

## TVS Diode – SMF5.0A-LLC

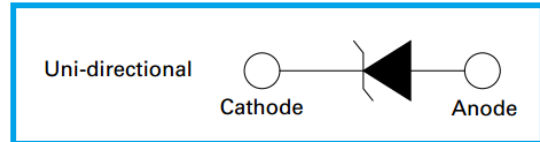
### Features

- Plastic package, excellent insulation strength.
- Glass passivated chip junction in SOD-123 package.
- Excellent voltage clamping capability.
- Low Zener impedance.
- 200W peak pulse power capability on 10/1000μs waveform.
- Typical leakage current less than 10μA
- Very fast response time, typically less than 1.0ps from 0 volt to V<sub>BR</sub> minimum.
- High temperature soldering guaranteed: 265 °C/10 sec.
- MSL: JEDEC-J-STD-020, Level 1
- Automotive grade AEC-Q101 qualified.



### Applications

- I/O interface, V<sub>CC</sub> bus
- Telecom / Automotive
- Industrial and consumer electronic applications.
- Relay and electromagnetic valve surge absorption.
- Battery Management System



### Agency Approval

- Pending

### Mechanical and Physical Data

- Case: JEDEC SMF molded plastic.
- Axial leaded, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional.

### Maximum Ratings and Thermal Characteristics

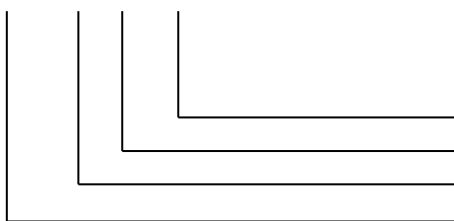
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1, Fig.1).	P <sub>PPM</sub>	Min 200	Watt
Peak Pulse Current of 10/1000μs waveform (Note 1, Fig.3).	I <sub>PPM</sub>	See Table	Amp
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6).	I <sub>FSM</sub>	20	Amp
Operating Junction and Storage Temperature Range.	T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub> = 25 °C per Fig.2.
2. 8.3ms single half sine wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

### Part Number Code

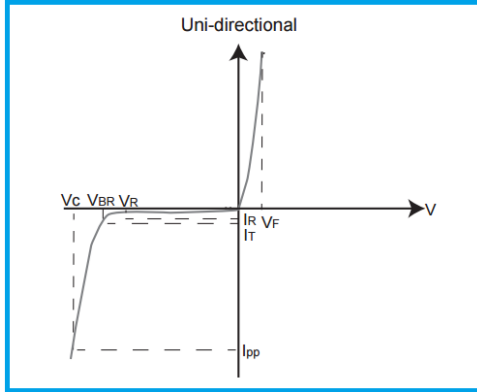
#### SMF 5.0 A - LLC



LLC: Low leakage current  
V<sub>BR</sub> Voltage tolerance (A: 5%; Blank: 10%)  
Reverse Stand-Off Voltage or Typical Breakdown Voltage  
SMF Series (200W)

## TVS Diode – SMF5.0A-LLC

### I-V Curve Characteristics



- $P_{PPM}$  Peak Pulse Power Dissipation – Maximum power dissipation
- $V_R$  Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation
- $V_{BR}$  Breakdown Voltage – Maximum voltage that flows through the TVS at a specified test current ( $I_T$ )
- $V_C$  Clamping Voltage – Peak voltage measured across the TVS at a specified  $I_{PPM}$  (Peak Impulse Current)
- $I_R$  Reverse Leakage Current – Current measured at  $V_R$
- $V_F$  Forward Voltage Drop for Uni-directional

### Electrical Characteristics

Part Number	Marking	Reverse Stand Off Voltage $V_R$ (V)	Breakdown Voltage $V_{BR}$ (V) @ $I_T$		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ (V) @ $I_{PP}$	Maximum Peak Pulse Current $I_{PP}$ (A)	Maximum Reverse Leakage $I_R$ ( $\mu$ A) @ $V_R$
			Min.	Max.				
SMF5.0A-LLC	FE	5.0	6.40	7.00	10	9.2	21.74	10

### Ratings and Characteristic Curves

Fig 1 - Peak Pulse Power Rating Curve

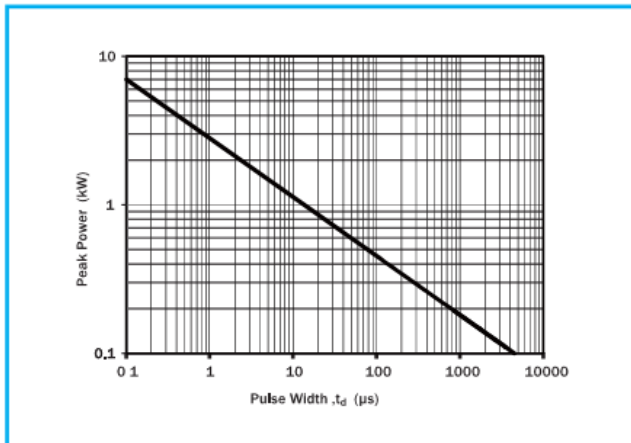
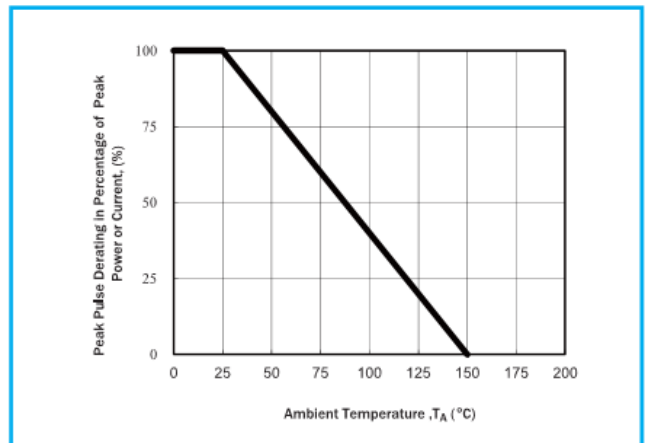


Fig 2 - Pulse Derating Curve



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Fig 3 - Pulse Waveform

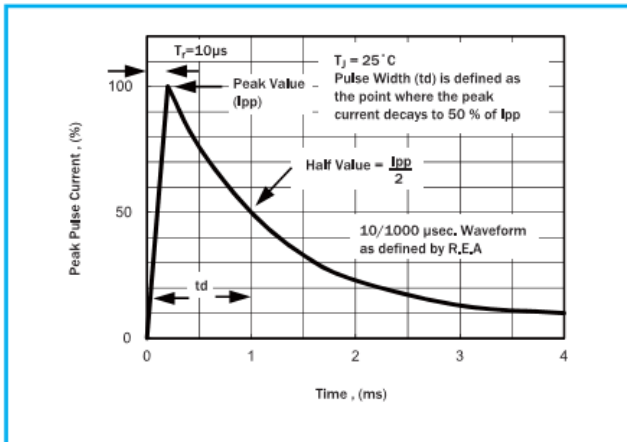


Fig 4 – Typical Junction Capacitance Uni-directional

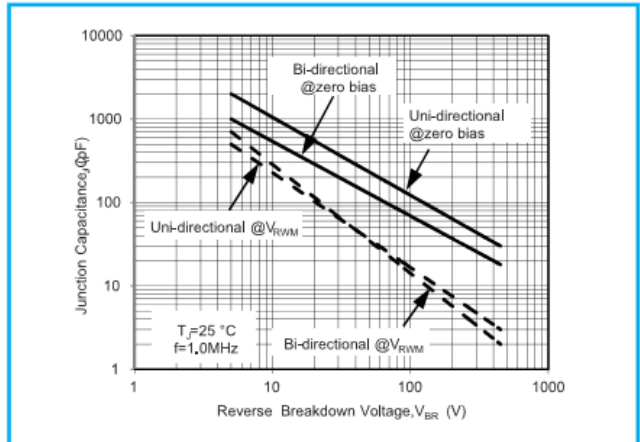


Fig 5 – Steady State Power Dissipation Derating Curve

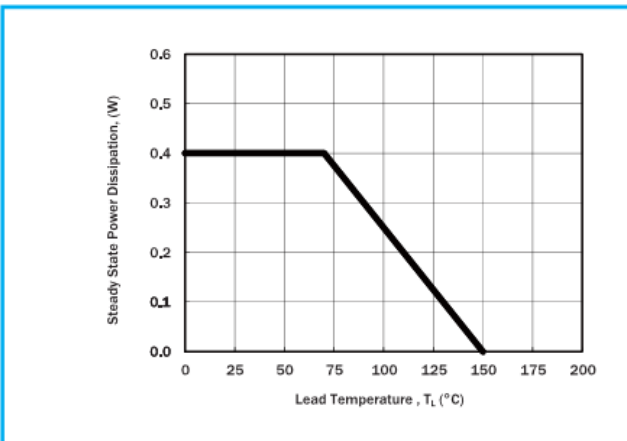
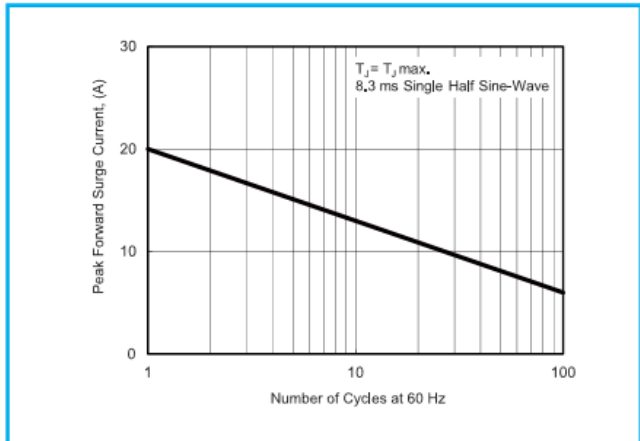
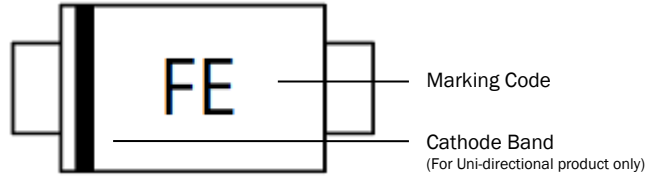


Fig 6 – Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)

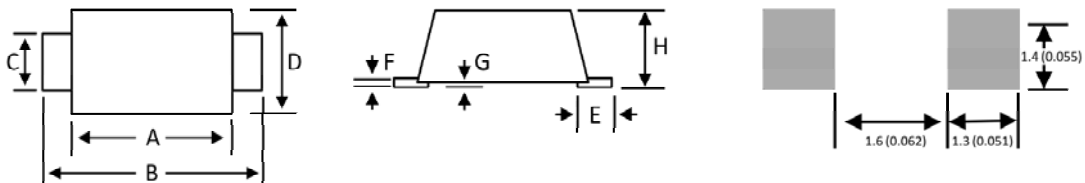


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### Marking Definitions



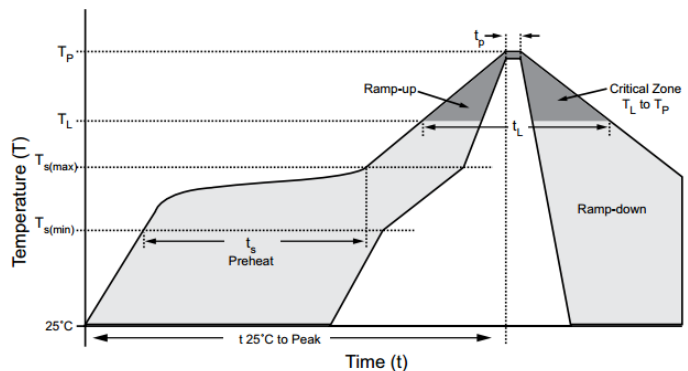
### Physical Dimensions



Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	2.50	2.90	0.0984	0.1142
B	3.40	3.90	0.1339	0.1535
C	0.70	1.20	0.0275	0.0472
D	1.50	2.00	0.0591	0.0787
E	0.35	0.90	0.0138	0.0354
F	0.05	0.26	0.0020	0.0102
G	-	0.10	-	0.0039
H	0.95	1.30	0.0374	0.0512

### Lead Free Reflow Soldering Recommendations

<b>Preheat</b>	
- Temperature Min ( $T_{s\_min}$ )	150°C
- Temperature Max ( $T_{s\_max}$ )	200°C
- Time ( $T_{s\_min}$ to $T_{s\_max}$ )	60-180 seconds
- Average Ramp-Up Rate	1~3°C/second
<b>Peak Temperature</b>	260°C max.
<b>Time within 5°C of actual Peak Temperature (<math>t_p</math>)</b>	40 seconds max.
<b>Ramp-Down Rate</b>	6 °C /second max.



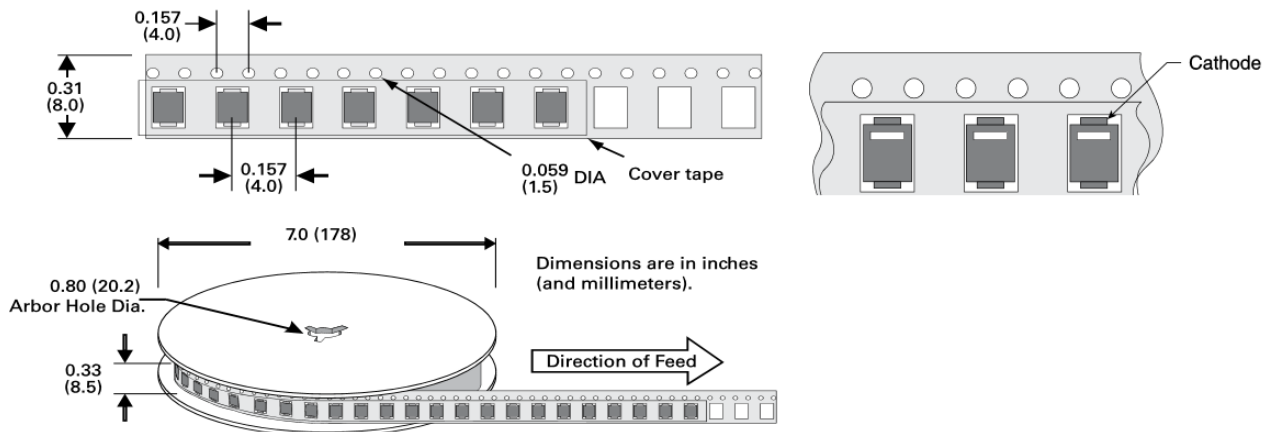
**Note:** If the soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

## TVS Diode – SMF5.0A-LLC

### Packaging Information

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
SMF5.0A-LLC	SOD-123	3000	Tape & Reel – 8mm tape/7" reel	EIA STD RS-481

### Tape and Reel Specifications



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