

SANYO

No. 1598A

**LA4147**

Monolithic Linear IC

0.6 TO 0.9 AF POWER AMPLIFIER

Use

- The LA4147 is especially suited for use in cassette tape recorder, radio-cassette recorder, stereo cassette player applications.

Features

- 0.6W typ/ $V_{CC}=6.0V$, $R_L=8\text{ohms}$, THD=10%
 - 0.9W typ/ $V_{CC}=6.0V$, $R_L=4\text{ohms}$, THD=10%
 - Minimum number of external parts required
 - Soft clip
 - Small pop noise at V_{CC} ON/OFF mode
 - Voltage gain fixed at 50dB
- An external resistor can be connected to reduce this value.

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

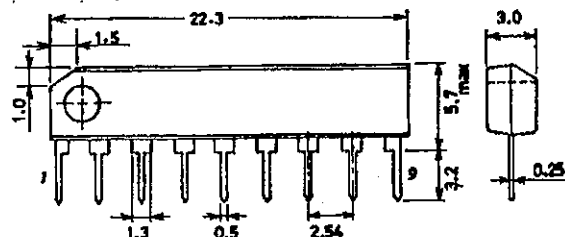
			unit
Maximum Supply Voltage	V_{CC} max	Quiescent mode	9 V
		Operating mode $R_L=8\text{ohms}$	8 V
Maximum Output Current	I_o peak		500 mA
Allowable Power Dissipation	P_d max	$50 \times 50\text{mm}^2$ PCB	0.9 W
Operating Temperature	T_{opg}		-20 to +70 $^\circ\text{C}$
Storage Temperature	T_{stg}		-40 to +150 $^\circ\text{C}$

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

			unit
Recommended Supply Voltage	V_{CC}		6 V
Operating Voltage Range	V_{CC} op		3.6 to 8 V
Recommended Load Resistance	R_L		4 to 8 ohm

Operating Characteristics at $T_a=25^\circ\text{C}$, $V_{CC}=6.0V$, $R_L=8\text{ohms}$, $R_g=600\text{ohms}$, $f=1\text{kHz}$

			min	typ	max	unit
Quiescent Current	I_{cc0}			10	20	mA
Voltage Gain	VG		48	50	52	dB
Output Power	P_o	THD=10%, $R_L=4\text{ohms}$		0.9		W
		THD=10%, $R_L=8\text{ohms}$	0.45	0.6		W
Total Harmonic Distortion	THD	$P_o=100\text{mW}$		0.2	1.0	%
Input Resistance	r_i			30		kohm
Output Noise Voltage	V_{NO}	$R_g=10\text{kohms}$, 20Hz to 20kHz		0.6	1.2	mV
		B.P.F				
Ripple Rejection	SVRR	$V_R=150\text{mV}$, $f_R=100\text{Hz}$, $R_g=0$	-35	-40		dB

**Case Outline 3017B-S9IC
(unit:mm)**

The application circuit diagrams and circuit constants herein are included as an example and provide no guarantee for designing equipment to be mass-produced. The information herein is believed to be accurate and reliable. However, no responsibility is assumed by SANYO for its use; nor for any infringements of patents or other rights of third parties which may result from its use.

Specifications and information herein are subject to change without notice.

SANYO: SEP9

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Proper care in changing voltage gain

An external resistor can be connected in series with the feedback capacitor at pin 3 to reduce the voltage gain. (See R_{NF} -VG characteristic.)

Proper cares in using IC

1. 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.

2. 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.

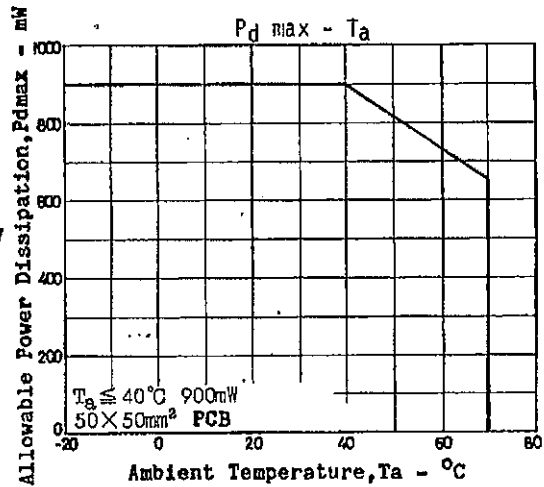
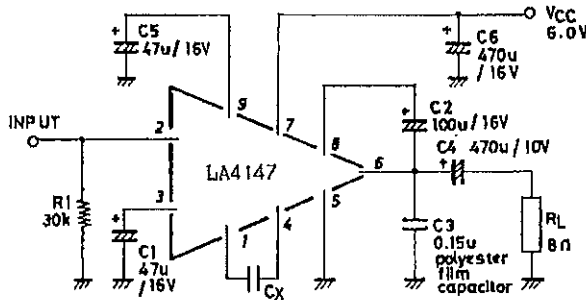
3. Radio applications

For use in radio applications, keep a good distance between IC and bar antenna.

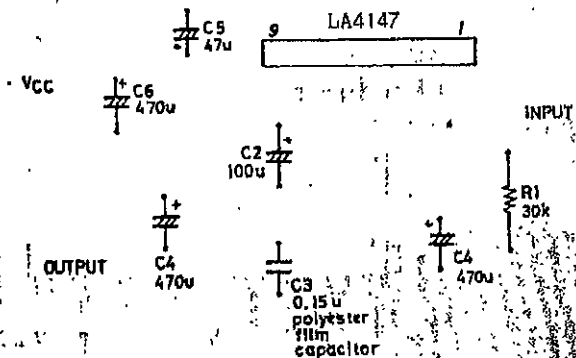
4. Printed circuit pattern

When designing the printed circuit pattern, make the power supply, output, and ground lines thicker and shorter and determine the pattern and parts placement so that no feedback loop is formed between input and output. Place power capacitor C6, oscillation blocking capacitor C3 as close to the IC pin as possible to prevent oscillation from occurring. See the sample printed circuit pattern.

Sample Application Circuit: AF power amp



CX: Phase compensating capacitor



Sample Printed Circuit Pattern
(Cu-foiled area)

Description of external parts

- C1(47uF):** Feedback capacitor (NF capacitor)
Low cutoff frequency f_L depends on this capacitor. $f_L=90\text{Hz}$ for $C1=47\mu\text{F}$. Decreasing the capacitor value makes the starting time earlier.
- C2(100uF):** Bootstrap capacitor
- C3(0.15uF):** Oscillation blocking capacitor
It is recommended to use a polyester film capacitor being good in temperature characteristic, high frequency characteristic.
- C4(470uF):** Output capacitor
- C5(47uF):** Decoupling capacitor
Serves to reject ripple. The starting time depends on this capacitor. Increasing the capacitor value makes the starting time later.
- C6(470uF):** Power capacitor
Place as close to the power pin of the IC as possible.
- R1(30kohms):** Input bias resistor
Serves to apply input bias. The input impedance almost entirely depends on this resistor value. If a variable resistor also serves for this purpose, this resistor can be omitted. In this case, it is recommended to use a resistor of 30kohms.

