HUASHUO SEMICONDUCTOR

HSBA0056

N-Ch 100V Fast Switching MOSFETs

Applications

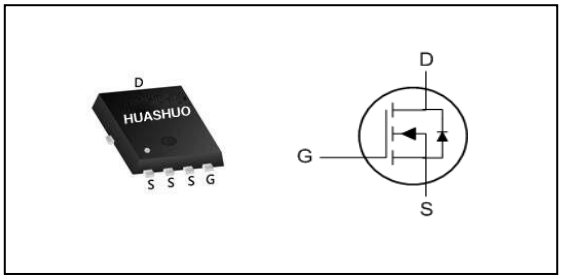
Portable Equipment.
Battery Powered Systems.
Hard Switching and High-Speed Circuit.

Product Summary

V_{DS}	100	V
$R_{DS(ON),Max}$	20	mΩ
I_D	32	A

- 100% EAS Guaranteed
- Low $R_{DS(ON)}$
- Low Gate Charge
- RoHs and Halogen-Free Compliant

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current[1,6]	32	A
I_D@T_C=100℃	Continuous Drain Current[1,6]	20	A
I_{DM}	Pulsed Drain Current[2]	90	A
EAS	Single Pulse Avalanche Energy[3]	45	mJ
I_{AS}	Avalanche Current	30	A
P_D@T_C=25℃	Total Power Dissipation[4]	37.9	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1](t≤10s)	---	25	℃/W
	Thermal Resistance Junction-Ambient [1]	---	55	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	3.3	℃/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	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=10A	---	15.5	20	mΩ
	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V , I_D=10A	---	21	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.8	2.2	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Rg	Gate Resistance	V_{DS}=0V , V_{GS}=0V,f=1MHz	---	1	---	Ω
Qg	Total Gate Charge (10V)	V_{DS}=50V , V_{GS}=10V , I_D=10A	---	17.9	---	nC
Qgs	Gate-Source Charge		---	2.8	---	
Qgd	Gate-Drain Charge		---	5.2	---	
Td(on)	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=6Ω, I_D=1A	---	13	---	ns
Tr	Rise Time		---	6	---	
Td(off)	Turn-Off Delay Time		---	30	---	
Tf	Fall Time		---	29	---	
Ciss	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1MHz	---	849	---	pF
Coss	Output Capacitance		---	185	---	
Crss	Reverse Transfer Capacitance		---	8	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5,6]	V_G=V_D=0V , Force Current	---	---	32	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V

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}=30A
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.
6.The maximum current rating is package limited.

Typical Characteristics

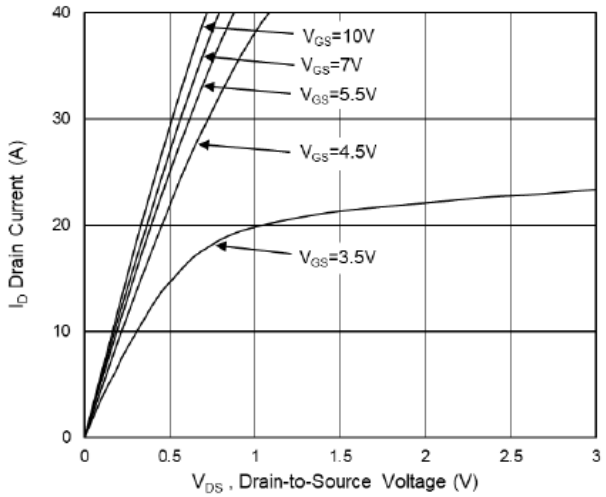


Fig.1 Typical Output Characteristics

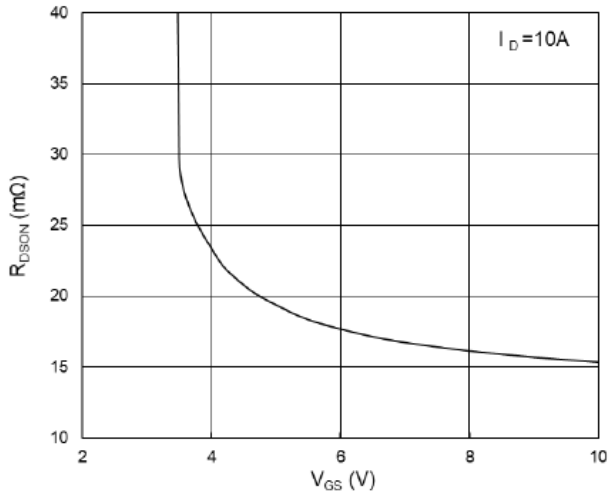


Fig.2 On-Resistance vs G-S Voltage

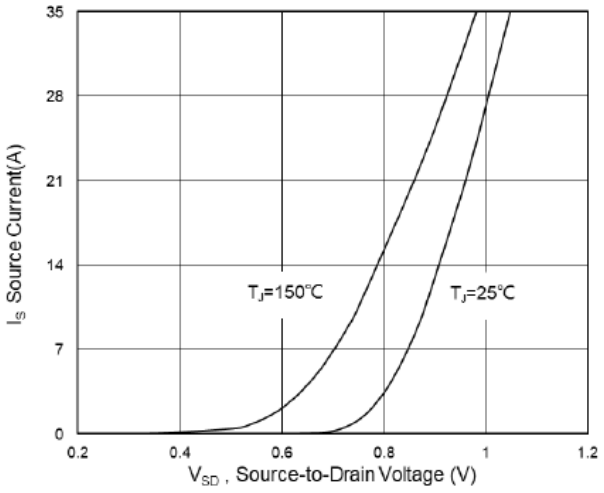


Fig.3 Source-Drain Forward Characteristics

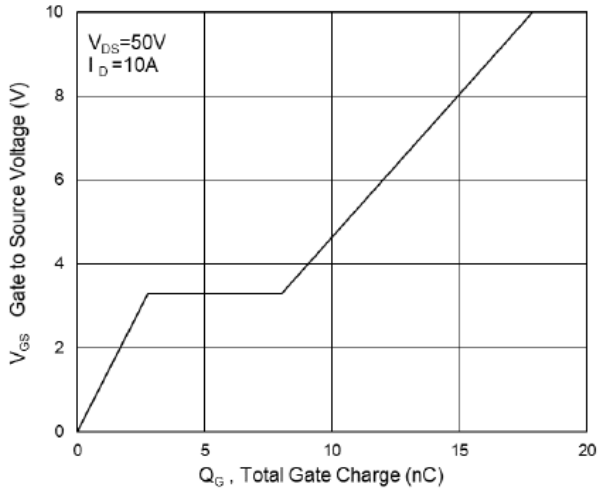


Fig.4 Gate-Charge Characteristics

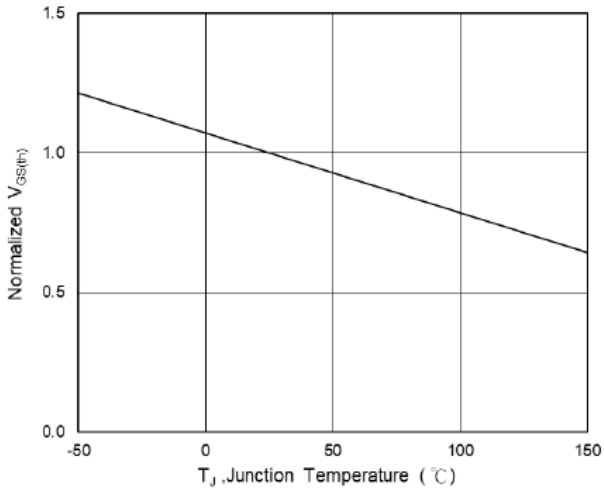


Fig.5 Normalized $V_{GS(th)}$ vs T_J

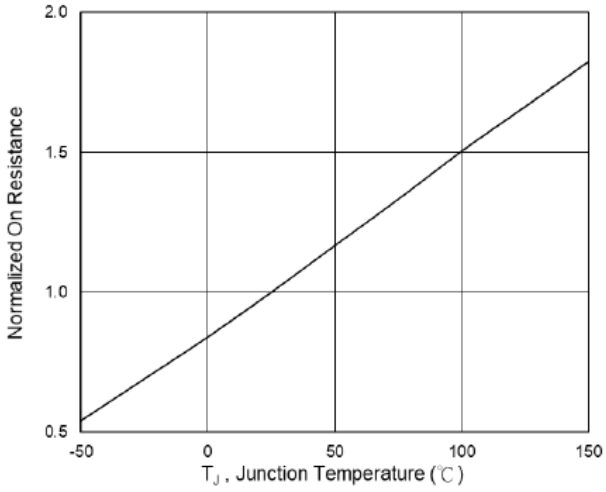


Fig.6 Normalized R_{DSON} vs T_J

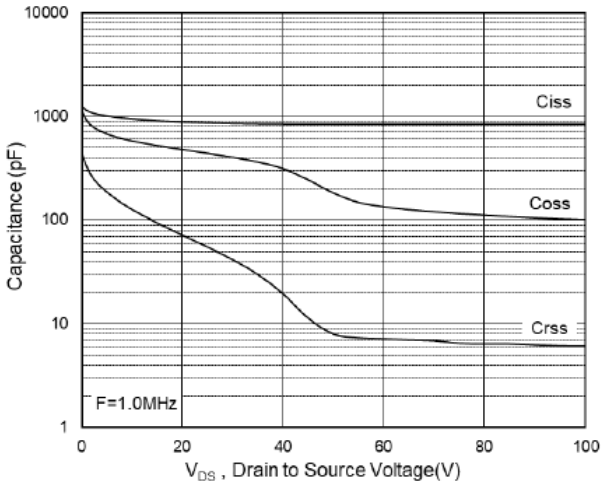


Fig.7 Capacitance

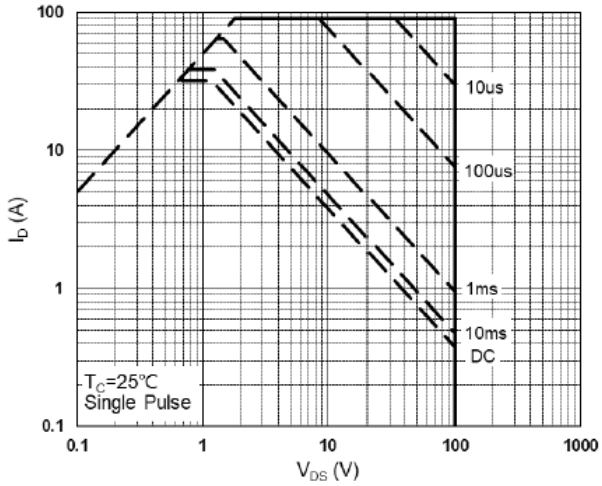


Fig.8 Safe Operating Area

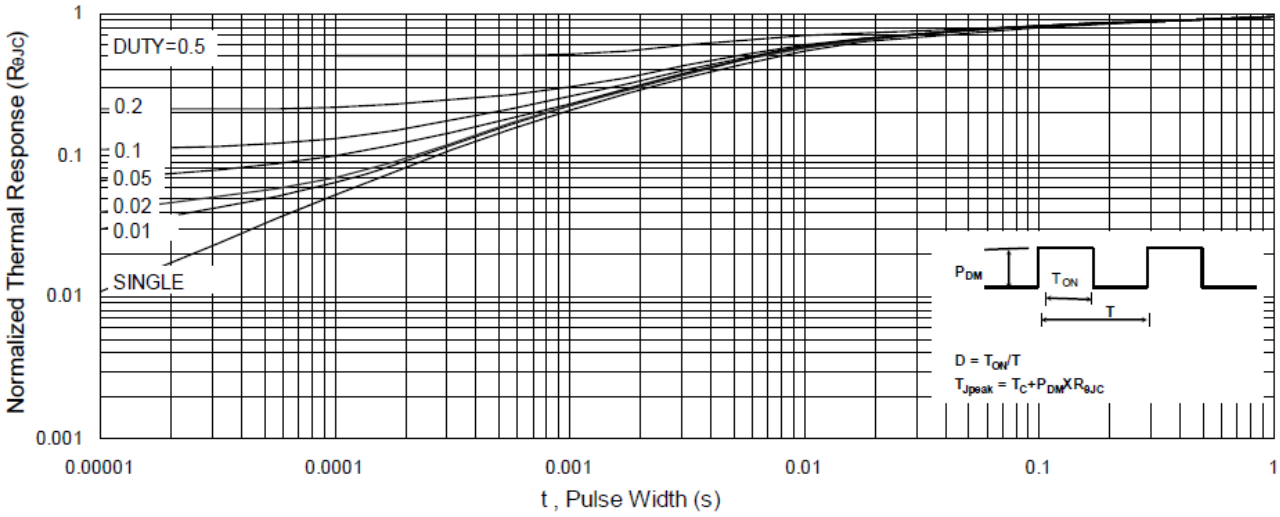


Fig.9 Normalized Maximum Transient Thermal Impedance

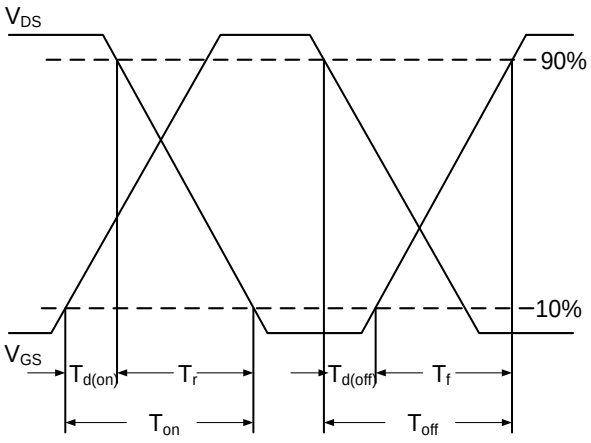


Fig.10 Switching Time Waveform

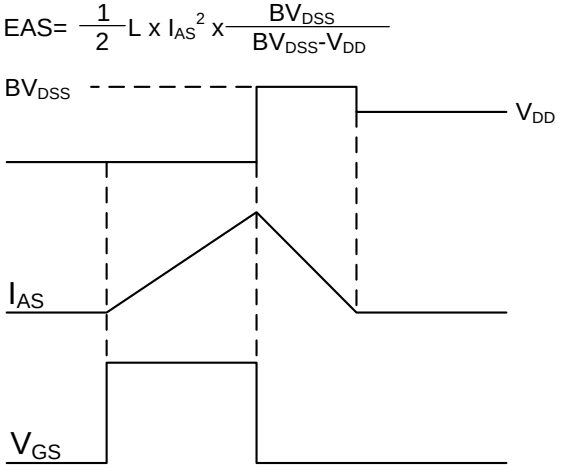
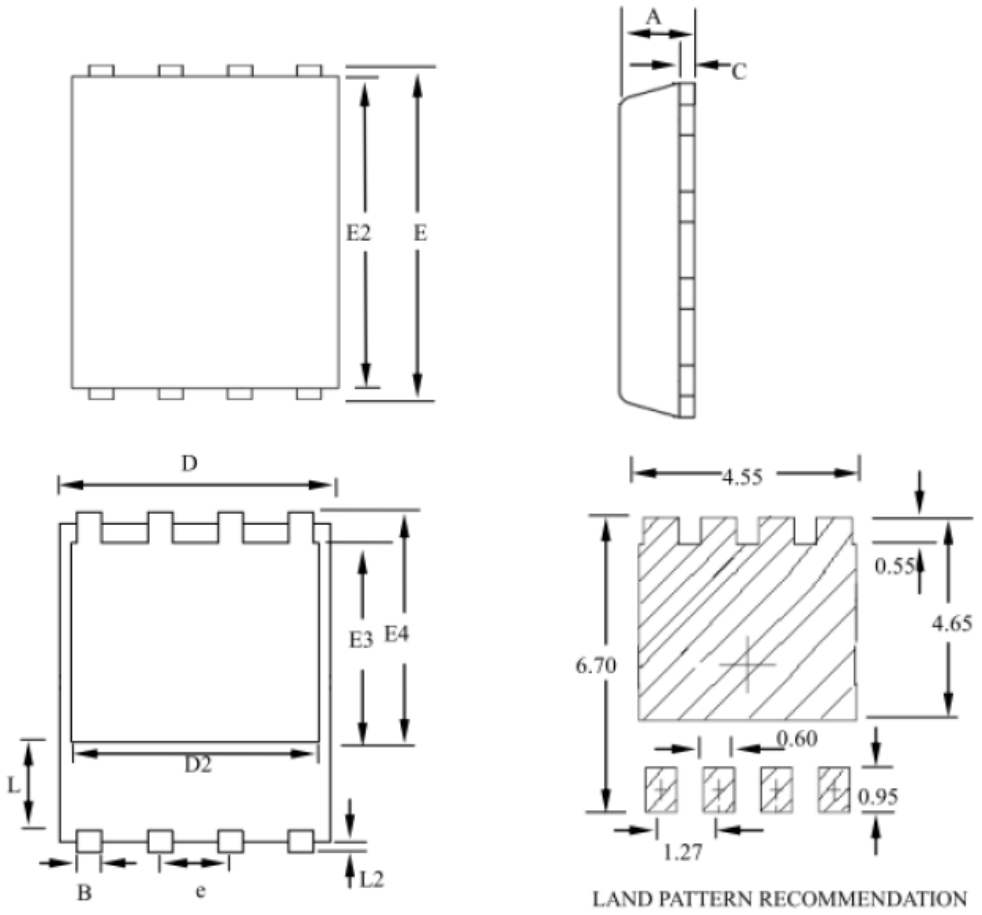


Fig.11 Unclamped Inductive Switching Waveform

PRPAK5X6 Package Outline Dimensions



LAND PATTERN RECOMMENDATION

SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.30	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.30	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	5.90	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145		0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--