

Microsemi Corp.
The diode experts

SANTA ANA, CA

SCOTTSDALE, AZ

For more information call:
(602) 941-6300

**1N5221
thru
1N5281
DO-7**

FEATURES

- 2.4 THRU 200 VOLTS
- COMPACT PACKAGE

MAXIMUM RATINGS

Operating and Storage Temperature: -65°C to +200°C
DC Power Dissipation: 500 mW
Power Derating: 4.0 mW/°C above 75°C
Forward Voltage @ 200 mA: 1.1 Volts

ELECTRICAL CHARACTERISTICS

See following page for table of parameter values. (Fig. 3)

Table as shown on following page (Fig. 3) lists JEDEC type numbers, which indicate a tolerance of ± 20% with guaranteed limits on only V_Z , I_r , and V_f . Devices with guaranteed limits on all six parameters are indicated by suffix A for ± 10% tolerance and suffix B for ± 5% tolerance. Also available with suffix C or D which indicates 2% and 1% tolerance respectively.

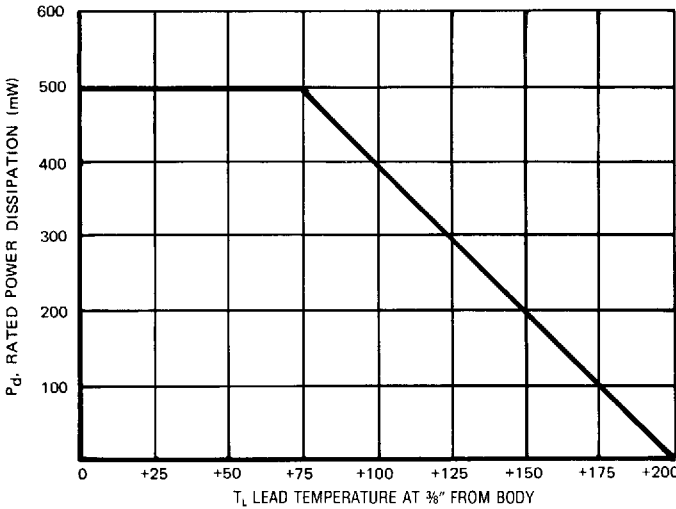


FIGURE 2
POWER DERATING CURVE

**SILICON
500 mW
ZENER DIODES**

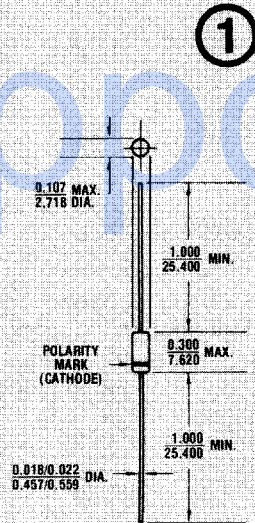


FIGURE 1
All dimensions in INCH
m.m.

MECHANICAL CHARACTERISTICS

CASE: Hermetically sealed glass case. DO-7.

FINISH: All external surfaces are corrosion resistant and leads solderable.

THERMAL RESISTANCE: 300°C/W (Typical) junction to lead at 0.375-inches from body.

POLARITY: Diode to be operated with the banded end positive with respect to the opposite end.

1N5221 thru 1N5281 DO-7

*ELECTRICAL CHARACTERISTICS @ 25°C

JEDEC Type No. Note 1	Nominal Zener Voltage V_z @ I_{zT} Volts	Test Current I_{zT} mA	Max Zener Impedance A & B Suffix Only Note 2		Max Reverse Leakage Current				Max Zener Voltage Temp. Coeff. (α_{Vz}) (% / °C) Note 3
			Z_{zT} @ I_{zT} Ohms	Z_{zK} @ $I_{zK} = 0.25$ mA Ohms	A, B, C & D Suffix Only			Non-Suffix I_z @ V_z Used For Suffix A μ A	
					I_z @ V_z μ A	A	B, C & D		
1N5221	2.4	20	30	1200	100	0.95	1.0	200	-0.085
1N5222	2.5	20	30	1250	100	0.95	1.0	200	-0.085
1N5223	2.7	20	30	1300	75	0.95	1.0	150	-0.080
1N5224	2.8	20	30	1400	75	0.95	1.0	150	-0.080
1N5225	3.0	20	29	1600	50	0.95	1.0	100	-0.075
1N5226	3.3	20	28	1600	25	0.95	1.0	100	-0.070
1N5227	3.6	20	24	1700	15	0.95	1.0	100	-0.065
1N5228	3.9	20	23	1900	10	0.95	1.0	75	-0.060
1N5229	4.3	20	22	2000	5.0	0.95	1.0	50	\pm 0.055
1N5230	4.7	20	19	1900	5.0	1.9	2.0	50	\pm 0.030
1N5231	5.1	20	17	1600	5.0	1.9	2.0	50	\pm 0.030
1N5232	5.6	20	11	1600	5.0	2.9	3.0	50	+0.038
1N5233	6.0	20	7.0	1600	5.0	3.3	3.5	50	+0.038
1N5234	6.2	20	7.0	1900	5.0	3.8	4.0	50	+0.045
1N5235	6.8	20	5.0	750	3.0	4.8	5.0	30	+0.050
1N5236	7.5	20	6.0	500	3.0	5.7	6.0	30	+0.058
1N5237	8.2	20	8.0	500	3.0	6.2	6.5	30	+0.062
1N5238	8.7	20	6.0	600	3.0	6.2	6.5	30	+0.065
1N5239	9.1	20	10	600	3.0	6.7	7.0	30	+0.068
1N5240	10	20	17	600	3.0	7.6	8.0	30	+0.075
1N5241	11	20	22	600	2.0	8.0	8.4	30	+0.076
1N5242	12	20	30	600	1.0	8.7	9.1	10	+0.077
1N5243	13	9.5	13	600	0.5	9.4	9.9	10	+0.079
1N5244	14	9.0	10	600	0.1	9.5	10	10	+0.082
1N5245	15	8.5	16	600	0.1	10.5	11	10	+0.082
1N5246	16	7.8	17	600	0.1	11.4	12	10	+0.083
1N5247	17	7.4	19	600	0.1	12.4	13	10	+0.084
1N5248	18	7.0	21	600	0.1	13.3	14	10	+0.085
1N5249	19	6.6	23	600	0.1	13.3	14	10	+0.086
1N5250	20	6.2	25	600	0.1	14.3	15	10	+0.086
1N5251	22	5.6	29	600	0.1	16.2	17	10	+0.087
1N5252	24	5.2	33	600	0.1	17.1	18	10	+0.088
1N5253	25	5.0	35	600	0.1	18.1	19	10	+0.089
1N5254	27	4.6	41	600	0.1	20	21	10	+0.090
1N5255	28	4.5	44	600	0.1	20	21	10	+0.091
1N5256	30	4.2	49	600	0.1	22	23	10	+0.091
1N5257	33	3.8	58	700	0.1	24	25	10	+0.092
1N5258	36	3.4	70	700	0.1	26	27	10	+0.093
1N5259	39	3.2	80	800	0.1	29	30	10	+0.094
1N5260	43	3.0	93	900	0.1	31	33	10	+0.095
1N5261	47	2.7	105	1000	0.1	34	36	10	+0.095
1N5262	51	2.5	125	1100	0.1	37	39	10	+0.096
1N5263	56	2.2	150	1300	0.1	41	43	10	+0.096
1N5264	60	2.1	170	1400	0.1	44	46	10	+0.097
1N5265	62	2.0	185	1400	0.1	45	47	10	+0.097
1N5266	68	1.8	230	1600	0.1	49	52	10	+0.097
1N5267	75	1.7	270	1700	0.1	53	56	10	+0.098
1N5268	82	1.5	330	2000	0.1	59	62	10	+0.098
1N5269	87	1.4	370	2200	0.1	65	68	10	+0.099
1N5270	91	1.4	400	2300	0.1	66	69	10	+0.099
1N5271	100	1.3	500	2600	0.1	72	76	10	+0.110
1N5272	110	1.1	750	3000	0.1	80	84	10	+0.110
1N5273	120	1.0	900	4000	0.1	86	91	10	+0.110
1N5274	130	0.95	1100	4500	0.1	94	99	10	+0.110
1N5275	140	0.90	1300	4500	0.1	101	106	10	+0.110
1N5276	150	0.85	1500	5000	0.1	108	114	10	+0.110
1N5277	160	0.80	1700	5500	0.1	116	122	10	+0.110
1N5278	170	0.74	1900	5500	0.1	123	129	10	+0.110
1N5279	180	0.68	2200	6000	0.1	130	137	10	+0.110
1N5280	190	0.66	2400	6500	0.1	137	144	10	+0.110
1N5281	200	0.65	2500	7000	0.1	144	152	10	+0.110

FIGURE 3

*JEDEC registered data

NOTE 1 The electrical characteristics are measured after allowing the device to stabilize for 20 seconds when mounted with a $\frac{1}{16}$ " minimum lead length from the case.

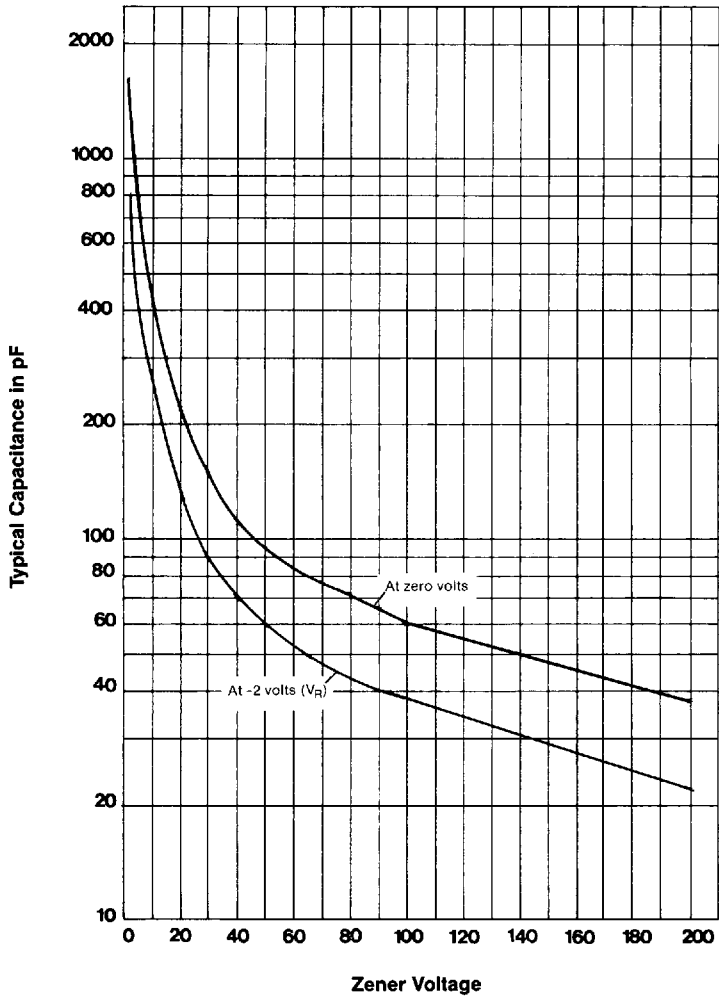
NOTE 2 The zener impedance is derived from the 60 HZ ac voltage, which results when an ac current having an r.m.s. value equal to 10% of the DC zener current (I_{zT} or I_{zK}) is superimposed on I_{zT} or I_{zK} . Zener impedance is measured at two points to insure a sharp knee on the breakdown curve, thereby eliminating unstable units.

NOTE 3 Temperature coefficient (α_{Vz}). Test conditions for temperature coefficient are as follows:

- $I_{zT} = 7.5$ mA, $T_1 = 25^\circ\text{C}$, $T_2 = 125^\circ\text{C}$ (1N5221A, B thru 1N5242A, B.)
- $I_{zT} = \text{Rated } I_{zT}$, $T_1 = 25^\circ\text{C}$, $T_2 = 125^\circ\text{C}$ (1N5243A, B thru 1N5281A, B.)

Device to be temperature stabilized with current applied prior to reading breakdown voltage at the specified ambient temperature.

1N5221 thru 1N5281 DO-7



1

FIGURE 4
CAPACITANCE VS. ZENER VOLTAGE
(TYPICAL)



SANTA ANA, CA

SCOTTSDALE, AZ

For more information call:
(602) 941-6300

**1N5221
thru
1N5281
DO-35**

FEATURES

- 2.4 THRU 200 VOLTS
- COMPACT PACKAGE
- CONSULT FACTORY FOR VOLTAGES ABOVE 200 V

MAXIMUM RATINGS

Operating and Storage Temperature: -65°C to $+200^{\circ}\text{C}$
 DC Power Dissipation: 500 mW
 Power Derating: 4.0 mW/ $^{\circ}\text{C}$ above 75°C
 Forward Voltage @ 200 mA: 1.1 Volts

ELECTRICAL CHARACTERISTICS

See following page for table of parameter values. (Fig. 3)

Table as shown on following page (Fig. 3) lists JEDEC type numbers, which indicate a tolerance of $\pm 20\%$ with guaranteed limits on only V_Z , I_f , and V_f . Devices with guaranteed limits on all six parameters are indicated by suffix A for $\pm 10\%$ tolerance and suffix B for $\pm 5\%$ tolerance. Also available with suffix C or D which indicates 2% and 1% tolerance respectively.

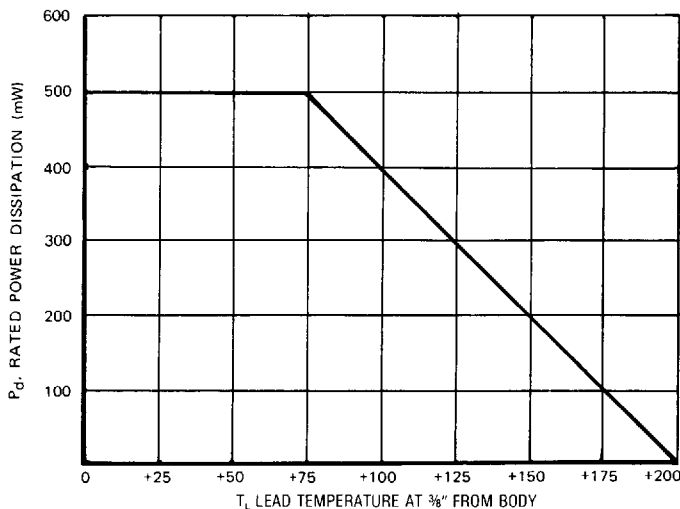


FIGURE 2
POWER DERATING CURVE

**SILICON
500 mW
ZENER DIODES**

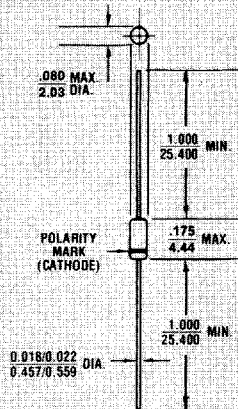


FIGURE 1
All dimensions in $\frac{\text{INCH}}{\text{M.M.}}$

MECHANICAL CHARACTERISTICS

CASE: Hermetically sealed glass case. DO-35.

FINISH: All external surfaces are corrosion resistant and leads solderable.

THERMAL RESISTANCE: 150 $^{\circ}\text{C}/\text{W}$ (Typical) junction to lead at 0.375-inches from body.

POLARITY: Diode to be operated with the banded end positive with respect to the opposite end.

1N5221 thru 1N5281 DO-35

*ELECTRICAL CHARACTERISTICS @ 25°C

JEDEC Type No. Note 1	Nominal Zener Voltage $V_Z @ I_{ZT}$ Volts	Test Current I_{ZT} mA	Max Zener Impedance A & B Suffix Only Note 2		Max Reverse Leakage Current			Max Zener Voltage Temp. Coeff. (A & B Suffix Only) α_{VZ} (%/°C) Note 3	
			$Z_{ZT} @ I_{ZT}$ Ohms	$Z_{ZK} @ I_{ZK} = 0.25$ mA Ohms	A, B, C & D Suffix Only		Non-Suffix		
					I_{LZ} μ A	V_Z Volts	$I_{LZ} @ V_Z$ Used For Suffix A μ A		
1N5221	2.4	20	30	1200	100	0.95	1.0	200	-0.085
1N5222	2.5	20	30	1250	100	0.95	1.0	200	-0.085
1N5223	2.7	20	30	1300	75	0.95	1.0	150	-0.080
1N5224	2.8	20	30	1400	75	0.95	1.0	150	-0.080
1N5225	3.0	20	29	1600	50	0.95	1.0	100	-0.075
1N5226	3.3	20	28	1600	25	0.95	1.0	100	-0.070
1N5227	3.6	20	24	1700	15	0.95	1.0	100	-0.065
1N5228	3.9	20	23	1900	10	0.95	1.0	75	-0.060
1N5229	4.3	20	22	2000	5.0	0.95	1.0	50	± 0.055
1N5230	4.7	20	19	1900	5.0	1.9	2.0	50	± 0.330
1N5231	5.1	20	17	1600	5.0	1.9	2.0	50	± 0.030
1N5232	5.6	20	11	1600	5.0	2.9	3.0	50	+0.038
1N5233	6.0	20	7.0	1600	5.0	3.3	3.5	50	+0.038
1N5234	6.2	20	7.0	1000	5.0	3.8	4.0	50	+0.045
1N5235	6.8	20	5.0	750	3.0	4.8	5.0	30	+0.050
1N5236	7.5	20	6.0	500	3.0	5.7	6.0	30	+0.058
1N5237	8.2	20	8.0	500	3.0	6.2	6.5	30	+0.062
1N5238	8.7	20	8.0	600	3.0	6.2	6.5	30	+0.065
1N5239	9.1	20	10	600	3.0	6.7	7.0	30	+0.068
1N5240	10	20	17	600	3.0	7.6	8.0	30	+0.075
1N5241	11	20	22	600	2.0	8.0	8.4	30	+0.076
1N5242	12	20	30	600	1.0	8.7	9.1	10	+0.077
1N5243	13	9.5	13	600	0.5	9.4	9.9	10	+0.079
1N5244	14	9.0	15	600	0.1	9.5	10	10	+0.082
1N5245	15	8.5	16	600	0.1	10.5	11	10	+0.082
1N5246	16	7.8	17	600	0.1	11.4	12	10	+0.083
1N5247	17	7.4	19	600	0.1	12.4	13	10	+0.084
1N5248	18	7.0	21	600	0.1	13.3	14	10	+0.085
1N5249	19	6.6	23	600	0.1	13.3	14	10	+0.086
1N5250	20	6.2	25	600	0.1	14.3	15	10	+0.086
1N5251	22	5.6	29	600	0.1	16.2	17	10	+0.087
1N5252	24	5.2	33	600	0.1	17.1	18	10	+0.088
1N5253	25	5.0	35	600	0.1	18.1	19	10	+0.089
1N5254	27	4.6	41	600	0.1	20	21	10	+0.090
1N5255	28	4.5	44	600	0.1	20	21	10	+0.091
1N5256	30	4.2	49	600	0.1	22	23	10	+0.091
1N5257	33	3.8	58	700	0.1	24	25	10	+0.092
1N5258	36	3.4	70	700	0.1	26	27	10	+0.093
1N5259	39	3.2	80	800	0.1	29	30	10	+0.094
1N5260	43	3.0	93	900	0.1	31	33	10	+0.095
1N5261	47	2.7	105	1000	0.1	34	36	10	+0.095
1N5262	51	2.5	125	1100	0.1	37	39	10	+0.096
1N5263	56	2.2	150	1300	0.1	41	43	10	+0.096
1N5264	60	2.1	170	1400	0.1	44	46	10	+0.097
1N5265	62	2.0	185	1400	0.1	45	47	10	+0.097
1N5266	68	1.8	230	1600	0.1	49	52	10	+0.097
1N5267	75	1.7	270	1700	0.1	53	56	10	+0.098
1N5268	82	1.5	330	2000	0.1	59	62	10	+0.098
1N5269	87	1.4	370	2200	0.1	65	68	10	+0.099
1N5270	91	1.4	400	2300	0.1	66	69	10	+0.099
1N5271	100	1.3	500	2600	0.1	72	76	10	+0.110
1N5272	110	1.1	750	3000	0.1	80	84	10	+0.110
1N5273	120	1.0	900	4000	0.1	86	91	10	+0.110
1N5274	130	0.95	1100	4500	0.1	94	99	10	+0.110
1N5275	140	0.90	1300	4500	0.1	101	106	10	+0.110
1N5276	150	0.85	1500	5000	0.1	108	114	10	+0.110
1N5277	160	0.80	1700	5500	0.1	116	122	10	+0.110
1N5278	170	0.74	1900	5500	0.1	123	129	10	+0.110
1N5279	180	0.68	2200	6000	0.1	130	137	10	+0.110
1N5280	190	0.66	2500	6500	0.1	137	144	10	+0.110
1N5281	200	0.65	2500	7000	0.1	144	152	10	+0.110

①

*JEDEC registered data

FIGURE 3

NOTE 1 The electrical characteristics are measured after allowing the device to stabilize for 20 seconds when mounted with a $\frac{1}{16}$ " minimum lead length from the case.

NOTE 2 The zener impedance is derived from the 60 HZ ac voltage, which results when an ac current having an r.m.s. 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 two points to insure a sharp knee on the breakdown curve, thereby, eliminating unstable units.

NOTE 3 Temperature coefficient (α_{VZ}).

Test conditions for temperature coefficient are as follows:

- $I_{ZT} = 7.5$ mA, $T_1 = 25^\circ\text{C}$,
 $T_2 = 125^\circ\text{C}$ (1N5221A, B thru 1N5242A, B.)
- $I_{ZT} = \text{Rated } I_{ZT}$, $T_1 = 25^\circ\text{C}$,
 $T_2 = 125^\circ\text{C}$ (1N5243A, B thru 1N5281A, B.)

Device to be temperature stabilized with current applied prior to reading breakdown voltage at the specified ambient temperature.

1N5221 thru 1N5281 DO-35

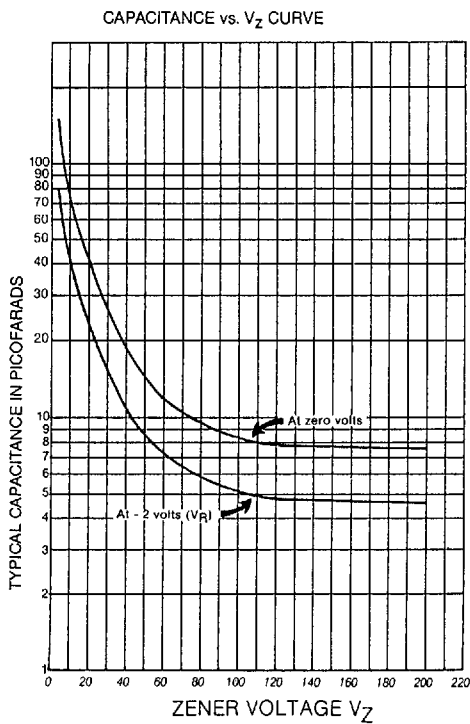


FIGURE 4
CAPACITANCE VS. ZENER VOLTAGE
(TYPICAL)