# 5-channel stereo graphic equalizer BA3822LS / BA3822FS / BA3823LS / BA3824LS

The BA3822LS, BA3823LS, and BA3824LS are monolithic, five-point stereo graphic equalizer ICs. Each IC has two channels, and the five center frequencies for each channel are independently set using external capacitors. These ICs feature a wide operating power supply voltage range (Vcc = 3.5V to 14V), and are available in compact 24-pin SZIP and SSOP packages, depending on the type. This makes them an ideal choice for home stereo systems, radio cassette players, and car stereos.

The difference between the ICs is the amount of boost and cut control. Choose according to the requirements of your application.

# Applications

Five-point stereo graphic equalizer for home and car stereo systems.

### Features

- 1) Allows construction of a five-point stereo graphic equalizer with a single IC.
- 2) Wide operating power supply voltage range (Vcc = 3.5V to 14V).
- 3) Low current dissipation (Iq = 7mA).
- 4) Available in compact SZIP/SSOP-A24 packages.

## ■Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	Vcc	16	V
Power dissipation	Pd	500*1 (SZIP) ,800*2 (SSOP)	mW
Operating temperature	Topr	<b>−25</b> ~ <b>+</b> 75	င
Storage temperature	Tstg	<b>−55∼</b> +125	°C

<sup>\*1</sup> Reduced by 5mW for each increase in Ta of 1°C over 25°C.

### • Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit
Power supply voltage	Vcc	3.5	8	14	٧



<sup>\*2</sup> Reduced by 8mW for each increase in Ta of 1°C over 25°C.

# Electrical characteristics

# BA3822LS and BA3822FS

(unless otherwise noted, Ta =  $25^{\circ}$ C, Vcc = 8V, V<sub>IN</sub> = 100mV<sub>rms</sub> (1kHz), R<sub>L</sub> = 20k $\Omega$ , and F = FLAT)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Circuit current	Icc	4.5	7	9.5	mA	No input
Maximum input voltage	V <sub>INm</sub>	0.4	0.6	_	V <sub>rms</sub>	THD=1%
Total harmonic distortion	THD	_	0.1	0.3	%	
Output noise voltage	VND	_	10	20	μV <sub>rms</sub>	R <sub>IN</sub> =2.2kΩ
Input / output gain	Gv	-3	-1.5	0	dB	
Control range	CR	±9	±11	±14	dB	
Stereo crosstalk	CT <sub>L-R</sub>	60	70	_	dB	Between channels
Stereo balance	CB <sub>L-R</sub>	-2	0	2	dB	Between channels

# BA3823LS (unless otherwise noted, Ta = 25°C, Vcc = 8V, V<sub>IN</sub> = 100mV<sub>rms</sub> (1kHz), R<sub>L</sub> = 20k $\Omega$ , and F = FLAT)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Circuit current	lcc	4.3	6.7	9.2	mA	No input
Maximum input voltage	Vom	0.5	0.6	_	V <sub>rms</sub>	THD=1%
Total harmonic distortion	THD	_	0.01	0.3	%	
Output noise voltage	V <sub>ND</sub>	_	3	20	μV <sub>rms</sub>	R <sub>IN</sub> =2.2kΩ, DIN AUDIO
Input / output gain	Gv	-1.0	0.5	1.5	dB	
Control range	CR	±7	±10	±13	dB	
Crosstalk	СТ	60	73	_	dB	Between channels
Channel balance	СВ	-1.5	0	1.5	dB	Between channels
Ripple rejection ratio	RR	35	50	_	dB	f=100Hz,V <sub>IN</sub> =-20dBm

BA3824LS (unless otherwise noted, Ta = 25°C, Vcc = 8V, V<sub>IN</sub> = 100mV<sub>rms</sub> (1kHz), R<sub>L</sub> = 20k $\Omega$ , and F = FLAT)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Circuit current	Icc	4.5	7	9.5	mA	No input
Maximum input voltage	VINm	0.4	0.6	_	V <sub>rms</sub>	THD=1%
Total harmonic distortion	THD	_	0.1	0.3	%	
Output noise voltage	V <sub>ND</sub>	_	10	20	μV <sub>rms</sub>	R <sub>IN</sub> =2.2kΩ
Input / output gain	Gv	-3	-1.5	0	dB	
Control range	CR	±6	±8.5	±11	dB	
Stereo crosstalk	CT <sub>L-R</sub>	60	70	_	dB	Between channels
Stereo balance	CB <sub>L-R</sub>	-2	0	2	dB	Between channels

• Differences between the BA3822LS, BA3822FS, BA3823LS and BA3824LS

# ■Control range gain

		С	I Imia					
		Min.	Тур.	Max.	Unit			
•	BA3822LS/BA3822FS	±9	±11	±14	dB			
	BA3823LS	±7	±10	±13	dB			
	BA3824LS	±6	±8.5	±11	dB			

# Application examples

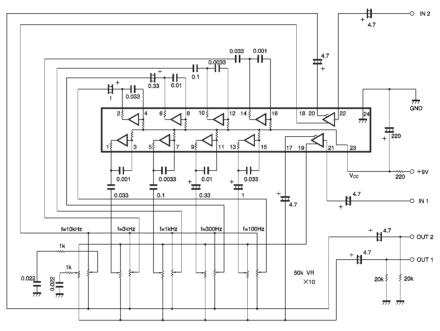
# **BA3822LS**

# External components

As the ICs have different control range gain, the external component values are different for the same center frequencies.

# Ripple rejection

The BA3823LS circuit design has excellent ripple rejection, and the external ripple filter can be omitted.



Units:

 $\begin{array}{ll} \mbox{Resistance (carbon)} & : \Omega \; (\pm 5\%) \\ \mbox{Capacitance (film)} & : \; \mu \, \mbox{F} \; (\pm 10\%) \\ \mbox{Capacitance (electrolytic)} : \; \mu \, \mbox{F} \; (\pm 20\%) \end{array}$ 

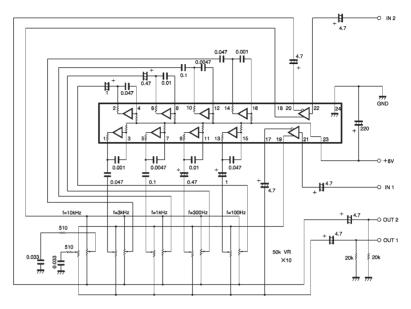
Capacitance (electrolytic):  $\mu$ F ( $\pm$ 20%)

Capacitance (ceramic) : pF ( $\pm$ 10%)(680pF)

Potentiometer (carbon) : 50k $\Omega$ , B-type ( $\pm$ 10%)

Fig.1

### **BA3823LS**



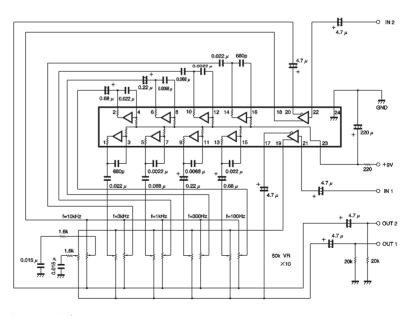
Units:

 $\begin{tabular}{lll} Resistance (carbon) & : \Omega & (\pm 5\%) \\ Capacitance (film) & : $\mu F $ (\pm 10\%) $ \\ Capacitance (electrolytic) : $\mu F $ (\pm 20\%) $ \\ Capacitance (ceramic) & : $p F $ (\pm 10\%) $ (680 pF) $ \\ \end{tabular}$ 

Potentiometer (carbon) : 50kΩ, B-type (±10%)

Fig.2

# **BA3824LS**



Units:

 $\begin{tabular}{lll} Resistance (carbon) & : \Omega & (\pm 5\%) \\ Capacitance (film) & : $\mu F (\pm 10\%)$ \\ Capacitance (electrolytic) : $\mu F (\pm \cdot 20\%)$ \\ Capacitance (ceramic) & : $p F (\pm 10\%)$ (680 pF) \\ \end{tabular}$ 

Potentiometer (carbon) : 50kΩ, B-type (±10%)

Fig.3



# **BA3822FS**

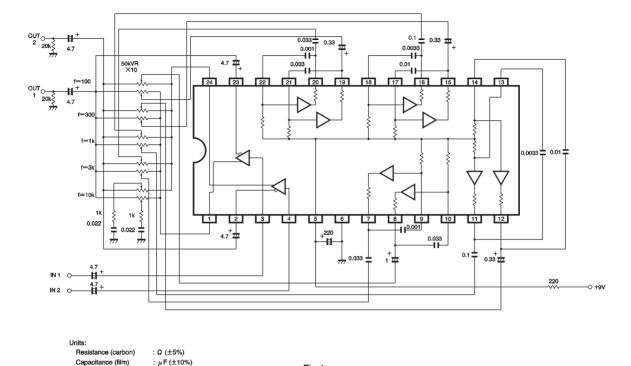


Fig.4

# External dimensions (Units: mm)

Capacitance (electrolytic) :  $\mu$ F ( $\pm 20\%$ ) Potentiometer (carbon) : 50k $\Omega$ , B-type ( $\pm 10\%$ )

