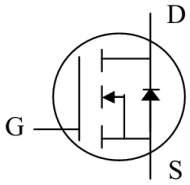
N-Channel 20V MOSFET

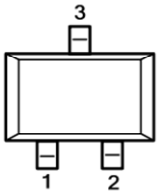
Features:

- Surface-mounted package
- High Density Cell Design
- Halogen free

Application

- **Ultra Low On-Resistance**





Top View
SOT23S-3L

B_{VDSS}= 20V ,
$R_{DS(ON)}$< 41mΩ@VGS= 4.5V
$R_{DS(ON)}$< 47mΩ@VGS= 2.5V
$R_{DS(ON)}$< 57mΩ@VGS= 1.8V
I_D= 4.9A

Absolute Maximum Ratings (TA=25℃ Unless Otherwise Noted)

Parameter		Symbol	LTC2312	Unit
		Marking	N12	
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current(3)	Ta=25℃	I_D	4.9	A
	Ta=70℃		3.4	A
Pulsed Drain Current(1、2)		I_{DM}	15	A
Power Dissipation(1)	Ta=25℃	P_D	0.75	W
Linear Derating Factor			1.3	℃/W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to150	℃

Thermal Characteristics

Symbol	Characteristic	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient(3)	140	℃/W

Note：

(1) Pulse width limited by Max. junction temperature

(2) Pulse width ≦ 300us, duty cycle,≦ 2%

(3) Surface mounted on 1 in^2 copper PCB board

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Electrical Characteristics (T_A =25℃ Unless Otherwise Specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	20	--	--	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.4	0.6	1	V
I_{GSS}	Gate-Body Leakage	V_{DS} =0V,V_{GS}=±8V	--	--	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =20V,V_{GS}=0V	--	--	1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=4.5 V, I_D=5A	--	21	41	mΩ
		V_{GS}=2.5 V, I_D=4.5A	--	24	47	mΩ
		V_{GS}=1.8 V, I_D=4A	--	31	57	mΩ
V_{SD}	Diode Forward voltage	I_S=1.7A, V_{GS}=0V	--	--	1.2	V
g_{FS}	Forward Transconductance	I_D=5A, V_{DS}=10V	--	40	--	S
I_S	Maximum Diode Forward Current		--	--	1.7	A
Dynamic						
C_{iss}	Input Capacitance	V_{DS}=8V, V_{GS}=0V, f =1.0MHz	--	700	--	pF
C_{oss}	Output Capacitance		--	100	--	
C_{rss}	Reverse Transfer Capacitance		--	70	--	
Switch Parameters						
Qg	Total Gate Charge	V_{DS}=10V, V_{GS}=4.5V I_D=5A,	--	11.2	--	nC
Qgs	Gate Source Charge		--	1.4	--	
Qgd	Gate Drain Charge		--	2.2	--	
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=10V, V_{GS}=4.5V, I_D=1A, R_{GEN}=6Ω,	--	2	25	ns
t_r	Turn-On Rise Time		--	25	60	
$t_{d(off)}$	Turn-Off Delay Time		--	25	70	
t_f	Turn-Off Fall Time		--	20	45	

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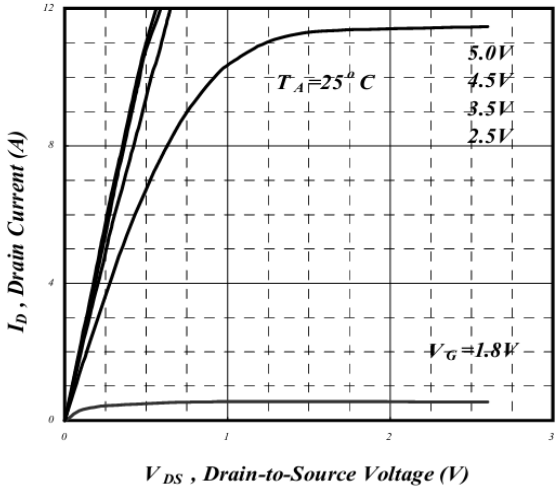

Fig 1. Typical Output Characteristics

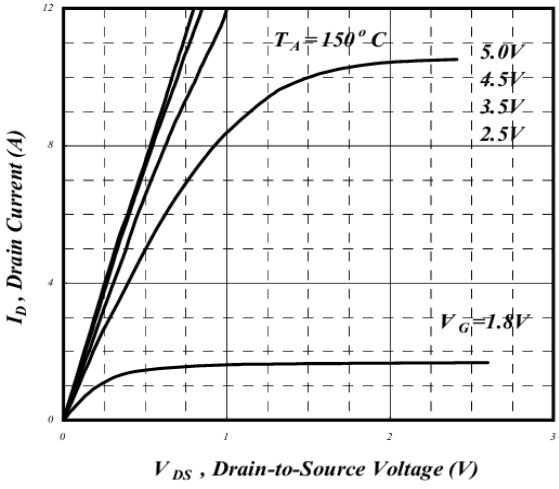

Fig 2. Typical Output Characteristics

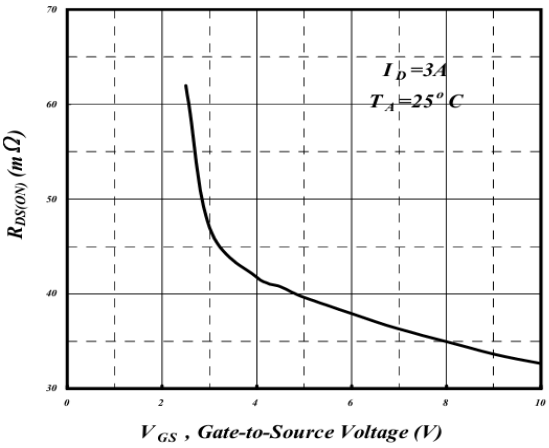

Fig 3. On-Resistance v.s. Gate Voltage

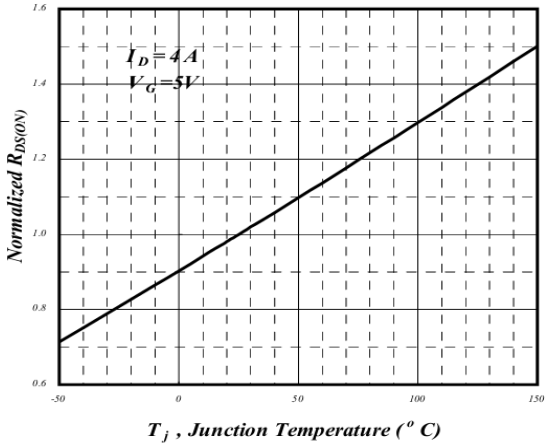

Fig 4. Normalized On-Resistance v.s. Junction Temperature

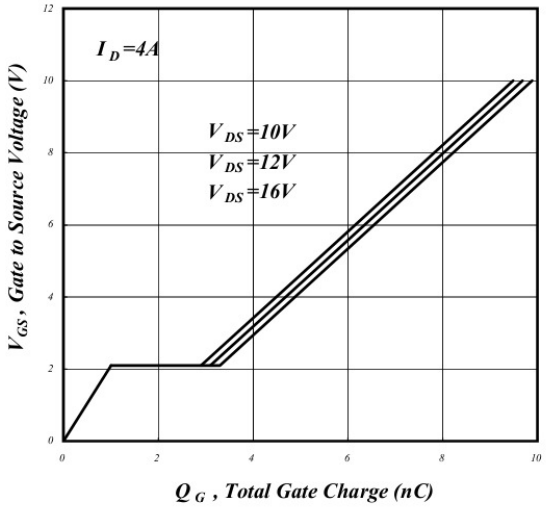

Fig 7. Gate Charge Characteristics

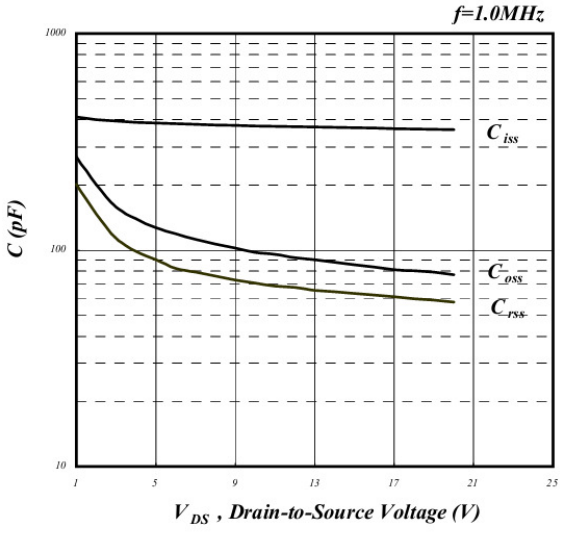

Fig 8. Typical Capacitance Characteristics

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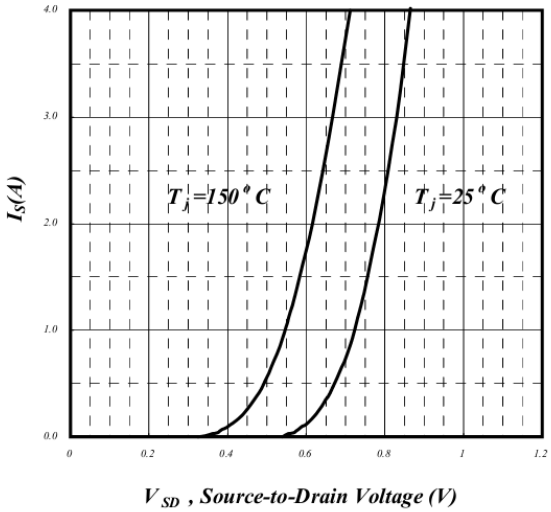

Fig 5. Forward Characteristic of Reverse Diode

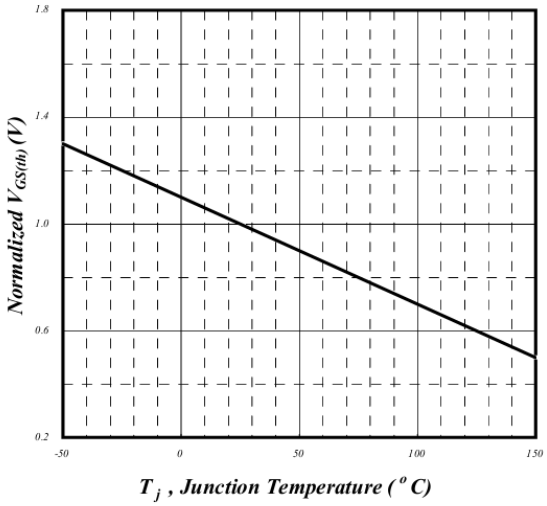

Fig 6. Gate Threshold Voltage v.s. Junction Temperature

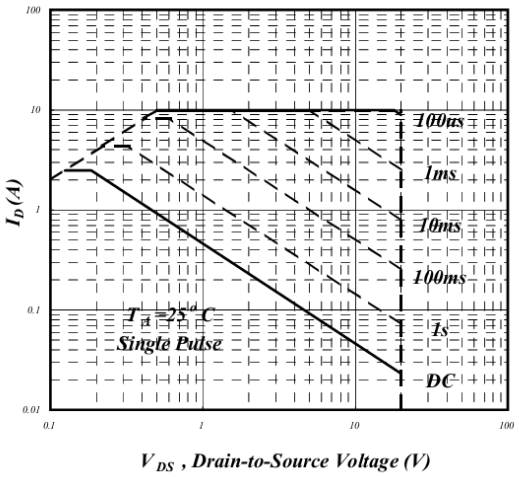

Fig 9. Maximum Safe Operating Area

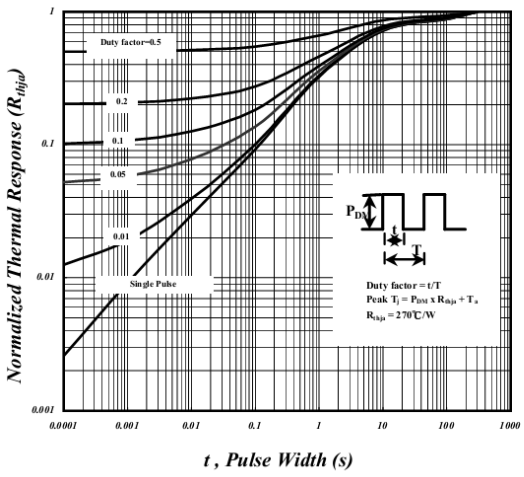

Fig 10. Effective Transient Thermal Impedance

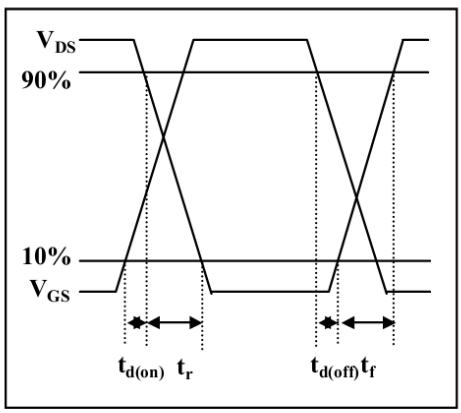

Fig 11. Switching Time Circuit

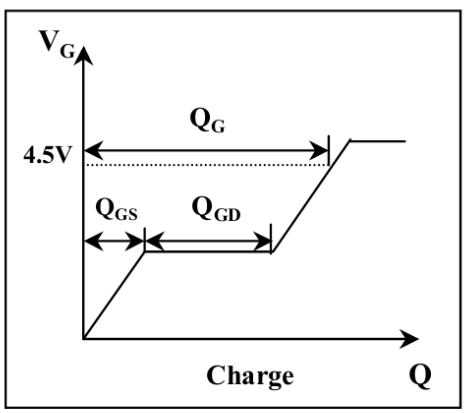

Fig 12. Gate Charge Circuit

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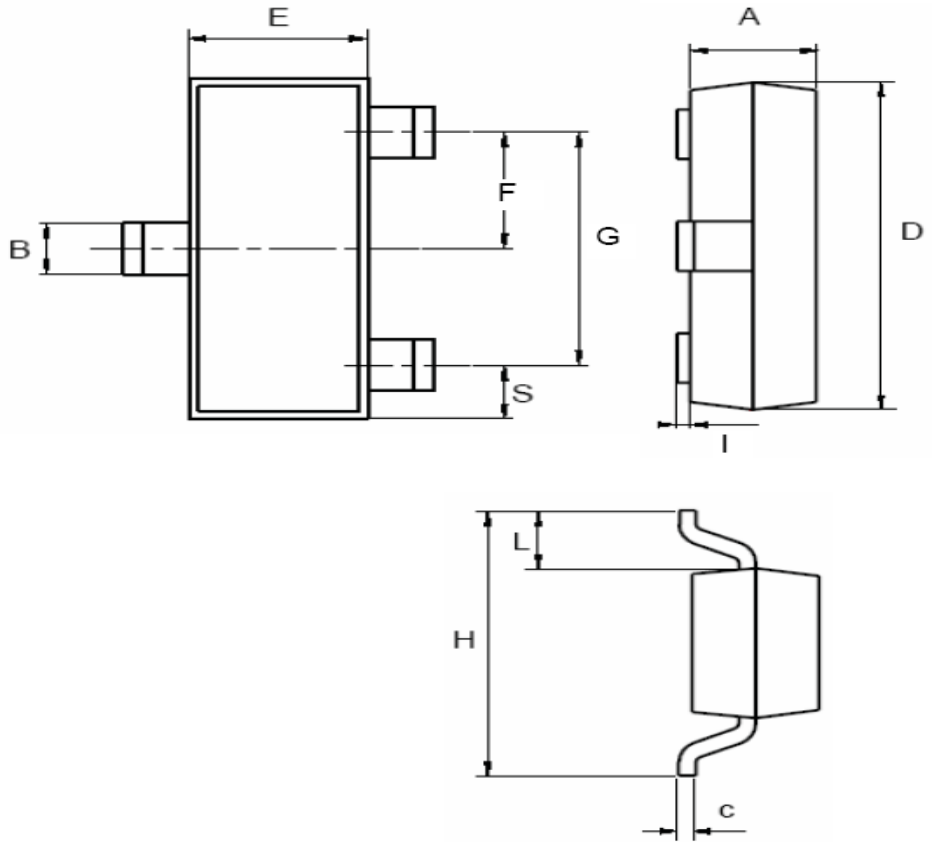

SOT-23		
DIM.	MIN.	MAX.
A	0.89	1.40
B	0.30	0.51
C	0.085	0.18
D	2.75	3.04
E	1.20	1.60
F	0.85	1.05
G	1.70	2.10
H	2.10	2.75
I	0.0	0.1
L	0.60 typ.	
S	0.35	0.65
All Dimensions in millimeter		

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