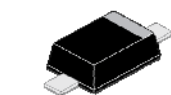
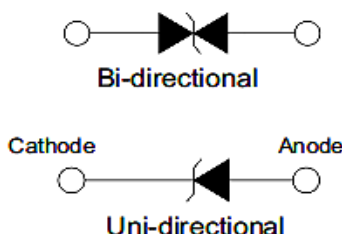


## 200W Surface Mount Transient Voltage Suppressors

SMFXXXA /CA



SOD - 123FL



SOD-123FL  
Surface Mount  
Plastic Package  
RoHS compliant

### FEATURES:

1. Peak power dissipation 200W @10 x 1000us Pulse
2. Low profile package.
3. Excellent clamping capability.
4. Glass passivated junction.
5. Fast response time: typically less than 1ns from 0 Volts to BV min
6. Typical IR less than 1uA when VBR min above 15V.
7. IEC 61000-4-2 ESD 30KV(Air), 30KV(Contact)
8. ESD protection of data lines in accordance with IEC 61000-4-2
9. EFT protection of data lines in accordance with IEC 61000-4-4
10. Halogen free and RoHS compliant
11. Lead-free finish

### ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C Unless otherwise specified)

PARAMETER	SYMBOL	VALUE	UNIT
Peak Pulse Power Dissipation on 10/1000 us Waveform <sup>1,2</sup> (FIG.1)	P <sub>PPM</sub>	Min 200	W
Peak Pulse Current of on 10/1000us Waveform <sup>1</sup> ( FIG.2)	I <sub>PPM</sub>	See Table 1	A
Operating Junction Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

#### Note:

1. Non-repetitive current pulse, per Fig.2 and derated above T<sub>A</sub>=25°C per Fig.3.
2. For Bi-directional type having V<sub>RWM</sub> of 10 Volts and less, the I<sub>R</sub> limit is double



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# **ELECTRICAL CHARACTERISTICS** at (Ta = 25 °C Unless otherwise specified)

Type Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage Min. @I <sub>T</sub>	Breakdown Voltage Max. @ I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @VRMW
Uni	Bi	Uni	Bi	V <sub>RMW</sub> (V)	V <sub>BR MIN</sub> (V)	V <sub>BR MAX</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (uA)
SMF5.0A	SMF5.0CA	5.0A	5.0CA	5.0	6.40	7.00	10	9.2	21.7	400.0
SMF6.0A	SMF6.0CA	6.0A	6.0CA	6.0	6.67	7.37	10	10.3	19.4	400.0
SMF6.5A	SMF6.5CA	6.5A	6.5CA	6.5	7.22	7.98	10	11.2	17.9	250.0
SMF7.0A	SMF7.0CA	7.0A	7.0CA	7.0	7.78	8.60	10	12.0	16.7	100.0
SMF7.5A	SMF7.5CA	7.5A	7.5CA	7.5	8.33	9.21	1	12.9	15.5	50.0
SMF8.0A	SMF8.0CA	8.0A	8.0CA	8.0	8.89	9.83	1	13.6	14.7	25.0
SMF8.5A	SMF8.5CA	8.5A	8.5CA	8.5	9.44	10.40	1	14.4	13.9	10.0
SMF9.0A	SMF9.0CA	9.0A	9.0CA	9.0	10.00	10.40	1	15.4	13.0	5.0
SMF10A	SMF10CA	10A	10CA	10.0	11.10	12.30	1	17.0	11.8	2.5
SMF11A	SMF11CA	11A	11CA	11.0	12.20	13.50	1	18.2	11.0	2.5
SMF12A	SMF12CA	12A	12CA	12.0	13.30	14.70	1	19.9	10.1	2.5
SMF13A	SMF13CA	13A	13CA	13.0	14.40	15.90	1	21.5	9.3	1
SMF14A	SMF14CA	14A	14CA	14.0	15.60	17.20	1	23.2	8.6	1
SMF15A	SMF15CA	15A	15CA	15.0	16.70	18.50	1	24.4	8.2	1
SMF16A	SMF16CA	16A	16CA	16.0	17.80	19.70	1	26.0	7.7	1
SMF17A	SMF17CA	17A	17CA	17.0	18.90	20.90	1	27.6	7.2	1
SMF18A	SMF18CA	18A	18CA	18.0	20.00	22.10	1	27.6	6.8	1
SMF20A	SMF20CA	20A	20CA	20.0	22.20	24.50	1	32.4	6.2	1
SMF22A	SMF22CA	22A	22CA	22.0	24.40	26.90	1	35.5	5.6	1
SMF24A	SMF24CA	24A	24CA	24.0	26.70	29.50	1	38.9	5.1	1
SMF26A	SMF26CA	26A	26CA	26.0	28.90	31.90	1	42.1	5.1	1
SMF28A	SMF28CA	28A	28CA	28.0	31.10	34.40	1	45.4	4.4	1
SMF30A	SMF30CA	30A	30CA	30.0	33.30	36.80	1	48.4	4.1	1
SMF33A	SMF33CA	33A	33CA	33.0	36.70	40.60	1	48.4	3.8	1
SMF36A	SMF36CA	36A	36CA	36.0	40.00	44.20	1	58.1	3.4	1
SMF40A	SMF40CA	40A	40CA	40.0	44.40	49.10	1	64.5	3.1	1
SMF43A	SMF43CA	43A	43CA	43.0	44.80	52.80	1	69.4	2.9	1
SMF45A	SMF45CA	45A	45CA	45.0	50.00	55.30	1	72.7	2.8	1
SMF48A	SMF48CA	48A	48CA	48.0	53.30	58.90	1	77.4	2.6	1
SMF51A	SMF51CA	51A	51CA	51.0	56.70	62.70	1	82.4	2.4	1
SMF54A	SMF54CA	54A	54CA	54.0	60.00	66.30	1	87.1	2.3	1
SMF58A	SMF58CA	58A	58CA	58.0	64.40	71.20	1	93.6	2.1	1
SMF60A	SMF60CA	60A	60CA	60.0	66.70	73.70	1	96.8	1.8	1
SMF64A	SMF64CA	64A	64CA	64.0	71.10	78.60	1	103.0	1.7	1
SMF70A	SMF70CA	70A	70CA	70.0	77.80	86.00	1	113.0	1.5	1
SMF75A	SMF75CA	75A	75CA	75.0	83.30	92.10	1	121.0	1.4	1

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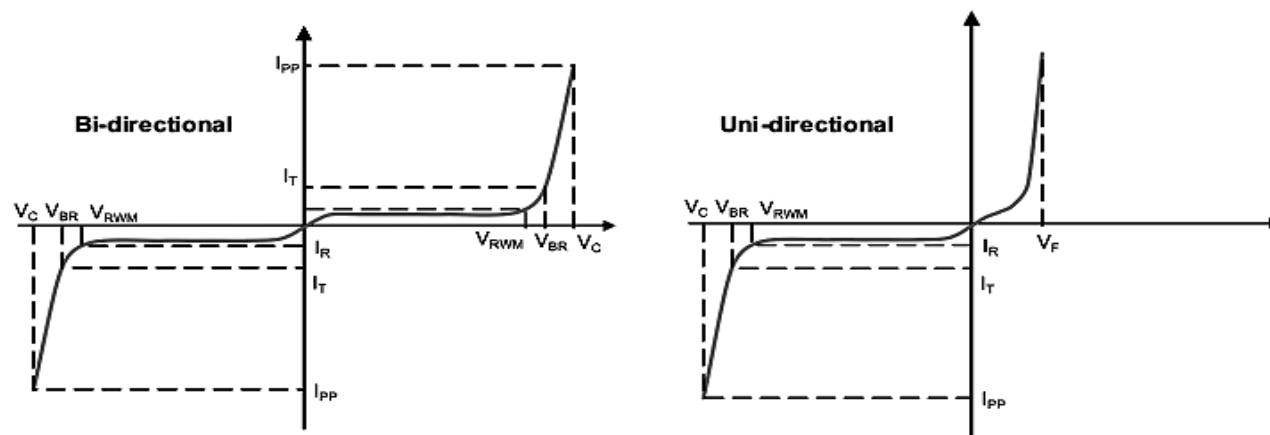
## ELECTRICAL CHARACTERISTICS at ( $T_a = 25^\circ\text{C}$ Unless otherwise specified)

Type Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage Min. @ $I_T$	Breakdown Voltage Max. @ $I_T$	Test Current	Maximum Clamping Voltage @ $I_{PP}$	Peak Pulse Current	Reverse Leakage @ $V_{RMW}$
Uni	Bi	Uni	Bi	$V_{RMW}(V)$	$V_{BR\ MIN}(V)$	$V_{BR\ MAX}(V)$	$I_T\ (mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
SMF78A	SMF78CA	78A	78CA	78.0	86.70	95.80	1	126.0	1.4	1
SMF85A	SMF85CA	85A	85CA	85.0	94.40	104.00	1	137.0	1.3	1
SMF90A	SMF90CA	90A	90CA	90.0	100.00	111.00	1	146.0	1.2	1
SMF100A	SMF100CA	100A	100CA	100.0	111.00	123.00	1	162.0	1.1	1
SMF110A	SMF110CA	110A	110CA	110.0	122.00	135.00	1	177.0	1.0	1
SMF120A	SMF120CA	120A	120CA	120.0	133.00	147.00	1	193.0	0.9	1
SMF130A	SMF130CA	130A	130CA	130.0	144.00	159.00	1	209.0	0.8	1
SMF150A	SMF150CA	150A	150CA	150.0	167.00	185.00	1	243.0	0.7	1
SMF160A	SMF160CA	160A	160CA	160.0	178.00	197.00	1	259.0	0.7	1
SMF170A	SMF170CA	170A	170CA	170.0	189.00	209.00	1	275.0	0.6	1
SMF180A	SMF180CA	180A	180CA	180.0	198.00	222.00	1	292.0	0.6	1
SMF190A	SMF190CA	190A	190CA	190.0	209.00	233.00	1	308.0	0.5	1

### Note:

1. Non-repetitive current pulse, per Fig.2 and derated above  $T_A=25^\circ\text{C}$  per Fig.3.
2. For Bi-directional type having  $V_{RMW}$  of 10 Volts and less, the  $I_R$  limit is double

### I-V Curve Characteristics



$P_{PPM}$  Peak Pulse Power Dissipation - Max power dissipation

$V_{RMW}$  Reverse Stand-off Voltage - Maximum voltage that can be applied to TVS without operation

$V_{BR}$  Breakdown Voltage – Maximum voltage that flows though the TVS at a specified 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

## TYPICAL CHARACTERISTIC CURVES

Fig 1: Peak Pulse Power Rating

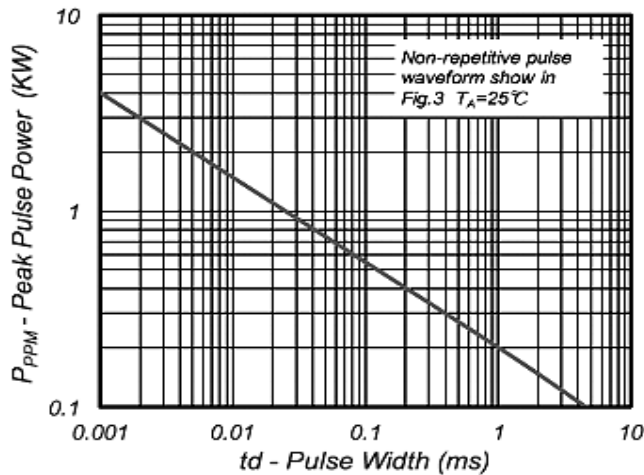


Fig 3: Pulse Derating Curve

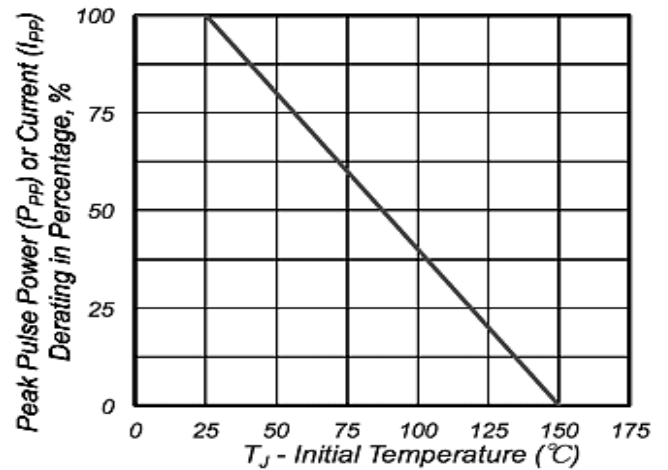


Fig 2: Pulse Waveform

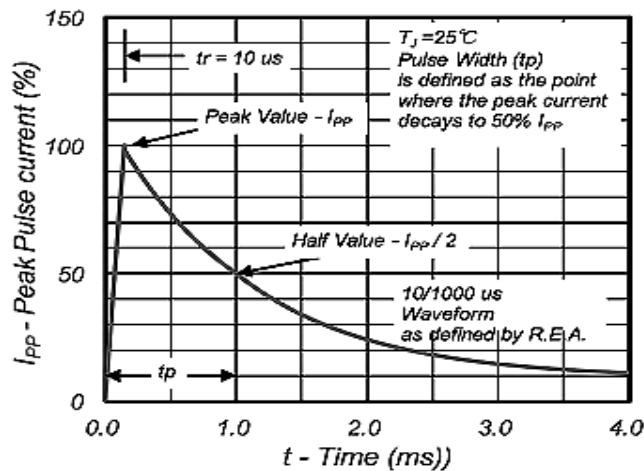
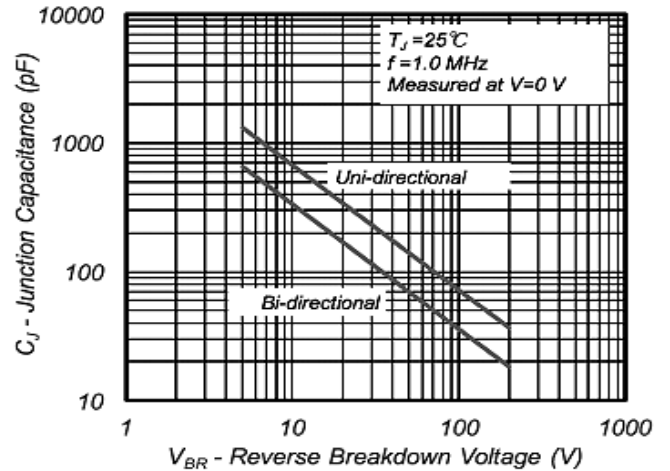
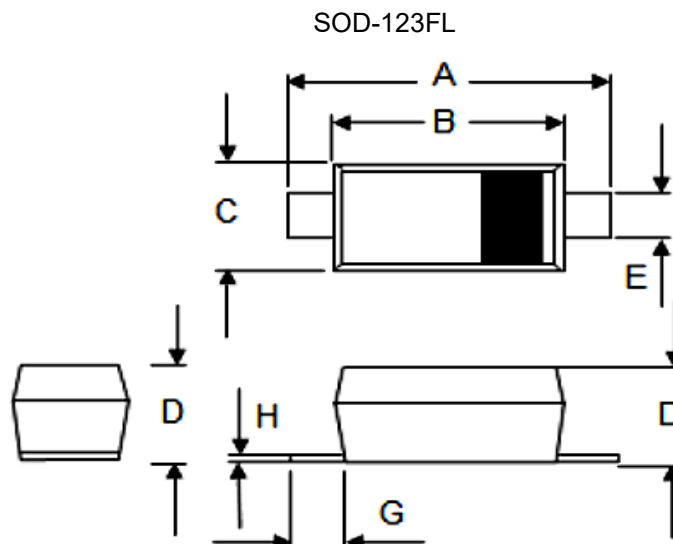


Fig 4: Typical Junction Capacitance



## PACKAGE DETAILS



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	3.40	3.95	0.142	0.155
B	2.50	2.90	0.098	0.114
C	1.40	1.95	0.055	0.077
D	0.90	1.35	0.035	0.053
E	0.50	1.10	0.020	0.043
G	0.25	--	0.010	--
H	--	0.20	--	0.008

All Dimensions are in mm

### Mechanical Characteristics

**CASE:** SOD-123FL Molded Plastic over glass passivated junction.

**Mounting Position:** Any

**Polarity:** by cathode band denotes uni-directional device, none cathode band denotes bi-directional device.

**Terminal:** Solder plated



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### **Recommended Product Storage Environment for Discrete Semiconductor Devices**

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
  - Humidity between 40 to 70 %RH
  - Air should be clean.
  - Avoid harmful gas or dust.
  - Avoid outdoor exposure or storage in areas subject to rain or water spraying .
  - Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
  - Avoid rapid change of temperature.
  - Avoid condensation.
  - Mechanical stress such as vibration and impact shall be avoided.
  - The product shall not be placed directly on the floor.
  - The product shall be stored on a plane area. They should not be turned upside down.
- They should not be placed against the wall.

### **Shelf Life of CDIL Products**

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.

If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.

The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

### **Floor Life of CDIL Products and MSL Level**

When the products are opened from the original packing, the floor life will start.

For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	Time	Condition
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH



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## Customer Notes

### Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

### Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



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