

## 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<br>(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/>.

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

| Characteristic   | Symbol    | Value  | Unit |
|--|-----------|--|------|
| Peak Power Dissipation, $t_p = 1.0\text{ms}$<br>(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 @ $I_F = 35\text{A}$<br>300 $\mu\text{s}$ Square Wave Pulse, Unidirectional Only                             | $V_F$     | $V_{BR} \leq 200\text{V}$<br>5.0<br>$V_{BR} > 200\text{V}$ | V    |

## Thermal Characteristics

| Characteristic  | Symbol          | Value       | Unit               |
|---|-----------------|-------------|--------------------|
| Steady State Power Dissipation at $T_L = +75^\circ\text{C}$<br>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<br>(Note 4) | Type Number<br>(Note 4) | Reverse Standoff Voltage | Breakdown Voltage<br>V <sub>BR</sub> @ I <sub>T</sub> |         | Test Current<br>I <sub>T</sub> (mA) | Max Reverse Leakage<br>(Note 5)<br>@ V <sub>R</sub><br>I <sub>R</sub> (μA) | Max Clamping Voltage<br>@ I <sub>PP</sub><br>V <sub>C</sub> (V) | Max Peak Pulse Current<br>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.

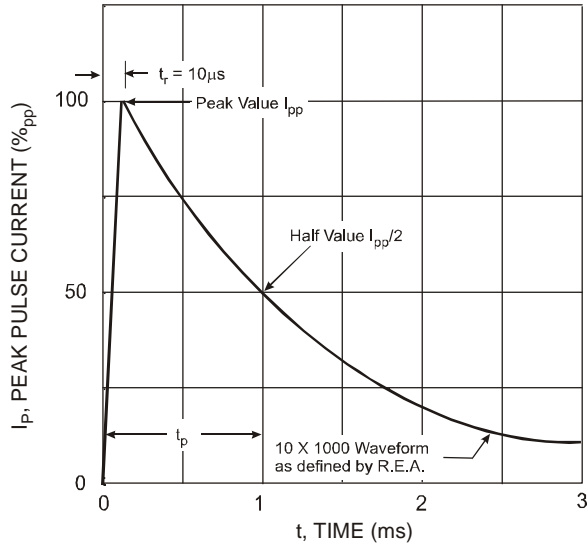


Fig. 1 Pulse Waveform

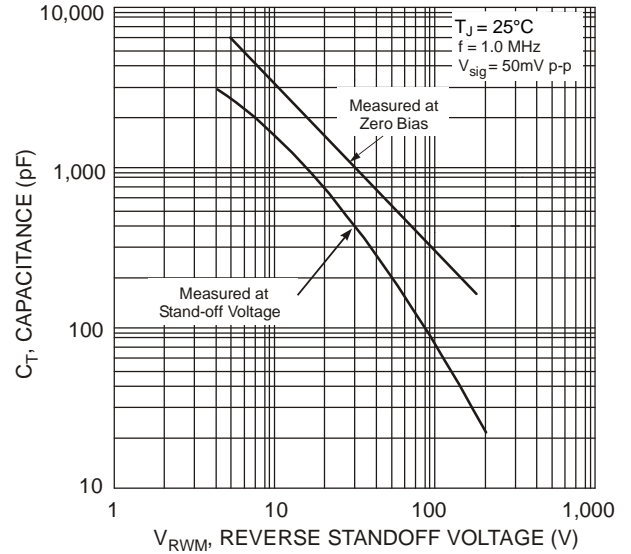


Fig. 2 Typical Total Capacitance

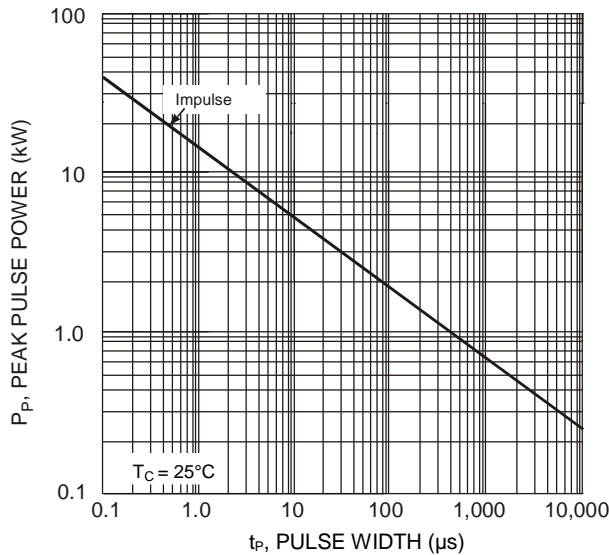


Fig. 3 Pulse Rating Curve

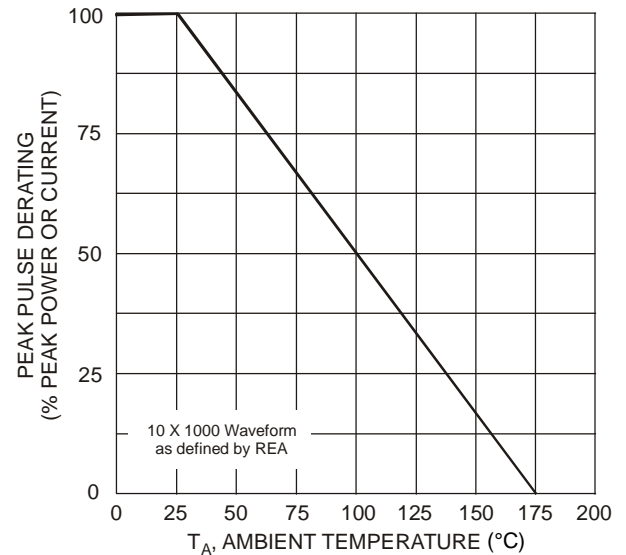


Fig. 4 Pulse Derating Curve

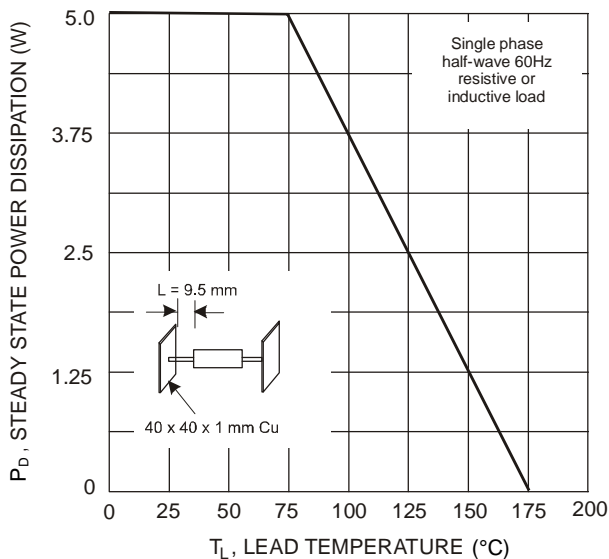


Fig. 5, Steady State Power Derating

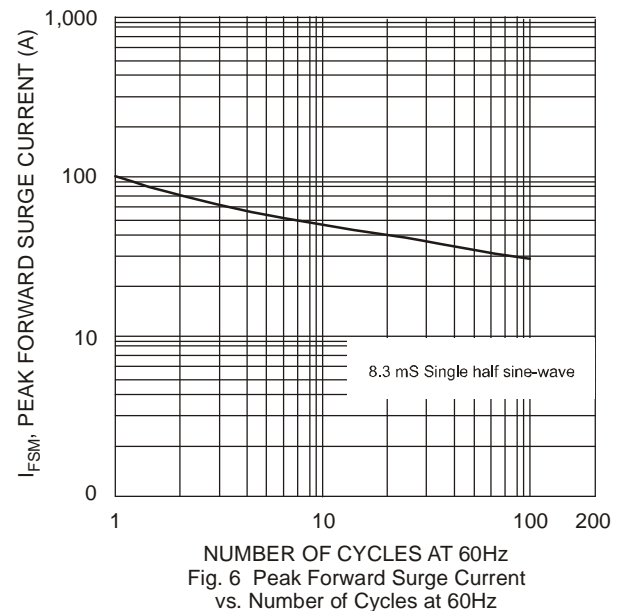
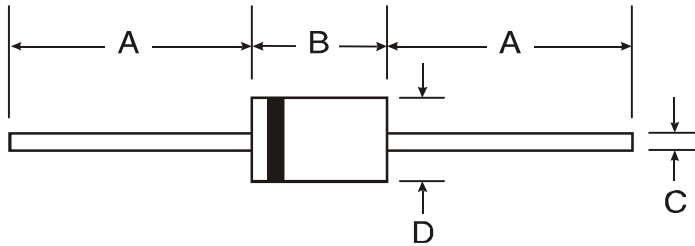


Fig. 6 Peak Forward Surge Current vs. Number of Cycles at 60Hz

## 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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