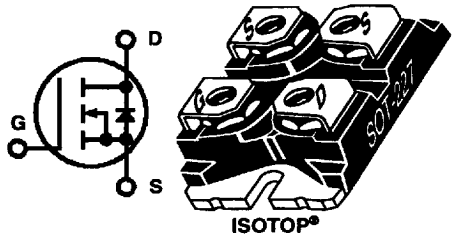

ADVANCED POWER TECHNOLOGY®

APT20M25JNR 200V 100A 0.025Ω
APT20M30JNR 200V 90A 0.030Ω

"UL Recognized" File No. E145592 (S)

POWER MOS IV® | **AVALANCHE RATED ISOTOP® PACKAGE**

N-CHANNEL ENHANCEMENT MODE LOW VOLTAGE POWER MOSFETS

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

Symbol	Parameter	APT20M25JNR	APT20M30JNR	UNIT
V_{DSS}	Drain-Source Voltage	200	200	Volts
I_D	Continuous Drain Current @ T_C = 25°C	100	90	Amps
I_{DM}	Pulsed Drain Current ①	400	360	
V_{GS}	Gate-Source Voltage Continuous	±20		Volts
V_{GSM}	Gate-Source Voltage Transient	±30		
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)	58		Amps
E_{AR}	Repetitive Avalanche Energy ①	30		mJ
E_{AS}	Single Pulse Avalanche Energy ④	1300		

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 1.0mA)		200			Volts
$I_{D(ON)}$	On State Drain Current ②	APT20M25JNR	100			Amps
	(V_{DS} > $I_{D(ON)}$ x $R_{DS(ON)}$ Max, V_{GS} = 10V)	APT20M30JNR	90			
$R_{DS(ON)}$	Drain-Source On-State Resistance ②	APT20M25JNR			0.025	Ohms
	(V_{GS} = 10V, 0.5 I_D [Cont.])	APT20M30JNR			0.030	
I_{DSS}	Zero Gate Voltage Drain Current (V_{DS} = 0.8 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} = ±20V, V_{DS} = 0V)				±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 1.0mA)		2		4	Volts

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	

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

USA
405 S.W. Columbia Street **Bend, Oregon 97702-1035** **Phone: (541) 382-8028** **FAX: (541) 388-0364**
EUROPE
Avenue J.F. Kennedy Bât B4 Parc Cadéra Nord **F-33700 Merignac - France** **Phone: (33) 57 92 15 15** **FAX: (33) 56 47 97 61**

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DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1 MHz		10100	13000	pF
C_{oss}	Output Capacitance			2460	3400	
C_{rss}	Reverse Transfer Capacitance			730	1080	
Q_g	Total Gate Charge ③	V_{GS} = 10V V_{DD} = 0.5 V_{DSS} I_D = I_D [Cont.] @ 25°C		324	480	nC
Q_{gs}	Gate-Source Charge			59	90	
Q_{gd}	Gate-Drain ("Miller") Charge			152	230	
t_d(on)	Turn-on Delay Time	V_{GS} = 15V V_{DD} = 0.5 V_{DSS} I_D = I_D [Cont.] @ 25°C R_G = 0.6Ω		20	30	ns
t_r	Rise Time			56	110	
t_d(off)	Turn-off Delay Time			100	150	
t_f	Fall Time			80	120	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)	APT20M25JNR			100	Amps
		APT20M30JNR			90	
I_{SM}	Pulsed Source Current ① (Body Diode)	APT20M25JNR			400	
		APT20M30JNR			360	
V_{SD}	Diode Forward Voltage ② (V_{GS} = 0V, I_S = -I_D [Cont.])				1.75	Volts
t_{rr}	Reverse Recovery Time (I_S = -I_D [Cont.], dI_S/dt = 100A/µs)			330	660	ns
Q_{rr}	Reverse Recovery Charge (I_S = -I_D [Cont.], dI_S/dt = 100A/µs)			5.1	10	µC

PACKAGE CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
L_D	Internal Drain Inductance (Measured From Drain Terminal to Center of Die.)		3		nH
L_S	Internal Source Inductance (Measured From Source Terminals to Source Bond Pads)		5		
$V_{Isolation}$	RMS Voltage (50-60 Hz Sinusoidal Waveform From Terminals to Mounting Base for 1 Min.)	2500			Volts
$C_{Isolation}$	Drain-to-Mounting Base Capacitance (f = 1MHz)		35		pF
Torque	Maximum Torque for Device Mounting Screws and Electrical Terminations.			13	in-lbs

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 = 773µH, R_G = 25Ω, Peak I_L = 58A

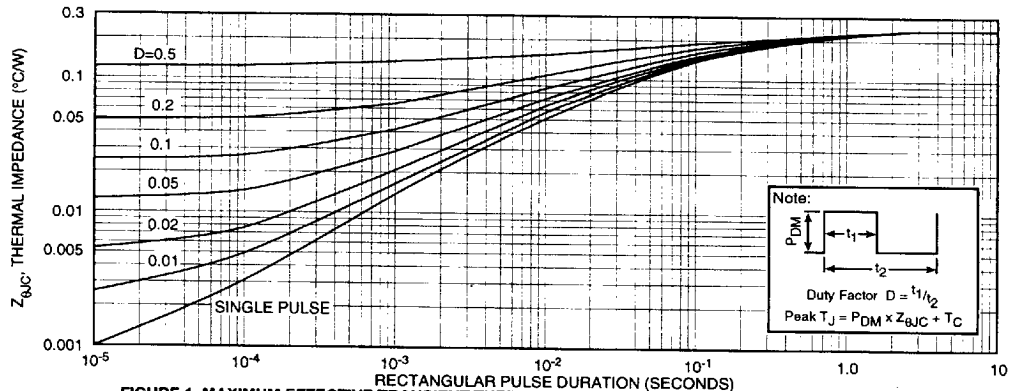

FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

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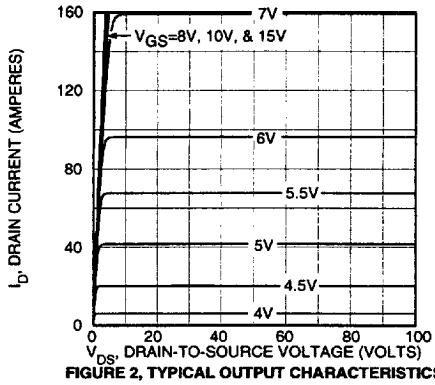

FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

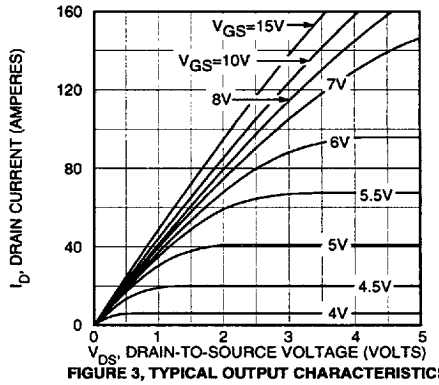

FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

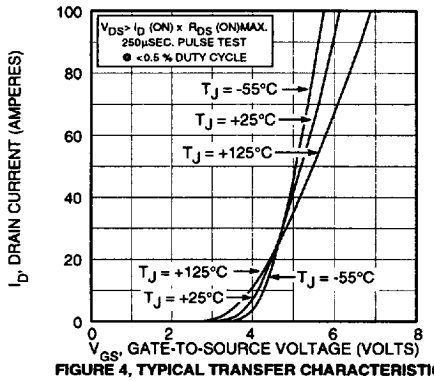

FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

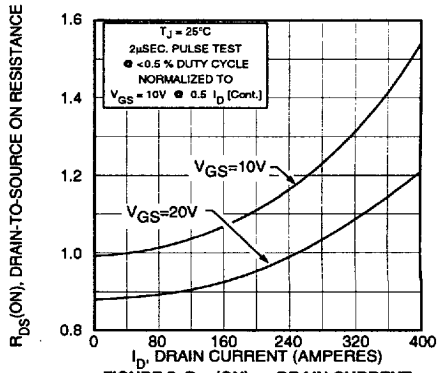

FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT

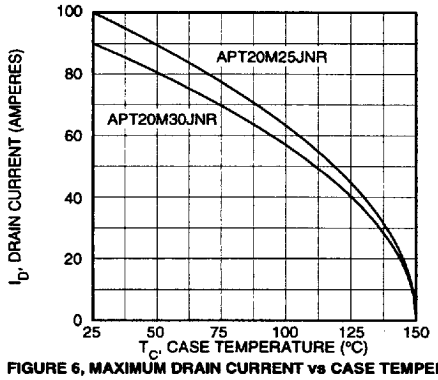

FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

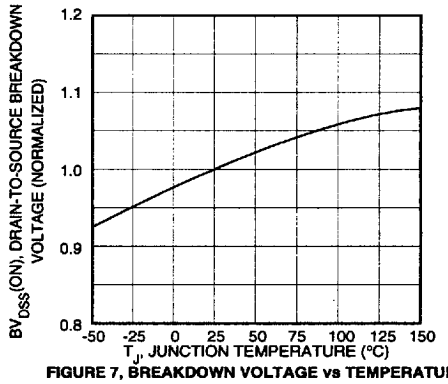

FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

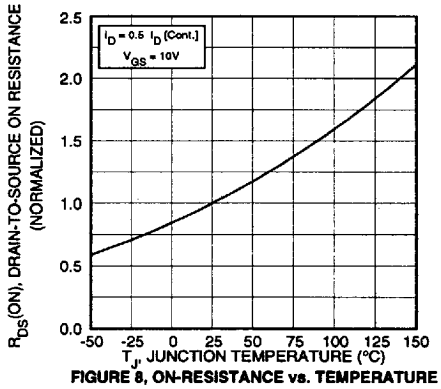

FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

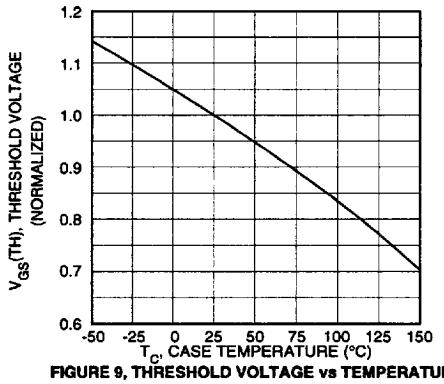

FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

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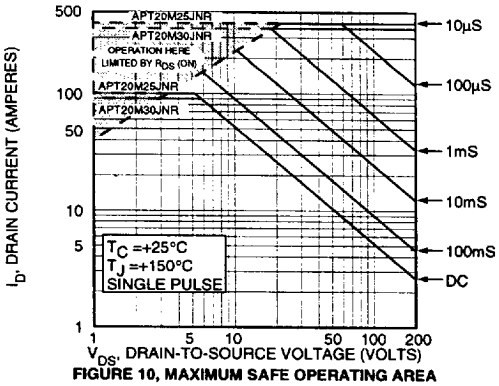


FIGURE 10, MAXIMUM SAFE OPERATING AREA

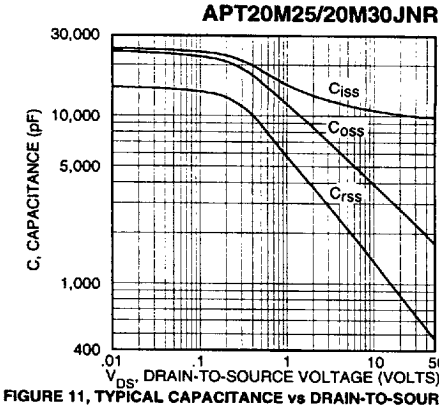


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

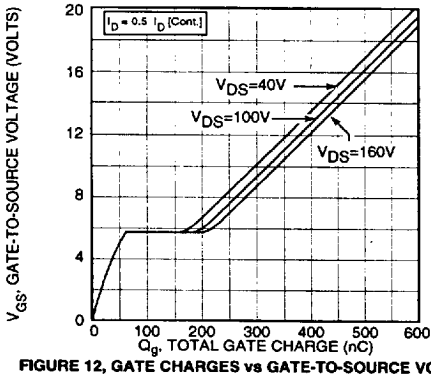


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

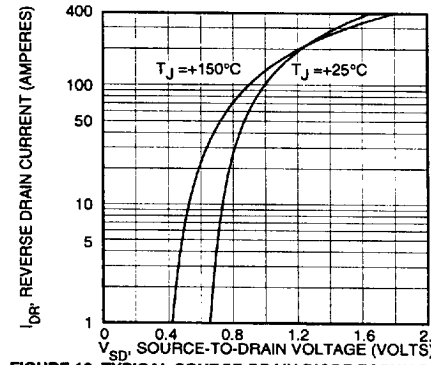
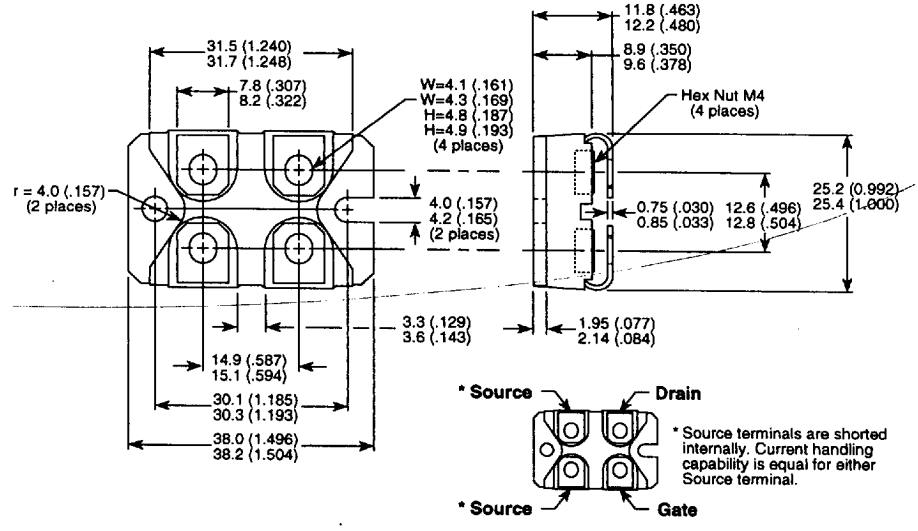


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

SOT-227 (ISOTOP®) Package Outline



Dimensions in Millimeters and (Inches)

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