Ordering number : ENN6501

Monolithic Linear IC

LA4627

Two-Channel Audio Frequency Power Amplifier

Overview

The LA4627 is a 2-channel power amplifier developed for use in radio/cassette player products. The LA4627 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.

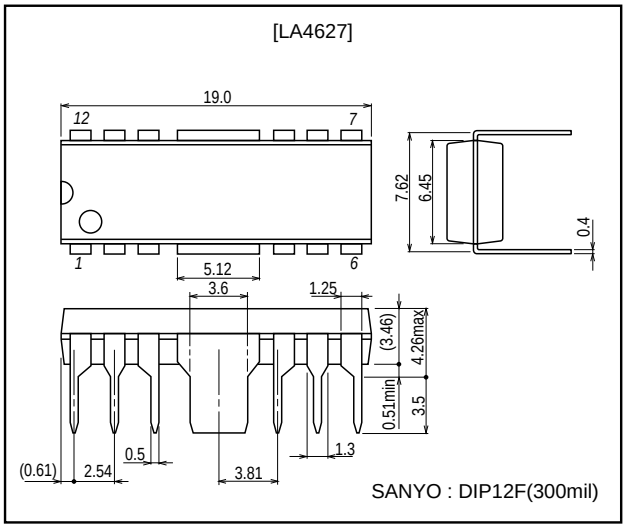
Features

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

Package Dimensions

unit : mm

3022B-DIP12F



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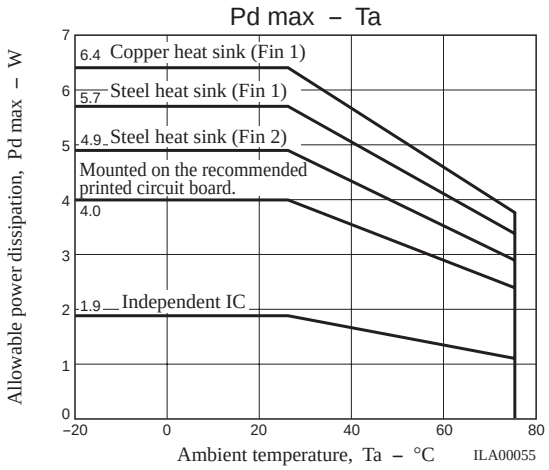
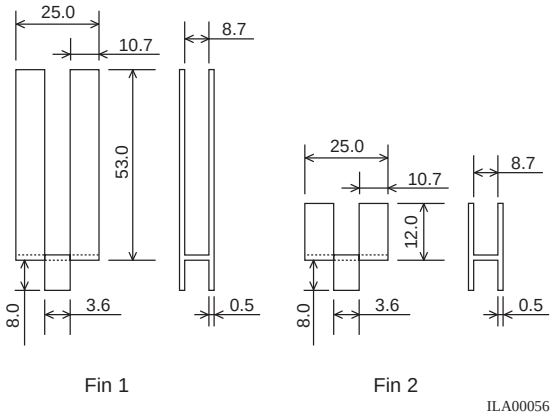
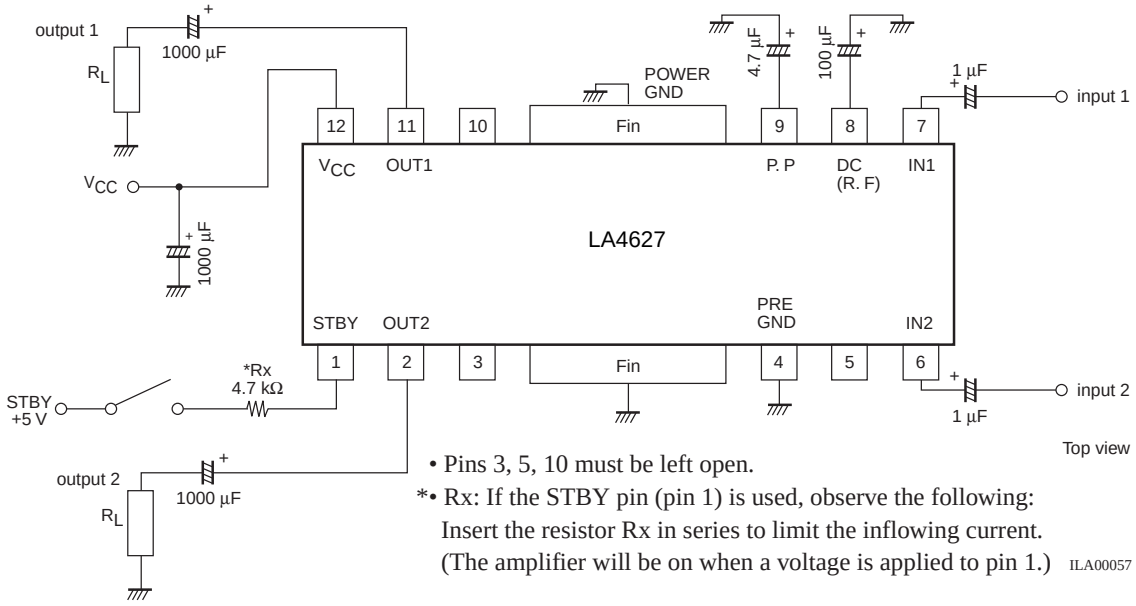
Operating Characteristics at Ta = 25°C, V_{CC} = 9 V, R_L = 3 Ω, f = 1 kHz, Rg = 600 Ω

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	Rg = 0	17	30	70	mA
Voltage gain	V_G	V_O = 0 dBm	43	45	47	dB
Total harmonic distortion	THD	P_O = 0.33 W(V_O = 1.0 V)		0.1	0.8	%
Output power	P_O(1)	THD = 10 %	2.0	2.5		W
	P_O(2)	THD = 10 %, R_L = 4 Ω		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 = 100 Hz, Vr = 0 dBm, DIN AUDIO	45	52		dB
Channel separation	CHsep	Rg = 0, V_O = 0 dBm, 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





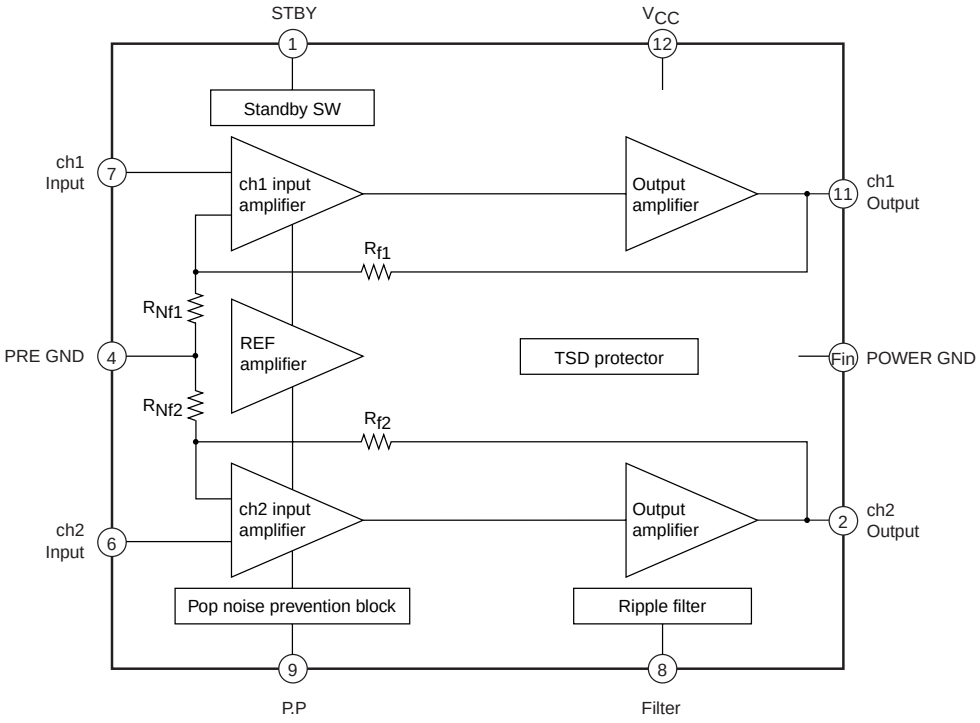
Application Circuit



• 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.) ILA00057

Block Diagram



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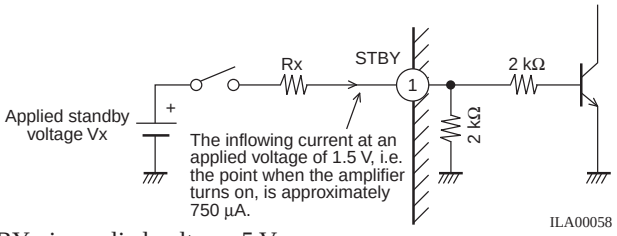
Pin Functions

1. Standby switch function (pin 1)



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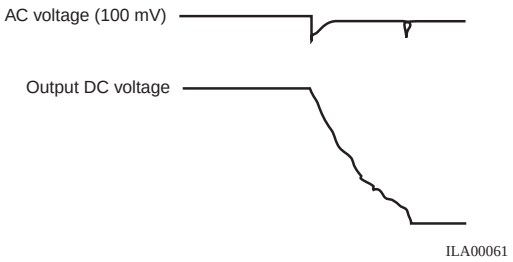
STBY pin applied voltage: 5 V
To hold the pin 1 inflow current to about 750 µA insert a resistor (Rx) of 4.7 kΩ
STBY pin applied voltage: 12 V
To hold the pin 1 inflow current to about 750 µA insert a resistor (Rx) of 14 kΩ (12 kΩ).
STBY pin applied voltage: Other value (Vx)
To hold the pin 1 inflow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

• 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.

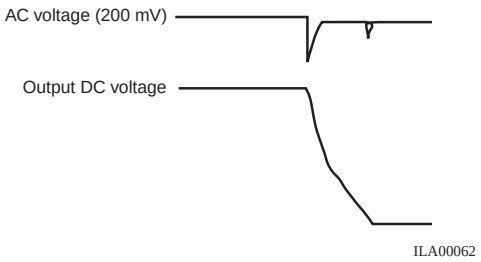
2. Input pins (pins 6 and 7)
The input pin voltage is about $2V_{BE}$ (1.4 V).
The input pin impedance is about 30 kΩ.
• Although the recommended value for the input capacitor is 0.22 µF, the starting time can be modified by changing the value of this capacitor. (The time from the point a voltage is applied to the standby pin to the point sound is emitted.)

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

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



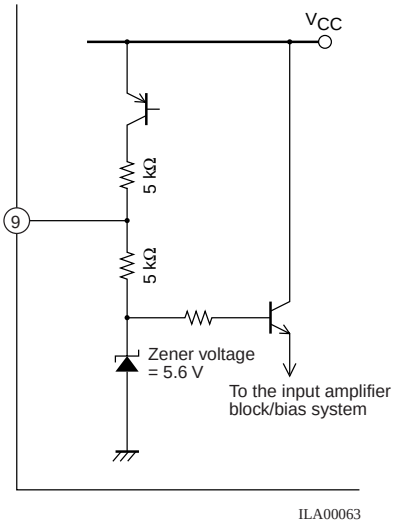
Filter capacitor = 100 µF



Filter capacitor = 47 µF

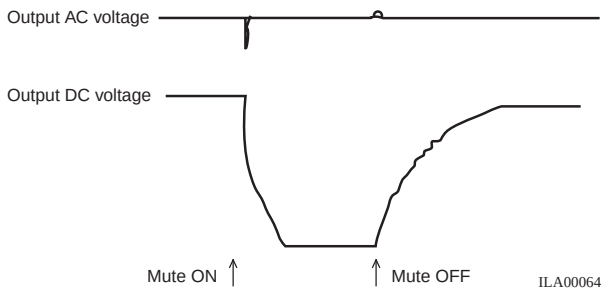
4. P.P (pulse noise) pin (pin 9)
Pin 9 pin voltage $\approx \frac{V_{CC} - V_{CE}\text{ (about 0.3 V)} - 5.6\text{ V}}{2\text{ k}\Omega} + 5.6\text{ V}$

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

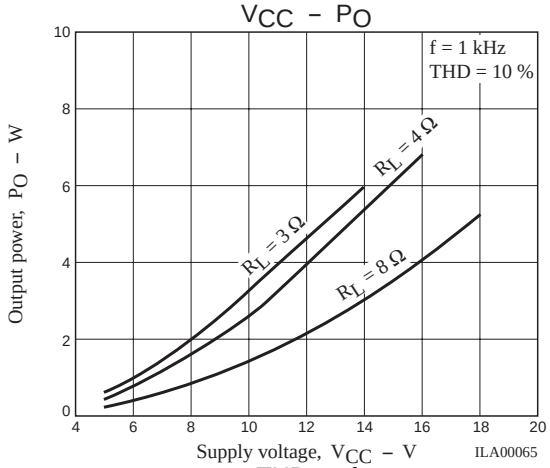


5. MUTE (Muting)

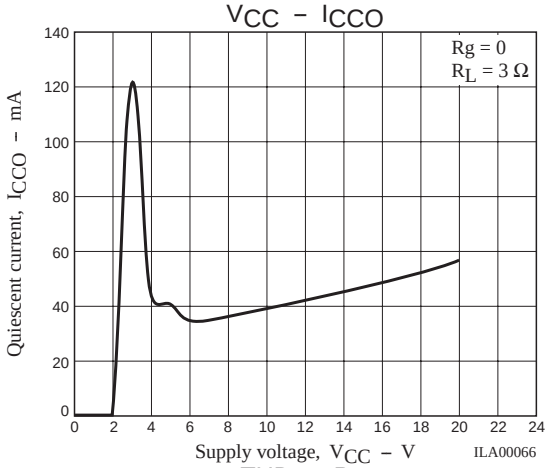
The output signal can be controlled by shifting the pin 8 (FILTER) level towards ground with a 300 to 500 Ω resistor. However, note that the degree of suppression is reduced if a value of 750 Ω or more is used.



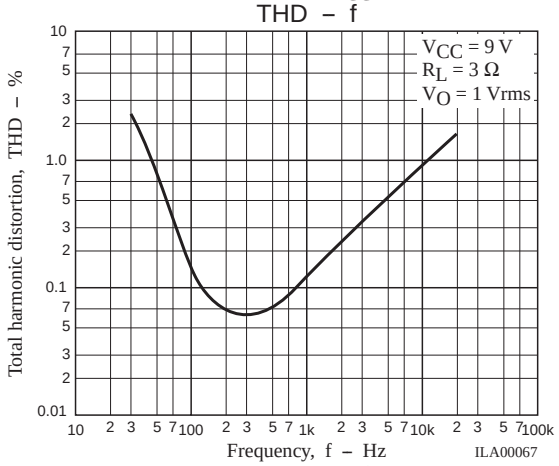
V_{CC} – P_O



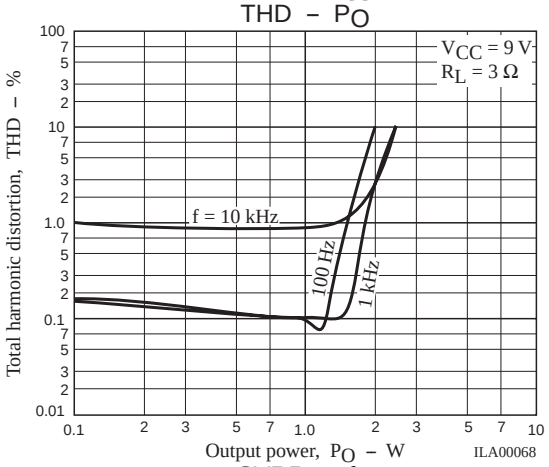
V_{CC} – I_{CCO}



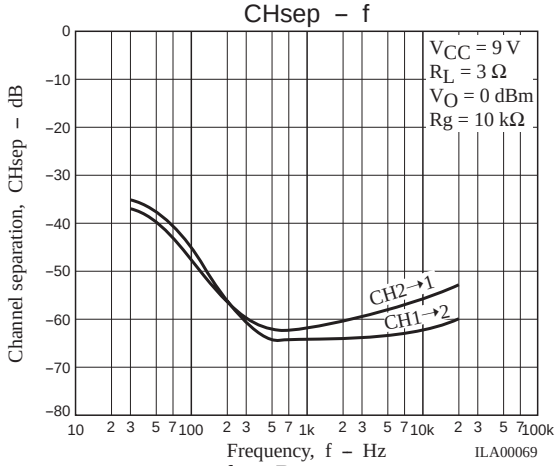
THD – f



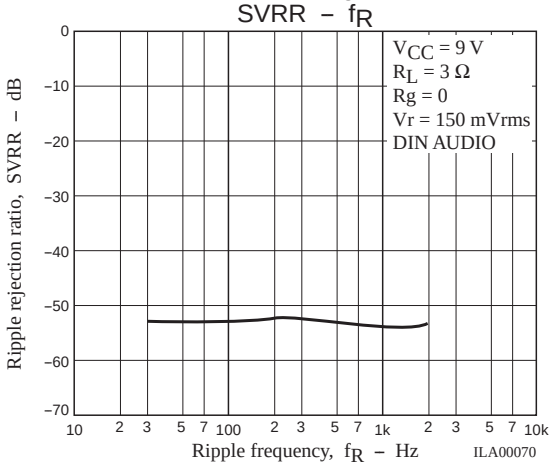
THD – P_O



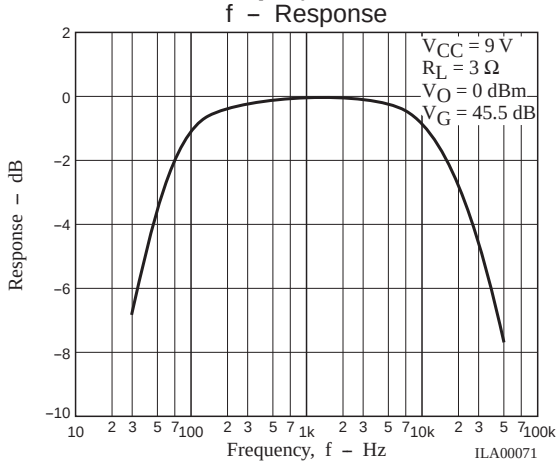
CHsep – f



SVRR – f_R



f – Response



V_{NO} – Rg