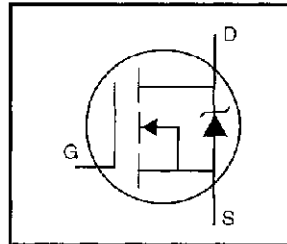


IRLZ14PbF

HEXFET® Power MOSFET

- Dynamic dv/dt Rating
- Logic-Level Gate Drive
- $R_{DS(on)}$ Specified at $V_{GS}=4V$ & $5V$
- 175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements
- Lead-Free



$$V_{DSS} = 60V$$

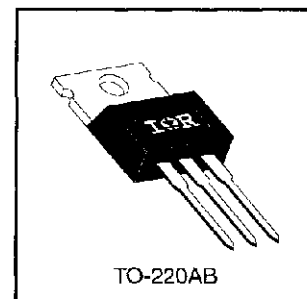
$$R_{DS(on)} = 0.20\Omega$$

$$I_D = 10A$$

Description

Third Generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

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.



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 5.0 V$	10	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 5.0 V$	7.2	
I_{DM}	Pulsed Drain Current ①	40	
$P_D @ T_C = 25^\circ C$	Power Dissipation	43	W
	Linear Derating Factor	0.29	W/°C
V_{GS}	Gate-to-Source Voltage	± 10	V
E_{AS}	Single Pulse Avalanche Energy ②	68	mJ
dv/dt	Peak Diode Recovery dv/dt ③	4.5	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 screw	10 lbf·in (1.1 N·m)	

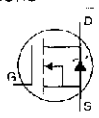
Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	3.5	°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	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	60	—	—	V	V _{GS} =0V, I _D =250μA
ΔV _{(BR)DSS/ΔT_J}	Breakdown Voltage Temp. Coefficient	—	0.070	—	V/°C	Reference to 25°C, I _D =1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	0.20 0.28	Ω	V _{GS} =5.0V, I _D =6.0A ④ V _{GS} =4.0V, I _D =5.0A ④
V _{GS(th)}	Gate Threshold Voltage	1.0	—	2.0	V	V _{DS} =V _{GS} , I _D =250μA
g _{fs}	Forward Transconductance	3.5	—	—	S	V _{DS} =25V, I _D =6.0A ④
I _{DSS}	Drain-to-Source Leakage Current	—	—	25 250	μA	V _{DS} =60V, V _{GS} =0V V _{DS} =48V, V _{GS} =0V, T _J =150°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V _{GS} =10V
	Gate-to-Source Reverse Leakage	—	—	-100	nA	V _{GS} =-10V
Q _g	Total Gate Charge	—	—	8.4	nC	I _D =10A
Q _{gs}	Gate-to-Source Charge	—	—	3.5	nC	V _{DS} =48V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	—	6.0	nC	V _{GS} =5.0V See Fig. 6 and 13 ④
t _{d(on)}	Turn-On Delay Time	—	9.3	—	ns	V _{DD} =30V
t _r	Rise Time	—	110	—	ns	I _D =10A
t _{d(off)}	Turn-Off Delay Time	—	17	—	ns	R _G =12Ω
t _f	Fall Time	—	28	—	ns	R _D =2.8Ω See Figure 10 ④
L _D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6 mm (0.25in.) from package and center of die contact
L _S	Internal Source Inductance	—	7.5	—	nH	
C _{ISS}	Input Capacitance	—	400	—	pF	V _{GS} =0V
C _{OSS}	Output Capacitance	—	170	—	pF	V _{DS} =25V
C _{RSS}	Reverse Transfer Capacitance	—	42	—	pF	f=1.0MHz See Figure 5

Source-Drain Ratings and Characteristics

Parameter	Parameter	Min.	Typ.	Max.	Units	Test 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	A	
V _{SD}	Diode Forward Voltage	—	—	1.6	V	T _J =25°C, I _S =10A, V _{GS} =0V ④
t _{rr}	Reverse Recovery Time	—	93	130	ns	T _J =25°C, I _F =10A
Q _{rr}	Reverse Recovery Charge	—	0.34	0.65	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 Figure 11)

③ I_{SD}≤10A, di/dt≤90A/μs, V_{DD}≤V_{(BR)DSS}, T_J≤175°C

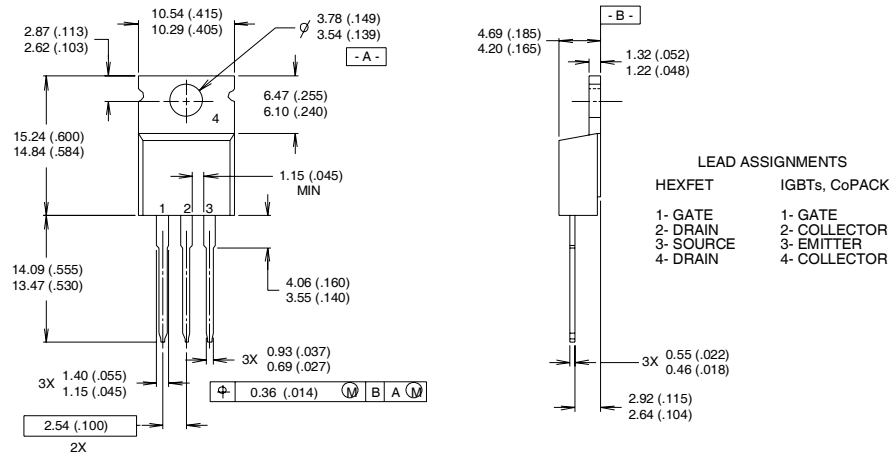
② V_{DD}=25V, starting T_J=25°C, L=793μH, R_G=25Ω, I_{AS}=10A (See Figure 12)

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

IRLZ14PbF

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"

