N-Channel Enhancement Mode MOSFET

BL270N20H

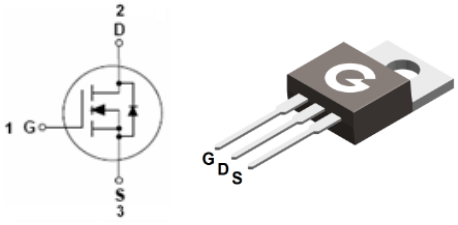
Features

- Reliable and rugged
- 100% avalanche tested

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
BL270N20H	TO-220AB	50 pcs / Tube	270N20H

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	200	V
Gate-to-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (T_C = 25°C)	I_D	62	A
Continuous Drain Current (T_C = 100°C)		44	A
Pulsed Drain Current *1 (tp=10us)	I_{DM}	360	A
Single Pulse Avalanche Energy *3	E_{AS}	784	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C)	P_D	375	W
Power Dissipation (T_C = 100°C)		187.5	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.4	°C/W
Thermal Resistance Junction-to-Air *2	$R_{\theta JA}$	62.5	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +175	°C
Storage Temperature Range	T_{STG}	-55 ~ +175	°C

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	200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 200V, V_{GS} = 0V (T_C=25°C)	-	-	1	μA
		V_{DS} = 200V, V_{GS} = 0V (T_C=55°C)	-	-	5	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance *4	V_{GS} = 10V, I_D = 45A	-	22	27	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	V
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS} = 0V, f = 1MHz	-	3.4	-	Ω
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1MHz	-	5871	-	pF
C_{OSS}	Output Capacitance		-	392	-	
C_{RSS}	Reverse Transfer Capacitance		-	165	-	
Q_G	Total Gate-Charge	V_{DD} = 160V V_{GS} = 10V I_D = 45A	-	130.4	-	nC
Q_{GS}	Gate to Source Charge		-	22.1	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	38.2	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = 100V V_{GS} = 10V R_G = 4Ω I_D = 45A	-	29	-	ns
t_r	Turn-on Rise Time		-	45	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	22	-	
t_f	Turn-Off Fall Time		-	41	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *4	I_{SD} = 45A, V_{GS} = 0V	-	-	1.1	V
trr	Reverse Recovery Time	I_F = 45A di/dt = 100A/μs	-	80	-	ns
Qrr	Reverse Recovery Charge		-	160		nC

Notes:

1. Repetitive rating; pulse width limited by max. junction temperature
2. Surface mounted on FR-4 board
3. The E_{AS} data shows Max. rating. The test condition is R_G = 25Ω, V_{GS} = 10V, L = 0.5mH
4. The data tested by pulsed , pulse width≦300μs , duty cycle≦2%

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

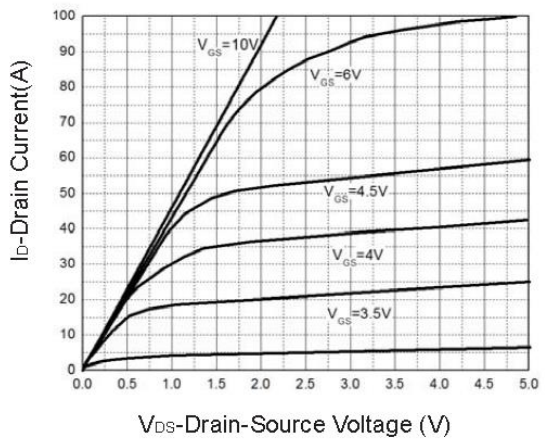


Fig 1 Typical Output Characteristics

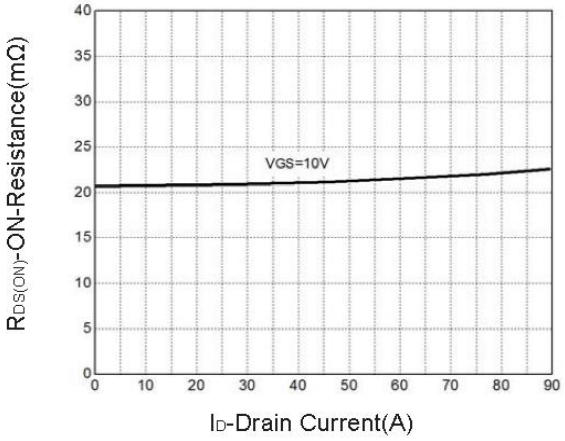


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

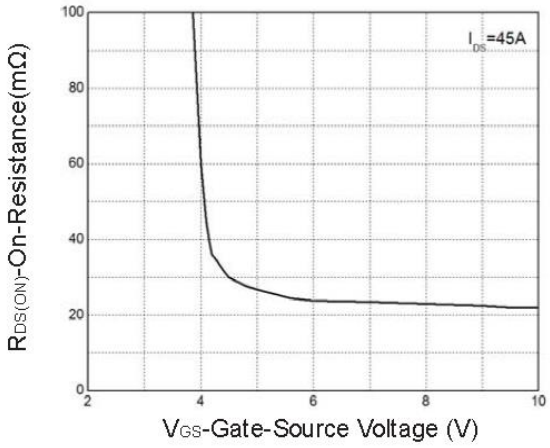


Fig 3 On-Resistance vs. Gate-Source Voltage

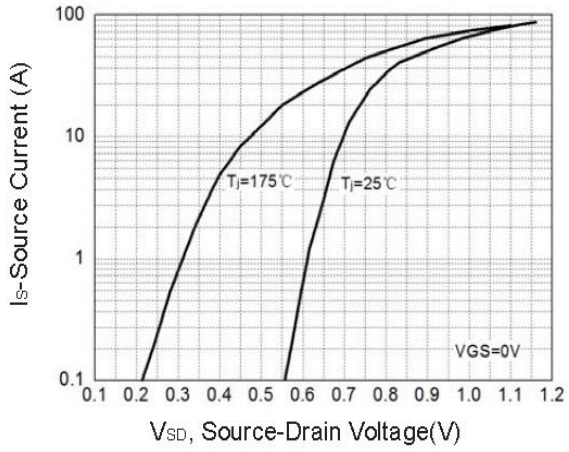


Fig 4 Body-Diode Characteristics

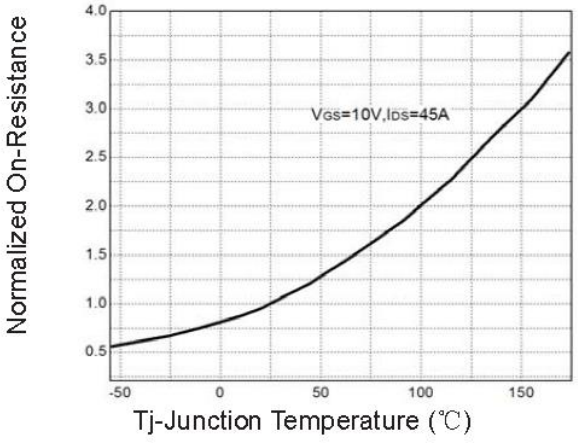


Fig 5 On-Resistance vs. Junction Temperature

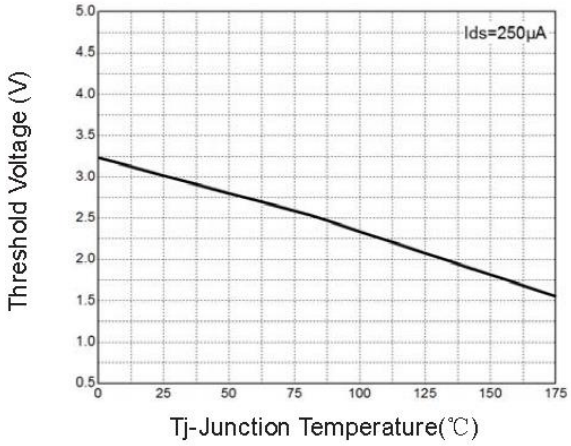


Fig 6 $V_{GS(th)}$ vs. Junction Temperature

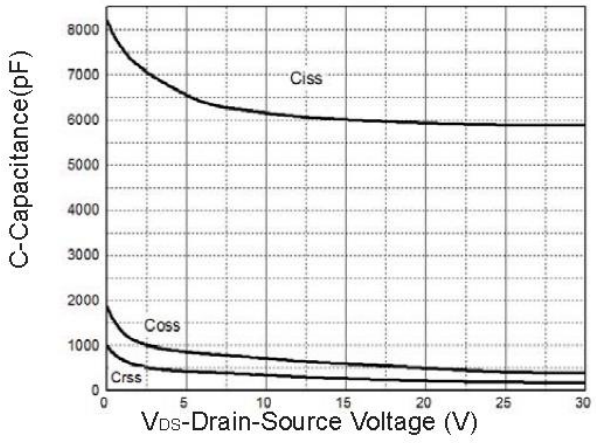


Fig 7 Capacitance Characteristics

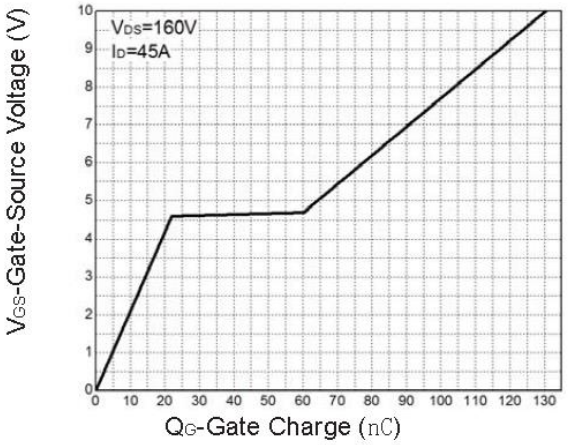


Fig 8 Gate-Charge Characteristics

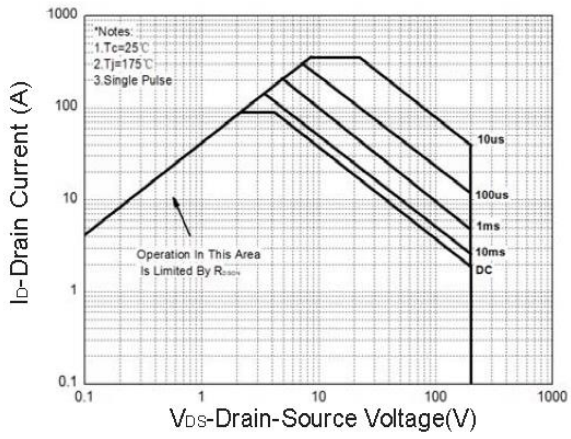


Fig 9 Safe Operation Area

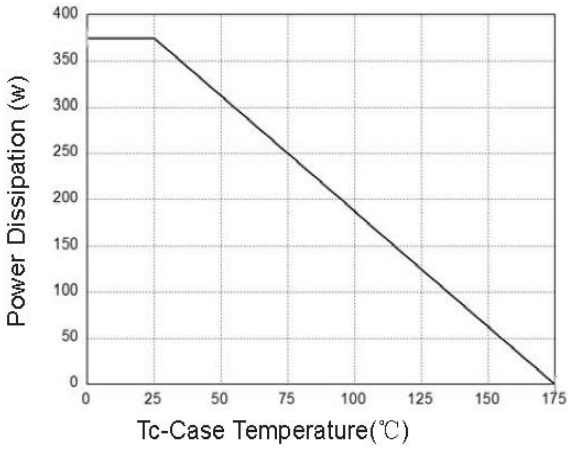


Fig 10 Power Dissipation

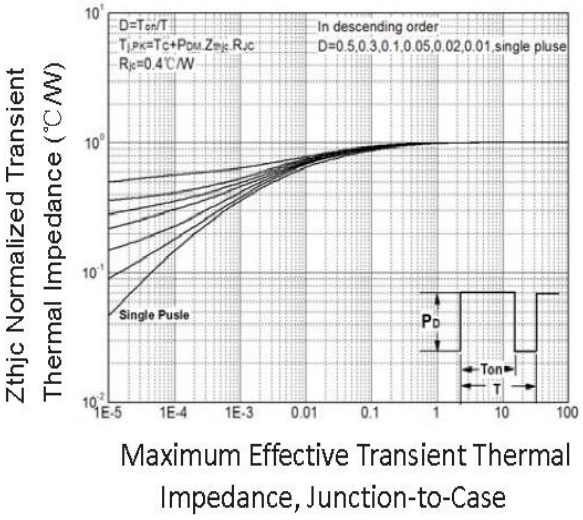


Fig 11 Thermal Transient Impedance

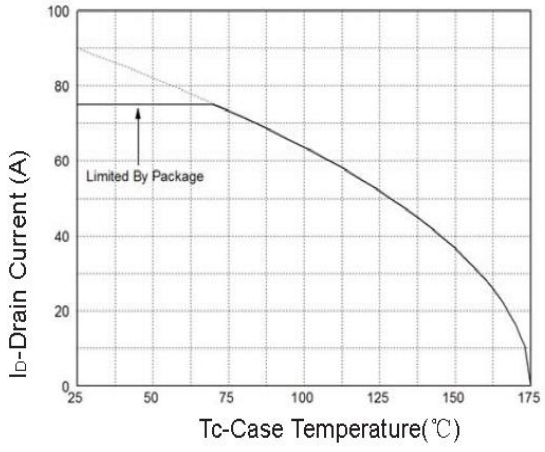
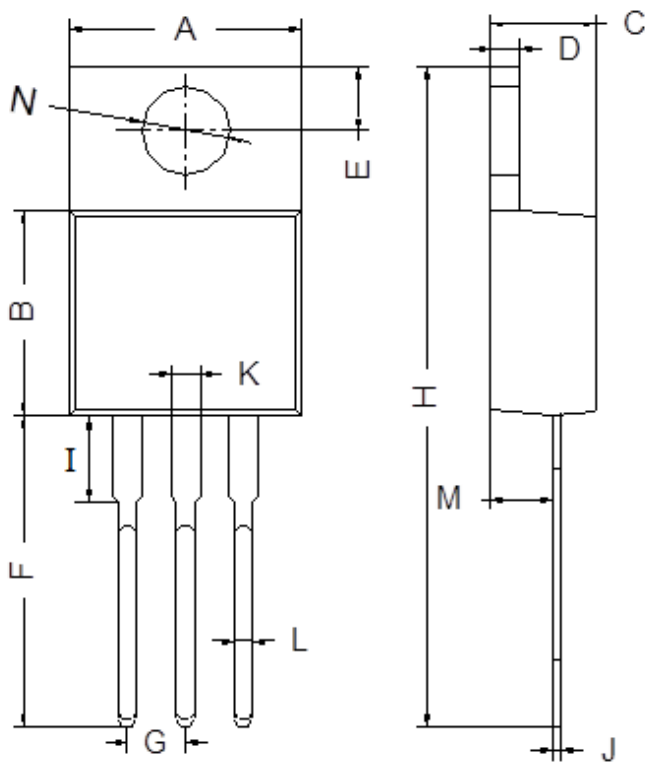


Figure 12 Maximum Continuous Drain Current vs. Case Temperature

Package Outline Dimensions (Unit: mm)



TO-220AB		
Dimension	**Min.**	**Max.**
A	9.80	10.30
B	8.70	9.10
C	4.37	4.77
D	1.07	1.47
E	2.64	2.84
F	13.14	13.74
G	2.44	2.64
H	28.03	28.83
I	3.50	4.00
J	0.28	0.48
K	1.22	1.32
L	0.71	0.91
M	2.40	2.60
N	3.76	3.96

IMPORTANT NOTICE