

# P6KE6.8A Series

## 600 Watt Peak Power Surmetic™ -40 Transient Voltage Suppressors Unidirectional\*

The P6KE6.8A series is designed to protect voltage sensitive components from high voltage, high energy transients. They have excellent clamping capability, high surge capability and fast response time. These devices are ON Semiconductor's exclusive, cost-effective, highly reliable Surmetic™ axial leaded package and is ideally-suited for use in communication systems, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer applications.

### Features:

- Working Peak Reverse Voltage Range - 5.8 to 171 V
- Peak Power - 600 W @ 1 ms
- ESD Rating of Class 3 (>16 KV) per Human Body Model
- Maximum Clamp Voltage @ Peak Pulse Current
- Low Leakage < 5  $\mu$ A above 10 V
- Maximum Temperature Coefficient Specified
- UL 497B for Isolated Loop Circuit Protection
- Response Time is Typically < 1 ns
- Pb-Free Packages are Available\*

### Mechanical Characteristics:

**CASE:** Void-free, Transfer-molded, Thermosetting plastic

**FINISH:** All external surfaces are corrosion resistant and leads are readily solderable

### MAXIMUM LEAD TEMPERATURE FOR SOLDERING:

260°C, 1/16" from the case for 10 seconds

**POLARITY:** Cathode indicated by polarity band

**MOUNTING POSITION:** Any

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Power Dissipation (Note 1) @ $T_L \leq 25^\circ\text{C}$	$P_{PK}$	600	W
Steady State Power Dissipation @ $T_L \leq 75^\circ\text{C}$ , Lead Length = 3/8 in Derated above $T_L = 75^\circ\text{C}$	$P_D$	5.0	W
		50	mW/°C
Thermal Resistance, Junction-to-Lead	$R_{\theta JL}$	20	°C/W
Forward Surge Current (Note 2) @ $T_A = 25^\circ\text{C}$	$I_{FSM}$	100	A
Operating and Storage Temperature Range	$T_J, T_{stg}$	- 55 to +175	°C

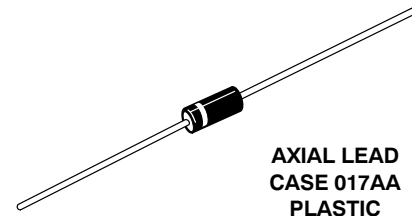
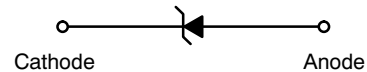
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Nonrepetitive current pulse per Figure 4 and derated above  $T_A = 25^\circ\text{C}$  per Figure 2.
2. 1/2 sine wave (or equivalent square wave), PW = 8.3 ms, duty cycle = 4 pulses per minute maximum.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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### MARKING DIAGRAM



A = Assembly Location  
P6KExxxA = Device Number  
YY = Year  
WW = Work Week  
■ = Pb-Free Package  
▪ = Microdot (Note: Microdot may be in either location)

### ORDERING INFORMATION

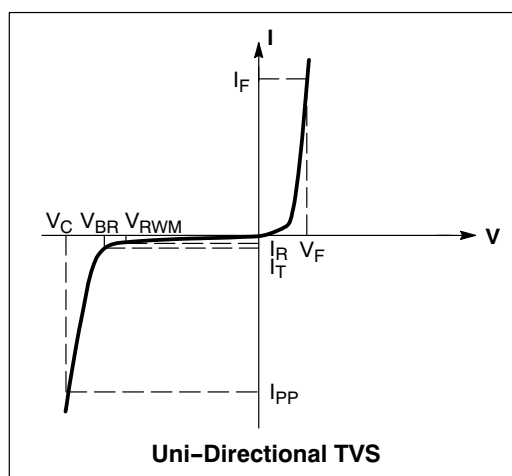
Device	Package	Shipping†
P6KExxxA	Axial Lead	1000 Units / Box
P6KExxxAG	Axial Lead (Pb-Free)	1000 Units / Box
P6KExxxARL	Axial Lead	4000/Tape & Reel
P6KExxxARLG	Axial Lead (Pb-Free)	4000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

## P6KE6.8A Series

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 3.5\text{ V Max.}$  @  $I_F$  (Note 6) = 50 A)

Symbol	Parameter
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Maximum Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current
$\Theta_{V_{BR}}$	Maximum Temperature Coefficient of $V_{BR}$
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$



**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 3.5\text{ V Max.}$  @  $I_F$  (Note 6) = 50 A)

Device*	Device Marking	$V_{RWM}$ (Note 3) V	$I_R$ @ $V_{RWM}$ $\mu\text{A}$	Breakdown Voltage			$V_C$ @ $I_{PP}$ (Note 5)		$\Theta_{V_{BR}}$ %/°C	
				$V_{BR}$ (Note 4) (V)			$@ I_T$	$V_C$		$I_{PP}$
				Min	Nom	Max	mA	V		A
P6KE6.8A, G	P6KE6.8A	5.8	1000	6.45	6.80	7.14	10	10.5	57	0.057
P6KE7.5ARLG	P6KE7.5A	6.4	500	7.13	7.51	7.88	10	11.3	53	0.061
P6KE10AG	P6KE10A	8.55	10	9.5	10	10.5	1	14.5	41	0.073
P6KE12A, G	P6KE12A	10.2	5	11.4	12	12.6	1	16.7	36	0.078
P6KE13AG	P6KE13A	11.1	5	12.4	13.05	13.7	1	18.2	33	0.081
P6KE15AG	P6KE15A	12.8	5	14.3	15.05	15.8	1	21.2	28	0.084
P6KE16A, G	P6KE16A	13.6	5	15.2	16	16.8	1	22.5	27	0.086
P6KE18AG	P6KE18A	15.3	5	17.1	18	18.9	1	25.2	24	0.088
P6KE20ARLG	P6KE20A	17.1	5	19	20	21	1	27.7	22	0.09
P6KE22ARLG	P6KE22A	18.8	5	20.9	22	23.1	1	30.6	20	0.092
P6KE24ARLG	P6KE24A	20.5	5	22.8	24	25.2	1	33.2	18	0.094
P6KE27ARLG	P6KE27A	23.1	5	25.7	27.05	28.4	1	37.5	16	0.096
P6KE30ARLG	P6KE30A	25.6	5	28.5	30	31.5	1	41.4	14.4	0.097
P6KE33AG	P6KE33A	28.2	5	31.4	33.05	34.7	1	45.7	13.2	0.098
P6KE36AG	P6KE36A	30.8	5	34.2	36	37.8	1	49.9	12	0.099
P6KE39AG	P6KE39A	33.3	5	37.1	39.05	41	1	53.9	11.2	0.1
P6KE43AG	P6KE43A	36.8	5	40.9	43.05	45.2	1	59.3	10.1	0.101
P6KE47AG	P6KE47A	40.2	5	44.7	47.05	49.4	1	64.8	9.3	0.101
P6KE51AG	P6KE51A	43.6	5	48.5	51.05	53.6	1	70.1	8.6	0.102
P6KE56AG	P6KE56A	47.8	5	53.2	56	58.8	1	77	7.8	0.103
P6KE62ARLG	P6KE62A	53	5	58.9	62	65.1	1	85	7.1	0.104
P6KE68AG	P6KE68A	58.1	5	64.6	68	71.4	1	92	6.5	0.104
P6KE75ARLG	P6KE75A	64.1	5	71.3	75.05	78.8	1	103	5.8	0.105
P6KE82ARLG	P6KE82A	70.1	5	77.9	82	86.1	1	113	5.3	0.105
P6KE91ARLG	P6KE91A	77.8	5	86.5	91	95.5	1	125	4.8	0.106
P6KE100ARLG	P6KE100A	85.5	5	95	100	105	1	137	4.4	0.106
P6KE120ARLG	P6KE120A	102	5	114	120	126	1	165	3.6	0.107
P6KE130AG	P6KE130A	111	5	124	130.5	137	1	179	3.3	0.107
P6KE150AG	P6KE150A	128	5	143	150.5	158	1	207	2.9	0.108
P6KE160ARLG	P6KE160A	136	5	152	160	168	1	219	2.7	0.108
P6KE180ARLG	P6KE180A	154	5	171	180	189	1	246	2.4	0.108
P6KE200A, G	P6KE200A	171	5	190	200	210	1	274	2.2	0.108

3. A transient suppressor is normally selected according to the maximum working peak reverse voltage ( $V_{RWM}$ ), which should be equal to or greater than the dc or continuous peak operating voltage level.

4.  $V_{BR}$  measured at pulse test current  $I_T$  at an ambient temperature of  $25^\circ\text{C}$

5. Surge current waveform per Figure 4 and derate per Figures 1 and 2.

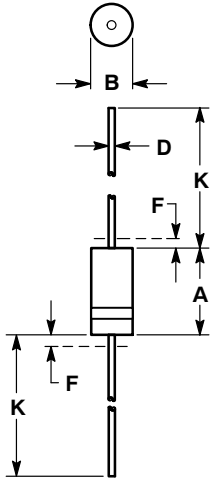
6. 1/2 sine wave (or equivalent square wave),  $PW = 8.3\text{ ms}$ , duty cycle = 4 pulses per minute maximum.

\*The "G" suffix indicates Pb-Free package or Pb-Free Packages are available.

# P6KE6.8A Series

## PACKAGE DIMENSIONS

SURMETIC 40, AXIAL LEAD  
CASE 017AA-01  
ISSUE O



### NOTES:

1. CONTROLLING DIMENSION: INCH
2. LEAD DIAMETER AND FINISH NOT CONTROLLED WITHIN DIMENSION F.
3. CATHODE BAND INDICATES POLARITY

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.330	0.350	8.38	8.89
B	0.130	0.145	3.30	3.68
D	0.037	0.043	0.94	1.09
F	---	0.050	---	1.27
K	1.000	1.250	25.40	31.75