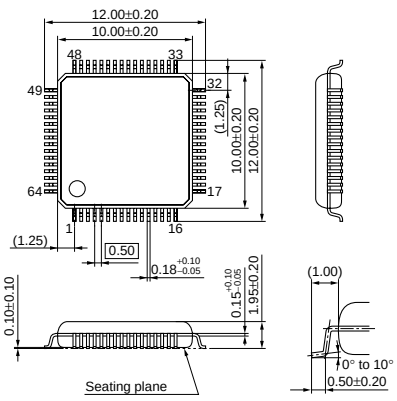
AN2492FH

Luminance and chrominance signal processing circuit for 8 mm video (NTSC)

Unit: mm



QFP064-P-1010

■ Overview

The AN2492FH is a single chip LSI on which Y/C main signal processing circuit of NTSC normal 8 mm VCR is integrated. It is possible to reduce the system cost drastically thanks to the introduction of an external filter on to the chip and fc auto adjustment.

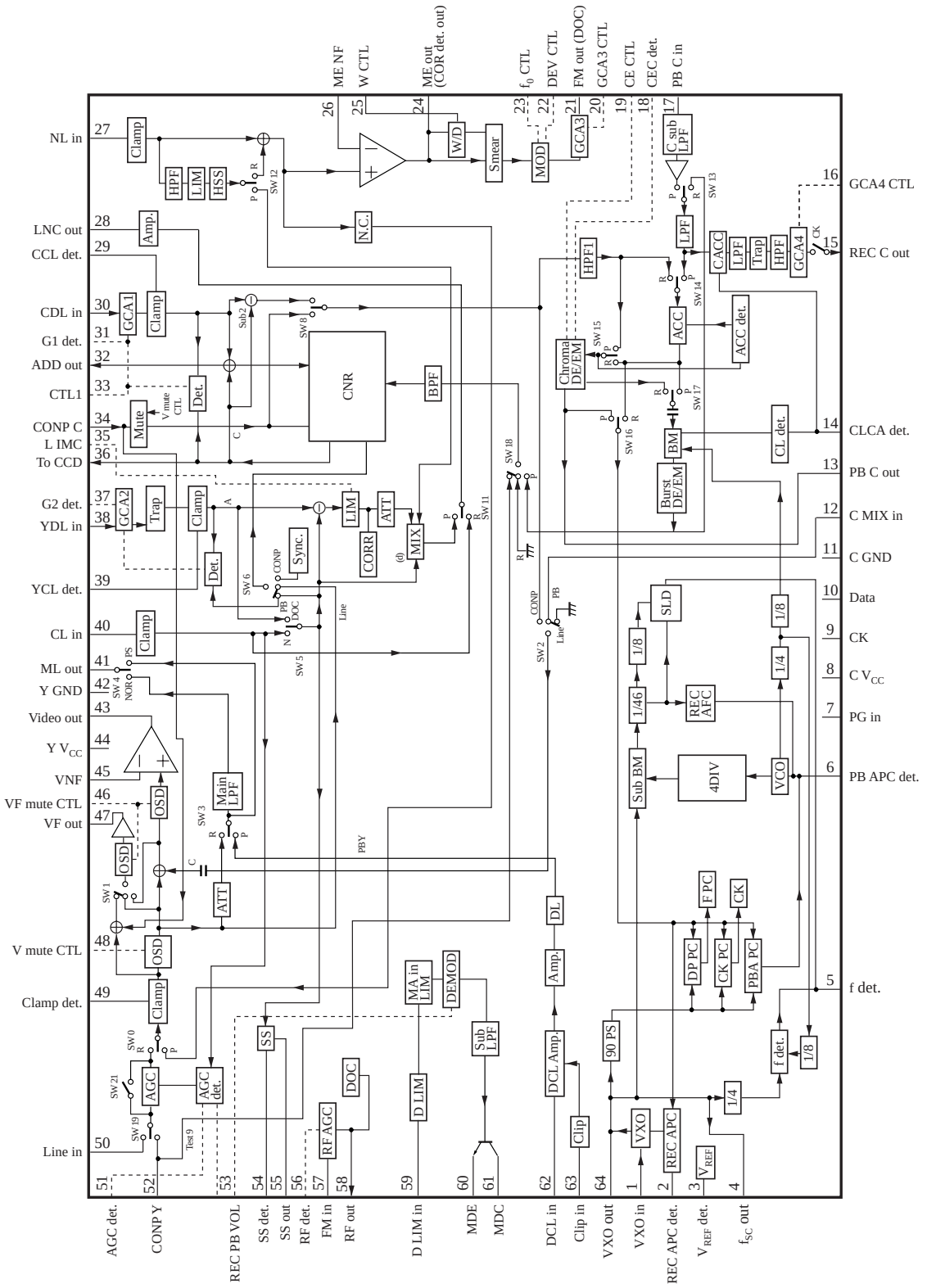
■ Features

- 5 V single power supply
- Reduction of the external components and adjusting parts by adopting automatic adjustment filter
- No need of glass delay lines
- For NTSC (PAL: AN2493 pin-compatible)

■ Applications

- 8 mm VCR, 8 mm video camera

■ Block Diagram



■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	VXO in	33	GCA1 CTL
2	REC APC det.	34	CONP C
3	V_{REF} det.	35	LIMC
4	f_{SC} out	36	To CCD
5	f det.	37	G2 det.
6	PB APC det.	38	YDL in
7	PG in.	39	YCL det.
8	C V_{CC}	40	CL in
9	CK	41	ML out
10	Data	42	Y GND
11	C GND	43	Video out
12	C MIX in	44	Y V_{CC}
13	PB C out	45	VNF
14	CLCA det.	46	VF mute CTL
15	REC C out	47	VF out (BGP out)
16	GCA4 CTL	48	V mute CTL
17	PB C in	49	Clamp det.
18	CEC det.	50	Line in
19	Chroma emph. CTL	51	AGC det.
20	GCA3 CTL (APT CTL)	52	CONP Y
21	FM out (DOC)	53	REC PB VOL
22	DEV CTL	54	SS det.
23	f_0 CTL	55	SS out
24	ME out (COR det. out)	56	RF det.
25	W CTL	57	FM in
26	MENF	58	RF out
27	NL in	59	DLIM in
28	LNC out	60	MD E
29	CCL det.	61	MD C
30	CDL in	62	DCL in
31	G1 det.	63	Clip in
32	ADD out	64	VXO out

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	5.5	V
Supply current	I_{CC}	100	mA
Power dissipation *2	P_D	359	mW
Operating ambient temperature *1, *3	T_{opr}	−10 to +70	°C
Storage temperature *1	T_{stg}	−55 to +125	°C

Note) *1: Except for the power dissipation, operating ambient temperature and storage temperature, all ratings are for T_a = 25°C.

*2: The power dissipation shown is for the IC package at T_a = 70°C.

P_D = 696 (mW) (T_a = 70°C) in mounting on the glass epoxy printed circuit board of 50 × 50 × 0.8 (mm).

*3: P_D = 471 (mW) at supply voltage V_{CC} = 4.8 V.

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	4.7 to 5.2	V

■ Electrical Characteristics at V_{CC} = 4.8 V, T_a = 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Consumption current 1	I_{CC1}	Consumption current for recording	52	72	92	mA
Consumption current 2	I_{CC2}	Consumption current for playback	58	78	98	mA
Consumption current 3	I_{CC3}	Power save mode	42	62	82	mA
Consumption current 4	I_{CC4}	Camera power save mode	−8	−4.2	−1	mA
Internal reference voltage source	V_{REF}	Pin 3 voltage	—	2.5	—	V
REC overall	V_{ME}	Adjust pin 53 to set pin 47 output at 1 V[p-p]	−14	−12	−10	dB
Y-AGC control characteristics	ΔV_{AGC}	Pin 47 output gain ratio with input 0.5 V[p-p] and 2.0 V[p-p]	−1.5	0	1.5	dB
Y-AGC through mode	V_{26S}	Pin 24 output at pin 50 input	200	250	300	mV[p-p]
View finder amp. frequency characteristics	f_{BA}	Output ratio of 5 MHz/100 kHz at input 100 kHz, 5 MHz	−1.5	0	1.5	dB
Video-OSD white mute level	V_{OW}	DC voltage based on a pedestal level	56	68	80	IRE
Video-OSD black mute level	V_{OB}	DC voltage based on a pedestal level	−7	0	12	IRE
Video-OSD white mute CTL voltage	V_{48W}	Pin 48 input at inserting a record character	3.6	—	4.8	V
Video-OSD black mute CTL voltage	V_{48B}	Pin 48 input at inserting a record character	2.0	—	2.6	V
Video-OSD through CTL voltage	V_{48S}	Pin 48 input at inserting a record character	0	—	1.0	V

■ Electrical Characteristics at V_{CC} = 4.8 V, T_a = 25°C (continued)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Video-OSD quasi V level	V_{OV}	DC voltage difference based on sync. tip in PB mode	–100	–50	0	mV
Video-OSD quasi V mute CTL voltage	V_{48V}	PB mode, pin 48 input	2.0	—	4.8	V
Video-OSD through CTL voltage	V_{48G}	PB mode, pin 48 input	0	—	1.0	V
Y-main-LPF frequency characteristics 1	Df_{ML1}	Input: 100 kHz, 2.5 MHz Output: 2.5 MHz/100 kHz	–5	–2	2	dB
Y-main-LPF frequency characteristics 2	Df_{ML2}	Input: 100 kHz, 3.58 MHz Output: 3.58 MHz/100 kHz	—	—	–25	dB
Video amp. output amplitude	V_{VO}	VF out 1 V[p-p] adjustment	1.75	2.0	2.25	V[p-p]
Video amp. frequency characteristics	f_{VI}	Input: 100 kHz, 5 MHz Output: 5 MHz/100 kHz	–1.5	0	1.5	dB
View finder OSD white mute level	V_{BOW}	DC voltage based on a pedestal level	56	68	80	IRE
View finder OSD black mute level	V_{BOB}	DC voltage based on a pedestal level	–7	0	12	IRE
View finder OSD white mute CTL voltage	V_{46W}	Pin 48 = 0 V at inserting the display characters	3.6	—	4.8	V
View finder OSD black mute CTL voltage	V_{46B}	Pin 48 = 0 V at inserting the display characters	2.0	—	2.6	V
View finder OSD through CTL voltage	V_{46S}	Pin 48 = 0 V at inserting the display characters	0	—	1.0	V
View finder OSD quasi V level	V_{BOV}	DC voltage based on sync. tip in PB mode	–60	–20	20	mV
View finder OSD quasi V mute CLT voltage	V_{B48V}	PB mode, pin 48 input	2.0	—	4.8	V
View finder OSD through CTL voltage	V_{B48S}	PB mode, pin 48 input	0	—	1.0	V
PB OSD white mute level	V_{POW}	DC voltage based on a pedestal level	56	68	80	IRE
PB OSD black mute level	V_{POB}	DC voltage based on a pedestal level	–7	0	12	IRE
PB OSD white mute CTL voltage	V_{46W}	Pin 48 = 0 V at inserting the display characters	3.6	—	4.8	V
PB OSD black mute CTL voltage	V_{46B}	Pin 48 = 0 V at inserting the display characters	2.0	—	2.6	V
PB OSD through CTL voltage	V_{46S}	Pin 48 = 0 V at inserting the display characters	0	—	1.0	V
PB OSD off	V_{VOO}	Pin 48 = 0 V at inserting the display characters	1.75	2.0	2.25	V[p-p]
Sync. separation min. input sensitivity	V_{SS}	Input sync. level	—	—	65	mV[p-p]
Sync. separation pulse delay amount	t_{SS}	Measurement of sync. delay at pin 40 and pin 55	560	760	960	ns

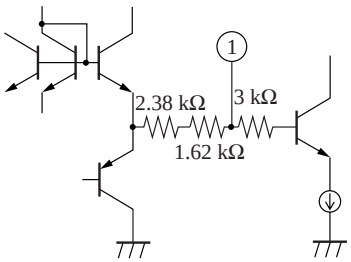
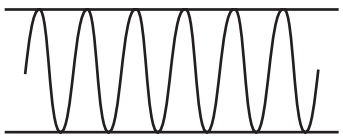
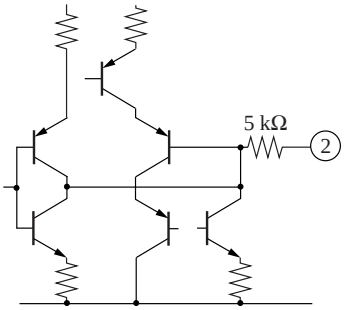
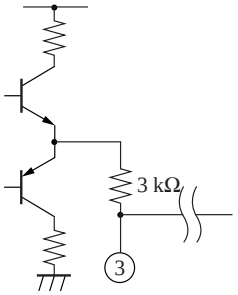
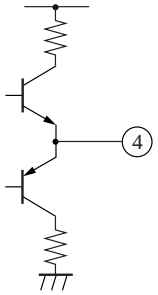
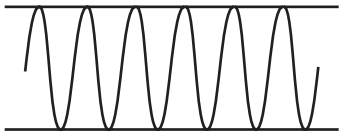
■ Electrical Characteristics at V_{CC} = 4.8 V, T_a = 25°C (continued)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Sync. separation output amplitude 1	V_{SSH}	Pin 55 output amplitude	4.0	—	—	V
Sync. separation output amplitude 2	V_{SSL}	Pin 55 output amplitude	—	—	0.4	V
Non linear emphasis 1	f_{RNL1}	Input: 0 dB, output: 1 MHz/10 kHz	1.0	3.0	5.0	dB
Non linear emphasis 2	f_{RNL2}	Input: −10 dB, output: 1 MHz/10 kHz	3.7	6.2	8.7	dB
Non linear emphasis 3	f_{RNL3}	Input: −20 dB, output: 1 MHz/10 kHz	6.3	9.3	12.3	dB
Non linear de-emphasis 1	f_{PNL1}	Input: 0 dB, output: 1 MHz/10 kHz	–5.0	–3.0	–1.0	dB
Non linear de-emphasis 2	f_{PNL2}	Input: −10 dB, output: 1 MHz/10 kHz	–10	–7.5	–5.0	dB
Non linear de-emphasis 3	f_{PNL3}	Input: −20 dB, output: 1 MHz/10 kHz	–11.5	–8.5	–5.5	dB
Dark clip level	V_{CD}	Fixed	90	100	110	%
White clip level	V_{CW}	Adjust at pin 25	—	220	—	%
FM carrier interleave	V_{CI}	Apply voltage to pin 7	—	1.64	—	mV[p-p]
FM modulator oscillation frequency	f_0	Adjust at pin 23	—	4.2	—	MHz
FM modulator deviation CTL	f_{DEV}	Apply voltage to pin 27, adjust at pin 22	—	2.4	—	MHz/V
FM modulator secondary distortion	$2f_{FM}$	Pin 21 output	—	—	–30	dB
Y-FM-GCA output amplitude 1	V_{FMS}	Pin 20 = 0 V	—	—	100	mV[p-p]
Y-FM-GCA output amplitude 2	V_{FML}	Pin 20 = 4.8 V	370	—	—	mV[p-p]
PB-Y-RFAGC output amplitude	V_{58}	Input 50 mV[p-p], 200 mV[p-p], f = 5 MHz	345	420	495	mV[p-p]
PB-Y-RFAGC output secondary distortion	$2f_{58}$	Input 100 mV[p-p], f = 5 MHz	—	—	–30	dB
PB-over-all 1 (NOR)	V_{NOR}	Pin 47 output, adjust pin 53	—	1.0	—	V[p-p]
FM demodulation linearity 1	ΔV_{NOR}	Input 3 MHz, 5 MHz, 7 MHz Pin 63 = 4.8 V, adjust pin 53	90	97	110	%
Dropout detection on level	V_{DOC}	Input pin 57, f = 5 MHz	–17	–12	–7	dB
Dropout detection off hysteresis	ΔV_{DOC}	Input pin 57, f = 5 MHz	1	4	10	dB
Dropout detection ENV off	V_{DOCH}	Input pin 57, f = 5 MHz	5	8	11	H
Dropout detection output high-level	V_{P21H}	Input pin 57, pin 21 output	2.8	—	—	V
Dropout detection output low-level	V_{P21L}	Input pin 57, pin 21 output	—	—	0.4	V
Noise canceller frequency characteristics 1	f_{NC11}	Input 0 dB, NC1 mode output 1 MHz/50 kHz	–3	– 0.3	0.5	dB
Noise canceller frequency characteristics 2	f_{NC12}	Input −10 dB, NC1 mode output 1 MHz/50 kHz	–3.5	– 0.8	0.5	dB
Noise canceller frequency characteristics 3	f_{NC13}	Input −20 dB, NC1 mode output 1 MHz/50 kHz	–6	–2.3	0	dB
Noise canceller frequency characteristics 4	f_{NC14}	Input −30 dB, NC1 mode output 1 MHz/50 kHz	–10	–6.5	–3.0	dB
NC off mode	f_{NCOFF}	Input −30 dB, NC1 mode output 1 MHz/50 kHz, NC off	–10	–6.5	–3.0	dB
Clip comp. limiter level	V_{CL}	Input pin 63, pin 41 output	45	70	95	mV
Line noise canceller frequency characteristics 1	f_{LNC1}	Input 0 dB	–2.2	– 0.2	1.8	dB

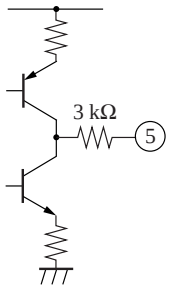
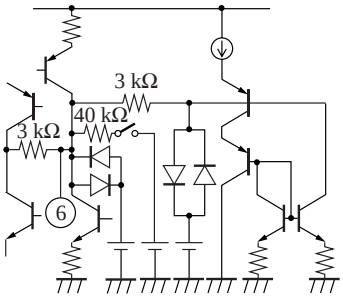
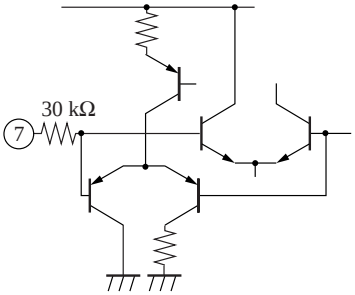
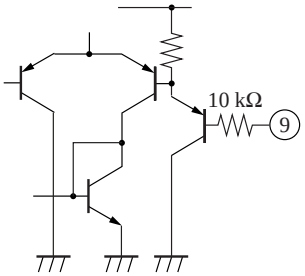
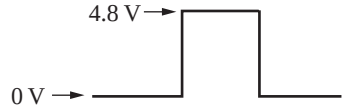
■ Electrical Characteristics at V_{CC} = 4.8 V, T_a = 25°C (continued)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Line noise canceller frequency characteristics 2	f_{LNC2}	Input: −30 dB	−15.0	−8.5	−3.0	dB
Line noise canceller (off)	f_{LNC3}	Input: −30 dB	−1.5	0	1.5	dB
C-BPF frequency characteristics 1	f_{BP1}	Input: 100 mV[p-p], output: 3.28 MHz/3.58 MHz	−2.5	− 0.5	−1.5	dB
C-BPF frequency characteristics 2	f_{BP2}	Input: 100 mV[p-p], output: 3.88 MHz/3.58 MHz	−2.5	− 0.5	−1.5	dB
C-BPF frequency characteristics 3	f_{BP3}	Input: 100 mV[p-p], output: 2.09 MHz/3.58 MHz	—	—	−20	dB
C-BPF frequency characteristics 4	f_{BP4}	Input: 100 mV[p-p], output: 5.07 MHz/3.58 MHz	—	—	−20	dB
REC APC pull-in range 1	$+\Delta f_{SC}$	Input: f_{SC} +300 Hz Pin 4 output (specified Xtal)	275	—	—	Hz
REC APC pull-in range 2	$-\Delta f_{SC}$	Input: f_{SC} −300 Hz Pin 4 output (specified Xtal)	—	—	−275	Hz
Xtal output amplitude	V_{FSC}	Pin 4 output, at lock (specified Xtal)	320	520	720	mV[p-p]
Xtal oscillation frequency	f_{SC}	Pin 4 frequency deviation at PB	−50	—	50	Hz
ACC output amplitude	V_{AC}	Pin 34 input, pin 15 output (test 3)	350	450	600	mV[p-p]
ACC control characteristics	ΔV_{AC}	Level ratio of −14 dB to 6 dB input	−2.0	0	2.0	dB
ACC maximum gain	V_{ACM}	Input/output level ratio	14	20	—	dB
C ACC output characteristics	V_{CAC}	Output burst ratio at input chroma signal 0 dB and −14 dB	1.0	3	5.0	dB
Burst emphasis amount	V_{BU}	Pin 34 input, pin 15 output	4.0	6.0	8.0	dB
Burst de-emphasis amount	V_{BD}	Pin 17 input, pin 13 output	−8.5	−6.0	−3.5	dB
Chroma de-emphasis characteristics 1	V_{CE1}	Input: 0 dB, output: fsc +500/fsc	−3.3	—	1.3	dB
Chroma de-emphasis characteristics 2	V_{CE2}	Input: 0 dB, output: fsc −500/fsc	−3.3	—	1.3	dB
Chroma de-emphasis characteristics 3	V_{CE3}	Input: −10 dB, output: fsc −500/fsc	−5.8	—	−1.0	dB
Chroma de-emphasis characteristics 4	V_{CE4}	Input: −10 dB, output: fsc +500/fsc	−5.8	—	−1.0	dB
REC chroma out level 1	V_{RCO1}	Pin 16 = 0 V, pin15 output	—	—	100	mV[p-p]
REC chroma out level 2	V_{RCO2}	Pin 16 = 4.8 V, pin 15 output	230	—	—	mV[p-p]
Color killer on level	CK_{ON}	Pin 34 input signal, 100 mV[p-p] → 2 mV[p-p], pin15 output DC	—	—	0.4	V
Color killer off level	CK_{OFF}	Pin 34 input signal, 0 mV[p-p] → 40 mV[p-p], pin15 output DC	1.5	1.9	2.3	V
PB APC pull-in range 1	Δf_{XO1}	Pin 40, pin 17 input, pin 13 output	−100	—	100	Hz
PB APC pull-in range 2	Δf_{XO2}	Pin 40, pin 17 input, pin 13 output	−100	—	100	Hz
CNR characteristics 1	CNR3	Pin 40 white 50%, pin 52: B+C signal input	−13	−9	−5.5	dB
CNR characteristics 2	CNR4	Pin 40 white 50%, pin 52: B+C signal input	−13	−9	−5.5	dB
PB burst level	V_{PBC}	Pin 13 output burst level	110	200	280	mV[p-p]
Clip comp. gain	V_{CG}	Input pin 63, pin 41 output	−8.5	−6	−3.5	dB

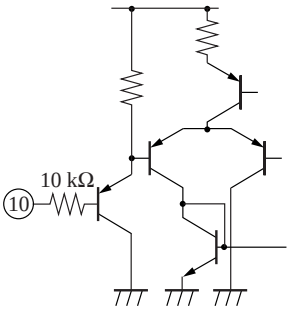
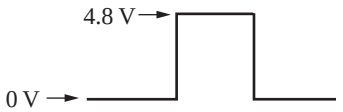
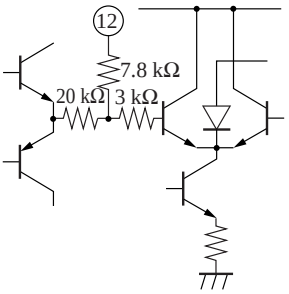
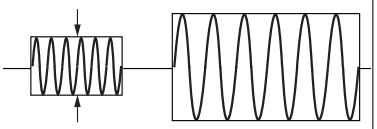
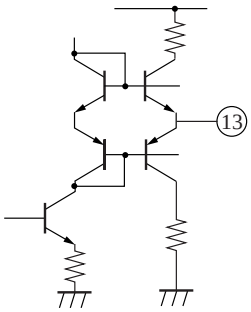
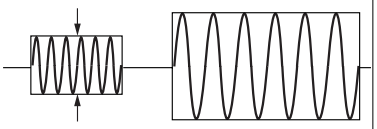
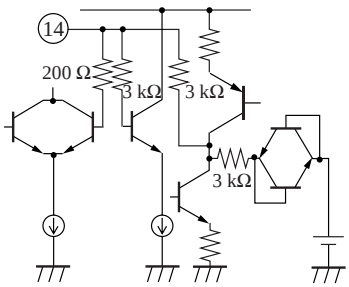
■ Terminal Equivalent Circuits

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
1	VXO in		500 mV[p-p] f = 3.5795 MHz 	DC 2.76
2	REC APC det.		Det. pin	DC 2 ± 0.75
3	V_{REF} det.		Bias pin	DC 2.48
4	f_{SC} out		AC 540 mV[p-p] f = 3.5795 MHz 	DC 2.7

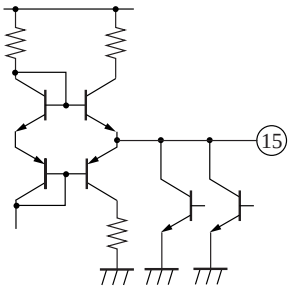
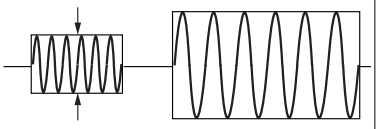
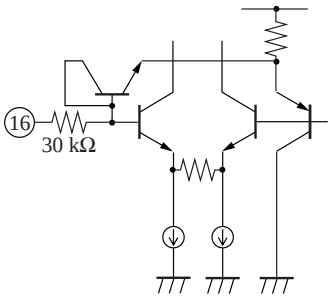
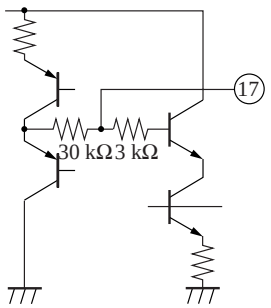
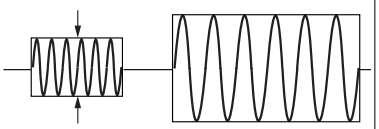
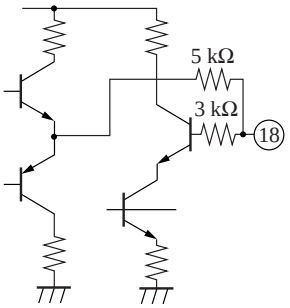
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
5	f det.		Det. pin	—
6	PB APC det.		Det. pin	DC 1.974 ± 0.75
7	PG in		* FM out comes to high frequency with high carrier interleave 	0 ↔ 4.8 (reference: DC 2.5 V)
8	C V_{CC}	—	—	—
9	CK			0 ↔ 4.8 (reference: DC 2.5 V)

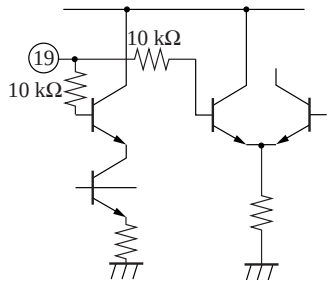
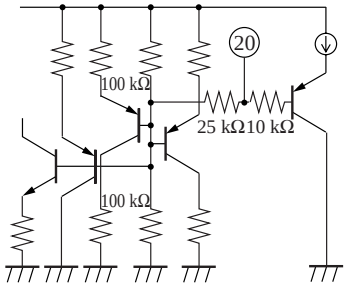
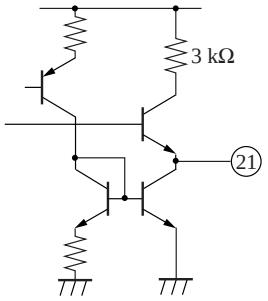
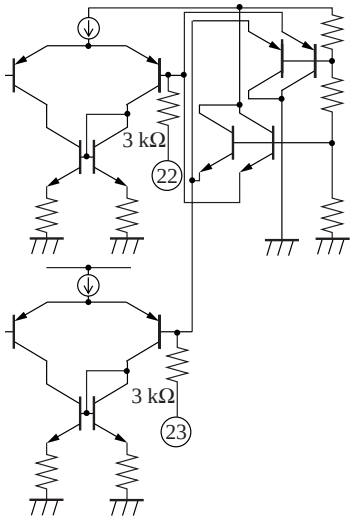
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
10	Data			0 ↔ 4.8 (reference: DC 2.5 V)
11	C GND	—	—	—
12	C MIX in		B: 200 mV[p-p] (NTSC)  f = 3.5795 MHz (Input at a low impedance.)	DC 2.475
13	PB C out		 B: 200 mV[p-p] f = 3.5795 MHz	DC 2.145
14	CLCA det.		Det. pin	DC 3.62 ± 0.75

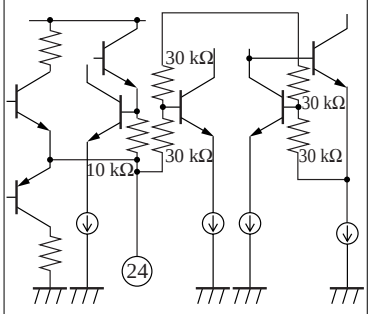
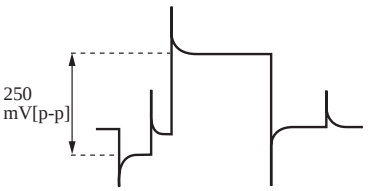
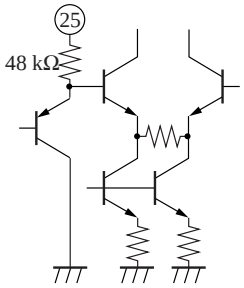
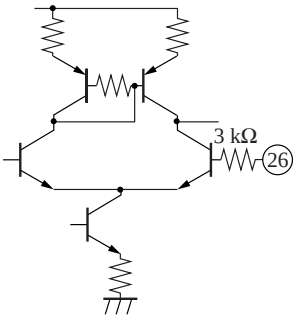
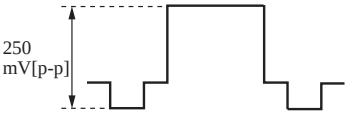
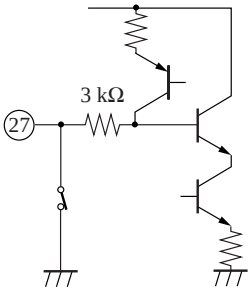
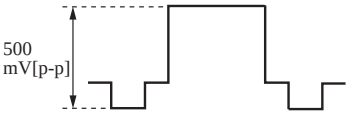
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
15	REC C out		f = 743 kHz 	REC mode DC 2
16	CTL 4		REC out level adjustment	0 to 4.8
17	PB C in		B: 100 mV[p-p] f = 743 kHz  Being inputted into PB-C-in with Y+C signal, Y signal is 400 mV[p-p]	DC 2.75
18	CE C		Det. pin	DC 2.9

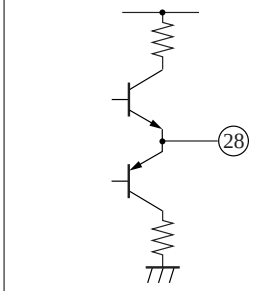
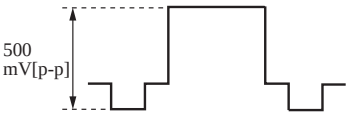
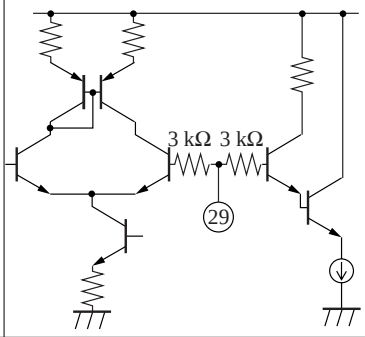
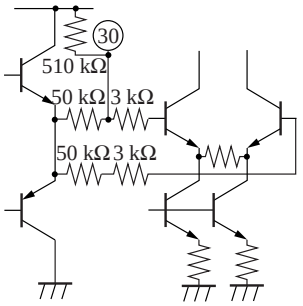
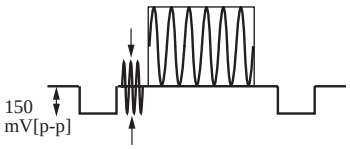
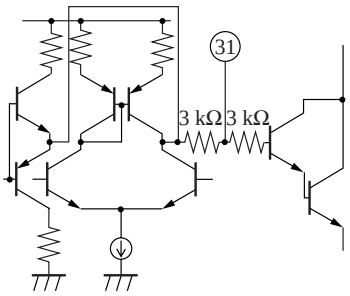
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
19	CE CTL		Chroma emphasis, de-emphasis adjustment pin Adjustment off at 1 V or less	0 to 4.8
20	CTL 3		REC mode (GCA3 control)	0 to 4.8 (1.5 to 3.0)
21	FM out		 PB mode: 2.5 V or more at DOC on 0.4 V or less at DOC off	REC mode DC 3.35
22	DEV CTL		Adjust to 5.4 MHz with DC at 100% white.	1.3 to 3.7 typ. 2.5
23	f_0 CTL		Adjust FM out to 4.2 MHz at sync. tip.	1.3 to 3.7 typ. 2.5

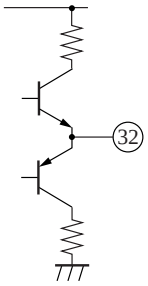
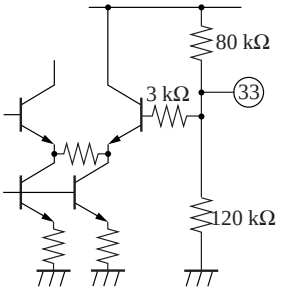
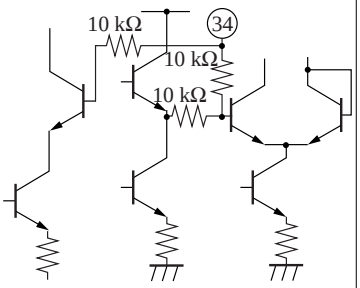
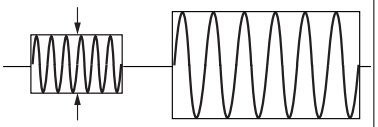
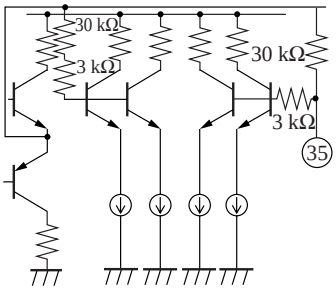
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
24	ME out			DC 2.195
25	W CTL		Adjust a white clip level to 220%.	1.5 to 3.7 typ. 2.0
26	MENF			DC 2.19 (sync. tip) (With externally attached feedback resistor R)
27	NL in			DC 2.93 (sync. tip)

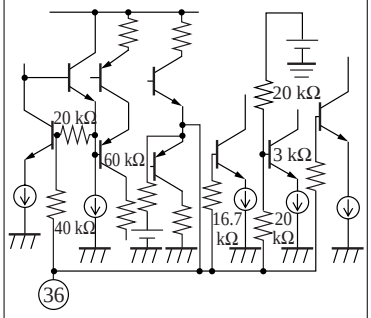
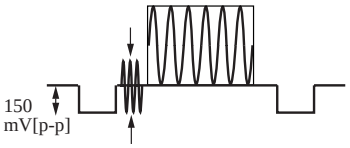
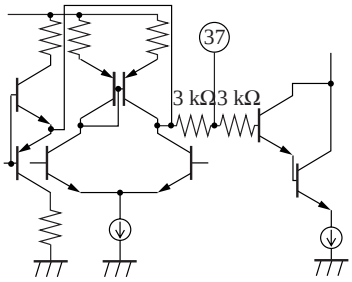
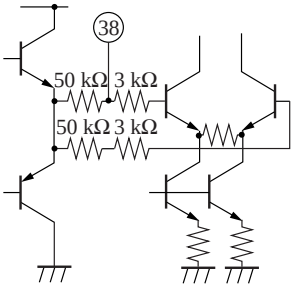
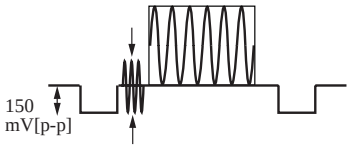
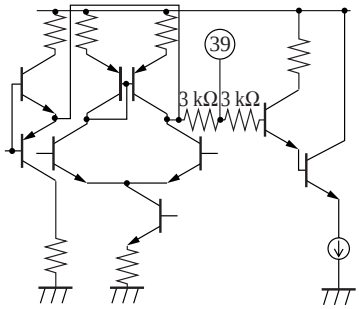
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
28	LNC out			DC 3.14 (sync. tip)
29	CCL det.		Det. pin	DC 2.66 ± 0.75
30	CDL in		 B: 143 mV[p-p] f = 3.5795 MHz	DC 2.755
31	G1 det.		Det. pin	DC 3.515 ± 0.75

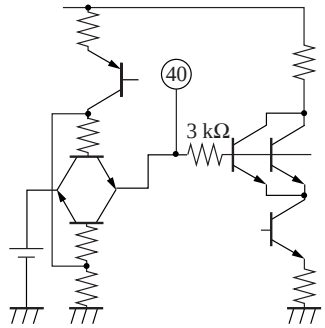
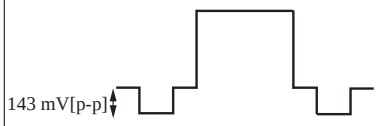
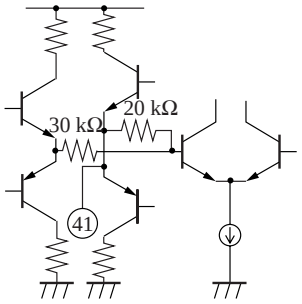
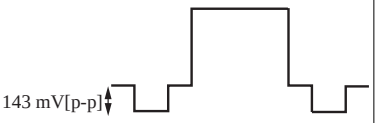
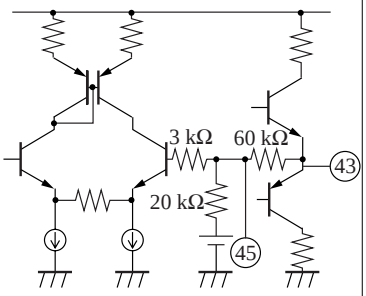
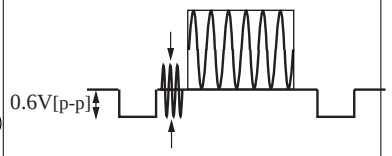
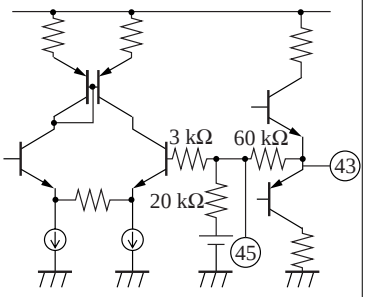
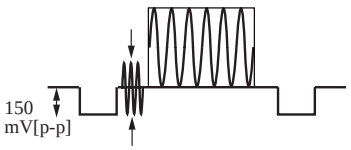
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
32	ADD out		Adjust pin 33 voltage (CTL1) so as not to mix a chroma signal.	DC 2.0
33	CTL 1		Adjust so that a comb shape chroma level adjustment pin 32 (ADD out) becomes Y signal only.	DC 2.994
34	CONP C		 B: 286 mV[p-p] f = 3.5795 MHz	DC 1.96
35	LIMC		Det. pin	DC 2.7

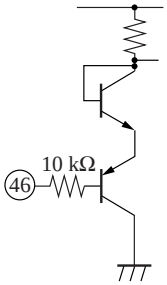
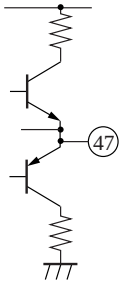
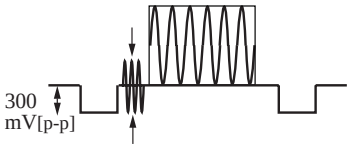
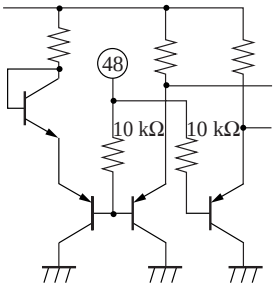
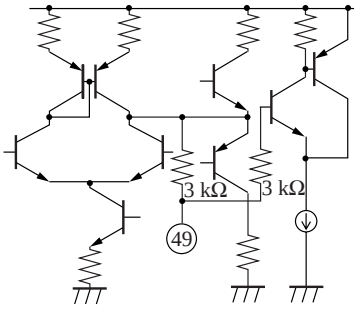
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
36	To CCD		 B: 143 mV[p-p] f = 3.5795 MHz	DC 2.031 (sync. tip)
37	G2 det.		Det. pin	DC 3.515 ± 0.75
38	YDL in		 B: 143 mV[p-p] f = 3.5795 MHz	DC 2.622
39	YCL det.		Det. pin	DC 2.66 ± 0.75

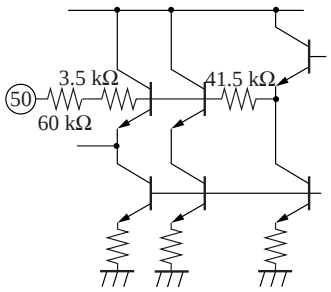
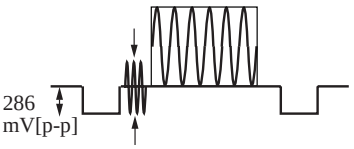
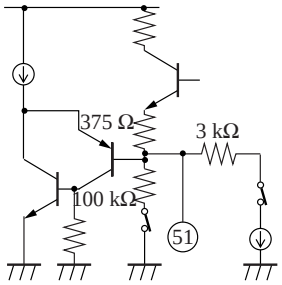
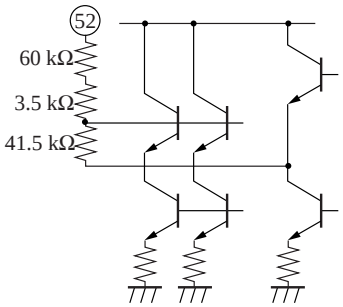
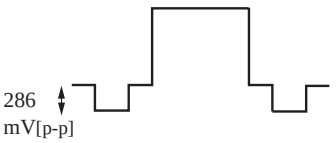
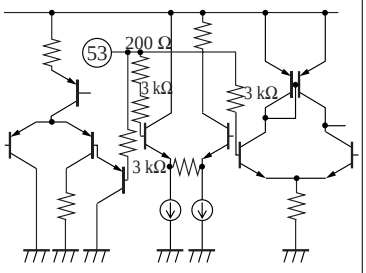
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
40	CL in		 500 mV[p-p] with 100% white input	DC 3.4 (sync. tip)
41	ML out		 500 mV[p-p] with 100% white input	DC 1.897
42	Y GND	—	—	—
43	Video out		2 V[p-p] with 100% white input  B: 0.57 V[p-p] f = 3.5795 MHz	DC 1.236 (sync. tip)
44	Y V_{CC}	—	—	—
45	VNF		 B: 143 mV[p-p] f = 3.5795 MHz Video amp. off when pin 45 is 0.3 V or less	DC 1.237 (sync. tip)

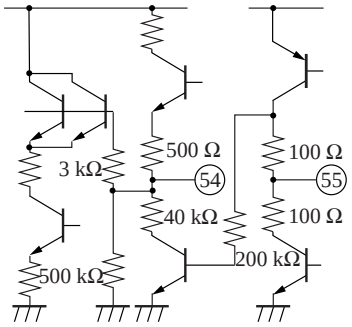
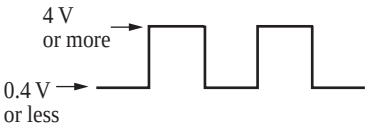
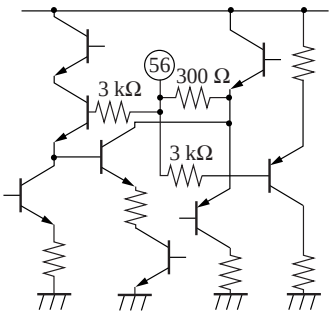
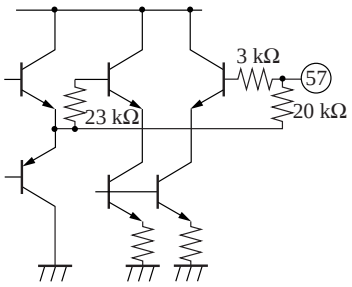
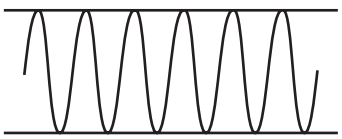
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
46	VF mute		VF amp.-OSD-CTL voltage	0 V to 4.8 V
47	VF out		 B: 286 mV[p-p] f = 3.5795 MHz (1 V[p-p] with 100% white input)	DC 1.968 (sync. tip)
48	V mute		Video amp.-OSD-CTL voltage	0 to 5
49	Clamp det.		Det. pin	DC 3.506

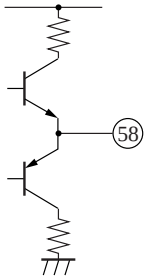
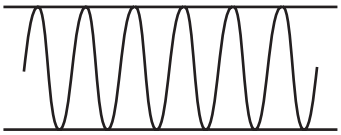
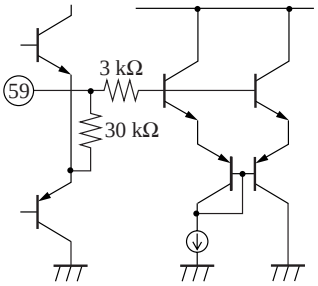
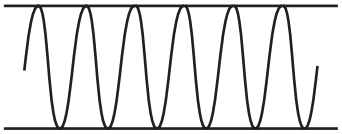
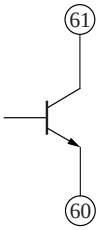
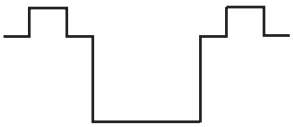
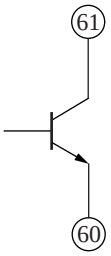
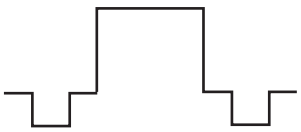
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
50	Line in		 B: 286 mV[p-p] f = 3.5795 MHz (AGC through mode is 6 dB down.)	DC 3.2
51	AGC det.		Det. pin	DC 1.63
52	CONP Y		 (AGC through mode is 6 dB down.)	DC 3.2
53	REC PB VOL		REC mode: Adjust to 2 V[p-p] at video out. 0.7 V to 4.8 V PB mode: Adjust to 2 V[p-p] at video out. 0.7 V to 4.8 V Filter off mode: 0 V to 0.3 V	Normally 0 ↔ 4.8 Filter off 0 ↔ 0.3

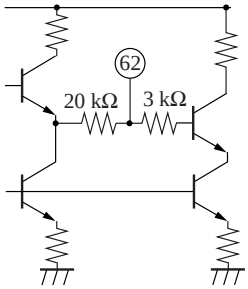
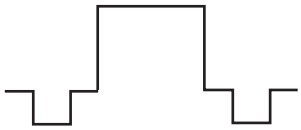
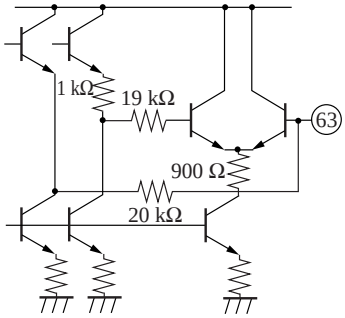
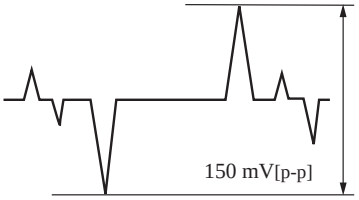
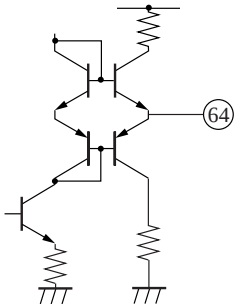
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
54	SS det.		Det. pin	DC 2.781
55	SS out			4 V ↔ 0.4 V
56	RF det.		Det. pin	DC 3
57	FM in		200 mV[p-p] 	DC 3.26

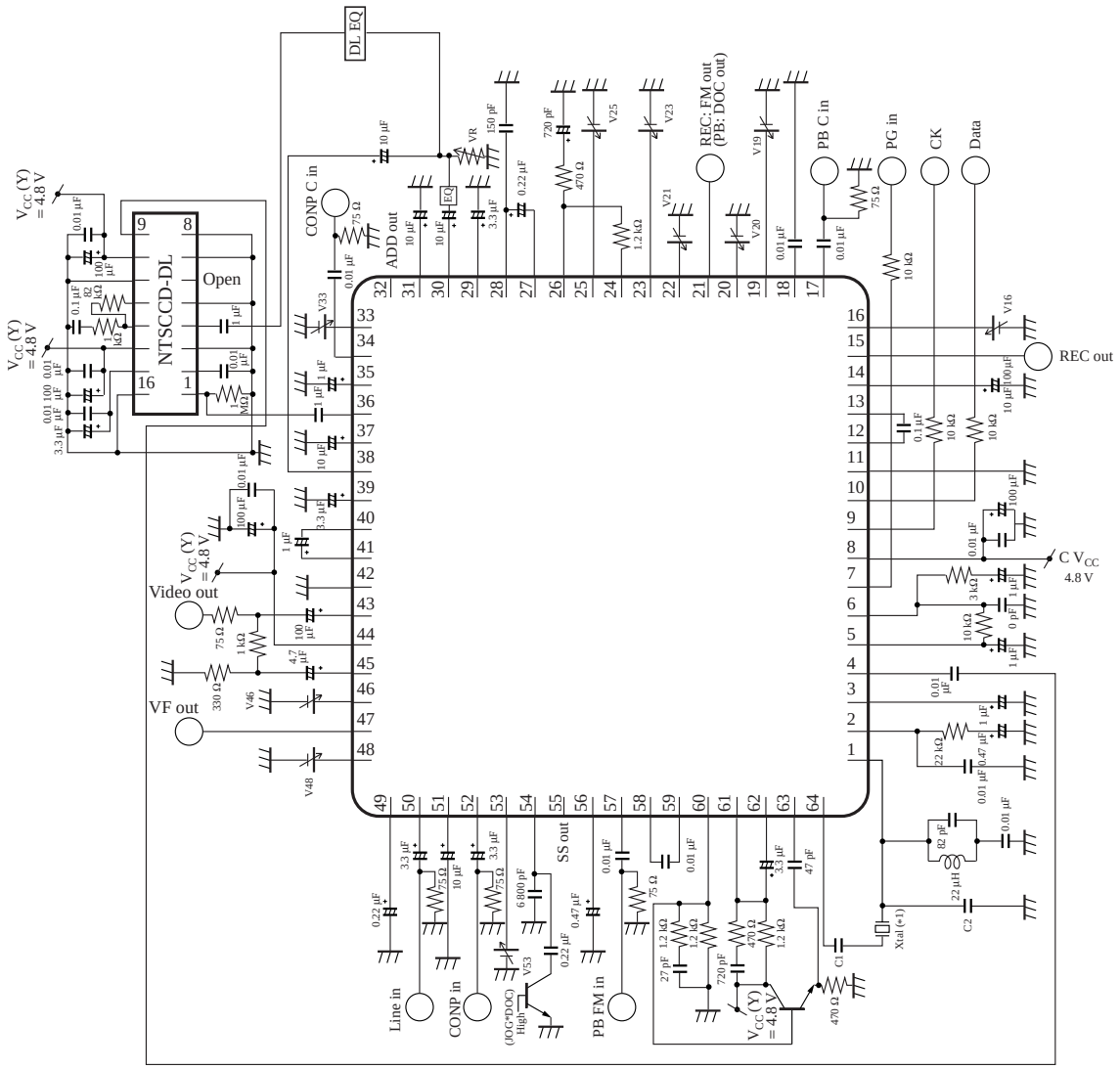
■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
58	RF out		400 mV[p-p] 	DC 2.40
59	DLIM in		400 mV[p-p] 	DC 2.49
60	MDE			DC (emitter) 1.6
61	MDC			DC 3.4

■ Terminal Equivalent Circuits (continued)

Pin No.	Symbol	Equivalent circuit	Description	Voltage (V)
62	DCL in			DC 3.421
63	Clip in			DC 3.4
64	VXO out		350 mV[p-p]  f = 3.5795 MHz	DC 3.33

■ Application Circuit Example



Note) ∗1: Optimize the C1 and C2 to meet Xtal characteristics.

1. Adjust variable resistor (VR), V33 voltage and variable resistor in that order so as to get a minimum level of chroma signal at ADD out (pin 32) output. (REC mode, line mode, chroma 100% input)
2. The application circuit diagram in this data is just a typical circuit example as a reference data for use, and whatever the loss caused or the infringement of the third party's industrial property right by the use of this circuit is not our responsibility.

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