# **1SMF16B**

# 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

### **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

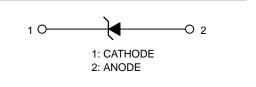
Epoxy Meets UL94, VO



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# 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		

## **MAXIMUM RATINGS**

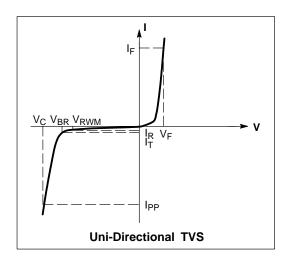
Rating	Symbol	Value	Unit
Maximum $P_{pk}$ Dissipation @ $T_A = 25$ °C, (PW-10/1000 $\mu$ s) (Note 1)	P <sub>pk</sub>	175	W
Maximum P <sub>pk</sub> Dissipation @ T <sub>A</sub> = 25°C, (PW-8/20 μs) (Note 2)	P <sub>pk</sub>	1000	W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

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

# **ELECTRICAL CHARACTERISTICS**

(T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter					
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current					
V <sub>C</sub>	Clamping Voltage @ I <sub>PP</sub>					
V <sub>RWM</sub>	Working Peak Reverse Voltage					
I <sub>R</sub>	Maximum Reverse Leakage Current @ V <sub>RWM</sub>					
$V_{BR}$	Breakdown Voltage @ I <sub>T</sub>					
I <sub>T</sub>	Test Current					
I <sub>F</sub>	Forward Current					
V <sub>F</sub>	Forward Voltage @ I <sub>F</sub>					

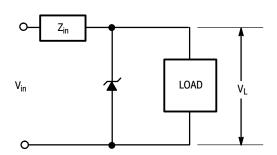


# **ELECTRICAL CHARACTERISTICS** ( $T_L = 30$ °C unless otherwise noted, $V_F = 1.3$ Volts @ 850 mA)

		V <sub>RWM</sub> (Note 3)	V <sub>BR</sub> @ <b>I<sub>T</sub> (V)</b> (Note 4)			I <sub>T</sub>	I <sub>R</sub> @ V <sub>RWM</sub>	Max V <sub>C</sub> @ I <sub>PP</sub> = 1 Amp	Max V <sub>C</sub> @ I <sub>PP</sub> = 7 Amp
Device	Marking	(V)	Min	Nom	Max	(mA)	(μΑ)	(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<sub>RWM</sub>) which should be equal to or greater than the DC or continuous peak operating voltage level.
- 4. V<sub>BR</sub> measured at pulse test current I<sub>T</sub> at ambient temperature of 25°C.

# TYPICAL PROTECTION CIRCUIT



# **1SMF16B**

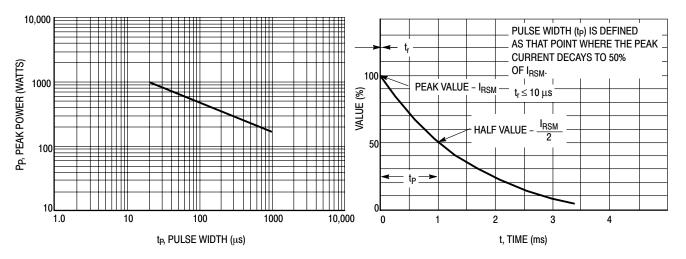


Figure 1. Pulse Rating Curve

Figure 2. 10 X 1000 µs Pulse Waveform

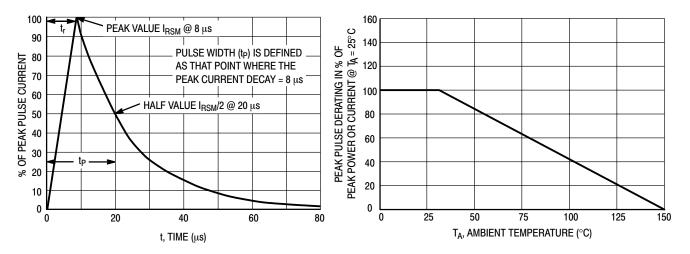


Figure 3. 8 X 20 µs Pulse Waveform

Figure 4. Pulse Derating Curve

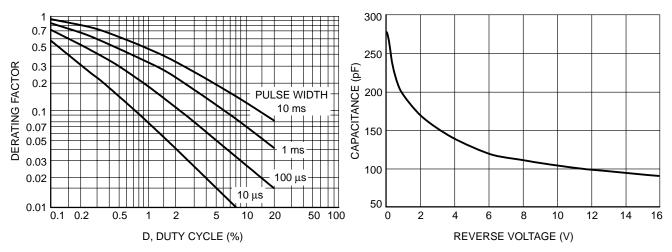


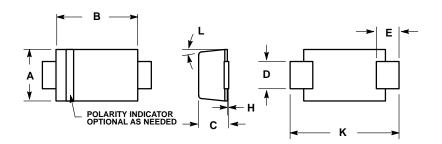
Figure 5. Typical Derating Factor for Duty Cycle

Figure 6. Capacitance versus Reverse Voltage

### **OUTLINE DIMENSIONS**

# **Transient Voltage Suppressor - Surface Mounted**

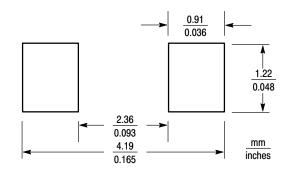
SOD-123FL CASE 498-01 **ISSUE O** 



- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: MILLIMETER.
  DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH
- 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.

	MILLIN	IETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
Α	1.50	1.80	0.059	0.071	
В	2.50	2.90	0.098	0.114	
С	0.90	1.00	0.035	0.039	
D	0.70	1.10	0.028	0.043	
Е	0.55	0.95	0.022	0.037	
Н	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 °	

## **RECOMMENDED FOOTPRINT FOR SOD-123FL**



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