Ordering number : EN4179A

Monolithic Digital IC

LB1832V

Low-Saturation 1.5-Channel 3 V Drive Bidirectional Driver

Overview

The LB1832V is a bidirectional driver IC that includes an on-chip low-voltage low-saturation 1.5-channel bridge and is provided in a miniature package. It is therefore optimal for cameras that use 3 V lithium batteries. This IC allows direct drive from the control microprocessor and supports control of standby, forward, reverse, and braking operations for two motors, i.e. the film take-up and lens drive motors, from three inputs.

Features

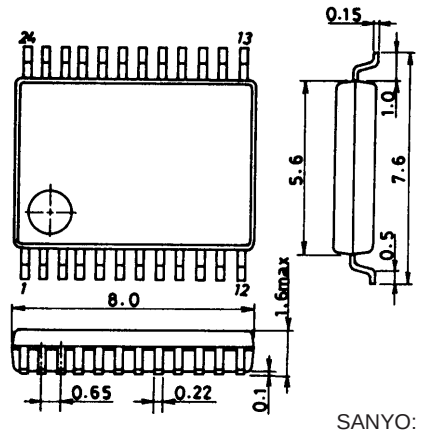
- Supports low-voltage drive.
  - — When the same power supply is used for V_{CC} and V_S: $V_{CC} = V_S = 1.6$ V min.
  - — When different power supplies are used for V_{CC} and V_S: $V_S = 1.0$ V min, $V_{CC} = 2.5$ V min.
- Low saturation voltage (Upper side transistor plus lower side transistor remaining voltage: 0.6 V (typ) at 1 A)
- Zero current drain in standby mode
- 1.5-channel bidirectional driver that can be directly driven from the control microprocessor
- Separate logic and motor power supply connections
- Brake function
- Built-in spark killer diode
- Miniature package (SSOP-24)

Package Dimensions

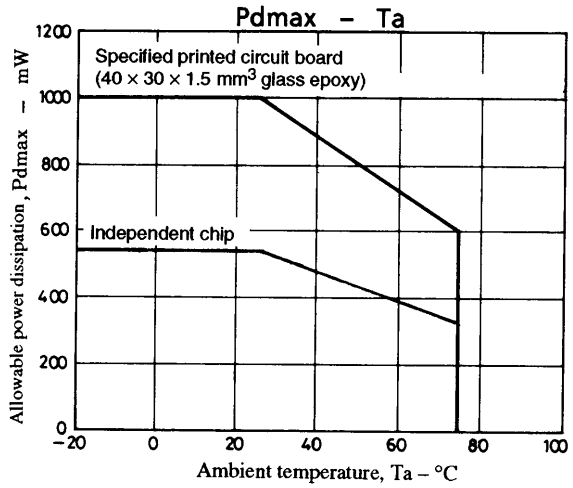
unit: mm

3175A-SSOP24

[LB1832V]



SANYO: SSOP24



Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		–0.3 to +8.0	V
	V_S max		–0.3 to +8.0	V
Output applied voltage	V_{OUT}		–0.3 to V_S + V_{SF}	V
Input applied voltage	V_{IN}		–0.3 to +0.8	V
GND pin current	I_{GND}		2.0	A
Allowable power dissipation	Pd max1	Independent IC	550	mW
	Pd max2	Mounted on the specified printed circuit board ($40 \times 30 \times 1.5$ mm^3 glass epoxy)	1000	mW
Operating temperature	Topr		–20 to +75	°C
Storage temperature	Tstg		–40 to +150	°C

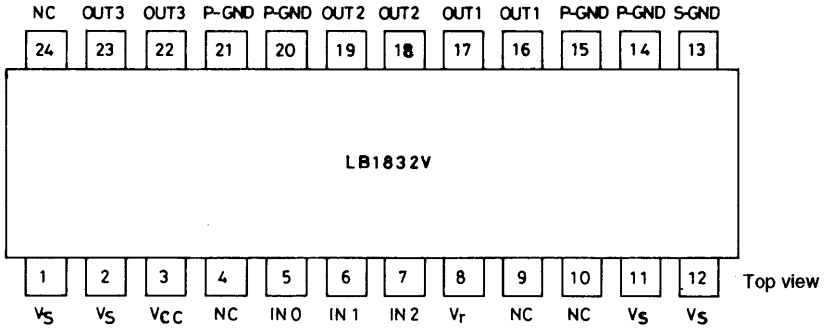
Allowable Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_E	V_{CC} = V_S; Using the same power supply	1.6 to 7.0	V
	V_{CC}	Using separate power supplies for V_{CC} and V_S	2.5 to 7.0	V
	V_S		1.0 to 7.0	V
Input high-level voltage	V_{IH}		1.6 to 7.0	V
Input low-level voltage	V_{IL}		–0.3 to +0.4	V

Electrical Characteristics at Ta = 25°C, V_{CC} = V_S = 3 V

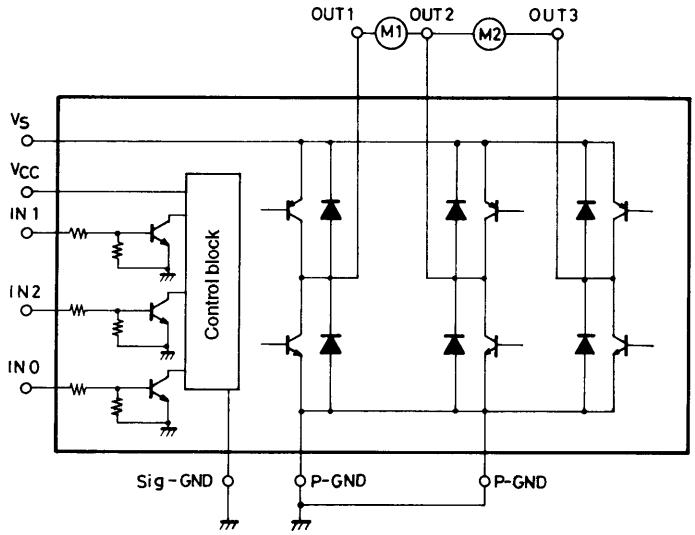
Parameter	Symbol	Conditions	min	typ	max	Unit
Current drain	$I_{CC}0$	Standby: I_{CC} + I_S		0.1	3	µA
	$I_{CC}1$	I_{CC}		3.5	5	mA
	I_S1	Forward/reverse: I_S		65	85	mA
	I_S2	Brake: I_S		60	80	mA
Output saturation voltage (upper + lower)	V_O (sat)1	I_{OUT} = 500 mA (V_{CC} = V_S = 2 V)		0.3	0.4	V
	V_O (sat)2	I_{OUT} = 1 A (V_{CC} = V_S = 2.2 V)		0.6	0.8	V
Variation in output applied voltage		I_{OUT} = 500 mA	–20	0	+20	%
Sustainable output voltage	$V_{O\ (SUS)}$	I_{OUT} = 1 A	9			V
Input current	I_{IN}	V_{IN} = 5 V, V_{CC} = 7 V			100	µA
[Spark killer diode]						
Reverse current	I_S (leak)	V_{CC}, V_S = 7 V			10	µA
Forward voltage	V_{SF}	I_{OUT} = 1 A			1.7	V

Pin Assignment



Note: 1. V_S (motor power supply pins)
Connect either pins 1 and 2 or pins 11 and 12. The wiring resistance falls if all four are connected.
2. P-GND (motor power supply ground pins)
Connect all four of these pins
3. S-GND (Control power supply ground pin)
Connect to the microprocessor ground.

Block Diagram



Note: The two P-GND pins must be connected to a ground as close as possible to the IC.

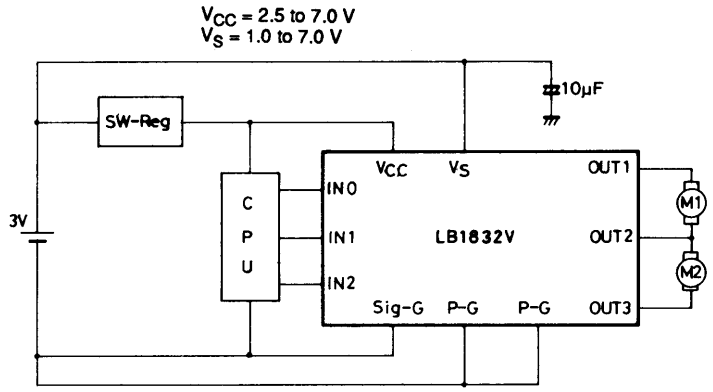
Truth Table

Input			Output			Mode	
IN0	IN1	IN2	OUT1	OUT21	OUT3		
L	L	L				Standby	
H	L	L					
L	H	L	H	L		ch1	Forward
L	L	H	L	H			Reverse
L	H	H	L	L			Brake
H	H	L		L	H	ch2	Forward
H	L	H		H	L		Reverse
H	H	H		L	L		Brake

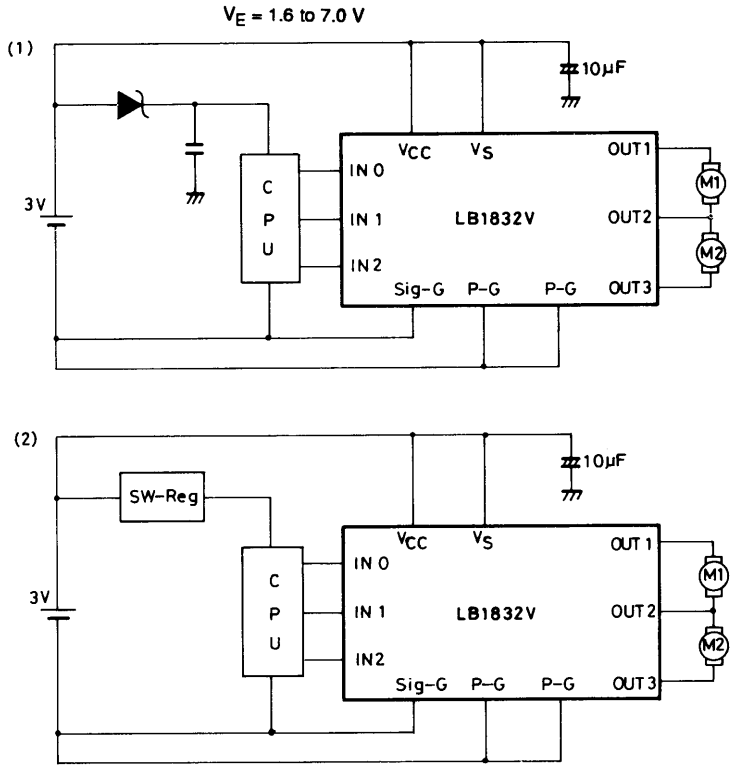
Note: Blanks are off.

Application Circuit Examples

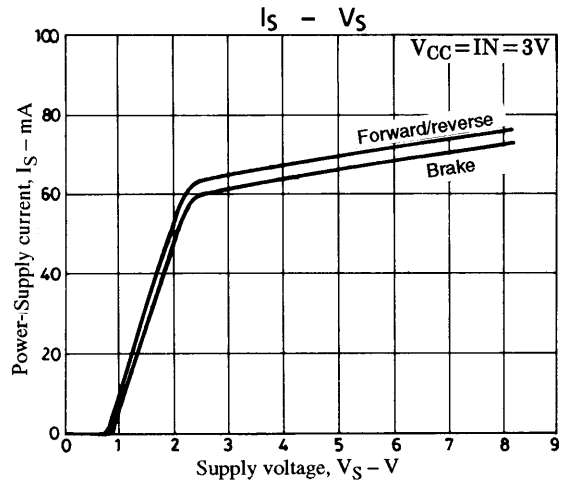
When separate power supplies are used for V_{CC} and V_S

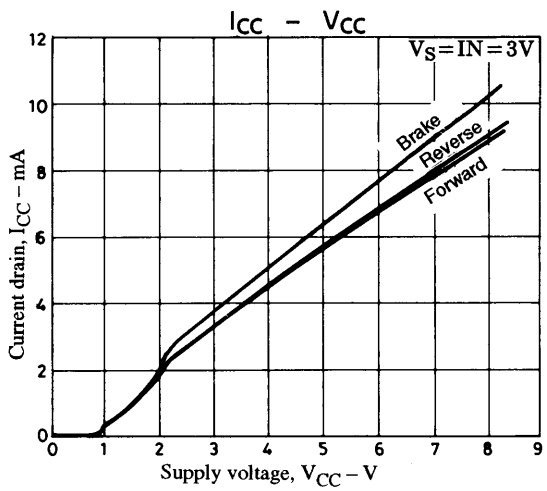


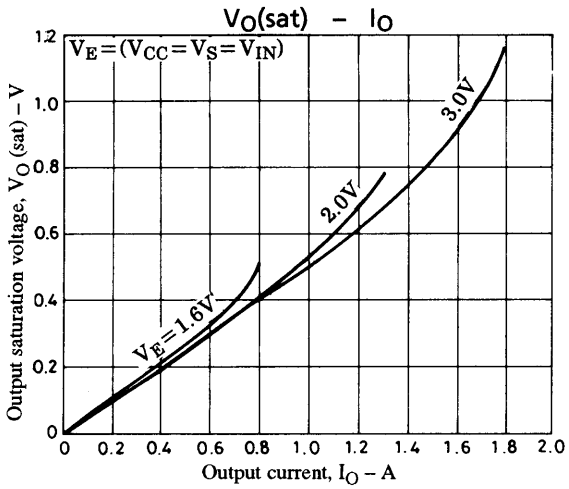
When the same power supply is used for V_{CC} and V_S

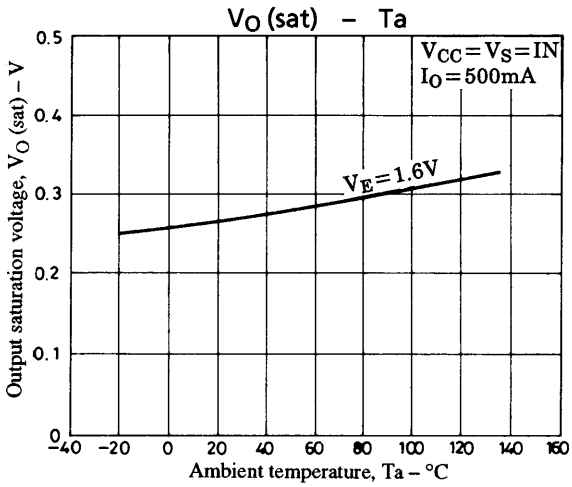


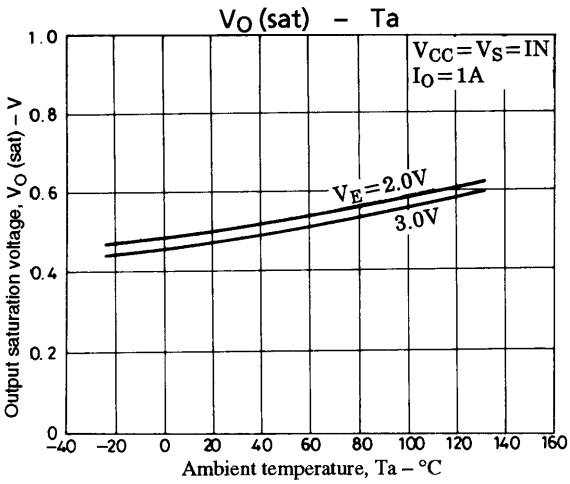
Note: There are no limitations on the magnitude relationships between V_{CC}, V_S, and V_{IN}.


IS – VS
VCC=IN=3V
Forward/reverse
Brake
Power-Supply current, IS – mA
Supply voltage, VS – V


ICC – VCC
VS=IN=3V
Brake
Reverse
Forward
Current drain, ICC – mA
Supply voltage, VCC – V


VO(sat) – IO
VE=(VCC=VS=VIN)
3.0V
2.0V
VE=1.6V
Output saturation voltage, VO (sat) – V
Output current, IO – A


VO (sat) – Ta
VCC=VS=IN
IO=500mA
VE=1.6V
Output saturation voltage, VO (sat) – V
Ambient temperature, Ta – °C


VO (sat) – Ta
VCC=VS=IN
IO=1A
VE=2.0V
3.0V
Output saturation voltage, VO (sat) – V
Ambient temperature, Ta – °C

Low-Voltage Low-Saturation Bidirectional Motor Driver Product Line