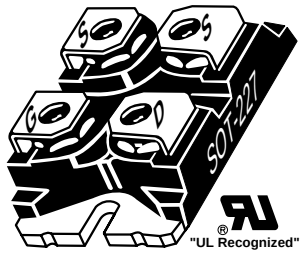
# APT8024JLL

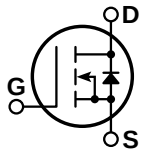
## 800V 29A 0.240Ω

## 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.



ISOTOP®




- **Lower Input Capacitance**
- **Lower Miller Capacitance**
- **Lower Gate Charge, Qg**
- **Increased Power Dissipation**
- **Easier To Drive**
- **Popular SOT-227 Package**

**MAXIMUM RATINGS** All Ratings: $T_C$ = 25°C unless otherwise specified.

| Symbol | Parameter | APT8024JLL | UNIT |
|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | 800 | Volts |
| $I_D$ | Continuous Drain Current @ $T_C$ = 25°C | 29 | Amps |
| $I_{DM}$ | Pulsed Drain Current ① | 116 | |
| $V_{GS}$ | Gate-Source Voltage Continuous | ±30 | Volts |
| $V_{GSM}$ | Gate-Source Voltage Transient | ±40 | |
| $P_D$ | Total Power Dissipation @ $T_C$ = 25°C | 460 | Watts |
| | Linear Derating Factor | 3.68 | 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 ① (Repetitive and Non-Repetitive) | 29 | Amps |
| $E_{AR}$ | Repetitive Avalanche Energy ① | 50 | mJ |
| $E_{AS}$ | Single Pulse Avalanche Energy ④ | 2500 | |



**STATIC ELECTRICAL CHARACTERISTICS**

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage ($V_{GS}$ = 0V, $I_D$ = 250µA) | 800 | | | Volts |
| $I_{D(on)}$ | On State Drain Current ② ($V_{DS}$ > $I_{D(on)}$ x $R_{DS(on)}$ Max, $V_{GS}$ = 10V) | 29 | | | Amps |
| $R_{DS(on)}$ | Drain-Source On-State Resistance ② ($V_{GS}$ = 10V, 0.5 $I_{D[Cont.]}$) | | | 0.240 | 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°C) | | | 500 | |
| $I_{GSS}$ | Gate-Source Leakage Current ($V_{GS}$ = ±30V, $V_{DS}$ = 0V) | | | ±100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage ($V_{DS}$ = $V_{GS}$, $I_D$ = 2.5mA) | 3 | | 5 | Volts |

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

*APT Website - http://www.advancedpower.com*


**USA** 405 S.W. Columbia Street Bend, Oregon 97702-1035 Phone: (541) 382-8028 FAX: (541) 388-0364

**EUROPE** Chemin de Magret F-33700 Merignac - France Phone: (33) 5 57 92 15 15 FAX: (33) 5 56 47 97 61


050-7075 Rev - 8-2001

## DYNAMIC CHARACTERISTICS

**APT8024JLL**

| Symbol | Characteristic | Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0V | | 4420 | | pF |
| $C_{oss}$ | Output Capacitance | $V_{DS}$ = 25V | | 850 | | |
| $C_{rss}$ | Reverse Transfer Capacitance | f = 1 MHz | | 140 | | |
| $Q_g$ | Total Gate Charge ③ | $V_{GS}$ = 10V | | 163 | | nC |
| $Q_{gs}$ | Gate-Source Charge | $V_{DD}$ = 0.5 $V_{DSS}$ | | 21 | | |
| $Q_{gd}$ | Gate-Drain ("Miller") Charge | $I_D$ = $I_{D[Cont.]}$ @ 25°C | | 92 | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{GS}$ = 15V | | 17 | | ns |
| $t_r$ | Rise Time | $V_{DD}$ = 0.5 $V_{DSS}$ | | 16 | | |
| $t_{d(off)}$ | Turn-off Delay Time | $I_D$ = $I_{D[Cont.]}$ @ 25°C | | 51 | | |
| $t_f$ | Fall Time | $R_G$ = 0.6Ω | | 10 | | |



## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | | | 29 | Amps |
| $I_{SM}$ | Pulsed Source Current ① (Body Diode) | | | 116 | |
| $V_{SD}$ | 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/µs) | | 850 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge ($I_S$ = -$I_{D[Cont.]}$, $dI_S/dt$ = 100A/µs) | | 22.0 | | µC |
| $dv/dt$ | Peak Diode Recovery $dv/dt$ ⑤ | | | 10 | V/ns |

## THERMAL CHARACTERISTICS

| Symbol | Characteristic | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $R_{\theta JC}$ | Junction to Case | | | 0.27 | °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 µs, Duty Cycle < 2%

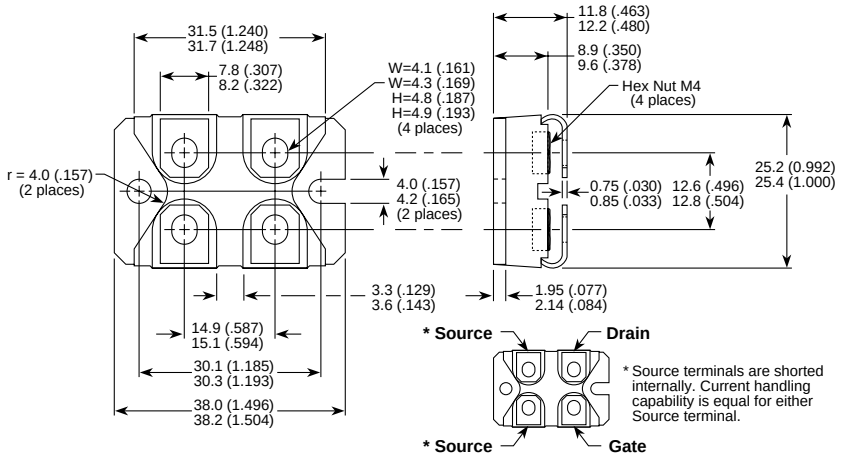
③ See MIL-STD-750 Method 3471

④ Starting $T_j$ = +25°C, L = 5.95mH, $R_G$ = 25Ω, Peak $I_L$ = 29A

⑤ $dv/dt$ numbers reflect the limitations of the test circuit rather than the device itself. $I_S \le -I_{D[Cont.]}$ $di/dt \le 700A/\mu s$ $V_R \le V_{DSS}$ $T_J \le 150°C$



### SOT-227 (ISOTOP®) 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

050-7075 Rev - 8-2001