



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

Monolithic Digital IC

LB1838JM — Low-Saturation Bidirectional Motor Driver for Low-Voltage Drive

Overview

The LB1838JM is a low-saturation two-channel bidirectional motor driver IC for use in low-voltage applications. It has a wide operating temperature range of -40 to 80°C and is ideal for 2-phase excitation bipolar stepping motor driver IC used in automotive components (other than critical safety parts), consumer and industrial products, and many other applications.

Features

- Low voltage operation (2.5V min)
- Low saturation voltage (upper transistor + lower transistor residual voltage ; 0.40V typ at 400mA).
- Through-current prevention circuit built in
- Separate logic power supply and motor power supply
- Spark killer diodes built in
- Thermal shutdown circuit built in
- Compact package (14-pin MFP)

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
Output supply voltage	V _{OUT}		V _S to V _{SF}	V
Input supply voltage	V _{IN}		-0.3 to +10	V
GND pin flow-out current	IGND	Per channel	1.0	A
Allowable power dissipation	Pd max1	Independent IC	550	mW
	Pd max2	* Mounted on a board.	800	mW
Operating temperature	T _{opr}		-40 to +85	°C
Storage temperature	T _{stg}		-55 to +150	°C

* Mounted on a substrate: 30×30×1.5mm³, glass epoxy board.

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LB1838JM

Allowable Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V _{CC}		2.5 to 9.0	V
	V _S		1.8 to 9.0	V
Input high-level voltage	V _{IH}		1.8 to 9.0	V
Input low-level voltage	V _{IL}		-0.3 to +0.7	V

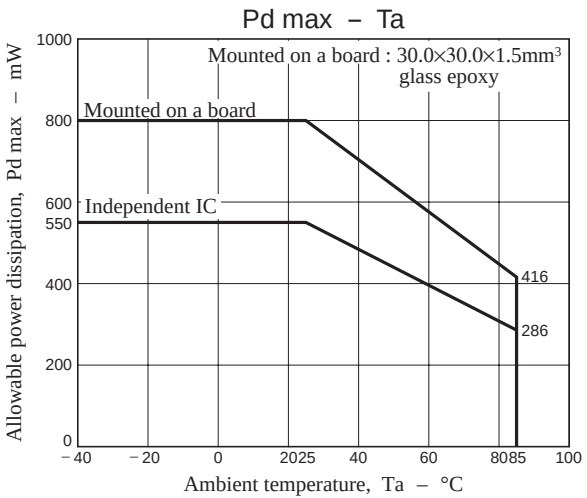
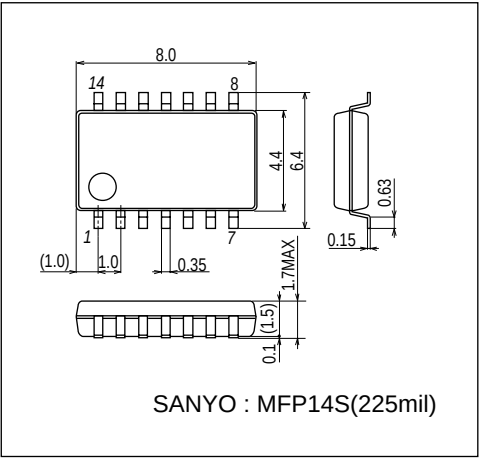
Electrical Characteristics at Ta = 25°C, V_{CC} = 3V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current	I _{CC0}	EMA1, 2 = 0V, V _{IN1} = 3V or 0V		0.1	10	μA
	I _{CC1}	EMA1 = 3V, V _{IN1} = 3V or 0V		12	18	mA
Output saturation voltage	V _{OUT1}	EMA1 = 3V, V _{IN1} = 3V or 0V, I _{OUT} = 200mA		0.20	0.28	V
	V _{OUT2}	EMA1 = 3V, V _{IN1} = 3V or 0V, I _{OUT} = 400mA		0.40	0.60	V
Input current	I _{IN}	V _{CC} = 6V, V _{IN} = 6V			200	μA
	I _{ENA}	V _{CC} = 6V, ENA = 6V			200	μA
Output sustaining voltage	V _O (SUS)	I _{OUT} = 400mA	9			V
Spark killer diode						
Reverse current	I _S (leak)	V _{CC1} , V _S = 7V			30	μA
Forward voltage	V _{SF}	I _{OUT} = 400mA			1.7	V

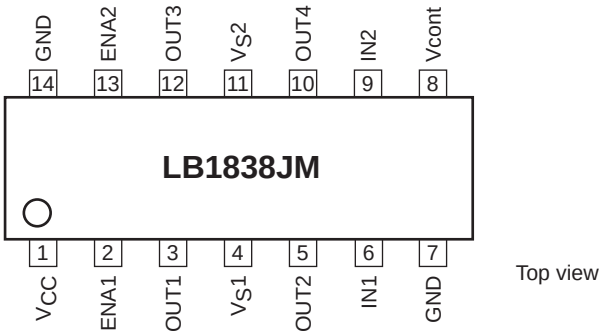
Package Dimensions

unit : mm (typ)

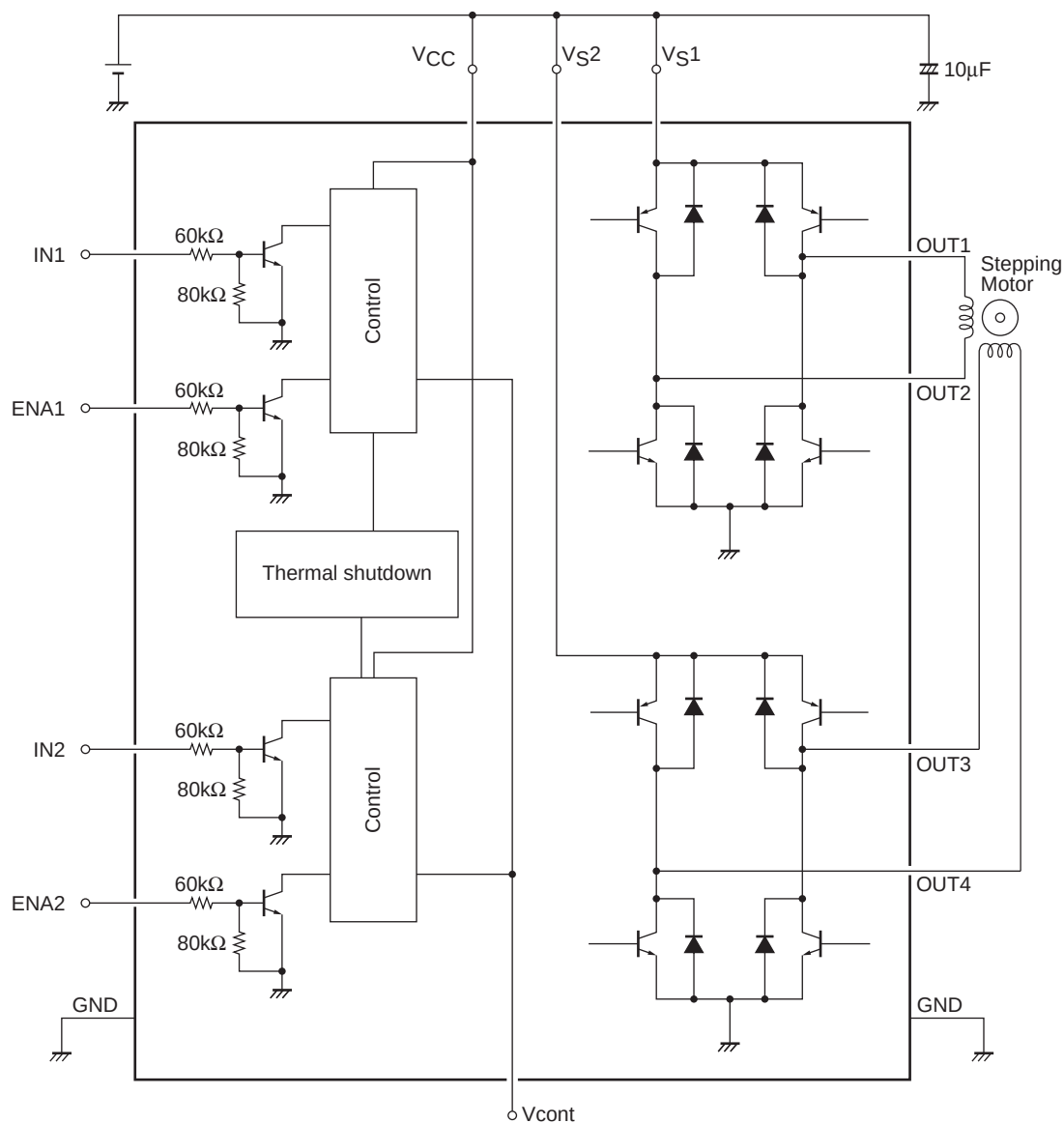
3111A



Pin Assignment



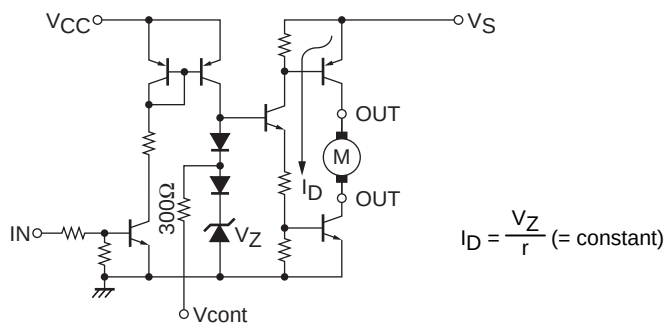
Note) Ground both GND pins.



Truth Table

IN1/2	ENA1/2	OUT1/3	OUT2/4	Mode
L	H	H	L	Forward
H	H	L	H	Reverse
L	L	OFF	OFF	Standby
H	L	OFF	OFF	Standby

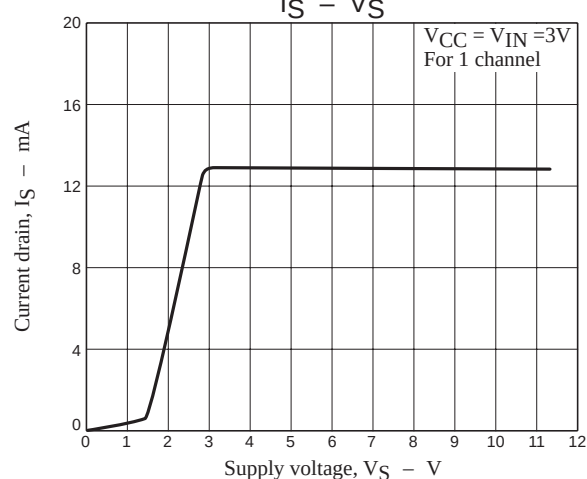
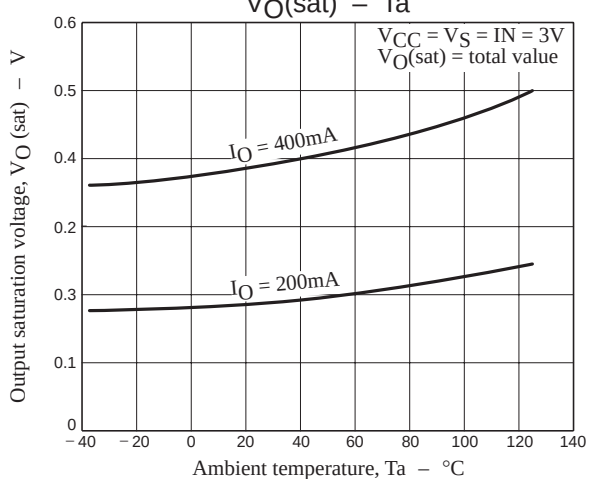
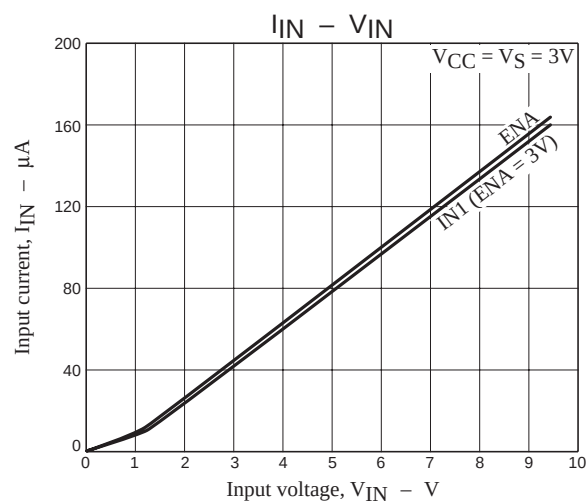
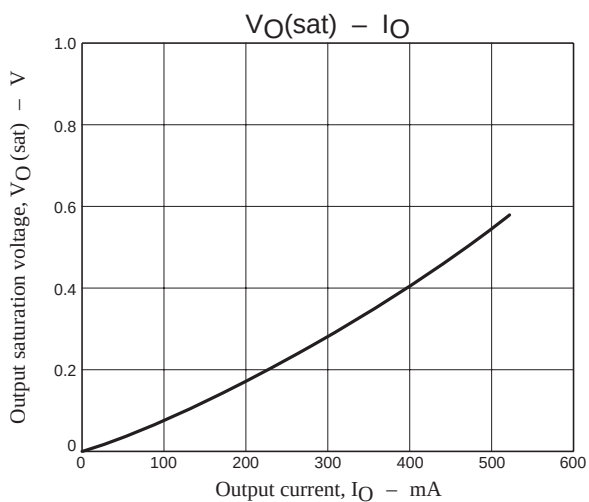
Vcont pin

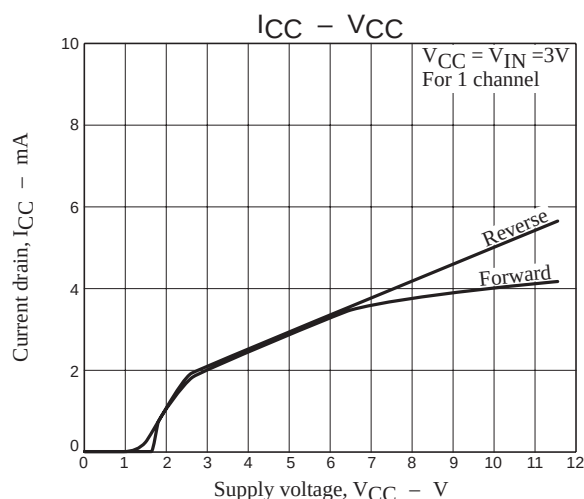


As shown in the above diagram, the Vcont pin outputs the voltage of the band gap Zener $V_Z + V_F (=1.93V)$.

In normal use, this pin is left open.

The drive current I_D is varied by the Vcont voltage. However, because the band gap Zener is shared, it functions as a bridge.





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