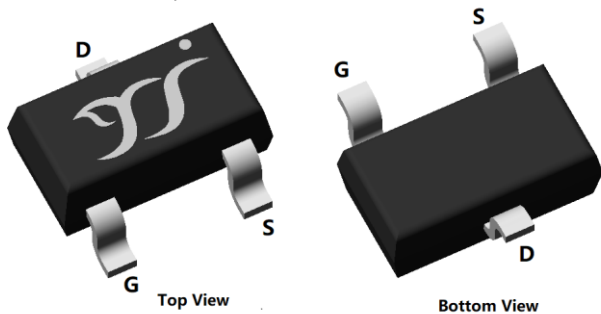
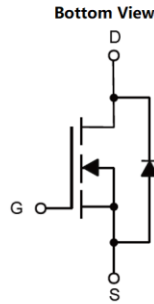


## N-Channel Enhancement Mode Field Effect Transistor



**SOT-23-3L**



### Product Summary

- $V_{DS}$  30V
- $I_D$  6A
- $R_{DS(ON)}$  ( at  $V_{GS}=10V$ ) < 24m $\Omega$
- $R_{DS(ON)}$  ( at  $V_{GS}=4.5V$ ) < 34m $\Omega$

### General Description

- Trench Power LV MOSFET technology
- High density cell design for low  $R_{DS(ON)}$
- High Speed switching
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### Applications

- Battery protection
- Load switch
- Power management

### ■ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	30	V
Gate-source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$T_A=25^\circ\text{C}$	6
		$T_A=100^\circ\text{C}$	3.8
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	30	A
Total Power Dissipation <sup>B</sup>	$P_D$	$T_A=25^\circ\text{C}$	1.0
		$T_A=100^\circ\text{C}$	0.4
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### ■ Thermal resistance

Parameter	Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient <sup>C</sup>	$R_{\theta JA}$	100	120	$^\circ\text{C/W}$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL3404AL	F2	R4.	3000	30000	120000	7" reel



# YJL3404AL

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	30	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	-	1	μA
		V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =150°C	-	-	100	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.4	2.2	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =6A	-	18	24	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A	-	26	34	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =6A, V <sub>GS</sub> =0V	-	0.9	1.2	V
Gate resistance	R <sub>G</sub>	f=1MHz, Open drain	-	2	-	Ω
Maximum Body-Diode Continuous Current	I <sub>S</sub>		-	-	6	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	-	380	-	pF
Output Capacitance	C <sub>oss</sub>		-	75	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	60	-	
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =6A	-	12.2	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2.4	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2.3	-	
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =6A, di/dt=100A/us	-	1.3	-	nC
Reverse Recovery Time	t <sub>rr</sub>		-	16.5	-	ns
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =15V, I <sub>D</sub> =6A R <sub>GEN</sub> =3Ω	-	5	-	ns
Turn-on Rise Time	t <sub>r</sub>		-	29	-	
Turn-off Delay Time	t <sub>D(off)</sub>		-	13	-	
Turn-off fall Time	t <sub>f</sub>		-	22	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B. P<sub>d</sub> is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

C. The value of R<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in the still air environment with T<sub>A</sub> =25°C.

The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



## Typical Electrical and Thermal Characteristics Diagrams

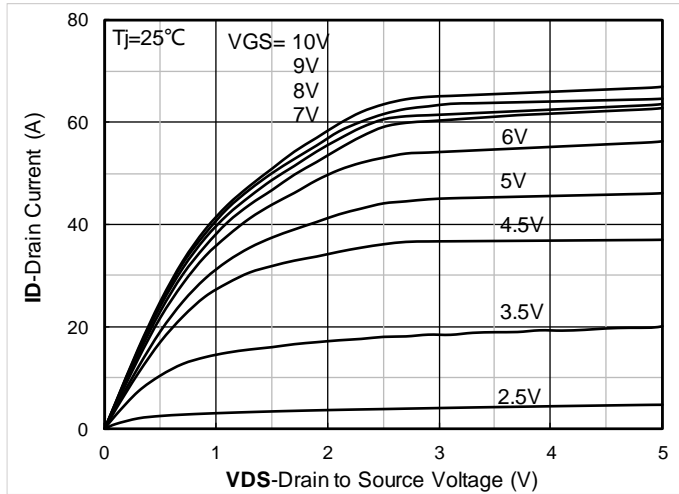


Figure 1. Output Characteristics

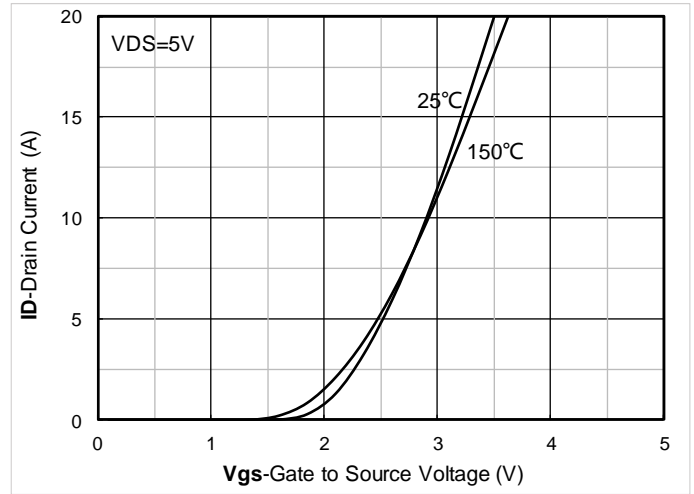


Figure 2. Transfer Characteristics

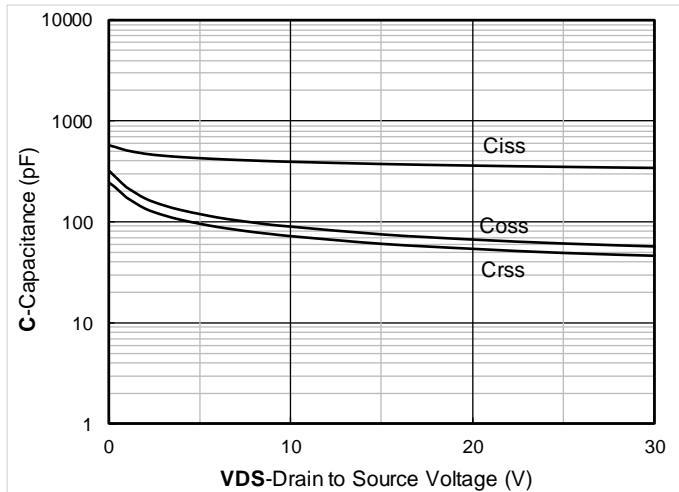


Figure 3. Capacitance Characteristics

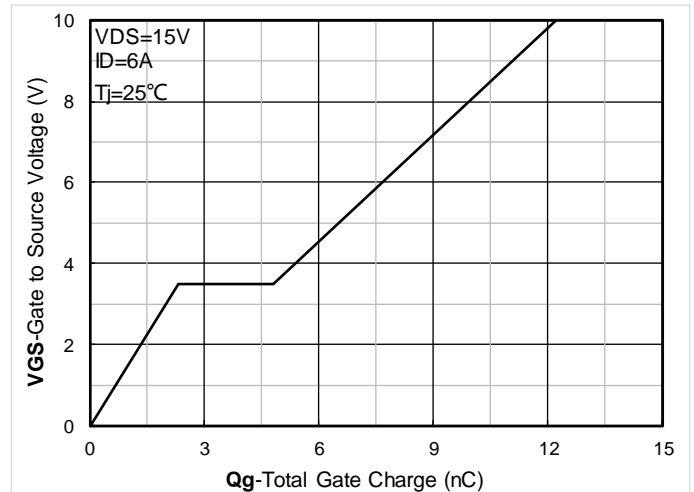


Figure 4. Gate Charge

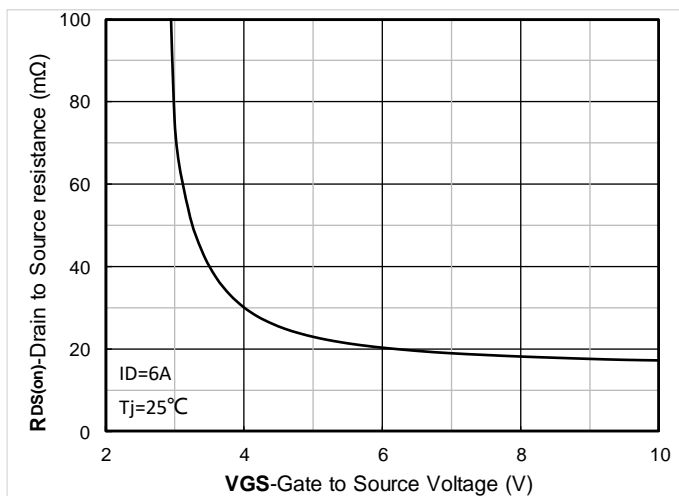


Figure 5. On-Resistance vs Gate to Source Voltage

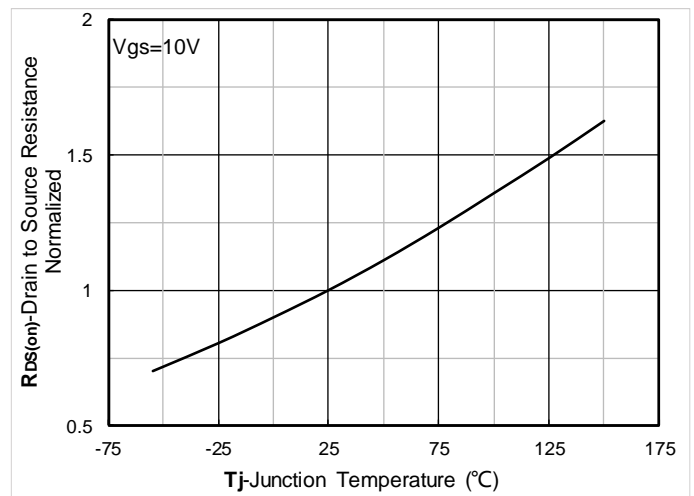


Figure 6. Normalized On-Resistance

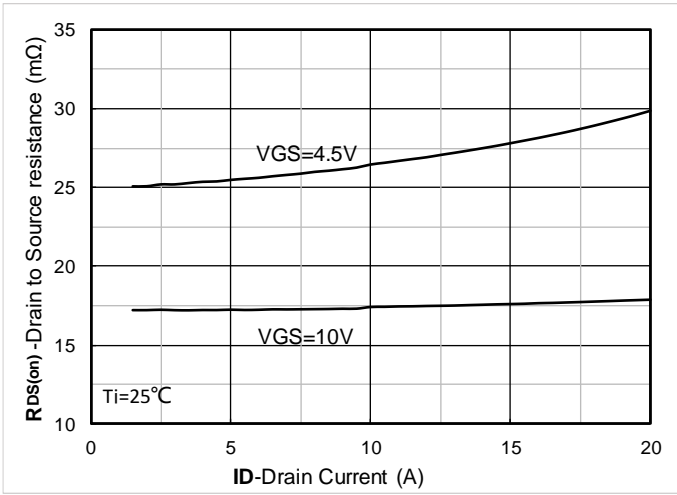


Figure 7.  $R_{DS(on)}$  VS Drain Current

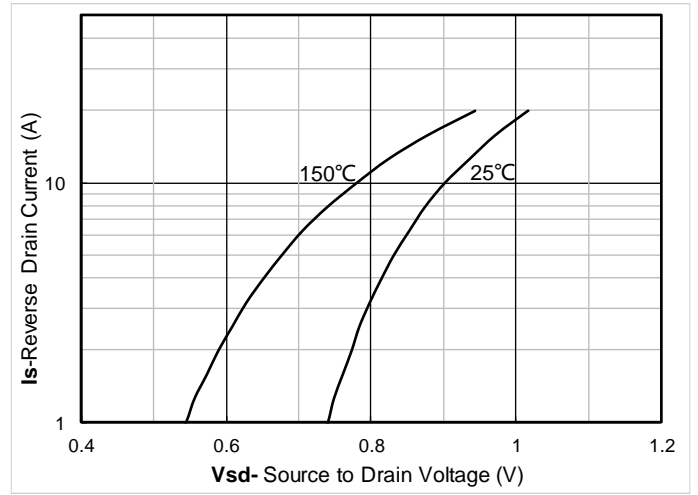


Figure 8. Forward characteristics of reverse diode

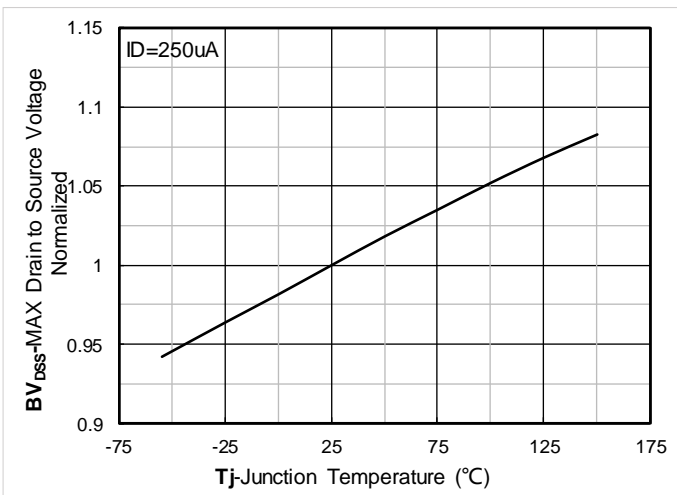


Figure 9. Normalized breakdown voltage

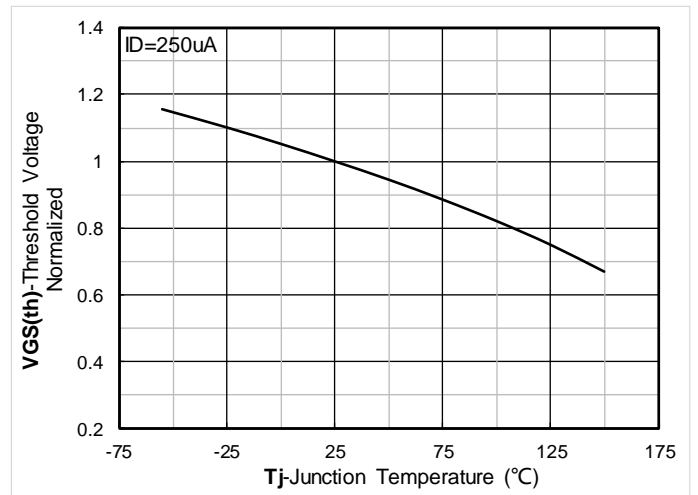


Figure 10. Normalized Threshold voltage

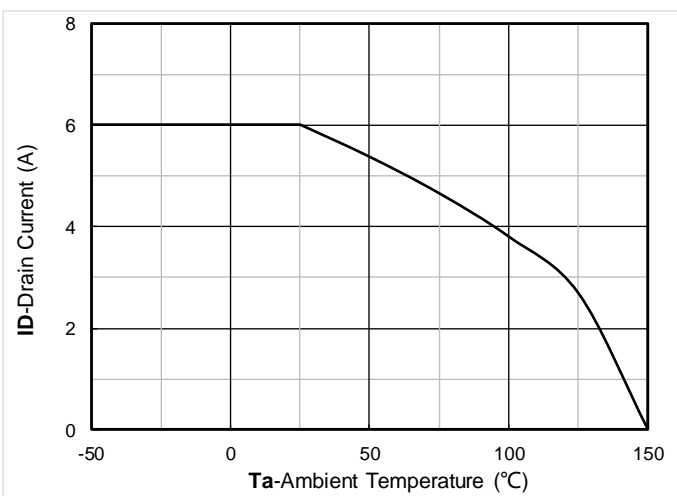


Figure 11. Current dissipation

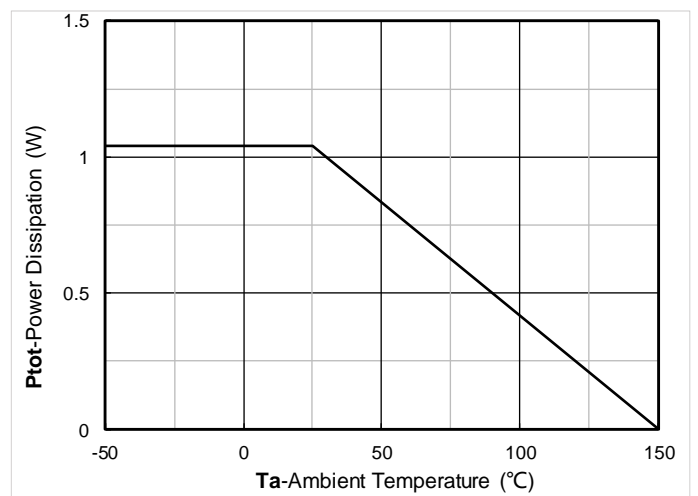


Figure 12. Power dissipation



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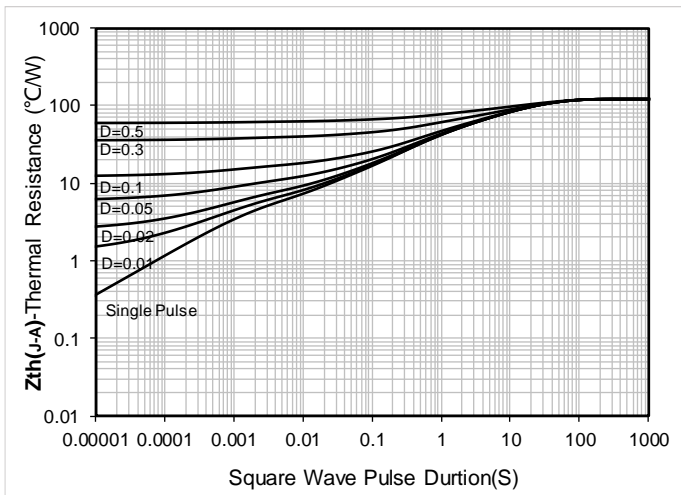


Figure 13. Maximum Transient Thermal Impedance

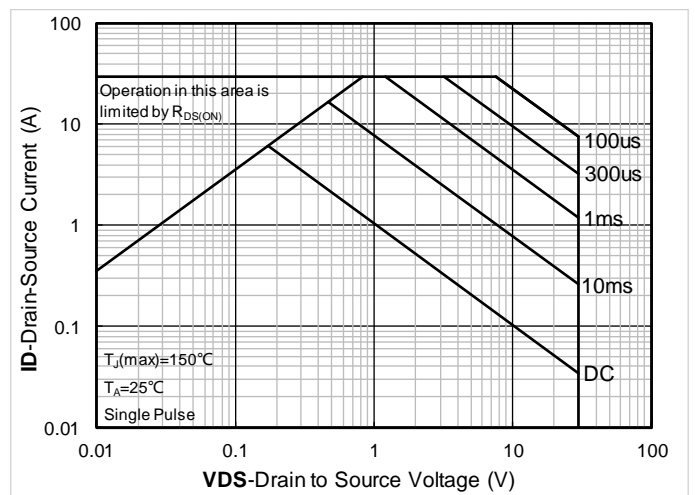
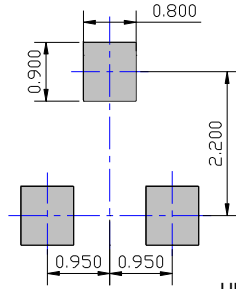
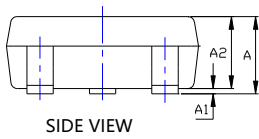
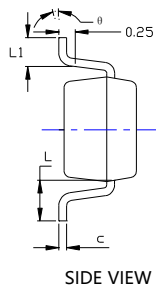
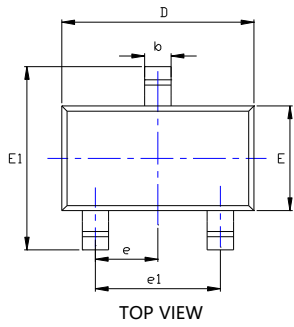


Figure 14. Safe Operation Area

## ■ SOT-23-3L Package information



UNIT: mm

SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.041	---	0.049	1.050	---	1.250
A1	0.000	---	0.008	0.000	---	0.200
A2	0.041	0.043	0.045	1.050	1.100	1.150
b	0.012	0.016	0.020	0.300	0.400	0.500
c	0.004	---	0.008	0.100	---	0.200
D	0.111	0.115	0.119	2.820	2.920	3.020
E	0.059	0.063	0.067	1.500	1.600	1.700
E1	0.104	0.110	0.116	2.650	2.800	2.950
e	0.037TYP			0.950TYP		
e1	0.071	0.075	0.079	1.800	1.900	2.000
L	0.024REF			0.600REF		
L1	0.012	0.018	0.024	0.300	0.450	0.600
θ	0°	---	8°	0°	---	8°

### NOTE:

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



## YJL3404AL

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