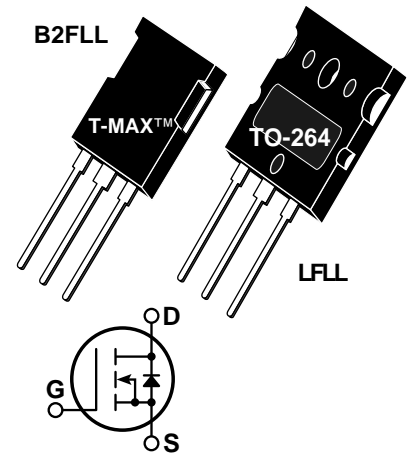


**POWER MOS 7™**
**FREDFET**

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
- Lower Miller Capacitance
- Lower Gate Charge,  $Q_g$
- Increased Power Dissipation
- Easier To Drive
- Popular T-MAX™ or TO-264 Package
- **FAST RECOVERY BODY DIODE**


**MAXIMUM RATINGS**

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

Symbol	Parameter	APT6013	UNIT
$V_{DSS}$	Drain-Source Voltage	600	Volts
$I_D$	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	43	Amps
$I_{DM}$	Pulsed Drain Current <sup>①</sup>	172	
$V_{GS}$	Gate-Source Voltage Continuous	$\pm 30$	Volts
$V_{GSM}$	Gate-Source Voltage Transient	$\pm 40$	
$P_D$	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	565	Watts
	Linear Derating Factor	4.52	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 <sup>①</sup> (Repetitive and Non-Repetitive)	43	Amps
$E_{AR}$	Repetitive Avalanche Energy <sup>①</sup>	50	mJ
$E_{AS}$	Single Pulse Avalanche Energy <sup>④</sup>	2500	

**STATIC ELECTRICAL CHARACTERISTICS**

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$BV_{DSS}$	Drain-Source Breakdown Voltage ( $V_{GS} = 0V, I_D = 250\mu\text{A}$ )	600			Volts
$I_{D(on)}$	On State Drain Current <sup>②</sup> ( $V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10V$ )	43			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance <sup>②</sup> ( $V_{GS} = 10V, 0.5 I_{D[Cont.]}$ )			0.130	Ohms
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{DS} = V_{DSS}, V_{GS} = 0V$ )			250	$\mu\text{A}$
	Zero Gate Voltage Drain Current ( $V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$ )			1000	
$I_{GSS}$	Gate-Source Leakage Current ( $V_{GS} = \pm 30V, V_{DS} = 0V$ )			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 2.5\text{mA}$ )	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**

**APT6013 B2FLL - LFLL**

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C <sub>ISS</sub>	Input Capacitance	V <sub>GS</sub> = 0V		5640		pF
C <sub>OSS</sub>	Output Capacitance	V <sub>DS</sub> = 25V		1010		
C <sub>RSS</sub>	Reverse Transfer Capacitance	f = 1 MHz		63		
Q <sub>g</sub>	Total Gate Charge <sup>③</sup>	V <sub>GS</sub> = 10V		129		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DD</sub> = 0.5 V <sub>DSS</sub>		30		
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	I <sub>D</sub> = I <sub>D</sub> [Cont.] @ 25°C		58		
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> = 15V		16		ns
t <sub>r</sub>	Rise Time	V <sub>DD</sub> = 0.5 V <sub>DSS</sub>		11		
t <sub>d(off)</sub>	Turn-off Delay Time	I <sub>D</sub> = I <sub>D</sub> [Cont.] @ 25°C		29		
t <sub>f</sub>	Fall Time	R <sub>G</sub> = 0.6Ω		5		

**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I <sub>S</sub>	Continuous Source Current (Body Diode)			43	Amps
I <sub>SM</sub>	Pulsed Source Current <sup>①</sup> (Body Diode)			172	
V <sub>SD</sub>	Diode Forward Voltage <sup>②</sup> (V <sub>GS</sub> = 0V, I <sub>S</sub> = -I <sub>D</sub> [Cont.])			1.3	Volts
dv/dt	Peak Diode Recovery dv/dt <sup>⑤</sup>			15	V/ns
t <sub>rr</sub>	Reverse Recovery Time (I <sub>S</sub> = -I <sub>D</sub> [Cont.], di/dt = 100A/μs)	T <sub>j</sub> = 25°C		250	ns
		T <sub>j</sub> = 125°C		500	
Q <sub>rr</sub>	Reverse Recovery Charge (I <sub>S</sub> = -I <sub>D</sub> [Cont.], di/dt = 100A/μs)	T <sub>j</sub> = 25°C		1.6	μC
		T <sub>j</sub> = 125°C		5.5	
I <sub>RRM</sub>	Peak Recovery Current (I <sub>S</sub> = -I <sub>D</sub> [Cont.], di/dt = 100A/μs)	T <sub>j</sub> = 25°C		15	Amps
		T <sub>j</sub> = 125°C		27	

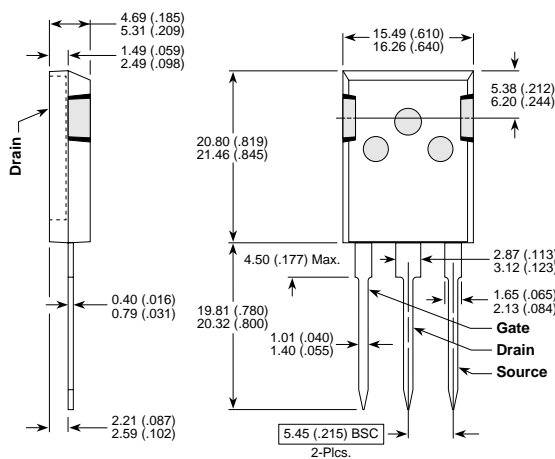
**THERMAL CHARACTERISTICS**

Symbol	Characteristic	MIN	TYP	MAX	UNIT
R <sub>θJC</sub>	Junction to Case			0.22	°C/W
R <sub>θJA</sub>	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<sub>j</sub> = +25°C, L = 2.70mH, R<sub>G</sub> = 25Ω, Peak I<sub>L</sub> = 43A
- ⑤ The maximum current is limited by lead temperature

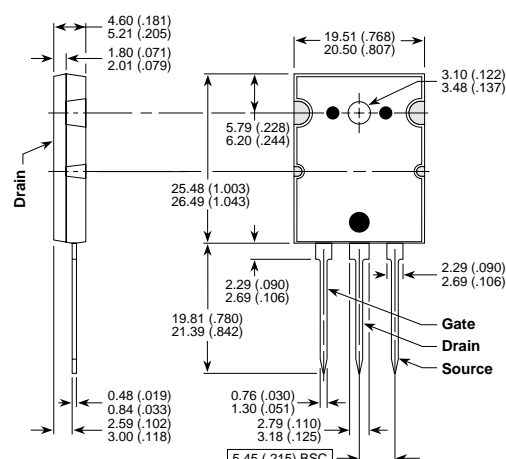
APT Reserves the right to change, without notice, the specifications and information contained herein.

**T-MAX™ (B2) Package Outline**



These dimensions are equal to the TO-247 without the mounting hole.  
Dimensions in Millimeters and (Inches)

**TO-264 (L) Package Outline**



Dimensions in Millimeters and (Inches)