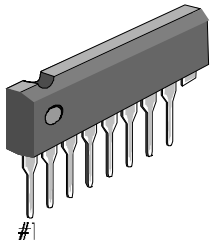
INTRODUCTION

The S1A2221A01 is a monolithic integrated circuit for car stereos,which possesses 2-channel low noise amplifiers and a regulated power supply.

8–SIP



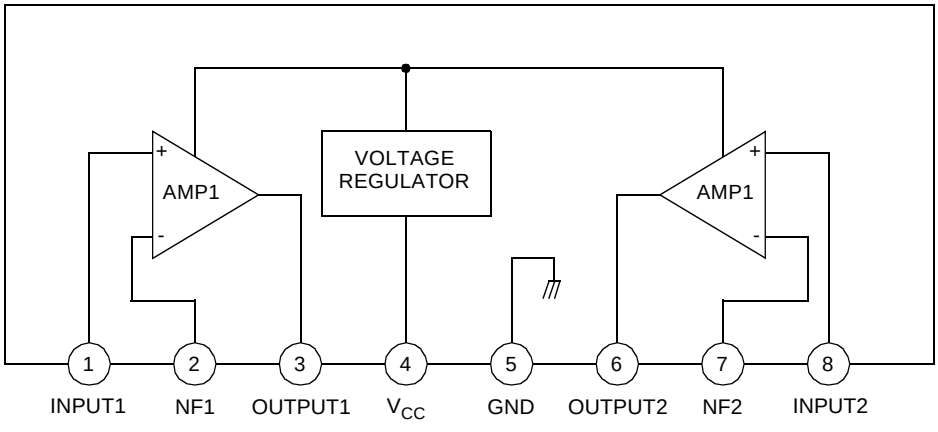
FEATURES

- Suitable for a car stereo
- Low noise amplifier
- Voltage regulator included
- Good ripple rejection
- High channel separation (65dB Typ)
- Minimum number of external parts required

ORDERING INFORMATION

Device	Package	Operating Temperature
S1A2221A01-I0U0	8–SIP	–20°C — +70°C

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

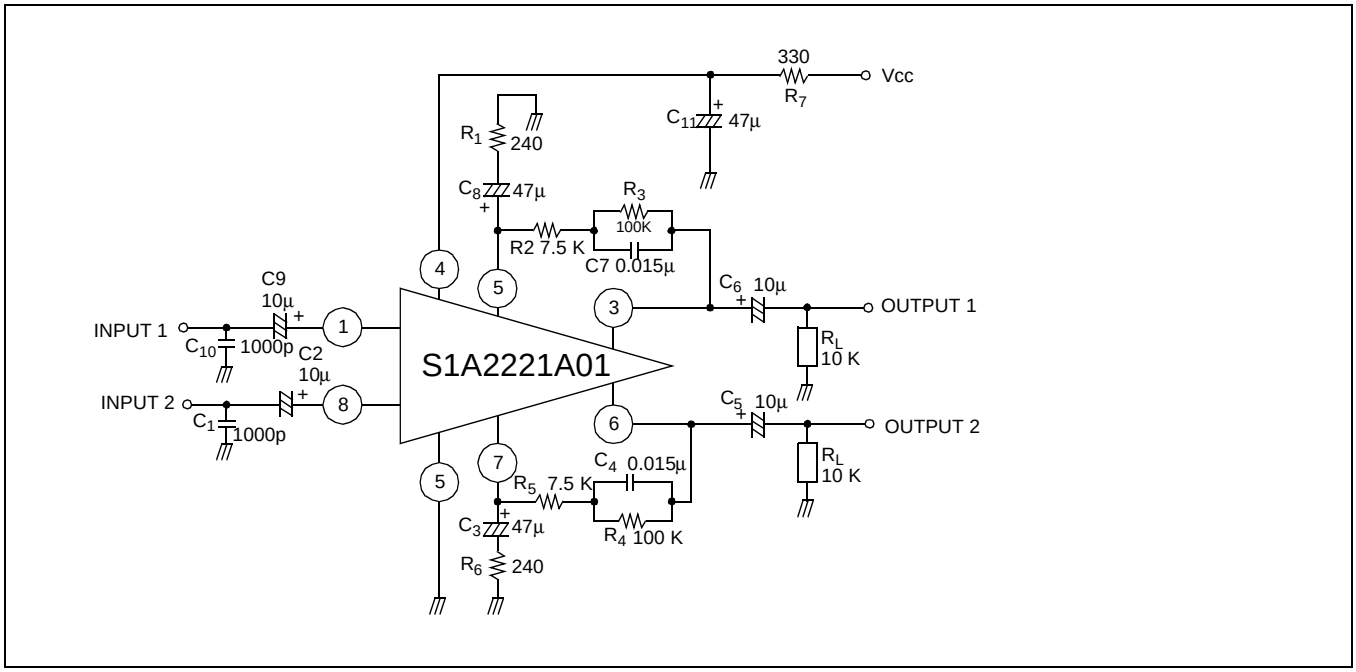
Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	18	V
Power Dissipation	P_O	200	mW
Operating Temperature	T_{OPR}	– 20 — +70	°C
Storage Temperature	T_{STG}	– 40 — +125	°C

ELECTRICAL CHARACTERISTICS

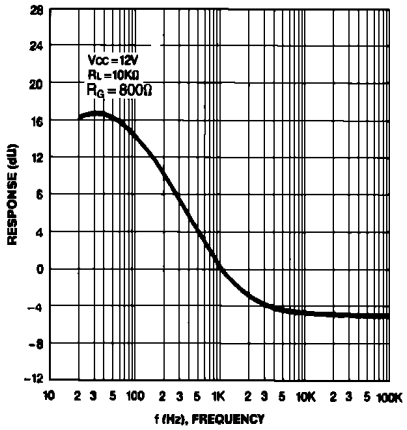
(T = 25°C, V_{CC} = 12V, R_L = 10K, f = 1kHz, NAB, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Quiescent Circuit Current	I_{CCQ}	V_I = 0	–	6.0	9.0	mA
Open Loop Voltage Gain	G_{VO}	–	65	80	–	dB
Closed Loop Voltage Gain	G_{VE}	V_O = 0.5 V	33	35	37	dB
Output Voltage	V_O	THD = 1%	0.6	1.0	–	V
Total Harmonic Distortion	THD	V_O = 0.5 V	–	0.1	0.3	%
Input Resistance	R_I	–	–	150	–	KΩ
Equivalent Input Noise Voltage	V_{NI}	R_G = 2.2kΩ BW (–3dB) =15Hz – 30kHz	–	1.0	2.0	μV
Cross Talk	CT	R_G = 2.2kΩ	50	65	–	dB

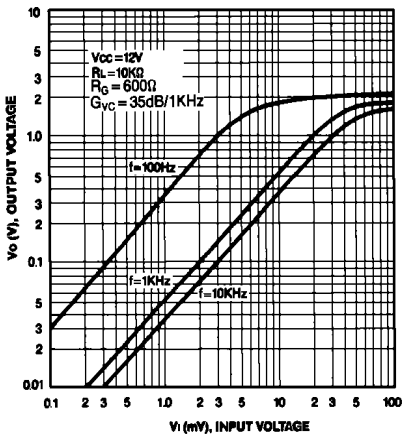
TEST CIRCUIT



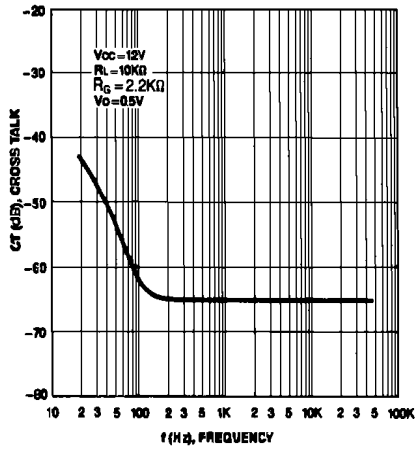
FREQUENCY RESPONSE



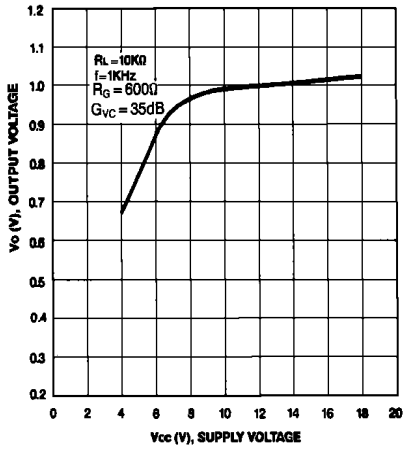
OUTPUT VOLTAGE-INPUT VOLTAGE



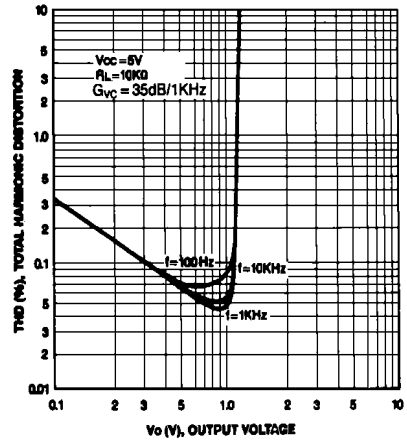
CROSS TALK-FREQUENCY



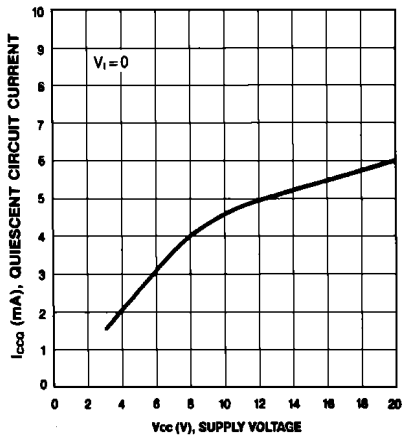
OUTPUT VOLTAGE-SUPPLY VOLTAGE



TOTAL HARMONIC DISTORTION-OUTPUT VOLTAGE



QUIESCENT CIRCUIT CURRENT-SUPPLY VOLTAGE



APPLICATION INFORMATION

External Components (Refer to test circuits)

C_1 (C_{10}): Noise filter

These capacitors prevent radio interference in strong electric fields. The recommended value is 1000 pF.

C_2 (C_8):Input coupling capacitor

The recommended value is 10µF. If made too small, the low frequency characteristics will change for the worse, but too large a value will increase the rising time when power is applied.

C_1 (C_9):Negative feedback capacitor

The lower cut-off frequency depends on the value of these capacitors and is determined as follows:

$$C_3\ (C_8) = \frac{1}{2\pi f_L \bullet R1}$$

f_L: Low cut-off frequency

If the value of these capacitors is made larger, the starting time of the amplifier is delayed further.

C_5 (C_6): Output coupling capacitor

The recommended value is 10µF.

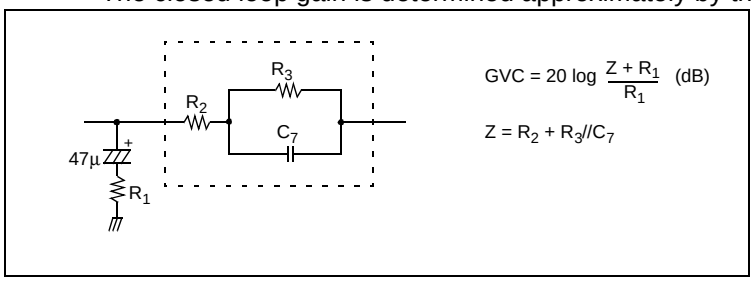
R_2, R_3, C_7 (R_4, R_5, C_4): Equalizer network

The time constants of standard NAB characteristic are as follows.

	Tape speed	9.5 cm/sec	4.75 cm/sec
T2	C_7 (R_2 + R_3)	3180 µsec	1590 µsec
T1	R_2, C_7	90 µsec	120 µsec

R_1 (R_6): Feedback component

The closed loop gain is determined approximately by the following relationship.



Choose R_2, R_3, (DC resistance of NAB element) as 100 K approximately.

NOTES