



Description

The IRF830PBF can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-220C, which accords with the RoHS standard.

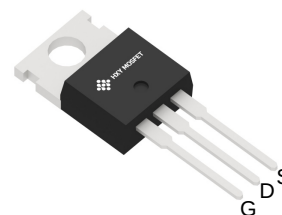
General Features

$V_{DS} = 500V, I_D = 4.5A$

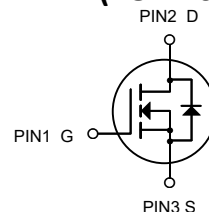
$R_{DS(ON)} < 1.5\Omega @ V_{GS}=10V$

Application

- Power switch circuit of adaptor and charger.



TO-220C
(TO-220AB)



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Units Tube
IRF830PBF	TO-220C(TO-220AB)	HXY MOSFET	50

Absolute Maximum Ratings@T =25°C(unless otherwise specified)

Symbol	Parameter	Limit	Unit
V_{DSS}	Drain-to-Source Voltage	500	V
V_{GSS}	Gate-to-Source Voltage	± 30	
I_D	Continuous Drain Current ^[1]	4.5	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current @ $T_c = 100^\circ C$	2.6	
I_{DM}	Pulsed Drain Current at $V_{GS} = 10V$ ^{[1][2]}	16	
E_{AS}	Single Pulse Avalanche Energy ^[3]	315	mJ
P_D	Power Dissipation ^[1]	139	W
$T_J \& T_{STG}$	Operating and Storage Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case ^[1]	0.9	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ^[6]	77	



Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

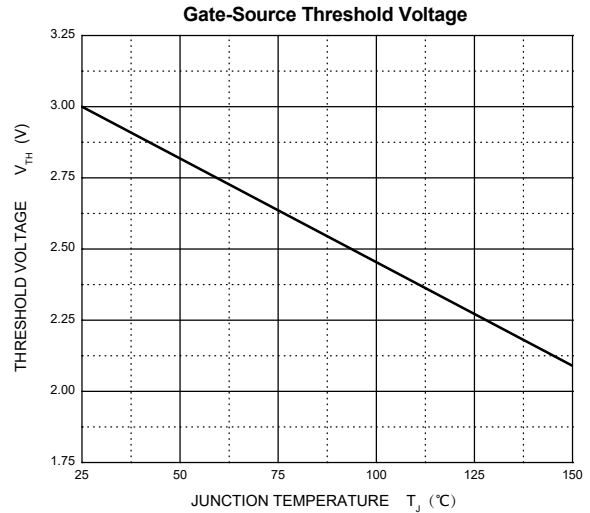
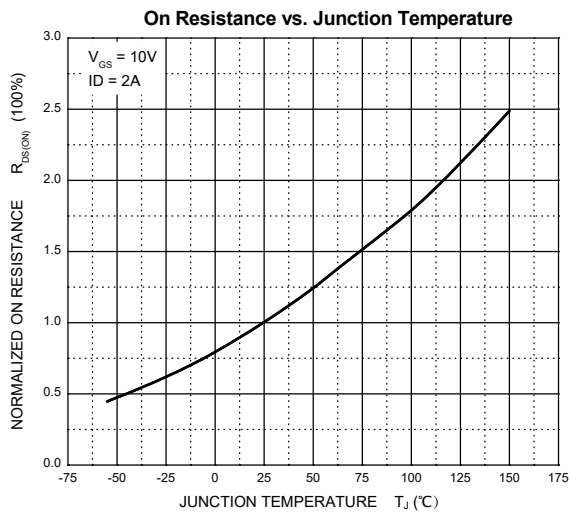
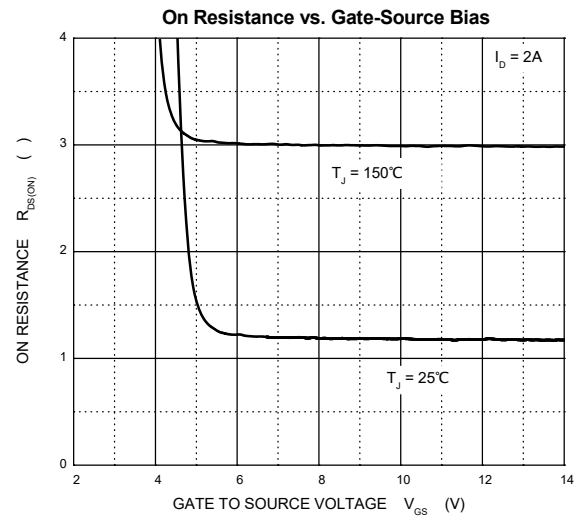
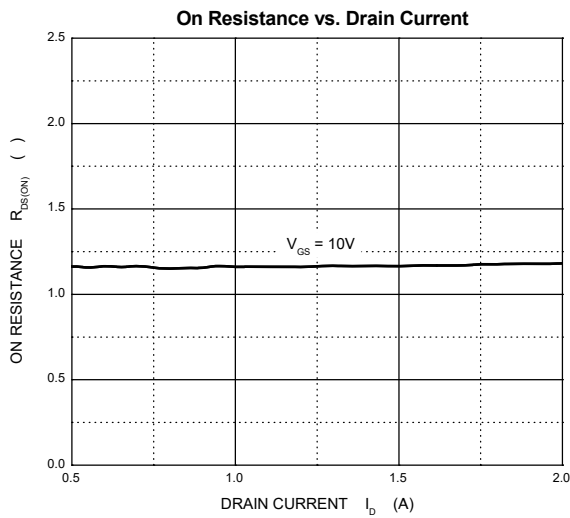
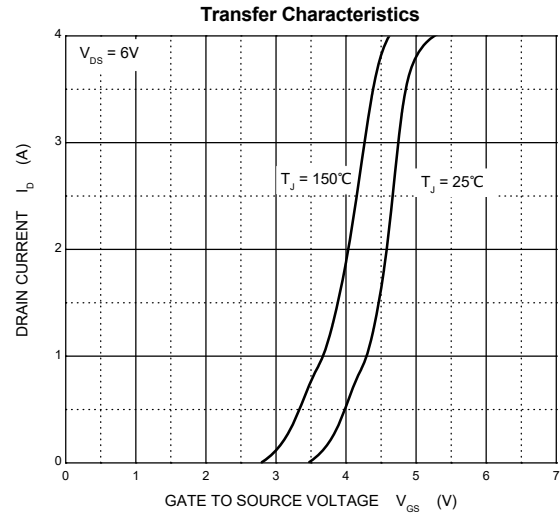
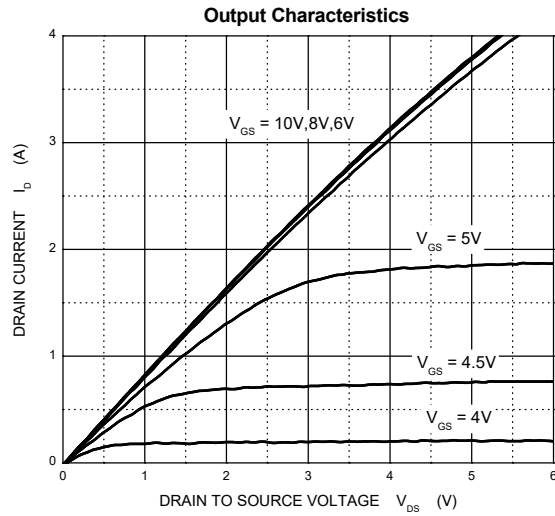
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =1mA		500	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =500V, V _{GS} =0V	T _J =25°C	-	-	1.0	μA
			T _J =125°C	-	-	100	
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =± 30V		-	-	±100	nA
On characteristics ^[4]							
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA		2.0	3.0	4.0	V
Static drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =2A		-	1.2	1.5	Ω
Dynamic characteristics ^[5]							
Input capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =1MHz		-	639	-	pF
Output capacitance	C _{oss}			-	41	-	
Reverse transfer capacitance	C _{rss}			-	2	-	
Gate resistance	R _g	f =1MHz		-	2.8	-	Ω
Switching characteristics ^[5]							
Total gate charge	Q _g	V _{DS} =50V, V _{GS} =10V, I _D =4A		-	10	-	nC
Gate-source charge	Q _{gs}			-	3	-	
Gate-drain charge	Q _{gd}			-	2	-	
Turn-on delay time	t _{d(on)}	V _{DD} =250V, V _{GS} =10V, R _G =10Ω, I _D =10A		-	7	-	ns
Turn-on rise time	t _r			-	5	-	
Turn-off delay time	t _{d(off)}			-	13	-	
Turn-off fall time	t _f			-	5	-	
Drain-Source Diode Characteristics							
Drain-source diode forward voltage ^[4]	V _{SD}	V _{GS} =0V, I _S =4A		-	-	1.2	V
Maximum continuous drain-source diode forward current ^[1]	I _S			-	-	4	A
Maximum pulsed drain-source diode forward current ^{[1][2]}	I _{SM}			-	-	16	A
Reverse recovery time	t _{rr}	dIF/dt = 100A/μs, I _S =10A, V _{DD} = 50V		-	196	-	ns
Reverse recovery charge	Q _{rr}			-	1131	-	nC

Notes :

1. $T_C=25^\circ\text{C}$ Limited only by maximum temperature allowed.
2. $P_W \leq 10\mu s$, Duty cycle $\leq 1\%$.
3. EAS condition: $V_{DD}=50V, V_{GS}=10V, L=10mH, R_g=25\Omega$, Starting $T_J = 25^\circ\text{C}$.
4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. Guaranteed by design, not subject to production.
6. The value of $R_{\theta JA}$ is measured with the device in a still air environment with $T_a=25^\circ\text{C}$

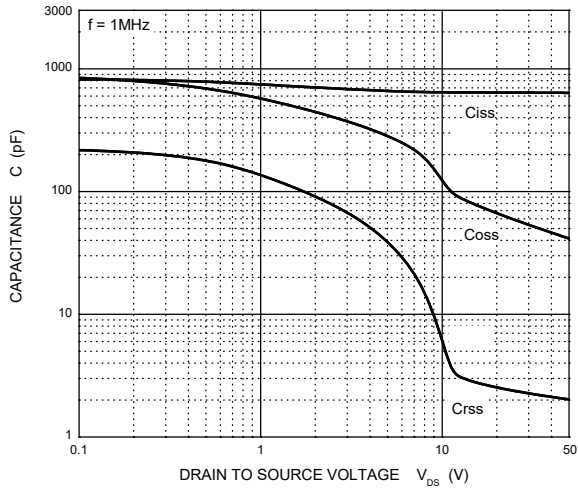


Typical Characteristics

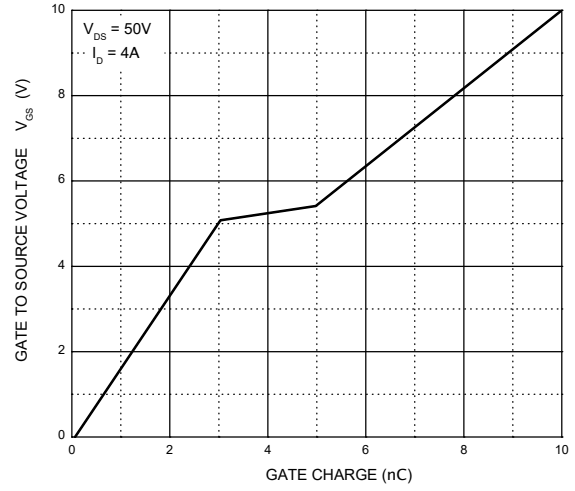




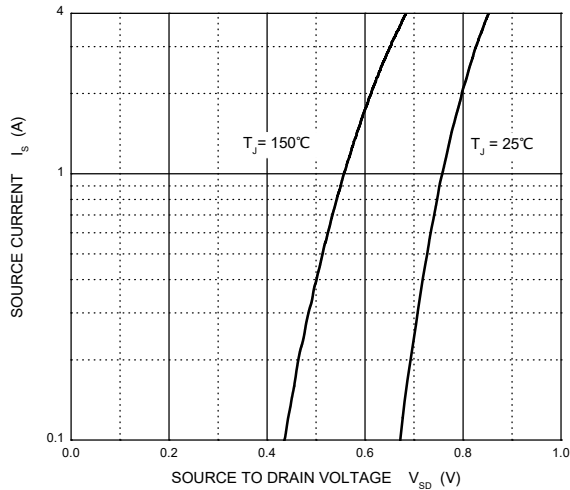
Typical Capacitances



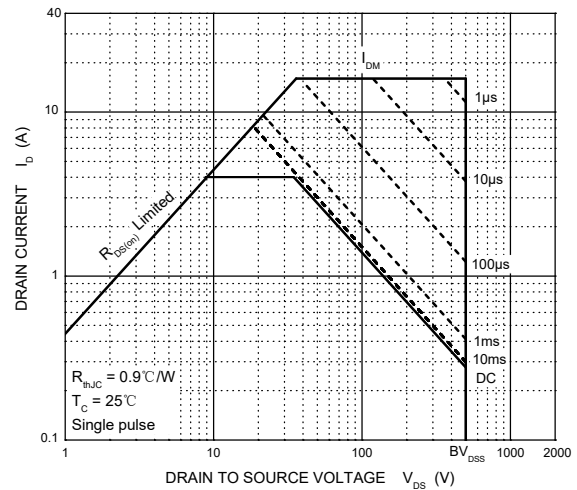
Gate Charge



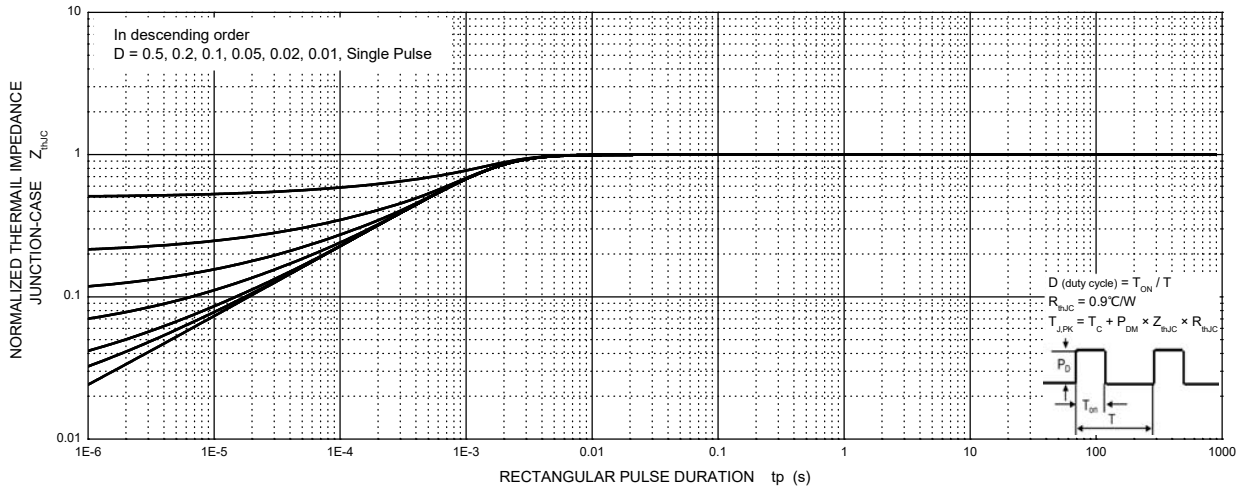
Source-Drain Diode Forward Characteristics



Maximum Safe Operating Area

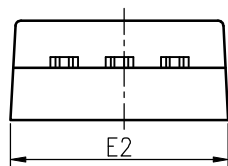
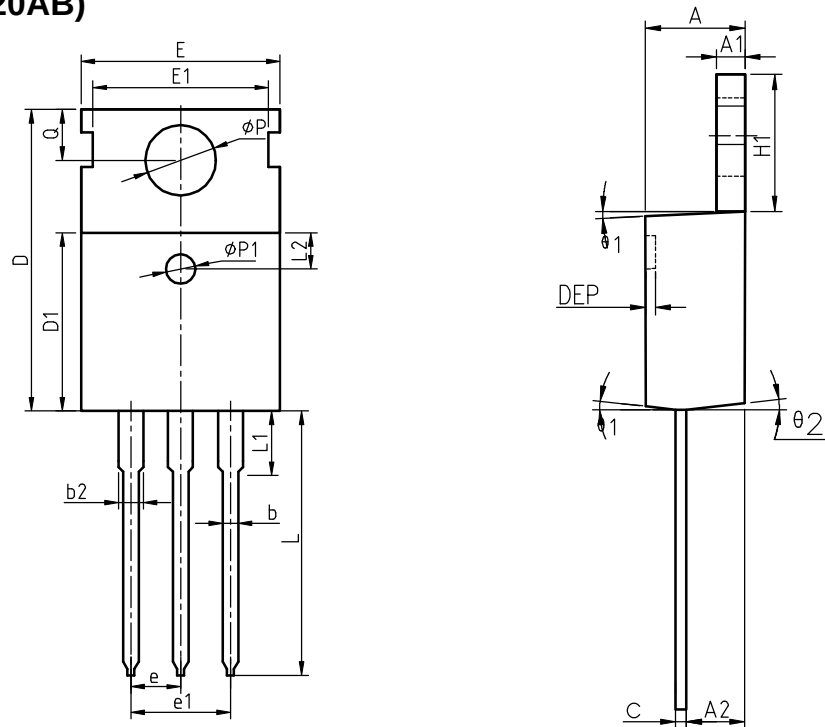


Transient Thermal Impedance, Junction-Case





Package Information
TO-220C(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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