PD- 94828

International
IOR Rectifier

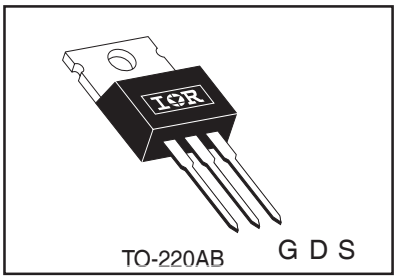
SMPS MOSFET # IRF740APbF

HEXFET® Power MOSFET

V_{DSS}	Rds(on) max	I_D
400V	0.55Ω	10A

Applications
- Switch Mode Power Supply (SMPS)
- Uninterruptable Power Supply
- High speed power switching
- Lead-Free

Benefits
- Low Gate Charge Qg results in Simple Drive Requirement
- Improved Gate, Avalanche and dynamic dv/dt Ruggedness
- Fully Characterized Capacitance and Avalanche Voltage and Current
- Effective Coss specified (See AN 1001)



Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	10	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	6.3	
I_{DM}	Pulsed Drain Current ①	40	
P_D @T_C = 25°C	Power Dissipation	125	W
	Linear Derating Factor	1.0	W/°C
V_{GS}	Gate-to-Source Voltage	± 30	V
dv/dt	Peak Diode Recovery dv/dt ③	5.9	V/ns
T_J	Operating Junction and	-55 to + 150	°C
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting torqe, 6-32 or M3 screw	10 lbf•in (1.1N•m)	

Typical SMPS Topologies:

- Single transistor Flyback Xfmr. Reset
- Single Transistor Forward Xfmr. Reset
  (Both for US Line Input only)

Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	400	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.48	—		V/°C Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.55	Ω	V_{GS} = 10V, I_D = 6.0A ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	µA	V_{DS} = 400V, V_{GS} = 0V
		—	—	250		V_{DS} = 320V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 30V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -30V

Dynamic @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	4.9	—	—	S	V_{DS} = 50V, I_D = 6.0A
Q_g	Total Gate Charge	—	—	36	nC	I_D = 10A
Q_{gs}	Gate-to-Source Charge	—	—	9.9		V_{DS} = 320V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	16		V_{GS} = 10V, See Fig. 6 and 13 ④
$t_{d(on)}$	Turn-On Delay Time	—	10	—	ns	V_{DD} = 200V
t_r	Rise Time	—	35	—		I_D = 10A
$t_{d(off)}$	Turn-Off Delay Time	—	24	—		R_G = 10Ω
t_f	Fall Time	—	22	—		R_D = 19.5Ω,See Fig. 10 ④
C_{iss}	Input Capacitance	—	1030	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	170	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	7.7	—		f = 1.0MHz, See Fig. 5
C_{oss}	Output Capacitance	—	1490	—		V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0MHz
C_{oss}	Output Capacitance	—	52	—		V_{GS} = 0V, V_{DS} = 320V, f = 1.0MHz
C_{oss} eff.	Effective Output Capacitance	—	61	—		V_{GS} = 0V, V_{DS} = 0V to 320V ⑤

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②	—	630	mJ
I_{AR}	Avalanche Current①	—	10	A
E_{AR}	Repetitive Avalanche Energy①	—	12.5	mJ

Thermal Resistance

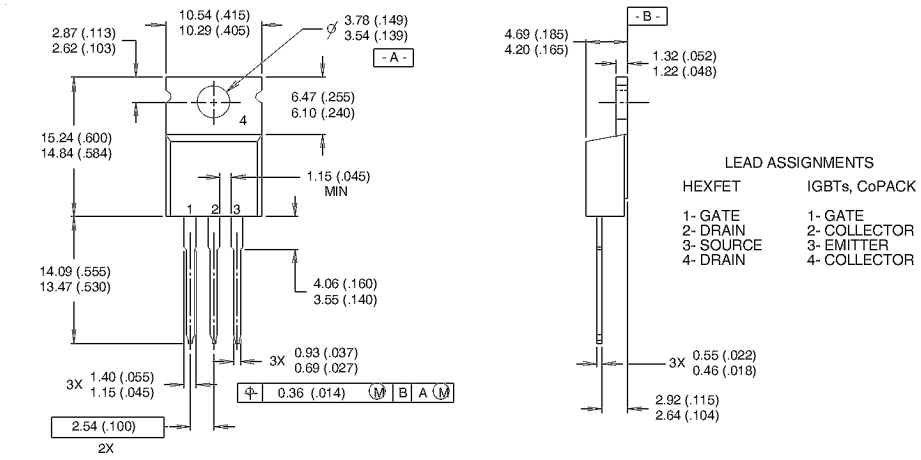
	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	1.0	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	62	

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	10	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	40		
V_{SD}	Diode Forward Voltage	—	—	2.0	V	T_J = 25°C, I_S = 10A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	240	360	ns	T_J = 25°C, I_F = 10A
Q_{rr}	Reverse RecoveryCharge	—	1.9	2.9	µC	di/dt = 100A/µs ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



LEAD ASSIGNMENTS

HEXFET	IGBTs, CoPACK
1- GATE	1- GATE
2- DRAIN	2- COLLECTOR
3- SOURCE	3- EMITTER
4- DRAIN	4- COLLECTOR

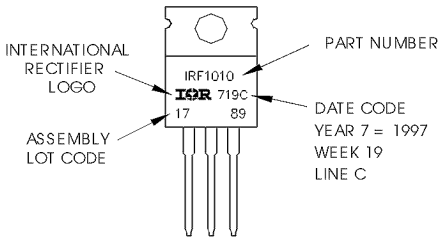
NOTES:

1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
2 CONTROLLING DIMENSION : INCH
3 OUTLINE CONFORMS TO JEDEC OUTLINE TO-220AB.
4 HEATSINK & LEAD MEASUREMENTS DO NOT INCLUDE BURRS.

TO-220AB Part Marking Information

EXAMPLE: THIS IS AN IRF1010
LOT CODE 1789
ASSEMBLED ON WW 19, 1997
IN THE ASSEMBLY LINE "C"

Note: "P" in assembly line position indicates "Lead-Free"



Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)

② Starting T_J = 25°C, L = 12.6mH R_G = 25Ω, I_{AS} = 10A. (See Figure 12)

③ $I_{SD} \leq$ 10A, di/dt ≤ 330A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq$ 150°C

④ Pulse width ≤ 300µs; duty cycle ≤ 2%.

⑤ C_{oss} eff. is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}

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