

# 1500 WATT TRANSIENT VOLTAGE 1.5 SE-SERIES SUPPRESSOR DIODES

## 5V to 342V $V_R$ (C-4 CASE)

### FEATURES:

- 1500 Watts Peak Power – 1 ms
- 5 Watt D.C. Power @ 75°C Lead Temp.
- Superfast Response ( $1 \times 10^{-12}$  sec.)  
(Bi-Polar  $5 \times 10^{-9}$  sec.)
- High Temperature Operation
- Low Clamping Voltage
- Metallurgically Bonded

### DESCRIPTION

... a low cost commercial product for use in applications where large voltage transients can permanently damage voltage-sensitive components.

This series has a peak pulse power rating of 1500 watts for one millisecond. The response time of the clamping action of these devices is theoretically instantaneous ( $1 \times 10^{-12}$  sec); therefore, they are designed to protect integrated Circuits, MOS devices, Hybrids, and other voltage-sensitive semiconductors and components. This series of devices can also be used in series or parallel to increase the peak power ratings.

### MAXIMUM RATINGS: (See Notes)

|                                                                  |                         |
|------------------------------------------------------------------|-------------------------|
| Maximum Temperatures                                             |                         |
| Ambient Storage and Operating Range                              | Tstg TA -65°C to +175°C |
| Lead Temperature (For soldering 1/16 inch from case for 10 sec.) | 230°C                   |

### Maximum Power

|                                                                                  |                  |
|----------------------------------------------------------------------------------|------------------|
| Peak Power Dissipation (1.0 msec pulse width, $T_A = 25^\circ\text{C}$ , Fig. 4) | $P_P$ 1500 Watts |
| DC Power Dissipation ( $T_L$ @ 3/8" from body = 75°C)                            | $P_M$ 5.0 Watt   |

### Maximum Currents

|                       |                             |
|-----------------------|-----------------------------|
| Maximum Pulse Current | $I_{PP}$ See Table (Note 2) |
|-----------------------|-----------------------------|

Peak Forward One-Cycle Surge Current (1/2 60 Hz sine wave)  
 $T_A = 25^\circ\text{C}$

|           |                    |
|-----------|--------------------|
| $I_{FSM}$ | 50.0 Amps (Note 3) |
|-----------|--------------------|

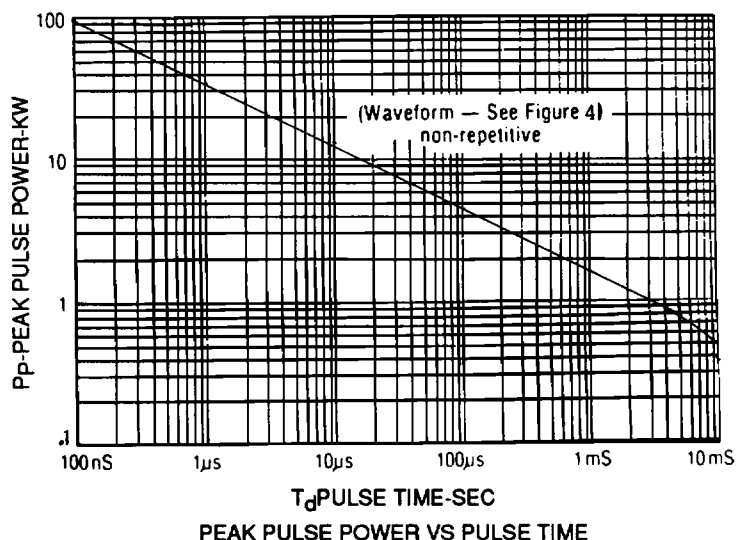
### Maximum Forward Voltage

|                                        |                 |
|----------------------------------------|-----------------|
| $T_A = 25^\circ\text{C}$ @ 1.0 Amps DC | $V_F$ 1.0 Volts |
|----------------------------------------|-----------------|

### Notes:

- (1) Exceeding these ratings may impair operation of the semiconductor device.
- (2) The applied current pulse is as shown in the "Pulse Current vs. Time" plot. Maximum Rate of Applications is 2 pulses per minute. (Fig. 4)
- (3) The applied current is 1/2 cycle of a 60 Hz waveform, with a maximum rate of application of 4 pulses per minute.

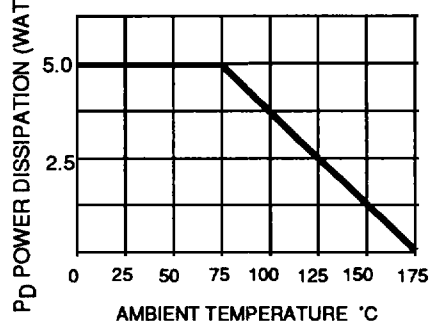
FIG 1



PEAK PULSE POWER VS PULSE TIME

FIG 2

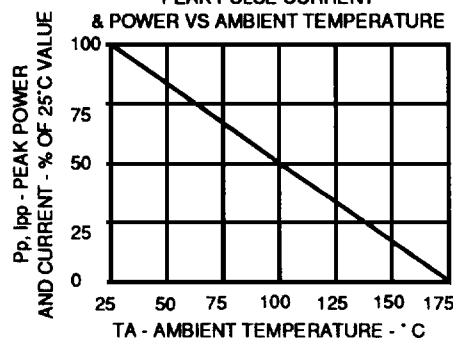
TEMPERATURE RATING CURVE



AMBIENT TEMPERATURE °C

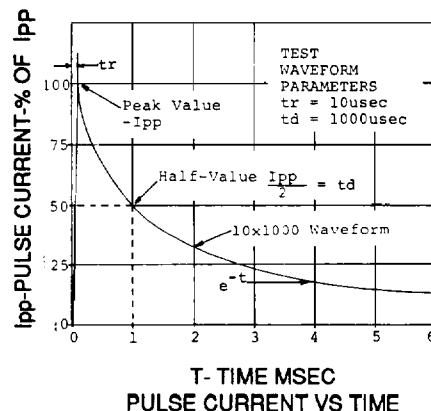
FIG 3

MAXIMUM ALLOWABLE  
PEAK PULSE CURRENT  
& POWER VS AMBIENT TEMPERATURE



TA - AMBIENT TEMPERATURE - °C

FIG 4



T - TIME MSEC  
PULSE CURRENT VS TIME

**TRANSIENT SUPPRESSORS**  
**1.5 KW EPOXY MOLDED (C4 CASE)**

| CASE<br>C-4 | CASE<br>C-4 | REVERSE<br>STAND-OFF<br>VOLTAGE<br>V <sub>R</sub><br>VOLTS | BREAKDOWN<br>VOLTAGE<br>@ |                      | Note 1<br>MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@ I <sub>PP</sub><br>(1 msec)<br>V <sub>C</sub><br>VOLTS | MAXIMUM<br>REVERSE<br>LEAKAGE<br>@ V <sub>R</sub><br>I <sub>R</sub><br>μA | MAXIMUM<br>PEAK<br>PULSE<br>CURRENT<br>I <sub>PP</sub><br>A | MAXIMUM<br>TEMPERA-<br>TURE<br>COEFFICIENT<br>OF BV<br>%/°C |
|-------------|-------------|------------------------------------------------------------|---------------------------|----------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
|             |             |                                                            | BV<br>VOLTS               | I <sub>T</sub><br>mA |                                                                                                      |                                                                           |                                                             |                                                             |
| 1.5SE6.8    | 1N6267      | 5.50                                                       | 6.12 - 7.48               | 10                   | 10.8                                                                                                 | 1000                                                                      | 139                                                         | .057                                                        |
| 1.5SE6.8A   | 1N6267A     | 5.80                                                       | 6.45 - 7.14               | 10                   | 10.5                                                                                                 | 1000*                                                                     | 143                                                         | .057                                                        |
| 1.5SE7.5    | 1N6268      | 6.05                                                       | 6.75 - 8.25               | 10                   | 11.7                                                                                                 | 500*                                                                      | 128                                                         | .061                                                        |
| 1.5SE7.5A   | 1N6268A     | 6.40                                                       | 7.13 - 7.88               | 10                   | 11.3                                                                                                 | 500*                                                                      | 132                                                         | .061                                                        |
| 1.5SE8.2    | 1N6269      | 6.63                                                       | 7.38 - 9.02               | 10                   | 12.5                                                                                                 | 200*                                                                      | 120                                                         | .065                                                        |
| 1.5SE8.2A   | 1N6269A     | 7.02                                                       | 7.79 - 8.61               | 10                   | 12.1                                                                                                 | 200*                                                                      | 124                                                         | .065                                                        |
| 1.5SE9.1    | 1N6270      | 7.37                                                       | 8.19 - 10.0               | 1                    | 13.8                                                                                                 | 50*                                                                       | 109                                                         | .068                                                        |
| 1.5SE9.1A   | 1N6270A     | 7.78                                                       | 8.65 - 9.55               | 1                    | 13.4                                                                                                 | 50*                                                                       | 112                                                         | .068                                                        |
| 1.5SE10     | 1N6271      | 8.10                                                       | 9.00 - 11.0               | 1                    | 15.0                                                                                                 | 50*                                                                       | 100                                                         | .073                                                        |
| 1.5SE10A    | 1N6271A     | 8.55                                                       | 9.5 - 10.5                | 1                    | 14.5                                                                                                 | 10*                                                                       | 103                                                         | .073                                                        |
| 1.5SE11     | 1N6272      | 8.92                                                       | 9.9 - 12.1                | 1                    | 16.2                                                                                                 | 5*                                                                        | 93                                                          | .075                                                        |
| 1.5SE11A    | 1N6272A     | 9.40                                                       | 10.5 - 11.6               | 1                    | 15.6                                                                                                 | 5*                                                                        | 96                                                          | .075                                                        |
| 1.5SE12     | 1N6273      | 9.72                                                       | 10.8 - 13.2               | 1                    | 17.3                                                                                                 | 5*                                                                        | 87                                                          | .078                                                        |
| 1.5SE12A    | 1N6273A     | 10.2                                                       | 11.4 - 12.6               | 1                    | 16.7                                                                                                 | 5*                                                                        | 90                                                          | .078                                                        |
| 1.5SE13     | 1N6274      | 10.5                                                       | 11.7 - 14.3               | 1                    | 19.0                                                                                                 | 5                                                                         | 79                                                          | .081                                                        |
| 1.5SE13A    | 1N6274A     | 11.1                                                       | 12.4 - 13.7               | 1                    | 18.2                                                                                                 | 5                                                                         | 82                                                          | .081                                                        |
| 1.5SE15     | 1N6275      | 12.1                                                       | 13.5 - 16.5               | 1                    | 22.0                                                                                                 | 5                                                                         | 68                                                          | .084                                                        |
| 1.5SE15A    | 1N6275A     | 12.8                                                       | 14.3 - 15.8               | 1                    | 21.2                                                                                                 | 5                                                                         | 71                                                          | .084                                                        |
| 1.5SE16     | 1N6276      | 12.9                                                       | 14.4 - 17.6               | 1                    | 23.5                                                                                                 | 5                                                                         | 64                                                          | .086                                                        |
| 1.5SE16A    | 1N6276A     | 13.6                                                       | 15.2 - 16.8               | 1                    | 22.5                                                                                                 | 5                                                                         | 67                                                          | .086                                                        |
| 1.5SE18     | 1N6277      | 14.5                                                       | 16.2 - 19.8               | 1                    | 26.5                                                                                                 | 5                                                                         | 56.5                                                        | .088                                                        |
| 1.5SE18A    | 1N6277A     | 15.3                                                       | 17.1 - 18.9               | 1                    | 25.2                                                                                                 | 5                                                                         | 59.5                                                        | .088                                                        |
| 1.5SE20     | 1N6278      | 16.2                                                       | 18.0 - 22.0               | 1                    | 29.1                                                                                                 | 5                                                                         | 51.5                                                        | .090                                                        |
| 1.5SE20A    | 1N6278A     | 17.1                                                       | 19.0 - 21.0               | 1                    | 27.7                                                                                                 | 5                                                                         | 54                                                          | .090                                                        |
| 1.5SE22     | 1N6279      | 17.8                                                       | 19.8 - 24.2               | 1                    | 31.9                                                                                                 | 5                                                                         | 47                                                          | .092                                                        |
| 1.5SE22A    | 1N6279A     | 18.8                                                       | 20.9 - 23.1               | 1                    | 30.6                                                                                                 | 5                                                                         | 49                                                          | .092                                                        |
| 1.5SE24     | 1N6280      | 19.4                                                       | 21.6 - 26.4               | 1                    | 34.7                                                                                                 | 5                                                                         | 43                                                          | .094                                                        |
| 1.5SE24A    | 1N6280A     | 20.5                                                       | 22.8 - 25.2               | 1                    | 33.2                                                                                                 | 5                                                                         | 45                                                          | .094                                                        |
| 1.5SE27     | 1N6281      | 21.8                                                       | 24.3 - 29.7               | 1                    | 39.1                                                                                                 | 5                                                                         | 38.5                                                        | .096                                                        |
| 1.5SE27A    | 1N6281A     | 23.1                                                       | 25.7 - 28.4               | 1                    | 37.5                                                                                                 | 5                                                                         | 40                                                          | .096                                                        |
| 1.5SE30     | 1N6282      | 24.3                                                       | 27.0 - 33.0               | 1                    | 43.5                                                                                                 | 5                                                                         | 34.5                                                        | .097                                                        |
| 1.5SE30A    | 1N6282A     | 25.6                                                       | 28.5 - 31.5               | 1                    | 41.4                                                                                                 | 5                                                                         | 36                                                          | .097                                                        |
| 1.5SE33     | 1N6283      | 26.8                                                       | 29.7 - 36.3               | 1                    | 47.7                                                                                                 | 5                                                                         | 31.5                                                        | .098                                                        |
| 1.5SE33A    | 1N6283A     | 28.2                                                       | 31.4 - 34.7               | 1                    | 45.7                                                                                                 | 5                                                                         | 33                                                          | .098                                                        |
| 1.5SE36     | 1N6284      | 29.1                                                       | 32.4 - 39.6               | 1                    | 52.0                                                                                                 | 5                                                                         | 29                                                          | .099                                                        |
| 1.5SE36A    | 1N6284A     | 30.8                                                       | 34.2 - 37.8               | 1                    | 49.9                                                                                                 | 5                                                                         | 30                                                          | .099                                                        |
| 1.5SE39     | 1N6285      | 31.6                                                       | 35.1 - 42.9               | 1                    | 56.4                                                                                                 | 5                                                                         | 26.5                                                        | .100                                                        |
| 1.5SE39A    | 1N6285A     | 33.3                                                       | 37.1 - 41.0               | 1                    | 53.9                                                                                                 | 5                                                                         | 28                                                          | .100                                                        |
| 1.5SE43     | 1N6286      | 34.8                                                       | 38.7 - 47.3               | 1                    | 61.9                                                                                                 | 5                                                                         | 24                                                          | .101                                                        |
| 1.5SE43A    | 1N6286A     | 36.8                                                       | 40.9 - 45.2               | 1                    | 59.3                                                                                                 | 5                                                                         | 25.3                                                        | .101                                                        |
| 1.5SE47     | 1N6287      | 38.1                                                       | 42.3 - 51.7               | 1                    | 67.8                                                                                                 | 5                                                                         | 22.2                                                        | .101                                                        |
| 1.5SE47A    | 1N6287A     | 40.2                                                       | 44.7 - 49.4               | 1                    | 64.8                                                                                                 | 5                                                                         | 23.2                                                        | .101                                                        |
| 1.5SE51     | 1N6288      | 41.3                                                       | 45.9 - 56.1               | 1                    | 73.5                                                                                                 | 5                                                                         | 20.4                                                        | .102                                                        |
| 1.5SE51A    | 1N6288A     | 43.6                                                       | 48.5 - 53.6               | 1                    | 70.1                                                                                                 | 5                                                                         | 21.4                                                        | .102                                                        |
| 1.5SE56     | 1N6289      | 45.4                                                       | 50.4 - 61.6               | 1                    | 80.5                                                                                                 | 5                                                                         | 18.6                                                        | .103                                                        |
| 1.5SE56A    | 1N6289A     | 47.8                                                       | 53.2 - 58.8               | 1                    | 77.0                                                                                                 | 5                                                                         | 19.5                                                        | .103                                                        |
| 1.5SE62     | 1N6290      | 50.2                                                       | 55.6 - 68.2               | 1                    | 89.0                                                                                                 | 5                                                                         | 16.9                                                        | .104                                                        |
| 1.5SE62A    | 1N6290A     | 53.0                                                       | 58.9 - 65.1               | 1                    | 85.0                                                                                                 | 5                                                                         | 17.7                                                        | .104                                                        |
| 1.5SE68     | 1N6291      | 55.1                                                       | 61.2 - 74.8               | 1                    | 98.0                                                                                                 | 5                                                                         | 15.3                                                        | .104                                                        |
| 1.5SE68A    | 1N6291A     | 58.1                                                       | 64.6 - 71.4               | 1                    | 92.0                                                                                                 | 5                                                                         | 16.3                                                        | .104                                                        |
| 1.5SE75     | 1N6292      | 60.7                                                       | 67.5 - 82.5               | 1                    | 108.0                                                                                                | 5                                                                         | 13.9                                                        | .105                                                        |
| 1.5SE75A    | 1N6292A     | 64.1                                                       | 71.3 - 78.8               | 1                    | 103.0                                                                                                | 5                                                                         | 14.6                                                        | .105                                                        |
| 1.5SE82     | 1N6293      | 66.4                                                       | 73.8 - 90.2               | 1                    | 118.0                                                                                                | 5                                                                         | 12.7                                                        | .105                                                        |
| 1.5SE82A    | 1N6293A     | 70.1                                                       | 77.9 - 86.1               | 1                    | 113.0                                                                                                | 5                                                                         | 13.3                                                        | .105                                                        |
| 1.5SE91     | 1N6294      | 73.7                                                       | 81.9 - 100.0              | 1                    | 131.0                                                                                                | 5                                                                         | 11.4                                                        | .106                                                        |
| 1.5SE91A    | 1N6294A     | 77.8                                                       | 86.5 - 95.5               | 1                    | 125.0                                                                                                | 5                                                                         | 12.0                                                        | .106                                                        |
| 1.5SE100    | 1N6295      | 81.0                                                       | 90.0 - 110.0              | 1                    | 144.0                                                                                                | 5                                                                         | 10.4                                                        | .106                                                        |
| 1.5SE100A   | 1N6295A     | 85.5                                                       | 95.0 - 105.0              | 1                    | 137.0                                                                                                | 5                                                                         | 11.0                                                        | .106                                                        |
| 1.5SE110    | 1N6296      | 89.2                                                       | 99.0 - 121.0              | 1                    | 158.0                                                                                                | 5                                                                         | 9.5                                                         | .107                                                        |
| 1.5SE110A   | 1N6296A     | 94.0                                                       | 105.0 - 116.0             | 1                    | 152.0                                                                                                | 5                                                                         | 9.9                                                         | .107                                                        |
| 1.5SE120    | 1N6297      | 97.2                                                       | 108.0 - 132.0             | 1                    | 173.0                                                                                                | 5                                                                         | 8.7                                                         | .107                                                        |
| 1.5SE120A   | 1N6297A     | 102.0                                                      | 114.0 - 126.0             | 1                    | 165.0                                                                                                | 5                                                                         | 9.1                                                         | .107                                                        |
| 1.5SE130    | 1N6298      | 105.0                                                      | 117.0 - 143.0             | 1                    | 187.0                                                                                                | 5                                                                         | 8.0                                                         | .107                                                        |
| 1.5SE130A   | 1N6298A     | 111.0                                                      | 124.0 - 137.0             | 1                    | 179.0                                                                                                | 5                                                                         | 8.4                                                         | .107                                                        |
| 1.5SE150    | 1N6299      | 121.0                                                      | 135.0 - 165.0             | 1                    | 215.0                                                                                                | 5                                                                         | 7.0                                                         | .108                                                        |
| 1.5SE150A   | 1N6299A     | 128.0                                                      | 143.0 - 158.0             | 1                    | 207.0                                                                                                | 5                                                                         | 7.2                                                         | .108                                                        |
| 1.5SE180    | 1N6300      | 130.0                                                      | 144.0 - 176.0             | 1                    | 230.0                                                                                                | 5                                                                         | 6.5                                                         | .108                                                        |
| 1.5SE160A   | 1N6300A     | 136.0                                                      | 152.0 - 168.0             | 1                    | 219.0                                                                                                | 5                                                                         | 6.9                                                         | .108                                                        |
| 1.5SE170    | 1N6301      | 138.0                                                      | 153.0 - 187.0             | 1                    | 244.0                                                                                                | 5                                                                         | 6.2                                                         | .108                                                        |
| 1.5SE170A   | 1N6301A     | 145.0                                                      | 162.0 - 179.0             | 1                    | 234.0                                                                                                | 5                                                                         | 6.4                                                         | .108                                                        |
| 1.5SE180    | 1N6302      | 146.0                                                      | 162.0 - 198.0             | 1                    | 258.0                                                                                                | 5                                                                         | 5.8                                                         | .108                                                        |
| 1.5SE180A   | 1N6302A     | 154.0                                                      | 171.0 - 189.0             | 1                    | 246.0                                                                                                | 5                                                                         | 6.1                                                         | .108                                                        |
| 1.5SE200    | 1N6303      | 162.0                                                      | 180.0 - 220.0             | 1                    | 287.0                                                                                                | 5                                                                         | 5.2                                                         | .108                                                        |
| 1.5SE200A   | 1N6303A     | 171.0                                                      | 190.0 - 210.0             | 1                    | 274.0                                                                                                | 5                                                                         | 5.5                                                         | .108                                                        |
| 1.5SE220    |             | 175.0                                                      | 198.0 - 242.0             | 1                    | 344.0                                                                                                | 5                                                                         | 4.3                                                         | .110                                                        |
| 1.5SE220A   |             | 185.0                                                      | 209.0 - 231.0             | 1                    | 328.0                                                                                                | 5                                                                         | 4.6                                                         | .110                                                        |
| 1.5SE250    |             | 202.0                                                      | 225.0 - 275.0             | 1                    | 360.0                                                                                                | 5                                                                         | 5.0                                                         | .110                                                        |
| 1.5SE250A   |             | 214.0                                                      | 237.0 - 253.0             | 1                    | 344.0                                                                                                | 5                                                                         | 5.0                                                         | .110                                                        |
| 1.5SE300    |             | 243.0                                                      | 270.0 - 330.0             | 1                    | 430.0                                                                                                | 5                                                                         | 6.0                                                         | .110                                                        |
| 1.5SE300A   |             | 256.0                                                      | 285.0 - 315.0             | 1                    | 414.0                                                                                                | 5                                                                         | 5.0                                                         | .110                                                        |
| 1.5SE350    |             | 284.0                                                      | 315.0 - 385.0             | 1                    | 504.0                                                                                                | 5                                                                         | 4.0                                                         | .110                                                        |
| 1.5SE350A   |             | 300.0                                                      | 333.0 - 368.0             | 1                    | 482.0                                                                                                | 5                                                                         | 4.0                                                         | .110                                                        |
| 1.5SE400    |             | 324.0                                                      | 360.0 - 449.0             | 1                    | 574.0                                                                                                | 5                                                                         | 4.0                                                         | .110                                                        |
| 1.5SE400A   |             | 342.0                                                      | 380.0 - 420.0             | 1                    | 548.0                                                                                                | 5                                                                         | 4.0                                                         | .110                                                        |
| 1N5908      |             | 5.0                                                        | 6.0                       | 1                    | 8.6                                                                                                  | 300                                                                       | 165                                                         | .06                                                         |

Note 1: Clamping Voltage = Approx. 1.3 x BV

\* I<sub>R</sub> Double for Bi Polar Types

Note 2: Add Suffix "C" to Part # for Bi Polar Types