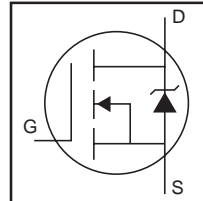


Applications

- High Efficiency Synchronous Rectification in SMPS
- Uninterruptible Power Supply
- High Speed Power Switching
- Hard Switched and High Frequency Circuits

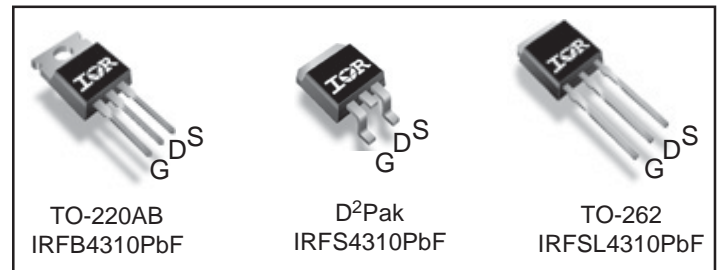
HEXFET® Power MOSFET



V_{DSS}		100V
$R_{DS(on)}$	typ.	5.6mΩ
	max.	7.0mΩ
I_D		130A

Benefits

- Improved Gate, Avalanche and Dynamic dV/dt Ruggedness
- Fully Characterized Capacitance and Avalanche SOA
- Enhanced body diode dV/dt and dI/dt Capability
- Lead-Free



Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	130①	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	92①	
I_{DM}	Pulsed Drain Current ②	550	
$P_D @ T_C = 25^\circ\text{C}$	Maximum Power Dissipation	300	W
	Linear Derating Factor	2.0	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dV/dt	Peak Diode Recovery ④	14	V/ns
T_J	Operating Junction and	-55 to +175	°C
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds (1.6mm from case)	300	
	Mounting torque, 6-32 or M3 screw	10lb·in (1.1N·m)	

Avalanche Characteristics

E_{AS} (Thermally limited)	Single Pulse Avalanche Energy ③	980	mJ
I_{AR}	Avalanche Current ①	See Fig. 14, 15, 22a, 22b,	A
E_{AR}	Repetitive Avalanche Energy ⑤		mJ

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ⑥	—	0.50	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat Greased Surface, TO-220	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient, TO-220 ⑦	—	62	
$R_{\theta JA}$	Junction-to-Ambient (PCB Mount), D²Pak ⑧⑨	—	40	

Static @ T_J = 25°C (unless otherwise specified)

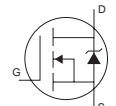
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	100	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS/ΔT_J}	Breakdown Voltage Temp. Coefficient	—	0.064	—	V/°C	Reference to 25°C, I _D = 1mA ^②
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	5.6	7.0	mΩ	V _{GS} = 10V, I _D = 75A ^③
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} = V _{GS} , I _D = 250μA
I _{DSS}	Drain-to-Source Leakage Current	—	—	20	μA	V _{DS} = 100V, V _{GS} = 0V
		—	—	250		V _{DS} = 100V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	200	nA	V _{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-200		V _{GS} = -20V
R _G	Gate Input Resistance	—	1.4	—	Ω	f = 1MHz, open drain

Dynamic @ T_J = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
gfs	Forward Transconductance	160	—	—	S	V _{DS} = 50V, I _D = 75A
Q _g	Total Gate Charge	—	170	250	nC	I _D = 75A
Q _{gs}	Gate-to-Source Charge	—	46	—		V _{DS} = 80V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	62	—		V _{GS} = 10V ^⑤
t _{d(on)}	Turn-On Delay Time	—	26	—	ns	V _{DD} = 65V
t _r	Rise Time	—	110	—		I _D = 75A
t _{d(off)}	Turn-Off Delay Time	—	68	—		R _G = 2.6Ω
t _f	Fall Time	—	78	—		V _{GS} = 10V ^⑤
C _{iss}	Input Capacitance	—	7670	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	540	—		V _{DS} = 50V
C _{rss}	Reverse Transfer Capacitance	—	280	—		f = 1.0MHz
C _{oss eff. (ER)}	Effective Output Capacitance (Energy Related) ^⑦	—	650	—		V _{GS} = 0V, V _{DS} = 0V to 80V ^⑧ , See Fig.11
C _{oss eff. (TR)}	Effective Output Capacitance (Time Related) ^⑥	—	720.1	—		V _{GS} = 0V, V _{DS} = 0V to 80V ^⑥ , See Fig. 5

Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	130 ^①	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode) ^{②⑦}	—	—	550		
V _{SD}	Diode Forward Voltage	—	—	1.3	V	T _J = 25°C, I _S = 75A, V _{GS} = 0V ^⑤
t _{rr}	Reverse Recovery Time	—	45	68	ns	T _J = 25°C V _R = 85V,
		—	55	83		T _J = 125°C I _F = 75A
Q _{rr}	Reverse Recovery Charge	—	82	120	nC	T _J = 25°C di/dt = 100A/μs ^⑤
		—	120	180		T _J = 125°C
I _{RSM}	Reverse Recovery Current	—	3.3	—	A	T _J = 25°C
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				



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.
- ③ Limited by T_{Jmax}, starting T_J = 25°C, L = 0.35mH
R_G = 25Ω, I_{AS} = 75A, V_{GS} = 10V. Part not recommended for use above this value.
- ④ I_{SD} ≤ 75A, di/dt ≤ 550A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 175°C.
- ⑤ Pulse width ≤ 400μs; duty cycle ≤ 2%.
- ⑥ C_{oss eff. (TR)} is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}.
- ⑦ C_{oss eff. (ER)} is a fixed capacitance that gives the same energy as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}.
- ⑧ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.
- ⑨ R_θ is measured at T_J approximately 90°C.

