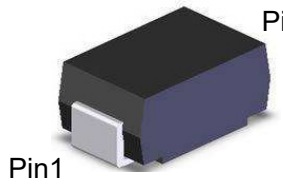
Prisemi®

P1SMBXXXXB Series
Silicon Planar Zener Diodes

Description

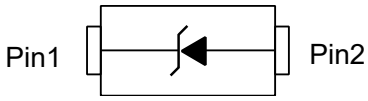
The P1SMBXXXXB series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.



SMB(Top View)

Feature

- Total power dissipation: Max. 3W.
- Small plastic package suitable for surface mounted design.
- Wide Zener reverse voltage range 3.3V to 200V



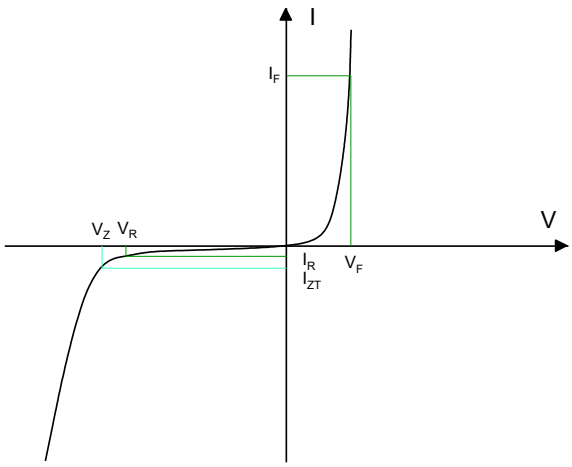
Circuit Diagram

Mechanical Characteristics

- Case: SMB
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.095g/0.0034oz

Electronics Parameter

Symbol	Parameter
V_Z	Reverse Zener Voltage @I_{ZT}
I_{ZT}	Reverse Current
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impendance @I_{ZK}
I_R	Reverse Leakage Current@ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @I_F
I_{ZM}	Maximum DC Zener Current



Absolute maximum rating@25℃

Rating	Symbol	Value	Units
DC power dissipation at TL=75℃, measure at zero lead length[1)]	P_D	3.0	W
Derate Above 75℃		40	mW/℃
Maximum Steady State Power Dissipation @ TA=25℃	P_D	550	mW
Derate Above 25℃		4.4	mW/℃
Junction to ambient thermal resistance	$R_{\theta JA}$	226	℃/W
Junction to lead thermal resistance	$R_{\theta JL}$	25	℃/W
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	℃

Note:
1. Mounted on Cu-Pad size 5mm x 5mm on PCB.

Maximum Ratings and Thermal Characteristics (T_A=25℃ unless otherwise noted)

Device	Nominal Zener Voltage[3]				Zener Impedance[4]			Leakage Current		Maximum DC Zener Current
	V_Z			I_{ZT}	Z_{ZT}@I_{ZT}	Z_{ZK}@I_{ZK}		I_R@V_R		
	Min(V)	Nom(V)[2]	Max(V)	(mA)	(Ω)	(Ω)	(mA)	μA	V	I_{ZM}(mA)(DC)
P1SMB5914B	3.42	3.6	3.78	104.2	9	500	1	75	1	416
P1SMB5915B	3.70	3.9	4.10	96.1	7.5	500	1	25	1	384
P1SMB5916B	4.08	4.3	4.52	87.2	6	500	1	5	1	348
P1SMB5917B	4.46	4.7	4.94	79.8	5	500	1	5	1.5	319
P1SMB5918B	4.84	5.1	5.36	73.5	4	400	1	5	2	294
P1SMB5919B	5.32	5.6	5.88	66.9	2	250	1	5	3	267
P1SMB5920B	5.89	6.2	6.51	60.5	2	200	1	5	4	241
P1SMB5921B	6.46	6.8	7.14	55.1	2.5	200	1	5	5.2	220
P1SMB5922B	7.12	7.5	7.88	50	3	400	0.5	5	6	200
P1SMB5923B	7.79	8.2	8.61	45.7	3.5	400	0.5	5	6.5	182
P1SMB5924B	8.64	9.1	9.56	41.2	4	500	0.5	5	7	164
P1SMB5925B	9.5	10	10.5	37.5	4.5	500	0.25	5	8	150
P1SMB5926B	10.45	11	11.55	34.1	5.5	550	0.25	1	8.4	136
P1SMB5927B	11.4	12	12.6	31.2	6.5	550	0.25	1	9.1	125
P1SMB5928B	12.35	13	13.65	28.8	7	550	0.25	1	9.9	115
P1SMB5929B	14.25	15	15.75	25	9	600	0.25	1	11.4	100
P1SMB5930B	15.2	16	16.8	23.4	10	600	0.25	1	12.2	93
P1SMB5931B	17.1	18	18.9	20.8	12	650	0.25	1	13.7	83
P1SMB5932B	19	20	21	18.7	14	650	0.25	1	15.2	75
P1SMB5933B	20.9	22	23.1	17	17.5	650	0.25	1	16.7	68
P1SMB5934B	22.8	24	25.2	15.6	19	700	0.25	1	18.2	62
P1SMB5935B	25.65	27	28.35	13.9	23	700	0.25	1	20.6	55
P1SMB5936B	28.5	30	31.5	12.5	28	750	0.25	1	22.8	50
P1SMB5937B	31.35	33	34.65	11.4	33	800	0.25	1	25.1	45
P1SMB5938B	34.2	36	37.8	10.4	38	850	0.25	1	27.4	41
P1SMB5939B	37.05	39	40.95	9.6	45	900	0.25	1	29.7	38
P1SMB5940B	40.85	43	45.15	8.7	53	950	0.25	1	32.7	34
P1SMB5941B	44.65	47	49.35	8	67	1000	0.25	1	35.8	31
P1SMB5942B	48.45	51	53.55	7.3	70	1100	0.25	1	38.8	29
P1SMB5943B	53.2	56	58.8	6.7	86	1300	0.25	1	42.6	26
P1SMB5944B	58.9	62	65.1	6	100	1500	0.25	1	47.1	24
P1SMB5945B	64.6	68	71.4	5.5	120	1700	0.25	1	51.7	22
P1SMB5946B	71.25	75	78.75	5	140	2000	0.25	1	56	20
P1SMB5947B	77.9	82	86.1	4.6	160	2500	0.25	1	62.2	18
P1SMB5948B	86.45	91	95.55	4.1	200	3000	0.25	1	69.2	16

Device	Nominal Zener Voltage[3]				Zener Impedance[4]			Leakage Current		Maximum DC Zener Current
	V_Z			I_{ZT}	$Z_{ZT}@I_{ZT}$	$Z_{ZK}@I_{ZK}$		$I_R@V_R$		
	Min(V)	Nom(V)[2]	Max(V)	(mA)	(Ω)	(Ω)	(mA)	μA	V	I_{ZM}(mA)(DC)
P1SMB5949B	95	100	105	3.7	250	3100	0.25	1	76	15
P1SMB5950B	104.5	110	115.5	3.4	300	4000	0.25	1	83.6	13
P1SMB5951B	114	120	126	3.1	380	4500	0.25	1	91.2	12
P1SMB5952B	123.5	130	136.5	2.9	450	5000	0.25	1	98.8	11
P1SMB5953B	142.5	150	157.5	2.5	600	6000	0.25	1	114	10
P1SMB5954B	152	160	168	2.3	700	6500	0.25	1	121.6	9
P1SMB5955B	171	180	189	2.1	900	7000	0.25	1	136.8	8
P1SMB5956B	190	200	210	1.9	1200	8000	0.25	1	152	7

Notes:
2. Tolerance and type number designation the type numbers listed indicate a tolerance of 5%.
3. Zener voltage (V_Z) measurement.
   Nominal Zener voltage is measured with the device junction in thermal equilibrium with ambient temperature 25℃.
4. Zener impedance (Z_Z) derivation: Z_{ZT} and Z_{ZK} are measures by dividing the AC voltage drop across the device by the AC current applied.
   The specified limits are for $I_{Z\,(AC)}$ =0.1 $I_{Z\,(DC)}$ with the AC frequency =60HZ

Typical Characteristics

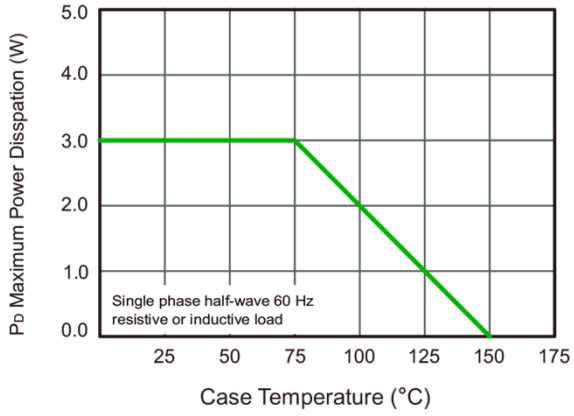


Fig.1 Forward Current Derating Curve

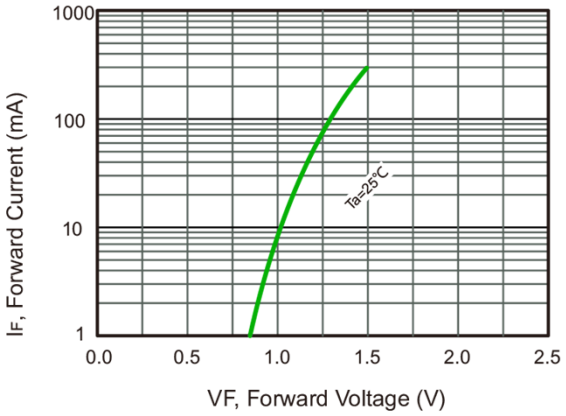


Fig.2 Typical Forward Voltage

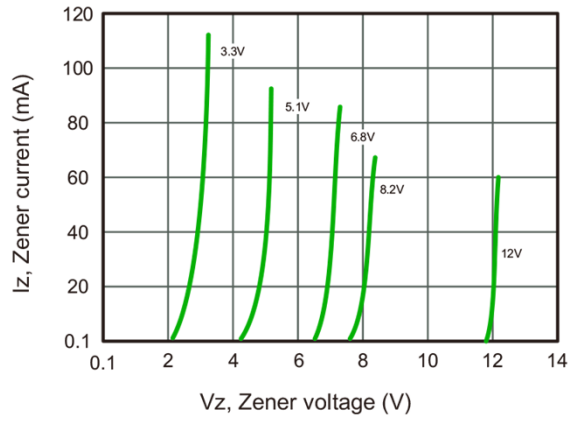


Fig.3 Vz = 3.3 THRU 12 VOLTS

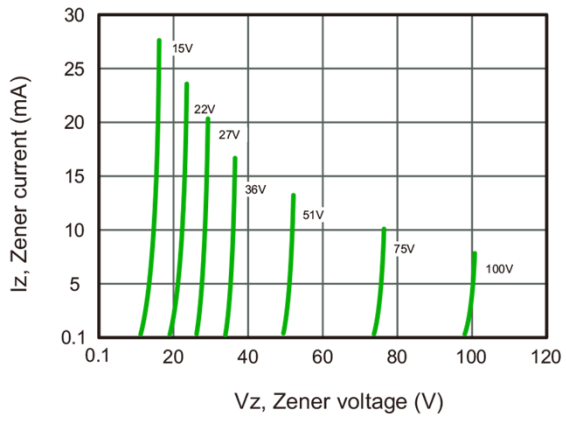
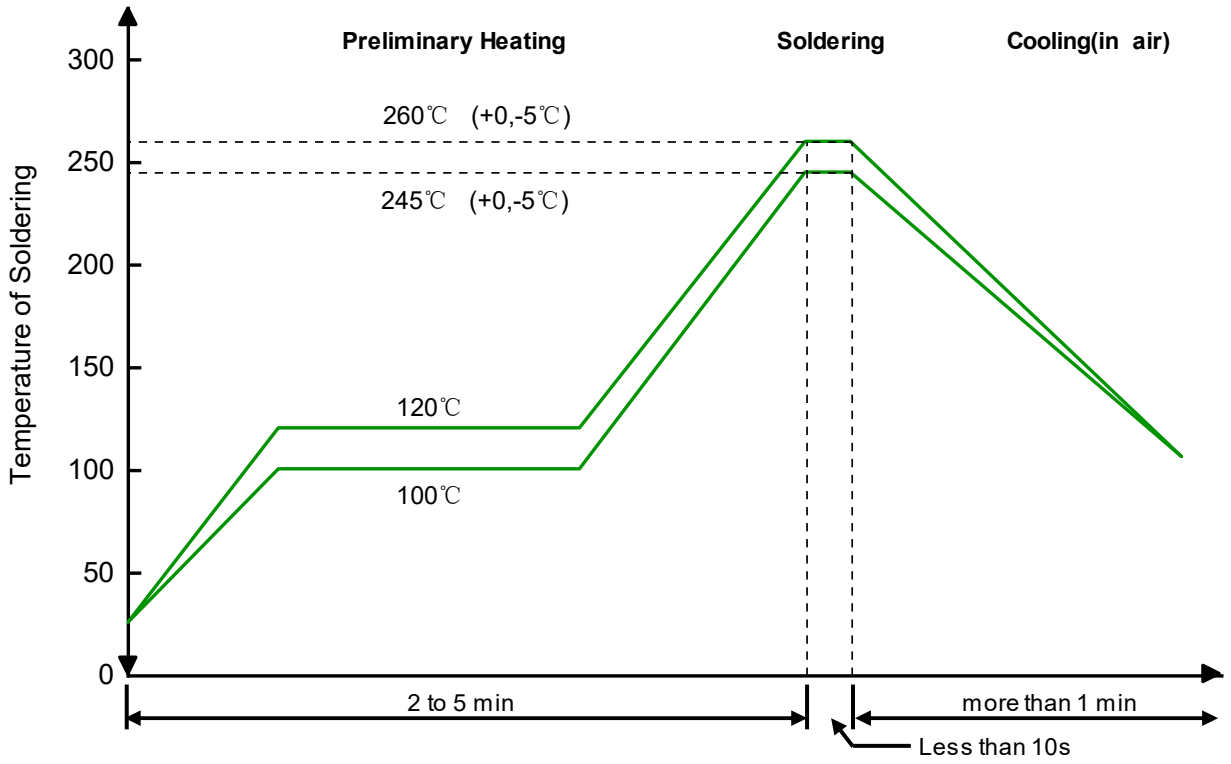


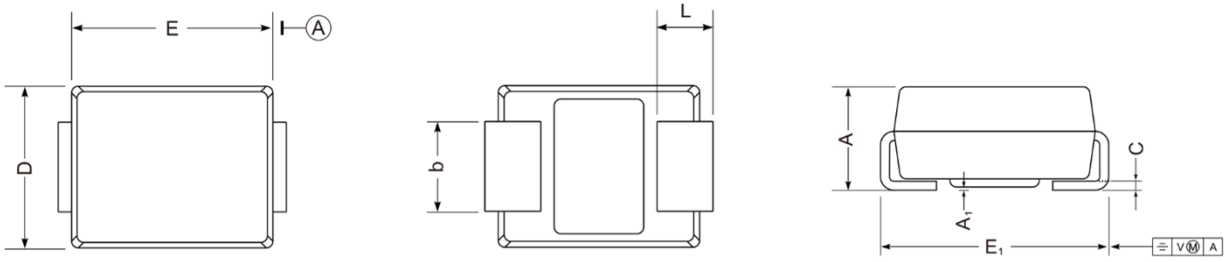
Fig.4 Vz = 15 THRU 100 VOLTS

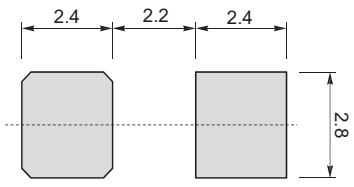
Solder Reflow Recommendation



Remark: Pb free for 260℃; Pb for 245℃.

Product dimension (SMB)





Suggested PCB Layout

Unit:mm

Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	2.13	2.44	0.084	0.096
E	4.06	4.70	0.160	0.185
D	3.30	3.94	0.130	0.155
E_1	5.08	5.59	0.200	0.220
A_1	0.05	0.20	0.002	0.008
L	0.80	1.50	0.031	0.059
C	0.152	0.305	0.006	0.012
b	1.90	2.20	0.075	0.087

Ordering information

Device	Package	Shipping
P1SMBXXXXB Series	SMB (Pb-Free)	3000 / Tape & Reel

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