

International IR Rectifier

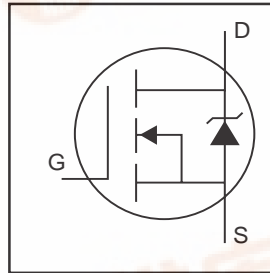
PD - 93803

PROVISIONAL

IRF1205

HEXFET® Power MOSFET

- Advanced Process Technology
- Dynamic dv/dt Rating
- 175 °C Operating Temperature
- Fast Switching
- Fully Avalanche Rated

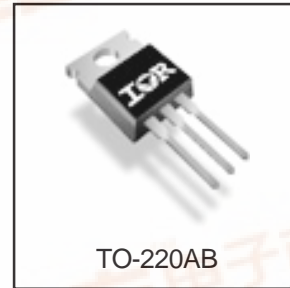


$V_{DS} = 55V$
$R_{DS(on)} = 0.027\Omega$
$I_D = 41A$ ⑤

Description

Fifth Generation 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 device for use in a wide variety of applications.

The TO-220 package is universally preferred for all commercial 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.



Absolute Maximum Ratings

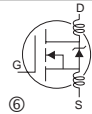
	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	41⑤	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	29⑤	
I_{DM}	Pulsed Drain Current ①	164	
$P_D @ T_C = 25^\circ C$	Power Dissipation	83	W
	Linear Derating Factor	0.56	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy②	190	mJ
I_{AR}	Avalanche Current①	25	A
E_{AR}	Repetitive Avalanche Energy①	8.3	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.0	V/ns
T_J	Operating Junction and	-55 to + 175	°C
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds		
	Mounting torque, 6-32 or M3 screw	10 lbf•in (1.1N•m)	

Thermal Resistance

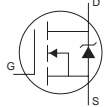
	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	1.8	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	62	



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

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	55	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.05	—	V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	0.027	Ω	V _{GS} = 10V, I _D = 25A ④⑥
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} = V _{GS} , I _D = 250μA
g _{fs}	Forward Transconductance	13	—	—	S	V _{DS} = 25V, I _D = 25A
I _{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	V _{DS} = 55V, V _{GS} = 0V
		—	—	250		V _{DS} = 44V, 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	—	—	50	nC	I _D = 25A
Q _{gs}	Gate-to-Source Charge	—	—	10		V _{DS} = 44V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	—	21		V _{GS} = 10V ④⑥
t _{d(on)}	Turn-On Delay Time	—	9.9	—	ns	V _{DD} = 28V
t _r	Rise Time	—	44	—		I _D = 25A
t _{d(off)}	Turn-Off Delay Time	—	34	—		R _G = 9.1Ω
t _f	Fall Time	—	35	—		R _D = 1.1Ω ④ ⑥
L _D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact⑥ ⑥
L _S	Internal Source Inductance	—	7.5	—		
C _{iss}	Input Capacitance	—	1200	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	390	—		V _{DS} = 25V
C _{rss}	Reverse Transfer Capacitance	—	140	—		f = 1.0MHz ⑥

Source-Drain Ratings and Characteristics

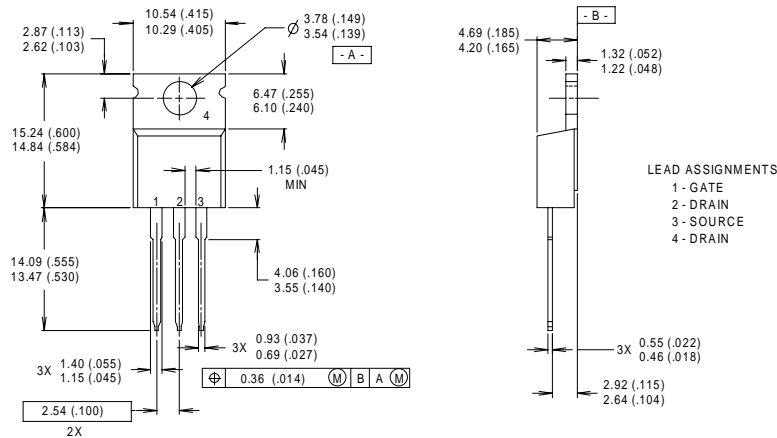
	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	41⑤	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①⑥	—	—	164		
V _{SD}	Diode Forward Voltage	—	—	1.3	V	T _J = 25°C, I _S = 25A, V _{GS} = 0V ④⑥
t _{rr}	Reverse Recovery Time	—	63	94	ns	T _J = 25°C, I _F = 25A
Q _{rr}	Reverse Recovery Charge	—	140	210	nC	di/dt = 100A/μs ④ ⑥
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.
- ② V_{DD}=25V, Starting T_J = 25°C, L = 610μH, R_G = 25Ω, I_{AS} = 25A
- ③ I_{SD} ≤ 25A, di/dt ≤ 220A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 175°C
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%
- ⑤ Calculated continuous current based on maximum allowable junction temperature: Package limitation current = 20A
- ⑥ Use IRFR/U1205 Data and Test conditons.

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
WITH ASSEMBLY
LOT CODE 9B1M

