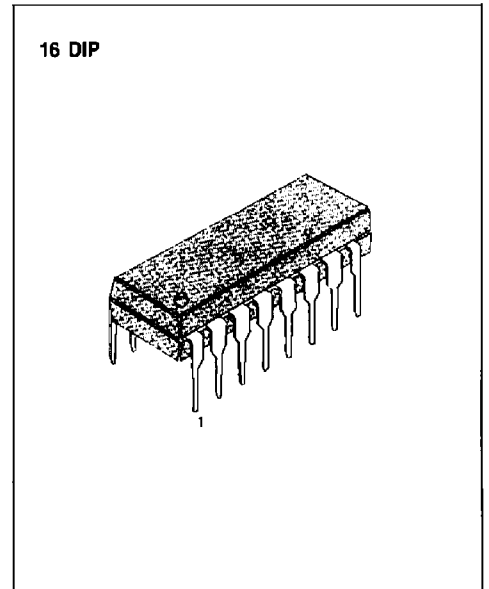


## 5-BAND GRAPHIC EQUALIZER AMPLIFIER

The KA2223 is a monolithic integrated circuit consisting of an operational amplifier with five resonant circuits and a active filter, and it is suitable for radio-cassette tape recorders, car stereos or music center audio systems.

### FEATURES

- Tone control with independent adjustment of each band through an external capacitor.
- Gain control through an external variable resistor.
- Increasing the bands by adding resonant circuit or using two KA2223 in series.
- Low noise ( $V_{NO} = 7\mu V$ : Typ. Flat).
- Low distortion (THD=0.02% Typ. f=1KHz Flat).
- Large allowable input ( $V_i = 2.3V$ : Typ,  $V_{CC} = 9V$ , f=1KHz Flat).
- Operating supply voltage range:  $V_{CC} = 5V \sim 13V$



### ORDERING INFORMATION

Device	Package	Operating Temperature
KA2223	16 DIP	-20°C ~ +70°C

### BLOCK DIAGRAM

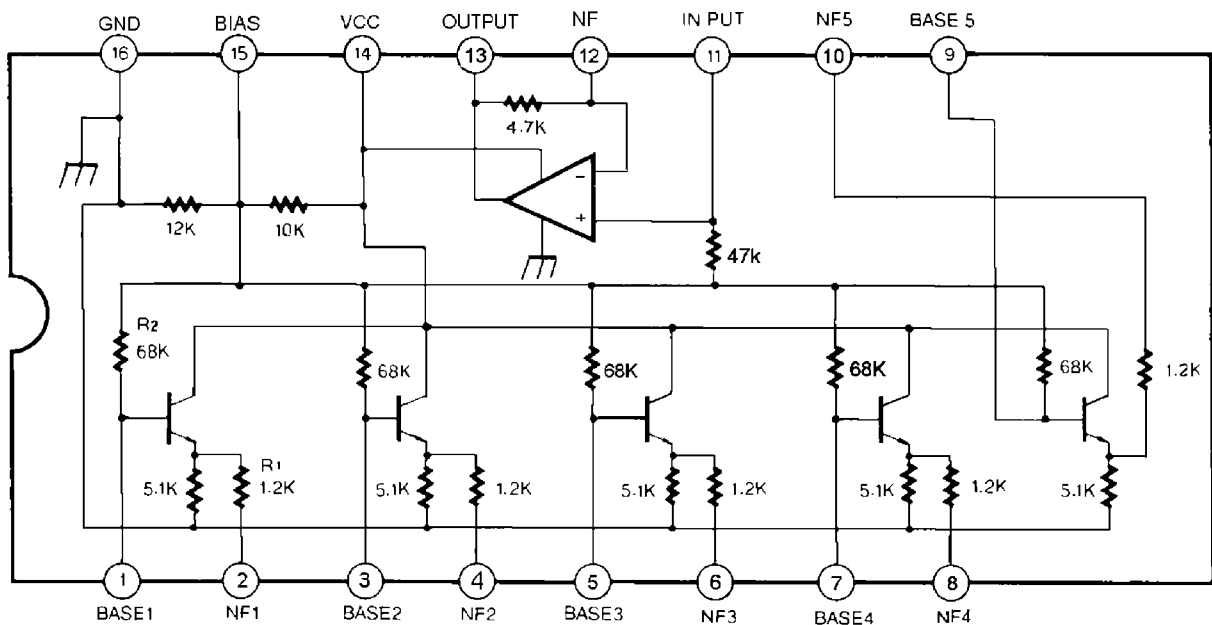


Fig. 1

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

Characteristic	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	20	V
Power Dissipation	P <sub>D</sub>	700	mW
Operating Temperature	T <sub>OPR</sub>	-20 ~ +70	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +125	°C

**ELECTRICAL CHARACTERISTICS**(Ta = 25°C, V<sub>CC</sub> = 9V unless otherwise specified)

Characteristic	Symbol	Test		Min	Typ	Max	Unit	
		f(Hz)	Conditions					
Quiescent Circuit Current	I <sub>CCQ</sub>		V <sub>I</sub> = 0	3.0	5.2	8.0	mA	
Voltage Gain	Flat	G <sub>V</sub> (Flat)	1K	V <sub>I</sub> = -10dBm	-3.8	-0.8	2.2	dB
	Boost	G <sub>V</sub> (Boost)	108	V <sub>I</sub> = -10dBm	8	10.5	12	dB
			343					dB
			1.08K					dB
			3.43K					dB
			10.8K					dB
	Cut	G <sub>V</sub> (Cut)	108	V <sub>I</sub> = -10dBm	-12	-10.5	-8	dB
			343					dB
			1.08K					dB
			3.43K					dB
10.8K			dB					
Total Harmonic Distortion	THD	1K	V <sub>I</sub> = 1V		0.02	0.1	%	
Output Noise Voltage	V <sub>NO</sub>	Flat, Input Short BW(-3dB) = 10Hz ~ 30KHz			7.0	30	μV	

TEST CIRCUIT

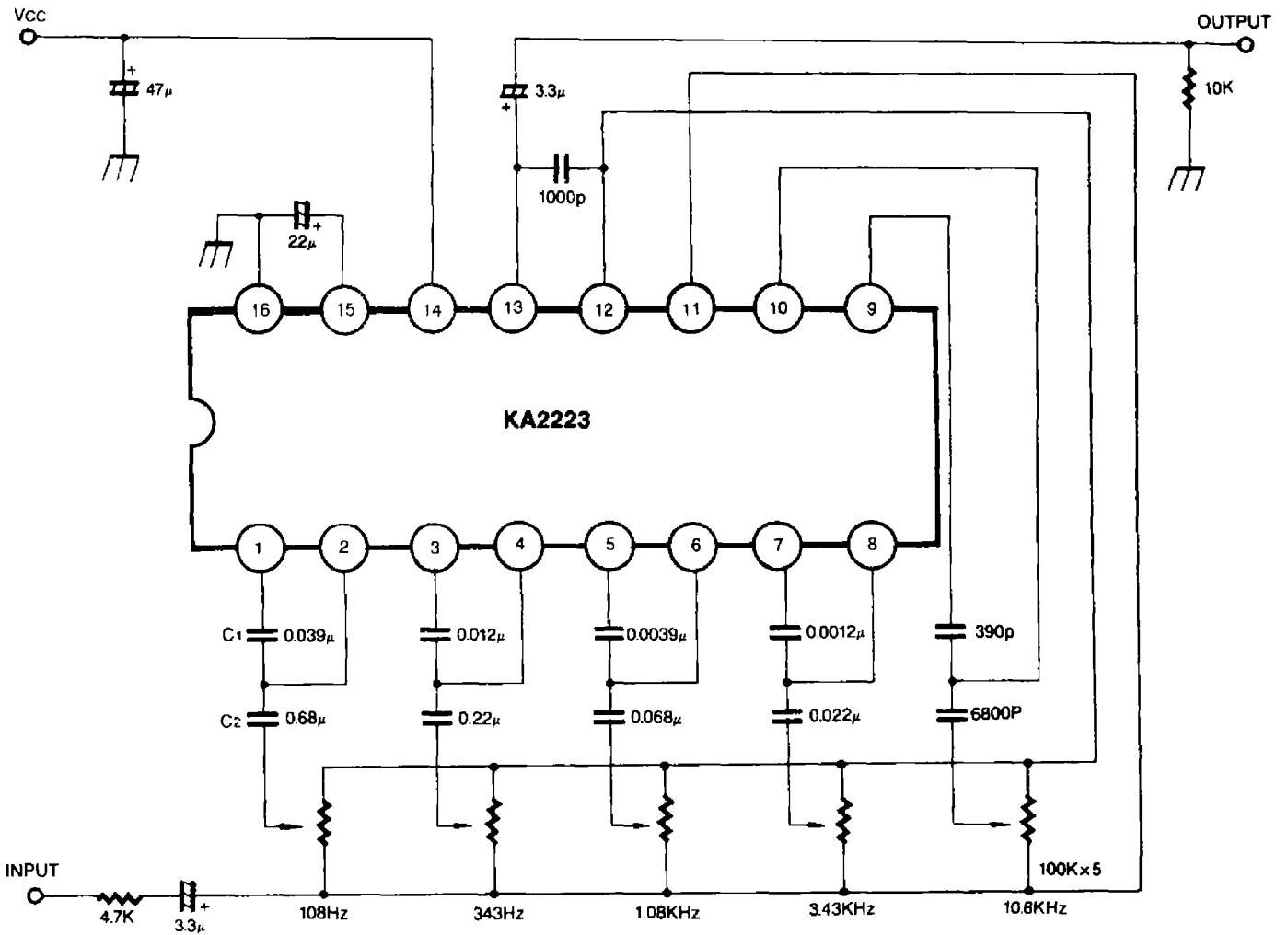


Fig. 2

$$\text{Resonant frequency } f_0 = \frac{1}{2\pi\sqrt{R_1 R_2 C_1 C_2}}$$

(R<sub>1</sub> = 1.2K, R<sub>2</sub> = 68K on-chip resistor)

# APPLICATION CIRCUIT

## 1. 7 BAND

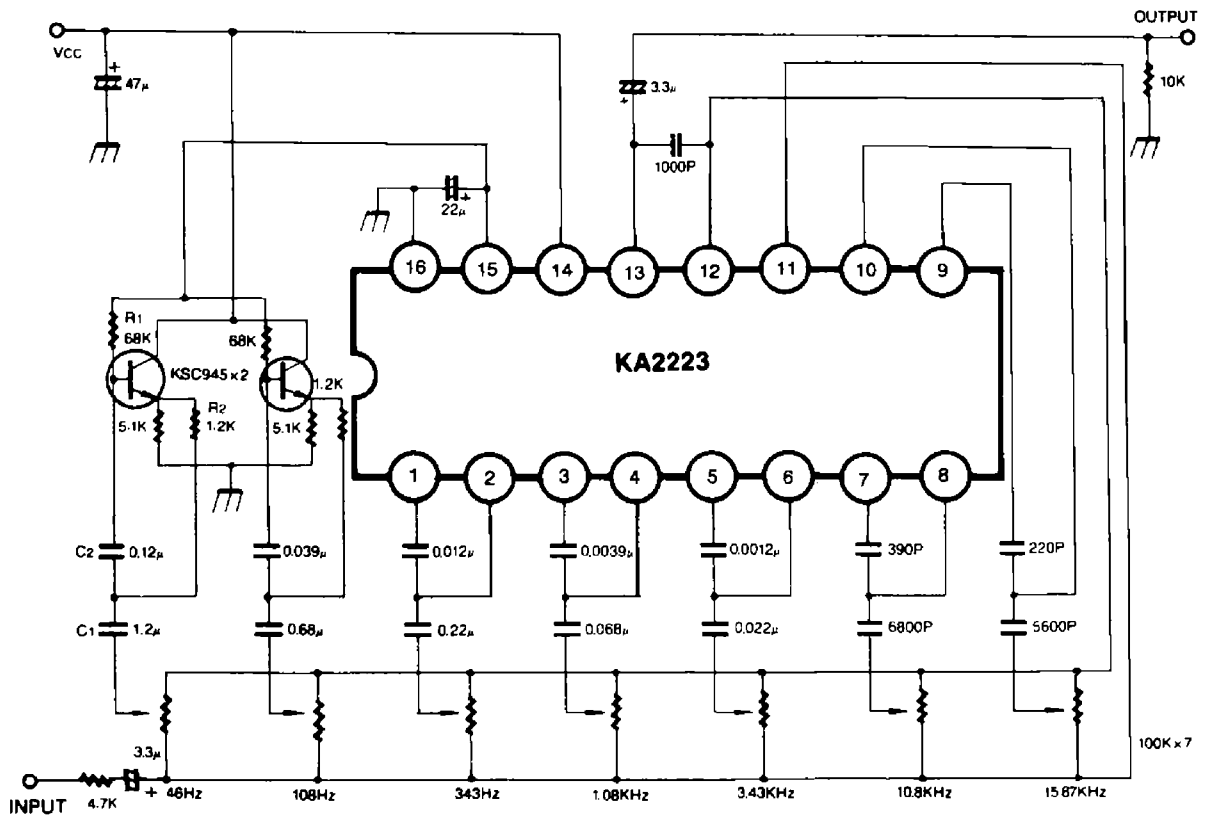


Fig. 3

## 2. 10 BAND

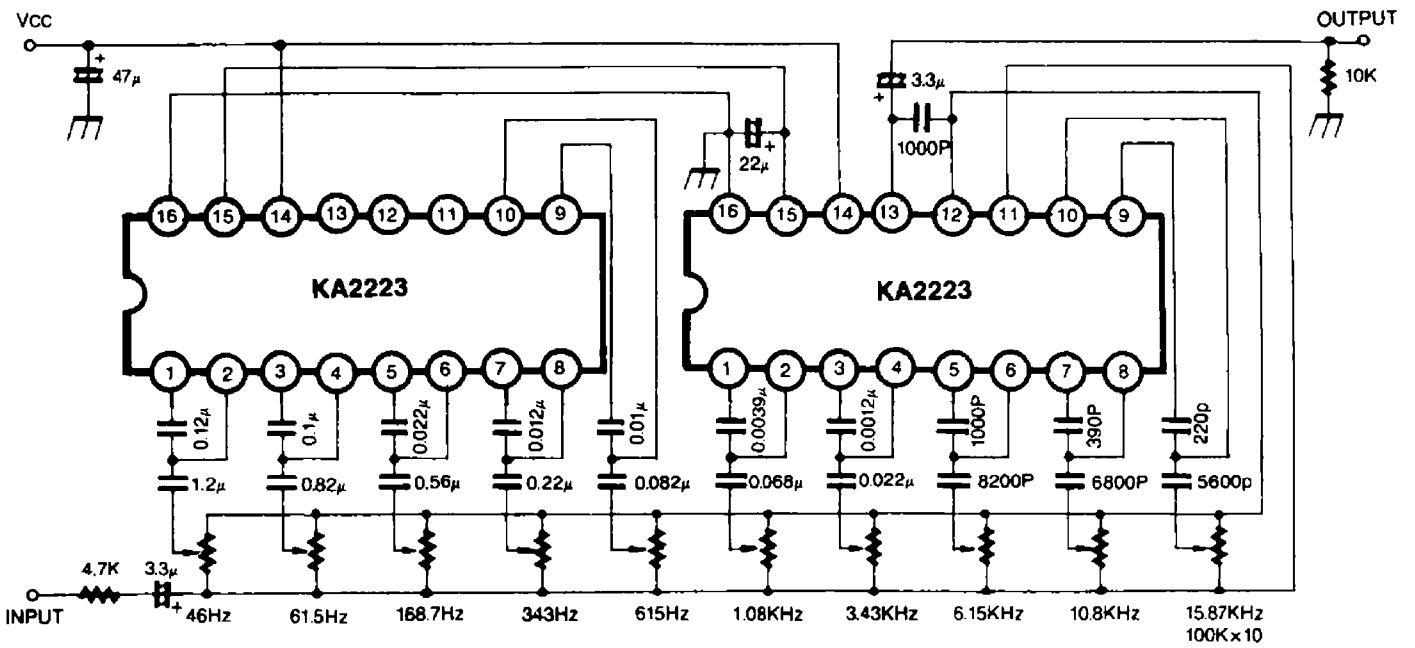


Fig. 4