Ordering number: EN1530C

Monolithic Digital IC

No. 1530C

LB1650

Dual Bidirectional Motor Driver

The LB1650 is a dual bidirectional motor driver that is designed to accept standard TTL input logic levels and drive motors. It provides the functions of bidirectional motor drive, brake that are determined by two inputs and the inhibit function that brings the output to a high impedance state.

Applications

- Multi DC motor driver
- Bidirectional motor driver
- Bipolar stepping motor driver

Features

- High output current (1A/ch)
- Wide operating voltage range (4.5 to 36V)
- Inhibit facility
- Input connectable to TTL, CMOS IC
- High noise margin

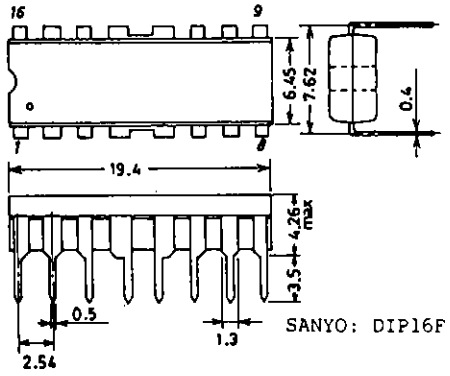
Absolute Maximum Ratings at Ta=25°C

				unit
Maximum Supply Voltage	V_{CC1}		36	V
Logic Supply Voltage	V_{CC2}		36	V
Input Voltage	V_i		7	V
Inhibit Voltage	V_{inh}		7	V
Peak Output Current	I_{OUT}	1ms non-repetitive	2	A
Allowable Power Dissipation	Pd max	IC only	1.9	W
Operating Temperature	Topr		-20 to +80	°C
Storage Temperature	Tstg		-40 to +150	°C

Allowable Operating Conditions at Ta=25°C

			unit
Supply Voltage	V_{CC1}	4.5 to 36	V
Logic Supply Voltage	V_{CC2}	4.5 to 36	V

Package Dimensions 3054A
(unit: mm)



SANYO Electric Co.,Ltd. Semiconductor Business Headquarters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

Electrical Characteristics at Ta=25°C, V_{CC1}=24V, V_{CC2}=5V

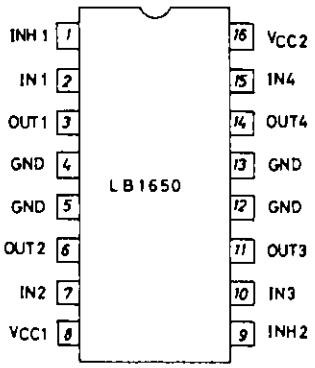
			min	typ	max	unit
Supply Current (Per CH)	I_{CC1}	V_i=L, I_O=0, V_{inh}=H			1.5	mA
		V_i=H, I_O=0, V_{inh}=H			6	mA
		V_{inh}=L			1	mA
Logic Supply Current	I_{CC2}	V_i=L, I_O=0, V_{inh}=H		44	60	mA
		V_i=H, I_O=0, V_{inh}=H			22	mA
		V_{inh}=L			24	mA
"L"-Level Input Voltage	V_{IL}		-0.3		1.5	V
"H"-Level Input Voltage	V_{IH}	$V_{CC2}\leqq 7V$	2.3		V_{CC2}	V
		$V_{CC2}>7V$	2.3		7	V
"L"-Level Input Current	I_{IL}	V_i=L			±10	μA
"H"-Level Input Current	I_{IH}	V_i=H-0.3V		30	100	μA
"L"-Level Inhibit Voltage	V_{inhL}		-0.3		1.5	V
"H"-Level Inhibit Voltage	V_{inhH}	$V_{CC2}\leqq 7V$	2.3		V_{CC2}	V
		$V_{CC2}>7V$	2.3		7	V
"L"-Level Inhibit Current	I_{inhL}		-100	-30		μA
"H"-Level Inhibit Current	I_{inhH}				±10	μA
Saturation Voltage	$V_{CE(sat)H}$	I_O=-1A		1.4	1.8	V
	$V_{CE(sat)L}$	I_O=1A		1.2	1.8	V

Truth Table

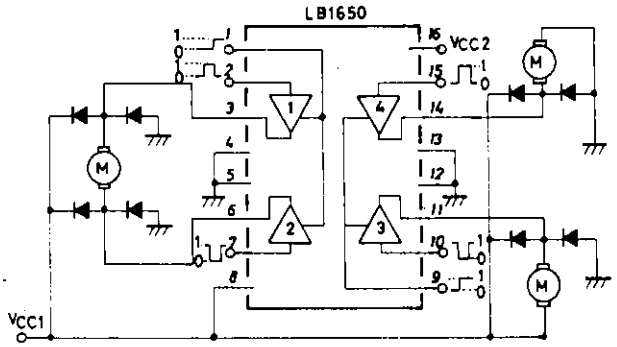
V_i (per CH)	V_{inh}	V_O
H	H	H
L	H	L
H	L	Open*
L	L	Open*

*: High impedance

Pin Assignment

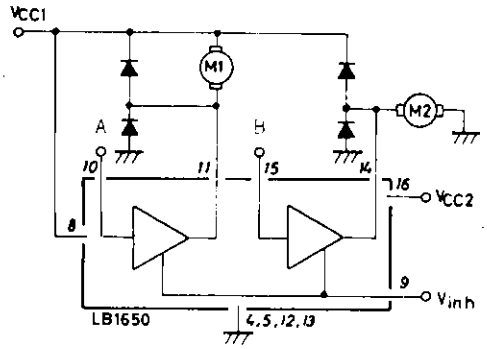


Equivalent Circuit Block Diagram and Peripheral Circuit



Sample Application Circuits

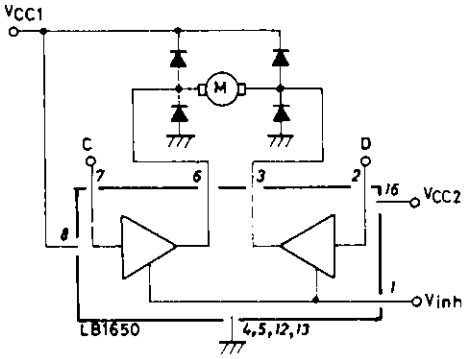
(1) DC motor control



V_{inh}	A	M1	B	M2
H	H	Brake	H	Forward
H	L	Forward	L	Brake
L	X	Open*	X	Open*

X: don't care

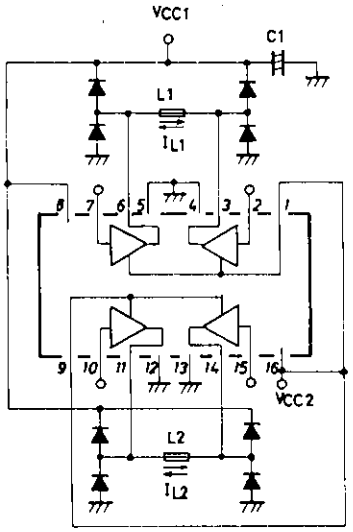
(2) DC motor control (Forward, reverse)

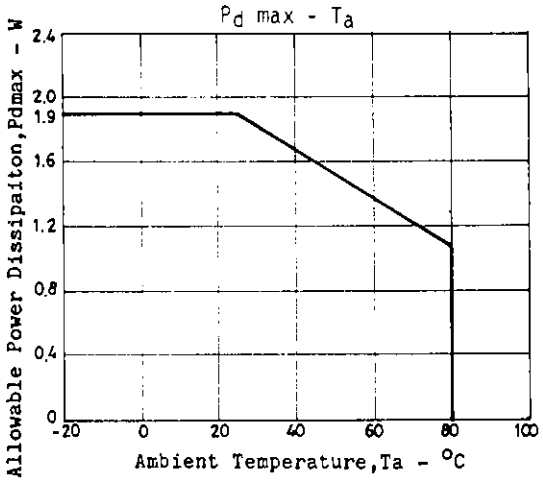


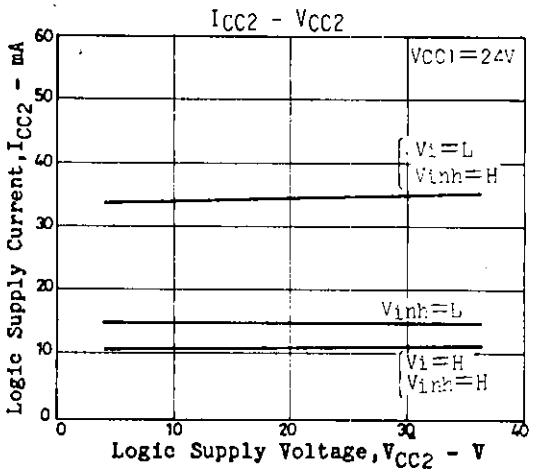
Input		Function
V_{inh}=H	C=H D=L	Forward(right)
	C=L D=H	Reverse(left)
	C=D	Brake
V_{inh}=L	C=X D=X	Open*

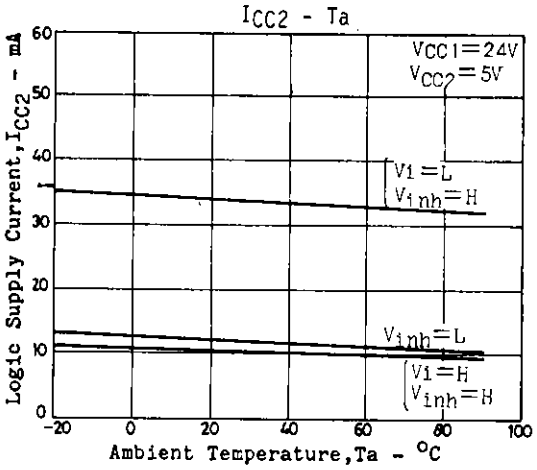
*: High impedance

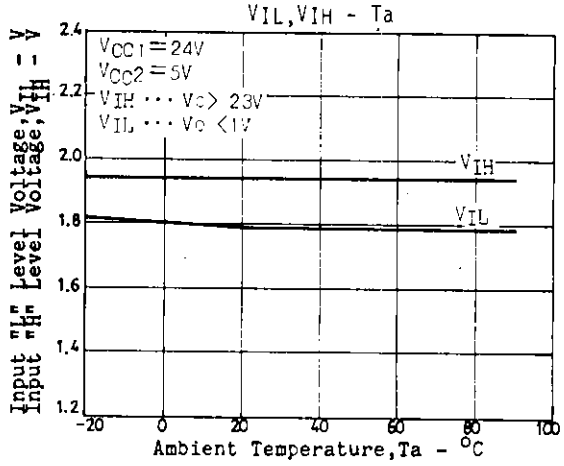
(3) Stepping motor control (Bipolar drive)

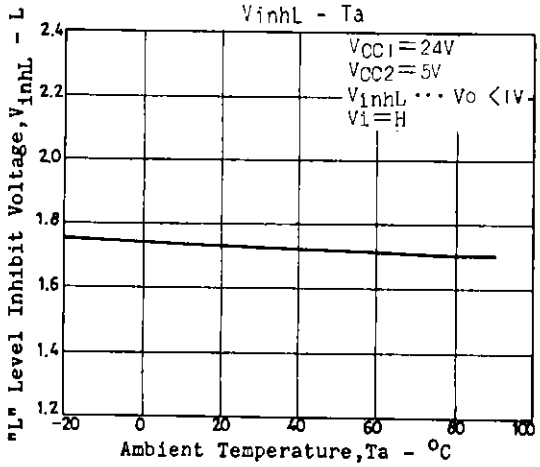


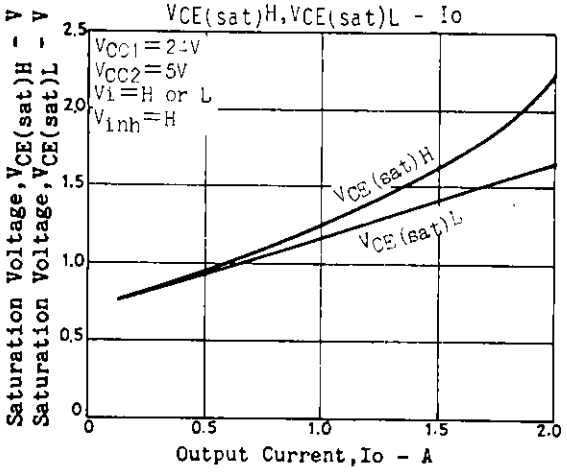


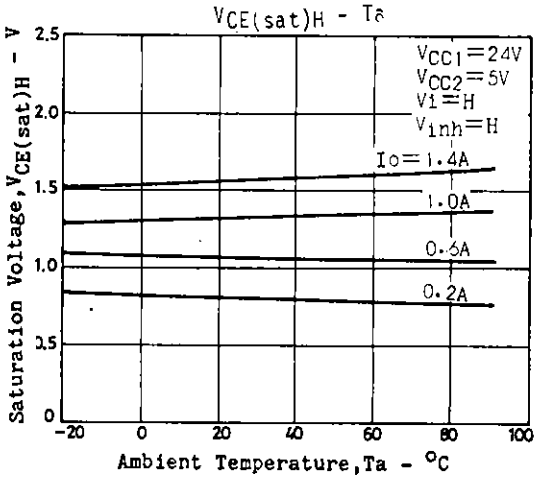

ICC2 - VCC2
VCC1=24V
Vi=L
Vinh=H
Vinh=L
Vi=H
Vinh=H
Logic Supply Current,ICC2 - mA
Logic Supply Voltage,VCC2 - V

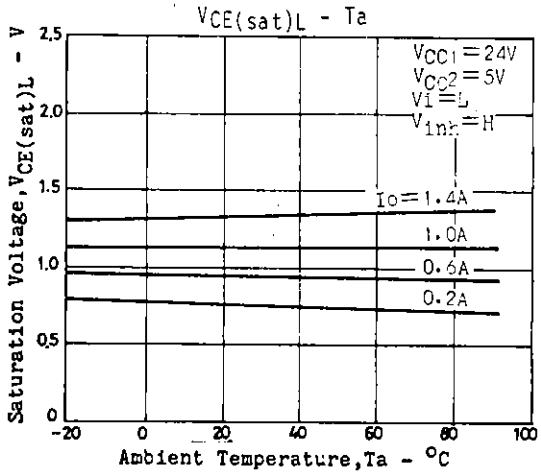

ICC2 - Ta
VCC1=24V
VCC2=5V
Vi=L
Vinh=H
Vinh=L
Vi=H
Vinh=H
Logic Supply Current,ICC2 - mA
Ambient Temperature,Ta - °C


VIL,VIH - Ta
VCC1=24V
VCC2=5V
VIH ··· Vo> 2.3V
VIL ··· Vo <1V
VIH
VIL
Input "L" Level Voltage,VIL - V
Input "H" Level Voltage,VIH - V
Ambient Temperature,Ta - °C


VinhL - Ta
VCC1=24V
VCC2=5V
VinhL ··· Vo <1V
Vi=H
"L" Level Inhibit Voltage,VinhL - L
Ambient Temperature,Ta - °C


VCE(sat)H,VCE(sat)L - Io
VCC1=24V
VCC2=5V
Vi=H or L
Vinh=H
VCE(sat)H
VCE(sat)L
Saturation Voltage,VCE(sat)H - V
Saturation Voltage,VCE(sat)L - V
Output Current,Io - A


VCE(sat)H - Ta
VCC1=24V
VCC2=5V
Vi=H
Vinh=H
Io=1.4A
1.0A
0.6A
0.2A
Saturation Voltage,VCE(sat)H - V
Ambient Temperature,Ta - °C


VCE(sat)L - Ta
VCC1=24V
VCC2=5V
Vi=L
Vinh=H
Io=1.4A
1.0A
0.6A
0.2A
Saturation Voltage,VCE(sat)L - V
Ambient Temperature,Ta - °C