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=8ohms, THD=10%
  0.9W typ/V_{CC}=6.0V, R_L=4ohms, 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 Ta=25°C

				unit
Maximum Supply Voltage	V_{CC} max	Quiescent mode	9	V
		Operating mode R_L=8ohms	8	V
Maximum Output Current	Io peak		500	mA
Allowable Power Dissipation	Pd max	50x50mm² PCB	0.9	W
Operating Temperature	Topg		-20 to +70	°C
Storage Temperature	Tstg		-40 to +150	°C

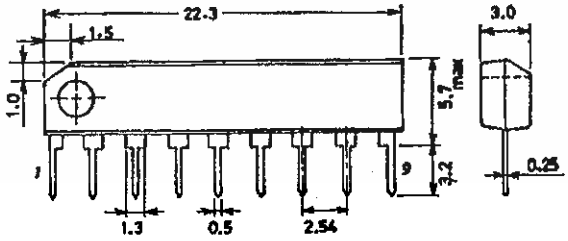
Operating Conditions at Ta=25°C

			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 Ta=25°C, V_{CC}=6.0V, R_L=8ohms, Rg=600ohms, f=1kHz

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

Case Outline 3017B-S9IC
(unit:mm)



SANYO: SEP9

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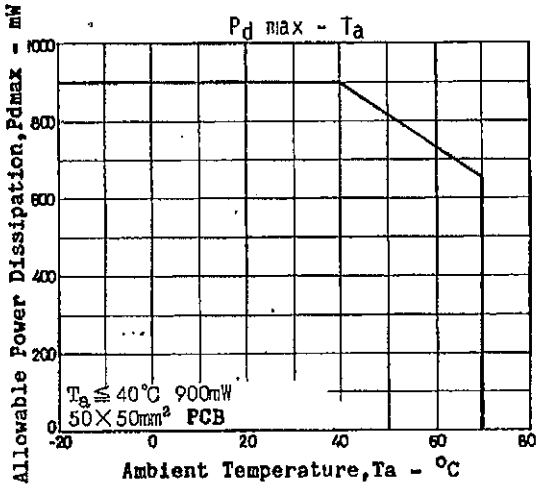
Proper care in changing voltage gain

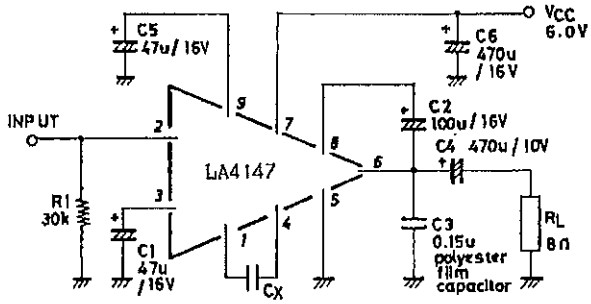
An external resistor can be connected in series with the feedback capacitor at pin 3 to reduce the voltage gain. (See R_{NF}-VG characteristic.)

Proper cares in using IC

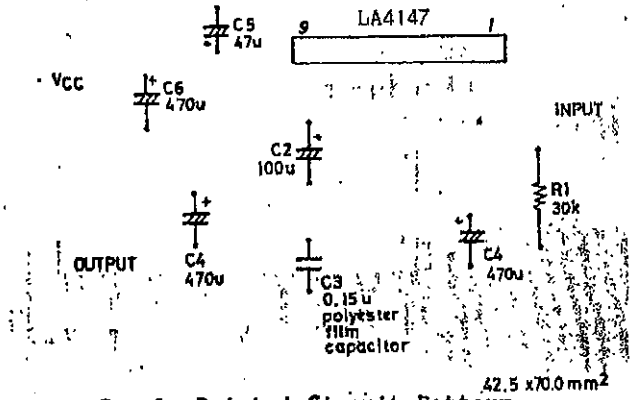
1. Maximum ratings
   If the IC is used in the vicinity of the maximum ratings, even a slight variation in conditions may cause the maximum ratings to be exceeded, thereby leading to breakdown. Allow an ample margin of variation for supply voltage, etc. and use the IC in the range where the maximum ratings 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



C_X : 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=90Hz for C1=47uF. Decreasing the capacitor value makes the starting time earlier.

C2(100uF): Bootstrap capacitor

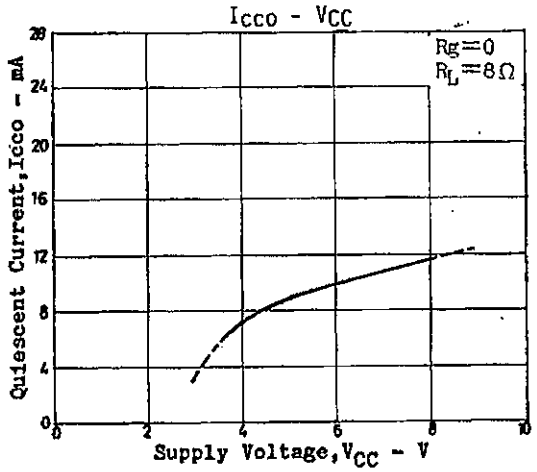
C3(0.15uF): Oscillation blocking capacitor
It is recommended to use a polyester film capacitor being good in temperature characteristic, high frequency characteristic.

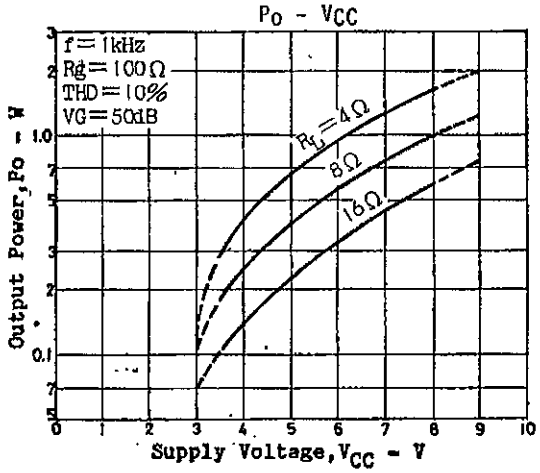
C4(470uF): Output capacitor

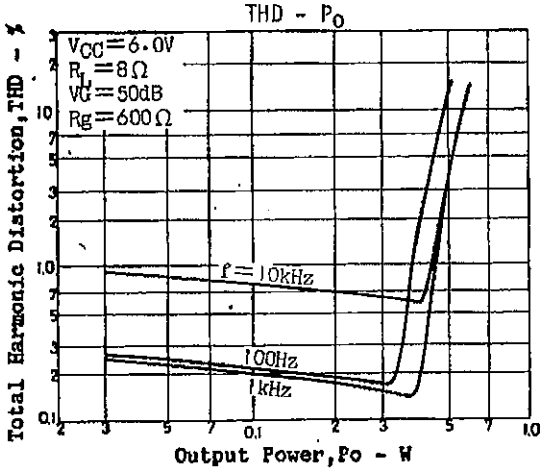
C5(47uF): Decoupling capacitor
Serves to reject ripple. The starting time depends on this capacitor. Increasing the capacitor value makes the starting time later.

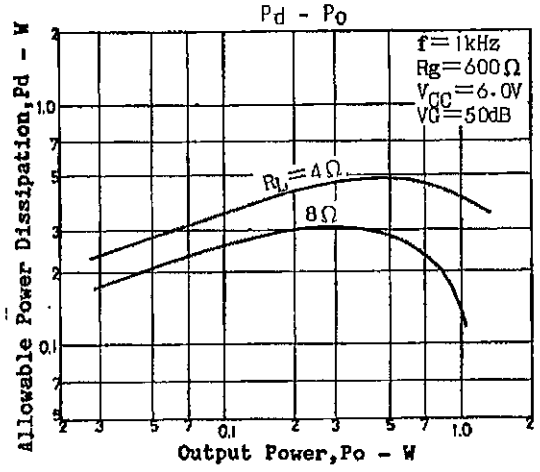
C6(470uF): Power capacitor
Place as close to the power pin of the IC as possible.

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.

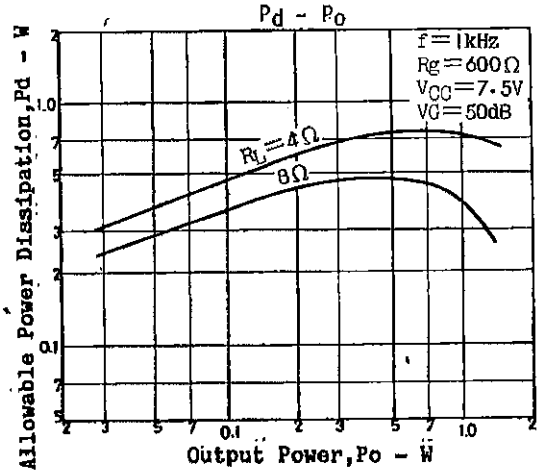




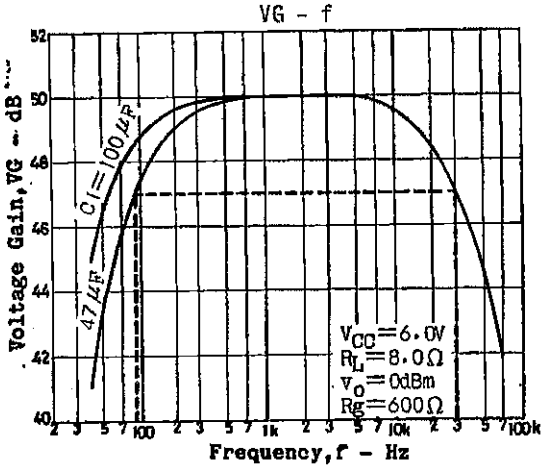




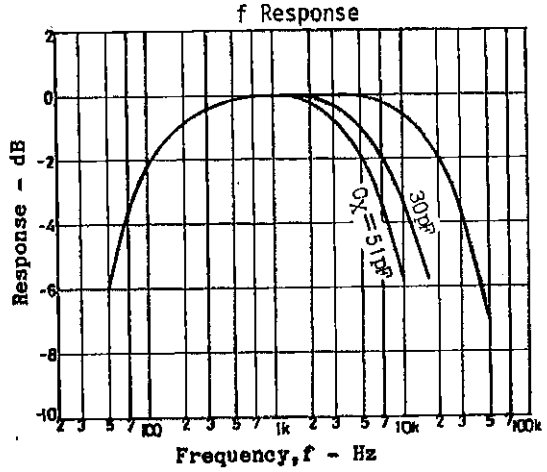
Pd - Po



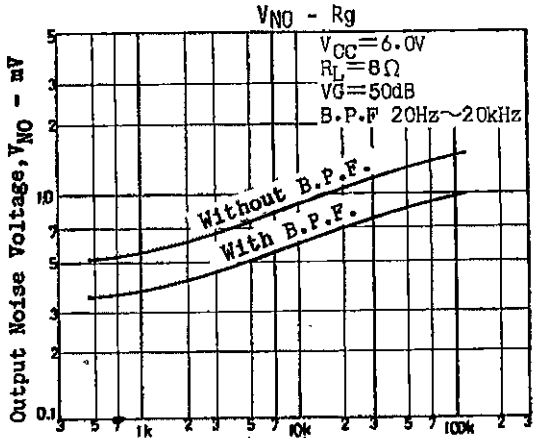
VG - f



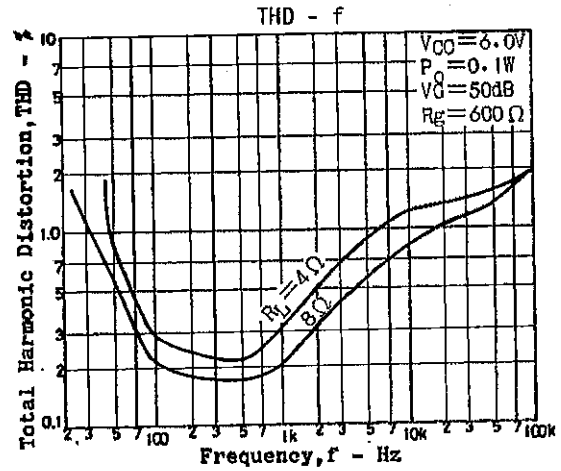
f Response



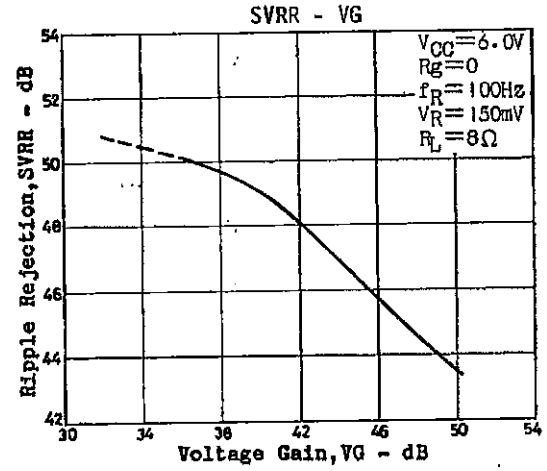
VNO - Rg



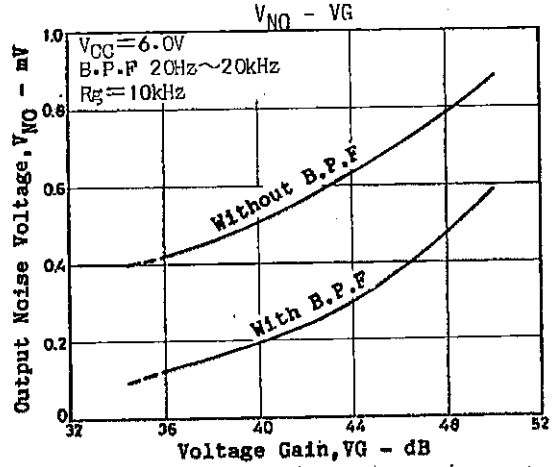
THD - f



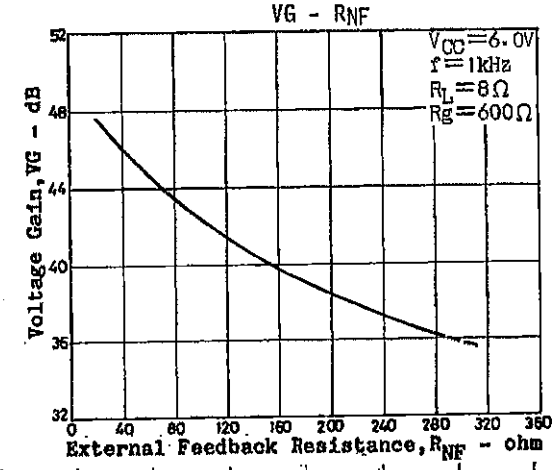
SVRR - VG

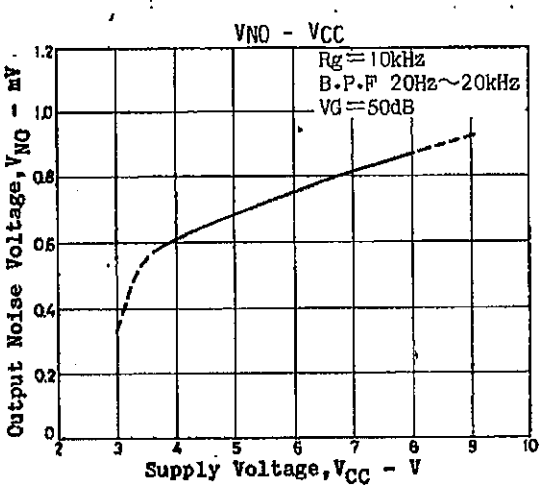


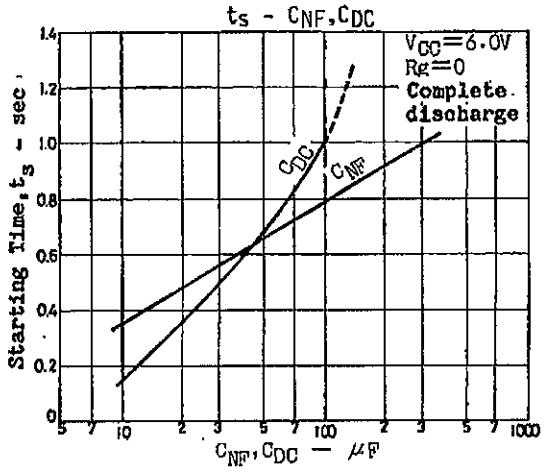
VNO - VG

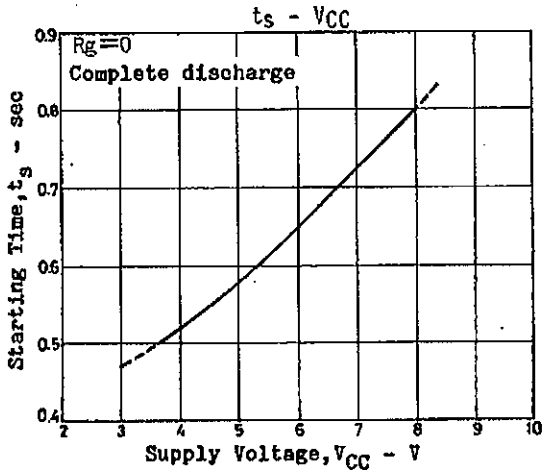


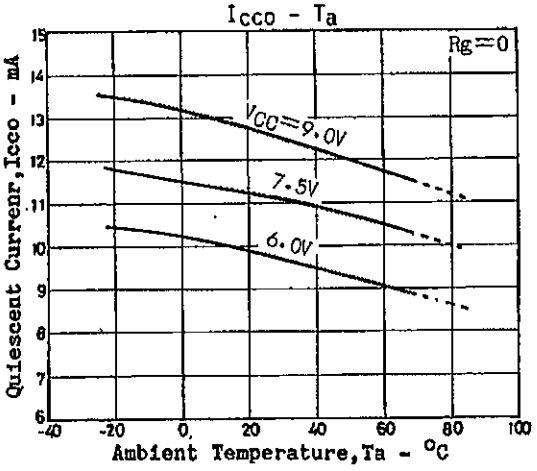
VG - RNF

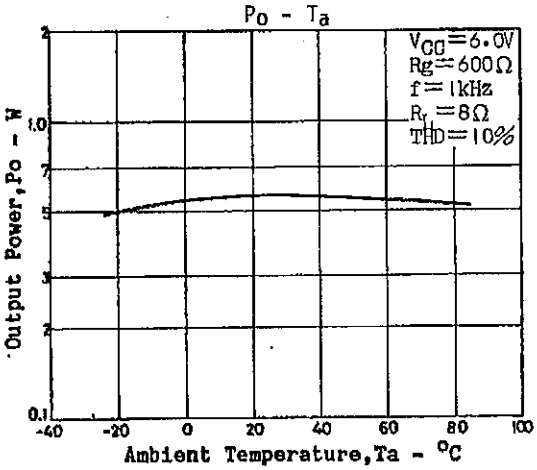



VNO - VCC
Rg=10kHz
B.P.F 20Hz~20kHz
VG=50dB
Output Noise Voltage, VNO - mV
Supply Voltage, VCC - V


ts - CNF, CDC
VCC=6.0V
Rg=0
Complete discharge
CDC
CNF
Starting Time, ts - sec
CNF, CDC — μF


ts - VCC
Rg=0
Complete discharge
Starting Time, ts - sec
Supply Voltage, VCC - V


Icco - Ta
Rg=0
VCC=9.0V
7.5V
6.0V
Quiescent Currenr, Icco - mA
Ambient Temperature, Ta - °C


Po - Ta
VCC=6.0V
Rg=600Ω
f=1kHz
RL=8Ω
THD=10%
Output Power, Po - W
Ambient Temperature, Ta - °C