FMSBSS123

List

List.. 1

Package outline.. 2

Features.. 2

Mechanical data.. 2

Maximum ratings .... 2~3

Rating and characteristic curves.. 4

Pinning information.. 5

Marking.. 5

Suggested solder pad layout.. 5

Packing information.. 6

Reel packing.. 7

Suggested thermal profiles for soldering processes.. 7

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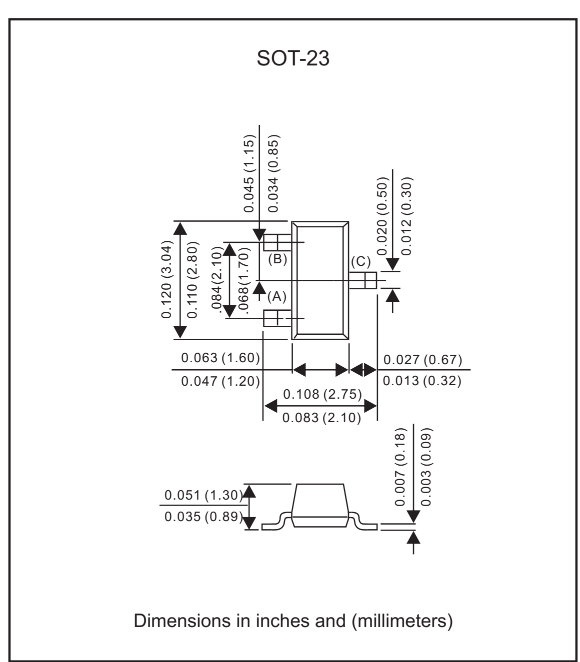
FMSBSS123

100V N-Channel Enhancement
Mode Power MOSFET

Package outline



Features

- Low on-resistance $R_{DS(ON)}$ = 6.0Ω
- Low input capacitance : 20pF
- Fast switching speed : 20ns
- Low output capacitance : 9pF
- Low threshole : 2.8V
- In compliance with EU RoHS 2002/95/EC directives
- Suffix "-H" indicates Halogen-free part, ex.FMSBSS123-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

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

PARAMETER	Symbol	MIN.	TYP.	MAX.	UNIT
Drain-source voltage	V_{DSS}			100	Vdc
Drain current-Continuous *1	I_D			170	mAdc
-pulsed*2	I_{DM}			680	
Gate- source voltage-Continuous Non-repetitive（tp≤50us）	V_{GS} V_{GSM}			±20 ±40	Vdc Vpk
Total Device Dissipation FR-5 Board *3 TA=25°C	P_D			225	mW
Derate above 25°C				1.8	mW/°C
Typical Thermal resistance junction to ambient	$R_{\theta JA}$		556		°C/W
Operation junction temperature	T_J	-55		+150	°C
Storage temperature	T_{STG}	-55		+150	°C

*1: The Power Dissipation of the package may result in a lower continuous drain current.
*2: Pulse Width ≤ 300us, Duty Cycle ≤ 2.0%
*3: FR-5=1.0x0.75x0.062 in.

FMSBSS123

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= 250uAdc	BV_{DSS}	100			Vdc
Zero gate voltage drain current	V_{GS} = 0V, V_{DS} = 100Vdc, T_J = 25°C	I_{DSS}			15	μAdc
	V_{GS} = 0V, V_{DS} = 100Vdc, T_J = 125°C				60	
Gate-body leakage current	V_{GS} = 20Vdc, V_{DS}=0	I_{GSS}			50	nAdc
On Characteristics *4						
Gate threshold voltage	V_{DS} = V_{GS}, I_D = 1.0mAdc	$V_{GS(th)}$	0.8		2.8	Vdc
Static drain-source on-resistance	V_{GS} = 10Vdc, I_D = 100mAdc	$R_{DS(ON)}$		5.0	6.0	Ω
Forward transconductance	V_{DS} =25Vdc, I_D =100mAdc	g_{fs}	80			mmhos
Dynamic Characteristics						
Intput capacitance	V_{DS} = 25Vdc, V_{GS} = 0V, f=1.0MHz	C_{iss}		20		pF
Output capacitance		C_{oss}		9.0		
Reverse transfer capacitance		C_{rss}		4.0		
Switching Characteristics *4						
Turn-On Delay Time	V_{CC} = 30Vdc, R_{GS}=50Ω I_C=0.28Adc, V_{GS}=10Vdc	$t_{d(on)}$		20		ns
Turn-Off Delay Time		$t_{d(off)}$		40		
Reverse Diode						
Diode forward on-voltage	V_{GS} =0Vdc, I_D = 0.34Adc, T_J =25°C,	V_{SD}			1.3	V

*4: Pulse Test: Pulse Width ≤300us, Duty Cycle ≤2. 0%

Rating and characteristic curves (FMSBSS123)

FIG.1 OHMIC REGION

T_A = 25°C

V_{GS}=10V, 9V, 8V, 7V, 6V, 5V, 4V, 3V

I_D, DRAIN CURRENT,(A): 0, 0.4, 0.8, 1.2, 1.6, 2.0

0, 2.0, 4.0, 6.0, 8.0, 10

V_{DS}, DRAIN TO SOURCE VOLTAGE, (V)

FIG.2 TRANSFER CHARACTERISTICS

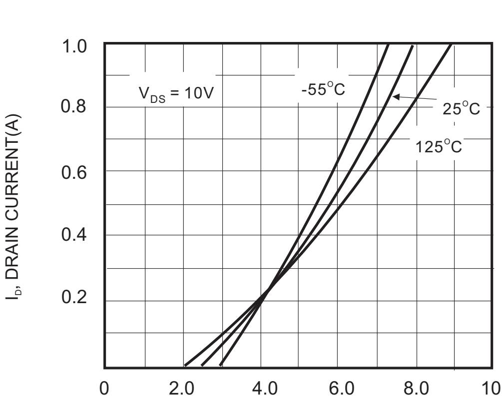


FIG.3 TEMPERATURE VS DRAIN-SOURCE ON-RESISTANCE

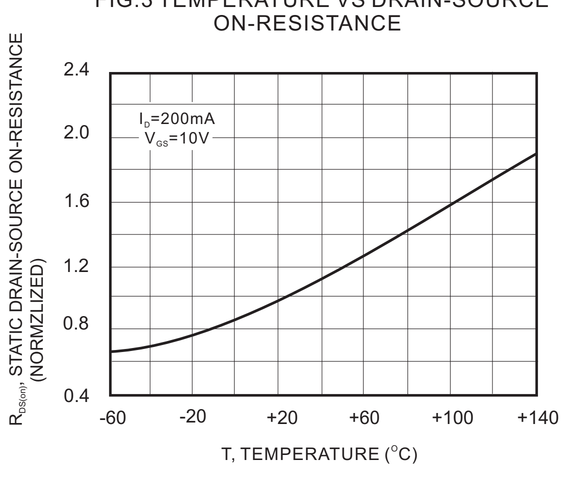
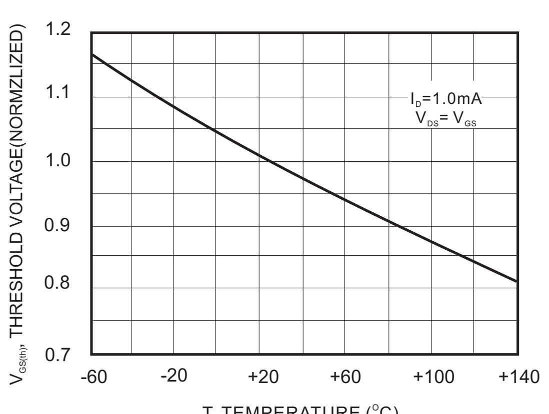


FIG.4 TEMPERATURE VS GATE THRESHOLE VOLTAGE



FMSBSS123

Pinning information

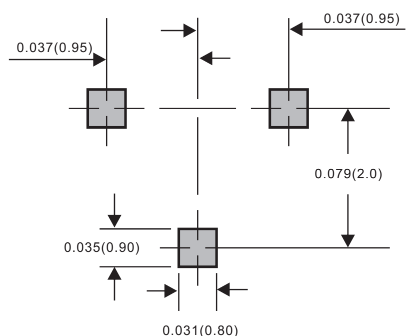
Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source	D G S	Drain Gate Source

Marking

Type number	Marking code
FMSBSS123	SA

Suggested solder pad layout

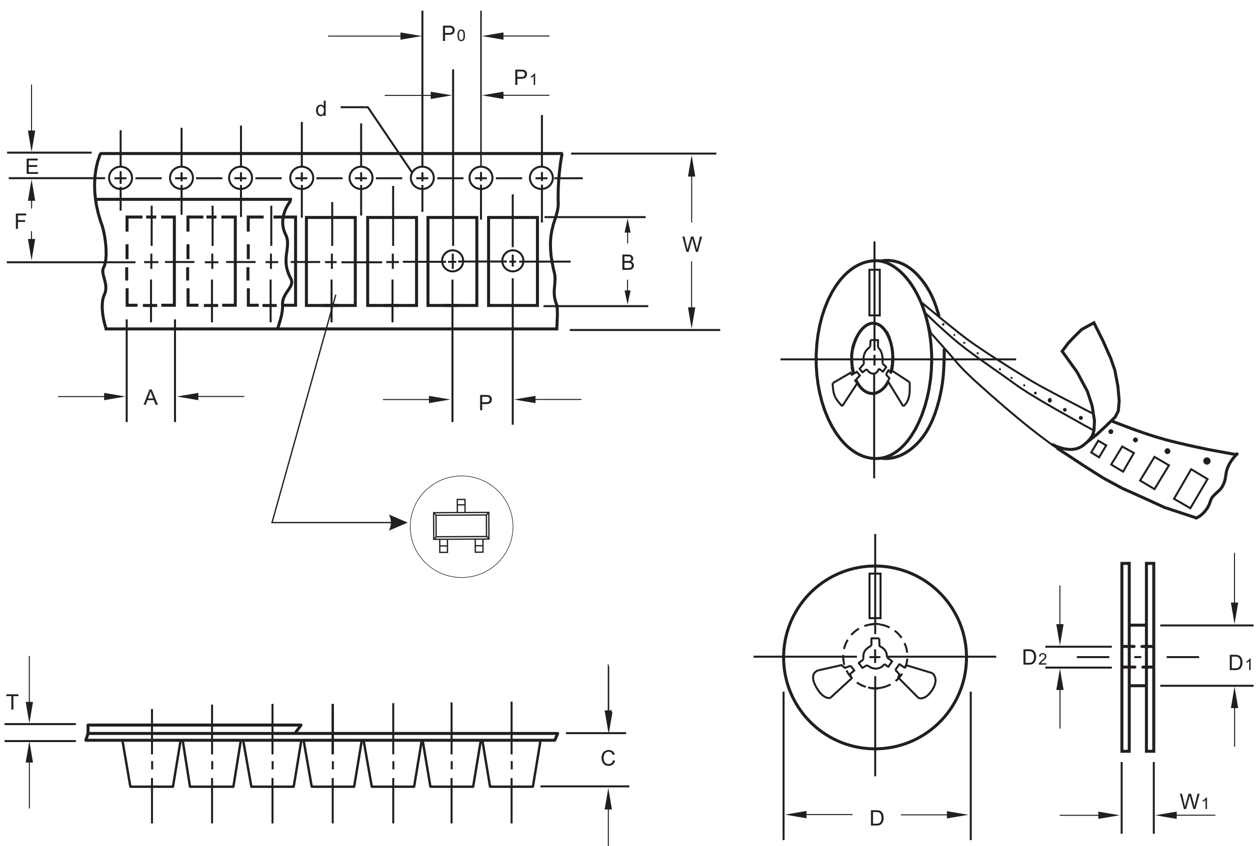
SOT-23



Dimensions in inches and (millimeters)

FMSBSS123

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.

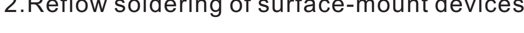
FMSBSS123

Reel packing

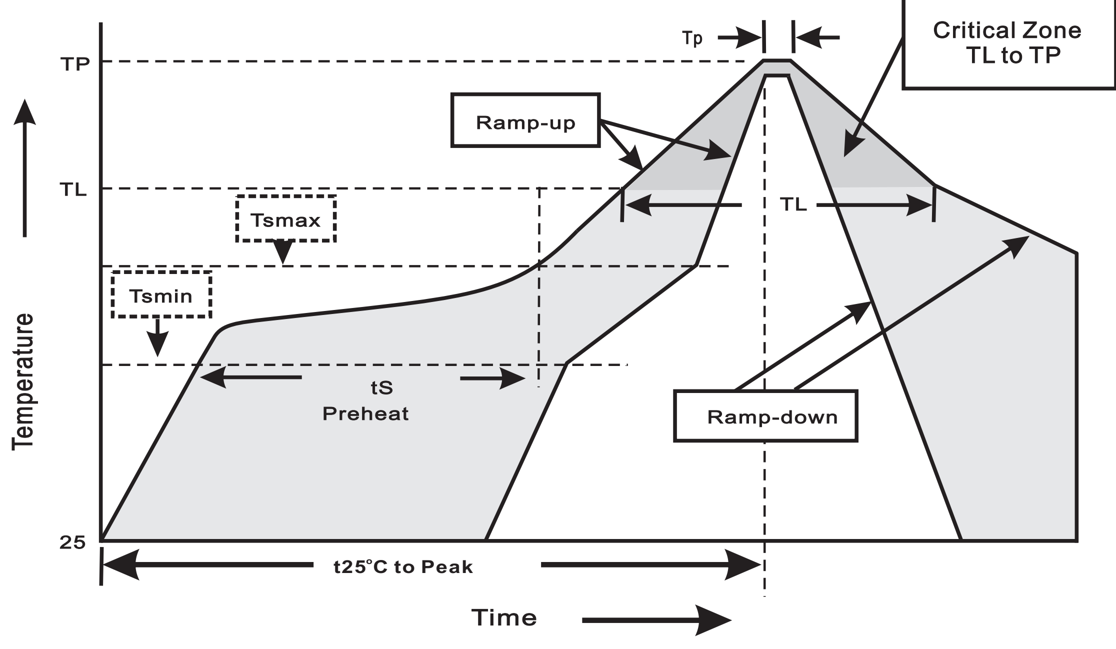
PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3000	4.0	30,000	183*183*123	178	383*262*387	240,000	11.6

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