



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

Bi-CMOS LSI

LV8075LP — Constant-voltage Control 1-channel Forward/Reverse Motor Driver

Overview

LV8075LP is a constant voltage control 1-channel forward/reverse motor driver IC.

Features

- Constant voltage control forward/reverse H-bridge
Parallel input-Analog value must be entered for constant voltage reference input
 $V(\text{OUT}) = V(\text{VC}) \times 2.0$
- Built-in thermal protection circuit and under-voltage detection protection circuit

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$, $\text{SGND} = \text{PGND} = 0\text{V}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|--------------------------------------|-----------------------|-----------------------------|-------------|------------------|
| Maximum control power supply voltage | $V_{CC \text{ max}}$ | | 6 | V |
| Maximum load power supply voltage | $V_M \text{ max}$ | | 6 | V |
| Maximum control pin voltage | $V_C \text{ max}$ | | 6 | V |
| Maximum output current | $I_O \text{ max}$ | OUT1, 2 | 0.5 | A |
| VREF maximum current | $I_{REF \text{ max}}$ | VREF | 1 | mA |
| Allowable power dissipation | $P_d \text{ max}$ | Mounted on a circuit board* | 700 | mW |
| Operating temperature | T_{opr} | | -30 to +85 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | | -40 to +150 | $^\circ\text{C}$ |

* Specified circuit board : $40.0 \times 50.0 \times 0.8 \text{mm}^3$: glass epoxy four-layer board

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Allowable Operating Range at $T_a = 25^\circ\text{C}$, $\text{SGND} = \text{PGND} = 0\text{V}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-------------------|----------------|---|------|
| Control power-supply voltage | V_{CC} | | 2.5 to 5.5 | V |
| Load power-supply voltage | V_{M} | | 2.5 to 5.5 | V |
| Output control input voltage | V_{cont} | VC pin | 0 to $V_{\text{CC}}-1$ | V |
| Input pin "H" voltage | V_{INH} | IN1, 2, EN pin | $V_{\text{CC}} \times 0.6$ to $V_{\text{CC}}+0.3$ | V |
| Input pin "L" voltage | V_{INL} | IN1, 2, EN pin | -0.1 to $V_{\text{CC}} \times 0.2$ | V |

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{\text{CC}} = V_{\text{M}} = 3.0\text{V}$, $\text{PGND} = \text{SGND} = 0\text{V}$, unless otherwise specified.

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|------------------|--|---------|------|------|------------------|
| | | | min | typ | max | |
| Standby current consumption 1 | I_{CCO} | EN, IN1, 2 = H/L/L or EN = L | | | 1 | μA |
| Standby current consumption 1 | I_{MO} | EN, IN1, 2 = H/L/L or EN = L | | | 1 | μA |
| Operating current consumption | V_{CC1} | EN = H, IN1 or IN2 = H | | 0.5 | 1.0 | mA |
| H-level input current | I_{INH} | 200k Ω pull-down, $V_{\text{IN}} = 3\text{V}$ | 10 | 15 | 20 | μA |
| L-level input current | I_{INL} | $V_{\text{IN}} = 0\text{V}$ | | 0 | 1 | μA |
| Reference voltage output | V_{REF} | $I_{\text{REF}} = 500\mu\text{F}$ | 1.4 | 1.5 | 1.6 | V |
| Output on-resistance | R_{on1} | Total of top and bottom | | 1.75 | 2.5 | Ω |
| Constant-voltage control output voltage | V_{OUT} | VC = 1.0V | 1.94 | 2.0 | 2.06 | V |
| Under-voltage detection operating voltage | V_{CS} | V_{CC} Voltage | 2.1 | 2.2 | 2.35 | V |
| Thermal protection temperature | TSD | Design guarantee value* | 150 | 180 | 210 | $^\circ\text{C}$ |
| Output rise time | T_{r} | (Note) | | 1.6 | 3.0 | μs |
| Output fall time | T_{f} | (Note) | | 0.2 | 1.0 | μs |

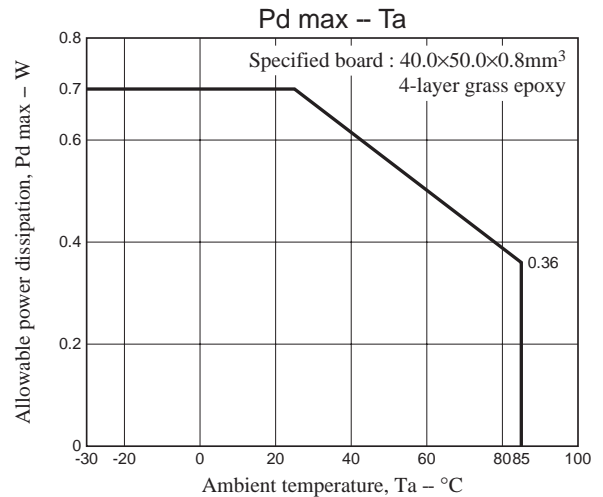
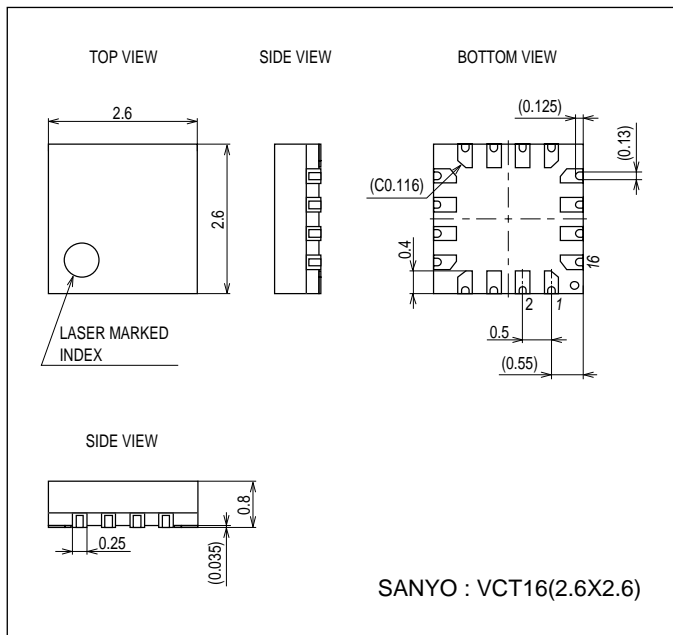
* Design guarantee value and no measurement is made.

Note : Specify rising control start time \rightarrow 90% of OUT output voltage, and falling control start time \rightarrow 10% of OUT output voltage.

Package Dimensions

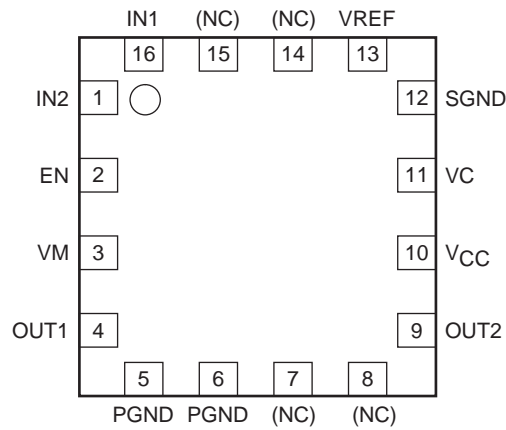
unit : mm (typ)

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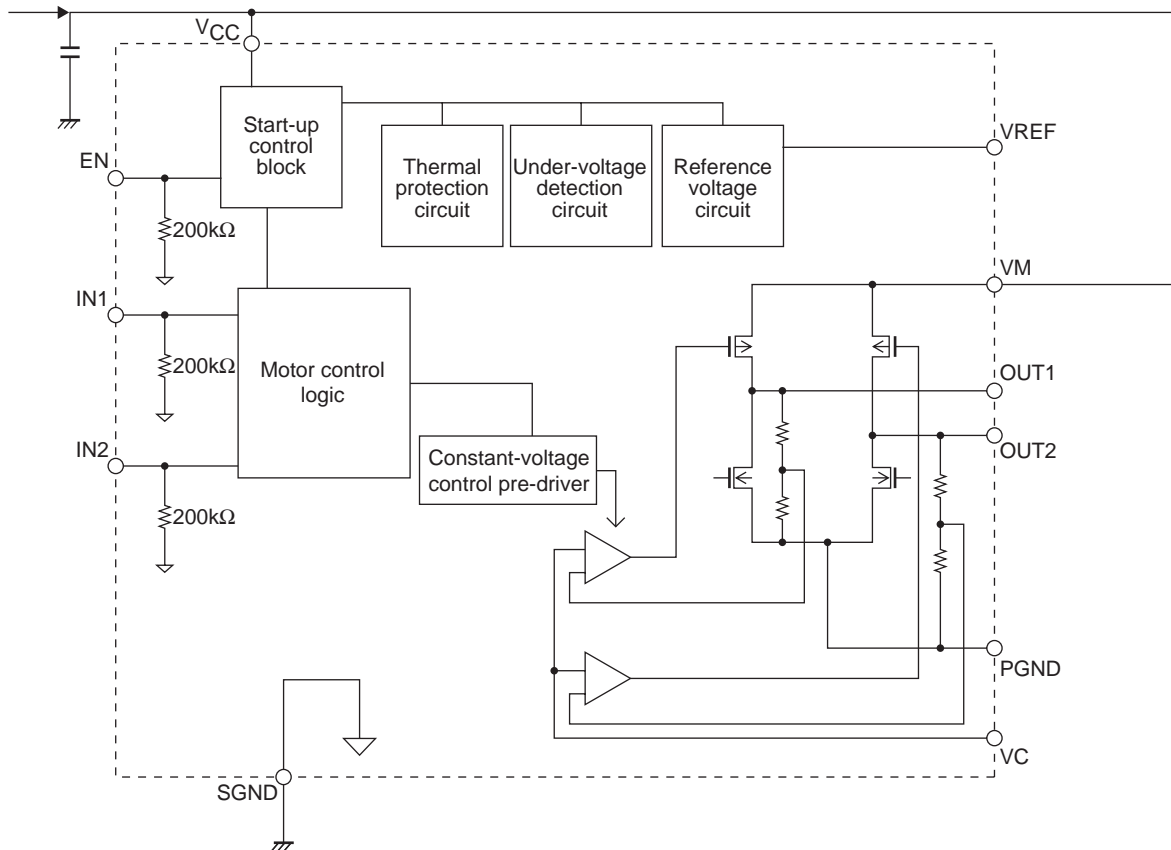
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Pin Assignment



Top view

Block Diagram



Truth Table

Constant voltage output H-bridge

| EN | IN1 | IN2 | OUT1 | OUT2 | Mode |
|----|-----|-----|------|------|-------------------|
| H | H | H | L | L | Brake |
| | H | L | H | L | Forward evolution |
| | L | H | L | H | Reverse rotation |
| | L | L | off | off | Stand by |
| L | - | - | off | off | Stand by |

"-" entries indicate don't care state, "off" indicates output off state, insert 20kΩ impedance across PGND.

Constant voltage output value : $V(OUT) = V(VC) \times 2.0$

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Pin Functions

| Pin No. | Pin name | Description |
|---------|-----------------|---|
| 10 | V _{CC} | Power supply pin for control |
| 5, 6 | PGND | Power ground pins for IC |
| 12 | SGND | IC system ground |
| 3 | VM | Power supply pin for constant voltage output H-bridge |
| 2 | EN | IC enable pin. Power-saving mode is established when L-level is applied. Pulled-down with 200k Ω |
| 16, 1 | IN1, 2 | Input pins for manipulating constant-current output H-bridge (OUT1, 2). Pulled-down with 200k Ω |
| 4, 9 | OUT1, 2 | Constant voltage H-bridge output pins |
| 13 | VREF | Reference voltage output, outputs 1.5V |
| 11 | VC | Analog voltage input pin for constant voltage setting. Must be short-circuited to V _{CC} pin when using saturation control. |

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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