N-Channel Enhancement Mode MOSFET

BL14N25D

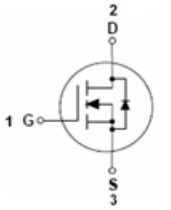
Features

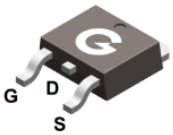
- Fast Switching
- Low on resistance
- Low gate charge
- Low reverse transfer capacitances
- RoHS compliant with Halogen-free

HF

Mechanical Data

- Case: TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208





TO-252

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL14N25D	TO-252	80 pcs / Tube & 2500 pcs / Tape & Reel	14N25D

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	250	V
Gate-to-Source Voltage	V_{GSS}	±30	V
Continuous Drain Current (T_C = 25°C)	I_D	14	A
Continuous Drain Current (T_C = 100°C)		8.4	
Pulsed Drain Current	I_{DM}	56	A
Single Pulse Avalanche Energy (L = 10mH) *2	E_{AS}	500	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C)	P_D	100	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.25	°C/W
Thermal Resistance Junction-to-Air*1	$R_{\theta JA}$	100	°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	250	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 250V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±30V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance *3	V_{GS} = 10V, I_D = 7A	-	-	250	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	-	4	V
gfs	Forward Threshold Voltage	V_{DS} = 15V, I_D = 7A	-	9.2	-	S
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	-	1080	-	pF
C_{OSS}	Output Capacitance		-	156	-	
C_{RSS}	Reverse Transfer Capacitance		-	13	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DS} = 125V V_{GS} = 15V R_G = 10Ω I_D = 7A	-	17	-	ns
t_r	Turn-on Rise Time		-	57	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	47	-	
t_f	Turn-Off Fall Time		-	29	-	
Q_G	Total Gate-Charge	V_{DS} = 200V V_{GS} = 10V I_D = 14A	-	22.7	-	nC
Q_{GS}	Gate to Source Charge		-	5.7	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	9.6	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *3	I_{SD} = 14A, V_{GS} = 0V	-	-	1.5	V
I_S	Continuous Source Current		-	-	14	A
I_{SM}	Maximum Pulsed Current		-	-	56	A
trr	Reverse Recovery Time	I_{SD} = 14A dI_{SD}/d_t = 100A/μs	-	167	-	ns
Qrr	Reverse Recovery Charge		-	1.1	-	μC

Notes:

1. The data tested by surface mounted on a minimum recommended FR-4 board
2. The E_{AS} data shows Max. rating. The test condition is V_{DD} = 100V, V_{GS} = 15V, L = 10mH
3. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%

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

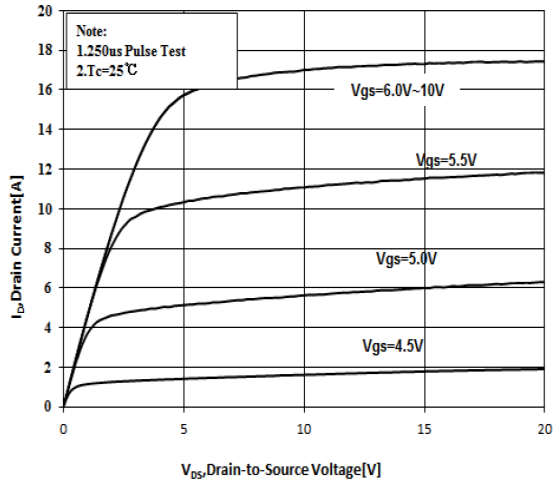


Fig 1 Typical Output Characteristics

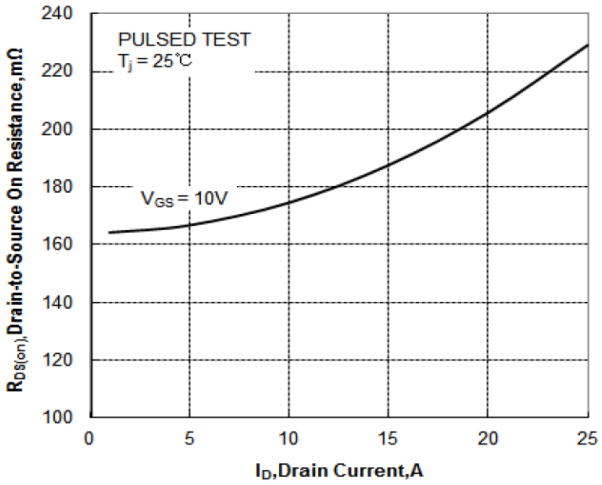


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

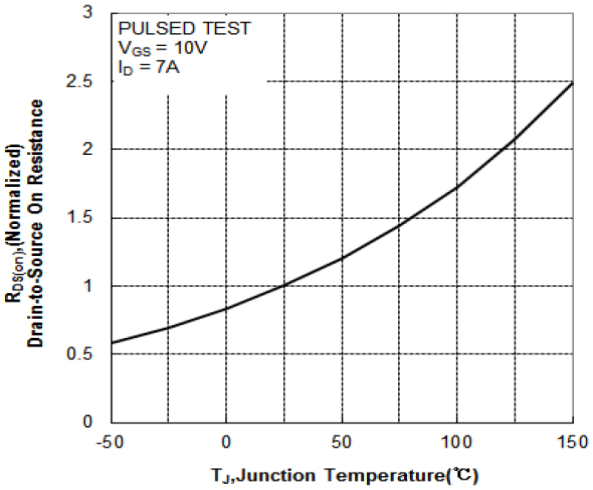


Fig 3 On-Resistance vs. Gate-Source Voltage

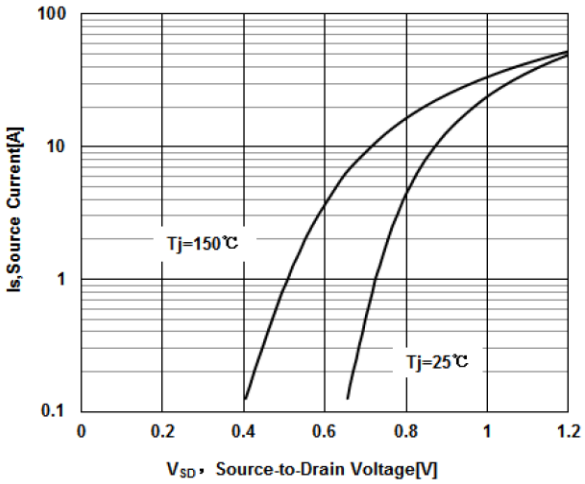


Fig 4 Body-Diode Characteristics

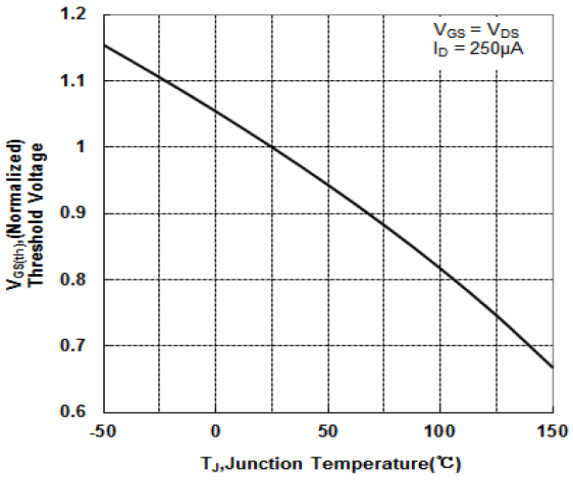


Fig 5 Theshold Voltage vs Junction Temperature

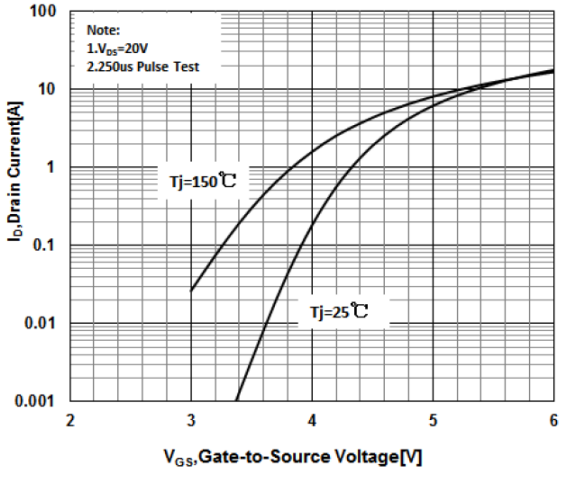


Fig 6 Transfer Characteristics

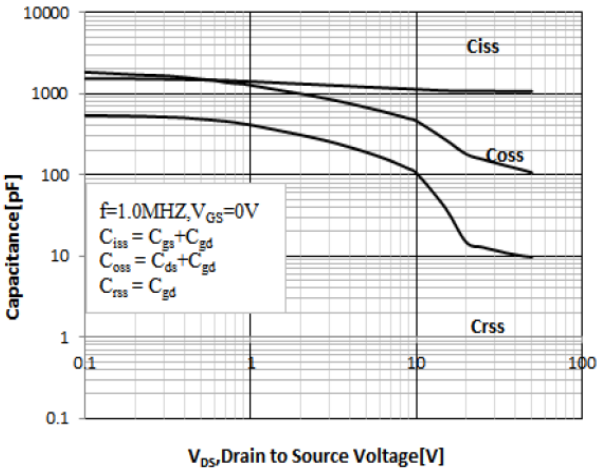


Fig 7 Capacitance Characteristics

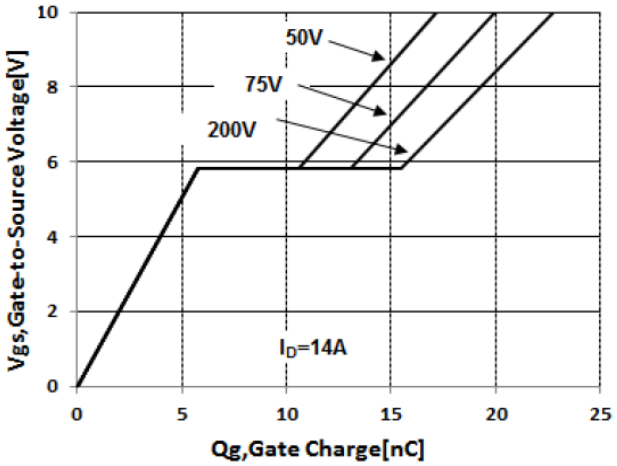


Fig 8 Gate-Charge Characteristics

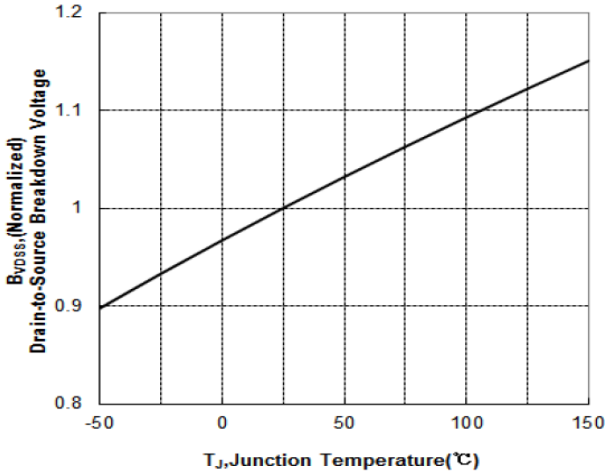


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

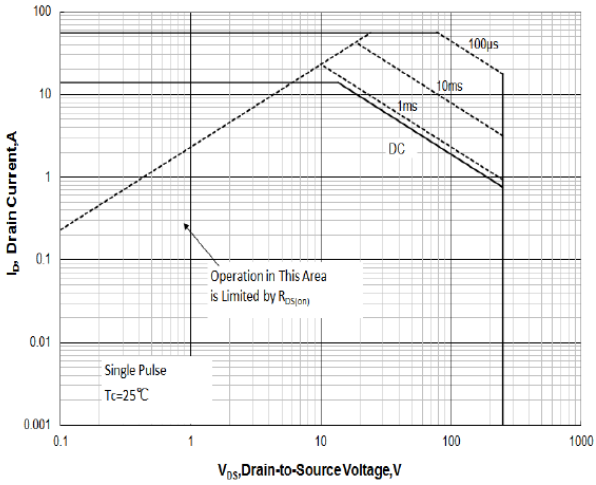


Fig 10 Maximum Safe Operating Area

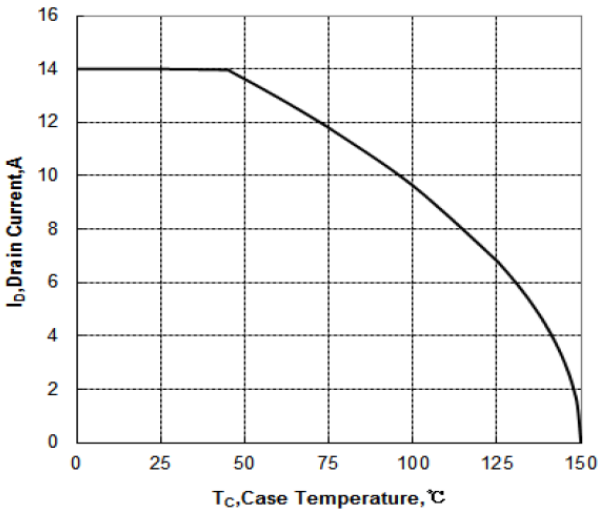


Figure 11 Maximum Continuous Drain Current vs. Case Temperature

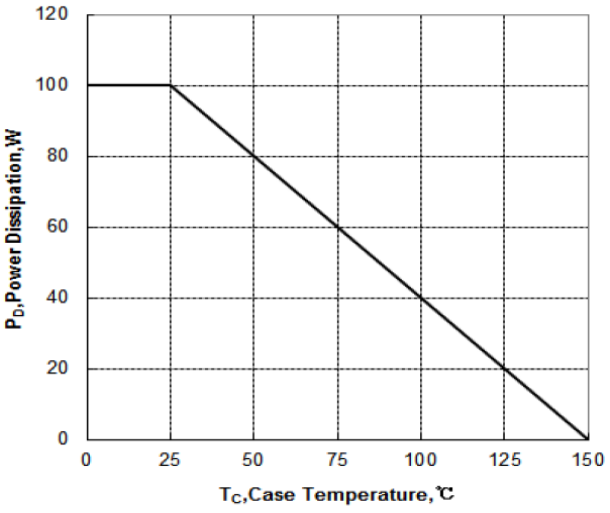


Figure 12 Maximum Power Dissipation vs. Case Temperature

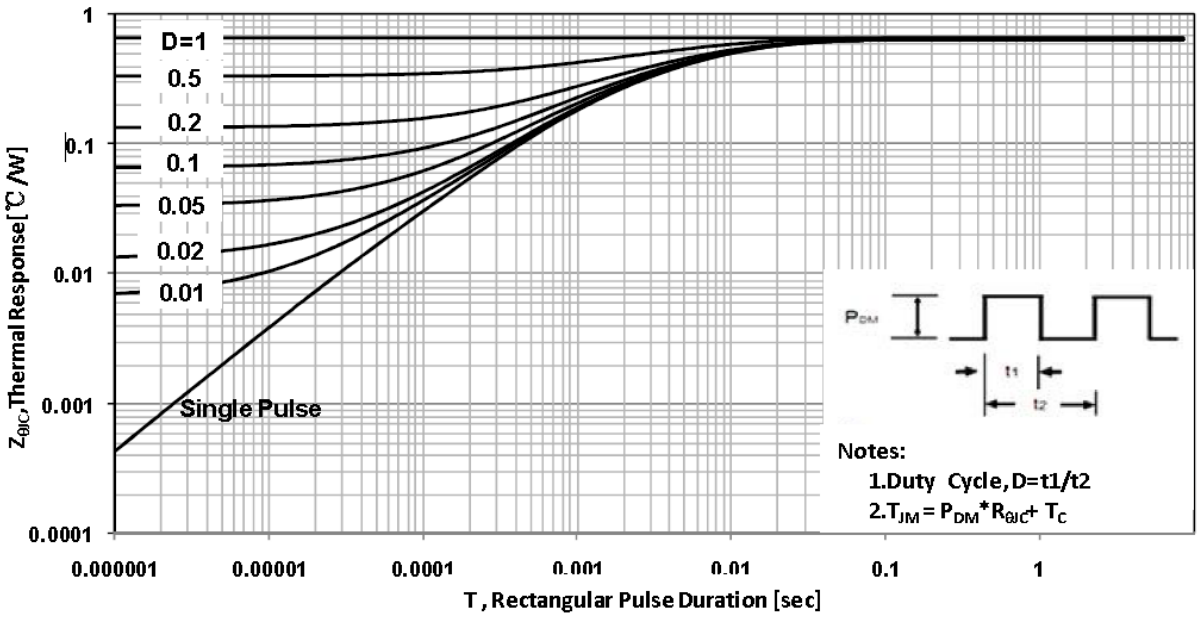
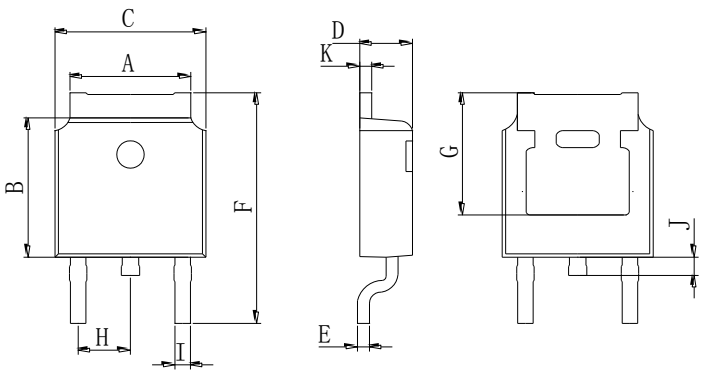


Figure 13 Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Outline Dimensions (Unit: mm)



TO-252		
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	9.71	10.31
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	0.50	0.70
K	0.40	0.60

Mounting Pad Layout (Unit: mm)

TO-252