% are available.
- Hermetically sealed surface mount package.
- Non-sensitive to ESD per MIL-STD-750 method 1020.
- Minimal capacitance (see [Figure 3](#)).
- Inherently radiation hard as described in Microsemi [MicroNote 050](#).

MAXIMUM RATINGS @ $T_C = +25^\circ\text{C}$ unless otherwise specified

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J and T_{STG}	-65 to +175	$^\circ\text{C}$
Thermal Resistance Junction-to-Ambient ⁽¹⁾	$R_{\theta JA}$	300	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-to-End Cap	$R_{\theta JEC}$	100	$^\circ\text{C}/\text{W}$
Rated Average Power Dissipation ⁽²⁾	$P_{M(AV)}$	0.5	W
Forward Voltage @ 200 mA	V_F	1.1	V
Solder Temperature @ 10 s		260	$^\circ\text{C}$

- Notes:**
1. When mounted on FR4 PC board (1 oz Cu) with recommended footprint (see [last page](#)).
 2. The 0.5 W linearly derates starting at $T_{EC} = 125^\circ\text{C}$ and goes to zero at 175°C . For ambient T_A condition on a typical PC board, it linearly derates from 500 mW starting at 25°C and goes to zero at 175°C (see [Figure 2](#)).

MSC – Lawrence
6 Lake Street,
Lawrence, MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

MSC – Ireland
Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:
www.microsemi.com

MECHANICAL and PACKAGING

- CASE: Hermetically sealed glass DO-213AA (SOD80 or CDLL34) MELF style package.
- TERMINALS: Tin-lead or RoHS compliant annealed matte-tin (on commercial grade only) plating. Solderable per MIL-STD-750, method 2026.
- POLARITY: Cathode indicated by banded end. Diode is to be operated with the banded end positive with respect to the opposite end for Zener regulation.
- MARKING: Cathode band only.
- TAPE & REEL option: Standard per EIA-481-1-A with 12 mm tape (add "TR" suffix to part number). Consult factory for quantities.
- WEIGHT: Approximately 0.04 grams.
- See [Package Dimensions](#) on last page.

PART NOMENCLATURE

JAN 1N4099 C UR -1 (e3)

Reliability Level

JAN = JAN level
JANTX = JANTX level
JANTXV = JANTXV level
JANS = JANS level
Blank = Commercial

JEDEC type number

(See [Electrical Characteristics](#) table)

Zener Voltage Tolerance

Blank = 5%
C = 2%
D = 1%

RoHS Compliance

e3 = RoHS compliant (available on commercial grade only)
Blank = non-RoHS compliant

Metallurgically Bonded
Surface Mount Package

CDLL 4099 C -1 (e3)

Microsemi Designation
JEDEC type number

(See [Electrical Characteristics](#) table)

Zener Voltage Tolerance

Blank = 5%
C = 2%
D = 1%

RoHS Compliance

e3 = RoHS compliant Blank = non-RoHS compliant

Metallurgically Bonded

SYMBOLS & DEFINITIONS	
Symbol	Definition
α_{VZ}	Temperature Coefficient of Regulator Voltage: The change in regulator voltage divided by the change in temperature that caused it expressed in %/C or mV/°C.
I_R	Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
I_Z, I_{ZT}, I_{ZK}	Regulator Current: The dc regulator current (I_Z), at a specified test point (I_{ZT}), near breakdown knee (I_{ZK}).
I_{ZM}	Maximum Regulator (Zener) Current: The maximum rated dc current for the specified power rating.
N_D	Noise Density: The noise generated over a specified frequency bandwidth usually specified in terms of mV/ $\sqrt{\text{Hz}}$.
V_R	Reverse Voltage: The reverse voltage dc value, no alternating component.
V_Z	Zener Voltage: The Zener voltage the device will exhibit at a specified current (I_Z) in its breakdown region.
Z_{ZT} or Z_{ZK}	Dynamic Impedance: The small signal impedance of the diode when biased to operate in its breakdown region at a specified rms current modulation (typically 10% of I_{ZT} or I_{ZK}) and superimposed on I_{ZT} or I_{ZK} respectively.

ELECTRICAL CHARACTERISTICS @ 25 °C unless otherwise stated

INDUSTRY PART NUMBER (Note 1)	MICROSEMI PART NUMBER (Note 1)	NOMINAL ZENER VOLTAGE $V_Z @ I_{ZT}$ (Note 2)	ZENER TEST CURRENT I_{ZT}	MAXIMUM ZENER IMPEDANCE Z_{ZT} (Note 3)	MAXIMUM REVERSE CURRENT $I_R @ V_R$		MAXIMUM NOISE DENSITY $N_D @ I_{ZT}$	MAXIMUM ZENER CURRENT I_{ZM}	MAXIMUM TEMP. COEFF. OF ZENER VOLTAGE α_{VZ}
		Volts	μA	Ohms	μA	Volts	$\mu V/\sqrt{Hz}$	mA	%/°C
1N4614UR-1	CDLL4614-1	1.8	250	1200	3.5	1.0	1	120.0	-0.075
1N4615UR-1	CDLL4615-1	2.0	250	1250	2.5	1.0	1	110.0	-0.075
1N4616UR-1	CDLL4616-1	2.2	250	1300	2.0	1.0	1	100.0	-0.075
1N4617UR-1	CDLL4617-1	2.4	250	1400	1.0	1.0	1	95.0	-0.075
1N4618UR-1	CDLL4618-1	2.7	250	1500	0.5	1.0	1	90.0	-0.075
1N4619UR-1	CDLL4619-1	3.0	250	1600	0.4	1.0	1	87.0	-0.075
1N4620UR-1	CDLL4620-1	3.3	250	1650	3.5	1.5	1	85.0	-0.075
1N4621UR-1	CDLL4621-1	3.6	250	1700	3.5	2.0	1	83.0	-0.065
1N4622UR-1	CDLL4622-1	3.9	250	1650	2.5	2.0	1	80.0	-0.060
1N4623UR-1	CDLL4623-1	4.3	250	1600	2.0	2.0	1	77.0	-0.050
1N4624UR-1	CDLL4624-1	4.7	250	1550	5.0	3.0	1	75.0	-0.050,+0.020
1N4625UR-1	CDLL4625-1	5.1	250	1500	5.0	3.0	2	70.0	-0.045,+0.030
1N4626UR-1	CDLL4626-1	5.6	250	1400	5.0	4.0	4	65.0	-0.020,+0.040
1N4627UR-1	CDLL4627-1	6.2	250	1200	5.0	5.0	5	61.0	-0.010,+0.050
1N4099UR-1	CDLL4099-1	6.8	250	200	1.0	5.2	40	56.0	+0.060
1N4100UR-1	CDLL4100-1	7.5	250	200	1.0	5.7	40	51.0	+0.065
1N4101UR-1	CDLL4101-1	8.2	250	200	0.5	6.3	40	46.0	+0.070
1N4102UR-1	CDLL4102-1	8.7	250	200	0.5	6.7	40	44.0	+0.075
1N4103UR-1	CDLL4103-1	9.1	250	200	0.5	7.0	40	42.0	+0.080
1N4104UR-1	CDLL4104-1	10.0	250	200	0.5	7.6	40	38.0	+0.080
1N4105UR-1	CDLL4105-1	11.0	250	200	0.05	8.5	40	35.0	+0.080
1N4106UR-1	CDLL4106-1	12.0	250	200	0.05	9.2	40	32.0	+0.080
1N4107UR-1	CDLL4107-1	13.0	250	200	0.05	9.9	40	29.0	+0.080
1N4108UR-1	CDLL4108-1	14.0	250	200	0.05	10.7	40	27.0	+0.085
1N4109UR-1	CDLL4109-1	15.0	250	100	0.05	11.4	40	25.0	+0.085
1N4110UR-1	CDLL4110-1	16.0	250	100	0.05	12.2	40	24.0	+0.085
1N4111UR-1	CDLL4111-1	17.0	250	100	0.05	13.0	40	22.0	+0.090
1N4112UR-1	CDLL4112-1	18.0	250	100	0.05	13.7	40	21.0	+0.090
1N4113UR-1	CDLL4113-1	19.0	250	150	0.05	14.5	40	20.0	+0.090
1N4114UR-1	CDLL4114-1	20.0	250	150	0.01	15.2	40	19.0	+0.090
1N4115UR-1	CDLL4115-1	22.0	250	150	0.01	16.8	40	17.0	+0.090
1N4116UR-1	CDLL4116-1	24.0	250	150	0.01	18.3	40	16.0	+0.090
1N4117UR-1	CDLL4117-1	25.0	250	150	0.01	19.0	40	15.0	+0.090
1N4118UR-1	CDLL4118-1	27.0	250	150	0.01	20.5	40	14.0	+0.090
1N4119UR-1	CDLL4119-1	28.0	250	200	0.01	21.3	40	14.0	+0.095
1N4120UR-1	CDLL4120-1	30.0	250	200	0.01	22.8	40	13.0	+0.095
1N4121UR-1	CDLL4121-1	33.0	250	200	0.01	25.1	40	12.0	+0.095
1N4122UR-1	CDLL4122-1	36.0	250	200	0.01	27.4	40	11.0	+0.095
1N4123UR-1	CDLL4123-1	39.0	250	200	0.01	29.7	40	9.8	+0.095
1N4124UR-1	CDLL4124-1	43.0	250	250	0.01	32.7	40	8.9	+0.095
1N4125UR-1	CDLL4125-1	47.0	250	250	0.01	35.8	40	8.1	+0.095
1N4126UR-1	CDLL4126-1	51.0	250	300	0.01	38.8	40	7.5	+0.100
1N4127UR-1	CDLL4127-1	56.0	250	300	0.01	42.6	40	6.7	+0.100
1N4128UR-1	CDLL4128-1	60.0	250	400	0.01	45.6	40	6.4	+0.100
1N4129UR-1	CDLL4129-1	62.0	250	500	0.01	47.1	40	6.1	+0.100
1N4130UR-1	CDLL4130-1	68.0	250	700	0.01	51.7	40	5.6	+0.100
1N4131UR-1	CDLL4131-1	75.0	250	700	0.01	57.0	40	5.1	+0.100
1N4132UR-1	CDLL4132-1	82.0	250	800	0.01	62.4	40	4.6	+0.100
1N4133UR-1	CDLL4133-1	87.0	250	1000	0.01	66.2	40	4.4	+0.100
1N4134UR-1	CDLL4134-1	91.0	250	1200	0.01	69.2	40	4.2	+0.100
1N4135UR-1	CDLL4135-1	100.0	250	1600	0.01	76.0	40	3.8	+0.100

SEE NOTES ON NEXT PAGE.

NOTE 1: These may be ordered as either 1N4614UR-1 thru 1N4627UR-1 and 1N4099UR-1 thru 1N4135UR-1 or CDLL4614-1 thru CDLL4627-1 and CDLL4099-1 thru CDLL4135-1. For 1N military types, add the JAN, JANTX, JANTXV prefix for required screening to the industry part number.

NOTE 2: The JEDEC type numbers shown above have a standard tolerance of +/-5% on the nominal Zener voltage. V_Z is measured with the diode in thermal equilibrium (still air) at 25 °C for end-cap terminations.

NOTE 3: Zener impedance is derived by superimposing on I_{ZT} a 60 Hz rms ac current at 10% of I_{ZT} . See [MicroNote 202](#) for Z_{ZT} variation with I_Z .

GRAPHS

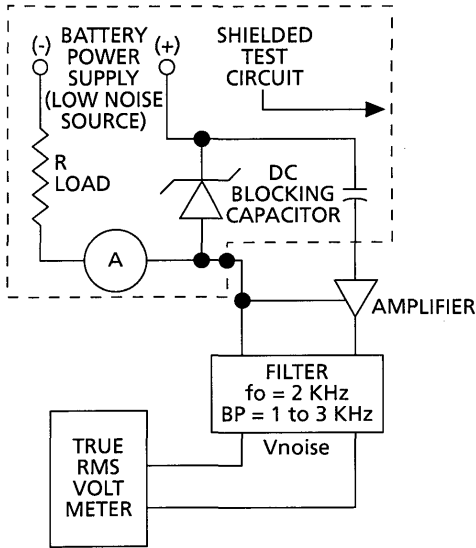


FIGURE 1 – Noise Density Measurement Circuit

Noise density, (N_D) is specified in microvolt-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.

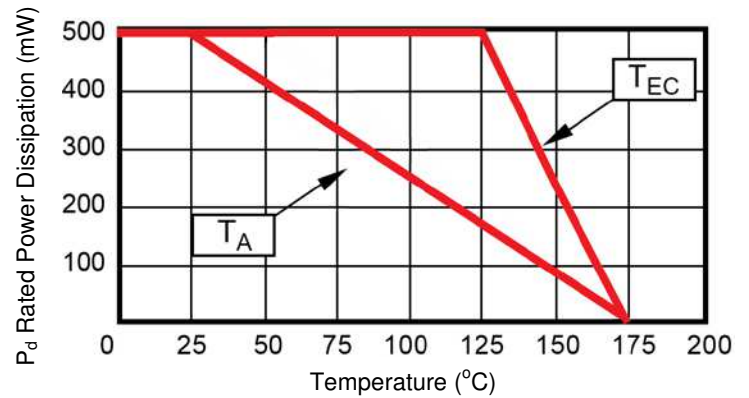


FIGURE 2 – Power Derating Curve

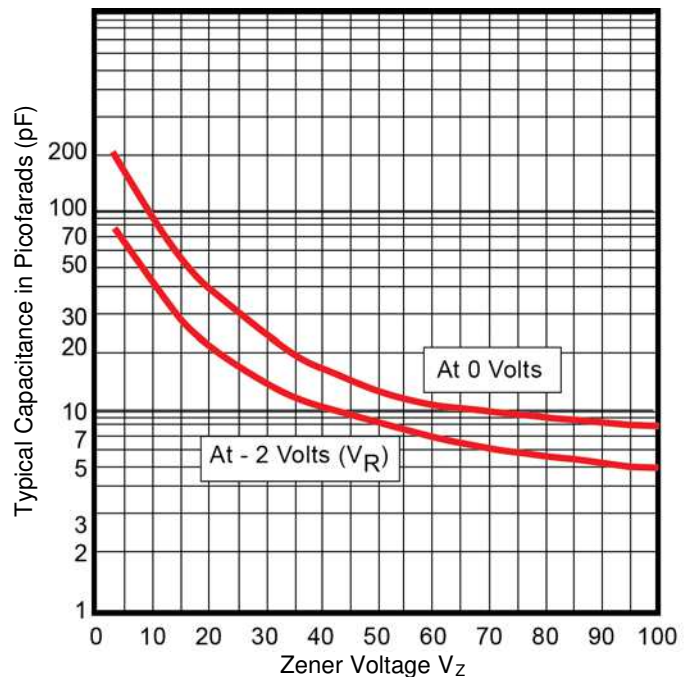
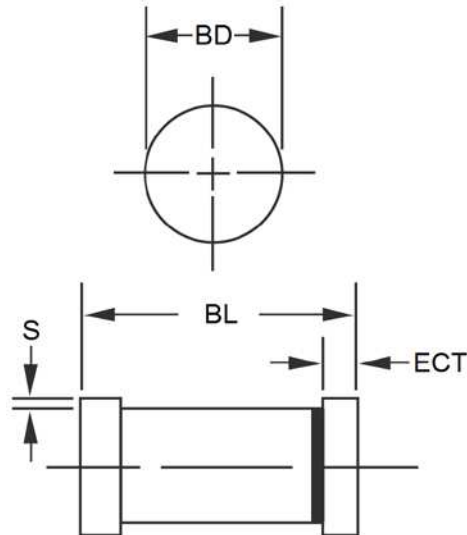
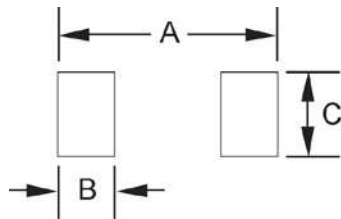


FIGURE 3 – Capacitance vs. Zener Voltage (Typical)

PACKAGE DIMENSIONS


DIM	INCH		MILLIMETERS	
	MIN	MAX	MIN	MAX
BD	0.063	0.067	1.60	1.70
BL	0.130	0.146	3.30	3.71
ECT	0.016	0.022	0.41	0.56
S	0.001 min		0.03 min	

PAD LAYOUT


	INCH	mm
A	0.200	5.08
B	0.055	1.40
C	0.080	2.03