Ordering number : ENA2049A

LB1830MC

Monolithic Digital IC

Low-Voltage, Low-Saturation
Bidirectional Motor Driver

ON Semiconductor®

http://onsemi.com

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 × 76.1mm × 1.6mm, glass epoxy board.

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

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.

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	V_{IH}		2.0 to 9.0	V
Input low level voltage	V_{IL}		-0.3 to +0.3	V
Control voltage	V_C		1.0 to 6.0	V

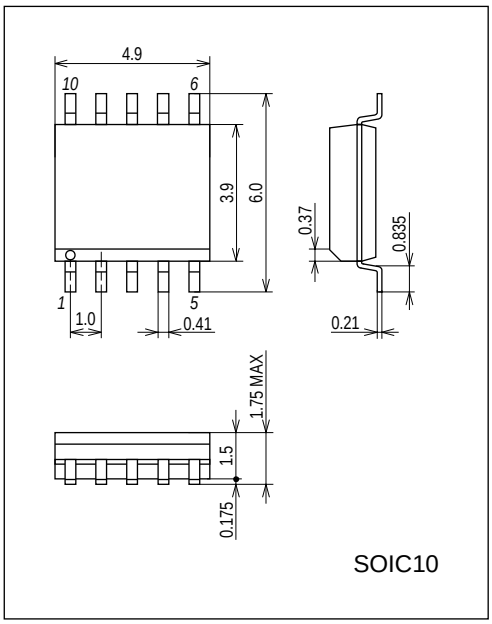
Electrical Characteristics at Ta = 25°C, V_{CC} = 6V

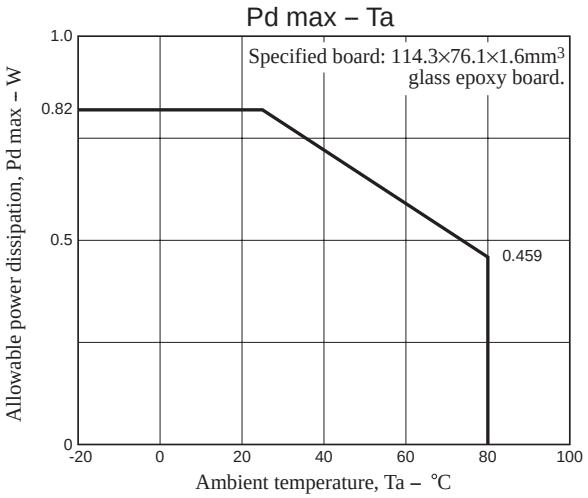
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	$I_{CC}0$	IN1 = IN2 = Vm = 0V, V_C = Vref at standby mode		0.1	10	μA
	$I_{CC}1$	Forward/reverse, control, load OPEN		2	3	mA
	$I_{CC}2$	Forward/reverse, saturation, load OPEN		3	5	mA
	$I_{CC}3$	Braking, load OPEN		5	8	mA
Output saturation 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 = 40mA			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	μA
Output voltage	V_O	V_C= 2V	2.3×V_C		2.5×V_C	V

Package Dimensions

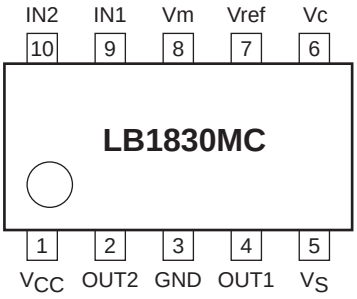
unit : mm (typ)

3426A

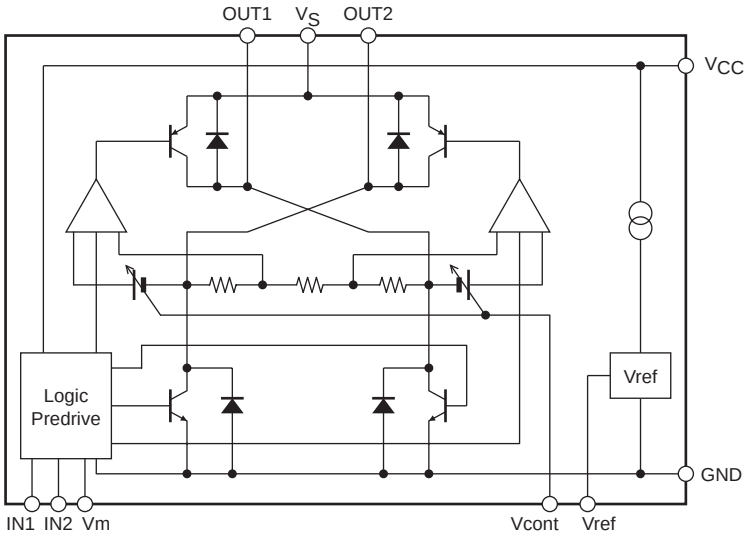




Pin Assignment



Block Diagram



- The output voltage (voltage between output pins) Vo during drive with constant voltage is set as follows:
  V_O = (V_C pin input voltage) × 2.4 (typical)

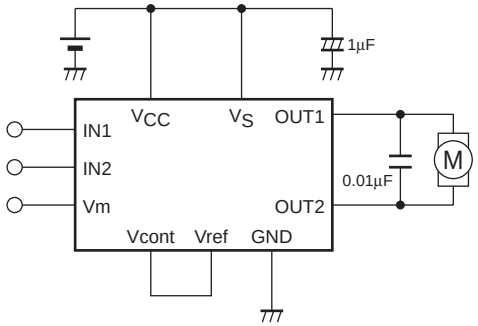
- There is no hierarchical relationship among voltages; VCC (control supply voltage), VS (motor supply voltage), IN1/IN2 (input signal voltage).

Truth Table

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

* when in saturation mode, V_C = VS available.

Application Circuit Example



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