



APT6011LVFR

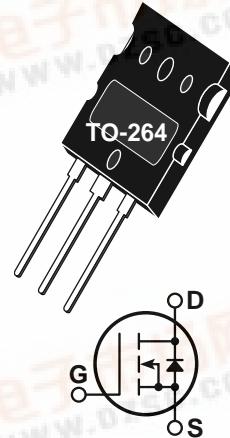
600V 49A 0.110Ω

POWER MOS V®

FREDFET

Power MOS V® is a new generation of high voltage N-Channel enhancement mode power MOSFETs. This new technology minimizes the JFET effect, increases packing density and reduces the on-resistance. Power MOS V® also achieves faster switching speeds through optimized gate layout.

- Fast Recovery Body Diode
- Lower Leakage
- Faster Switching
- 100% Avalanche Tested
- Popular TO-264 Package



MAXIMUM RATINGS

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

Symbol	Parameter	APT6011LVFR	UNIT
V_{DSS}	Drain-Source Voltage	600	Volts
I_D	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	49	Amps
I_{DM}	Pulsed Drain Current ^①	196	
V_{GS}	Gate-Source Voltage Continuous	± 30	
V_{GSM}	Gate-Source Voltage Transient	± 40	Volts
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	625	Watts
	Linear Derating Factor	5.0	$\text{W}/^\circ\text{C}$
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)	49	Amps
E_{AR}	Repetitive Avalanche Energy ^①	50	mJ
E_{AS}	Single Pulse Avalanche Energy ^④	3000	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$)	600			Volts
$I_{D(on)}$	On State Drain Current ^② ($V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, $V_{GS} = 10\text{V}$)	49			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ^② ($V_{GS} = 10\text{V}$, $0.5 I_{D(\text{Cont.})}$)			0.110	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, $V_{GS} = 0\text{V}$)			250	μA
	Zero Gate Voltage Drain Current ($V_{DS} = 0.8 V_{DSS}$, $V_{GS} = 0\text{V}$, $T_C = 125^\circ\text{C}$)			1000	
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 ($V_{DS} = V_{GS}$, $I_D = 2.5\text{mA}$)	2		4	Volts



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

APT Website - <http://www.advancedpower.com>

DYNAMIC CHARACTERISTICS

APT6011LVFR

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$		8310		pF
C_{oss}	Output Capacitance			990		
C_{rss}	Reverse Transfer Capacitance			390		
Q_g	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D[\text{Cont.}] @ 25^\circ C$		370		nC
Q_{gs}	Gate-Source Charge			51		
Q_{gd}	Gate-Drain ("Miller") Charge			156		
$t_d(\text{on})$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D[\text{Cont.}] @ 25^\circ C$ $R_G = 0.6\Omega$		17		ns
t_r	Rise Time			16		
$t_d(\text{off})$	Turn-off Delay Time			63		
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)			49	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			196	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V$, $I_S = -I_D[\text{Cont.}]$)			1.3	Volts
dv/dt	Peak Diode Recovery dv/dt ⑤			5	V/ns
t_{rr}	Reverse Recovery Time ($I_S = -I_D[\text{Cont.}]$, $di/dt = 100A/\mu s$)	$T_j = 25^\circ C$		300	ns
		$T_j = 125^\circ C$		600	
Q_{rr}	Reverse Recovery Charge ($I_S = -I_D[\text{Cont.}]$, $di/dt = 100A/\mu s$)	$T_j = 25^\circ C$		2.0	μC
		$T_j = 125^\circ C$		6.8	
I_{RRM}	Peak Recovery Current ($I_S = -I_D[\text{Cont.}]$, $di/dt = 100A/\mu s$)	$T_j = 25^\circ C$		15	Amps
		$T_j = 125^\circ C$		27	

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.20	$^\circ C/W$
$R_{\theta JA}$	Junction to Ambient			40	

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

④ Starting $T_j = +25^\circ C$, $L = 2.49mH$, $R_G = 25\Omega$, Peak $I_L = 49A$

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

⑤ $I_S \leq I_D[\text{Cont.}]$, $di/dt = 100A/\mu s$, $T_j \leq 150^\circ C$, $R_G = 2.0\Omega$, $V_R = 200V$.

③ See MIL-STD-750 Method 3471

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

TO-264 Package Outline

