WEE Technology Company Limited
Silicon Planar Zener Diodes

1SMB2EZ6.8~1SMB2EZ51

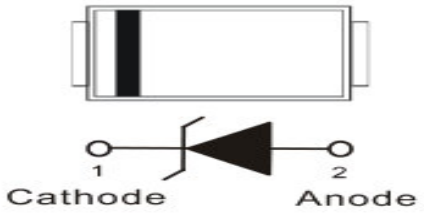
20 to 100 Volts
2 Watt

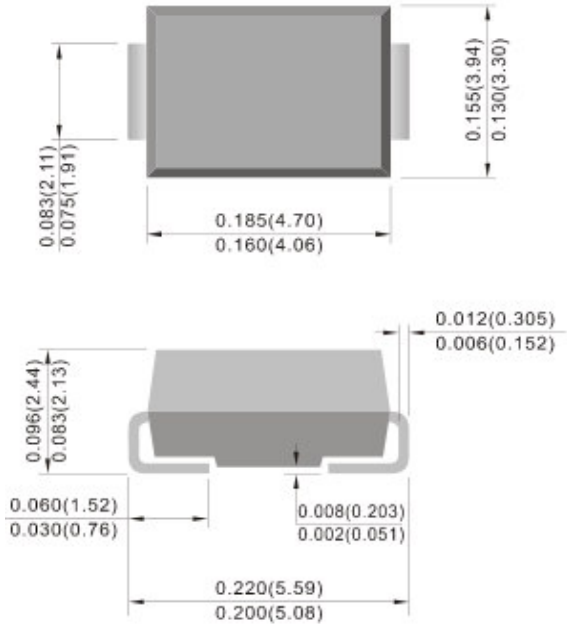
FEATURES

- 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
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Green molding compound as per IEC61249 Std. . (Halogen Free)

MECHANICAL DATA

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





SMB/DO-214AA Unit：inch（mm）

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	2	W atts
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load	I_{FSM}	15	Amps
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to + 150	°C

NOTES :

A.Mounted on 5mm² (0.013mm 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	
2.0 watt Zener Diodes										
1SMB2EZ6.8	6.8	6.46	7.14	2	73.5	700	1	5	4	2006
1SMB2EZ7.5	7.5	7.13	7.88	2	66.5	700	0.5	5	5	2007
1SMB2EZ8.2	8.2	7.79	8.61	2	61	700	0.5	5	6	2008
1SMB2EZ8.7	8.7	8.27	9.14	2	58	700	0.5	4	6.6	20A8
1SMB2EZ9.1	9.1	8.65	9.56	3	55	700	0.5	3	7	2009
1SMB2EZ10	10	9.5	10.5	4	50	700	0.25	3	7.6	2010
1SMB2EZ11	11	10.45	11.55	4	45.5	700	0.25	1	8.4	2011
1SMB2EZ12	12	11.4	12.6	5	41.5	700	0.25	1	9.1	2012
1SMB2EZ13	13	12.35	13.65	5	38.5	700	0.25	0.5	9.9	2013
1SMB2EZ14	14	13.3	14.7	6	35.7	700	0.25	0.5	10.6	2014
1SMB2EZ15	15	14.25	15.75	7	33.4	700	0.25	0.5	11.4	2015
1SMB2EZ16	16	15.2	16.8	8	31.2	700	0.25	0.5	12.2	2016
1SMB2EZ17	17	16.15	17.85	9	29.4	750	0.25	0.5	13	2017
1SMB2EZ18	18	17.1	18.9	10	27.8	750	0.25	0.5	13.7	2018
1SMB2EZ19	19	18.05	19.95	11	26.3	750	0.25	0.5	14.4	2019
1SMB2EZ20	20	19	21	11	25	750	0.25	0.5	15.2	2020
1SMB2EZ22	22	20.9	23.1	12	22.8	750	0.25	0.5	16.7	2022
1SMB2EZ24	24	22.8	25.2	13	20.8	750	0.25	0.5	18.2	2024
1SMB2EZ25	25	23.75	26.25	14	20	750	0.25	0.5	19	2025
1SMB2EZ27	27	25.65	28.35	18	18.5	750	0.25	0.5	20.6	2027
1SMB2EZ28	28	26.6	29.4	18	17	750	0.25	0.5	21.3	2028
1SMB2EZ30	30	28.5	31.5	20	16.6	1000	0.25	0.5	22.5	2030
1SMB2EZ33	33	31.35	34.65	23	15.1	1000	0.25	0.5	25.1	2033
1SMB2EZ36	36	34.2	37.8	25	13.9	1000	0.25	0.5	27.4	2036
1SMB2EZ39	39	37.05	40.95	30	12.8	1000	0.25	0.5	29.7	2039
1SMB2EZ43	43	40.85	45.15	35	11.6	1500	0.25	0.5	32.7	2043
1SMB2EZ47	47	44.65	49.35	40	10.6	1500	0.25	0.5	35.8	2047
1SMB2EZ51	51	48.45	53.55	48	9.8	1500	0.25	0.5	38.8	2051

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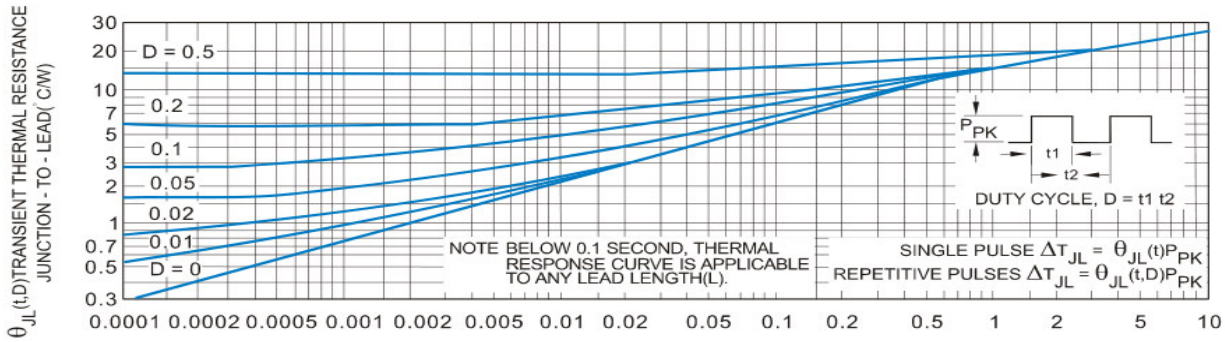

FIGURE 1. TYPICAL THERMAL RESPONSE L,

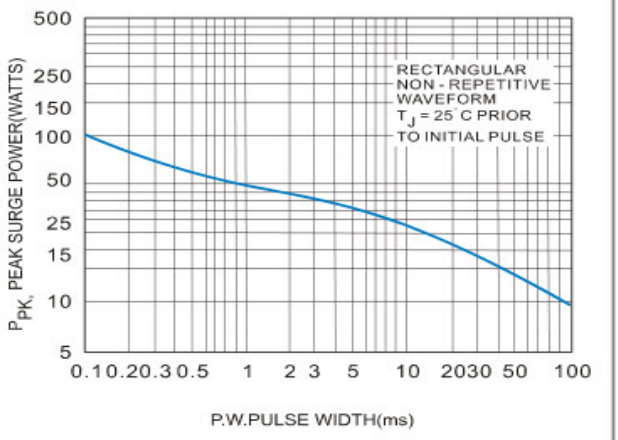

FIGURE 2. MAXIMUM SURGE POWER

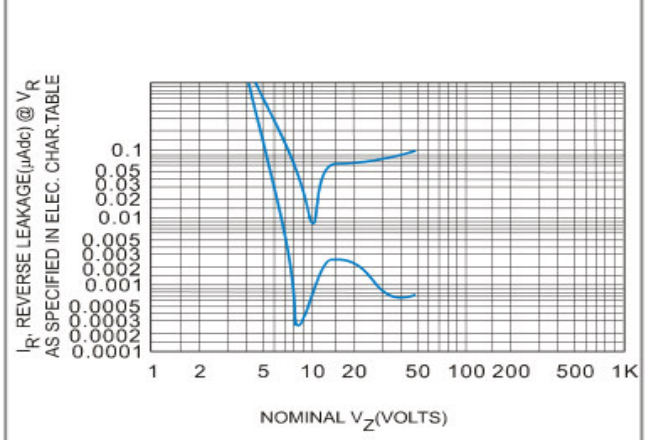

FIGURE 3. TYPICAL REVERSE LEAKAGE

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:

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

θLA is the lead-to-ambient thermal resistance (°C/W) and Pd is the power dissipation. The value for θLA will vary and depends on the device mounting method. θLA 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:

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

ΔTJL is the increase in junction temperature above the lead temperature and may be found from Figure 2 for a train of power pulses.

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

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

$$\Delta V = \theta_{VZ} \Delta T_J$$

θVz, 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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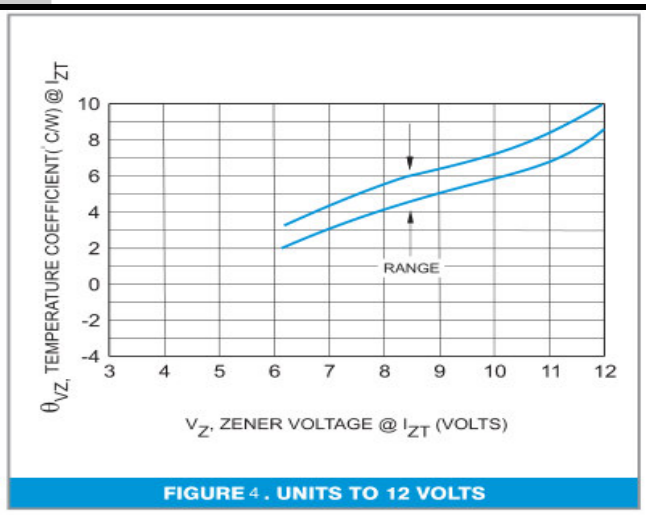

FIGURE 4 . UNITS TO 12 VOLTS

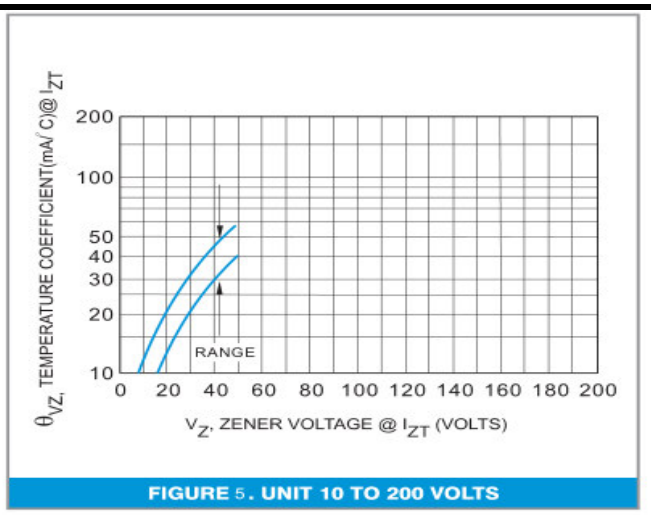

FIGURE 5. UNIT 10 TO 200 VOLTS

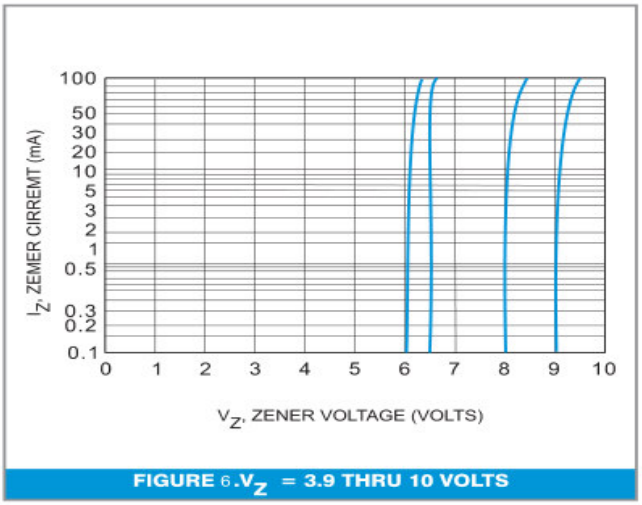

FIGURE 6.V_Z = 3.9 THRU 10 VOLTS

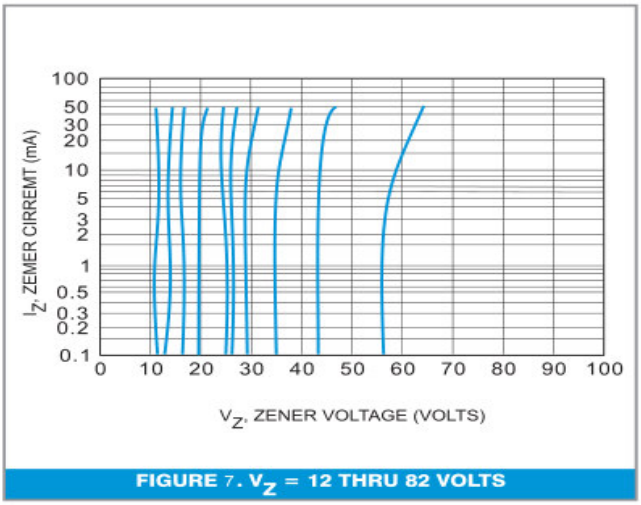

FIGURE 7. V_Z = 12 THRU 82 VOLTS

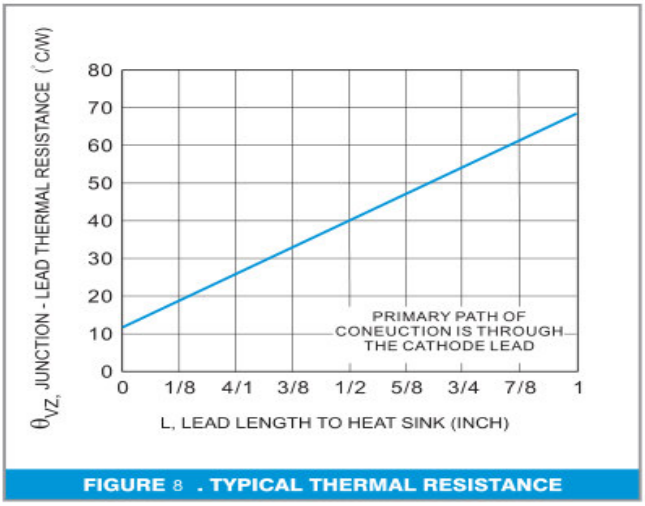

FIGURE 8 . TYPICAL THERMAL RESISTANCE

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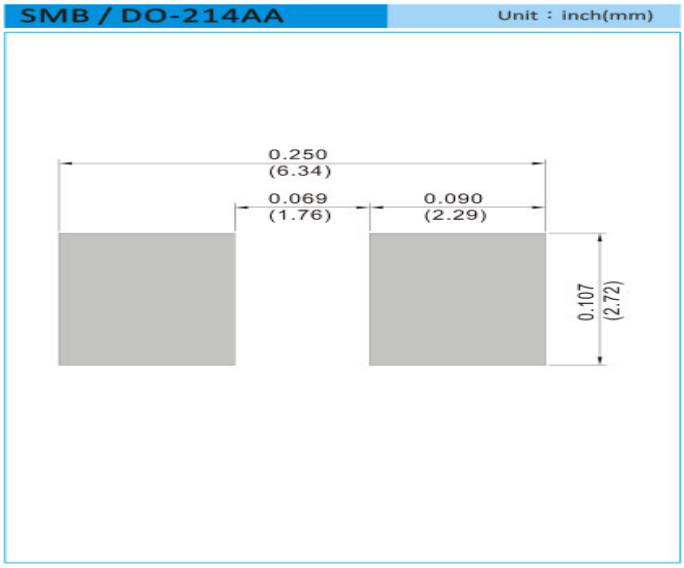
SMB / DO-214AA Unit : inch(mm)



ORDER INFORMATION

- Packing information

  T/R - 3K per 13" plastic Reel

  T/R - 0.5K per 7" plastic Reel

Part No_packing code_Version

1SMB2EZ6.8_R1_00001

1SMB2EZ6.8_R2_00001

For example :

RB500V-40_R2_00001

Part No.

- Serial number
- Version code means HF
- Packing size code means 13"
- Packing type means T/R

Packing Code XX				Version Code XXXXX		
Packing type	1st Code	Packing size code	2nd Code	HF or RoHS	1st Code	2nd~5th Code
Tape and Ammunition Box (T/B)	A	N/A	0	HF	0	serial number
Tape and Reel (T/R)	R	7"	1	RoHS	1	serial number
Bulk Packing (B/P)	B	13"	2			
Tube Packing (T/P)	T	26mm	X			
Tape and Reel (Right Oriented) (TRR)	S	52mm	Y			
Tape and Reel (Left Oriented) (TRL)	L	PANASERT T/B CATHODE UP (PBCU)	U			
FORMING	F	PANASERT T/B CATHODE DOWN (PBCD)	D			

Note: Specifications are subject to change without notice. For more detail and update, please visit our website.

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