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# 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

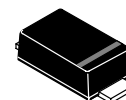
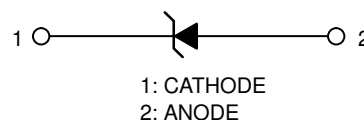
Epoxy Meets UL 94, V-0



**ON Semiconductor®**

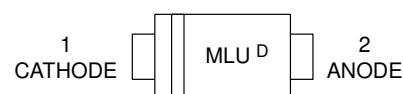
<http://onsemi.com>

## PLASTIC SURFACE MOUNT ZENER OVERVOLTAGE TRANSIENT SUPPRESSOR 175 WATT PEAK POWER



**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.

# 1SMF16BT1, 1SMF16BT3, 1SMF16BT3G

## MAXIMUM RATINGS

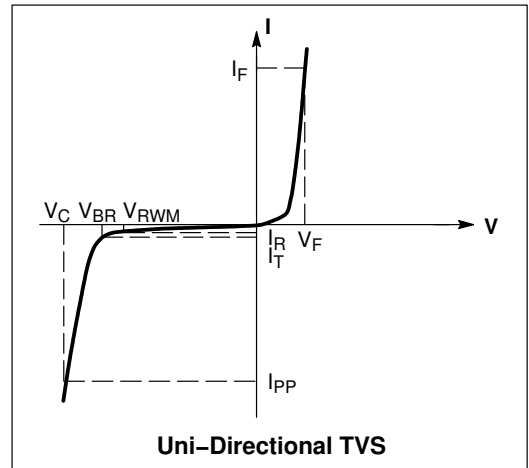
Rating	Symbol	Value	Unit
Maximum $P_{pk}$ Dissipation @ $T_A = 25^\circ\text{C}$ , (PW-10/1000 $\mu\text{s}$ ) (Note 1)	$P_{pk}$	175	W
Maximum $P_{pk}$ Dissipation @ $T_A = 25^\circ\text{C}$ , (PW-8/20 $\mu\text{s}$ ) (Note 2)	$P_{pk}$	1000	W
Operating and Storage Temperature Range	$T_J, T_{stg}$	-55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

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)

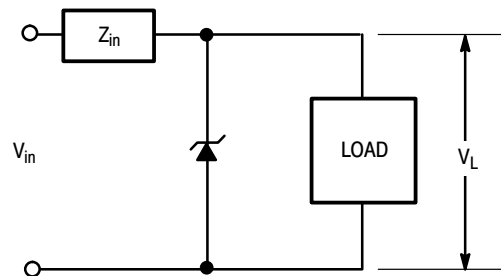
Symbol	Parameter
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Maximum Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$



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

Device	Marking	$V_{RWM}$ (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)	( $\mu\text{A}$ )	(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  $25^\circ\text{C}$ .



**Figure 1. Typical Protection Circuit**

# 1SMF16BT1, 1SMF16BT3, 1SMF16BT3G

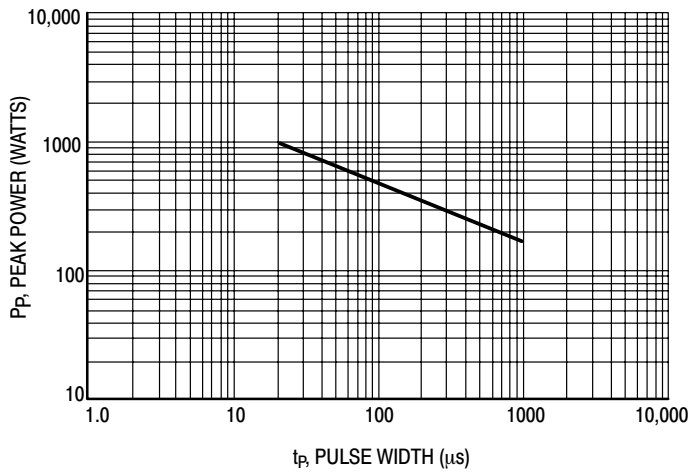


Figure 2. Pulse Rating Curve

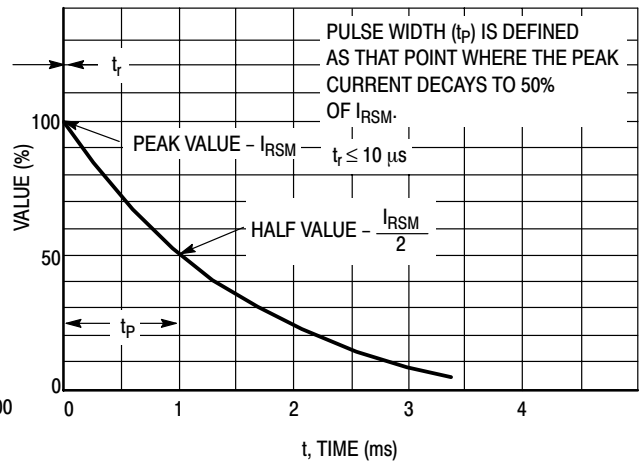


Figure 3. 10 X 1000  $\mu$ s Pulse Waveform

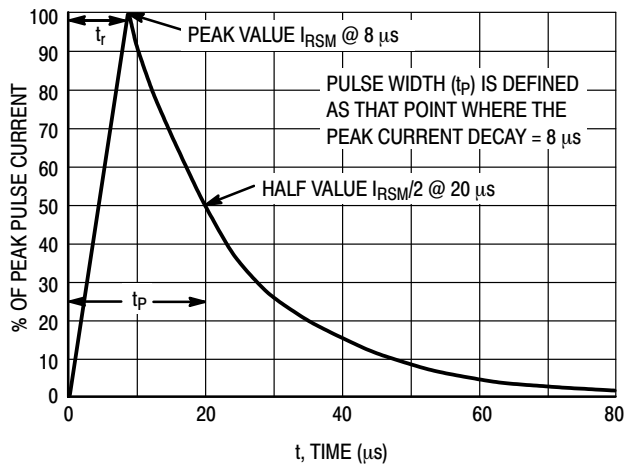


Figure 4. 8 X 20  $\mu$ s Pulse Waveform

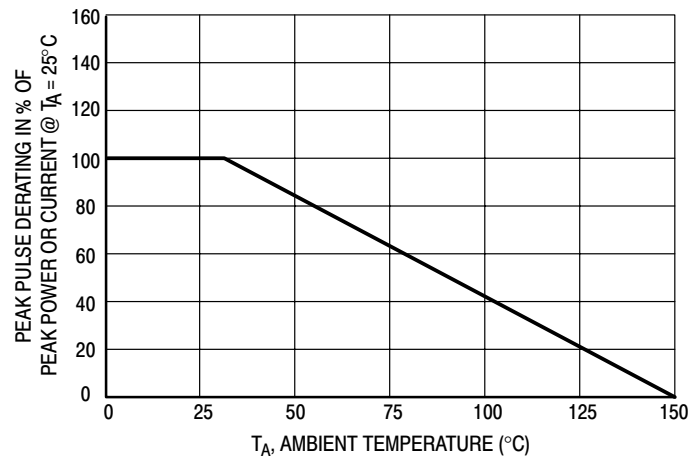


Figure 5. Pulse Derating Curve

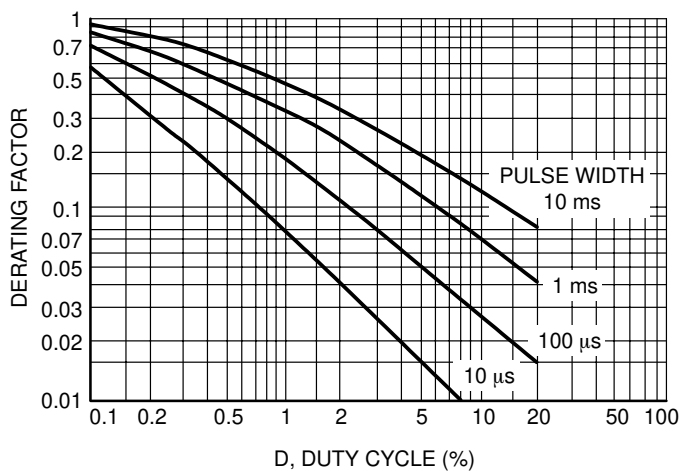


Figure 6. Typical Derating Factor for Duty Cycle

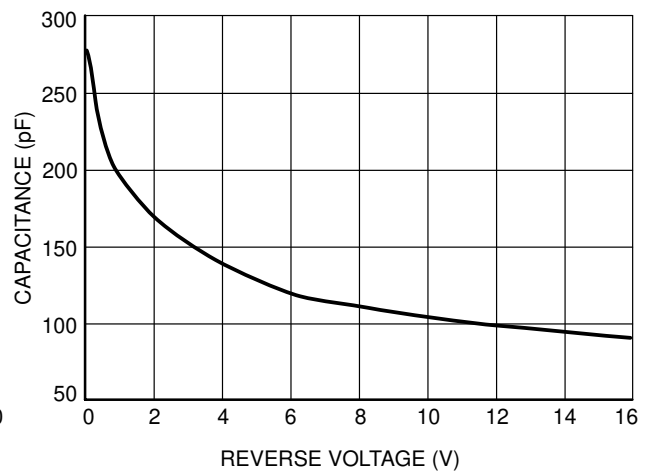
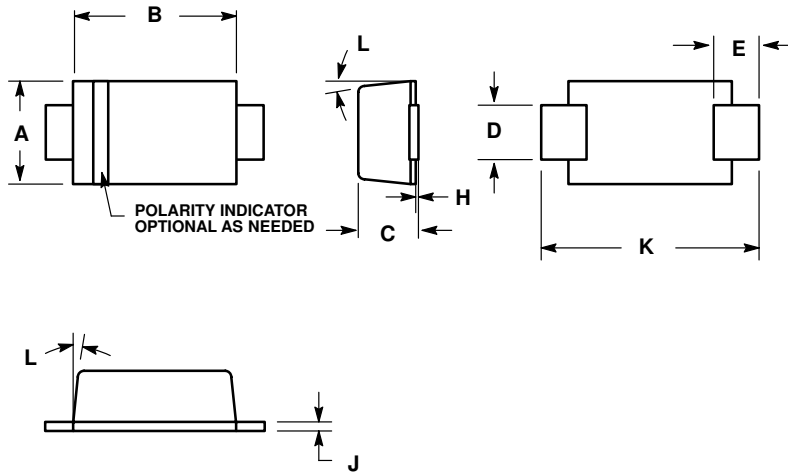


Figure 7. Capacitance versus Reverse Voltage

# 1SMF16BT1, 1SMF16BT3, 1SMF16BT3G

## PACKAGE DIMENSIONS

SOD-123FL  
CASE 498-01  
ISSUE O

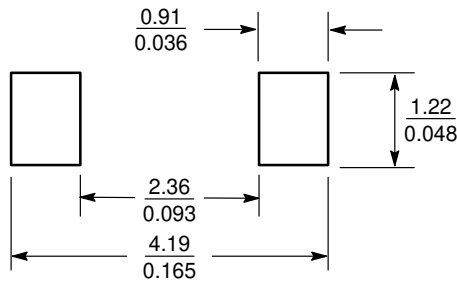


### NOTES:

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.

DIM	MILLIMETERS		INCHES	
	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\*



SCALE 10:1 (mm/inches)

### 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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