

APT50M60BFN 500V 78.0A 0.060 Ω
 APT45M60BFN 450V 78.0A 0.060 Ω

POWER MOS IV™

N - CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

MAXIMUM RATINGS

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

Symbol	Parameter	APT45M60BFN	APT50M60BFN	UNIT
V_{DSS}	Drain-Source Voltage	450	500	Volts
I_D	Continuous Drain Current	78		Ampe
I_{DM}	Pulsed Drain Current ¹	312		Ampe
V_{GS}	Gate-Source Voltage	±30		Volts
P_D	Total Power Dissipation @ $T_c = 25^\circ\text{C}$, Derate Above 25°C	830		Watts
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150		$^\circ\text{C}$

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT	
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0V, I_D = 250 \mu\text{A}$)	APT50M60BFN	500			Volts
		APT45M60BFN	450			Volts
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}, V_{GS} = 0V$) ($V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_c = 125^\circ\text{C}$)			250		μA
				1000		μA
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 30V, V_{DS} = 0V$)			±100		nA
$I_{D(ON)}$	On State Drain Current ($V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max, $V_{GS} = 10V$)	78				Ampe
$V_{GS(TH)}$	Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 1\text{mA}$)	2		4		Volts
$R_{DS(ON)}$	Static Drain-Source On-State Resistance ² ($V_{GS} = 10V, I_D = 0.5 I_D$ [Cont.])			0.060		Ohms

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.15	$^\circ\text{C/W}$
$R_{\theta JA}$	Junction to Ambient			20	$^\circ\text{C/W}$
T_L	Max. Lead Temp. for Soldering Conditions: 0.063" from Case for 10 Sec.			300	$^\circ\text{C}$

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Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1 \text{ MHz}$		11176	13000	pF
C_{oss}	Output Capacitance			2337	3272	pF
C_{rss}	Reverse Transfer Capacitance			943	1414	pF
Q_g	Total Gate Charge ³	$V_{GS} = 10V, I_D = I_D [\text{Cont}]$ $V_{DD} = 0.5 V_{DSS}$		420	675	nC
Q_{gs}	Gate-Source Charge			68	102	nC
Q_{gd}	Gate-Drain ("Miller") Charge			263	394	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}], V_{GS} = 15V$ $R_G = 0.6$		20	40	ns
t_r	Rise Time			44	88	ns
$t_{d(off)}$	Turn-off Delay Time			125	188	ns
t_f	Fall Time			60	120	ns

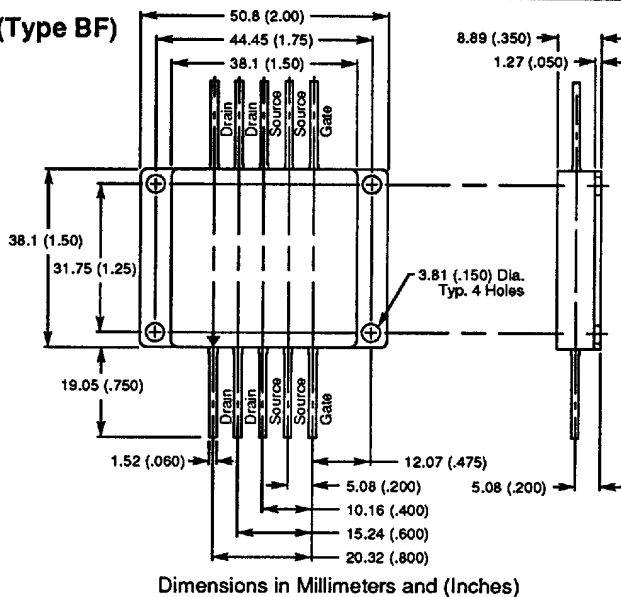
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			78	Amps
I_{SM}	Pulsed Source Current ¹ (Body Diode)			312	Amps
V_{SD}	Diode Forward Voltage ² ($V_{GS} = 0V, I_S = -I_D [\text{Cont.}]$)			1.8	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_D [\text{Cont.}] \text{ di}/dt = 100A/\mu s$)	360	720	1400	ns
Q_{rr}	Reverse Recovery Charge	12	25	50	μC

SAFE OPERATING AREA CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
SOA1	Safe Operating Area	$V_{DS} = 0.4 V_{DSS}, I_{DS} = P_D / 0.4 V_{DSS}, t = 1 \text{ Sec.}$	830			Watts
SOA2	Safe Operating Area	$I_{DS} = I_D [\text{Cont.}], V_{DS} = P_D / I_D [\text{Cont.}], t = 1 \text{ Sec.}$	830			Watts
I_{LM}	Inductive Current Clamped		312			Amps

F-Pack Package Outline (Type BF)



- 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