HUASHUO SEMICONDUCTOR

HSS0038A

N-Ch 100V Small-Signal-Transistor

Description

The HSS0038A is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

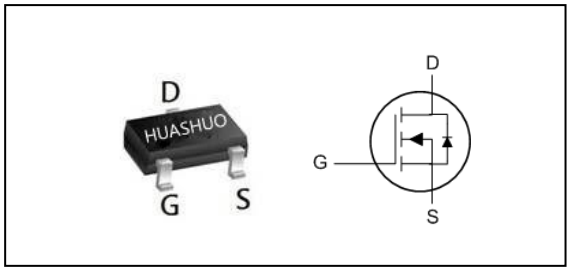
The HSS0038A meet the RoHS and Green Product requirement with full function reliability approved.

Product Summary

V_{DS}	100	V
$R_{DS(ON),max}$	6	Ω
I_D	0.18	A

- Green Device Available
- Rugged and Relaible
- Switching Application
- Advanced high cell density Trench technology

SOT23 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℃	Continuous Drain Current, V_{GS} @ 10V[1]	0.18	A
IDM	Pulsed Drain Current(note 1)	0.68	A
P_D@T_A=25℃	Total Power Dissipation[3]	0.36	W
Is	Continous Source-Drain Diode Current	0.17	A
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient(steady state)[1]	---	357	℃/W

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

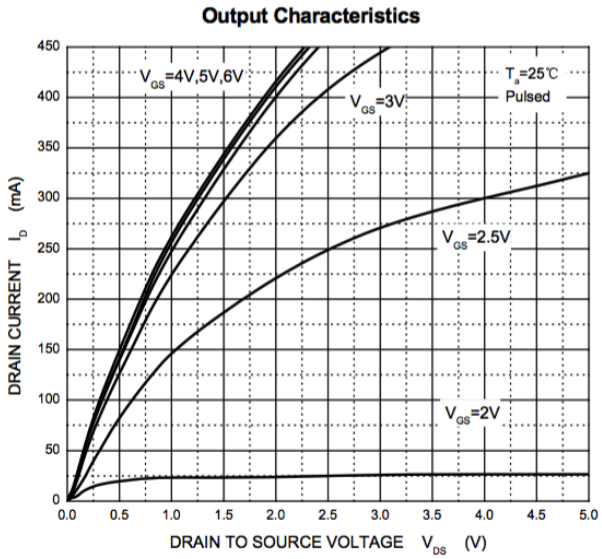
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.122	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance2	V_{GS}=10V , I_D=0.22A	---	3.6	6	Ω
		V_{GS}=4.5V , I_D=0.22A	---	3.9	10	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1	1.6	2.8	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.84	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=100V , V_{GS}=0V , T_J=55℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±50	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=170mA	80	---	---	mS
Qg	Total Gate Charge	V_{DD}=10V , V_{GS}=10V , I_D=0.22A	---	1.3	---	nC
Qgs	Gate-Source Charge		---	0.18	---	nC
Qgd	Gate-Drain Charge		---	0.21	---	nC
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=50Ω I_D=0.3A	---	---	7	ns
T_r	Rise Time		---	---	7	
$T_{d(off)}$	Turn-Off Delay Time		---	---	12	
T_f	Fall Time		---	---	14	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	28	---	pF
C_{oss}	Output Capacitance		---	14	---	
C_{rss}	Reverse Transfer Capacitance		---	3	---	

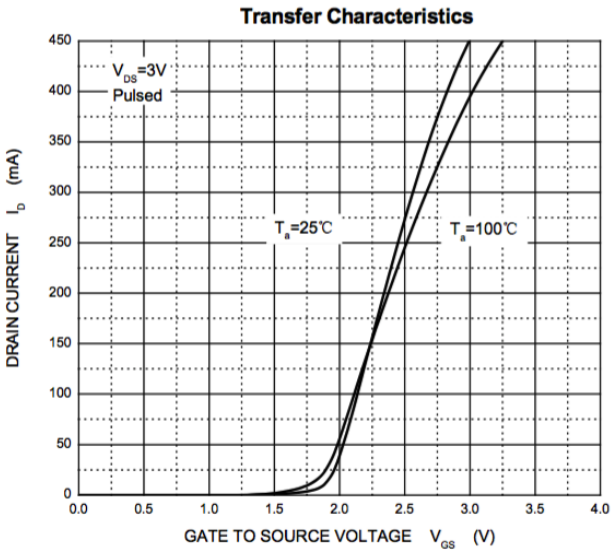
Diode Characteristics

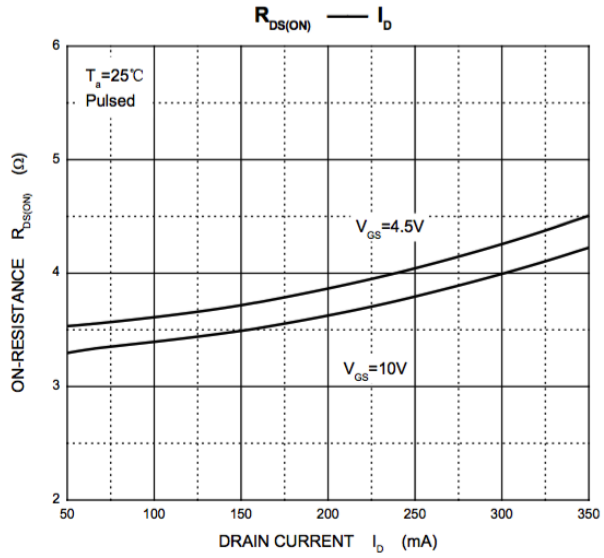
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current1,4	V_G=V_D=0V , Force Current	---	---	0.17	A
V_{SD}	Diode Forward Voltage2	V_{GS}=0V , I_S=0.44A , T_J=25℃	---	---	1.4	V

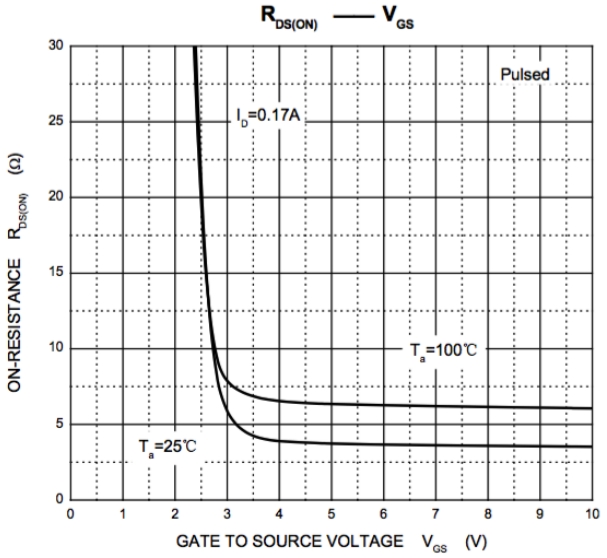
Note :
1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

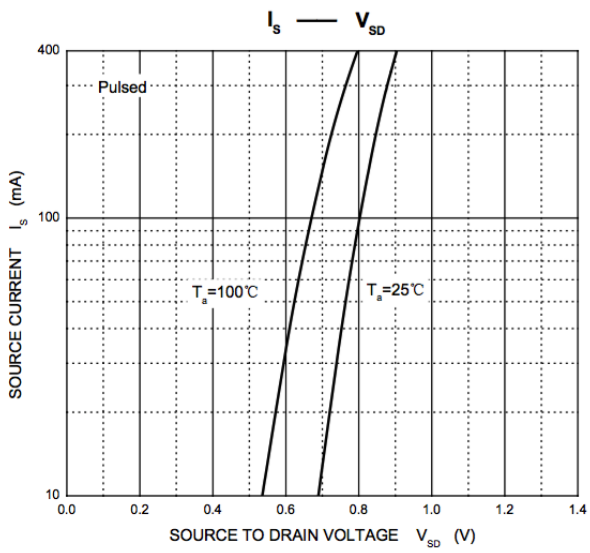
Typical Characteristics

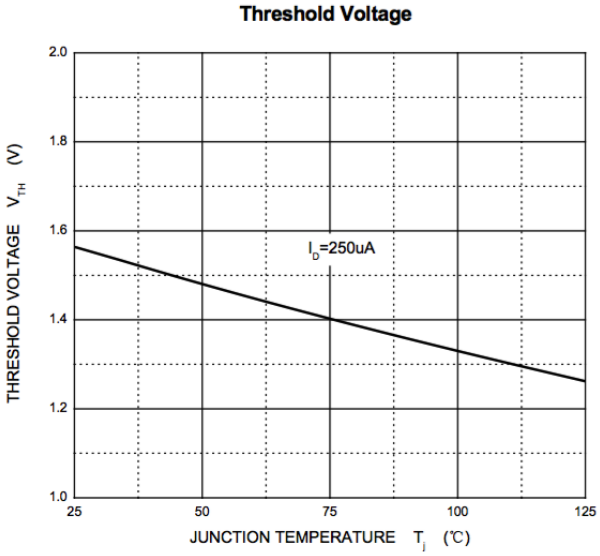






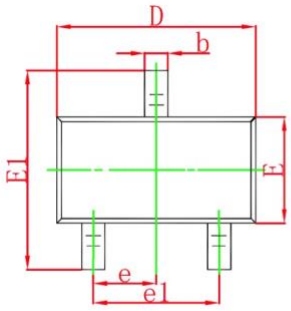


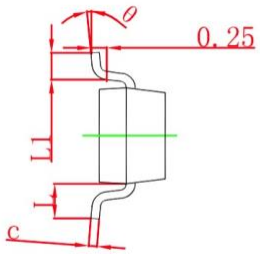

I_S — V_{SD}
400
100
10
Pulsed
T_a=100℃
T_a=25℃
SOURCE CURRENT I_S (mA)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
SOURCE TO DRAIN VOLTAGE V_{SD} (V)

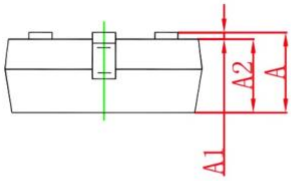

Threshold Voltage
2.0
1.8
1.6
1.4
1.2
1.0
THRESHOLD VOLTAGE V_{TH} (V)
I_D=250uA
25
50
75
100
125
JUNCTION TEMPERATURE T_j (℃)

Ordering Information

Part Number	Package code	Packaging
HSS0038A	SOT-23	3000/Tape&Reel







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°