

Description

The HSS1N20B is the high cell density trench N-ch MOSFETs, which provides excellent R_{DS(ON)} and efficiency for most of the small power switching and load switch applications.

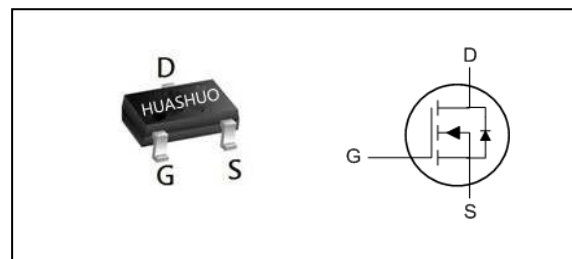
The HSS1N20B meets the RoHS and Green Product requirement with full function reliability approved.

- Green Device Available
- Super Low Gate Charge
- Excellent C_{dv/dt} effect decline
- Advanced high cell density Trench technology

Product Summary

V _{DS}	200	V
R _{DS(ON),typ}	2.5	Ω
I _D	0.8	A

SOT-23L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	200	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _A =25°C	Continuous Drain Current, V _{GS} @ 10V ¹	0.8	A
I _{DM}	Pulsed Drain Current ²	7	A
P _D @T _A =25°C	Total Power Dissipation ³	0.8	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	---	42	°C/W

N-Ch 200V Fast Switching MOSFETs
Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	200	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=0.8A$	---	2.5	3.0	Ω
		$V_{GS}=4.5V, I_D=0.8A$	---	2.6	3.3	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	---	3.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=200V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	μA
		$V_{DS}=200V, V_{GS}=0V, T_J=55^\circ C$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=15V, I_D=2A$	---	9	---	S
Q_g	Total Gate Charge (10V)	$V_{DS}=100V, V_{GS}=10V, I_D=2A$	---	10	---	nC
Q_{gs}	Gate-Source Charge		---	2.1	---	
Q_{gd}	Gate-Drain Charge		---	4.8	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=100V, V_{GS}=10V, R_G=2.5\Omega$ $I_D=1A$	---	8	---	ns
T_r	Rise Time		---	13	---	
$T_{d(off)}$	Turn-Off Delay Time		---	11	---	
T_f	Fall Time		---	18	---	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	---	450	---	pF
C_{oss}	Output Capacitance		---	78	---	
C_{rss}	Reverse Transfer Capacitance		---	4	---	

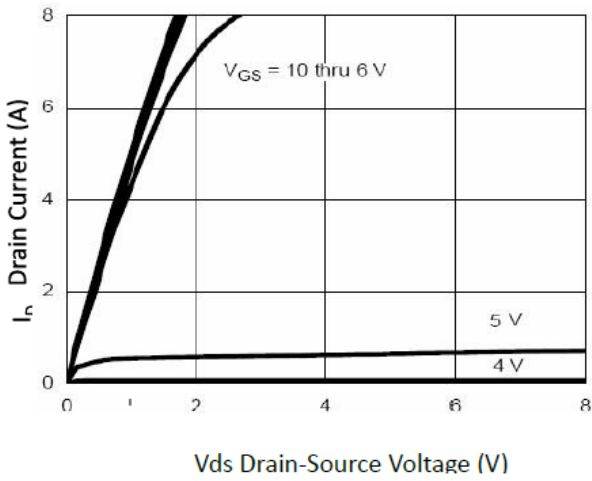
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	0.8	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.2	V

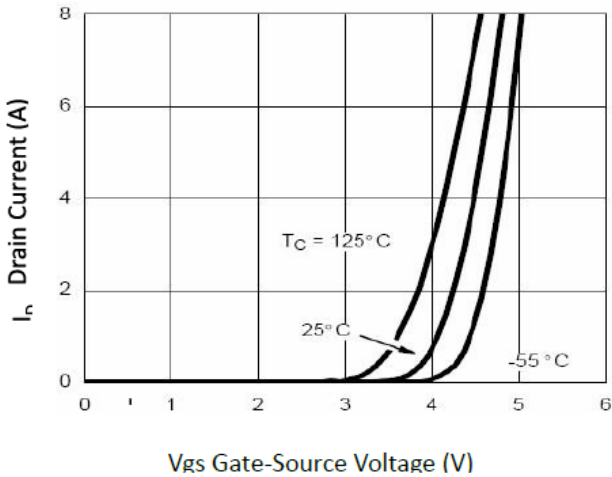
Note:

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 $^\circ C$ 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.

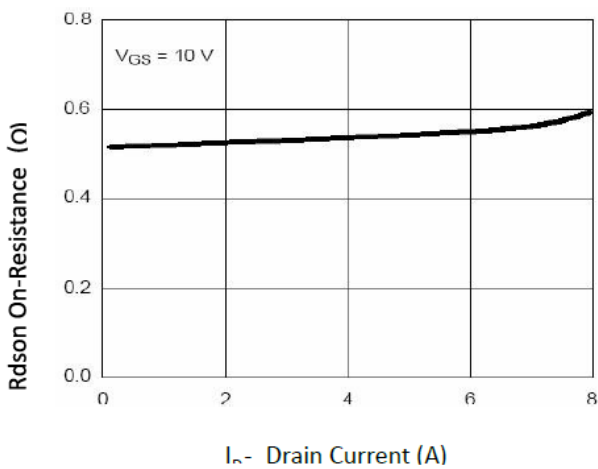
Typical Characteristics



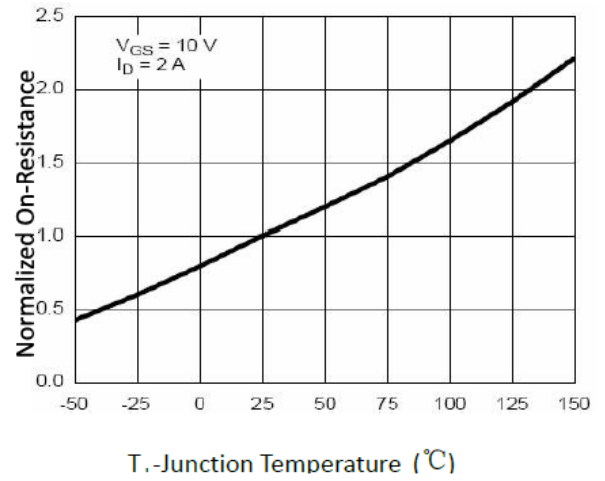
$V_{GS} = 10$ thru 6 V
Figure 1 Output Characteristics



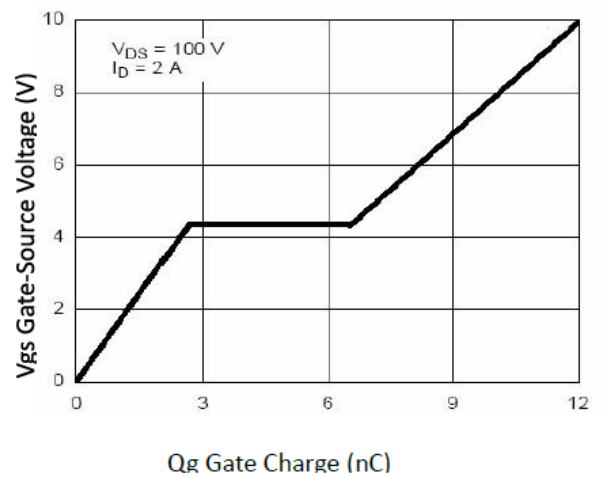
$T_C = 125^\circ\text{C}$
 25°C
 -55°C
Figure 2 Transfer Characteristics



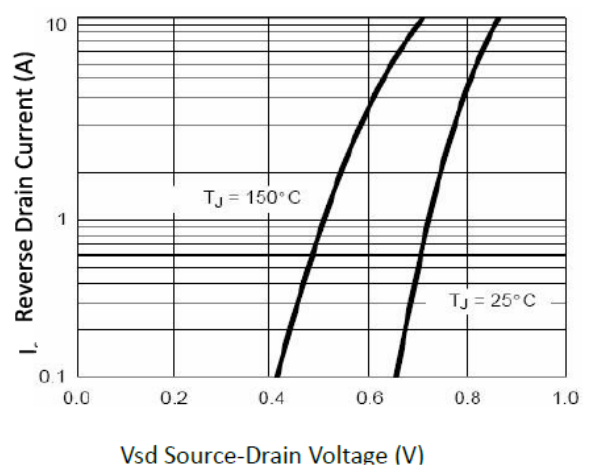
$V_{GS} = 10$ V
Figure 3 Rdson- Drain Current



$V_{GS} = 10$ V
 $I_D = 2$ A
Figure 4 Rdson-Junction Temperature



$V_{DS} = 100$ V
 $I_D = 2$ A
Figure 5 Gate Charge



$T_J = 150^\circ\text{C}$
 $T_J = 25^\circ\text{C}$
Figure 6 Source- Drain Diode Forward

N-Ch 200V Fast Switching MOSFETs

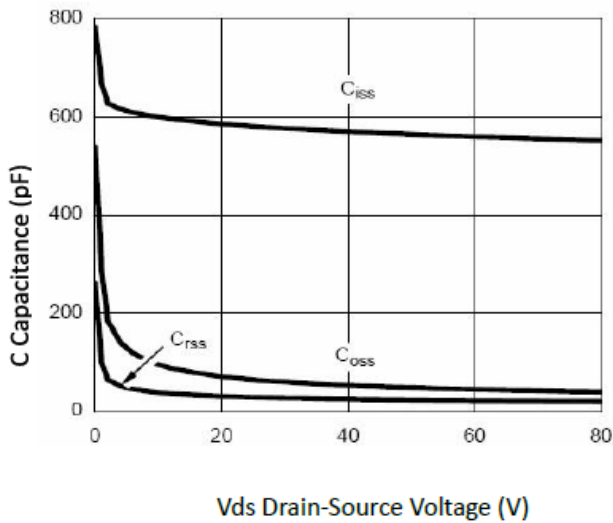


Figure 7 Capacitance vs Vds

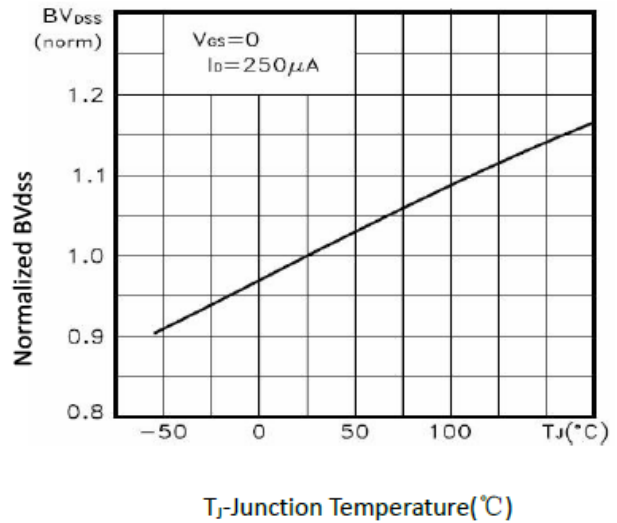


Figure 9 BV_{DSS} vs Junction Temperature

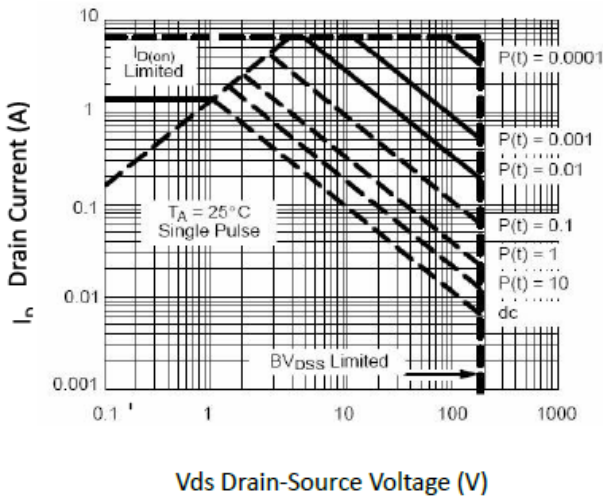


Figure 8 Safe Operation Area

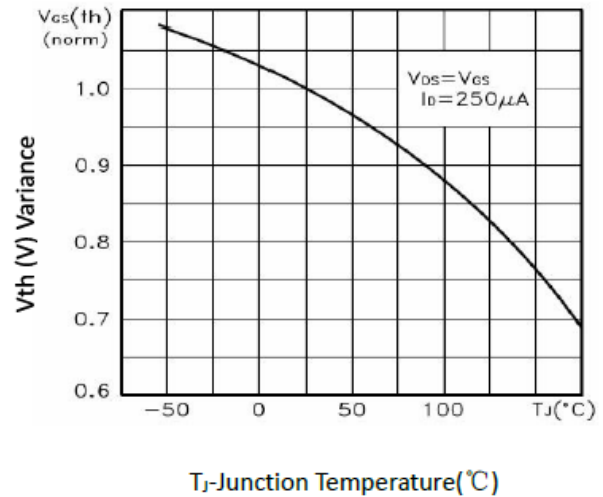


Figure 10 V_{GS(th)} vs Junction Temperature

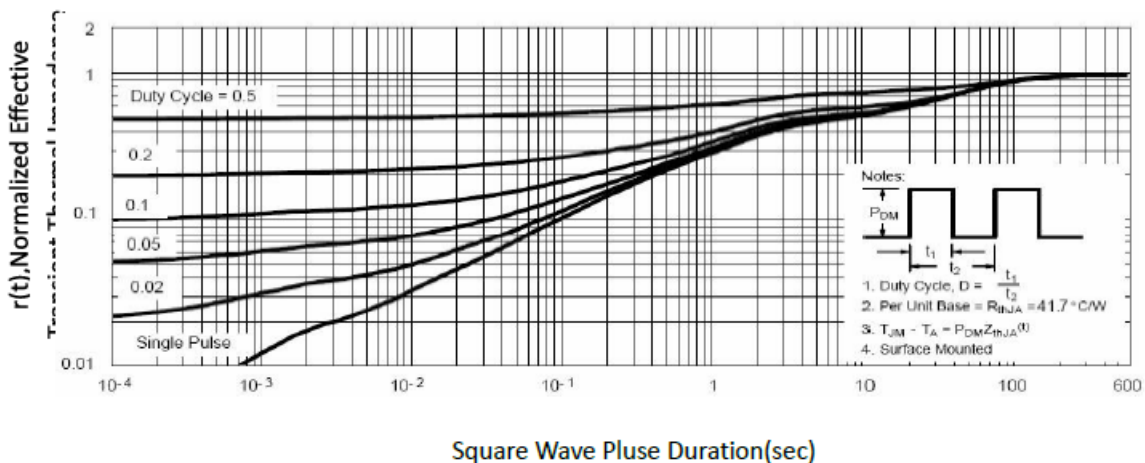
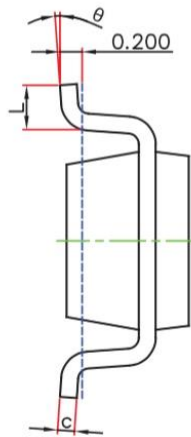
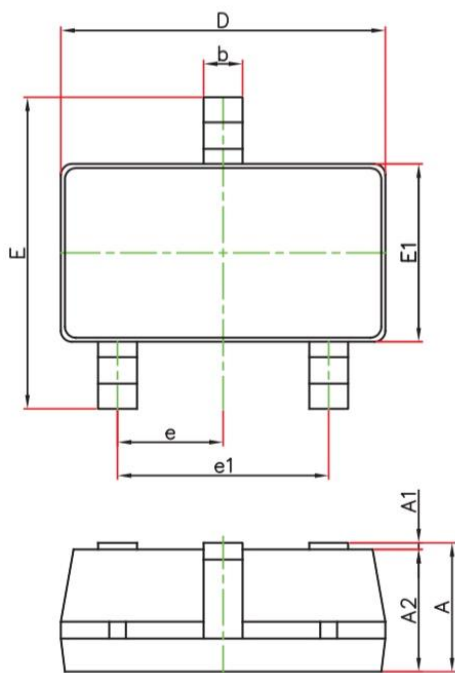


Figure 11 Normalized Maximum Transient Thermal Impedance

Ordering Information

Part Number	Package code	Packaging
HSS1N20B	SOT-23L	3000/Tape&Reel



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°