



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

LB1638

LB1638M

Monolithic Digital IC

Low-Voltage, Low-Saturation

Bidirectional Motor Driver

Overview

The LB1638, LB1638M are low-saturation bidirectional motor driver ICs for use in low-voltage applications. At an I_O of 500mA, they have a low saturation output of $V_O(\text{sat}) = 0.75\text{V}$. They are especially suited for use in compact motor of portable equipment.

Features

- Low voltage operation (2.5V min.)
- Low saturation voltage (upper transistor + lower transistor residual voltage; at $I_O = 500\text{mA}$, $V_O(\text{sat}) = 0.75\text{V}$ typ.)
- Low current drain at standby mode ($I_{\text{CCO}} = 0.1\mu\text{A}$ typ. or less)
- Separate logic power supply and motor power supply
- Brake function
- Built-in spark killer diodes

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{\text{CC max}}$		-0.3 to +10.5	V
	$V_{\text{S max}}$		-0.3 to +10.5	V
Output applied voltage	V_{OUT}		-0.3 to $V_{\text{S}}+V_{\text{F}}$	V
Input applied voltage	V_{IN}		-0.3 to +10.0	V
Ground pin flow-out current	I_{GND}		1.0	A
Allowable power dissipation	$P_{\text{d max}}$	LB1638	1.0	W
		LB1638M: Independent IC	440	mW
		LB1638M: Mounted on a specified board	550	mW
Operating temperature	T_{opr}		-20 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +125	$^\circ\text{C}$

* Specified board: 30mm × 30mm × 1.5mm, glass epoxy board.

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Allowable Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage range	V_{CC}		2.5 to 9.0	V
	V_S		2.2 to 9.0	V
Input high-level voltage	V_{IH}		2.0 to 9.0	V
Input low-level	V_{IL}		-0.3 to +0.7	V

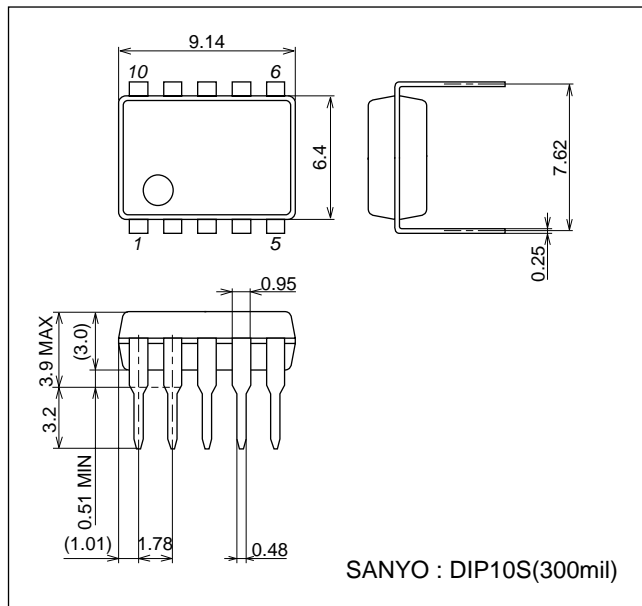
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	I_{CC0}	$V_{IN1,2}$	$I_{CC} + I_S$		10	μA
	I_{CC1}	$V_{IN1} = 3\text{V}, V_{IN2} = 0\text{V}$	$I_{CC} + I_S$		20	mA
	I_{CC2}	$V_{IN1,2} = 3\text{V}$	$I_{CC} + I_S$		40	mA
Output saturation voltage (upper + lower)	V_{OUT1}	$I_{OUT} = 200\text{mA}$		0.25	0.5	V
	V_{OUT2}	$I_{OUT} = 500\text{mA}$		0.70	1.3	V
Output pin voltage difference		$I_O = 200\text{mA}$			0.1	V
Output sustain voltage	$V_{O(sus)}$	$I_{OUT} = 500\text{mA}$	9			V
Input current	I_{IN}	$V_{IN} = 7\text{V}, V_{CC} = 7\text{V}$			0.5	mA
Spark killer diode						
Reverse current	$I_S(\text{leak})$	$V_{CC}, V_S = 7\text{V}$			10	μA
Forward voltage	V_{SF}	$I_{OUT} = 200\text{mA}$			1.7	V

Package Dimensions

unit : mm (typ)

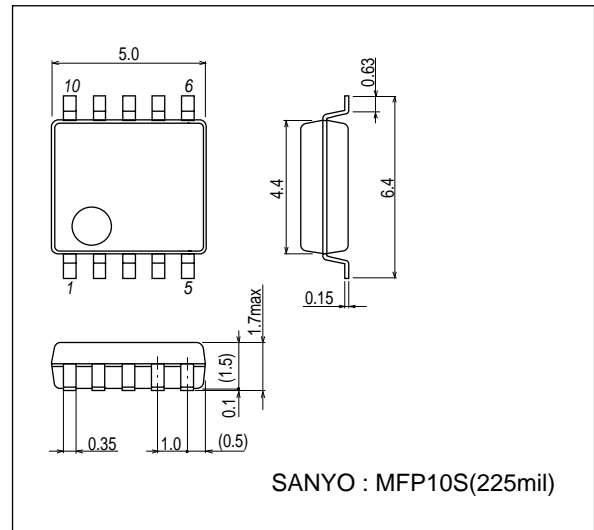
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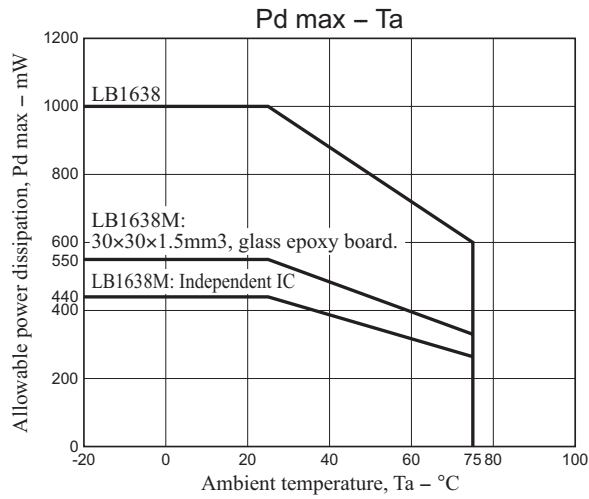
Package Dimensions

unit : mm (typ)

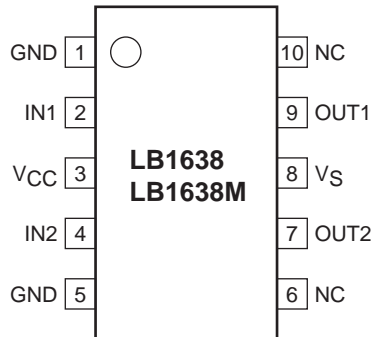
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LB1638,1638M



Pin Assignment

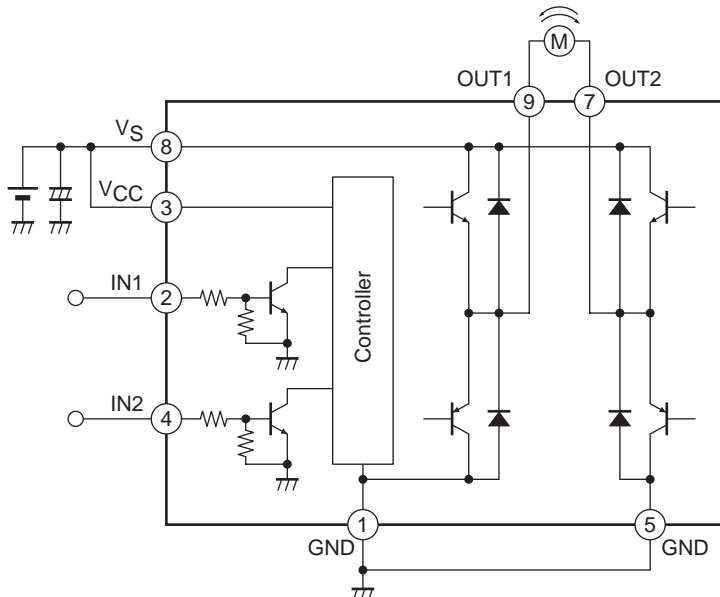


Note: both ground pins must be grounded.

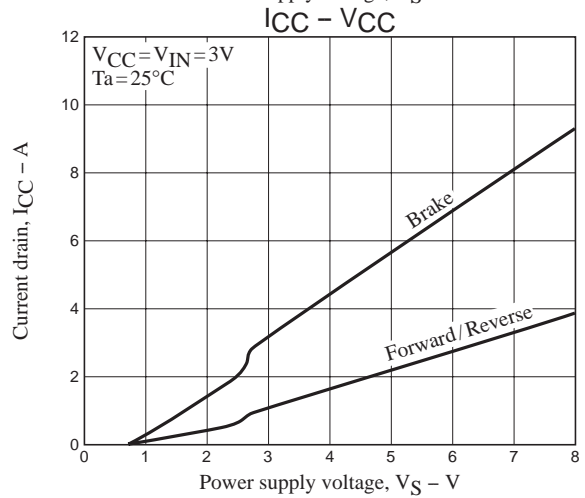
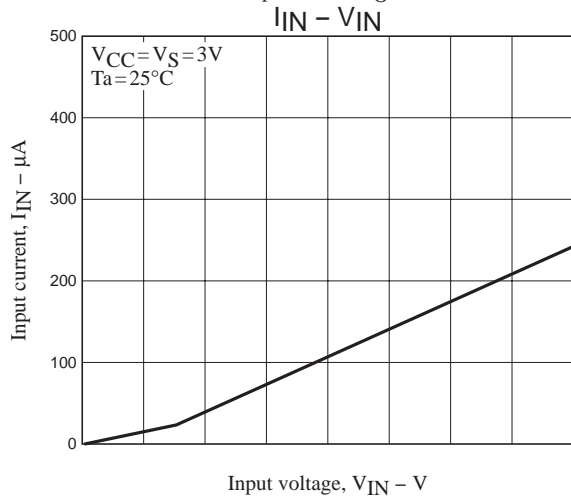
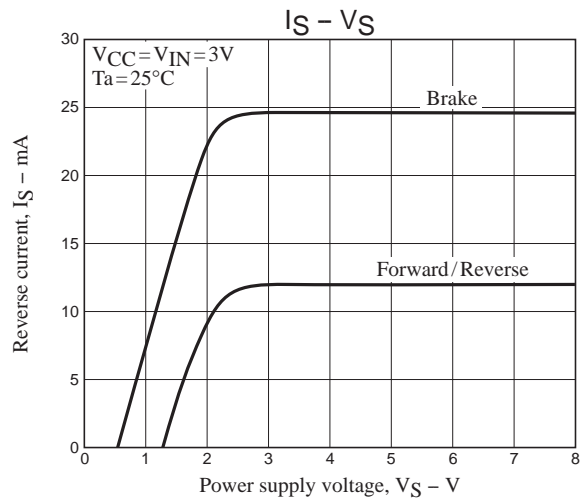
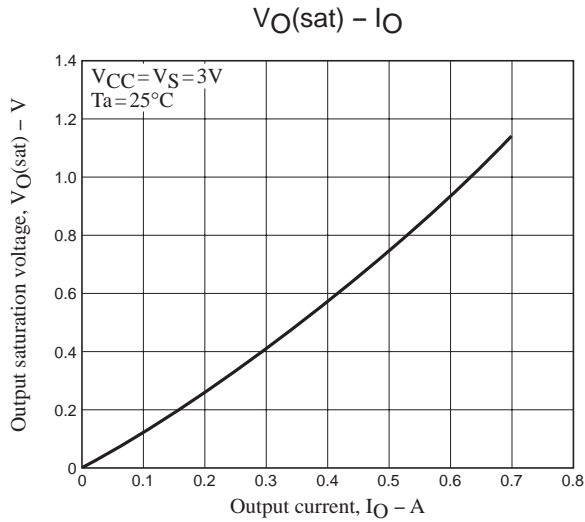
Truth Table

IN1	IN2	OUT1	OUT2	MOde
H	L	H	L	Forward
L	H	L	H	Reverse
H	H	L	L	Brake
L	L	OFF	OFF	Standby

Block Diagram and Sample Application Circuit



Note: When using the same power supply for VS and VCC, short the VCC and VS pins to each other or insert a capacitor in the VCC line.



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