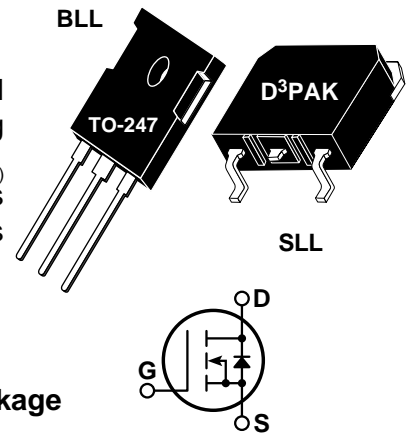


**POWER MOS 7™**

Power MOS 7™ is a new generation of low loss, high voltage, N-Channel enhancement mode power MOSFETS. Both conduction and switching losses are addressed with Power MOS 7™ by significantly lowering  $R_{DS(ON)}$  and  $Q_g$ . Power MOS 7™ combines lower conduction and switching losses along with exceptionally fast switching speeds inherent with APT's patented metal gate structure.

- Lower Input Capacitance
- Lower Miller Capacitance
- Lower Gate Charge,  $Q_g$
- Increased Power Dissipation
- Easier To Drive
- TO-247 or Surface Mount D<sup>3</sup>PAK Package


**MAXIMUM RATINGS**

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

| Symbol         | Parameter  | APT30M75   | UNIT  |
|----------------|--|------------|-------|
| $V_{DSS}$      | Drain-Source Voltage   | 300        | Volts |
| $I_D$          | Continuous Drain Current @ $T_C = 25^\circ\text{C}$            | 44         | Amps  |
| $I_{DM}$       | Pulsed Drain Current <sup>①</sup>                              | 176        |       |
| $V_{GS}$       | Gate-Source Voltage Continuous                                 | ±30        | Volts |
| $V_{GSM}$      | Gate-Source Voltage Transient                                  | ±40        |       |
| $P_D$          | Total Power Dissipation @ $T_C = 25^\circ\text{C}$             | 325        | Watts |
|                | Linear Derating Factor   | 2.60       | W/°C  |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range               | -55 to 150 | °C    |
| $T_L$          | Lead Temperature: 0.063" from Case for 10 Sec.                 | 300        |       |
| $I_{AR}$       | Avalanche Current <sup>①</sup> (Repetitive and Non-Repetitive) | 44         | Amps  |
| $E_{AR}$       | Repetitive Avalanche Energy <sup>①</sup>                       | 30         | mJ    |
| $E_{AS}$       | Single Pulse Avalanche Energy <sup>④</sup>                     | 1300       |       |

**STATIC ELECTRICAL CHARACTERISTICS**

| Symbol       | Characteristic / Test Conditions   | MIN | TYP | MAX   | UNIT  |
|--------------|--|-----|-----|-------|-------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage ( $V_{GS} = 0V, I_D = 250\mu\text{A}$ )                             | 300 |     |       | Volts |
| $I_{D(on)}$  | On State Drain Current <sup>②</sup> ( $V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10V$ ) | 44  |     |       | Amps  |
| $R_{DS(on)}$ | Drain-Source On-State Resistance <sup>②</sup> ( $V_{GS} = 10V, 0.5 I_{D[Cont.]}$ )                 |     |     | 0.075 | Ohms  |
| $I_{DSS}$    | Zero Gate Voltage Drain Current ( $V_{DS} = V_{DSS}, V_{GS} = 0V$ )                                |     |     | 100   | μA    |
|              | Zero Gate Voltage Drain Current ( $V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$ )   |     |     | 500   |       |
| $I_{GSS}$    | Gate-Source Leakage Current ( $V_{GS} = \pm 30V, V_{DS} = 0V$ )                                    |     |     | ±100  | nA    |
| $V_{GS(th)}$ | Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 1mA$ )  | 3   |     | 5     | Volts |

 **CAUTION:** These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

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

**DYNAMIC CHARACTERISTICS**

**APT30M75 BLL - SLL**

| Symbol       | Characteristic               | Test Conditions  | MIN | TYP  | MAX | UNIT |
|--------------|------------------------------|--|-----|------|-----|------|
| $C_{iss}$    | Input Capacitance            | $V_{GS} = 0V$<br>$V_{DS} = 25V$<br>$f = 1\text{ MHz}$  |     | 3160 |     | pF   |
| $C_{oss}$    | Output Capacitance           |  |     | 750  |     |      |
| $C_{rss}$    | Reverse Transfer Capacitance |  |     | 36   |     |      |
| $Q_g$        | Total Gate Charge ③          | $V_{GS} = 10V$<br>$V_{DD} = 0.5 V_{DSS}$<br>$I_D = I_{D[Cont.]} @ 25^\circ C$                      |     | 59   |     | nC   |
| $Q_{gs}$     | Gate-Source Charge           |  |     | 16   |     |      |
| $Q_{gd}$     | Gate-Drain ("Miller") Charge |  |     | 23   |     |      |
| $t_{d(on)}$  | Turn-on Delay Time           | $V_{GS} = 15V$<br>$V_{DD} = 0.5 V_{DSS}$<br>$I_D = I_{D[Cont.]} @ 25^\circ C$<br>$R_G = 0.6\Omega$ |     | 11   |     | ns   |
| $t_r$        | Rise Time                    |  |     | 10   |     |      |
| $t_{d(off)}$ | Turn-off Delay Time          |  |     | 27   |     |      |
| $t_f$        | Fall Time                    |  |     | 9    |     |      |

**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

| Symbol   | Characteristic / Test Conditions  | MIN | TYP | MAX | UNIT    |
|----------|---|-----|-----|-----|---------|
| $I_S$    | Continuous Source Current (Body Diode)                                  |     |     | 44  | Amps    |
| $I_{SM}$ | Pulsed Source Current ① (Body Diode)                                    |     |     | 176 |         |
| $V_{SD}$ | Diode Forward Voltage ② ( $V_{GS} = 0V, I_S = -I_{D[Cont.]}$ )          |     |     | 1.3 | Volts   |
| $t_{rr}$ | Reverse Recovery Time ( $I_S = -I_{D[Cont.]}, di_S/dt = 100A/\mu s$ )   |     | 390 |     | ns      |
| $Q_{rr}$ | Reverse Recovery Charge ( $I_S = -I_{D[Cont.]}, di_S/dt = 100A/\mu s$ ) |     | 6.0 |     | $\mu C$ |
| $dv/dt$  | Peak Diode Recovery $dv/dt$ ⑤   |     |     | 5   | V/ns    |

**THERMAL CHARACTERISTICS**

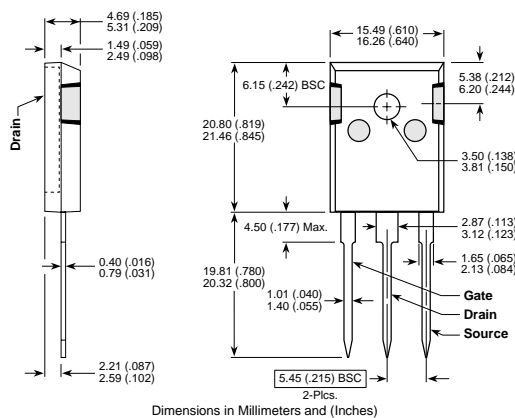
| Symbol          | Characteristic      | MIN | TYP | MAX  | UNIT         |
|-----------------|---------------------|-----|-----|------|--------------|
| $R_{\theta JC}$ | Junction to Case    |     |     | 0.38 | $^\circ C/W$ |
| $R_{\theta JA}$ | Junction to Ambient |     |     | 40   |              |

- ① Repetitive Rating: Pulse width limited by maximum junction temperature.
- ② Pulse Test: Pulse width < 380  $\mu s$ , Duty Cycle < 2%

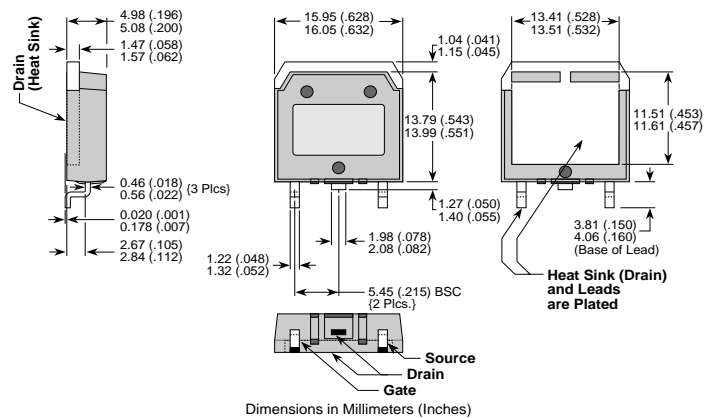
- ③ See MIL-STD-750 Method 3471
- ④ Starting  $T_j = +25^\circ C$ ,  $L = 1.34mH$ ,  $R_G = 25\Omega$ , Peak  $I_L = 44A$
- ⑤  $dv/dt$  numbers reflect the limitations of the test circuit rather than the device itself.  $I_S \leq -I_{D[Cont.]}$ ,  $di/dt \leq 700A/\mu s$ ,  $V_R \leq V_{DSS}$ ,  $T_j \leq 150^\circ C$

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

**TO-247 Package Outline**



**D<sup>3</sup>PAK Package Outline**



050-7155 Rev - 11-2001

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



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