Ordering number : ENA2036A

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

Monolithic Digital IC

LB1848MC — Low-Voltage/Low Saturation Voltage Type Bidirectional Motor Driver

Overview

The LB1848MC 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 LB1848MC products can directly control a motor from signals from a microcontroller. The LB1848MC is optimal for 2-phase excitation drive for 2-phase stepping motors using 3-input logic (ENA, IN1 and IN2).

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 2-phase excitation drive for 2-phase stepping motors
- Low saturation voltage. V_O (sat) = 0.55V typical at I_O = 400mA
- Through-current prevention circuit
- Standby current: Zero
- Thermal shutdown circuit
- No limitations on the magnitude relationship between the power supply voltage (V_{CC}) and the input voltage (V_{IN})
- “Soft off” function that reduces power supply line noise when switching from drive to standby modes. (Requires the use of one external capacitor.)

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*	820	mW
Operating temperature	Topr		-20 to +75	°C
Storage temperature	Tstg		-40 to +150	°C

Continued on next page.

■ Any and all SANYO Semiconductor Co.,Ltd. products described or contained herein are, with regard to "standard application", intended for the use as general electronics equipment. The products mentioned herein shall not be intended for use for any "special application" (medical equipment whose purpose is to sustain life, aerospace instrument, nuclear control device, burning appliances, transportation machine, traffic signal system, safety equipment etc.) that shall require extremely high level of reliability and can directly threaten human lives in case of failure or malfunction of the product or may cause harm to human bodies, nor shall they grant any guarantee thereof. If you should intend to use our products for new introduction or other application different from current conditions on the usage of automotive device, communication device, office equipment, industrial equipment etc. , please consult with us about usage condition (temperature, operation time etc.) prior to the intended use. If there is no consultation or inquiry before the intended use, our customer shall be solely responsible for the use.

■ Specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

Continued from preceding page.

*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.

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

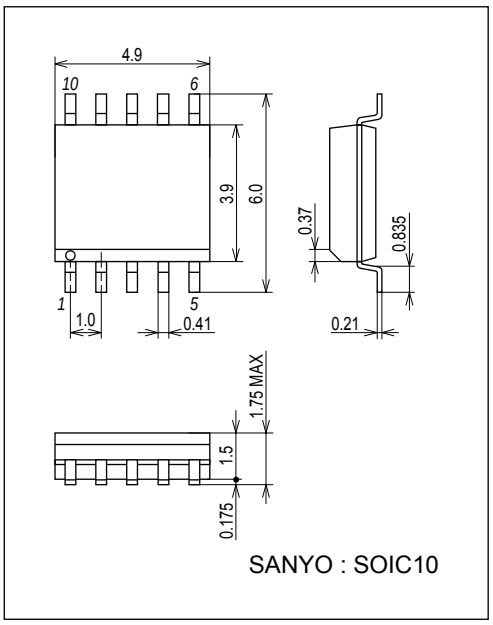
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V

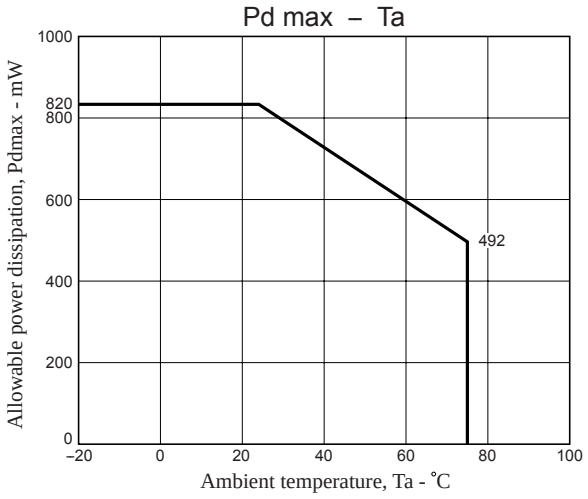
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	$I_{CC}0$	ENA = 0V, V_{IN} = 3V or 0V	-	0.1	10	μA
	$I_{CC}1$	ENA = 3V, V_{IN} = 3V or 0V	-	25	35	mA
Output saturation voltage	$V_{OUT}1$	ENA = 3V, V_{IN} = 3V or 0V, V_{CC} = 3 to 7.5V, I_{OUT} = 200mA	-	0.27	0.4	V
	$V_{OUT}2$	ENA = 3V, 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	-	75	100	μA
	I_{ENA}	ENA = 5V	-	85	110	μA
Spark Killer Diode						
Reverse current	I_S (leak)		-	-	30	μA
Forward voltage	V_{SF}	I_{OUT} = 400mA	-	-	1.7	V

Package Dimensions

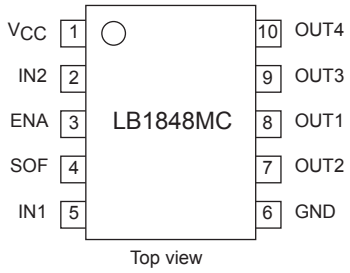
unit : mm (typ)

3426A

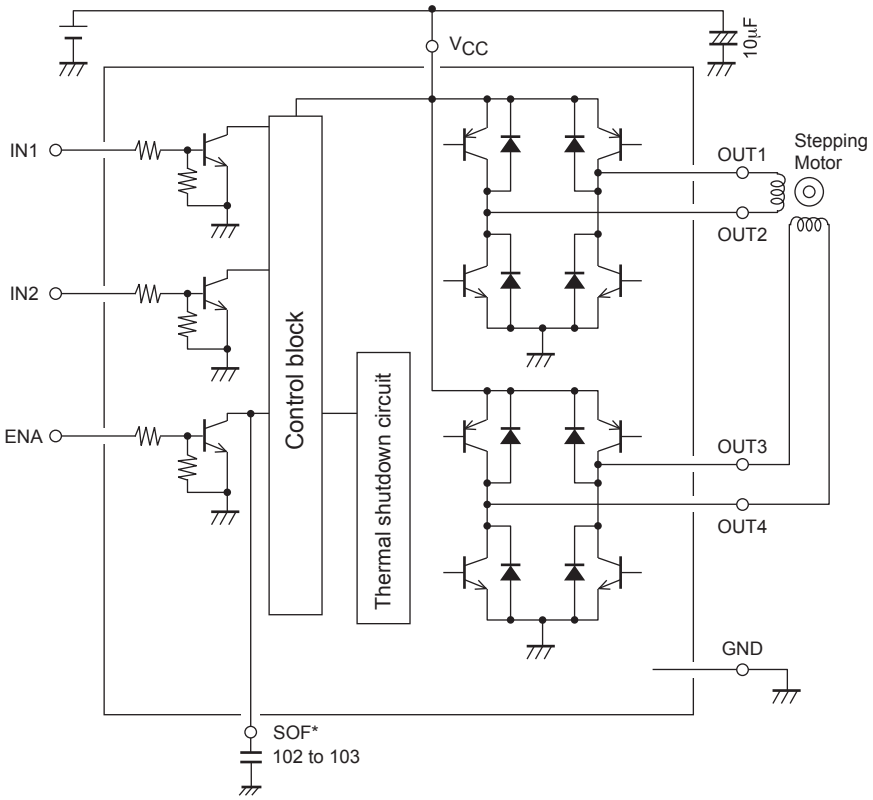




Pin Assignment



Block Diagram



Note: When the “soft off” function is used, a capacitor must be connected to the SOF pin. IF this function is not used, this pin must be left open with absolutely no signals or lines connect.

Truth Tables

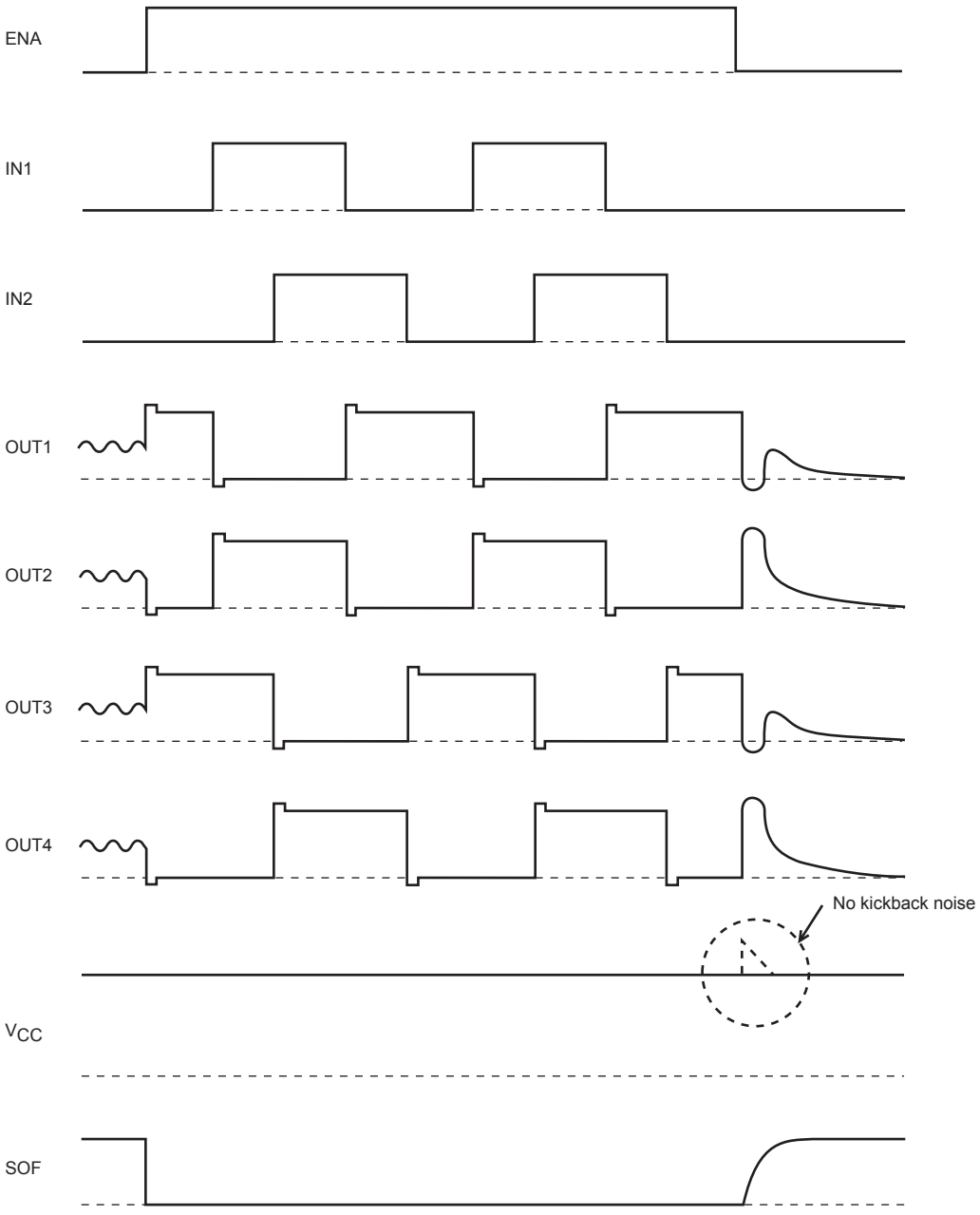
ENA	IN1	IN2	OUT1	OUT2	OUT3	OUT4
L	-	-	OFF	OFF	OFF	OFF
H	L	L	H	L	H	L
	L	H	H	L	L	H
	H	H	L	H	L	H
	H	L	L	H	H	L

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

SOF pin (“Soft off” function) operation

The soft off function reduces power supply line noise due to the kickback current generated when the stepping motor drive mode is switched from drive to standby. The “soft off” function provided by this IC operates when a capacitor (0.001 to 0.01μF) is connected between the SOF pin and ground. (Leave the SOF pin open to disable the soft off function.)

The waveforms for each pin are shown below.

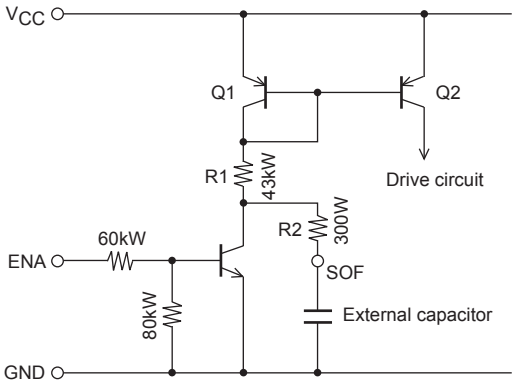


(Cautions)

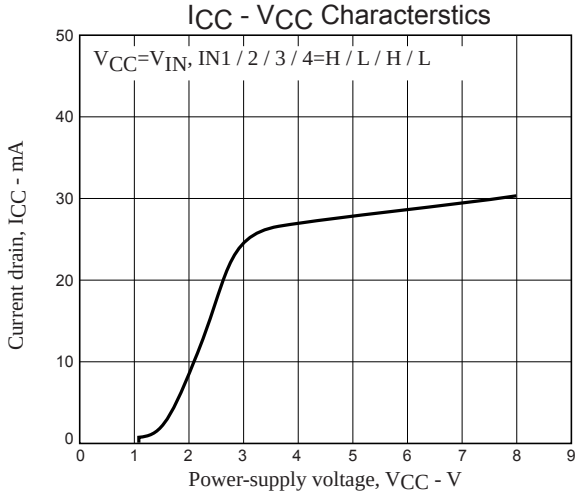
Pay attention to following two points in an application where the capacitor to GND is connected to the SOF pin:

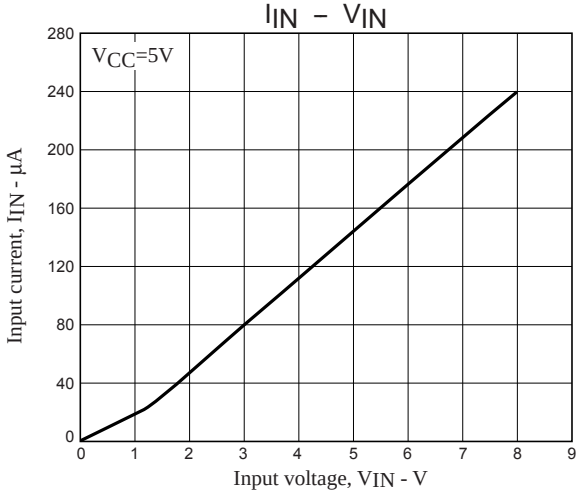
(1) Sudden startup of VCC power supply causes charging of the capacitor from the IC inside via the SOF pin at startup. During charging, the state equivalent to the one with the ENA input at "H" occurs, causing output of the corresponding logic to the output pin, which may result in driving of the load. (The output time period is dependent on the capacity of capacitor; about 2 ms for 0.01μF.)

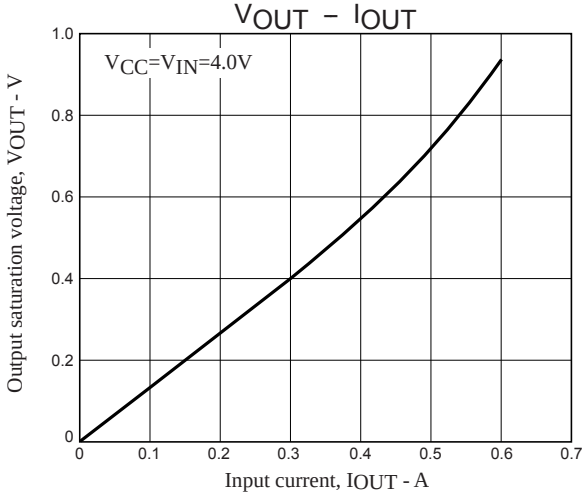
(2) To transfer from the drive mode to the standby mode by changing the ENA input from "H" to "L", the capacitor is charged from the IC inside via the SOF pin as in the case of above (1). During this charge period, the ENA input keeps the "H" condition in IC. By changing IN1/IN2 input at this time point, the output can be changed. (The time period is equal to that of (1) above.)



[SOF pin internal equivalent circuit diagram]







■ SANYO Semiconductor Co.,Ltd. assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein.

■ SANYO Semiconductor Co.,Ltd. strives to supply high-quality high-reliability products, however, any and all semiconductor products fail or malfunction with some probability. It is possible that these probabilistic failures or malfunction could give rise to accidents or events that could endanger human lives, trouble that could give rise to smoke or fire, or accidents that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all SANYO Semiconductor Co.,Ltd. products described or contained herein are controlled under any of applicable local export control laws and regulations, such products may require the export license from the authorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written consent of SANYO Semiconductor Co.,Ltd.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO Semiconductor Co.,Ltd. product that you intend to use.

■ Upon using the technical information or products described herein, neither warranty nor license shall be granted with regard to intellectual property rights or any other rights of SANYO Semiconductor Co.,Ltd. or any third party. SANYO Semiconductor Co.,Ltd. shall not be liable for any claim or suits with regard to a third party's intellctual property rights which has resulted from the use of the technical information and products mentioned above.

This catalog provides information as of April, 2012. Specifications and information herein are subject to change without notice.

OCEAN CHIPS
Океан Электроники
Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

AVIC JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

FORSTAR®

Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А