HUASHUO SEMICONDUCTOR

HSU90N03

N-Ch 30V Fast Switching MOSFETs

Features

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

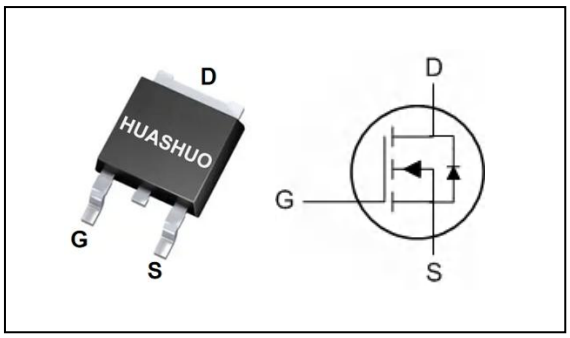
Product Summary

V_{DS}	30	V
$R_{DS(ON),typ}$	2.8	mΩ
I_D	90	A

Application

- Load Switch
- Motor Driver
- PWM Application
- Power Management

TO-252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	90	A
I_D@T_C=100℃	Continuous Drain Current	60	A
I_{DM}	Pulsed Drain Current[1]	420	A
EAS	Single Pulse Avalanche Energy[2]	256	mJ
P_D@T_C=25℃	Total Power Dissipation	78	W
P_D@T_C=100℃	Total Power Dissipation	31	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	1.61	℃/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=250μA	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	2.8	3.5	mΩ
		V_{GS}=4.5V , I_D=15A	---	4.3	5.5	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250μA	1.0	1.4	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25℃	---	---	1	μA
		V_{DS}=30V , V_{GS}=0V , T_J=125℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	28.2	---	S
R_g	Gate Resistance	V_{DS}=10V , V_{GS}=0V , f=1MHz	---	1.7	---	Ω
Q_g	Total Gate Charge	V_{DS}=15V , V_{GS}=10V , I_D=20A	---	48		nC
Q_{gs}	Gate-Source Charge		---	5.2		
Q_{gd}	Gate-Drain Charge		---	9.6		
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3Ω R_L=0.75Ω	---	14.4		ns
T_r	Rise Time		---	36		
$T_{d(off)}$	Turn-Off Delay Time		---	43.6		
T_f	Fall Time		---	22		
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	2764		pF
C_{oss}	Output Capacitance		---	289		
C_{rss}	Reverse Transfer Capacitance		---	265		

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	90	A
V_{SD}	Diode Forward Voltage[3]	V_{GS}=0V , I_S=20A , T_J=25℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , T_J=25℃	---	56	---	nS
Q_{rr}	Reverse Recovery Charge		---	42	---	nC

Note :
1.Repetitive Rating: Pulse width limited by maximum junction temperature.
2.E_{AS} condition: T_J=25℃,V_{DD}=30V,V_G=10V, Rg=25Ω, L=0.5mH.
3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics

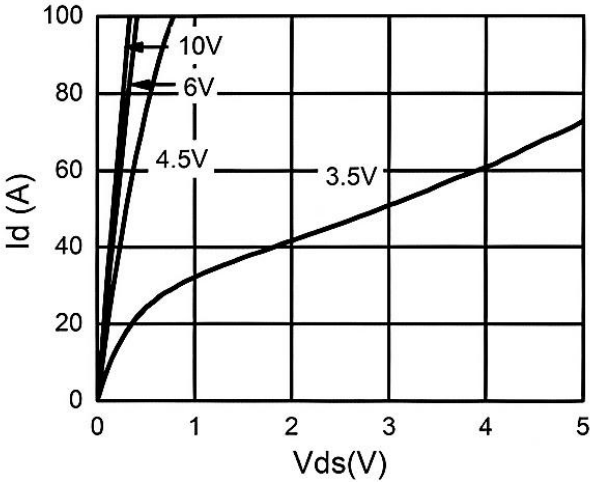


Fig.1 Typical Output Characteristics

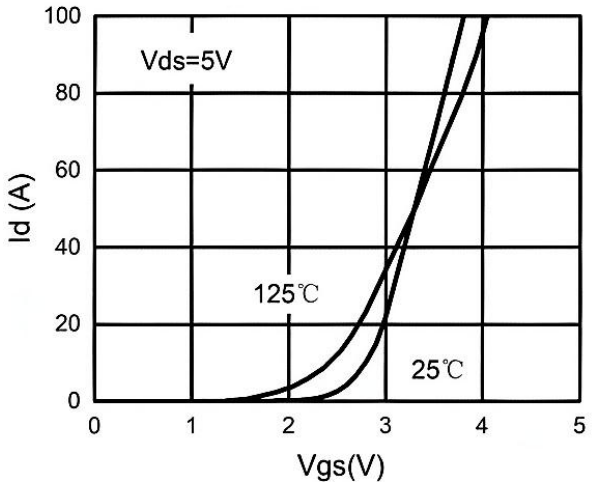


Fig.2 Transfer Characteristics

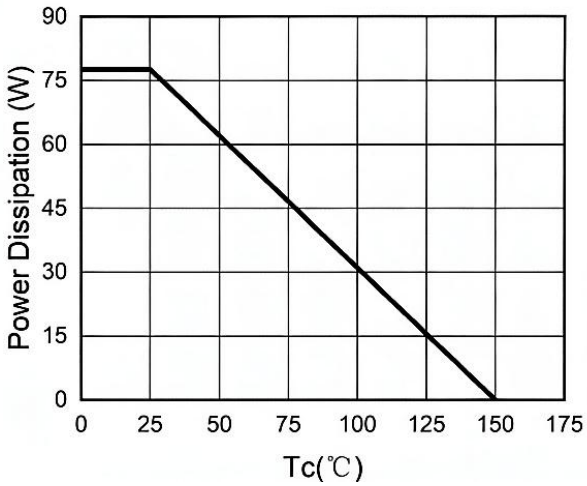


Fig.3 Power Dissipation

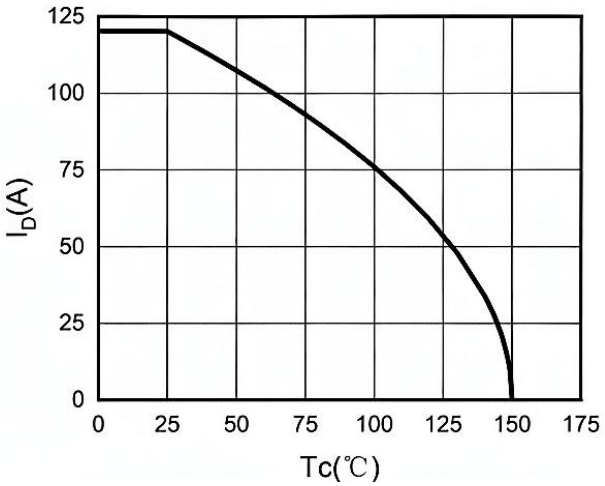


Fig.4 Drain Current

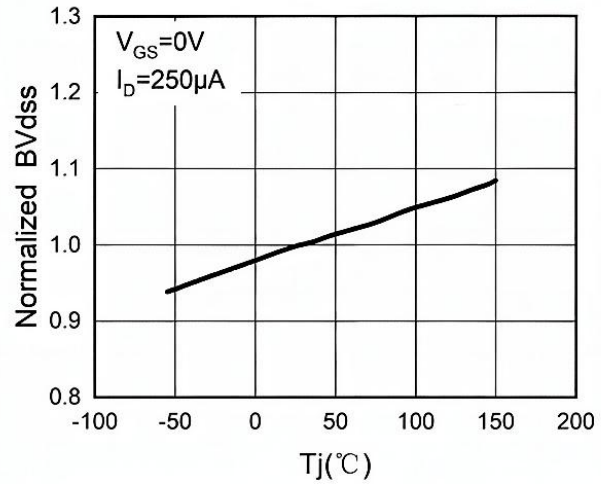


Fig.5 BV_{DSS} vs Junction Temperature

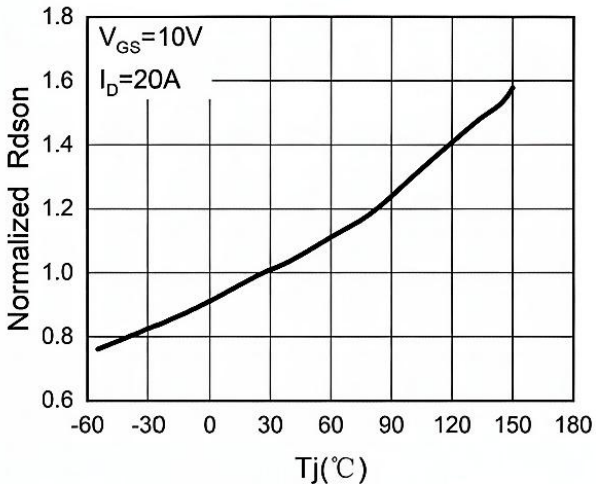


Fig.6 $R_{DS(ON)}$ vs Junction Temperature

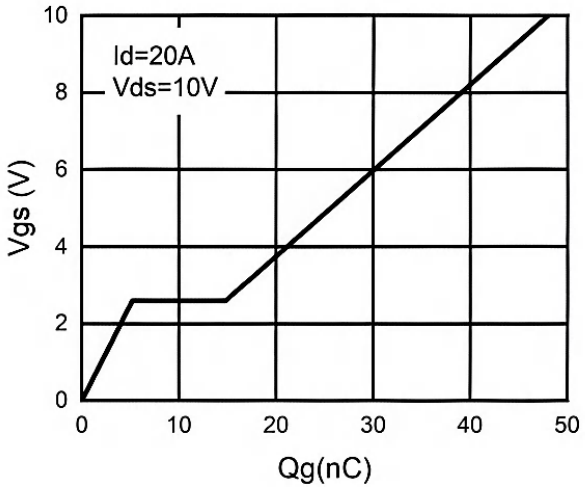


Fig.7 Gate Charge Waveforms

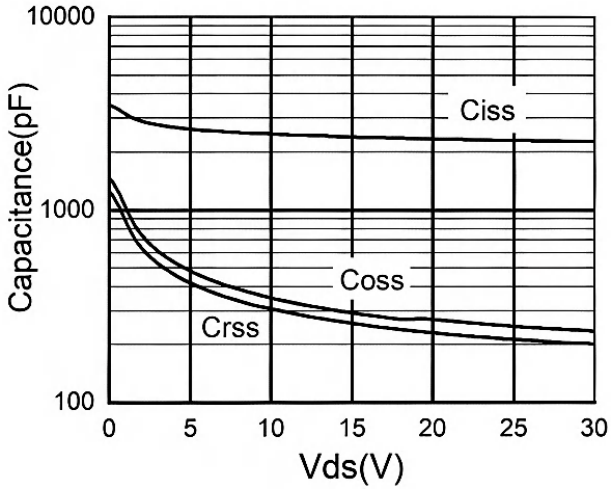


Fig.8 Capacitance

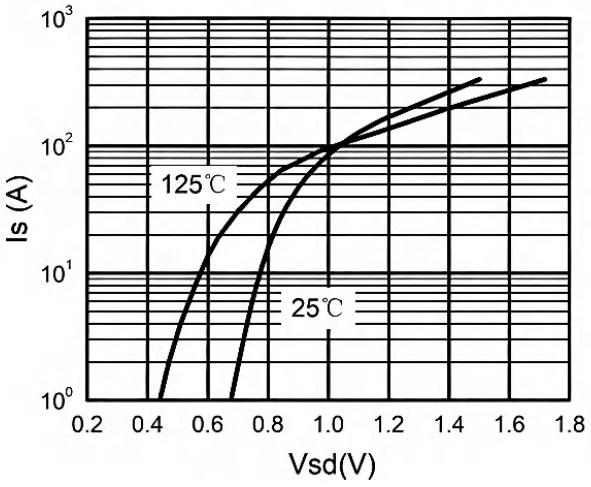


Fig.9 Body Diode Characteristics

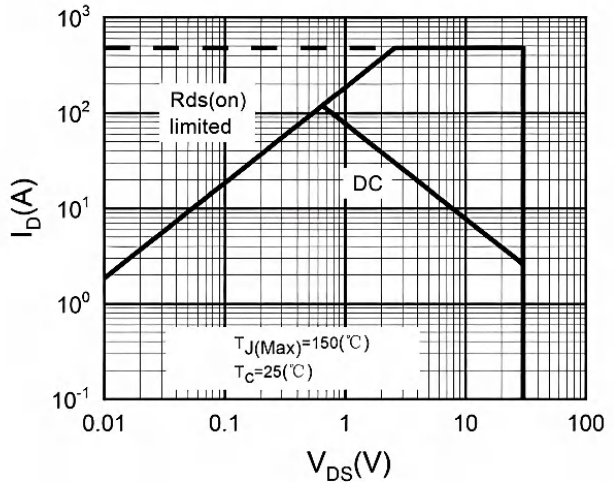
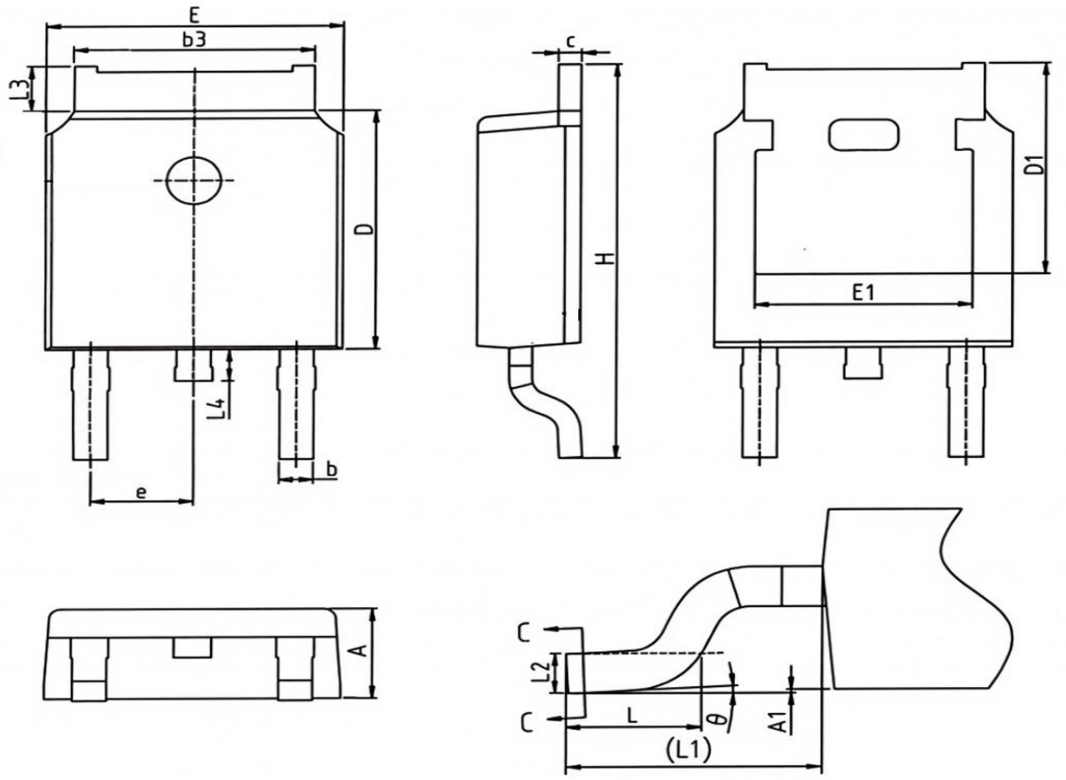


Fig.10 Maximum Safe Operating Area

Ordering Information

Part Number	Package code	Packaging
HSU90N03	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°

HSU90N03 Marking:

