

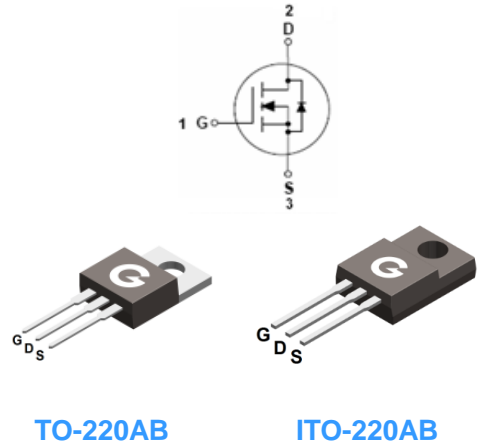
Features

- Low $R_{DS(ON)}$
- Fast switching
- Low gate charge
- Low Reverse transfer capacitances

HF

Mechanical Data

- Case: TO-220AB, ITO-220AB
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matted-Tin plated; Solderable Per MIL-STD-202, Method 208



Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL10N70	TO-220AB	50 pcs / Tube	10N70
BL10N70F	ITO-220AB	50 pcs / Tube	10N70F

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	700	V
Gate-to-Source Voltage	V_{GSS}	± 30	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$)	I_D	10	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$)		6.3	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_C = 25^\circ\text{C}$)	I_{DM}	40	A
Single Pulse Avalanche Energy ^{*2}	E_{AS}	380	mJ
Power Dissipation (TO-220AB, $T_C = 25^\circ\text{C}$)	P_D	125	W
Power Dissipation (ITO-220AB, $T_C = 25^\circ\text{C}$)		40	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	TO-220AB	ITO-220AB	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1	3.1	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	50	62.5	$^\circ\text{C/W}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	700	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 700V, V_{GS} = 0V$	-	-	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 *1	$V_{GS} = 10V, I_D = 5A$	-	-	1.1	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	-	4	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$	-	1563	-	pF
C_{OSS}	Output Capacitance	$V_{DS} = 25V$	-	120	-	
C_{RSS}	Reverse Transfer Capacitance	$f = 1MHz$	-	6.2	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time *3	$V_{DD} = 350V$	-	25.6	-	ns
t_r	Turn-on Rise Time *3	$V_{GS} = 15V$	-	24.8	-	
$t_{d(OFF)}$	Turn-Off Delay Time *3	$I_D = 10A$	-	48.2	-	
t_f	Turn-Off Fall Time *3	$R_G = 10\Omega$	-	30.4	-	
Q_G	Total Gate-Charge	$V_{DD} = 560V$	-	34	-	nC
Q_{GS}	Gate to Source Charge	$V_{GS} = 10V$	-	7.2	-	
Q_{GD}	Gate to Drain (Miller) Charge	$I_D = 10A$	-	15.2	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *1	$I_{SD} = 10A, V_{GS} = 0V$	-	-	1.5	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 10A, V_{GS} = 0V$	-	504	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt = 100A/\mu s$	-	3.9	-	μC

Notes:

1. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
2. The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 100V, V_{GS} = 15V, L = 50mH$
3. Guaranteed by design, not subject to production

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

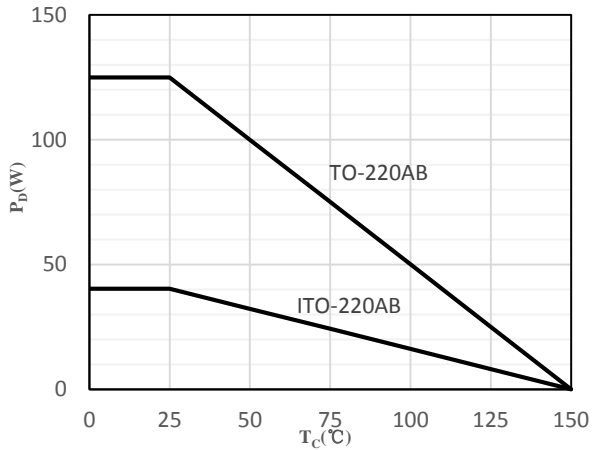


Fig 1 Power Dissipation

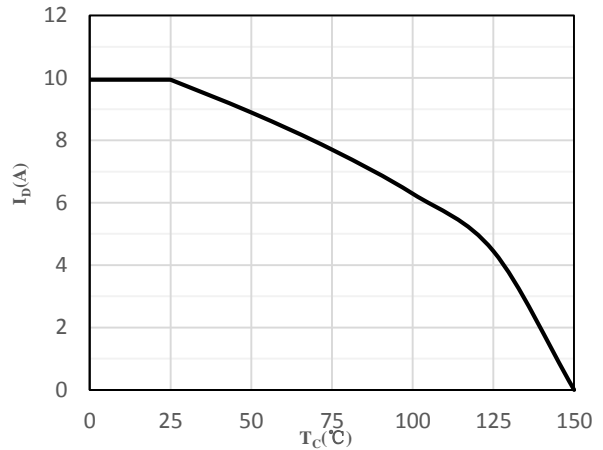


Fig 2 Drain Current

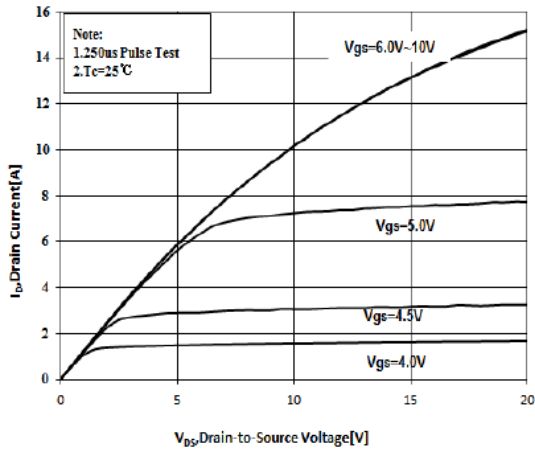


Fig 3 Typical Output Characteristics

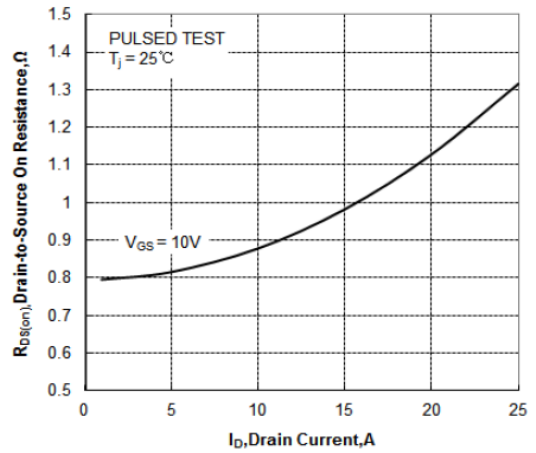


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

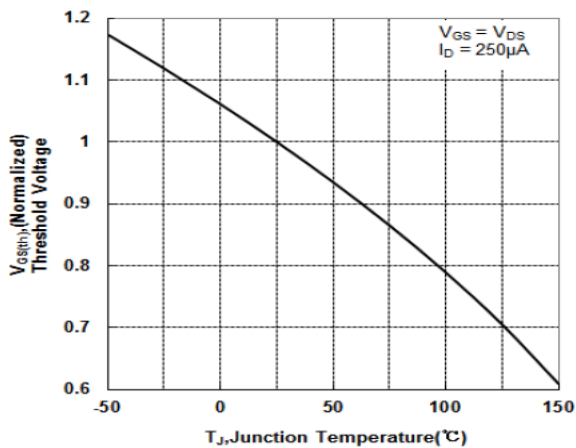


Fig 5 Normalized $V_{GS(th)}$ vs. Junction Temperature

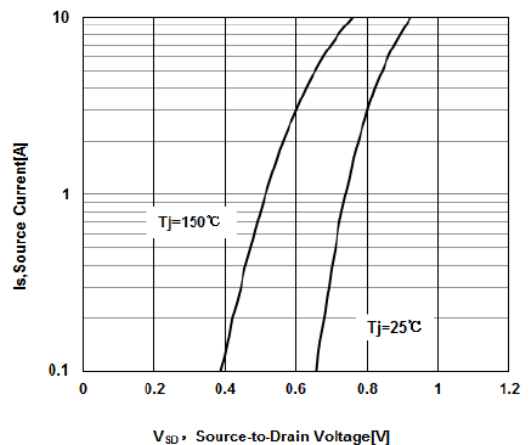


Fig 6 Body-Diode Characteristics

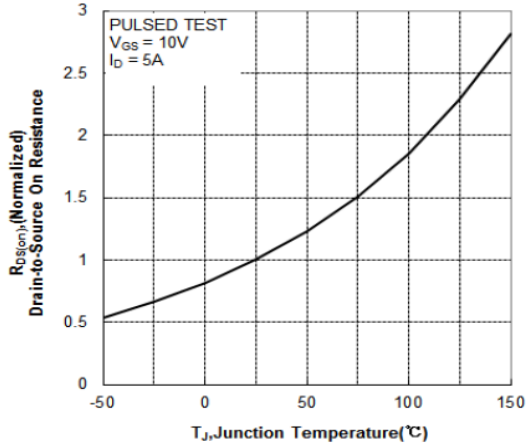


Fig 7 Normalized On-Resistance vs. Junction Temperature

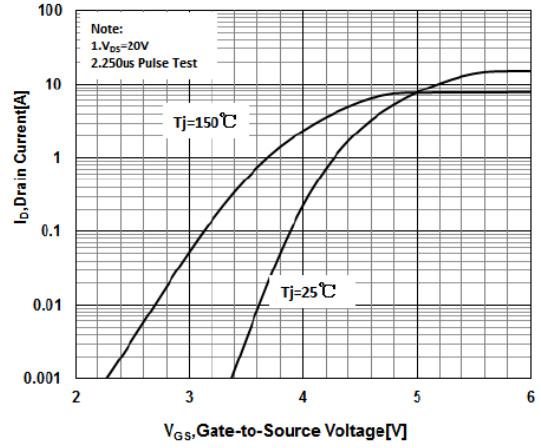


Fig 8 Transfer Characteristics

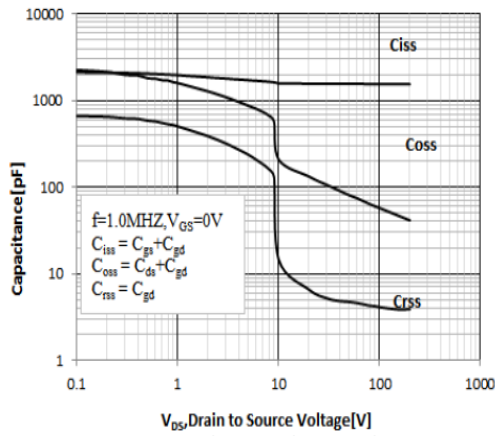


Fig 9 Capacitance Characteristics

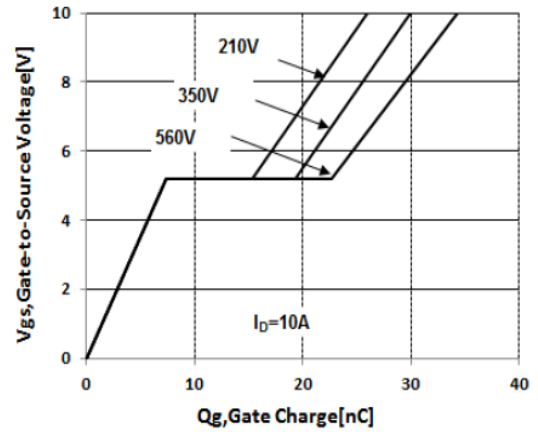


Fig 10 Gate-Charge Characteristics

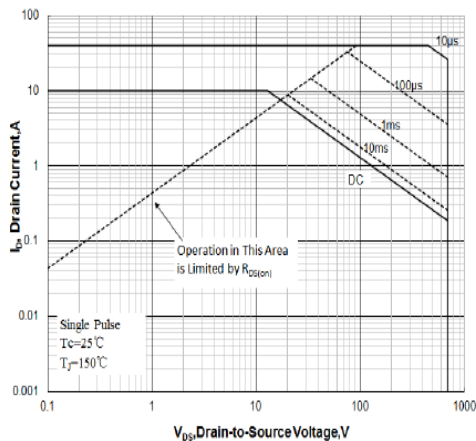


Fig 11 Safe Operation Area (TO-220AB)

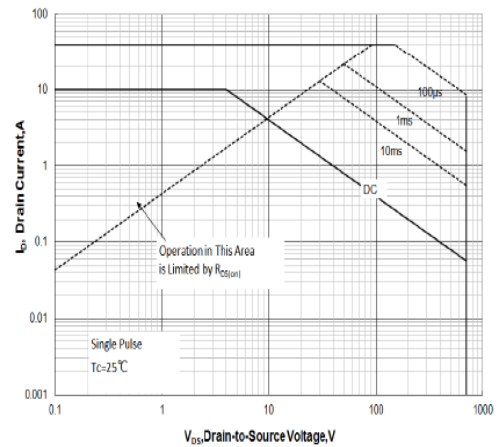


Fig 12 Safe Operation Area (ITO-220AB)

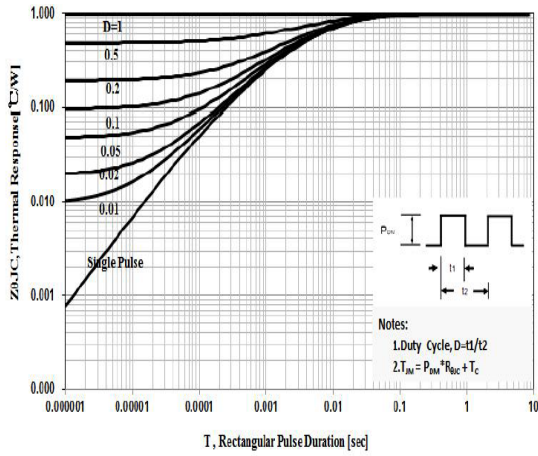


Fig 13 Maximum transient thermal impedance
(TO-220AB)

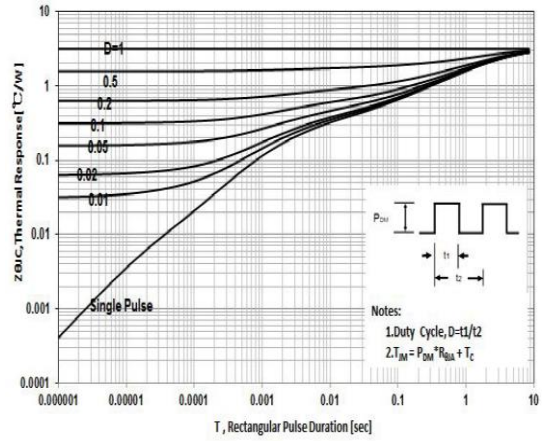


Fig 14 Maximum transient thermal impedance
(ITO-220AB)

Package Outline Dimensions (Unit: mm)

TO-220AB	
Dimension	Min. / Max.
A	9.80 / 10.30
B	8.70 / 9.10
C	4.37 / 4.77
D	1.07 / 1.47
E	2.64 / 2.84
F	13.14 / 13.74
G	2.44 / 2.64
H	28.03 / 28.83
I	3.50 / 4.00
J	0.28 / 0.48
K	1.22 / 1.32
L	0.71 / 0.91
M	2.40 / 2.60
N	3.76 / 3.96

ITO-220AB	
Dimension	Min. / Max.
A	9.90 / 10.30
B	14.80 / 15.20
C	4.30 / 4.70
D	2.50 / 2.90
E	2.80 / 3.30
F	13.00 / 13.60
G	3.10 / 3.30
H	28.00 / 28.60
I	7.90 / 8.90
J	0.40 / 0.60
L	0.70 / 0.90
M	1.30 / 1.50
N	2.60 / 2.80
O	2.60 / 3.10
P	2.45 / 2.65
K/R	1.10 / 1.30

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