

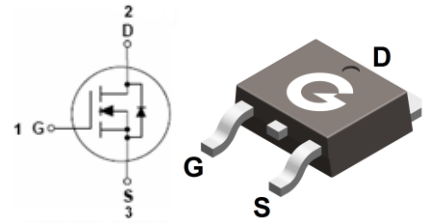
Features

- Low $R_{DS(ON)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity

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
BL120N10TD	TO-252	80 pcs / Tube & 2500 pcs / Tape & Reel	120N10TD

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	100	V
Gate-to-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$) ^{*4}	I_D	53	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$) ^{*4}	I_D	34	A
Pulsed Drain Current ^{*3} ($t_p=10\mu\text{s}$)	I_{DM}	240	A
Single Pulse Avalanche Energy ^{*3,5}	E_{AS}	27	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_C = 25^\circ\text{C}$) ^{*2}	P_D	62.5	W
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-to-Case ^{*1}	$R_{\theta JC}$	2	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 80V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance	$V_{GS} = 10V, I_D = 20A$	-	10	12	m Ω
		$V_{GS} = 4.5V, I_D = 10A$	-	15	17	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.8	2.6	V
R_G	Gate Resistance	$V_{DS} = V_{GS} = 0V, f = 1MHz$	-	5.7	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 40V$ $f = 1.0MHz$	-	1641	-	pF
C_{OSS}	Output Capacitance		-	529	-	
C_{RSS}	Reverse Transfer Capacitance		-	12	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	$V_{DS} = 50V$ $V_{GS} = 10V$ $R_G = 3\Omega$ $I_D = 20A$	-	33	-	ns
t_r	Turn-on Rise Time		-	20	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	31	-	
t_f	Turn-Off Fall Time		-	12	-	
Q_G	Total Gate-Charge	$V_{DS} = 50V$ $V_{GS} = 10V$ $I_D = 20A$	-	31	-	nC
Q_{GS}	Gate to Source Charge		-	6	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	7	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage	$I_{SD} = 20A, V_{GS} = 0V$	-	0.91	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 20A, V_{GS} = 30V$ $di_{SD}/dt = 100A/\mu s$	-	46	-	ns
Q_{rr}	Reverse Recovery Charge		-	63	-	nC

Notes:

- The data tested by surface mounted on a 35mm * 35mm * 1mm FR4-epoxy P.C.B
- The power dissipation P_D is based on $T_{J(MAX)} = 150^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used
- Single pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$
- The maximum current rating is package limited
- The E_{AS} data shows Max. rating. The test condition is $V_{DS} = 50V, V_{GS} = 10V, L = 0.5mH$

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

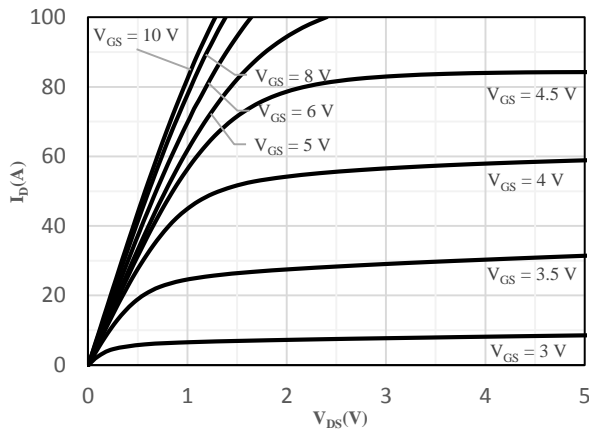


Fig 1 Typical Output Characteristics

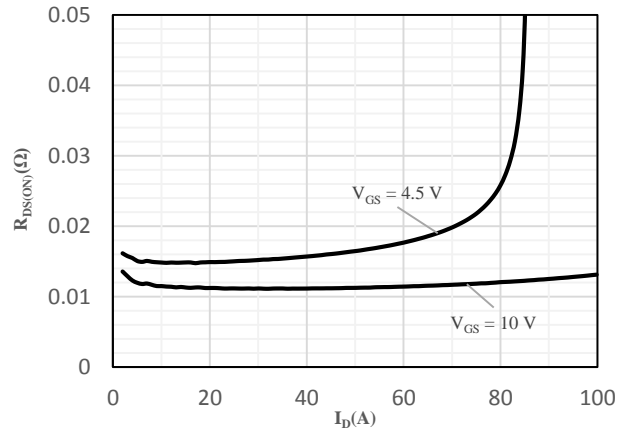


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

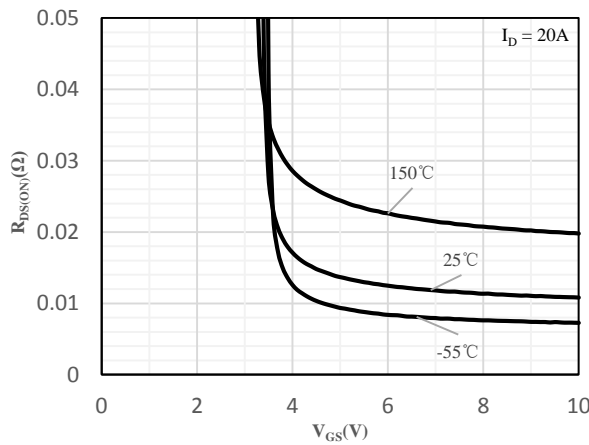


Fig 3 On-Resistance vs. Gate-Source Voltage

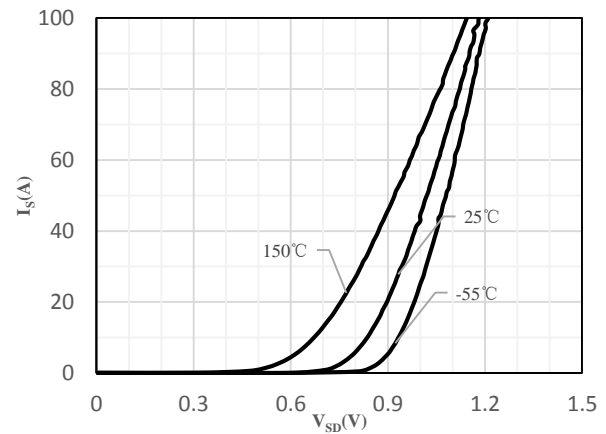


Fig 4 Body-Diode Characteristics

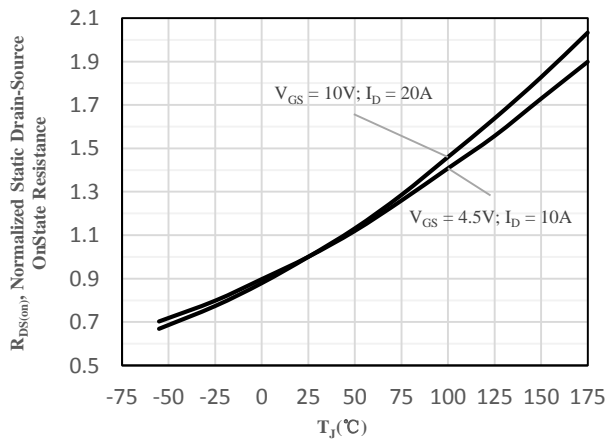


Fig 5 On-Resistance vs. Junction Temperature

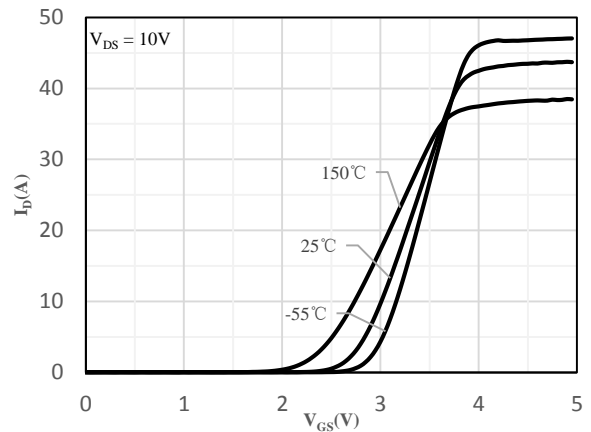


Fig 6 Transfer Characteristics

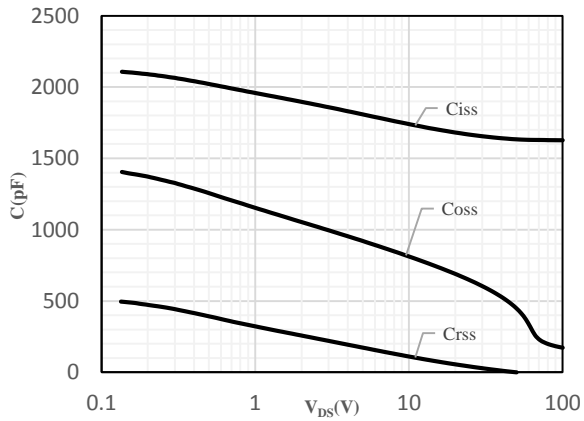


Fig 7 Capacitance Characteristics

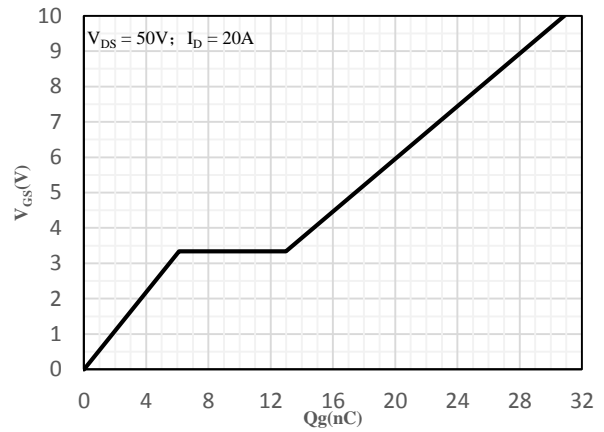


Fig 8 Gate-Charge Characteristics

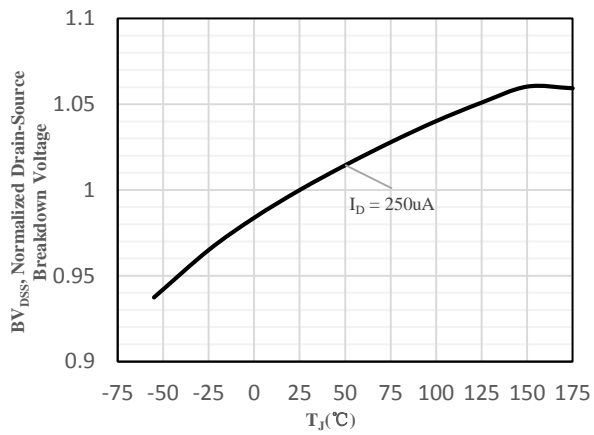


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

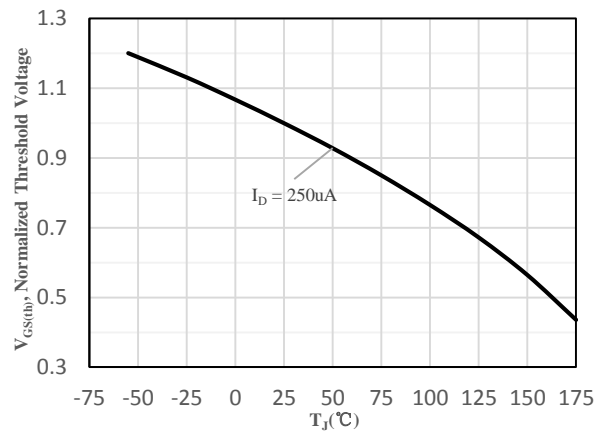


Fig 10 V_{GS(th)} vs. Junction Temperature

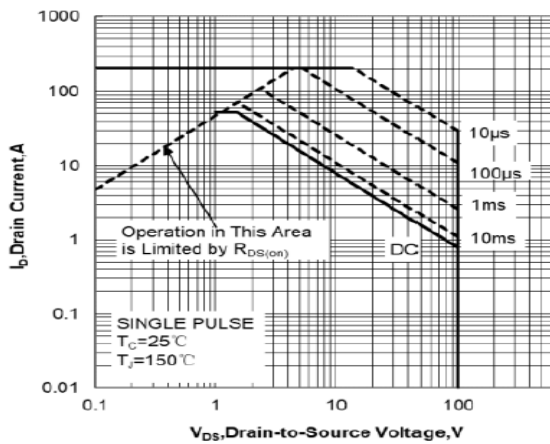
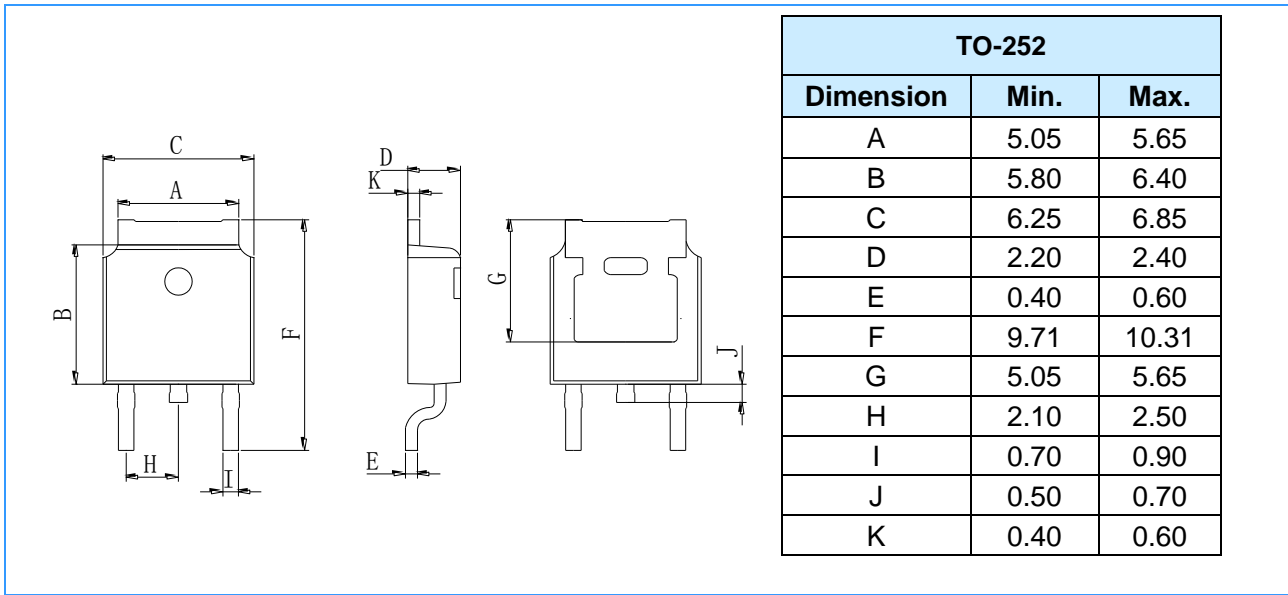
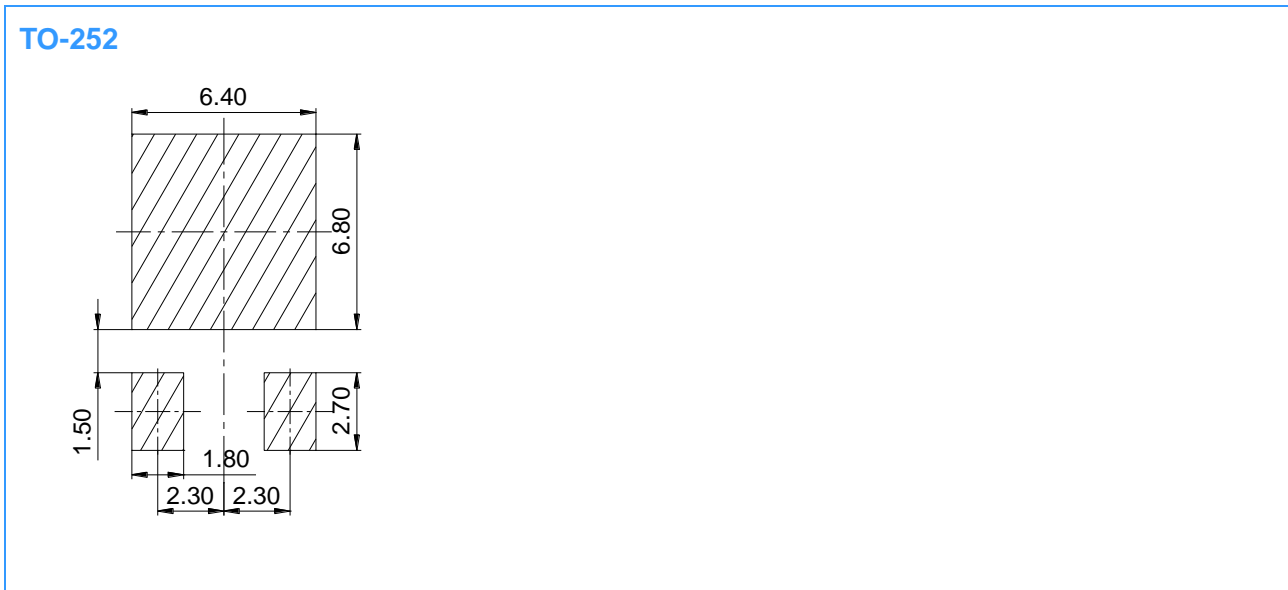


Figure 11 Maximum Safe Operating Area

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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