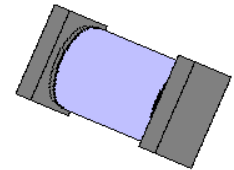


### DESCRIPTION

This Zener Voltage Regulator series is military qualified to MIL-PRF-19500/533 and is ideal for high-reliability applications where a failure cannot be tolerated. These industry-recognized 0.5 Watt Zener Voltage Regulators are hermetically sealed with voidless-glass construction using an internal metallurgical bond. It includes Zener selections from 2.4 to 200 volts in standard 5% tolerances as well as tighter tolerances identified by different suffix letters on the part number. They are also available in axial-leaded packages (see separate data sheet for 1N6309 thru 1N6355). Microsemi also offers numerous other Zener products to meet higher and lower power ratings in both thru-hole and surface mount packages.

### APPEARANCE



**"B" PACKAGE  
(or "D-5D")**

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

### FEATURES

- Popular JEDEC registered series
- Voidless hermetically sealed glass package
- Triple-layer passivation
- Internal "Category I" Metallurgical bonds for 1N6320 thru 1N6355 and "Category III" for 1N6309 thru 1N6319
- JAN, JANTX, JANTXV, and JANS available per MIL-PRF-19500/533 for 1N6309US to 1N6336US
- JANS types available per MIL-S-19500/533 for 1N6320US to 1N6336US.
- Axial-leaded equivalents also available (see separate data sheet for 1N6309 thru 1N6355)

### APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- Extensive selection from 2.4 to 200 V
- Standard voltage tolerances are plus/minus 5% with no suffix
- Tight tolerances available in plus or minus 2% or 1% with C or D suffix respectively
- Extremely robust construction
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Inherently radiation hard as described in Microsemi MicroNote 050

### MAXIMUM RATINGS

- Operating Temperature: -65°C to +175°C
- Storage Temperature: -65°C to +175°C
- Power Dissipation: 0.5 Watts @  $T_{EC} = 150^{\circ}\text{C}$
- Thermal Resistance: 50°C/W junction to End Cap
- Thermal Impedance: 15°C/W at 10 ms
- Forward Voltage: 1.4 V at 1.0 A

### MECHANICAL AND PACKAGING

- CASE: Hermetically sealed voidless hard glass with Tungsten slugs
- TERMINATIONS: End caps are Tin/Lead (Sn/Pb) over Silver
- MARKING: None
- POLARITY: Cathode indicated by band
- Tape & Reel option: Standard per EIA-481-B
- Weight: 84 mg

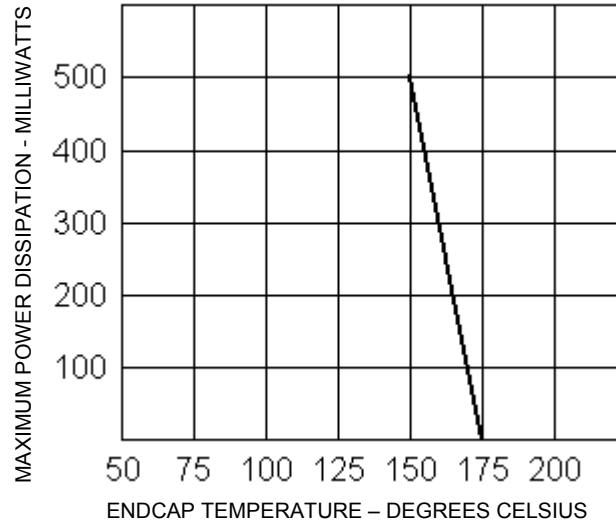
**ELECTRICAL CHARACTERISTICS**

TYPE Note 1	V <sub>Z2</sub> NOM. +/-5% @ I <sub>Z2</sub>	V <sub>Z1</sub> MIN. @ I <sub>Z1</sub> 250 µA	Test Current I <sub>Z2</sub>	Dynamic Impedance Z <sub>Z</sub> @ I <sub>Z2</sub>	Dynamic Impedance Z <sub>ZK</sub> @ 250 µA	Max. Current I <sub>ZM</sub>	Voltage Reg. V <sub>Z(reg)</sub> (ΔV <sub>Z</sub> ) Note 2	Max. Surge Current I <sub>ZSM</sub>	Reverse Voltage V <sub>R</sub>	Max. Reverse Current I <sub>R1</sub> @ V <sub>R</sub> 25°C	Max. Reverse Current I <sub>R2</sub> @ V <sub>R</sub> 150°C	Maximum Noise Density N <sub>b</sub> @ 250 µA 1 to 3 kHz	Max. Temp. Coeff. of Zener Voltage α <sub>VZ</sub>	Max. Cap. @ 0 V
	VOLTS	VOLTS	mA	OHMS	OHMS	mA	VOLTS	AMPS	VOLTS	µA	µA	µV/√Hz	%/°C	pF
1N6309US	2.4	1.1	20	30	1200	177	1.5	2.5	1.0	100	200	1.0	-.085	2000
1N6310US	2.7	1.2	20	30	1300	157	1.5	2.2	1.0	60	150	1.0	-.080	1900
1N6311US	3.0	1.3	20	29	1400	141	1.5	2.0	1.0	30	100	1.0	-.075	1800
1N6312US	3.3	1.5	20	24	1400	128	1.6	1.8	1.0	5.0	20	1.0	-.065	1650
1N6313US	3.6	1.8	20	22	1400	109	1.6	1.65	1.0	3.0	12	1.0	-.055 +.020	1600
1N6314US	3.9	2.0	20	20	1700	118	1.6	1.5	1.0	2.0	12	1.0	-.043 +.025	1400
1N6315US	4.3	2.4	20	18	1400	99	0.9	1.4	1.0	2.0	12	1.0	-.030 +.030	1350
1N6316US	4.7	2.8	20	16	1500	90	0.5	1.27	1.5	5.0	12	1.0	-.028 +.032	1300
1N6317US	5.1	3.3	20	14	1300	83	0.4	1.17	2.0	5.0	12	1.0	+.045	1200
1N6318US	5.6	4.3	20	8.0	1200	76	0.4	1.10	2.5	5.0	10	2.0	+.050	1150
1N6319US	6.2	5.2	20	3.0	800	68	0.3	0.97	3.5	5.0	10	5.0	.060	1050
1N6320US	6.8	6.0	20	3.0	400	63	0.35	1.23	4.0	2.0	10	5.0	.062	1000
1N6321US	7.5	6.6	20	4.0	400	57	0.4	1.16	5.0	2.0	10	5.0	.068	900
1N6322US	8.2	7.5	20	5.0	400	52	0.4	1.07	6.0	1.0	10	20	.075	800
1N6323US	9.1	8.4	20	6.0	500	47	0.5	0.97	7.0	1.0	10	40	.076	700
1N6324US	10	9.1	20	6.0	500	43	0.5	.89	8.0	1.0	10	80	.079	600
1N6325US	11	10	20	7.0	550	39	0.5	.83	8.5	1.0	10	100	.082	500
1N6326US	12	11	20	7.0	550	35	0.55	.77	9.0	1.0	10	100	.083	450
1N6327US	13	11.9	9.5	8.0	550	33	0.55	.71	9.9	.05	10	100	.079	400
1N6328US	15	13.8	8.5	10	600	28	.70	.62	11	.05	10	100	.082	350
1N6329US	16	14.7	7.8	12	600	27	.75	.58	12	.05	10	100	.083	325
1N6330US	18	16.6	7.0	14	600	24	.85	.52	14	.05	10	100	.085	300
1N6331US	20	18.5	6.2	18	500	21	.95	.47	15	.05	10	100	.086	275
1N6332US	22	20.4	5.6	20	500	19	1.05	.43	17	.05	10	100	.087	260
1N6333US	24	22.3	5.2	24	500	18	1.15	.39	18	.05	10	100	.088	240
1N6334US	27	25.2	4.6	27	500	16	1.30	.35	21	.05	10	100	+.090	220
1N6335US	30	28	4.2	32	500	14	1.45	.31	23	.05	10	100	.091	200
1N6336US	33	30.9	3.8	40	600	13	1.60	.28	25	.05	10	100	.092	185
1N6337US	36	33.7	3.4	50	600	12	1.75	.26	27	.05	10	100	.093	175
1N6338US	39	36.6	3.2	55	700	11	1.90	.24	30	.05	10	100	.094	170
1N6339US	43	40.4	3.0	65	800	9.9	2.10	.22	33	.05	10	80	.095	165
1N6340US	47	44.2	2.7	75	900	9.0	2.25	.20	36	.05	10	80	.095	155
1N6341US	51	48	2.5	85	1000	8.3	2.50	.18	39	.05	10	80	.096	145
1N6342US	56	52.7	2.2	100	1200	7.6	2.70	.17	43	.05	10	80	.097	135
1N6343US	62	58.4	2.0	125	1300	6.8	2.90	.15	47	.05	10	80	.097	130
1N6344US	68	64.1	1.8	155	1500	6.3	3.20	.13	52	.05	10	80	.098	120
1N6345US	75	70.8	1.7	180	1600	5.7	3.40	.125	56	.05	10	80	.098	110
1N6346US	82	77.4	1.5	220	1800	5.2	3.80	.115	62	.05	10	80	.099	105
1N6347US	91	86	1.4	270	2100	4.7	4.20	.100	69	.05	10	80	.099	100
1N6348US	100	94.5	1.3	340	2400	4.3	4.40	.095	76	.05	10	80	.110	95
1N6349US	110	104	1.1	500	2800	3.9	4.80	.085	84	.05	10	80	.110	90
1N6350US	120	113	1.0	600	3200	3.5	5.20	.080	91	.05	10	80	.110	70
1N6351US	130	122	0.95	850	4100	3.3	5.60	.070	99	.05	10	80	.110	70
1N6352US	150	141	.85	1000	4500	2.8	7.00	.065	114	.05	10	80	.110	65
1N6353US	160	151	.80	1200	5000	2.7	7.50	.060	122	.05	10	80	.110	65
1N6354US	180	170	.68	1500	5600	2.4	9.00	.050	137	.05	10	80	.110	60
1N6355US	200	189	.65	1800	6500	2.1	12.0	.045	152	.05	10	80	.110	55

NOTE 1: Tight tolerances available in plus or minus 2% or 1% with C or D suffix respectively, e.g. 1N6309CUS, 1N6335DUS, etc.

NOTE 2: Voltage regulation V<sub>Z(reg)</sub> is the measured voltage change at thermal equilibrium between the current of 10% and 50% of Maximum Zener Current I<sub>ZM</sub> when the lead temperature is maintained at 25°C =+8°C, -2°C.

**GRAPHS**



**PACKAGE DIMENSIONS**

