



SANYO Semiconductors

DATA SHEET

LA4450

Monolithic Linear IC

For Bus and Track in Car Stereo

2-Channel Power Amplifier

Overview

The LA4450 is a single package 2-channel power Amplifier that supports an operating voltage of 26V. It is particularly well suited for use as the bus and track power IC in car stereo applications. Additionally, since the LA4450 can drive 4Ω loads, it can be used effectively in high-power high-end products. Furthermore, since it supports a high operating voltage and has low distortion, it is also optimal for use in TV and home audio products.

Features

- Two channels in a single package
- $P_O = 12W \times 2$ ($V_{CC} = 26.4V$, $R_L = 8\Omega$, THD = 10%)
- $P_O = 20W \times 2$ ($V_{CC} = 26.4V$, $R_L = 4\Omega$, THD = 10%)
- Can drive 4Ω speakers
- Built-in standby switch
- Minimizes impulse noises

Functions

- Standby switch (active on high (+5V) input)
- On-chip impulse noise protection circuit
- On-chip thermal protection circuit
- On-chip overvoltage and surge protection circuits

Specifications

Maximum Ratings at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	$R_g = 0$ (no signal)	37	V
Maximum output current	I_O peak		4	A
Allowable power dissipation	P_d max	Infinite heat sink*	25	W
Operating temperature	T_{opr}		-35 to +80	$^\circ C$
Storage temperature	T_{stg}		-40 to +150	$^\circ C$

Note : * Set V_{CC} and R_L within ranges that do not cause P_d max to exceed 25W.

(When V_{CC} is 37V, R_L should be 6Ω or larger and when V_{CC} is 35V, R_L should be 4Ω or larger.)

■ 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.

SANYO Semiconductor Co., Ltd.

www.semiconductor-sanyo.com/network

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		26.4	V
Recommended load resistance	R_L		8	Ω
Operating supply voltage range	$V_{CC\text{ op}}$		10 to 30	V

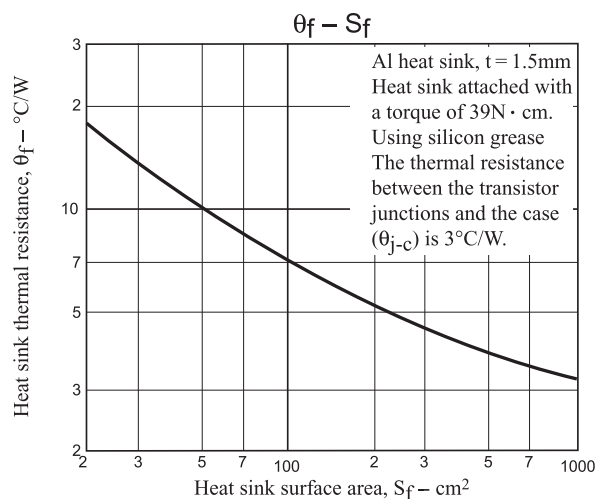
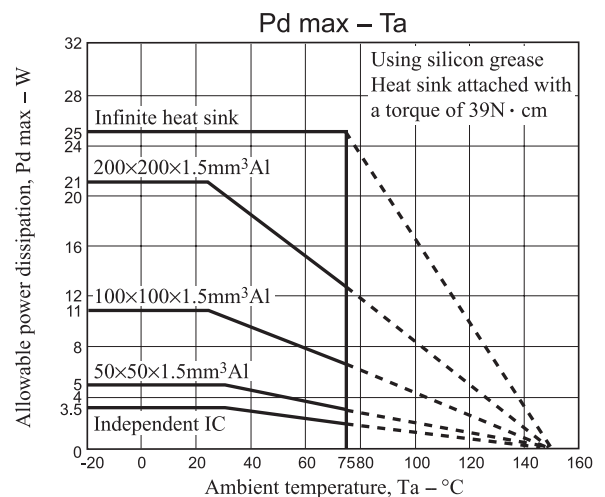
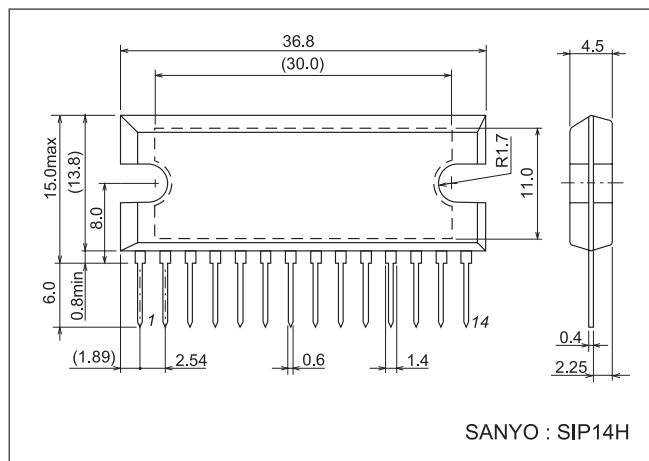
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 26.4\text{V}$, $R_L = 8\Omega$, $f = 1\text{kHz}$, $R_g = 600\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Standby current	I_{st}	Standby switch off		1	30	μA
Quiescent current	I_{CCO}	$R_g = 0$	50	80	140	mA
Output power	P_{O1}	THD = 10%	10	12		W
	P_{O2}	THD = 10%, $R_L = 4\Omega$		20		W
Voltage gain	V_G	$V_O = 0\text{dBm}$	49	51	53	dB
Total harmonic distortion	THD	$P_O = 1\text{W}$		0.07	0.4	%
Output noise voltage	V_{NO}	$R_g = 0$, BPF-BW = 20Hz to 20kHz		0.4	1.0	mV
Ripple exclusion ratio	SVRR	$R_g = 0$, $f_R = 100\text{Hz}$, $V_R = 0\text{dBm}$	45	55		dB
Channel separation	CHsep	$V_O = 0\text{dBm}$, $R_g = 10\text{k}\Omega$	45	55		dB
Standby control voltage	V_{st}	With a $10\text{k}\Omega$ resistor connected at pin 12	2.5		V_{CC}	V

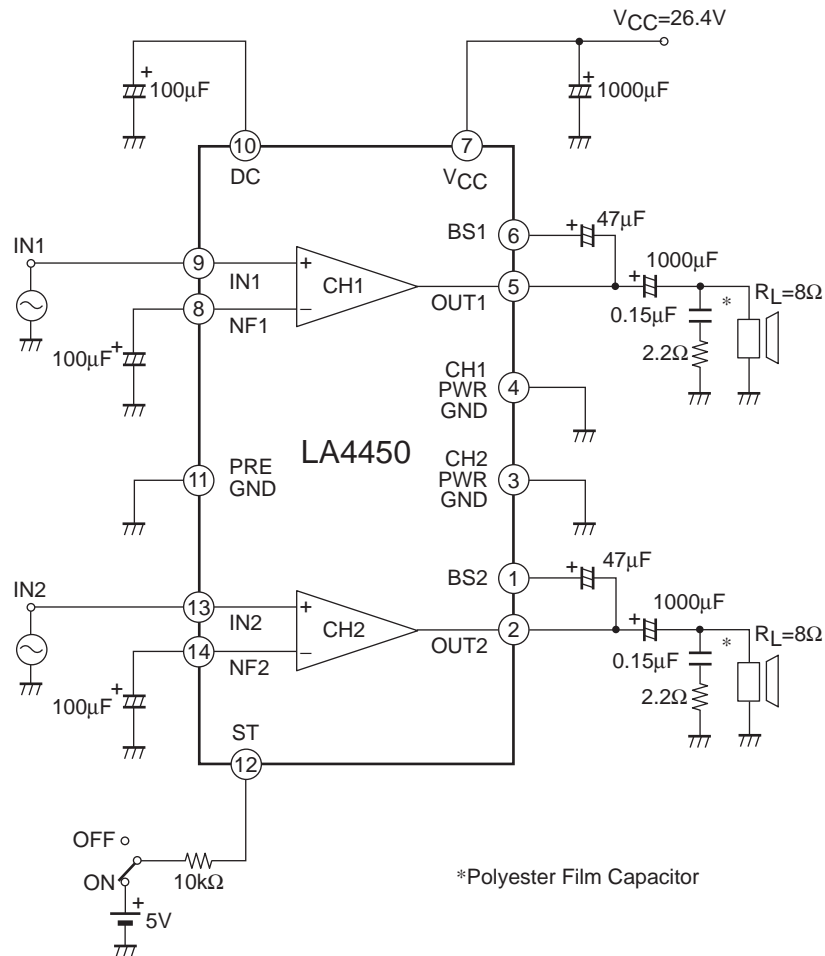
Package Dimensions

unit : mm (typ)

3023B

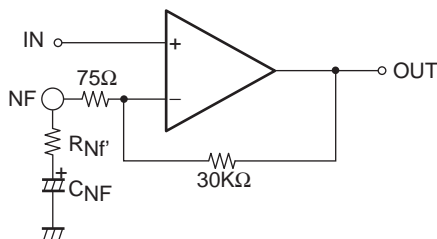


Test Circuit



1. Features and Usage Notes

- Pin 12 is the standby pin. The IC operates when a voltage of 2V or higher is applied through the external resistor R1. Note that the maximum influx current to pin 12 is 500µA.
- Changing the voltage gain



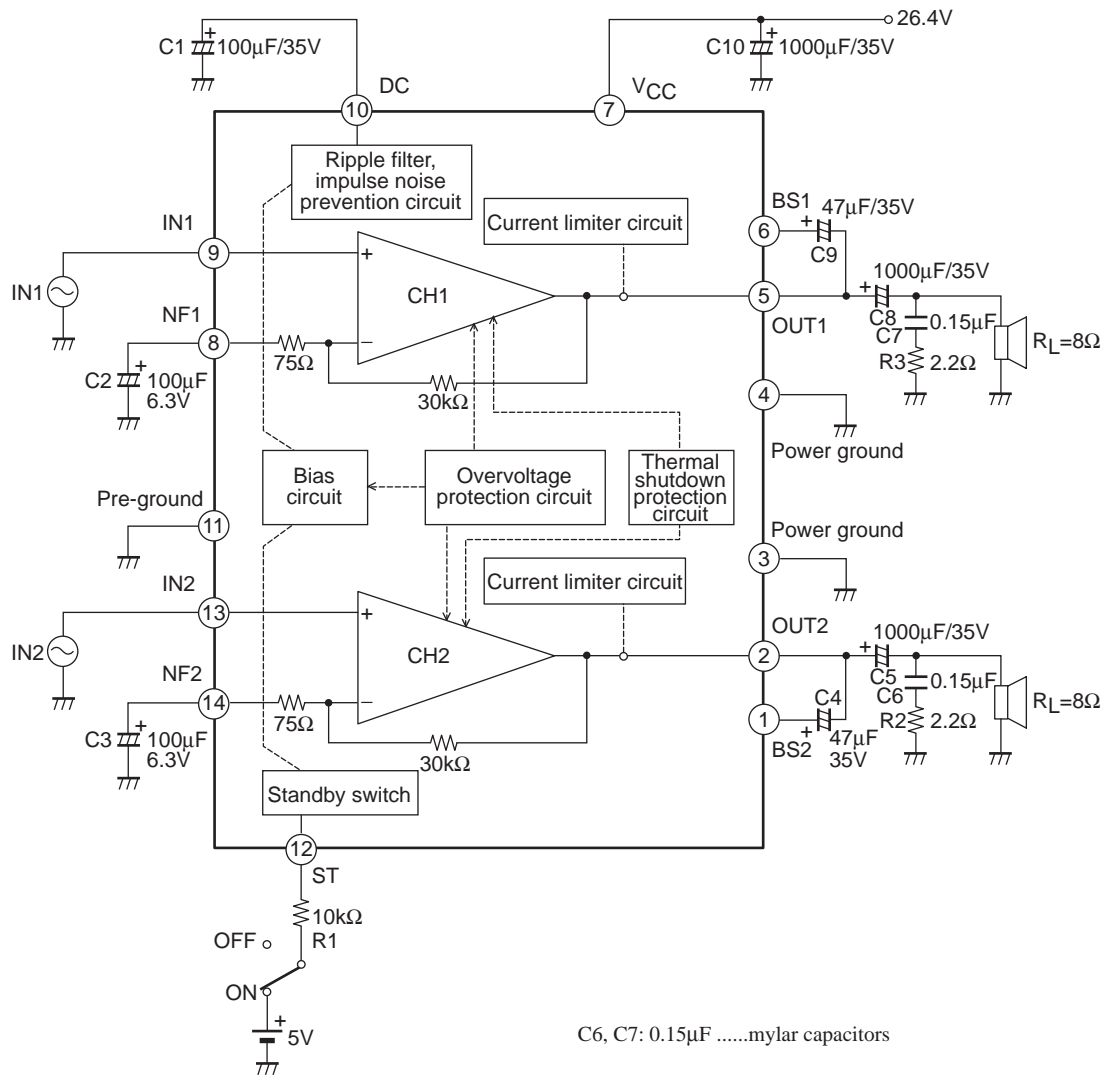
The voltage gain VG can be lowered by connecting an external resistor in series between the NF pin (pins 8 and 14) and CNF.

$$VG = 20 \log \frac{30k\Omega}{75 + R_{NF}}$$

However, since the IC may oscillate if VG is 30dB or lower, use a VG of 36dB or higher.

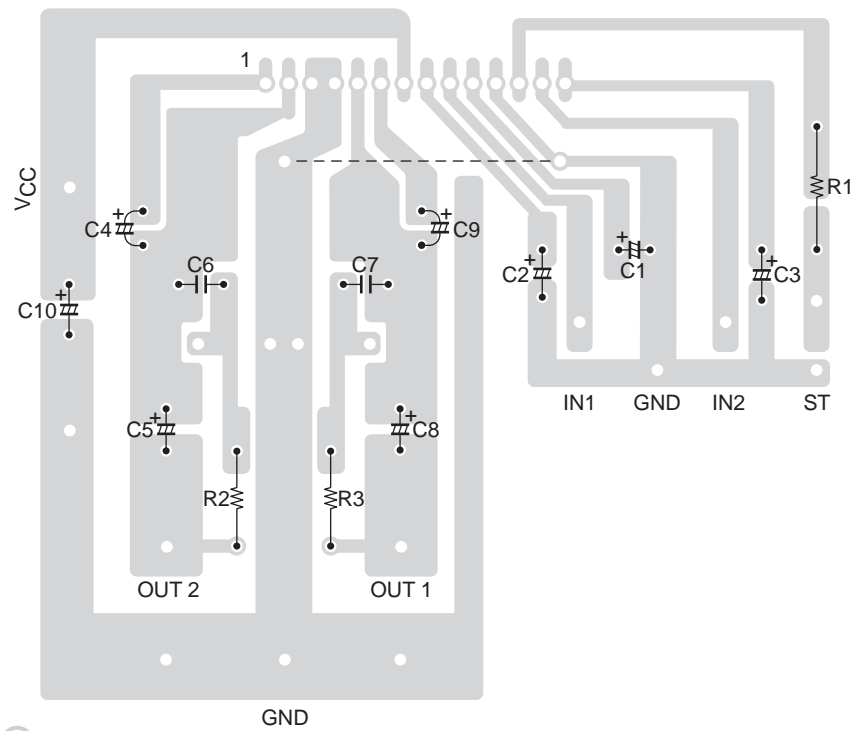
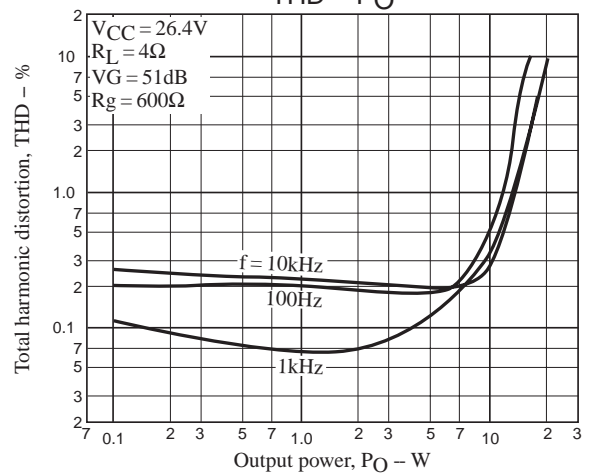
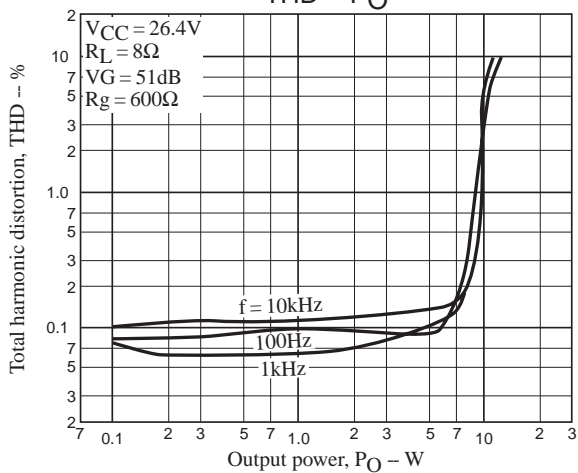
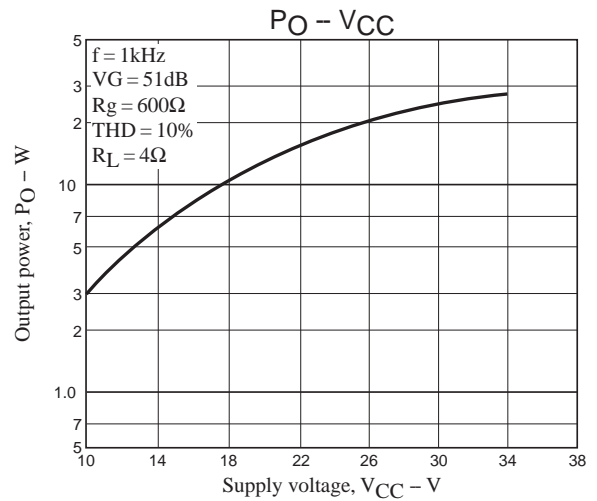
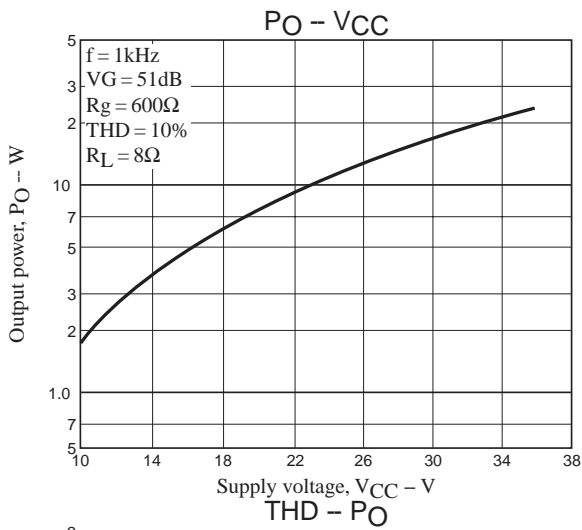
- The LA4450 includes a thermal protection circuit to prevent damage to or destruction of the IC due to abnormal overheating. As a result, the output may be attenuated or cut off if the application heat sinking is inadequate.
- The LA4450 includes an overvoltage protection circuit to protect the IC against power supply surges and abnormal voltages. This circuit has hysteresis characteristics : it operates at between 39 and 40V, and recovers at around 34V.
- Although the LA4450 includes a current limiter circuit to prevent damage due to abnormal currents, care must still be exercised to prevent load shorts and other excessive current conditions.

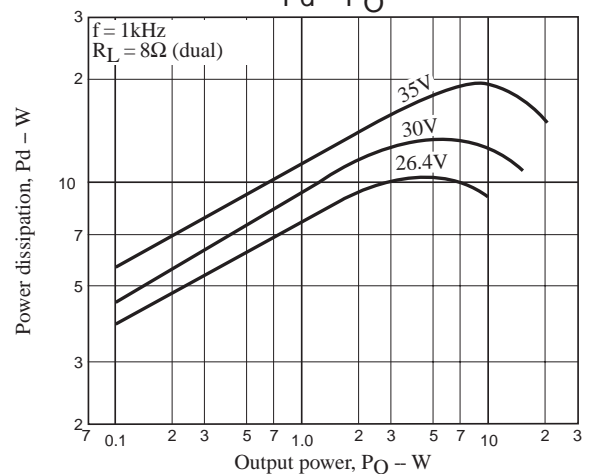
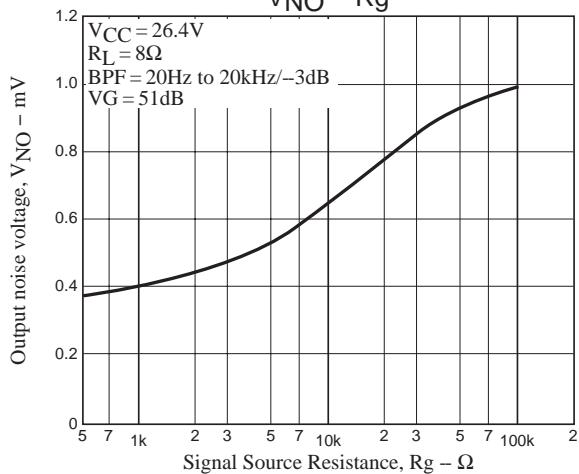
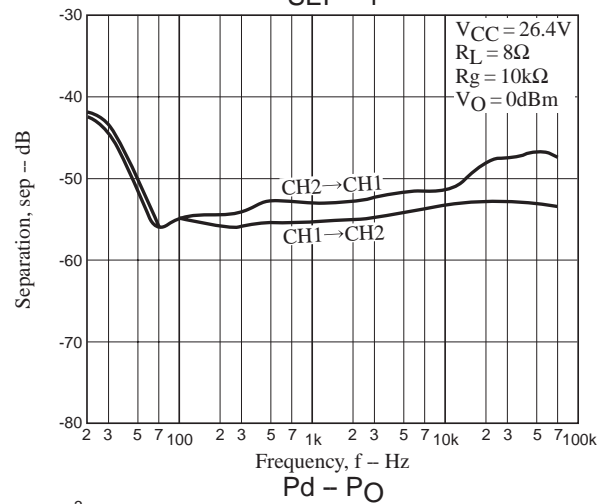
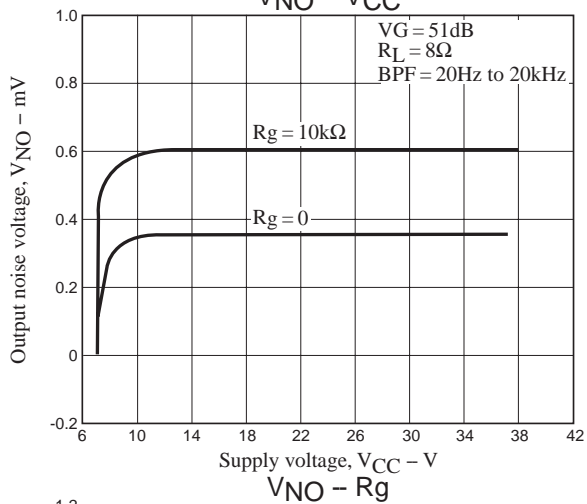
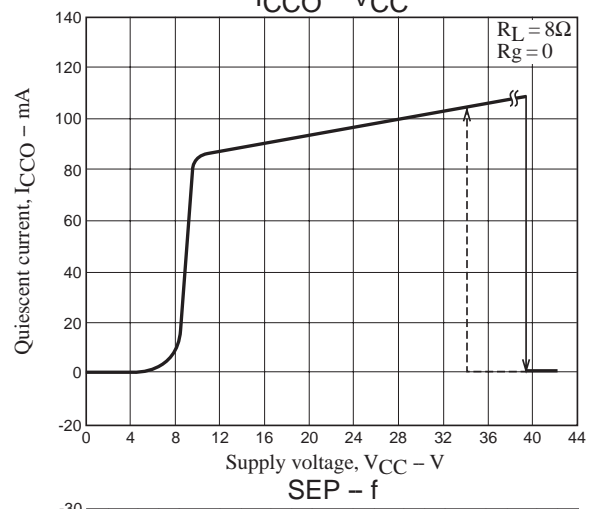
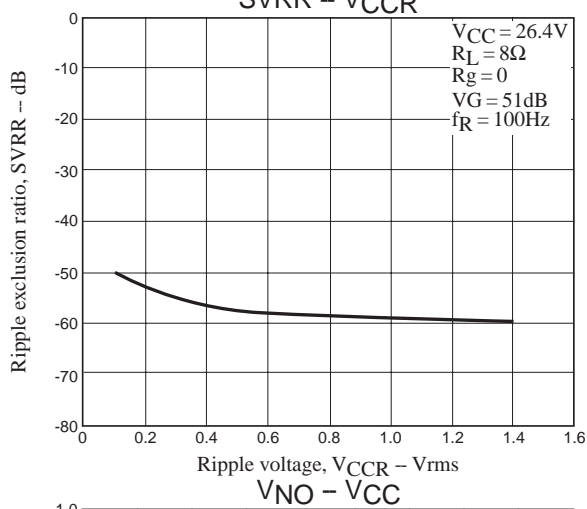
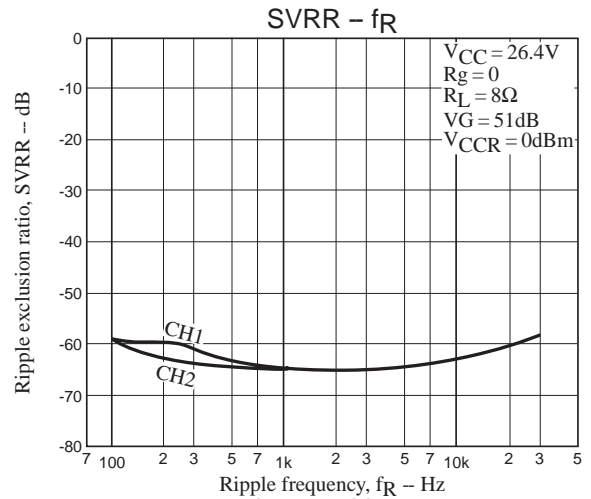
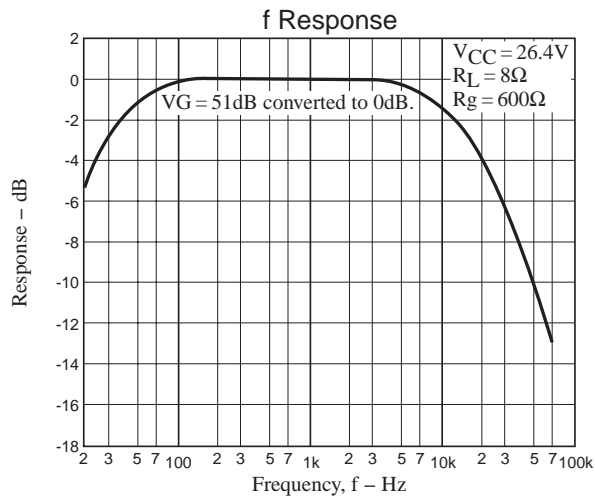
Application Circuit Example

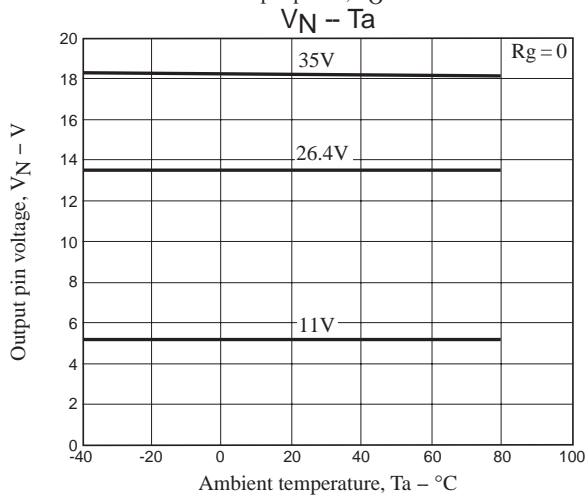
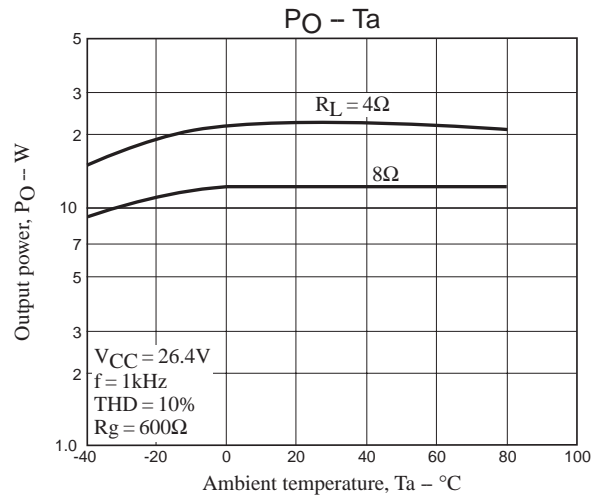
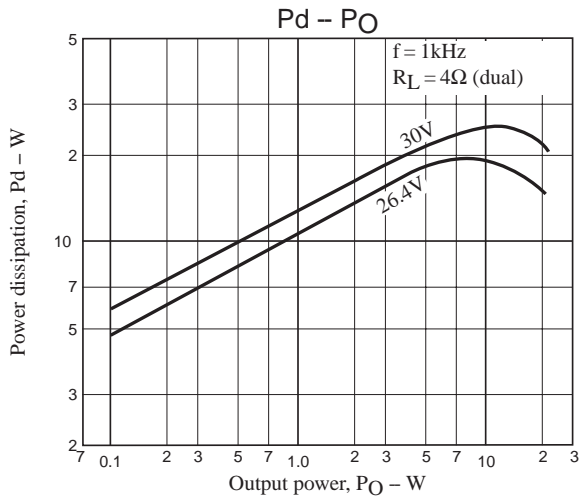


C6, C7: 0.15μFmylar capacitors

Printed Circuit Board Pattern Example

Copper foiled side 90×100mm²





- 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 September, 2008. Specifications and information herein are subject to change without notice.