# ADVANCED POWER TECHNOLOGY®

APT20M20B2LL
APT20M20LLL
200V 100A 0.020Ω

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, Qg**
- **Increased Power Dissipation**
- **Easier To Drive**
- **Popular T-MAX™ or TO-264 Package**

B2LL

T-MAX™   TO-264

LLL
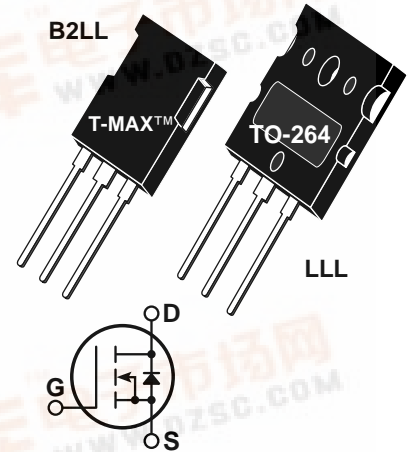
MAXIMUM RATINGS

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

Symbol	Parameter	APT20M20	UNIT
V_{DSS}	Drain-Source Voltage	200	Volts
I_D	Continuous Drain Current @ T_C = 25°C ⑤	100	Amps
I_{DM}	Pulsed Drain Current ① ⑤	400	
V_{GS}	Gate-Source Voltage Continuous	±30	Volts
V_{GSM}	Gate-Source Voltage Transient	±40	
P_D	Total Power Dissipation @ T_C = 25°C	570	Watts
	Linear Derating Factor	4.56	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)	100	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 ($V_{GS} = 0V$, $I_D = 250\mu A$)	200			Volts
$I_{D(on)}$	On State Drain Current ② ($V_{DS} > I_{D(on)}$ x $R_{DS(on)}$ Max, $V_{GS} = 10V$)	100			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ② ($V_{GS} = 10V$, 0.5 $I_{D[Cont.]}$)			0.020	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, $V_{GS} = 0V$)			25	µA
	Zero Gate Voltage Drain Current ($V_{DS} = 0.8$ V_{DSS}, $V_{GS} = 0V$, $T_C = 125°C$)			250	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm30V$, $V_{DS} = 0V$)			±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.

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$		5870		
C_{oss}	Output Capacitance	$V_{DS} = 25V$		1990		pF
C_{rss}	Reverse Transfer Capacitance	$f = 1$ MHz		150		
Q_g	Total Gate Charge ③	$V_{GS} = 10V$		145		
Q_{gs}	Gate-Source Charge	$V_{DD} = 0.5\ V_{DSS}$		44		nC
Q_{gd}	Gate-Drain ("Miller") Charge	$I_D = I_{D[Cont.]}$ @ 25°C		80		
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$		12		
t_r	Rise Time	$V_{DD} = 0.5\ V_{DSS}$		22		
$t_{d(off)}$	Turn-off Delay Time	$I_D = I_{D[Cont.]}$ @ 25°C		26		ns
t_f	Fall Time	$R_G = 0.6\Omega$		6		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			100	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			400	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V$, $I_S = -I_{D[Cont.]}$)			1.3	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_{D[Cont.]}$, $dI_S/dt = 100A/\mu s$)		330		ns
Q_{rr}	Reverse Recovery Charge ($I_S = -I_{D[Cont.]}$, $dI_S/dt = 100A/\mu s$)		5.8		μC

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.22	°C/W
$R_{\theta JA}$	Junction to Ambient			40	

① Repetitive Rating: Pulse width limited by maximum junction
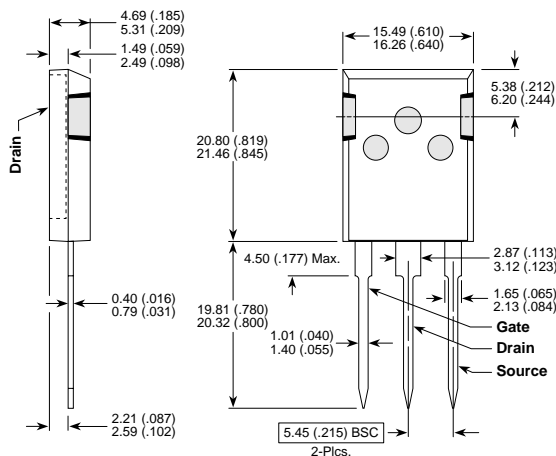   temperature.

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

③ See MIL-STD-750 Method 3471

④ Starting $T_j = +25°C$, L = .5mH, $R_G = 25\Omega$, Peak $I_L = 100A$

⑤ The maximum current is limited by lead temperature

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

T-MAX™ (B2) Package Outline

TO-264 (L) Package Outline

These dimensions are equal to the TO-247 without the mounting hole.

Dimensions in Millimeters and (Inches)

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