

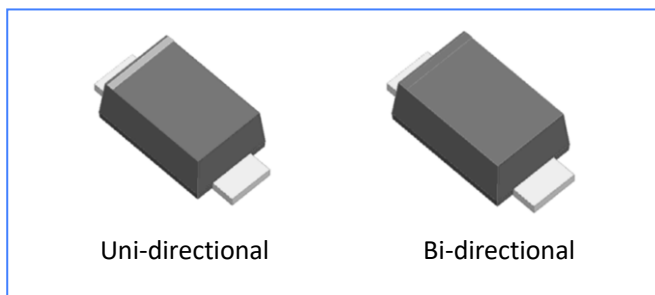
## SMF Series

### Description

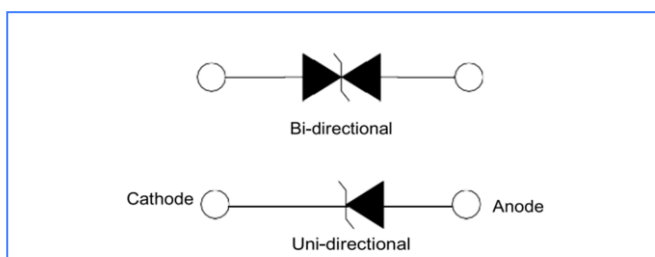
The SMF series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. The SMF series is supplied in YINT Semiconductor's exclusive, cost-effective, highly reliable and is ideally suited for use in communication systems, automotive, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer Applications.

### Features

- Case: SOD123FL
- Excellent clamping capability
- 200 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Fast response time: typically less than 1.0ps from 0 Volts to VB min.
- IEC61000-4-2 (ESD)  $\pm$ 30kV (air),  $\pm$ 30kV (contact).



### Functional Diagram



### Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

### Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at $T_A=25^\circ\text{C}$ by 10/1000 $\mu$ s Waveform	$P_{PK}$	200	W
Power Dissipation on Infinite Heat Sink at $T_L=50^\circ\text{C}$	$P_D$	1	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave <sup>1</sup>	$I_{FSM}$	30	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	$V_F$	3.5	V
Operating Temperature Range	$T_J$	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$

NOTES:

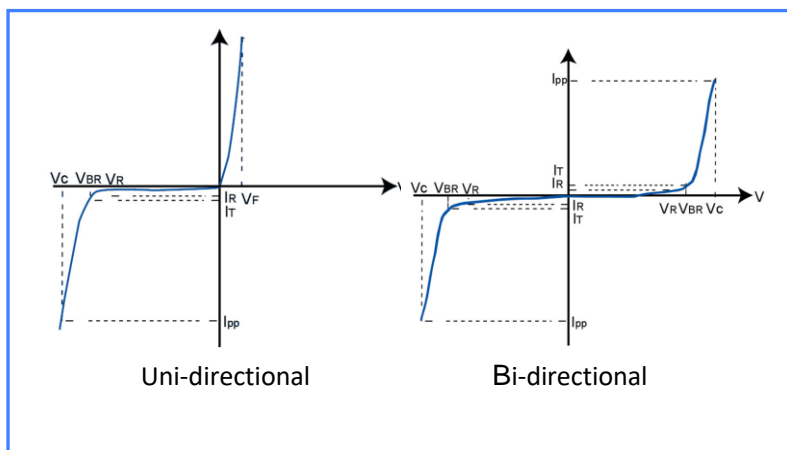
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

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

Part Number (Bi)	Part Number (Uni)	MARKING		Reverse Stand off Voltage $V_R$ (Volts)	Breakdown Voltage $V_{BR}$ (Volts)@ $I_T$		Test Current $I_T$ (mA)	Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu$ A)	Maximum Peak Pulse Current $I_{pp}$ (A)	Maximum Clamping Voltage $V_C$ @ $I_{pp}$ (V)
		BI	UNI		Min .V	Max .V				
SMF5.0CA	SMF5.0A	5.0CA	5.0A	5.0	6.40	7.00	10	400	21.70	9.2
SMF6.0CA	SMF6.0A	6.0CA	6.0A	6.0	6.67	7.37	10	400	19.40	10.3
SMF6.5CA	SMF6.5A	6.5CA	6.5A	6.5	7.22	7.98	10	250	17.90	11.2
SMF7.0CA	SMF7.0A	7.0CA	7.0A	7.0	7.78	8.60	10	100	16.70	12.0
SMF7.5CA	SMF7.5A	7.5CA	7.5A	7.5	8.33	9.21	1.0	50	15.50	12.9
SMF8.0CA	SMF8.0A	8.0CA	8.0A	8.0	8.89	9.83	1.0	25	14.70	13.6
SMF8.5CA	SMF8.5 A	8.5CA	8.5A	8.5	9.44	10.4	1.0	10	13.90	14.4
SMF9.0CA	SMF9.0 A	9.0CA	9.0A	9	10.0	11.1	1.0	5.0	13.00	15.4
SMF10CA	SMF10A	10CA	10A	10	11.1	12.3	1.0	2.0	11.80	17.0
SMF11CA	SMF11A	11CA	11A	11	12.2	13.5	1.0	2.0	11.00	18.2
SMF12CA	SMF12A	12CA	12A	12	13.3	14.7	1.0	2.0	10.10	19.9
SMF13CA	SMF13A	13CA	13A	13	14.4	15.9	1.0	1.0	9.30	21.5
SMF14CA	SMF14A	14CA	14A	14	15.6	17.2	1.0	1.0	8.62	23.2
SMF15CA	SMF15A	15CA	15A	15	16.7	18.5	1.0	1.0	8.20	24.4
SMF16CA	SMF16A	16CA	16A	16	17.8	19.7	1.0	1.0	7.69	26.0
SMF17CA	SMF17A	17CA	17A	17	18.9	20.9	1.0	1.0	7.25	27.6
SMF18CA	SMF18A	18CA	18A	18	20.0	22.1	1.0	1.0	6.85	29.2
SMF19CA	SMF19A	19CA	19A	19	21.0	23.3	1.0	1.0	6.54	30.6
SMF20CA	SMF20A	20CA	20A	20	22.2	24.5	1.0	1.0	6.17	32.4
SMF22CA	SMF22A	22CA	22A	22	24.4	26.9	1.0	1.0	5.63	35.5
SMF24CA	SMF24A	24CA	24A	24	26.7	29.5	1.0	1.0	5.14	38.9
SMF26CA	SMF26A	26CA	26A	26	28.9	31.9	1.0	1.0	4.75	42.1
SMF28CA	SMF28A	28CA	28A	28	31.1	34.4	1.0	1.0	4.41	45.4
SMF30CA	SMF30A	30CA	30A	30	33.3	36.8	1.0	1.0	4.13	48.4
SMF33CA	SMF33A	33CA	33A	33	36.7	40.6	1.0	1.0	3.75	53.3
SMF36CA	SMF36A	36CA	36A	36	40.0	44.2	1.0	1.0	3.44	58.1
SMF40CA	SMF40A	40CA	40A	40	44.4	49.1	1.0	1.0	3.10	64.5
SMF43CA	SMF43A	43CA	43A	43	47.8	52.8	1.0	1.0	2.88	69.4
SMF45CA	SMF45A	45CA	45A	45	50.0	55.3	1.0	1.0	2.75	72.7
SMF48CA	SMF48A	48CA	48A	48	53.3	58.9	1.0	1.0	2.58	77.4
SMF51CA	SMF51A	51CA	51A	51	56.7	62.7	1.0	1.0	2.43	82.4
SMF54CA	SMF54A	54CA	54A	54	60.0	66.3	1.0	1.0	2.30	87.1
SMF58CA	SMF58A	58CA	58A	58	64.4	71.2	1.0	1.0	2.14	93.6
SMF60CA	SMF60A	60CA	60A	60	66.7	73.7	1.0	1.0	2.07	96.8
SMF64CA	SMF64A	64CA	64A	64	71.1	78.6	1.0	1.0	1.94	103
SMF70CA	SMF70A	70CA	70A	70	77.8	86.0	1.0	1.0	1.77	113

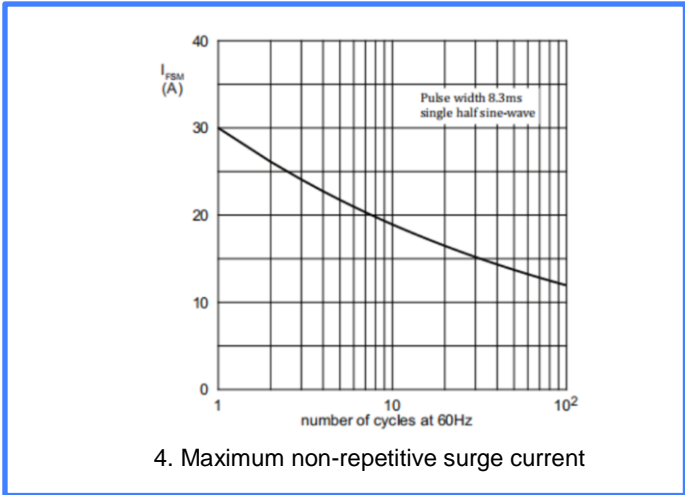
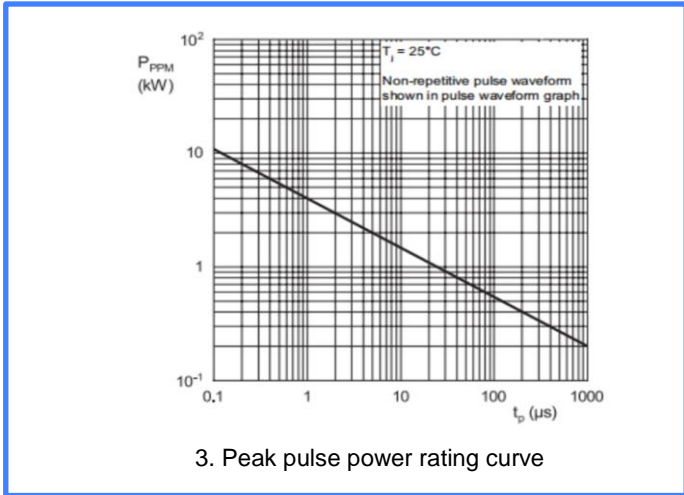
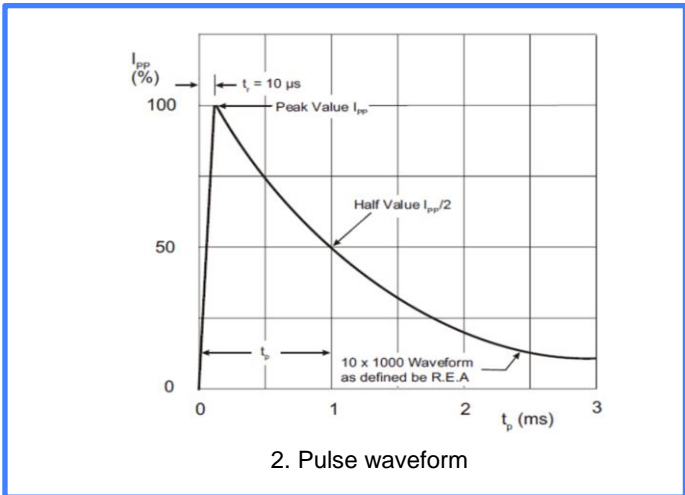
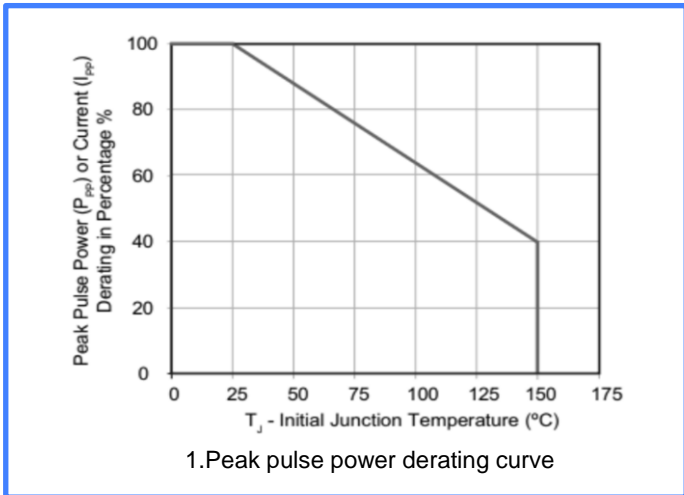
SMF75CA	SMF75A	75CA	75A	75	83.3	92.1	1.0	1.0	1.65	121
SMF78CA	SMF78A	78CA	78A	78	86.7	95.8	1.0	1.0	1.59	126
SMF80CA	SMF80A	80CA	80A	80	88.8	97.6	1.0	1.0	1.55	129
SMF85CA	SMF85A	85CA	85A	85	94.4	104	1.0	1.0	1.46	137
SMF90CA	SMF90A	90CA	90A	90	100	111	1.0	1.0	1.37	146
SMF100CA	SMF100A	100CA	100A	100	111	123	1.0	1.0	1.23	162
SMF110CA	SMF110A	110CA	110A	110	122	135	1.0	1.0	1.13	177
SMF120CA	SMF120A	120CA	120A	120	133	147	1.0	1.0	1.04	193
SMF130CA	SMF130A	130CA	130A	130	144	159	1.0	1.0	0.96	209
SMF140CA	SMF140A	140CA	140A	140	155	171	1.0	1.0	0.89	224
SMF150CA	SMF150A	150CA	150A	150	167	185	1.0	1.0	0.82	243
SMF160CA	SMF160A	160CA	160A	160	178	197	1.0	1.0	0.77	259
SMF170CA	SMF170A	170CA	170A	170	189	209	1.0	1.0	0.73	275
SMF180CA	SMF180A	180CA	180A	180	200	220	1.0	1.0	0.69	290
SMF200CA	SMF200A	200CA	200A	200	224	247	1.0	1.0	0.60	324
SMF220CA	SMF220A	220CA	220A	220	246	272	1.0	1.0	0.50	356

### I-V Curve characteristics

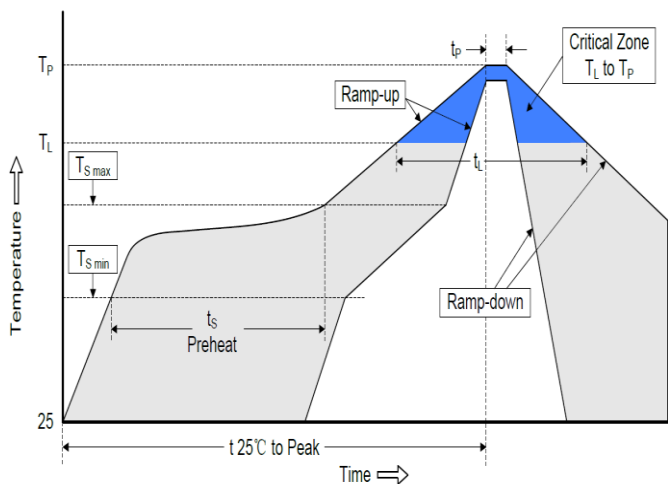


Symbol	Parameter
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Maximum Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$ (Test Current)

**Rating & Characteristic Curves**

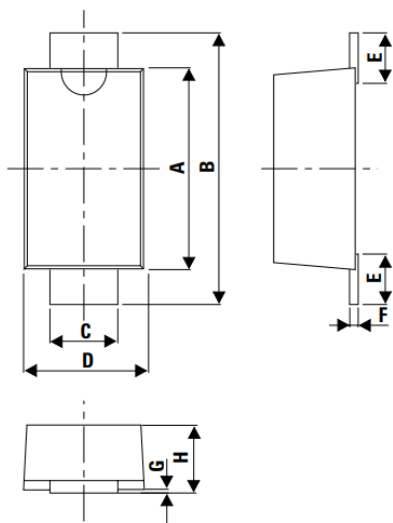


### Soldering parameters



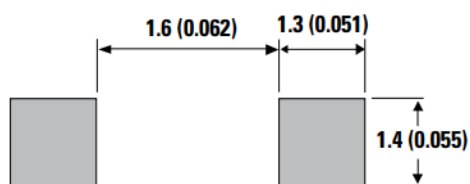
Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat <ul style="list-style-type: none"> <li>-Temperature Min (<math>T_{Smin}</math>)</li> <li>-Temperature Max (<math>T_{Smax}</math>)</li> <li>-Time (min to max)(<math>t_s</math>)</li> </ul>	150°C 200°C 60-180 seconds
$T_{Smax}$ to $T_L$ <ul style="list-style-type: none"> <li>-Ramp-up Rate</li> </ul>	3°C/second max.
Time maintained above: <ul style="list-style-type: none"> <li>- Temperature (<math>T_L</math>)</li> <li>- Time (<math>t_L</math>)</li> </ul>	217°C 60-150 seconds
Peak Temperature ( $T_P$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_p$ )	20-40 seconds
Ramp-down Rate	6°C /second max.
Time 25°C to Peak Temperature	8 minutes max.

### Package outline dimensions in millimeters

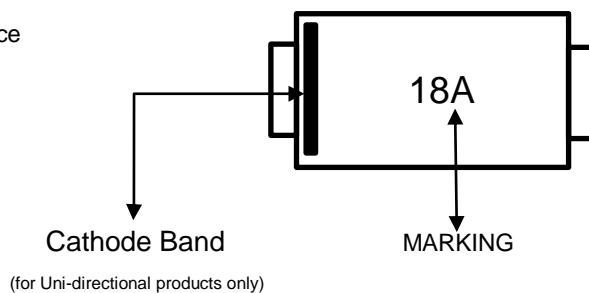
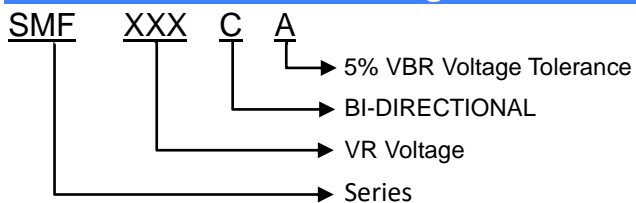


Dimensions	Millimeter	
	Min	Max
A	2.50	3.10
B	3.40	3.90
C	0.70	1.20
D	1.50	2.00
E	0.35	0.90
F	0.05	0.26
G	0.00	0.10
H	0.90	1.25

Mounting Pad Layout



### Part number code & Marking code



### Disclaimer

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.