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Ordering number : ENA2026A

LB1638MC

Monolithic Digital IC

Low-Voltage, Low-Saturation Bidirectional Motor Driver

ON Semiconductor®

http://onsemi.com

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} = 0.1μA typ. or less)
- Separate logic power supply and motor power supply
- Brake function
- Built-in spark killer diodes

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 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	Pd max	Mounted on a specified board	820	mW
Operating temperature	Topr		-20 to +75	°C
Storage temperature	Tstg		-40 to +125	°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.

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

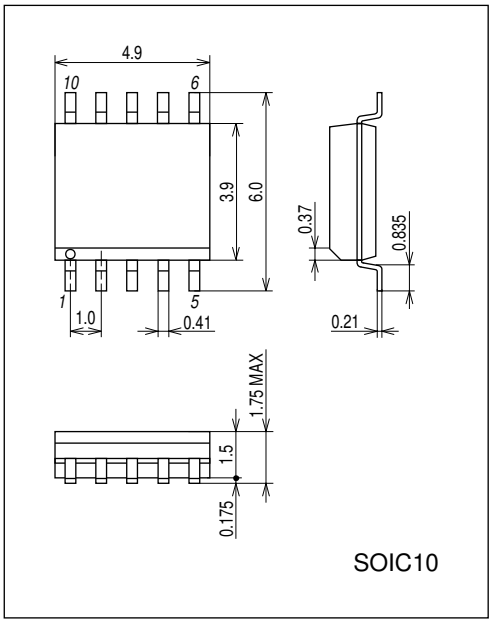
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V

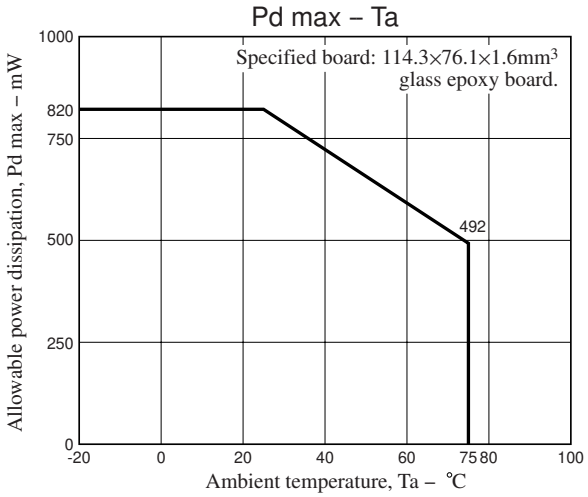
Parameter	Symbol	Conditions		Ratings			Unit
				min	typ	max	
Current drain	$I_{CC}0$	$V_{IN}1,2$	$I_{CC} + I_S$			10	μA
	$I_{CC}1$	$V_{IN}1$ = 3V, $V_{IN}2$ = 0V	$I_{CC} + I_S$			20	mA
	$I_{CC}2$	$V_{IN}1,2$ = 3V	$I_{CC} + I_S$			40	mA
Output saturation voltage (upper + lower)	$V_{OUT}1$	I_{OUT} = 200mA			0.25	0.5	V
	$V_{OUT}2$	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

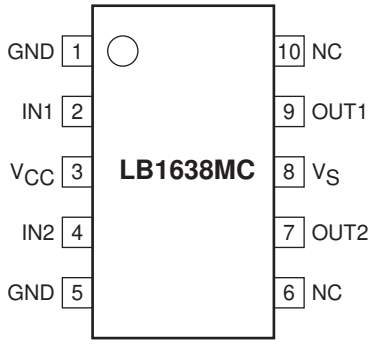
unit : mm (typ)

3426A





Pin Assignment

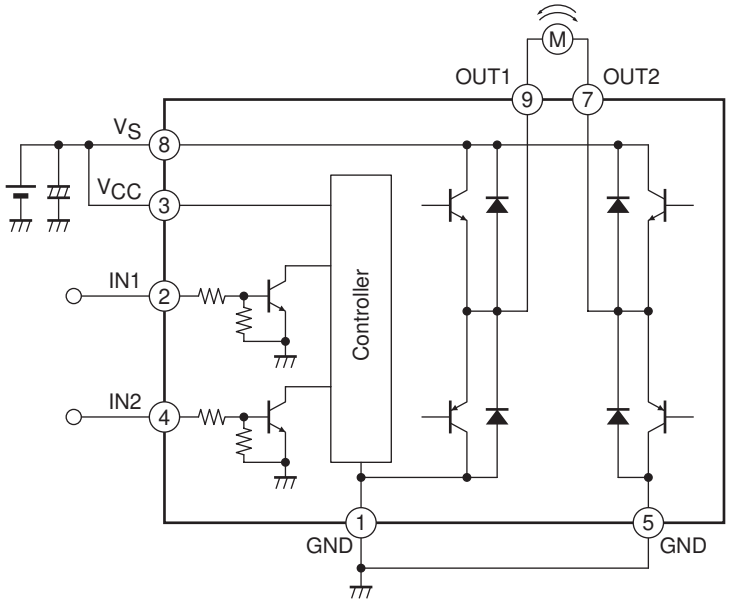


Note: both ground pins must be grounded.

Truth Table

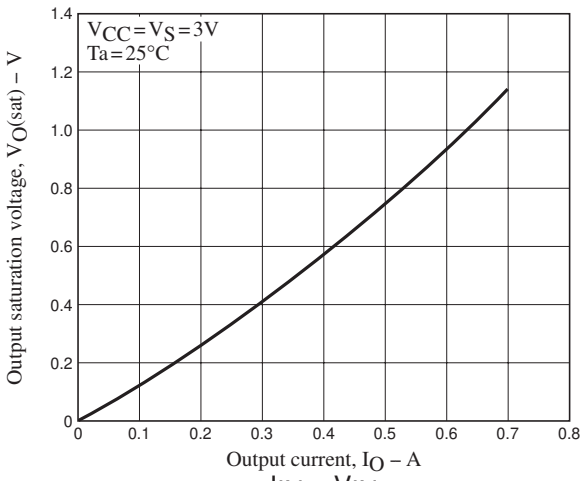
IN1	IN2	OUT1	OUT2	MOde
H	L	H	L	Forward
L	H	L	H	Reverse
H	H	L	L	Brake
L	L	OFF	OFF	Standby

Block Diagram and Sample Application Circuit

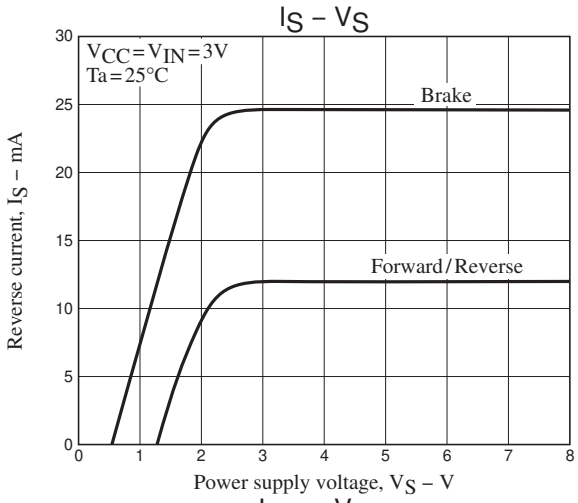


Note: When using the same power supply for V_S and V_{CC}, short the V_{CC} and V_S pins to each other or insert a capacitor in the V_{CC} line.

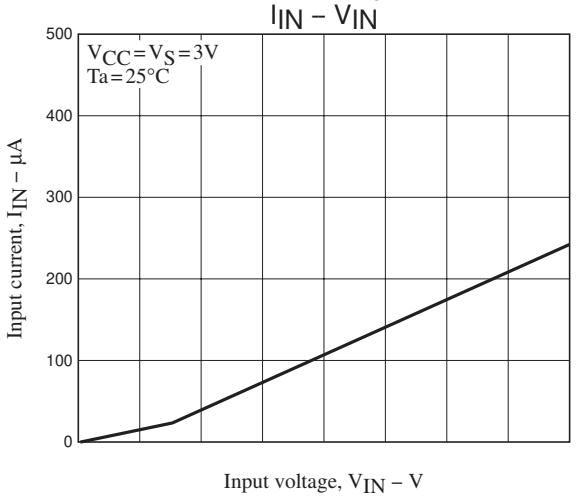
$V_O(sat) - I_O$



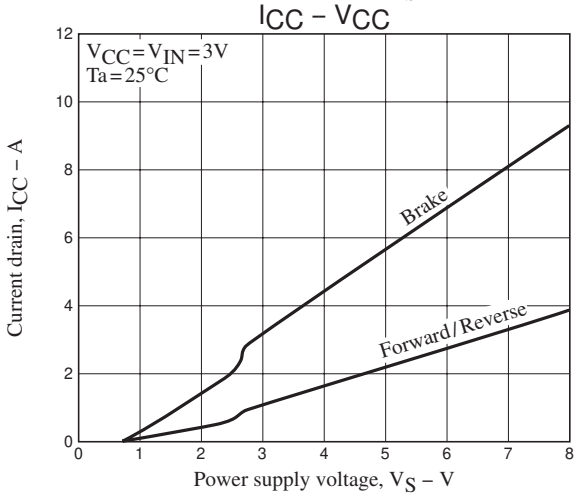
$I_S - V_S$



$I_{IN} - V_{IN}$



$I_{CC} - V_{CC}$



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