

General Description

The HSBA6105 is the high cell density trench P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The HSBA6105 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

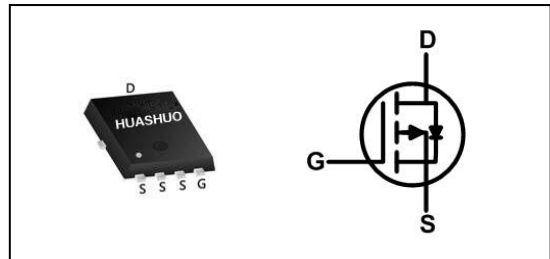
Features

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

Product Summary

V_{DS}	-60	V
$R_{DS(ON), Typ}$	25	m Ω
I_D	-30	A

PRPAK5*6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current	-30	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current	-19	A
I_{DM}	Pulsed Drain Current ¹	-126	A
EAS	Single Pulse Avalanche Energy ²	270	mJ
$P_D @ T_C = 25^\circ\text{C}$	Maximum Power Dissipation	51	W
$P_D @ T_C = 100^\circ\text{C}$	Maximum Power Dissipation	22	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	---	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	2.6	$^\circ\text{C/W}$



Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-15A$, $T_J=25^{\circ}\text{C}$	---	25	32	$m\Omega$
		$V_{GS}=-4.5V$, $I_D=-10A$, $T_J=25^{\circ}\text{C}$	---	31	42	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.0	-1.8	-2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-60V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	-1	μA
		$V_{DS}=-60V$, $V_{GS}=0V$, $T_J=55^{\circ}\text{C}$	---	---	-100	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-5V$, $I_D=-10A$	---	30	---	S
Q_g	Total Gate Charge	$V_{DS}=-30V$, $V_{GS}=-10V$, $I_D=-10A$	---	69	---	nC
Q_{gs}	Gate-Source Charge		---	10.5	---	
Q_{gd}	Gate-Drain Charge		---	13	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=-30V$, $V_{GS}=-10V$, $R_L=2\Omega$, $R_{GEN}=3\Omega$	---	12	---	ns
T_r	Rise Time		---	10	---	
$T_{d(off)}$	Turn-Off Delay Time		---	64	---	
T_f	Fall Time		---	15	---	
C_{iss}	Input Capacitance	$V_{DS}=-30V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	3840	---	pF
C_{oss}	Output Capacitance		---	138	---	
C_{rss}	Reverse Transfer Capacitance		---	110	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Source-Drain Current(Body Diode)	$V_G=V_D=0V$, Force Current	---	---	-30	A
T_{rr}	Reverse Recovery Time	$I_F=20A$, $dI/dt=100A/\mu s$, $T_J=25^{\circ}\text{C}$	---	26	---	nS
Q_{rr}	Reverse Recovery Charge		---	29	---	nC
V_{SD}	Diode Forward Voltage ³	$V_{GS}=0V$, $I_S=-15A$, $T_J=25^{\circ}\text{C}$	---	---	-1.2	V

Note :

1.Repetitive Rating : Pluse width limited by maximum junction temperature.

2. E_{AS} condition : $T_J=25^{\circ}\text{C}$, $V_{DD}=-40V$, $V_G=-10V$, $R_g=25\Omega$, $L=0.5\text{mH}$.

3.Repetitive Rating : Pluse width limited by maximum junction temperature.



Typical Characteristics

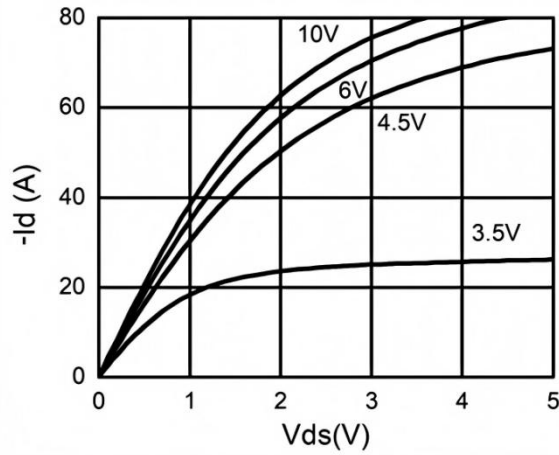


Figure 1. Output Characteristics

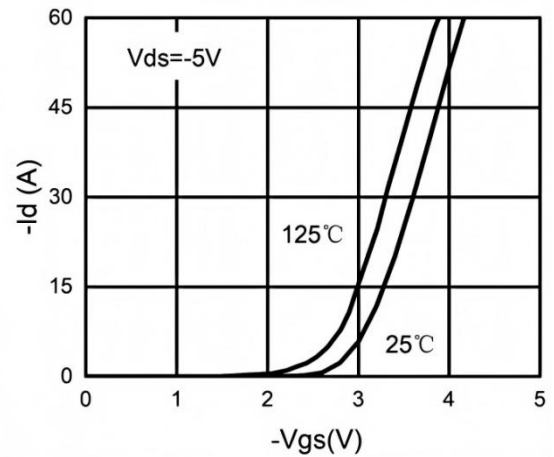


Figure 2. Transfer Characteristics

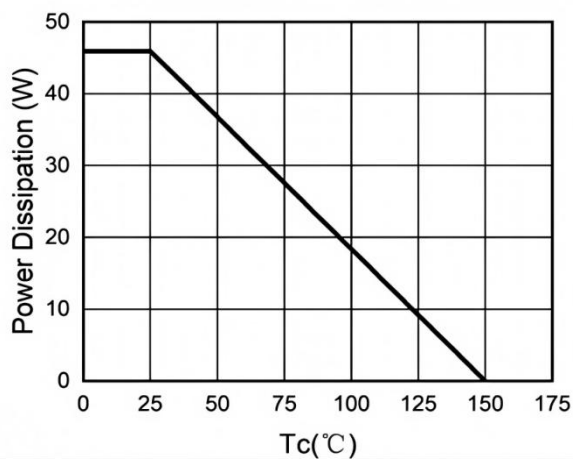


Figure 3. Power Dissipation

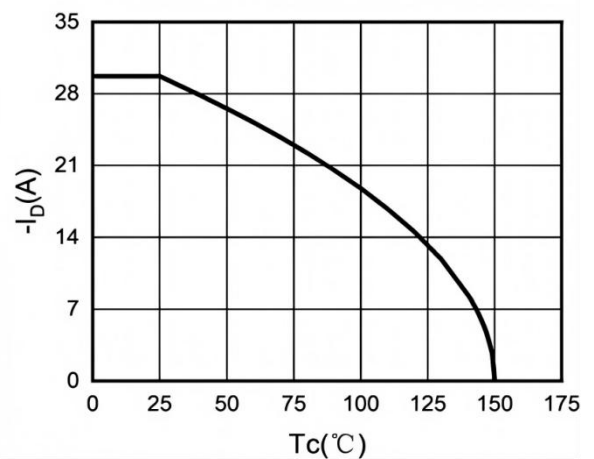


Figure 4. Drain Current

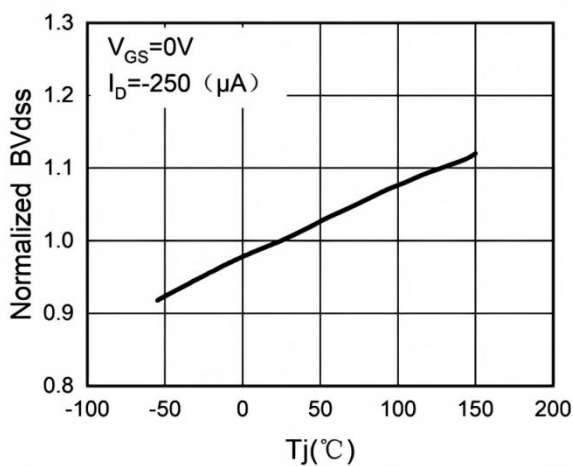


Figure 5. BVDSS vs Junction Temperature

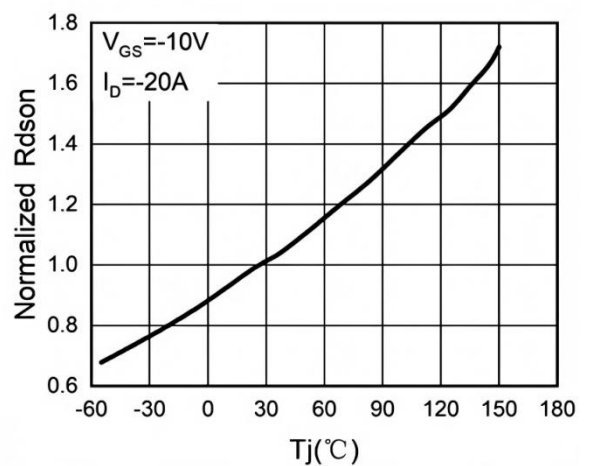


Figure 6. RDS(ON) vs Junction Temperature

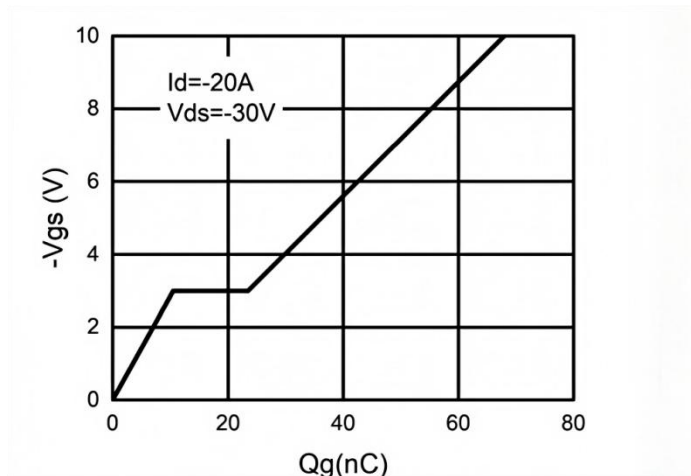


Figure 7. Gate Charge Waveforms

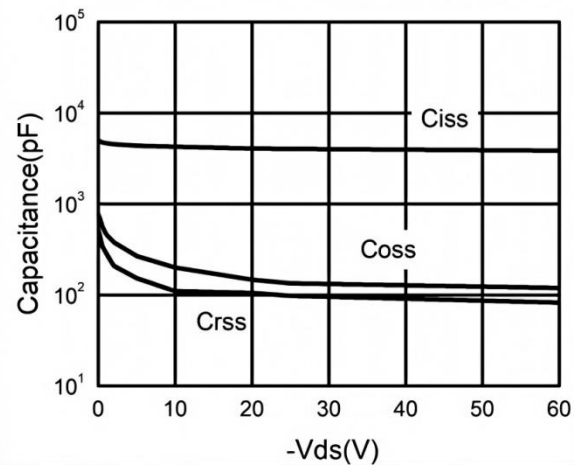


Figure 8. Capacitance

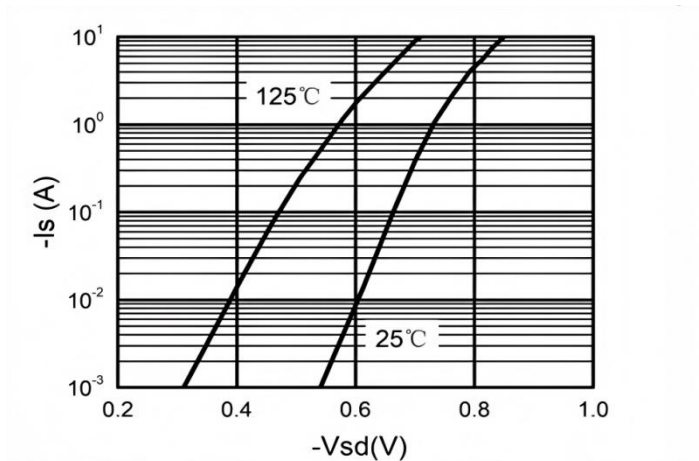


Figure 9. Body-Diode Characteristics

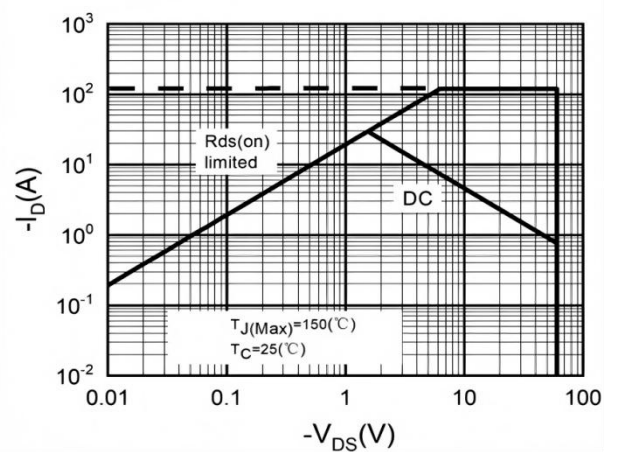


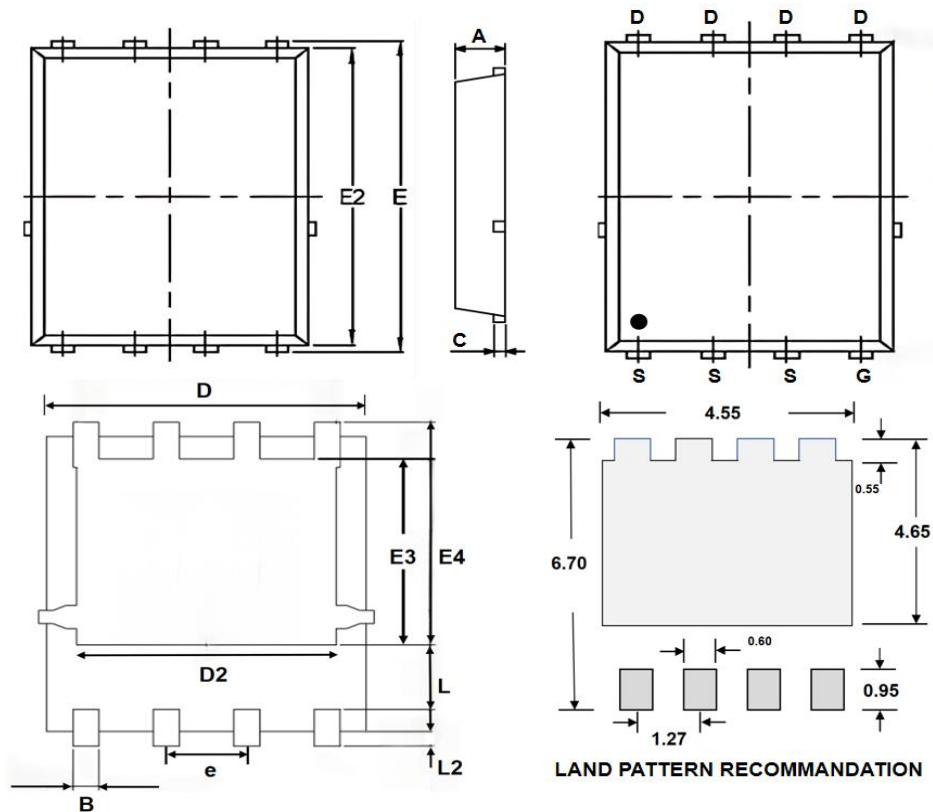
Figure 10. Maximum Safe Operating Area



Ordering Information

Part Number	Package code	Packaging
HSBA6105	PRPAK5*6	3000/Tape&Reel

PRPAK5*6 Package Outline



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.25	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.45	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	--	6.06	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	--



HSBA6105 Marking:

