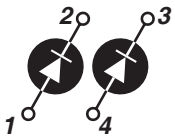
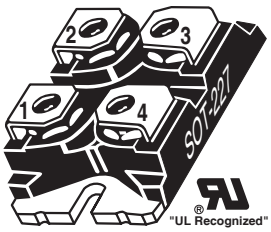



*Anti-Parallel*
**APT2X60D20J**




*Parallel*
**APT2X61D20J**




**ISOTOP®**

**ADVANCED POWER TECHNOLOGY®**

**APT2X61D20J 200V 60A**
**APT2X60D20J 200V 60A**

# DUAL DIE ISOTOP® PACKAGE
# 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 SOT-227 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°C unless otherwise specified.

| Symbol | Characteristic / Test Conditions | APT2X61_60D20J | UNIT |
|---|---|---|---|
| $V_R$ | Maximum D.C. Reverse Voltage | 200 | Volts |
| $V_{RRM}$ | Maximum Peak Repetitive Reverse Voltage | | |
| $V_{RWM}$ | Maximum Working Peak Reverse Voltage | | |
| $I_{F(AV)}$ | Maximum Average Forward Current ($T_C$ = 122°C, Duty Cycle = 0.5) | 60 | Amps |
| $I_{F(RMS)}$ | RMS Forward Current (Square wave, 50% duty) | 107 | |
| $I_{FSM}$ | Non-Repetitive Forward Surge Current ($T_J$ = 45°C, 8.3ms) | 600 | |
| $T_J$,$T_{STG}$ | Operating and StorageTemperature Range | -55 to 175 | °C |
| $T_L$ | Lead Temperature for 10 Sec. | 300 | |

### STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_F$ | Forward Voltage | $I_F$ = 60A | | 1.1 | 1.3 | Volts |
| | | $I_F$ = 120A | | 1.4 | | |
| | | $I_F$ = 60A, $T_J$ = 125°C | | 0.9 | | |
| $I_{RM}$ | Maximum Reverse Leakage Current | $V_R$ = $V_R$ Rated | | | 250 | µA |
| | | $V_R$ = $V_R$ Rated, $T_J$ = 125°C | | | 500 | |
| $C_T$ | Junction Capacitance, $V_R$ = 200V | | | 210 | | pF |



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## DYNAMIC CHARACTERISTICS

**APT2X61_60D20J**

| Symbol | Characteristic | Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 1A, $di_F/dt$ = -100A/µs, $V_R$ = 30V, $T_J$ = 25°C | - | 30 | | ns |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 60A, $di_F/dt$ = -200A/µs, $V_R$ = 133V, $T_C$ = 25°C | - | 31 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 60 | | nC |
| $I_{RRM}$ | Maximum Reverse Recovery Current | | - | 3 | - | Amps |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 60A, $di_F/dt$ = -200A/µs, $V_R$ = 133V, $T_C$ = 125°C | - | 60 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 250 | | nC |
| $I_{RRM}$ | Maximum Reverse Recovery Current | | - | 7 | - | Amps |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 60A, $di_F/dt$ = -1000A/µs, $V_R$ = 133V, $T_C$ = 125°C | - | 40 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 540 | | nC |
| $I_{RRM}$ | Maximum Reverse Recovery Current | | - | 24 | | Amps |

## THERMAL AND MECHANICAL CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $R_{\theta JC}$ | Junction-to-Case Thermal Resistance | | | .60 | °C/W |
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance | | | 20 | |
| $W_T$ | Package Weight | | 1.03 | | oz |
| | | | 29.2 | | g |
| Torque | Maximum Mounting Torque | | | 10 | lb•in |
| | | | | 1.1 | N•m |

**APT Reserves the right to change, without notice, the specifications and information contained herein.**

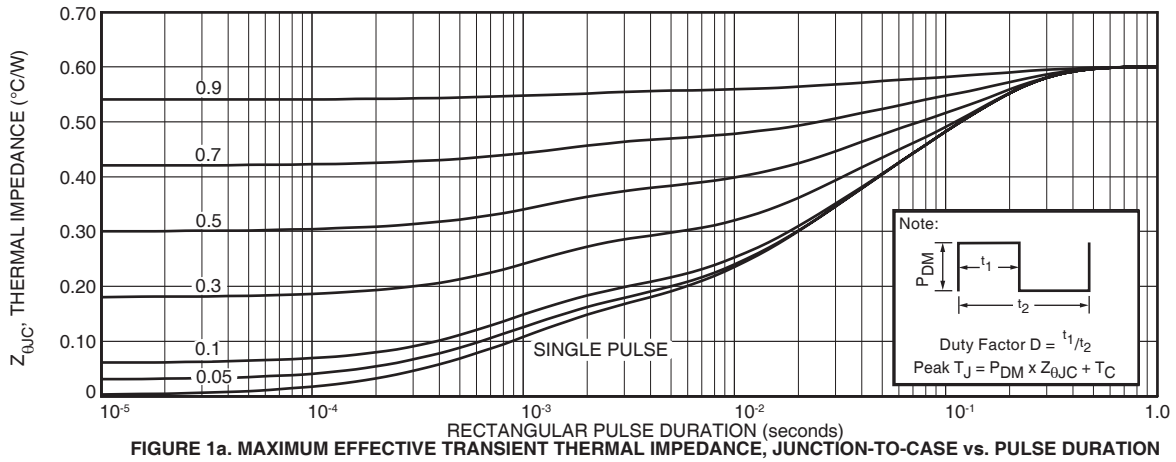



**FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION**

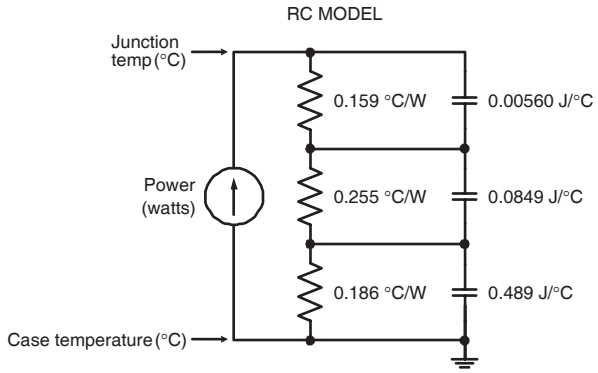



**FIGURE 1b, TRANSIENT THERMAL IMPEDANCE MODEL**

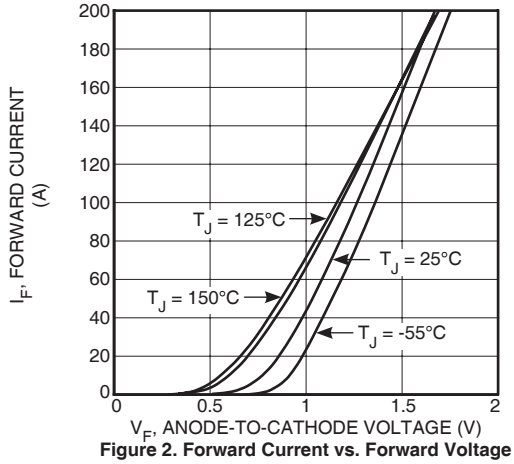



**Figure 2. Forward Current vs. Forward Voltage**

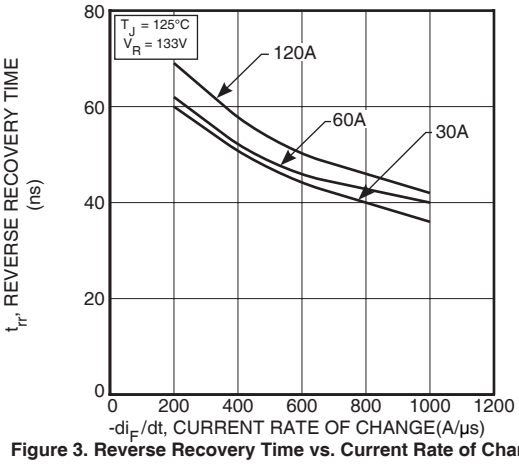



**Figure 3. Reverse Recovery Time vs. Current Rate of Change**

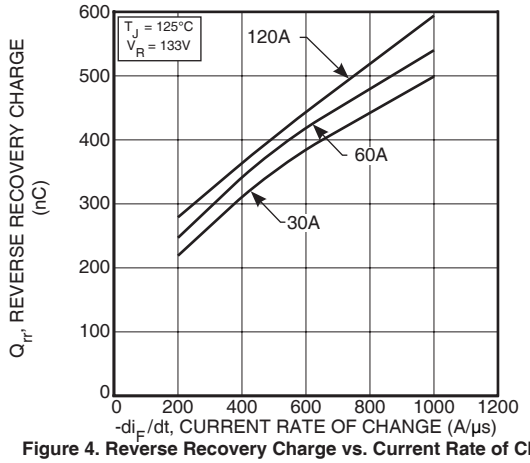



**Figure 4. Reverse Recovery Charge vs. Current Rate of Change**

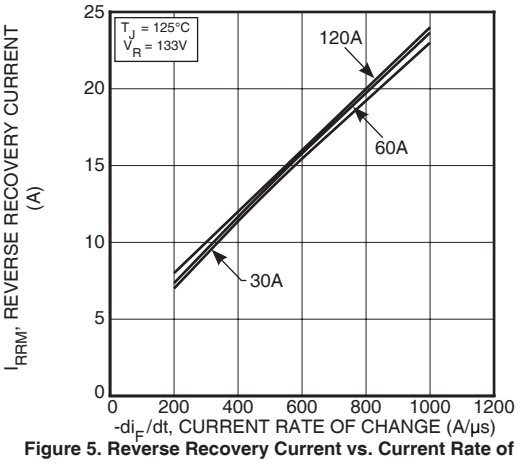



**Figure 5. Reverse Recovery Current vs. Current Rate of Change**

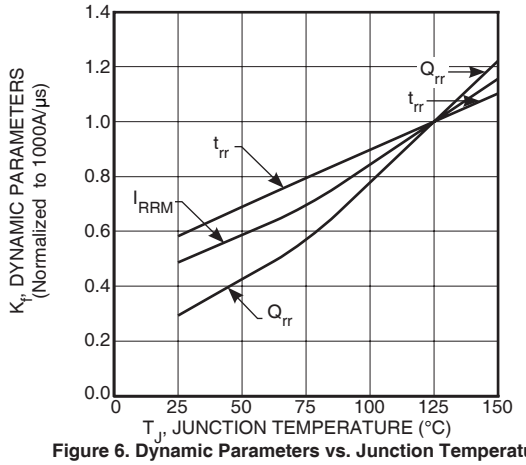



**Figure 6. Dynamic Parameters vs. Junction Temperature**

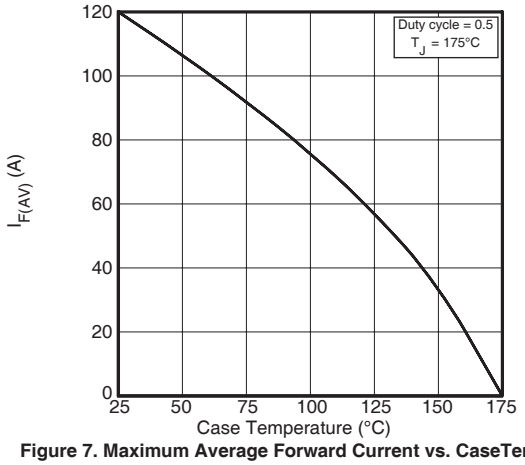



**Figure 7. Maximum Average Forward Current vs. CaseTemperature**

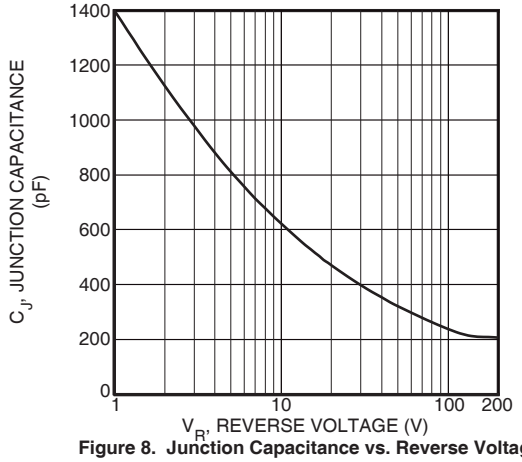



**Figure 8. Junction Capacitance vs. Reverse Voltage**

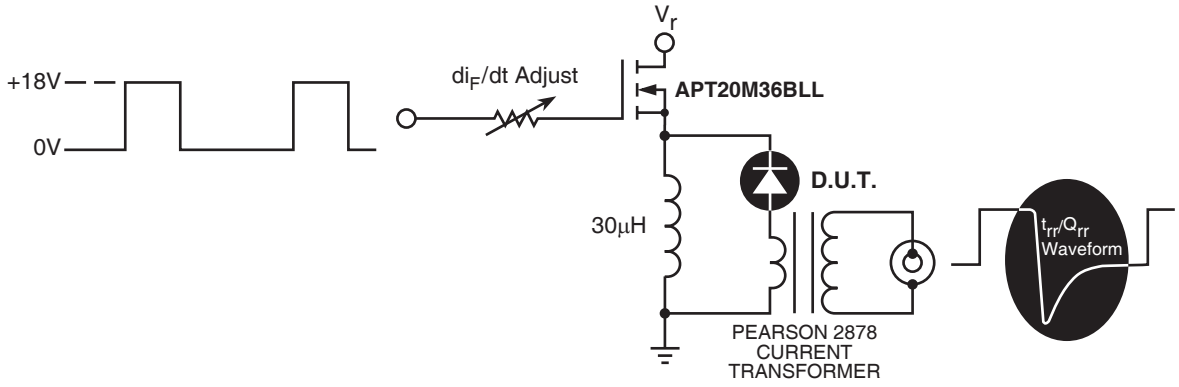
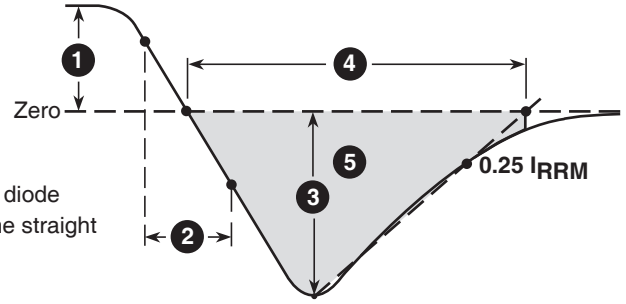


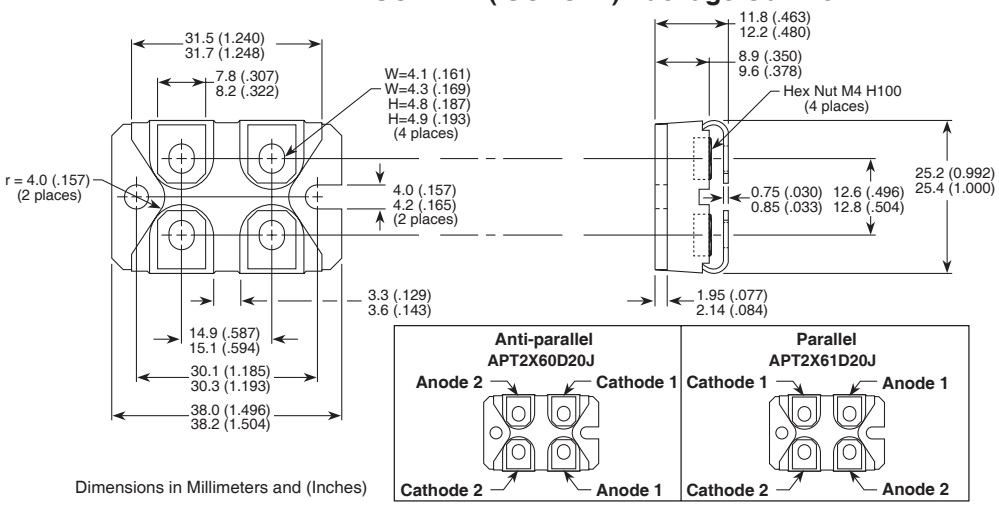

**Figure 9. Diode Test Circuit**




1. $I_F$ - Forward Conduction Current
2. $di_F/dt$ - Rate of Diode Current Change Through Zero Crossing.
3. $I_{RRM}$ - Maximum Reverse Recovery Current.
4. $t_{rr}$ - Reverse Recovery Time, measured from zero crossing where diode current goes from positive to negative, to the point at which the straight line through $I_{RRM}$ and $0.25 \bullet I_{RRM}$ passes through zero.
5. $Q_{rr}$ - Area Under the Curve Defined by $I_{RRM}$ and $t_{rr}$.

**Figure 10, Diode Reverse Recovery Waveform and Definitions**

## SOT-227 (ISOTOP®) Package Outline




Dimensions in Millimeters and (Inches)

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