Ordering number : ENA2075

LB11669MC

ON Semiconductor®

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Monolithic Digital IC

For Fan Motor

Two-Phase Half-Wave Driver

Overview

The LB11669MC 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_{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	Pd max	Mounted on a board *	750	mW
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

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

Caution 1) Absolute maximum ratings represent the value which cannot be exceeded for any length of time.

Caution 2) Even when the device is used within the range of absolute maximum ratings, as a result of continuous usage under high temperature, high current, high voltage, or drastic temperature change, the reliability of the IC may be degraded. Please contact us for the further details.

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Recommended Operating Conditions at Ta = 25°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 Ta = 25°C, V_{CC}=24V, R1=1kΩ, unless otherwise specified.

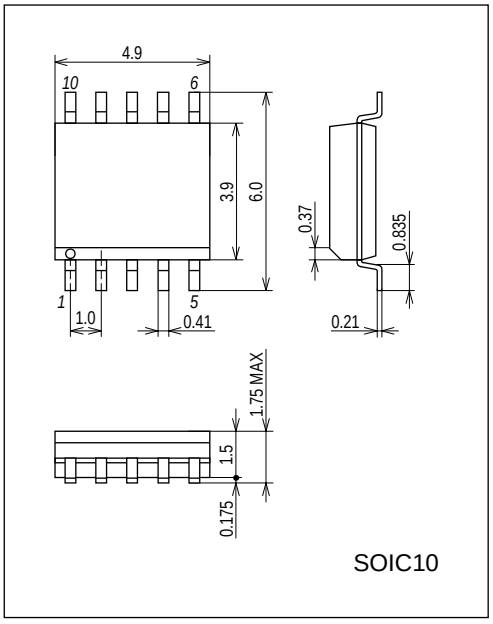
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
V_{IN} voltage	V_{IN}	I_{IN} = 6mA	5.95	6.3	6.65	V
CT capacitor charging current	$I_{CT}1$	CT = 0.5V	1.8	2.55	3.4	μA
Capacitor dis-charging current	$I_{CT}2$	CT = 6.0V	0.15	0.23	0.31	μA
Capacitor charging / dis-charging current ratio	R_{CT}	$R_{CT} = I_{CT}1 / I_{CT}2$	10.5	11	14.5	
CT charging voltage	$V_{CT}H$	V_{CT} / V_{IN}	74	79	84	%
CT dis-charging voltage	$V_{CT}L$	V_{CT} / V_{IN}	41	46	51	%
Output limit withstand voltage	$V_{O}LM$	I_O = 100mA	49	52	55	V
Output saturation voltage	$V_{O}L1$	I_O = 200mA		0.85	1.1	V
Hall input sensitivity	V_{HN}	Including offset and hysteresis		±15	±30	mV
FG/RD output saturation voltage	$V_{FG/RD}$	$I_{FG/RD}$ = 5mA		0.15	0.3	V
FG/RD output leak current	$I_{FG}L/RDL$	$V_{FG/RD}$ = 14V		0.1	10	μA
Thermal protection function operating temperature	TSD	Design target value *		180		°C

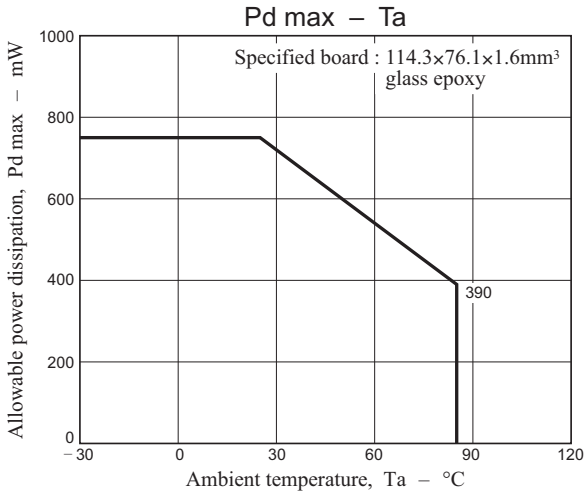
* Design target value and is not measured.

Package Dimensions

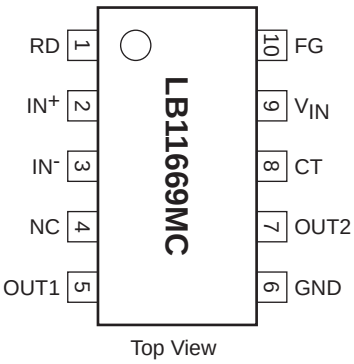
unit : mm (typ)

3426A



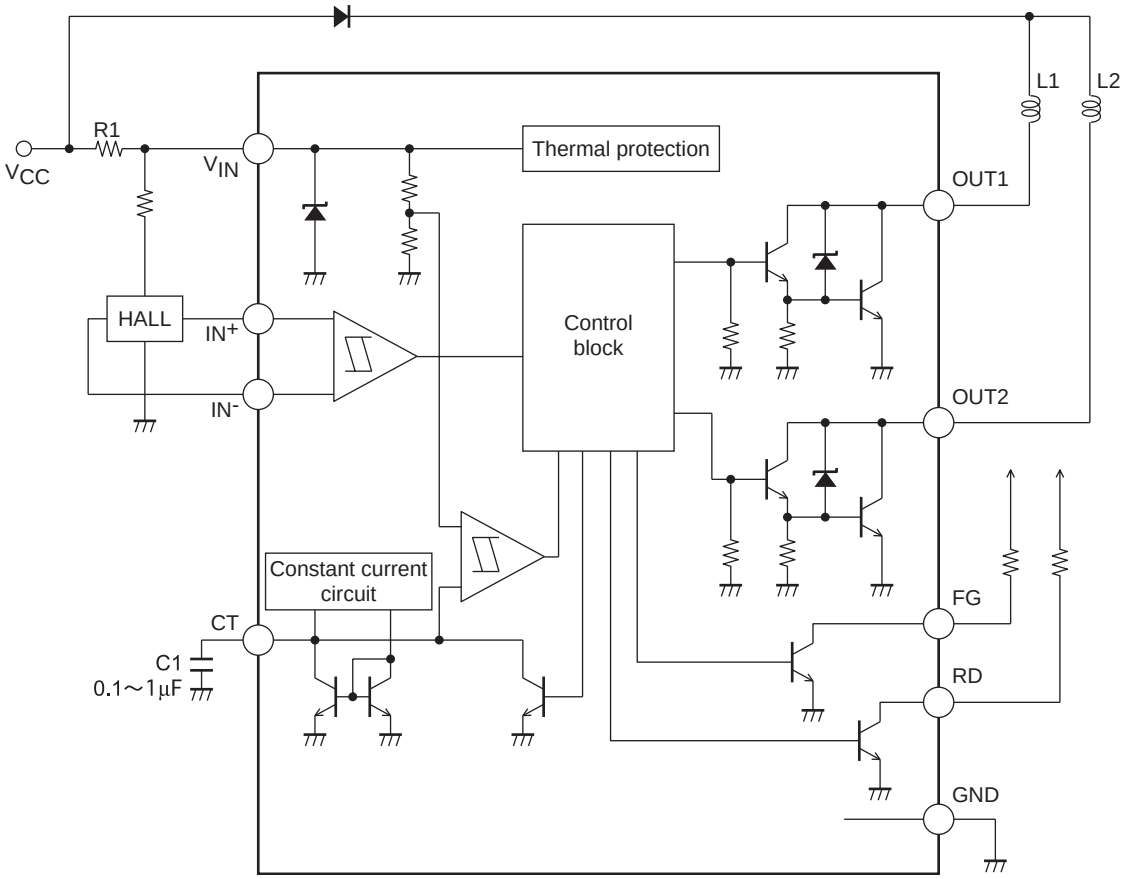


Pin Assignment



Top View

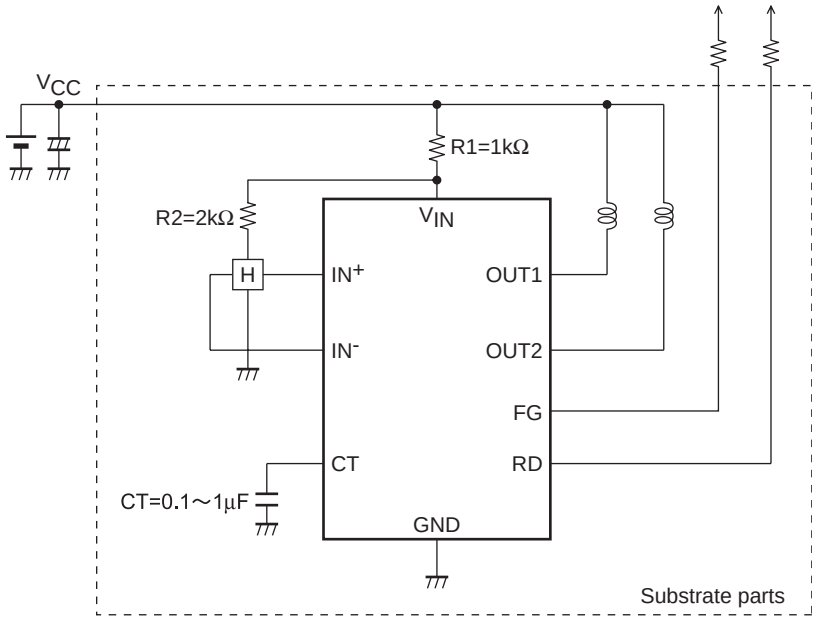
Block Diagram



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.