

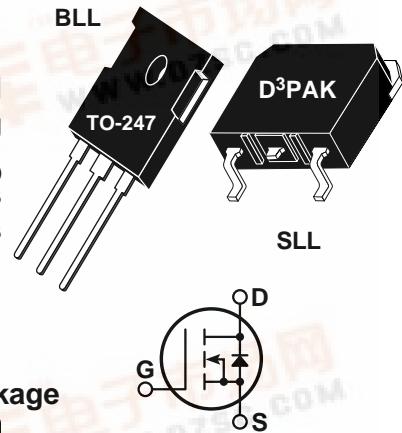


**APT5016BFLL
APT5016SFLL
500V 30A 0.160Ω**

POWER MOS 7™

FREDFET

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
- Increased Power Dissipation
- Lower Miller Capacitance
- Easier To Drive
- Lower Gate Charge, Q_g
- TO-247 or Surface Mount D³PAK Package
- FAST RECOVERY BODY DIODE

MAXIMUM RATINGS

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

| Symbol | Parameter | APT5016 | UNIT |
|----------------|---|------------|---------------------------|
| V_{DSS} | Drain-Source Voltage | 500 | Volts |
| I_D | Continuous Drain Current @ $T_C = 25^\circ\text{C}$ | 30 | Amps |
| I_{DM} | Pulsed Drain Current ① | 120 | |
| 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 | 2.6 | $\text{W}/^\circ\text{C}$ |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| T_L | Lead Temperature: 0.063" from Case for 10 Sec. | 300 | |
| I_{AR} | Avalanche Current ① (Repetitive and Non-Repetitive) | 30 | Amps |
| E_{AR} | Repetitive Avalanche Energy ① | 30 | mJ |
| E_{AS} | Single Pulse Avalanche Energy ④ | 1300 | |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|--------------|---|-----|-----|-----------|---------------|
| BV_{DSS} | Drain-Source Breakdown Voltage ($V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$) | 500 | | | Volts |
| $I_{D(on)}$ | On State Drain Current ② ($V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10\text{V}$) | 30 | | | Amps |
| $R_{DS(on)}$ | Drain-Source On-State Resistance ② ($V_{GS} = 10\text{V}$, $0.5 I_{D[\text{Cont.}]}$) | | | 0.160 | Ohms |
| I_{DSS} | Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, $V_{GS} = 0\text{V}$) | | | 250 | μA |
| | Zero Gate Voltage Drain Current ($V_{DS} = 0.8 V_{DSS}$, $V_{GS} = 0\text{V}$, $T_C = 125^\circ\text{C}$) | | | 1000 | |
| I_{GSS} | Gate-Source Leakage Current ($V_{GS} = \pm 30\text{V}$, $V_{DS} = 0\text{V}$) | | | ± 100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 1\text{mA}$) | 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

APT5016 BFLL - SFLL

| Symbol | Characteristic | Test Conditions | MIN | TYP | MAX | UNIT |
|-------------------|------------------------------|--|-----|------|-----|------|
| C_{iss} | Input Capacitance | $V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$ | | 2800 | | pF |
| C_{oss} | Output Capacitance | | | 570 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 40 | | |
| Q_g | Total Gate Charge ③ | $V_{GS} = 10V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}] @ 25^\circ C$ | | 70 | | nC |
| Q_{gs} | Gate-Source Charge | | | 10 | | |
| Q_{gd} | Gate-Drain ("Miller") Charge | | | 30 | | |
| $t_d(\text{on})$ | Turn-on Delay Time | $V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}] @ 25^\circ C$ $R_G = 0.6\Omega$ | | 15 | | ns |
| t_r | Rise Time | | | 9 | | |
| $t_d(\text{off})$ | Turn-off Delay Time | | | 35 | | |
| t_f | Fall Time | | | 8 | | |

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

| Symbol | Characteristic / Test Conditions | MIN | TYP | MAX | UNIT |
|-----------|---|---------------------|-----|-----|---------|
| I_S | Continuous Source Current (Body Diode) | | | 30 | Amps |
| I_{SM} | Pulsed Source Current ① (Body Diode) | | | 120 | |
| V_{SD} | Diode Forward Voltage ② ($V_{GS} = 0V$, $I_S = -I_D [\text{Cont.}]$) | | | 1.3 | Volts |
| dv/dt | Peak Diode Recovery dv/dt ⑤ | | | 5 | |
| t_{rr} | Reverse Recovery Time ($I_S = -I_D [\text{Cont.}]$, $di/dt = 100A/\mu s$) | $T_j = 25^\circ C$ | | 250 | ns |
| | | $T_j = 125^\circ C$ | | 500 | |
| Q_{rr} | Reverse Recovery Charge ($I_S = -I_D [\text{Cont.}]$, $di/dt = 100A/\mu s$) | $T_j = 25^\circ C$ | | 1.3 | μC |
| | | $T_j = 125^\circ C$ | | 4.5 | |
| I_{RRM} | Peak Recovery Current ($I_S = -I_D [\text{Cont.}]$, $di/dt = 100A/\mu s$) | $T_j = 25^\circ C$ | | 12 | Amps |
| | | $T_j = 125^\circ C$ | | 18 | |

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.

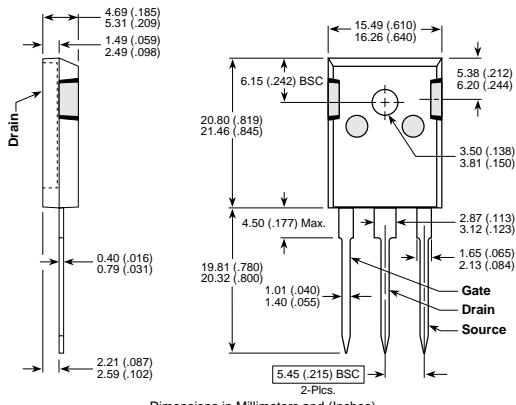
③ See MIL-STD-750 Method 3471

④ Starting $T_j = +25^\circ C$, $L = 2.89mH$, $R_G = 25\Omega$, Peak $I_L = 30A$

② Pulse Test: Pulse width < 380 μs , Duty Cycle < 2%

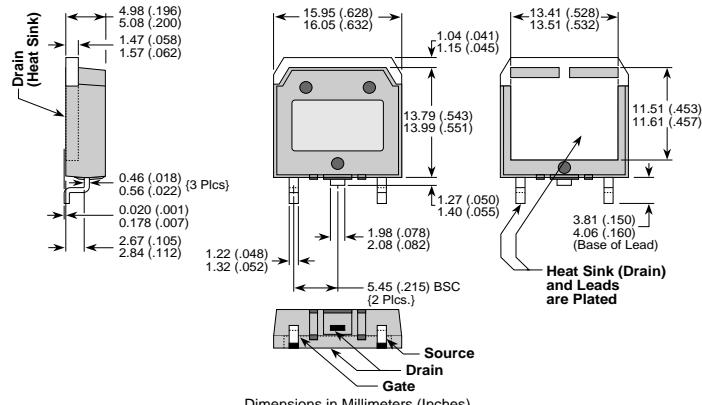
APT Reserves the right to change, without notice, the specifications and information contained herein.

TO-247 Package Outline



Dimensions in Millimeters and (Inches)

D³PAK Package Outline



Dimensions in Millimeters (Inches)