



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 $V_{O(sat)} = 0.75V$. 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 $I_O = 500mA$, $V_{O(sat)} = 0.75V$ typ.)
- Low current drain at standby mode ($I_{CCO} = 0.1\mu A$ typ. or less)
- Separate logic power supply and motor power supply
- Brake function
- Built-in spark killer diodes

Specifications

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

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 applied voltage	V_{OUT}		-0.3 to $V_S + V_F$	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	Pd 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	$^\circ C$
Storage temperature	T_{stg}		-40 to +125	$^\circ C$

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

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Allowable Operating Conditions at Ta = 25°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

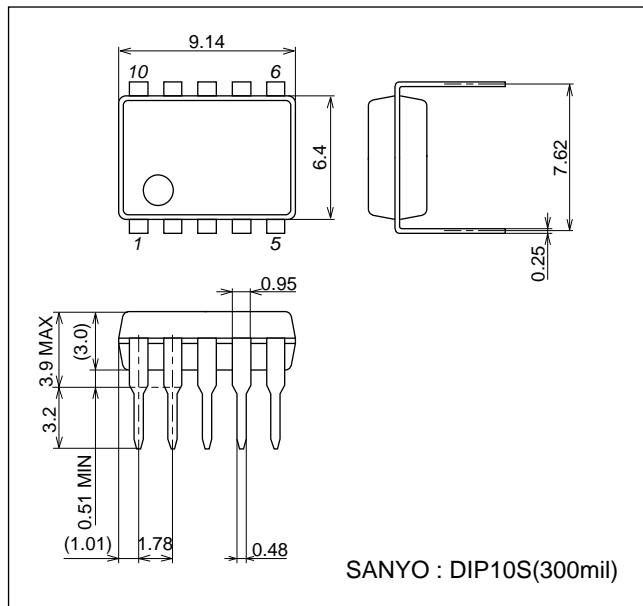
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V

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} = 3V, V _{IN2} = 0V	I _{CC} + I _S		20	mA
	I _{CC2}	V _{IN1,2} = 3V	I _{CC} + I _S		40	mA
Output saturation voltage (upper + lower)	V _{OUT1}	I _{OUT} = 200mA		0.25	0.5	V
	V _{OUT2}	I _{OUT} = 500mA		0.70	1.3	V
Output pin voltage difference		I _O = 200mA			0.1	V
Output sustain voltage	V _{O(sus)}	I _{OUT} = 500mA	9			V
Input current	I _{IN}	V _{IN} = 7V, V _{CC} = 7V			0.5	mA
Spark killer diode						
Reverse current	I _{S(Leak)}	V _{CC} , V _S = 7V			10	μA
Forward voltage	V _{SF}	I _{OUT} = 200mA			1.7	V

Package Dimensions

unit : mm (typ)

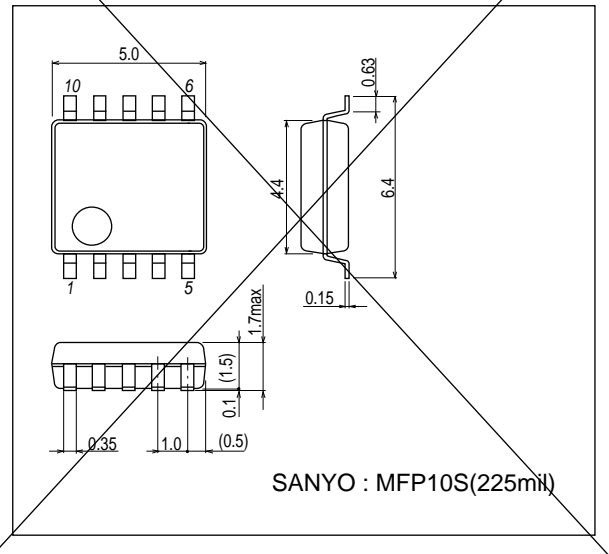
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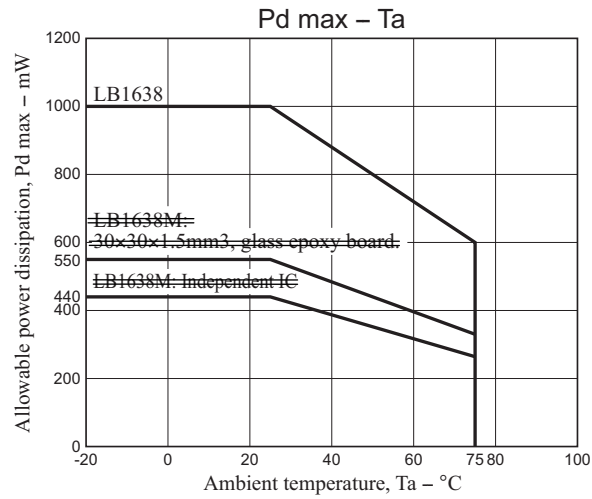
Package Dimensions

unit : mm (typ)

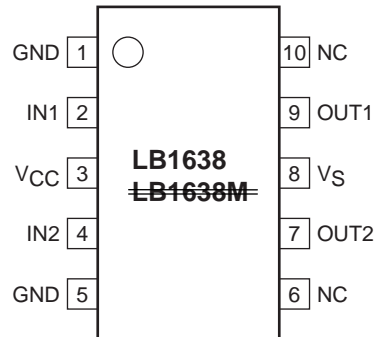
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Pin Assignment

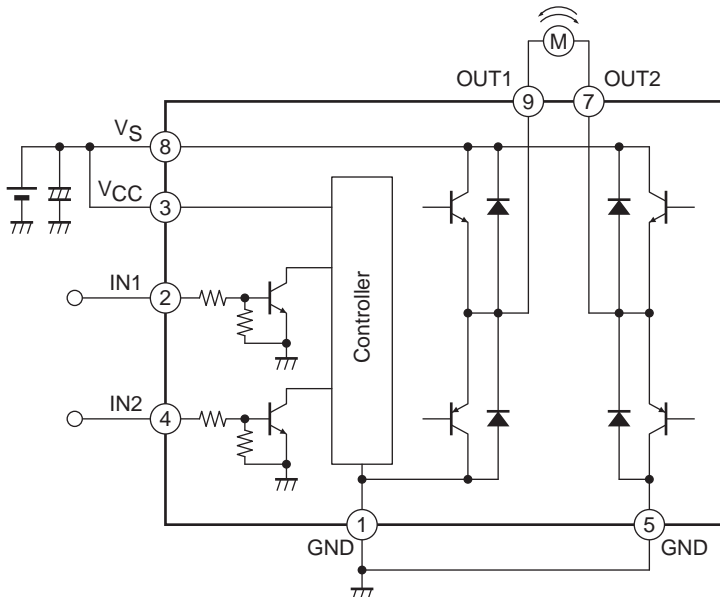


Note: both ground pins must be grounded.

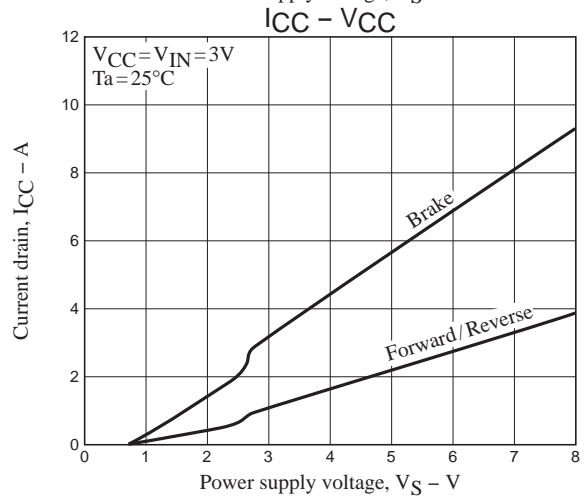
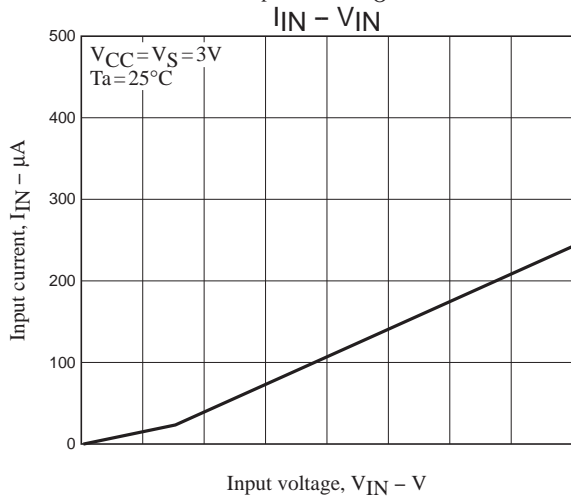
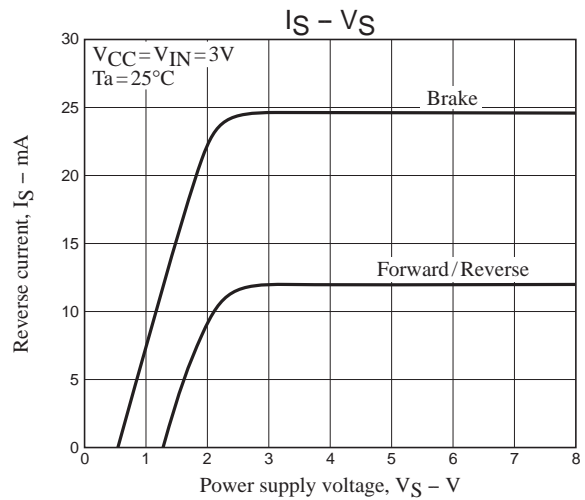
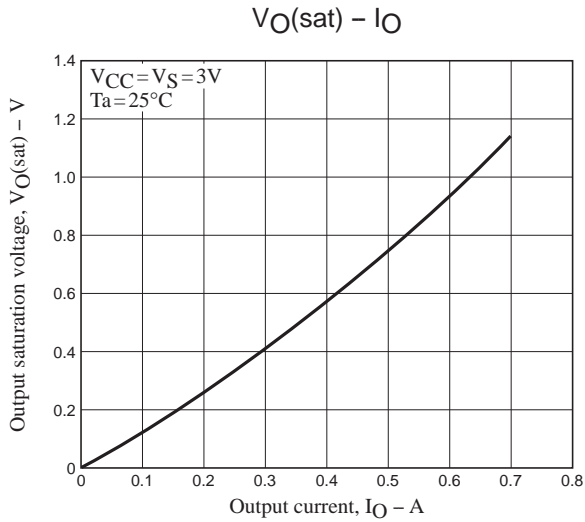
Truth Table

IN1	IN2	OUT1	OUT2	M Ode
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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