



# SA5.0 THRU SA170CA

## GLASS PASSIVAED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

Breakdown Voltage:5.0-170CA Volts    Peak Pulse Power:500 Watts

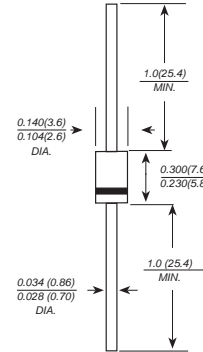
### FEATURE

500w peak pulse power capability  
 Excellent clamping capability  
 Low incremental surge resistance  
 Fast response time:typically less than 1.0ps from 0v to  $V_{BR}$  for unidirectional and 5.0ns for bidirectional types.  
 High temperature soldering guaranteed:  
 265°C/10S/9.5mm lead length at 5 lbs tension

### MECHANICAL DATA

**Case:** JEDEC DO-15 molded plastic body over passivated junction  
**Terminals:** Plated axial leads, solderable per MIL-STD 750 method 2026  
**Polarity:** Color band denotes cathode except for bidirectional types  
**Mounting Position:** Any  
**Weight:** 0.014 ounce,0.40 grams

### DO-15



Dimensions in inches and (millimeters)

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional use C or CA suffix for types SA5.0 thru types SA170 (e.g. SA5.0CA,SA170CA).  
 Electrical characteristics apply in both directions.

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOLS	VALUE	UNITS
Peak power dissipation (Note 1)	P <sub>ppm</sub>	Minimum 500	Watts
Peak pulse reverse current (Note 1, Fig.3)	I <sub>PPM</sub>	See Table 1	Amps
Steady state power dissipation (Note 2)	P <sub>M(AV)</sub>	1.6	Watts
Peak forward surge current (Note 3)	I <sub>FSM</sub>	70	Amps
Maximum instantaneous forward voltage at 35A for unidirectional only (Note 3)	V <sub>F</sub>	3.5	Volts
Operating junction and storage temperature range	T <sub>STG,TJ</sub>	-55 to + 175	°C

#### Notes:

- 1.10/1000μs waveform non-repetitive current pulse,per Fig.3 and derated above Ta=25°C per Fig.2
- 2.T<sub>L</sub>=75°C,lead lengths 9.5mm,Mounted on copper pad area of (40x40mm)Fig.5
- 3.Measured on 8.3ms single half sine-wave or equivalent square wave,duty cycle=4 pulses per minute maximum.



## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

Device Type	Breakdown Voltage V <sub>(BR)</sub> (Volts)(NOTES 1)		Test Current I <sub>T</sub> (mA)	Stand-off Voltage V <sub>WM</sub> (Volts)	Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (NOTE3)(μA)	Maximum Peak Pulse Reverse Current I <sub>PPM</sub> (NOTE2) (Amps)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>C</sub> (Volts)	Maximum Temperature Coefficient of V <sub>(BR)</sub> (mv/°C)
	MIN	MAX						
SA5.0	6.40	7.30	10	5.0	600	52.1	9.6	5.0
SA5.0A	6.40	7.00	10	5.0	600	54.3	9.2	5.0
SA6.0	6.67	8.15	10	6.0	600	43.9	11.4	5.0
SA6.0A	6.67	7.37	10	6.0	600	48.5	10.3	5.0
SA6.5	7.22	8.82	10	6.5	400	40.7	12.3	5.0
SA6.5A	7.22	7.98	10	6.5	400	44.7	11.2	5.0
SA7.0	7.78	9.51	10	7.0	150	37.6	13.3	6.0
SA7.0A	7.78	8.60	10	7.0	150	41.7	12.0	6.0
SA7.5	8.33	10.20	1.0	7.5	50	35.0	14.3	7.0
SA7.5A	8.33	9.21	1.0	7.5	50	38.8	12.9	7.0
SA8.0	8.89	10.90	1.0	8.0	25	33.3	15.0	7.0
SA8.0A	8.89	9.83	1.0	8.0	25	36.8	13.6	7.0
SA8.5	9.44	11.50	1.0	8.5	10	31.4	15.9	8.0
SA8.5A	9.44	10.40	1.0	8.5	10	34.7	14.4	8.0
SA9.0	10.00	12.20	1.0	9.0	5.0	29.6	16.9	9.0
SA9.0A	10.00	11.10	1.0	9.0	5.0	32.5	15.4	9.0
SA10	11.10	13.60	1.0	10.00	1.0	26.6	18.8	10.0
SA10A	11.10	12.30	1.0	10.00	1.0	29.4	17.0	10.0
SA11	12.20	14.90	1.0	11.00	1.0	24.9	20.1	11.0
SA11A	12.20	13.50	1.0	11.00	1.0	27.5	18.2	11.0
SA12	13.30	16.30	1.0	12.00	1.0	22.7	22.0	12.0
SA12A	13.30	14.70	1.0	12.00	1.0	25.1	19.9	12.0
SA13	14.40	17.60	1.0	13.00	1.0	21.0	23.8	13.0
SA13A	14.40	15.90	1.0	13.00	1.0	23.3	21.5	13.0
SA14	15.60	19.10	1.0	14.00	1.0	19.4	25.8	14.0
SA14A	15.60	17.20	1.0	14.00	1.0	21.6	23.2	14.0
SA15	16.70	20.40	1.0	15.00	1.0	18.6	26.9	16.0
SA15A	16.70	18.50	1.0	15.00	1.0	20.5	24.4	16.0
SA16	17.80	21.80	1.0	16.00	1.0	17.4	28.8	19.0
SA16A	17.80	19.70	1.0	16.00	1.0	19.2	26.0	17.0
SA17	18.90	23.10	1.0	17.00	1.0	16.4	30.5	20.0
SA17A	18.90	20.90	1.0	17.00	1.0	18.1	27.6	19.0
SA18	20.00	24.40	1.0	18.00	1.0	15.5	32.2	21.0
SA18A	20.00	22.10	1.0	18.00	1.0	17.1	29.2	20.0
SA20	22.20	27.10	1.0	20.00	1.0	14.0	35.8	25.0
SA20A	22.20	24.50	1.0	20.00	1.0	15.4	32.4	23.0
SA22	24.40	29.80	1.0	22.00	1.0	22.7	39.4	28.0
SA22A	24.40	26.90	1.0	22.00	1.0	14.1	35.5	25.0
SA24	26.70	32.60	1.0	24.00	1.0	11.6	43.0	31.0
SA24A	26.70	29.50	1.0	24.00	1.0	12.9	38.9	28.0
SA26	28.90	35.30	1.0	26.00	1.0	10.7	46.6	31.0
SA26A	28.90	31.90	1.0	26.00	1.0	11.9	42.1	30.0
SA28	31.10	38.00	1.0	28.00	1.0	10.0	50.1	35.0
SA28A	31.10	34.40	1.0	28.00	1.0	11.0	45.4	31.0
SA30	33.30	40.70	1.0	30.00	1.0	9.3	53.5	39.0
SA30A	33.30	36.80	1.0	30.00	1.0	10.0	48.4	36.0
SA33	36.70	44.90	1.0	33.00	1.0	8.5	59.0	42.0
SA33A	36.70	40.60	1.0	33.00	1.0	9.4	53.3	39.0



## ELECTRICAL CHARACTERISTICS (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Device Type	Breakdown Voltage $V_{(BR)}$ (Volts)(NOTES 1)		Test Current $I_T$ (mA)	Stand-off Voltage $V_{WM}$ (Volts)	Maximum Reverse Leakage at $V_{WM}$ $I_D$ (NOTE3)( $\mu\text{A}$ )	Maximum Peak Pulse Reverse Current $I_{PPM}$ (NOTE2) (Amps)	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (Volts)	Maximum Temperature Coefficient of $V_{(BR)}$ (mv/ $^{\circ}\text{C}$ )
	MIN	MAX						
SA36	40.00	48.90	1.0	36.00	1.0	7.8	64.3	46.0
SA36A	40.00	44.20	1.0	36.00	1.0	8.6	58.1	41.0
SA40	44.40	54.30	1.0	40.00	1.0	7.0	71.4	51.0
SA40A	44.40	49.10	1.0	40.00	1.0	7.8	64.5	46.0
SA43	47.80	58.40	1.0	43.00	1.0	6.5	76.7	55.0
SA43A	47.80	52.80	1.0	43.00	1.0	7.2	69.4	50.0
SA45	50.00	61.10	1.0	45.00	1.0	6.2	80.3	58.0
SA45A	50.00	55.30	1.0	45.00	1.0	6.9	72.7	52.0
SA48	53.30	65.20	1.0	48.00	1.0	5.8	85.8	63.0
SA48A	53.30	58.90	1.0	48.00	1.0	6.5	77.4	56.0
SA51	56.70	69.30	1.0	51.00	1.0	5.5	91.1	66.0
SA51A	56.70	62.70	1.0	51.00	1.0	6.1	82.4	61.0
SA54	60.00	73.30	1.0	54.00	1.0	5.2	96.3	71.0
SA54A	60.00	66.30	1.0	54.00	1.0	5.7	87.1	65.0
SA58	64.40	78.70	1.0	58.00	1.0	4.9	103.0	78.0
SA58A	64.40	71.20	1.0	58.00	1.0	5.3	93.6	70.0
SA60	66.70	81.50	1.0	60.00	1.0	4.7	107.0	80.0
SA60A	66.70	73.70	1.0	60.00	1.0	5.2	96.8	71.0
SA64	71.10	86.90	1.0	64.00	1.0	4.4	114.0	86.0
SA64A	71.10	78.60	1.0	64.00	1.0	4.9	103.0	76.0
SA70	77.80	95.10	1.0	70.00	1.0	4.0	125.0	94.0
SA70A	77.80	86.00	1.0	70.00	1.0	4.4	113.0	85.0
SA75	83.30	102.00	1.0	75.00	1.0	3.7	134.0	101
SA75A	83.30	92.10	1.0	75.00	1.0	4.1	121.0	91.0
SA78	86.70	106.00	1.0	78.00	1.0	3.6	139.0	105
SA78A	86.70	95.80	1.0	78.00	1.0	4.0	126.0	95.0
SA85	94.40	115.00	1.0	85.00	1.0	3.3	151.0	114
SA85A	94.40	104.00	1.0	85.00	1.0	3.6	137.0	103
SA90	100.00	122.00	1.0	90.00	1.0	3.1	160.0	121
SA90A	100.00	111.00	1.0	90.00	1.0	3.4	146.0	111
SA100	111.00	136.00	1.0	100.00	1.0	2.8	179.0	135
SA100A	111.00	123.00	1.0	100.00	1.0	3.1	162.0	123
SA110	122.00	149.00	1.0	110.00	1.0	2.6	196.0	148
SA110A	122.00	135.00	1.0	110.00	1.0	2.8	177.0	133
SA120	133.00	163.00	1.0	120.00	1.0	2.3	214.0	162
SA120A	133.00	147.00	1.0	120.00	1.0	2.6	193.0	146
SA130	144.00	176.00	1.0	130.00	1.0	2.2	230.0	175
SA130A	144.00	159.00	1.0	130.00	1.0	2.4	209.0	158
SA150	167.00	204.00	1.0	150.00	1.0	1.9	268.0	203
SA150A	167.00	185.00	1.0	150.00	1.0	2.1	243.0	184
SA160	178.00	218.00	1.0	160.00	1.0	1.7	287.0	217
SA160A	178.00	197.00	1.0	160.00	1.0	1.9	259.0	196
SA170	189.00	231.00	1.0	170.00	1.0	1.6	304.0	230
SA170A	189.00	209.00	1.0	170.00	1.0	1.8	275.0	208

### NOTES:

1.  $V_{(BR)}$  measured after  $I_T$  applied for 300 $\mu\text{s}$ ,  $I_T$  = square wave pulse or equivalent
2. Surge current waveform per Fig.3 and derated per Fig.2
3. For bidirectional types having  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled
4. All items and symbols are consistent with ANSI/IEEE C62.35



# RATINGS AND CHARACTERISTIC CURVES SA5.0 THUR SA170CA

FIG. 1-PEAK PULSE POWER RATING CURVE

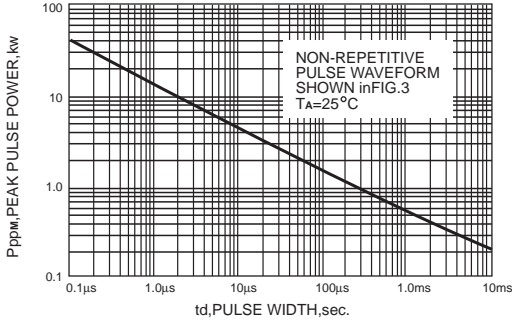


FIG. 2-PULSE DERATING CURVE

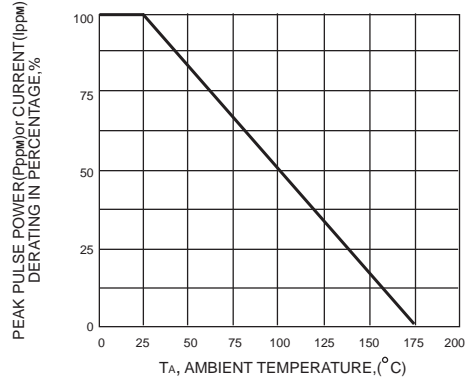


FIG.3-PULSE WAVEFORM

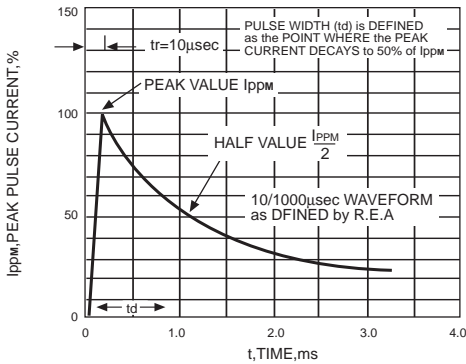


FIG. 4-TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

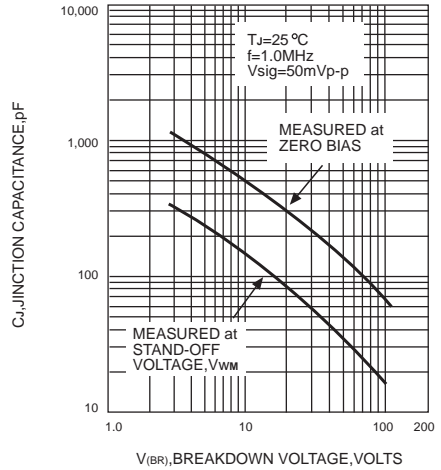


FIG.5-STEADY STATE POWER DERATING CURVE

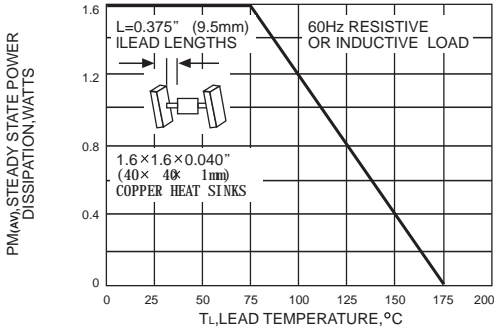


FIG.7-TYPICAL REVERSE LEAKAGE CHARACTERISTICS

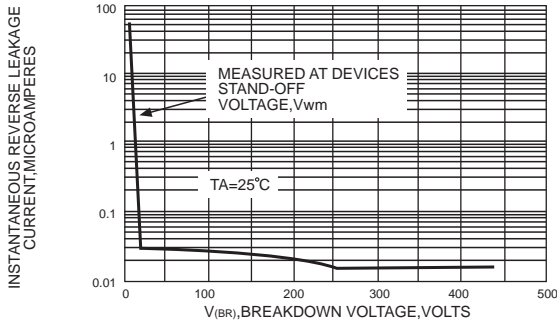


FIG.6-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

