Ordering number : ENN*6202

Monolithic Digital IC

LB1868

Two-Phase Brushless Fan Motor Driver

Preliminary

Overview

The LB1868 is a 2-phase unipolar brushless motor driver. With only a few peripheral parts, lockup protection and automatic recovery can be implemented. The IC can be configured for 12V or 24V operation and a wide range of variations, from LOW speed to H-High speed and from 60 cm to 120 cm square using the same PCB. This makes it easy to design highly reliable fan motor installations.

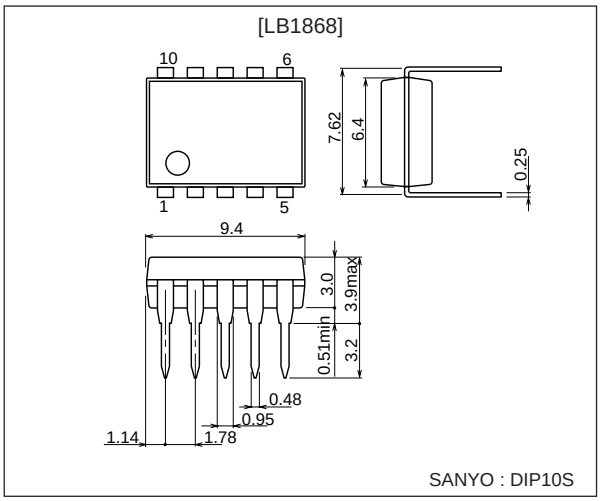
Functions and Features

- Output protection Zener diode with variable withstand voltage
  Z1, Z2 pins open: VOLM = 57V (24V specification)
  Z1, Z2 pins shorted: VOLM = 32V (12V specification)
  External Zener diode connected across Z1 - VCC pins: support for fans with large drive current
- External resistor allows configuration for 12V or 24V.
- Direct Hall element connection possible (built-in Hall amplifier with hysteresis supports core without auxiliary electrode)
- Built-in output transistor with 1.0A output current (strengthened negative-current support for core without auxiliary electrode)
- Built-in rotation detection function: Low during rotation and High during stop
- Built-in lockup protection with automatic recovery
- Built-in thermal shutdown

Package Dimensions

unit: mm

3098B-DIP10S



SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum input current	ICC max	t ≤ 20 ms	200	mA
Maximum applied output voltage	VOUT max		Internal	V
Maximum output current	IOUT max		1.0	A
Current flowing into RD pin	IRD max		10	mA
RD applied voltage	VRD max		30	V
Allowable power dissipation	Pd max		1.1	W
Operating temperature	Topr		–30 to +80	°C
Storage temperature	Tstg		–55 to +150	°C

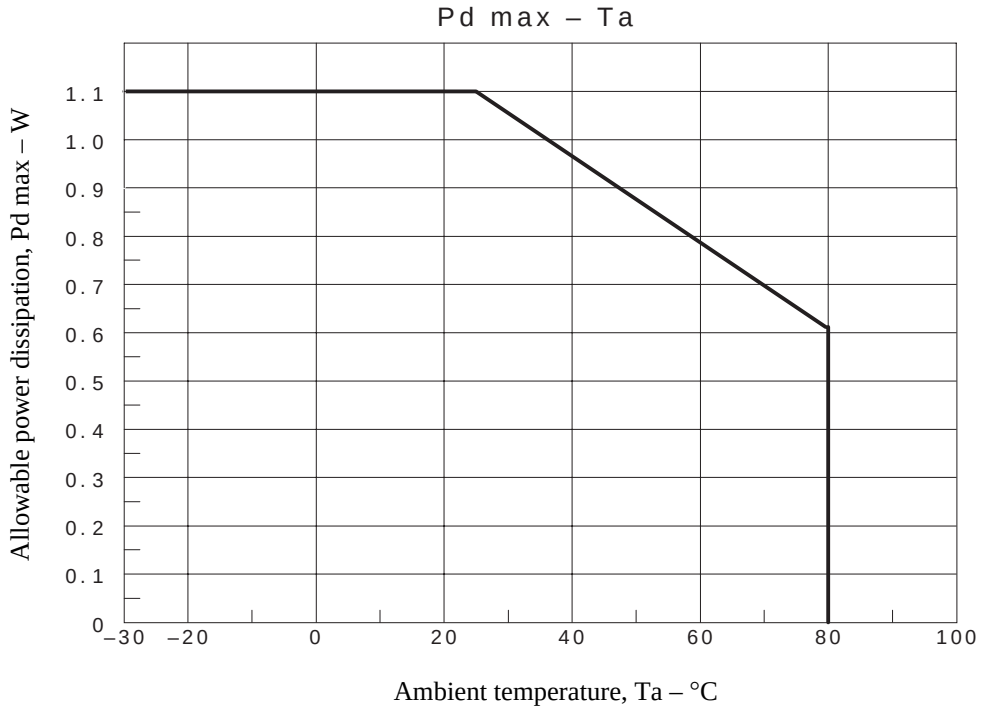
Allowable Operating Ranges at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage range	ICC		6.0 to 50	mA
Common mode input voltage range	VICM		0.2 to VIN–1.5	V

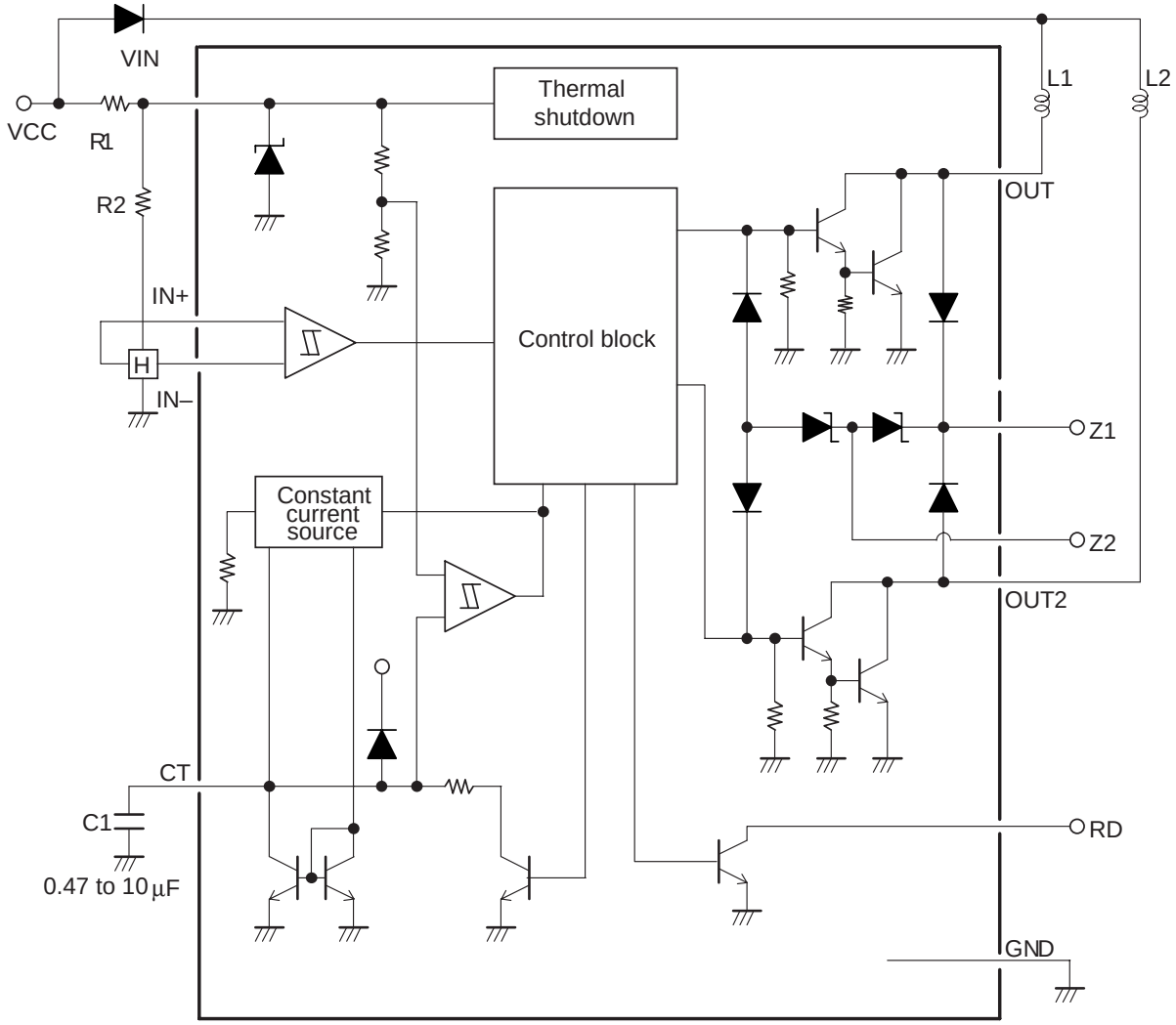
Electrical Characteristics at Ta = 25˚C, Icc = 10 mA

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output limiter withstand voltage	VOLM1	Z1, Z2 open	54	57	60	V
	VOLM2	Z1, Z2 short	31	33	35	V
Output saturation voltage	Vosat 1	Io = 0.5A		0.95	1.2	V
	2	Io = 1.0A		0.15	1.5	V
VIN voltage	VIN	ICC = 7.0 mA	6.4	6.7	7.0	V
Hall input sensitivity (at zero peak)	VHN	Including offset and hysteresis			20	mV
RD output saturation voltage	VRDsat	IRD = 5 mA		0.1	0.3	V
CT drain current	IC1	C = GND	2.7	3.8	4.9	µA
CT discharge current	IC2	C = VIN	0.19	0.30	0.41	µA
Comp input threshold voltage	VTH1		0.77	0.8VIN	0.83	V
	VTH2		0.42	0.45VIN	0.48	V
Thermal protection operating temperature	TSD	Design target value*		180		°C
Thermal protection circuit hysteresis	ΔTSD	Design target value*		40		°C

* Design target values are not measured.



Block Diagram and Sample Application Circuit



Truth Table

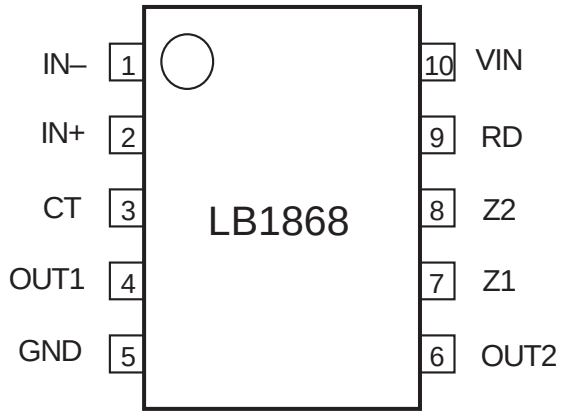
IN+	IN–	C	OUT1	OUT2	RD
H	L	L	H	L	L
L	H	L	L	H	L
H	L	H	H	H	H
L	H	H	H	H	H

*RD is a latch type output.

Pin Description

Pin name	Function
IN–	Hall input + pin Hysteresis amplifier
IN+	Hall input – pin Hysteresis amplifier
CT	Lockup protection time setting capacitor pin (0.47 to 4.7 μF)
Z1	External Zener diode pin (external Zener diode to be connected between power supply and Z1)
Z2	Kickback absorption voltage alteration pin (shorted to Z1: 12V operation)
OUT1	Output 1 pin
OUT2	Output 2 pin
VIN	Regulated power supply input pin (limiting resistor to be inserted between power supply and VIN)
GND	GND pin
RD	Lockup detection pin (latch type)

Pin Assignment



Top view