

## SOD-123FL Plastic-Encapsulate Diodes

### SMF SERIES

Transient Voltage Suppressor Diodes

#### Features

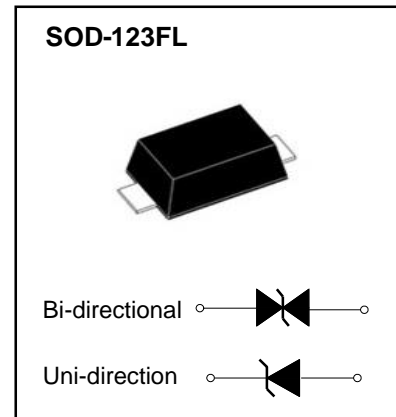
- $P_{PP}$  200W
- $V_{RWM}$  5.0V- 440V

#### Applications

- Clamping Voltage

#### Marking

- SMF XXCA/XXA
- XX : From 5.0 To 440



#### Limiting Values(Absolute Maximum Rating)

| Item   | Symbol          | Unit | Conditions                   | Max            |
|--|-----------------|------|------------------------------|----------------|
| Peak power dissipation                           | $P_{PPM}$       | W    | with a 10/1000us waveform    | 200            |
| Peak pulse current                               | $I_{PPM}$       | A    | with a 10/1000us waveform    | See Next Table |
| Operating junction and storage temperature range | $T_J, T_{STG}$  | °C   |                              | -55 ~ +150     |
| Thermal resistance                               | $R_{\theta JL}$ | °C/W | Between junction and lead    | 26             |
|  | $R_{\theta JA}$ | °C/W | Between junction and Ambient | 300            |

#### Notes:

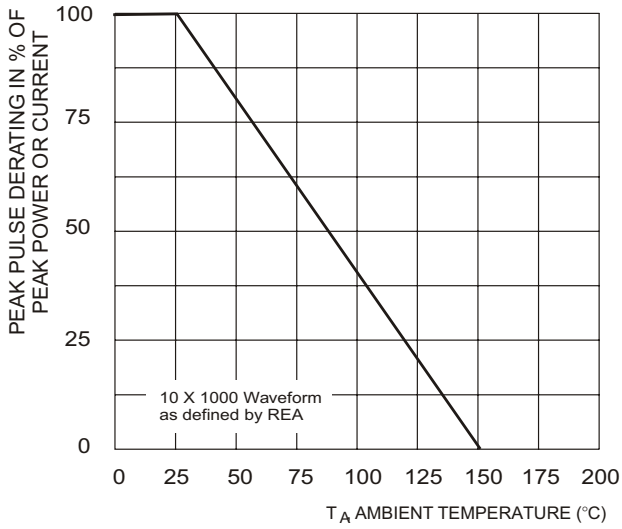
- (1) Non-repetitive current pulse at  $T_A=25^\circ\text{C}$ , per waveform of Figure 2.
- (2)  $T_L=30^\circ\text{C}$  unless otherwise noted,  $V_F \leq 1.25\text{Volts}@200\text{mA}$

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

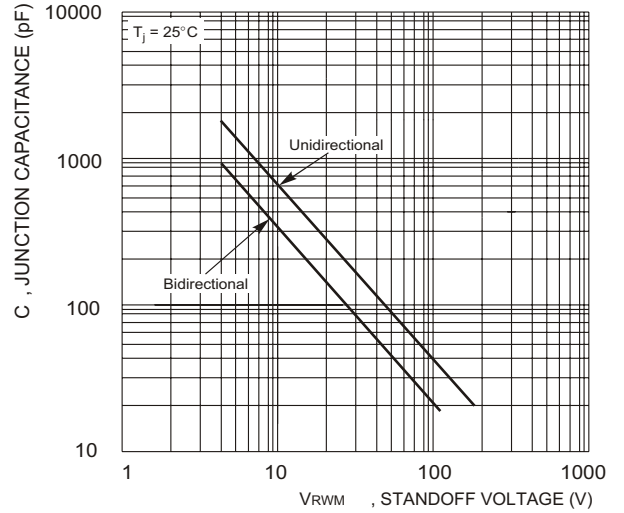
| Part Number |          | Reverse Stand off Voltage | Breakdown Voltage<br>V <sub>BR</sub> @I <sub>T</sub> |         | Test Current        | Max Clamping Voltage@I <sub>pp</sub> | Max Peak Pulse Current | Max Reverse Leakage@V <sub>RWM</sub> |
|-------------|----------|---------------------------|--|---------|---------------------|--------------------------------------|------------------------|--------------------------------------|
| UNI-POLAR   | BI-POLAR | V <sub>RWM</sub> (V)      | Min.(V)  | Max.(V) | I <sub>T</sub> (mA) | V <sub>C</sub> MAX.(V)               | I <sub>pp</sub> (A)    | I <sub>R</sub> (uA)                  |
| SMF5.0A     | SMF5.0CA | 5.0                       | 6.40   | 7.00    | 10                  | 9.2                                  | 21.7                   | 800                                  |
| SMF6.0A     | SMF6.0CA | 6.0                       | 6.67   | 7.37    | 10                  | 10.3                                 | 19.4                   | 800                                  |
| SMF6.5A     | SMF6.5CA | 6.5                       | 7.22   | 7.98    | 10                  | 11.2                                 | 17.8                   | 500                                  |
| SMF7.0A     | SMF7.0CA | 7.0                       | 7.78   | 8.60    | 10                  | 12                                   | 16.6                   | 200                                  |
| SMF7.5A     | SMF7.5CA | 7.5                       | 8.33   | 9.21    | 1                   | 12.9                                 | 15.5                   | 100                                  |
| SMF8.0A     | SMF8.0CA | 8.0                       | 8.89   | 9.83    | 1                   | 13.6                                 | 14.7                   | 50                                   |
| SMF8.5A     | SMF8.5CA | 8.5                       | 9.44   | 10.40   | 1                   | 14.4                                 | 13.8                   | 20                                   |
| SMF9.0A     | SMF9.0CA | 9.0                       | 10.00  | 11.10   | 1                   | 15.4                                 | 13                     | 10                                   |
| SMF10A      | SMF10CA  | 10.0                      | 11.10  | 12.30   | 1                   | 17                                   | 11.7                   | 5                                    |
| SMF11A      | SMF11CA  | 11.0                      | 12.20  | 13.50   | 1                   | 18.2                                 | 11                     | 1                                    |
| SMF12A      | SMF12CA  | 12.0                      | 13.30  | 14.70   | 1                   | 19.9                                 | 10                     | 1                                    |
| SMF13A      | SMF13CA  | 13.0                      | 14.40  | 15.90   | 1                   | 21.5                                 | 9.3                    | 1                                    |
| SMF14A      | SMF14CA  | 14.0                      | 15.60  | 17.20   | 1                   | 23.2                                 | 8.6                    | 1                                    |
| SMF15A      | SMF15CA  | 15.0                      | 16.70  | 18.50   | 1                   | 24.4                                 | 8.2                    | 1                                    |
| SMF16A      | SMF16CA  | 16.0                      | 17.80  | 19.70   | 1                   | 26                                   | 7.7                    | 1                                    |
| SMF17A      | SMF17CA  | 17.0                      | 18.90  | 20.90   | 1                   | 27.6                                 | 7.2                    | 1                                    |
| SMF18A      | SMF18CA  | 18.0                      | 20.00  | 22.10   | 1                   | 29.2                                 | 6.8                    | 1                                    |
| SMF20A      | SMF20CA  | 20.0                      | 22.00  | 24.50   | 1                   | 32.4                                 | 6.1                    | 1                                    |
| SMF22A      | SMF22CA  | 22.0                      | 24.40  | 26.90   | 1                   | 35.5                                 | 5.6                    | 1                                    |
| SMF24A      | SMF24CA  | 24.0                      | 26.70  | 29.50   | 1                   | 38.9                                 | 5.1                    | 1                                    |
| SMF26A      | SMF26CA  | 26.0                      | 28.90  | 31.90   | 1                   | 42.1                                 | 4.7                    | 1                                    |
| SMF28A      | SMF28CA  | 28.0                      | 31.10  | 34.40   | 1                   | 45.4                                 | 4.4                    | 1                                    |
| SMF30A      | SMF30CA  | 30.0                      | 33.50  | 36.80   | 1                   | 48.4                                 | 4.1                    | 1                                    |
| SMF33A      | SMF33CA  | 33.0                      | 36.70  | 40.60   | 1                   | 53.3                                 | 3.7                    | 1                                    |
| SMF36A      | SMF36CA  | 36.0                      | 40.00  | 44.20   | 1                   | 58.1                                 | 3.4                    | 1                                    |
| SMF40A      | SMF40CA  | 40.0                      | 44.40  | 49.10   | 1                   | 64.5                                 | 3.1                    | 1                                    |
| SMF43A      | SMF43CA  | 43.0                      | 47.80  | 52.80   | 1                   | 69.4                                 | 2.9                    | 1                                    |
| SMF45A      | SMF45CA  | 45.0                      | 50.00  | 55.30   | 1                   | 72.7                                 | 2.7                    | 1                                    |
| SMF48A      | SMF48CA  | 48.0                      | 53.30  | 58.90   | 1                   | 77.4                                 | 2.6                    | 1                                    |
| SMF51A      | SMF51CA  | 51.0                      | 56.70  | 62.70   | 1                   | 82.4                                 | 2.4                    | 1                                    |
| SMF54A      | SMF54CA  | 54.0                      | 60.00  | 66.30   | 1                   | 87.1                                 | 2.3                    | 1                                    |
| SMF58A      | SMF58CA  | 58.0                      | 64.40  | 71.20   | 1                   | 93.6                                 | 2.1                    | 1                                    |
| SMF60A      | SMF60CA  | 60.0                      | 66.70  | 73.70   | 1                   | 96.8                                 | 2                      | 1                                    |
| SMF64A      | SMF64CA  | 64.0                      | 71.10  | 78.60   | 1                   | 103.0                                | 1.9                    | 1                                    |
| SMF70A      | SMF70CA  | 70.0                      | 77.80  | 86.00   | 1                   | 113.0                                | 1.7                    | 1                                    |
| SMF75A      | SMF75CA  | 75.0                      | 83.30  | 92.10   | 1                   | 121.0                                | 1.6                    | 1                                    |
| SMF78A      | SMF78CA  | 78.0                      | 86.70  | 95.80   | 1                   | 126.0                                | 1.5                    | 1                                    |
| SMF85A      | SMF85CA  | 85.0                      | 94.4   | 104.0   | 1                   | 137.0                                | 1.4                    | 1                                    |
| SMF90A      | SMF90CA  | 90.0                      | 100.0  | 111.0   | 1                   | 146.0                                | 1.3                    | 1                                    |
| SMF100A     | SMF100CA | 100.0                     | 111.0  | 123.0   | 1                   | 162.0                                | 1.2                    | 1                                    |
| SMF110A     | SMF110CA | 110.0                     | 122.0  | 135.0   | 1                   | 177.0                                | 1.1                    | 1                                    |
| SMF120A     | SMF120CA | 120.0                     | 133.0  | 147.0   | 1                   | 193.0                                | 1                      | 1                                    |
| SMF130A     | SMF130CA | 130.0                     | 144.0  | 159.0   | 1                   | 209.0                                | 0.9                    | 1                                    |
| SMF150A     | SMF150CA | 150.0                     | 167.0  | 185.0   | 1                   | 243.0                                | 0.8                    | 1                                    |
| SMF160A     | SMF160CA | 160.0                     | 178.0  | 197.0   | 1                   | 259.0                                | 0.7                    | 1                                    |
| SMF170A     | SMF170CA | 170.0                     | 189.0  | 209.0   | 1                   | 275.0                                | 0.7                    | 1                                    |
| SMF180A     | SMF180CA | 180.0                     | 201.0  | 222.0   | 1                   | 292.0                                | 0.7                    | 1                                    |
| SMF190A     | SMF190CA | 190.0                     | 209.0  | 243.0   | 1                   | 308.0                                | 0.6                    | 1                                    |
| SMF200A     | SMF200CA | 200.0                     | 224.0  | 247.0   | 1                   | 324.0                                | 0.6                    | 1                                    |
| SMF210A     | SMF210CA | 210.0                     | 231.0  | 268.0   | 1                   | 340.0                                | 0.6                    | 1                                    |
| SMF220A     | SMF220CA | 220.0                     | 246.0  | 272.0   | 1                   | 356.0                                | 0.5                    | 1                                    |
| SMF250A     |          | 250.0                     | 279.0  | 309.0   | 1                   | 405.0                                | 0.5                    | 1                                    |
| SMF300A     |          | 300.0                     | 335.0  | 371.0   | 1                   | 486.0                                | 0.4                    | 1                                    |
| SMF350A     |          | 350.0                     | 391.0  | 432.0   | 1                   | 567.0                                | 0.3                    | 1                                    |
| SMF400A     |          | 400.0                     | 447.0  | 494.0   | 1                   | 648.0                                | 0.3                    | 1                                    |
| SMF440A     |          | 440.0                     | 492.0  | 543.0   | 1                   | 713.0                                | 0.3                    | 1                                    |

# Typical Characteristics

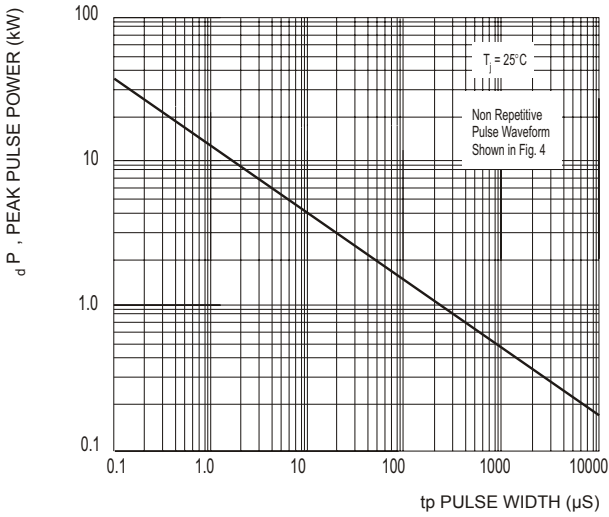
**Fig. 1 Pulse Derating Curve**



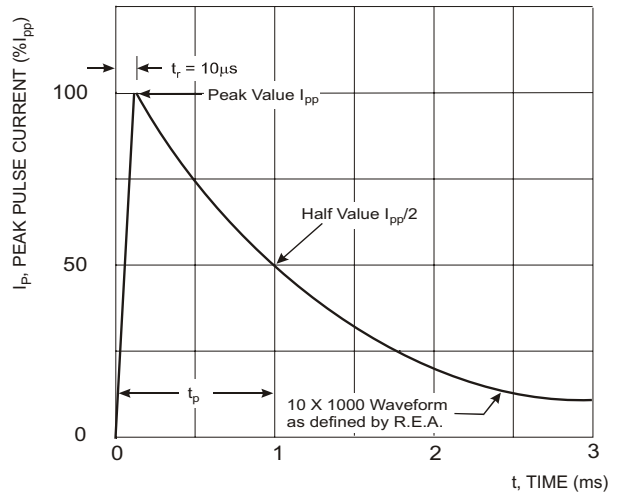
**Fig. 2 Typical Total Capacitance**



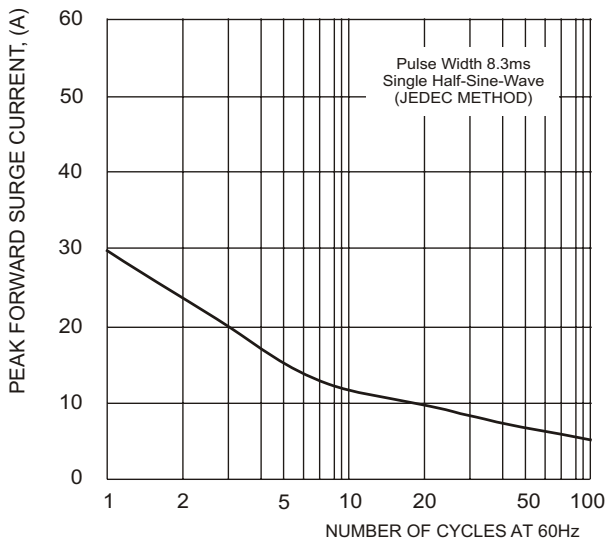
**Fig. 3 Pulse rating curve**



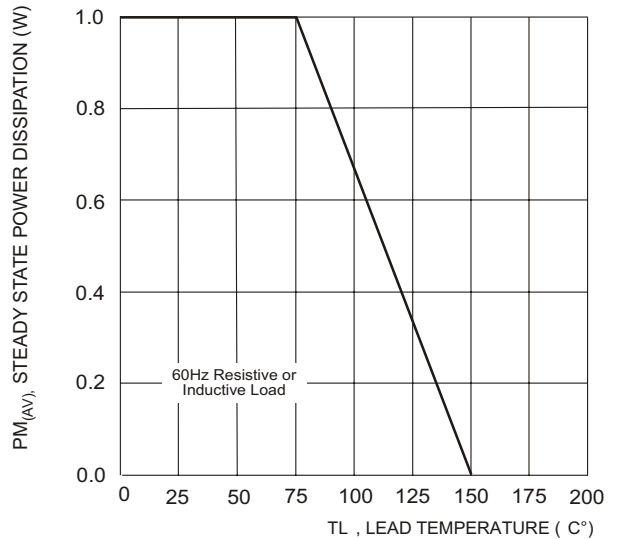
**Fig. 4 Pulse Waveform**



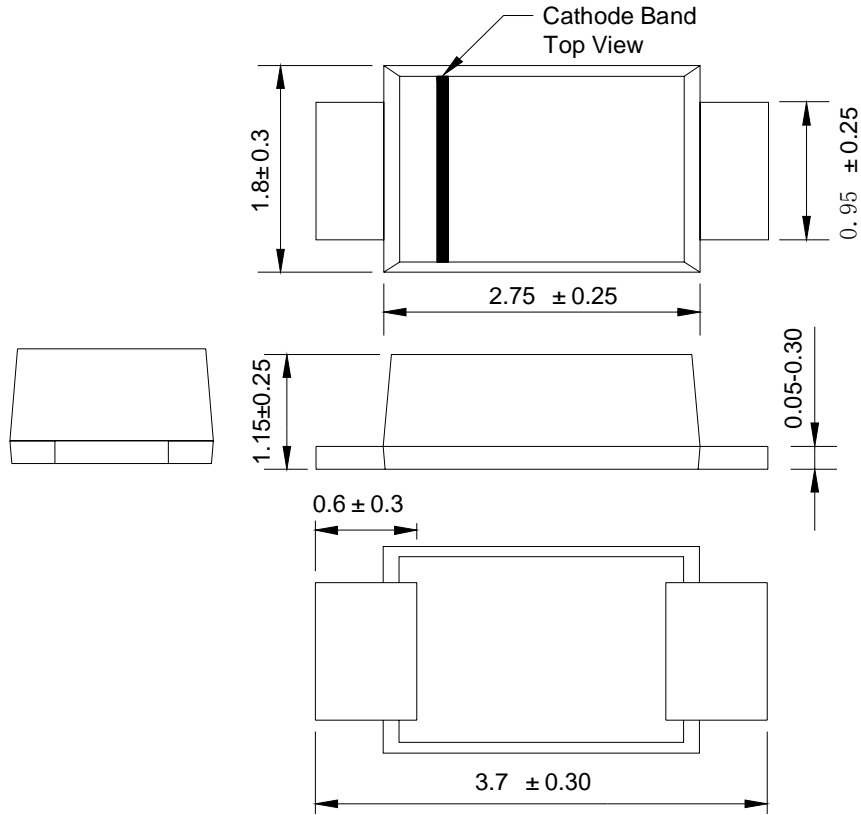
**Fig. 5 Maximum Non-Repetitive Surge Current**



**Fig. 6 Steady State Power Derating Curve**

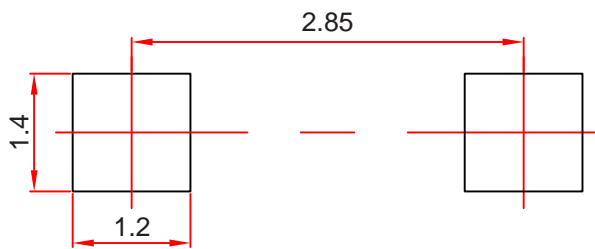


## SOD-123FL Package Outline Dimensions



Dimensions in millimeters

## SOD-123FL 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.

### NOTICE

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# Reel Taping Specifications For Surface Mount Devices-SOD-123FL



**FIG: CONFIGURATION OF SURFACE MOUNTED DEVICES TAPING**

| ITEM                   | SYMBOL | SOD-123FLmm(inch)      |
|------------------------|--------|------------------------|
| Carrier width          | A      | 2.05±0.1(0.081±0.004)  |
| Carrier length         | B      | 3.95±0.1(0.156±0.004)  |
| Carrier depth          | C      | 1.45±0.1(0.057±0.004)  |
| Sprocket hole          | d      | 1.55±0.05(0.061±0.002) |
| Reel outside diameter  | D      | 178±2.0(7.0±0.079)     |
| Reel inner diameter    | D1     | 54±1.0(2.13±0.039)     |
| Feed hole diameter     | D2     | 13±0.5(0.512±0.020)    |
| Sprocket hole position | E      | 1.75±0.1(0.069±0.004)  |
| Punch hole position    | F      | 3.50±0.1(0.138±0.002)  |
| Punch hole pitch       | P      | 4.0±0.1(0.157±0.004)   |
| Sprocket hole pitch    | P0     | 4.0±0.1(0.157±0.004)   |
| Embossment center      | P1     | 2.0±0.1(0.079±0.004)   |
| Totall tape thickness  | T      | 0.21±0.25(0.008±0.010) |
| Tape width             | W      | 8.0±0.2(0.315±0.008)   |
| Reel width             | W1     | 10.0±2.0(0.394±0.079)  |

NOTE: Devices are packed in accordance with EIA standard RS-481-A and specification given above.

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