Ordering number:ENN405D

Monolithic Linear IC

LA3210

Equalizer Amplifier with ALC

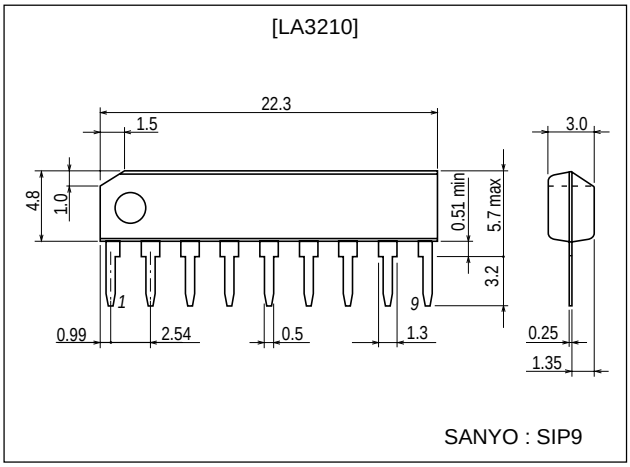
Features

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

Package Dimensions

unit:mm

3017C-SIP9



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Supply Voltage	V_{CC} max		15	V
Allowable Power Dissipation	Pd max		200	mW
Current Dissipation in Amplifier	I_{CC} max		3.0	mA
Allowable Current in ALC Transistor	I_6 max		3.5	mA
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		5.1k	Ω

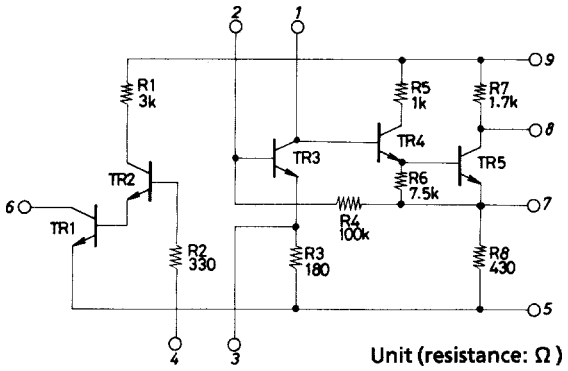
SANYO Electric Co.,Ltd. Semiconductor Company

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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

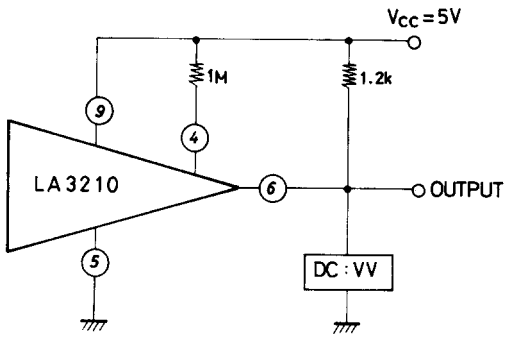
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current Dissipation	I_{CC}	Vi=0, ALC off		1.4	2.0	mA
Voltage Gain	VG_O	Open loop	66	69		dB
	VG	Closed loop	33	35	37	dB
Output Voltage	V_O	THD=1%	0.7	1.0		V
Total Harmonic Distortion	THD	V_O=0.2V		0.1		%
Input Resistance	r_i		60	100		kΩ
Equivalent Input Noise Voltage	V_{NI}	Rg=2.2kΩ, NAB		1	2	μV
ALT Transistor Saturation Voltage	Vsat			75	100	mV

Equivalent Circuit

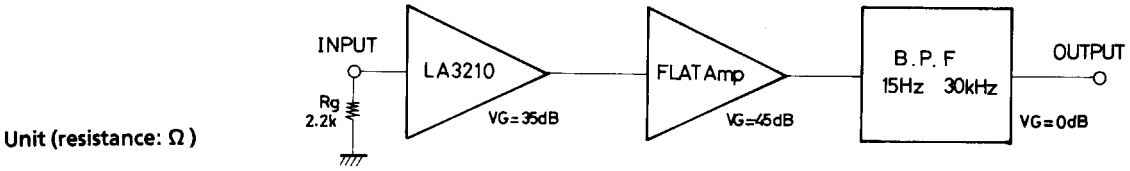


Test Circuit

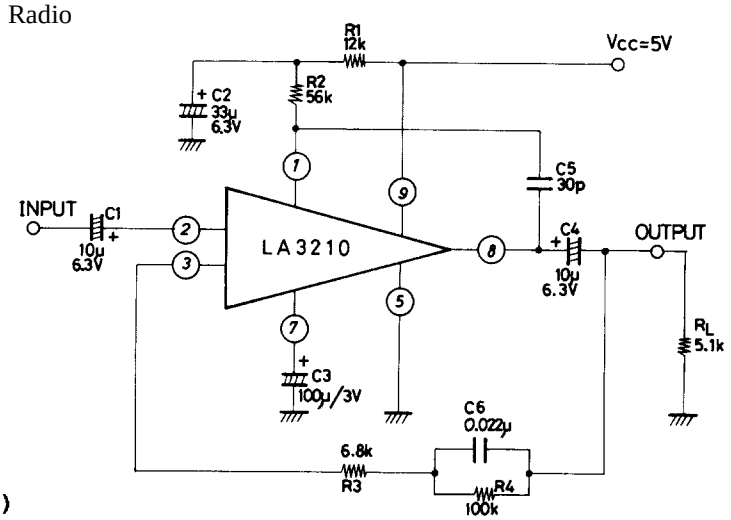
· ALC saturation voltage



· Noise Voltage

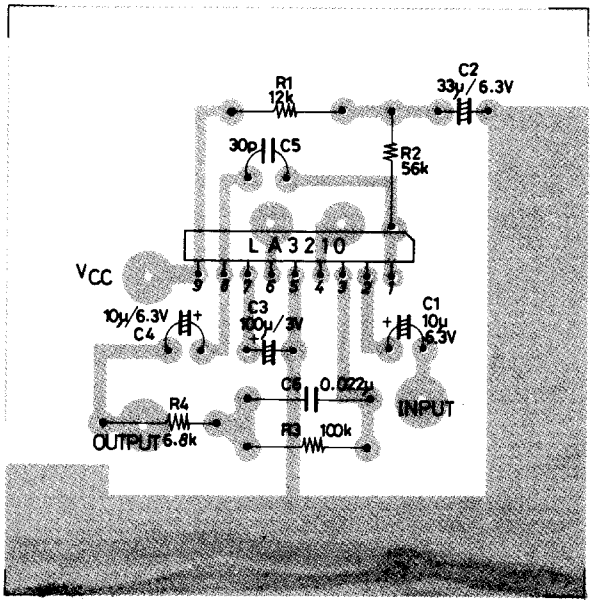


Sample Application Circuit : Equalizer Amplifier with Automatic Level Control designed for Cassette Tape Recorder, Radio



Unit (resistance: Ω, capacitance: F)

Sample Printed Circuit Pattern
(Cu-foiled side, 60 x 60mm2)



Unit (resistance: Ω, capacitance: F)

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, fT : 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 6.3WV 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.

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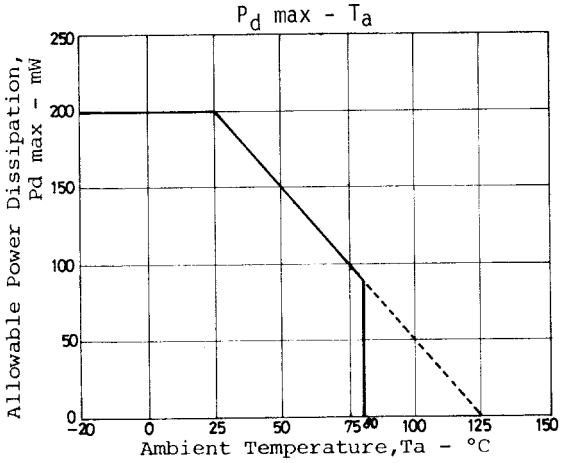
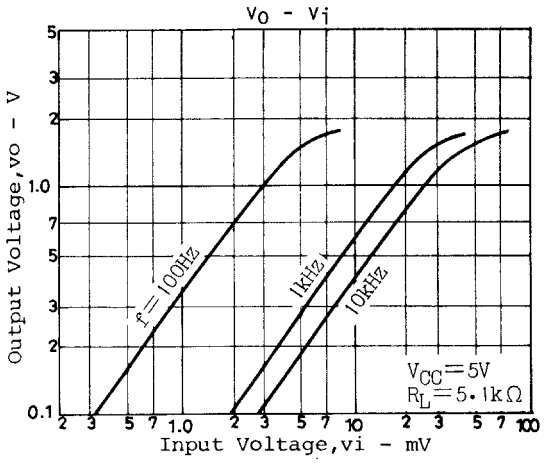
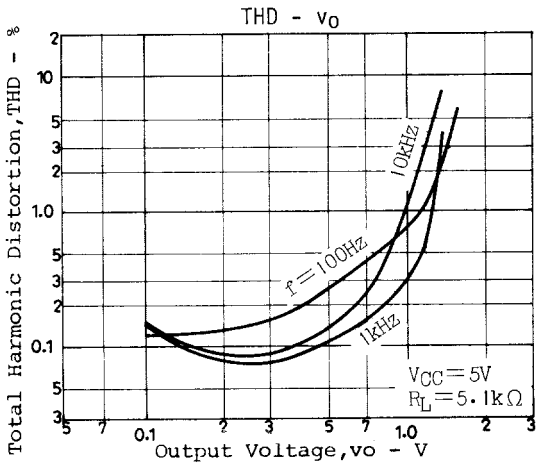
R1 : Decoupling resistor used to bypass the power source ripple through C2.

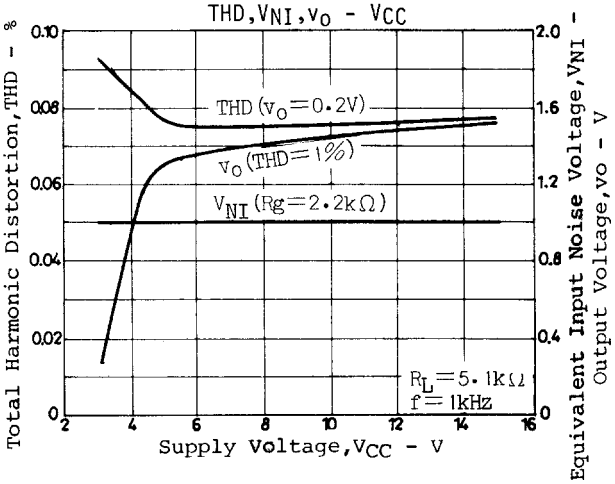
R2 : Collector resistor of the first stage transistor of IC. Taken as load resistance in terms of AC.

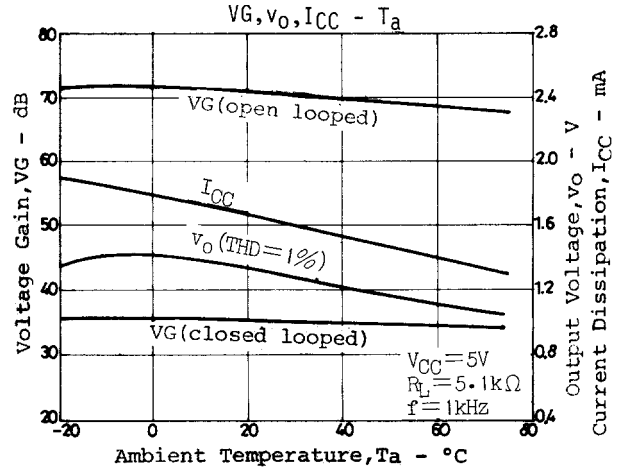
C6, R3, R4 : Equalizer parts on which the closed-loop voltage gain depends. NAB 4.75cm/s is provided.

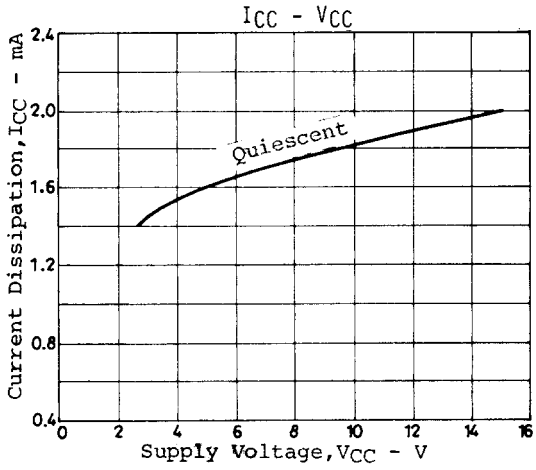


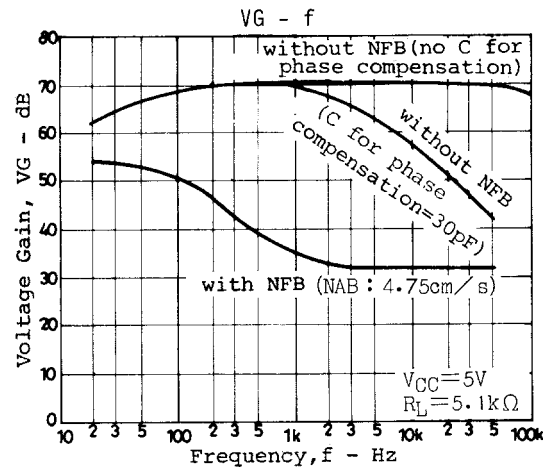


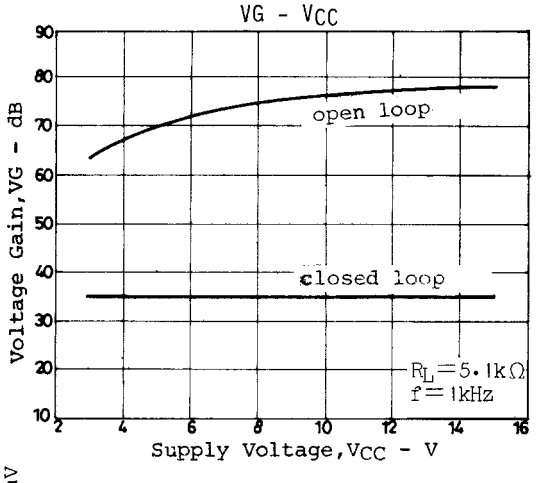


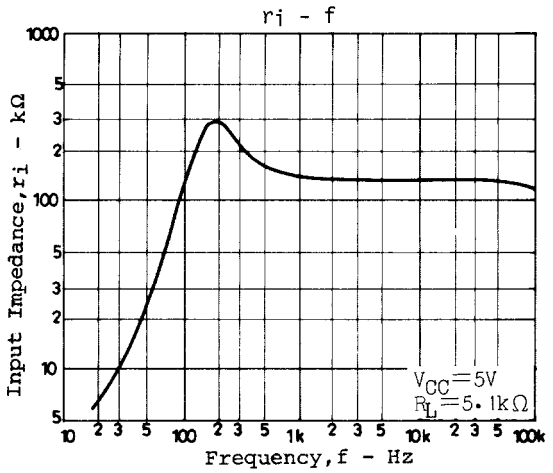


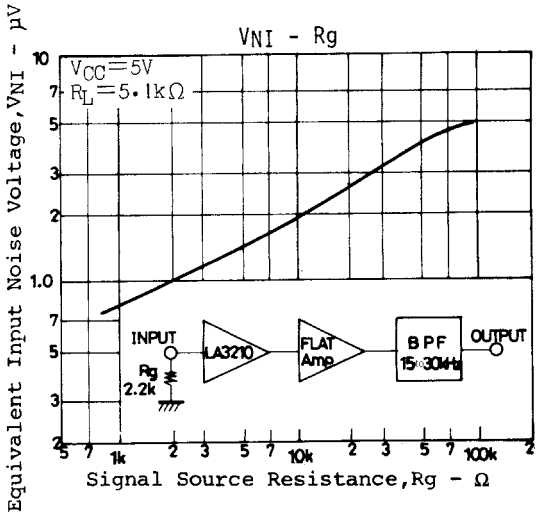












Proper Cares in Using IC

1. 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.