

TVS Diode – SMF5.0A-LLC

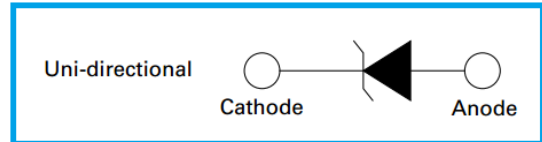
Features

- 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_{BR} 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_{CC} 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

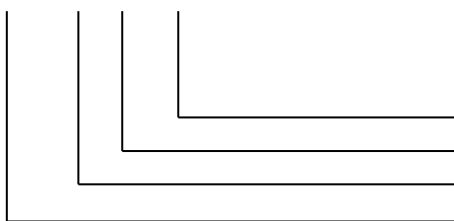
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1, Fig.1).	P _{PPM}	Min 200	Watt
Peak Pulse Current of 10/1000μs waveform (Note 1, Fig.3).	I _{PPM}	See Table	Amp
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6).	I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

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A = 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

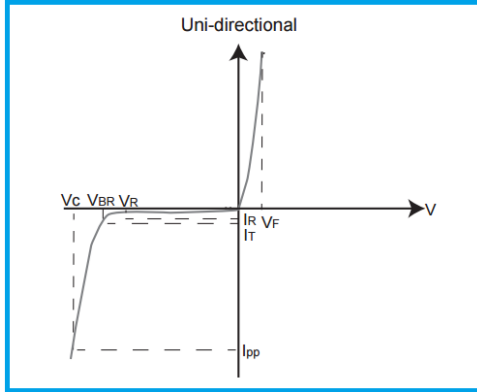
SMF 5.0 A - LLC



LLC: Low leakage current
V_{BR} Voltage tolerance (A: 5%; Blank: 10%)
Reverse Stand-Off Voltage or Typical Breakdown Voltage
SMF Series (200W)

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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 (μ 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

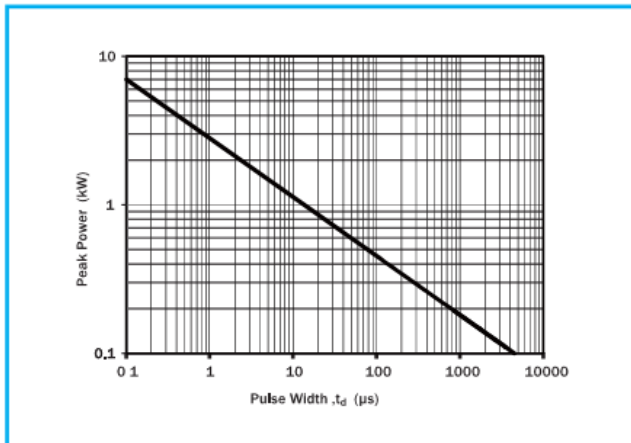
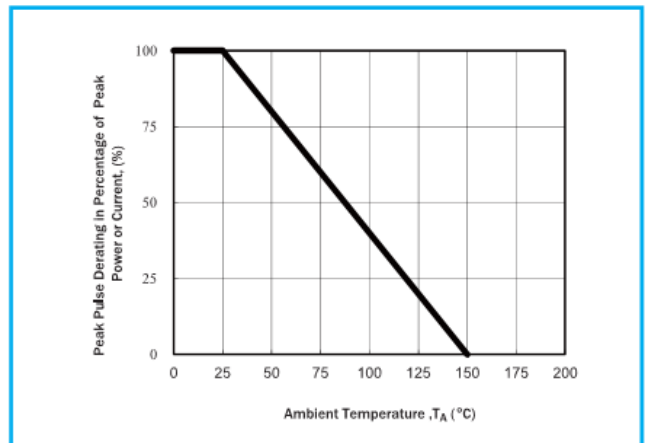


Fig 2 - Pulse Derating Curve



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Fig 3 - Pulse Waveform

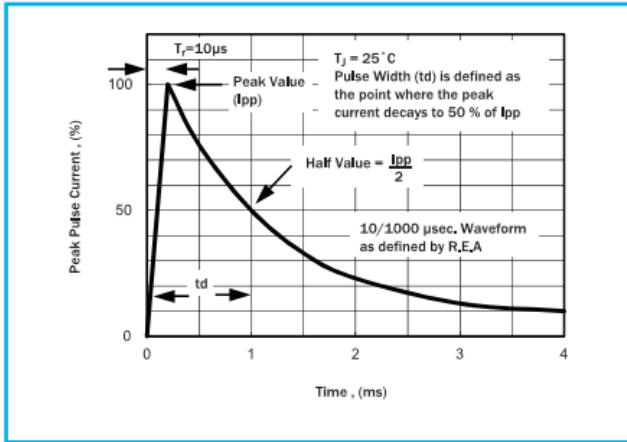


Fig 4 – Typical Junction Capacitance Uni-directional

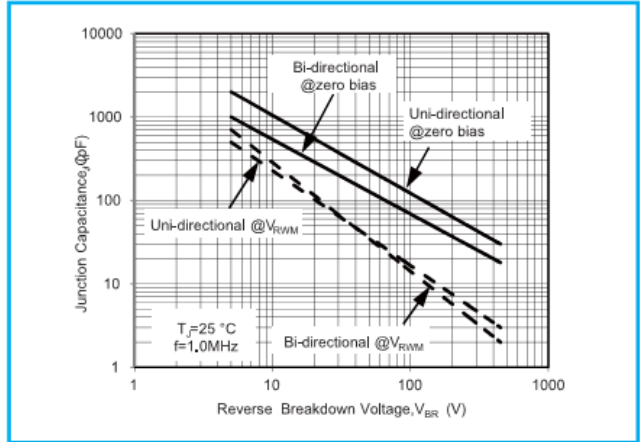


Fig 5 – Steady State Power Dissipation Derating Curve

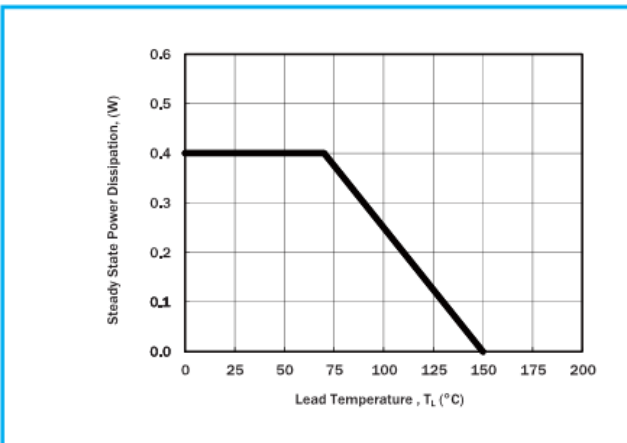
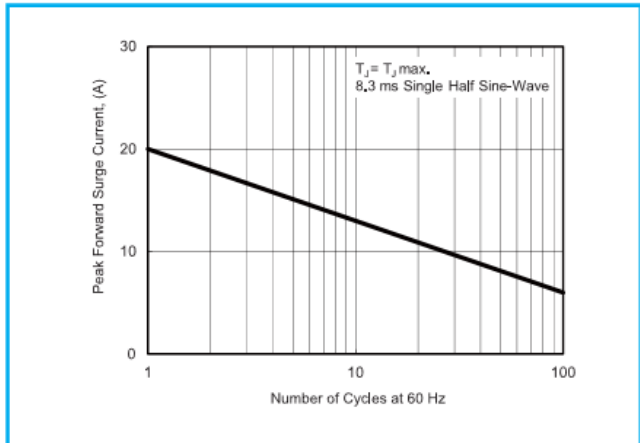
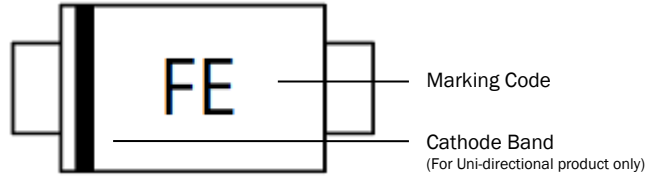


Fig 6 – Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)

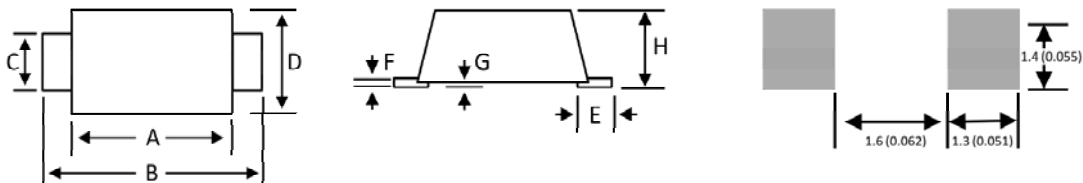


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Marking Definitions



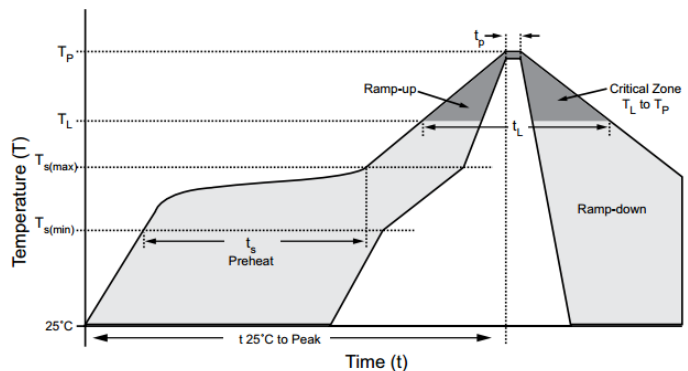
Physical Dimensions



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

Preheat	
- 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
Peak Temperature	260°C max.
Time within 5°C of actual Peak Temperature (t_p)	40 seconds max.
Ramp-Down Rate	6 °C /second max.



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

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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

