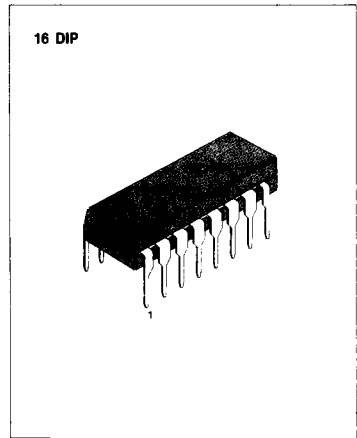


### 5-BAND GRAPHIC EQUALIZER AMPLIFIER

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.  $f = 1\text{KHz}$  Flat).
- Large allowable input ( $V_i = 2.3\text{V}$ : Typ,  $V_{CC} = 9\text{V}$ ,  $f = 1\text{KHz}$  Flat).
- Operating supply voltage range:  $V_{CC} = 5\text{V} \sim 13\text{V}$



### ORDERING INFORMATION

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

### BLOCK DIAGRAM

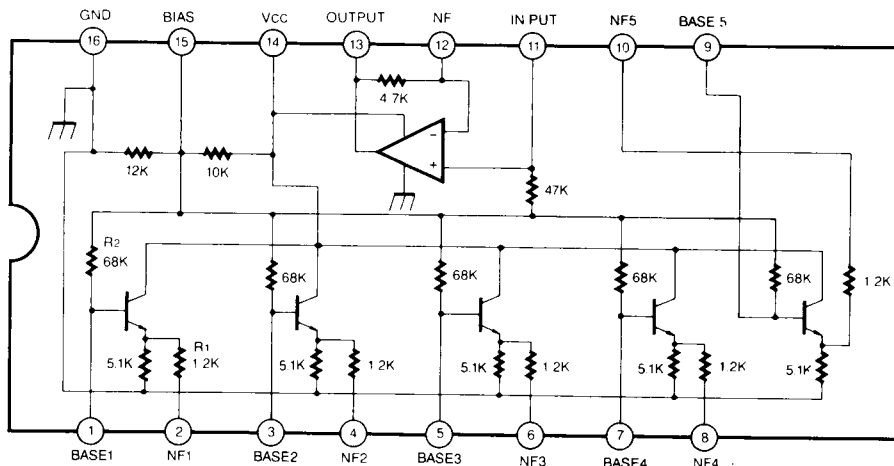


Fig. 1

## 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>CCO</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
	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

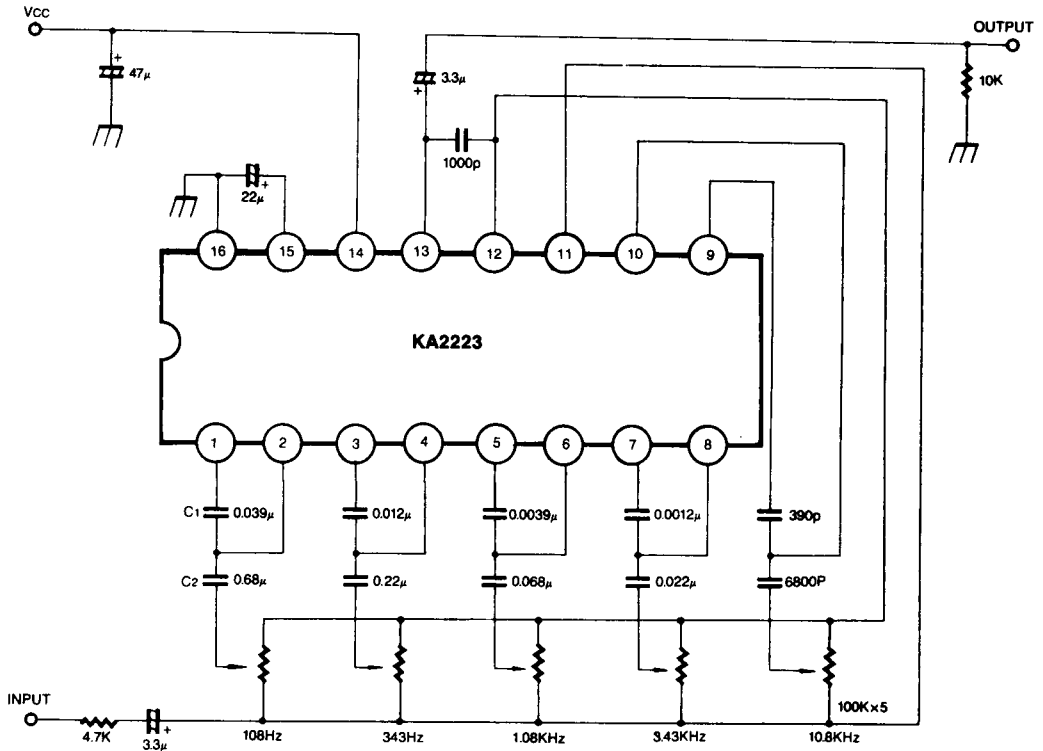


Fig. 2

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

( $R_1 = 1.2K$ ,  $R_2 = 68K$  on-chip resistor)

APPLICATION CIRCUIT

1. 7 BAND

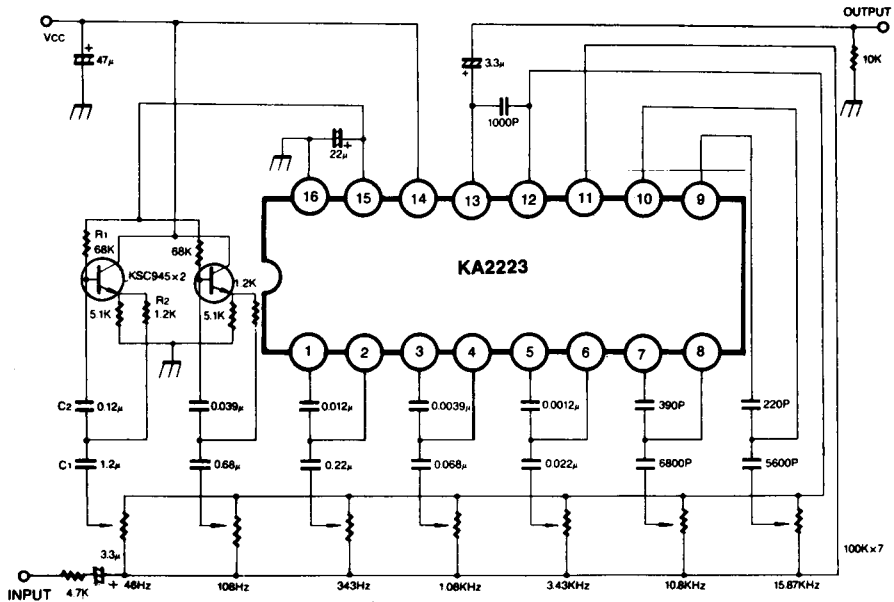


Fig. 3

2. 10 BAND

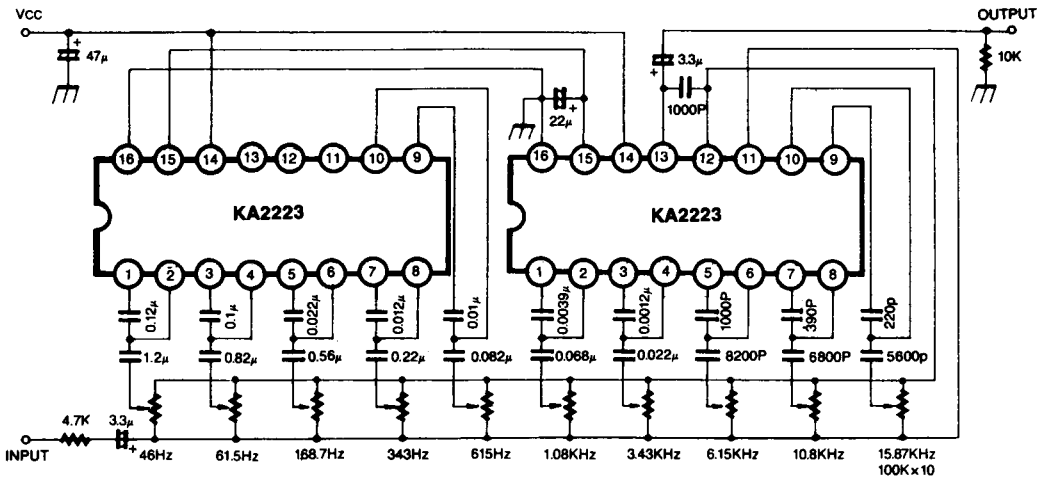


Fig. 4