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Silicon Avalanche Diodes

1500 Watt Metal Axial Leaded Transient Voltage Suppressors

1N56 Series



FEATURES

- Hermetically sealed
- Breakdown voltage range 6.8 - 200 volts
- Glass passivated junction
- Excellent clamping capability
- Low zener impedance
- 100% surge tested
- -55°C to +150°C
- Uni-polar

MAXIMUM RATING

- Peak Pulse Power (Ppk): 1500 Watts (10 x 1000µs)@25°C (see diagram on page 3 for wave form)
- 1 watt steady state
- Response time: 1×10^{-12} seconds (theoretical)
- Operating & storage temperature: -55°C to +150°C

MECHANICAL CHARACTERISTICS

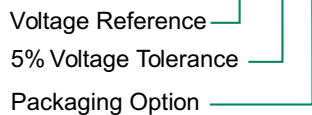
- Case: Metal hermetically sealed DO-13 package
- Terminals: Axial leads, solderable per MIL-STD-202 Method 208
- Solderable leads = 230°C for 10 seconds (1.59mm from case)
- Polarity: cathode indicated by colour band
- Weight: 1.5 grammes (approx)

Agency Approvals: Recognized under the Components Program of Underwriters Laboratories.

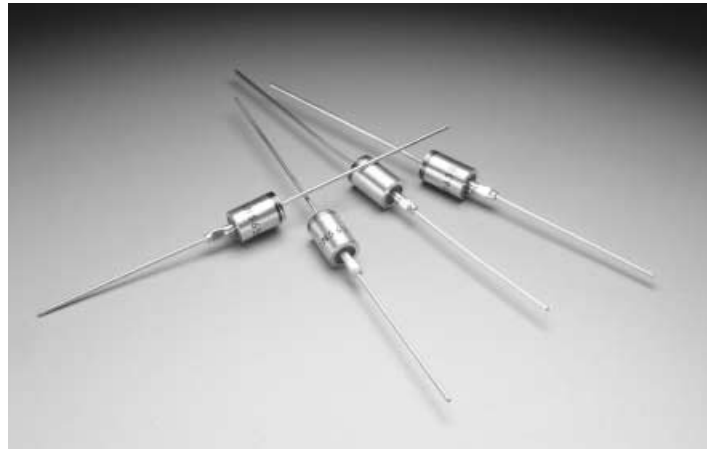
Agency File Number: E128662

ORDERING INFORMATION

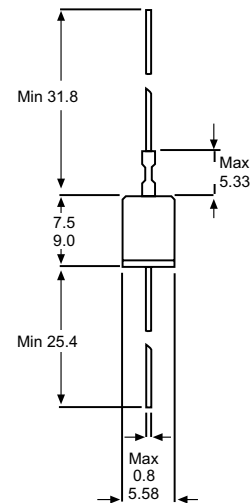
1 N 5 6 | X | X | A |



B = Bulk (500 pcs)



SILICON DIODE ARRAYS



All dimensions in mm

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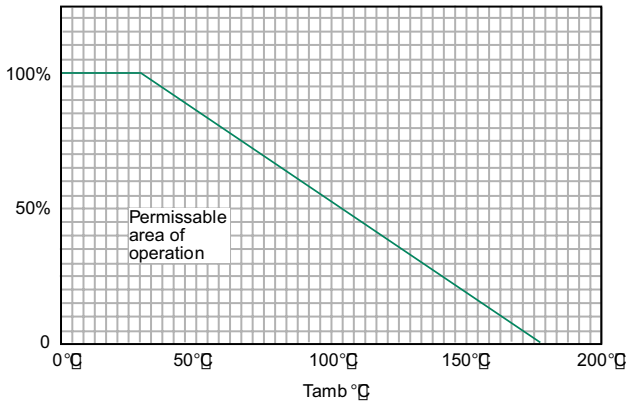


Figure 1 - Peak Power Derating Curve
Peak pulse power in percent of 25°C rating

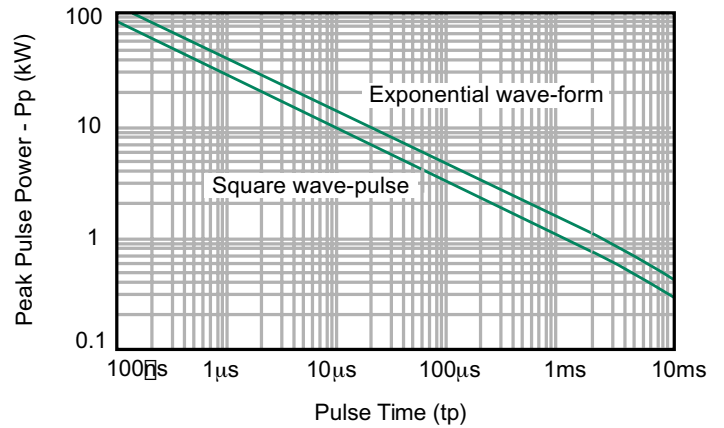


Figure 3 - Peak Pulse Power vs. Pulse Time

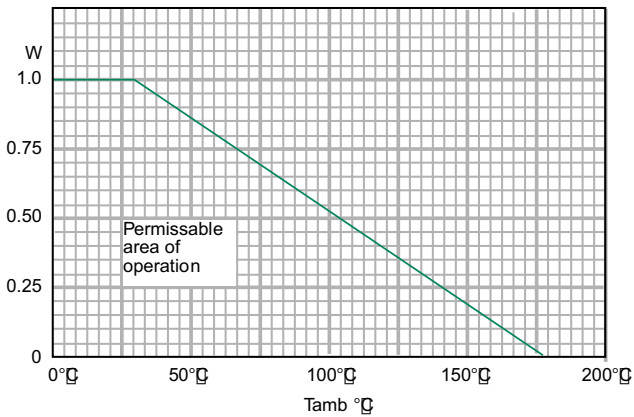


Figure 2 - Continuous D.C. Power Derating Curve
Continuous d.c. power dissipation

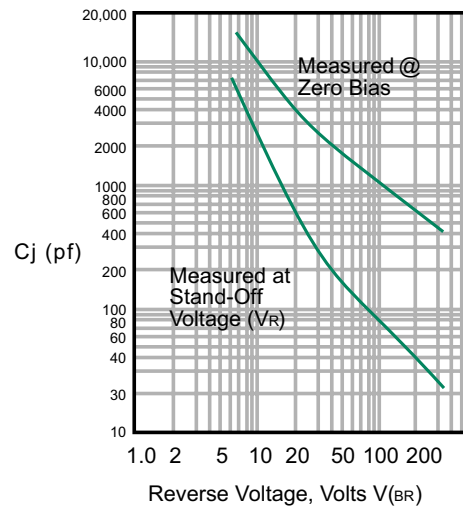


Figure 4 - Typical Junction Capacitance

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ELECTRICAL SPECIFICATION @ Tamb 25°C

| Part Number | Reverse Stand Off Voltage V_R (Volts) | Breakdown Voltage V_{BR} (Volts) @ I_T | | | Maximum Reverse Leakage I_R @ V_R (μA) | Maximum Clamping Voltage V_C @ I_{PP} (Volts) | Maximum Peak Pulse Current I_{PP} (A) | Max Voltage Temperature Variation of V_{BR} (mV/°C) |
|-------------|---|--|-------|------|---|---|---|---|
| | | MIN | MAX | (mA) | | | | |
| 1N5629* | 5.50 | 6.12 | 7.48 | 10 | 1000.0 | 10.8 | 139.0 | 5.0 |
| 1N5629A* | 5.80 | 6.45 | 7.14 | 10 | 1000.0 | 10.5 | 143.0 | 5.0 |
| 1N5630 | 6.05 | 6.75 | 8.25 | 10 | 500.0 | 11.7 | 128.0 | 5.0 |
| 1N5630A | 6.40 | 7.13 | 7.88 | 10 | 500.0 | 11.3 | 132.0 | 5.0 |
| 1N5631 | 6.63 | 7.38 | 9.02 | 10 | 200.0 | 12.5 | 120.0 | 6.0 |
| 1N5631A | 7.02 | 7.79 | 8.61 | 10 | 200.0 | 12.1 | 124.0 | 6.0 |
| 1N5632 | 7.37 | 8.19 | 10.00 | 1.0 | 50.0 | 13.8 | 109.0 | 7.0 |
| 1N5632A | 7.78 | 8.65 | 9.55 | 1.0 | 50.0 | 13.4 | 112.0 | 7.0 |
| 1N5633 | 8.10 | 9.00 | 11.00 | 1.0 | 10.0 | 15.0 | 100.0 | 8.0 |
| 1N5633A | 8.55 | 9.50 | 10.50 | 1.0 | 10.0 | 14.5 | 103.0 | 8.0 |
| 1N5634 | 8.92 | 9.90 | 12.10 | 1.0 | 5.0 | 16.2 | 93.0 | 9.0 |
| 1N5634A | 9.40 | 10.50 | 11.60 | 1.0 | 5.0 | 15.6 | 96.0 | 9.0 |
| 1N5635 | 9.72 | 10.80 | 13.20 | 1.0 | 5.0 | 17.3 | 87.0 | 10.0 |
| 1N5635A | 10.20 | 11.40 | 12.60 | 1.0 | 5.0 | 16.7 | 90.0 | 10.0 |
| 1N5636 | 10.50 | 11.70 | 14.30 | 1.0 | 5.0 | 19.0 | 79.0 | 11.0 |
| 1N5636A | 11.10 | 12.40 | 13.70 | 1.0 | 5.0 | 18.2 | 82.0 | 11.0 |
| 1N5637* | 12.10 | 13.50 | 16.50 | 1.0 | 5.0 | 22.0 | 68.0 | 13.0 |
| 1N5637A* | 12.80 | 14.30 | 15.80 | 1.0 | 5.0 | 21.2 | 71.0 | 12.0 |
| 1N5638* | 12.90 | 14.40 | 17.60 | 1.0 | 5.0 | 23.5 | 64.0 | 16.0 |
| 1N5638A* | 13.60 | 15.20 | 16.80 | 1.0 | 5.0 | 22.5 | 67.0 | 14.0 |
| 1N5639* | 14.50 | 16.20 | 19.80 | 1.0 | 5.0 | 26.5 | 56.5 | 17.0 |
| 1N5639A* | 15.30 | 17.10 | 18.90 | 1.0 | 5.0 | 25.2 | 59.5 | 19.0 |
| 1N5640 | 16.20 | 18.00 | 22.00 | 1.0 | 5.0 | 29.1 | 51.5 | 20.0 |
| 1N5640A | 17.10 | 19.00 | 21.00 | 1.0 | 5.0 | 27.7 | 54.0 | 19.0 |
| 1N5641 | 17.80 | 19.80 | 24.20 | 1.0 | 5.0 | 31.9 | 47.0 | 21.0 |
| 1N5641A | 18.80 | 20.90 | 23.10 | 1.0 | 5.0 | 30.6 | 49.0 | 20.0 |
| 1N5642 | 19.40 | 21.60 | 26.40 | 1.0 | 5.0 | 34.7 | 43.0 | 25.0 |
| 1N5642A | 20.50 | 22.80 | 25.20 | 1.0 | 5.0 | 33.2 | 45.0 | 23.0 |
| 1N5643* | 21.80 | 24.30 | 29.70 | 1.0 | 5.0 | 39.1 | 38.5 | 28.0 |
| 1N5643A* | 23.10 | 25.70 | 28.40 | 1.0 | 5.0 | 37.5 | 40.0 | 25.0 |
| 1N5644* | 24.30 | 27.00 | 33.00 | 1.0 | 5.0 | 43.5 | 34.5 | 31.0 |
| 1N5644A | 25.60 | 28.50 | 31.50 | 1.0 | 5.0 | 41.4 | 36.0 | 28.0 |
| 1N5645 | 26.80 | 29.70 | 36.30 | 1.0 | 5.0 | 47.7 | 31.5 | 31.0 |
| 1N5645A | 28.20 | 31.40 | 34.70 | 1.0 | 5.0 | 45.7 | 33.0 | 30.0 |
| 1N5646* | 29.10 | 32.40 | 39.60 | 1.0 | 5.0 | 52.0 | 29.0 | 35.0 |
| 1N5646A* | 30.80 | 34.20 | 37.80 | 1.0 | 5.0 | 49.9 | 30.0 | 31.0 |

Suffix 'A' denotes 5% tolerance device, no suffix denotes a 10% tolerance device.

1N5629 to 1N5647A V_F max = 3.5V at I_F = 50A 300 μ S square wave pulse.

1N5648 to 1N5665A V_F max = 5.0V at I_F = 50A 300 μ S square wave pulse.

* Preferred voltages.

6 SILICON DIODE ARRAYS

Silicon Avalanche Diodes

1500 Watt Metal Axial Leaded Transient Voltage Suppressors

1N56 Series



ELECTRICAL SPECIFICATION @ Tamb 25°C

| Part Number | Reverse Stand Off Voltage V_R (Volts) | Breakdown Voltage V_{BR} (Volts) @ I_T | | | Maximum Reverse Leakage I_R @ V_R (μA) | Maximum Clamping Voltage V_C @ I_{PP} (Volts) | Maximum Peak Pulse Current I_{PP} (A) | Max Voltage Temperature Variation of V_{BR} (mV/°C) |
|-------------|---|--|-------|------|---|---|---|---|
| | | MIN | MAX | (mA) | | | | |
| 1N5647 | 31.60 | 35.10 | 42.90 | 1.0 | 5.0 | 56.4 | 26.5 | 39.0 |
| 1N5647A | 33.30 | 37.10 | 41.00 | 1.0 | 5.0 | 53.9 | 28.0 | 36.0 |
| 1N5648 | 34.80 | 38.70 | 47.30 | 1.0 | 5.0 | 61.9 | 24.0 | 46.0 |
| 1N5648A | 36.80 | 40.90 | 45.20 | 1.0 | 5.0 | 59.3 | 25.3 | 44.0 |
| 1N5649* | 38.10 | 42.30 | 51.70 | 1.0 | 5.0 | 67.8 | 22.2 | 50.0 |
| 1N5649A* | 40.20 | 44.70 | 49.40 | 1.0 | 5.0 | 64.8 | 23.2 | 48.0 |
| 1N5650 | 41.30 | 45.90 | 56.10 | 1.0 | 5.0 | 73.5 | 20.4 | 55.0 |
| 1N5650A | 43.60 | 48.50 | 53.60 | 1.0 | 5.0 | 70.1 | 21.4 | 51.0 |
| 1N5651 | 45.4 | 50.4 | 61.6 | 1.0 | 5.0 | 80.5 | 18.6 | 58.0 |
| 1N5651A | 47.8 | 53.2 | 58.8 | 1.0 | 5.0 | 77.0 | 19.5 | 56.0 |
| 1N5652 | 50.2 | 55.8 | 68.2 | 1.0 | 5.0 | 89.0 | 16.9 | 65.0 |
| 1N5652A | 53.0 | 58.9 | 65.1 | 1.0 | 5.0 | 85.0 | 17.7 | 62.0 |
| 1N5653 | 55.1 | 61.2 | 74.8 | 1.0 | 5.0 | 98.0 | 15.3 | 71.0 |
| 1N5653A | 58.1 | 64.6 | 71.4 | 1.0 | 5.0 | 92.0 | 16.3 | 69.0 |
| 1N5654 | 60.7 | 67.5 | 82.5 | 1.0 | 5.0 | 108.0 | 13.9 | 80.0 |
| 1N5654A | 64.1 | 71.3 | 78.8 | 1.0 | 5.0 | 103.0 | 14.6 | 76.0 |
| 1N5655* | 66.4 | 73.8 | 90.2 | 1.0 | 5.0 | 118.0 | 12.7 | 90.0 |
| 1N5655A* | 70.1 | 77.9 | 86.1 | 1.0 | 5.0 | 113.0 | 13.3 | 86.0 |
| 1N5656* | 73.7 | 81.9 | 100.0 | 1.0 | 5.0 | 131.0 | 11.4 | 99.0 |
| 1N5656A* | 77.8 | 86.5 | 95.5 | 1.0 | 5.0 | 125.0 | 12.0 | 94.0 |
| 1N5657 | 81.0 | 90.0 | 110.0 | 1.0 | 5.0 | 144.0 | 10.4 | 109.0 |
| 1N5657A | 85.5 | 95.0 | 105.0 | 1.0 | 5.0 | 137.0 | 11.0 | 104.0 |
| 1N5658 | 89.2 | 99.0 | 121.0 | 1.0 | 5.0 | 158.0 | 9.5 | 120.0 |
| 1N5658A | 94.0 | 105.0 | 116.0 | 1.0 | 5.0 | 152.0 | 9.9 | 115.0 |
| 1N5659 | 97.2 | 108.0 | 132.0 | 1.0 | 5.0 | 173.0 | 8.7 | 131.0 |
| 1N5659A | 102.0 | 114.0 | 126.0 | 1.0 | 5.0 | 165.0 | 9.1 | 125.0 |
| 1N5660* | 105.0 | 117.0 | 143.0 | 1.0 | 5.0 | 187.0 | 8.0 | 142.0 |
| 1N5660A* | 111.0 | 124.0 | 137.0 | 1.0 | 5.0 | 179.0 | 8.4 | 136.0 |
| 1N5661 | 121.0 | 135.0 | 165.0 | 1.0 | 5.0 | 215.0 | 7.0 | 164.0 |
| 1N5661A | 128.0 | 143.0 | 158.0 | 1.0 | 5.0 | 207.0 | 7.2 | 157.0 |
| 1N5662 | 130.0 | 144.0 | 176.0 | 1.0 | 5.0 | 230.0 | 6.5 | 175.0 |
| 1N5662A | 136.0 | 152.0 | 168.0 | 1.0 | 5.0 | 219.0 | 6.8 | 167.0 |
| 1N5663 | 138.0 | 153.0 | 187.0 | 1.0 | 5.0 | 244.0 | 6.2 | 186.0 |
| 1N5663A | 145.0 | 162.0 | 179.0 | 1.0 | 5.0 | 234.0 | 6.4 | 188.0 |
| 1N5664 | 146.0 | 162.0 | 198.0 | 1.0 | 5.0 | 258.0 | 5.8 | 197.0 |
| 1N5664A | 154.0 | 171.0 | 189.0 | 1.0 | 5.0 | 246.0 | 6.1 | 188.0 |
| 1N5665 | 162.0 | 180.0 | 220.0 | 1.0 | 5.0 | 287.0 | 5.2 | 219.0 |
| 1N5665A | 171.0 | 190.0 | 210.0 | 1.0 | 5.0 | 274.0 | 5.5 | 209.0 |

Suffix 'A' denotes 5% tolerance device, no suffix denotes a 10% tolerance device.

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1N5648 to 1N5665A V_F max = 5.0V at I_F = 50A 300 μ S square wave pulse.

* Preferred voltages.