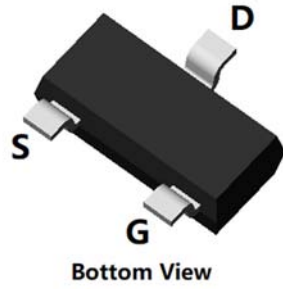
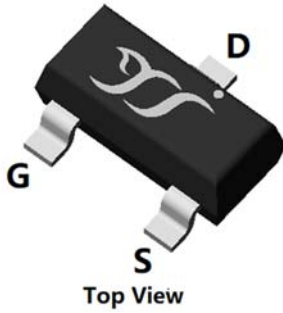
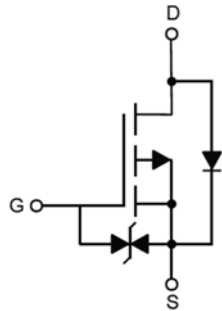


## P-Channel Enhancement Mode Field Effect Transistor



**SOT-23**



### Product Summary

- $V_{DS}$  -20V
- $I_D$  -2.4A
- $R_{DS(ON)}$ ( at  $V_{GS}=-4.5V$ ) <95mohm
- ESD Protected Up to 2.0KV (HBM)

### General Description

- Trench Power LV MOSFET technology
- High Power and Current handling capability
- Low Gate Charge
- Part no. with suffix "Q" means AEC-Q101 qualified
- Moisture Sensitivity Level 1

### Applications

- PWM applications
- Power management
- Load switch

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		$V_{DS}$	-20	V
Gate-source Voltage		$V_{GS}$	$\pm 12$	V
Drain Current	$T_A=25^\circ\text{C}$	$I_D$	-2.4	A
	$T_A=100^\circ\text{C}$		-1.5	
Total Power Dissipation	$T_A=25^\circ\text{C}$	$P_D$	890	mW
	$T_A=100^\circ\text{C}$		350	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	-10	A
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>B</sup>	Steady-State	$R_{\theta JA}$	115	140	$^\circ\text{C/W}$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL2301HQ	F2	2301H.	3000	30000	120000	7" reel



# YJL2301HQ

## ■ 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	-20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V			-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V			±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.5	-1	-1.5	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2.4A		70	95	mΩ
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V			-1.2	V
<b>Dynamic Parameters</b>						
Gate resistance	R <sub>G</sub>	f=1MHz, Open drain		15		Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHZ		380		pF
Output Capacitance	C <sub>oss</sub>			81		
Reverse Transfer Capacitance	C <sub>rss</sub>			60		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-2.4A		5.3		nC
Gate-Source Charge	Q <sub>gs</sub>			1.6		
Gate-Drain Charge	Q <sub>gd</sub>			1.7		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =-1A, di/dt=40A/us		1.71		
Reverse Recovery Time	t <sub>rr</sub>			13.5		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-1A R <sub>GEN</sub> =3Ω		8.2		ns
Turn-on Rise Time	t <sub>r</sub>			23		
Turn-off Delay Time	t <sub>D(off)</sub>			22.8		
Turn-off fall Time	t <sub>f</sub>			25.6		

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

B. 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 Performance Characteristics

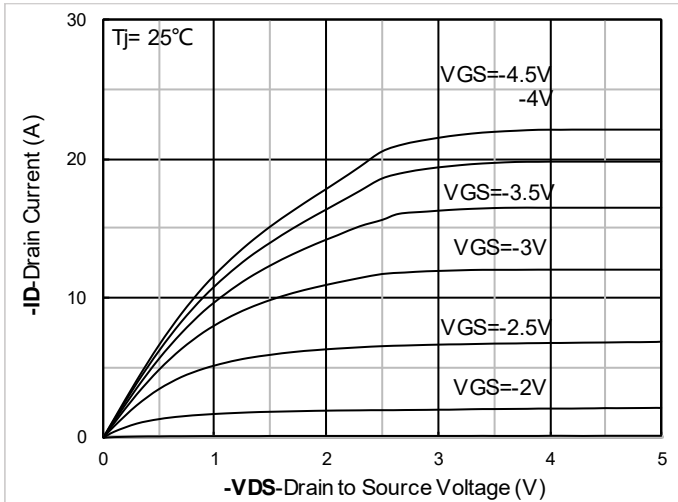


Figure1. Output Characteristics

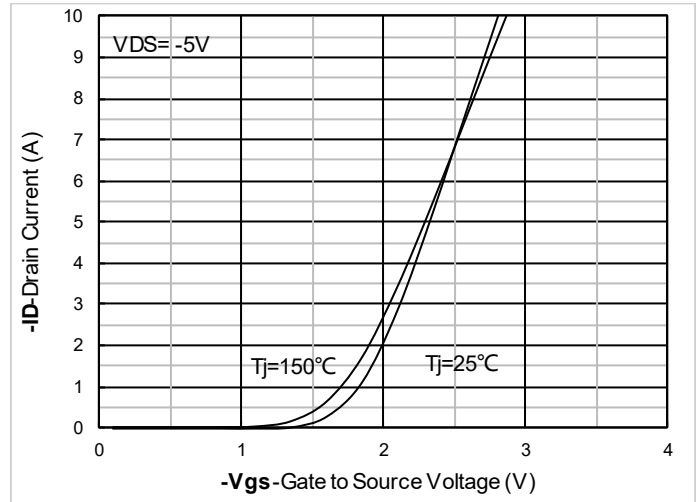


Figure2. Transfer Characteristics

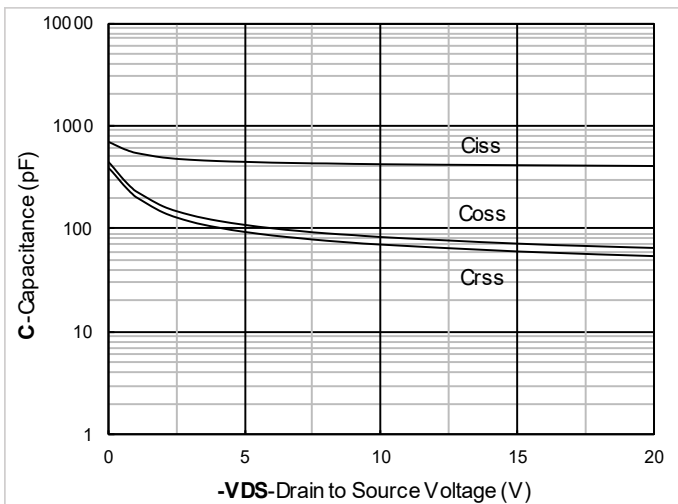


Figure3. Capacitance Characteristics

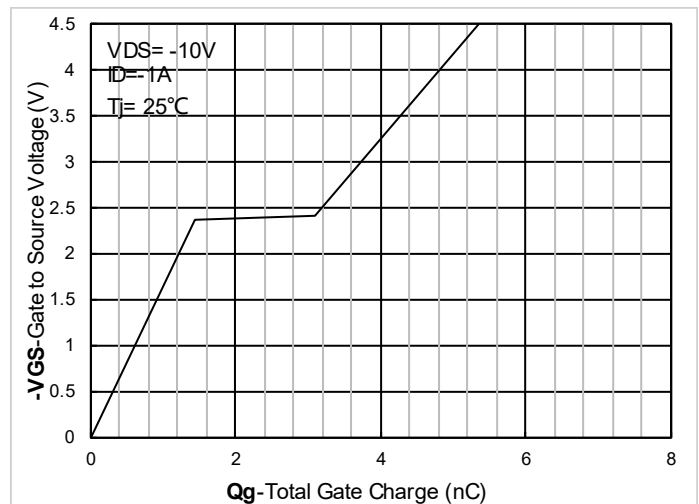


Figure4. Gate Charge

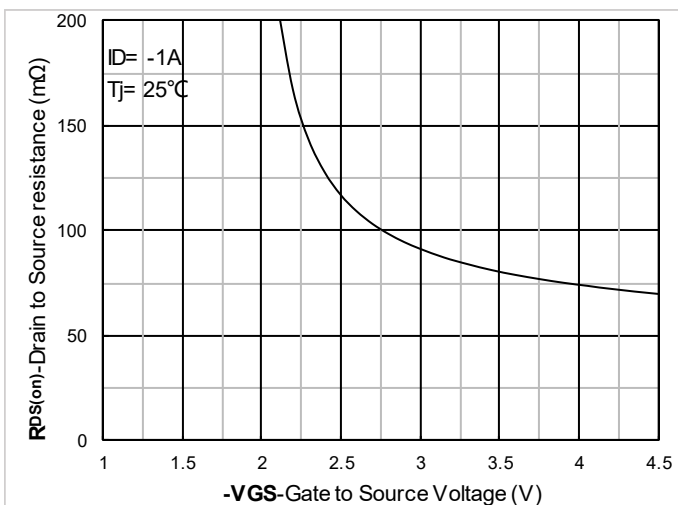


Figure5. On-Resistance vs Gate to Source Voltage

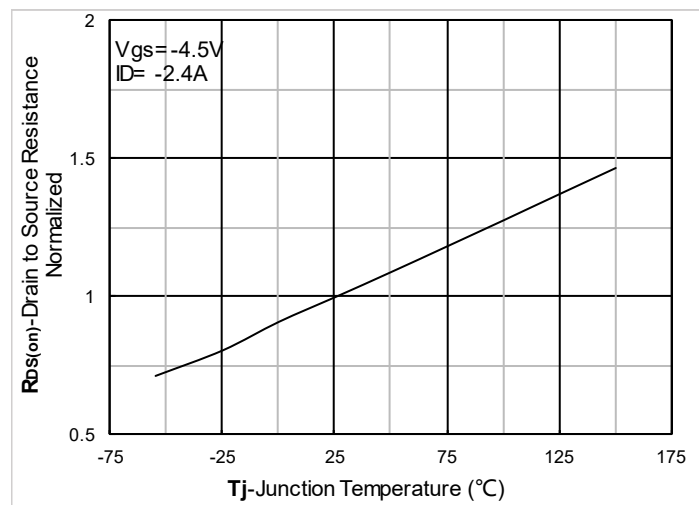


Figure6. Normalized On-Resistance



# YJL2301HQ

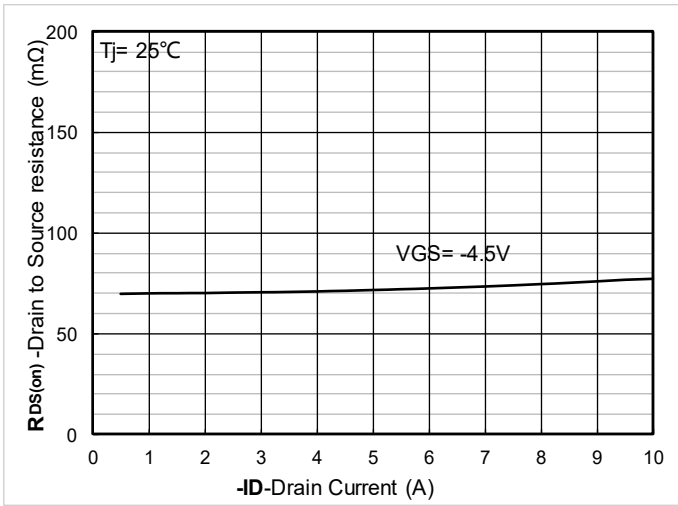


Figure 7.  $R_{DS(on)}$  VS Drain Current

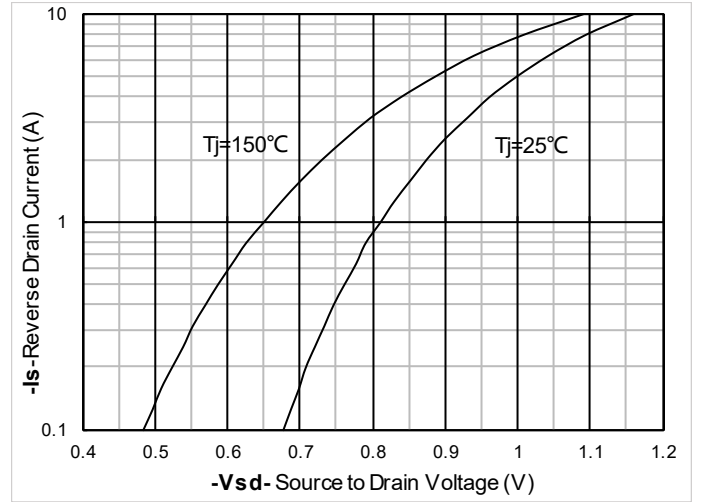


Figure 8. Forward characteristics of reverse diode

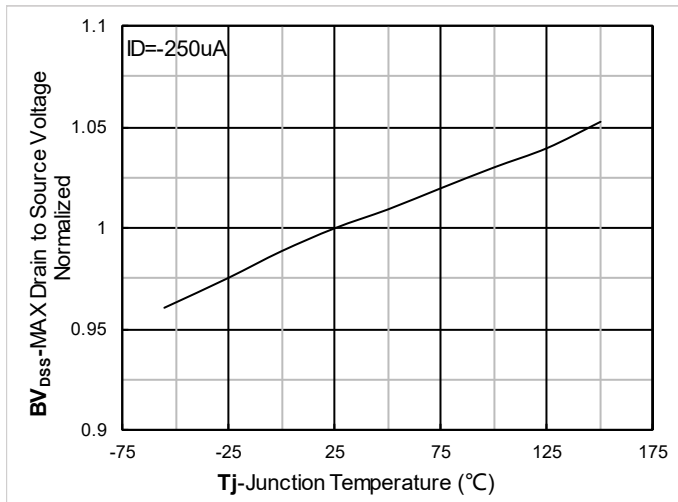


Figure 9. Normalized breakdown voltage

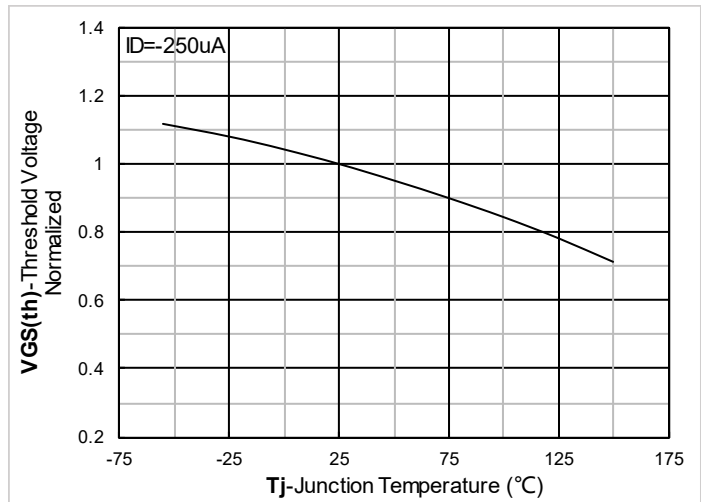


Figure 10. Normalized Threshold voltage

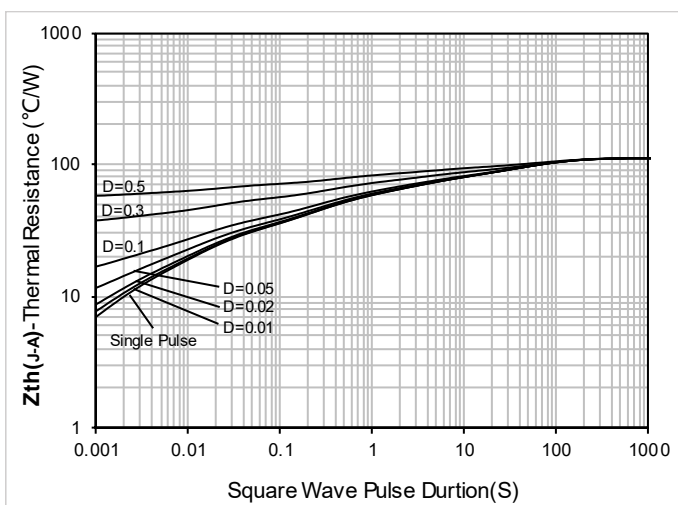


Figure 11. Maximum Transient Thermal Impedance

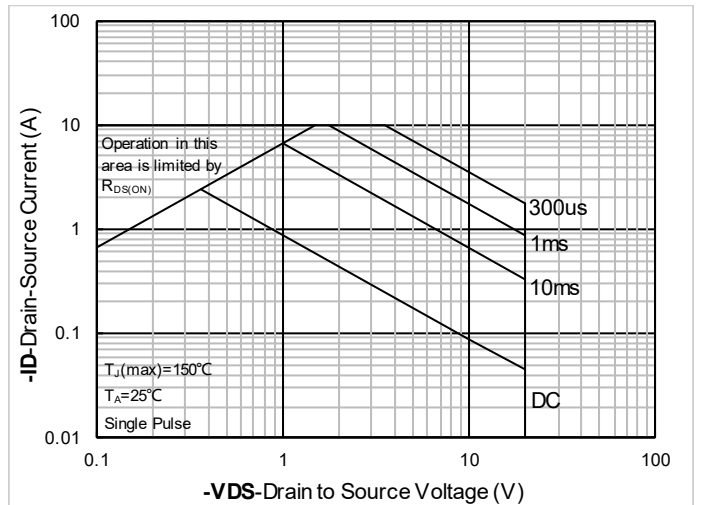
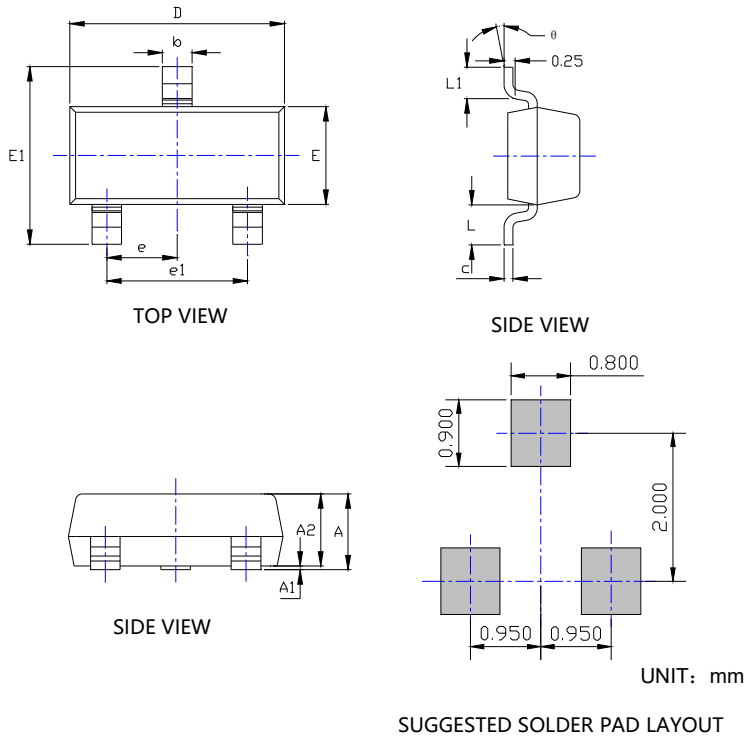


Figure 12. Safe Operation Area



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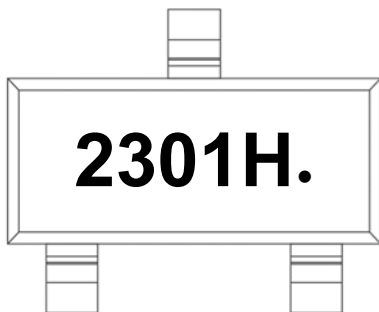
## ■ SOT-23 Package Outline Dimensions



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.045	0.900	1.150
A1	0.000	0.004	0.000	0.100
A2	0.035	0.041	0.900	1.050
b	0.012	0.020	0.300	0.500
c	0.004	0.008	0.100	0.200
D	0.110	0.118	2.800	3.000
E	0.047	0.055	1.200	1.400
E1	0.089	0.100	2.250	2.550
e	0.037TYP		0.950TYP	
e1	0.071	0.079	1.800	2.000
L	0.022REF		0.550REF	
L1	0.012	0.020	0.300	0.500
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.

## ■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser marking
3. 2301H is Marking Code
4. Body color: Black



## Disclaimer

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