



SANYO Semiconductors

DATA SHEET

LA4627N — Monolithic Linear IC 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.
- $P_O : 2.0W \times 2$ ($V_{CC}=9V, R_L=4\Omega$)
 $2.5W \times 2$ ($V_{CC}=9V, R_L=3\Omega$)
- 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 $T_a=25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Supply Voltage	$V_{CC\ max}$	$R_g=0$	22	V
Allowable Power Dissipation	$P_d\ max$	When mounted on the Sanyo-recommended PCB	4.0	W
Operating Temperature	T_{op}		-25 to +75	°C
Storage Temperature	T_{stg}		-55 to +150	°C

Operating Conditions at $T_a=25^\circ C$

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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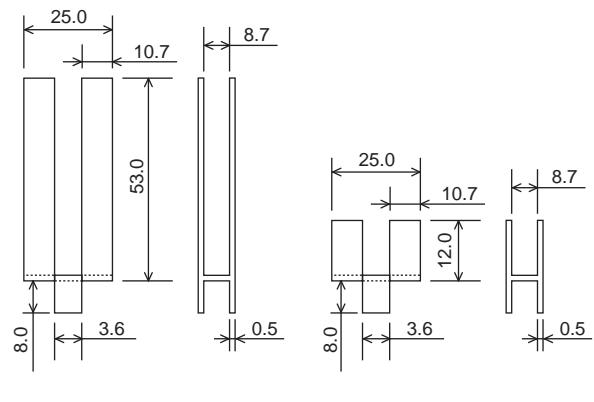
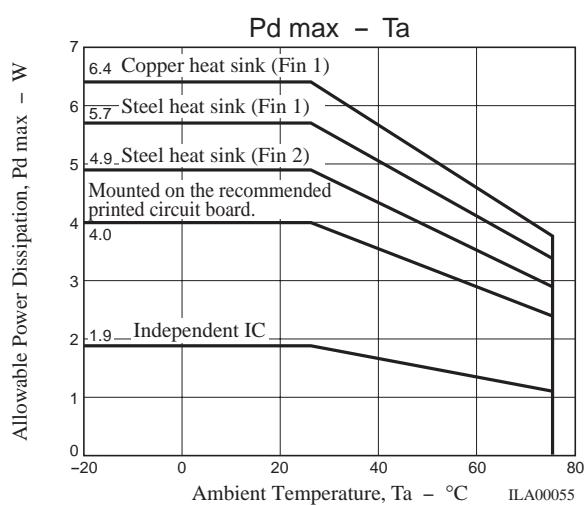
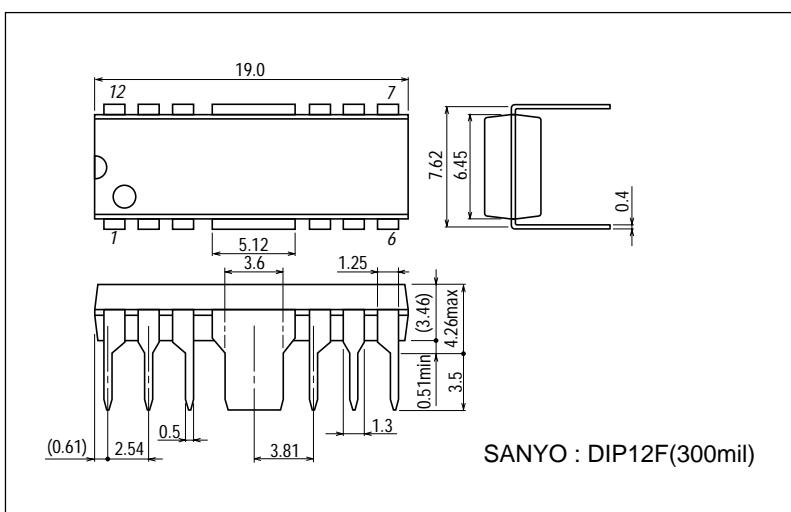
Operating Characteristics at $T_a=25^\circ\text{C}$, $V_{CC}=9\text{V}$, $R_L=3\Omega$, $f=1\text{kHz}$, $R_g=600\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent Current	I_{CC0}	$R_g=0$	17	30	70	mA
Voltage Gain	V_G	$V_O=0\text{dBm}$	43	45	47	dB
Total Harmonic Distortion	THD	$P_O=0.33\text{W}$ ($V_O=1.0\text{V}$)		0.1	0.8	%
Output Power	P_{O1}	THD=10%	2.0	2.5		W
	P_{O2}	THD=10%, $R_L=4\Omega$		2.0		W
Output Noise Voltage	V_{NO}	$R_g=0$, DIN AUDIO		0.15	0.5	mVrms
Ripple Rejection Ratio	SVRR	$R_g=0$, $f_R=100\text{Hz}$, $V_r=0\text{dBm}$, DIN AUDIO	45	52		dB
Channel Separation	CHsep	$R_g=0$, $V_O=0\text{dBm}$, DIN AUDIO	50	60		dB
Standby Current	I_{ST}	$R_g=0$		1.0	10	μA
Input Resistance	R_i		20	30	40	$\text{k}\Omega$
Standby Pin Voltage	V_{ST}	The pin 1 voltage such that the amplifier is on	1.5	5.0		V

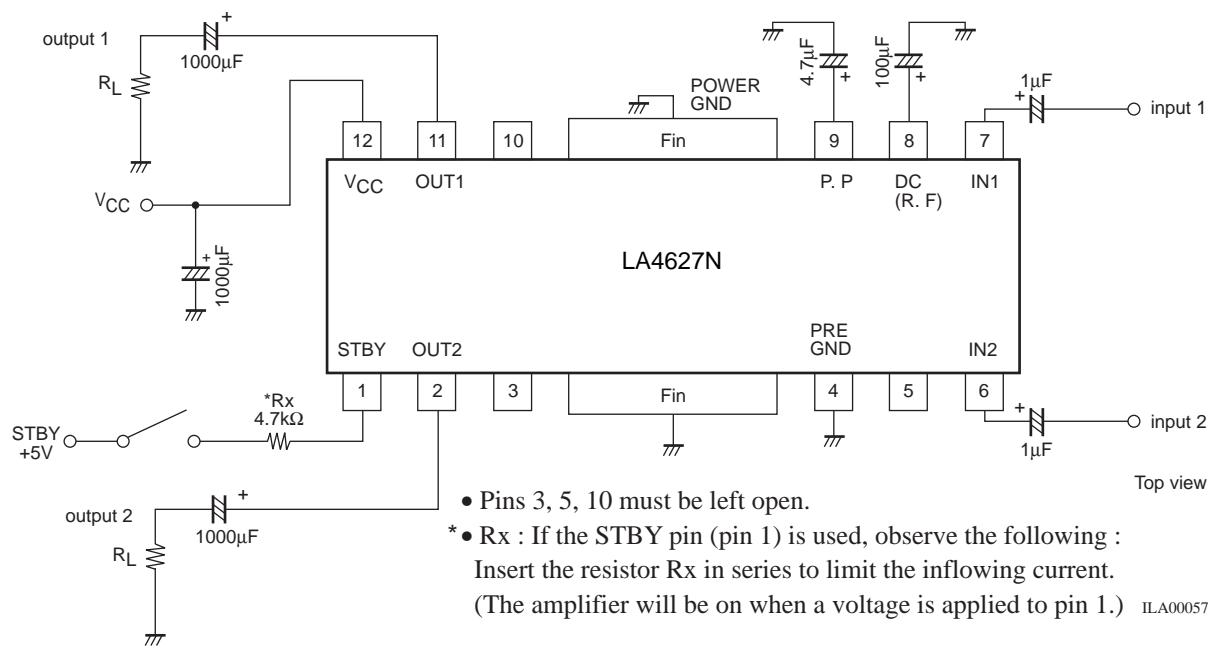
Package Dimensions

unit : mm

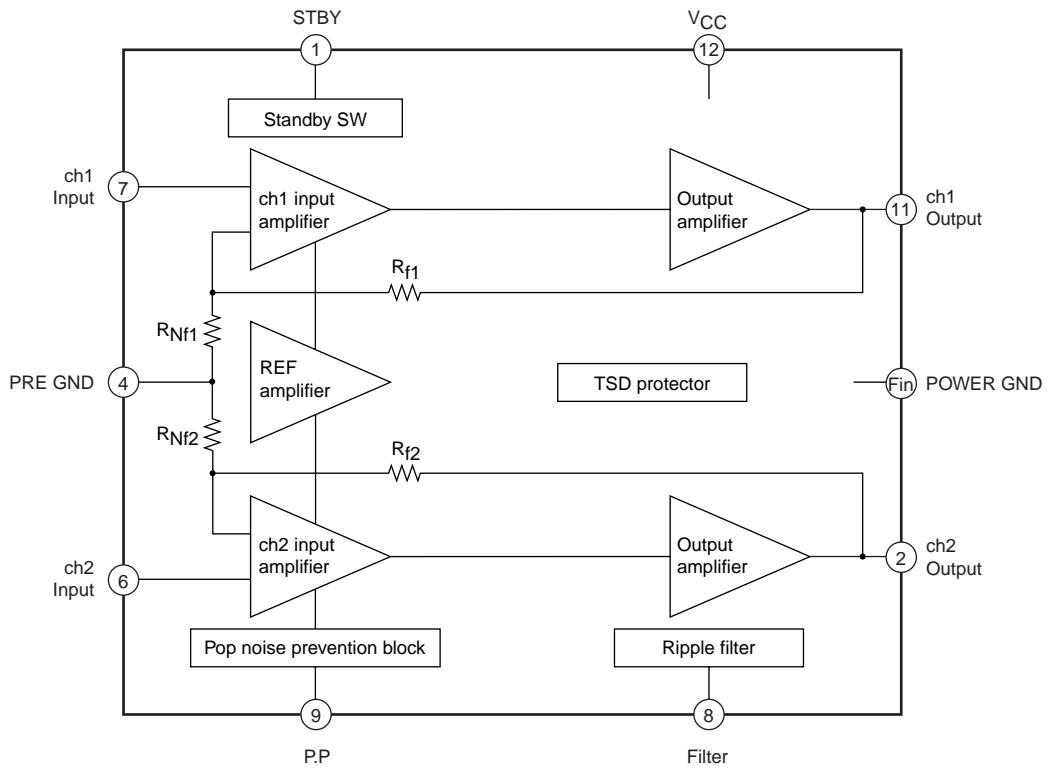
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Sample Application Circuit



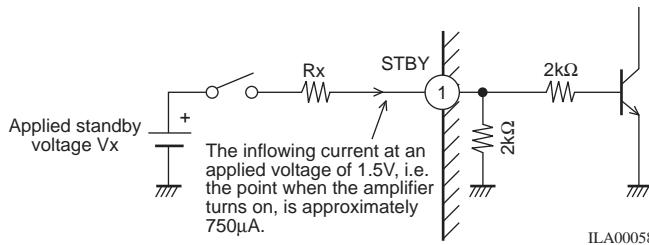
Block Diagram



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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 (R_x) of $4.7k\Omega$

STBY pin applied voltage : 12V

To hold the pin 1 inflow current to about 750μA insert a resistor (R_x) of $14k\Omega$ ($12k\Omega$).

STBY pin applied voltage : Other value (V_x)

To hold the pin 1 inflow current to about 750μA insert a resistor (R_x) of $(V_x - 1.5V) / 750\mu A$.

- 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 $30k\Omega$.

- Although the recommended value for the input capacitor is $1\mu F$, 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.)

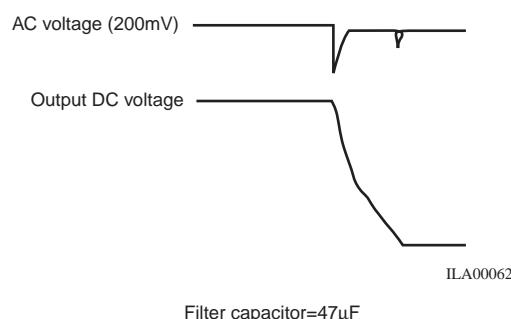
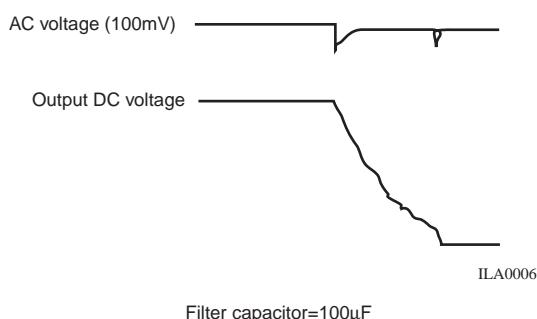
Input capacitor	$1.0\mu F$	$2.2\mu F$	$3.3\mu F$	$4.7\mu F$	$10\mu F$
Starting time (ts)	0.2s	0.3s	0.5s	0.65s	1.5s

3. FILTER (decoupling) pin (pin 8)

The pin voltage is about $1/2 V_{CC}$.

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

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.



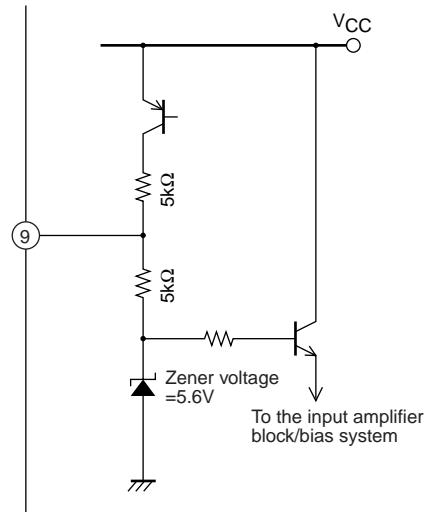
4. P.P (pulse noise) pin (pin 9)

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

- The recommended value for the P.P capacitor is $4.7\mu\text{F}$.

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

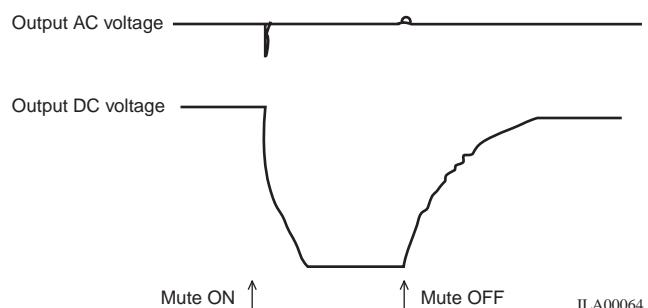
Furthermore, if a value over $10\mu\text{F}$ is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).



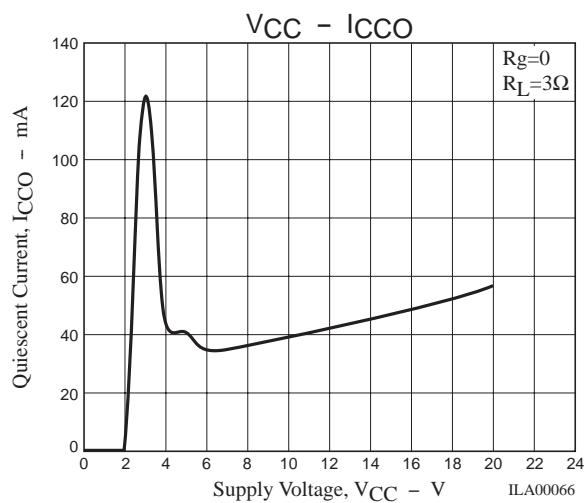
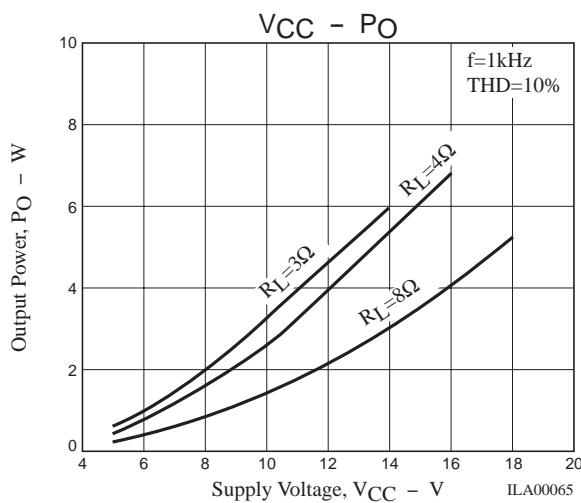
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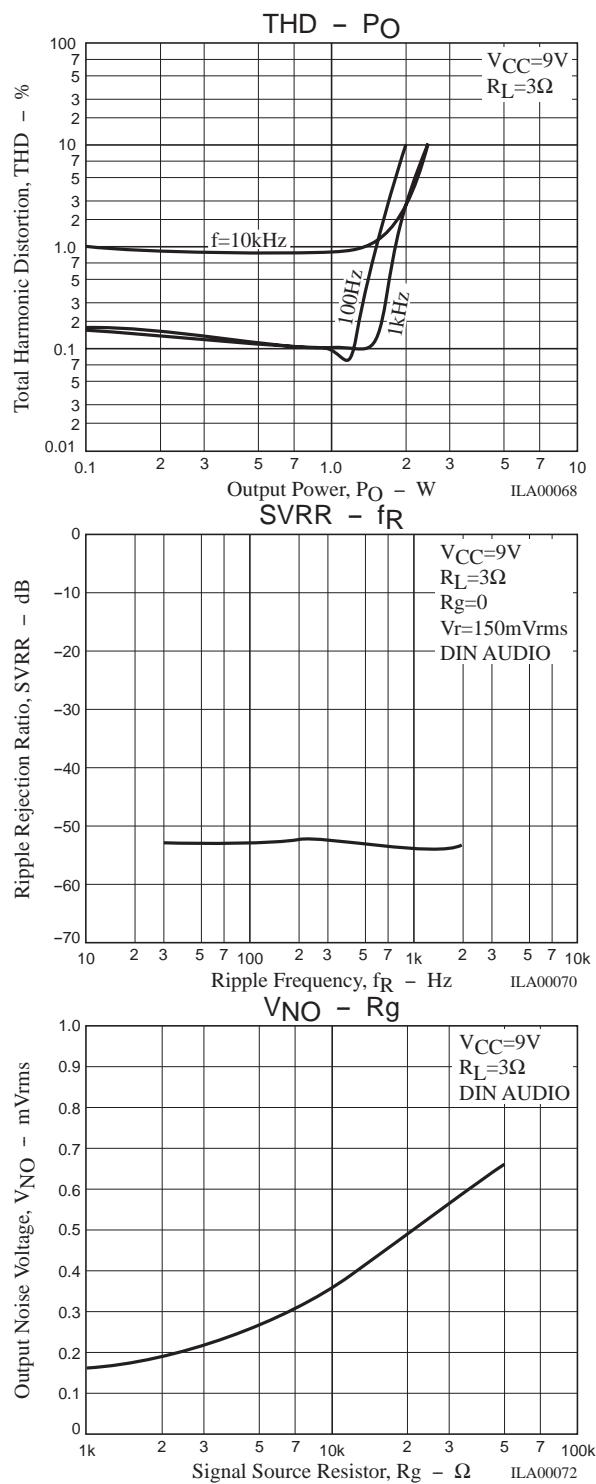
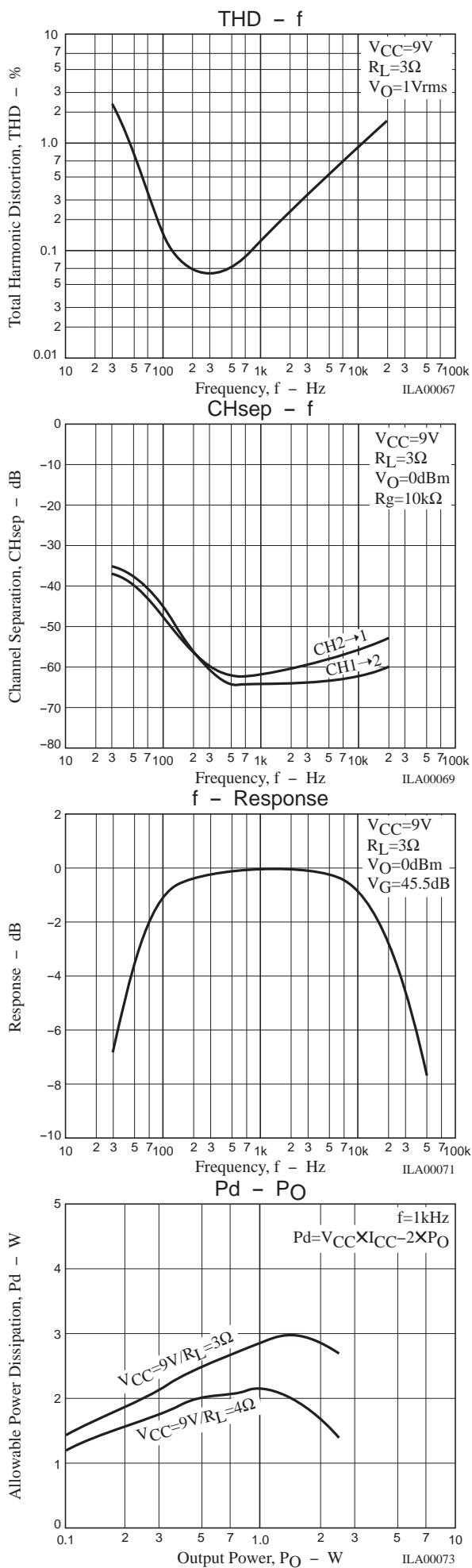
5. MUTE (Muting)

The output signal can be controlled by shifting the pin 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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