

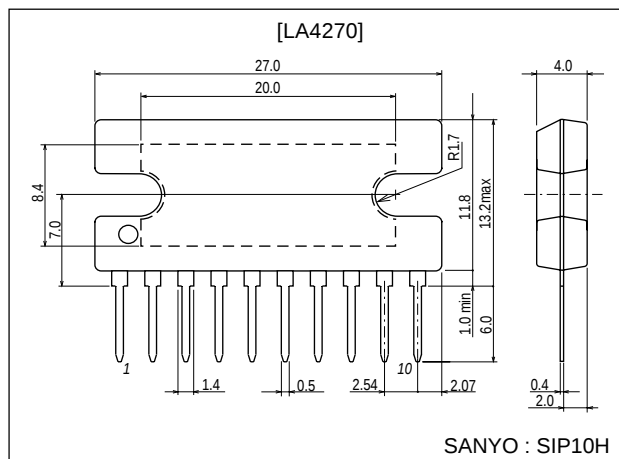
**LA4270****6W Dual-Channel AF Power Amplifier****Features**

- High-output dual-channel AF Power IC.
($P_O=6.0W \times 2$, $V_{CC}=25V$, $R_L=8\Omega$, $f=1kHz$, $THD=1.0\%$)
- Low distortion ($THD=0.1\%$, $V_{CC}=25V$, $R_L=8\Omega$, $f=1kHz$, $P_O=2W$).
- Minimum number of external parts required (no bootstrap capacitor required).
- Low pop noise at the time of power switch ON/OFF.
- High ripple rejection (58dB typ).
- Wide supply voltage range (10V to 32V).
- On-chip protector against abnormality (thermal shutdown, overvoltage).

Package Dimensions

unit:mm

3024A-SIP10H

**Specifications****Absolute Maximum Ratings** at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \max}$		35	V
Maximum output current	$I_O \text{ peak}$		3.5	V
Allowable power dissipation	$P_d \text{ max}$	With heat sink. See P_d - T_a graph.	20	W
Operating temperature	T_{opr}		-20 to +75	$^\circ C$
Storage temperature	T_{stg}		-40 to +150	$^\circ C$

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		25	V
Operating voltage range	$V_{CC \text{ op}}$		10 to 32	V
Recommended load resistance	R_L		8	Ω

Operating Characteristics at $T_a = 25^\circ C$, $V_{CC}=25V$, $R_L=8\Omega$, $f=1kHz$, $R_g=600\Omega$, See specified test circuit

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}		25	45	90	mA
Voltage gain	V_G		38	40	42	dB
Output power	P_O	$THD=1\%$	5.0	6.0		W
Total harmonic distortion	THD	$P_O=2W$		0.1	0.8	%
Output noise voltage	V_{NO}	$R_g=10k\Omega$, $BW=20Hz$ to $20kHz$		0.25	1.0	mV
Ripple rejection	$SVRR$	$R_g=10k\Omega$, $f_R=100Hz$, $V_R=0dBm$	45	58		dB

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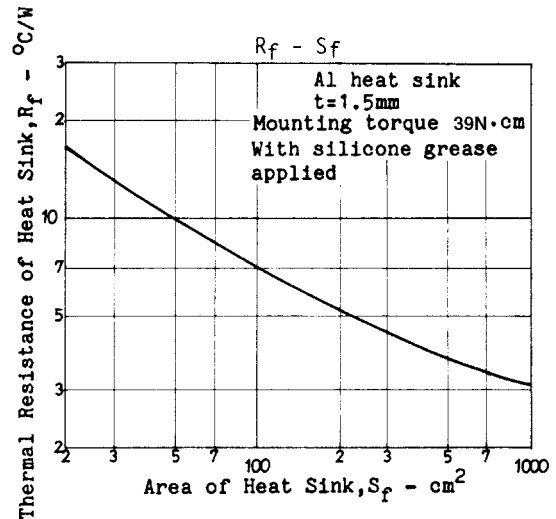
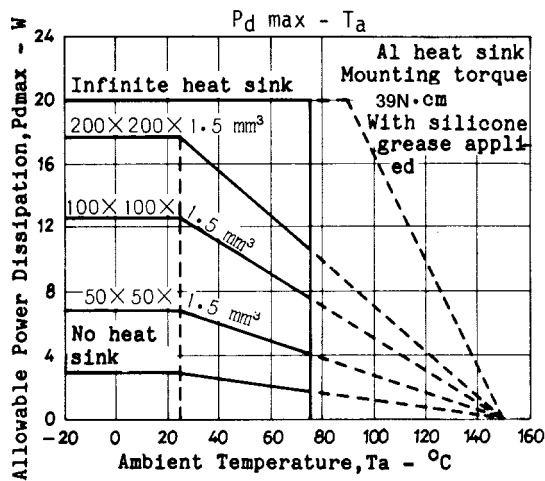
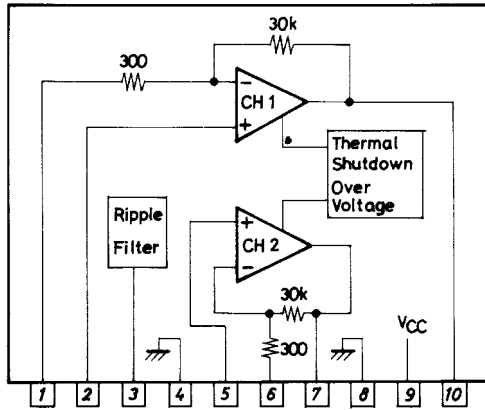
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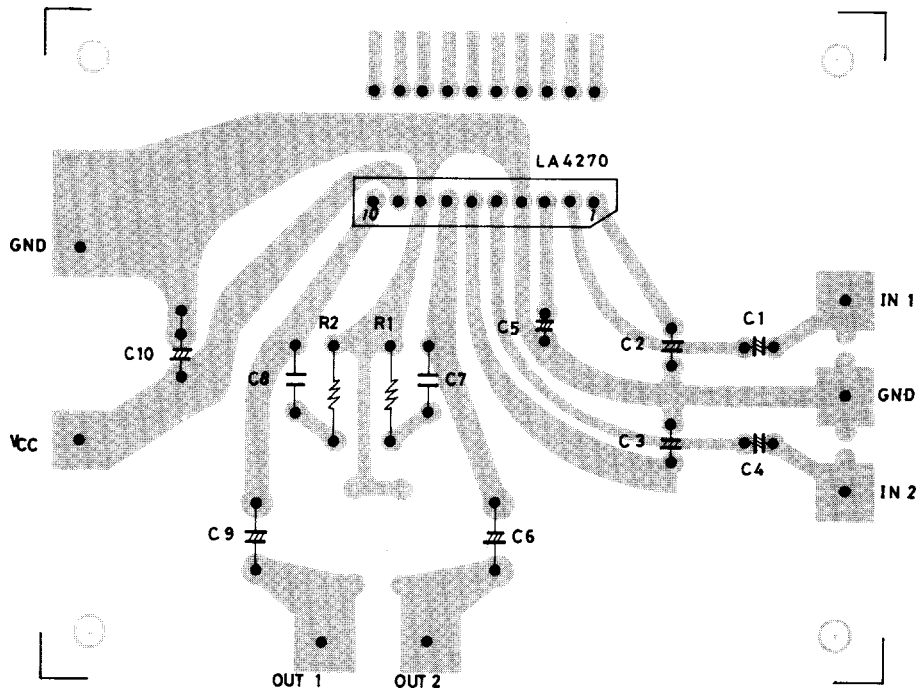
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Crosstalk	CT	Rg=10k Ω	45	60		dB
Channel balance	ΔVG				1.5	dB

Equivalent Circuit Block Diagram and Pin Assignment

Unit (resistance: Ω)



Sample Printed Circuit Pattern

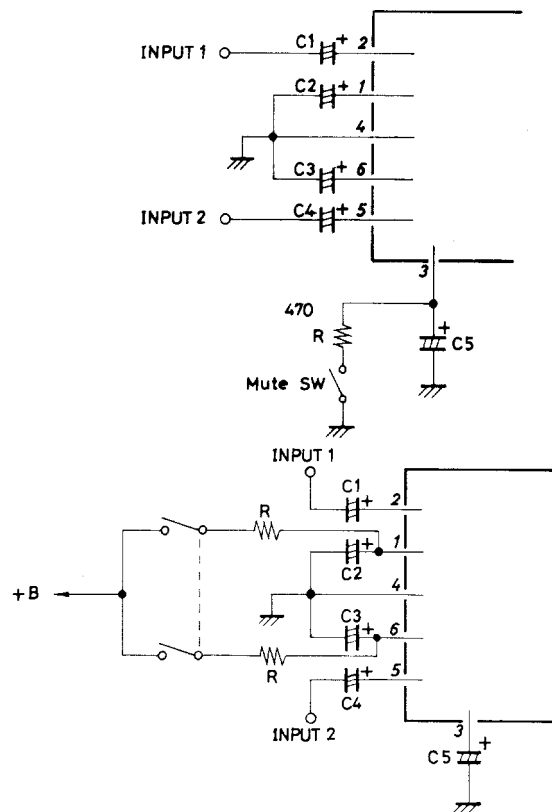




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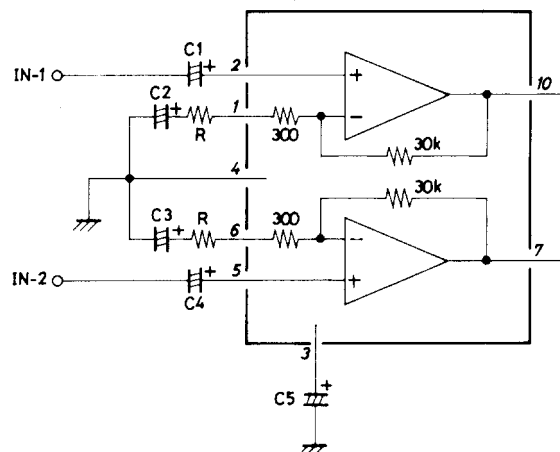
External Muting

1. Lowering of potential at ripple filter pin (pin 3).
Muting can be provided by discharging resistor R connected across pin 3 and GND to lower the potential at pin 3. Too small an R value causes pop noise to occur ; and too large an R value causes muting to fail to work.
If no adequate R value is obtained, it is recommended that the R value is made rather small and the C5 value is increased.
2. Application of positive bias to NF pins.
Muting can be provided by positive bias applied to the NF pins. In this case, the R value must be determined so that the potential at the NF pins (pins 1, 6) does not exceed 3V at the muting mode.

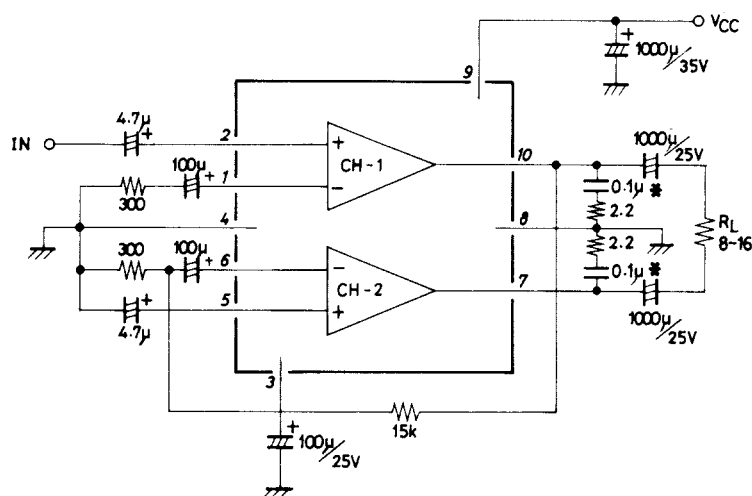


Voltage Gain

The voltage gain is fixed to 40dB by the ratio of on-chip resistors $30k\Omega$ and 300Ω . It is impossible to use the IC at a voltage gain greater than this. In an application where the IC is used at a voltage gain of less than 40dB, resistors are connected in series with feedback resistors as shown right. In this application, however, oscillation is liable to occur. So, the voltage gain must not be less than 30dB.



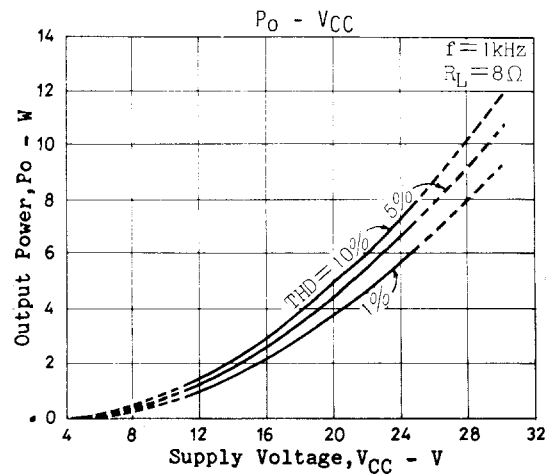
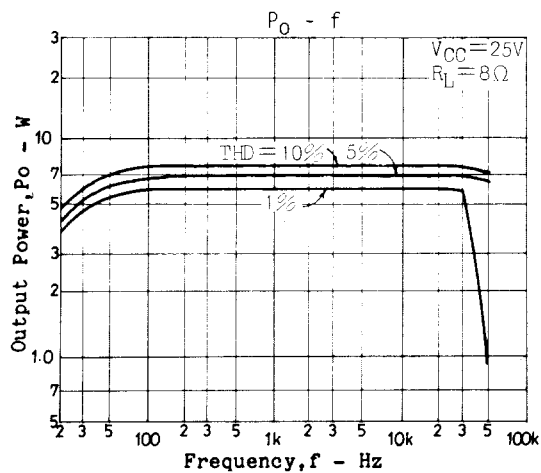
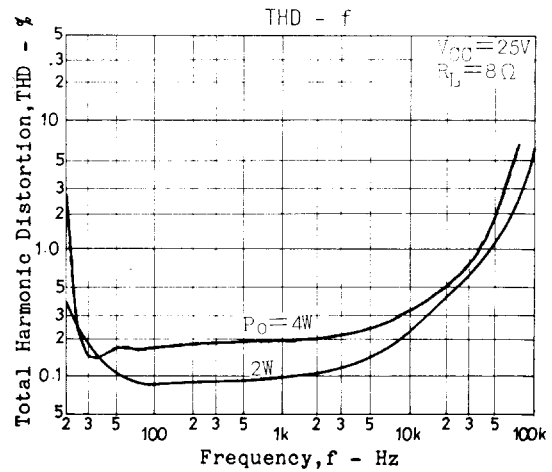
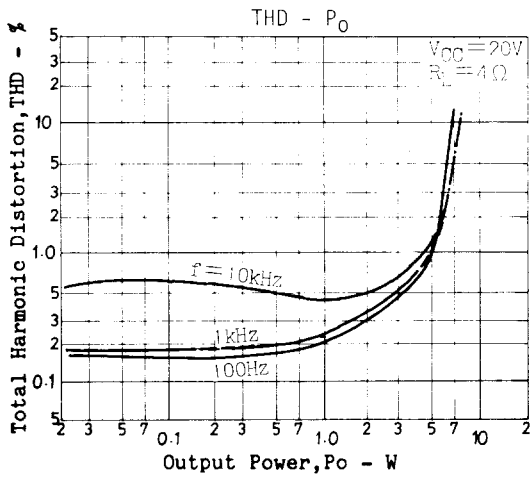
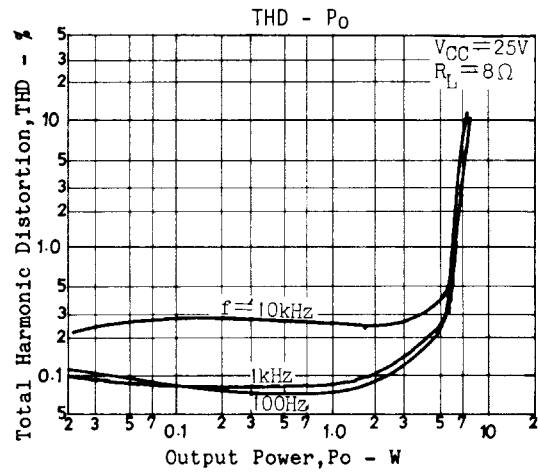
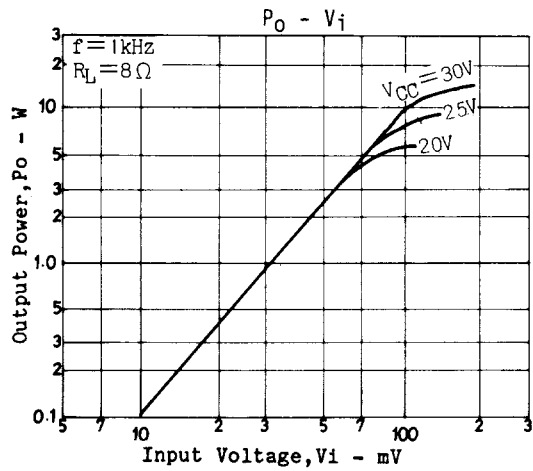
Sample Application Circuit 2 : Bridge amplifier use

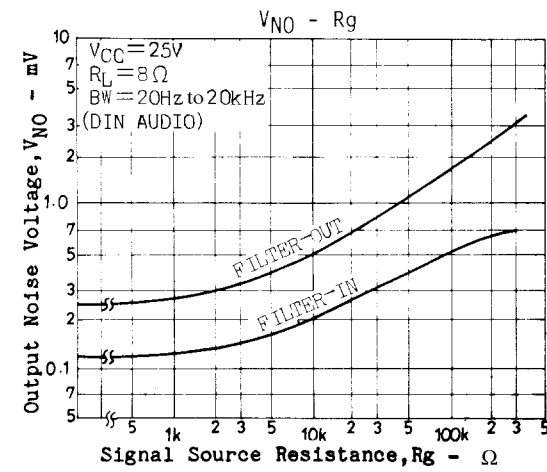
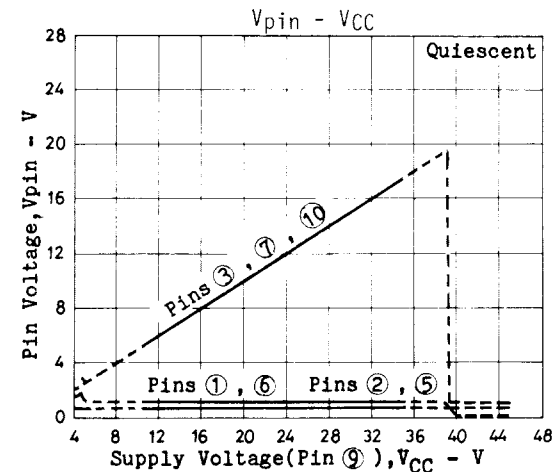
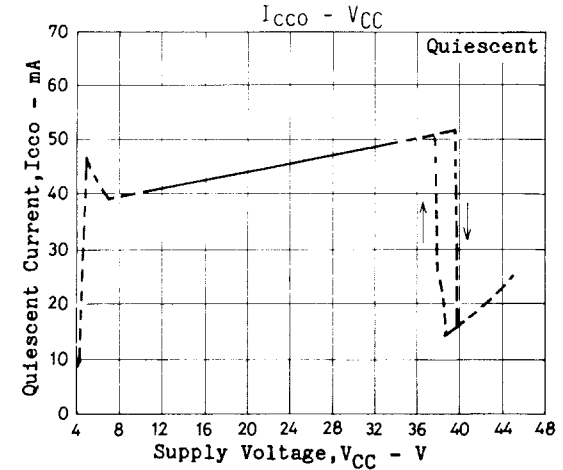
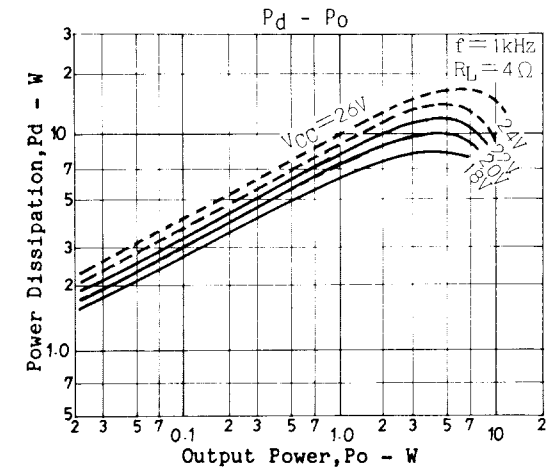
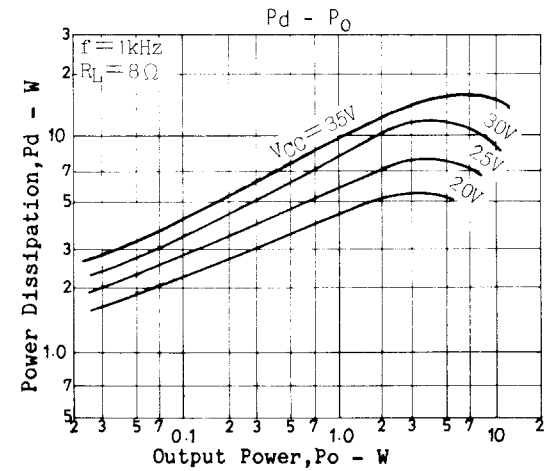
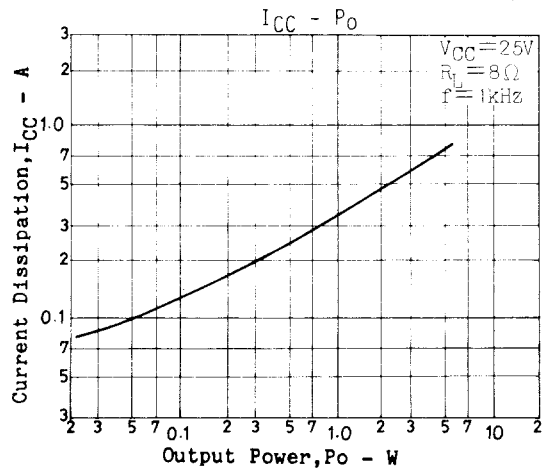
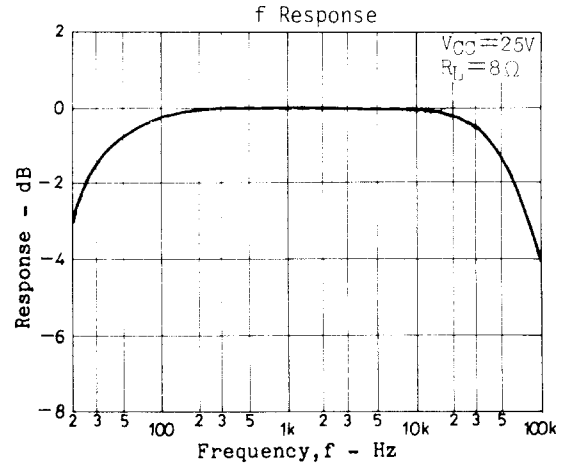
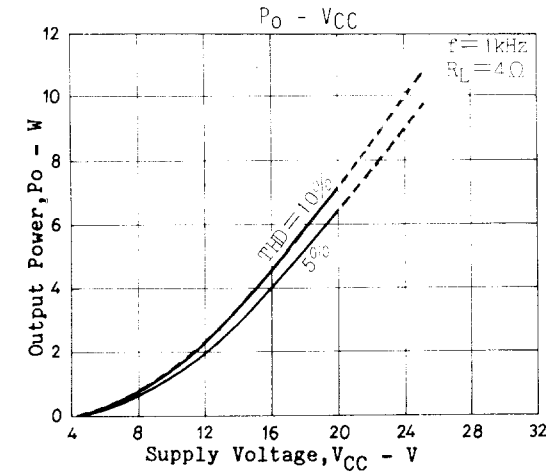


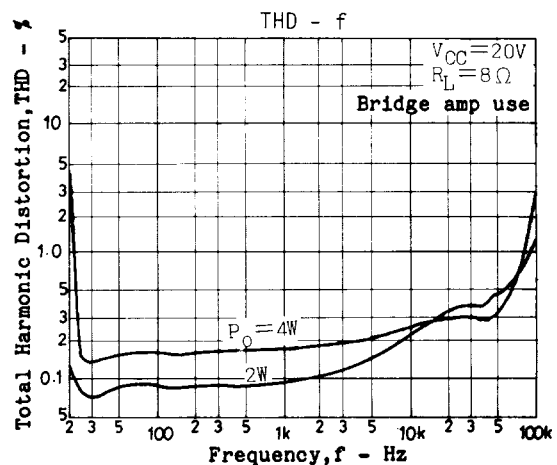
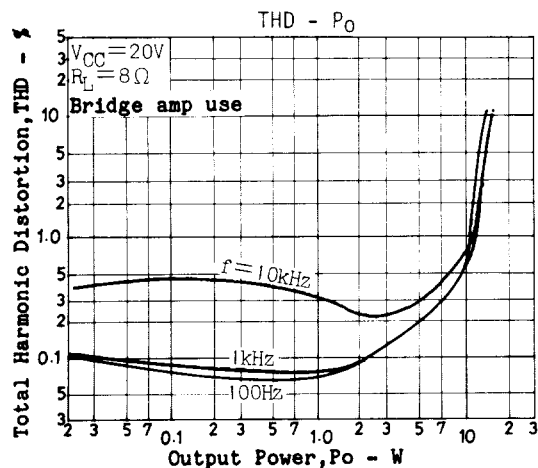
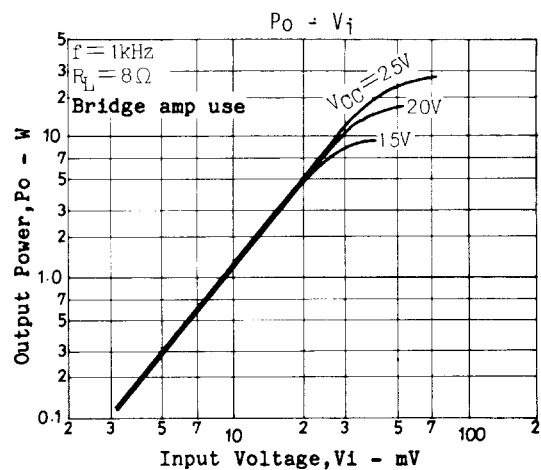
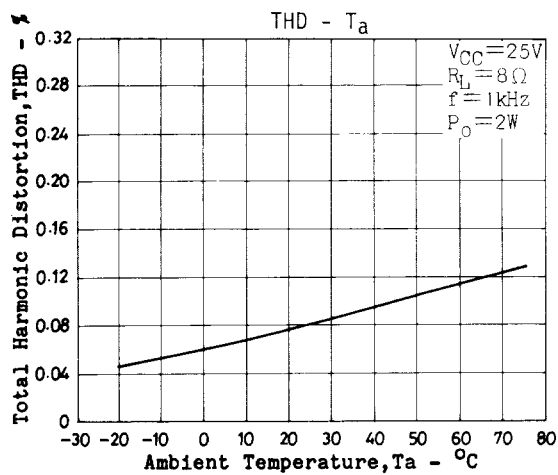
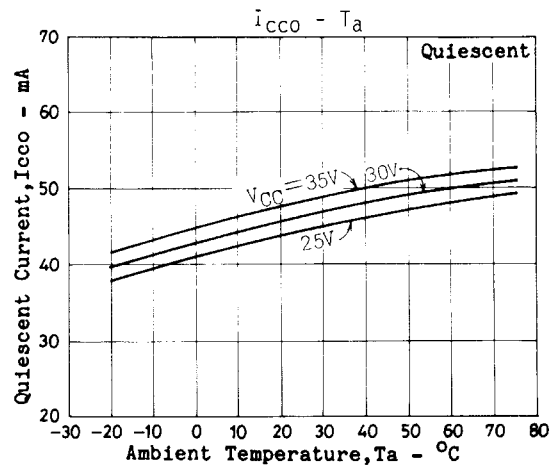
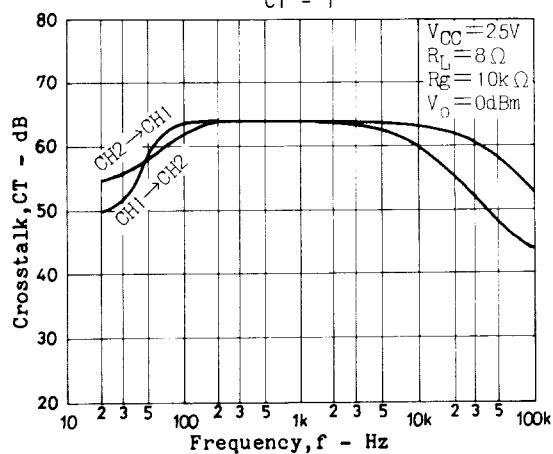
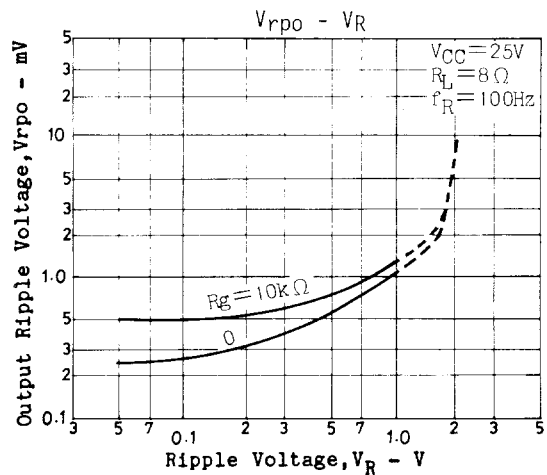
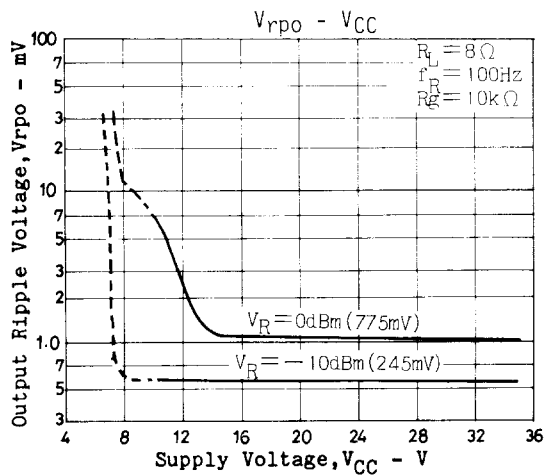
*:Polyester film capacitor

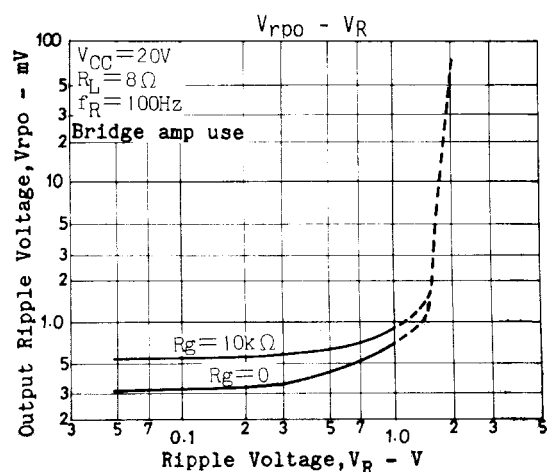
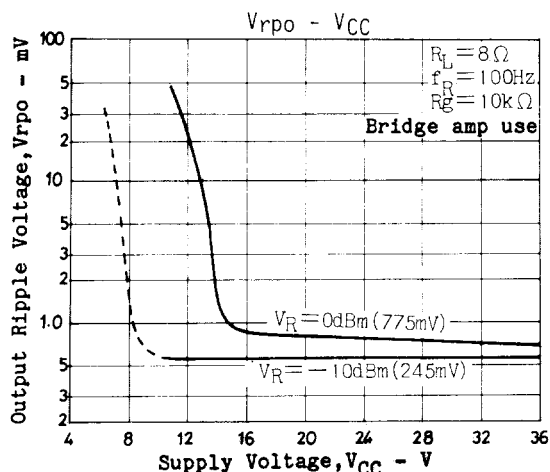
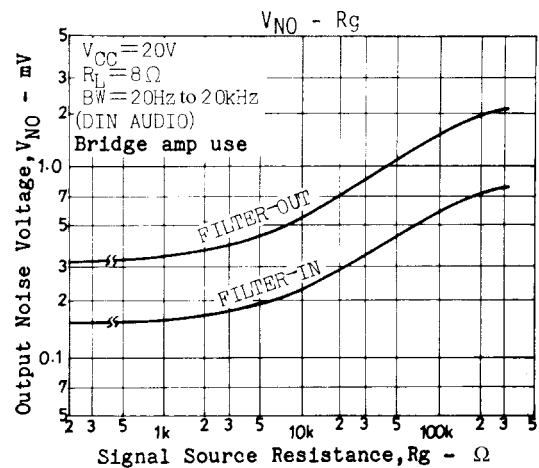
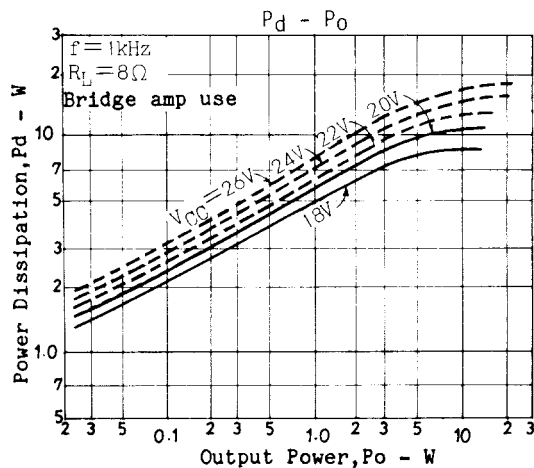
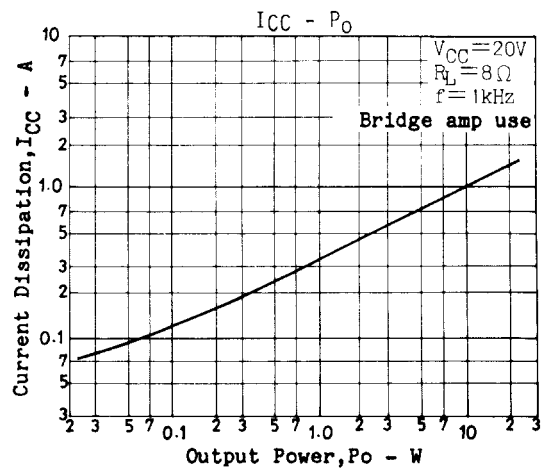
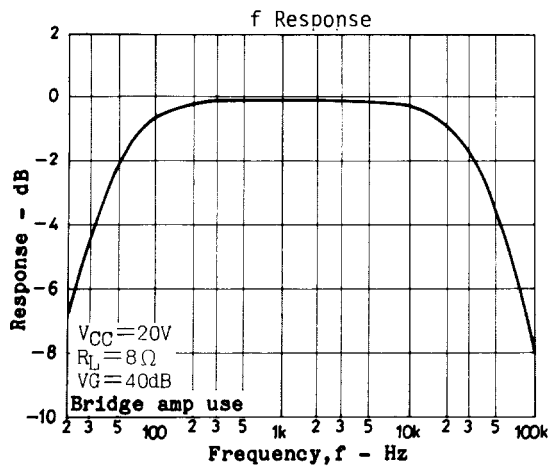
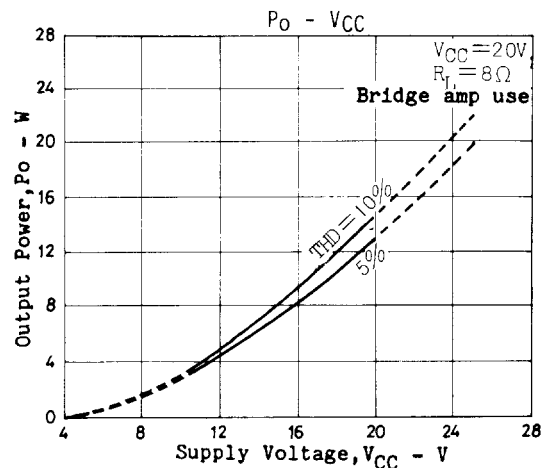
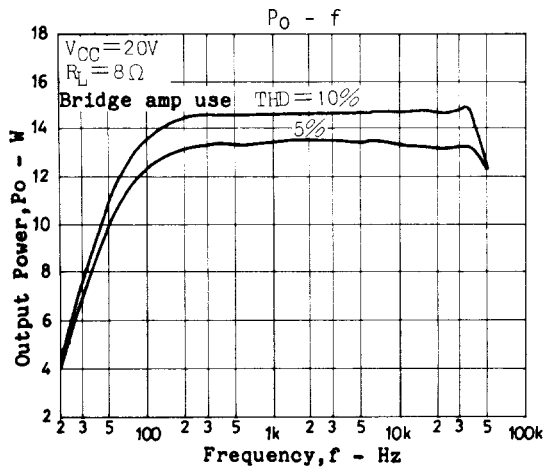
Unit (resistance: Ω , capacitance: F)

In this application, output capacitors must be used. Since the IC handles an apparent load of 4Ω , more distortion results, making it impossible for the IC to deliver power at THD=1% as in 2-channel use. It is possible for the IC to deliver power at THD=5% or 10%







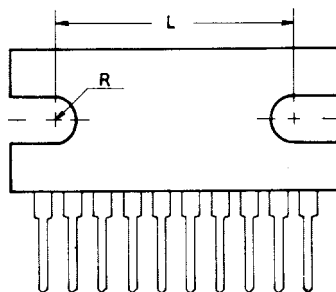


Proper Cases in Using IC

- Maximum ratings : If the IC is used in the vicinity of the maximum ratings, even a slight variation in conditions may cause the maximum ratings to be exceeded, thereby leading to breakdown. Allow an ample margin of variation for supply voltage, etc. and use the IC in the range where the maximum ratings are not exceeded.
- Pin-to-pin short : If power is applied when the space between pins is shorted, breakdown or deterioration may occur. When mounting the IC on the board or applying power, make sure that the space between pins is not shorted with solder, etc.
- When used in radio applications : When using in radios, allow a good distance between IC and bar antenna.
- Printed circuit pattern : When drawing the printed circuit pattern, make the power supply, output, and ground lines thick and short and arrange the pattern and parts so that no feedback loop is formed between input and output. Place power capacitor C10, oscillation blocking capacitors C7, C8 as close to IC pins as possible to prevent oscillation from occurring. Refer to the sample printed circuit pattern.

Proper Cares Mounting Radiator Fin

1. The mounting torque is in the range of 39 to 59N · cm.
2. The distance between screw holes of the radiator fin must coincide with the distance between screw holes of the IC. With case outline dimensions L and R referred to, the screws must be tightened with the distance between them as close to each other as possible.



3. The screw to be used must have a head equivalent to the truss machine screw or binder machine screw defined by JIS. Washers must be also used to protect the IC case.
4. No foreign matter such as cutting particles shall exist between heat sink and radiator fin. When applying grease on the junction surface, it must be applied uniformly on the whole surface.
5. IC lead pins are soldered to the printed circuit board after the radiator fin is mounted on the IC.

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