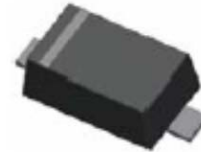


**Small Signal Product**

**500mW, 2% Tolerance SMD Zener Diode**

**FEATURES**

- Wide zener voltage range selection : 2.4V to 75V
- Surface Mount Device Type
- Moisture sensitivity level 1
- Pb free and RoHS compliant
- Green compound (Halogen free) with suffix "G" on packing code and prefix "G" on date code
- Ideal for Surface Mounted Applications
- $V_Z$  Tolerance Selection of  $\pm 2\%$
- Matte Tin(Sn) lead finish with Nickel(Ni) underplate



**SOD-123F**



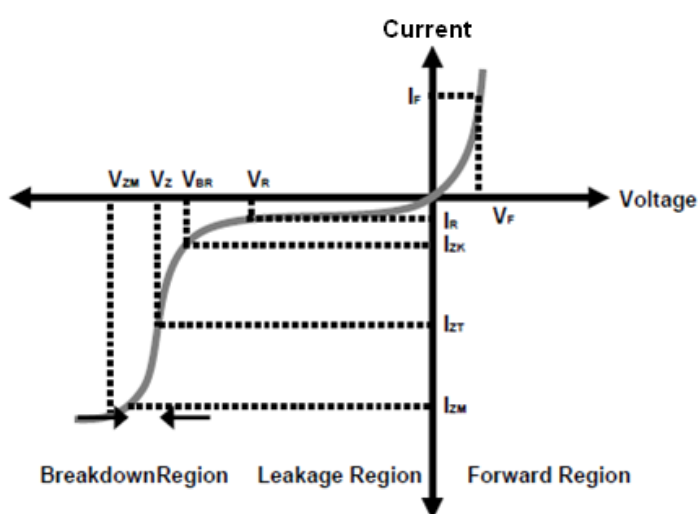
**MECHANICAL DATA**

- Case: Flat lead SOD-123 small outline plastic package
- Terminal: Matte tin plated, lead free, solderable per MIL-STD-202, Method 208 guaranteed
- High temperature soldering guaranteed: 260°C/10s
- Polarity: Indicated by cathode band
- Weight : 8.85  $\pm$  0.5mg

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ unless otherwise noted) |                 |               |                    |
|-------------------------------------------------------------------------------------------------|-----------------|---------------|--------------------|
| PARAMETER                                                                                       | SYMBOL          | VALUE         | UNIT               |
| Forward Voltage @ $I_F = 10\text{mA}$                                                           | $V_F$           | 1             | V                  |
| Power Dissipation                                                                               | $P_D$           | 500           | mW                 |
| Thermal Resistance from Junction to Ambient (Note 1)                                            | $R_{\theta JA}$ | 350           | $^\circ\text{C/W}$ |
| Junction Temperature                                                                            | $T_J$           | 150           | $^\circ\text{C}$   |
| Storage Temperature                                                                             | $T_{STG}$       | - 65 to + 150 | $^\circ\text{C}$   |

Notes: 1. Valid provided that electrodes are kept at ambient temperature

**ZENER I vs. V CHARACTERISTICS**



- $V_{BR}$  : Voltage at  $I_{ZK}$
- $I_{ZK}$  : Test current for voltage  $V_{BR}$
- $Z_{ZK}$  : Dynamic impedance at  $I_{ZK}$
- $I_{ZT}$  : Test current for voltage  $V_Z$
- $V_Z$  : Voltage at current  $I_{ZT}$
- $Z_{ZT}$  : Dynamic impedance at  $I_{ZT}$
- $I_{ZM}$  : Maximum steady state current
- $V_{ZM}$  : Voltage at  $I_{ZM}$

## Small Signal Product

### ELECTRICAL CHARACTERISTICS

(Ratings at TA=25°C ambient temperature unless otherwise specified, and V<sub>F</sub> Forward Voltage = 1V Maximum @ I<sub>F</sub> = 10 mA for all part numbers)

| Device Type | Marking code | Zener Voltage Range              |        |        |                 | Maximun Zener Impedance           |                                   |                 | Maximun Reverse Current |                |
|-------------|--------------|----------------------------------|--------|--------|-----------------|-----------------------------------|-----------------------------------|-----------------|-------------------------|----------------|
|             |              | 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>ZK</sub> | I <sub>R</sub>          | V <sub>R</sub> |
|             |              | Min(V)                           | Nom(V) | Max(V) | mA              | Ohm                               |                                   | mA              | uA                      | V              |
| BZT52B2V4   | 2V4B         | 2.35                             | 2.40   | 2.45   | 5               | 100                               | 564                               | 1               | 45                      | 1              |
| BZT52B2V7   | 2V7B         | 2.65                             | 2.70   | 2.75   | 5               | 100                               | 564                               | 1               | 18                      | 1              |
| BZT52B3V0   | 3V0B         | 2.94                             | 3.00   | 3.06   | 5               | 100                               | 564                               | 1               | 9                       | 1              |
| BZT52B3V3   | 3V3B         | 3.23                             | 3.30   | 3.37   | 5               | 95                                | 564                               | 1               | 4.5                     | 1              |
| BZT52B3V6   | 3V6B         | 3.53                             | 3.60   | 3.67   | 5               | 90                                | 564                               | 1               | 4.5                     | 1              |
| BZT52B3V9   | 3V9B         | 3.82                             | 3.90   | 3.98   | 5               | 90                                | 564                               | 1               | 2.7                     | 1              |
| BZT52B4V3   | 4V3B         | 4.21                             | 4.30   | 4.39   | 5               | 90                                | 564                               | 1               | 2.7                     | 1              |
| BZT52B4V7   | 4V7B         | 4.61                             | 4.70   | 4.79   | 5               | 80                                | 470                               | 1               | 2.7                     | 2.0            |
| BZT52B5V1   | 5V1B         | 5.00                             | 5.10   | 5.20   | 5               | 60                                | 451                               | 1               | 1.8                     | 2.0            |
| BZT52B5V6   | 5V6B         | 5.49                             | 5.60   | 5.71   | 5               | 40                                | 376                               | 1               | 0.9                     | 2.0            |
| BZT52B6V2   | 6V2B         | 6.08                             | 6.20   | 6.32   | 5               | 10                                | 141                               | 1               | 2.7                     | 4.0            |
| BZT52B6V8   | 6V8B         | 6.66                             | 6.80   | 6.94   | 5               | 15                                | 75                                | 1               | 1.8                     | 4.0            |
| BZT52B7V5   | 7V5B         | 7.35                             | 7.50   | 7.65   | 5               | 15                                | 75                                | 1               | 0.9                     | 5.0            |
| BZT52B8V2   | 8V2B         | 8.04                             | 8.20   | 8.36   | 5               | 15                                | 75                                | 1               | 0.63                    | 5.0            |
| BZT52B9V1   | 9V1B         | 8.92                             | 9.10   | 9.28   | 5               | 15                                | 94                                | 1               | 0.45                    | 6.0            |
| BZT52B10    | 10VB         | 9.80                             | 10.00  | 10.20  | 5               | 20                                | 141                               | 1               | 0.18                    | 7.0            |
| BZT52B11    | 11VB         | 10.78                            | 11.00  | 11.22  | 5               | 20                                | 141                               | 1               | 0.09                    | 8.0            |
| BZT52B12    | 12VB         | 11.76                            | 12.00  | 12.24  | 5               | 25                                | 141                               | 1               | 0.09                    | 8.0            |
| BZT52B13    | 13VB         | 12.74                            | 13.00  | 13.26  | 5               | 30                                | 160                               | 1               | 0.09                    | 8.0            |
| BZT52B15    | 15VB         | 14.70                            | 15.00  | 15.30  | 5               | 30                                | 188                               | 1               | 0.045                   | 10.5           |
| BZT52B16    | 16VB         | 15.68                            | 16.00  | 16.32  | 5               | 40                                | 188                               | 1               | 0.045                   | 11.2           |
| BZT52B18    | 18VB         | 17.64                            | 18.00  | 18.36  | 5               | 45                                | 212                               | 1               | 0.045                   | 12.6           |
| BZT52B20    | 20VB         | 19.60                            | 20.00  | 20.40  | 5               | 55                                | 212                               | 1               | 0.045                   | 14.0           |
| BZT52B22    | 22VB         | 21.56                            | 22.00  | 22.44  | 5               | 55                                | 235                               | 1               | 0.045                   | 15.4           |
| BZT52B24    | 24VB         | 23.52                            | 24.00  | 24.48  | 5               | 70                                | 235                               | 1               | 0.045                   | 16.8           |
| BZT52B27    | 27VB         | 26.46                            | 27.00  | 27.54  | 2               | 80                                | 282                               | 0.5             | 0.045                   | 18.9           |
| BZT52B30    | 30VB         | 29.40                            | 30.00  | 30.60  | 2               | 80                                | 282                               | 0.5             | 0.045                   | 21.0           |
| BZT52B33    | 33VB         | 32.34                            | 33.00  | 33.66  | 2               | 80                                | 306                               | 0.5             | 0.045                   | 23.0           |
| BZT52B36    | 36VB         | 35.28                            | 36.00  | 36.72  | 2               | 90                                | 329                               | 0.5             | 0.045                   | 25.2           |
| BZT52B39    | 39VB         | 38.22                            | 39.00  | 39.78  | 2               | 130                               | 329                               | 0.5             | 0.045                   | 27.3           |
| BZT52B43    | 43VB         | 42.14                            | 43.00  | 43.86  | 2               | 150                               | 353                               | 0.5             | 0.045                   | 30.1           |
| BZT52B47    | 47VB         | 46.06                            | 47.00  | 47.94  | 2               | 170                               | 353                               | 0.5             | 0.045                   | 33.0           |
| BZT52B51    | 51VB         | 49.98                            | 51.00  | 52.02  | 2               | 180                               | 376                               | 0.5             | 0.045                   | 35.7           |
| BZT52B56    | 56VB         | 54.88                            | 56.00  | 57.12  | 2               | 200                               | 400                               | 0.5             | 0.045                   | 39.2           |
| BZT52B62    | 62VB         | 60.76                            | 62.00  | 63.24  | 2               | 215                               | 423                               | 0.5             | 0.045                   | 43.4           |
| BZT52B68    | 68VB         | 66.64                            | 68.00  | 69.36  | 2               | 240                               | 447                               | 0.5             | 0.045                   | 47.6           |
| BZT52B75    | 75VB         | 73.50                            | 75.00  | 76.50  | 2               | 255                               | 470                               | 0.5             | 0.045                   | 52.5           |

Notes : 1. The Zener Voltage (V<sub>Z</sub>) is tested under pulse condition of 10ms.

2. The device numbers listed have a standard tolerance on the nomial zener voltage of ±2%.

3. For detailed information on price, availability and delivery of nominal zener voltages between the voltages shown and tighter voltage tolerances, contact your nearest **Taiwan Semiconductor** representative.

4. The Zener impedance is derived from the 60-cycle ac voltage, which results when an ac current having an RMS value equal to 10% of the dc zener current is superimposed to I<sub>ZT</sub> or I<sub>ZK</sub>.

## Small Signal Product

### RATINGS AND CHARACTERISTICS CURVES

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

Fig. 1 Typical Forward Characteristics

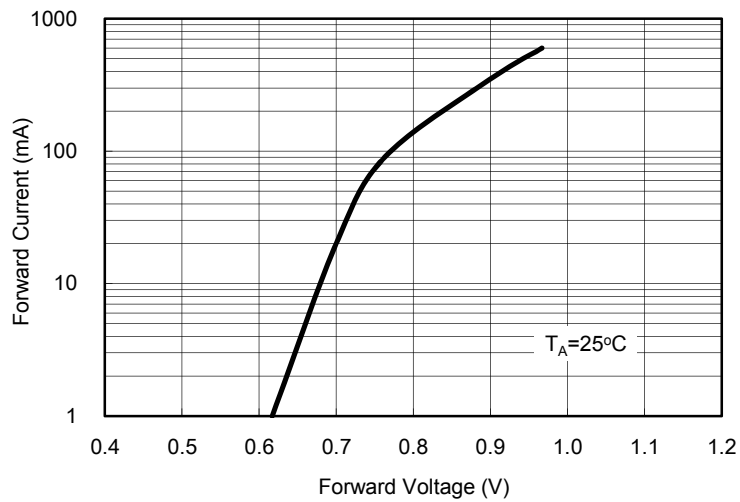


Fig. 2 Zener Breakdown Characteristics

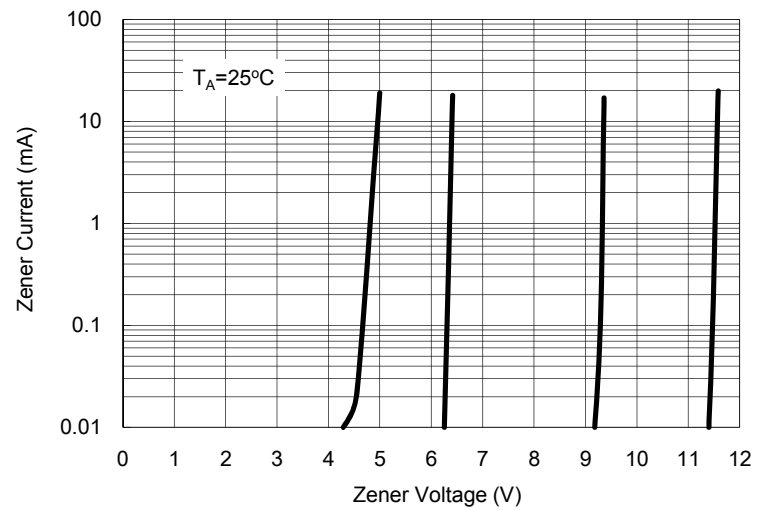


Fig. 3 Zener Breakdown Characteristics

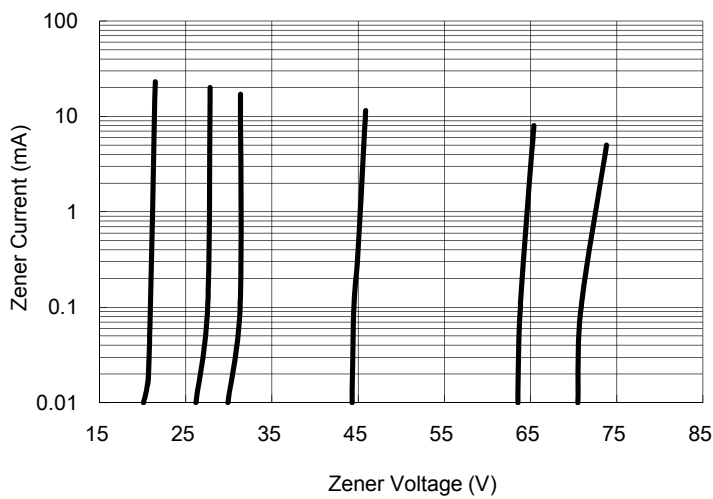


Fig. 4 Admissible Power Dissipation Curve

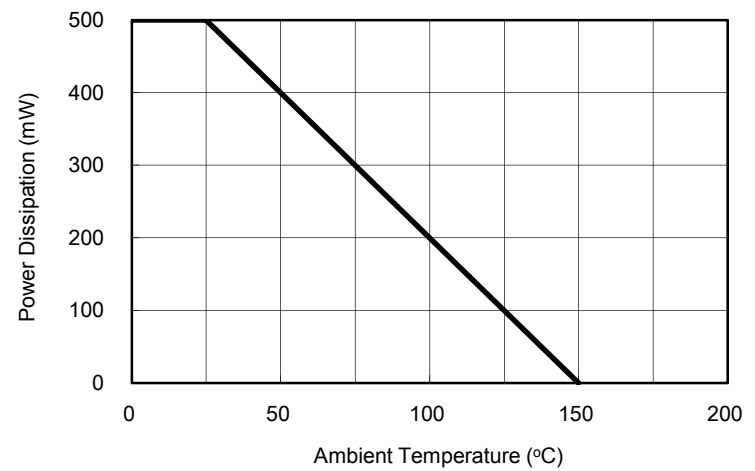


Fig. 5 Typical Capacitance

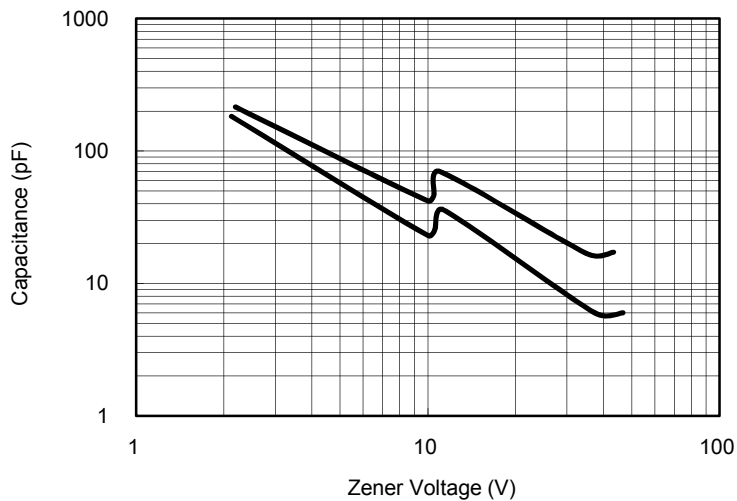
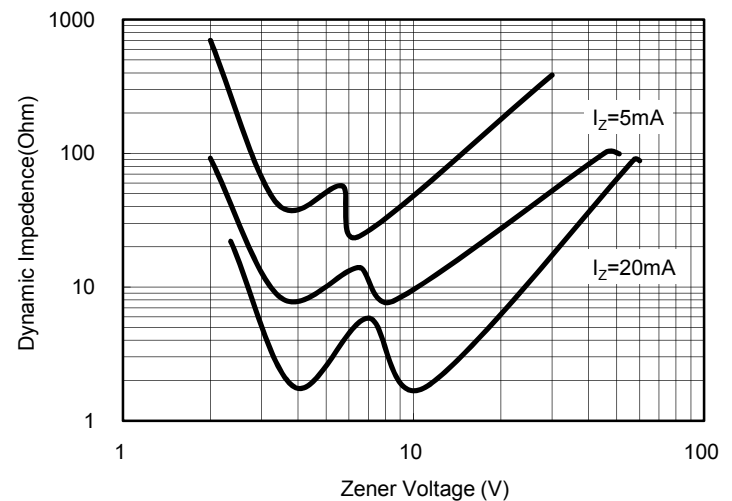


Fig. 6 Effect of Zener Voltage on Impedance



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| ORDERING INFORMATION |                             |              |                        |          |              |
|----------------------|-----------------------------|--------------|------------------------|----------|--------------|
| PART NO.             | MANUFACTURE<br>CODE (Note1) | PACKING CODE | GREEN COMPOUND<br>CODE | PACKAGE  | PACKING      |
| BZT52Bxxx<br>(Note2) |                             | RH           | G                      | SOD-123F | 3K / 7" Reel |

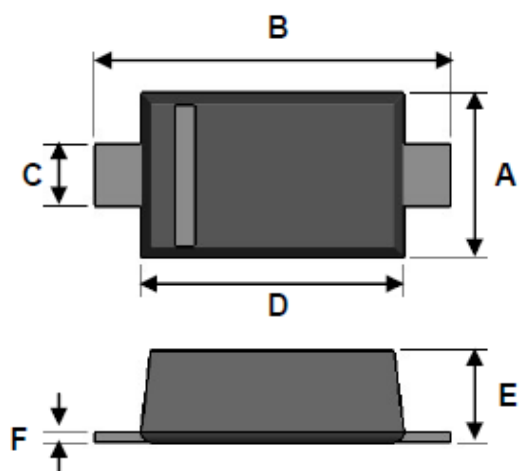
Note1: Manufacture special control, if empty means no special control requirement.

Note2: "xxx" is Device Code from "2V4" thru "75", detail could follow the previous page

| EXAMPLE          |           |                     |              |                        |                |
|------------------|-----------|---------------------|--------------|------------------------|----------------|
| PREFERRED P/N    | PART NO.  | MANUFACTURE<br>CODE | PACKING CODE | GREEN COMPOUND<br>CODE | DESCRIPTION    |
| BZT52B2V4 RHG    | BZT52B2V4 |                     | RH           | G                      | Green compound |
| BZT52B2V4-B0 RHG | BZT52B2V4 | B0                  | RH           | G                      | Green compound |
| BZT52B2V4-L0 RHG | BZT52B2V4 | L0                  | RH           | G                      | Green compound |

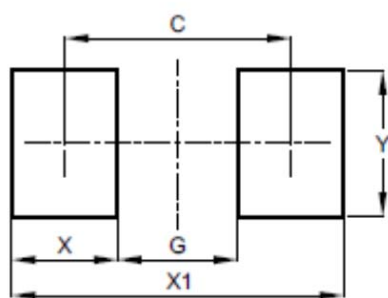
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**DIMENSIONS**



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 1.50      | 1.70 | 0.059       | 0.067 |
| B    | 3.30      | 3.90 | 0.130       | 0.154 |
| C    | 0.50      | 0.70 | 0.020       | 0.028 |
| D    | 2.50      | 2.70 | 0.098       | 0.106 |
| E    | 0.80      | 1.15 | 0.031       | 0.045 |
| F    | 0.05      | 0.20 | 0.002       | 0.008 |

**SUGGESTED PAD LAYOUT**



| DIM. | Unit (mm) | Unit (inch) |
|------|-----------|-------------|
|      | Typ.      | Typ.        |
| C    | 2.86      | 0.113       |
| G    | 1.52      | 0.060       |
| X    | 1.34      | 0.053       |
| X1   | 4.20      | 0.165       |
| Y    | 1.80      | 0.071       |

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