LB1935FA

Monolithic Digital IC

Stepping Motor Driver IC

ON Semiconductor®

http://onsemi.com

Overview

LB1935FA is IC with forward/reverse motor drive 2-channel in which low saturation voltage and low voltage operation possible. Its small sized package is optimal for 2 phase excitation drive of 2 phase bipolar stepping motors for various portable devices such as digital still cameras.

Features

- Low saturation voltage, V_O (sat) = 0.3V typ at I_O = 150mA
- Built-in shoot-through current protection circuit
- No standby current consumption (or zero)
- Built-in thermal shutdown circuit
- Micro10 small-sized package

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum power source voltage	V_{CC} max		-0.3 to +8.0	V
Applied output voltage	V_{OUT} max	OUT1, OUT2, OUT3, OUT4 pin	V_{CC}+VSF	V
Applied input voltage	V_{IN} max	ENA, IN1, IN2 pin	-0.3 to +8.0	V
GND Pin outflow current	I GND	Per channel	400	mA
Allowable power dissipation	Pd max	With substrate*	400	mW
Operating temperature	Topr		-20 to +75	°C
Storage temperature	Tstg		-40 to +150	°C

* Specified substrate: 20.0mm×10.0mm×0.8mm, paper phenol

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.

LB1935FA

Allowable Operating Range at Ta = 25°C

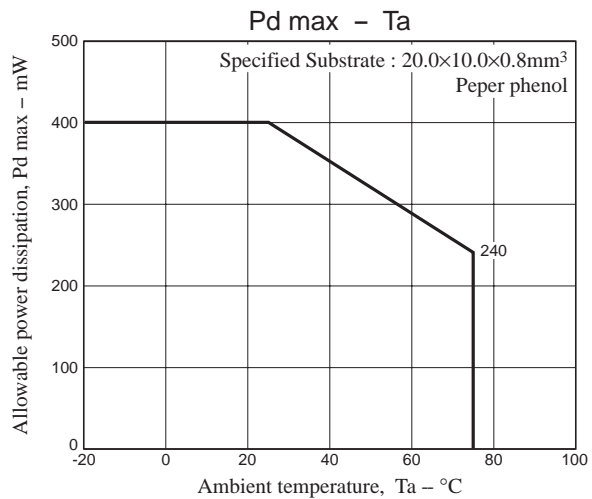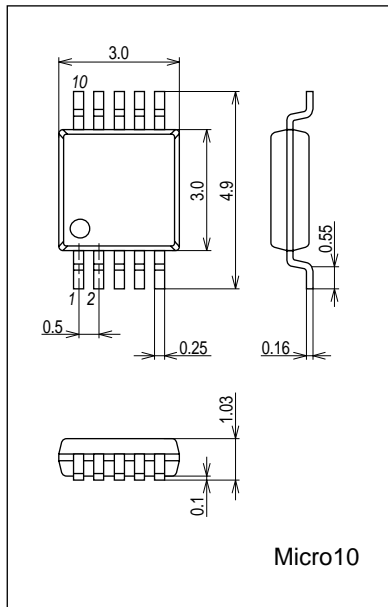| Parameter	Symbol	Conditions	Ratings	Unit
Source voltage	V_{CC}		2.2 to 7.5	V
Input high level voltage	V_{IH}	ENA, IN1, IN2 pin	1.8 to 7.5	V
Input low level voltage	V_{IL}	ENA, IN1, IN2 pin	-0.3 to +0.7	V

Electric Characteristics at Ta = 25°C, V_{CC} = 3.3V

Parameter Sy	mbol	Conditions	Ratings			Unit
			min ty	p	max	
Power source current	$I_{CC}0$	ENA = 0V, V_{IN} = 3V or 0V	0.1		1	μA
	$I_{CC}1$	ENA = 3V, V_{IN} = 3V or 0V	13		19	mA
Output saturation voltage	$V_{OUT}1$	ENA = 3V, V_{IN} = 3V or 0V, I_{OUT} = 100mA	0.2		0.3	V
	$V_{OUT}2$	ENA = 3V, V_{IN} = 3V or 0V, I_{OUT} = 200mA	0.4		0.6	V
Input current	I_{IN}	V_{IN} = 3V	40		60	μA
	IENA	VENA = 3V	40		60	μA
Spark killer diode						
Reverse current	IS(leak)				1	μA
Forward voltage	VSF	I_{OUT} = 200mA			1.7	V

Package Dimensions

unit : mm (typ)

3428

Micro10

Pd max – Ta

Specified Substrate : $20.0×10.0×0.8mm^3$

Peper phenol

240

Allowable power dissipation, Pd max – mW

Ambient temperature, Ta – °C

Pin Assignments

Top view

LB1935FA
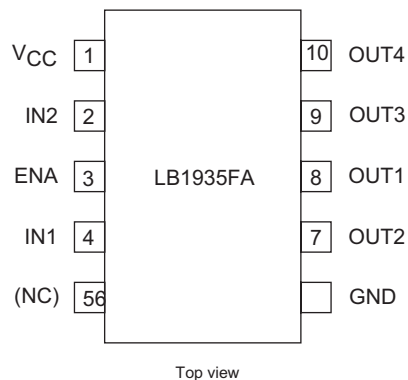
Block Diagram
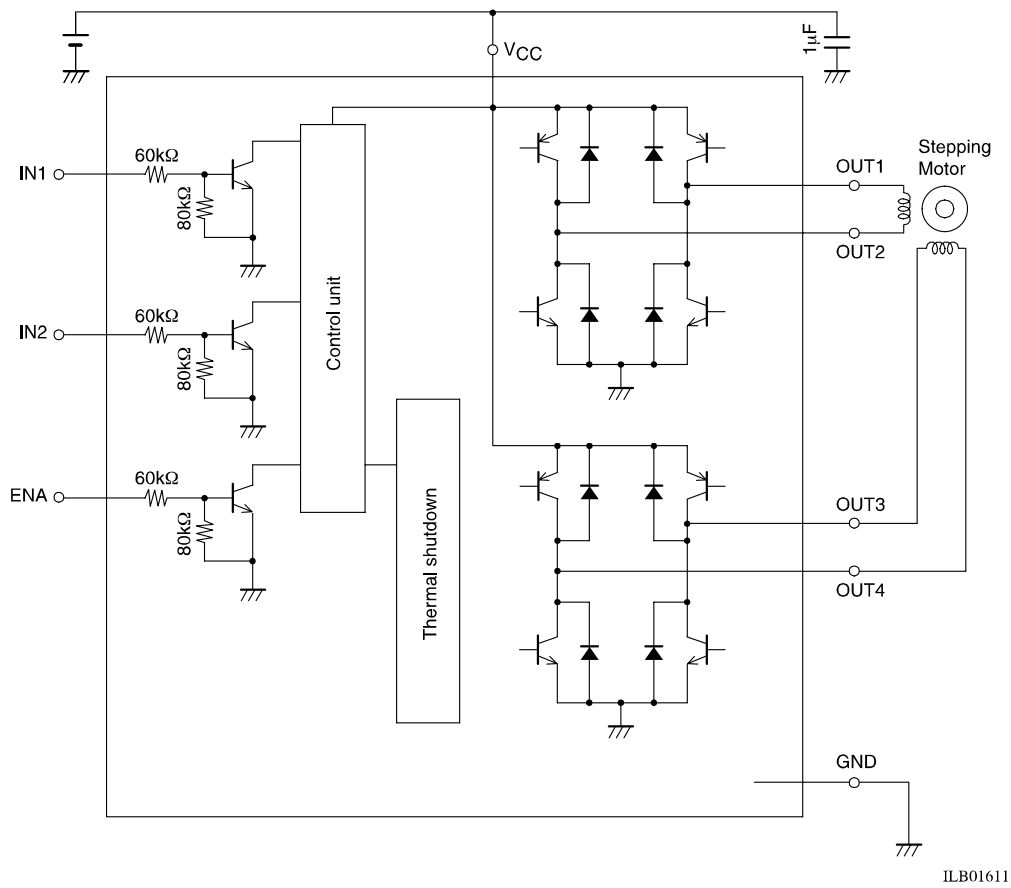
ILB01611

Truth Table

Input			Output				Remarks
ENA	IN1	IN2	OUT1	OUT2	OUT3	OUT4	
L	-	-	OFF	OFF	OFF	OFF	Standby
H	L	L	H	L	H	L	2-phase excitation
	L	H	H	L	L	H	
	H	H	L	H	L	H	
	H	L	L H		H L		

LB1935FA

Timing Chart

Timing chart below shows the 2 phase excitation stepping motor.