



SMAF5.0A THRU SMAF220A

Surface mount transient voltage suppressor power 200 watts

FEATURES

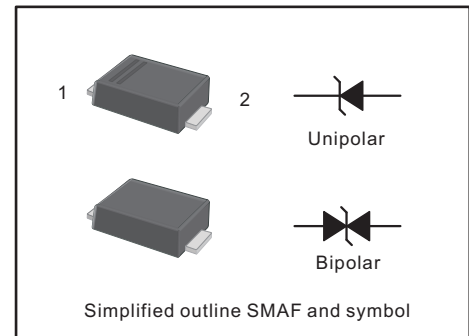
- For surface mounted applications in order to optimize board space.
- Low profile package
- Glass passivated junction
- Low inductance
- Plastic package has Underwriters Laboratory Flammability

MECHANICAL DATA

- Case: SMAF
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 27mg 0.00095oz

PINNING

PIN	DESCRIPTION
1	Cathode
2	Anode



Maximum Ratings and Electrical characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000us waveform	P_{PPM}	Min200	W
Peak Forward Surge Current (Note 2, Fig 4)	I_{FSM}	20	A
Peak Pulse Current on 10/1000 us waveform (Note 1, Fig 2)	I_{PPM}	see Table 1	A
Typical Junction capacitance at VR=4V, f=1MHz	C_J	390	pF
ESD Voltage per IEC6100-4-2	Contact	V_{ESD1}	± 8
	Air	V_{ESD2}	± 15
Typical Thermal Resistance Junction to Ambient(Note 2)	$R_{\theta JA}$	150	°C/W
Operating Junction Temperature and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	°C

NOTES:

1. Non-repetitive current pulse, per Fig.3 and derated above $T_A = 25^\circ\text{C}$ per Fig. 2.
2. Mounted on FR-4 PCB single-sided copper, mini pad.
3. Peak Forward Surge Current : 8.3ms single half sine-wave Superimposed on rated load (JEDEC method).
4. Peak pulse power waveform is 10/1000 μs .



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Characteristics at Ta = 25°C

Table 1

Type		Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage		Max. Clamp Voltage	Peak Pulse Current	Package	
			V _{BR} @ I _T			I _T	I _R @ V _{RWM}			V _C @ I _{PP}	I _{PP}
		V _{RWM}	Min	Max	UNI		BI	V	A		
UNI	BI	V	V	V	mA	µA	µA	V	A	UNI	BI
SMAF5.0	SMAF5.0C	5	6.4	7.82	10	800	1600	9.6	41.7	5.0V	5.0C
SMAF5.0A	SMAF5.0CA	5	6.4	7.07	10	800	1600	9.2	43.85	5.0A	5.0D
SMAF6.0	SMAF6.0C	6	6.67	8.15	10	800	1600	11.4	35.1	6.0V	6.0C
SMAF6.0A	SMAF6.0CA	6	6.67	7.37	10	800	1600	10.3	38.8	6.0A	6.0D
SMAF6.5	SMAF6.5C	6.5	7.22	8.82	10	500	1000	12.3	32.5	6.5V	6.5C
SMAF6.5A	SMAF6.5CA	6.5	7.22	7.98	10	500	1000	11.2	35.7	6.5A	6.5D
SMAF7.0	SMAF7.0C	7	7.78	9.51	10	200	400	13.3	30.1	7.0V	7.0C
SMAF7.0A	SMAF7.0CA	7	7.78	8.6	10	200	400	12	33.3	7.0A	7.0D
SMAF7.5	SMAF7.5C	7.5	8.33	10.2	1	100	200	14.3	28	7.5V	7.5C
SMAF7.5A	SMAF7.5CA	7.5	8.33	9.21	1	100	200	12.9	31	7.5A	7.5D
SMAF8.0	SMAF8.0C	8	8.89	10.9	1	50	100	15	26.7	8.0V	8.0C
SMAF8.0A	SMAF8.0CA	8	8.89	9.83	1	50	100	13.6	29.4	8.0A	8.0D
SMAF8.5	SMAF8.5C	8.5	9.44	11.5	1	10	20	15.9	25.2	8.5V	8.5C
SMAF8.5A	SMAF8.5CA	8.5	9.44	10.4	1	10	20	14.4	27.8	8.5A	8.5D
SMAF9.0	SMAF9.0C	9	10	12.2	1	5	10	16.9	23.7	9.0V	9.0C
SMAF9.0A	SMAF9.0CA	9	10	11.1	1	5	10	15.4	26	9.0A	9.0D
SMAF10	SMAF10C	10	11.1	13.6	1	5	10	18.8	21.3	10V	10C
SMAF10A	SMAF10CA	10	11.1	12.3	1	5	10	17	23.5	10A	10D
SMAF11	SMAF11C	11	12.2	14.9	1	5	5	20.1	19.9	11V	11C
SMAF11A	SMAF11CA	11	12.2	13.5	1	5	5	18.2	22	11A	11D
SMAF12	SMAF12C	12	13.3	16.3	1	5	5	22	18.2	12V	12C
SMAF12A	SMAF12CA	12	13.3	14.7	1	5	5	19.9	20.1	12A	12D
SMAF13	SMAF13C	13	14.4	17.6	1	5	5	23.8	16.8	13V	13C
SMAF13A	SMAF13CA	13	14.4	15.9	1	5	5	21.5	18.6	13A	13D
SMAF14	SMAF14C	14	15.6	19.1	1	5	5	25.8	15.5	14V	14C
SMAF14A	SMAF14CA	14	15.6	17.2	1	5	5	23.2	17.2	14A	14D
SMAF15	SMAF15C	15	16.7	20.4	1	5	5	26.9	14.9	15V	15C
SMAF15A	SMAF15CA	15	16.7	18.5	1	5	5	24.4	16.4	15A	15D
SMAF16	SMAF16C	16	17.8	21.8	1	5	5	28.8	13.9	16V	16C
SMAF16A	SMAF16CA	16	17.8	19.7	1	5	5	26	15.4	16A	16D
SMAF17	SMAF17C	17	18.9	23.1	1	5	5	30.5	13.1	17V	17C
SMAF17A	SMAF17CA	17	18.9	20.9	1	5	5	27.6	14.5	17A	17D
SMAF18	SMAF18C	18	20	24.4	1	5	5	32.2	12.4	18V	18C
SMAF18A	SMAF18CA	18	20	22.1	1	5	5	29.2	13.7	18A	18D
SMAF20	SMAF20C	20	22.2	27.1	1	5	5	35.8	11.2	20V	20C
SMAF20A	SMAF20CA	20	22.2	24.5	1	5	5	32.4	12.3	20A	20D
SMAF22	SMAF22C	22	24.4	29.8	1	5	5	39.4	10.2	22V	22C
SMAF22A	SMAF22CA	22	24.4	26.9	1	5	5	35.5	11.3	22A	22D
SMAF24	SMAF24C	24	26.7	32.6	1	5	5	43	9.3	24V	24C
SMAF24A	SMAF24CA	24	26.7	29.5	1	5	5	38.9	10.3	24A	24D
SMAF26	SMAF26C	26	28.9	35.3	1	5	5	46.6	8.6	26V	26C
SMAF26A	SMAF26CA	26	28.9	31.9	1	5	5	42.1	9.5	26A	26D
SMAF28	SMAF28C	28	31.1	38	1	5	5	50	8	28V	28C
SMAF28A	SMAF28CA	28	31.1	34.4	1	5	5	45.4	8.8	28A	28D
SMAF30	SMAF30C	30	33.3	40.7	1	5	5	53.5	7.5	30V	30C
SMAF30A	SMAF30CA	30	33.3	36.8	1	5	5	48.4	8.3	30A	30D
SMAF33	SMAF33C	33	36.7	44.9	1	5	5	59	6.8	33V	33C
SMAF33A	SMAF33CA	33	36.7	40.6	1	5	5	53.3	7.5	33A	33D
SMAF36	SMAF36C	36	40	48.9	1	5	5	64.3	6.2	36V	36C
SMAF36A	SMAF36CA	36	40	44.2	1	5	5	58.1	6.9	36A	36D
SMAF40	SMAF40C	40	44.4	54.3	1	5	5	71.4	5.6	40V	40C
SMAF40A	SMAF40A	40	44.4	49.1	1	5	5	64.5	6.2	40A	40D
SMAF43	SMAF43C	43	47.8	58.4	1	5	5	76.7	5.2	43V	43C
SMAF43A	SMAF43CA	43	47.8	52.8	1	5	5	69.4	5.8	43A	43D
SMAF45	SMAF45C	45	50	61.1	1	5	5	80.3	5	45V	45C





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Table 1

Type		Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage		Max. Clamp Voltage	Peak Pulse Current	Package	
			V _{BR} @ I _T			I _T	I _R @ V _{RWM}			V _C @ I _{PP}	I _{PP}
		V _{RWM}	Min	Max	UNI		BI	UNI	BI		
UNI	BI	V	V	V	mA	µA	µA	V	A	UNI	BI
SMAF45A	SMAF45CA	45	50	55.3	1	5	5	72.7	5.5	45A	45D
SMAF48	SMAF48C	48	53.3	65.1	1	5	5	85.5	4.7	48V	48C
SMAF48A	SMAF48CA	48	53.3	58.9	1	5	5	77.4	5.2	48A	48D
SMAF51	SMAF51C	51	56.7	69.3	1	5	5	91.1	4.4	51V	51C
SMAF51A	SMAF51CA	51	56.7	62.7	1	5	5	82.4	4.9	51A	51D
SMAF54	SMAF54C	54	60	73.3	1	5	5	96.3	4.2	54V	54C
SMAF54A	SMAF54CA	54	60	66.3	1	5	5	87.1	4.6	54A	54D
SMAF58	SMAF58C	58	64.4	78.7	1	5	5	103	3.9	58V	58C
SMAF58A	SMAF58CA	58	64.4	71.2	1	5	5	93.6	4.3	58A	58D
SMAF60	SMAF60C	60	66.7	81.5	1	5	5	107	3.7	60V	60C
SMAF60A	SMAF60CA	60	66.7	73.7	1	5	5	96.8	4.1	60A	60D
SMAF64	SMAF64C	64	71.1	86.9	1	5	5	114	3.5	64V	64C
SMAF64A	SMAF64CA	64	71.1	78.6	1	5	5	103	3.9	64A	64D
SMAF70	SMAF70C	70	77.8	95.1	1	5	5	125	3.2	70V	70C
SMAF70A	SMAF70CA	70	77.8	86	1	5	5	113	3.5	70A	70D
SMAF75	SMAF75C	75	83.3	102	1	5	5	134	3	75V	75C
SMAF75A	SMAF75CA	75	83.3	92.1	1	5	5	121	3.0	75A	75D
SMAF78	SMAF78C	78	86.7	106	1	5	5	139	2.9	78V	78C
SMAF78A	SMAF78CA	78	86.7	95.8	1	5	5	126	3.2	78A	78D
SMAF85	SMAF85C	85	94.4	115	1	5	5	151	2	85V	85C
SMAF85A	SMAF85CA	85	94.4	104	1	5	5	137	2.2	85A	85D
SMAF90	SMAF90C	90	100	122	1	5	5	160	1.9	90V	90C
SMAF90A	SMAF90CA	90	100	111	1	5	5	146	2.1	90A	90D
SMAF100	SMAF100C	100	111	136	1	5	5	179	1.7	100V	100C
SMAF100A	SMAF100CA	100	111	123	1	5	5	162	1.9	100A	100D
SMAF110	SMAF110C	110	122	149	1	5	5	196	1.5	110V	110C
SMAF110A	SMAF110CA	110	122	135	1	5	5	177	1.7	110A	110D
SMAF120	SMAF120C	120	133	163	1	5	5	214	1.4	120V	120C
SMAF120A	SMAF120CA	120	133	147	1	5	5	193	1.6	120A	120D
SMAF130	SMAF130C	130	144	176	1	5	5	231	1.3	130V	130C
SMAF130A	SMAF130CA	130	144	159	1	5	5	209	1.4	130A	130D
SMAF150	SMAF150C	150	167	204	1	5	5	268	1.1	150V	150C
SMAF150A	SMAF150CA	150	167	185	1	5	5	243	1.2	150A	150D
SMAF160	SMAF160C	160	178	218	1	5	5	287	1.1	160V	160C
SMAF160A	SMAF160CA	160	178	197	1	5	5	259	1.2	160A	160D
SMAF170	SMAF170C	170	189	231	1	5	5	304	1.1	170V	170C
SMAF170A	SMAF170CA	170	189	209	1	5	5	275	1.1	170A	170D
SMAF180	SMAF180C	180	200	243	1	5	5	323	1.1	180V	180C
SMAF180A	SMAF180CA	180	200	220	1	5	5	291	1.1	180A	180D
SMAF190	SMAF190C	190	211	254	1	5	5	341	1.1	190V	190C
SMAF190A	SMAF190CA	190	211	230	1	5	5	307	1.1	190A	190D
SMAF200	SMAF200C	200	222	264	1	5	5	361	1.1	200V	200C
SMAF200A	SMAF200CA	200	222	239	1	5	5	323	1.1	200A	200D
SMAF220	SMAF220C	220	243	282	1	5	5	386	1.1	220V	220C
SMAF220A	SMAF220CA	220	243	255	1	5	5	356	1.1	220A	220D



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

Fig.1 Peak Pulse Power Rating Curve

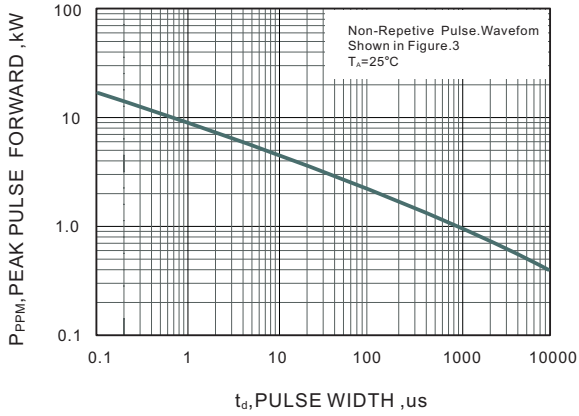


Fig.2 Forward Current Derating Curve

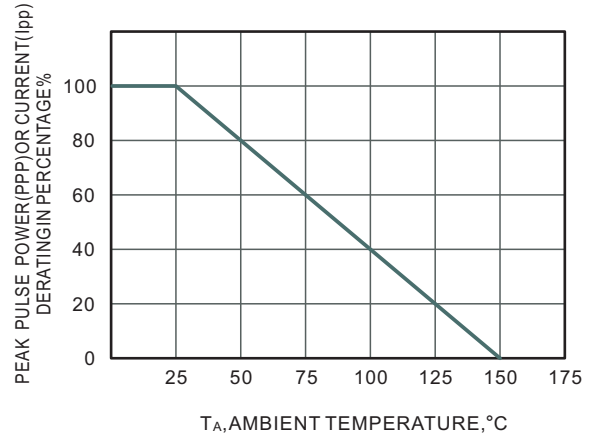


Fig.3 Pulse Waveform

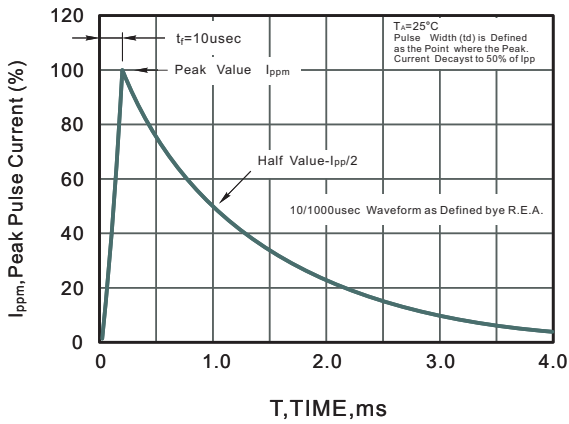
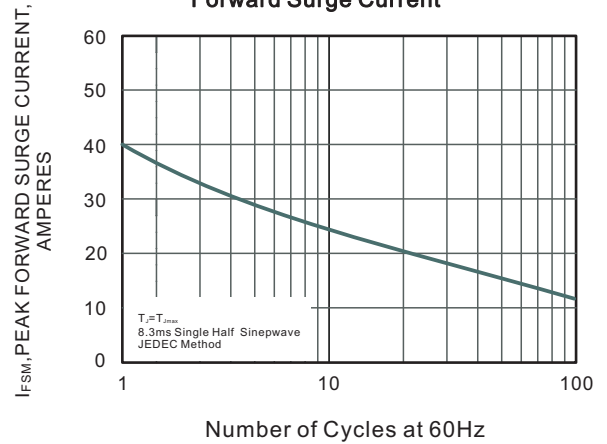


Fig.4 Maximum Non-Repetitive Peak Forward Surge Current





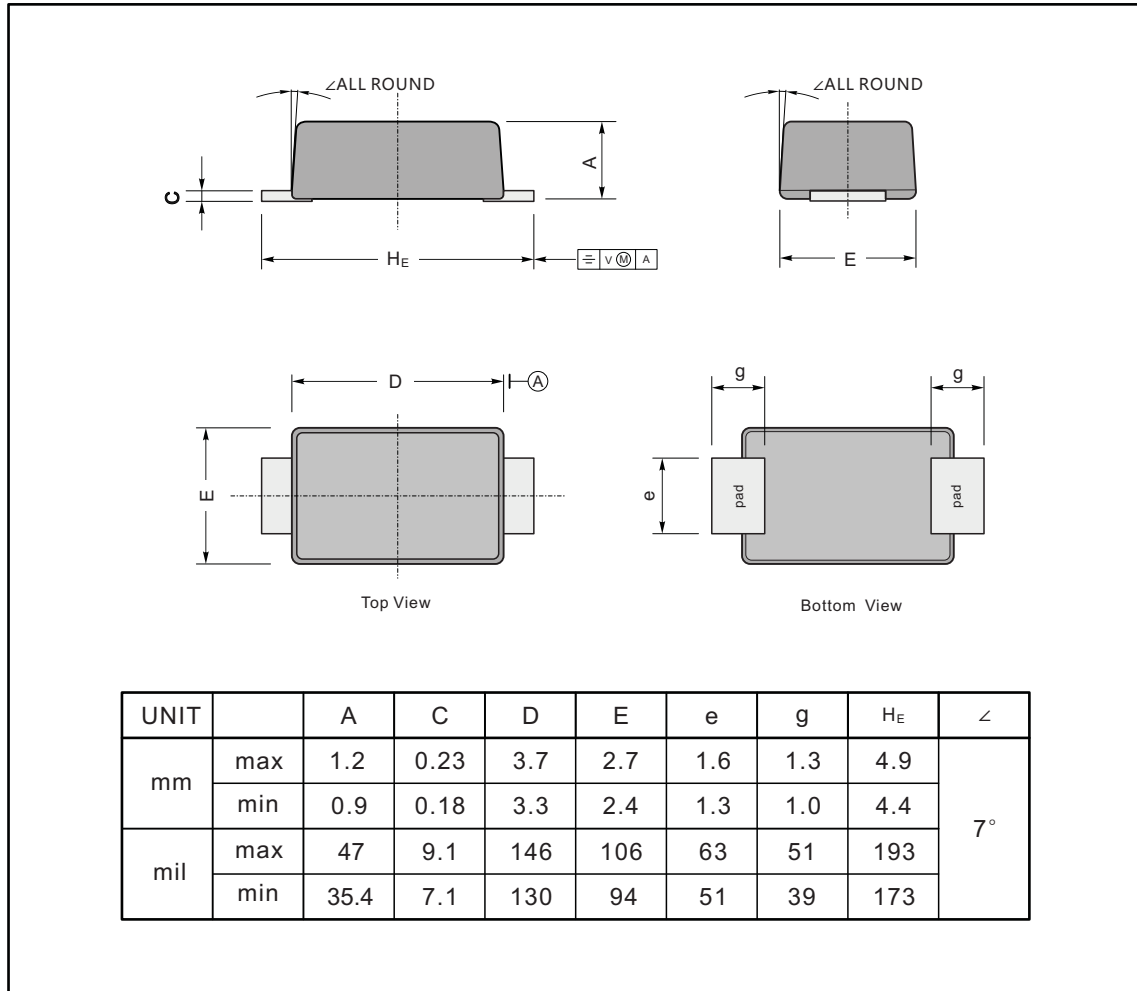
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PACKAGE OUTLINE

Plastic surface mounted package; 2 leads

SMAF



The recommended mounting pad size

