HSBA1119

P-Ch 12V Fast Switching MOSFETs

Description

The HSBA1119 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

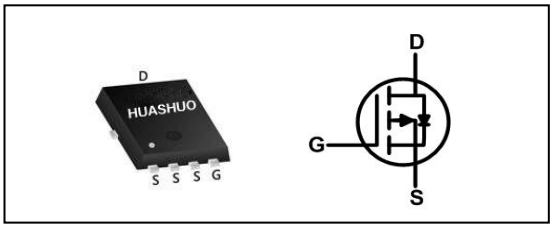
The HSBA1119 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

V_{DS}	-12	V
$R_{DS(ON),typ}$	1.2	mΩ
I_D	-210	A

- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1,6]	-210	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1,6]	-154	A
I_{DM}	Pulsed Drain Current[2]	-830	A
EAS	Single Pulse Avalanche Energy[3]	370	mJ
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](t≦10S)	---	18	℃/W
	Thermal Resistance Junction-ambient [1](Steady State)	---	60	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case [1]	---	1.4	℃/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	-12	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V , I_D=-20A	---	1.2	1.6	mΩ
		V_{GS}=-2.5V , I_D=-20A	---	1.8	2.1	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.5	---	-1.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-12V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-12V , V_{GS}=0V , T_J=55℃	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ± 12V , V_{DS}=0V	---	---	± 100	nA
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1.0MHz	---	1.9	---	Ω
Q_g	Total Gate Charge	V_{DS}=-6V , V_{GS}=-4.5V , I_D=-20A	---	170	---	nC
Q_{gs}	Gate-Source Charge		---	22	---	
Q_{gd}	Gate-Drain Charge		---	33	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-6V , V_{GS}=-10V , R_G=3Ω, I_D=-20A	---	17	---	ns
T_r	Rise Time		---	8.1	---	
$T_{d(off)}$	Turn-Off Delay Time		---	25	---	
T_f	Fall Time		---	33	---	
C_{iss}	Input Capacitance	V_{DS}=-6V , V_{GS}=0V , f=1MHz	---	18211	---	pF
C_{oss}	Output Capacitance		---	1480	---	
C_{rss}	Reverse Transfer Capacitance		---	1300	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	-210	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-20A , T_J=25℃	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	I_F=-20A , di/dt=100A/μs , T_J=25℃	---	30	---	nS
Q_{rr}	Reverse Recovery Charge		---	19	---	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}=-6V,V_{GS}=-4.5V,L=0.5mH
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

Figure 1. Output Characteristics

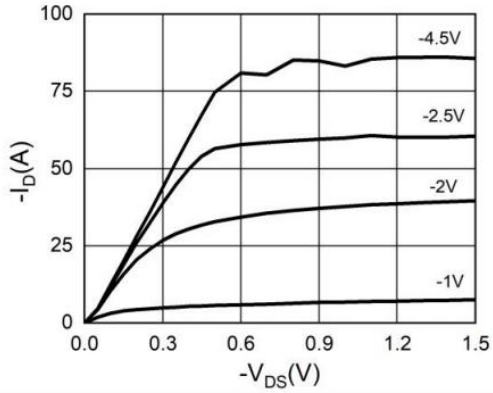


Figure 2. Transfer Characteristics

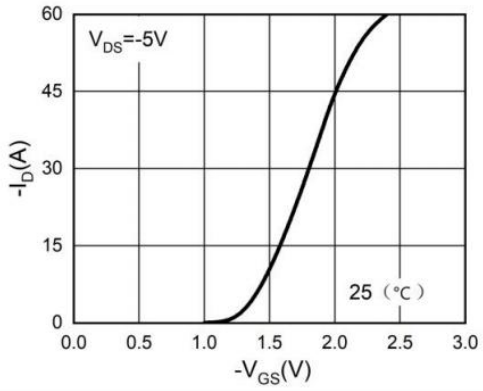


Figure 3. Power Dissipation

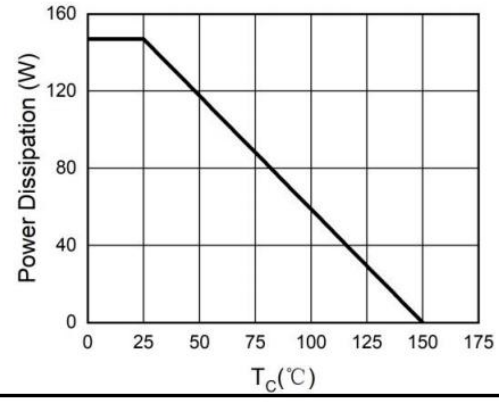


Figure 4. Drain Current

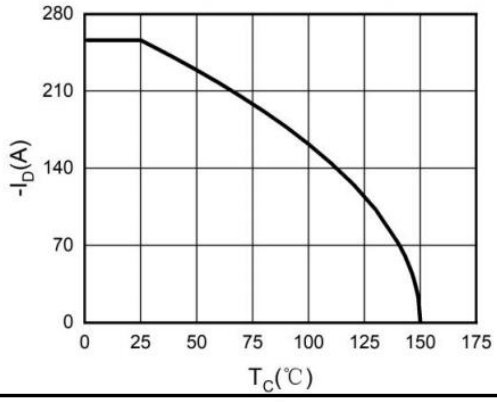


Figure 5. BV_{DSS} vs Junction Temperature

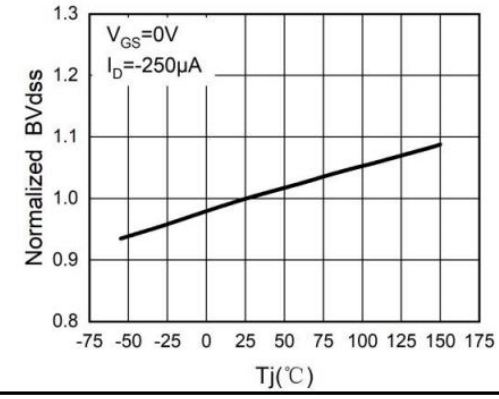


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

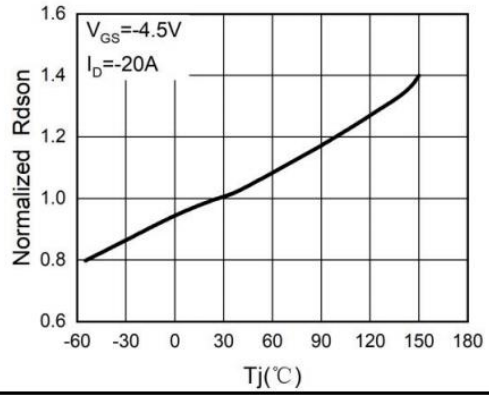


Figure 7. Gate Charge Waveforms

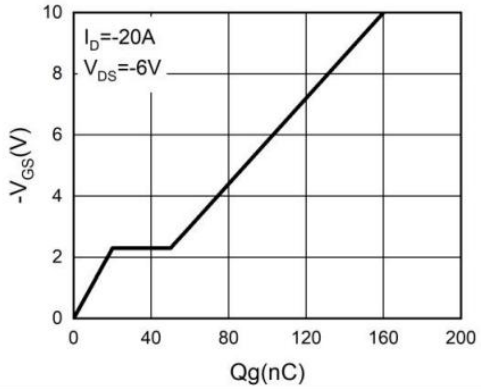


Figure 8. Capacitance

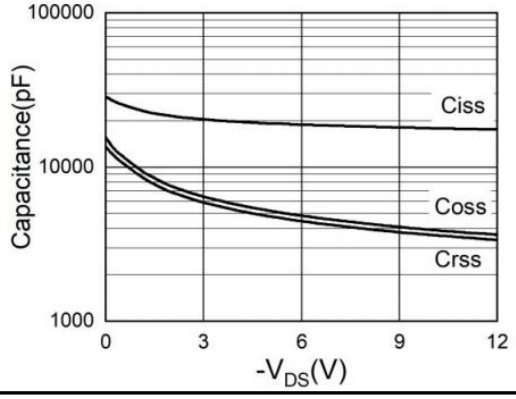


Figure 9. Body-Diode Characteristics

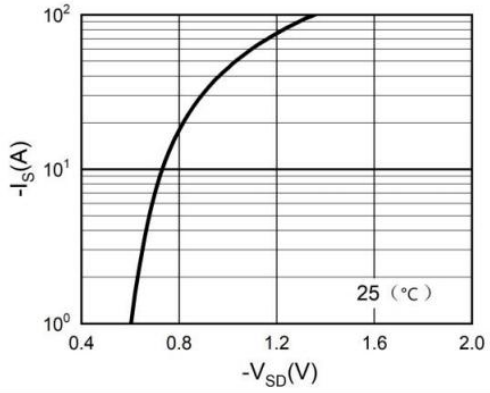
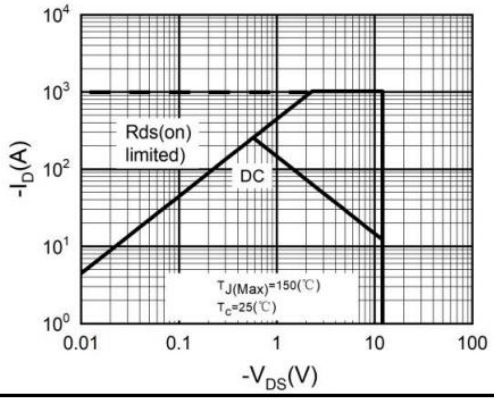
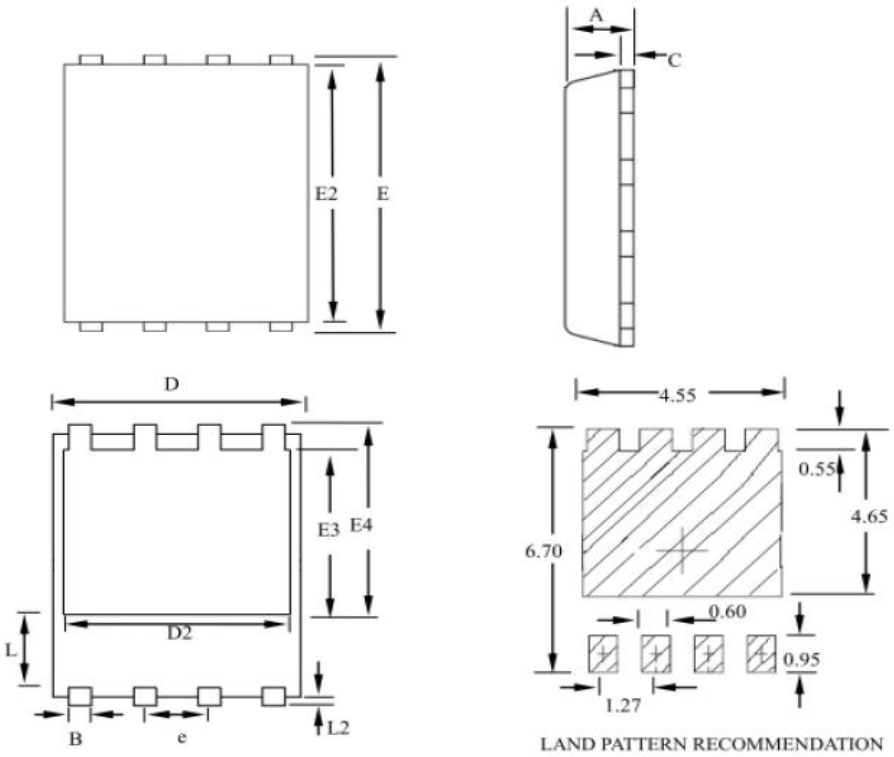


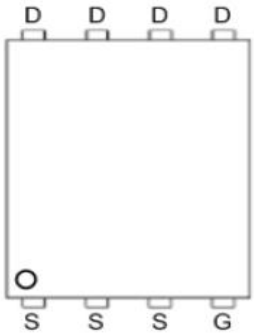
Figure 10. Maximum Safe Operating Area



Ordering Information

Part Number	Package code	Packaging
HSBA1119	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	--