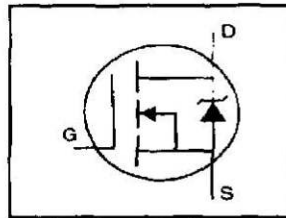


# IRF740LCPbF

## HEXFET® Power MOSFET

- Ultra Low Gate Charge
- Reduced Gate Drive Requirement
- Enhanced 30V VGS Rating
- Reduced Ciss, Coss, Crss
- Extremely High Frequency Operation
- Repetitive Avalanche Rated
- Lead-Free



$$V_{DSS} = 400V$$

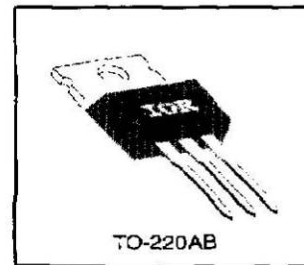
$$R_{DS(on)} = 0.55\Omega$$

$$I_D = 10A$$

### Description

This new series of Low Charge HEXFETs achieve significantly lower gate charge over conventional MOSFETs. Utilizing the new LCDMOS technology, the device improvements are achieved without added product cost, allowing for reduced gate drive requirements and total system savings. In addition, reduced switching losses and improved efficiency are achievable in a variety of high frequency applications. Frequencies of a few MHz at high current are possible using the new Low Charge MOSFETs.

These device improvements combined with the proven ruggedness and reliability that are characteristic of HEXFETs offer the designer a new standard in power transistors for switching applications.



### Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D$ @ $T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	10	A
$I_D$ @ $T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	6.3	
$I_{DM}$	Pulsed Drain Current ①	32	
$P_D$ @ $T_C = 25^\circ C$	Power Dissipation	125	W
	Linear Derating Factor	1.0	W/°C
$V_{GS}$	Gate-to-Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulse Avalanche Energy ②	520	mJ
$I_{AR}$	Avalanche Current ③	10	A
$E_{AR}$	Repetitive Avalanche Energy ④	13	mJ
$dv/dt$	Peak Diode Recovery $dv/dt$ ⑤	4.0	V/ns
$T_J$	Operating Junction and	-55 to +150	°C
$T_{STG}$	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting Torque, 6-32 or M3 screw	10 lbf.in (1.1 N.m)	

### Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	1.0	°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>	400	—	—	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub>	—	0.76	—	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
R <sub>DSON</sub>	—	—	0.55	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =6.0A ④
V <sub>GS(th)</sub>	2.0	—	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
g <sub>fs</sub>	3.0	—	—	S	V <sub>DS</sub> =50V, I <sub>D</sub> =6.0A ④
I <sub>DSS</sub>	—	—	25	μA	V <sub>DS</sub> =400V, V <sub>GS</sub> =0V
	—	—	250	μA	V <sub>DS</sub> =320V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C
I <sub>GSS</sub>	—	—	100	nA	V <sub>GS</sub> =20V
	—	—	-100	nA	V <sub>GS</sub> =-20V
Q <sub>g</sub>	—	—	39	nC	I <sub>D</sub> =10A
Q <sub>gs</sub>	—	—	10	nC	V <sub>DS</sub> =320V
Q <sub>gd</sub>	—	—	19	nC	V <sub>GS</sub> =10V See Fig. 6 and 13 ④
t <sub>d(on)</sub>	—	11	—	ns	V <sub>DD</sub> =200V
t <sub>r</sub>	—	31	—	ns	I <sub>D</sub> =10A
t <sub>d(off)</sub>	—	25	—	ns	R <sub>G</sub> =9.1Ω
t <sub>f</sub>	—	20	—	ns	R <sub>D</sub> =20Ω See Figure 10 ④
L <sub>D</sub>	—	4.5	—	nH	Between lead, 6 mm (0.25in.) from package and center of die contact
L <sub>S</sub>	—	7.5	—	nH	
C <sub>iss</sub>	—	1100	—	pF	V <sub>GS</sub> =0V
C <sub>oss</sub>	—	190	—	pF	V <sub>DS</sub> =25V
C <sub>rss</sub>	—	18	—	pF	f=1.0MHz See Figure 5

### Source-Drain Ratings and Characteristics

Parameter	Min.	Typ.	Max.	Units	Test Conditions
I <sub>S</sub>	—	—	10	A	MOSFET symbol showing the integral reverse p-n junction diode.
I <sub>SM</sub>	—	—	32	A	
V <sub>SD</sub>	—	—	2.0	V	T <sub>J</sub> =25°C, I <sub>S</sub> =10A, V <sub>GS</sub> =0V ④
t <sub>rr</sub>	—	380	570	ns	T <sub>J</sub> =25°C, I <sub>F</sub> =10A
Q <sub>rr</sub>	—	2.8	4.2	μC	di/dt=100A/μs ④
t <sub>on</sub>	Intrinsic turn-on time is negligible (turn-on is dominated by L <sub>S</sub> +L <sub>D</sub> )				

#### Notes:

① Repetitive rating; pulse width limited by max. junction temperature (See Figure 11)

② V<sub>DD</sub>=50V, starting T<sub>J</sub>=25°C, L=9.1mH R<sub>G</sub>=25Ω, I<sub>AS</sub>=10A (See Figure 12)

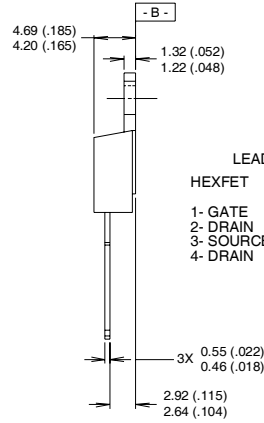
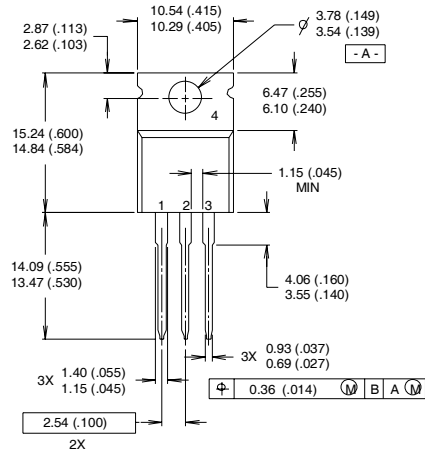
③ I<sub>DS</sub>≤10A, di/dts≤120A/μs, V<sub>DS</sub>≤V<sub>(BR)DSS</sub>, T<sub>J</sub>≤150°C

④ Pulse width ≤ 300 μs; duty cycle ≤2%.

# IRF740LCPbF

## TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



LEAD ASSIGNMENTS

HEXFET	IGBTs, CoPACK
1- GATE	1- GATE
2- DRAIN	2- COLLECTOR
3- SOURCE	3- EMITTER
4- DRAIN	4- COLLECTOR

NOTES:

- 1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
- 2 CONTROLLING DIMENSION : INCH

- 3 OUTLINE CONFORMS TO JEDEC OUTLINE TO-220AB.
- 4 HEATSINK & LEAD MEASUREMENTS DO NOT INCLUDE BURRS.

## TO-220AB Part Marking Information

EXAMPLE: THIS IS AN IRF1010  
 LOT CODE 1789  
 ASSEMBLED ON WW 19, 1997  
 IN THE ASSEMBLY LINE "C"  
**Note:** "P" in assembly line  
 position indicates "Lead-Free"

