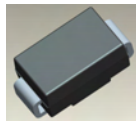


Features

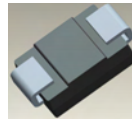
- 3.0W Power Dissipation
- Ideally Suited for Automated Assembly
- 6.2V - 39V Nominal Zener Voltage Range
- Standard V_Z Tolerance is $\pm 5\%$
- ESD Rating of Class 3 ($>16kV$) per Human Body Model
- **Lead Free Finish/RoHS Compliant (Note 1)**
- **Green Molding Compound (No Halogen and Antimony)**

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

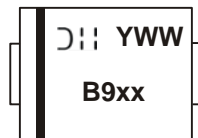
Ordering Information (Note 2)

| 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_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 2) | | 40 | mW/°C |
| Thermal Resistance - Junction to Terminal (Note 2) | R _{θJT} | 25 | °C/W |
| Power Dissipation @T _A = 25°C | P _D | 550 | mW |
| Derate Above 25°C (Note 2) | | 4.4 | mW/°C |
| Thermal Resistance - Junction to Ambient (Note 2) | 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 4) | | | Test Current | Maximum Zener Impedance (Note 5) | | | Maximum Reverse Current (Note 4) | | I _{ZM} Max | |
|-------------|--------------|----------------------------------|---------|---------|--------------|----------------------------------|-----------------------------------|-----------------------------------|----------------------------------|---------------------------------|---------------------|----|
| | | V _Z @ I _{ZT} | | | | I _{ZT} | Z _{ZT} @ I _{ZT} | Z _{ZK} @ I _{ZK} | | I _R @ V _R | | |
| | | 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_Z) DERIVATION Z_{ZT} 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.

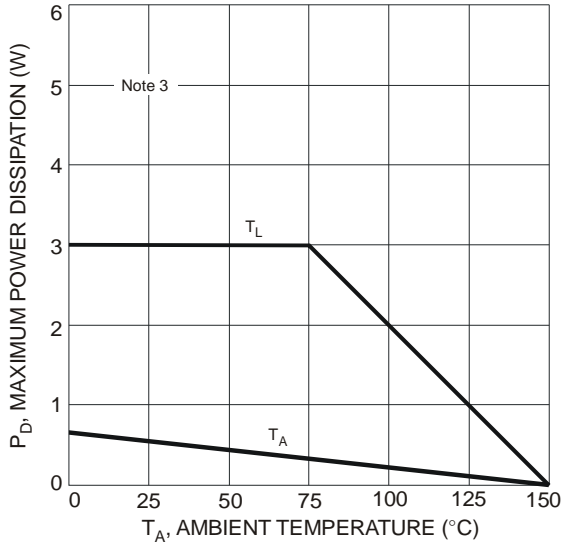


Fig. 1 Power Dissipation vs. Ambient Temperature

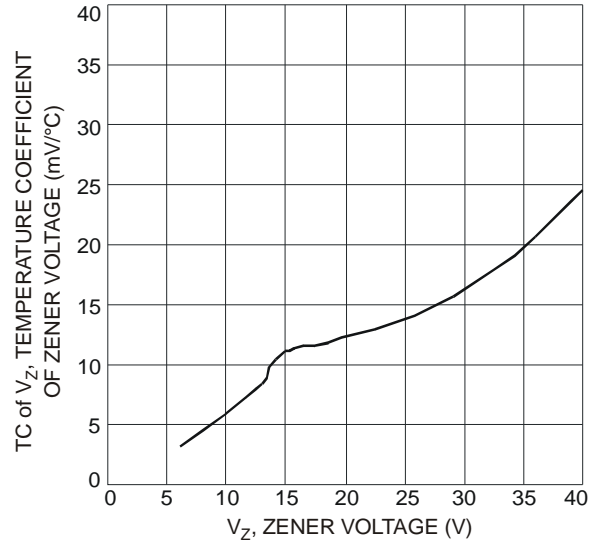


Fig. 2 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage

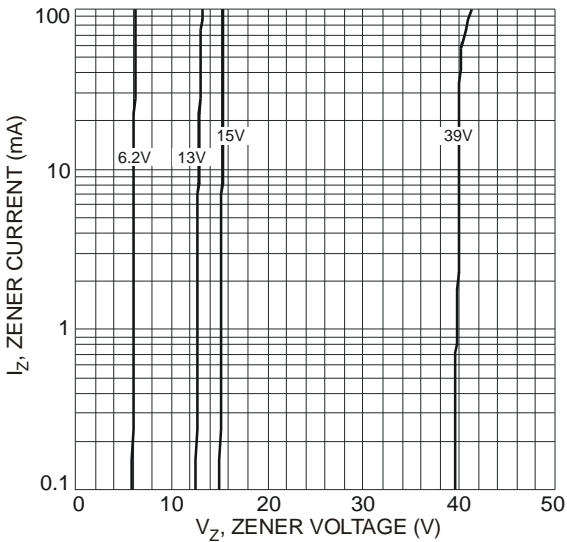


Fig. 3 Typical Zener Breakdown Characteristics

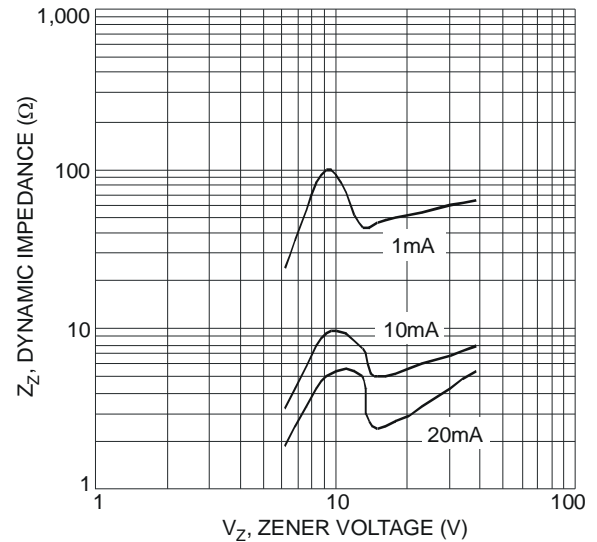


Fig. 4 Effect of Zener Voltage

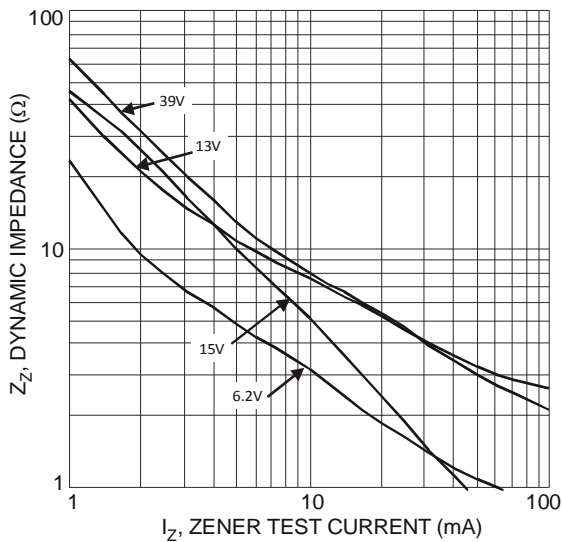


Fig. 5 Effect of Zener Current

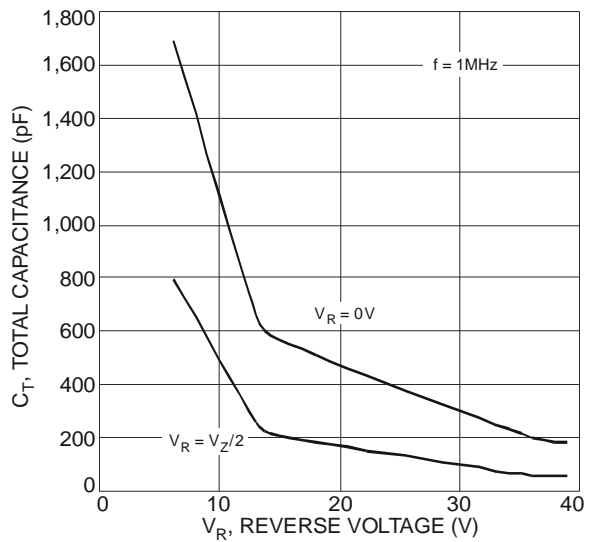


Fig. 6 Typical Total Capacitance vs. Reverse Voltage

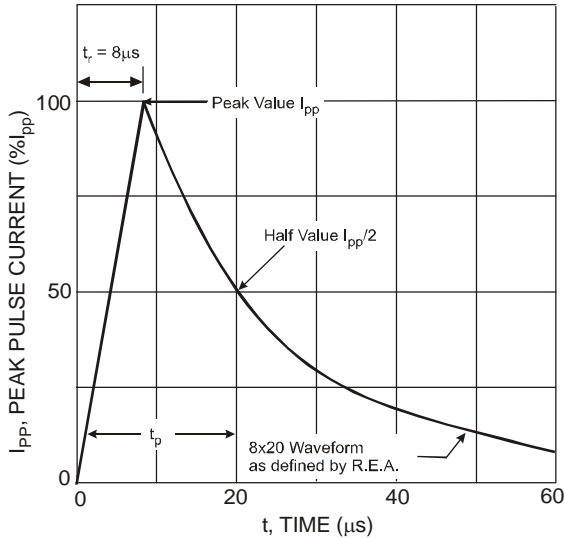


Fig. 7 Pulse Waveform

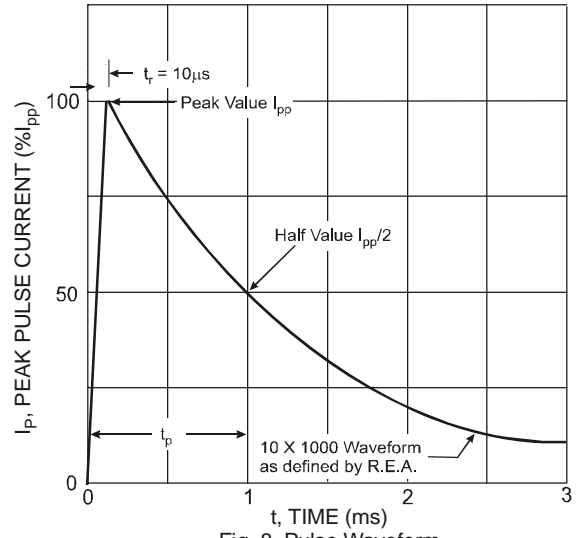


Fig. 8 Pulse Waveform

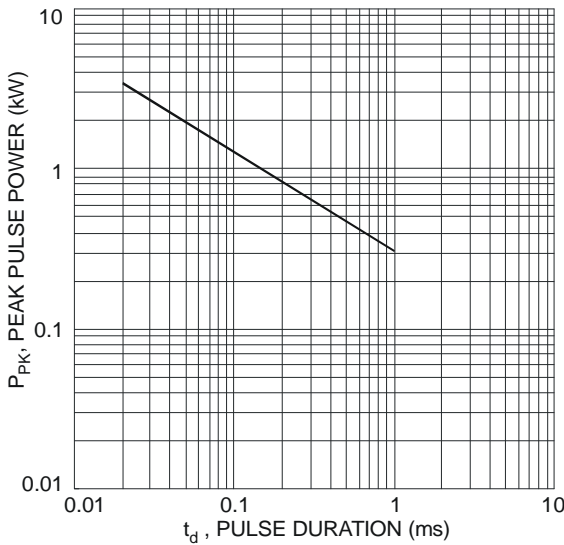
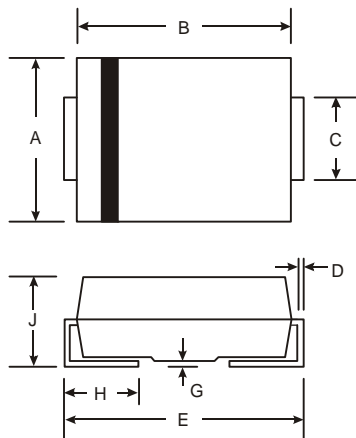


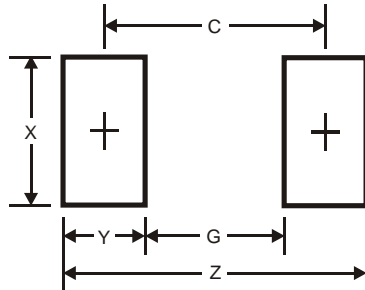
Fig. 9 Max. Peak Pulse Power vs. Pulse Duration

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 |
| All Dimensions in mm | | |

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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