

# 1SMF5920B

## 2.5 Watt Zener Diode in Flat Lead Package

This complete new line of 2.5 Watt Zener Diodes are offered in highly efficient micro miniature and space saving surface mount design. Because of its small size, it is ideal for use in cellular phones, portable devices, business machines and many other industrial/consumer applications.

### Features

- Zener Breakdown Voltage: 6.2 V
- Low Leakage < 5  $\mu$ A
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- Small Footprint – Footprint Area of 8.45 mm<sup>2</sup>
- Low Profile – Maximum Height of 1.0 mm
- Supplied in 8 mm Tape and Reel – 3,000 Units per Reel
- Cathode Indicated by Polarity Band
- Lead Orientation in Tape: Cathode Lead to Sprocket Holes
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### Mechanical Characteristics:

**CASE:** Void-free, transfer-molded, thermosetting plastic  
Epoxy Meets UL 94 V-0

**LEAD FINISH:** 100% Matte Sn (Tin)

**MOUNTING POSITION:** Any

**QUALIFIED MAX REFLOW TEMPERATURE:** 260°C

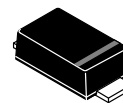
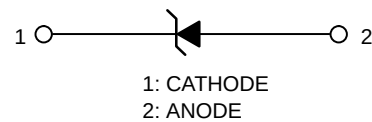
Device Meets MSL 1 Requirements



**ON Semiconductor®**

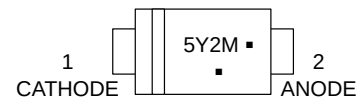
<http://onsemi.com>

### PLASTIC SURFACE MOUNT 2.5 WATT ZENER DIODE 6.2 VOLTS



**SOD-123FL  
CASE 498**

### MARKING DIAGRAM



5Y2 = Device Code

M = Date Code

■ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device       | Package                | Shipping <sup>†</sup> |
|--------------|------------------------|-----------------------|
| 1SMF5920BT1G | SOD-123FL<br>(Pb-Free) | 3000/Tape & Reel      |

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# 1SMF5920B

## MAXIMUM RATINGS

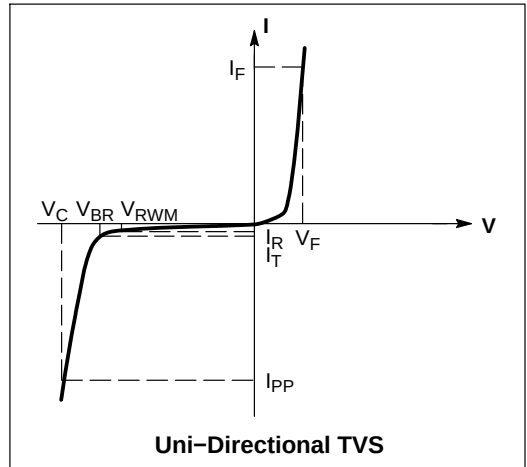
| Rating                                                                                      | Symbol          | Value       | Unit                       |
|---------------------------------------------------------------------------------------------|-----------------|-------------|----------------------------|
| DC Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 1)<br>Derate above $25^\circ\text{C}$ | $P_D$           | 350         | mW                         |
| Thermal Resistance, Junction-to-Ambient                                                     | $R_{\theta JA}$ | 2.9         | $\text{mW}/^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Lead                                                        | $R_{\theta JL}$ | 350         | $^\circ\text{C}/\text{W}$  |
| Maximum DC Power Dissipation (Notes 1 and 2)                                                | $P_D$           | 30          | $^\circ\text{C}/\text{W}$  |
| Operating and Storage Temperature Range                                                     | $T_J, T_{stg}$  | 2.5         | W                          |
|                                                                                             |                 | -55 to +150 | $^\circ\text{C}$           |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Mounted with recommended minimum pad size, PC board FR-4.
2. At lead temperature  $75^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 1.5\text{ V}$  Max. @  $I_F = 200\text{ mA}$  for all types)

| Symbol    | Parameter                                   |
|-----------|---------------------------------------------|
| $I_{PP}$  | Maximum Reverse Peak Pulse Current          |
| $V_C$     | Clamping Voltage @ $I_{PP}$                 |
| $V_{RWM}$ | Working Peak Reverse Voltage                |
| $I_R$     | Maximum Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$  | Breakdown Voltage @ $I_T$                   |
| $I_T$     | Test Current                                |
| $I_F$     | Forward Current                             |
| $V_F$     | Forward Voltage @ $I_F$                     |



**ELECTRICAL CHARACTERISTICS** ( $T_L = 30^\circ\text{C}$  unless otherwise noted,  $V_F = 1.25\text{ Volts}$  @  $200\text{ mA}$ )

| Device       | Device Marking | Zener Voltage (Note 3)                   |     |      | I <sub>ZT</sub> | I <sub>R</sub> @ V <sub>R</sub> | V <sub>R</sub> | Z <sub>ZT</sub> @ I <sub>ZT</sub><br>(Note 4) | Z <sub>ZK</sub> @ I <sub>ZK</sub><br>(Note 4) | I <sub>ZK</sub> |
|--------------|----------------|------------------------------------------|-----|------|-----------------|---------------------------------|----------------|-----------------------------------------------|-----------------------------------------------|-----------------|
|              |                | V <sub>Z</sub> @ I <sub>ZT</sub> (Volts) |     |      |                 |                                 |                |                                               |                                               |                 |
|              |                | Min                                      | Nom | Max  |                 |                                 |                |                                               |                                               |                 |
| 1SMF5920BT1G | 5Y2            | 5.89                                     | 6.2 | 6.51 | 60.5            | 5.0                             | 4.0            | 2.0                                           | 200                                           | 1.0             |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Zener voltage is measured with the device junction in thermal equilibrium with an ambient temperature of  $25^\circ\text{C}$ .
4. Zener Impedance 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  $I_Z(\text{ac}) = 0.1 I_Z(\text{dc})$  with the ac frequency =  $60\text{ Hz}$ .

TYPICAL CHARACTERISTICS

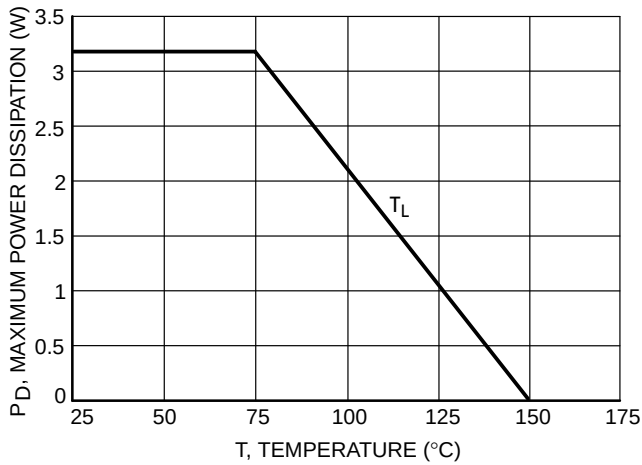


Figure 1. Steady State Power Derating

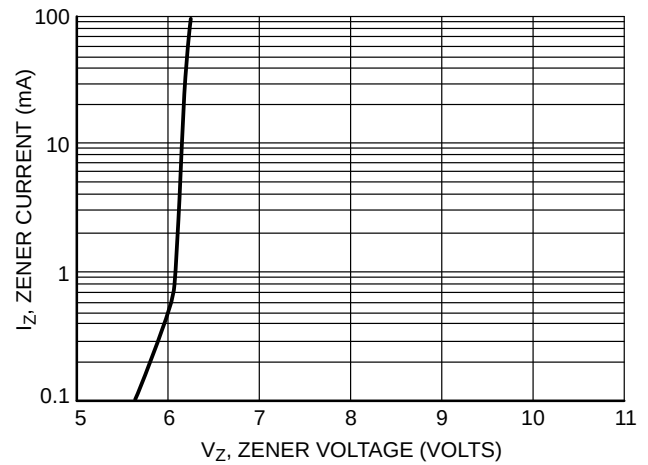


Figure 2.  $V_Z$

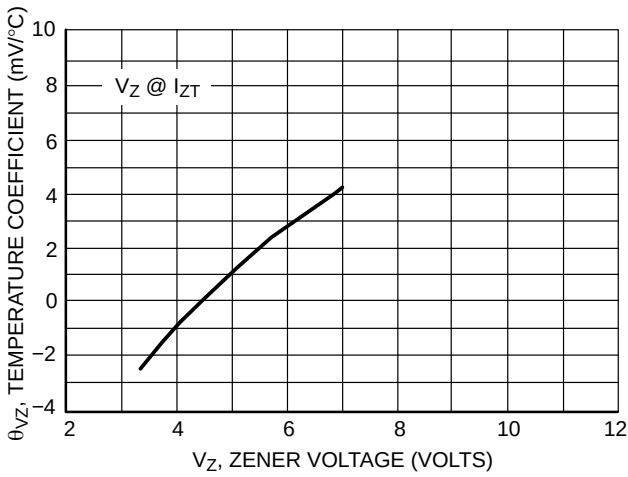


Figure 3. Zener Voltage

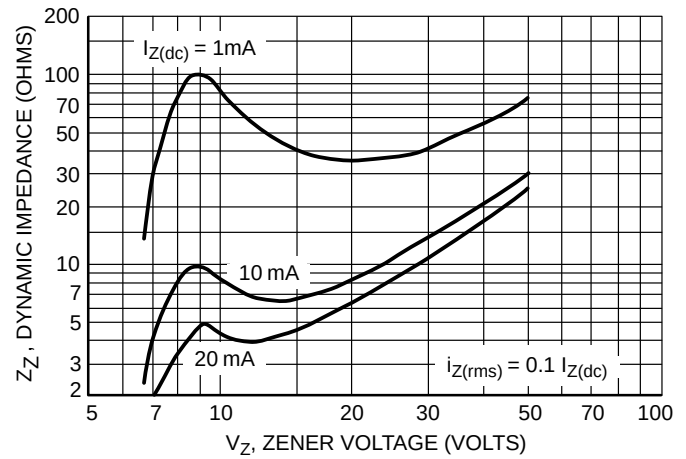


Figure 4. Effect of Zener Voltage

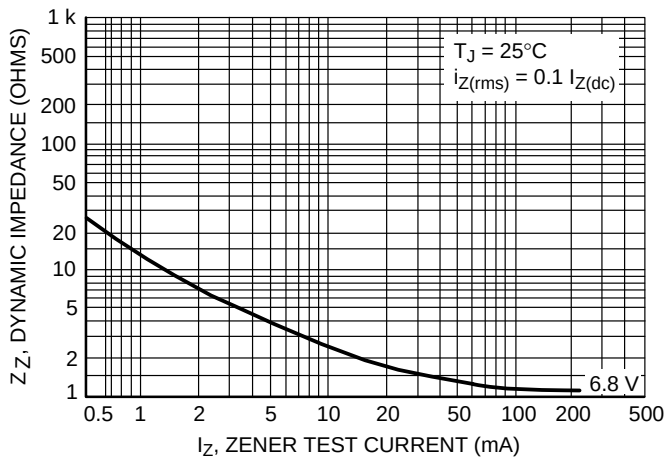


Figure 5. Effect of Zener Current

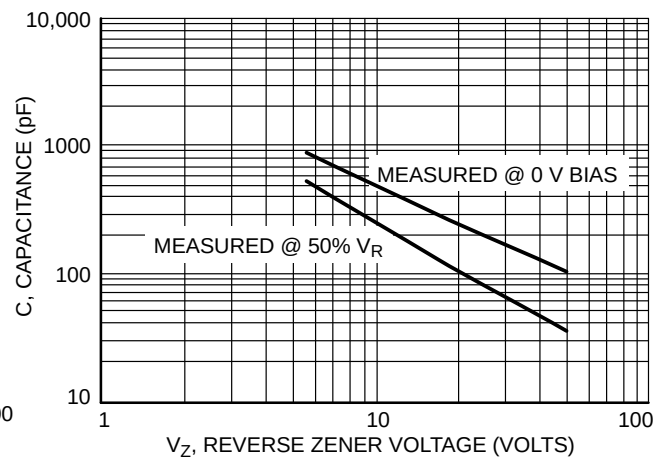
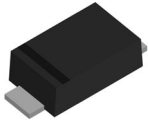
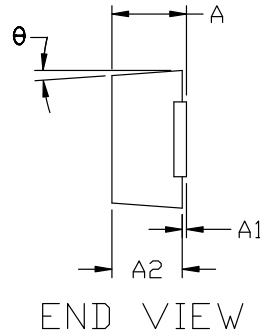
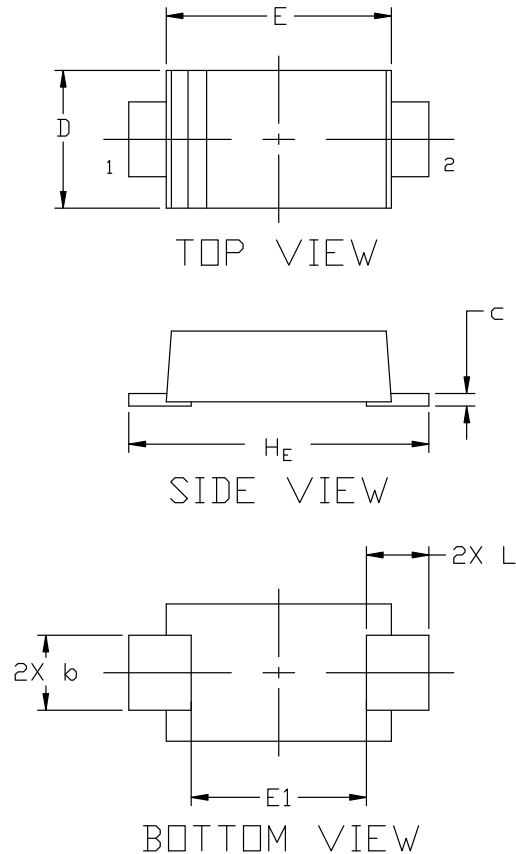


Figure 6. Capacitance versus Reverse Zener Voltage



**SOD-123-2 1.65x2.70x0.90**  
**CASE 498**  
**ISSUE E**

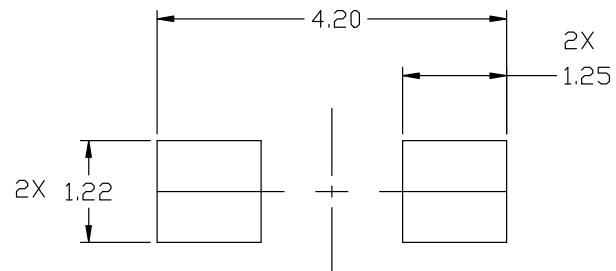
DATE 22 AUG 2023



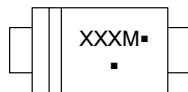
| DIM            | MILLIMETERS |      |      |
|----------------|-------------|------|------|
|                | MIN.        | NOM. | MAX. |
| A              | 0.90        | 0.95 | 0.98 |
| A1             | 0.00        | 0.05 | 0.10 |
| A2             | 0.85        | 0.90 | 0.95 |
| b              | 0.70        | 0.90 | 1.10 |
| c              | 0.10        | 0.15 | 0.20 |
| D              | 1.50        | 1.65 | 1.80 |
| E              | 2.50        | 2.70 | 2.90 |
| E1             | 1.70        | 2.10 | 2.50 |
| H <sub>E</sub> | 3.40        | 3.60 | 3.80 |
| L              | 0.55        | 0.75 | 0.95 |
| θ              | 0°          | ---  | 8°   |

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS b AND L ARE TO BE MEASURED ON A FLAT SECTION OF THE LEAD BETWEEN 0.10 AND 0.25 FROM THE LEAD TIP.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH PROTRUSIONS, OR GATE BURRS.
5. FLAT LEAD.



**GENERIC MARKING DIAGRAM\***



XXX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

\* For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

|                         |                                 |                                                                                                                                                                                  |
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