

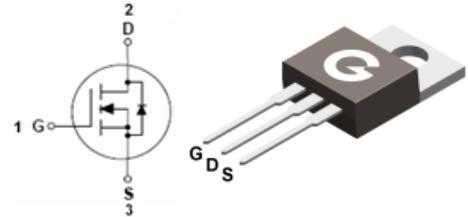
Features

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

HF

Mechanical Data

- Case: TO-220AB
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



TO-220AB

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL3N80	TO-220AB	50 pcs / Tube	3N80

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	I _D	3	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 _A = 25°C)	P _D	1.9	W
Thermal Resistance Junction-to-Air	R _{θJA}	65	°C/W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	-	-	1	μA
		$V_{DS} = 640V, V_{GS} = 0V, T_J = 125^\circ\text{C}$	-	-	100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	± 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	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	-	4	V
gfs	Forward Transconductance	$V_{DS} = 15V, I_D = 3A$	-	5.5	-	S
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$	-	490	-	pF
C_{OSS}	Output Capacitance	$V_{DS} = 25V$	-	25	-	
C_{RSS}	Reverse Transfer Capacitance	$f = 1.0\text{MHz}$	-	50	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD} = 400V$	-	10	-	ns
t_r	Turn-on Rise Time	$V_{GS} = 10V$	-	10	-	
$t_{d(OFF)}$	Turn-Off Delay Time	$R_G = 12\Omega$	-	30	-	
t_f	Turn-Off Fall Time	$I_D = 3A$	-	15	-	
Q_G	Total Gate-Charge	$V_{DD} = 400V$	-	16	-	nC
Q_{GS}	Gate to Source Charge	$V_{GS} = 10V$	-	3	-	
Q_{GD}	Gate to Drain (Miller) Charge	$I_D = 3A$	-	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
t_{rr}	Reverse Recovery Time	$I_F = 3A, V_{GS} = 0V$	-	135	-	ns
Q_{rr}	Reverse Recovery Charge	$di_F/dt = 100A/\mu s$	-	446	-	nC

Notes:

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

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

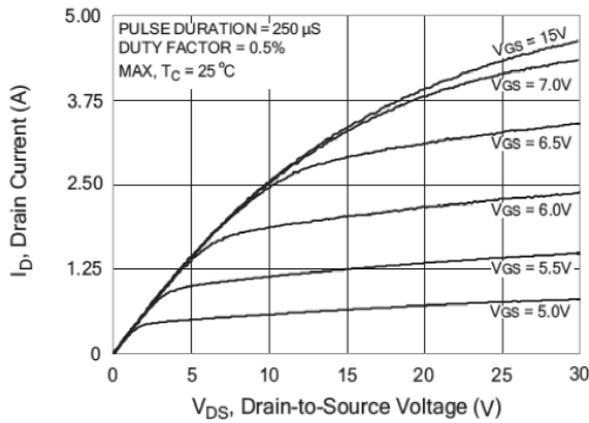


Fig 1 Typical Output Characteristics

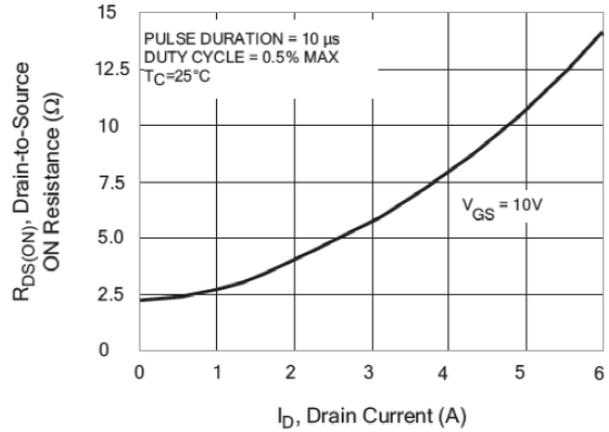


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

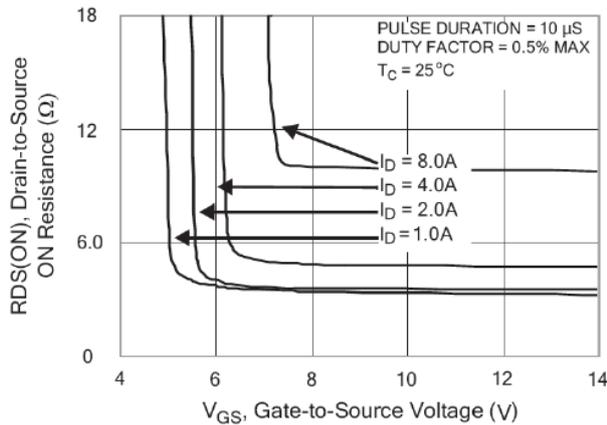


Fig 3 On-Resistance vs. Gate-Source Voltage

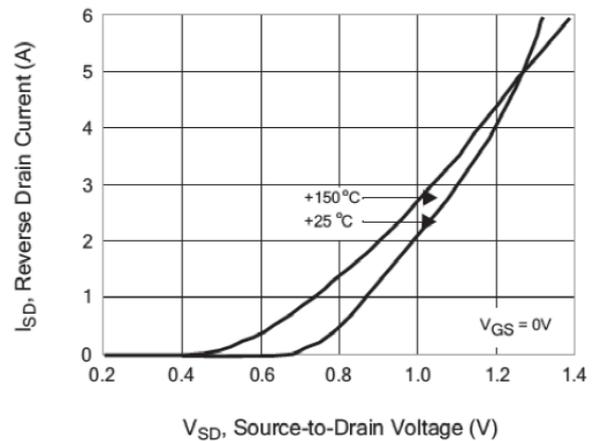


Fig 4 Body-Diode Characteristics

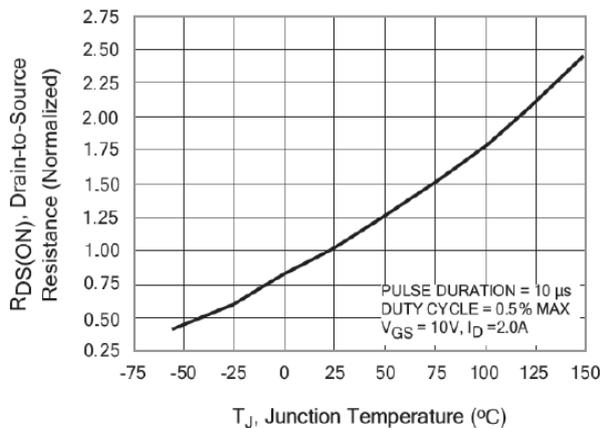


Fig 5 On-Resistance vs. Junction Temperature

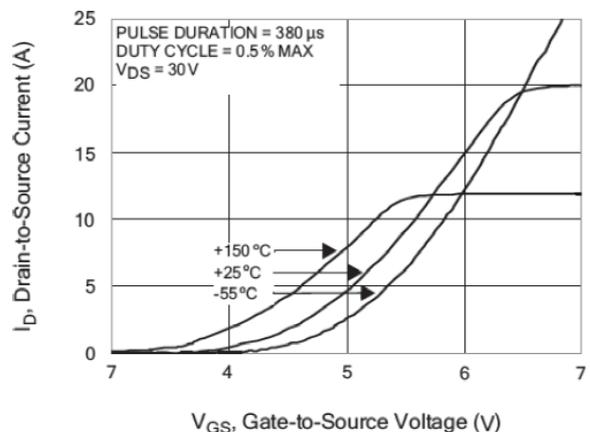


Fig 6 Transfer Characteristics

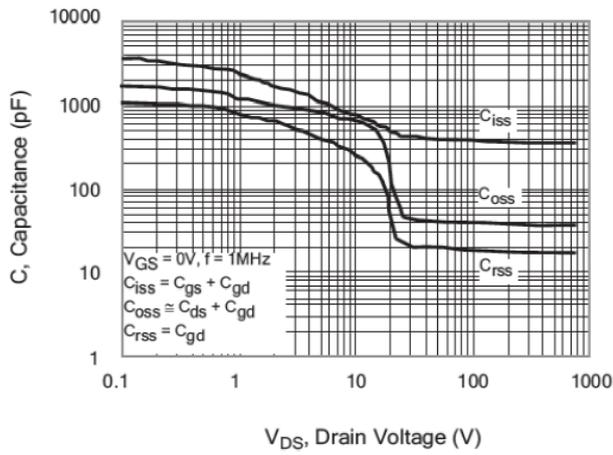


Fig 7 Capacitance Characteristics

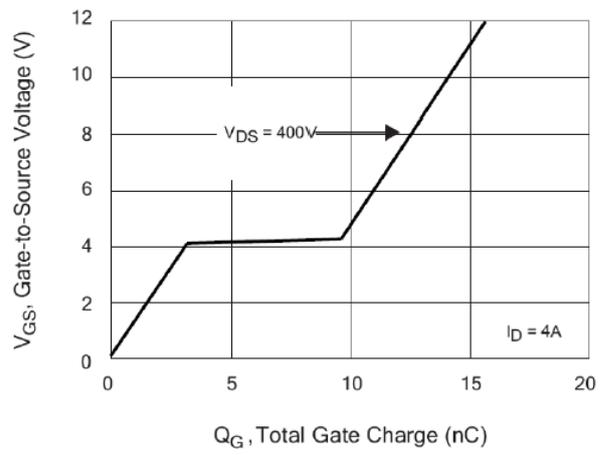


Fig 8 Gate-Charge Characteristics

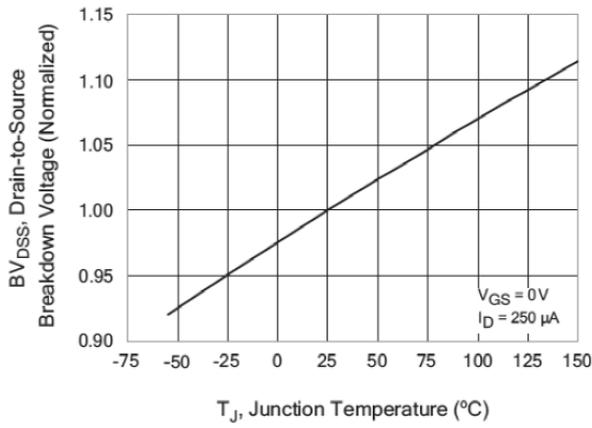


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

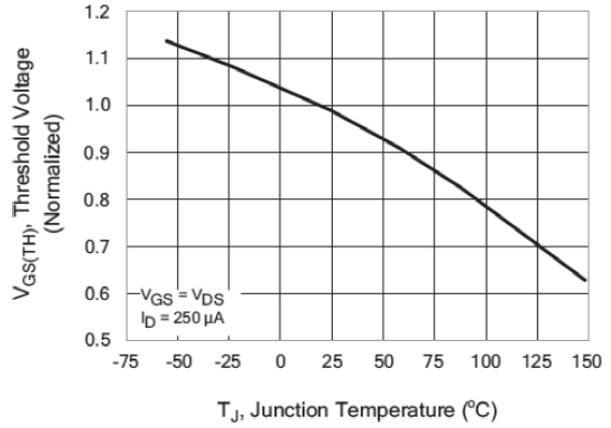


Fig 10 $V_{GS(th)}$ vs. Junction Temperature

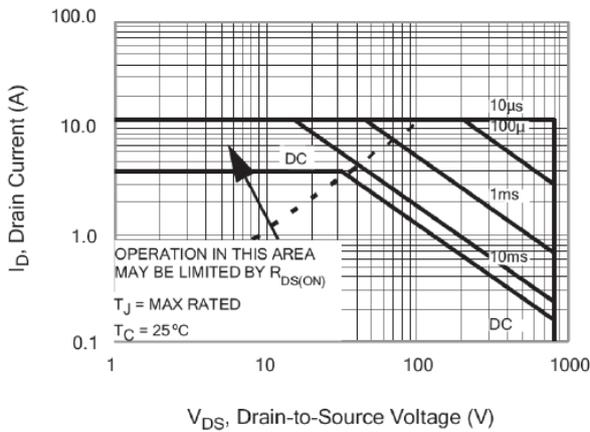


Fig 11 Safe Operation Area

Package Outline Dimensions (Unit: mm)

