Ordering number : ENA1338

SANYO Semiconductors
DATA SHEET

Monolithic Digital IC

LA1909M — Stepping Motor Driver IC

Overview

The LB1909M is a 2-channel low saturation voltage forward/reverse motor driver that can operate on a wide supply voltage range (2.5V to 16V). The IC is ideal for use in 2-phase excitation drive of general-purpose 2-phase bipolar stepping motors including dampers for refrigerators.

Features

- Wide supply voltage range : 2.5V to 16V
- Low saturation voltage : V_O(sat) = 0.25V typ at I_O = 200mA.
- Built-in shoot-through current protection circuit.
- No standby current consumption (or zero).
- Built-in thermal shutdown circuit.
- Small package : MFP10S (225mil)

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum power source voltage	V_{CC} max		-0.3 to +20	V
Applied output voltage	V_{OUT} max		-0.3 to +20	V
Applied input voltage	V_{IN} max		-0.3 to +18	V
GND pin outflow current	I_{GND}		800	mA
Allowable power consumption	Pd max	Independent IC	350	mW
		Mounted on the specified board *	870	mW
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-40 to +150	°C

* Specified board: 114.3mm × 76.1mm × 1.6mm, glass epoxy board.

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Allowable Operating Range at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		2.5 to 16	V
Input high level voltage	V_{IH}	Pins ENA, IN1, IN2	1.8 to 10	V
Input low level voltage	V_{IL}		-0.3 to +0.7	V

Electrical Characteristics at Ta = 25°C, V_{CC} = 12V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Power source current	$I_{CC}0$	ENA = L		0.1	10	μA
	$I_{CC}1$	ENA = H		25	35	mA
Output saturation voltage	$V_{OUT}1$	I_{OUT} = 200mA		0.25	0.35	V
	$V_{OUT}2$	I_{OUT} = 400mA		0.50	0.75	V
Input current	I_{IN}	V_{IN} = 5V		120	160	μA
Thermal protection block *1						
Thermal shutdown operation temperature	Ttsd	Design guarantee *2		180		°C
Temperature hysteresis width	ΔTtsd			60		°C
Spark killer diode						
Reverse current	I_S(leak)				30	μA
orward voltage	V_{SF}	I_{OUT} = 400mA			1.7	V

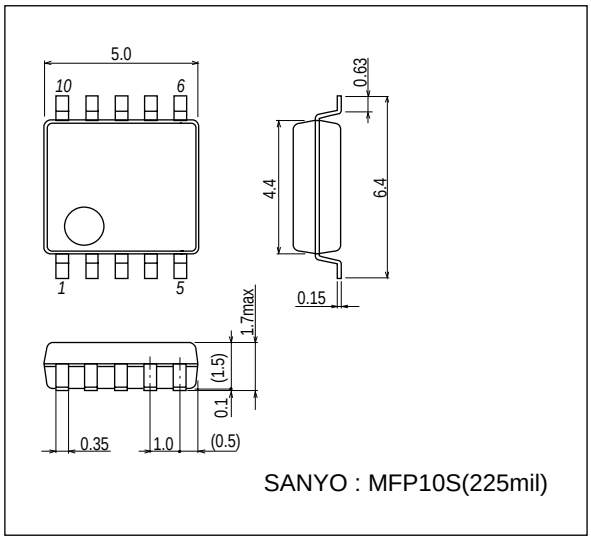
*1 The thermal protection function is a feature to prevent the product from smoking and firing under unusual conditions. It is not intended to guarantee operation of the product under an ambient temperature exceeding the operating temperature range.

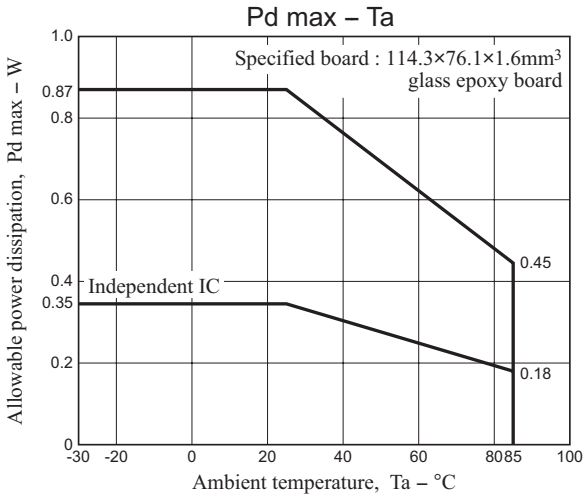
*2 Design guarantee is not tested in individual units.

Package Dimensions

unit : mm (typ)

3086B





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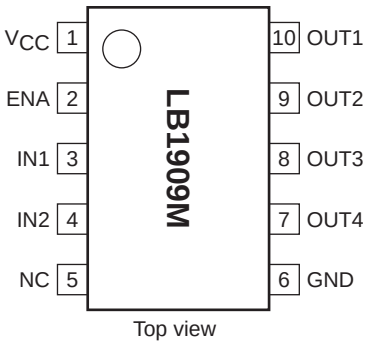
Pin Assignment

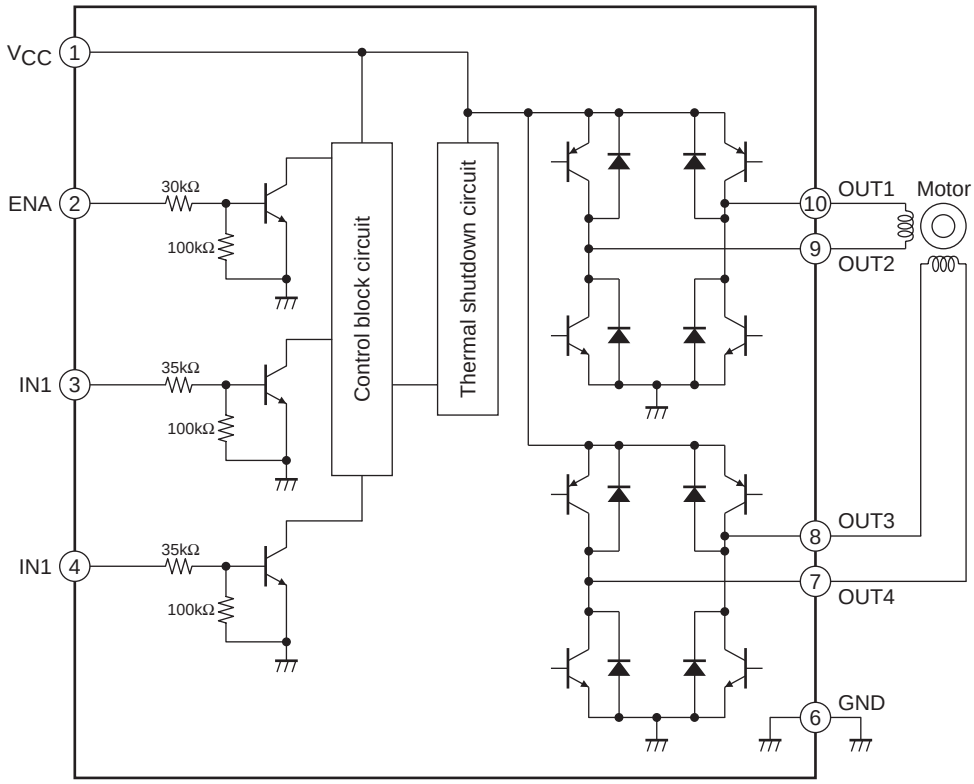


Top view

Truth table

Input			Output				Remarks	
ENA	IN1	IN2	OUT1	OUT2	OUT3	OUT4		
L	×	×	OFF	OFF	OFF	OFF	Standby mode	
H	L		H	L			Channel 1	Forward
	H		L	H				Reverse
		L			H	L	Channel 2	Forward
		H			L	H		Reverse

Block Diagram



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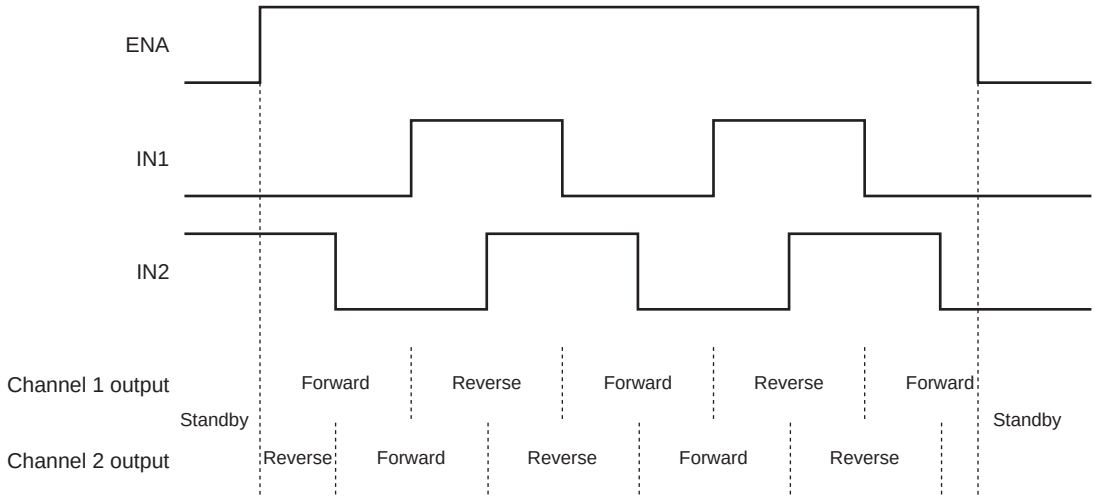
Timing Chart (2 phase excitation drive)



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