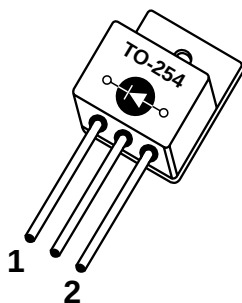


1 - Cathode  
2 - Anode  
Case Isolated



**ADVANCED  
POWER  
TECHNOLOGY®**  
**APT15D40C 400V 15A**

## 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
- Hermetic TO-254 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                                               | APT15D40C  | UNIT             |
|----------------|--------------------------------------------------------------------------------|------------|------------------|
| $V_R$          | Maximum D.C. Reverse Voltage                                                   | 400        | Volts            |
| $V_{RRM}$      | Maximum Peak Repetitive Reverse Voltage                                        |            |                  |
| $V_{RWM}$      | Maximum Working Peak Reverse Voltage                                           |            |                  |
| $I_F(AV)$      | Maximum Average Forward Current ( $T_C = 90^\circ\text{C}$ , Duty Cycle = 0.5) | 15         | Amps             |
| $I_F(RMS)$     | RMS Forward Current                                                            | 25         |                  |
| $I_{FSM}$      | Non-Repetitive Forward Surge Current ( $T_J = 45^\circ\text{C}$ , 8.3ms)       | 110        |                  |
| $T_J, T_{STG}$ | 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                        | $I_F = 15\text{A}$                                 |     | 1.7 | Volts         |
|          |                                                | $I_F = 30\text{A}$                                 |     | 1.7 |               |
|          |                                                | $I_F = 15\text{A}, T_J = 150^\circ\text{C}$        |     | 1.5 |               |
| $I_{RM}$ | Maximum Reverse Leakage Current                | $V_R = V_R \text{ Rated}$                          |     | 150 | $\mu\text{A}$ |
|          |                                                | $V_R = V_R \text{ Rated}, T_J = 125^\circ\text{C}$ |     | 500 |               |
| $C_T$    | Junction Capacitance, $V_R = 200\text{V}$      |                                                    | TBD |     | pF            |
| $L_S$    | Series Inductance (Lead to Lead 5mm from Base) |                                                    | 10  |     | nH            |

APT Website - <http://www.advancedpower.com>

USA 405 S.W. Columbia Street  
EUROPE Chemin de Magret

Bend, Oregon 97702-1035  
F-33700 Merignac - France

Phone: (541) 382-8028  
Phone: (33) 5 57 92 15 15

FAX: (541) 388-0364  
FAX: (33) 5 56 47 97 61

## DYNAMIC CHARACTERISTICS

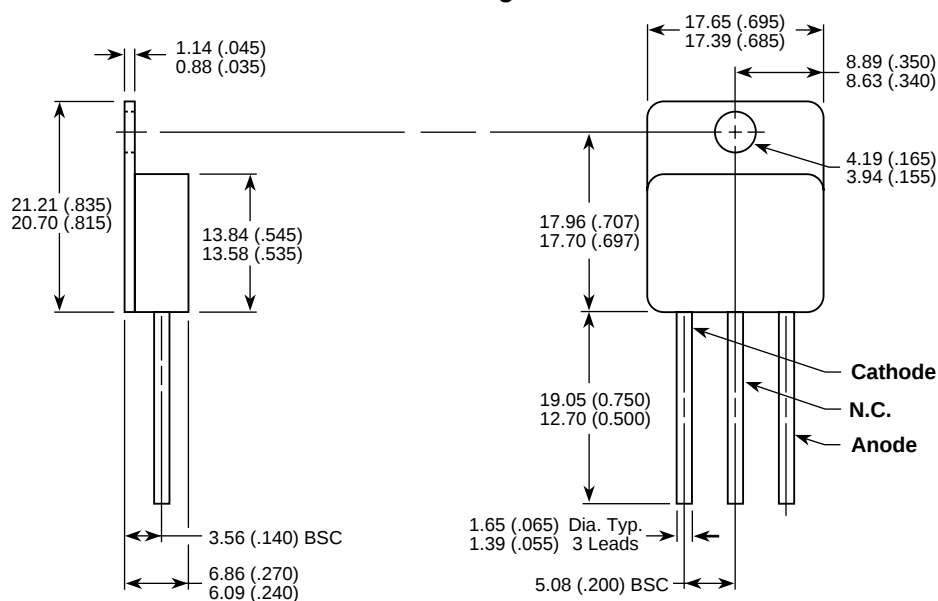
| Symbol     | Characteristic                                                                                  | MIN                 | TYP | MAX | UNIT       |
|------------|-------------------------------------------------------------------------------------------------|---------------------|-----|-----|------------|
| $t_{rr1}$  | Reverse Recovery Time, $I_F = 1.0A$ , $di_F/dt = -15A/\mu s$ , $V_R = 30V$ , $T_J = 25^\circ C$ |                     | 40  | 50  | ns         |
| $t_{rr2}$  | Reverse Recovery Time                                                                           | $T_J = 25^\circ C$  | 40  |     |            |
| $t_{rr3}$  | $I_F = 15A$ , $di_F/dt = -100A/\mu s$ , $V_R = 240V$                                            | $T_J = 100^\circ C$ | 70  |     |            |
| $t_{fr1}$  | Forward Recovery Time                                                                           | $T_J = 25^\circ C$  | 170 |     |            |
| $t_{fr2}$  | $I_F = 15A$ , $di_F/dt = -100A/\mu s$ , $V_R = 240V$                                            | $T_J = 100^\circ C$ | 170 |     |            |
| $I_{RRM1}$ | Reverse Recovery Current                                                                        | $T_J = 25^\circ C$  | 2.8 | 5   | Amps       |
| $I_{RRM2}$ | $I_F = 15A$ , $di_F/dt = -100A/\mu s$ , $V_R = 240V$                                            | $T_J = 100^\circ C$ | 5   | 10  |            |
| $Q_{rr1}$  | Recovery Charge                                                                                 | $T_J = 25^\circ C$  | 56  |     | nC         |
| $Q_{rr2}$  | $I_F = 15A$ , $di_F/dt = -100A/\mu s$ , $V_R = 240V$                                            | $T_J = 100^\circ C$ | 175 |     |            |
| $V_{fr1}$  | Forward Recovery Voltage                                                                        | $T_J = 25^\circ C$  | 1.6 |     | Volts      |
| $V_{fr2}$  | $I_F = 15A$ , $di_F/dt = -100A/\mu s$ , $V_R = 240V$                                            | $T_J = 100^\circ C$ | 1.6 |     |            |
| $diM/dt$   | Rate of Fall of Recovery Current                                                                | $T_J = 25^\circ C$  | 150 |     | A/ $\mu s$ |
|            | $I_F = 15A$ , $di_F/dt = -100A/\mu s$ , $V_R = 240V$                                            | $T_J = 100^\circ C$ | 100 |     |            |

## THERMAL AND MECHANICAL CHARACTERISTICS

| Symbol          | Characteristic / Test Conditions       | MIN | TYP  | MAX | UNIT         |
|-----------------|----------------------------------------|-----|------|-----|--------------|
| $R_{\theta JC}$ | Junction-to-Case Thermal Resistance    |     |      | 2.3 | $^\circ C/W$ |
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance |     |      | 80  |              |
| $W_T$           | Package Weight                         |     | 0.16 |     | oz           |
|                 |                                        |     | 4.4  |     | gm           |

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

## TO-254 Package Outline



Dimensions in Millimeters and (Inches)

APT's devices are covered by one or more of the following U.S. patents: 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336  
5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058