HUASHUO SEMICONDUCTOR

HSSN2302

N-Ch 20V Fast Switching MOSFETs

General Description

The HSSN2302 is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The HSSN2302 meets the RoHS and Green Product requirement with full function reliability approved.

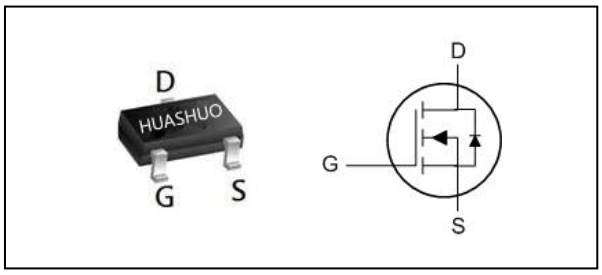
Product Summary

V_{DS}	20	V
$R_{DS(ON),typ}$	55	mΩ
I_D	2	A

Features

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

SOT-323 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 4.5V(T_J=150℃)[1]	2	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 4.5V(T_J=150℃)[1]	1.5	A
I_{DM}	Pulsed Drain Current[2]	8	A
I_S	Continuous source current (diode conduction)[1]	0.6	A
P_D@T_A=25℃	Total Power Dissipation[1]	0.3	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board.
2.Pulse width limited by maximum junction temperature.

Electrical Characteristics (T_A=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[1]	V_{GS}=4.5V , I_D=2A	---	55	65	mΩ
		V_{GS}=2.5V , I_D=1A	---	75	90	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250μA	0.5	0.65	1.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V , V_{GS}=0V , T_J=25℃	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance[1]	V_{DS}=5V , I_D=2A	---	5	---	S
Q_g	Total Gate Charge (4.5V)	V_{DS}=10V , V_{GS}=4.5V , I_D=2A	---	3.5	---	nC
Q_{gs}	Gate-Source Charge		---	0.6	---	
Q_{gd}	Gate-Drain Charge		---	0.45	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V , V_{GS}=4.5V , R_L=3Ω, R_{GEN}=6Ω	---	8	---	ns
T_r	Rise Time		---	7	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	7	---	
C_{iss}	Input Capacitance	V_{DS}=10V , V_{GS}=0V , f=1MHz	---	180	---	pF
C_{oss}	Output Capacitance		---	38	---	
C_{rss}	Reverse Transfer Capacitance		---	20	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=2A , T_J=25℃	---	0.76	1.16	V

Note :
1.Pulse Test : Pulse width ≤ 300μs, duty cycle ≤ 2%.
2.Guaranrteed by design, not subject to production testing.

Typical Characteristics

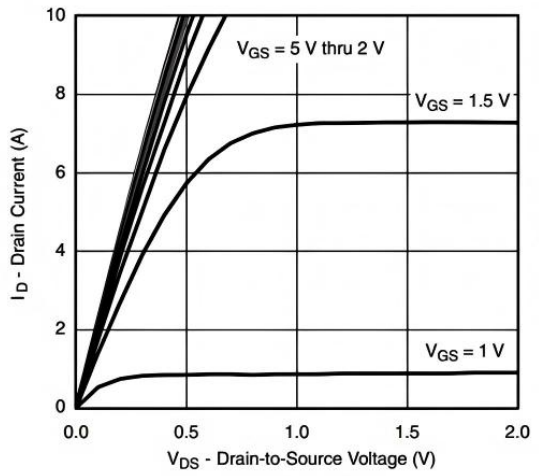


Fig.1 Output Characteristic

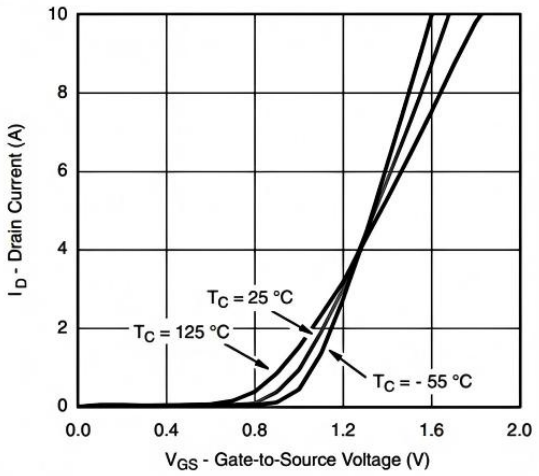


Fig.2 Transfer Characteristics

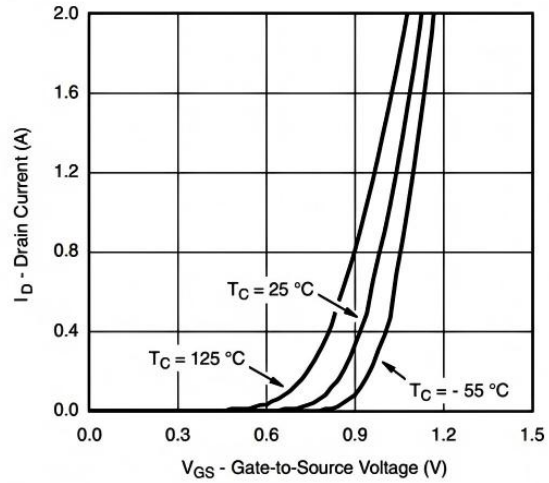


Fig.3 Transfer Characteristic

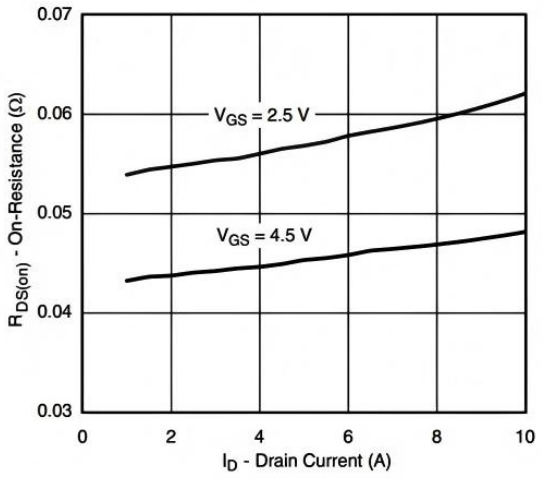


Fig.4 On-Resistance vs. Junction

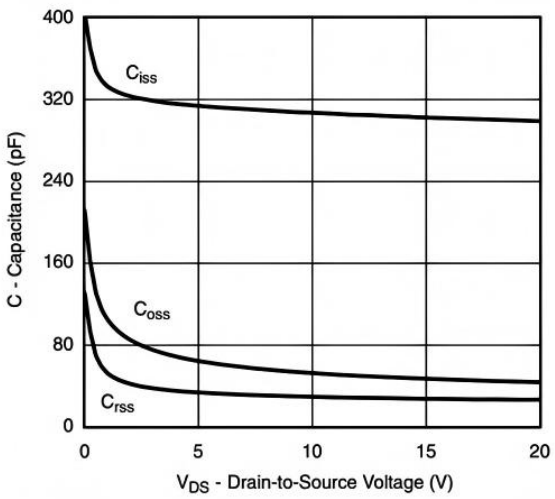


Fig.5 Capacitance

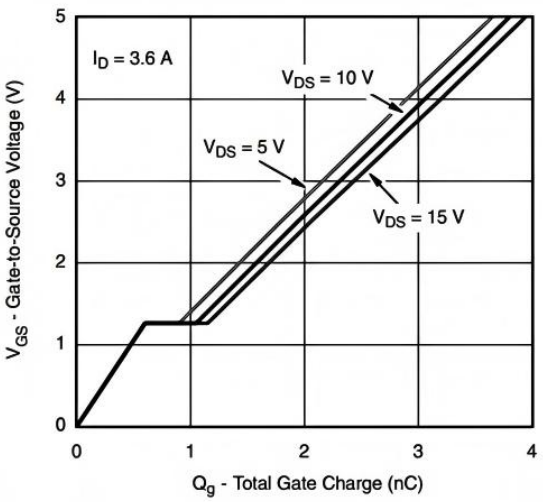


Fig.6 Gate Charge

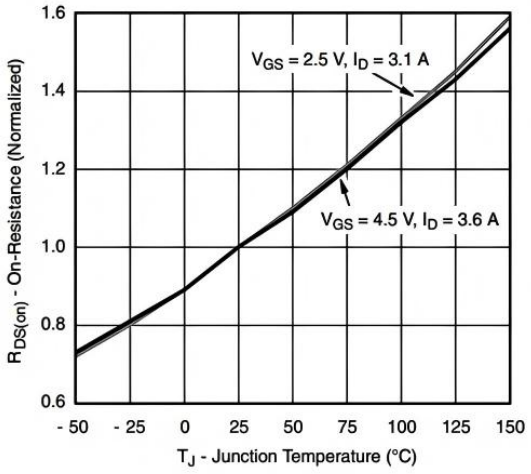


Fig.7 On-Reststance Junction Temperature

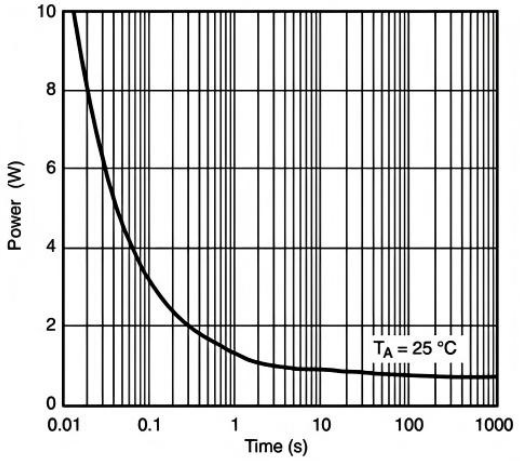


Fig.8 Single Pulse Power

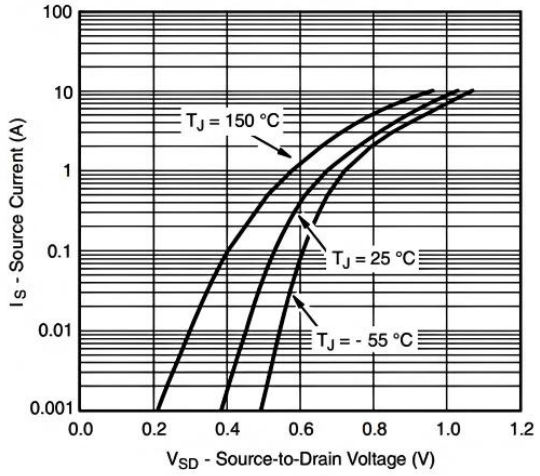


Fig.9 Source-Drain Diode Forward Voltage

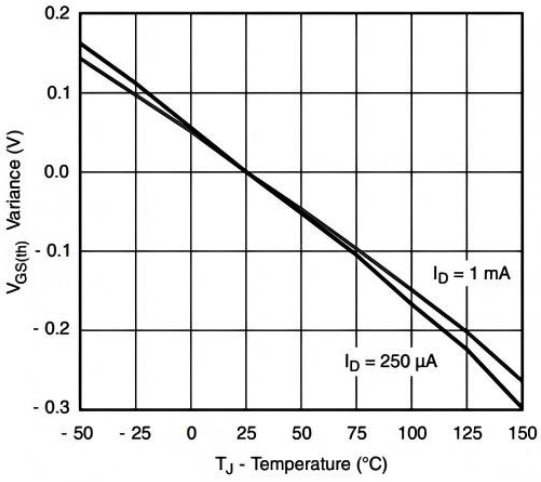


Fig.10 Threshold Voltage

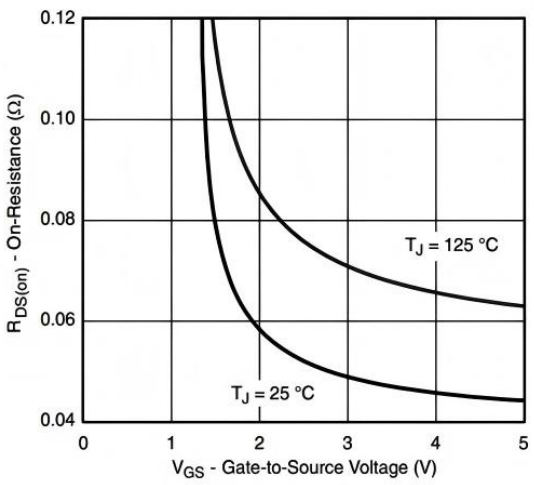


Fig.11 On-Resistance vs. Gate-Source Voltage

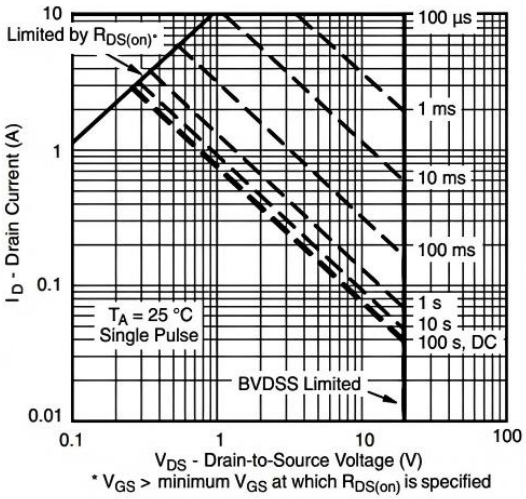
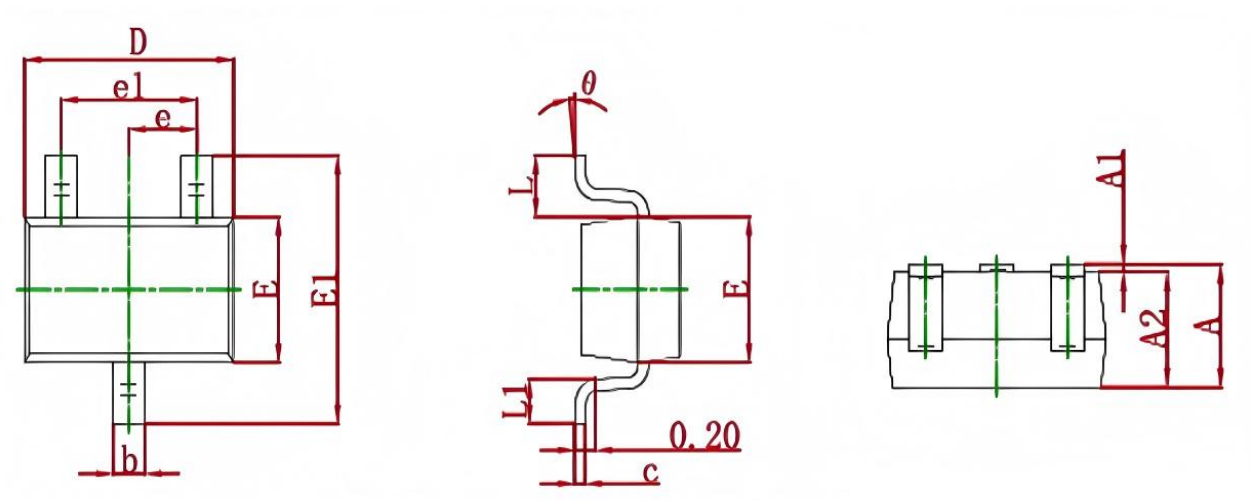


Fig.12 Safe Operating Area, Junction-Ambient

Ordering Information

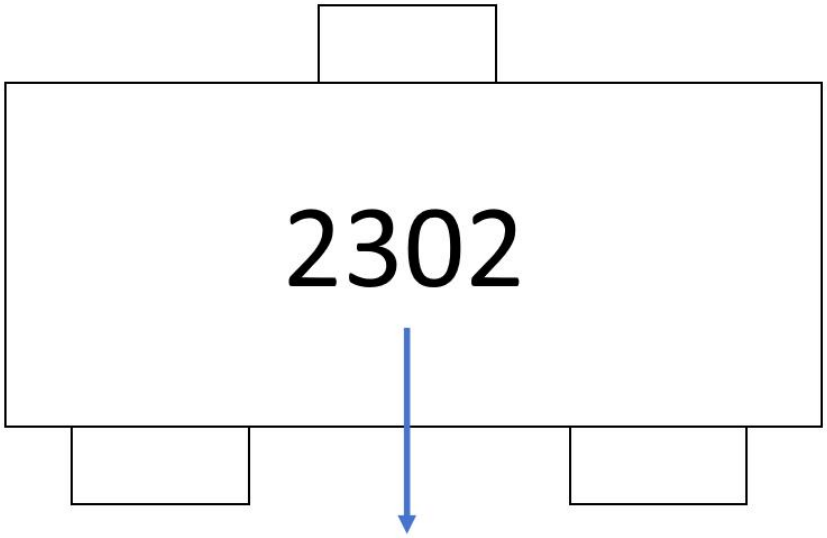
Part Number	Package code	Packaging
HSSN2302	SOT-323	3000/Tape&Reel

SOT-323 Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
C	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

HSSN2302 TOP Marking



Marking