Ordering number : EN405E

SANYO Semiconductors
DATA SHEET

LA3210 — Monolithic Linear IC For Cassette Tape Recorders, Radio Cassette Recorders Equalizer Amplifier with ALC

Overview

The LA3210 is a low-noise equalizer amplifier with ALC for cassette tape recorders, radio cassette recorders.

Features

- Low noise.
- Wide automatic level control range.
- Good reduced voltage characteristics.

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		15	V
Current dissipation in amplifier	I_{CC} max		3.0	mA
Allowable current in ALC transistor	I_6 max		3.5	mA
Allowable power dissipation	Pd max		200	mW
Operating temperature	Topr		-20 to +80	°C
Storage temperature	Tstg		-40 to +125	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		5	V
Recommended load resistance	R_L		5.1	kΩ

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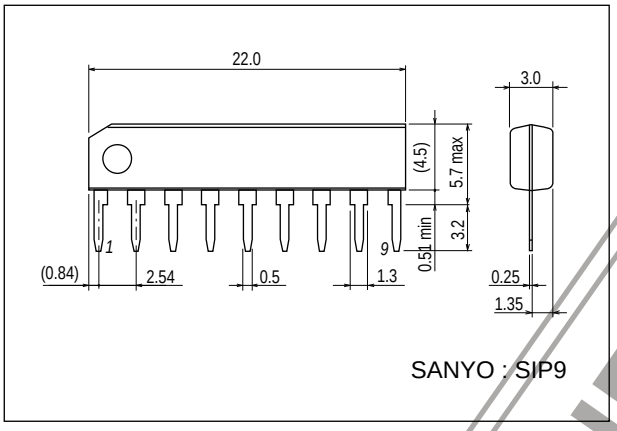
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V, R_L = 5.1kΩ, Rg = 600Ω, f = 1kHz, See specified Test Circuit.

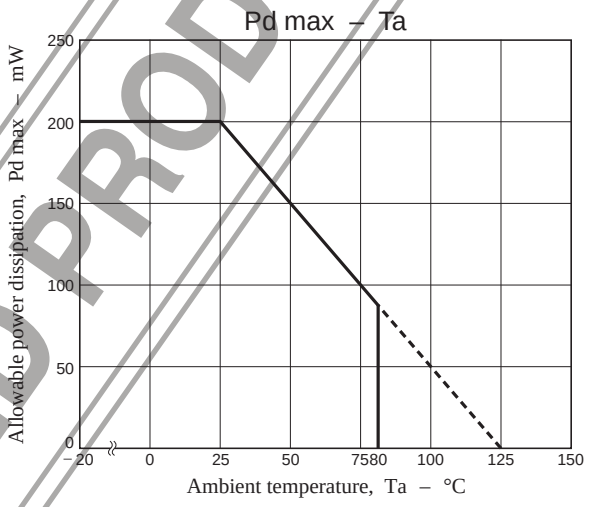
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current dissipation	I_{CC}	Vi = 0, ALC off		1.4	2.0	mA
Voltage gain	V_{GO}	Open loop	66	69		dB
	V_G	Closed loop	33	35	37	dB
Output voltage	V_O	THD = 1%	0.7	1.0		V
Total harmonic distortion	THD	V_O = 0.2V		0.1		%
Input resistance	r_i		60	100		kΩ
Equivalent input noise voltage	V_{NI}	Rg = 2.2kΩ, NAB		1	2	μV
ALT transistor saturation voltage	Vsat			75	100	mV

Package Dimensions

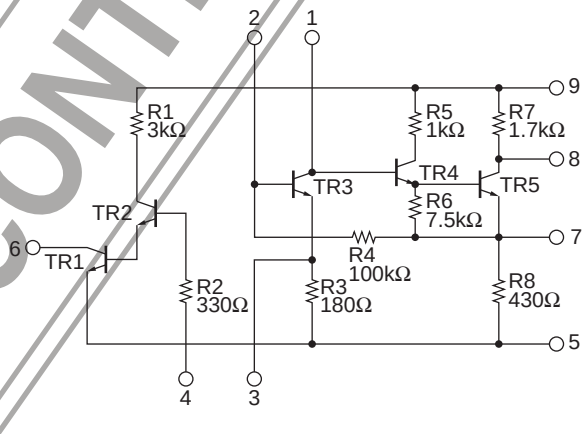
unit : mm (typ)

3017D



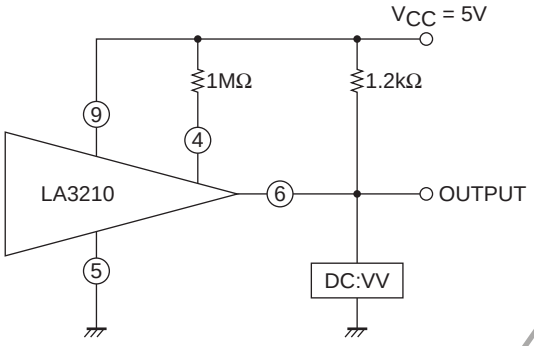


Equivalent Circuit

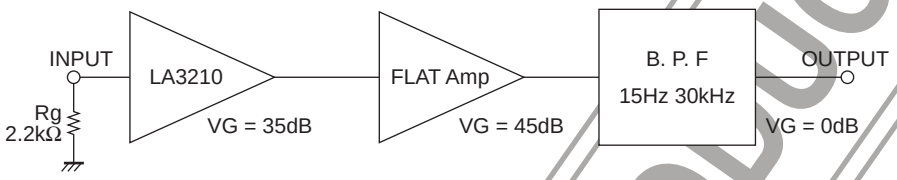


Test Circuit

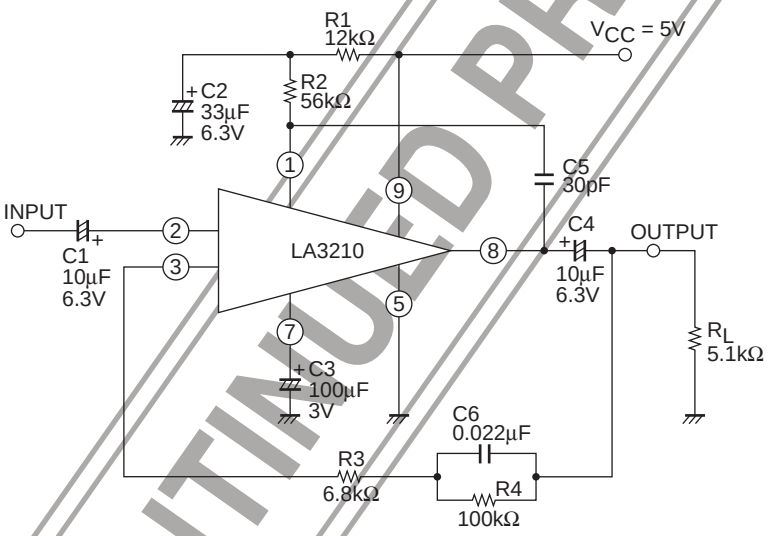
- ALC Saturation Voltage



- Noise Voltage

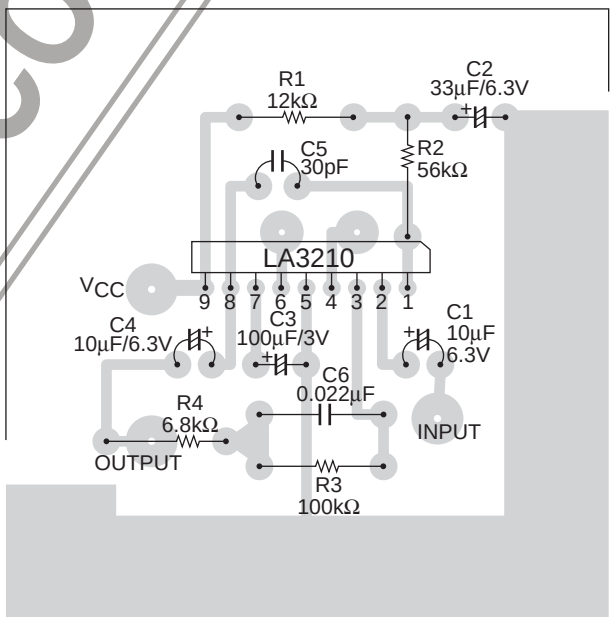


Sample Application Circuit : Equalizer Amplifier with Automatic Level Control designed for Cassette Tape Recorder, Radio



Sample Printed Circuit Pattern

(Cu-foiled side, 60×60mm²)



Description of External Parts

C1 : Input coupling capacitor (10μF)
DC current blocking capacitor used to prevent the DC current applied to the base from mixing in the AC signal source.
The C1 is calculated using $C1 = 1/2\pi f_T z_i$ (z_i : input resistance, f_T : low cutoff frequency). If the capacitance value is too decreased, your set is subjected to inductive hum. We recommend using a capacitor of 2.2μF or greater. We also recommend using 6.3V or greater because the chemical capacitor becomes less leaky as the withstand voltage gets higher.

C2 : Decoupling capacitor (33μF)
Used to bypass the power source ripple.
Decreasing the capacitance value makes the starting time shorter. We recommend using a capacitor of 33μF.

C3 : Bypass capacitor (100μF)
Used to AC-Short the emitter resistance and prevent AC components from being fed back to the input.

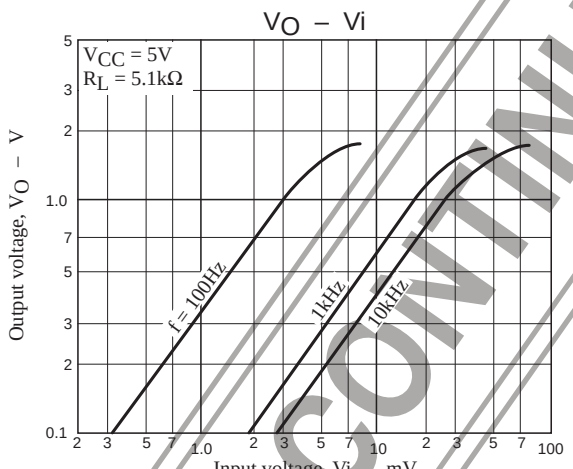
C4 : Output capacitor (10μF)
Used to block DC components and pass AC Components only.
The C4 is calculated using $C4 = 1/1\pi f_L \cdot R_L$ (f_L : low cutoff frequency, R_L : load resistance).

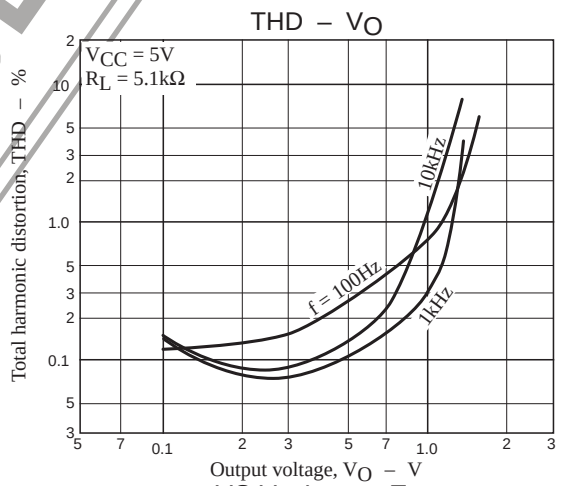
C5 : Phase compensation capacitor (30pF)
Used to prevent high-frequency oscillation caused by phase shift when a deep feedback is provided. It should be noted that the high frequency response depends on the capacitance value of C5.

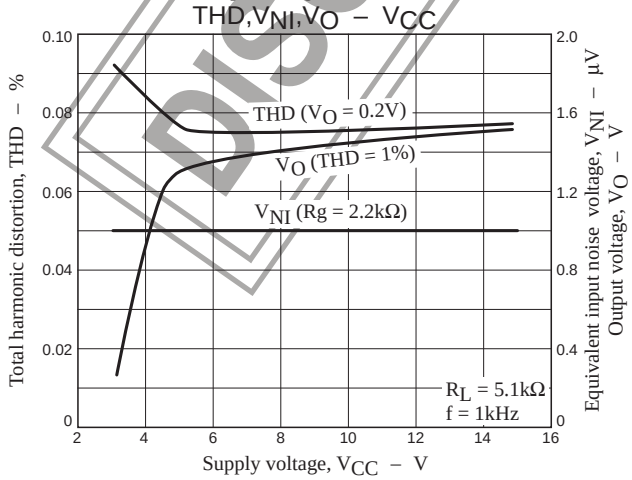
R1 : Decoupling resistor used to bypass the power source ripple through C2.

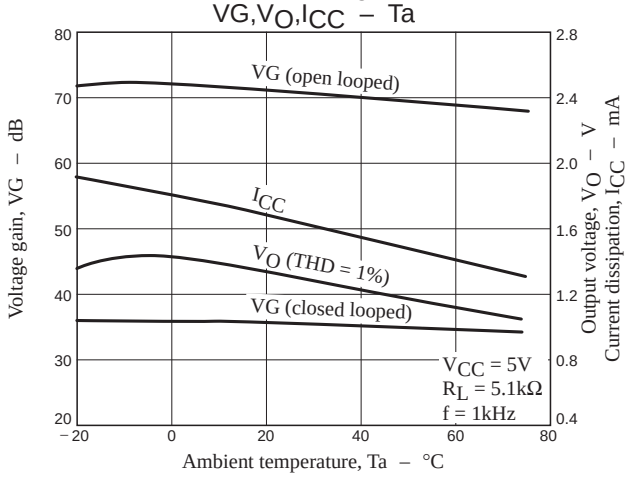
R2 : Collector resistor of the first stage transistor of IC. Taken as load resistance in terms of AC.

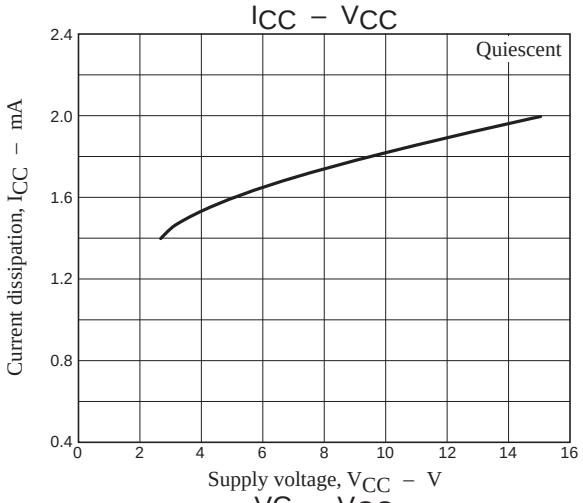
C6, R3, R4 : Equalizer parts on which the closed-loop voltage gain depends. NAB 4.75cm/s is provided.

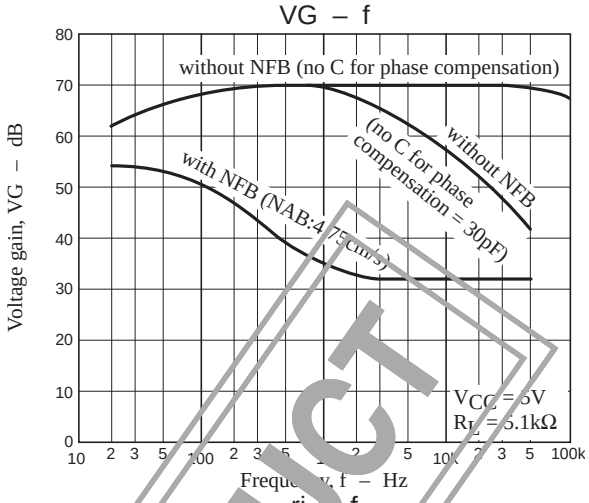


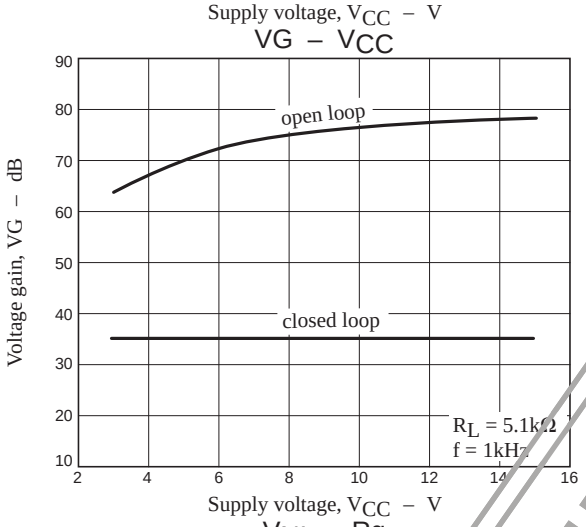


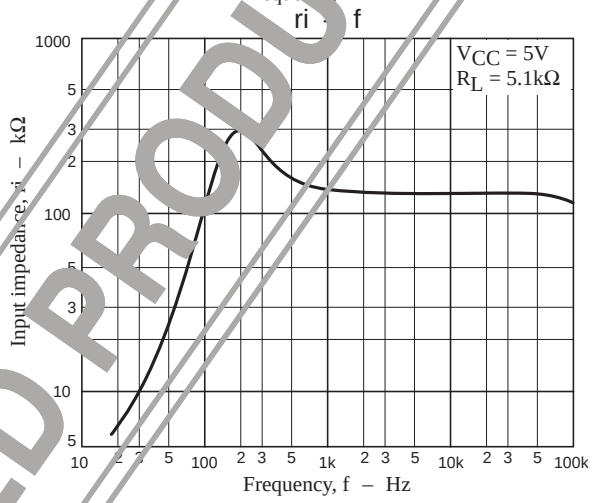


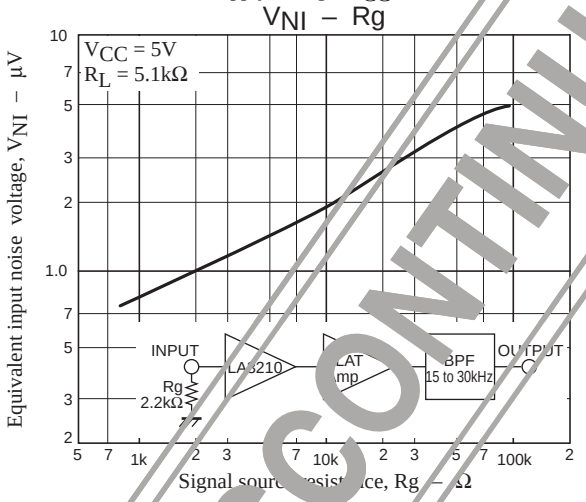












Proper cares in using IC

1. Maximum rating
   If the IC is used in the vicinity of the maximum rating, even a slight variation in conditions may cause the maximum rating to be exceeded, thereby leading to a breakdown. Allow an ample margin of variation for supply voltage, etc. and use the IC in the range where the maximum rating is not exceed.
2. Pin-to-pin Short
   If the supply voltage is applied when the space between pins is shorted, a breakdown or deterioration may occur. When installing the IC on the board or applying the supply voltage, make sure that the space between pins is not shorted with solder, etc.

This catalog provides information as of April, 2008. Specifications and information herein are subject to change without notice.