N-Channel Enhancement Mode MOSFET

BL3N80I BL3N80D

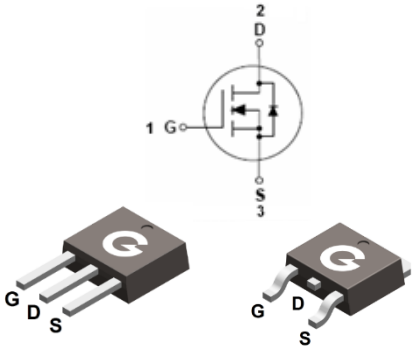
Features

HF

- Proprietary new planar technology
- Low gate charge minimize switching loss
- Fast recovery body diode
- RoHS compliant with Halogen-free

Mechanical Data

- Case: TO-251, TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



TO-251 TO-252

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL3N80I	TO-251	80 pcs / Tube	3N80I
BL3N80D	TO-252	80pcs / Tube or 2500pcs / Tape & Reel	3N80D

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	800	V
Gate-to-Source Voltage	V_{GSS}	±30	V
Continuous Drain Current (T_C = 25°C)	I_D	3	A
Continuous Drain Current (T_C = 100°C)		1.9	A
Pulsed Drain Current (V_{GS} = 10V) *1	I_{DM}	12	A
Single Pulse Avalanche Energy *3	E_{AS}	120	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C)	P_D	75	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.67	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ T_J = 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	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 800V, V_{GS} = 0V, T_J = 25°C	-	-	1	μA
		V_{DS} = 640V, V_{GS} = 0V, T_J = 125°C	-	-	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±30V, V_{DS} = 0V	-	-	±100	nA
On Characteristics *2						
$R_{DS(ON)}$	Static Drain-Source On-resistance	V_{GS} = 10V, I_D = 1.5A	-	-	4.8	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	-	4	V
gfs	Forward Transconductance	V_{DS} = 15V, I_D = 3A	-	5.5	-	S
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	-	490	-	pF
C_{OSS}	Output Capacitance		-	25	-	
C_{RSS}	Reverse Transfer Capacitance		-	50	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = 400V V_{GS} = 10V R_G = 12Ω I_D = 3A	-	10	-	ns
t_r	Turn-on Rise Time		-	10	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	30	-	
t_f	Turn-Off Fall Time		-	15	-	
Q_G	Total Gate-Charge	V_{DD} =400V V_{GS} = 10V I_D = 3A	-	16	-	nC
Q_{GS}	Gate to Source Charge		-	3	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	6	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = 3A, V_{GS} = 0V	-	-	1.5	V
I_S	Continuous Source Current		-	-	3	A
I_{SM}	Pulsed Source Current		-	-	12	A
trr	Reverse Recovery Time	I_F = 3A, V_{GS} = 0V d_{IF}/d_t = 100A/us	-	135	-	ns
Qrr	Reverse Recovery Charge		-	446	-	nC

Notes:

1. Repetitive rating; pulse width limited by maximum junction temperature
2. The data tested by pulsed, pulse width ≤ 380μs, duty cycle ≤ 2%
3. The E_{AS} data shows Max. rating. The test condition is V_{DD} = 100V, V_{GS} = 15V, L = 10mH

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

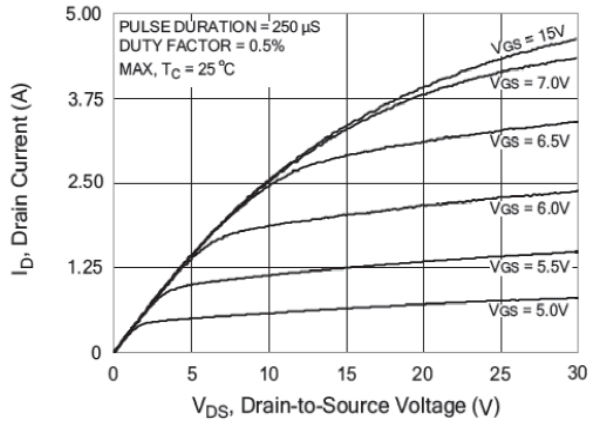


Fig 1 Typical Output Characteristics

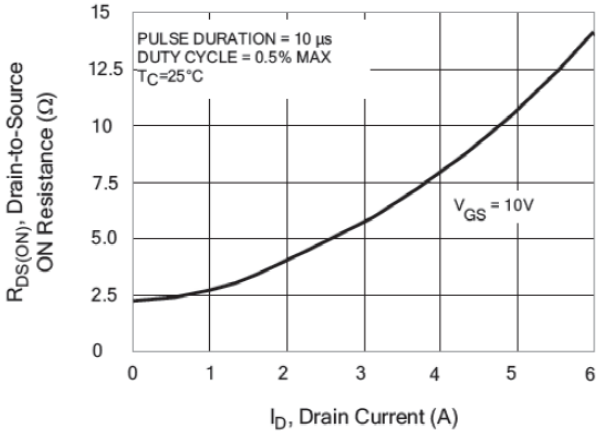


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

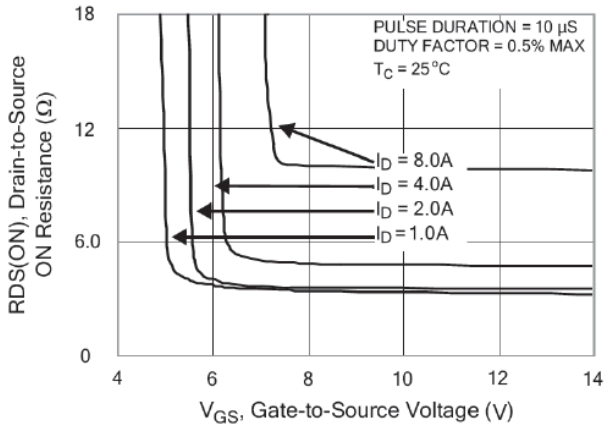


Fig 3 On-Resistance vs. Gate-Source Voltage

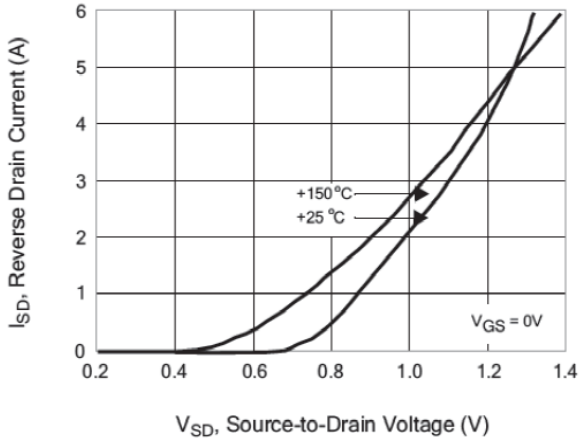


Fig 4 Body-Diode Characteristics

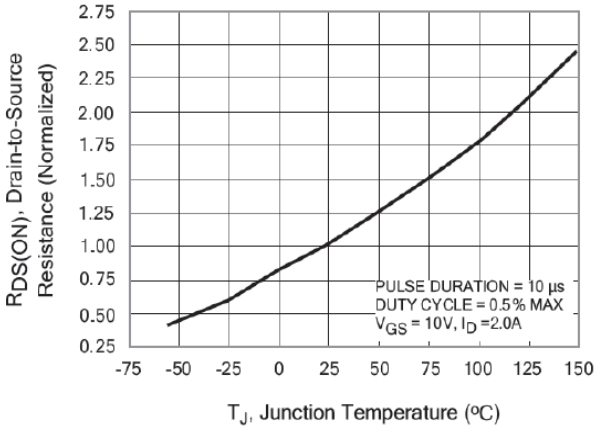


Fig 5 On-Resistance vs. Junction Temperature

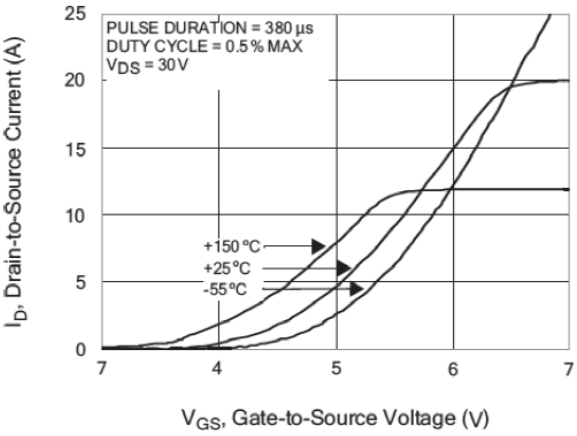


Fig 6 Transfer Characteristics

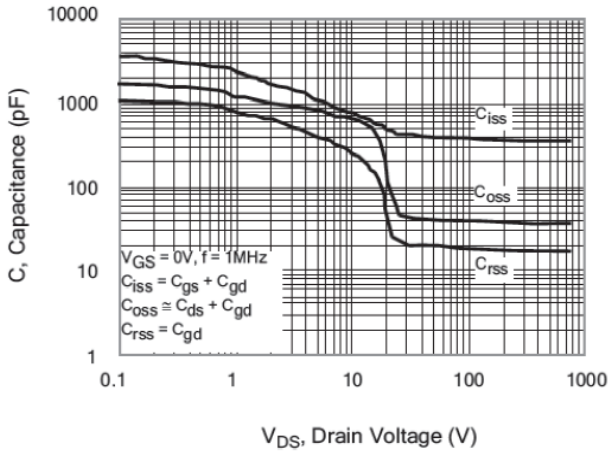


Fig 7 Capacitance Characteristics

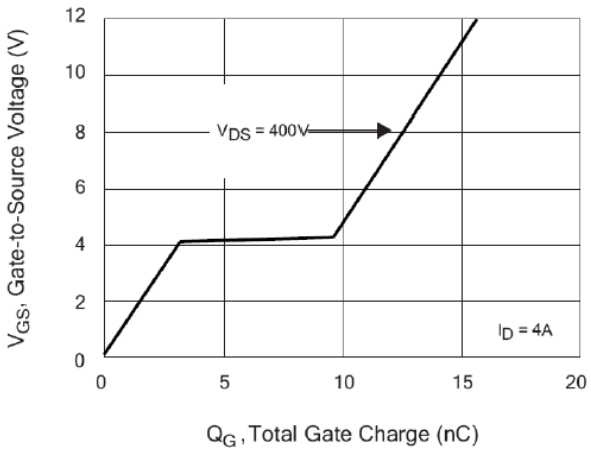


Fig 8 Gate-Charge Characteristics

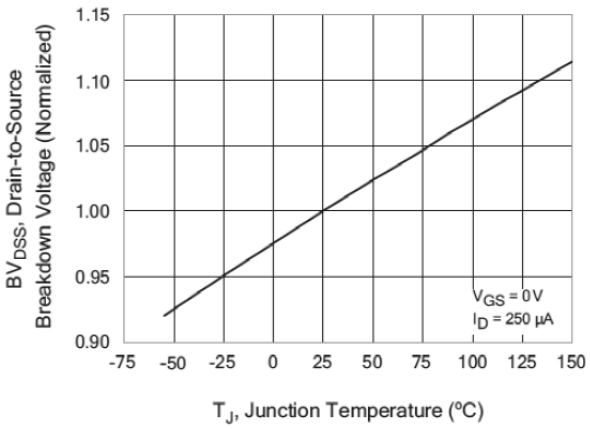


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

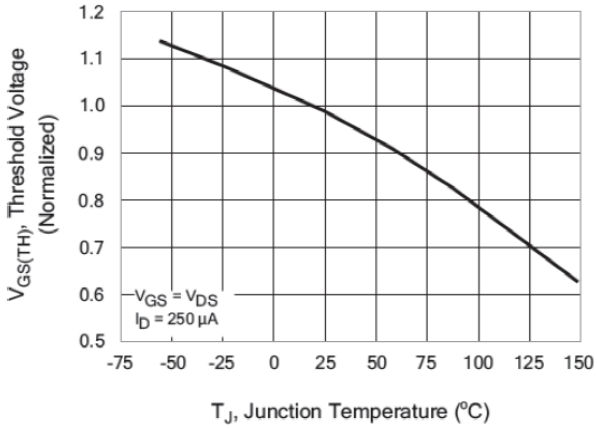


Fig 10 $V_{GS(th)}$ vs. Junction Temperature

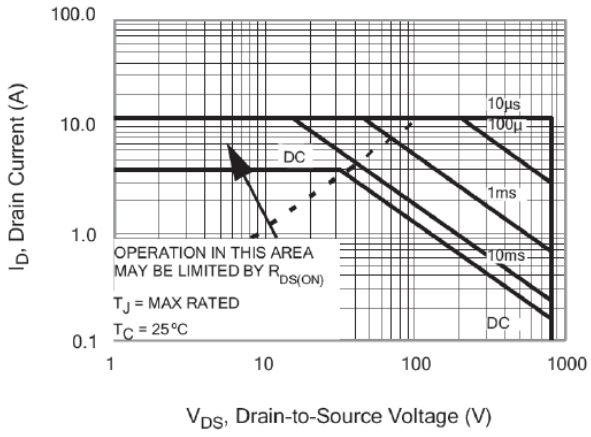
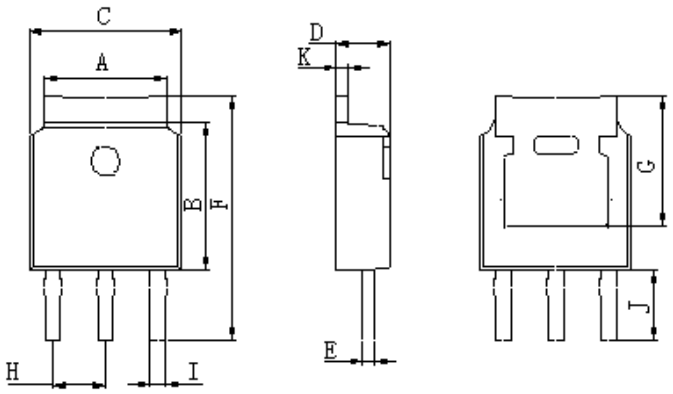
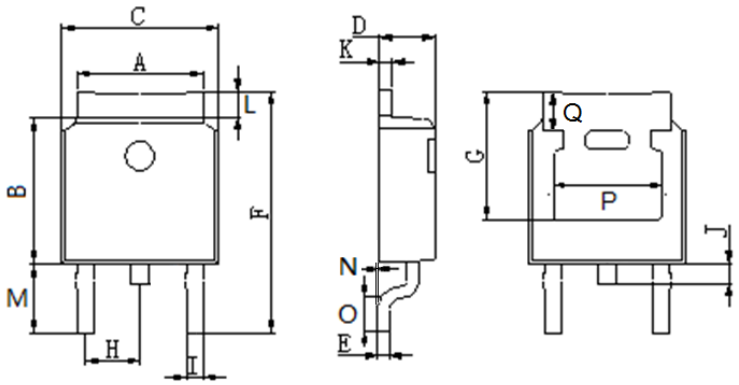


Fig 11 Safe Operation Area

Package Outline Dimensions (Unit: mm)



TO-251		
Dimension	**Min.**	**Max.**
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	11.00	11.60
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	4.00	4.40
K	0.40	0.60



TO-252		
Dimension	**Min.**	**Max.**
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	9.71	10.31
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	0.50	0.7
K	0.40	0.60
L	0.80	1.20
M	2.70	3.10
N	0.00	0.12
O	1.10	1.50
P	4.70	4.90
Q	1.25	1.45

Mounting Pad Layout (Unit: mm)

TO-252