Ordering number : ENA0724A

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

Bi-CMOS IC

LV8019V — Forward/Reverse Motor Driver

Overview

The LV8019V is a forward/reverse motor driver.

Features

- One H-bridge driver channel
- Provides a constant current output
- Built-in thermal shutdown circuit

Specifications

Maximum Ratings at Ta = 25°C and SGND = PGND = 0V

Parameter	Symbol	Conditions	Ratings	Unit
Output block supply voltage	VM max		-0.5 to 8.4	V
Control block supply voltage	V_{CC} max		-0.5 to 7.0	V
Constant current output block supply voltage	VRG max		-0.5 to 6.0	V
Maximum output current	I_O max		1.2	A
	I_O peak1	t ≤ 200ms, f = 2Hz	3	A
	I_O peak2	t ≤ 10ms, f = 2Hz	5	A
Input signal voltage	V_{IN} max		-0.5 to V_{CC}+0.5	A
Allowable power dissipation	Pd max	When mounted on a circuit board *1	0.8	W
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

*1 Specified circuit board : 114.3 × 76.1 × 1.6mm^3, glass epoxy

Recommended Operating Conditions at Ta = 25°C and SGND = PGND = 0V

Parameter	Symbol	Conditions	Ratings	Unit
Output block supply voltage	VM		3.0 to 7.4	V
Control block supply voltage	V_{CC}		2.7 to 6.0	V
Constant current output block supply voltage	VRGIN		1.5 to V_{CC}	V
Input signal voltage	V_{IN}		0 to V_{CC}	V
Maximum input signal frequency	f_{max}	Duty = 50%	100	kHz

Electrical Characteristics Ta = 25°C, V_{CC} = VM = 5V, and SGND = PGND = 0V unless otherwise specified.

Parameter		Symbol	Conditions	Ratings			Unit
				min	typ	max	
Standby mode output block current consumption		IMO	EN = 0V, IN1 = IN2 = ICTRL = 0V			1.0	μA
Control block current consumption	Standby mode	I_{CCO}	EN = 0V, IN1 = IN2 = ICTRL = 0V		0	1.0	μA
	Operation mode	I_{CC}	EN = 5V		0.8	1.3	mA
High-level input voltage		$V_{IN}H$		2.5		V_{CC}	V
Low-level input voltage		$V_{IN}L$		0		0.8	V
High-level input current		$I_{IN}H$				1.0	μA
Low-level input current		$I_{IN}L$		-1.0			μA
High-level EN pin current		$I_{EN}H$	EN pin	15	25	35	μA
Low-level EN pin current		$I_{EN}L$	EN pin			1.0	μA
Output on resistance	1	$R_{ON}1$	VM = 5V, sink + source		0.45	0.55	Ω
	2	$R_{ON}2$	VM = 3V, sink + source		0.60	0.75	Ω
ISET setting resistance		RSET	Between ISET pin and SGND	80			Ω
ISET pin voltage		VISET	RSET > 80Ω	0.90	1.05	1.20	V
CC pin output saturation voltage		VCSAT	RSET > 150Ω *1			1.5	V
CC pin output leakage current		ICONL	CTRL = 0V			1.0	μA
Low voltage shutdown operation voltage		VLVD	V_{CC} pin voltage detection	2.10	2.35	2.60	V
High-level output turn-on time		TOH	The transition from 10% to 90% of the output amplitude *2		0.1	1.0	μs
Low-level output turn-on time		TOL	The transition from 90% to 10% of the output amplitude *2		0.2	2.0	μs
Thermal shutdown temperature		TSD	*2	150	180		°C
Thermal shutdown hysteresis		ΔTSD	*2		40		°C

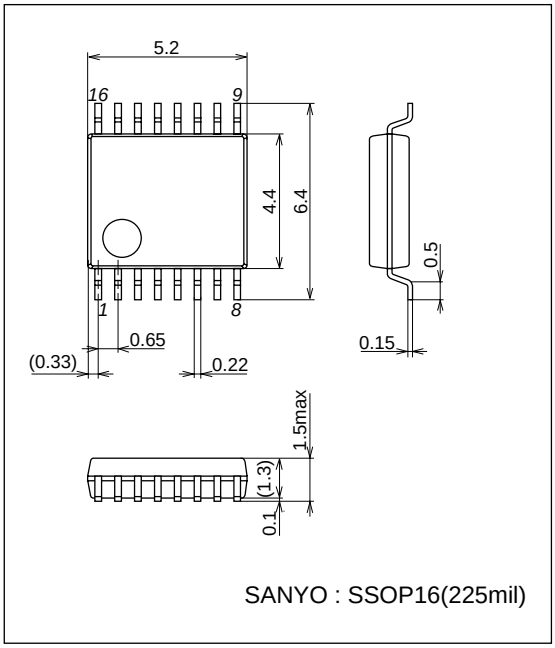
*1 : Voltage between CC pin and ISET pin

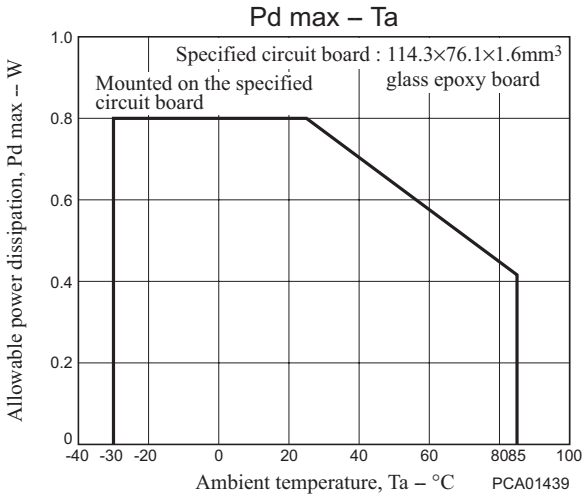
*2 : Design guarantee: These characteristics are not measured.

Package Dimensions

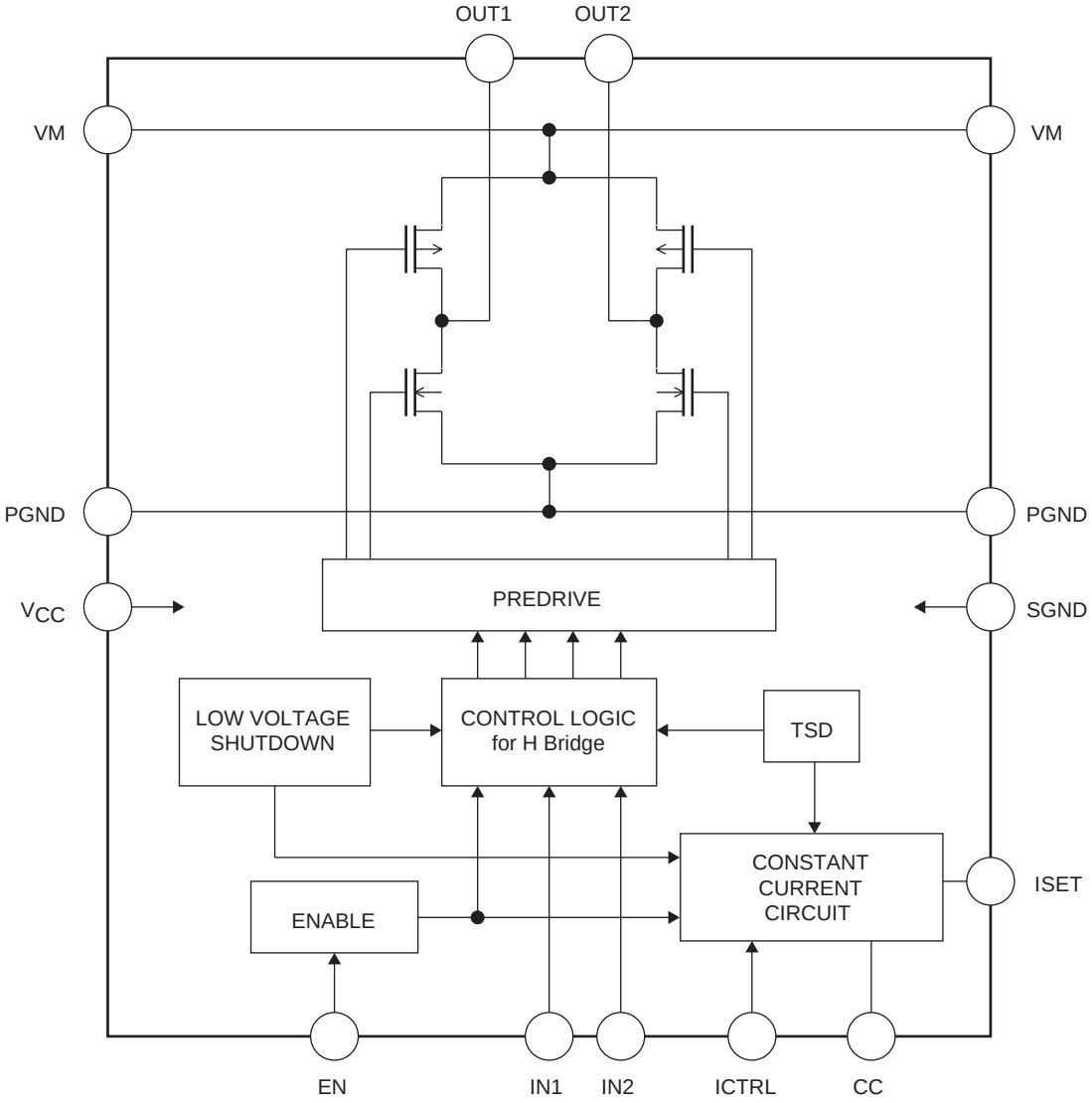
unit : mm (typ)

3178B





Block Diagram

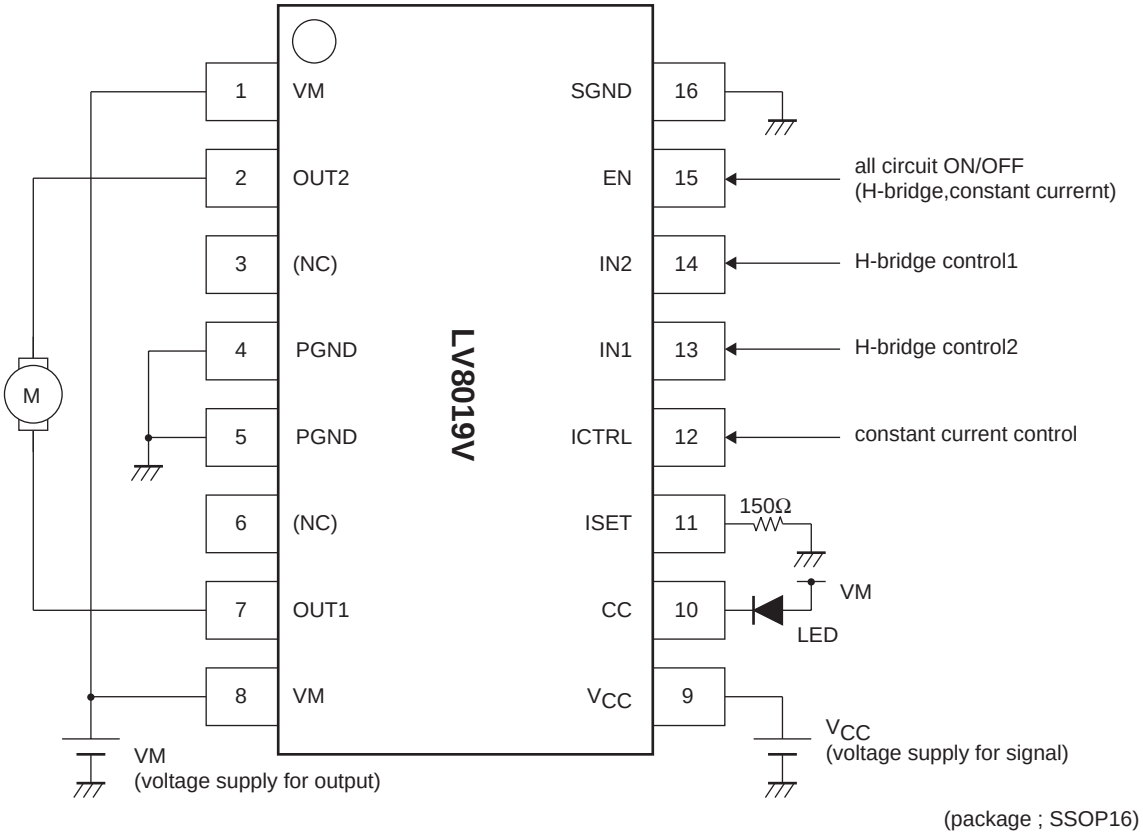


Truth Table

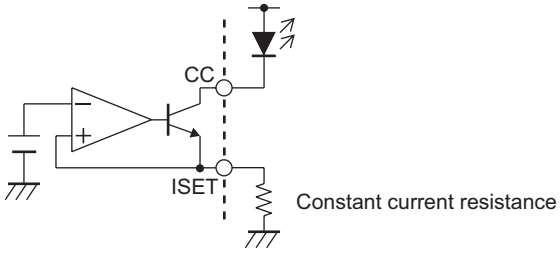
EN	IN1	IN2	ICTRL	OUT1	OUT2	CC	Mode
H	H	H	X	L	L	X	Break
H	H	L	X	H	L	X	Forward
H	L	H	X	L	H	X	Reverse
H	L	L	X	Z	Z	X	Standby
L	X	X	X	L	L	L	Standby
H	X	X	L	X	X	Z	Constant current output off
H	X	X	H	X	X	ON	Constant current output on

H : High level
L : Low level
Z : Hi-impedance
X : Don't care

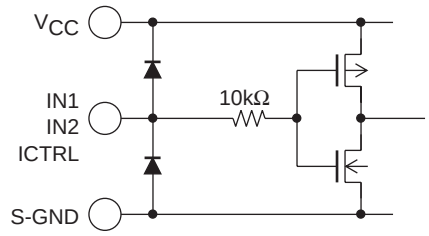
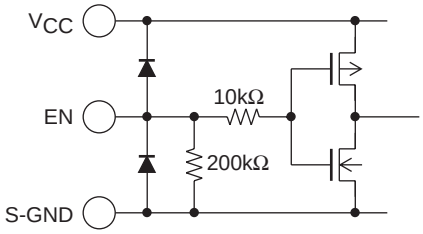
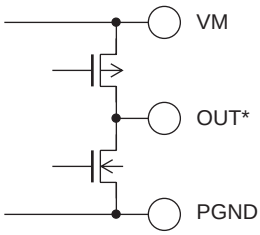
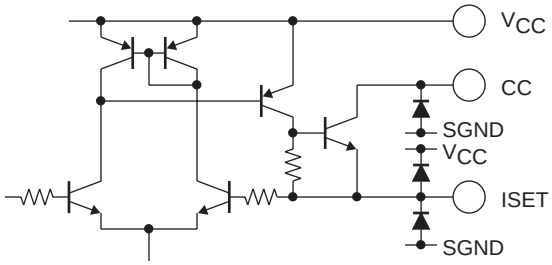
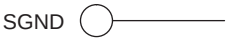
Pin Assignment and Application Example



Constant current output



Pin Functions

Pin No.	Pin	Description	Equivalent circuit
13 14	IN1 IN2	Logic input 1 Logic input 2 The output is set by the combination of the input 1 and 2 states. See the truth table for details.	
12	ICTRL	Controls the output on/off state of the constant current block.	
15	EN	EN pin. Controls the on/off state of the H-bridge output (OUT1 and OUT2) and the constant current output. See the truth table for details.	
7 2	OUT1 OUT2	Output 1. Output 2. The source side is a p-channel transistor and sink side is an n-channel transistor.	
10 11	CC ISET	Constant current output. Constant current setting. The output current (CC) is set by connecting a resistor between the ISET pin and ground.	
9	V_{CC}	Signal system power supply.	
8	VM	Power system power supply.	
16	SGND	Signal system ground.	
4,5	PGND	Power system ground.