

FMOSBSS123K

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FMOSBSS123K

170mA, 100V N-Channel Enhancement Mode MOSFET - ESD Protected

Features

- High density cell design for extremely low $R_{DS(ON)}$.
- Voltage controlled small signal switch.
- Rugged and reliable.
- ESD Protected.
- RoHs compliant & Halogen - Free.
- Suffix "-H" indicates Halogen-free part, ex.FMOSBSS123K-H.

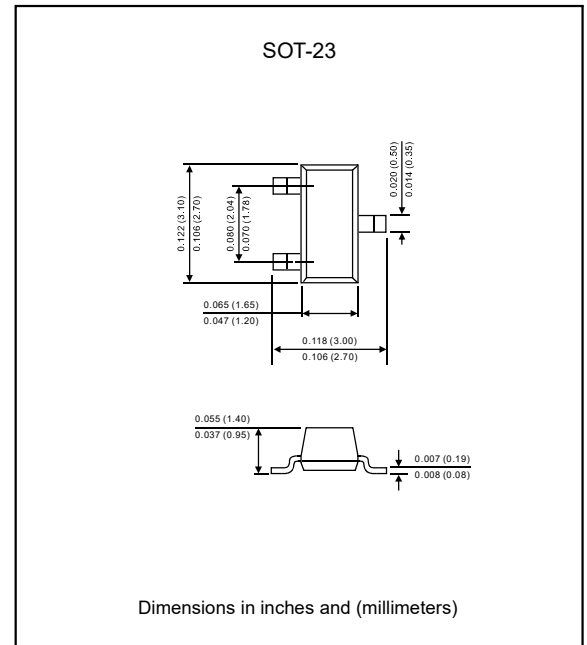
Application

- Small servo motor controls.
- Power MOSFET gate drivers.
- Switching application.

Mechanical data

- Case : SOT-23-3, Plastic.
- Terminals : Solderable per MIL-STD-202, METHOD208.
- Polarity : Indicated by cathode band.
- Approx weight : 0.0084 grams.

Package outline



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

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current (Note 1)	I_D	170	mA
Pulsed drain current (Note 2)	I_{DM}	680	mA
Power dissipation	P_D	350	mW
Thermal resistance form junction to ambient (Note 1)	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Operating Junction temperature range	T_J	+150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$
Lead temperature for soldering purposes (1/8" form case for 10s)	T_L	260	$^\circ\text{C}$

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Electrical characteristics (At $T_j=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Drain-source leakage current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			100	nA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±1	μA
On characteristics						
Gate threshold voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		2.5	V
Static drain-source on-resistance (Note 2)	R _{DS(ON)}	V _{GS} =4.5V, I _D =170mA			10	Ω
		V _{GS} =10V, I _D =170mA			6	
Forward Transconductance	g _{FS}	V _{GS} =10V, I _D =170mA	80			mS
Dynamic Parameters (Note 4)						
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		29	60	pF
Output capacitance	C _{oss}			10	15	
Reverse transfer capacitance	C _{rss}			2	6	
Switching parameters						
Total gate charge	Q _g	V _{GS} =10V, V _{DS} =10V, I _D =220mA		1.4	2	nC
Gate to source charge	Q _{gs}			0.15	0.25	
Gate to Drain charge	Q _{gd}			0.2	0.4	
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V, I _D =2.8A, R _G =50Ω			8	ns
Turn-on rise time	t _r				8	
Turn-off delay time	t _{d(off)}				13	
Turn-off fall time	t _f				16	
Source-drain diode ratings and characteristics						
Continuous diode forward current	I _S				0.55	A
Pulse diode forward current	I _{SM}				2	A
Diode forward voltage (Note 2)	V _{SD}	V _{GS} =0V, I _{SD} =340mA			1.3	V

Note : 1. Surface mounted on FR4 board using the minimum recommended pad size.

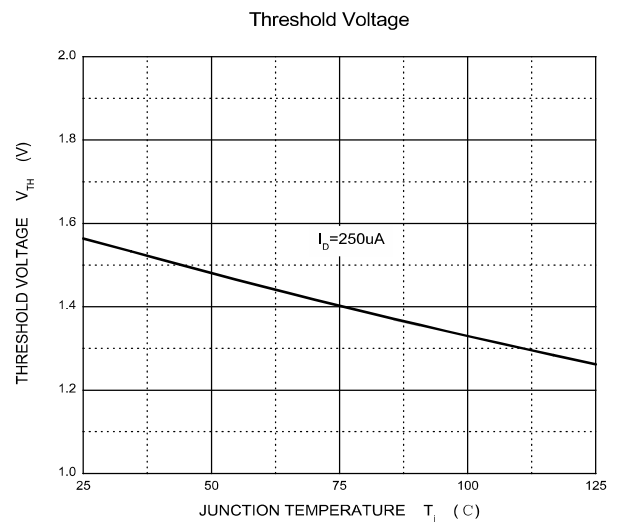
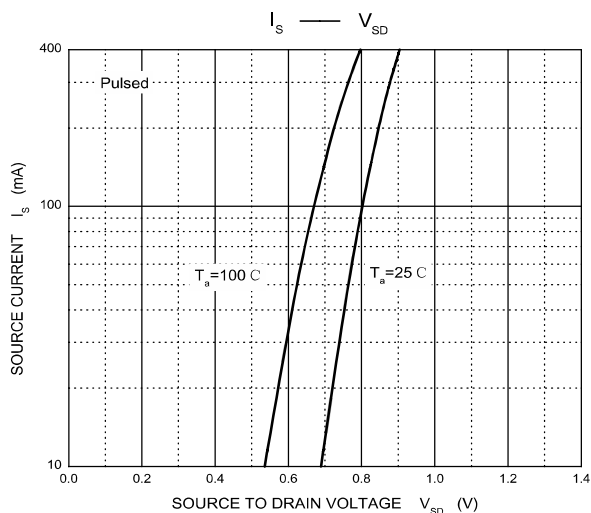
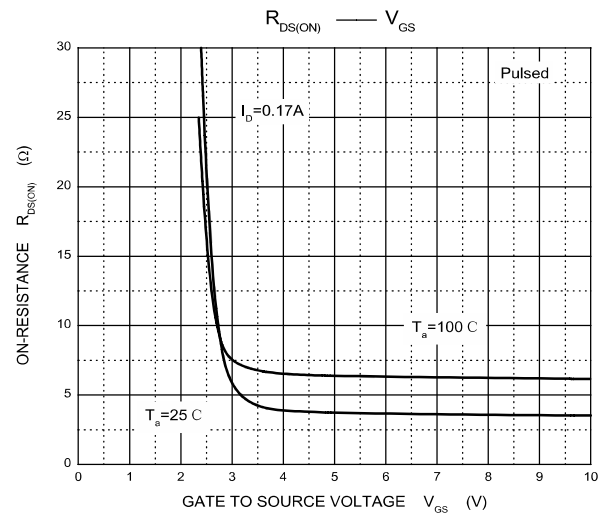
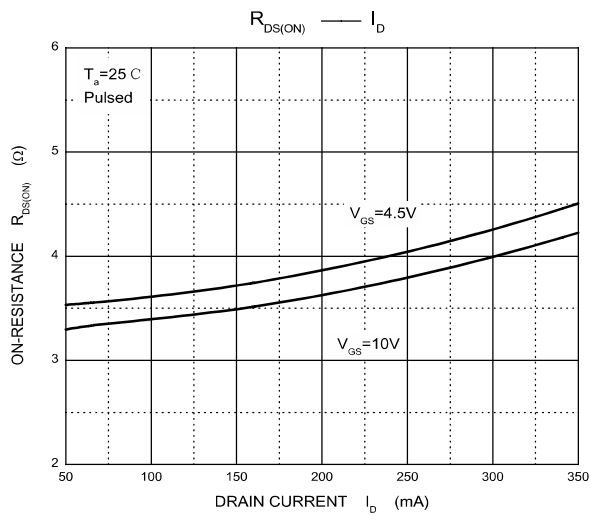
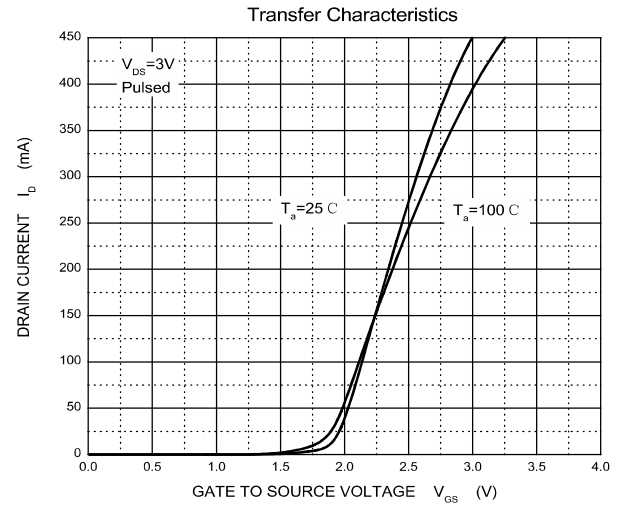
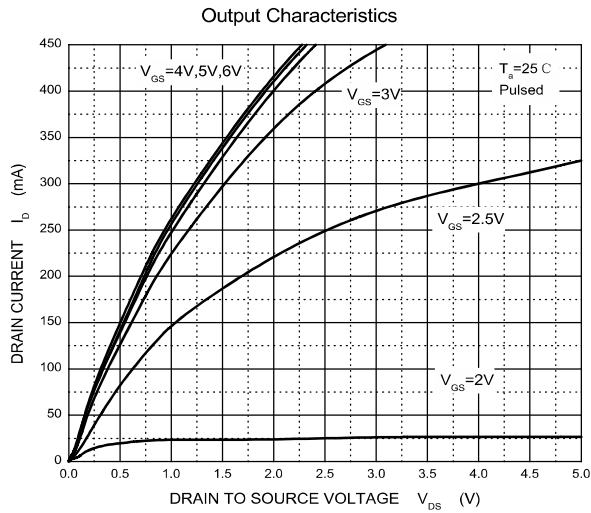
2. Pulse Test : Pulse width = 300us , Duty Cycle $\leq 2\%$.

3. Switching characteristics are independent of operating junction temperature.

4. Guaranteed by design, not subject to production testing.

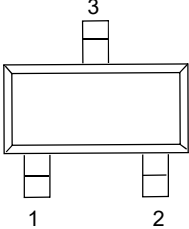
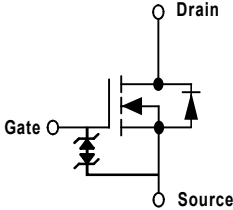
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Rating and characteristic curves

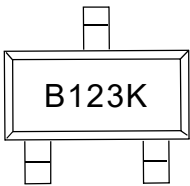


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Pinning information

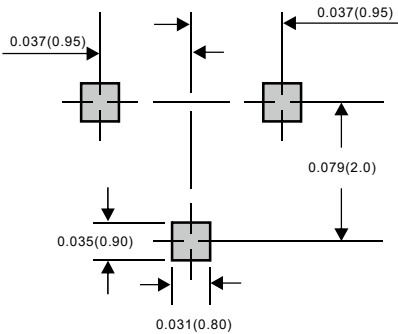
Pin	Simplified outline	Symbol
Pin 1 Gate Pin 2 Source Pin 3 Drain		

Marking



Suggested solder pad layout

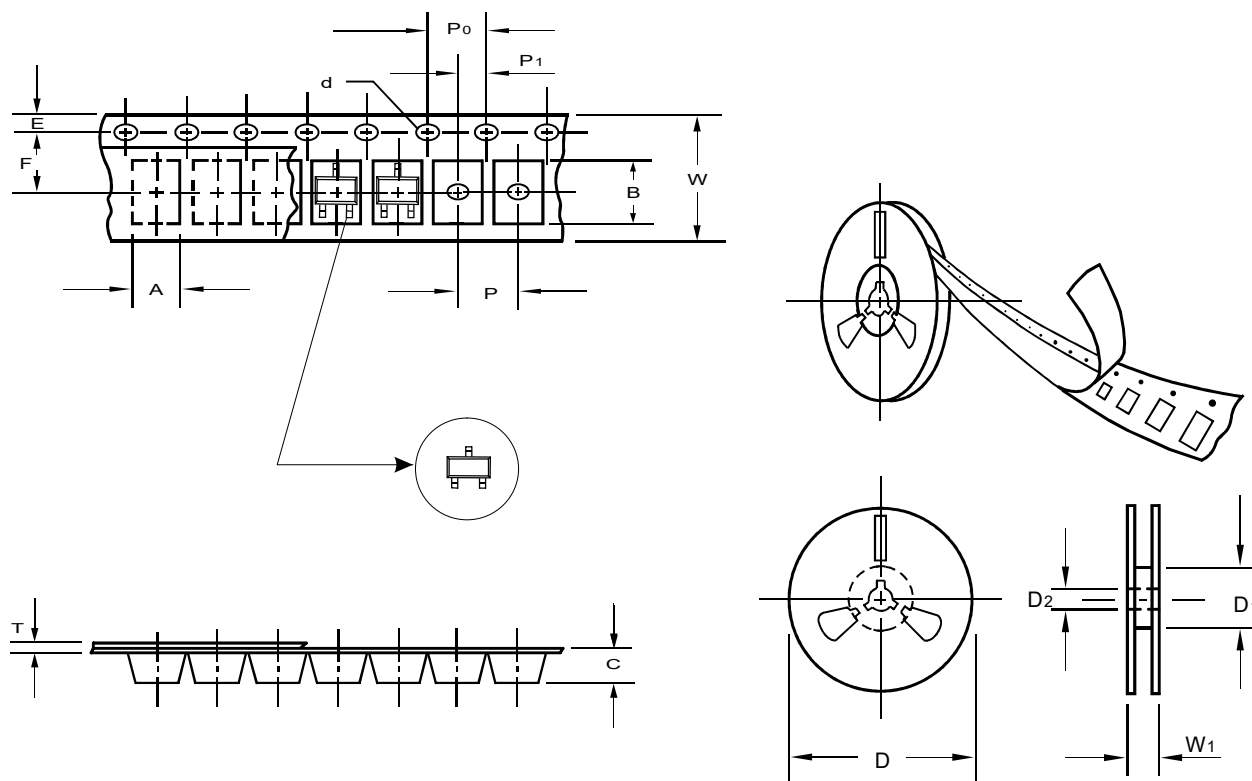
SOT-23



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	54.40
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	11.40

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

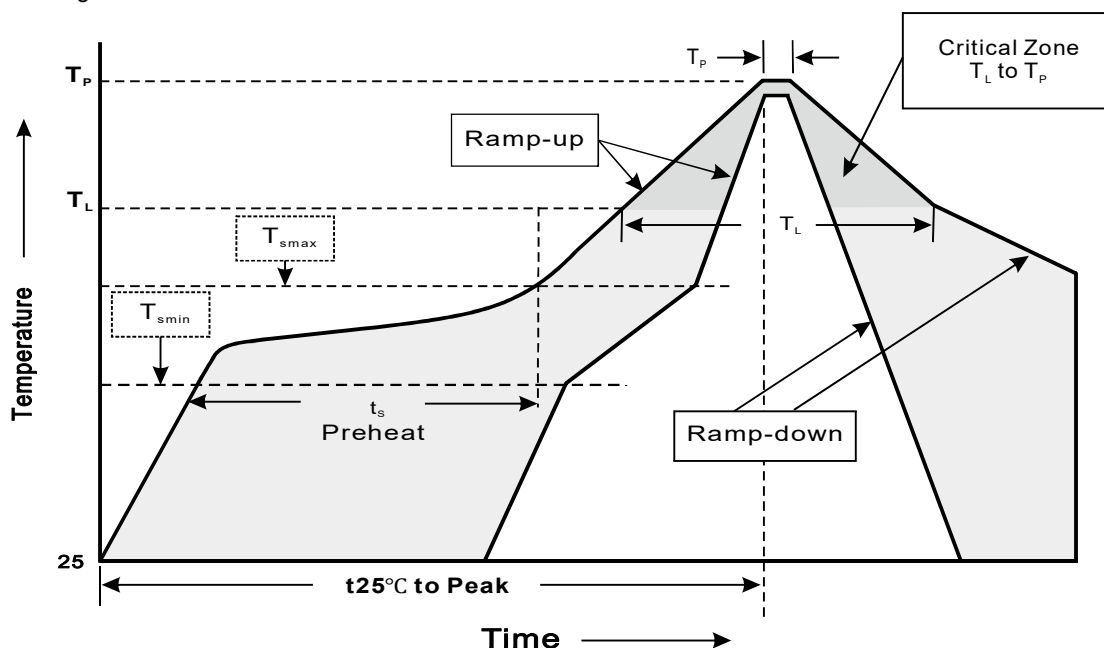
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Reel packing

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*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 (T_{smin}) -Temperature Max (T_{smax}) -Time (min to max) (t_s)	150°C 200°C 60 ~ 120sec
T_{smax} to T_L -Ramp-up rate	< 3°C/sec
Time maintained above: -Temperature (T_L) -Time(T_L)	217°C 60 ~ 260 sec
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	< 6 minutes