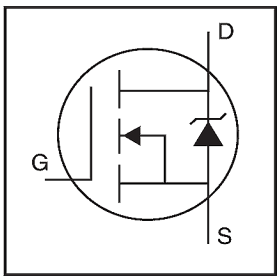
PD - 95007

International
IOR Rectifier

IRFP250NPbF

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

$R_{DS(on)}$ = 0.075Ω

I_D = 30A

Description

Fifth Generation HEXFETs 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-247 package is preferred for commercial-industrial applications where higher power levels preclude the use of TO-220 devices. The TO-247 is similar but superior to the earlier TO-218 package because of its isolated mounting hole.

TO-247AC

Absolute Maximum Ratings

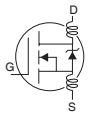
	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	30	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	21	
I_{DM}	Pulsed Drain Current ①	120	
P_D @T_C = 25°C	Power Dissipation	214	W
	Linear Derating Factor	1.4	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy②	315	mJ
I_{AR}	Avalanche Current①	30	A
E_{AR}	Repetitive Avalanche Energy①	21	mJ
dv/dt	Peak Diode Recovery dv/dt ③	8.6	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 srew	10 lbf•in (1.1N•m)	

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	0.7	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.24	—	
$R_{\theta JA}$	Junction-to-Ambient	—	40	

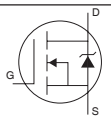
Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	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	—	—	0.075	Ω	V_{GS} = 10V, I_D = 18A ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
g_{fs}	Forward Transconductance	17	—	—	S	V_{DS} = 50V, I_D = 18A ④
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	—	—	123	nC	I_D = 18A
Q_{gs}	Gate-to-Source Charge	—	—	21		V_{DS} = 160V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	57		V_{GS} = 10V, See Fig. 6 and 13 ④
$t_{d(on)}$	Turn-On Delay Time	—	14	—	ns	V_{DD} = 100V
t_r	Rise Time	—	43	—		I_D = 18A
$t_{d(off)}$	Turn-Off Delay Time	—	41	—		R_G = 3.9Ω
t_f	Fall Time	—	33	—		R_D = 5.5Ω, See Fig. 10 ④
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	—	2159	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	315	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	83	—		f = 1.0MHz, See Fig. 5



Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	30	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode)①	—	—	120		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J = 25°C, I_S = 18A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	186	279	ns	T_J = 25°C, I_F = 18A
Q_{rr}	Reverse Recovery Charge	—	1.3	2.0	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)				



Notes:

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

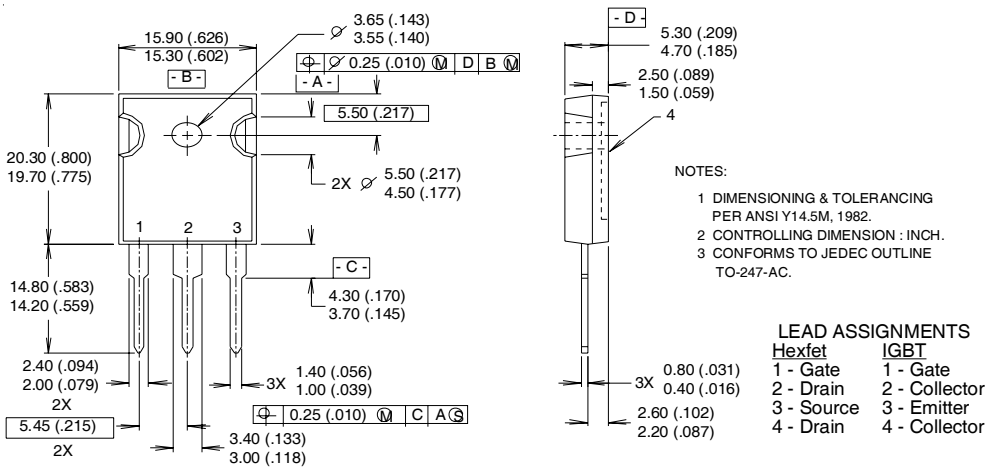
② Starting T_J = 25°C, L = 1.9mH R_G = 25Ω, I_{AS} = 18A. (See Figure 12)

③ I_{SD} ≤ 18A, di/dt ≤ 374A/µs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 175°C

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

TO-247AC Package Outline

Dimensions are shown in millimeters (inches)



NOTES:

1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
2 CONTROLLING DIMENSION : INCH.
3 CONFORMS TO JEDEC OUTLINE TO-247-AC.

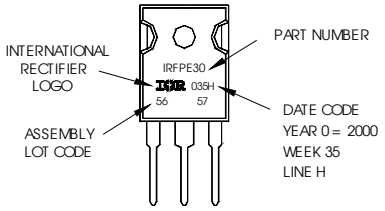
LEAD ASSIGNMENTS

Hexfet	IGBT
1 - Gate	1 - Gate
2 - Drain	2 - Collector
3 - Source	3 - Emitter
4 - Drain	4 - Collector

TO-247AC Part Marking Information

EXAMPLE: THIS IS AN IRFPE30
WITH ASSEMBLY
LOT CODE 5657
ASSEMBLED ON WW 35, 2000
IN THE ASSEMBLY LINE "H"

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



Data and specifications subject to change without notice.

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