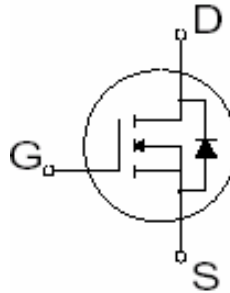


- Advanced Process Technology
- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated



$$V_{DSS} = 60V$$

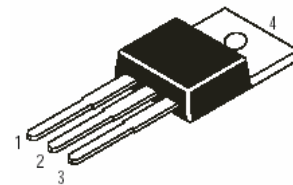
$$I_D = 84A$$

$$R_{DS(ON)} = 13m\ \Omega$$

Description

Advanced HEXFET® Power MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

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



Pin1–Gate
Pin2–Drain
Pin3–Source

Absolute Maximum Ratings

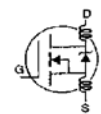
	Parameter	Max.	Units
ID @ TC = 25°C	Continuous Drain Current, VGS @ 10V	84.⑦	A
ID @ TC = 100°C	Continuous Drain Current, VGS @ 10V	59	
IDM	Pulsed Drain Current ①	330	
PD @TC = 25°C	Power Dissipation	170	W
	Linear Derating Factor	1.4	W/°C
VGS	Gate-to-Source Voltage	± 20	V
IAR	Avalanche Current①	50	A
EAR	Repetitive Avalanche Energy①	17	mJ
dv/dt	Peak Diode Recovery dv/dt . ③	4.0	V/ns
TJ TSTG	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

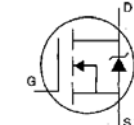
	Parameter	Typ.	Max.	Units
R _{θJC}	Junction-to-Case	—	0.75	°C/W
R _{θCS}	Case-to-Sink, Flat, Greased Surface	0.50	—	
R _{θJA}	Junction-to-Ambient	—	62	

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	60	—	—	V	V _{GS} =0V, I _D =250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.064	—	V/°C	Reference to 25°C, I _D =1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	13	mΩ	V _{GS} =10V, I _D =50A ④
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 =50A ④
I _{DSS}	Drain-to-Source Leakage current	—	—	25	μA	V _{DS} =60V, 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	—	—	130	nC	I _D =50A
Q _{gs}	Gate-to-Source charge	—	—	28		V _{DS} =48V
Q _{gd}	Gate-to-Drain ("Miller") charge	—	—	44		V _{GS} =10V See Fig.6 and 13④
t _{d(on)}	Turn-on Delay Time	—	12	—	nS	V _{DD} =30V
t _r	Rise Time	—	78	—		I _D =50A
t _{d(off)}	Turn-Off Delay Time	—	48	—		R _G =3.6Ω
t _f	Fall Time	—	53	—		V _{GS} =10V See Figure 10④
LD	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm(0.25in.) from package and center of die contact
LS	Internal Source Inductance	—	7.5	—		
C _{iss}	Input Capacitance	—	3210	—	pF	V _{GS} =0V
C _{oss}	Output Capacitance	—	690	—		V _{DS} =25V
C _{rss}	Reverse Transfer Capacitance	—	140	—		f=1.0MHz See Figure 5
EAS	Single Pulse Avalanche Energy.	—	1180	320	mJ	I _{AS} = 50A, L = 260μH



Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	—	—	84	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	330		
V _{SD}	Diode Forward Voltage	—	—	1.3	V	T _J =25°C, I _S =50A, V _{GS} =0V ④
t _{rr}	Reverse Recovery Time	—	73	110	nS	T _J =25°C, I _F =50A di/dt=100A/μs ④
Q _{rr}	Reverse Recovery Charge	—	220	330	μC	
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.
2. Starting $T_J = 25^{\circ}\text{C}$, $L = 260\mu\text{H}$
 $R_G = 25\text{W}$, $I_{AS} = 50\text{A}$, $V_{GS} = 10\text{V}$
3. $I_{SD} \leq 50\text{A}$, $di/dt \leq 230\text{A}/\mu\text{s}$, $V_{DD} \leq V(\text{BR})_{DSS}$,
 $T_J \leq 175^{\circ}\text{C}$
4. Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
5. This is a typical value at device destruction and represents operation outside rated limits.
6. This is a calculated value limited to $T_J = 175^{\circ}\text{C}$.
7. Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.