Ordering number : ENA2016

LB1846MC

Monolithic Digital IC

Low-Voltage/Low Saturation Voltage Type Bidirectional Motor Driver

ON Semiconductor®

http://onsemi.com

Overview

The LB1846MC is 2-channel low-voltage, low saturation voltage type bidirectional motor driver IC that is optimal for use as 2-phase stepping motor drivers in printers, cameras and other portable equipment. The output circuits are of the bipolar type, with PNP transistors in the upper side and NPN transistors in the lower side, and they achieve low saturation output and low power characteristics despite being provided in a miniature package.

The LB1846MC products can directly control a motor from signals from a microcontroller. The LB1846MC is optimal for 1-2 phase excitation drive for 2-phase stepping motors using 4-input logic (IN1, IN2, IN3 and IN4).

Another point is that these IC include built-in thermal shutdown circuits so that IC scorching or burning is prevented in advance even if the IC output is shorted.

Functions

- Optimal for 1-2 phase excitation drive for 2-phase stepping motors
- Low saturation voltage. V_O (sat) = 0.55V typical at I_O = 400mA
- No limitations on the magnitude relationship between the power supply voltage (V_{CC}) and the input voltage (V_{IN})
- Standby current: Zero
- Thermal shutdown circuit

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		-0.3 to +8.0	V
Output voltage	V_{OUT}		V_{CC} + V_{SF}	V
Input voltage	V_{IN}		-0.3 to +8.0	V
Ground pin outflow current	I_{GND}	Per channel	800	mA
Allowable power dissipation	Pd max	When mounted*	870	mW
Operating temperature	Topr		-20 to +75	°C
Storage temperature	Tstg		-40 to +150	°C

*1: When mounted on the specified printed circuit board (114.3mm × 76.2mm × 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.

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}		2.5 to 7.5	V
Input high-level voltage	V_{IH}		2.5 to 7.5	V
Input low-level voltage	V_{IL}		-0.3 to +0.7	V

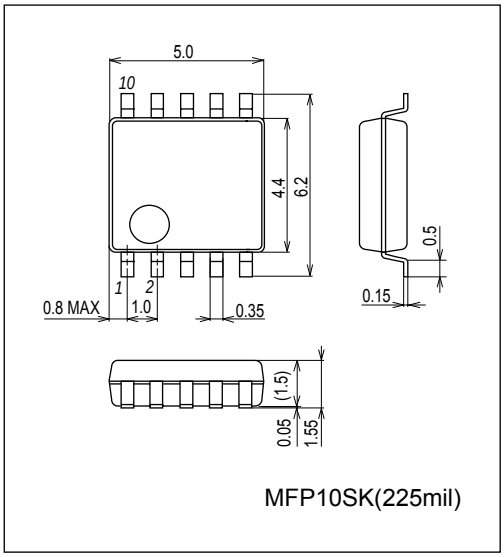
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V

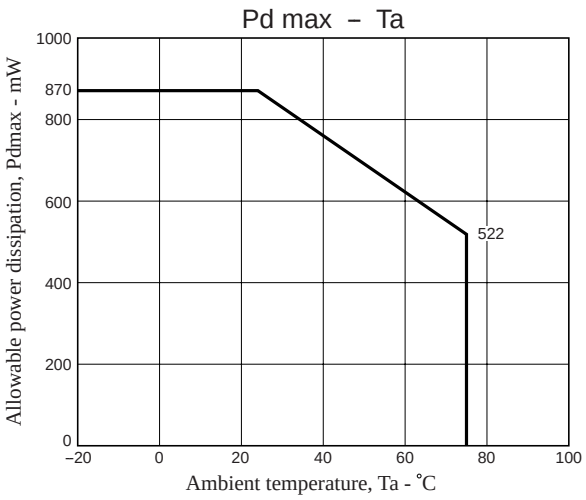
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	$I_{CC}0$	IN1, 2, 3, 4 = 0V		0.1	10	μA
	$I_{CC}1$	IN1, 3 = 3V, IN2, 4 = 0V		30	40	mA
Output saturation voltage	$V_{OUT}1$	V_{IN} = 3V or 0V, V_{CC} = 3 to 7.5V, I_{OUT} = 200mA		0.27	0.4	V
	$V_{OUT}2$	V_{IN} = 3V or 0V, V_{CC} = 4 to 7.5V, I_{OUT} = 400mA		0.55	0.8	V
Input current	I_{IN}	V_{IN} = 5V		150	200	μA
Spark Killer Diode						
Reverse current	I_S (leak)				30	μA
Forward voltage	V_{SF}	I_{OUT} = 400mA			1.7	V

Package Dimensions

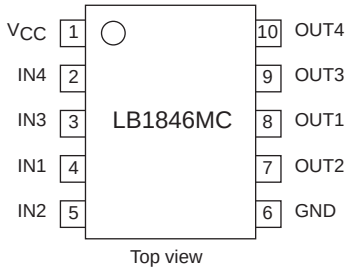
unit : mm (typ)

3420

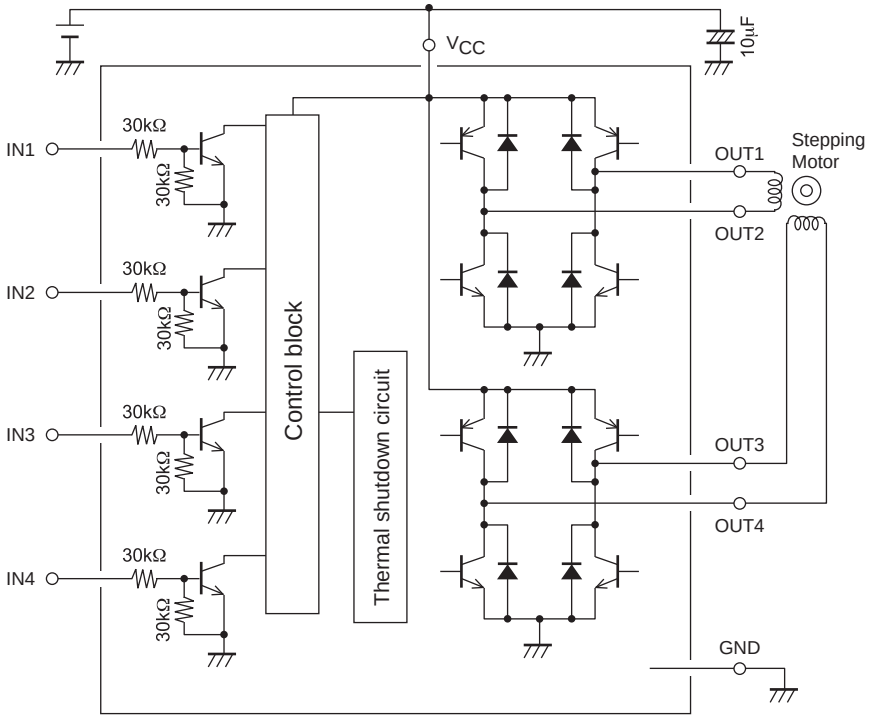




Pin Assignment



Block Diagram



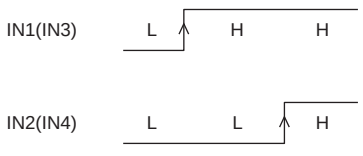
Truth Tables

IN1	IN2	IN3	IN4	OUT1	OUT2	OUT3	OUT4	Note
L	L	L	L	OFF	OFF	OFF	OFF	Standby
H	L	L	L	H	L	OFF	OFF	1-2 phase excitation
H	L	H	L	H	L	H	L	
L	L	H	L	OFF	OFF	H	L	
L	H	H	L	L	H	H	L	
L	H	L	L	L	H	OFF	OFF	
L	H	L	H	L	H	L	H	
L	L	L	H	OFF	OFF	L	H	
H	L	L	H	H	L	L	H	
H	H	-	-	The logic output for the first high-level input is produced. *2				
-	-	H	H					

Note: *1 "-" indicates a "don't care" input.

*2 If two high levels (H/H) are input to the IN1/IN2 pins with the timing shown in (1) in the figure below, then the IN2 input that arrived later will be ignored and the IC will function as though an H/L combination is applied to the IN1/IN2 pins. Similarly, the timing shown in (2) results in a L/H combination on the IN1/IN2 pins.

(1)



(2)