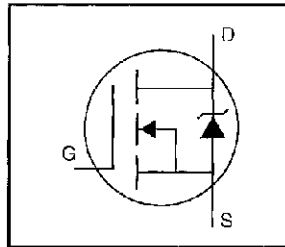


IRL520PbF

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

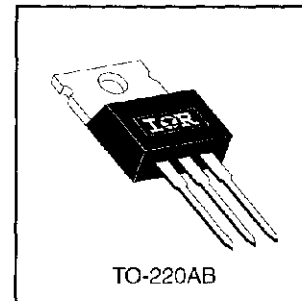


$V_{DSS} = 100V$
$R_{DS(on)} = 0.27\Omega$
$I_D = 9.2A$

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.



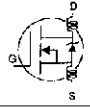
Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 5.0 V$	9.2	A
$I_D @ T_C = 100^{\circ}C$	Continuous Drain Current, $V_{GS} @ 5.0 V$	6.5	
I_{DM}	Pulsed Drain Current ①	36	
$P_D @ T_C = 25^{\circ}C$	Power Dissipation	60	W
	Linear Derating Factor	0.40	W/ $^{\circ}C$
V_{GS}	Gate-to-Source Voltage	± 10	V
E_{AS}	Single Pulse Avalanche Energy ②	170	mJ
I_{AR}	Avalanche Current ①	9.2	A
E_{AR}	Repetitive Avalanche Energy ①	6.0	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.5	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	$^{\circ}C$
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting Torque, 6-32 or M3 screw	10 lbf•in (1.1 N•m)	

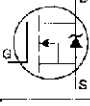
Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	2.5	$^{\circ}C/W$
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	62	

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	100	—	—	V	V _{GS} =0V, I _D =250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.12	—	V/°C	Reference to 25°C, I _D =1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	0.27 0.38	Ω	V _{GS} =5.0V, I _D =5.5A ① V _{GS} =4.0V, I _D =4.6A ②
V _{GS(th)}	Gate Threshold Voltage	1.0	—	2.0	V	V _{DS} =V _{GS} , I _D =250μA
g _{fs}	Forward Transconductance	3.2	—	—	S	V _{DS} =50V, I _D =5.5A ③
I _{DSS}	Drain-to-Source Leakage Current	—	—	25 250	μA	V _{DS} =100V, V _{GS} =0V V _{DS} =80V, V _{GS} =0V, T _J =150°C
I _{GSS}	Gate-to-Source Forward Leakage Gate-to-Source Reverse Leakage	—	—	100 -100	nA	V _{GS} =10V V _{GS} =-10V
Q _g	Total Gate Charge	—	—	12	nC	I _D =9.2A
Q _{gs}	Gate-to-Source Charge	—	—	3.0	nC	V _{DS} =80V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	—	7.1	nC	V _{GS} =5.0V See Fig. 6 and 13 ④
t _{d(on)}	Turn-On Delay Time	—	9.8	—	ns	V _{DD} =50V I _D =9.2A R _G =9.0Ω R _D =5.2Ω See Figure 10 ④
t _r	Rise Time	—	64	—		
t _{f(off)}	Turn-Off Delay Time	—	21	—		
t _f	Fall Time	—	27	—		
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	—	490	—	pF	V _{GS} =0V V _{DS} =25V f=1.0MHz See Figure 5
C _{oss}	Output Capacitance	—	150	—		
C _{rss}	Reverse Transfer Capacitance	—	30	—		

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	—	—	9.2	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	36		
V _{SD}	Diode Forward Voltage	—	—	2.5	V	T _J =25°C, I _S =9.2A, V _{GS} =0V ④
t _{rr}	Reverse Recovery Time	—	130	190	ns	T _J =25°C, I _F =9.2A
Q _{rr}	Reverse Recovery Charge	—	0.83	1.0	μC	di/dt=100A/μs ⑤
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)
- ② V_{DD}=25V, starting T_J=25°C, L=3.0mH R_G=25Ω, I_{AS}=9.2A (See Figure 12)
- ③ I_{SD}≤9.2A, di/dt≤110A/μs, V_{DD}≤V_{(BR)DSS}, T_J≤175°C
- ④ Pulse width ≤ 300 μs; duty cycle ≤2%.

