Ordering number : ENA0893

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	Pd max	as mounted on the substrate	1.05	W
Operating temperature	Topr		-20 to +75	°C
Storage temperature	Tstg		-40 to +150	°C

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Operating Conditions at Ta = 25°C

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

Electrical Characteristics Ta = 25°C, V_{CC} = 5V, f = 1kHz, R_L = 4Ω

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Standby current	Ist	Current at ST ON			1	μA
Current at no signal	$I_{CCO}1$	At LC filter-less		12	20	mA
Current at Mute	I_{CCO} mute	At Mute of speaker		10	16	mA
Voltage gain	VG	V_O = 0dBm	21	23	25	dB
Channel balance	ΔVG	V_O = 0dBm	-1	0	1	dB
Output power	P_O	THD = 10%		2		W
Total harmonic distortion	THD	P_O = 0.5W, DIN AUDIO		0.4	0.7	%
Output noise voltage	V_{NO}	Rg = 0, DIN AUDIO		100	200	μV
Crosstalk	CT	V_O = 0dBm, TUN 1kHz		-60	-40	dB
Ripple rejection ratio	RR	fr = 100Hz, Vr = -10dBm, TUN 100Hz		-40	-30	dB
Common mode rejection ratio	CMRR	V_O = 0dBm, DIN AUDIO		-60	-40	dB
Mute attenuation value	V_{OFF}	V_O = 0dBm, 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

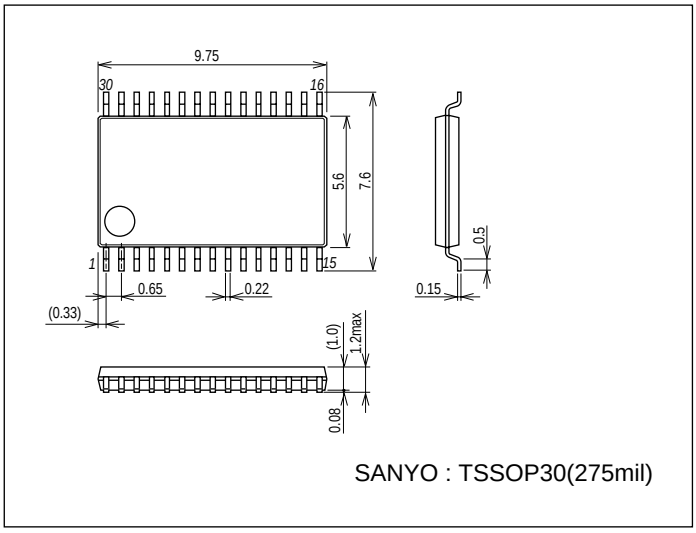
* Electrical characteristics vary depending on the substrate layout and selection of external parts.

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

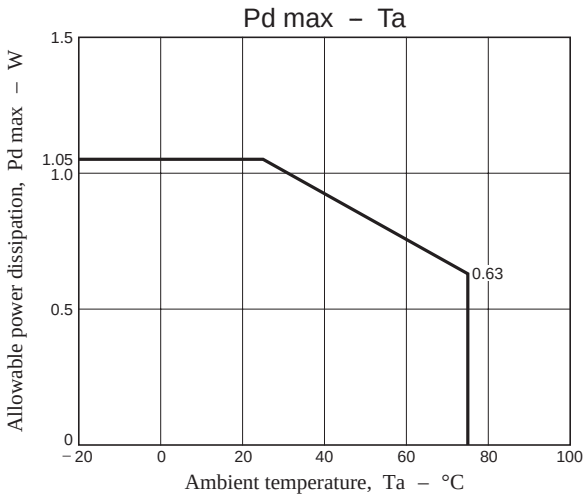
Package Dimensions

unit : mm (typ)

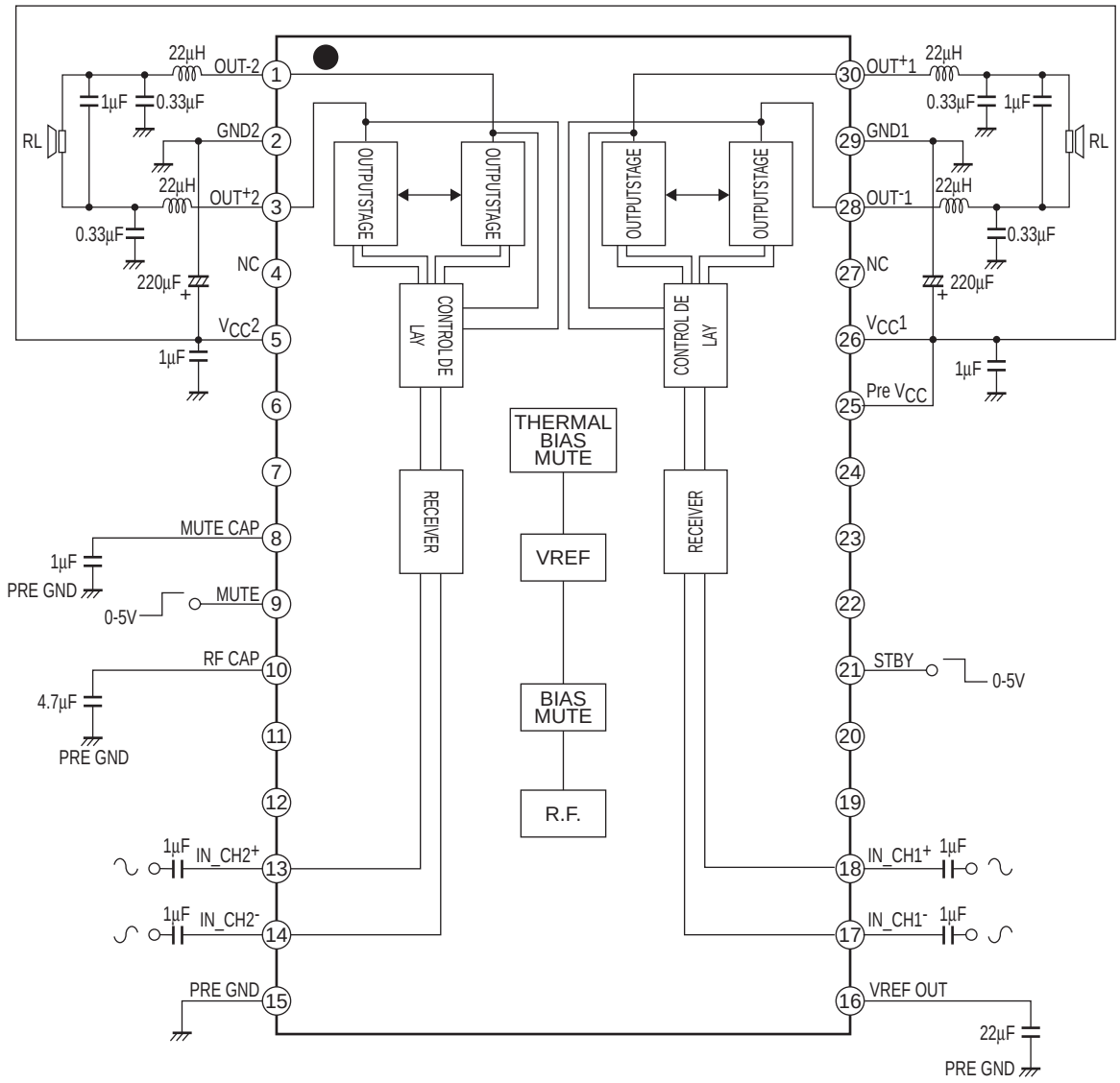
3259



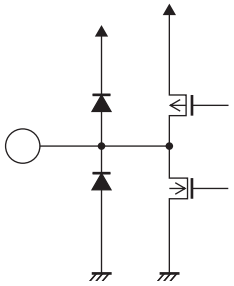
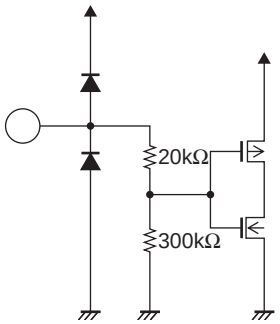
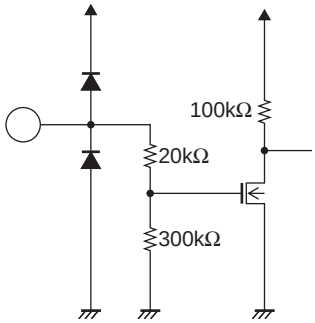
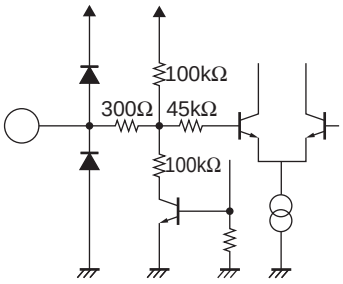
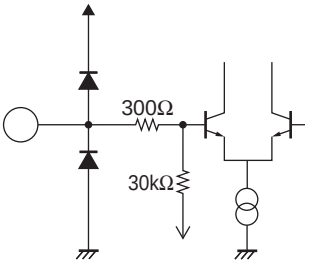
SANYO : TSSOP30(275mil)



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	• Power outputs	
2	GND2	0		
4	NC		• Non-connection	
5	$V_{CC}2$	5		
6	NC		• Non-connection	
7	NC		• Non-connection	
8	MUTE CAP	4.9	• Connection for the mute switch On/Off impulse noise reduction capacitor	
9	MUTE		• Mute On/Off switch • 2 to 5.5V : Mute Off • 0 to 0.7V : Mute On	
10	RF CAP	2.6	• Ripple filter reference	
11	NC		• Non-connection	
12	NC		• Non-connection	
13 14 17 18	IN_ch2^+ IN_ch2^- IN_ch1^- IN_ch1^+	2.4	• Signal input	

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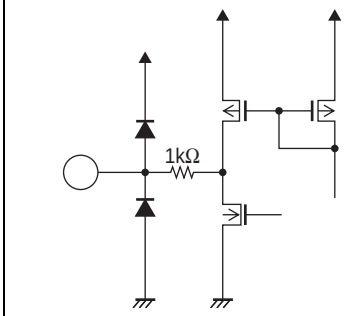
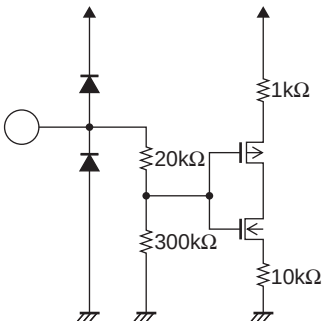
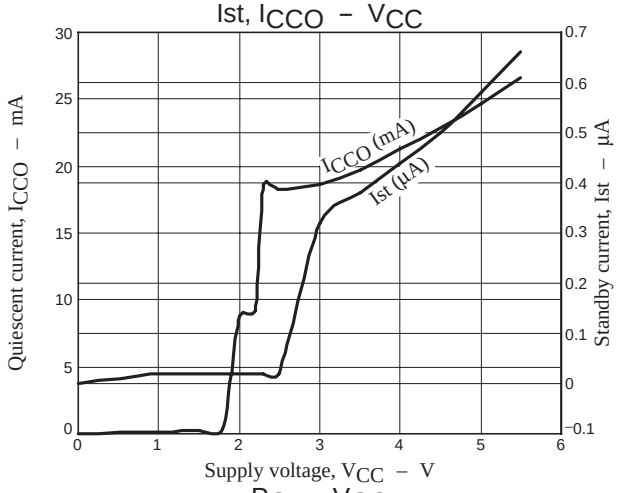
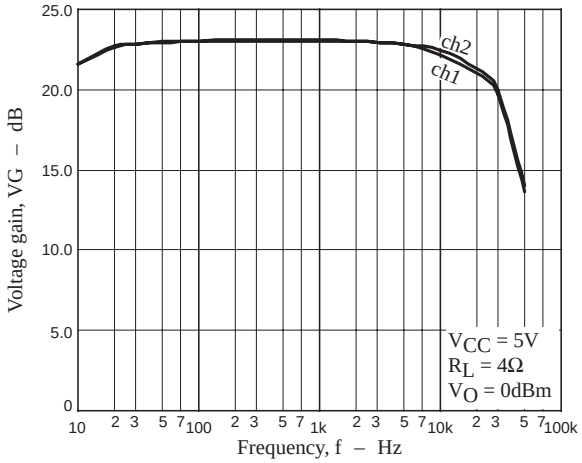
Pin No.	Pin name	Pin voltage (V)	Pin description	Equivalent circuit
15	PRE GND	0		
16	VREF OUT	2.55	• VREF amplifier reference	
19	NC		• Non-connection	
20	NC		• Non-connection	
21	STBY		• STBY On/Off switch • 0 to 1V : Power Off • 3 to 5.5V : Power On	
22	NC		• Non-connection	
23	NC		• Non-connection	
24	NC		• Non-connection	
25	PRE V_{CC}	5		
26	$V_{CC}1$	5		
27	NC		• Non-connection	
29	GND1	0		

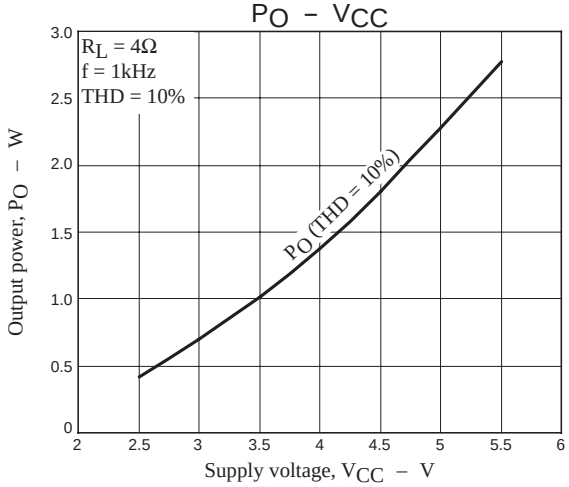
Ist, I_{CCO} – V_{CC}



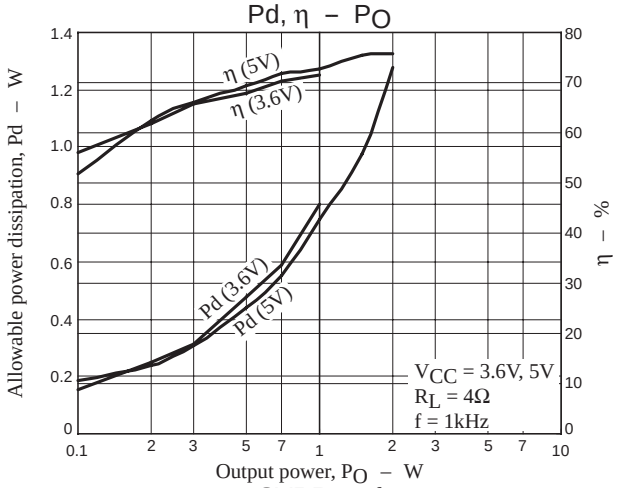
VG – f



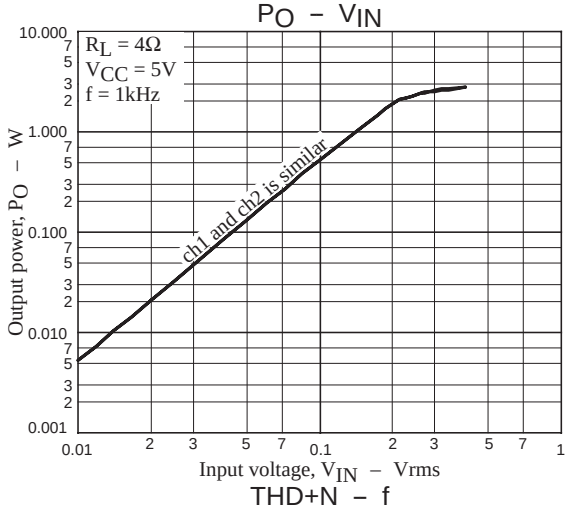
P_O – V_{CC}



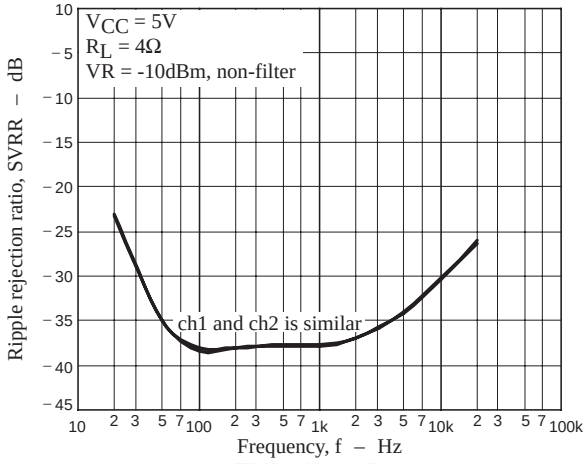
Pd, η – P_O



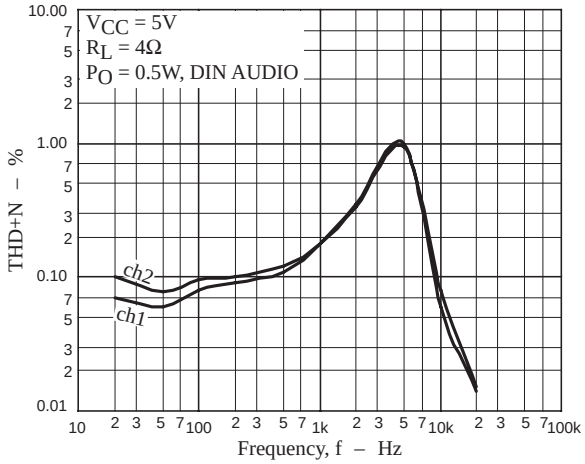
P_O – V_{IN}



SVRR – f



THD+N – f



THD+N – P_O