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AVAILABLE IN  
SURFACE  
MOUNT

**Microsemi Corp.**

The diode experts

SCOTTSDALE, AZ

For more information call:  
(602) 941-6300

**1N6267 thru  
1N6303A  
and 1.5KE6.8 thru  
1.5KE400A**

## FEATURES

- ECONOMICAL
- 1500 WATTS PEAK PULSE POWER DISSIPATION
- STAND OFF VOLTAGES FROM 5.5V - 171V
- UNIPOLAR OR BIPOLAR
- AVAILABLE IN CHIP FORM FOR HYBRID APPLICATION
- MULTI-CHIP BIDIRECTIONAL CELLS AVAILABLE

## DESCRIPTION

This defines a series of silicon Transient Suppressors designed to protect voltage sensitive components from high energy voltage transients. TAZ devices have become very important as a consequence of their high surge capability, extremely fast response time, and low incremental surge resistance ( $R_s$ ).

To characterize TAZ, a minimum voltage at low current conditions ( $V_{BR}$ ), and a maximum clamping voltage ( $V_C$ ), at a maximum peak pulse current are specified. In addition, a maximum clamping ratio is indicated. The maximum leakage current at the rated stand-off voltage is also provided to assure low power consumption under normal conditions.

## APPLICATION

This TAZ series has a peak pulse power rating of 1500 watts for one millisecond. It can protect integrated circuits, hybrids, CMOS, MOS, and other voltage sensitive components in a broad range of applications such as telecommunications, power supplies, computers, automotive, and industrial equipment.

## MAXIMUM RATINGS

1500 Watts of Peak Pulse Power Dissipation at 25°C.

$t_{clamping}$  (0 Volts to  $V_{(BR)}$  Min.):

Unidirectional  $< 1 \times 10^{-12}$  Seconds; Bidirectional  $< 5 \times 10^{-9}$  Seconds.

Operating and Storage Temperature -65°C to +175°C.

Forward Surge Rating 200 Amps, 1/20 Second at 25°C.

Steady State Power Dissipation 5.0 W @  $T_1 = 75^\circ\text{C}$ .

(Not Applicable in Chip Form).

## ELECTRICAL CHARACTERISTICS

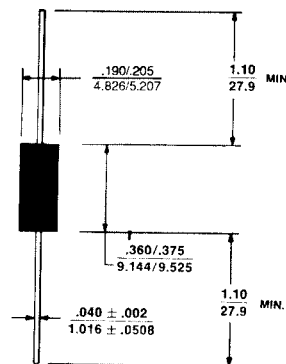
Clamping Factor: 1.33 @ full rated power

1.20 @ 50% rated power

The Clamping Factor is defined as: The ratio of the actual  $V_C$  (Clamping Voltage) to the actual  $V_{(BR)}$  (Breakdown Voltage) as measured on a specific device.

TRANSIENT  
ABSORPTION ZENER

UNIDIRECTIONAL  
AND  
BIDIRECTIONAL



All dimensions in **INCH**  
m. m.

## MECHANICAL CHARACTERISTICS

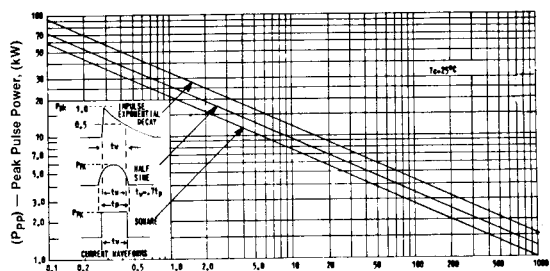
CASE: Molded

WEIGHT: 1.5 Grams (Approx.)

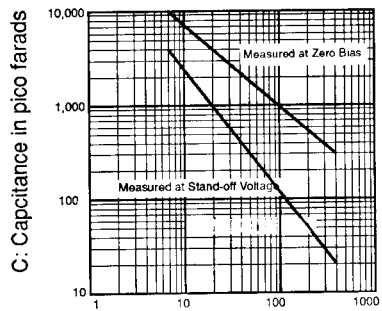
POLARITY: Positive Terminal  
Marked with Band

# 1N6267 thru 1N6303A and 1.5KE6.8 thru 1.5KE400A ELECTRICAL CHARACTERISTICS @ 25°C

Industry Type Number	JEDEC Type Number	Rated Stand-off Voltage V <sub>WM</sub>	Breakdown Voltage (BR) VOLTS	Maximum Clamping Voltage @ I <sub>pp</sub> (1 msEC)			Maximum Reverse Leakage @ V <sub>WM</sub> I <sub>D</sub> μA	Rated Peak Pulse Current I <sub>pp</sub> A	Maximum Temperature Coefficient α <sub>v</sub> %
				V <sub>WM</sub>	MIN	MAX			
1.5KE6.8	1N5908	5.0	6.0	0.57	1	7.6	300	30.	-0.57
1.5KE8.8A	1N6267	5.0	6.12	7.48	10	10.8	1000	139.0	-0.57
1.5KE11.5	1N6268	5.80	6.45	7.14	10	10.5	1000	143.0	-0.57
1.5KE17.5	1N6268	6.05	6.75	8.25	10	11.7	500	128.0	-0.61
1.5KE17.5A	1N6268	6.05	7.13	7.88	10	11.3	500	132.0	-0.61
1.5KE29	1N6269	6.63	7.38	9.02	10	12.5	200	120.0	-0.65
1.5KE29.2A	1N6269A	7.02	7.79	8.61	10	12.1	200	124.0	-0.65
1.5KE49	1N6270	7.37	8.19	10.00	1	13.8	50	109.0	-0.68
1.5KE49.1A	1N6270A	7.78	8.65	9.55	1	13.4	50	112.0	-0.68
1.5KE10	1N6271	8.10	9.00	11.00	1	15.0	10	100.0	-0.73
1.5KE10A	1N6271A	8.55	9.50	10.50	1	14.5	10	103.0	-0.73
1.5KE11	1N6272	8.92	9.90	12.10	1	16.2	5	93.0	-0.75
1.5KE11A	1N6272A	9.40	10.40	11.60	1	15.6	5	96.0	-0.75
1.5KE12	1N6273	9.72	10.80	13.70	1	17.3	5	87.0	-0.78
1.5KE12A	1N6273A	10.20	11.40	12.60	1	16.7	5	90.0	-0.78
1.5KE13	1N6274	10.50	11.70	14.30	1	19.0	5	81.0	-0.81
1.5KE13A	1N6274A	11.10	12.40	13.70	1	18.2	5	82.0	-0.81
1.5KE15	1N6275	12.10	13.50	16.50	1	22.0	5	68.0	-0.84
1.5KE15A	1N6275A	12.80	14.30	15.80	1	21.2	5	71.0	-0.84
1.5KE16	1N6276	12.90	14.40	17.60	1	23.5	5	64.0	-0.86
1.5KE16A	1N6276A	13.60	15.20	16.90	1	22.5	5	67.0	-0.86
1.5KE18	1N6277	14.50	16.20	19.80	1	26.5	5	56.5	-0.88
1.5KE18A	1N6277A	15.30	17.10	18.90	1	25.2	5	59.0	-0.88
1.5KE20	1N6278	16.20	18.00	22.00	1	31.5	5	49.1	-0.91
1.5KE20A	1N6278A	17.10	19.10	21.00	1	27.7	5	54.0	-0.90
1.5KE22	1N6279	17.80	19.80	24.20	1	33.9	5	47.0	-0.92
1.5KE22A	1N6279A	18.80	20.90	23.10	1	30.6	5	49.0	-0.92
1.5KE24	1N6280	19.40	21.60	26.40	1	39.7	5	43.0	-0.94
1.5KE24A	1N6280A	20.50	22.80	25.20	1	33.2	5	45.0	-0.94
1.5KE27	1N6281	21.80	24.30	29.70	1	39.1	5	38.5	-0.96
1.5KE27A	1N6281A	23.10	25.70	28.40	1	37.5	5	40.0	-0.96
1.5KE30	1N6282	24.00	27.00	33.00	1	43.5	5	34.5	-0.97
1.5KE30A	1N6282A	25.60	28.50	31.50	1	41.4	5	36.0	-0.97
1.5KE33	1N6283	26.80	29.70	36.30	1	47.7	5	31.5	-0.98
1.5KE33A	1N6283A	28.20	31.40	34.70	1	45.6	5	33.0	-0.98
1.5KE36	1N6284	29.0	32.40	39.60	1	52.0	5	29.0	-0.99
1.5KE36A	1N6284A	30.80	34.20	37.80	1	49.9	5	30.0	-0.99
1.5KE39	1N6285	31.60	35.10	42.90	1	58.4	5	26.5	-1.00
1.5KE39A	1N6285A	33.30	37.10	41.00	1	53.9	5	28.0	-1.00
1.5KE43	1N6286	34.80	38.70	47.30	1	61.9	5	24.0	-1.01
1.5KE43A	1N6286A	36.80	40.90	45.20	1	59.2	5	25.3	-1.01
1.5KE47	1N6287	38.10	42.30	51.70	1	67.8	5	22.2	-1.01
1.5KE47A	1N6287A	40.20	44.70	49.40	1	64.8	5	23.2	-1.01
1.5KE51	1N6288	41.30	45.90	56.10	1	73.5	5	20.4	-1.02
1.5KE51A	1N6288A	43.60	48.50	53.60	1	70.1	5	21.4	-1.02
1.5KE56	1N6289	45.80	50.80	61.80	1	80.5	5	18.6	-1.03
1.5KE56A	1N6289A	47.80	53.20	59.80	1	77.0	5	19.5	-1.03
1.5KE62	1N6290	50.70	55.80	68.20	1	89.0	5	16.9	-1.04
1.5KE62A	1N6290A	53.00	58.90	65.10	1	85.0	5	17.7	-1.04
1.5KE68	1N6291	55.10	61.20	74.80	1	98.0	5	15.3	-1.04
1.5KE68A	1N6291A	58.10	64.60	71.40	1	92.0	5	16.3	-1.04
1.5KE75	1N6292	60.70	67.50	82.50	1	108.0	5	13.9	-1.05
1.5KE75A	1N6292A	64.10	71.30	78.00	1	103.0	5	14.6	-1.05
1.5KE82	1N6293	66.40	73.80	90.20	1	118.0	5	12.7	-1.05
1.5KE82A	1N6293A	70.10	77.90	86.10	1	113.0	5	13.3	-1.05
1.5KE91	1N6294	73.70	81.90	100.00	1	133.0	5	11.4	-1.06
1.5KE91A	1N6294A	77.80	86.50	95.50	1	125.0	5	12.0	-1.06
1.5KE100	1N6295	81.00	90.00	110.00	1	144.0	5	10.4	-1.06
1.5KE100A	1N6295A	85.50	95.00	105.00	1	137.0	5	11.0	-1.06
1.5KE110	1N6296	89.20	99.10	121.00	1	158.0	5	9.5	-1.07
1.5KE110A	1N6296A	94.00	105.00	116.00	1	152.0	5	9.9	-1.07
1.5KE120	1N6297	97.20	108.00	132.00	1	173.0	5	8.7	-1.07
1.5KE120A	1N6297A	102.00	114.00	126.00	1	165.0	5	9.1	-1.07
1.5KE130	1N6298	105.00	117.00	143.00	1	187.0	5	8.0	-1.07
1.5KE130A	1N6298A	111.00	124.00	137.00	1	179.0	5	8.4	-1.07
1.5KE150	1N6299	121.00	135.00	165.00	1	215.0	5	7.0	-1.08
1.5KE150A	1N6299A	128.00	143.00	158.00	1	207.0	5	7.2	-1.08
1.5KE160	1N6300	130.00	144.00	176.00	1	230.0	5	6.5	-1.08
1.5KE160A	1N6300A	136.00	152.00	168.00	1	219.0	5	6.8	-1.08
1.5KE170	1N6303	138.00	153.00	187.00	1	244.0	5	6.2	-1.08
1.5KE170A	1N6303A	145.00	162.00	179.00	1	234.0	5	6.4	-1.08
1.5KE180	1N6302	146.00	162.00	198.00	1	258.0	5	5.8	-1.08
1.5KE180A	1N6302A	154.00	171.00	189.00	1	246.0	5	6.1	-1.08
1.5KE200	1N6303	162.00	180.00	220.00	1	287.0	5	5.2	-1.08
1.5KE200A	1N6303A	171.00	190.00	210.00	1	274.0	5	5.5	-1.08
1.5KE220	175.00	198.00	242.00	1	344.0	5	4.3	0.110	
1.5KE220A	185.00	209.00	231.00	1	328.0	5	4.6	0.110	
1.5KE250	202.00	225.00	275.00	1	360.0	5	5.0	0.110	
1.5KE250A	214.00	237.00	263.00	1	344.0	5	5.0	0.110	
1.5KE300	243.00	270.00	330.00	1	430.0	5	5.0	0.111	
1.5KE300A	256.00	285.00	315.00	1	414.0	5	5.0	0.111	
1.5KE350	284.00	315.00	385.00	1	504.0	5	4.0	0.111	
1.5KE350A	300.00	332.00	368.00	1	482.0	5	4.0	0.111	
1.5KE400	324.00	360.00	440.00	1	574.0	5	4.0	0.111	
1.5KE400A	342.00	380.00	420.00	1	548.0	5	4.0	0.111	

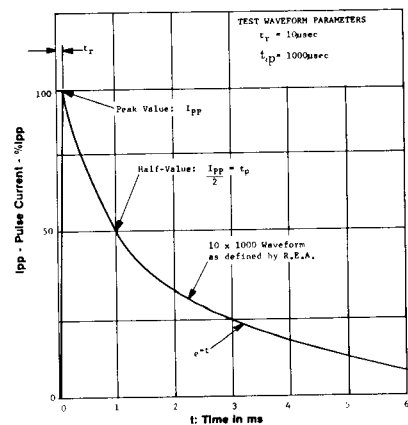


**FIGURE 1**  
PEAK PULSE POWER VS. PULSE TIME (T<sub>w</sub>) IN μs

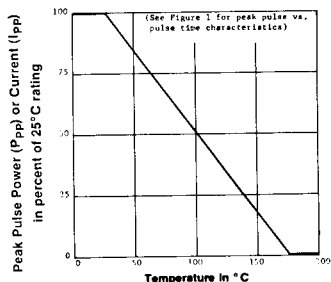


BV: Breakdown Voltage in Volts

**FIGURE 2**  
TYPICAL CAPACITANCE VS. BREAKDOWN VOLTAGE



**FIGURE 3** PULSE WAVE FORM



**FIGURE 4** DERATING CURVE

V<sub>Br</sub> at 100 amps peak, 8.3 ms sine wave equals 3.5 volts max. (unidirectional only). For Bidirectional part number add C or CA as suffix (e.g., 1.5KE33C or 1.5KE33CA). For Bidirectional types having V<sub>WM</sub> of 8 volts and under, the I<sub>D</sub> leakage current is doubled. 1N62XX or 1N5908 not available as bidirectional. For bipolar capacitance will be .5 that shown in Fig. 2 for zero bias.

## SYMBOLS AND ABBREVIATIONS

- V<sub>WM</sub> = Rated Stand-off Voltage  
I<sub>pp</sub> = Peak Pulse Current  
P<sub>pp</sub> = Peak Pulse Power  
V<sub>C(MAX)</sub> = Maximum Clamping Voltage
- V<sub>BR</sub> = Breakdown Voltage  
I<sub>T</sub> = Test Current  
I<sub>D</sub> = Reverse Leakage

**NOTE 1:** Normal selection criteria for TAZ devices is by rated stand-off voltage (V<sub>WM</sub>) and should be equal or greater than DC or continuous peak operating voltage.  
**NOTE 2:** TAZ devices are tested to maximum peak pulse current (I<sub>pp</sub>) with clamping voltage monitored. This surge capability is one of the most significant electrical characteristics of the device and should be considered as part of customer quality inspections.