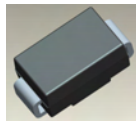


## Features

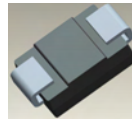
- 3.0W Power Dissipation
- Ideally Suited for Automated Assembly
- 6.2V - 39V Nominal Zener Voltage Range
- Standard  $V_Z$  Tolerance is  $\pm 5\%$
- ESD Rating of Class 3 ( $>16kV$ ) per Human Body Model
- **Lead Free Finish/RoHS Compliant (Note 1)**
- **Green Molding Compound (No Halogen and Antimony)**

## Mechanical Data

- Case: SMB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band
- Weight: 0.096 grams (approximate)



Top View



Bottom View

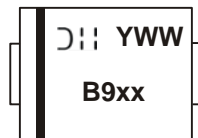
## Ordering Information (Note 2)

Device*	Packaging	Shipping
1SMB59xxB-13	SMB	3000/Tape & Reel

\*x = Device Voltage, e.g., 1SMB5920B-13.

- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see EU Directive 2002/95/EC Annex Notes.
  2. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



B9xx = Product type marking code  
(See Electric Characteristics Table)  
 D11 = Manufacturers' code marking  
 YWW = Date code marking  
 Y = Last digit of year (ex: 1 for 2011)  
 WW = Week code (01 - 53)

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Forward Voltage @I <sub>F</sub> = 200mA	V <sub>F</sub>	1.5	V
Zener Current (see Table page 2)	I <sub>ZM</sub>	P <sub>D</sub> / V <sub>Z</sub>	mA

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation @T <sub>L</sub> = 75°C	P <sub>D</sub>	3.0	W
Derate Above 75°C (Note 2)		40	mW/°C
Thermal Resistance - Junction to Terminal (Note 2)	R <sub>θJT</sub>	25	°C/W
Power Dissipation @T <sub>A</sub> = 25°C	P <sub>D</sub>	550	mW
Derate Above 25°C (Note 2)		4.4	mW/°C
Thermal Resistance - Junction to Ambient (Note 2)	R <sub>θJA</sub>	228	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Type Number	Marking Code	Zener Voltage Range (Note 4)			Test Current	Maximum Zener Impedance (Note 5)			Maximum Reverse Current (Note 4)		I <sub>ZM</sub> Max	
		V <sub>Z</sub> @ I <sub>ZT</sub>				I <sub>ZT</sub>	Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @ I <sub>ZK</sub>		I <sub>R</sub> @ V <sub>R</sub>		
		Min (V)	Typ (V)	Max (V)				Ω	Ω	mA		μA
1SMB5920B	B920	5.89	6.2	6.51	60.5	2	200	1	5	4	241	
1SMB5921B	B921	6.46	6.8	7.14	55.1	2.5	200	1	5	5.2	220	
1SMB5922B	B922	7.12	7.5	7.88	50	3	400	0.5	5	6	200	
1SMB5923B	B923	7.79	8.2	8.61	45.7	3.5	400	0.5	5	6.5	182	
1SMB5924B	B924	8.64	9.1	9.56	41.2	4	500	0.5	5	7	164	
1SMB5925B	B925	9.5	10	10.5	37.5	4.5	500	0.25	5	8	150	
1SMB5926B	B926	10.45	11	11.55	34.1	5.5	550	0.25	1	8.4	136	
1SMB5927B	B927	11.4	12	12.6	31.2	6.5	550	0.25	1	9.1	125	
1SMB5928B	B928	12.35	13	13.65	28.8	7	550	0.25	1	9.9	115	
1SMB5929B	B929	14.25	15	15.75	25	9	600	0.25	1	11.4	100	
1SMB5930B	B930	15.2	16	16.8	23.4	10	600	0.25	1	12.2	93	
1SMB5931B	B931	17.1	18	18.9	20.8	12	650	0.25	1	13.7	83	
1SMB5932B	B932	19	20	21	18.7	14	650	0.25	1	15.2	75	
1SMB5933B	B933	20.9	22	23.1	17	17.5	650	0.25	1	16.7	68	
1SMB5934B	B934	22.8	24	25.2	15.6	19	700	0.25	1	18.2	62	
1SMB5935B	B935	25.65	27	28.35	13.9	23	700	0.25	1	20.6	55	
1SMB5936B	B936	28.5	30	31.5	12.5	28	750	0.25	1	22.8	50	
1SMB5937B	B937	31.35	33	34.65	11.4	33	800	0.25	1	25.1	45	
1SMB5938B	B938	34.2	36	37.8	10.4	38	850	0.25	1	27.4	41	
1SMB5939B	B939	37.05	39	40.95	9.6	45	900	0.25	1	29.7	38	

- Notes:
- Device mounted on FR-4 PCB; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com>.
  - Short duration pulse test used to minimize self-heating effect.
  - ZENER IMPEDANCE (Z<sub>Z</sub>) DERIVATION Z<sub>ZT</sub> and Z<sub>ZK</sub> are measured by dividing the ac voltage drop across the device by the ac current applied. The specified limits are for I<sub>Z(ac)</sub> = 0.1 I<sub>Z(dc)</sub> with the ac frequency = 60 Hz.

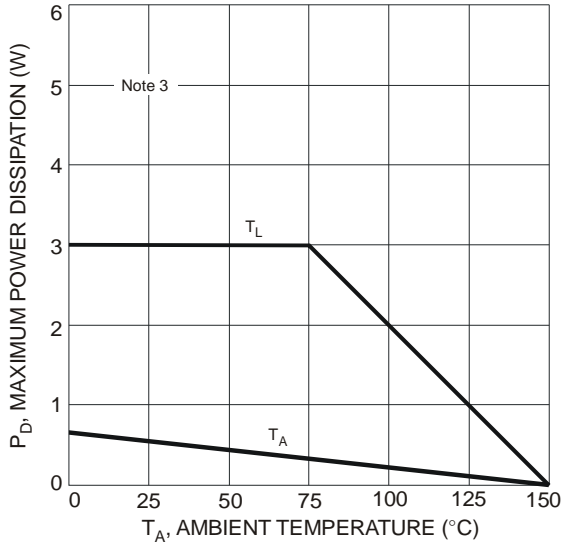


Fig. 1 Power Dissipation vs. Ambient Temperature

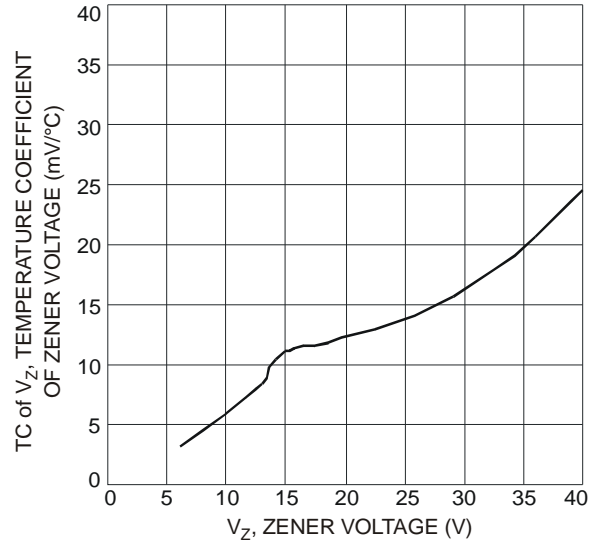


Fig. 2 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage

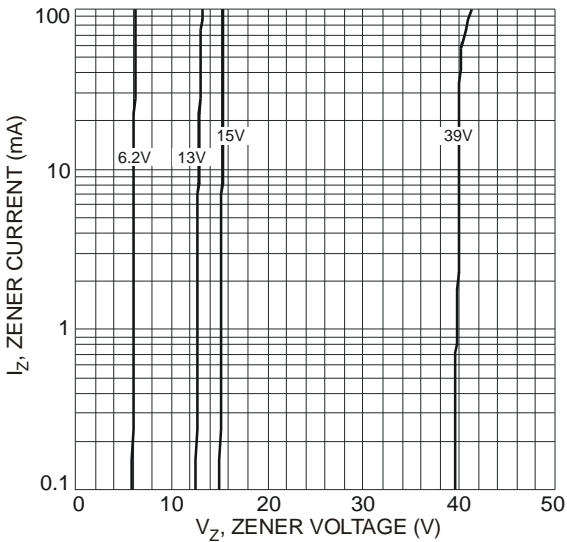


Fig. 3 Typical Zener Breakdown Characteristics

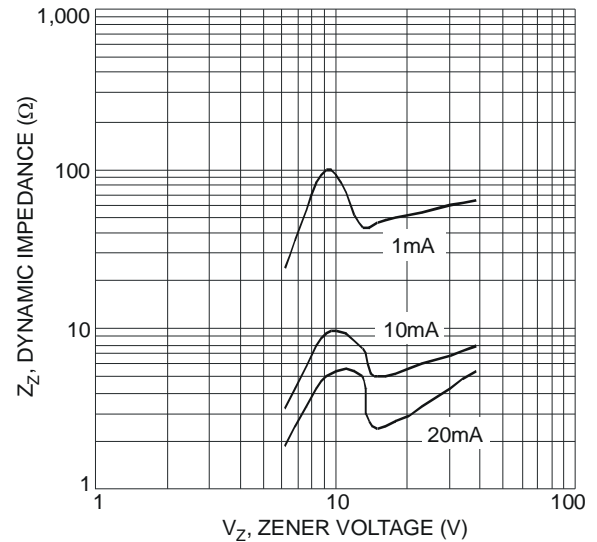


Fig. 4 Effect of Zener Voltage

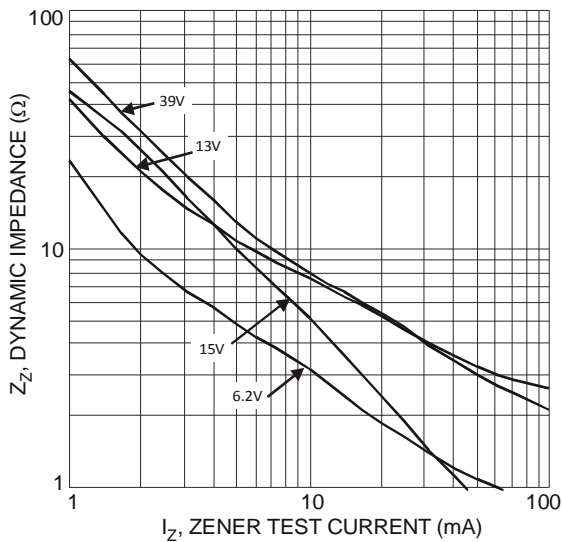


Fig. 5 Effect of Zener Current

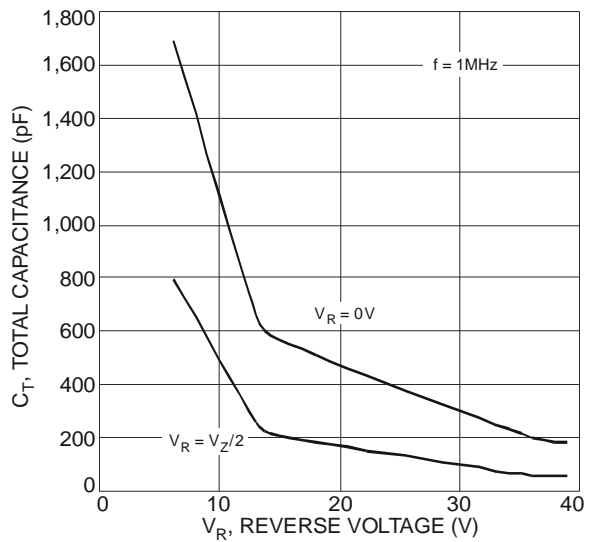
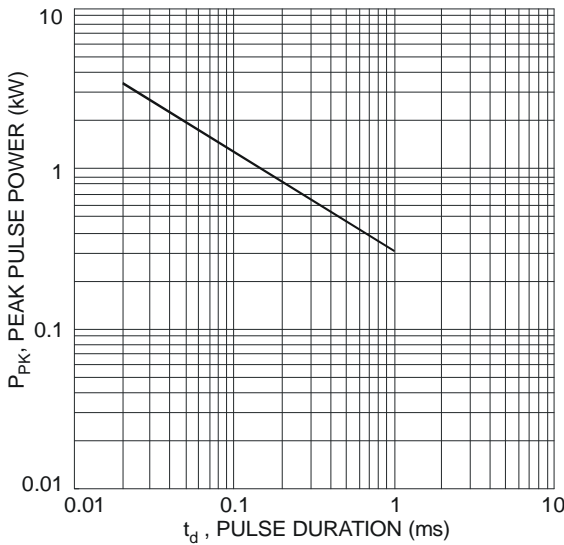
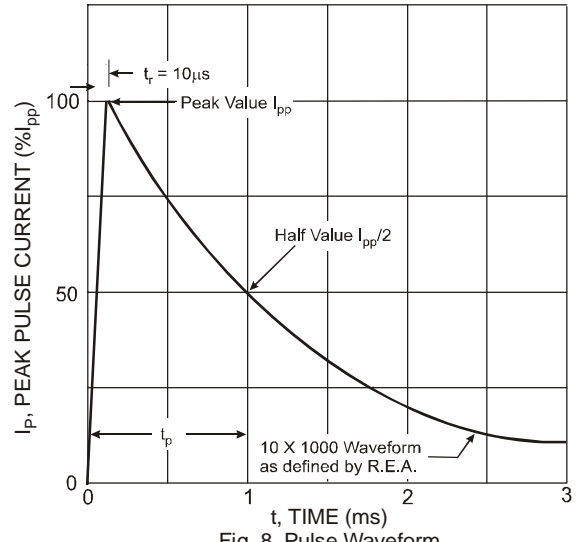
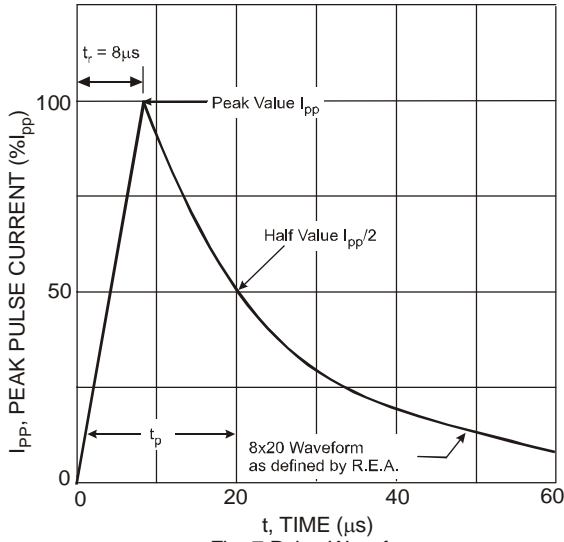
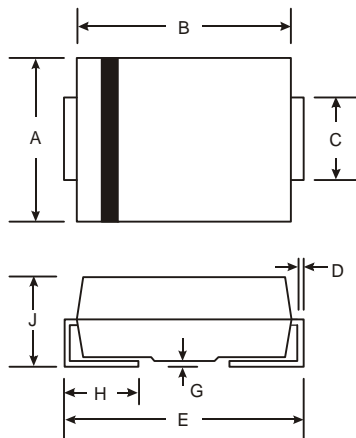


Fig. 6 Typical Total Capacitance vs. Reverse Voltage

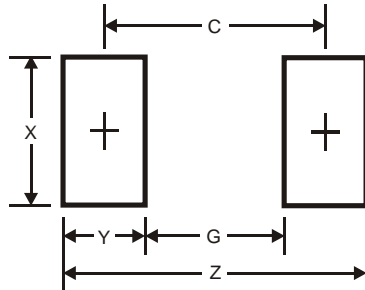


**Package Outline Dimensions**



SMB		
Dim	Min	Max
A	3.30	3.94
B	4.06	4.57
C	1.96	2.21
D	0.15	0.31
E	5.00	5.59
G	0.05	0.20
H	0.76	1.52
J	2.00	2.50
<b>All Dimensions in mm</b>		

## Suggested Pad Layout



Dimensions	Value (in mm)
Z	6.8
G	1.8
X	2.3
Y	2.5
C	4.3

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