HUASHUO SEMICONDUCTOR

HSU0026
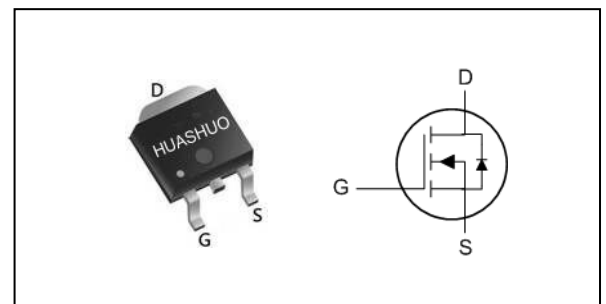
N-Ch 100V Fast Switching MOSFETs

Description

The HSU0026 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The HSU0026 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

- Green Device Available
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology

Product Summary

V_{DS}	100	V
$R_{DS(ON),typ}$	16	mΩ
I_D	40	A

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_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	40	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	22	A
I_{DM}	Pulsed Drain Current[2]	75	A
EAS	Single Pulse Avalanche Energy[3]	16	mJ
I_{AS}	Avalanche Current	18	A
P_D@T_A=25°C	Total Power Dissipation[4]	62.5	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{θJA}$	Thermal Resistance Junction-ambient [1](t≦10S)	---	50	°C/W
	Thermal Resistance Junction-ambient [1](Steady State)	---	2	°C/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	100	---	---	V
$\triangle$BV$_{DSS}$/$\triangle$T$_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I$_D$=1mA	---	0.08	---	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance2	V$_{GS}$=10V , I$_D$=9A	---	16	22	mΩ
		V$_{GS}$=4.5V , I$_D$=7A	---	20	28	
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	1.2	---	2.5	V
$\triangle$V$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	-5.5	---	mV/℃
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=80V , V$_{GS}$=0V , T$_J$=25℃	---	---	10	uA
		V$_{DS}$=80V , V$_{GS}$=0V , T$_J$=55℃	---	---	100	
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=$\pm$20V , V$_{DS}$=0V	---	---	$\pm$100	nA
gfs	Forward Transconductance	V$_{DS}$=5V , I$_D$=9A	---	28	---	S
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	1.6	---	Ω
Q$_g$	Total Gate Charge (10V)		---	36	---	nC
Q$_{gs}$	Gate-Source Charge	V$_{DS}$=80V , V$_{GS}$=10V , I$_D$=7A	---	5	---	
Q$_{gd}$	Gate-Drain Charge		---	10	---	
T$_{d(on)}$	Turn-On Delay Time		---	11.5	---	ns
T$_r$	Rise Time	V$_{DD}$=50V , V$_{GS}$=10V , R$_G$=3.3Ω	---	29	---	
T$_{d(off)}$	Turn-Off Delay Time	I$_D$=7A	---	42	---	
T$_f$	Fall Time		---	18	---	
C$_{iss}$	Input Capacitance		---	1930	---	pF
C$_{oss}$	Output Capacitance	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	245	---	
C$_{rss}$	Reverse Transfer Capacitance		---	125	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current1,6	V$_G$=V$_D$=0V , Force Current	---	---	40	A
V$_{SD}$	Diode Forward Voltage2	V$_{GS}$=0V , I$_S$=1A , T$_J$=25℃	---	---	1.2	V
t$_{rr}$	Reverse Recovery Time		---	48	---	nS
Q$_{rr}$	Reverse Recovery Charge	IF=7A , dI/dt=100A/μs , T$_J$=25℃	---	29	---	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 $\leqq$ 300us , duty cycle $\leqq$ 2%

3.The EAS data shows Max. rating . The test condition is V$_{DD}$=25V,V$_{GS}$=10V,L=0.1mH

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.
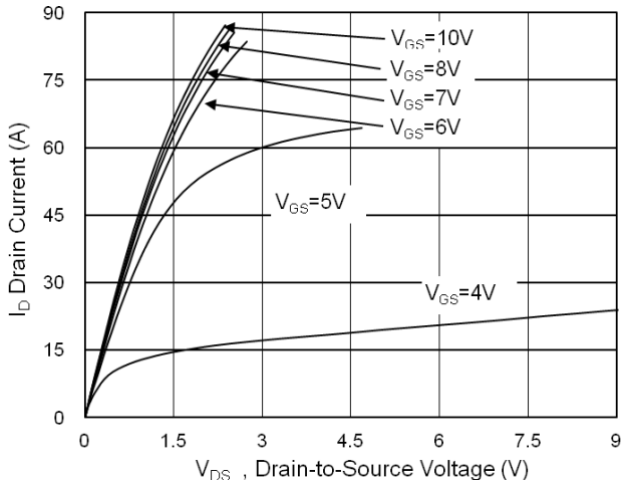
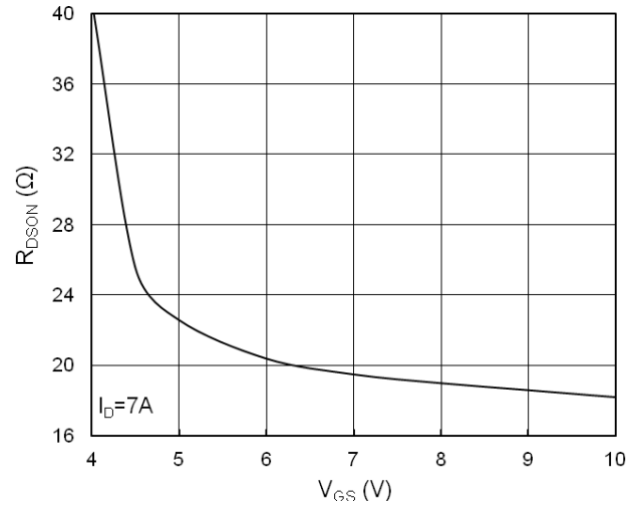**Fig.1 Typical Output Characteristics**
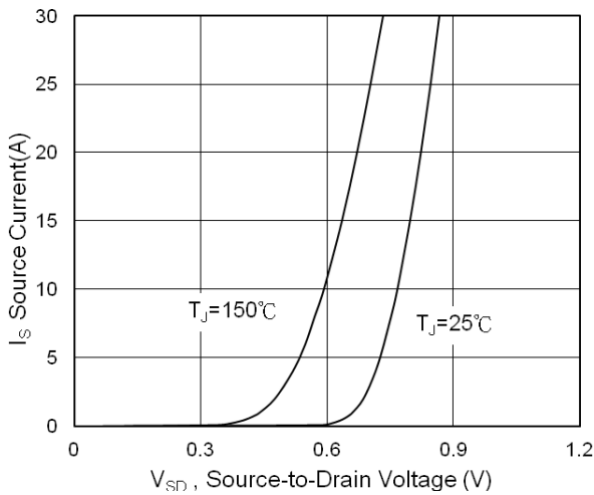
Fig.2 On-Resistance vs. Gate-Source
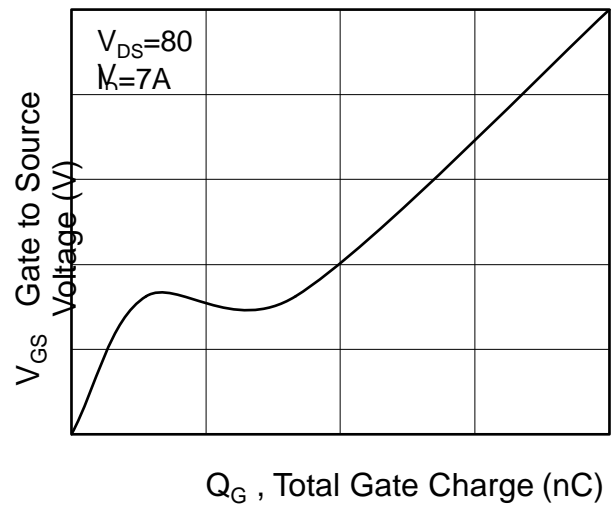
Fig.3 Forward Characteristics Of Reverse
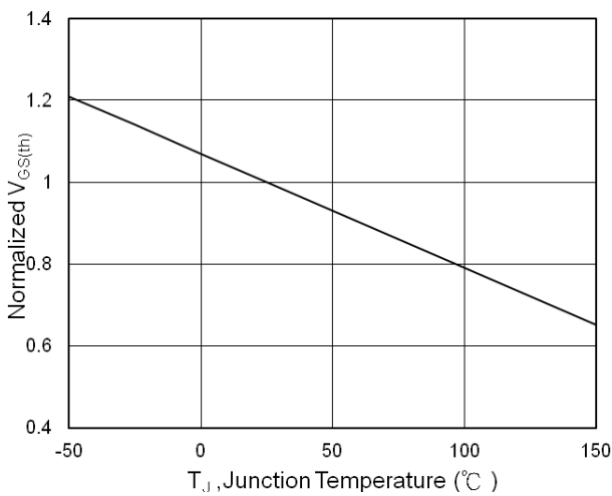
Fig.4 Gate-Charge Characteristics
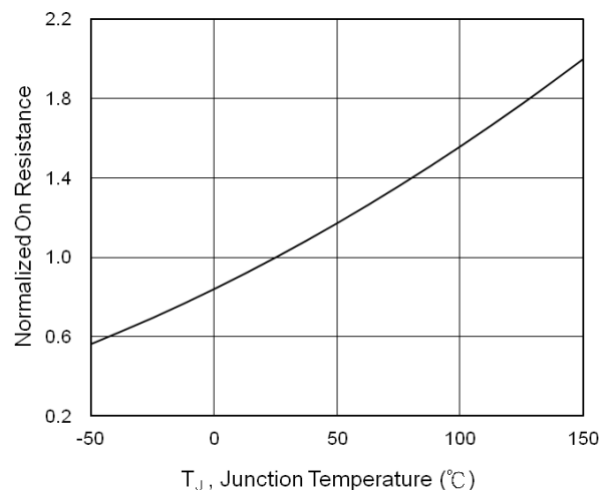
Fig.5 Normalized VGS(th) vs. TJ

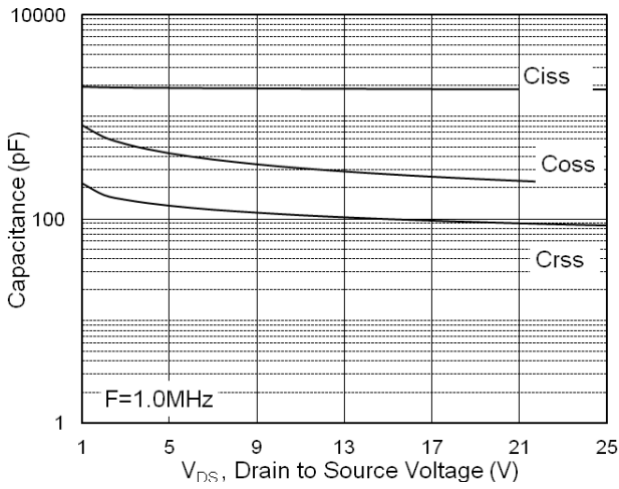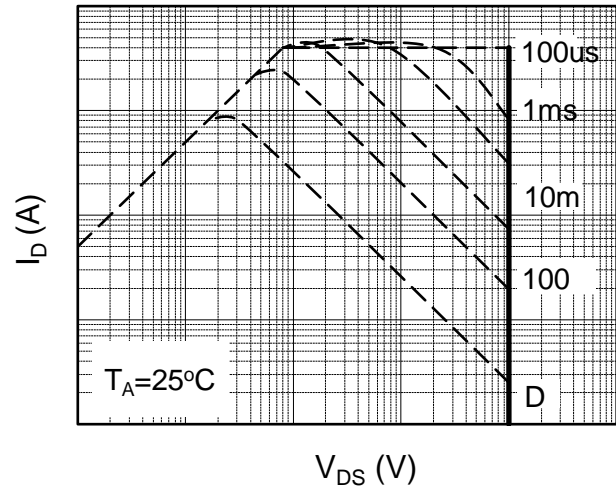**Fig.6 Normalized RDSON vs. TJ**

Fig.7 Capacitance
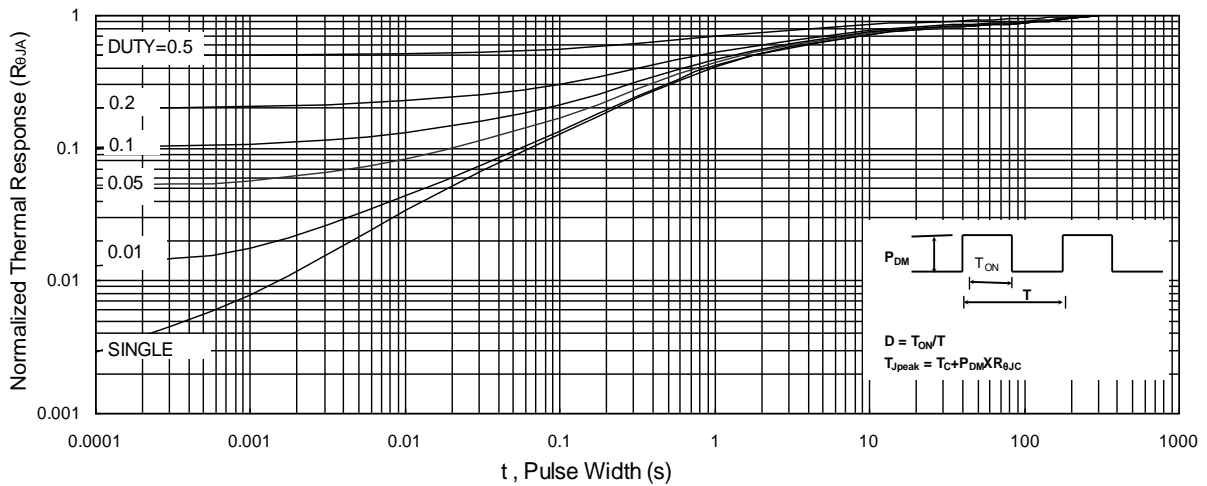
Fig.8 Safe Operating Area
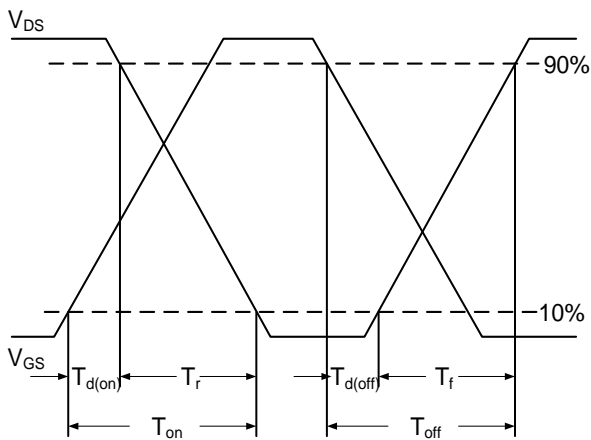
Fig.9 Normalized Maximum Transient Thermal Impedance

Fig.10 Switching Time Waveform

Fig.11 Unclamped Inductive Switching

Ordering Information

Part Number	Package code	Packaging
HSU0026	TO-252	2500/Tape&Reel

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	

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