



# LA6557H

## Five-Channel Bridge Driver for MD and CD Players

### Overview

The LA6557H is a five-channel bridge driver developed for use in CD and MD players. It provides four BTL power amplifier channels and one H-bridge power amplifier channel.

### Features and Functions

- Four BTL power amplifier channels and one H-bridge power amplifier channel
- $I_{Omax}$ : 700 mA (each channel)
- Built-in level shifter circuits (BTL amplifiers)
- One muting circuit (output on/off control) system that operates for the BTL amplifiers
- Thermal shutdown circuit built in

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	$V_{CC\ max}$		14	V
Maximum output current	$I_{Omax}$	For each channel in channels 1 to 5	0.7	A
Maximum input voltage	$V_{INBmax}$		13	V
Mute pin voltage	$V_{MUTE}$		13	V
Allowable power dissipation	$Pd\ max$	Independent IC	0.82	W
		Mounted on the specified printed circuit board*	2.0	W
Operating temperature	$T_{opr}$		-30 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

Note: \* Specified printed circuit board:  $76.1 \times 114.3 \times 1.6\ \text{mm}^3$  glass-epoxy PCB

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

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

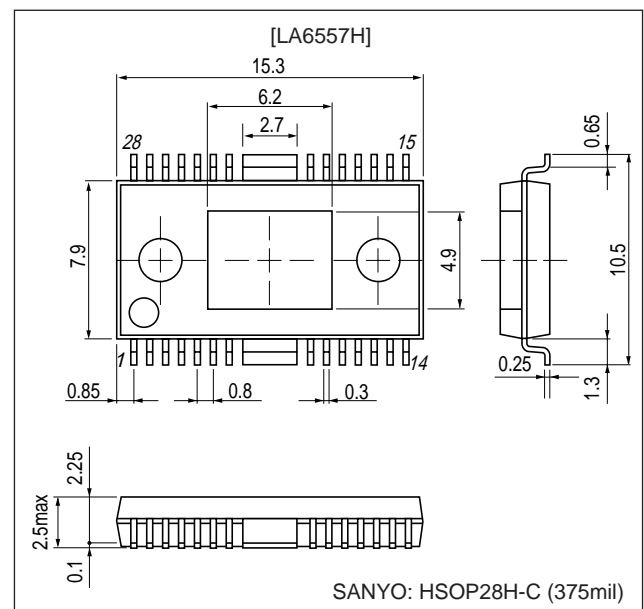
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### Package Dimensions

unit: mm

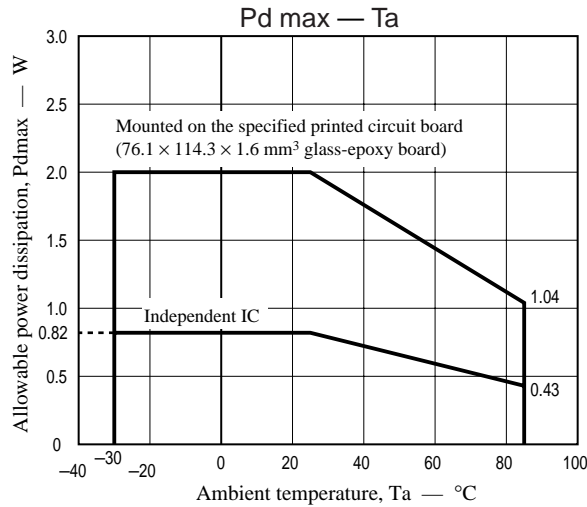
#### 3234-HSOP28H-C



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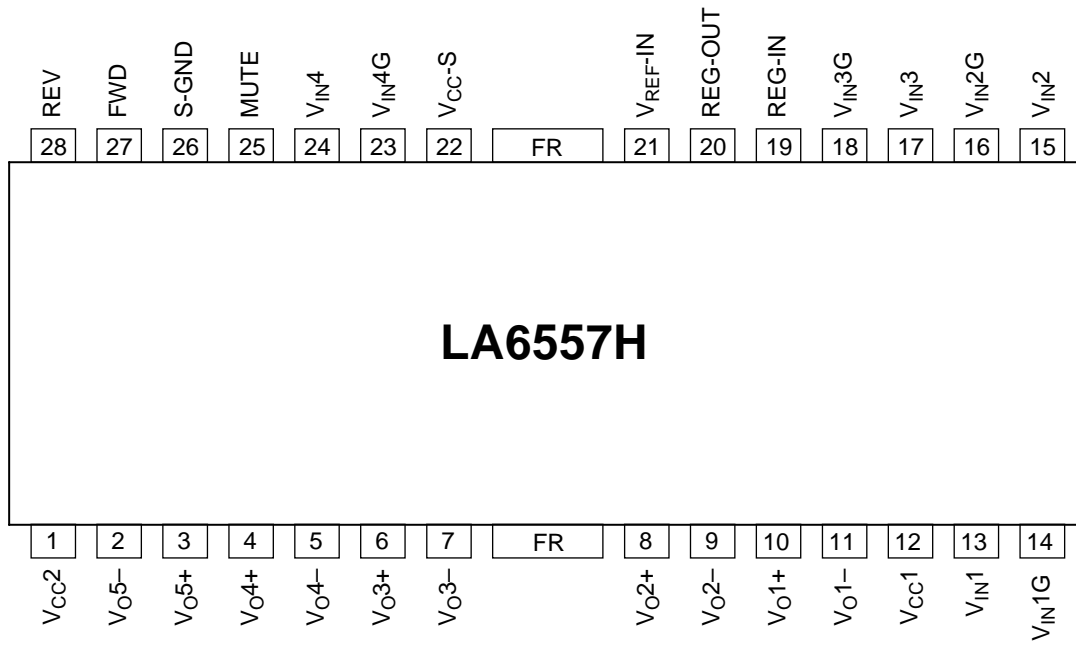
### Electrical Characteristics at Ta = 25°C, V<sub>CC1</sub> = V<sub>CC2</sub> = 8 V, V<sub>REF</sub> = 1.65 V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
No-load current drain: on	I <sub>CC-ON</sub>	All outputs on*1, FWD = REV = 0 V		30	50	mA
No-load current drain: off	I <sub>CC-OFF</sub>	All outputs off*1, FWD = REV = 0 V		10	20	mA
V <sub>REF</sub> input voltage range	V <sub>REF-IN</sub>		1		V <sub>CC</sub> -1	V
<b>[BTL Amplifier Block]</b>						
Output offset voltage	V <sub>OFF</sub>	The voltage difference between outputs for the BTL amplifiers	-50		+50	mV
Input voltage range	V <sub>IN</sub>	The input voltage range	0		V <sub>CC</sub>	V
Output voltage	V <sub>O</sub>	The voltage between V <sub>O+</sub> and V <sub>O-</sub> for each channel when R <sub>L</sub> = 8 Ω.*2	4	5		V
Closed-circuit voltage gain	V <sub>G</sub>	Gain from input to output		12		dB
Slew rate	SR	For independent amplifiers. Twice when measured between outputs *4		0.5		V/μs
Mute on voltage	V <sub>MUTE-ON</sub>	For each MUTE *3			0.5	V
Mute off voltage	V <sub>MUTE-OFF</sub>	For each MUTE *3	2			V
<b>[H Bridge Block]</b>						
Output voltage	V <sub>O-LOAD</sub>	The voltage between V <sub>O+</sub> and V <sub>O-</sub> for each channel when R <sub>L</sub> = 8 Ω.*2		6		V
Low-level input voltage	V <sub>IN-L</sub>				1	V
High-level input voltage	V <sub>IN-H</sub>		2			V
<b>[Regulator Block]</b>						
Output voltage	V <sub>reg</sub>	I <sub>L</sub> = 100 mA	4.75	5	5.25	V
Output load regulation	ΔV <sub>RL</sub>	I <sub>L</sub> = 0 to 200 mA	-50	0	10	mV
Supply voltage regulation	ΔV <sub>VCC</sub>	V <sub>CC</sub> = 6 to 12 V, I <sub>L</sub> = 100 mA	-15	21	60	mV

- Notes: 1. The total current drain for V<sub>CC1</sub> and V<sub>CC2</sub> with no load.  
 2. The voltage across an 8 Ω load. With the output saturated.  
 3. MUTE: When the MUTE pin is high, the outputs will be on, and when low, off (high impedance)  
 4. These values are design guarantee values, and are not tested.

# LA6557H

## Pin Assignment



Top view

Pin Description

Pin No.	Pin	Function	Equivalent circuit
1	V <sub>CC2</sub>	Channel 3, 4, and 5 power supply (shorted to V <sub>CC1</sub> and V <sub>CC-S</sub> )	<p style="text-align: center;">② ③ V<sub>O5+</sub> V<sub>O5-</sub></p> <p style="text-align: right;">HM0001</p>
2	V <sub>O5-</sub>	Loading output (-)	
3	V <sub>O5+</sub>	Loading output (+)	
4	V <sub>O4+</sub>	Channel 4 output (+)	<p style="text-align: right;">OUT (4,5,6,7, 8,9,10,11)</p> <p style="text-align: right;">HM0002</p>
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>	Channel 1 and 2 (BTL) power supply (shorted to V <sub>CC-S</sub> and V <sub>CC2</sub> )	<p style="text-align: center;">V<sub>IN</sub> ⑬ (15,17,24) V<sub>ING</sub> ⑭ (16,18,23) Vref ⑰ (21)</p> <p style="text-align: right;">HM0003</p>
13	V <sub>IN1</sub>	Channel 1 input	
15	V <sub>IN2</sub>	Channel 2 input	
17	V <sub>IN3</sub>	Channel 3 input	
24	V <sub>IN4</sub>	Channel 4 input	
14	V <sub>IN1G</sub>	Channel 1 input (gain adjustment)	
16	V <sub>IN2G</sub>	Channel 2 input (gain adjustment)	
18	V <sub>IN3G</sub>	Channel 3 input (gain adjustment)	
23	V <sub>IN4G</sub>	Channel 4 input (gain adjustment)	

Notes: The center frame (FR) functions as the power system ground. It must be, along with S-GND, at the lowest potential in the system.  
The power supply pins, V<sub>CC-S</sub>, V<sub>CC1</sub>, and V<sub>CC2</sub> must be shorted together externally to the IC.

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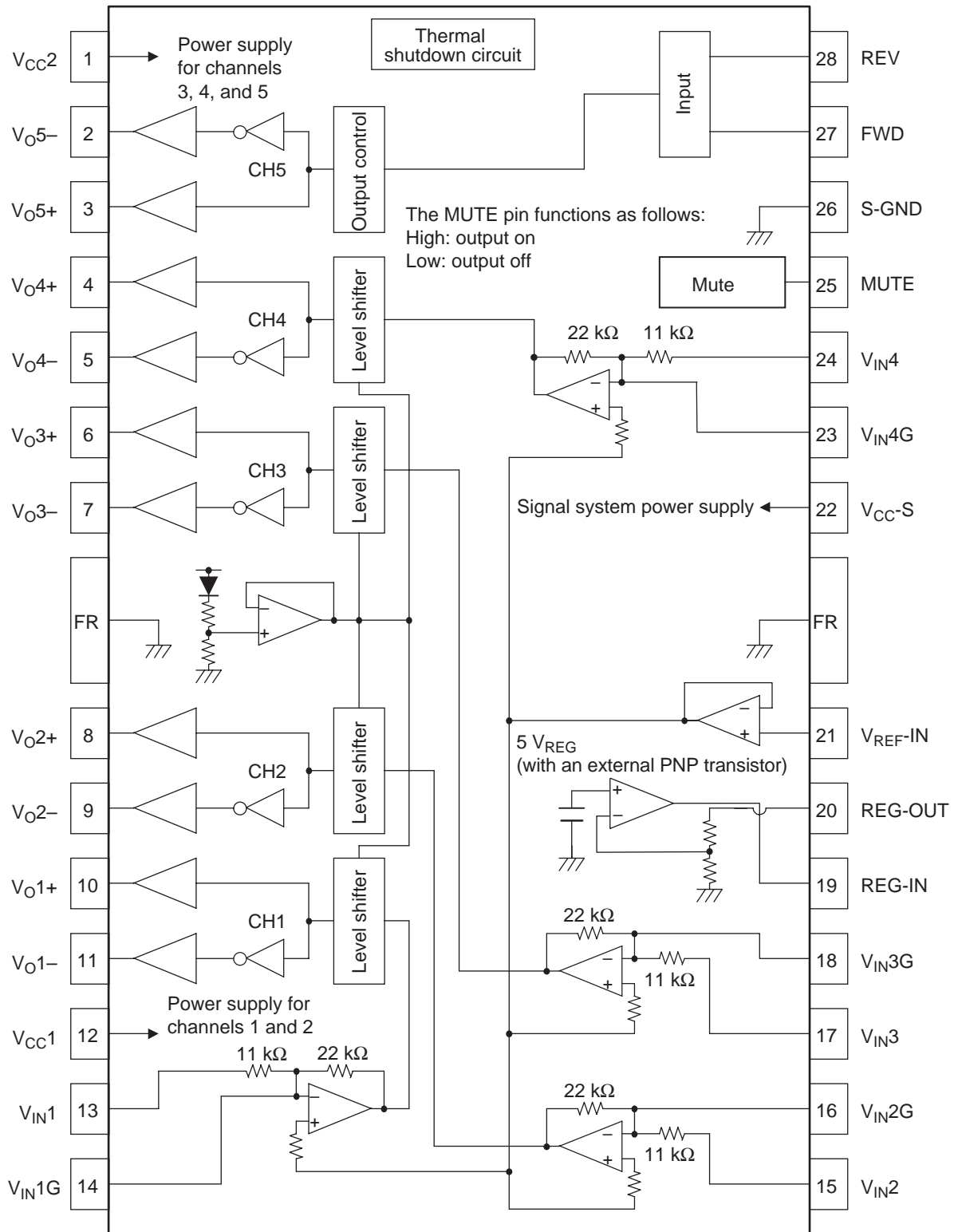
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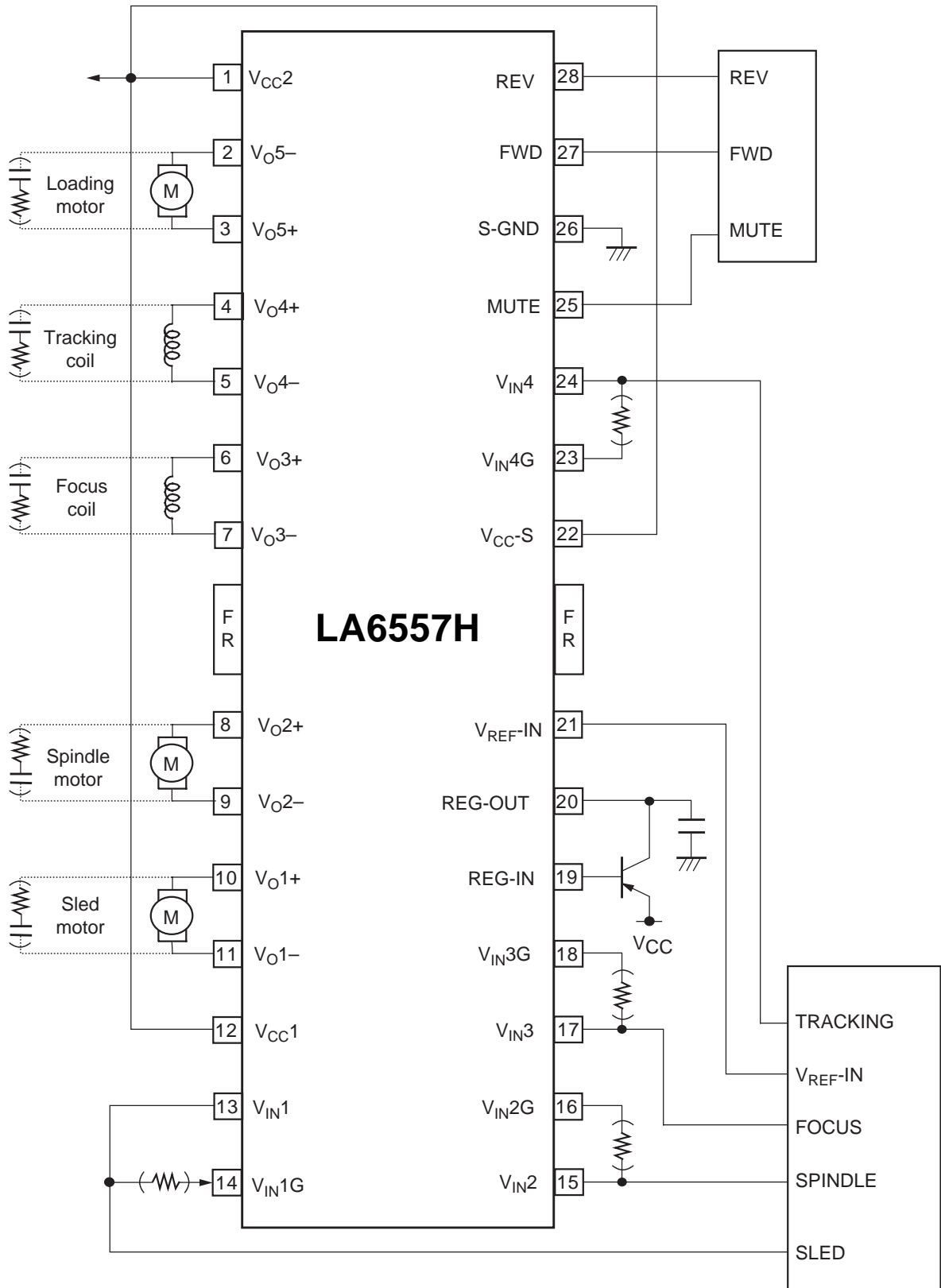
Pin No.	Pin	Function	Equivalent circuit
19	REG-IN	Regulator input (base of the external pnp transistor)	
20	REG-OUT	Regulator output (collector of the external pnp transistor)	
21	V <sub>REF-IN</sub>	Reference voltage input	
22	V <sub>CC-S</sub>	Signal system power supply (shorted to V <sub>CC1</sub> and V <sub>CC2</sub> )	
25	MUTE	Output on/off control for channels 1 to 4 (the BTL amplifiers)	
26	S-GND	Signal system ground	
27	FWD	Channel 5 (VLO) output switching (FWD), logic input to the loading block	
28	REV	Channel 5 (VLO) output switching (REV), logic input to the loading block	

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The power supply pins, V<sub>CC-S</sub>, V<sub>CC1</sub>, and V<sub>CC2</sub> must be shorted together externally to the IC.

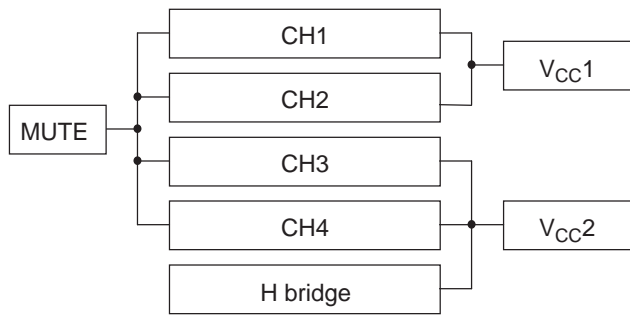
Block Diagram



Sample Application Circuit



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



Note: \* V<sub>CC</sub>1 and V<sub>CC</sub>2 must be connected externally.

**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

Notes: 1. The outputs are in the high-impedance state in this mode.  
 2. During braking, the sink side transistor will be turned on (short braking).  
 V<sub>LO+</sub> and V<sub>LO-</sub> will be close to the ground level.

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