

**LA4629****Two-Channel Audio Frequency Power Amplifier****Overview**

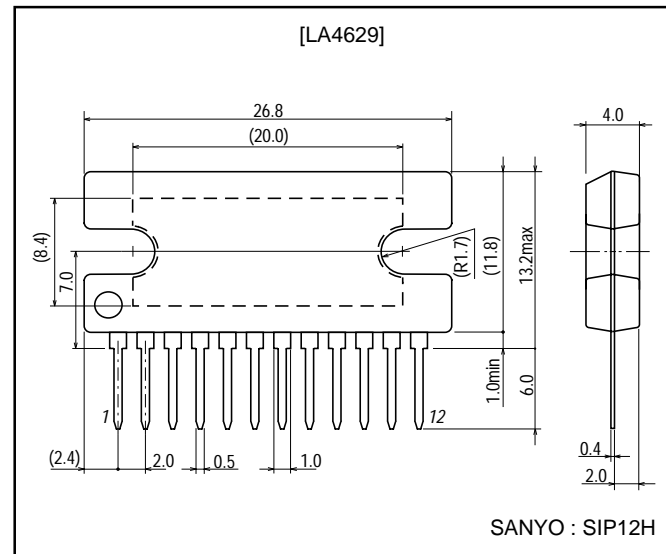
The LA4629 is a 2-channel power amplifier developed for use in radio/cassette player products. The LA4629 reduces the number of required external components by 50% over earlier products (BS/NF capacitors and oscillation prevention RC components) and thus can contribute significantly to space saving in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

■ 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.

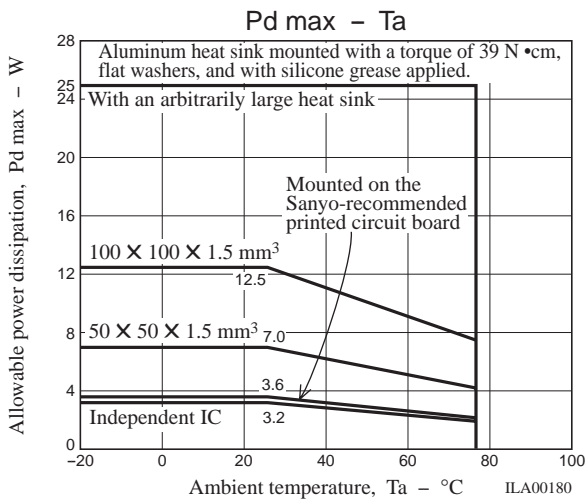
SANYO Electric Co., Ltd. Semiconductor Company

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

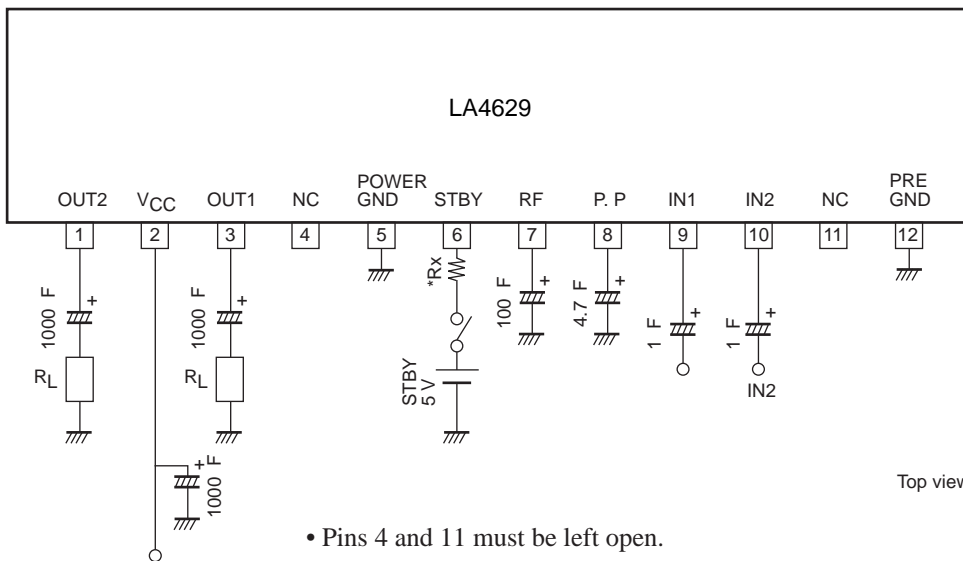
LA4629

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	μA
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	V_{ST}	The pin 6 voltage such that the amplifier is on	1.5	5.0		V



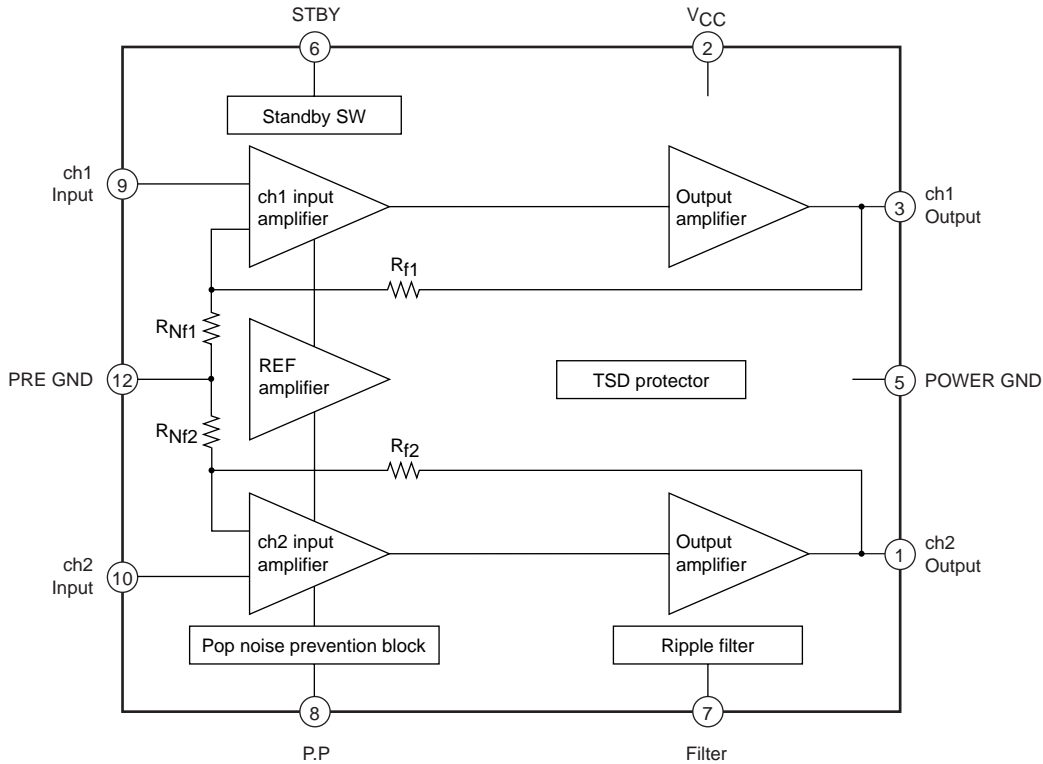
Application Circuit



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

ILA00074

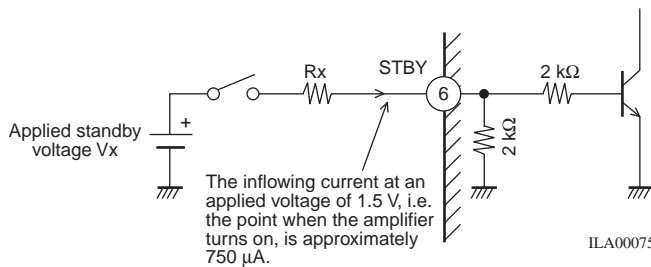
Block Diagram



ILA00076

Pin Functions

1. Standby switch function (pin 6)



ILA00075

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_{BE} (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.)

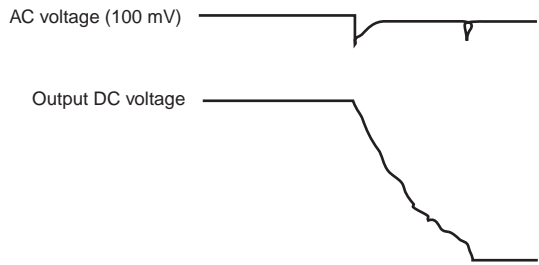
Input capacitor	1.0 μF	2.2 μF	3.3 μF	4.7 μF	10 μF
Starting time (ts)	0.2 s	0.3 s	0.5 s	0.65 s	1.5 s

3. FILTER (decoupling) pin (pin 7)

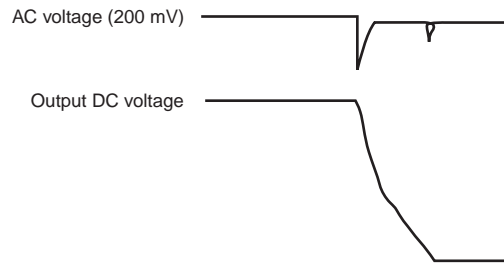
The pin voltage is about 1/2 VCC.

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.



Filter capacitor = 100 µF ILA00078



Filter capacitor = 47 µF ILA00079

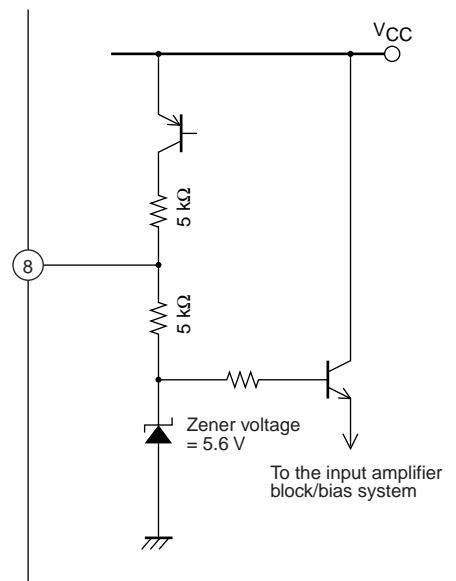
4. P.P (pulse noise) pin (pin 8)

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

• 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.

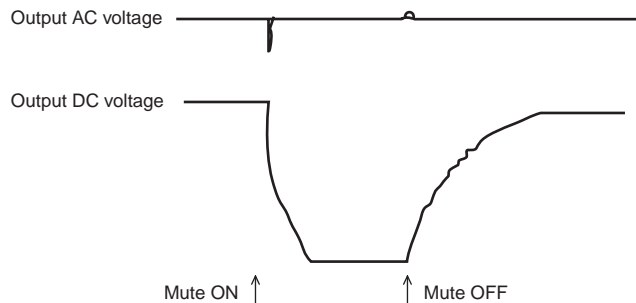
Furthermore, if a value over 10 µF is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).



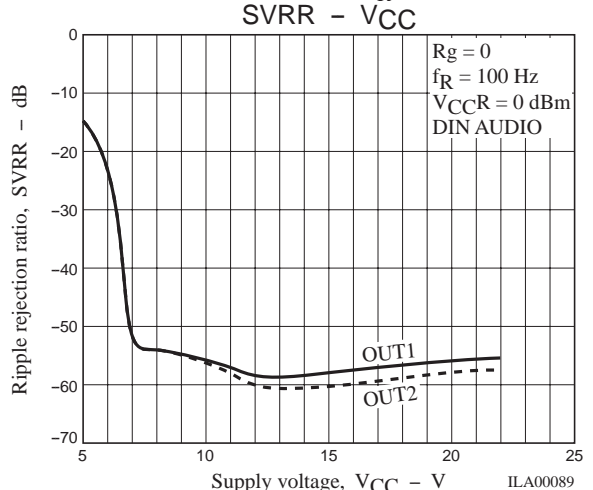
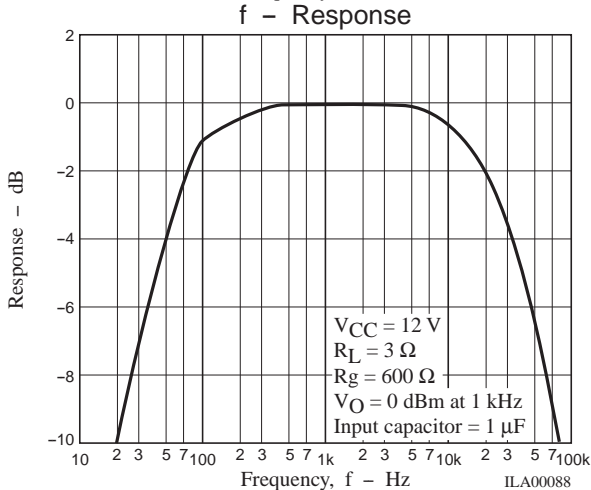
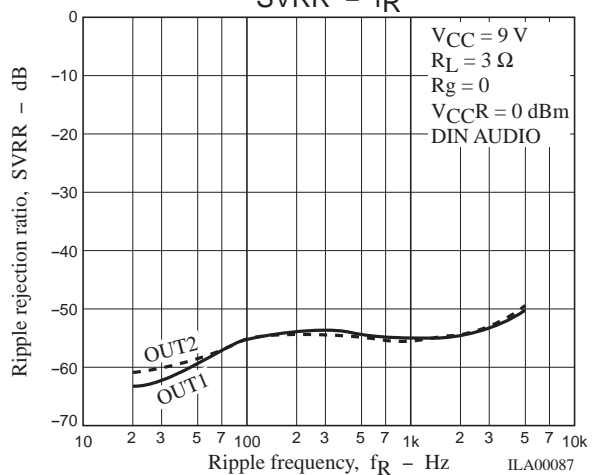
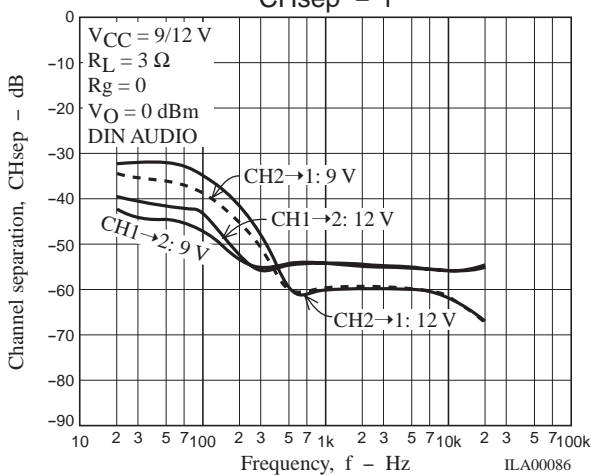
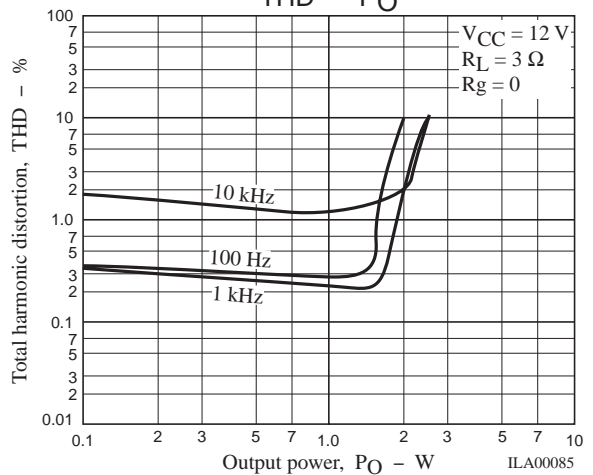
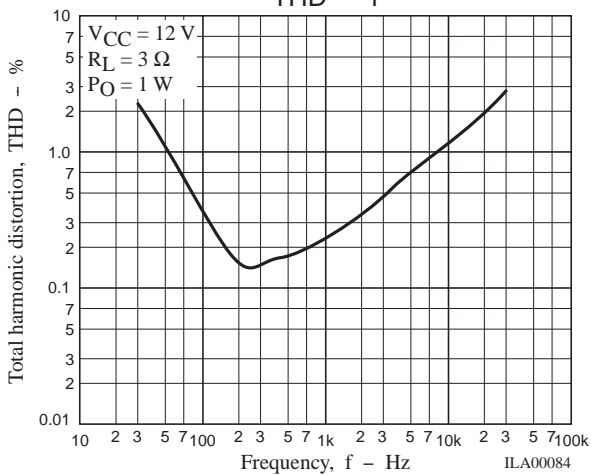
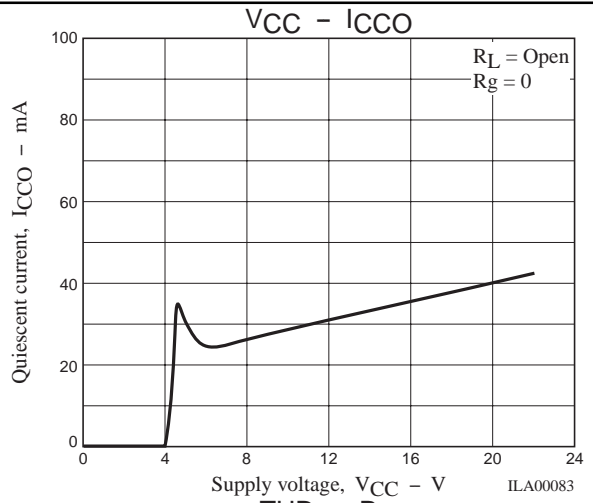
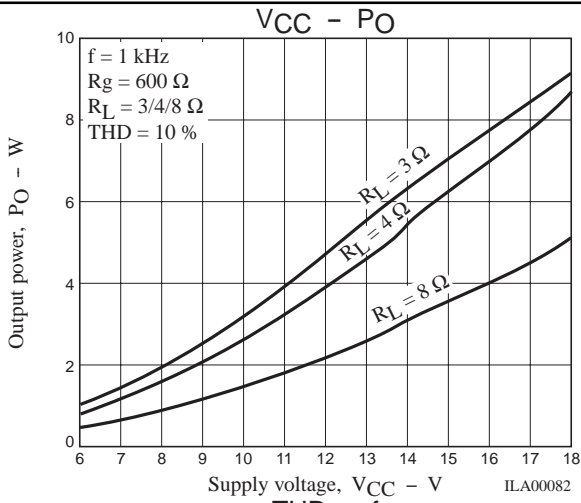
ILA00080

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.



ILA00081



- 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 April, 2000. Specifications and information herein are subject to change without notice.