



**THE DATASHEET OF  
P6KE51CA-T**



## Features

- 600W Peak Pulse Power Dissipation
- Voltage Range: 6.8V to 400V
- Constructed with Glass Passivated Die
- Uni- and Bidirectional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**

## Mechanical Data

- Case: DO-15
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Leads: Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Marking: Unidirectional - Type Number and Cathode Band
- Marking: Bidirectional - Type Number Only
- Weight: 0.4 grams (Approximate)

## Ordering Information (Note 3)

Part Number (Type Number)-T*	Case	Packaging
	DO-15	4K/Tape & Reel, 13-inch

\* Add "-T" to the appropriate type number in Table 1 for Tape & Reel, respectively. Example: 6.40V  $V_{RWM}$  = P6KE7V5A-T for Tape & Reel.

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Maximum Ratings (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Power Dissipation, $t_P = 1.0\text{ms}$ (Non Repetitive Current Pulse, Derated above $T_A = +25^\circ\text{C}$ )	$P_{PK}$	600	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave, Superimposed on Rated Load Duty Cycle = 4 Pulses Per Minute Maximum	$I_{FSM}$	100	A
Forward Voltage @ $I_F = 35\text{A}$ 300 $\mu\text{s}$ Square Wave Pulse, Unidirectional Only	$V_F$	$V_{BR} \leq 200\text{V}$ 5.0 $V_{BR} > 200\text{V}$	V

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Steady State Power Dissipation at $T_L = +75^\circ\text{C}$ Lead Lengths 9.5mm (Mounted on Copper Land Area of 40mm)	$P_D$	5.0	W
Typical Thermal Resistance, Junction to Case	$R_{\theta JC}$	20	$^\circ\text{C/W}$
Typical Thermal Resistance, Junction to Lead	$R_{\theta JL}$	15	$^\circ\text{C/W}$
Typical Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +175	$^\circ\text{C}$

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Type Number (Note 4)	Type Number (Note 4)	Reverse Standoff Voltage	Breakdown Voltage V <sub>BR</sub> @ I <sub>T</sub>		Test Current I <sub>T</sub> (mA)	Max Reverse Leakage (Note 5) @ V <sub>R</sub> I <sub>R</sub> (μA)	Max Clamping Voltage @ I <sub>PP</sub> V <sub>C</sub> (V)	Max Peak Pulse Current I <sub>PP</sub> (A)
			Min (V)	Max (V)				
(UNI)	(BI)	V <sub>RWM</sub> (V)	Min (V)	Max (V)	I <sub>T</sub> (mA)	I <sub>R</sub> (μA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)
P6KE6V8A	P6KE6V8CA	5.80	6.45	7.14	10	1000	10.5	57.0
P6KE7V5A	P6KE7V5CA	6.40	7.13	7.88	10	500	11.3	53.0
P6KE8V2A	P6KE8V2CA	7.02	7.79	8.61	10	200	12.1	50.0
P6KE9V1A	P6KE9V1CA	7.78	8.65	9.55	1.0	50	13.4	45.0
P6KE10A	P6KE10CA	8.55	9.50	10.50	1.0	10	14.5	41.0
P6KE11A	P6KE11CA	9.40	10.50	11.60	1.0	5.0	15.6	38.0
P6KE12A	P6KE12CA	10.20	11.40	12.60	1.0	5.0	16.7	36.0
P6KE13A	P6KE13CA	11.10	12.40	13.70	1.0	5.0	18.2	33.0
P6KE15A	P6KE15CA	12.80	14.30	15.80	1.0	5.0	21.2	28.0
P6KE16A	P6KE16CA	13.60	15.20	16.80	1.0	5.0	22.5	27.0
P6KE18A	P6KE18CA	15.30	17.10	18.90	1.0	5.0	25.2	24.0
P6KE20A	P6KE20CA	17.10	19.00	21.00	1.0	5.0	27.7	22.0
P6KE22A	P6KE22CA	18.80	20.90	23.10	1.0	5.0	30.6	20.0
P6KE24A	P6KE24CA	20.50	22.80	25.20	1.0	5.0	33.2	18.0
P6KE27A	P6KE27CA	23.10	25.70	28.40	1.0	5.0	37.5	16.0
P6KE30A	P6KE30CA	25.60	28.50	31.50	1.0	5.0	41.4	14.40
P6KE33A	P6KE33CA	28.20	31.40	34.70	1.0	5.0	45.7	13.20
P6KE36A	P6KE36CA	30.80	34.20	37.80	1.0	5.0	49.9	12.00
P6KE39A	P6KE39CA	33.30	37.10	41.00	1.0	5.0	53.9	11.20
P6KE43A	P6KE43CA	36.80	40.90	45.20	1.0	5.0	59.3	10.10
P6KE47A	P6KE47CA	40.20	44.70	49.40	1.0	5.0	64.8	9.30
P6KE51A	P6KE51CA	43.60	48.50	53.60	1.0	5.0	70.1	8.60
P6KE56A	P6KE56CA	47.80	53.20	58.80	1.0	5.0	77.0	7.80
P6KE62A	P6KE62CA	53.00	58.90	65.10	1.0	5.0	85.0	7.10
P6KE68A	P6KE68CA	58.10	64.60	71.40	1.0	5.0	92.0	6.50
P6KE75A	P6KE75CA	64.10	71.30	78.80	1.0	5.0	103.0	5.80
P6KE82A	P6KE82CA	70.10	77.90	86.10	1.0	5.0	113.0	5.30
P6KE91A	P6KE91CA	77.80	86.50	95.50	1.0	5.0	125.0	4.80
P6KE100A	P6KE100CA	85.50	95.00	105.00	1.0	5.0	137.0	4.40
P6KE110A	P6KE110CA	94.00	105.00	116.00	1.0	5.0	152.0	4.00
P6KE120A	P6KE120CA	102.00	114.00	126.00	1.0	5.0	165.0	3.60
P6KE130A	P6KE130CA	111.00	124.00	137.00	1.0	5.0	179.0	3.30
P6KE150A	P6KE150CA	128.00	143.00	158.00	1.0	5.0	207.0	2.90
P6KE160A	P6KE160CA	136.00	152.00	168.00	1.0	5.0	219.0	2.70
P6KE170A	P6KE170CA	145.00	162.00	179.00	1.0	5.0	234.0	2.60
P6KE180A	P6KE180CA	154.00	171.00	189.00	1.0	5.0	246.0	2.40
P6KE200A	P6KE200CA	171.00	190.00	210.00	1.0	5.0	274.0	2.20
P6KE220A	P6KE220CA	185.00	209.00	231.00	1.0	5.0	328.0	1.83
P6KE250A	P6KE250CA	214.00	237.00	263.00	1.0	5.0	344.0	1.75
P6KE300A	P6KE300CA	256.00	285.00	315.00	1.0	5.0	414.0	1.45
P6KE350A	P6KE350CA	300.00	332.00	368.00	1.0	5.0	482.0	1.25
P6KE400A	P6KE400CA	342.00	380.00	420.00	1.0	5.0	548.0	1.10

Notes: 4. Suffix 'C' denotes bidirectional device.  
5. For bidirectional devices having V<sub>R</sub> of 10 volts and under, the I<sub>R</sub> limit is doubled.

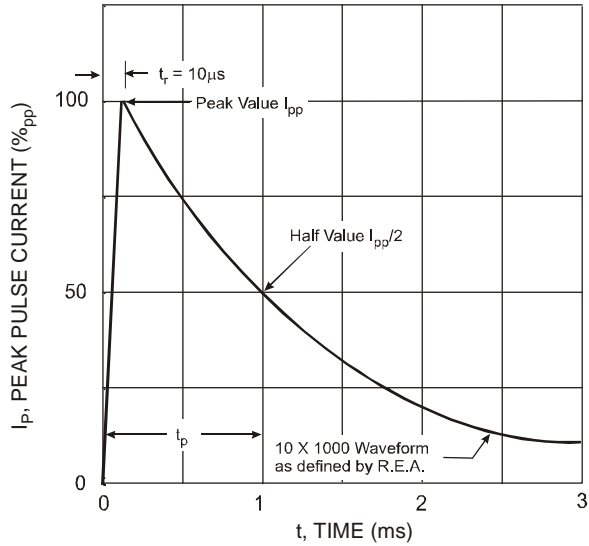


Fig. 1 Pulse Waveform

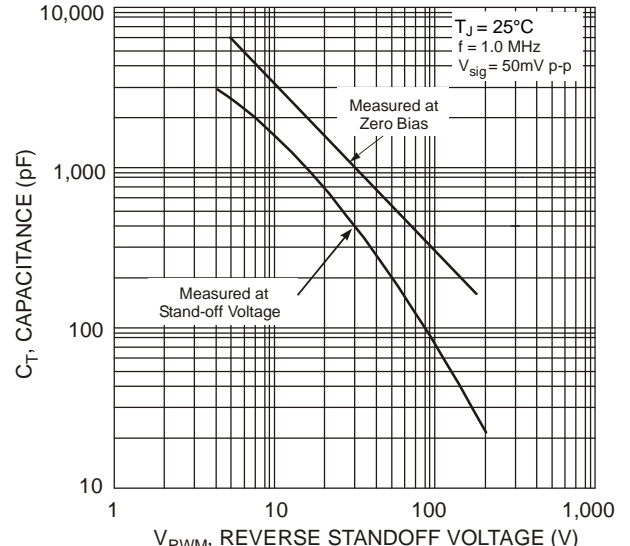


Fig. 2 Typical Total Capacitance

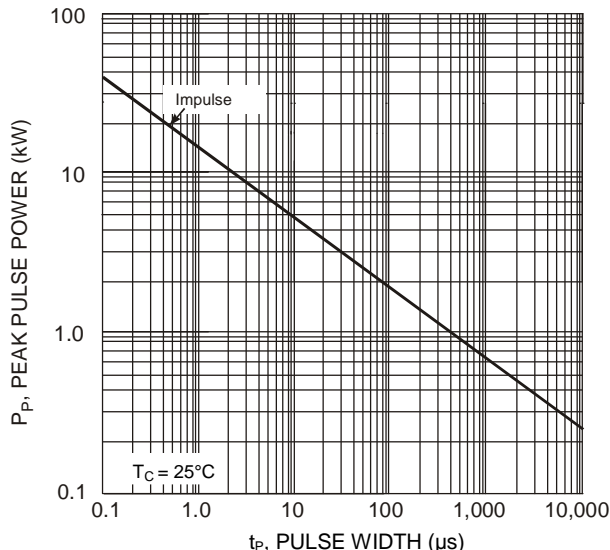


Fig. 3 Pulse Rating Curve

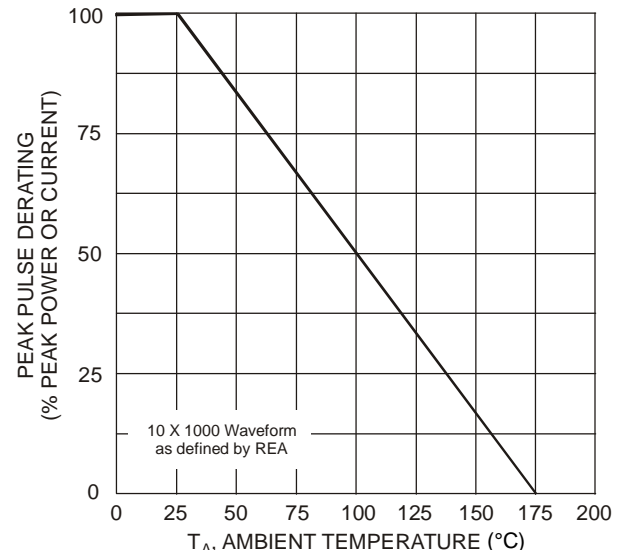


Fig. 4 Pulse Derating Curve

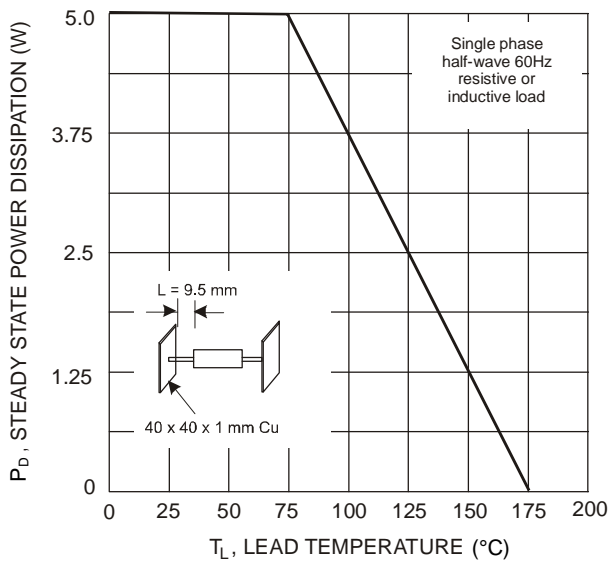


Fig. 5, Steady State Power Derating

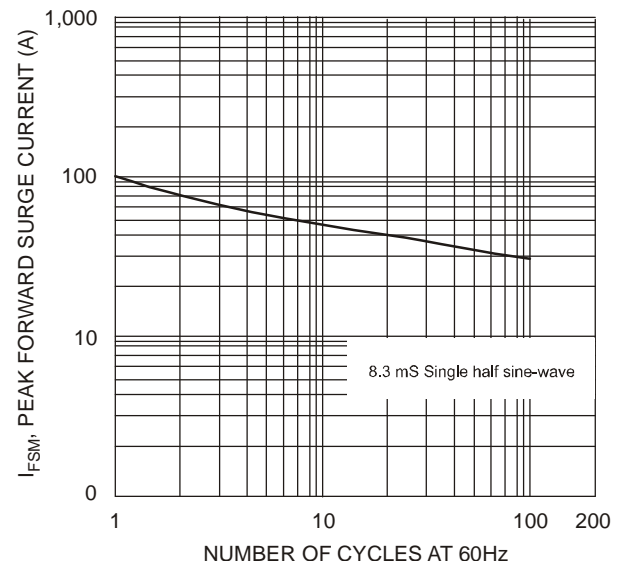
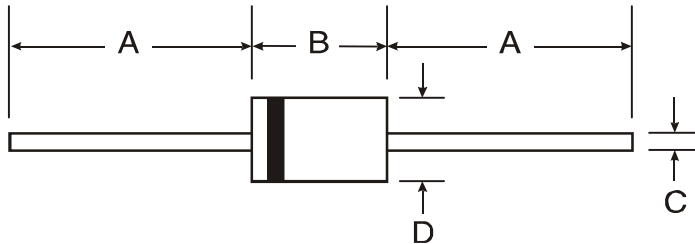


Fig. 6 Peak Forward Surge Current vs. Number of Cycles at 60Hz

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



DO-15		
Dim	Min	Max
A	25.40	—
B	5.50	7.62
C	0.686	0.889
D	2.60	3.60
<b>All Dimensions in mm</b>		

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