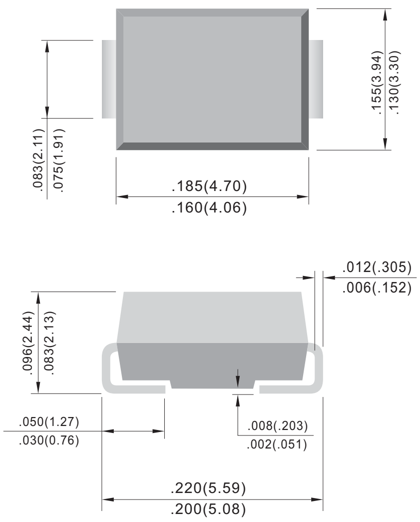
PANJIT SEMI CONDUCTOR

1SMB2EZ6.8~1SMB2EZ100

GLASS PASSIVATED JUNCTION SILICON ZENER DIODES

VOLTAGE 6.8 to 100 Volts POWER 2.0 Watts

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



FEATURES

- Low profile package
- Built-in strain relief
- 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
- Pb free product are available : 99% Sn can meet RoHS environment substance directive request

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: 0.003 ounce, 0.093 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Units
Peak Pulse Power Dissipation on TA=50°C (Notes A) Derate above 70°C	P_D	2.0 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 5.0mm^2 (.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	Package
	Vz @ IZT			ZZT @ IZT	IZT	ZZK @ IZK	IZK	IR @VR			
	Nom. V	Min. V	Max. V	Ohms	mA	Ohms	mA	µA	V		
2.0 watt Zener Diodes											
1SMB2EZ6.8	6.8	6.46	7.14	2	73.5	700	1.00	5.00	4.00	2006	SMB
1SMB2EZ7.5	7.5	7.13	7.88	2	66.5	700	0.50	5.00	5.00	2007	SMB
1SMB2EZ8.2	8.2	7.79	8.61	2	61.0	700	0.50	5.00	6.00	2008	SMB
1SMB2EZ8.7	8.7	8.27	9.14	2	58.0	700	0.50	4.00	6.60	20A8	SMB
1SMB2EZ9.1	9.1	8.65	9.56	3	55.0	700	0.50	3.00	7.00	2009	SMB
1SMB2EZ10	10	9..50	10.50	4	50.0	700	0.25	3.00	7.60	2010	SMB
1SMB2EZ11	11	10.45	11.55	4	45.5	700	0.25	1.00	8.40	2011	SMB
1SMB2EZ12	12	11.40	12.60	5	41.5	700	0.25	1.00	9.10	2012	SMB
1SMB2EZ13	13	12.35	13.65	5	38.5	700	0.25	0.50	9.90	2013	SMB
1SMB2EZ14	14	13.30	14.70	6	35.7	700	0.25	0.50	10.60	2014	SMB
1SMB2EZ15	15	14.25	15.75	7	33.4	700	0.25	0.50	11.40	2015	SMB
1SMB2EZ16	16	15.20	16.80	8	31.2	700	0.25	0.50	12.20	2016	SMB
1SMB2EZ17	17	16.15	17.85	9	29.4	750	0.25	0.50	13.00	2017	SMB
1SMB2EZ18	18	17.10	18.90	10	27.8	750	0.25	0.50	13.70	2018	SMB
1SMB2EZ19	19	18.05	19.95	11	26.3	750	0.25	0.50	14.40	2019	SMB
1SMB2EZ20	20	19.00	21.00	11	25.0	750	0.25	0.50	15.20	2020	SMB
1SMB2EZ22	22	20.90	23.10	12	22.8	750	0.25	0.50	16.70	2022	SMB
1SMB2EZ24	24	22.80	25.20	13	20.8	750	0.25	0.50	18.20	2024	SMB
1SMB2EZ25	25	23.75	26.25	14	20.0	750	0.25	0.50	19.00	2025	SMB
1SMB2EZ27	27	25.65	28.35	18	18.5	750	0.25	0.50	20.60	2027	SMB
1SMB2EZ28	28	26.60	29.40	18	17.0	750	0.25	0.50	21.30	2028	SMB
1SMB2EZ30	30	28.50	31.50	20	16.6	1000	0.25	0.50	22.50	2030	SMB
1SMB2EZ33	33	31.35	34.65	23	15.1	1000	0.25	0.50	25.10	2033	SMB
1SMB2EZ36	36	34.20	37.80	25	13.9	1000	0.25	0.50	27.40	2036	SMB
1SMB2EZ39	39	37.05	40.95	30	12.8	1000	0.25	0.50	29.70	2039	SMB
1SMB2EZ43	43	40.85	45.15	35	11.6	1500	0.25	0.50	32.70	2043	SMB
1SMB2EZ47	47	44.65	49.35	40	10.6	1500	0.25	0.50	35.80	2047	SMB
1SMB2EZ51	51	48.45	53.55	48	9.8	1500	0.25	0.50	38.80	2051	SMB
1SMB2EZ56	56	53.20	58.80	55	9.0	2000	0.25	0.50	42.60	2056	SMB
1SMB2EZ60	60	57.00	63.00	58	8.5	2000	0.25	0.50	45.60	2060	SMB
1SMB2EZ62	62	58.90	65.10	60	8.1	2000	0.25	0.50	47.10	2062	SMB
1SMB2EZ68	68	64.60	71.40	75	7.4	2000	0.25	0.50	51.70	2068	SMB
1SMB2EZ75	75	71.25	78.75	90	6.7	2000	0.25	0.50	56.00	2075	SMB
1SMB2EZ82	82	77.90	86.10	100	6.1	3000	0.25	0.50	62.20	2082	SMB
1SMB2EZ87	87	82.65	91.35	120	5.8	3000	0.25	0.50	66.10	2087	SMB
1SMB2EZ91	91	86.45	95.55	125	5.5	3000	0.25	0.50	69.20	2091	SMB
1SMB2EZ100	100	95.00	105.00	175	5.0	3000	0.25	0.50	76.00	2100	SMB

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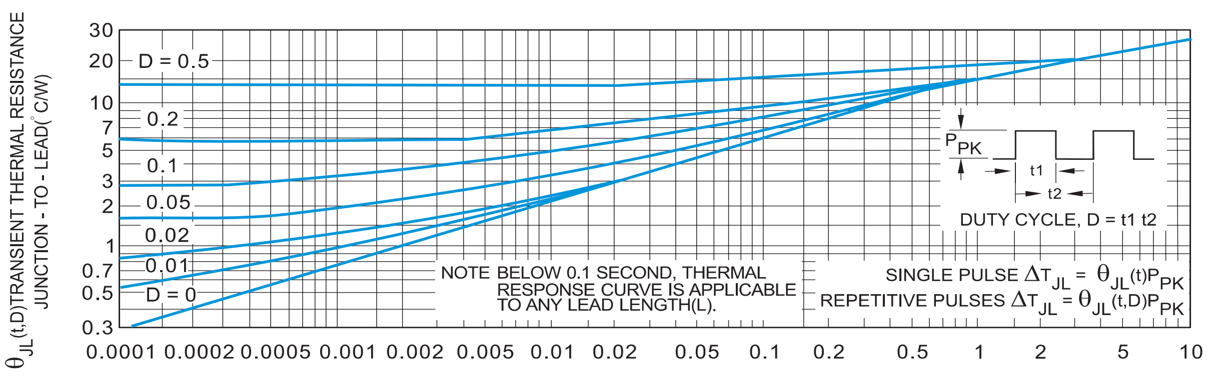

FIGURE 1 . TYPICAL THERMAL RESPONSE L,

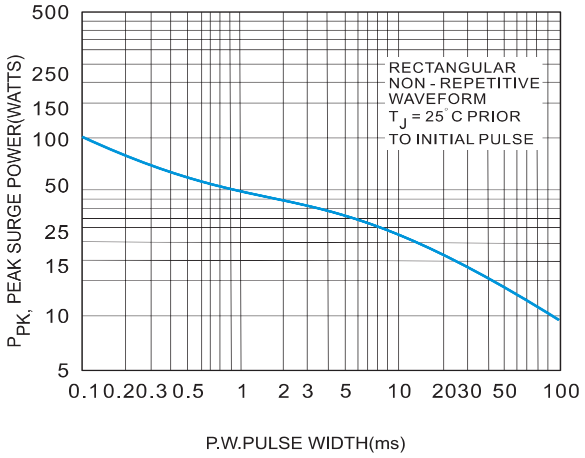

FIGURE 2 . MAXIMUM SURGE POWER

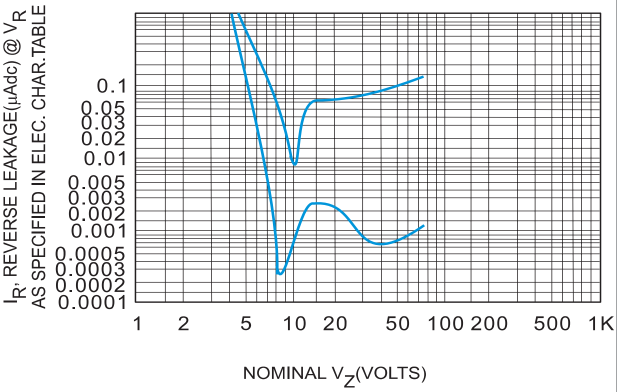

FIGURE 3 . TYPICAL REVERSE LEAKAGE

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, 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 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:

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

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

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

For worst-case design, using expected limits of I_Z, limits of P_D and the extremes of $T_J(\Delta T_J)$ may be estimated. Changes in voltage, 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 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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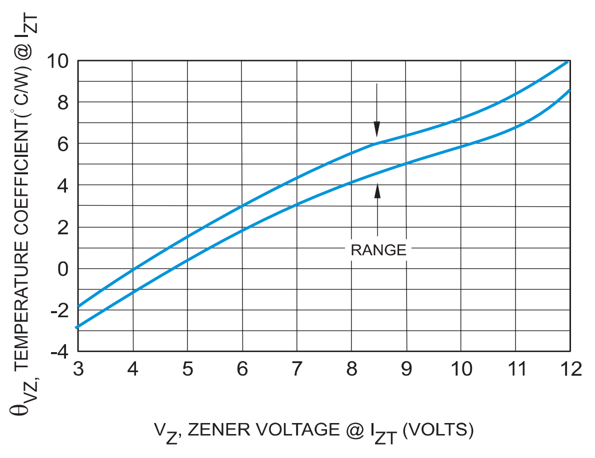

FIGURE 4 . UNITS TO 12 VOLTS

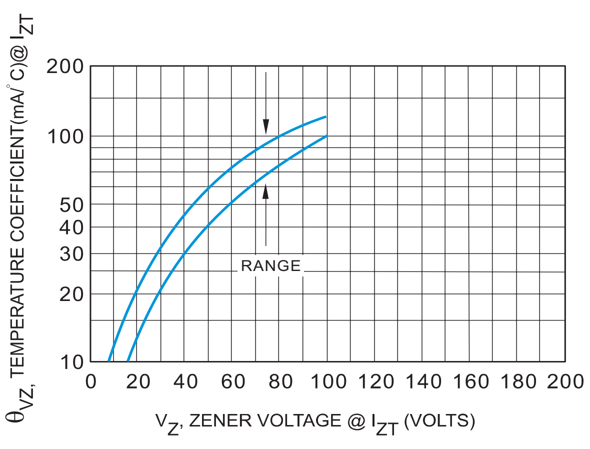

FIGURE 5 . UNIT 10 TO 200 VOLTS

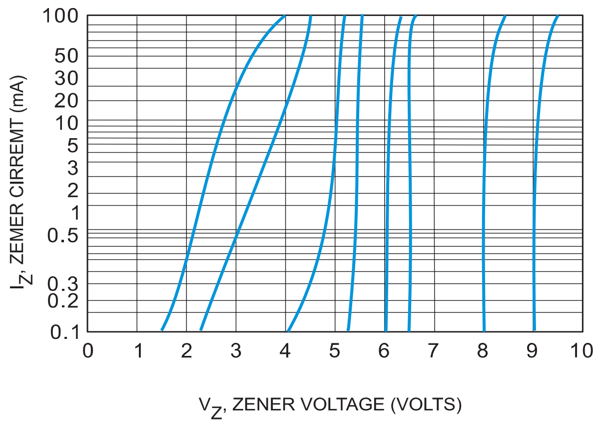

FIGURE 6 .V_Z = 3.9 THRU 10 VOLTS

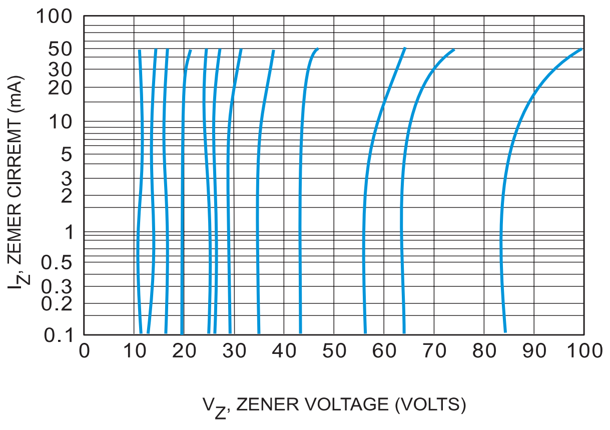

FIGURE 7 . V_Z = 12 THRU 82 VOLTS

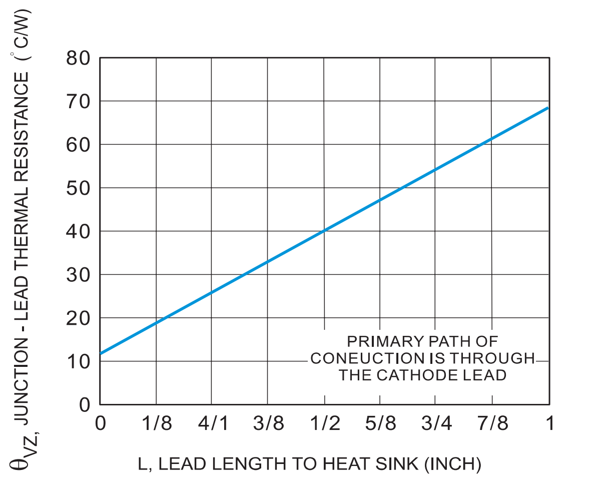

FIGURE 8 . TYPICAL THERMAL RESISTANCE