

**P4KE6.8 thru  
P4KE400**

**Features**

- ECONOMICAL SERIES
- AVAILABLE IN BOTH UNIDIRECTIONAL AND BIDIRECTIONAL CONSTRUCTION
- 6.8 TO 400 VOLTS AVAILABLE
- 400 WATTS PEAK PULSE POWER DISSIPATION
- QUICK RESPONSE

**Maximum Ratings**

Peak Pulse Power Dissipation at 25°C: 400 Watts  
Steady State Power Dissipation: 1.0 Watt at  $T_L = +75^\circ\text{C}$  at 3/8" Lead Length  
 $t_{clamping}$  (0 volts to  $V_{(BR)}$  Min.): Unidirectional  $< 1 \times 10^{-12}$  seconds;  
Bidirectional  $< 5 \times 10^{-9}$  seconds.  
Operating and Storage Temperature:  $-65^\circ$  to  $+175^\circ\text{C}$

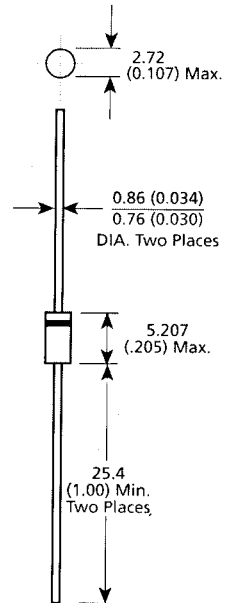
**Application**

This TAZ is an economical molded product frequently used for automotive applications to protect voltage sensitive components from destruction or partial degradation. The response time for unipolar clamping action is virtually instantaneous ( $1 \times 10^{-12}$  seconds). They have a peak pulse power rating of 400 watts for 1 ms as depicted in Figures 1 and 2. Microsemi also offers various other TAZ devices to meet higher and lower power demands and special applications.

**Electrical Characteristics at 25°C**

TYPE NUMBER	RATED STAND-OFF VOLTAGE		BREAKDOWN VOLTAGE		$I_T$ mA	MAXIMUM CLAMPING VOLTAGE $V_C \text{ MAX. @ } I_{PP}$	MAXIMUM REVERSE LEAKAGE CURRENT $I_D @ V_{WM}$	MAXIMUM PEAK PULSE CURRENT $I_{PP}$	MAXIMUM TEMPERATURE COEFFICIENT OF $-V_{(BR)}$
	$V_{WM}$		MIN.	MAX.					
	V	$V_{DC}$	$V_{DC}$			V	$\mu\text{ADC}$	A	% / °C
P4KE6.8	5.50	6.12	7.48	10	10.8	500	37	.057	
P4KE6.8A	5.80	6.45	7.14	10	10.5	500	38	.057	
P4KE7.5	6.05	6.75	8.25	10	11.7	200	34	.061	
P4KE7.5A	6.40	7.13	7.88	10	11.3	200	35	.061	
P4KE8.2	6.63	7.38	9.02	10	12.5	100	32	.065	
P4KE8.2A	7.02	7.79	8.61	10	12.1	100	33	.065	
P4KE9.1	7.37	8.19	10.0	1	13.8	20	29	.068	
P4KE9.1A	7.78	8.65	9.55	1	13.4	20	30	.068	
P4KE10	8.10	9.00	11.0	1	15.0	20	27	.073	
P4KE10A	8.55	9.50	10.5	1	14.5	5	28	.073	
P4KE11	8.92	9.90	12.1	1	16.2	2	25	.075	
P4KE11A	9.40	10.5	11.6	1	15.6	2	26	.075	
P4KE12	9.72	10.8	13.2	1	17.3	2	23	.078	
P4KE12A	10.2	11.4	12.6	1	16.7	2	24	.078	
P4KE13	10.5	11.7	14.3	1	19.0	2	21	.081	
P4KE13A	11.1	12.4	13.7	1	18.2	2	22	.081	
P4KE15	12.1	13.5	16.5	1	22.0	2	18	.084	
P4KE15A	12.8	14.3	15.8	1	21.2	2	19	.084	
P4KE16	12.9	14.4	17.6	1	23.5	2	17	.086	
P4KE16A	13.6	15.2	16.8	1	22.5	2	18	.086	
P4KE18	14.5	16.2	19.8	1	26.5	2	15	.088	
P4KE18A	15.3	17.1	18.0	1	25.2	2	16	.088	
P4KE20	16.2	18.0	22.0	1	29.1	2	14	.090	
P4KE20A	17.1	19.0	21.0	1	27.7	2	14.5	.090	
P4KE22	17.8	19.8	24.2	1	31.9	2	12.5	.092	
P4KE22A	18.8	20.9	23.1	1	30.6	2	13	.092	
P4KE24	19.4	21.6	26.4	1	34.7	2	11.5	.094	
P4KE24A	20.5	22.8	25.2	1	33.2	2	12	.094	
P4KE27	21.8	24.3	29.7	1	39.1	2	10	.096	
P4KE27A	23.1	25.7	28.4	1	37.5	2	11	.096	
P4KE30	24.3	27.0	33.0	1	43.5	2	9.0	.097	
P4KE30A	25.6	28.5	31.5	1	41.4	2	9.5	.097	
P4KE33	26.8	29.7	36.3	1	47.7	2	8.5	.098	
P4KE33A	28.2	31.4	34.7	1	45.7	2	9.0	.098	
P4KE36	29.1	32.4	39.6	1	52.0	2	7.5	.099	
P4KE36A	30.8	34.2	37.8	1	49.9	2	8.0	.099	

**TRANSIENT  
ABSORPTION  
ZENER**



NOTE: Cathode indicated by band.  
All dimensions in millimeters (inches)

**Mechanical Characteristics**

**CASE:** Void Free Transfer Molded Thermosetting Plastic.

**FINISH:** Plated Copper Readily Solderable.

**POLARITY:** Band Denotes Cathode. Bidirectional Not Marked.

**WEIGHT:** 0.7 Gram (Appx.).

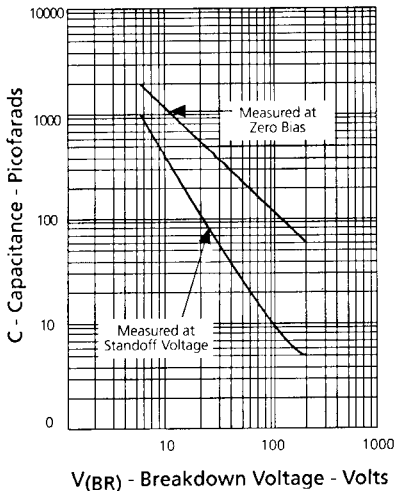
**MOUNTING POSITION:** Any.

# P4KE6.8 thru P4KE400

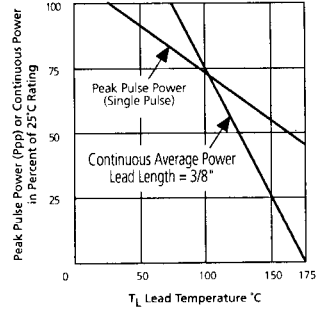
## Electrical Characteristics at 25°C

TYPE NUMBER	RATED STAND-OFF VOLTAGE $V_{WM}$	BREAKDOWN VOLTAGE $V_{(BR)}$		$I_T$ mA	MAXIMUM CLAMPING VOLTAGE $V_C$ MAX. @ $I_{pp}$	MAXIMUM REVERSE LEAKAGE CURRENT $I_D$ @ $V_{WM}$	MAXIMUM PEAK PULSE CURRENT $I_{pp}$	MAXIMUM TEMPERATURE COEFFICIENT OF $V_{(BR)}$
		MIN.	MAX.					
	V	$V_{DC}$	$V_{DC}$		V	$\mu$ ADC	A	% / °C
P4KE39	31.6	35.1	42.9	1	56.4	2	7.0	.100
P4KE39A	33.3	37.1	41.0	1	53.9	2	7.5	.100
P4KE43	34.8	38.7	47.3	1	61.9	2	6.5	.101
P4KE43A	36.8	40.9	45.2	1	59.3	2	7.0	.101
P4KE47	38.1	42.3	51.7	1	67.8	2	5.9	.101
P4KE47A	40.2	44.7	49.4	1	64.8	2	6.2	.101
P4KE51	41.3	45.9	56.1	1	73.5	2	5.4	.102
P4KE51A	43.6	48.5	53.6	1	70.1	2	5.7	.102
P4KE56	45.4	50.4	61.6	1	89.5	2	5.0	.103
P4KE56A	47.8	53.2	58.8	1	77.0	2	5.2	.103
P4KE62	50.2	55.8	68.2	1	89.0	2	4.5	.104
P4KE62A	53.0	58.9	65.1	1	85.0	2	4.7	.104
P4KE68	55.1	61.2	74.8	1	98.0	2	4.1	.104
P4KE68A	58.1	64.6	71.4	1	92.0	2	4.4	.104
P4KE75	60.7	67.5	82.5	1	108.0	2	3.7	.105
P4KE75A	64.1	71.3	78.8	1	103.0	2	3.9	.105
P4KE82	66.4	73.8	90.2	1	118.0	2	3.4	.105
P4KE82A	70.1	77.9	86.1	1	113.0	2	3.5	.105
P4KE91	73.7	81.9	100.0	1	131.0	2	3.1	.106
P4KE91A	77.8	86.5	95.5	1	125.0	2	3.2	.106
P4KE100	81.0	90.0	110.0	1	144.0	2	2.8	.106
P4KE100A	85.5	95.0	105.0	1	137.0	2	2.9	.106
P4KE110	89.2	99.0	121.0	1	158.0	2	2.5	.107
P4KE110A	94.0	105.0	116.0	1	152.0	2	2.6	.107
P4KE120	97.2	108.0	132.0	1	173.0	2	2.3	.107
P4KE120A	102.0	114.0	126.0	1	165.0	2	2.4	.107
P4KE130	105.0	117.0	143.0	1	187.0	2	2.1	.107
P4KE130A	111.0	124.0	137.0	1	179.0	2	2.2	.107
P4KE150	121.0	135.0	165.0	1	215.0	2	1.9	.108
P4KE150A	128.0	143.0	158.0	1	207.0	2	1.95	.108
P4KE160	130.0	144.0	176.0	1	230.0	2	1.7	.108
P4KE160A	136.0	152.0	168.0	1	219.0	2	1.8	.108
P4KE170	138.0	153.0	187.0	1	244.0	2	1.6	.108
P4KE170A	145.0	162.0	179.0	1	234.0	2	1.7	.108
P4KE180	146.0	162.0	198.0	1	258.0	2	1.5	.108
P4KE180A	154.0	171.0	189.0	1	246.0	2	1.6	.108
P4KE200	162.0	180.0	220.0	1	287.0	2	1.4	.108
P4KE200A	171.0	190.0	210.0	1	274.0	2	1.5	.108
P4KE220	175.0	198.0	242.0	1	344.0	2	1.0	.110
P4KE220A	185.0	209.0	231.0	1	328.0	2	1.0	.110
P4KE250	202.0	225.0	275.0	1	360.0	2	1.0	.110
P4KE250A	214.0	237.0	263.0	1	344.0	2	1.0	.110
P4KE300	243.0	270.0	330.0	1	430.0	2	1.0	.110
P4KE300A	256.0	285.0	315.0	1	414.0	2	1.0	.110
P4KE350	284.0	315.0	385.0	1	504.0	2	1.0	.110
P4KE350A	300.0	333.0	368.0	1	482.0	2	1.0	.110
P4KE400	324.0	360.0	440.0	1	574.0	2	1.0	.110
P4KE400A	342.0	380.0	420.0	1	548.0	2	1.0	.110

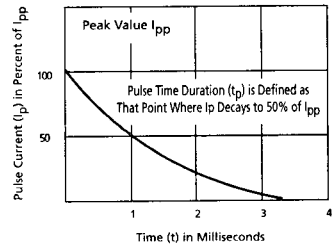
Forward Voltage ( $V_f$ ) @ 30 amps peak, 8.3 ms sine wave equal to 3.5 volts maximum for P4KE6.8 to 200. (Excluding Bidirectional)  
For bidirectional construction, indicate a C or CA suffix after part number, i.e. P4KE170CA.



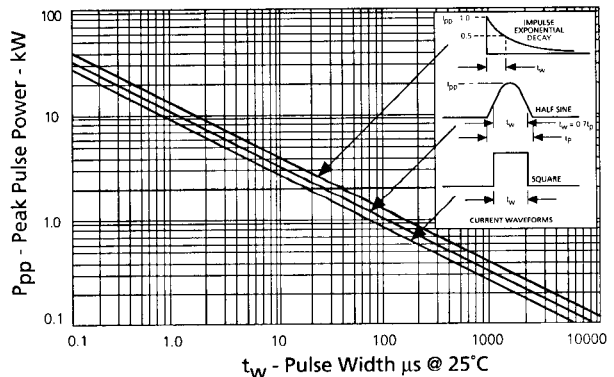
**FIGURE 3**  
P4KE Typical Capacitance vs Breakdown Voltage (Unipolar)



**FIGURE 1**  
Derating Curve



**FIGURE 2**  
Pulse Waveform For Exponential Surge



**FIGURE 4**  
Peak Pulse Power vs Pulse Time

### Symbols and Abbreviations

- $V_{WM}$  = Rated Stand-Off Voltage
- $I_{pp}$  = Peak Pulse Current
- $P_{pp}$  = Peak Pulse Power
- $V_C$  (MAX) = Maximum Clamping Voltage
- $V_{(BR)}$  = Breakdown Voltage
- $I_T$  = Test Current
- $I_D$  = Reverse Leakage