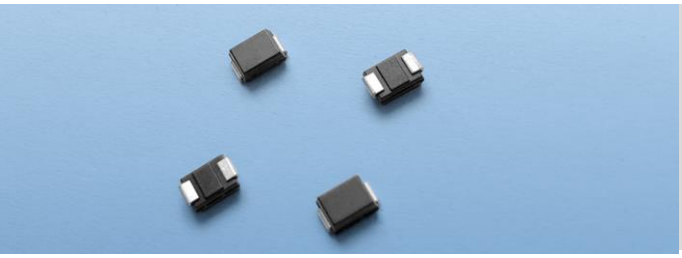
Together We Make It Safe!

DA TECHNOLOGY



Transient Voltage Suppressor (TVS)

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DCN: DA0018-00
Rev: A

Transient Voltage Suppressor (TVS) SMF

- SOD-123F
- 200W

Features

- For surface mounted applications
- Reliable low cost construction utilizing molded plastic technique
- Plastic material has UL flammability classification 94V-0
- Typical IR less than 1uA above 10V
- Fast response time: typically less than 1.0ps from 0 Volts to V_{BR} min
- Halogen free
- RoHS compliant

Maximum Ratings and Thermal Characteristics

Parameter	Symbol	Value	Unit
Peak Power Dissipation At T_A = 25°C T_p=10/1000μs Waveform[3]	P_{PK}	200	W
Power Dissipation on Infinite Heat Sink at T_A=50°C[4]	$P_{M(AV)}$	1	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave[5]	I_F	20	A
Maximum Instantaneous forward voltage at 25A for unidirectional devices only[6]	V_F	3.5	V
Storage Temperature Range	T_{STG}	-55~150	°C
Operating Junction Temperature Range	T_J	-55~150	°C
Typical Thermal Resistance Junction to Lead	$T_{\theta JL}$	200	°C/W
Typical Thermal Resistance Junction to Ambient	$T_{\theta JL}$	200	°C/W

1. Ratings at 25°C ambient temperature unless otherwise specified.
2. Single phase, half wave, 60Hz, resistive or inductive load.
3. Non-repetitive current pulse@10/1000μs and derated above T_A=25ºC
4. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.
5. V_F < 3.5V for V_{BR} ≤ 200V.

Product Identification

SMF XXX A or CA
(1) (2) (3) (4)

(1) Product Code (2) Reverse Standoff Voltage V_{RM} (3) Unidirectional (4) Bidirectional

Transient Voltage Suppressor (TVS) SMF

SOD-123F 200W

Electrical Characteristics

Part Number		Marking		V_{BR} [1]@I_T		I_T [2]	V_{RM} [3]	Max I_R [4] @V_{RM}	Max V_C [5]	Max I_{PP} [6]
Uni	Bi	Uni	Bi	MIN(V)	MAX(V)	mA	V	μA	V	A
SMF5.0A	SMF5.0CA	AE	FE	6.4	7	10	5	400	21.7	9.2
SMF6.0A	SMF6.0CA	AG	FG	6.67	7.37	10	6	400	19.4	10.3
SMF6.5A	SMF6.5CA	AK	FK	7.22	7.98	10	6.5	250	17.9	11.2
SMF7.0A	SMF7.0CA	AM	FM	7.78	8.6	10	7	100	16.7	12
SMF7.5A	SMF7.5CA	AP	FP	8.33	9.21	1	7.5	50	15.5	12.9
SMF8.0A	SMF8.0CA	AR	FR	8.89	9.83	1	8	25	14.7	13.6
SMF8.5A	SMF8.5CA	AT	FT	9.44	10.4	1	8.5	10	13.9	14.4
SMF9.0A	SMF9.0CA	AV	FV	10	11.1	1	9	5	13	15.4
SMF10A	SMF10CA	AX	FX	11.1	12.3	1	10	2.5	11.8	17
SMF11A	SMF11CA	AZ	FZ	12.2	13.5	1	11	2.5	11	18.2
SMF12A	SMF12CA	BE	GE	13.3	14.7	1	12	2.5	10.1	19.9
SMF13A	SMF13CA	BG	GG	14.4	15.9	1	13	1	9.3	21.5
SMF14A	SMF14CA	BK	GK	15.6	17.2	1	14	1	8.6	23.2
SMF15A	SMF15CA	BM	GM	16.7	18.5	1	15	1	8.2	24.4
SMF16A	SMF16CA	BP	GP	17.8	19.7	1	16	1	7.7	26
SMF17A	SMF17CA	BR	GR	18.9	20.9	1	17	1	7.2	27.6
SMF18A	SMF18CA	BT	GT	20	22.1	1	18	1	6.8	29.2
SMF20A	SMF20CA	BV	GV	22.2	24.5	1	20	1	6.2	32.4
SMF22A	SMF22CA	BX	GX	24.4	26.9	1	22	1	5.6	35.5
SMF24A	SMF24CA	BZ	GZ	26.7	29.5	1	24	1	5.1	38.9
SMF26A	SMF26CA	CE	HE	28.9	31.9	1	26	1	4.8	42.1
SMF28A	SMF28CA	CG	HG	31.1	34.4	1	28	1	4.4	45.4
SMF30A	SMF30CA	CK	HK	33.3	36.8	1	30	1	4.1	48.4
SMF33A	SMF33CA	CM	HM	36.7	40.6	1	33	1	3.8	53.3
SMF36A	SMF36CA	CP	HP	40	44.2	1	36	1	3.4	58.1
SMF40A	SMF40CA	CR	HR	44.4	49.1	1	40	1	3.1	64.5
SMF43A	SMF43CA	CT	HT	47.8	52.8	1	43	1	2.9	69.4
SMF45A	SMF45CA	CV	HV	50	55.3	1	45	1	2.8	72.7
SMF48A	SMF48CA	CX	HX	53.3	58.9	1	48	1	2.6	77.4
SMF51A	SMF51CA	CZ	HZ	56.7	62.7	1	51	1	2.4	82.4
SMF54A	SMF54CA	DE	IE	60	66.3	1	54	1	2.3	87.1
SMF58A	SMF58CA	DG	IG	64.4	71.2	1	58	1	2.1	93.6
SMF60A	SMF60CA	DK	IK	66.7	73.7	1	60	1	1.8	96.8
SMF64A	SMF64CA	DM	IM	71.1	78.6	1	64	1	1.7	103

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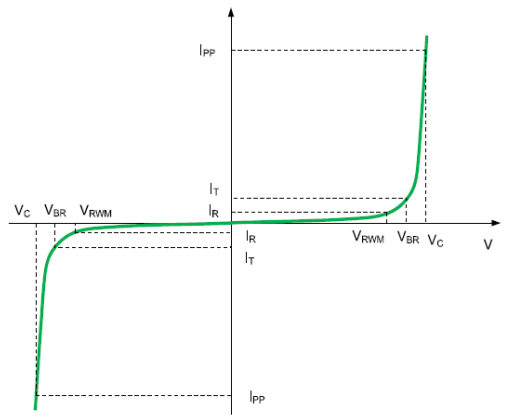
Part Number		Marking		V_{BR} (1)@I_T		I_T (2)	V_{RM} (3)	Max I_R (4) @V_{RM}	Max V_C (5)	Max I_{PP} (6)
Uni	Bi	Uni	Bi	MIN(V)	MAX(V)	mA	V	μA	V	A
SMF70A	SMF70CA	DP	IP	77.8	86	1	70	1	1.5	113
SMF75A	SMF75CA	DR	IR	83.3	92.1	1	75	1	1.4	121
SMF78A	SMF78CA	DT	IT	86.7	95.8	1	78	1	1.4	126
SMF85A	SMF85CA	DV	IV	94.4	104	1	85	1	1.3	137
SMF90A	SMF90CA	DX	IX	100	111	1	90	1	1.2	146
SMF100A	SMF100CA	EZ	JZ	111	123	1	100	1	1.1	162
SMF110A	SMF110CA	EE	JE	122	135	1	110	1	1	177
SMF120A	SMF120CA	EG	JG	133	147	1	120	1	0.9	193
SMF130A	SMF130CA	EK	JK	144	159	1	130	1	0.8	209
SMF150A	SMF150CA	EM	JM	167	185	1	150	1	0.7	243
SMF160A	SMF160CA	EP	JP	178	197	1	160	1	0.7	259
SMF170A	SMF170CA	ER	JR	189	209	1	170	1	0.6	275

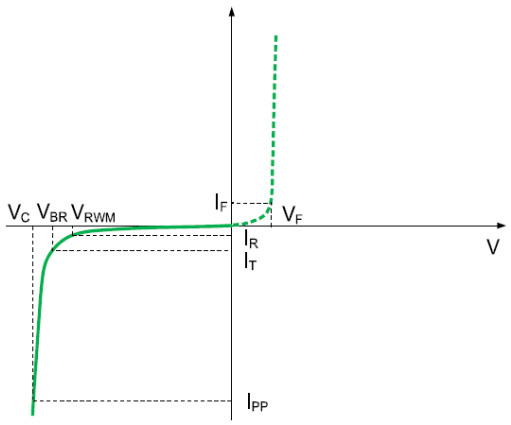
For bidirectional type having V_R of 10 volts and less, the I_R limit is double.

I-V Curve Characteristics

Bidirectional



Unidirectional



Symbol	Parameter	Explanation
(1) V_{BR}	**Breakdown voltage**	The Voltage that flows though the TVS at a specified test current (I_T)
(2) I_T	**Test current**	A specified test current that flows though the TVS
(3) V_{RM}	**Stand-off voltage**	Maximum voltage that can be applied to the TVS without operation
(4) I_R	**Leakage current @ V_R**	Current measured at V_R
(5) V_C	**Clamping voltage**	Peak voltage measured across the suppressor at a specified Ipp (peak impulse current)
(6) I_{PP}	**Peak pulse current**	The maximum surge current that flows though the TVS

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Fig1. Pulse Waveform

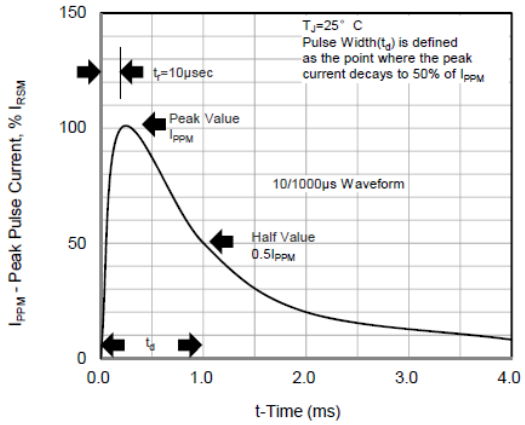


Fig2. Pulse Derating Curve

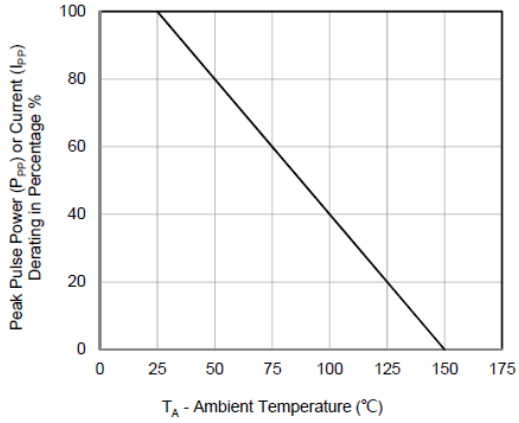


Figure 3. Steady Power Dissipation Derating Curve

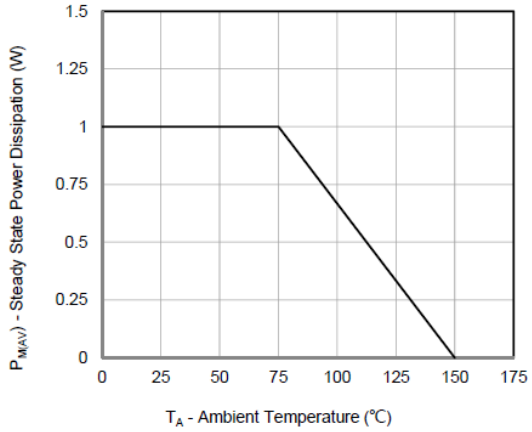


Figure 4. Peak Pulse Power Rating Curve

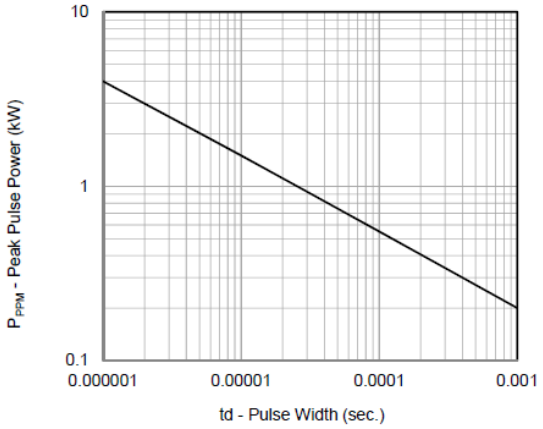


Figure 5. Maximum Non-Repetitive Surge Current

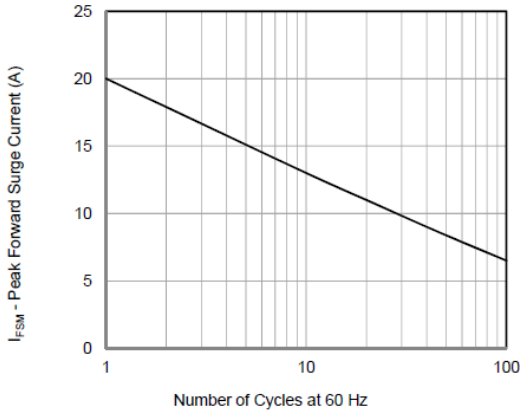
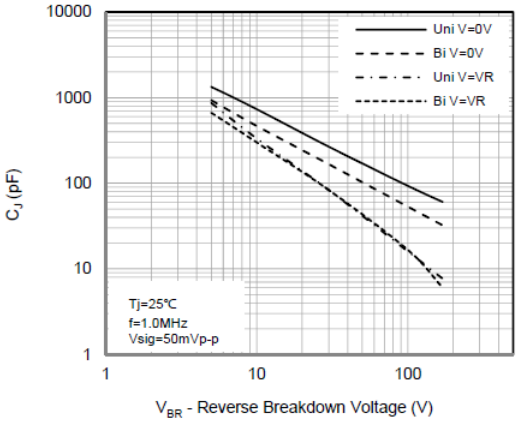


Figure 6. Typical Junction Capacitance



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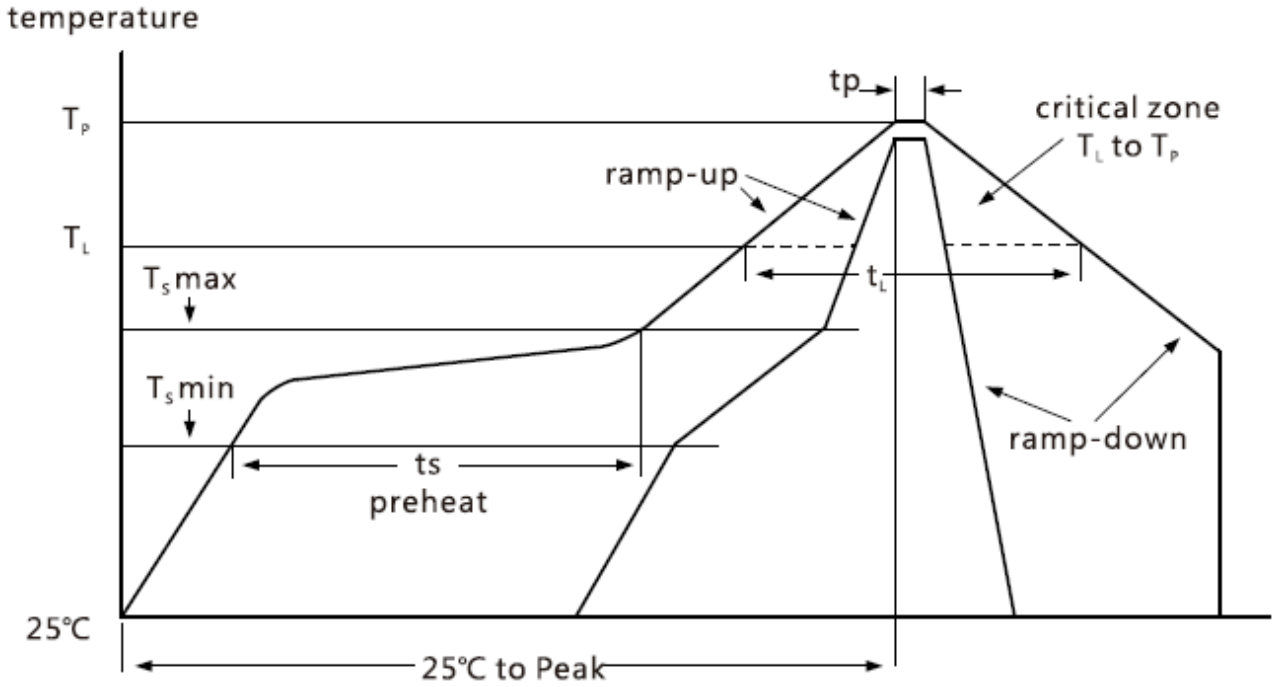
Reflow Soldering Profile



Reflow Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-uprate ($T_s$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 ($T_s$min to $T_s$max)	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 (tp)	10 s to 30 s	10 s to 30 s
Ramp-down rate	6°C/s maximum	6°C/s maximum
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum

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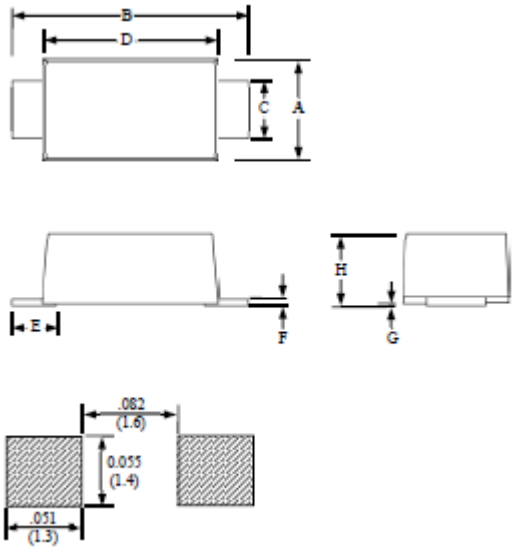
Package and Layout Dimensions (DO-214AB / SMC)



Dimension	Inches		Millimeters	
	Min	Max	Min	Max
A	0.0591	0.0787	1.5	2
B	0.1339	0.1535	3.4	3.9
C	0.0275	0.0472	0.7	1.2
D	0.0984	0.1142	2.5	2.9
E	0.0138	0.0354	0.35	0.9
F	0.002	0.0102	0.05	0.26
G	0	0.0039	0	0.1
H	0.0374	0.0531	0.95	1.35

Packaging

Part	Component Package	Quantity	Packaging Option
SMF-XXX-A/CA	SOD-123F	3,000pcs	12mm tape / 7” reel