

## P-Channel Enhancement Mode Field Effect Transistor

### Product Summary

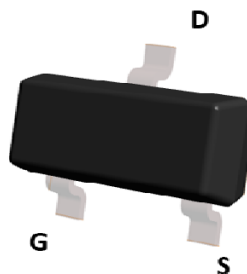
- $V_{DS}$  -20V
- $I_D$  -2A
- $R_{DS(ON)}$  (at  $V_{GS}=-4.5V$ ) < 120 mohm
- $R_{DS(ON)}$  (at  $V_{GS}=-2.5V$ ) < 150 mohm
- $R_{DS(ON)}$  (at  $V_{GS}=-1.8V$ ) < 195 mohm

### General Description

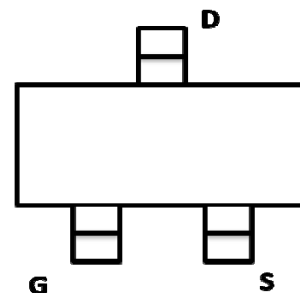
- Trench Power LV MOSFET technology
- Low  $R_{DS(ON)}$
- Low Gate Charge

### Applications

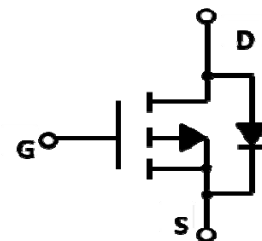
- Video monitor
- Power management



Top View



**SOT-23**



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

Parameter	Symbol	Maximum	Unit
Drain-source Voltage	$V_{DS}$	-20	V
Gate-source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current	$I_D$	$T_A=25^\circ C$ @ Steady State	-2
		$T_A=70^\circ C$ @ Steady State	-1.6
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	-8	A
Total Power Dissipation @ $T_A=25^\circ C$	$P_D$	0.7	W
Thermal Resistance Junction-to-Ambient <sup>B</sup>	$R_{\theta JA}$	178	$^\circ C/W$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ C$

### Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
JH2301F	F2	2301F	3000	30000	120000	7"reel

# JH2301F

## Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V, T_C=25^\circ\text{C}$			-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.7	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-2A$		95	120	m $\Omega$
		$V_{GS}=-2.5V, I_D=-1.6A$		120	150	
		$V_{GS}=-1.8V, I_D=-1.5A$		165	195	
Diode Forward Voltage	$V_{SD}$	$I_S=-2A, V_{GS}=0V$		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	$I_S$				-2	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$		260		pF
Output Capacitance	$C_{oss}$			44		
Reverse Transfer Capacitance	$C_{rss}$			29		
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=-4.5V, V_{DS}=-10V, I_D=-2A$		3.9		nC
Gate Source Charge	$Q_{gs}$			0.7		
Gate Drain Charge	$Q_{gd}$			0.9		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=-4.5V, V_{DD}=-10V, I_D=-1A, R_{GEN}=2.5\Omega$		12		ns
Turn-on Rise Time	$t_r$			54		
Turn-off Delay Time	$t_{D(off)}$			15		
Turn-off Fall Time	$t_f$			9		

A. A.Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

## Typical Performance Characteristics

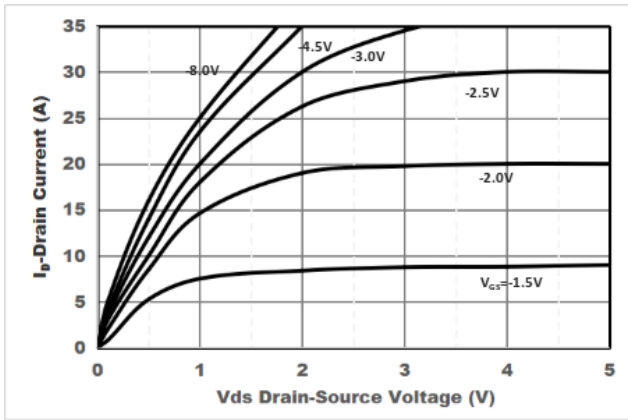


Figure1. Output Characteristics

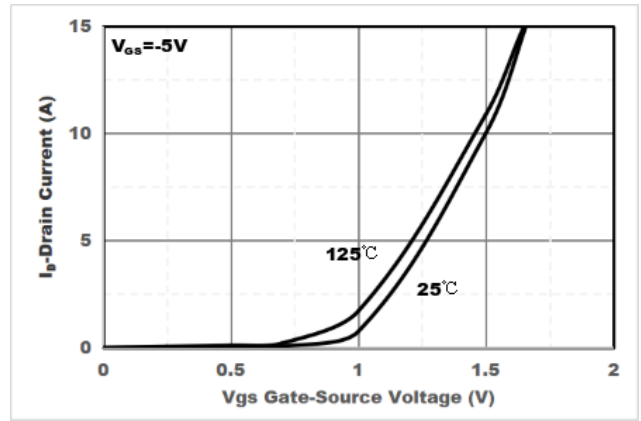


Figure2. Transfer Characteristics

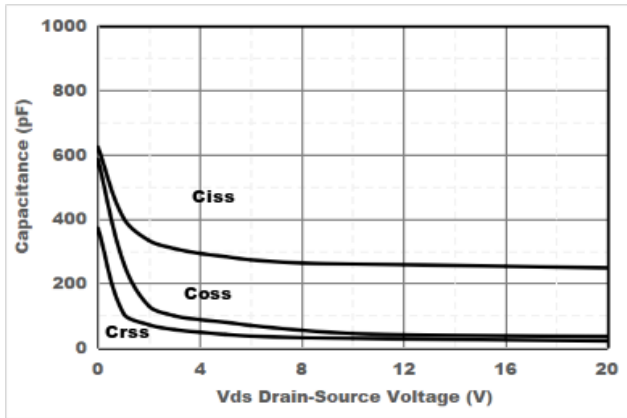


Figure3. Capacitance Characteristics

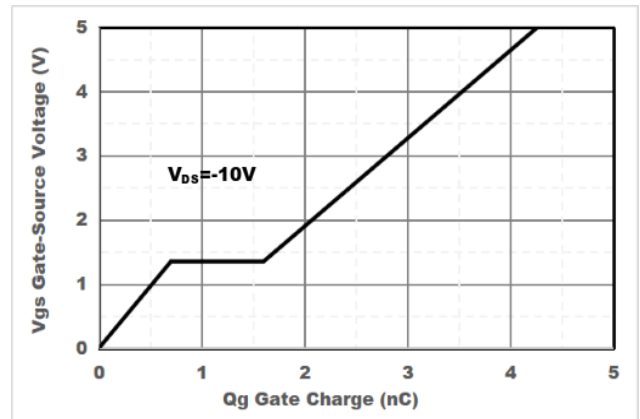


Figure4. Gate Charge

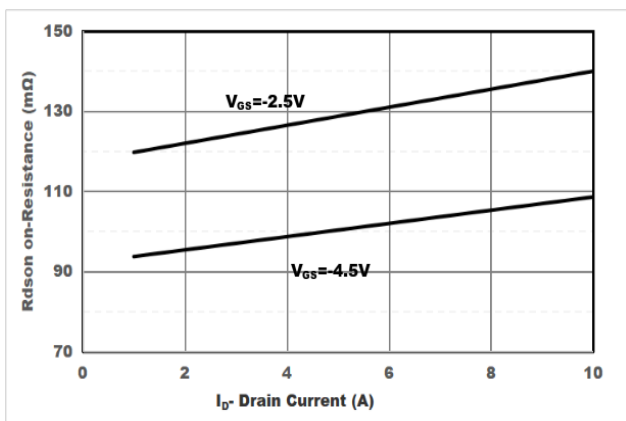


Figure5. Drain-Source on Resistance

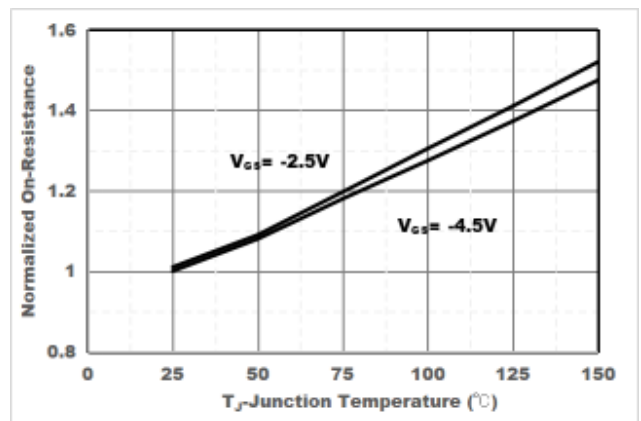


Figure6. Drain-Source on Resistance

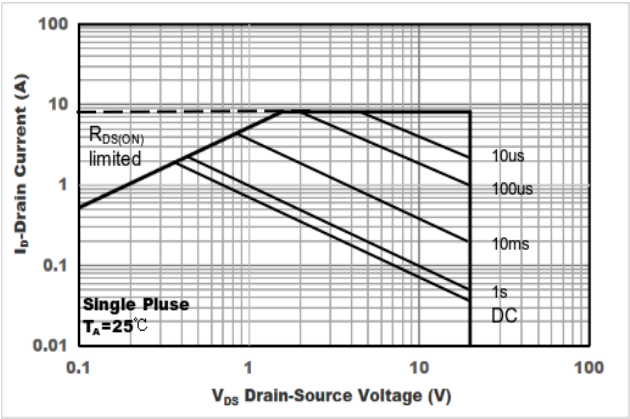


Figure7. Safe Operation Area

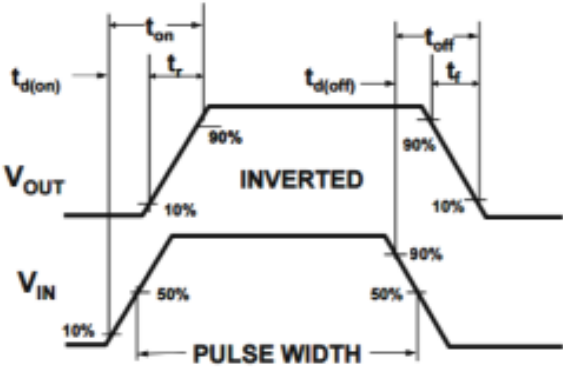
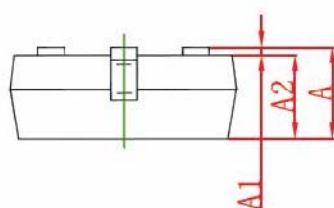
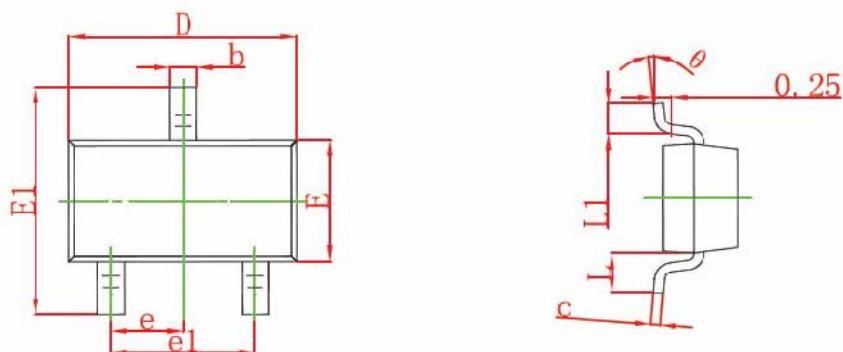


Figure8. Switching wave

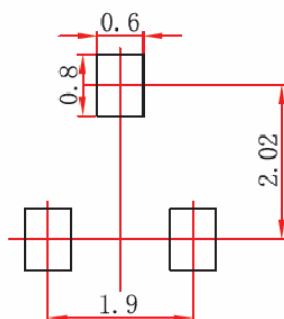
# JH2301F

## SOT-23 Package information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	8°

## SOT-23 Suggested Pad Layout



### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$ mm.
3. The pad layout is for reference purposes only.