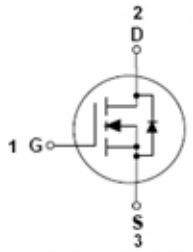
N-Channel Enhancement Mode MOSFET

BL1N50C-3L

Features

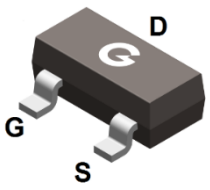
HF

- Fast switching
- Low on-resistance
- Low gate charge
- Low reverse transfer capacitances



APPLICATIONS

- Power switching application
- Hard switching and high frequency circuits
- Uninterruptible power supply



SOT-23-3L

Mechanical Data

- Case: SOT-23-3L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL1N50C-3L	SOT-23-3L	3000 pcs / Tape & Reel	1N50

Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	500	V
Gate-to-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (T_C = 25°C)	I_D	1	A
Continuous Drain Current (T_C = 100°C)		0.62	A
Pulsed Drain Current (T_C = 25°C)	I_{DM}	4	A
Power Dissipation (T_C = 25°C)	P_D	3	W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	-	42	°C/W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	-	-	200	°C/W

Electrical Characteristics (@ T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	500	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 500V, V_{GS} = 0V, T_J = 25°C	-	-	1	μA
		V_{DS} = 400V, V_{GS} = 0V, T_J = 125°C	-	-	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance *1	V_{GS} = 10V,I_D = 0.5A	-	8.7	10	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	3.3	4	V
Dynamic Characteristics						
g_{FS}	Forward Transconductance	V_{DS} = 15V, I_D = 0.5A	-	0.8	-	S
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	-	70	-	pF
C_{OSS}	Output Capacitance		-	16	-	
C_{RSS}	Reverse Transfer Capacitance		-	2.5	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time *3	V_{DD} = 250V R_G = 10Ω I_D = 1A	-	7.7	-	ns
t_r	Turn-on Rise Time *3		-	9.7	-	
$t_{d(OFF)}$	Turn-Off Delay Time *3		-	25.4	-	
t_f	Turn-Off Fall Time *3		-	14.4	-	
Q_G	Total Gate-Charge	V_{DD} = 400V V_{GS} = 10V I_D = 1A	-	6.2	-	nC
Q_{GS}	Gate to Source Charge		-	0.5	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	4.7	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *1	I_{SD} = 1A, V_{GS} = 0V	-	-	1.5	V
trr	Reverse Recovery Time	I_{SD} = 1A, V_{GS} = 0V d_I/d_t = 100A/μs	-	265	-	ns
Qrr	Reverse Recovery Charge		-	322	-	nC

Notes:

1. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
2. The E_{AS} data shows Max. rating. The test condition is V_{DD} = 50V, V_{GS} = 15V, L = 10mH
3. Guaranteed by design, not subject to production

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

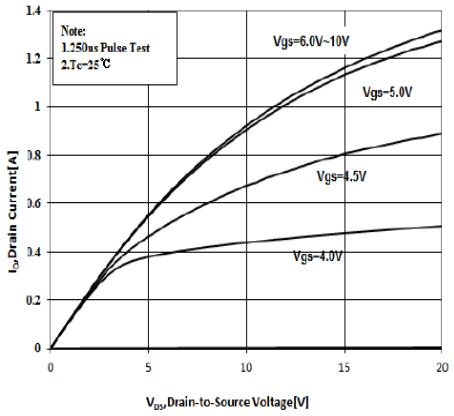


Fig 1 Typical Output Characteristics

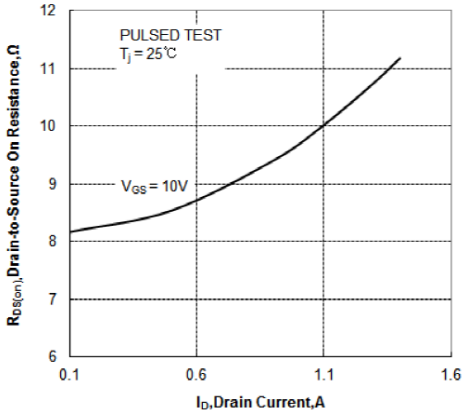


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

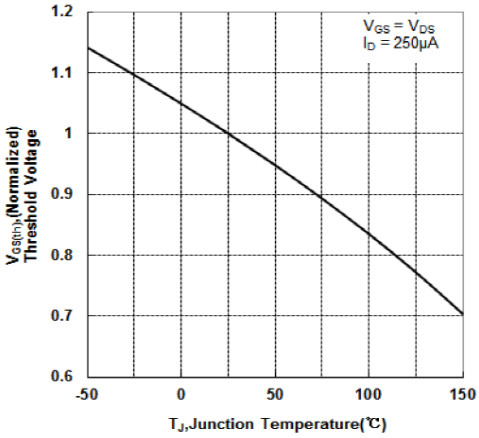


Fig 3 Normalized $V_{GS(th)}$ vs. Junction Temperature

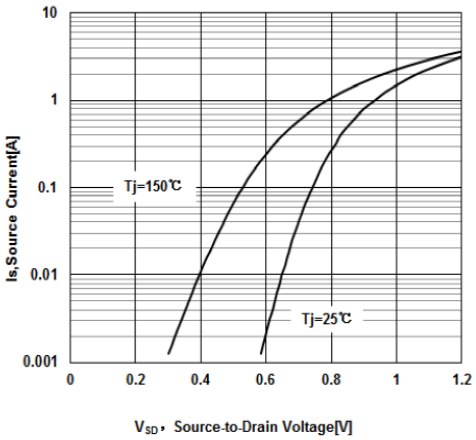


Fig 4 Body-Diode Characteristics

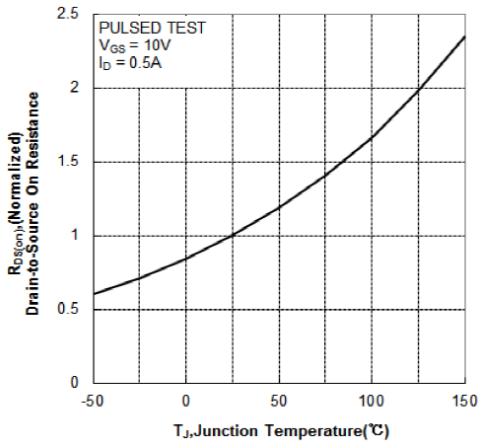


Fig 5 Normalized On-Resistance vs. Junction Temperature

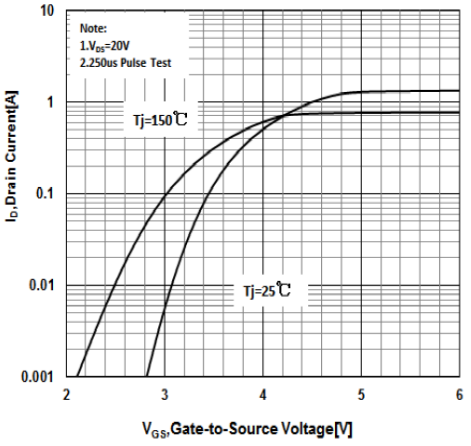


Fig 6 Transfer Characteristics

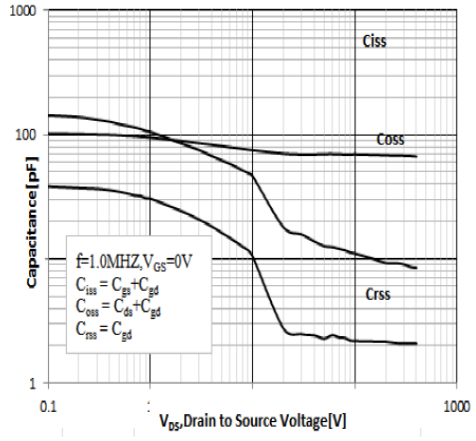


Fig 7 Capacitance Characteristics

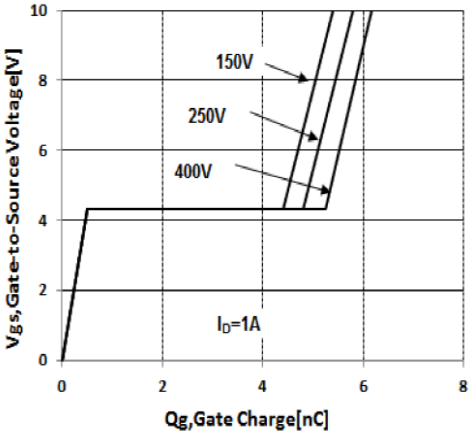


Fig 8 Gate-Charge Characteristics

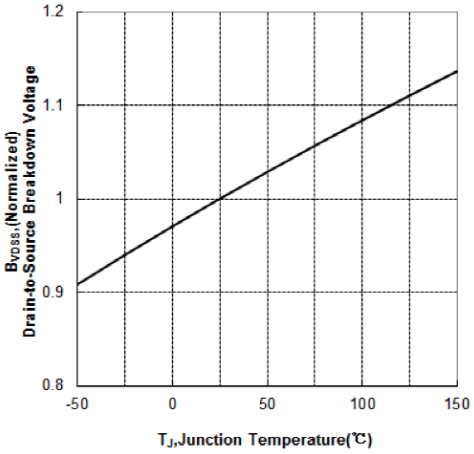
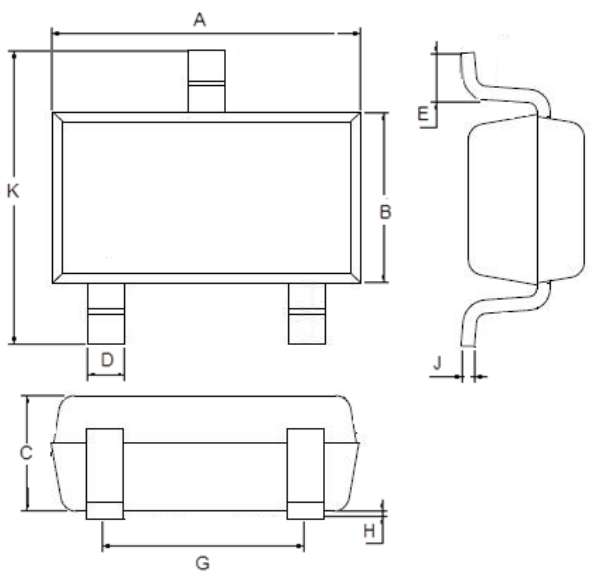


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

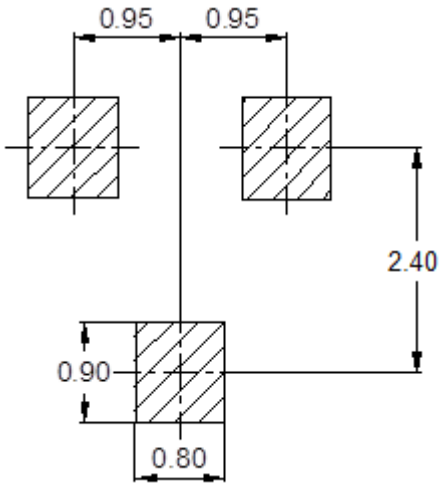
Package Outline Dimensions (Unit: mm)



SOT-23-3L		
Dimension	**Min.**	**Max.**
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
G	1.80	2.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)

SOT-23-3L



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