

8-pin Single-chip AM Radio with Built-in Power Amplifier

Description

The CXA1600P/M is an 8-pin single-chip bipolar IC for AM radios. This IC includes all functions from the front-end to the power amplifier.

The CXA1600P/M doesn't require any external filter, making external ceramic filter attachment unnecessary.

Features

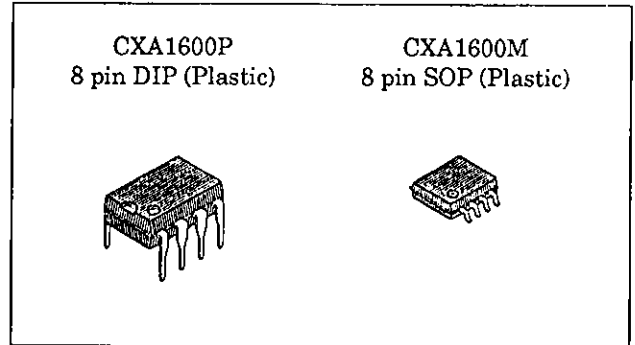
- EIAJ output=100 mW (typ.)
(VCC=3V, RL=8Ω)
- Built-in electrical volume control.
- No ceramic filter required.
- Few peripheral components.

Application

AM radio

Structure

Bipolar silicon monolithic IC



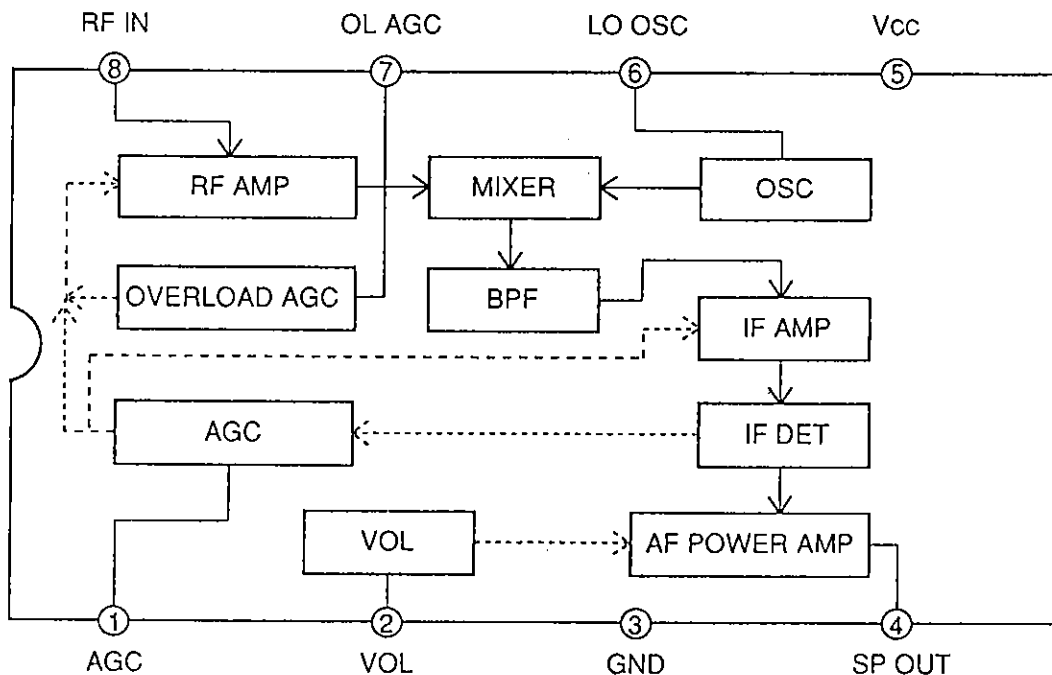
Absolute Maximum Ratings (Ta=25°C)

• Supply voltage	VCC	7	V
• Operating temperature	Topr	-20 to +75	°C
• Storage temperature	Tstg	-65 to +150	°C

Operating Condition

• Supply voltage	VCC	1.8 to 4.5	V
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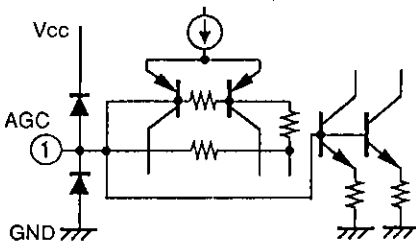
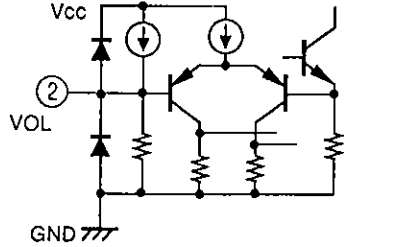
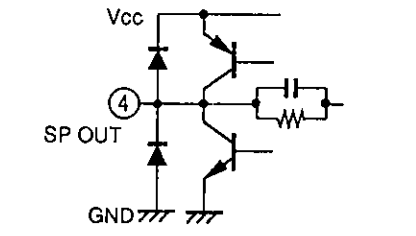
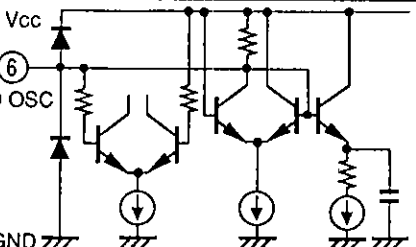
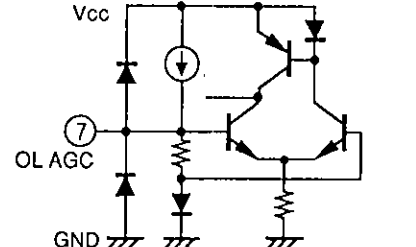
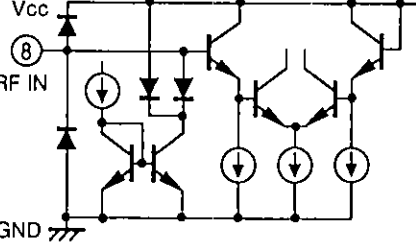
Block Diagram



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Pin Description

V_{CC}=3V

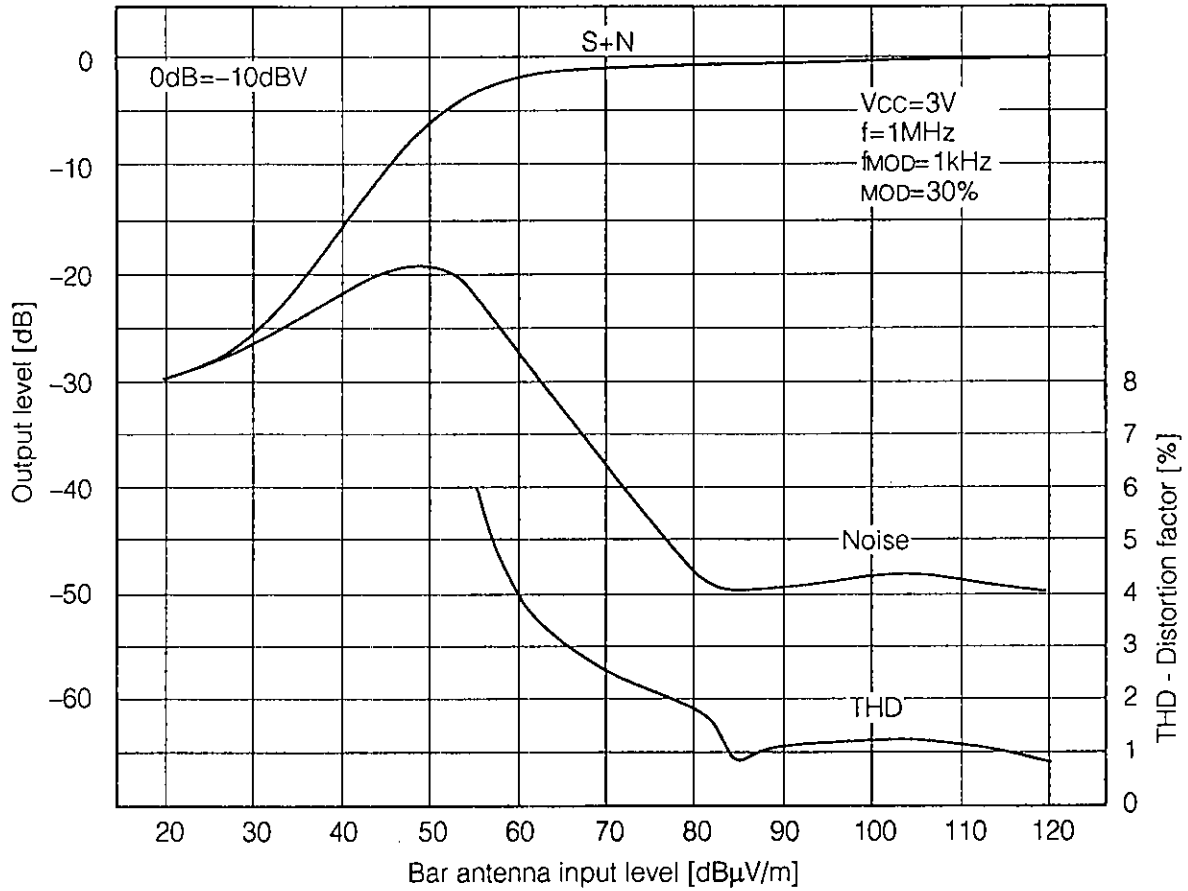
No.	Symbol	Voltage (typ.)	Equivalent Circuit	Description
1	AGC	0.61V		Connect with a capacitor.
2	VOL	0.1V		Connect to the midpoint of the volume control.
3	GND	0V		Ground
4	SP OUT	1.28V		Audio output. Connect with a capacitor.
5	V _{CC}	3V		Power supply
6	LO OSC	V _{CC}		Oscillation output. Connect with an oscillation coil.
7	OL AGC	0.62V		Connect with a capacitor.
8	RF IN	3V		RF input. Connect with the antenna circuit.

Electrical Characteristics

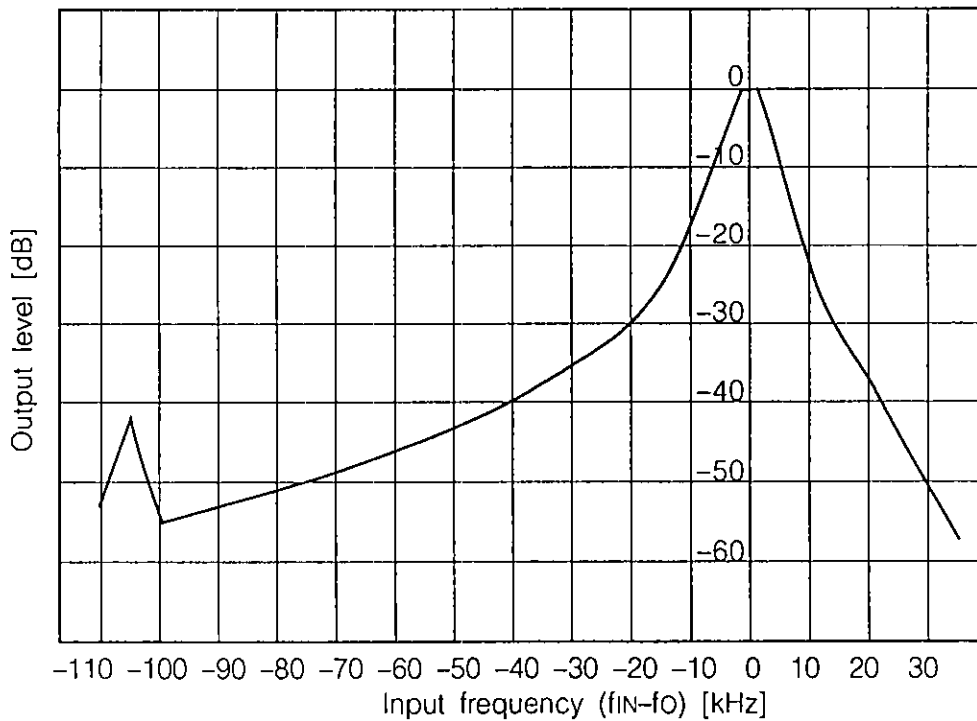
VCC=3V, Ta=25°C

	Item	Test conditions	Min.	typ.	Max.	Unit
1	Non-signal circuit current	No signal	4.8	6	10	mA
2	EIAJ output (with 8Ω load)	f=1MHz, fMOD=1kHz, 30% Vin=90dBμV	80	100		mW
3	Volume attenuation	f=1MHz, fMOD=1kHz, 30% Vin=90dBμV, Volume=minimum		-70	-65	dBm
4	Overall noise level	Short circuit at RF IN with a 1μF capacitor. Measure the level at SP OUT. Volume=maximum		-25	-15	dBm
5	Selectivity	f=1.010MHz, fMOD=1kHz, 30% Vin=35dBμV.	14	19		dB

AM I/O Characteristics



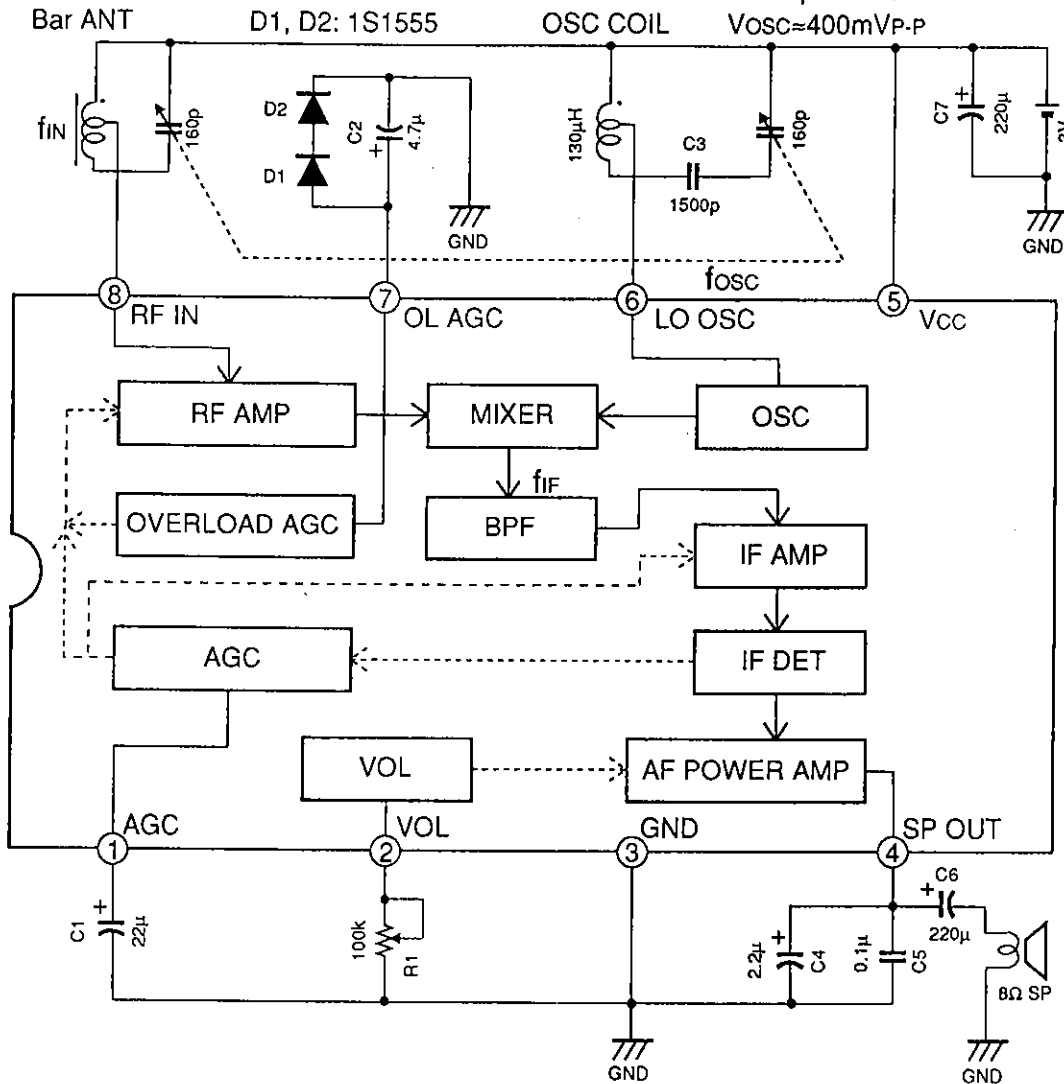
Selectivity Characteristics



Notes on Applications

Application 1

VARIABLE CAPACITOR:
 HQ-025A of Toko Co., Ltd.
 or equivalent
 $V_{OSC} \approx 400\text{mV-P-P}$



The CXA1600P/M operates on the new system using very low intermediate frequency (approx. 55 kHz). (Actual IF frequency is determined by internal B.P.F. fo.)

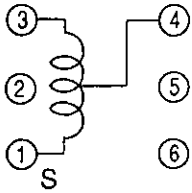
$$f_{IF} = \frac{1}{2} f_{OSC} - f_{IN} \approx 55 \text{ kHz}$$

Please take care of choice of the coil and variable capacitor as follows. (See next page.)

Coil Data

Application 1

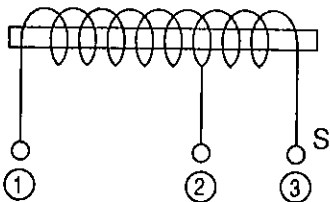
AM OSC



Wire diameter ϕ 0.08mm 2UEW

f(kHz)	L(μ H) 1 to 3	Qo 1 to 3	Number of windings (μ H)	
			1 to 4	4 to 3
796	130	70	32.5	97.5

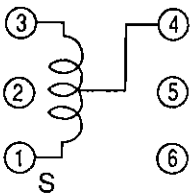
AM Bar Antenna



f(kHz)	L(μ H)	3 to 2	2 to 1
796	560	140	420

Application 2

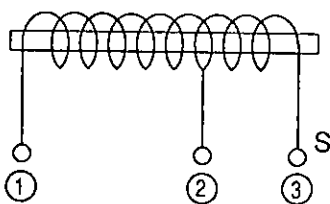
AM OSC



Wire diameter ϕ 0.08mm 2UEW

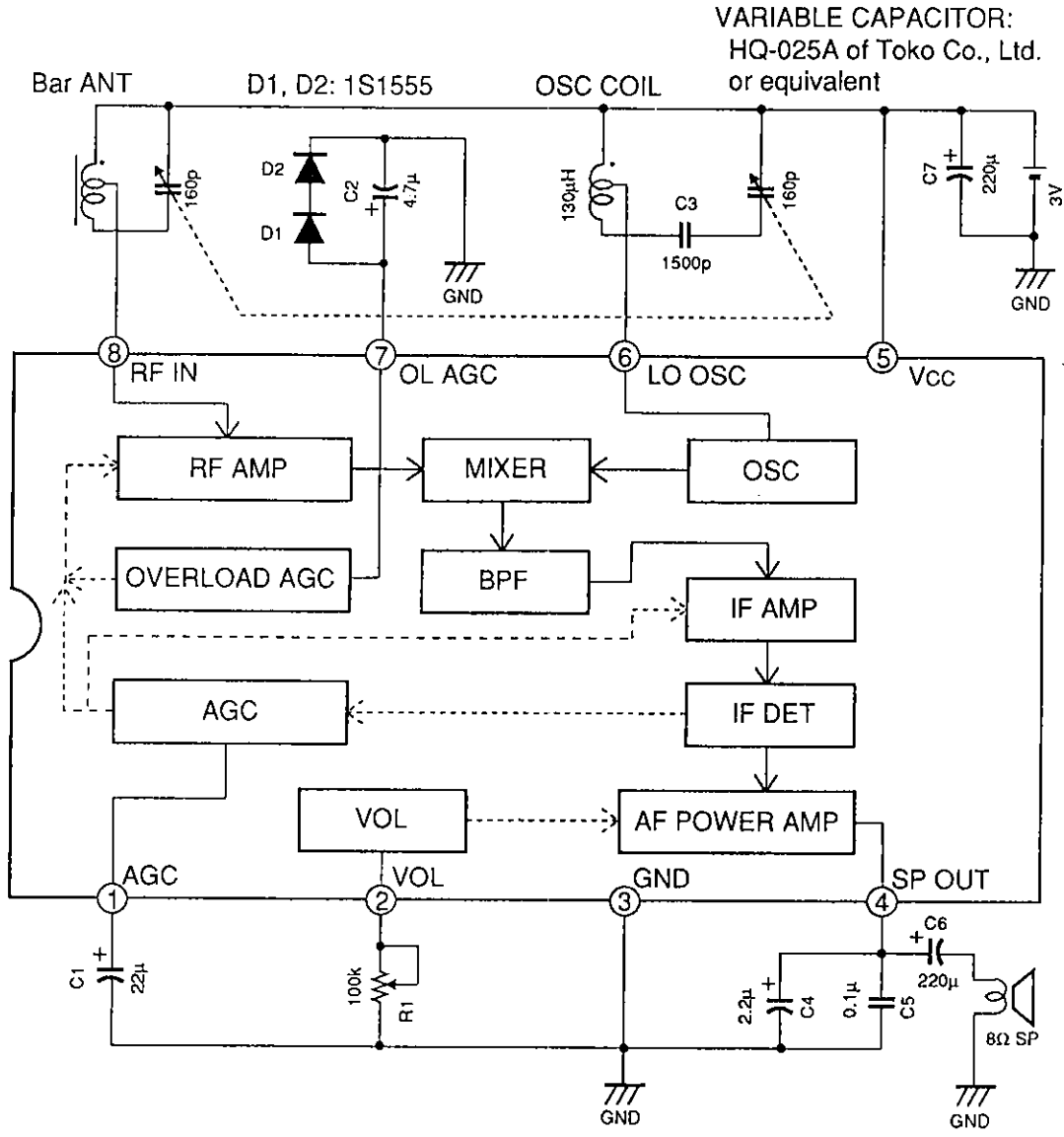
f(kHz)	L(μ H) 1 to 3	Qo 1 to 3	Number of windings (μ H)	
			1 to 4	4 to 3
796	210	70	71.3	138.7

AM Bar Antenna



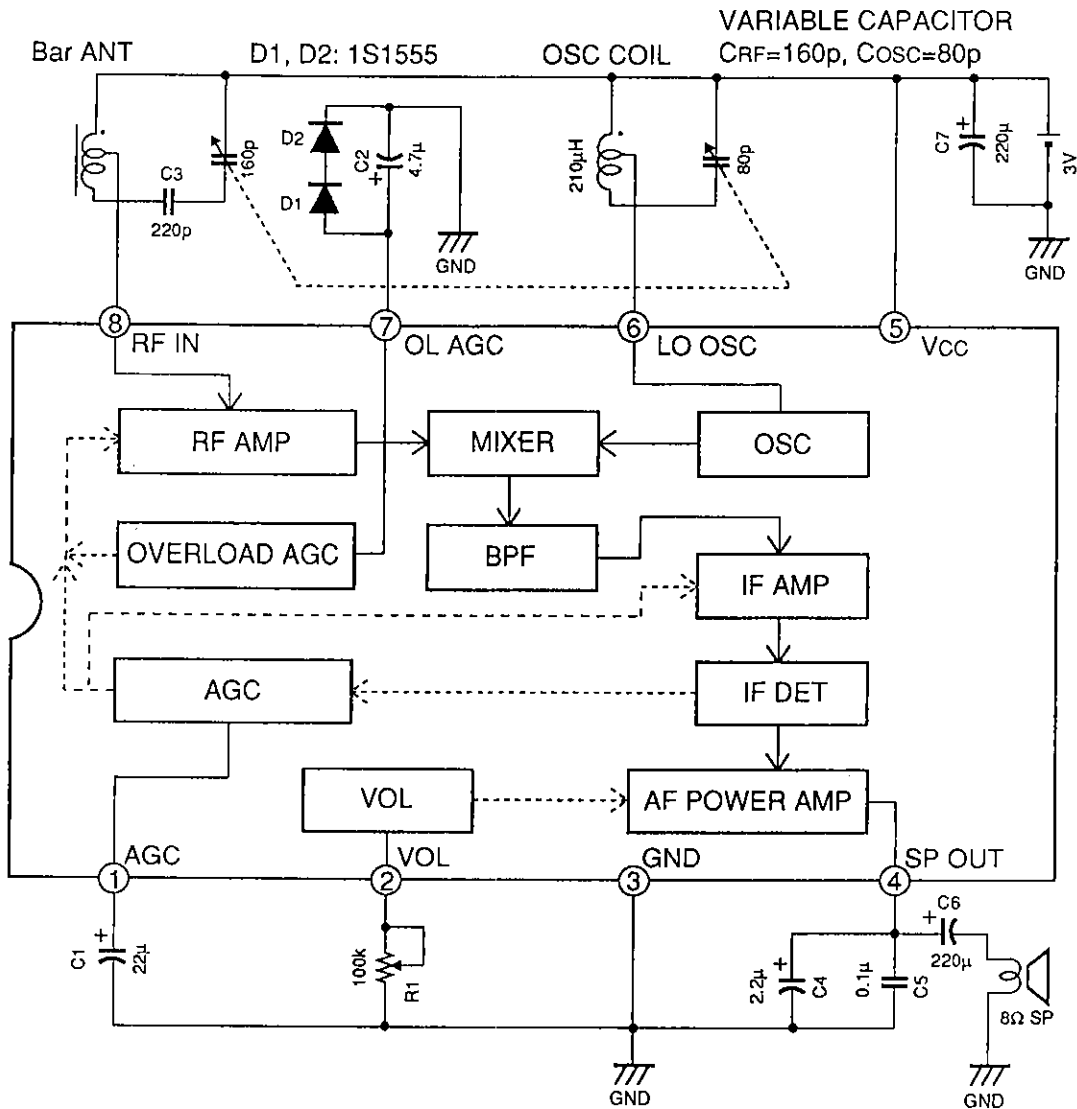
f(kHz)	L(μ H)	3 to 2	2 to 1
796	900	180	720

Application Circuit 1 VARIABLE CAPACITOR used (Equivalent capacitor)



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 patents and other right due to same.

Application Circuit 2 VARIABLE CAPACITOR used (Non-Equivalent capacitor)

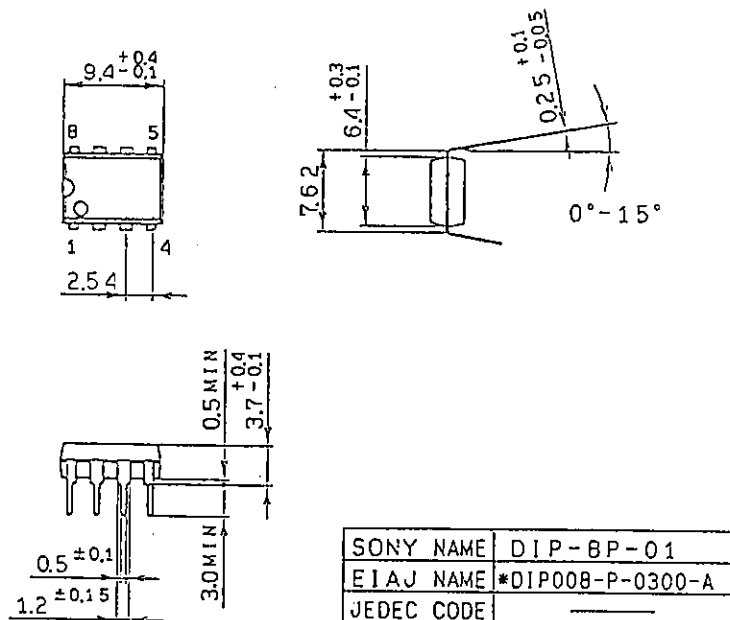


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Package Outline Unit: mm

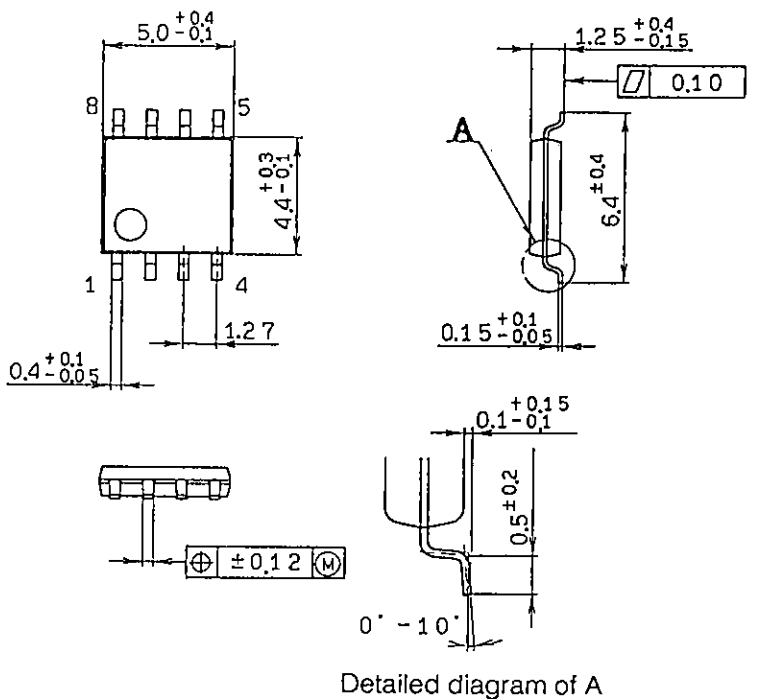
CXA1600P

8pin DIP (Plastic) 300mil 0.5g



CXA1600M

8pin SOP (Plastic) 225mil



Detailed diagram of A

SONY NAME	SOP-8P-L03
EIAJ NAME	*SOP008-P-0225-A
JEDEC CODE	—