

# SANYO Semiconductors DATA SHEET



# 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 Ta = 25°C

Parameter	Symbol	Conditions Ratings		Unit
Maximum inflow current	I <sub>IN</sub> max		100	mA
Output current	I <sub>OUT</sub> ave		400	mA
	I <sub>OUT</sub> peak		800	mA
Output withstand voltage	V <sub>OUT</sub> max		Internal	V
RD output current	I <sub>RD</sub> max		10	mA
RD output withstand voltage	V <sub>RD</sub> max		28	V
Allowable power dissipation	Pd max	Mounted on a board *	800	mW
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

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

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## LB11668M

#### **Recommended Operating Conditions** at Ta = 25°C

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

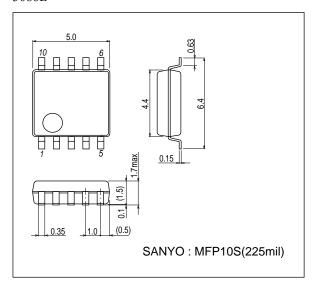
## **Electrical Characteristics** at $Ta = 25^{\circ}C$ , $V_{CC}=24V$ , $R1=1k\Omega$ , unless otherwise specified.

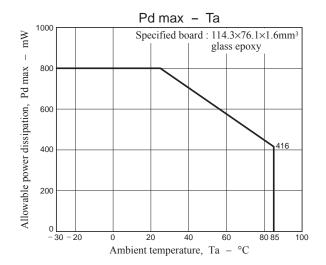
Daramatar	Symbol	Ratings			1.1:4	
Parameter	Symbol	Conditions	min	min typ max		Unit
V <sub>IN</sub> voltage	VIN	I <sub>IN</sub> = 6mA	6.9	7.2	7.6	V
CT capacitor charging current	I <sub>CT</sub> 1	CT = 0V	0.8	1.2	2.0	μA
CT capacitor dis-charging current	I <sub>CT</sub> 2	CT = 6.0V	0.12	0.24	0.4	μA
capacitor charging / dis-charging current ratio	R <sub>CT</sub>	$R_{CT} = I_{CT}1 / I_{CT}2$	4.0	5.0	7.0	
CT charging voltage	V <sub>CT</sub> H	V <sub>CT</sub> / V <sub>IN</sub>	66	70	74	%
CT dis-charging voltage	VCTL	V <sub>CT</sub> / V <sub>IN</sub>	36	40	44	%
Output limit withstand voltage	V <sub>O</sub> LM	I <sub>O</sub> = 10mA	50	53	56	V
Output saturation voltage	V <sub>O</sub> L1	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	IFGL/RDL	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.

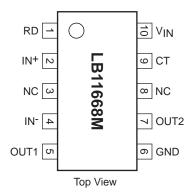
## **Package Dimensions**

unit : mm (typ) 3086B

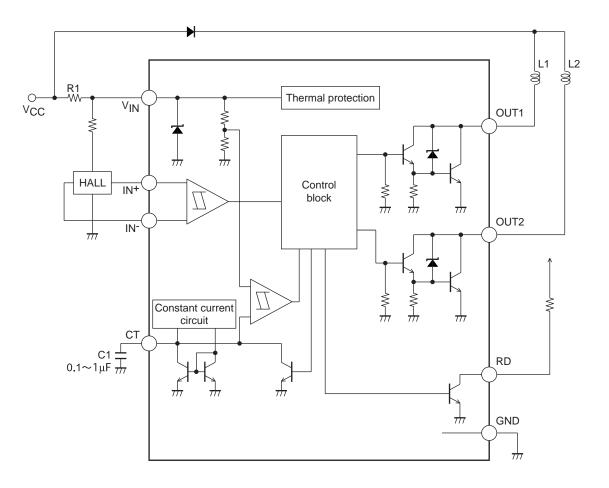




## **Pin Assignment**



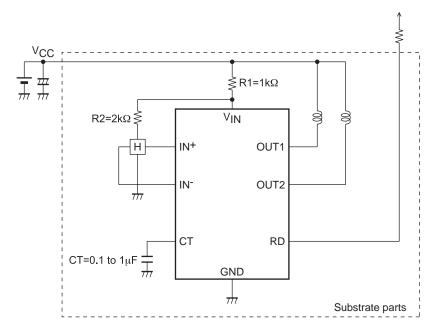
# **Block Diagram**



## Truth table

IN-	IN+	СТ	OUT1	OUT2	RD	Mode
н	L		L	н	L	Detetion
L	н	L	н	L	L	Rotation
-	-	Н	OFF	OFF	Н	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  $GND \rightarrow OUT \rightarrow coil \rightarrow power supply by the coil resistance flows in the reverse-connection of power supply- GND by the above figure application. Di is put between VCC and the coil if there is a necessity.$ 
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