



SANYO Semiconductors

## DATA SHEET

An ON Semiconductor Company

# LB1638MC

Monolithic Digital IC — Low-Voltage, Low-Saturation Bidirectional Motor Driver

## Overview

The LB1638MC 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 $V_{CC} + V_{SF}$	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	$P_d\ max$	Mounted on a specified board	820	mW
Operating temperature	$T_{opr}$		-20 to +75	$^\circ C$
Storage temperature	$T_{stg}$		-40 to +125	$^\circ C$

\* Specified board: 114.3mm × 76.1mm × 1.6mm, glass epoxy board.

Caution 1) Absolute maximum ratings represent the value which cannot be exceeded for any length of time.

Caution 2) Even when the device is used within the range of absolute maximum ratings, as a result of continuous usage under high temperature, high current, high voltage, or drastic temperature change, the reliability of the IC may be degraded. Please contact us for the further details.

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Allowable Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage range	VCC		2.5 to 9.0	V
	VS		2.2 to 9.0	V
Input high-level voltage	VIH		2.0 to 9.0	V
Input low-level	VIL		-0.3 to +0.7	V

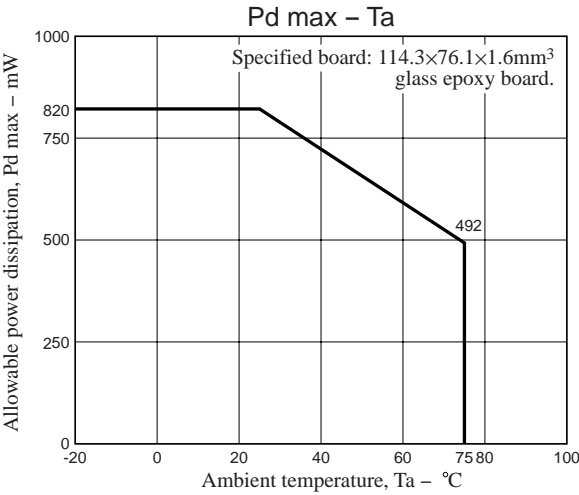
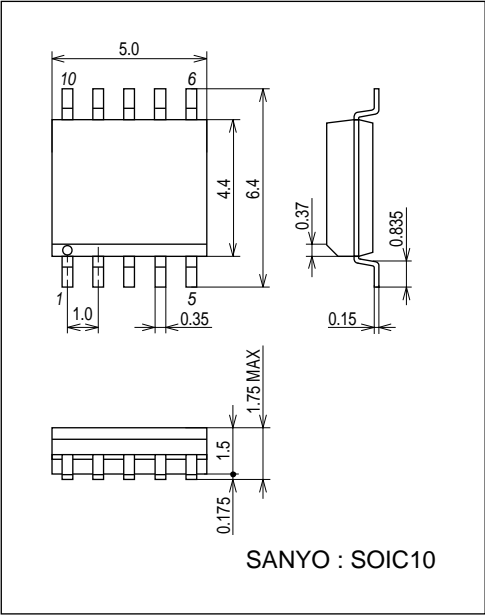
Electrical Characteristics at Ta = 25°C, VCC = 5V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	ICC0	VIN1,2 ICC + IS			10	μA
	ICC1	VIN1 = 3V, VIN2 = 0V ICC + IS			20	mA
	ICC2	VIN1,2 = 3V ICC + IS			40	mA
Output saturation voltage (upper + lower)	VOUT1	IOUT = 200mA		0.25	0.5	V
	VOUT2	IOUT = 500mA		0.70	1.3	V
Output pin voltage difference		IO = 200mA			0.1	V
Output sustain voltage	VO(sus)	IOUT = 500mA	9			V
Input current	IIN	VIN = 7V, VCC = 7V			0.5	mA
Spark killer diode						
Reverse current	IS(leak)	VCC, VS = 7V			10	μA
Forward voltage	VSF	IOUT = 200mA			1.7	V

Package Dimensions

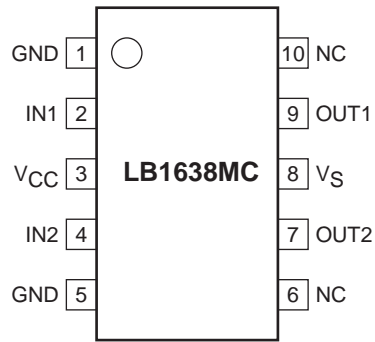
unit : mm (typ)

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Pin Assignment

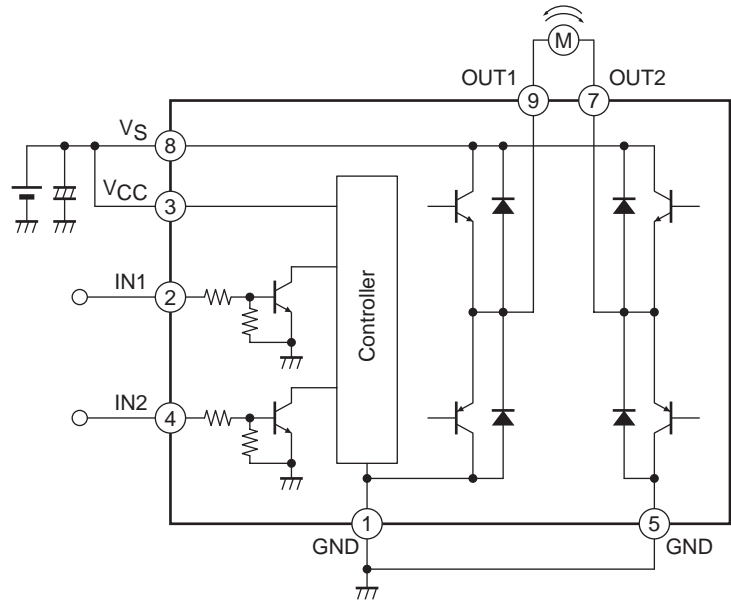


Note: both ground pins must be grounded.

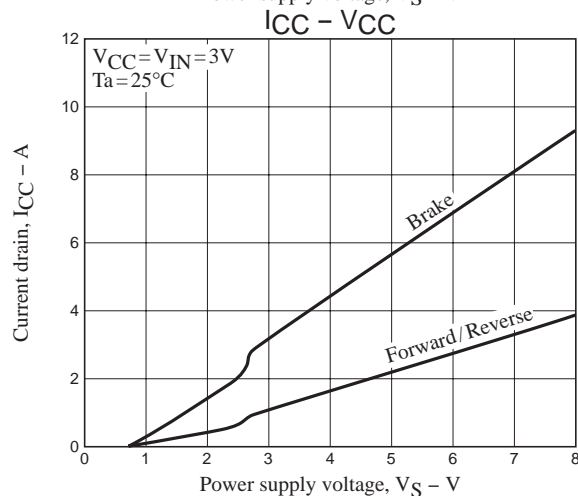
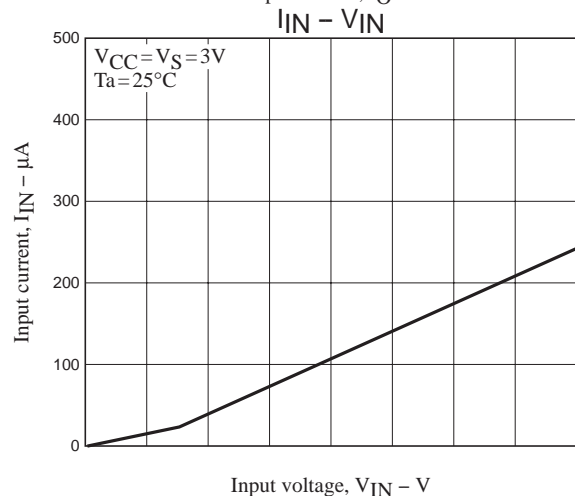
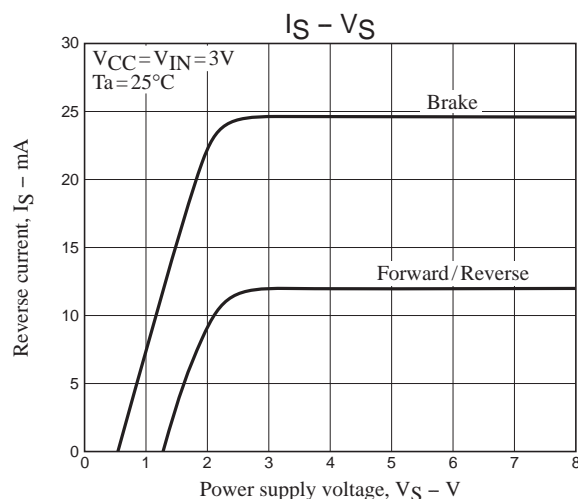
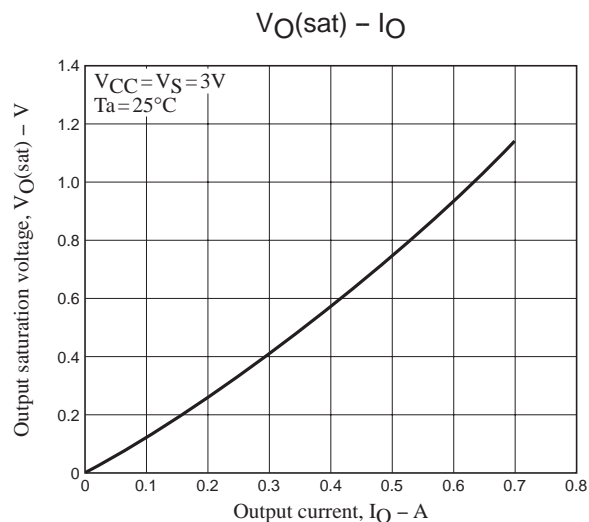
Truth Table

IN1	IN2	OUT1	OUT2	MMode
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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