Ordering number : EN3518D

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

LB1830M — Monolithic Digital IC Low-Voltage, Low-Saturation Bidirectional Motor Driver

Overview

The LB1830M 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: MFP10S

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
maximum supply voltage	V_{CC} 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	Independent IC	0.4	W
		Mounted on a specified board *	0.55	W
Operating temperature	Topr		-20 to +80	°C
Storage temperature	Tstg		-40 to +125	°C

* Specified board: 30mm × 30mm × 1.5mm, glass epoxy board.

Allowable Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		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

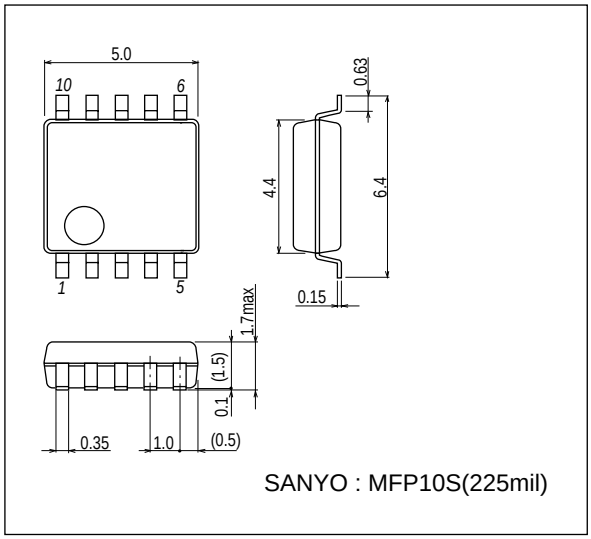
Electrical Characteristics at Ta = 25°C, V_{CC} = 6V

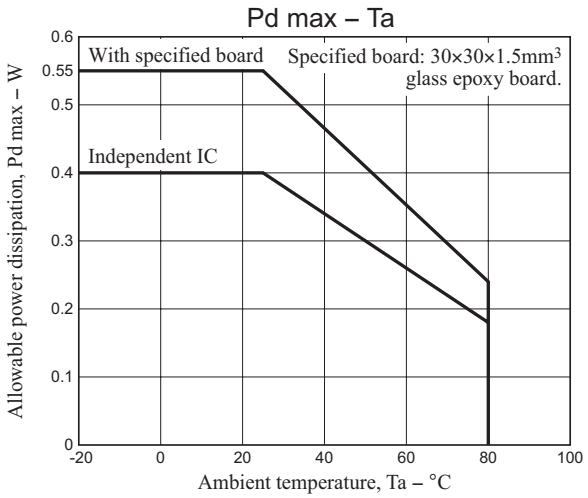
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	$I_{CC}0$	IN1 = IN2 = Vm = 0V, V_C = Vref at standby mode		0.1	10	μA
	$I_{CC}1$	Forward/reverse, control, load OPEN		2	3	mA
	$I_{CC}2$	Forward/reverse, saturation, load OPEN		3	5	mA
	$I_{CC}3$	Braking, load OPEN		5	8	mA
Output saturation 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	$\frac{\Delta V_O}{\Delta V_{CC}}$	V_O = 5V, V_{CC} = 5.5 to 9V, I_O = 40mA			80	mA
Current characteristics of output voltage	$\frac{\Delta V_O}{\Delta I_O}$	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

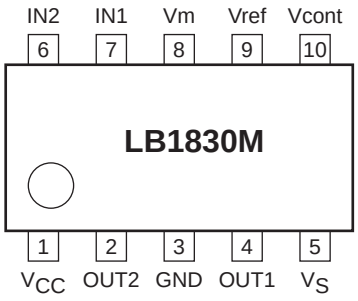
unit : mm (typ)

3086B

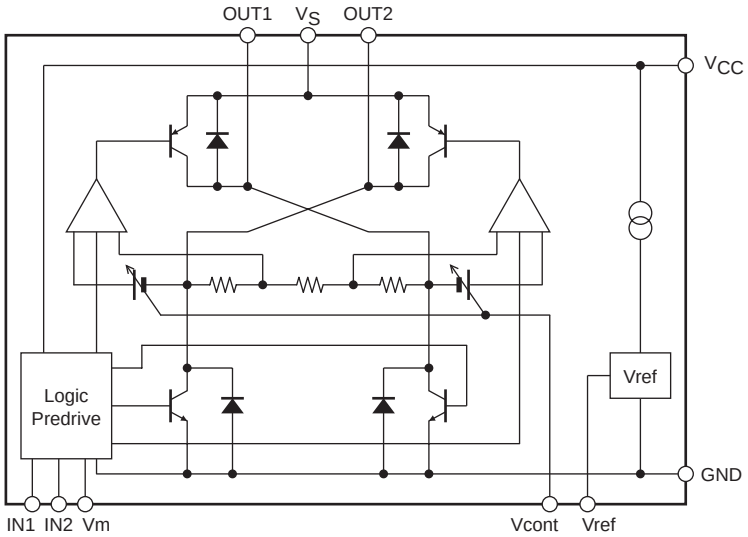




Pin Assignment



Block Diagram



- The constant-voltage drive mode output voltage (the voltage between the output pins) V_O is determined by the following formula. V_O = (Vcont pin input voltage) × 2.4 (typical)

- There are no restrictions on the relative magnitudes between the following voltages: V_{CC} (control system supply voltage), VS (motor supply voltage), and IN1/IN2/Vm (the input signal voltages).

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