PANJIT SEMI CONDUCTOR

DATA SHEET

3EZ11~3EZ39

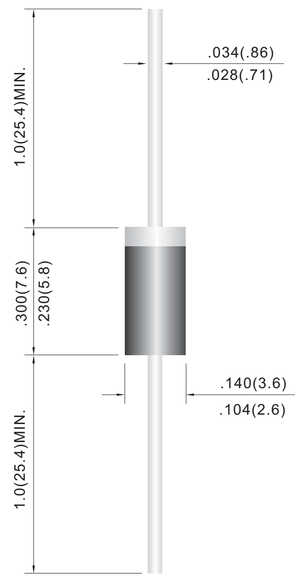
GLASS PASSIVATED JUNCTION SILICON ZENER DIODES

VOLTAGE	11 to 39 Volts	POWER	3.0 Watts

FEATURES

- Low profile package
- Built-in strain relief
- Glass passivated iunction
- Low inductance
- Typical I_D less than 1.0μA above 11V
- Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- High temperature soldering : 260°C /10 seconds at terminals
- Both normal and Pb free product are available :
  Normal : 80~95% Sn, 5~20% Pb
  Pb free: 98.5% Sn above

DO-15 Unit: inch(mm)



MECHANICALDATA

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 packing: 52mm tape

Weight: 0.015 ounce, 0.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Units
Pwak Pulse Power Dissipation on TA=50°C (Notes A) Derate above 70°C	P_D	3.0 24.0	W atts mW/ °C
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC method)	I_{FSM}	15	Amps
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to + 150	°C

NOTES:
A.Mounted on 5.0mm2 (.013mm thick) land areas.
B.Measured on8.3ms, and single half sine-wave or equivalent square wave ,duty cycle=4 pulses per minute maximum

Part Number	Nominal Zener Voltage			Maximum Zener Impedance				Leakage Current	
	V_Z @ I_{ZT}			Z_{ZT} @ I_{ZT}	I_{ZT}	Z_{ZK} @ I_{ZK}	I_{ZK}	I_R @ V_R	
	Nom. V	Min. V	Max. V	Ohms	mA	Ohms	mA	uA	V
3.0 Watt ZENER									
3EZ11	11.0	10.05	11.6	4.0	68.0	700	0.25	1.0	8.4
3EZ12	12.0	11.4	12.6	4.5	63.0	700	0.25	1.0	9.1
3EZ13	13.0	12.4	13.7	4.5	58.0	700	0.25	0.5	9.9
3EZ14	14.0	13.3	14.7	5.0	53.0	700	0.25	0.5	10.6
3EZ15	15.0	14.3	15.8	5.5	50.0	700	0.25	0.5	11.4
3EZ16	16.0	15.2	16.8	5.5	47.0	700	0.25	0.5	12.2
3EZ17	17.0	16.2	17.9	6.0	44.0	750	0.25	0.5	13.0
3EZ18	18.0	17.1	18.9	6.0	42.0	750	0.25	0.5	13.7
3EZ19	19.0	18.1	20.0	7.0	40.0	750	0.25	0.5	14.4
3EZ20	20.0	19.0	21.0	7.0	37.0	750	0.25	0.5	15.2
3EZ22	22.0	20.9	23.1	8.0	34.0	750	0.25	0.5	16.7
3EZ24	24.0	22.8	25.2	9.0	31.0	750	0.25	0.5	18.2
3EZ27	27.0	25.7	28.4	10.0	28.0	750	0.25	0.5	20.6
3EZ28	28.0	26.6	29.4	12.0	27.0	750	0.25	0.5	21.0
3EZ30	30.0	28.5	31.5	16.0	25.0	1000	0.25	0.5	22.5
3EZ33	33.0	31.4	34.7	20.0	23.0	1000	0.25	0.5	25.1
3EZ36	36.0	34.2	37.8	22.0	21.0	1000	0.25	0.5	27.4
3EZ39	39.0	37.1	41.0	28.0	19.0	1000	0.25	0.5	29.7

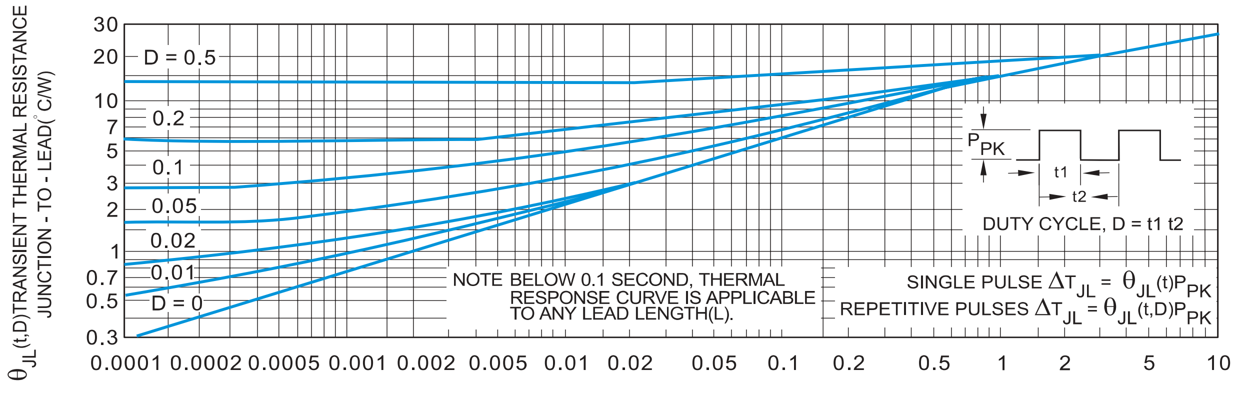


FIGURE 2. TYPICAL THERMAL RESPONSE L,

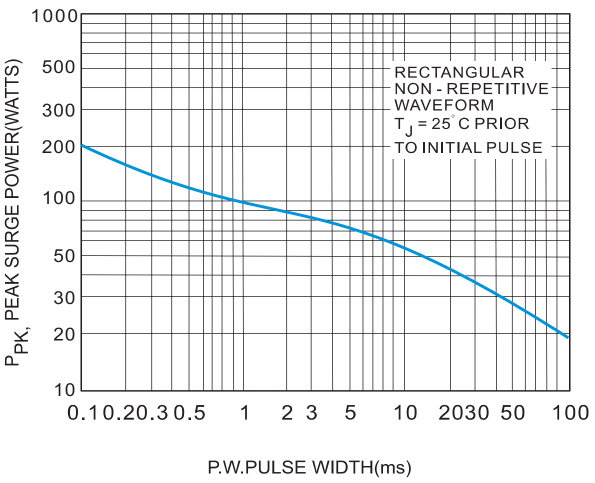


FIGURE 3. MAXIMUM SURGE POWER

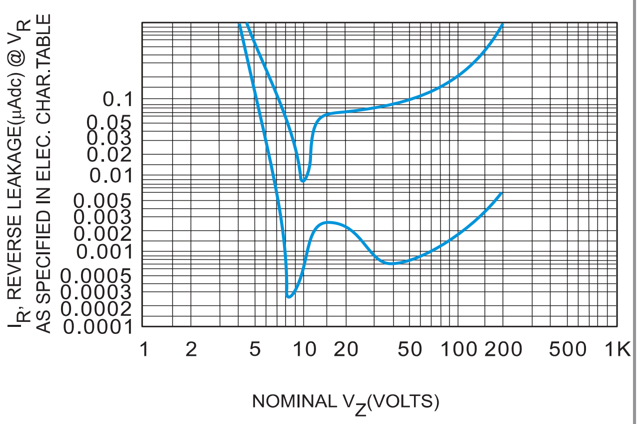


FIGURE 4. TYPICAL REVERSE LEAKAGE

APPLICATION NOTE:

Since the actual voltage available from a given zener diode is temperature dependent, it is necessary to determinejunction 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:

$$T_L = \theta_{LA} P_D + T_A$$

θ_{LA} is the lead-to-ambient thermal resistance (°C/W) and Pd is the power dissipation. The value for θ_{LA} will vary and depends on the device mounting method. θ_{LA} is generally 30-40 °C/W for the various clips 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 poin

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 TL, the junction temperature may be determined by:

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

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

$$\Delta T_{JL} = \theta_{JL} P_D$$

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

$$\Delta V = \theta V_Z \Delta T_J$$

θV_Z, 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 by the zener resis For best regulation, keep current excursions as low as possible.

Data of Figure 2 should not be used to compute surge capa-bility. Surge limitations are given in Figure 3. They are lower than \ be expected by considering only junction temperature, as current crowding effects cause temperatures to be extremely high in s spots resulting in device degradation should the limits of Figure 3 be exceeded.

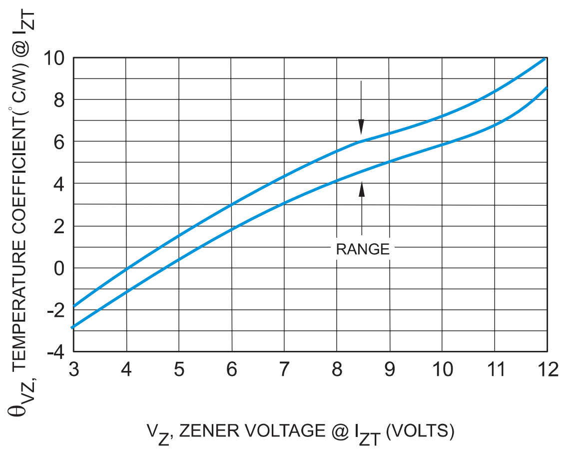


FIGURE 5. UNITS TO 12 VOLTS

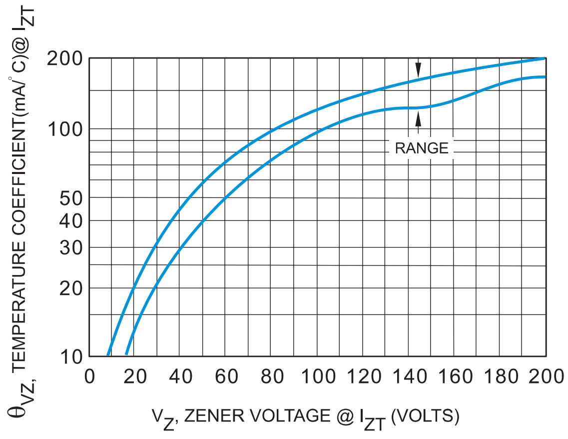


FIGURE 6. UNIT 10 TO 200 VOLTS

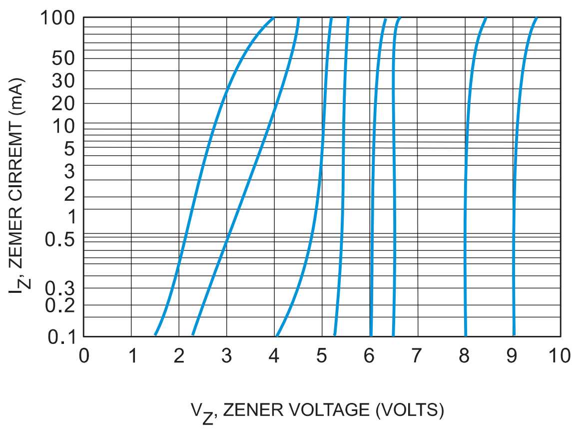


FIGURE 7. V_Z = 3.9 THRU 10 VOLTS

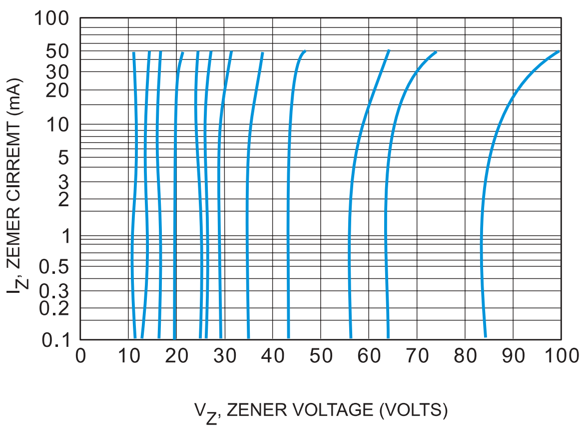


FIGURE 8. V_Z = 12 THRU 82 VOLTS

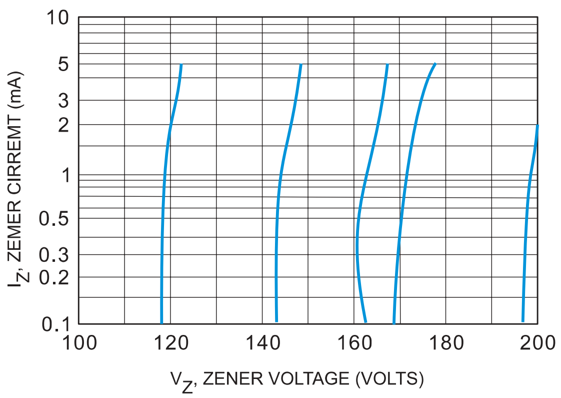


FIGURE 9. V_Z = 100 THRU 200 VOLTS

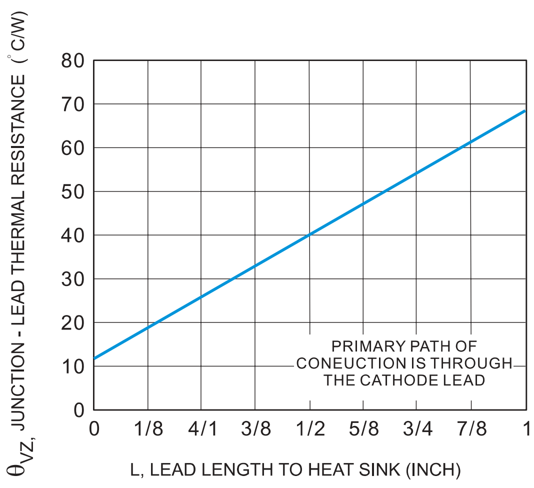


FIGURE 10. TYPICAL THERMAL RESISTANCE