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LV8075LP

Bi-CMOS LSI

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 : 40.0x50.0x0.8mm³ : glass epoxy four-layer board

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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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

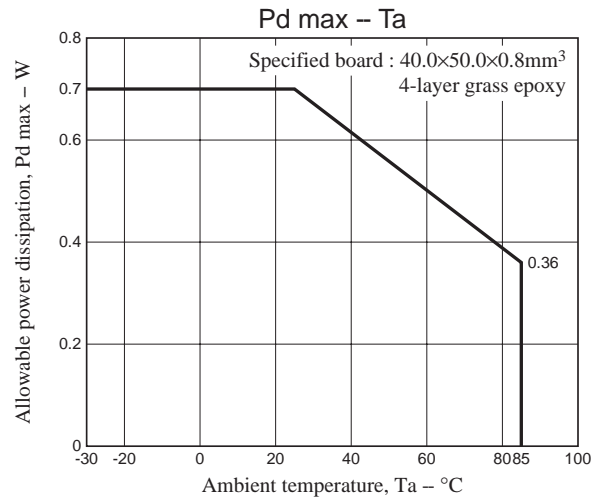
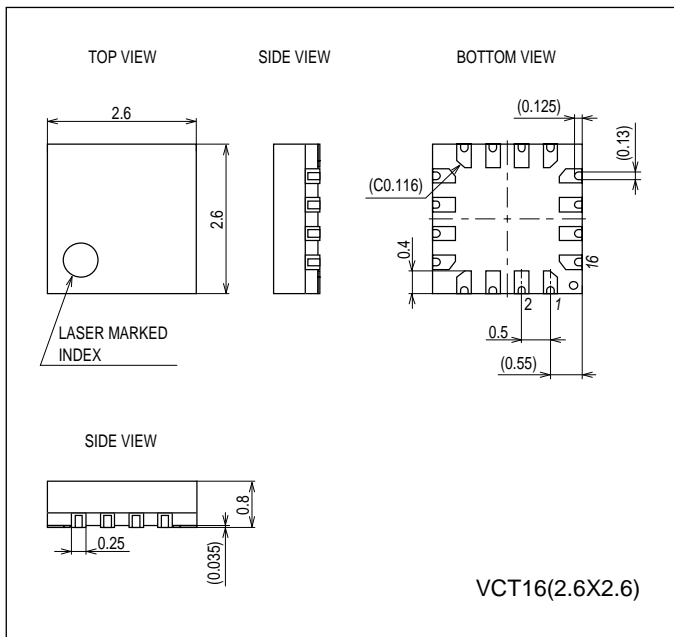
* Design guarantee value and no measurement is made.

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

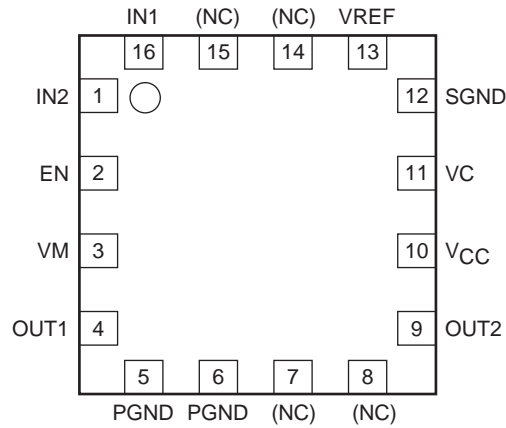
unit : mm (typ)

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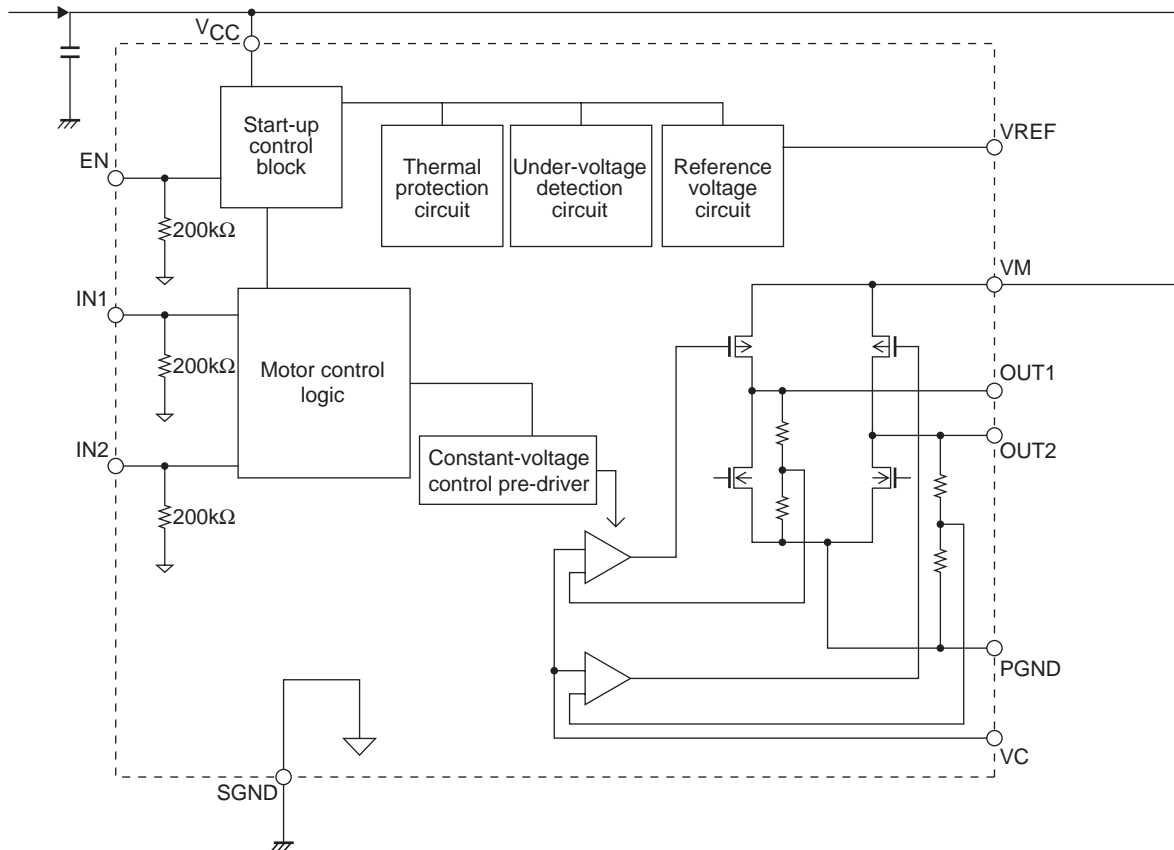
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Pin Assignment



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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