

General Description

The HSS2312 is the high cell density trench N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The HSS2312 meet the RoHS and Green Product requirement with full function reliability approved.

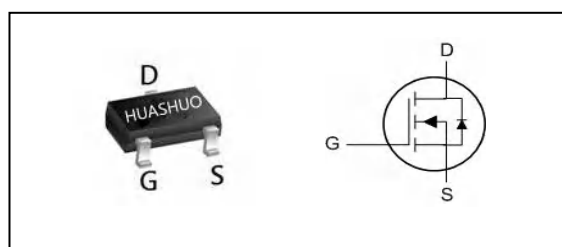
Features

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

Product Summary

V_{DS}	20	V
$R_{DS(ON),typ}$	15	mΩ
I_D	6	A

SOT-23L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	6	A
$I_D@T_A=70^{\circ}C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	5	A
I_{DM}	Pulsed Drain Current ²	24	A
$P_D@T_A=25^{\circ}C$	Total Power Dissipation ³	1.4	W
$P_D@T_A=70^{\circ}C$	Total Power Dissipation ³	0.9	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	90	$^{\circ}C/W$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.018	---	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=4.5V$, $I_D=6A$	---	15	20	$m\Omega$
		$V_{GS}=2.5V$, $I_D=5A$	---	19	28	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.5	0.7	1.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-3.1	---	$mV/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=16V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=4A$	---	10	---	S
Q_g	Total Gate Charge (4.5V)	$V_{DS}=15V$, $V_{GS}=4.5V$, $I_D=4A$	---	12	---	nC
Q_{gs}	Gate-Source Charge		---	2.4	---	
Q_{gd}	Gate-Drain Charge		---	1.1	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=10V$, $V_{GS}=4.5V$, $R_G=6\Omega$ $I_D=6A$	---	9	---	ns
T_r	Rise Time		---	12	---	
$T_{d(off)}$	Turn-Off Delay Time		---	33	---	
T_f	Fall Time		---	36	---	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $f=1MHz$	---	900	---	pF
C_{oss}	Output Capacitance		---	220	---	
C_{rss}	Reverse Transfer Capacitance		---	100	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	6	A
I_{SM}	Pulsed Source Current ^{2,4}		---	---	24	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	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 $\leq 300\mu s$, duty cycle $\leq 2\%$

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

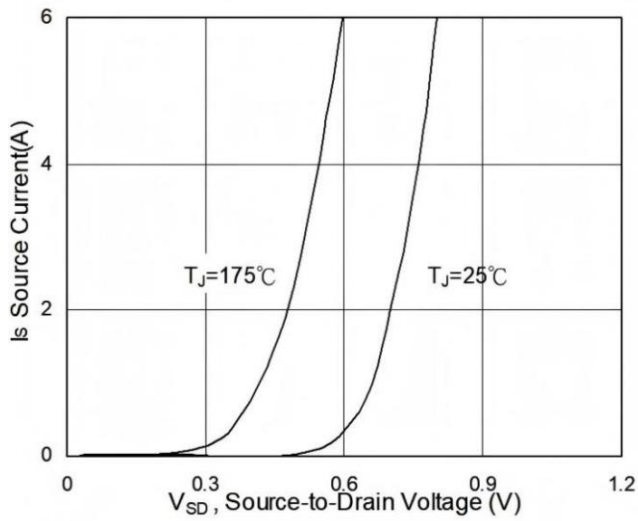


Fig.1 Forward Characteristics Of Reverse

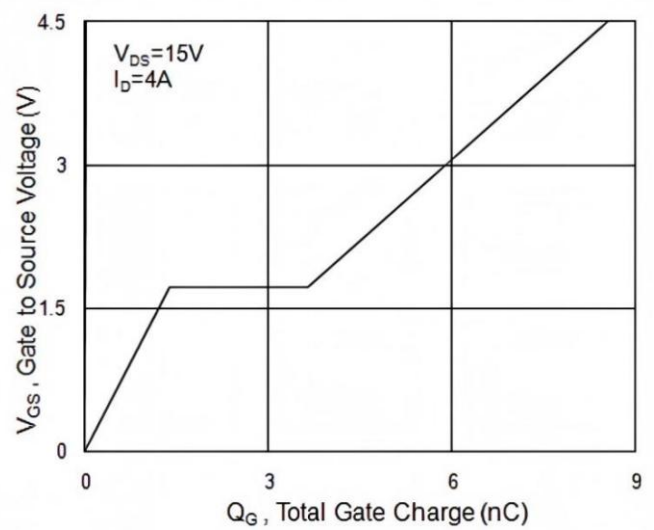


Fig.2 Gate-Charge Characteristics

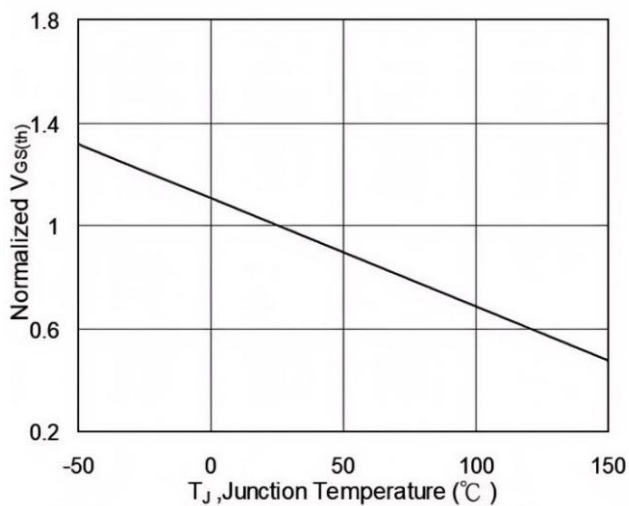


Fig.3 Normalized $V_{GS(th)}$ vs. T_J

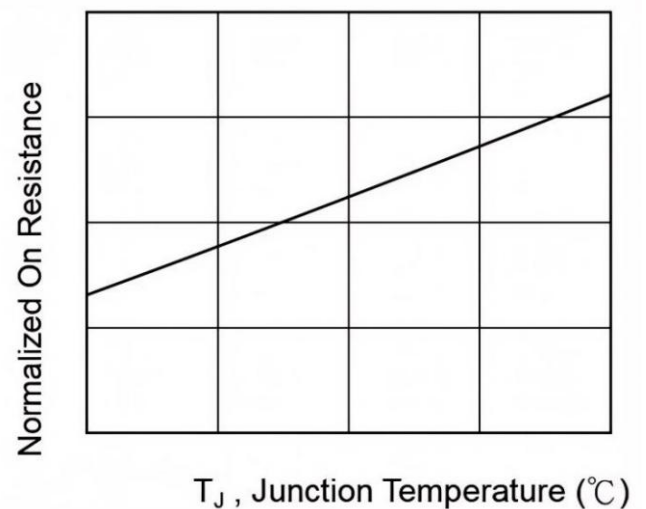


Fig.4 Normalized $R_{DS(on)}$ vs. T_J

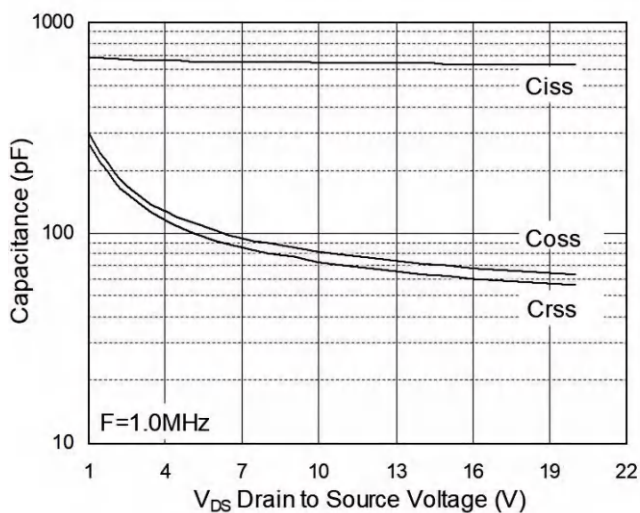


Fig.5 Capacitance

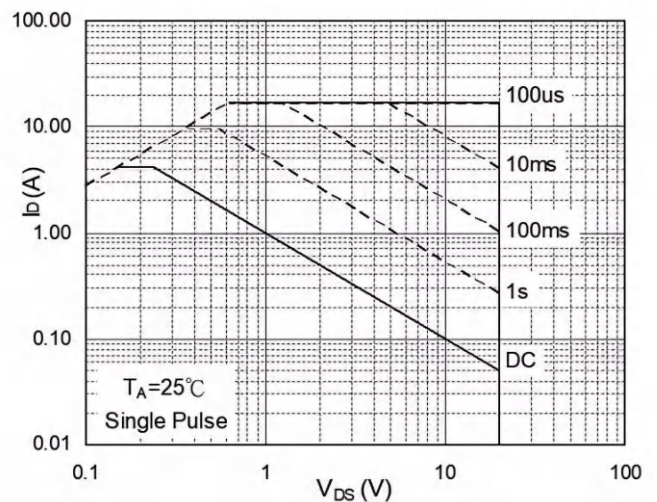
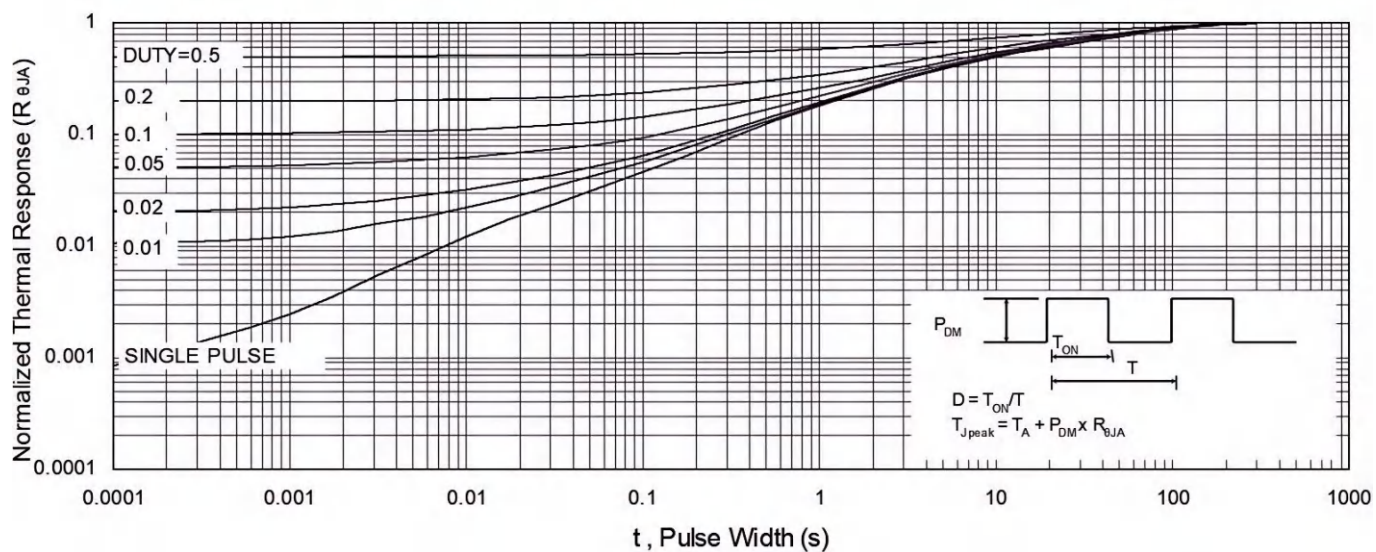
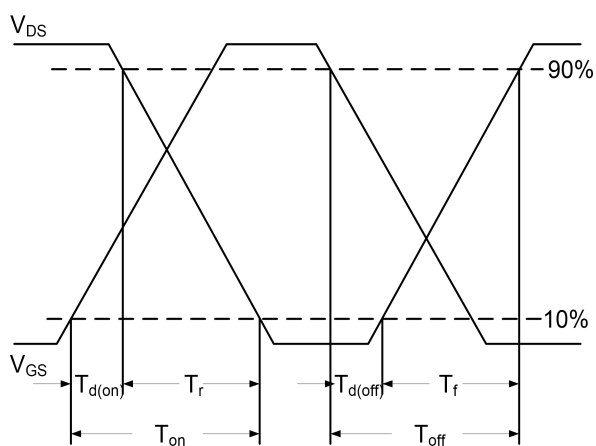
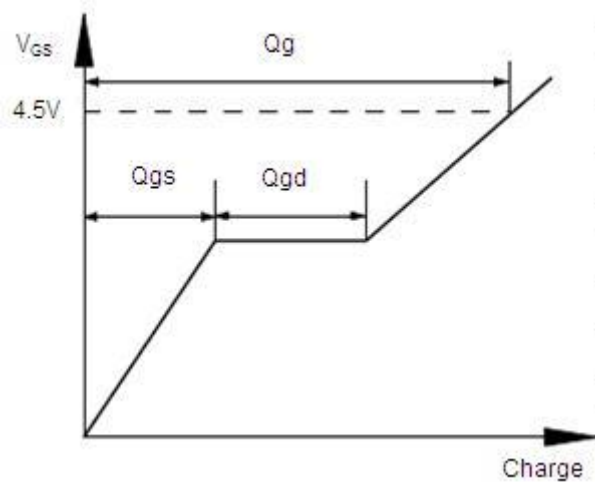


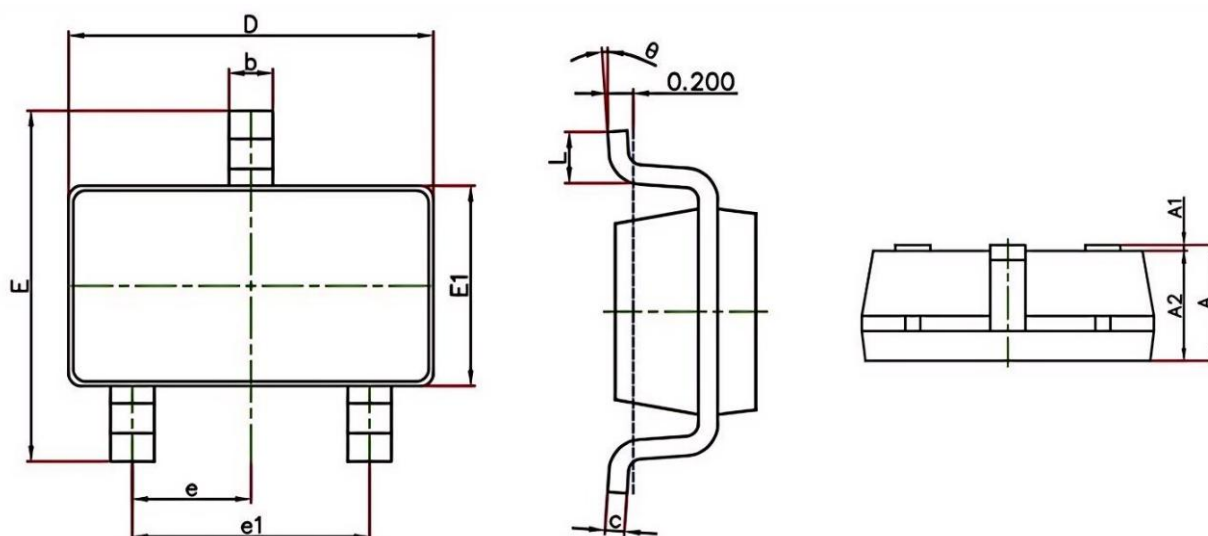
Fig.6 Safe Operating Area


Fig.7 Normalized Maximum Transient Thermal Impedance

Fig.8 Switching Time Waveform

Fig.9 Gate Charge Waveform

Ordering Information

Part Number	Package code	Packaging
HSS2312	SOT-23L	3000/Tape&Reel

SOT-23L Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
C	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

HSS2312 TOP Marking

