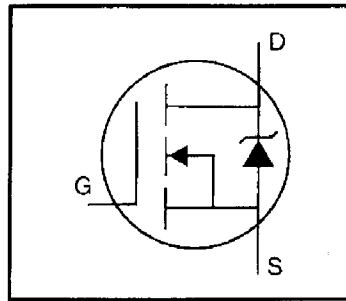


IRFZ46

HEXFET® Power MOSFET

- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements

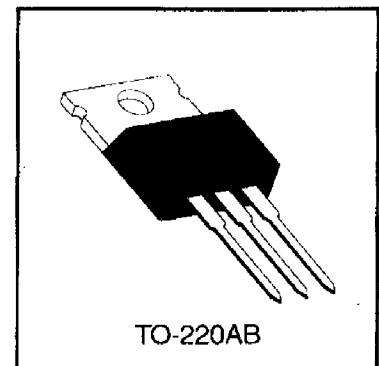


$$V_{DSS} = 50V$$

$$R_{DS(on)} = 0.024\Omega$$

$$I_D = 50^*A$$

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.



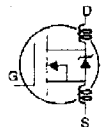
Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	50*	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	38	
I_{DM}	Pulsed Drain Current ①	220	
$P_D @ T_C = 25^\circ C$	Power Dissipation	150	W
	Linear Derating Factor	1.0	W/°C
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy ②	100	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	—	—	1.0	°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	Test Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	50	—	—	V	V _{GS} =0V, I _D =250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.057	—	V/°C	Reference to 25°C, I _D =1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	0.024	Ω	V _{GS} =10V, I _D =32A ④
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} =V _{GS} , I _D =250μA
g _{fs}	Forward Transconductance	27	—	—	S	V _{DS} =25V, I _D =32A ④
I _{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	V _{DS} =50V, V _{GS} =0V
		—	—	250		V _{DS} =48V, 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	—	—	66	nC	I _D =54A
Q _{gs}	Gate-to-Source Charge	—	—	21		V _{DS} =48V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	—	25		V _{GS} =10V See Fig. 6 and 13 ④
t _{d(on)}	Turn-On Delay Time	—	12	—	ns	V _{DD} =28V
t _r	Rise Time	—	120	—		I _D =54A
t _{d(off)}	Turn-Off Delay Time	—	42	—		R _G =9.1Ω
t _f	Fall Time	—	95	—		R _D =0.49Ω 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	—		
C _{iss}	Input Capacitance	—	1800	—	pF	V _{GS} =0V
C _{oss}	Output Capacitance	—	960	—		V _{DS} =25V
C _{rss}	Reverse Transfer Capacitance	—	160	—		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)	—	—	50*	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	220		
V _{SD}	Diode Forward Voltage	—	—	2.5	V	T _J =25°C, I _S =54A, V _{GS} =0V ④
t _{rr}	Reverse Recovery Time	—	66	99	ns	T _J =25°C, I _F =54A
Q _{rr}	Reverse Recovery Charge	—	0.17	0.31	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}≤54A, di/dt≤250A/μs, V_{DD}≤V_{(BR)DSS}, T_J≤175°C

② V_{DD}=25V, starting T_J=25°C, L=34μH, R_G=25Ω, I_{AS}=54A (See Figure 12)

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

* Current limited by the package, (Die Current =54A)