



LA4629

Monolithic Linear IC

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

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\ max}$	No input	24	V
Allowable power dissipation	$P_d\ max$	With an arbitrarily large heat sink	25	W
Operating temperature	T_{opr}		-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	$V_{CC\ op}$	The range over which the package P_d is not exceeded.	5 to 22	V
Recommended operating load resistance	R_{Lop}		2.7 to 8	Ω

■ Any and all SANYO Semiconductor Co.,Ltd. products described or contained herein are, with regard to "standard application" intended for the use as general electronics equipment (home appliances, AV equipment, communication device, office equipment, industrial equipment etc.). The products mentioned herein shall not be intended for use for any "special application" (medical equipment whose purpose is to sustain life, aerospace instrument, nuclear control device, burning appliances, transportation machine, traffic signal system, safety equipment, etc.) that shall require extremely high level of reliability and can directly threaten human lives in case of failure or malfunction of the product or may cause harm to human bodies, nor shall they grant any guarantee thereof. If you should intend to use our products for applications outside the standard applications of our customer, who is considering such use and/or outside the scope of our intended standard applications, please consult with us prior to the intended use. If there is no consultation or inquiry before the intended use, our customer shall be solely responsible for the use.

■ Specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

LA4629

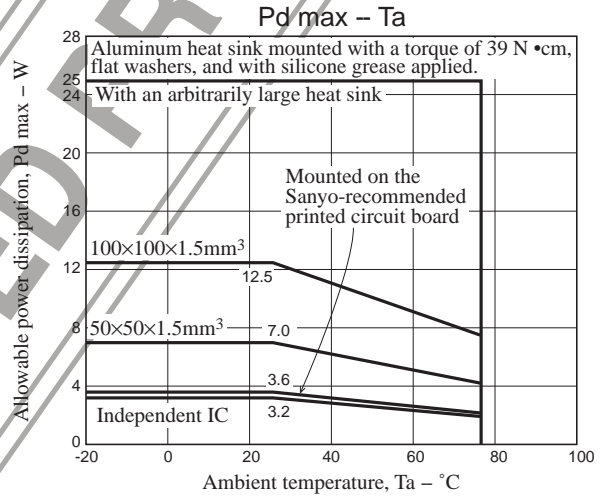
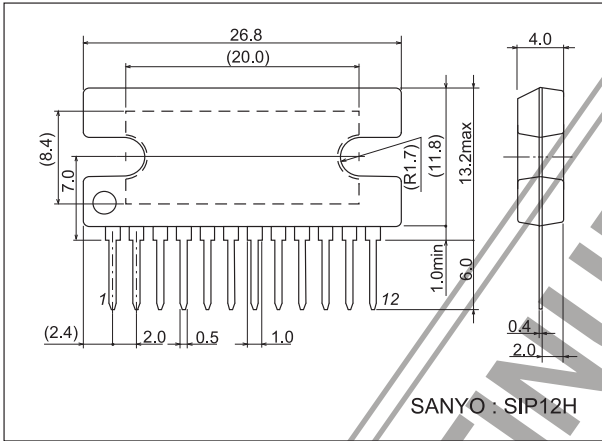
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 12\text{V}$, $R_L = 3\Omega$, $f = 1\text{kHz}$, $R_g = 600\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	$R_g = 0$	18	35	80	mA
Standby current	I_{ST}			1.0	10	μA
Voltage gain	V_G	$V_O = 0\text{dBm}$	43	45	47	dB
Output power	$P_{O(1)}$	THD = 10%	3.0	4.5		W
	$P_{O(2)}$	$V_{CC} = 12\text{V}$, $R_L = 4\Omega$, THD = 10%		4.0		W
	$P_{O(3)}$	$V_{CC} = 9\text{V}$, $R_L = 3\Omega$, THD = 10%	2.0	2.5		W
	$P_{O(4)}$	$V_{CC} = 9\text{V}$, $R_L = 4\Omega$, 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	V_{ST}	The pin 6 voltage such that the amplifier is on	1.5	5.0		V

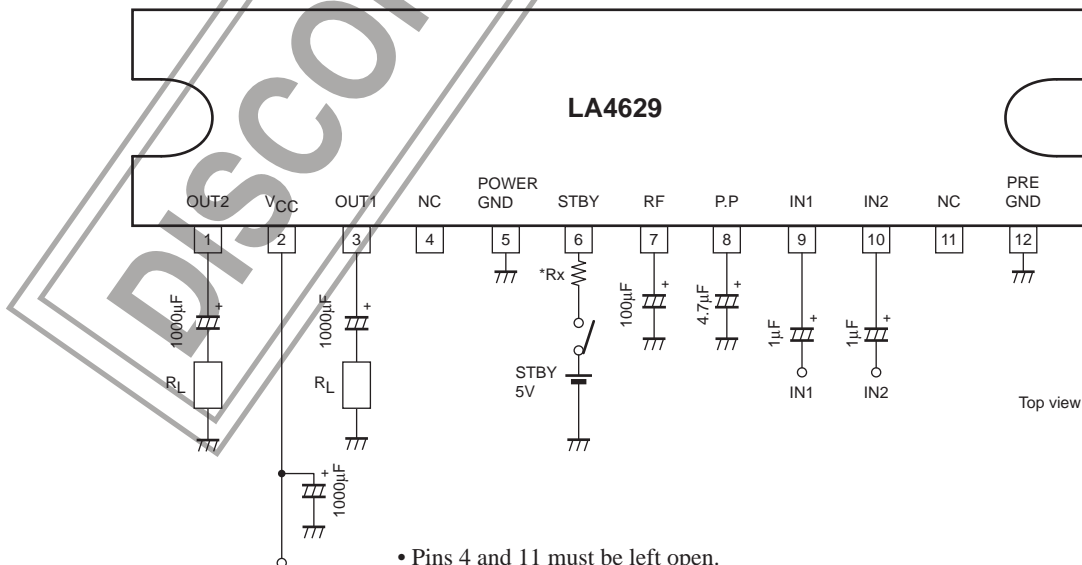
Package Dimensions

unit : mm (typ)

3049B

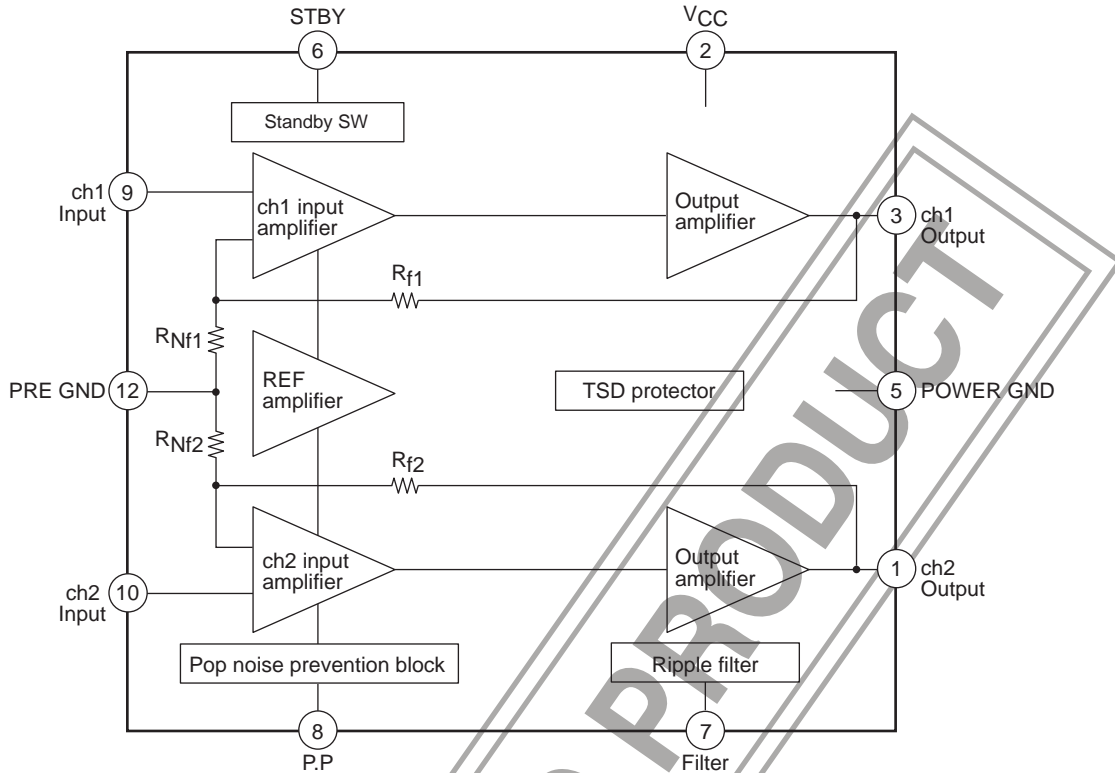


Pin Assignment and Application Circuit Example



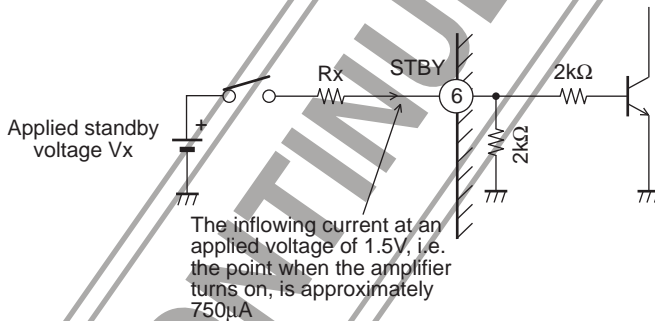
- Pins 4 and 11 must be left open.
- * • Rx : If the STBY pin (pin 6) is used, observe the following :
Insert the resistor Rx in series to limit the inflowing current.
(The amplifier will be on when a voltage is applied to pin 6.)

Block Diagram



Pin Functions

1. Standby switch function (pin 6)



STBY pin applied voltage: 5V

To hold the pin 6 inflow current to about 750μA insert a resistor (Rx) of 4.7kΩ

STBY pin applied voltage: 12V

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

STBY pin applied voltage: Other value (Vx)

To hold the pin 6 inflow current to about 750μA insert a resistor (Rx) 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 9 and 10)

The input pin voltage is about $2V_{BE}$ (1.4V).

The input pin impedance is about 30kΩ.

- Although the recommended value for the input capacitor is 0.22μF, 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.)

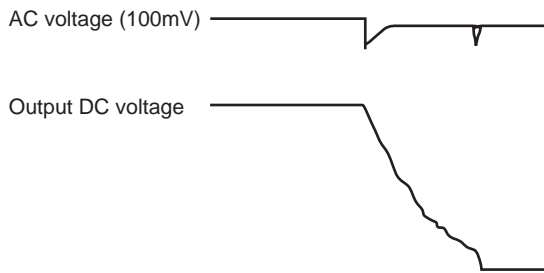
Input capacitor	1.0μF	2.2μF	3.3μF	4.7μF	10μF
Starting time (t _s)	0.2s	0.3s	0.5s	0.65s	1.5s

3. FILTER (decoupling) pin (pin 7)

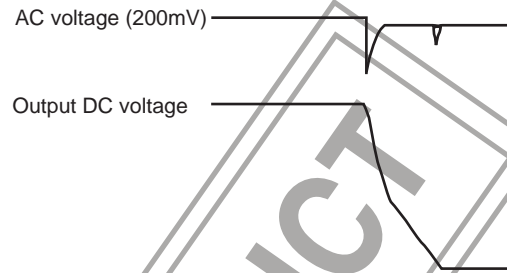
The pin voltage is about $1/2V_{CC}$.

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

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



Filter capacitor = $100\mu\text{F}$



Filter capacitor = $47\mu\text{F}$

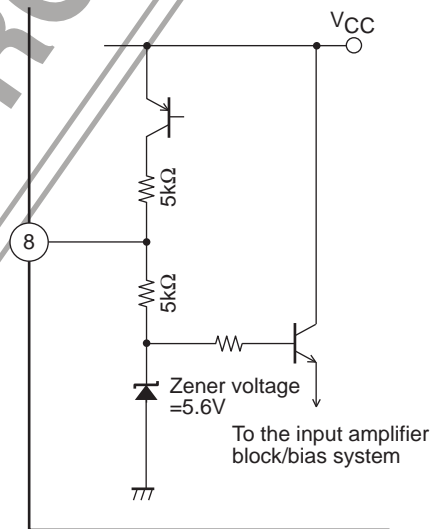
4. P.P (pulse noise) pin (pin 8)

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

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

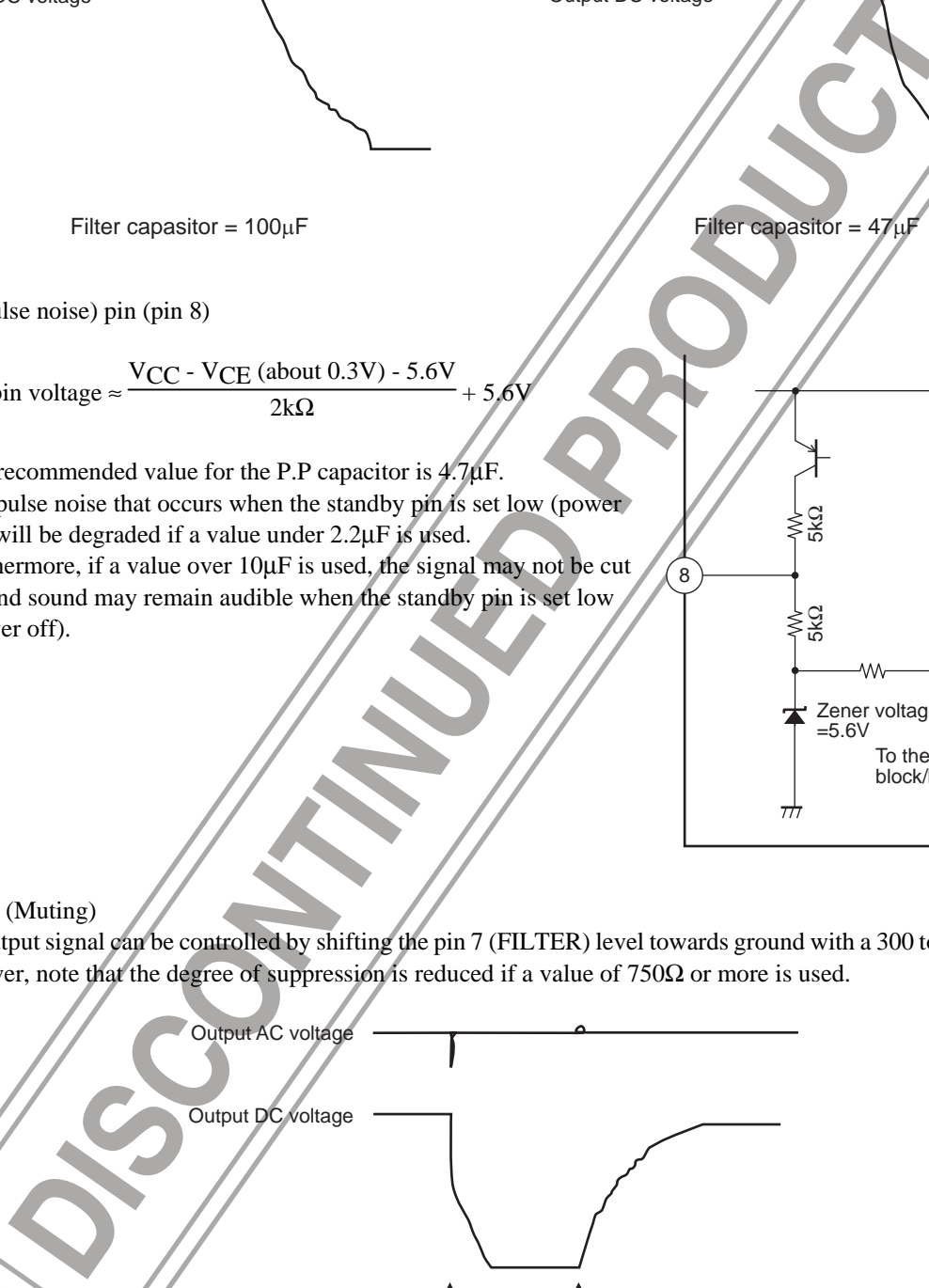
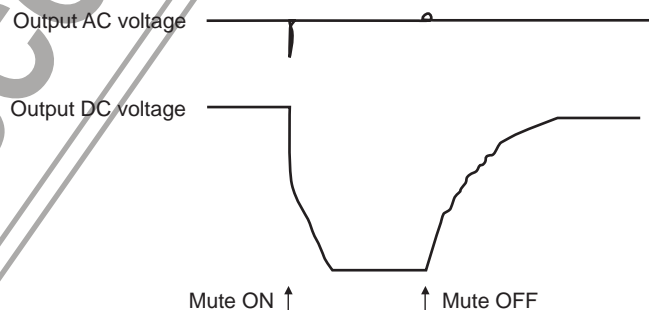
The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under $2.2\mu\text{F}$ is used.

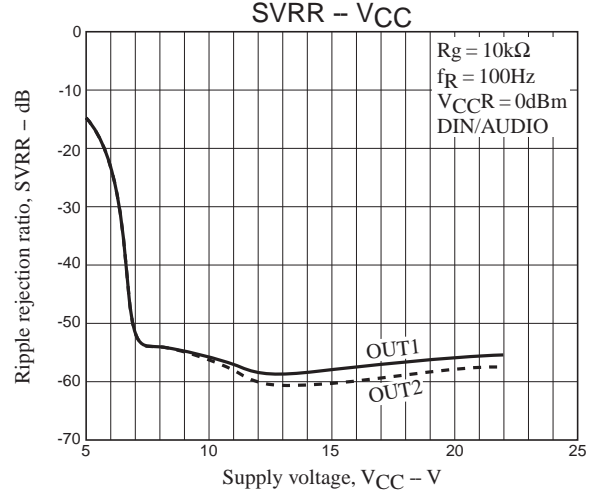
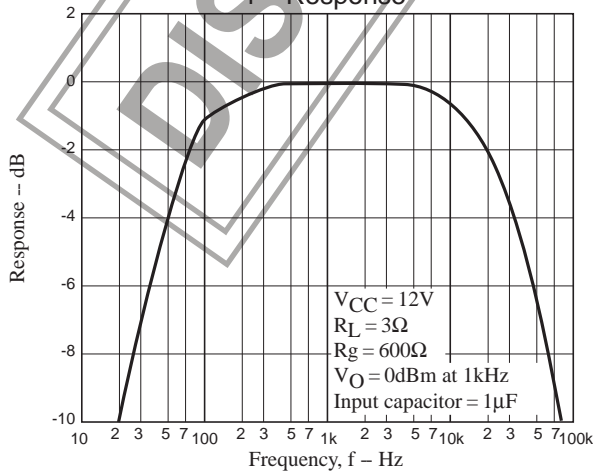
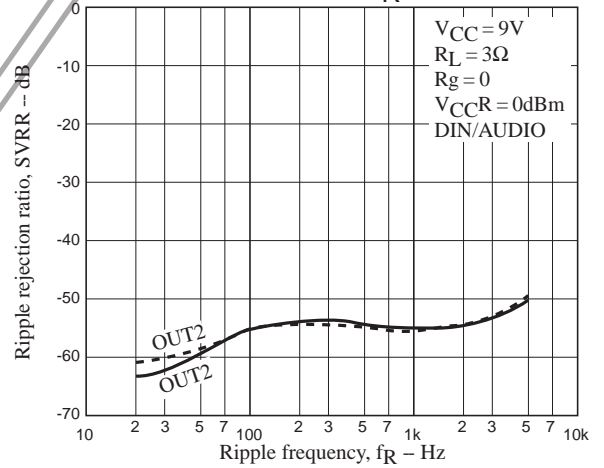
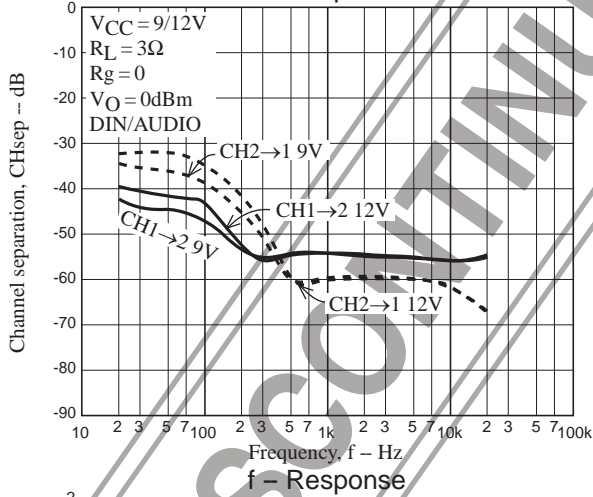
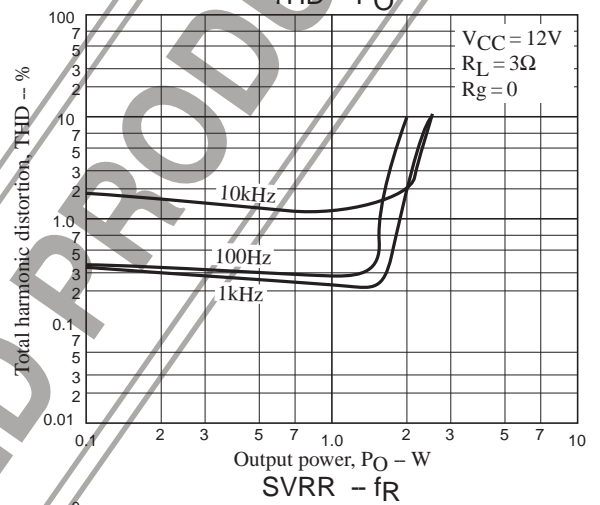
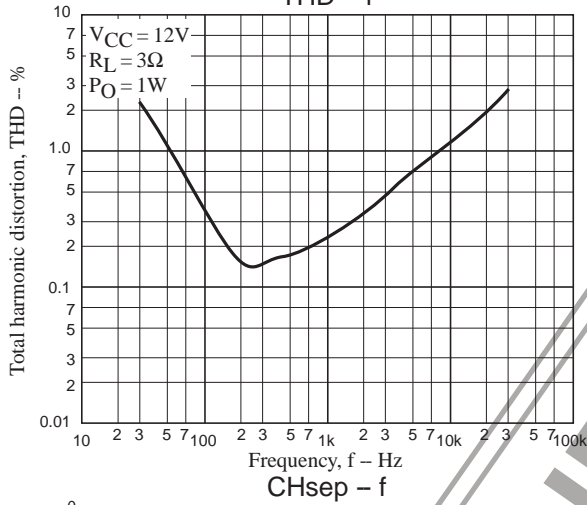
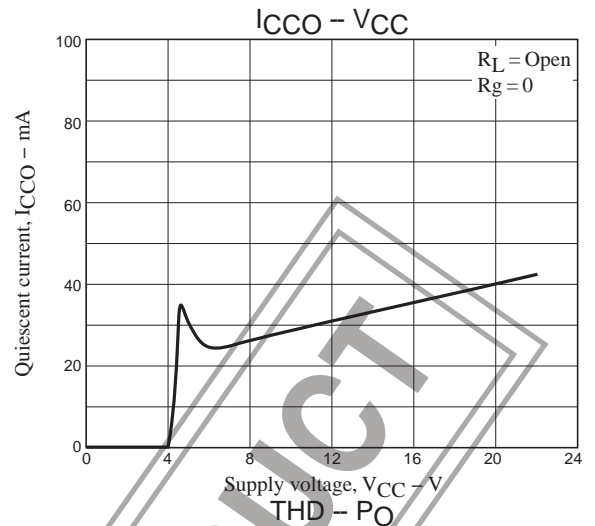
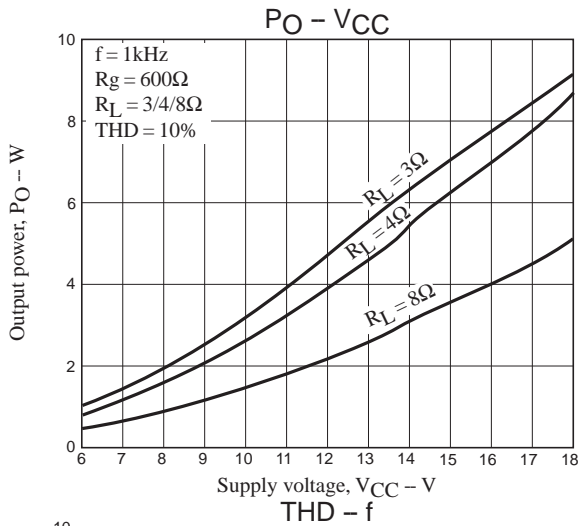
Furthermore, if a value over $10\mu\text{F}$ is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).

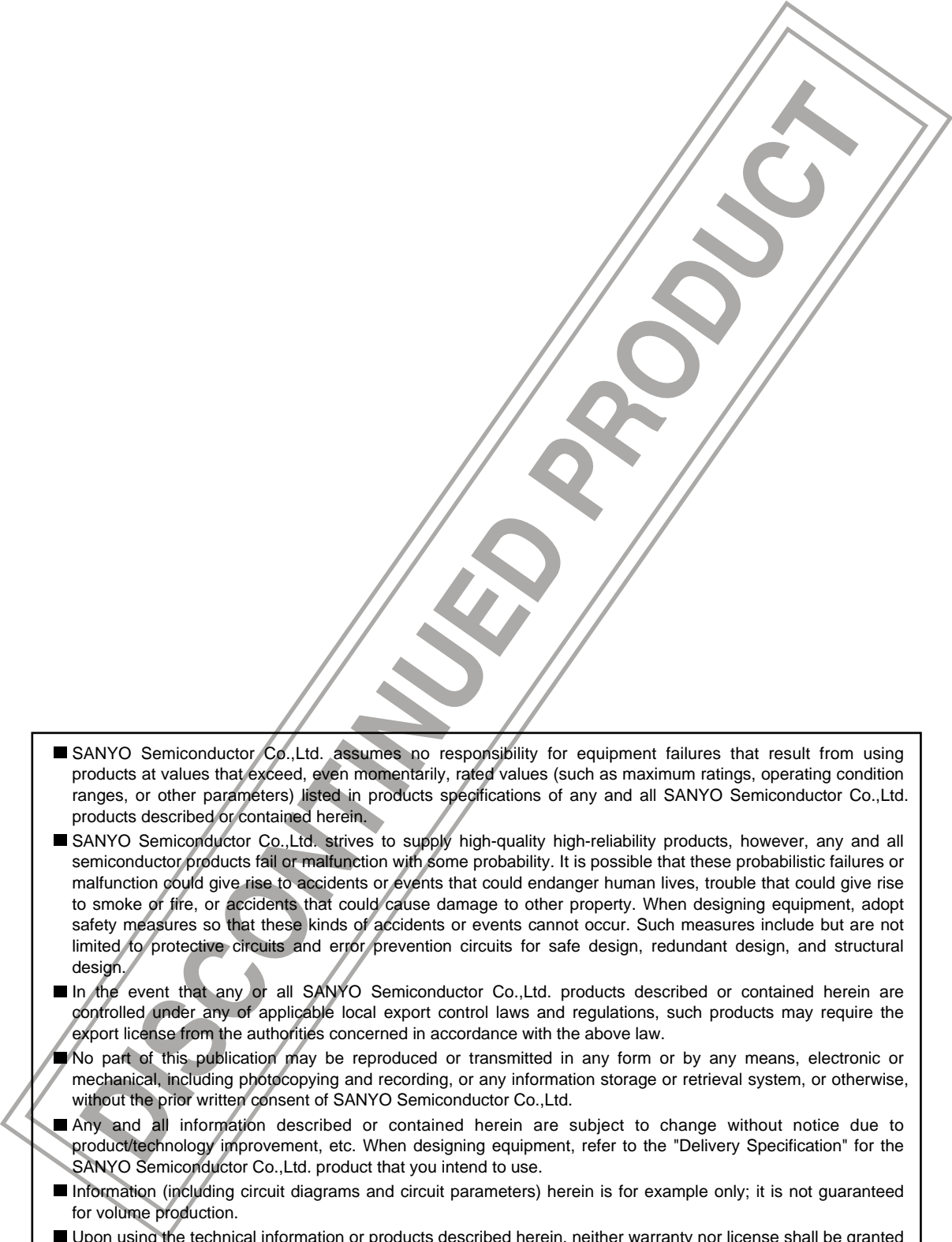


5. MUTE (Muting)

The output signal can be controlled by shifting the pin 7 (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.





- 
- SANYO Semiconductor Co.,Ltd. assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein.
 - SANYO Semiconductor Co.,Ltd. strives to supply high-quality high-reliability products, however, any and all semiconductor products fail or malfunction with some probability. It is possible that these probabilistic failures or malfunction could give rise to accidents or events that could endanger human lives, trouble that could give rise to smoke or fire, or accidents that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
 - In the event that any or all SANYO Semiconductor Co.,Ltd. products described or contained herein are controlled under any of applicable local export control laws and regulations, such products may require the export license from the authorities concerned in accordance with the above law.
 - No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written consent of SANYO Semiconductor Co.,Ltd.
 - Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO Semiconductor Co.,Ltd. product that you intend to use.
 - Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production.
 - Upon using the technical information or products described herein, neither warranty nor license shall be granted with regard to intellectual property rights or any other rights of SANYO Semiconductor Co.,Ltd. or any third party. SANYO Semiconductor Co.,Ltd. shall not be liable for any claim or suits with regard to a third party's intellectual property rights which has resulted from the use of the technical information and products mentioned above.

This catalog provides information as of October, 2008. Specifications and information herein are subject to change without notice.