



APT30M40LVFR

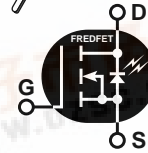
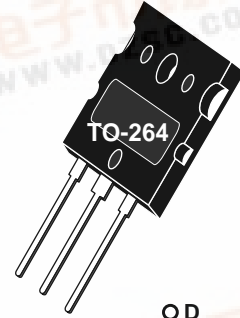
300V 76A 0.040Ω

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°C unless otherwise specified.

Symbol	Parameter	APT30M40LVFR	UNIT
V _{DSS}	Drain-Source Voltage	300	Volts
I _D	Continuous Drain Current @ T _C = 25°C	76	Amps
I _{DM}	Pulsed Drain Current ^①	304	
V _{GS}	Gate-Source Voltage Continuous	±30	Volts
V _{GSM}	Gate-Source Voltage Transient	±40	
P _D	Total Power Dissipation @ T _C = 25°C	520	Watts
	Linear Derating Factor	4.16	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)	76	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 = 250μA)	300			Volts
I _{D(on)}	On State Drain Current ^② (V _{DS} > I _{D(on)} × R _{DS(on)} Max, V _{GS} = 10V)	76			Amps
R _{DS(on)}	Drain-Source On-State Resistance ^② (V _{GS} = 10V, 0.5 I _{D(Cont.)})			0.040	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 = 2.5mA)	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

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Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$		8500	10200	pF
C_{oss}	Output Capacitance			1500	2100	
C_{riss}	Reverse Transfer Capacitance			390	585	
Q_g	Total Gate Charge ^③	$V_{GS} = 10V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}] @ 25^\circ\text{C}$		285	425	nC
Q_{gs}	Gate-Source Charge			56	85	
Q_{gd}	Gate-Drain ("Miller") Charge			120	180	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}] @ 25^\circ\text{C}$ $R_G = 0.6\Omega$		16	32	ns
t_r	Rise Time			20	40	
$t_{d(off)}$	Turn-off Delay Time			48	72	
t_f	Fall Time			4	8	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			76	Amps
I_{SM}	Pulsed Source Current ^① (Body Diode)			304	
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 ($I_S = -I_D [\text{Cont.}], di/dt = 100A/\mu s$)	$T_j = 25^\circ\text{C}$		240	ns
		$T_j = 125^\circ\text{C}$		500	
Q_{rr}	Reverse Recovery Charge ($I_S = -I_D [\text{Cont.}], di/dt = 100A/\mu s$)	$T_j = 25^\circ\text{C}$		1.1	μC
		$T_j = 125^\circ\text{C}$		5.2	
I_{RRM}	Peak Recovery Current ($I_S = -I_D [\text{Cont.}], di/dt = 100A/\mu s$)	$T_j = 25^\circ\text{C}$		12	Amps
		$T_j = 125^\circ\text{C}$		22	

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.24	$^\circ\text{C/W}$
$R_{\theta JA}$	Junction to Ambient			40	

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

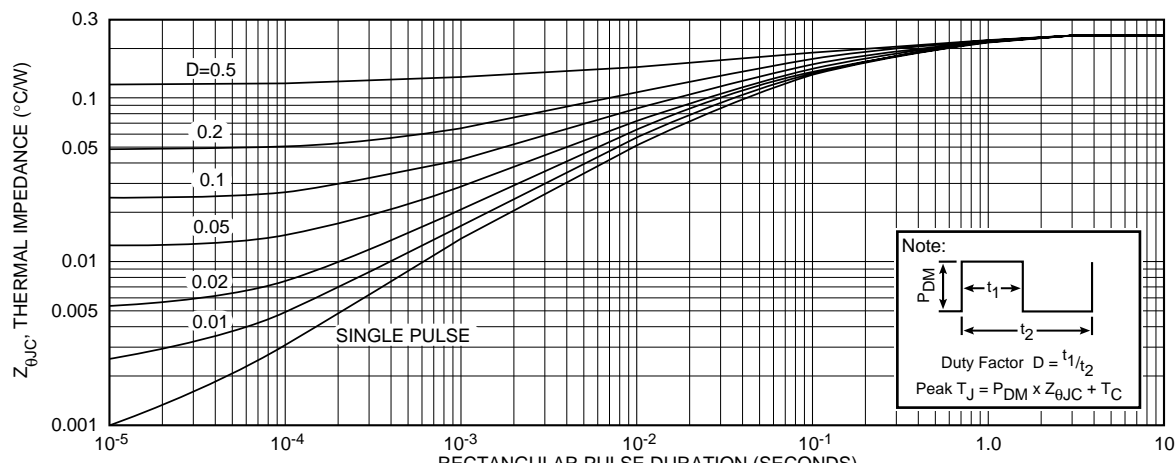
② Pulse Test: Pulse width < 380 μs , Duty Cycle < 2%

③ See MIL-STD-750 Method 3471

④ Starting $T_j = +25^\circ\text{C}$, $L = 870\mu\text{H}$, $R_G = 25\Omega$, Peak $I_L = 76\text{A}$

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

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



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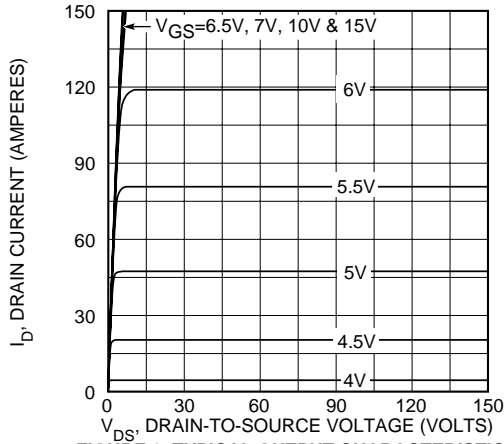


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

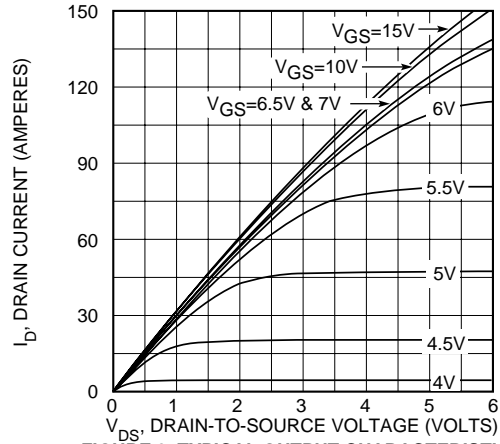


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

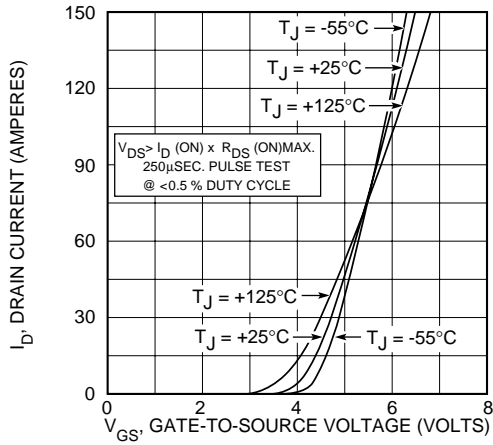


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

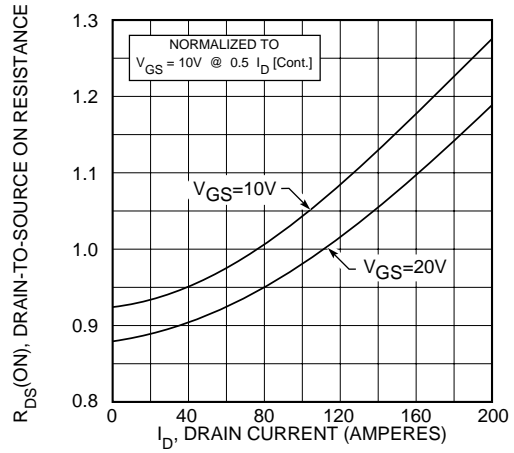


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

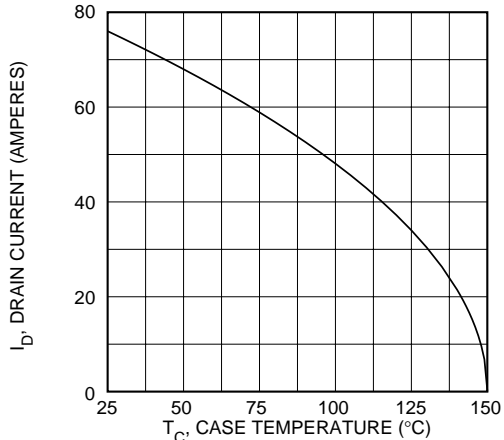


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

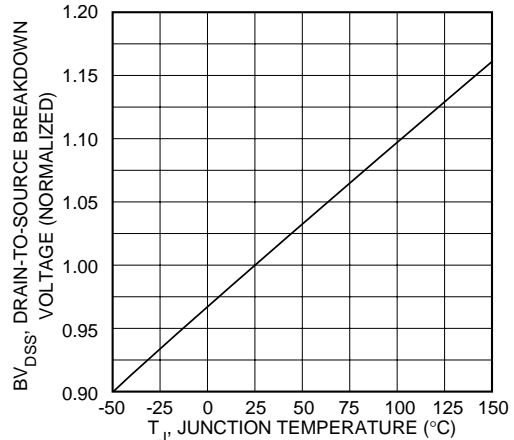


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

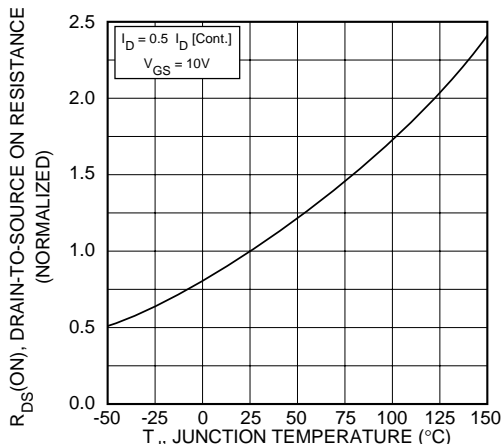


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

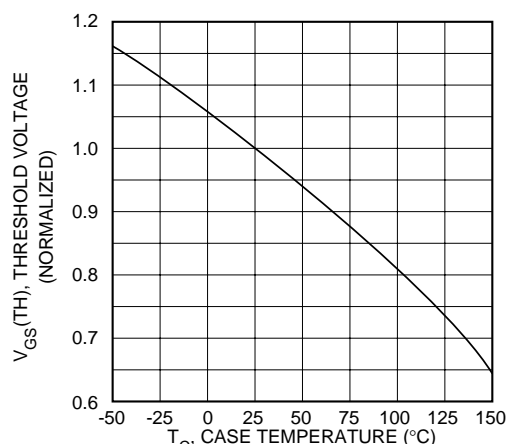


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

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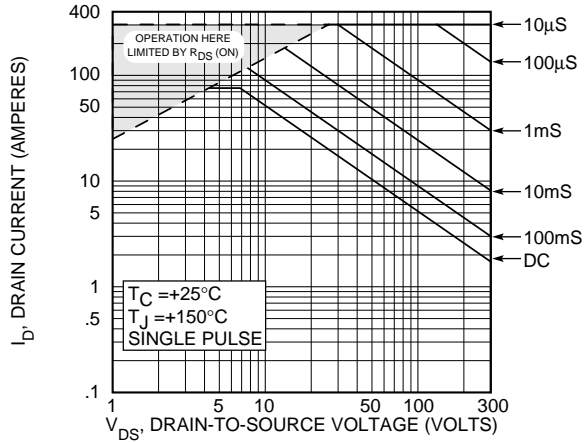


FIGURE 10, MAXIMUM SAFE OPERATING AREA

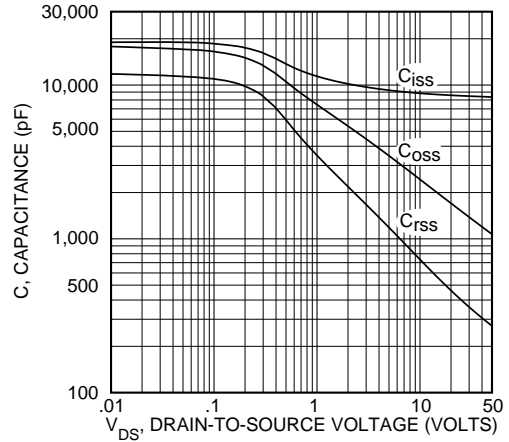


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

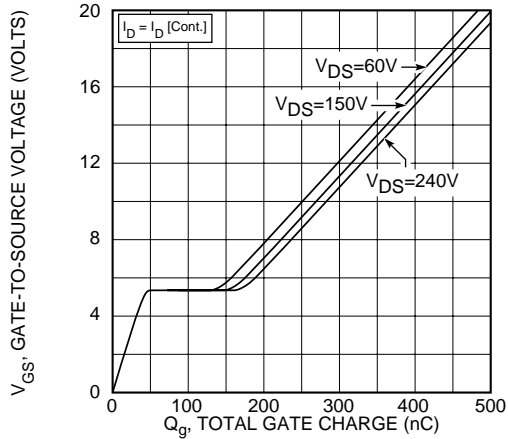


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

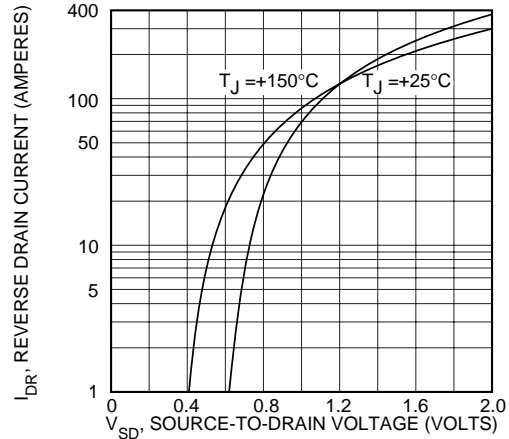
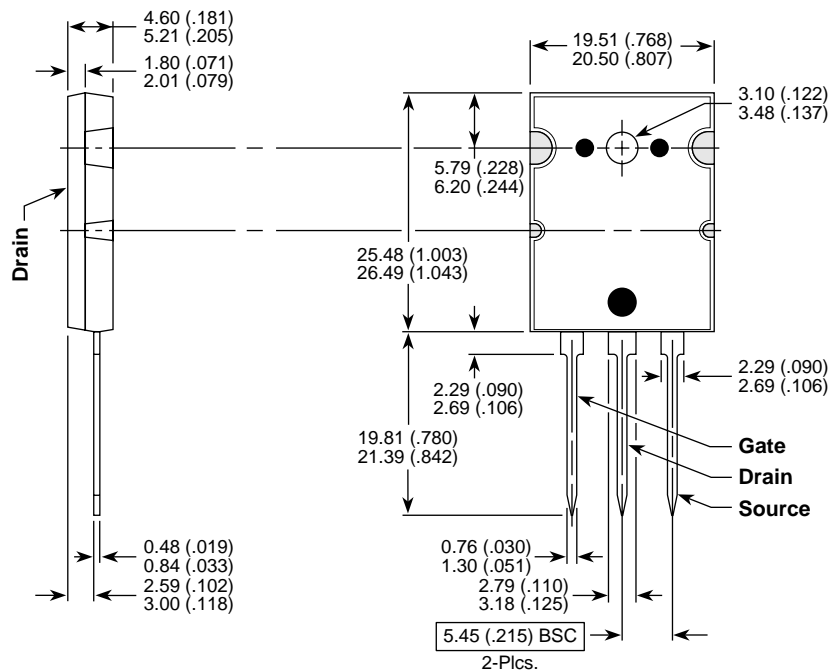


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

TO-264 Package Outline



Dimensions in Millimeters and (Inches)