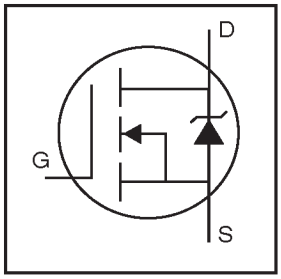
International
IOR Rectifier

PD - 95047

IRF630NPbF
IRF630NSPbF
IRF630NLPbF

HEXFET® Power MOSFET

- Advanced Process Technology
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Ease of Paralleling
- Simple Drive Requirements
- Lead-Free



V_{DSS} = 200V

$R_{DS(on)}$ = 0.30Ω

I_D = 9.3A

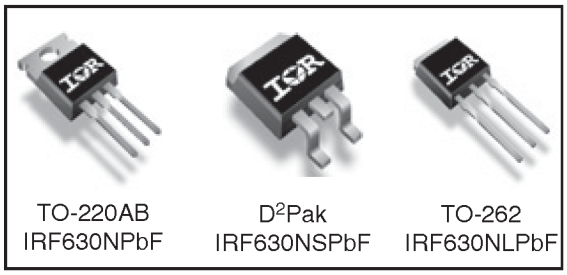
Description

Fifth Generation HEXFET® Power MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.

The D^2Pak is a surface mount power package capable of accommodating die sizes up to HEX-4. It provides the highest power capability and the lowest possible on-resistance in any existing surface mount package. The D^2Pak is suitable for high current applications because of its low internal connection resistance and can dissipate up to 2.0W in a typical surface mount application.

The through-hole version (IRF630NL) is available for low-profile application.



TO-220AB	D^2Pak	TO-262
IRF630NPbF	IRF630NSPbF	IRF630NLPbF

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	9.3	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	6.5	
I_{DM}	Pulsed Drain Current ①	37	
P_D @T_C = 25°C	Power Dissipation	82	W
	Linear Derating Factor	0.5	W/°C
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy②	94	mJ
I_{AR}	Avalanche Current①	9.3	A
E_{AR}	Repetitive Avalanche Energy①	8.2	mJ
dv/dt	Peak Diode Recovery dv/dt ⑥	8.1	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting torque, 6-32 or M3 srew④	10 lbf•in (1.1N•m)	

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	200	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.26	—	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.30	Ω	V_{GS} = 10V, I_D = 5.4A ③
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
g_{fs}	Forward Transconductance	4.9	—	—	S	V_{DS} = 50V, I_D = 5.4A ③
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	µA	V_{DS} = 200V, V_{GS} = 0V
		—	—	250		V_{DS} = 160V, V_{GS} = 0V, T_J = 150°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -20V
Q_g	Total Gate Charge	—	—	35	nC	I_D = 5.4A
Q_{gs}	Gate-to-Source Charge	—	—	6.5		V_{DS} = 160V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	17		V_{GS} = 10V ③
$t_{d(on)}$	Turn-On Delay Time	—	7.9	—	ns	V_{DD} = 100V
t_r	Rise Time	—	14	—		I_D = 5.4A
$t_{d(off)}$	Turn-Off Delay Time	—	27	—		R_G = 13Ω
t_f	Fall Time	—	15	—		R_D = 18Ω ③
L_D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L_S	Internal Source Inductance	—	7.5	—		
C_{iss}	Input Capacitance	—	575	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	89	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	25	—		f = 1.0MHz

Source-Drain Ratings and Characteristics

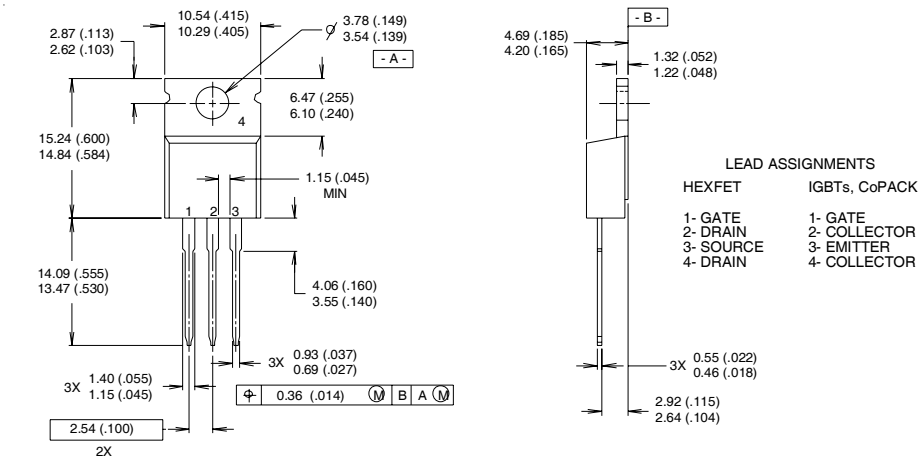
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	9.3	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode)①	—	—	37		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J = 25°C, I_S = 5.4A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	117	176	ns	T_J = 25°C, I_F = 5.4A
Q_{rr}	Reverse Recovery Charge	—	542	813	nC	di/dt = 100A/µs ③
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	1.83	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface ④	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient④	—	62	
$R_{\theta JA}$	Junction-to-Ambient (PCB mount)⑤	—	40	

TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



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"