N-Channel Enhancement Mode MOSFET

BL3N90I BL3N90D

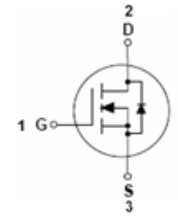
Features

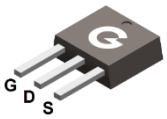
HF

- Ultra Low gate charge
- Low reverse transfer capacitance
- Fast switching capability
- Avalanche energy specified
- Improved dv/dt capability, high ruggedness

Mechanical Data

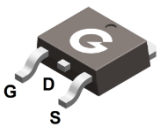
- Case: TO-251, TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208





BL3N90I

TO-251



BL3N90D

TO-252

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL3N90I	TO-251	80 pcs / Tube	3N90I
BL3N90D	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	3N90D

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	900	V
Gate-to-Source Voltage	V_{GSS}	±30	V
Continuous Drain Current (T_C = 25°C)	I_D	3	A
Pulsed Drain Current	I_{DM}	12	A
Single Pulse Avalanche Energy *1	E_{AS}	24	mJ

Thermal Characteristics

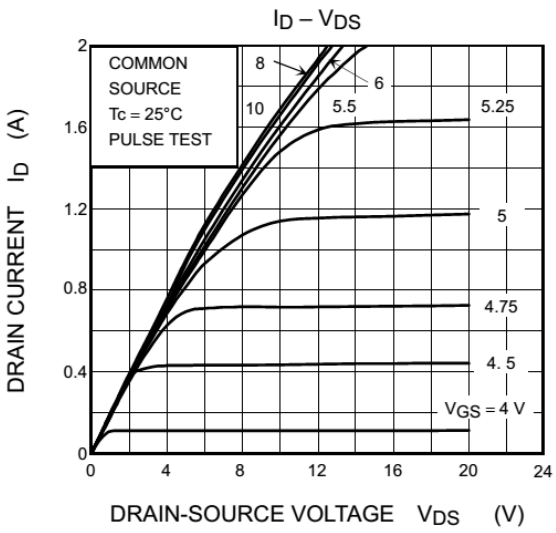
Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C)	P_D	62.5	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

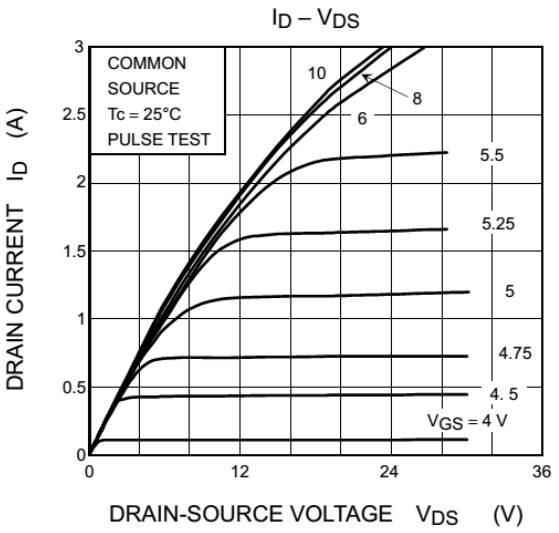
Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

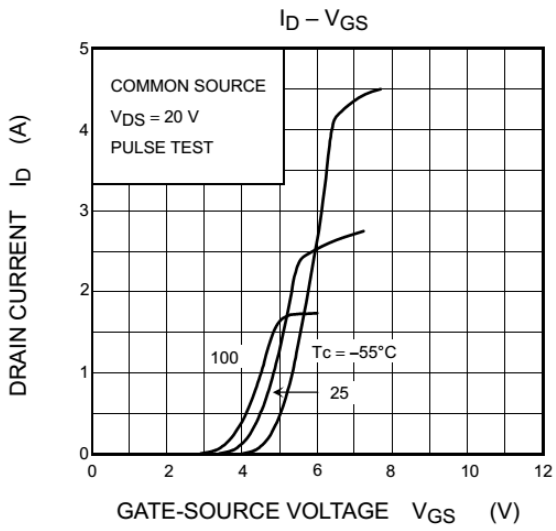
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	900	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 900V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±30V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance	V_{GS} = 10V, I_D = 1.5A	-	-	5.5	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	-	4	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	-	480	-	pF
C_{OSS}	Output Capacitance		-	43	-	
C_{RSS}	Reverse Transfer Capacitance		-	7	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = 450V V_{GS} = 10V R_G = 25Ω I_D = 3A	-	11	-	ns
t_r	Turn-on Rise Time		-	14	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	44	-	
t_f	Turn-Off Fall Time		-	26	-	
Q_G	Total Gate-Charge	V_{DD} = 450V I_D = 3A V_{GS} = 10V	-	15	-	nC
Q_{GS}	Gate to Source Charge		-	2.5	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	6	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD} = 3A, V_{GS} = 0V	-	-	1.5	V
I_S	Continuous Source Current(Body Diode)		-	-	3	A
I_{SM}	Maximum Pulsed Current (Body Diode)		-	-	12	A
trr	Reverse Recovery Time	I_S = 3.0A, d_{IF} / d_t = 100A/μs V_{GS} = 0V	-	140	-	ns
Qrr	Reverse Recovery Charge		-	530	-	nC

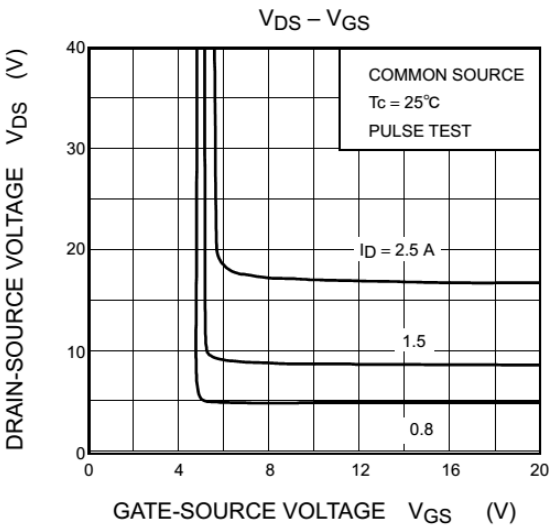
Note 1: Limited by T_{Jmax} , starting T_J = 25°C, L = 10mH, V_{DS} = 50V, V_{GS} = 15V

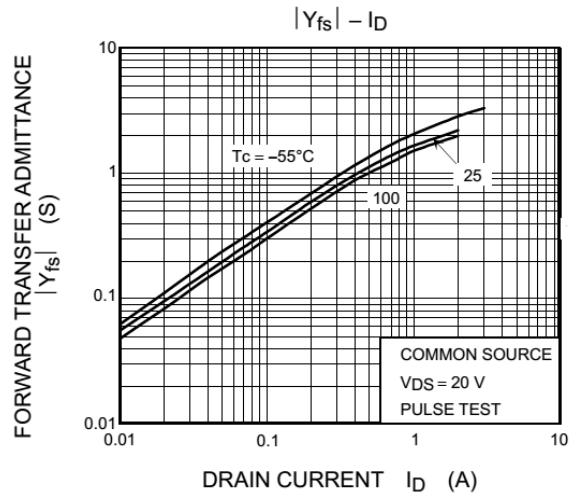
Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

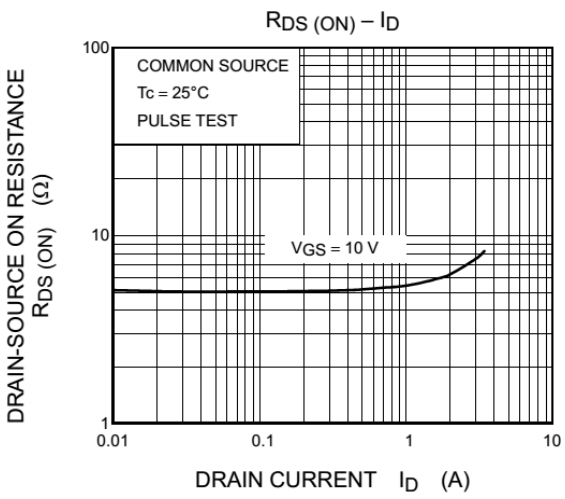


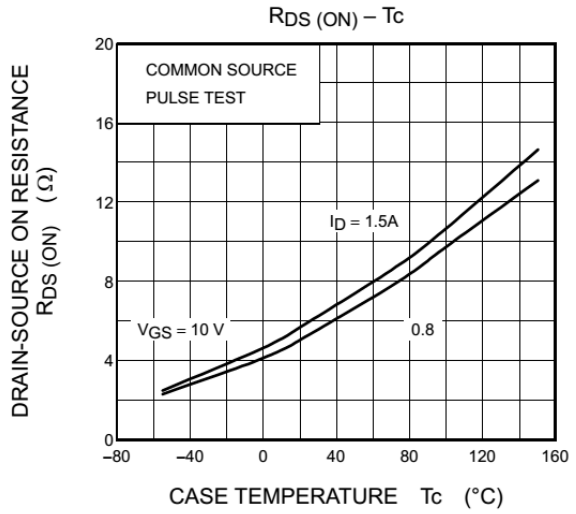


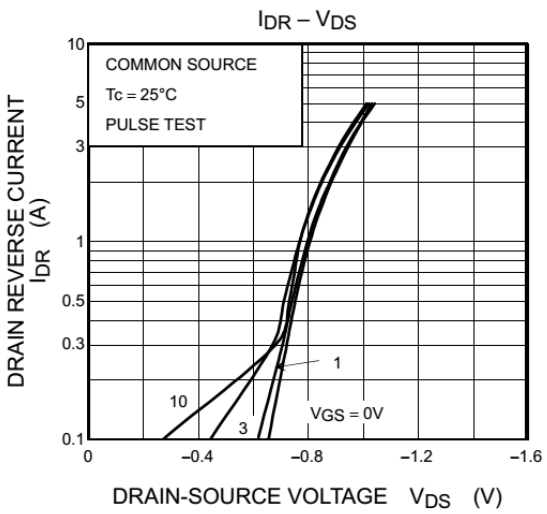


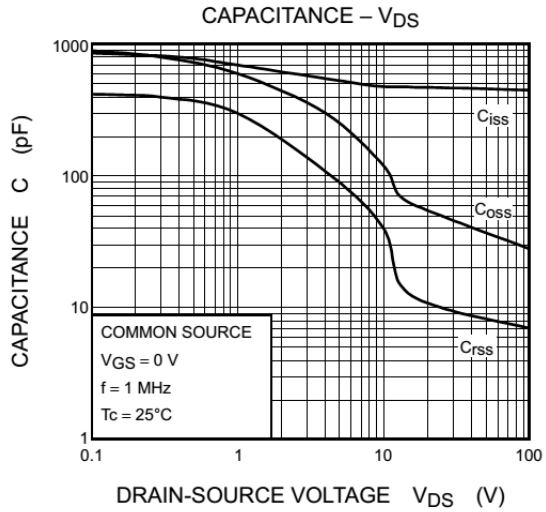


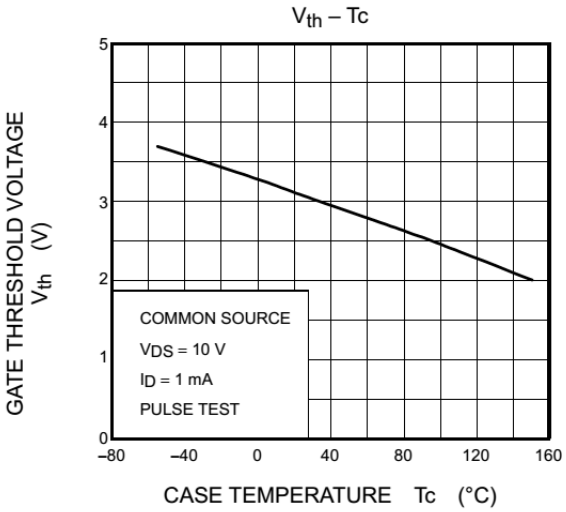




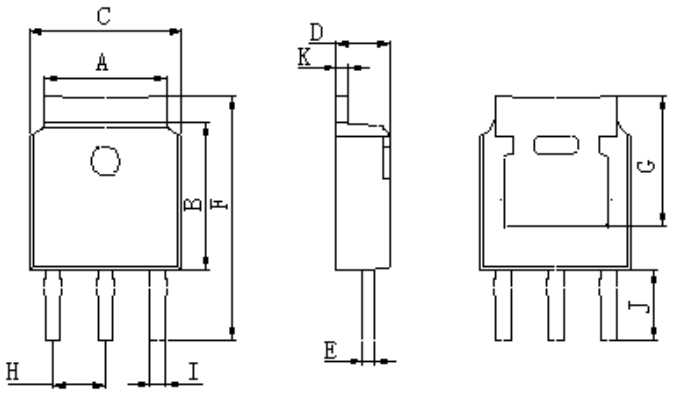

RDS (ON) – Tc
COMMON SOURCE
PULSE TEST
ID = 1.5A
VGS = 10 V
0.8
DRAIN-SOURCE ON RESISTANCE RDS (ON) (Ω)
CASE TEMPERATURE Tc (°C)
20
16
12
8
4
0
–80
–40
0
40
80
120
160


IDR – VDS
COMMON SOURCE
Tc = 25°C
PULSE TEST
DRAIN REVERSE CURRENT IDR (A)
DRAIN-SOURCE VOLTAGE VDS (V)
10
5
3
1
0.5
0.3
0.1
0
–0.4
–0.8
–1.2
–1.6
1
10
3
VGS = 0V

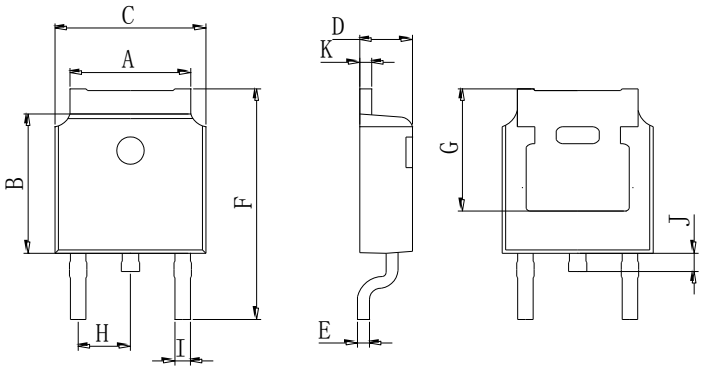

CAPACITANCE – VDS
Ciss
Coss
Crss
COMMON SOURCE
VGS = 0 V
f = 1 MHz
Tc = 25°C
CAPACITANCE C (pF)
DRAIN-SOURCE VOLTAGE VDS (V)
1000
100
10
1
0.1
1
10
100


Vth – Tc
COMMON SOURCE
VDS = 10 V
ID = 1 mA
PULSE TEST
GATE THRESHOLD VOLTAGE Vth (V)
CASE TEMPERATURE Tc (°C)
5
4
3
2
1
0
–80
–40
0
40
80
120
160

Package Outline Dimensions (Unit: mm)



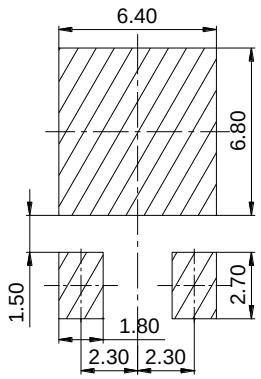
TO-251		
Dimension	**Min.**	**Max.**
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	12.00	12.60
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	4.90	5.50
K	0.40	0.60



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	0.70
K	0.40	0.60

Mounting Pad Layout (Unit: mm)

TO-252



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