

No.3296

# LB1831M

## Low-Saturation Bidirectional Motor Driver for Low-Voltage Applications

The LB1831M is a dual low-saturation bidirectional motor driver IC for use in low-voltage applications. It is especially suited for use in compact low-voltage motors in portable equipment such as printer, FDD, camera.

**Features**

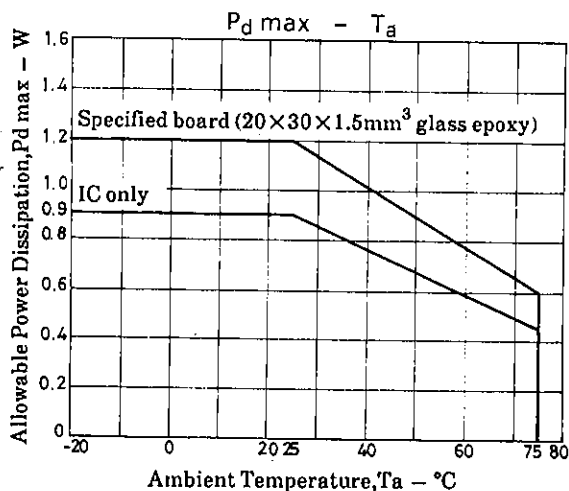
- Capable of being operated from a low voltage (2.5V min)
- Low saturation voltage  
(Upper transistor + lower transistor residual voltage 1.0V max at 400mA)
- Parallel connection available  
(Upper transistor + lower transistor residual voltage 0.5V max at 400mA)  
(Upper transistor + lower transistor residual voltage 1.0V max at 800mA)
- Logic power supply and motor power supply are separate.
- On-chip braking function
- On-chip spark killer diodes
- Possible to increase the internal allowable power dissipation because the package is compact (MFP-16FS) and heat can be radiated easily to the outside.

**Absolute Maximum Ratings at Ta = 25°C**

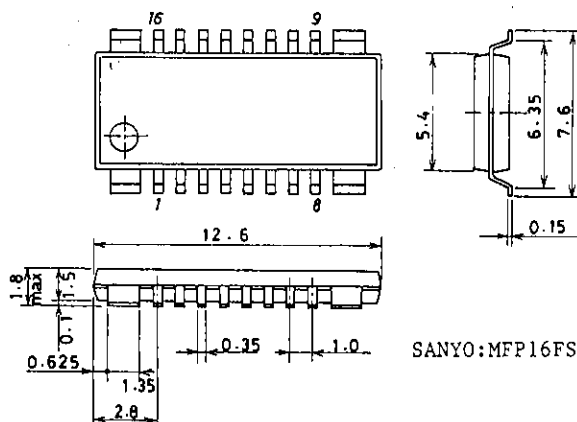
Parameter	Symbol	Value	unit
Maximum Supply Voltage	V <sub>CC</sub> max	-0.3 to +10	V
	V <sub>S</sub> max	-0.3 to +10	V
Output Supply Voltage	V <sub>OUT</sub>	V <sub>S</sub> + V <sub>SF</sub>	V
Input Supply Voltage	V <sub>IN</sub>	-0.3 to +10	V
GND Pin Flow-out Current	I <sub>GND</sub>	Per channel 1.0	A
Allowable Power Dissipation	P <sub>d</sub> max1	IC only 900	mW
	P <sub>d</sub> max2	Mounted on specified board (20×30×1.5mm <sup>3</sup> glass epoxy) 1200	mW
Operating Temperature	T <sub>opr</sub>	-20 to +75	°C
Storage Temperature	T <sub>stg</sub>	-40 to +125	°C

**Allowable Operating Conditions at Ta = 25°C**

Parameter	Symbol	Value	unit
Supply Voltage	V <sub>CC</sub>	2.5 to 9.0	V
	V <sub>S</sub>	1.8 to 9.0	V
Input 'H'-Level Voltage	V <sub>IH</sub>	1.8 to 9.0	V
Input 'L'-Level Voltage	V <sub>IL</sub>	-0.3 to +0.7	V



**Package Dimensions 3097 (unit: mm)**



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**Electrical Characteristics at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 3\text{V}$**

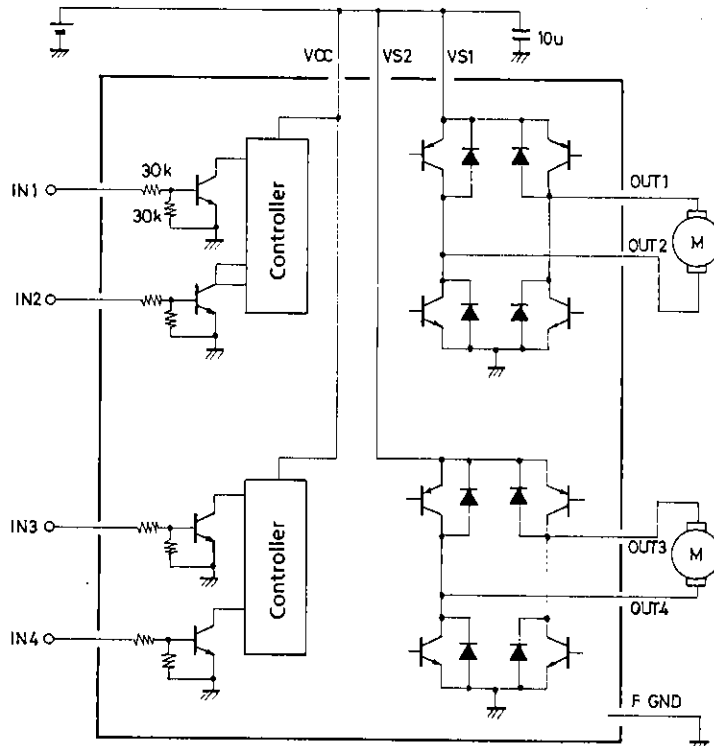
			min	typ	max	unit
Supply Current	$I_{CC}$	$V_{IN1,2,3,4} = 0\text{V}, I_{CC} + I_S$		0.1	10	$\mu\text{A}$
	$I_{CC1}$	$V_{IN1} = 3\text{V}, V_{IN2,3,4} = 0\text{V}, I_{CC} + I_S$		10	18	mA
	$I_{CC2}$	$V_{IN1,2} = 3\text{V}, V_{IN3,4} = 0\text{V}, I_{CC} + I_S$		20	35	mA
Output Saturation Voltage (Upper + Lower)	$V_{OUT1}$	$I_{OUT} = 200\text{mA}$		0.35	0.50	V
	$V_{OUT2}$	$I_{OUT} = 400\text{mA}$		0.75	1.0	V
	$V_{OUT3}$	$I_{OUT} = 400\text{mA}, \text{parallel connection}$		0.4	0.55	V
	$V_{OUT4}$	$I_{OUT} = 800\text{mA}, \text{parallel connection}$		0.8	1.1	V
Output Sustain Voltage	$V_{O(sus)}$	$I_{OUT} = 400\text{mA}$	9			V
Input Current [Spark Killer Diode]	$I_{IN}$	$V_{IN} = 2\text{V}, V_{CC} = 6\text{V}$			80	$\mu\text{A}$
Reverse Current	$I_S (\text{leak})$	$V_{CC1,2} = 9\text{V}$			30	$\mu\text{A}$
Forward Voltage	$V_{SF}$	$I_{OUT} = 500\text{mA}$			1.7	V

## Truth Table

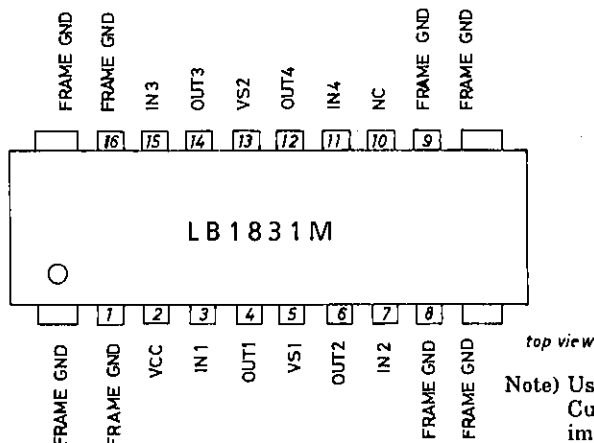
IN 1/3	IN 2/4	OUT 1/3	OUT 2/4	Mode
H	L	H	L	Forward
L	H	L	H	Reverse
H	H	L	L	Brake
L	L	OFF	OFF	Standby

## Equivalent Circuit Block Diagram

Unit (resistance:  $\Omega$ , capacitance: F)



## Pin Assignment



Note) Use one of the FRAME-GND pins for grounding. When the Cu-foil side is soldered, heat radiation can be more improved.

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