SuperMOS – SOT-23 -30V BV_{DSS}, 42mΩ $R_{DS(on)}$, P-channel MOSFET

1. Description

The ESJ3401A is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product ESJ3401A is Pb-free.

2. Features

- -30V, $R_{DS(ON)}$=42mΩ(TYP.) @V_{GS}=-10V
  $R_{DS(ON)}$=49mΩ(TYP.) @V_{GS}=-4.5V
  $R_{DS(ON)}$=72mΩ(TYP.) @V_{GS}=-2.5V
- Fast Switching
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

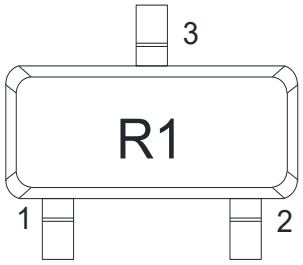
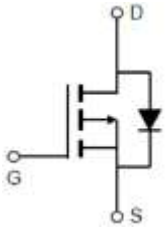
3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
ESJ3401A	SOT-23	R1	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
1	Gate		
2	Source		
3	Drain		

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6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 ˚C ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	-30	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_A=25°C	I_D	-3.9	A
	T_A=100°C		-2.4	
Maximum Power Dissipation	T_A=25°C	P_D	1.5	W
Pulsed Drain Current [a]		I_{DM}	-15.6	A
Junction-to-Ambient Thermal Resistance [b]		$R_{\theta JA}$	83	°C/W
Operating Junction Temperature		T_J	-55 to +150	°C
Storage Temperature Range		T_{stg}	-55 to +150	°C

Note:

a: Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

b: $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.

c: Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%.

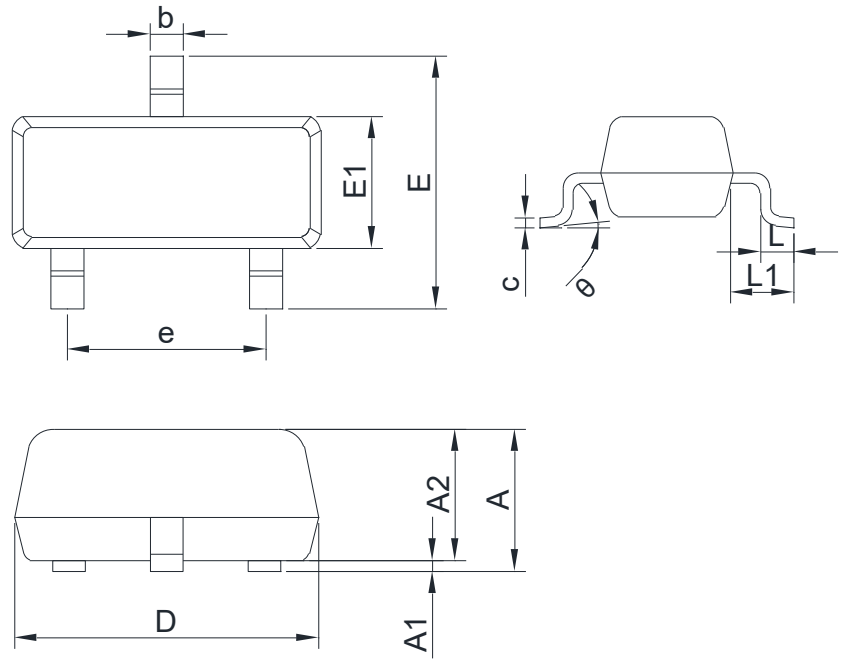
Electrical Characteristics

At TA = 25℃ unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=-250uA	-0.5	-0.9	-1.1	V
Drain-to-source On-resistance [c]	$R_{DS(on)}$	V_{GS}=-10V, I_D=-3.9A		42	58	mΩ
		V_{GS}=-4.5V, I_D=-3.5A		49	65	
		V_{GS}=-2.5V, I_D=-2.5A		72	90	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS} =-15V f=1MHz		510		pF
Output Capacitance	C_{OSS}			54		
Reverse Transfer Capacitance	C_{RSS}			47		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=0 to -4.5V V_{DS}=-15V, I_D =-3A		6		nC
Gate-to-Source Charge	Q_{GS}			1.4		
Gate-to-Drain Charge	Q_{GD}			2		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS}=-4.5V, V_{DS}=-15V I_D=-3A, R_G=3Ω		10		ns
Rise Time	t_r			80		
Turn-Off Delay Time	$t_{d(OFF)}$			120		
Fall Time	t_f			350		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-2A			-1.2	V

7. Dimension (SOT-23)

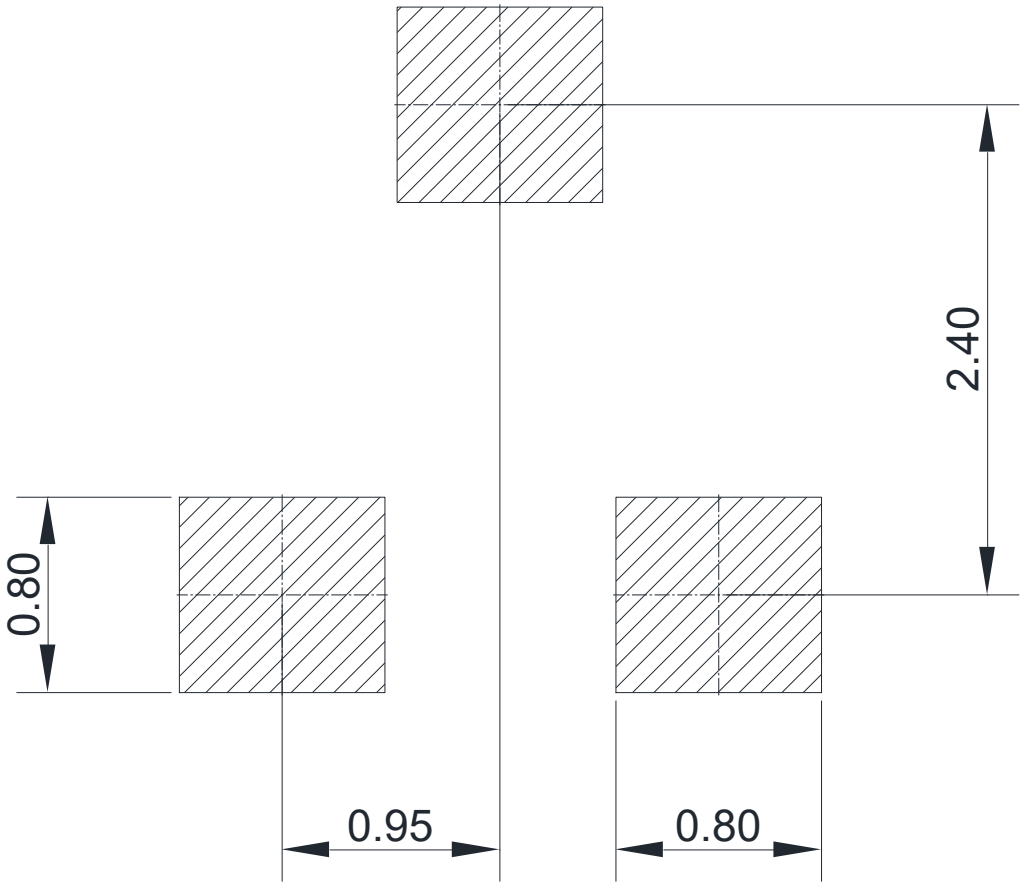
POD(Z)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	0.90	1.20	E	2.25	2.55
A1	0.00	0.10	E1	1.20	1.40
A2	0.90	1.10	e	1.80	2.00
b	0.30	0.50	L	0.30	0.50
c	0.07	0.18	L1	0.475	0.625
D	2.80	3.04	θ	0°	8°

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8. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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