



DC COMPONENTS CO., LTD.

RECTIFIER SPECIALISTS

SA5.0
THRU
SA220CA

TECHNICAL SPECIFICATIONS OF TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE RANGE - 5.0 to 220Volts PEAK PULSE POWER - 500 Watts

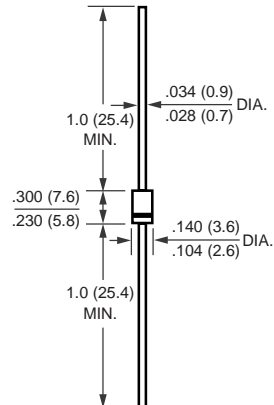
FEATURES

- * Glass passivated junction
- * 500 Watts Peak Pulse Power capability on 10/1000 μ s waveform
- * Excellent clamping capability
- * Low zener impedance
- * Fast response time

MECHANICAL DATA

- * Case: Molded plastic
- * Epoxy: UL 94V-0 rate flame retardant
- * Lead: MIL-STD-202E, Method 208 guaranteed
- * Polarity: Color band denotes positive end (cathode) except bidirectional types
- * Mounting position: Any
- * Weight: 0.4 gram

DO-15



Dimensions in inches and (millimeters)

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load,
For capacitive load, derate current by 20%.

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA suffix (e.g. SA5.0C, SA220CA).

Electrical characteristics apply in both directions

| | SYMBOL | VALUE | UNITS |
|---|-----------------------------------|--------------|-------|
| Peak Pulse Power Dissipation on 10/1000 μ s waveform (Note1, FIG.1) | PPPM | Minimum 500 | Watts |
| Steady State Power Dissipation at T = 75°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(JEDEC Method) (Note 3) | I _{FSM} | 70 | Amps |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional only | V _F | 3.5 | Volts |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to + 175 | °C |

NOTES : 1. Non-repetitive current pulse, per Fig.3 and derated above TA = 25°C per Fig. 2.

2. Mounted on Copper Leaf area of 1.6 X 1.6"(40 X 40mm) per Fig. 5

3. 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

RATING AND CHARACTERISTIC CURVES (SA5.0 THRU SA220CA)

FIG. 1 - PEAK PULSE POWER RATING CURVE

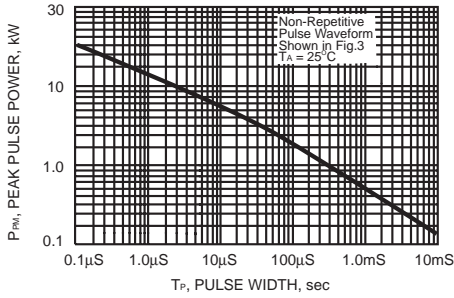


FIG. 2 - PULSE DERATING CURVE

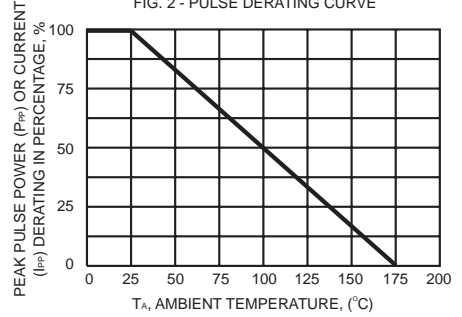


FIG. 3 - PULSE WAVEFORM

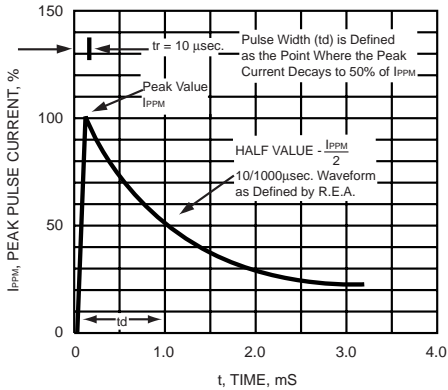


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

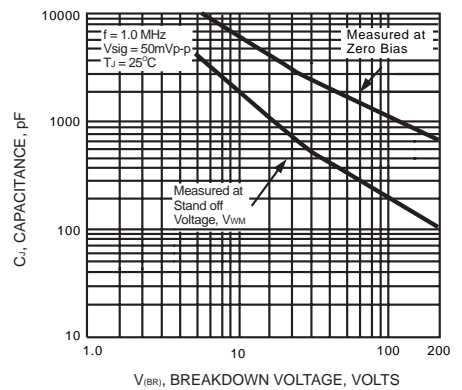


FIG. 5 - STEADY STATE POWER DERTING CURVE

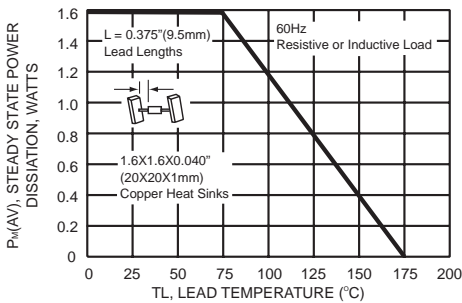


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL

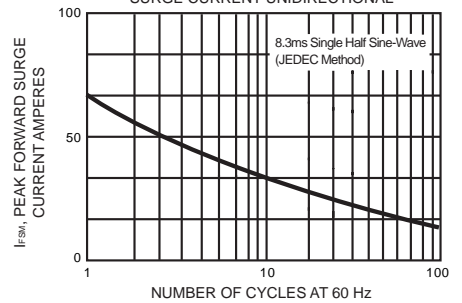
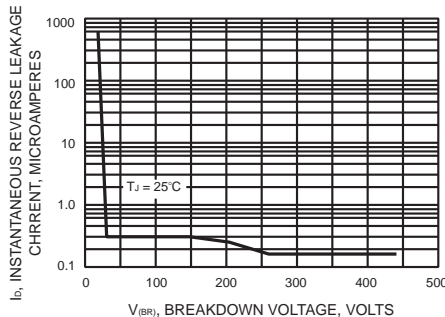


FIG. 7 - TYPICAL REVERSE LEAKAGE CHARACTERISTICS



SA (500W) SERIES TRANSIENT VOLTAGE SUPPRESSORS

| TYPE | Reverse Stand-off Voltage | Breakdown Voltage @ I _T | | Test Current | Maximum Reverse Leakage @ V _{RWM} | | Maximum Clamping Voltage @ I _{PP} | Maximum Peak Pulse Current |
|--------|---------------------------|------------------------------------|-------|----------------|--|----------------|--|----------------------------|
| | | V _{BR} | | | I _R | I _R | | |
| | V _{RWM} | Min. | Max. | I _T | | UNI- | BI- | V _C |
| | | V | V | | V | mA | μA | |
| SA5.0 | 5.0 | 6.40 | 7.55 | 10 | 600 | 1200 | 9.6 | 52.3 |
| SA5.0A | 5.0 | 6.40 | 7.25 | 10 | 600 | 1200 | 9.2 | 54.3 |
| SA6.0 | 6.0 | 6.67 | 8.45 | 10 | 600 | 1200 | 11.4 | 43.9 |
| SA6.0A | 6.0 | 6.67 | 7.67 | 10 | 600 | 1200 | 10.3 | 48.5 |
| SA6.5 | 6.5 | 7.22 | 9.14 | 10 | 400 | 800 | 12.3 | 40.7 |
| SA6.5A | 6.5 | 7.22 | 8.30 | 10 | 400 | 800 | 11.2 | 44.7 |
| SA7.0 | 7.0 | 7.78 | 9.86 | 10 | 150 | 300 | 13.3 | 37.8 |
| SA7.0A | 7.0 | 7.78 | 8.95 | 10 | 150 | 300 | 12.0 | 41.7 |
| SA7.5 | 7.5 | 8.33 | 10.67 | 1 | 50 | 100 | 14.3 | 35.0 |
| SA7.5A | 7.5 | 8.33 | 9.58 | 1 | 50 | 100 | 12.9 | 38.8 |
| SA8.0 | 8.0 | 8.89 | 11.30 | 1 | 25 | 50 | 15.0 | 33.3 |
| SA8.0A | 8.0 | 8.89 | 10.23 | 1 | 25 | 50 | 13.6 | 36.7 |
| SA8.5 | 8.5 | 9.44 | 11.92 | 1 | 10 | 20 | 15.9 | 31.4 |
| SA8.5A | 8.5 | 9.44 | 10.82 | 1 | 10 | 20 | 14.4 | 34.7 |
| SA9.0 | 9.0 | 10.0 | 12.6 | 1 | 5 | 10 | 16.9 | 29.5 |
| SA9.0A | 9.0 | 10.0 | 11.5 | 1 | 5 | 10 | 15.4 | 32.5 |
| SA10 | 10 | 11.1 | 14.1 | 1 | 3 | | 18.8 | 26.6 |
| SA10A | 10 | 11.1 | 12.8 | 1 | 3 | | 17.0 | 29.4 |
| SA11 | 11 | 12.2 | 15.4 | 1 | 3 | | 20.1 | 24.9 |
| SA11A | 11 | 12.2 | 14.0 | 1 | 3 | | 18.2 | 27.4 |
| SA12 | 12 | 13.3 | 16.9 | 1 | 3 | | 22.0 | 22.7 |
| SA12A | 12 | 13.3 | 15.3 | 1 | 3 | | 19.9 | 25.1 |
| SA13 | 13 | 14.4 | 18.2 | 1 | 3 | | 23.8 | 21.0 |
| SA13A | 13 | 14.4 | 16.5 | 1 | 3 | | 21.5 | 23.2 |
| SA14 | 14 | 15.6 | 19.8 | 1 | 3 | | 25.8 | 19.4 |
| SA14A | 14 | 15.6 | 17.9 | 1 | 3 | | 23.2 | 21.5 |
| SA15 | 15 | 16.7 | 21.1 | 1 | 3 | | 26.9 | 18.8 |
| SA15A | 15 | 16.7 | 19.2 | 1 | 3 | | 24.4 | 20.6 |
| SA16 | 16 | 17.8 | 22.6 | 1 | 3 | | 28.8 | 17.6 |
| SA16A | 16 | 17.8 | 20.5 | 1 | 3 | | 26.0 | 19.2 |
| SA17 | 17 | 18.9 | 23.9 | 1 | 3 | | 30.5 | 16.4 |
| SA17A | 17 | 18.9 | 21.7 | 1 | 3 | | 27.6 | 16.1 |
| SA18 | 18 | 20.0 | 25.3 | 1 | 3 | | 32.2 | 15.5 |
| SA18A | 18 | 20.0 | 23.3 | 1 | 3 | | 29.2 | 17.2 |
| SA20 | 20 | 22.2 | 28.1 | 1 | 3 | | 35.8 | 13.9 |
| SA20A | 20 | 22.2 | 25.5 | 1 | 3 | | 32.4 | 15.4 |
| SA22 | 22 | 24.4 | 30.9 | 1 | 3 | | 39.4 | 12.7 |
| SA22A | 22 | 24.4 | 28.0 | 1 | 3 | | 35.5 | 14.1 |
| SA24 | 24 | 26.7 | 33.8 | 1 | 3 | | 43.0 | 11.6 |
| SA24A | 24 | 26.7 | 30.7 | 1 | 3 | | 38.9 | 12.8 |
| SA26 | 26 | 28.9 | 36.6 | 1 | 3 | | 46.6 | 10.7 |
| SA26A | 26 | 28.9 | 33.2 | 1 | 3 | | 42.1 | 11.9 |
| SA28 | 28 | 31.1 | 39.4 | 1 | 3 | | 50.0 | 9.9 |
| SA28A | 28 | 31.1 | 35.8 | 1 | 3 | | 45.4 | 11.0 |
| SA30 | 30 | 33.3 | 42.2 | 1 | 3 | | 53.5 | 9.3 |
| SA30A | 30 | 33.3 | 38.3 | 1 | 3 | | 48.4 | 10.3 |
| SA33 | 33 | 36.7 | 46.5 | 1 | 3 | | 59.0 | 5.8 |
| SA33A | 33 | 36.7 | 42.2 | 1 | 3 | | 53.3 | 9.4 |
| SA36 | 36 | 40.0 | 50.7 | 1 | 3 | | 64.3 | 7.8 |
| SA36A | 36 | 40.0 | 46.0 | 1 | 3 | | 58.1 | 8.6 |
| SA40 | 40 | 44.4 | 56.3 | 1 | 3 | | 71.4 | 7.0 |
| SA40A | 40 | 44.4 | 51.1 | 1 | 3 | | 64.5 | 7.8 |



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|--------|---------------------------|------------------------------------|-------|--------------|--|----------------|--|----------------------------|
| | | V _{BR} | | | I _T | I _R | | |
| | V _{RWM} | Min. | Max. | UNI- | | BI- | | |
| | V | V | V | mA | μA | μA | V | A |
| SA43 | 43 | 47.8 | 60.5 | 1 | 3 | | 76.7 | 6.5 |
| SA43A | 43 | 47.8 | 54.9 | 1 | 3 | | 69.4 | 7.2 |
| SA45 | 45 | 50.0 | 63.3 | 1 | 3 | | 80.3 | 6.2 |
| SA45A | 45 | 50.0 | 57.5 | 1 | 3 | | 72.7 | 6.9 |
| SA48 | 48 | 53.3 | 67.5 | 1 | 3 | | 85.5 | 5.8 |
| SA48A | 48 | 53.3 | 61.3 | 1 | 3 | | 77.4 | 6.5 |
| SA51 | 51 | 56.7 | 71.8 | 1 | 3 | | 91.1 | 5.5 |
| SA51A | 51 | 56.7 | 65.2 | 1 | 3 | | 82.4 | 6.1 |
| SA54 | 54 | 60.0 | 76.0 | 1 | 3 | | 96.3 | 5.2 |
| SA54A | 54 | 60.0 | 69.0 | 1 | 3 | | 87.1 | 5.7 |
| SA58 | 58 | 64.4 | 81.6 | 1 | 3 | | 103.0 | 4.9 |
| SA58A | 58 | 64.4 | 74.1 | 1 | 3 | | 93.6 | 5.3 |
| SA60 | 60 | 66.7 | 84.5 | 1 | 3 | | 107.0 | 4.7 |
| SA60A | 60 | 66.7 | 76.7 | 1 | 3 | | 96.8 | 5.2 |
| SA64 | 64 | 71.1 | 90.1 | 1 | 3 | | 114 | 4.4 |
| SA64A | 64 | 71.1 | 81.8 | 1 | 3 | | 103 | 4.9 |
| SA70 | 70 | 77.8 | 98.6 | 1 | 3 | | 125 | 4.0 |
| SA70A | 70 | 77.8 | 89.5 | 1 | 3 | | 113 | 4.4 |
| SA75 | 75 | 83.3 | 105.7 | 1 | 3 | | 134 | 3.7 |
| SA75A | 75 | 83.3 | 95.8 | 1 | 3 | | 121 | 4.1 |
| SA78 | 78 | 86.7 | 109.8 | 1 | 3 | | 139 | 3.6 |
| SA78A | 78 | 86.7 | 99.7 | 1 | 3 | | 126 | 4.0 |
| SA85 | 85 | 94.4 | 119.2 | 1 | 3 | | 151 | 3.3 |
| SA85A | 85 | 94.4 | 108.2 | 1 | 3 | | 137 | 3.6 |
| SA90 | 90 | 100 | 126.5 | 1 | 3 | | 160 | 3.1 |
| SA90A | 90 | 100 | 115.5 | 1 | 3 | | 146 | 3.4 |
| SA100 | 100 | 111 | 141.0 | 1 | 3 | | 179 | 2.8 |
| SA100A | 100 | 111 | 128.0 | 1 | 3 | | 162 | 3.1 |
| SA110 | 110 | 122 | 154.5 | 1 | 3 | | 196 | 2.6 |
| SA110A | 110 | 122 | 140.5 | 1 | 3 | | 177 | 2.8 |
| SA120 | 120 | 133 | 169.0 | 1 | 3 | | 214 | 2.3 |
| SA120A | 120 | 133 | 153.0 | 1 | 3 | | 193 | 2.0 |
| SA130 | 130 | 144 | 182.5 | 1 | 3 | | 231 | 2.2 |
| SA130A | 130 | 144 | 165.5 | 1 | 3 | | 209 | 2.4 |
| SA150 | 150 | 167 | 211.5 | 1 | 3 | | 268 | 1.9 |
| SA150A | 150 | 167 | 192.5 | 1 | 3 | | 243 | 2.1 |
| SA160 | 160 | 178 | 226.0 | 1 | 3 | | 287 | 1.7 |
| SA160A | 160 | 178 | 205.0 | 1 | 3 | | 259 | 1.9 |
| SA170 | 170 | 189 | 239.5 | 1 | 3 | | 304 | 1.6 |
| SA170A | 170 | 189 | 217.5 | 1 | 3 | | 275 | 1.8 |
| SA180 | 180 | 198 | 253.8 | 1 | 3 | | 322 | 1.6 |
| SA180A | 180 | 198 | 230.4 | 1 | 3 | | 292 | 1.7 |
| SA190 | 190 | 209 | 267.9 | 1 | 3 | | 340 | 1.5 |
| SA190A | 190 | 209 | 243.2 | 1 | 3 | | 308 | 1.6 |
| SA200 | 200 | 220 | 282.0 | 1 | 3 | | 358 | 1.4 |
| SA200A | 200 | 220 | 256.0 | 1 | 3 | | 324 | 1.5 |
| SA210 | 210 | 231 | 296.1 | 1 | 3 | | 376 | 1.3 |
| SA210A | 210 | 231 | 268.8 | 1 | 3 | | 340 | 1.5 |
| SA220 | 220 | 242 | 310.2 | 1 | 3 | | 394 | 1.3 |
| SA220A | 220 | 242 | 281.6 | 1 | 3 | | 356 | 1.4 |

- NOTES: 1. V_{BR} measured after I_T applied for 300μs. I_T= Square Wave Pulse or equivalent.
 2. For Bidirectional use "C" or "CA" Suffix for all types (e.g.: SA5.0C, SA5.0CA, SA220C, SA220CA).
 Electrical characteristics apply in both directions.
 3. For bidirectional types having V_{RWM} of 10 volts and less, the I_D limit is doubled.



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