Ordering number : ENN8098

SANYO Semiconductors
DATA SHEET

Monolithic Linear IC

LA4627N — Two-Channel Audio Frequency Power Amplifier

Overview

The LA4627N is a 2-channel power amplifier developed for use in radio/cassette player products.
The LA4627N reduces the number of required external components by 50% over earlier products (BS/NF capacitors and oscillation prevention RC components) and thus can contribute significantly to space saving in end products.

Features

- Provided in the DIP12F.
- P_O : 2.0W×2 (V_{CC}=9V, R_L=4Ω)
  2.5W×2 (V_{CC}=9V, R_L=3Ω)
- Standby function built in (supports direct microcontroller control).
- Built-in thermal protection circuit.
- Built-in protection circuit against shorting to V_{CC}.

Specifications

Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Supply Voltage	V_{CC} max	Rg=0	22	V
Allowable Power Dissipation	Pd max	When mounted on the Sanyo-recommended PCB	4.0	W
Operating Temperature	Topr		−25 to +75	°C
Storage Temperature	Tstg		−55 to +150	°C

Operating Conditions at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended Supply Voltage	V_{CC}		9	V
Recommended Load Resistance	R_L		3	Ω
Operating Voltage Range	V_{CC} op	Under conditions such that the maximum ratings are not exceeded.	5.0 to 20	V
Recommended Operating Load Resistance	R_L op		2.7 to 8.0	Ω

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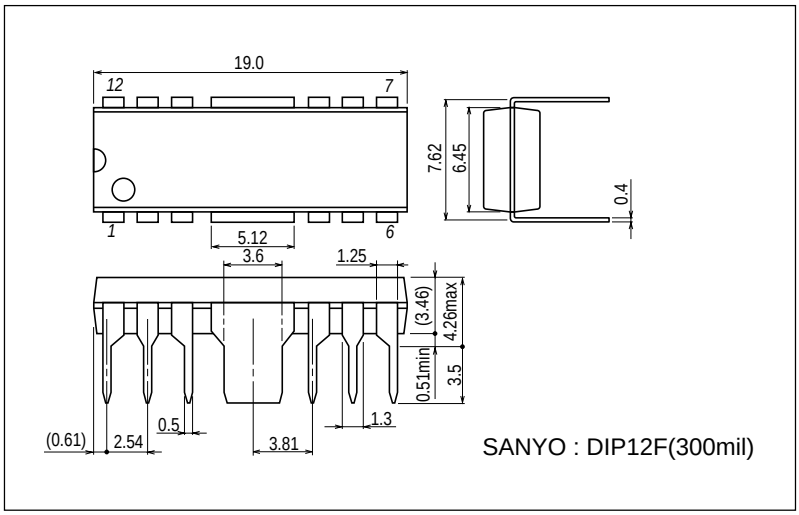
Operating Characteristics at Ta=25°C, V_{CC}=9V, R_L=3Ω, f=1kHz, Rg=600Ω

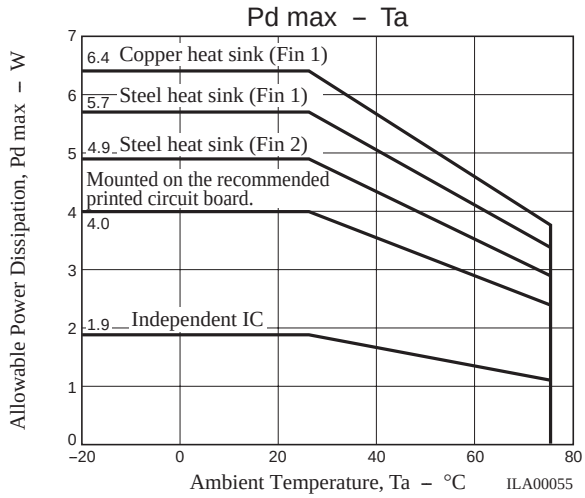
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent Current	I_{CCO}	Rg=0	17	30	70	mA
Voltage Gain	V_G	V_O=0dBm	43	45	47	dB
Total Harmonic Distortion	THD	P_O=0.33W (V_O=1.0V)		0.1	0.8	%
Output Power	P_O1	THD=10%	2.0	2.5		W
	P_O2	THD=10%, R_L=4Ω		2.0		W
Output Noise Voltage	V_{NO}	Rg=0, DIN AUDIO		0.15	0.5	mVrms
Ripple Rejection Ratio	SVRR	Rg=0, f_R=100Hz, Vr=0dBm, DIN AUDIO	45	52		dB
Channel Separation	CHsep	Rg=0, V_O=0dBm, DIN AUDIO	50	60		dB
Standby Current	I_{ST}	Rg=0		1.0	10	μA
Input Resistance	Ri		20	30	40	kΩ
Standby Pin Voltage	V_{ST}	The pin 1 voltage such that the amplifier is on	1.5	5.0		V

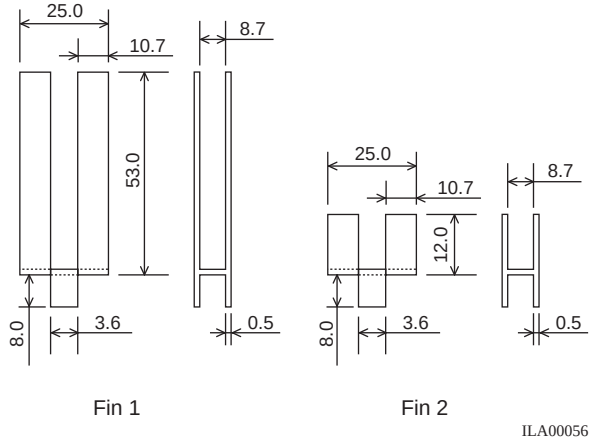
Package Dimensions

unit : mm

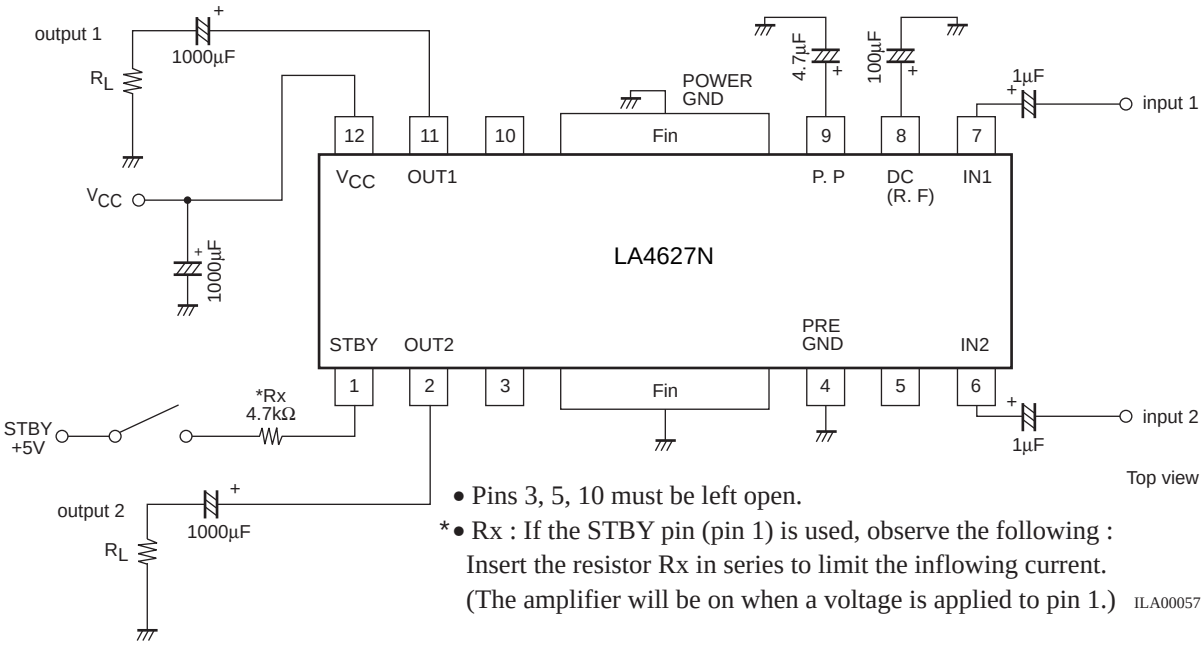
3022B







Sample Application Circuit



Top view

- Pins 3, 5, 10 must be left open.
- *Rx : If the STBY pin (pin 1) is used, observe the following : Insert the resistor Rx in series to limit the inflowing current. (The amplifier will be on when a voltage is applied to pin 1.)

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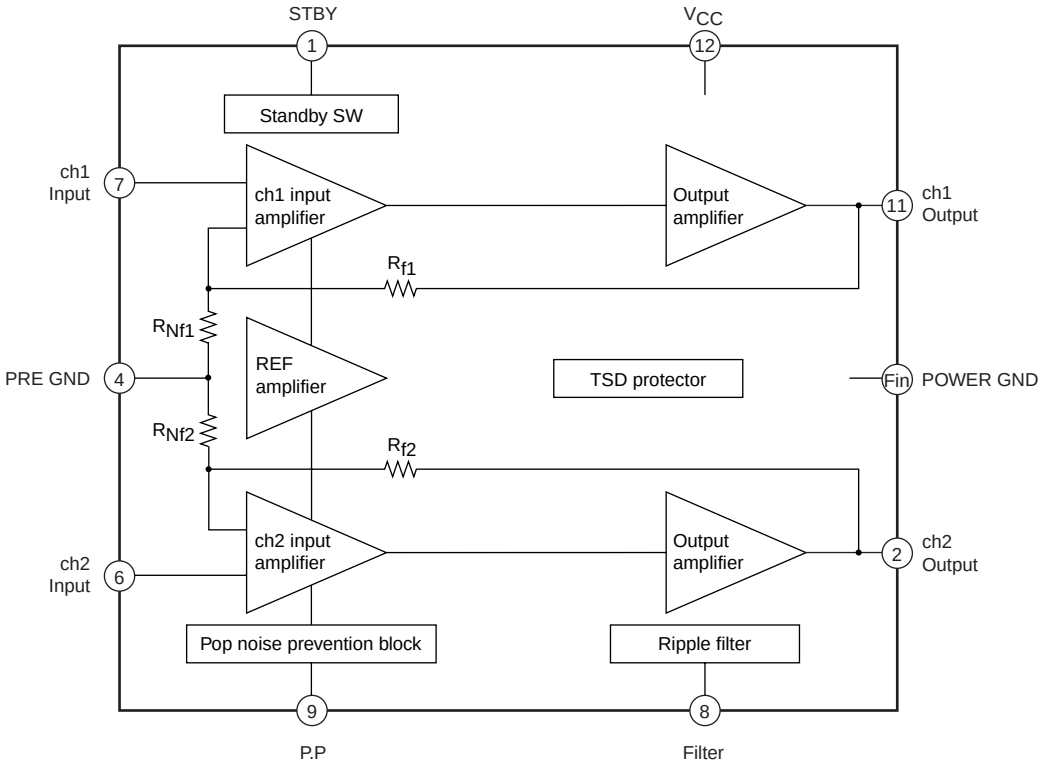
Block Diagram



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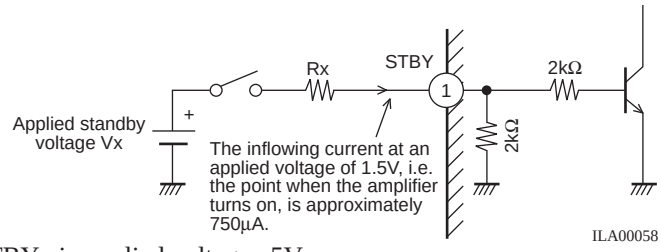
Pin Functions

1. Standby switch function (pin 1)



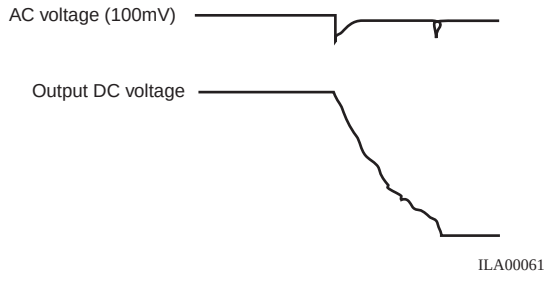
STBY pin applied voltage : 5V
To hold the pin 1 inflow current to about 750μA insert a resistor (Rx) of 4.7kΩ
STBY pin applied voltage : 12V
To hold the pin 1 inflow current to about 750μA insert a resistor (Rx) of 14kΩ (12kΩ).
STBY pin applied voltage : Other value (Vx)
To hold the pin 1 inflow current to about 750μA insert a resistor (Rx) of (Vx−1.5V) /750μA.

• If a microcontroller output signal is applied directly, insert a resistor in series and adjust the current to a level optimal for the drive capability of the microcontroller.

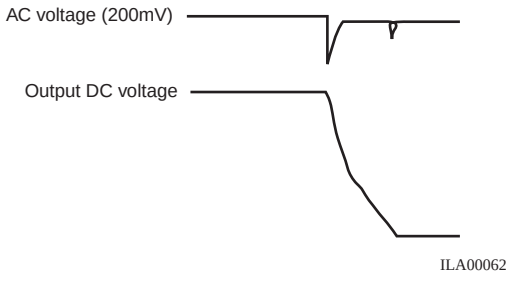
2. Input pins (pins 6 and 7)
The input pin voltage is about $2V_{BE}$ (1.4V).
The input pin impedance is about 30kΩ.
• Although the recommended value for the input capacitor is 1μF, the starting time can be modified by changing the value of this capacitor. (The time from the point a voltage is applied to the standby pin to the point sound is emitted.)

Input capacitor	1.0μF	2.2μF	3.3μF	4.7μF	10μF
Starting time (ts)	0.2s	0.3s	0.5s	0.65s	1.5s

3. FILTER (decoupling) pin (pin 8)
The pin voltage is about 1/2 V_{CC}.
The recommended value for the filter capacitor is 100μF.
The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under 100μF is used.



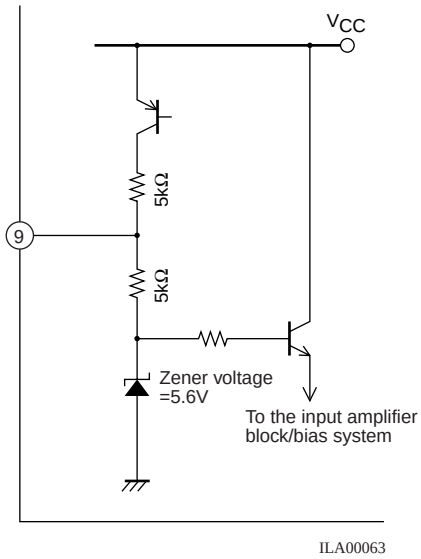
Filter capacitor=100μF



Filter capacitor=47μF

4. P.P (pulse noise) pin (pin 9)

Pin 9 pin voltage $\approx \frac{V_{CC}-V_{CE}\text{ (about 0.3V)} - 5.6V}{2} + 5.6V$



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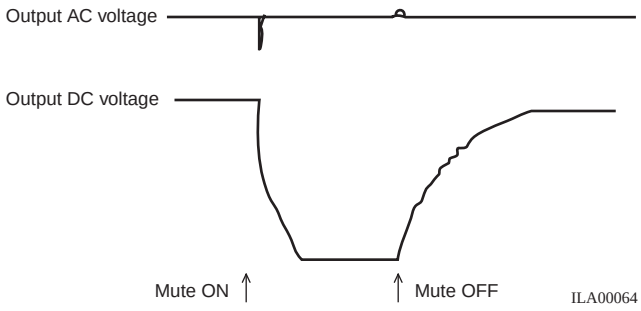
• The recommended value for the P.P capacitor is 4.7µF.
The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under 2.2µF is used.
Furthermore, if a value over 10µF is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).

5. MUTE (Muting)

The output signal can be controlled by shifting the pin 8 (FILTER) level towards ground with a 300 to 500Ω resistor. However, note that the degree of suppression is reduced if a value of 750Ω or more is used.



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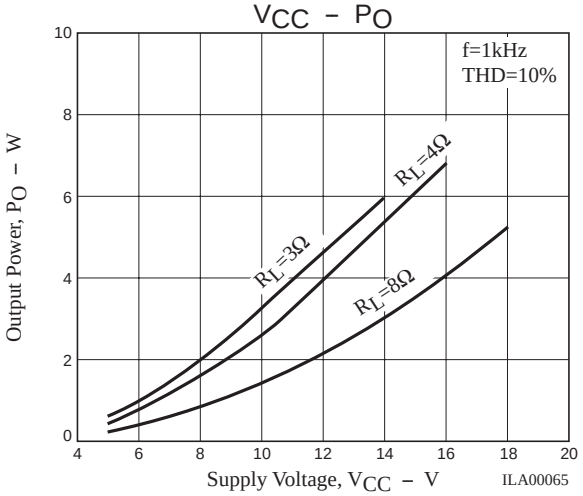

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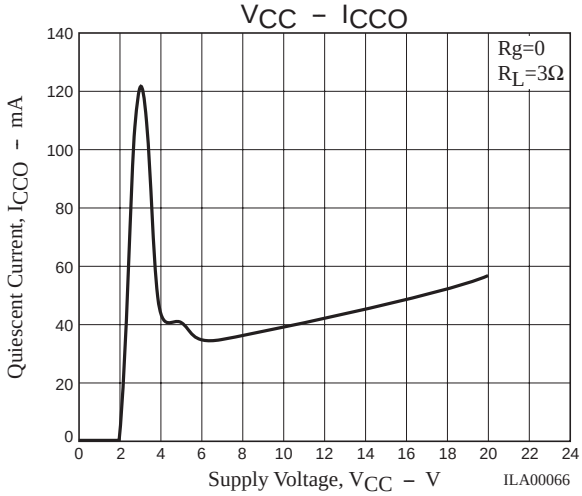

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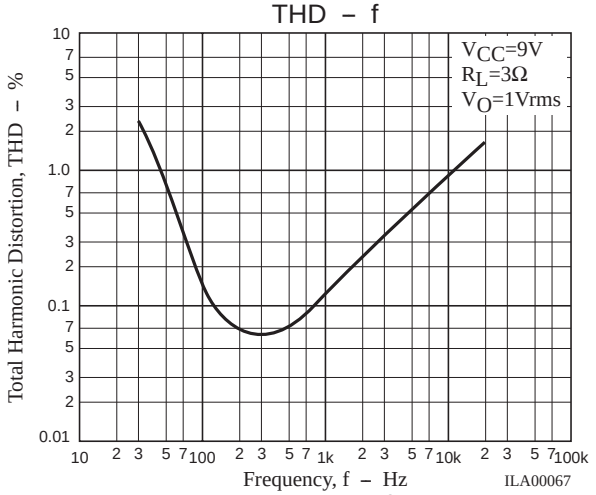
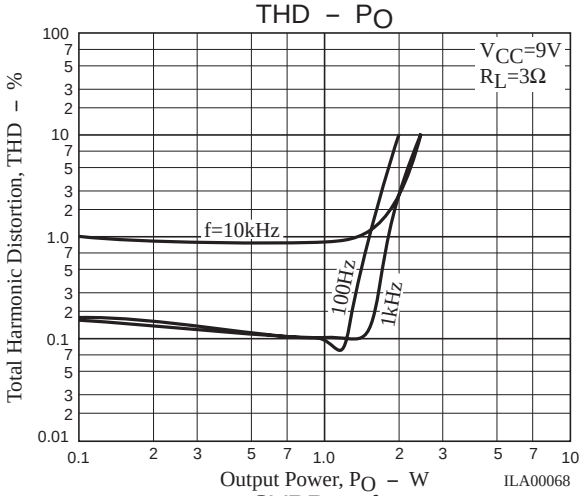
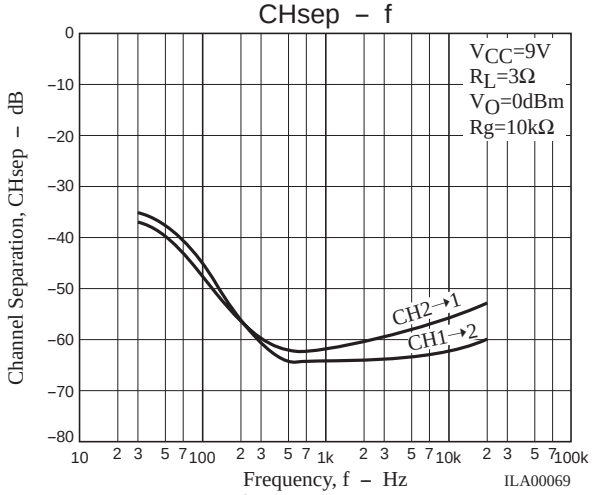
THD – f



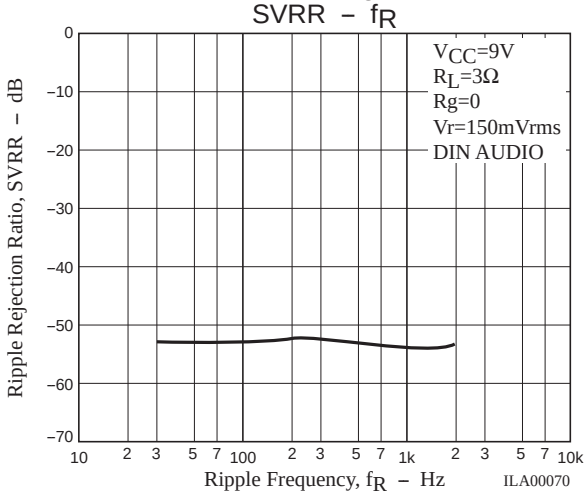
THD – PO



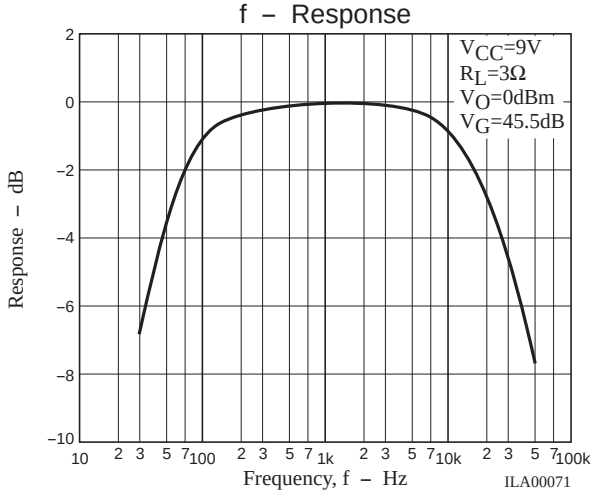
CHsep – f



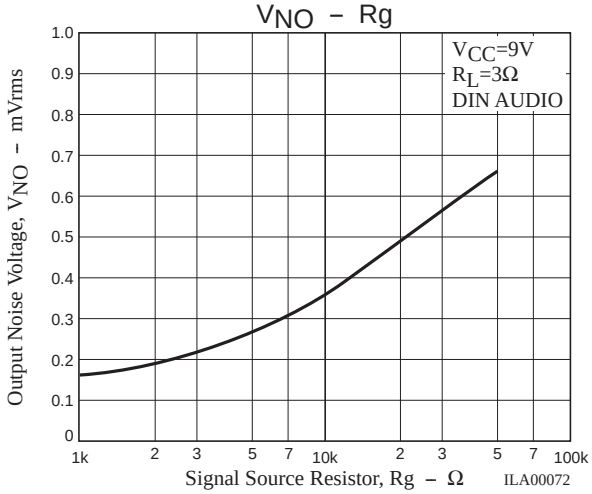
SVRR – fR



f – Response



VNO – Rg



Pd – PO