Ordering number:EN3296

Monolithic Digital IC

LB1831M

Low-Saturation Bidirectional Motor Driver for Low-Voltage Applications

Overview

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.

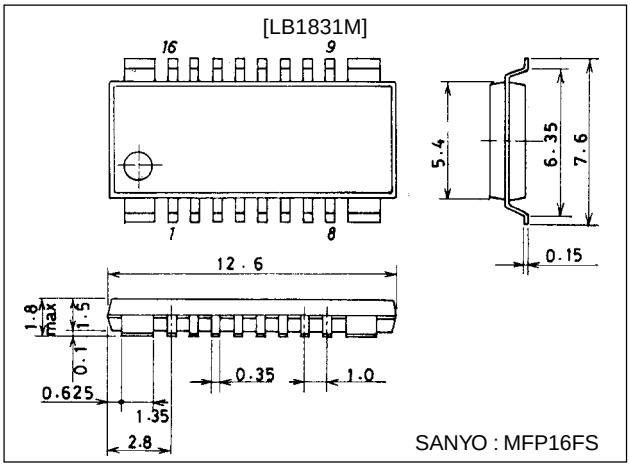
Features

- 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 avaiable.
  (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.

Package Dimensions

unit:mm

3097-MFP16FS



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	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	Pd max1	IC only	900	mW
	Pd max2	Mounted on specified board (20×30×1.5mm³ glass epoxy)	1200	mW
Operating temperature	Topr		–20 to +75	˚C
Storage temperature	Tstg		–40 to +125	˚C

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Allowable Operating Conditions at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		2.5 to 9.0	V
	V_S		1.8 to 9.0	V
Input high-level voltage	V_{IH}		1.8 to 9.0	V
Input low-level voltage	V_{IL}		–0.3 to 0.7	V

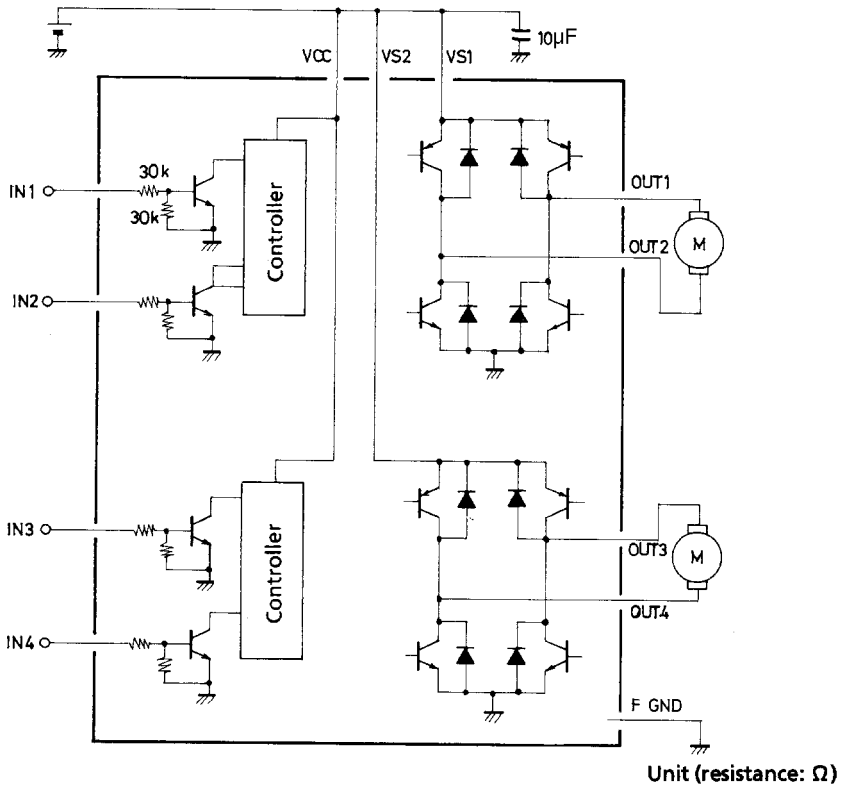
Electrical Characteristics at Ta = 25˚C, V_{CC}=3V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current	I_{CC}	V_{IN}1, 2, 3, 4=0V, $I_{CC}+I_S$		0.1	10	μA
	$I_{CC}1$	V_{IN}1=3V, V_{IN}2, 3, 4=0V, $I_{CC}+I_S$		10	18	mA
	$I_{CC}2$	V_{IN}1, 2=3V, V_{IN}3, 4=0V, $I_{CC}+I_S$		20	35	mA
Output saturation voltage (upper+lower)	$V_{OUT}1$	I_{OUT}=200mA		0.35	0.50	V
	$V_{OUT}2$	I_{OUT}=400mA		0.75	1.0	V
	$V_{OUT}3$	I_{OUT}=400mA, parallel connection		0.4	0.55	V
	$V_{OUT}4$	I_{OUT}=800mA, parallel connection		0.8	1.1	V
Output sastain voltage	$V_{O(sus)}$	I_{OUT}=400mA	9			V
Input current	I_{IN}	V_{IN}=2V, V_{CC}=6V			80	μA
[Spark Killer Diode]						
Reverse current	$I_{S(leak)}$	V_{CC}1, 2=9V			30	μA
Forward voltage	V_{SF}	I_{OUT}=500mA			1.7	V

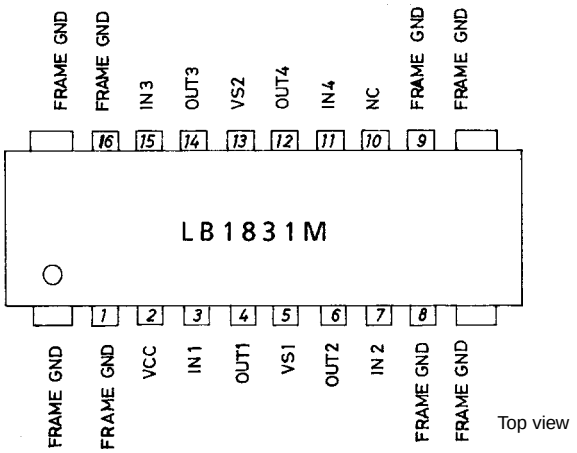
Truth Table

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



Pin Assignment



Top view

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