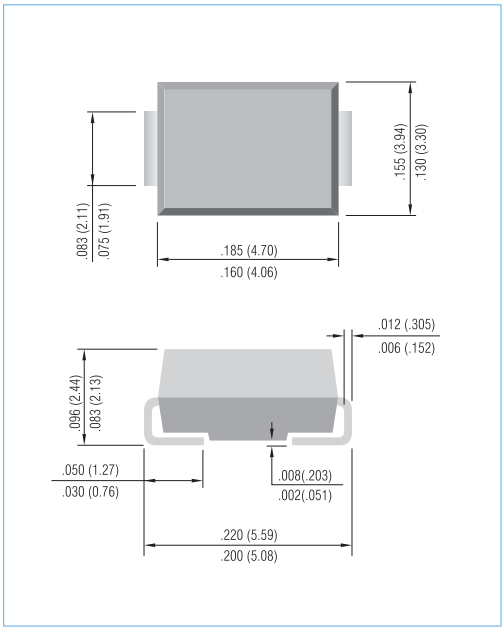
1SMB3EZ6.8~1SMB3EZ51

GLASS PASSIVATED JUNCTION SILICON ZENER DIODES

VOLTAGE 6.8 to 51 Volts **POWER** 3.0 Watts

SMB / DO-214AA Unit: inch (mm)



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
- In compliance with EU RoHS 2002/95/EC directives

MECHANICALDATA

- Case: JEDEC DO-214AA, Molded plastic over passivated junction
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Indicated by cathode band
- Standard packing: 12mm tape (E1A-481)
- Weight: 0.0032 ounce, 0.092 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Units
Peak Pulse Power Dissipation on T_L=50 °C (Notes A) Derate above 50 °C	P_D	3.0	W atts
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 on 8.3ms, and single half sine-wave or equivalent square wave ,duty cycle=4 pulses per minute maximum

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Part Number	Nominal Zener Voltage			Maximum Zener Impedance				Max Reverse Leakage Current		Marking Code
	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	Ω	mA	Ω	mA	μA	V	
3.0 Watt ZENER										
1SMB3EZ6.8	6.8	6.46	7.14	2	110	700	1	5	4	6V8B
1SMB3EZ7.5	7.5	7.13	7.88	2	100	700	0.5	5	5	7V5B
1SMB3EZ8.2	8.2	7.79	8.61	2	91	700	0.5	5	6	8V2B
1SMB3EZ8.7	8.7	8.27	9.14	2	85	700	0.5	4	6.6	8V7B
1SMB3EZ9.1	9.1	8.65	9.56	3	82	700	0.5	3	7	9V1B
1SMB3EZ10	10	9.5	10.5	4	75	700	0.25	3	7.6	10B
1SMB3EZ11	11	10.45	11.55	4	68	700	0.25	1	8.4	11B
1SMB3EZ12	12	11.4	12.6	5	63	700	0.25	1	9.1	12B
1SMB3EZ13	13	12.35	13.65	5	58	700	0.25	0.5	9.9	13B
1SMB3EZ14	14	13.3	14.7	5	53	700	0.25	0.5	10.6	14B
1SMB3EZ15	15	14.25	15.75	6	50	700	0.25	0.5	11.4	15B
1SMB3EZ16	16	15.2	16.8	6	47	700	0.25	0.5	12.2	16B
1SMB3EZ17	17	16.15	17.85	6	44	750	0.25	0.5	13	17B
1SMB3EZ18	18	17.1	18.9	6	42	750	0.25	0.5	13.7	18B
1SMB3EZ19	19	18.05	19.95	7	40	750	0.25	0.5	14.4	19B
1SMB3EZ20	20	19	21	7	37	750	0.25	0.5	15.2	20B
1SMB3EZ22	22	20.9	23.1	8	34	750	0.25	0.5	16.7	22B
1SMB3EZ24	24	22.8	25.2	9	31	750	0.25	0.5	18.2	24B
1SMB3EZ25	25	23.75	26.25	10	30	750	0.25	0.5	19	25B
1SMB3EZ27	27	25.65	28.35	10	28	750	0.25	0.5	20.6	27B
1SMB3EZ28	28	26.6	29.4	12	27	750	0.25	0.5	21.3	28B
1SMB3EZ30	30	28.5	31.5	16	25	1000	0.25	0.5	22.5	30B
1SMB3EZ33	33	31.35	34.65	20	23	1000	0.25	0.5	25.1	33B
1SMB3EZ36	36	34.2	37.8	22	21	1000	0.25	0.5	27.4	36B
1SMB3EZ39	39	37.05	40.95	28	19	1000	0.25	0.5	29.7	39B
1SMB3EZ43	43	40.85	45.15	33	17	1500	0.25	0.5	32.7	43B
1SMB3EZ47	47	44.65	49.35	38	16	1500	0.25	0.5	35.8	47B
1SMB3EZ51	51	48.45	53.55	45	15	1500	0.25	0.5	38.8	51B

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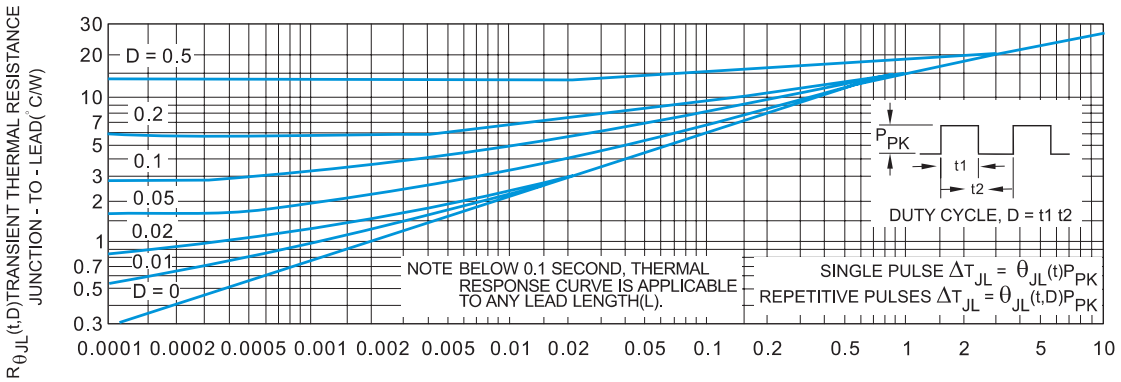

FIGURE 1 . TYPICAL THERMAL RESPONSE L,

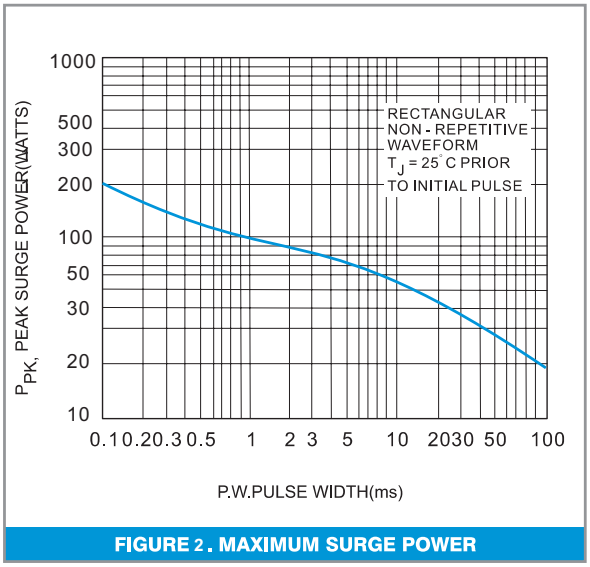

FIGURE 2 . MAXIMUM SURGE POWER

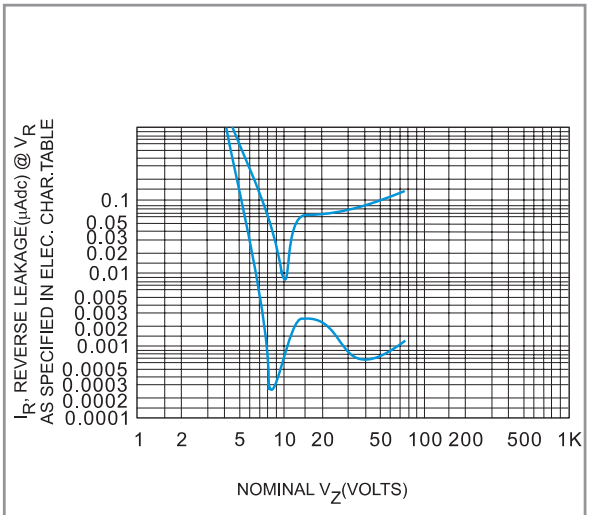

FIGURE 3 . TYPICAL REVERSE LEAKAGE

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, TL, should be determined from:

$$T_L = L_A P_D + T_A$$

LA is the lead-to-ambient thermal resistance (°C/W) and Pd is the power dissipation. The value for LA will vary and depends on the device mounting method. 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 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 TL, the junction temperature may be determined by:

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

TJL 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.

$$T_{JL} = J_L P_D$$

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

$$V = V_Z T_J$$

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 by the zener resistance. 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 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.

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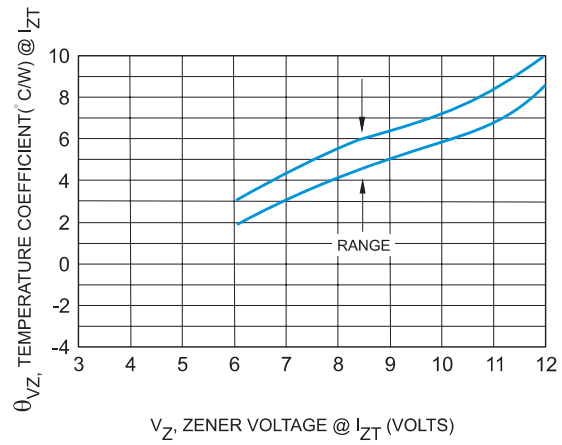

FIGURE 4 . UNITS TO 12 VOLTS

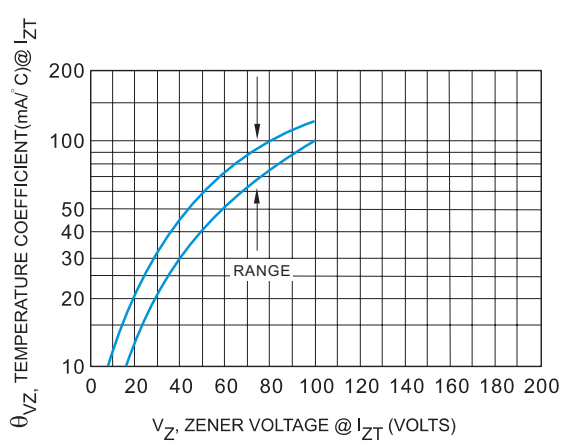

FIGURE 5. UNIT 10 TO 200 VOLTS

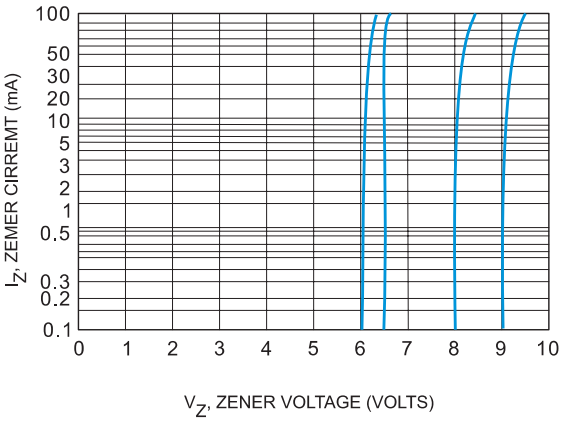

FIGURE 6.V_Z = 3.9 THRU 10 VOLTS

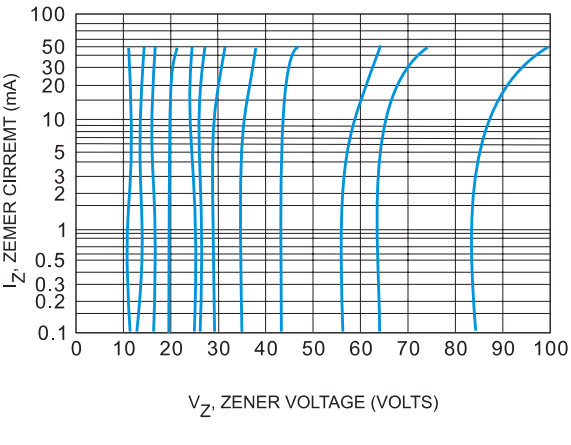

FIGURE 7. V_Z = 12 THRU 82 VOLTS

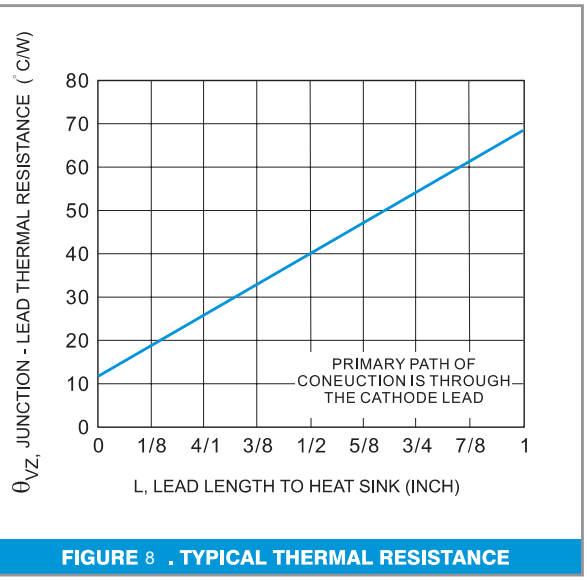

FIGURE 8 . TYPICAL THERMAL RESISTANCE

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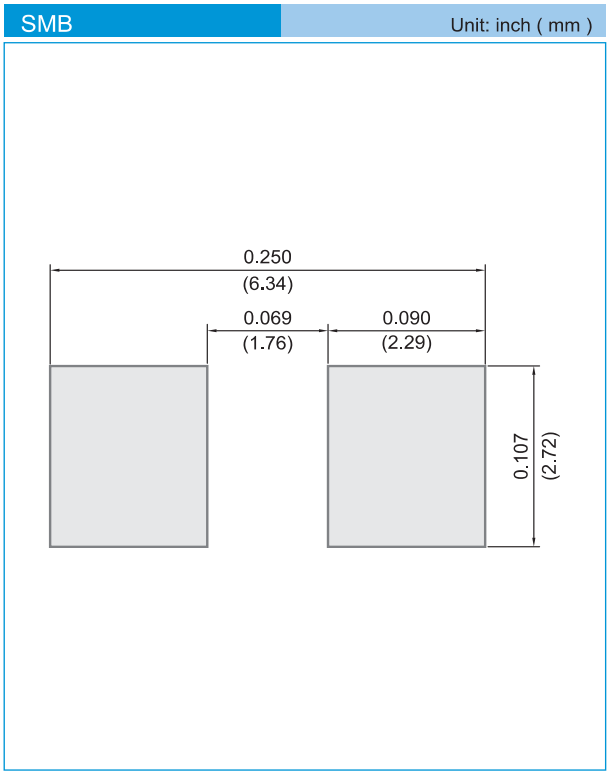
MOUNTING PAD LAYOUT

SMB Unit: inch (mm)



ORDER INFORMATION

- Packing information

  T/R - 3K per 13" plastic Reel

  T/R - 0.5Kper 7" plastic Reel

LEGAL STATEMENT