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ON Semiconductor
1SMF16BT3

For any questions, you can email us directly:
sales@integrated-circuit.com

1SMF16BT1, 1SMF16BT3, 1SMF16BT3G

Zener Transient Voltage Suppressor SOD-123 Flat Lead Package

The 1SMF16B is designed to protect voltage sensitive components from high voltage, high energy transients. Excellent clamping capability, high surge capability, low Zener impedance and fast response time. Because of its small size, it is ideal for use in cellular phones, portable devices, business machines, power supplies and many other industrial/consumer applications.

Specification Features:

- Stand−off Voltage: 16 Volt
- Peak Power − 175 Watts @ 1 ms
- Maximum Clamp Voltage @ Peak Pulse Current
- Low Leakage
- Response Time is Typically < 1 ns
- IEC61000−4−2 Level 4 ESD Protection
- Low Profile − Maximum Height of 1.0 mm
- Small Footprint
- Cathode Indicated by Polarity Band
- Pb−Free Package is Available

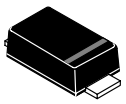
Mechanical Characteristics:
CASE: Void-free, transfer-molded, thermosetting plastic
LEAD FINISH: 100% Matte Sn (Tin)
MOUNTING POSITION: Any
QUALIFIED MAX REFLOW TEMPERATURE: 260°C
Device Meets MSL 1 Requirements
Epoxy Meets UL 94, V−0

ON Semiconductor®

http://onsemi.com

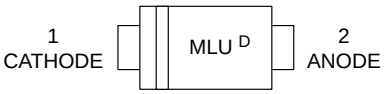
PLASTIC SURFACE MOUNT ZENER OVERVOLTAGE TRANSIENT SUPPRESSOR 175 WATT PEAK POWER

1: CATHODE
2: ANODE



SOD−123FL
CASE 498
PLASTIC

MARKING DIAGRAM



MLU = Specific Device Code
D = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
1SMF16BT1	SOD−123FL	3,000/Tape & Reel
1SMF16BT3	SOD−123FL	10,000/Tape & Reel
1SMF16BT3G	SOD−123FL (Pb−Free)	10,000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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February, 2004 − Rev. 1
Publication Order Number:
1SMF16B/D

1SMF16BT1, 1SMF16BT3, 1SMF16BT3G

MAXIMUM RATINGS

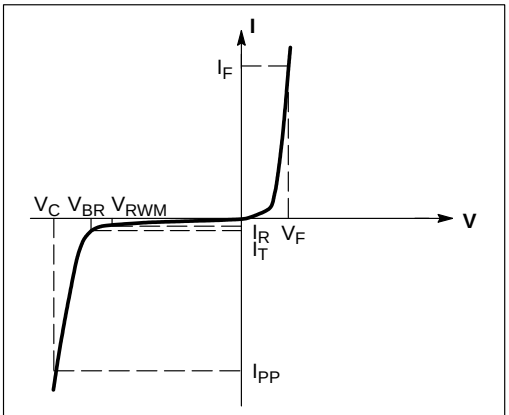
Rating	Symbol	Value	Unit
Maximum P_{pk} Dissipation @ T_A = 25°C, (PW−10/1000 μs) (Note 1)	P_{pk}	175	W
Maximum P_{pk} Dissipation @ T_A = 25°C, (PW−8/20 μs) (Note 2)	P_{pk}	1000	W
Operating and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

1. Non−repetitive current pulse at T_A = 25°C, per waveform of Figure 3.
2. Non−repetitive current pulse at T_A = 25°C, per waveform of Figure 4.

ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_F	Forward Current
V_F	Forward Voltage @ I_F



Uni−Directional TVS

ELECTRICAL CHARACTERISTICS (T_L = 30°C unless otherwise noted, V_F = 1.3 Volts @ 850 mA)

Device	Marking	V_{RWM} (Note 3)	V_{BR} @ I_T (V) (Note 4)			I_T	I_R @ V_{RWM}	Max V_C @ I_{PP} = 1 Amp	Max V_C @ I_{PP} = 7 Amp
		(V)	Min	Nom	Max	(mA)	(μA)	(V)	(V)
1SMF16B	MLU	16	16.7	17.6	18.5	1.0	1.0	20	26

3. A transient suppressor is normally selected according to the Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.
4. V_{BR} measured at pulse test current I_T at ambient temperature of 25°C.

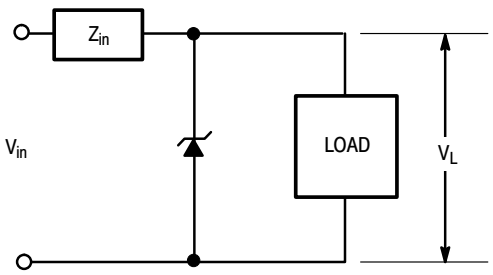


Figure 1. Typical Protection Circuit

1SMF16BT1, 1SMF16BT3, 1SMF16BT3G

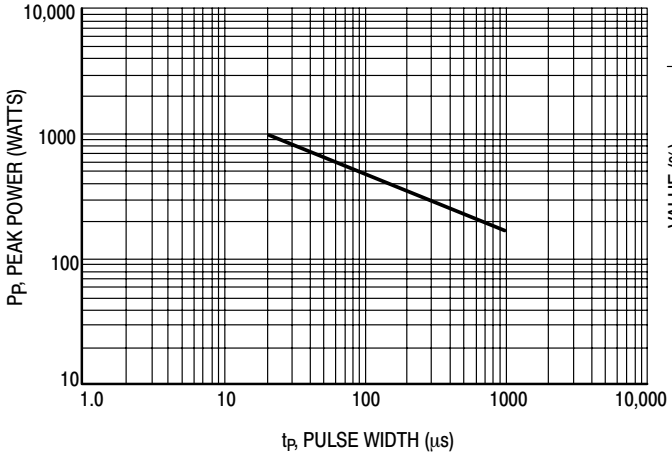


Figure 2. Pulse Rating Curve

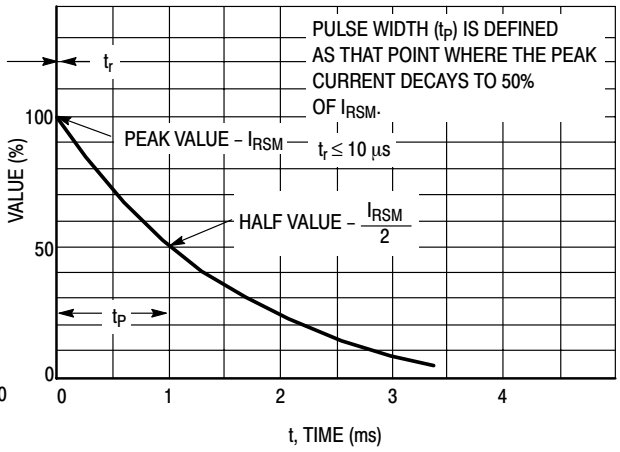


Figure 3. 10 X 1000 μs Pulse Waveform

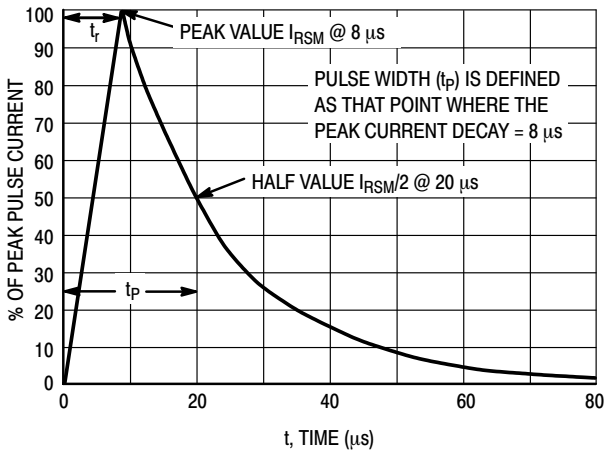


Figure 4. 8 X 20 μs Pulse Waveform

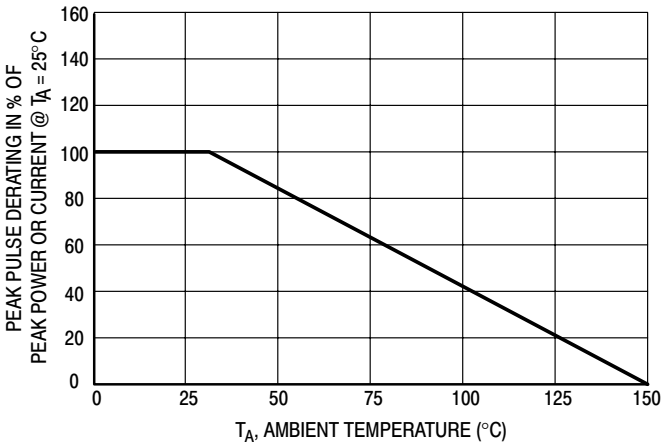


Figure 5. Pulse Derating Curve

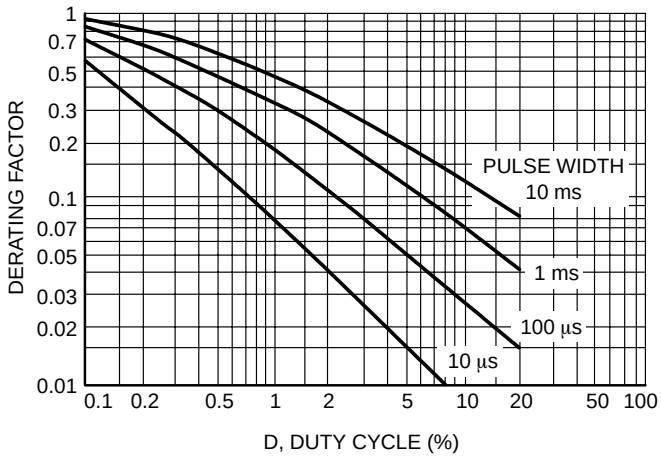


Figure 6. Typical Derating Factor for Duty Cycle

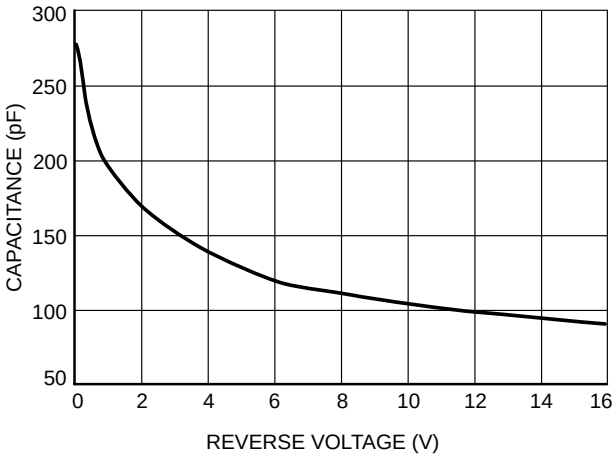
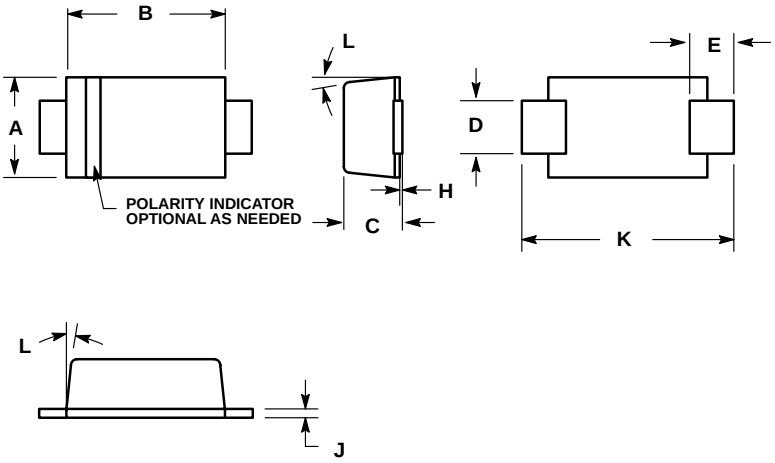


Figure 7. Capacitance versus Reverse Voltage

1SMF16BT1, 1SMF16BT3, 1SMF16BT3G

PACKAGE DIMENSIONS

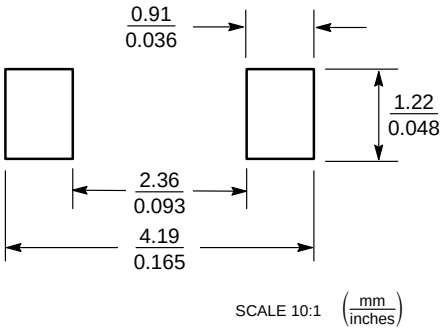
SOD−123FL
CASE 498−01
ISSUE O



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH.
4. DIMENSIONS D AND J ARE TO BE MEASURED ON FLAT SECTION OF THE LEAD: BETWEEN 0.10 AND 0.25 MM FROM THE LEAD TIP.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	1.50	1.80	0.059	0.071
B	2.50	2.90	0.098	0.114
C	0.90	1.00	0.035	0.039
D	0.70	1.10	0.028	0.043
E	0.55	0.95	0.022	0.037
H	0.00	0.10	0.000	0.004
J	0.10	0.20	0.004	0.008
K	3.40	3.80	0.134	0.150
L	0 °	8 °	0 °	8 °

SOLDERING FOOTPRINT*



SOD−123

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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