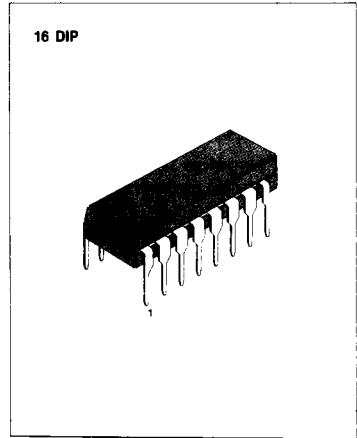


5-BAND GRAPHIC EQUALIZER AMPLIFIER

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

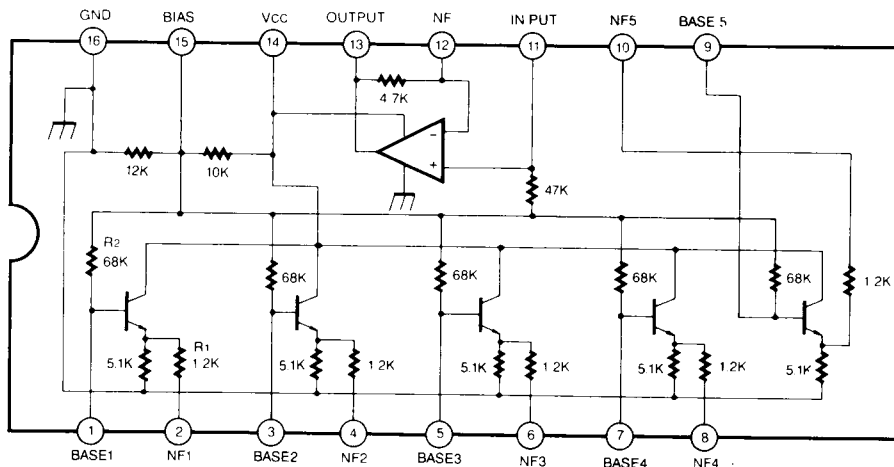


Fig. 1

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	20	V
Power Dissipation	P_D	700	mW
Operating Temperature	T_{OPR}	-20 ~ +70	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +125	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS

($T_a = 25^\circ\text{C}$, $V_{CC} = 9\text{V}$ unless otherwise specified)

Characteristic	Symbol	Test		Min	Typ	Max	Unit	
		f(Hz)	Conditions					
Quiescent Circuit Current	I_{CCO}		$V_i = 0$	3.0	5.2	8.0	mA	
Voltage Gain	Flat	G_v (Flat)	1K	$V_i = -10\text{dBm}$	-3.8	-0.8	2.2	dB
	343	dB						
	1.08K	dB						
	3.43K	dB						
	10.8K	dB						
	Cut	G_v (Cut)	$V_i = -10\text{dBm}$	108	-12	-10.5	-8	dB
				343				dB
				1.08K				dB
				3.43K				dB
10.8K				dB				
Total Harmonic Distortion	THD	1K	$V_i = 1\text{V}$		0.02	0.1	%	
Output Noise Voltage	V_{NO}	Flat, Input Short $BW(-3\text{dB}) = 10\text{Hz} \sim 30\text{KHz}$			7.0	30	μV	

TEST CIRCUIT

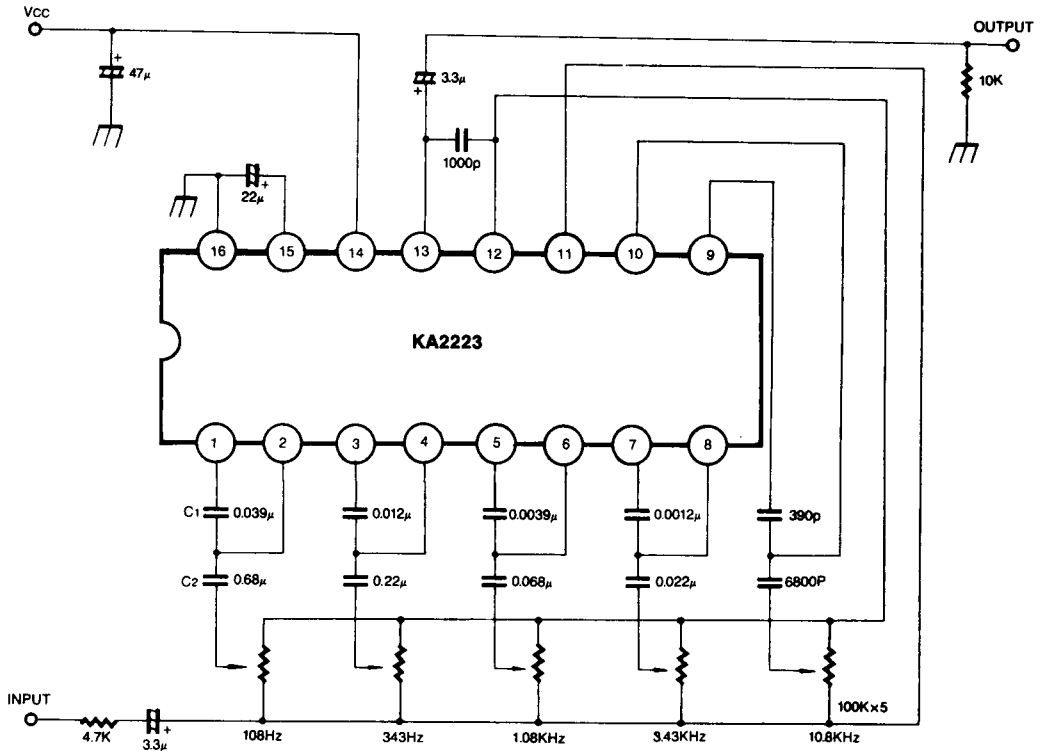


Fig. 2

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

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

APPLICATION CIRCUIT

1. 7 BAND

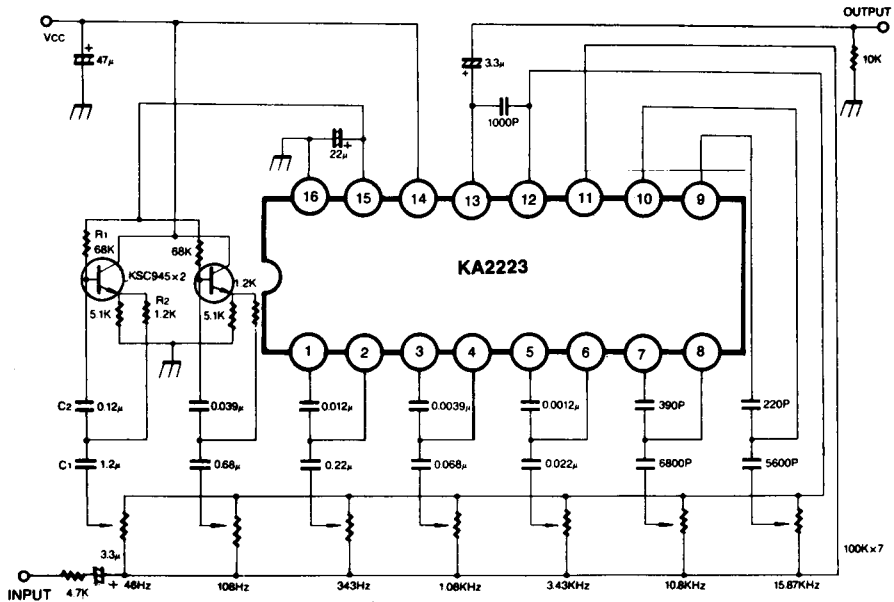


Fig. 3

2. 10 BAND

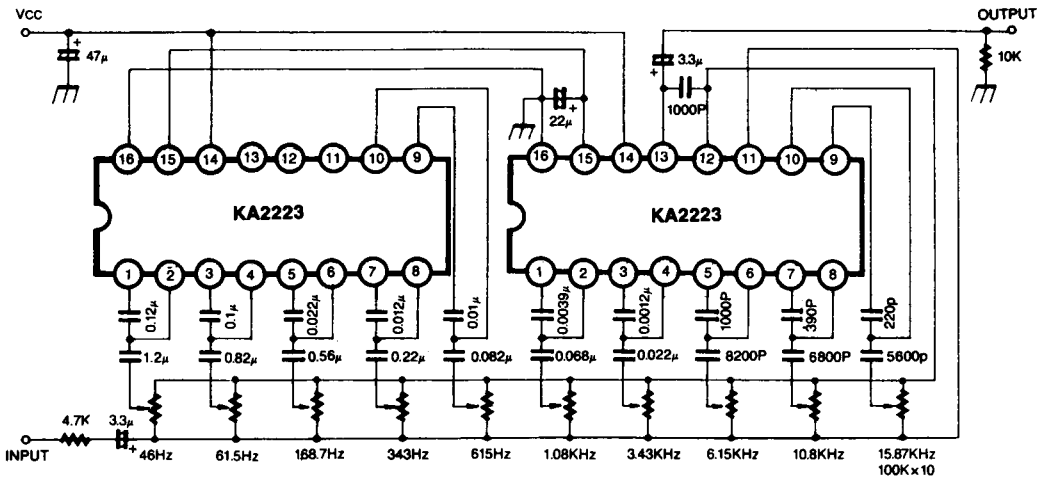


Fig. 4