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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

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LB1933M

ON Semiconductor®

http://onsemi.com

Monolithic Digital IC

Low-saturation Forward/Reverse Motor Drive

Overview

The 1933M is a forward/reverse motor driver that supports low voltage drive and features low-saturation outputs in a miniature package.

Features

- Low saturation output: $V_O$sat=0.3V typ (I_O=300mA)

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		-0.3 to +10.5	V
	V_S max		-0.3 to +10.5	V
Maximum Output applied voltage	V_{OUT}		V_S+V_{SF}	V
Maximum input applied voltage	V_{IN}		-0.3 to +10.0	V
Maximum output current	I_{GND}	Per channel	1.0	A
Allowable power dissipation	Pd max1	Independent IC	550	mW
	Pd max2	* Mounted on a specified board	800	mW
Operating temperature	Topr		-30 to +75	°C
Storage temperature	Tstg		-40 to +150	°C

Note *: Mounted on a specified board: 30mm×30mm×1.5mm, glass epoxy

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.

Allowable Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Power supply voltage range	V_{CC}		2.2 to 7.5	V
	V_S		1.8 to 7.5	V
Input high-level voltage	V_{IH}		1.8 to 7.5	V
Input low-level voltage	V_{IL}		-0.3 to +0.7	V

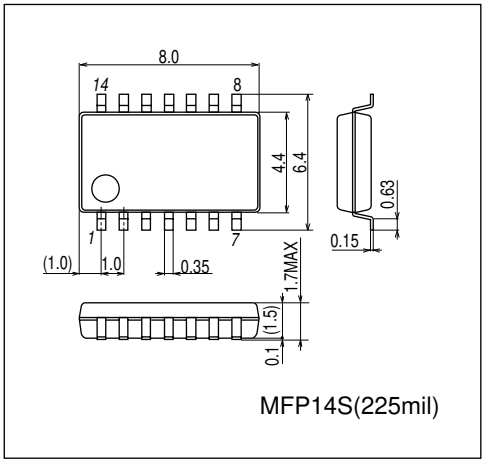
Electrical Characteristics at Ta = 25°C, $V_S1=V_S2=V_{CC}=3V$

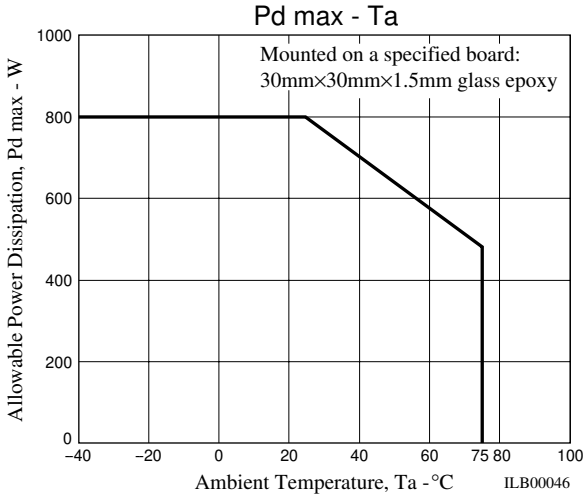
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Power current	I_{CCO}	TOTAL, ENA=0V, V_{IN}=0V		0.1	10	μA
	I_{CC}	V_{CC}, ENA=3V, V_{IN}=3V		5	7	mA
	I_S	V_S1+V_S2, ENA=3V, V_{IN}=3V		16	25	mA
Output saturation voltage	$V_O$sat1	ENA=3V, V_{IN}=3V or 0V, I_{OUT}=300mA		0.30	0.45	V
	$V_O$sat2	ENA=2.2V, V_{IN}=2.2V or 0V, V_{CC}=2.2V, V_S=2.0V, I_{OUT}=150mA			0.20	V
Input current	I_{IN}	V_{IN}=3V			80	μA
	I_{ENA}	V_{ENA}=3V			80	μA
Spark killer diode						
Reverse current	I_S (leak)	$V_{CC}=V_S$=7V			30	μA
Forward voltage	V_{SF}	I_{OUT}=400mA			1.7	V

Package Dimensions

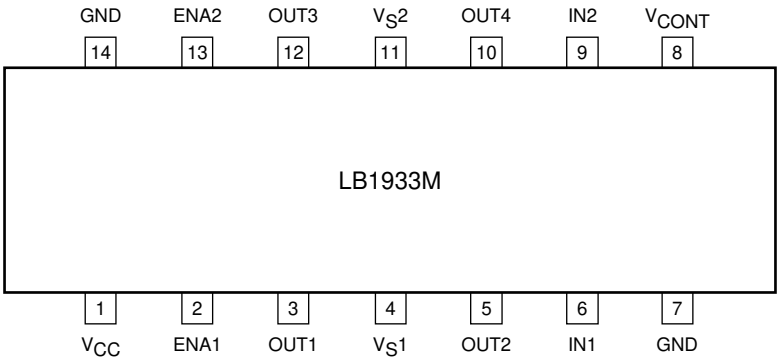
unit : mm (typ)

3111A





Pin Assignment



Top view

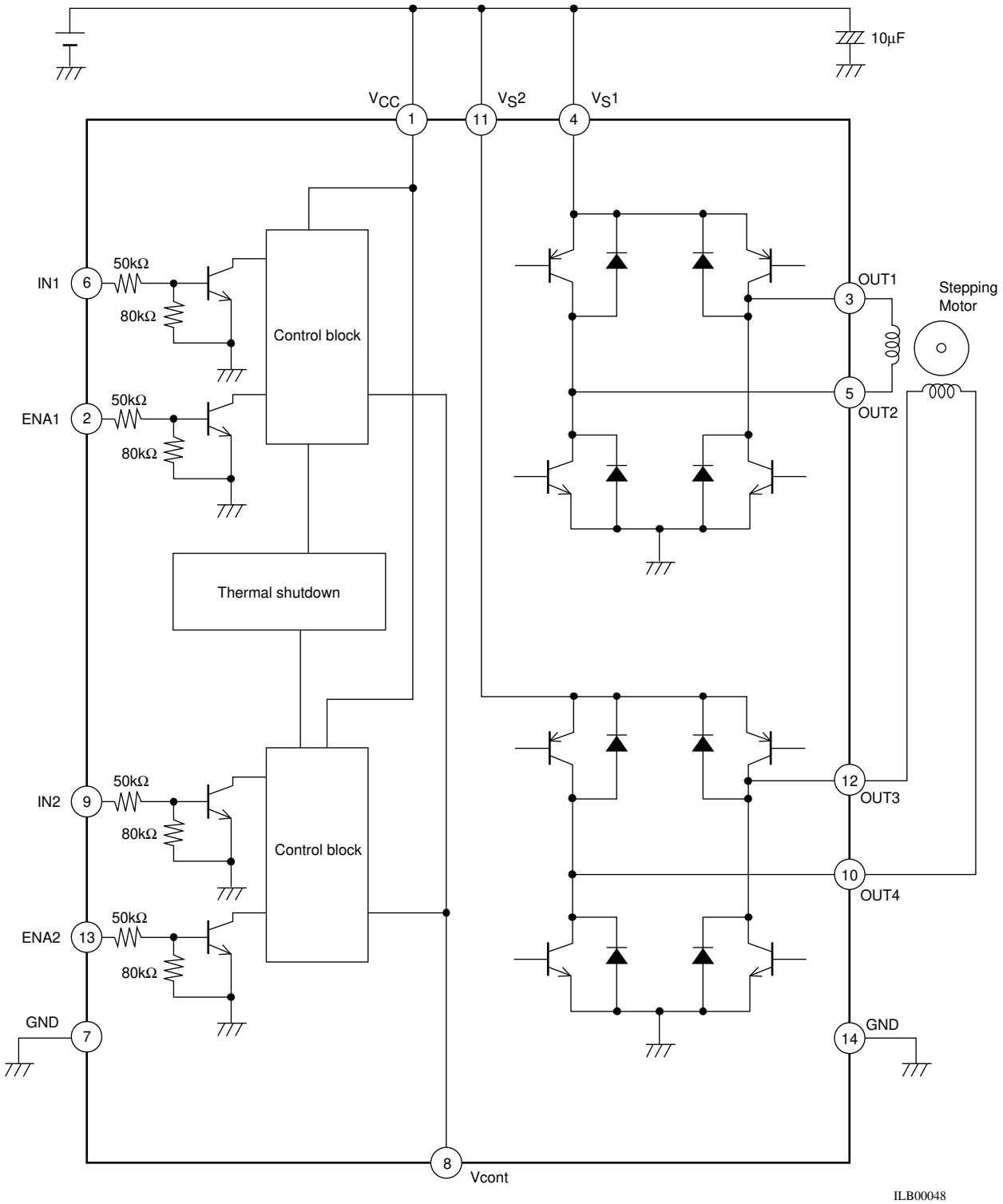
Note: Connect both ground pins.

ILB00047

Truth Table

IN 1/2	ENA 1/2	OUT 1/3	OUT 2/4	Mode
L	H	H	L	Forward
H	H	L	H	Reverse
L	L	OFF	OFF	Standby
H	L	OFF	OFF	Standby

Equivalent Circuit Block Diagram



* There are no constraints on the relationship between the applied voltage to V_{CC}, V_S1, V_S2, ENA1, ENA2, IN1, and IN2 within the absolute maximum ratings (For example, this IC can be used at V_{CC}=3V, V_S1=V_S2=2V, and ENA=IN=5V)