



APT20M10JLL

200V 185A 0.010Ω

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

MAXIMUM RATINGS

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

Symbol	Parameter	APT20M10JLL	UNIT
V_{DSS}	Drain-Source Voltage	200	Volts
I_D	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	180	Amps
I_{DM}	Pulsed Drain Current ^①	720	
V_{GS}	Gate-Source Voltage Continuous	± 30	Volts
V_{GSM}	Gate-Source Voltage Transient	± 40	
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	690	Watts
	Linear Derating Factor	5.52	$\text{W}/^\circ\text{C}$
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)	180	Amps
E_{AR}	Repetitive Avalanche Energy ^①	30	mJ
E_{AS}	Single Pulse Avalanche Energy ^④	3600	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$)	200			Volts
$I_{D(on)}$	On State Drain Current ^② ($V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10\text{V}$)	180			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ^② ($V_{GS} = 10\text{V}$, $0.5 I_{D[\text{Cont.}]}$)			0.010	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, $V_{GS} = 0\text{V}$)			100	μA
	Zero Gate Voltage Drain Current ($V_{DS} = 0.8 V_{DSS}$, $V_{GS} = 0\text{V}$, $T_C = 125^\circ\text{C}$)			500	
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 ($V_{DS} = V_{GS}$, $I_D = 5\text{mA}$)	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

APT20M10JLL

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$		12780		pF
C_{oss}	Output Capacitance			4330		
C_{rss}	Reverse Transfer Capacitance			327		
Q_g	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_{D[\text{Cont.}]} @ 25^\circ\text{C}$		316		nC
Q_{gs}	Gate-Source Charge			96		
Q_{gd}	Gate-Drain ("Miller") Charge			174		
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_{D[\text{Cont.}]} @ 25^\circ\text{C}$ $R_G = 0.6\Omega$		15		ns
t_r	Rise Time			35		
$t_{d(off)}$	Turn-off Delay Time			41		
t_f	Fall Time			12		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			180	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			720	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V, I_S = -I_{D[\text{Cont.}]}^+$)			1.3	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_{D[\text{Cont.}]}^+$, $dI_S/dt = 100A/\mu\text{s}$)			460	ns
Q_{rr}	Reverse Recovery Charge ($I_S = -I_{D[\text{Cont.}]}^+$, $dI_S/dt = 100A/\mu\text{s}$)			7.0	μC
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			0.18	°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%

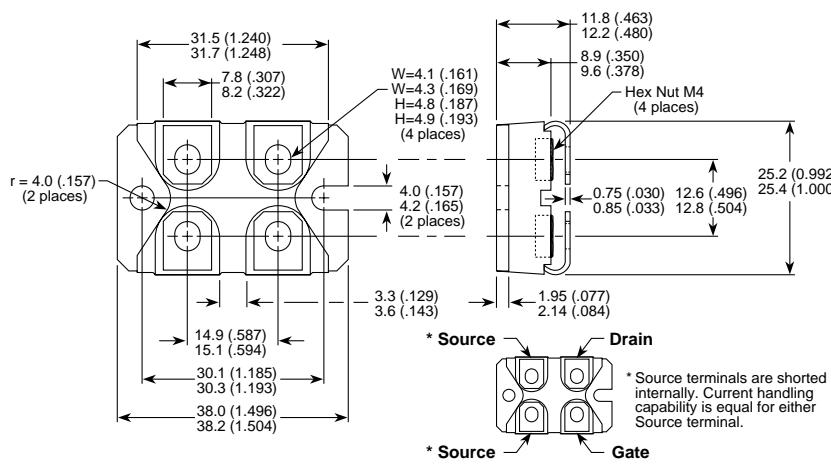
③ See MIL-STD-750 Method 3471

④ Starting $T_j = +25^\circ\text{C}$, $L = 0.22\text{mH}$, $R_G = 25\Omega$, Peak $I_L = 180\text{A}$

⑤ dv/dt numbers reflect the limitations of the test circuit rather than the device itself. $I_S \leq -I_{D[\text{Cont.}]}^+$, $dv/dt \leq 700A/\mu\text{s}$, $V_R \leq V_{DSS}$, $T_j \leq 150^\circ\text{C}$

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

SOT-227 (ISOTOP®) Package Outline



Dimensions in Millimeters and (Inches)