

## DESCRIPTION

The 1N61xx series of transient voltage suppressors are designed to protect military and commercial electronic equipment from overvoltages caused by lightning, ESD, EFT, inductive load switching, and EMP. These devices are constructed using two p-n junction TVS diodes in a back-to-back configuration, hermetically sealed in a voidless glass package. The hermetically sealed package provides high reliability in harsh environmental conditions. TVS diodes are further characterized by their high surge capability, low operating and clamping voltages, and a theoretically instantaneous response time. This makes them ideal for use as board level protection for sensitive semiconductor components.

## FEATURES:

- 1500 Watts Peak Pulse Power (tp = 10/1000µs)
- Voidless hermetically sealed glass package
- Metallurgically bonded
- High surge capacity
- Military & Industrial applications
- Available in **JAN**, **JTX**, **JTXV** and **JANS** versions per MIL-S-19500/516

## MECHANICAL CHARACTERISTICS:

- Hermetically sealed glass package
- Tinned copper leads
- Marking : P/N, date code, logo

## MAXIMUM RATINGS

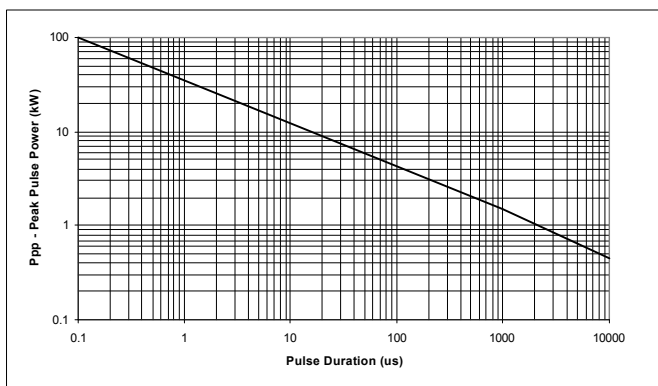
| RATING                                            | SYMBOL | VALUE       | UNIT  |
|---------------------------------------------------|--------|-------------|-------|
| Peak Pulse Power (tp = 10 x 1000µs)               | Ppk    | 1500        | Watts |
| Operating Temperature                             | Tj     | -65 to +175 | °C    |
| Storage Temperature                               | Tstg   | -65 to +175 | °C    |
| Steady-State Power Dissipation @ TL = 75°C (3/8") | PD     | 5           | Watts |

## ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise specified)

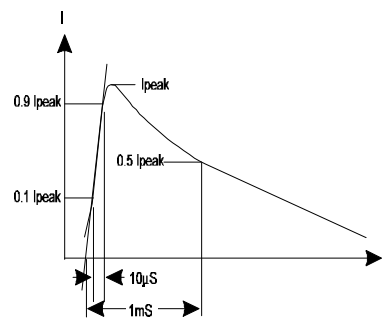
| DEVICE TYPE | REVERSE STAND-OFF VOLTAGE<br>V <sub>RWM</sub> | REVERSE LEAKAGE CURRENT<br>I <sub>R</sub> | MINIMUM BREAKDOWN VOLTAGE<br>V <sub>BR</sub> @ I <sub>T</sub> | TEST CURRENT<br>I <sub>T</sub> | MAXIMUM CLAMPING VOLTAGE<br>V <sub>C</sub> @ I <sub>PP</sub> | PEAK PULSE CURRENT<br>I <sub>PP</sub><br>tp = 1mS | TEMPERATURE COEFFICIENT<br>OF V <sub>BR</sub><br>αVz | MAXIMUM REVERSE LEAKAGE CURRENT (I <sub>R2</sub> )<br>TA=+150°C |
|-------------|-----------------------------------------------|-------------------------------------------|---------------------------------------------------------------|--------------------------------|--------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------|
|             | (V)                                           | (µA)                                      | (V)                                                           | (mA)                           | (V)                                                          | (A)                                               | % / °C                                               | (A)                                                             |
| 1N6138A     | 5.2                                           | 500                                       | 6.46                                                          | 175                            | 10.5                                                         | 142.8                                             | 0.05                                                 | 12000                                                           |
| 1N6139A     | 5.7                                           | 300                                       | 7.13                                                          | 175                            | 11.2                                                         | 133.9                                             | 0.06                                                 | 3000                                                            |
| 1N6140A     | 6.2                                           | 100                                       | 7.79                                                          | 150                            | 12.1                                                         | 124.0                                             | 0.06                                                 | 2000                                                            |
| 1N6141A     | 6.9                                           | 100                                       | 8.65                                                          | 150                            | 13.4                                                         | 111.9                                             | 0.06                                                 | 1200                                                            |
| 1N6142A     | 7.6                                           | 100                                       | 9.50                                                          | 125                            | 14.5                                                         | 103.4                                             | 0.07                                                 | 800                                                             |
| 1N6143A     | 8.4                                           | 20                                        | 10.45                                                         | 125                            | 15.6                                                         | 96.2                                              | 0.07                                                 | 800                                                             |
| 1N6144A     | 9.1                                           | 20                                        | 11.40                                                         | 100                            | 16.9                                                         | 88.8                                              | 0.07                                                 | 600                                                             |
| 1N6145A     | 9.9                                           | 20                                        | 12.35                                                         | 100                            | 18.2                                                         | 82.4                                              | 0.08                                                 | 600                                                             |
| 1N6146A     | 11.4                                          | 20                                        | 14.25                                                         | 75                             | 21.0                                                         | 71.4                                              | 0.08                                                 | 400                                                             |
| 1N6147A     | 12.2                                          | 20                                        | 15.20                                                         | 75                             | 22.3                                                         | 67.3                                              | 0.08                                                 | 400                                                             |
| 1N6148A     | 13.7                                          | 10                                        | 17.10                                                         | 65                             | 25.1                                                         | 59.8                                              | 0.085                                                | 400                                                             |
| 1N6149A     | 15.2                                          | 5                                         | 19.0                                                          | 65                             | 27.7                                                         | 54.2                                              | 0.085                                                | 400                                                             |
| 1N6150A     | 16.7                                          | 5                                         | 20.9                                                          | 50                             | 30.5                                                         | 49.2                                              | 0.085                                                | 400                                                             |
| 1N6151A     | 18.2                                          | 5                                         | 22.8                                                          | 50                             | 33.3                                                         | 45.0                                              | 0.09                                                 | 400                                                             |
| 1N6152A     | 20.6                                          | 5                                         | 25.7                                                          | 50                             | 37.4                                                         | 40.1                                              | 0.09                                                 | 400                                                             |
| 1N6153A     | 22.8                                          | 5                                         | 28.5                                                          | 40                             | 41.6                                                         | 36.0                                              | 0.09                                                 | 400                                                             |
| 1N6154A     | 25.1                                          | 5                                         | 31.4                                                          | 40                             | 45.7                                                         | 32.8                                              | 0.095                                                | 400                                                             |
| 1N6155A     | 27.4                                          | 5                                         | 34.2                                                          | 30                             | 49.9                                                         | 30.1                                              | 0.095                                                | 400                                                             |
| 1N6156A     | 29.7                                          | 5                                         | 37.1                                                          | 30                             | 53.6                                                         | 28.0                                              | 0.095                                                | 400                                                             |
| 1N6157A     | 32.7                                          | 5                                         | 40.9                                                          | 30                             | 59.1                                                         | 25.4                                              | 0.095                                                | 400                                                             |
| 1N6158A     | 35.8                                          | 5                                         | 44.7                                                          | 25                             | 64.6                                                         | 23.2                                              | 0.095                                                | 400                                                             |
| 1N6159A     | 38.8                                          | 5                                         | 48.5                                                          | 25                             | 70.1                                                         | 21.4                                              | 0.095                                                | 400                                                             |
| 1N6160A     | 42.6                                          | 5                                         | 53.2                                                          | 20                             | 77.0                                                         | 19.5                                              | 0.095                                                | 400                                                             |
| 1N6161A     | 47.1                                          | 5                                         | 58.9                                                          | 20                             | 85.3                                                         | 17.6                                              | 0.100                                                | 400                                                             |
| 1N6162A     | 51.7                                          | 5                                         | 64.6                                                          | 20                             | 97.1                                                         | 15.4                                              | 0.100                                                | 400                                                             |
| 1N6163A     | 56.0                                          | 5                                         | 71.3                                                          | 20                             | 103.1                                                        | 14.5                                              | 0.100                                                | 400                                                             |
| 1N6164A     | 62.2                                          | 5                                         | 77.9                                                          | 15                             | 112.8                                                        | 13.3                                              | 0.100                                                | 400                                                             |
| 1N6165A     | 69.2                                          | 5                                         | 86.5                                                          | 15                             | 125.1                                                        | 12.0                                              | 0.100                                                | 400                                                             |
| 1N6166A     | 76.0                                          | 5                                         | 95.0                                                          | 12                             | 137.6                                                        | 10.9                                              | 0.100                                                | 400                                                             |
| 1N6167A     | 83.6                                          | 5                                         | 104.5                                                         | 12                             | 151.3                                                        | 9.9                                               | 0.100                                                | 400                                                             |
| 1N6168A     | 91.2                                          | 5                                         | 114.0                                                         | 10                             | 165.1                                                        | 9.1                                               | 0.100                                                | 400                                                             |
| 1N6169A     | 98.8                                          | 5                                         | 123.5                                                         | 10                             | 178.8                                                        | 8.4                                               | 0.105                                                | 400                                                             |
| 1N6170A     | 114.0                                         | 5                                         | 142.5                                                         | 8                              | 206.3                                                        | 7.3                                               | 0.105                                                | 400                                                             |
| 1N6171A     | 121.6                                         | 5                                         | 152.0                                                         | 8                              | 218.4                                                        | 6.9                                               | 0.105                                                | 400                                                             |
| 1N6172A     | 136.8                                         | 5                                         | 171.0                                                         | 5                              | 245.7                                                        | 6.1                                               | 0.110                                                | 400                                                             |
| 1N6173A     | 152.0                                         | 5                                         | 190.0                                                         | 5                              | 273.0                                                        | 5.5                                               | 0.110                                                | 400                                                             |

1. Non-A Part has 5% higher clamping voltage, 5% lower minimum breakdown voltage, and 5% lower peak pulse current.

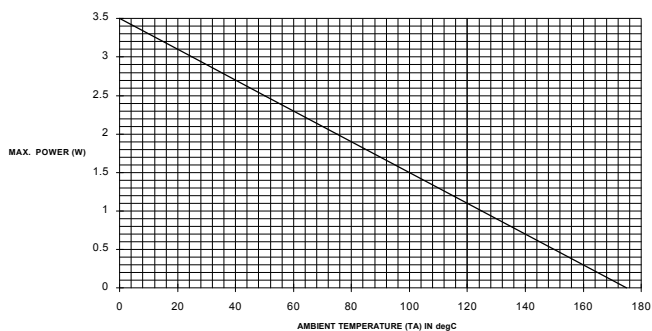
#### PEAK PULSE POWER vs. PULSE TIME



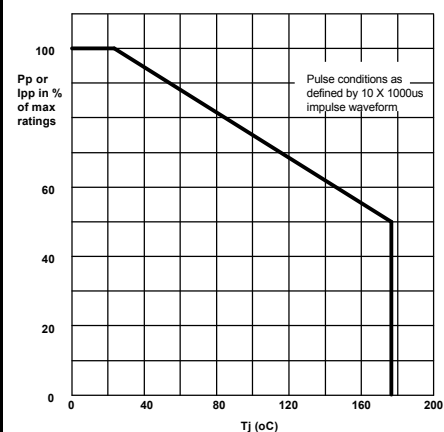
#### 10x1000μs IMPULSE WAVEFORM



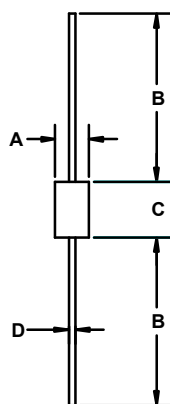
#### STEADY STATE DERATING CHARACTERISTICS FOR FREE AIR MOUNTING



#### PULSE DERATING CURVE



#### MECHANICAL OUTLINE



| DIMENSIONS       |        |       |       |       |      |
|------------------|--------|-------|-------|-------|------|
| DIM <sup>N</sup> | INCHES |       | MM    |       | NOTE |
|                  | MIN    | MAX   | MIN   | MAX   |      |
| A                | 0.135  | 0.185 | 3.40  | 4.70  |      |
| B                | 0.900  | 1.300 | 22.86 | 33.02 |      |
| C                | 0.140  | 0.195 | 3.5   | 4.95  | 2    |
| D                | 0.036  | 0.042 | 0.91  | 1.07  |      |

#### NOTES :

1. Controlling dimension is inches.
2. Includes uncontrolled area of device leads.

#### SCHEMATIC



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