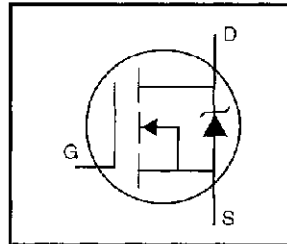


IRLZ14PbF

HEXFET® Power MOSFET

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



$$V_{DSS} = 60V$$

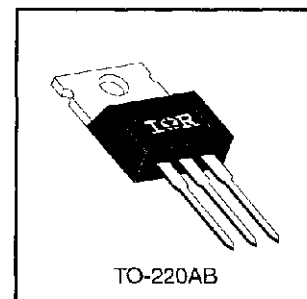
$$R_{DS(on)} = 0.20\Omega$$

$$I_D = 10A$$

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/ $^{\circ}C$
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	Operating Junction and	-55 to +175	
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds		
	Mounting Torque, 6-32 or M3 screw	300 (1.6mm from case) 10 lbf·in (1.1 N·m)	

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	3.5	$^{\circ}C/W$
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	62	

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	60	—	—	V	$V_{GS}=0V$, $I_D=250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.070	—	V/ $^\circ\text{C}$	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	$V_{DS}=V_{GS}$, $I_D=250\mu A$
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	$V_{DS}=60V$, $V_{GS}=0V$ $V_{DS}=48V$, $V_{GS}=0V$, $T_J=150^\circ\text{C}$
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	$I_D=10A$ $V_{DS}=48V$
Q_{gs}	Gate-to-Source Charge	—	—	3.5	nC	$V_{GS}=5.0V$ See Fig. 6 and 13 ④
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	6.0	nC	$V_{DD}=30V$
$t_{d(on)}$	Turn-On Delay Time	—	9.3	—	ns	$I_D=10A$
t_r	Rise Time	—	110	—	ns	$R_G=12\Omega$
$t_{d(off)}$	Turn-Off Delay Time	—	17	—	ns	$R_D=2.8\Omega$ See Figure 10 ④
t_f	Fall Time	—	28	—	ns	
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	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	$T_J=25^\circ\text{C}$, $I_S=10A$, $V_{GS}=0V$ ④
t_{rr}	Reverse Recovery Time	—	93	130	ns	$T_J=25^\circ\text{C}$, $I_F=10A$
Q_{rr}	Reverse Recovery Charge	—	0.34	0.65	μC	$di/dt=100A/\mu s$ ④
t_{on}	Forward Turn-On Time	—	—	—	ns	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 $I_{SD} \leq 10A$, $di/dt \leq 90A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 175^\circ\text{C}$

② $V_{DD}=25V$, starting $T_J=25^\circ\text{C}$, $L=793\mu H$, $R_G=25\Omega$, $I_{AS}=10A$ (See Figure 12)

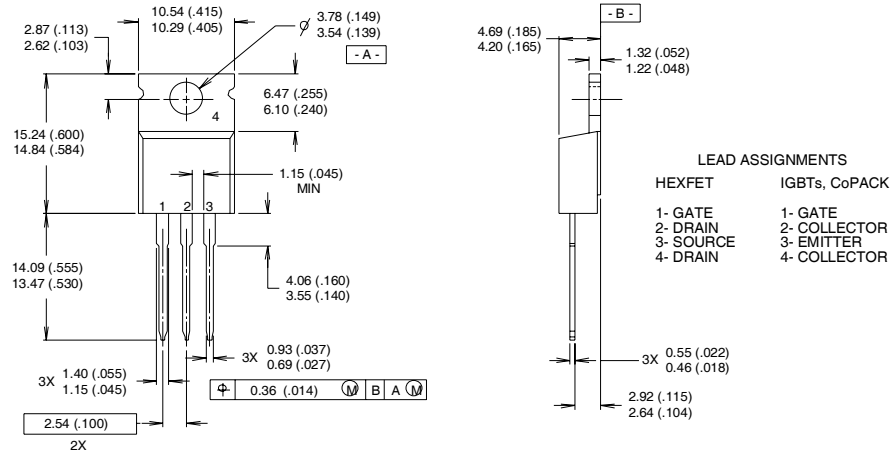
④ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

IRLZ14PbF

International
IR Rectifier

TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



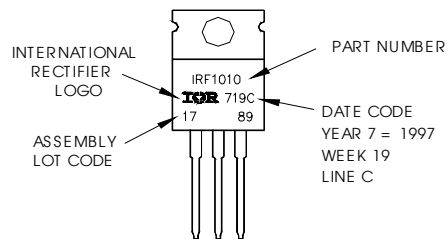
NOTES:

- 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"



International
IR Rectifier