



SANYO Semiconductors

DATA SHEET

LB11669M — Monolithic Digital IC For Fan Motor Two-Phase Half-Wave Driver

Overview

The LB11669M 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
	$I_{OUT\ peak}$	Only when starting and lock protection is activated	800	mA
Output withstand voltage	$V_{OUT\ max}$		Internal	V
FG/RD output current	$I_{FG/RD\ max}$		10	mA
FG/RD output withstand voltage	$V_{FG/RD\ max}$		30	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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LB11669M

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Inflow current range	I_{IN}		5 to 25	mA
Common-mode input voltage range	VCOM		0.2 to $V_{IN} - 2.3$	V

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 24\text{V}$, $R_1 = 1\text{k}\Omega$, unless otherwise specified.

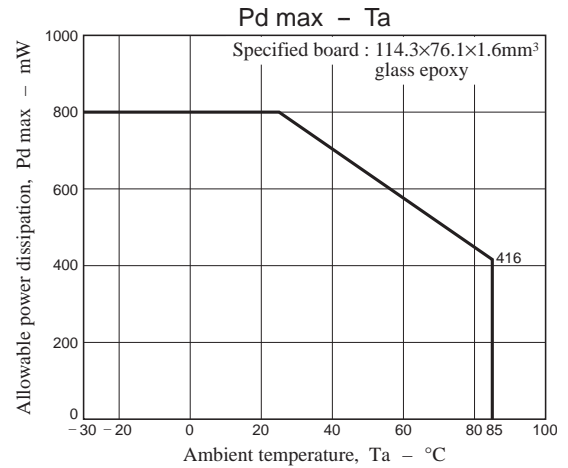
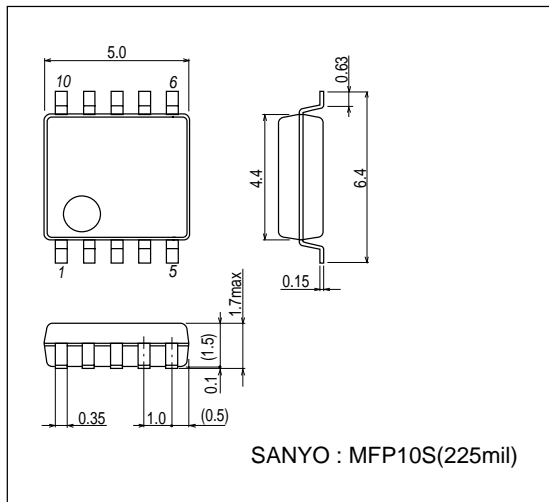
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
V_{IN} voltage	V_{IN}	$I_{IN} = 6\text{mA}$	5.95	6.3	6.65	V
CT capacitor charging current	I_{CT1}	$CT = 0.5\text{V}$	1.8	2.55	3.4	μA
CT capacitor dis-charging current	I_{CT2}	$CT = 6.0\text{V}$	0.15	0.23	0.31	μA
capacitor charging / dis-charging current ratio	R_{CT}	$R_{CT} = I_{CT1} / I_{CT2}$	10.5	11	14.5	
CT charging voltage	V_{CTH}	V_{CT} / V_{IN}	74	79	84	%
CT dis-charging voltage	V_{CTL}	V_{CT} / V_{IN}	41	46	51	%
Output limit withstand voltage	V_{OLM}	$I_O = 100\text{mA}$	49	52	55	V
Output saturation voltage	V_{OL1}	$I_O = 200\text{mA}$		0.85	1.1	V
Hall input sensitivity	V_{HN}	Including offset and hysteresis		± 15	± 30	mV
FG/RD output saturation voltage	$V_{FG/RD}$	$I_{FG/RD} = 5\text{mA}$		0.15	0.3	V
FG/RD output leak current	$I_{FGL/RDL}$	$V_{FG/RD} = 14\text{V}$		0.1	10	μA
Thermal protection function operating temperature	TSD	Design target value *		180		$^\circ\text{C}$

* Design target value and is not measured.

Package Dimensions

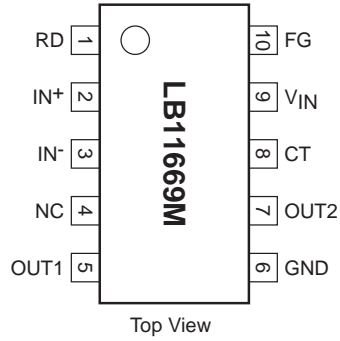
unit : mm (typ)

3086B

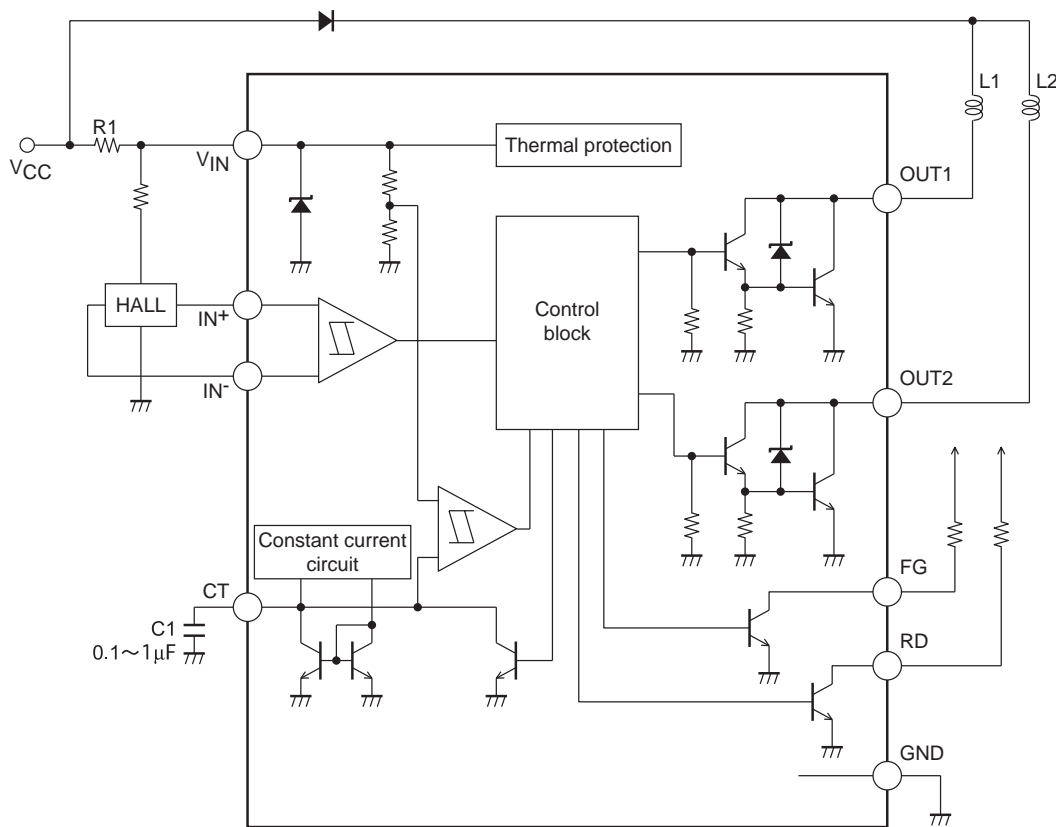


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Pin Assignment



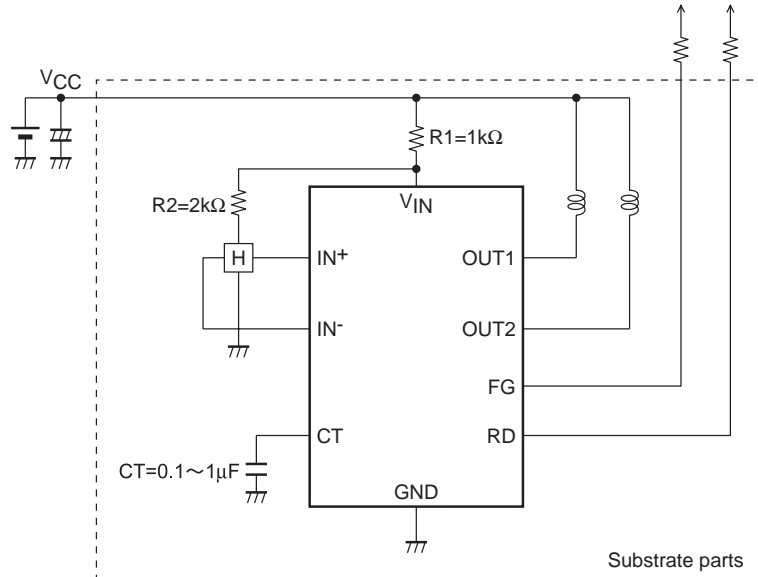
Block Diagram



Truth table

IN ⁻	IN ⁺	CT	OUT1	OUT2	FG	RD	Mode
H	L	L	H	L	L	L	Rotation
L	H		L	H	OFF	L	
H	L	H	OFF	OFF	L	OFF	Lock protection
L	H		OFF	OFF	OFF	OFF	

Application Circuit Example 24V power supply



Notice

- Take care not to cause interference due to wiring of IN⁻ and OUT1.
- Wiring need to be short to prevent carrying of the noise. If the noise is carried, insert a capacitor between IN⁺ and IN⁻.
- In application of connecting the CT pin to GND, lock protection and restart function are not effective.

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