

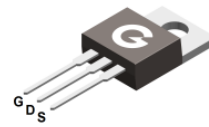
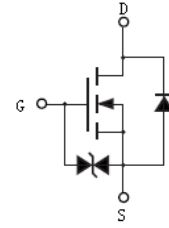
Features

- Fast switching
- ESD improved capability
- Low gate charge
- Low reverse transfer capacitances

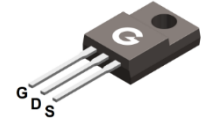
HF

Mechanical Data

- Case: TO-220AB, ITO-220AB
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



TO-220AB



ITO-220AB

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL8N80K	TO-220AB	50 pcs / Tube	8N80K
BL8N80KF	ITO-220AB	50 pcs / Tube	8N80KF

Maximum Ratings (@ T_C = 25°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°C)	I _D	8	A
Continuous Drain Current (T _C = 100°C)		5	A
Pulsed Drain Current	I _{DM}	32	A
Single Pulse Avalanche Energy *3	E _{AS}	350	mJ
Power Dissipation (TO-220AB, T _C = 25°C)	P _D	125	W
Power Dissipation (ITO-220AB, T _C = 25°C)		50	W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	TO-220AB*1	ITO-220AB	Unit
Thermal Resistance Junction-to-Case	R _{θJC}	1	2.5	°C/W
Thermal Resistance Junction-to-Air	R _{θJA}	40	40	°C/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800V, V_{GS} = 0V, T_A = 25^\circ\text{C}$	-	-	25	μA
		$V_{DS} = 640V, V_{GS} = 0V, T_A = 125^\circ\text{C}$	-	-	250	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 10	μA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance ^{*2}	$V_{GS} = 10V, I_D = 4A$	-	-	1.25	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	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1.0\text{MHz}$	-	2150	-	pF
C_{OSS}	Output Capacitance		-	164	-	
C_{RSS}	Reverse Transfer Capacitance		-	14	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time ^{*4}	$V_{DD} = 400V$ $V_{GS} = 10V$ $R_G = 25\Omega$ $I_D = 8A$	-	26	-	ns
t_r	Turn-on Rise Time ^{*4}		-	40	-	
$t_{d(OFF)}$	Turn-Off Delay Time ^{*4}		-	140	-	
t_f	Turn-Off Fall Time ^{*4}		-	68	-	
Q_G	Total Gate-Charge	$V_{DD} = 400V$ $V_{GS} = 10V$ $I_D = 8A$	-	49	-	nC
Q_{GS}	Gate to Source Charge		-	8.5	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	19	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage ^{*2}	$I_{SD} = 8A, V_{GS} = 0V$	-	-	1.5	V
t_{rr}	Reverse Recovery Time	$I_F = 8A, V_{GS} = 0V$ $dI_F/dt = 100A/\mu s$	-	300	-	ns
Q_{rr}	Reverse Recovery Charge		-	2.2	-	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 $V_{DD} = 50V, V_{GS} = 15V, L = 10mH$
4. Guaranteed by design, not subject to production

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

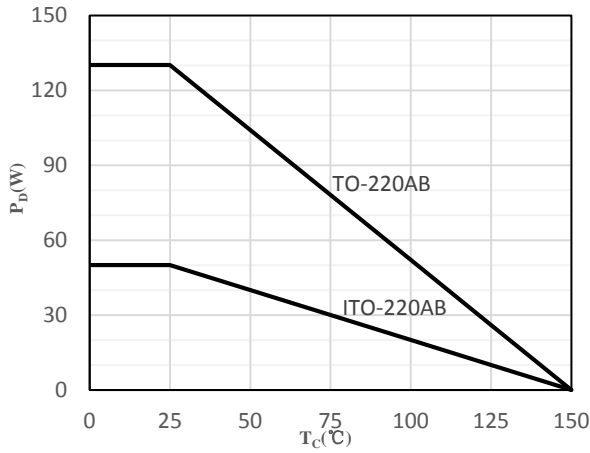


Fig 1 Power Dissipation

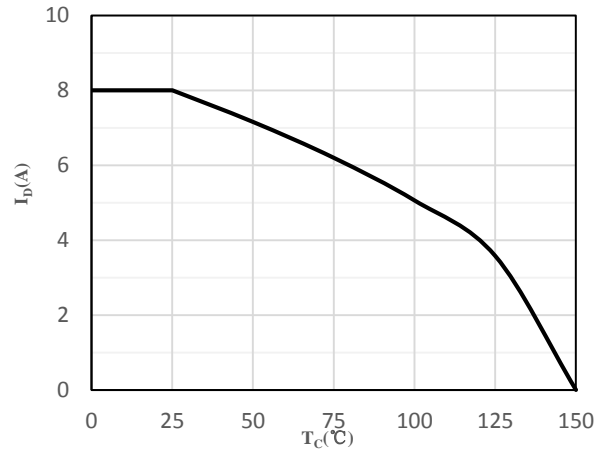


Fig 2 Drain Current

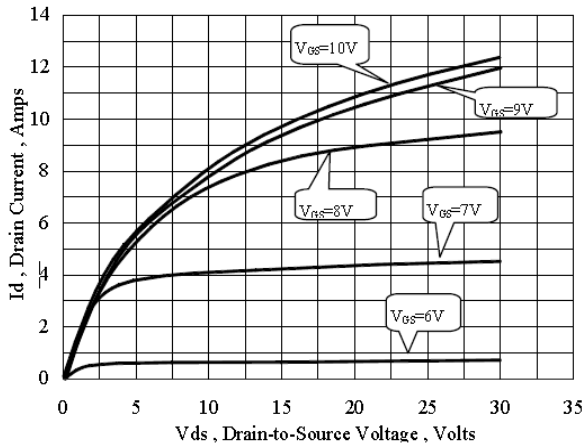


Fig 3 Typical Output Characteristics

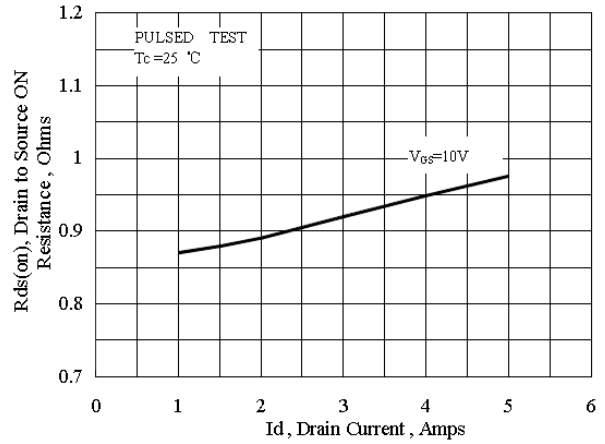


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

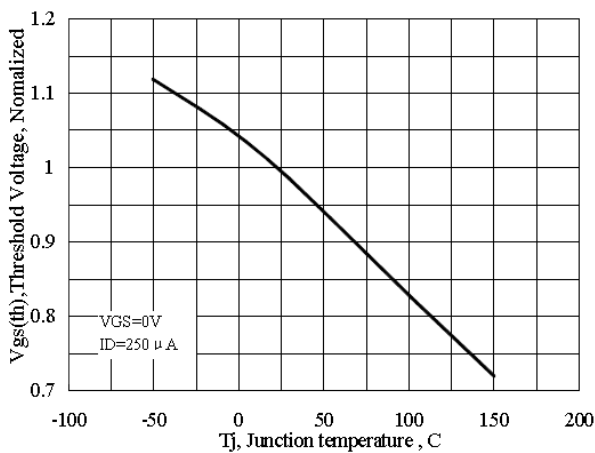


Fig 5 Normalized $V_{GS(th)}$ vs. Junction Temperature

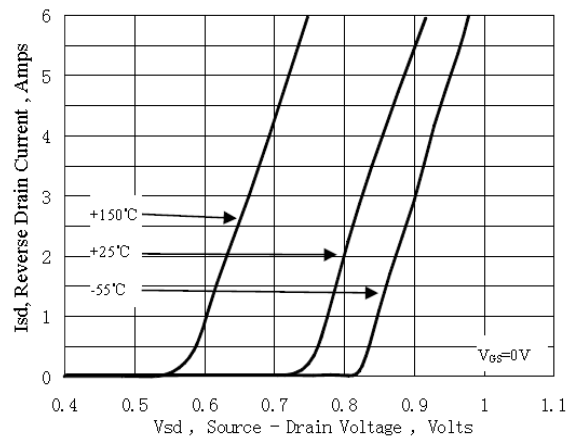


Fig 6 Body-Diode Characteristics

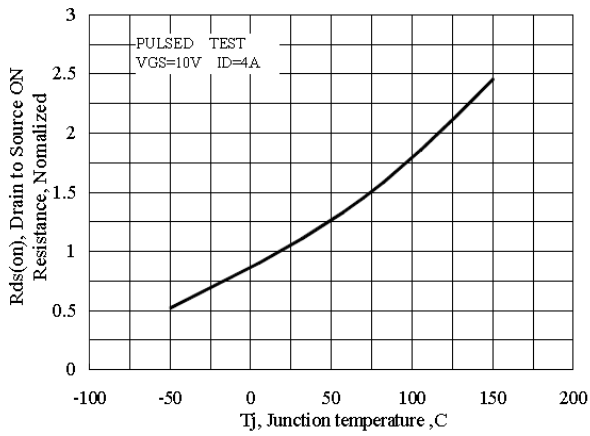


Fig 7 Normalized On-Resistance vs. Junction Temperature

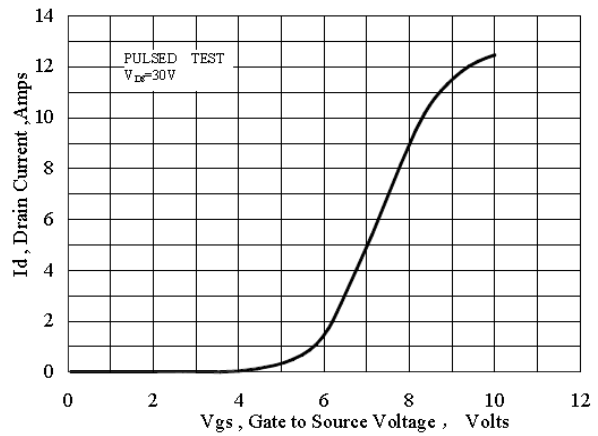


Fig 8 Transfer Characteristics

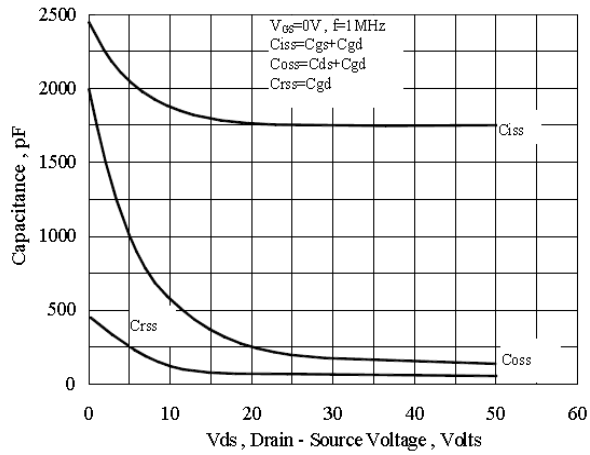


Fig 9 Capacitance Characteristics

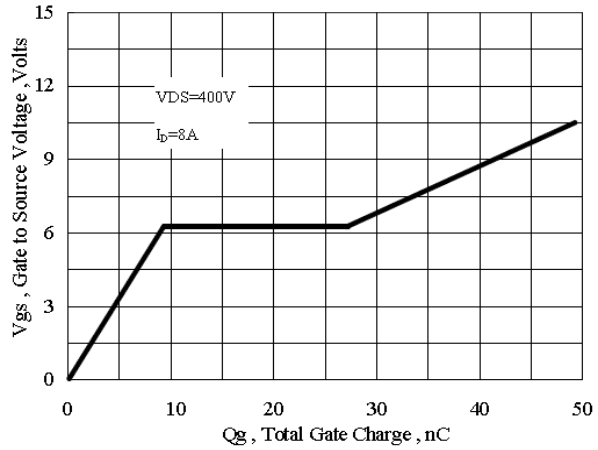


Fig 10 Gate-Charge Characteristics

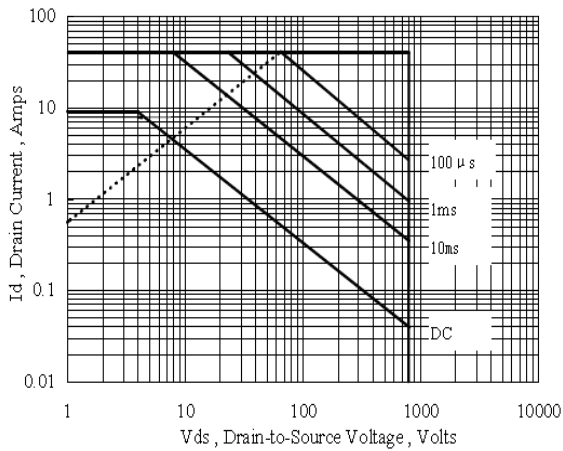


Fig 11 Safe Operation Area (TO-220AB)

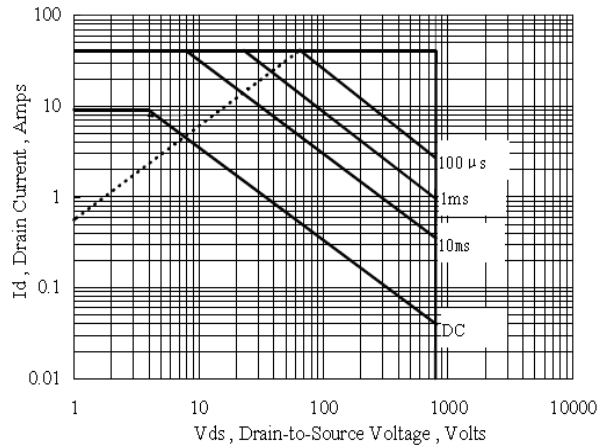
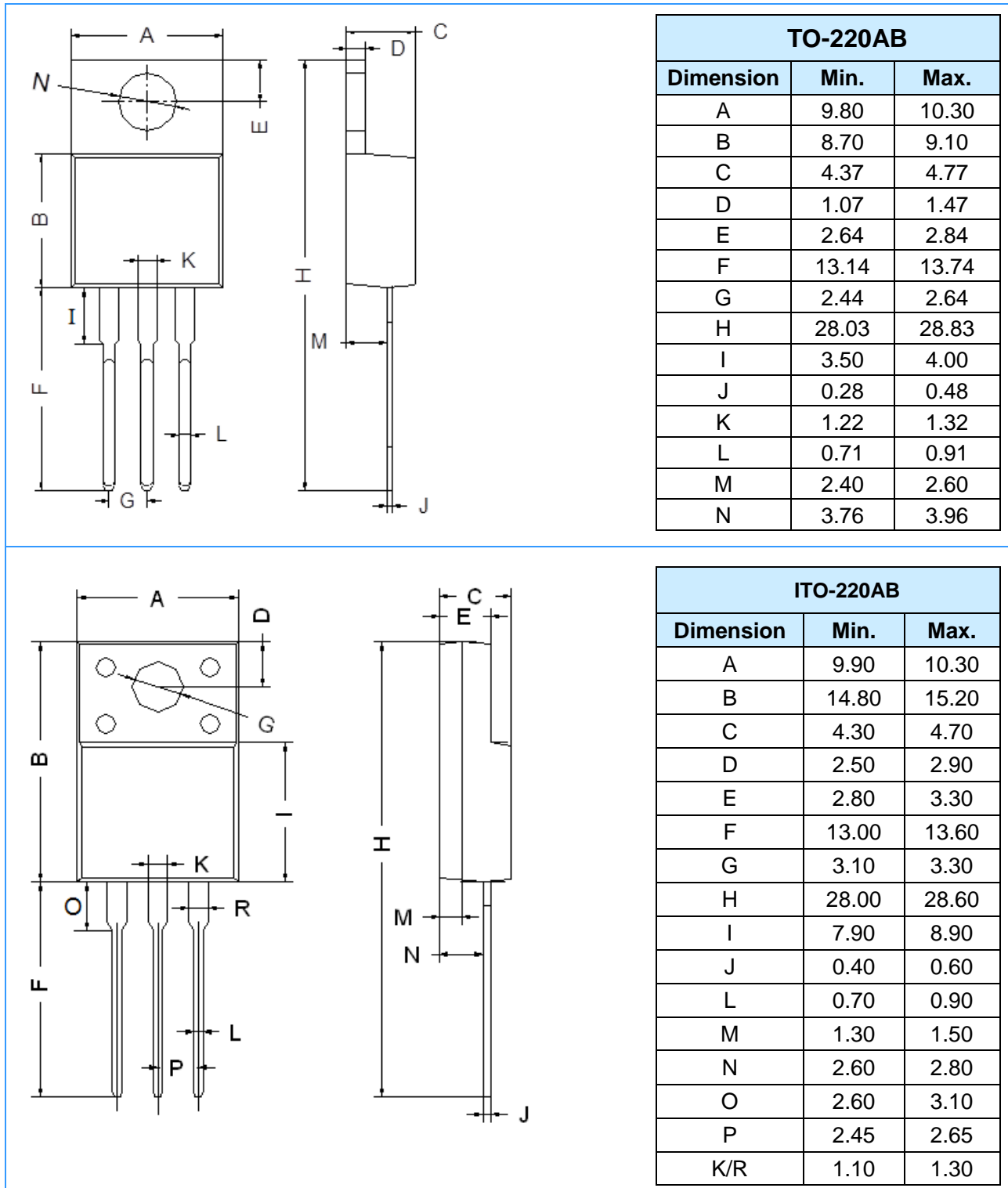


Fig 12 Safe Operation Area (ITO-220AB)

Package Outline Dimensions (Unit: mm)



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