

# SANYO Semiconductors **DATA SHEET**

# 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: Vosat=0.3V typ (Io=300mA)

#### **Specifications**

**Absolute Maximum Ratings** at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max		-0.3 to +10.5	V
	V <sub>S</sub> max		-0.3 to +10.5	V
Maximum Output applied voltage	VOUT		V <sub>S</sub> +V <sub>SF</sub>	V
Maximum input applied voltage	V <sub>IN</sub>		-0.3 to +10.0	V
Maximum output current	IGND	Per channel	1.0	Α
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

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#### Allowable Operating Ranges at Ta = 25°C

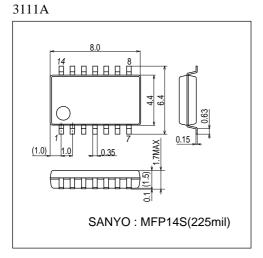
Parameter	Symbol	Conditions	Ratings	Unit
Power supply voltage range	VCC		2.2 to 7.5	V
	٧s		1.8 to 7.5	V
Input high-level voltage	VIH		1.8 to 7.5	V
Input low-level voltage	V <sub>IL</sub>		-0.3 to +0.7	V

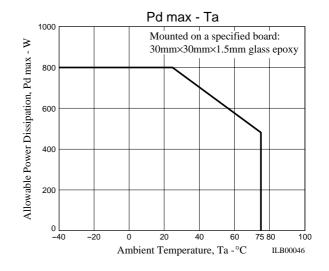
# Electrical Characteristics at Ta = 25°C, $V_S1 = V_S2 = V_{CC} = 3V$

Parameter	Symbol Conditions	O an alitica a	Ratings			1.114
Parameter		min	typ	max	Unit	
Power current	Icco	TOTAL, ENA=0V, V <sub>IN</sub> =0V		0.1	10	μΑ
	Icc	V <sub>CC</sub> , ENA=3V, V <sub>IN</sub> =3V		5	7	mA
	IS	V <sub>S</sub> 1+V <sub>S</sub> 2, ENA=3V, V <sub>IN</sub> =3V		16	25	mA
Output saturation voltage	V <sub>O</sub> sat1	ENA=3V, V <sub>IN</sub> =3V or 0V, I <sub>OUT</sub> =300mA		0.30	0.45	V
	V <sub>O</sub> sat2	ENA=2.2V, V <sub>IN</sub> =2.2V or 0V, V <sub>CC</sub> =2.2V, V <sub>S</sub> =2.0V, I <sub>OUT</sub> =150mA			0.20	V
Input current	I <sub>IN</sub>	V <sub>IN</sub> =3V			80	μΑ
	I <sub>ENA</sub>	V <sub>ENA</sub> =3V			80	μΑ
Spark killer diode						
Reverse current	I <sub>S</sub> (leak)	V <sub>CC</sub> =V <sub>S</sub> =7V			30	μΑ
Forward voltage	VSF	I <sub>OUT</sub> =400mA			1.7	V

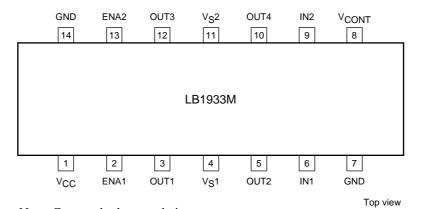
## **Package Dimensions**

unit: mm (typ)





# **Pin Assignment**



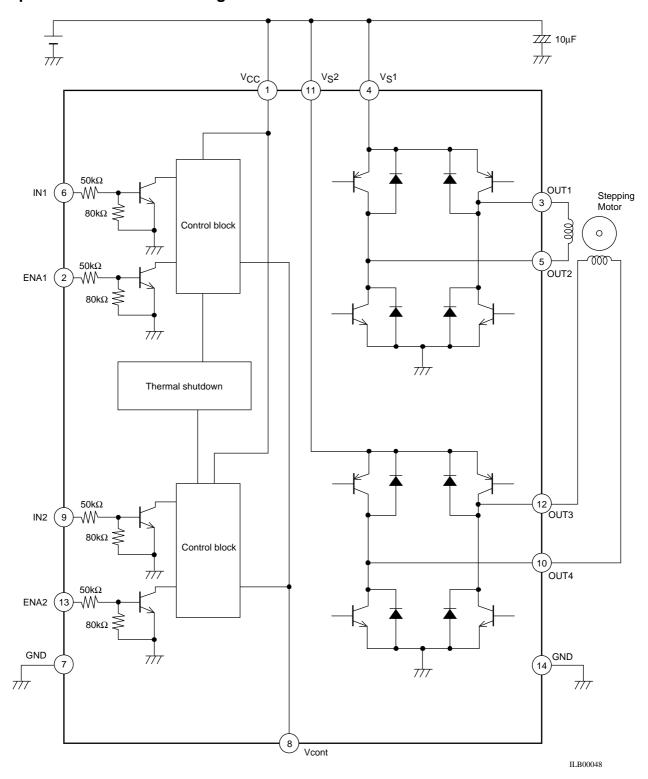
Note: Connect both ground pins.

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## **Truth Table**

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

## **Equivalent Circuit Block Diagram**



<sup>\*</sup> There are no constraints on the relationship between the applied voltage to  $V_{CC}$ ,  $V_S1$ ,  $V_S2$ , ENA1, ENA2, ENA2

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