

Features

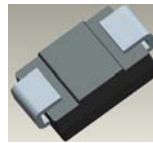
- 3.0W Power Dissipation
- Ideally Suited for Automated Assembly
- 3.3V - 39V Nominal Zener Voltage Range
- Standard V_Z Tolerance is $\pm 5\%$
- ESD Rating of Class 3 ($>16kV$) per Human Body Model
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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

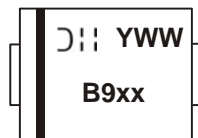
Ordering Information (Note 4)

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

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

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain $<900\text{ppm}$ bromine, $<900\text{ppm}$ chlorine ($<1500\text{ppm}$ total Br + Cl) and $<1000\text{ppm}$ antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



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

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Forward Voltage @ I _F = 200mA	V _F	1.5	V
Zener Current (see Table page 2)	I _{ZM}	P _D / V _Z	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @T _L = +75°C	P _D	3.0	W
Derate Above +75°C (Note 5)		40	mW/°C
Thermal Resistance - Junction to Terminal (Note 5)	R _{θJT}	25	°C/W
Power Dissipation @T _A = +25°C	P _D	550	mW
Derate Above +25°C (Note 5)		4.4	mW/°C
Thermal Resistance - Junction to Ambient (Note 5)	R _{θJA}	228	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Type Number	Marking Code	Zener Voltage Range (Note 6)			Test Current	Maximum Zener Impedance (Note 7)			Maximum Reverse Current (Note 6)		I _{ZM} Max	
		V _Z @ I _{ZT}				I _{ZT}	Z _{TT} @ I _{ZT}	Z _{ZK} @ I _{ZK}		I _R @ V _R		
		Min (V)	Typ (V)	Max (V)				Ω	Ω	mA		μA
1SMB5913B	B913	3.13	3.3	3.47	113.6	10	500	1	100	1	454	
1SMB5914B	B914	3.42	3.6	3.78	104.2	9	500	1	75	1	416	
1SMB5915B	B915	3.7	3.9	4.1	96.1	7.5	500	1	25	1	384	
1SMB5916B	B916	4.08	4.3	4.52	87.2	6	500	1	5	1	348	
1SMB5917B	B917	4.46	4.7	4.94	79.8	5	500	1	5	1.5	319	
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: 5. 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>.
6. Short duration pulse test used to minimize self-heating effect.
7. ZENER IMPEDANCE (Z_Z) DERIVATION Z_{TT} and Z_{ZK} are measured 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 = 60 Hz.

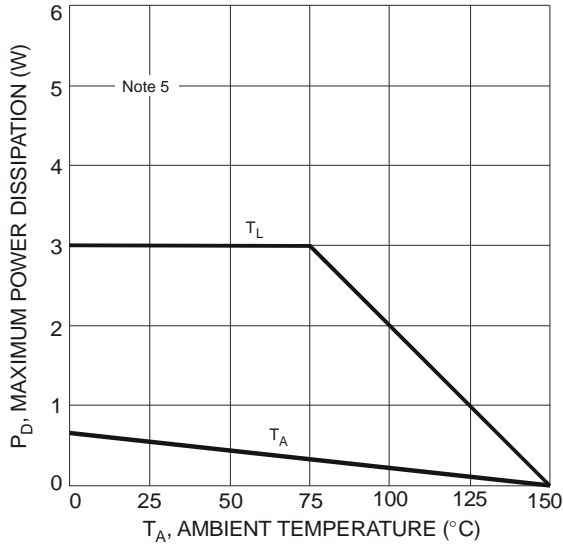


Figure 1 Power Dissipation vs. Ambient Temperature

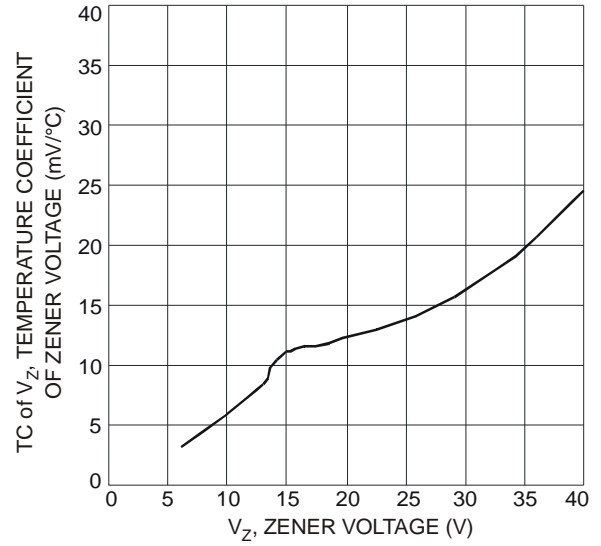


Figure 2 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage

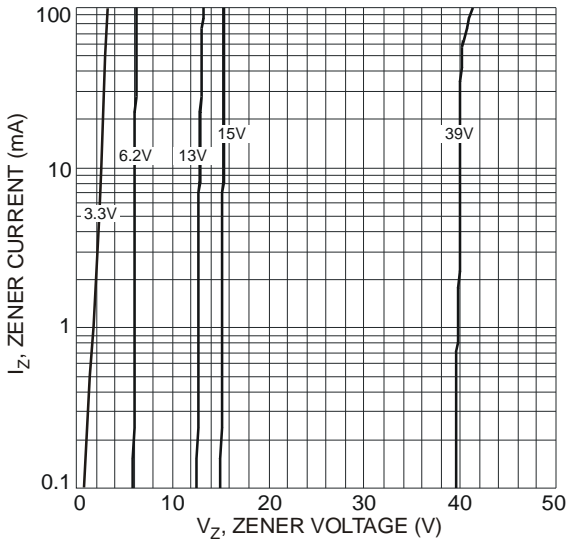


Figure 3 Typical Zener Breakdown Characteristics

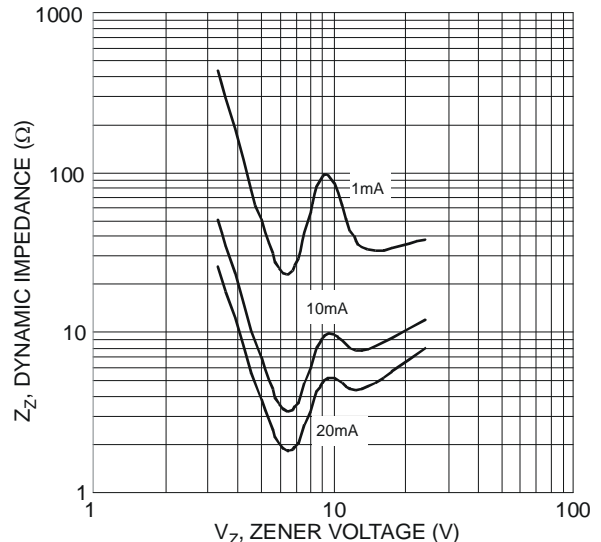


Figure 4 Effect of Zener Voltage

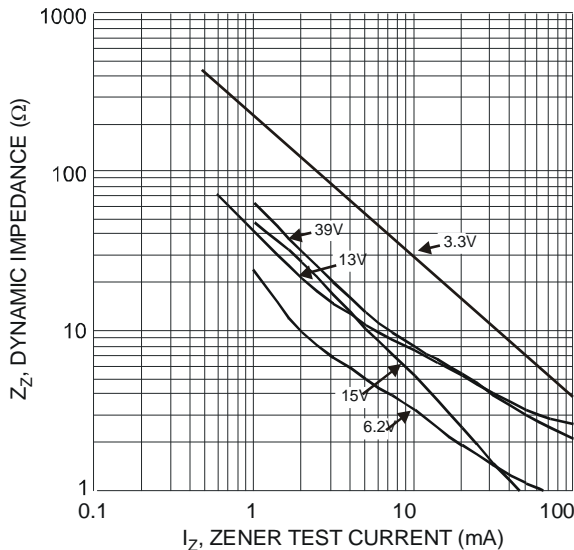


Figure 5 Effect of Zener Current

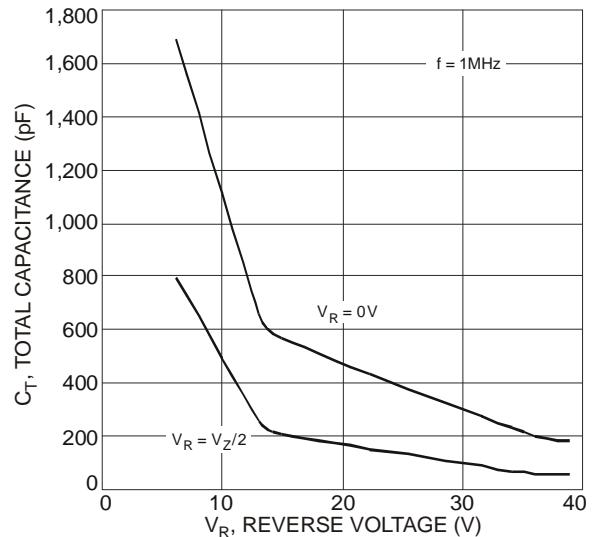


Figure 6 Typical Total Capacitance vs. Reverse Voltage

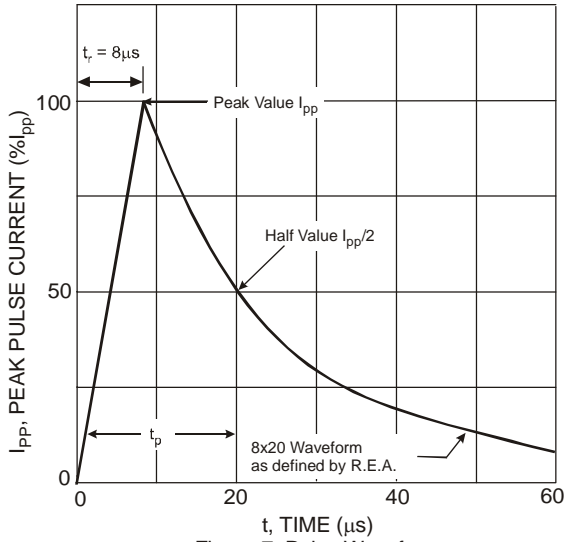


Figure 7 Pulse Waveform

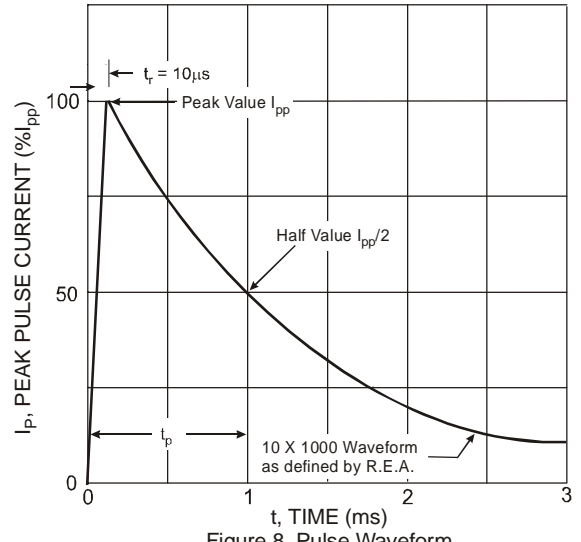


Figure 8 Pulse Waveform

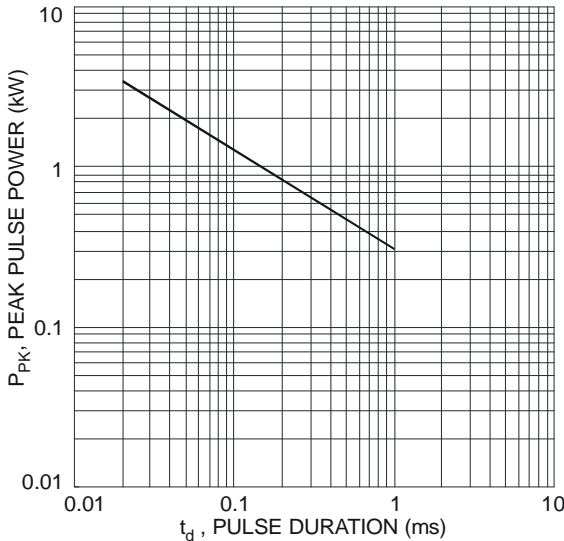
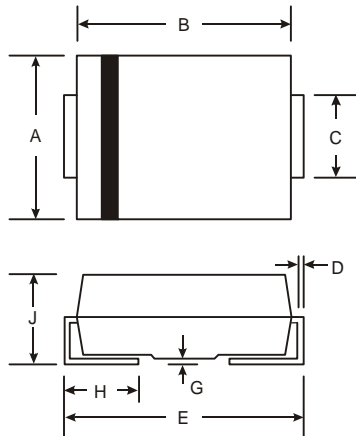


Figure 9 Max. Peak Pulse Power vs. Pulse Duration

Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

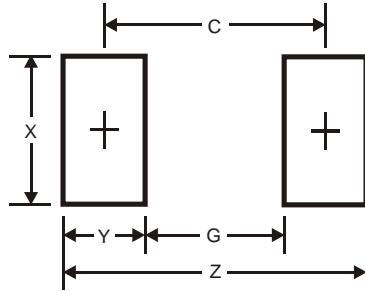


SMB		
Dim	Min	Max
A	3.30	3.94
B	4.06	4.57
C	1.96	2.21
D	0.15	0.31
E	5.00	5.59
G	0.05	0.20
H	0.76	1.52
J	2.00	2.50

All Dimensions in mm

Suggested Pad Layout

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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

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