LB1830MC



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Monolithic Digital IC Low-Voltage, Low-Saturation Bidirectional Motor Driver

Overview

The LB1830MC is a low-saturation bidirectional motor driver IC with brake function for use in low-voltage applications.

As both of forward and reverse outputs are regulated, it is especially suited for use in portable equipment.

Features

- Wide operating voltage range: 3.0 to 9.0 V
- Low saturation voltage: 0.2V at $I_O = 40mA$ (typ)
- Low current drain at standby mode (0.1µA or less)
- Brake function
- Regulated voltage value (forward/reverse) setting available by one variable resistor
- Regulated output/saturation output switching available
- Built-in spark killer diodes
- Small package: SOIC10

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
maximum supply voltage	V _{CC} max, V _S max		10.5	V
Output current	I _M max		500	mA
Input supply voltage	V _{IN}		-0.3 to +10	V
Allowable power dissipation	Pd max	Mounted on a specified board *	0.82	W
Operating temperature	Topr		-20 to +80	°C
Storage temperature	Tstg		-40 to +125	°C

^{*} Specified board: 114.3mm \times 76.1mm \times 1.6mm, glass epoxy board.

Caution 2) Even when the device is used within the range of absolute maximum ratings, as a result of continuous usage under high temperature, high current, high voltage, or drastic temperature change, the reliability of the IC may be degraded. Please contact us for the further details.

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Caution 1) Absolute maximum ratings represent the value which cannot be exceeded for any length of time.

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Allowable Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V _{CC} , V _S		3.0 to 9.0	V
Input high level voltage	VIH		2.0 to 9.0	V
Input low level voltage	V _{IL}		-0.3 to +0.3	V
Control voltage	VC		1.0 to 6.0	V

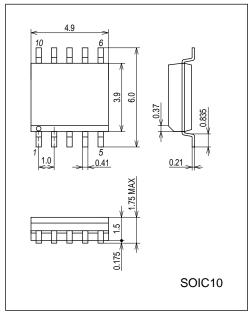
Electrical Characteristics at Ta = 25°C, $V_{CC} = 6V$

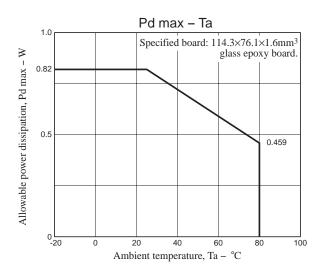
Parameter	Cumbal	Conditions	Ratings			Linit	
Parameter	Symbol	Symbol Conditions		typ	max	Unit	
Current drain	I _{CC} 0	$IN1 = IN2 = Vm = 0V$, $V_C = Vref$ at standby mode		0.1	10	μΑ	
I _{CC} 1		Forward/reverse, control, load OPEN		2	3	mA	
	I _{CC} 2	Forward/reverse, saturation, load OPEN		3	5	mA	
	I _{CC} 3	Braking, load OPEN		5	8	mA	
Output saturation voltage	Vsat1	I _O = 40mA (upper side + lower side)		0.2	0.3	V	
	Vsat2	I _O = 80mA (upper side + lower side)		0.4	0.6	V	
Reference voltage	Vref	I _{Vref} = 1mA	1.85	2.0	2.15	V	
Voltage characteristics of output voltage	ΔV _O -Line	$V_O = 5V$, $V_{CC} = 5.5$ to 9V, $I_O = 40$ mA			80	mA	
Current characteristics of output voltage	ΔV _O -Load	$V_O = 5V$, $V_{CC} = 6V$, $I_O = 10$ to 80mA			50	mA	
Input current	I _{IN}	V _{IN} = 5V		90	150	μΑ	
Output voltage	VO	V _C = 2V	2.3×V _C		2.5×V _C	V	

Package Dimensions

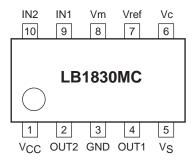
unit : mm (typ)

3426A

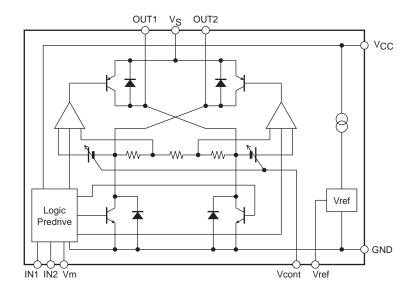




Pin Assignment



Block Diagram



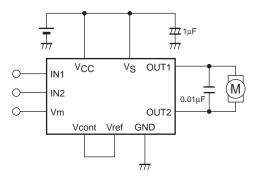
- The output voltage (voltage between output pins) Vo during drive with constant voltage is set as follows: $V_O = (V_C \text{ pin input voltage}) \times 2.4 \text{ (typical)}$
- There is no hierarchical relationship among voltages; VCC (control supply voltage), VS (motor supply voltage), IN1/IN2 (input signal voltage).

Truth Table

Input		Output			
IN1	IN2	Vm	OUT1	OUT2	Mode
L	L	L	OFF	OFF	Standby
Н	L	L	Н	L	Forward (Regulated)
Н	L	Н	Н	L	Forward (Saturation)
L	Н	L	L	Н	Reverse (Regulated)
L	Н	Н	L	Н	Reverse (Saturation)
Н	Н	*	L	L	Brake

 $^{^{\}star}$ when in saturation mode, V_{C} = VS available.

Application Circuit Example



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