

Features

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

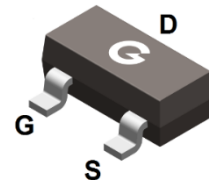
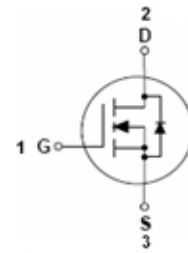
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APPLICATIONS

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

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



SOT-23-3L

Ordering Information

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

Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

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

Thermal Characteristics

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

Electrical Characteristics (@ $T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DS}	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	-	70	-	pF
C _{OSS}	Output Capacitance	V _{DS} = 25V	-	16	-	
C _{RSS}	Reverse Transfer Capacitance	f = 1.0MHz	-	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	-	6.2	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = 10V	-	0.5	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = 1A	-	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	-	265	-	ns
Qrr	Reverse Recovery Charge	dI/dt = 100A/μs	-	322	-	nC

Notes:

1. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
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 (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

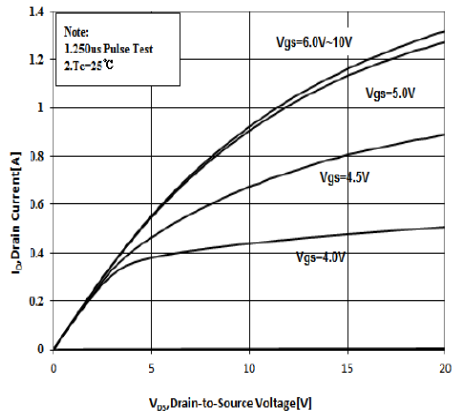


Fig 1 Typical Output Characteristics

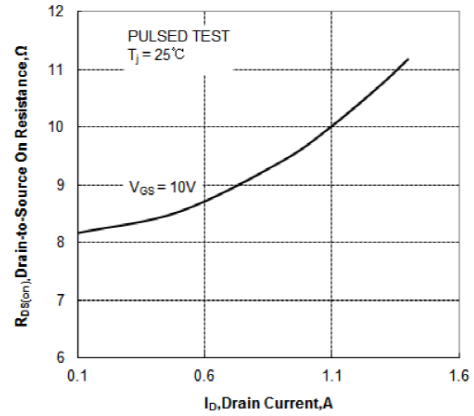


Fig 2 On-Resistance vs. Drain Current
and Gate Voltage

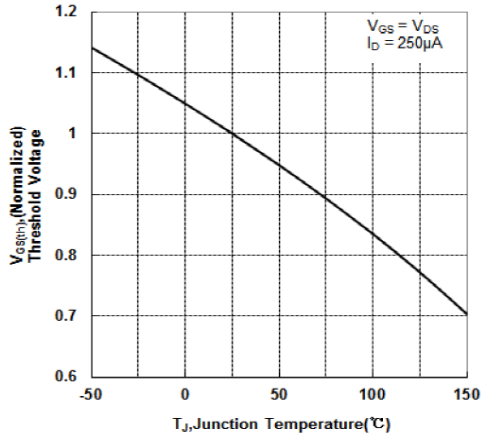


Fig 3 Normalized $V_{GS(th)}$ vs. Junction Temperature

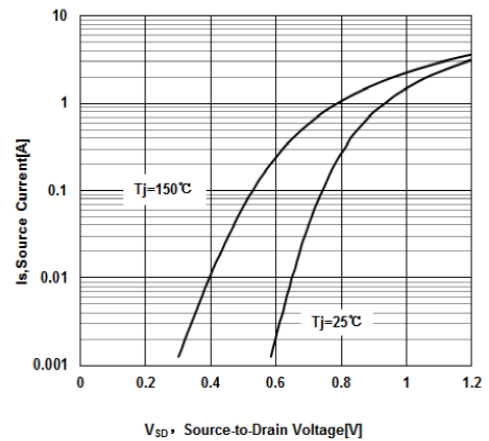


Fig 4 Body-Diode Characteristics

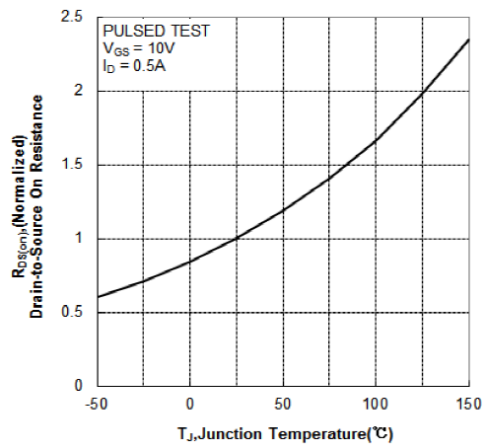


Fig 5 Normalized On-Resistance vs. Junction
Temperature

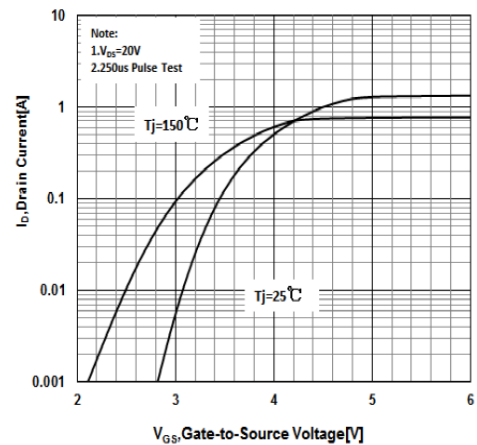
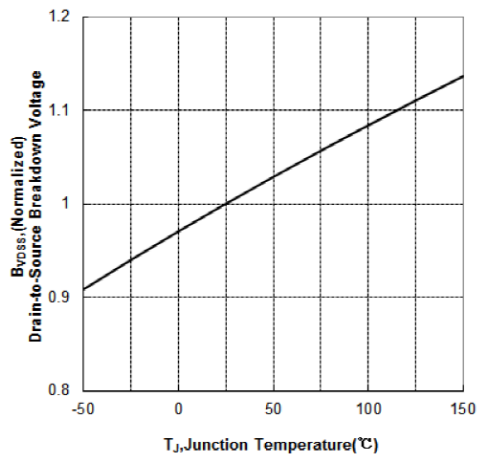
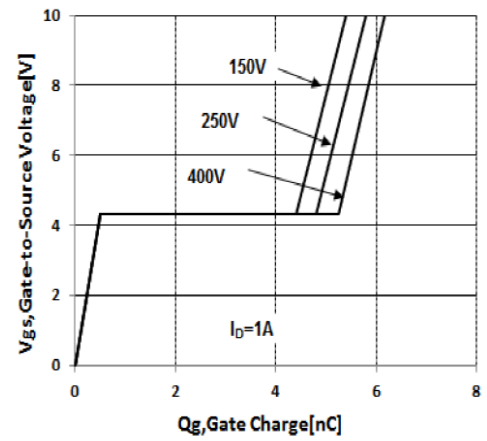
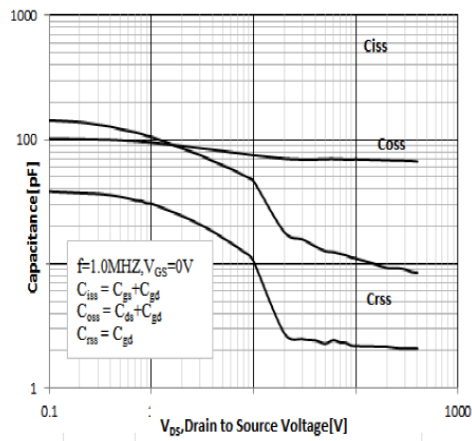
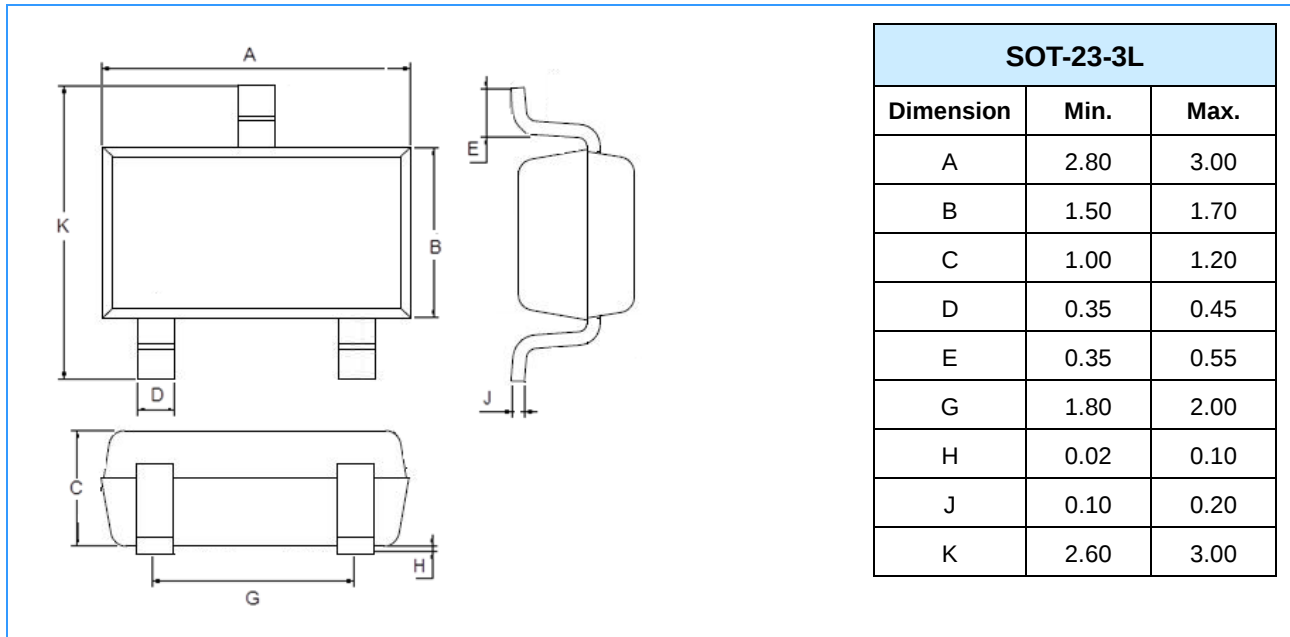


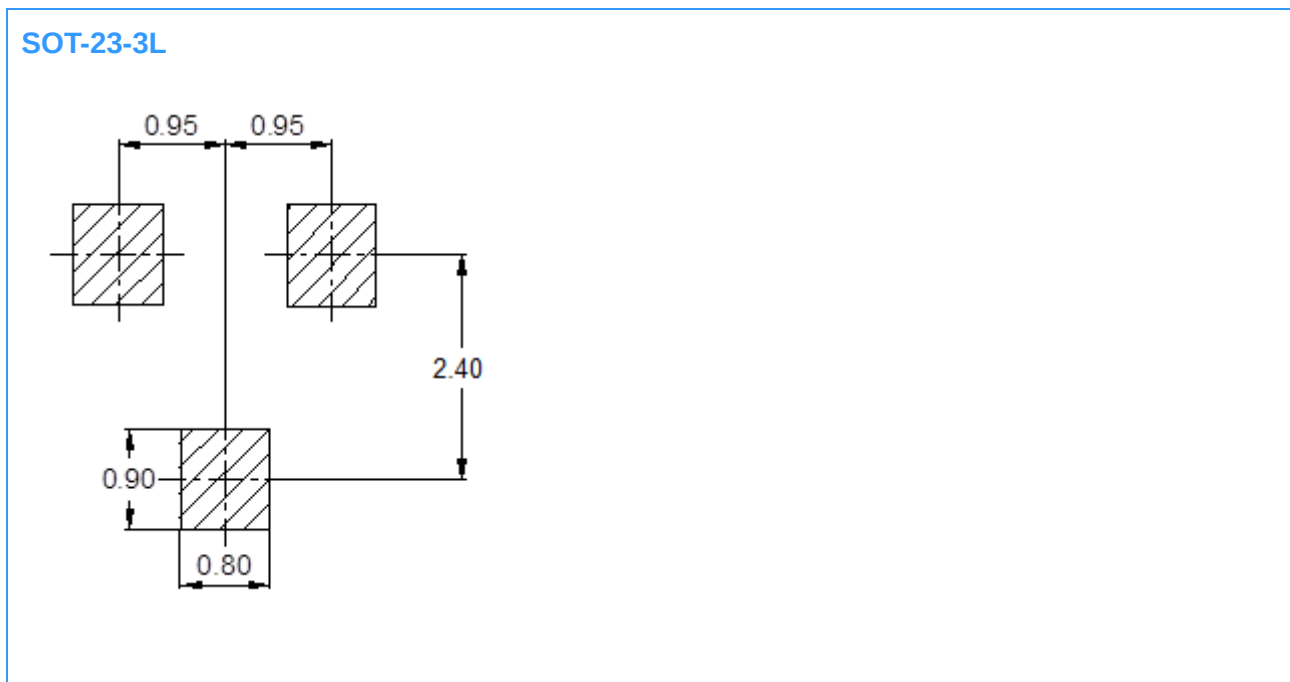
Fig 6 Transfer Characteristics



Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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