

# P4KE SERIES

## GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE - 6.8 TO 440 Volts

400 Watt Peak Power

1.0 Watt Steady State

### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- Glass passivated chip junction in DO-41 package
- 400W surge capability at 1ms
- Excellent clamping capability
- Low zener impedance
- Fast response time: typically less than 1.0 ps from 0 volts to BV min
- Typical  $I_R$  less than 1  $\mu$ A above 10V
- High temperature soldering guaranteed: 300  $\text{C}$ /10 seconds/.375", (9.5mm) lead length/5lbs., (2.3kg) tension

### DO-41



### MECHANICAL DATA

Case: JEDEC DO-41 molded plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denoted cathode except Bipolar

Mounting Position: Any

Weight: 0.012 ounce, 0.34 gram

### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types  
Electrical characteristics apply in both directions.

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25  $\text{C}$  ambient temperature unless otherwise specified.

Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25\text{C}$ , $T_P=1\text{ms}$ (Note 1)	$P_{PK}$	Minimum 400	Watts
Steady State Power Dissipation at $T_L=75\text{C}$ Lead Lengths .375", (9.5mm) (Note 2)	PD	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load(JECED Method) (Note 3)	$I_{FSM}$	40.0	Amps
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +175	$\text{C}$

### NOTES:

- 1.Non-repetitive current pulse, per Fig. 3 and derated above  $T_A=25\text{C}$  per Fig. 2.
- 2.Mounted on Copper Leaf area of  $1.57\text{in}^2$  ( $40\text{mm}^2$ ).
- 3.8.3ms single half sine-wave, duty cycle= 4 pulses per minutes maximum.

## RATING AND CHARACTERISTIC CURVES P4KE SERIES



Fig. 1-PEAK PULSE POWER RATING VERSUS PULSE TIME CURVE



Fig. 2-PULSE DERATING CURVE



Fig. 3-PULSE WAVEFORM



Fig. 4-TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL



Fig. 5-STeady State Power Derating Curve



Fig. 6-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

**UNI-DIRECTIONAL 400 Watt Axial Lead TVS**

UNI-DIRECTIONAL PART NUMBER	REVERSE STAND-OFF Voltage VRWM (V)	BREAKDOWN VOLTAGE VBR (V) MIN. @IT	BREAKDOWN VOLTAGE VBR (V) MAX. @IT	TEST CURRENT IT (mA)	MAXIMUM CLAMPING VOLTAGE @I <sub>PP</sub> VC (V)	PEAK PULSE CURRENT I <sub>PP</sub> (A)	REVERSE LEAKAGE @VRWM IR (uA)
P4KE6.8	5.50	6.12	7.48	10	10.8	38.0	1000
P4KE6.8A	5.80	6.45	7.14	10	10.5	40.0	1000
P4KE7.5	6.05	6.75	8.25	10	11.7	36.0	500
P4KE7.5A	6.40	7.13	7.88	10	11.3	37.0	500
P4KE8.2	6.63	7.38	9.02	10	12.5	33.0	200
P4KE8.2A	7.02	7.79	8.61	10	12.1	35.0	200
P4KE9.1	7.37	8.19	10.00	1	13.8	30.0	50
P4KE9.1A	7.78	8.65	9.50	1	13.4	31.0	50
P4KE10	8.10	9.00	11.00	1	15.0	28.0	10
P4KE10A	8.55	9.50	10.50	1	14.5	29.0	10
P4KE11	8.92	9.90	12.10	1	16.2	26.0	5
P4KE11A	9.40	10.50	11.60	1	15.6	27.0	5
P4KE12	9.72	10.80	13.20	1	17.3	24.0	5
P4KE12A	10.20	11.40	12.60	1	16.7	25.0	5
P4KE13	10.50	11.70	14.30	1	19.0	22.0	5
P4KE13A	11.10	12.40	13.70	1	18.2	23.0	5
P4KE15	12.10	13.50	16.50	1	22.0	19.0	5
P4KE15A	12.80	14.30	15.80	1	21.2	20.0	5
P4KE16	12.90	14.40	17.60	1	23.5	18.0	5
P4KE16A	13.60	15.20	16.80	1	22.5	19.0	5
P4KE18	14.50	16.20	19.80	1	26.5	16.0	5
P4KE18A	15.30	17.10	18.90	1	25.2	17.0	5
P4KE20	16.20	18.00	22.00	1	29.1	14.0	5
P4KE20A	17.10	19.00	21.00	1	27.7	15.0	5
P4KE22	17.80	19.80	24.20	1	31.9	13.0	5
P4KE22A	18.80	20.90	23.10	1	30.6	14.0	5
P4KE24	19.40	21.60	26.40	1	34.7	12.0	5
P4KE24A	20.50	22.80	25.20	1	33.2	13.0	5
P4KE27	21.80	24.30	29.70	1	39.1	11.0	5
P4KE27A	23.10	25.70	28.40	1	37.5	11.2	5
P4KE30	24.30	27.00	33.00	1	43.5	10.0	5
P4KE30A	25.60	28.50	31.50	1	41.4	10.0	5
P4KE33	26.80	29.70	36.30	1	47.7	9.0	5
P4KE33A	28.20	31.40	34.70	1	45.7	9.0	5
P4KE36	29.10	32.40	39.60	1	52.0	8.0	5
P4KE36A	30.80	34.20	37.80	1	49.9	8.4	5
P4KE39	31.60	35.10	42.90	1	56.4	7.4	5
P4KE39A	33.30	37.10	41.00	1	53.9	7.8	5
P4KE43	34.80	38.70	47.30	1	61.9	6.8	5
P4KE43A	36.80	40.90	45.20	1	59.3	7.1	5
P4KE47	38.10	42.30	51.70	1	67.8	6.2	5
P4KE47A	40.20	44.70	49.40	1	64.8	5.0	5
P4KE51	41.30	45.90	56.10	1	73.5	5.7	5
P4KE51A	43.60	48.50	53.60	1	70.1	6.0	5
P4KE56	45.60	50.40	61.60	1	80.5	5.2	5
P4KE56A	47.80	53.20	58.80	1	77.0	5.5	5
P4KE62	50.20	55.80	68.20	1	89.0	4.7	5
P4KE62A	53.00	58.90	65.10	1	85.0	5.0	5
P4KE68	55.10	61.20	74.80	1	98.0	4.3	5
P4KE68A	58.10	64.60	71.40	1	92.0	4.6	5
P4KE75	60.70	67.50	82.50	1	108.0	3.9	5
P4KE75A	64.10	71.30	78.80	1	103.0	4.1	5
P4KE82	66.40	73.80	90.20	1	118.0	3.6	5
P4KE82A	70.10	77.90	86.10	1	113.0	3.7	5
P4KE91	73.70	81.90	100.00	1	131.0	3.2	5
P4KE91A	77.80	86.50	95.50	1	125.0	3.4	5
P4KE100	81.00	90.00	110.00	1	144.0	2.9	5
P4KE100A	85.50	95.00	105.00	1	137.0	3.1	5
P4KE110	89.20	99.00	121.00	1	158.0	2.7	5
P4KE110A	94.00	105.00	116.00	1	152.0	2.8	5
P4KE120	97.20	108.00	132.00	1	173.0	2.4	5
P4KE120A	102.00	114.00	126.00	1	165.0	2.5	5
P4KE130	105.00	117.00	143.00	1	187.0	2.2	5
P4KE130A	111.00	124.00	137.00	1	179.0	2.3	5

### UNI-DIRECTIONAL 400 Watt Axial Lead TVS

UNI-DIRECTIONAL PART NUMBER	REVERSE STAND-OFF Voltage VRWM (V)	BREAKDOWN VOLTAGE VBR (V) MIN. @IT	BREAKDOWN VOLTAGE VBR (V) MAX. @IT	TEST CURRENT IT (mA)	MAXIMUM CLAMPING VOLTAGE @I <sub>PP</sub> VC (V)	PEAK PULSE CURRENT I <sub>PP</sub> (A)	REVERSE LEAKAGE @VRWM IR (uA)
P4KE150	121.00	135.00	165.00	1	215.0	2.0	5
P4KE150A	128.00	143.00	158.00	1	207.0	2.0	5
P4KE160	130.00	144.00	176.00	1	230.0	1.8	5
P4KE160A	136.00	152.00	168.00	1	219.0	1.9	5
P4KE170	138.00	153.00	187.00	1	244.0	1.7	5
P4KE170A	145.00	162.00	179.00	1	234.0	1.8	5
P4KE180	146.00	162.00	198.00	1	258.0	1.6	5
P4KE180A	154.00	171.00	189.00	1	246.0	1.7	5
P4KE200	162.00	180.00	220.00	1	287.0	1.5	5
P4KE200A	171.00	190.00	210.00	1	274.0	1.53	5
P4KE220	175.00	198.00	242.00	1	344.0	1.16	5
P4KE220A	185.00	209.00	231.00	1	328.0	1.22	5
P4KE250	202.00	225.00	275.00	1	360.0	1.1	5
P4KE250A	214.00	237.00	263.00	1	344.0	1.16	5
P4KE300	243.00	270.00	330.00	1	430.0	0.93	5
P4KE300A	256.00	285.00	315.00	1	414.0	0.97	5
P4KE350	284.00	315.00	385.00	1	504.0	0.79	5
P4KE350A	300.00	332.00	368.00	1	482.0	0.83	5
P4KE400	324.00	360.00	440.00	1	574.0	0.70	5
P4KE400A	342.00	380.00	420.00	1	548.0	0.73	5
P4KE440	356.00	396.00	484.00	1	631.0	0.66	5
P4KE440A	376.00	418.00	462.00	1	600.0	0.69	5

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## BI-DIRECTIONAL 400 Watt Axial Lead TVS

BI-DIRECTIONAL PART NUMBER	REVERSE STAND-OFF Voltage VRWM (V)	BREAKDOWN VOLTAGE VBR (V) MIN. @IT	BREAKDOWN VOLTAGE VBR (V) MAX. @IT	TEST CURRENT IT (mA)	MAXIMUM CLAMPING VOLTAGE @I <sub>PP</sub> VC (V)	PEAK PULSE CURRENT I <sub>PP</sub> (A)	REVERSE LEAKAGE @VRWM IR (uA)
P4KE6.8C	5.50	6.12	7.48	10	10.8	38.0	2000
P4KE6.8CA	5.80	6.45	7.14	10	10.5	40.0	2000
P4KE7.5C	6.05	6.75	8.25	10	11.7	36.0	1000
P4KE7.5CA	6.40	7.13	7.88	10	11.3	37.0	1000
P4KE8.2C	6.63	7.38	9.02	10	12.5	33.0	400
P4KE8.2CA	7.02	7.79	8.61	10	12.1	35.0	400
P4KE9.1C	7.37	8.19	10.00	1	13.8	30.0	100
P4KE9.1CA	7.78	8.65	9.50	1	13.4	31.0	100
P4KE10C	8.10	9.00	11.00	1	15.0	28.0	20
P4KE10CA	8.55	9.50	10.50	1	14.5	29.0	20
P4KE11C	8.92	9.90	12.10	1	16.2	26.0	10
P4KE11CA	9.40	10.50	11.60	1	15.6	27.0	10
P4KE12C	9.72	10.80	13.20	1	17.3	24.0	5
P4KE12CA	10.20	11.40	12.60	1	16.7	25.0	5
P4KE13C	10.50	11.70	14.30	1	19.0	22.0	5
P4KE13CA	11.10	12.40	13.70	1	18.2	23.0	5
P4KE15C	12.10	13.50	16.50	1	22.0	19.0	5
P4KE15CA	12.80	14.30	15.80	1	21.2	20.0	5
P4KE16C	12.90	14.40	17.60	1	23.5	18.0	5
P4KE16CA	13.60	15.20	16.80	1	22.5	19.0	5
P4KE18C	14.50	16.20	19.80	1	26.5	16.0	5
P4KE18CA	15.30	17.10	18.90	1	25.2	17.0	5
P4KE20C	16.20	18.00	22.00	1	29.1	14.0	5
P4KE20CA	17.10	19.00	21.00	1	27.7	15.0	5
P4KE22C	17.80	19.80	24.20	1	31.9	13.0	5
P4KE22CA	18.80	20.90	23.10	1	30.6	14.0	5
P4KE24C	19.40	21.60	26.40	1	34.7	12.0	5
P4KE24CA	20.50	22.80	25.20	1	33.2	13.0	5
P4KE27C	21.80	24.30	29.70	1	39.1	11.0	5
P4KE27CA	23.10	25.70	28.40	1	37.5	11.2	5
P4KE30C	24.30	27.00	33.00	1	43.5	10.0	5
P4KE30CA	25.60	28.50	31.50	1	41.4	10.0	5
P4KE33C	26.80	29.70	36.30	1	47.7	9.0	5
P4KE33CA	28.20	31.40	34.70	1	45.7	9.0	5
P4KE36C	29.10	32.40	39.60	1	52.0	8.0	5
P4KE36CA	30.80	34.20	37.80	1	49.9	8.4	5
P4KE39C	31.60	35.10	42.90	1	56.4	7.4	5
P4KE39CA	33.30	37.10	41.00	1	53.9	7.8	5
P4KE43C	34.80	38.70	47.30	1	61.9	6.8	5
P4KE43CA	36.80	40.90	45.20	1	59.3	7.1	5
P4KE47C	38.10	42.30	51.70	1	67.8	6.2	5
P4KE47CA	40.20	44.70	49.40	1	64.8	5.0	5
P4KE51C	41.30	45.90	56.10	1	73.5	5.7	5
P4KE51CA	43.60	48.50	53.60	1	70.1	6.0	5
P4KE56C	45.60	50.40	61.60	1	80.5	5.2	5
P4KE56CA	47.80	53.20	58.80	1	77.0	5.5	5
P4KE62C	50.20	55.80	68.20	1	89.0	4.7	5
P4KE62CA	53.00	58.90	65.10	1	85.0	5.0	5
P4KE68C	55.10	61.20	74.80	1	98.0	4.3	5
P4KE68CA	58.10	64.60	71.40	1	92.0	4.6	5
P4KE75C	60.70	67.50	82.50	1	108.0	3.9	5
P4KE75CA	64.10	71.30	78.80	1	103.0	4.1	5
P4KE82C	66.40	73.80	90.20	1	118.0	3.6	5
P4KE82CA	70.10	77.90	86.10	1	113.0	3.7	5
P4KE91C	73.70	81.90	100.00	1	131.0	3.2	5
P4KE91CA	77.80	86.50	95.50	1	125.0	3.4	5
P4KE100C	81.00	90.00	110.00	1	144.0	2.9	5
P4KE100CA	85.50	95.00	105.00	1	137.0	3.1	5
P4KE110C	89.20	99.00	121.00	1	158.0	2.7	5
P4KE110CA	94.00	105.00	116.00	1	152.0	2.8	5
P4KE120C	97.20	108.00	132.00	1	173.0	2.4	5
P4KE120CA	102.00	114.00	126.00	1	165.0	2.5	5
P4KE130C	105.00	117.00	143.00	1	187.0	2.2	5
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P4KE150C	121.00	135.00	165.00	1	215.0	2.0	5
P4KE150CA	128.00	143.00	158.00	1	207.0	2.0	5
P4KE160C	130.00	144.00	176.00	1	230.0	1.8	5
P4KE160CA	136.00	152.00	168.00	1	219.0	1.9	5
P4KE170C	138.00	153.00	187.00	1	244.0	1.7	5
P4KE170CA	145.00	162.00	179.00	1	234.0	1.8	5
P4KE180C	146.00	162.00	198.00	1	258.0	1.6	5
P4KE180CA	154.00	171.00	189.00	1	246.0	1.7	5
P4KE200C	162.00	180.00	220.00	1	287.0	1.5	5
P4KE200CA	171.00	190.00	210.00	1	274.0	1.53	5
P4KE220C	175.00	198.00	242.00	1	344.0	1.16	5
P4KE220CA	185.00	209.00	231.00	1	328.0	1.22	5
P4KE250C	202.00	225.00	275.00	1	360.0	1.11	5
P4KE250CA	214.00	237.00	263.00	1	344.0	1.16	5
P4KE300C	243.00	270.00	330.00	1	430.0	0.93	5
P4KE300CA	256.00	285.00	315.00	1	414.0	0.97	5
P4KE350C	284.00	315.00	385.00	1	504.0	0.79	5
P4KE350CA	300.00	332.00	368.00	1	482.0	0.83	5
P4KE400C	324.00	360.00	440.00	1	574.0	0.70	5
P4KE400CA	342.00	380.00	420.00	1	548.0	0.73	5
P4KE440C	356.00	396.00	484.00	1	631.0	0.66	5
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