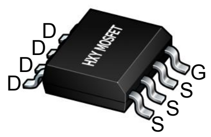
Description

The IRF7413PBF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOP-8

General Features

V_{DS} = 30V I_D =15A

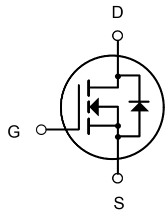
$R_{DS(ON)}$ < 10mΩ @ V_{GS}=10V

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IRF7413PBF	SOP-8	HXY MOSFET	3000

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25°C	Continuous Drain Current[1]	15	A
I_D@T_A=70°C	Continuous Drain Current[1]	8	A
I_{DM}	Pulsed Drain Current[2]	45	A
EAS	Single Pulse Avalanche Energy[3]	12	mJ
P_D@T_A=25°C	Total Power Dissipation[4]	15	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-ambient[1](t≤10s)	85	°C/W
	Thermal Resistance Junction-ambient[1]	25	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
△BV_{DSS}/△T_J	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.034	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=7A	---	8	10	mΩ
		V_{GS}=4.5V , I_D=4A	---	12	15	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.4	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-3.84	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=7A	---	6.2	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.04	2.1	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=7A	---	6	8.4	nC
Q_{gs}	Gate-Source Charge		---	2.2	3.1	
Q_{gd}	Gate-Drain Charge		---	2	2.8	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=7A	---	1.2	2.4	ns
T_r	Rise Time		---	40	72.0	
$T_{d(off)}$	Turn-Off Delay Time		---	18	36.0	
T_f	Fall Time		---	7.2	14.4	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	983	1616	pF
C_{oss}	Output Capacitance		---	147	207.8	
C_{rss}	Reverse Transfer Capacitance		---	109	162.6	
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	7	A
I_{SM}	Pulsed Source Current[2,5]		---	---	35	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I_F=7A , dI/dt=100A/µs , T_J=25℃	---	7.2	---	nS
Q_{rr}	Reverse Recovery Charge		---	2.9	---	nC

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=20A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

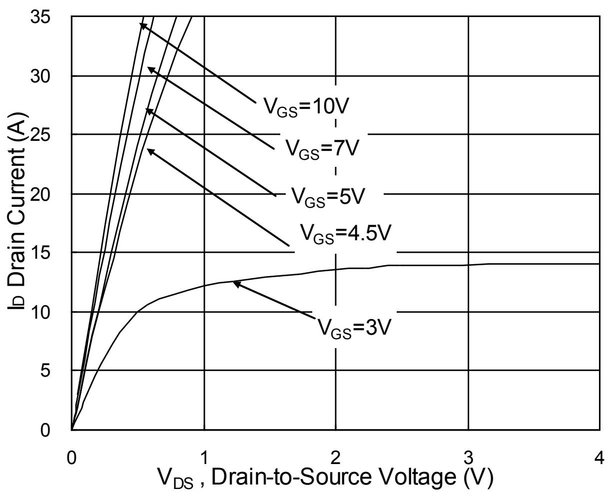


Fig.1 Typical Output Characteristics

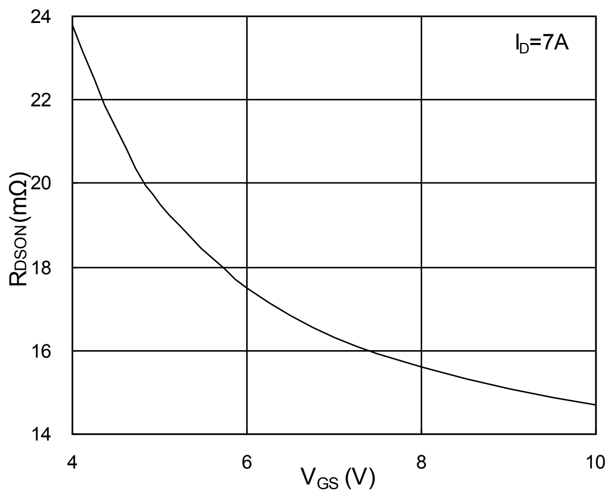


Fig.2 On-Resistance vs. Gate-Source

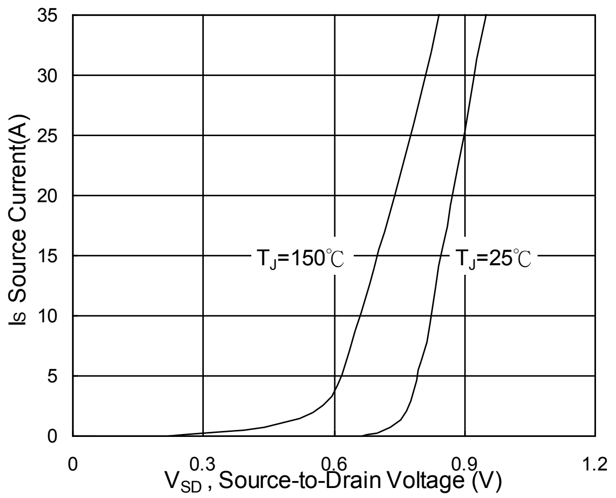


Fig.3 Forward Characteristics Of Reverse

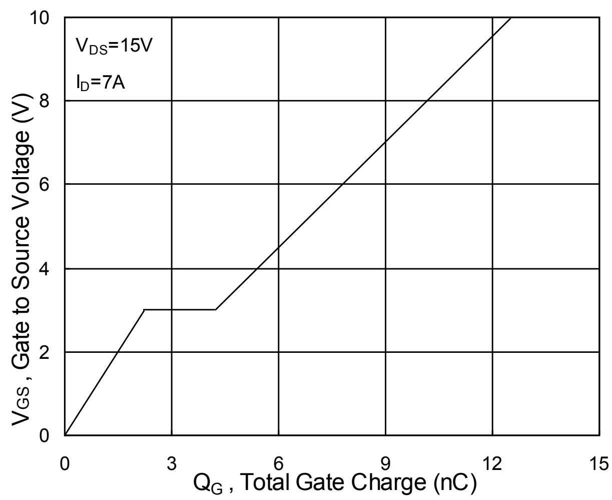


Fig.4 Gate-Charge Characteristics

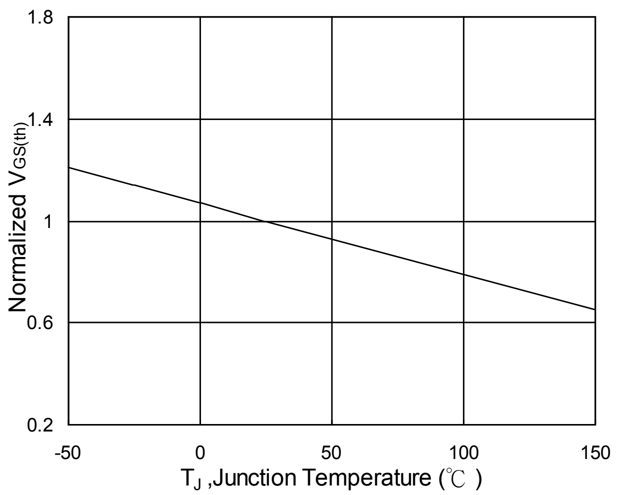


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

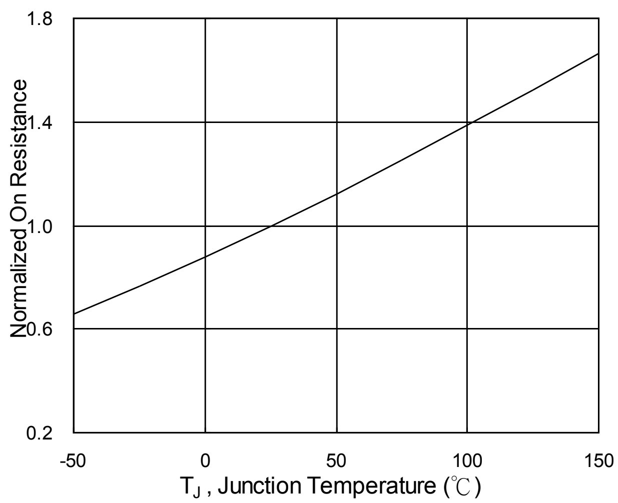


Fig.6 Normalized R_{DSON} vs. T_J

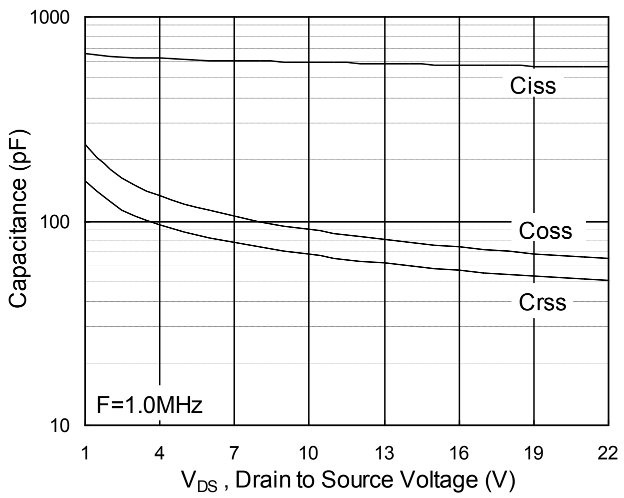


Fig.7 Capacitance

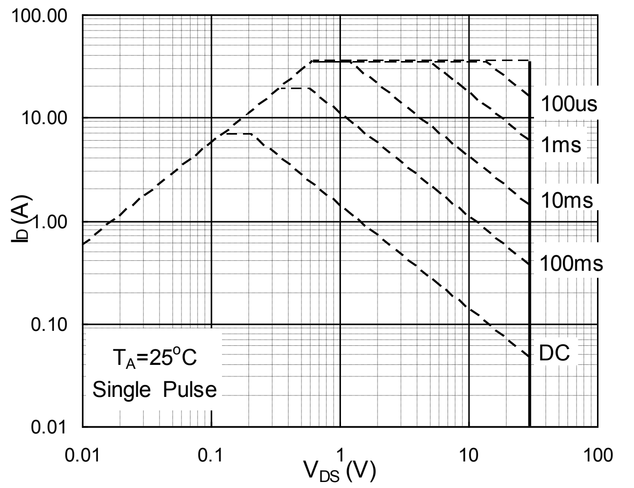


Fig.8 Safe Operating Area

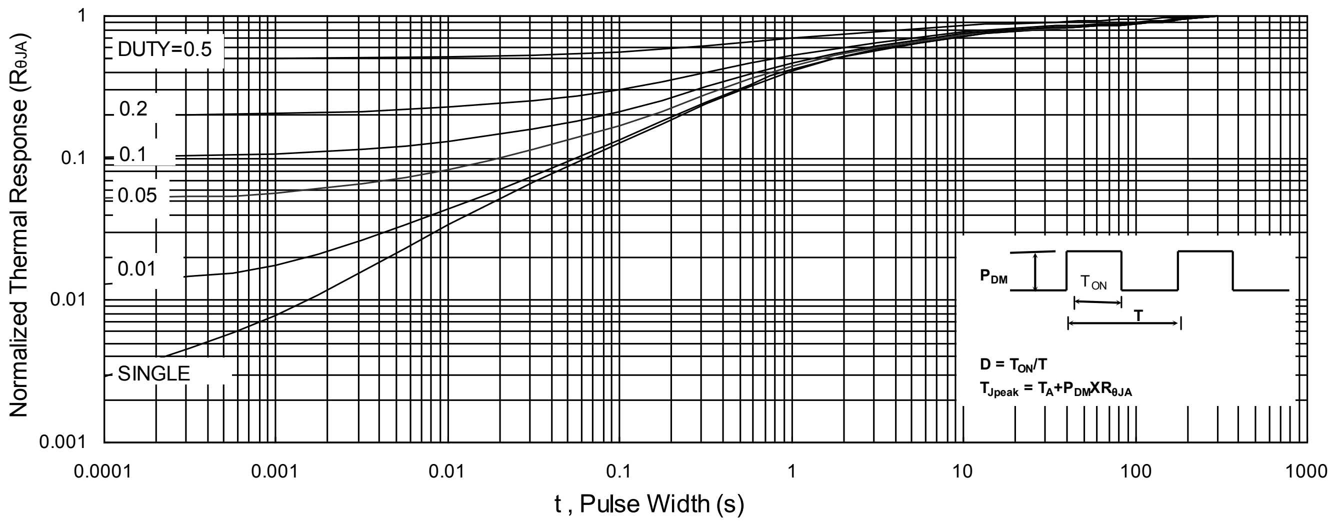


Fig.9 Normalized Maximum Transient Thermal Impedance

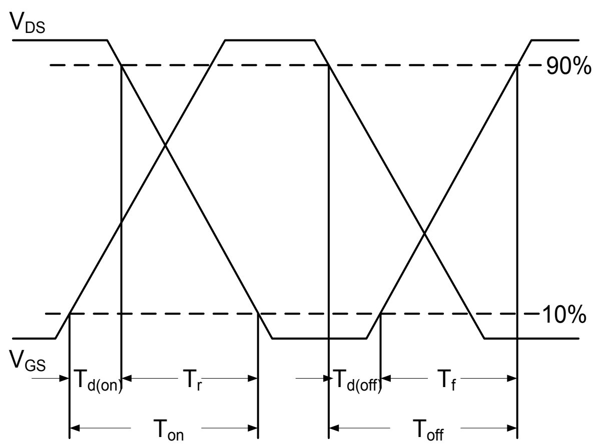


Fig.10 Switching Time Waveform

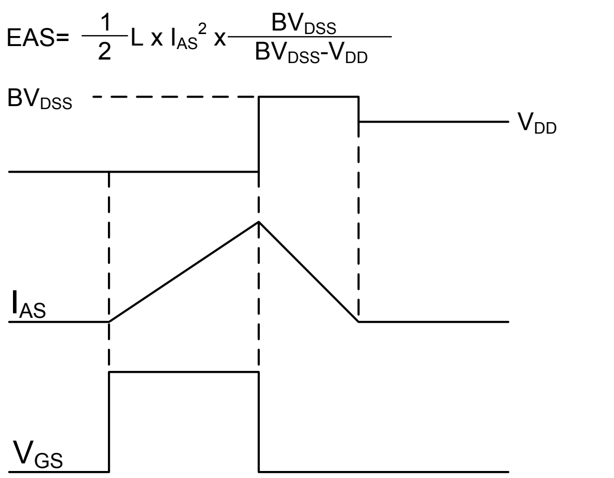
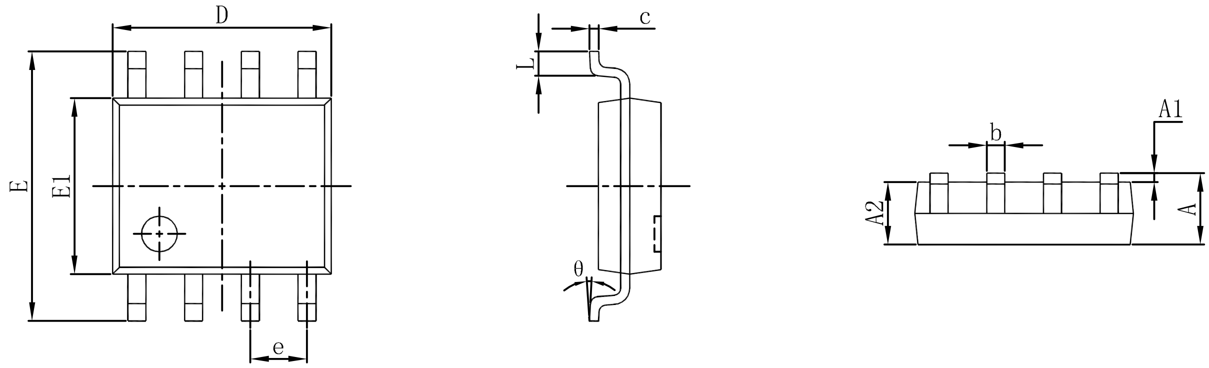
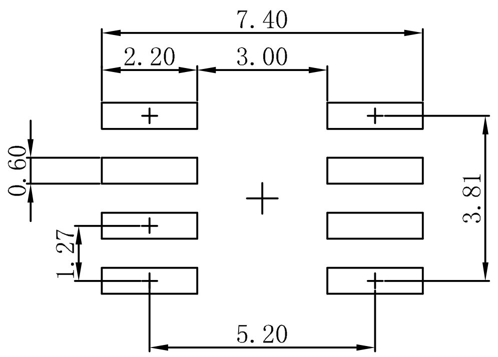


Fig.11 Unclamped Inductive Switching Waveform

SOP-8 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1. 350	1. 750	0. 053	0. 069
A1	0. 100	0. 250	0. 004	0. 010
A2	1. 350	1. 550	0. 053	0. 061
b	0. 330	0. 510	0. 013	0. 020
c	0. 170	0. 250	0. 007	0. 010
D	4. 800	5. 000	0. 189	0. 197
e	1. 270 (BSC)		0. 050 (BSC)	
E	5. 800	6. 200	0. 228	0. 244
E1	3. 800	4. 000	0. 150	0. 157
L	0. 400	1. 270	0. 016	0. 050
θ	0°	8°	0°	8°



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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