Ordering number: EN 5226

Monolithic Linear IC

# LA6530M

## 2-channel Bridge Driver for CD and CD-ROMs

## Overview

The LA6530M is a 2-channel bridge (BTL) driver which was developed for compact discs and CD-ROMs.

## Features

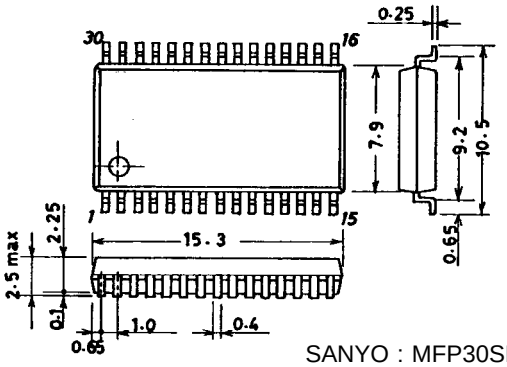
- High output current ($I_O$ max = 0.7 A).
- Wide operating voltage range (4 to 15 V).
- Small input bias current.

## Package Dimensions

unit : mm

**3073A-MFP30SLF**

[LA6530M]




## Specifications

### Maximum Ratings at Ta = 25 °C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Maximum supply voltage | $V_{CC}$ max | | 16 | V |
| Differential input voltage | $V_{ID}$ | Amplifier 2, amplifier 3 | 15 | V |
| Common-mode input voltage | $V_{ICM}$ | Amplifier 2, amplifier 3 | 15 | V |
| Maximum input voltage | $V_{INB}$ | Buffer amplifier | 15 | V |
| Mute pin maximum inflow current | $I_M$ max | | 1.0 | mA |
| Maximum output current | $I_O$ max | | 0.7 | A |
| Allowable power dissipation | Pd max | | 0.9 | W |
| Operating temperature | Topr | | –20 to +75 | °C |
| Storage temperature | Tstg | | –55 to +150 | °C |

### Operating Conditions at Ta = 25 °C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Recommended supply voltage | $V_{CC}$ | | 5.0 | V |
| Operating voltage range | $V_{CC}$ op | | 4.0 to 15.0 | V |
| Recommended load resistance | $R_L$ | Pin 11 to 20, pin 5 to 26 | 8.0 | Ω |

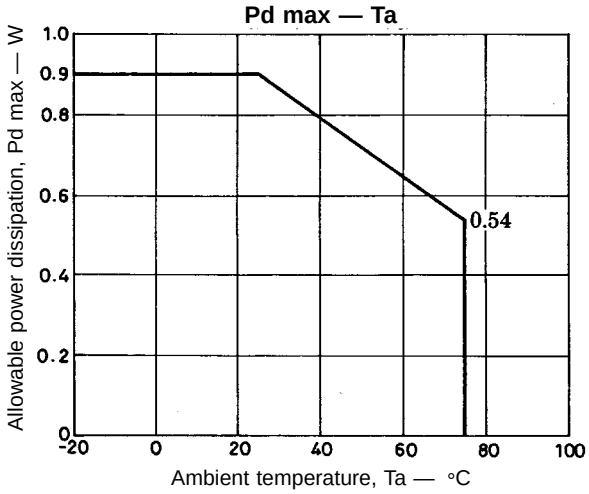
## Electrical Characteristics at Ta = 25 °C, $V_{CC}$ = 5.0 V

| Parameter | Symbol | Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| No-load current drain | $I_{CC}1$ | Mute off pins 7, 22 and 24 connected to GND | 5 | 10 | 20 | mA |
| | $I_{CC}2$ | Mute on pins 7, 22 and 24 connected to GND | 3 | 7 | 15 | mA |
| | $I_{CC}3$ | Mute off pins 7, 22 and 24 connected to 1/2 $V_{CC}$ | 10 | 20 | 30 | mA |
| | $I_{CC}4$ | Mute on pins 7, 22 and 24 connected to 1/2 $V_{CC}$ | 4 | 8 | 16 | mA |
| Output offset voltage | $V_{OF}1$ | OUT1-OUT2 | –50 | | +50 | mV |
| | $V_{OF}2$ | OUT4-OUT3 | –50 | | +50 | mV |
| Input-output voltage difference | $V_{BIO}$ | Buffer amplifier | –30 | | +30 | mV |
| Input voltage range | $V_{BICM}$ | Buffer amplifier | 1.5 | $V_{CC}$–1.5 | | V |
| Common-mode input voltage range | $V_{ICM}$ | Amplifier 2, amplifier 3 | 1.0 | $V_{CC}$–1.5 | | V |
| Input bias current | $I_B$ | | | 50 | 300 | nA |
| Output voltage | $V_O$ | 8 Ω load between pins 11 — 20, 5 — 26 | 2.8 | 3.3 | | V |
| Bridge output voltage difference | $V_{OD}$ | 8 Ω load between pins 11 — 20, 5 — 26 | 1.8 | 2.2 | | V |
| Closed-circuit voltage gain | VG | Specified Test Circuit, f = 1 kHz | 30 | 38 | | dB |
| Mute on voltage | $V_M$ | | | 0.7 | | V |
| Mute pin inflow current | $I_M$ | | | 3.0 | | μA |

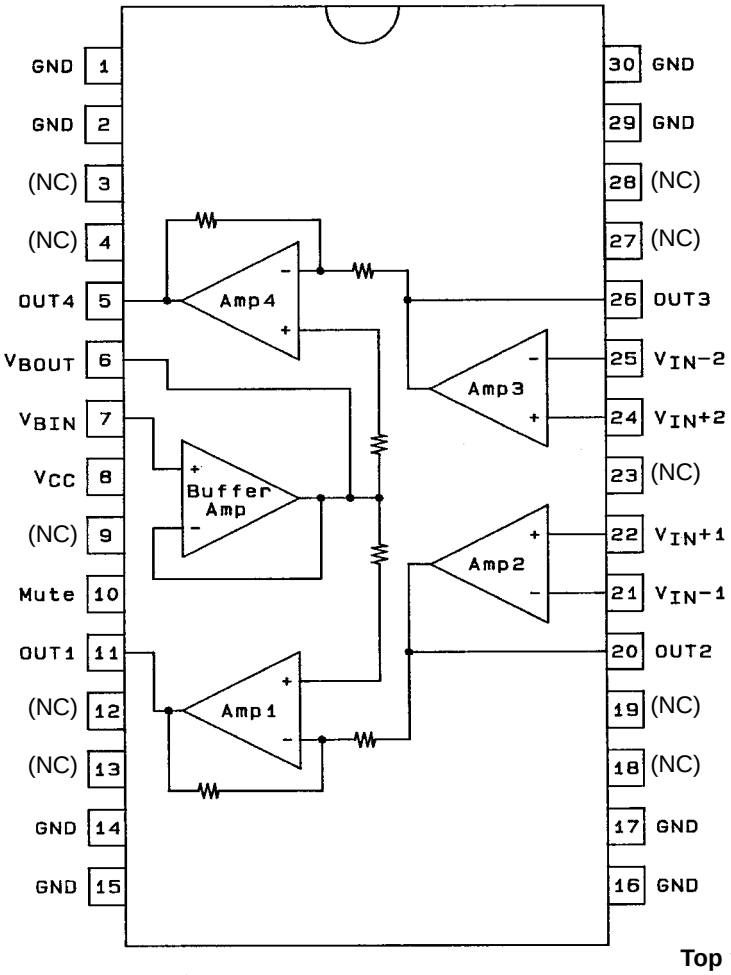
*Thermal shutdown function built in.

Notes:

1. When the muting function is on, the OUT1 to OUT4 outputs are turned off and the buffer output is not turned off.
2. This IC must be handled carefully owing to its susceptibility electrostatic discharge damage.



## Block Diagram and Pin Assignment




Do not use the NC pin.

**Top view**

A04479

## Test Method

| SW No. / Item | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $I_{CC}1$ | a | b | OFF | OFF | OFF | OFF | b | OFF | OFF | OFF | b | b | a | OFF | a | OFF | OFF | OFF | OFF | OFF | OFF | a | b |
| $I_{CC}2$ | a | c | OFF | OFF | OFF | OFF | b | OFF | OFF | OFF | b | b | a | OFF | a | OFF | OFF | OFF | OFF | OFF | OFF | a | b |
| $I_{CC}3$ | a | b | OFF | OFF | OFF | OFF | b | OFF | OFF | OFF | b | c | a | OFF | a | OFF | OFF | OFF | OFF | OFF | OFF | b | b |
| $I_{CC}4$ | a | c | OFF | OFF | OFF | OFF | b | OFF | OFF | OFF | b | c | a | OFF | a | OFF | OFF | OFF | OFF | OFF | OFF | b | b |
| $V_{OF}1,2$ | b | b | OFF | OFF | OFF | ON | b | OFF | OFF | OFF | b | c | a | OFF | a | OFF | OFF | ON | OFF | OFF | OFF | b | b |
| $V_{BIO}$ | b | b | OFF | OFF | OFF | ON | b | OFF | OFF | OFF | b | c | a | OFF | a | OFF | OFF | ON | OFF | OFF | OFF | b | b |
| $I_B$ | b | b | OFF | OFF | OFF | OFF | a | OFF | OFF | OFF | a | c | b | OFF | b | OFF | OFF | OFF | OFF | OFF | OFF | b | a |
| $V_O$ | b | b | OFF | ON | ON | OFF | b | OFF | ON | OFF | b | a | a | OFF | a | OFF | ON | OFF | ON | OFF | ON | b | b |
| $V_{OD}$ | b | b | OFF | OFF | ON | ON | b | OFF | OFF | OFF | b | a | a | OFF | a | OFF | OFF | ON | ON | OFF | OFF | b | b |
| VG | b | b | ON | OFF | OFF | OFF | a | ON | OFF | ON | b | c | a | ON | b | ON | OFF | OFF | OFF | ON | OFF | b | b |
| $V_M$ | b | a | OFF | ON | OFF | OFF | b | OFF | ON | OFF | b | c | a | OFF | a | OFF | ON | OFF | OFF | OFF | ON | b | b |

1. For $I_{CC}1$ to 4, measure the circuit current.
2. For $V_{OF}1$ and 2, measure the voltage between pins 11 and 20 and the voltage between pins 5 and 26.
3. For $V_{BIO}$, measure the voltage between pins 7 and 6.
4. For $I_B$, measure the voltage across the 100 kΩ resistor.
5. For $V_O$, measure the voltage on pins 11, 20, 5 and 26 by switching the input pin voltage to 0.5 V and 4.5 V, respectively.
6. For $V_{OD}$, measure the voltage between pins 11 and 20 and the voltage between pins 5 and 26.
7. For VG, measure the voltage on pins 11, 20, 5 and 26 at f = 1 kHz, and use the following formula:
   VG = 20 log $V_O/V_1$ dB.
8. $V_M$ is the mute voltage when the mute voltage is varied and the output is turned off.

## Test Circuit