

# CXA1622M/P

## Stereo Power Amplifier/Monaural BTL Power Amplifier

**Description**

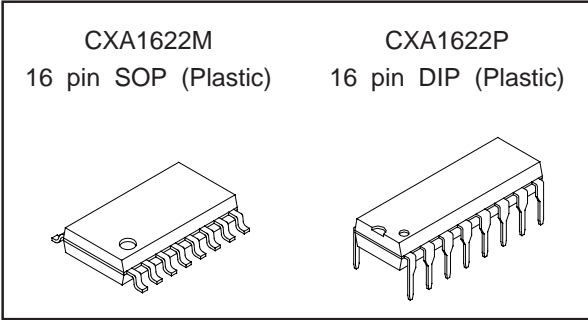
The CXA1622M/P is a bipolar IC developed as power amplifier for compact radio cassettes with built-in pre-amplifier and power amplifier electrical volume.

**Features**

- Use one channel in stereo mode
  - EIAJ output=110 mW (Typ.),  $V_{CC}=3\text{ V}$ ,  $R_L=8\ \Omega$  (CXA1622M)
  - EIAJ output=450 mW (Typ.),  $V_{CC}=6\text{ V}$ ,  $R_L=8\ \Omega$  (CXA1622P)
- BTL mode
  - EIAJ output=320 mW (Typ.),  $V_{CC}=3\text{ V}$ ,  $R_L=8\ \Omega$  (CXA1622M)
  - EIAJ output=360 mW (Typ.),  $V_{CC}=3\text{ V}$ ,  $R_L=8\ \Omega$  (CXA1622P)
- Built-in electrical volume
- Built-in ripple filter (ripple rejection 34.5 dB typ.)
- Selection between stereo power amplifier and monaural BTL power amplifier is possible by switching Pin 2.

**Applications**

Suitable for audio power amplifier for stereo and monaural radios and power amplifier for radio cassette and Walkman.



**Structure**

Bipolar silicon monolithic IC

**Absolute Maximum Ratings** ( $T_a=25\text{ }^\circ\text{C}$ )

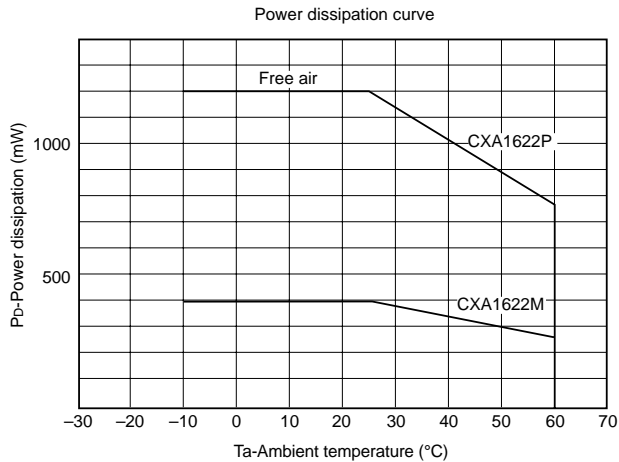
- Supply voltage  $V_{CC}$  8 V
- Operating temperature  $T_{opr}$   $-10\text{ to }+60\text{ }^\circ\text{C}$
- Storage temperature  $T_{stg}$   $-65\text{ to }+150\text{ }^\circ\text{C}$
- Allowable power dissipation
 

$P_D$	410 (CXA1622M) mW
	1200 (CXA1622P) mW

**Operating Conditions** ( $T_a=25\text{ }^\circ\text{C}$ )

- Supply voltage
- Stereo mode
 

{	1.8 V to 4.5 V (CXA1622M)
}	1.8 V to 7.0 V (CXA1622P)
- Monaural BTL mode 1.8 V to 4.5 V  
(3 V recommended)



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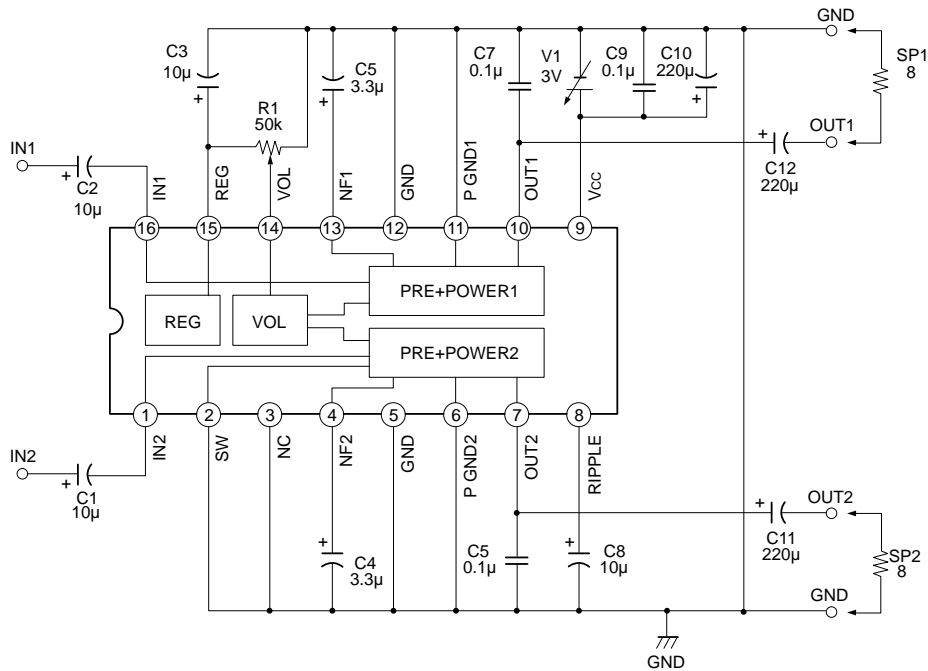
Pin Description

Pin No.	Symbol	Equivalent circuit	Pin voltage		Description
			3 V	6 V	
1, 16	IN1 IN2		0	0	Input
3	NC		—	—	
4, 13	NF1 NF2		1.5	3	Power amplifier NF. Connected to time constant 4.7 μF.
5, 12	GND1 GND2		0	0	Pre-amplifier GND
6, 11	P-GND1 P-GND2		0	0	Power amplifier GND
7, 10	OUT1 OUT2		1.5	3	Power amplifier output
8	RIPPLE		2.72	5.43	Connected to time constant 10 μF for ripple filter.
9	Vcc		3	6	Vcc

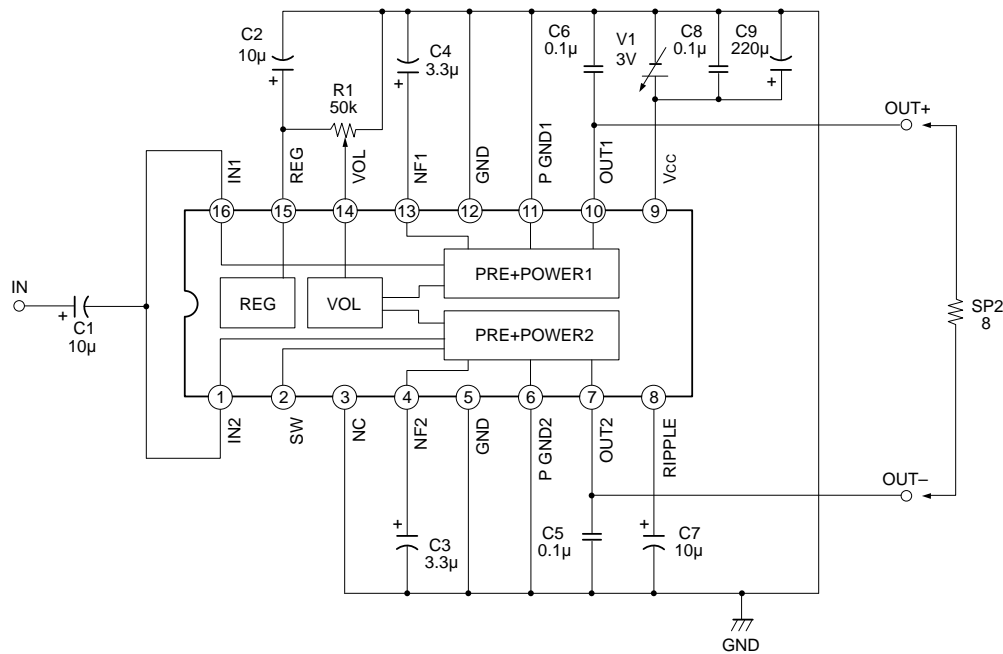
Pin No.	Symbol	Equivalent circuit	Pin voltage		Description
			3 V	6 V	
14	VOL		0 to 1.25	0 to 1.25	Control gain with change in voltage (0 to 1.25 V) to electrical volume control pin.
15	REG		1.25	1.25	Regulator pin
2	SW		1.25	1.25	Mode selection SW • BTL mode when open • Stereo mode when connected to GND

**Block Diagram, Pin Configuration, and Application Circuit**

1) Stereo mode



2) BTL mode



- \* The input signal enters the pre-amplifier with attenuation controlled with DC at Pin 14 and then it is amplified by the approximately 30 dB (fixed) power amplifier.
- \* The state of Pin 2 can be used to select between stereo mode and monaural BTL mode. The pre-power 1 and pre-power 2 output are positive phase output when Pin 2 is GND. Pre-power 2 is inverse output of pre-power 1 output when Pin 2 is open.

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Stereo mode { Upper : CXA1622M (Vcc=3 V)  
Lower : CXA1622P (Vcc=6 V)

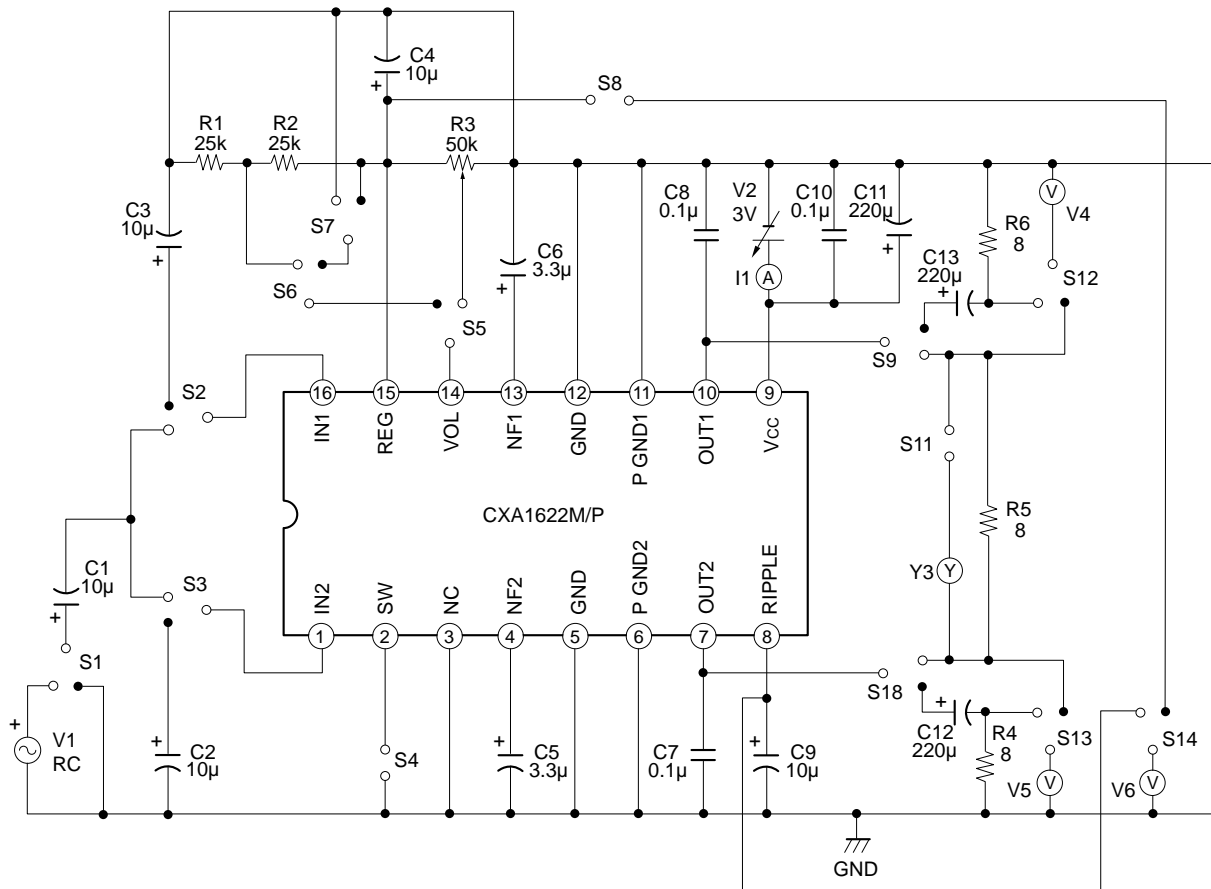
Function block	Test No.	Test item	BIAS SW conditions														Input point	Input waveform and bias description	Test point	Output waveform and description of test method	Min.	Typ.	Max.	Unit																					
			S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14																													
Typical conditions for each bias																																													
	1	Circuit current during no signal	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF		I1	Circuit current during no signal	1.0	3.0	8.2	mA																
	2	Audio voltage gain Lch	ON	ON	OFF																		V4	V1=-40 dBm 1 kHz	28	33.7	38	dB																	
	3	Audio voltage gain Rch		OFF	ON																		V5	V1=-40 dBm 1 kHz	27	32.6	36	dB																	
	4	Channel balance																					V4 V5	L and R channel balance	28 27	33.7 32.6	38 36	dB																	
	5	Attenuation Lch		ON	OFF					ON													V4	V1=-40 dBm 1 kHz Output level difference between max volume and half volume	1.5	5.8	12	dB																	
	6	Attenuation Rch		OFF	ON																		V5	V1=-40 dBm 1 kHz Output level difference between max volume and half volume	1.0	4.3	12	dB																	
	7	EIAJ output Lch	ON	OFF	ON																		V4	V1=-20 dBm 1 kHz, RL=8 Ω Output level where THD=10 %	350	450		mW																	
	8	EIAJ output Rch	OFF	ON	OFF																		V5	V1=-20 dBm 1 kHz, RL=8 Ω Output level where THD=10 %	90	110		mW																	
	9	Audio distortion factor Lch		ON	OFF																		V4	V1=-20 dBm 1 kHz, RL=8 Ω Distortion factor when output is 50 mW		0.7	2.5	%																	
	10	Audio distortion factor Rch		OFF	ON																		V5	V1=-20 dBm 1 kHz, RL=8 Ω Distortion factor when output is 50 mW		0.7	2.5	%																	
	11	Residual noise level Lch	OFF	OFF	OFF					OFF	OFF												V4	Noise level during no signal at max volume		-65	-60	dBm																	
	12	Residual noise level Rch																					V5	Noise level during no signal at max volume		-65	-60	dBm																	
	13	Crosstalk L → R	ON	ON																					V1=-40 dBm 1 kHz Rch output level when Lch is input		-60	-56	dBm																
	14	Crosstalk R → L		OFF	ON																				V1=-40 dBm 1 kHz Lch output level when Rch is input		-60	-56	dBm																

Upper : CXA1622M  
Lower : CXA1622P

BTL mode  $V_{cc}=3\text{ V}$

Function block	Test No.	Test item	BIAS SW conditions														Input point	Input waveform and bias description	Test point	Output waveform and description of test method	Min.	Typ.	Max.	Unit											
			S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14																			
			OFF	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	ON	ON	OFF																			
Typical conditions for each bias																																			
1		Circuit current during no signal	OFF	ON	ON	OFF	OFF	ON	OFF	ON	ON	OFF	ON	ON	OFF	ON	OFF	ON	ON	OFF	ON	OFF					I <sub>1</sub>	Circuit current during no signal			3	7		mA	
2		Output DC bias lag	ON												ON												V <sub>3</sub>	Output DC bias lag			0	30		mV	
3		Audio voltage gain																								V <sub>3</sub>	V <sub>i</sub> = -40 dBm 1 kHz			34	38	42		dB	
4		Attenuation														ON										V <sub>3</sub>	Output level difference between max volume and half volume			1.5	6.0	12		dB	
5		EIAJ output																								V <sub>3</sub>	Output level where THD=10%			1.0	5.0	12		dB	
6		Audio distortion factor																								V <sub>3</sub>	Distortion factor when output is 50 mW			260	360			mW	
7		Residual noise level																								V <sub>3</sub>	Noise level during no signal at max volume				-65	-62			dBm

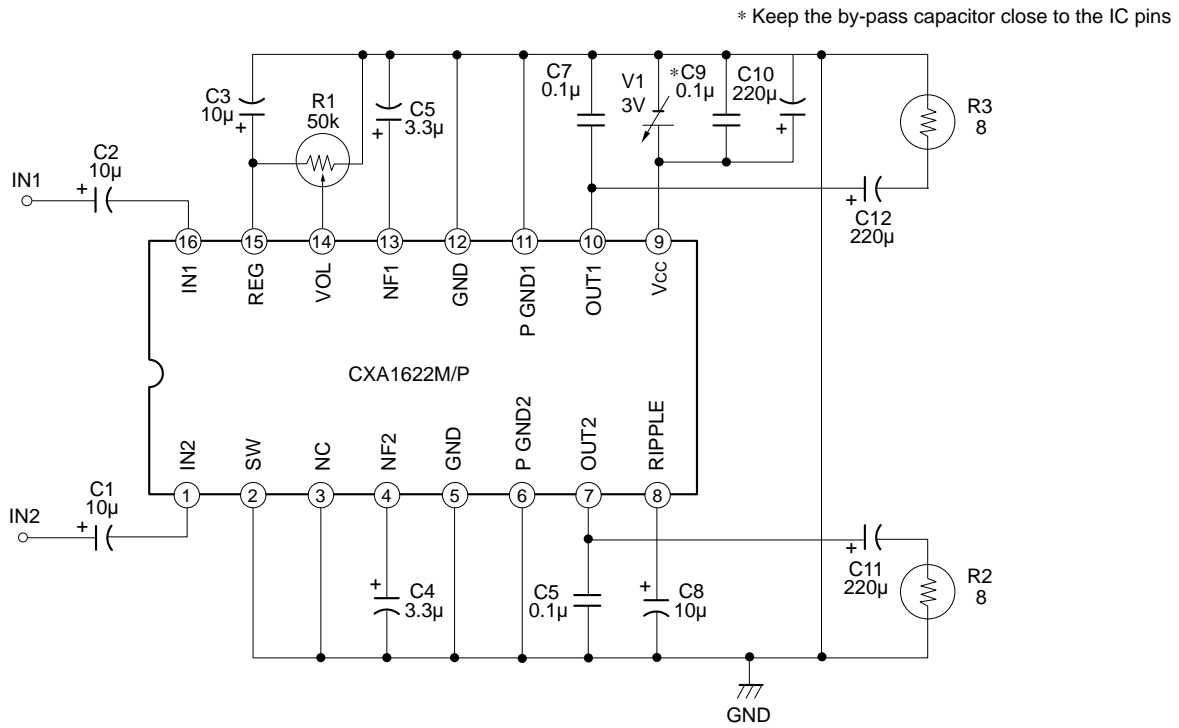
Electrical Characteristics Test Circuit



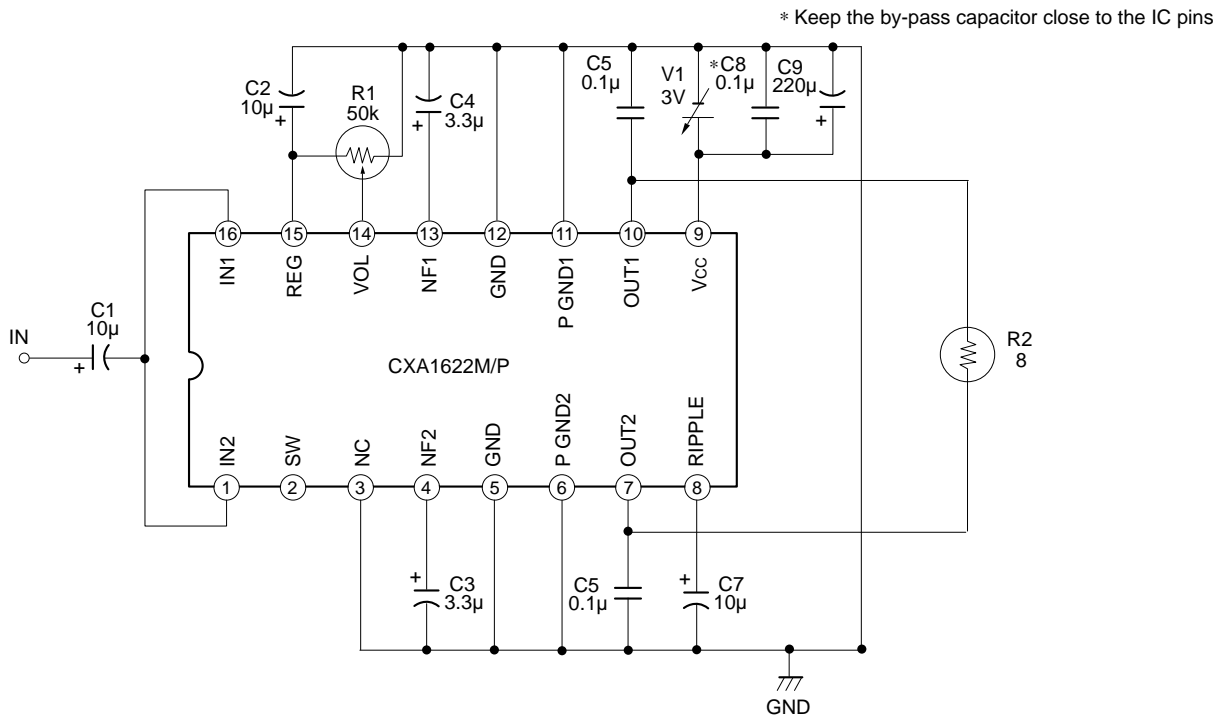
Notes on Operation

- Set print pattern to low impedance because Pins 6 and 11 are GND of power amplifier output stage.
- The value of the phase correction capacitance attached to Pins 7 and 10 varies slightly according to the print pattern.
- Provide a large land for DIP type Pin 5 because it also serves as heat dissipation pin.
- Place the by-pass capacitor of Vcc (Pin 9) as close to the pin as possible.

Stereo output single mode

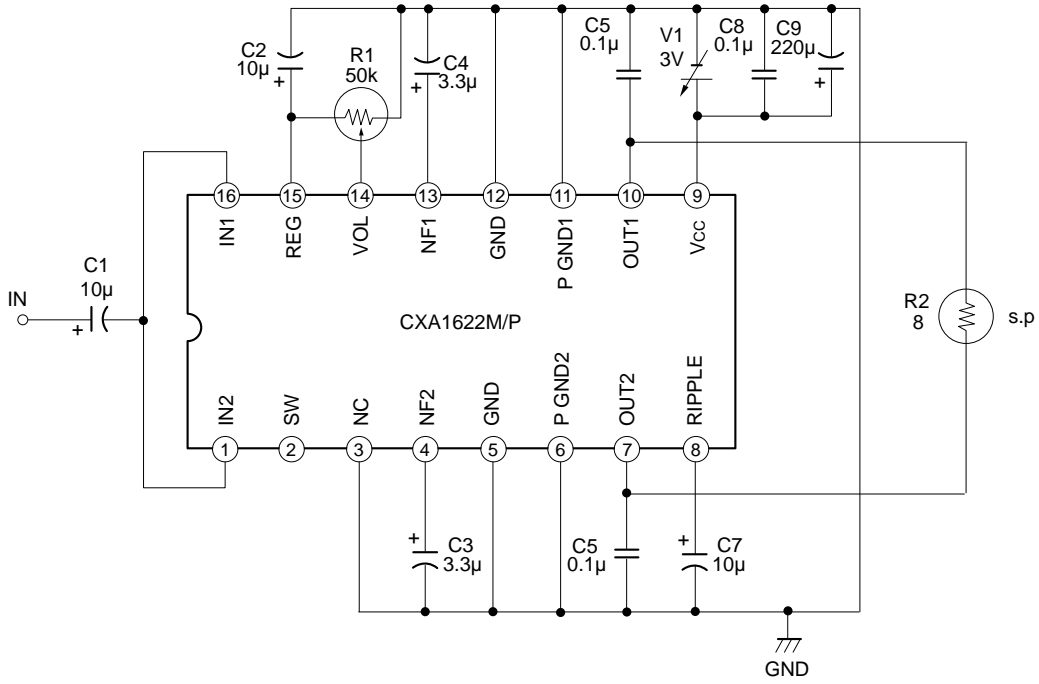


Monaural output BTL mode

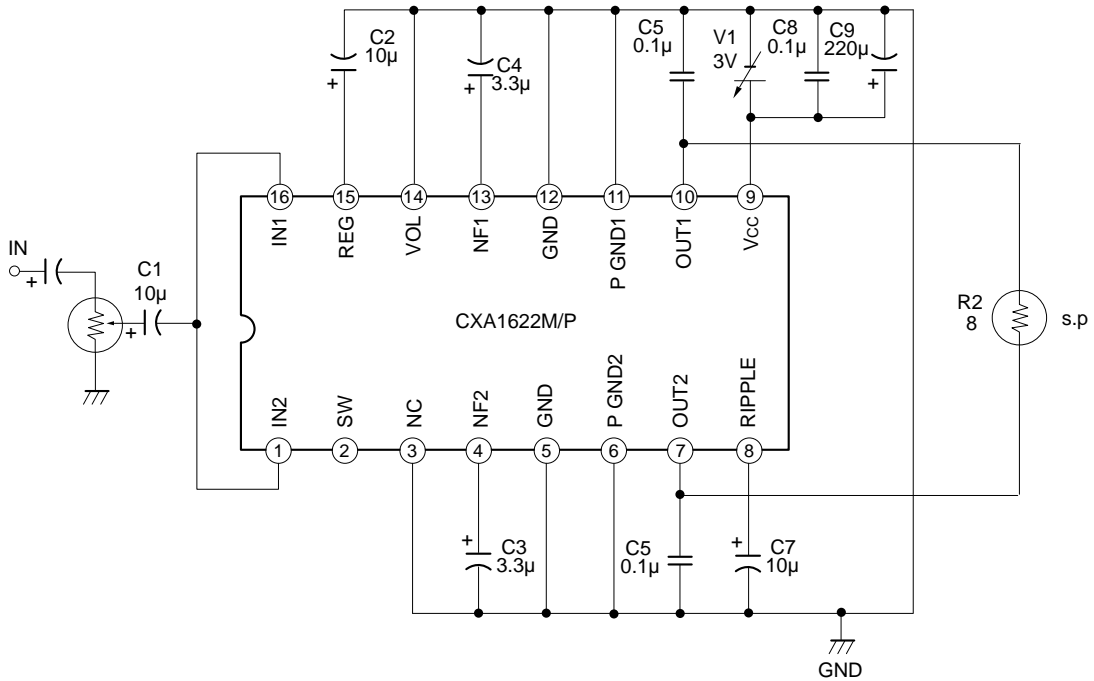




When using internal IC electrical volume in BTL mode

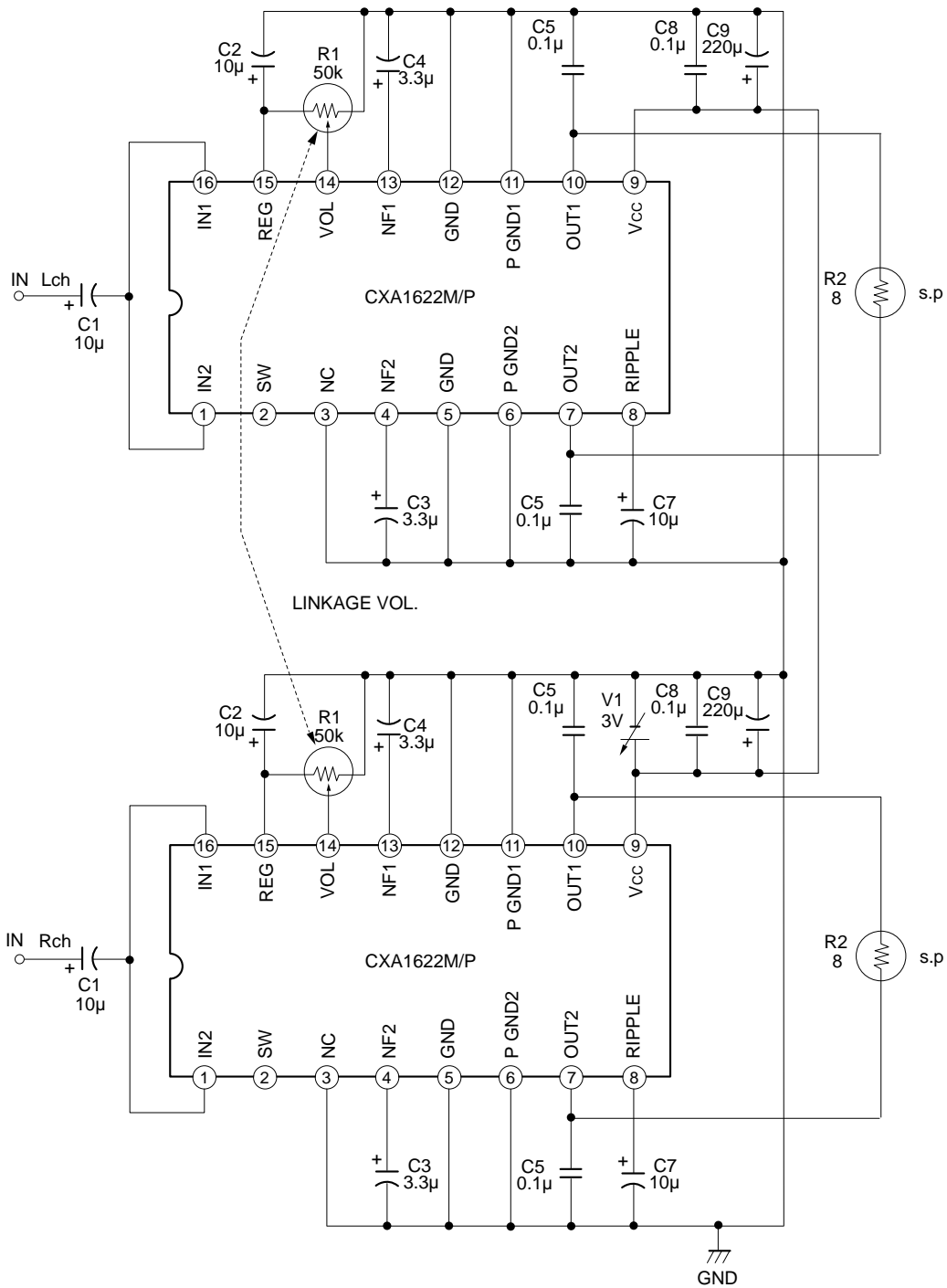


When using IC as fixed gain amplifier in BTL mode  
Pin14 → GND (IC Gain MAX)



**BTL, Stereo Application Circuit**

When using internal IC electrical volume

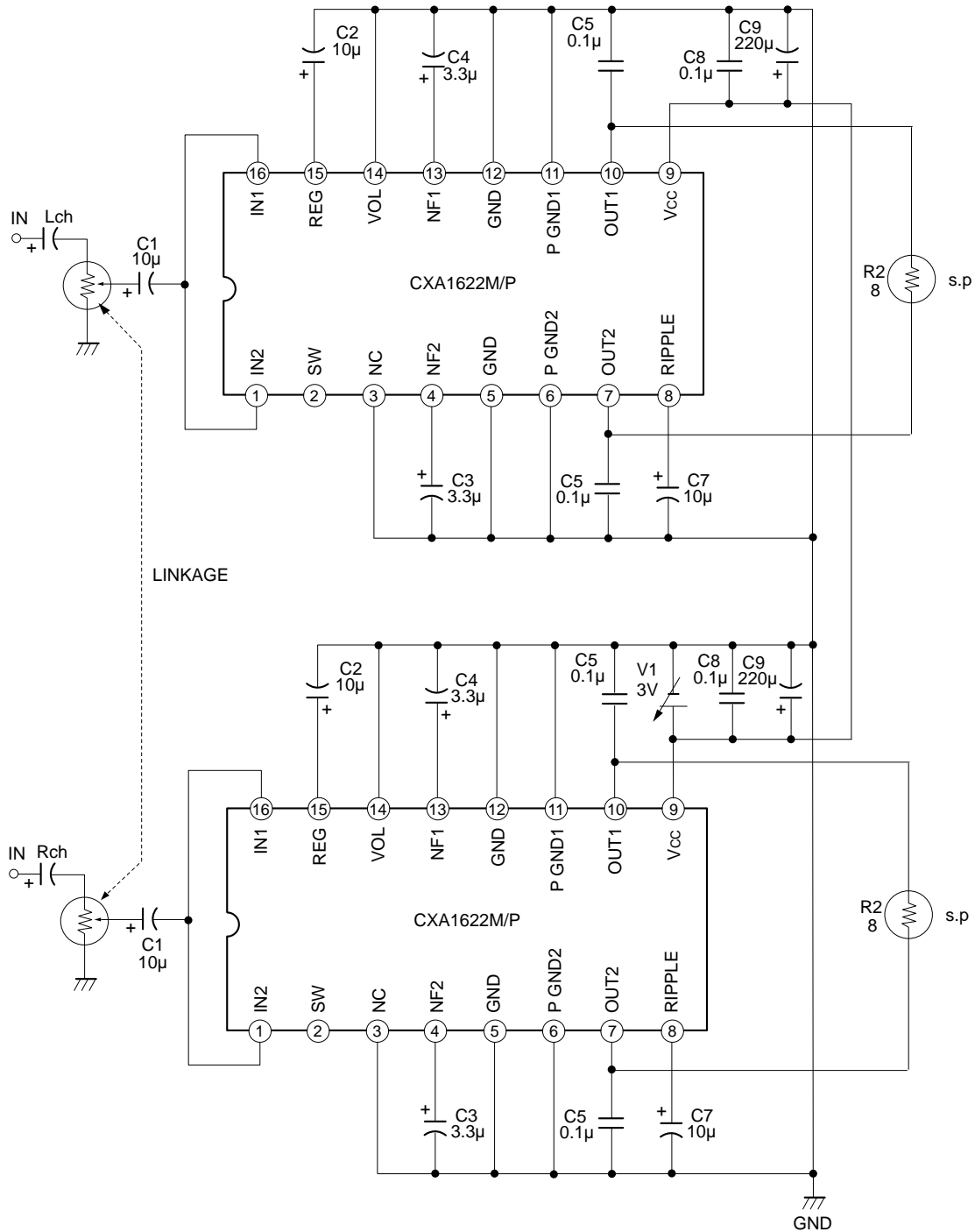


Application circuits shown are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits or for any infringement of third party patent and other right due to same.

**BTL, Stereo Application Circuit**

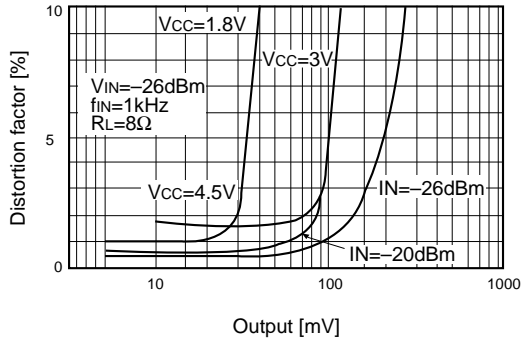
When using IC as fixed gain amplifier

Pin14 → GND (IC Gain Max)

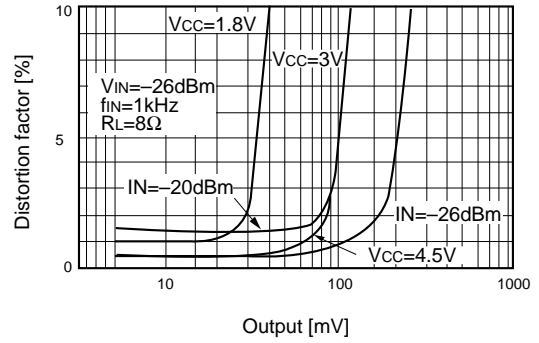


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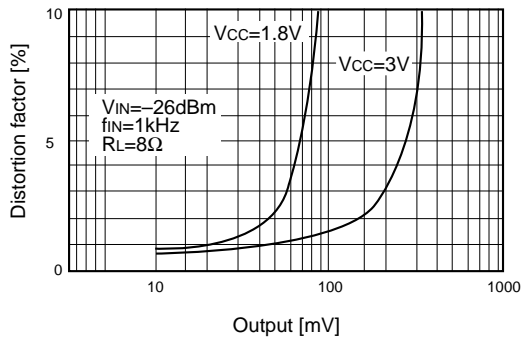
Output vs Distortion 1 CXA1622P  
stereo mode single-channel input



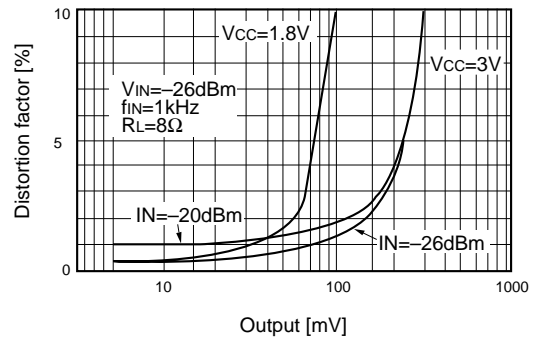
Output vs Distortion 2 CXA1622M  
stereo mode single-channel input



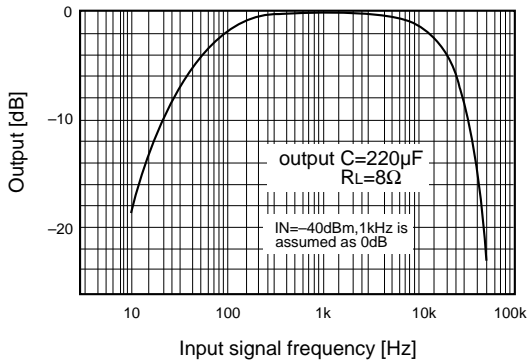
Output vs Distortion factor 3  
CXA1622P BTL mode



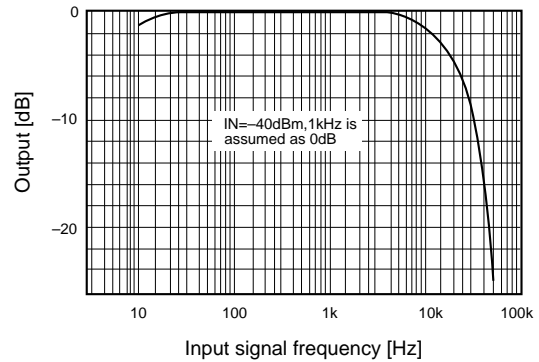
Output vs Distortion 4 CXA1622M BTL mode



Stereo mode frequency characteristics  
VIN = -40dBm VOL MAX VCC = 3V



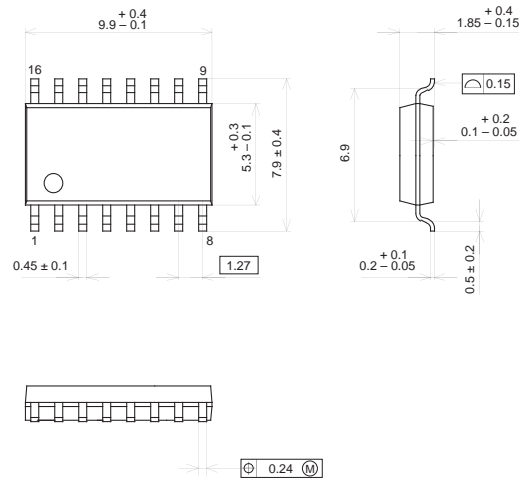
BTL mode frequency characteristics  
VIN = -40dBm VOL MAX VCC = 3V



Package Outline Unit : mm

CXA1622M

16PIN SOP (PLASTIC)



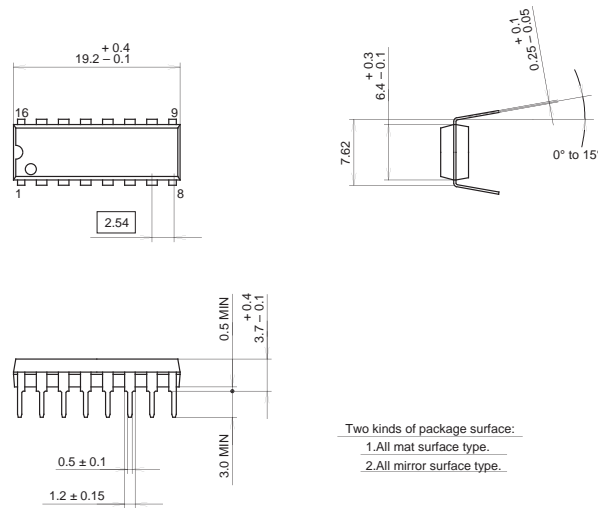
SONY CODE	SOP-16P-L01
EIAJ CODE	SOP016-P-0300
JEDEC CODE	

PACKAGE STRUCTURE

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE MASS	0.2g

CXA1622P

16PIN DIP (PLASTIC)



- Two kinds of package surface:
1. All mat surface type.
  2. All mirror surface type.

SONY CODE	DIP-16P-01
EIAJ CODE	DIP016-P-0300
JEDEC CODE	Similar to MO-001-AE

PACKAGE STRUCTURE

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE MASS	1.0 g