



ON Semiconductor®

<http://onsemi.com>

# LB1935FA

Monolithic Digital IC

## Stepping Motor Driver IC

### 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,  $V_O(\text{sat}) = 0.3\text{V}$  typ at  $I_O = 150\text{mA}$
- 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 $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum power source voltage	$V_{CC\text{ max}}$		-0.3 to +8.0	V
Applied output voltage	$V_{OUT\text{ max}}$	OUT1, OUT2, OUT3, OUT4 pin	$V_{CC} + V_{SF}$	V
Applied input voltage	$V_{IN\text{ max}}$	ENA, IN1, IN2 pin	-0.3 to +8.0	V
GND Pin outflow current	$I_{GND}$	Per channel	400	mA
Allowable power dissipation	$P_d\text{ max}$	With substrate*	400	mW
Operating temperature	$T_{opr}$		-20 to +75	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-40 to +150	$^\circ\text{C}$

\* 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 $T_a = 25^\circ\text{C}$

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

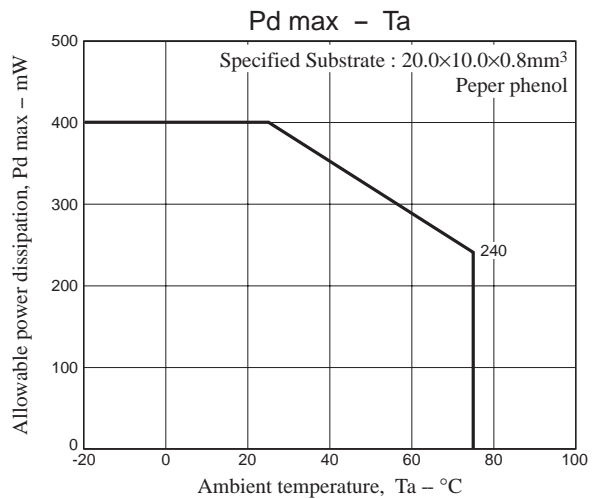
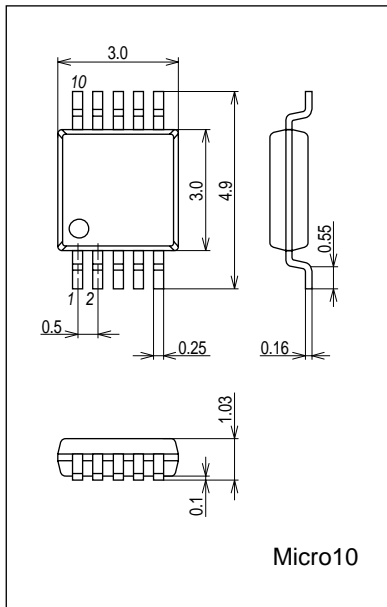
## Electric Characteristics at $T_a = 25^\circ\text{C}$ , $V_{CC} = 3.3\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Power source current	$I_{CC0}$	ENA = 0V, $V_{IN} = 3\text{V}$ or 0V		0.1	1	$\mu\text{A}$
	$I_{CC1}$	ENA = 3V, $V_{IN} = 3\text{V}$ or 0V		13	19	mA
Output saturation voltage	$V_{OUT1}$	ENA = 3V, $V_{IN} = 3\text{V}$ or 0V, $I_{OUT} = 100\text{mA}$		0.2	0.3	V
	$V_{OUT2}$	ENA = 3V, $V_{IN} = 3\text{V}$ or 0V, $I_{OUT} = 200\text{mA}$		0.4	0.6	V
Input current	$I_{IN}$	$V_{IN} = 3\text{V}$		40	60	$\mu\text{A}$
	$I_{ENA}$	VENA = 3V		40	60	$\mu\text{A}$
Spark killer diode						
Reverse current	$I_S(\text{leak})$				1	$\mu\text{A}$
Forward voltage	VSF	$I_{OUT} = 200\text{mA}$			1.7	V

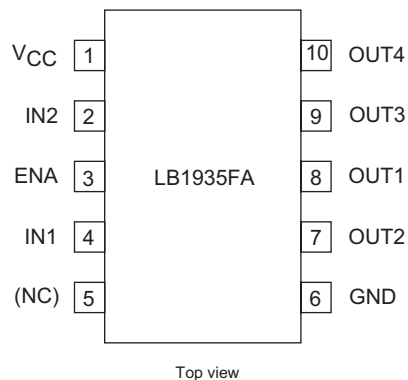
## Package Dimensions

unit : mm (typ)

3428

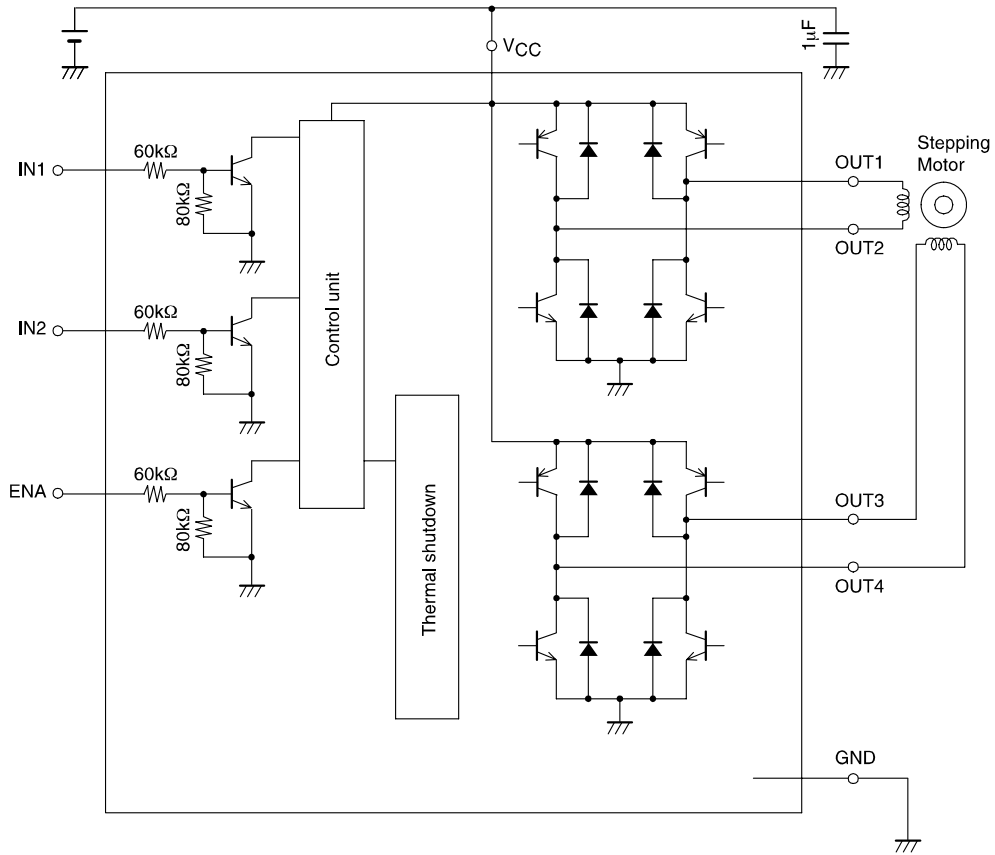


## Pin Assignments



# LB1935FA

## Block Diagram



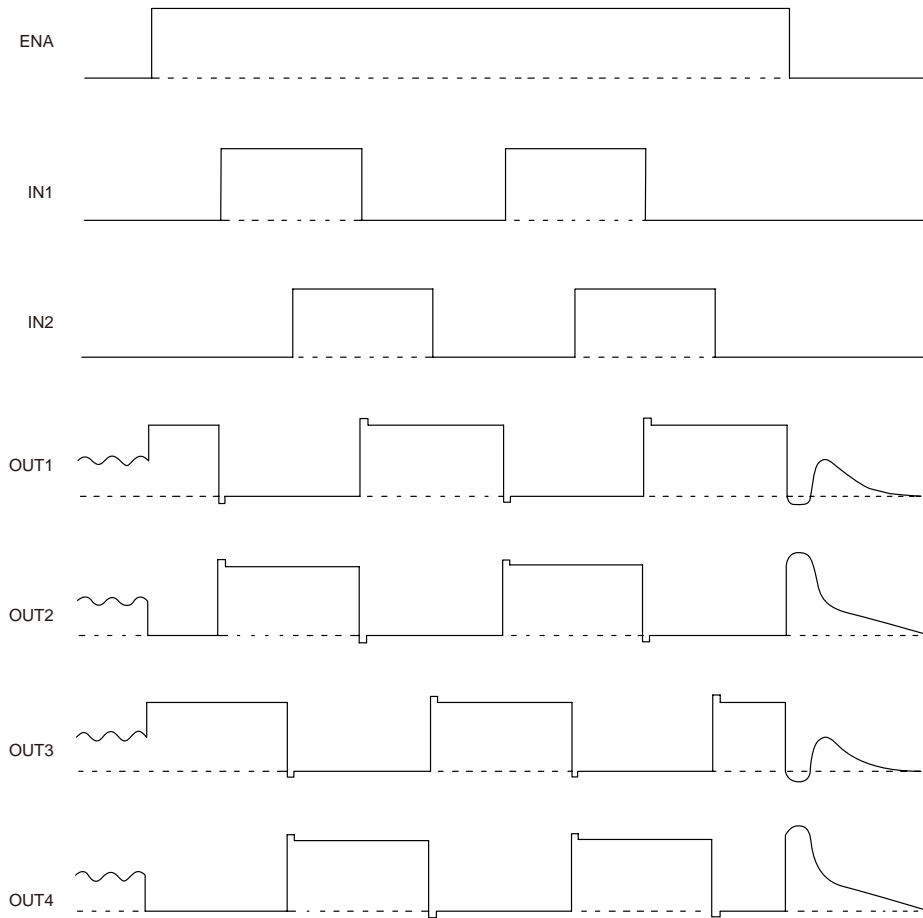
ILB01611

## 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	

**Timing Chart**

Timing chart below shows the 2 phase excitation stepping motor.



ON Semiconductor and the ON logo are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Motor/Motion/Ignition Controllers & Drivers](#) category:*

*Click to view products by [ON Semiconductor](#) manufacturer:*

Other Similar products are found below :

[FSB50550TB2](#) [FSBF15CH60BTH](#) [MSVCPM2-63-12](#) [MSVGW45-14-2](#) [MSVGW54-14-3](#) [MSVGW54-14-5](#) [NTE7043](#) [LA6565VR-TLM-E](#)  
[LB11650-E](#) [LB1837M-TLM-E](#) [LB1845DAZ-XE](#) [LC898300XA-MH](#) [SS30-TE-L-E](#) [26700](#) [LV8281VR-TLM-H](#) [BA5839FP-E2](#) [IRAM236-1067A](#) [LA6584JA-AH](#) [LB11847L-E](#) [NCV70501DW002R2G](#) [AH293-PL-B](#) [STK672-630CN-E](#) [TND315S-TL-2H](#) [FNA23060](#) [FSB50250AB](#)  
[FNA41060](#) [MSVB54](#) [MSVBTC50E](#) [MSVCPM3-54-12](#) [MSVCPM3-63-12](#) [MSVCPM4-63-12](#) [MSVTA120](#) [FSB50550AB](#)  
[NCV70501DW002G](#) [LC898301XA-MH](#) [LV8413GP-TE-L-E](#) [MSVGW45-14-3](#) [MSVGW45-14-4](#) [MSVGW45-14-5](#) [MSVGW54-14-4](#)  
[STK984-091A-E](#) [MP6519GQ-Z](#) [LB11651-E](#) [IRSM515-025DA4](#) [LV8127T-TLM-H](#) [MC33812EKR2](#) [NCP81382MNTXG](#) [TDA21801](#)  
[LB11851FA-BH](#) [NCV70627DQ001R2G](#)