

**SPECIFICATION SHEET**

|                                |                                                                                                                                                                                                                                                                                                      |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFICATION SHEET NO.</b> | P1102 - SMF12A0000S12A                                                                                                                                                                                                                                                                               |
| <b>DATE</b>                    | Nov. 02, 2022                                                                                                                                                                                                                                                                                        |
| <b>REVISION</b>                | A1                                                                                                                                                                                                                                                                                                   |
| <b>DESCRIPTION</b>             | <p>SMD Transient Voltage Suppressor (TVs) Diodes, SMF/SOD-123FL series,<br/>SMF12A Type, 2 Pads, Unidirectional Type</p> <p>Stand-off Voltage 12V, Peak Pulse Current: 10.1A</p> <p>Operating Temp. Range -55°C ~+150°C</p> <p>Package in Tape/Reel, 3000pcs/Reel</p> <p>RoHS/RoHS III compliant</p> |
| <b>CUSTOMER</b>                |                                                                                                                                                                                                                                                                                                      |
| <b>CUSTOMER PART NUMBER</b>    |                                                                                                                                                                                                                                                                                                      |
| <b>CROSS REF. PART NUMBER</b>  |                                                                                                                                                                                                                                                                                                      |
| <b>ORIGINAL PART NUMBER</b>    | MDD SMF12A                                                                                                                                                                                                                                                                                           |
| <b>PART CODE</b>               | SMF12A0000S12A                                                                                                                                                                                                                                                                                       |

|                         |                                                                                     |                                                                                      |                                                                                       |
|-------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>VENDOR APPROVE</b>   |                                                                                     |                                                                                      |                                                                                       |
| Issued/Checked/Approved |  |  |  |
| DATE: Nov. 02, 2022     |                                                                                     |                                                                                      |                                                                                       |

|                         |
|-------------------------|
| <b>CUSTOMER APPROVE</b> |
|                         |
| DATE:                   |
| 11/3/2022               |

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### MAIN FEATURE

- Low profile package
- Glass passivated chip junction
- Low inductance
- Plastic package has Underwriters Laboratory Flammability



### APPLICATION

- For SMD application

**RFQ**

[Request For Quotation](#)

### PART CODE GUIDE

| SMF | 12A0000 | S | 12A |
|-----|---------|---|-----|
| 1   | 2       | 3 | 4   |

- 1) **SMF**: SMD Transient Voltage Suppressor (TVs) Diodes, SMF/SOD-123FL series
- 2) **12A0000**: Type code for original part number SMF12A
- 3) **S**: Package code, Tape/reel, 3000pcs/reel.
- 4) **12A**: Marking code for "12A" on the case surface, Different Marking for different specification.

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### MORE ITEMS AVAILABLE- Unidirectional Type

|                       |                |                |                |                |
|-----------------------|----------------|----------------|----------------|----------------|
| SMF050A00S050A        | SMF060A00S060A | SMF065A00S065A | SMF070A00S070A | SMF075A00S075A |
| SMF080A00S080A        | SMF085A00S085A | SMF090A00S090A | SMF10A0000S10A | SMF11A0000S11A |
| <b>SMF12A0000S12A</b> | SMF13A0000S13A | SMF14A0000S14A | SMF15A0000S15A | SMF16A0000S16A |
| SMF17A0000S17A        | SMF18A0000S18A | SMF20A0000S20A | SMF22A0000S22A | SMF24A0000S24A |
| SMF26A0000S26A        | SMF28A0000S28A | SMF30A0000S30A | SMF33A0000S33A | SMF36A0000S36A |
| SMF40A0000S40A        | SMF43A0000S43A | SMF45A0000S45A | SMF48A0000S48A | SMF51A0000S51A |
| SMF54A0000S54A        | SMF58A0000S58A | SMF60A0000S60A | SMF64A0000S64A | SMF70A0000S70A |
| SMF75A0000S75A        | SMF78A0000S78A | SMF85A0000S85A | SMF90A0000S90A | SMF100A00S100A |
| SMF110A00S110A        | SMF120A00S120A | SMF130A00S130A | SMF150A00S150A | SMF160A00S160A |
| SMF170A00S170A        | SMF180A00S180A | SMF200A00S200A | SMF220A00S220A | SMF250A00S250A |
| SMF300A00S300A        | SMF350A00S350A | SMF400A00S400A | SMF440A00S440A |                |

### MORE ITEMS AVAILABLE- Bidirectional Type

|                 |                |                |                |                |
|-----------------|----------------|----------------|----------------|----------------|
| SMF050CAS050CA  | SMF060CAS060CA | SMF065CAS065CA | SMF070CAS070CA | SMF075CAS075CA |
| SMF080CA0S080CA | SMF085CAS085CA | SMF090CAS090CA | SMF10CA00S10CA | SMF11CA00S11CA |
| SMF12CA00S12CA  | SMF13CA00S13CA | SMF14CA00S14CA | SMF15CA00S15CA | SMF16CA00S16CA |
| SMF17CA00S17CA  | SMF18CA00S18CA | SMF20CA00S20CA | SMF22CA00S22CA | SMF24CA00S24CA |
| SMF26CA00S26CA  | SMF28CA00S28CA | SMF30CA00S30CA | SMF33CA00S33CA | SMF36CA00S36CA |
| SMF40CA00S40CA  | SMF43CA00S43CA | SMF45CA00S45CA | SMF48CA00S48CA | SMF51CA00S51CA |
| SMF54CA00S54CA  | SMF58CA00S58CA | SMF60CA00S60CA | SMF64CA00S64CA | SMF70CA00S70CA |
| SMF75CA00S75CA  | SMF78CA00S78CA | SMF85CA00S85CA | SMF90CA00S90CA | SMF100CAS100CA |
| SMF110CAS110CA  | SMF120CAS120CA | SMF130CAS130CA | SMF150CAS150CA | SMF160CAS160CA |
| SMF170CAS170CA  | SMF180CAS180CA | SMF200CAS200CA | SMF220CAS220CA | SMF250CAS250CA |
| SMF300CAS300CA  | SMF350CAS350CA | SMF400CAS400CA | SMF440CAS440CA |                |

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

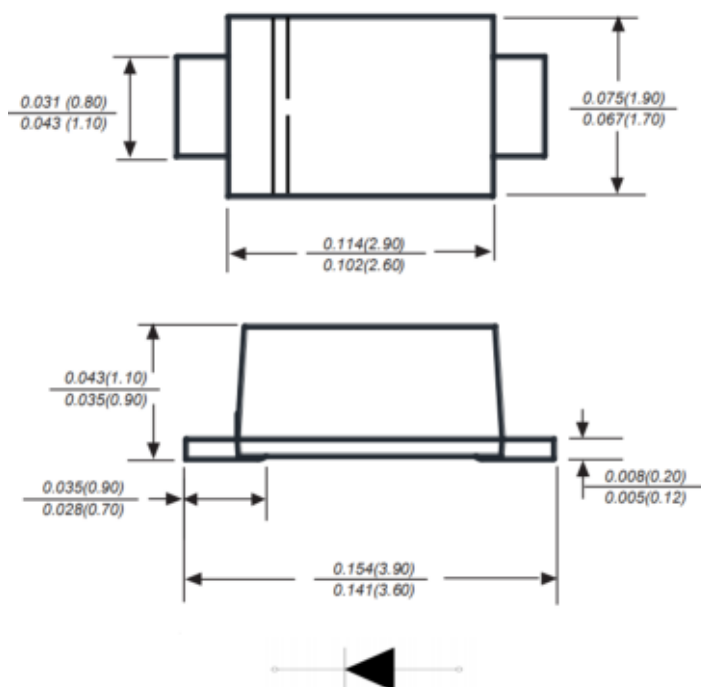
**DIMENSION (Unit: Inch/mm)**

Image for reference

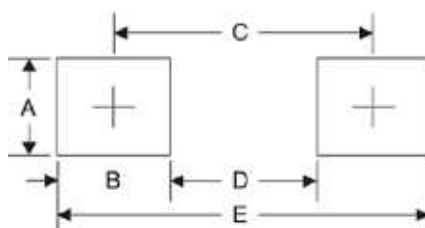


Marking: 12A

SMF/SOD-123FL



Recommend Pad Layout



| Symbol | Unit (Inch) | Unit (mm) |
|--------|-------------|-----------|
| A      | 0.047       | 1.20      |
| B      | 0.047       | 1.20      |
| C      | 0.126       | 3.20      |
| D      | 0.079       | 2.00      |
| E      | 0.173       | 4.40      |

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### MECHANICAL DATA

| Case                                    | Terminals                                              | Polarity                        | Mounting Position | Weight per piece          |
|-----------------------------------------|--------------------------------------------------------|---------------------------------|-------------------|---------------------------|
| JEDEC SMF/SOD-123FL molded plastic body | Solder plated, Solderable per MIL-STD-750, Method 2026 | Polarity symbol marking on case | Any               | 0.0048 Ounce, 0.015 grams |

### MAX. RATING & CHARACTERISTICS - Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter                                                | SYMBOLS            | VALUE |         |      | UNITS |
|----------------------------------------------------------|--------------------|-------|---------|------|-------|
|                                                          |                    | Min.  | Typical | Max. |       |
| Peak pulse power dissipation (Note 1,2,5, Fig.1)         | P <sub>ppm</sub>   | 200   |         |      | W     |
| Peak Forward surge current (Note 3)                      | I <sub>FSM</sub>   |       | 20      |      | A     |
| Peak pulse current on 10/1000μs waveform (Note 1, Fig.2) | I <sub>ppm</sub>   |       |         | 10.1 | A     |
| Steady state power dissipation (Note 4)                  | P <sub>M(AV)</sub> |       | 1.0     |      | W     |
| Operating junction temperature range                     | T <sub>J</sub>     | -55   |         | +150 | °C    |
| Storage temperature range                                | T <sub>STG</sub>   | -55   |         | +150 | °C    |
| Thermal resistance junction to ambient                   | R <sub>ΘJA</sub>   |       | 180     |      | °C/W  |

#### Note

1. Non-repetitive current pulse, per Fig 3 and derated above TA=25 °C per Fig 2
2. Mounted on 5.0\*5.0mm copper pads to each terminal
3. 8.3ms single half sinewave or equivalent square wave, duty cycle=4 pulsed per minute Max.
4. Lead temperature at T<sub>L</sub> =75 °C
5. Peak pulse power waveform is tp =10/1000μs
6. A transient suppressor is selected according to the working peak reverse voltage (V<sub>RWM</sub>), which should be equal to or great than the DC or continuous peak operating voltage level.

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### ELECTRICAL CHARACTERISTICS - Ratings at 25°C

| Parameter                                 | SYMBOLS          | VALUE | UNITS |
|-------------------------------------------|------------------|-------|-------|
| Reverse Stand-Off                         | V <sub>RWM</sub> | 12.0  | V     |
| Min. Breakdown Voltage @I <sub>T</sub>    | V <sub>BR</sub>  | 13.3  | V     |
| Max. Breakdown Voltage @I <sub>T</sub>    | V <sub>BR</sub>  | 14.7  | V     |
| Test Current                              | I <sub>T</sub>   | 1     | mA    |
| Reverse Leakage @V <sub>RWM</sub>         | I <sub>R</sub>   | 2.5   | μA    |
| Maximum Clamping Voltage @I <sub>PP</sub> | V <sub>C</sub>   | 19.9  | V     |
| Peak Pulse Current                        | I <sub>PP</sub>  | 10.1  | A     |

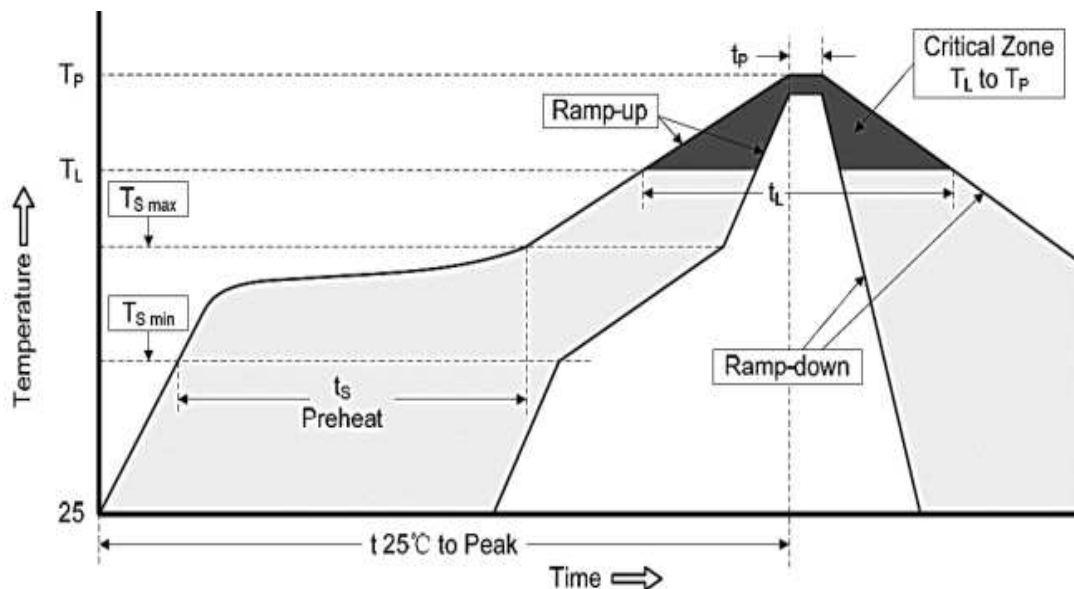
## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### RELIABILITY

| Number | Experiment Items                   | Experiment Method And Conditions                                                                               | Reference Documents             |
|--------|------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------|
| 1      | Solder Resistance Test             | Test 260°C± 5°C for 10 ± 2 sec.<br>Immerse body into solder 1/16" ± 1/32"                                      | MIL-STD-750D<br>METHOD-2031.2   |
| 2      | Solderability Test                 | 230°C ±5°C for 5 sec.                                                                                          | MIL-STD-750D<br>METHOD-2026.1 0 |
| 3      | Pull Test                          | 1 kg in axial lead direction for 10 sec.                                                                       | MIL-STD-750D<br>METHOD-2036.4   |
| 4      | Bend Test                          | 0.5Kg Weight Applied To Each Lead,<br>Bending Arcs 90 °C ± 5 °C For 3 Times                                    | MIL-STD-750D<br>METHOD-2036.4   |
| 5      | High Temperature Reverse Bias Test | TA=100°C for 1000 Hours at VR=80%<br>Rated VR                                                                  | MIL-STD-750D<br>METHOD-1038.4   |
| 6      | Forward Operation Life Test        | TA=25°C Rated Average Rectified<br>Current                                                                     | MIL-STD-750D<br>METHOD-1027.3   |
| 7      | Intermittent Operation Life Test   | On state: 5 min with rated IRMS Power<br>Off state: 5 min with Cool Forced Air.<br>On and off for 1000 cycles. | MIL-STD-750D<br>METHOD-1036.3   |
| 8      | Pressure Cooker Test               | 15 PSIG, TA=121°C, 4 hours                                                                                     | MIL-S-19500<br>APPENIOXC        |
| 9      | Temperature Cycling Test           | -55°C~+125°C; 30 Minutes For Dwelled<br>Time 5 minutes for transferred time.<br>Total: 10 cycles.              | MIL-STD-750D<br>METHOD-1051.7   |
| 10     | Thermal Shock Test                 | 0°C for 5 minutes., 100°C for 5minutes,<br>Total: 10 cycles                                                    | MIL-STD-750D<br>METHOD-1056.7   |
| 11     | Forward Surge Test                 | 8.3ms Single Sale Sine-wave One Surge.                                                                         | MIL-STD-750D<br>METHOD-4066.4   |
| 12     | Humidity Test                      | TA=65°C, RH=98% for 1000 hours.                                                                                | MIL-STD-750D<br>METHOD-1021.3   |
| 13     | High Temperature Storage life Test | 150°C for 1000 Hours                                                                                           | MIL-STD-750D<br>METHOD-1031.5   |

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### SUGGESTED REFLOW PROFILE (For Reference Only)



| Profile Feature                                 |                           | Pb-Free Assembly  |
|-------------------------------------------------|---------------------------|-------------------|
| Average Ramp-up Rate (Ts Max to Tp)             |                           | 3°C/second Max    |
| Preheat                                         | Temperature Min (Ts Min.) | 150°C             |
|                                                 | Temperature Max (Ts Max.) | 200°C             |
|                                                 | Time (ts Min. to ts Max.) | 60 ~ 180 seconds  |
| Time maintained above                           | Temperature (Tl)          | 217°C             |
|                                                 | Time (tl)                 | 60 ~ 150 seconds  |
| Peak/Classification Temperature (Tp)            |                           | 260 °C            |
| Time within 5°C of actual Peak Temperature (tp) |                           | 20 ~ 40 seconds   |
| Ramp-down rate                                  |                           | 6 °C /Second Max. |
| Time 25 °C to Peak Temperature                  |                           | 8 minutes Max.    |
| Suggest reflow times                            |                           | 3 Times Max.      |

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Fig.1 Peak Pulse Power Rating Curve

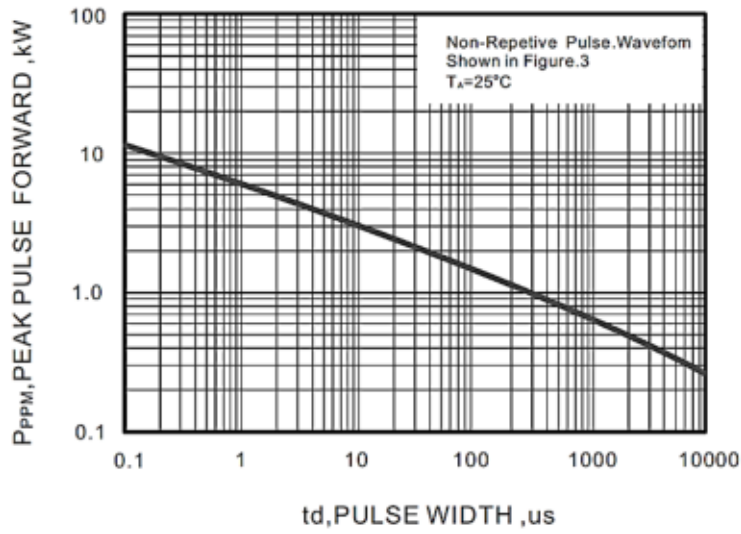
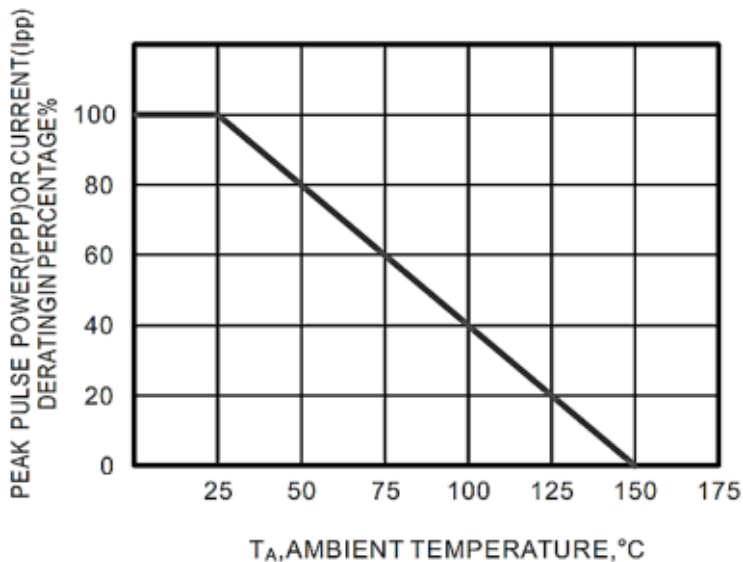


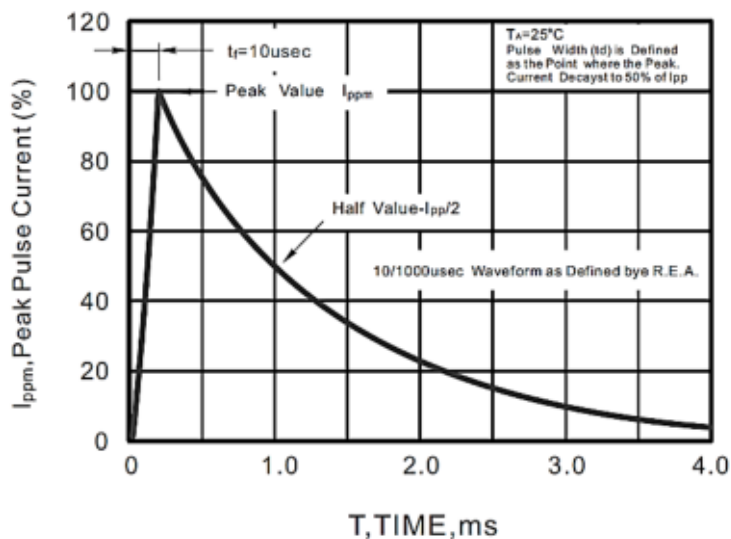
Fig.2 Forward Current Derating Curve



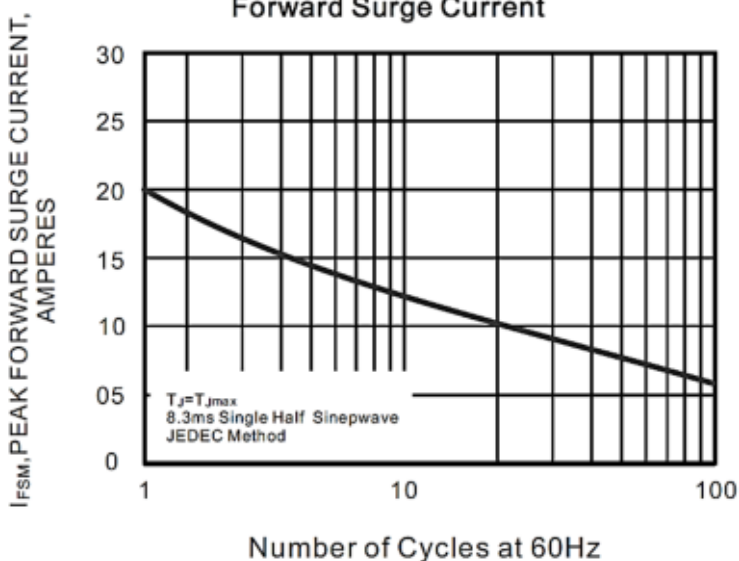
## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

**Fig.3 Pulse Waveform**



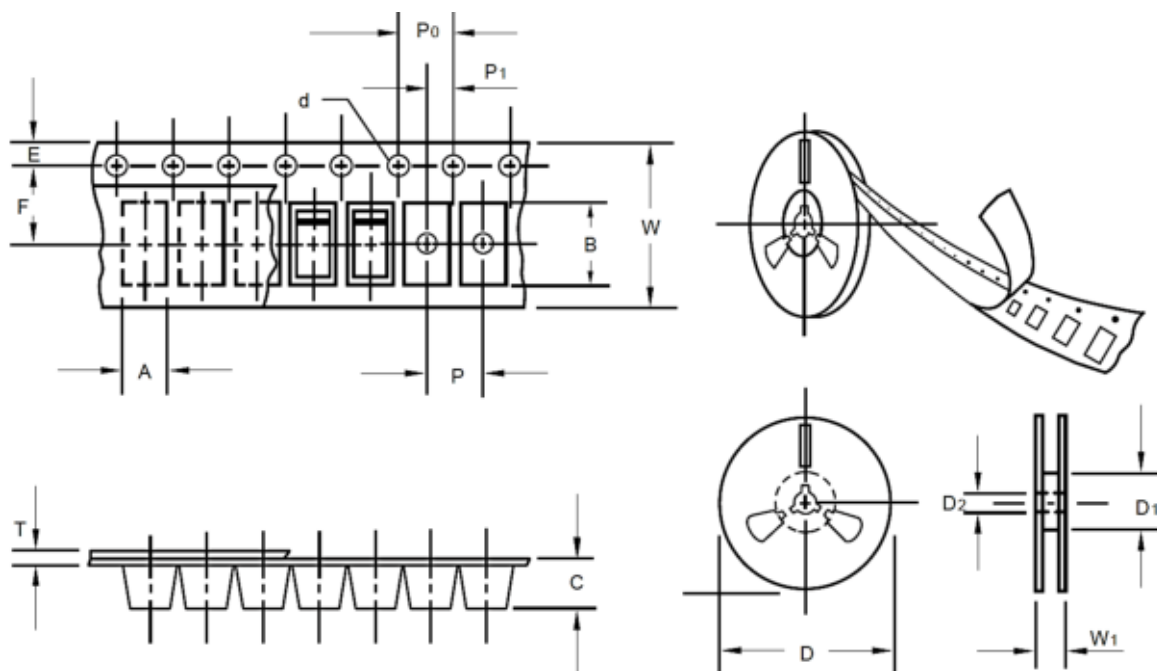
**Fig.4 Maximum Non-Repetitive Peak Forward Surge Current**



## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### TAPE/REEL (Unit: mm)

All Devices are packed in accordance with EIA standard RS-481-A and specifications.



| Item                    | Symbol | Tolerance | SMF/SOD-123FL |
|-------------------------|--------|-----------|---------------|
| Carrier width           | A      | 0.1       | 2.10          |
| Carrier Length          | B      | 0.1       | 4.00          |
| Carrier Depth           | C      | 0.1       | 1.60          |
| Sprocket hole           | d      | 0.05      | 1.55          |
| 7"Reel outside diameter | D      | 2.0       | 178.00        |
| 7"Reel inner diameter   | D1     | Min.      | 50.00         |
| Feed hole diameter      | D2     | 0.5       | 13.00         |
| Sprocket hole position  | E      | 0.1       | 1.75          |
| Punch hole position     | F      | 0.1       | 3.50          |
| Punch hole pitch        | P      | 0.1       | 4.00          |
| Sprocket hole pitch     | P0     | 0.1       | 4.00          |
| Embossment center       | P1     | 0.1       | 2.00          |
| Overall tape thickness  | T      | 0.1       | 0.25          |
| Tape width              | W      | 0.3       | 8.15          |
| Reel width              | W1     | 1.0       | 10.50         |

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### PACKAGE For Reference

|           |           |
|-----------|-----------|
| Case Code | SOD-123FL |
| Reel Size | 7"        |
| Reel Size | 178 mm    |
| MPQ/Reel  | 3000 pcs  |
| Qty. /Box | 6000 pcs  |
| G.W/Box   | 1 lbs     |

### IMPORTANT NOTICE AND DISCLAIMER

- 1) NextGen Component, Inc. reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.
- 2) NextGen Component, Inc makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does NextGen Component, Inc assume any liability for application assistance or customer product design.
- 3) NextGen Component, Inc does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application. No license is granted by implication or otherwise under any intellectual property rights of NextGen Component, Inc
- 4) NextGen Component, Inc. products are not authorized for use as critical components in life support devices or systems without express written approval of NextGen Component, Inc.