



## LB1833M

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

#### Overview

The LB1833M is a low-saturation stepping motor driver IC for use in low-voltage applications. It is especially suited for use in portable equipment such as printer, FDD, camera.

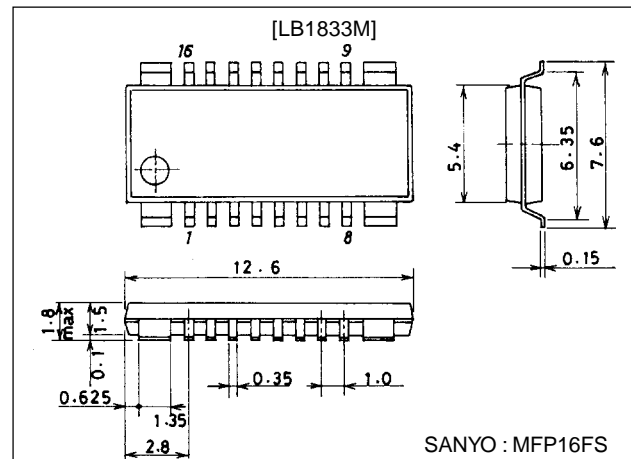
#### Features

- Capable of being operated from a low voltage (2.5V min).
- Low saturation voltage.  
(Upper transistor+low transistor residual voltage 1.0V max at 400mA).
- Through current preventer on-chip.
- Logic power supply and motor power supply are separate.
- On-chip spark killer diodes.
- Possible to increase the internal allowable power dissipation because the package is compact (MFP-16FS) and heat can be radiated easily to the outside.

#### Package Dimensions

unit:mm

##### 3097-MFP16FS



#### Specifications

##### Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max		-0.3 to +8.0	V
	V <sub>S</sub> max		-0.3 to +8.0	V
Output supply voltage	V <sub>OUT</sub>		-0.3 to V <sub>S</sub> +V <sub>SF</sub>	V
Input supply voltage	V <sub>IN</sub>		-0.3 to +8.0	V
GND pin flow-out current	I <sub>GND</sub>	per channel	1.0	A
Allowable power dissipation	Pd max1	IC only	900	mW
	Pd max2	Mounted on specified board (20×30×1.5mm <sup>3</sup> glass epoxy)	1200	mW
Operating temperature	T <sub>opr</sub>		-20 to +75	°C
Storage temperature	T <sub>stg</sub>		-40 to +125	°C

##### Allowable Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V <sub>CC</sub>		2.5 to 7.0	V
	V <sub>S</sub>		1.8 to 7.0	V
Input high-level voltage	V <sub>IH</sub>		1.8 to 7.0	V
Input low-level voltage	V <sub>IL</sub>		-0.3 to +0.7	V

■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

■ SANYO 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 products described or contained herein.

**SANYO Electric Co.,Ltd. Semiconductor Business Headquarters**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

82098HA (KT)/2070TA/TS No.3297-1/3

# LB1833M

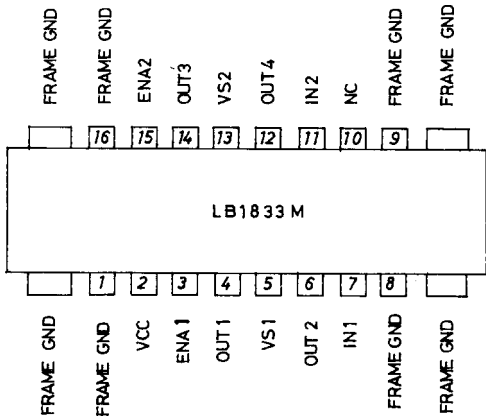
## Electrical Characteristics at Ta = 25°C, VCC=3V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current 1	I <sub>CCO</sub>	ENA1, 2=0V, ENA4=0V, V <sub>IN1</sub> =3V or 0V, I <sub>S</sub> +I <sub>CC</sub>		0.1	10	μA
Supply current 2	I <sub>CC</sub>	ENA1=3V, V <sub>IN1</sub> =3V or 0V, I <sub>S</sub> +I <sub>CC</sub>		10	18	mA
Output saturation voltage	V <sub>OUT1</sub>	ENA=3V, V <sub>IN</sub> =3V or 0V, I <sub>OUT</sub> =200mA		0.35	0.50	V
	V <sub>OUT2</sub>	ENA=3V, V <sub>IN</sub> =3V or 0V, I <sub>OUT</sub> =400mA		0.75	1.0	V
Input current 1	I <sub>IN</sub>	V <sub>CC</sub> =6V, V <sub>IN</sub> =6V			250	μA
Input current 2	I <sub>ENA</sub>	V <sub>CC</sub> =6V, E <sub>NA</sub> =6V			350	μA
Output sustain voltage	V <sub>O(sus)</sub>	I <sub>OUT</sub> =400mA	9			V
[Spark Killer Diode]						
Reverse current	I <sub>S(leak)</sub>	V <sub>CC</sub> , V <sub>S</sub> =7V			30	μA
Forward voltage	V <sub>SF</sub>	I <sub>OUT</sub> =500mA			1.7	V

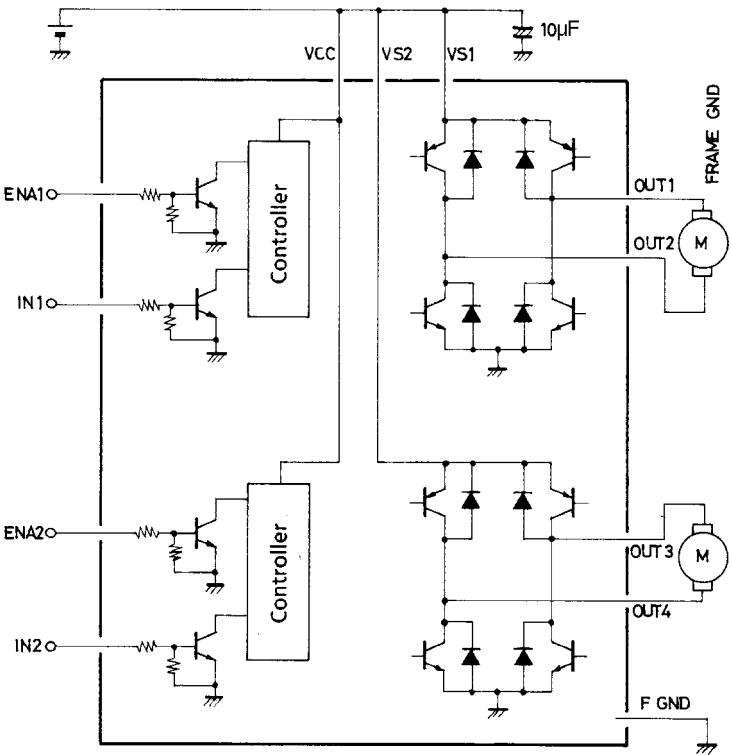
## Truth Table

IN 1/2	ENA 1/2	OUT 1/3	OUT 2/4	Mode
L	H	H	L	Forward
H	H	L	H	Reverse
L	L	OFF	OFF	Standby
H	L	OFF	OFF	Standby

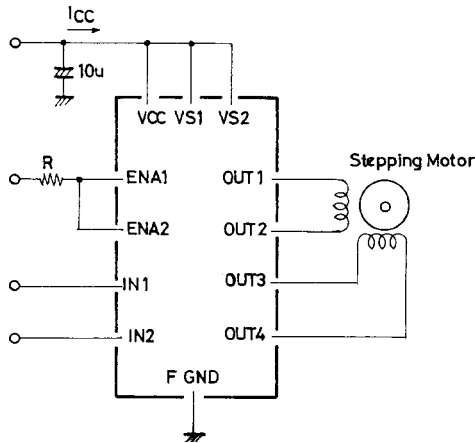
## Pin Assignment



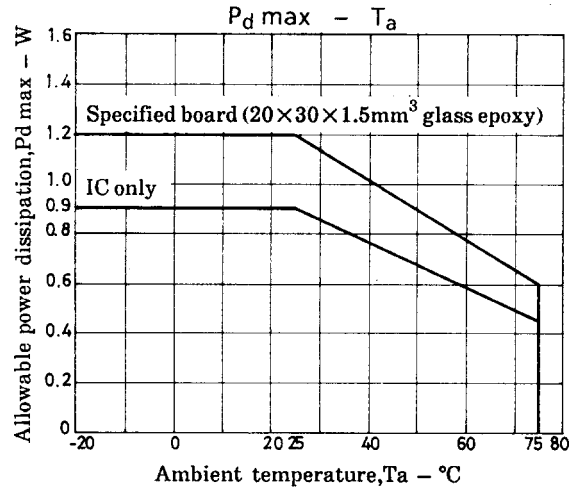
## Equivalent Circuit Block Diagram



# Sample Application Circuit



Note : Use one of the FRAME-GND pins for grounding. when the Cu-foild side is soldered, heat radiation can be more improved.



- Specifications of any and all SANYO 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.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or 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 and all SANYO products described or contained herein fall under strategic products (including services) controlled under the Foreign Exchange and Foreign Trade Control Law of Japan, such products must not be exported without obtaining export license from the Ministry of International Trade and Industry 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 permission of SANYO Electric 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 product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of August, 1998. Specifications and information herein are subject to change without notice.