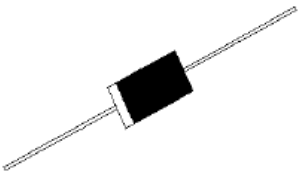
SA Series 500W Transient Voltage Suppressor

Rev.3.2

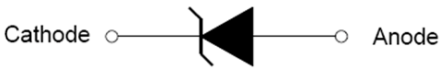
DESCRIPTION

The SA series of high current uni/bi-directional transient suppressors are designed for A.C. line protection and high power DC bus clamping applications. These devices offer uni/bi-directional port protection from 5.0 volts to 220 volts. They provide a clamping voltage lower than the avalanche voltage. Therefore, any voltage rise due to increased current conduction is contained to a minimum, providing the best possible protection level. They can also be connected in series and/or parallel to create very high capacity protection solutions.



DO-15

Bi-directional



Uni-directional

Symbol

FEATURES

- ✧ Low incremental surge resistance.
- ✧ Excellent clamping capability.
- ✧ Color band denoted cathode except bidirectional.
- ✧ Typical I_R less than 1μA above 10V.
- ✧ High temperature wave soldering: 265℃/10s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ 500W peak pulse power capability at 10×1000μs waveform.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.

ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000μs waveform	P_{PP}	500	W
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	3.0	W
Peak forward surge current, 8.3ms single half sine-wave for unidirectional only (NOTE 1)	I_{FSM}	70	A
Maximum instantaneous forward voltage at 35A for unidirectional	V_F	3.5	V
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	℃
Typical thermal resistance junction to lead	$R_{\theta JL}$	20	℃/W

ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted, continued)

Parameter	Symbol	Value	Unit
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	℃/W

Notes：

1 Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

ELECTRICAL CHARACTERISTICS (T_A=25℃)

Part Number		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	V	μA	min(V)	max(V)	mA	max(V)	A
SA5.0A	SA5.0CA	5.0	200	6.40	7.00	10	9.2	55.4
SA6.0A	SA6.0CA	6.0	200	6.67	7.37	10	10.3	49.5
SA6.5A	SA6.5CA	6.5	120	7.22	7.98	10	11.2	45.5
SA7.0A	SA7.0CA	7.0	50	7.78	8.60	10	12.0	42.5
SA7.5A	SA7.5CA	7.5	50	8.33	9.21	1	12.9	39.5
SA8.0A	SA8.0CA	8.0	20	8.89	9.83	1	13.6	37.5
SA8.5A	SA8.5CA	8.5	10	9.44	10.40	1	14.4	35.5
SA9.0A	SA9.0CA	9.0	5	10.00	11.10	1	15.4	33.1
SA10A	SA10CA	10.0	2	11.10	12.30	1	17.0	30.0
SA11A	SA11CA	11.0	1	12.20	13.50	1	18.2	28.0
SA12A	SA12CA	12.0	1	13.30	14.70	1	19.9	25.6
SA13A	SA13CA	13.0	1	14.40	15.90	1	21.5	23.7
SA14A	SA14CA	14.0	1	15.60	17.20	1	23.2	22.0
SA15A	SA15CA	15.0	1	16.70	18.50	1	24.4	20.9
SA16A	SA16CA	16.0	1	17.80	19.70	1	26.0	19.6
SA17A	SA17CA	17.0	1	18.90	20.90	1	27.6	18.5
SA18A	SA18CA	18.0	1	20.00	22.10	1	29.2	17.5
SA20A	SA20CA	20.0	1	22.20	24.50	1	32.4	15.7
SA22A	SA22CA	22.0	1	24.40	26.90	1	35.5	14.4
SA24A	SA24CA	24.0	1	26.70	29.50	1	38.9	13.1
SA26A	SA26CA	26.0	1	28.90	31.90	1	42.1	12.1
SA28A	SA28CA	28.0	1	31.10	34.40	1	45.4	11.2
SA30A	SA30CA	30.0	1	33.30	36.80	1	48.4	10.5

ELECTRICAL CHARACTERISTICS (T_A=25℃, continued)

Part Number		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	V	μA	min(V)	max(V)	mA	max(V)	A
SA33A	SA33CA	33.0	1	36.70	40.60	1	53.3	9.6
SA36A	SA36CA	36.0	1	40.00	44.20	1	58.1	8.8
SA40A	SA40CA	40.0	1	44.40	49.10	1	64.5	7.9
SA43A	SA43CA	43.0	1	47.80	52.80	1	69.4	7.3
SA45A	SA45CA	45.0	1	50.00	55.30	1	72.7	7.0
SA48A	SA48CA	48.0	1	53.30	58.90	1	77.4	6.6
SA51A	SA51CA	51.0	1	56.70	62.70	1	82.4	6.2
SA54A	SA54CA	54.0	1	60.00	66.30	1	87.1	5.9
SA58A	SA58CA	58.0	1	64.40	71.20	1	93.6	5.4
SA60A	SA60CA	60.0	1	66.70	73.70	1	96.8	5.3
SA64A	SA64CA	64.0	1	71.10	78.60	1	103.0	5.0
SA70A	SA70CA	70.0	1	77.80	86.00	1	113.0	4.5
SA75A	SA75CA	75.0	1	83.30	92.10	1	121.0	4.2
SA78A	SA78CA	78.0	1	86.70	95.80	1	126.0	4.0
SA85A	SA85CA	85.0	1	94.40	104.0	1	137.0	3.7
SA90A	SA90CA	90.0	1	100.0	111.0	1	146.0	3.5
SA100A	SA100CA	100.0	1	111.0	123.0	1	162.0	3.1
SA110A	SA110CA	110.0	1	122.0	135.0	1	177.0	2.9
SA120A	SA120CA	120.0	1	133.0	147.0	1	193.0	2.6
SA130A	SA130CA	130.0	1	144.0	159.0	1	209.0	2.4
SA150A	SA150CA	150.0	1	167.0	185.0	1	243.0	2.1
SA160A	SA160CA	160.0	1	178.0	197.0	1	259.0	2.0
SA170A	SA170CA	170.0	1	189.0	209.0	1	275.0	1.9
SA180A	SA180CA	180.0	1	201.0	222.0	1	292.0	1.7
SA200A	SA200CA	200.0	1	224.0	247.0	1	324.0	1.5
SA220A	SA220CA	220.0	1	246.0	272.0	1	356.0	1.4

① Surge waveform:10/1000μs

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

RATINGS AND V-I CHARACTERISTICS CURVES (T_A=25℃, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

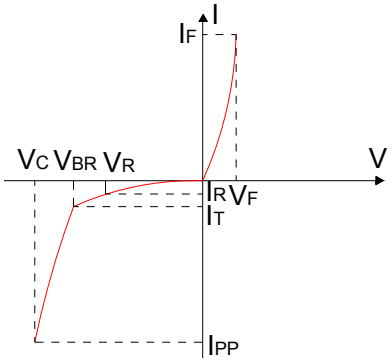


FIG.2:V- I curve characteristics (Bi-directional)

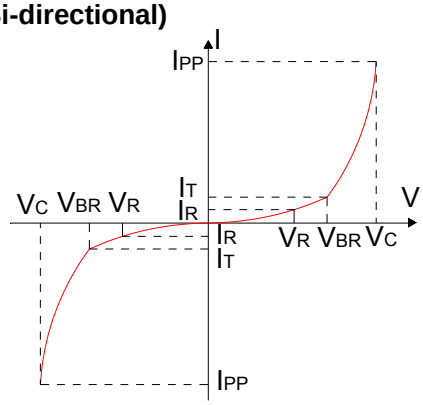


FIG.3: Pulse waveform

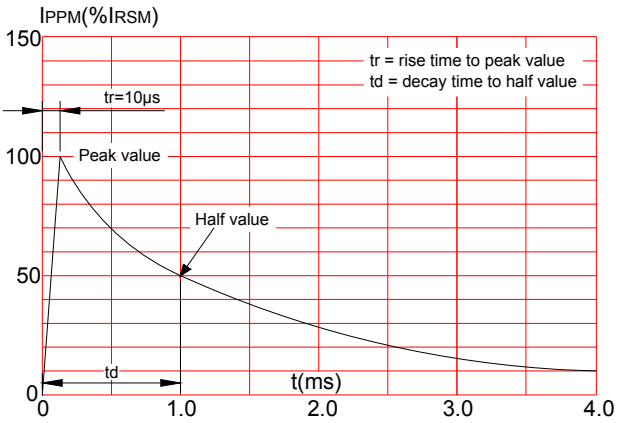
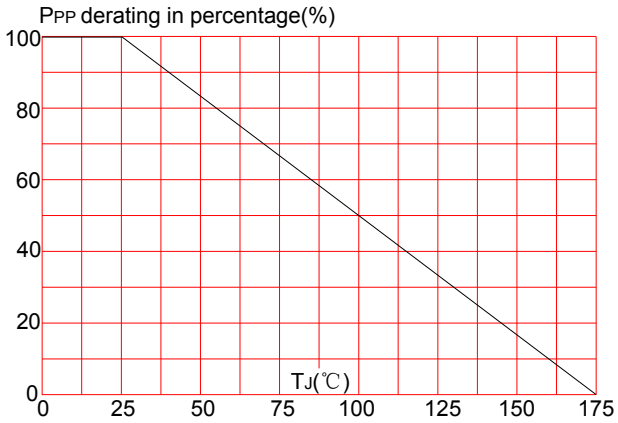
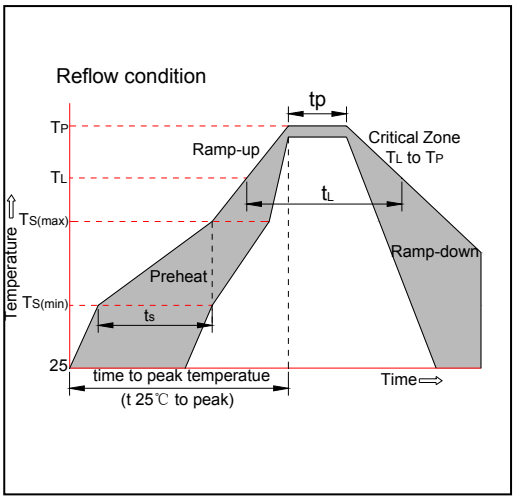


FIG.4: Pulse derating curve



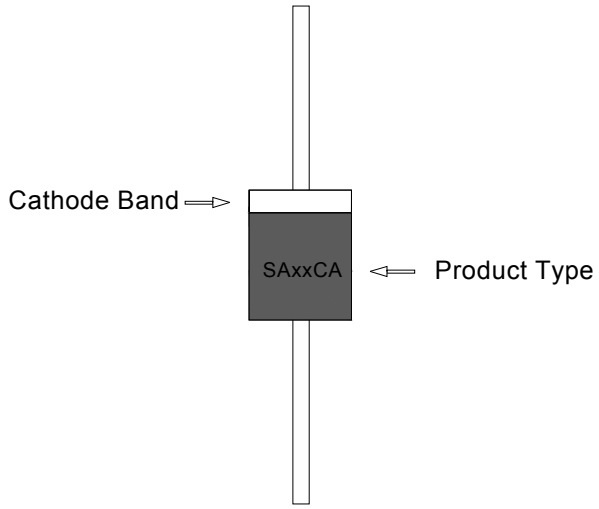
SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃



Flow/Wave Soldering(Solder Dipping)	
Peak temperature	265℃
Dipping time	10 sec.
Soldering	1 time

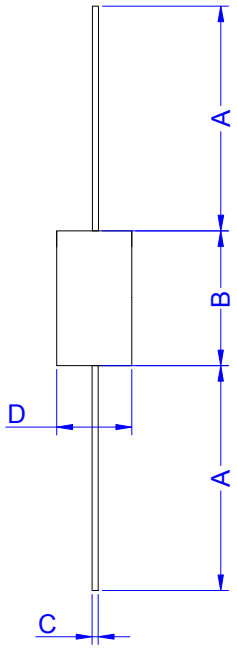
MARKING & ORDERING INFORMATION



SA xx C A
(1) (2) (3) (4)

(1)Series:500 watts series
(2)Reverse Stand-off Voltage
(3)Bi-directional
(4)5% V_{BR} Voltage tolerance

PACKAGE MECHANICAL DATA



DO-15

Ref.	Dimensions			
	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	1.000	-	25.40	-
B	0.228	0.300	5.80	7.62
C	0.022	0.035	0.56	0.89
D	0.102	0.142	2.60	3.60

Part Number	UNIT WEIGHT (g/PCS) typ.	Case Type	Quantity	Packing Option
SAxxA/CA	0.42	DO-15/DO-204AC	2000	Box

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