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SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

Monolithic Digital IC

LB1830M — 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, 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	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.

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.

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 min	Ratings typ	Ratings max	Unit
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

SANYO : MFP10S(225mil)

Pd max – Ta

With specified board   Specified board: 30□30□1.5mm³ glass epoxy board.

Independent IC
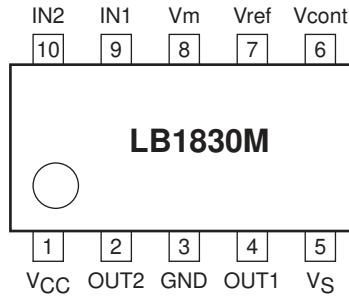
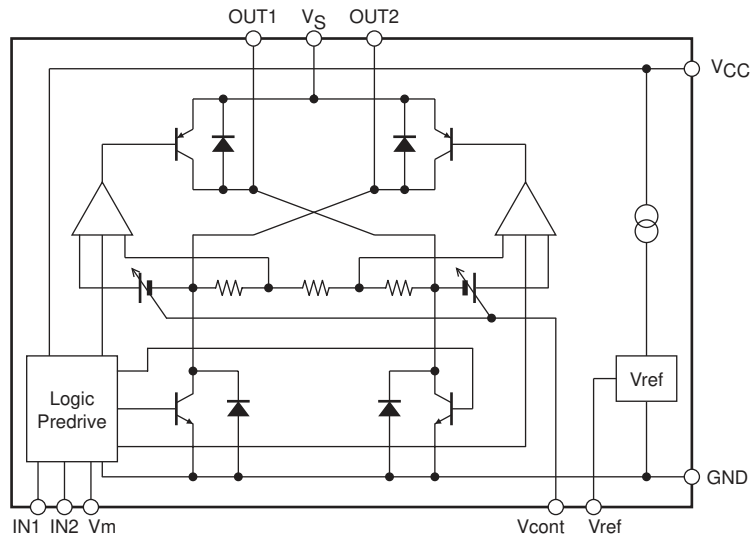Allowable power dissipation, Pd max – W

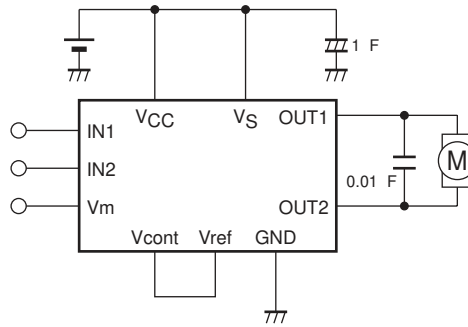Ambient temperature, Ta – °C
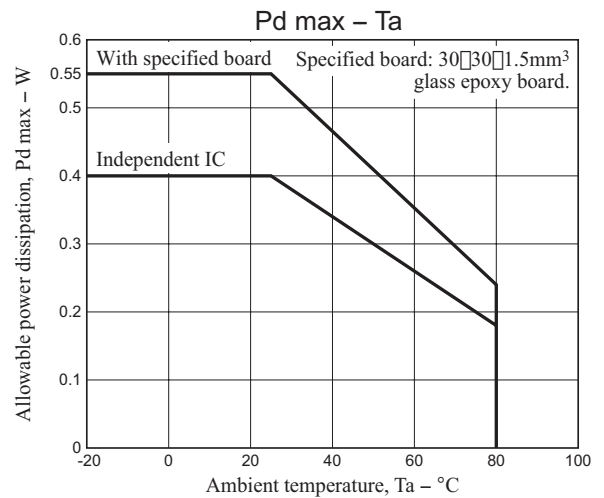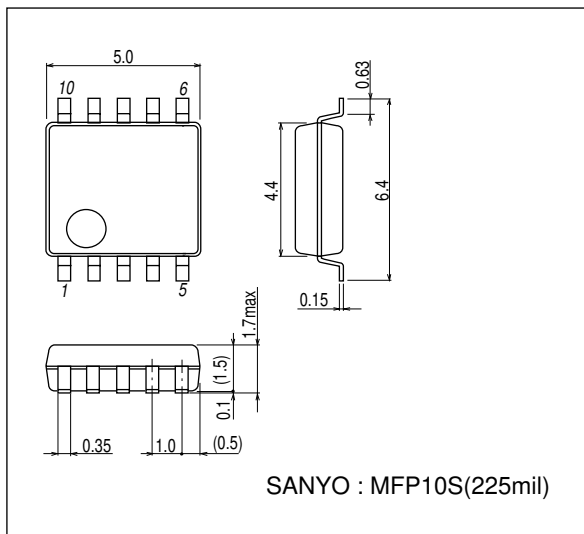
Pin Assignment

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.

LB1830M

Application Circuit Example

This catalog provides information as of October, 2011. Specifications and information herein are subject to change without notice.