



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×2 ( $V_{CC}=9V$ ,  $R_L=4\Omega$ )  
2.5W×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 $T_a=25^\circ\text{C}$

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

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended Supply Voltage	$V_{CC}$		9	V
Recommended Load Resistance	$R_L$		3	$\Omega$
Operating Voltage Range	$V_{CC \text{ op}}$	Under conditions such that the maximum ratings are not exceeded.	5.0 to 20	V
Recommended Operating Load Resistance	$R_L \text{ op}$		2.7 to 8.0	$\Omega$

■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

■ SANYO 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 products described or contained herein.

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

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

# LA4627N

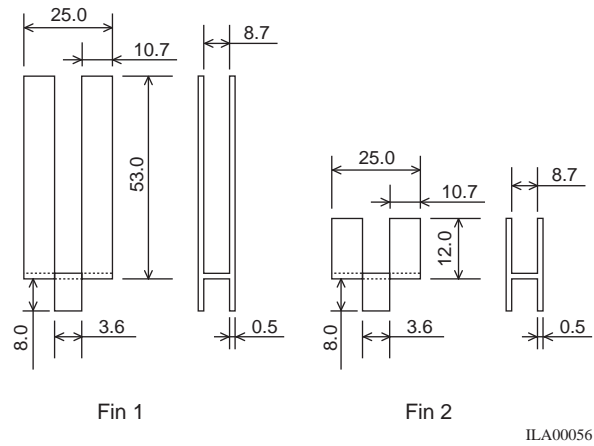
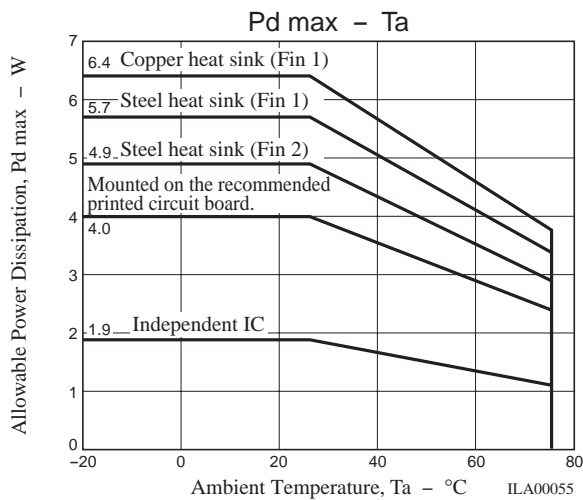
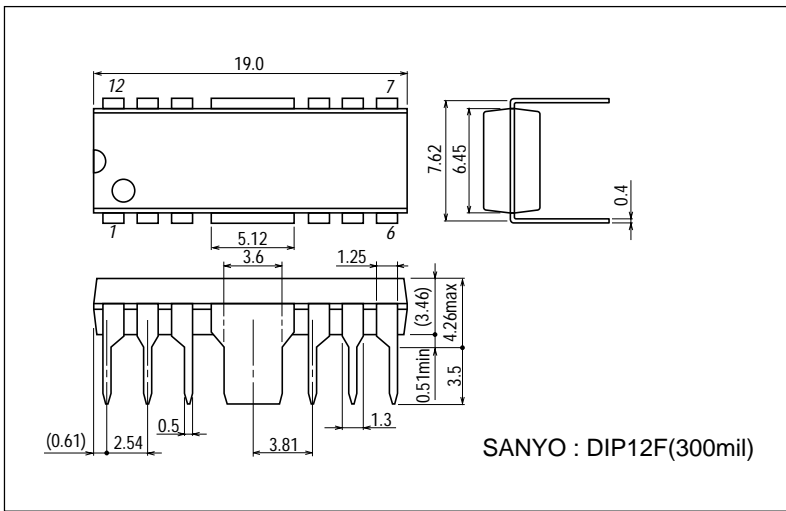
Operating Characteristics at  $T_a=25^\circ\text{C}$ ,  $V_{CC}=9\text{V}$ ,  $R_L=3\Omega$ ,  $f=1\text{kHz}$ ,  $R_g=600\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent Current	$I_{CCO}$	$R_g=0$	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	$\mu\text{A}$
Input Resistance	$R_i$		20	30	40	k $\Omega$
Standby Pin Voltage	$V_{ST}$	The pin 1 voltage such that the amplifier is on	1.5	5.0		V

## Package Dimensions

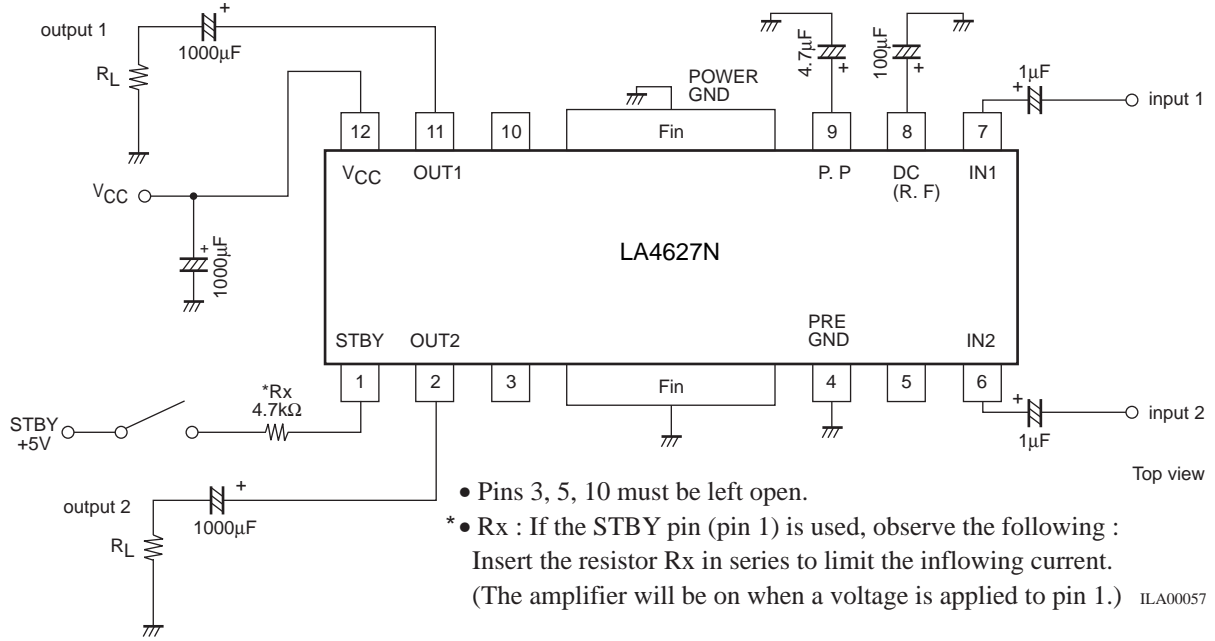
unit : mm

3022B

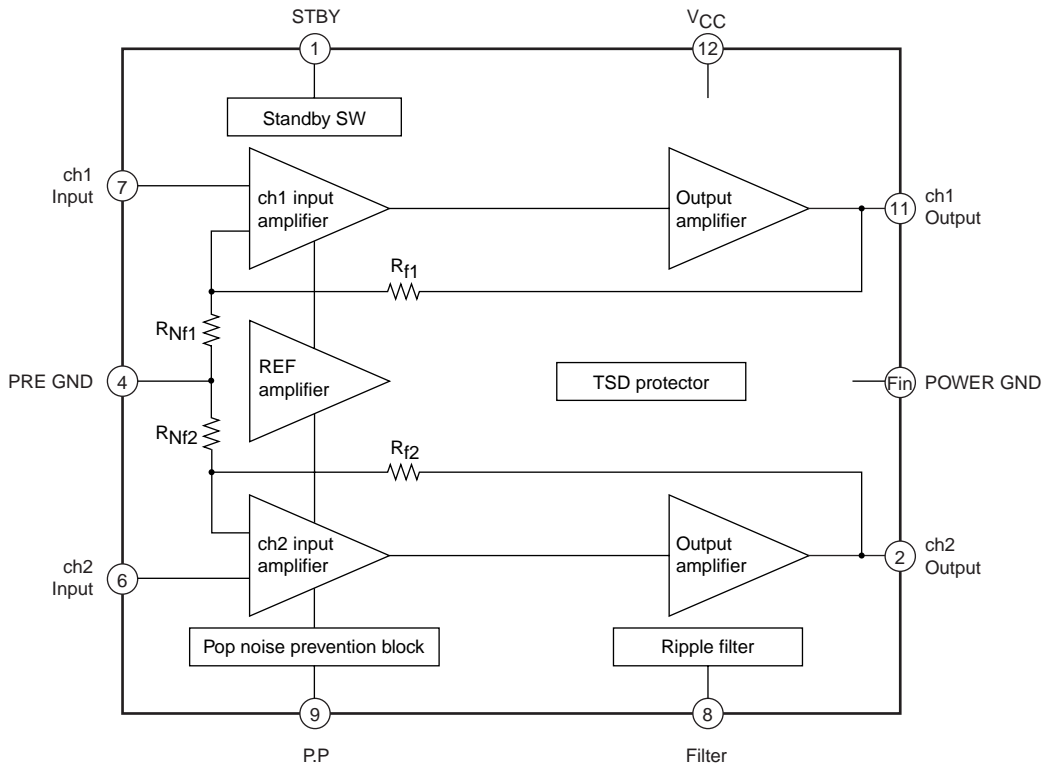


# LA4627N

## Sample Application Circuit

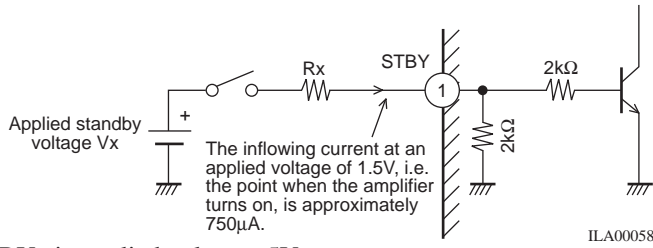


## Block Diagram



**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 (Rx) of 4.7kΩ

STBY pin applied voltage : 12V

To hold the pin 1 inflow current to about 750μA insert a resistor (Rx) of 14kΩ (12kΩ).

STBY pin applied voltage : Other value (Vx)

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

- 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 30kΩ.

- Although the recommended value for the input capacitor is 1μF, 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.)

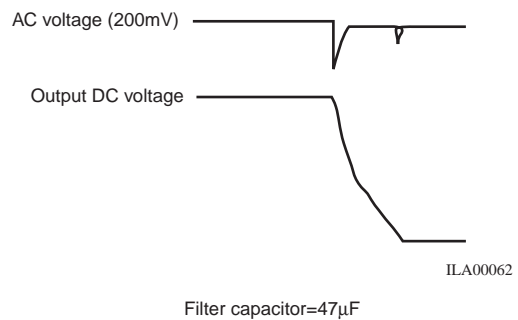
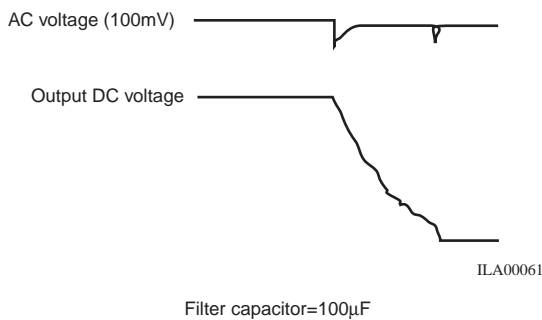
Input capacitor	1.0μF	2.2μF	3.3μF	4.7μF	10μF
Starting time (ts)	0.2s	0.3s	0.5s	0.65s	1.5s

3. FILTER (decoupling) pin (pin 8)

The pin voltage is about 1/2 VCC.

The recommended value for the filter capacitor is 100μF.

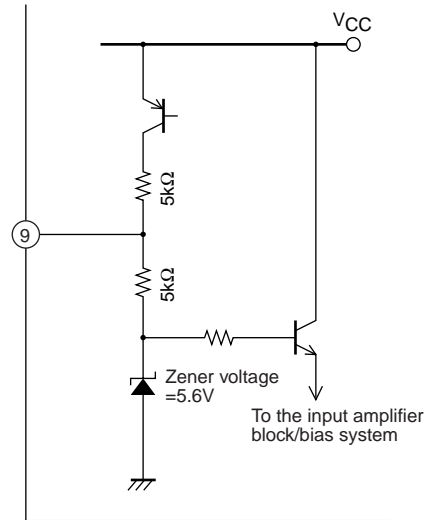
The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under 100μF is used.



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

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

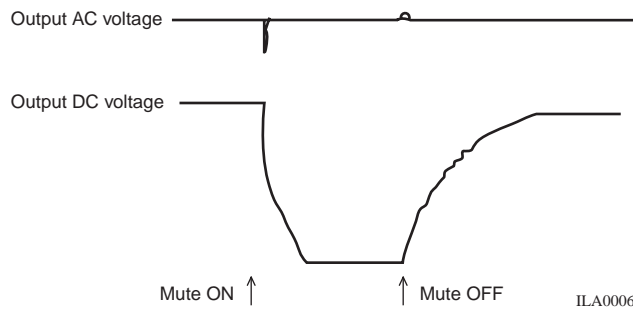
- The recommended value for the P.P capacitor is 4.7μF.
- The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under 2.2μF is used.
- Furthermore, if a value over 10μF is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).



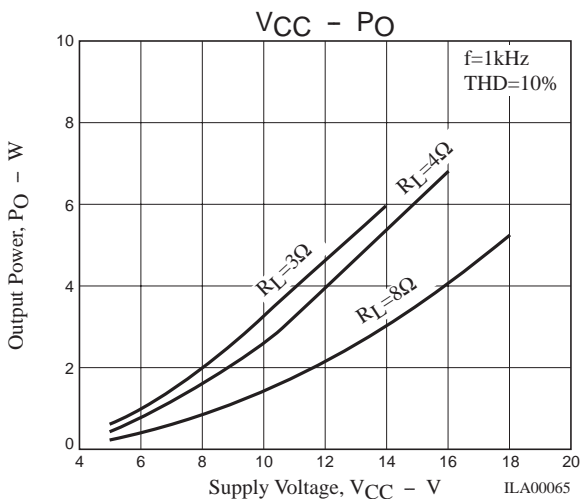
ILA00063

5. MUTE (Muting)

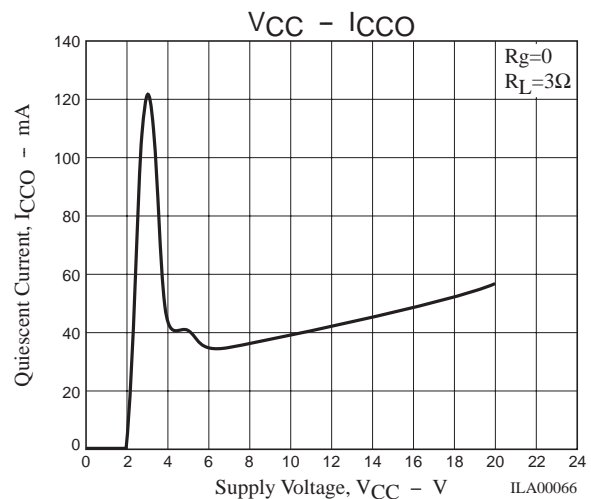
The output signal can be controlled by shifting the pin 8 (FILTER) level towards ground with a 300 to 500Ω resistor. However, note that the degree of suppression is reduced if a value of 750Ω or more is used.



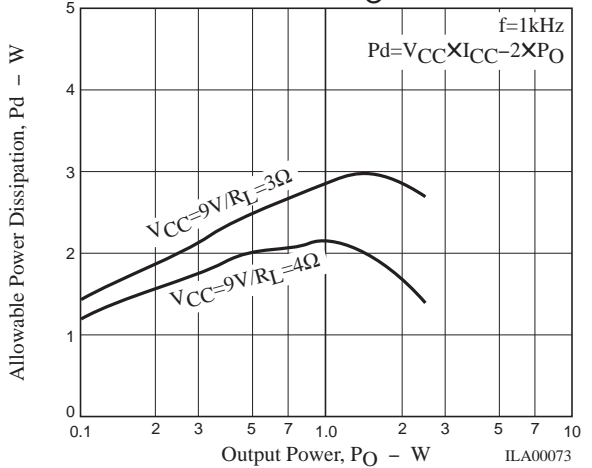
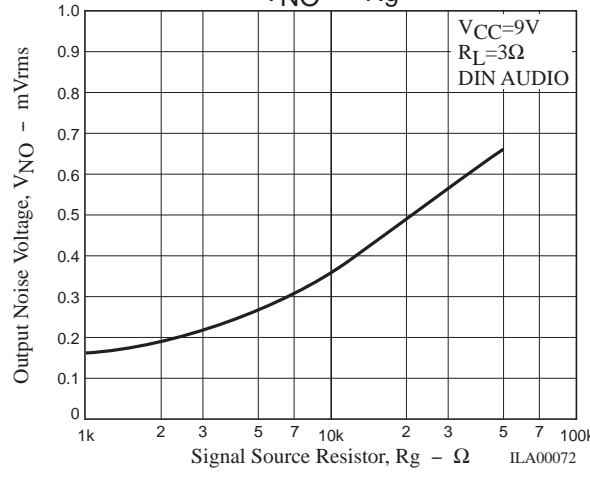
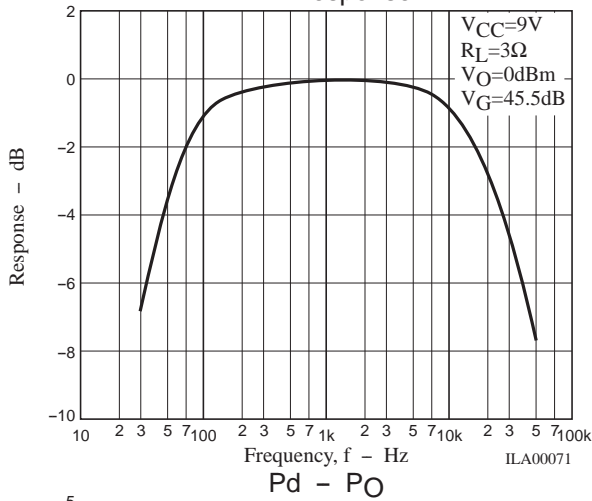
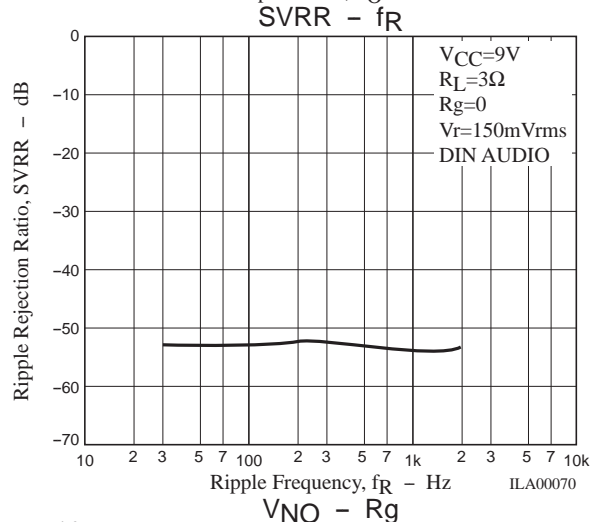
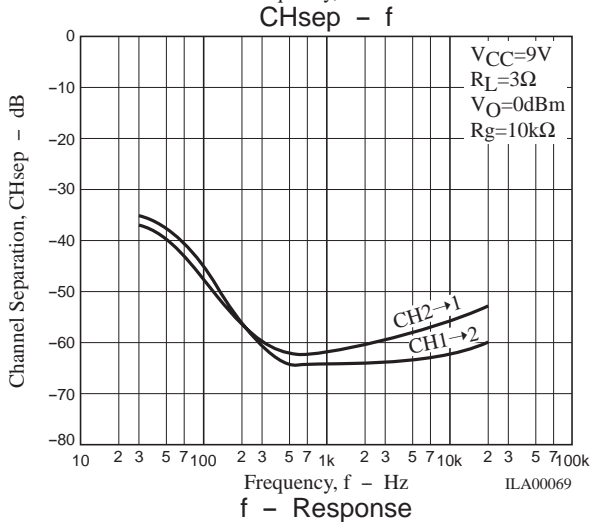
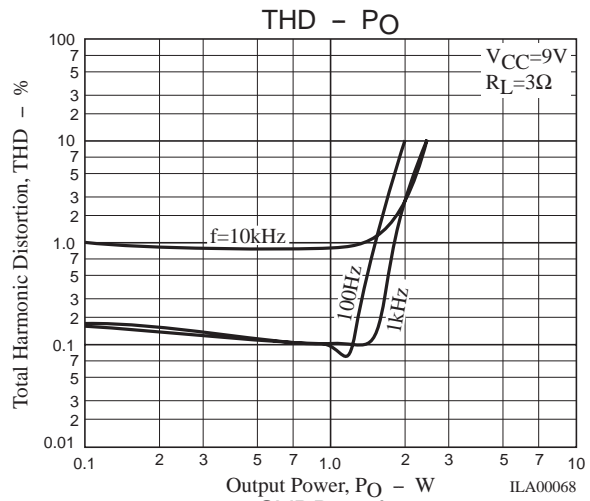
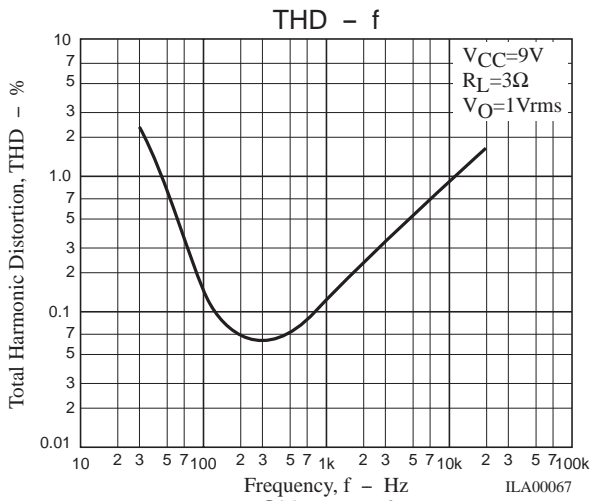
ILA00064



ILA00065



ILA00066



- Specifications of any and all SANYO 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.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or 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 products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining 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 permission of SANYO Electric 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 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. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of November, 2004. Specifications and information herein are subject to change without notice.