

**SANYO**

No.405D

**LA3210****EQUALIZER AMPLIFIER WITH ALC****Features**

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

**Maximum Ratings at Ta=25°C**

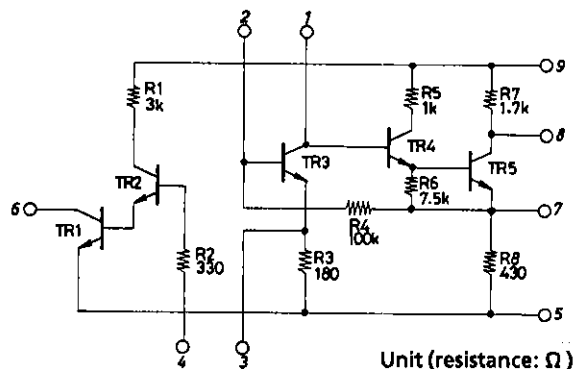
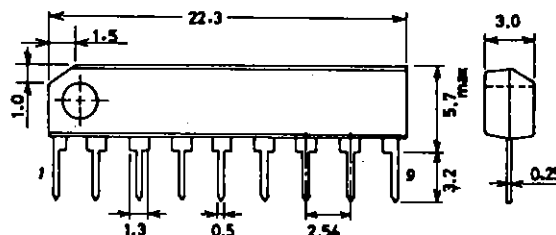
			unit
Maximum Supply Voltage	V <sub>CCmax</sub>	15	V
Allowable Power Dissipation	P <sub>dmax</sub>	200	mW
Current Dissipation in Amplifier	I <sub>CCmax</sub>	3.0	mA
Allowable Current in ALC Transistor	I <sub>Gmax</sub>	3.5	mA
Operating Temperature	T <sub>opr</sub>	-20 to +80	°C
Storage Temperature	T <sub>stg</sub>	-40 to +125	°C

**Operating Conditions at Ta=25°C**

			unit
Recommended Supply Voltage	V <sub>CC</sub>	5	V
Recommended Load Resistance	R <sub>L</sub>	5.1k	ohm

**Operating Characteristics at Ta=25°C, V<sub>CC</sub>=5V, R<sub>L</sub>=5.1kohms, R<sub>G</sub>=600ohms, f=1kHz,**

			min	typ	max	unit
Current Dissipation	I <sub>CC</sub>	v <sub>i</sub> =0, ALC off		1.4	2.0	mA
Voltage Gain	V <sub>GO</sub>	Open loop	66	69		dB
	V <sub>G</sub>	Closed loop	33	35	37	dB
Output Voltage	V <sub>O</sub>	THD=1%	0.7	1.0		V
Total Harmonic Distortion	THD	V <sub>O</sub> =0.2V		0.1		%
Input Resistance	r <sub>i</sub>		60	100		kohm
Equivalent Input Noise Voltage	V <sub>NI</sub>	R <sub>G</sub> =2.2kohms, NAB		1	2	uV
ALC Transistor Saturation Voltage	V <sub>sat</sub>			75	100	mV

**Equivalent Circuit****Package Dimensions  
(unit: mm)  
3017B**

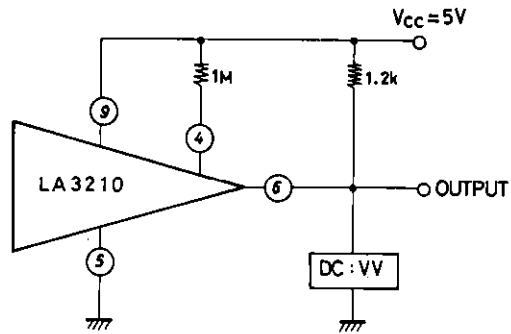
SANYO:SIP9

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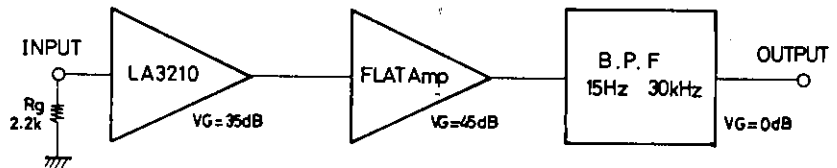
Test Circuit

•ALC saturation voltage

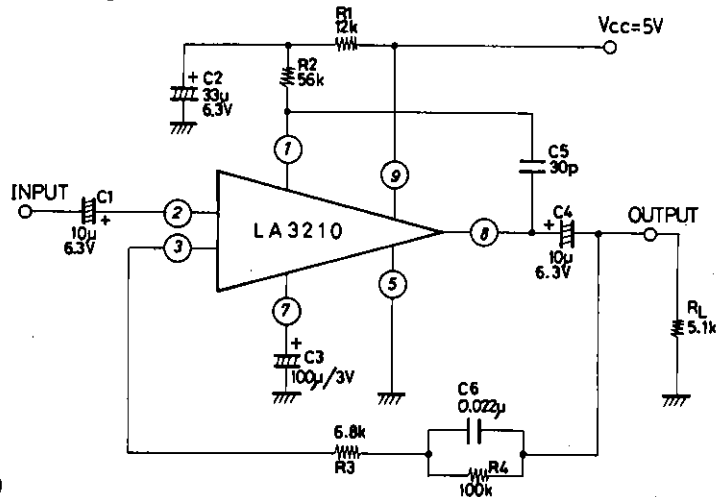


•Noise voltage

Unit (resistance:  $\Omega$ )

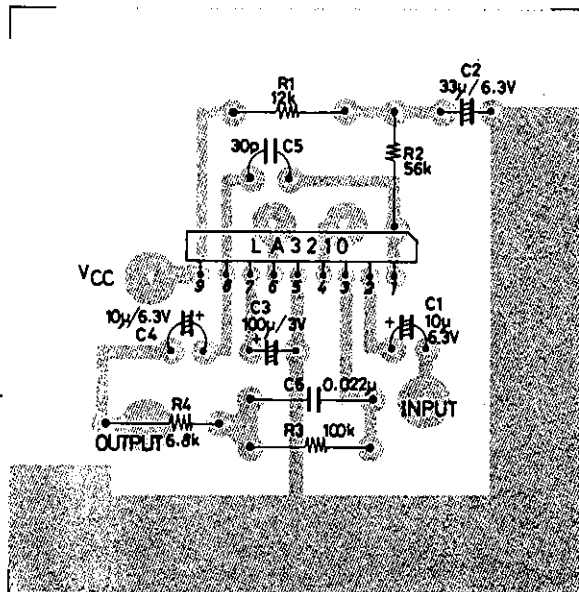


■ Sample Application Circuit: Equalizer Amplifier with Automatic Level Control designed for Cassette Tape Recorder, Radio



Unit (resistance:  $\Omega$ , capacitance: F)

Sample Printed Circuit Pattern  
(Cu-foiled side, 60 x 60mm<sup>2</sup>)



Unit (resistance:  $\Omega$ , capacitance: F)

Description of External Parts

C1: Input coupling capacitor (10uF)

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 2.2uF 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 (33uF)

Used to bypass the power source ripple.

Decreasing the capacitance value makes the starting time shorter. We recommend using a capacitor of 33uF.

C3: Bypass capacitor (100uF)

Used to AC-short the emitter resistance and prevent AC components from being fed back to the input

C4: Output capacitor (10uF)

Used to block DC components and pass AC components only

The C4 is calculated using  $C4 = 1 / (2\pi f_L R_L)$  ( $f_L$ : low cutoff frequency,  $R_L$ : load resistance).

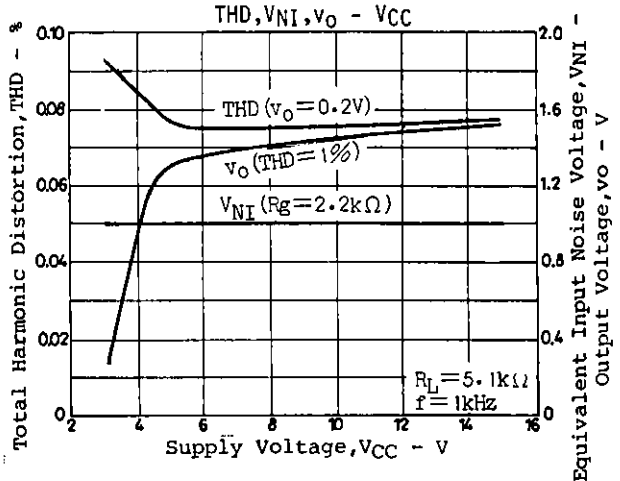
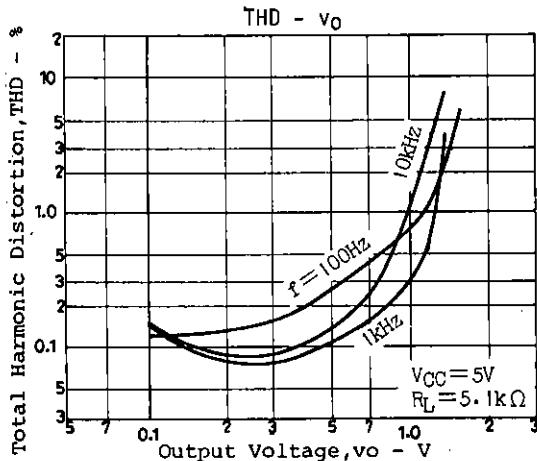
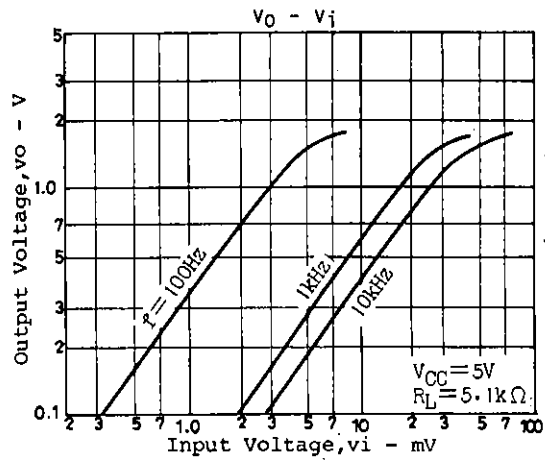
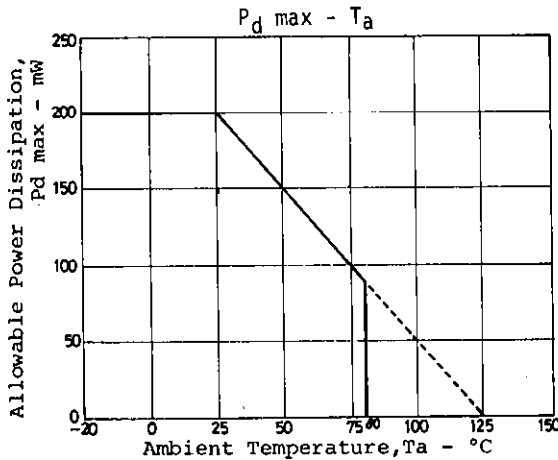
C5: Phase compensation capacitor (30pF)

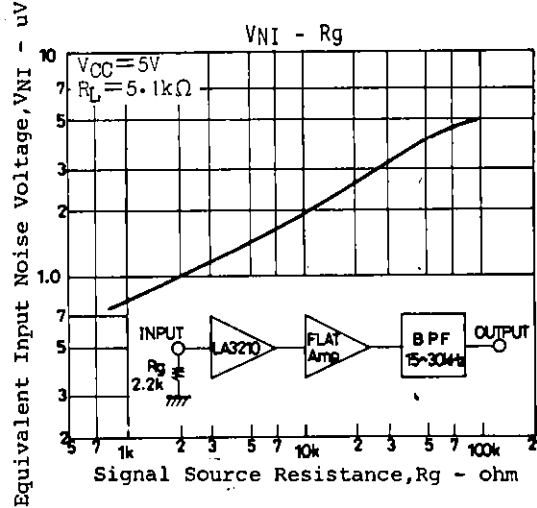
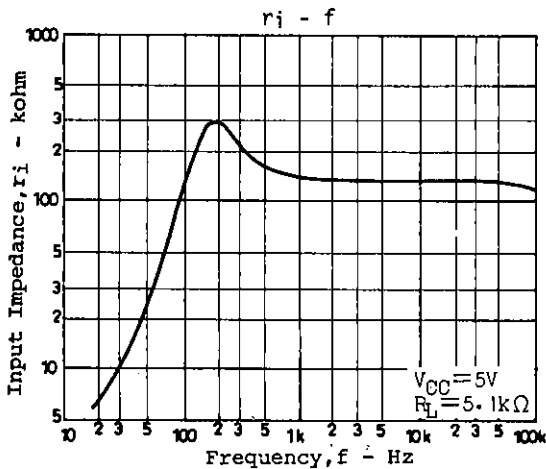
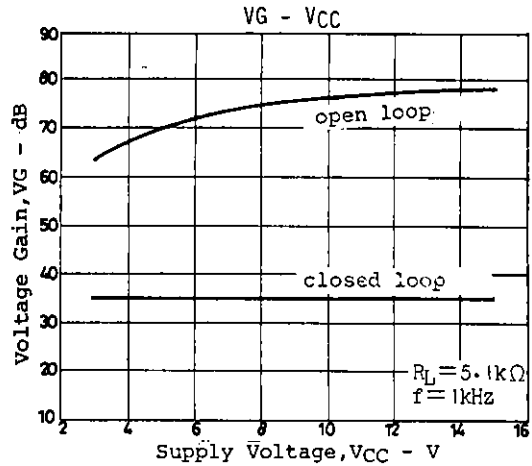
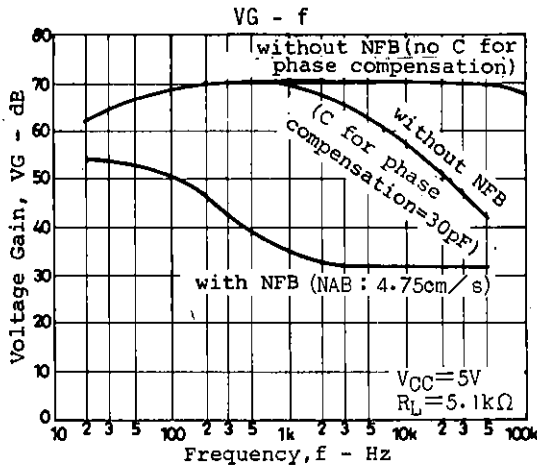
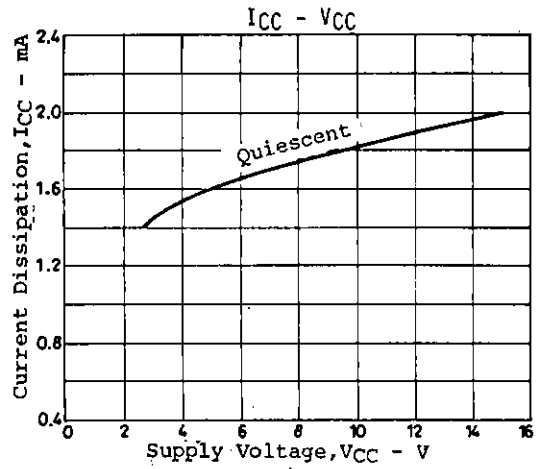
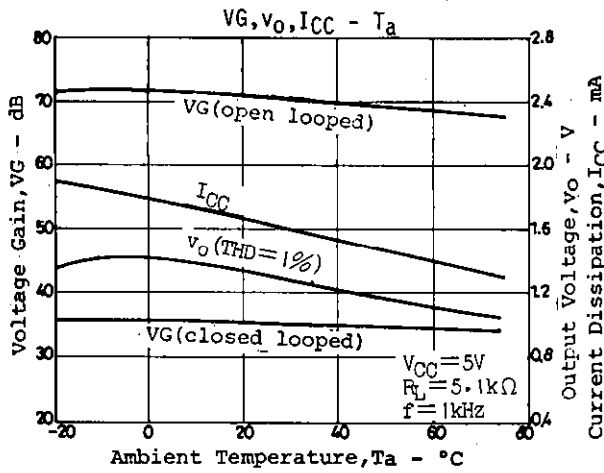
Used to prevent high-frequency oscillation caused by phase shift when a deep feedback is provided. It should be noted that the high frequency response depends on the capacitance value of C5.

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 4.75 cm/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 exceeded.
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.

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