



# SANYO Semiconductors

## DATA SHEET

An ON Semiconductor Company

Bi-CMOS LSI

# LV8082LP — Constant-voltage 1ch + Constant-current 1ch H-Bridge

## Overview

The LV8082LP is a Constant-voltage 1ch + Constant-current 1ch driver that supports low-voltage operation. It is optimal for constant-voltage and constant-current drive of voice coil motors (AF and Shutter) in portable equipment such as camera cell phones.

## Features

- Constant-voltage 1ch + Constant-current 1ch H-bridge driver
- Built-in power supply switch and position detection comparator for use with a photoreflector
- Implemented in a low-power MOS IC process.
- Ultraminiature easy to solder VCT16 package (2.6 × 2.6mm)
- Built-in thermal protection and low-voltage sensing circuits

## Specifications

### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter                   | Symbol        | Conditions                   | Ratings      | Unit |
|-----------------------------|---------------|------------------------------|--------------|------|
| Maximum supply voltage      | $V_{CC}$ max  |                              | 6.5          | V    |
| Output voltage              | $V_{OUT}$ max | OUT1, OUT2, OUT3, OUT4       | 6.5          | V    |
| Input voltage               | $V_{IN}$ max  | IN1, IN2, IN3, IN4           | -0.3 to +6.5 | V    |
| Ground pin source current   | IGND          | Per channel                  | 400          | mA   |
| Allowable power dissipation | $P_d$ max     | Mounted on a circuit board.* | 700          | mW   |
| Operating temperature       | $T_{opr}$     |                              | -30 to +85   | °C   |
| Storage temperature         | $T_{stg}$     |                              | -40 to +150  | °C   |

\* Specified circuit board : 50×40×0.8mm<sup>3</sup> : 4-layer (2S2P) glass epoxy printed circuit board

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**LV8082LP**

## Allowable Operating Ratings at $T_a = 25^\circ\text{C}$

| Parameter                | Symbol   | Conditions         | Ratings              | Unit |
|--------------------------|----------|--------------------|----------------------|------|
| Supply voltage           | $V_{CC}$ |                    | 2.5 to 6.0           | V    |
| High-level input voltage | $V_{IH}$ | IN1, IN2, IN3, IN4 | $0.53V_{CC}$ or more | V    |
| Low-level input voltage  | $V_{IL}$ |                    | Up to $0.2V_{CC}$    | V    |

### **Electrical Characteristics** at $T_a = 25^\circ\text{C}$ , $V_{CC} = 3.0\text{V}$

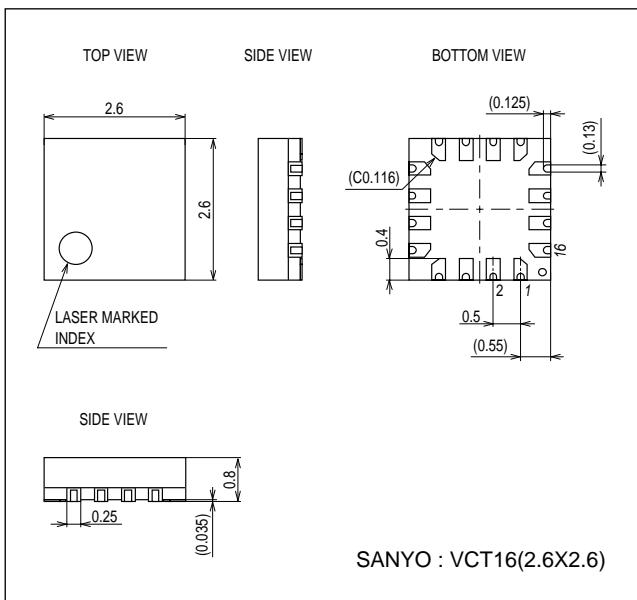
| Parameter                               | Symbol            | Conditions  | Ratings |      |      | Unit |
|---|-------------------|---|---------|------|------|------|
|   |                   |   | min     | typ  | max  |      |
| Current drain                           | I <sub>CCO</sub>  | IN = 0V   |         | 0.1  | 1    | μA   |
|   | I <sub>CCO1</sub> | IN = 3V   |         | 0.7  | 1    | mA   |
| Output on resistance                    | R <sub>on1</sub>  | V <sub>CC</sub> = 3.0V (High and low side total)<br>IN = 3.0V, I <sub>OUT</sub> = 100mA |         | 2.0  | 3.0  | Ω    |
|   | R <sub>on2</sub>  | V <sub>CC</sub> = 5.0V (High and low side total)<br>IN = 5.0V, I <sub>OUT</sub> = 100mA |         | 1.50 | 2.0  | Ω    |
| Constant-voltage output 1               | V <sub>OUT1</sub> | V <sub>C</sub> = 1V, V <sub>CC</sub> = 3.0V   | 1.94    | 2.0  | 2.06 | V    |
| Constant-current output 1               | I <sub>OUT1</sub> | Between RFG and ground : 1Ω   | 95      | 100  | 105  | mA   |
| Constant-current output 2               | I <sub>OUT2</sub> | Between RFG and ground : 0.5Ω<br>(Design specification)                                 | 190     | 200  | 210  | mA   |
| Output turn-on time                     | T <sub>rise</sub> | With RFG shorted to ground (Design specification)                                       |         | 1.5  | 3    | μs   |
| Output turn-off time                    | T <sub>fall</sub> | With RFG shorted to ground (Design specification)                                       |         | 0.2  | 0.65 | μs   |
| Comparator threshold high-level voltage | V <sub>H</sub>    |   |         | 1.3  | 1.37 | V    |
| Comparator threshold Low-level voltage  | V <sub>L</sub>    |   | 0.86    | 0.91 |      | V    |
| Comparator hysteresis                   | V <sub>hys</sub>  |   |         | 0.39 |      | V    |
| Input current                           | I <sub>IN</sub>   | V <sub>IN</sub> = 3V  |         | 15   | 30   | μA   |

Note : The design specification items are design guarantees and are not measured.

## Package Dimensions

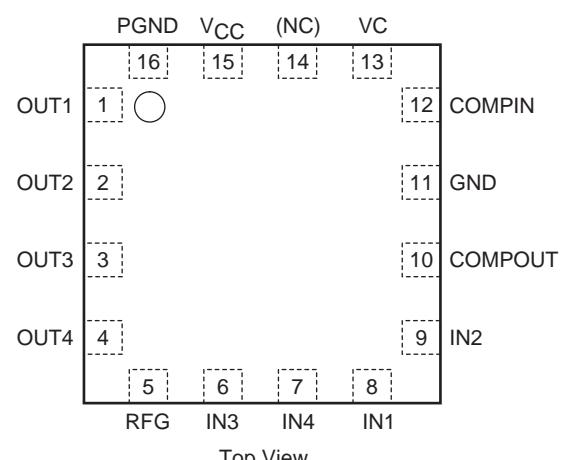
unit : mm (typ)

3318

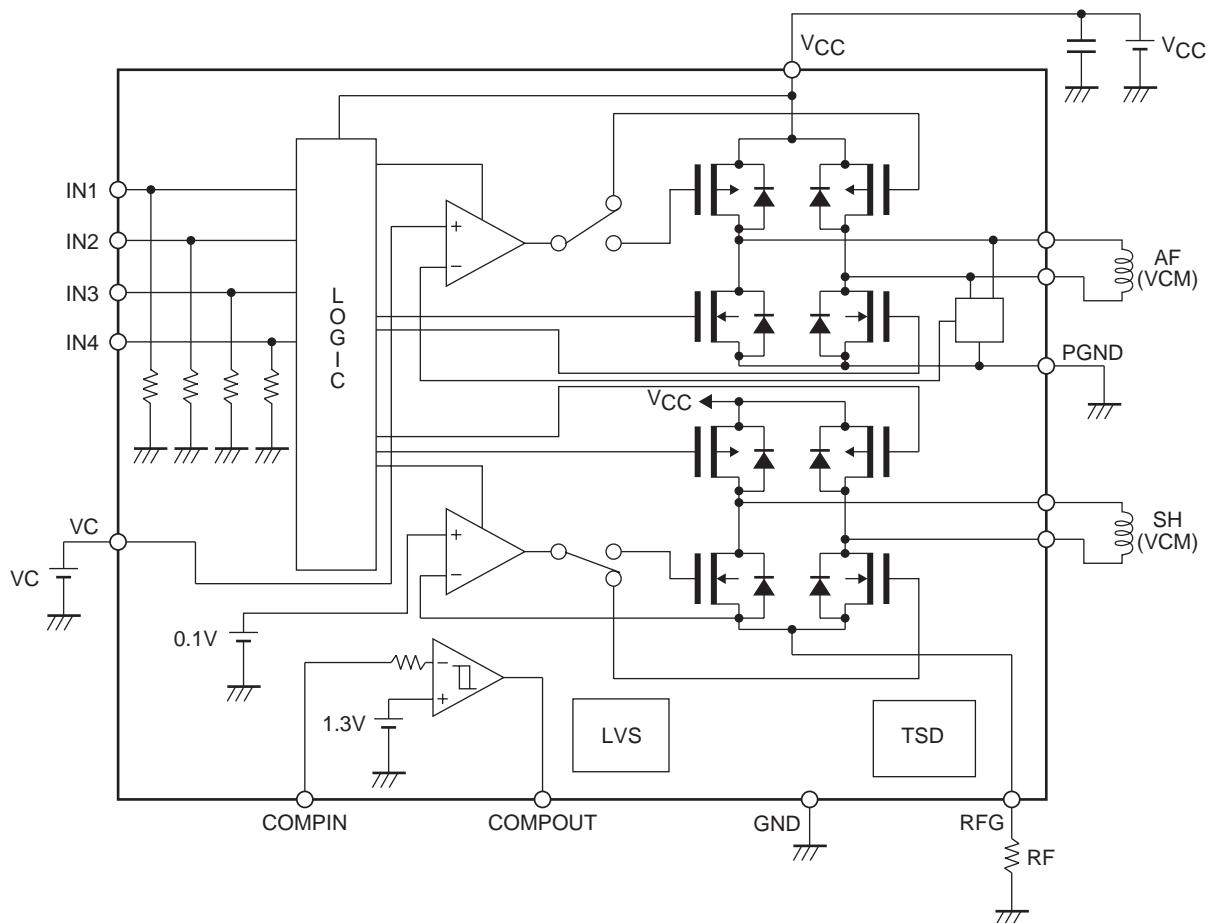


## Pin Assignment

(VCT16)



## Block Diagram



Constant-voltage calculation :  $V_{OUT} = VC \times 2$  Example : When an  $V_{OUT}$  of 2V is required, VC must be 1V

Constant-current calculation :  $I_{OUT} = 0.1 \div RF$  Example : When an  $I_{OUT}$  of 100mA is required, RF must be  $1\Omega$ .

### Usage Notes

The constant current is set by the resource RF connected between RFG and ground according to the formula shown above.

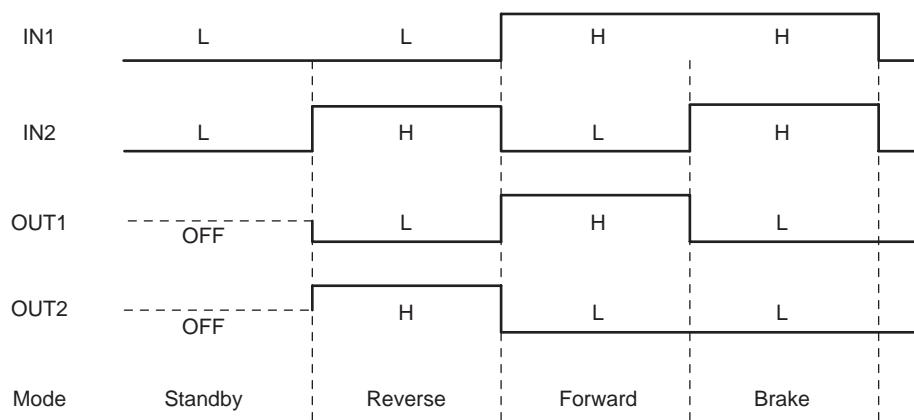
### Truth Table

| Input |      |      |      | Output |      |      |      | Mode                                 |
|-------|------|------|------|--------|------|------|------|--------------------------------------|
| IN1   | IN2  | IN3  | IN4  | OUT1   | OUT2 | OUT3 | OUT4 |                                      |
| Low   | Low  | Low  | Low  | Off    | Off  | Off  | Off  | Standby mode                         |
| Low   | High |      |      | Low    | High |      |      | Channel 1, constant voltage, reverse |
| High  | Low  |      |      | High   | Low  |      |      | Channel 1, constant voltage, forward |
| High  | High |      |      | Low    | Low  |      |      | Channel 1, brake mode                |
| Low   | Low  | Low  | Low  | Off    | Off  | Off  | Off  | Standby mode                         |
|       |      | Low  | High |        |      | Low  | High | Channel 2, constant current, reverse |
|       |      | High | Low  |        |      | High | Low  | Channel 2, constant current, forward |
|       |      | High | High |        |      | Low  | Low  | Channel 2, brake mode                |

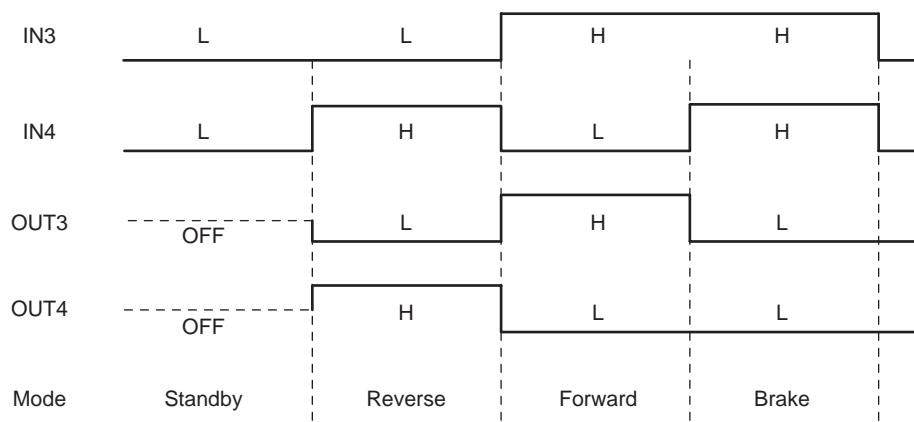
Note : When off, a high-impedance state.

**Timing Chart**

(1) Constant voltage channel timing chart

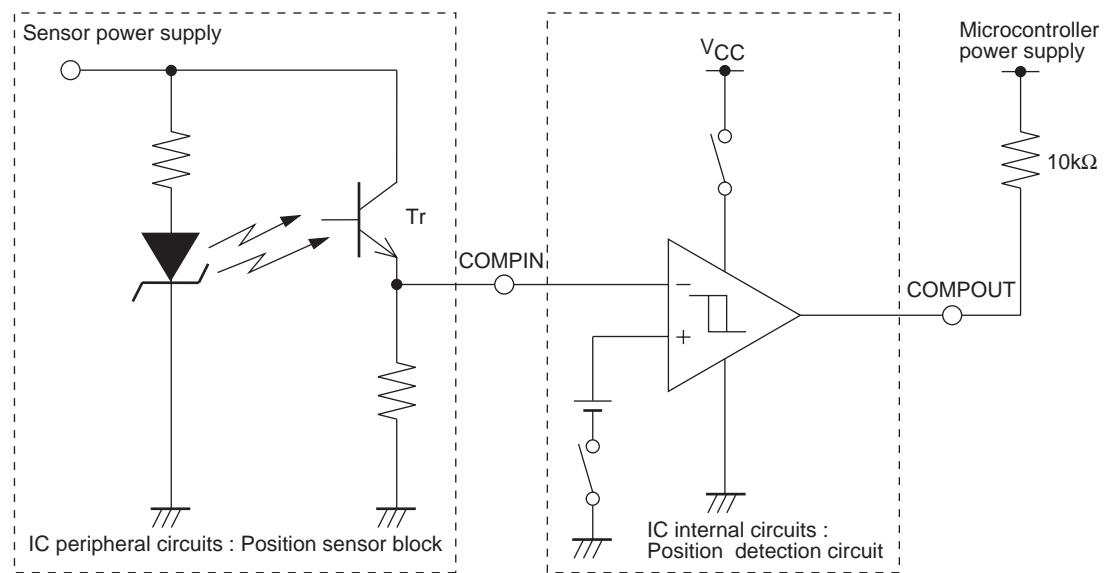


(2) Constant current channel timing chart

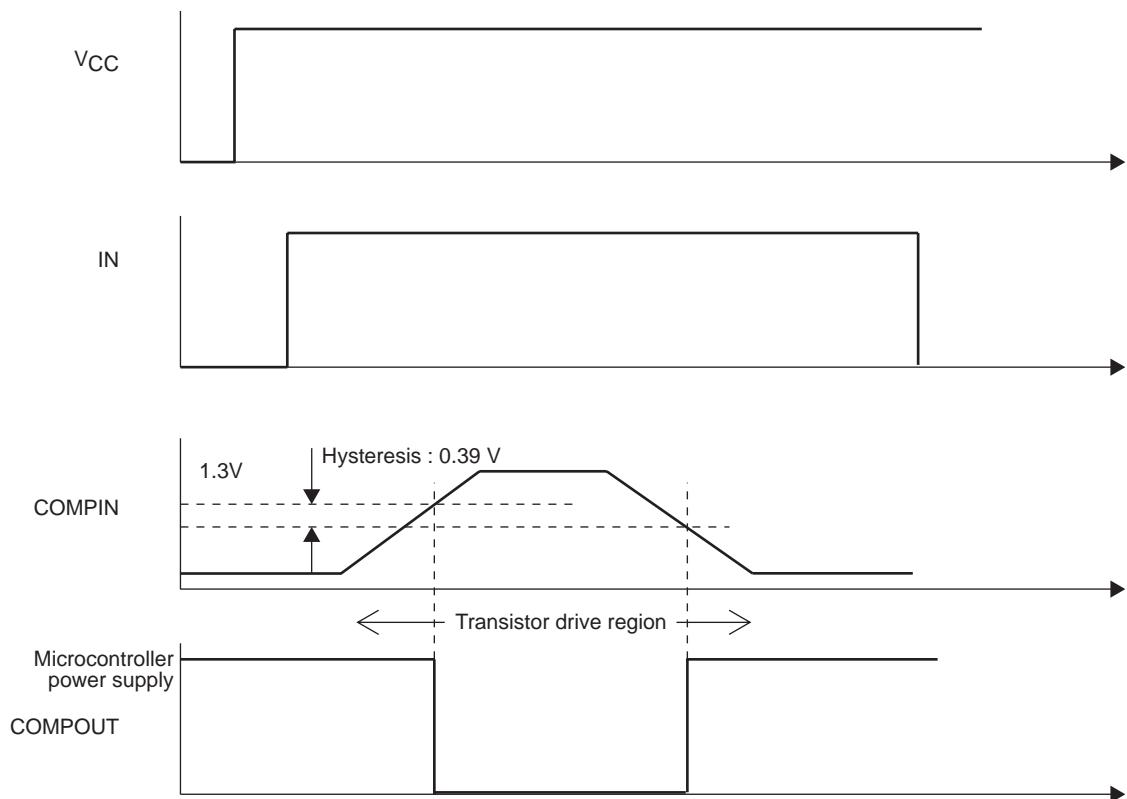


## Photosensor Position Detection Application Circuit Example

(a) Application circuit



(b) Timing chart



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