



General Description

The HSU6105 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 HSU6105 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

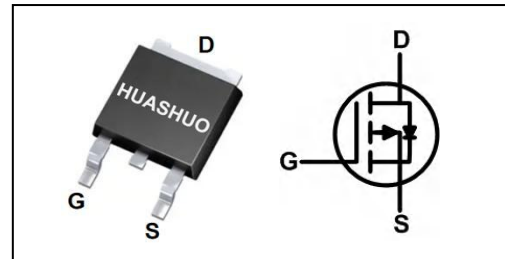
Features

- 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
$R_{DS(ON),max}$	28	mΩ
I_D	-40	A

TO252 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, $-V_{GS}$ @ -10V	-40	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $-V_{GS}$ @ -10V	-25	A
I_{DM}	Pulsed Drain Current ¹	-160	A
EAS	Single Pulse Avalanche Energy ²	196	mJ
$P_D@T_C=25^\circ\text{C}$	Maximum Power Dissipation	71	W
$P_D@T_C=100^\circ\text{C}$	Maximum Power Dissipation	28	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
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	1.75	$^\circ\text{C/W}$



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	$V_{GS}=-10V$, $I_D=-15A$, $T_J=25^{\circ}\text{C}$	---	24	28	$m\Omega$
		$V_{GS}=-4.5V$, $I_D=-10A$, $T_J=25^{\circ}\text{C}$	---	30.5	40.5	
$V_{GS(th)}$	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	$V_{DS}=-5V$, $I_D=-10A$	---	30.5	---	S
Q_g	Total Gate Charge	$V_{DS}=-30V$, $V_{GS}=-10V$, $I_D=-20A$	---	69	---	nC
Q_{gs}	Gate-Source Charge		---	10.5	---	
Q_{gd}	Gate-Drain Charge		---	13	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=-30V$, $V_{GS}=-10V$, $R_L=1.5\Omega$, $R_{GEN}=3\Omega$	---	12.2	---	ns
T_r	Rise Time		---	10	---	
$T_{d(off)}$	Turn-Off Delay Time		---	64	---	
T_f	Fall Time		---	14	---	
C_{iss}	Input Capacitance	$V_{DS}=-25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	4026	---	pF
C_{oss}	Output Capacitance		---	134	---	
C_{rss}	Reverse Transfer Capacitance		---	98	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Source-Drain Current(Body Diode)	$V_G=V_D=0V$, Force Current	---	---	-40	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.EAS 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

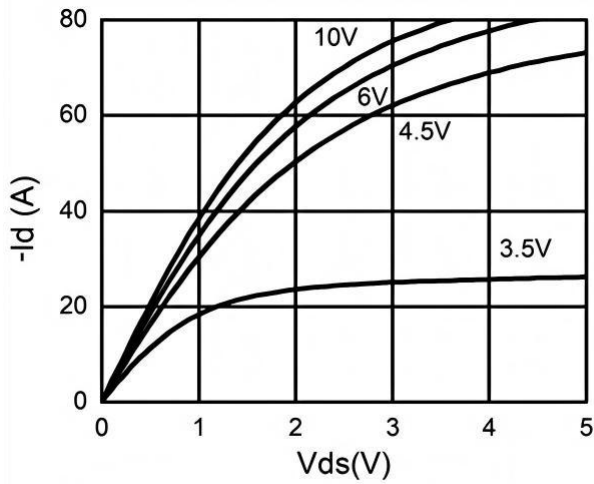


Figure 1. Output Characteristics

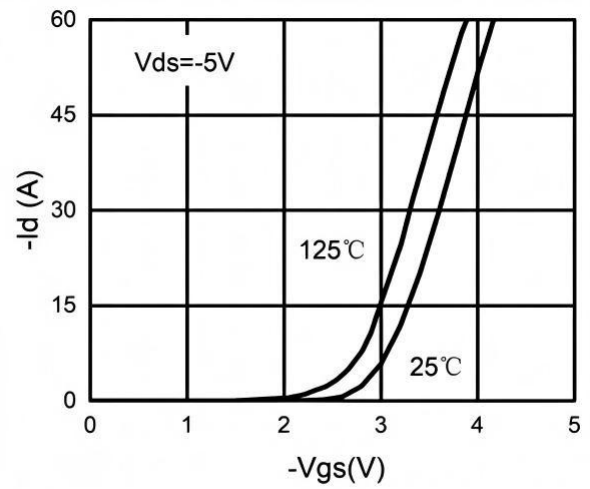


Figure 2. Transfer Characteristics

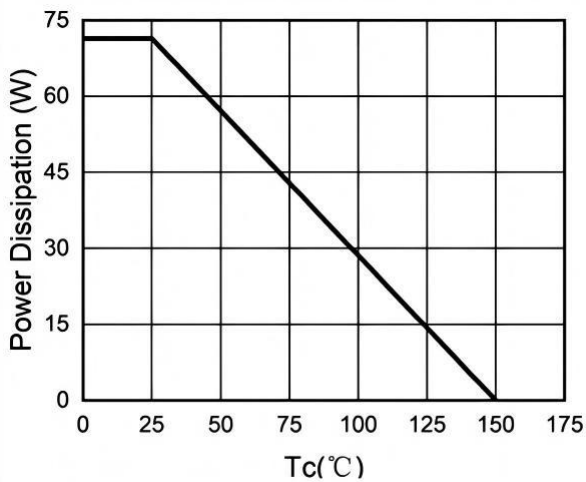


Figure 3. Power Dissipation

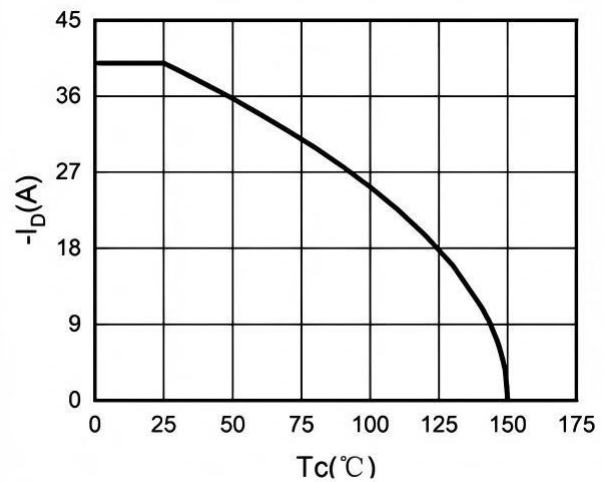


Figure 4. Drain Current

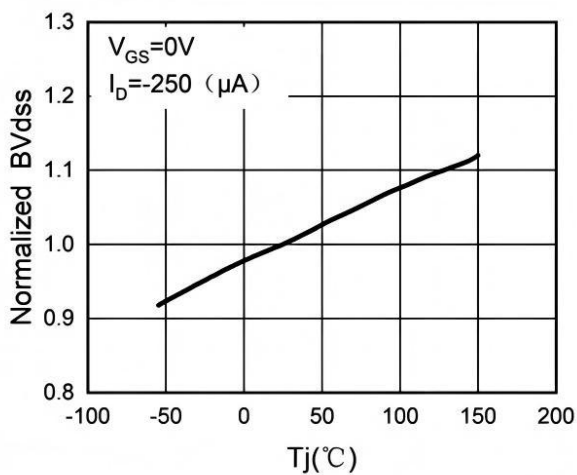


Figure 5. BV_{DSS} vs Junction Temperature

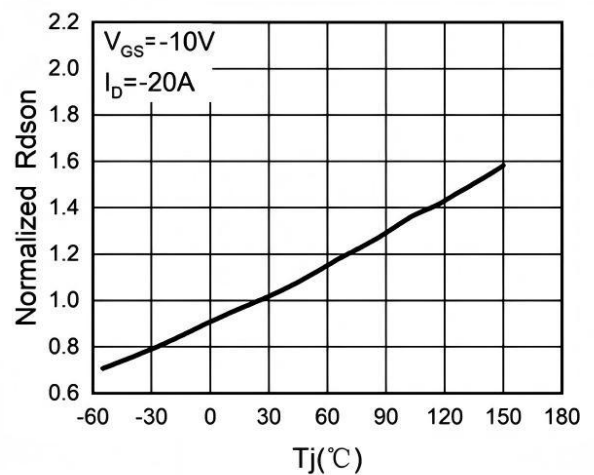


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



P-Ch 60V Fast Switching MOSFETs

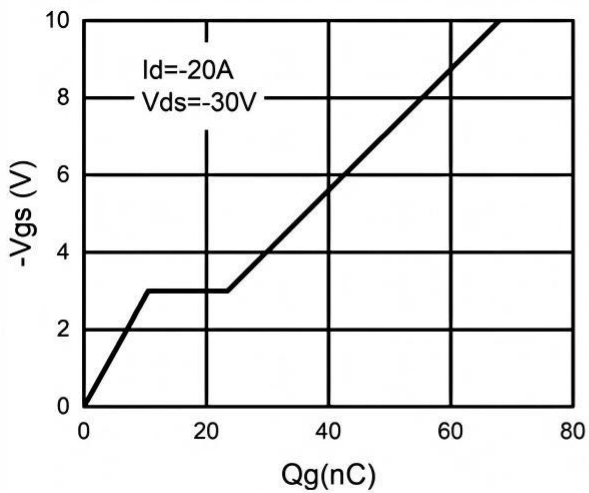


Figure 7. Gate Charge Waveforms

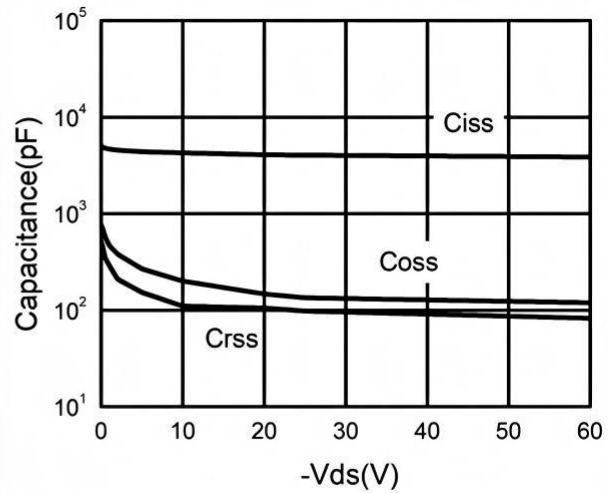


Figure 8. Capacitance

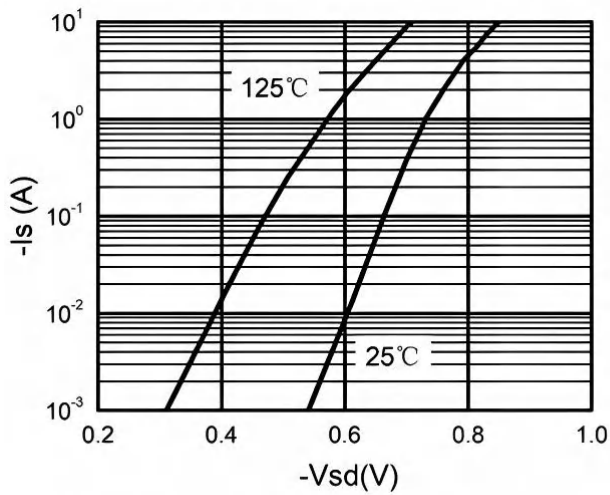


Figure 9. Body-Diode Characteristics

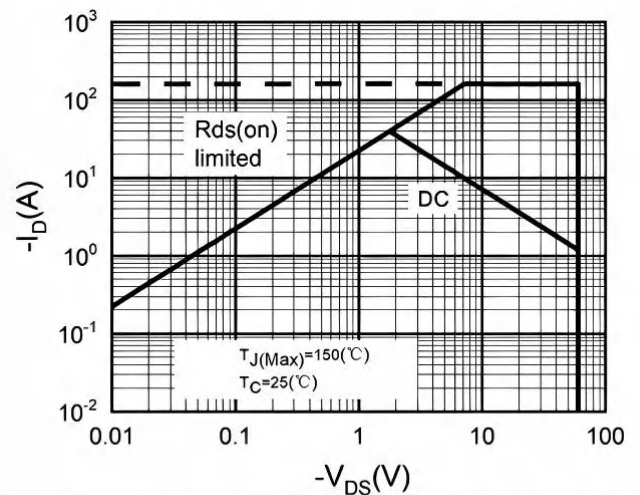


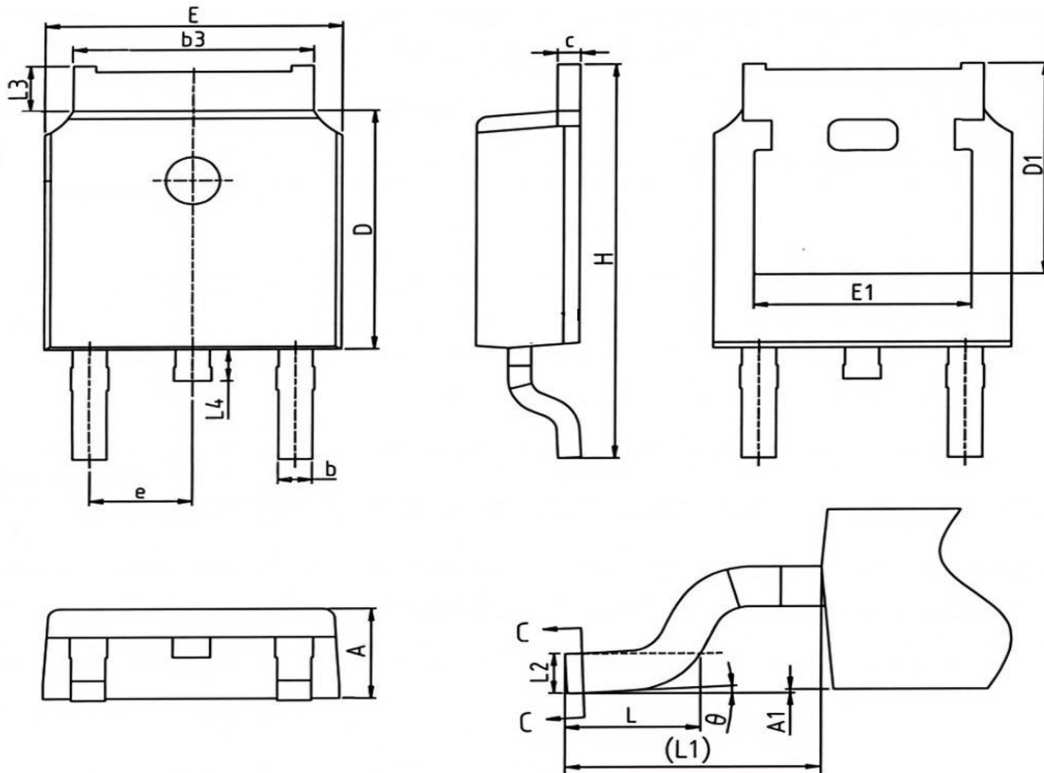
Figure 10. Maximum Safe Operating Area



Ordering Information

Part Number	Package code	Packaging
HSU6105	TO252	2500/Tape&Reel

TO252 Package Outline



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.18	2.40	0.086	0.095
A1	-	0.2	-	0.008
b	0.68	0.9	0.026	0.036
b3	4.95	5.46	0.194	0.215
C	0.43	0.89	0.017	0.035
D	5.97	6.22	0.235	0.245
D1	5.300REF		0.209REF	
E	6.35	6.73	0.250	0.265
E1	4.32	---	0.170	-
e	2.286BSC		0.09BSC	
H	9.4	10.5	0.370	0.413
L	1.38	1.78	0.054	0.070
L1	2.90REF		0.114REF	
L2	0.51BSC		0.020BSC	
L3	0.88	1.28	0.034	0.050
L4	0.5	1	0.019	0.039
θ	0°	8°	0°	8°



HSU6105 Marking:

