FMOS2310B-H

List

FMOS2310B-H

3.0A 60V N-Channel
Enhancement Mode Power MOSFET

Features

- V_{DS} = 60V, I_D = 3.0A.
- $R_{DS(ON)}$ < 90mΩ, V_{GS} = 10V, I_D = 3.0A.
- $R_{DS(ON)}$ < 110mΩ, V_{GS} = 4.5V, I_D = 3.0A.
- Low threshold voltage .
- Fast switching speed.
- Lead-free parts meet RoHS requirements.

Applications

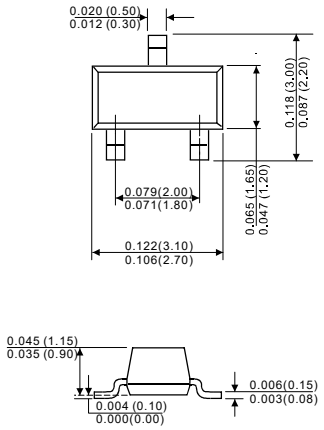
- Load switch for portable devices.
- Voltage controlled small signal switch.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.
- Mounting Position : Any.

Package outline

SOT-23



Dimensions in inches and (millimeters)

Maximum Ratings (At T_A=25°C Unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain source voltage	V_{DS}	60	V
Gate source voltage	V_{GS}	±20	V
Drain current continuous	I_D	3	A
Pulsed drain current (Note 1)	I_{DM}	10	A
Power dissipation (Note 2)	P_D	1.25	W
Thermal resistance, junction to ambient (Note 2)	$R_{\theta JA}$	100	°C/W
Operating junction temperature range	T_J	-55 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Note: 1. Pulse width≤ 100μs, duty cycle≤ 1%, limited by $T_{J(Max)}$.
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1 inch square copper plate in still air.

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

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	I_D=250μA, V_{GS}=0V	BV_{DSS}	60			V
Drain-source leakage current	V_{DS}=60V, V_{GS}=0V	I_{DSS}			1	μA
Gate-source leakage current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}			±100	nA
On characteristics						
Gate threshold voltage	V_{DS}=V_{GS}, I_D=250μA	$V_{GS(TH)}$	1		2.2	V
Static drain-source on-state resistance	V_{GS}=10V, I_D=3A	$R_{DS(ON)}$		75	90	mΩ
	V_{GS}=4.5V, I_D=3A			90	110	
Forward transconductance	V_{DS}=5V, I_D=3A	g_{FS}		6		S
Dynamic parameters						
Input capacitance	V_{GS}=0V, V_{DS}=30V, f=1.0MHz	C_{iss}		410		pF
Out capacitance		C_{oss}		35		
Reverse transfer capacitance		C_{rss}		32		
Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1.0MHz	R_g		15		Ω
Switching parameters						
Total gate charge	V_{GS}=10V, V_{DS}=30V, I_D=3A	Q_g		12		nC
	V_{GS}=4.5V, V_{DS}=30V, I_D=3A			5.9		
Gate to source charge	V_{GS}=10V, V_{DS}=30V, I_D=3A	Q_{gs}		2.8		
Gate to drain charge		Q_{gd}		1.6		
Turn-on delay time	V_{DS}=30V, V_{GS}=10V, R_G=4.5Ω, I_D=3A	$t_{d(on)}$		10		ns
Rise time		t_r		23		
Turn-off delay time		$t_{d(off)}$		34		
Fall time		t_f		4.6		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage	I_{SD}=3A, V_{GS}=0V	V_{SD}			1	V
Body diode reverse recovery time	I_{SD}= 3A, di/dt=100A/μs	t_{rr}		34		nS
Pulsed drain-source diode forward current	I_{SD}= 3A, di/dt=100A/μs	Q_{rr}		4.6		nC

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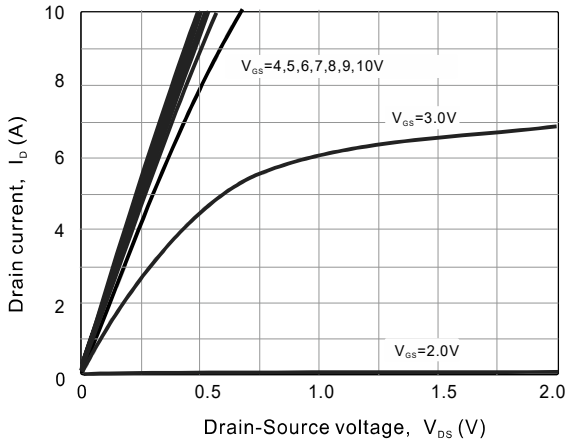
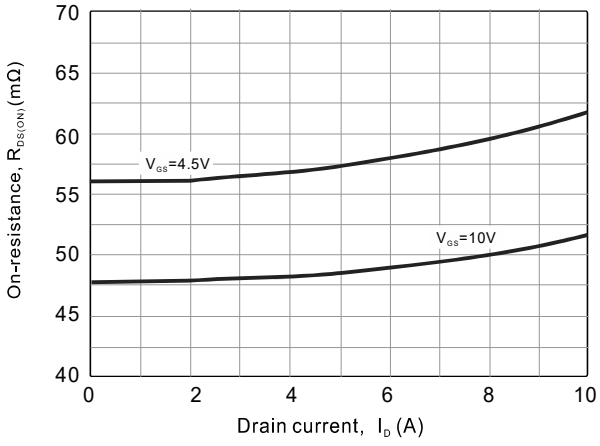
Rating and Characteristic Curves

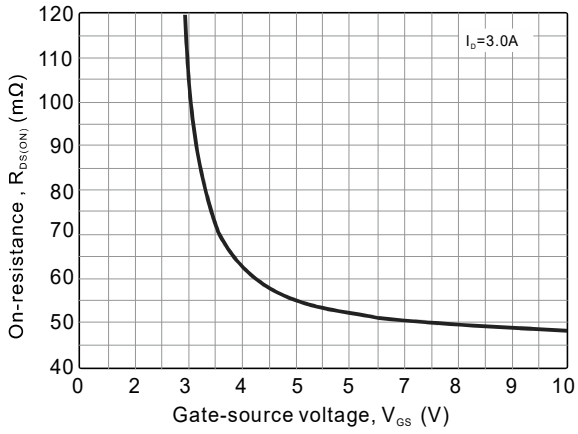
Output characteristics



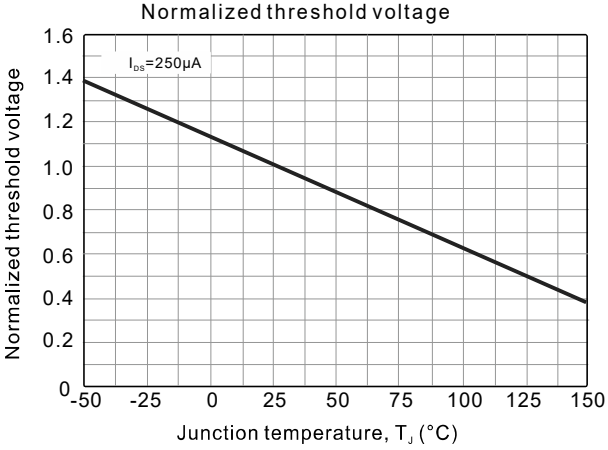
On-resistance



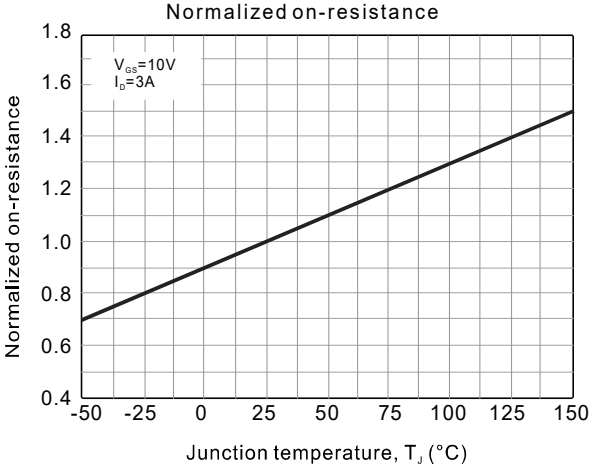
Transfer characteristics



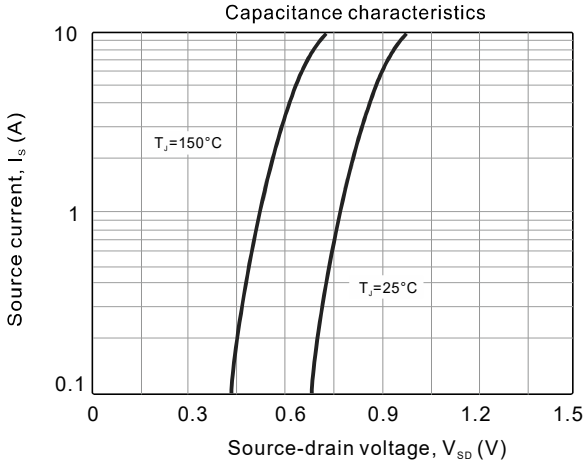
Normalized threshold voltage



Normalized on-resistance



Capacitance characteristics



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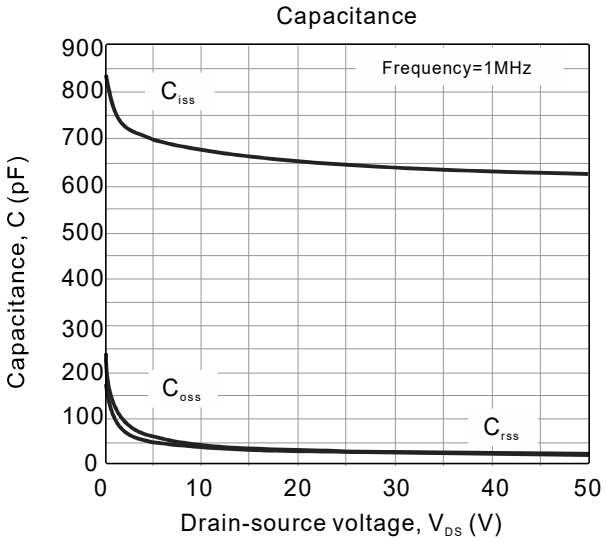
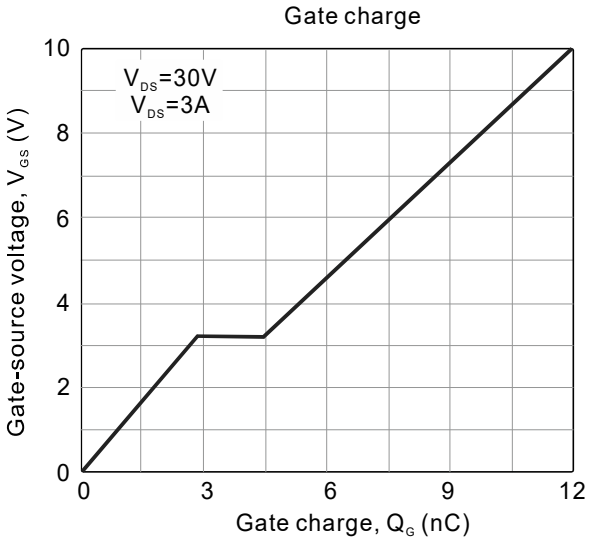
Rating and Characteristic Curves





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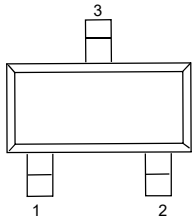
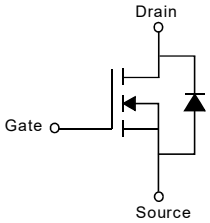
Pinning information

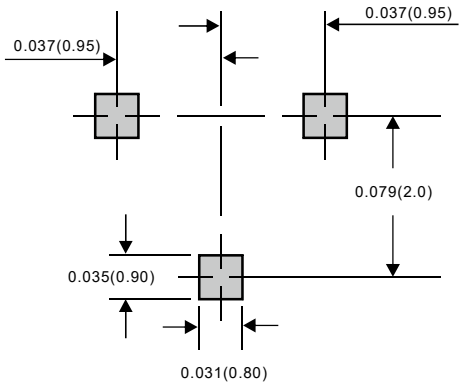
Pin	Simplified outline	Symbol
Pin 1 Gate Pin 2 Source Pin 3 Drain		

Marking

Type number	Marking code
FMOS2310B	S10

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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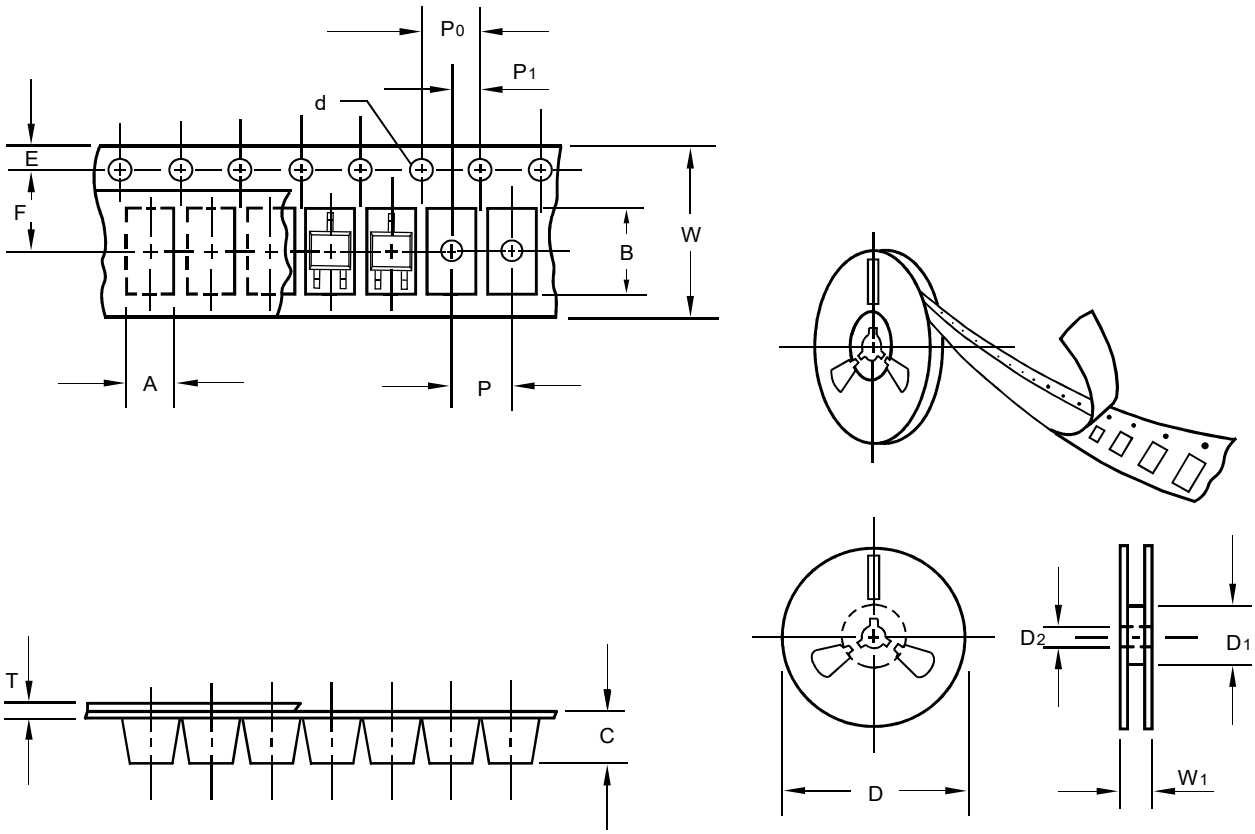
Packing information



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	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	12.3

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

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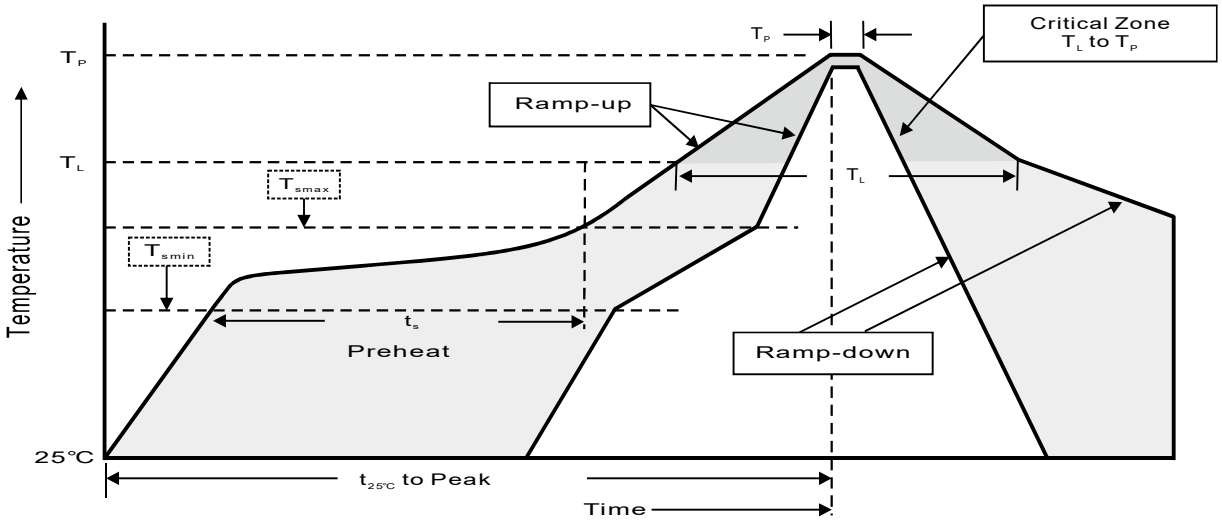
Reel packing

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)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000

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 ℃/sec
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (Min to Max) (t_s)	 150℃ 200℃ 60 ~ 120 sec
T_{smax} to T_L - Ramp-up rate	 < 3 ℃/sec
Time maintained above : - Temperature (T_L) - Time (T_L)	 217℃ 60 ~ 260 sec
Peak temperature (T_P)	255 ℃ -0/+5℃
Time with 5℃ of actual peak temperature (T_P)	10 ~30 sec
Ramp-down rate	< 6 ℃/sec
Time 25℃ to peak temperature	< 6 minutes