

## TRANSIENT VOLTAGE SUPPRESSOR

**BREAKDOWN VOLTAGE: 5.0 --- 170 V**  
**PEAK PULSE POWER: 500 W**

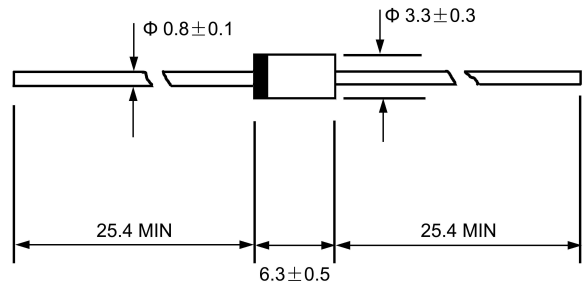
### FEATURES

Plastic package gas Underwriters Laboratory  
 Flammability Classification 94V-0  
 Glass passivated junction  
 500W peak pulse power capability with a 10/1000µs  
 waveform, repetition rate (duty cycle): 0.01%  
 Excellent clamping capability  
 Low incremental surge resistance  
 Fast response time: typically less than 1.0ps from 0 Volts to  
 V<sub>BR</sub> for uni-directional and 5.0ns for bidirectional types  
 Typical I<sub>D</sub> Less than 1 µA above 10V  
 High temperature soldering guaranteed: 265 / 10 seconds,  
 0.375"(9.5mm) lead length, 51bs. (2.3kg) tension

### MECHANICAL DATA

Case: JEDEC DO-15, molded plastic body over  
 passivated junction  
 Terminals: Axial leads, solderable per MIL-STD-750,  
 method 2026  
 Polarity: Color band denotes positive end (cathode)  
 except bidirectionals  
 Weight: 0.014 ounces, 0.39 grams  
 Mounting position: Any

### DO-15



Dimensions in millimeters

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

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

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified.

	SYMBOL	VALUE	UNIT
Peak power power dissipation with a 10/1000µs waveform (NOTE 1, FIG.1)	P <sub>PPM</sub>	Minimum 500	W
Peak pulse current with a 10/1000µs waveform (NOTE 1, FIG.3)	I <sub>PPM</sub>	SEE TABLE 1	A
Steady state power dissipation at T <sub>L</sub> =75 °C lead lengths 0.375"(9.5mm) (NOTE 2)	P <sub>M(AV)</sub>	1.0	W
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (NOTE 3)	I <sub>FSM</sub>	70.0	A
Maximum instantaneous forward voltage at 35A for unidirectional only (NOTE 3)	V <sub>F</sub>	3.5	V
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-50---+175	

NOTES: (1) Non-repetitive current pulses, per Fig. 3 and derated above T<sub>A</sub>=25 °C per Fig. 2

(2) Mounted on copper pad area of 1.6" x 1.6" (40 x 40mm<sup>2</sup>) per Fig. 5

(3) Measured of 8.3ms single half sine-wave or equare wave, duty cycle=4 pulses per minute maximum

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ELECTRICAL CHARACTERISTICS at(T<sub>A</sub>=25°C unless otherwise noted)

TABLE 1

Device Type	Breakdown voltage V <sub>(BR)</sub> (Volts) (NOTE 1)		Test current at I <sub>T</sub> (m A)	Stand-off voltage V <sub>WM</sub> (Volts)	Maximum reverse leakage at V <sub>WM</sub> I <sub>D</sub> (NOTE3) (μ A)	Maximum peak pulse current I <sub>PPM</sub> (NOTE 2) (Amps)	Maximum clamping voltage at I <sub>PPM</sub> V <sub>C</sub> (Volts)	Maximum temperature coefficient of V <sub>(BR)</sub> (m V/°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	10.2	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	10.9	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	11.5	1.0	8.5	10	31.4	15.9	8.0
SA8.5A	9.44	10.4	1.0	8.5	10	34.7	14.4	8.0
SA9.0	10.0	12.2	1.0	9.0	5.0	29.6	16.9	9.0
SA9.0A	10.0	11.1	1.0	9.0	5.0	32.5	15.4	9.0
SA10	11.1	13.6	1.0	10.0	1.0	26.6	18.8	10.0
SA10A	11.1	12.3	1.0	10.0	1.0	29.4	17.0	10.0
SA11	12.2	14.9	1.0	11.0	1.0	24.9	20.1	11.0
SA11A	12.2	13.5	1.0	11.0	1.0	27.5	18.2	11.0
SA12	13.3	16.3	1.0	12.0	1.0	22.7	22.0	12.0
SA12A	13.3	14.7	1.0	12.0	1.0	25.1	19.9	12.0
SA13	14.4	17.6	1.0	13.0	1.0	21.0	23.8	13.0
SA13A	14.4	15.9	1.0	13.0	1.0	23.3	21.5	13.0
SA14	15.6	19.1	1.0	14.0	1.0	19.4	25.8	14.0
SA14A	15.6	17.2	1.0	14.0	1.0	21.6	23.2	14.0
SA15	16.7	20.4	1.0	15.0	1.0	18.6	26.9	16.0
SA15A	16.7	18.5	1.0	15.0	1.0	20.5	24.4	16.0
SA16	17.8	21.8	1.0	16.0	1.0	17.4	28.8	19.0
SA16A	17.8	19.7	1.0	16.0	1.0	19.2	26.0	17.0
SA17	18.9	23.1	1.0	17.0	1.0	16.4	30.5	20.0
SA17A	18.9	20.9	1.0	17.0	1.0	18.1	27.6	19.0

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**ELECTRICAL CHARACTERISTICS at (T<sub>A</sub>=25°C unless otherwise noted)**

**TABLE 1(Cont'd)**

Device Type	Breakdown voltage V <sub>(BR)</sub> (Volts) (NOTE1)		Test current at I <sub>T</sub> (m A)	Stand-off voltage V <sub>WM</sub> (Volts)	Maximum reverse leakage at V <sub>WM</sub> I <sub>D</sub> (NOTE3) (μ A)	Maximum peak pulse current I <sub>PPM</sub> (NOTE 2) (Amps)	Maximum clamping voltage at I <sub>PPM</sub> V <sub>C</sub> (Volts)	Maximum temperature coefficient of V <sub>(BR)</sub> (m V/°C)
	MIN	MAX						
SA18	20.0	24.4	1.0	18.0	1.0	15.5	32.2	21.0
SA18A	20.0	22.1	1.0	18.0	1.0	17.1	29.2	20.0
SA20	22.2	27.1	1.0	20.0	1.0	14.0	35.8	25.0
SA20A	22.2	24.5	1.0	20.0	1.0	15.4	32.4	23.0
SA22A	24.4	29.8	1.0	22.0	1.0	22.7	39.4	28.0
SA22A	24.4	26.9	1.0	22.0	1.0	14.1	35.5	25.0
SA24	26.7	32.6	1.0	24.0	1.0	11.6	43.0	31.0
SA24A	26.7	29.5	1.0	24.0	1.0	12.9	38.9	28.0
SA26	28.9	35.3	1.0	26.0	1.0	10.7	46.6	31.0
SA26A	28.9	31.9	1.0	26.0	1.0	11.9	42.1	30.0
SA28	31.1	38.0	1.0	28.0	1.0	10.0	50.1	35.0
SA28A	31.1	34.4	1.0	28.0	1.0	11.0	45.4	31.0
SA30	33.3	40.7	1.0	30.0	1.0	9.3	53.5	39.0
SA30A	33.3	36.8	1.0	30.0	1.0	10	48.4	36.0
SA33	36.7	44.9	1.0	33.0	1.0	8.5	59.0	42.0
SA33A	36.7	40.6	1.0	33.0	1.0	9.4	53.3	39.0
SA36	40.0	48.9	1.0	36.0	1.0	7.8	64.3	46.0
SA36A	40.0	44.2	1.0	36.0	1.0	8.6	58.1	41.0
SA40	44.4	54.3	1.0	40.0	1.0	7.0	71.4	51.0
SA40A	44.4	49.1	1.0	40.0	1.0	7.8	64.5	46.0
SA43	47.8	58.4	1.0	43.0	1.0	6.5	76.7	55.0
SA43A	47.8	52.8	1.0	43.0	1.0	7.2	69.4	50.0
SA45	50.0	61.1	1.0	45.0	1.0	6.2	80.3	58.0
SA45A	50.0	55.3	1.0	45.0	1.0	6.9	72.7	52.0
SA48	53.3	65.2	1.0	48.0	1.0	5.8	85.5	63.0
SA48A	53.3	58.9	1.0	48.0	1.0	6.5	77.4	56.0
SA51	56.7	69.3	1.0	51.0	1.0	5.5	91.1	66.0
SA51A	56.7	62.7	1.0	51.0	1.0	6.1	82.4	61.0
SA54	60.0	73.3	1.0	54.0	1.0	5.2	96.3	71.0
SA54A	60.0	66.3	1.0	54.0	1.0	5.7	87.1	65.0
SA58	64.4	78.7	1.0	58.0	1.0	4.9	103	78.0
SA58A	64.4	71.2	1.0	58.0	1.0	5.3	93.6	70.0

ELECTRICAL CHARACTERISTICS at(T<sub>A</sub>=25°C unless otherwise noted)

TABLE 1(Cont'd)

Device Type	Breakdown voltage V <sub>(BR)</sub> (Volts) (NOTE1)		Test current at I <sub>T</sub> (m A)	Stand-off voltage V <sub>WM</sub> (Volts)	Maximum reverse leakage at V <sub>WM</sub> I <sub>D</sub> (NOTE3) (μ A)	Maximum peak pulse current I <sub>PPM</sub> (NOTE 2) (Amps)	Maximum clamping voltage at I <sub>PPM</sub> V <sub>C</sub> (Volts)	Maximum temperature coefficient of V <sub>(BR)</sub> (m V/°C)
	MIN	MAX						
SA60	66.7	81.5	1.0	60.0	1.0	4.7	107	80.0
SA60A	66.7	73.7	1.0	60.0	1.0	5.2	96.8	71.0
SA64	71.1	86.9	1.0	64.0	1.0	4.4	114	86.0
SA64A	71.1	78.6	1.0	64.0	1.0	4.9	103	76.0
SA70	77.8	95.1	1.0	70.0	1.0	4.0	125	94.0
SA70A	77.8	86.0	1.0	70.0	1.0	4.4	113	85.0
SA75	83.3	102	1.0	75.0	1.0	3.7	134	101
SA75A	83.3	92.1	1.0	75.0	1.0	4.1	121	91.0
SA78	86.7	106	1.0	78.0	1.0	3.6	139	105
SA78A	86.7	95.8	1.0	78.0	1.0	4.0	126	95.0
SA85	94.4	115	1.0	85.0	1.0	3.3	151	114
SA85A	94.4	104	1.0	85.0	1.0	3.6	137	103
SA90	100	122	1.0	90.0	1.0	3.1	160	121
SA90A	100	111	1.0	90.0	1.0	3.4	146	110
SA100	111	136	1.0	100	1.0	2.8	179	135
SA100A	111	123	1.0	100	1.0	3.1	162	123
SA110	122	149	1.0	110	1.0	2.6	196	148
SA110A	122	135	1.0	110	1.0	2.8	177	133
SA120	133	163	1.0	120	1.0	2.3	214	162
SA120A	133	147	1.0	120	1.0	2.6	193	146
SA130	144	176	1.0	130	1.0	2.2	230	175
SA130A	144	159	1.0	130	1.0	2.4	209	158
SA150	167	204	1.0	150	1.0	1.9	268	203
SA150A	167	185	1.0	150	1.0	2.1	243	184
SA160	178	218	1.0	160	1.0	1.7	257	217
SA160A	178	197	1.0	160	1.0	1.9	259	196
SA170	189	231	1.0	170	1.0	1.6	304	230
SA170A	189	1209	1.0	170	1.0	1.8	275	208

NOTES:(1)V<sub>(BR)</sub> measured after I<sub>T</sub> applied for 300ms.I<sub>T</sub>=square wave pulse or equivalent

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(2)Surge current waveform per Fig.3 and derate per Fig.2

(3)For bidirectional types with V<sub>WM</sub> of 10Volts and less,the I<sub>D</sub> limit is doubled.

(4) All terms and symbols are consistent with ANSI/IEEE C62.35