HUASHUO SEMICONDUCTOR

HSBA6076

N-Ch 60V Fast Switching MOSFETs

Description

The HSBA6076 is the high cell density SGT N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

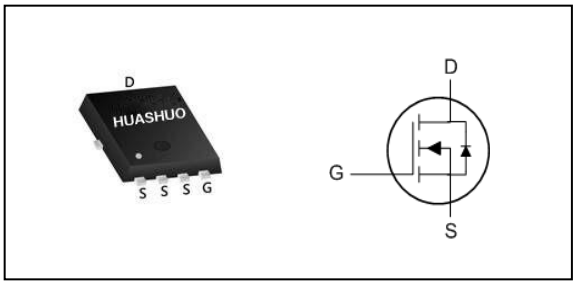
The HSBA6076 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

V_{DS}	60	V
$R_{DS(ON),typ}$	1.6	mΩ
I_D	150	A

- Motor Control
- 100% EAS Guaranteed
- DC/DC Converter.
- Excellent CdV/dt effect decline
- Synchronous rectifier applications.

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current[1,6]	150	A
I_D@T_C=100℃	Continuous Drain Current[1,6]	90	A
I_{DM}	Pulsed Drain Current[2]	600	A
EAS	Single Pulse Avalanche Energy[3]	430	mJ
I_{AS}	Avalanche Current	90	A
P_D@T_C=25℃	Total Power Dissipation[4]	110	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]	---	60	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	1.1	℃/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	60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	1.6	2.0	mΩ
		V_{GS}=4.5V , I_D=20A	---	2.3	3.0	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=52V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=52V , 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=20A	---	18	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.1	---	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=30V , V_{GS}=10V , I_D=20A	---	105	---	nC
Q_{gs}	Gate-Source Charge		---	26	---	
Q_{gd}	Gate-Drain Charge		---	27	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=3Ω, I_D=20A	---	19	---	ns
T_r	Rise Time		---	12	---	
$T_{d(off)}$	Turn-Off Delay Time		---	66	---	
T_f	Fall Time		---	119	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , f=1MHz	---	5980	---	pF
C_{oss}	Output Capacitance		---	2822	---	
C_{rss}	Reverse Transfer Capacitance		---	28	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	150	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.0	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}=50V,V_{GS}=10V,L=0.5mH,I_{AS}=90A
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

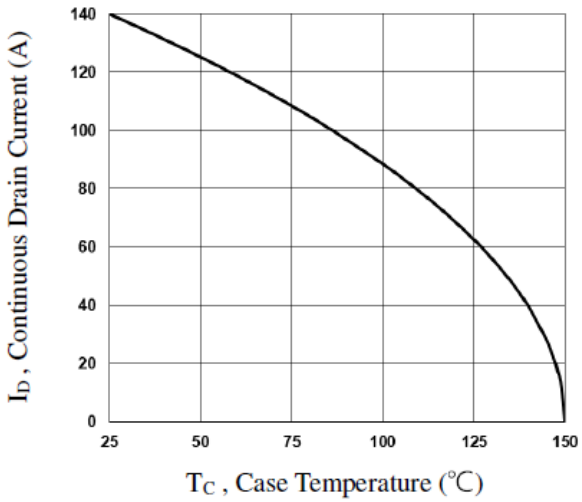


Fig.1 Continuous Drain Current vs.TC

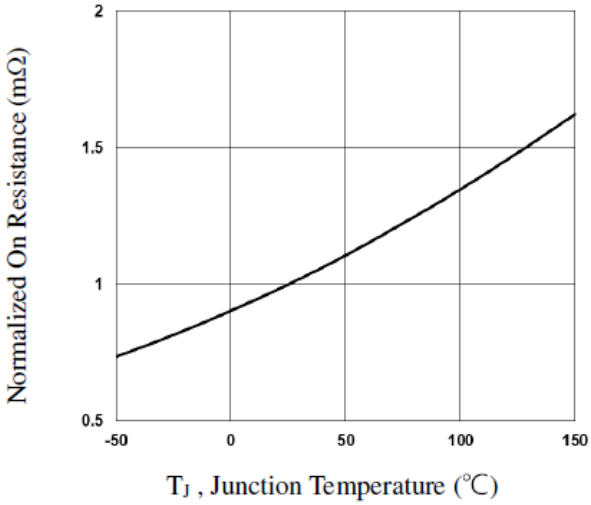


Fig.2 Normalized RDSON vs.TJ

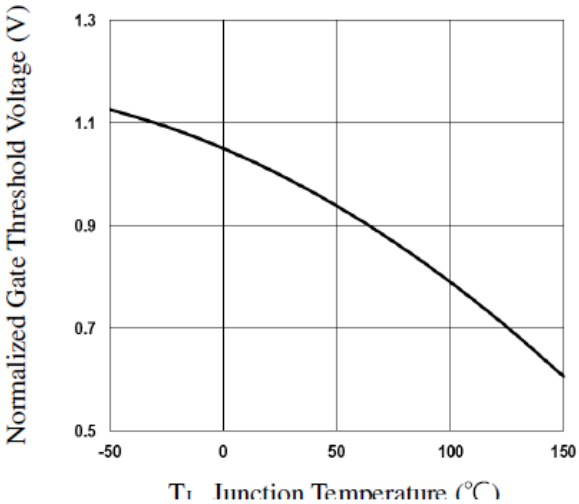


Fig.3 Normalized Vth vs.Tj

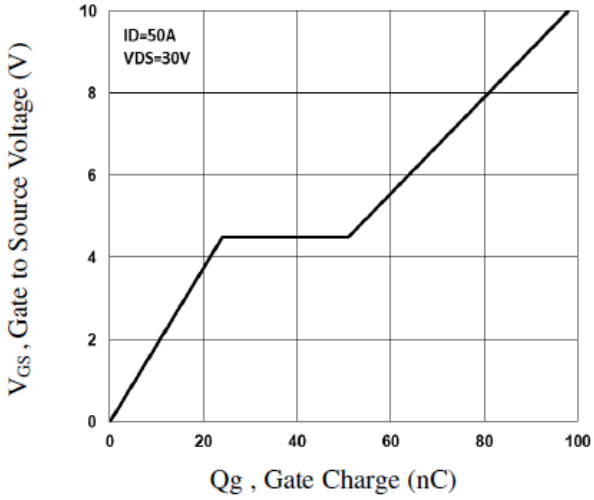


Fig.4 Gate-Charge Characteristics

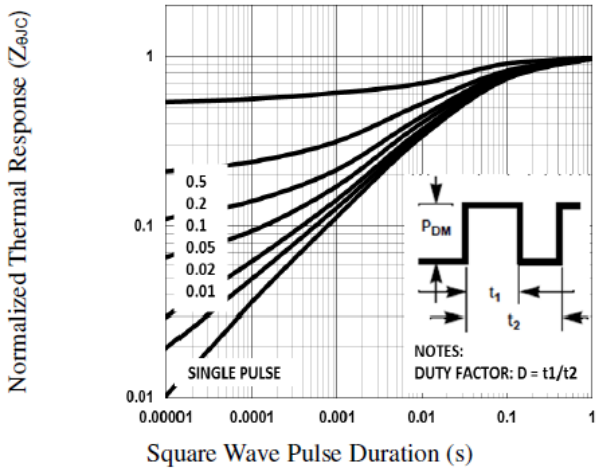


Fig.5 Normalized Transient Impedance

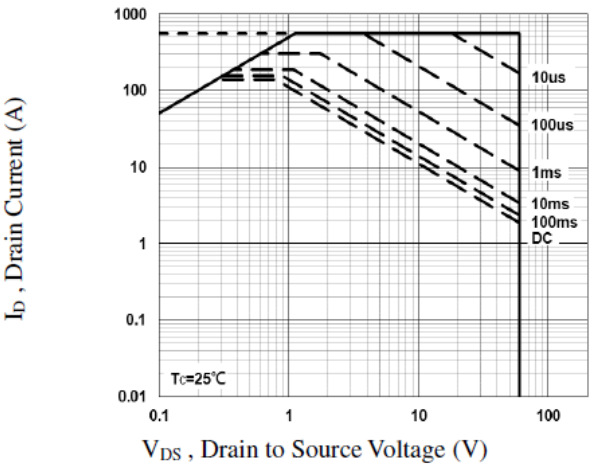


Fig.6 Maximun Safe Operation Area

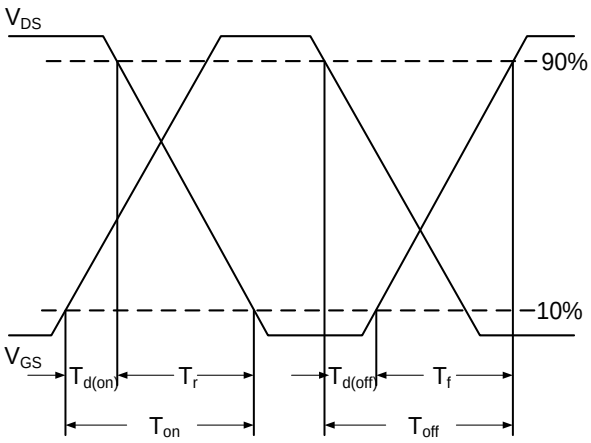


Fig.7 Switching Time Waveform

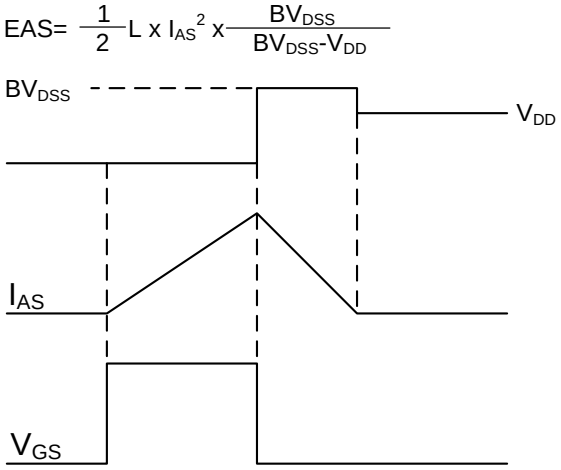
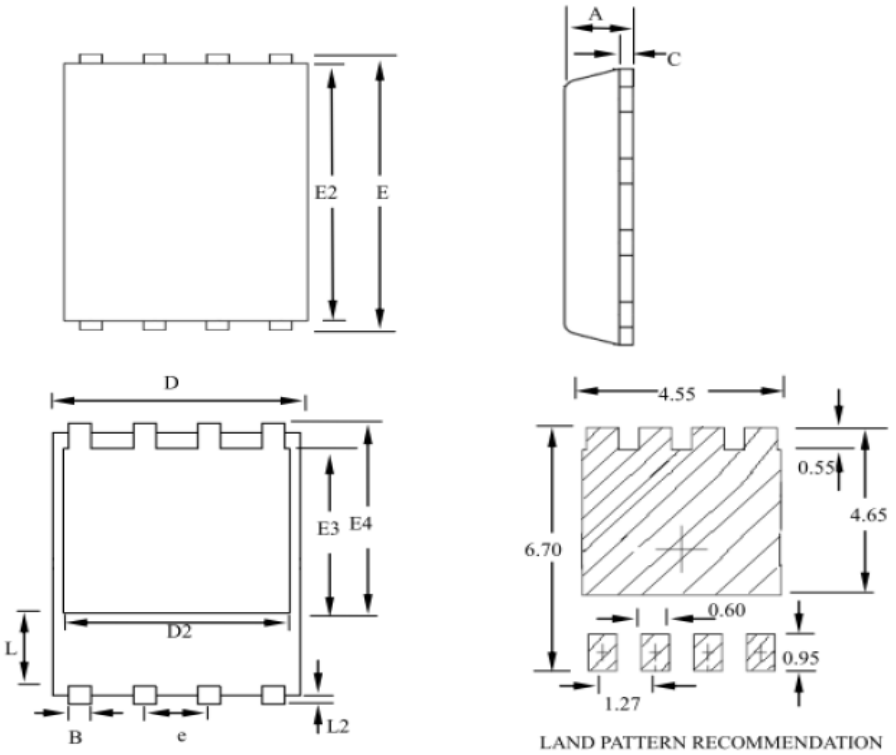


Fig.8 Unclamped Inductive Switching Waveform

Ordering Information

Part Number	Package code	Packaging
HSBA6076	PRPAK5*6	3000/Tape&Reel



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	--