

### Applications

- ◆ Power supply protection
- ◆ Automotive application
- ◆ Industrial application
- ◆ Power management

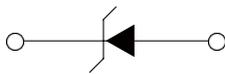
### Features

- ◆ Low profile package
- ◆ Ideal for automated placement
- ◆ 400 Watt peak pulse power capability with a 10/1000 $\mu$ s waveform
- ◆ For surface mounted applications to optimize board space
- ◆ Excellent clamping capability
- ◆ Very fast response time
- ◆ Low incremental surge resistance

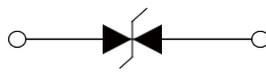
### SMAF



SMAF



Uni-directional



Bi-directional

### Product and Packing Information

Part Number	QTY/Reel	Reel Size
SMFAxx(C)A	5,000	13 inch

### Maximum Ratings

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on $T_A=25^\circ\text{C}$	$P_{PPM}$	400	W
Peak Forward Surge Current	$I_{FSM}$	40	A
Peak Pulse Current on 10/1000 $\mu$ s waveform	$I_{PPM}$	See Electrical Characteristics Table	A

### Thermal Considerations

Parameter	Symbol	Value	Unit
Operating Junction Temperature	$T_J$	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	$T_S$	-55 to +150	$^\circ\text{C}$
Junction to Ambient on printed circuit	$R_{\theta JA}$	150	$^\circ\text{C/W}$

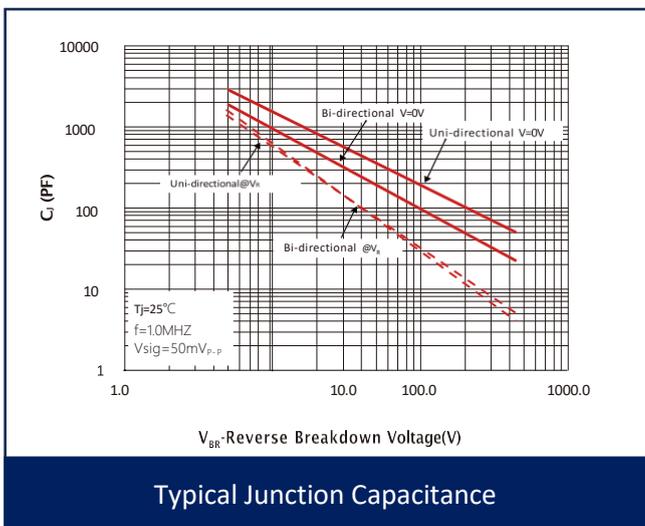
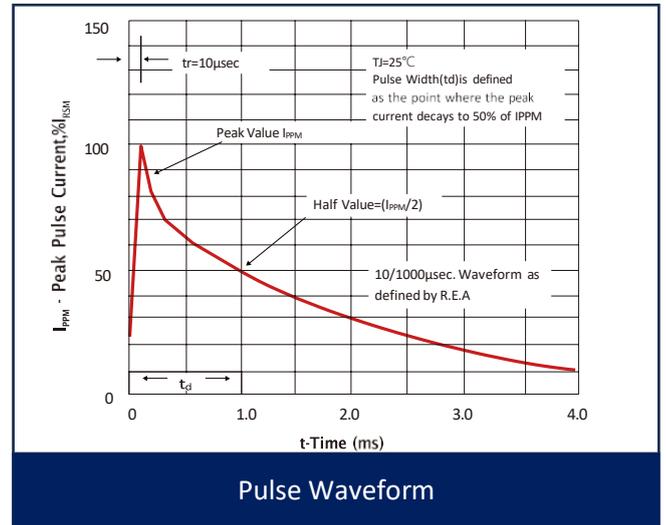
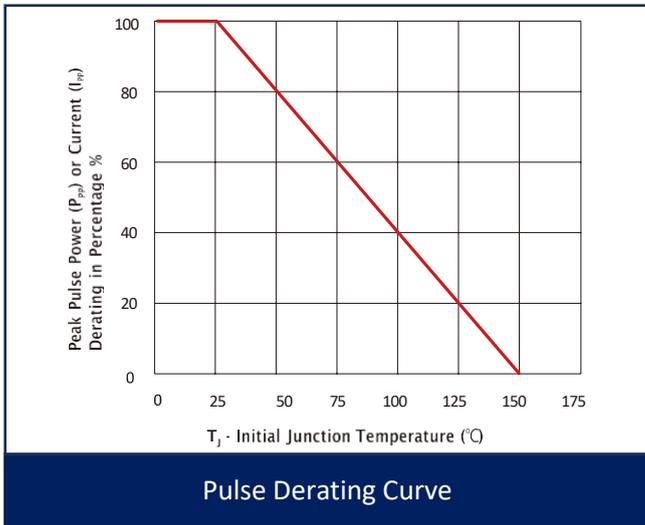
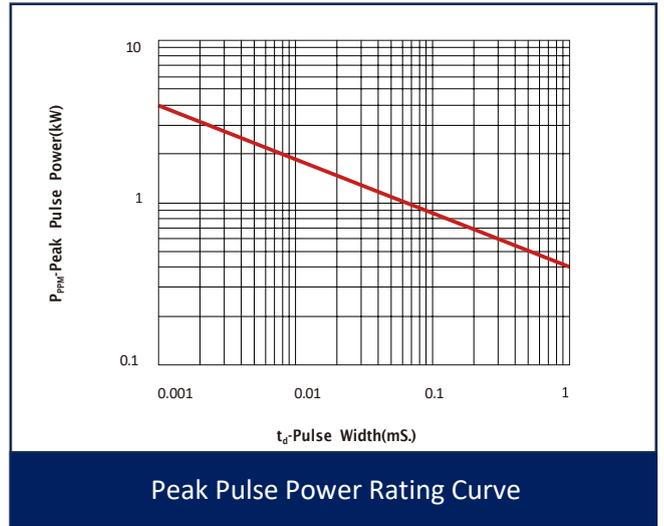
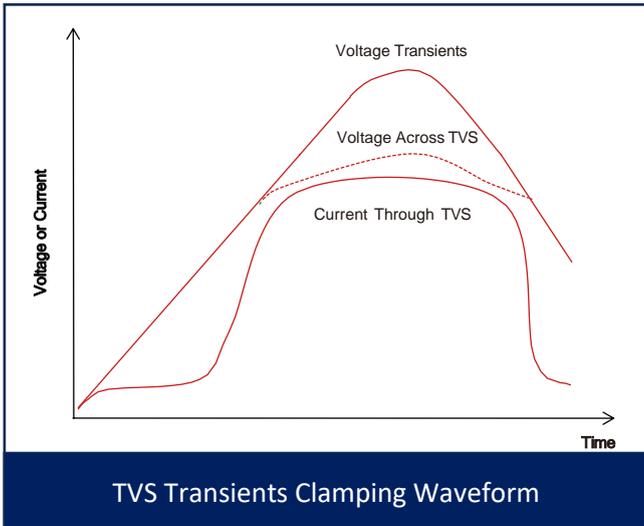
**Electrical Characteristics**

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min. @I <sub>T</sub>	Breakdown Voltage Max. @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Maximum Peak Pulse Current	Maximum Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	Uni	Bi	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> ( $\mu$ A)
SMAF5.0A	SMAF5.0CA	AE	WE	5.0	6.40	7.00	10	9.2	43.5	800
SMAF6.0A	SMAF6.0CA	AG	WG	6.0	6.67	7.37	10	10.3	38.8	800
SMAF6.5A	SMAF6.5CA	AK	WK	6.5	7.22	7.98	10	11.2	35.7	500
SMAF7.0A	SMAF7.0CA	AM	WM	7.0	7.78	8.60	10	12.0	33.3	200
SMAF7.5A	SMAF7.5CA	AP	WP	7.5	8.33	9.21	1	12.9	31.0	100
SMAF8.0A	SMAF8.0CA	AR	WR	8.0	8.89	9.83	1	13.6	29.4	50
SMAF8.5A	SMAF8.5CA	AT	WT	8.5	9.44	10.40	1	14.4	27.8	20
SMAF9.0A	SMAF9.0CA	AV	WV	9.0	10.00	11.10	1	15.4	26.0	10
SMAF10A	SMAF10CA	AX	WX	10.0	11.10	12.30	1	17.0	23.5	5
SMAF11A	SMAF11CA	AZ	WZ	11.0	12.20	13.50	1	18.2	22.0	1
SMAF12A	SMAF12CA	BE	XE	12.0	13.30	14.70	1	19.9	20.1	1
SMAF13A	SMAF13CA	BG	XG	13.0	14.40	15.90	1	21.5	18.6	1
SMAF14A	SMAF14CA	BK	XK	14.0	15.60	17.20	1	23.2	17.2	1
SMAF15A	SMAF15CA	BM	XM	15.0	16.70	18.50	1	24.4	16.4	1
SMAF16A	SMAF16CA	BP	XP	16.0	17.80	19.70	1	26.0	15.4	1
SMAF17A	SMAF17CA	BR	XR	17.0	18.90	20.90	1	27.6	14.5	1
SMAF18A	SMAF18CA	BT	XT	18.0	20.00	22.10	1	29.2	13.7	1
SMAF20A	SMAF20CA	BV	XV	20.0	22.20	24.50	1	32.4	12.3	1
SMAF22A	SMAF22CA	BX	XX	22.0	24.40	26.90	1	35.5	11.3	1
SMAF24A	SMAF24CA	BZ	XZ	24.0	26.70	29.50	1	38.9	10.3	1
SMAF26A	SMAF26CA	CE	YE	26.0	28.90	31.90	1	42.1	9.5	1
SMAF28A	SMAF28CA	CG	YG	28.0	31.10	34.40	1	45.4	8.8	1
SMAF30A	SMAF30CA	CK	YK	30.0	33.30	36.80	1	48.4	8.3	1
SMAF33A	SMAF33CA	CM	YM	33.0	36.70	40.60	1	53.3	7.5	1
SMAF36A	SMAF36CA	CP	YP	36.0	40.00	44.20	1	58.1	6.9	1
SMAF40A	SMAF40CA	CR	YR	40.0	44.40	49.10	1	64.5	6.2	1
SMAF43A	SMAF43CA	CT	YT	43.0	47.80	52.80	1	69.4	5.8	1
SMAF45A	SMAF45CA	CV	YV	45.0	50.00	55.30	1	72.7	5.5	1
SMAF48A	SMAF48CA	CX	YX	48.0	53.30	58.90	1	77.4	5.2	1
SMAF51A	SMAF51CA	CZ	YZ	51.0	56.70	62.70	1	82.4	4.9	1

**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ )**

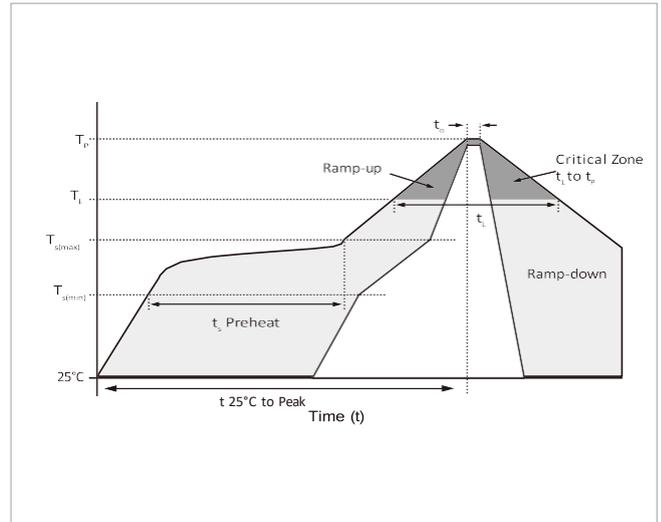
Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min. @I <sub>r</sub>	Breakdown Voltage Max. @I <sub>r</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Maximum Peak Pulse Current	Maximum Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	Uni	Bi	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	V <sub>BR</sub> (V)	I <sub>r</sub> (mA)	V <sub>c</sub> (V)	I <sub>PP</sub> (A)	I <sub>r</sub> ( $\mu$ A)
SMAF54A	SMAF54CA	RE	ZE	54.0	60.00	66.30	1	87.1	4.6	1
SMAF58A	SMAF58CA	RG	ZG	58.0	64.40	71.20	1	93.6	4.3	1
SMAF60A	SMAF60CA	RK	ZK	60.0	66.70	73.70	1	96.8	4.1	1
SMAF64A	SMAF64CA	RM	ZM	64.0	71.10	78.60	1	103.0	3.9	1
SMAF70A	SMAF70CA	RP	ZP	70.0	77.80	86.00	1	113.0	3.5	1
SMAF75A	SMAF75CA	RR	ZR	75.0	83.30	92.10	1	121.0	3.3	1
SMAF78A	SMAF78CA	RT	ZT	78.0	86.70	95.80	1	126.0	3.2	1
SMAF85A	SMAF85CA	RV	ZV	85.0	94.40	104.00	1	137.0	2.9	1
SMAF90A	SMAF90CA	RX	ZX	90.0	100.00	111.00	1	146.0	2.7	1
SMAF100A	SMAF100CA	RZ	ZZ	100.0	111.00	123.00	1	162.0	2.5	1
SMAF110A	SMAF110CA	SE	VE	110.0	122.00	135.00	1	177.0	2.3	1
SMAF120A	SMAF120CA	SG	VG	120.0	133.00	147.00	1	193.0	2.1	1
SMAF130A	SMAF130CA	SK	VK	130.0	144.00	159.00	1	209.0	1.9	1
SMAF150A	SMAF150CA	SM	VM	150.0	167.00	185.00	1	243.0	1.6	1
SMAF160A	SMAF160CA	SP	VP	160.0	178.00	197.00	1	259.0	1.5	1
SMAF170A	SMAF170CA	SR	VR	170.0	189.00	209.00	1	275.0	1.5	1
SMAF180A	SMAF180CA	ST	VT	180.0	201.00	222.00	1	292.0	1.4	1
SMAF200A	SMAF200CA	SV	VV	200.0	224.00	247.00	1	324.0	1.2	1
SMAF220A	SMAF220CA	SX	VX	220.0	246.00	272.00	1	356.0	1.1	1
SMAF250A	SMAF250CA	SZ	VZ	250.0	279.00	309.00	1	405.0	1.0	1
SMAF300A	SMAF300CA	TE	UE	300.0	335.00	371.00	1	486.0	0.8	1
SMAF350A	SMAF350CA	TG	UG	350.0	391.00	432.00	1	567.0	0.7	1
SMAF400A	SMAF400CA	TK	UK	400.0	447.00	494.00	1	648.0	0.6	1
SMAF440A	SMAF440CA	TM	UM	440.0	492.00	543.00	1	713.0	0.6	1

Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$ )

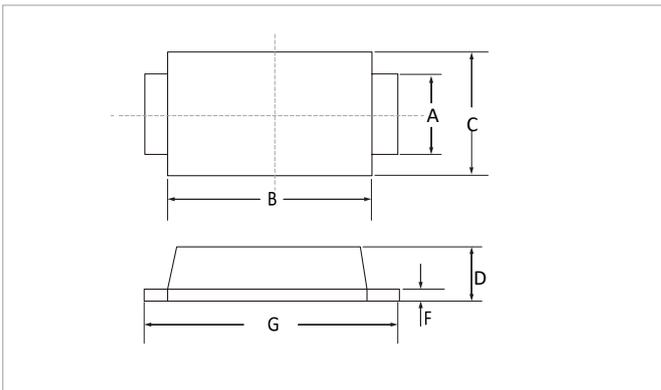


**Soldering Parameters**

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ( $T_{s(min)}$ )	150°C
	Temperature Max ( $T_{s(max)}$ )	200°C
	Time (min to max) ( $t_p$ )	60 – 180 secs
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	Temperature ( $T_L$ ) (Liquidus)	217°C
	Time (min to max) ( $t_r$ )	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 ( $T_p$ )		8 minutes max.
Do not exceed		260°C

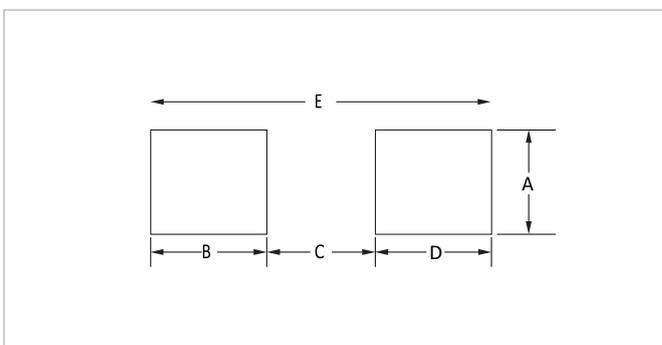


**SMAF Package Information**



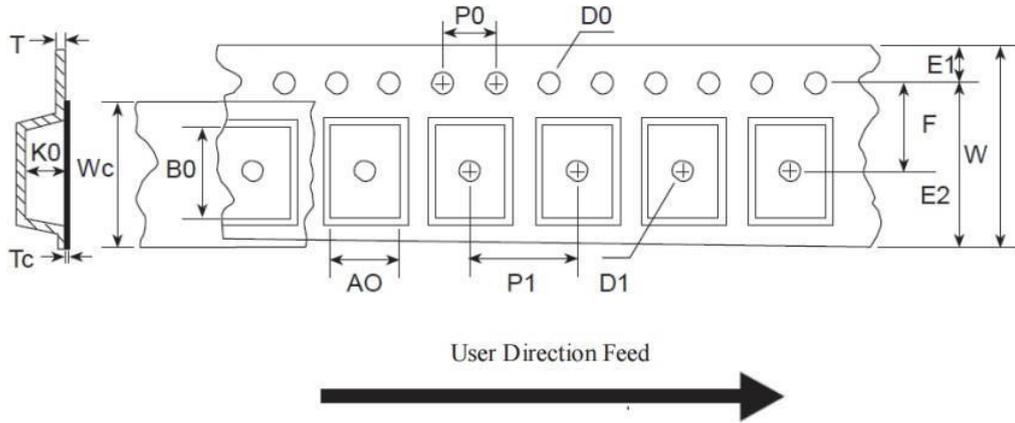
Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.45	0.053	0.057
B	3.40	3.80	0.134	0.145
C	2.40	2.80	0.094	0.110
D	0.95	1.45	0.037	0.057
F	0.15	0.22	0.006	0.009
G	4.40	4.80	0.173	0.189

**Recommended Pad Lay Out Dimensions**

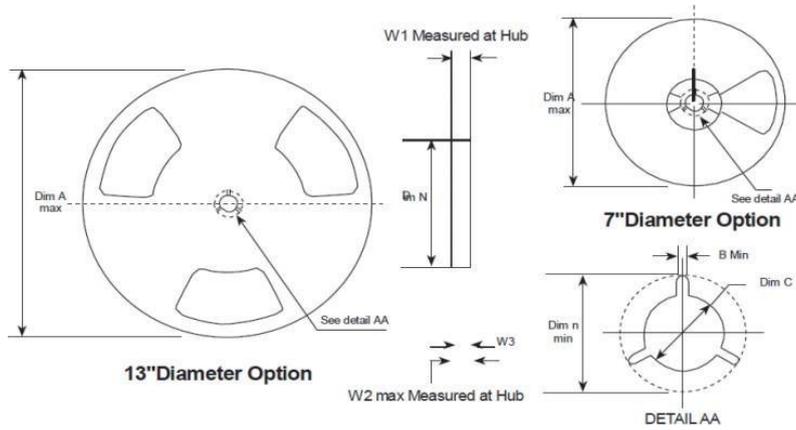


Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.70	-	0.067	-
B	2.50	-	0.098	-
C	-	1.5	-	0.059
D	2.50	-	0.098	-
E	6.50 REF		0.256 REF	

Tape And Reel Specification - SMAF



Pkg type	AO	BO	W	DO	DI	E1	E2	F	P1	P0	K0	T	TC	WC
SMAF	2.93±0.10	5.0±0.10	12±0.10	1.55±0.05	1.55±0.05	1.75±0.10	10.25min	5.5±0.05	4.0±0.10	4.0±0.10	1.45±0.10	0.23±0.02	9.5±0.2	0.05 以上



Pkg type	A	B	C	D	N	W1	W2	W3
SMAF	330	3.0	13+0.5/-0.2	23.0	74	13+1.5/0	18	8-13