

### SMB



**Marking:** 9XXB

XX : 13 To 56

### Features

- $P_d$  3.0W
- $V_z$  3.3V-200V
- Glass passivated chip
- The marking bar indicates the cathode

### Limiting Values(Absolute Maximum Rating)

| Item                                             | Symbol         | Unit               | Conditions               | Max        |
|--------------------------------------------------|----------------|--------------------|--------------------------|------------|
| Power dissipation                                | $P_d$          | W                  | $T_L=75^{\circ}\text{C}$ | 3          |
| Zener current                                    | $I_z$          | mA                 |                          | $P_v/V_z$  |
| Operation Junction and Storage Temperature Range | $T_J, T_{stg}$ | $^{\circ}\text{C}$ |                          | -55 ~ +150 |

### Electrical Characteristics ( $T_a=25^{\circ}\text{C}$ Unless otherwise specified)

| Item               | Symbol          | Unit                 | Conditions                  | Max |
|--------------------|-----------------|----------------------|-----------------------------|-----|
| Thermal resistance | $R_{\theta JA}$ | $^{\circ}\text{C/W}$ | Between junction to ambient | 226 |
|                    | $R_{\theta JL}$ | $^{\circ}\text{C/W}$ | Between junction to lead    | 25  |
| Forward voltage    | $V_F$           | V                    | $I_F=200\text{mA}$          | 1.5 |

**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

| Number    | Code | Zener Voltage |     |       |       | Zener Impedance |           |      | Leakage Current |       | IZM    |
|-----------|------|---------------|-----|-------|-------|-----------------|-----------|------|-----------------|-------|--------|
|           |      | VZ (Volts)    |     |       | @ IZT | ZZT @ IZT       | ZZK @ IZK |      | IR @ VR         |       |        |
|           |      | Min           | Nom | Max   | mA    | Ω               | Ω         | mA   | μA              | Volts | mA(dc) |
| 1SMB5913B | 913B | 3.13          | 3.3 | 3.47  | 113.6 | 10              | 500       | 1    | 100             | 1     | 454    |
| 1SMB5914B | 914B | 3.42          | 3.6 | 3.78  | 104.2 | 9               | 500       | 1    | 75              | 1     | 416    |
| 1SMB5915B | 915B | 3.70          | 3.9 | 4.10  | 96.1  | 7.5             | 500       | 1    | 25              | 1     | 384    |
| 1SMB5916B | 916B | 4.08          | 4.3 | 4.52  | 87.2  | 6               | 500       | 1    | 5               | 1     | 348    |
| 1SMB5917B | 917B | 4.46          | 4.7 | 4.94  | 79.8  | 5               | 500       | 1    | 5               | 1.5   | 319    |
| 1SMB5918B | 918B | 4.84          | 5.1 | 5.36  | 73.5  | 4               | 350       | 1    | 5               | 2     | 294    |
| 1SMB5919B | 919B | 5.32          | 5.6 | 5.88  | 66.9  | 2               | 250       | 1    | 5               | 3     | 267    |
| 1SMB5920B | 920B | 5.89          | 6.2 | 6.51  | 60.5  | 2               | 200       | 1    | 5               | 4     | 241    |
| 1SMB5921B | 921B | 6.46          | 6.8 | 7.14  | 55.1  | 2.5             | 200       | 1    | 5               | 5.2   | 220    |
| 1SMB5922B | 922B | 7.12          | 7.5 | 7.88  | 50    | 3               | 400       | 0.5  | 5               | 6     | 200    |
| 1SMB5923B | 923B | 7.79          | 8.2 | 8.61  | 45.7  | 3.5             | 400       | 0.5  | 5               | 6.5   | 182    |
| 1SMB5924B | 924B | 8.64          | 9.1 | 9.56  | 41.2  | 4               | 500       | 0.5  | 5               | 7     | 164    |
| 1SMB5925B | 925B | 9.5           | 10  | 10.5  | 37.5  | 4.5             | 500       | 0.25 | 5               | 8     | 150    |
| 1SMB5926B | 926B | 10.45         | 11  | 11.55 | 34.1  | 5.5             | 550       | 0.25 | 1               | 8.4   | 136    |
| 1SMB5927B | 927B | 11.4          | 12  | 12.6  | 31.2  | 6.5             | 550       | 0.25 | 1               | 9.1   | 125    |
| 1SMB5928B | 928B | 12.35         | 13  | 13.65 | 28.8  | 7               | 550       | 0.25 | 1               | 9.9   | 115    |
| 1SMB5929B | 929B | 14.25         | 15  | 15.75 | 25    | 9               | 600       | 0.25 | 1               | 11.4  | 100    |
| 1SMB5930B | 930B | 15.2          | 16  | 16.8  | 23.4  | 10              | 600       | 0.25 | 1               | 12.2  | 93     |
| 1SMB5931B | 931B | 17.1          | 18  | 18.9  | 20.8  | 12              | 650       | 0.25 | 1               | 13.7  | 83     |
| 1SMB5932B | 932B | 19            | 20  | 21    | 18.7  | 14              | 650       | 0.25 | 1               | 15.2  | 75     |
| 1SMB5933B | 933B | 20.9          | 22  | 23.1  | 17    | 17.5            | 650       | 0.25 | 1               | 16.7  | 68     |
| 1SMB5934B | 934B | 22.8          | 24  | 25.2  | 15.6  | 19              | 700       | 0.25 | 1               | 18.2  | 62     |
| 1SMB5935B | 935B | 25.65         | 27  | 28.35 | 13.9  | 23              | 700       | 0.25 | 1               | 20.6  | 55     |
| 1SMB5936B | 936B | 28.5          | 30  | 31.5  | 12.5  | 28              | 750       | 0.25 | 1               | 22.8  | 50     |
| 1SMB5937B | 937B | 31.35         | 33  | 34.65 | 11.4  | 33              | 800       | 0.25 | 1               | 25.1  | 45     |
| 1SMB5938B | 938B | 34.2          | 36  | 37.8  | 10.4  | 38              | 850       | 0.25 | 1               | 27.4  | 41     |
| 1SMB5939B | 939B | 37.05         | 39  | 40.95 | 9.6   | 45              | 900       | 0.25 | 1               | 29.7  | 38     |
| 1SMB5940B | 940B | 40.85         | 43  | 45.15 | 8.7   | 53              | 950       | 0.25 | 1               | 32.7  | 34     |
| 1SMB5941B | 941B | 44.65         | 47  | 49.35 | 8     | 67              | 1000      | 0.25 | 1               | 35.8  | 31     |
| 1SMB5942B | 942B | 48.45         | 51  | 53.55 | 7.3   | 70              | 1100      | 0.25 | 1               | 38.8  | 29     |
| 1SMB5943B | 943B | 53.2          | 56  | 58.8  | 6.7   | 86              | 1300      | 0.25 | 1               | 42.6  | 26     |
| 1SMB5944B | 944B | 58.9          | 62  | 65.1  | 6     | 100             | 1500      | 0.25 | 1               | 47.1  | 24     |
| 1SMB5945B | 945B | 64.6          | 68  | 71.4  | 5.5   | 120             | 1700      | 0.25 | 1               | 51.7  | 22     |
| 1SMB5946B | 946B | 71.25         | 75  | 78.75 | 5     | 140             | 2000      | 0.25 | 1               | 56    | 20     |
| 1SMB5947B | 947B | 77.9          | 82  | 86.1  | 4.6   | 160             | 2500      | 0.25 | 1               | 62.2  | 18     |
| 1SMB5948B | 948B | 86.45         | 91  | 95.55 | 4.1   | 200             | 3000      | 0.25 | 1               | 69.2  | 16     |
| 1SMB5949B | 949B | 95            | 100 | 105   | 3.7   | 250             | 3100      | 0.25 | 1               | 76    | 15     |
| 1SMB5950B | 950B | 104.5         | 110 | 115.5 | 3.4   | 300             | 4000      | 0.25 | 1               | 83.6  | 13     |
| 1SMB5951B | 951B | 114           | 120 | 126   | 3.1   | 380             | 4500      | 0.25 | 1               | 91.2  | 12     |
| 1SMB5952B | 952B | 123.5         | 130 | 136.5 | 2.9   | 450             | 5000      | 0.25 | 1               | 98.8  | 11     |
| 1SMB5953B | 953B | 142.5         | 150 | 157.5 | 2.5   | 600             | 6000      | 0.25 | 1               | 114   | 10     |
| 1SMB5954B | 954B | 152           | 160 | 168   | 2.3   | 700             | 6500      | 0.25 | 1               | 121.6 | 9      |
| 1SMB5955B | 955B | 171           | 180 | 189   | 2.1   | 900             | 7000      | 0.25 | 1               | 136.8 | 8      |
| 1SMB5956B | 956B | 190           | 200 | 210   | 1.9   | 1200            | 8000      | 0.25 | 1               | 152   | 7      |

## Typical Characteristics

Figure 1. Steady State Power Derating

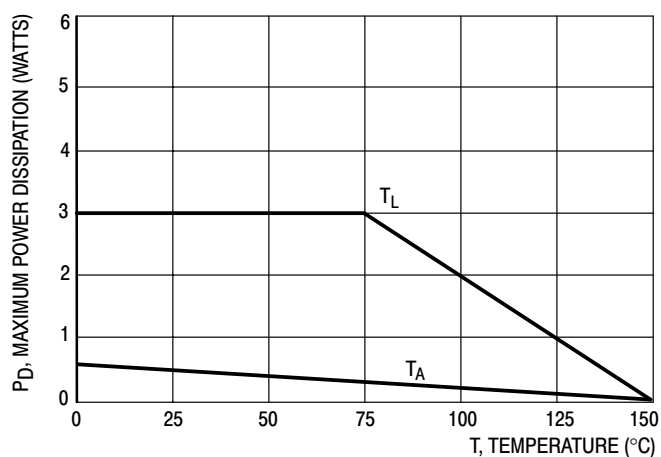


Figure 2. Maximum Surge Power

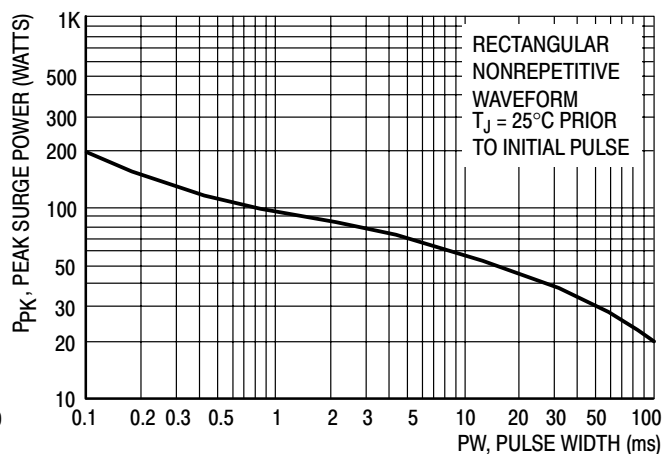


Figure 3. Zener Voltage – To 12 Volts

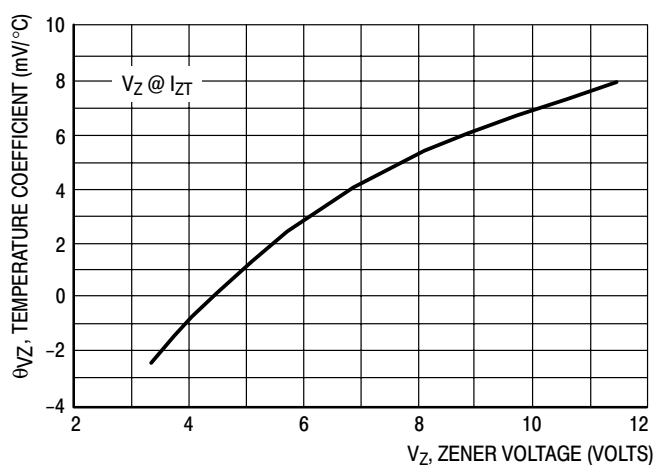


Figure 4. Zener Voltage – 14 To 200 Volts

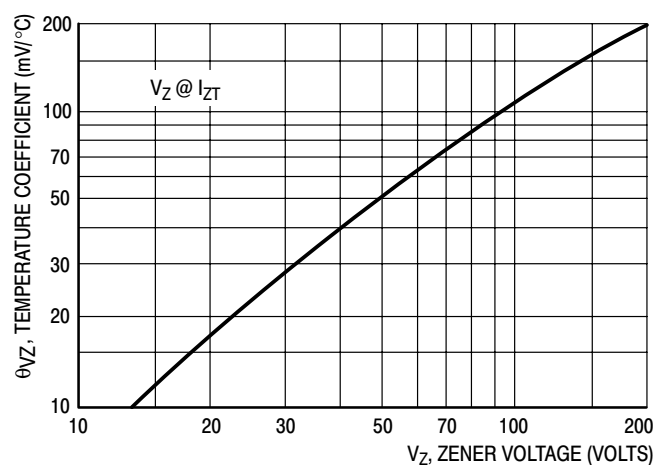


Figure 5.  $V_Z = 3.3$  thru 10 Volts

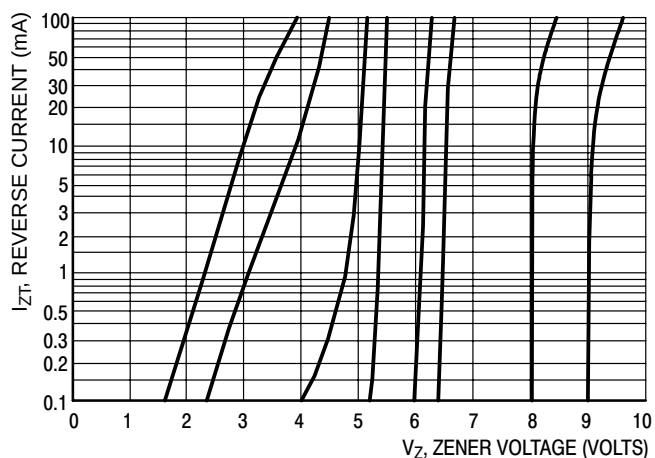
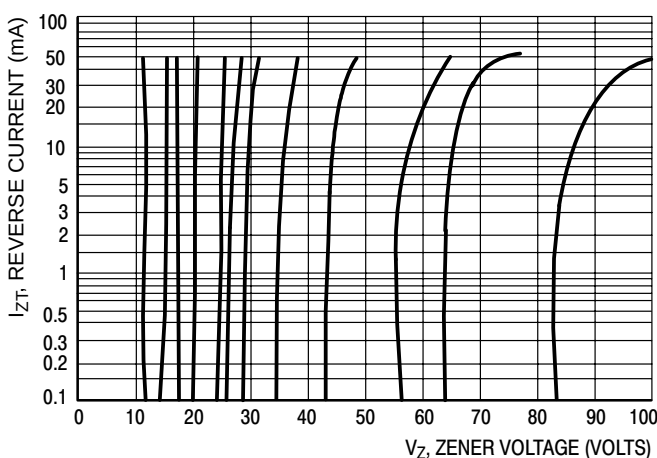
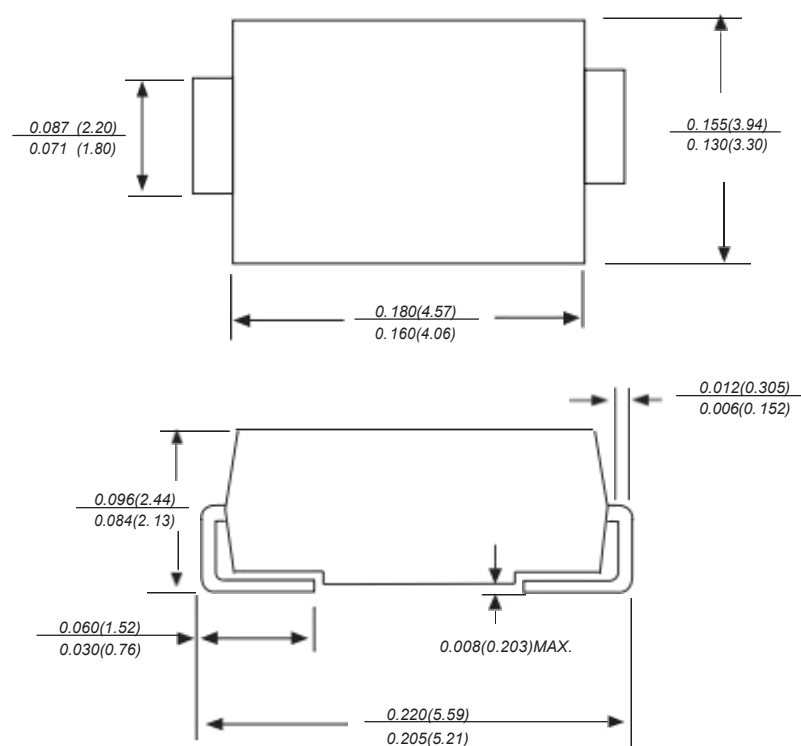


Figure 6.  $V_Z = 12$  thru 82 Volts

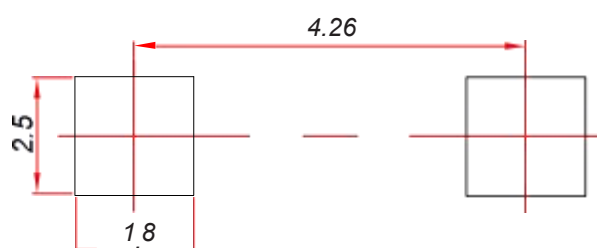


## SMB Package outline Dimensions



Dimensions in inches and (millimeters)

## SMB Suggested pad Layout



### Note:

1. Controlling dimension: In millimeters.
2. General tolerance:  $\pm 0.05$ mm.
3. The pad layout is for reference purposes only.