

General Description

The HSU15N10 is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications.

The HSU15N10 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

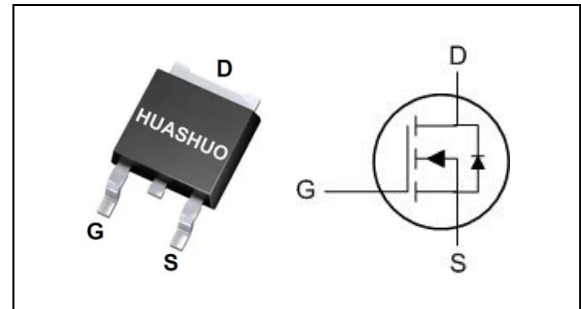
Product Summary

V_{DS}	100	V
$R_{DS(on),TYP}$	65	m Ω
I_D	15	A

Features

- Super Low Gate Charge
- Green Device Available
- Excellent $C_{dv/dt}$ effect decline
- Advanced high cell density Trench Technology

TO252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	15	A
$I_D@T_C=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	12	A
I_{DM}	Pulsed Drain Current ²	60	A
EAS	Single Pulse Avalanche Energy	3.2	mJ
I_{AS}	Avalanche Current	8	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ³	41	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 ¹	---	50	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	3	$^\circ\text{C/W}$



Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	100	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.06	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =15A	---	65	90	mΩ
		V _{GS} =4.5V, I _D =10A	---	75	100	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	1.8	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-6	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =100V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =100V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =10A	---	15	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	3	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =50V, V _{GS} =10V, I _D =5A	---	12	---	nC
Q _{gs}	Gate-Source Charge		---	2.9	---	
Q _{gd}	Gate-Drain Charge		---	1.8	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =50V, V _{GS} =10V, R _G =3.3Ω I _D =5A	---	3.9	---	ns
T _r	Rise Time		---	26	---	
T _{d(off)}	Turn-Off Delay Time		---	16	---	
T _f	Fall Time		---	8.6	---	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	1135	---	pF
C _{oss}	Output Capacitance		---	60	---	
C _{rss}	Reverse Transfer Capacitance		---	37	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	14.6	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.2	V

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 power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



Typical Characteristics

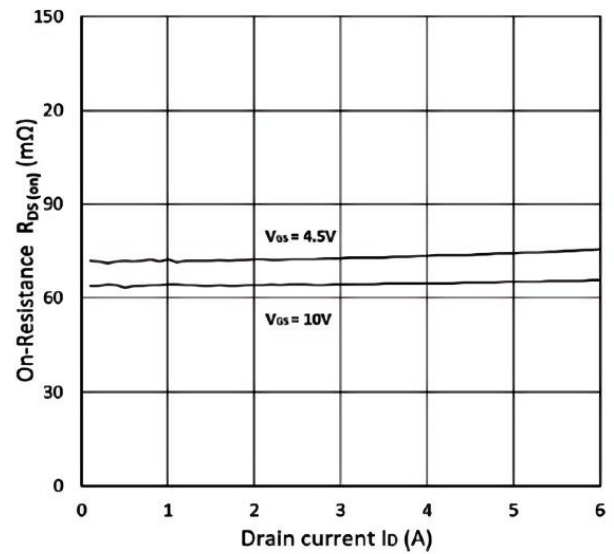
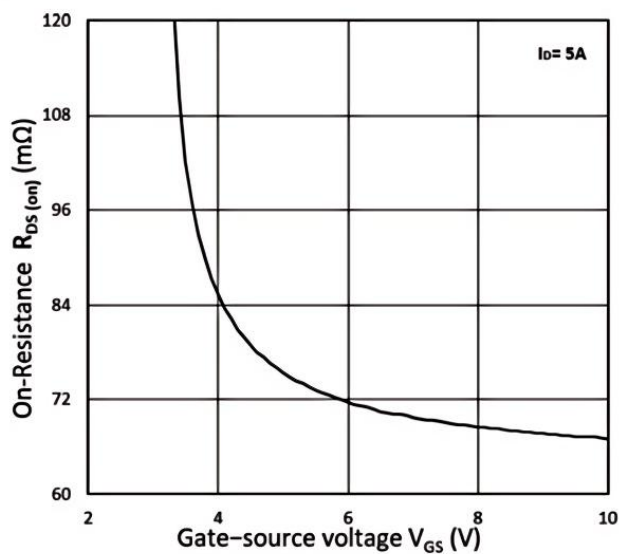
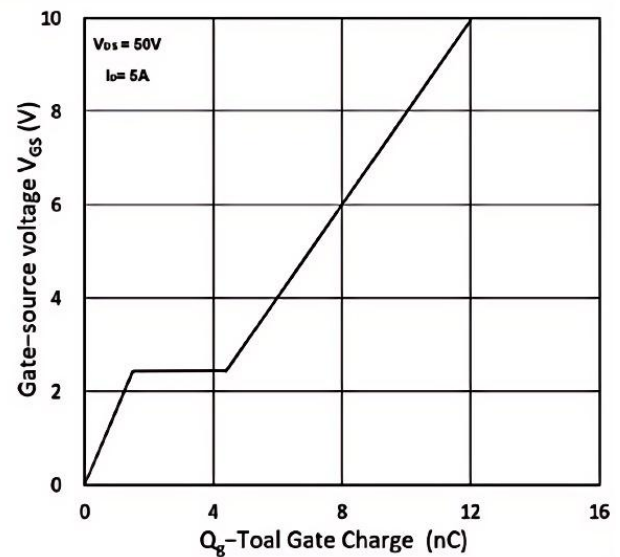
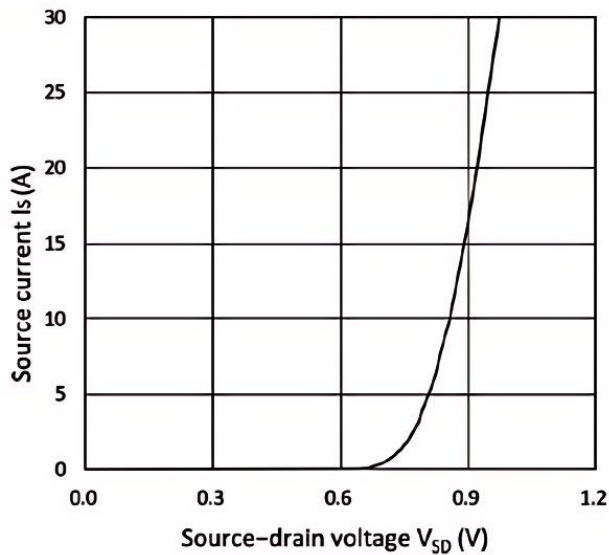
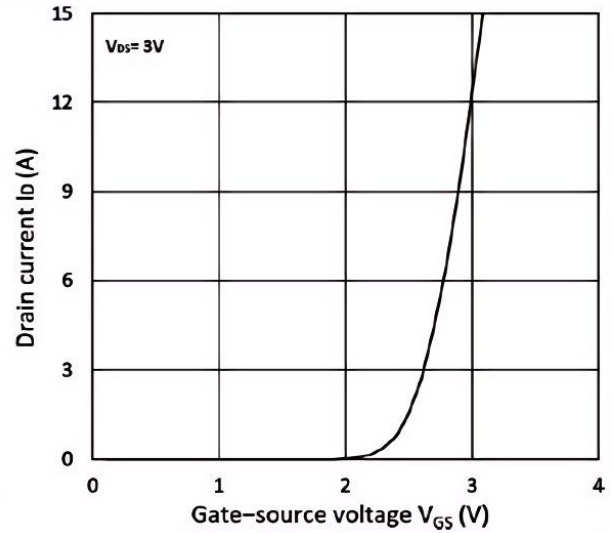
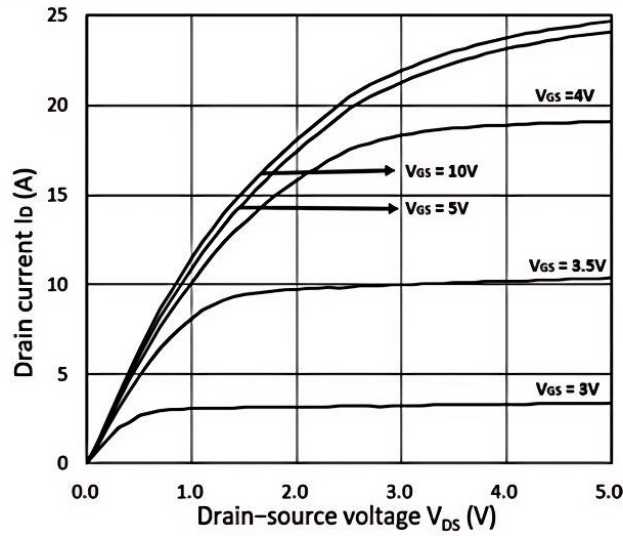


Figure 5. $R_{DS(on)}$ vs. V_{GS}

Figure 6. $R_{DS(on)}$ vs. I_D

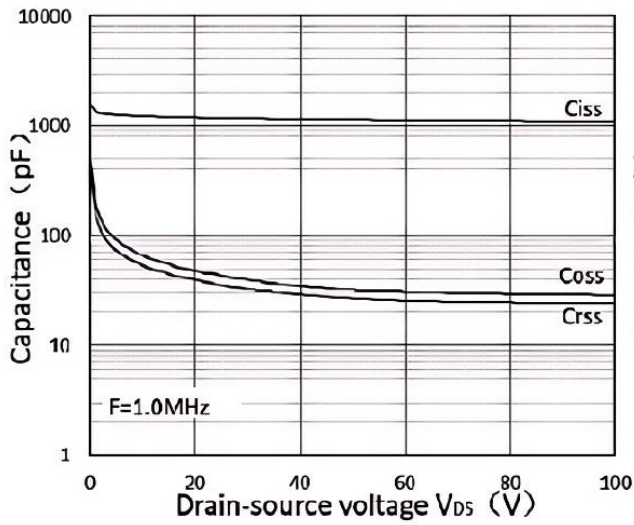


Figure 7. Capacitance Characteristics

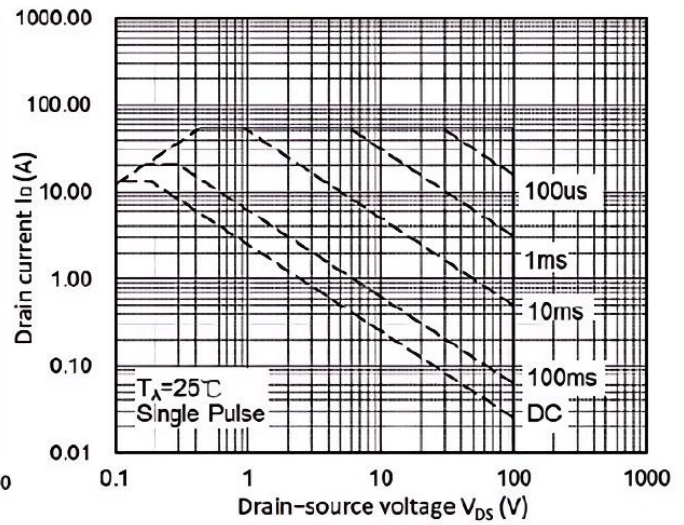


Figure 8. Safe Operating Area

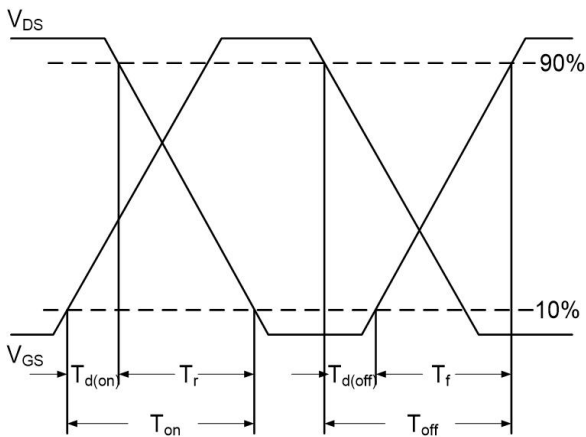


Fig.10 Switching Time Waveform

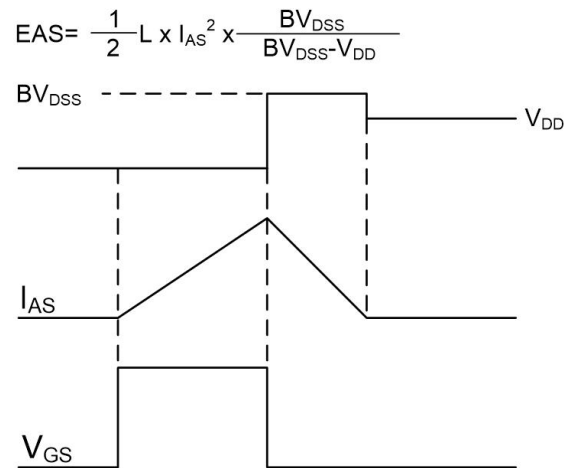


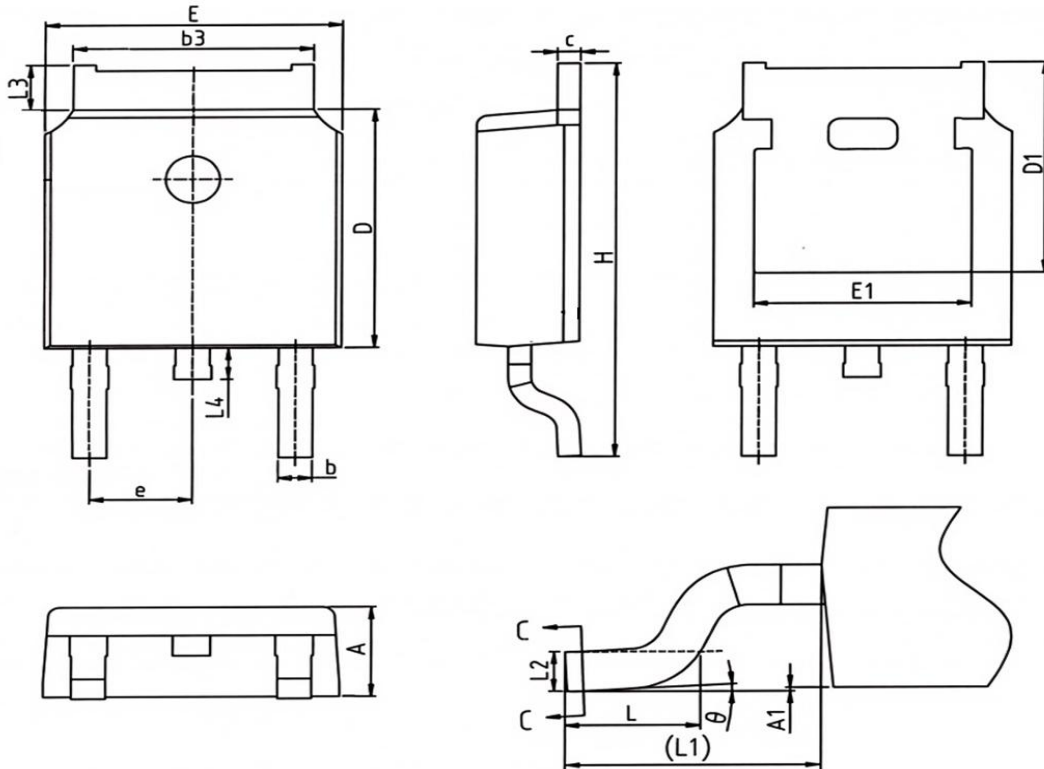
Fig.11 Unclamped Inductive Switching Waveform



Ordering Information

Part Number	Package code	Packaging
HSU15N10	TO-252	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°



HSU15N10 Marking:

