FMOS2324

List

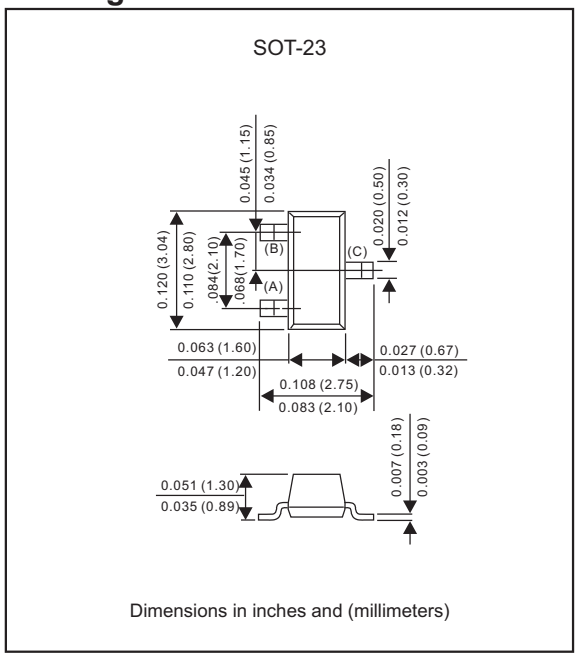
FMOS2324

100V N-Channel Enhancement Mode Power MOSFET

Features

- TrenchFET Power MOSFET
- Low $R_{DS(ON)}$
- Surface mount package
- Load Switch
- DC/DC Converter
- LED Backlighting in LCD TVs
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex.FMOS2324-H.

Package outline



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}			100	V
Continuous drain current	I_D			2.0	A
Pulsed drain current (note 1)	I_{DM}			8.0	
Gate-source voltage	V_{GS}			±20	V
Power dissipation	P_D			0.35	W
Thermal resistance junction to ambient	$R_{\theta JA}$		357		°C/W
Operation junction temperature range	T_J	-55		+150	°C
Storage temperature range	T_{STG}	-55		+150	°C

Notes :

1. Repetitive rating : Pulse width limited by junction temperature.

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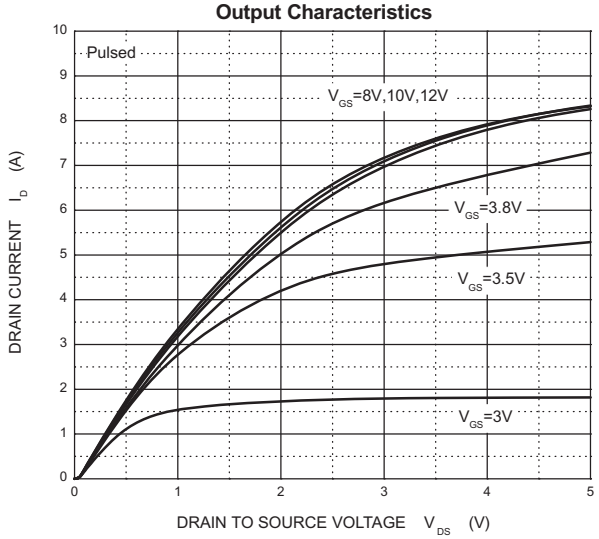
Electrical characteristics (At T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	V_{GS} = 0V, I_D =250μA	$V_{(BR)DSS}$	100			V
Zero gate voltage drain current	V_{DS} =100V,V_{GS} = 0V	I_{DSS}			1.0	μA
Gate-body leakage current	V_{GS} =±20V, V_{DS} = 0V	I_{GSS}			±100	nA
Gate threshold voltage (note 1)	V_{DS} =V_{GS}, I_D =250μA	$V_{GS(th)}$	1.2		2.8	V
Drain-source on-resistance (note 1)	V_{GS} =10V, I_D =1.5A V_{GS} =6.0V, I_D =1A V_{GS} =4.5V, I_D =0.5A	$R_{DS(on)}$			234 267 278	mΩ
Forward tranconductance (note 1)	V_{DS} =20V, I_D =1.5A	g_{FS}		2.0		sec
Diode forward voltage (note 1)	I_S=1.3A, V_{GS} = 0V	V_{SD}			1.2	V
DYNAMIC CHARACTERISTICS (note 2)						
Intput capacitance	V_{DS} =50V,V_{GS} =0V,f =1MHz	C_{iss}		190		pF
Output capacitance		C_{oss}		22		
Reverse transfer capacitance		C_{rss}		13		
Gate Resistance	f=1MHz	R_g	0.3		2.8	Ω
SWITCHING CHARACTERISTICS (note 2)						
Total Gate Charge	V_{DS} =50V,V_{GS} =4.5V,I_D =1.6A	Q_g			5.8	nC
Gate-Source Charge		Q_{gs}		0.75		
Gate-Drain Charge		Q_{gd}		1.4		
Turn-on delay time	V_{DD}=50V,V_{GEN}=4.5V, R_L=39Ω,R_G=1Ω,I_D=1.3A	$t_{d(on)}$			45	ns
Turn-on rise time		t_r			39	
Turn-off delay time		$t_{d(off)}$			26	
Turn-off fall time		t_f			20	

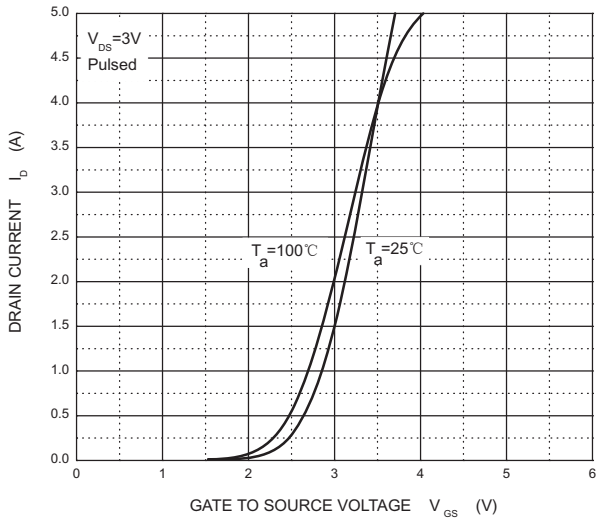
Notes :
1. Pulse Test : Pulse Width≤300μs, Duty Cycle≤0.5%.
2. Guaranteed by design, not subject to producting.

Rating and characteristic curves (FMOS2324)

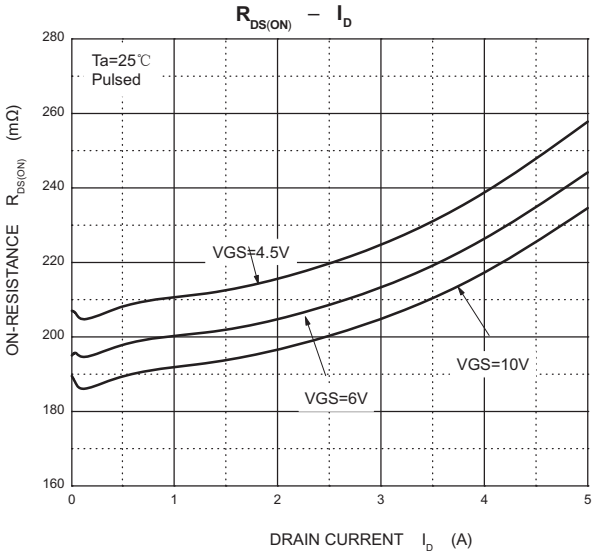
Output Characteristics



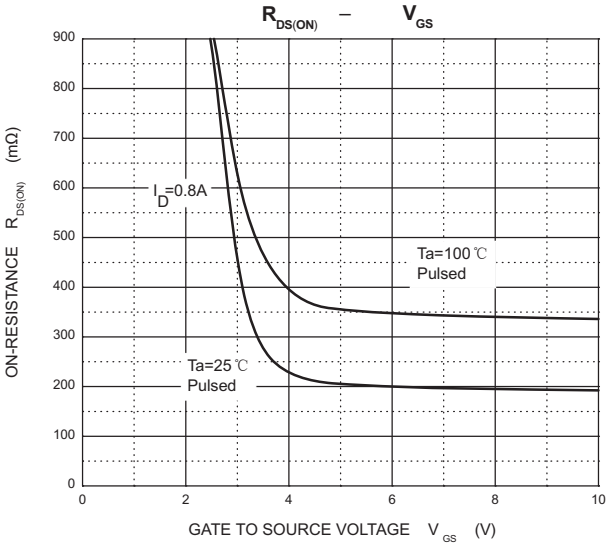
Transfer Characteristics



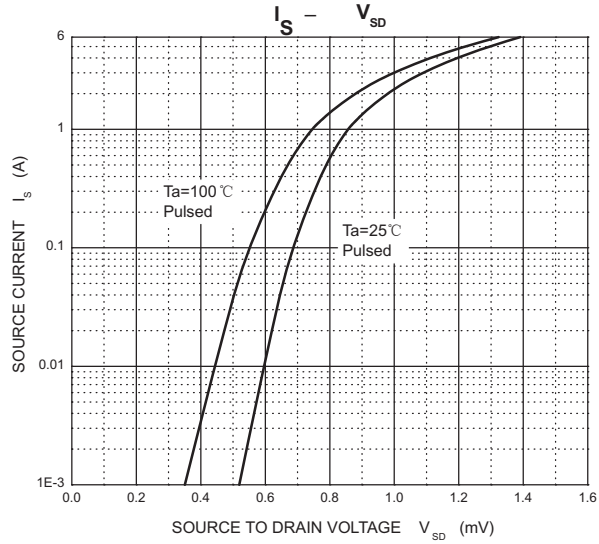
$R_{DS(ON)}$ – I_D



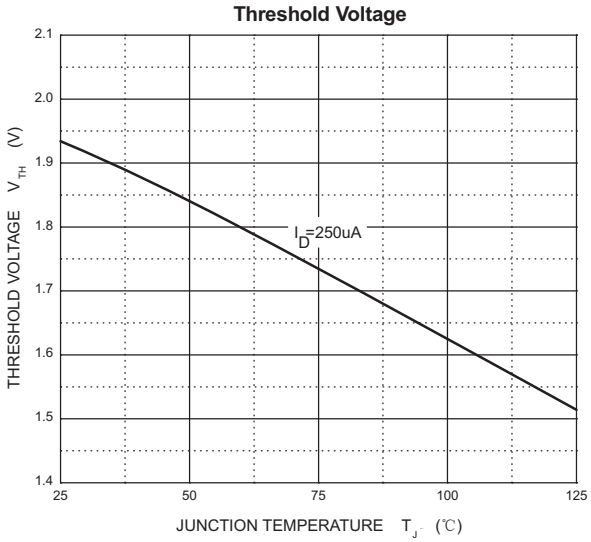
$R_{DS(ON)}$ – V_{GS}



I_S – V_{SD}



Threshold Voltage



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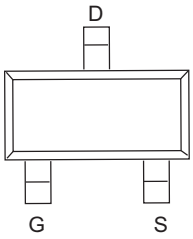
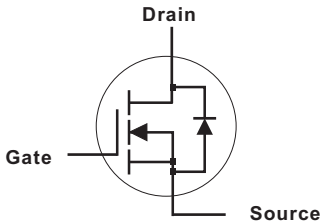
Pinning information

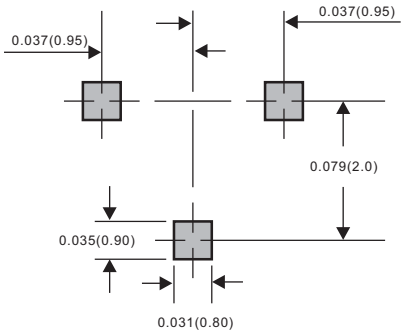
Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source		

Marking

Type number	Marking code
FMOS2324	S24

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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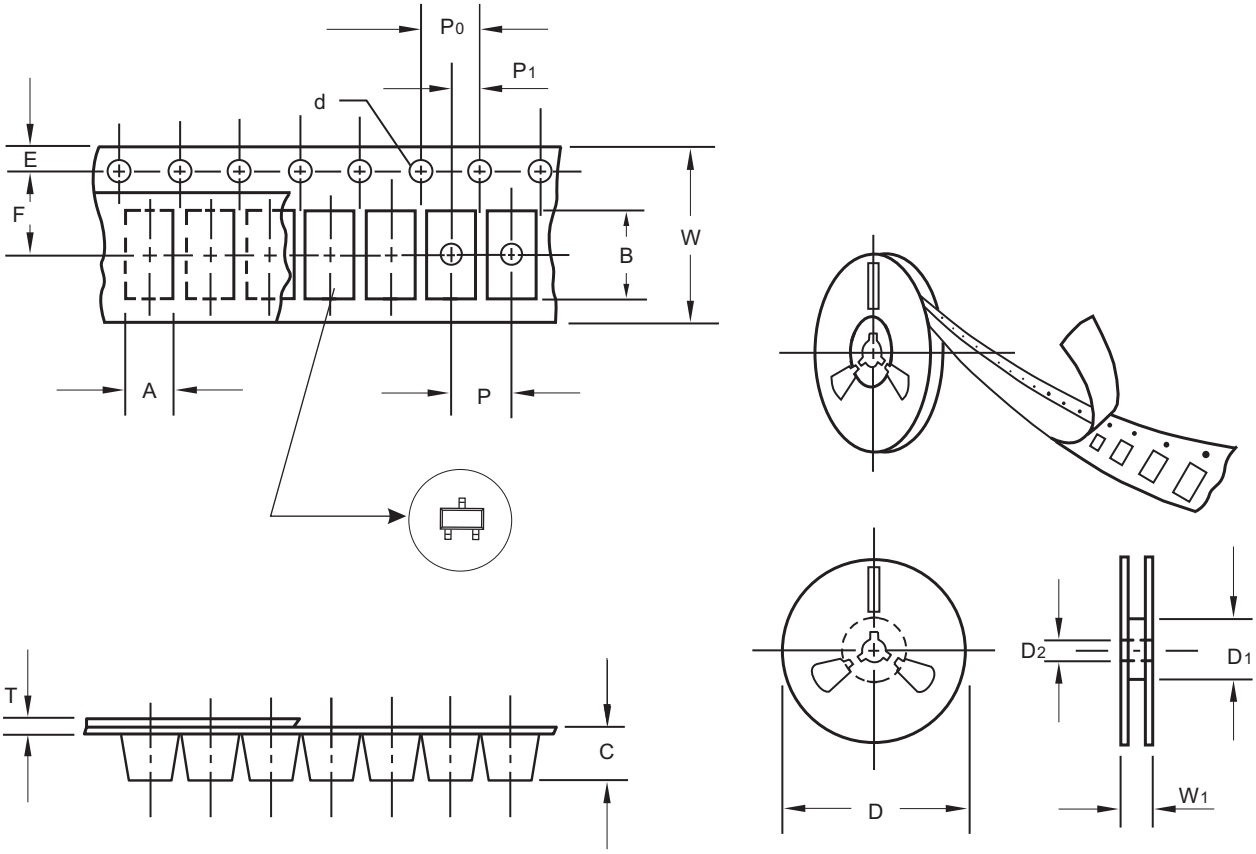
Packing information



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	55.00
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	12.0

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

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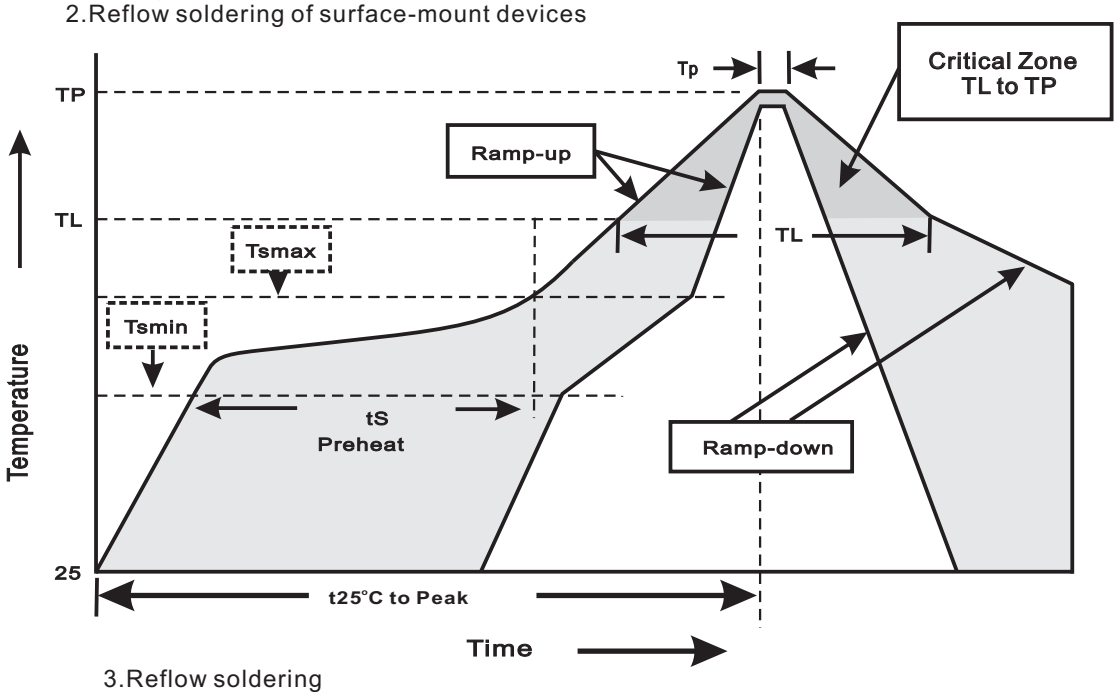
Reel packing

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*183*123	178	382*262*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