



SANYO Semiconductors

# DATA SHEET

## LB11668M

Monolithic Digital IC

For Fan Motor

## Two-Phase Half-Wave Driver

### Overview

The LB11668M is a two-phase uni-polar brushless motor driver for fan motor.

### Functions

- Two-phase half-wave drive.
- RD (lock detection) outputs incorporated.
- FG (rotation detection) outputs incorporated.
- Thermal shutdown circuit incorporated.
- Lock protection and automatic return function incorporated.
- Output protection zener diode incorporated.
- Hall input amplifier incorporated.

### Specifications

**Absolute Maximum Ratings** at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum inflow current	$I_{IN\ max}$		100	mA
Output current	$I_{OUT\ ave}$		400	mA
	$I_{OUT\ peak}$		800	mA
Output withstand voltage	$V_{OUT\ max}$		Internal	V
RD output current	$I_{RD\ max}$		10	mA
RD output withstand voltage	$V_{RD\ max}$		28	V
Allowable power dissipation	$P_d\ max$	Mounted on a board *	800	mW
Operating temperature	$T_{opr}$		-30 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

\* Specified board : 114.3mm × 76.1mm × 1.6mm, glass epoxy board.

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## Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Inflow current range	I <sub>IN</sub>		5 to 25	mA
Common-mode input voltage range	V <sub>COM</sub>		0.2 to V <sub>IN</sub> -2.3	V

## Electrical Characteristics at Ta = 25°C, V<sub>CC</sub>=24V, R<sub>1</sub>=1kΩ, unless otherwise specified.

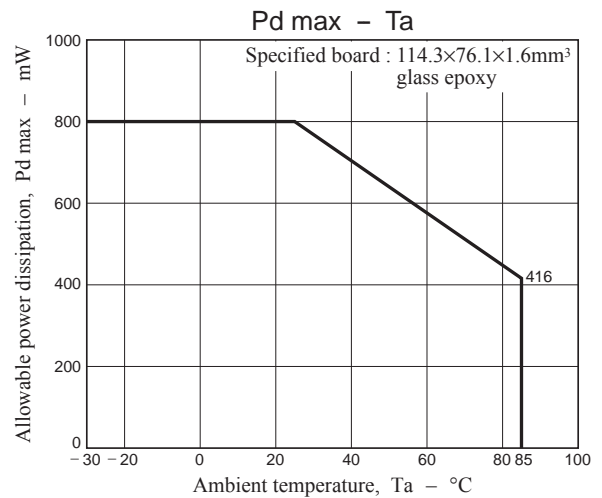
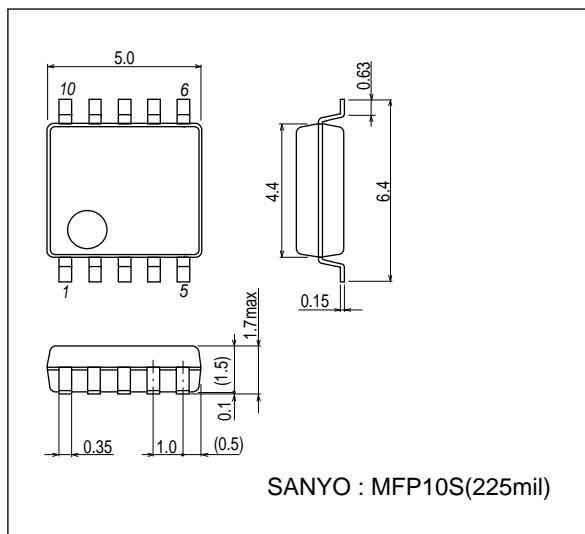
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
V <sub>IN</sub> voltage	V <sub>IN</sub>	I <sub>IN</sub> = 6mA	6.9	7.2	7.6	V
CT capacitor charging current	I <sub>CT1</sub>	CT = 0V	0.8	1.2	2.0	μA
CT capacitor dis-charging current	I <sub>CT2</sub>	CT = 6.0V	0.12	0.24	0.4	μA
capacitor charging / dis-charging current ratio	R <sub>CT</sub>	R <sub>CT</sub> = I <sub>CT1</sub> / I <sub>CT2</sub>	4.0	5.0	7.0	
CT charging voltage	V <sub>CTH</sub>	V <sub>CT</sub> / V <sub>IN</sub>	66	70	74	%
CT dis-charging voltage	V <sub>CTL</sub>	V <sub>CT</sub> / V <sub>IN</sub>	36	40	44	%
Output limit withstand voltage	V <sub>OLM</sub>	I <sub>O</sub> = 10mA	50	53	56	V
Output saturation voltage	V <sub>OL1</sub>	I <sub>O</sub> = 200mA		0.85	1.1	V
Hall input sensitivity	V <sub>HN</sub>	Including offset and hysteresis		8	18	mV
RD output saturation voltage	V <sub>FG/RD</sub>	I <sub>RD</sub> = 5mA		0.2	0.5	V
RD output leak current	I <sub>FGL/RDL</sub>	V <sub>RD</sub> = 14V		0.1	10	μA
Thermal protection function operating temperature	TSD	Design target value *	150	180	210	°C

\* Design target value and is not measured.

## Package Dimensions

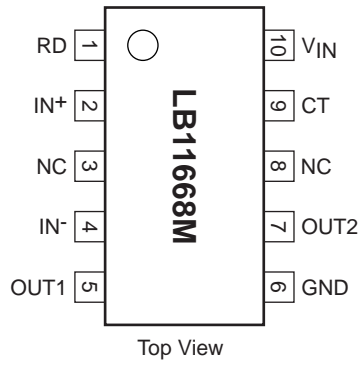
unit : mm (typ)

3086B

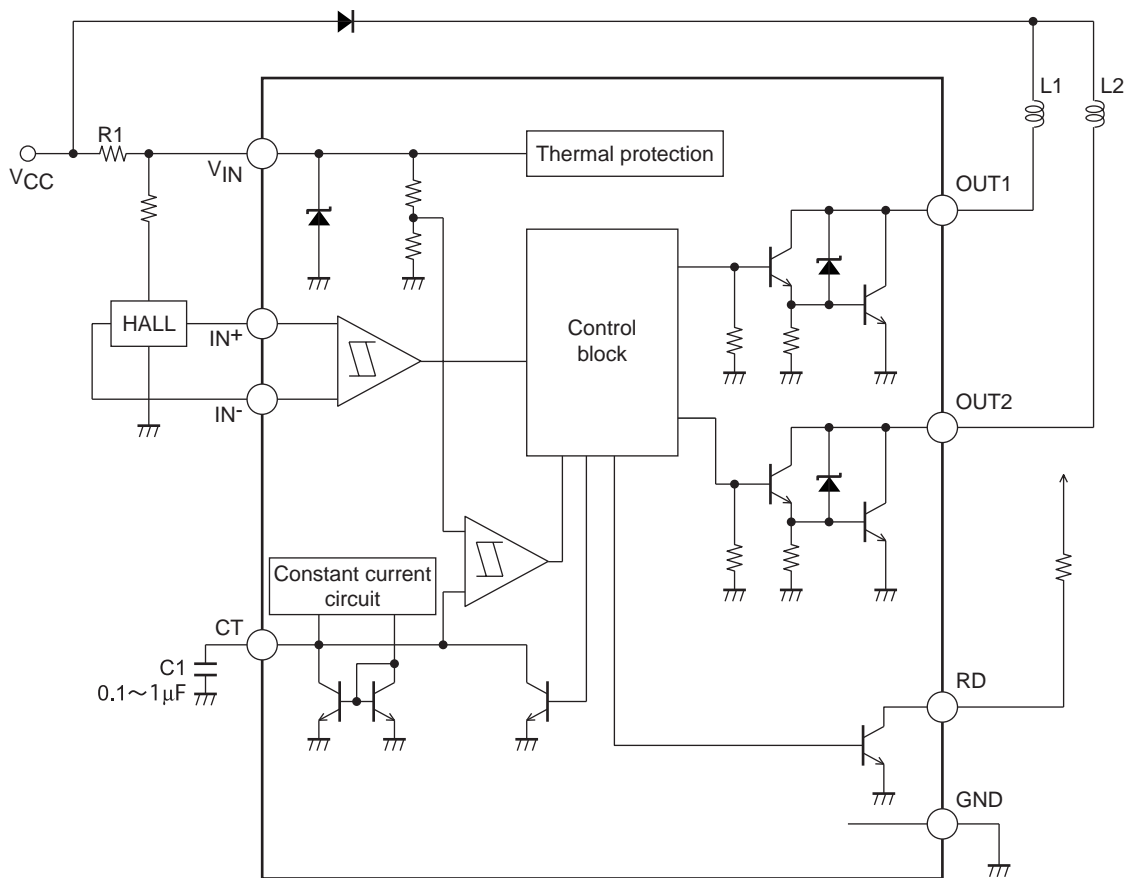


# LB11668M

## Pin Assignment



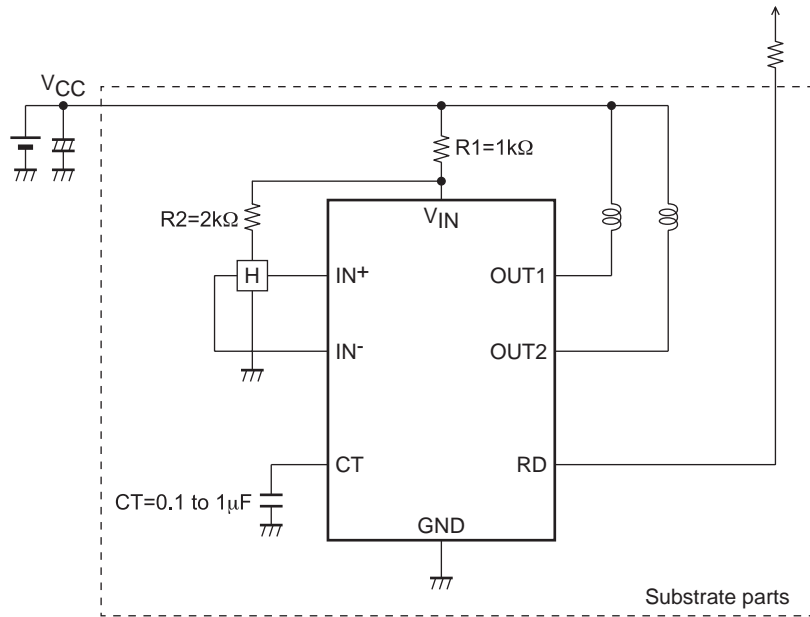
## Block Diagram



## Truth table

IN <sup>-</sup>	IN <sup>+</sup>	CT	OUT1	OUT2	RD	Mode
H	L	L	L	H	L	Rotation
L	H		H	L	L	
-	-	H	OFF	OFF	H	Lock protection

Application Circuit Example 24V power supply



Notice

- Take care not to cause interference due to wiring of IN- and OUT1.
- In application of connecting the CT pin to GND, lock protection and restart function are not effective.
- If the current value is about 500mA or less, IC cannot be destroyed though the current limited to GND→OUT→ coil → power supply by the coil resistance flows in the reverse-connection of power supply- GND by the above figure application. Di is put between VCC and the coil if there is a necessity.

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