N-Channel Enhancement Mode MOSFET

BL033N08TH

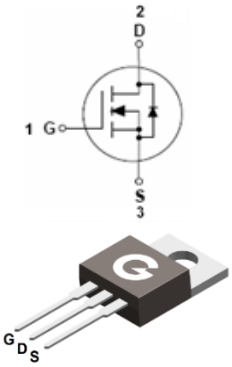
Features

HF

- Extremely low switching loss
- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Excellent stability and uniformity

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
BL033N08TH	TO-220AB	50 pcs / Tube	033N08TH

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	80	V
Gate-to-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (T_C = 25°C) *5	I_D	200	A
Continuous Drain Current (T_C = 100°C) *5	I_D	126.5	A
Pulsed Drain Current *3	I_{DM}	800	A
Single Pulse Avalanche Energy *3, 6	E_{AS}	1200	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C) *2	P_D	260	W
Thermal Resistance Junction-to-Air *1, 4	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.5	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°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	80	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 68V, V_{GS} = 0V	-	-	1	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	V_{GS} = 10V,I_D = 20A	-	-	3.3	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	2.8	4	V
R_g	Gate Resistance	V_{DS} = V_{GS} = 0V, f = 1.0MHz	-	2.25	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 50V f = 1.0MHz	-	6800	-	pF
C_{OSS}	Output Capacitance		-	2300	-	
C_{RSS}	Reverse Transfer Capacitance		-	470	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = 50V V_{GS} = 10V R_G = 3Ω I_D = 50A	-	31	-	ns
t_r	Turn-on Rise Time		-	28	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	86	-	
t_f	Turn-Off Fall Time		-	27	-	
Q_G	Total Gate-Charge	V_{DD} = 50V V_{GS} = 10V I_D = 50A	-	112	-	nC
Q_{GS}	Gate to Source Charge		-	22	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	35	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_S = 20A, V_{GS} = 0V	-	-	1.4	V
t_{rr}	Body Diode Reverse Recovery Time	I_F = 20A dI/dt = 100A / μs	-	75	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	133	-	nC

Notes:

1. The value of RθJC is measured in a still air environment with TA =25°C and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design
2. The power dissipation PD is based on TJ(MAX)=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used
3. Single pulse width limited by junction temperature $T_{J\,(MAX.)}$ = 150°C
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient
5. The maximum current rating is package limited
6. The E_{AS} data shows Max. rating. The test condition is V_{DS} = 50V, V_{GS} = 10V, L = 0.5mH

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

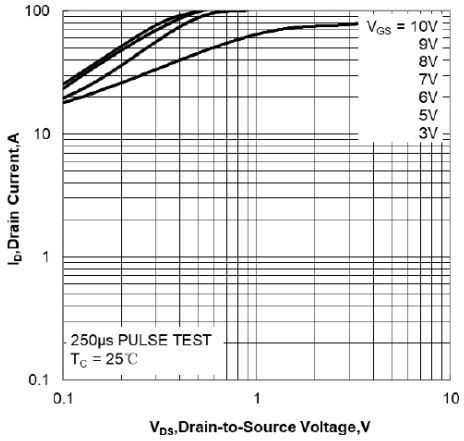


Fig 1 Output Characteristics

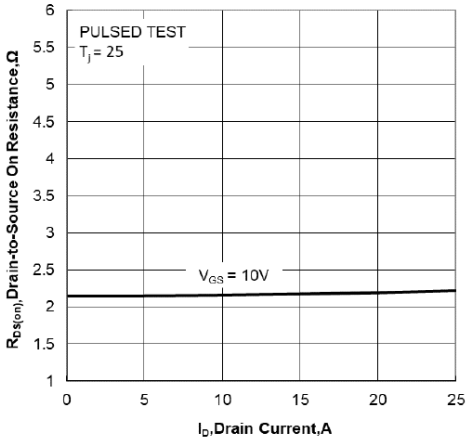


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

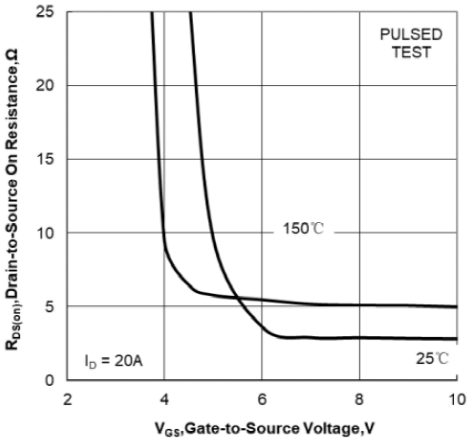


Fig 3 On-Resistance vs. Gate-Source Voltage

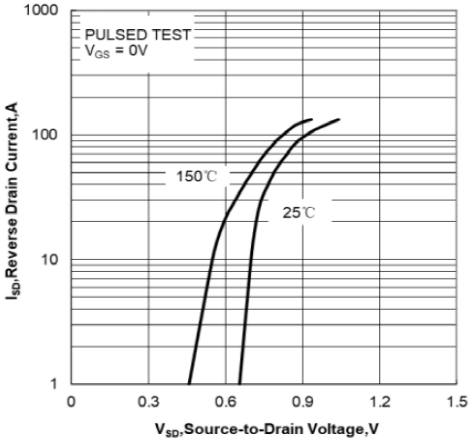


Fig 4 Body-Diode Characteristics

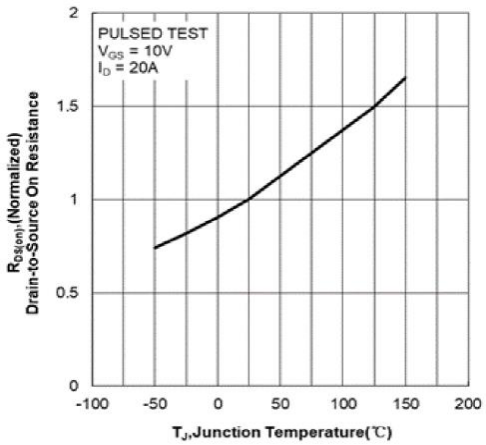


Fig 5 Normalized On-Resistance vs. Junction Temperature

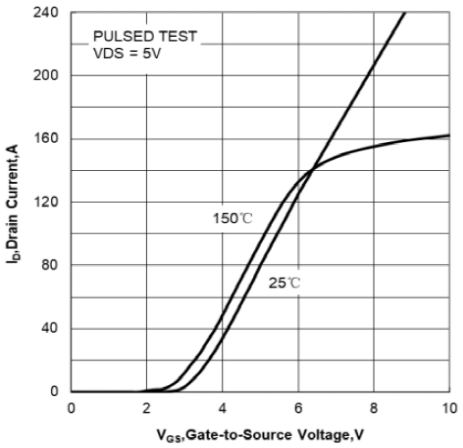


Fig 6 Transfer Characteristics

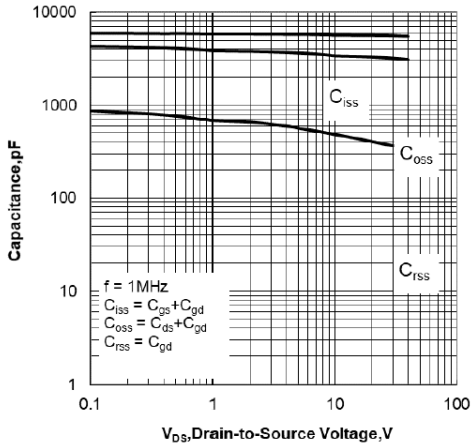


Fig 7 Capacitance Characteristics

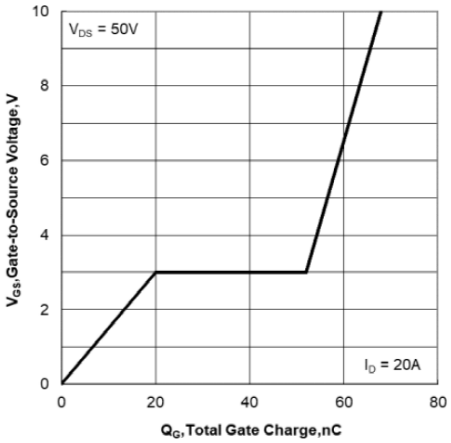


Fig 8 Gate-Charge Characteristics

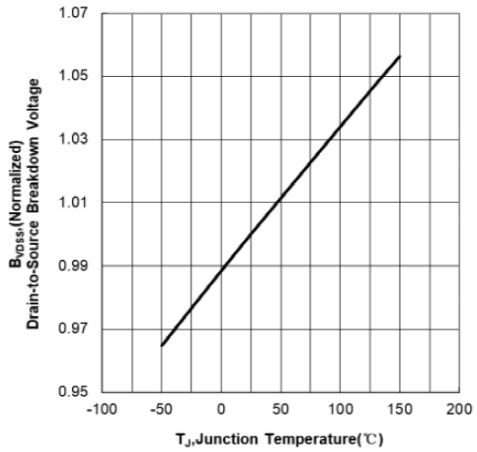


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

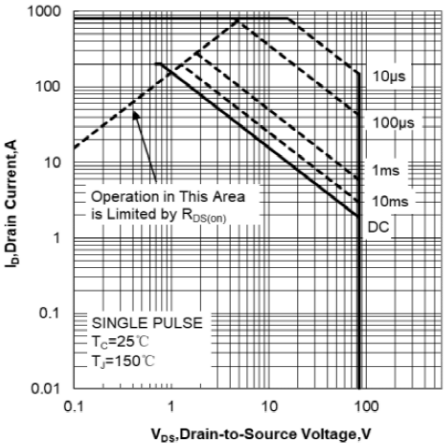


Fig 10 Safe Operation Area

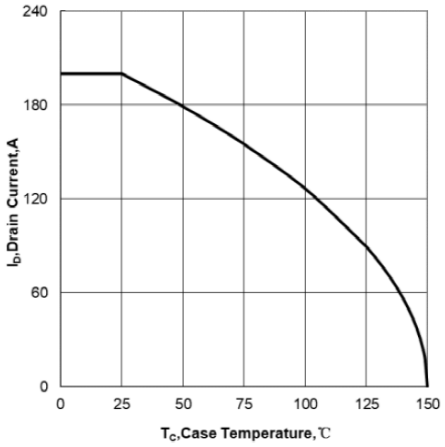


Figure 11 Maximum Continuous Drain Current vs. Case Temperature

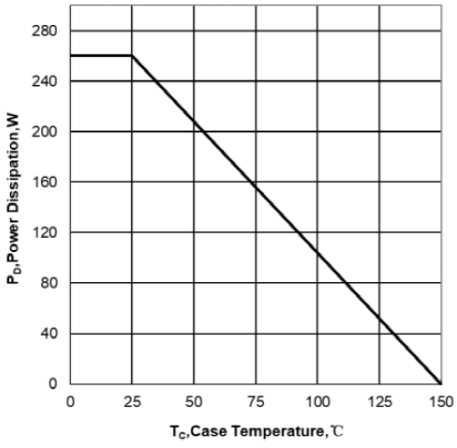
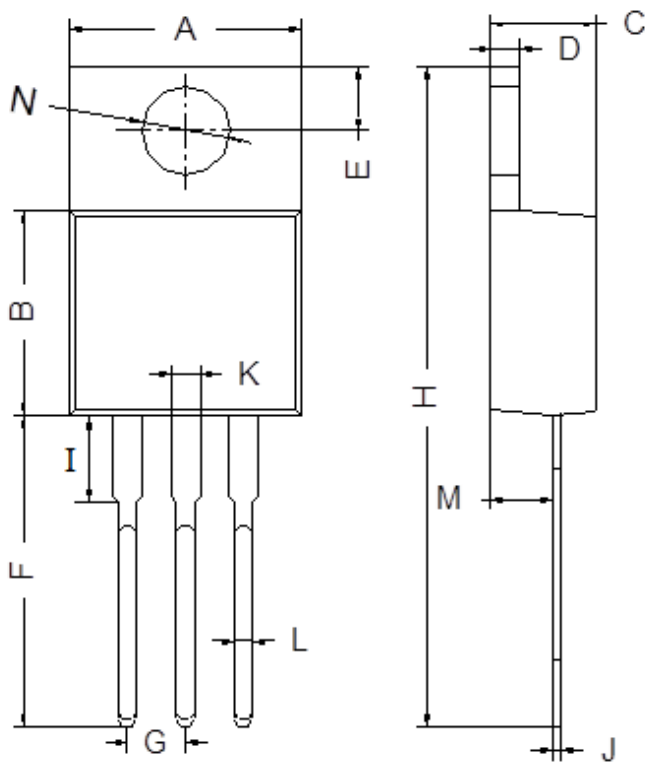


Figure 12 Maximum Power Dissipation vs. Case Temperature

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