Ordering number : ENA0893

LV4910T

ON Semiconductor®

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Bi-CMOS LSI

Class-D Audio Power Amplifier BTL 2W x 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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

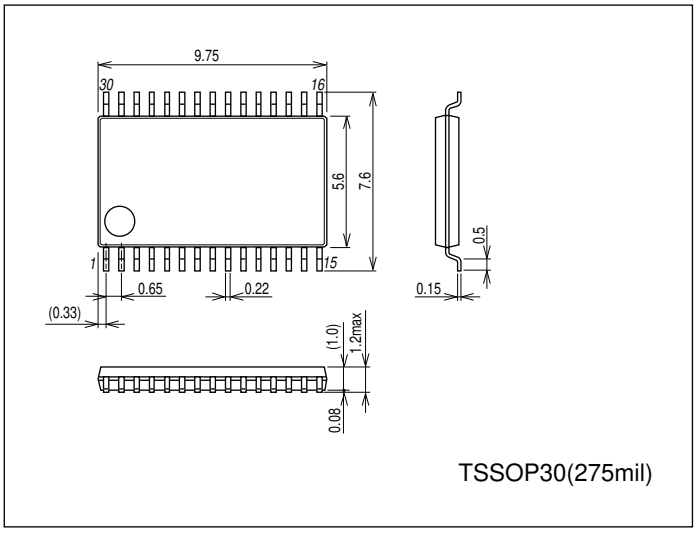
* Electrical characteristics vary depending on the substrate layout and selection of external parts.

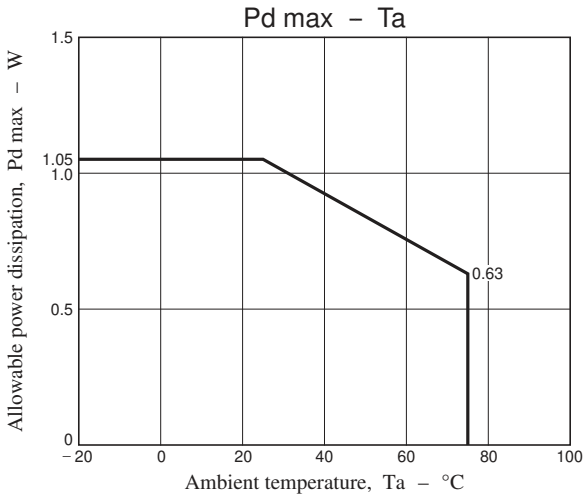
For measurement of the above characteristics, the coil : 22μH (Toko Kabushiki Kaisha made D63CB) is used.

Package Dimensions

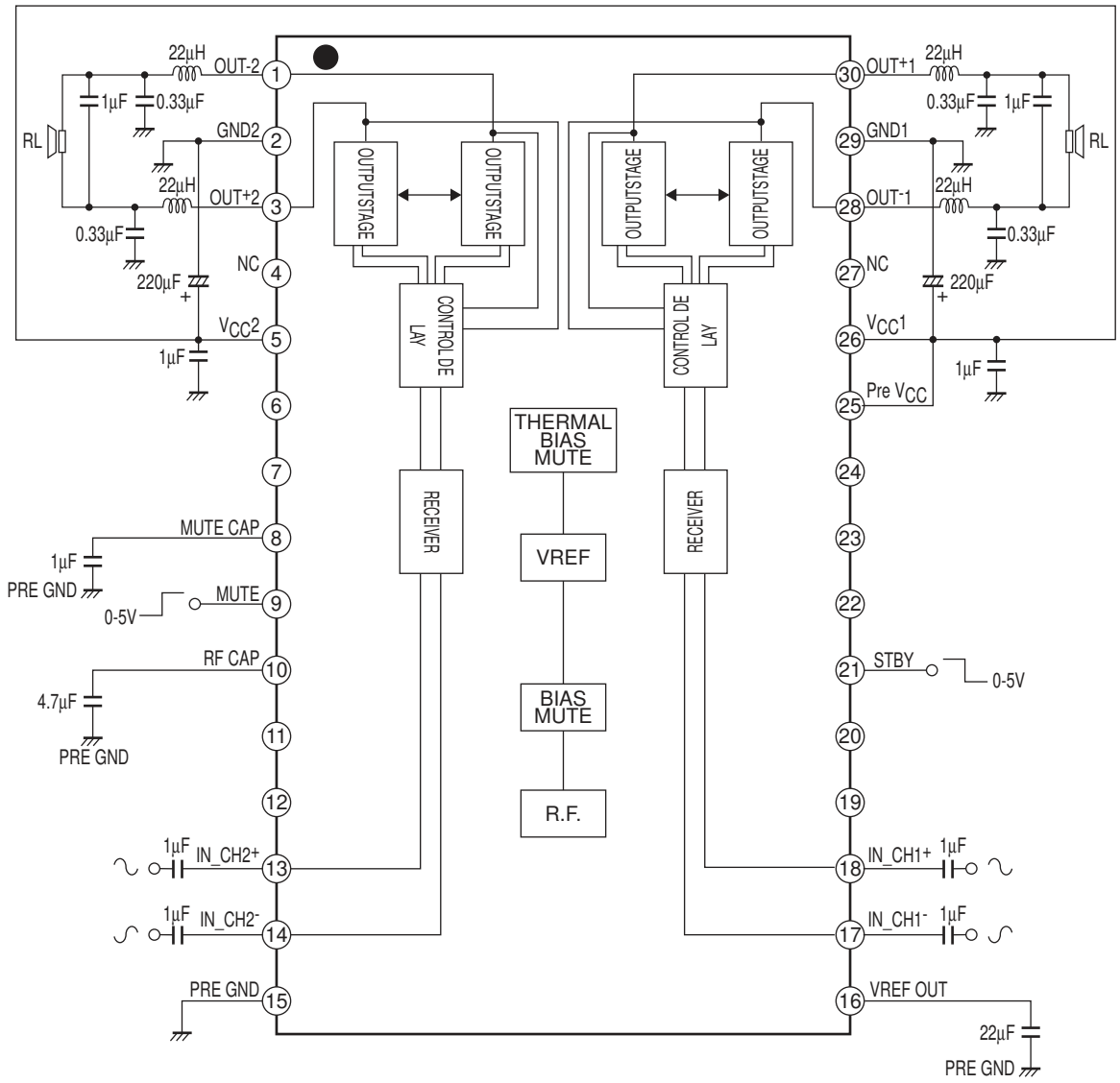
unit : mm (typ)

3259

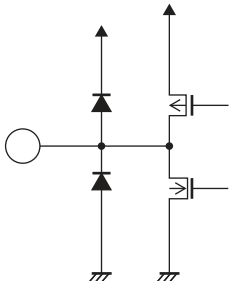
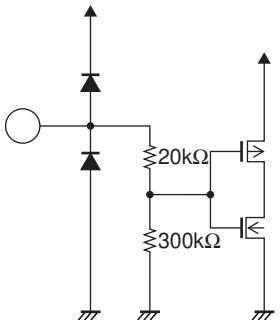
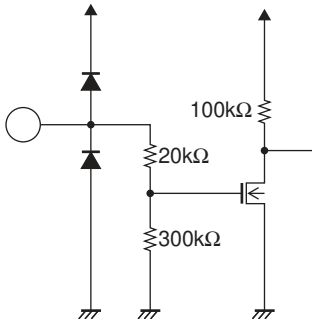
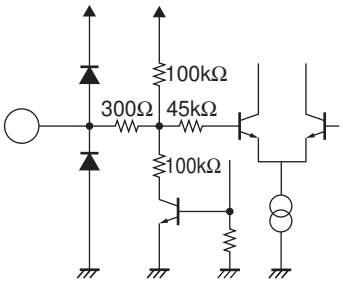
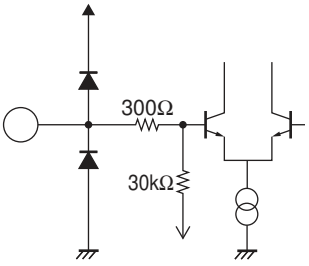




Block Diagram



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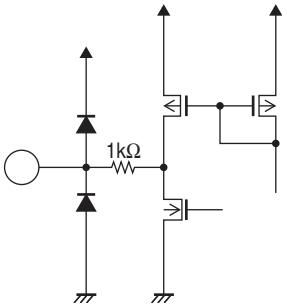
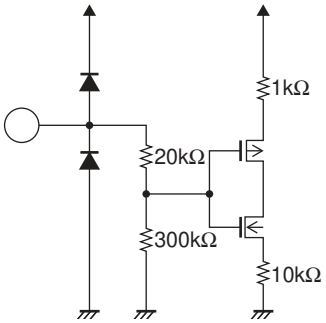
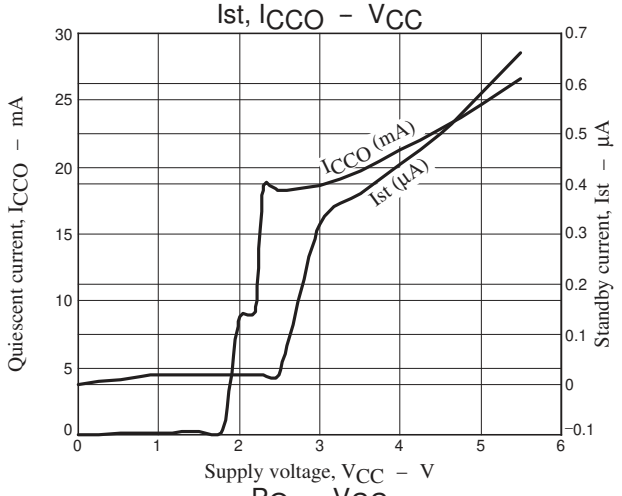
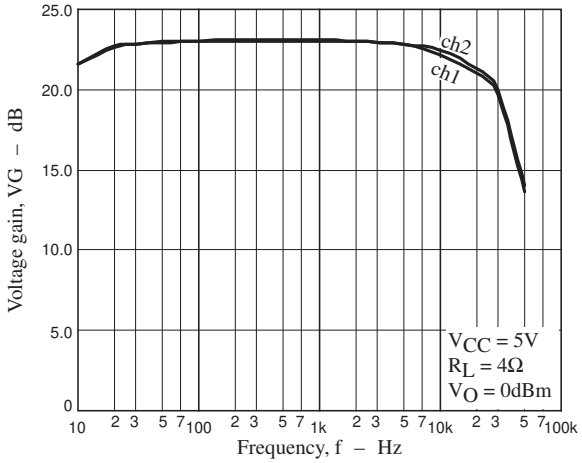
Pin No.	Pin name	Pin voltage (V)	Pin description	Equivalent circuit
15	PRE GND	0		
16	VREF OUT	2.55	• VREF amplifier reference	
19	NC		• Non-connection	
20	NC		• Non-connection	
21	STBY		• STBY On/Off switch • 0 to 1V : Power Off • 3 to 5.5V : Power On	
22	NC		• Non-connection	
23	NC		• Non-connection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

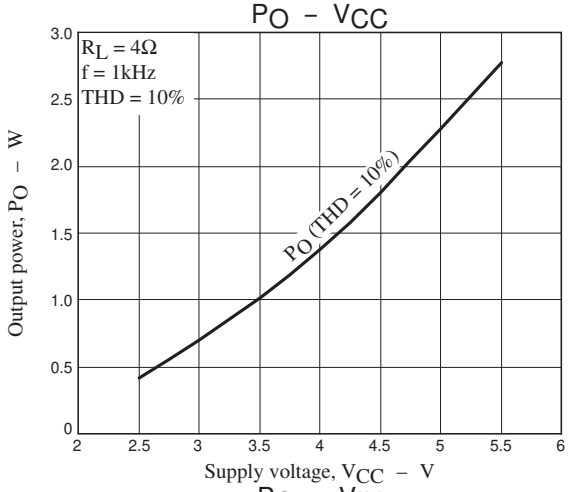
Ist, I_{CCO} – V_{CC}



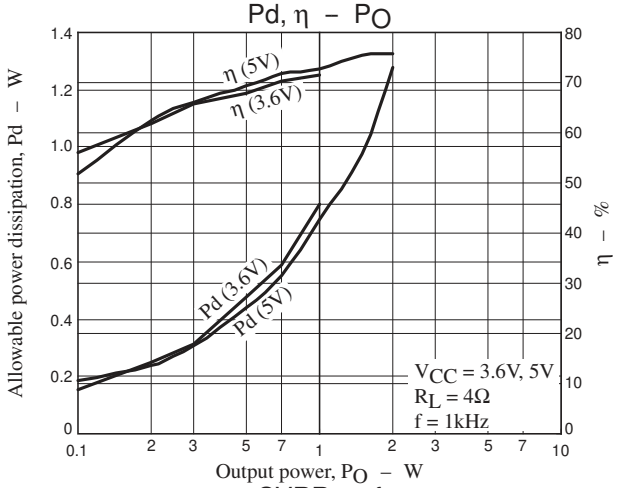
VG – f



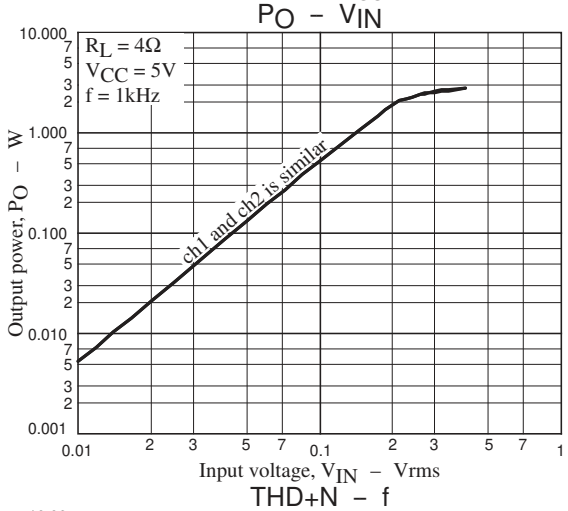
P_O – V_{CC}



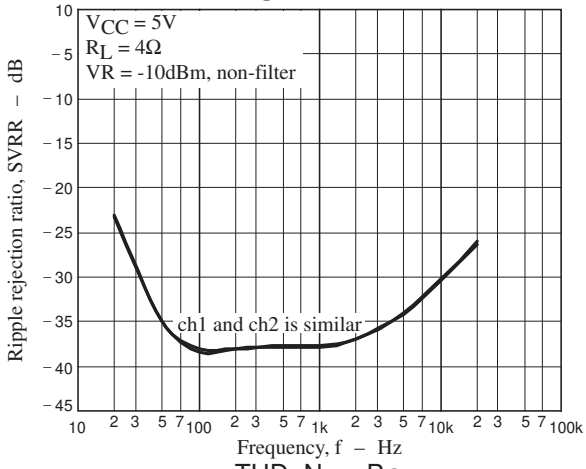
Pd, η – P_O



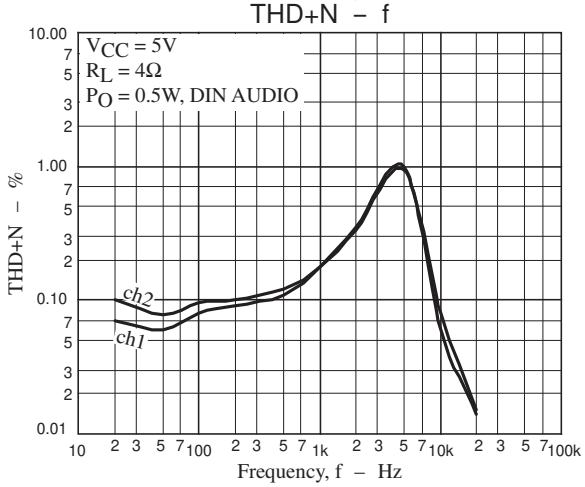
P_O – V_{IN}



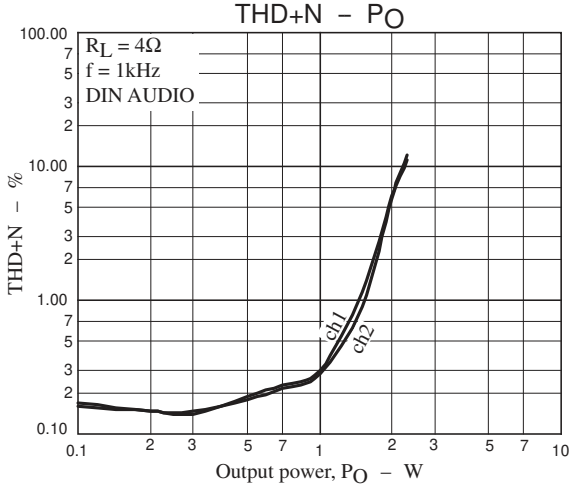
SVRR – f

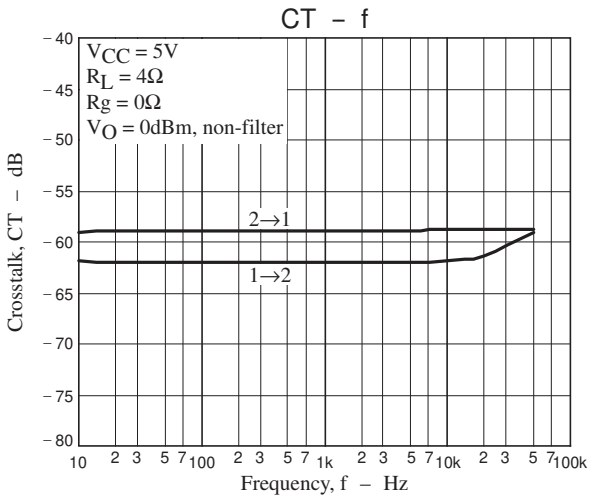


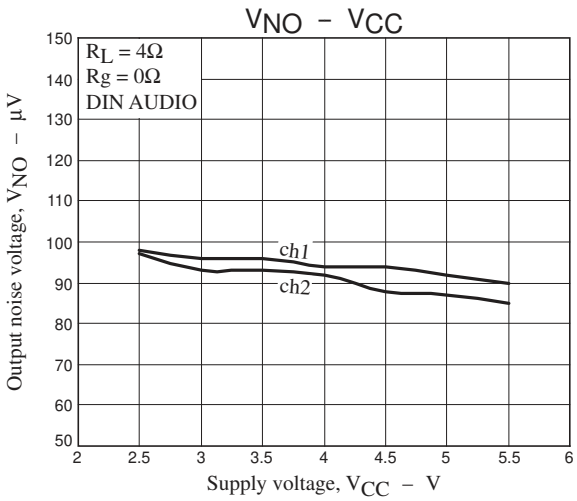
THD+N – f



THD+N – P_O







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