



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.

• PO: $2.5 \text{ W} \times 2 \text{ (V}_{CC} = 9 \text{ V}, R_L = 3 \Omega)$

 $4.5 \text{ W} \times 2 \text{ (V}_{CC} = 12 \text{ V}, \text{RL} = 3 \Omega)$

: $2.0 \text{ W} \times 2 \text{ (V}_{CC} = 9 \text{ V}, R_{L} = 4 \Omega)$

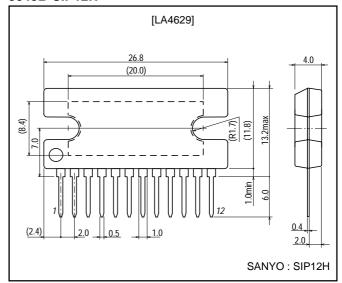
 $4.0 \text{ W} \times 2 \text{ (VCC} = 12 \text{ V}, \text{RL} = 4 \Omega)$

 Standby function built in (supports direct microcontroller control).

• Built-in thermal protection circuit.

Package Dimensions

unit : mm 3049B-SIP12H



Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	VCC 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 $Ta = 25^{\circ}C$

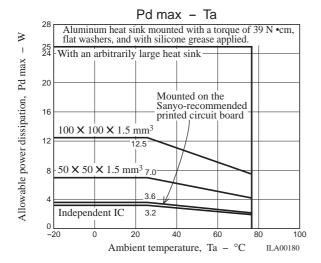
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	Vcc		12	V
Operating voltage range	ACC ob	The range over which the package Pd is not exceeded.	5 to 22	V
Recommended operating load resistance	R _L op		2.7 to 8	Ω

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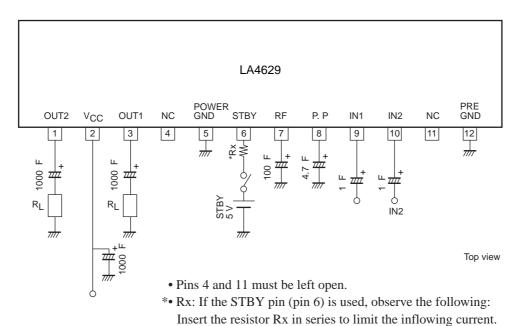
LA4629

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

Parameter	Symbol	Conditions	Ratings			Unit
		Conditions	min	typ	max	Unit
Quiescent current	Icco	Rg = 0	18	35	80	mA
Standby current	IST			1.0	10	μΑ
Voltage gain	VG	VO = 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	VNO	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	VST	The pin 6 voltage such that the amplifier is on	1.5	5.0		V



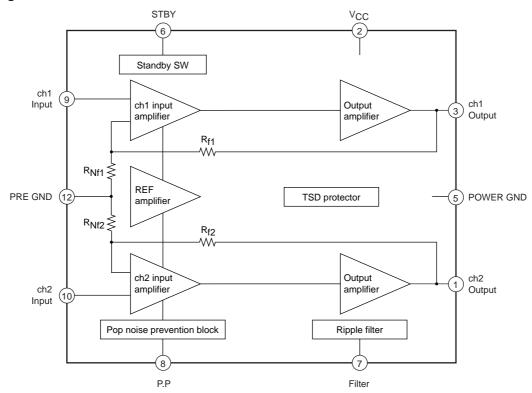
Application Circuit



(The amplifier will be on when a voltage is applied to pin 6.)

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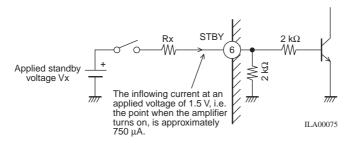
Block Diagram



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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 $k\Omega$

STBY pin applied voltage: 12 V

To hold the pin 6 inflow current to about 750 μA insert a resistor (Rx) of 14 $k\Omega$ (12 $k\Omega$).

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 VBE (1.4 V).

The input pin impedance is about 30 k Ω .

• Although the recommended value for the input capacitor is $0.22 \,\mu\text{F}$, 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.)

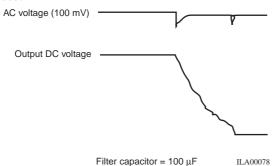
Input capacitor	1.0 μF	2.2 μF	3.3 μF	4.7 μF	10 μF
Starting time (ts)	0.2 s	0.3 s	0.5 s	0.65 s	1.5 s

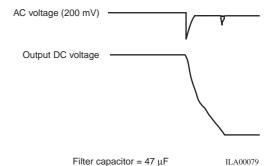
3. FILTER (decoupling) pin (pin 7)

The pin voltage is about 1/2 VCC.

The recommended value for the filter capacitor is $100 \, \mu F$.

The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under $100 \mu F$ is used.





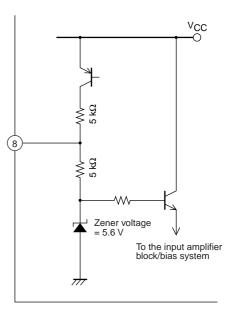
4. P.P (pulse noise) pin (pin 8)

Pin 8 pin voltage
$$\approx \frac{\text{VCC} - \text{VCE (about } 0.3 \text{ V}) - 5.6 \text{ V}}{2 \text{ k}\Omega} + 5.6 \text{ V}$$

• The recommended value for the P.P capacitor is $4.7 \mu F$.

The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under $2.2~\mu F$ is used.

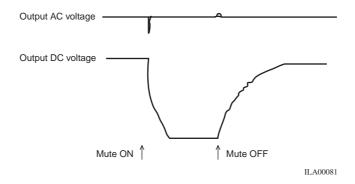
Furthermore, if a value over $10 \,\mu\text{F}$ is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).

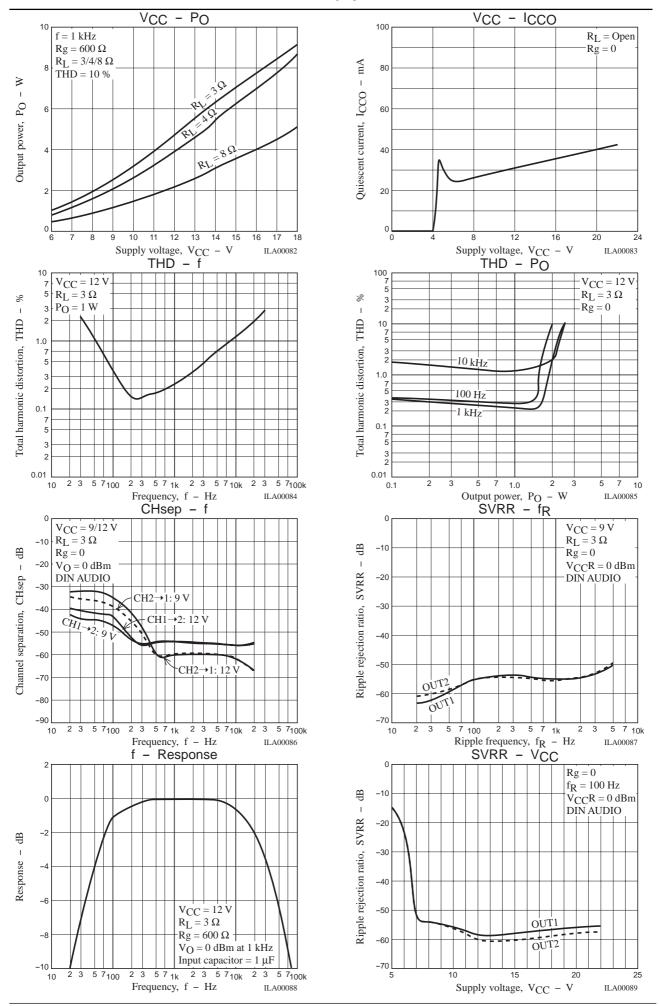


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5. MUTE (Muting)

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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