

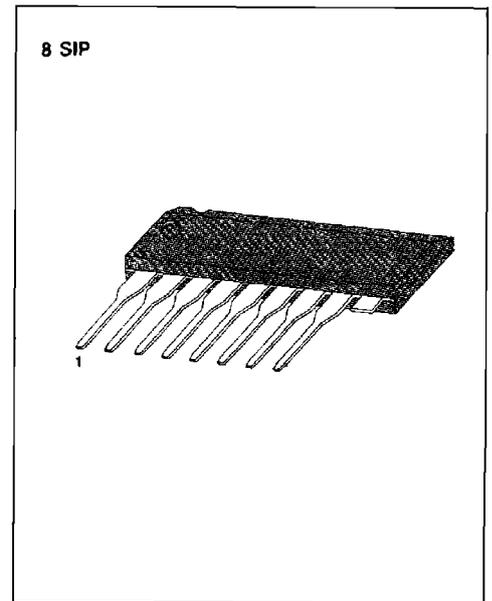
## DUAL LOW NOISE EQUALIZER AMPLIFIER

The KA22211 is a monolithic integrated circuit consisting of a 2-channel pre-amplifier in a 8-pin plastic single in-line package.

### FEATURES

- Recommended operating supply voltage range:  $V_{CC} = 5V \sim 14V$
- Low noise ( $V_{NI} = 1.0\mu V$ : Typ)
- High channel separation
- Minimum number of external parts required

### SCHEMATIC DIAGRAM



### ORDERING INFORMATION

Device	Package	Operating Temperature
KA22211	8 SIP	$-20^{\circ}C \sim +70^{\circ}C$

### BLOCK DIAGRAM

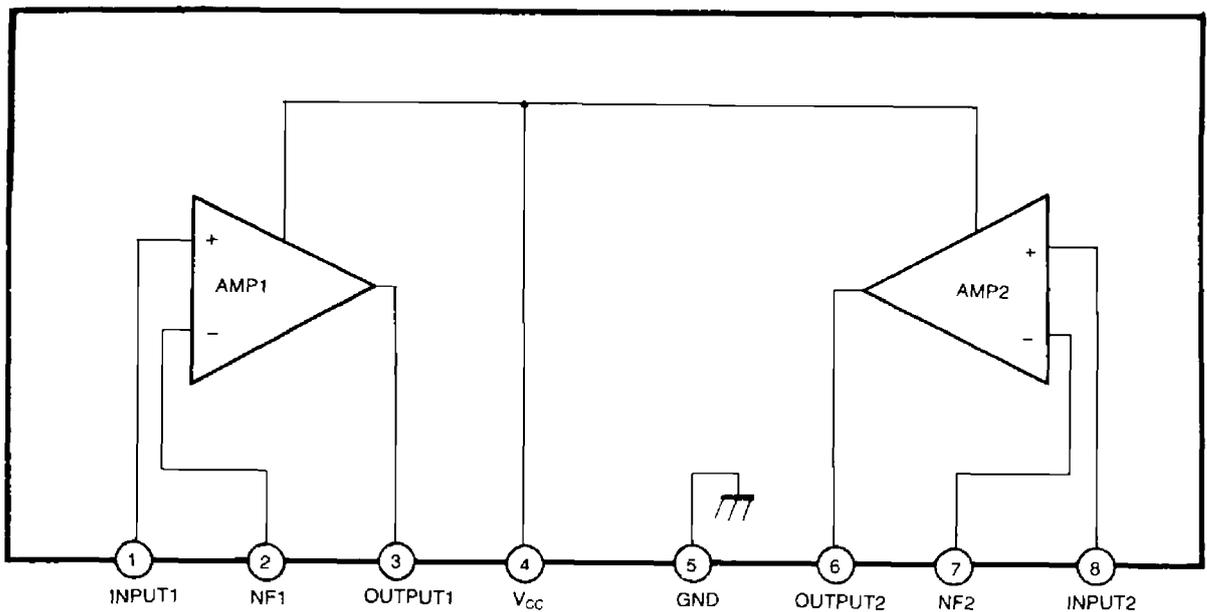


Fig. 1

### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	18	V
Power Dissipation	P <sub>D</sub>	200	mW
Operating Temperature	T <sub>OPR</sub>	- 20 ~ + 70	°C
Storage Temperature	T <sub>STG</sub>	- 40 ~ + 125	°C

### ELECTRICAL CHARACTERISTICS

(Ta = 25°C, V<sub>CC</sub> = 9V, R<sub>L</sub> = 10KΩ, R<sub>G</sub> = 600Ω, f = 1KHz, NAB, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Circuit Current	I <sub>CCO</sub>	V <sub>I</sub> = 0		4.0	6.0	mA
Open Loop Voltage Gain	G <sub>VO</sub>		65	80		dB
Closed Loop Voltage Gain	G <sub>VC</sub>	V <sub>o</sub> = 0.5V	33	35	37	dB
Output Voltage	V <sub>o</sub>	THD = 1%	1.1	1.3		V
Total Harmonic Distortion	THD	V <sub>o</sub> = 0.5V		0.1	0.3	%
Input Resistance	R <sub>I</sub>		70	100		KΩ
Equivalent Input Noise Voltage	V <sub>NI</sub>	R <sub>G</sub> = 2.2KΩ BW (- 3dB) = 15Hz ~ 30KHz		1.0	2.0	μV
Cross Talk	CT	R <sub>G</sub> = 2.2KΩ	50	65		dB

### TEST CIRCUIT

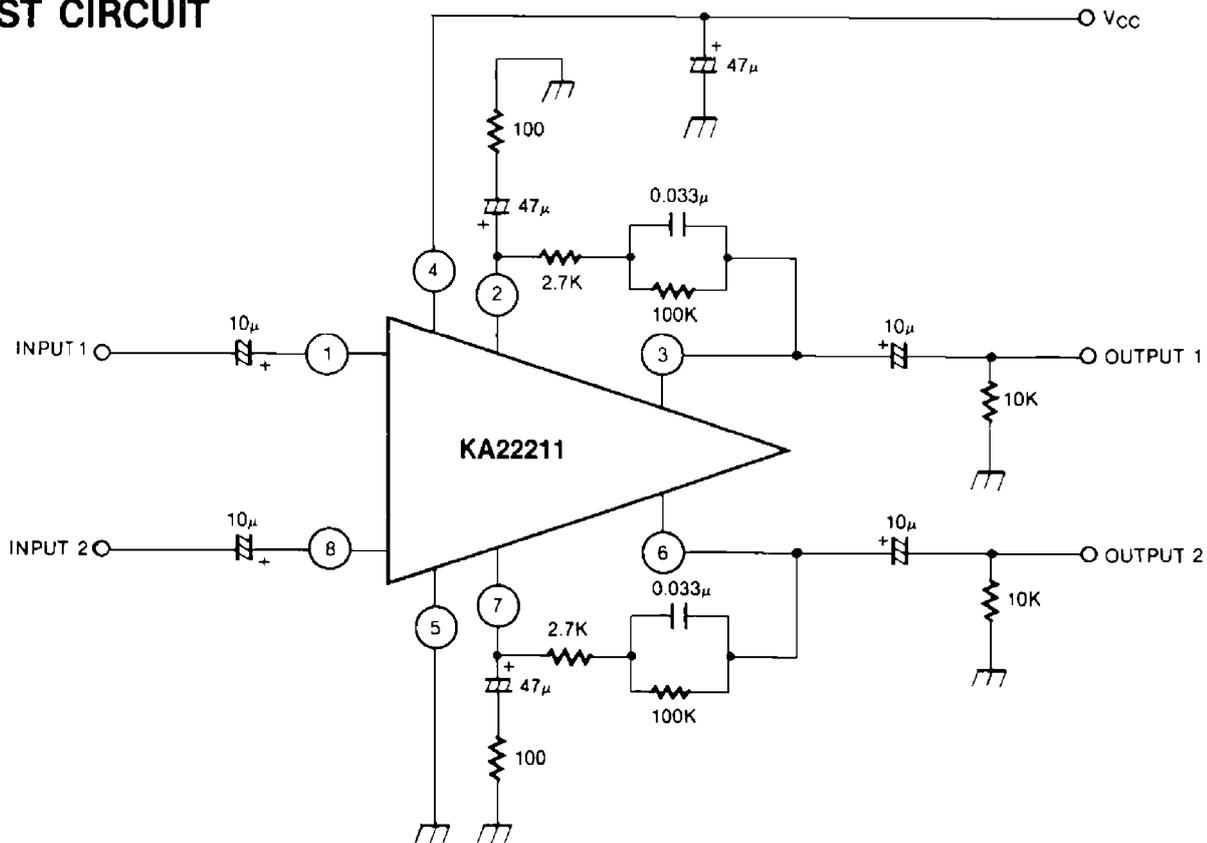


Fig. 2

# APPLICATION INFORMATION

## External Components

**C<sub>2</sub> (C<sub>9</sub>):** Input coupling capacitor

These components are concerned with the output noise and operation starting time, and its capacitance is adequate for 10μF.

As C<sub>2</sub> (C<sub>9</sub>) below 4.7μF extends the operation starting time, a capacitance of over 4.7μF is recommended.

**C<sub>3</sub> (C<sub>8</sub>):** Negative feedback capacitor

These components decide the low cut-off frequency, which is determined as follows:

$$C_3 (C_8) = \frac{1}{2\pi f_L \cdot R_2 (R_7)} \quad \text{where, } f_L: \text{ low cut-off frequency.}$$

A large C<sub>3</sub> (C<sub>8</sub>) makes the operation starting time of an amplifier late. It's capacitance is adequate for 47μF.

**C<sub>4</sub>, R<sub>3</sub>, R<sub>2</sub> (C<sub>7</sub>, R<sub>4</sub>, R<sub>5</sub>):** Equalizer network

This components decide the frequency response of an equalizer amplifier. The time constant of standard NAB characteristic is as follows:

Tape Speed Time Constant	9.5cm/sec	4.75cm/sec
C <sub>4</sub> (R <sub>2</sub> + R <sub>3</sub> )	3,180μsec	1,590μsec
C <sub>4</sub> , R <sub>2</sub>	90μsec	120μsec

**C<sub>11</sub>** Filter capacitor of the power line

This should be located as close to the supply voltage pin (Pin 4) as possible. The recommended value is 47μF:

**C<sub>1</sub> (C<sub>10</sub>):** Protection capacitor

These components protect against wave damage is strong electric fields and engine noise damage and block oscillation at high amplifying operation.

**C<sub>5</sub> (C<sub>6</sub>):** Output coupling capacitor

The recommended value is 10μF.

## APPLICATION CIRCUIT

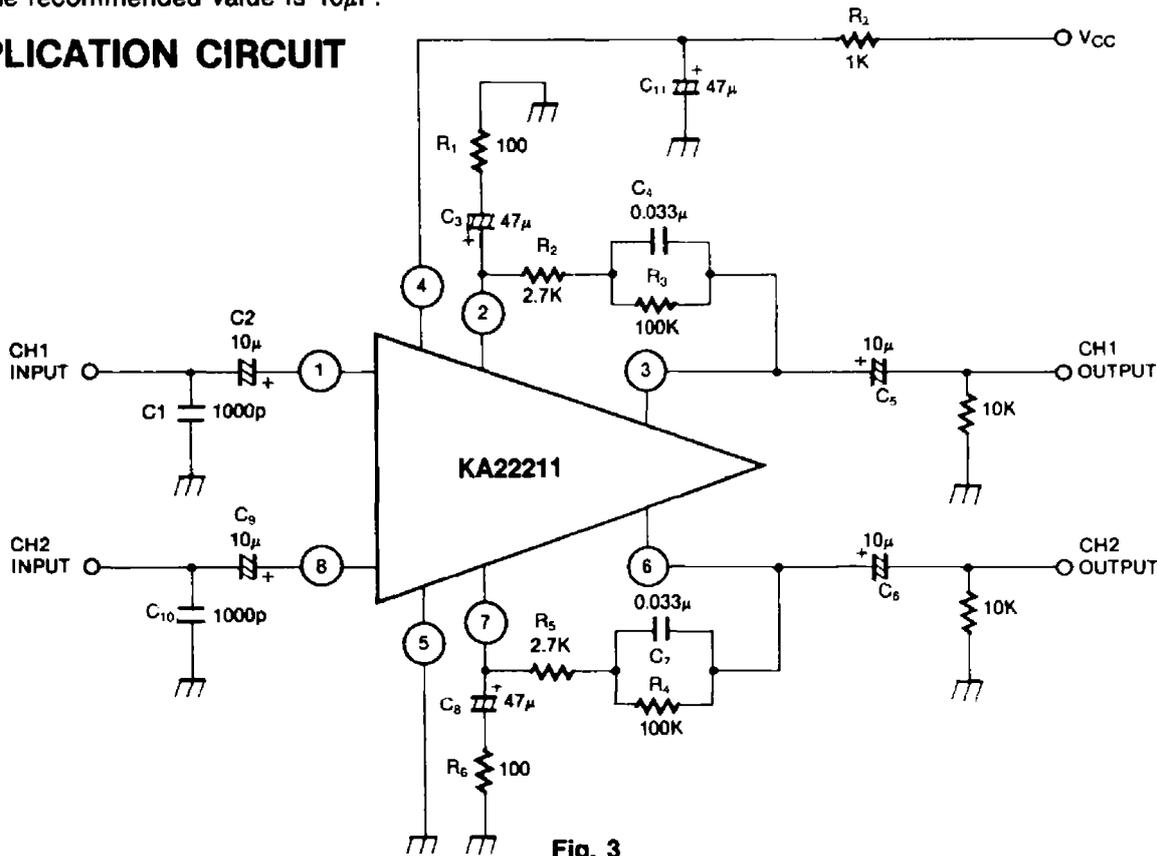


Fig. 3