

### Features

- High-speed switching
- Drive circuits can be simple
- Parallel use is easy

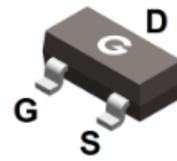
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### Typical Applications

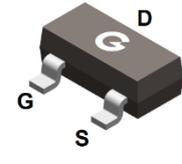
- Power management in note book
- Switching application
- Battery powered system
- Load switch

### Mechanical Data

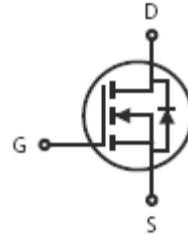
- Case: SOT-23, SOT-23-3L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



BL2300  
SOT-23



BL2300-3L  
SOT-23-3L



### Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL2300	SOT-23	3000 pcs / Tape & Reel	2300
BL2300-3L	SOT-23-3L	3000 pcs / Tape & Reel	2300

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	$V_{DSS}$	20	V
Gate-to-Source Voltage	$V_{GSS}$	$\pm 10$	V
Continuous Drain Current ( $T_A = 25^\circ\text{C}$ ) <sup>*1</sup>	$I_D$	4	A
Continuous Drain Current ( $T_A = 70^\circ\text{C}$ ) <sup>*1</sup>		3.2	A
Pulsed Drain Current ( $t_p = 10\mu\text{s}$ , $T_A = 25^\circ\text{C}$ )	$I_{DM}$	25	A
Single Pulse Avalanche Energy <sup>*3</sup>	$E_{AS}$	5	mJ
Power Dissipation ( $T_A = 25^\circ\text{C}$ ) <sup>*1</sup>	$P_D$	1.25	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	$R_{\theta JC}$	-	55	70	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-to-Air <sup>*1</sup>	$R_{\theta JA}$	-	-	100	$^{\circ}\text{C}/\text{W}$

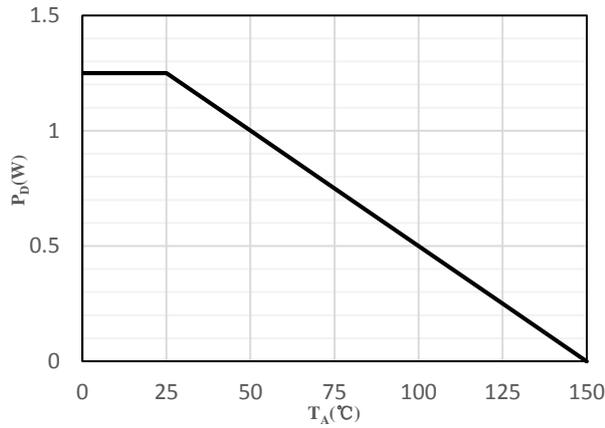
### Electrical Characteristics (@ $T_A = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
$V_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	20	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$	-	-	1	$\mu\text{A}$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS} = \pm 10\text{V}, V_{DS} = 0\text{V}$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$R_{DS(ON)}$	Drain-Source On-resistance <sup>*2</sup>	$V_{GS} = 4.5\text{V}, I_D = 5\text{A}$	-	22	40	m $\Omega$
		$V_{GS} = 2.5\text{V}, I_D = 4\text{A}$	-	30	60	
		$V_{GS} = 1.8\text{V}, I_D = 1\text{A}$	-	51	75	
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.6	0.8	1.5	V
$R_G$	Gate Resistance	$V_{GS} = 0\text{V}, f = 1\text{MHz}$	-	9	-	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{ISS}$	Input Capacitance	$V_{GS} = 0\text{V}$ $V_{DS} = 15\text{V}$ $f = 1.0\text{MHz}$	-	413	-	pF
$C_{OSS}$	Output Capacitance		-	63	-	
$C_{RSS}$	Reverse Transfer Capacitance		-	57	-	
<b>Switching Characteristics</b>						
$t_{d(ON)}$	Turn-on Delay Time <sup>*4</sup>	$V_{DD} = 10\text{V}$ $V_{GS} = 4.5\text{V}$ $I_D = 1\text{A}$ $R_G = 6\Omega$	-	31.8	-	ns
$t_r$	Turn-on Rise Time <sup>*4</sup>		-	14.5	-	
$t_{d(OFF)}$	Turn-Off Delay Time <sup>*4</sup>		-	50.3	-	
$t_f$	Turn-Off Fall Time <sup>*4</sup>		-	31.9	-	
$Q_G$	Total Gate-Charge	$V_{DD} = 10\text{V}$ $V_{GS} = 4.5\text{V}$ $I_D = 3.5\text{A}$	-	6.4	-	nC
$Q_{GS}$	Gate to Source Charge		-	1.1	-	
$Q_{GD}$	Gate to Drain (Miller) Charge		-	1.8	-	
<b>Source-Drain Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage <sup>*2</sup>	$I_{SD} = 1.25\text{A}, V_{GS} = 0\text{V}$	-	0.7	1.2	V

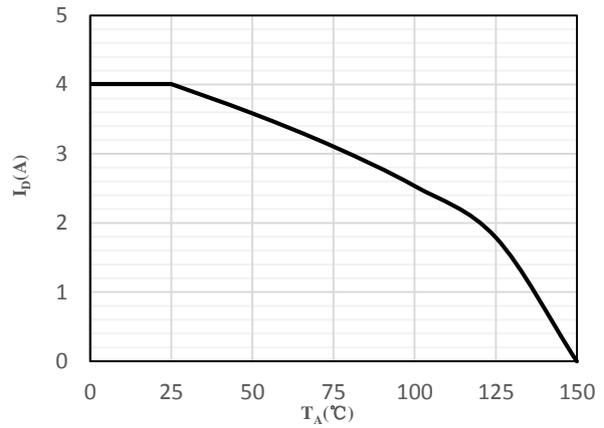
Notes:

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper
- The data tested by pulsed, pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$
- The  $E_{AS}$  data shows Max. rating. The test condition is  $V_{DD} = 10\text{V}, V_{GS} = 6\text{V}, L = 0.1\text{mH}$
- Guaranteed by design, not subject to production

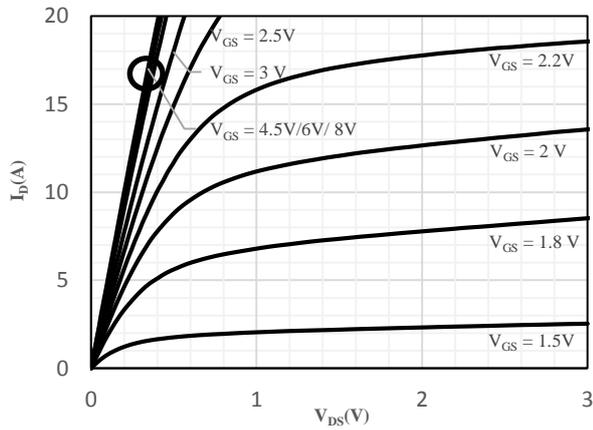
**Ratings and Characteristics Curves** (@  $T_A = 25^\circ\text{C}$  unless otherwise specified)



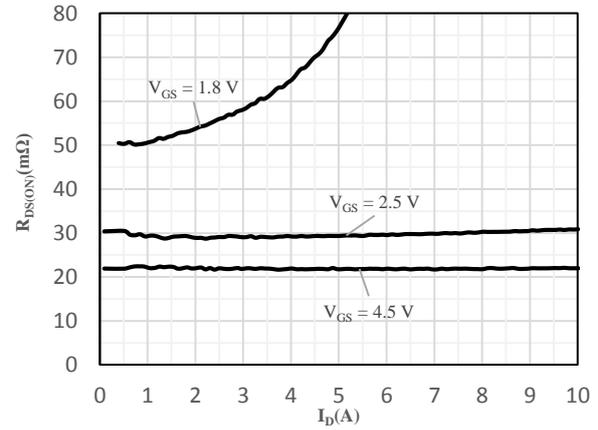
**Fig 1 Power Dissipation**



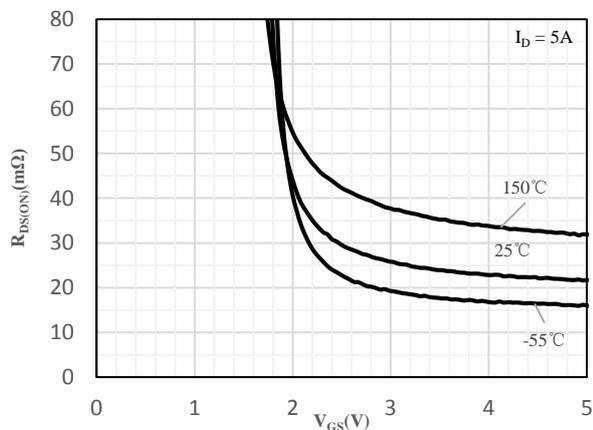
**Fig 2 Drain Current**



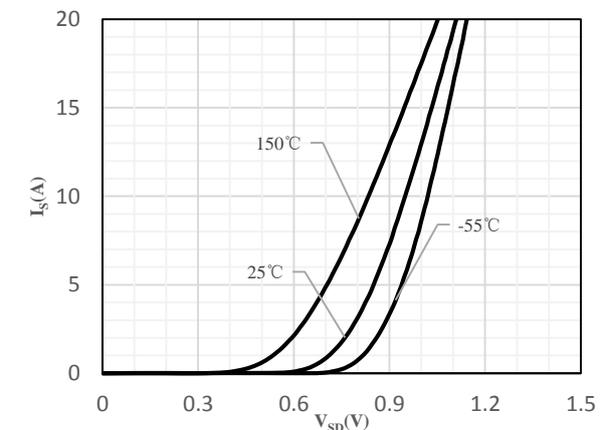
**Fig 3 Typical Output Characteristics**



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



**Fig 5 On-Resistance vs. Gate-Source Voltage**



**Fig 6 Body-Diode Characteristics**

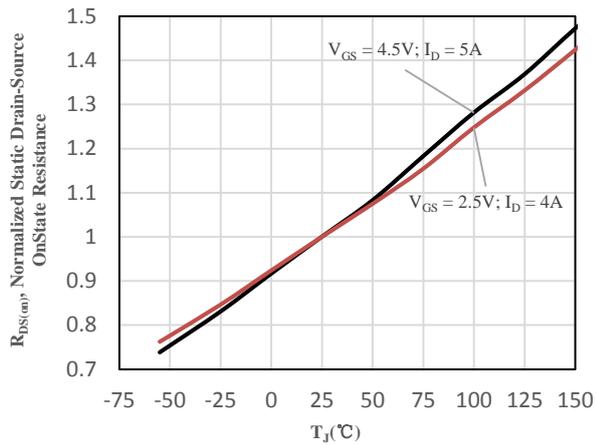


Fig 7 Normalized On-Resistance vs. Junction Temperature

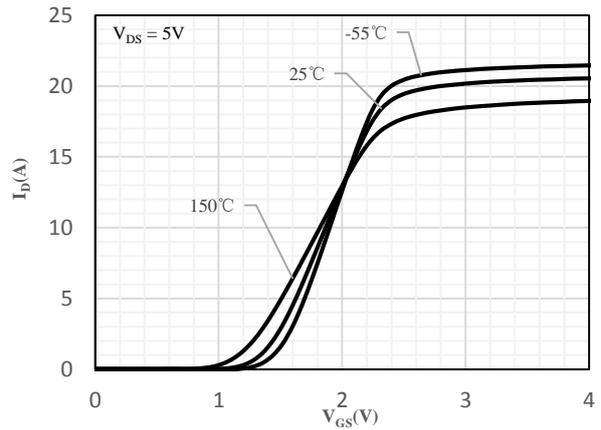


Fig 8 Transfer Characteristics

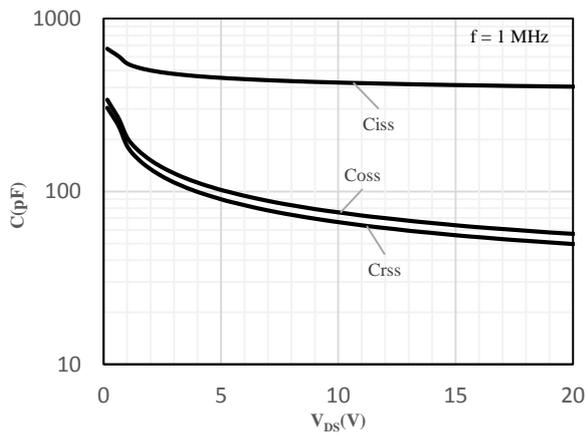


Fig 9 Capacitance Characteristics

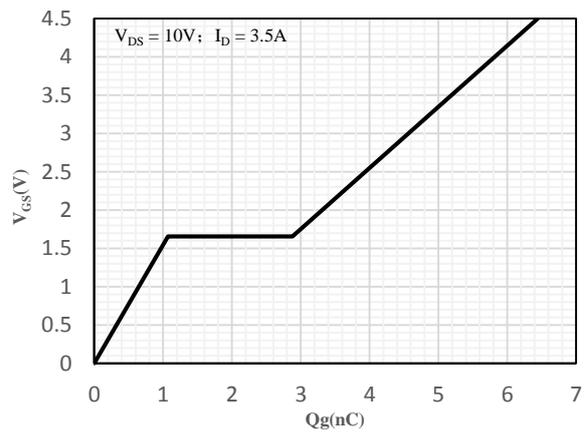


Fig 10 Gate-Charge Characteristics

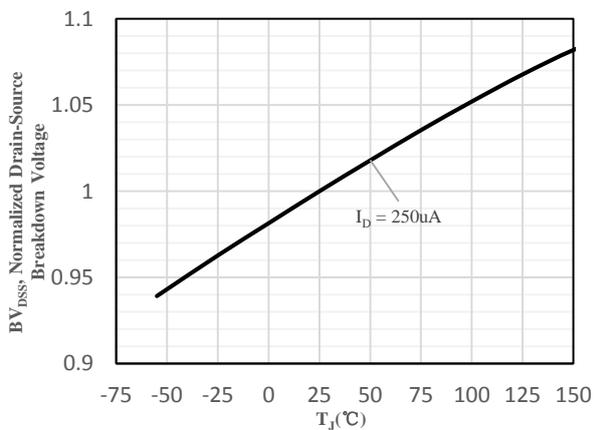


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

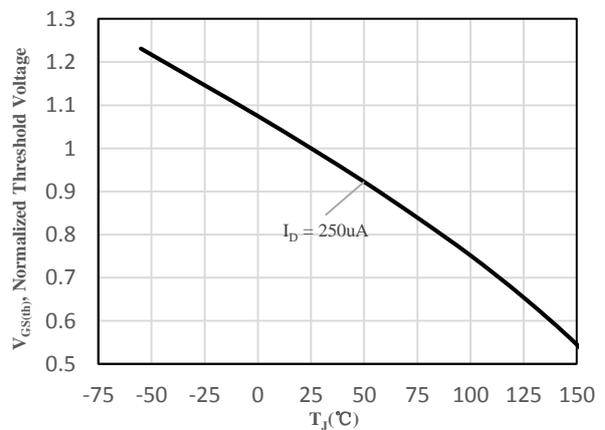
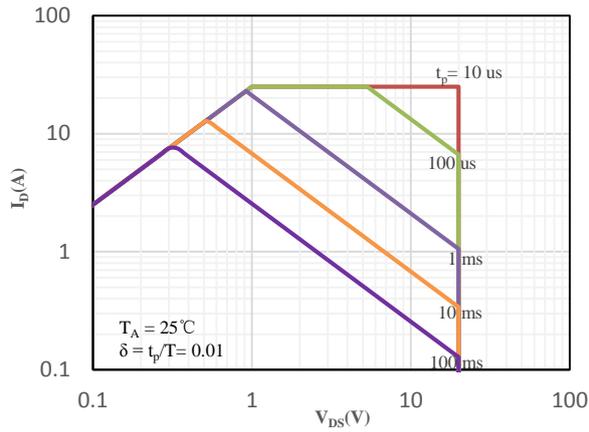
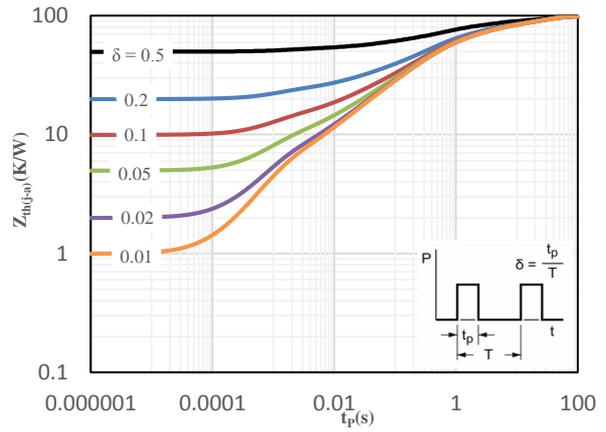


Fig 12 Normalized V<sub>GS(th)</sub> vs. Junction Temperature

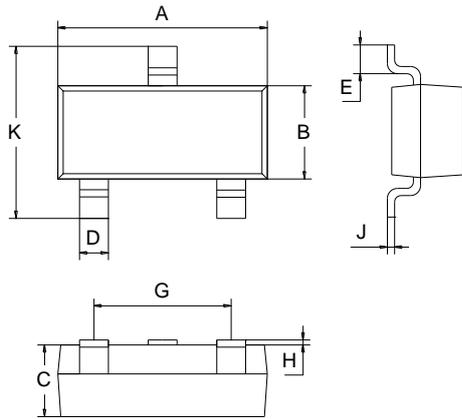


**Fig 13 Safe Operation Area**

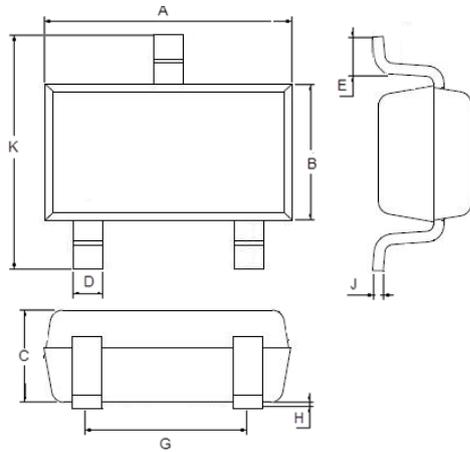


**Fig 14 Maximum transient thermal impedance**

**Package Outline Dimensions** (Unit: mm)



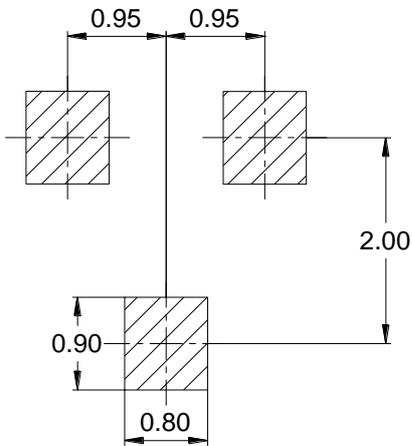
SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60



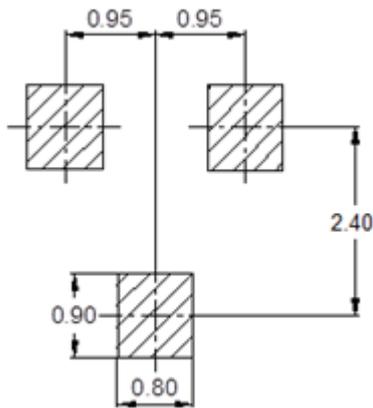
SOT-23-3L		
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
G	1.80	2.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)

SOT-23



SOT-23-3L



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