



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

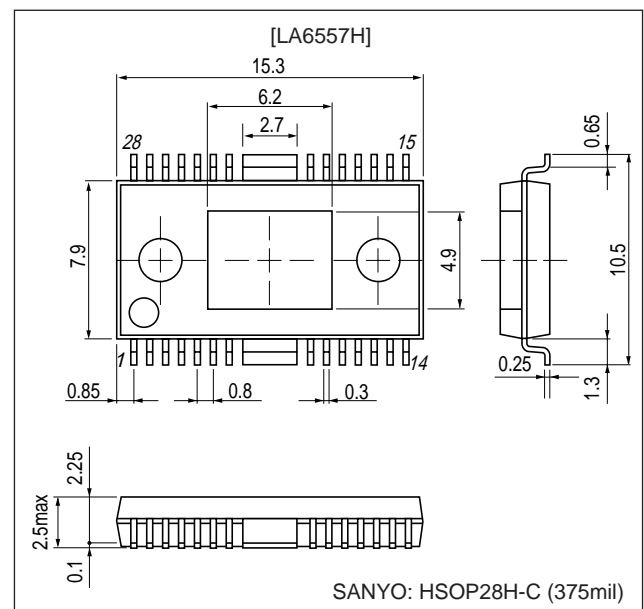
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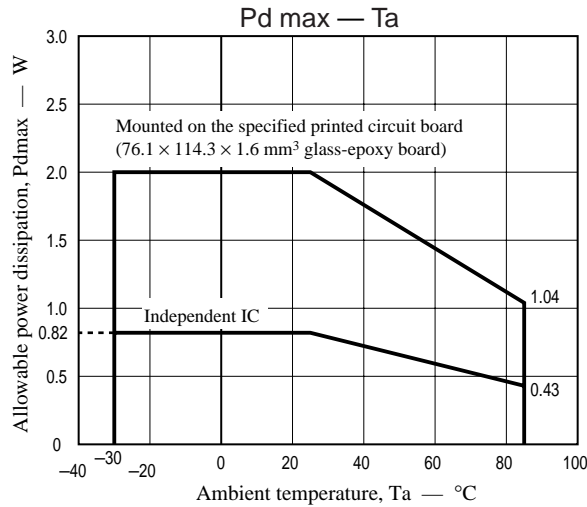
Package Dimensions

unit: mm

3234-HSOP28H-C



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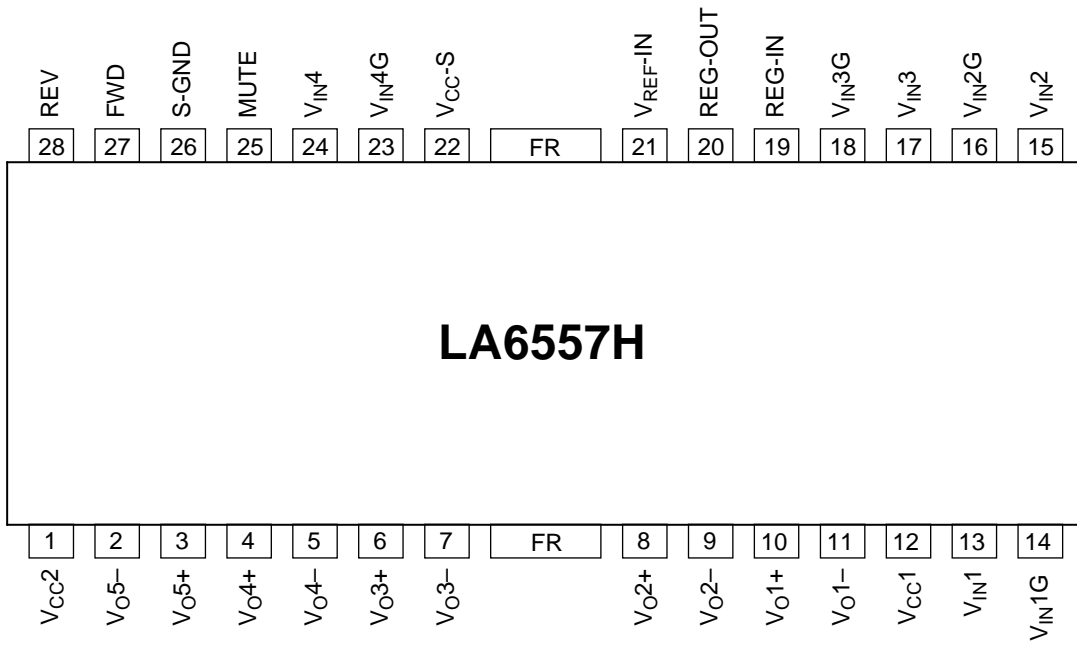
Electrical Characteristics at Ta = 25°C, V_{CC1} = V_{CC2} = 8 V, V_{REF} = 1.65 V

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

- Notes: 1. The total current drain for V_{CC1} and V_{CC2} 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.

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Pin Assignment



Top view

Pin Description

Pin No.	Pin	Function	Equivalent circuit
1	V _{CC2}	Channel 3, 4, and 5 power supply (shorted to V _{CC1} and V _{CC-S})	<p style="text-align: right;">HM0001</p>
2 3	V _{O5-} V _{O5+}	Loading output (-) Loading output (+)	
4 5 6 7 8 9 10 11	V _{O4+} V _{O4-} V _{O3+} V _{O3-} V _{O2+} V _{O2-} V _{O1+} V _{O1-}	Channel 4 output (+) Channel 4 output (-) Channel 3 output (+) Channel 3 output (-) Channel 2 output (+) Channel 2 output (-) Channel 1 output (+) Channel 1 output (-)	<p style="text-align: right;">HM0002</p>
12	V _{CC1}	Channel 1 and 2 (BTL) power supply (shorted to V _{CC-S} and V _{CC2})	<p style="text-align: right;">HM0003</p>
13 15 17 24	V _{IN1} V _{IN2} V _{IN3} V _{IN4}	Channel 1 input Channel 2 input Channel 3 input Channel 4 input	
14 16 18 23	V _{IN1G} V _{IN2G} V _{IN3G} V _{IN4G}	Channel 1 input (gain adjustment) Channel 2 input (gain adjustment) Channel 3 input (gain adjustment) 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_{CC-S}, V_{CC1}, and V_{CC2} must be shorted together externally to the IC.

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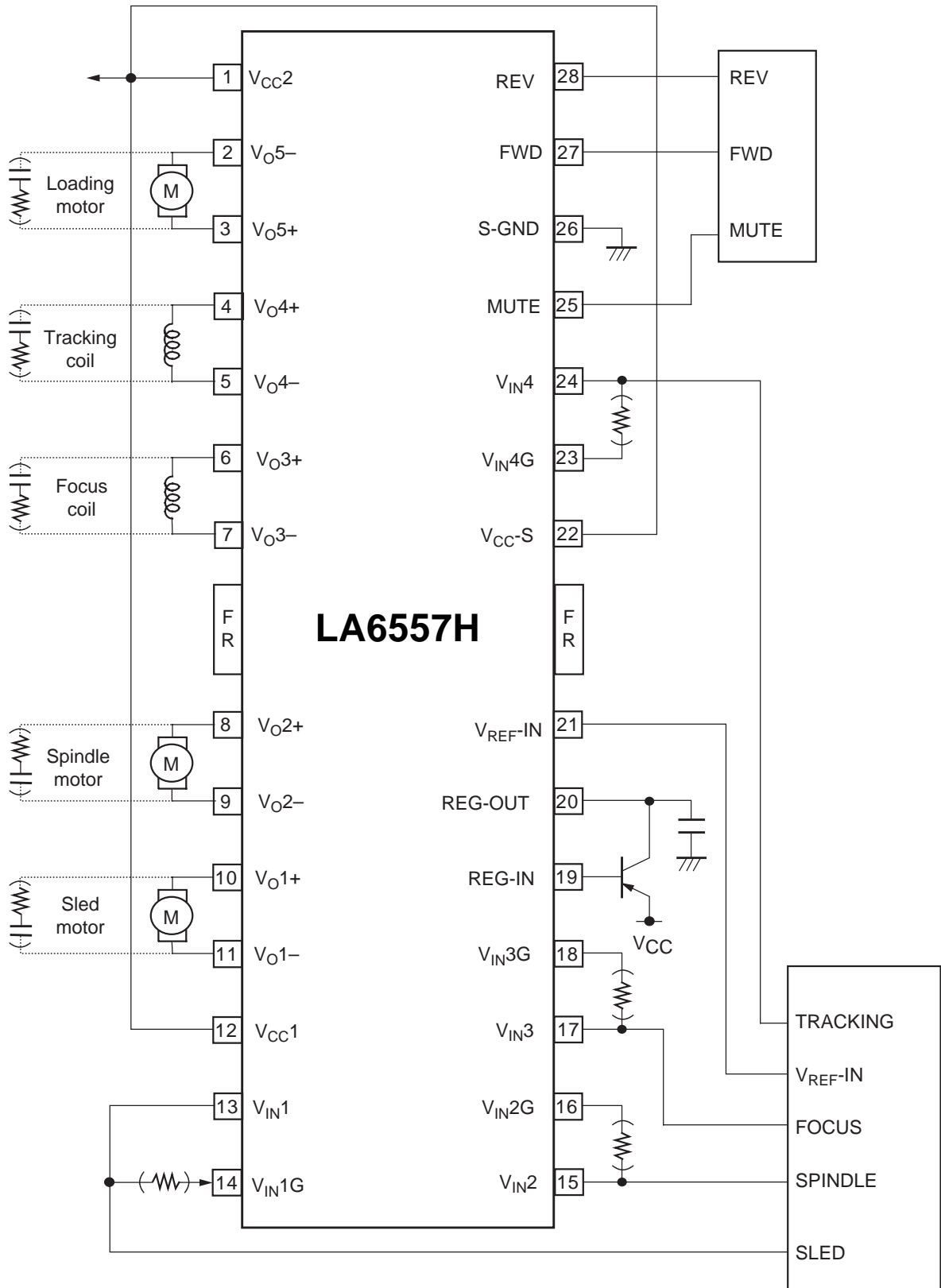
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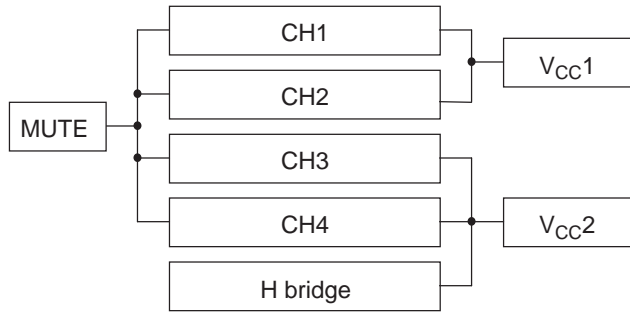
Pin No.	Pin	Function	Equivalent circuit
19	REG-IN	Regulator input (base of the external pnp transistor)	
20	REG-OUT	Regulator output (collector of the external pnp transistor)	
21	V _{REF-IN}	Reference voltage input	
22	V _{CC-S}	Signal system power supply (shorted to V _{CC1} and V _{CC2})	
25	MUTE	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	

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_{CC-S}, V_{CC1}, and V_{CC2} must be shorted together externally to the IC.

Sample Application Circuit



System Diagram (Relationship between MUTE and the power supplies (V_{CC}*))



Note: * V_{CC1} and V_{CC2} must be connected externally.

H Bridge Block

FWD	REV	V _{O5+}	V _{O5-}	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_{LO+} and V_{LO-} will be close to the ground level.

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