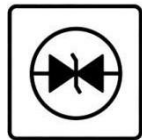


# MSKSEMI 美森科

SEMICONDUCTOR



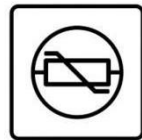
ESD



TVS



TSS



MOV



GDT



PLED

**SMF5.0(C)A-MS - SMF440(C)A-MS**

**Product specification**


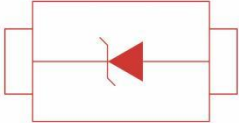

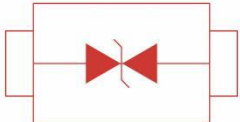
## FEATURES

- For surface mounted applications in order to
- optimize board space.
- Low profile package
- Glass passivated junction
- Low inductance
- Plastic package has Underwriters Laboratory  
Flammability

## Mechanical Data

- Case : JEDEC SOD-123FL molded plastic body
- Terminals : Solderable per MIL-STD-750, Method 2026
- Polarity : Polarity symbol marking on body
- Mounting Position : Any
- Weight : 0.0007 ounce, 0.02 grams
- Marking : Date Code and Marking Code See Page 2

## Reference News

| PACKAGE OUTLINE   | PIN CONFIGURATION   |
|---|---|
|  |  |
| Unipolar  |   |
|  |  |
| Bipolar   |   |

## Maximum Ratings and Electrical characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

| Parameter  | Symbol             | Value       | Unit |
|--|--------------------|-------------|------|
| Peak Pulse Power Dissipation on TA=25°C (Note 1,2,5, Fig1) | $P_{PPM}$          | 200         | W    |
| Peak Forward Surge Current (Note 3)                        | $I_{FSM}$<br>(UNI) | 30          | A    |
| Peak Pulse Current on 10/1000 us waveform (Note 1) Fig 2   | $I_{PPM}$          | see Table 1 | A    |
| Steady State Power Dissipation (Note 4)                    | $P_{M(AV)}$        | 1.0         | W    |
| Operating Junction and Storage Range                       | $T_J, T_{STG}$     | -55 to +150 | °C   |
| Typical Thermal Resistance                                 | $R_{\theta JA}$    | 180         | °C/W |

### NOTES

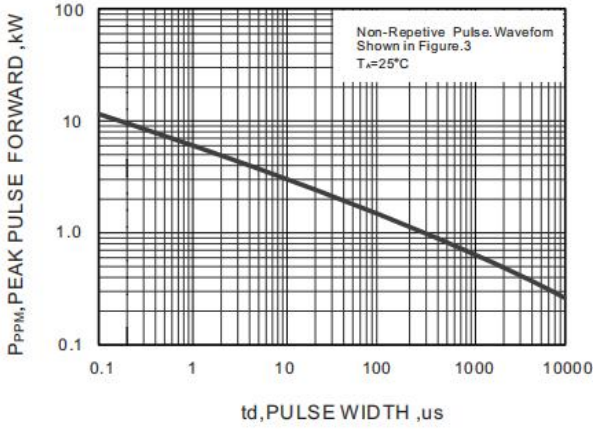
1. Non- repetitive current pulse per Fig 3 and derated above TA =25°C per Fig 2
2. Mounted on 5mm<sup>2</sup> copper pads to each terminal
3. 8 .3ms single half sinewave, or equivalent square wave duty cycle=4 pulses per minutes maximum
4. lead temperature at TL =75°C
5. Peak pulse powe . waveform is tp=10/1000us
6. A transient suppressor is selected according to the working peak reverse voltage(VRWM ),  
Which Should be equal to or greater than the DC or continuous peak operating voltage level

**Characteristics at Ta = 25°C**

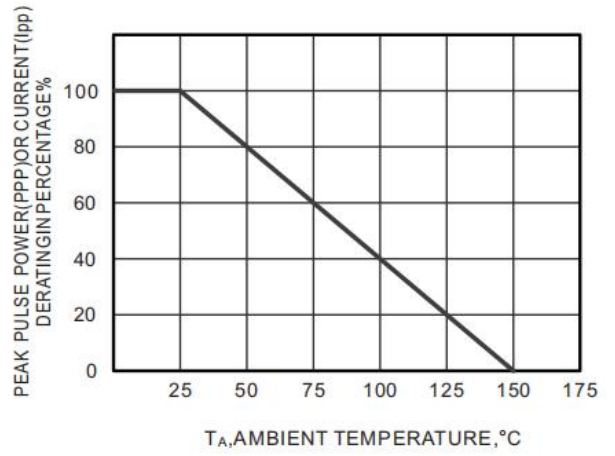
| Type       |             | Marking |      | RMW | Breakdown Voltage |      | Test Current | Reverse Leakage | Max . C lamp Vo ltage | Peak P ulse Current |
|------------|-------------|---------|------|-----|-------------------|------|--------------|-----------------|-----------------------|---------------------|
|            |             |         |      |     | VBR @ IT          |      |              |                 |                       |                     |
|            |             |         |      |     | Min               | Max  | IT           | IR @ VRWM       | VC @ IPP              | IPP                 |
| Uni        | BI          | Uni     | BI   | V   | V                 | V    | mA           | µA              | V                     | A                   |
| SMF5.0A-MS | SMF5.0CA-MS | AE      | NE   | 5   | 6.4               | 7    | 10           | 400             | 9.2                   | 21.7                |
| SMF6.0A-MS | SMF6.0CA-MS | AG      | NG   | 6   | 6.67              | 7.37 | 10           | 400             | 10.3                  | 19.4                |
| SMF6.5A-MS | SMF6.5CA-MS | AK      | NK   | 6.5 | 7.22              | 7.98 | 10           | 250             | 11.2                  | 17.9                |
| SMF7.0A-MS | SMF7.0CA-MS | AM      | NM   | 7   | 7.78              | 8.6  | 10           | 100             | 12                    | 16.7                |
| SMF7.5A-MS | SMF7.5CA-MS | AP      | NP   | 7.5 | 8.33              | 9.21 | 1            | 50              | 12.9                  | 15.5                |
| SMF8.0A-MS | SMF8.0CA-MS | AR      | NR   | 8   | 8.89              | 9.83 | 1            | 25              | 13.6                  | 14.7                |
| SMF8.5A-MS | SMF8.5CA-MS | AT      | NT   | 8.5 | 9.44              | 10.4 | 1            | 10              | 14.4                  | 13.9                |
| SMF9.0A-MS | SMF9.0CA-MS | AV      | NV   | 9   | 10                | 11.1 | 1            | 5               | 15.4                  | 13                  |
| SMF10A-MS  | SMF10CA-MS  | AX      | NX   | 10  | 11.1              | 12.3 | 1            | 2.5             | 17                    | 11.8                |
| SMF11A-MS  | SMF11CA-MS  | AZ      | NZ   | 11  | 12.2              | 13.5 | 1            | 2.5             | 18.2                  | 11                  |
| SMF12A-MS  | SMF12CA-MS  | BE      | OE   | 12  | 13.3              | 14.7 | 1            | 2.5             | 19.9                  | 10.1                |
| SMF13A-MS  | SMF13CA-MS  | BG      | OG   | 13  | 14.4              | 15.9 | 1            | 1               | 21.5                  | 9.3                 |
| SMF14A-MS  | SMF14CA-MS  | BK      | OK   | 14  | 15.6              | 17.2 | 1            | 1               | 23.2                  | 8.6                 |
| SMF15A-MS  | SMF15CA-MS  | BM      | OM   | 15  | 16.7              | 18.5 | 1            | 1               | 24.4                  | 8.2                 |
| SMF16A-MS  | SMF16CA-MS  | BP      | OP   | 16  | 17.8              | 19.7 | 1            | 1               | 26                    | 7.7                 |
| SMF17A-MS  | SMF17CA-MS  | BR      | OR   | 17  | 18.9              | 20.9 | 1            | 1               | 27.6                  | 7.2                 |
| SMF18A-MS  | SMF18CA-MS  | BT      | OT   | 18  | 20                | 22.1 | 1            | 1               | 29.2                  | 6.8                 |
| SMF20A-MS  | SMF20CA-MS  | BV      | OV   | 20  | 22.2              | 24.5 | 1            | 1               | 32.4                  | 6.2                 |
| SMF22A-MS  | SMF22CA-MS  | BX      | OX   | 22  | 24.4              | 26.9 | 1            | 1               | 35.5                  | 5.6                 |
| SMF24A-MS  | SMF24CA-MS  | BZ      | OZ   | 24  | 26.7              | 29.5 | 1            | 1               | 38.9                  | 5.1                 |
| SMF26A-MS  | SMF26CA-MS  | CE      | PE   | 26  | 28.9              | 31.9 | 1            | 1               | 42.1                  | 4.8                 |
| SMF28A-MS  | SMF28CA-MS  | CG      | PG   | 28  | 31.1              | 34.4 | 1            | 1               | 45.4                  | 4.4                 |
| SMF30A-MS  | SMF30CA-MS  | CK      | PK   | 30  | 33.3              | 36.8 | 1            | 1               | 48.4                  | 4.1                 |
| SMF33A-MS  | SMF33CA-MS  | CM      | PM   | 33  | 36.7              | 40.6 | 1            | 1               | 53.3                  | 3.8                 |
| SMF36A-MS  | SMF36CA-MS  | CP      | PP   | 36  | 40                | 44.2 | 1            | 1               | 58.1                  | 3.4                 |
| SMF40A-MS  | SMF40CA-MS  | CR      | PR   | 40  | 44.4              | 49.1 | 1            | 1               | 64.5                  | 3.1                 |
| SMF43A-MS  | SMF43CA-MS  | CT      | PT   | 43  | 47.8              | 52.8 | 1            | 1               | 69.4                  | 2.9                 |
| SMF45A-MS  | SMF45CA-MS  | CV      | PV   | 45  | 50                | 55.3 | 1            | 1               | 72.7                  | 2.8                 |
| SMF48A-MS  | SMF48CA-MS  | CX      | PX   | 48  | 53.3              | 58.9 | 1            | 1               | 77.4                  | 2.6                 |
| SMF51A-MS  | SMF51CA-MS  | CZ      | PZ   | 51  | 56.7              | 62.7 | 1            | 1               | 82.4                  | 2.4                 |
| SMF54A-MS  | SMF54CA-MS  | DE      | PA   | 54  | 60                | 66.3 | 1            | 1               | 87.1                  | 2.3                 |
| SMF58A-MS  | SMF58CA-MS  | DG      | PC   | 58  | 64.4              | 71.2 | 1            | 1               | 93.6                  | 2.1                 |
| SMF60A-MS  | SMF60CA-MS  | DK      | CDK  | 60  | 66.7              | 73.7 | 1            | 1               | 96.8                  | 1.8                 |
| SMF64A-MS  | SMF64CA-MS  | DM      | CDM  | 64  | 71.1              | 78.6 | 1            | 1               | 103                   | 1.7                 |
| SMF70A-MS  | SMF70CA-MS  | DP      | CDP  | 70  | 77.8              | 86   | 1            | 1               | 113                   | 1.5                 |
| SMF75A-MS  | SMF75CA-MS  | DR      | CDR  | 75  | 83.3              | 92.1 | 1            | 1               | 121                   | 1.4                 |
| SMF78A-MS  | SMF78CA-MS  | DT      | CDT  | 78  | 86.7              | 95.8 | 1            | 1               | 126                   | 1.4                 |
| SMF85A-MS  | SMF85CA-MS  | DV      | CDV  | 85  | 94.4              | 104  | 1            | 1               | 137                   | 1.3                 |
| SMF90A-MS  | SMF90CA-MS  | DX      | CDX  | 90  | 100               | 111  | 1            | 1               | 146                   | 1.2                 |
| SMF100A-MS | SMF100CA-MS | DZ      | CDZ  | 100 | 111               | 123  | 1            | 1               | 162                   | 1.1                 |
| SMF110A-MS | SMF110CA-MS | EE      | CEE  | 110 | 122               | 135  | 1            | 1               | 177                   | 1                   |
| SMF120A-MS | SMF120CA-MS | EG      | CEG  | 120 | 133               | 147  | 1            | 1               | 193                   | 0.9                 |
| SMF130A-MS | SMF130CA-MS | EK      | CEK  | 130 | 144               | 159  | 1            | 1               | 209                   | 0.8                 |
| SMF150A-MS | SMF150CA-MS | EM      | CEM  | 150 | 167               | 185  | 1            | 1               | 243                   | 0.7                 |
| SMF160A-MS | SMF160CA-MS | EP      | CEP  | 160 | 178               | 197  | 1            | 1               | 259                   | 0.7                 |
| SMF170A-MS | SMF170CA-MS | ER      | CER  | 170 | 189               | 209  | 1            | 1               | 275                   | 0.6                 |
| SMF180A-MS | SMF180CA-MS | ET      | CET  | 180 | 201               | 222  | 1            | 1               | 292                   | 0.5                 |
| SMF190A-MS | SMF190CA-MS | EV      | CEV  | 190 | 211               | 232  | 1            | 1               | 308                   | 0.5                 |
| SMF200A-MS | SMF200CA-MS | EX      | CEX  | 200 | 224               | 247  | 1            | 1               | 324                   | 0.5                 |
| SMF220A-MS | SMF220CA-MS | E22     | CE22 | 220 | 246               | 272  | 1            | 1               | 356                   | 0.5                 |
| SMF250A-MS | SMF250CA-MS | E25     | CE25 | 250 | 279               | 309  | 1            | 1               | 405                   | 0.5                 |
| SMF300A-MS | SMF300CA-MS | E30     | CE30 | 300 | 335               | 371  | 1            | 1               | 486                   | 0.45                |
| SMF350A-MS | SMF350CA-MS | E35     | CE35 | 350 | 391               | 432  | 1            | 1               | 567                   | 0.4                 |
| SMF400A-MS | SMF400CA-MS | E40     | CE40 | 400 | 447               | 494  | 1            | 1               | 648                   | 0.35                |
| SMF440A-MS | SMF440CA-MS | E44     | CE44 | 440 | 492               | 543  | 1            | 1               | 713                   | 0.3                 |

**Typical Characteristics**

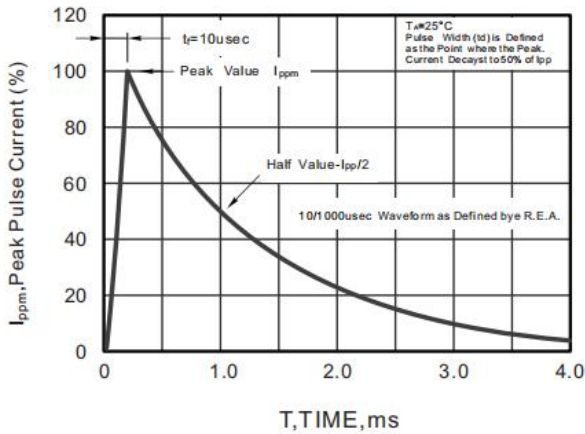
**Fig.1 Peak Pulse Power Rating Curve**



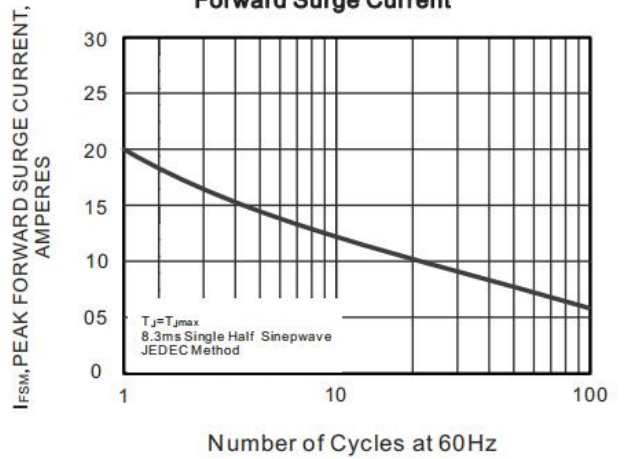
**Fig.2 Forward Current Derating Curve**



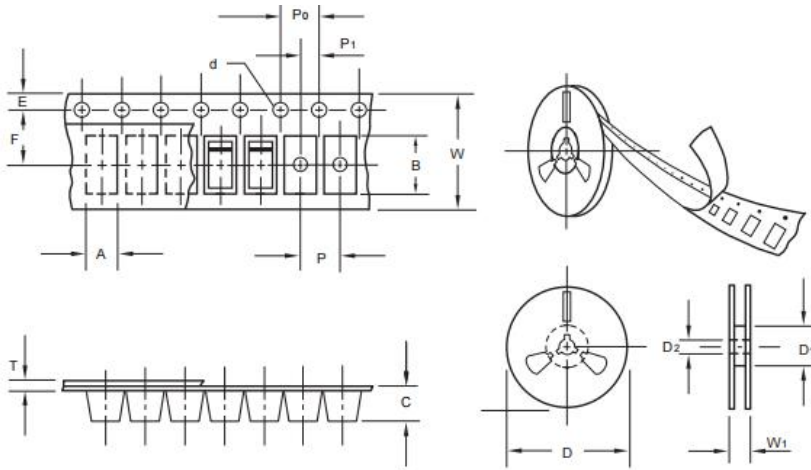
**Fig.3 Pulse Waveform**



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



**Packing information**

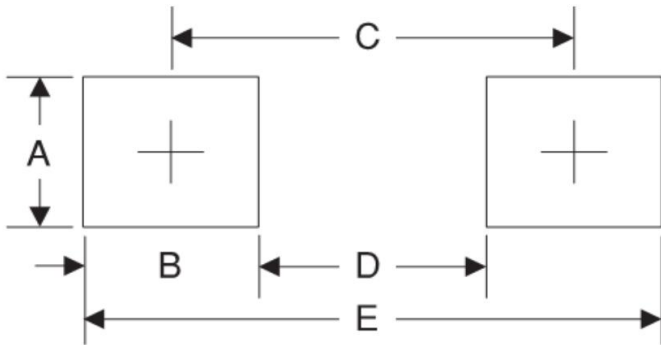


| Item                     | Symbol | Tolerance | SOD-123FL |
|--------------------------|--------|-----------|-----------|
| Carrier width            | A      | 0.1       | 2.1       |
| Carrier length           | B      | 0.1       | 4.0       |
| Carrier depth            | C      | 0.1       | 1.60      |
| Sprocket hole            | d      | 0.05      |           |
| 7" Reel outside diameter | D      | 2.0       |           |
| 7" Reel inner diameter   | D1     | min       |           |
| Feed hole diameter       | D2     | 0.5       |           |
| Sprocket hole position   | E      | 0.1       |           |
| Punch hole position      | F      | 0.1       |           |
| Punch hole pitch         | P      | 0.1       |           |
| Sprocket hole pitch      | P0     | 0.1       |           |
| Embossment center        | P1     | 0.1       |           |
| Overall tape thickness   | T      | 0.1       |           |
| Tape width               | W      | 0.3       |           |
| Reel width               | W1     | 1.0       |           |

**Reel packing**

| PACKAGE   | REEL SIZE | REEL (pcs) | COMPONENT SPACING (m/m) | BOX (pcs) | INNER BOX (m/m) | REEL DIA, (m/m) | CARTON SIZE (m/m) | CARTON (pcs) | APPROX. GROSS WEIGHT (kg) |
|-----------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| SOD-123FL | 7"        | 3,000      | 4.0                     | 45,000    | 210*208*203     | 178             | 430*430*235       | 180,000      | 9.0                       |

**Suggested Pad Layout**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.2       | 0.047       |
| B      | 1.2       | 0.047       |
| C      | 3.2       | 0.126       |
| D      | 2         | 0.079       |
| E      | 4.4       | 0.173       |

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