

# 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:  $1 \times 10^{-12}$  seconds (theoretical)
- Operating & storage temperature: -55°C to +150°C

#### MECHANICAL CHARACTERISTICS

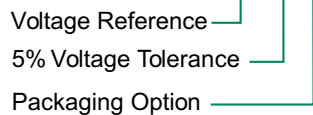
- Case: Metal hermetically sealed DO-13 package
- Terminals: Axial leads, solderable per MIL-STD-202 Method 208
- Solderable leads = 230°C for 10 seconds (1.59mm from case)
- Polarity: cathode indicated by colour band
- Weight: 1.5 grammes (approx)

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

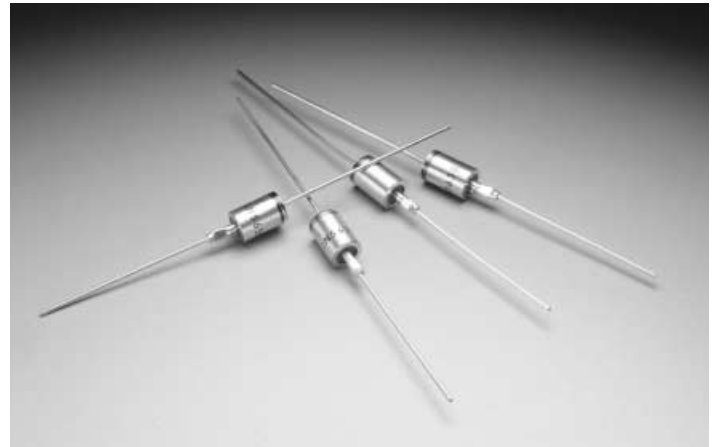
**Agency File Number:** E128662

#### ORDERING INFORMATION

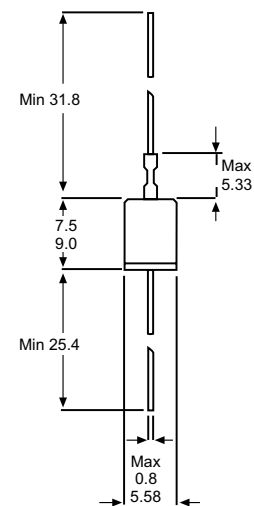
1 N 5 6 | X | X | A | J |



B = Bulk (500 pcs)



6  
SILICON DIODE ARRAYS

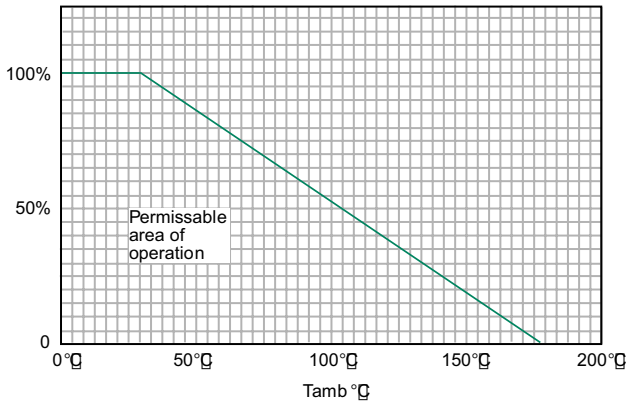


All dimensions in mm

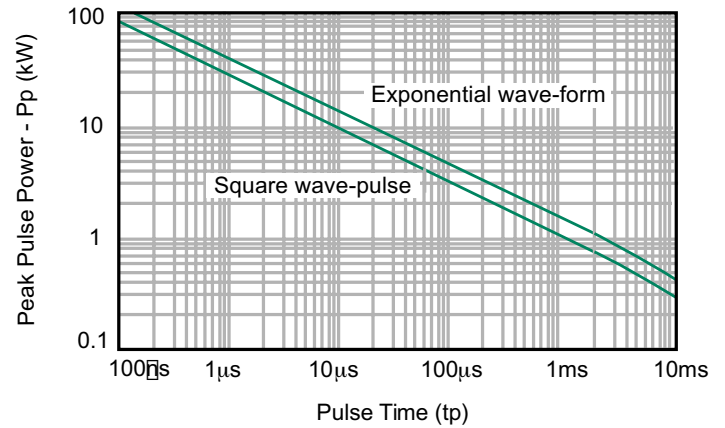
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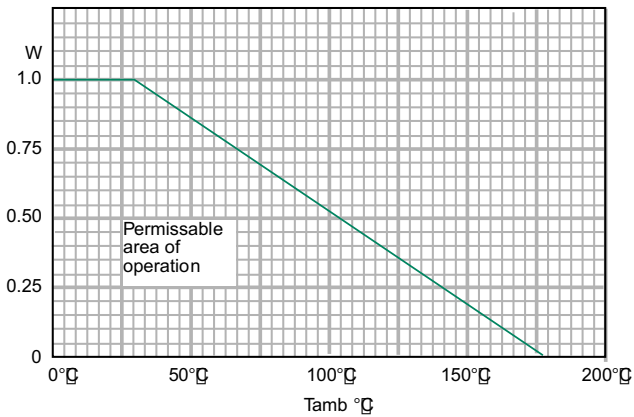
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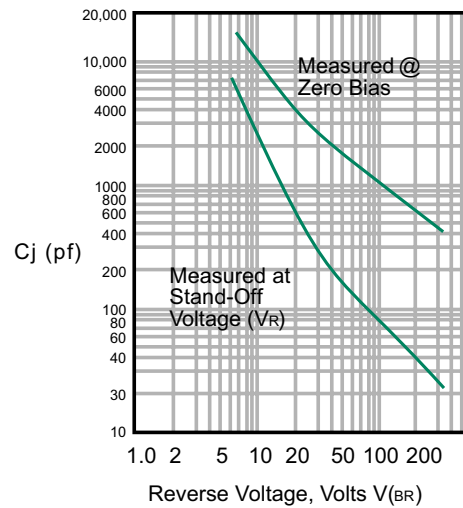
**Figure 1 - Peak Power Derating Curve**  
Peak pulse power in percent of 25°C rating



**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 $I_R$ @ $V_R$ ( $\mu A$ )	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  $\mu$ S square wave pulse.

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

\* Preferred voltages.

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		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

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