

1SMF16BT1, 1SMF16BT3

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.

Features:

- Stand-off Voltage: 16 V
- Peak Power – 175 W @ 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
- These are Pb-Free Devices

Mechanical Characteristics:

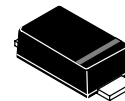
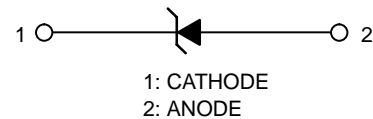
- **CASE:** Void-free, transfer-molded, thermosetting plastic
- **LEAD FINISH:** 100% Matte Sn (Tin)
- **MOUNTING POSITION:** Any
- **QUALIFIED MAX REFLOW TEMPERATURE:** 260°C
- Device Meets MSL 1 Requirements
- Epoxy Meets UL 94 V-0



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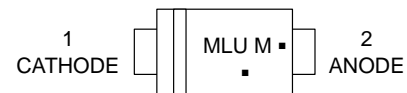
<http://onsemi.com>

PLASTIC SURFACE MOUNT ZENER OVERVOLTAGE TRANSIENT SUPPRESSOR 175 WATT PEAK POWER



**SOD-123FL
CASE 498
PLASTIC**

MARKING DIAGRAM



MLU = Specific Device Code

M = Date Code

▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
1SMF16BT1	SOD-123FL*	3000/Tape & Reel
1SMF16BT1G	SOD-123FL*	3000/Tape & Reel
1SMF16BT3	SOD-123FL*	10,000/Tape & Reel
1SMF16BT3G	SOD-123FL*	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.

*These packages are inherently Pb-Free.

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MAXIMUM RATINGS

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

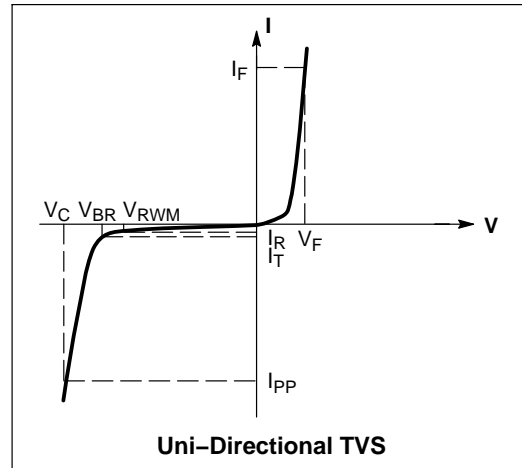
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Non-repetitive current pulse at $T_A = 25^\circ\text{C}$, per waveform of Figure 3.
2. Non-repetitive current pulse at $T_A = 25^\circ\text{C}$, per waveform of Figure 4.

ELECTRICAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$ 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



ELECTRICAL CHARACTERISTICS ($T_L = 30^\circ\text{C}$ unless otherwise noted, $V_F = 1.3$ Volts @ 850 mA)

Device	Marking	V_{RWM}	$V_{BR} @ I_T$ (V) (Note 4)			I_T	$I_R @ V_{RWM}$	Max $V_C @$	Max $V_C @$
		(V)	Min	Nom	Max	(mA)	(μA)	$I_{PP} = 1$ Amp	$I_{PP} = 7$ Amp
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 .

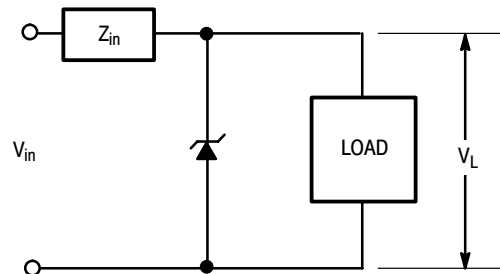


Figure 1. Typical Protection Circuit

1SMF16BT1, 1SMF16BT3

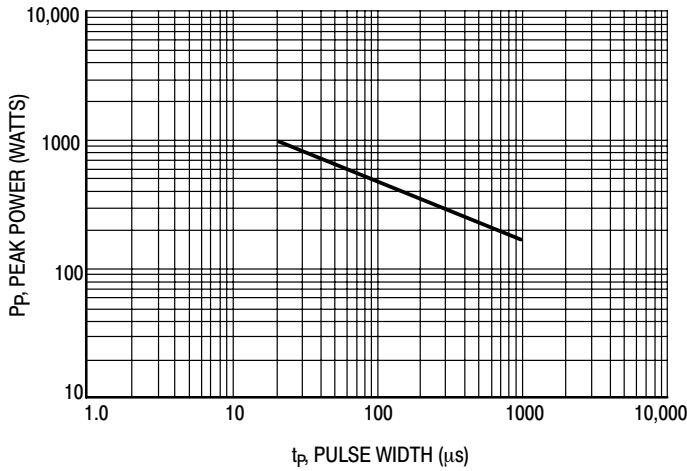


Figure 2. Pulse Rating Curve

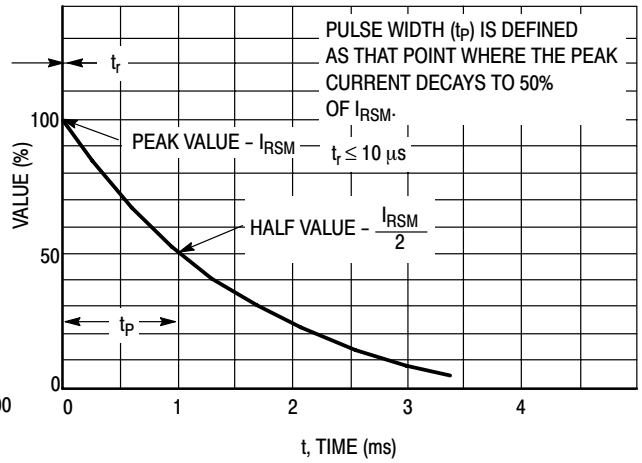


Figure 3. 10 X 1000 μ s Pulse Waveform

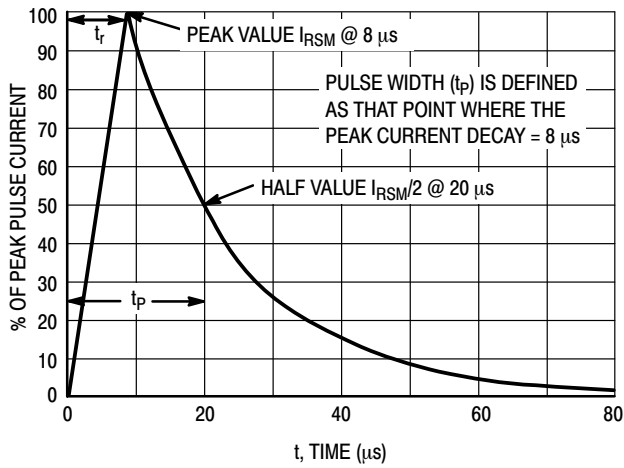


Figure 4. 8 X 20 μ s Pulse Waveform

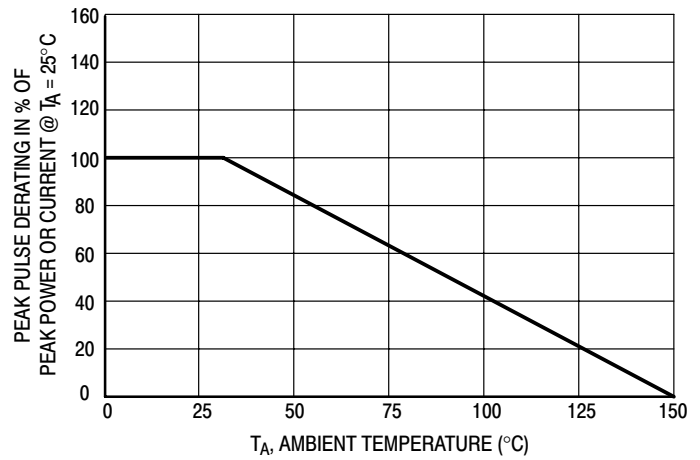


Figure 5. Pulse Derating Curve

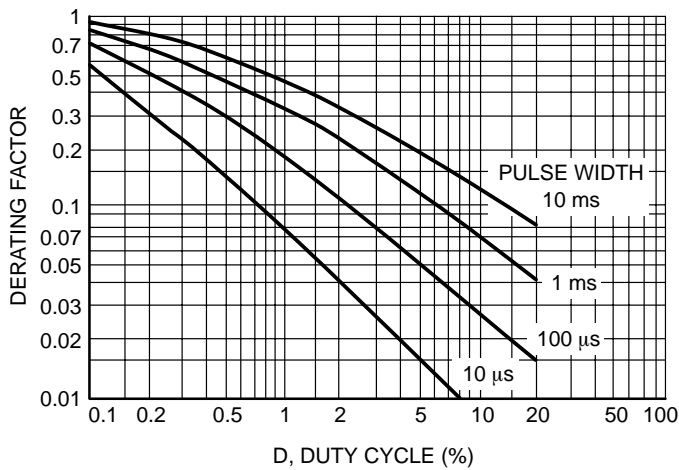


Figure 6. Typical Derating Factor for Duty Cycle

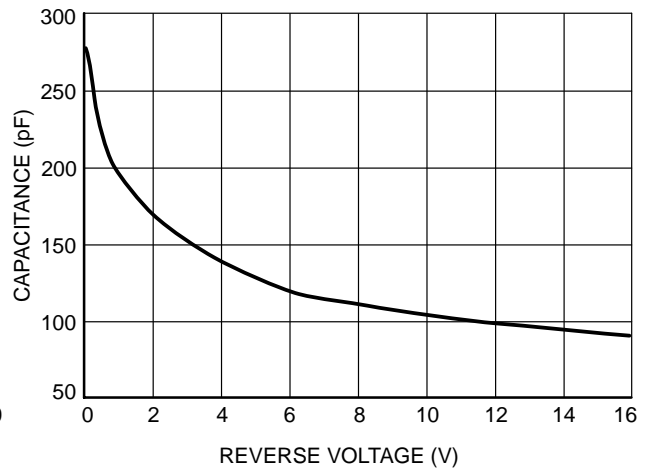
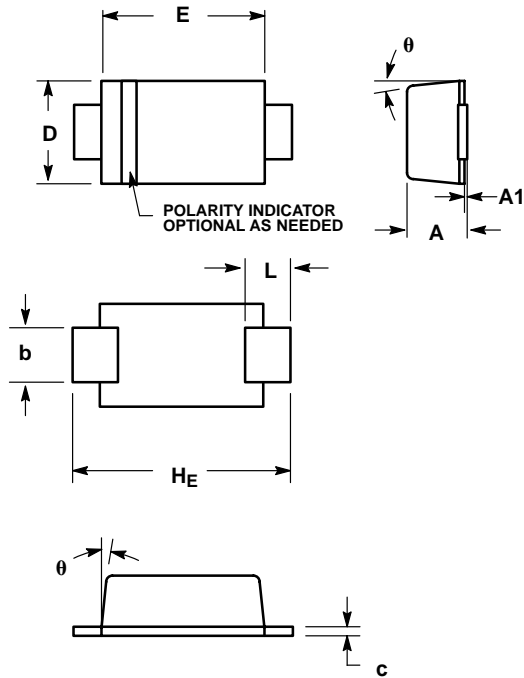


Figure 7. Capacitance versus Reverse Voltage

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PACKAGE DIMENSIONS

SOD-123FL
CASE 498-01
ISSUE A

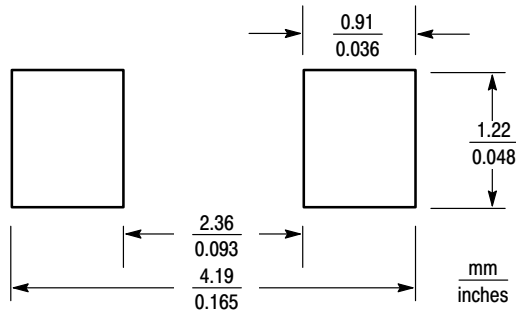


NOTES:

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.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	0.95	1.00	0.035	0.037	0.039
A1	0.00	0.05	0.10	0.000	0.002	0.004
b	0.70	0.90	1.10	0.028	0.035	0.043
c	0.10	0.15	0.20	0.004	0.006	0.008
D	1.50	1.65	1.80	0.059	0.065	0.071
E	2.50	2.70	2.90	0.098	0.106	0.114
L	0.55	0.75	0.95	0.022	0.030	0.037
HE	3.40	3.60	3.80	0.134	0.142	0.150
θ	0°	-	8°	0°	-	8°

SOLDERING FOOTPRINT*



*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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