

**LB1649****Dual Bidirectional Motor Driver****Overview**

The LB1649 is a dual bidirectional motor driver. Since each channel has a 2-input logic circuit and performs bidirectional driving and braking functions, it is capable of direct driving 2pcs. of motor of various types rated at 6 to 24V.

The output voltage can be varied by using external zener diodes.

It is especially suited for dual motor drive (reel motor, loading motor, cassette motor in VCR) and for stepping motor drive.

Features

- With power transistor for motor drive contained, capable of withstanding dash current of 1A max.
- Performs braking function at the motor stop mode.
- Contains elements to absorb motor dash current.
- Input connectable direct to MOS LSI.
- Minimum number of external parts required.
- Wide operating voltage range.

Specifications**Absolute Maximum Ratings at Ta = 25°C**

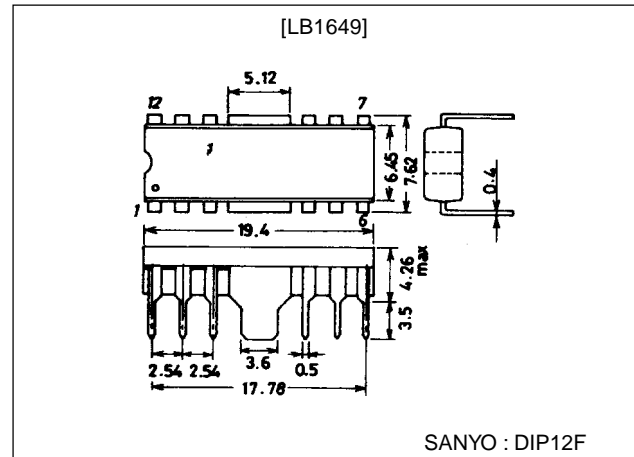
Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		25	V
Input voltage	V_{IN}		25	V
Output current	I_O		± 1	A
Allowable power dissipation	P_d max		1.9	W
Operating temperature	T_{opr}		-25 to +75	°C
Storage temperature	T_{stg}		-55 to +125	°C

Allowable Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		7 to +25	V

Package Dimensions

unit:mm

3022A-DIP12F

■ 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)/N3093TS/9074KI, TS No.1571-1/5

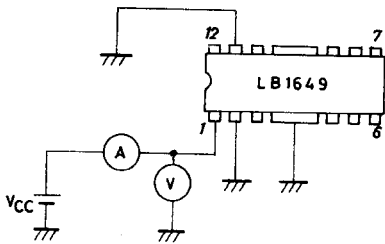
LB1649

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC}=12\text{V}$, per channel

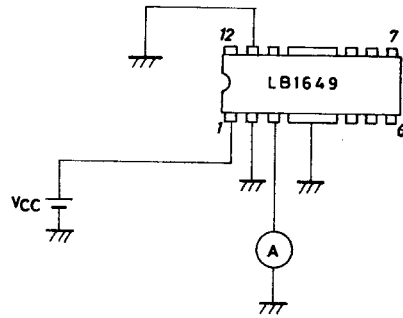
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	I_{CC}	Braking mode, $R_L=\infty$, per channel		7.0	10.0	mA
Output leakage current	I_{OL}	Braking mode, $R_L=\infty$, per channel		40	120	μA
Input threshold voltage	V_{th}	$R_L=\infty$	0.9	1.05	1.20	V
Output voltage	V_O	$R_L=60\Omega$, $V_Z=7.4\text{V}$	6.5	7.2	7.5	V
Output transistor saturation voltage (upper)	V_{sat1}	$I_{OUT}=300\text{mA}$		1.9	2.3	V
		$I_{OUT}=500\text{mA}$		2.0	2.4	V
Output transistor saturation voltage (lower)	V_{sat2}	$I_{OUT}=300\text{mA}$		0.3	0.55	V
		$I_{OUT}=500\text{mA}$		0.5	0.7	V

Test Circuit (per channel)

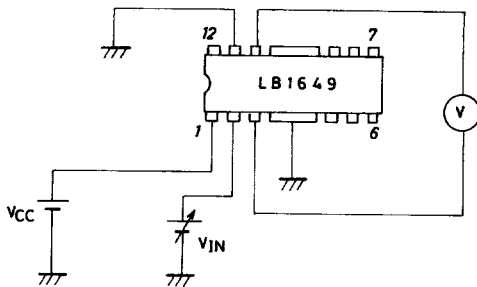
(1) I_{CC}



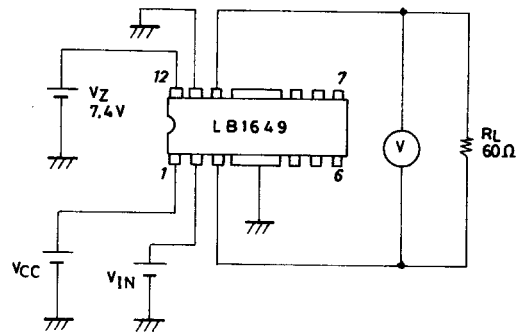
(2) I_{OL}



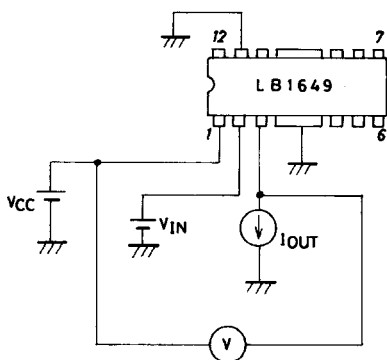
(3) V_{th}



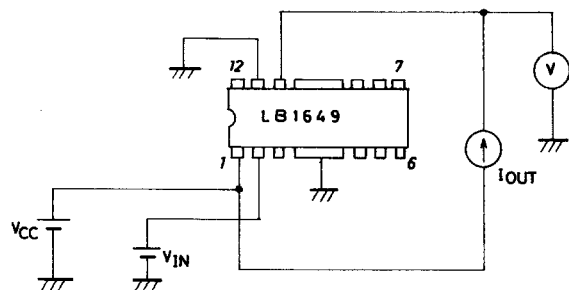
(4) V_O



(5) V_{sat1}

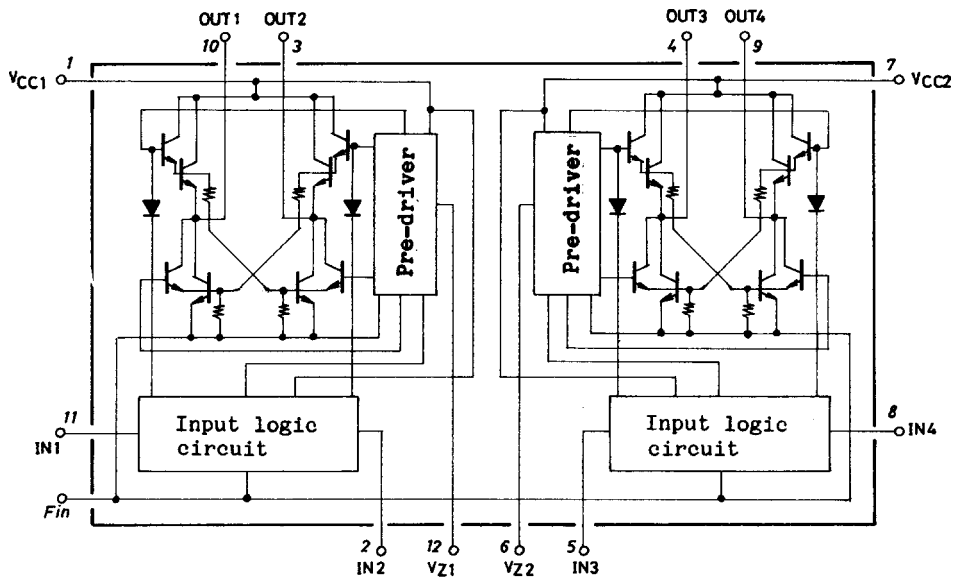


(6) V_{sat2}



LB1649

Equivalent Circuit Block Diagram



Truth Table of Logic Circuit

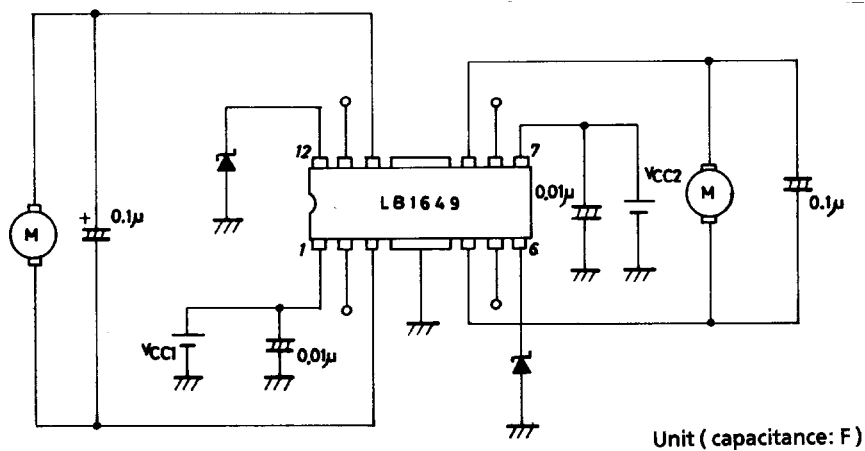
IN1	IN2	OUT1	OUT2	IN3	IN4	OUT3	OUT4
0	0	L	L	0	0	L	L
1	0	H	L	1	0	H	L
0	1	L	H	0	1	L	H
1	1	L	L	1	1	L	L

Note : A capacitor of 0.01 μ F or greater must be connected across V_{CC}1,2 and GND.

INPUT			OUTPUT				MODE	
IN1	IN2, 3	IN4	OUT1	OUT2	OUT3	OUT4	M1	M2
0	0	0	L	L	L	L	Brake	Brake
1	0	0	H	L	L	L	Forward/reverse	Brake
0	1	1	L	H	L	L	Reverse/forward	Brake
1	1	0	L	L	H	L	Brake	Forward/reverse
0	0	1	L	L	L	H	Brake	Reverse/forward
1	1	1	L	L	L	L	Brake	Brake

The remaining input states 1, 0, 1 and 0, 1, 0 are not inhibited.

Sample Application Circuit



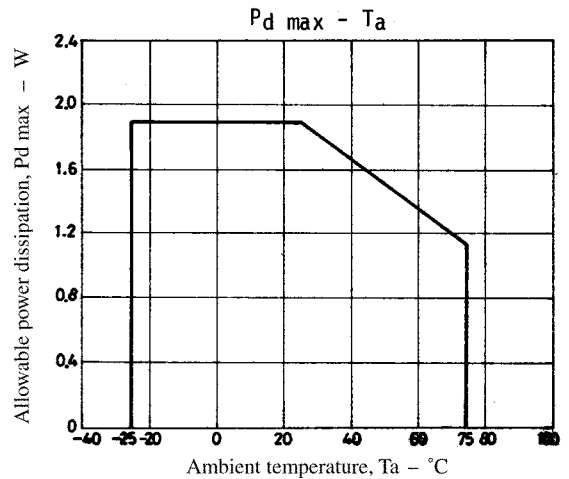
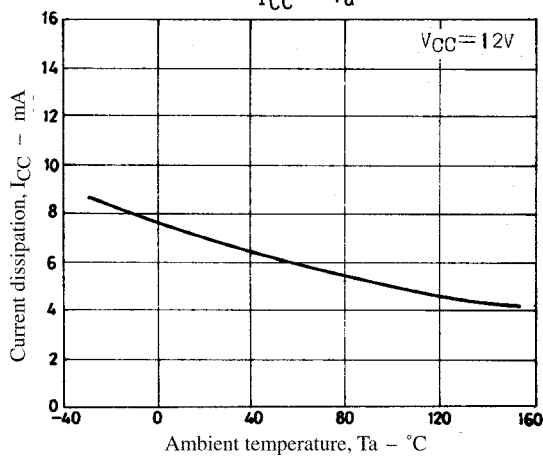
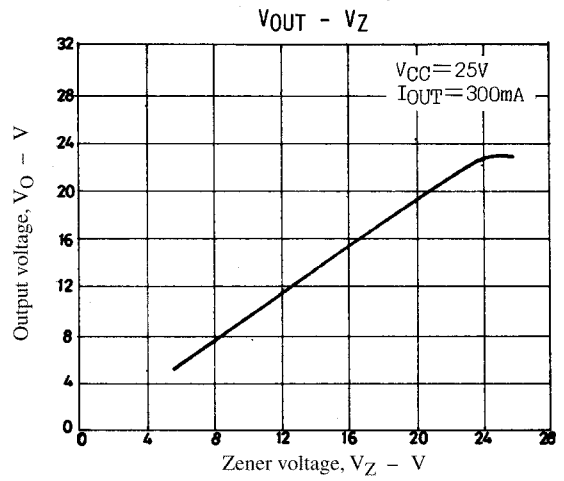
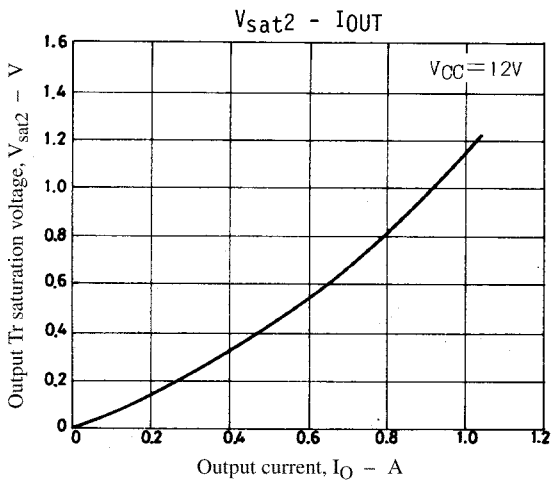
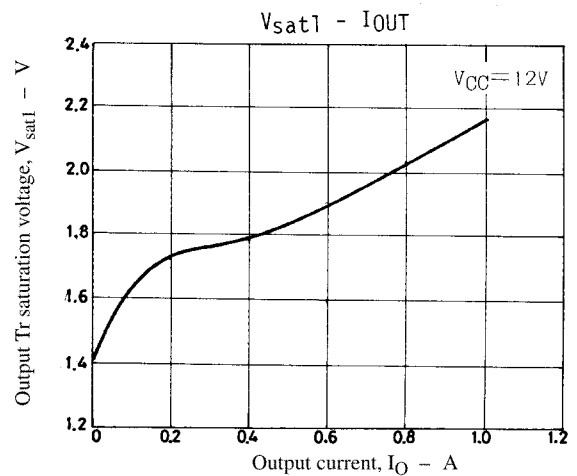
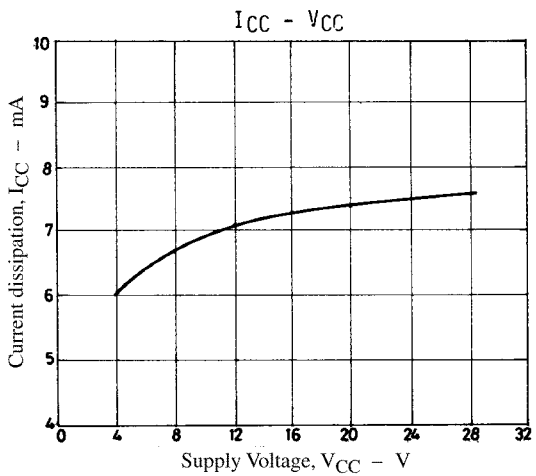
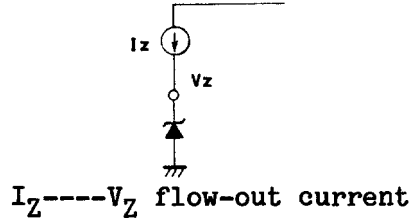
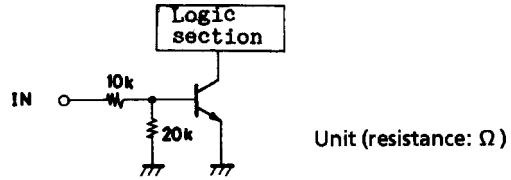
Input Circuit

The input circuit is shown right

V_Z pin

Zener voltage	V_Z pin voltage vaule
$\geq 5.6V$	small
$< 5.6V$	large*

* Susceptible to V_Z pin flow-out current change.



- 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.