FMOS3401A

List

FMOS3401A

30V P-Channel Enhancement Mode MOSFET

Features

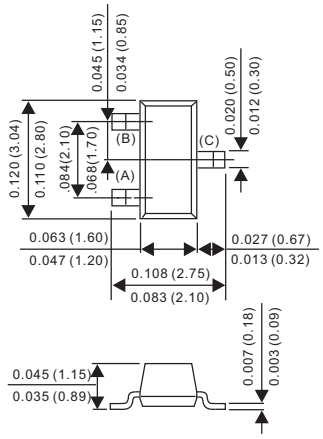
- High dense cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Lead-free parts meet RoHS requirments
- Suffix "-H" dinicates Halogen-free part, ex.FMOS3401A-H.

Application

- Load switch for portable devices
- DC/DC converter

Package outline

SOT-23



Dimensions in inches and (millimeters)

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Maximum ratings (AT T_A=25°C unless otherwise noted)

PARAMETER	Symbol	MIN.	TYP.	MAX.	UNIT
Drain-source voltage	V_{DS}			-30	V
Continuous drain current	I_D			-4.2	A
Gate-source voltage	V_{GS}			±12	V
Power dissipation	P_D			400	mW
Thermal resistance junction to ambient(t<5s)	$R_{\theta JA}$		313		°C/W
Operation junction temperature range	T_J	-55		+150	°C
Storage temperature range	T_{STG}	-55		+150	°C

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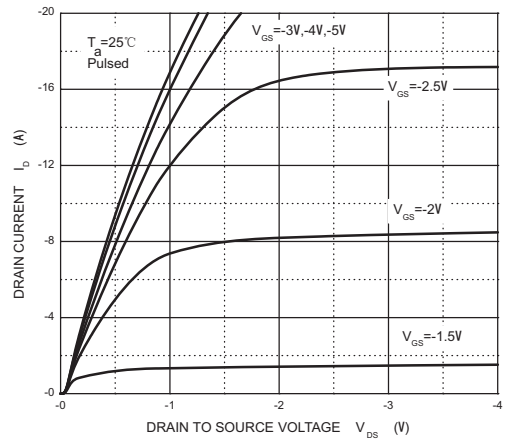
Electrical characteristics (At T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Off characteristics						
Drain-source breakdown voltage	V_{GS} = 0V, I_D =-250μA	$V_{(BR)DSS}$	-30			V
Zero gate voltage drain current	V_{DS} =-24V,V_{GS} = 0V	I_{DSS}			-1.0	μA
Gate-source leakage current	V_{GS} =±12V, V_{DS} = 0V	I_{GSS}			±100	nA
On characteristics						
Gate threshold voltage	V_{DS} =V_{GS}, I_D =-250μA	$V_{GS(th)}$	-0.7		-1.3	V
Drain-source on-resistance (note 1)	V_{GS} =-10V, I_D =-4.2A V_{GS} =-4.5V, I_D =-4.0A V_{GS} =-2.5V, I_D =-1.0A	$R_{DS(on)}$		41 47 61	60 70 85	mΩ
Forward tranconductance (note 1)	V_{DS} =-5.0V, I_D =-5.0A	g_{FS}	7.0			S
Dynamic characteristics (note 2)						
Intput capacitance	V_{DS} =-15V,V_{GS} =0V,f =1MHz	C_{iss}		1050		pF
Output capacitance		C_{oss}		127		
Reverse transfer capacitance		C_{rss}		85		
Switching characteristics (note 2)						
Turn-on delay time	V_{GS}=-10V,V_{DS}=-15V, R_L=3.6Ω,R_{GEN}=6.0Ω	$t_{d(on)}$			6.5	ns
Turn-on rise time		t_r			3.5	
Turn-off delay time		$t_{d(off)}$			40	
Turn-off fall time		t_f			13	
Drain-source diode characteristics and maximum ratings						
Diode forward voltage (note 1)	I_S=-1.0A, V_{GS} = 0V	V_{SD}			-1.0	V

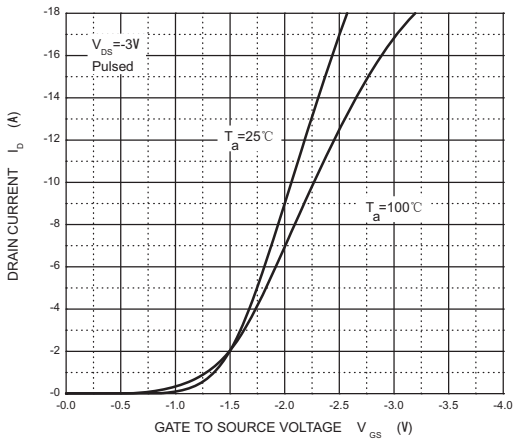
Notes :
1. Pulse test : pulse width≤300μs, duty cycle≤2%.
2. These parameters have no way to verify.

Rating and characteristic curves (FMOS3401A)

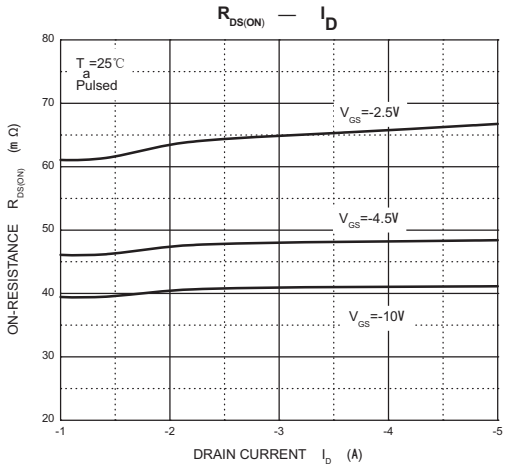
Output Characteristics



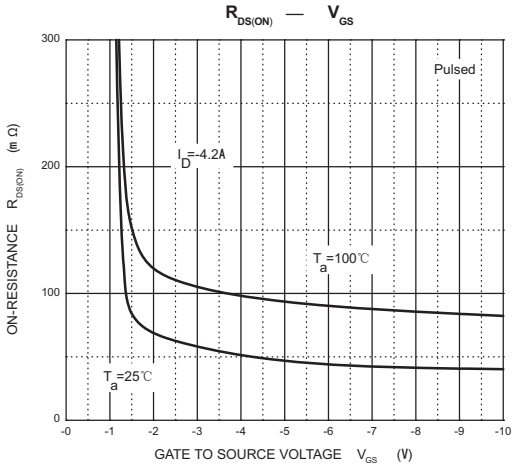
Transfer Characteristics



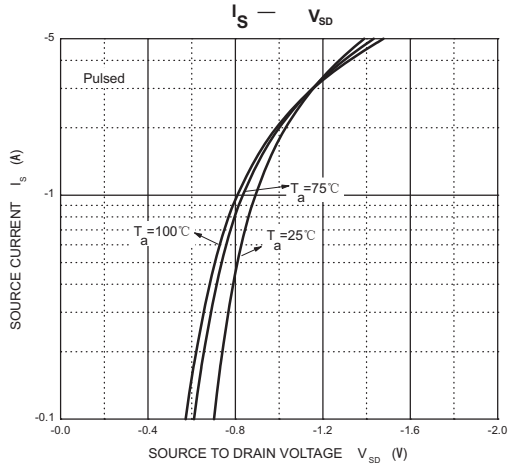
$R_{DS(ON)}$ — I_D



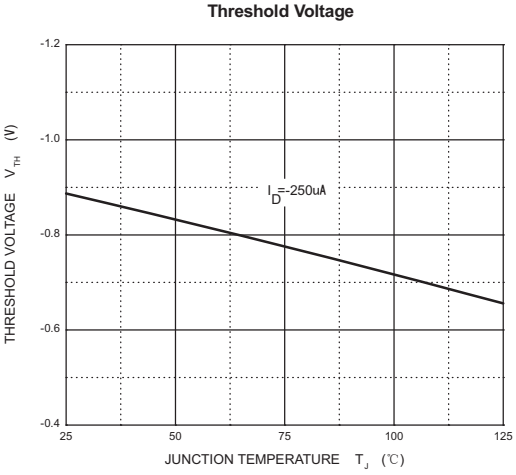
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage



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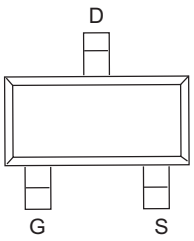
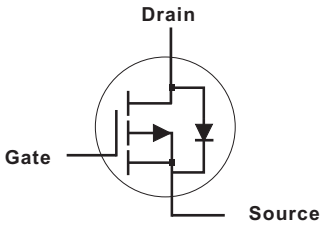
Pinning information

Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source		

Marking

Type number	Marking code
FMOS3401A	R1A ,3401,R1

Suggested solder pad layout

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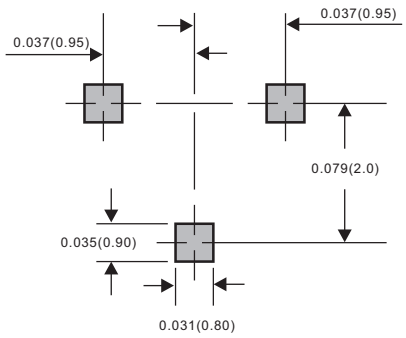

Dimensions in inches and (millimeters)

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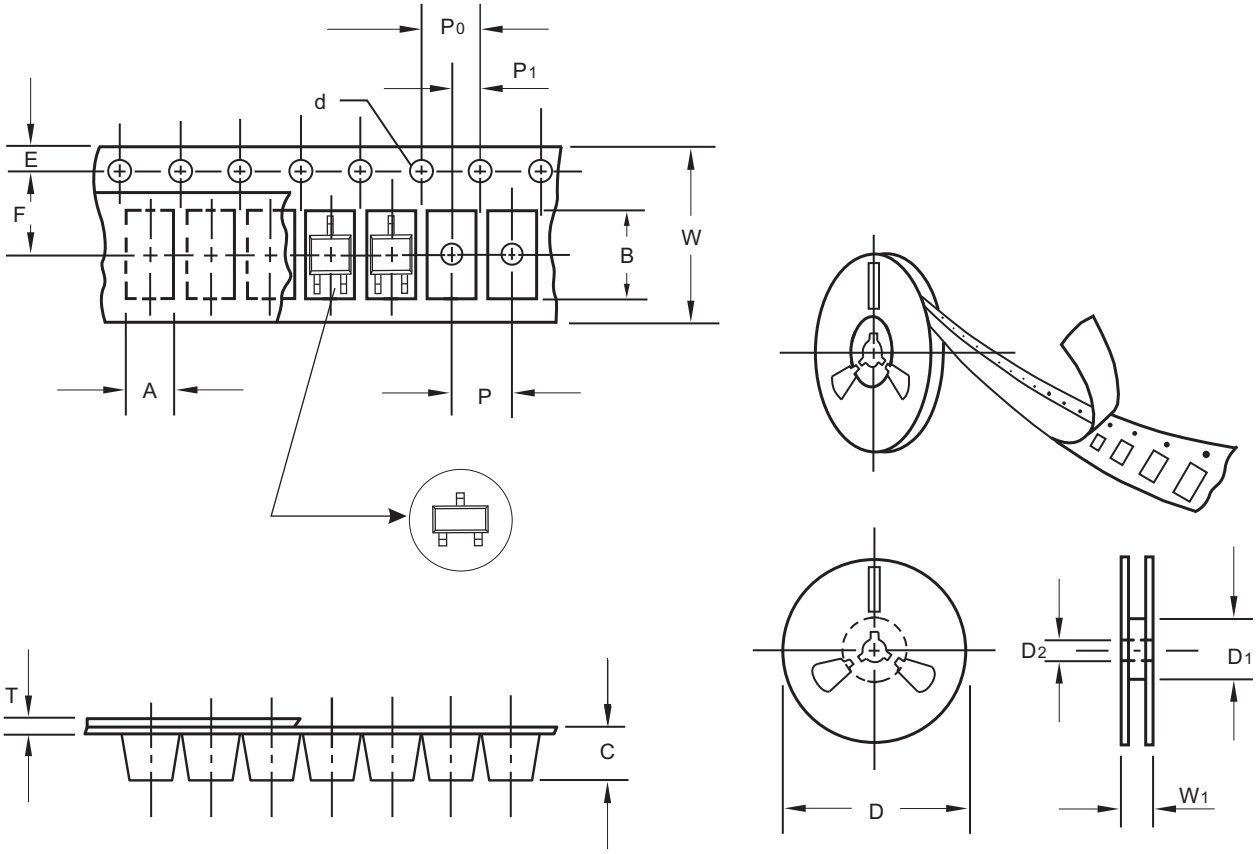
Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	54.40
Feed hole diameter	D_2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	9.50

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

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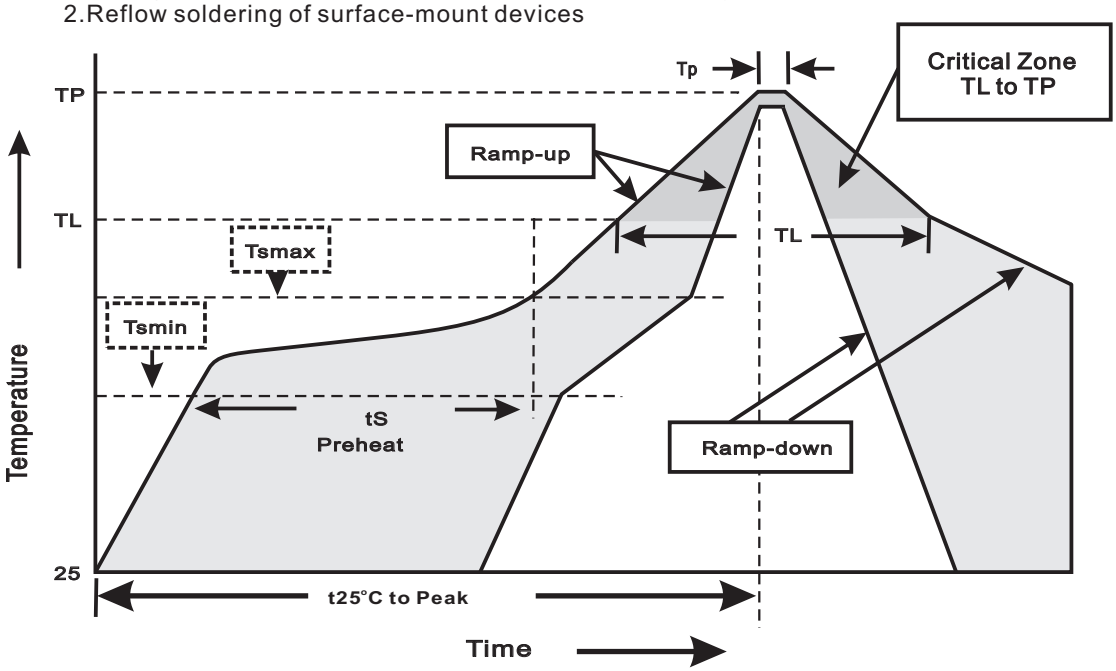
Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	383*257*387	240,000	11.6

Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%

2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax to T_L -Ramp-upRate	 <3°C/sec
Time maintained above: -Temperature(T_L) -Time(t_L)	 217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes