Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!


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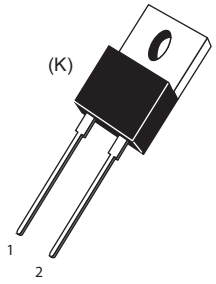
**600V 15A**
**APT15D60K**
**APT15D60KG***

*G Denotes RoHS Compliant, Pb Free Terminal Finish.

# ULTRAFAST SOFT RECOVERY RECTIFIER DIODE





1 - Cathode
2 - Anode
Back of Case - Cathode

## PRODUCT APPLICATIONS

- Anti-Parallel Diode
  - -Switchmode Power Supply
  - -Inverters
- Free Wheeling Diode
  - -Motor Controllers
  - -Converters
  - -Inverters
- Snubber Diode
- PFC

## PRODUCT FEATURES

- Ultrafast Recovery Times
- Soft Recovery Characteristics
- Popular TO-220 Package or Surface Mount $D^2PAK$ Package
- Low Forward 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 | APT15D60K(G) | 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 ($T_C$ = 133°C, Duty Cycle = 0.5) | 15 | Amps |
| $I_{F(RMS)}$ | RMS Forward Current (Square wave, 50% duty) | 32 | |
| $I_{FSM}$ | Non-Repetitive Forward Surge Current ($T_J$ = 45°C, 8.3ms) | 110 | |
| $T_J$,$T_{STG}$ | 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 | $I_F$ = 15A | | 1.6 | 1.8 | Volts |
| | | $I_F$ = 30A | | 1.9 | | |
| | | $I_F$ = 15A, $T_J$ = 125°C | | 1.4 | | |
| $I_{RM}$ | 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 | | | 23 | | pF |

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## DYNAMIC CHARACTERISTICS

**APT15D60K(G)**

| 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 | - | 21 | | ns |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 15A, $di_F/dt$ = -200A/µs $V_R$ = 400V, $T_C$ = 25°C | - | 80 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 95 | | nC |
| $I_{RRM}$ | Maximum Reverse Recovery Current | | - | 3 | - | Amps |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 15A, $di_F/dt$ = -200A/µs $V_R$ = 400V, $T_C$ = 125°C | - | 150 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 520 | | nC |
| $I_{RRM}$ | Maximum Reverse Recovery Current | | - | 7 | - | Amps |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 15A, $di_F/dt$ = -1000A/µs $V_R$ = 400V, $T_C$ = 125°C | - | 60 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 810 | | nC |
| $I_{RRM}$ | Maximum Reverse Recovery Current | | - | 22 | | Amps |

## THERMAL AND MECHANICAL CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $R_{\theta JC}$ | Junction-to-Case Thermal Resistance | | | 1.35 | °C/W |
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance | | | 80 | °C/W |
| $W_T$ | Package Weight | | 0.07 | | oz |
| | | | 1.9 | | g |
| Torque | Maximum Mounting Torque | | | 10 | lb•in |
| | | | | 1.1 | N•m |



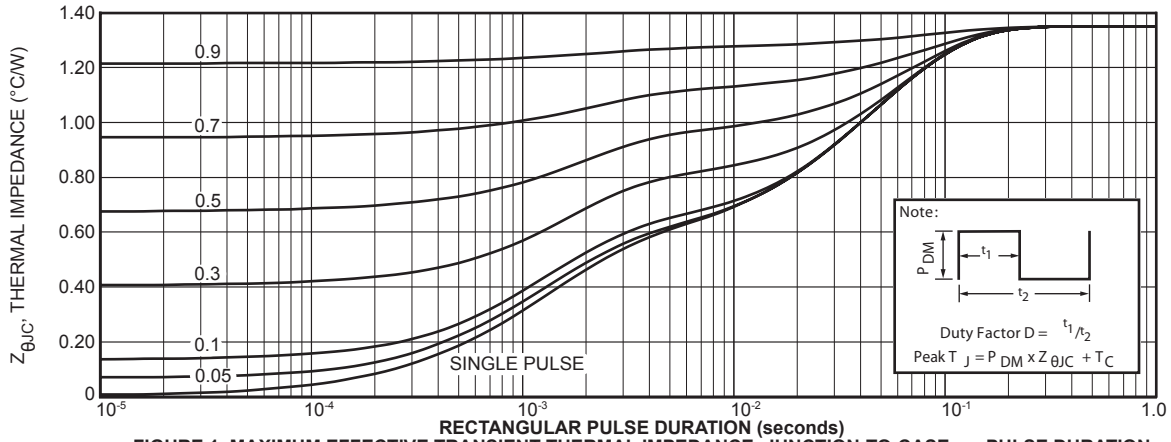



**FIGURE 1. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION**

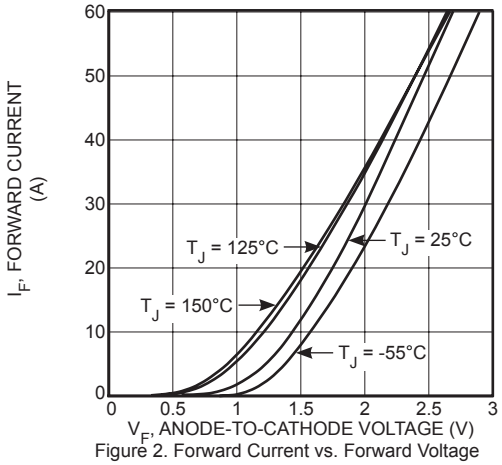


Figure 2. Forward Current vs. Forward Voltage

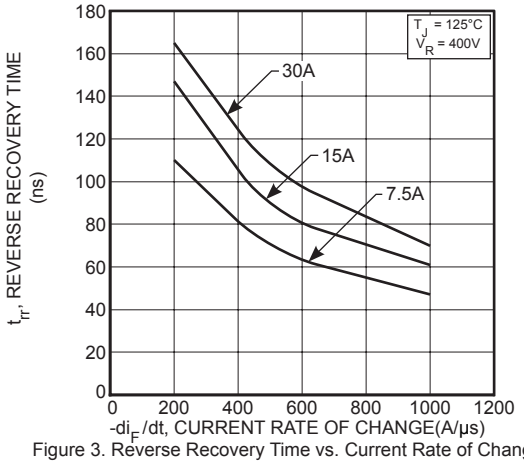


Figure 3. Reverse Recovery Time vs. Current Rate of Change

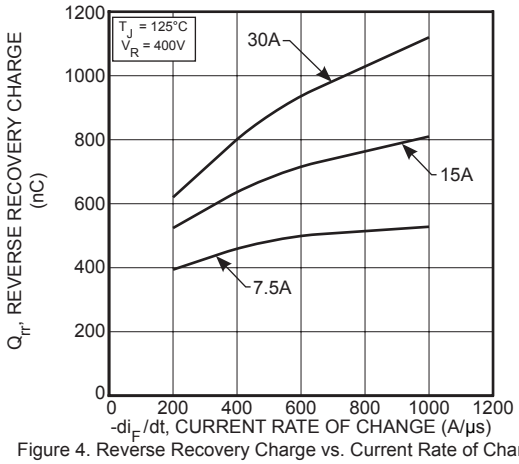


Figure 4. Reverse Recovery Charge vs. Current Rate of Change

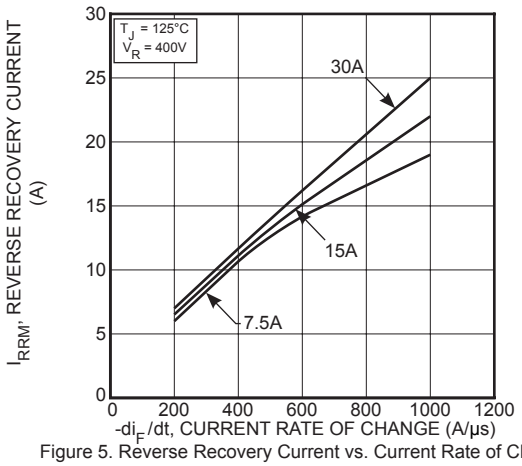


Figure 5. Reverse Recovery Current vs. Current Rate of Change

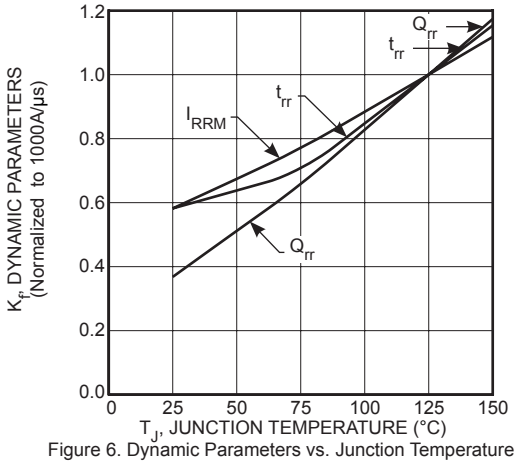


Figure 6. Dynamic Parameters vs. Junction Temperature

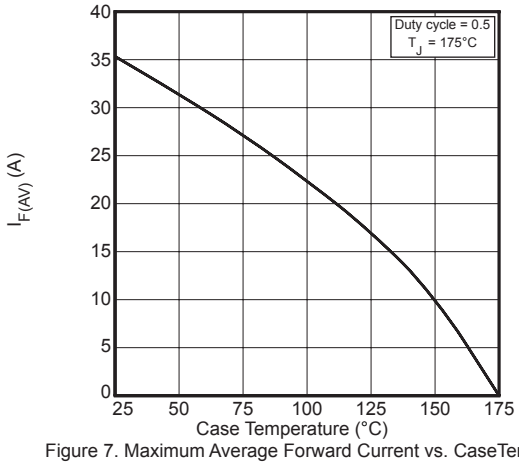


Figure 7. Maximum Average Forward Current vs. CaseTemperature

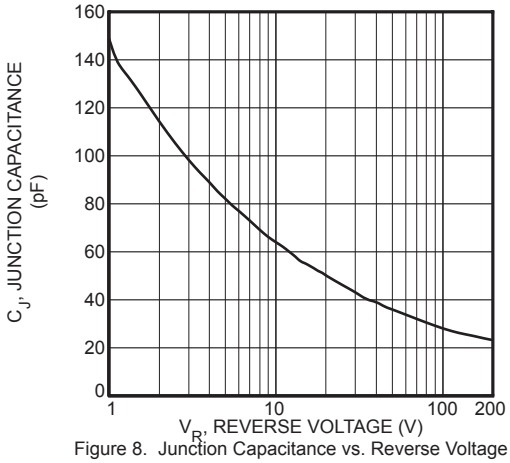


Figure 8. Junction Capacitance vs. Reverse Voltage

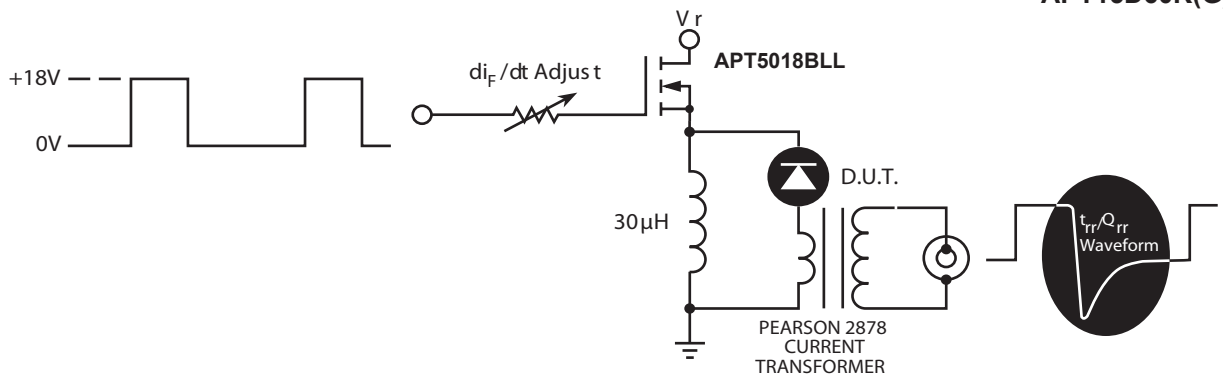



**Figure 9. Diode Test Circuit**

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, $I_{RRM}$ passes through zero.
5. $Q_{rr}$ - Area Under the Curve Defined by $I_{RRM}$ and $t_{RR.}$

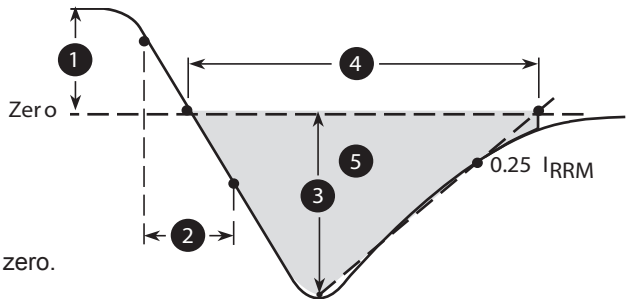
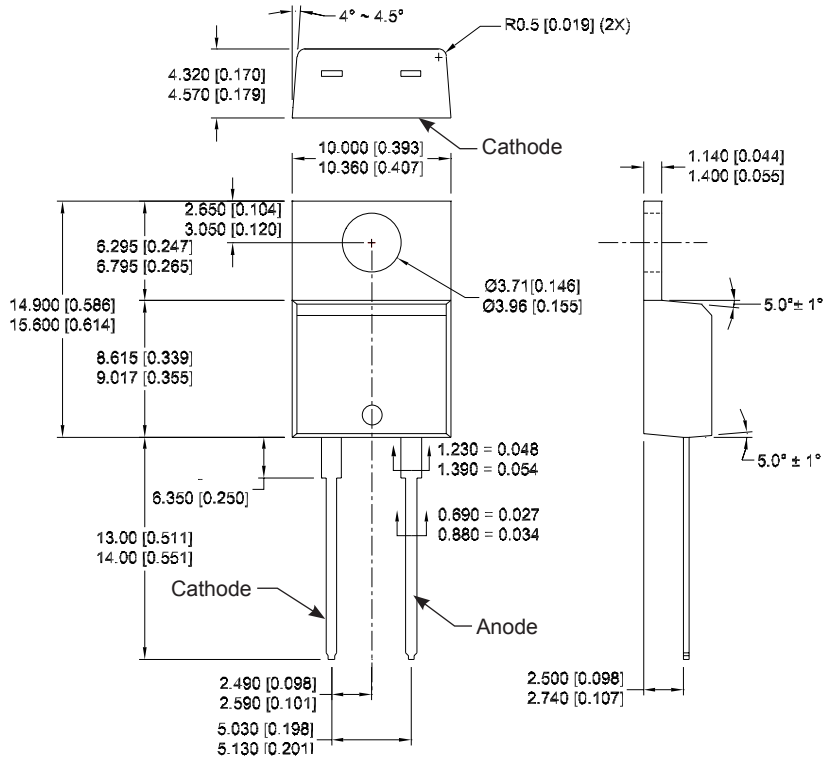



**Figure 10. Diode Reverse Recovery Waveform Definition**

## TO-220 (K) Package Outline

e3 100% Sn




Dimensions in millimeters and [inches]

## Disclaimer:



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