

Features

- Super low gate charge
- Green device available
- Excellent C_{av} / d_t effect decline
- Advanced high cell density trench technology
- RoHS compliant with Halogen-free

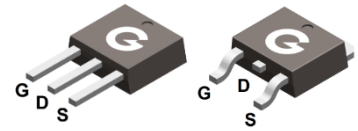
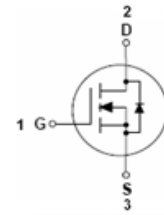
HF

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Mechanical Data

- Case: TO-251, TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



TO-251

TO-252

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL2N60I	TO-251	80 pcs / Tube	2N60I
BL2N60D	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	2N60D

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	600	V
Gate-to-Source Voltage	V_{GSS}	± 30	V
Continuous Drain Current	I_D	2	A
Pulsed Drain Current	I_{DM}	8	A
Single Pulse Avalanche Energy ^{*1}	E_{AS}	140	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_A = 25^\circ\text{C}$)	P_D	2.5	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case, top	$R_{\theta JC}$	25	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case, bottom		3.57	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	600	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 600V, V_{GS} = 0V$	-	-	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}	$V_{GS} = 10V, I_D = 1A$	-	3.8	5	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	-	4	V
R_G	Gate Resistance	$V_{GS} = 0V, f = 1MHz$	-	23.6	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$	-	359	-	pF
C_{OSS}	Output Capacitance	$V_{DS} = 25V$	-	48	-	
C_{RSS}	Reverse Transfer Capacitance	$f = 1.0MHz$	-	17	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD} = 300V$ $R_G = 25\Omega$ $I_D = 2.4A$	-	10	-	ns
t_r	Turn-on Rise Time		-	25	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	20	-	
t_f	Turn-Off Fall Time		-	25	-	
Q_G	Total Gate-Charge	$V_{DD} = 480V$	-	7.8	-	nC
Q_{GS}	Gate to Source Charge	$V_{GS} = 10V$	-	1.7	-	
Q_{GD}	Gate to Drain (Miller) Charge	$I_D = 2.4A$	-	2.3	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage ^{*2}	$I_{SD} = 2A, V_{GS} = 0V$	-	-	1.4	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 2.4A, V_{GS} = 0V$	-	503	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt = 100A/\mu s$	-	1838	-	nC

Notes:

- The E_{AS} data shows Max. rating. The test condition is $V_{DS} = 50V, V_{GS} = 10V, L = 70mH$
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

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

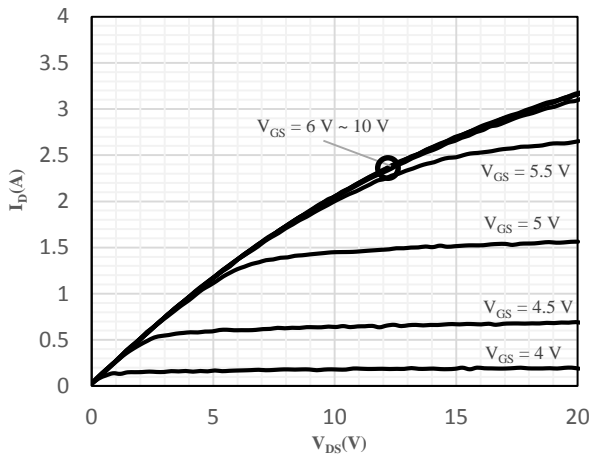


Fig 1 Typical Output Characteristics

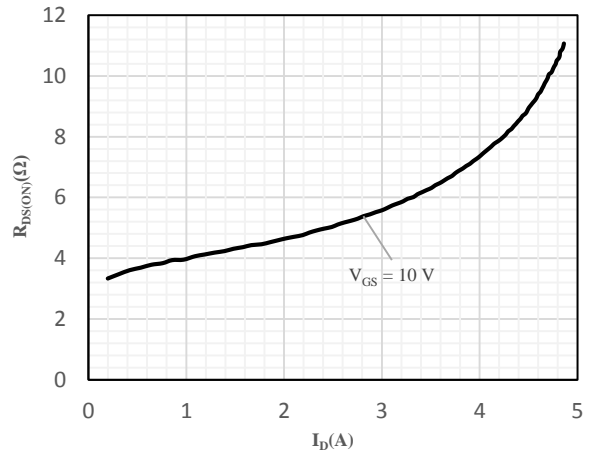


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

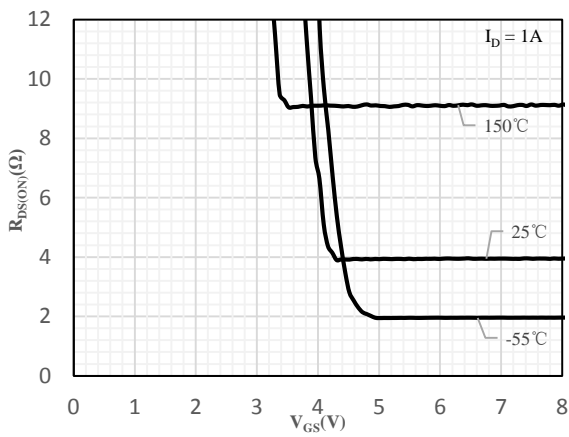


Fig 3 On-Resistance vs. Gate-Source Voltage

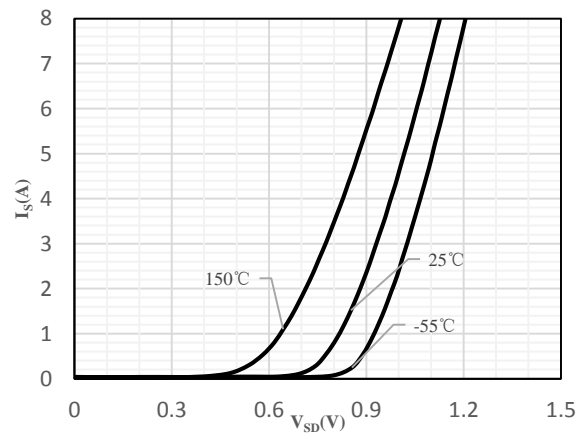


Fig 4 Body-Diode Characteristics

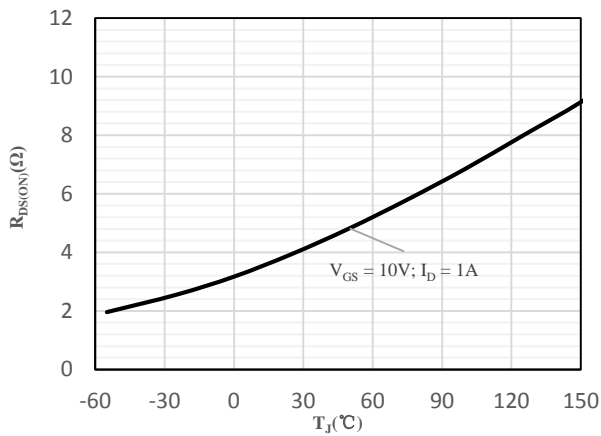


Fig 5 On-Resistance vs. Junction Temperature

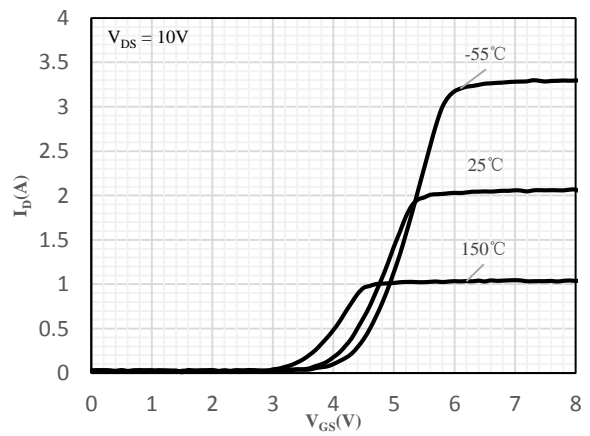


Fig 6 Transfer Characteristics

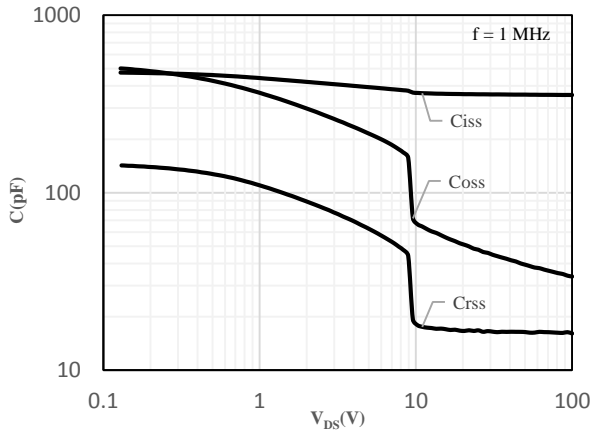


Fig 7 Capacitance Characteristics

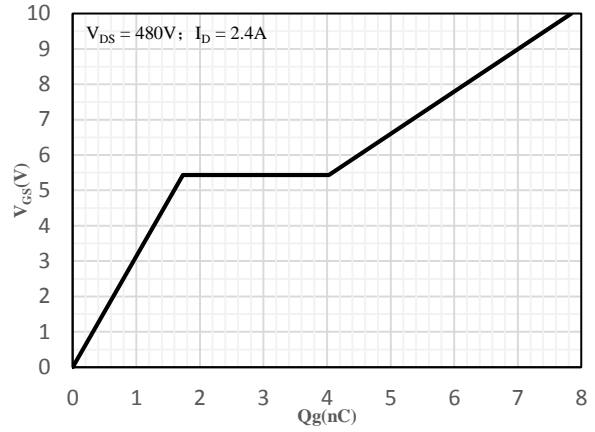


Fig 8 Gate-Charge Characteristics

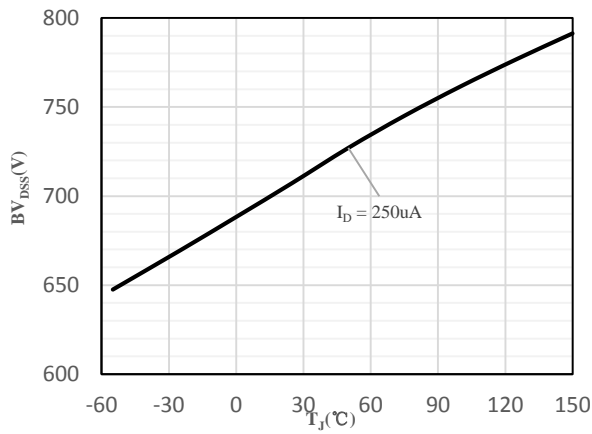


Fig 9 Breakdown Voltage vs. Junction Temperature

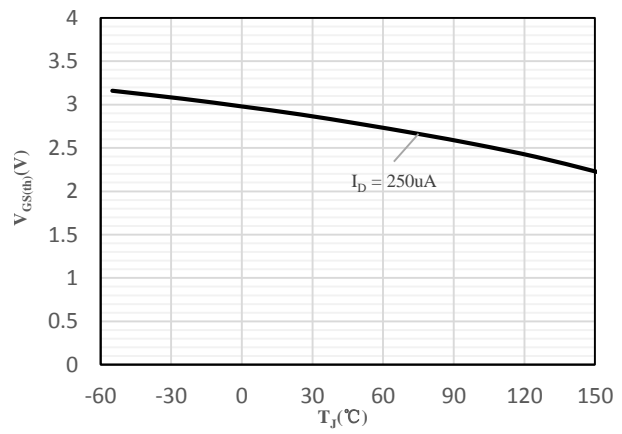


Fig 10 $V_{GS(th)}$ vs. Junction Temperature

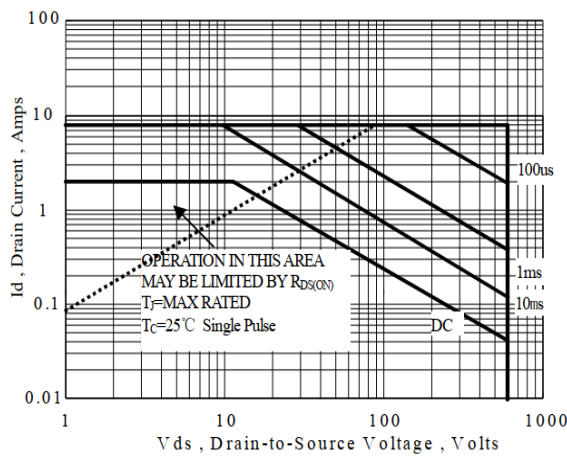


Fig 11 Safe Operating Area

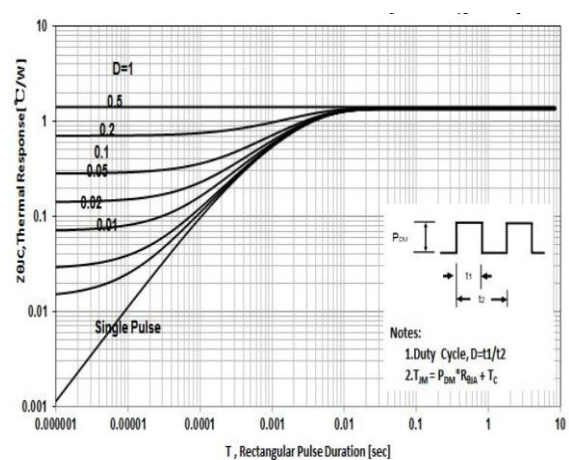
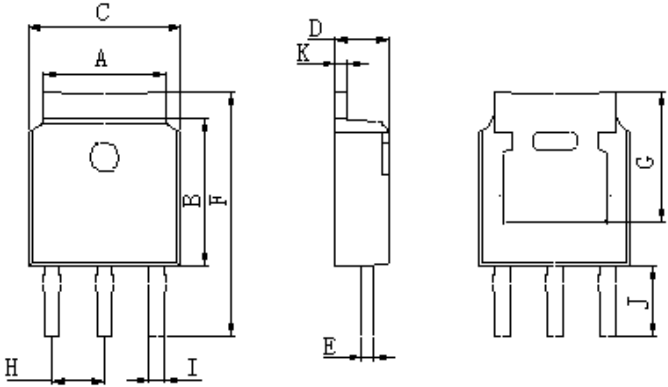
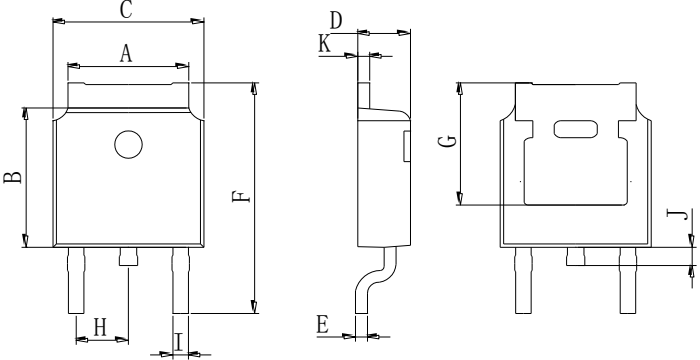


Fig 12 Maximum transient thermal impedance

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	

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)

