



SANYO Semiconductors

DATA SHEET

Bi-CMOS LSI

LV4910T — Class-D Audio Power Amplifier

BTL 2W × 2ch

Overview

LV4910T is a stereo digital amplifier for portable equipment, for example notebook-PC, portable DVD and portable mini-speakers. It is characterized by the use of an original feedback technology to improve sound quality though it is Class-D amplifier, and does not need the LC filter in the output stage.

Features

- D-class high-efficiency amplifier
- Low pop sound at SW changeover
- Differential input type

Functions

- 2W stereo digital power amplifier
- Standby switch
- Mute switch
- Various protective circuits (over-current protective, thermal protective, and under-voltage circuits) incorporated

Specifications

Absolute Maximum Ratings at Ta = 25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|---------------------|-----------------------------|-------------|------|
| Maximum supply voltage | V _{CC} max | | 6 | V |
| Allowable power dissipation | P _d max | as mounted on the substrate | 1.05 | W |
| Operating temperature | T _{opr} | | -20 to +75 | °C |
| Storage temperature | T _{stg} | | -40 to +150 | °C |

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LV4910T

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|--------------------------------|---------------------|------------|------------|----------|
| Recommended supply voltage | V_{CC} | | 5 | V |
| Operation supply voltage range | $V_{CC\text{ opg}}$ | | 2.5 to 5.5 | V |
| Recommended load resistance | R_L | Speaker | 4 | Ω |

Electrical Characteristics $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $f = 1\text{kHz}$, $R_L = 4\Omega$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---------------------------------|-----------------------|--|---------|-----|-----|---------------|
| | | | min | typ | max | |
| Standby current | I_{st} | Current at ST ON | | | 1 | μA |
| Current at no signal | I_{CCO1} | At LC filter-less | | 12 | 20 | mA |
| Current at Mute | $I_{CCO\text{ mute}}$ | At Mute of speaker | | 10 | 16 | mA |
| Voltage gain | V_G | $V_O = 0\text{dBm}$ | 21 | 23 | 25 | dB |
| Channel balance | ΔV_G | $V_O = 0\text{dBm}$ | -1 | 0 | 1 | dB |
| Output power | P_O | THD = 10% | | 2 | | W |
| Total harmonic distortion | THD | $P_O = 0.5\text{W}$, DIN AUDIO | | 0.4 | 0.7 | % |
| Output noise voltage | V_{NO} | $R_g = 0$, DIN AUDIO | | 100 | 200 | μV |
| Crosstalk | CT | $V_O = 0\text{dBm}$, TUN 1kHz | | -60 | -40 | dB |
| Ripple rejection ratio | RR | $f_r = 100\text{Hz}$, $V_r = -10\text{dBm}$, TUN 100Hz | | -40 | -30 | dB |
| Common mode rejection ratio | CMRR | $V_O = 0\text{dBm}$, DIN AUDIO | | -60 | -40 | dB |
| Mute attenuation value | V_{OFF} | $V_O = 0\text{dBm}$, DIN AUDIO | | -80 | -70 | dB |
| Oscillation frequency | F_{PWM} | | | 300 | | kHz |
| Standby ON voltage sensitivity | V_{PWROFF} | Standby ON start voltage | | | 1 | V |
| Standby OFF voltage sensitivity | V_{PWRON} | Standby OFF start voltage | 3 | | | V |
| Mute ON voltage sensitivity | V_{MUTEON} | Mute ON start voltage | | | 0.5 | V |
| Mute OFF voltage sensitivity | $V_{MUTEOFF}$ | Mute OFF start voltage | 2 | | | V |

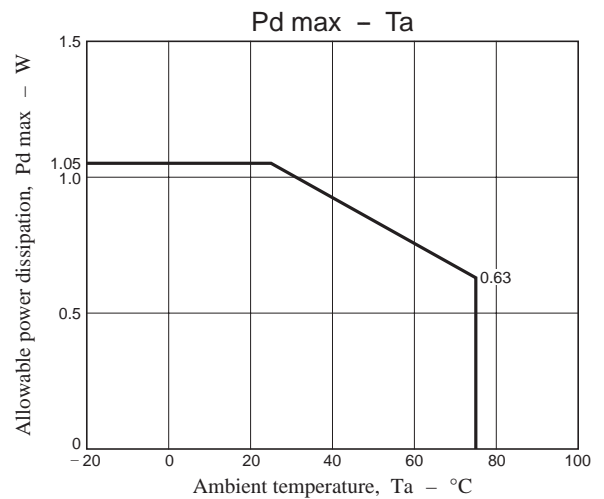
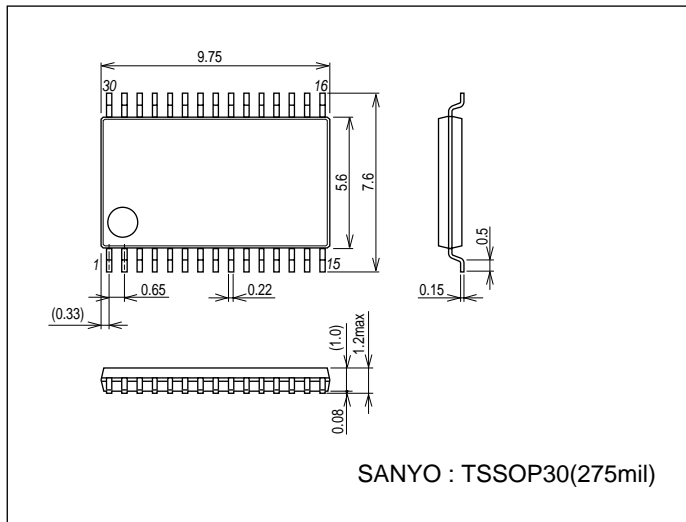
* Electrical characteristics vary depending on the substrate layout and selection of external parts.

For measurement of the above characteristics, the coil : 22 μH (Toko Kabushiki Kaisha made D63CB) is used.

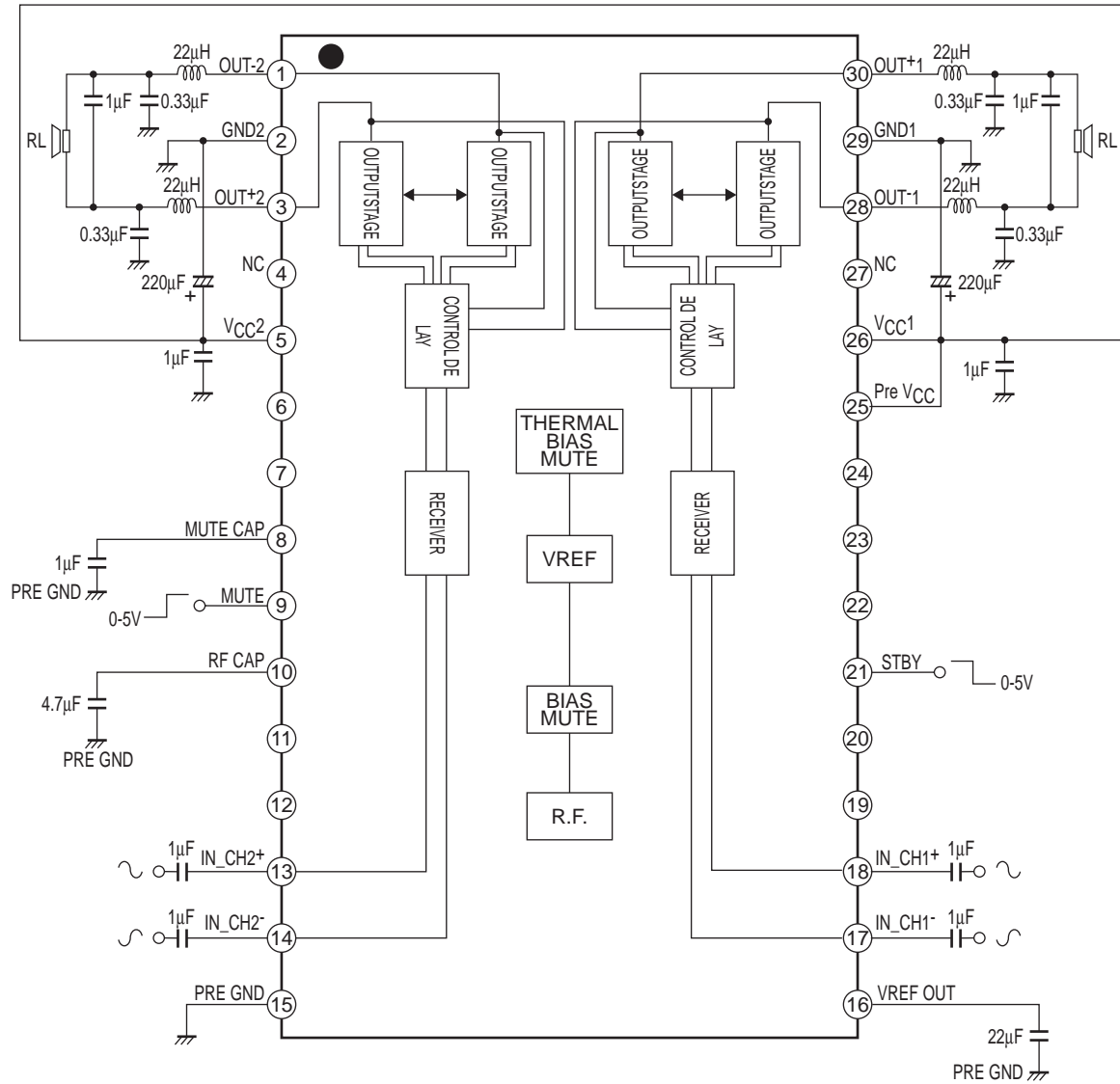
Package Dimensions

unit : mm (typ)

3259



Block Diagram

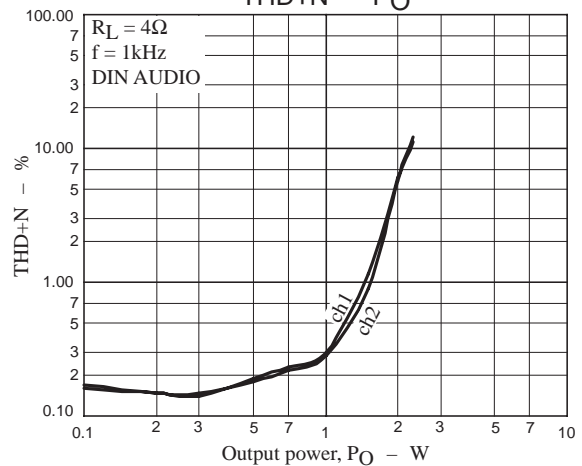
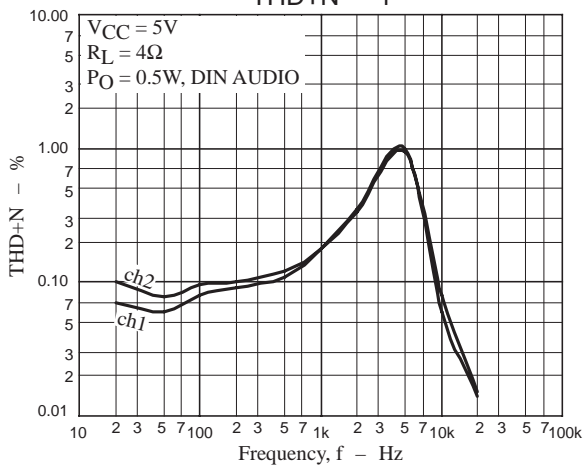
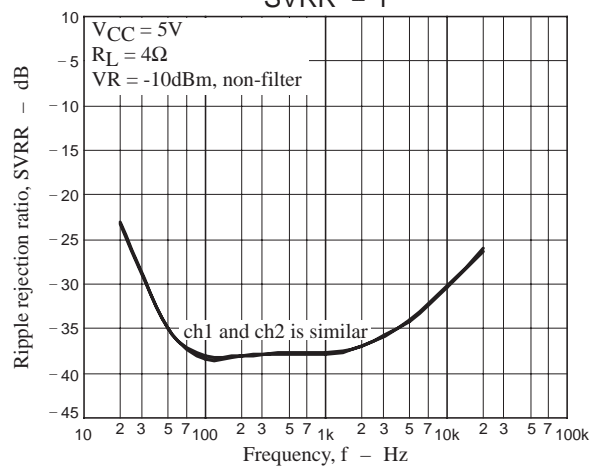
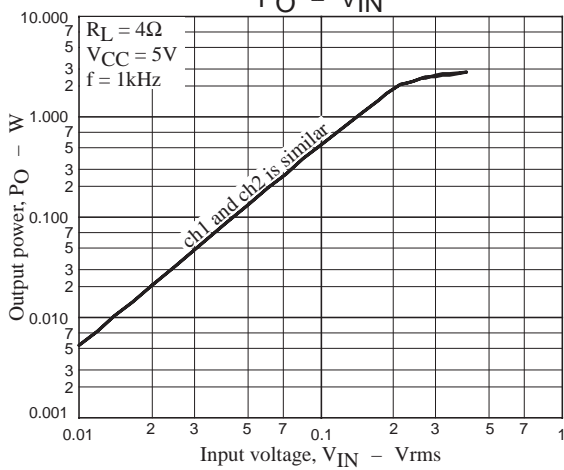
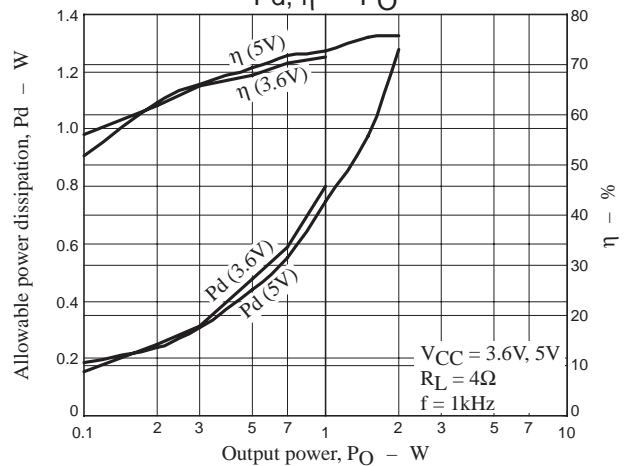
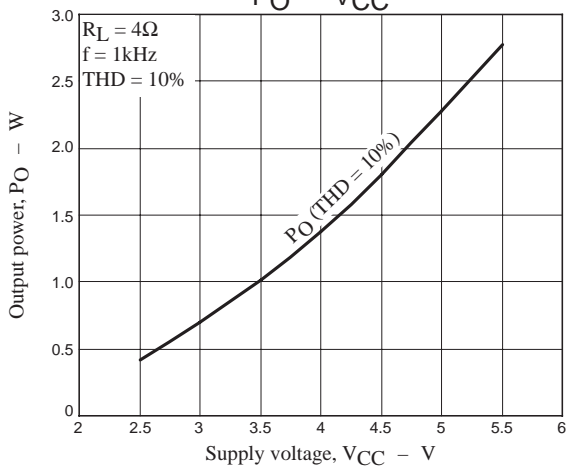
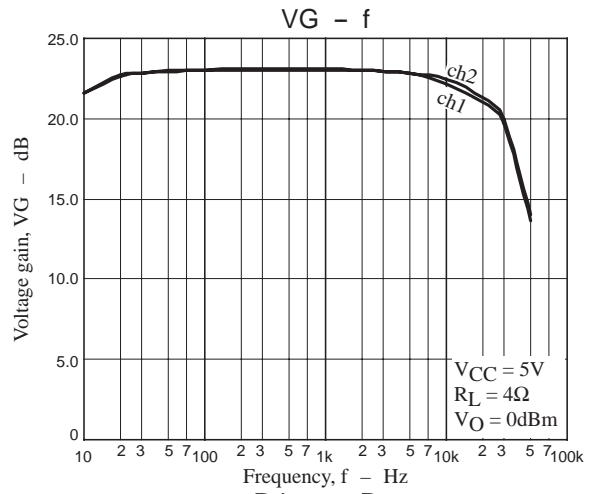
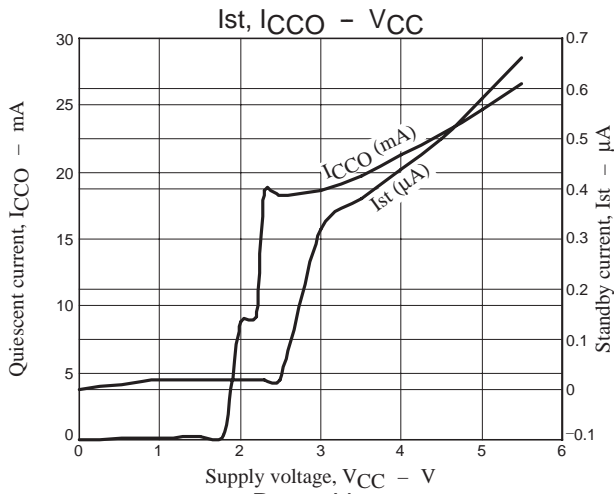


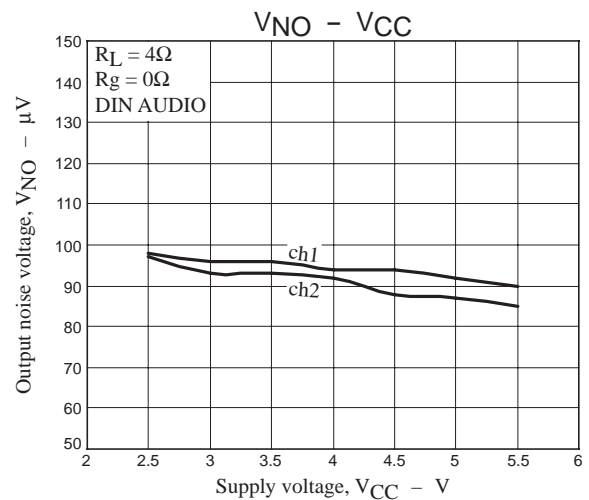
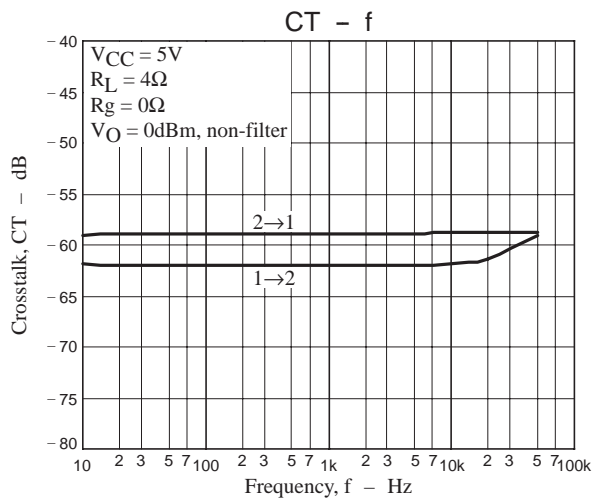
Pin Descriptions

| Pin No. | Pin name | Pin voltage (V) | Pin description | Equivalent circuit |
|----------------------|--|-----------------|---|--------------------|
| 1 3 28 30 | OUT ⁻ 2 OUT ⁺ 2 OUT ⁻ 1 OUT ⁺ 1 | 2.58 | <ul style="list-style-type: none"> Power outputs | |
| 2 | GND2 | 0 | | |
| 4 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 5 | V _{CC} 2 | 5 | | |
| 6 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 7 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 8 | MUTE CAP | 4.9 | <ul style="list-style-type: none"> Connection for the mute switch On/Off impulse noise reduction capacitor | |
| 9 | MUTE | | <ul style="list-style-type: none"> Mute On/Off switch 2 to 5.5V : Mute Off 0 to 0.7V : Mute On | |
| 10 | RF CAP | 2.6 | <ul style="list-style-type: none"> Ripple filter reference | |
| 11 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 12 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 13 14 17 18 | IN _{ch2} ⁺ IN _{ch2} ⁻ IN _{ch1} ⁻ IN _{ch1} ⁺ | 2.4 | <ul style="list-style-type: none"> Signal input | |

Continued on next page.

| Pin No. | Pin name | Pin voltage (V) | Pin description | Equivalent circuit |
|---------|---------------------|-----------------|---|--------------------|
| 15 | PRE GND | 0 | | |
| 16 | VREF OUT | 2.55 | <ul style="list-style-type: none"> VREF amplifier reference | |
| 19 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 20 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 21 | STBY | | <ul style="list-style-type: none"> STBY On/Off switch 0 to 1V : Power Off 3 to 5.5V : Power On | |
| 22 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 23 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 24 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 25 | PRE V _{CC} | 5 | | |
| 26 | V _{CC} 1 | 5 | | |
| 27 | NC | | <ul style="list-style-type: none"> Non-connection | |
| 29 | GND1 | 0 | | |





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