

**Microsemi Corp.**  
The diode experts

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**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

$t_{\text{clamping}}$  (0 volts to  $V_{\text{BR}}$  Min.): Unidirectional  $< 1 \times 10^{-12}$  seconds;

Bidirectional  $< 5 \times 10^{-9}$  seconds.

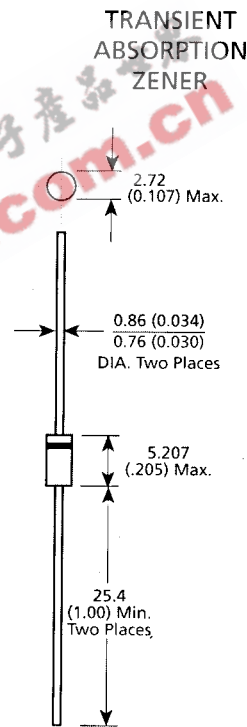
Operating and Storage Temperature:  $-65^\circ$  to  $+175^\circ\text{C}$

## 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 $V_{\text{WM}}$	BREAKDOWN VOLTAGE $V_{\text{BR}}$		$I_{\text{T}}$ mA	MAXIMUM CLAMPING VOLTAGE $V_{\text{C MAX}}$ @ $I_{\text{pp}}$	MAXIMUM REVERSE LEAKAGE CURRENT $I_{\text{D}}$ @ $V_{\text{WM}}$	MAXIMUM PEAK PULSE CURRENT $I_{\text{pp}}$	MAXIMUM TEMPERATURE COEFFICIENT OF $-V_{\text{BR}}$
		MIN.	MAX.					
	V	V <sub>DC</sub>	V <sub>ADC</sub>		V	µADC	A	
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
P4KE35	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



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.).

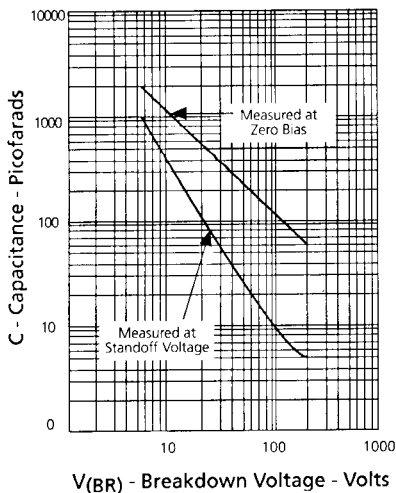
**MOUNTING POSITION:**  
Any.

# P4KE6.8 thru P4KE400

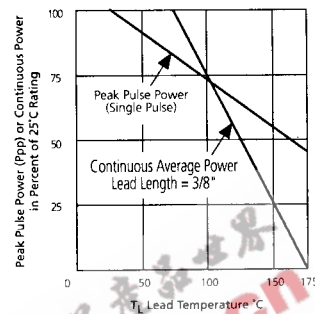
## Electrical Characteristics at 25°C

TYPE NUMBER	RATED STAND-OFF VOLTAGE		BREAKDOWN VOLTAGE		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 $V_{(BR)}$
	$V_{WM}$	MIN.	$V_{(BR)}$					
			MIN.	MAX.				
	V	VDC	VDC		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	80.5	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	1.1	-.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

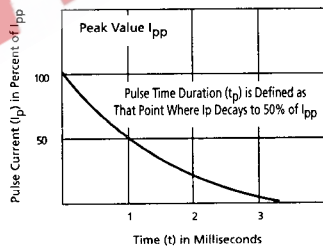
Forward Voltage ( $V_f$ ) @ 30 amps peak, 8.3 ms sine wave equal to 3.5 volts maximum for P4KE6.8 to 200. (Excluding Bidirectional)  
 For bidirectional construction, indicate a C or CA suffix after part number, i.e. P4KE170CA.



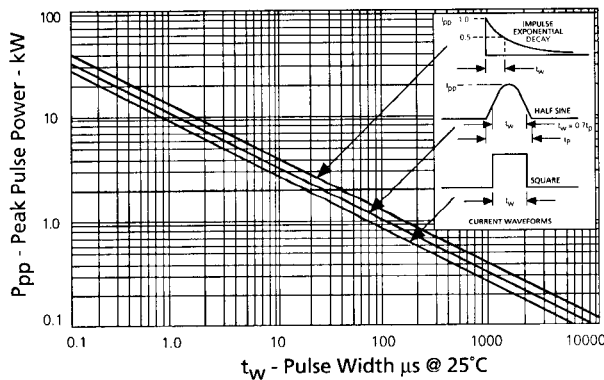
**FIGURE 3**  
 P4KE Typical Capacitance vs Breakdown Voltage (Unipolar)



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