



LB1934T

3V Camera 1.5-Channel Driver

Preliminary

Overview

The LB1934T is a low-voltage, low-saturation forward/reverse driver IC with built-in 1.5-channel bridge. Its compact, low-profile package makes it ideal for use in compact cameras powered by 3V lithium batteries. Using direct microprocessor drive, it is possible to control standby, forward rotation, reverse rotation, and braking of two motors for film rewind and lens drive by means of only three control signals. The 0.5-channel section of the 1.5-channel bridge can be divided into sink/source output, allowing configurations such as 1-channel bridge + sink output + source output.

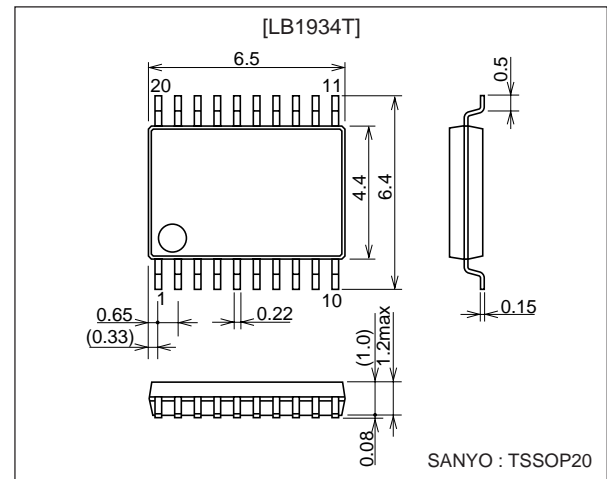
Features

- Low voltage drive possible
When using same power supply for V_{cc} and V_s : $V_{cc} = V_s = 1.4V$ min.
When using separate power supply for V_{cc} and V_s : $V_s = 1.0V$ min., $V_{cc} = 1.4V$ min.
- Low saturation voltage: remaining voltage (upper side transistor + lower side transistor) = 0.5V typ. at $I_o = 1A$
- Zero power dissipation in standby mode
- Direct microprocessor drive possible (any strength relationships of voltage supported between microprocessor control signal and V_{cc} or V_s)
- Logic power supply and motor power supply can be supplied at separate pins.
- Built-in thermal protection circuit
- Number of control signals can be optimized for the set.
“2-motor control” or “1-motor + 2-load control” can be implemented by 3 control signals.
In addition to the above, 4 control signals allow implementation of a “input ignore mode” where two control signals are used in conjunction with other IC input signals.
- Built-in spark killer diode
- Compact, low-profile package (TSSOP-20; $t = 1.1$ mm typ.)

Package Dimensions

unit: mm

3246-TSSOP20



- Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.
- SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _S max	VS	-0.3 to 8.0	V
	V _{CC} max	VCC	-0.3 to 8.0	V
Maximum output current	I _{omax1}	OUT1, OUT2	2000	mA
	I _{omax2}	OUT3P, OUT3N	1500	mA
Maximum applied output voltage	V _{omax}	OUT1, OUT2, OUT3P, OUT3N	-0.3 to VS+VSF	V
Maximum applied input voltage	V _{imax}	MD1, MD2, IN1, IN2	-0.3 to 8.0	V
Allowable power dissipation	P _{dmax}	With specified substrate*	850	mW
Operating temperature	T _{opr}		-20 to +70	°C
Storage temperature	T _{stg}		-55 to +150	°C

*Specified substrate: 76.1×114.3×1.6 mm³ (glass epoxy)

Allowable Operating Ranges at Ta = 25°C

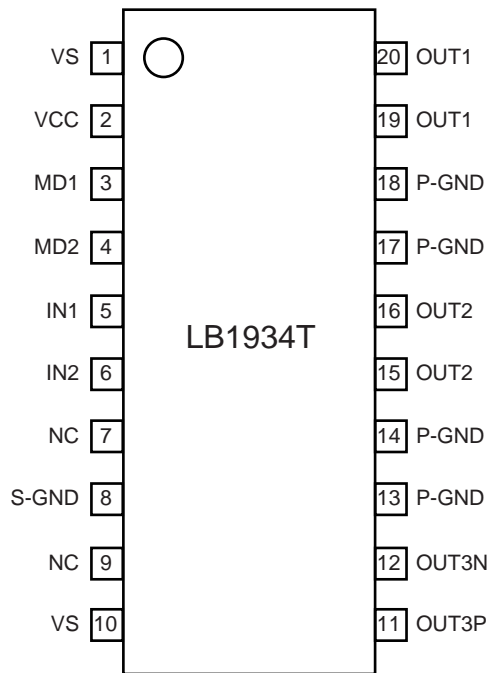
Parameter	Symbol	Conditions	Ratings	Unit
Power supply voltage	V _S	VS	1.0 to 7.0	V
	V _{CC}	VCC	1.4 to 7.0	V
Input High level voltage	V _{INH}	MD1, MD2, IN1, IN2	1.4 to 7.0	V
Input Low level voltage	V _{INL}	MD1, MD2, IN1, IN2	-0.3 to +0.4	V

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[Operating current drain]						
Standby mode current drain	ISTB	ICC+IS		0.1	3	μA
VS operating current drain 1	IS1	(Forward/reverse)		70	90	mA
VS operating current drain 2	IS2	(Brake)		75	95	mA
VCC operating current drain 1	ICC1	(1ch/2ch/half-bridge mode)		4	5	mA
VCC operating current drain 1	ICC1	(IN1/IN2 input ignore mode)		1	2	mA
[Output circuits]						
OUT1/OUT2 output saturation voltage	V _{osat1}	(PNP+NPN) I _o = 1000 mA		0.5	0.75	V
OUT3P output saturation voltage	V _{osat2}	(PNP) I _o = 1000 mA		0.4	0.55	V
OUT3N output saturation voltage	V _{osat3}	(NPN) I _o = 1000 mA		0.3	0.45	V
Spark killer diode reverse current	I _s (leak)				10	μA
Spark killer diode forward voltage	V _{SF}	OUT1, OUT2, OUT3P, OUT3N			1.7	V
[Input circuit]						
High level input current	I _{INH}	V _{IN} = 5V (MD1, MD2, IN1, IN2)		70	100	μA
Low level input current	I _{INL}	V _{IN} = 0V (MD1, MD2, IN1, IN2)			0	μA

LB1934T

Pin Assignment

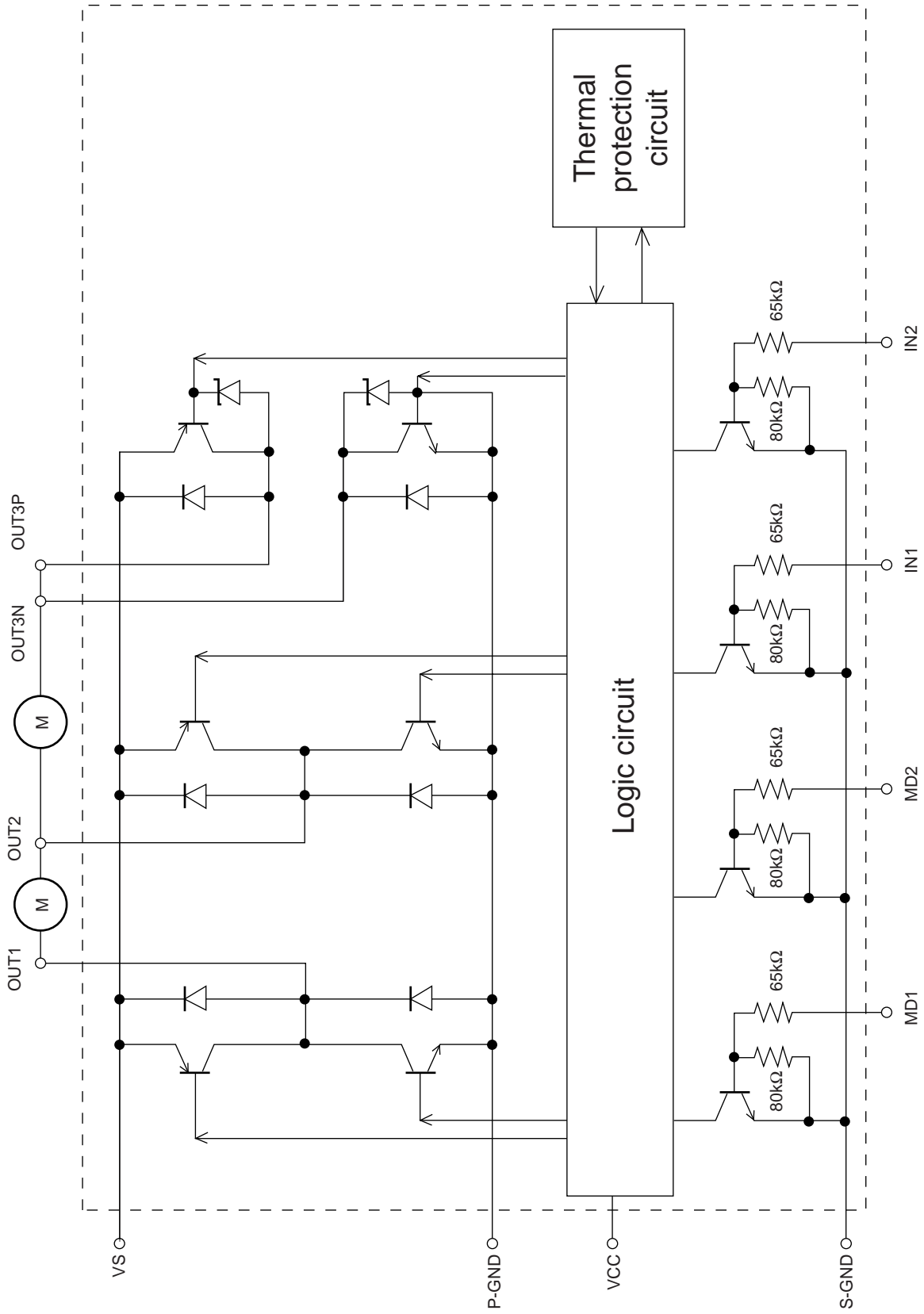


Top view

Pin Description

Pin number	Pin name	Description
1, 10	VS	Motor drive power supply pin (+)
2	VCC	Control system power supply pin (+)
13, 14, 17, 18	P-GND	Motor drive ground pin (-)
8	S-GND	Control system ground pin (-)
19, 20	OUT1	Motor drive output pin (sink/source)
15, 16	OUT2	Motor drive output pin (sink/source)
11	OUT3P	Motor drive output pin (source)
12	OUT3N	Motor drive output pin (sink)
3	MD1	Control input pin (High active)
4	MD2	Control input pin (High active)
5	IN1	Control input pin (High active)
6	IN2	Control input pin (High active)
7, 9	NC	Not used

Block Diagram



LB1934T

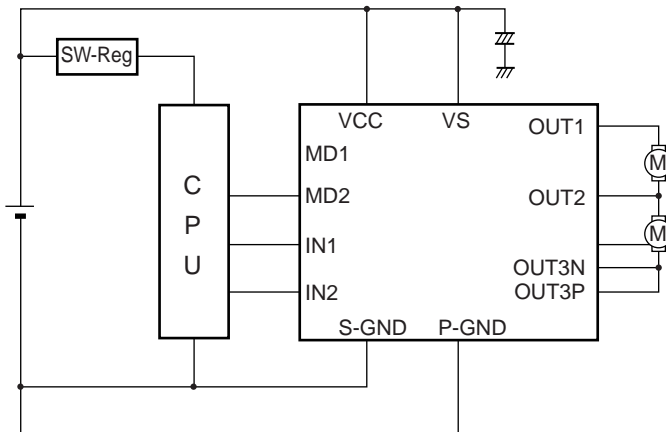
Truth Table

Input				Output				Mode	
MD1	MD2	IN1	IN2	OUT1	OUT2	OUT3P	OUT3N		
L	L	L	L					1 ch	Standby
		H	L	H	L				Forward rotation
		L	H	L	H				Reverse rotation
		H	H	H	H				Brake
L	H	L	L					2 ch	Standby
		H	L		L	H			Forward rotation
		L	H		H		L		Reverse rotation
		H	H		H	H			Brake
H	L	L	L					Half-bridge	Standby
		H	L			H			Source
		L	H				L		Sink
		H	H			H			Source
H	H	*	*					Disregard IN1/IN2 input	

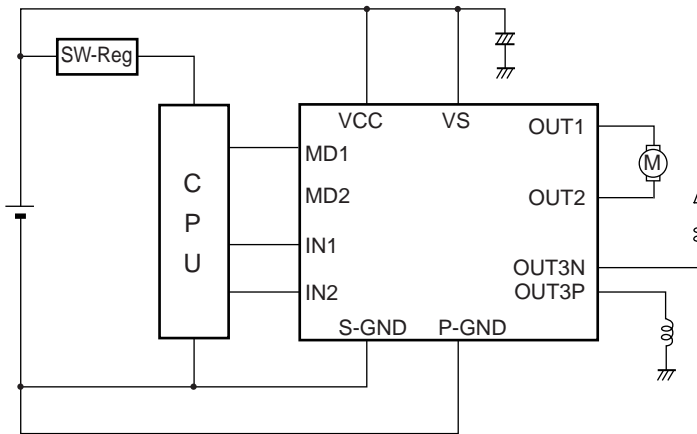
Note: "*" in the input column means "don't care". Blank in the output column means "off".

Sample Application Circuits

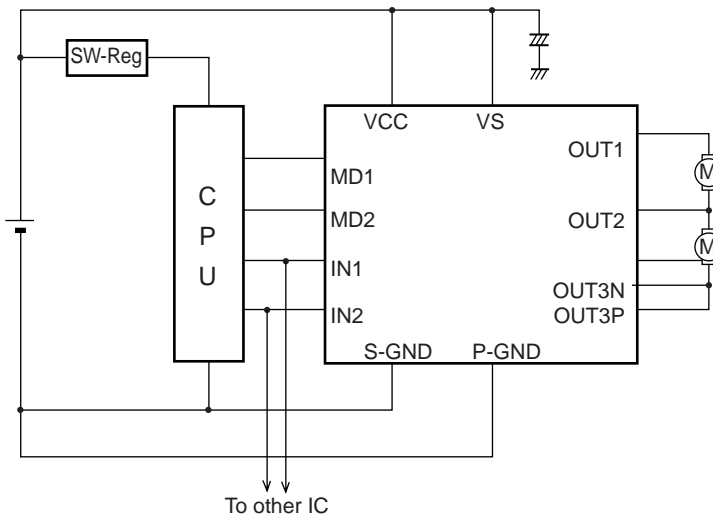
1) 2-motor control (3 control signals)



2) 1-motor + 2-load control (3 control signals)



3) 2-motor control (4 control signals)



Note: 1-motor + 2-load control can also be implemented with 4 control signals.

- Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of June, 1999. Specifications and information herein are subject to change without notice.