Ordering number : ENA1412

SANYO Semiconductors
DATA SHEET

LB11966M — Monolithic Digital IC For Fan Motor 2-phase Half-Wave Driver

Overview

The LB11966M is a two-phase half-wave brushless motor driver for fan motor.

Functions

- 2-phase half-wave drive.
- RD (Rotation Detection) outputs incorporated.
- FG (Frequency Generation) 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 supply voltage	V_{CC} max		16	V
Output current	I_{OUT} ave		500	mA
	I_{OUT} peak	t ≤ 1s	1200	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		16	V
Allowable power dissipation	Pd max	Mounted on a specified board *	800	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.

Recommended Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		3.0 to 15	V
Common-mode input voltage range	V_{COM}		0.2 to V_{CC}-2.3	V

Electrical Characteristics at Ta = 25°C, V_{CC}=12V

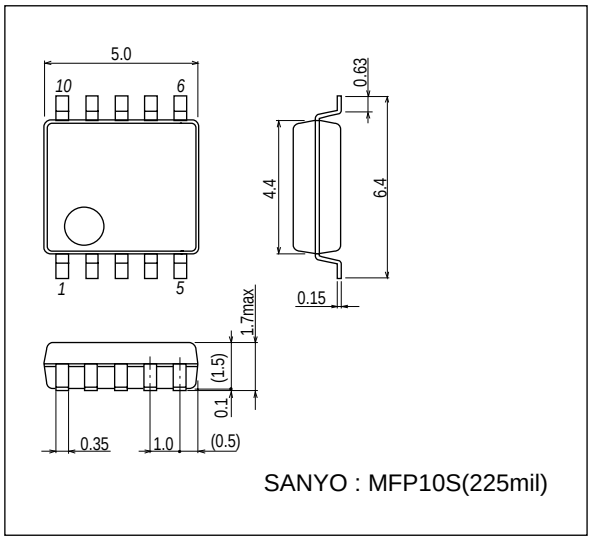
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit current	I_{CC}	During driving (CT = L)		4	6	mA
		During lock protection (CT = H)		3	5	mA
CT capacitor charging current	$I_{CT}1$	CT = 0.2	2.4	3.0	3.6	μA
CT capacitor dis-charging current	$I_{CT}2$	CT = 2.0	0.2	0.3	0.4	μA
capacitor charging / dis-charging current ratio	R_{CT}	$R_{CT} = I_{CT}1 / I_{CT}2$	8	10	12	
CT charging voltage	$V_{CT}1$		1.4	1.6	1.8	V
CT dis-charging voltage	$V_{CT}2$		0.6	0.8	1.0	V
Output limit withstand voltage	V_OLM	I_O = 10mA	23.5	25	26.5	V
Output saturation voltage	V_{OL}	I_O = 500mA		0.95	1.3	V
Hall input sensitivity	V_{HN}	Including offset and hysteresis		6	18	mV
RD output saturation voltage	V_{RD}	I_{RD} = 5mA		0.2	0.5	V
RD output leak current	I_{RL}	V_{RD} = 14V		0.1	10	μA
RD output saturation voltage	V_{FG}	I_{FG} = 5mA		0.2	0.5	V
RD output leak current	I_{FL}	V_{FG} = 14V		0.1	10	μA
Thermal protection function operating temperature	VTH	Design target value *	150	180	200	°C

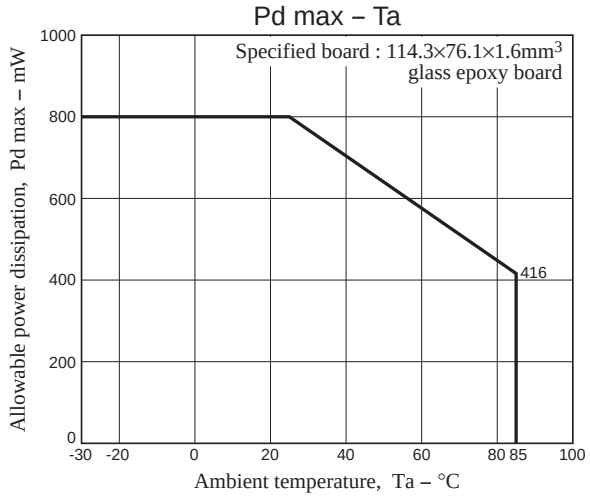
* Design target value and is not measured.

Package Dimensions

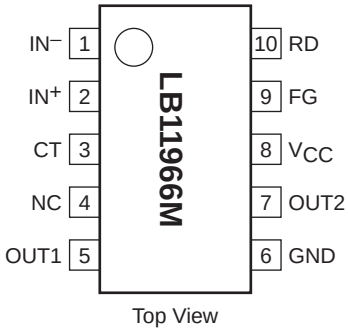
unit : mm (typ)

3086B





Pin Assignment

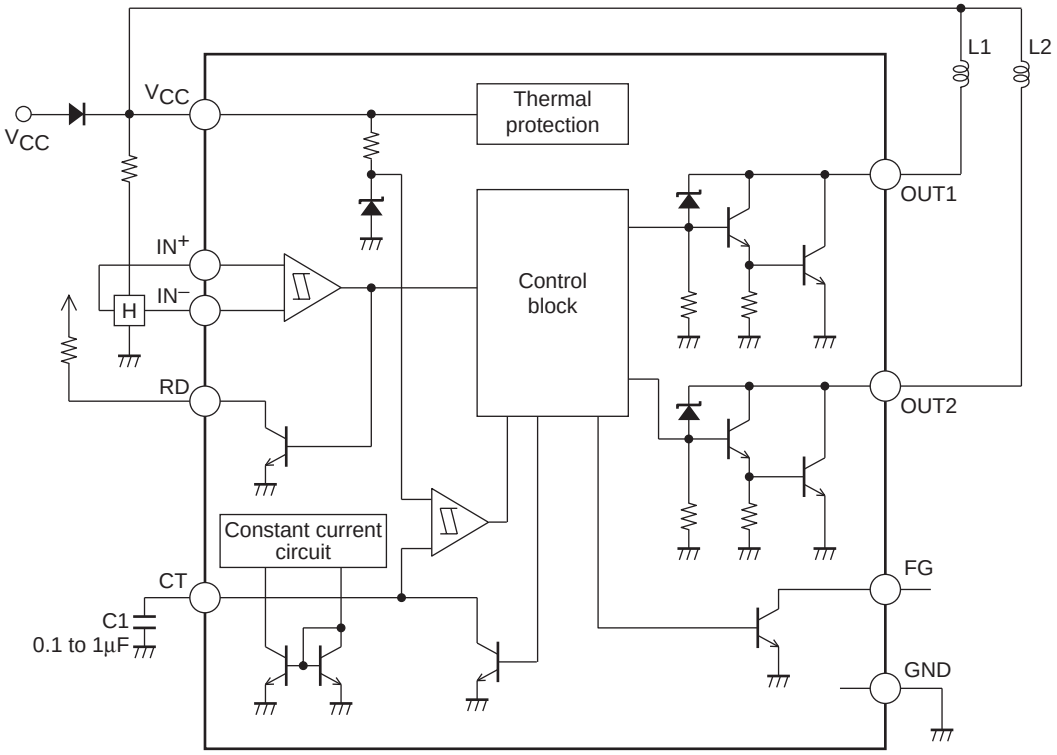


Top View

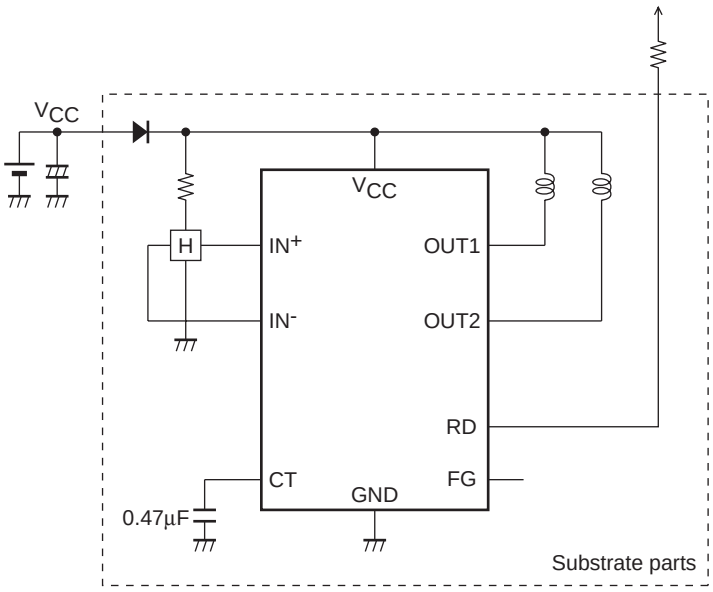
Truth table

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

Block Diagram



Application Circuit Example



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.
- In a circuit configuration as shown above, a power supply/GND reverse connection will cause a current to flow as follows: GND → OUT → coil → power supply. The magnitude of this current is limited by the coil resistance. If it is less than 500mA, the IC will not be destroyed. If required, insert a diode between V_{CC} and the coil.
- The FG pin and RD pin are left open when not used.