2EZ11 THRU 2EZ200

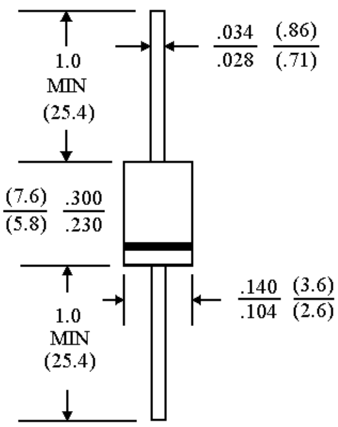
GLASS PASSIVATED JUNCTION SILICON ZENER DIODE

VOLTAGE - 11 TO 200 Volts   Power - 2.0 Watts

FEATURES

- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- Typical I_D less than 1 £gA above 11V
- High temperature soldering :
  260 ¢J/10 seconds at terminals
- Plastic package has Underwriters Laboratory
  Flammability Classification 94V-O

DO-15



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 ¢J ambient temperature unless otherwise specified.

	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation (Note A) Derate above 75 ¢J	P_D	2 24	Watts mW/¢J
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	¢J

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 ¢J 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 ¢J ir - mA (Note 4.)
			Z_{ZT} @ I_{ZT} Ohms	Z_{Zk} @ I_{ZK} Ohms	I_{ZK} mA	I_R £g A Max @	V_R Volts		
2EZ11	11.0	45.5	4.0	700	0.25	1.0	8.4	166	1.82
2EZ12	12.0	41.5	4.5	700	0.25	1.0	9.1	152	1.66
2EZ13	13.0	38.5	5.0	700	0.25	0.5	9.9	138	1.54
2EZ14	14.0	35.7	5.5	700	0.25	0.5	10.6	130	1.43
2EZ15	15.0	33.4	7.0	700	0.25	0.5	11.4	122	1.33
2EZ16	16.0	31.2	8.0	700	0.25	0.5	12.2	114	1.25
2EZ17	17.0	29.4	9.0	750	0.25	0.5	13.0	107	1.18
2EZ18	18.0	27.8	10.0	750	0.25	0.5	13.7	100	1.11
2EZ19	19.0	26.3	11.0	750	0.25	0.5	14.4	95	1.05
2EZ20	20.0	25.0	11.0	750	0.25	0.5	15.2	90	1.00
2EZ22	22.0	22.8	12.0	750	0.25	0.5	16.7	82	0.91
2EZ24	24.0	20.8	13.0	750	0.25	0.5	18.2	76	0.83
2EZ27	27.0	18.5	18.0	750	0.25	0.5	20.6	68	0.74
2EZ30	30.0	16.6	20.0	1000	0.25	0.5	22.5	60	0.67
2EZ33	33.0	15.1	23.0	1000	0.25	0.5	25.1	55	0.61
2EZ36	36.0	13.9	25.0	1000	0.25	0.5	27.4	50	0.56
2EZ39	39.0	12.8	30.0	1000	0.25	0.5	29.7	47	0.51
2EZ43	43.0	11.6	35.0	1500	0.25	0.5	32.7	43	0.45
2EZ47	47.0	10.6	40.0	1500	0.25	0.5	35.8	39	0.42
2EZ51	51.0	9.8	48.0	1500	0.25	0.5	38.8	36	0.39
2EZ56	56.0	9.0	55.0	2000	0.25	0.5	42.6	32	0.36
2EZ62	62.0	8.1	60.0	2000	0.25	0.5	47.1	29	0.32
2EZ68	68.0	7.4	75.0	2000	0.25	0.5	51.7	27	0.29
2EZ75	75.0	6.7	90.0	2000	0.25	0.5	56.0	24	0.27
2EZ82	82.0	6.1	100.0	3000	0.25	0.5	62.2	22	0.24
2EZ91	91.0	5.5	125.0	3000	0.25	0.5	69.2	20	0.22
2EZ100	100.0	5.0	175.0	3000	0.25	0.5	76.0	18	0.20
2EZ110	110.0	4.5	250.0	4000	0.25	0.5	83.6	17	0.18
2EZ120	120.0	4.2	325.0	4500	0.25	0.5	91.2	15	0.16
2EZ130	130.0	3.8	400.0	5000	0.25	0.5	98.8	14	0.15
2EZ140	140.0	3.6	500.0	5500	0.25	0.5	106.4	13	0.14
2EZ150	150.0	3.3	575.0	6000	0.25	0.5	114.0	12	0.13
2EZ160	160.0	3.1	650.0	6500	0.25	0.5	121.6	11	0.12
2EZ170	170.0	2.9	675.0	7000	0.25	0.5	130.4	11	0.12
2EZ180	180.0	2.8	725.0	7000	0.25	0.5	136.8	10	0.11
2EZ190	190.0	2.6	825.0	8000	0.25	0.5	144.8	10	0.10
2EZ200	200.0	2.5	900.0	8000	0.25	0.5	152.0	9	0.10

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 ¡Ó10ms from the diode body, and an ambient temperature of 25 ¢J (¡Ï68 ¢J, -2 ¢J).
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

2EZ11 THRU 2EZ200

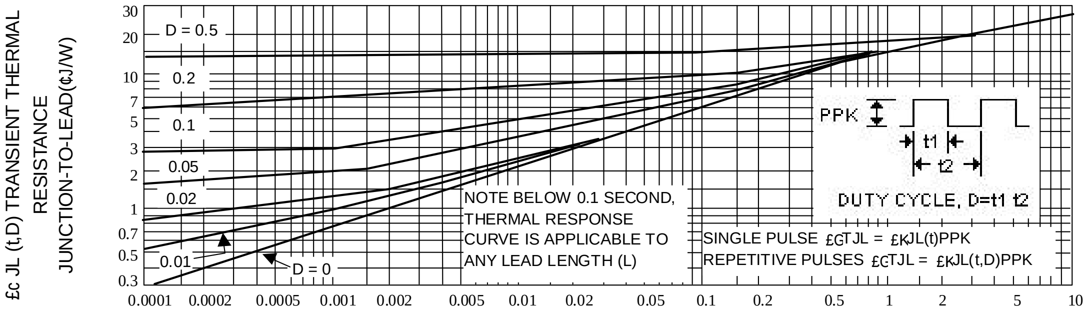

Fig. 2-TYPICAL THERMAL RESPONSE L,

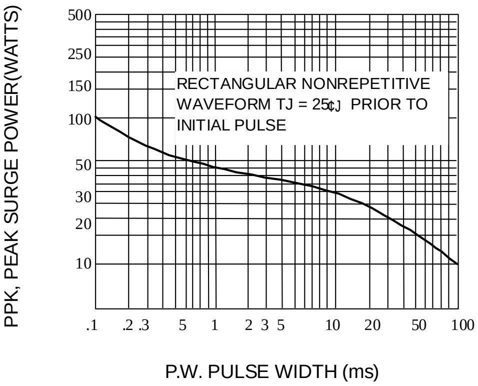

Fig. 3-MAXIMUM SURGE POWER

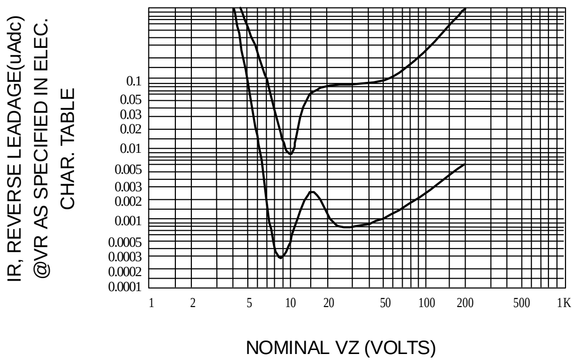

Fig. 4-TYPICAL REVERSE LEAKAGE

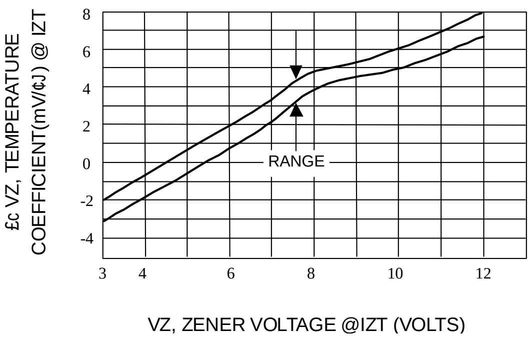

Fig. 5-UNITS TO 12 VOLTS

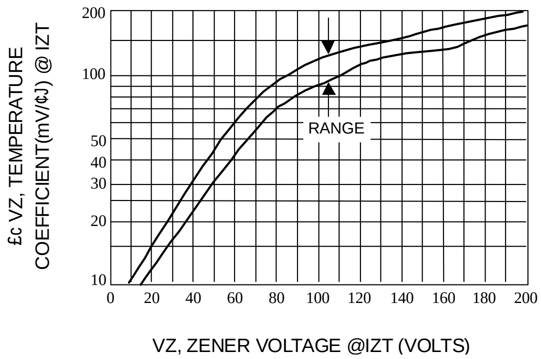

Fig. 6-UNITS 10 TO 200 VOLTS

RATING AND CHARACTERISTICS CURVES

2EZ11 THRU 2EZ200

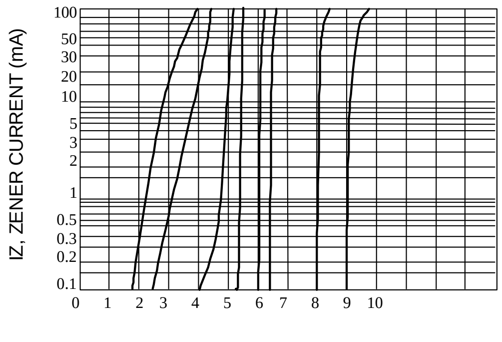

Fig. 7-VZ = 3.9 THRU 10 VOLTS

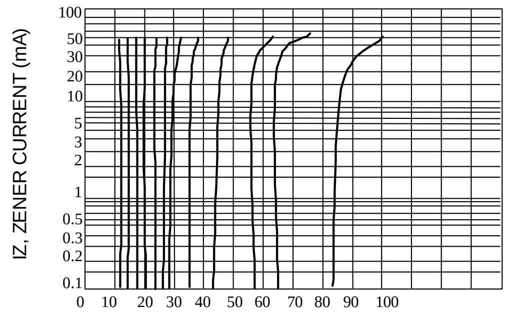

Fig. 8-VZ = 12 THRU 82 VOLTS

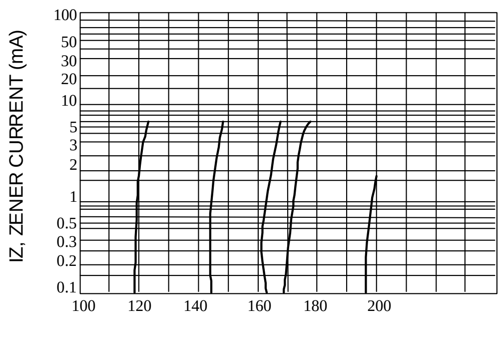

Fig. 9-VZ = 100 THRU 200 VOLTS

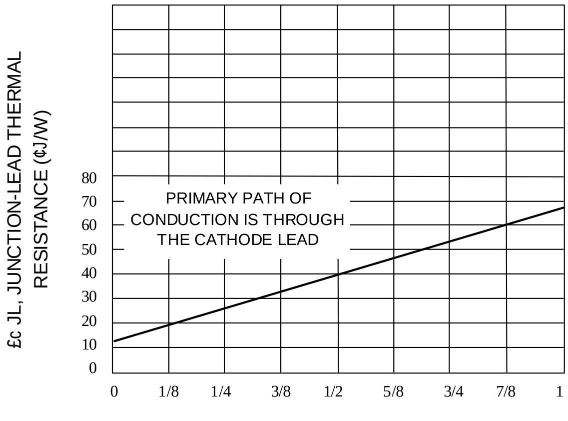

Fig. 10-TYPICAL THERMAL RESISTANCE

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:

$$TL = £c_{LA}P_D + T_A$$

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

£c $_{LA}$ is generally 30-40 ¢J/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:

$$T_J = T_L + £GT_{JL}$$

$£GT_{JL}$ 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.

$$£GT_{JL} = £c_{LA}P_D$$

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

$$£GV = £c_{VZ}\, £GT_J$$

£c $_{VZ}$, 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.