



# LA6575H — Monolithic Digital IC Five-Channel Driver (four BTL channels plus one H bridge channel) for MD and CD Player

## Overview

The LA6575H is a five-channel motor driver IC for MD and CD players with four BTL channels and one H bridge channel for the loading motor. It features a built-in 5 V regulator circuit.

## Functions and Features

- Four power amplifier channels plus one H bridge channel
- $I_O$  max: 700 mA (each channel)
- Built-in level shifting circuits for the BLT amplifiers
- One muting circuit system (output on/off control): applies to the BTL amplifiers
- Thermal protection circuit (Thermal shutdown circuit)
- Separate loading block power supply
- Built-in 5 V regulator

## Specifications

### Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	$V_{CC}$ max		14	V
Allowable power dissipation	$P_{dmax}$	Independent IC	0.82	W
		* Mounted on a board.	2.0	
Maximum output current	$I_O$ max	Each channel for CH1 to CH5	0.7	A
Maximum input voltage	VINB		13	V
MUTE pin voltage	VMUTE		13	V
Operating temperature	$T_{opr}$		-30 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

Note \*: Mounted on a board (76.1 × 114.3 × 1.6 mm) Material: glass epoxy

### Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	$V_{CC}$		5.6 to 13	V

- 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.

# LA6575H

**Electrical Characteristics** (Unless specified otherwise, the conditions are  $T_a = 25^\circ\text{C}$ ,  $V_{CC1} = V_{CC2} = 8\text{ V}$ ,  $V_{REF} = 1.65\text{ V}$ )

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[Overall Characteristics]						
No load current drain - ICC on	$I_{CC-ON}$	All outputs on, FWD = REV = 0 V	*1	30	50	mA
No load current drain - ICC off	$I_{CC-OFF}$	All outputs off, FWD = REV = 0 V	*1	10	20	mA
VREF input voltage range	VREF-IN		1		$V_{CC}-1.5$	V
[BTL Amplifier Block]						
Output offset voltage	VOFF	BTL amplifiers, the voltage difference across each channel's output	-50		+50	mV
Input voltage range	$V_{IN}$	Input voltage range	0		$V_{CC}$	V
Output voltage	$V_O$	The voltage between each of the $V_{O+}/V_{O-}$ pairs when $R_L$ is $8\ \Omega$ .	4	5		V
Closed loop voltage gain	VG	Gain from input to output	3.5	4	4.5	Multiplier
Slew rate	SR	With the amplifier operating independently, twice the value measured between outputs		0.5		$\text{V}/\mu\text{s}$
Mute on voltage	VMUTE-ON	Each Mute			0.5	V
Mute off voltage	VMUTE-OFF	Each Mute	2			V
[H Bridge Block]						
Output voltage	$V_{O-LOAD}$	The voltage between each of the $V_{O+}/V_{O-}$ pairs when $R_L$ is $8\ \Omega$ .	5.6	6		V
Low-level input voltage	$V_{IN-L}$				1	V
High-level input voltage	$V_{IN-H}$		2			V
[Regulator Block]						
Output voltage	Vreg	$I_L = 100\text{ mA}$	4.75	5	5.25	V
Load regulation	$\Delta V_{RL}$	$I_L = 0\text{ to }200\text{ mA}$	-50	0	+10	mV
Line regulation	$\Delta V_{VCC}$	$V_{CC} = 6\text{ to }12\text{ V}$ , $I_L = 100\text{ mA}$	-15	+21	+60	mV

Note \*1: The total current drain for  $V_{CC1}$  and  $V_{CC2}$  with no load.

\*2: Voltage difference across the load ( $8\ \Omega$ ). With the outputs in the saturated state.

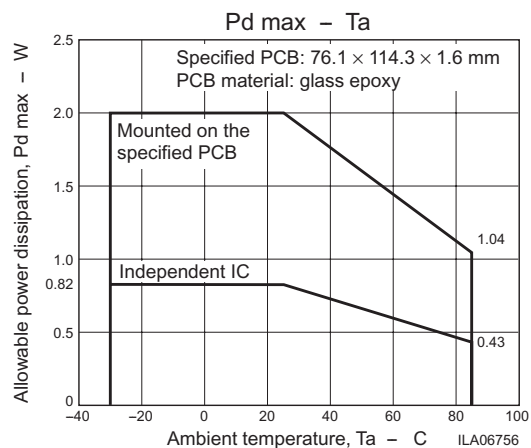
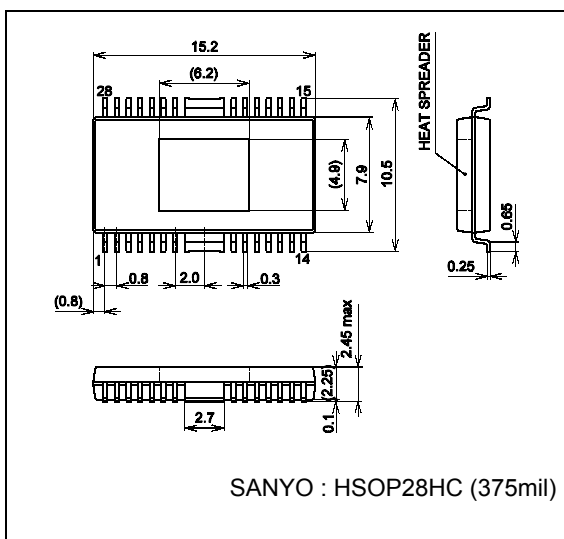
\*3: When the MUTE pin is high, the outputs will be on, and when low, the outputs will be off (high-impedance state).

\*4: Design guarantee value

## Package Dimensions

unit: mm

3234B



## LA6575H

### Pin Functions

Pin No.	Symbol	Pin descriptions
1	V <sub>CC2</sub>	Channel 5 power supply
2	V <sub>O5-</sub>	Loading output (-)
3	V <sub>O5+</sub>	Loading output (+)
4	V <sub>O4+</sub>	Channel 4 output (+)
5	V <sub>O4-</sub>	Channel 4 output (-)
6	V <sub>O3+</sub>	Channel 3 output (+)
7	V <sub>O3-</sub>	Channel 3 output (-)
8	V <sub>O2+</sub>	Channel 2 output (+)
9	V <sub>O2-</sub>	Channel 2 output (-)
10	V <sub>O1+</sub>	Channel 1 output (+)
11	V <sub>O1-</sub>	Channel 1 output (-)
12	V <sub>CC1</sub>	Channels 1 to 4 (BTL) power supply (This pin must be shorted to V <sub>CC-S</sub> )
13	V <sub>IN1</sub>	Channel 1 input
14	V <sub>IN1G</sub>	Channel 1 input (gain adjustment input)
15	V <sub>IN2</sub>	Channel 2 input
16	V <sub>IN2G</sub>	Channel 2 input (gain adjustment input)
17	V <sub>IN3</sub>	Channel 3 input
18	V <sub>IN3G</sub>	Channel 3 input (gain adjustment input)
19	REG-IN	Regulator input (external pnp transistor base)
20	REG-OUT	Regulator output (external pnp transistor collector)
21	VREF-IN	Reference voltage input
22	V <sub>CC-S</sub>	Signal system power supply (This pin must be shorted to V <sub>CC1</sub> .)
23	V <sub>IN4G</sub>	Channel 4 input (gain adjustment input)
24	V <sub>IN4</sub>	Channel 4 input
25	MUTE	Channels 1 to 4 (BTL amplifiers) output on/off control
26	S-GND	Signal system ground
27	FWD	Channel 5 (VLO) output switching (FWD); loading block logic input
28	REV	Channel 5 (VLO) output switching (REV); loading block logic input

- Note:
- The center frame (FR) is used as the power system ground. Along with the signal system ground (S-GND), this level must be the lowest potential in the system.
  - The three power supply pins V<sub>CC-S</sub>, V<sub>CC1</sub>, and V<sub>CC2</sub> must be shorted together externally.

# LA6575H

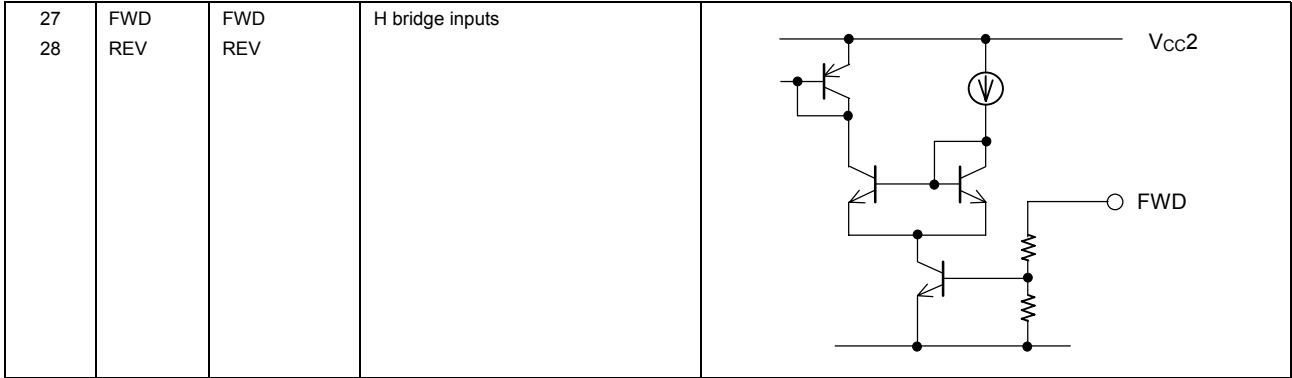
## Pin Functions

Pin No.	Symbol	Pin name	Pin description	Equivalent circuit
13 14 15 16 17 18 23 24	$V_{IN}$	Inputs	Inputs	
4 5 6 7 8 9 10 11	$V_O$	Outputs	Outputs	
25	MUTE	Mute	ON/OFF each output MUTE: H output ON MUTE: L output OFF	
2 3	$V_{O5+}$ $V_{O5-}$	$V_{O5}$	H bridge outputs	

Continued on next page

# LA6575H

Continued from preceding page.



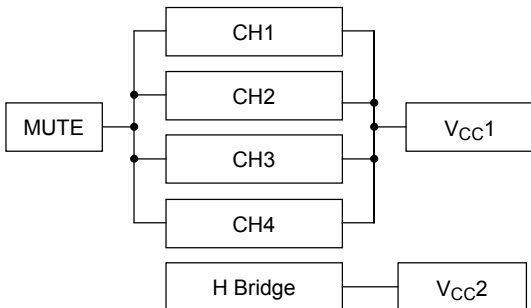
## H Bridge Block

FWD	REV	V <sub>O5+</sub>	V <sub>O5-</sub>	Mode
L	L	OFF	OFF	Open *1
L	H	H	L	Forward
H	L	L	H	Reverse
H	H	L	L	Brake *2

Note \*1: The output are in the high-impedance state in this mode

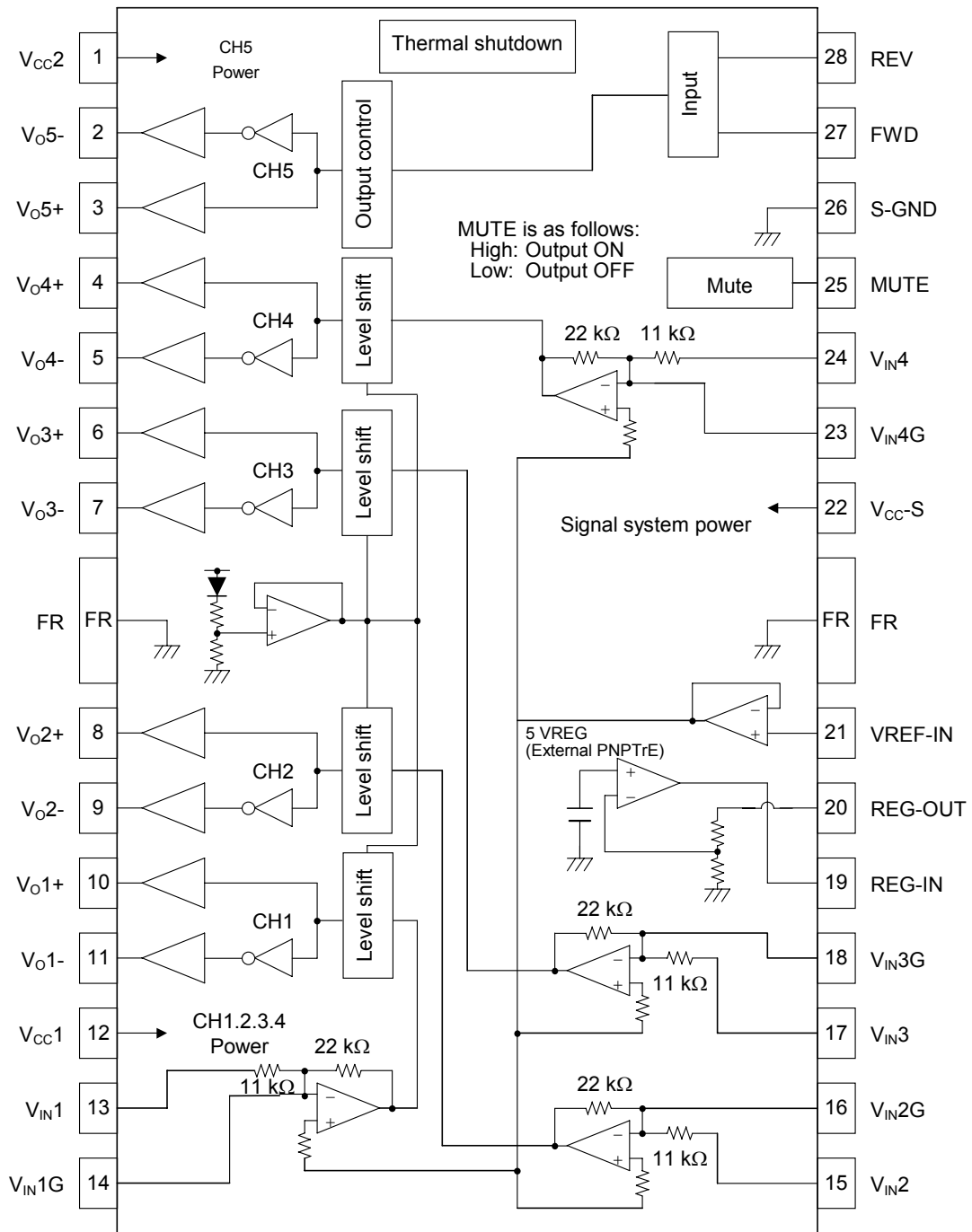
\*2: In brake mode, the sink side transistors are on (short-circuit braking). The V<sub>LO+</sub> and V<sub>LO-</sub> levels go to a level essentially the same as the ground level.

## Relationship between the MUTE pin and the power supplies (V<sub>CC</sub>\*)



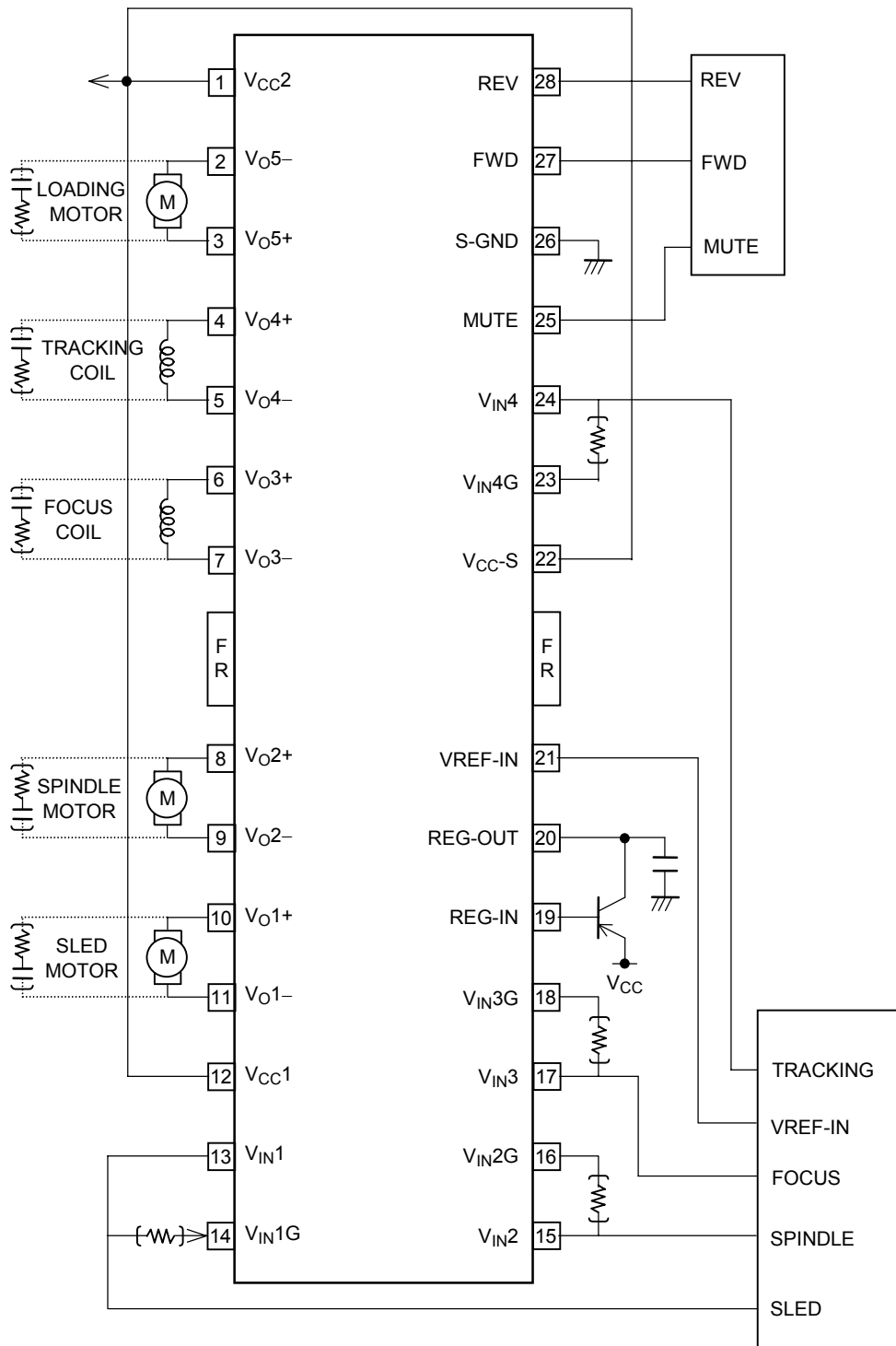
# LA6575H

## Block Diagram



# LA6575H

## Sample Application Circuit



- 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, of 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

This catalog provides information as of August, 2004. Specifications and information herein are subject to change without notice.