

# 1N6267 - 1N6303A

## TRANSIENT VOLTAGE SUPPRESSOR

**V<sub>BR</sub> : 6.8 - 200 Volts**

**P<sub>PK</sub> : 1500 Watts**

### FEATURES :

- \* 1500W surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time : typically less than 1.0 ps from 0 volt to V<sub>BR(min.)</sub>
- \* Typical I<sub>R</sub> less than 1μA above 10V
- \* **Pb / RoHS Free**

### MECHANICAL DATA

- \* Case : DO-201 Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Axial lead solderable per MIL-STD-202, method 208 guaranteed
- \* Polarity : Color band denotes cathode end except Bipolar.
- \* Mounting position : Any
- \* Weight : 0.93 gram

### DEVICES FOR BIPOLAR APPLICATIONS

For bi-directional use C or CA Suffix

Electrical characteristics apply in both directions

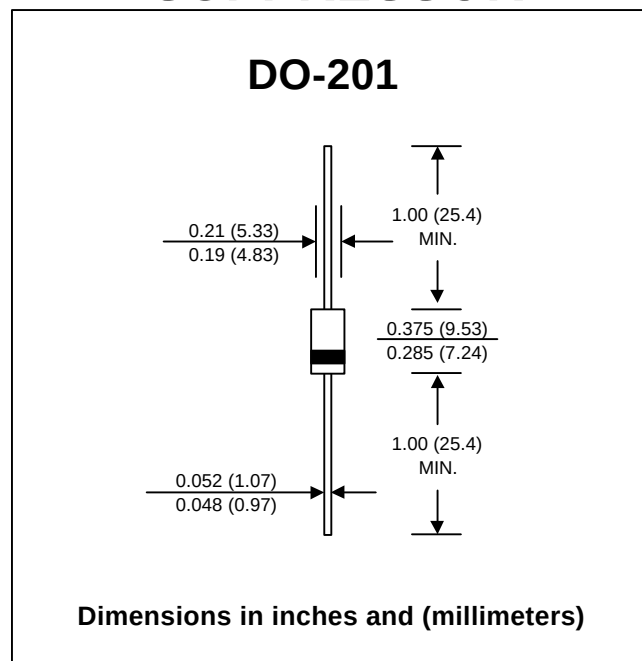
### MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified.

| Rating                                                                                                           | Symbol                            | Value         | Unit |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------|------|
| Peak Power Dissipation at Ta = 25 °C, Tp=1ms (Note1)                                                             | PPK                               | 1500          | W    |
| Steady State Power Dissipation at TL = 75 °C<br>Lead Lengths 0.375", (9.5mm) (Note 2)                            | P <sub>D</sub>                    | 5.0           | W    |
| Peak Forward Surge Current, 8.3ms Single Half<br>Sine-Wave Superimposed on Rated Load<br>(JEDEC Method) (Note 3) | I <sub>FSM</sub>                  | 200           | A    |
| Operating and Storage Temperature Range                                                                          | T <sub>J</sub> , T <sub>STG</sub> | - 65 to + 175 | °C   |

### Note :

- (1) Non-repetitive Current pulse, per Fig. 5 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on Copper Lead area of 1.57 in<sup>2</sup> (40mm<sup>2</sup>).
- (3) 8.3 ms single half sine-wave, duty cycle = 4 pulses per minutes maximum.



## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

| TYPE    | Breakdown Voltage @ It<br>( Note 1 ) |      |      | Working Peak<br>Reverse<br>Voltage | Maximum<br>Reverse Leakage<br>@ VRWM | Maximum<br>Reverse<br>Current | Maximum<br>Clamping<br>Voltage @ IRSM | Maximum<br>Temperature<br>Co-efficient<br>of VBR |
|---------|--------------------------------------|------|------|------------------------------------|--------------------------------------|-------------------------------|---------------------------------------|--------------------------------------------------|
|         | VBR (V)                              |      | It   | VRWM                               | IR                                   | IRSM                          | VRSM                                  | of VBR<br>of VBR                                 |
|         | Min.                                 | Max. | (mA) | (V)                                | (μA)                                 | (A)                           | (V)                                   |                                                  |
|         |                                      |      |      |                                    |                                      |                               |                                       |                                                  |
| 1N6267  | 6.12                                 | 7.48 | 10   | 5.50                               | 1000                                 | 139                           | 10.8                                  | 0.057                                            |
| 1N6267A | 6.45                                 | 7.14 | 10   | 5.80                               | 1000                                 | 143                           | 10.5                                  | 0.057                                            |
| 1N6268  | 6.75                                 | 8.25 | 10   | 6.05                               | 500                                  | 128                           | 11.7                                  | 0.061                                            |
| 1N6268A | 7.13                                 | 7.88 | 10   | 6.40                               | 500                                  | 132                           | 11.3                                  | 0.061                                            |
| 1N6269  | 7.38                                 | 9.02 | 10   | 6.63                               | 200                                  | 120                           | 12.5                                  | 0.065                                            |
| 1N6269A | 7.79                                 | 8.61 | 10   | 7.02                               | 200                                  | 124                           | 12.1                                  | 0.065                                            |
| 1N6270  | 8.19                                 | 10.0 | 1.0  | 7.37                               | 50                                   | 109                           | 13.8                                  | 0.068                                            |
| 1N6270A | 8.65                                 | 9.55 | 1.0  | 7.78                               | 50                                   | 112                           | 13.4                                  | 0.068                                            |
| 1N6271  | 9.00                                 | 11.0 | 1.0  | 8.10                               | 10                                   | 100                           | 15.0                                  | 0.073                                            |
| 1N6271A | 9.50                                 | 10.5 | 1.0  | 8.55                               | 10                                   | 103                           | 14.5                                  | 0.073                                            |
| 1N6272  | 9.90                                 | 12.1 | 1.0  | 8.92                               | 5.0                                  | 93.0                          | 16.2                                  | 0.075                                            |
| 1N6272A | 10.5                                 | 11.6 | 1.0  | 9.40                               | 5.0                                  | 96.0                          | 15.6                                  | 0.075                                            |
| 1N6273  | 10.8                                 | 13.2 | 1.0  | 9.72                               | 5.0                                  | 87.0                          | 17.3                                  | 0.078                                            |
| 1N6273A | 11.4                                 | 12.6 | 1.0  | 10.2                               | 5.0                                  | 90.0                          | 16.7                                  | 0.078                                            |
| 1N6274  | 11.7                                 | 14.3 | 1.0  | 10.5                               | 5.0                                  | 79.0                          | 19.0                                  | 0.081                                            |
| 1N6274A | 12.4                                 | 13.7 | 1.0  | 11.1                               | 5.0                                  | 82.0                          | 18.2                                  | 0.081                                            |
| 1N6275  | 13.5                                 | 16.5 | 1.0  | 12.1                               | 5.0                                  | 68.0                          | 22.0                                  | 0.084                                            |
| 1N6275A | 14.3                                 | 15.8 | 1.0  | 12.8                               | 5.0                                  | 71.0                          | 21.2                                  | 0.084                                            |
| 1N6276  | 14.4                                 | 17.6 | 1.0  | 12.9                               | 5.0                                  | 64.0                          | 23.5                                  | 0.086                                            |
| 1N6276A | 15.2                                 | 16.8 | 1.0  | 13.6                               | 5.0                                  | 67.0                          | 22.5                                  | 0.086                                            |
| 1N6277  | 16.2                                 | 19.8 | 1.0  | 14.5                               | 5.0                                  | 56.5                          | 26.5                                  | 0.088                                            |
| 1N6277A | 17.1                                 | 18.9 | 1.0  | 15.3                               | 5.0                                  | 59.5                          | 25.2                                  | 0.088                                            |
| 1N6278  | 18.0                                 | 22.0 | 1.0  | 16.2                               | 5.0                                  | 51.5                          | 29.1                                  | 0.090                                            |
| 1N6278A | 19.0                                 | 21.0 | 1.0  | 17.1                               | 5.0                                  | 54.0                          | 27.7                                  | 0.090                                            |
| 1N6279  | 19.8                                 | 24.2 | 1.0  | 17.8                               | 5.0                                  | 47.0                          | 31.9                                  | 0.092                                            |
| 1N6279A | 20.9                                 | 23.1 | 1.0  | 18.8                               | 5.0                                  | 49.0                          | 30.6                                  | 0.092                                            |
| 1N6280  | 21.6                                 | 26.4 | 1.0  | 19.4                               | 5.0                                  | 43.0                          | 34.7                                  | 0.094                                            |
| 1N6280A | 22.8                                 | 25.2 | 1.0  | 20.5                               | 5.0                                  | 45.0                          | 33.2                                  | 0.094                                            |
| 1N6281  | 24.3                                 | 29.7 | 1.0  | 21.8                               | 5.0                                  | 38.5                          | 39.1                                  | 0.096                                            |
| 1N6281A | 25.7                                 | 28.4 | 1.0  | 23.1                               | 5.0                                  | 40.0                          | 37.5                                  | 0.096                                            |
| 1N6282  | 27.0                                 | 33.0 | 1.0  | 24.3                               | 5.0                                  | 34.5                          | 43.5                                  | 0.097                                            |
| 1N6282A | 28.5                                 | 31.5 | 1.0  | 25.6                               | 5.0                                  | 36.0                          | 41.4                                  | 0.097                                            |
| 1N6283  | 29.7                                 | 36.3 | 1.0  | 26.8                               | 5.0                                  | 31.5                          | 47.7                                  | 0.098                                            |
| 1N6283A | 31.4                                 | 34.7 | 1.0  | 28.2                               | 5.0                                  | 33.0                          | 45.7                                  | 0.098                                            |
| 1N6284  | 32.4                                 | 39.6 | 1.0  | 29.1                               | 5.0                                  | 29.0                          | 52.0                                  | 0.099                                            |
| 1N6284A | 34.2                                 | 37.8 | 1.0  | 30.8                               | 5.0                                  | 30.0                          | 49.9                                  | 0.099                                            |
| 1N6285  | 35.1                                 | 42.9 | 1.0  | 31.6                               | 5.0                                  | 26.5                          | 56.4                                  | 0.100                                            |
| 1N6285A | 37.1                                 | 41.0 | 1.0  | 33.3                               | 5.0                                  | 28.0                          | 53.9                                  | 0.100                                            |
| 1N6286  | 38.7                                 | 47.3 | 1.0  | 34.8                               | 5.0                                  | 24.0                          | 61.9                                  | 0.101                                            |
| 1N6286A | 40.9                                 | 45.2 | 1.0  | 36.8                               | 5.0                                  | 25.3                          | 59.3                                  | 0.101                                            |
| 1N6287  | 42.3                                 | 51.7 | 1.0  | 38.1                               | 5.0                                  | 22.2                          | 67.8                                  | 0.101                                            |
| 1N6287A | 44.7                                 | 49.4 | 1.0  | 40.2                               | 5.0                                  | 23.2                          | 64.8                                  | 0.101                                            |
| 1N6288  | 45.9                                 | 56.1 | 1.0  | 41.3                               | 5.0                                  | 20.4                          | 73.5                                  | 0.102                                            |
| 1N6288A | 48.5                                 | 53.6 | 1.0  | 43.6                               | 5.0                                  | 21.4                          | 70.1                                  | 0.102                                            |

## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

| TYPE    | Breakdown Voltage @ It<br>( Note 1 ) |      |      | Working Peak<br>Reverse<br>Voltage<br>V <sub>RWM</sub> | Maximum<br>Reverse Leakage<br>@ V <sub>RWM</sub> | Maximum<br>Reverse<br>Current<br>I <sub>RSM</sub> | Maximum<br>Clamping<br>Voltage @ I <sub>RSM</sub><br>V <sub>RSM</sub> | Maximum<br>Temperature<br>Co-efficient<br>of V <sub>BR</sub><br>(% / °C) |
|---------|--------------------------------------|------|------|--------------------------------------------------------|--------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------|
|         | V <sub>BR</sub> (V)                  |      | It   |                                                        |                                                  |                                                   |                                                                       |                                                                          |
|         | Min.                                 | Max. | (mA) |                                                        |                                                  |                                                   |                                                                       |                                                                          |
|         |                                      |      |      | (V)                                                    | (μA)                                             | (A)                                               | (V)                                                                   |                                                                          |
| 1N6289  | 50.4                                 | 61.6 | 1.0  | 45.4                                                   | 5.0                                              | 18.6                                              | 80.5                                                                  | 0.103                                                                    |
| 1N6289A | 53.2                                 | 58.8 | 1.0  | 47.8                                                   | 5.0                                              | 19.5                                              | 77.0                                                                  | 0.103                                                                    |
| 1N6290  | 55.8                                 | 68.2 | 1.0  | 50.2                                                   | 5.0                                              | 16.9                                              | 89.0                                                                  | 0.104                                                                    |
| 1N6290A | 58.9                                 | 65.1 | 1.0  | 53.0                                                   | 5.0                                              | 17.7                                              | 85.0                                                                  | 0.104                                                                    |
| 1N6291  | 61.2                                 | 74.8 | 1.0  | 55.1                                                   | 5.0                                              | 15.3                                              | 98.0                                                                  | 0.104                                                                    |
| 1N6291A | 64.6                                 | 71.4 | 1.0  | 58.1                                                   | 5.0                                              | 16.3                                              | 92.0                                                                  | 0.104                                                                    |
| 1N6292  | 67.5                                 | 82.5 | 1.0  | 60.7                                                   | 5.0                                              | 13.9                                              | 108                                                                   | 0.105                                                                    |
| 1N6292A | 71.3                                 | 78.8 | 1.0  | 64.1                                                   | 5.0                                              | 14.6                                              | 103                                                                   | 0.105                                                                    |
| 1N6293  | 73.8                                 | 90.2 | 1.0  | 66.4                                                   | 5.0                                              | 12.7                                              | 118                                                                   | 0.105                                                                    |
| 1N6293A | 77.9                                 | 86.1 | 1.0  | 70.1                                                   | 5.0                                              | 13.3                                              | 113                                                                   | 0.105                                                                    |
| 1N6294  | 81.9                                 | 100  | 1.0  | 73.7                                                   | 5.0                                              | 11.4                                              | 131                                                                   | 0.106                                                                    |
| 1N6294A | 86.5                                 | 95.5 | 1.0  | 77.8                                                   | 5.0                                              | 12.0                                              | 125                                                                   | 0.106                                                                    |
| 1N6295  | 90.0                                 | 110  | 1.0  | 81.0                                                   | 5.0                                              | 10.4                                              | 144                                                                   | 0.106                                                                    |
| 1N6295A | 95.0                                 | 105  | 1.0  | 85.5                                                   | 5.0                                              | 11.0                                              | 137                                                                   | 0.106                                                                    |
| 1N6296  | 99.0                                 | 121  | 1.0  | 89.2                                                   | 5.0                                              | 9.5                                               | 158                                                                   | 0.107                                                                    |
| 1N6296A | 105                                  | 116  | 1.0  | 94.0                                                   | 5.0                                              | 9.9                                               | 152                                                                   | 0.107                                                                    |
| 1N6297  | 108                                  | 132  | 1.0  | 97.2                                                   | 5.0                                              | 8.7                                               | 173                                                                   | 0.107                                                                    |
| 1N6297A | 114                                  | 126  | 1.0  | 102                                                    | 5.0                                              | 9.1                                               | 165                                                                   | 0.107                                                                    |
| 1N6298  | 117                                  | 143  | 1.0  | 105                                                    | 5.0                                              | 8.0                                               | 187                                                                   | 0.107                                                                    |
| 1N6298A | 124                                  | 137  | 1.0  | 111                                                    | 5.0                                              | 8.4                                               | 179                                                                   | 0.107                                                                    |
| 1N6299  | 135                                  | 165  | 1.0  | 121                                                    | 5.0                                              | 7.0                                               | 215                                                                   | 0.108                                                                    |
| 1N6299A | 143                                  | 158  | 1.0  | 128                                                    | 5.0                                              | 7.2                                               | 207                                                                   | 0.108                                                                    |
| 1N6300  | 144                                  | 176  | 1.0  | 130                                                    | 5.0                                              | 6.5                                               | 230                                                                   | 0.108                                                                    |
| 1N6300A | 152                                  | 168  | 1.0  | 136                                                    | 5.0                                              | 6.8                                               | 219                                                                   | 0.108                                                                    |
| 1N6301  | 153                                  | 187  | 1.0  | 138                                                    | 5.0                                              | 6.2                                               | 244                                                                   | 0.108                                                                    |
| 1N6301A | 162                                  | 179  | 1.0  | 145                                                    | 5.0                                              | 6.4                                               | 234                                                                   | 0.108                                                                    |
| 1N6302  | 162                                  | 198  | 1.0  | 146                                                    | 5.0                                              | 5.8                                               | 258                                                                   | 0.108                                                                    |
| 1N6302A | 171                                  | 189  | 1.0  | 154                                                    | 5.0                                              | 6.1                                               | 246                                                                   | 0.108                                                                    |
| 1N6303  | 180                                  | 220  | 1.0  | 162                                                    | 5.0                                              | 5.2                                               | 287                                                                   | 0.108                                                                    |
| 1N6303A | 190                                  | 210  | 1.0  | 171                                                    | 5.0                                              | 5.5                                               | 274                                                                   | 0.108                                                                    |

### Note:

- ( 1 )  $V_{BR}$  measured after  $I_t$  applied for 300  $\mu$ s.,  $I_t$  = square wave pulse or equivalent.
- ( 2 )  $V_F$  = 3.5  $V_{max.}$ ,  $I_F$  = 100 Amps. ( 6.8 Volts thru 91 Volts )  
 $V_F$  = 5.0  $V_{max.}$ ,  $I_F$  = 100 Amps. ( 100 Volts thru 200 Volts ) per 1/2 square or equivalent sine wave.  
PW = 8.3 ms, duty cycle = 4 pulses per minute maximum.

## RATING AND CHARACTERISTIC CURVES ( 1N6267 - 1N6303A )

FIG.1 - PULSE DERATING CURVE

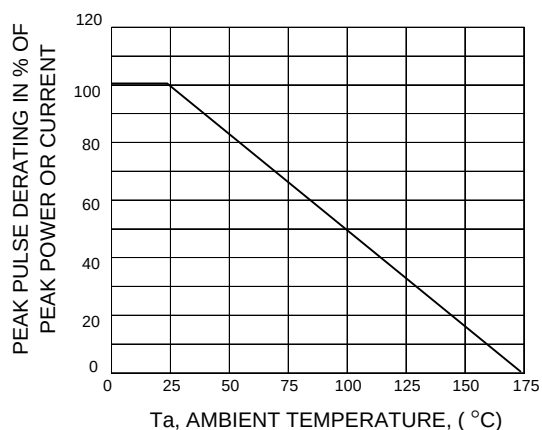


FIG.2 - MAXIMUM NON-REPETITIVE SURGE CURRENT

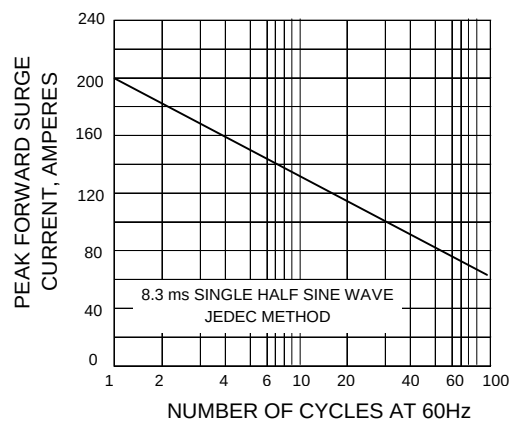


FIG.3 - STEADY STATE POWER DERATING

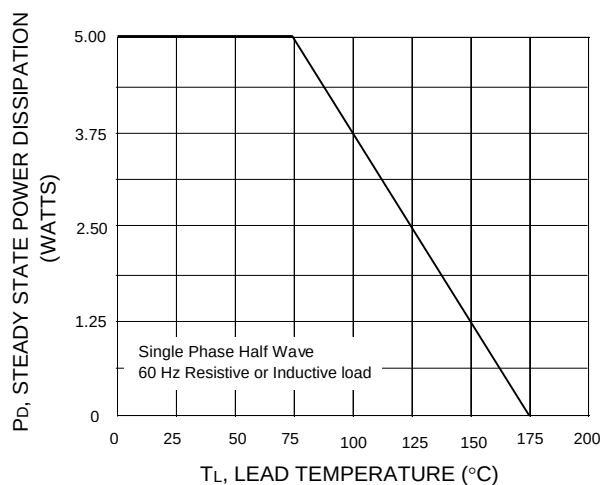


FIG.4 - PULSE RATING CURVE

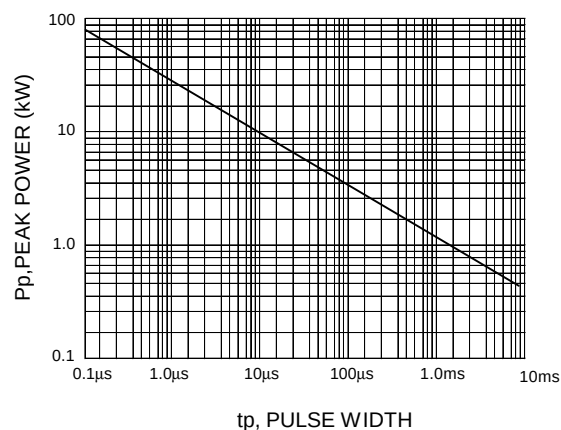


FIG.5 - PULSE WAVEFORM

