

SMF

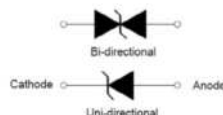
200 W Transient voltage suppressor



Product features

- Low profile SOD-123FL package
- Excellent clamping capability
- 200 W peak pulse power capability at 10/1000 μ s waveform
- Typical I_R less than 1 μ A above 10 V
- Fast response time: typically less than 1.0 ps from 0 V to V_{BR} minimum
- High temperature reflow soldering: +260 °C /40 s at terminal
- Plastic package meets UL 94 V-0 flammability rating
- Meets moisture sensitivity level (MSL) level 1
- Terminal: Tin plated leads, solderable per J-STD-002
- For surface mounted applications in order to optimize board space

PIN configuration



Applications

- Consumer electronics
- Telecommunications
- Computing and servers
- Appliances
- Industrial automation
- Mobile and wearables

Environmental compliance and general specifications



Ordering part number

SMF 5.0 C A
 Family name _____
 V_R voltage _____
 Bi-/Uni-Directional (Blank=Uni, C=Bi) _____
 Voltage tolerance _____

Alternate ordering part number

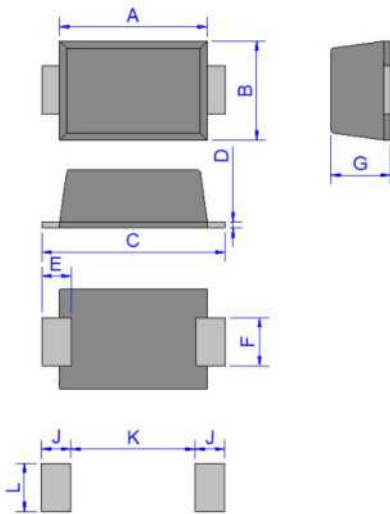
SMFE 5-0 C A
 Family name _____
 V_R voltage ("-" indicates decimal point) _____
 Bi-/Uni-Directional (Blank=Uni, C=Bi) _____
 Voltage tolerance _____

Absolute maximum ratings

(+25 °C, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage operating junction temperature range	T_{STG}/T_J	-55 to +150	°C
Peak pulse power dissipation on 10/1000 μ s waveform	P_{PP}	200	W
Maximum instantaneous forward voltage at 20 A for unidirectional	V_F	3.5	V
Typical thermal resistance junction to lead	$R_{\theta JL}$	100	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	220	°C/W

Mechanical parameters, pad layout- mm



Dimension	Millimeters		Inches	
	Minimum	Maximum	Minimum	Maximum
A	2.60	3.00	0.102	0.118
B	1.60	2.00	0.063	0.079
C	3.45	3.95	0.136	0.156
D	0.10	0.25	0.004	0.01
E	0.3	0.9	0.012	0.035
F	0.80	1.20	0.031	0.047
G	0.70	1.00	0.0275	0.0393
J	1.30		0.051	
K		1.70		0.067
L	1.30		0.051	

Part marking

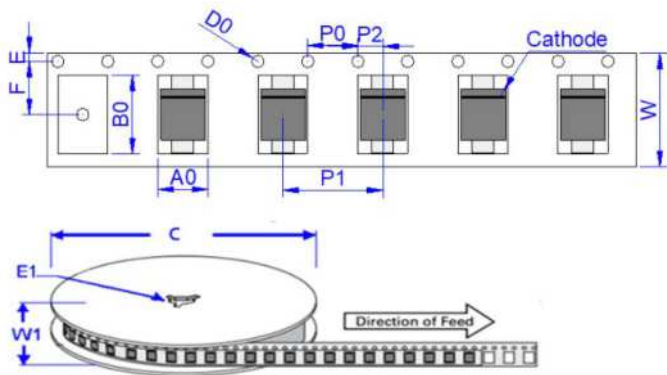


Cathode band (uni-polar only)
Part marking: xx = Refer to marking designator listed in Electrical Characteristics table

Packaging information (mm)

Drawing not to scale.

Supplied in tape and reel packaging, 3,000 parts per 7" diameter reel (EIA-481 compliant)



Dimension	Millimeters	Inches
A0	1.95 ± 0.3	0.077 ± 0.012
B0	3.95 ± 0.3	0.156 ± 0.012
C	178	7.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524 ± 0.012
F	3.50 ± 0.2	0.138 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	4.00 ± 0.2	0.157 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	8.0 ± 0.2	0.315 ± 0.008
W1	11.5 ± 1.0	0.453 ± 0.039

SMF
200 W Transient voltage suppressor

Technical Data 11218
Effective September 2024

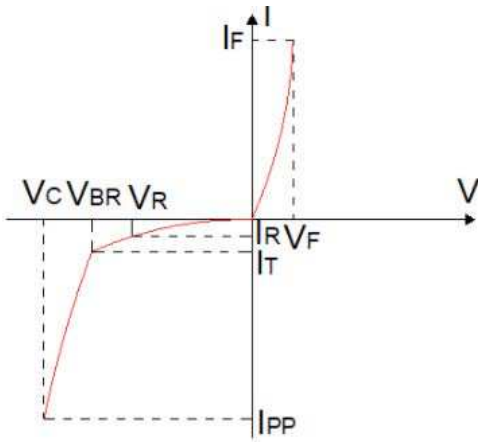
Electrical characteristics (+25 °C)

Part number		Marking		V_R	$I_R @ V_R$	$V_{BR} @ I_T$		I_T	$V_C @ I_{PP}$	I_{PP}
Uni-polar	Bi-polar	Uni	Bi	(V)	(μA)	min (V)	max (V)	(mA)	max (V)	(A)
SMF5.0A	SMF5.0CA	KE	5C	5	100	6.4	7	10	9.2	21.7
SMF6.0A	SMF6.0CA	KG	6C	6	100	6.67	7.37	10	10.3	19.4
SMF6.5A	SMF6.5CA	KK	6VC	6.5	30	7.22	7.98	10	11.2	17.9
SMF7.0A	SMF7.0CA	KM	7C	7	10	7.78	8.6	10	12	16.7
SMF7.5A	SMF7.5CA	KP	7VC	7.5	5	8.33	9.21	1	12.9	15.5
SMF8.0A	SMF8.0CA	KR	8C	8	2	8.89	9.83	1	13.6	14.7
SMF8.5A	SMF8.5CA	KT	8VC	8.5	2	9.44	10.4	1	14.4	13.8
SMF9.0A	SMF9.0CA	KV	9C	9	2	10	11.1	1	15.4	13
SMF10A	SMF10CA	KX	10C	10	1	11.1	12.3	1	17	11.8
SMF11A	SMF11CA	KZ	11C	11	1	12.2	13.5	1	18.2	11
SMF12A	SMF12CA	LE	12C	12	1	13.3	14.7	1	19.9	10.1
SMF13A	SMF13CA	LG	13C	13	1	14.4	15.9	1	21.5	9.3
SMF14A	SMF14CA	LK	14C	14	1	15.6	17.2	1	23.2	8.6
SMF15A	SMF15CA	LM	15C	15	1	16.7	18.5	1	24.4	8.2
SMF16A	SMF16CA	LP	16C	16	1	17.8	19.7	1	26	7.7
SMF17A	SMF17CA	LR	17C	17	1	18.9	20.9	1	27.6	7.2
SMF18A	SMF18CA	LT	18C	18	1	20	22.1	1	29.2	6.8
SMF20A	SMF20CA	LV	20C	20	1	22.2	24.5	1	32.4	6.2
SMF22A	SMF22CA	LX	22C	22	1	24.4	26.9	1	35.5	5.6
SMF24A	SMF24CA	LZ	24C	24	1	26.7	29.5	1	38.9	5.1
SMF26A	SMF26CA	ME	26C	26	1	28.9	31.9	1	42.1	4.8
SMF28A	SMF28CA	MG	28C	28	1	31.1	34.4	1	45.4	4.4
SMF30A	SMF30CA	MK	30C	30	1	33.3	36.8	1	48.4	4.1
SMF33A	SMF33CA	MM	33C	33	1	36.7	40.6	1	53.3	3.8
SMF36A	SMF36CA	MP	36C	36	1	40	44.2	1	58.1	3.4
SMF40A	SMF40CA	MR	40C	40	1	44.4	49.1	1	64.5	3.1
SMF43A	SMF43CA	MT	43C	43	1	47.8	52.8	1	69.4	2.8
SMF45A	SMF45CA	MV	45C	45	1	50	55.3	1	72.7	2.7
SMF48A	SMF48CA	MX	48C	48	1	53.3	58.9	1	77.4	2.6
SMF51A	SMF51CA	MZ	51C	51	1	56.7	62.7	1	82.4	2.4
SMF54A	SMF54CA	NE	54C	54	1	60	66.3	1	87.1	2.3
SMF58A	SMF58CA	NG	58C	58	1	64.4	71.2	1	93.6	2.1
SMF60A	SMF60CA	NK	60C	60	1	66.7	73.7	1	96.8	2
SMF64A	SMF64CA	NM	64C	64	1	71.1	78.6	1	103	1.9
SMF70A	SMF70CA	NP	70C	70	1	77.8	86	1	113	1.8
SMF75A	SMF75CA	NR	75C	75	1	83.3	92.1	1	121	1.7
SMF78A	SMF78CA	NV	78C	78	1	86.7	95.8	1	126	1.6
SMF85A	SMF85CA	NX	85C	85	1	94.4	104	1	137	1.5
SMF90A	SMF90CA	NZ	90C	90	1	100	111	1	146	1.4
SMF100A	SMF100CA	PE	100C	100	1	111	123	1	162	1.2
SMF110A	SMF110CA	PG	110C	110	1	122	135	1	177	1.1
SMF120A	SMF120CA	PK	120C	120	1	133	147	1	193	1
SMF130A	SMF130CA	PM	130C	130	1	144	159	1	209	0.9
SMF150A	SMF150CA	PR	150C	150	1	167	185	1	243	0.8
SMF160A	SMF160CA	PV	160C	160	1	178	197	1	259	0.8
SMF170A	SMF170CA	PX	170C	170	1	189	209	1	275	0.7
SMF180A	SMF180CA	PZ	180C	180	1	201	222	1	292	0.7
SMF200A	SMF200CA	QE	200C	200	1	224	247	1	324	0.6
SMF220A	SMF220CA	QR	220C	220	1	246	272	1	356	0.5

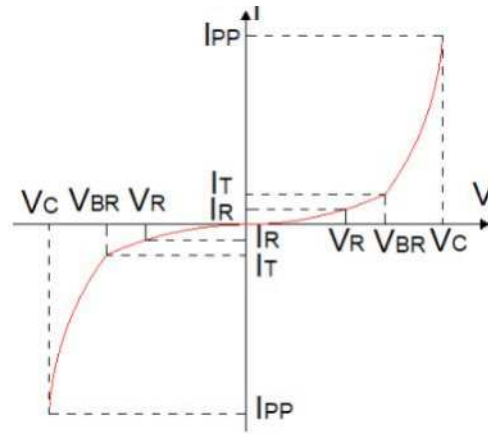
Note: Standard part numbers listed
Alternate part numbers have the
addition of an E and a “-” for the “.”
where applicable. Example standard
part number SMF5.0A, Alternate part
number SMFE5-0A

Ratings and V-I characteristic curves (+25 °C unless otherwise noted)

V- I curve characteristics (Uni-directional)



V- I curve characteristics (Bi-directional)



Surge waveform: 10/1000 μ s

V_R : Stand-off voltage – Maximum voltage that can be applied

V_{BR} : Breakdown voltage

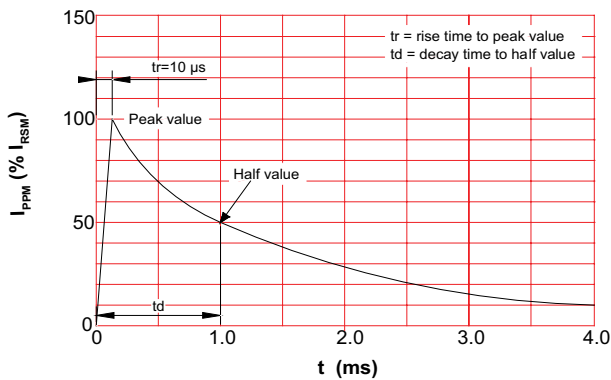
V_C : Clamping voltage – Peak voltage measured across the suppressor at a specified I_{PP}

I_R : Reverse leakage current

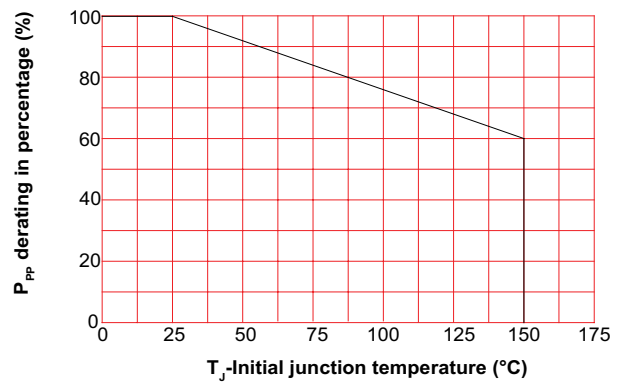
I_T : Test current

V_F : Forward voltage drop for Uni-directional TVS diode

Pulse waveform



Pulse derating curve



Solder reflow profile

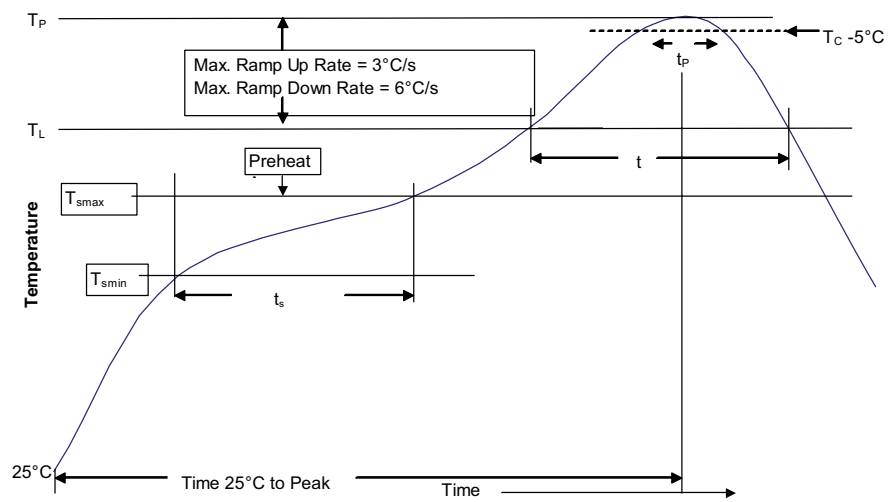


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak		
• Temperature min. (T _{smin})	100 °C	150 °C
• Temperature max. (T _{smax})	150 °C	200 °C
• Time (T _{smin} to T _{smax}) (t _s)	60-120 seconds	60-180 seconds
Ramp up rate T _L to T _p	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T _L)	183 °C	217 °C
Time (t _L) maintained above T _L	60-150 seconds	60-150 seconds
Peak package body temperature (T _p)*	Table 1	Table 2
Time (t _p)* within 5 °C of the specified classification temperature (T _C)	20 seconds*	40 seconds*
Ramp-down rate (T _p to T _L)	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

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Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

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