



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	$V_{CC}$ max		6	V
Maximum load power supply voltage	$V_M$ max		6	V
Maximum control pin voltage	$V_C$ max		6	V
Maximum output current	$I_O$ max	OUT1, 2	0.5	A
VREF maximum current	$I_{REF}$ max	VREF	1	mA
Allowable power dissipation	$P_d$ 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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# LV8075LP

**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	$V_{\text{CC}}$		2.5 to 5.5	V
Load power-supply voltage	$V_{\text{M}}$		2.5 to 5.5	V
Output control input voltage	$V_{\text{cont}}$	VC pin	0 to $V_{\text{CC}}-1$	V
Input pin "H" voltage	$V_{\text{INH}}$	IN1, 2, EN pin	$V_{\text{CC}} \times 0.6$ to $V_{\text{CC}}+0.3$	V
Input pin "L" voltage	$V_{\text{INL}}$	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	$I_{\text{CCO}}$	EN, IN1, 2 = H/L/L or EN = L			1	$\mu\text{A}$
Standby current consumption 1	$I_{\text{MO}}$	EN, IN1, 2 = H/L/L or EN = L			1	$\mu\text{A}$
Operating current consumption	$V_{\text{CC1}}$	EN = H, IN1 or IN2 = H		0.5	1.0	mA
H-level input current	$I_{\text{INH}}$	200k $\Omega$ pull-down, $V_{\text{IN}} = 3\text{V}$	10	15	20	$\mu\text{A}$
L-level input current	$I_{\text{INL}}$	$V_{\text{IN}} = 0\text{V}$		0	1	$\mu\text{A}$
Reference voltage output	$V_{\text{REF}}$	$I_{\text{REF}} = 500\mu\text{F}$	1.4	1.5	1.6	V
Output on-resistance	$R_{\text{on1}}$	Total of top and bottom		1.75	2.5	$\Omega$
Constant-voltage control output voltage	$V_{\text{OUT}}$	VC = 1.0V	1.94	2.0	2.06	V
Under-voltage detection operating voltage	$V_{\text{CS}}$	$V_{\text{CC}}$ Voltage	2.1	2.2	2.35	V
Thermal protection temperature	TSD	Design guarantee value*	150	180	210	$^\circ\text{C}$
Output rise time	$T_{\text{r}}$	(Note)		1.6	3.0	$\mu\text{s}$
Output fall time	$T_{\text{f}}$	(Note)		0.2	1.0	$\mu\text{s}$

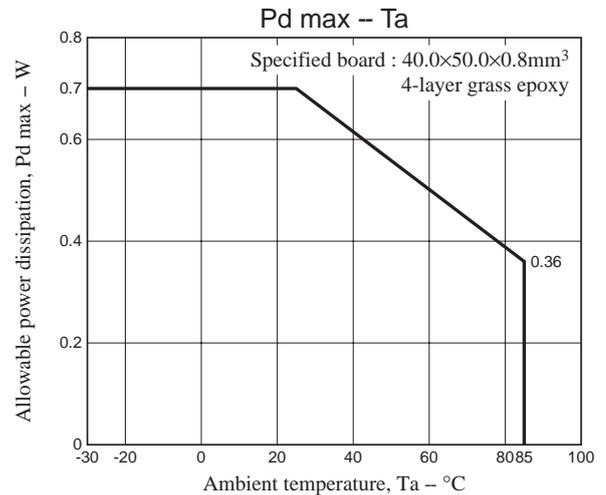
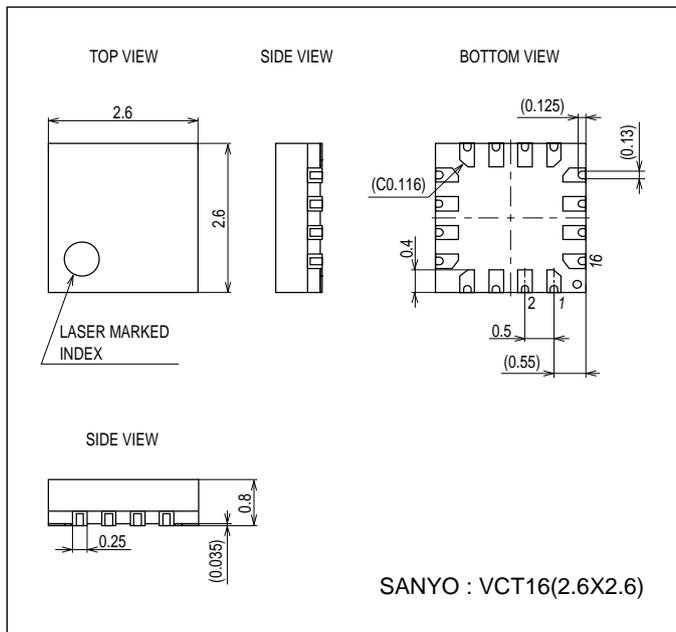
\* Design guarantee value and no measurement is made.

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

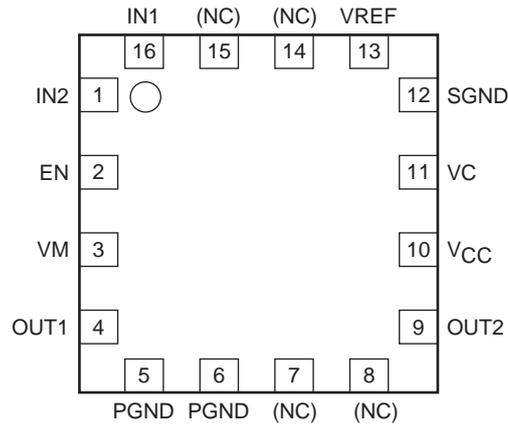
unit : mm (typ)

3318



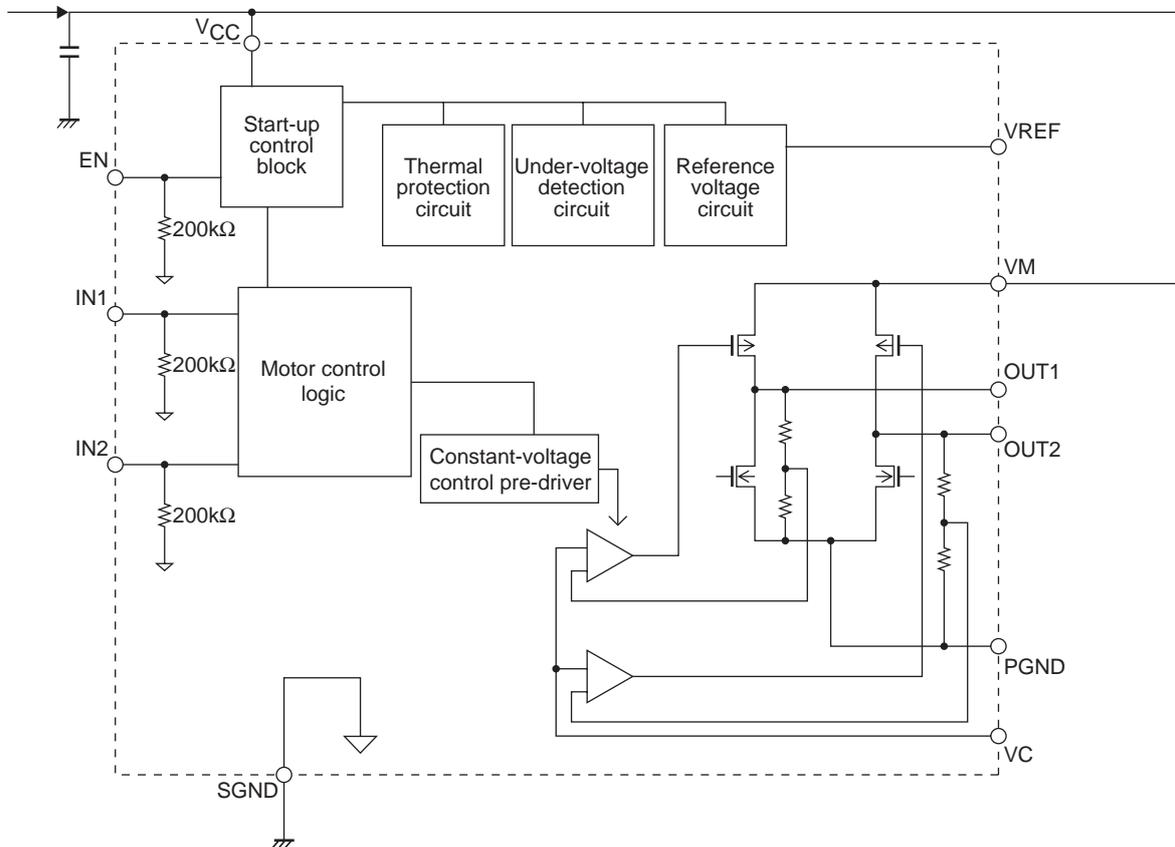
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## Pin Assignment



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 <sub>CC</sub>	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 $\Omega$
16, 1	IN1, 2	Input pins for manipulating constant-current output H-bridge (OUT1, 2). Pulled-down with 200k $\Omega$
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 <sub>CC</sub> pin when using saturation control.

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