



## Two-Channel Audio Frequency Power Amplifier

### Overview

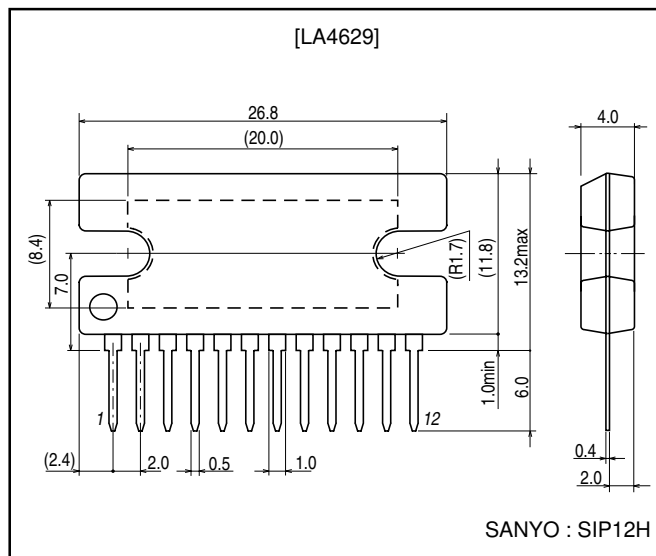
The LA4629 is a 2-channel power amplifier developed for use in radio/cassette player products. The LA4629 reduces the number of required external components by 50% over earlier products (BS/NF capacitors and oscillation prevention RC components) and thus can contribute significantly to space saving in end products.

### Features

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

### Package Dimensions

unit : mm  
**3049B-SIP12H**



### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$	No input	24	V
Allowable power dissipation	$P_d \text{ max}$	With an arbitrarily large heat sink	25	W
Operating temperature	$T_{op}$		-25 to +75	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-40 to +150	$^\circ\text{C}$

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

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

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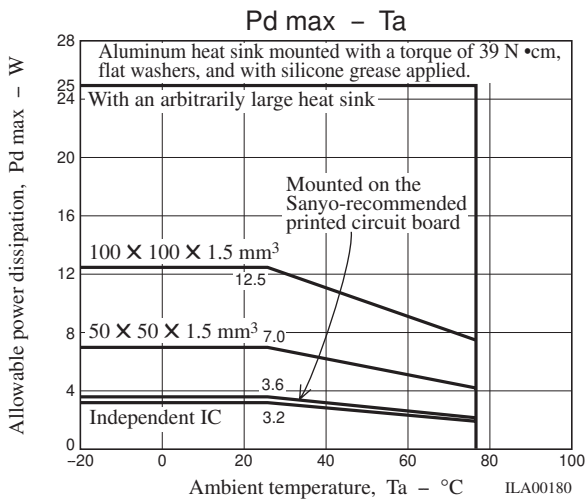
**SANYO Electric Co., Ltd. Semiconductor Company**

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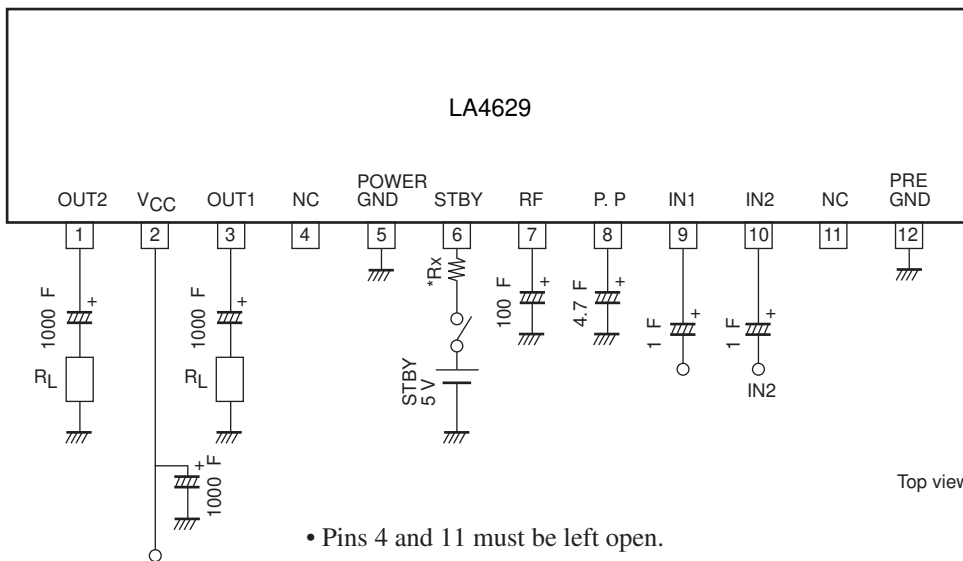
# LA4629

Operating Characteristics at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 12\text{V}$ ,  $R_L = 3\ \Omega$ ,  $f = 1\ \text{kHz}$ ,  $R_g = 600\ \Omega$

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



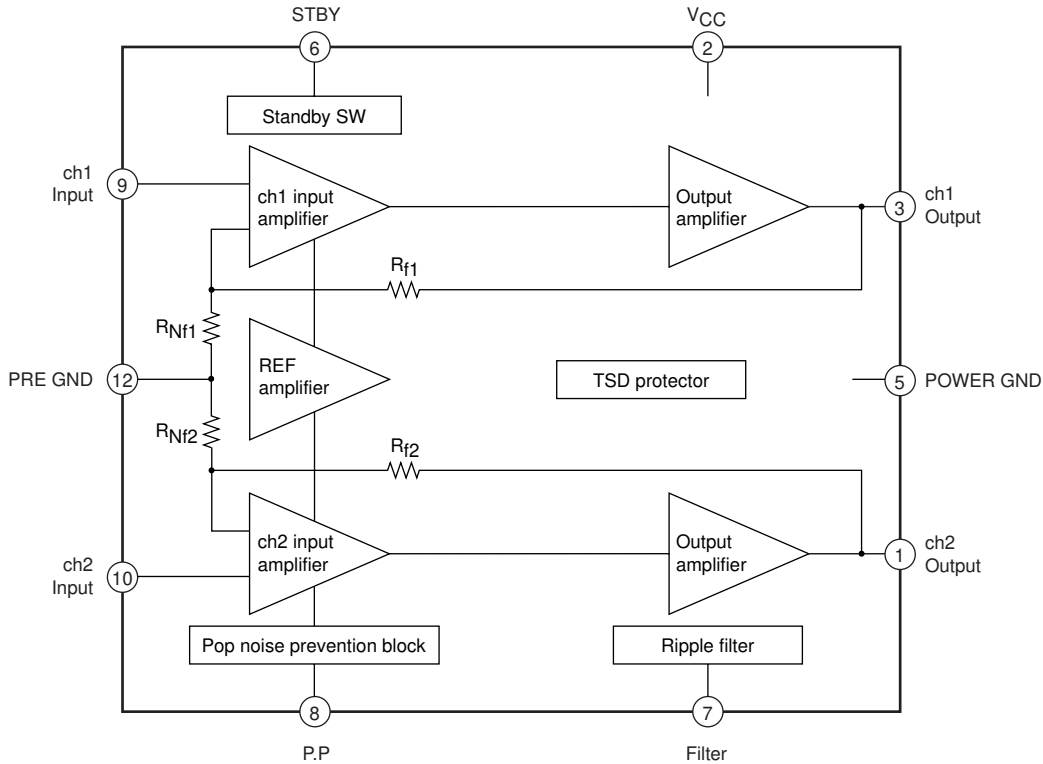
## Application Circuit



- 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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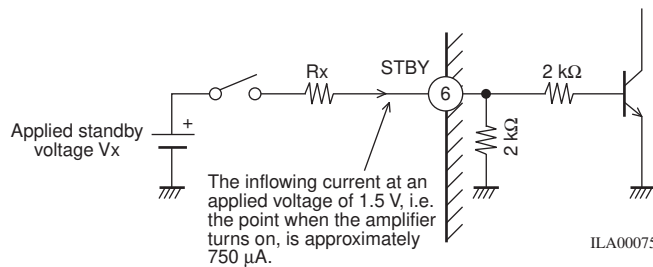
**Block Diagram**



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**Pin Functions**

1. Standby switch function (pin 6)



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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<sub>BE</sub> (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.)

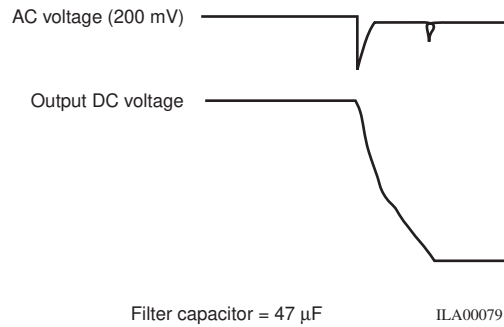
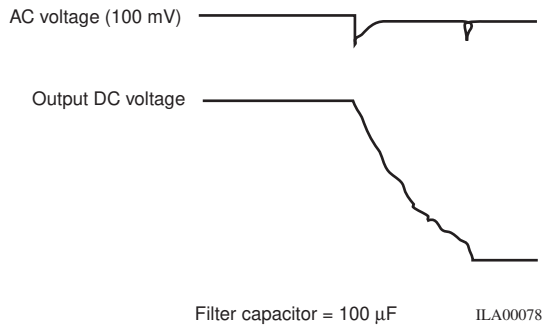
Input capacitor	1.0 μF	2.2 μF	3.3 μF	4.7 μF	10 μF
Starting time (ts)	0.2 s	0.3 s	0.5 s	0.65 s	1.5 s

3. FILTER (decoupling) pin (pin 7)

The pin voltage is about 1/2 VCC.

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.



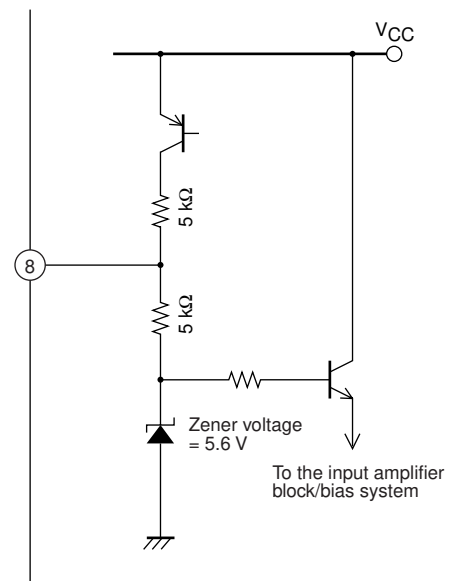
4. P.P (pulse noise) pin (pin 8)

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

• The recommended value for the P.P capacitor is 4.7 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.

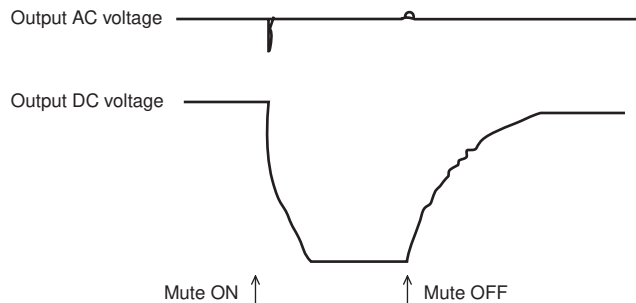
Furthermore, if a value over 10 µF is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).



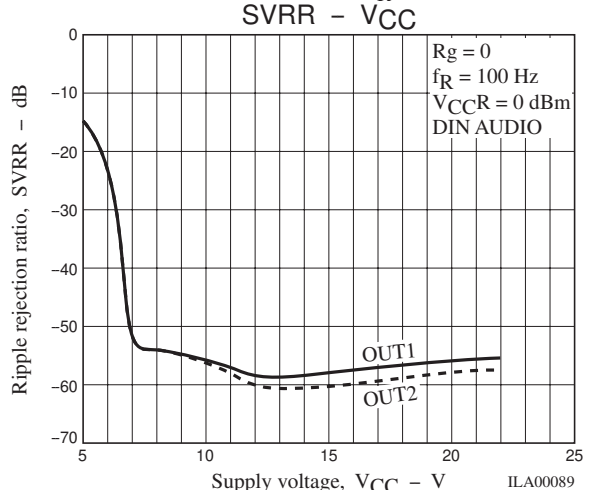
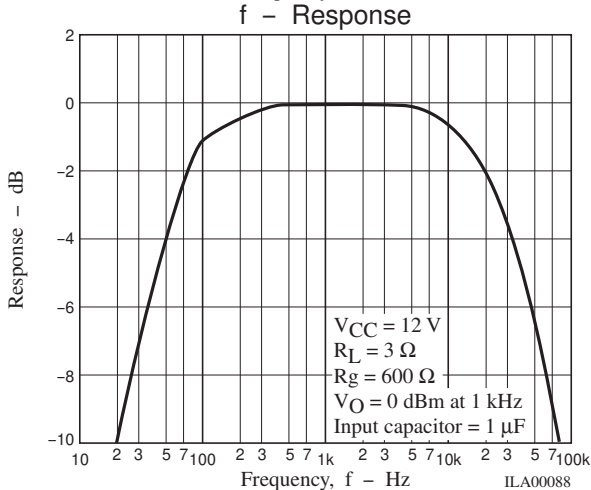
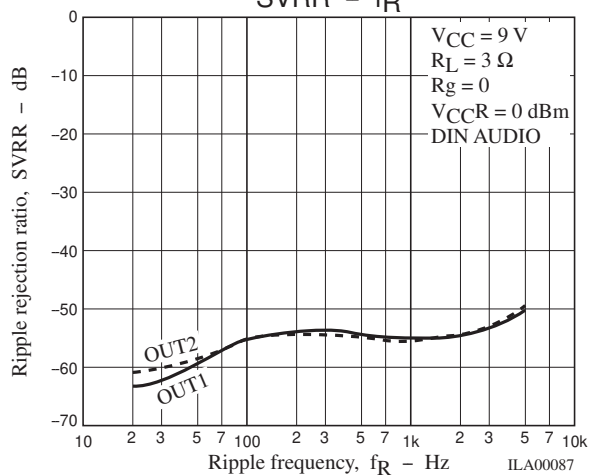
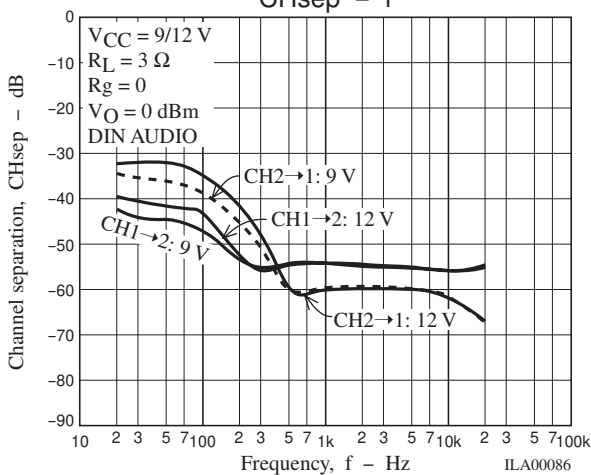
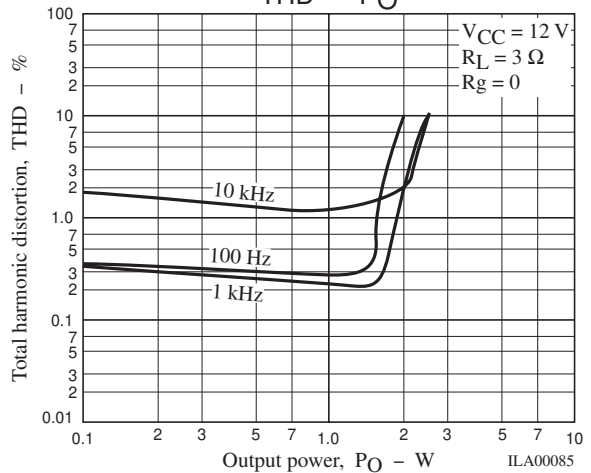
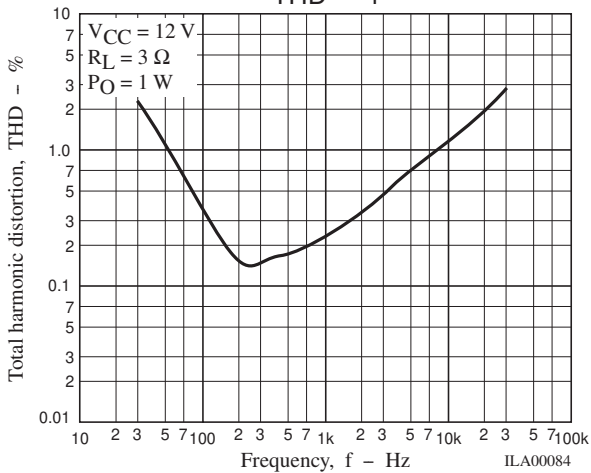
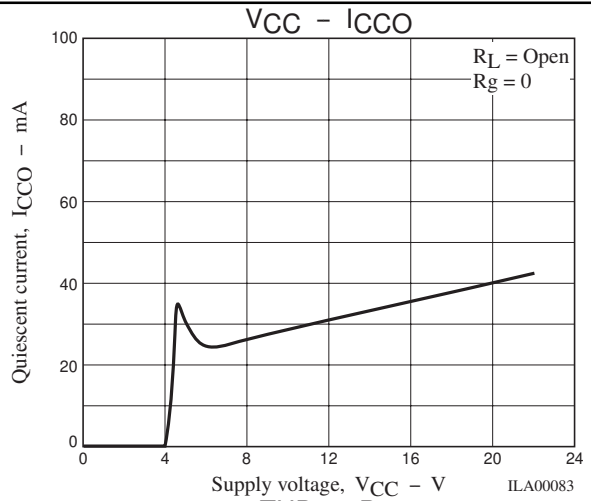
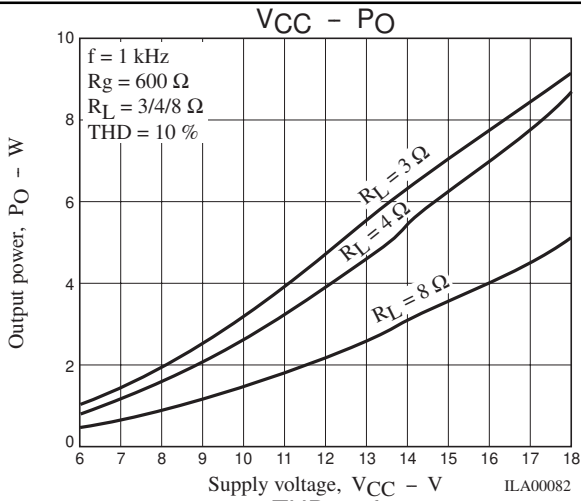
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5. MUTE (Muting)

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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