



# SA5.0 THRU SA170A

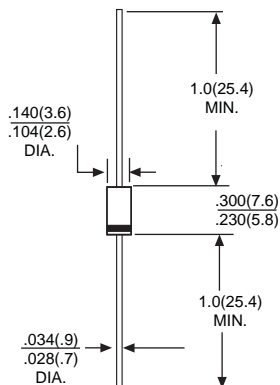
## Features

- \*500W Peak pulse power capability
- \*Excellent clamping capability
- \*Low incremental surge resistance
- \*Fast response time: Typically less than 1.0ps from 0v to VBR for unidirection and 5.0 ns for bidirectional types.

## Mechanical Data

- \*Cases: Molded plastic
- \*Epoxy: UL94V-0 rate flame retardant
- \*Lead: Axial leads, solderable per MIL-STD-202, Method 208 guaranteed
- \*Polarity: Color band denotes cathode except Bipolar
- \*Mounting position: Any
- \*Weight: 0.40 gram

## DO-15



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

| Type Number   |                                   | Value       | Units |
|---|-----------------------------------|-------------|-------|
| Peak Power Dissipation (Note 1)                                     | PPPM                              | Minimum 500 | W     |
| Peak Pulse reverse current (Note 1)                                 | IPPM                              | See Table   | A     |
| Steady State Power Dissipation (Note 2)                             | PM(AV)                            | 1.0         | W     |
| Peak Forward Surge Current (Note 3)                                 | IFSM                              | 70          | A     |
| Maximum Instaneous Forward Voltage at 50.0A for Unidirectional Only | V <sub>F</sub>                    | 3.5         | V     |
| Operating and Storage Temperature Range                             | T <sub>J</sub> , T <sub>STG</sub> | -55~+175    | °C    |

- NOTES: 1. 10/100us waveform Non-repetitive Current Pulse Per Fig.3 and Derated above TA=25°C Per Fig.2.  
 2. T<sub>1</sub>=75°C, lead lengths 9.5mm. Mounted on Copper Pad Area of (40 x40 mm) Fig.5  
 3. Measured on 8.3ms Single Half Sine-Wave or Equivalent Square Wave, Duty Cycle=4 Pulses Per Minute Maximun.  
 Devices for Bipolar Applications  
 1. For Bidirectional Use C or CA Suffix for Types SA5.0 thru types SA170 (e.g.SA5.0C,SA170CA)  
 2. Electrical Characteristics Apply in Both Directions.

# RATING AND CHARACTERISTIC CURVES SA5.0 THRU SA170A



FIG.1- PEAK PULSE POWER RATING CURVE

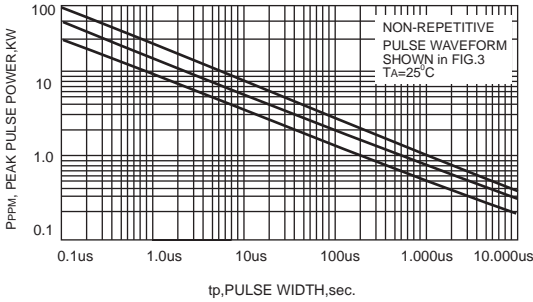


FIG.2-PULSE DERATING CURVE

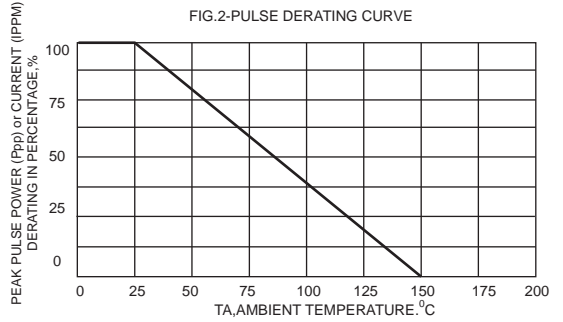


FIG.3- PULSE WAVEFORM

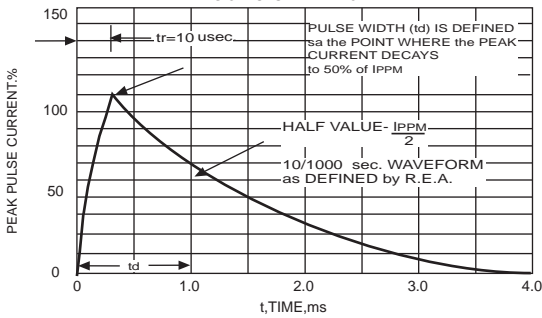


FIG.5-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

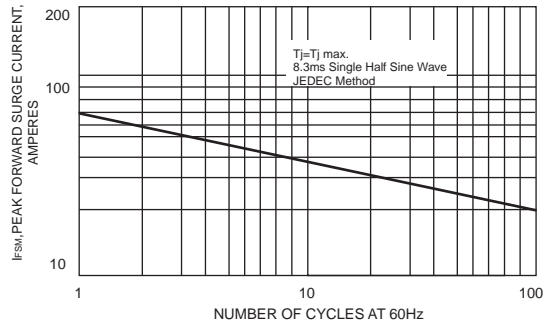
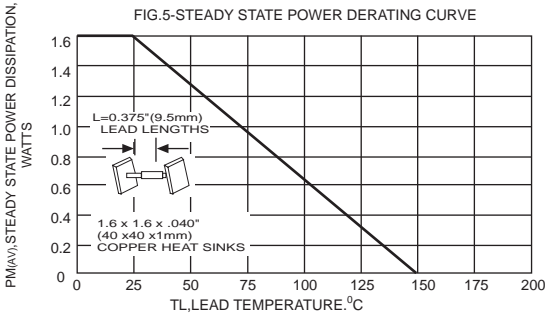


FIG.5-STEADY STATE POWER DERATING CURVE





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

| Device Type | Breakdown Voltage |      | Test Current   | Stand-off voltage | Maximun Reverse Leakage at VWM | Maximun Peak Pulse Current | Maximun Clamping Voltage at IPPM | Maximun Temperature Coefficient of VBR |
|-------------|-------------------|------|----------------|-------------------|--------------------------------|----------------------------|----------------------------------|--|
|             | V(BR) (Note1)     |      | I <sub>T</sub> | VWM               | I <sub>D</sub> (Note3)         | IPPM(Note2)                | V <sub>c</sub>                   |  |
|             | Volts             |      | (mA)           | (Volts)           | uA                             | Amps                       | Volts                            |  |
|             | Min               | Max  |                |                   |                                |                            |                                  |  |
| SA5.0       | 6.40              | 7.30 | 10.0           | 5.0               | 600                            | 54.0                       | 9.60                             | 5.0                                    |
| SA5.0A      | 6.40              | 7.00 | 10.0           | 5.0               | 600                            | 57.0                       | 9.20                             | 5.0                                    |
| SA6.0       | 6.67              | 8.15 | 10.0           | 6.0               | 600                            | 46.0                       | 11.4                             | 5.0                                    |
| SA6.0A      | 6.67              | 7.37 | 10.0           | 6.0               | 600                            | 50.0                       | 10.3                             | 5.0                                    |
| SA6.5       | 7.22              | 8.82 | 10.0           | 6.5               | 400                            | 42.0                       | 12.3                             | 5.0                                    |
| SA6.5A      | 7.22              | 7.98 | 10.0           | 6.5               | 400                            | 46.0                       | 11.2                             | 5.0                                    |
| SA7.0       | 7.78              | 9.51 | 1.0            | 7.0               | 150                            | 39.0                       | 13.3                             | 6.0                                    |
| SA7.0A      | 7.78              | 8.60 | 1.0            | 7.0               | 150                            | 43.0                       | 12.0                             | 6.0                                    |
| SA7.5       | 8.33              | 10.2 | 1.0            | 7.5               | 50                             | 36.0                       | 14.3                             | 7.0                                    |
| SA7.5A      | 8.33              | 9.21 | 1.0            | 7.5               | 50                             | 40.0                       | 12.9                             | 7.0                                    |
| SA8.0       | 8.89              | 10.9 | 1.0            | 8.0               | 25                             | 35.0                       | 15.0                             | 7.0                                    |
| SA8.0A      | 8.89              | 9.83 | 1.0            | 8.0               | 25                             | 38.0                       | 13.6                             | 7.0                                    |
| SA8.5       | 9.44              | 11.5 | 1.0            | 8.5               | 10                             | 33.0                       | 15.9                             | 8.0                                    |
| SA8.5A      | 9.44              | 10.4 | 1.0            | 8.5               | 10                             | 36.0                       | 14.4                             | 8.0                                    |
| SA9.0       | 10.0              | 12.2 | 1.0            | 9.0               | 5.0                            | 31.0                       | 16.9                             | 9.0                                    |
| SA9.0A      | 10.0              | 11.1 | 1.0            | 9.0               | 5.0                            | 34.0                       | 15.4                             | 9.0                                    |
| SA10        | 11.1              | 13.6 | 1.0            | 10.0              | 1.0                            | 27.0                       | 18.8                             | 10.0                                   |
| SA10A       | 11.1              | 12.3 | 1.0            | 10.0              | 1.0                            | 30.0                       | 17.0                             | 10.0                                   |
| SA11        | 12.2              | 14.9 | 1.0            | 11.0              | 1.0                            | 26.0                       | 20.1                             | 11.0                                   |
| SA11A       | 12.2              | 13.5 | 1.0            | 11.0              | 1.0                            | 28.0                       | 18.2                             | 11.0                                   |
| SA12        | 13.3              | 16.3 | 1.0            | 12.0              | 1.0                            | 23.0                       | 22.0                             | 12.0                                   |
| SA12A       | 13.3              | 14.7 | 1.0            | 12.0              | 1.0                            | 26.0                       | 19.9                             | 12.0                                   |
| SA13        | 14.4              | 17.6 | 1.0            | 13.0              | 1.0                            | 22.0                       | 23.8                             | 13.0                                   |
| SA13A       | 14.4              | 15.9 | 1.0            | 13.0              | 1.0                            | 24.0                       | 21.5                             | 13.0                                   |
| SA14        | 15.6              | 19.1 | 1.0            | 14.0              | 1.0                            | 20.3                       | 25.8                             | 14.0                                   |
| SA14A       | 15.6              | 17.2 | 1.0            | 14.0              | 1.0                            | 22.6                       | 23.2                             | 14.0                                   |
| SA15        | 16.7              | 20.4 | 1.0            | 15.0              | 1.0                            | 19.5                       | 26.9                             | 16.0                                   |
| SA15A       | 16.7              | 18.5 | 1.0            | 15.0              | 1.0                            | 21.0                       | 24.4                             | 16.0                                   |
| SA16        | 17.8              | 21.8 | 1.0            | 16.0              | 1.0                            | 18.0                       | 28.8                             | 19.0                                   |
| SA16A       | 17.8              | 19.7 | 1.0            | 16.0              | 1.0                            | 20.0                       | 26.0                             | 17.0                                   |
| SA17        | 18.9              | 23.1 | 1.0            | 17.0              | 1.0                            | 17.0                       | 30.5                             | 20.0                                   |
| SA17A       | 18.9              | 20.9 | 1.0            | 17.0              | 1.0                            | 19.0                       | 27.6                             | 19.0                                   |
| SA18        | 20.0              | 24.4 | 1.0            | 18.0              | 1.0                            | 16.3                       | 32.2                             | 21.0                                   |
| SA18A       | 20.0              | 22.1 | 1.0            | 18.0              | 1.0                            | 17.9                       | 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                            | 16.0                       | 32.4                             | 23.0                                   |
| SA22        | 24.4              | 29.8 | 1.0            | 22.0              | 1.0                            | 13.0                       | 39.4                             | 28.0                                   |
| SA22A       | 24.4              | 26.9 | 1.0            | 22.0              | 1.0                            | 14.7                       | 35.6                             | 25.0                                   |
| SA24        | 26.7              | 32.6 | 1.0            | 24.0              | 1.0                            | 12.0                       | 43.0                             | 31.0                                   |
| SA24A       | 26.7              | 29.5 | 1.0            | 24.0              | 1.0                            | 13.4                       | 38.9                             | 28.0                                   |
| SA26        | 28.9              | 35.3 | 1.0            | 26.0              | 1.0                            | 11.0                       | 46.6                             | 31.0                                   |
| SA26A       | 28.9              | 31.6 | 1.0            | 26.0              | 1.0                            | 12.4                       | 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                            | 11.5                       | 45.4                             | 31.0                                   |
| SA30        | 33.3              | 40.7 | 1.0            | 30.0              | 1.0                            | 9.8                        | 53.5                             | 39.0                                   |
| SA30A       | 33.3              | 36.8 | 1.0            | 30.0              | 1.0                            | 10.8                       | 48.4                             | 36.0                                   |
| SA33        | 36.7              | 44.9 | 1.0            | 33.0              | 1.0                            | 8.8                        | 59.0                             | 42.0                                   |
| SA33A       | 36.7              | 40.6 | 1.0            | 33.0              | 1.0                            | 9.8                        | 53.3                             | 39.0                                   |



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

| Device Type | Breakdown Voltage |      | Test Current | Stand-off voltage | Maximun Reverse Leakage at VWM | Maximun Peak Pulse Current | Maximun Clamping Voltage at IPPM | Maximun Temperature Coefficient of VBR |
|-------------|-------------------|------|--------------|-------------------|--------------------------------|----------------------------|----------------------------------|--|
|             | V(BR) (Note1)     |      | IT           | VWM               | ID(Note3)                      | IPPM(Note2)                | Vc                               | MV / °C                                |
|             | Volts             |      | (mA)         | (Volts)           | uA                             | Amps                       | Volts                            |  |
|             | Min               | Max  |              |                   |                                |                            |                                  |  |
| SA36        | 40.0              | 48.9 | 1.0          | 36.0              | 1.0                            | 8.1                        | 64.3                             | 46.0                                   |
| SA36A       | 40.0              | 44.2 | 1.0          | 36.0              | 1.0                            | 9.0                        | 58.1                             | 41.0                                   |
| SA40        | 44.4              | 54.3 | 1.0          | 40.0              | 1.0                            | 7.3                        | 71.4                             | 51.0                                   |
| SA40A       | 44.4              | 49.1 | 1.0          | 40.0              | 1.0                            | 8.1                        | 64.5                             | 46.0                                   |
| SA43        | 47.8              | 58.4 | 1.0          | 43.0              | 1.0                            | 6.8                        | 76.7                             | 55.0                                   |
| SA43A       | 47.8              | 52.8 | 1.0          | 43.0              | 1.0                            | 7.5                        | 69.4                             | 50.0                                   |
| SA45        | 50.0              | 61.1 | 1.0          | 45.0              | 150                            | 6.5                        | 80.3                             | 58.0                                   |
| SA45A       | 50.0              | 55.3 | 1.0          | 45.0              | 150                            | 7.2                        | 72.7                             | 52.0                                   |
| SA48        | 53.3              | 65.2 | 1.0          | 48.0              | 50                             | 6.1                        | 85.5                             | 63.0                                   |
| SA48A       | 53.3              | 58.9 | 1.0          | 48.0              | 50                             | 6.7                        | 77.4                             | 56.0                                   |
| SA51        | 56.7              | 69.3 | 1.0          | 51.0              | 25                             | 5.7                        | 91.1                             | 66.0                                   |
| SA51A       | 56.7              | 62.7 | 1.0          | 51.0              | 25                             | 6.3                        | 82.4                             | 61.0                                   |
| SA54        | 60.0              | 73.3 | 1.0          | 54.0              | 10                             | 5.4                        | 96.3                             | 71.0                                   |
| SA54A       | 60.0              | 66.3 | 1.0          | 54.0              | 10                             | 6.0                        | 87.1                             | 65.0                                   |
| SA58        | 64.4              | 78.7 | 1.0          | 58.0              | 5.0                            | 5.0                        | 103                              | 78.0                                   |
| SA58A       | 64.4              | 71.2 | 1.0          | 58.0              | 5.0                            | 5.6                        | 93.6                             | 70.0                                   |
| SA60        | 66.7              | 81.5 | 1.0          | 60.0              | 1.0                            | 4.9                        | 107                              | 80.0                                   |
| SA60A       | 66.7              | 73.7 | 1.0          | 60.0              | 1.0                            | 5.4                        | 96.8                             | 71.0                                   |
| SA64        | 71.1              | 86.9 | 1.0          | 64.0              | 1.0                            | 4.6                        | 114                              | 86.0                                   |
| SA64A       | 71.1              | 78.6 | 1.0          | 64.0              | 1.0                            | 5.0                        | 103                              | 76.0                                   |
| SA70        | 77.8              | 95.1 | 1.0          | 70.0              | 1.0                            | 4.2                        | 125                              | 94.0                                   |
| SA70A       | 77.8              | 86   | 1.0          | 70.0              | 1.0                            | 4.6                        | 113                              | 85.0                                   |
| SA75        | 88.3              | 102  | 1.0          | 75.0              | 1.0                            | 3.9                        | 134                              | 101                                    |
| SA75A       | 88.3              | 92.1 | 1.0          | 75.0              | 1.0                            | 4.3                        | 121                              | 91                                     |
| SA78        | 86.7              | 103  | 1.0          | 78.0              | 1.0                            | 3.7                        | 139                              | 105                                    |
| SA78A       | 86.7              | 95.8 | 1.0          | 78.0              | 1.0                            | 4.1                        | 126                              | 95                                     |
| SA85        | 94.4              | 115  | 1.0          | 85.0              | 1.0                            | 3.4                        | 151                              | 114                                    |
| SA85A       | 94.4              | 104  | 1.0          | 85.0              | 1.0                            | 3.8                        | 137                              | 103                                    |
| SA90        | 100               | 122  | 1.0          | 90.0              | 1.0                            | 3.2                        | 160                              | 121                                    |
| SA90A       | 100               | 111  | 1.0          | 90.0              | 1.0                            | 3.5                        | 146                              | 110                                    |
| SA100       | 111               | 136  | 1.0          | 100               | 1.0                            | 2.9                        | 179                              | 135                                    |
| SA100A      | 111               | 123  | 1.0          | 100               | 1.0                            | 3.2                        | 162                              | 123                                    |
| SA110       | 122               | 149  | 1.0          | 110               | 1.0                            | 2.6                        | 196                              | 148                                    |
| SA110A      | 122               | 135  | 1.0          | 110               | 1.0                            | 2.9                        | 177                              | 133                                    |
| SA120       | 133               | 163  | 1.0          | 120               | 1.0                            | 2.4                        | 214                              | 162                                    |
| SA120A      | 133               | 147  | 1.0          | 120               | 1.0                            | 2.7                        | 193                              | 146                                    |
| SA130       | 144               | 176  | 1.0          | 130               | 1.0                            | 2.2                        | 230                              | 175                                    |
| SA130A      | 144               | 159  | 1.0          | 130               | 1.0                            | 2.5                        | 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                            | 2.0                        | 257                              | 217                                    |
| SA160A      | 178               | 197  | 1.0          | 160               | 1.0                            | 2.0                        | 259                              | 196                                    |
| SA170       | 189               | 231  | 1.0          | 170               | 1.0                            | 1.7                        | 304                              | 230                                    |
| SA170A      | 189               | 209  | 1.0          | 170               | 1.0                            | 1.9                        | 275                              | 208                                    |

Notes:  
 1.VBR measured after IT applied for 300us.IT=square wave pulse or equivalent.  
 2.Surge current waveform per Figure 3 and derate per Figure 2.  
 3.For bipolar types having VWM of 10 volts and under,the ID limit is doubled.  
 4.All terms and symbols are consistent with ANSI/IEEE C62.35.