



## Description

The IRF740PBF uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

## General Features

$V_{DS} = 420V, I_D = 11A$

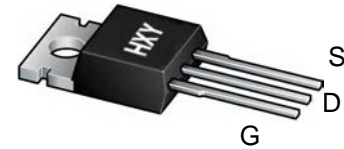
$R_{DS(ON)} < 0.5\Omega @ V_{GS} = 10V$

## Application

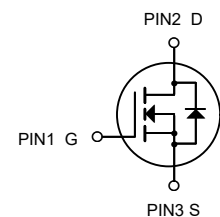
High efficiency switch mode power supplies

Power factor correction

Electronic lamp ballast



TO-220  
(TO-220AB)



N-Channel MOSFET

## Package Marking and Ordering Information

Product ID	Pack	Marking	Units Tube
IRF740PBF	TO-220(TO-220AB)	IRF740 XXXX	50

## Absolute Maximum Ratings@ $T_J = 25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	420	V
VGS	Gate-Source Voltage	$\pm 30$	V
$I_D @ T_C = 25^\circ C$	Drain Current, $V_{GS} @ 4.5V$	11	A
IDM	Pulsed Drain Current <sup>1</sup>	44	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	87	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$



**Electrical Characteristics** ( $T_C=25^{\circ}\text{C}$ , unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	420			V
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V			1	μA
Gate- Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =30V, V <sub>DS</sub> = 0V			100	nA
	Reverse		V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V			-100	nA
On Characteristics							
Gate Threshold Voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =1A		0.36	0.5	Ω
Dynamic Characteristics							
Input Capacitance		C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0 MHz		1368		pF
Output Capacitance		C <sub>OSS</sub>			90.3		pF
Reverse Transfer Capacitance		C <sub>RSS</sub>			3		pF
Switching Characteristics							
Turn-On Delay Time		t <sub>D(ON)</sub>	V <sub>DD</sub> =250V, I <sub>D</sub> =10A, R <sub>G</sub> =25Ω (Note 1, 2)		16		ns
Turn-On Rise Time		t <sub>R</sub>			25		ns
Turn-Off Delay Time		t <sub>D(OFF)</sub>			40		ns
Turn-Off Fall Time		t <sub>F</sub>			29		ns
Total Gate Charge		Q <sub>G</sub>	V <sub>DS</sub> =480V, I <sub>D</sub> =12A, V <sub>GS</sub> =10V (Note 1, 2)		8.1		nC
Gate-Source Charge		Q <sub>GS</sub>			7.4		nC
Gate-Drain Charge		Q <sub>GD</sub>			5		nC
Drain-Source Diode Characteristics And Maximum Ratings							
Drain-Source Diode Forward Voltage		V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 11A			1.2	V
Maximum Continuous Drain-Source Diode Forward Current		I <sub>S</sub>				11	A
Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>				44	A
Reverse Recovery Time		t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =12A,		435		ns
Reverse Recovery Charge		Q <sub>RR</sub>	di <sub>F</sub> /dt =100 A/μs (Note 1)		4		μC

Notes: 1. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating temperature.



## Typical Characteristics:

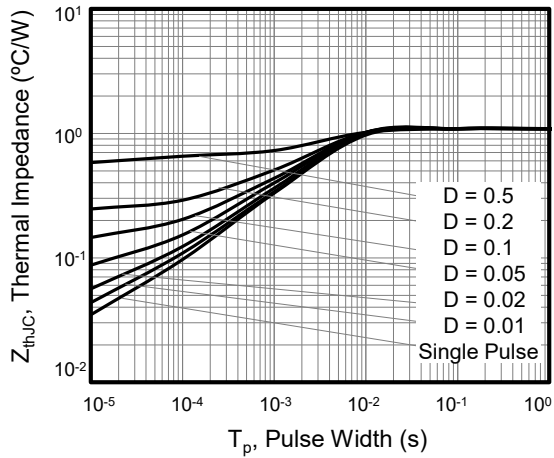


Figure 1. Transient Thermal Impedance

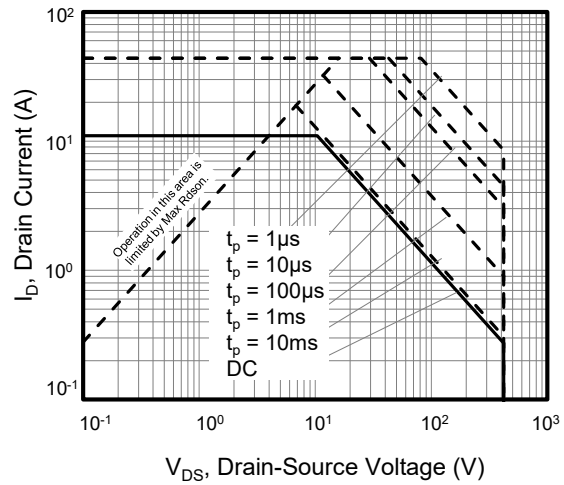


Figure 2. Safe Operation Area

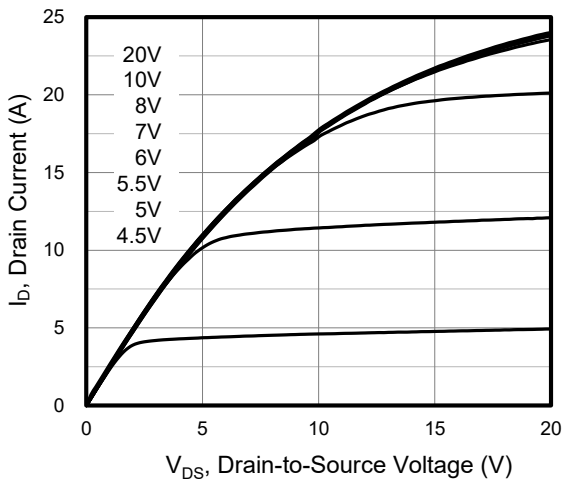


Figure 3. Output Characteristics

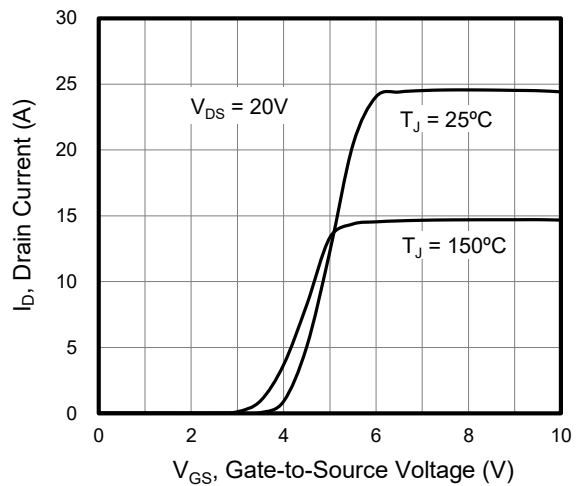


Figure 4. Transfer Characteristics

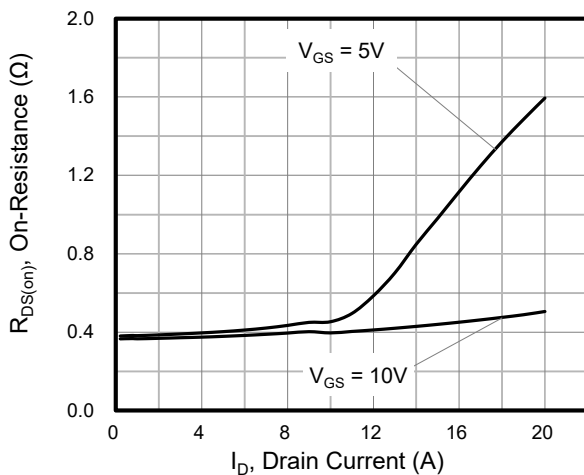


Figure 5. On-Resistance vs Drain Current

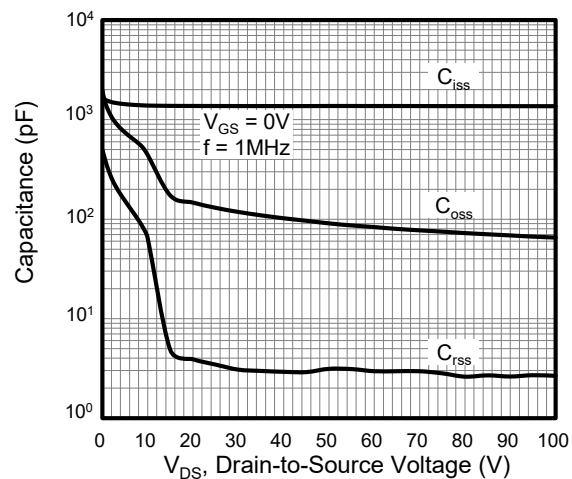


Figure 6. Capacitance

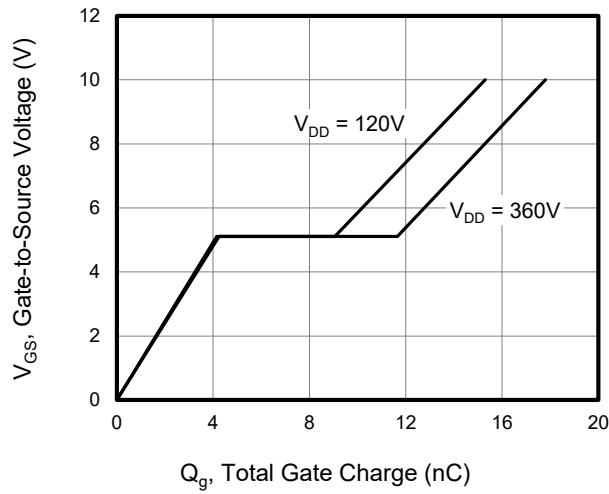


Figure 7. Gate Charge

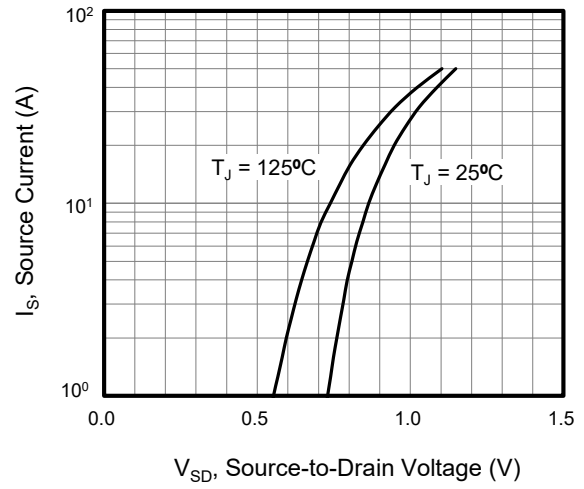


Figure 8. Body Diode Forward Voltage

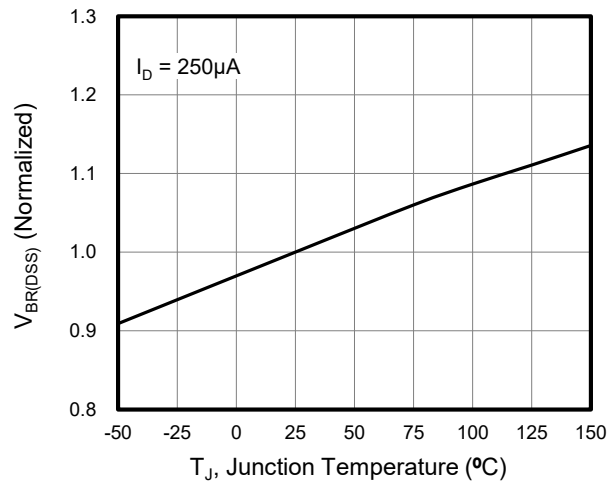


Figure 9. Breakdown Voltage vs Junction Temperature

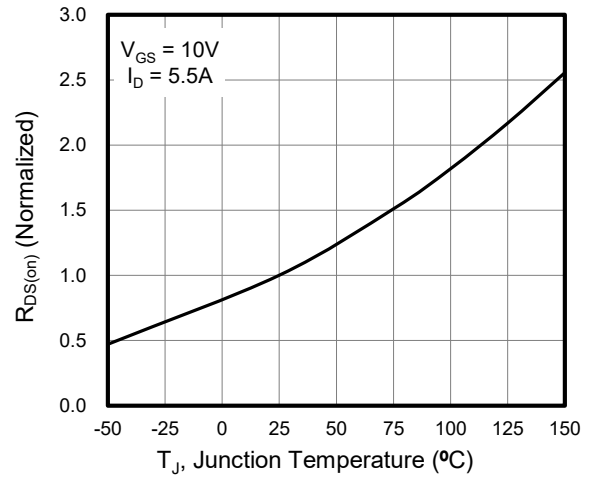
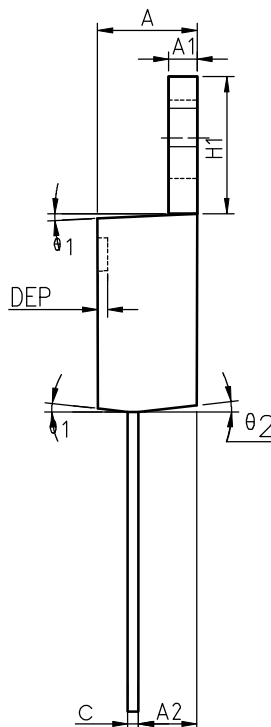
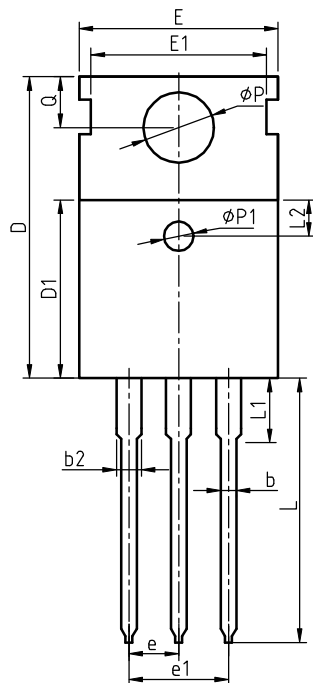


Figure 10. On-Resistance vs Temperature



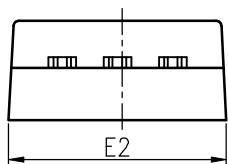
## Package Information

### TO-220(TO-220AB)



COMMON DIMENSIONS

SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.27	1.30	1.33	0.050	0.051	0.052
A2	2.35	2.40	2.50	0.093	0.094	0.098
b	0.77	0.80	0.90	0.030	0.031	0.035
b2	1.17	1.27	1.36	0.046	0.050	0.054
c	0.48	0.50	0.56	0.019	0.020	0.022
D	15.40	15.60	15.80	0.606	0.614	0.622
D1	9.00	9.10	9.20	0.354	0.358	0.362
DEP	0.05	0.10	0.20	0.002	0.004	0.008
E	9.80	10.00	10.20	0.386	0.394	0.402
E1	-	8.70	-	-	0.343	-
E2	9.80	10.00	10.20	0.386	0.394	0.402
e		2.54	BSC		0.100	BSC
e1		5.08	BSC		0.200	BSC
H1	6.40	6.50	6.60	0.252	0.256	0.260
L	12.75	13.50	13.65	0.502	0.531	0.537
L1	-	3.10	3.30	-	0.122	0.130
L2		2.50	REF		0.098	REF
P	3.50	3.60	3.63	0.138	0.142	0.143
P1	3.50	3.60	3.63	0.138	0.142	0.143
Q	2.73	2.80	2.87	0.107	0.110	0.113
θ 1	5°	7°	9°	5°	7°	9°
θ 2	1°	3°	5°	1°	3°	5°
θ 3	1°	3°	5°	1°	3°	5°





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