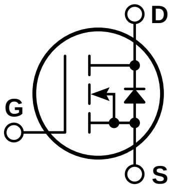

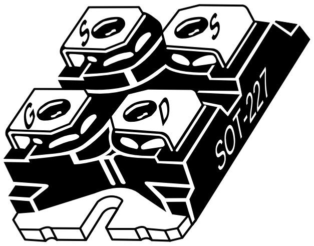

ISOTOP®

ADVANCED POWER TECHNOLOGY®

APT40M75JN 400V 56.0A 0.075Ω
APT40M90JN 400V 51.0A 0.090Ω

"UL Recognized" File No. E145592 (S)

POWER MOS IV®

SINGLE DIE ISOTOP® PACKAGE

N-CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

MAXIMUM RATINGS

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

Symbol	Parameter	APT 40M75JN	APT 40M90JN	UNIT
V_{DSS}	Drain-Source Voltage	400	400	Volts
I_D	Continuous Drain Current @ T_C = 25°C	56	51	Amps
I_{DM}, I_{LM}	Pulsed Drain Current ① and Inductive Current Clamped	224	204	
V_{GS}	Gate-Source Voltage	±30		Volts
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		

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number		MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 250 μA)	APT40M75JN	400			Volts
		APT40M90JN	400			
I_D(ON)	On State Drain Current ② (V_{DS} > I_D(ON) x R_{DS}(ON) Max, V_{GS} = 10V)	APT40M75JN	56			Amps
		APT40M90JN	51			
R_{DS}(ON)	Drain-Source On-State Resistance ② (V_{GS} = 10V, 0.5 I_D [Cont.])	APT40M75JN			0.075	Ohms
		APT40M90JN			0.090	
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

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\Theta JC}$	Junction to Case			0.24	°C/W
$R_{\Theta CS}$	Case to Sink (Use High Efficiency Thermal Joint Compound and Planer Heat Sink Surface.)		0.06		

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

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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) 5 57 92 15 15　FAX: (33) 5 56 47 97 61

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ f = 1 MHz		5630	6800	pF
C_{oss}	Output Capacitance			1320	1950	
C_{rss}	Reverse Transfer Capacitance			510	720	
Q_g	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 0.5\ V_{DSS}$ $I_D = I_D$ [Cont.] @ 25°C		241	370	nC
Q_{gs}	Gate-Source Charge			34	50	
Q_{gd}	Gate-Drain ("Miller") Charge			117	180	
t_d(on)	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5\ V_{DSS}$ $I_D = I_D$ [Cont.] @ 25°C $R_G = 0.6\Omega$		16	32	ns
t_r	Rise Time			31	62	
t_d(off)	Turn-off Delay Time			45	70	
t_f	Fall Time			13	26	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)	**APT40M75JN**			56	Amps
		APT40M90JN			51	
I_{SM}	Pulsed Source Current ① (Body Diode)	**APT40M75JN**			224	
		APT40M90JN			204	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V$, $I_S = -I_D$ [Cont.])				1.8	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_D$ [Cont.], $dI_S/dt = 100A/\mu s$)			370	740	ns
Q_{rr}	Reverse Recovery Charge ($I_S = -I_D$ [Cont.], $dI_S/dt = 100A/\mu s$)			8	16	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

①Repetitive Rating: Pulse width limited by maximum junction temperature. See Transient Thermal Impedance Curve. (Fig.1)

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

③See MIL-STD-750 Method 3471

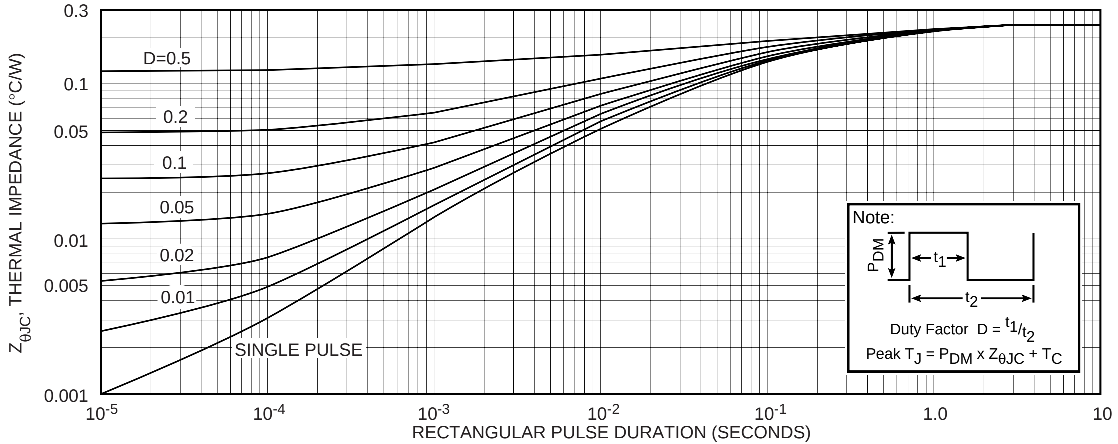


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

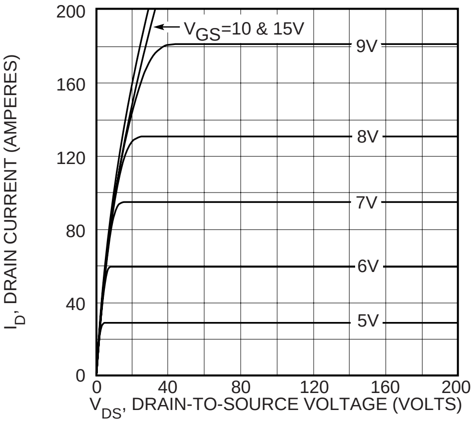


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

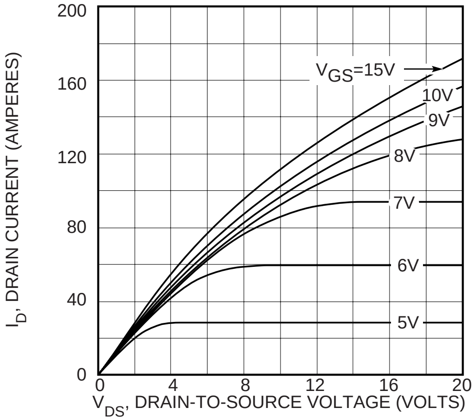


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

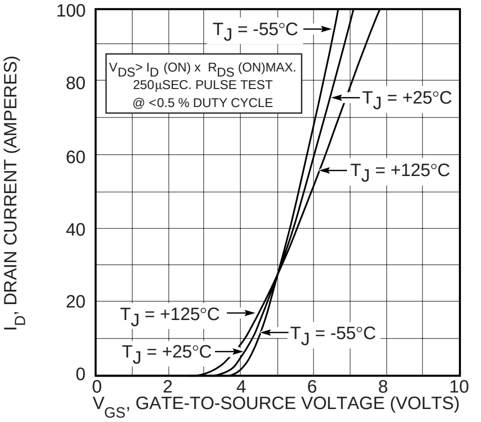


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

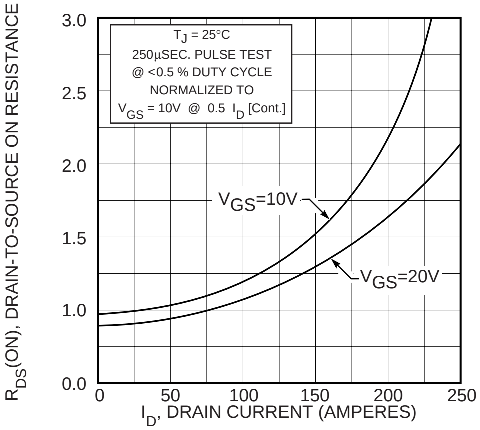


FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT

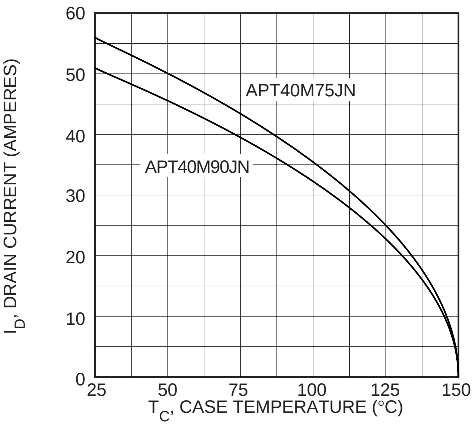


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

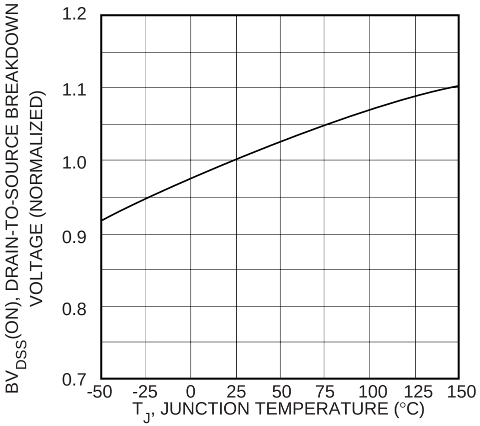


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

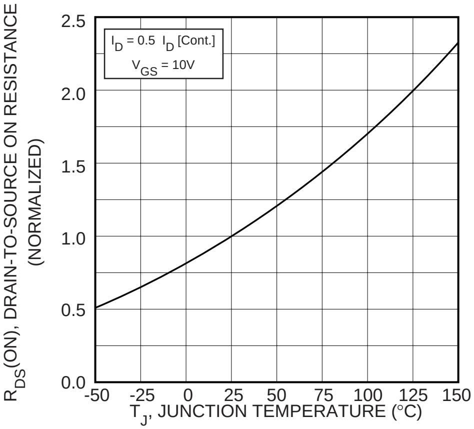


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

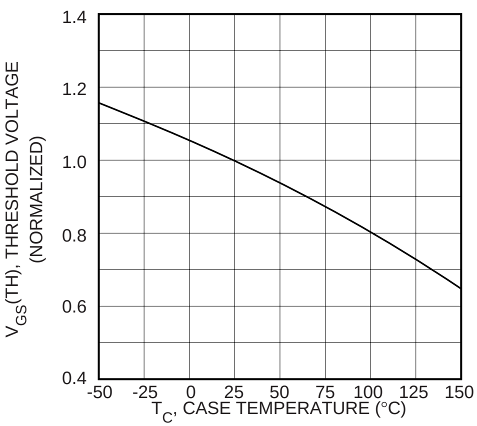


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

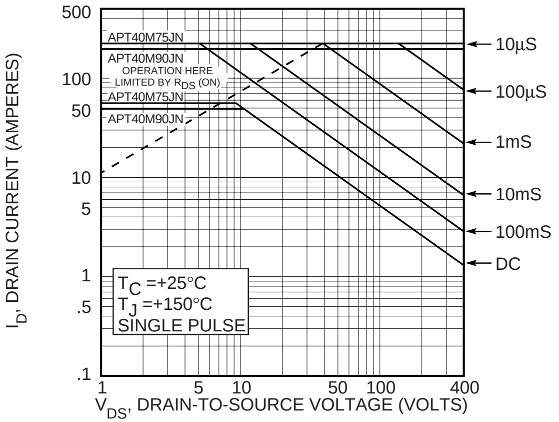


FIGURE 10, MAXIMUM SAFE OPERATING AREA

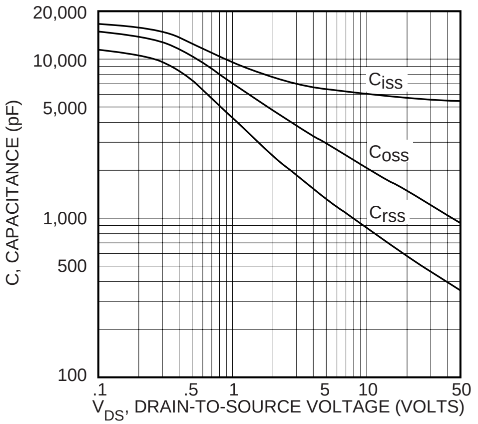


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

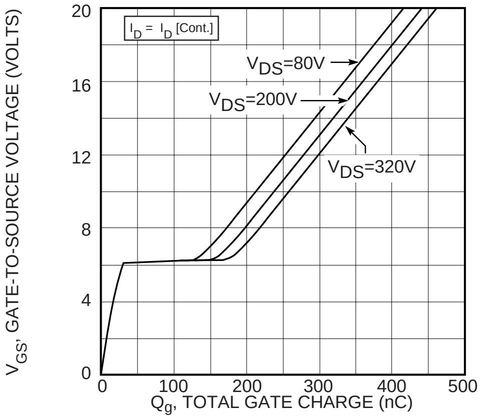


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

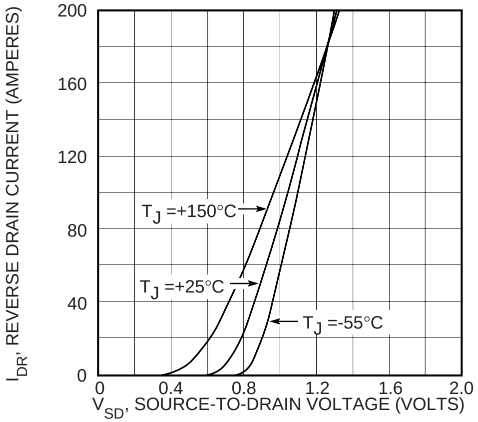
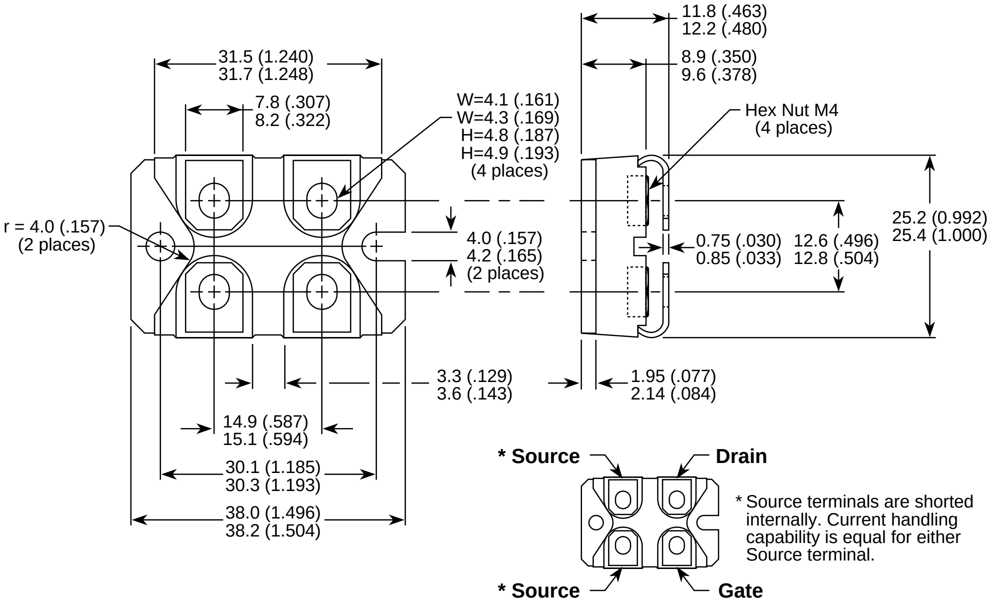


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

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

SOT-227 (ISOTOP®) Package Outline



* Source terminals are shorted internally. Current handling capability is equal for either Source terminal.

Dimensions in Millimeters and (Inches)

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