

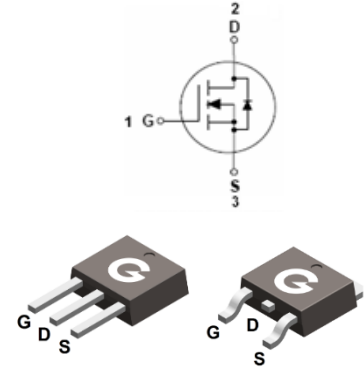
Features

- Low $R_{DS(ON)}$
- Fast switching
- Low gate charge
- Low Reverse transfer capacitances
- RoHS compliant with Halogen-free

HF

Mechanical Data

- Case: TO-251, TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matted-Tin plated; Solderable Per MIL-STD-202, Method 208



TO-251

TO-252

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL6N80I	TO-251	80 pcs / Tube	6N80I
BL6N80D	TO-252	80pcs / Tube or 2500pcs / Tape & Reel	6N80D

Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	800	V
Gate-to-Source Voltage	V_{GSS}	± 30	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$)	I_D	6	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$)		3.8	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_C = 25^\circ\text{C}$)	I_{DM}	24	A
Single Pulse Avalanche Energy ^{*3}	E_{AS}	200	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	125	W
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	-	1	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	-	-	50	$^\circ\text{C/W}$

Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800V, V_{GS} = 0V$	-	-	10	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance ^{*2}	$V_{GS} = 10V, I_D = 3A$	-	-	2.5	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	-	4	V
R_G	Gate Resistance	$V_{GS} = 0V, f = 1MHz$	-	2.1	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$	-	1556	-	pF
C_{OSS}	Output Capacitance	$V_{DS} = 25V$	-	115	-	
C_{RSS}	Reverse Transfer Capacitance	$f = 1MHz$	-	4.7	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time ^{*4}	$V_{DD} = 400V$ $I_D = 6A$ $R_G = 10\Omega$	-	24	-	ns
t_r	Turn-on Rise Time ^{*4}		-	17	-	
$t_{d(OFF)}$	Turn-Off Delay Time ^{*4}		-	47	-	
t_f	Turn-Off Fall Time ^{*4}		-	18	-	
Q_G	Total Gate-Charge	$V_{DD} = 640V$	-	28.4	-	nC
Q_{GS}	Gate to Source Charge	$V_{GS} = 10V$	-	5.8	-	
Q_{GD}	Gate to Drain (Miller) Charge	$I_D = 6A$	-	13.3	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage ^{*2}	$I_{SD} = 6A, V_{GS} = 0V$	-	-	1.4	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 6A, V_R = 400V$	-	382	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt = 100A/\mu s$	-	2.36	-	μC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 100V, V_{GS} = 15V, L = 50mH$
4. Guaranteed by design, not subject to production

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

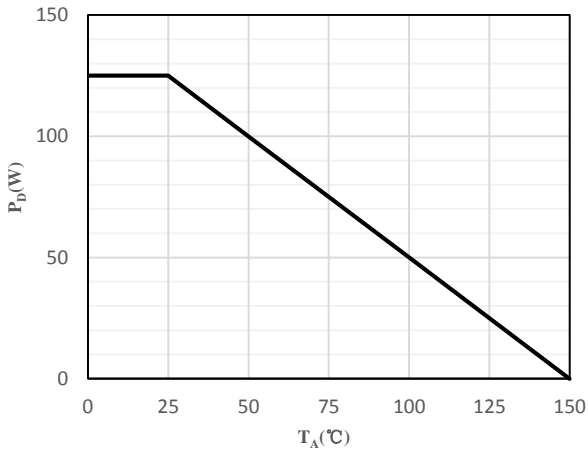


Fig 1 Power Dissipation

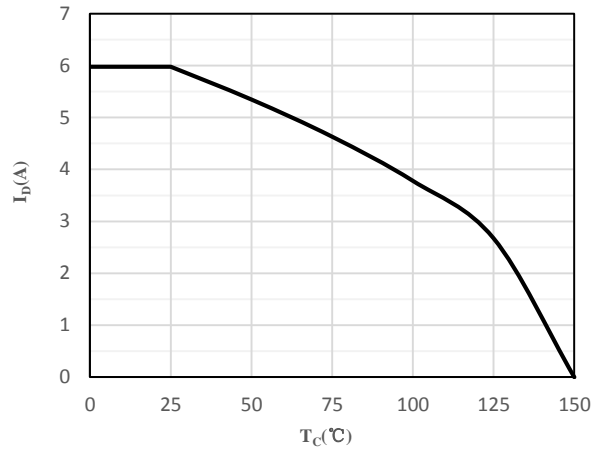


Fig 2 Drain Current

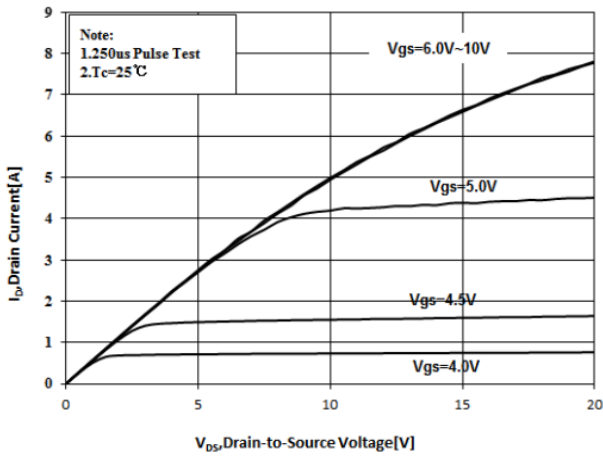


Fig 3 Typical Output Characteristics

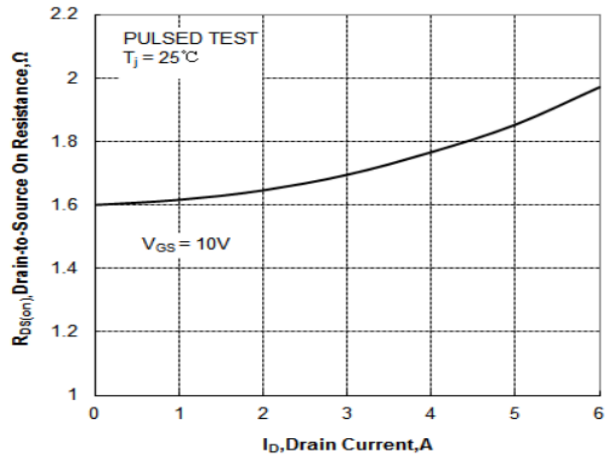


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

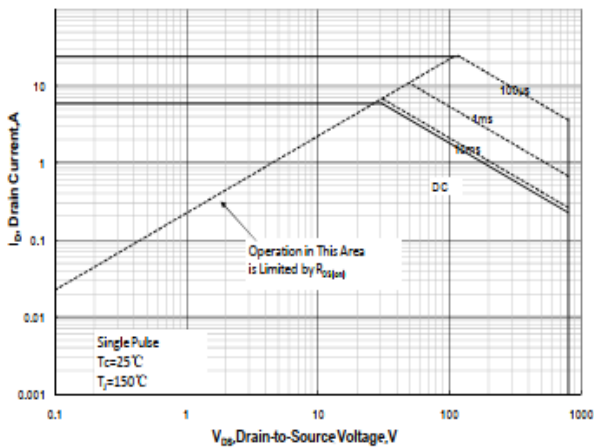


Fig 5 Safe Operation Area

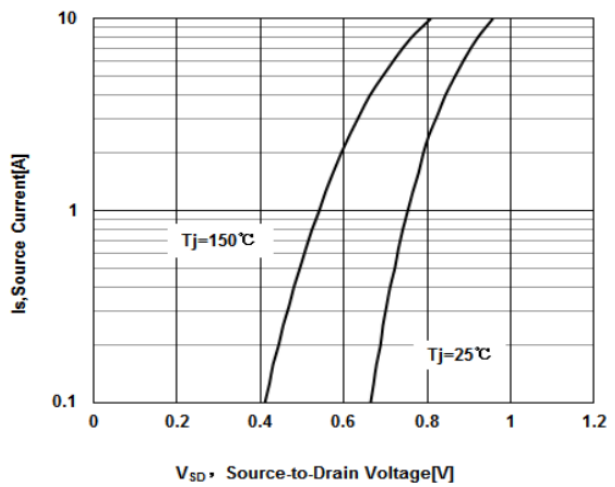


Fig 6 Body-Diode Characteristics

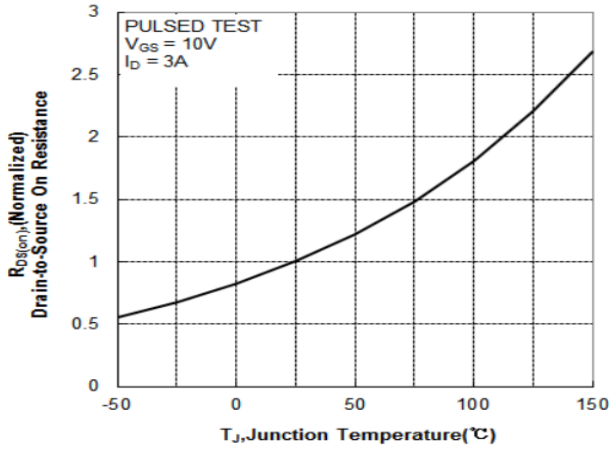


Fig 7 Normalized On-Resistance vs. Junction Temperature

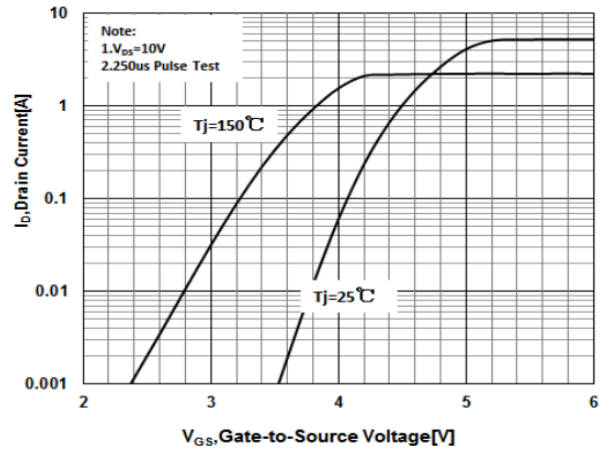


Fig 8 Transfer Characteristics

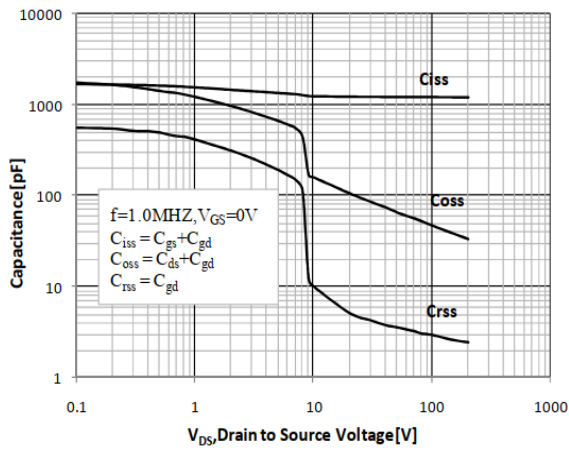


Fig 9 Capacitance Characteristics

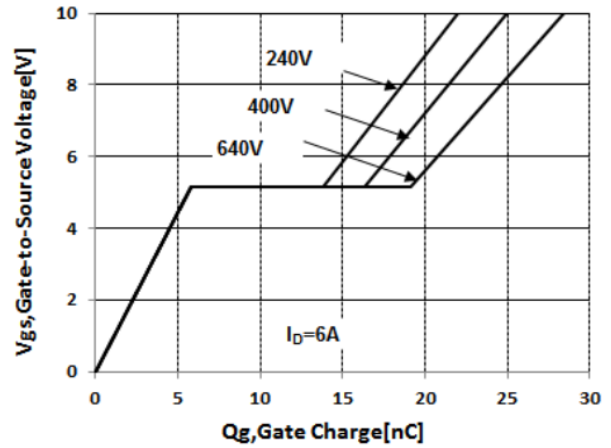


Fig 10 Gate-Charge Characteristics

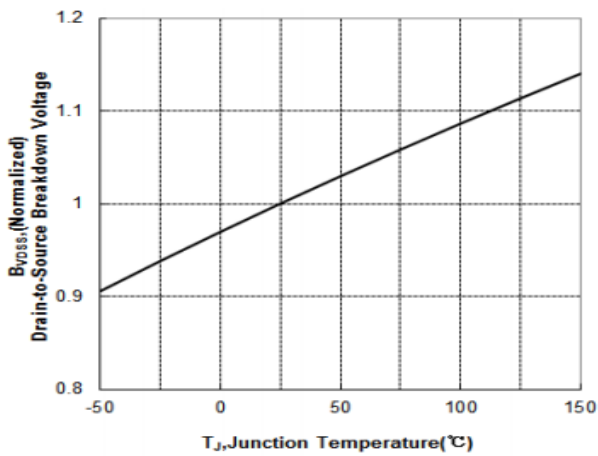


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

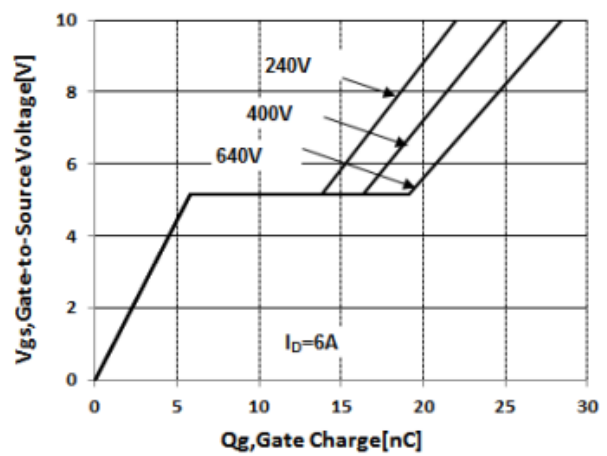
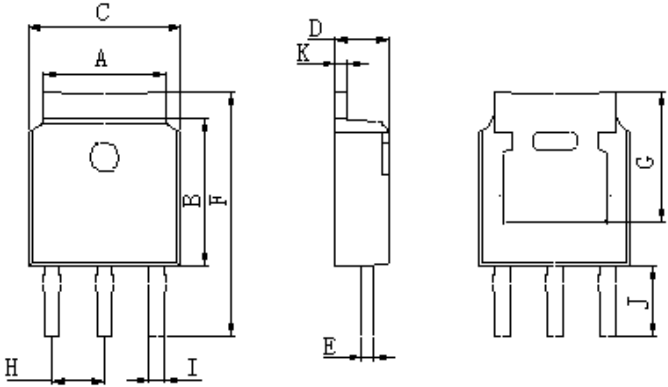
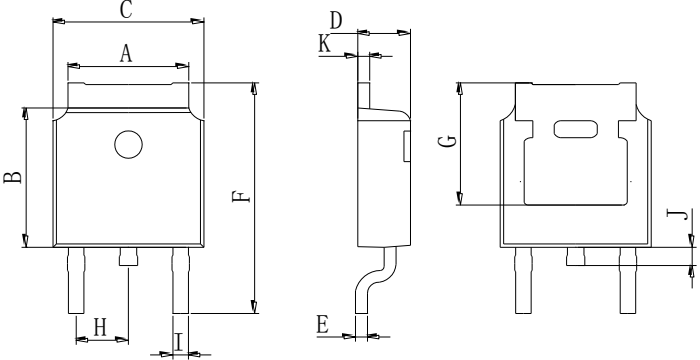


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

Package Outline Dimensions (Unit: mm)

TO-251			
Dimension	Min.	Max.	
A	5.05	5.65	 <p>Diagram showing TO-251 package outline dimensions: A (width), B (height), C (total width), D (lead height), E (lead length), F (total height), G (lead width), H (lead spacing), I (lead width), J (lead length), K (lead thickness).</p>
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	

TO-252			
Dimension	Min.	Max.	
A	5.05	5.65	 <p>Diagram showing TO-252 package outline dimensions: A (width), B (height), C (total width), D (lead height), E (lead length), F (total height), G (lead width), H (lead spacing), I (lead width), J (lead length), K (lead thickness).</p>
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)

