



SANYO Semiconductors

DATA SHEET

LB11862M — Monolithic Digital IC Single-Phase Full-Wave Fan Motor Driver

Overview

The LB11862M is optimal for small fan applications, especially CPU cooling fans, due to its single-phase full-wave drive technique and the compact package.

Low switching noise and effective motor drive are further advantages.

Features

- Support for 5V/12V dual power supply voltage.
- Built-in regenerative circuit allows use of reverse-connection protection diode.
- Built-in Hall amplifier with hysteresis (supports core without commutating pole).
- Built-in lockup protection and automatic recovery circuits.
- Latch-type lockup detection output (RD) is low during rotation and high during stop.
- Hall bias pin and start/stop pin allow reduced current drain in standby mode.
- Built-in thermal protection circuit.

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		17	V
Maximum output current	I_{OUT} max		0.8	A
Maximum output withstand voltage	V_{OUT} max		17	V
RD maximum output withstand voltage	V_R max		17	V
RD maximum output current	I_R max		5	mA
HB maximum output current	I_B max		10	mA
ST maximum input voltage	V_{ST} max		15	V
Allowable power dissipation	P_d max	Mounted on the specified board*	800	mW
Operating temperature	T_{opr}		-40 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

*Specified board : $114.3 \times 76.2 \times 1.5$ mm, glass epoxy.

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Allowable Operating Range at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V _{CC}		3.8 to 16.8	V
ST input high-level voltage	STH		3 to 14	V
ST input low-level voltage	STL		-0.3 to 0.4	V
Hall input common-mode input voltage range	V _{ICM}		0.2 to V _{CC} -1.5	V

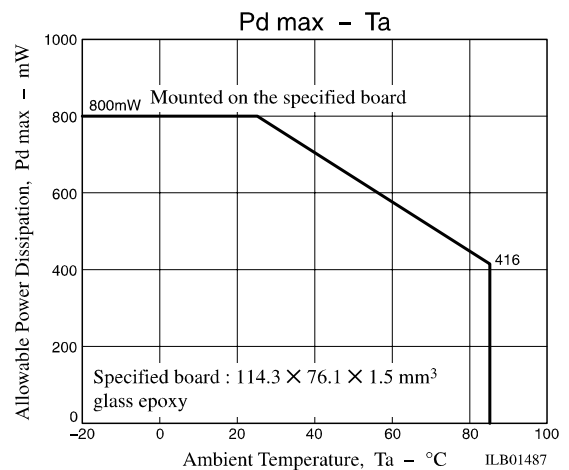
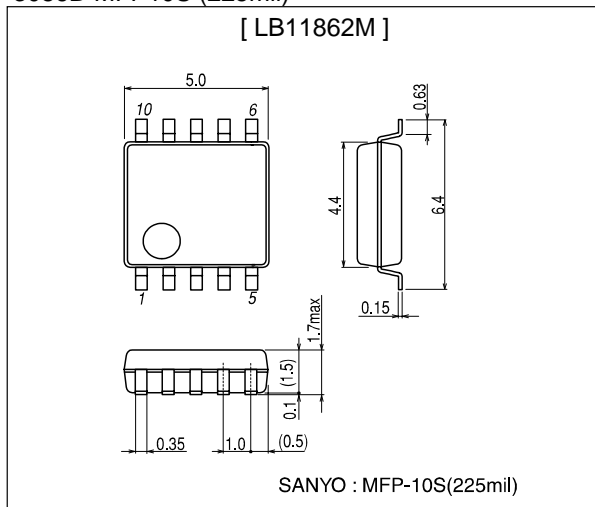
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V, unless otherwise specified.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit current	I _{CC}	Operating mode (CT = L, ST = L)		12	17	mA
		Lock protecting mode (CT = H, ST = L)		2.5	4.0	mA
		Standby mode (ST = H)		110	150	μA
Lock detection capacitor charging current	ICT1	VCT = 0.2 V	1.5	2.1	3.0	μA
Capacitor discharging current	ICT2	VCT = 3.0 V	0.21	0.35	0.50	μA
Capacitor charging/discharging current ratio	RCT	RCD = ICT1/ICT2	5.0	6.0	8.0	-
CT charging voltage	VCT1		2.55	2.75	2.95	V
CT discharging voltage	VCT2		1.6	1.8	2.0	V
Output low-level voltage	V _{OL}	I _O = 200 mA		0.2	0.3	V
Output high-level voltage	V _{OH}	I _O = 200 mA	3.9	4.1		V
Hall input sensitivity	V _{HN}	Zero peak value. (Including offset, hysteresis)		7	15	mV
RD output pin low-level voltage	VRD	IRD = 5 mA		0.1	0.3	V
RD output pin leakage current	IRDL	VRD = 15 V			30	μA
HB output low-level voltage	V _{HBL}	I _{HB} = 5 mA		1.0	1.3	V
ST pin input current	IST	VST = 5 V		75	100	μA

Package Dimensions

unit : mm

3086B-MFP10S (225mil)



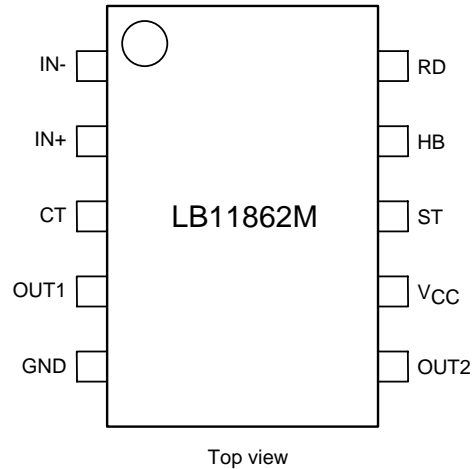
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Truth Table

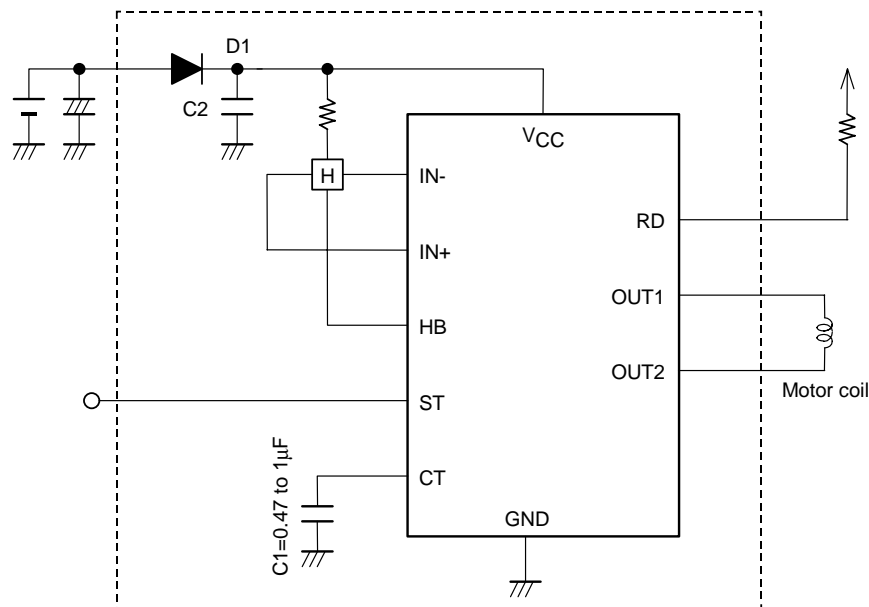
ST	IN-	IN+	CT	OUT1	OUT2	RD	HB	Mode
H	-	-	-	off	off	off	off	Standby
L	H	L	L	H	L	L	L	Operating
	L	H		L	H			
			H	off	off	off	L	Lock protection

(The RD output is latched at “L”-level in operating mode and “H”-level in stop mode.)

Pin Assignment



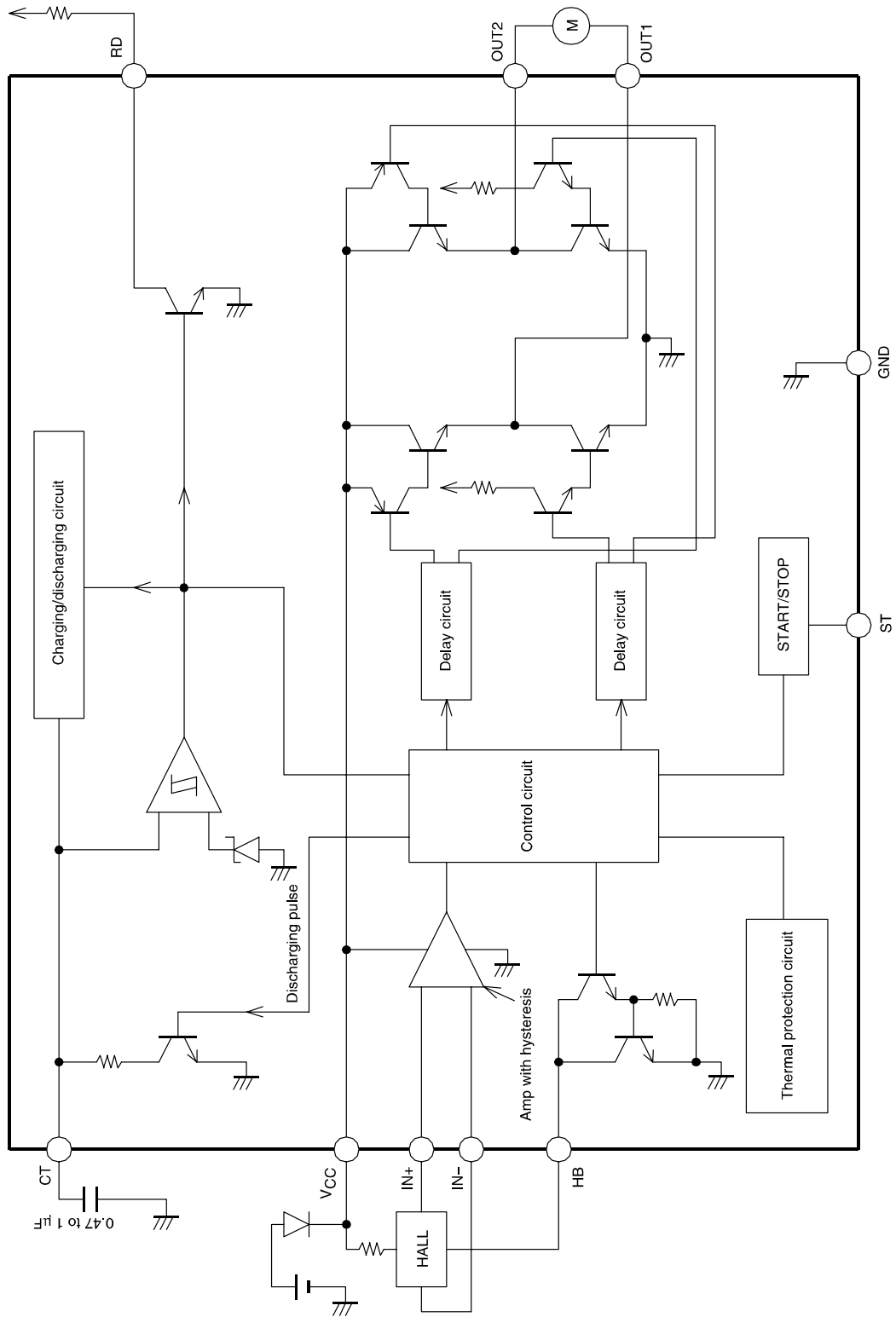
Sample Application Circuit



- (1) D1 is used to prevent IC destruction caused by reverse-connection. It can be omitted if no problems are expected.
- (2) C2 is used to apply a kickback regenerative current when using the IC with the coil current over 500 mA.
- (3) When CT is not used, it should be connected to ground.
- (4) When RD, ST, and HB are not used, they should be left open.

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Block Diagram



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