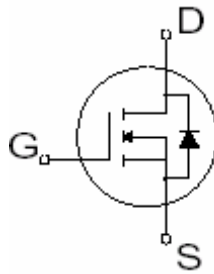


- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast switching
- Ease of Paralleling
- Simple Drive Requirements



$$V_{DSS} = 75V$$

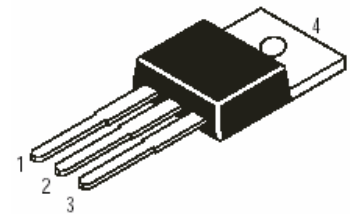
$$I_{D25} = 75A$$

$$R_{DS(ON)} = 13.0 \text{ m}\Omega$$

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 50watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.



Pin1–Gate
Pin2–Drain
Pin3–Source

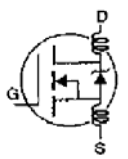
Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS}@10V$	75 ①	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS}@10V$	60	
I_{DM}	Pulsed Drain Current ②	300	
$P_D@T_C=25^\circ\text{C}$	Power Dissipation	200	W
	Linear Derating Factor	1.5	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AR}	Single Pulse Avalanche Energy ③	23	mJ
dv/dt	Peak Diode Recovery dv/dt ④	5.9	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(1.1N . m)	

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	—	0.65	°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	75	—	—	V	V _{GS} =0V, I _D =250μA
ΔV _{(BR)DSS} / ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.074	—	V/°C	Reference to 25°C, I _D =1mA
R _{DS(on)}	Static Drain-to-Source On-resistance	—	—	13.0	mΩ	V _{GS} =10V, I _D =40A ⑤
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} =V _{GS} , I _D =250μA
g _{fs}	Forward Transconductance	20	—	—	S	V _{DS} =25V, I _D =40A ⑤
I _{DSS}	Drain-to-Source Leakage current	—	—	25	μA	V _{DS} =75V, V _{GS} =0V
		—	—	250		V _{DS} =60V, 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	—	—	160	nC	I _D =40A
Q _{gs}	Gate-to-Source charge	—	—	29		V _{DS} =60V
Q _{gd}	Gate-to-Drain ("Miller") charge	—	—	55		V _{GS} =10V See Fig.6 and 13⑤
t _{d(on)}	Turn-on Delay Time	—	13	—	nS	V _{DD} =38V
t _r	Rise Time	—	64	—		I _D =40A
t _{d(off)}	Turn-Off Delay Time	—	49	—		R _G =2.5Ω
t _f	Fall Time	—	48	—		V _{GS} =10V See Figure 10⑤
L _D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm(0.25in.) from package and center of die contact
L _S	Internal Source Inductance	—	7.5	—		
C _{iss}	Input Capacitance	—	3820	—	pF	V _{GS} =0V
C _{oss}	Output Capacitance	—	610	—		V _{DS} =25V
C _{rss}	Reverse Transfer Capacitance	—	130	—		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)	—	—	75	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode) ②	—	—	300		
V _{SD}	Diode Forward Voltage	—	—	1.3	V	T _J =25°C, I _S =40A, V _{GS} =0V ⑤
t _{rr}	Reverse Recovery Time	—	100	150	nS	T _J =25°C, I _F =40A
Q _{rr}	Reverse Recovery Charge	—	410	610	nC	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 Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.
- ② Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ③ Starting T_J = 25°C, L = 370mH, R_G = 25Ω, I_{AS} = 40A, V_{GS}=10V (See Figure 12)
- ④ I_{SD} ≤ 40A, di/dt ≤ 300A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 175°C
- ⑤ Pulse width ≤ 400μs; duty cycle ≤ 2%.