

**SOD-123FL**

**Features**

- |  $P_{tot}$  1.5W
- |  $V_Z$  3.3V- 200V
- | The marking bar indicates the cathode

**Applications**

- | Stabilizing Voltage

**Limiting Values(Absolute Maximum Rating)**

| Item                                             | Symbol         | Unit               | Conditions               | Max         |
|--------------------------------------------------|----------------|--------------------|--------------------------|-------------|
| Power dissipation                                | $P_d$          | W                  | $T_L=75^{\circ}\text{C}$ | 1.5         |
| Zener current                                    | $I_Z$          | mA                 |                          | $P_V / V_Z$ |
| Operation Junction and Storage Temperature Range | $T_J, T_{stg}$ | $^{\circ}\text{C}$ |                          | -55 ~ +150  |

**Electrical Characteristics (Ta=25°C Unless otherwise specified)**

| Item               | Symbol          | Unit                 | Conditions                  | Max |
|--------------------|-----------------|----------------------|-----------------------------|-----|
| Thermal resistance | $R_{\theta JA}$ | $^{\circ}\text{C/W}$ | Between junction to ambient | 170 |
|                    | $R_{\theta JL}$ | $^{\circ}\text{C/W}$ | Between junction to lead    | 25  |
| Forward voltage    | $V_F$           | V                    | $I_F=200\text{mA}$          | 1.5 |

### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| Part Number | Zener Voltage @I <sub>T</sub> |                         |                         | I <sub>ZT</sub> (mA) | Zener Impedance                                      |                                                      |                      | Reverse Leakage Current            |                    | DC Zener Current |
|-------------|-------------------------------|-------------------------|-------------------------|----------------------|------------------------------------------------------|------------------------------------------------------|----------------------|------------------------------------|--------------------|------------------|
|             | V <sub>Z AVE.</sub> (V)       | V <sub>Z MIN.</sub> (V) | V <sub>Z MAX.</sub> (V) |                      | Z <sub>KT</sub> MAX. <sup>(1)</sup> @I <sub>ZT</sub> | Z <sub>KK</sub> MAX. <sup>(2)</sup> @I <sub>ZK</sub> | I <sub>ZK</sub> (mA) | I <sub>R</sub> (uA)@V <sub>R</sub> | V <sub>R</sub> (V) |                  |
| SMF5913A    | 3.3                           | 3.135                   | 3.465                   | 113.6                | 10                                                   | 500.0                                                | 1.00                 | 100.0                              | 1.0                | 274.0            |
| SMF5914A    | 3.6                           | 3.42                    | 3.78                    | 104.2                | 9.0                                                  | 500.0                                                | 1.00                 | 75.0                               | 1.0                | 251.0            |
| SMF5915A    | 3.9                           | 3.71                    | 4.10                    | 96.1                 | 7.5                                                  | 500.0                                                | 1.00                 | 25.0                               | 1.0                | 232.0            |
| SMF5916A    | 4.3                           | 4.09                    | 4.52                    | 87.2                 | 6.0                                                  | 500.0                                                | 1.00                 | 5.0                                | 1.0                | 210.0            |
| SMF5917A    | 4.7                           | 4.47                    | 4.94                    | 79.8                 | 5.0                                                  | 500.0                                                | 1.00                 | 5.0                                | 1.5                | 192.0            |
| SMF5918A    | 5.1                           | 4.85                    | 5.36                    | 73.5                 | 4.0                                                  | 350.0                                                | 1.00                 | 5.0                                | 2.0                | 177.0            |
| SMF5919A    | 5.6                           | 5.32                    | 5.88                    | 66.9                 | 2.0                                                  | 250.0                                                | 1.00                 | 5.0                                | 3.0                | 161.0            |
| SMF5920A    | 6.2                           | 5.89                    | 6.51                    | 60.5                 | 2.0                                                  | 200.0                                                | 1.00                 | 2.5                                | 4.0                | 146.0            |
| SMF5921A    | 6.8                           | 6.46                    | 7.14                    | 55.1                 | 2.5                                                  | 200.0                                                | 1.00                 | 2.5                                | 5.2                | 133.0            |
| SMF5922A    | 7.5                           | 7.13                    | 7.88                    | 50.0                 | 3.0                                                  | 400.0                                                | 0.50                 | 2.5                                | 6.0                | 121.0            |
| SMF5923A    | 8.2                           | 7.79                    | 8.61                    | 45.7                 | 3.5                                                  | 400.0                                                | 0.50                 | 2.5                                | 6.5                | 110.0            |
| SMF5924A    | 9.1                           | 8.65                    | 9.56                    | 41.2                 | 4.0                                                  | 500.0                                                | 0.50                 | 2.5                                | 7.0                | 100.0            |
| SMF5925A    | 10.0                          | 9.50                    | 10.50                   | 37.5                 | 4.5                                                  | 500.0                                                | 0.25                 | 2.5                                | 8.0                | 91.0             |
| SMF5926A    | 11.0                          | 10.45                   | 11.55                   | 34.1                 | 5.5                                                  | 550.0                                                | 0.25                 | 0.5                                | 8.4                | 83.0             |
| SMF5927A    | 12.0                          | 11.40                   | 12.60                   | 31.2                 | 6.5                                                  | 550.0                                                | 0.25                 | 0.5                                | 9.1                | 76.0             |
| SMF5928A    | 13.0                          | 12.35                   | 13.65                   | 28.8                 | 7.0                                                  | 550.0                                                | 0.25                 | 0.5                                | 9.9                | 69.0             |
| SMF5929A    | 15.0                          | 14.25                   | 15.75                   | 25.0                 | 9.0                                                  | 600.0                                                | 0.25                 | 0.5                                | 11.4               | 61.0             |
| SMF5930A    | 16.0                          | 15.20                   | 16.80                   | 23.4                 | 10.0                                                 | 600.0                                                | 0.25                 | 0.5                                | 12.2               | 57.0             |
| SMF5931A    | 18.0                          | 17.10                   | 18.90                   | 20.8                 | 12.0                                                 | 650.0                                                | 0.25                 | 0.5                                | 13.7               | 50.0             |
| SMF5932A    | 20.0                          | 19.00                   | 21.00                   | 18.7                 | 14.0                                                 | 650.0                                                | 0.25                 | 0.5                                | 15.2               | 45.0             |
| SMF5933A    | 22.0                          | 20.90                   | 23.10                   | 17.0                 | 17.5                                                 | 650.0                                                | 0.25                 | 0.5                                | 16.7               | 41.0             |
| SMF5934A    | 24.0                          | 22.80                   | 25.20                   | 15.6                 | 19.0                                                 | 700.0                                                | 0.25                 | 0.5                                | 18.2               | 38.0             |
| SMF5935A    | 27.0                          | 25.65                   | 28.35                   | 13.9                 | 23.0                                                 | 700.0                                                | 0.25                 | 0.5                                | 20.6               | 34.0             |
| SMF5936A    | 30.0                          | 28.50                   | 31.50                   | 12.5                 | 26.0                                                 | 750.0                                                | 0.25                 | 0.5                                | 22.8               | 30.0             |
| SMF5937A    | 33.0                          | 31.35                   | 34.65                   | 11.4                 | 33.0                                                 | 800.0                                                | 0.25                 | 0.5                                | 25.1               | 27.0             |
| SMF5938A    | 36.0                          | 34.20                   | 37.80                   | 10.4                 | 38.0                                                 | 850.0                                                | 0.25                 | 0.5                                | 27.4               | 25.0             |
| SMF5939A    | 39.0                          | 37.05                   | 40.95                   | 9.6                  | 45.0                                                 | 900.0                                                | 0.25                 | 0.5                                | 29.7               | 23.0             |
| SMF5940A    | 43.0                          | 40.85                   | 45.15                   | 8.7                  | 53.0                                                 | 950.0                                                | 0.25                 | 0.5                                | 32.7               | 22.0             |
| SMF5941A    | 47.0                          | 44.65                   | 49.35                   | 8.0                  | 67.0                                                 | 1000.0                                               | 0.25                 | 0.5                                | 35.8               | 19.0             |
| SMF5942A    | 51.0                          | 48.45                   | 53.55                   | 7.3                  | 70.0                                                 | 1100.0                                               | 0.25                 | 0.5                                | 38.8               | 18.0             |
| SMF5943A    | 56.0                          | 53.20                   | 58.80                   | 6.7                  | 86.0                                                 | 1300.0                                               | 0.25                 | 0.5                                | 42.6               | 16.0             |
| SMF5944A    | 62.0                          | 58.90                   | 65.10                   | 6.0                  | 100.0                                                | 1500.0                                               | 0.25                 | 0.5                                | 47.1               | 14.0             |
| SMF5945A    | 68.0                          | 64.60                   | 71.40                   | 5.5                  | 120.0                                                | 1700.0                                               | 0.25                 | 0.5                                | 51.7               | 13.0             |
| SMF5946A    | 75.0                          | 71.25                   | 78.75                   | 5.0                  | 140.0                                                | 2000.0                                               | 0.25                 | 0.5                                | 56.0               | 12.0             |
| SMF5947A    | 82.0                          | 77.90                   | 86.10                   | 4.6                  | 160.0                                                | 2500.0                                               | 0.25                 | 0.5                                | 62.2               | 11.0             |
| SMF5948A    | 91.0                          | 86.45                   | 95.55                   | 4.1                  | 200.0                                                | 3000.0                                               | 0.25                 | 0.5                                | 69.2               | 10.0             |
| SMF5949A    | 100.0                         | 95.00                   | 105.00                  | 3.7                  | 250.0                                                | 3100.0                                               | 0.25                 | 0.5                                | 76.0               | 9.0              |
| SMF5950A    | 110.0                         | 104.50                  | 115.50                  | 3.4                  | 300.0                                                | 4000.0                                               | 0.25                 | 0.5                                | 83.6               | 8.6              |
| SMF5951A    | 120.0                         | 114.00                  | 126.00                  | 3.1                  | 380.0                                                | 4500.0                                               | 0.25                 | 0.5                                | 91.2               | 7.8              |
| SMF5952A    | 130.0                         | 123.50                  | 136.50                  | 2.9                  | 450.0                                                | 5000.0                                               | 0.25                 | 0.5                                | 98.8               | 7.0              |
| SMF5953A    | 150.0                         | 142.50                  | 157.50                  | 2.5                  | 600.0                                                | 6000.0                                               | 0.25                 | 0.5                                | 114.0              | 6.4              |
| SMF5954A    | 160.0                         | 152.00                  | 168.00                  | 2.3                  | 700.0                                                | 6500.0                                               | 0.25                 | 0.5                                | 121.6              | 5.8              |
| SMF5955A    | 180.0                         | 171.00                  | 189.00                  | 2.1                  | 900.0                                                | 7000.0                                               | 0.25                 | 0.5                                | 136.8              | 5.2              |
| SMF5956A    | 200.0                         | 190.00                  | 210.00                  | 1.9                  | 1200.0                                               | 8000.0                                               | 0.25                 | 0.5                                | 152.0              | 4.7              |

(1) The type number listed have a standard tolerance on the nominal zener voltage of ± 5 %

(2) The reverse surge current is a non-repetitive, 8.3ms pulse width square wave or equivalent sine-wave superimposed on I<sub>ZT</sub> per method.

## Typical Characteristics

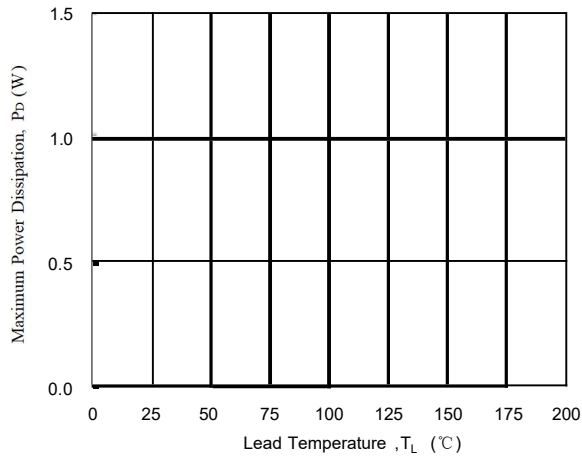


Fig. 1 - Power Temperature Derating Curve

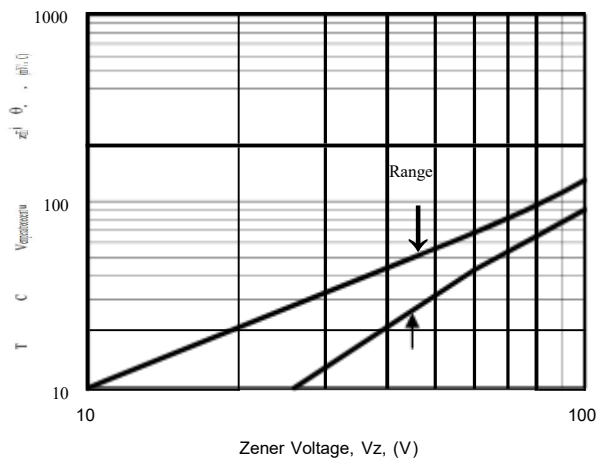


Fig. 2 - Temperature Coefficients v.s. Zener Voltage

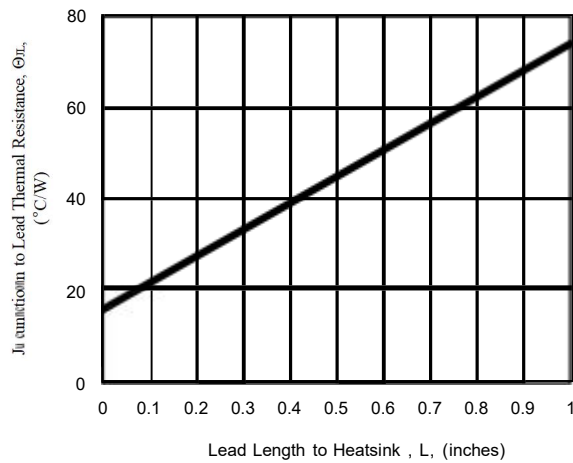


Fig. 3 - Typical Thermal Resistance v.s. Lead Length

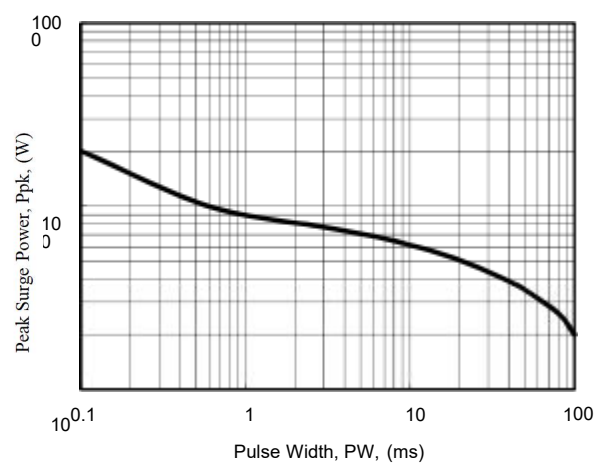


Fig. 4 - Maximum Surge Power

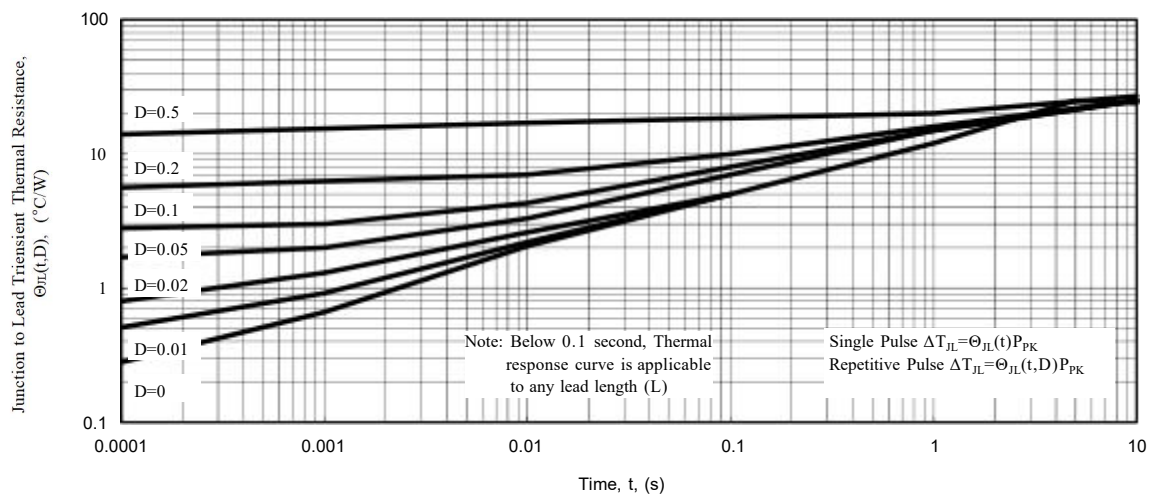
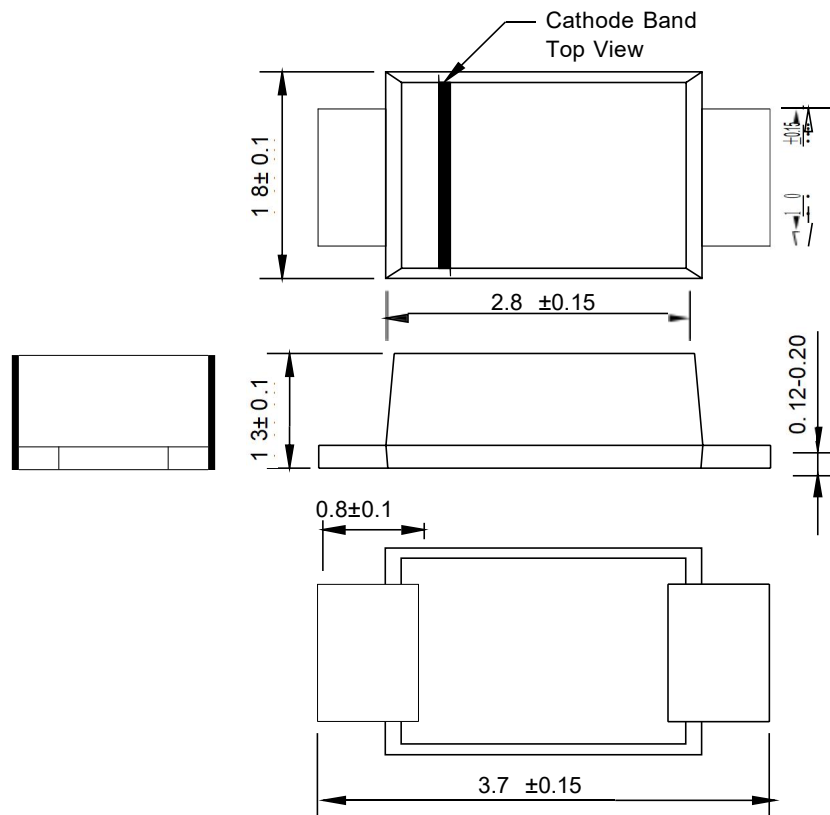


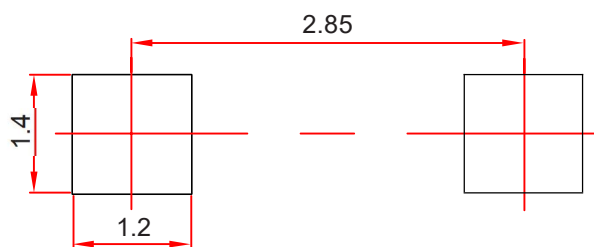
Fig. 5 - Typical Thermal Response L, Lead Length=3/8 inch

## SOD-1 23FL Package outline Dimensions



Dimensions in millimeters

## SOD-1 23FL Suggested pad Layout



### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.