FMOS8810E

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FMOS8810E

20V N-Channel Enhancement Mode MOSFET- ESD Protection

Features

- $R_{DS(ON)}$≦26mΩ@V_{GS}=10V
- $R_{DS(ON)}$≦27mΩ@V_{GS}=4.5V
- $R_{DS(ON)}$≦30mΩ@V_{GS}=3,8V
- $R_{DS(ON)}$≦33mΩ@V_{GS}=2.5V
- $R_{DS(ON)}$≦70mΩ@V_{GS}=1,8V
- Low $R_{DS(ON)}$
- ESD protected Gate
- Lead-free parts meet RoHS requirements
- Suffix "-H" for Halogen-free part, ex. FMOS8810E-H

Application

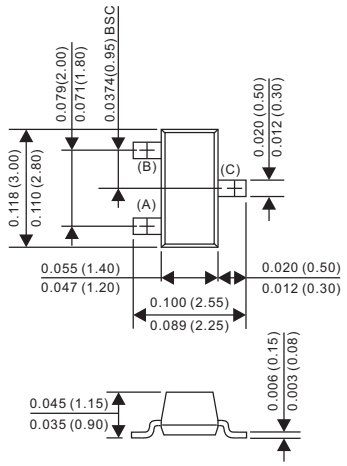
- Load/Power Switching
- Small Portable Electronic

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

SOT-23



Dimensions in inches and (millimeters)

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

Parameter	Conditions	SYMBOL	MIN.	TYP.	MAX.	Unit
Drain-source voltage		V_{DSS}			20	V
Gate-source voltage		V_{GS}			±12	V
Continuous drain current		I_D			5	A
Pulsed drain current		I_{DM}			20	A
Power dissipation		P_D			0.35	W
Thermal resistance	Junction to ambient	$R_{\theta JA}$			357	°C/W
Operating junction and storage temperature		T_J, 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
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	V_{GS} = 0V, I_D = 250μA	$V_{(BR)DSS}$	20			V
Gate-source threshold voltage (Note1)	V_{DS} = V_{GS} , I_D = 100uA	$V_{GS(th)}$	0.4	0.8	1.0	V
Zero gate voltage drai n current	V_{DS} = 16V, V_{GS} = 0V	I_{DSS}			1	μA
Gate-source leakage current	V_{GS} = ±4.5V, V_{DS} = 0V	I_{GSS}			±1	μA
	V_{GS} = ±8.0V, V_{DS} = 0V				±10	
Drain-source on-resistance (Note1)	V_{GS} = 10V, I_D = 7.0A	$R_{DS(on)}$		14	26	mΩ
	V_{GS} = 4.5V, I_D = 6.6A			16	27	
	V_{GS} = 3.8V, I_D = 6.0A			17	30	
	V_{GS} = 2.5V, I_D = 5.5A			23	33	
	V_{GS} = 1.8V, I_D = 3.0A			48	70	
Forward tranconductance (Note1)	V_{DS} = 5.0V, I_D = 7.0A,	g_{fs}	9	13.6		S
DYNAMIC CHARACTERISTICS (Note 2)						
Input capacitance	V_{DS} = 10V, V_{GS} = 0V, f = 1.0 MHz	C_{iss}		740		pF
Output capacitance		C_{oss}		141		
Reverse transfer capacitance		C_{rss}		136		
Total gate charge	V_{DS} = 10V, V_{GS} = 4.5V, I_D = 7.0A	Q_g		15		nC
Gate-source charge		Q_{gs}		0.8		
Gate-drain charge		Q_{gd}		3.2		
Gate resistance	V_{DS} = 0V, V_{GS} = 0V, f = 1.0 MHz	R_g		2		Ω
SWITCHING CHARACTERISTICS (Note 2)						
Turn-on delay time	V_{GS} = 5V, V_{DD} = 10V,R_L = 1.35Ω, R_{GEN} = 3Ω	td(on)		6		ns
Turn-on rise time		tr		13		
Turn-off delay time		td(off)		52		
Turn-off fall time		tr		16		
SOURCE-DRAIN DIODE CHARACTERISTICS (Note1)						
Body diode voltage	I_S = 1A, V_{GS} = 0V	V_{SD}		0.77	1.2	V

Notes

1. Pulse Test : Pulse width ≦ 300μs,duty cycle ≦ 0.5%
2. Guaranteed by design, not subject to production testing.

Rating and characteristic curves (FMOS8810E)

Fig.1 Output Characteristics

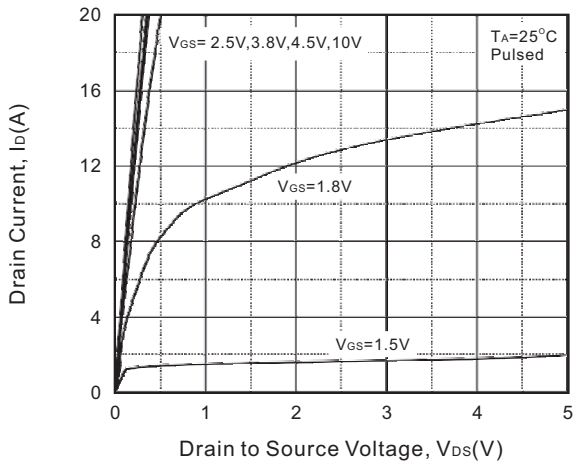


Fig.2 Transfer Characteristics

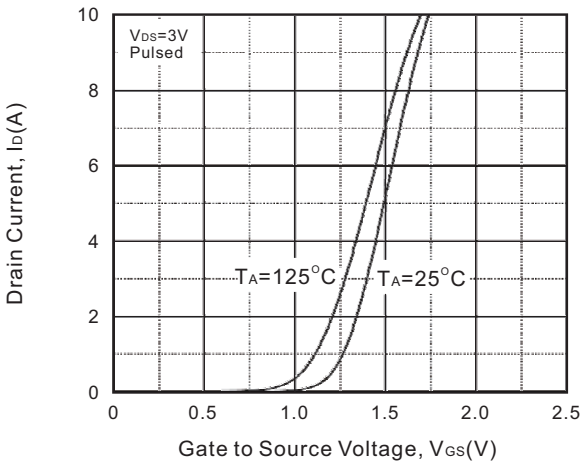


Fig.3 On-Resistance VS Drain Current

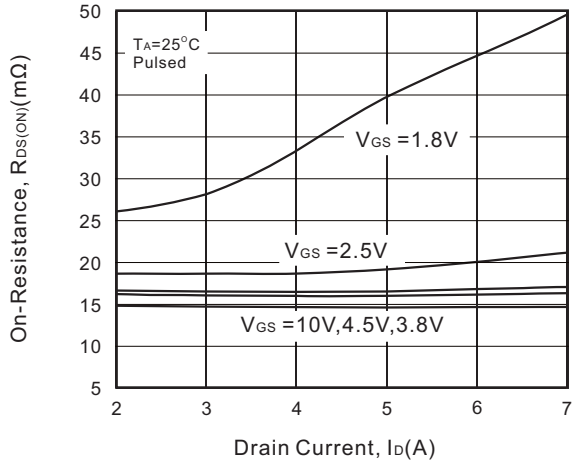


Fig.4 On-Resistance VS Drain-Source Voltage

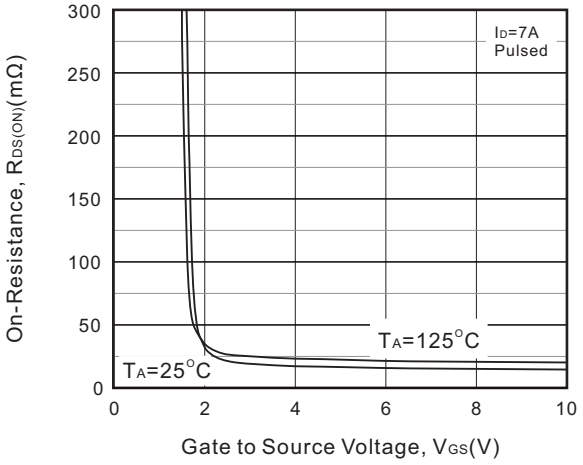


Fig.5 Threshold Voltage

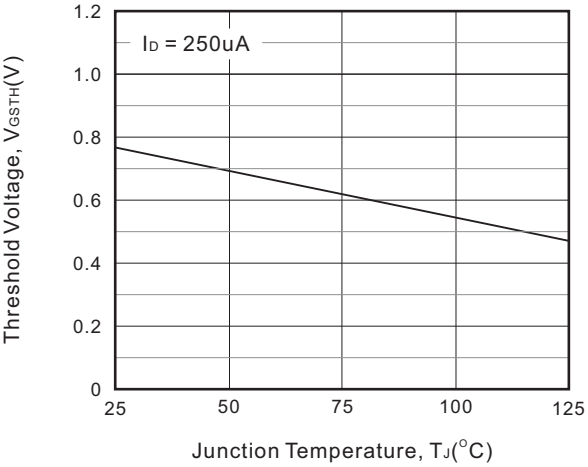
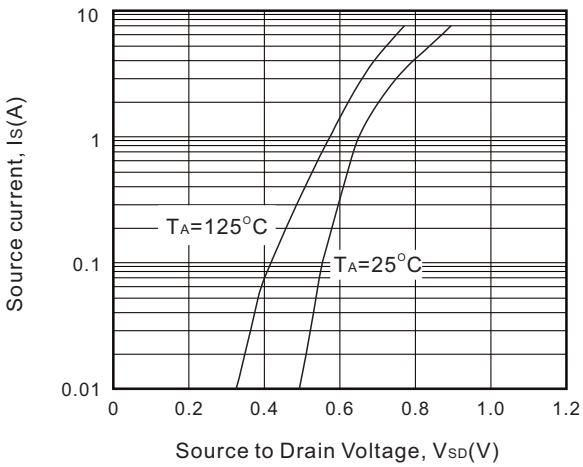
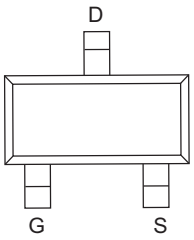
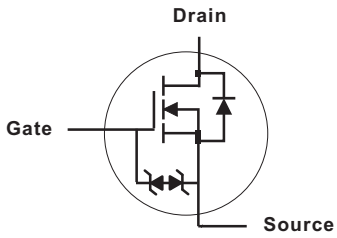


Fig.6 Body Diode Forward Voltage Variation With Source Current



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Pinning information

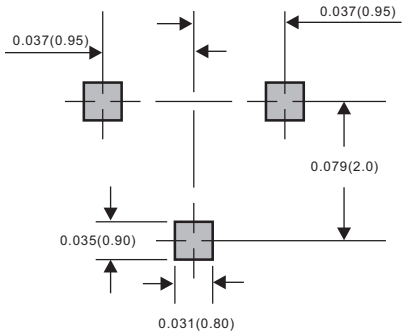
Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source		

Marking

Type number	Marking code
FMOS8810E	8810

Suggested solder pad layout

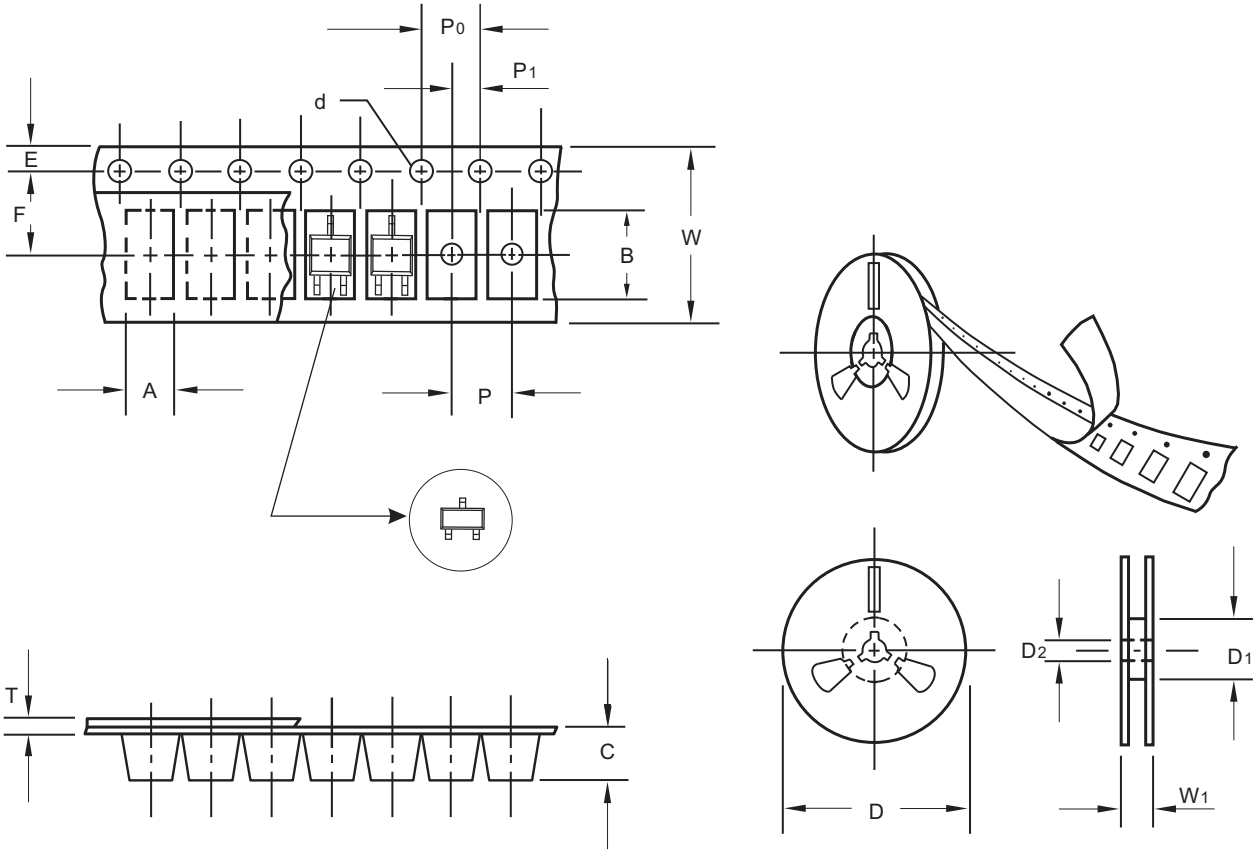
SOT-23



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	12.0

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

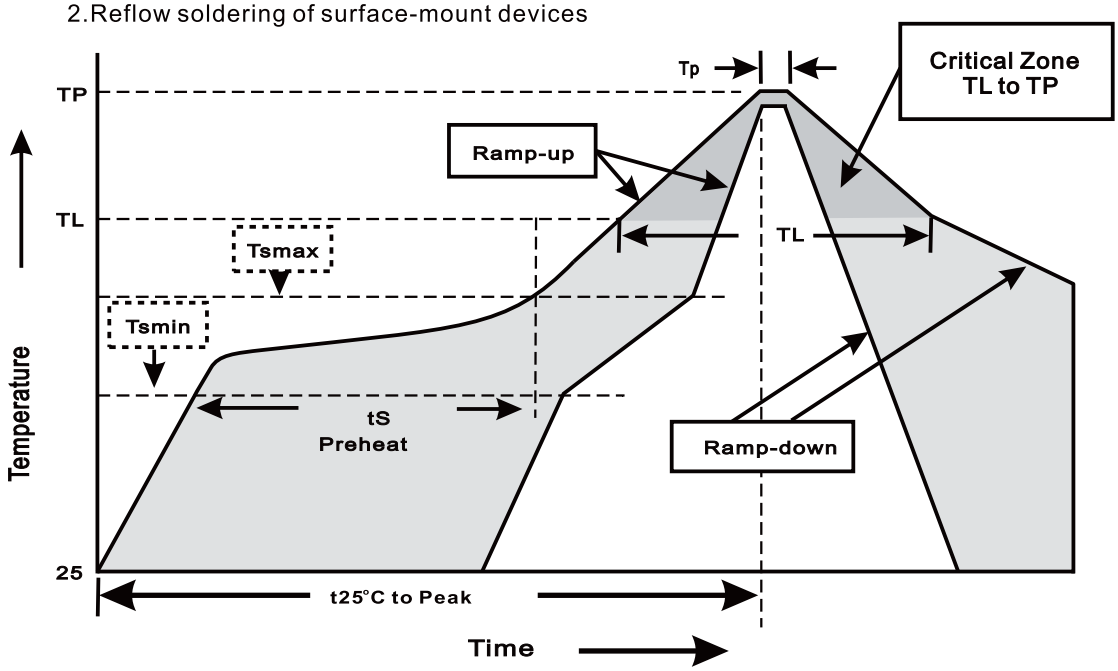
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Reel packing

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*123*183	178	382*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