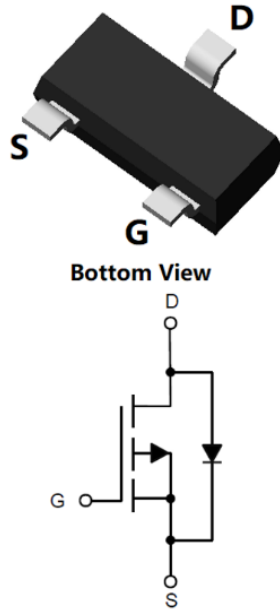
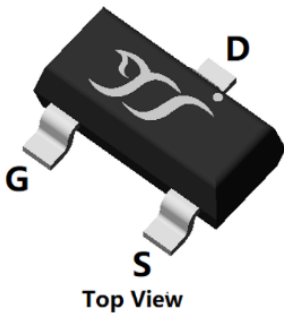


## P-Channel Enhancement Mode Field Effect Transistor



**SOT-23**

### Product Summary

• $V_{DS}$	-19V
• $I_D$	-3.8A
• $R_{DS(ON)}$ ( at $V_{GS}=-4.5V$ )	<47mohm
• $R_{DS(ON)}$ ( at $V_{GS}=-2.5V$ )	<63mohm
• $R_{DS(ON)}$ ( at $V_{GS}=-1.8V$ )	<107mohm

### General Description

- Trench Power LV MOSFET technology
- Low  $R_{DS(ON)}$
- Low Gate Charge
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### 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	$V_{DS}$	-19	V
Gate-source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current	$I_D$	$T_A=25^\circ\text{C}$	-3.8
		$T_A=70^\circ\text{C}$	-3
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	-15	A
Total Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$	1
		$T_A=70^\circ\text{C}$	0.64
Thermal Resistance Junction-to-Ambient <sup>B</sup>	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL2301D	F2	2301D.	3000	30000	120000	7" reel



# YJL2301D

## ■ 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	-19			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-19V, V <sub>GS</sub> =0V			-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, 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	-0.4	-0.62	-1.0	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.8A		36	47	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3.0A		48	63	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.5A		78	107	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-3.8A, V <sub>GS</sub> =0V			-1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-3.8	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHZ		606		pF
Output Capacitance	C <sub>oss</sub>			114		
Reverse Transfer Capacitance	C <sub>rss</sub>			103		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-3.8A		8.48		nC
Gate-Source Charge	Q <sub>gs</sub>			1.54		
Gate-Drain Charge	Q <sub>gd</sub>			2.61		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-3.8A R <sub>GEN</sub> =3Ω		5.8		
Turn-on Rise Time	t <sub>r</sub>			34.8		
Turn-off Delay Time	t <sub>D(off)</sub>			51.4		
Turn-off fall Time	t <sub>f</sub>			52		

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R<sub>θJC</sub> is guaranteed by design, while R<sub>θJA</sub> is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.



### Typical Performance Characteristics

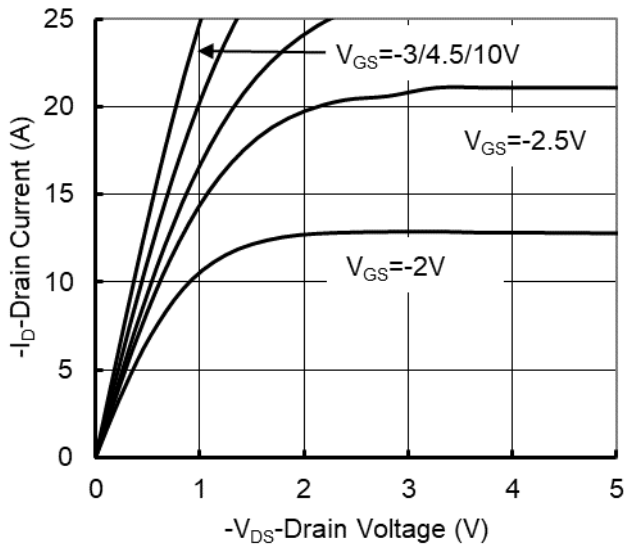


Figure1. Output Characteristics

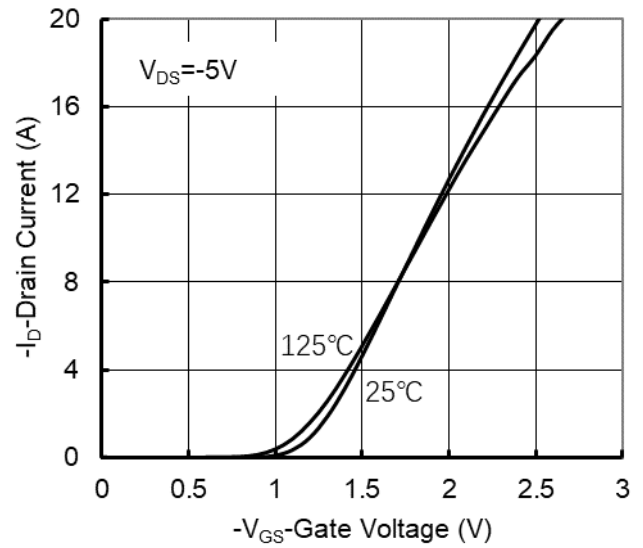


Figure2. Transfer Characteristics

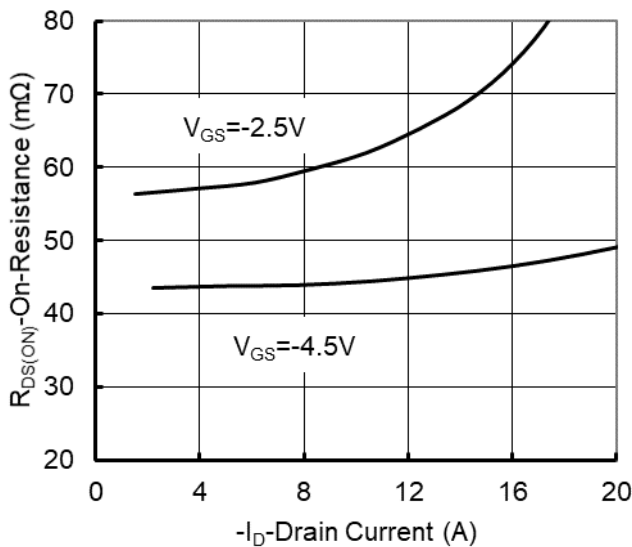


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

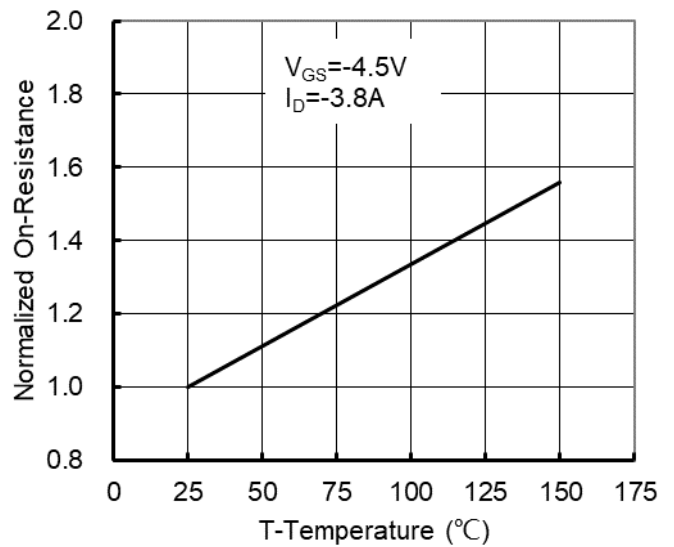


Figure 4: On-Resistance vs. Junction Temperature

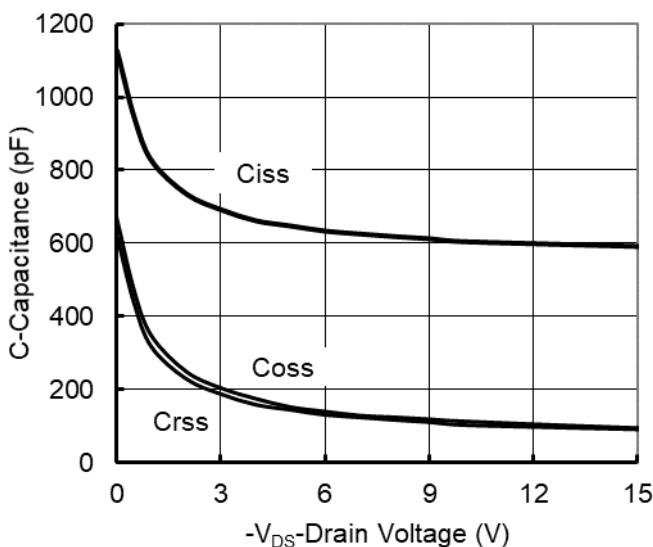


Figure5. Capacitance Characteristics

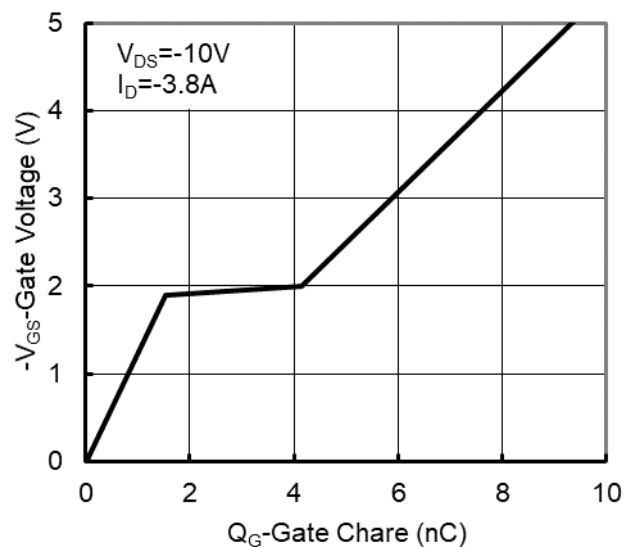
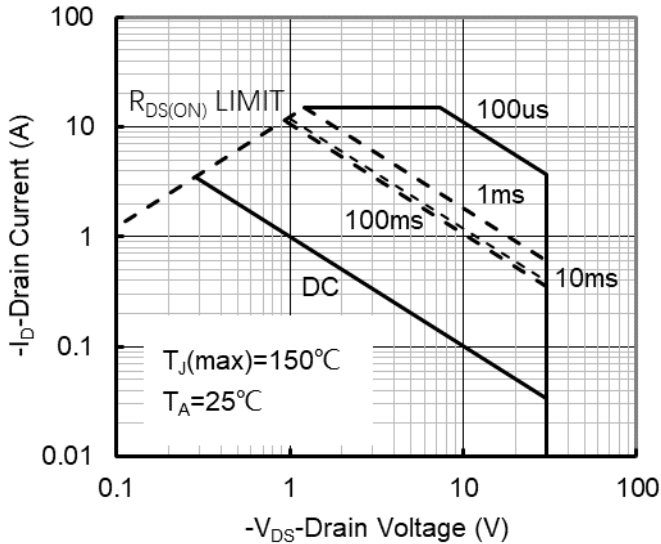
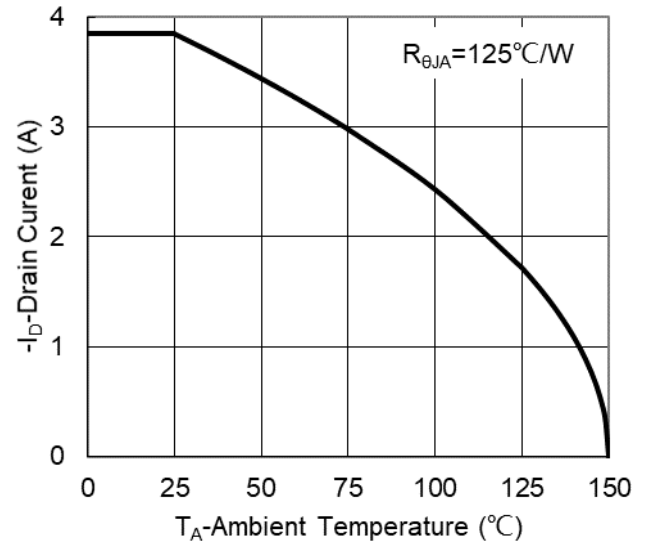


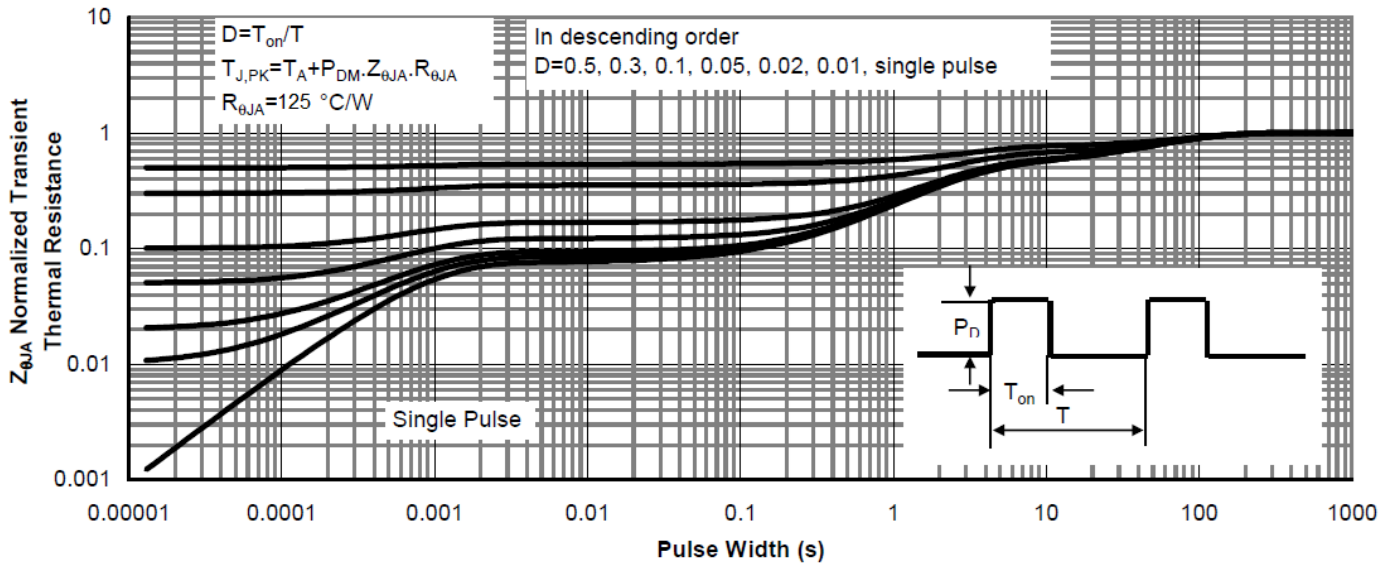
Figure6. Gate Charge



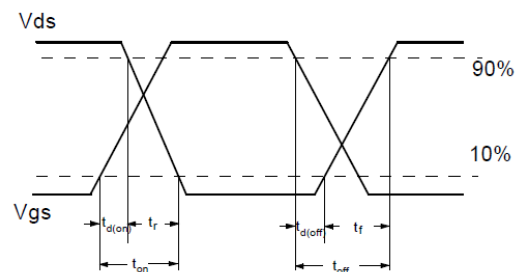
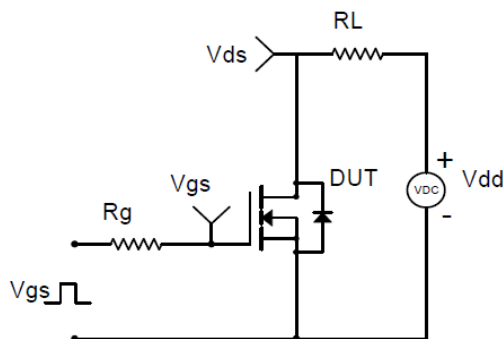
**Figure7. Safe Operation Area**



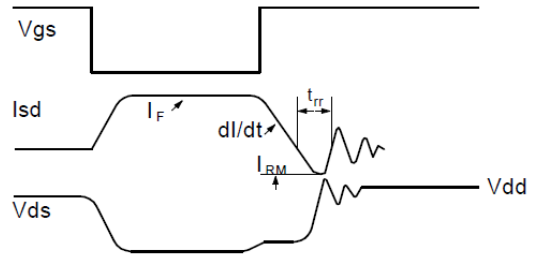
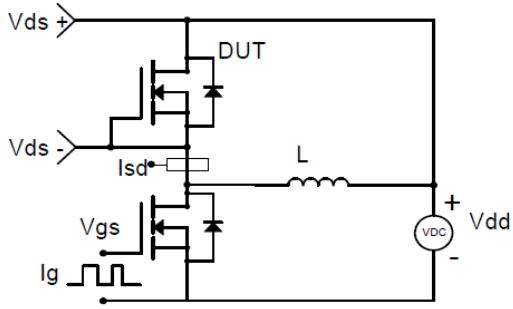
**Figure8. Maximum Continuous Drain Current vs Ambient Temperature**



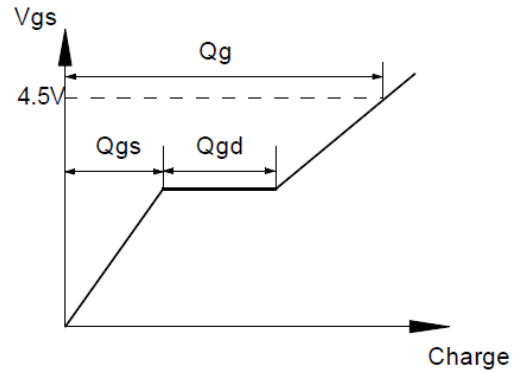
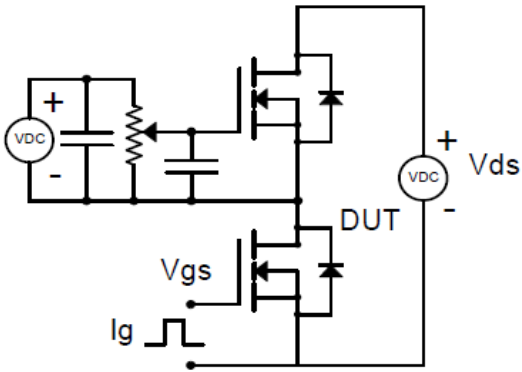
**Figure9. Normalized Maximum Transient Thermal Impedance**



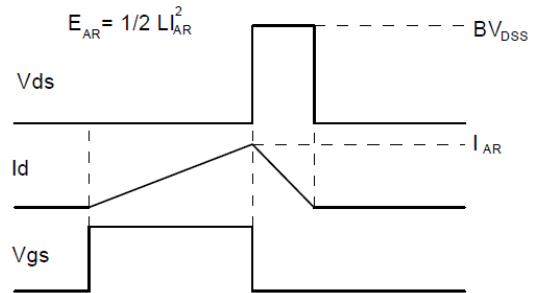
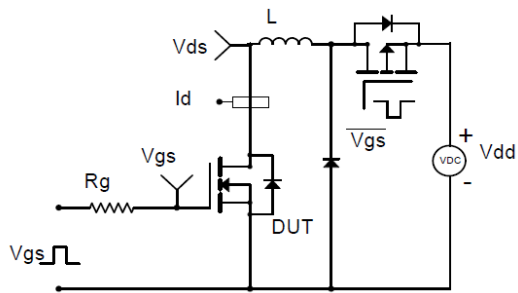
**Resistive Switching Test Circuit & Waveforms**



**Diode Recovery Test Circuit & Waveforms**



**Gate Charge Test Circuit & Waveform**

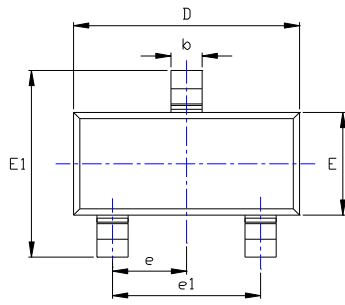


**Unclamped Inductive Switching (UIS) Test Circuit & Waveforms**

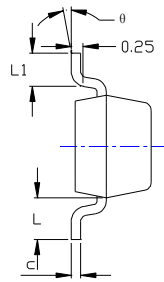


# YJL2301D

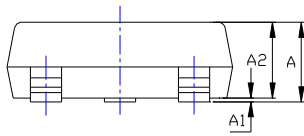
## ■ SOT-23 Package information



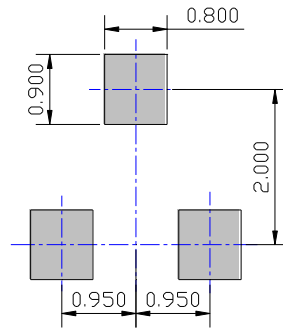
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

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	0.200	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.



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