

# Transient Voltage Suppressors

# P6KE6.8A thru P6KE550A iS Electronics



DO-204AC (DO-15)

PRIMARY CHARACTERISTICS	
$V_{WM}$	5.8 V to 468 V
$V_{BR}$ uni-directional	6.8 V to 550 V
$V_{BR}$ bi-directional	6.8 V to 440 V
$P_{PPM}$	600 W
$P_D$	5.0 W
$I_{FSM}$ (uni-directional only)	100 A
$T_J$ max.	175 °C
Polarity	Uni-directional, bi-directional
Package	DO-204AC (DO-15)

## FEATURES

- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 600 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.iselectronics.top](http://www.iselectronics.top)

## TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive, and telecommunication.

## MECHANICAL DATA

**Case:** DO-204AC, molded epoxy over passivated chip  
Molding compound meets UL 94 V-0 flammability rating  
**Note**

- P6KE250A to P6KE550A and P6KE250CA to P6KE440CA for commercial grade only

**Polarity:** For uni-directional types the color band denotes cathode end, no marking on bi-directional types

## DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional types, use CA suffix (e.g. P6KE440CA).

Electrical characteristics apply in both directions.

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup> (fig. 1)	$P_{PPM}$	600	W
Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	$I_{PPM}$	See next table	A
Power dissipation on infinite heatsink at $T_L = 75$ °C (fig. 5)	$P_D$	5.0	W
Peak forward surge current 8.3 ms single half sine-wave <sup>(2)</sup>	$I_{FSM}$	100	A
Maximum instantaneous forward voltage at 50 A for uni-directional only <sup>(3)</sup>	$V_F$	3.5/5.0	V
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 175	°C

### Notes

- <sup>(1)</sup> Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25$  °C per fig. 2
- <sup>(2)</sup> Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
- <sup>(3)</sup>  $V_F = 3.5$  V for P6KE220A and below;  $V_F = 5.0$  V for P6KE250A and above



**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

DEVICE TYPE 型号	BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ <sup>(1)</sup> (V) 崩溃电压		TEST CURRENT $I_T$ (mA) 测试电流	STAND-OFF VOLTAGE $V_{WM}$ (V) 对峙电压	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ <sup>(3)</sup> $I_D$ ( $\mu\text{A}$ ) 最大反向漏电流	MAXIMUM PEAK PULSE CURRENT $I_{PPM}$ <sup>(2)</sup> (A) 最大峰值脉冲电流	MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V) 最大箝位电压	MAXIMUM TEMPERATURE COEFFICIENT AT $V_{BR}$ (%/°C) 最大温度系数
	MIN.	MAX.						
(+)P6KE6.8A / CA	6.45	7.14	10	5.80	1000	57.1	10.5	0.057
(+)P6KE7.5A / CA	7.13	7.88	10	6.40	500	53.1	11.3	0.061
(+)P6KE8.2A / CA	7.79	8.61	10	7.02	200	49.6	12.1	0.065
(+)P6KE9.1A / CA	8.65	9.55	1.0	7.78	50	44.8	13.4	0.068
(+)P6KE10A / CA	9.50	10.5	1.0	8.55	10	41.4	14.5	0.073
(+)P6KE11A / CA	10.5	11.6	1.0	9.40	5.0	38.5	15.6	0.075
(+)P6KE12A / CA	11.4	12.6	1.0	10.2	5.0	35.9	16.7	0.078
(+)P6KE13A / CA	12.4	13.7	1.0	11.1	5.0	33.0	18.2	0.081
(+)P6KE15A / CA	14.3	15.8	1.0	12.8	1.0	28.3	21.2	0.084
(+)P6KE16A / CA	15.2	16.8	1.0	13.6	1.0	26.7	22.5	0.086
(+)P6KE18A / CA	17.1	18.9	1.0	15.3	1.0	23.8	25.2	0.088
(+)P6KE20A / CA	19.0	21.0	1.0	17.1	1.0	21.7	27.7	0.090
(+)P6KE22A / CA	20.9	23.1	1.0	18.8	1.0	19.6	30.6	0.092
(+)P6KE24A / CA	22.8	25.2	1.0	20.5	1.0	18.1	33.2	0.094
(+)P6KE27A / CA	25.7	28.4	1.0	23.1	1.0	16.0	37.5	0.096
(+)P6KE30A / CA	28.5	31.5	1.0	25.6	1.0	14.5	41.4	0.097
(+)P6KE33A / CA	31.4	34.7	1.0	28.2	1.0	13.1	45.7	0.098
(+)P6KE36A / CA	34.2	37.8	1.0	30.8	1.0	12.0	49.9	0.099
(+)P6KE39A / CA	37.1	41.0	1.0	33.3	1.0	11.1	53.9	0.100
(+)P6KE43A / CA	40.9	45.2	1.0	36.8	1.0	10.1	59.3	0.101
(+)P6KE47A / CA	44.7	49.4	1.0	40.2	1.0	9.3	64.8	0.101
(+)P6KE51A / CA	48.5	53.6	1.0	43.6	1.0	8.6	70.1	0.102
(+)P6KE56A / CA	53.2	58.8	1.0	47.8	1.0	7.8	77.0	0.103
(+)P6KE62A / CA	58.9	65.1	1.0	53.0	1.0	7.1	85.0	0.104
(+)P6KE68A / CA	64.6	71.4	1.0	58.1	1.0	6.5	92.0	0.104
(+)P6KE75A / CA	71.3	78.8	1.0	64.1	1.0	5.8	103	0.105
(+)P6KE82A / CA	77.9	86.1	1.0	70.1	1.0	5.3	113	0.105
(+)P6KE91A / CA	86.5	95.5	1.0	77.8	1.0	4.8	125	0.106
(+)P6KE100A / CA	95.0	105	1.0	85.5	1.0	4.4	137	0.106
(+)P6KE110A / CA	105	116	1.0	94.0	1.0	3.9	152	0.107
(+)P6KE120A / CA	114	126	1.0	102	1.0	3.6	165	0.107
(+)P6KE130A / CA	124	137	1.0	111	1.0	3.4	179	0.107
(+)P6KE150A / CA	143	158	1.0	128	1.0	2.9	207	0.108
(+)P6KE160A / CA	152	168	1.0	136	1.0	2.7	219	0.108
(+)P6KE170A / CA	162	179	1.0	145	1.0	2.6	234	0.108
(+)P6KE180A / CA	171	189	1.0	154	1.0	2.4	246	0.108
(+)P6KE200A / CA	190	210	1.0	171	1.0	2.2	274	0.108
(+)P6KE220A / CA	209	231	1.0	185	1.0	1.8	328	0.108
(+)P6KE250A / CA	237	263	1.0	214	1.0	1.7	344	0.110
(+)P6KE300A / CA	285	315	1.0	256	1.0	1.4	414	0.110
(+)P6KE350A / CA	333	368	1.0	300	1.0	1.2	482	0.110
(+)P6KE400A / CA	380	420	1.0	342	1.0	1.1	548	0.110
(+)P6KE440A / CA	418	462	1.0	376	1.0	1.00	602	0.110
P6KE480A / CA	456	504	1.0	408	1.0	0.91	658	0.110
P6KE510A / CA	485	535	1.0	434	1.0	0.86	698	0.110
P6KE540A / CA	513	567	1.0	459	1.0	0.81	740	0.110
P6KE550A / CA	522.5	577.5	1.0	468	1.0	0.81	760	0.110

**Notes**

- (1) Pulse test:  $t_p \leq 50$  ms
- (2) Surge current waveform per fig. 3 and derate per fig. 2
- (3) For bi-directional types with  $V_{WM}$  of 10 V and less the  $I_D$  limit is doubled
- (4) All terms and symbols are consistent with ANSI/IEEE CA62.35
- (5) Underwriters laboratory recognition for the classification of protectors (QVGQ2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices



THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to lead	$R_{\theta JL}$	20	$^\circ\text{C}/\text{W}$
Typical thermal resistance, junction to ambient	$R_{\theta JA}$	75	

ORDERING INFORMATION (Example)		
PREFERRED PIN	UNIT WEIGHT (g)	BASE QUANTITY
P6KE6.8A	0.432	2000

**Note**  
 (1) AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)**

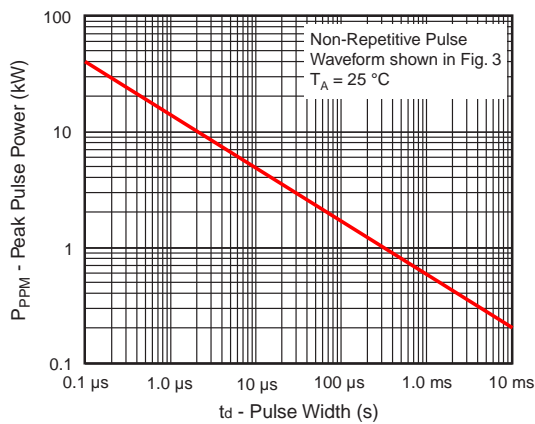


Fig. 1 - Peak Pulse Power Rating Curve

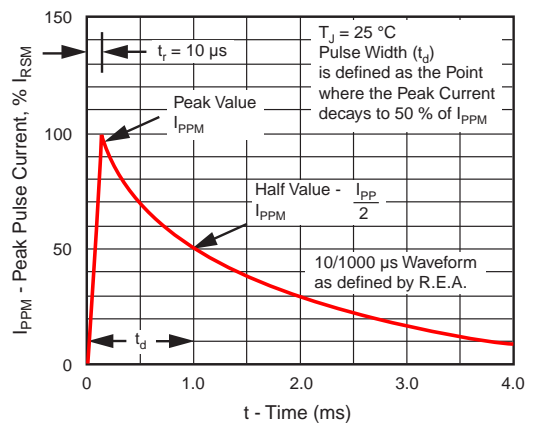


Fig. 3 - Pulse Waveform

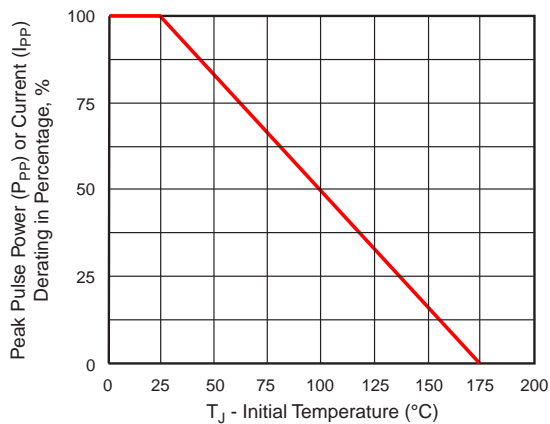


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

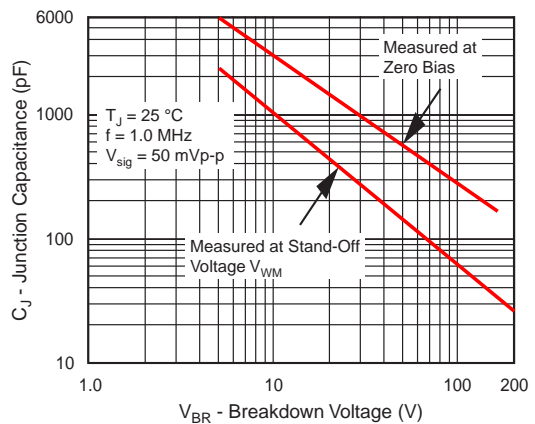


Fig. 4 - Typical Junction Capacitance Uni-Directional

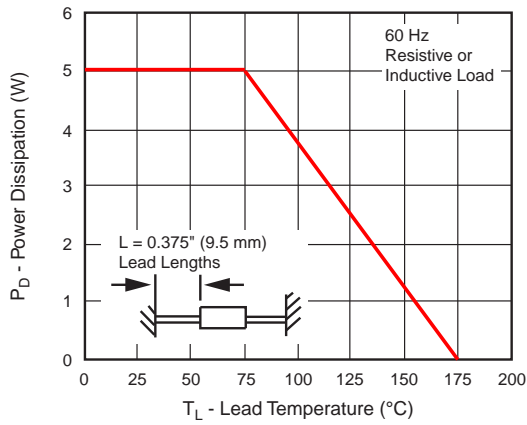


Fig. 5 - Power Derating Curve

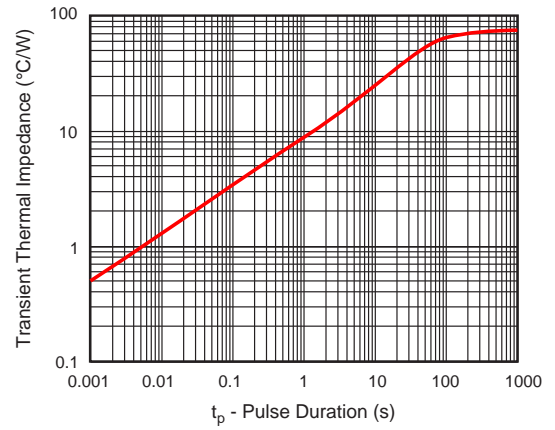


Fig. 7 - Typical Transient Thermal Impedance

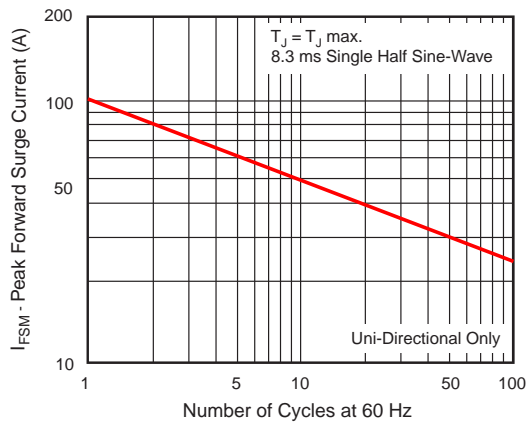


Fig. 6 - Maximum Non-Repetitive Forward Surge Current



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)

