


SANYO Semiconductors

DATA SHEET

Monolithic Digital IC

LB1933M — 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: $V_{O\text{sat}}=0.3\text{V}$ typ ($I_O=300\text{mA}$)

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max}}$		-0.3 to +10.5	V
	$V_S\text{ max}$		-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	$P_d\text{ max1}$	Independent IC	550	mW
	$P_d\text{ max2}$	* Mounted on a specified board	800	mW
Operating temperature	T_{opr}		-30 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +150	$^\circ\text{C}$

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

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LB1933M

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

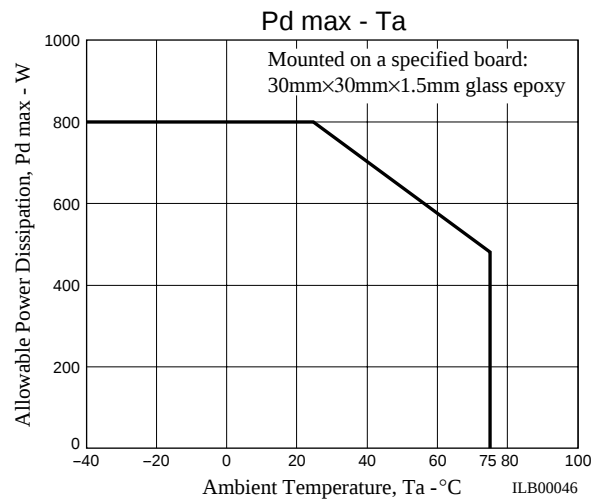
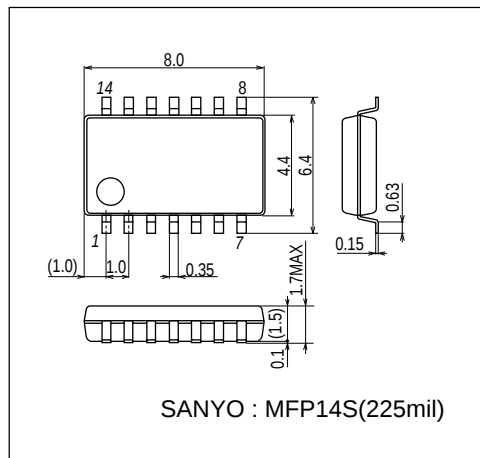
Electrical Characteristics at Ta = 25°C, V_{S1}=V_{S2}=V_{CC}=3V

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 _{Osat1}	ENA=3V, V _{IN} =3V or 0V, I _{OUT} =300mA		0.30	0.45	V
	V _{Osat2}	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

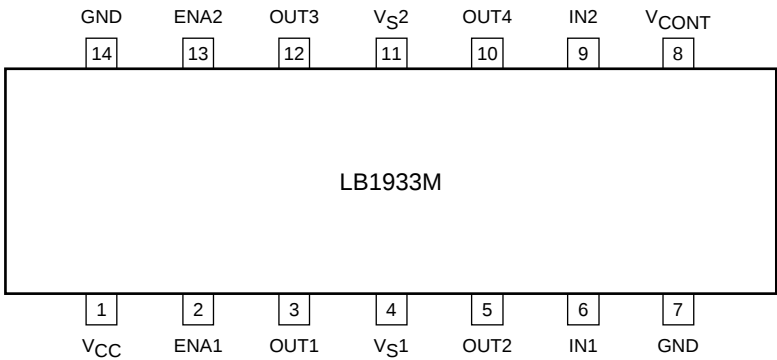
unit : mm (typ)

3111A



LB1933M

Pin Assignment



Note: Connect both ground pins.

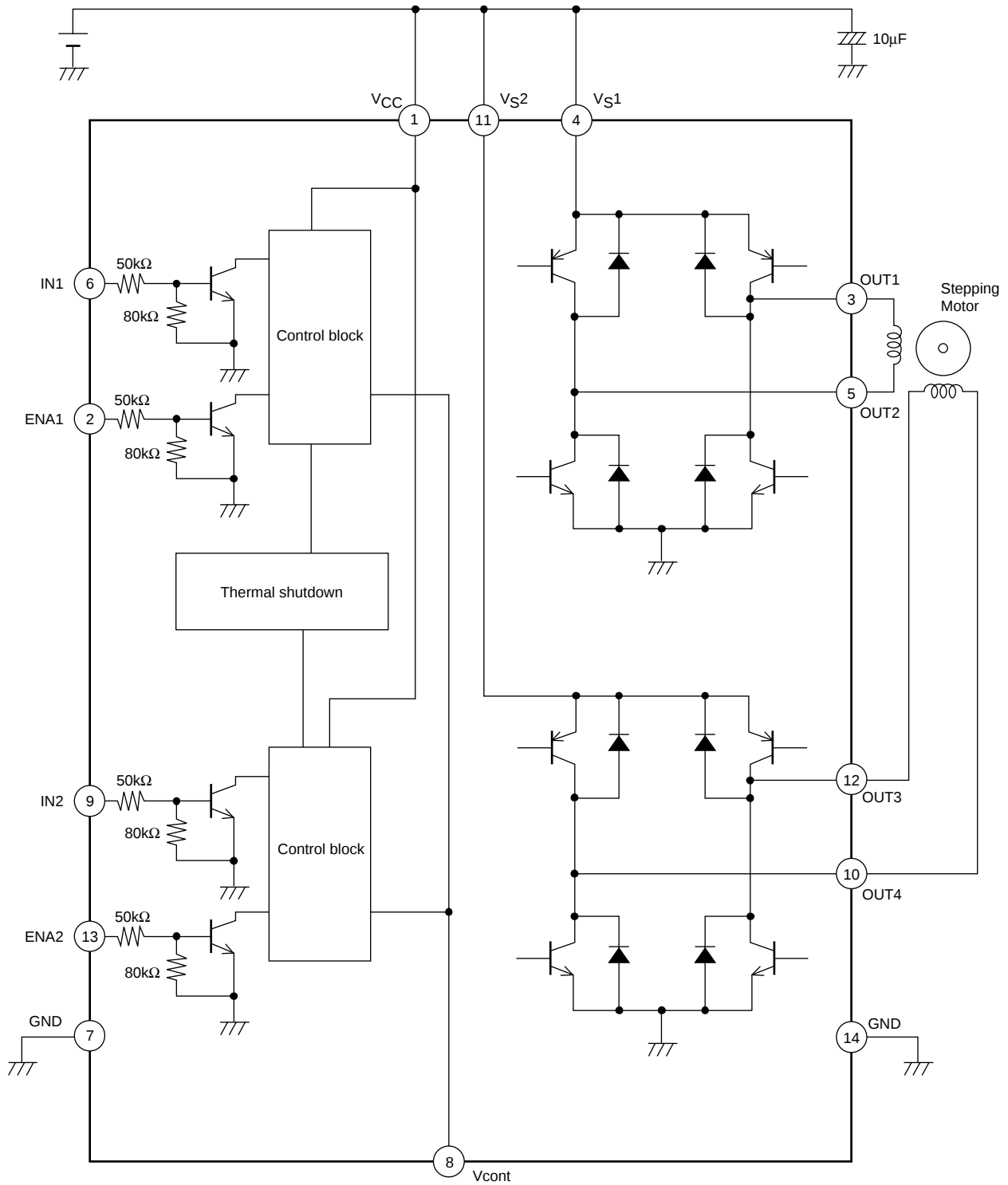
Top view

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 $ENA=IN=5V$)

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