

## 3.0W Surface Mount Zener Diodes - 6.8V-200V

### Features

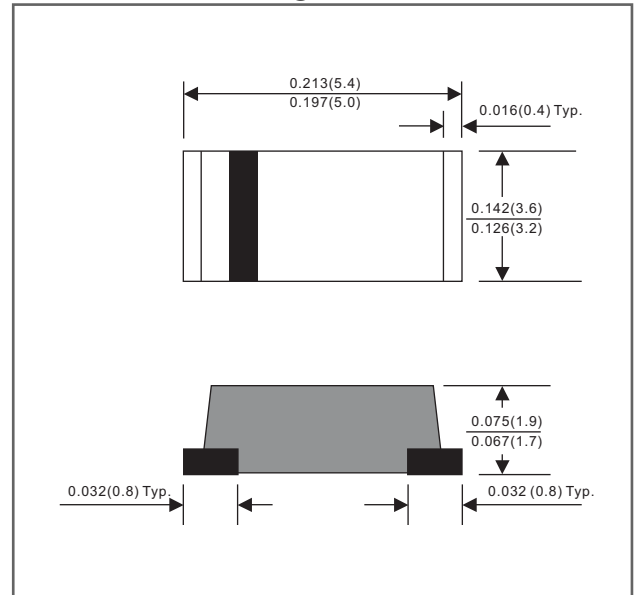
- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance.
- Glass passivated chip junction.
- Typical IR less than 0.5 $\mu$ A above 200V.
- Standard zener voltage tolerance  $\pm$ 5%.
- Low inductance.
- Low profile package.
- Built-in strain relief.
- Lead-free parts meet environmental standards of MIL-STD-19500/228
- Suffix "-H" indicates Halogen free parts, ex. 1SMB3V6.8BG-H.

### Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AA/SMB
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight :Approximated 0.09 gram

### Package outline

#### SMB



Dimensions in inches and (millimeters)

### Maximum ratings (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

| PARAMETER             | CONDITIONS  | Symbol    | MIN. | TYP. | MAX. | UNIT               |
|-----------------------|---|-----------|------|------|------|--------------------|
| Forward voltage       | $I_F = 200 \text{ mAdc}$  | $V_F$     |      |      | 1.20 | V                  |
| Power Dissipation     | $T_L = 50^{\circ}\text{C}$ (Note 1)                                   | $P_D$     |      |      | 3.0  | W                  |
| Forward surge current | 8.3ms single half sine-wave superimposed on rate load (JEDEC methode) | $I_{FSM}$ |      |      | 15   | A                  |
| Operating temperature |   | $T_J$     | -55  |      | +150 | $^{\circ}\text{C}$ |
| Storage temperature   |   | $T_{STG}$ | -65  |      | +175 | $^{\circ}\text{C}$ |

Note.1 Mounted on 11 x 11mm FR-4 or FR-5 Board

### Thermal haracteristics

| PARAMETER                                      | Symbol          | Limit | UNIT                 |
|--|-----------------|-------|----------------------|
| Typical thermal resistance junction to ambient | $R_{\theta JA}$ | 85    | $^{\circ}\text{C/W}$ |



# 1SMB3V6.8BG THRU 1SMB3V200BG

## Electrical characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

| Part No.    | Zener voltage          |      |       | Test current | Zener impedance   |                   |          | Leakage current        |       |
|-------------|------------------------|------|-------|--------------|-------------------|-------------------|----------|------------------------|-------|
|             | $V_Z @ I_{ZT}$ (Volts) |      |       | $I_{ZT}$     | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK}$ | $I_{ZK}$ | $I_R$                  | $V_R$ |
|             | Min.                   | Nom. | Max.  | mA           | Max. ( $\Omega$ ) | Max. ( $\Omega$ ) | mA       | Max. ( $\mu\text{A}$ ) | Volts |
| 1SMB3V6.8BG | 6.46                   | 6.8  | 7.14  | 110          | 2.0               | 700               | 1.00     | 5.0                    | 4.0   |
| 1SMB3V7.5BG | 7.13                   | 7.5  | 7.88  | 100          | 2.0               | 700               | 0.50     | 5.0                    | 5.0   |
| 1SMB3V8.2BG | 7.79                   | 8.2  | 8.61  | 91           | 2.0               | 700               | 0.50     | 5.0                    | 6.0   |
| 1SMB3V8.7BG | 8.27                   | 8.7  | 9.14  | 85           | 2.0               | 700               | 0.50     | 4.0                    | 6.6   |
| 1SMB3V9.1BG | 8.65                   | 9.1  | 9.56  | 82           | 3.0               | 700               | 0.50     | 3.0                    | 7.0   |
| 1SMB3V10BG  | 9.50                   | 10   | 10.50 | 75           | 4.0               | 700               | 0.50     | 3.0                    | 7.6   |
| 1SMB3V11BG  | 10.45                  | 11   | 11.55 | 68           | 4.0               | 700               | 0.25     | 1.0                    | 8.4   |
| 1SMB3V12BG  | 11.40                  | 12   | 12.60 | 63           | 4.5               | 700               | 0.25     | 1.0                    | 9.1   |
| 1SMB3V13BG  | 12.35                  | 13   | 13.65 | 58           | 5.0               | 700               | 0.25     | 0.5                    | 9.9   |
| 1SMB3V15BG  | 14.25                  | 15   | 15.75 | 50           | 7.0               | 700               | 0.25     | 0.5                    | 11.4  |
| 1SMB3V16BG  | 15.20                  | 16   | 16.80 | 47           | 8.0               | 700               | 0.25     | 0.5                    | 12.2  |
| 1SMB3V18BG  | 17.10                  | 18   | 18.90 | 42           | 10.0              | 750               | 0.25     | 0.5                    | 13.7  |
| 1SMB3V20BG  | 19.00                  | 20   | 21.00 | 37           | 11.0              | 750               | 0.25     | 0.5                    | 15.2  |
| 1SMB3V22BG  | 20.90                  | 22   | 23.10 | 34           | 12.0              | 750               | 0.25     | 0.5                    | 16.7  |
| 1SMB3V24BG  | 22.80                  | 24   | 25.20 | 31           | 13.0              | 750               | 0.25     | 0.5                    | 18.2  |
| 1SMB3V27BG  | 25.65                  | 27   | 28.35 | 28           | 18.0              | 750               | 0.25     | 0.5                    | 20.6  |
| 1SMB3V30BG  | 28.50                  | 30   | 31.50 | 25           | 20.0              | 1000              | 0.25     | 0.5                    | 22.8  |
| 1SMB3V33BG  | 31.35                  | 33   | 34.65 | 23           | 23.0              | 1000              | 0.25     | 0.5                    | 25.4  |
| 1SMB3V36BG  | 34.20                  | 36   | 37.80 | 21           | 25.0              | 1000              | 0.25     | 0.5                    | 27.4  |
| 1SMB3V39BG  | 37.05                  | 39   | 40.95 | 19           | 30.0              | 1500              | 0.25     | 0.5                    | 29.7  |
| 1SMB3V43BG  | 40.85                  | 43   | 45.15 | 17           | 35.0              | 1500              | 0.25     | 0.5                    | 32.7  |
| 1SMB3V47BG  | 44.65                  | 47   | 49.35 | 16           | 40.0              | 1500              | 0.25     | 0.5                    | 35.8  |
| 1SMB3V51BG  | 48.45                  | 51   | 53.55 | 15           | 48.0              | 1500              | 0.25     | 0.5                    | 38.8  |
| 1SMB3V56BG  | 53.20                  | 56   | 58.80 | 13           | 55.0              | 2000              | 0.25     | 0.5                    | 42.6  |
| 1SMB3V62BG  | 58.90                  | 62   | 65.10 | 12           | 60.0              | 2000              | 0.25     | 0.5                    | 47.1  |
| 1SMB3V68BG  | 64.60                  | 68   | 71.40 | 11           | 75.0              | 2000              | 0.25     | 0.5                    | 51.7  |
| 1SMB3V75BG  | 71.25                  | 75   | 78.75 | 10           | 90.0              | 2000              | 0.25     | 0.5                    | 56.0  |
| 1SMB3V82BG  | 77.90                  | 82   | 86.10 | 9.1          | 100               | 3000              | 0.25     | 0.5                    | 62.2  |
| 1SMB3V91BG  | 86.45                  | 91   | 95.55 | 8.2          | 125               | 3000              | 0.25     | 0.5                    | 69.2  |
| 1SMB3V100BG | 95.00                  | 100  | 105.0 | 7.5          | 175               | 3000              | 0.25     | 0.5                    | 76.0  |
| 1SMB3V110BG | 104.50                 | 110  | 115.5 | 6.8          | 250               | 4000              | 0.25     | 0.5                    | 83.6  |
| 1SMB3V120BG | 114.00                 | 120  | 126.0 | 6.3          | 325               | 4500              | 0.25     | 0.5                    | 91.2  |
| 1SMB3V130BG | 123.50                 | 130  | 136.5 | 5.8          | 400               | 5000              | 0.25     | 0.5                    | 98.8  |
| 1SMB3V150BG | 142.50                 | 150  | 157.5 | 5.0          | 575               | 6000              | 0.25     | 0.5                    | 114.0 |
| 1SMB3V160BG | 152.00                 | 160  | 168.0 | 4.7          | 650               | 6500              | 0.25     | 0.5                    | 121.6 |
| 1SMB3V180BG | 171.00                 | 180  | 189.0 | 4.2          | 725               | 7000              | 0.25     | 0.5                    | 136.8 |
| 1SMB3V200BG | 190.00                 | 200  | 210.0 | 3.7          | 900               | 8000              | 0.25     | 0.5                    | 152.0 |

Note : 20% tolerance of Zener voltage for no suffix ex: 1SMB3V6.8 is 6.8V 20%  
 10% tolerance of Zener voltage for suffix "A" ex: 1SMB3V6.8A is 6.8V 10%  
 5% tolerance of Zener voltage for suffix "B" ex: 1SMB3V6.8B is 6.8V 5%  
 2% tolerance of Zener voltage for suffix "C" ex: 1SMB3V6.8C is 6.8V 2%



## Rating and characteristic curves

FIG.1 Typical Thermal Response L

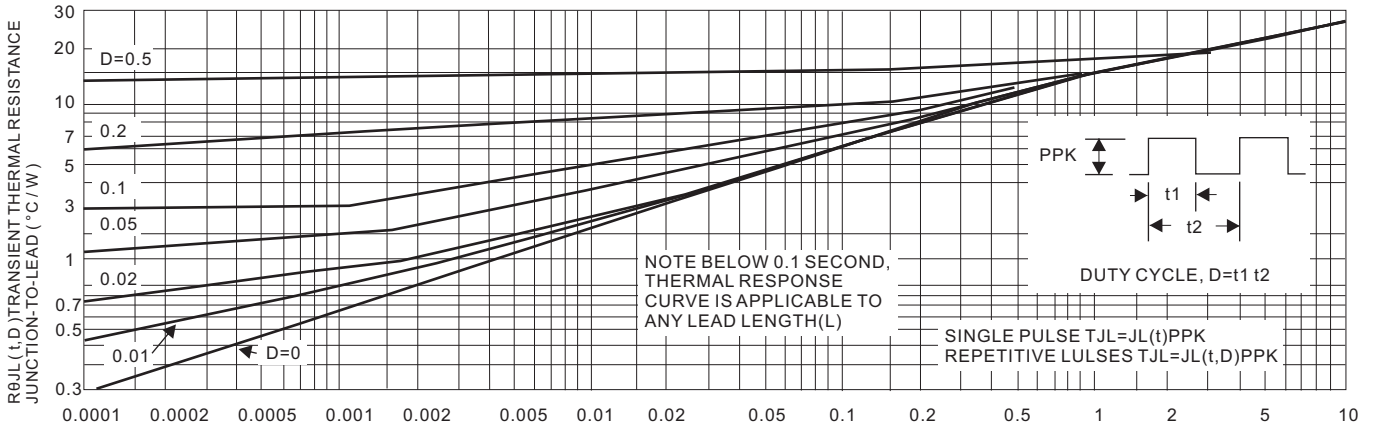


FIG. 2 Maximum Surge Power

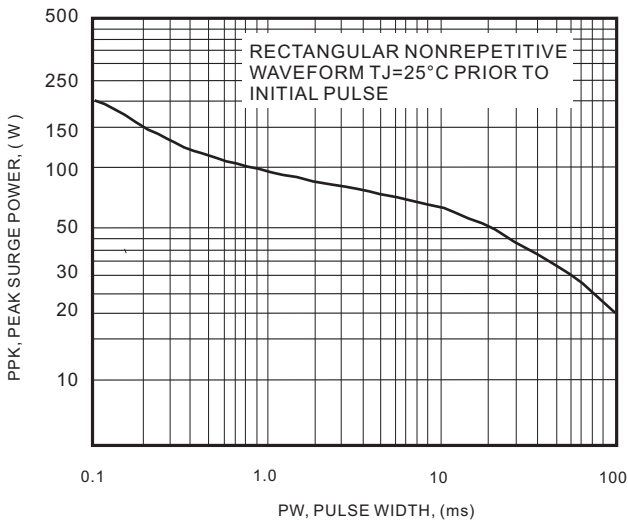


FIG. 3 Maximum Surge Power

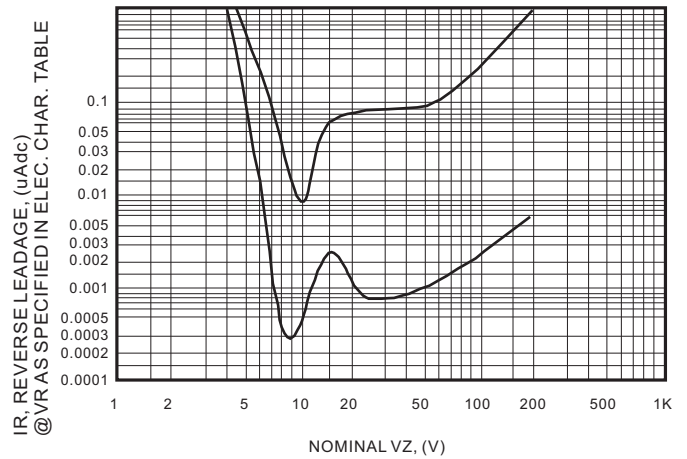


FIG.4 Units To 12 Volts

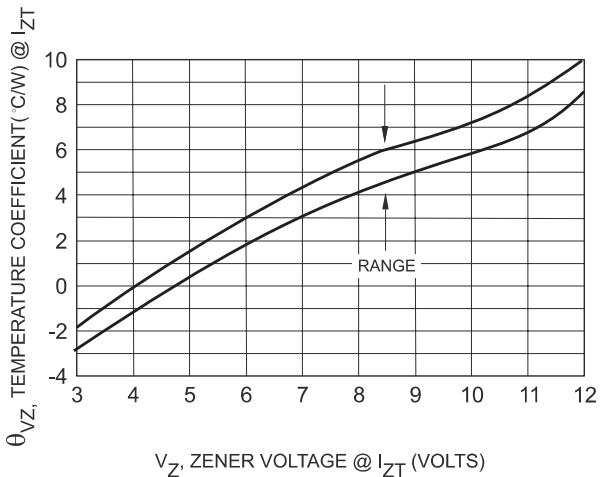
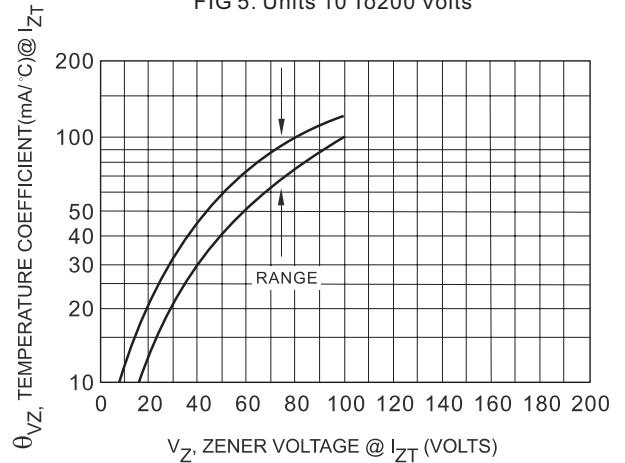


FIG 5. Units 10 To200 Volts



## Rating and characteristic curves

FIG.6 VZ = 3.9 Thru 10 Volts

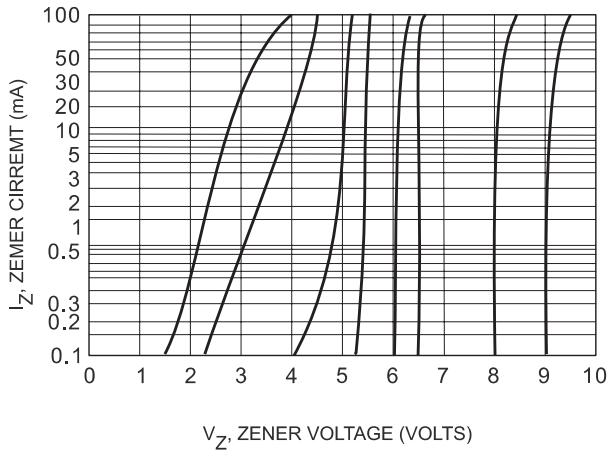


FIG.7 VZ = 12 Thru 82 Volts

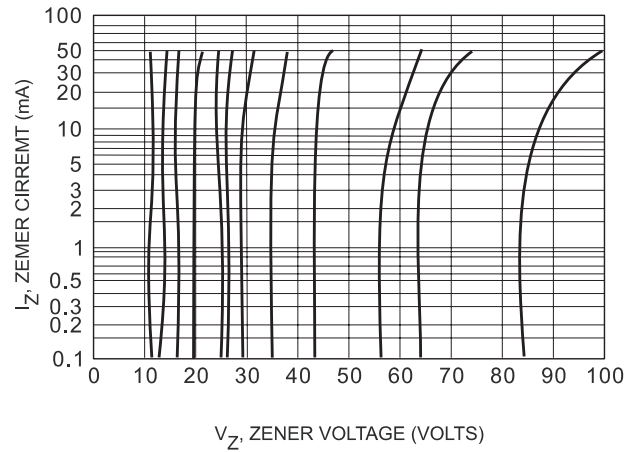


FIG. 8 Typical Thermal Resistance

