

# 400 WATT TRANSIENT VOLTAGE TZB-SERIES SUPPRESSOR DIODES 5.5V to 342V $V_R$ (B CASE)

## FEATURES:

- 400 Watts Peak Power – 1 ms
- 1 Watt D.C. Power @ 75°C Lead Temp.
- Superfast Response ( $1 \times 10^{-12}$  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 400 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	T <sub>stg</sub> T <sub>A</sub>	-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 <sub>A</sub> =25°C, Fig. 4)	P <sub>p</sub>	400 Watts
DC Power Dissipation (T <sub>L</sub> @ 3/8" from body = 75°C)	P <sub>M</sub>	1.0 Watt

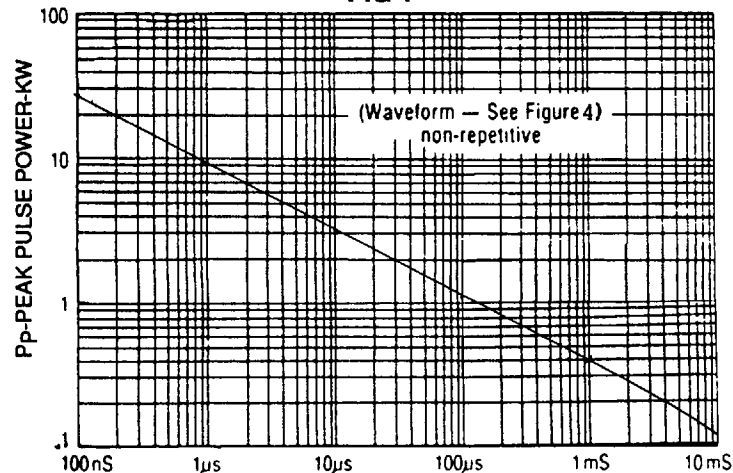
### Maximum Currents

Maximum Pulse Current	I <sub>pp</sub>	See Table (Note 2)
Peak Forward One-Cycle Surge Current (1/2 60 Hz sine wave) T <sub>A</sub> = 25°C	I <sub>FSM</sub>	50.0 Amps (Note 3)
Maximum Forward Voltage T <sub>A</sub> = 25°C @ 1.0 Amps DC	V <sub>F</sub>	1.2 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.

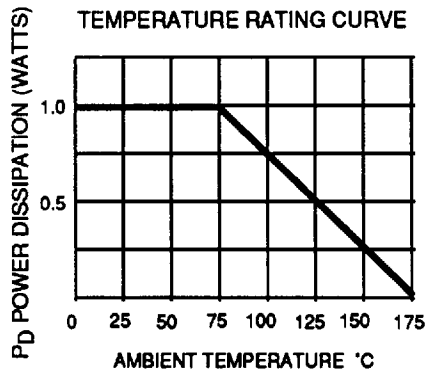
**FIG 1**



PEAK PULSE POWER VS PULSE TIME

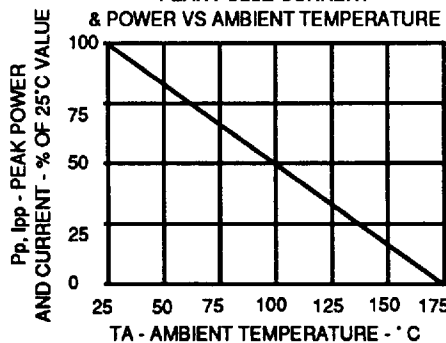
**FIG 2**

TEMPERATURE RATING CURVE

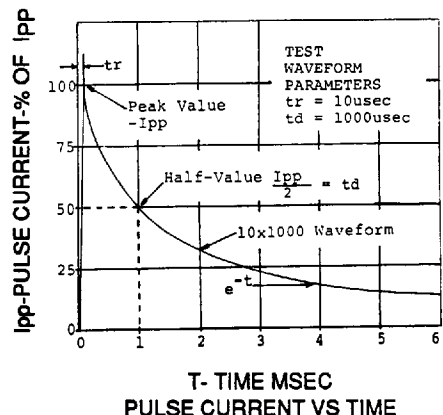


**FIG 3**

MAXIMUM ALLOWABLE  
PEAK PULSE CURRENT  
& POWER VS AMBIENT TEMPERATURE



**FIG 4**



ELECTRICAL CHARACTERISTICS at 25°C

TYPE NUMBER	(Note 1) REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE @		MAXIMUM CLAMPING VOLTAGE @ I <sub>pp</sub> (1 mSEC) V <sub>C</sub> VOLTS	MAXIMUM REVERSE LEAKAGE @ V <sub>R</sub> I <sub>R</sub> µA	MAXIMUM PEAK PULSE CURRENT I <sub>pp</sub> A	MAXIMUM TEMPERATURE COEFFICIENT OF BV %/°C	
	V <sub>R</sub> VOLTS	BV						
		MIN	MAX					I <sub>T</sub> mA
* TZB6.8A * TZB6.8B * TZB7.5A * TZB7.5B * TZB8.2A	5.50 5.80 6.05 6.40 6.63	6.12- 6.45- 6.75- 7.13- 7.38-	7.48 7.14 8.25 7.88 9.02	10 10 10 10 10	10.8 10.5 11.7 11.3 12.5	500 500 200 200 100	37 38 34 35 32	.057 .057 .061 .061 .065
* TZB8.2B * TZB9.1A * TZB9.1B * TZB10A * TZB10B	7.02 7.37 7.78 8.10 8.55	7.79- 8.19- 8.65- 9.00- 9.5-	8.61 10.0 9.55 11.0 10.5	10 1 1 1 1	12.1 13.8 13.4 15.0 14.5	100 20 20 20 5	33 29 30 27 28	.065 .068 .068 .073 .073
* TZB11A * TZB11B TZB12A TZB12B TZB13A	8.92 9.40 9.72 10.2 10.5	9.9- 10.5- 10.8- 11.4- 11.7-	12.1 11.6 13.2 12.6 14.3	1 1 1 1 1	16.2 15.6 17.3 16.7 19.0	2 2 2 2 2	25 26 23 24 21	.075 .075 .078 .078 .081
TZB13B TZB15A TZB15B TZB16A TZB16B	11.1 12.1 12.8 12.9 13.6	12.4- 13.5- 14.3- 14.4- 15.2-	13.7 16.5 15.8 17.6 16.8	1 1 1 1 1	18.2 22.0 21.2 23.5 22.5	2 2 2 2 2	22 18 19 17 18	.081 .084 .084 .086 .086
TZB18A TZB18B TZB20A TZB20B TZB22A	14.5 15.3 16.2 17.1 17.8	16.2- 17.1- 18.0- 19.0- 19.8-	19.8 18.0 22.0 21.0 24.2	1 1 1 1 1	26.5 25.2 29.1 27.7 31.9	2 2 2 2 2	15 16 14 14.5 12.5	.088 .088 .090 .090 .092
TZB22B TZB24A TZB24B TZB27A TZB27B	18.8 19.4 20.5 21.8 23.1	20.9- 21.6- 22.8- 24.3- 25.7-	23.1 26.4 25.2 29.7 28.4	1 1 1 1 1	30.6 34.7 33.2 39.1 37.5	2 2 2 2 2	13 11.5 12 10 11	.092 .094 .094 .096 .096
TZB30A TZB30B TZB33A TZB33B TZB36A	24.3 25.6 26.8 28.2 29.1	27.0 28.5- 29.7- 31.4- 32.4-	33.0 31.5 36.3 34.7 39.6	1 1 1 1 1	49.5 41.4 47.7 45.7 52.0	2 2 2 2 2	9.0 9.5 8.5 9.0 7.5	.097 .097 .098 .098 .099
TZB36B TZB39A TZB39B TZB43A TZB43B	30.8 31.6 33.3 34.8 36.8	34.2- 35.1- 37.1- 38.7- 40.9-	37.8 42.9 41.0 47.3 45.2	1 1 1 1 1	49.9 56.4 53.9 61.9 59.3	2 2 2 2 2	8.0 7.0 7.5 6.5 7.0	.099 .100 .100 .101 .101
TZB47A TZB47B TZB51A TZB51B TZB56A	38.1 40.2 41.3 43.6 45.4	42.3- 44.7- 45.9- 48.5- 50.4-	51.7 49.4 56.1 53.6 61.8	1 1 1 1 1	67.8 64.8 73.5 70.1 80.5	2 2 2 2 2	5.9 6.2 5.4 5.7 5.0	.101 .101 .102 .102 .103
TZB56B TZB62A TZB62B TZB68A TZB68B	47.8 50.2 53.0 55.1 58.1	53.2- 55.8- 58.9- 61.2- 64.6-	58.8 68.2 65.1 74.8 71.4	1 1 1 1 1	77.0 89.0 85.0 98.0 92.0	2 2 2 2 2	5.2 4.5 4.7 4.1 4.4	.103 .104 .104 .104 .104
TZB75A TZB75B TZB82A TZB82B TZB91A	60.7 64.1 66.4 70.1 73.7	67.5- 71.3- 73.8- 77.9- 81.9-	82.5 78.8 90.2 86.1 100.0	1 1 1 1 1	108.0 103.0 118.0 113.0 131.0	2 2 2 2 2	3.7 3.9 3.4 3.5 3.1	.105 .105 .105 .105 .106
TZB91B TZB100A TZB100B TZB110A TZB110B	77.8 81.0 85.5 89.2 94.0	86.5- 90.0- 95.0- 99.0- 105.0-	95.5 110.0 105.0 121.0 116.0	1 1 1 1 1	125.0 144.0 137.0 158.0 152.0	2 2 2 2 2	3.2 2.8 2.9 2.5 2.6	.106 .106 .106 .107 .107
TZB120A TZB120B TZB130A TZB130B TZB150A	97.2 102.0 105.0 111.0 121.0	108.0- 114.0- 117.0- 124.0- 135.0-	132.0 126.0 143.0 137.0 165.0	1 1 1 1 1	173.0 165.0 187.0 179.0 215.0	2 2 2 2 2	2.3 2.4 2.1 2.2 1.9	.107 .107 .107 .107 .108
TZB150B TZB160A TZB160B TZB170A TZB170B	128.0 130.0 136.0 138.0 145.0	143.0- 144.0- 152.0- 153.0- 162.0-	158.0 176.0 168.0 187.0 179.0	1 1 1 1 1	207.0 230.0 219.0 244.0 234.0	2 2 2 2 2	1.95 1.7 1.8 1.6 1.7	.108 .108 .108 .108 .108
TZB180A TZB180B TZB200A TZB200B TZB220A	146.0 154.0 162.0 171.0 175.0	162.0- 171.0- 180.0- 190.0- 198.0-	198.0 189.0 220.0 210.0 242.0	1 1 1 1 1	258.0 246.0 287.0 274.0 344.0	2 2 2 2 2	1.5 1.6 1.4 1.5 1.0	.108 .108 .108 .108 .110
TZB220B TZB250A TZB250B TZB300A TZB300B	185.0 202.0 214.0 243.0 256.0	209.0- 225.0- 237.0- 270.0- 285.0-	231.0 275.0 263.0 330.0 315.0	1 1 1 1 1	328.0 360.0 344.0 430.0 414.0	2 2 2 2 2	1.0 1.0 1.0 1.0 1.0	.110 .110 .110 .110 .110
TZB350A TZB350B TZB400A TZB400B	284.0 300.0 324.0 342.0	315.0- 333.0- 360.0- 380.0-	385.0 368.0 440.0 420.0	1 1 1 1	504.0 482.0 574.0 548.0	2 2 2 2	1.0 1.0 1.0 1.0	.110 .110 .110 .110

NOTES

- 1 - Available as BI-Polar (Add Suffix "C" to Part Number)
- 2 - Clamping Voltage 1.3 x Max. BV (Approx.)

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