

3-Mode Surround and Vocal Cancellation

Description

The CXA1842S is a bipolar IC which combines 3-mode surround, bass boosting and vocal cancellation function into a single chip.

Features

- 3-mode surround (surround A, surround B, simulated stereo)
- Vocal cancellation function
- Bass boosting function

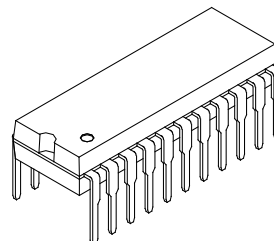
Applications

CD Radio-cassette tape recorders, equipment with Karaoke functions

Structure

Bipolar silicon monolithic IC

22 pin SDIP (Plastic)



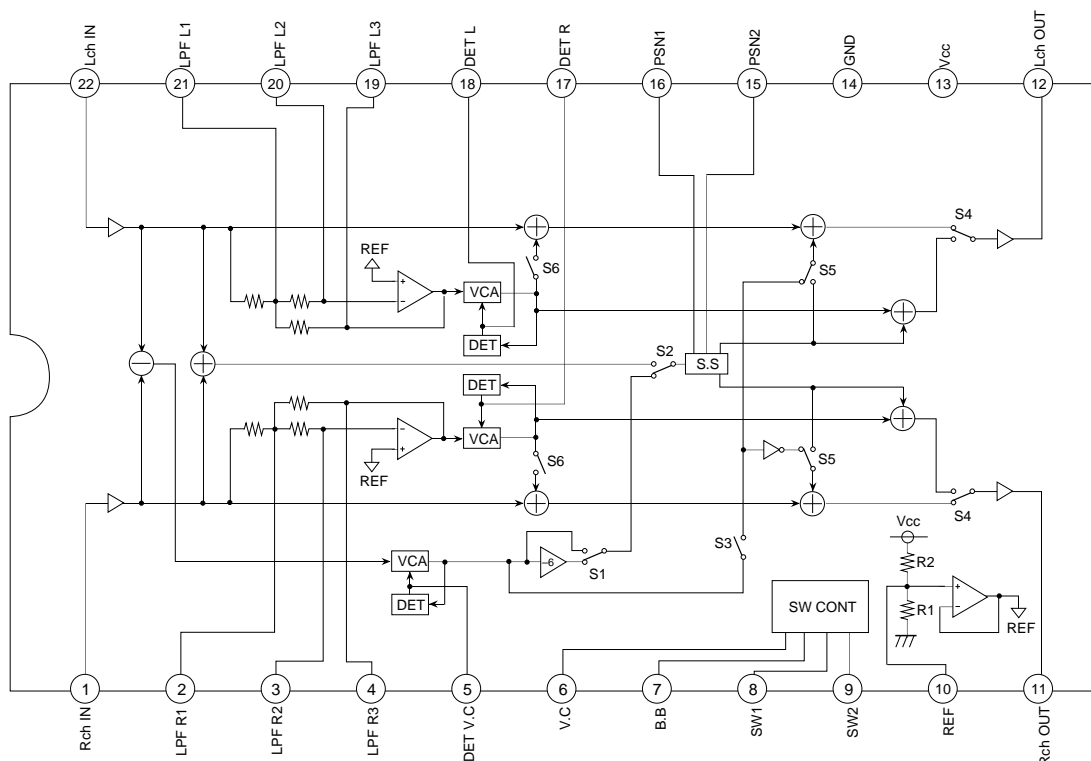
Absolute Maximum Ratings (Ta=25°C)

• Supply voltage	V _{CC}	14	V
• Operating temperature	T _{opr}	-20 to +75	°C
• Storage temperature	T _{stg}	-65 to +150	°C
• Allowable power dissipation	P _D	880	mW

Recommended Operating Conditions

Supply voltage	V _{CC}	5 to 12	V
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Block Diagram and Pin Configuration



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Pin Description

(Vcc=10V, Ta=25°C)

Pin No.	Symbol	Pin Voltage	Equivalent Circuit	Description
1 22	Rch IN Lch IN	5.0V		Channel L input pin Channel R
2 21 3 20 4 19	LPF R1 LPF L1 LPF R2 LPF L2 LPF R3 LPF L3	5.0V		Time constants for L.P.F.
5 17 18	DET V.C DET R DET L	0.5V		Level detector pin. To be connected with a capacitor

Pin No.	Symbol	Pin Voltage	Equivalent Circuit	Description
6 7 8 9	V.C B.B SW 1 SW 2	—		SW is turned ON when this pin is connected to GND
10	REF	5.0V		Reference voltage (1/2 Vcc)
11 12	Rch OUT Lch OUT	5.0V		Channel R output pin Channel L
13	Vcc	10V		Power supply
14	GND	0		GND pin
15 16	PSN 2 PSN 1	5.0V		The pin to be connected with a capacitor for time constants of phase shift

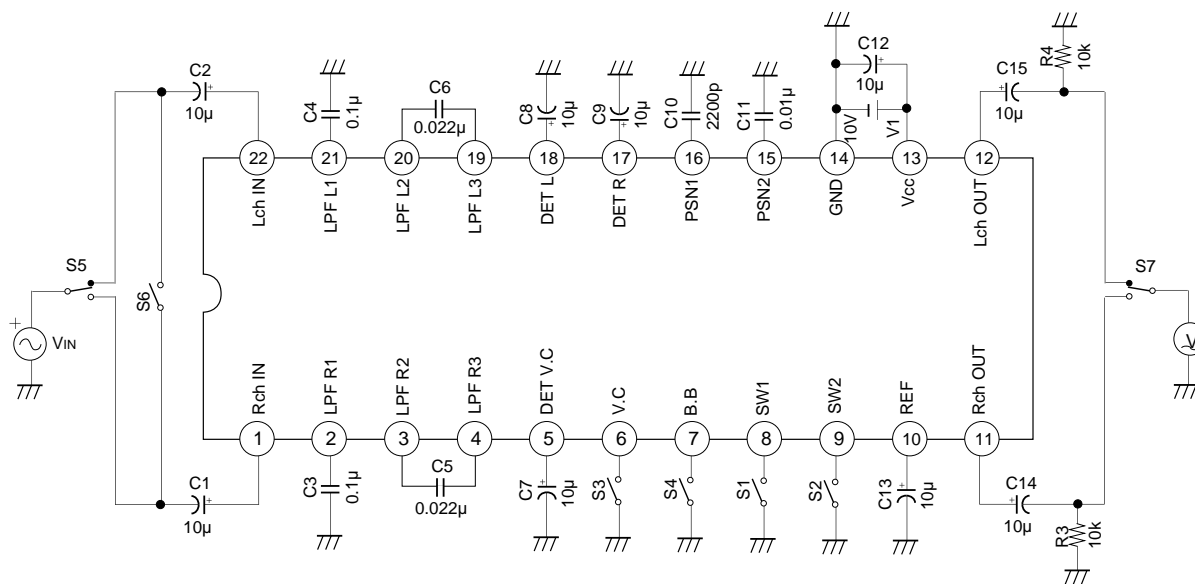
Electrical Characteristics

(V_{CC}=10V, T_a=25°C)

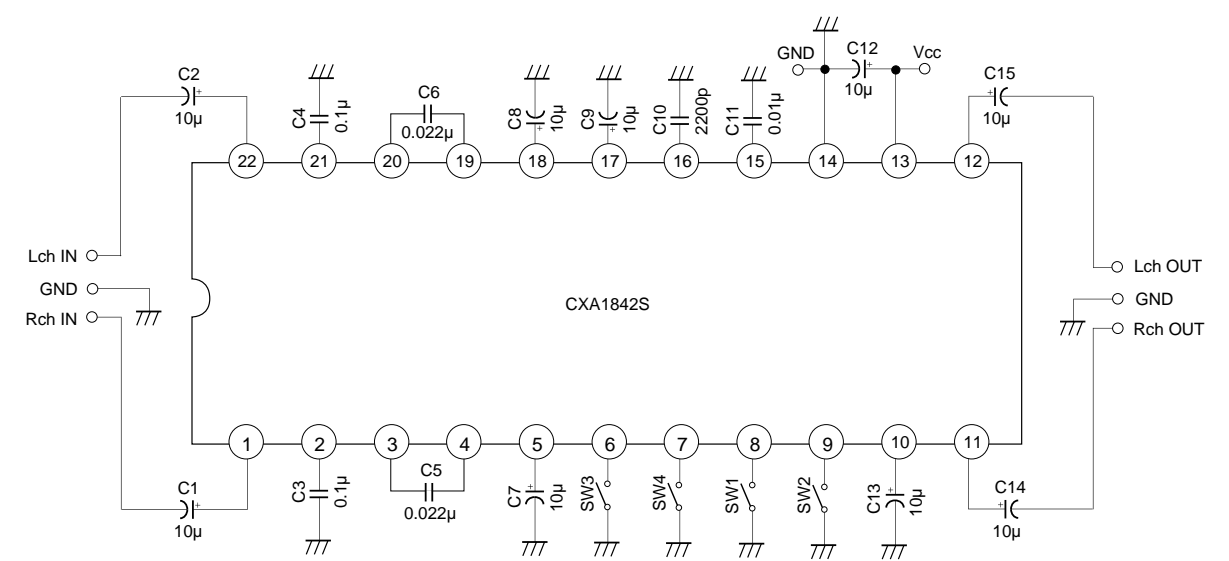
No.	Item	Conditions	SW conditions							Min.	Typ.	Max.	Unit
			S1	S2	S3	S4	S5	S6	S7				
1	No signal current	V _{in} =GND			O			O		1.6	3.35	5.1	mA
2	Lch gain	V _{in} =2V _{rms} , f=1kHz			O					- 3	0	3	dB
3	Rch gain	↓			O		O		O	- 3	0	3	dB
4	Channel balance	Lch gain - Rch gain	—	—	—	—	—	—	—	- 3	0	3	dB
5	Lch total harmonic distortion	V _{in} =2V _{rms} , f=1kHz			O					—	0.07	0.1	%
6	Rch total harmonic distortion	↓			O		O		O	—	0.07	0.1	%
7	Lch noise level	V _{in} =GND			O			O		—	- 90	- 80	dBm
8	Rch noise level	↓			O			O	O	—	- 90	- 80	dBm
9	Channel separation	V _{in} =2V _{rms} , f=1kHz			O				O	55	63	—	dB

O...indicates "ON".

Electrical Characteristics Measurement Circuit



Application Circuit



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Mode Switch Correspondence

No.	MODE	SW1	SW2	SW3
1	Simulated Stereo	ON	ON	ON
2	Surround A	ON	OFF	ON
3	Surround B	OFF	ON	ON
4	Pass	OFF	OFF	ON
5	Vocal cancel	—	—	OFF

—…don't care
Bass boosting ON when SW4=ON (Invalid during vocal cancellation)

VTH for SW ... VTH (H) = VCC to 3 V, VTH (L) = 2 V to GND

Description of Functions**(1) Simulated Stereo**

The sum of the L and R signals is input to the Simulated Stereo* (hereafter S.S) block, and a simulated stereo signal is generated.

(2) Surround A (matrix surround)

The difference of the L and R signals is raised in level by the VCA (maximum 18 dB (typ.)), and is added to the raw signal.

(3) Surround B

The difference of the L and R signals is raised in level by the VCA (maximum 18 dB (typ.)), is input to the S.S block, and is then added to the raw signal.

(4) Pass

The L and R signals are output without modification.

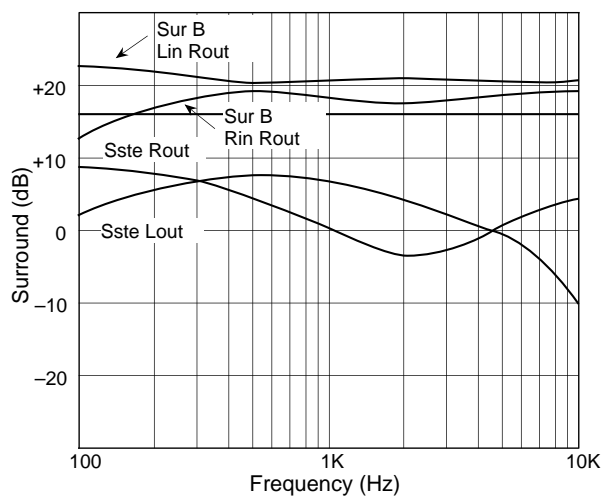
(5) Vocal Cancellation

The difference of the L and R signals is input to the S.S block after first passing through the AGC circuit, and is then output to L and R. In contrast with conventional products, the vocal cancel signal (L-R signal) is raised in level by the VCA (max. 12 dB typ.), and low frequency part is enhanced, to prevent reduction in the acoustic pressure level when vocal cancellation is ON.

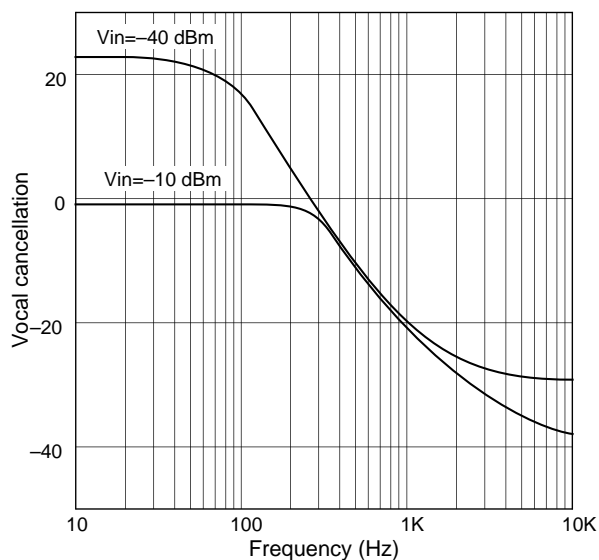
*** Simulated Stereo circuit:**

Phases in the audio band are divided into two separate orthogonal channels and treated as L+R and L-R signals, and are added and subtracted to produce simulated L and R signals. All-pass network.

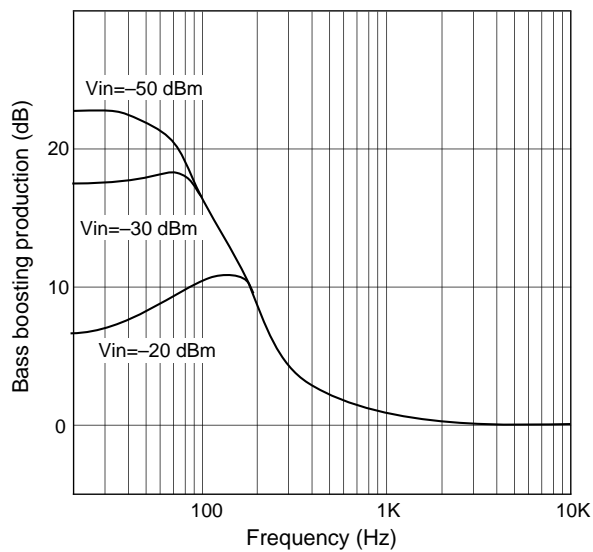
Surround Frequency response



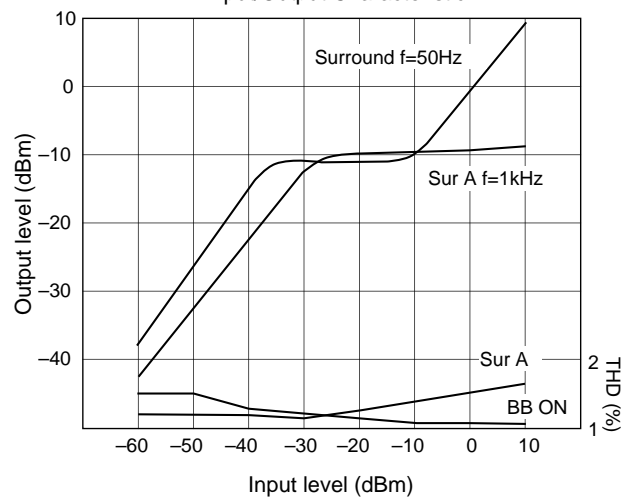
Vocal cancellation Frequency response



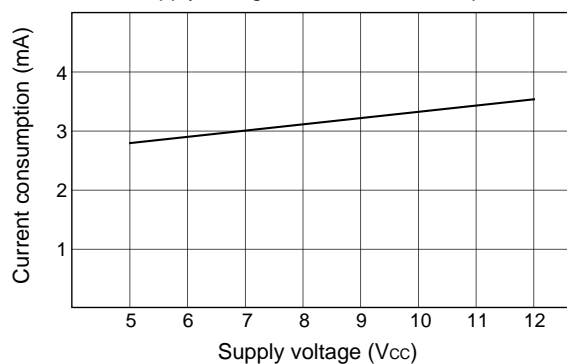
Bass boosting Frequency response



Input/Output Characteristic

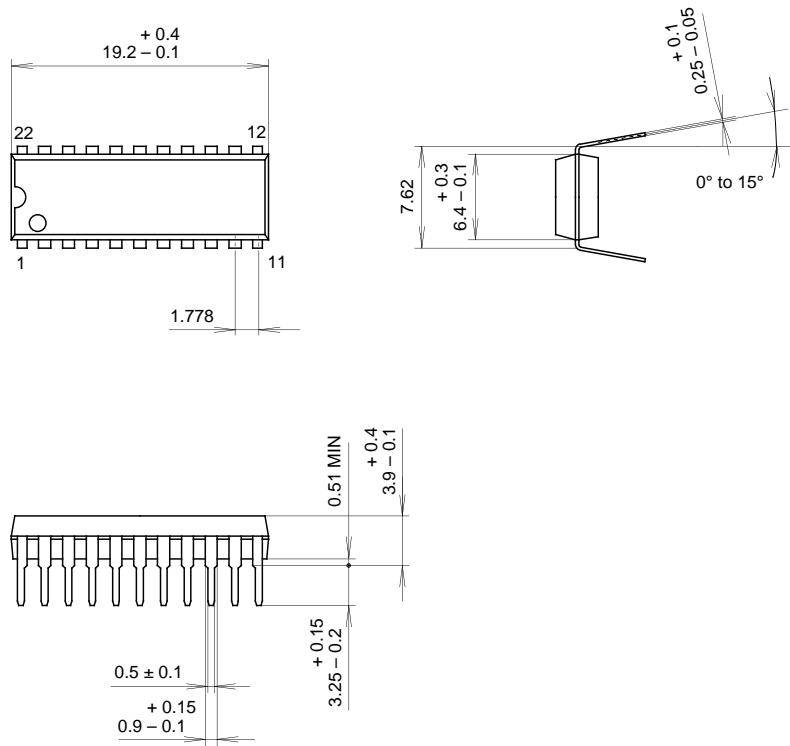


Supply voltage vs. Current consumption



Package Outline Unit : mm

22PIN SDIP (PLASTIC)



PACKAGE STRUCTURE

SONY CODE	SDIP-22P-01
EIAJ CODE	SDIP022-P-0300
JEDEC CODE	_____

MOLDING COMPOUND	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE WEIGHT	0.95g