

Surface Mount Zener Diode

MM5Z Series

RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise specified)

100mW, SOD-523

| Type Number | Marking Code | Zener Voltage Range (Note 2) | | | | Maximum Zener Impedance (Note 3) | | | Maximum Reverse Current (Note 2) | | Temperature Coefficient of Zener Voltage @ $I_{ZT} = 10\text{ mA}$ $\text{mV}/^\circ\text{C}$ | |
|-------------|--------------|------------------------------|-----|------|------------|----------------------------------|------------------|----------|----------------------------------|---------------|---|------|
| | | V_Z | | | $@ I_{ZT}$ | $Z_{ZT}@ I_{ZT}$ | $Z_{ZK}@ I_{ZK}$ | | $I_R @ V_R$ | | Min | Max |
| | | Min | Nom | Max | | | Ω | Ω | mA | μA | | |
| MM5Z2V4 | Z11 | 2.2 | 2.4 | 2.6 | 5.0 | 100 | 600 | 1.0 | 50 | 1.0 | -3.5 | 0 |
| MM5Z2V7 | Z12 | 2.5 | 2.7 | 2.9 | 5.0 | 100 | 600 | 1.0 | 20 | 1.0 | -3.5 | 0 |
| MM5Z3V0 | Z13 | 2.8 | 3.0 | 3.2 | 5.0 | 95 | 600 | 1.0 | 10 | 1.0 | -3.5 | 0 |
| MM5Z3V3 | Z14 | 3.1 | 3.3 | 3.5 | 5.0 | 95 | 600 | 1.0 | 5.0 | 1.0 | -3.5 | 0 |
| MM5Z3V6 | Z15 | 3.4 | 3.6 | 3.8 | 5.0 | 90 | 600 | 1.0 | 5.0 | 1.0 | -3.5 | 0 |
| MM5Z3V9 | Z16 | 3.7 | 3.9 | 4.1 | 5.0 | 90 | 600 | 1.0 | 3.0 | 1.0 | -3.5 | 0 |
| MM5Z4V3 | Z17 | 4.0 | 4.3 | 4.6 | 5.0 | 90 | 600 | 1.0 | 3.0 | 1.0 | -3.5 | 0 |
| MM5Z4V7 | Z1 | 4.4 | 4.7 | 5.0 | 5.0 | 80 | 500 | 1.0 | 3.0 | 2.0 | -3.5 | 0.2 |
| MM5Z5V1 | Z2 | 4.8 | 5.1 | 5.4 | 5.0 | 60 | 480 | 1.0 | 2.0 | 2.0 | -2.7 | 1.2 |
| MM5Z5V6 | Z3 | 5.2 | 5.6 | 6.0 | 5.0 | 40 | 400 | 1.0 | 1.0 | 2.0 | -2.0 | 2.5 |
| MM5Z6V2 | Z4 | 5.8 | 6.2 | 6.6 | 5.0 | 10 | 150 | 1.0 | 3.0 | 4.0 | 0.4 | 3.7 |
| MM5Z6V8 | Z5 | 6.4 | 6.8 | 7.2 | 5.0 | 15 | 80 | 1.0 | 2.0 | 4.0 | 1.2 | 4.5 |
| MM5Z7V5 | Z6 | 7.0 | 7.5 | 7.9 | 5.0 | 15 | 80 | 1.0 | 1.0 | 5.0 | 2.5 | 5.3 |
| MM5Z8V2 | Z7 | 7.7 | 8.2 | 8.7 | 5.0 | 15 | 80 | 1.0 | 0.7 | 5.0 | 3.2 | 6.2 |
| MM5Z9V1 | Z8 | 8.5 | 9.1 | 9.6 | 5.0 | 15 | 100 | 1.0 | 0.5 | 6.0 | 3.8 | 7.0 |
| MM5Z10V | Z9 | 9.4 | 10 | 10.6 | 5.0 | 20 | 150 | 1.0 | 0.2 | 7.0 | 4.5 | 8.0 |
| MM5Z11V | Y1 | 10.4 | 11 | 11.6 | 5.0 | 20 | 150 | 1.0 | 0.1 | 8.0 | 5.4 | 9.0 |
| MM5Z12V | Y2 | 11.4 | 12 | 12.7 | 5.0 | 25 | 150 | 1.0 | 0.1 | 8.0 | 6.0 | 10.0 |
| MM5Z13V | Y3 | 12.4 | 13 | 14.1 | 5.0 | 30 | 170 | 1.0 | 0.1 | 8.0 | 7.0 | 11.0 |
| MM5Z15V | Y4 | 13.8 | 15 | 15.6 | 5.0 | 30 | 200 | 1.0 | 0.1 | 10.5 | 9.2 | 13.0 |
| MM5Z16V | Y5 | 15.3 | 16 | 17.1 | 5.0 | 40 | 200 | 1.0 | 0.1 | 11.2 | 10.4 | 14.0 |
| MM5Z18V | Y6 | 16.8 | 18 | 19.1 | 5.0 | 45 | 225 | 1.0 | 0.1 | 12.6 | 12.4 | 16.0 |
| MM5Z20V | Y7 | 18.8 | 20 | 21.2 | 5.0 | 55 | 225 | 1.0 | 0.1 | 14.0 | 14.4 | 18.0 |
| MM5Z22V | Y8 | 20.8 | 22 | 23.3 | 5.0 | 55 | 250 | 1.0 | 0.1 | 15.4 | 16.4 | 20.0 |
| MM5Z24V | Y9 | 22.8 | 24 | 25.6 | 5.0 | 70 | 250 | 1.0 | 0.1 | 16.8 | 18.4 | 22.0 |
| MM5Z27V | Y10 | 25.1 | 27 | 28.9 | 2.0 | 80 | 300 | 0.5 | 0.1 | 18.9 | 21.4 | 25.3 |
| MM5Z30V | Y11 | 28.0 | 30 | 32.0 | 2.0 | 80 | 300 | 0.5 | 0.1 | 21.0 | 24.4 | 29.4 |
| MM5Z33V | Y12 | 31.0 | 33 | 35.0 | 2.0 | 80 | 325 | 0.5 | 0.1 | 23.1 | 27.4 | 33.4 |
| MM5Z36V | Y13 | 34.0 | 36 | 38.0 | 2.0 | 90 | 350 | 0.5 | 0.1 | 25.2 | 30.4 | 37.4 |
| MM5Z39V | Y14 | 37.0 | 39 | 41.0 | 2.0 | 130 | 350 | 0.5 | 0.1 | 27.3 | 33.4 | 41.2 |
| MM5Z43V | Y15 | 40.0 | 43 | 46.0 | 2.0 | 150 | 375 | 0.5 | 0.1 | 30.1 | 10.0 | 12.0 |
| MM5Z47V | Y16 | 44.0 | 47 | 50.0 | 2.0 | 170 | 375 | 0.5 | 0.1 | 32.9 | 10.0 | 12.0 |
| MM5Z51V | Y17 | 48.0 | 51 | 54.0 | 2.0 | 180 | 500 | 0.5 | 0.1 | 35.7 | 10.0 | 12.0 |

- Notes: 1. Valid provided that device terminals are kept at ambient temperature.
 2. Test with pulses. period = 5 ms, pulse width = 300 μs
 3. $f = 1\text{ KHz}$

• Maximum Ratings @ $T_A = 25^\circ\text{C}$

| Characteristic | Symbol | Value | Unit |
|--|-----------------|------------|----------------------------|
| Power Dissipation (Note 1), Derate above 25°C | P_d | 100 | mW |
| Forward Voltage (Note 2) @ $I_F = 10\text{ mA}$ | V_F | 1.5 | $\text{mW}/^\circ\text{C}$ |
| Thermal Resistance from Junction to Ambient (Note 1) | $R_{\theta JA}$ | 0.9 | V |
| Operating and Storage Temperature Range | T_j, T_{STG} | 625 | $^\circ\text{C}/\text{W}$ |
| | | -65 ~ +150 | $^\circ\text{C}$ |

- Note: 1. Valid provided that device terminals are kept at ambient temperature.
 2. Short duration test pulse used in minimize self-heating effect.
 3. $f = 1\text{ KHz}$

● **Features**

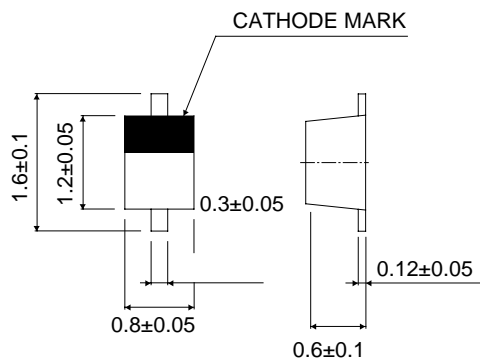
- . Standard Zener Breakdown Voltage Range -2.0V to 75V
- . Steady State Power Rating of 100 mW
- . Small Body Outline Dimensions: 1.2 mm x 0.80 mm
- . Low Body Height: 0.7 mm
- . Package Weight: 4.507 mg/unit
- . ESD Rating of Class 3 (>16 KV) per Human Body Model

● **Mechanical Data**

- . Case: SOD-523, Void-free, transfer-molded plastic
- . Finish: All external surfaces are corrosion resistant
- . Maximum Case Temperature For Soldering Purposes: 260 °C for 10 Seconds
- . Polarity: Cathode indicated by polarity band
- . Flammability Rating: UL94 V-0
- . Mounting Position: Any

● **Outline**

SOD-523



Dimensions in millimeters

• Typical Characteristics

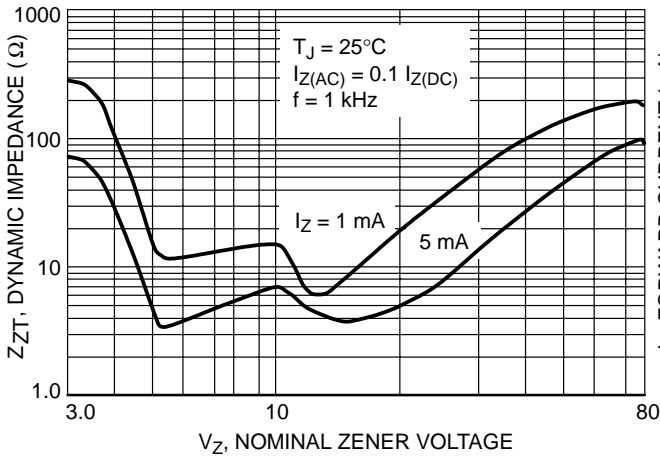


Figure 1. Effect of Zener Voltage on Zener Impedance

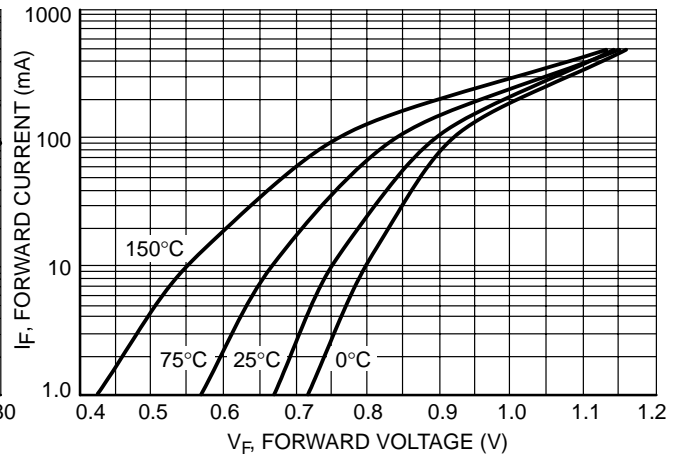


Figure 2. Typical Forward Voltage

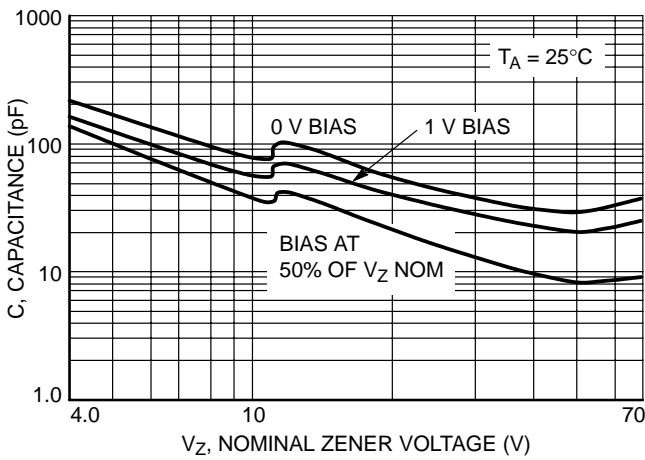


Figure 3. Typical Capacitance

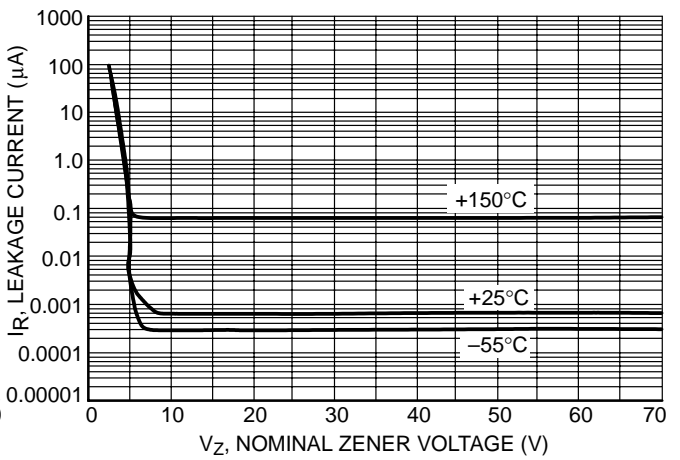


Figure 4. Typical Leakage Current

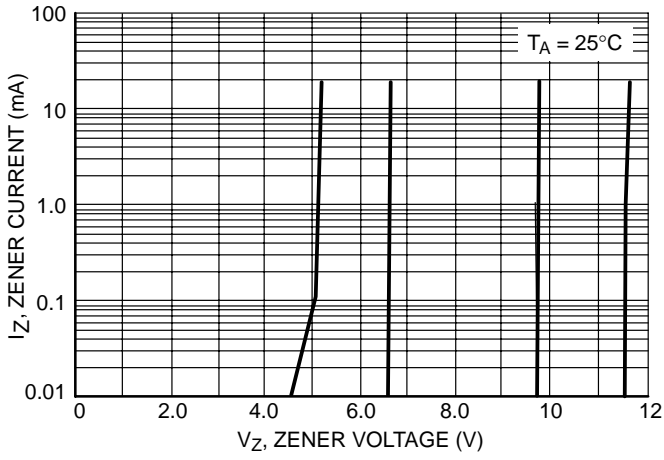


Figure 5. Zener Voltage versus Zener Current (V_Z Up to 12 V)

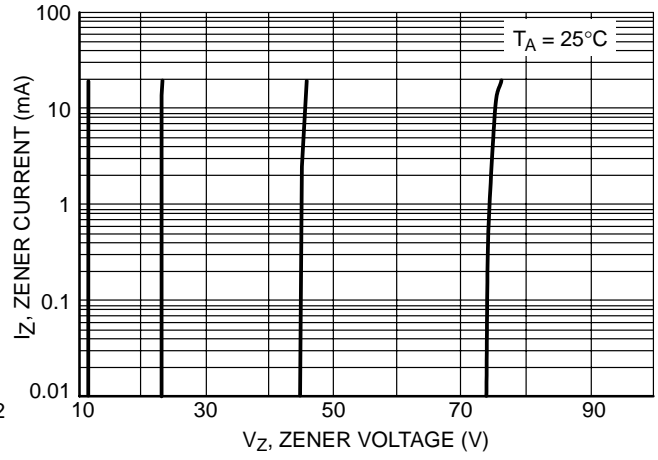


Figure 6. Zener Voltage versus Zener Current (12 V to 75 V)

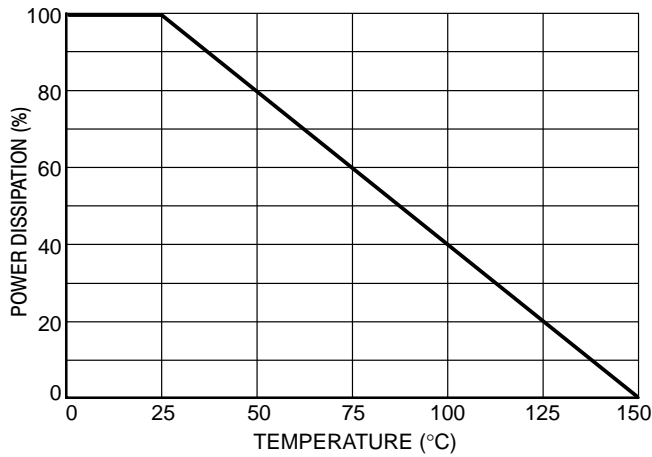


Figure 7. Steady State Power Derating