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Ordering number : ENN6502

Monolithic Linear IC

LA4629

Two-Channel Audio Frequency Power Amplifier

Overview

The LA4629 is a 2-channel power amplifier developed for use in radio/cassette player products. The LA4629 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.

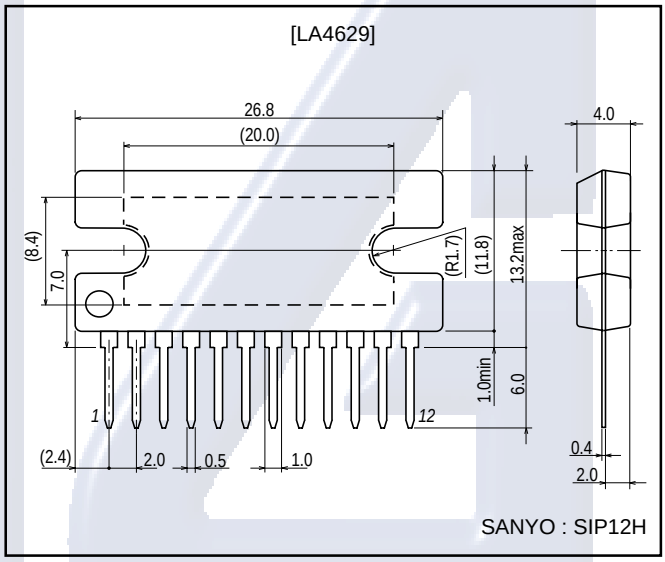
Features

- Provided in the SIP12H package.
- P_O : 2.5 W × 2 (V_{CC} = 9 V, R_L = 3 Ω)
  4.5 W × 2 (V_{CC} = 12 V, R_L = 3 Ω)
  : 2.0 W × 2 (V_{CC} = 9 V, R_L = 4 Ω)
  4.0 W × 2 (V_{CC} = 12 V, R_L = 4 Ω)
- Standby function built in
  (supports direct microcontroller control).
- Built-in thermal protection circuit.

Package Dimensions

unit : mm

3049B-SIP12H



Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	No input	24	V
Allowable power dissipation	Pd max	With an arbitrarily large heat sink	25	W
Operating temperature	Topr		-25 to +75	°C
Storage temperature	Tstg		-40 to +150	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		12	V
Operating voltage range	V_{CC} op	The range over which the package Pd is not exceeded.	5 to 22	V
Recommended operating load resistance	R_L op		2.7 to 8	Ω

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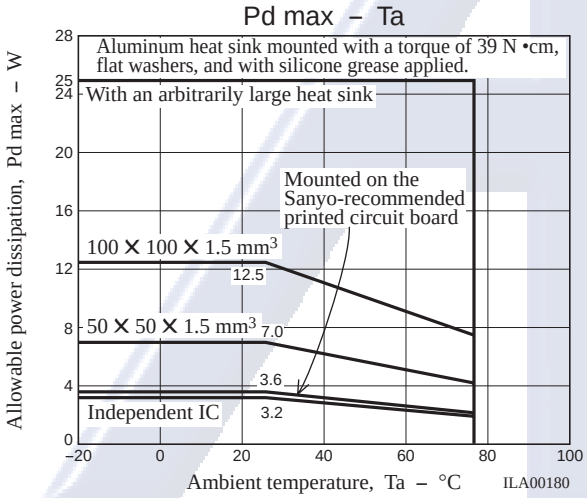
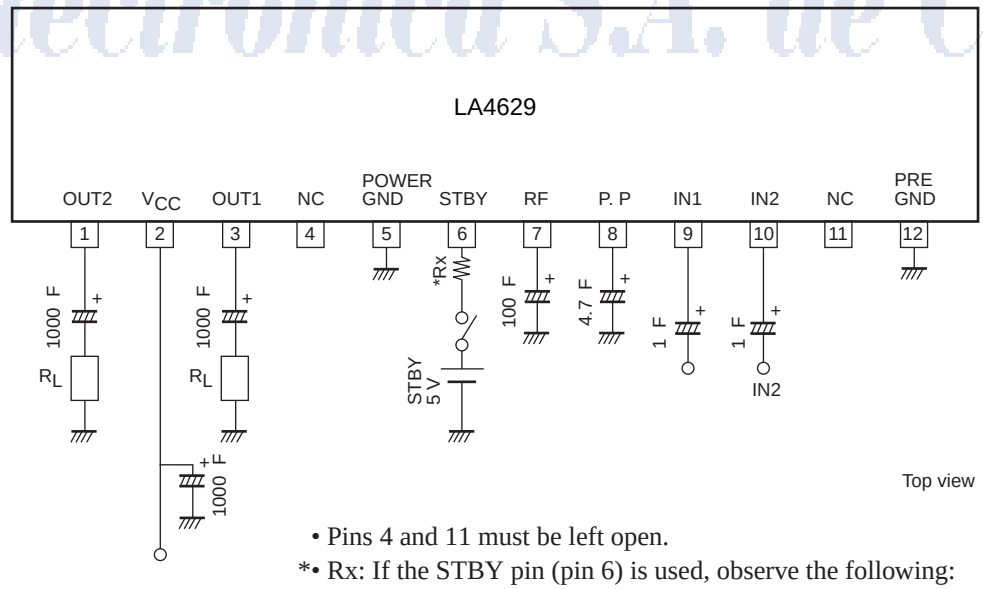
Operating Characteristics at Ta = 25°C, V_{CC} = 12V, R_L = 3 Ω, f = 1 kHz, Rg = 600 Ω

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	Rg = 0	18	35	80	mA
Standby current	I_{ST}			1.0	10	μA
Voltage gain	V_G	V_O = 0 dBm	43	45	47	dB
Output power	P_O(1)	THD = 10 %	3.0	4.5		W
	P_O(2)	V_{CC} = 12 V, R_L = 4 Ω, THD = 10 %		4.0		W
	P_O(3)	V_{CC} = 9 V, R_L = 3 Ω, THD = 10 %	2.0	2.5		W
	P_O(4)	V_{CC} = 9 V, R_L = 4 Ω, THD = 10 %		2.0		W
Total harmonic distortion	THD	P_O = 1 W		0.2	0.8	%
Output noise voltage	V_{NO}	Rg = 0, DIN AUDIO		0.15	0.5	mV
Ripple rejection ratio	SVRR	Rg = 0, f_R = 100 Hz, Vr = 0 dBm, DIN AUDIO	45	55		dB
Channel separation	CHsep	Rg = 0, V_O = 0 dBm, DIN AUDIO	43	50		dB
Input resistance	Ri		20	30	40	kΩ
Standby pin voltage	V_{ST}	The pin 6 voltage such that the amplifier is on	1.5	5.0		V



Application Circuit



- Pins 4 and 11 must be left open.
- *Rx: If the STBY pin (pin 6) 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 6.)

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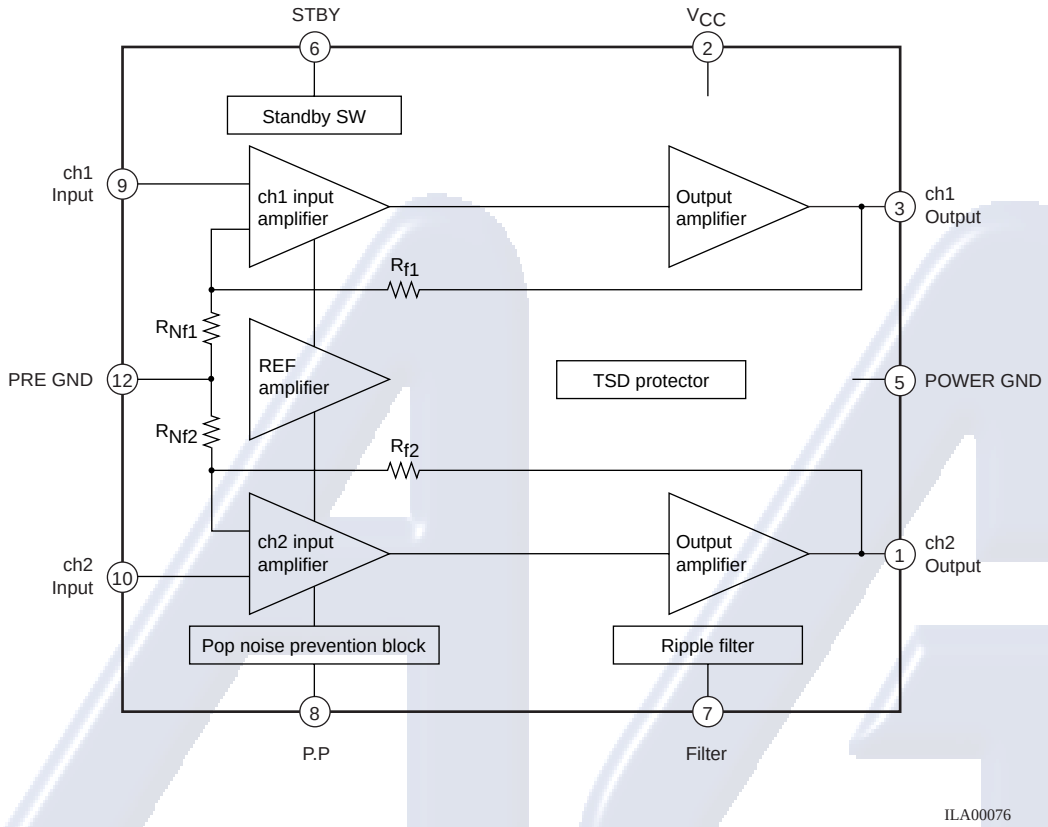
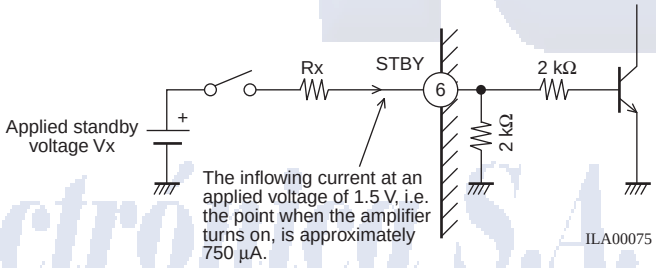
Block Diagram



Pin Functions

1. Standby switch function (pin 6)



STBY pin applied voltage: 5 V
To hold the pin 6 inflow current to about 750 µA insert a resistor (Rx) of 4.7 kΩ
STBY pin applied voltage: 12 V
To hold the pin 6 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 6 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 9 and 10)
The input pin voltage is about 2 V_{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

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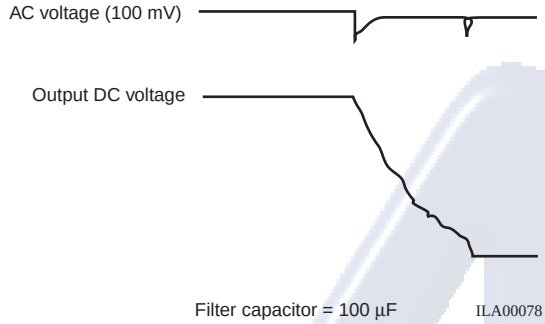
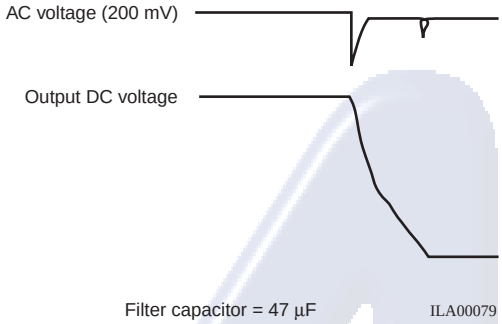
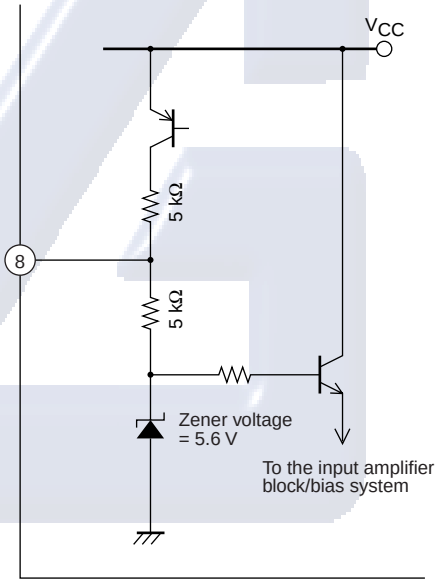
3. FILTER (decoupling) pin (pin 7)
The pin voltage is about 1/2 V_{CC}.
The recommended value for the filter capacitor is 100 µF.
The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under 100 µF is used.





4. P.P (pulse noise) pin (pin 8)
Pin 8 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).



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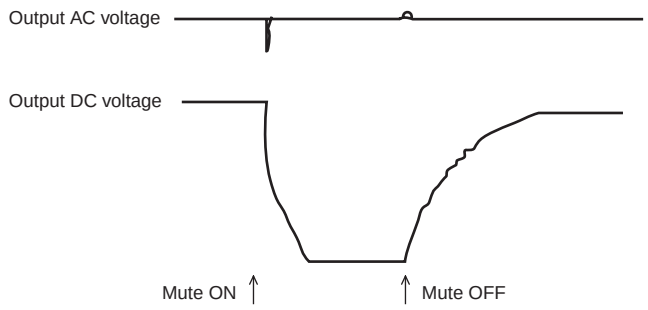
5. MUTE (Muting)
The output signal can be controlled by shifting the pin 7 (FILTER) level towards ground with a 300 to 500 Ω resistor. However, note that the degree of suppression is reduced if a value of 750 Ω or more is used.



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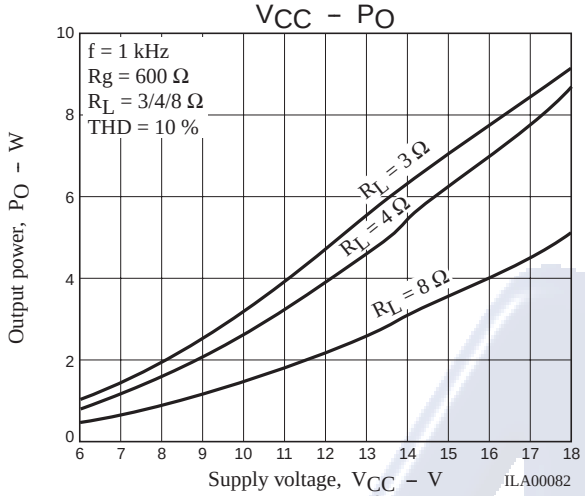
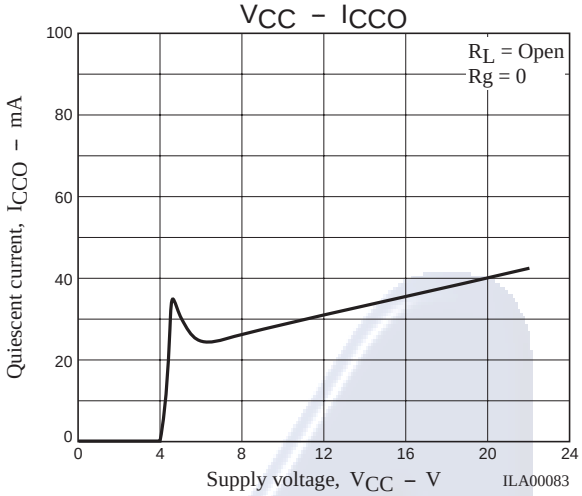
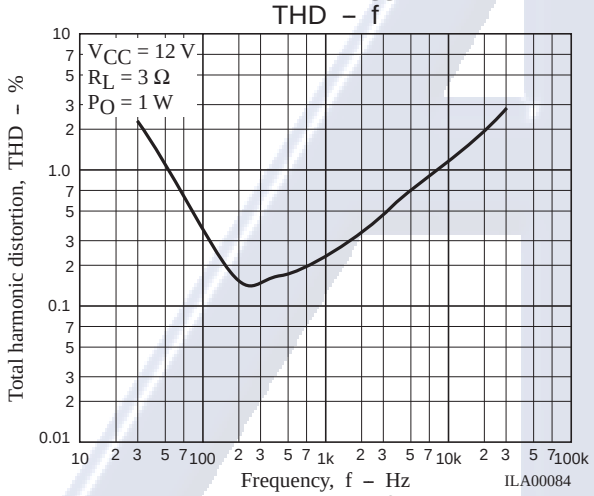
V_{CC} – P_O



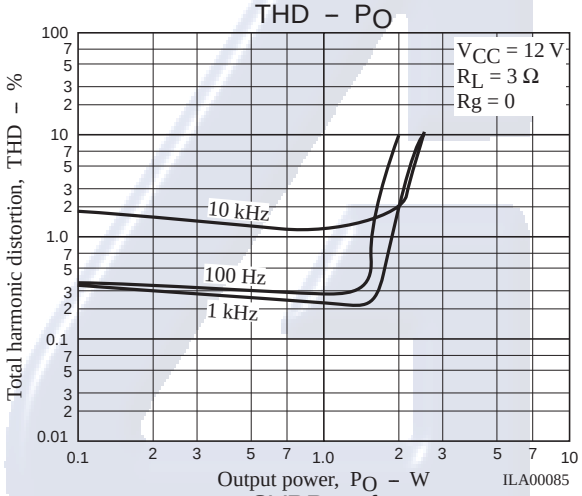
V_{CC} – I_{CCO}



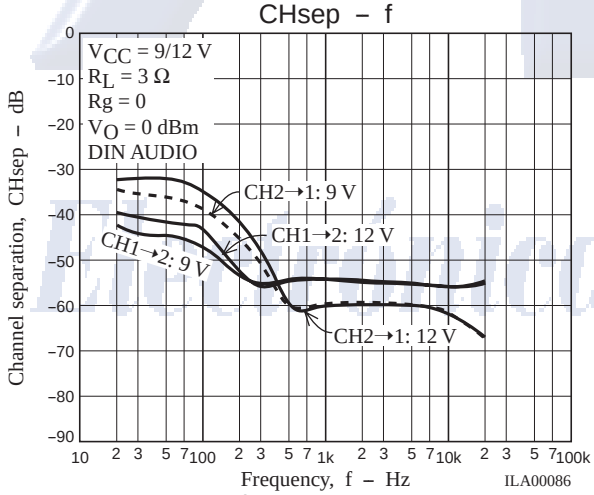
THD – f



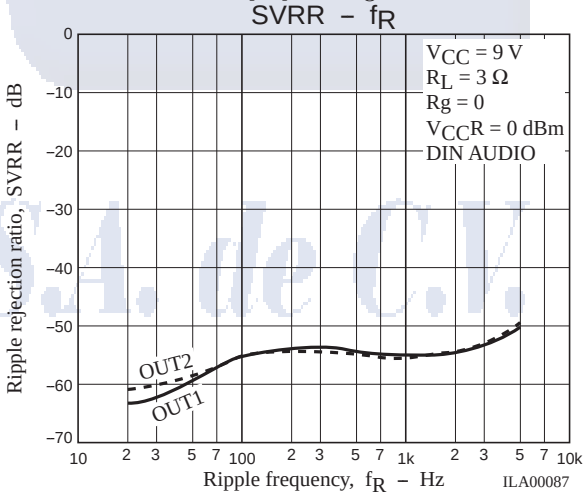
THD – P_O



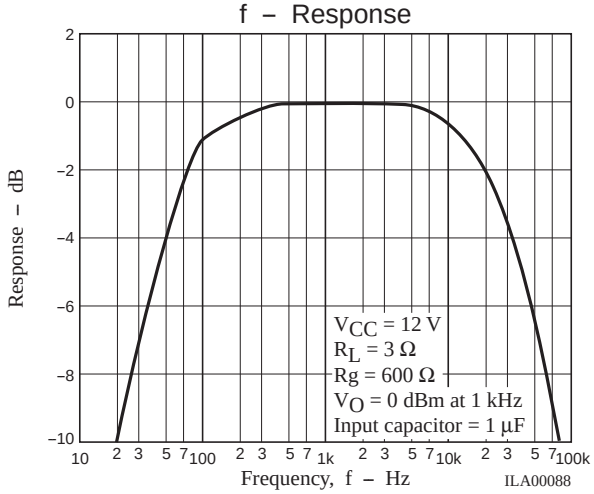
CHsep – f



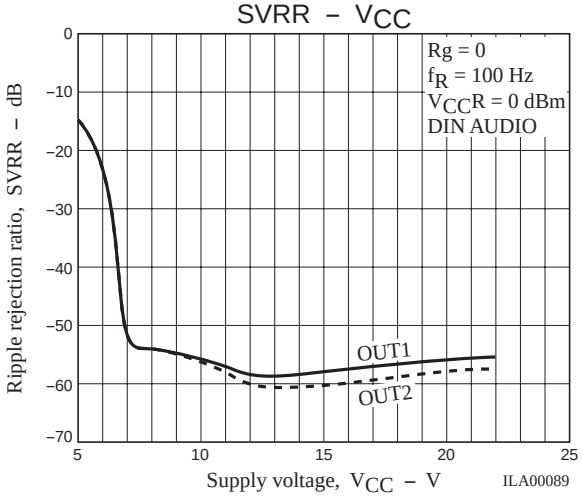
SVRR – f_R



f – Response



SVRR – V_{CC}



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