

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

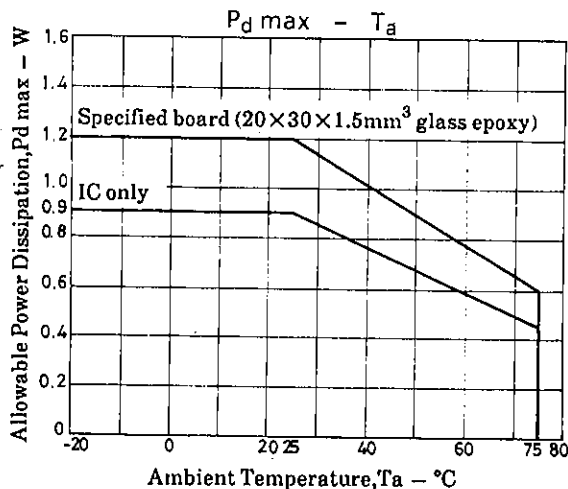
- Capable of being operated from a low voltage (2.5V min)
- Low saturation voltage
(Upper transistor + lower transistor residual voltage 1.0V max at 400mA)
- Parallel connection available
(Upper transistor + lower transistor residual voltage 0.5V max at 400mA)
(Upper transistor + lower transistor residual 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

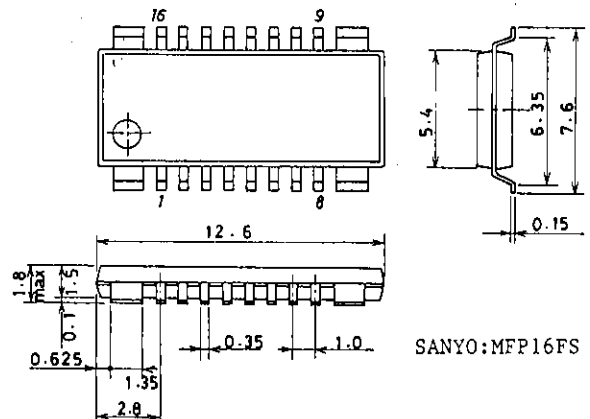
Parameter	Symbol	Conditions	Value	Unit
Maximum Supply Voltage	V _{CC} max		-0.3 to +10	V
		V _S max	-0.3 to +10	V
Output Supply Voltage	V _{OUT}		V _S + V _{SF}	V
Input Supply Voltage	V _{IN}		-0.3 to +10	V
GND Pin Flow-out Current	I _{GND}	Per channel	1.0	A
Allowable Power Dissipation	P _d max1	IC only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

Allowable Operating Conditions at Ta = 25°C

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	2.5 to 9.0	V
		V _S	1.8 to 9.0
Input 'H'-Level Voltage	V _{IH}	1.8 to 9.0	V
Input 'L'-Level Voltage	V _{IL}	-0.3 to +0.7	V



Package Dimensions 3097
(unit: mm)



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

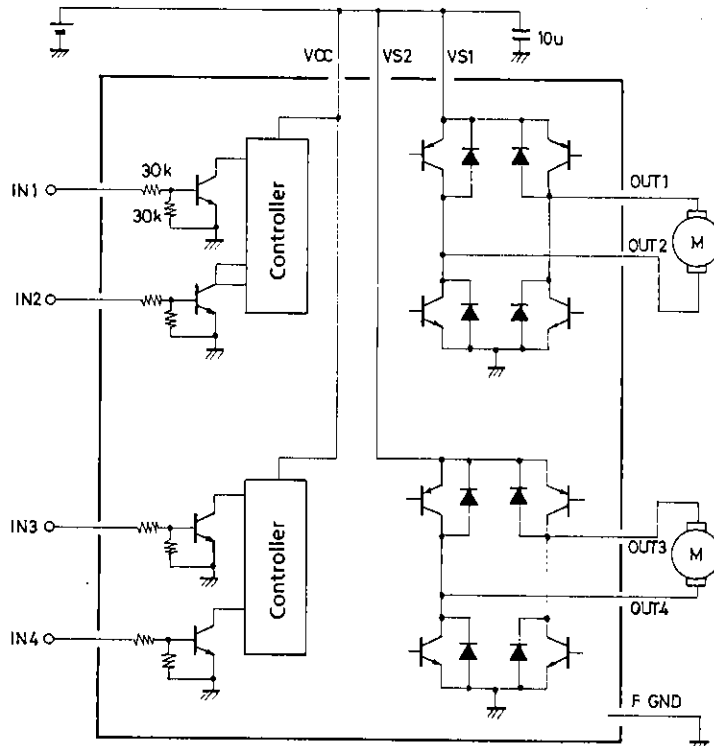
			min	typ	max	unit
Supply Current	I_{CC}	$V_{IN1,2,3,4} = 0\text{V}, I_{CC} + I_S$		0.1	10	μA
	I_{CC1}	$V_{IN1} = 3\text{V}, V_{IN2,3,4} = 0\text{V}, I_{CC} + I_S$		10	18	mA
	I_{CC2}	$V_{IN1,2} = 3\text{V}, V_{IN3,4} = 0\text{V}, I_{CC} + I_S$		20	35	mA
Output Saturation Voltage (Upper + Lower)	V_{OUT1}	$I_{OUT} = 200\text{mA}$		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	μA
Reverse Current	$I_S (\text{leak})$	$V_{CC1,2} = 9\text{V}$			30	μA
Forward Voltage	V_{SF}	$I_{OUT} = 500\text{mA}$			1.7	V

Truth Table

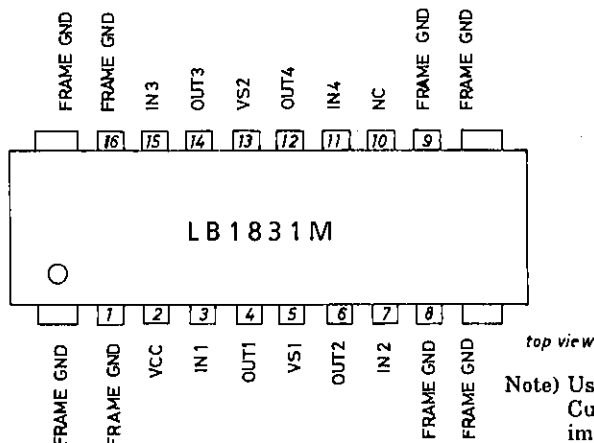
IN 1/3	IN 2/4	OUT 1/3	OUT 2/4	Mode
H	L	H	L	Forward
L	H	L	H	Reverse
H	H	L	L	Brake
L	L	OFF	OFF	Standby

Equivalent Circuit Block Diagram

Unit (resistance: Ω , 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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