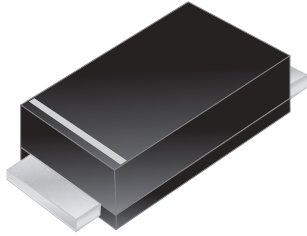


Surface Mount Transient Voltage Suppressors



SMF

Features

- Glass passivated chip
- 200 W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle): 0.01 %
- Low leakage
- Uni and Bidirectional unit
- Excellent clamping capability
- Very fast response time
- RoHS compliant

Mechanical Data

- Case: Molded plastic
- Epoxy: UL 94V-0 rate flame retardant
- Lead: Solderable per MIL-STD-750, method 2026
- Polarity: cathode band except Bipolar
- Mounting position: Any

Ordering Information

Part No.	Package	Packing
SMF Series	SMF	3000 / Tape & Reel

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

Parameter	Symbol	Limit	Unit
Peak power dissipation with a 10/1000 μ s waveform (Note 1)	P_{PP}	200	W
Peak power dissipation with a 8/20 μ s waveform (Note 1)	P_{PP}	1000	W
Peak pulse current with a 10/1000 μ s waveform (Note 1)	I_{PP}	See Next Table	A
Power dissipation on infinite heatsink at $T_L = 75^\circ\text{C}$	P_D	0.4	W
Peak forward surge current, 8.3 ms single half sinewave unidirectional only (Note 2)	I_{FSM}	20	A
Maximum instantaneous forward voltage at 25 A for unidirectional only	V_F	3.5	V
Operating junction and storage temperature range	T_J, T_{STG}	-55~+150	$^\circ\text{C}$

Note:

(1) Non-repetitive current pulse per Fig.5 and derated above $T_A = 25^\circ\text{C}$ per Fig.1

(2) Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum



Surface Mount Transient Voltage Suppressors

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Part Number		Marking Code		Breakdown Voltage V_{BR} @ I_T			Maximum Reverse Leakage I_R @ V_{RWM}	Working Peak Reverse Voltage V_{RWM}	Maximum Reverse Surge Current I_{PP}	Maximum Clamping Voltage V_C @ I_{PP}
				Min (V)	Max (V)	I_T (mA)	(μA)	(V)	(A)	(V)
SMF5.0A	SMF5.0CA	FE	KE	6.40	7.00	10	400	5.0	21.74	9.2
SMF6.0A	SMF6.0CA	FG	KG	6.67	7.37	10	400	6.0	19.42	10.3
SMF6.5A	SMF6.5CA	FK	KK	7.22	7.98	10	250	6.5	17.86	11.2
SMF7.0A	SMF7.0CA	FM	KM	7.78	8.60	10	100	7.0	16.67	12.0
SMF7.5A	SMF7.5CA	FP	KP	8.33	9.21	1	50	7.5	15.50	12.9
SMF8.0A	SMF8.0CA	FR	KR	8.89	9.83	1	25	8.0	14.71	13.6
SMF8.5A	SMF8.5CA	FT	KT	9.44	10.40	1	10	8.5	13.89	14.4
SMF9.0A	SMF9.0CA	FV	KV	10.00	11.10	1	5	9.0	12.99	15.4
SMF10A	SMF10CA	FX	KX	11.10	12.30	1	2.5	10.0	11.76	17.0
SMF11A	SMF11CA	FZ	KZ	12.20	13.50	1	2.5	11.0	10.99	18.2
SMF12A	SMF12CA	HE	LE	13.30	14.70	1	2.5	12.0	10.05	19.9
SMF13A	SMF13CA	HG	LG	14.40	15.90	1	1	13.0	9.30	21.5
SMF14A	SMF14CA	HK	LK	15.60	17.20	1	1	14.0	8.62	23.2
SMF15A	SMF15CA	HM	LM	16.70	18.50	1	1	15.0	8.20	24.4
SMF16A	SMF16CA	HP	LP	17.80	19.70	1	1	16.0	7.69	26.0
SMF17A	SMF17CA	HR	LR	18.90	20.90	1	1	17.0	7.25	27.6
SMF18A	SMF18CA	HT	LT	20.00	22.10	1	1	18.0	6.85	29.2
SMF19A	SMF19CA	HB	LB	21.10	23.30	1	1	19.0	6.54	30.6
SMF20A	SMF20CA	HV	LV	22.20	24.50	1	1	20.0	6.17	32.4
SMF22A	SMF22CA	HX	LX	24.40	26.90	1	1	22.0	5.63	35.5
SMF24A	SMF24CA	HZ	LZ	26.70	29.50	1	1	24.0	5.14	38.9
SMF26A	SMF26CA	JE	ME	28.90	31.90	1	1	26.0	4.75	42.1
SMF28A	SMF28CA	JG	MG	31.10	34.40	1	1	28.0	4.41	45.4
SMF30A	SMF30CA	JK	MK	33.30	36.80	1	1	30.0	4.13	48.4
SMF33A	SMF33CA	JM	MM	36.70	40.60	1	1	33.0	3.75	53.3
SMF36A	SMF36CA	JP	MP	40.00	44.20	1	1	36.0	3.44	58.1
SMF40A	SMF40CA	JR	MR	44.40	49.10	1	1	40.0	3.10	64.5
SMF43A	SMF43CA	JT	MT	47.80	52.80	1	1	43.0	2.88	69.4
SMF45A	SMF45CA	JV	MV	50.00	55.30	1	1	45.0	2.75	72.7
SMF48A	SMF48CA	JX	MX	53.30	58.90	1	1	48.0	2.58	77.4
SMF51A	SMF51CA	JZ	MZ	56.70	62.70	1	1	51.0	2.43	82.4
SMF54A	SMF54CA	XE	NE	60.00	66.30	1	1	54.0	2.30	87.1
SMF58A	SMF58CA	XG	NG	64.40	71.20	1	1	58.0	2.14	93.6
SMF60A	SMF60CA	XK	NK	66.70	73.70	1	1	60.0	2.07	96.8
SMF64A	SMF64CA	XM	NM	71.10	78.60	1	1	64.0	1.94	103.0
SMF70A	SMF70CA	XP	NP	77.80	86.00	1	1	70.0	1.77	113.0

Note:

1. The available parts are "A" type only, the parts without A (V_{BR} is $\pm 10\%$) is not available
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having V_R of 10 volts and under, the I_R limit is double



Surface Mount Transient Voltage Suppressors

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Part Number		Device Marking Code		Breakdown Voltage V_{BR} @ I_T			Maximum Reverse Leakage I_R @ V_{RWM}	Working Peak Reverse Voltage V_{RWM}	Maximum Reverse Surge Current I_{PP}	Maximum Clamping Voltage V_C @ I_{PP}
Uni	Bi	Uni	Bi	Min (V)	Max (V)	I_T (mA)	(μA)	(V)	(A)	(V)
SMF75A	SMF75CA	XR	NR	83.3	92.1	1	1	75.0	1.65	121.0
SMF78A	SMF78CA	XT	NT	86.7	95.8	1	1	78.0	1.59	126.0
SMF80A	SMF80CA	XB	NB	88.8	97.6	1	1	80.0	1.55	129.0
SMF85A	SMF85CA	XV	NV	94.4	104	1	1	85.0	1.46	137.0
SMF90A	SMF90CA	XX	NX	100	111	1	1	90.0	1.37	146.0
SMF100A	SMF100CA	XZ	NZ	111	123	1	1	100.0	1.23	162.0
SMF110A	SMF110CA	TE	PE	122	135	1	1	110.0	1.13	177.0
SMF120A	SMF120CA	TG	PG	133	147	1	1	120.0	1.04	193.0
SMF130A	SMF130CA	TK	PK	144	159	1	1	130.0	0.96	209.0
SMF140A	SMF140CA	TB	PB	155	171	1	1	140.0	0.89	224.0
SMF150A	SMF150CA	TM	PM	167	185	1	1	150.0	0.82	243.0
SMF160A	SMF160CA	TP	PP	178	197	1	1	160.0	0.77	259.0
SMF170A	SMF170CA	TR	PR	189	209	1	1	170.0	0.73	275.0
SMF180A	SMF180CA	TT	PT	200	220	1	1	180.0	0.68	292.0
SMF190A	SMF190CA	TV	PV	211	232	1	1	190.0	0.65	308.0
SMF200A	SMF200CA	TX	PX	224	247	1	1	200.0	0.62	324.0
SMF220A	SMF220CA	TZ	PZ	246	272	1	1	220.0	0.56	356.0

Note:

1. The available parts are "A" type only, the parts without A (V_{BR} is $\pm 10\%$) is not available
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having V_R of 10 volts and under, the I_R limit is double

Surface Mount Transient Voltage Suppressors

Rating and Characteristics Curvers

Fig 1 Pulse Derating Curve

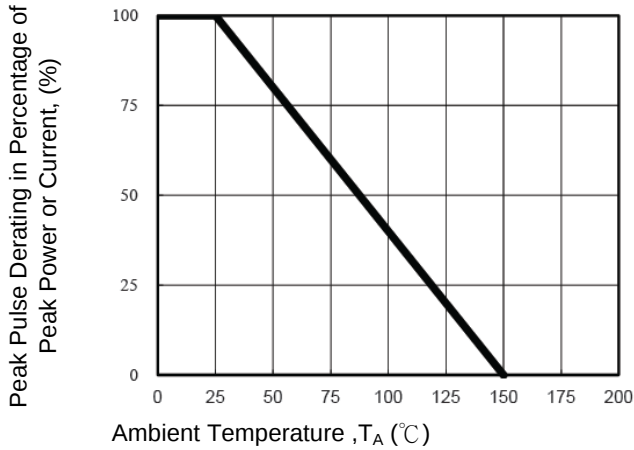


Fig 2 Maximum Non-Repetitive Surge Current

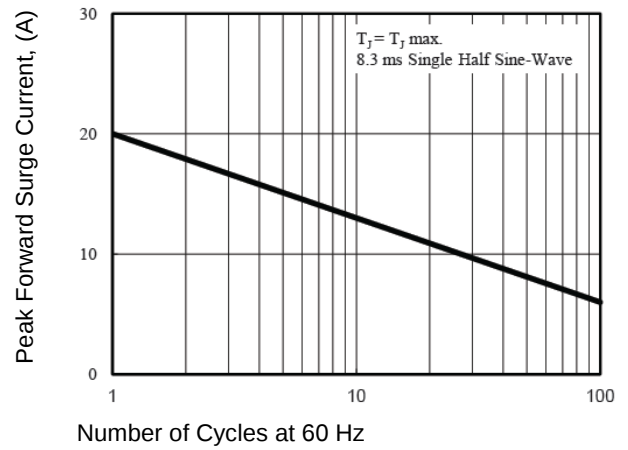


Fig 3 Steady State Power Derating Curve

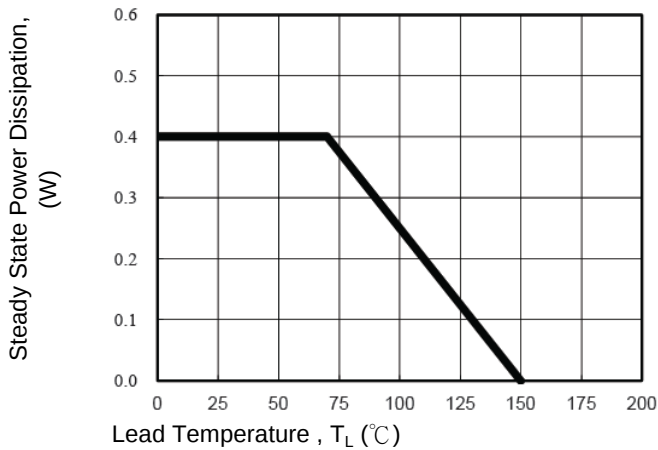


Fig 4 Peak Pulse Power Rating Curve

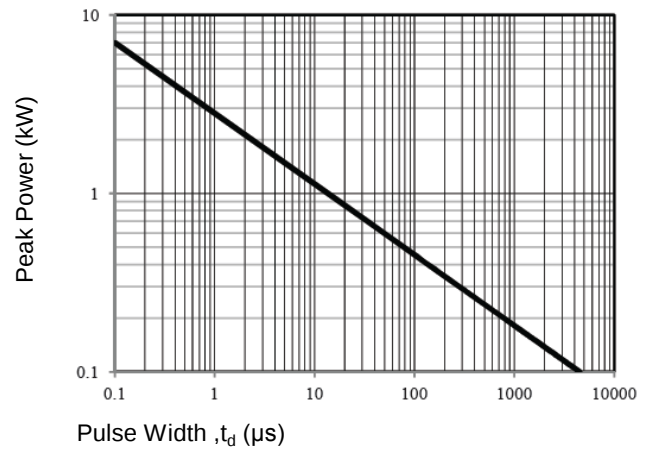


Fig 5 Pulse Waveform

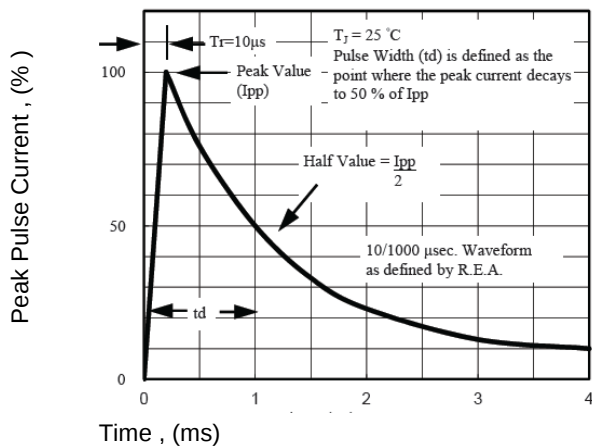
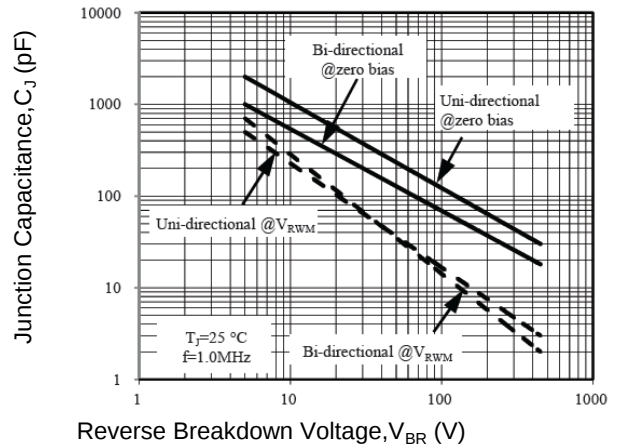
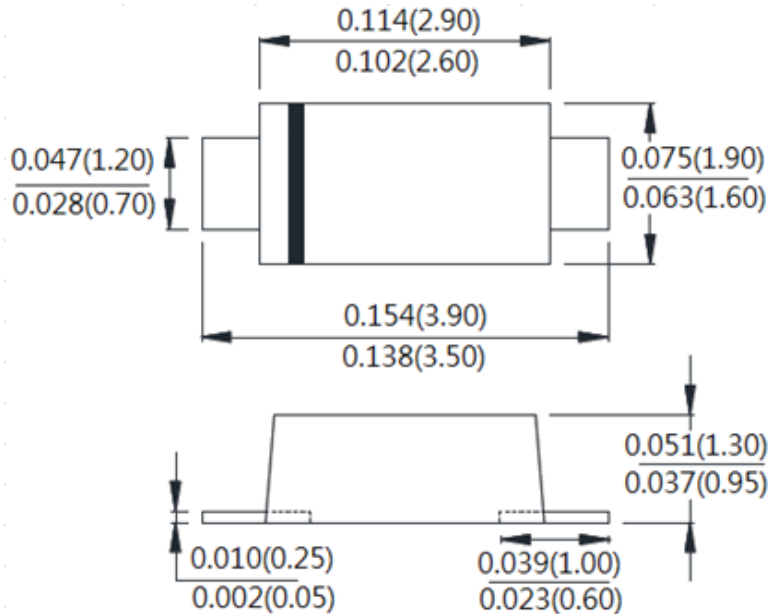


Fig 6 Typical Junction Capacitance



Surface Mount Transient Voltage Suppressors

Package Outline Dimensions

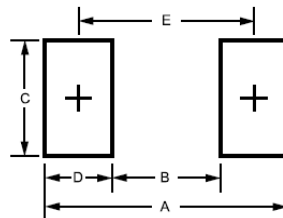


SMF

Dimensions in inches and (millimeters)

Suggested Pad Layout

Dimension	Outline	SMF (mm)
A		-
B		-
C		1.40
D		1.30
E		2.90



Tap & Reel Specification

Item	Symbol	Dimension
		millimeters
Carrier width	A	2.0 ±0.1
Carrier length	B	3.95 ±0.1
Sprocket hole	d	1.55 ±0.05
Reel outside diameter	D	178.0 ± 2.0
Reel inner diameter	D1	13.5±1
Feed Hole diameter	D2	50.0 min.
Sprocket hole position	E	1.75 ±0.1
Punch hole position	F	3.5 ±0.1
Punch hole pitch	P	4.0 ±0.1
Sprocket hole pitch	P0	4.0 ±0.1
Embossment center	P1	2.0 ±0.1
Tape width	W	8.0 ±0.1
Reel width	W1	11.4max.

