Ordering number : ENA2142

LB11668MC

ON Semiconductor®

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Monolithic Digital IC

For Fan Motor

Two-Phase Half-Wave Driver

Overview

The LB11668MC 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		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 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 × 1.5mm, glass epoxy board.

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	$I_{IN}1$		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.

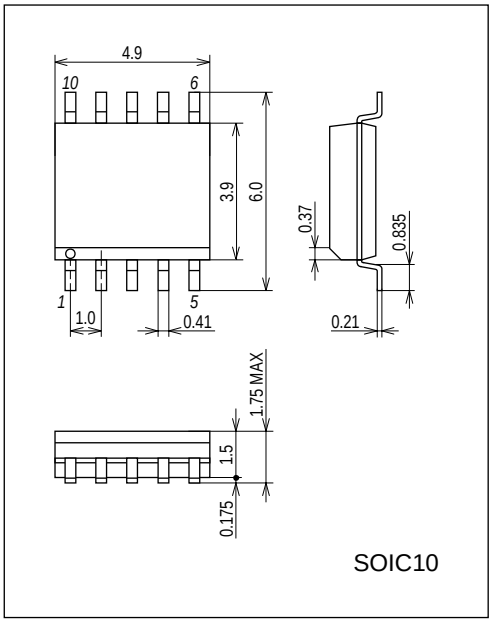
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
V_{IN} voltage	V_{IN}	I_{IN} = 6mA	6.9	7.2	7.6	V
CT capacitor charging current	$I_{CT}1$	CT = 0V	0.8	1.2	2.0	μA
Capacitor discharging current	$I_{CT}2$	CT = 6.0V	0.12	0.24	0.4	μA
Capacitor charging/ discharging current ratio	R_{CT}	$R_{CT} = I_{CT}1 / I_{CT}2$	4.0	5.0	7.0	
CT charging voltage	$V_{CT}H$	V_{CT}/V_{IN}	66	70	74	%
CT discharging voltage	$V_{CT}L$	V_{CT}/V_{IN}	36	40	44	%
Output limit withstand voltage	V_OLM	I_O = 10mA	50	53	56	V
Output saturation voltage	V_OL1	I_O = 200mA		0.85	1.1	V
Hall input sensitivity	V_{HN}	Including offset and hysteresis		8	18	mV
RD output saturation voltage	V_{RD}	I_{RD} = 5mA		0.2	0.5	V
RD output leak current	I_{RD}	V_{RD} = 14V		0.1	10	μA
Thermal protection function operating temperature	VTH	Design target value *	150	180	210	°C

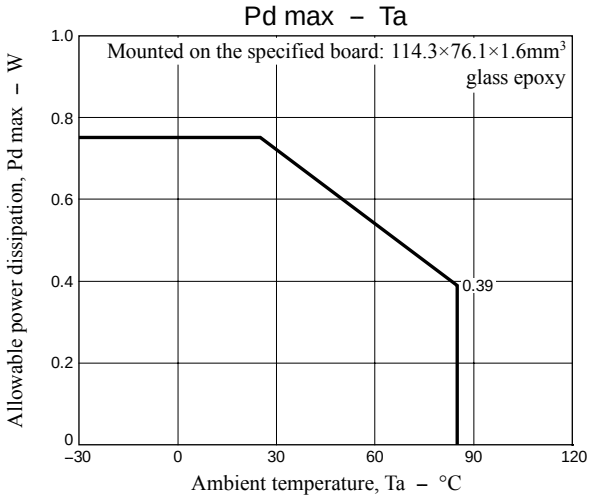
* "Design" is a design target and is not measured.

Package Dimensions

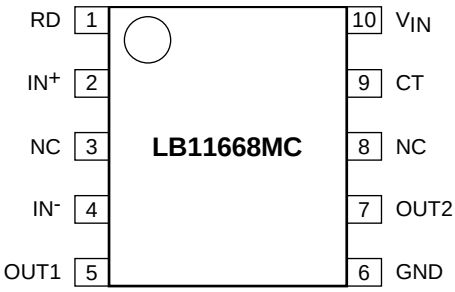
unit : mm (typ)

3426A



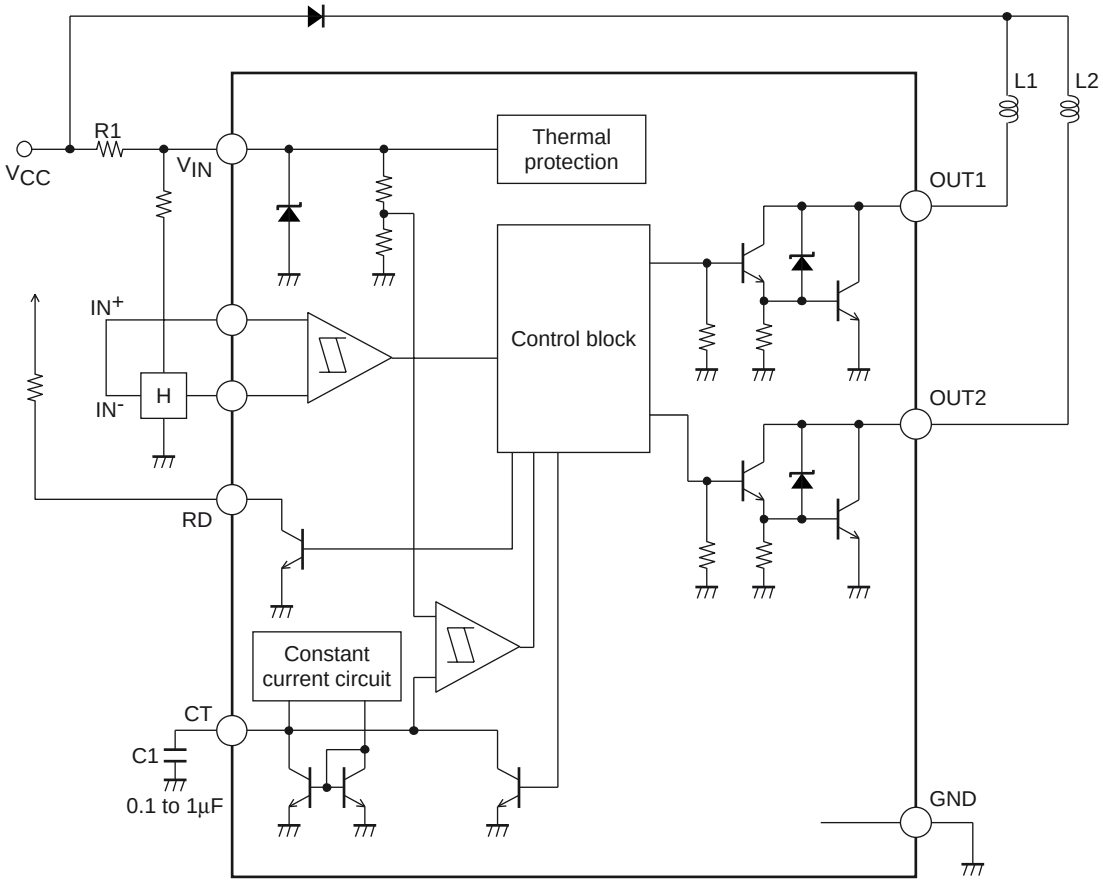


Pin Assignment



Top view

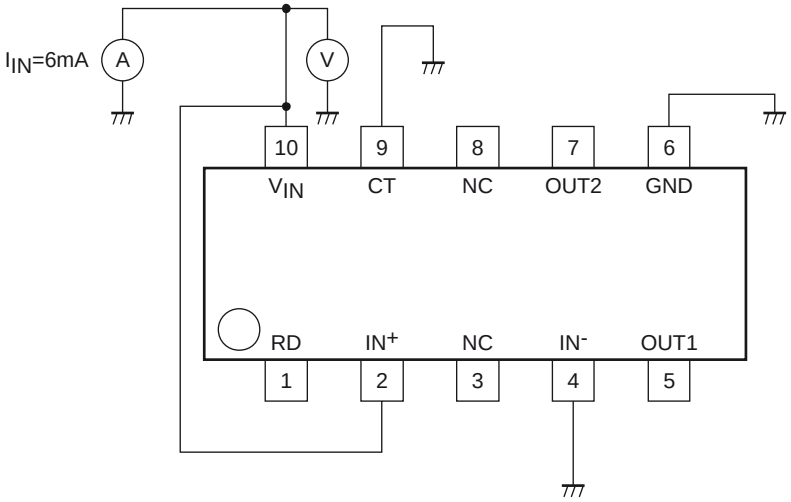
Block Diagram



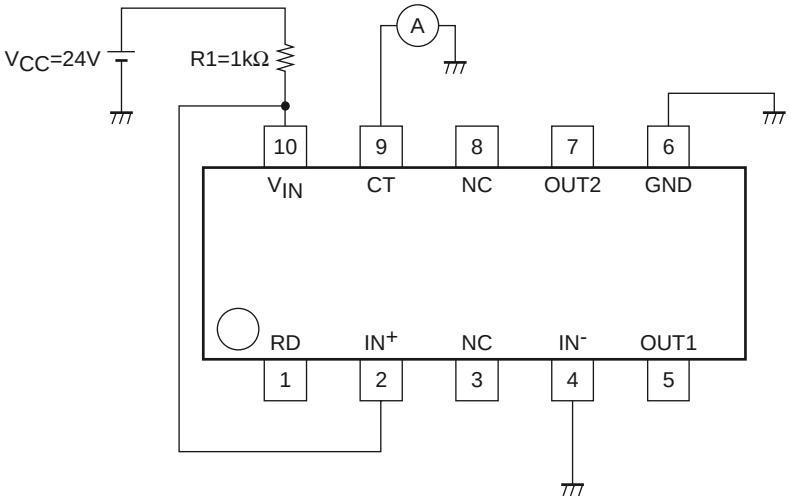
Truth table

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

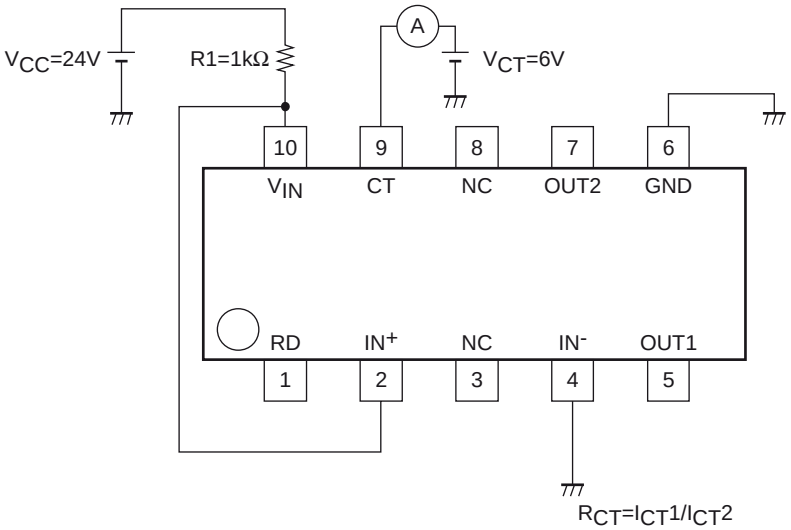
$V_{IN}1$



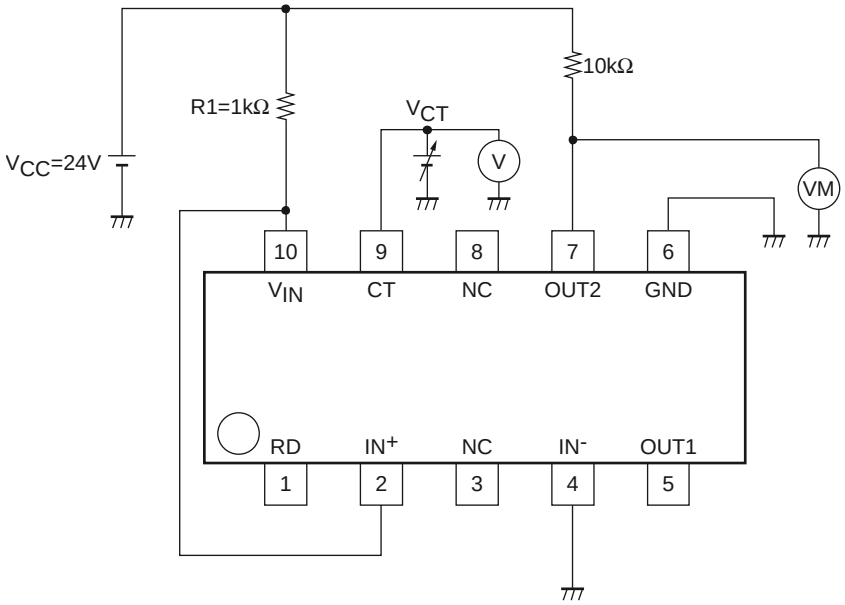
$I_{CT}1$



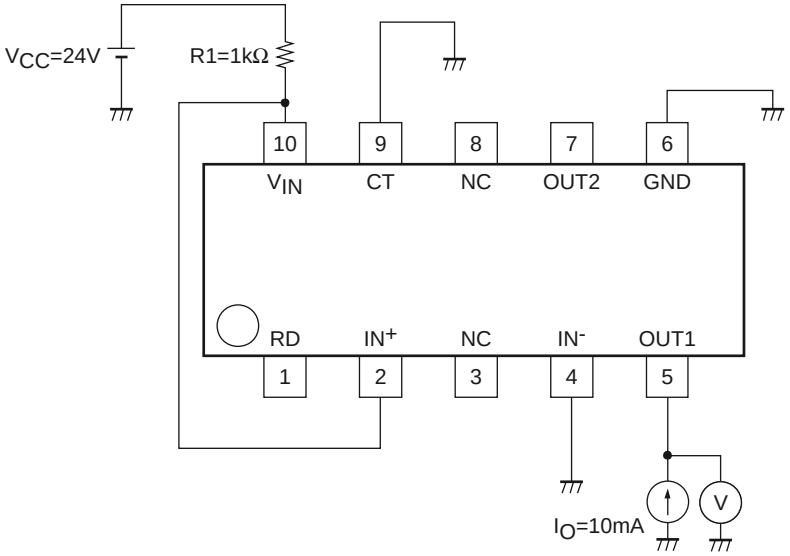
$I_{CT}2$



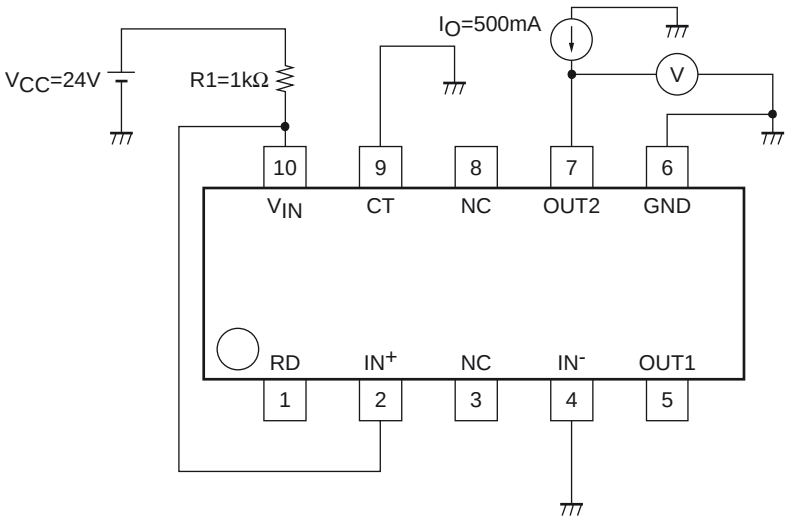
$V_{CT}H$, $V_{CT}L$



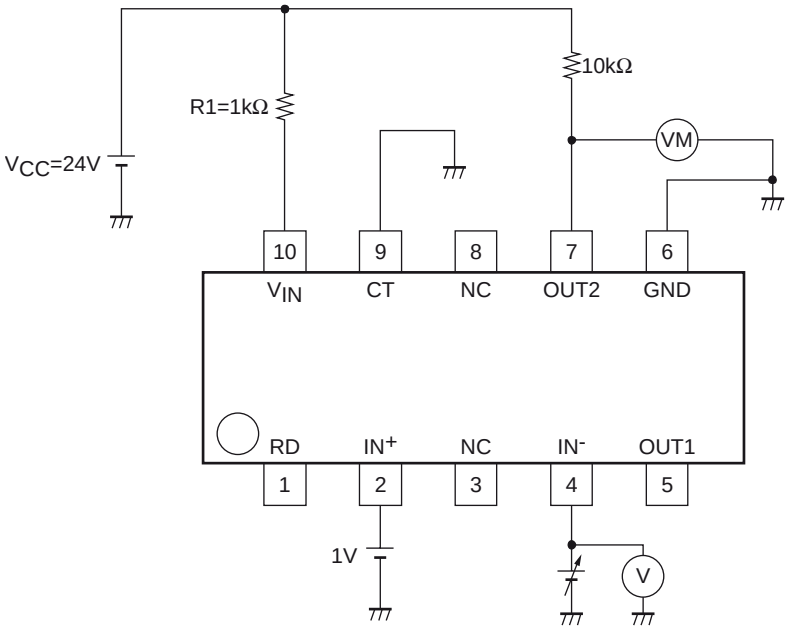
V_OLM



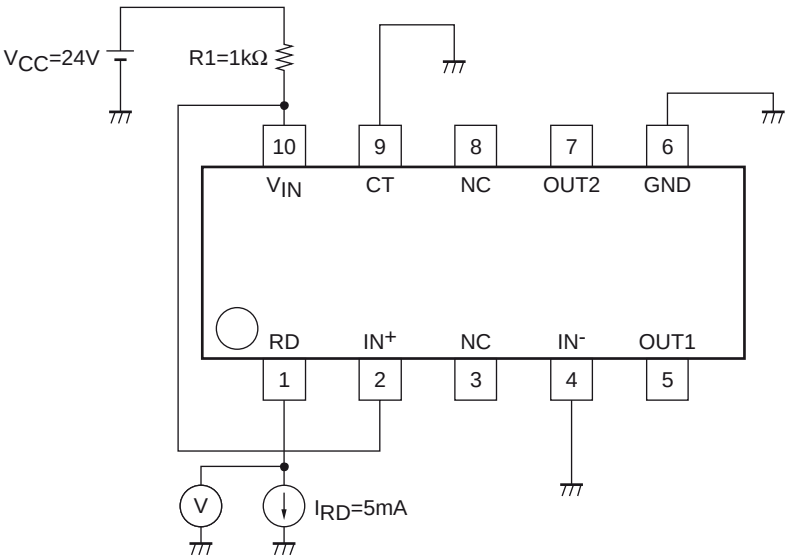
V_OL1



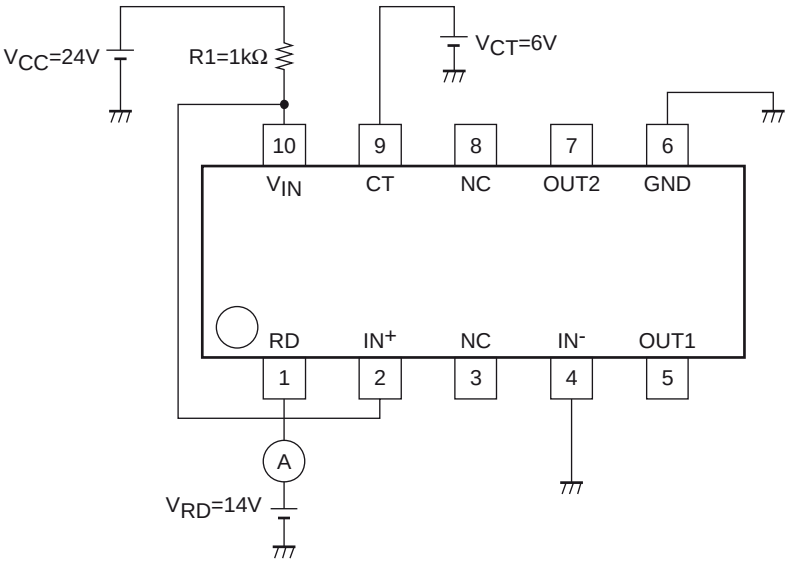
V_{HN}



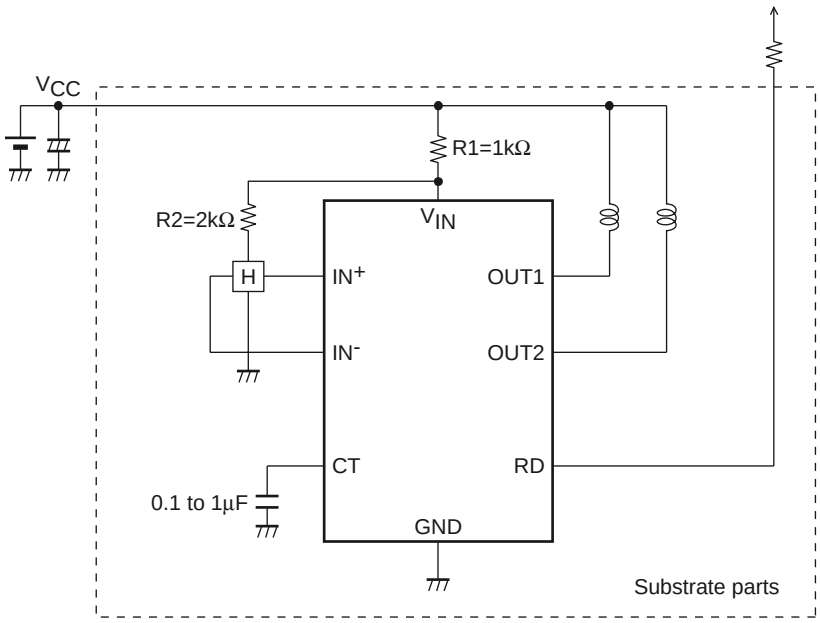
V_{RD}



V_{RL}



Application Circuit Example 24V power supply



Notice

- Take care not to cause interference due to wiring of IN- and OUT1.
- In an application of connecting the CT pin to GND, lock protection and restart function are not effective.
- With reverse power - GND connection in the above application figure, the current restricted by the coil resistance flows from GND → OUT → coil → power supply. IC breakage does not occur if the current value is 500mA or less. If necessary, insert Di between V_{CC} and coil.