

**LB1830M**

## Low-Saturation Bidirectional Motor Driver for Low-Voltage Applications

### Overview

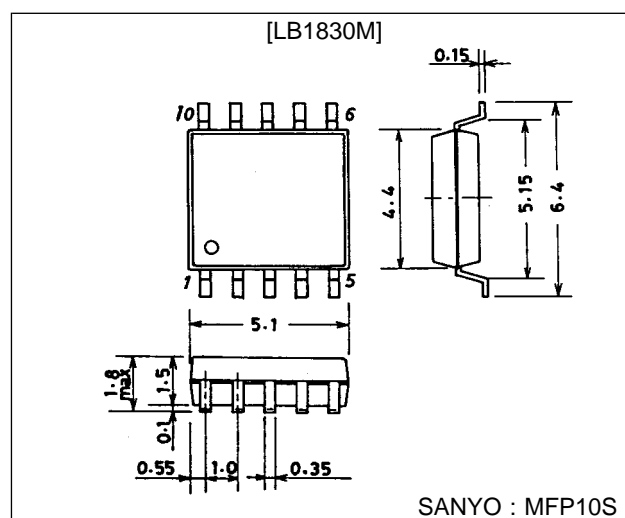
The LB1830M is a low-saturation bidirectional motor driver IC with brake function for use in low-voltage applications. As both of forward and reverse outputs are regulated, it is especially suited for use in portable equipment such as VCR, camera.

### Features

- Wide operating voltage range: 3.0 to 9.0 V
- Low saturation voltage: 0.2 V at  $I_O = 40$  mA (typ)
- Low current drain at standby mode (0.1  $\mu$ A 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
- MFP-10S package

### Package Dimensions

unit: mm

**3086A-MFP10S**

### Specifications

#### Absolute Maximum Ratings at $T_a = 25$ °C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC}$ max		10.5	V
Output current	$I_m$ max		200	mA
Input supply voltage	$V_{IN}$		-0.3 to +10	V
Allowable power dissipation	$P_d$ max	Independent IC	0.4	W
		With specified board (30 × 30 × 1.5 mm <sup>3</sup> )	0.55	W
Operating temperature	$T_{opr}$		-20 to +80	°C
Storage temperature	$T_{stg}$		-40 to +125	°C

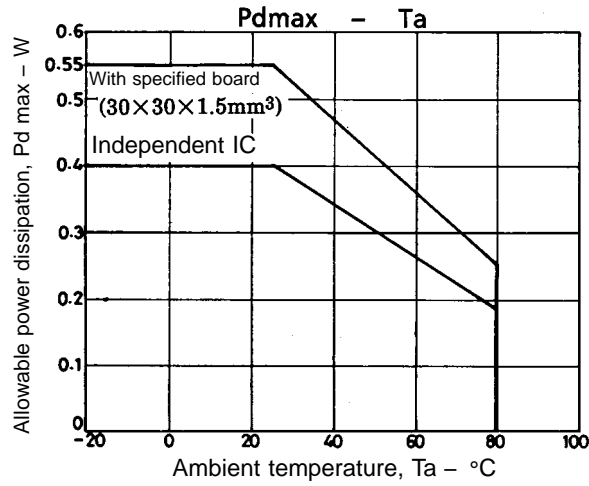
#### Allowable Operating Ranges at $T_a = 25$ °C

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

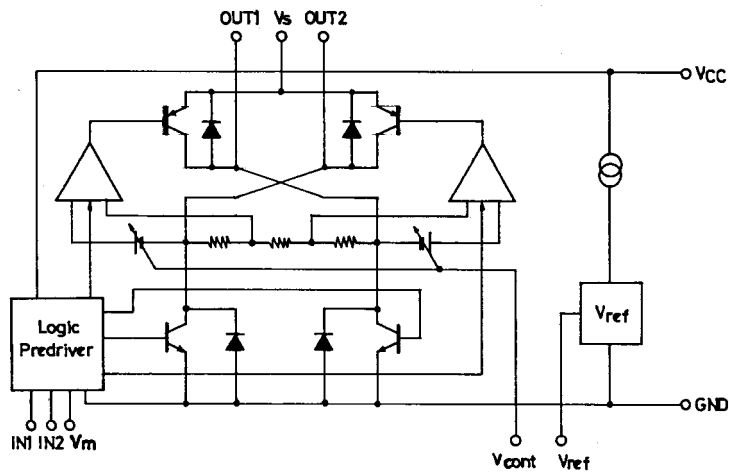
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## Electrical Characteristics at $T_a = 25\text{ }^\circ\text{C}$ , $V_{CC} = 6\text{ V}$

Parameter	Symbol	Conditions	min	typ	max	Unit
Current drain	$I_{CC0}$	$IN1 = IN2 = V_m = 0\text{ V}$ , $V_C = V_{ref}$ at standby mode		0.1	10	$\mu\text{A}$
	$I_{CC1}$	Forward/reverse, control, load OPEN		2	3	$\text{mA}$
	$I_{CC2}$	Forward/reverse, saturation, load OPEN		3	5	$\text{mA}$
	$I_{CC3}$	Braking, load OPEN		5	8	$\text{mA}$
Output saturation voltage	$V_{sat1}$	$I_O = 40\text{ mA}$ (upper + lower)		0.2	0.3	$\text{V}$
	$V_{sat2}$	$I_O = 80\text{ mA}$ (upper + lower)		0.4	0.6	$\text{V}$
Reference voltage	$V_{ref}$	$I_{Vref} = 1\text{ mA}$	1.85	2.0	2.15	$\text{V}$
Voltage characteristics of output voltage	$\frac{\Delta V_O}{\Delta V_{CC}}$	$V_O = 5\text{ V}$ , $V_{CC} = 5.5\text{ to }9\text{ V}$ , $I_O = 40\text{ mA}$			80	$\text{mV}$
Current characteristics of output voltage	$\frac{\Delta V_O}{\Delta I_{CC}}$	$V_O = 5\text{ V}$ , $V_{CC} = 6\text{ V}$ , $I_O = 10\text{ to }80\text{ mA}$			50	$\text{mV}$
Input current	$I_{IN}$	$V_{IN} = 5\text{ V}$		90	150	$\mu\text{A}$
Output voltage	$V_O$	$V_C = 2\text{ V}$	$2.3 \times V_C$		$2.5 \times V_C$	$\text{V}$

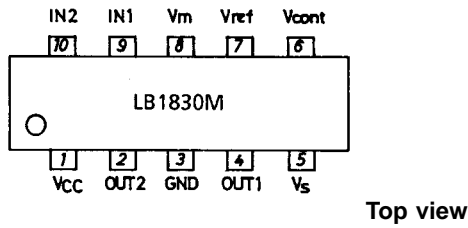


## Equivalent Circuit Block Diagram

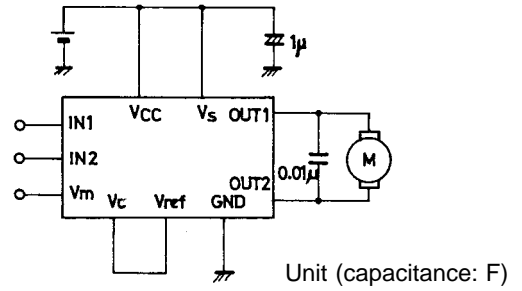


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## Pin Assignment



## Sample Application Circuit



## Truth Table

Input			Output		Mode
IN1	IN2	V <sub>m</sub>	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,  $V_C = V_S$  available

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