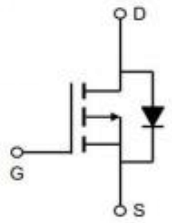
迈诺斯科技

IRFP9140PBF

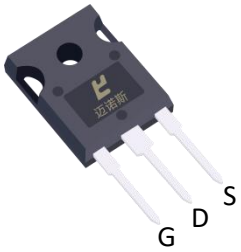
-100V P-Channel MOSFET

Description

IRFP9140PBF, the silicon P-channel Enhanced MOSFETs, is obtained by advanced MOSFET technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy.The transistor is suitable device for SMPS, Motor Control and general purpose applications.



Schematic diagram



TO-247

FEATURES

① V_{DS}=100V,I_D=30A
$R_{DS(ON)}$ ≦117mΩ @V_{GS}=10V
② Fast switching
③ 100% avalanche tested
④ Improved dv/dt capability

APPLICATIONS

① Switch Mode Power Supply (SMPS)
② Motor Control
③ Chopper, Inverter

Package Marking And Ordering Information

Ordering Codes	Package	Product Code	Packing
IRFP9140PBF	TO-247	IRFP9140	Tube

Absolute Maximum Ratings TC = 25ºC, unless otherwise noted

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage (VGS = 0V)	-100	V
I_D	Continuous Drain Current	-30	A
I_{DM}	Pulsed Drain Current(note1)	-75	A
V_{GSS}	Gate-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy(note2)	160	mJ
I_{AS}	Avalanche Current(note1)	-25	A
P_D	Power Dissipation (TC = 25℃)	96	W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.3	W/℃
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	W/℃
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55~+150	℃

Electrical Characteristics(at T_C = 25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	-100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -100V, V_{GS} = 0V, TJ = 25ºC	--	--	-1	μA
I_{GSS}	Gate-Source Leakage	V_{GS} = ±20V	--	--	±100	nA
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-2	--	-4	V
$R_{DS(on)}$	Drain-Source On-Resistance (Note3)	V_{GS} = -10V, I_D = -15A	--	--	117	mΩ
Dynamic						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} =-20V, f = 1.0MHz	--	3030	---	pF
C_{oss}	Output Capacitance		--	130	--	
C_{rss}	Reverse Transfer Capacitance		--	76	--	
Q_g	Total Gate Charge	V_{DD}=-50V, I_D=-20A, V_{GS} = -10V	--	45	--	nC
Q_{gs}	Gate-Source Charge		--	9.15	--	
Q_{gd}	Gate-Drain Charge		--	5.95	--	
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = -50V, I_D=-10A, R_G = 3.3 Ω I_D=-10A	--	12	--	ns
t_r	Turn-on Rise Time		--	27.4	--	
$t_{d(off)}$	Turn-off Delay Time		--	79	--	
t_f	Turn-off Fall Time		--	53.6	--	

Drain-Source Body Diode Characteristics						
I_S	Continuous Body Diode Current	T_C = 25 ºC	--	--	-18	A
V_{SD}	Body Diode Voltage	T_J = 25ºC, I_{SD} = -1A, V_{GS} = 0V	--	--	-1.2	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V,I_S = -8A, $d_{iF/dt}$ =100A /μs	--	38.7	--	ns
Q_{rr}	Reverse Recovery Charge		--	2.4	--	μC

Characteristics Curves

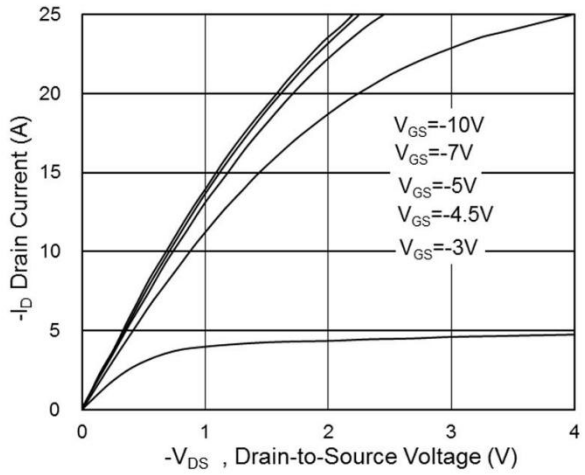


Fig.1 Typical Output Characteristics

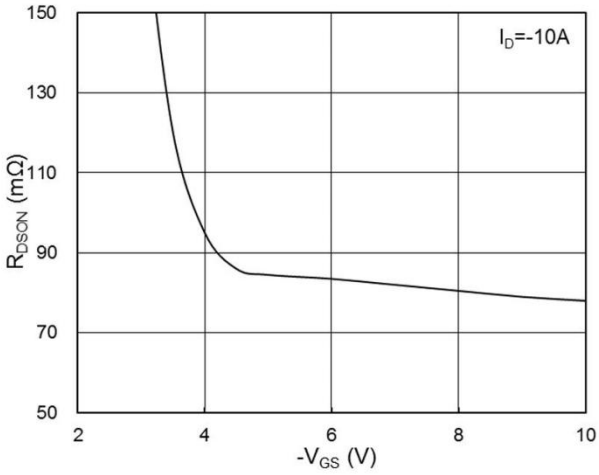


Fig.2 On-Resistance vs G-S Voltage

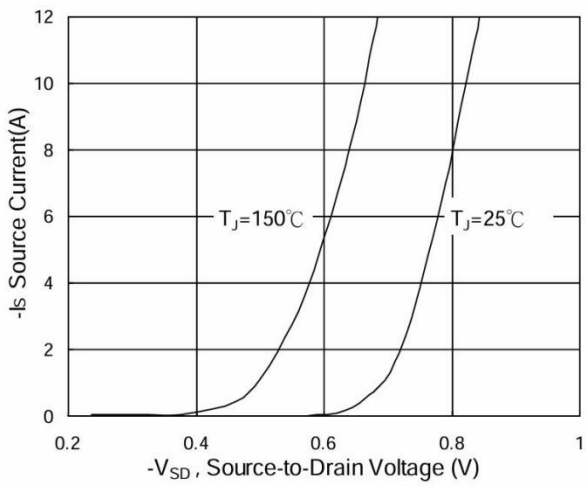


Fig.3 Typical S-D Diode Forward Voltage

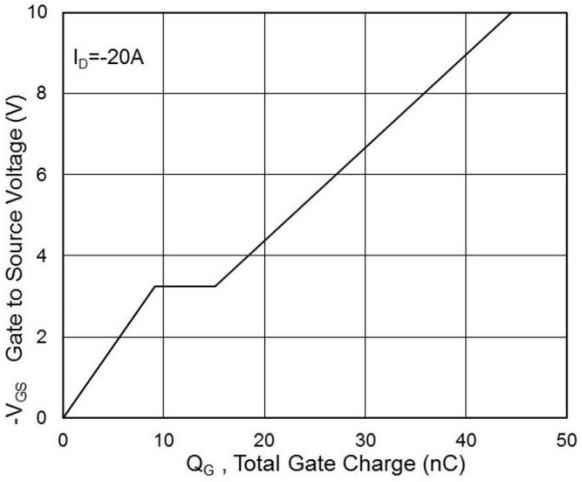


Fig.4 Gate-Charge Characteristics

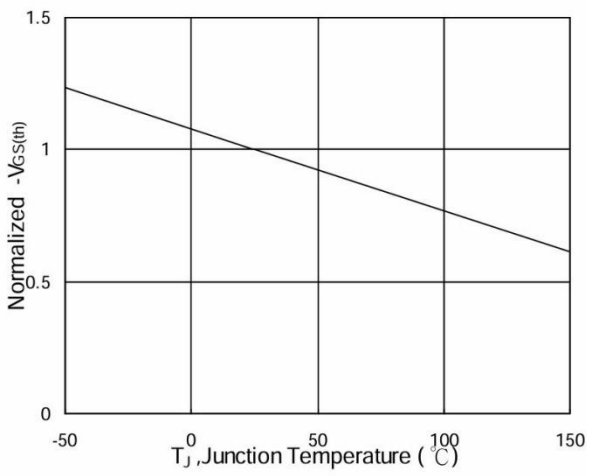


Fig.5 Normalized $V_{GS(th)}$ vs T_J

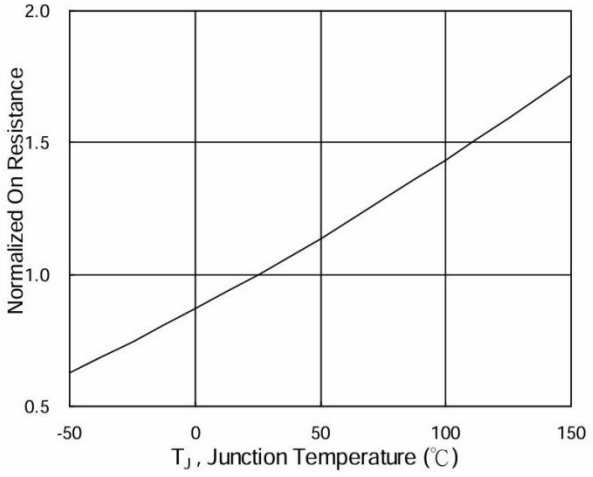


Fig.6 Normalized R_{DSON} vs T_J

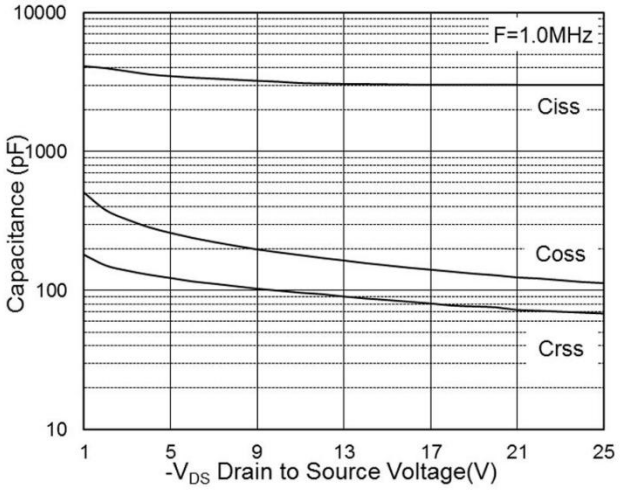


Fig.7 Capacitance

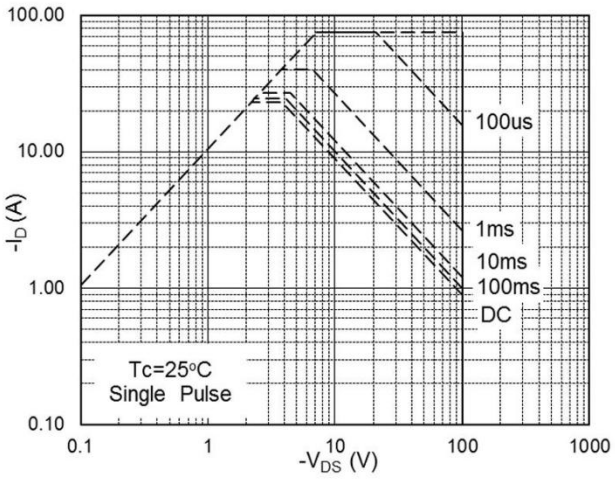


Fig.8 Safe Operating Area

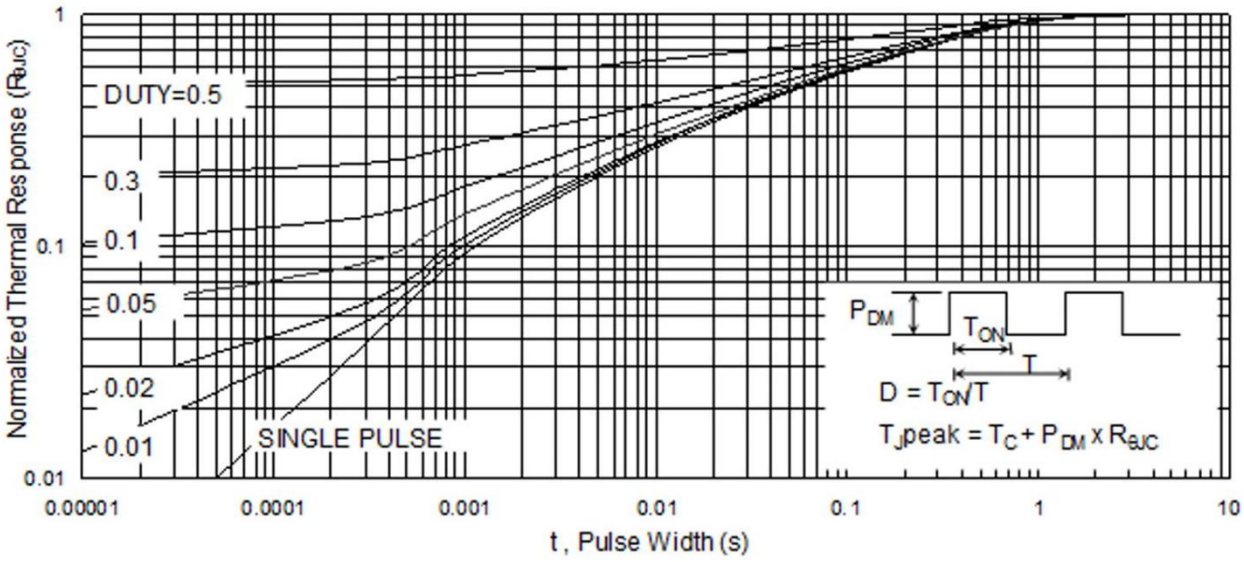


Fig.9 Normalized Maximum Transient Thermal Impedance

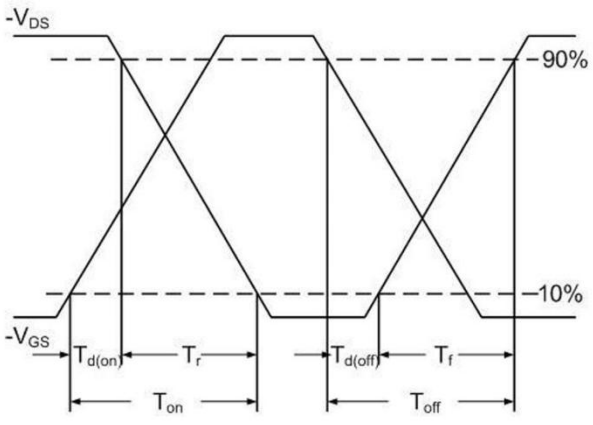


Fig.10 Switching Time Waveform

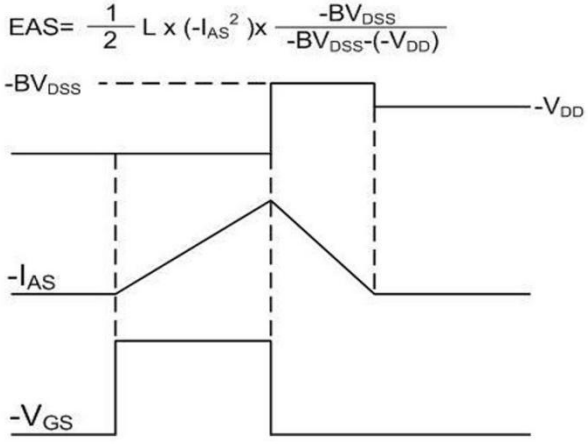
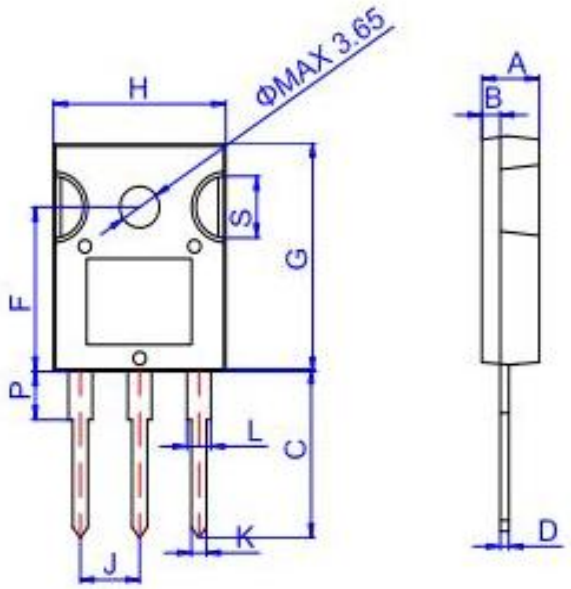


Fig.11 Unclamped Inductive Waveform

Package Information



Symbol	Values(mm)	
	MIN	MAX
A	4.9	5.4
B	1.6	2.0
C	14.35	15.4
D	0.5	0.8
F	14.4	15.1
G	19.7	20.6
H	15.4	16.2
J	5.3	5.6
K	1.3	1.5
L	2.8	3.3
ϕp	3.7	4.2
S	5.35	5.65

TO-247 Package

NOTE:

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shenzhen Minos reserves the right to make changes in this specification sheet and is subject to change without prior notice.

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