3EZ11 THRU 3EZ200

GLASS PASSIVATED JUNCTION SILICON ZENER DIODE

VOLTAGE - 11 TO 200 Volts   Power - 3.0 Watts

FEATURES

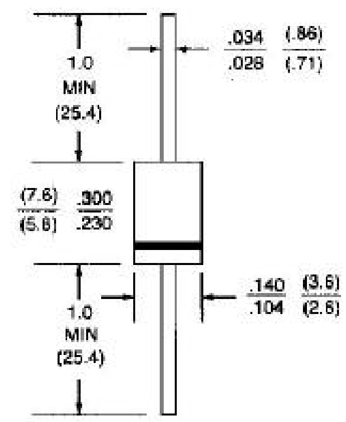
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- Typical I_D less than 1 A above 11V
- High temperature soldering :

260 /10 seconds at terminals

- Plastic package has Underwriters Laboratory

Flammability Classification 94V-O

DO-15



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC DO-15, Molded plastic over passivated junction

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

method 2026

Polarity: Color band denotes positive end (cathode)

Standard Packaging: 52mm tape

Weight: 0.015 ounce, 0.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 ambient temperature unless otherwise specified.

	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation (Note A) Derate above 75	P_D	3 24	Watts mW/
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load(JEDEC Method) (Note B)	I_{FSM}	15	Amps
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to +150	

NOTES:

A. Mounted on 5.0mm^2(.013mm thick) land areas.

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

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ELECTRICAL CHARACTERISTICS (T_A=25 unless otherwise noted) V_F=1.2 V max , I_F=500 mA for all types

Type No. (Note 1.)	Nominal Zener Voltage Vz @ I_{ZT} volts (Note 2.)	Test current I_{ZT} mA	Maximum Zener Impedance (Note 3.)			Leakage Current		Maximum Zener Current I_{ZM} Madc	Surge Current @ T_A = 25 ir - mA (Note 4.)
			Z_{ZT} @ I_{ZT} Ohms	Z_{Zk} @ I_{ZK} Ohms	I_{ZK} mA	I_R A Max @	V_R Volts		
3EZ11	11	68	4	700	0.25	1	8.4	225	1.82
3EZ12	12	63	4.5	700	0.25	1	9.1	246	1.66
3EZ13	13	58	4.5	700	0.25	0.5	9.9	208	1.54
3EZ14	14	53	5	700	0.25	0.5	10.6	193	1.43
3EZ15	15	50	5.5	700	0.25	0.5	11.4	180	1.33
3EZ16	16	47	5.5	700	0.25	0.5	12.2	169	1.25
3EZ17	17	44	6	750	0.25	0.5	13	150	1.18
3EZ18	18	42	6	750	0.25	0.5	13.7	159	1.11
3EZ19	19	40	7	750	0.25	0.5	14.4	142	1.05
3EZ20	20	37	7	750	0.25	0.5	15.2	135	1
3EZ22	22	34	8	750	0.25	0.5	16.7	123	0.91
3EZ24	24	31	9	750	0.25	0.5	18.2	112	0.83
3EZ27	27	28	10	750	0.25	0.5	20.6	100	0.74
3EZ28	28	27	12	750	0.25	0.5	21	96	0.71
3EZ30	30	25	16	1000	0.25	0.5	22.5	90	0.67
3EZ33	33	23	20	1000	0.25	0.5	25.1	82	0.61
3EZ36	36	21	22	1000	0.25	0.5	27.4	75	0.56
3EZ39	39	19	28	1000	0.25	0.5	29.7	69	0.51
3EZ43	43	17	33	1500	0.25	0.5	32.7	63	0.45
3EZ47	47	16	38	1500	0.25	0.5	35.6	57	0.42
3EZ51	51	15	45	1500	0.25	0.5	38.8	53	0.39
3EZ56	56	13	50	2000	0.25	0.5	42.6	48	0.36
3EZ62	62	12	55	2000	0.25	0.5	47.1	44	0.32
3EZ68	68	11	70	2000	0.25	0.5	51.7	40	0.29
3EZ75	75	10	85	2000	0.25	0.5	56	36	0.27
3EZ82	82	9.1	95	3000	0.25	0.5	62.2	33	0.24
3EZ91	91	8.2	115	3000	0.25	0.5	69.2	30	0.22
3EZ100	100	7.5	160	3000	0.25	0.5	76	27	0.2
3EZ110	110	6.8	225	4000	0.25	0.5	83.6	25	0.18
3EZ120	120	6.3	300	4500	0.25	0.5	91.2	22	0.16
3EZ130	130	5.8	375	5000	0.25	0.5	98.8	21	0.15
3EZ140	140	5.3	475	5000	0.25	0.5	106.4	19	0.14
3EZ150	150	5	550	6000	0.25	0.5	114	18	0.13
3EZ160	160	4.7	625	6500	0.25	0.5	121.6	17	0.12
3EZ170	170	4.4	650	7000	0.25	0.5	130.4	16	0.12
3EZ180	180	4.2	700	7000	0.25	0.5	136.8	15	0.11
3EZ190	190	4	800	8000	0.25	0.5	144.8	14	0.1
3EZ200	200	3.7	875	8000	0.25	0.5	152	13	0.1

NOTES:

1. TOLERANCES - Suffix indicates 5% tolerance any other tolerance will be considered as a special device.
2. ZENER VOLTAGE (Vz) MEASUREMENT - guarantees the zener voltage when measured at 40 ms±10ms from the diode body, and an ambient temperature of 25 (8 , -2).
3. ZENER IMPEDANCE (Zz) DERIVATION - The zener impedance is derived from the 60 cycle ac voltage, which results when an ac current having an rms falue equal to 10% of the dc zener current (I_{ZT} or I_{ZK}) is superimposed on I_{ZT} or I_{ZK}.
4. SURGE CURRENT (Ir) NON-REPETITIVE - The rating listed in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current, I_{ZT}, per JEDEC standards, however, actual device capability is as described in Figure 3.

RATING AND CHARACTERISTICS CURVES

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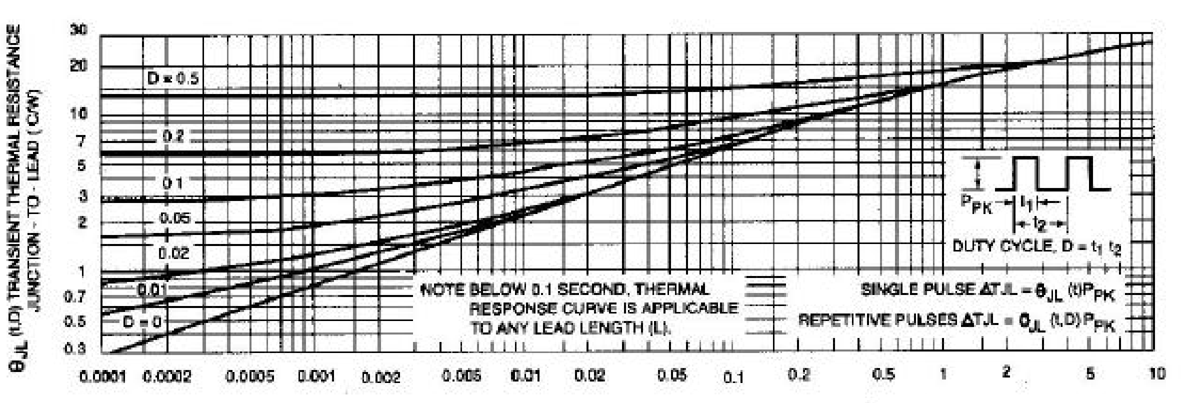

Fig. 2-TYPICAL THERMAL RESPONSE L

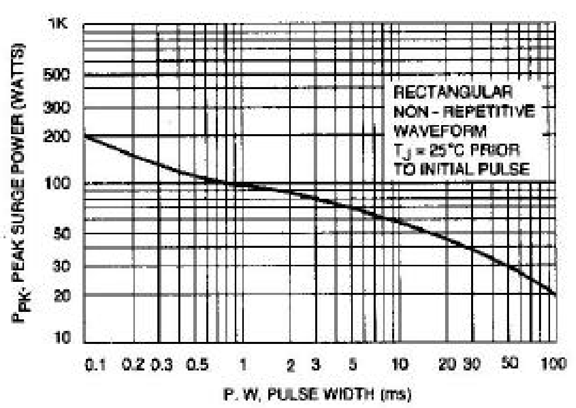

Fig. 3-MAXIMUM SURGE POWER

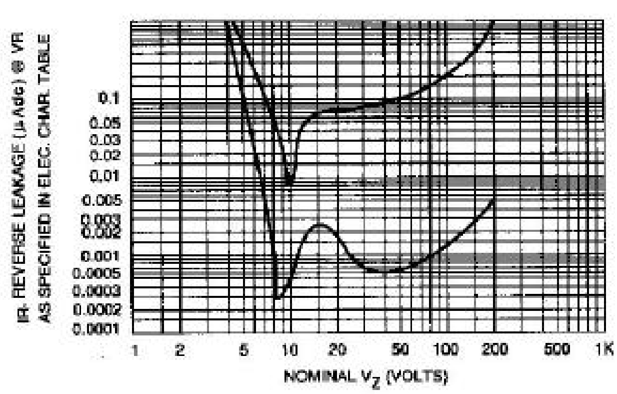

Fig. 4-TYPICAL REVERSE LEAKAGE

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:

$$TL = \ _{LA}P_D + T_A$$

$_{LA}$ is the lead-to-ambient thermal resistance (/W) and P_D is the power dissipation. The value for $_{LA}$ will vary and depends on the device mounting method.

$_{LA}$ is generally 30-40 /W for the various chips and tie points in common use and for printed circuit board wiring.

The temperature of the lead can also be measured using a thermocouple placed on the lead as close as possible to the tie point. The thermal mass connected to the tie point is normally large enough so that it will not significantly respond to heat surges generated in the diode as a result of pulsed operation once steady-state conditions are achieved. Using the measured value of T_L, the junction temperature may be determined by:

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

T_{JL} is the increase in junction temperature above the lead temperature and may be found from Figure 2 for a train of power pulses or from Figure 10 for dc power.

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

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

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

$_{VZ}$, the zener voltage temperature coefficient, is found from Figures 5 and 6.

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 2 should not be used to compute surge capability. Surge limitations are given in Figure 3. 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 3 be exceeded.

RATING AND CHARACTERISTICS CURVES

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TEMPERATURE COEFFICIENT REAGES

(90% of the Units are int he Ranges Indicated)

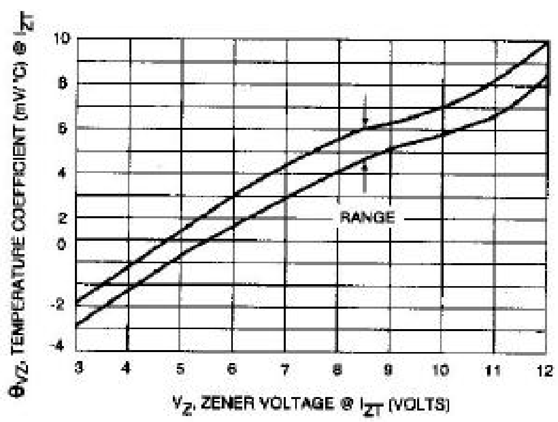

Fig. 5-UNITS TO 12 VOLTS

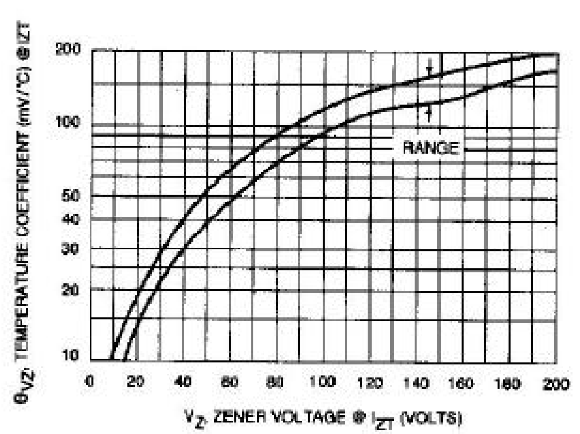

Fig. 6-UNITS 10 TO 200 VOLTS

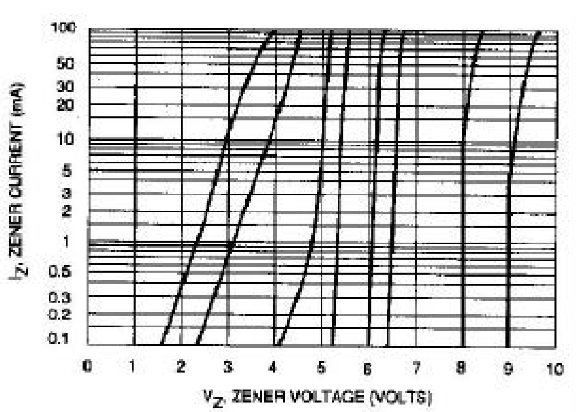

Fig. 7-V_Z = 3.9 THRU 10 VOLTS

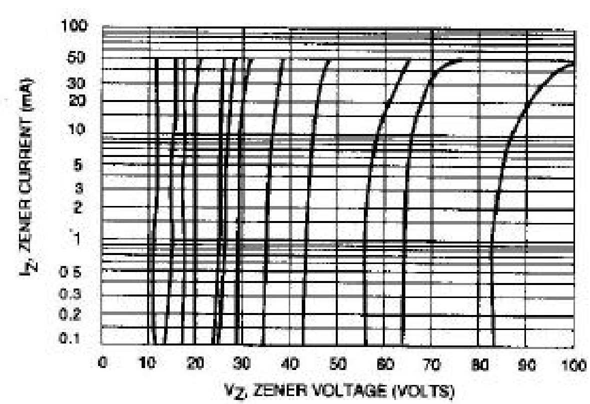

Fig. 8- V_Z = 12 THRU 82 VOLTS

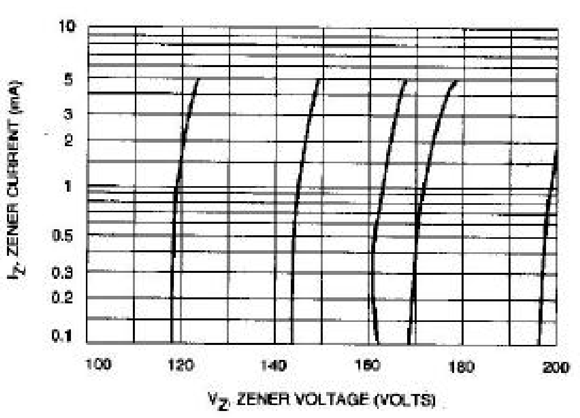

Fig. 9-V_Z = 100 THRU 200 VOLTS

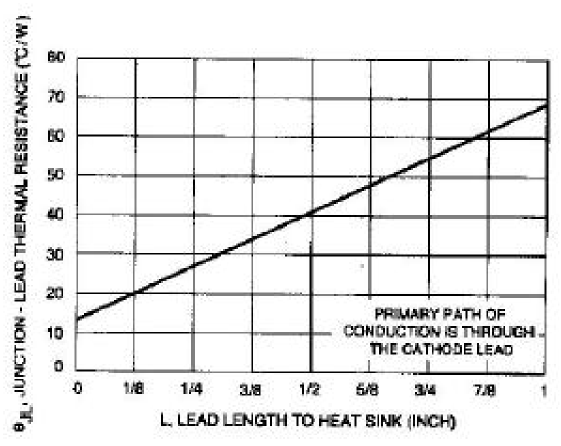

Fig. 10-TYPICAL THERMAL RESISTANCE