

**GLASS PASSIVATED  
 UNIDIRECTIONAL AND BIDIRECTIONAL  
 TRANSIENT VOLTAGE SUPPRESSORS**

**FEATURES**

- ◆ Glass passivated chip
- ◆ Low leakage
- ◆ Uni and Bidirectional unit
- ◆ Excellent clamping capability
- ◆ The plastic material has U/L recognition 94V-0
- ◆ AEC-Q101 qualified



**MECHANICAL DATA**

Case : Molded Plastic

Marking : Unidirectional - type number and cathode

Band Bidirectional - type number only

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60Hz, resistive or inductive load.

CHARACTERISTICS	SYMBOLS	VALUE	UNIT
Peak Power Dissipation At $T_A = 25^\circ\text{C}$ $T_p=10/1000\mu\text{s}$ Waveform	$P_{PK}$	200	W
Peak Forward Surge Current 8.3ms single half sine-wave super imposed on rated load	$I_{FSM}$	30	A
Steady State Power Dissipation	$P_{M(AV)}$	3.3	W
Maximum Instantaneous forward voltage at 100A for unidirectional devices only	$V_F$	SEE Note 3	V
Operating Temperature Range	$T_J$	-55~150	°C
Storage Temperature Range	$T_{STG}$	-55~150	°C

NOTES :

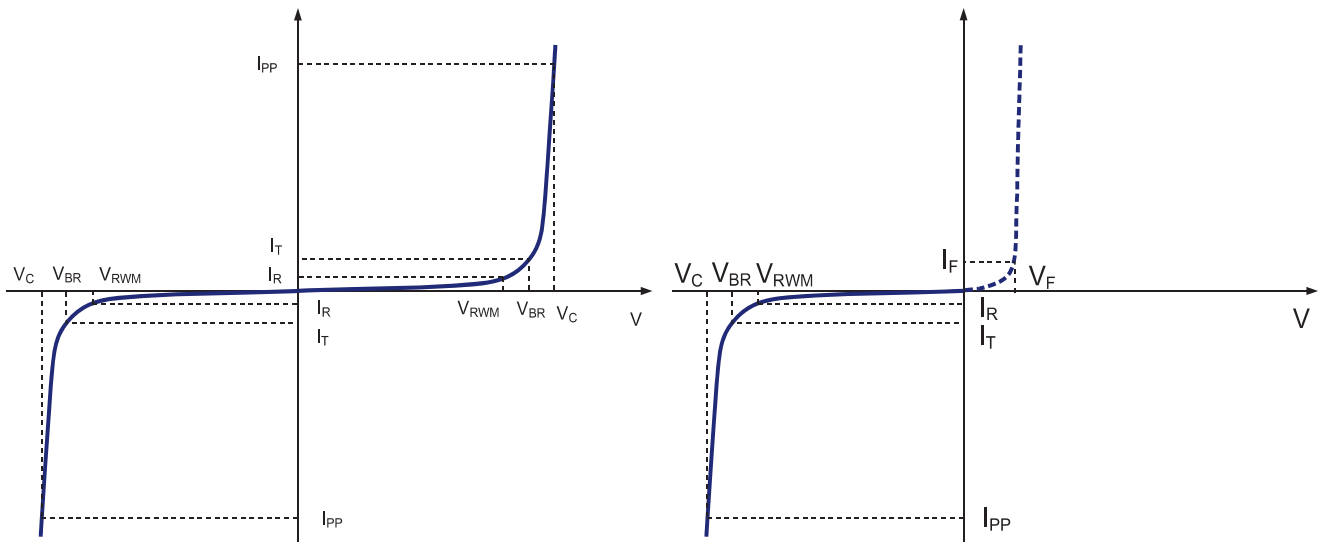
1. Non-repetitive current pulse@10/1000 $\mu\text{s}$  and derated above  $T_A=25^\circ\text{C}$
2. Mounted on 5.0x5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.
4.  $V_F < 3.5\text{V}$  for  $V_{BR\_} < 200\text{V}$  and  $V_F < 6.5\text{V}$  for  $V_{BR\_} > 201\text{V}$ .

Part Number		Marking code		<sup>(1)</sup> V <sub>BR</sub> @I <sub>T</sub>		<sup>(2)</sup> I <sub>T</sub>	<sup>(3)</sup> V <sub>RM</sub>	Max. <sup>(4)</sup> IR @V <sub>RM</sub>	Max. <sup>(5)</sup> V <sub>C</sub> @ I <sub>PP</sub>	Max. <sup>(6)</sup> I <sub>PP</sub>
Uni	Bi	Uni	Bi	MIN (V)	MAX (V)	mA	V	µA	V	A
SMF5.0A	SMF5.0CA	AE	FE	6.4	7.0	10	5.0	400	9.2	21.7
SMF6.0A	SMF6.0CA	AG	FG	6.67	7.37	10	6.0	400	10.3	19.4
SMF6.5A	SMF6.5CA	AK	FK	7.22	7.98	10	6.5	250	11.2	17.9
SMF7.0A	SMF7.0CA	AM	FM	7.78	8.6	10	7.0	100	12	16.7
SMF7.5A	SMF7.5CA	AP	FP	8.33	9.21	1	7.5	50	12.9	15.5
SMF8.0A	SMF8.0CA	AR	FR	8.89	9.83	1	8.0	25	13.6	14.7
SMF8.5A	SMF8.5CA	AT	FT	9.44	10.4	1	8.5	10	14.4	13.9
SMF9.0A	SMF9.0CA	AV	FV	10.0	11.1	1	9.0	5	15.4	13.0
SMF10A	SMF10CA	AX	FX	11.1	12.3	1	10.0	2.5	17	11.8
SMF11A	SMF11CA	AZ	FZ	12.2	13.5	1	11.0	2.5	18.2	11.0
SMF12A	SMF12CA	BE	GE	13.3	14.7	1	12.0	1	19.9	10.1
SMF13A	SMF13CA	BG	GG	14.4	15.9	1	13.0	1	21.5	9.3
SMF14A	SMF14CA	BK	GK	15.6	17.2	1	14.0	1	23.2	8.6
SMF15A	SMF15CA	BM	GM	16.7	18.5	1	15.0	1	24.4	8.2
SMF16A	SMF16CA	BP	GP	17.8	19.7	1	16.0	1	26	7.7
SMF17A	SMF17CA	BR	GR	18.9	20.9	1	17.0	1	27.6	7.2
SMF18A	SMF18CA	BT	GT	20.0	22.1	1	18.0	1	29.2	6.8
SMF20A	SMF20CA	BV	GV	22.2	24.5	1	20.0	1	32.4	6.2
SMF22A	SMF22CA	BX	GX	24.4	26.9	1	22.0	1	35.5	5.6
SMF24A	SMF24CA	BZ	GZ	26.7	29.5	1	24.0	1	38.9	5.1
SMF26A	SMF26CA	CE	HE	28.9	31.9	1	26.0	1	42.1	4.8
SMF28A	SMF28CA	CG	HG	31.1	34.4	1	28.0	1	45.4	4.4
SMF30A	SMF30CA	CK	HK	33.3	36.8	1	30.0	1	48.4	4.1
SMF33A	SMF33CA	CM	HM	36.7	40.6	1	33.0	1	53.3	3.8
SMF36A	SMF36CA	CP	HP	40.0	44.2	1	36.0	1	58.1	3.4
SMF40A	SMF40CA	CR	HR	44.4	49.1	1	40.0	1	64.5	3.1
SMF43A	SMF43CA	CT	HT	47.8	52.8	1	43.0	1	69.4	2.9
SMF45A	SMF45CA	CV	HV	50.0	55.3	1	45.0	1	72.7	2.8
SMF48A	SMF48CA	CX	HX	53.3	58.9	1	48.0	1	77.4	2.6
SMF51A	SMF51CA	CZ	HZ	56.7	62.7	1	51.0	1	82.4	2.4
SMF54A	SMF54CA	DE	IE	60.0	66.3	1	54.0	1	87.1	2.3
SMF58A	SMF58CA	DG	IG	64.4	71.2	1	58	1	93.6	2.1
SMF60A	SMF60CA	DK	IK	66.7	73.7	1	60	1	96.8	2.1
SMF64A	SMF64CA	DM	IM	71.1	78.6	1	64	1	103	1.9
SMF70A	SMF70CA	DP	IP	77.8	86	1	70	1	113	1.8
SMF75A	SMF75CA	DR	IR	83.3	92.1	1	75	1	121	1.7
SMF78A	SMF78CA	DT	IT	86.7	95.8	1	78	1	126	1.6
SMF85A	SMF85CA	DV	IV	94.4	104	1	85	1	137	1.5
SMF90A	SMF90CA	DX	IX	100	111	1	90	1	146	1.4
SMF100A	SMF100CA	EZ	JZ	111	123	1	100	1	162	1.2
SMF110A	SMF110CA	EE	JE	122	135	1	110	1	177	1.1

Part Number		Marking code		<sup>(1)</sup> V <sub>BR</sub> @I <sub>T</sub>		<sup>(2)</sup> I <sub>T</sub>	<sup>(3)</sup> V <sub>RM</sub>	Max. <sup>(4)</sup> I <sub>R</sub> @V <sub>RM</sub>	Max. <sup>(5)</sup> V <sub>C</sub> @ I <sub>PP</sub>	Max. <sup>(6)</sup> I <sub>PP</sub>
Uni	Bi	Uni	Bi	MIN (V)	MAX (V)	mA	V	μA	V	A
SMF120A	SMF120CA	EG	JG	133	147	1	120	1	193	1.0
SMF130A	SMF130CA	EK	JK	144	159	1	130	1	209	0.9
SMF150A	SMF150CA	EM	JM	167	185	1	150	1	243	0.82
SMF160A	SMF160CA	EP	JP	178	197	1	160	1	259	0.77
SMF170A	SMF170CA	ER	JR	189	209	1	170	1	275	0.7

For bidirectional type having VR of 10 volts and less, the IR limit is double.

## I-V Curve Characteristics



Symbol	Parameter	
<b>(1) V<sub>BR</sub></b>	<b>Breakdown voltage</b>	The Voltage that flows though the TVS at a specified test current (I <sub>T</sub> )
<b>(2) I<sub>T</sub></b>	<b>Test current</b>	A specified test current that flows though the TVS
<b>(3) V<sub>RM</sub></b>	<b>Stand-off voltage</b>	Maximum voltage that can be applied to the TVS without operation
<b>(4) I<sub>R</sub></b>	<b>Leakage current @ VR</b>	Current measured at V <sub>R</sub>
<b>(5) V<sub>C</sub></b>	<b>Clamping voltage</b>	Peak voltage measured across the suppressor at a specified I <sub>pp</sub> (peak impulse current)
<b>(6) I<sub>PP</sub></b>	<b>Peak pulse current</b>	The maximum surge current that flows though the TVS

Figure 1-Peak Pulse Power Rating Curve

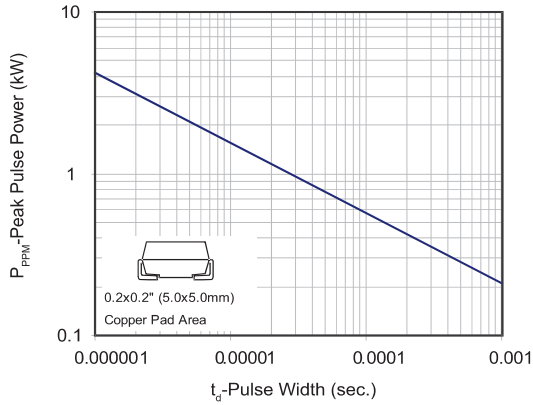


Figure 2-Pulse Waveform

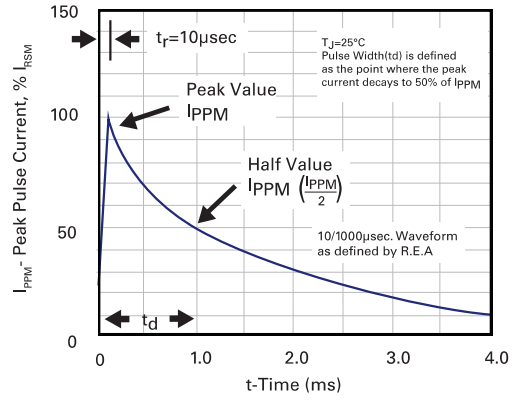


Figure 3-Power Derating Curve

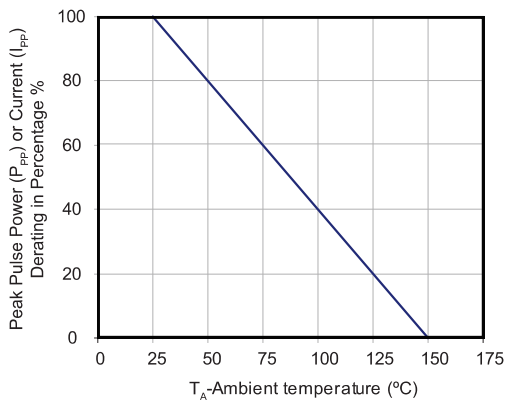
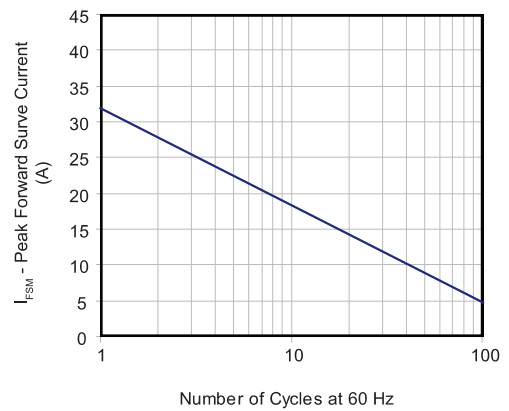
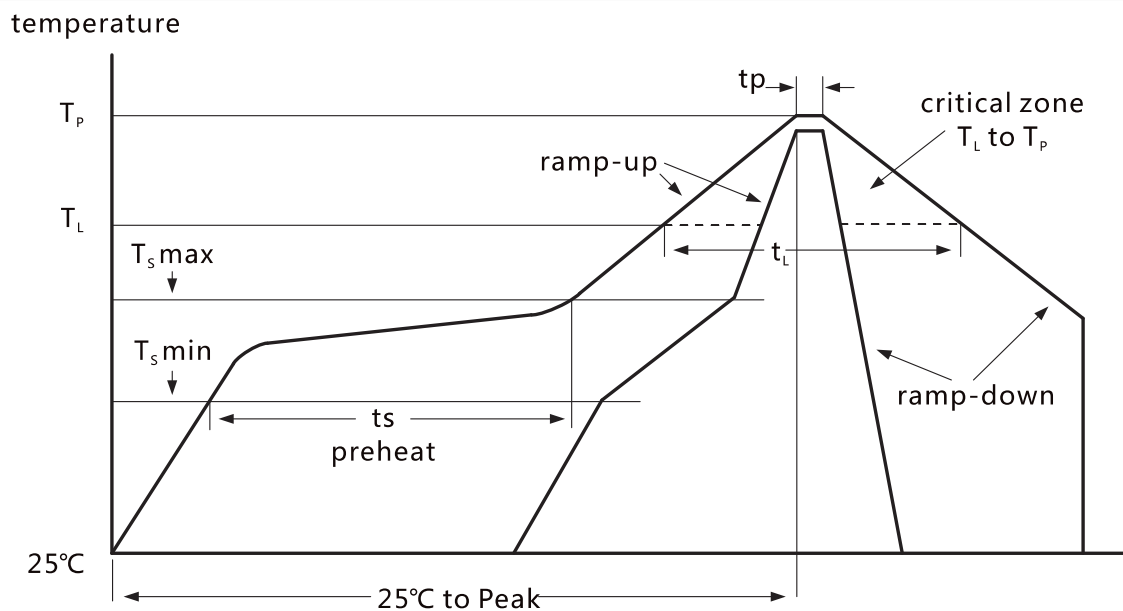


Figure 4-Maximum Non-repetitive Forward Surge

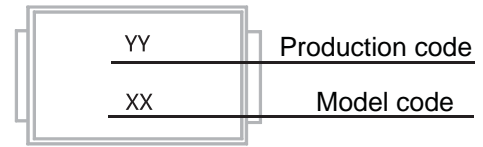
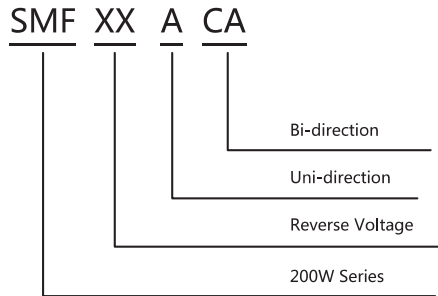


## Reflow Soldering Profile

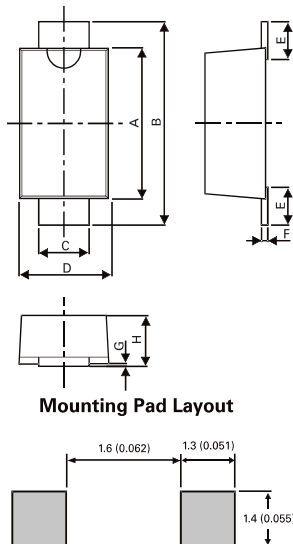


Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate ( $T_{s,max}$ to $T_p$ )	3°C/s maximum	3°C/s maximum
Preheat		
Temperature minimum ( $T_{s,min}$ )	100°C	150°C
Temperature maximum ( $T_{s,max}$ )	150°C	200°C
Time ( $t_{smin}$ to $t_{smax}$ )	60 s to 120 s	60 s to 180 s
Time maintained above		
Temperature ( $T_L$ )	183°C	217°C
Time ( $t_L$ )	60 s to 150 s	60 s to 150 s
Peak/classification temperature ( $T_p$ )	235°C	260°C
Number of allowed reflow cycles	3	3
Time within 5 °C of actual peak temperature ( $t_p$ )	10 s to 30 s	20 s to 40 s
Ramp-down rate	6°C/s maximum	6°C/s maximum
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum

## Part Numbering & Part Marking



## DIMENSION - SOD123



Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A	2.5	2.9	0.0984	0.1142
B	3.4	3.9	0.1339	0.1535
C	0.7	1.2	0.0275	0.0472
D	1.5	2	0.0591	0.0787
E	0.35	0.9	0.0138	0.0354
F	0.05	0.26	0.002	0.0102
G	0	0.1	0	0.0039
H	0.95	1.1	0.0374	0.0433

## PACKAGING

Part number	Component Package	Quantity	Packaging Option
SMF-XXX-XX	SOD123	3,000pcs	Tape & Reel—7" tape