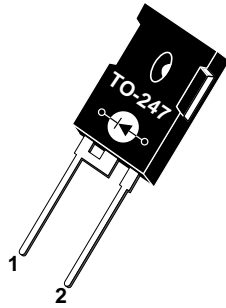


1 - Cathode  
2 - Anode  
Back of Case - Cathode



**ADVANCED  
POWER  
TECHNOLOGY®**  
APT60D60B 600V 60A

## ULTRAFAST SOFT RECOVERY RECTIFIER DIODE

### PRODUCT APPLICATIONS

- Anti-Parallel Diode
  - Switchmode Power Supply
  - Inverters
- Free Wheeling Diode
  - Motor Controllers
  - Converters
- Snubber Diode
- Uninterruptible Power Supply (UPS)
- Induction Heating
- High Speed Rectifiers

### PRODUCT FEATURES

- Ultrafast Recovery Times
- Soft Recovery Characteristics
- Popular TO-247 Package
- Low Forward Voltage
- High Blocking Voltage
- Low Leakage Current

### PRODUCT BENEFITS

- Low Losses
- Low Noise Switching
- Cooler Operation
- Higher Reliability Systems
- Increased System Power Density

### MAXIMUM RATINGS

All Ratings:  $T_C = 25^\circ\text{C}$  unless otherwise specified.

| Symbol         | Characteristic / Test Conditions   | APT60D60B  | UNIT             |
|----------------|--|------------|------------------|
| $V_R$          | Maximum D.C. Reverse Voltage   | 600        | Volts            |
| $V_{RRM}$      | Maximum Peak Repetitive Reverse Voltage  |            |                  |
| $V_{RWM}$      | Maximum Working Peak Reverse Voltage   |            |                  |
| $I_F(AV)$      | Maximum Average Forward Current ( $T_C = 70^\circ\text{C}$ , Duty Cycle = 0.5) | 60         | Amps             |
| $I_F(RMS)$     | RMS Forward Current  | 100        |                  |
| $I_{FSM}$      | Non-Repetitive Forward Surge Current ( $T_J = 45^\circ\text{C}$ , 8.3ms)       | 600        |                  |
| $T_J, T_{STG}$ | Operating and Storage Temperature Range  | -55 to 150 | $^\circ\text{C}$ |
| $T_L$          | Lead Temperature: 0.063" from Case for 10 Sec.                                 | 300        |                  |

### STATIC ELECTRICAL CHARACTERISTICS

| Symbol   | Characteristic / Test Conditions               | MIN | TYP | MAX                 | UNIT          |
|----------|--|-----|-----|---------------------|---------------|
| $V_F$    | Maximum Forward Voltage                        |     |     | 1.8                 | Volts         |
|          |  |     |     | $I_F = 60\text{A}$  |               |
|          |  |     |     | $I_F = 120\text{A}$ |               |
| $I_{RM}$ | Maximum Reverse Leakage Current                |     |     | 250                 | $\mu\text{A}$ |
|          |  |     |     | $V_R = V_R$ Rated   |               |
| $C_T$    | Junction Capacitance, $V_R = 200\text{V}$      |     | 85  |                     | pF            |
|          |  |     |     |                     |               |
| $L_S$    | Series Inductance (Lead to Lead 5mm from Base) |     | 10  |                     | nH            |

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FAX: (33) 5 56 47 97 61

### DYNAMIC CHARACTERISTICS

APT60D60B

| Symbol     | Characteristic   | MIN | TYP | MAX | UNIT       |
|------------|--|-----|-----|-----|------------|
| $t_{rr1}$  | Reverse Recovery Time, $I_F = 1.0A, di_F/dt = -15A/\mu s, V_R = 30V, T_J = 25^\circ C$ |     | 55  | 70  | ns         |
| $t_{rr2}$  | Reverse Recovery Time  |     | 70  |     |            |
| $t_{rr3}$  | $I_F = 60A, di_F/dt = -480A/\mu s, V_R = 350V$   |     | 90  |     |            |
| $t_{fr1}$  | Forward Recovery Time  |     | 160 |     |            |
| $t_{fr2}$  | $I_F = 60A, di_F/dt = 480A/\mu s, V_R = 350V$  |     | 160 |     |            |
| $I_{RRM1}$ | Reverse Recovery Current   |     | 10  | 17  | Amps       |
| $I_{RRM2}$ | $I_F = 60A, di_F/dt = -480A/\mu s, V_R = 350V$   |     | 20  | 30  |            |
| $Q_{rr1}$  | Recovery Charge  |     | 350 |     | nC         |
| $Q_{rr2}$  | $I_F = 60A, di_F/dt = -480A/\mu s, V_R = 350V$   |     | 900 |     |            |
| $V_{fr1}$  | Forward Recovery Voltage   |     | 6   |     | Volts      |
| $V_{fr2}$  | $I_F = 60A, di_F/dt = 480A/\mu s, V_R = 350V$  |     | 6   |     |            |
| $diM/dt$   | Rate of Fall of Recovery Current   |     | 800 |     | A/ $\mu s$ |
|            | $I_F = 60A, di_F/dt = -480A/\mu s, V_R = 350V$ (See Figure 10)                         |     | 500 |     |            |

### THERMAL AND MECHANICAL CHARACTERISTICS

| Symbol          | Characteristic / Test Conditions                           | MIN | TYP  | MAX  | UNIT         |
|-----------------|--|-----|------|------|--------------|
| $R_{\theta JC}$ | Junction-to-Case Thermal Resistance                        |     |      | 0.66 | $^\circ C/W$ |
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance                     |     |      | 40   |              |
| $W_T$           | Package Weight   |     | 0.22 |      | oz           |
|                 |  |     | 6.1  |      | gm           |
| Torque          | Maximum Mounting Torque (Screw Type = 6-32 or 3mm Machine) |     |      | 10   | lb•in        |
|                 |  |     |      | 1.1  | N•m          |

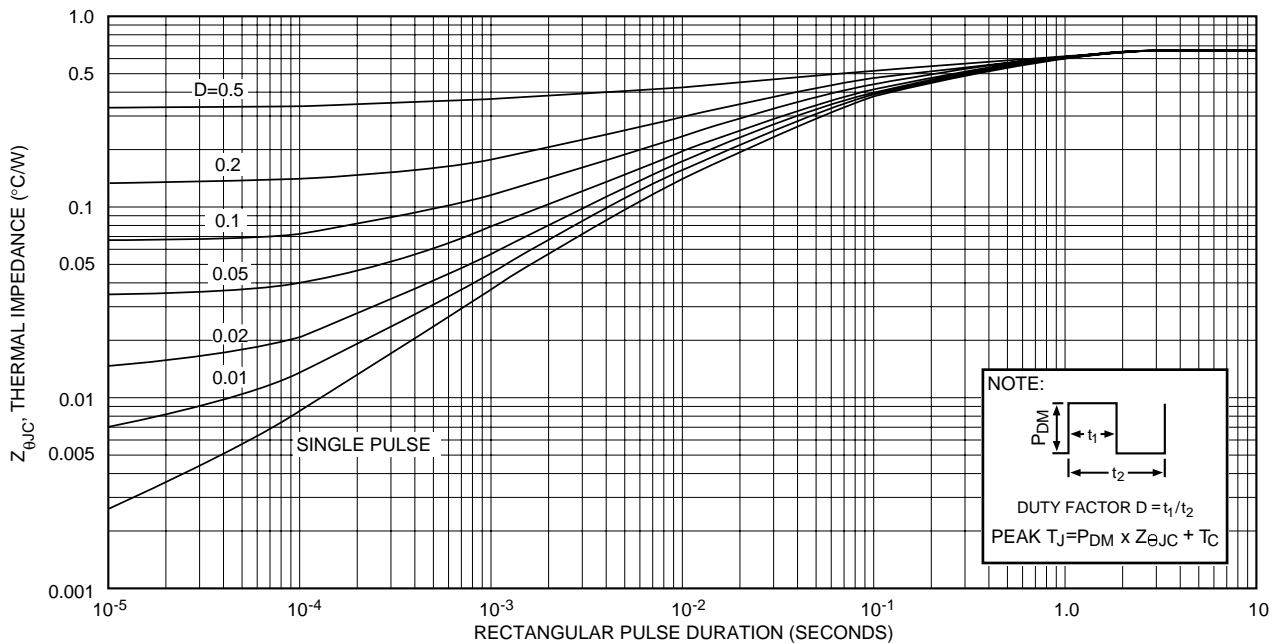
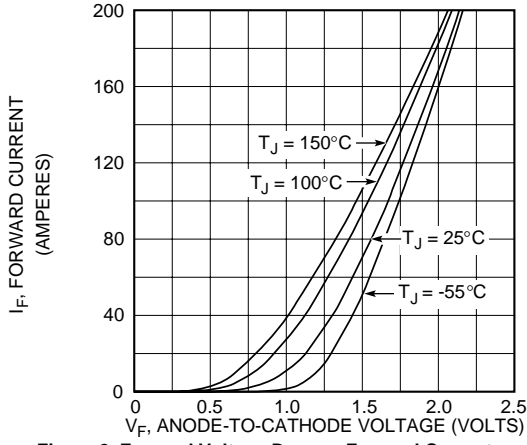
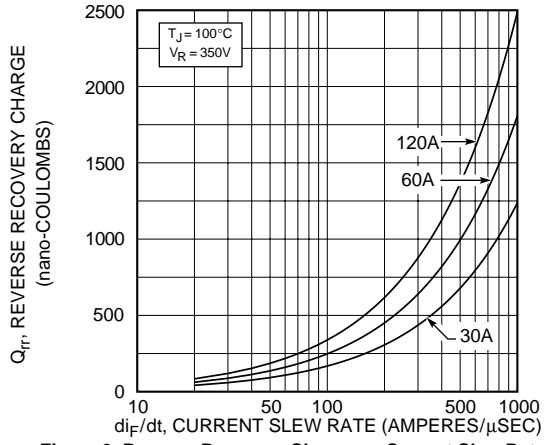


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

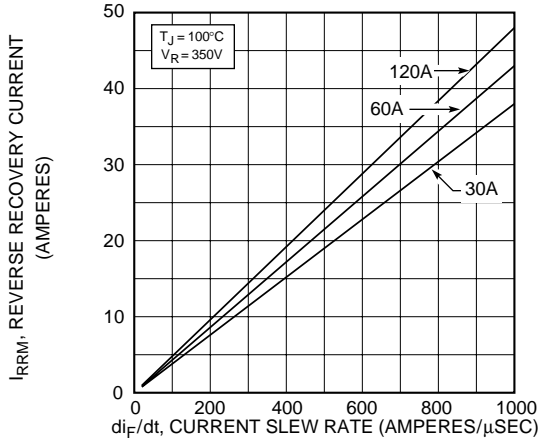
**APT60D60B**



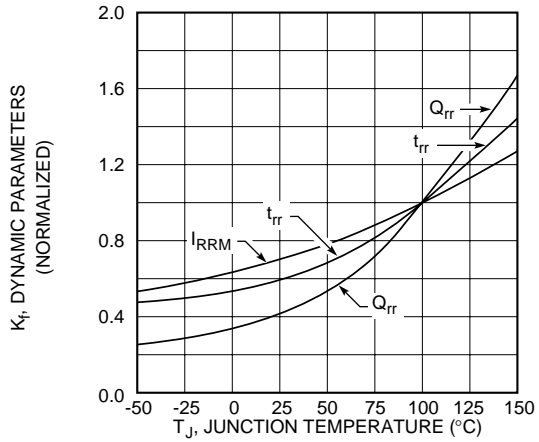
**Figure 2, Forward Voltage Drop vs Forward Current**



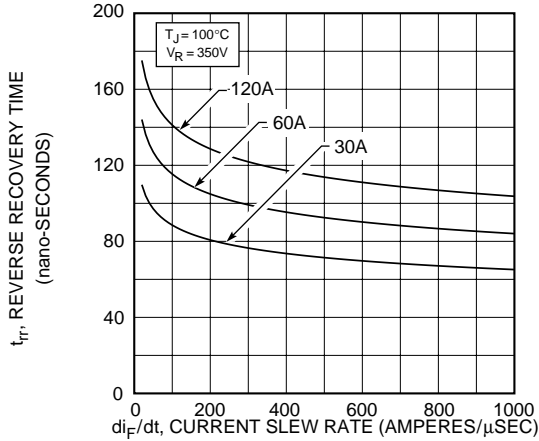
**Figure 3, Reverse Recovery Charge vs Current Slew Rate**



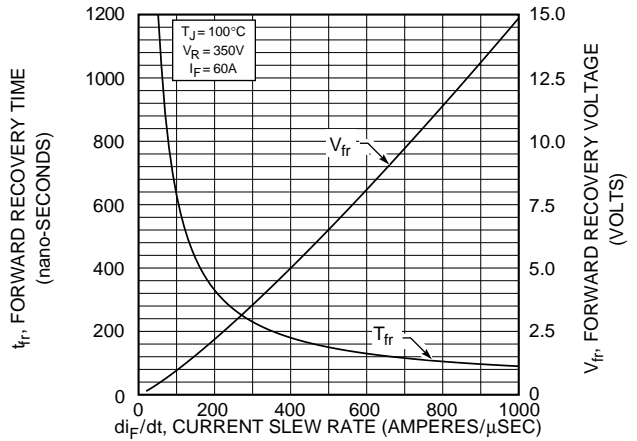
**Figure 4, Reverse Recovery Current vs Current Slew Rate**



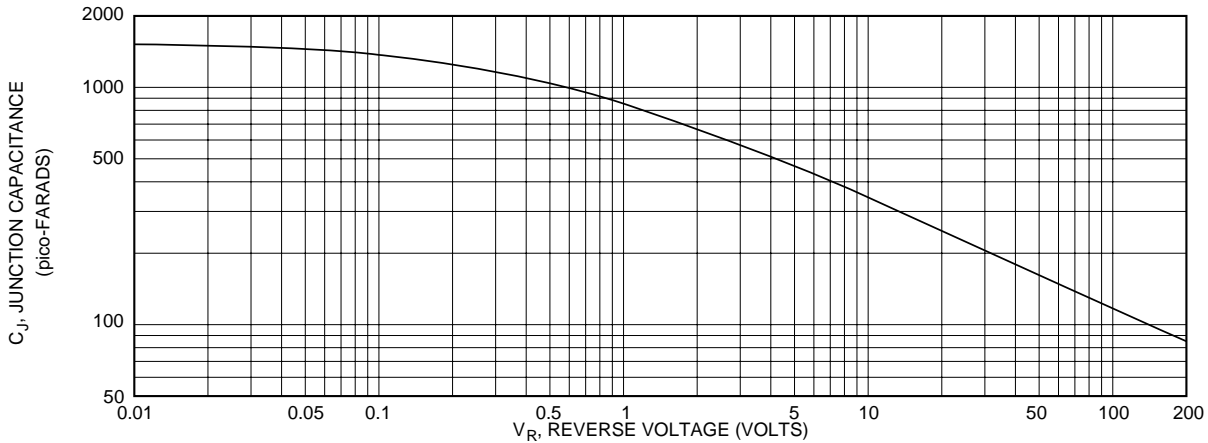
**Figure 5, Dynamic Parameters vs Junction Temperature**



**Figure 6, Reverse Recovery Time vs Current Slew Rate**



**Figure 7, Forward Recovery Voltage/Time vs Current Slew Rate**



**Figure 8, Junction Capacitance vs Reverse Voltage**

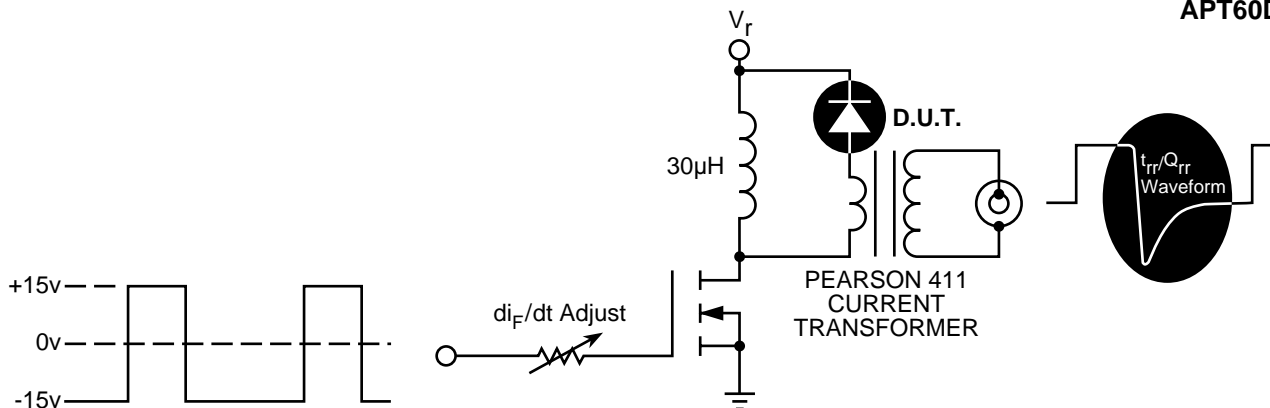


Figure 9, Diode Reverse Recovery Test Circuit and Waveforms

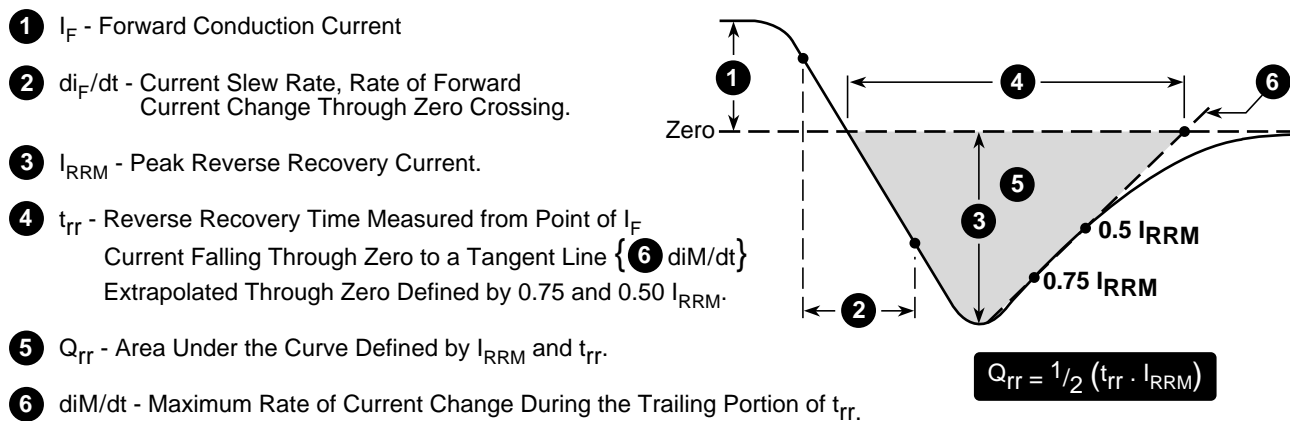
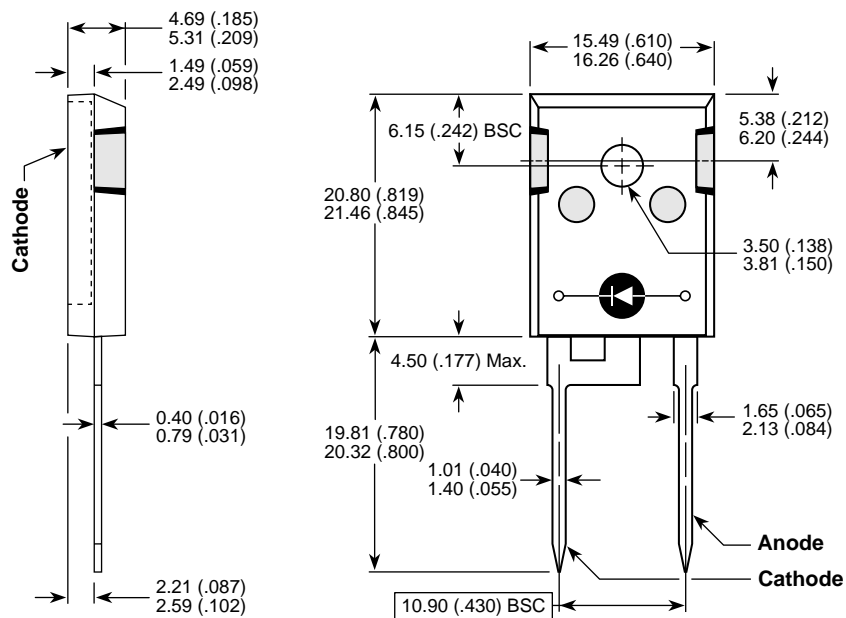


Figure 10, Diode Reverse Recovery Waveform and Definitions

### TO-247 Package Outline



Dimensions in Millimeters and (Inches)