SONY CX20034/CXA1234AR

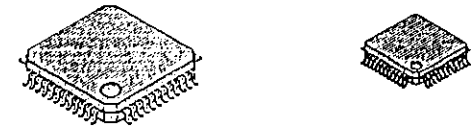
REC/PB Amplifier

Description

CX20034/CXA1234AR is a bipolar IC containing the periheral functions of a VTR head on a single chip. It has following functions.

- Recording
  - REC AMP (2 channels)
  - Gain controlled amplifier for each of the 4 REC signal inputs (Y, Chroma, PCM, AFT (Automatic Track Finding)).
  - Signal MIX, switch.
- Playback
  - Low noise head amplifier (2 channels).
  - Playback signal output switch.
- Control/Logic
  - Logic control circuits of each mode.

48pin QFP(Plastic) 48pin VQFP(Plastic)



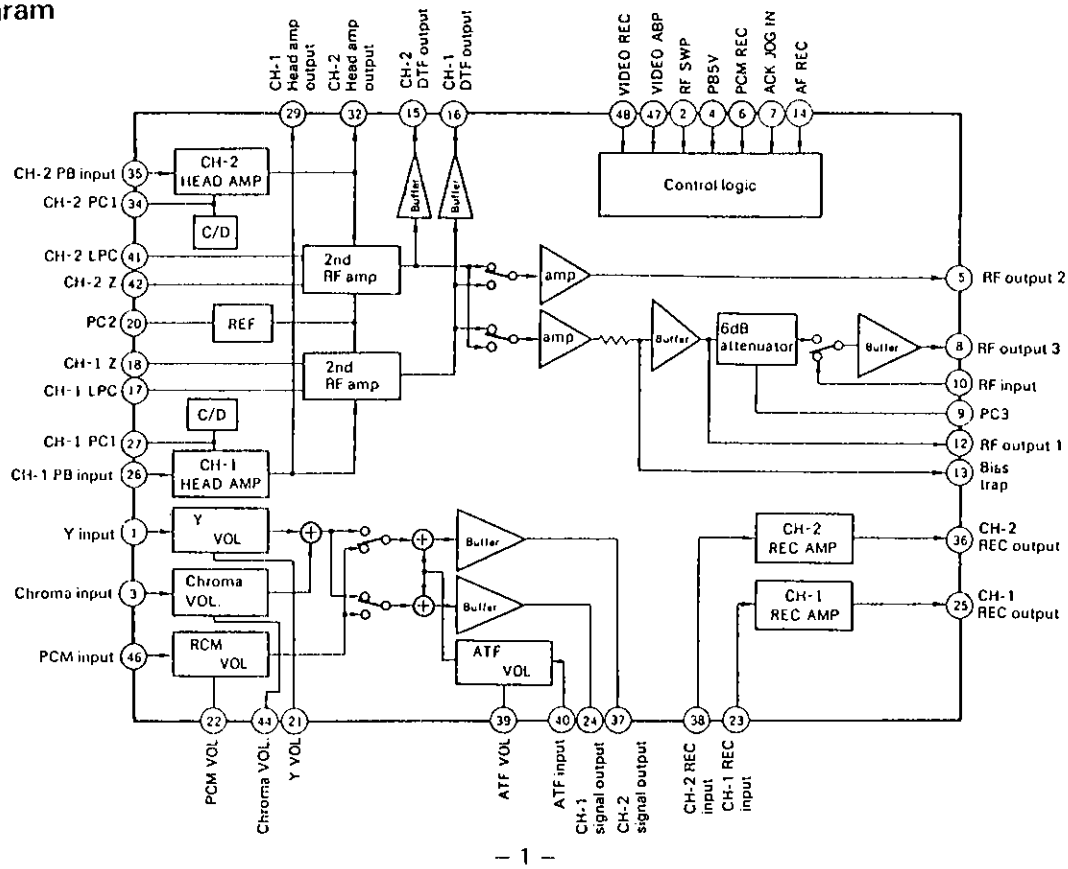
Features

- Single power supply 5V
- Low power consumption (about 80 mW in REC mode, 85 mW in PB mode) power saving mode.
- Audio PCM (after recording is possible) and ATF are provided.
- DC REC signal (Y, Chroma, PCM and ATF) level control.
- Logic circuit is incorporated to control signal switching and save power in the REC, PB and after recording mode.

Structure

Bipolar silicon monolithic IC

Block Diagram



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Absolute Maximum Ratings (Ta = 25°C)

• Supply voltage	V_{CC}	10	V
• Operating temperature	Topr	−20 to +75	°C
• Storage temperature	Tstg	−55 to +150	°C
• Allowable power dissipation	P_D (CX20034)	920	mW
	P_D (CXA1234AR)	1100	mW

(CXA1232AR; Substrate surface 40 × 25 mm, t = 0.635 mm when ceramic substrate mounted.)

Recommended Operating Condition

• Supply voltage	V_{CC}	5.0 ± 0.25	V

Pin Description

E. F; Emitter Follower

No.	Name	Voltage (Typ.) (V)	Input/Output resistance (Typ.)	Operation/Description
1	Y input	3.3V in REC	20kΩ	Input pin for recording Y signal.
2	RF SWP	— (Open: L)	40kΩ	Input pin of RF switching pulse to switch CH. H: over 3V L: under 1V
3	Chroma input	2.3V in REC	20kΩ	Input pin for recording chroma signal.
4	PB 5V	— (Open; L)	40kΩ	Logic control pin switching PB ON or OFF. H: over 3V. L: under 1V.
5	RF output 2	3.4V in PB	(E.F)	Output pin for playback PCM signal.
6	PCM REC	— (Open; L)	40kΩ	Logic control pin to record PCM. Priority over VIDEO REC. H; over 3V, L; under 1V.
7	ACK JOG IN	— (Open; L)	3kΩ +PN junction	Switching between VIDEO signal (L) and RF signal (H) for RF output 3 in PB mode. H; over 25μA, L; under 5μA.
8	RF output 3	3.4V in PB	(E.F)	Playback output pin to be controlled by ACK JOG IN.
9	PC3	2.5V in PB		Attenuator bypass capacitor pin.
10	RF input	2.5V in PB	20kΩ	VIDEO signal input pin.
11	PB Vcc	5V	—	Power supply pin for PB and control logic.
12	RF output 1	2.5V in PB	(E.F)	Playback Video output pin.
13	Bias trap	3.3V in PB	500Ω	Pin to connect a filter in the fixed head audio mode. Open when not in use.
14	AF REC	— (Open: L)	40kΩ	Logic control pin to set in after recording mode. H; over 3V, L; under 1V.
15	CH-2 DTF output	2.5V in PB	(E.F)	CH-2 signal output pin when DTF is in use. Open when not in use.
16	CH-1 DTF output	2.5V in PB	(E.F)	CH-1 signal output pin when DTF is in use. Open when not in use.
17	CH-1 LPC	1.7V in PB		Bypass capacitor pin for 2nd RF AMP.
18	CH-1Z	About 3.9V in PB		Connect a resonance circuit to Vcc. About 1.5kΩ of DC resistance from Vcc is desirable.
19	PB GND	—	—	GND for PB and control logic.
20	PC2	2.5V in PB		Bypass capacitor pin.

No.	Name	Voltage (Typ.) (V)	Input/Output resistance (Typ.)	Operation/Description
21	Y VOL	–	≫ 100kΩ	Gain control DC voltage (2 to 3V) application pin for recording Y signal. Not open allowable.
22	PCM VOL	–	≫ 100kΩ	Gain control DC voltage (2 to 3V) application pin for recording chroma signal. Not open allowable.
23	CH-1 REC input	0.7V in REC	≃ 0Ω	Input pin for CH-1 REC AMP
24	CH-1 signal output	3.3V in REC	(E.F)	CH-1 signal output pin for recording VOL + SW.
25	CH-1 REC output	–	(Open collector)	CH-1 REC AMP output pin.
26	CH-1 PB input	2.3V in PB	1.7kΩ	CH-1 HEAD AMP input pin.
27	CH-1 PC1	1.7V in PB		Bypass capacitor pin for CH-1 HEAD AMP. (About 0.2μ)
28	HEAD AMP Vcc	5V	–	Power supply pin for HEAD AMP.
29	CH-1 HEAD AMP output	3.1V in PB	(E.F)	CH-1 HEAD AMP output.
30	HEAD AMP GND	–	–	GND for HEAD AMP.
31	REC AMP GND	–	–	GND for REC AMP.
32	CH-2 HEAD AMP output	3.1V in PB	(E.F)	CH-2 HEAD AMP output pin
33	REC AMP Vcc	–	–	Power supply pin for REC AMP.
34	CH-2 PC1	1.7V in PB	–	Bypass capacitor pin for CH-2 HEAD AMP.
35	CH-2 PB input	2.3V in PB	1.7kΩ	Input pin for CH-2 HEAD AMP.
36	CH-2 REC output	–	(Open collector)	Output pin for CH-2 REC AMP.
37	CH-2 signal output	3.3V in REC	(E.F)	CH-2 signal output pin for recording VOL + SW.
38	CH-2 REC input	0.7V in REC	≃ 0Ω	Input pin for CH-2 REC AMP.
39	ATF VOL		≫ 100kΩ	Gain control DC voltage (2 to 3V) supply pin for recording ATF signal. Not open allowable.
40	ATF IN	2.3V in REC	20kΩ	Input pin for recording ATF signal.

No.	Name	Voltage (Typ.) (V)	Input/Output resistance (Typ.)	Operation/Description
41	CH-2 LPC	1.7V in PB	–	Bypass capacitor pin for 2nd RF AMP.
42	CH-2 Z	About 3.9V in PB	–	Connect a resonance circuit to Vcc. About 1.5kΩ DC resistance from Vcc is desirable.
43	REC GND	–	–	GND for REC except REC AMP.
44	Chroma VOL		⩾ 100kΩ	Gain control DC voltage (2 to 3V) supply pin for recording chroma signal. Not open allowable.
45	REC Vcc	5V		Power supply pin for REC except for REC AMP.
46	PCM input	3.3V in REC	20kΩ	Input pin for recording PCM signal.
47	VIDEO ABP	– (Open; L)	40kΩ	Logic mode control pin to record overlap by activating REC AMP for both channels. H; over 3V, L; under 1V.
48	VIDEO REC	– (Open; L)	40kΩ	Logic control pin to record VIDEO signal. H; over 3V, L; under 1V.

Control Logic Truth Table

(Input) Control logic input / Control logic condition	Control input condition: AF REC ⑭	PB 5V ①	VIDEO REC ⑩	PCM REC ⑥	RF SWP ②	VIDEO ABP ④	(Output) Operation of each section: REC output: VOLUME-SW	CH-1 REC AMP	CH-2 REC AMP	PB output: HEAD AMP. 2NDRF AMP	RF output 1 (VIDEO output)	RF output 2 (PCM output)	Operation	Mode
SW 1	X	L	L	L	X	X	○	X	X	X	X	X	REC PAUSE	REC
SW 2	X	L	H	L	L	L	○	X	V	X	X	X		
SW 3	X	L	H	L	H	L	○	V	X	X	X	X	VIDEO REC	
SW 4	X	L	H	L	X	H	○	V	V	X	X	X		
SW 5	X	L	L	H	L	X	○	P	X	X	X	X	PCM REC	
SW 6	X	L	L	H	H	X	○	X	P	X	X	X		
SW 7	X	L	H	H	L	X	○	P	V	X	X	X	VIDEO PCM REC	
SW 8	X	L	H	H	H	X	○	V	P	X	X	X		
SW 9	L	H	L	L	L	X	X	X	X	○	CH_{-2}	CH_{-1}	PB	PB
SW10	L	H	L	L	H	X	X	X	X	○	CH_{-1}	CH_{-2}		
SW11	H	H	L	L	L	X	○	X	X	○	CH_{-2}	CH_{-1}	PB in dubbing	Dubbing
SW12	H	H	L	L	H	X	○	X	X	○	CH_{-1}	CH_{-2}		
SW13	H	H	L	H	L	X	○	P	X	X	Z	△	PCM REC in dubbing	
SW14	H	H	L	H	H	X	○	X	P	X	Z	△		
SW9–SW12	ACKJOGIN ⑦ ··· H						RFOUT3 outputs signal from FRIN in each mode of SW9–12.							
	ACKJOGIN ⑦ ··· L						RFOUT3 outputs signal with the same channel for RFOUT1 in each mode of SW9–12.							

Description of input condition

X ..... Independent of H, L.
H ..... Control logic input, over 3V.
L ..... Control logic input, under 1V.
Only for ACKJOGIN
H ..... Input current over 25μA.
L ..... Input current under 5μA.

Description of operation mode

○ ..... Operating
X ..... Not operating. Power saving.
When VOLUME output is input to REC AMP (in REC mode)
V ..... VIDEO signal is output.
P ..... PCM signal is output.
In PB mode
CH-1 ... CH-1 signal is output.
CH-2 ... CH-2 signal is output.
Z ..... DC level is held in place.
△ ..... Current flows but no normal output is obtained.

Electrical Characteristics

*1 See the Control Logic Truth Table for control logic conditions. *2 See the Description of Circuit.

Ta = 25°C, VCC = 5V

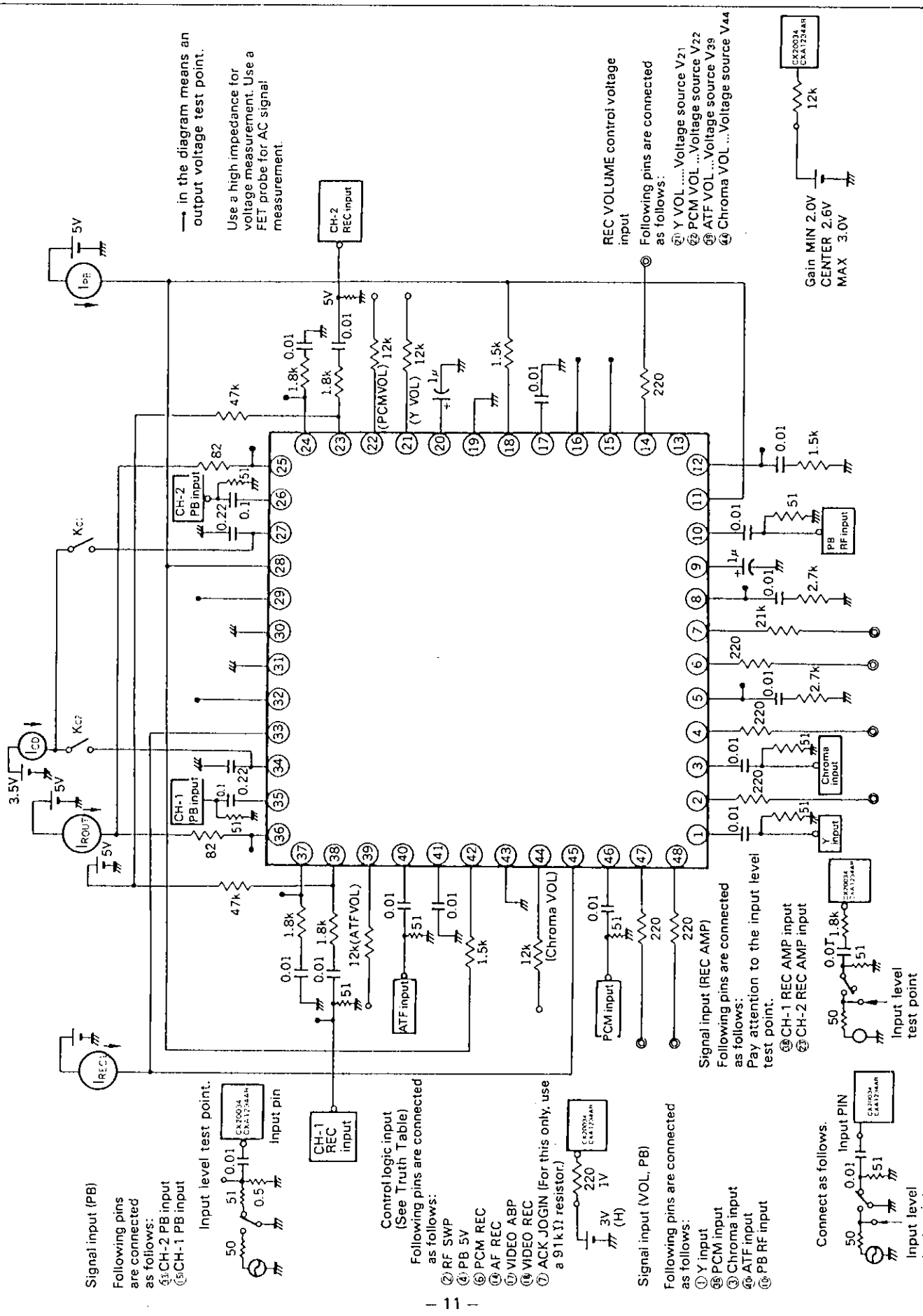
No.	Item	Symbol	Input condition *2 Input pin level · frequency	SW condition *1 Control logic condition	SW condition Other SW ON	Bias voltage V_{21} Y vol	Bias voltage V_{22} PCH vol	Bias voltage V_{44} Chroma vol	Bias voltage V_{39} ATF vol	Output pin Ammeter name	Test content	Min.	Typ.	Max.	Unit
1	REC mode total current (In both CH REC)	I_{RECB}		SW4		2.6V	2.6V	2.6V	2.6V	I_{REC1} + I_{PB}	In both CH REC, sum of I_{REC1} and I_{PB}, internal consumption current. (Excluding REC output current)	13.5	17.0	21.5	mA
2	PB mode total current	I_{PB}		SW9		↓	↓	↓	↓	I_{REC1} + I_{PB}	In both CH PB, sum of I_{REC1} and I_{PB}, internal consumption current.	14.0	17.5	22.5	mA
3	REC output bias current (CH1)	I_{OUT1}		SW3		↓	↓	↓	↓	I_{ROUT}	In each CH REC, REC output bias DC current (current flows through 82 Ω).	12.0	14.0	16.0	mA
	(CH2)	I_{OUT2}		SW2		↓	↓	↓	↓	↓					
4	PC1 CHARGE current (CH1)	I_{CC1}		SW5	K_{C1}	↓	↓	↓	↓	I_{CD}	In REC, assume CHARGE current PB— REC into the head amp bypass condenser (externally provided with CH-1 PC1, CH-2PC1). The current flow into the 3.5V power supply is measured.	−29.0	−22.0	−14.0	mA
	(CH2)	I_{CC2}		SW6	K_{C2}	↓	↓	↓	↓	↓					
5	PC1 DISCHARGE current (CH1)	I_{DC1}		SW10	K_{C1}	↓	↓	↓	↓	↓	In PB, assume DISCHARGE current REC— PB from the head amp bypass condenser (externally provided with CH-1 PC1, CH-2PC1). The current flow from the 3.5V power supply is measured.	28.0	34.0	40.0	mA
	(CH2)	I_{DC2}		SW9	K_{C2}	↓	↓	↓	↓	↓					
6	RF output 1DC voltage difference in switching inputs (CH-1, CH-2)	$\lvert\Delta V_{V12}\rvert$		SW11 — SW12		↓	↓	↓	↓	12	DC voltage difference of RF output 1 in switching input modes (|absolute value|)			40	mA
7	RF output 2 DC voltage difference in switching PB output in place (Setting CH-1, CH-2)	ΔV_{VM}		SW11-SW13 SW12-SW13		↓	↓	↓	↓	12	RF output 1 pin DC voltage. In normal PB output in DC setting mode.			90	mV
8	RF output 2 DC voltage difference in switching inputs (CH1 — CH2)	$\lvert\Delta V_{P12}\rvert$		SW11 — SW12		↓	↓	↓	↓	5	DC voltage difference of RF output 2 in switching input modes (|absolute value|)			30	mV
	<AC in REC system>														
9	Y VOL output level (MIN) (CH1)	Y_{1MIN}	1; −2dBm 1MHz	SW3		2.0V	2.6V	2.6V	2.6V	24	Output level in Y VOL GAIN MIN (Standard input level, 1 MHz)	−17.5	−16.3	−15.5	dBm
	(CH2)	Y_{2MIN}	↓; ↓ ↓	SW2		↓	↓	↓	↓	37					
10	Y VOL output level (TYP) (CH1)	Y_{1TYP}	↓; ↓ ↓	SW3		2.6V	↓	↓	↓	24	Output level in Y VOL GAIN TYP (Standard input level, 1 MHz)	−11.5	−10.5	−9.5	dBm
	(CH2)	Y_{2TYP}	↓; ↓ ↓	SW2		↓	↓	↓	↓	37					

No.	Item	Symbol	Input condition *2 Input pin level · frequency	SW condition *1Control logic condition	SW condition Other SW ON	Bias voltage V_{21} Y vol	Bias voltage V_{22} PCH vol	Bias voltage V_{44} Chroma vol	Bias voltage V_{39} ATF vol	Output pin Ammeter name	Test content	Min.	Typ.	Max.	Unit
11	Y VOL output level (MAX) (CH1)	Y_{1MAX}	1; −2dBm 1MHz	SW3		3.0V	2.6V	2.6V	2.6V	24	Output level in Y VOL GAIN MAX (Standard input level, 1 MHz)	−4.5	−1.8	+1.0	dBm
	(CH2)	Y_{2MAX}	↓ ↓ ↓	SW2		↓	↓	↓	↓	37					
12	Y VOL frequency response (TYP) (CH1)	ΔY_{1TYP}	↓ ↓ 1MHz	SW3		2.6V	↓	↓	↓	24	Output level drops during 1 − 10 MHz in Y VOL GAIN TYP			1.0	dB
	(CH2)	ΔY_{2TYP}	↓ ↓ 10MHz	SW2		↓	↓	↓	↓	37					
13	Y VOL (TYP) 2nd harmonic (CH1)	D_{Y1}	↓ ↓ 4MHz	SW3		↓	↓	↓	↓	24	2nd harmonic in Y VOL GAIN TYP (Standard input level, 4MHz)			−44	dB
	(CH2)	D_{Y2}	↓ ↓ 4MHz	SW2		↓	↓	↓	↓	37					
14	PCM VOL output level (MIN) (CH1)										Output level in PCM VOL GAIN MIN (Standard input level, 1MHz)	−17.5	−16.3	−15.5	dBm
	(CH2)	P_{2MIN}	46; −2dBm 1MHz	SW6		↓	2.0V	↓	↓	37					
15	PCM VOL output level (TYP) (CH1)										Output level in PCM VOL GAIN TYP (Standard input level, 1MHz)	−11.5	−10.5	−9.5	dBm
	(CH2)	P_{2TYP}	↓ ↓ ↓	SW6		↓	2.6V	↓	↓	37					
16	PCM VOL output level (MAX) (CH1)										Output level in PCM VOL GAIN MAX (Standard input level, 1MHz)	−4.5	−1.8	+1.0	dBm
	(CH2)	P_{2MAX}	↓ ↓ ↓	SW6		↓	3.0V	↓	↓	37					
17	PCM VOL frequency response (TYP) (CH1)	ΔP_{1TYP}	↓ ↓ 1MHz, 10MHz,	SW5		↓	2.6V	↓	↓	24	Output level drops during 1 to 10MHz in PCM VOL GAIN TYP.			1.0	dB
	(CH2)	ΔP_{2TYP}	↓ ↓ 1MHz, 10MHz,	SW6		↓	↓	↓	↓	37					
18	PCM VOL (TYP) 2nd harmonic (CH1)	D_{P1}	↓ ↓ 4MHz	SW5		↓	↓	↓	↓	24	2nd harmonic in PCM VOL GAIN TYP. (Standard input level, 4MHz).			−42	dB
	(CH2)	D_{P2}	↓ ↓ 4MHz	SW6		↓	↓	↓	↓	37					
19	Chroma VOL output level (MIN) (CH1)										Output level in chroma VOL GAIN MIN (Standard input level, 750kHz)	−29.7	−28.9	−28.2	dBm
	(CH2)	C_{2MIN}	3; −12 dBm 750 kHz	SW2		↓	↓	2.0V	↓	37					
20	Chroma VOL output level (TYP) (CH1)	C_{1TYP}	↓ ↓ ↓	SW3		↓	↓	2.6V	↓	24	Output level in chroma VOL GAIN TYP (Standard input level, 750kHz)	−24.6	−23.8	−23.0	dBm
21	Chroma VOL output level (MAX) (CH1)										Output level in chroma VOL GAIN MAX (Standard input level, 750kHz)	−19.0	−17.5	−15.8	dBm
	(CH2)	C_{2MAX}	↓ ↓ ↓	SW2		↓	↓	3.0V	↓	37					
22	Chroma VOL (TYP) 2nd harmonic (CH1)	D_{C1}	↓ ↓ ↓	SW3		↓	↓	2.6V	↓	24	2nd harmonic of chroma VOL GAIN TYP. (Standard input level, 750kHz).			−44	dB
	(CH2)	D_{C2}	↓ ↓ ↓	SW2		↓	↓	2.6V	↓	37					
23	ATF VOL output level (MIN) (CH1)	A_{1MIN}	40; −2 dBm 100 kHz	SW3		↓	↓	↓	2.0V	24	Output level in ATF VOL GAIN MIN (Standard input level, 100kHz)	−44.0	−43.2	−42.0	dBm
	(CH2)	A_{2MIN}	↓ ↓ ↓	SW2		↓	↓	↓	↓	37					

No.	Item		Symbol	Input condition *2 Input pin level · frequency	SW condition *1 Control logic condition	SW condition Other SW ON	Bias voltage V_{21} Y vol	Bias voltage V_{22} PCH vol	Bias voltage V_{44} Chroma vol	Bias voltage V_{39} ATF vol	Output pin Ammeter name	Test content	Min.	Typ.	Max.	Unit
24	ATF VOL output level (MIN)	(CH1)	A_{1MAX}	40; −2dBm 100kHz	SW3		2.6V	2.6V	2.6V	3.0V	24	Output level in ATF VOL GAIN MAX (Standard input level, 100kHz)	−31.0	−29.0	−27.0	dBm
		(CH2)	A_{2MAX}	↓; ↓ ↓	SW2		↓	↓	↓	↓	37					
25	ATF VOL 2nd harmonic (MAX)	(CH1)	D_{A1}	↓; ↓ ↓	SW3		↓	↓	↓	↓	24	2nd harmonic in ATF VOL GAIN MAX. (Standard input level, 100kHz).			−40	dB
		(CH2)	D_{A2}	↓; ↓ ↓	SW2		↓	↓	↓	↓	37					
26	REC AMP output level	(CH1)	R_1	23; −10 dBm 1MHz	SW3		↓	↓	↓	2.6V	25	Output voltage level when REC AMP 82 Ω is loaded (−10dBm, 1MHz input)	−16.5	−15.3	−14.0	dBm
		(CH2)	R_2	38; ↓ ↓	SW2		↓	↓	↓	↓	36					
27	REC AMP frequency response	(CH1)	ΔR_1	23; ↓ 1MHz 10MHz	SW3		↓	↓	↓	↓	25	Output level drops during 1 to 10MHz when REC AMP 82 Ω is loaded.			2.0	dB
		(CH2)	ΔR_2	38; ↓ 1MHz 10MHz	SW3		↓	↓	↓	↓	36					
28	REC AMP	(CH1)	DR_1	23; ↓ 4MHz	SW3		↓	↓	↓	↓	25	2nd harmonic when REC AMP 82 Ω is loaded. (−10dBm input, 4MHz).		−48	−38	dB
		(CH2)	DR_2	38; ↓ ↓	SW2		↓	↓	↓	↓	36					
29	REC AMP channel balance		$\lvert\Delta R_{12}\rvert$	23; ↓ 1MHz	SW3		↓	↓	↓	↓	25	Output voltage level difference between CH-1 and CH-2 when REC AMP 82 Ω is loaded. (Absolute value) (−10dBm input, 4MHz).			0.7	dB
				38; ↓ ↓	SW2		↓	↓	↓	↓	36					
	< AC in PB system >															
30	RF output 1 output level	(CH2)	P_{B12}	35; −69.5 dBm 1MHz	SW9		2.6V	2.6V	2.6V	2.6V	12	RF output 1 output level (−69.5 dBm input, 1MHz)	−8.5	−6.3	−4.5	dBm
31	RF output 2 output level	(CH1)	P_{B21}	26; ↓ ↓	SW9		↓	↓	↓	↓	5	RF output 2 output level (−69.5 dBm input, 1MHz)	−14.5	−12.0	−10.5	dBm
		(CH2)	P_{B22}	35; ↓ ↓	SW10		↓	↓	↓	↓	5					

No.	Item	Symbol	Input condition *2 Input pin level · frequency	SW condition *1 Control logic condition	SW condition Other SW ON	Bias voltage V_{21} Y vol	Bias voltage V_{22} PCH vol	Bias voltage V_{44} Chroma vol	Bias voltage V_{39} ATF vol	Output pin Ammeter name	Test content	Min.	Typ.	Max.	Unit
32	RF output 2 frequency response (CH1)	ΔP_{B21}	26; −69.5dBm 1MHz	SW9		2.6V	2.6V	2.6V	2.6V	5	Output level drops during 1 to 10MHz in RF output 2 output.			2.7	dB
	(CH2)	ΔP_{B22}	35; ↓ ↓	SW10		↓	↓	↓	↓	5					
33	RF output 3 output level (CH1)	P_{B31}	26; ↓ ↓	SW10 7pin−L		↓	↓	↓	↓	8	RF output 3 output level (−69.5dBm input, 1MHz)	−14.5	−12.0	−10.5	dBm
	(CH2)	ΔP_{B32}	35; ↓ ↓	SW9 7pin−L		↓	↓	↓	↓	8					
34	RF output 3 frequency response (CH1)	ΔP_{B31}	26; ↓ ↓	SW10 7pin−L		↓	↓	↓	↓	8	Output level drops during 1 to 10MHz in RF output 3 output.			3.2	dB
	(CH2)	ΔP_{B32}	35; ↓ ↓	SW9 7pin−L		↓	↓	↓	↓	8					
35	RF output 3 output level of RFIN input	P_{B3AJ}	10; −12 dBm ↓	SW10 7pin−H		↓	↓	↓	↓	8	1MHz output level in RFIN — RF output 3 modes.	−12.9	−12.1	−11.6	dBm
36	RF output 3 output frequency response of RFIN input	ΔP_{B3AJ}	10; ↓ 1MHz, 10MHz	SW10 7pin−H		↓	↓	↓	↓	8	Output level drops during 1 to 10MHz in RFIN — RF output 3 modes.			22	dB

Electrical Characteristics Test Circuit



Description of Operations

The CX20034/CXA1234AR has following functional blocks.

1. REC, VOL + SW section.
2. REC AMP section.
3. PB HEAD AMP section.
4. PB 2nd RF AMP + SW section.
5. CONTROL LOGIC section.

The CX20034/CXA1234AR has 4 power supply and GND pairs for above systems, 1, 2, 3, and 4, 5 (common). The following is a description for each block.

<REC VOL + SW>

Here, each of the Y, Chroma, PCM and ATF signals are input and the VIDEO + ATF and PCM + ATF signals are generated with the level matched in the head to the correct current and they are output with the correct timing to the CH-1 and CH-2 signal output pins.

In the VOL section, the DC voltage (0.4Vcc to 0.6Vcc, Open not allowable) is applied to each VOL terminal and controls the gain of the 4 inputs independently. In SW, the signal is output to the CH-1 and CH-2 signal output pins in the REC and after recording modes under control of the control logic section.

<REC AMP>

The REC VOL + SW output is input after it is converted into a suitable current by an external resistor, to drive the head. Adjustment of the external resistor makes it possible to set a gain and DC bias current to match that of the head. (Refer to the Example of Application Circuit).

Take care that capacitance coupling will not occur across the input and output.

<PB HEAD AMP>

The playback signal from the head is amplified with low-noise and high gain. For example, the equivalent input noise level at 1MHz is 696pV/$\sqrt{\text{Hz}}$ (Typ). The C/D (Charge/Discharge) circuit is a circuit used to rapidly charge or discharge the head amp bypass condenser.

In switching from PB to REC, it serves to shorten the switching time by rapidly injection current to the bypass condenser for PC1 PIN, and intake current in switching from REC to PB. The switching time is determined by bypass condenser for PC1 and LPC. Selection of values 0.22μF for the PC1 and 0.01μF for LPC, makes it possible to switch within 1 H ($\simeq$ 64 μs).

In PB, the total input capacitance will be about 82pF. (Fig.3 example of Application Circuit). However, this capacitance will increase when there is a capacitance coupling across the head input and output. Be careful about the relations between the later stages (RF outputs 1, 2, 3 etc.) and input or between the other channel outputs and inputs.

- Connect a bypass condenser for CH-1 PC1 and CH-2 PC1 between them and the rotary transformer Vcc.

<PB 2nd RF AMP + SW>

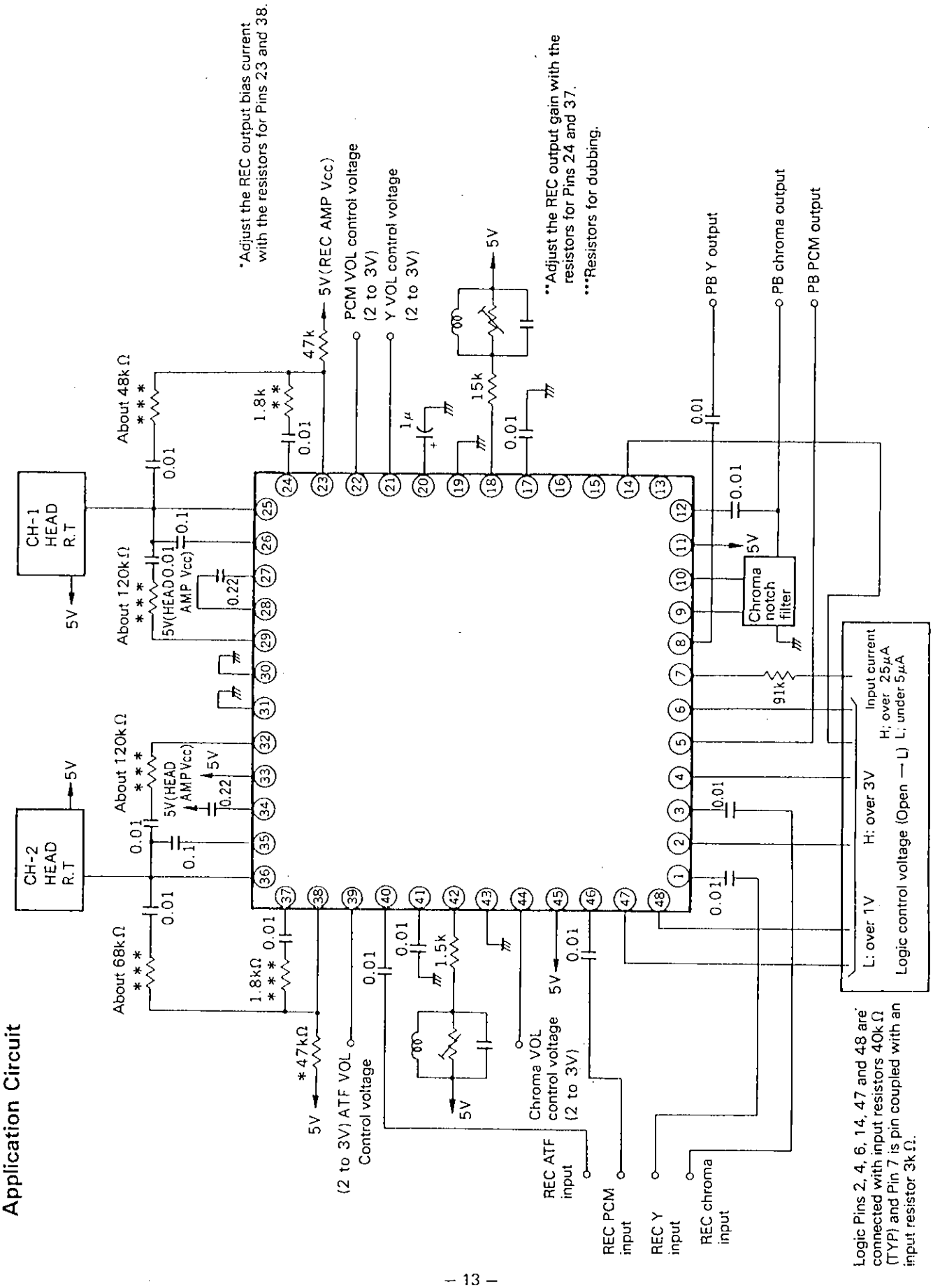
The playback signal from the head amp is further amplified here and the playback signal is output with the correct timing to the RF outputs 1, 2 and 3 under the control logic section.

<CONTROL LOGIC>

The IC is controlled from this section so it will save power when circuit blocks are not in use. Therefore, power saving is automatically executed when all the power supplies are switched on. Many SWs are also available to switch inputs or outputs with complicated timings; internal logic circuits to control them are provided.

With the 14 modes shown in the control logic condition table, all input and output combinations required for basic operations are satisfied. L is set when the control logic pin is open.

Application Circuit

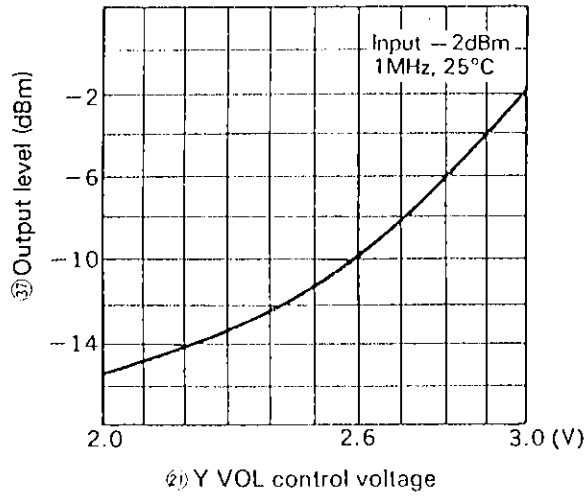


Y VOL + SW Typical Performance Curves

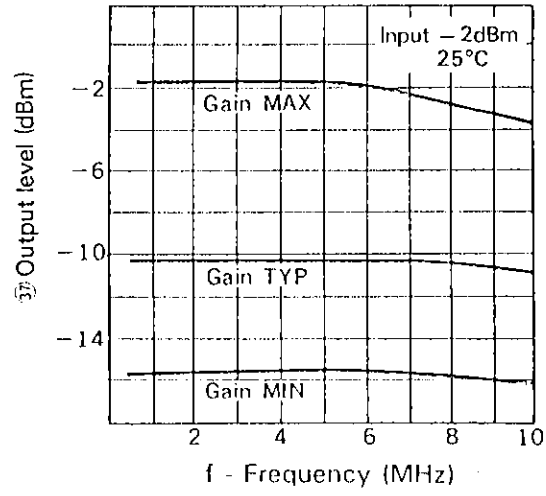
(Pin①input → Pin㊲ output,
with Pin 21 controlling gain.

Control voltage 2.0V → Minimum gain.
2.6V → Typical gain.
3.0V → Maximum gain.

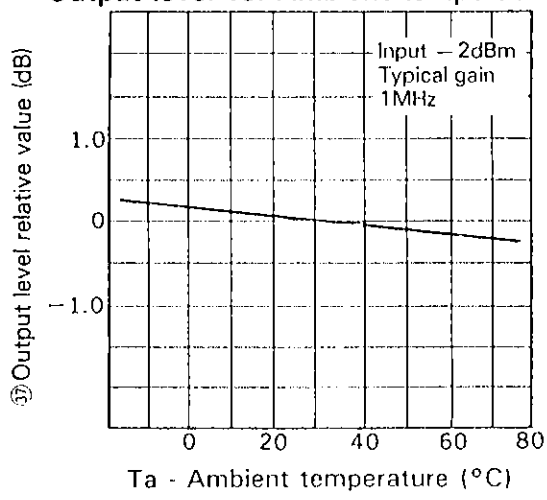
Output level vs. Y VOL control voltage



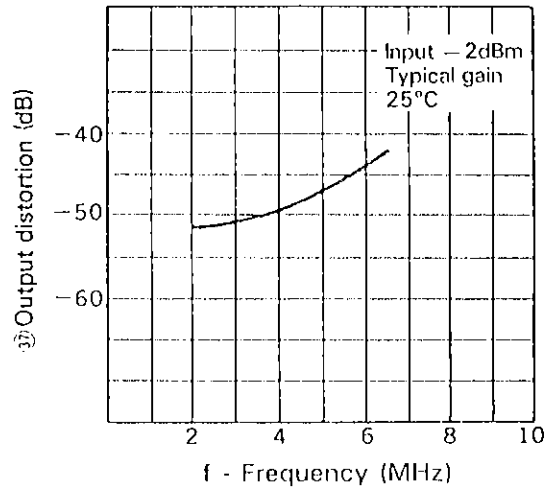
Output level vs. Frequency



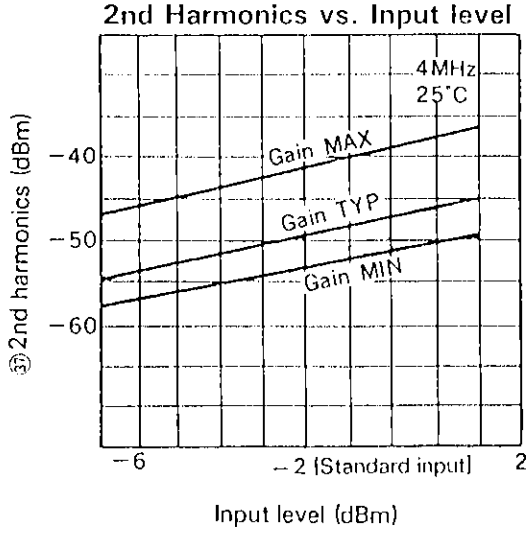
Output level vs. Ambient temperature



2nd Harmonics



2nd Harmonics vs. Input level

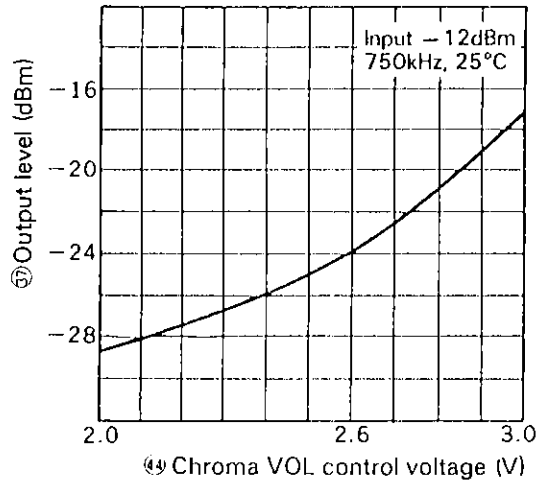


Chroma VOL + SW Typical Performance Curves

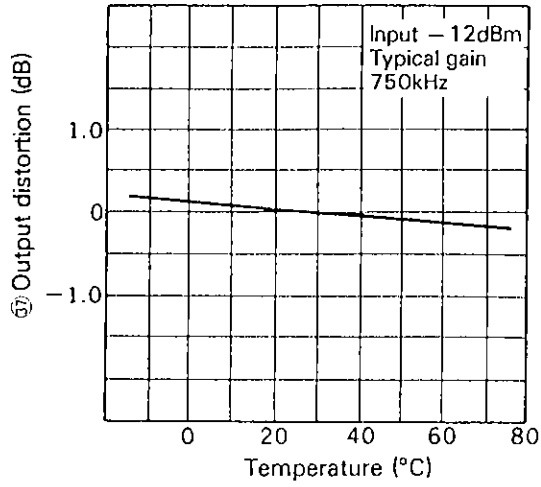
(Pin③input → Pin㊲ output,
with Pin 44 controlling gain.

Control voltage 2.0V → Minimum gain.
2.6V → Typical gain.
3.0V → Maximum gain.

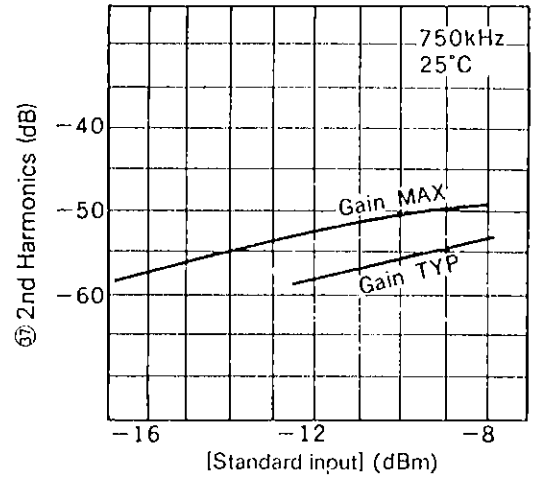
Output level vs. Chroma VOL control voltage



Output level vs. Temperature



2nd Harmonics vs. Input level

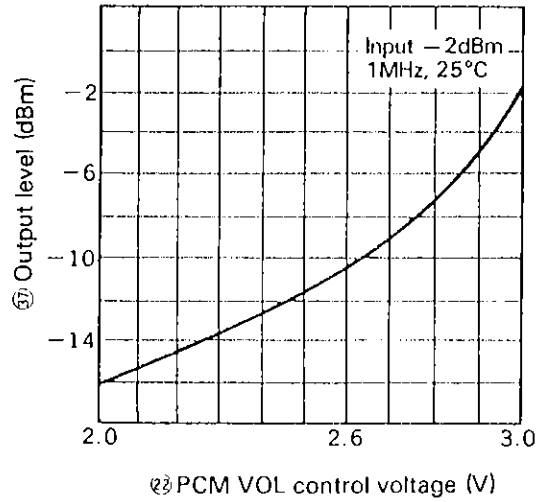


PCM VOL + SW Typical Performance Curves

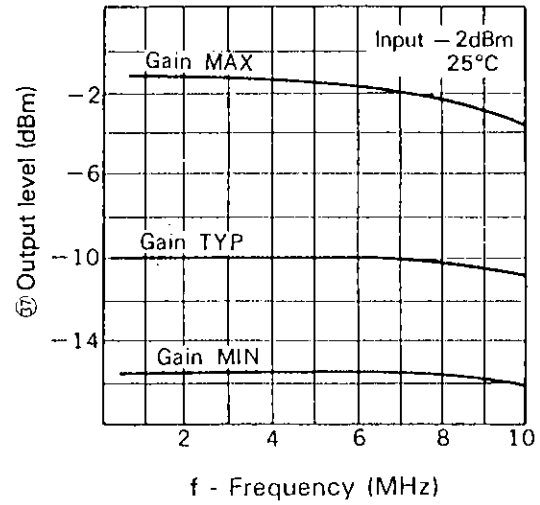
(Pin 46 input → Pin 37 output,
with Pin 22 controlling gain.

Control voltage 2.0V → Minimum gain.
2.6V → Typical gain.
3.0V → Maximum gain.

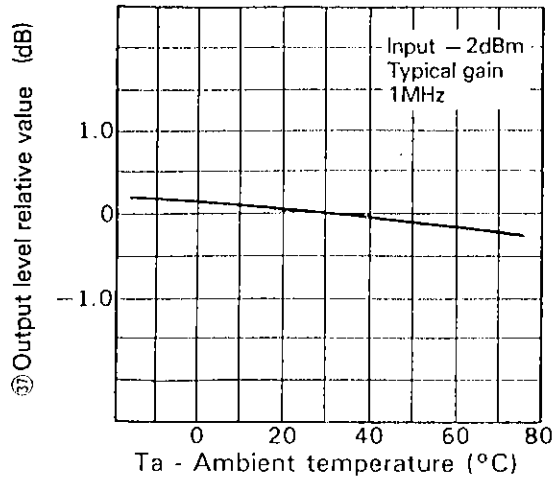
Output level vs. PCM VOL control voltage



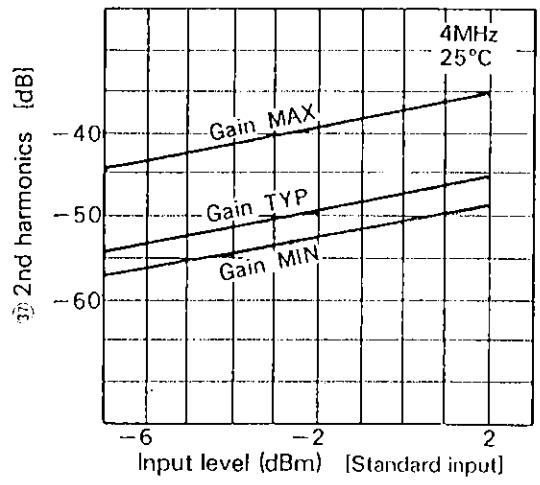
Output level vs. Frequency



Output level vs. Ambient temperature



2nd Harmonics vs. Input level

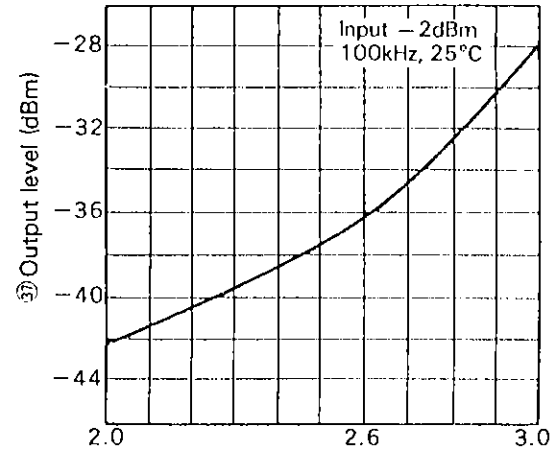


ATF VOL + SW Typical Performance Curves

(Pin ㊵ input → Pin ㊲ output,
with Pin 39 controlling gain.

Control voltage 2.0V → Minimum gain.
2.6V → Typical gain.
3.0V → Maximum gain.

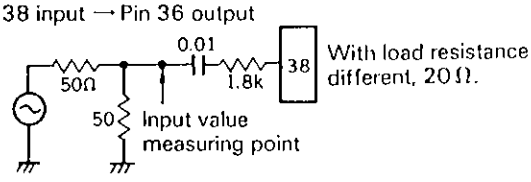
Output level vs. Control voltage



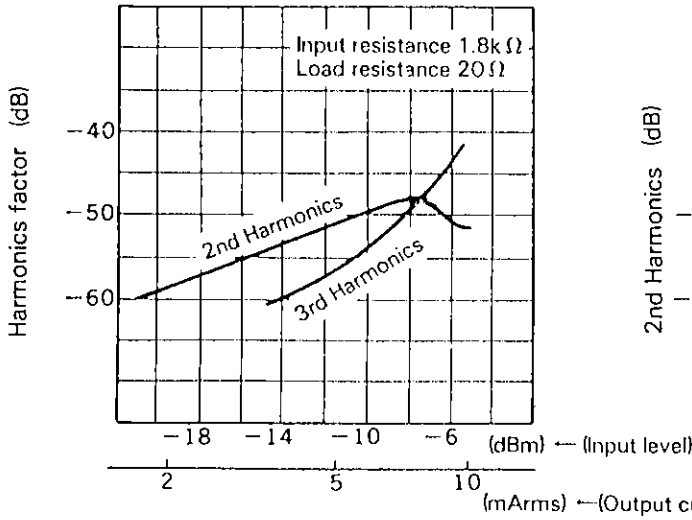
(Vcc = 5.0V, 4MHz, 25°C)

REC AMP Reference Characteristics

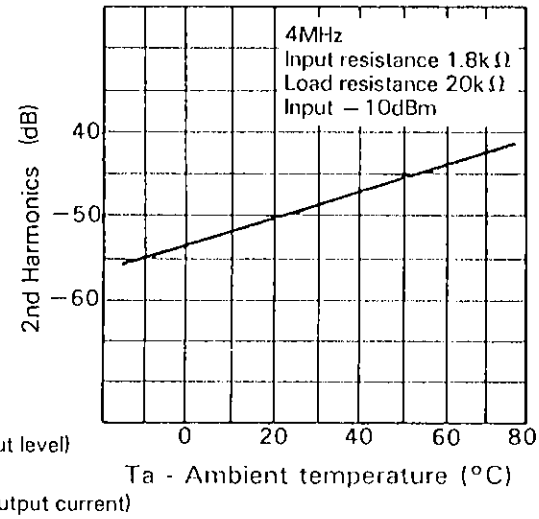
Pin 38 input → Pin 36 output



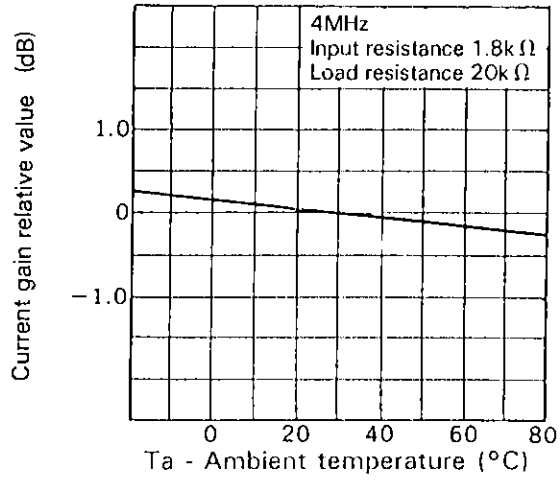
Distortion factor vs. Input level, Output current



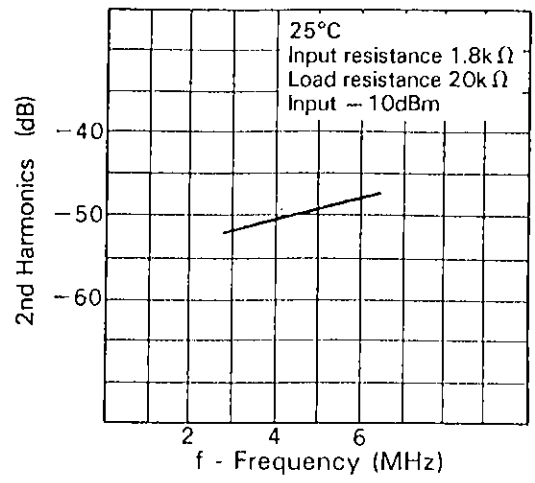
2nd Harmonics vs. Ambient temperature



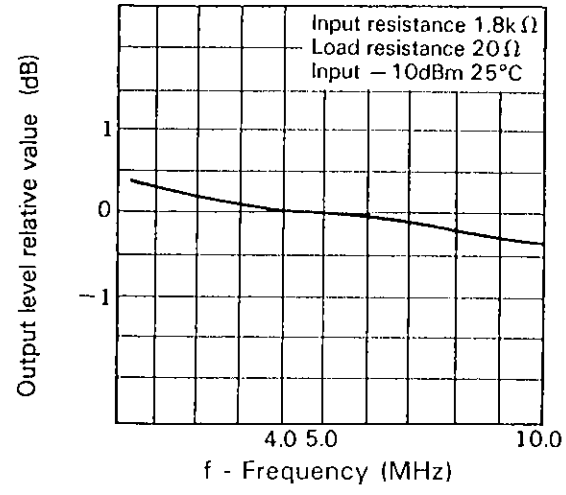
Current gain vs. Ambient temperature



2nd Harmonics vs. Frequency



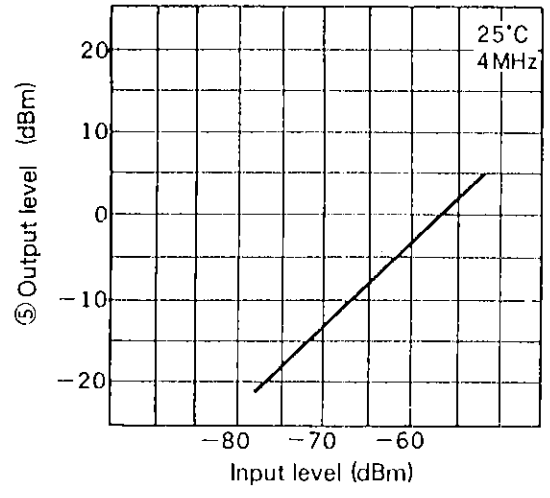
Output level relative value vs. Frequency



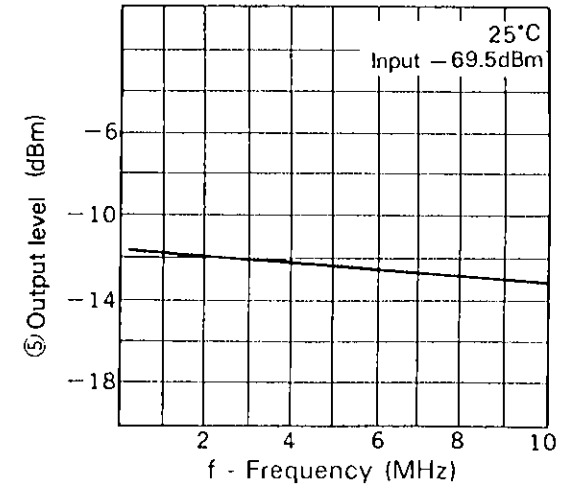
PB Typical Performance Curves

With Vcc = 5.0V in the Electrical Characteristics measuring Circuit, Pin 35 input → Pin 5 output.

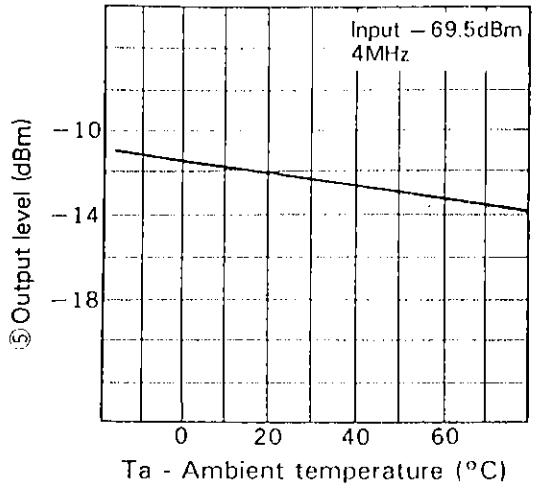
RF output 2 output level vs. PB input level



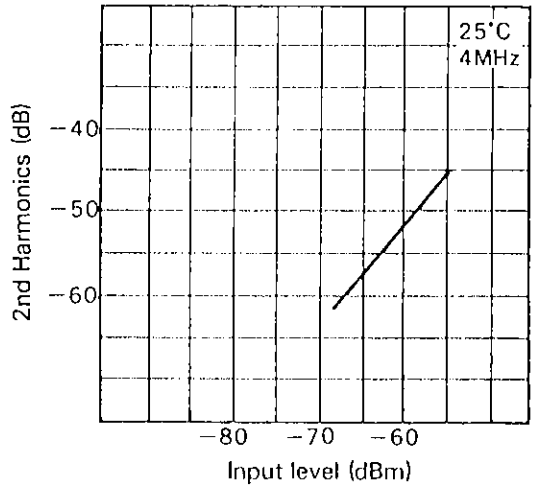
RF output 2 output level vs. Frequency



RF output 2 output level vs. Ambient temperature

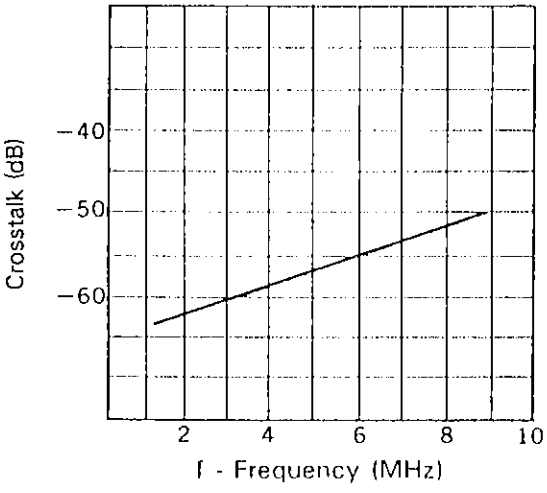


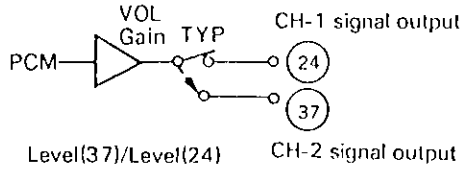
2nd Harmonics vs. Input level

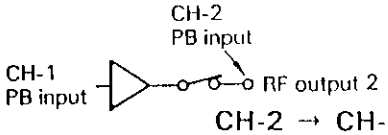


Crosstalk Typical Performance Curves

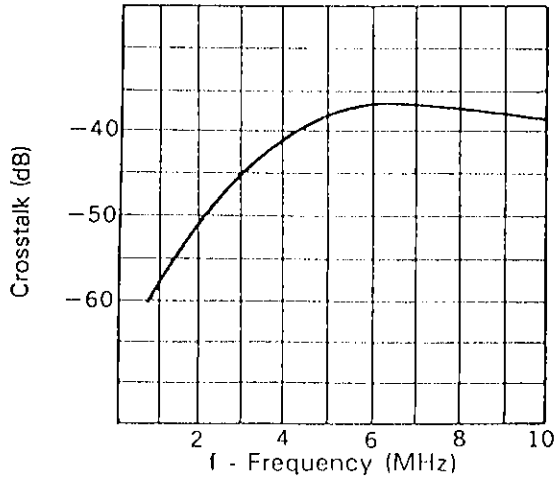
REC PCM VOL + SW crosstalk vs. Frequency

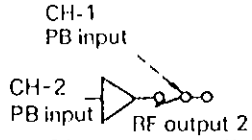




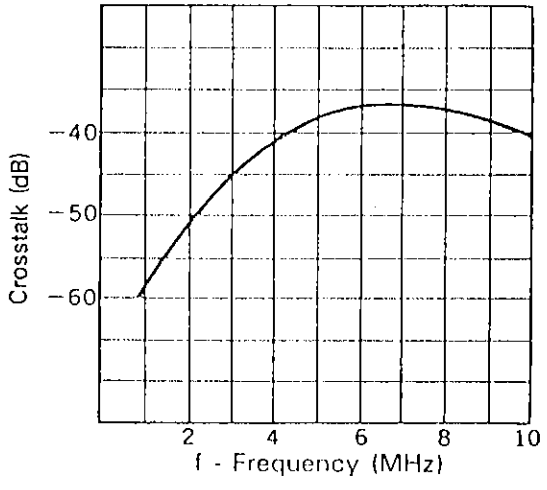


CH-2 → CH-1 crosstalk with PB RF output 2 vs. Frequency

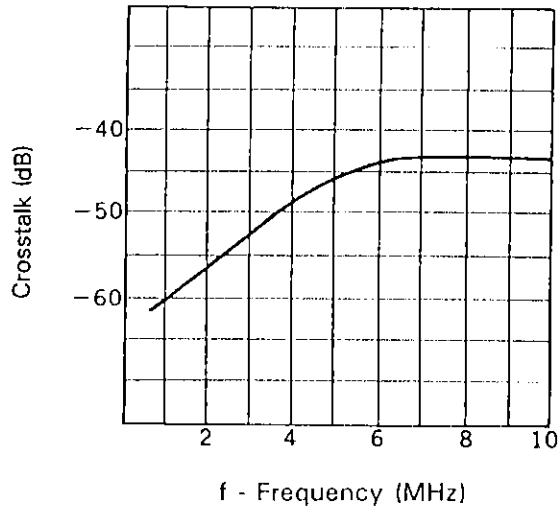




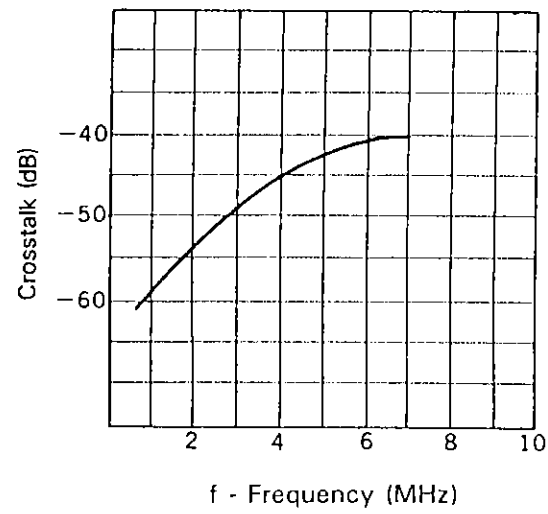
CH-1 → CH-2 crosstalk with PB RF output 2 vs. Frequency



CH-2 → CH-1 crosstalk with
PB RF OUTPUT 3 vs. Frequency

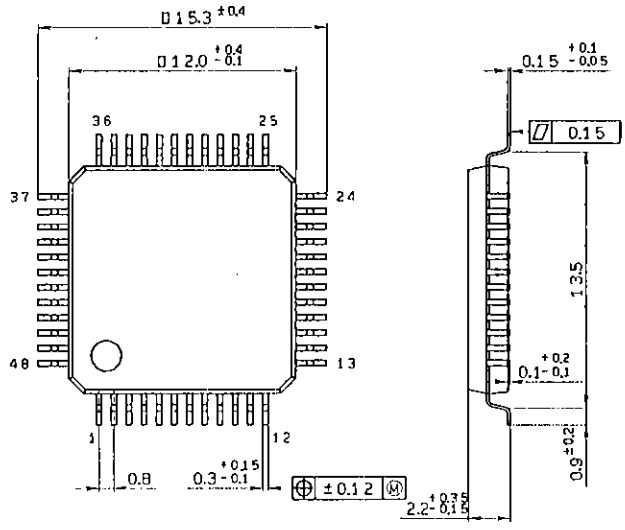


CH-1 → CH-2 crosstalk with
PB RF OUTPUT 3 vs. Frequency



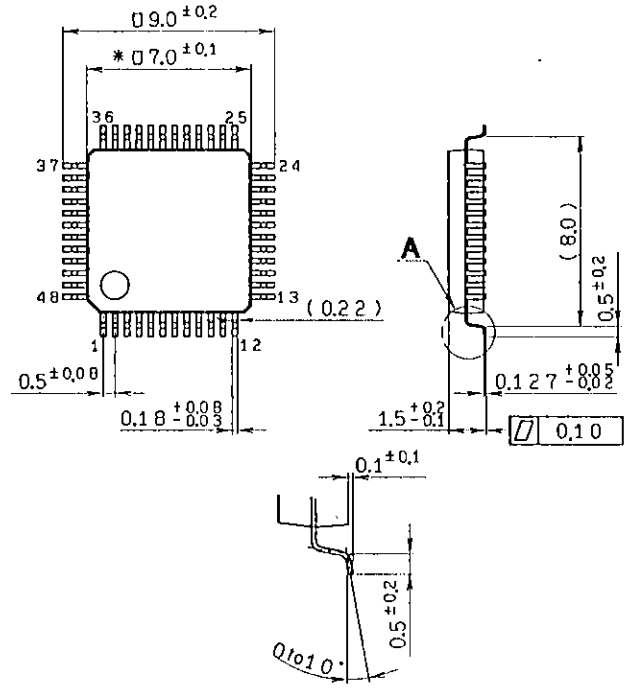
Package Outline Unit : mm

CX20034 48pin QFP(Plastic) 0.6g



QFP-48P-L04

CXA1234AR 48pin VQFP(Plastic) 0.2g



VQFP-48P-L01

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