Ordering number : ENN7111

Monolithic Digital IC

LB11862M

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

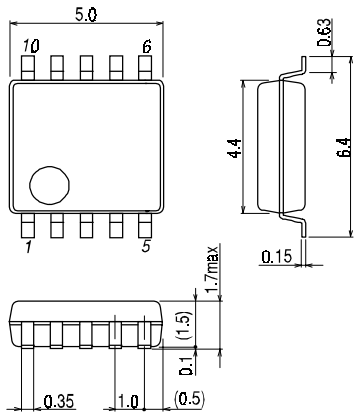
- Support for 5V/12V dual power supply voltage.
- Built-in regenerative circuit allows use of reverse-connection protection diode.
- Built-in Hall amplifier with hysteresis (supports core without commutating pole).
- Built-in lockup protection and automatic recovery circuits.
- Latch-type lockup detection 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.

Package Dimensions

unit : mm

3086B-MFP10S (225mil)

[LB11862M]



SANYO : MFP-10S(225mil)

Specifications

Absolute Maximum Ratings at Ta = 25°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	Pd max	Mounted on the specified board*	800	mW
Operating temperature	Topr		-40 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

*Specified board : 114.3 × 76.2 × 1.5 mm, glass epoxy.

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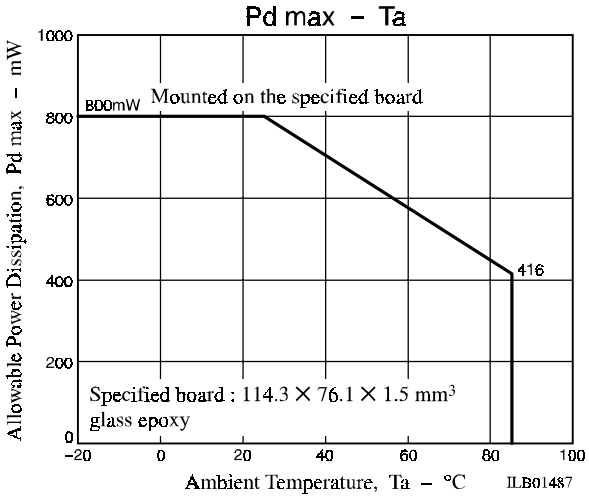
Allowable Operating Range at Ta = 25°C

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	VICM		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	VHN	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	VHBL	IHB = 5 mA		1.0	1.3	V
ST pin input current	IST	VST = 5 V		75	100	μA

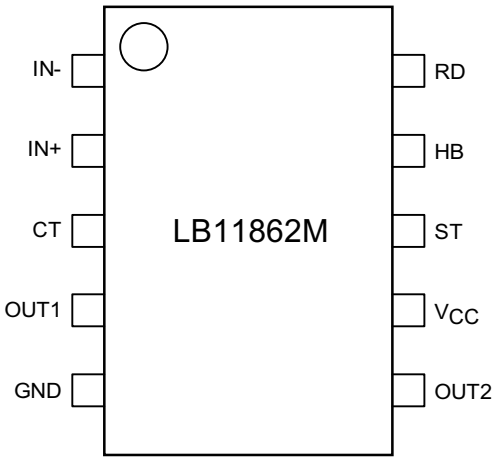


Truth Table

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

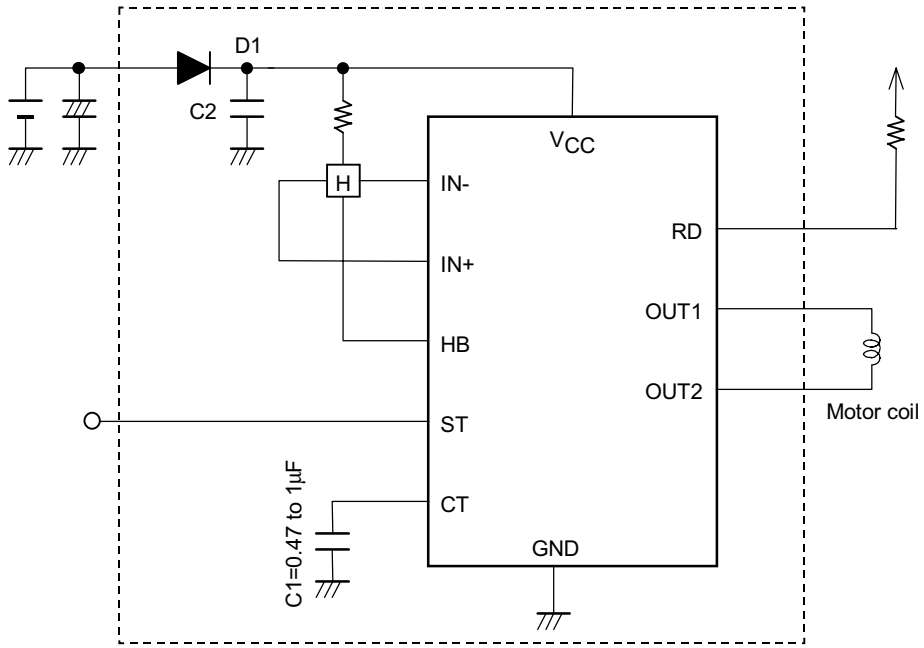
(The RD output is latched at “L”-level in operating mode and “H”-level in stop mode.)

Pin Assignment



Top view

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.

Block Diagram