



## Zener Diode Series

# ZD52XXBSF

### Description

The ZD52XXBSF series covers zener voltage range from 2.4V to 39V, and is encapsulated in SOD-123-MH package, very suitable for low cost, low power voltage regulation application.

### Features

- Extremely thin/leadless package
- 500mW power dissipation
- Designed for mounting on small surface

### Mechanical Data

- Case : Molded plastic, JEDEC SOD-123-MH
- Terminals: Solder plated, solderable per MIL-STD-750 method 2026
- Polarity: Indicated by cathode band
- Mounting position: Any

### Absolute Maximum Ratings( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER             | CONDITIONS   | Symbols   | MIN | TYP | MAX  | Unit               |
|-----------------------|--|-----------|-----|-----|------|--------------------|
| Forward Voltage       | $I_F=200\text{mA}$   | $V_F$     |     |     | 1.2  | V                  |
| Power Dissipation     |  | $P_D$     |     |     | 500  | mW                 |
| Forward Surge Current | 8.3ms single sine-wave superimposed on rated load (JEDEC method) | $I_{FSM}$ |     |     | 1000 | mA                 |
| Storage Temperature   |  | $T_{STG}$ | -55 |     | +125 | $^{\circ}\text{C}$ |
| Operating Temperature |  | $T_J$     | -55 |     | +125 | $^{\circ}\text{C}$ |



**Electrical Characteristic** (TA=25°C, unless otherwise noted)

| Device    | Nom. Zener Voltage |                   | Max. Zener Impedance |      |      |      | Max. Reverse Leakage Current |     | Marking Code |
|-----------|--------------------|-------------------|----------------------|------|------|------|------------------------------|-----|--------------|
|           | Vz@IzT (V)         |                   | ZzT                  | IzT  | ZzK  | IzK  | IR                           | VR  |              |
|           | Nom.               | Test Current (mA) | (Ω)                  | (mA) | (Ω)  | (mA) | (μA)                         | (V) |              |
| ZD5221BSF | 2.4                | 5                 | 100                  | 5    | 1800 | 0.25 | 100                          | 1.0 | N3           |
| ZD5223BSF | 2.7                | 5                 | 100                  | 5    | 1900 | 0.25 | 75                           | 1.0 | N4           |
| ZD5225BSF | 3.0                | 5                 | 95                   | 5    | 2000 | 0.25 | 50                           | 1.0 | N6           |
| ZD5226BSF | 3.3                | 5                 | 95                   | 5    | 2200 | 0.25 | 25                           | 1.0 | X1           |
| ZD5227BSF | 3.6                | 5                 | 90                   | 5    | 2300 | 0.25 | 15                           | 1.0 | X2           |
| ZD5228BSF | 3.9                | 5                 | 90                   | 5    | 2400 | 0.25 | 10                           | 1.0 | X3           |
| ZD5229BSF | 4.3                | 5                 | 88                   | 5    | 2500 | 0.25 | 5.0                          | 1.0 | X4           |
| ZD5230BSF | 4.7                | 5                 | 70                   | 5    | 2200 | 0.25 | 3.0                          | 1.0 | X5           |
| ZD5231BSF | 5.1                | 5                 | 50                   | 5    | 2050 | 0.25 | 2.0                          | 1.0 | X6           |
| ZD5232BSF | 5.6                | 5                 | 25                   | 5    | 1800 | 0.25 | 2.0                          | 1.0 | X7           |
| ZD5234BSF | 6.2                | 5                 | 10                   | 5    | 1300 | 0.25 | 1.0                          | 2.0 | X8           |
| ZD5235BSF | 6.8                | 5                 | 8                    | 5    | 750  | 0.25 | 1.0                          | 3.0 | X9           |
| ZD5236BSF | 7.5                | 5                 | 7                    | 5    | 600  | 0.25 | 0.5                          | 5.0 | Y1           |
| ZD5237BSF | 8.2                | 5                 | 7                    | 5    | 600  | 0.25 | 0.5                          | 6.2 | Y2           |
| ZD5239BSF | 9.1                | 5                 | 10                   | 5    | 600  | 0.25 | 0.1                          | 6.8 | Y3           |
| ZD5240BSF | 10                 | 5                 | 15                   | 5    | 600  | 0.25 | 0.1                          | 7.5 | Y4           |
| ZD5241BSF | 11                 | 5                 | 18                   | 5    | 600  | 0.25 | 0.1                          | 8.2 | Y5           |
| ZD5242BSF | 12                 | 5                 | 22                   | 5    | 600  | 0.25 | 0.1                          | 9.1 | Y6           |
| ZD5243BSF | 13                 | 5                 | 25                   | 5    | 600  | 0.25 | 1.0                          | 10  | Y7           |
| ZD5245BSF | 15                 | 5                 | 32                   | 5    | 600  | 0.25 | 0.1                          | 11  | Y8           |
| ZD5246BSF | 16                 | 5                 | 36                   | 5    | 600  | 0.25 | 0.1                          | 12  | Y9           |
| ZD5248BSF | 18                 | 5                 | 42                   | 5    | 600  | 0.25 | 0.1                          | 13  | Z1           |
| ZD5250BSF | 20                 | 5                 | 48                   | 5    | 600  | 0.25 | 0.1                          | 15  | Z2           |
| ZD5251BSF | 22                 | 5                 | 55                   | 5    | 600  | 0.25 | 0.1                          | 16  | Z3           |
| ZD5252BSF | 24                 | 5                 | 62                   | 5    | 600  | 0.25 | 0.1                          | 18  | Z4           |
| ZD5254BSF | 27                 | 5                 | 70                   | 5    | 600  | 0.25 | 0.1                          | 20  | Z5           |
| ZD5256BSF | 30                 | 5                 | 78                   | 5    | 600  | 0.25 | 0.1                          | 22  | Z6           |
| ZD5257BSF | 33                 | 5                 | 88                   | 5    | 700  | 0.25 | 0.1                          | 24  | Z7           |
| ZD5258BSF | 36                 | 5                 | 95                   | 5    | 700  | 0.25 | 0.1                          | 27  | Z8           |
| ZD5259BSF | 39                 | 5                 | 130                  | 5    | 800  | 0.25 | 0.1                          | 30  | Z9           |

Note: 2% tolerance of Zener voltage

**Characteristic Curves**

FIG. 1-TOTAL POWER DISSIPATION VS. AMBIENT TEMPERATURE

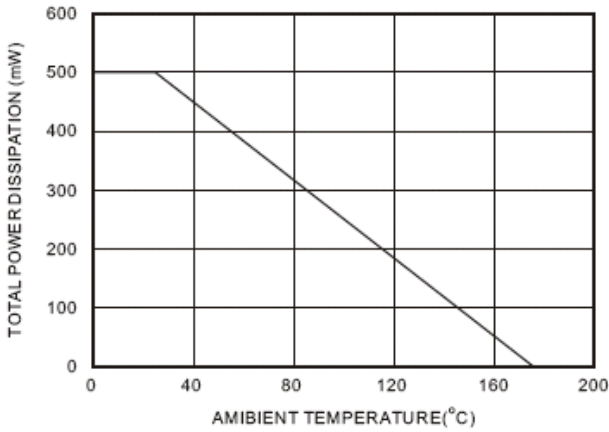


FIG. 2-TYPICAL CHANGE OF WORKING VOLTAGE UNDER OPERATING CONDITIONS AT TA=25°C

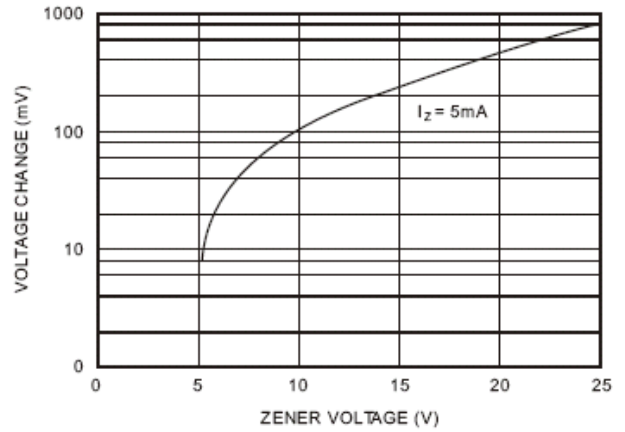


FIG. 3-TYPICAL CHANGE OF WORKING VOLTAGE VS. JUNCTION TEMPERATURE

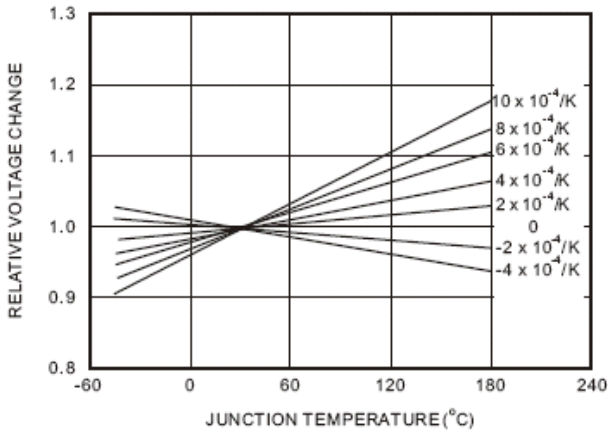


FIG. 4-TEMPERATURE COEFFICIENT OF VZ VS. Z-VOLTAGE

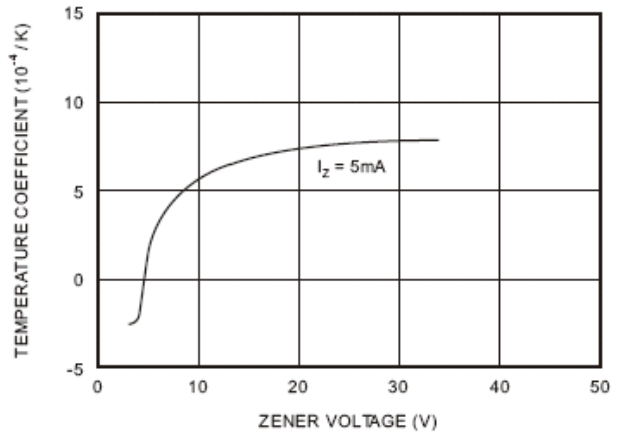
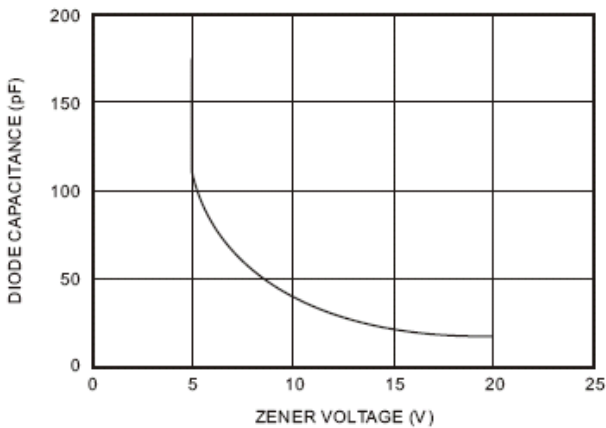


FIG. 5-DIODE CAPACITANCE VS. Z-VOLTAGE





**Characteristic Curves(Cont.)**

FIG. 6-FORWARD CURRENT VS. FORWARD VOLTAGE

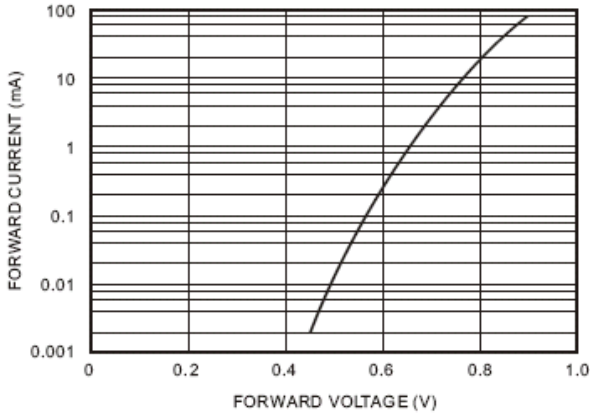


FIG. 7-Z-CURRENT VS. Z-VOLTAGE

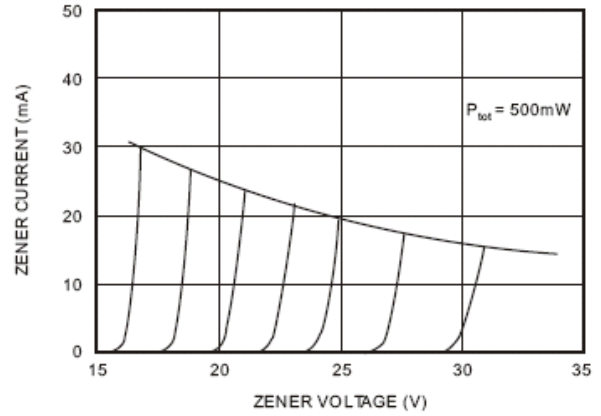


FIG. 8-Z-CURRENT VS. Z-VOLTAGE

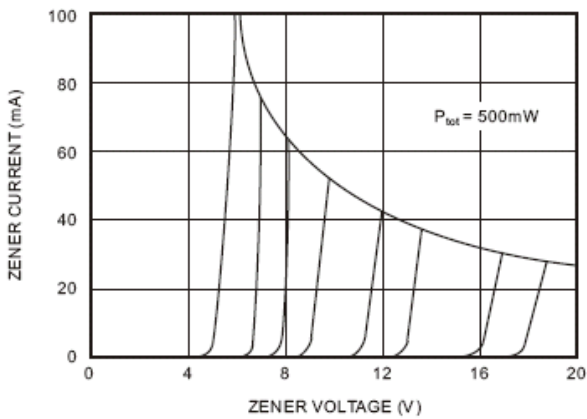


FIG. 9-DIFFERENTIAL Z-RESISTANCE VS. Z-VOLTAGE

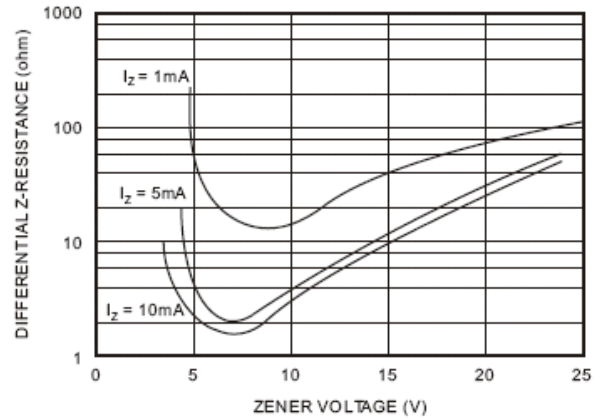
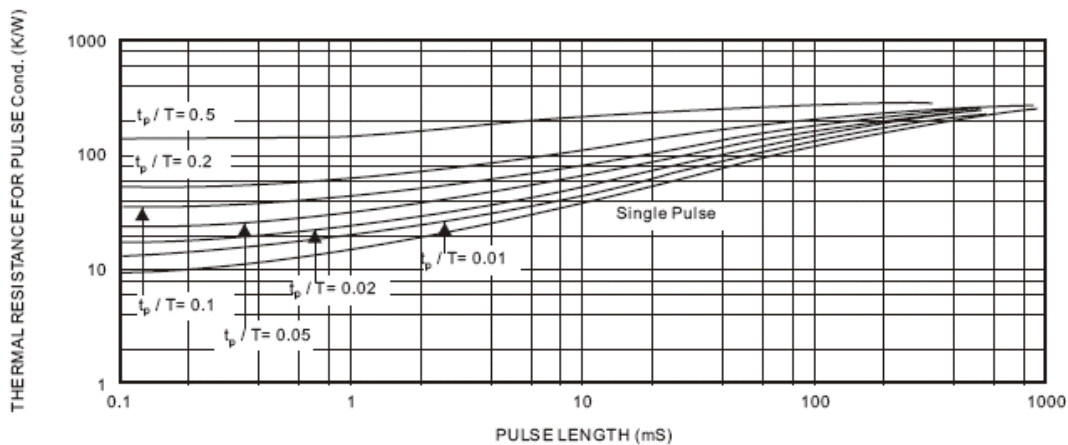
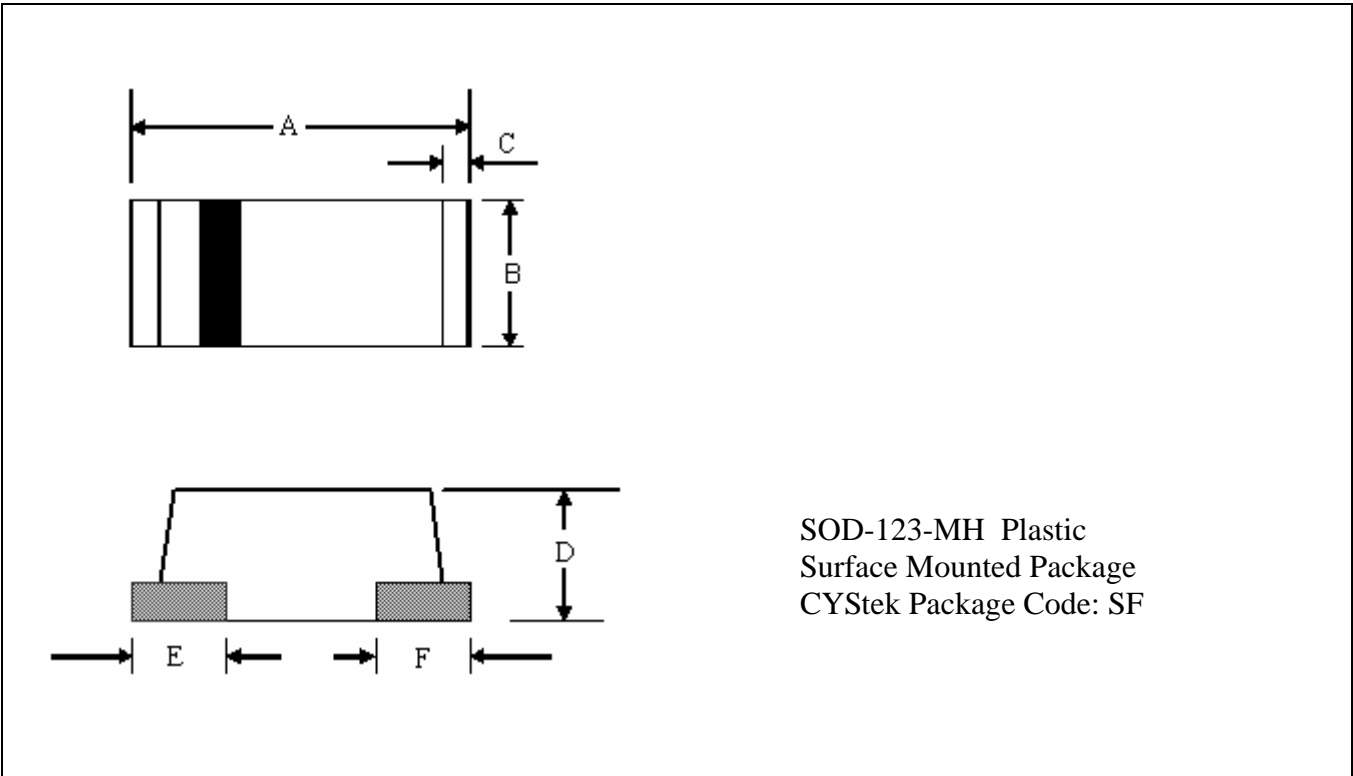


FIG. 10-THERMAL RESPONSE



**SOD-123-MH Dimension**



\*:Typical

| DIM | Inches     |       | Millimeters |      | DIM | Inches     |       | Millimeters |      |
|-----|------------|-------|-------------|------|-----|------------|-------|-------------|------|
|     | Min.       | Max.  | Min.        | Max. |     | Min.       | Max.  | Min.        | Max. |
| A   | 0.130      | 0.146 | 3.3         | 3.7  | D   | 0.024      | 0.039 | 0.6         | 1.0  |
| B   | 0.055      | 0.071 | 1.4         | 1.8  | E   | 0.031(typ) |       | 0.8(typ)    |      |
| C   | 0.012(typ) |       | 0.3(typ)    |      | F   | 0.031(typ) |       | 0.8(typ)    |      |
|     |            |       |             |      | -   | -          | -     | -           | -    |

Notes : 1.Controlling dimension : millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material :**

- Lead : 42 Alloy ; solder plating
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0

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