

FMOS2306-Q1

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FMOS2306-Q1

30V/3.16A

N-Channel Plastic-Encapsulate MOSFET

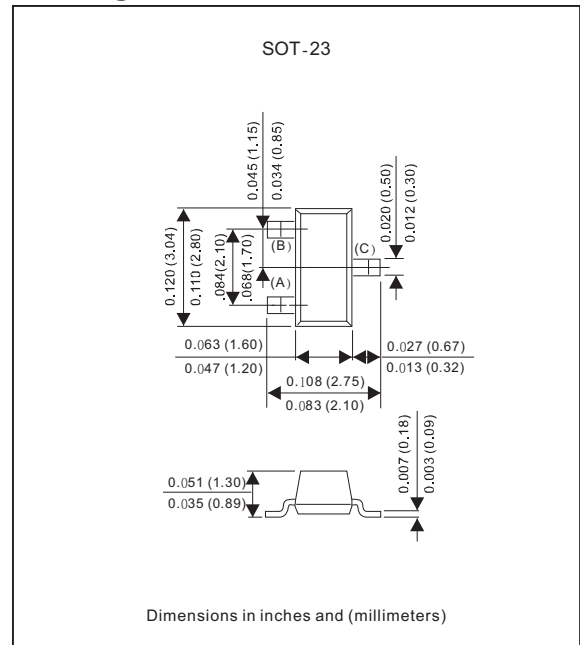
Features

- High power and current handing capability.
- Lead switch for portable devices.
- Surface mount package.
- Battery switch.
- Lead free parts meet RoHS requirements.
- Qualified to AEC-Q101 standards for high reliability.
- Suffix "-H" indicates Halogen free parts, ex. FMOS2306-Q1-H

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

Package outline

Maximum ratings (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current-Continuous ($T_J=150^{\circ}\text{C}$) ^{a,b}	I_D	3.16	A
Pulsed drain current	I_{DM}	20	A
Continuous source current-Continuous (Diode conduction) ^{a,b}	I_S	0.62	A
Power dissipation ($T_C=25^{\circ}\text{C}$)	P_D	0.75	W
Operating junction temperature range	T_J	+150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$
Thermal resistance Junction to ambient	$R_{\theta JA}$	100	$^{\circ}\text{C/W}$

Notes:

a. Surface mounted on 1" x 1" FR4 board, $t \leq 5\text{s}$.

b. Pulsed width limited by maximum junction temperature.

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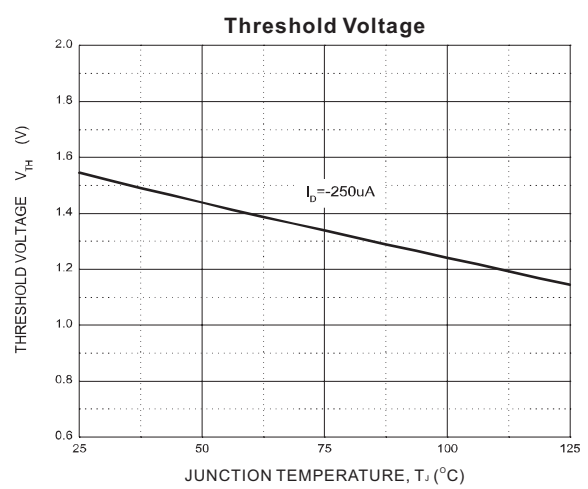
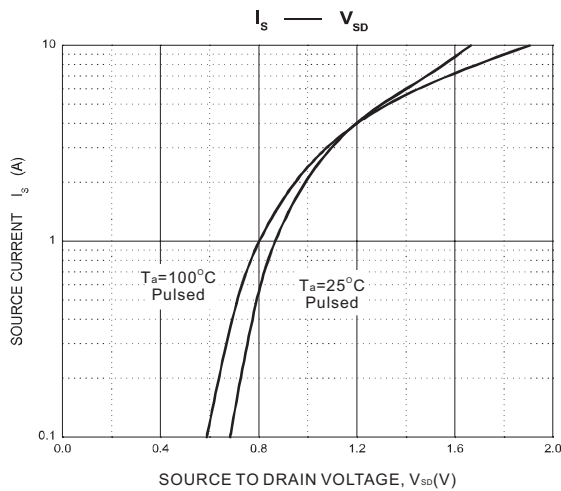
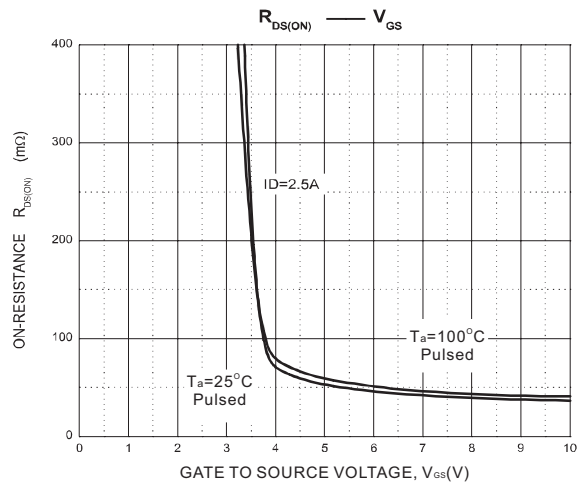
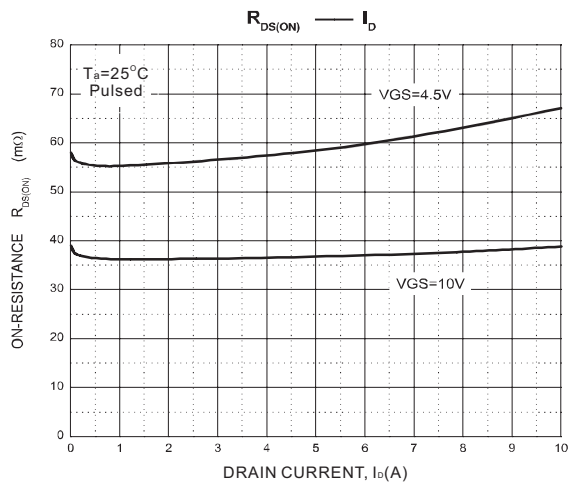
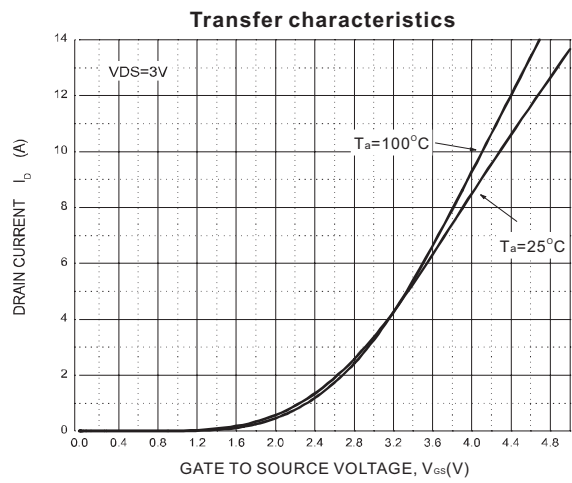
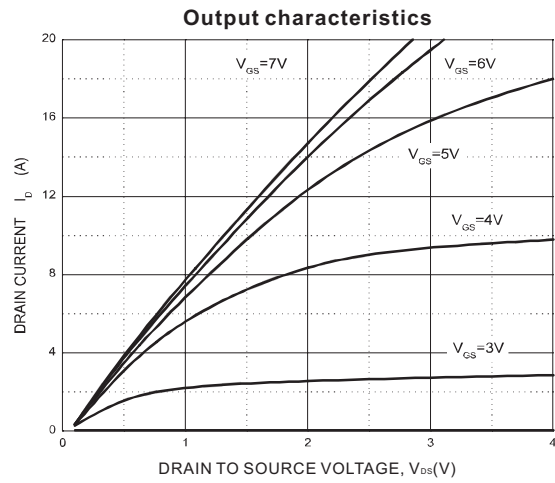
Electrical characteristics (AT T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Drain-source leakage current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			0.5	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
On characteristics						
Gate threshold voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250μA	1.0		3.0	V
Static drain-source on-resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =2.8A		52	65	mΩ
		V _{GS} =10V, I _D =3.5A		38	47	
Forward transconductance ^a	g _{FS}	V _{GS} =1.8V, I _D =0.2A		7.0		S
Diode forward voltage	V _{SD}	V _{GS} =0V, I _S =1.25A		0.8	1.2	V
Dynamic parameters						
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1.0MHZ		305		pF
Out capacitance	C _{oss}			65		
Reverse transfer capacitance	C _{rss}			29		
Switching parameters						
Gate charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _b =0.5A		3.0	4.5	nC
Total gate charge	Q _{gt}	V _{DS} =15V, V _{GS} =10V, I _b =2.5A		6	9	
Gate to source charge	Q _{gs}			1.6		
Gate to drain charge	Q _{gd}			0.6		
Gate Resistance	R _g	f=1MHz	2.5	5	7.5	Ω
Turn-on delay time	T _{d(on)}	V _{DD} =15V, R _L =15Ω, I _D ≈1A V _{GS} =10V, R _g =6Ω		7	11	ns
Rise time	T _r			12	18	
Turn-off delay time	T _{d(off)}			14	25	
Fall time	T _f			6	10	

Notes :

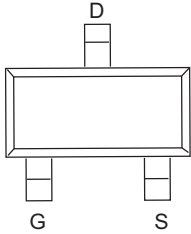
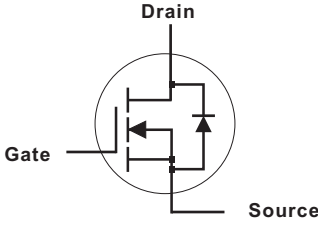
a. Pulse Test : Pulse width ≤ 300μs, duty cycle ≤ 2%.

Rating and characteristics curves(FMOS2306-Q1)



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Pinning information

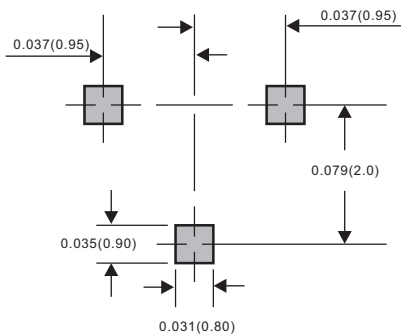
Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source		

Marking

Type number	Marking code
FMOS2306-Q1	2306

Suggested solder pad layout

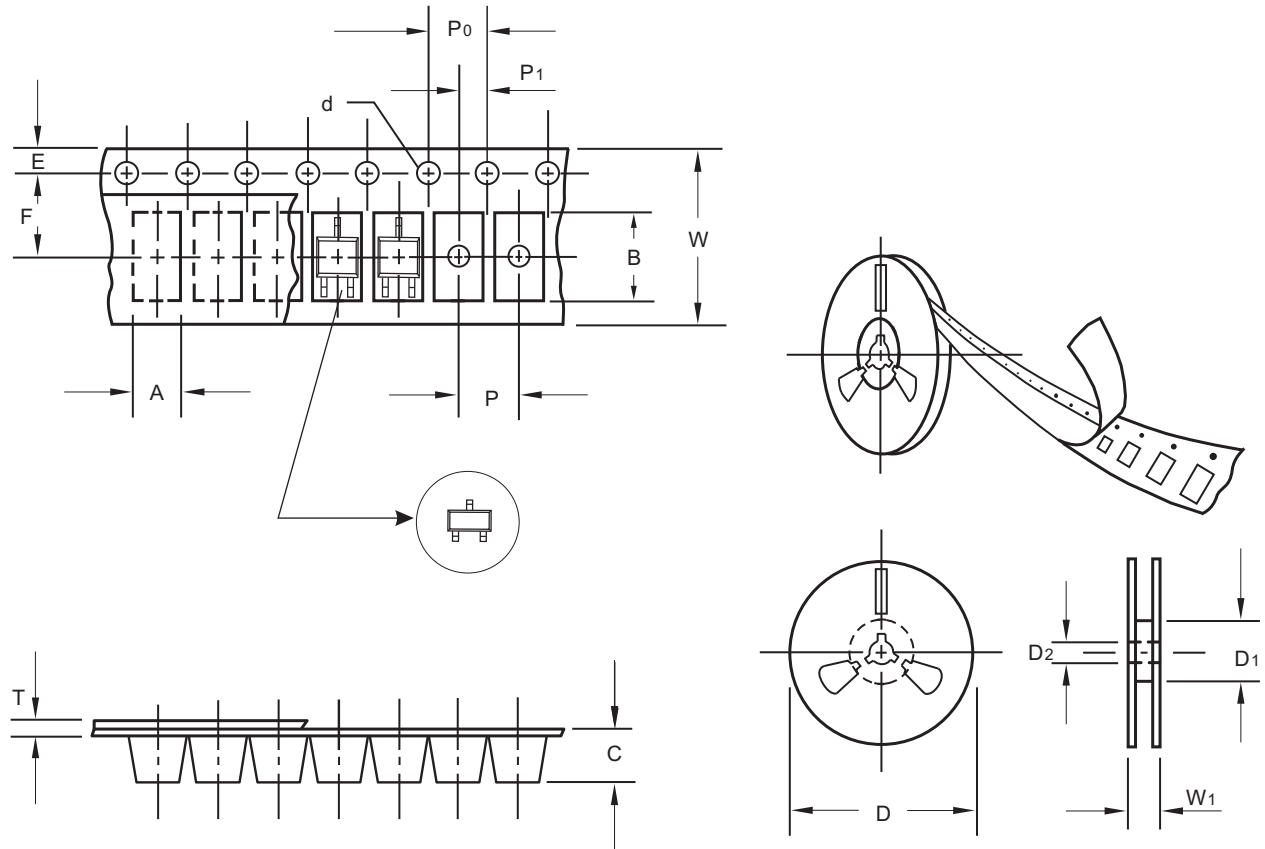
SOT-23



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	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	55.00
Feed hole diameter	D2	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	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	12.0

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

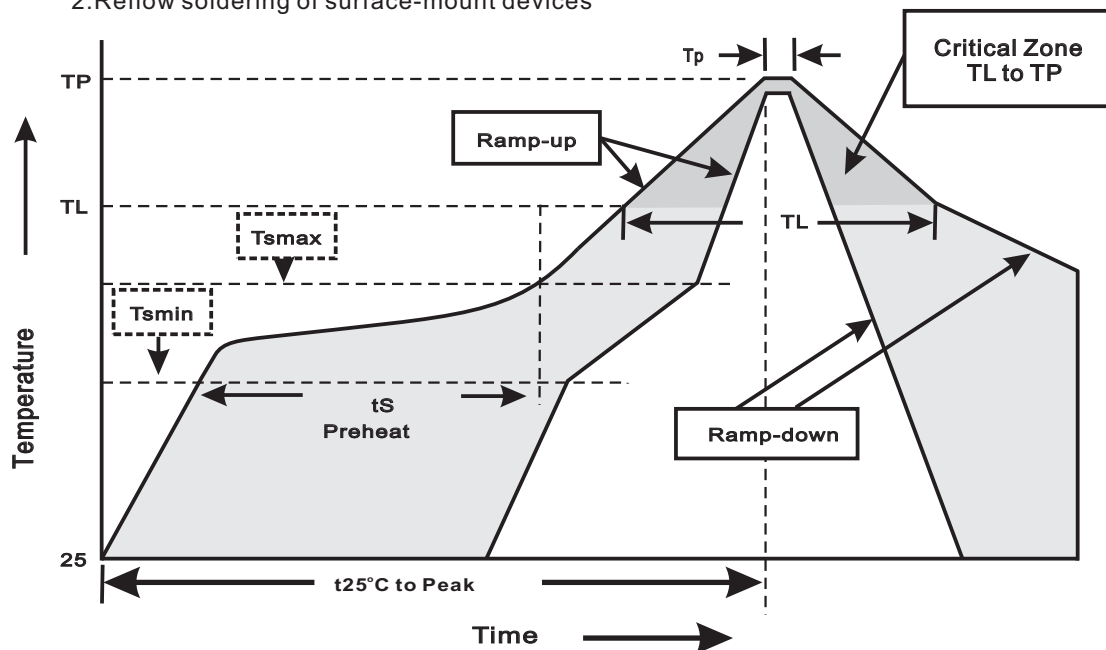
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Reel packing

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)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min($T_{\text{smín}}$) -Temperature Max($T_{\text{smáx}}$) -Time(min to max)(t_S)	150°C 200°C 60~120sec
$T_{\text{smáx}}$ to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
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	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$