

**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 2 pcs. 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**

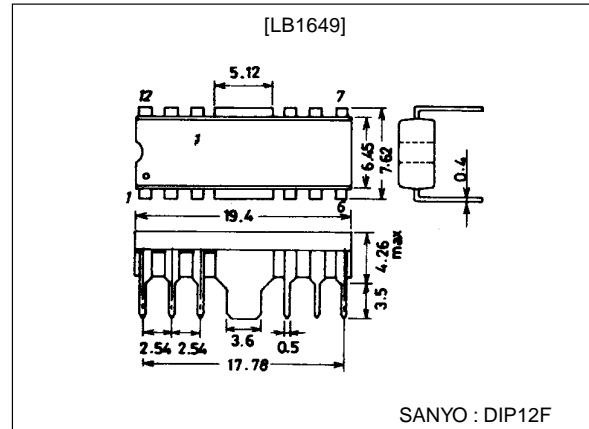
| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|--------------|------------|-------------|------|
| Maximum supply voltage | V_{CC} max | | 25 | V |
| Input voltage | V_{IN} | | 25 | V |
| Output current | I_O | | ± 1 | A |
| Allowable power dissipation | P_d max | | 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

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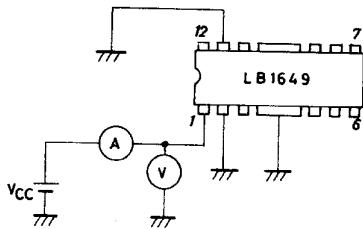
LB1649

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

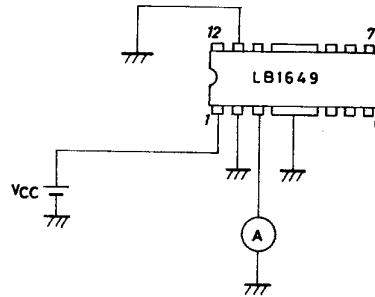
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|------------|--|---------|------|------|---------------|
| | | | min | typ | max | |
| Current drain | I_{CC} | Braking mode, $R_L=\infty$, per channel | | 7.0 | 10.0 | mA |
| Output leakage current | I_{OL} | Braking mode, $R_L=\infty$, per 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)

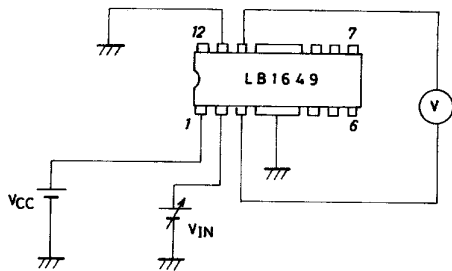
(1) I_{CC}



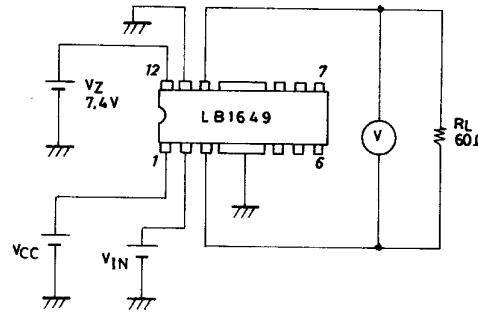
(2) I_{OL}



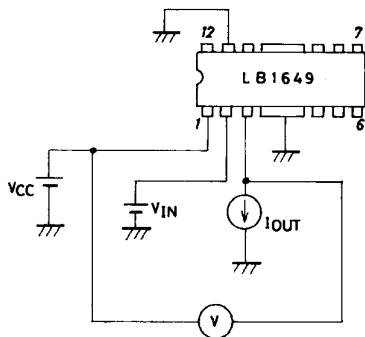
(3) V_{th}



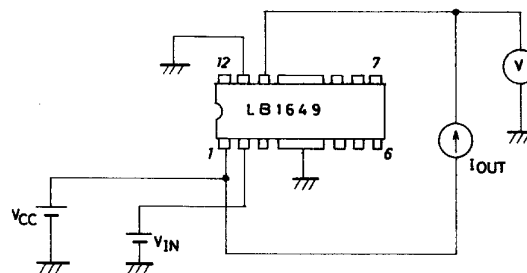
(4) V_O



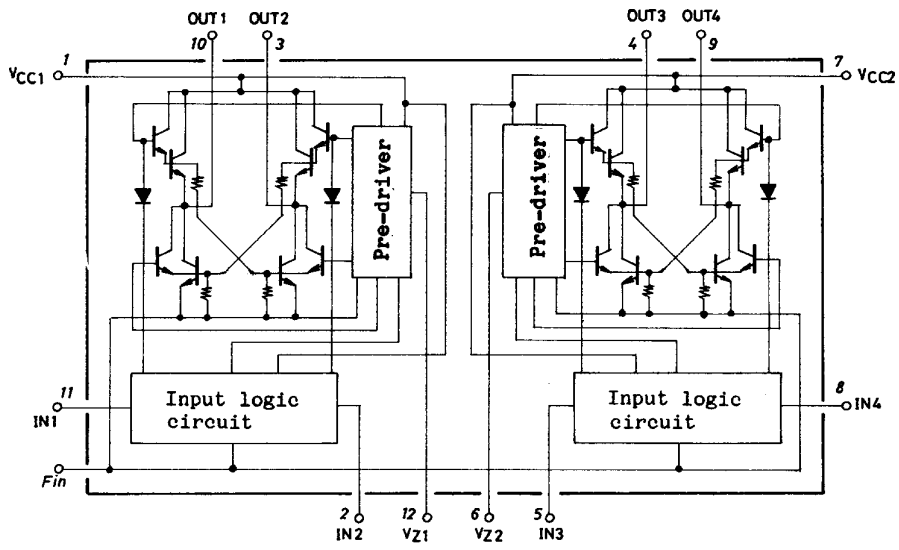
(5) V_{sat1}



(6) V_{sat2}



Equivalent Circuit Block Diagram



Truth Table of Logic Circuit

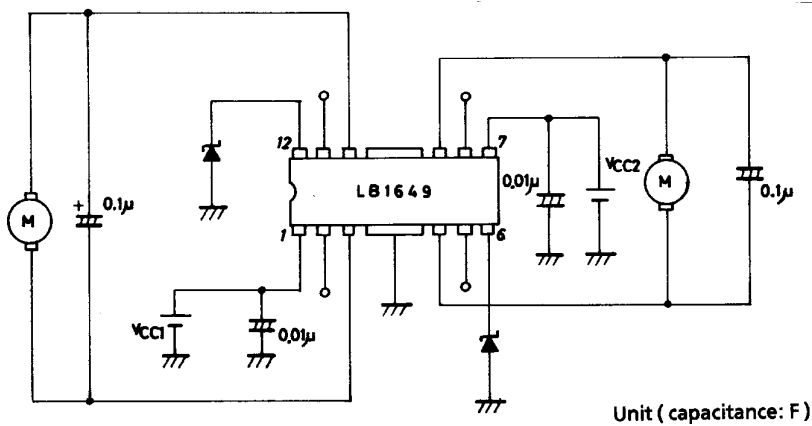
| IN1 | IN2 | OUT1 | OUT2 | IN3 | IN4 | OUT3 | OUT4 |
|-----|-----|------|------|-----|-----|------|------|
| 0 | 0 | L | L | 0 | 0 | L | L |
| 1 | 0 | H | L | 1 | 0 | H | L |
| 0 | 1 | L | H | 0 | 1 | L | H |
| 1 | 1 | L | L | 1 | 1 | L | L |

Note : A capacitor of 0.01μF 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



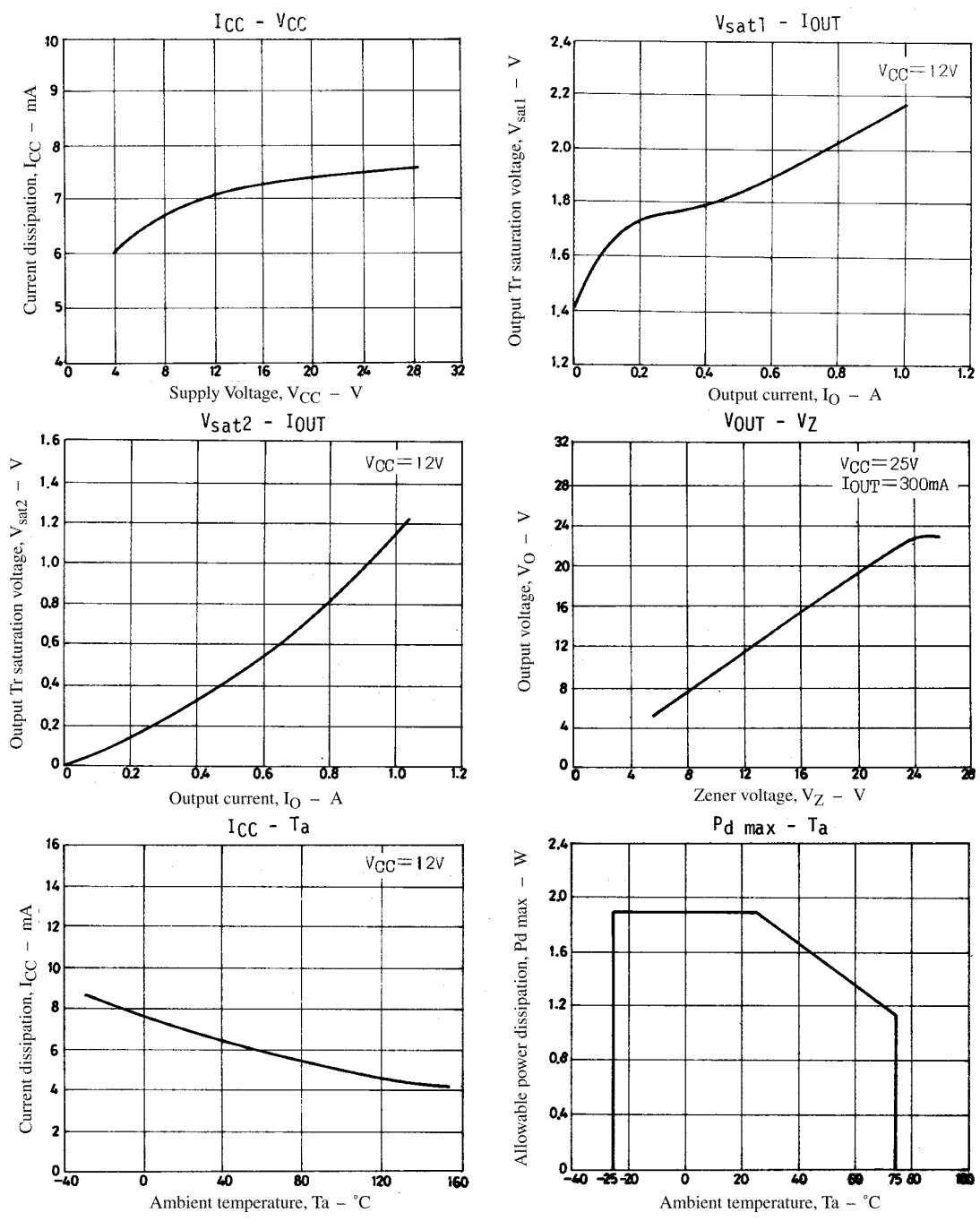
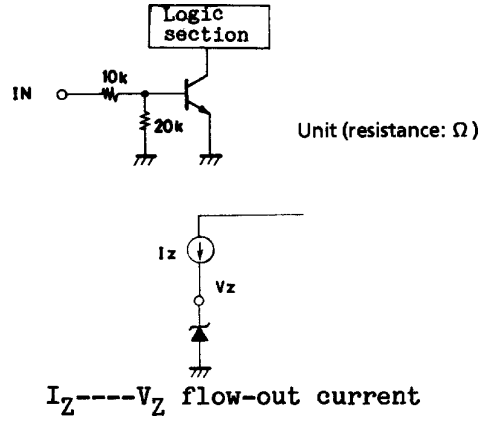
Input Circuit

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.



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