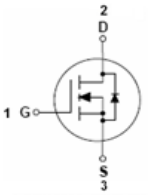
N-Channel Enhancement Mode MOSFET

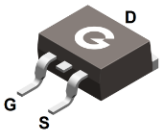
BL045N10B

Features

- Super low gate charge
- Green device available
- Excellent c_{dv} / d_t effect decline
- Advanced high cell density trench technology

HF





TO-263

Mechanical Data

- Case: TO-263
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL045N10B	TO-263	50pcs / Tube & 800pcs / Tape & Reel	045N10B

Maximum Ratings (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	100	V
Gate-to-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (T_C = 25°C) *1	I_D	180	A
Continuous Drain Current (T_C = 100°C) *1	I_D	110	A
Pulsed Drain Current *2	I_{DM}	450	A
Single Pulse Avalanche Energy *3	E_{AS}	665	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C)	P_D	284	W
Thermal Resistance Junction-to-Air *1	$R_{\theta JA}$	50	°C/W
Thermal Resistance Junction-to-Case *1	$R_{\theta JC}$	0.44	°C/W
Thermal Resistance Junction-to-Lead *1	$R_{\theta JL}$	0.34	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ T_A = 25℃ 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	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 100V, V_{GS} = 0V, T_C = 25°C	-	-	1	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 100V, 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 *2	V_{GS} = 10V, I_D = 50A	-	3.5	4.5	mΩ
		V_{GS} = 10V, I_D = 2A	-	3.4	4.5	mΩ
$V_{GS(th)}$	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	-	5678	-	pF
C_{OSS}	Output Capacitance		-	673	-	
C_{RSS}	Reverse Transfer Capacitance		-	27	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = 50V V_{GS} = 10V R_G = 4.7Ω I_D = 30A	-	25	-	ns
t_r	Turn-on Rise Time		-	33	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	45	-	
t_f	Turn-Off Fall Time		-	19	-	
Q_G	Total Gate-Charge	V_{DD} = 50V V_{GS} = 10V I_D = 40A	-	83	-	nC
Q_{GS}	Gate to Source Charge		-	22	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	19	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = 30A, V_{GS} = 0V, T_J = 25°C	-	-	1.2	V
I_{SD}	Source-Drain Current(Body Diode) *1, 4		-	-	180	A
I_{SDM}	Pulsed Source-Drain Current(Body Diode) *2, 4		-	-	450	A
trr	Reverse Recovery Time	T_J = 25°C, I_F = 30A di / dt =100A / μs	-	71	-	ns
Qrr	Reverse Recovery Charge		-	144	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. The EAS data shows Max. rating. The test condition is V_{DD} = 25V, V_{GS} = 10V, L = 0.5mH
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation

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

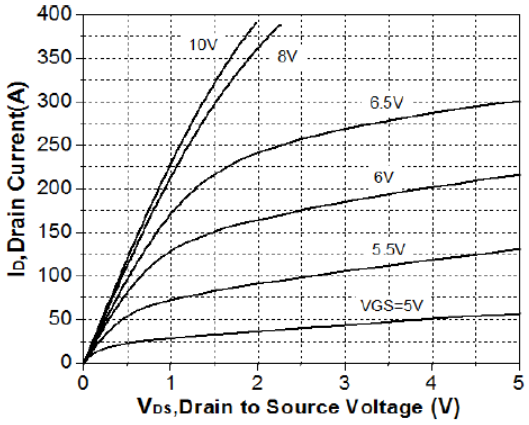


Figure 1. On-Region Characteristics

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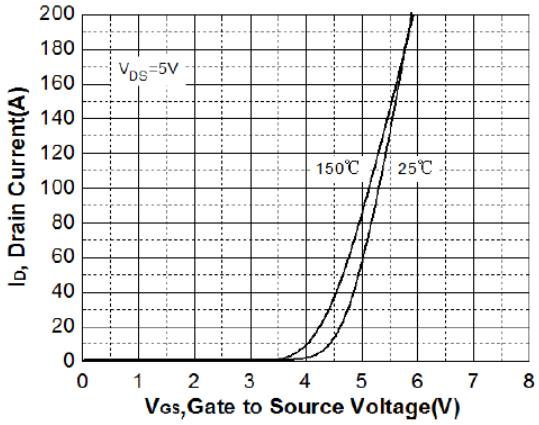

Figure 2. Transfer Characteristics

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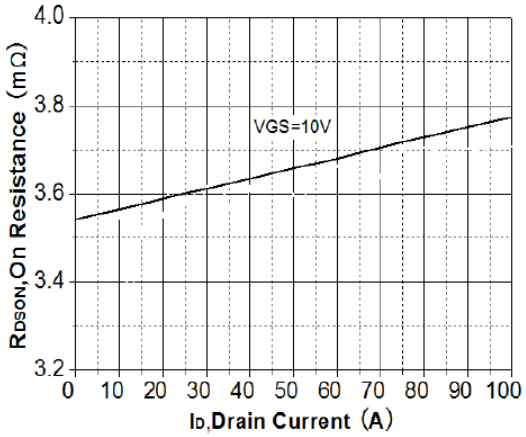


Figure 3. On-Resistance Variation vs Drain Current

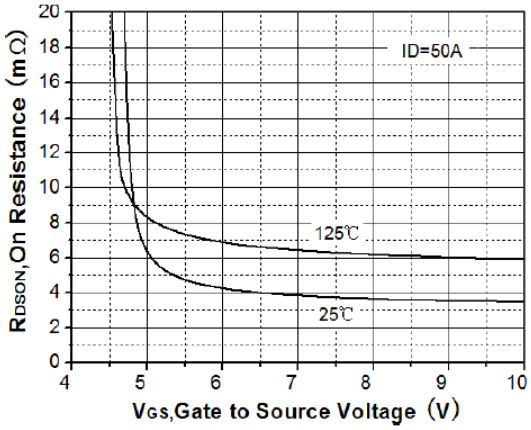


Figure 4. On-Resistance Vs Gate to Source Voltage

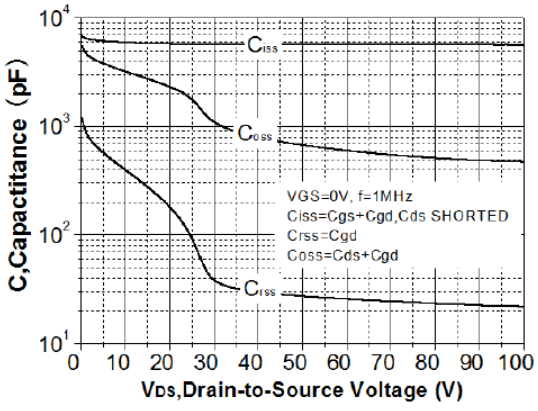


Figure 5. Capacitance Characteristics

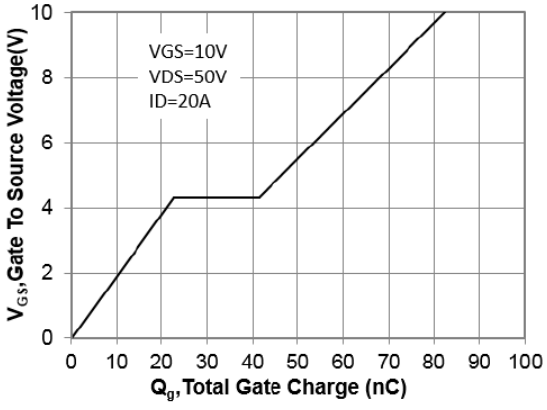


Figure 6. Gate Charge Characteristics

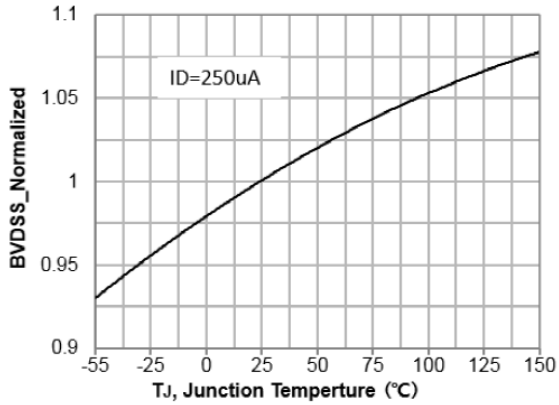


Figure 7. Breakdown Voltage Variation vs Temperature

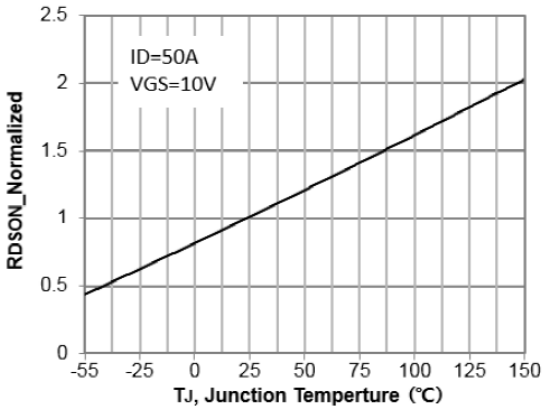


Figure 8. On-Resistance Variation vs Temperature

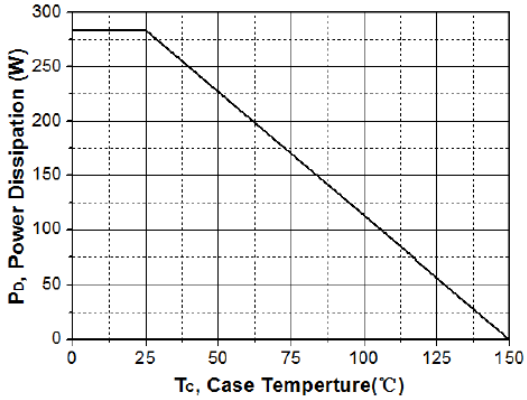


Figure 9. Power Dissipation

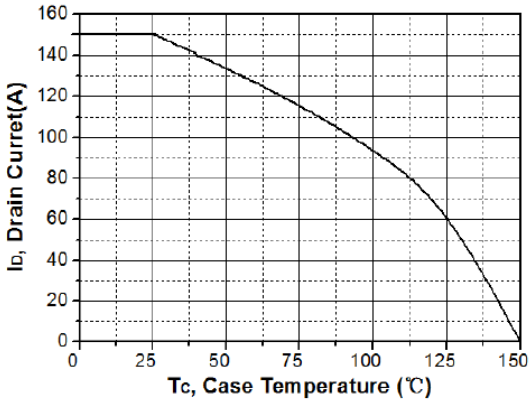


Figure 10. Drain Current Derating

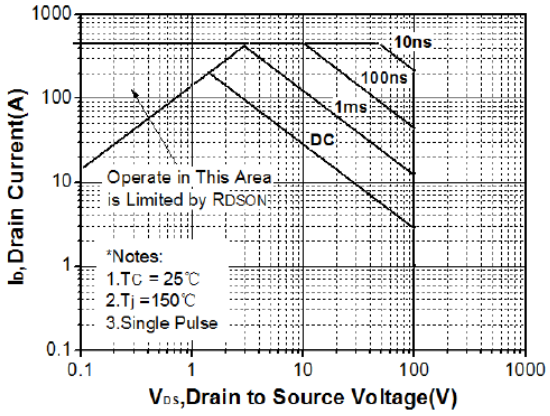


Figure 11. Maximum Safe Operating Area

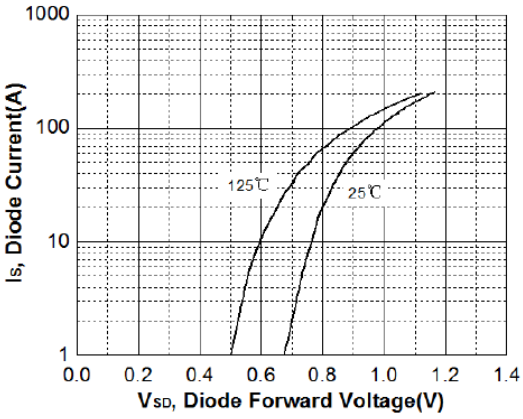
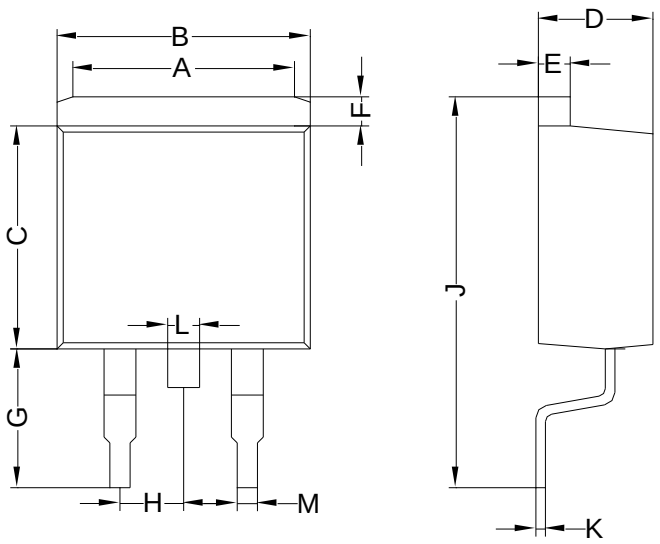


Figure 12. Body-diode Forward Characteristics

Package Outline Dimensions (Unit: mm)



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Dimension	**Min.**	**Max.**
A	6.00	8.00
B	9.90	10.30
C	8.50	9.10
D	4.37	4.77
E	1.07	1.47
F	1.07	1.47
G	5.34	5.74
H	2.44	2.64
J	15.30	15.90
K	0.28	0.48
L	1.17	1.37
M	0.71	0.91

Mounting Pad Layout (Unit: mm)

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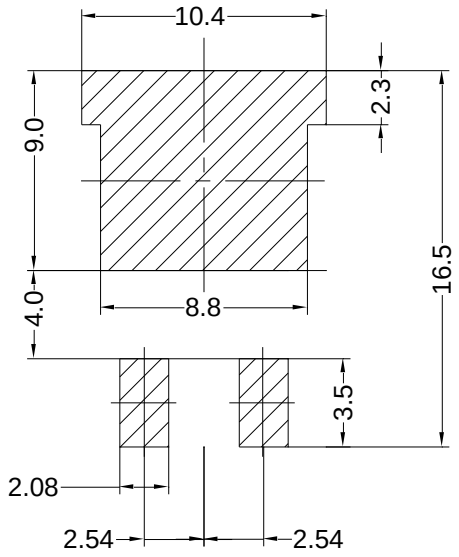

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