# 1SMF5920BT1G

*Product Preview*

# 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 μA
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- Small Footprint − Footprint Area of 8.45 $mm^2$
- 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

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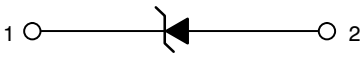
**http://onsemi.com**

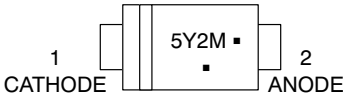
**PLASTIC SURFACE MOUNT**
**2.5 WATT ZENER DIODE**
**6.2 VOLTS**




1: CATHODE
2: ANODE

**SOD−123FL**
**CASE 498**
**PLASTIC**

**MARKING DIAGRAM**




5Y2 = Device Code
M = Date Code
▪ = Pb−Free Package
(Note: Microdot may be in either location)

**ORDERING INFORMATION**

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

†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.

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

## MAXIMUM RATINGS

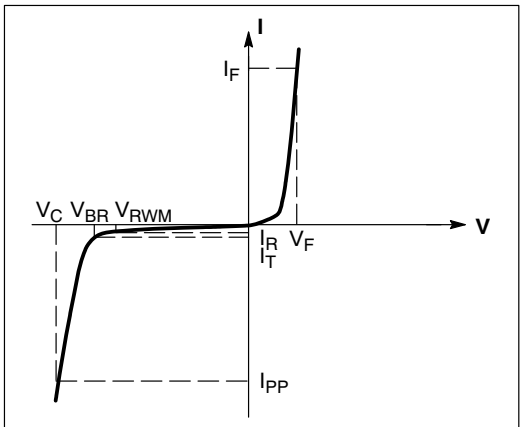
| Rating | Symbol | Value | Unit |
|---|---|---|---|
| DC Power Dissipation @ $T_A$ = 25°C (Note 1)<br>Derate above 25°C<br>Thermal Resistance, Junction−to−Ambient | $P_D$<br><br>$R_{\theta JA}$ | 350<br>2.9<br>350 | mW<br>mW/°C<br>°C/W |
| Thermal Resistance, Junction−to−Lead | $R_{\theta JL}$ | 30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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Mounted with recommended minimum pad size, PC board FR−4.
2. At lead temperature 75°C

## ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise noted, $V_F$ = 1.5 V Max. @ $I_F$ = 200 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 @ $I_F$ |



**Uni−Directional TVS**

## ELECTRICAL CHARACTERISTICS ($T_L$ = 30°C unless otherwise noted, $V_F$ = 1.25 Volts @ 200 mA)

| Device | Device Marking | Zener Voltage (Note 3) $V_Z$ @ $I_{ZT}$ (Volts) Min | Nom | Max | $I_{ZT}$ (mA) | $I_R$ @ $V_R$ ($\mu$A) | $V_R$ (V) | $Z_{ZT}$ @ $I_{ZT}$ (Note 4) (Ω) | $Z_{ZK}$ @ $I_{ZK}$ (Note 4) (Ω) | $I_{ZK}$ (mA) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1SMF5920BT1G | 5Y2 | 5.89 | 6.2 | 6.51 | 60.5 | 5.0 | 4.0 | 2.0 | 200 | 1.0 |

3. Zener voltage is measured with the device junction in thermal equilibrium with an ambient temperature of 25°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 $I_Z$(ac) = 0.1 $I_Z$(dc) with the ac frequency = 60 Hz.

## TYPICAL CHARACTERISTICS

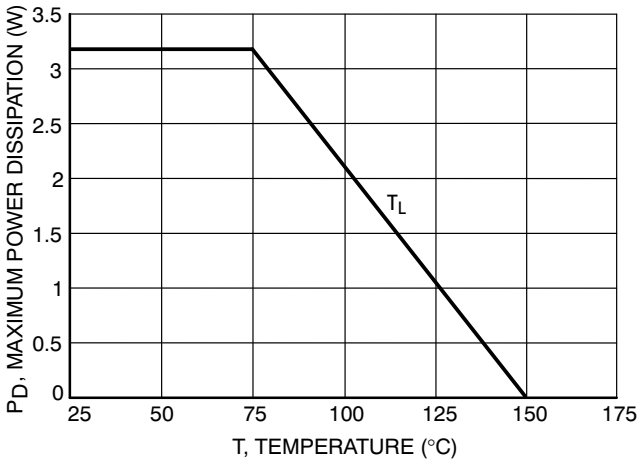



**Figure 1. Steady State Power Derating**

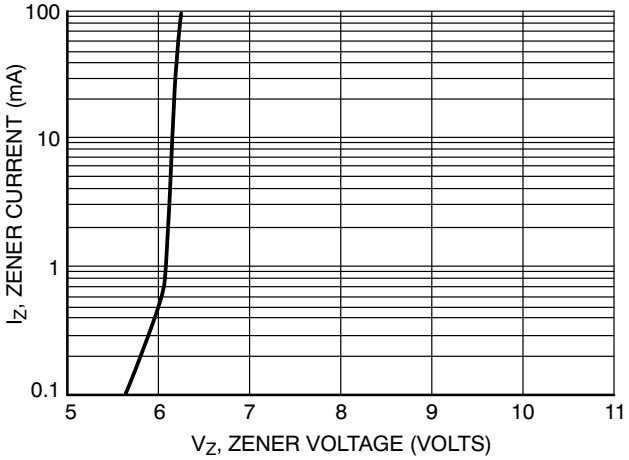



**Figure 2. $V_Z$**

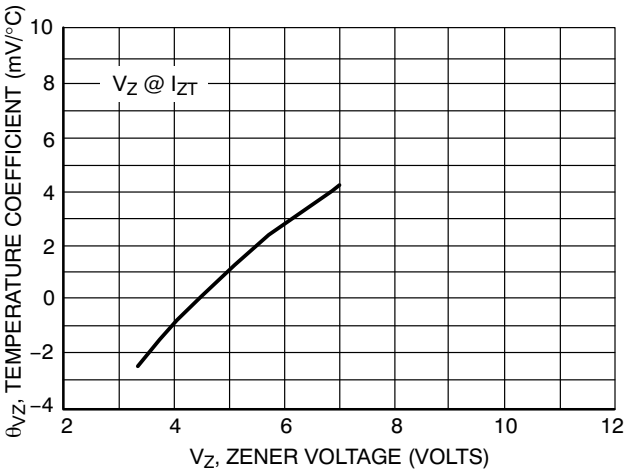



**Figure 3. Zener Voltage**

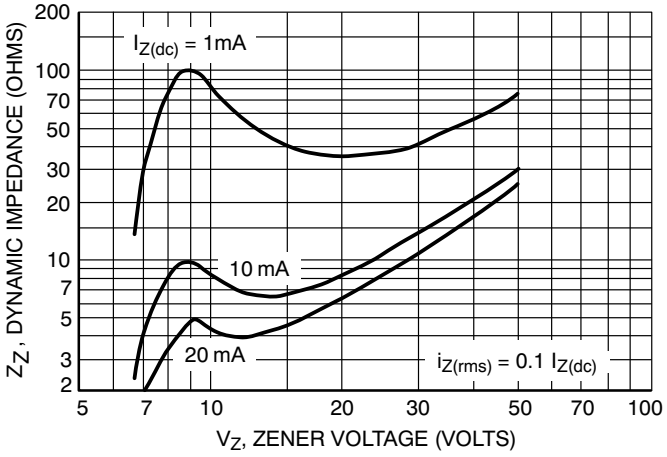



**Figure 4. Effect of Zener Voltage**

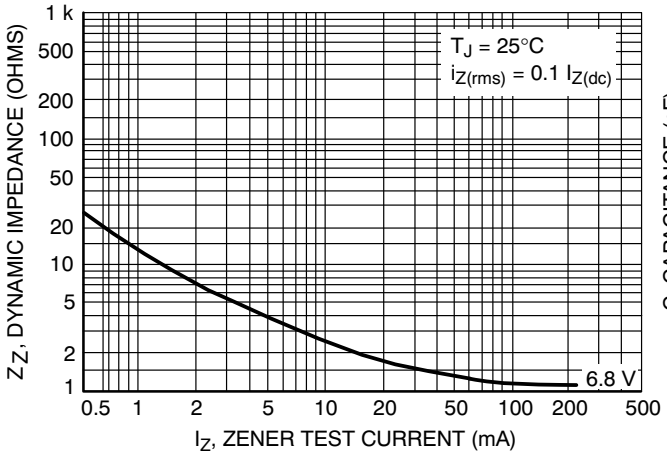



**Figure 5. Effect of Zener Current**

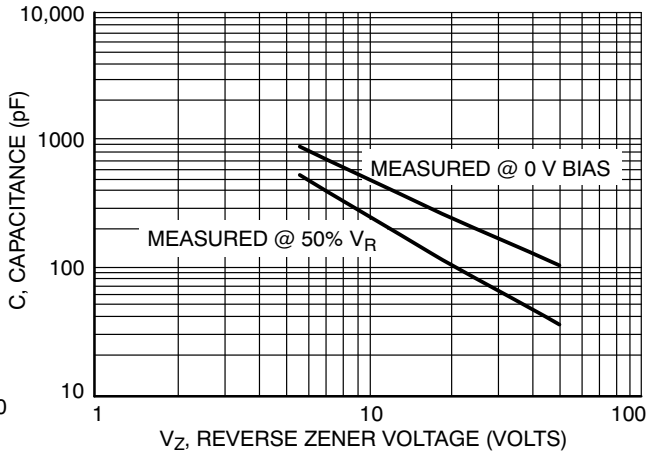
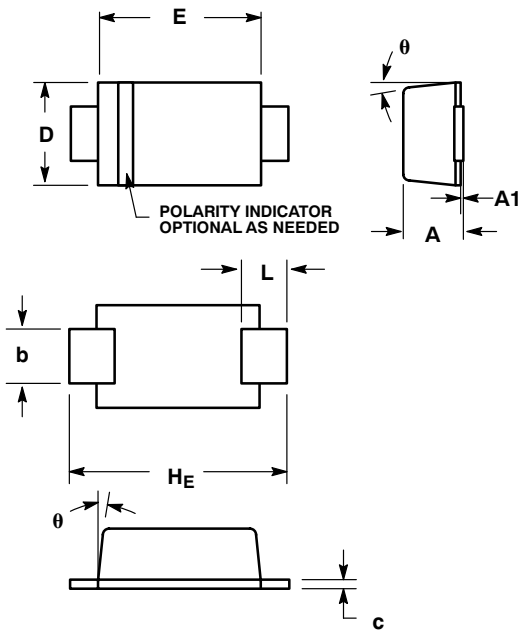



**Figure 6. Capacitance versus Reverse Zener Voltage**

## PACKAGE DIMENSIONS

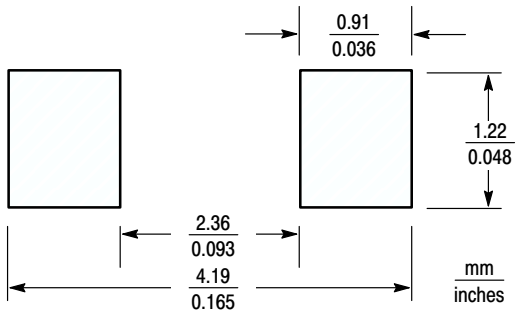
**SOD−123FL**
CASE 498−01
ISSUE A




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH.
4. DIMENSIONS D AND J ARE TO BE MEASURED ON FLAT SECTION OF THE LEAD: BETWEEN 0.10 AND 0.25 MM FROM THE LEAD TIP.

| | MILLIMETERS | | | INCHES | | |
|---|---|---|---|---|---|---|
| DIM | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.90 | 0.95 | 1.00 | 0.035 | 0.037 | 0.039 |
| A1 | 0.00 | 0.05 | 0.10 | 0.000 | 0.002 | 0.004 |
| b | 0.70 | 0.90 | 1.10 | 0.028 | 0.035 | 0.043 |
| c | 0.10 | 0.15 | 0.20 | 0.004 | 0.006 | 0.008 |
| D | 1.50 | 1.65 | 1.80 | 0.059 | 0.065 | 0.071 |
| E | 2.50 | 2.70 | 2.90 | 0.098 | 0.106 | 0.114 |
| L | 0.55 | 0.75 | 0.95 | 0.022 | 0.030 | 0.037 |
| $H_E$ | 3.40 | 3.60 | 3.80 | 0.134 | 0.142 | 0.150 |
| θ | 0° | – | 8° | 0° | – | 8° |

### SOLDERING FOOTPRINT*




*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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