

# P6KE SERIES

## TRANSIENT VOLTAGE SUPPRESSORS



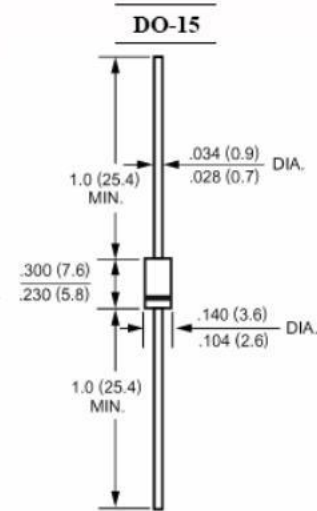
**REVERSE VOLTAGE:** 6.8 to 440 VOLTS  
**PEAK PULSE POWER:** 600 WATTS

### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- 600W peak pulse power capability on 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time

### MECHANICAL DATA

Case: Molded plastic, DO-15  
 Epoxy: UL 94V-0 rate flame retardant  
 Lead: Axial leads, solderable per MIL-STD-202, method 208 guaranteed  
 Polarity: Color band denotes cathode except bipolar  
 Mounting position: Any  
 Weight: 0.015ounce, 0.4gram



Dimensions in inches and (millimeters)

### Maximum Ratings and Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

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

For capacitive load, derate current by 20%.

	Symbols	Limit	Units
Peak power dissipation with a 10/1000 $\mu$ s waveform (Note 1) (Fig. 1)	P <sub>PPM</sub>	Minimum 600	Watts
Peak pulse current with a 10/1000 $\mu$ s waveform (Note 1)	I <sub>PPM</sub>	See Next Table	Amp
Steady state power dissipation at T <sub>L</sub> = 75°C, lead lengths 0.375" (9.5mm) (Note 2)	P <sub>M(AV)</sub>	5.0	Watts
Peak forward surge current, 8.3ms single half sine-wave unidirectional only (Note 3)	I <sub>FSM</sub>	100	Amp
Maximum instantaneous forward voltage at 50A for unidirectional only (Note 4)	V <sub>F</sub>	3.5/5.0	Volts
Typical thermal resistance junction-to-lead	R <sub>θ JL</sub>	20	°C/W
Typical thermal resistance junction-to-ambient	R <sub>θ JA</sub>	75	°C/W
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

#### NOTES:

- 1- Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub> = 25°C per Fig. 2
- 2- Mounted on copper pad area of 1.6 x 1.6" (40 x 40mm) per Fig. 5
- 3- Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
- 4- V<sub>F</sub> = 3.5V for P6KE200(A) & below; V<sub>F</sub> = 5.0V for P6KE220(A) & above

#### Devices for Bidirectional Applications:

1- For bi-directional, use C or CA suffix for types P6KE6.8 thru types P6KE440A (e.g. P6KE6.8C, P6KE440CA).

2- Electrical characteristics apply in both directions.

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Device Type	Breakdown Voltage		Test Current	Reverse Stand off Voltage	Maximum Reverse Leakage at $V_{WM}$	Maximum Peak Pulse Current	Maximum Clamping Voltage at $I_{PPM}$	Maximum Temperature Coefficient of $V_{BR}$
	$V_{BR}$ at $I_T$ (Note 1)		$I_T$	$V_{WM}$	$I_D$ (Note 3)	$I_{PPM}$ (Note 2)	$V_C$	/
	Volts (min.)	Volts (max.)	mAmps	Volts	uAmps	Amps	Volts	% / °C
P6KE6.8	6.12	7.48	10	5.50	1000	55.6	10.8	0.057
P6KE6.8A	6.45	7.14	10	5.80	1000	57.1	10.5	0.057
P6KE7.5	6.75	8.25	10	6.05	500	51.3	11.7	0.061
P6KE7.5A	7.13	7.88	10	6.40	500	53.1	11.3	0.061
P6KE8.2	7.38	9.02	10	6.63	200	48.0	12.5	0.065
P6KE8.2A	7.79	8.61	10	7.02	200	49.6	12.1	0.065
P6KE9.1	8.19	10.0	1.0	7.37	50	43.5	13.8	0.068
P6KE9.1A	8.65	9.55	1.0	7.78	50	44.8	13.4	0.068
P6KE10	9.00	11.0	1.0	8.10	10	40.0	15.0	0.073
P6KE10A	9.50	10.5	1.0	8.55	10	41.4	14.5	0.073
P6KE11	9.90	12.1	1.0	8.92	5.0	37.0	16.2	0.075
P6KE11A	10.5	11.6	1.0	9.40	5.0	38.5	15.6	0.075
P6KE12	10.8	13.2	1.0	9.72	5.0	34.7	17.3	0.078
P6KE12A	11.4	12.6	1.0	10.2	5.0	35.9	16.7	0.078
P6KE13	11.7	14.3	1.0	10.5	5.0	31.6	19.0	0.081
P6KE13A	12.4	13.7	1.0	11.1	5.0	33.0	18.2	0.081
P6KE15	13.5	16.5	1.0	12.1	5.0	27.3	22.0	0.084
P6KE15A	14.3	15.8	1.0	12.8	5.0	28.3	21.2	0.084
P6KE16	14.4	17.6	1.0	12.9	5.0	25.5	23.5	0.086
P6KE16A	15.2	16.8	1.0	13.6	5.0	26.7	22.5	0.086
P6KE18	16.2	19.8	1.0	14.5	5.0	22.6	26.5	0.088
P6KE18A	17.1	18.9	1.0	15.3	5.0	23.8	25.2	0.088
P6KE20A	18.0	22.0	1.0	16.2	5.0	20.6	29.1	0.090
P6KE20A	19.0	21.0	1.0	17.1	5.0	21.7	27.7	0.090
P6KE22	19.8	24.2	1.0	17.8	5.0	18.8	31.9	0.092
P6KE22A	20.9	23.1	1.0	18.8	5.0	19.6	30.6	0.092
P6KE24	21.6	26.4	1.0	19.4	5.0	17.3	34.7	0.094
P6KE24A	22.8	25.2	1.0	20.5	5.0	18.1	33.2	0.094
P6KE27	24.3	29.7	1.0	21.8	5.0	15.3	39.1	0.096
P6KE27A	25.7	28.4	1.0	23.1	5.0	16.0	37.5	0.096
P6KE30	27.0	33.0	1.0	24.3	5.0	13.8	43.5	0.097
P6KE30A	28.5	31.5	1.0	25.6	5.0	14.5	41.4	0.097
P6KE33	29.7	36.3	1.0	26.8	5.0	12.6	47.7	0.098
P6KE33A	31.4	34.7	1.0	28.2	5.0	13.1	45.7	0.098
P6KE36	32.4	39.6	1.0	29.1	5.0	11.5	52.0	0.099
P6KE36A	34.2	37.8	1.0	30.8	5.0	12.0	49.9	0.099
P6KE39	35.1	42.9	1.0	31.6	5.0	10.6	56.4	0.100
P6KE39A	37.1	41.0	1.0	33.3	5.0	11.1	53.9	0.100
P6KE43	38.7	47.3	1.0	34.8	5.0	9.7	61.9	0.101
P6KE43A	40.9	45.2	1.0	36.8	5.0	10.1	59.3	0.101
P6KE47	42.3	51.7	1.0	38.1	5.0	8.8	67.8	0.101
P6KE47A	44.7	49.4	1.0	40.2	5.0	9.3	64.8	0.101
P6KE51	45.9	56.1	1.0	41.3	5.0	8.2	73.5	0.102
P6KE51A	48.5	53.6	1.0	43.6	5.0	8.6	70.1	0.102
P6KE56	50.4	61.6	1.0	45.4	5.0	7.5	80.5	0.103
P6KE56A	53.2	58.8	1.0	47.8	5.0	7.8	77.0	0.103

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	$V_{BR}$ at $I_T$ (Note 1)							
	Volts (min.)	Volts (max.)	mAmps	Volts	uAmps	Amps	Volts	% / °C
P6KE62	55.8	68.2	1.0	50.2	5.0	6.7	89.0	0.104
P6KE62A	58.9	65.1	1.0	53.0	5.0	7.1	85.0	0.104
P6KE68	61.2	74.8	1.0	55.1	5.0	6.1	98.0	0.104
P6KE68A	64.6	71.4	1.0	58.1	5.0	6.5	92.0	0.104
P6KE75	67.5	82.5	1.0	60.7	5.0	5.6	108	0.105
P6KE75A	71.3	78.8	1.0	64.1	5.0	5.8	103	0.105
P6KE82	73.8	90.2	1.0	66.4	5.0	5.1	118	0.105
P6KE82A	77.9	86.1	1.0	70.1	5.0	5.3	113	0.105
P6KE91	81.9	100	1.0	73.7	5.0	4.6	131	0.106
P6KE91A	86.5	95.5	1.0	77.8	5.0	4.8	125	0.106
P6KE100	90.0	110	1.0	81.0	5.0	4.2	144	0.106
P6KE100A	95.0	105	1.0	85.5	5.0	4.4	137	0.106
P6KE110	99.0	121	1.0	89.2	5.0	3.8	158	0.107
P6KE110A	105	116	1.0	94.0	5.0	3.9	152	0.107
P6KE120	108	132	1.0	97.2	5.0	3.5	173	0.107
P6KE120A	114	126	1.0	102	5.0	3.6	165	0.107
P6KE130	117	143	1.0	105	5.0	3.2	187	0.107
P6KE130A	124	137	1.0	111	5.0	3.4	179	0.107
P6KE150	135	165	1.0	121	5.0	2.8	215	0.108
P6KE150A	143	158	1.0	128	5.0	2.9	207	0.108
P6KE160	144	176	1.0	130	5.0	2.6	230	0.108
P6KE160A	152	168	1.0	136	5.0	2.7	219	0.108
P6KE170	153	187	1.0	138	5.0	2.5	244	0.108
P6KE170A	162	179	1.0	145	5.0	2.6	234	0.108
P6KE180	162	198	1.0	146	5.0	2.3	258	0.108
P6KE180A	171	189	1.0	154	5.0	2.4	246	0.108
P6KE200	180	220	1.0	162	5.0	2.1	287	0.108
P6KE200A	190	210	1.0	171	5.0	2.2	274	0.108
P6KE220	198	242	1.0	175	5.0	1.7	344	0.108
P6KE220A	209	231	1.0	185	5.0	1.8	328	0.108
P6KE250	225	275	1.0	202	5.0	1.7	360	0.110
P6KE250A	237	263	1.0	214	5.0	1.7	344	0.110
P6KE300	270	330	1.0	243	5.0	1.4	430	0.110
P6KE300A	285	315	1.0	256	5.0	1.4	414	0.110
P6KE350	315	385	1.0	284	5.0	1.2	504	0.110
P6KE350A	332	368	1.0	300	5.0	1.2	482	0.110
P6KE400	360	440	1.0	324	5.0	1.0	574	0.110
P6KE400A	380	420	1.0	342	5.0	1.1	548	0.110
P6KE440	396	484	1.0	356	5.0	0.95	631	0.110
P6KE440A	418	462	1.0	376	5.0	1.00	602	0.110

#### NOTES:

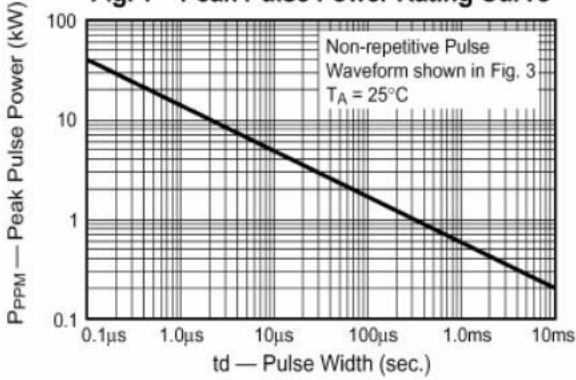
- 1- Pulse test:  $t_p \leq 50ms$
- 2- Surge current waveform per Fig. 3 and derated per Fig. 2
- 3- For bidirectional types having  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled
- 4- All terms and symbols are consistent with ANSI/IEEE C62.35  
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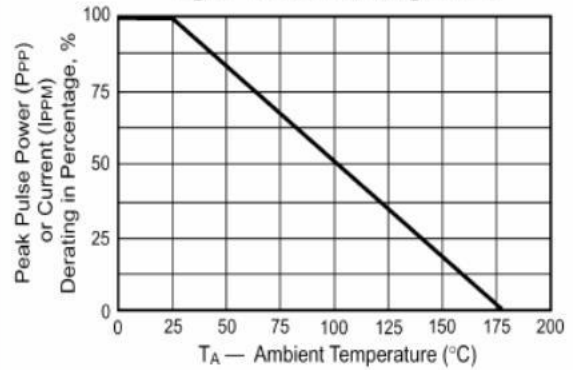
## TRANSIENT VOLTAGE SUPPRESSORS

### RATINGS AND CHARACTERISTIC CURVES

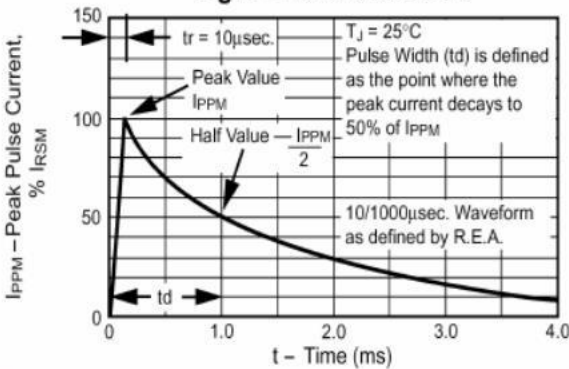
**Fig. 1 – Peak Pulse Power Rating Curve**



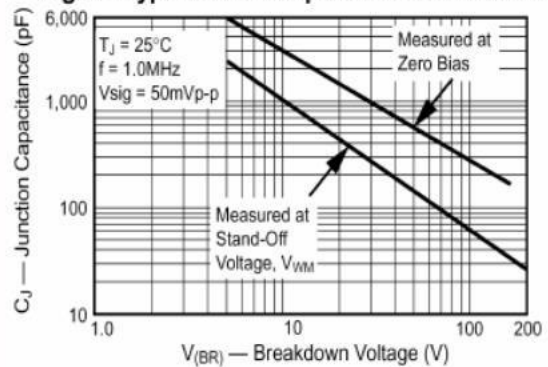
**Fig. 2 – Pulse Derating Curve**



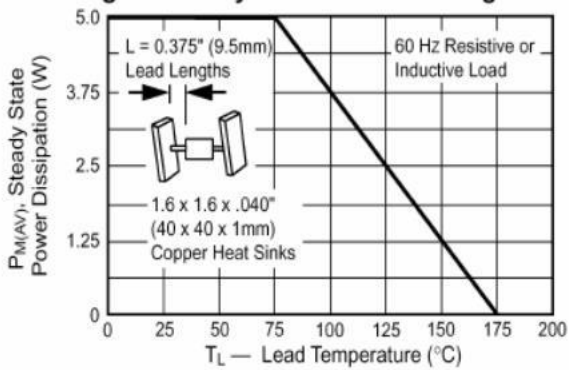
**Fig. 3 – Pulse Waveform**



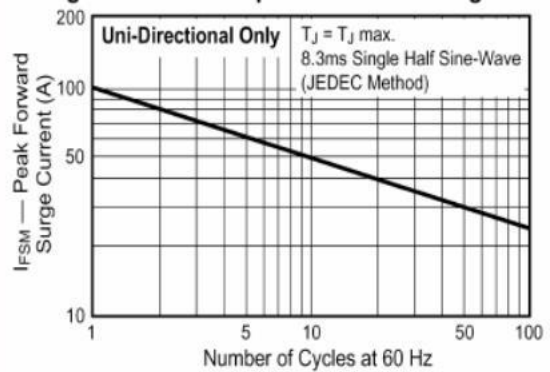
**Fig. 4 – Typ. Junction Capacitance Uni-Directional**



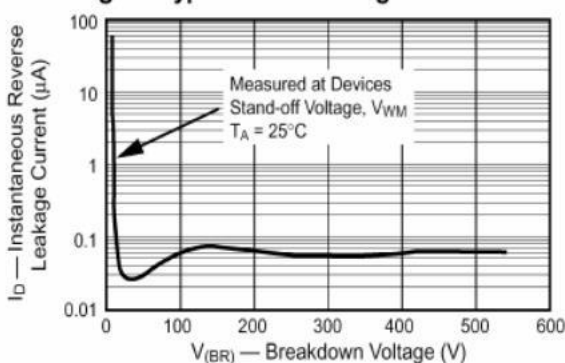
**Fig. 5 – Steady State Power Derating Curve**



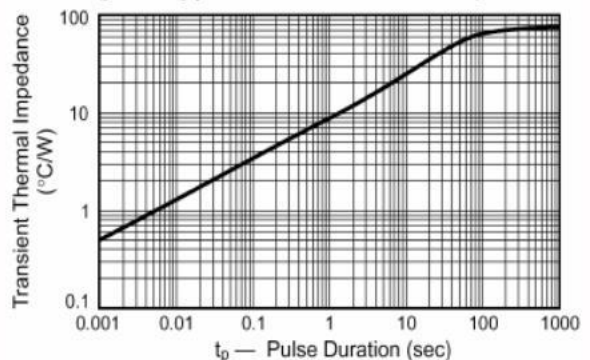
**Fig. 6 - Max. Non-Repetitive Forward Surge Current**



**Fig. 7 – Typ. Reverse Leakage Characteristics**



**Fig. 8 – Typ. Transient Thermal Impedance**



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