

Ordering number : ENN7139

Monolithic Linear IC



LA2901V

Four-Channel High-Output Line Amplifier for Car Audio Systems

Overview

The LA2901V is a high output level 4-channel line amplifier designed for car audio systems. This line amplifier provides an output signal with a significantly higher amplitude than the output signal provided by earlier preamplifiers. This higher amplitude significantly improves the signal-to-noise ratio in the connection from the main unit to the external power amplifier, and results in improved power amplifier performance.

The LA2901V also significantly reduces the required mounting area by cutting in half the number of external capacitors required for boosting the signal-system supply voltage and is available in SSOP miniature package.

Functions and Features

- High output level (5.3 Vrms)
- Low output noise voltage (12 μ V)
- Low total harmonic distortion (0.004%)
- High ripple rejection ratio (70 dB)
- Fewer external parts required
- Excellent audio fidelity

Specifications

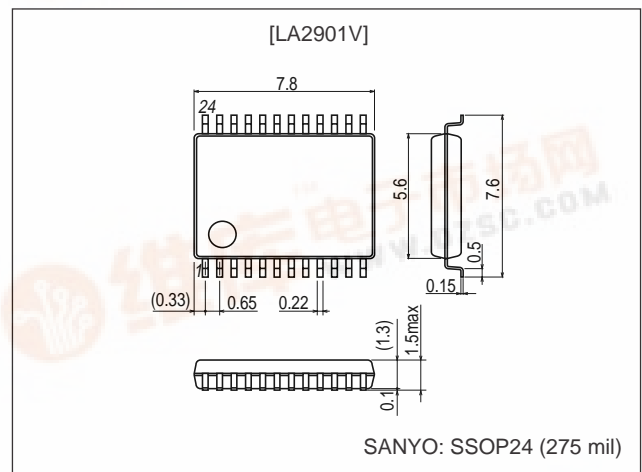
Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$	With no input signal	13	V
Allowable power dissipation	$P_d \text{ max}$	$T_a \leq 85^\circ\text{C}$, Mounted on a printed circuit board (114.3 \times 76.1 \times 1.6 mm ³ , glass epoxy)	400	mW
Operating temperature	T_{opr}		-40 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +150	$^\circ\text{C}$

Package Dimensions

unit: mm

3175B-SSOP24 (275 mil)



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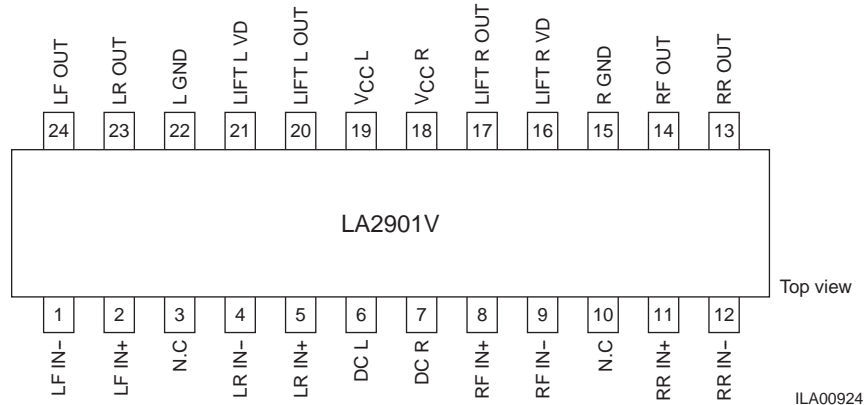
Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended operating voltage	V_{CC}		9	V
Allowable operating supply voltage range	V_{CCOP}		6 to 12	V
Recommended load resistance	R_{LOP}		10	$k\Omega$

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 9\text{ V}$, $R_L = 10\text{ k}\Omega$, $f = 1\text{ kHz}$, $R_g = 600\Omega$

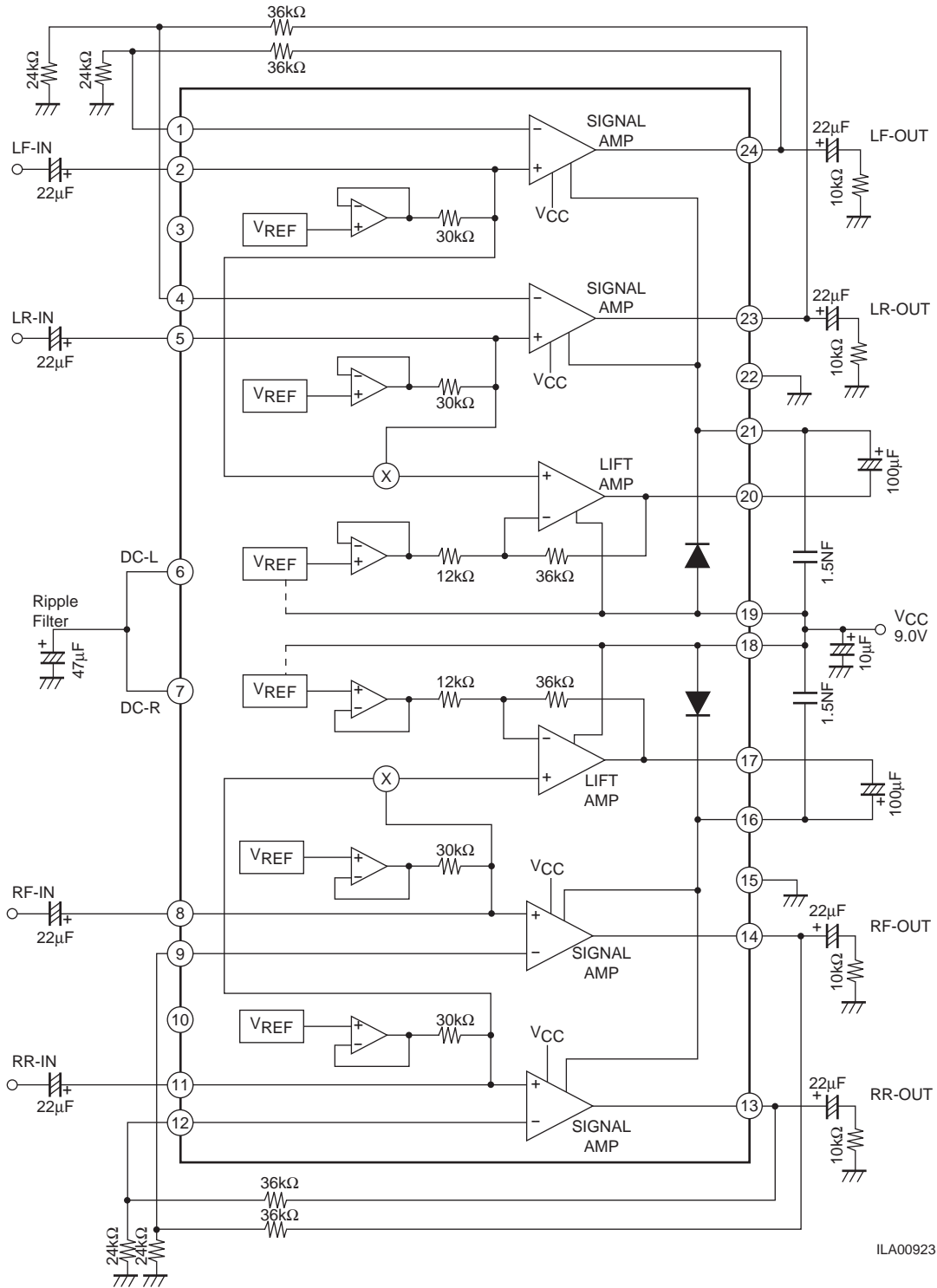
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	$R_g = 0$	10	16	22	mA
Voltage gain	V_G	$V_O = 0\text{ dBm}$	7.5	8	8.5	dB
Output voltage	V_O	THD = 0.1%	5.0	5.3		V _{rms}
Total harmonic distortion	THD	$V_O = 3\text{ Vrms}$, LPF = 80 kHz		0.004	0.01	%
Output noise voltage	V_{NO}	$R_g = 0$, BPF = 20 Hz to 20 kHz		12	17	μVrms
Ripple rejection ratio	SVRR	$R_g = 0$, $f_r = 100\text{ Hz}$, $V_r = 100\text{ mVrms}$, BPF = 20 Hz to 20 kHz	60	70		dB
Channel separation	CH_{sep}	$R_g = 10\text{ k}\Omega$, $V_O = 1\text{ Vrms}$	60	70		dB
Input resistance	R_i		21	30	39	$k\Omega$

Pin Assignment



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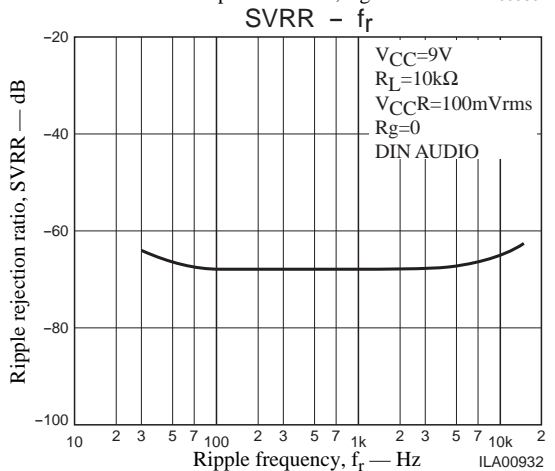
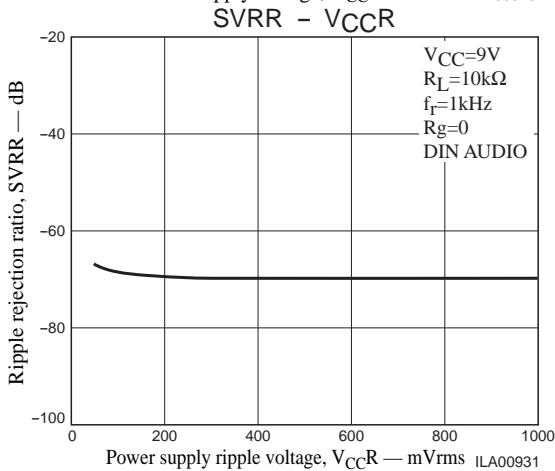
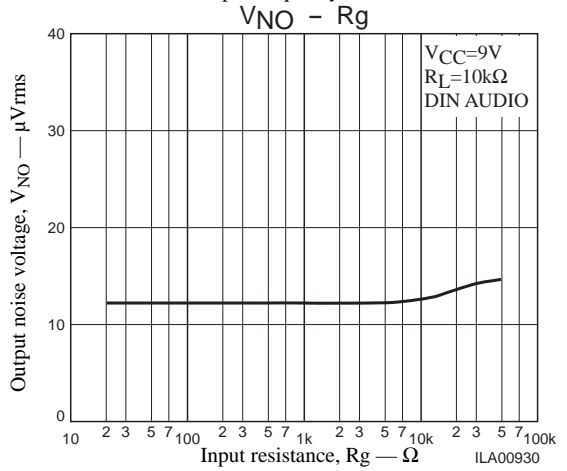
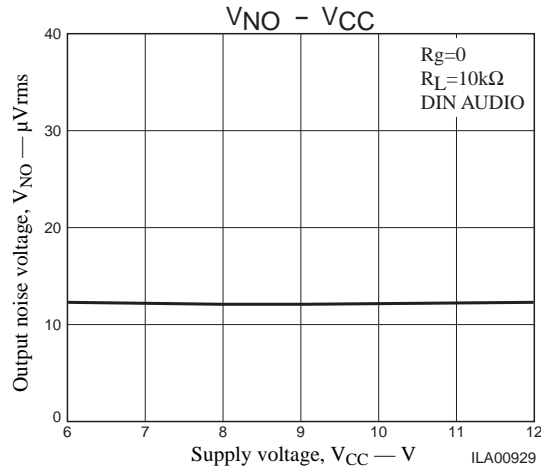
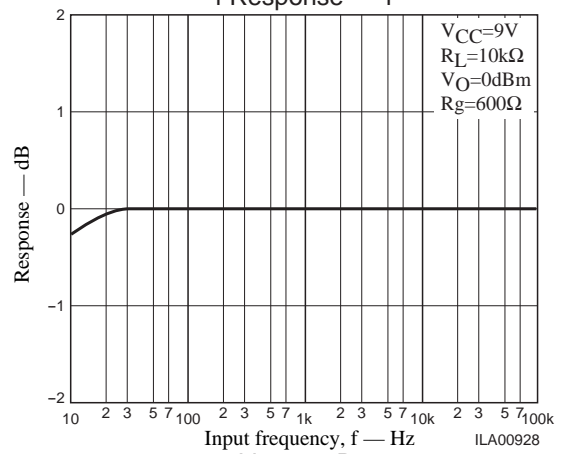
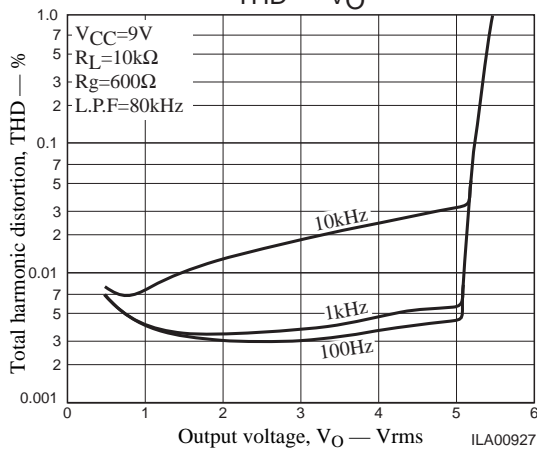
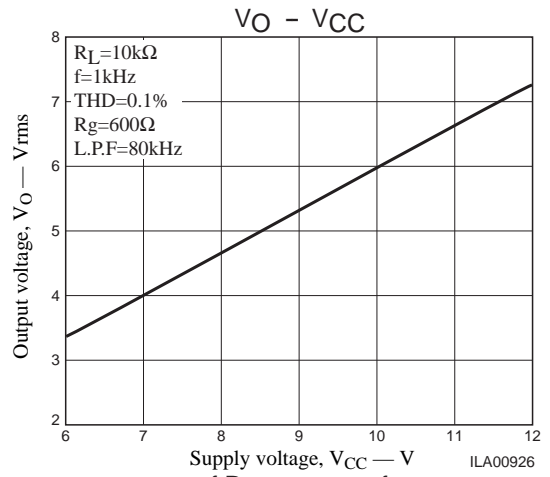
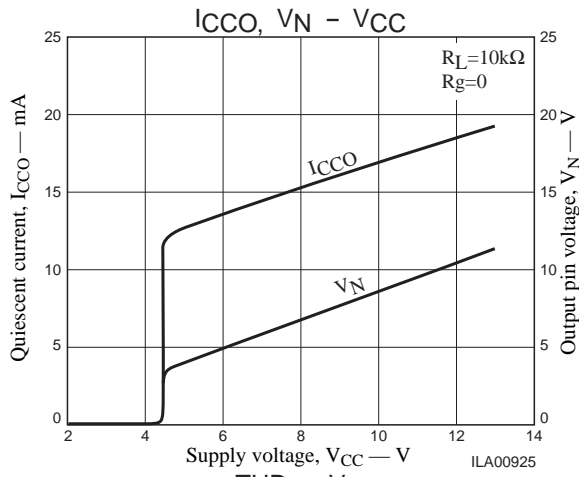
Sample Application Circuit and Block Diagram



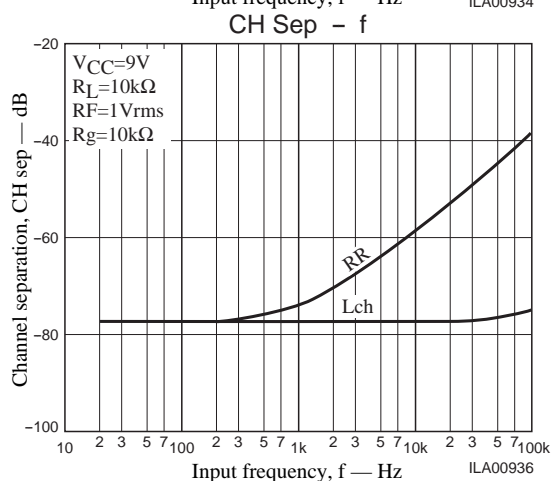
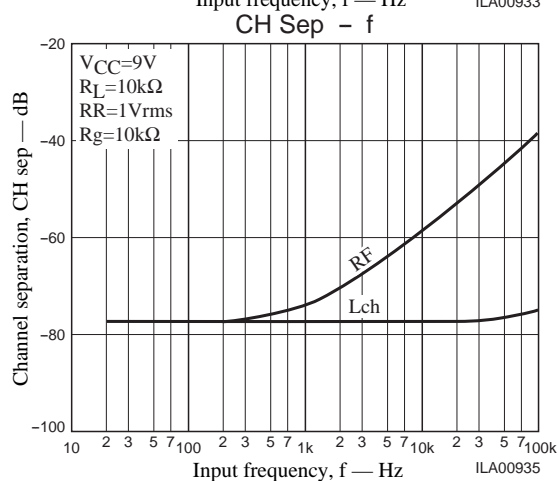
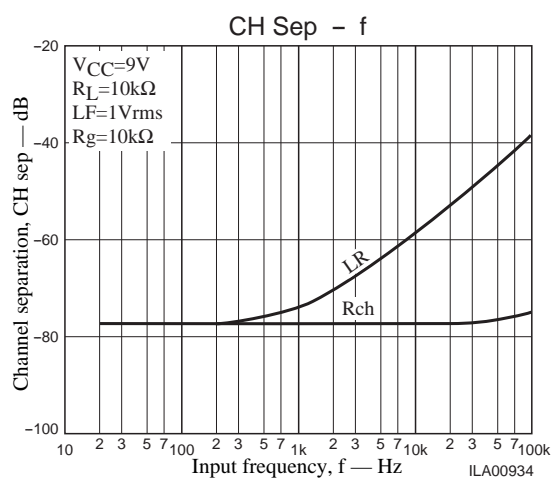
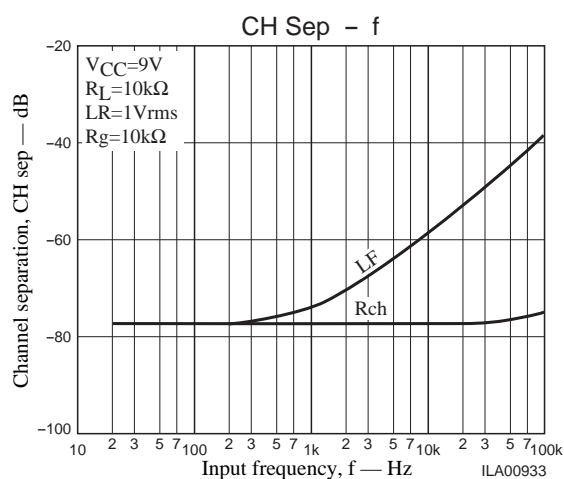
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Note: We recommend using resistors with tolerances of 1% or better for the 24 kΩ and 36 kΩ feedback resistors.

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