N-Channel Enhancement Mode MOSFET

BL10N10I

Features

- $R_{DS(ON)}$ ≤ 150mΩ @ V_{GS} = 10V
- Low gate charge

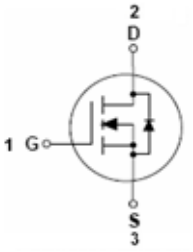
HF

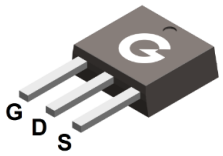
Applications

- Networking DC-DC power system
- Load switch

Mechanical Data

- Case: TO-251
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208





TO-251

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL10N10I	TO-251	80 pcs / Tube	10N10I

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	10	A
Pulsed Drain Current *2	I_{DM}	40	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C) *3	P_D	27	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	4.6	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ T_J = 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_J = 25°C	-	-	1	μA
		V_{DS} = 100V, V_{GS} = 0V, T_J = 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 = 10A	-	135	150	mΩ
		V_{GS} = 4.5V,I_D = 5A	-	180	220	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1	-	2.5	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	-	478	-	pF
C_{OSS}	Output Capacitance		-	33	-	
C_{RSS}	Reverse Transfer Capacitance		-	23	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DD} = 30V, V_{GS} = 10V R_G = 2.5Ω, R_L = 15Ω I_D = 2A	-	11	-	ns
t_r	Turn-on Rise Time		-	7.4	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	35	-	
t_f	Turn-Off Fall Time		-	9.1	-	
Q_G	Total Gate-Charge	V_{DD} = 30V V_{GS} = 10V I_D = 3A	-	14.1	-	nC
Q_{GS}	Gate to Source Charge		-	3.9	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	2.3	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = 1A, V_{GS} = 0V	-	-	1.2	V
I_S	Diode Continuous Forward Current		-	-	10	A

Notes:

1. The data tested by surface mounted on a 1 inch^2 board with 2 OZ copper
2. The data tested by pulsed, pulse width ≦ 300μs, duty cycle ≦ 2%
3. The power dissipation is limited by 150 °C Junction temperature

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

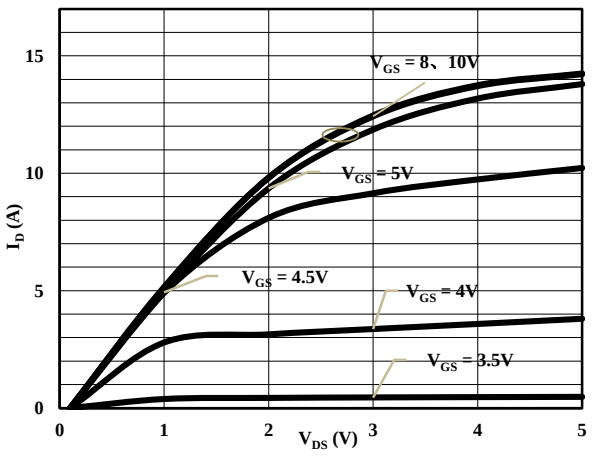


Fig 1 On-Region Characteristics

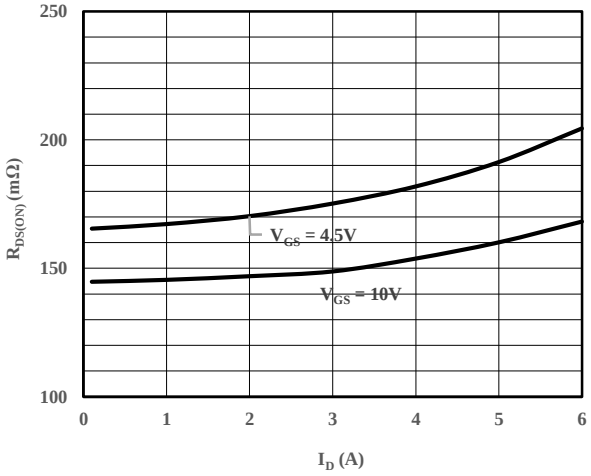


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

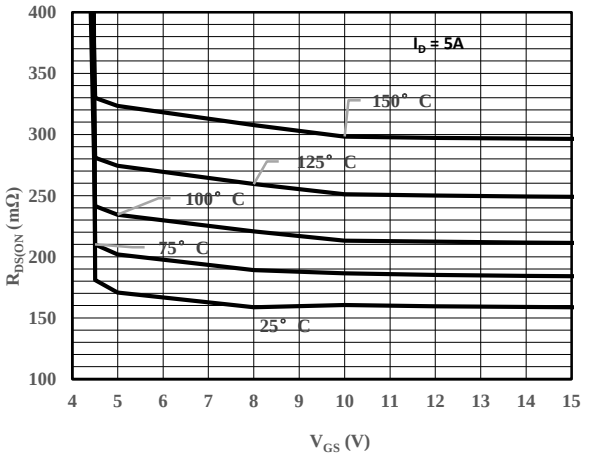


Fig 3 On-Resistance vs. Gate-Source Voltage

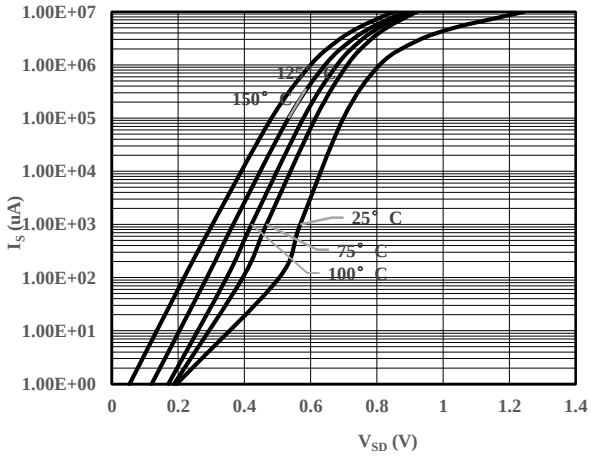


Fig 4 Body-Diode Characteristics

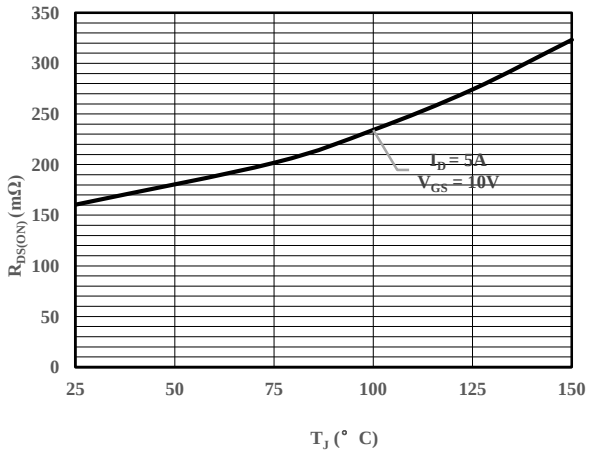


Fig 5 On-Resistance vs. Junction Temperature

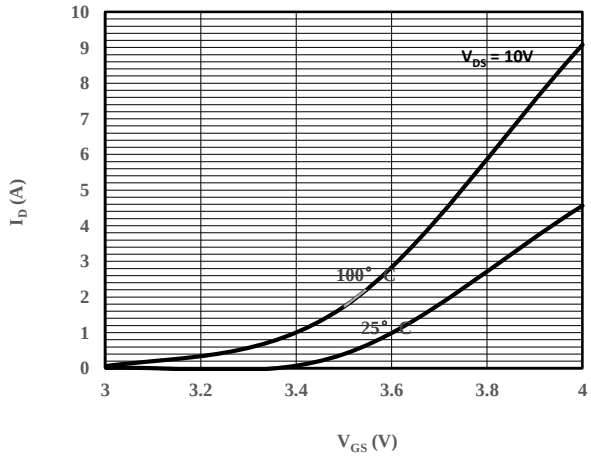


Fig 6 Transfer Characteristics

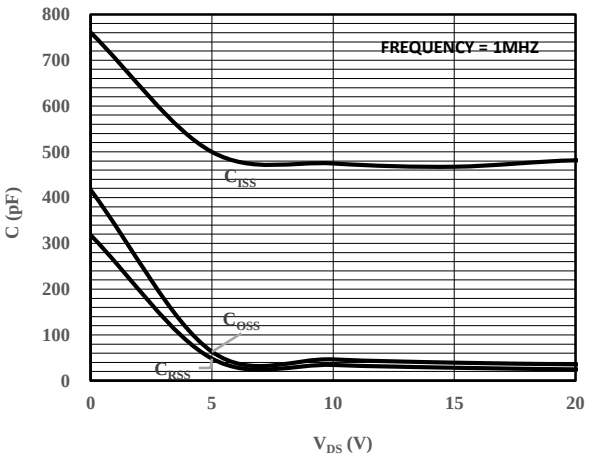


Fig 7 Capacitance Characteristics

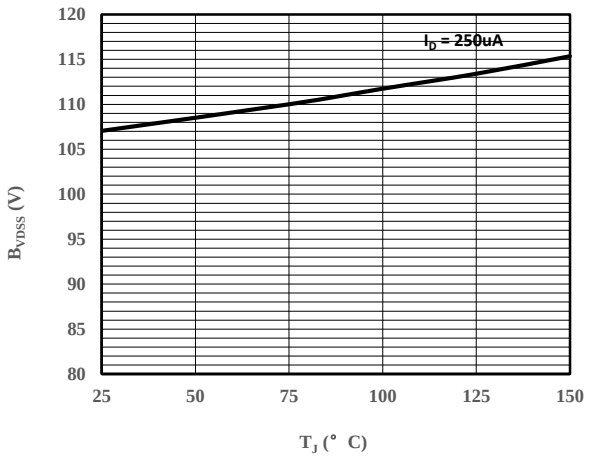


Fig 8 Drain-Source vs. Junction Temperature

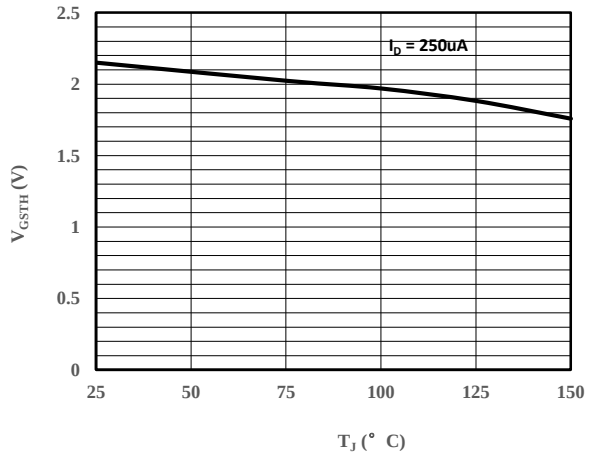
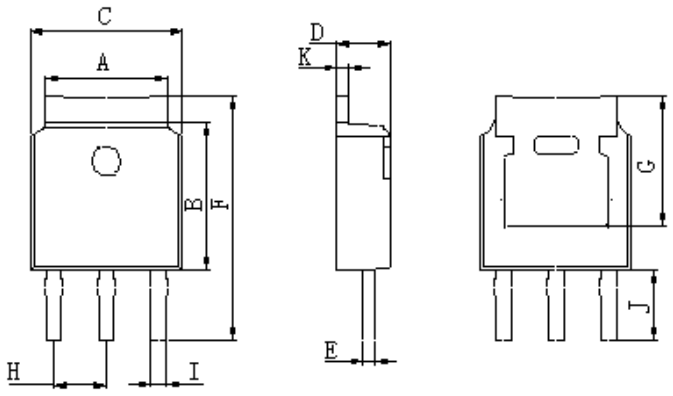


Fig 9 Gate Voltage vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



TO-251		
Dimension	**Min.**	**Max.**
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	11.00	11.60
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	4.00	4.40
K	0.40	0.60

Important Notice