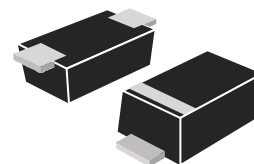


## Transient Voltage Suppression Diodes Surface Mount – 200W

### Descriptions

Transient Voltage Suppressors (TVS) are semiconductor devices designed to provide protection against over voltage transients. When over voltage events occur, the silicon TVS activates from an very high impedance status to a very low impedance status by operating in the avalanche mode and uses a large junction area to absorb large transient currents in a fast response time, protecting voltage sensitive electronics equipment from damaging.

Boarden supplies unipolar and bipolar TVS devices with axial and SMD packages, with maximum working voltage 5V to 550V, maximum power dissipation from 200W-5000W.



**SOD123FL**

### Features

- Glass passivated chip junction in SOD123FL Package
- 200W peak pulse power @10/1000 $\mu$ s
- Typical  $I_R$  less than 1 $\mu$ A above 13V
- Low incremental surge resistance
- Excellent clamping capability
- Typical failure mode is short from over-specified voltage/ current
- Fast response time: typically less than 1.0ps from 0V to BV min
- EFT protection of data lines in accordance with IEC 61000-4-4
- UL94V-0 Flammability Rating
- Halogen free and RoHS compliant

### Applications

- Telecom and Network
- Industrial Products
- Business Machines
- Vehicles Electronics
- Power Adapter
- Consumer Products
- Security Protection

### Maximum Ratings and Thermal Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000 $\mu$ s Test Waveform	P <sub>PPM</sub>	200	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 175	°C
Typical Thermal Resistance Junction to Lead	R <sub>uJL</sub>	100	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub>uJA</sub>	220	°C/W

**Notes:**

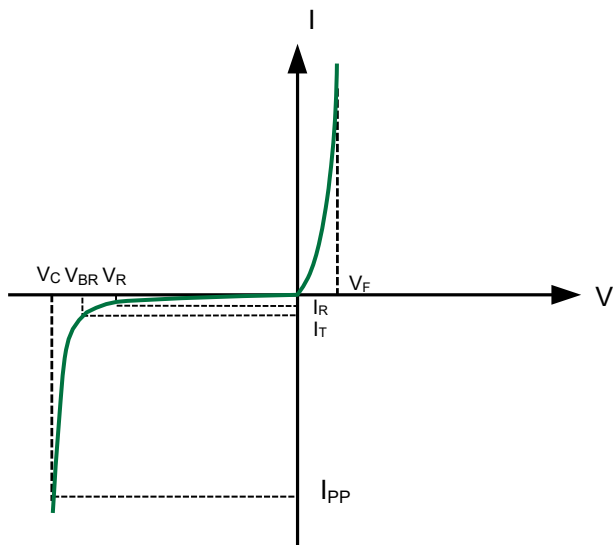
- 1) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.
- 2)  $V_F < 3.5V$  for devices of  $V_{BR} \leq 200V$  and  $V_F < 5.0V$  for devices of  $V_{BR} \geq 201V$ .

**Electrical Characteristics (TA=25°C unless otherwise noted)**

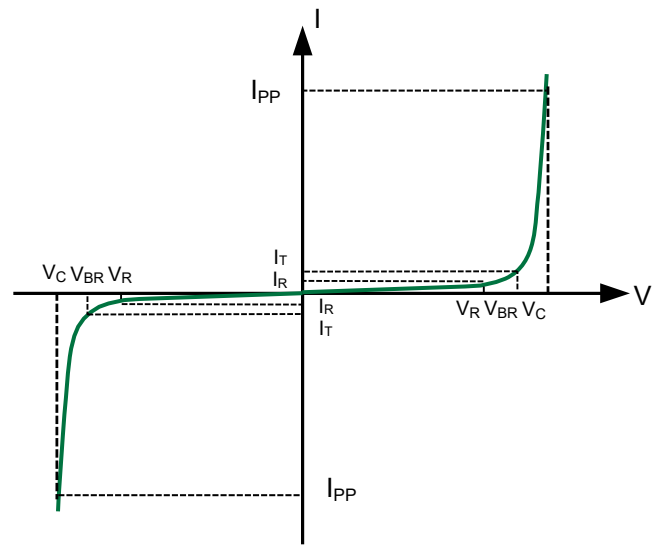
Type Number		V <sub>R</sub>	I <sub>R</sub> @V <sub>R</sub>	V <sub>BR</sub> @I <sub>T</sub> (V)			I <sub>T</sub>	V <sub>C</sub> @I <sub>PP</sub>	I <sub>PP</sub> MAX
Uni	Bi	(V)	(μA)	Min	Nom	Max	(mA)	(V)	(A)
SMF5.0A	SMF5.0CA	5.0	400	6.40	6.70	7.00	10	9.2	21.7
SMF6.0A	SMF6.0CA	6.0	400	6.67	7.02	7.37	10	10.3	19.4
SMF6.5A	SMF6.5CA	6.5	250	7.22	7.60	7.98	10	11.2	17.9
SMF7.0A	SMF7.0CA	7.0	100	7.78	8.19	8.60	10	12.0	16.7
SMF7.5A	SMF7.5CA	7.5	50	8.33	8.77	9.21	1	12.9	15.5
SMF8.0A	SMF8.0CA	8.0	25	8.89	9.36	9.83	1	13.6	14.7
SMF8.5A	SMF8.5CA	8.5	10	9.44	9.92	10.4	1	14.4	13.9
SMF9.0A	SMF9.0CA	9.0	5	10.0	10.6	11.1	1	15.4	13.0
SMF10A	SMF10CA	10	2.5	11.1	11.7	12.3	1	17.0	11.8
SMF11A	SMF11CA	11	2.5	12.2	12.9	13.5	1	18.2	11.0
SMF12A	SMF12CA	12	2.5	13.3	14.0	14.7	1	19.9	10.1
SMF13A	SMF13CA	13	1	14.4	15.2	15.9	1	21.5	9.3
SMF14A	SMF14CA	14	1	15.6	16.4	17.2	1	23.2	8.6
SMF15A	SMF15CA	15	1	16.7	17.6	18.5	1	24.4	8.2
SMF16A	SMF16CA	16	1	17.8	18.8	19.7	1	26.0	7.7
SMF17A	SMF17CA	17	1	18.9	19.9	20.9	1	27.6	7.2
SMF18A	SMF18CA	18	1	20.0	21.1	22.1	1	29.2	6.8
SMF20A	SMF20CA	20	1	22.2	23.4	24.5	1	32.4	6.2
SMF22A	SMF22CA	22	1	24.4	25.7	26.9	1	35.5	5.6
SMF24A	SMF24CA	24	1	26.7	28.1	29.5	1	38.9	5.1
SMF26A	SMF26CA	26	1	28.9	30.4	31.9	1	42.1	4.8
SMF28A	SMF28CA	28	1	31.1	32.8	34.4	1	45.4	4.4
SMF30A	SMF30CA	30	1	33.3	35.1	36.8	1	48.4	4.1
SMF33A	SMF33CA	33	1	36.7	38.7	40.6	1	53.3	3.8
SMF36A	SMF36CA	36	1	40.0	42.1	44.2	1	58.1	3.4
SMF40A	SMF40CA	40	1	44.4	46.8	49.1	1	64.5	3.1
SMF43A	SMF43CA	43	1	47.8	50.3	52.8	1	69.4	2.9
SMF45A	SMF45CA	45	1	50.0	52.7	55.3	1	72.7	2.8
SMF48A	SMF48CA	48	1	53.3	56.1	58.9	1	77.4	2.6
SMF51A	SMF51CA	51	1	56.7	59.7	62.7	1	82.4	2.4
SMF54A	SMF54CA	54	1	60.0	63.2	66.3	1	87.1	2.3
SMF58A	SMF58CA	58	1	64.4	67.8	71.2	1	93.6	2.1
SMF60A	SMF60CA	60	1	66.7	70.2	73.7	1	96.8	1.8
SMF64A	SMF64CA	64	1	71.1	74.9	78.6	1	103	1.7
SMF70A	SMF70CA	70	1	77.8	81.9	86.0	1	113	1.5
SMF75A	SMF75CA	75	1	83.3	87.7	92.1	1	121	1.4
SMF78A	SMF78CA	78	1	86.7	91.3	95.8	1	126	1.4
SMF85A	SMF85CA	85	1	94.4	99.2	104	1	137	1.3
SMF90A	SMF90CA	90	1	100	105.5	111	1	146	1.2
SMF100A	SMF100CA	100	1	111	117.0	123	1	162	1.1
SMF110A	SMF110CA	110	1	122	128.5	135	1	177	1.0
SMF120A	SMF120CA	120	1	133	140.0	147	1	193	1.0
SMF130A	SMF130CA	130	1	144	151.5	159	1	209	0.9
SMF150A	SMF150CA	150	1	167	176.0	185	1	243	0.8
SMF160A	SMF160CA	160	1	178	187.5	197	1	259	0.8
SMF170A	SMF170CA	170	1	189	199.0	209	1	275	0.7
SMF180A	SMF180CA	180	1	201	211.5	222	1	292	0.7
SMF200A	SMF200CA	200	1	224	235.5	247	1	324	0.6
SMF220A	SMF220CA	220	1	246	259.0	272	1	356	0.6
SMF250A	SMF250CA	250	1	279	294.0	309	1	405	0.5
SMF300A	SMF300CA	300	1	335	353.0	371	1	486	0.4
SMF350A	SMF350CA	350	1	391	411.5	432	1	567	0.4

For bidirectional type having V<sub>R</sub> of 10 volts and less, the I<sub>R</sub> limit is double.

I-V Curve Characteristics



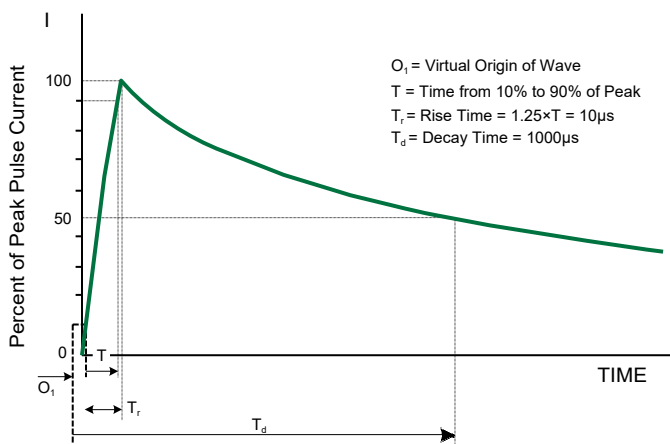
Uni-Directional TVS



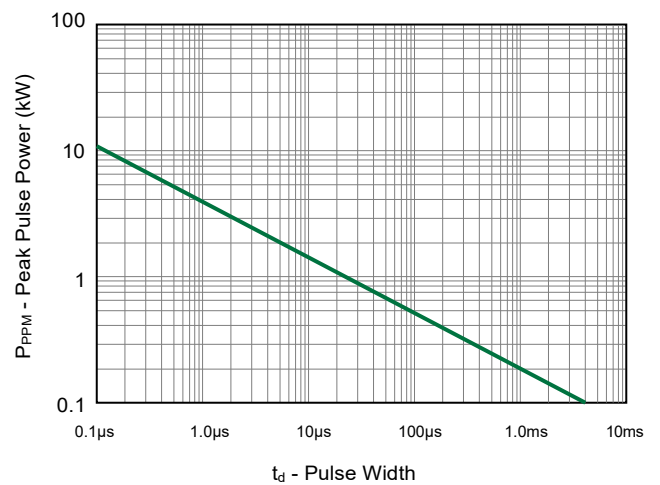
Bi-Directional TVS

- V<sub>R</sub> - Stand-Off Voltage** - Maximum voltage that can be applied to the TVS without operation
- V<sub>BR</sub> - Breakdown Voltage** - Maximum current that flows through the TVS at a specified test current ( $I_T$ )
- I<sub>T</sub> - Test Current** - Test Current
- V<sub>C</sub> - Clamping Voltage** - Peak voltage measured across the suppressor at a specified  $I_{PPM}$  (peak impulse current)
- I<sub>PP</sub> - Peak Pulse Current** - Maximum Reverse Peak Pulse Current
- P<sub>PP</sub> - Peak Pulse Power Dissipation** - Max power dissipation
- I<sub>R</sub> - Reverse Leakage Current** - Current measured at  $V_R$
- V<sub>F</sub> - Forward Voltage** - Drop for Uni-directional

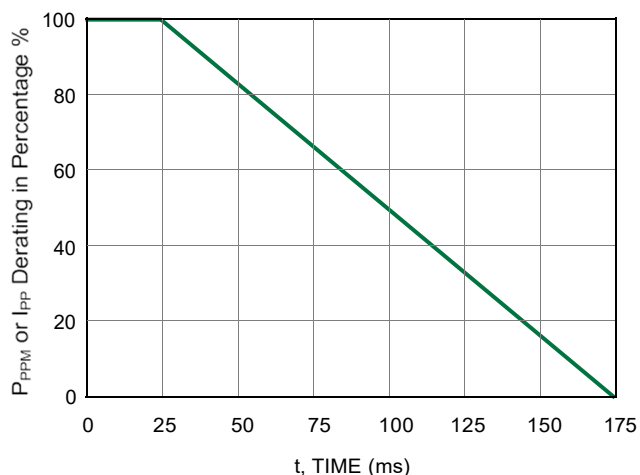
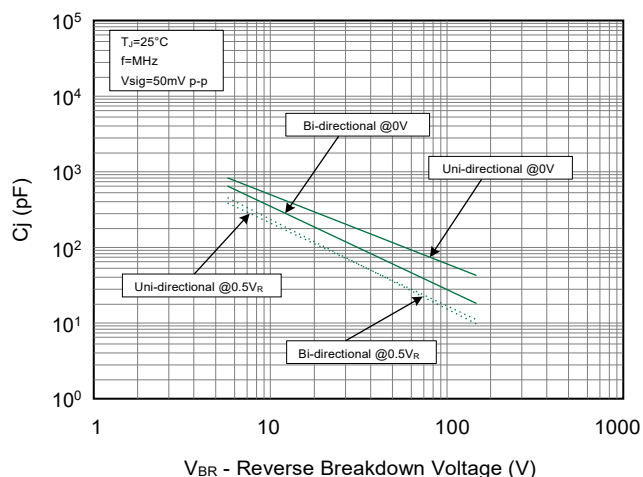
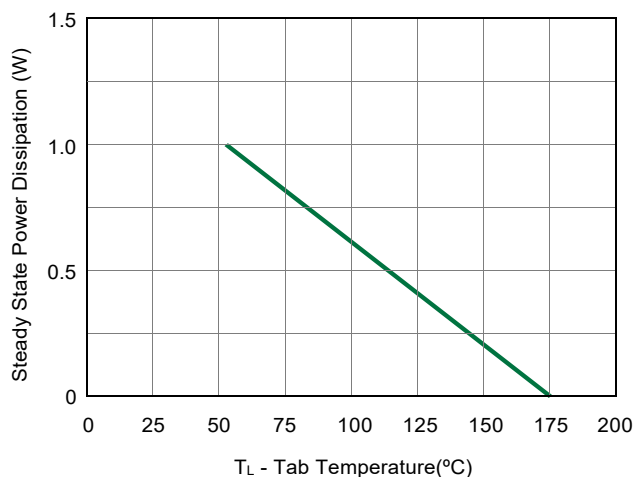
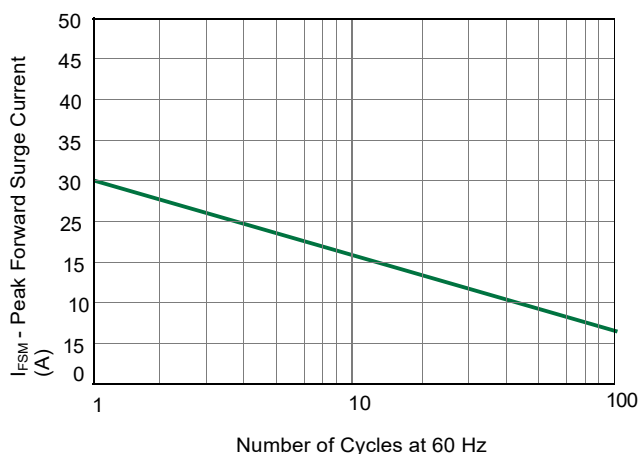
Ratings and Characteristic Curves (TA=25°C unless otherwise noted)



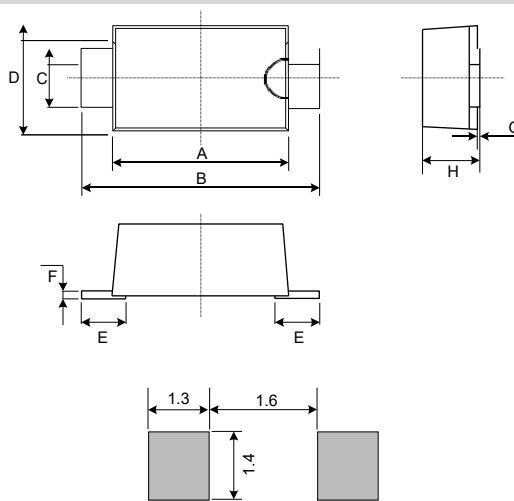
Pulse Waveform- 10/1000µs



Peak Pulse Power Rating Curve

**Ratings and Characteristic Curves (TA=25°C unless otherwise noted)**

**Pulse Derating Curve**

**Typical Junction Capacitance**

**Steady State Power Derating Curve**

**Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only**
**Product Dimensions**

Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.0984	0.1142	2.50	2.90
B	0.1339	0.1535	3.40	3.90
C	0.0275	0.0472	0.70	1.20
D	0.0591	0.0787	1.50	2.00
E	0.0138	0.0354	0.35	0.90
F	0.0020	0.0102	0.05	0.26
G	0.0000	0.0039	0.00	0.10
H	0.0354	0.0472	0.90	1.12


**Mounting Pad Layout (mm)**

