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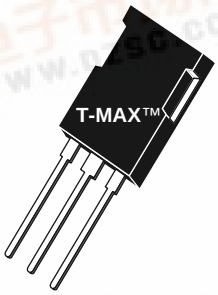
ADVANCED POWER TECHNOLOGY®

APT8030B2VFR

800V 27A 0.300Ω

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**
- **New T-MAX™ Package** (Clip-mounted TO-247 Package)

MAXIMUM RATINGS

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

Symbol	Parameter	APT8030B2VFR	UNIT
V_{DSS}	Drain-Source Voltage	800	Volts
I_D	Continuous Drain Current @ T_C = 25°C	27	Amps
I_{DM}	Pulsed Drain Current ①	108	
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)	27	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)	800			Volts
$I_{D(on)}$	On State Drain Current ② (V_{DS} > $I_{D(on)}$ x $R_{DS(on)}$ Max, V_{GS} = 10V)	27			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ② (V_{GS} = 10V, 0.5 $I_{D[Cont.]}$)			0.300	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

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EUROPE

-5623 Rev A

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V		6600	7900	pF
C_{oss}	Output Capacitance	V_{DS} = 25V		645	900	
C_{rss}	Reverse Transfer Capacitance	f = 1 MHz		320	480	
Q_g	Total Gate Charge ③	V_{GS} = 10V		340	510	nC
Q_{gs}	Gate-Source Charge	V_{DD} = 0.5 V_{DSS}		31	47	
Q_{gd}	Gate-Drain ("Miller") Charge	I_D = I_D [Cont.] @ 25°C		170	250	
t_d(on)	Turn-on Delay Time	V_{GS} = 15V		16	32	ns
t_r	Rise Time	V_{DD} = 0.5 V_{DSS}		14	28	
t_d(off)	Turn-off Delay Time	I_D = I_D [Cont.] @ 25°C		59	90	
t_f	Fall Time	R_G = 0.6Ω		8	16	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

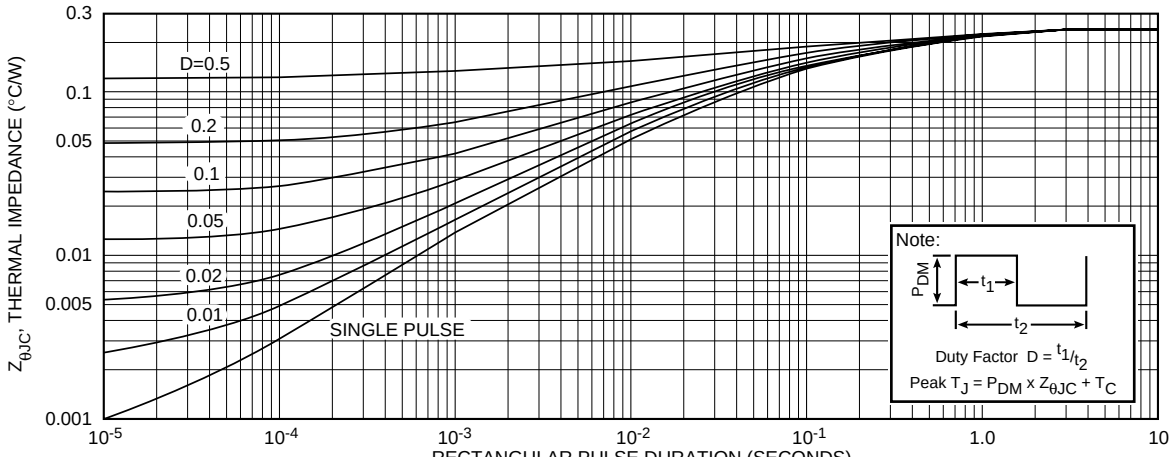
Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)				27	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)				108	
V_{SD}	Diode Forward Voltage ② (V_{GS} = 0V, I_S = -I_D [Cont.])				1.3	Volts
$^{dv}/_{dt}$	Peak Diode Recovery $^{dv}/_{dt}$ ⑥				5	V/ns
t_{rr}	Reverse Recovery Time	T_j = 25°C			300	ns
	(I_S = -I_D [Cont.], $^{di}/_{dt}$ = 100A/µs)	T_j = 125°C			600	
Q_{rr}	Reverse Recovery Charge	T_j = 25°C		2.0		µC
	(I_S = -I_D [Cont.], $^{di}/_{dt}$ = 100A/µs)	T_j = 125°C		6.7		
I_{RRM}	Peak Recovery Current	T_j = 25°C		13		Amps
	(I_S = -I_D [Cont.], $^{di}/_{dt}$ = 100A/µs)	T_j = 125°C		22		

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.24	°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 = 6.86mH, R_G = 25Ω, Peak I_L = 27A
⑤ These dimensions are equal to the TO-247 without mounting hole
⑥ I_S ≤ -I_D [Cont.], $^{di}/_{dt}$ = 100A/µs, V_{DD} ≤ V_{DSS}, T_j ≤ 150°C, R_G = 2.0Ω, V_R = 200V.

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



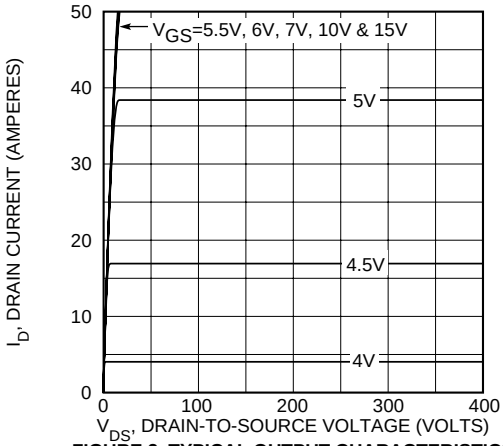


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

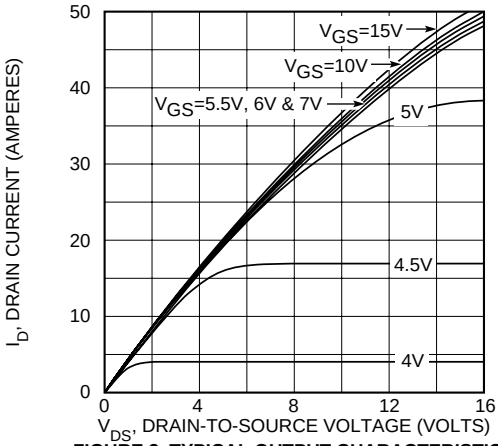


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

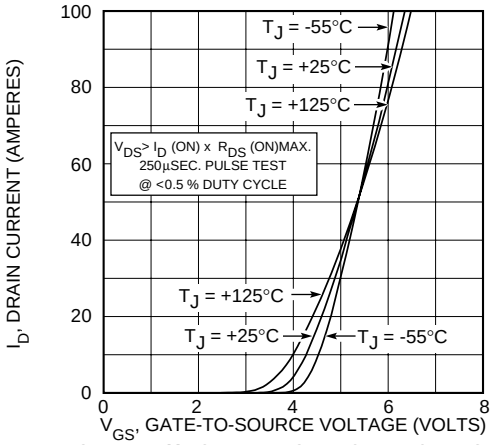


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

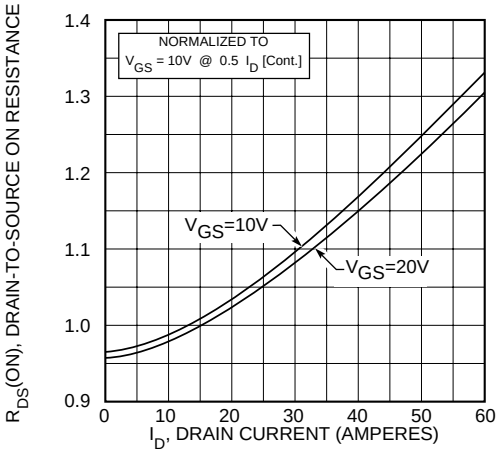


FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT

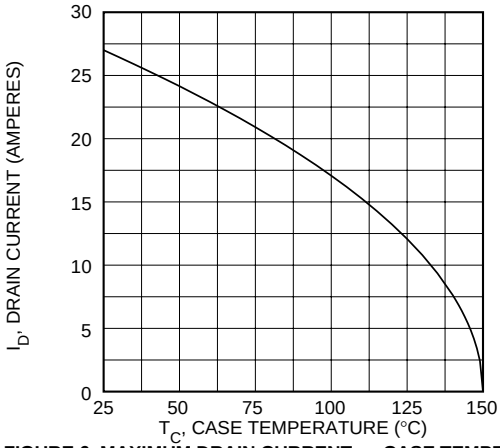


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

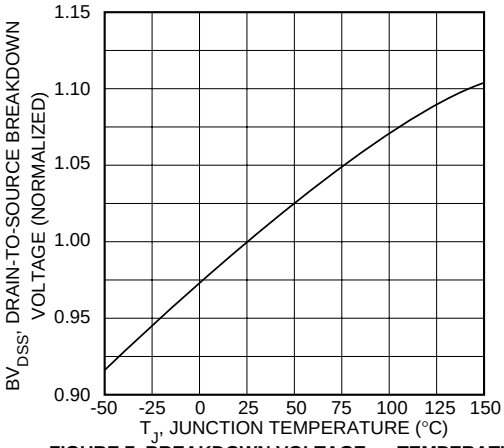


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

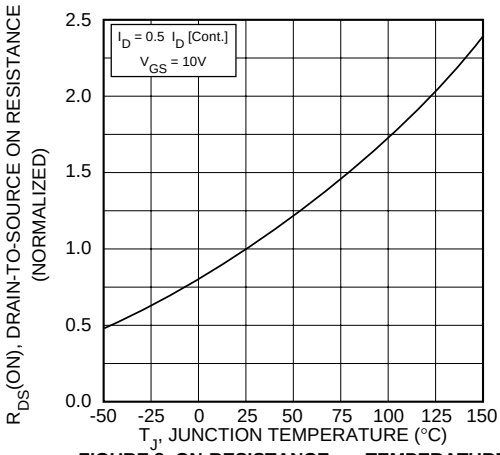


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

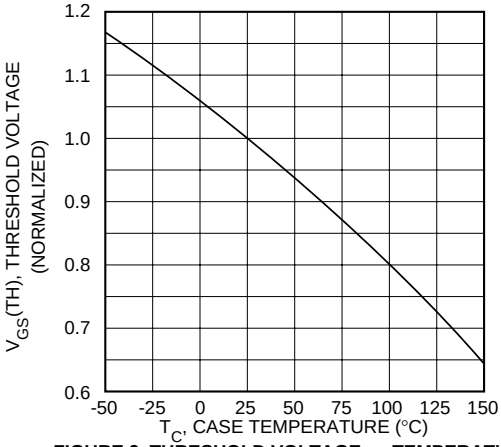


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

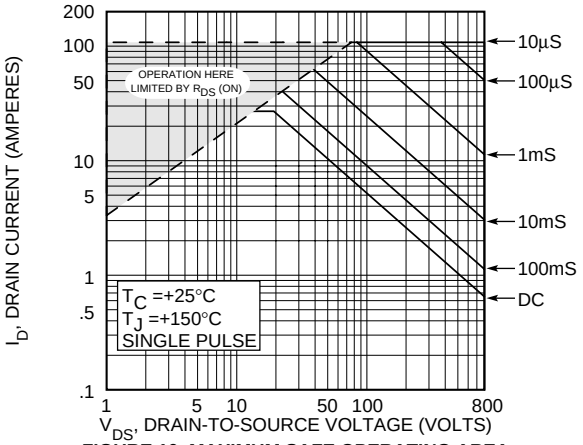


FIGURE 10, MAXIMUM SAFE OPERATING AREA

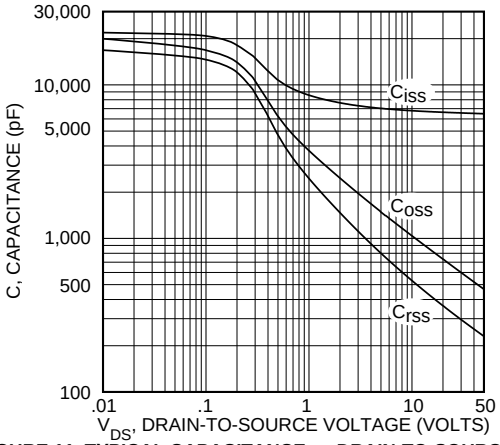


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

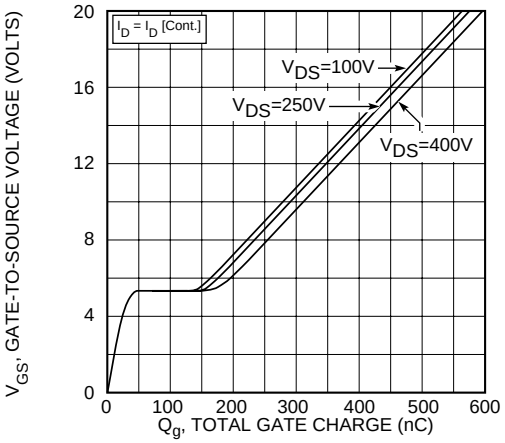


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

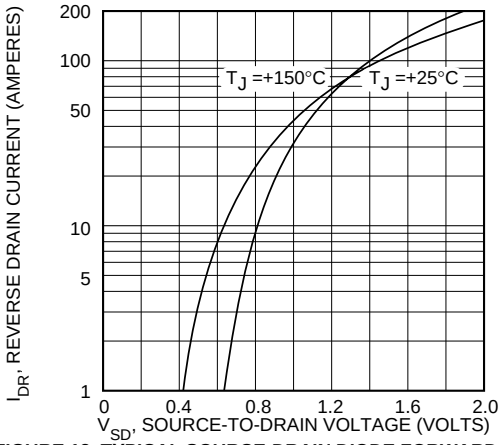
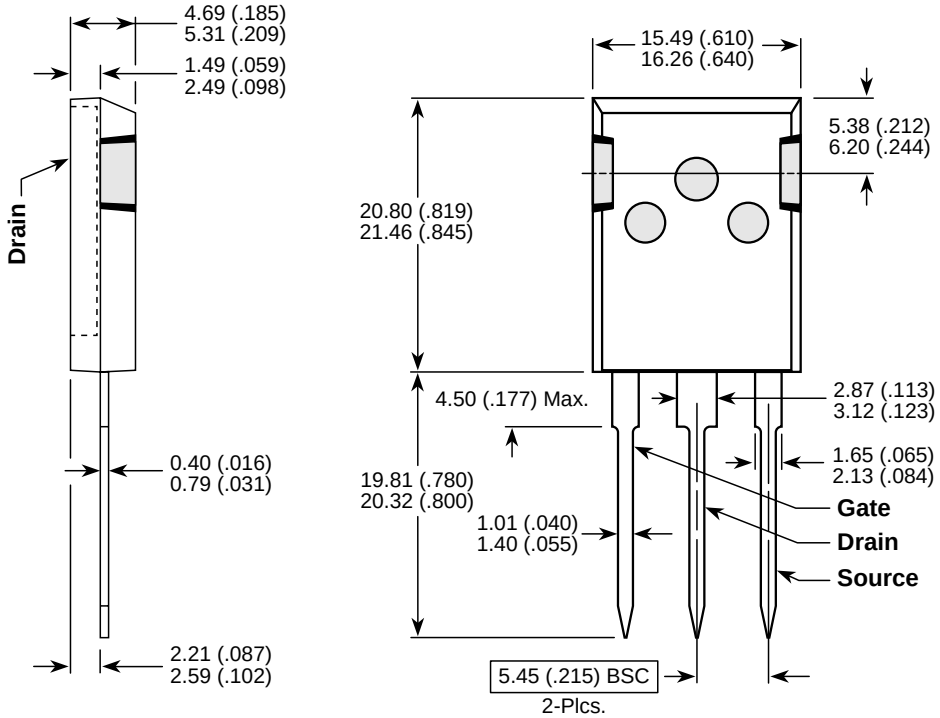


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

T-MAX™ Package Outline ⑤



Dimensions in Millimeters and (Inches)