1N5348B THRU 1N5388B

GLASS PASSIVATED JUNCTION SILICON ZENER DIODE

VOLTAGE - 11 TO 200 Volts   Power - 5.0 Watts

FEATURES

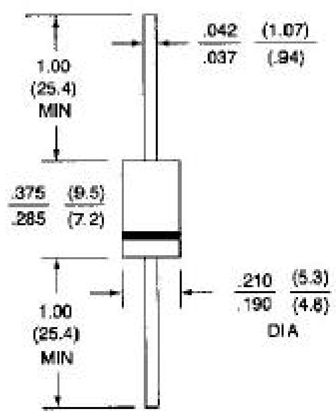
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Typical I_D less than 1 A above 13V
- High temperature soldering :

260 /10 seconds at terminals

- Plastic package has Underwriters Laboratory

Flammability Classification 94V-O

DO-201AE



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC DO-201AE Molded plastic over passivated junction

Terminals: Solder plated, solderable per MIL-STD-750,

method 2026

Standard Packaging: 52mm tape

Weight: 0.04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 ambient temperature unless otherwise specified.

	SYMBOL	VALUE	UNITS
DC Power Dissipation @ T_L=75 , Measure at Zero Lead Length(Fig. 1) Derate above 75 (Note 1)	P_D	5.0 40.0	Watts mW/
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load(JEDEC Method) (Note 1,2)	I_{FSM}	See Fig. 5	Amps
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to +150	

NOTES:

1. Mounted on 8.0mm^2 copper pads to each terminal.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle = 4 pulses per minute maximum.

1N5348B THRU 1N5388B

ELECTRICAL CHARACTERISTICS (T_A=25 unless otherwise noted, V_F=1.2 Max @ I_F=1A for all types.

Type No. (Note 1.)	Nominal Zener Voltage Vz @ I_{ZT} volts (Note 2.)	Test current I_{ZT} mA	Maximum Zener Impedance		Max reverse Leakage Current		Max Surge Current Ir Amps (Note 3.)	Max Voltage Regulation Vz, Volts (Note 4.)	Maximum Regulator Current I_{ZM} mA (Note 5.)
			Z_{ZT} @ I_{ZT} Ohms (Note 2.)	Z_{Zk} @ I_{ZK} = 1 mA Ohms (Note 2.)	I_R A	V_R Volts			
1N5348B	11	125	2.5	125	5	8.4	8	0.25	430
1N5349B	12	100	2.5	125	2	9.1	7.5	0.25	395
1N5350B	13	100	2.5	100	1	9.9	7	0.25	365
1N5351B	14	100	2.5	75	1	10.6	6.7	0.25	340
1N5352B	15	75	2.5	75	1	11.5	6.3	0.25	315
1N5353B	16	75	2.5	75	1	12.2	6	0.3	295
1N5354B	17	70	2.5	75	0.5	12.9	5.8	0.35	280
1N5355B	18	65	2.5	75	0.5	13.7	5.5	0.4	265
1N5356B	19	65	3	75	0.5	14.4	5.3	0.4	250
1N5357B	20	65	3	75	0.5	15.2	5.1	0.4	237
1N5358B	22	50	3.5	75	0.5	16.7	4.7	0.45	216
1N5359B	24	50	3.5	100	0.5	18.2	4.4	0.55	198
1N5360B	25	50	4	110	0.5	19	4.3	0.55	190
1N5361B	27	50	5	120	0.5	20.6	4.1	0.6	176
1N5362B	28	50	6	130	0.5	21.2	3.9	0.6	170
1N5363B	30	40	8	140	0.5	22.8	3.7	0.6	158
1N5364B	33	40	10	150	0.5	25.1	3.5	0.6	144
1N5365B	36	30	11	160	0.5	27.4	3.3	0.65	132
1N5366B	39	30	14	170	0.5	29.7	3.1	0.65	122
1N5367B	43	30	20	190	0.5	32.7	2.8	0.7	110
1N5368B	47	25	25	210	0.5	35.8	2.7	0.8	100
1N5369B	51	25	27	230	0.5	38.8	2.5	0.9	93
1N5370B	56	20	35	280	0.5	42.6	2.3	1	86
1N5371B	60	20	40	350	0.5	45.5	2.2	1.2	79
1N5372B	62	20	42	400	0.5	47.1	2.1	1.35	76
1N5373B	68	20	44	500	0.5	51.7	2	1.5	70
1N5374B	75	20	45	620	0.5	56	1.9	1.6	63
1N5375B	82	15	65	720	0.5	62.2	1.8	1.8	58
1N5376B	87	15	75	760	0.5	66	1.7	2	54.5
1N5377B	91	15	75	760	0.5	69.2	1.6	2.2	52.5
1N5378B	100	12	90	800	0.5	76	1.5	2.5	47.5
1N5379B	110	12	125	1000	0.5	83.6	1.4	2.5	43
1N5380B	120	10	170	1150	0.5	91.2	1.3	2.5	39.5
1N5381B	130	10	190	1250	0.5	98.8	1.2	2.5	36.6
1N5382B	140	8	230	1500	0.5	106	1.2	2.5	34
1N5383B	150	8	330	1500	0.5	114	1.1	3	31.6
1N5384B	160	8	35 0	1650	0.5	122	1.1	3	29.4
1N5385B	170	8	380	1750	0.5	129	1	3	28
1N5386B	180	5	430	1750	0.5	137	1	4	26.4
1N5387B	190	5	450	1850	0.5	144	0.9	5	25
1N5388B	200	5	480	1850	0.5	152	0.9	5	23.6

NOTE:

1. TOLERANCE AND VOLTAGE DESIGNATION - The JEDEC type numbers shown indicate a tolerance of ±10% with guaranteed limits on only Vz, I_R, I_r, and V_F as shown in the electrical characteristics table. Units with guaranteed limits on all seven parameters are indicated by suffix "B" for ±5% tolerance.
2. ZENER VOLTAGE (Vz) AND IMPEDANCE (Z_{ZT} & Z_{ZK}) - Test conditions for Zener voltage and impedance are as follows; Iz is applied 40±10 ms prior to reading. Mounting contacts are located from the inside edge of mounting clips to the body of the diode.(T_A=25).

3. SURGE CURRENT (Ir) - Surge current is specified as the maximum allowable peak, non-recurrent square-wave current with a pulse width, PW, of 8.3 ms. The data given in Figure 5 may be used to find the maximum surge current for a quare wave of any pulse width between 1 ms and 1000ms by plotting the applicable points on logarithmic paper. Examples of this, using the 6.8v and 200V zeners, are shown in Figure 6. Mounting contact located as specified in Note 3. (T_A=25).

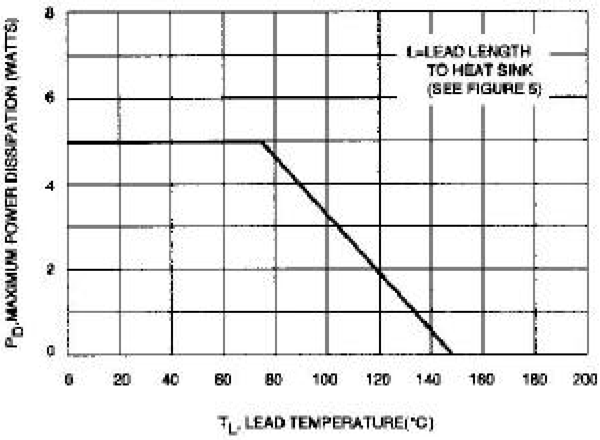
4. VOLTAGE REGULATION (Vz) - Test conditions for voltage regulation are as follows: Vz measurements are made at 10% and then at 50% of the Iz max value listed in the electrical characteristics table. The test currents are the same for the 5% and 10% tolerance devices. The test current time druation for each Vz measurement is 40±10 ms. (T_A=25). Mounting contact located as specified in Note2.

5. MAXIMUM REGULATOR CURRENT (I_{ZM}) - The maximum current shown is based on the maximum voltage of a 5% type unit. Therefore, it applies only to the B-suffix device. The actual I_{ZM} for any device may not exceed the value of 5 watts divided by the actual Vz of the device. T_L=75 at maximum from the device body.

RATING AND CHARACTERISTICS CURVES

1N5348B THRU 1N5388B

TEMPERATURE COEFFICIENTS



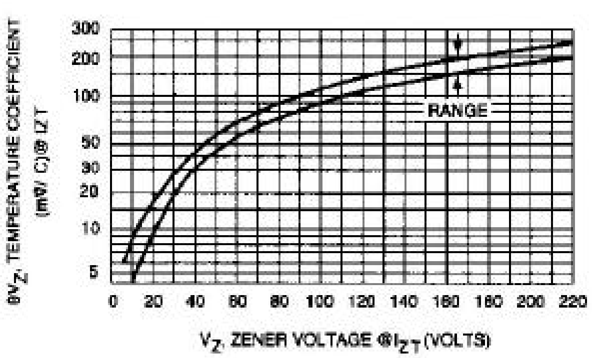


Fig. 1-POWER TEMPERATURE DERATING CURVE Fig. 2-TEMPERATURE COEFFICIENT RANGE FOR UNITS 6 TO 220 VOLTS

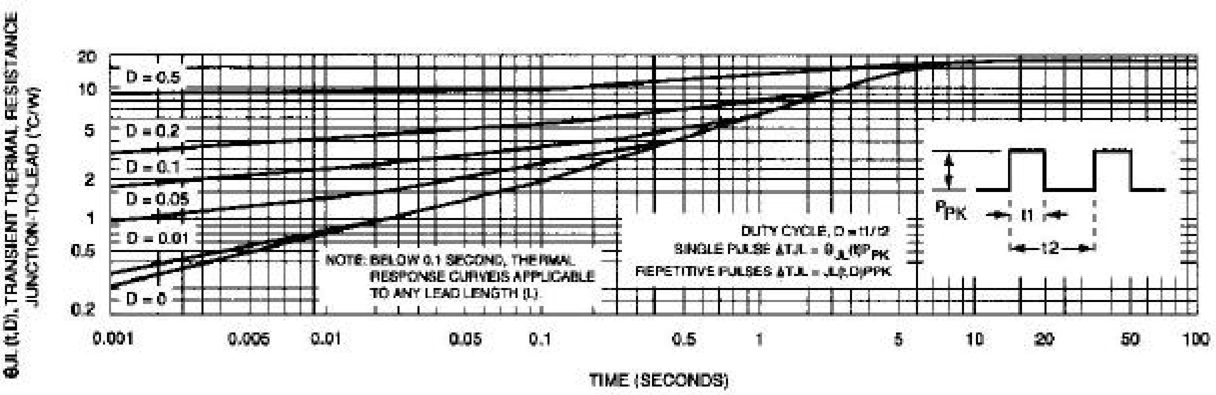
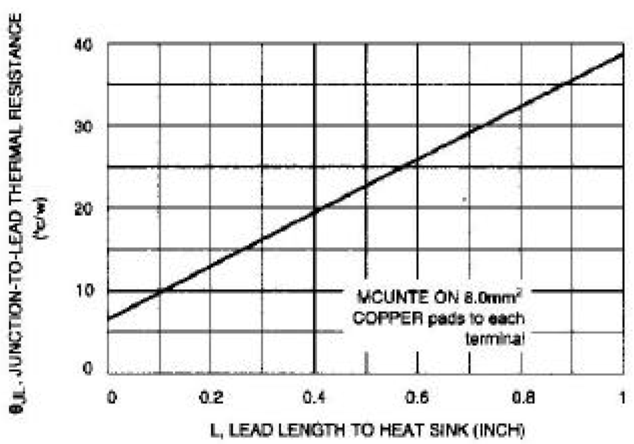


Fig. 3-TYPICAL THERMAL RESPONSE



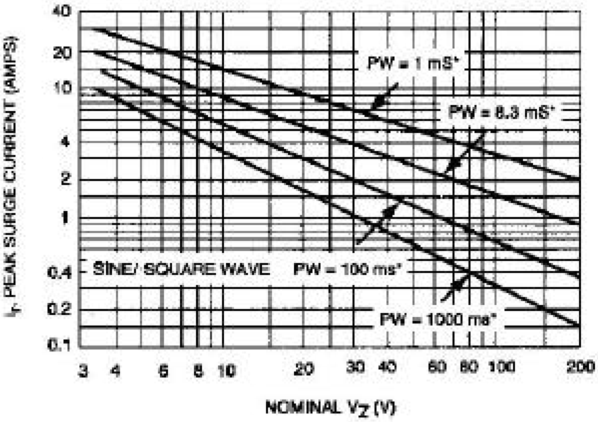
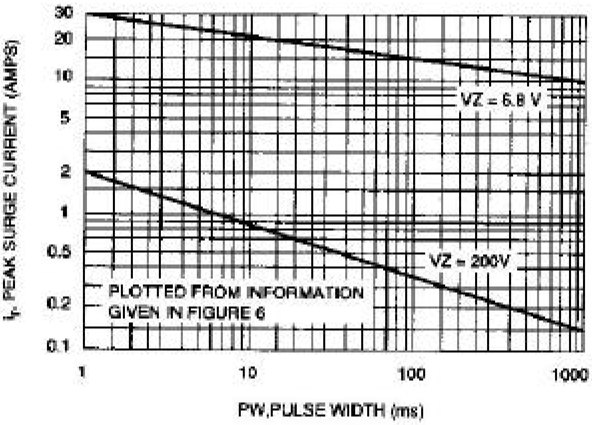


Fig. 4-TYPICAL THERMAL RESISTANCE

Fig. 5-MAXIMUM NON-REPETITIVE SURGE CURRENT VERSUS NOMINAL ZENER VOLTAGE(SEE NOTE 3)

RATING AND CHARACTERISTICS CURVES

1N5348B THRU 1N5388B



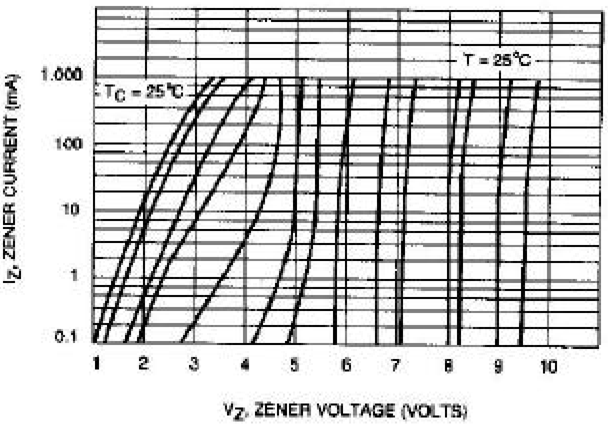
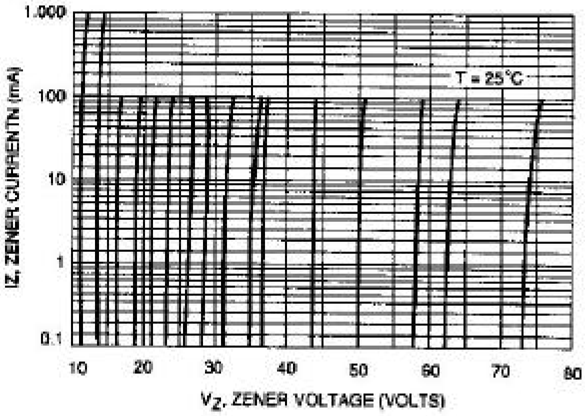


Fig. 6-PEAK SURGE CURRENT VERSUS PULSE WIDTH(SEE NOTE 3)

Fig. 7-ZENER VOLTAGE VERSUS ZENER CURRENT V_Z =6.8 THRU 10 VOLTS



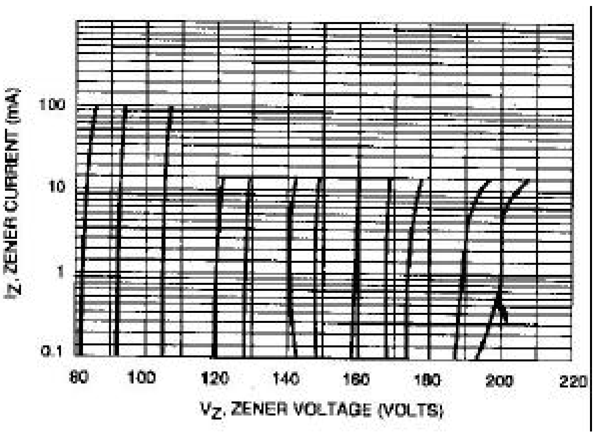


Fig. 8- ZENER VOLTAGE VERSUS ZENER CURRENT V_Z = 11 THRU 75 VOLTS

Fig. 9- ZENER VOLTAGE VERSUS ZENER CURRENT V_Z = 82 THRU 200 VOLTS

APPLICATION NOTE:

Since the actual voltage available from a given zener diode is temperature dependent, it is necessary to determine junction temperature under any set of operating conditions in order to calculate its value. The following procedure is recommended:

Lead Temperature, T_L, should be determined from:

$$T_L = {}_{LA}P_D + T_A$$

${}_{LA}$ is the lead-to-ambient thermal resistance (/W)

and P_D is the power dissipation.

Junction Temperature, T_J , may be found from:

$$T_J = T_L + \ T_{JL}$$

T_{JL} is the increase in junction temperature above the lead temperature and may be found from Figure 3 for a train of power pulses or from Figure 4 for dc power.

$$T_{JL} = {}_{JL}P_D$$

For worst-case design, using expected limits of Iz, limits of P_D and the extremes of T_J(T_J) may be estimated. Changes in voltage, Vz, can then be found from:

$$V = {}_{VZ}\ T_J$$

${}_{VZ}$, the zener voltage temperature coefficient, is fount from Figures 2.

Under high power-pulse operation, the zener voltage will vary with time and may also be affected significantly be the zener resistance. For best regulation, keep current excursions as low as possible.

Data of Figure 3 should not be used to compute surge capability. Surge limitations are given in Figure 5. They are lower than would be expected by considering only junction temperature, as current crowding effects cause temperatures to be extremely high in small spots resulting in device degradation should the limits of Figure. 5 be exceeded.