



SANYO Semiconductors

# DATA SHEET

## LV4910T — Bi-CMOS LSI 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  $T_a = 25^\circ\text{C}$

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	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-40 to +150	$^\circ\text{C}$

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## 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	$\Omega$

## 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	$\mu\text{A}$
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	VG	$V_O = 0\text{dBm}$	21	23	25	dB
Channel balance	$\Delta\text{VG}$	$V_O = 0\text{dBm}$	-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	$\mu\text{V}$
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

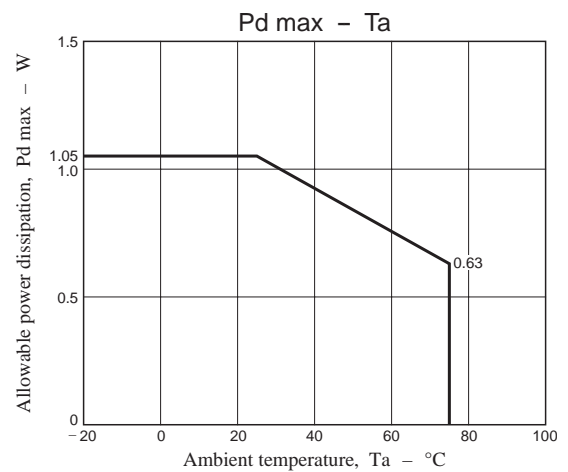
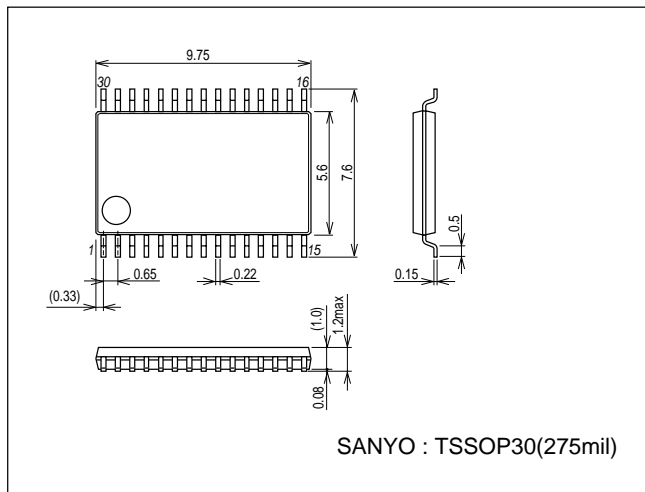
\* Electrical characteristics vary depending on the substrate layout and selection of external parts.

For measurement of the above characteristics, the coil : 22 $\mu\text{H}$  (Toko Kabushiki Kaisha made D63CB) is used.

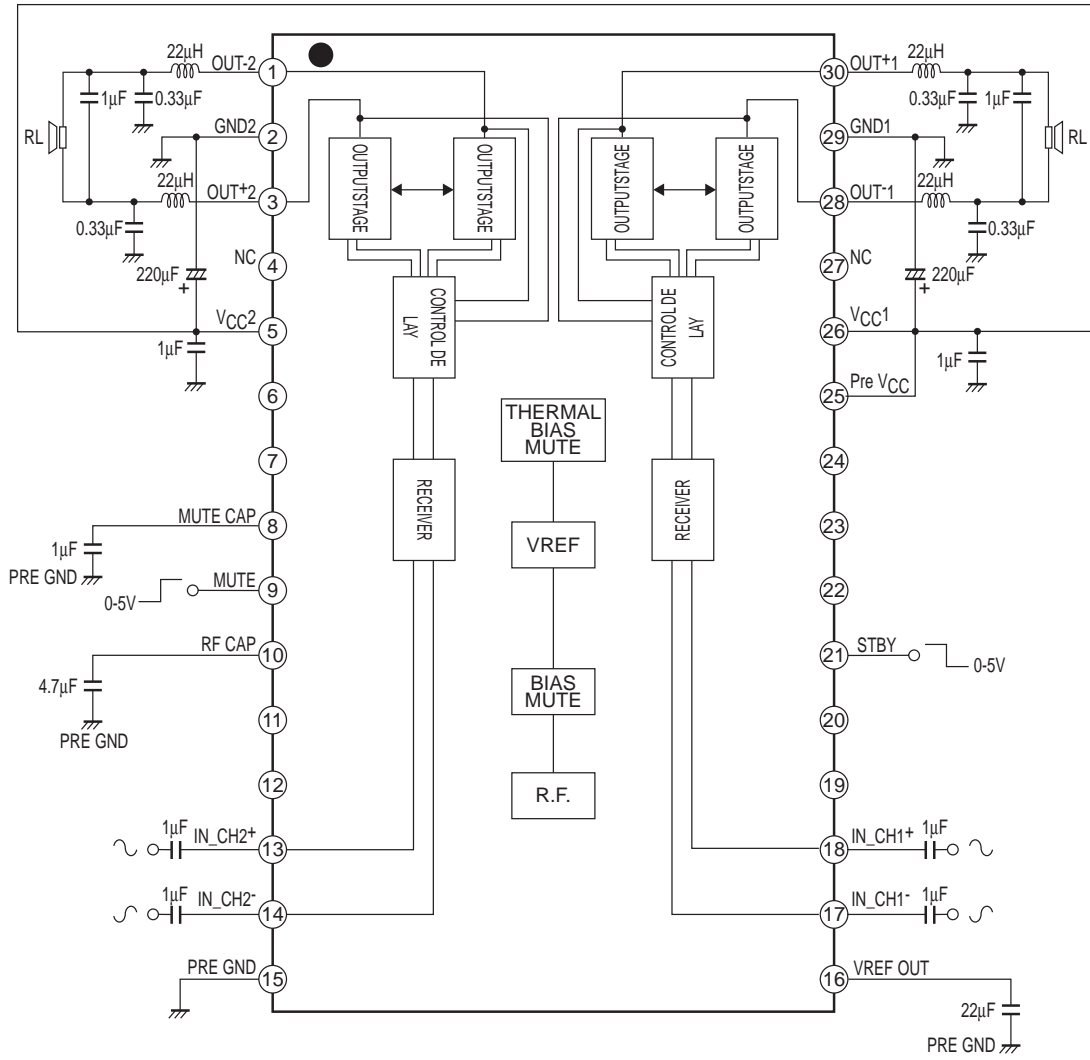
## Package Dimensions

unit : mm (typ)

3259



Block Diagram



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## 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"> <li>Power outputs</li> </ul>	
2	GND2	0		
4	NC		<ul style="list-style-type: none"> <li>Non-connection</li> </ul>	
5	VCC2	5		
6	NC		<ul style="list-style-type: none"> <li>Non-connection</li> </ul>	
7	NC		<ul style="list-style-type: none"> <li>Non-connection</li> </ul>	
8	MUTE CAP	4.9	<ul style="list-style-type: none"> <li>Connection for the mute switch On/Off impulse noise reduction capacitor</li> </ul>	
9	MUTE		<ul style="list-style-type: none"> <li>Mute On/Off switch</li> <li>2 to 5.5V : Mute Off</li> <li>0 to 0.7V : Mute On</li> </ul>	
10	RF CAP	2.6	<ul style="list-style-type: none"> <li>Ripple filter reference</li> </ul>	
11	NC		<ul style="list-style-type: none"> <li>Non-connection</li> </ul>	
12	NC		<ul style="list-style-type: none"> <li>Non-connection</li> </ul>	
13 14 17 18	IN_ch2+ IN_ch2- IN_ch1- IN_ch1+	2.4	<ul style="list-style-type: none"> <li>Signal input</li> </ul>	

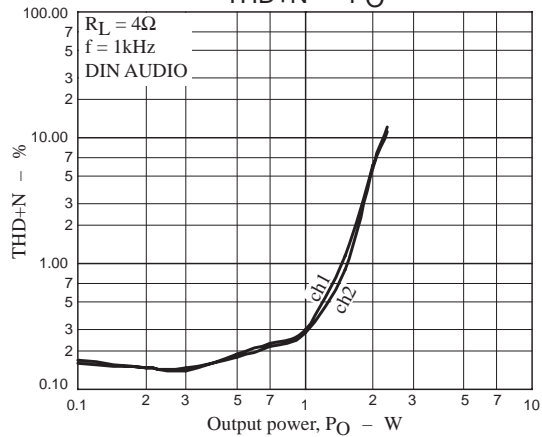
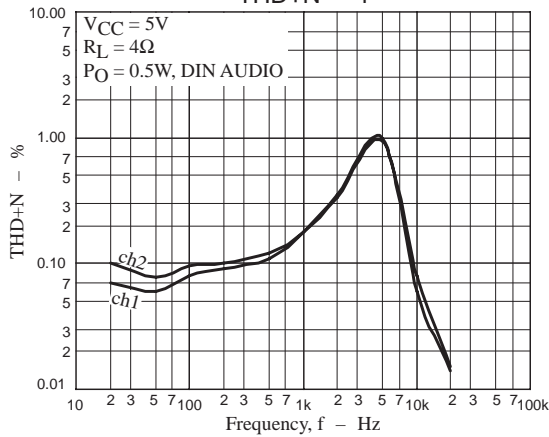
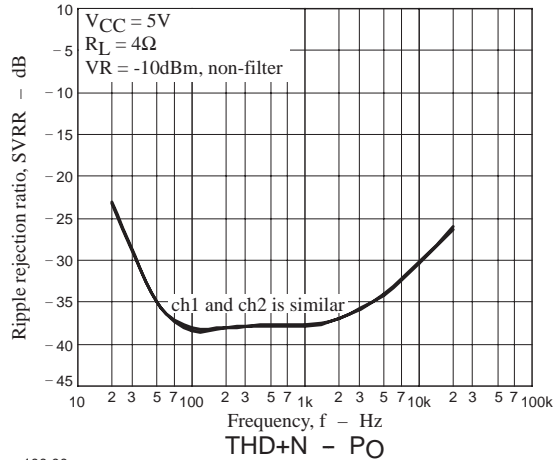
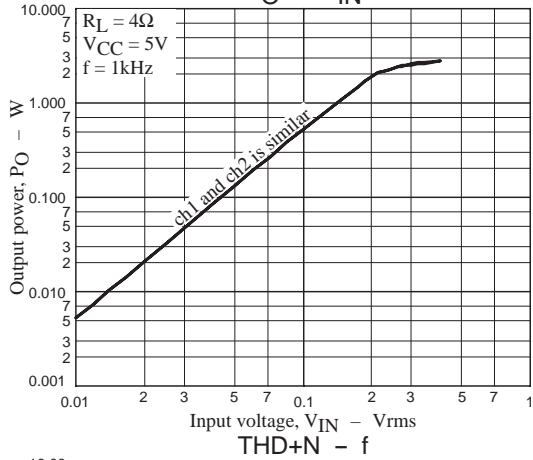
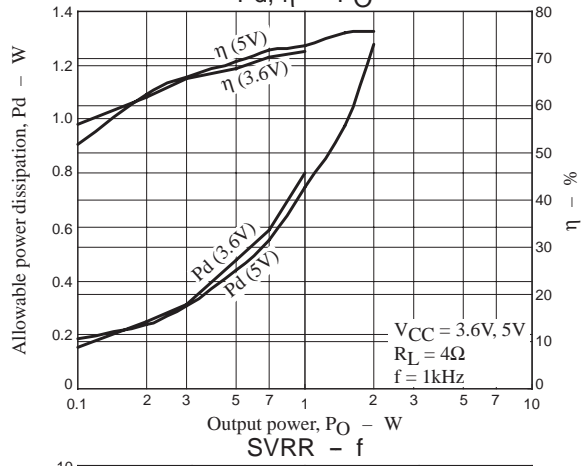
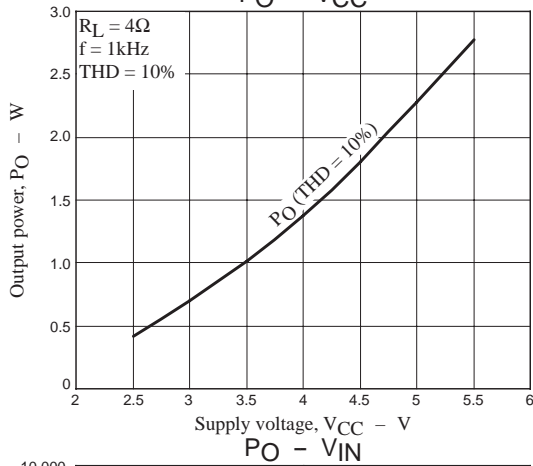
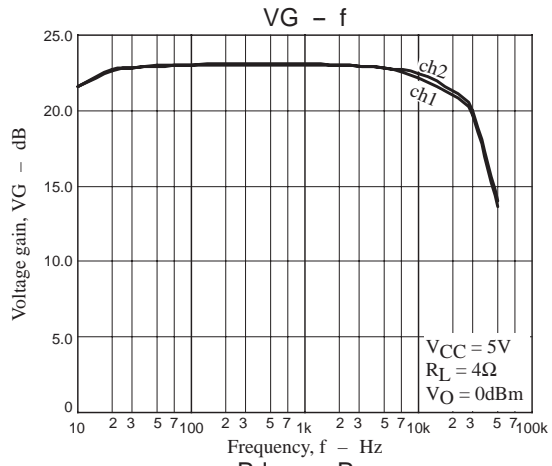
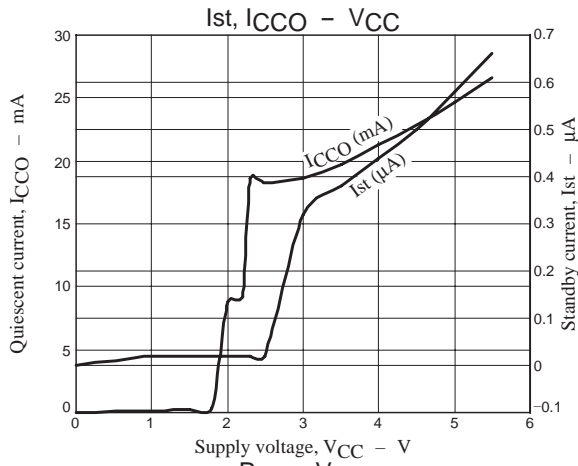
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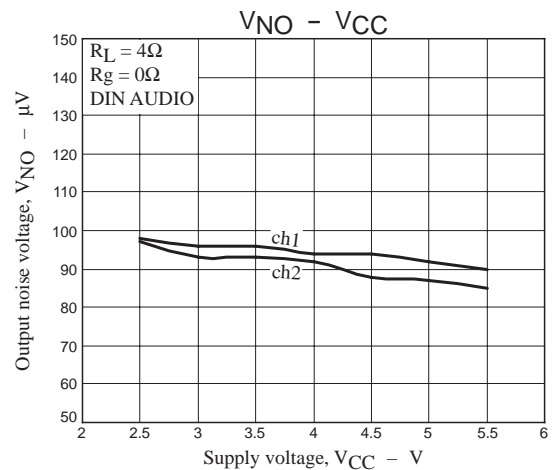
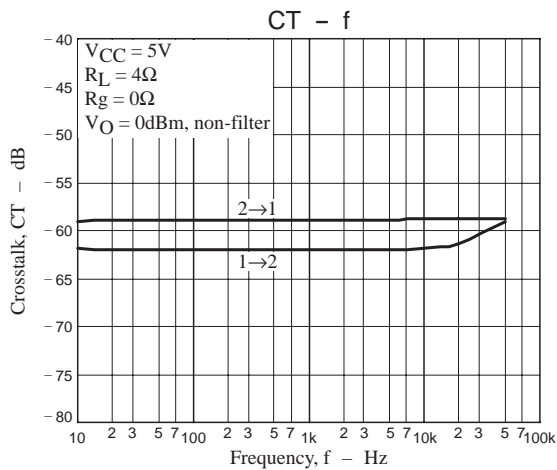
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Pin No.	Pin name	Pin voltage (V)	Pin description	Equivalent circuit
15	PRE GND	0		
16	VREF OUT	2.55	<ul style="list-style-type: none"> <li>• VREF amplifier reference</li> </ul>	
19	NC		<ul style="list-style-type: none"> <li>• Non-connection</li> </ul>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

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