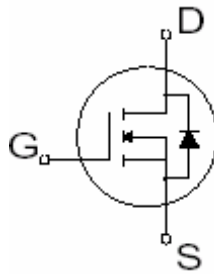


- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast switching
- Ease of Paralleling
- Simple Drive Requirements



$$V_{DSS} = 75V$$

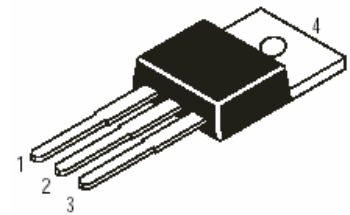
$$I_{D25} = 75A$$

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

### 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

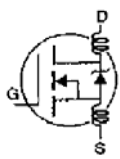
### Absolute Maximum Ratings

	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	$\pm 20$	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)	

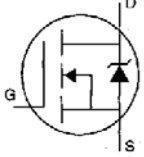
### Thermal Resistance

	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<sub>J</sub>=25 °C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source Breakdown Voltage	75	—	—	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA
$\frac{\Delta V_{(BR)DSS}}{\Delta T_J}$	Breakdown Voltage Temp. Coefficient	—	0.074	—	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-resistance	—	—	13.0	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =40A ⑤
V <sub>GS(th)</sub>	Gate Threshold Voltage	2.0	—	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
g <sub>fs</sub>	Forward Transconductance	20	—	—	S	V <sub>DS</sub> =25V, I <sub>D</sub> =40A ⑤
I <sub>DSS</sub>	Drain-to-Source Leakage current	—	—	25	μA	V <sub>DS</sub> =75V, V <sub>GS</sub> =0V
		—	—	250		V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =150°C
I <sub>GSS</sub>	Gate-to-Source Forward leakage	—	—	100	nA	V <sub>GS</sub> =20V
	Gate-to-Source Reverse leakage	—	—	-100		V <sub>GS</sub> =-20V
Q <sub>g</sub>	Total Gate Charge	—	—	160	nC	I <sub>D</sub> =40A
Q <sub>gs</sub>	Gate-to-Source charge	—	—	29		V <sub>DS</sub> =60V
Q <sub>gd</sub>	Gate-to-Drain ("Miller") charge	—	—	55		V <sub>GS</sub> =10V See Fig.6 and 13⑤
t <sub>d(on)</sub>	Turn-on Delay Time	—	13	—	nS	V <sub>DD</sub> =38V
t <sub>r</sub>	Rise Time	—	64	—		I <sub>D</sub> =40A
t <sub>d(off)</sub>	Turn-Off Delay Time	—	49	—		R <sub>G</sub> =2.5Ω
t <sub>f</sub>	Fall Time	—	48	—		V <sub>GS</sub> =10V See Figure 10⑤
L <sub>D</sub>	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm(0.25in.) from package and center of die contact
L <sub>S</sub>	Internal Source Inductance	—	7.5	—		
C <sub>iss</sub>	Input Capacitance	—	3820	—	pF	V <sub>GS</sub> =0V
C <sub>oss</sub>	Output Capacitance	—	610	—		V <sub>DS</sub> =25V
C <sub>rss</sub>	Reverse Transfer Capacitance	—	130	—		f=1.0MHz See Figure 5

### Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	75	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ②	—	—	300		
V <sub>SD</sub>	Diode Forward Voltage	—	—	1.3	V	T <sub>J</sub> =25°C, I <sub>S</sub> =40A, V <sub>GS</sub> =0V ⑤
t <sub>rr</sub>	Reverse Recovery Time	—	100	150	nS	T <sub>J</sub> =25°C, I <sub>F</sub> =40A
Q <sub>rr</sub>	Reverse Recovery Charge	—	410	610	nC	di/dt=100A/μs ⑤
t <sub>on</sub>	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by L <sub>S</sub> + L <sub>D</sub> )				

#### 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<sub>J</sub> = 25°C, L = 370mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 40A, V<sub>GS</sub>=10V (See Figure 12)
- ④ I<sub>SD</sub> ≤ 40A, di/dt ≤ 300A/μs, V<sub>DD</sub> ≤ V<sub>(BR)DSS</sub>, T<sub>J</sub> ≤ 175°C
- ⑤ Pulse width ≤ 400μs; duty cycle ≤ 2%.