N-Channel Enhancement Mode MOSFET

BL020N04TB

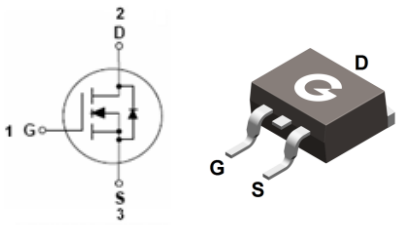
Features

HF

- Super low $R_{DS(on)}$ and gate charge
- Advanced shielded-gate technology
- Green device available

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



TO-263

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL020N04TB	TO-263	50 pcs / Tube or 800 pcs / Tape & Reel	020N04TB

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	40	V
Gate-to-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (Package limit) T_C = 25°C	I_D *1	100	A
Continuous Drain Current (Silicon limit) T_C = 25°C		220	A
Continuous Drain Current (Silicon limit) T_C = 100°C		140	A
Pulsed Drain Current (t_p < 10μs)	I_{DM}	880	A
Single Pulse Avalanche Energy *3	E_{AS}	65	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C)	P_D	156	W
Thermal Resistance Junction-to-Case *1	$R_{\theta JC}$	0.8	°C/W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	50	°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	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 40V, 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 *2	V_{GS} = 10V, I_D = 20A	-	1.7	2	mΩ
		V_{GS} = 4.5V, I_D = 20A	-	2.0	2.4	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	2.5	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 20V f = 150kHz	-	6269	-	pF
C_{OSS}	Output Capacitance		-	2818	-	
C_{RSS}	Reverse Transfer Capacitance		-	222	-	
Q_G	Total Gate-Charge	V_{DD} = 20V V_{GS} = 10V I_D = 100A	-	112	-	nC
Q_{GS}	Gate to Source Charge		-	21	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	14.6	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = 20V V_{GS} = 4.5V R_G = 3Ω I_D = 20A	-	24	-	ns
t_r	Turn-on Rise Time		-	84	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	62	-	
t_f	Turn-Off Fall Time		-	20	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = 50A, V_{GS} = 0V	-	-	1.2	V
trr	Reverse Recovery Time	I_F = 20A, V_R=30V di/dt = 100A/μs	-	152	-	ns
Qrr	Reverse Recovery Charge		-	375		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 E_{AS} data shows Max. rating. The test condition is V_{DD} =30V, V_{GS} = 10V, L = 0.1mH
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)

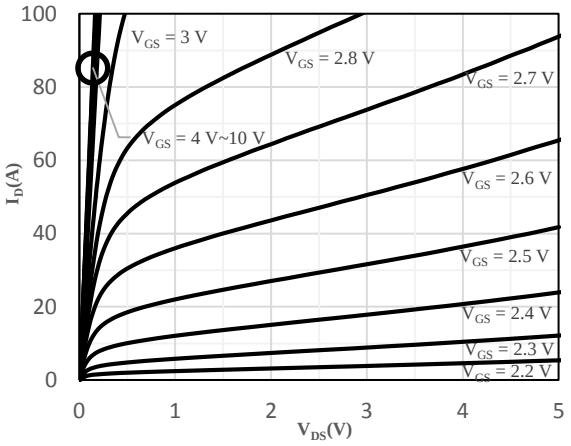


Fig 1 Output Characteristics

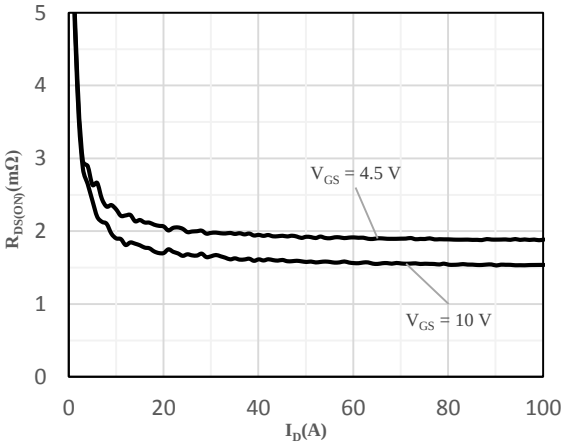


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

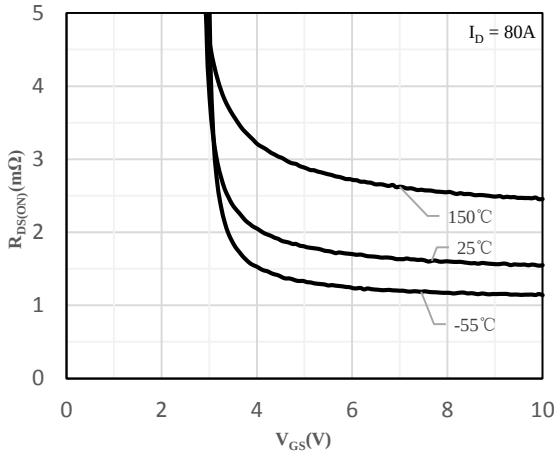


Fig 3 On-Resistance vs. Gate-Source Voltage

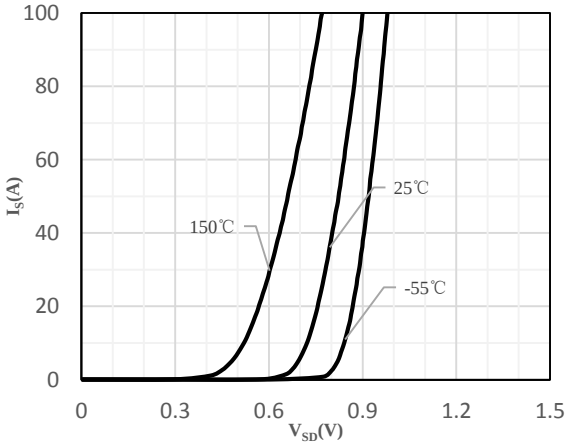


Fig 4 Body-Diode Characteristics

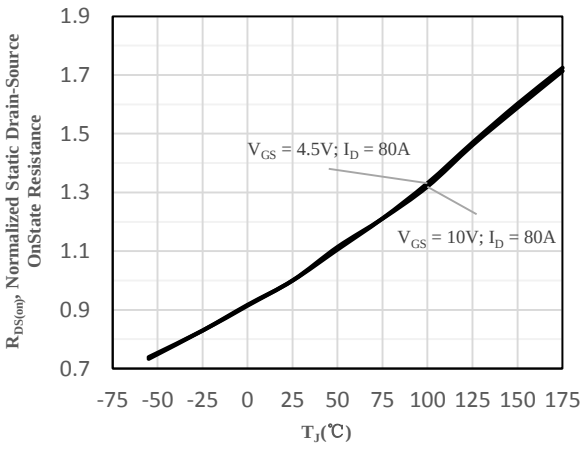


Fig 5 On-Resistance vs. Junction Temperature

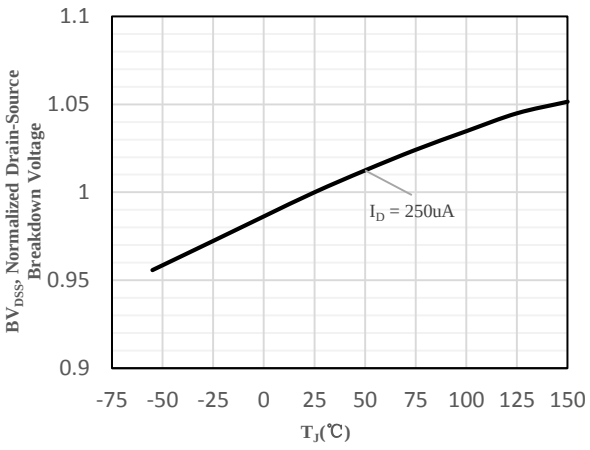


Fig 6 Drain-Source vs. Junction Temperature

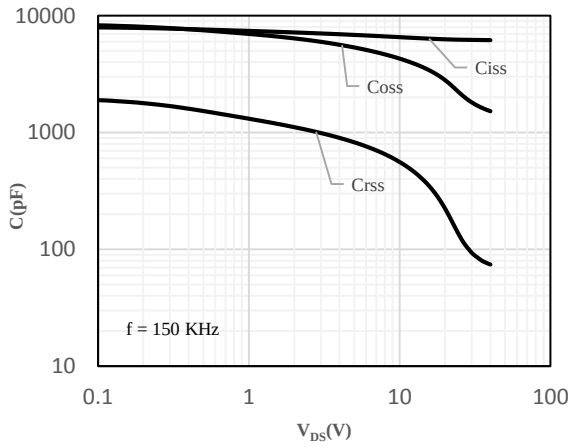


Fig 7 Capacitance Characteristics

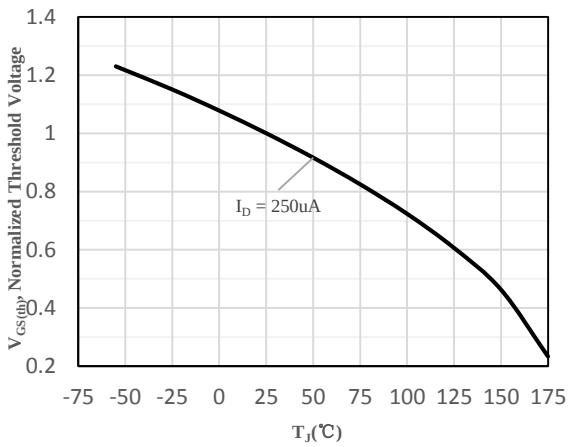


Fig 8 Gate Voltage vs. Junction Temperature

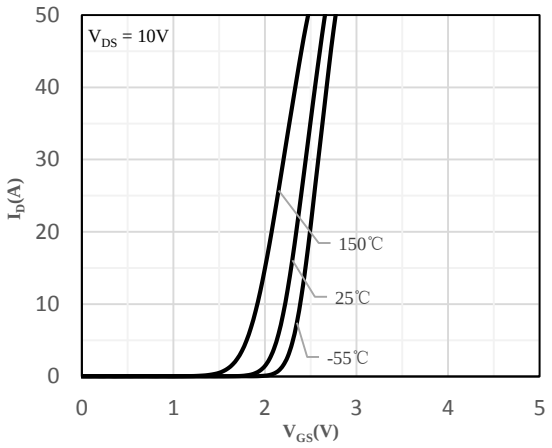


Fig 9 Transfer Characteristics

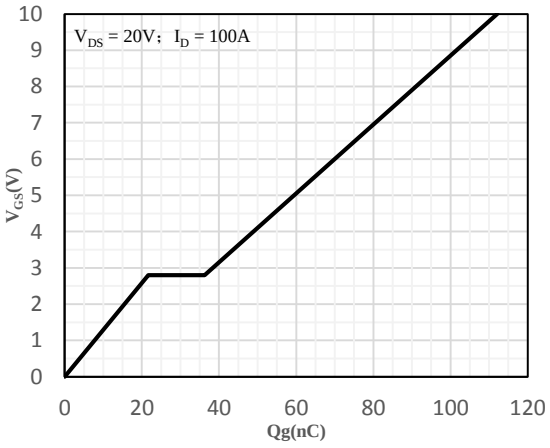
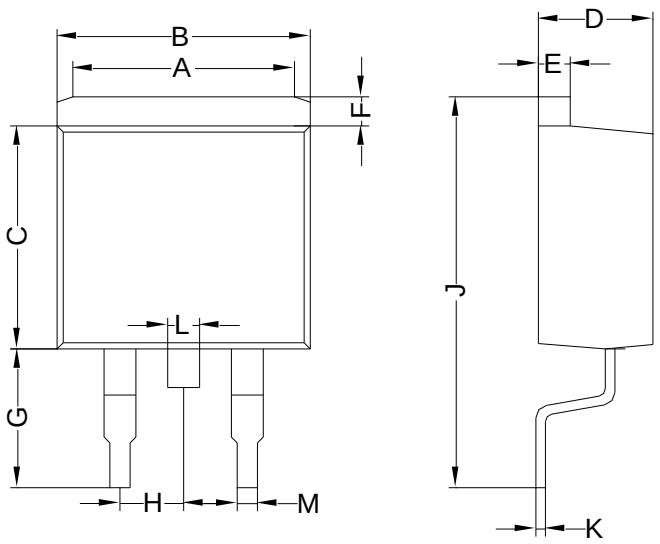


Fig 10 Gate-Charge Characteristics

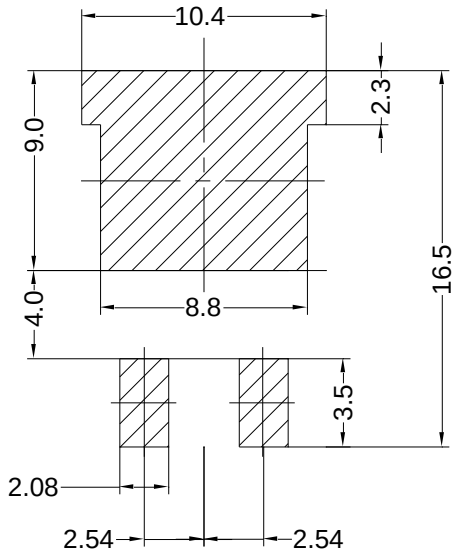
Package Outline Dimensions (Unit: mm)



TO-263		
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)

TO-263



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