

AN829P

Dual Attenuator

Outline

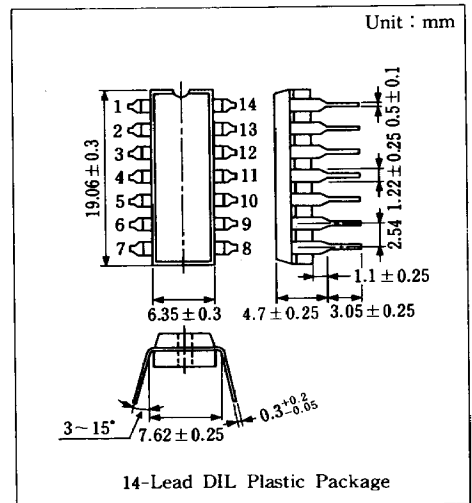
The AN829P is an integrated circuit which logarithmically controls the throughput (gain) of an audio signal by the DC voltage or resistance value and has 2 circuits. Since the voltage is internally stabilized, the stable operations are assured at the allowable supply voltage range (8 to 14.4V). The current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

Features

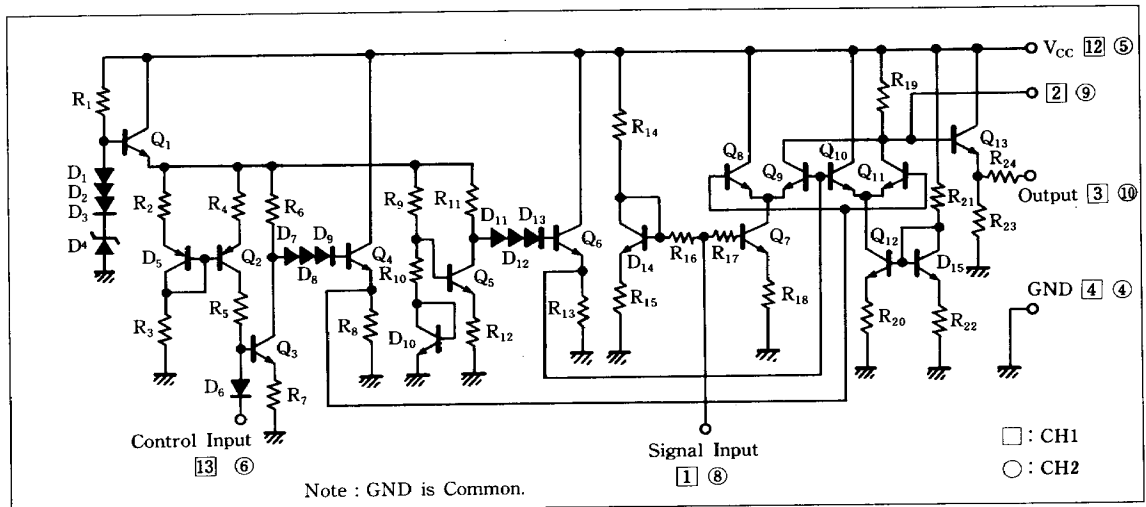
- A wide operating voltage range
- High attenuation level
- Easy to control signal gain with simple circuit
- Less crosstalk between each channel

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	V _{CC}	14.4	V
Circuit Voltage	V ₆ , V ₁₃ *	6	V
	V ₃ , V ₁₀	V _{CC}	V
Total Current Dissipation	I _{oig 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

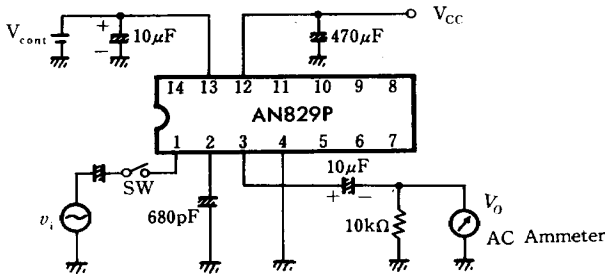
Note : DC voltage must not be applied to Pins ①, ②, ③ and ④ from the outside.
6 V is used as voltage for V₆ and V₁₃ and no larger than V_{CC} voltage.

■ Electrical Characteristics (Ta=25°C)

Item	Symbol	Test* Circuit	Condition	min.	typ.	max.	Unit
Gain (1)	G _{V1}	1	V _{CC} =12V, f=1kHz, v _i =100mV, V _{cont} =5V	11.7		15.7	dB
Gain (2)	G _{V2}	1	V _{CC} =12V, f=1kHz, v _i =100mV, V _{cont} =4V	10.5		15	dB
Gain (3)	G _{V3}	1	V _{CC} =12V, f=1kHz, v _i =100mV, V _{cont} =3V	-14		2	dB
Gain Ratio Channel 2 Channel 1	$\frac{G_{V3(2)}}{G_{V3(1)}}$	1	V _{CC} =12V, f=1kHz, v _i =100mV, V _{cont} =3V	-6		6	dB
Residual Noise	v _o	1	V _{CC} =12V, f=1kHz, v _i =100mV, V _C =1.0V, B=20kHz			100	μV
Noise	v _N	1	V _{CC} =12V, v _i =0V, V _C =3.5V, B=20kHz			150	μV
Crosstalk	CT	5	V _{CC} =12V, f=1kHz, v _i =500mV, V _C =5.0V	60			dB
Output DC Voltage	V _o	2	V _{CC} =12V, V _C =5.0V	5.7		8.2	V
Output Voltage Fluctuation	ΔV _o	2	V _{CC} =12V, V _C =5.0~0V	-0.65		0.65	V
Control Input Current	-I _{cont}	3	V _{CC} =12V, R _{cont} =0Ω	0.15		0.33	mA
			V _{CC} =12V, R _{cont} =20kΩ	0.15		0.33	mA
Supply Current	I _{CC}	4	V _{CC} =12V, V _C =5V			22	mA
Distortion Factor	THD	1	V _{CC} =12V, f=1kHz, V _C =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 (G_{V1}, G_{V2}, G_{V3}, $\frac{G_{V3(2)}}{G_{V3(1)}}$, v_o, v_N, THD)



● Gain (G_V)

$$\text{Gain} = 20 \log \frac{V_o}{V_i}$$

Conditions v_i : f=1kHz, 100Vrms

Signal source resistance < 600Ω

V_{CC}=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 < 600Ω

V_{CC}=12V, V_{cont}=1V, B=20kHz,

● Distortion factor (THD)

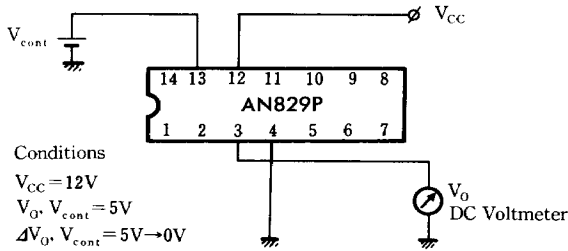
Conditions v_i : f=1kHz, 100mVrms

V_{CC}=12V, V_{cont}=5V

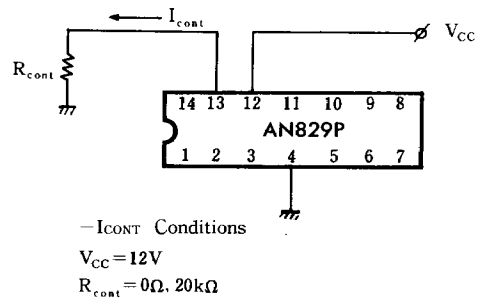
● Noise (v_N)

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

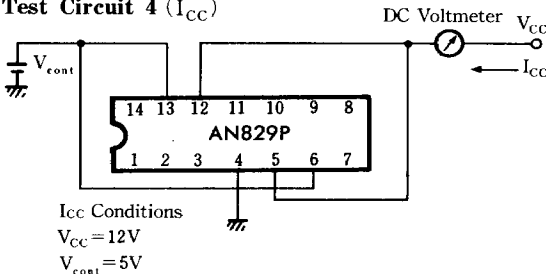
Test Circuit 2 ($V_O, \Delta V_O$)



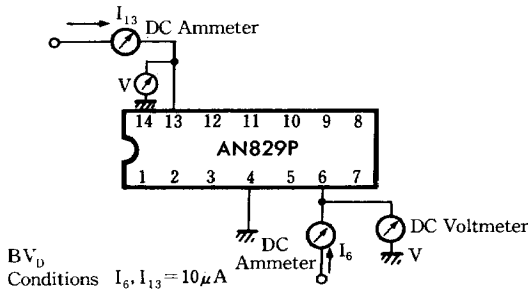
Test Circuit 3 (I_{cont})



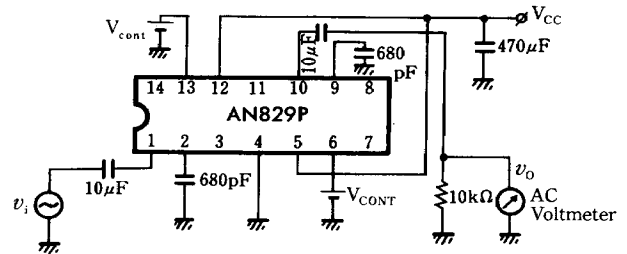
Test Circuit 4 (I_{CC})



Test Circuit 6 (BV_D)

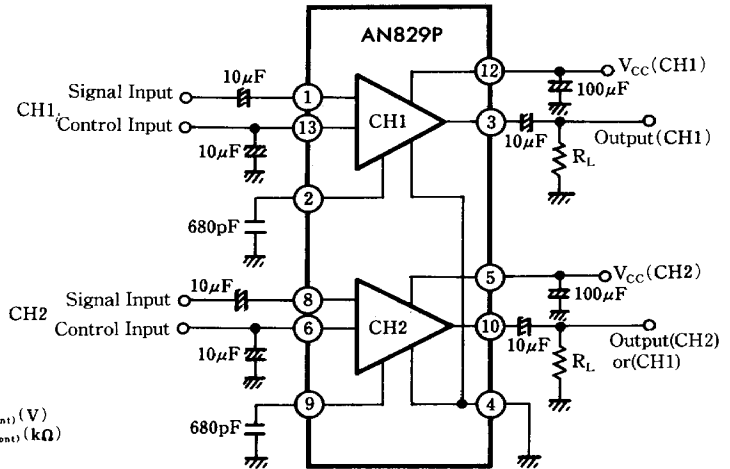
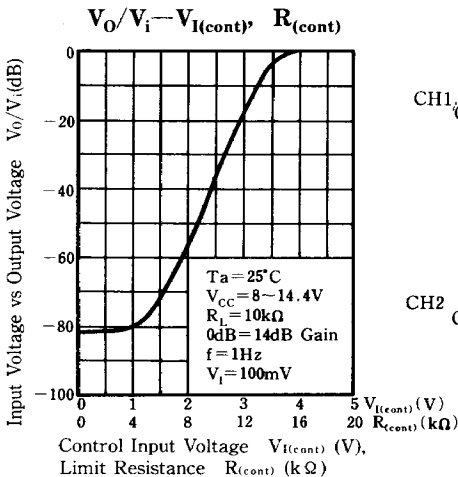


Test Circuit 5 (CT)



Conditions $v_{in} : f = 1kHz, 500mV_{rms}$
 Signal source resistance $\leq 600\Omega$
 $V_{CC} = 12V$
 $V_{cont} = 5V$
 Crosstalk = $20 \log_{10} \frac{v_o}{5v_{in}}$

Application Circuit



Note : GND Pin ④ is common.