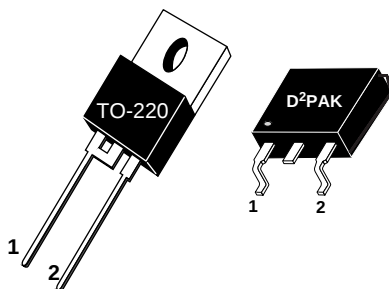


1 - Cathode  
2 - Anode  
Back of Case - Cathode



**APT6SC60K 600V 6A**

**APT6SC60SA 600V 6A**

## SILICON CARBIDE SCHOTTKY RECTIFIER DIODE

| PRODUCT APPLICATIONS                                                                                                                                                  | PRODUCT FEATURES                                                                                                                                                                                                                                                                                                                                                                                             | PRODUCT BENEFITS                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• PFC And Forward Topologies</li> <li>• Hard Or Soft Switched Topologies</li> <li>• High Frequency High Performance</li> </ul> | <ul style="list-style-type: none"> <li>• Schottky Barrier Majority Carrier Only</li> <li>• Wide Energy Gap</li> <li>• High Breakdown Electric Field</li> <li>• High Thermal Conductivity</li> <li>• High Pulse Capability</li> <li>• Positive Vf Temp Coefficient</li> <li>• Low Forward Voltage</li> <li>• No dv/dt Limitation</li> <li>• Popular TO-220 &amp; TO-263 (D2) Surface Mount Package</li> </ul> | <ul style="list-style-type: none"> <li>• Switching Losses Nearly Eliminated <i>zero recovery</i><sup>TM</sup></li> <li>• Greatly Reduced Turn On Loss</li> <li>• Improved Overall Efficiency</li> <li>• Enables Higher Freq. Operation</li> <li>• Simplify Or Eliminate Snubber Circuits</li> <li>• High Temperature Operation</li> <li>• Low Leakage Current</li> <li>• Radiation Hardness</li> <li>• High Power Density</li> <li>• Thermally Stable Paralleling</li> </ul> |

### MAXIMUM RATINGS

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

| Symbol            | Characteristic / Test Conditions                                                          | APT6SC60K_SA | UNIT             |
|-------------------|-------------------------------------------------------------------------------------------|--------------|------------------|
| $V_R$             | Maximum D.C. Reverse Voltage                                                              | 600          | Volts            |
| $V_{RRM}$         | Maximum Peak Repetitive Reverse Voltage                                                   |              |                  |
| $V_{RWM}$         | Maximum Working Peak Reverse Voltage                                                      |              |                  |
| $I_F(\text{AV})$  | Maximum Average Forward Current ( $T_C = 138^\circ\text{C}$ , Duty Cycle = 0.5)           | 6            | Amps             |
| $I_F(\text{RMS})$ | RMS Forward Current (Square wave, 50% duty)                                               | 13           |                  |
| $I_{FSM}$         | Non-Repetitive Forward Surge Current ( $T_J = 25^\circ\text{C}$ , $t_p = 10\mu\text{s}$ ) | 210          |                  |
| $P_{TOT}$         | Power Dissipation ( $T_C = 25^\circ\text{C}$ )                                            | 83           | Watts            |
| $T_J, T_{STG}$    | Operating and Storage Temperature Range                                                   | -55 to 175   | $^\circ\text{C}$ |
| $T_L$             | Lead Temperature for 10 Sec.                                                              | 300          |                  |

### STATIC ELECTRICAL CHARACTERISTICS

| Symbol   |                                 | MIN                                                | TYP | MAX  | UNIT          |
|----------|---------------------------------|----------------------------------------------------|-----|------|---------------|
| $V_F$    | Forward Voltage                 | $I_F = 6\text{A}, T_J = 25^\circ\text{C}$          |     | 1.6  | Volts         |
|          |                                 | $I_F = 12\text{A}, T_J = 25^\circ\text{C}$         |     | 2.4  |               |
|          |                                 | $I_F = 6\text{A}, T_J = 175^\circ\text{C}$         |     | 2.0  |               |
| $I_{RM}$ | Maximum Reverse Leakage Current | $V_R = V_R \text{ Rated}, T_J = 25^\circ\text{C}$  |     | 200  | $\mu\text{A}$ |
|          |                                 | $V_R = V_R \text{ Rated}, T_J = 175^\circ\text{C}$ |     | 1000 |               |

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# DYNAMIC CHARACTERISTICS

APT6SC60K\_SA

| Symbol   | Characteristic / Test Conditions                                                                    | MIN | TYP | MAX | UNIT |
|----------|-----------------------------------------------------------------------------------------------------|-----|-----|-----|------|
| C        | Capacitance ( $V_R = 400V$ , $T_C = 25^\circ C$ , $F = 1\text{ MHz}$ )                              | -   | 30  |     | pF   |
| $Q_C$    | Total Capacitive Charge ( $V_R = 600V$ , $I_F = 6A$ , $di_F/dt = 500A/\mu s$ , $T_C = 25^\circ C$ ) | -   | 17  |     | nC   |
| $t_{fr}$ | Forward Recovery Time <sup>①</sup>                                                                  |     | N/A |     | ns   |
| $t_{rr}$ | Reverse Recovery Time <sup>①</sup>                                                                  |     | N/A |     |      |
| $dv/dt$  | Peak Diode Recovery ( $V_R = 480V$ , $di/dt = 1000A/\mu s$ , $T_C = 25^\circ C$ )                   | 50  |     |     | V/ns |

# THERMAL AND MECHANICAL CHARACTERISTICS

| Symbol          | Characteristic / Test Conditions       | MIN | TYP  | MAX | UNIT         |
|-----------------|----------------------------------------|-----|------|-----|--------------|
| $R_{\theta JC}$ | Junction-to-Case Thermal Resistance    |     |      | 1.8 | $^\circ C/W$ |
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance |     |      | 80  |              |
| $W_T$           | Package Weight                         |     | 0.07 |     | oz           |
|                 |                                        |     | 1.9  |     | g            |
| Torque          | Maximum Mounting Torque                |     |      | 10  | lb•in        |
|                 |                                        |     |      | 1.1 | N•m          |

① As a majority carrier device, there is no reverse recovery charge.

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

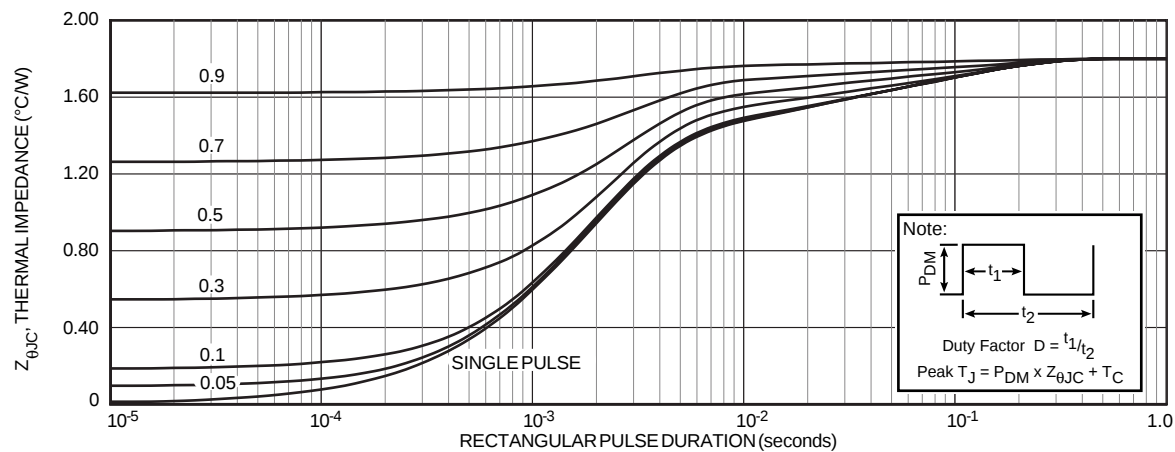


FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

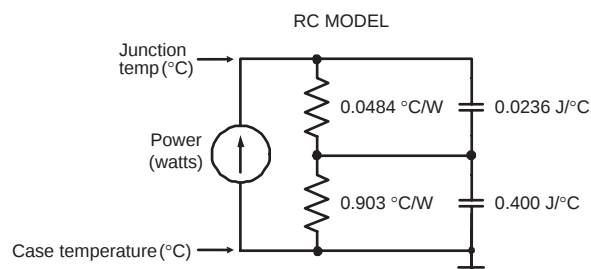


FIGURE 1b. TRANSIENT THERMAL IMPEDANCE MODEL

## TYPICAL PERFORMANCE CURVES

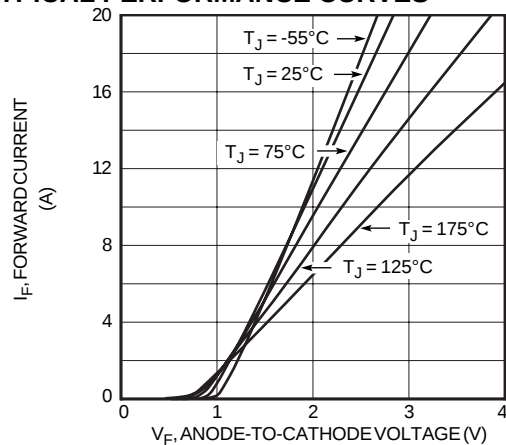


Figure 2. Forward Current vs. Forward Voltage

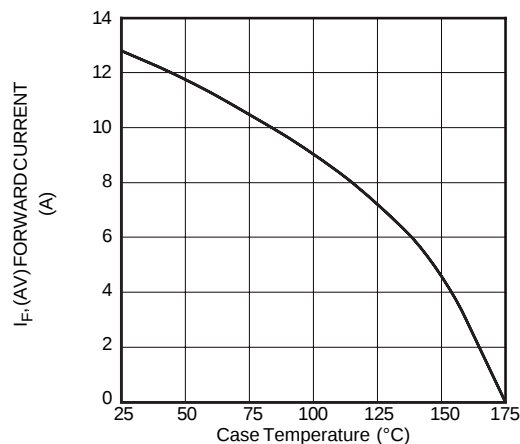


Figure 4. Current Derating

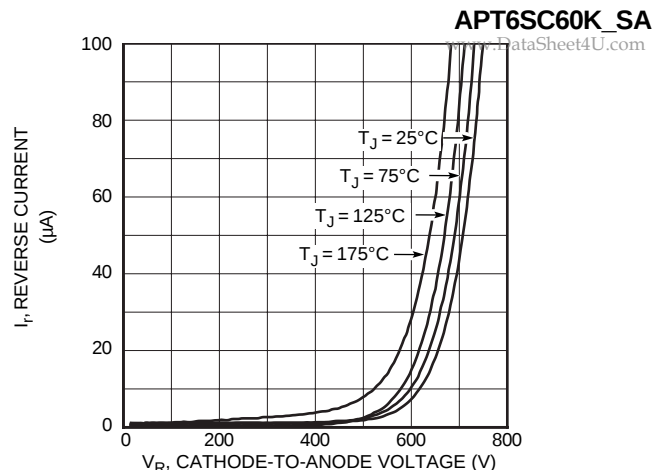


Figure 3. Reverse Current vs. Reverse Voltage

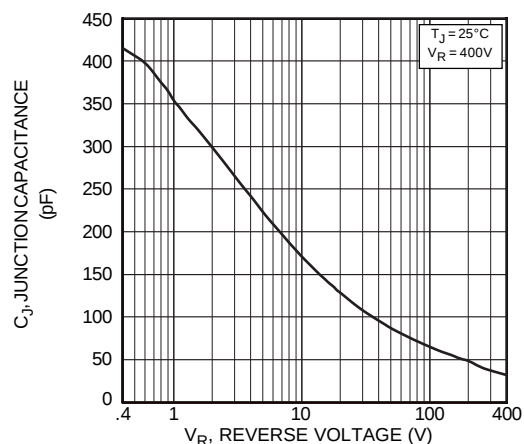
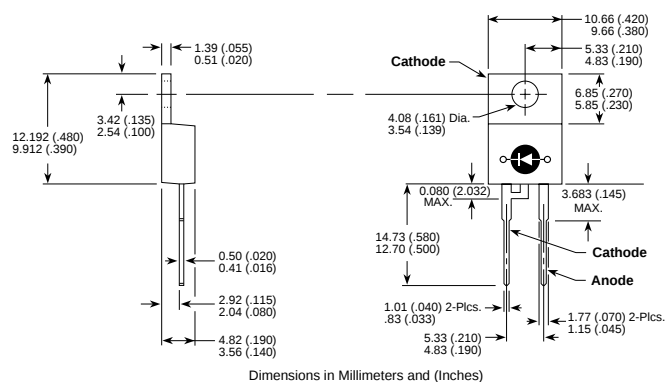


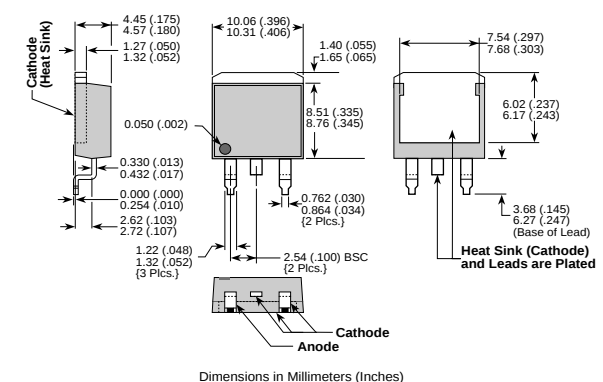
Figure 5. Junction Capacitance vs. Reverse Voltage

## TO-220AB Package Outline



Dimensions in Millimeters and (Inches)

## TO-263 (D<sup>2</sup>) Surface mount Package outline



Dimensions in Millimeters (Inches)

APT's products are covered by one or more of U.S. patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522

5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. US and Foreign patents pending. All Rights Reserved.