HUASHUO SEMICONDUCTOR

HSBA15810C

N-Ch 100V Fast Switching MOSFETs

General Description

- 100% EAS Guaranteed
- Green Device Available
- Super Low $R_{DS(ON)}$
- Advanced high cell density Trench technology

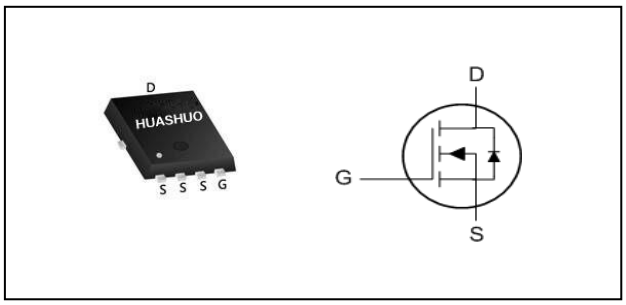
Product Summary

V_{DS}	100	V
$R_{DS(ON),typ}$	3.7	mΩ
I_D	100	A

Applications

- MOTOR Driver.
- BMS.
- High frequency switching and synchronous rectification.

PRPAK5*6 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, V_{GS} @ 10V[1,6]	100	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	95	A
I_{DM}	Pulsed Drain Current[2]	480	A
EAS	Single Pulse Avalanche Energy[3]	702	mJ
I_{AS}	Avalanche Current	53	A
P_D@T_C=25℃	Total Power Dissipation[4]	208	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]	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.6	℃/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-Resistance2	V_{GS}=10V , I_D=30A	---	3.7	4.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=100V , V_{GS}=0V , T_J=125℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=30A	---	50	---	S
R_g	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=20A	---	72	---	nC
Qgs	Gate-Source Charge		---	28	---	
Qgd	Gate-Drain Charge		---	15	---	
Td(on)	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3.0Ω, I_D=20A	---	35	---	ns
Tr	Rise Time		---	18	---	
Td(off)	Turn-Off Delay Time		---	45	---	
Tf	Fall Time		---	55	---	
Ciss	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1MHz	---	4725	---	pF
Coss	Output Capacitance		---	609	---	
Crss	Reverse Transfer Capacitance		---	14	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current1,5	V_G=V_D=0V , Force Current	---	---	100	A
V_{SD}	Diode Forward Voltage2	V_{GS}=0V , I_S=50A , T_J=25℃	---	---	1.3	V
t_{rr}	Reverse Recovery Time	I_F=30A , dI/dt=100A/μs , T_J=25℃	---	70	---	nS
Q_{rr}	Reverse Recovery Charge		---	170	---	nC

Note :
1.The data tested by surface mounted on a 1 inch2 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=0.5mH,I_{AS}=53A
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.Package limitation current.

Typical Characteristics

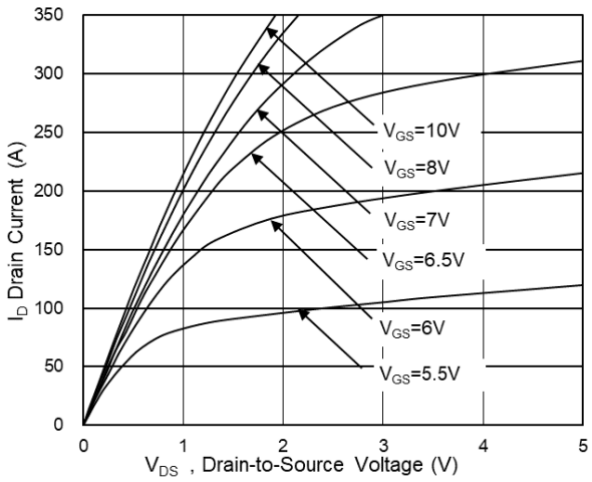


Fig.1 Typical Output Characteristics

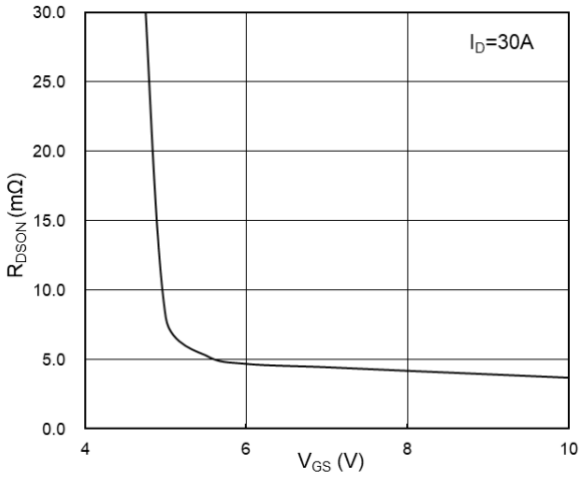


Fig.2 On-Resistance vs G-S Voltage

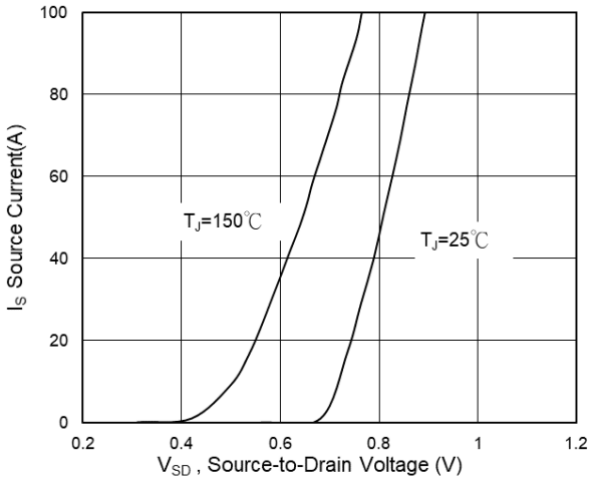


Fig.3 Source Drain Forward Characteristics

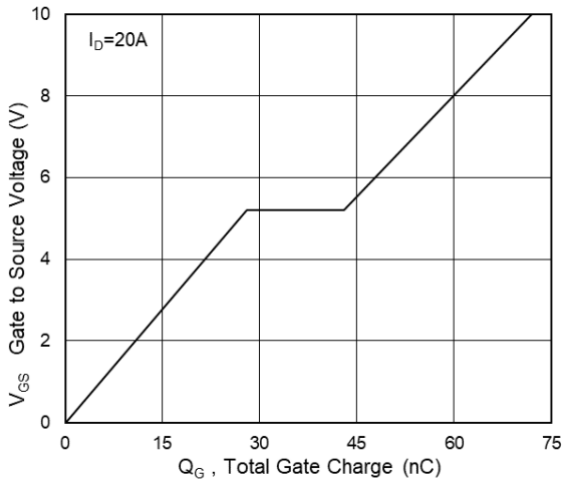


Fig.4 Gate-Charge Characteristics

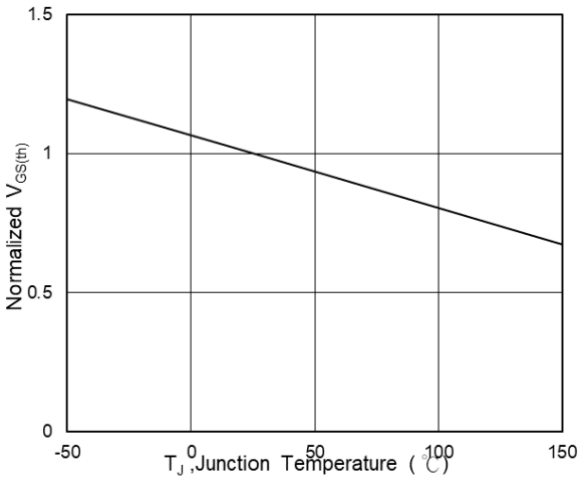


Fig.5 Normalized V_{TH} vs T_J

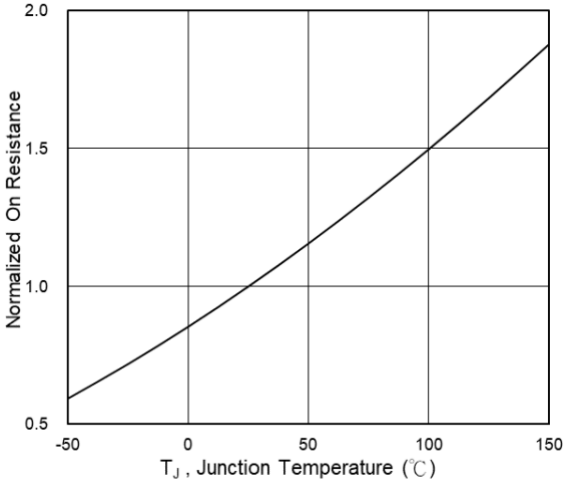


Fig.6 Normalized R_{DSON} vs T_J

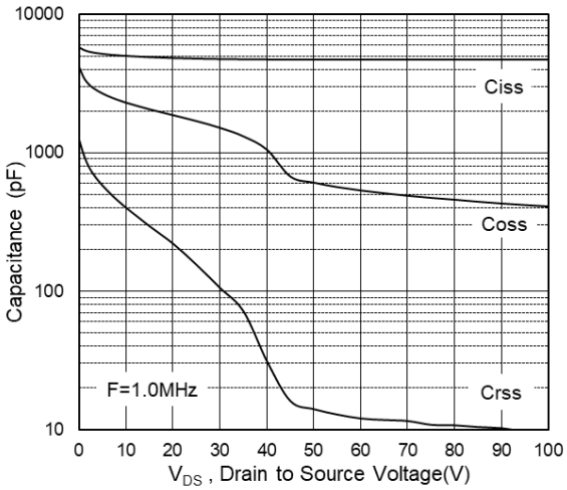


Fig.7 Capacitance

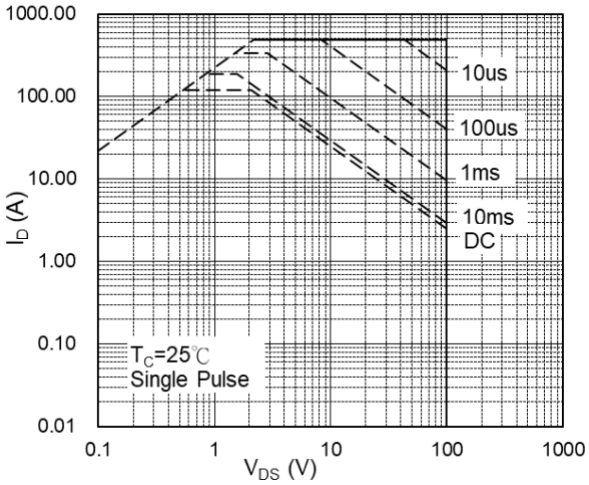


Fig.8 Safe Operating Area

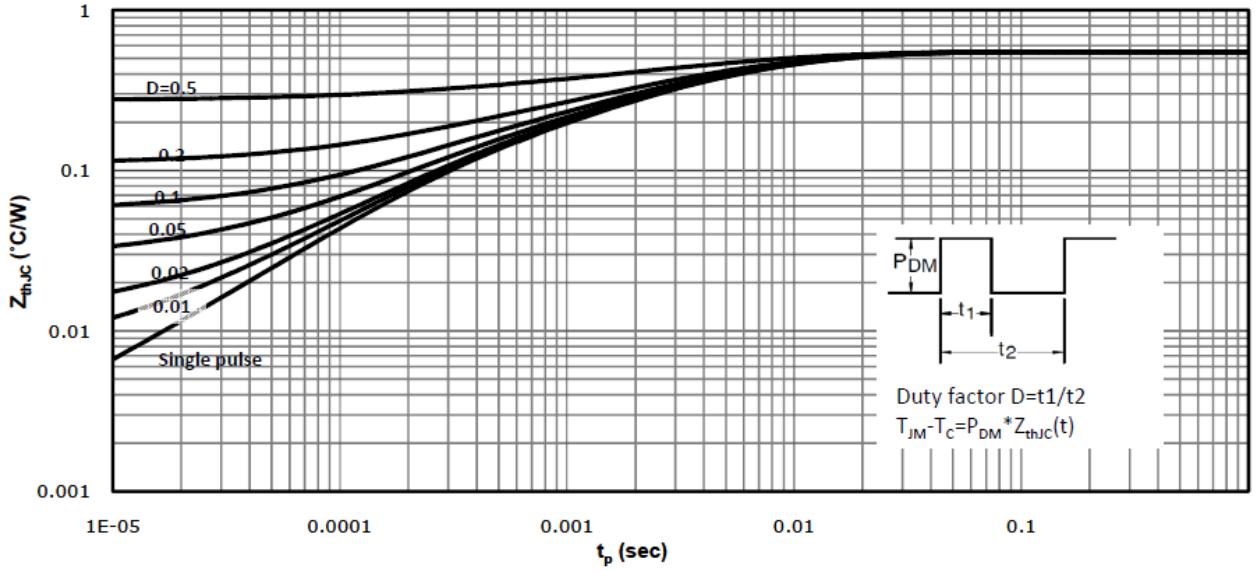


Fig.9 Normalized Maximum Transient Thermal Impedance

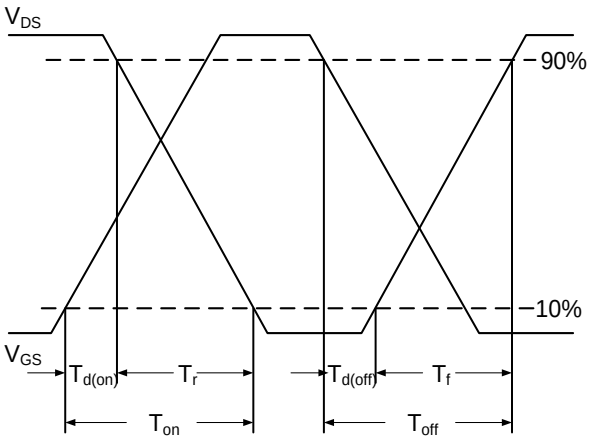


Fig.10 Switching Time Waveform

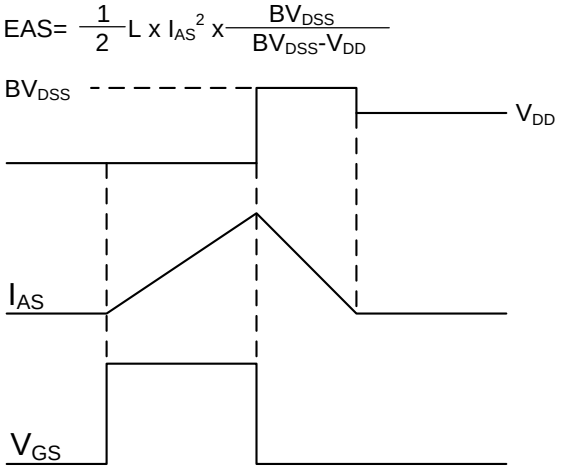
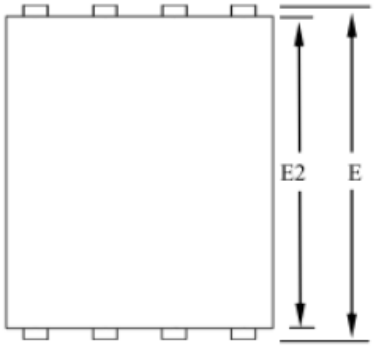
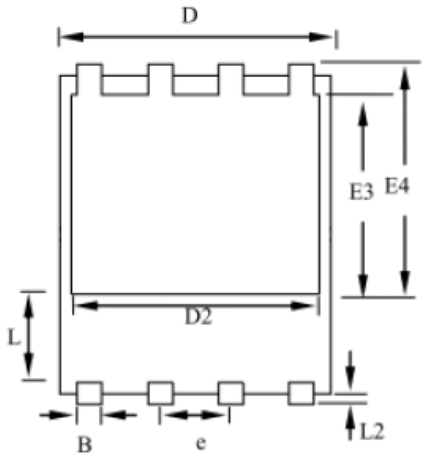
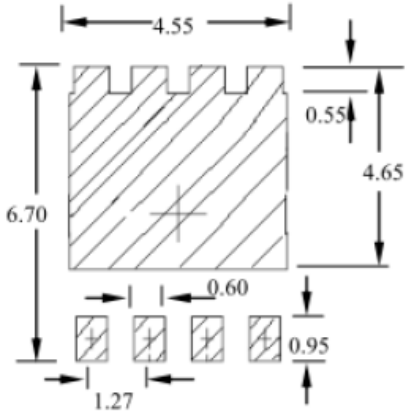


Fig.11 Unclamped Inductive Switching Waveform

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	--