

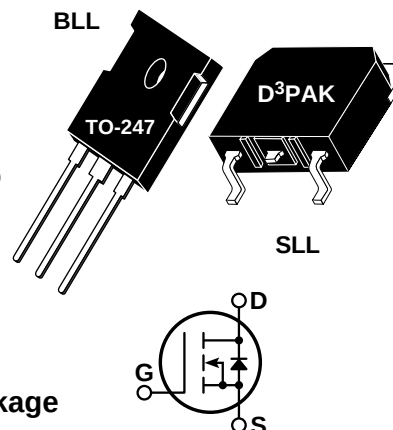


APT6038BLL
APT6038SLL
600V 17A 0.380Ω

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 D³PAK Package



MAXIMUM RATINGS

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

Symbol	Parameter	APT6038	UNIT
V_{DSS}	Drain-Source Voltage	600	Volts
I_D	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	17	Amps
I_{DM}	Pulsed Drain Current ^①	68	
V_{GS}	Gate-Source Voltage Continuous	±30	Volts
V_{GSM}	Gate-Source Voltage Transient	±40	
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	265	Watts
	Linear Derating Factor	2.12	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)	17	Amps
E_{AR}	Repetitive Avalanche Energy ^①	30	mJ
E_{AS}	Single Pulse Avalanche Energy ^④	960	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0V, I_D = 250\mu A$)	600			Volts
$I_{D(on)}$	On State Drain Current ^② ($V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10V$)	17			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ^② ($V_{GS} = 10V, 0.5 I_{D[Cont.]}$)			0.38	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>

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Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1 MHz		1860		pF
C _{oss}	Output Capacitance			330		
C _{rss}	Reverse Transfer Capacitance			21		
Q _g	Total Gate Charge ⑤	V _{GS} = 10V V _{DD} = 0.5 V _{DSS} I _D = I _{D[Cont.]} @ 25°C		43		nC
Q _{gs}	Gate-Source Charge			10		
Q _{gd}	Gate-Drain ("Miller") Charge			19		
t _{d(on)}	Turn-on Delay Time	V _{GS} = 15V V _{DD} = 0.5 V _{DSS} I _D = I _{D[Cont.]} @ 25°C R _G = 1.6Ω		11		ns
t _r	Rise Time			7		
t _{d(off)}	Turn-off Delay Time			24		
t _f	Fall Time			6		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			17	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			68	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V, I_S = -I_{D[Cont.]}$)			1.3	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_{D[Cont.]}$, $di_S/dt = 100A/\mu s$)		400		ns
Q_{rr}	Reverse Recovery Charge ($I_S = -I_{D[Cont.]}$, $di_S/dt = 100A/\mu s$)		6.0		μC
dv/dt	Peak Diode Recovery dv/dt ⑤			8	V/ns

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
R _{θJC}	Junction to Case			0.47	°C/W
R _{θJA}	Junction to Ambient			40	

- ④ Repetitive Rating: Pulse width limited by maximum junction temperature.

⑤ Pulse Test: Pulse width < 380 μ s, Duty Cycle < 2%

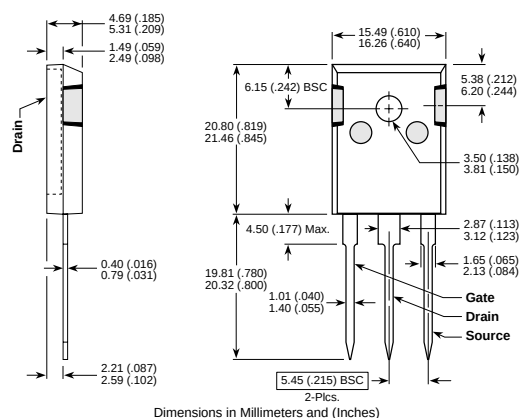
③ See MIL-STD-750 Method 3471

④ Starting $T_J = +25^\circ\text{C}$, $L = 6.64\text{mH}$, $R_G = 25\Omega$, Peak $I_L = 17\text{A}$

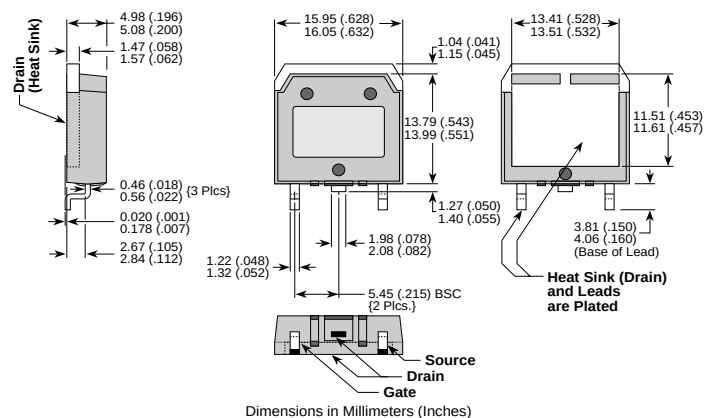
⑤ dv/dt numbers reflect the limitations of the test circuit rather than the device itself. $I_S \leq -I_{DJ(\text{Cont.})}$ $di/dt \leq 700\text{A}/\mu\text{s}$ $v_R \leq v_{DSS}$ $T_J \leq 150^\circ\text{C}$

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

TO-247 Package Outline



D³PAK Package Outline



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