

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

**SMF5.0A- SMF170CA**

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**Product specification**


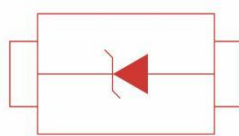

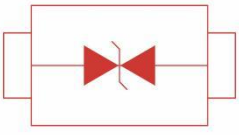
**Features**

- For surface mounted applications
- Low profile package
- Low incremental surge resistance, excellent
- clamping capability
- 200W peak pulse power capability with a10/1000  $\mu$ s wave from, repetition rate (duty cycle):0.01%
- High temperature soldering guaranteed: 260  $^{\circ}$ C/10 seconds, at terminals

**Mechanical Data**

- Case: JEDEC SOD- 123FL, molded plastic over passivated chip
- Polarity: Color band denotes positive end( cathode ) except for bidirectional
- Mounting position: Any
- Weight: 0.006 ounces, 0.02 gram

**Reference News**

| PACKAGE OUTLINE   | PIN CONFIGURATION   |
|---|---|
|    |    |
| SOD-123FL Unipolar  |   |
|  |  |
| SOD-123FL Bipolar   |   |

**Maximum Ratings TA = 25 $^{\circ}$ C unless otherwise specified**

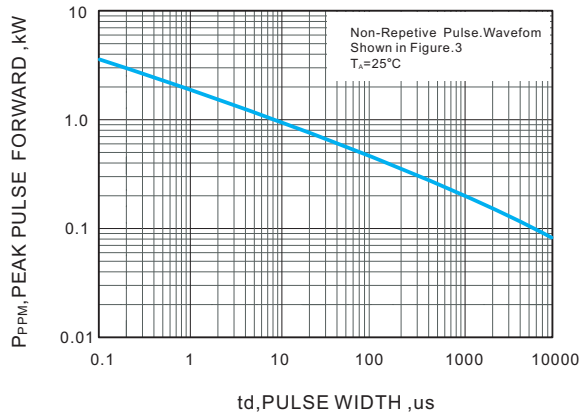
| Characteristic   | Symbol                            | Value        | Unit             |
|--|-----------------------------------|--------------|------------------|
| Maximum P <sub>PK</sub> Dissipation (PW -10/1000 $\mu$ s)                            | P <sub>PK</sub>                   | 200          | W                |
| Maximum P <sub>PK</sub> Dissipation @Ta =25 $^{\circ}$ C (PW - 8/10 $\mu$ s) (Note2) | P <sub>PK</sub>                   | 1000         | W                |
| DC Power Dissipation @Ta= 25 $^{\circ}$ C (Note 3)                                   | P <sub>D</sub>                    | 385          | W                |
| Derate above 25 $^{\circ}$ C   |                                   | 4.0          | mW/ $^{\circ}$ C |
| Thermal Resistance, Junction to Ambient ( Note3 )                                    | R $\theta$ JA                     | 325          | $^{\circ}$ C /W  |
| Thermal Resistance, Junction to Lead ( Note 3 )                                      | R $\theta$ JL                     | 26           | $^{\circ}$ C /W  |
| Operating Junction and Storage Temperature Range                                     | T <sub>J</sub> , T <sub>STG</sub> | -55 to + 150 | $^{\circ}$ C     |

**Notes :**

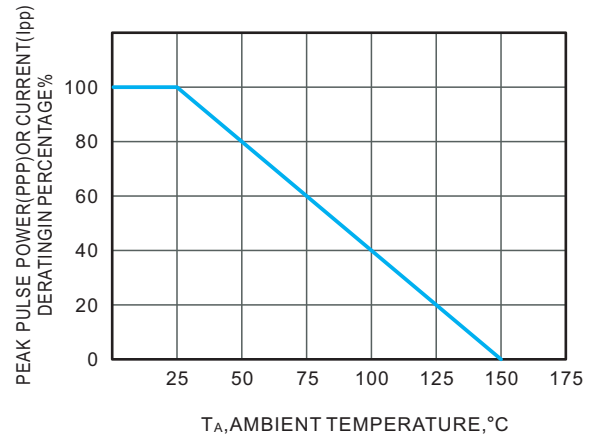
- (1) Non-repetitive current pulse at Ta = 25 $^{\circ}$ C, per waveform of Fig. 2.
- (2) Non-repetitive current pulse at Ta = 25 $^{\circ}$ C, per waveform of Fig.5.
- (3) Mounted with recommended minimum pad size , DC board FR4.

| TYPE    |          | Marking |      | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I <sub>T</sub> | Breakdown Voltage Max. @ I <sub>T</sub> | Test Current        | Reverse Leakage @ V <sub>RWM</sub> | Maximum Clamping Voltage @ I <sub>PP</sub> | Peak                |
|---------|----------|---------|------|---------------------------|--|---|---------------------|------------------------------------|--|---------------------|
| (Uni)   | (Bi)     | (Uni)   | (Bi) | V <sub>RWM</sub> (V)      | V <sub>BR</sub> MIN(V)                 | V <sub>BR</sub> MAX(V)                  | I <sub>T</sub> (mA) | I <sub>R</sub> (uA)                | V <sub>C</sub> (V)                         | I <sub>PP</sub> (A) |
| SMF5.0A | SMF5.0CA | KE      | FE   | 5.0                       | 6.40                                   | 7.00                                    | 10                  | 400                                | 9.2  | 21.7                |
| SMF6.0A | SMF6.0CA | KG      | FG   | 6.0                       | 6.67                                   | 7.37                                    | 10                  | 400                                | 10.3                                       | 19.4                |
| SMF6.5A | SMF6.5CA | KK      | FK   | 6.5                       | 7.22                                   | 7.98                                    | 10                  | 250                                | 11.2                                       | 17.9                |
| SMF7.0A | SMF7.0CA | KM      | FM   | 7.0                       | 7.78                                   | 8.60                                    | 10                  | 100                                | 12.0                                       | 16.7                |
| SMF7.5A | SMF7.5CA | KP      | FP   | 7.5                       | 8.33                                   | 9.21                                    | 1.0                 | 50                                 | 12.9                                       | 15.5                |
| SMF8.0A | SMF8.0CA | KR      | FR   | 8.0                       | 8.89                                   | 9.83                                    | 1.0                 | 25                                 | 13.6                                       | 14.7                |
| SMF8.5A | SMF8.5CA | KT      | FT   | 8.5                       | 9.44                                   | 10.4                                    | 1.0                 | 10                                 | 14.4                                       | 13.9                |
| SMF9.0A | SMF9.0CA | KV      | FV   | 9.0                       | 10.0                                   | 11.1                                    | 1.0                 | 5.0                                | 15.4                                       | 13.0                |
| SMF10A  | SMF10CA  | KX      | FX   | 10                        | 11.1                                   | 12.3                                    | 1.0                 | 2.5                                | 17.0                                       | 11.8                |
| SMF11A  | SMF11CA  | KZ      | FZ   | 11                        | 12.2                                   | 13.5                                    | 1.0                 | 2.5                                | 18.2                                       | 11.0                |
| SMF12A  | SMF12CA  | LE      | HE   | 12                        | 13.3                                   | 14.7                                    | 1.0                 | 2.5                                | 19.9                                       | 10.1                |
| SMF13A  | SMF13CA  | LG      | HG   | 13                        | 14.4                                   | 15.9                                    | 1.0                 | 1.0                                | 21.5                                       | 9.3                 |
| SMF14A  | SMF14CA  | LK      | HK   | 14                        | 15.6                                   | 17.2                                    | 1.0                 | 1.0                                | 23.2                                       | 8.6                 |
| SMF15A  | SMF15CA  | LM      | HM   | 15                        | 16.7                                   | 18.5                                    | 1.0                 | 1.0                                | 24.4                                       | 8.2                 |
| SMF16A  | SMF16CA  | LP      | HP   | 16                        | 17.8                                   | 19.7                                    | 1.0                 | 1.0                                | 26.0                                       | 7.7                 |
| SMF17A  | SMF17CA  | LR      | HR   | 17                        | 18.9                                   | 20.9                                    | 1.0                 | 1.0                                | 27.6                                       | 7.2                 |
| SMF18A  | SMF18CA  | LT      | HT   | 18                        | 20.0                                   | 22.1                                    | 1.0                 | 1.0                                | 29.2                                       | 6.8                 |
| SMF20A  | SMF20CA  | LV      | HV   | 20                        | 22.2                                   | 24.5                                    | 1.0                 | 1.0                                | 32.4                                       | 6.2                 |
| SMF22A  | SMF22CA  | LX      | HX   | 22                        | 24.4                                   | 26.9                                    | 1.0                 | 1.0                                | 35.5                                       | 5.6                 |
| SMF24A  | SMF24CA  | LZ      | HZ   | 24                        | 26.7                                   | 29.5                                    | 1.0                 | 1.0                                | 38.9                                       | 5.1                 |
| SMF26A  | SMF26CA  | ME      | JE   | 26                        | 28.9                                   | 31.9                                    | 1.0                 | 1.0                                | 42.1                                       | 4.8                 |
| SMF28A  | SMF28CA  | MG      | JG   | 28                        | 31.1                                   | 34.4                                    | 1.0                 | 1.0                                | 45.4                                       | 4.4                 |
| SMF30A  | SMF30CA  | MK      | JK   | 30                        | 33.3                                   | 36.8                                    | 1.0                 | 1.0                                | 48.4                                       | 4.1                 |
| SMF33A  | SMF33CA  | MM      | JM   | 33                        | 36.7                                   | 40.6                                    | 1.0                 | 1.0                                | 53.3                                       | 3.8                 |
| SMF36A  | SMF36CA  | MP      | JP   | 36                        | 40.0                                   | 44.2                                    | 1.0                 | 1.0                                | 58.1                                       | 3.4                 |
| SMF40A  | SMF40CA  | MR      | JR   | 40                        | 44.4                                   | 49.1                                    | 1.0                 | 1.0                                | 64.5                                       | 3.1                 |
| SMF43A  | SMF43CA  | MT      | JT   | 43                        | 47.8                                   | 52.8                                    | 1.0                 | 1.0                                | 69.4                                       | 2.9                 |
| SMF45A  | SMF45CA  | MV      | JV   | 45                        | 50.0                                   | 55.3                                    | 1.0                 | 1.0                                | 72.7                                       | 2.8                 |
| SMF48A  | SMF48CA  | MX      | JX   | 48                        | 53.3                                   | 58.9                                    | 1.0                 | 1.0                                | 77.4                                       | 2.6                 |
| SMF51A  | SMF51CA  | MZ      | JZ   | 51                        | 56.7                                   | 62.7                                    | 1.0                 | 1.0                                | 82.4                                       | 2.4                 |
| SMF54A  | SMF54CA  | NE      | XE   | 54                        | 60.0                                   | 66.3                                    | 1.0                 | 1.0                                | 87.1                                       | 2.3                 |
| SMF58A  | SMF58CA  | NG      | XG   | 58                        | 64.4                                   | 71.2                                    | 1.0                 | 1.0                                | 93.6                                       | 2.1                 |
| SMF60A  | SMF60CA  | NK      | XK   | 60                        | 66.7                                   | 73.7                                    | 1.0                 | 1.0                                | 96.8                                       | 1.8                 |
| SMF64A  | SMF64CA  | NM      | XM   | 64                        | 71.1                                   | 78.6                                    | 1.0                 | 1.0                                | 103  | 1.7                 |
| SMF70A  | SMF70CA  | NP      | XP   | 70                        | 77.8                                   | 86.0                                    | 1.0                 | 1.0                                | 113  | 1.5                 |
| SMF75A  | SMF75CA  | NR      | XR   | 75                        | 83.3                                   | 92.1                                    | 1.0                 | 1.0                                | 121  | 1.4                 |
| SMF78A  | SMF78CA  | NT      | XT   | 78                        | 86.7                                   | 95.8                                    | 1.0                 | 1.0                                | 126  | 1.4                 |
| SMF85A  | SMF85CA  | NV      | XB   | 85                        | 94.4                                   | 104                                     | 1.0                 | 1.0                                | 137  | 1.3                 |
| SMF90A  | SMF90CA  | NX      | XX   | 90                        | 100                                    | 111                                     | 1.0                 | 1.0                                | 146  | 1.2                 |
| SMF100A | SMF100CA | NZ      | XZ   | 100                       | 111                                    | 123                                     | 1.0                 | 1.0                                | 162  | 1.1                 |
| SMF110A | SMF110CA | PE      | TE   | 110                       | 122                                    | 135                                     | 1.0                 | 1.0                                | 177  | 1.0                 |
| SMF120A | SMF120CA | PG      | TG   | 120                       | 133                                    | 147                                     | 1.0                 | 1.0                                | 193  | 0.9                 |
| SMF130A | SMF130CA | PK      | TK   | 130                       | 144                                    | 159                                     | 1.0                 | 1.0                                | 209  | 0.8                 |
| SMF150A | SMF150CA | PM      | TM   | 150                       | 167                                    | 185                                     | 1.0                 | 1.0                                | 243  | 0.7                 |
| SMF160A | SMF160CA | PP      | TP   | 160                       | 178                                    | 197                                     | 1.0                 | 1.0                                | 259  | 0.7                 |
| SMF170A | SMF170CA | PR      | TR   | 170                       | 189                                    | 209                                     | 1.0                 | 1.0                                | 275  | 0.6                 |

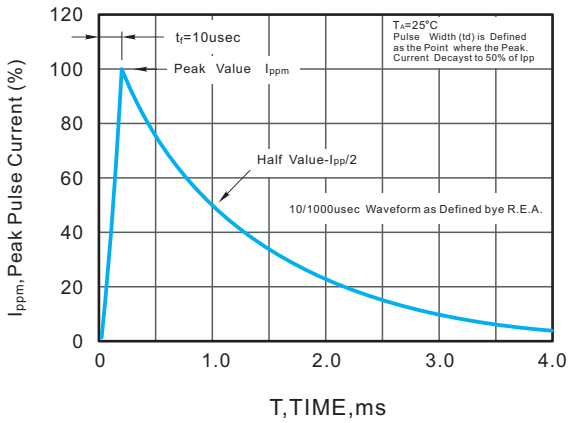
**Fig.1 Peak Pulse Power Rating Curve**



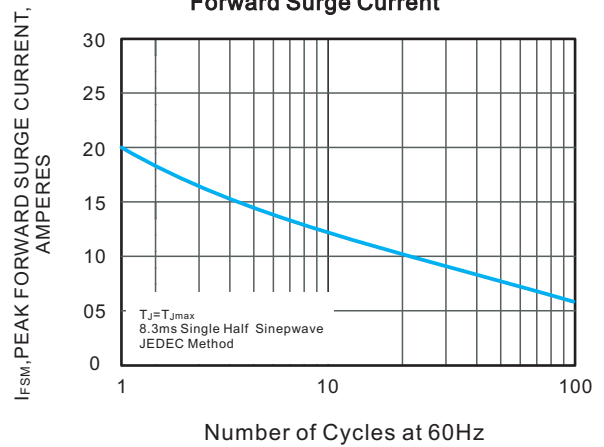
**Fig.2 Forward Current Derating Curve**



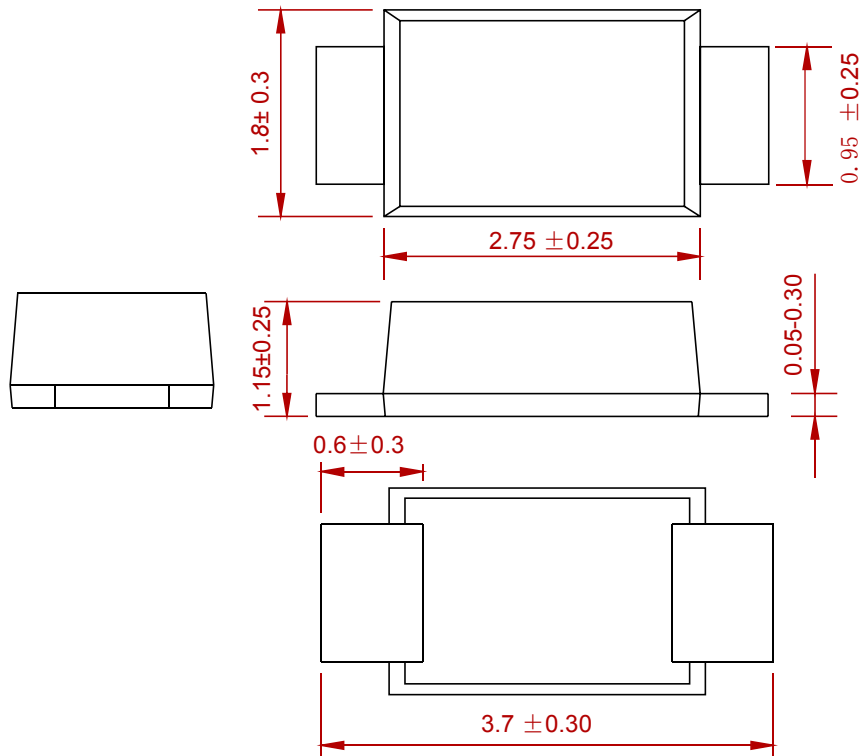
**Fig.3 Pulse Waveform**



**Fig.4 Maximum Non-Repetitive Peak Forward Surge Current**

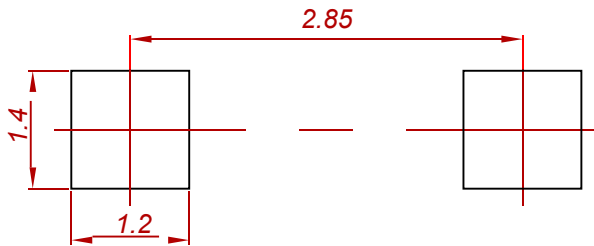


**PACKAGE MECHANICAL DATA**



*Dimensions in millimeters*

**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.

**REEL SPECIFICATION**

| P/N                | PKG       | QTY  |
|--------------------|-----------|------|
| SMF5.0A - SMF170CA | SOD-123FL | 3000 |

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