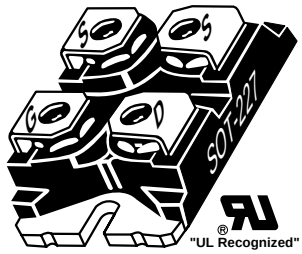
APT55M50JFLL

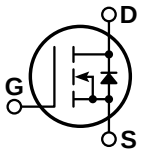
550V 77A 0.050Ω

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.



ISOTOP®



- **Lower Input Capacitance**
- **Lower Miller Capacitance**
- **Lower Gate Charge, Qg**
- **Increased Power Dissipation**
- **Easier To Drive**
- **Popular SOT-227 Package**
- **FAST RECOVERY BODY DIODE**

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

Symbol	Parameter	APT55M50JFLL	UNIT
V_{DSS}	Drain-Source Voltage	550	Volts
I_D	Continuous Drain Current @ T_C = 25°C	77	Amps
I_{DM}	Pulsed Drain Current ①	308	
V_{GS}	Gate-Source Voltage Continuous	±30	Volts
V_{GSM}	Gate-Source Voltage Transient	±40	
P_D	Total Power Dissipation @ T_C = 25°C	694	Watts
	Linear Derating Factor	5.56	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)	77	Amps
E_{AR}	Repetitive Avalanche Energy ①	50	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} = 0V, I_D = 250µA)	550			Volts
$I_{D(on)}$	On State Drain Current ② ($V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, V_{GS} = 10V)	77			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ② (V_{GS} = 10V, 0.5 $I_{D[Cont.]}$)			0.050	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, V_{GS} = 0V)			250	µA
	Zero Gate Voltage Drain Current (V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125°C)			1000	
I_{GSS}	Gate-Source Leakage Current (V_{GS} = ±30V, V_{DS} = 0V)			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage ($V_{DS} = V_{GS}$, I_D = 5mA)	3		5	Volts

CAUTION: These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

DYNAMIC CHARACTERISTICS

APT55M50JFLL

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V		12455		pF
C_{oss}	Output Capacitance	V_{DS} = 25V		2405		
C_{rss}	Reverse Transfer Capacitance	f = 1 MHz		167		
Q_g	Total Gate Charge③	V_{GS} = 10V		299		nC
Q_{gs}	Gate-Source Charge	V_{DD} = 0.5 V_{DSS}		74		
Q_{gd}	Gate-Drain ("Miller") Charge	I_D = I_D [Cont.] @ 25°C		135		
$t_d(on)$	Turn-on Delay Time	V_{GS} = 15V		26		ns
t_r	Rise Time	V_{DD} = 0.5 V_{DSS}		17		
$t_d(off)$	Turn-off Delay Time	I_D = I_D [Cont.] @ 25°C		55		
t_f	Fall Time	R_G = 0.6Ω		12		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)				77	Amps
I_{SM}	Pulsed Source Current① (Body Diode)				308	
V_{SD}	Diode Forward Voltage② (V_{GS} = 0V, I_S = -I_D [Cont.])				1.3	Volts
$^{dv}/_{dt}$	Peak Diode Recovery $^{dv}/_{dt}$⑤				15	V/ns
t_{rr}	Reverse Recovery Time (I_S = -I_D [Cont.], $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C			300	ns
		T_j = 125°C			600	
Q_{rr}	Reverse Recovery Charge (I_S = -I_D [Cont.], $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C		2.2		µC
		T_j = 125°C		9.0		
I_{RRM}	Peak Recovery Current (I_S = -I_D [Cont.], $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C		16		Amps
		T_j = 125°C		33		

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.

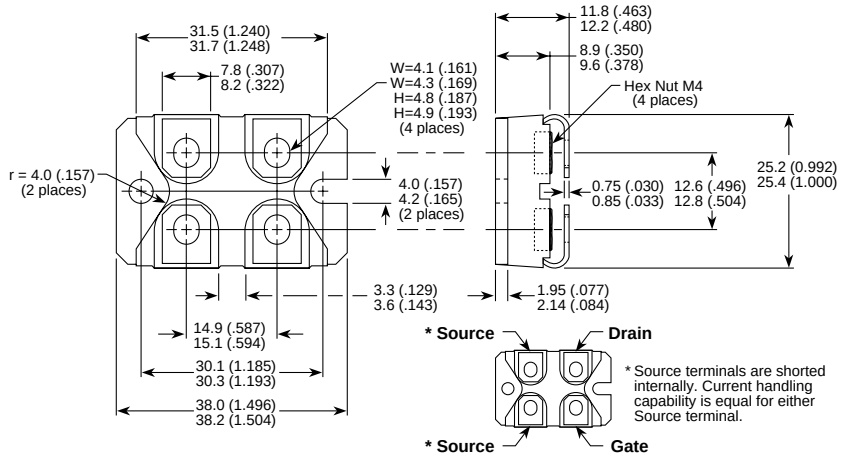
② Pulse Test: Pulse width < 380 µs, Duty Cycle < 2%

③ See MIL-STD-750 Method 3471

④ Starting T_j = +25°C, L = 1.21mH, R_G = 25Ω, Peak I_L = 77A

⑤ $^{dv}/_{dt}$ numbers reflect the limitations of the test circuit rather than the device itself. $I_S \le -I_{D[Cont.]}$ $^{di}/_{dt} \le 700A/\mu s$ $V_R \le V_{DSS}$ $T_J \le 150°C$

SOT-227 (ISOTOP®) Package Outline



Dimensions in Millimeters and (Inches)