Ordering number : EN2575E

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

Monolithic Digital IC

LB1641 — Bidirectional Motor Driver

Overview

The LB1641 is a bidirectional motor driver IC. Since it has a 2-input logic circuit and performs the functions of bidirectional driving and braking, it is capable of direct driving 6V, 9V, 12V motors. The output voltage can be varied by using an external zener diode.

Features

- 2-input logic can be used to exercise control of bidirectional driving and braking.
- On-chip elements to absorb dash current of motor.
- Input interfaceable to MOS LSI.
- Output voltage variable by use of external zener diode.

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		18	V
Input voltage	V_{IN}		-0.3 to V_{CC}	V
Output circuit	I_{OUT}		±1.6	A
Allowable power dissipation	Pd max		1.2	W
Operating temperature	Topr		-25 to +75	°C
Storage temperature	Tstg		-55 to +125	°C

Recommended Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	$V_{CC}1$		7 to 18	V
	$V_{CC}2$		5 to 18	V

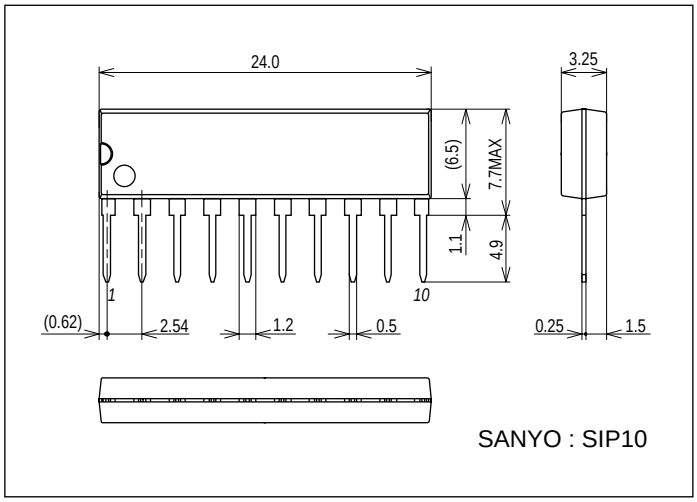
Electrical Characteristics at Ta = 25°C, V_{CC} = 12V

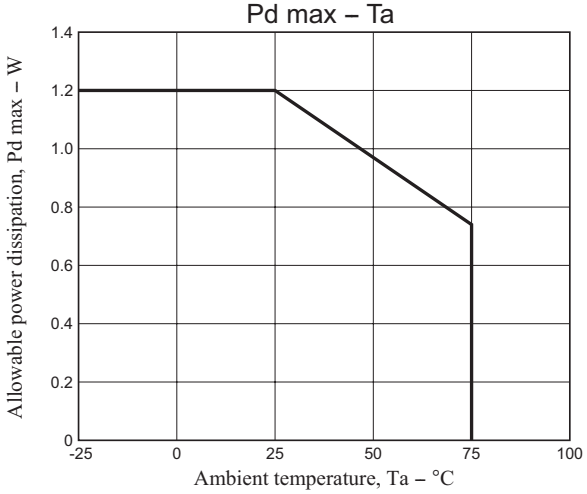
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input threshold voltage	Vth	R_L = ∞	1.1	1.3	1.5	V
Minimum input on-state current	I_{IN}	R_L = ∞		10	15	μA
Output voltage	V_O	R_L = 60Ω, V_Z = 7.4V	6.6	7.2	7.4	V
Output leakage current	I_{OL}	Pins 5,6 GND, R_L = ∞		0.01	1.0	mA
Current drain	I_{CC}	Pins 5,6 GND, R_L = ∞	3	6	10	mA
Saturation voltage (upper)	Vsat1	I_{OUT} = 300mA		1.9	2.2	V
	Vsat1'	I_{OUT} = 500mA		1.9	2.3	V
Saturation voltage (lower)	Vsat2	I_{OUT} = 300mA		0.25	0.5	V
	Vsat2'	I_{OUT} = 500mA		0.4	0.65	V

Package Dimensions

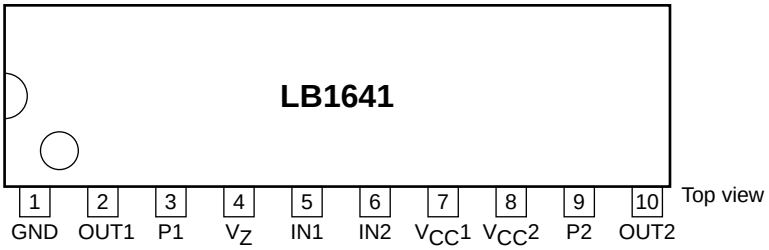
unit : mm (typ)

3043C





Pin Assignment



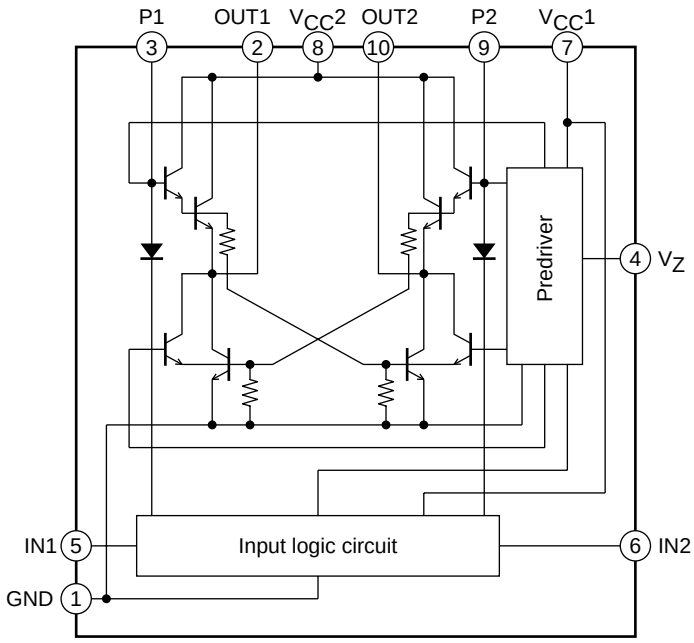
Truth Table

Input		Output		Operation
IN1	IN2	IN3	IN4	
0	0	0	0	Braking
1	0	1	0	Forward (reverse) drive
0	1	0	1	Reverse (forward) drive
1	1	0	0	Braking

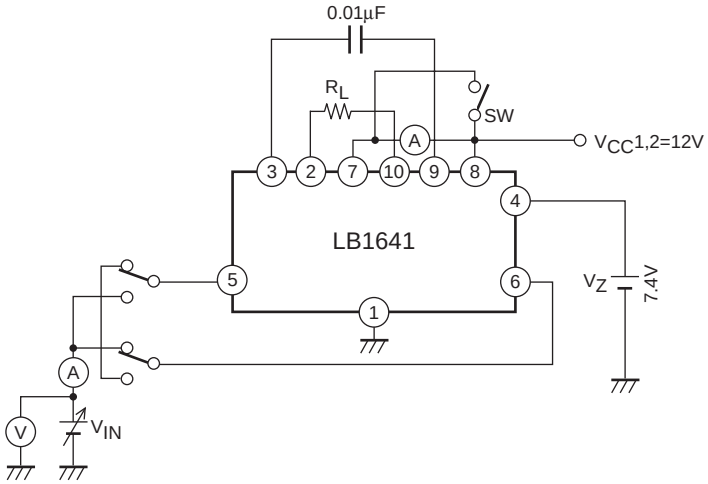
Input level 1 : 2.0V or greater

0 : 0.7V or less

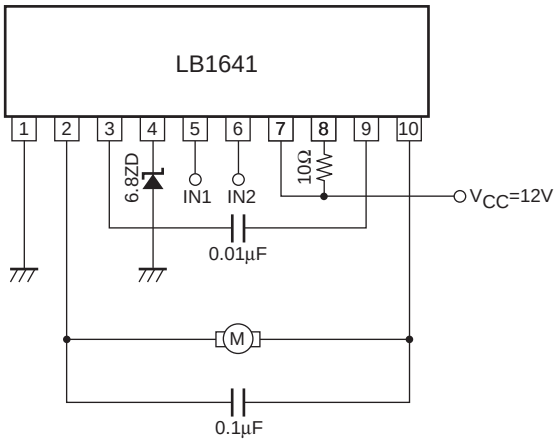
Block Diagram

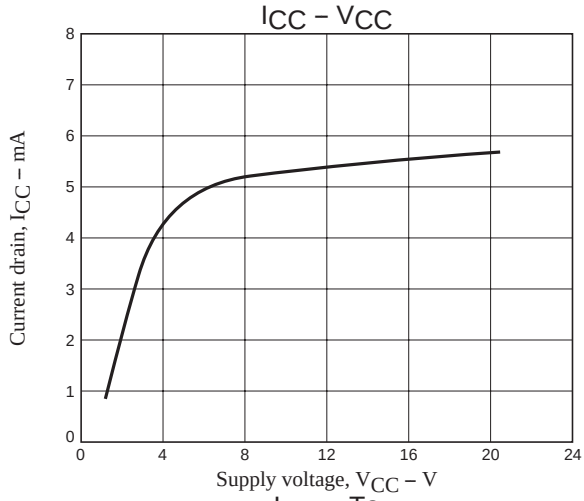


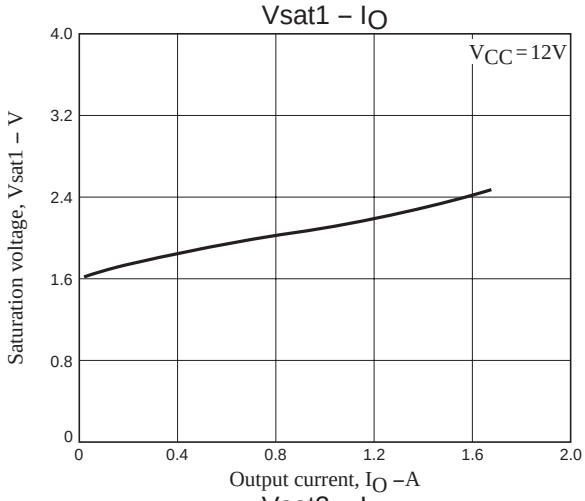
Test Circuit

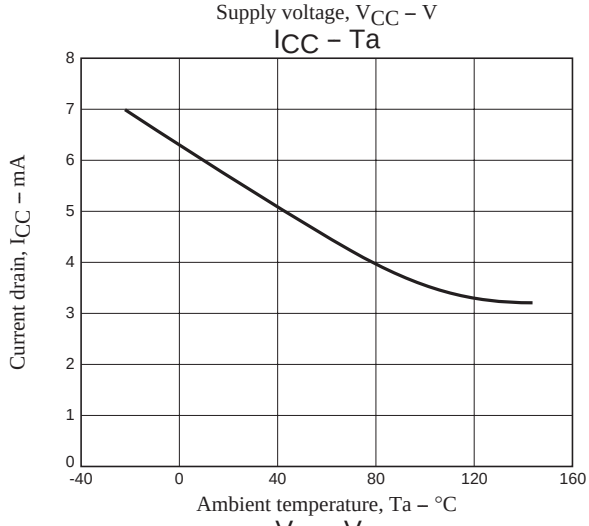


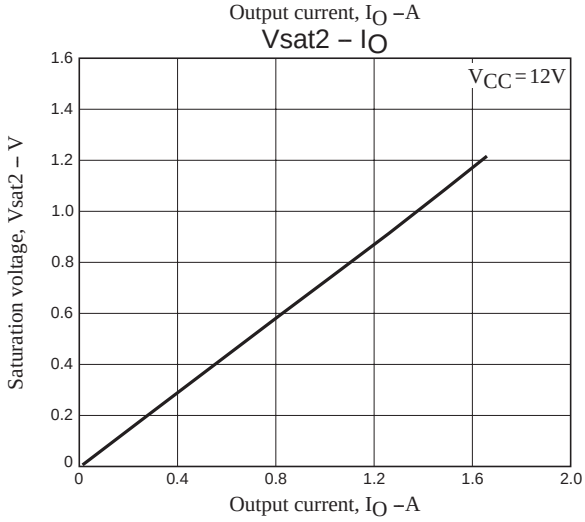
Sample Application Circuit : 6V motor circuit

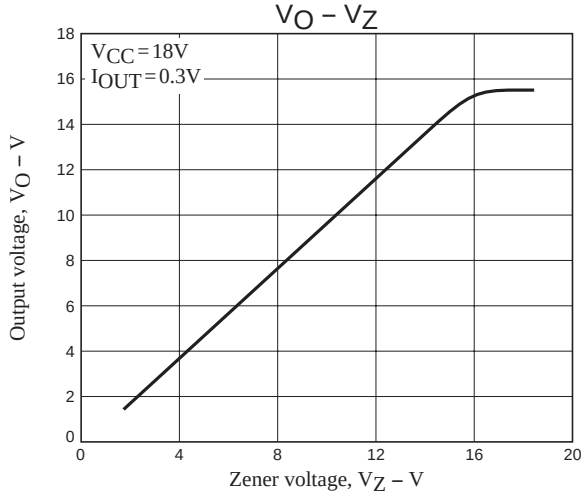



ICC – VCC
Current drain, ICC – mA
Supply voltage, VCC – V
0
1
2
3
4
5
6
7
8
0
4
8
12
16
20
24


Vsat1 – IO
VCC = 12V
Saturation voltage, Vsat1 – V
Output current, IO –A
0
0.8
1.6
2.4
3.2
4.0
0
0.4
0.8
1.2
1.6
2.0


ICC – Ta
Current drain, ICC – mA
Ambient temperature, Ta – °C
0
1
2
3
4
5
6
7
8
-40
0
40
80
120
160


Vsat2 – IO
VCC = 12V
Saturation voltage, Vsat2 – V
Output current, IO –A
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0
0.4
0.8
1.2
1.6
2.0


VO – VZ
VCC = 18V
IOUT = 0.3V
Output voltage, VO – V
Zener voltage, VZ – V
0
2
4
6
8
10
12
14
16
18
0
4
8
12
16
20