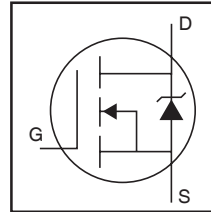


IRF1018EPbF
IRF1018ESPbF
IRF1018ESLPbF

HEXFET® Power MOSFET

Applications

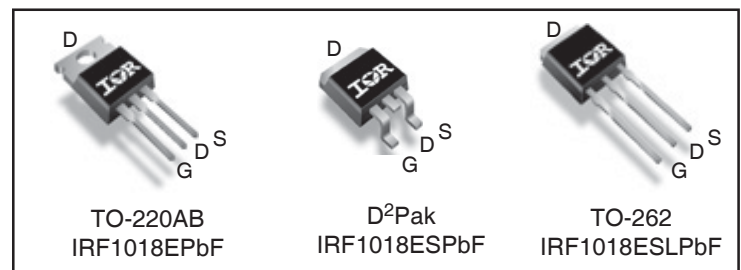
- High Efficiency Synchronous Rectification in SMPS
- Uninterruptible Power Supply
- High Speed Power Switching
- Hard Switched and High Frequency Circuits



V_{DSS}		60V
$R_{DS(on)}$	typ.	7.1mΩ
	max.	8.4mΩ
I_D		79A

Benefits

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



G	D	S
Gate	Drain	Source

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	79	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	56	
I_{DM}	Pulsed Drain Current ①	315	
$P_D @ T_C = 25^\circ\text{C}$	Maximum Power Dissipation	110	W
	Linear Derating Factor	0.76	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery ③	21	V/ns
T_J	Operating Junction and Storage Temperature Range	-55 to + 175	°C
T_{STG}			
	Soldering Temperature, for 10 seconds (1.6mm from case)	300	
	Mounting torque, 6-32 or M3 screw ④	10lb·in (1.1N·m)	

Avalanche Characteristics

E_{AS} (Thermally limited)	Single Pulse Avalanche Energy ②	88	mJ
I_{AR}	Avalanche Current ①	47	A
E_{AR}	Repetitive Avalanche Energy ④	11	mJ

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ⑥	—	1.32	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat Greased Surface, TO-220	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient, TO-220 ⑥	—	62	
$R_{\theta JA}$	Junction-to-Ambient (PCB Mount), D²Pak ⑦⑧	—	40	

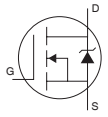
Static @ T_J = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	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	—	0.073	—	V/°C	Reference to 25°C, I _D = 5mA ^①
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	7.1	8.4	mΩ	V _{DS} = 10V, I _D = 47A ^④
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} = V _{GS} , I _D = 100μA
I _{DSS}	Drain-to-Source Leakage Current	—	—	20	μA	V _{DS} = 60V, V _{GS} = 0V
		—	—	250		V _{DS} = 48V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V _{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V _{GS} = -20V

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
g _{fs}	Forward Transconductance	110	—	—	S	V _{DS} = 50V, I _D = 47A
Q _g	Total Gate Charge	—	46	69	nC	I _D = 47A
Q _{gs}	Gate-to-Source Charge	—	10	—		V _{DS} = 30V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	12	—		V _{GS} = 10V ^④
Q _{sync}	Total Gate Charge Sync. (Q _g - Q _{gd})	—	34	—		I _D = 47A, V _{DS} = 0V, V _{GS} = 10V
R _{G(int)}	Internal Gate Resistance	—	0.73	—	Ω	
t _{d(on)}	Turn-On Delay Time	—	13	—	ns	V _{DD} = 39V
t _r	Rise Time	—	35	—		I _D = 47A
t _{d(off)}	Turn-Off Delay Time	—	55	—		R _G = 10Ω
t _f	Fall Time	—	46	—		V _{GS} = 10V ^④
C _{iss}	Input Capacitance	—	2290	—		V _{GS} = 0V
C _{oss}	Output Capacitance	—	270	—		V _{DS} = 50V
C _{rss}	Reverse Transfer Capacitance	—	130	—	pF	f = 1.0MHz
C _{oss eff. (ER)}	Effective Output Capacitance (Energy Related) ^⑥	—	390	—		V _{GS} = 0V, V _{DS} = 0V to 60V ^⑥
C _{oss eff. (TR)}	Effective Output Capacitance (Time Related) ^⑤	—	630	—		V _{GS} = 0V, V _{DS} = 0V to 60V ^⑤

Diode Characteristics

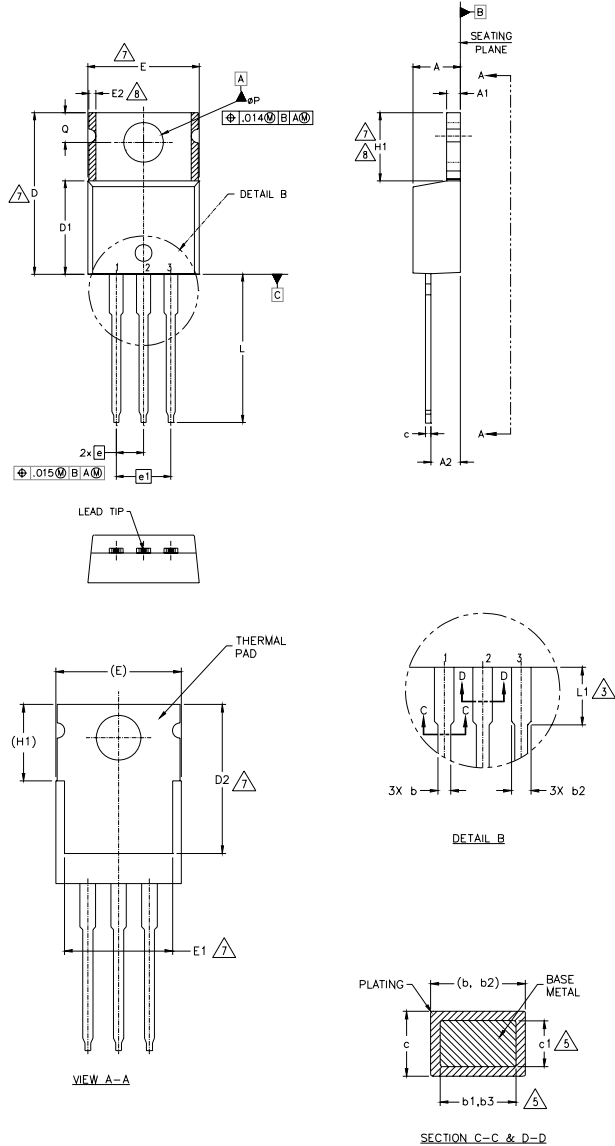
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	79	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ^①	—	—	315		
V _{SD}	Diode Forward Voltage	—	—	1.3	V	T _J = 25°C, I _S = 47A, V _{GS} = 0V ^④
t _{rr}	Reverse Recovery Time	—	26	39	ns	T _J = 25°C V _R = 51V, T _J = 125°C I _F = 47A
Q _{rr}	Reverse Recovery Charge	—	24	36	nC	T _J = 25°C T _J = 125°C
I _{RRM}	Reverse Recovery Current	—	1.8	—	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 Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.08mH
R_G = 25Ω, I_{AS} = 47A, V_{GS} = 10V. Part not recommended for use above this value.
- ③ I_{SD} ≤ 47A, di/dt ≤ 1668A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 175°C.
- ④ Pulse width ≤ 400μs; duty cycle ≤ 2%.
- ⑤ 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}.
- ⑥ 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}.
- ⑦ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.
- ⑧ R_θ is measured at T_J approximately 90°C.
- ⑨ This is only applied to TO-220

TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



NOTES:

- 1.- DIMENSIONING AND TOLERANCING AS PER ASME Y14.5 M- 1994.
- 2.- DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS].
- 3.- LEAD DIMENSION AND FINISH UNCONTROLLED IN L1.
- 4.- DIMENSION D, D1 & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- 5.- DIMENSION b1, b3 & c1 APPLY TO BASE METAL ONLY.
- 6.- CONTROLLING DIMENSION : INCHES.
- 7.- THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS E,H1,D2 & E1
- 8.- DIMENSION E2 X H1 DEFINE A ZONE WHERE STAMPING AND SINGULATION IRREGULARITIES ARE ALLOWED.
- 9.- OUTLINE CONFORMS TO JEDEC TO-220, EXCEPT A2 (max.) AND D2 (min.) WHERE DIMENSIONS ARE DERIVED FROM THE ACTUAL PACKAGE OUTLINE.

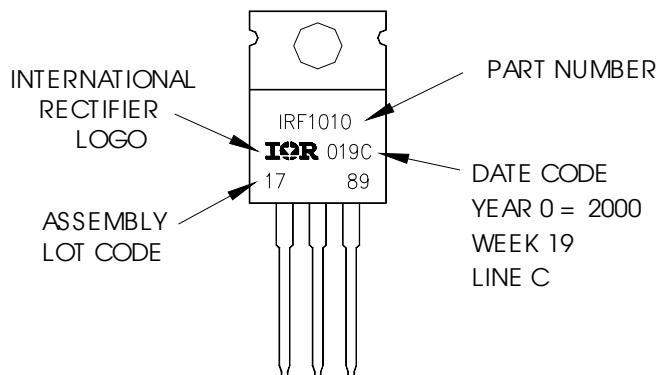
SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	3.56	4.83	.140	.190	
A1	0.51	1.40	.020	.055	
A2	2.03	2.92	.080	.115	
b	0.38	1.01	.015	.040	
b1	0.38	0.97	.015	.038	5
b2	1.14	1.78	.045	.070	
b3	1.14	1.73	.045	.068	5
c	0.36	0.61	.014	.024	
c1	0.36	0.56	.014	.022	5
D	14.22	16.51	.560	.650	4
D1	8.38	9.02	.330	.355	
D2	11.68	12.88	.460	.507	7
E	9.65	10.67	.380	.420	4,7
E1	6.86	8.89	.270	.350	7
E2	-	0.76	-	.030	8
e	2.54 BSC		.100 BSC		
e1	5.08 BSC		.200 BSC		
H1	5.84	6.86	.230	.270	7,8
L	12.70	14.73	.500	.580	
L1	3.56	4.06	.140	.160	3
φP	3.54	4.08	.139	.161	
Q	2.54	3.42	.100	.135	

- LEAD ASSIGNMENTS
- HEXFET
- 1.- GATE
 - 2.- DRAIN
 - 3.- SOURCE
- IGBTs, CoPACK
- 1.- GATE
 - 2.- COLLECTOR
 - 3.- EMITTER
- DIODES
- 1.- ANODE
 - 2.- CATHODE
 - 3.- ANODE

TO-220AB Part Marking Information

EXAMPLE: THIS IS AN IRF1010
 LOT CODE 1789
 ASSEMBLED ON WW 19, 2000
 IN THE ASSEMBLY LINE "C"

Note: "P" in assembly line position indicates "Lead - Free"



TO-220AB packages are not recommended for Surface Mount Application.