

# 1500 WATT TRANSIENT VOLTAGE SUPPRESSOR DIODES 5.50V to 171V (DO 13 CASE)

## FEATURES:

- 1500 Watts Peak Power – 1 ms
- 1 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 high quality hermetically sealed suppressor for use in military and commercial applications where large voltage transients can permanently damage voltage sensitive components.

This series has a peak pulse power rating of 1.5 KW 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.

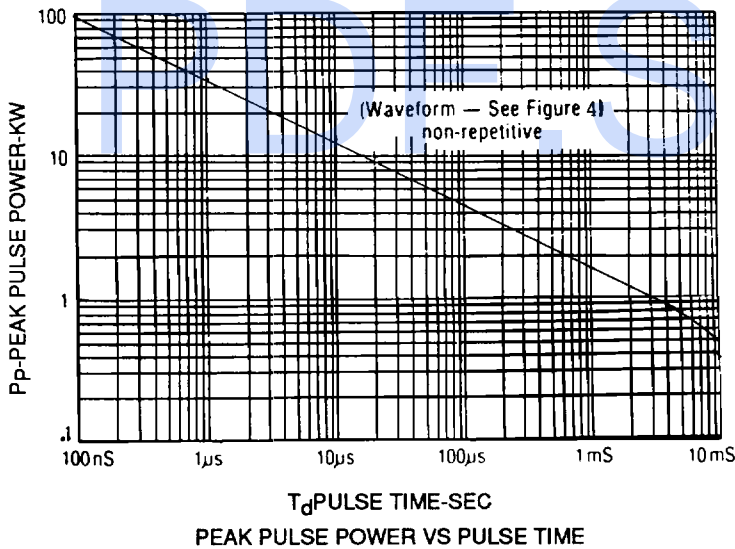
## MAXIMUM RATINGS: (See Notes)

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 <sub>P</sub>	1500 Watts	
DC Power Dissipation ( $T_L$ @ 3/8" from body = 75°C)	P <sub>M</sub>	1.0 Watt	
Maximum Currents			
Maximum Pulse Current	I <sub>PP</sub>	See Table (Note 2)	
Peak Forward One-Cycle Surge Current (1/2 60 Hz sine wave) $T_A = 25^\circ\text{C}$			
	I <sub>FSM</sub>	200 Amps (Note 3)	
Maximum Forward Voltage			
$T_A = 25^\circ\text{C}$ @ 1.0 Amps DC	V <sub>F</sub>	1.0 Volts	
$T_A = 25^\circ\text{C}$ @ 100 Amps DC	8.3 <sub>μs</sub>	3.5 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.
- (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

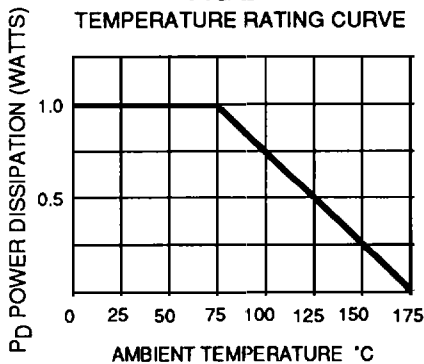


FIG 3

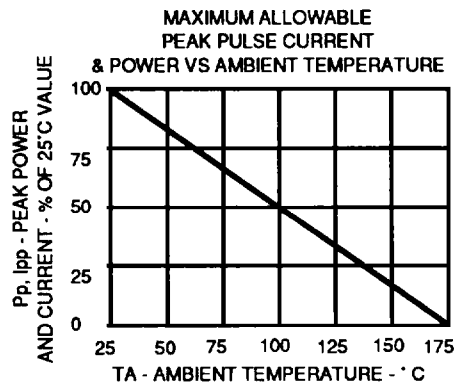
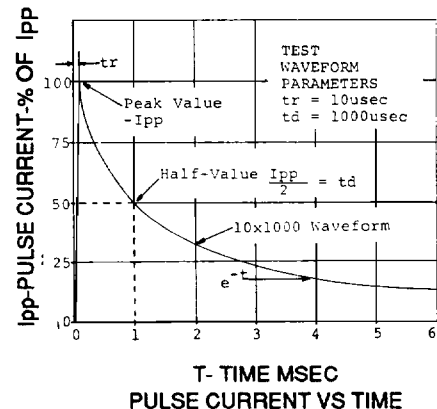


FIG 4



**TRANSIENT SUPPRESSORS  
1.5 KW DO-13 (METAL CASE)**

(Note 3)  DO 13	(Note 1) REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE @		(Note 2) MAXIMUM CLAMPING VOLTAGE @ I <sub>pp</sub> (1 mSEC)	MAXIMUM REVERSE LEAKAGE @ V <sub>R</sub>	MAXIMUM PEAK PULSE CURRENT	MAXIMUM TEMPERATURE COEFFICIENT OF BV
	V <sub>R</sub>	BV	I <sub>T</sub>	V <sub>C</sub>	I <sub>R</sub>	I <sub>pp</sub>	%°C
	VOLTS	VOLTS	mA	VOLTS	μA	A	
• 1N5555 • 1N5556 • 1N5557 • 1N5558 1N5629	30.5 40.3 49.0 175.0 5.50	33.0 43.7 54.0 191.0 6.12 - 7.48	1 1 1 1 10	47.5 63.5 78.5 265.0 10.8	5 5 5 5 1000	32 24 19 5.7 139	.093 .094 .096 .100 .057
1N5629A 1N5630 1N5630A 1N5631 1N5631A	5.80 6.05 6.40 6.63 7.02	6.45 - 7.14 6.75 - 8.25 7.13 - 7.88 7.38 - 9.02 7.79 - 8.61	10 10 10 10 10	10.5 11.7 11.3 12.5 12.1	1000 500 500 200 200	143 128 132 120 124	.057 .061 .061 .065 .065
1N5632 1N5632A 1N5633 1N5633A 1N5634	7.37 7.78 8.10 8.55 8.92	8.19 - 10.0 8.65 - 9.55 9.00 - 11.0 9.5 - 10.5 9.9 - 12.1	1 1 1 1 1	13.8 13.4 15.0 14.5 16.2	50 50 50 10 5	109 112 100 103 93	.068 .068 .073 .073 .075
1N5634A 1N5635 1N5635A 1N5636 1N5636A	9.40 9.72 10.2 10.5 11.1	10.5 - 11.6 10.8 - 13.2 11.4 - 12.6 11.7 - 14.3 12.4 - 13.7	1 1 1 1 1	15.6 17.3 16.7 19.0 18.2	5 5 5 5 5	96 87 90 79 82	.075 .078 .078 .081 .081
1N5637 1N5637A 1N5638 1N5638A 1N5639	12.1 12.8 12.9 13.6 14.5	13.5 - 16.5 14.3 - 15.8 14.4 - 17.6 15.2 - 16.8 16.2 - 19.8	1 1 1 1 1	22.0 21.2 23.5 22.5 26.5	5 5 5 5 5	68 71 64 67 56.5	.084 .084 .086 .086 .088
1N5639A 1N5640 1N5640A 1N5641 1N5641A	15.3 16.2 17.1 17.8 18.8	17.1 - 18.0 18.0 - 22.0 19.0 - 21.0 19.8 - 24.2 20.9 - 23.1	1 1 1 1 1	25.2 29.1 27.7 31.9 30.6	5 5 5 5 5	59.5 51.5 54 47 49	.088 .090 .090 .092 .092
1N5642 1N5642A 1N5643 1N5643A 1N5644	19.4 20.5 21.8 23.1 24.3	21.8 - 26.4 22.8 - 25.2 24.3 - 29.7 25.7 - 28.4 27.0 - 33.0	1 1 1 1 1	34.7 33.2 39.1 37.5 43.5	5 5 5 5 5	43 45 38.5 40 34.5	.094 .094 .096 .096 .097
1N5644A 1N56745 1N5645A 1N5646 1N5646A	25.6 26.8 28.2 29.1 30.8	28.5 - 31.5 29.7 - 36.3 31.4 - 34.7 32.4 - 39.6 34.2 - 37.8	1 1 1 1 1	41.4 47.7 45.7 52.0 49.9	5 5 5 5 5	36 31.5 33 29 30	.097 .098 .098 .099 .099
1N5647 1N5647A 1N5648 1N5648A 1N5649	31.6 33.3 34.8 36.8 38.1	35.1 - 42.9 37.1 - 41.0 38.7 - 47.3 40.9 - 45.2 42.3 - 51.7	1 1 1 1 1	56.4 53.9 61.9 59.3 67.8	5 5 5 5 5	26.5 28 24 25.3 22.2	.100 .100 .101 .101 .101
1N5649A 1N5650 1N5650A 1N5651 1N5651A	40.2 41.3 43.6 45.4 47.8	44.7 - 49.4 45.9 - 56.1 48.5 - 53.6 50.4 - 61.6 53.2 - 58.8	1 1 1 1 1	64.8 73.5 70.1 80.5 77.0	5 5 5 5 5	21.2 20.4 21.4 18.6 19.5	.101 .102 .102 .103 .103
1N5652 1N5652A 1N5653 1N5653A 1N5654	50.2 53.0 55.1 58.1 60.7	55.8 - 68.2 58.9 - 65.1 61.2 - 74.8 64.6 - 71.4 67.5 - 82.5	1 1 1 1 1	89.0 85.0 98.0 92.0 108.0	5 5 5 5 5	16.9 17.7 15.3 16.3 13.9	.104 .104 .104 .104 .105
1N5654A 1N5655 1N5655A 1N5656 1N5656A	64.1 66.4 70.1 73.7 77.8	71.3 - 78.8 73.8 - 90.2 77.9 - 86.1 81.9 - 100.0 86.5 - 95.5	1 1 1 1 1	103.0 118.0 113.0 131.0 125.0	5 5 5 5 5	14.6 12.7 13.3 11.4 12.0	.105 .105 .105 .106 .106
1N5657 1N5657A 1N5658 1N5658A 1N5659	81.0 85.5 89.2 94.0 97.2	90.0 - 110.0 95.0 - 105.0 99.0 - 121.0 105.0 - 116.0 108.0 - 132.0	1 1 1 1 1	144.0 137.0 158.0 152.0 173.0	5 5 5 5 5	10.4 11.0 9.5 9.9 8.7	.106 .106 .107 .107 .107
1N5659A 1N5660 1N5660A 1N5661 1N5661A	102.0 105.0 111.0 121.0 128.0	114.0 - 126.0 117.0 - 143.0 124.0 - 137.0 135.0 - 165.0 143.0 - 158.0	1 1 1 1 1	165.0 187.0 179.0 215.0 207.0	5 5 5 5 5	9.1 8.0 8.4 7.0 7.2	.107 .107 .107 .108 .108
1N5662 1N5662A 1N5663 1N5663A 1N5664	130.0 136.0 138.0 145.0 146.0	144.0 - 176.0 152.0 - 188.0 153.0 - 187.0 162.0 - 179.0 162.0 - 198.0	1 1 1 1 1	230.0 219.0 244.0 234.0 258.0	5 5 5 5 5	6.5 6.8 6.2 6.4 5.8	.108 .108 .108 .108 .108
1N5664A 1N5665 1N5665A 1N5907	154.0 162.0 171.0 5.0	171.0 - 189.0 180.0 - 220.0 190.0 - 210.0 6.0	1 1 1 1	246.0 287.0 274.0 8.8	5 5 5 300	6.1 5.2 5.5 165	.108 .108 .108 .06

**NOTES**

1 - AVAILABLE AS JAN, JTX, AND TXV TO MIL-S-19500/500  
2 - CLAMPING VOLTAGE - APPROX. 1.3 X MAX. BV

3 - FOR BI-POLAR TYPES SEE 1N6036 SERIES  
\* AVAILABLE AS JAN, JTX, AND JTXV TO MIL-S-19500/434