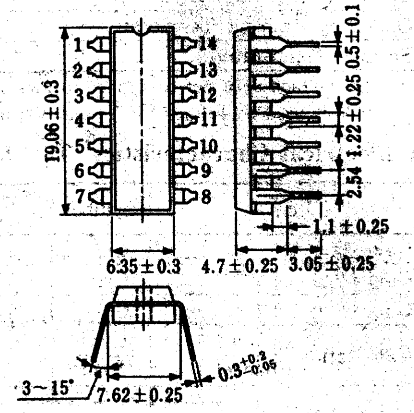
AN829P

Dual Attenuator

■ Outline

The AN829P is an integrated circuit which logarithmically controls the throughput (gain) of an audio signal by the DC voltage or resistance value and has 2 circuits. Since the voltage is internally stabilized, the stable operations are assured at the allowable supply voltage range (8 to 14.4V). The current source is provided with control circuit so that operation can be controlled by the voltage drop.

Unit : mm



14-Lead DIL Plastic Package

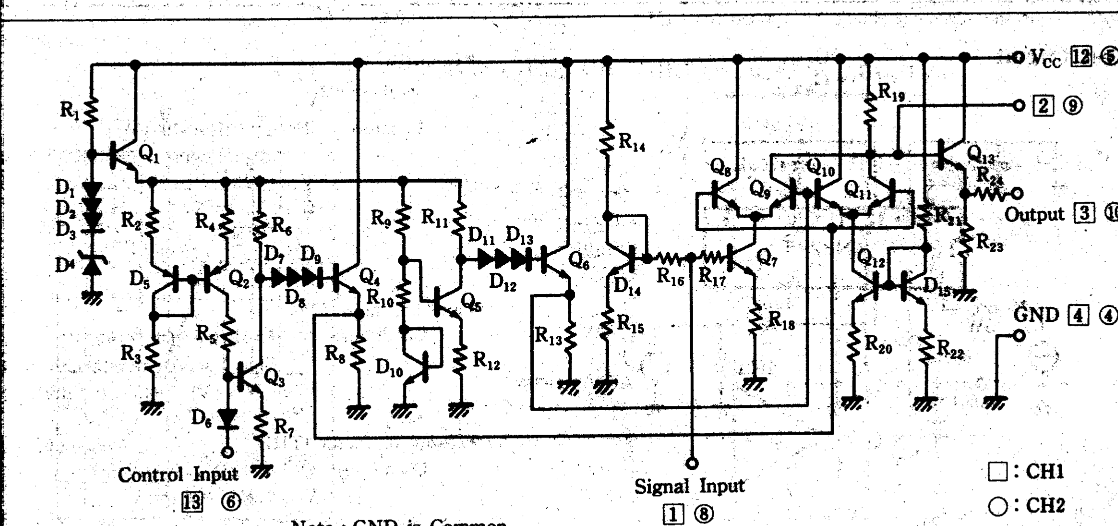
■ Features

- A wide operating voltage range
- High attenuation level
- Easy to control signal gain with simple circuit
- Less crosstalk between each channel

■ Use

This IC is used for electronic volume such as transceiver, radio, TV, stereo, tape recorder, etc.

■ Schematic Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply Voltage	Vcc	14.4	V
Circuit Voltage	V_6, V_{13}*	6	V
	V_3, V_{10}	Vcc	V
Total Current Dissipation	$I_{tog\ tot}$	25	mA
Total Power Dissipation	P_{tot}	360	mW
Operating Ambient Temperature	T_{opr}	−20～+75	°C
Storage Temperature	T_{stg}	−55～+150	°C

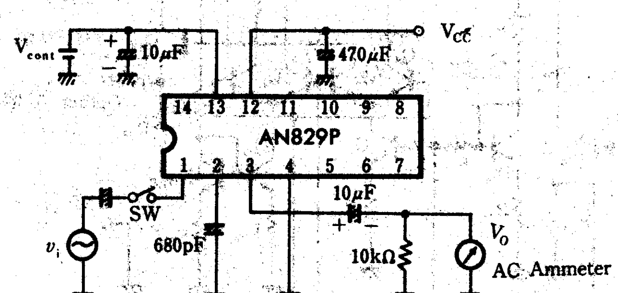
Note : DC voltage must not be applied to Pins ①, ②, ⑧ and ⑨ from the outside.
6 V is used as voltage for V_6 and V_{13} and no larger than Vcc voltage.

■ Electrical Characteristics (Ta=25°C)

Item	Symbol	Test* Circuit	Condition	min.	typ.	max.	Unit
Gain (1)	G_{V1}	1	Vcc=12V, f=1kHz, v_i=100mV, V_{cont}=5V	11.7		15.7	dB
Gain (2)	G_{V2}	1	Vcc=12V, f=1kHz, v_i=100mV, V_{cont}=4V	10.5		15	dB
Gain (3)	G_{V3}	1	Vcc=12V, f=1kHz, v_i=100mV, V_{cont}=3V	−14		2	dB
Gain Ratio Channel 2 / Channel 1	$G_{V3(2)}/G_{V3(1)}$	1	Vcc=12V, f=1kHz, v_i=100mV, V_{cont}=3V	−6		6	dB
Residual Noise	v_O	1	Vcc=12V, f=1kHz, v_i=100mV, Vc=1.0V, B=20kHz			100	μV
Noise	v_N	1	Vcc=12V, v_i=0V, Vc=3.5V, B=20kHz			150	μV
Crosstalk	CT	5	Vcc=12V, f=1kHz, v_i=500mV, Vc=5.0V	60			dB
Output DC Voltage	V_O	2	Vcc=12V, Vc=5.0V	5.7		8.2	V
Output Voltage Fluctuation	ΔV_O	2	Vcc=12V, Vc=5.0～0V	−0.65		0.65	V
Control Input Current	$-I_{cont}$	3	Vcc=12V, R_{cont}=0Ω	0.15		0.33	mA
			Vcc=12V, R_{cont}=20kΩ	0.15		0.33	mA
Supply Current	Icc	4	Vcc=12V, Vc=5V			22	mA
Distortion Factor	THD	1	Vcc=12V, f=1kHz, Vc=5V, v_i=100mV			0.5	%
D_6 Breakdown	BV_D	6	I_6, I_{13}=10μA	6			V

Note : Same measurement should be applied for CH2.

Test Circuit 1 $\left(G_{V1}, G_{V2}, G_{V3}, \frac{G_{V3(2)}}{G_{V3(1)}}, v_O, v_N, THD\right)$



● Gain (Gv)

Gain=20log$\frac{V_O}{V_{in}}$

Conditions v_i : f=1kHz, 100Vrms
Signal source resistance<600
Vcc=12V
G_{V1} ; V_{cont}=5V, G_{cont}=4V,
G_{V3} ; $\frac{G_{V3(2)}}{G_{V3(1)}}$; V_{cont}=3V

● Residual noise (v_O)

Conditions V_i : f=1kHz, 100mVrms
Signal source resistance<600
Vcc=12V, V_{cont}=1V, B=20kHz

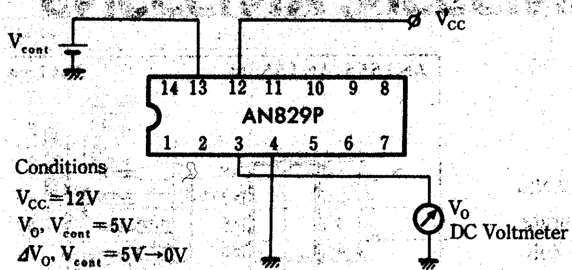
● Distortion factor (THD)

Conditions v_i : f=1kHz, 100mVrms
Vcc=12V, V_{cont}=5V

● Noise (v_N)

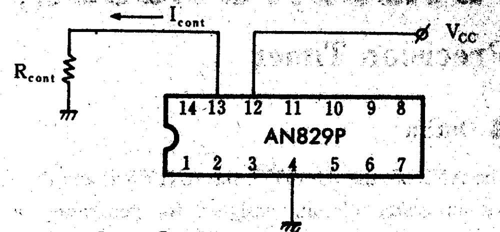
Conditions Vcc=12V, V_{cont}=3.5V, B=20kHz

Test Circuit 2 (V_O, ΔV_O)



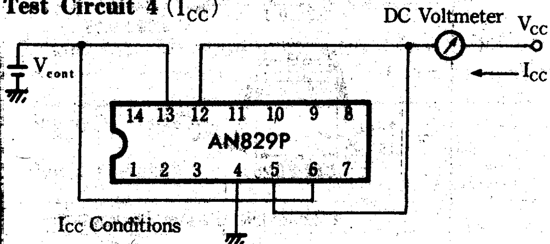
Conditions
$V_{CC}=12V$
V_O, $V_{cont}=5V$
ΔV_O, $V_{cont}=5V \rightarrow 0V$

Test Circuit 3 (I_{cont})



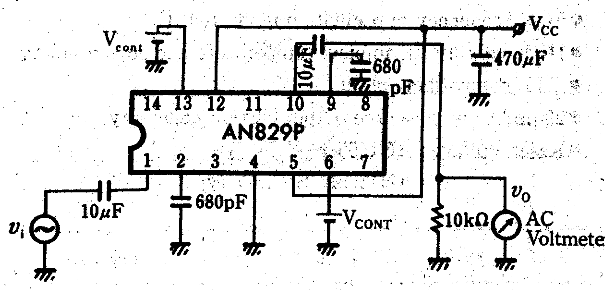
$-I_{CONT}$ Conditions
$V_{CC}=12V$
$R_{cont}=0\Omega, 20k\Omega$

Test Circuit 4 (I_{CC})



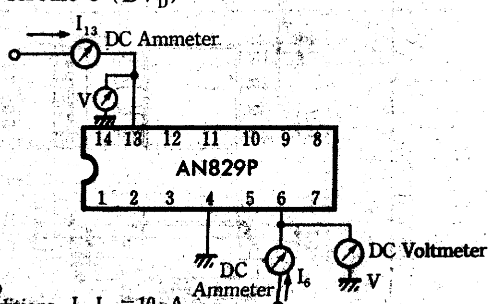
Icc Conditions
$V_{CC}=12V$
$V_{cont}=5V$

Test Circuit 5 (CT)



Conditions v_{in} : f=1kHz, 500mVrms
Signal source resistance≦600 Ω
$V_{CC}=12V$
$V_{cont}=5V$
$\text{Crosstalk}=20\log\frac{v_o}{5v_{in}}$

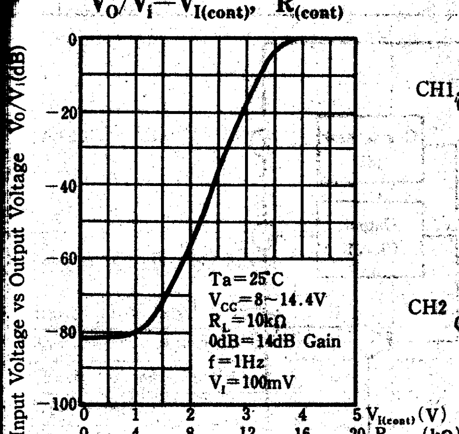
Test Circuit 6 (BV_D)

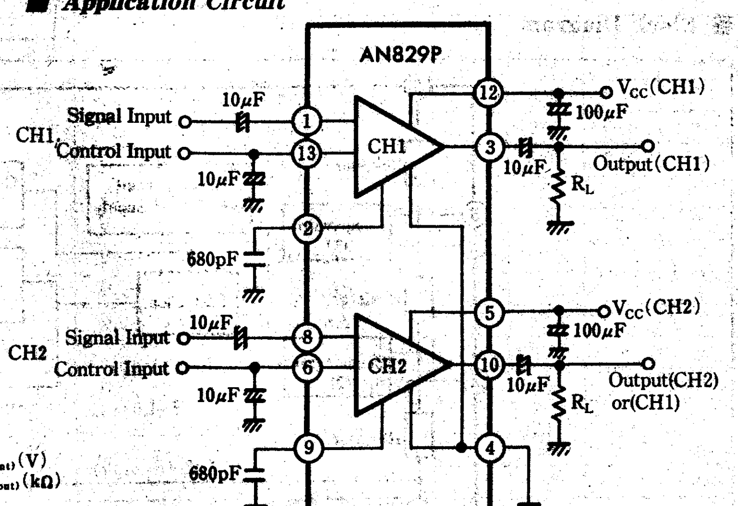


BV_D
Conditions $I_6, I_{13}=10\mu A$

■ Application Circuit

$V_O/V_i - V_{I(cont)}$, $R_{(cont)}$





Note : GND Pin ④ is common.