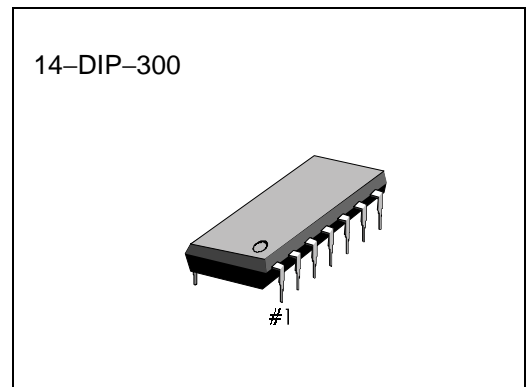


INTRODUCTION

The S1A2224A01 is a monolithic integrated circuit consisting of a dual equalizer amplifier with ALC, and it is suitable for stereo radio cassette-tape players.

FEATURES

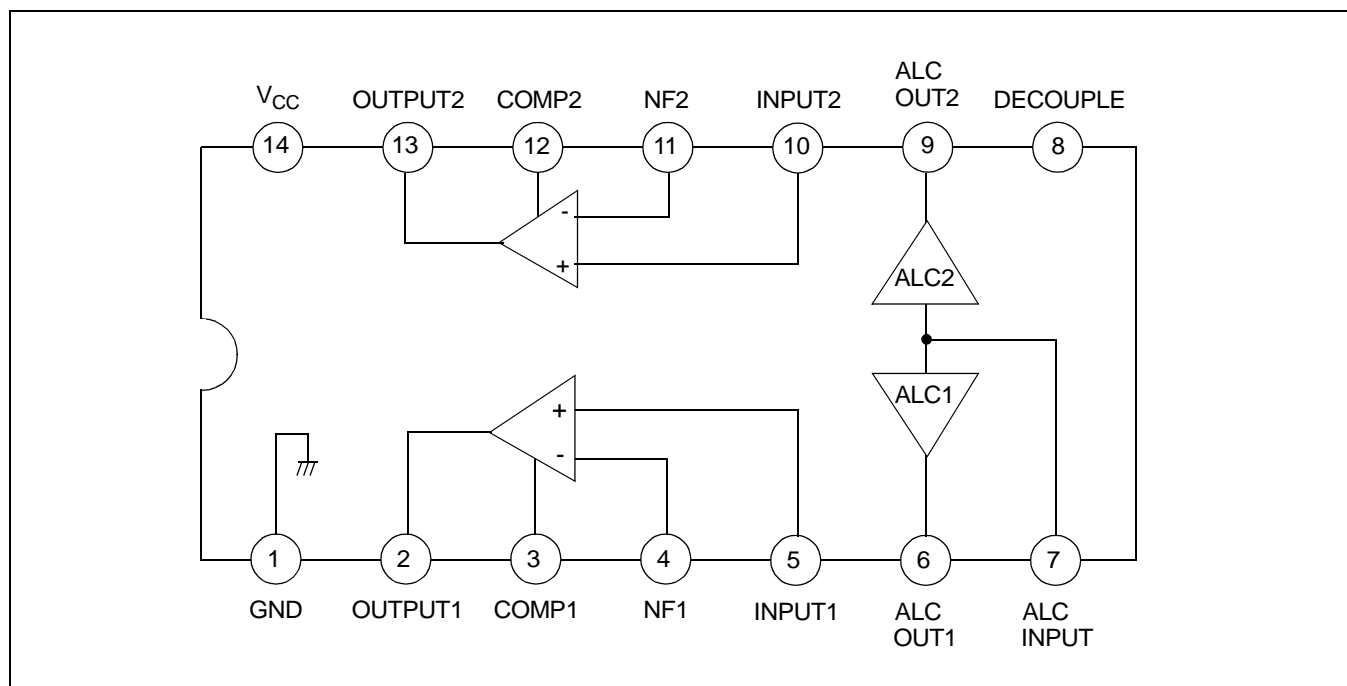
- Dual equalizer amplifier with a built-in ALC circuit
- Recording amp available because of high gain characteristics (Variable monitor possible)
- Good channel separation (sep = 50dB Typ)
- Quick stabilization after power on
- Capable of direct meter driving and ALC transistor
- Good ALC response balance between channels
- Wide operating supply voltage range: $V_{cc} = 4V - 13V$



ORDERING INFORMATION

Device	Package	Operating Temperature
S1A2224A01-D0B0	14-DIP-300	-20°C — +70°C

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta =25°C)

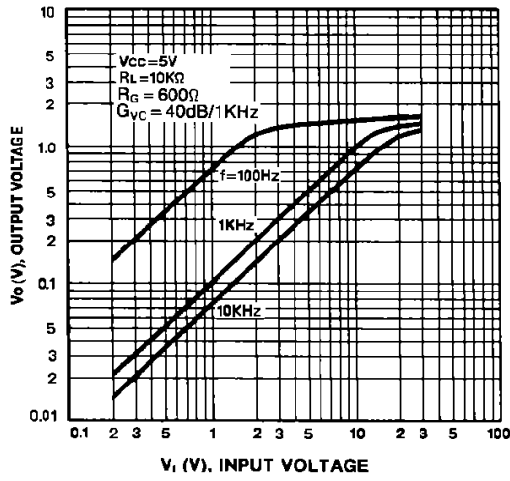
Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	14	V
Power Dissipation	P_D	600	mW
Operating Temperature	T_{OPR}	-20 — +70	°C
Storage Temperature	T_{STG}	-40 — +125	°C
ALC TR Maximum Current	—	3.5	mA

ELECTRICAL CHARACTERISTICS

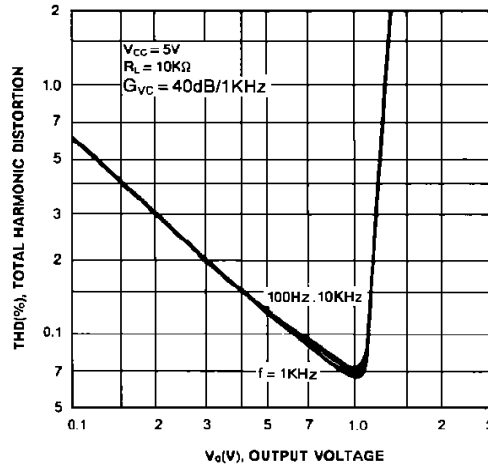
(Ta = 25°C, Vcc = 5V, RL = 10kΩ, f = 1kHz: play, RL = 680Ω: Recording)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Quiescent Circuit Current	I _{CCQ}	V _I = 0	–	4.5	10	mA
Open Loop Voltage Gain	G _{VO}	–	–	85	–	dB
Closed Loop Voltage Gain	G _{VC1}	Play	–	40	–	dB
	G _{VC2}	Record	–	58	–	dB
Output Voltage	V _O	THD = 1%, Play	0.9	1.2	–	V
Total Harmonic Distortion	THD	V _O = 0.5V, Play	–	0.1	1.0	%
Input Resistance	R _I	–	21	30	–	kΩ
Equivalent Input Noise Voltage	V _{NI}	BW (–3dB) = 20Hz – 20kHz	–	1.0	2.0	μV
Cross Talk	CT	R _G = 2.2kΩ	40	50	–	dB
ALC Range	V _{ALC}	V _I = –60dBm, Record	35	45	–	dB
ALC Balance	CB _{ALC}	V _I = –20dBm, Record	–	0	2.0	dB
ALC Distortion	THD _{ALC}	V _I = –20dBm, Record	–	0.5	2.0	%

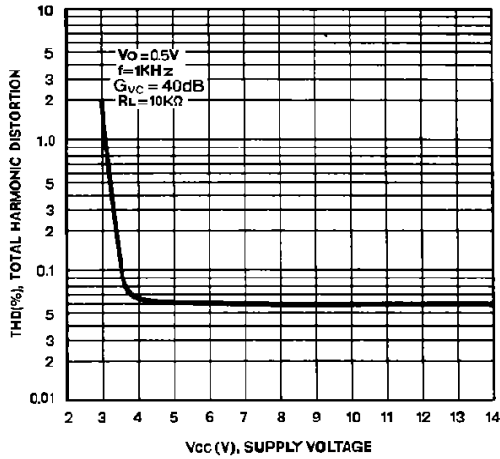
OUTPUT VOLTAGE-INPUT VOLTAGE



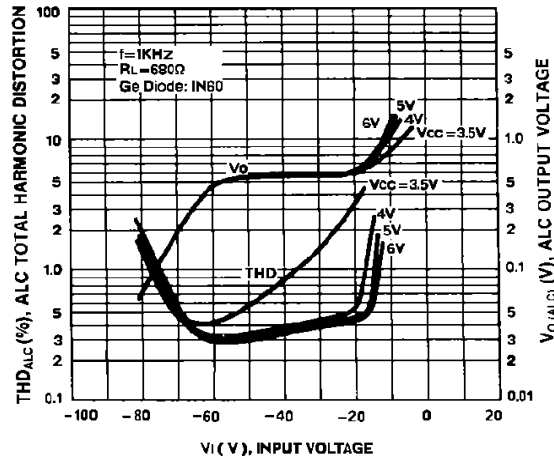
TOTAL HARMONIC DISTORTION-OUTPUT VOLTAGE



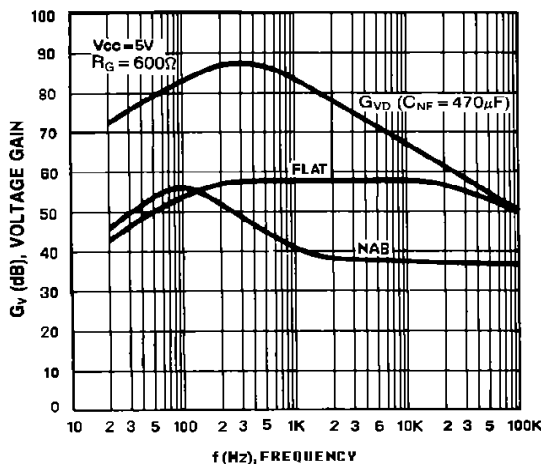
TOTAL HARMONIC DISTORTION-SUPPLY VOLTAGE



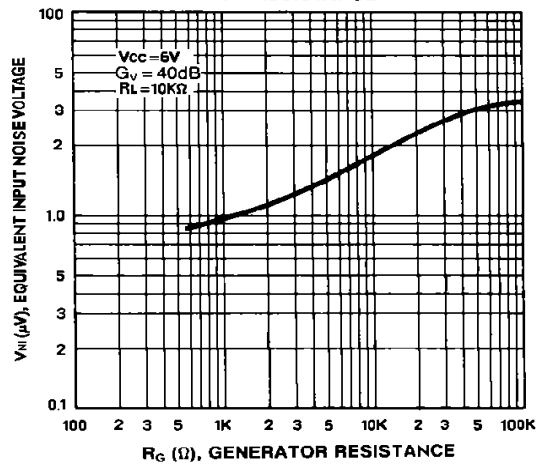
ALC OUTPUT VOLTAGE - INPUT VOLTAGE
ALC TOTAL HARMONIC DISTORTION



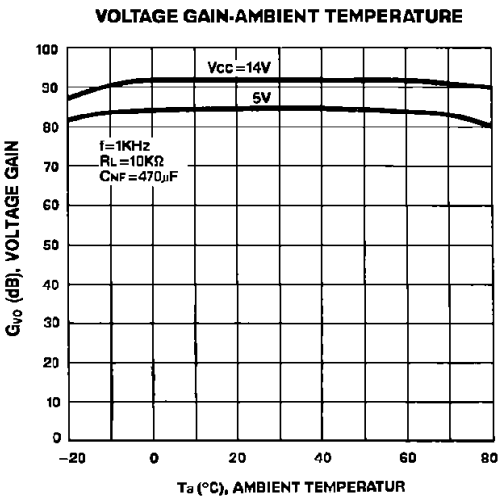
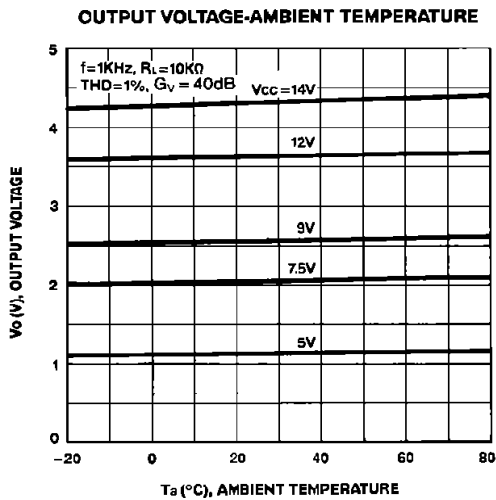
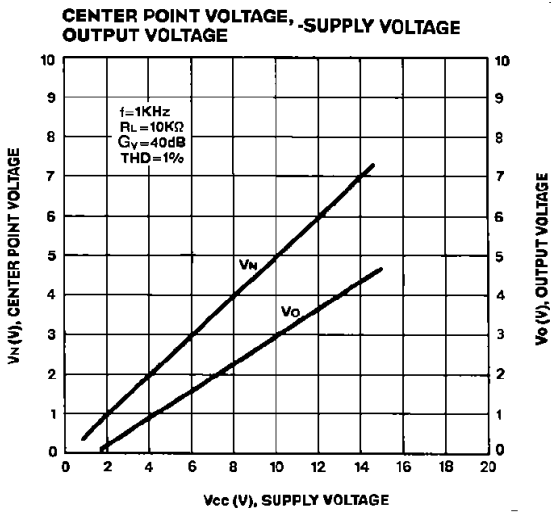
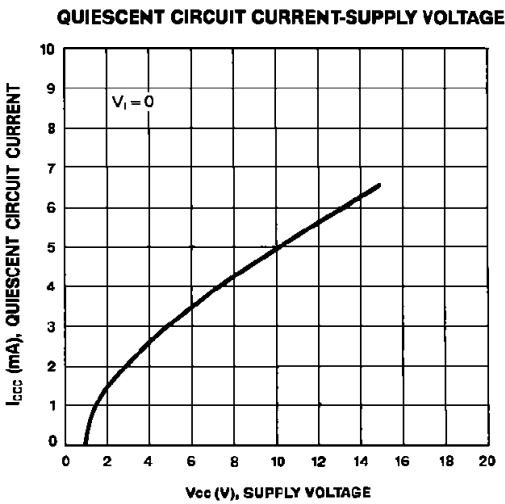
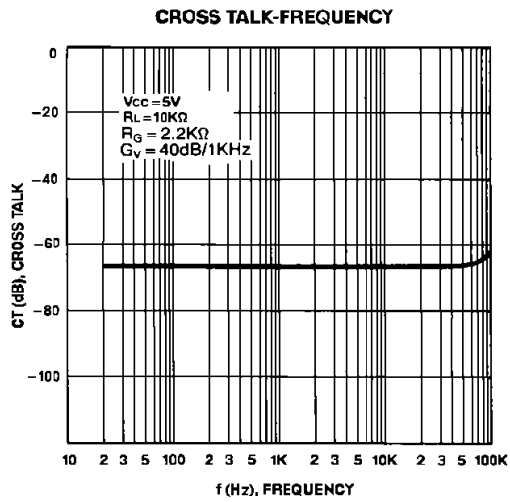
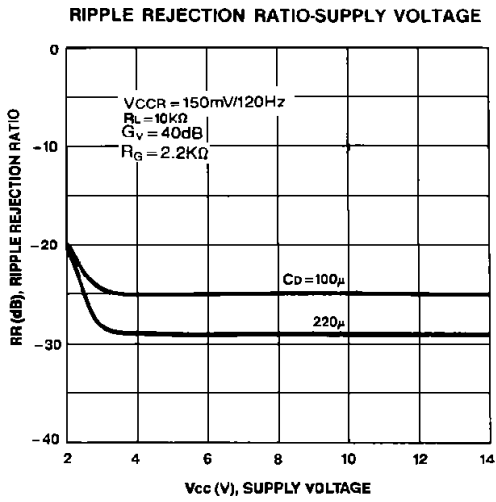
VOLTAGE GAIN-FREQUENCY



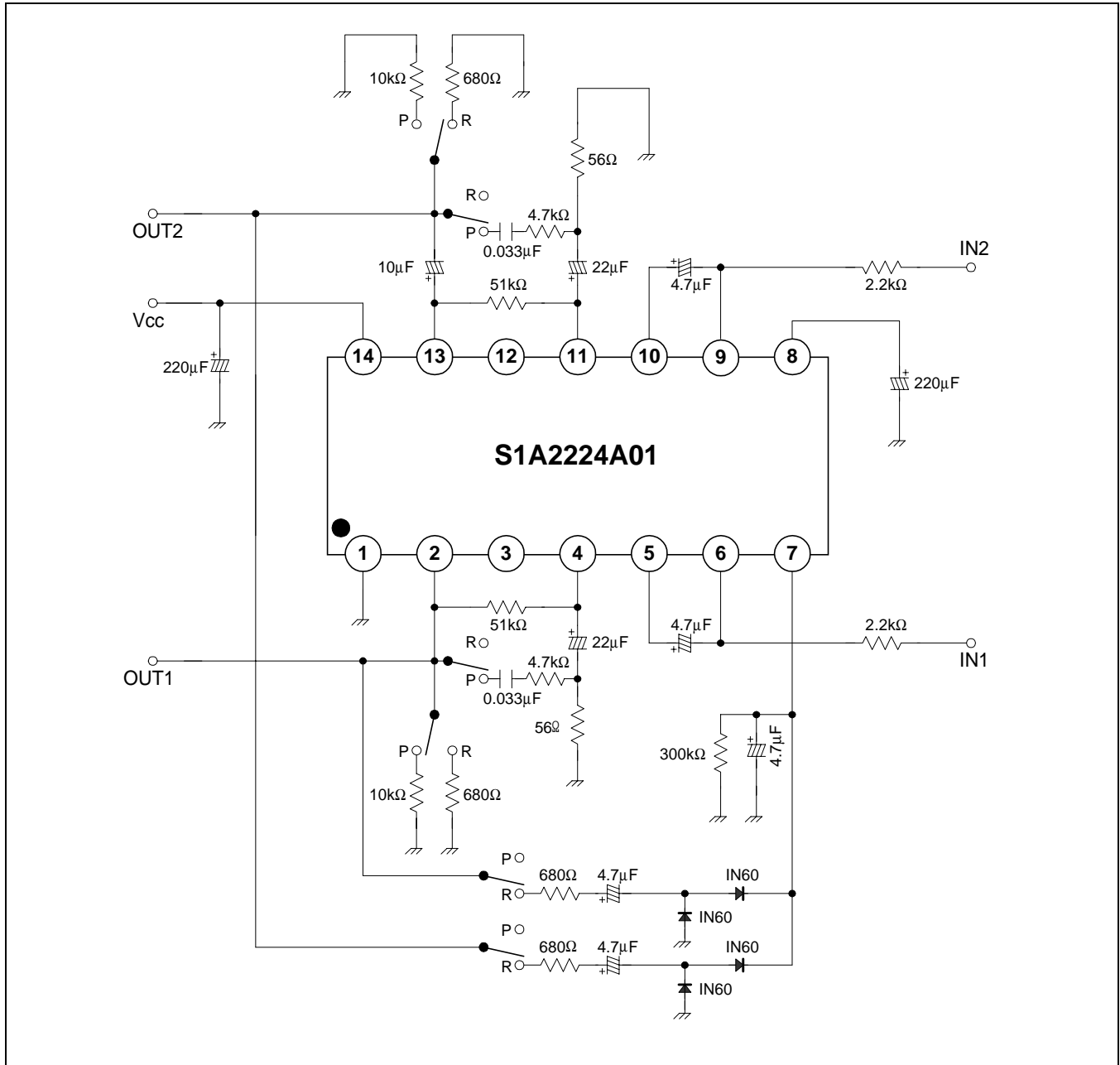
EQUIVALENT INPUT NOISE VOLTAGE - GENERATOR RESISTANCE



ELECTRONICS

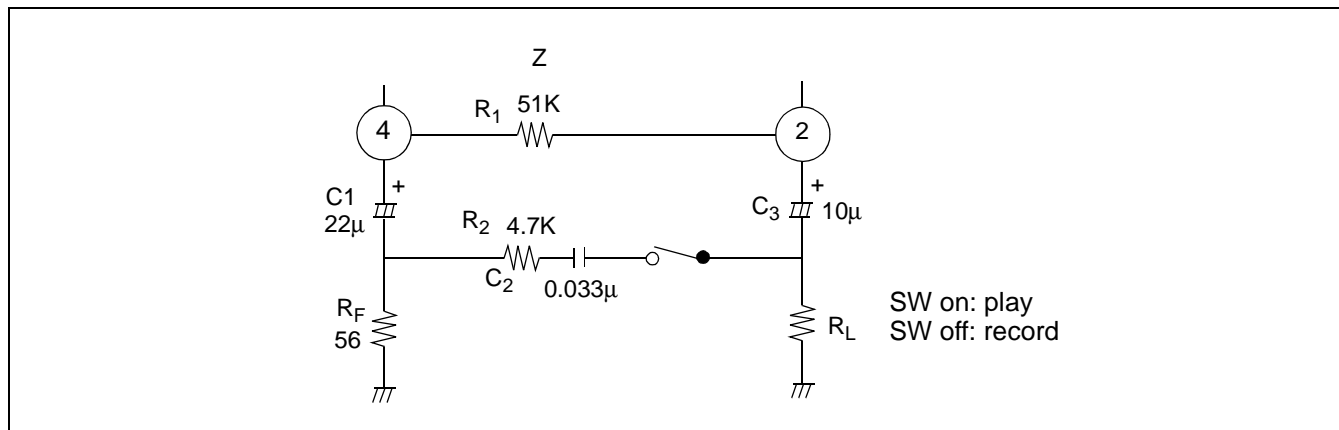


TEST CIRCUIT



APPLICATION INFORMATION

Closed Loop Voltage Gain



A. Playback amplifier

$$G_v = 20 \log \frac{Z}{R_F} \text{ (dB) at } f = 1 \text{ kHz, } G_v = 42 \text{ dB (Typ) } Z = R_1 // \left(R_2 + \frac{1}{2\pi f \cdot C_2} \right)$$

B. Recording amplifier

$$G_v = 20 \log \frac{R_1}{R_F} \text{ (dB) at } f = 1 \text{ kHz, } G_v = 58 \text{ dB (Typ)}$$

ALC Circuit

The ALC circuit consists of TR₁, TR₂ and some external components. The output level of the amplifier is rectified by external circuits. Since this DC level is applied to the ALC input terminal (Pin 7), the impedance between the collector and emitter of TR₁ can change its value. Therefore, the pre-amplifier input level can be controlled.

