



# SA5.0~SA220CA

## GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

**VOLTAGE** 5.0 to 220 Volts **POWER** 500 Watts

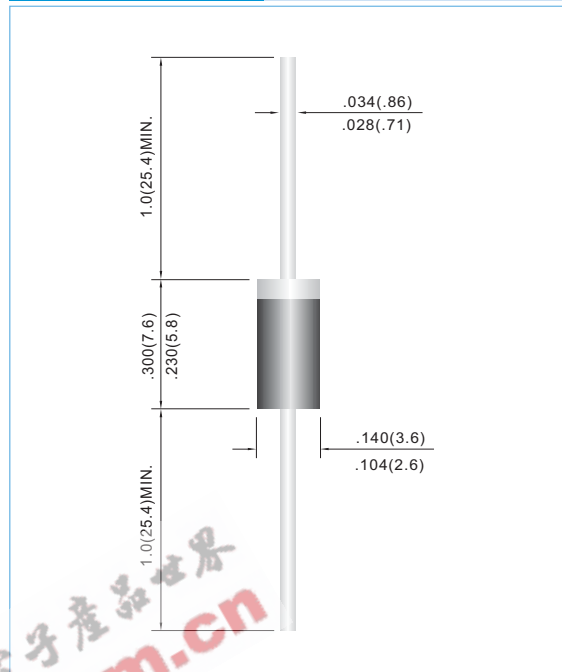
**DO-15** Unit: inch(mm)

### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- Glass passivated chip junction in DO-15 package
- 500W surge capability at 1ms
- Excellent clamping capability
- Low zener impedance
- Fast response time: typically less than 1.0 ps from 0 volts to BV min
- Typical IR less than 1μA above 10V
- High temperature soldering guaranteed: 260°C/10 seconds/.375" (9.5mm) lead length/5lbs., (2.3kg) tension
- In compliance with EU RoHS 2002/95/EC directives

### MECHANICAL DATA

- Case: JEDEC DO-15 molded plastic
- Terminals: Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except Bipolar
- Mounting Position: Any
- Weight: 0.015 ounce, 0.4 gram



### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types Electrical characteristics apply in both directions.

### MAXIMUM RATINGS AND CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise specified. Resistive or inductive load, 60Hz.  
For Capacitive load derate current by 20%.

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation at $T_A=25^\circ\text{C}$ , $T_P=1\text{ms}$ (Note 1, Fig.1)	$P_{PPM}$	500	Watts
Peak Pulse Current of on 10/1000μs waveform (Note 1, Fig.3)	$I_{PPM}$	SEE TABLE 1	Amps
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ Lead Lengths .375", (9.5mm) (Note 2)	$P_{M(AV)}$	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load(JECED Method) (Note 3)	$I_{FSM}$	70	Amps
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +175	°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 Copper Leaf area of  $1.57\text{in}^2$ (40mm<sup>2</sup>).
- 3.8.3ms single half sine-wave, duty cycle= 4 pulses per minutes maximum.

### LEGAL STATEMENT

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Part Number		Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage		Max. Clamp Voltage 10/1000μs	Peak Pulse Current 10/1000 μs	Marking Code		
		V <sub>RWM</sub>	V <sub>BR</sub> @ I <sub>T</sub>			I <sub>R</sub> @ V <sub>RWM</sub>		V <sub>C</sub> @ I <sub>PP</sub>	I <sub>PP</sub>			
UNI	BI		V	Min. V	Max. V	I <sub>T</sub> mA	UNI- uA	BI- uA	V	A	UNI	BI
<b>500W Transient Voltage Suppressor</b>												
SA5.0	SA5.0C	5	6.4	7.55	10	600	1200	9.6	52.3	SA5.0	SA5.0C	
SA5.0A	SA5.0CA	5	6.4	7.25	10	600	1200	9.2	54.3	SA5.0A	SA5.0CA	
SA6.0	SA6.0C	6	6.67	8.45	10	600	1200	11.4	43.9	SA6.0	SA6.0C	
SA6.0A	SA6.0CA	6	6.67	7.67	10	600	1200	10.3	48.5	SA6.0A	SA6.0CA	
SA6.5	SA6.5C	6.5	7.22	9.14	10	400	800	12.3	40.7	SA6.5	SA6.5C	
SA6.5A	SA6.5CA	6.5	7.22	8.3	10	400	800	11.2	44.7	SA6.5A	SA6.5CA	
SA7.0	SA7.0C	7	7.78	9.86	10	150	300	13.3	37.8	SA7.0	SA7.0C	
SA7.0A	SA7.0CA	7	7.78	8.95	10	150	300	12	41.7	SA7.0A	SA7.0CA	
SA7.5	SA7.5C	7.5	8.33	10.67	1	50	100	14.3	35	SA7.5	SA7.5C	
SA7.5A	SA7.5CA	7.5	8.33	9.58	1	50	100	12.9	38.8	SA7.5A	SA7.5CA	
SA8.0	SA8.0C	8	8.89	11.3	1	25	50	15	33.3	SA8.0	SA8.0C	
SA8.0A	SA8.0CA	8	8.89	10.23	1	25	50	13.6	36.7	SA8.0A	SA8.0CA	
SA8.5	SA8.5C	8.5	9.44	11.92	1	10	20	15.9	31.4	SA8.5	SA8.5C	
SA8.5A	SA8.5CA	8.5	9.44	10.82	1	10	20	14.4	34.7	SA8.5A	SA8.5CA	
SA9.0	SA9.0C	9	10	12.6	1	5	5	16.9	29.5	SA9.0	SA9.0C	
SA9.0A	SA9.0CA	9	10	11.5	1	5	5	15.4	32.5	SA9.0A	SA9.0CA	
SA10	SA10C	10	11.1	14.1	1	3	3	18.8	26.6	SA10	SA10C	
SA10A	SA10CA	10	11.1	12.8	1	3	3	17	29.4	SA10A	SA10CA	
SA11	SA11C	11	12.2	15.4	1	3	3	20.1	24.9	SA11	SA11C	
SA11A	SA11CA	11	12.2	14	1	3	3	18.2	27.4	SA11A	SA11CA	
SA12	SA12C	12	13.3	16.9	1	3	3	22	22.7	SA12	SA12C	
SA12A	SA12CA	12	13.3	15.3	1	3	3	19.9	25.1	SA12A	SA12CA	
SA13	SA13C	13	14.4	18.2	1	3	3	23.8	21	SA13	SA13C	
SA13A	SA13CA	13	14.4	16.5	1	3	3	21.5	23.2	SA13A	SA13CA	
SA14	SA14C	14	15.6	19.8	1	3	3	25.8	19.4	SA14	SA14C	
SA14A	SA14CA	14	15.6	17.9	1	3	3	23.2	21.5	SA14A	SA14CA	
SA15	SA15C	15	16.7	21.1	1	3	3	26.9	18.8	SA15	SA15C	
SA15A	SA15CA	15	16.7	19.2	1	3	3	24.4	20.6	SA15A	SA15CA	
SA16	SA16C	16	17.8	22.6	1	3	3	28.8	17.6	SA16	SA16C	
SA16A	SA16CA	16	17.8	20.5	1	3	3	26	19.2	SA16A	SA16CA	
SA17	SA17C	17	18.9	23.9	1	3	3	30.5	16.4	SA17	SA17C	
SA17A	SA17CA	17	18.9	21.7	1	3	3	27.6	16.1	SA17A	SA17CA	
SA18	SA18C	18	20	25.3	1	3	3	32.2	15.5	SA18	SA18C	
SA18A	SA18CA	18	20	23.3	1	3	3	29.2	17.2	SA18A	SA18CA	
SA20	SA20C	20	22.2	28.1	1	3	3	35.8	13.9	SA20	SA20C	
SA20A	SA20CA	20	22.2	25.5	1	3	3	32.4	15.4	SA20A	SA20CA	
SA22	SA22C	22	24.4	30.9	1	3	3	39.4	12.7	SA22	SA22C	
SA22A	SA22CA	22	24.4	28	1	3	3	35.5	14.1	SA22A	SA22CA	
SA24	SA24C	24	26.7	33.8	1	3	3	43	11.6	SA24	SA24C	
SA24A	SA24CA	24	26.7	30.7	1	3	3	38.9	12.8	SA24A	SA24CA	
SA26	SA26C	26	28.9	36.6	1	3	3	46.6	10.7	SA26	SA26C	
SA26A	SA26CA	26	28.9	33.2	1	3	3	42.1	11.9	SA26A	SA26CA	
SA28	SA28C	28	31.1	39.4	1	3	3	50	9.9	SA28	SA28C	
SA28A	SA28CA	28	31.1	35.8	1	3	3	45.4	11	SA28A	SA28CA	
SA30	SA30C	30	33.3	42.2	1	3	3	53.5	9.3	SA30	SA30C	
SA30A	SA30CA	30	33.3	38.3	1	3	3	48.4	10.3	SA30A	SA30CA	
SA33	SA33C	33	36.7	46.5	1	3	3	59	5.8	SA33	SA33C	
SA33A	SA33CA	33	36.7	42.2	1	3	3	53.3	9.4	SA33A	SA33CA	
SA36	SA36C	36	40	50.7	1	3	3	64.3	7.8	SA36	SA36C	
SA36A	SA36CA	36	40	46	1	3	3	58.1	8.6	SA36A	SA36CA	
SA40	SA40C	40	44.4	56.3	1	3	3	71.4	7	SA40	SA40C	
SA40A	SA40CA	40	44.4	51.1	1	3	3	64.5	7.8	SA40A	SA40CA	



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		V <sub>RWM</sub>	V <sub>BR</sub> @ I <sub>T</sub>		I <sub>T</sub>	I <sub>R</sub> @ V <sub>RWM</sub>		V <sub>C</sub> @ I <sub>PP</sub>	I <sub>PP</sub>		
			Min.	Max.		UNI-	BI-				
UNI	BI	V	V	V	mA	µA	µA	V	A	UNI	BI
<b>500W Transient Voltage Suppressor</b>											
SA43	SA43C	43	47.8	60.5	1	3	3	76.7	6.5	SA43	SA43C
SA43A	SA43CA	43	47.8	54.9	1	3	3	69.4	7.2	SA43A	SA43CA
SA45	SA45C	45	50	63.3	1	3	3	80.3	6.2	SA45	SA45C
SA45A	SA45CA	45	50	57.5	1	3	3	72.7	6.9	SA45A	SA45CA
SA48	SA48C	48	53.3	67.5	1	3	3	85.5	5.8	SA48	SA48C
SA48A	SA48CA	48	53.3	61.3	1	3	3	77.4	6.5	SA48A	SA48CA
SA51	SA51C	51	56.7	71.8	1	3	3	91.1	5.5	SA51	SA51C
SA51A	SA51CA	51	56.7	65.2	1	3	3	82.4	6.1	SA51A	SA51CA
SA54	SA54C	54	60	76	1	3	3	96.3	5.2	SA54	SA54C
SA54A	SA54CA	54	60.0	69	1	3	3	87.1	5.7	SA54A	SA54CA
SA58	SA58C	58	64.4	81.6	1	3	3	103	4.9	SA58	SA58C
SA58A	SA58CA	58	64.4	74.1	1	3	3	93.6	5.3	SA58A	SA58CA
SA60	SA60C	60	66.7	84.5	1	3	3	107	4.7	SA60	SA60C
SA60A	SA60CA	60	66.7	76.7	1	3	3	96.8	5.2	SA60A	SA60CA
SA64	SA64C	64	71.1	90.1	1	3	3	114	4.4	SA64	SA64C
SA64A	SA64CA	64	71.1	81.8	1	3	3	103	4.9	SA64A	SA64CA
SA70	SA70C	70	77.8	98.6	1	3	3	125	4	SA70	SA70C
SA70A	SA70CA	70	77.8	89.5	1	3	3	113	4.4	SA70A	SA70CA
SA75	SA75C	75	83.3	105.7	1	3	3	134	3.7	SA75	SA75C
SA75A	SA75CA	75	83.3	95.8	1	3	3	121	4.1	SA75A	SA75CA
SA78	SA78C	78	86.7	109.8	1	3	3	139	3.6	SA78	SA78C
SA78A	SA78CA	78	86.7	99.7	1	3	3	126	4	SA78A	SA78CA
SA85	SA85C	85	94.4	119.2	1	3	3	151	3.3	SA85	SA85C
SA85A	SA85CA	85	94.4	108.2	1	3	3	137	3.6	SA85A	SA85CA
SA90	SA90C	90	100	126.5	1	3	3	160	3.1	SA90	SA90C
SA90A	SA90CA	90	100	115.5	1	3	3	146	3.4	SA90A	SA90CA
SA100	SA100C	100	111	141	1	3	3	179	2.8	SA100	SA100C
SA100A	SA100CA	100	111	128	1	3	3	162	3.1	SA100A	SA100CA
SA110	SA110C	110	122	154.5	1	3	3	196	2.6	SA110	SA110C
SA110A	SA110CA	110	122	140.5	1	3	3	177	2.8	SA110A	SA110CA
SA120	SA120C	120	133	169	1	3	3	214	2.3	SA120	SA120C
SA120A	SA120CA	120	133	153	1	3	3	193	2	SA120A	SA120CA
SA130	SA130C	130	144	182.5	1	3	3	231	2.2	SA130	SA130C
SA130A	SA130CA	130	144	165.5	1	3	3	209	2.4	SA130A	SA130CA
SA150	SA150C	150	167	211.5	1	3	3	268	1.9	SA150	SA150C
SA150A	SA150CA	150	167	192.5	1	3	3	243	2.1	SA150A	SA150CA
SA160	SA160C	160	178	226	1	3	3	287	1.7	SA160	SA160C
SA160A	SA160CA	160	178	205	1	3	3	259	1.9	SA160A	SA160CA
SA170	SA170C	170	189	239.5	1	3	3	304	1.6	SA170	SA170C
SA170A	SA170CA	170	189	217.5	1	3	3	275	1.8	SA170A	SA170CA
SA180	SA180C	180	198	253.8	1	3	3	322	1.6	SA180	SA180C
SA180A	SA180CA	180	198	230.4	1	3	3	292	1.7	SA180A	SA180CA
SA190	SA190C	190	209	267.9	1	3	3	340	1.5	SA190	SA190C
SA190A	SA190CA	190	209	243.2	1	3	3	308	1.6	SA190A	SA190CA
SA200	SA200C	200	220	282	1	3	3	358	1.4	SA200	SA200C
SA200A	SA200CA	200	220	256	1	3	3	324	1.5	SA200A	SA200CA
SA210	SA210C	210	231	296.1	1	3	3	376	1.3	SA210	SA210C
SA210A	SA210CA	210	231	268.8	1	3	3	340	1.5	SA210A	SA210CA
SA220	SA220C	220	242	310.2	1	3	3	394	1.3	SA220	SA220C
SA220A	SA220CA	220	242	281.6	1	3	3	356	1.4	SA220A	SA220CA



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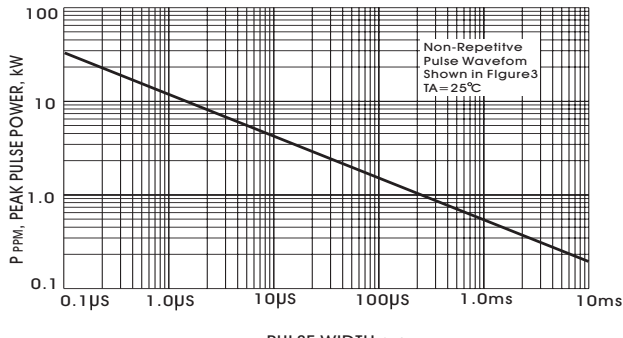


FIGURE 1-PEAK PULSE POWER RATING VERSUS PULSE TIME CURVE

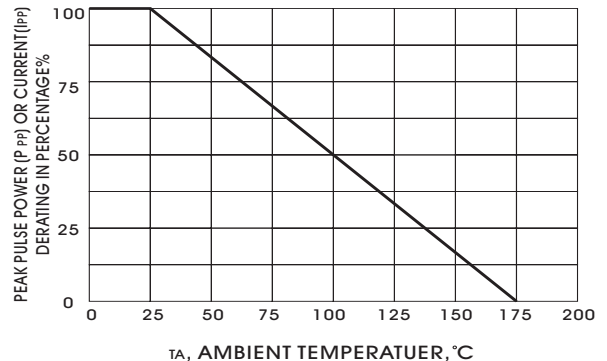


FIGURE 2-PULSE DERATING CURVE

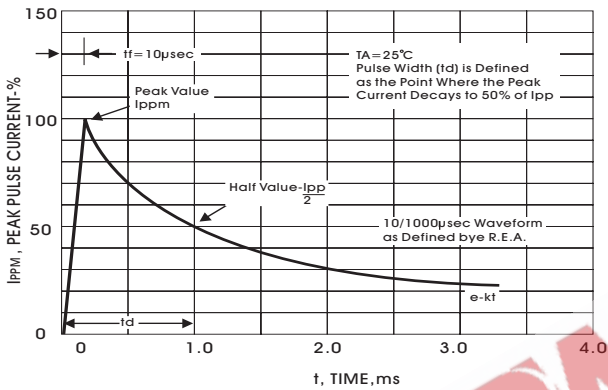


FIGURE 3-PULSE WAVEFORM

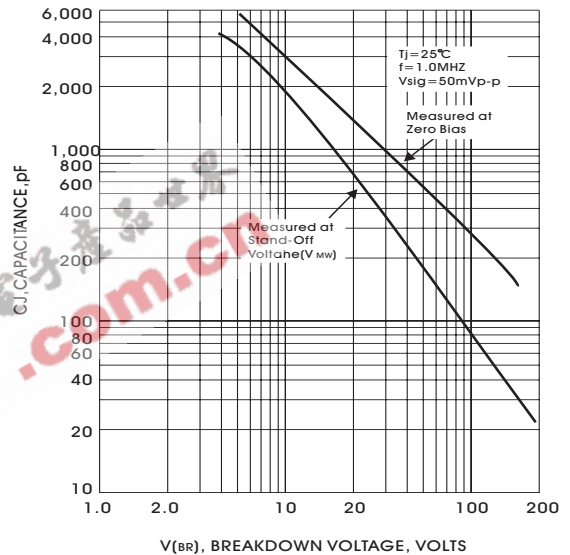


FIG. 4-TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

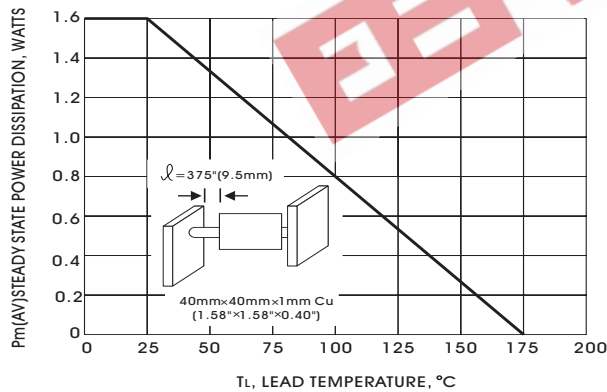


FIG. 5-STEADY STATE POWER DERATING CURVE

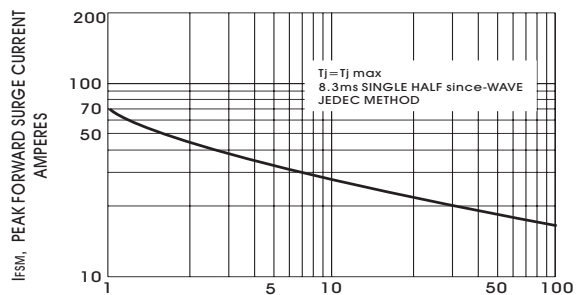


FIG. 6-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT UNIDIRECTIONAL

PLEASE REFER THE TVS APPLICATION NOTE IN PANJIT WEBSITE

<http://www.panjit.com/protection-transient-voltage-suppressors.html>