

N-Ch 250V Fast Switching MOSFETs

General Description

The HSU16N25 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 HSU16N25 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

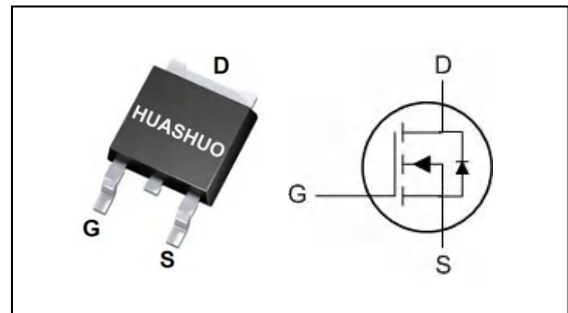
Product Summary

V_{DS}	250	V
$R_{DS(ON),max}$	250	m Ω
I_D	16	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	250	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	16	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	7.5	A
I_{DM}	Pulsed Drain Current ²	65	A
EAS	Single Pulse Avalanche Energy ³	140	mJ
I_{AS}	Avalanche Current	16	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ³	35	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	---	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	3.3	$^\circ\text{C}/\text{W}$



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	250	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =8A	---	220	250	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	3	4	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =160V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =160V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±30V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =8A	---	10	---	S
Q _g	Total Gate Charge (10V)	V _{DS} =200V, V _{GS} =10V, I _D =16A	---	23	---	nC
Q _{gs}	Gate-Source Charge		---	9	---	
Q _{gd}	Gate-Drain Charge		---	6.2	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =120V, V _{GS} =10V, R _G =25Ω I _D =16A	---	13	---	ns
T _r	Rise Time		---	30	---	
T _{d(off)}	Turn-Off Delay Time		---	125	---	
T _f	Fall Time		---	39	---	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	1289	---	pF
C _{oss}	Output Capacitance		---	149	---	
C _{rss}	Reverse Transfer Capacitance		---	47	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	16	A
I _{SM}	Pulsed Source Current ^{2,5}		---	---	65	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =16A, T _J =25°C	---	---	1.4	V
t _{rr}	Reverse Recovery Time	I _F =16A, dI/dt=100A/μs, T _J =25°C	---	205	---	nS
Q _{rr}	Reverse Recovery Charge		---	1.88	---	nC

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 EAS data shows Max. rating . The test condition is V_{DD}=50V,V_{GS}=10V,L=0.3mH, R_G=25Ω, I_{AS}=16A
- 4.The power dissipation is limited by 150°C 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.



Typical Characteristics

Fig. 1 $I_D - V_{DS}$

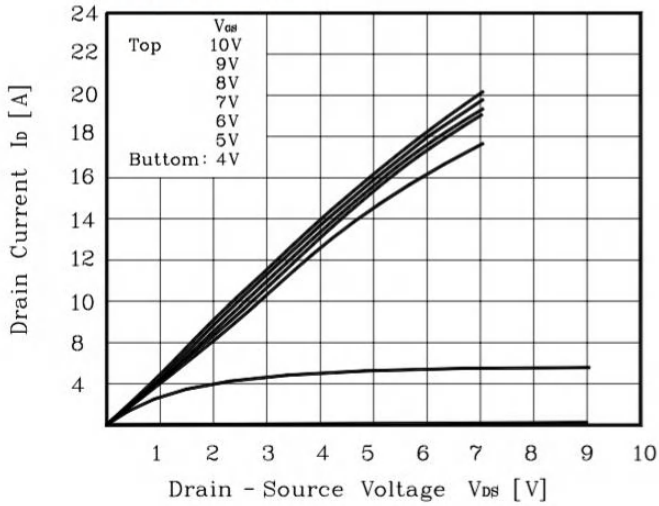


Fig. 2 $I_D - V_{GS}$

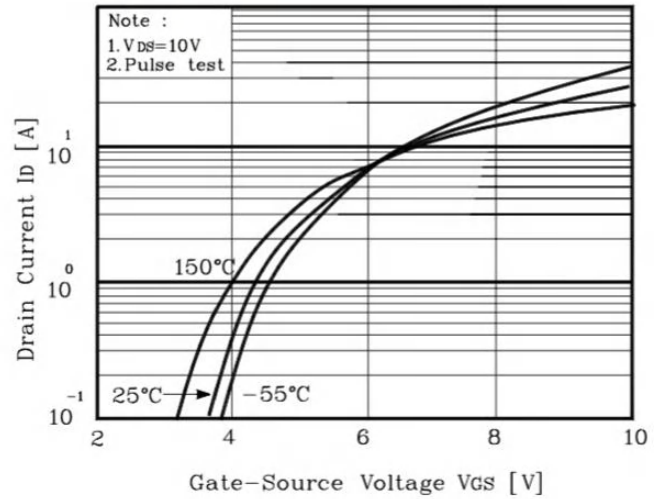


Fig. 3 $R_{DS(on)} - I_D$

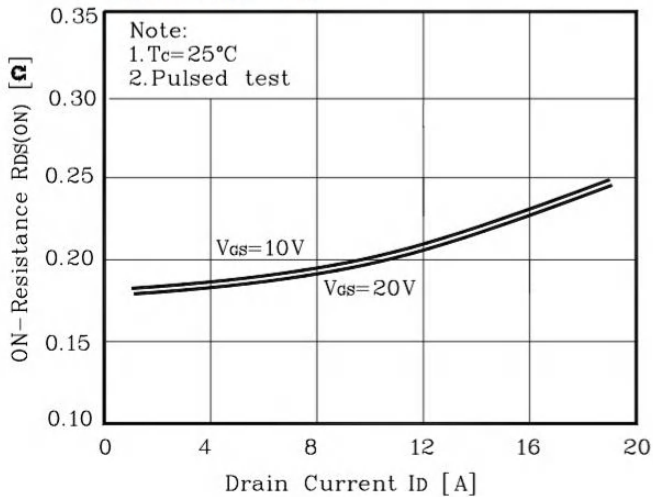


Fig. 4 $I_S - V_{SD}$

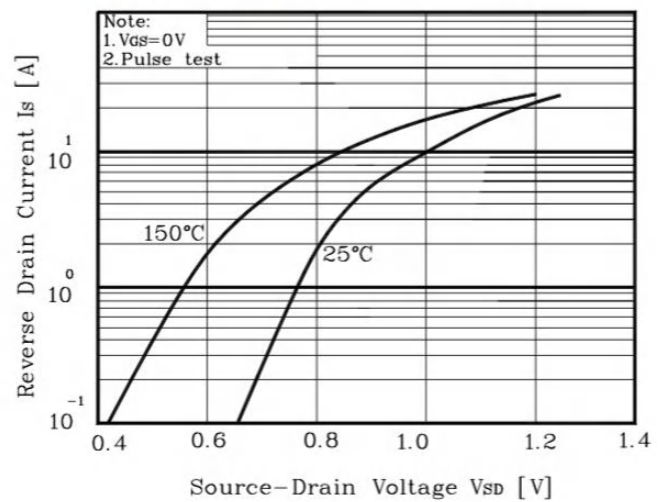


Fig. 5 Capacitance - V_{DS}

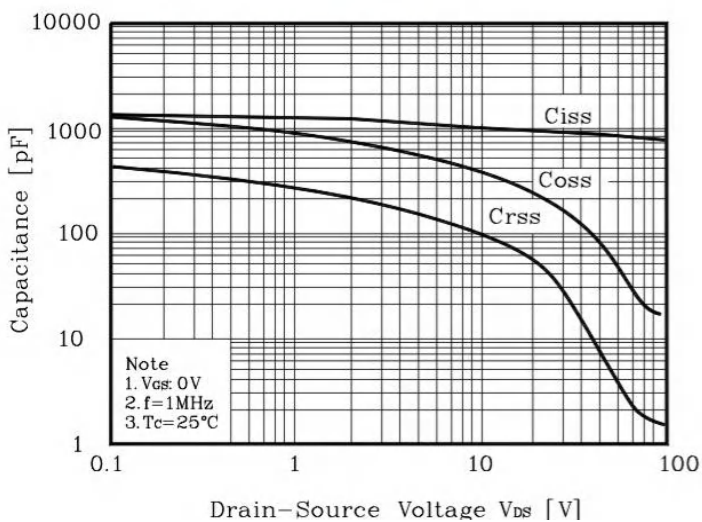


Fig. 6 $V_{GS} - Q_G$

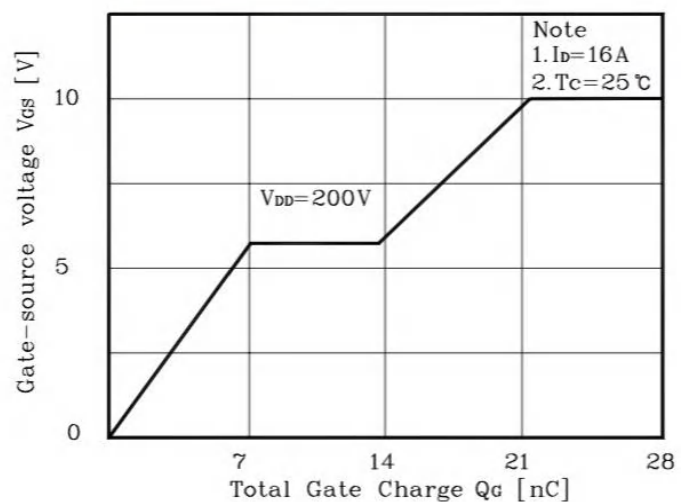




Fig. 7 $V_{DS} - T_J$

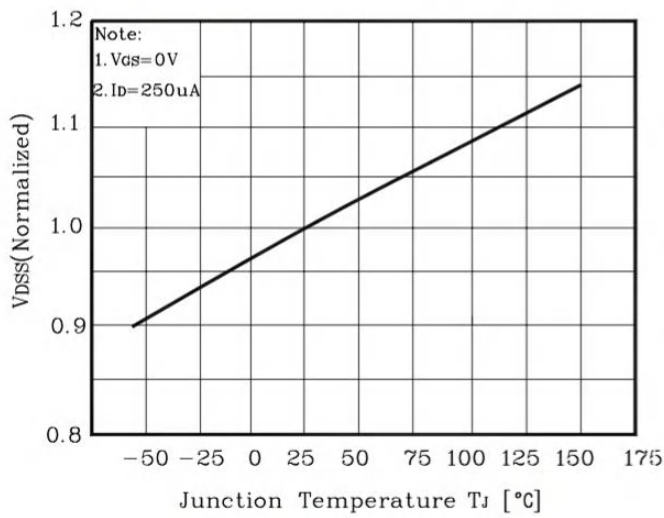


Fig. 8 $R_{DS(on)} - T_J$

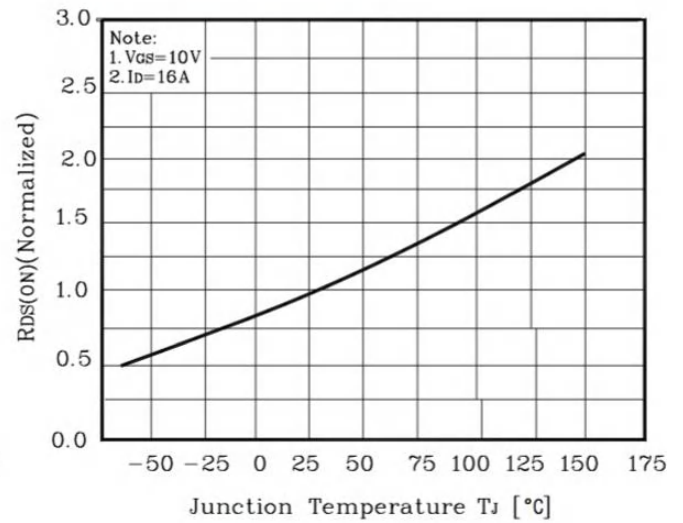


Fig. 9 $I_D - T_C$

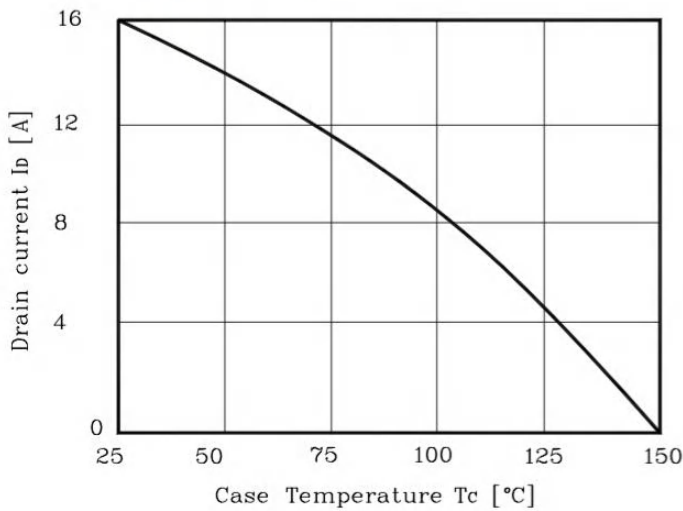
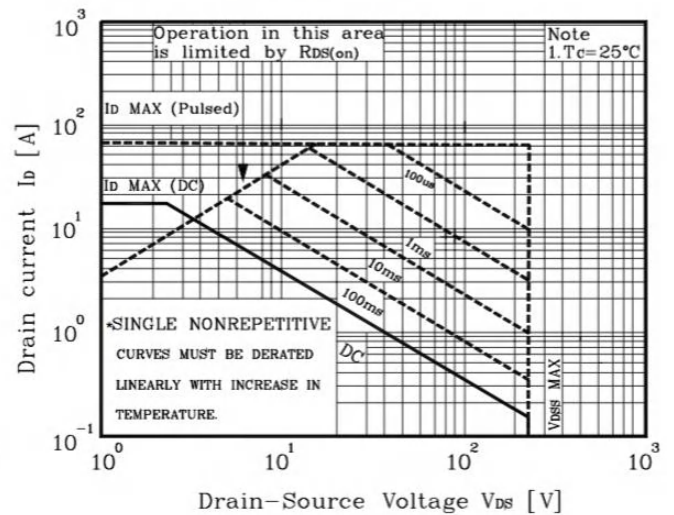


Fig. 10 Safe Operating Area

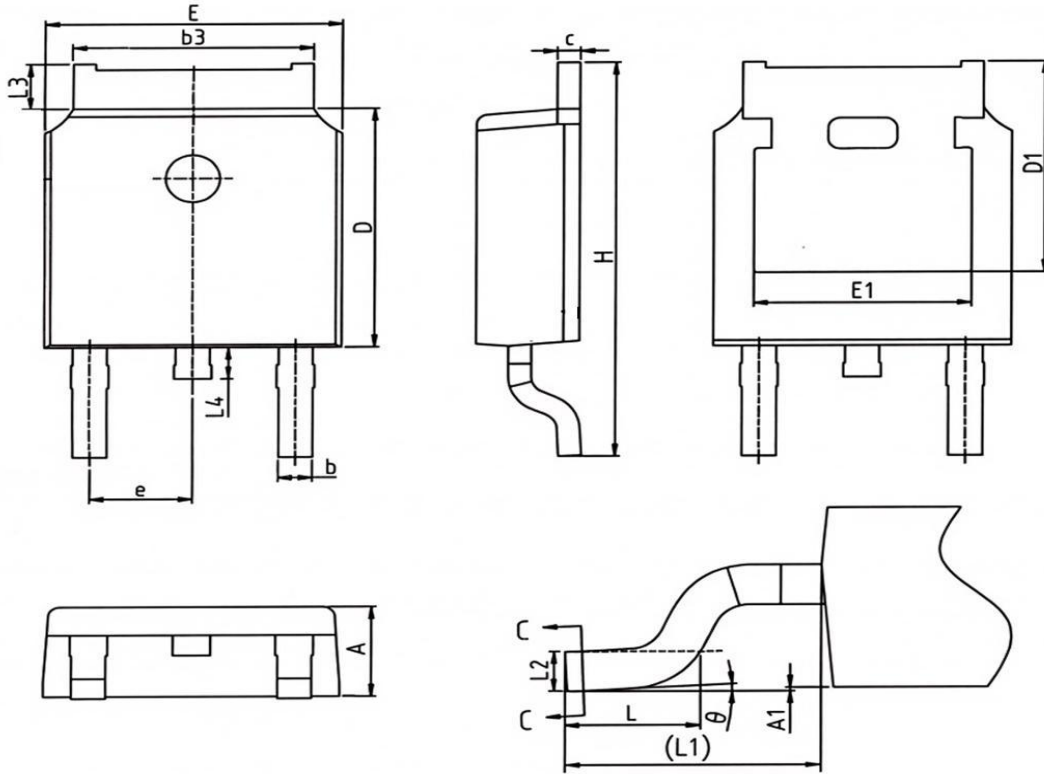




Ordering Information

Part Number	Package code	Packaging
HSU16N25	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°



HSU16N25 Marking:

