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Discontinued

SANYO Semiconductors
DATA SHEET

LA71582M

Monolithic Linear IC
For VHS VCR
Video Audio Signal Processor (Y/C/A/HA 1chip)

Overview

The LA71582M is a signal processing IC for VHS VCRs. In addition to conventional video signal processing, it also features normal audio processing, as well as recording/playback FM-EQ functions on-chip. Together with the CCD chip, it is configured as a single package consisting of two chips.

This device eliminates the various adjustments that are usually performed by trimming inside the chip: by incorporating automatic adjustments for the comb filter as well, it is completely adjustment-free. This has made it possible to reduce significantly the number of externally attached components, simplify the design around the signal processing, and cut production costs.

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC}	Pins 40, 16, 58, 87, 75	7.0	V
Allowable power dissipation	Pd max	Ta≤65°C *	1400	mW
Operating temperature	Topr		-10 to +65	°C
Storage temperature	Tstg		-40 to +150	°C

* Mounted on a board 70× 70×1.6^{3}mm phenol resin laminates.

Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}	Pins 40, 16, 58, 87, 75	5.0	V
Allowable operating voltage range	V_{CC} opg	Pins 40, 16, 58, 87, 75	4.8 to 5.2	V

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Electrical Characteristics at Ta = 25°C, V_{CC} = 5.0V

REC Mode Y

Parameter	Symbol	In	Out	Conditions	Ratings min	Ratings typ	Ratings max	Unit
Current dissipation (REC)	$I_{CC}R$			Measure the sum of currents flowing into pins 40, 16, 58, 87, 75.	200	220	240	mA
EE Output level 1 (SW 1)	$V_{EE}1$	T38A	T29	With V_{IN} a 1Vp-p video signal (PAL), measure the output level on T29.	2.00	2.10	2.20	Vp-p
EE Output level 2 (SW 2)	$V_{EE}2$	T36A	T29	With V_{IN} a 1Vp-p video signal (NTSC), measure the output level on T29.	2.00	2.10	2.20	Vp-p
EE Output level 3 (SW 3)	$V_{EE}2$	T34A	T29	With V_{IN} a 1Vp-p video signal (NTSC), measure the output level on T29.	2.00	2.10	2.20	Vp-p
AGC characteristics 1	AGC1	T38A	T29	With V_{IN} a 2.0Vp-p video signal, measure the ratio of the output level on T29 and VEE1.	0	0.6	1.2	dB
AGC characteristics 2	AGC2	T38A	T29	With V_{IN} a 0.5Vp-p video signal, measure the ratio of the output level on T29 and VEE1.	-1.2	-0.2	0.0	dB
AGC characteristics 3	AGC3	T38A	T29	With V_{IN} a 700mVp-p luminance, 600mVp-p sync, measure the sync level on T29.	550	650	750	mVp-p
AGC characteristics 4	AGC4	T38A	T29	With V_{IN} a 700mVp-p luminance, 150mVp-p sync, measure the sync level on T29.	330	380	430	mVp-p
Sync separator output level	VSYR	T38A	T28	With V_{IN} a 1.0Vp-p video signal, measure the output pulse wave height on T28.	4.0	4.2	4.4	Vp-p
Sync separator output pulse width	PWSYR	T38A	T28	With V_{IN} a 1.0Vp-p video signal, measure the output pulse width on T28.	4.4	4.7	5.0	μs
Sync separator threshold level	THSYR	T38A	T28	Gradually reduce the input level, and measure the input level at the point that the output pulse width is 1μs or more wider than PWSYR.		-20	-15	dB
H-Sync output level	VHSYR	T38A	T27	With V_{IN} a 1.0Vp-p video signal, measure the output pulse wave height on T27.	4.0	4.2	4.4	Vp-p
H-Sync output pulse width	PWHSYR	T38A	T27	With V_{IN} a 1.0Vp-p video signal, measure the output pulse width on T27.		5.0		μs
Sync tip level Pedestal level White level	LVOR	T38A	T29	With V_{IN} a 1.0Vp-p video signal, measure the sync tip and pedestal and white level on T29 video output, and take these as LSYN LPED LWHT, respectively.				
Quasi-V insertion level	ΔVDR	T38A	T29	Measure the T26 DC voltage with 4.7V applied to T26,and take this to be LVDR, and compute the difference with LSYN measured above. ΔWHR = LSYN-LVDR		0		mV
Quasi-H insertion level	ΔHDR	T38A	T29	Measure the T29 DC voltage with 3.6V applied to T26, and take this to be LHDR, and compute the difference with LPED measured above. ΔHDR = LPED-LHDR		-100		mV
White insertion level	ΔWHR	T38A	T29	Measure the T29 DC voltage with 2.6V applied to T26. and take this to be LWHR, and compute the difference with LWHT measured above. ΔWHR = LWHT-LWHR		0		mV
Edge insertion level	ΔEGR	T38A	T29	Measure the T29 DC voltage with 1.5V applied to T26.and take this to be LEGR, and compute the difference with LPED measured above. ΔEGR = LPED-LEGR		-100		mV
REC YNR operation	RYNR	T38A	T21	V_{IN}=White 50%+CW (31.6mVp-p) Measure the ratio of 32fH component and 32.5fH. Serial 00: OFF 01: MIN 10: TYP 11: MAX		 0 2 4 6		dB
Y LPF frequency characteristics (1)	YLPF1	T38A	T21	With V_{IN} a standard multi-burst signal (1Vp-p), measure the 1MHz response to a 500kHz signal on T21.	-0.6	-0.1	0.4	dB
Y LPF frequency characteristics (2)	YLPF2	T38A	T21	With V_{IN} a standard multi-burst signal (1Vp-p), measure the 2MHz response to a 500kHz signal on T21.	-1.3	-0.3	0.7	dB
Y LPF frequency characteristics (3)	YLPF3	T38A	T21	With V_{IN} a standard multi-burst signal (1Vp-p), measure the 3MHz response to a 500kHz signal on T21.	-4.5	-2.5	-0.5	dB

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Parameter	Symbol	In	Out	Conditions		Ratings min	Ratings typ	Ratings max	Unit
Y LPF frequency characteristics (4)	YLPF4	T38A	T21	With V_{IN} a standard multi-burst signal (1Vp-p) measure the 4.43MHz response to a 500kHz signal on T21.				-25	dB
Y LPF frequency characteristics (5)	YLPF5	T38A	T21	With V_{IN} a standard multi-burst signal (1Vp-p), measure the 3.58MHz response to a 500kHz signal on T21.				-25	dB
FM modulator output level	VFM		T12	Measure the T12 output level with no input.	Serial 00 01 10 11		 270 300 330 360		mVp-p
Carrier frequency (Expect M mode)	FFM1		T12	Measure the output frequency on T12 with no input.		3.77	3.80	3.90	MHz
Carrier frequency (M mode)	FFM2		T12	Measure the output frequency on T12 with no input.		3.30	3.40	3.50	MHz
REC-FM output second distortion	HMOD		T12	Measure the second distortion with the above state.			-40	-35	dB
Deviation 1 (Expect M mode)	DEV1	T38A	T12	With V_{IN} a 100% white 1Vp-p signal, measure the deviation on T5.		0.95	1.00	1.05	MHz
Deviation 2 (M mode)	DEV2	T38A	T12	With V_{IN} a 100% white 1Vp-p signal, measure the deviation on T12.		0.95	1.00	1.05	MHz
FM modulator linearity	LMOD	T20	T12	Let f2.85 be the output frequency when 2.85VDC is applied to T20. $LMOD = \frac{f2.85-(f3.1+f2.6)/2}{f3.1-f2.6} \times 100$		-2	0	2	%
1/2 fH carrier shift	CS		T12	The output frequency change		6.5	8.2	9.5	kHz
Emphasis gain	GEMP	T20A	T18	With V_{IN} a 500mVp-p 10kHz sine wave, measure the ratio of the levels on T20A and T18.		-0.75	-0.25	0.25	dB
Detail enhancer Characteristics (1)	GENH1	T20A	T18	With V_{IN} a 158mVp-p 2MHz sine wave, measure the ratio of the levels on T20A and T18, and take the difference with GEMP.	Serial 000: MIN 100: TYP 111: MAX	1.0	1.5	2.0	dB
Detail enhancer Characteristics (2)	GENH2	T20A	T18	With V_{IN} a 50mVp-p 2MHz sine wave, measure the ratio of the levels on T20A and T18, and take the difference with GEMP.	Serial 000: MIN 100: TYP 111: MAX	3.0	4.0	5.0	dB
Detail enhancer Characteristics (3)	GENH3	T20A	T18	With V_{IN} a 15.8mVp-p 2MHz sine wave, measure the ratio of the levels on T20A and T18, and take the difference with GEMP.	Serial 000: MIN 100: TYP 111: MAX	4.3	5.8	7.3	dB
Nonlinear emphasis Characteristics (1)	GNLEMP1	T20A	T18	With V_{IN} a 500mVp-p 2MHz sine wave, measure the ratio of the levels on T20A and T18, and take the difference with GEMP. (Y-TEST)	Serial 01: MAX 10: TYP 11: MIN		0.5		dB
Nonlinear emphasis Characteristics (2)	GNLEMP2	T20A	T18	With V_{IN} a 158mVp-p 2MHz sine wave, measure the ratio of the levels on T20A and T18, and take the difference with GEMP. (Y-TEST)	Serial 01: MAX 10: TYP 11: MIN		4		dB
Nonlinear emphasis Characteristics (3)	GNLEMP3	T20A	T18	With V_{IN} a 50mVp-p 2MHz sine wave, measure the ratio of the levels on T20A and T18, and take the difference with GEMP. (Y-TEST)	Serial 01: MAX 10: TYP 11: MIN		6		dB
Main linear emphasis Characteristics (1)	GME1	T20A	T18	With V_{IN} a 50mVp-p 500kHz sine wave, measure the ratio of the levels on T20A and T18, and take the difference with GEMP. (Y-TEST)		10.5	11.0	11.5	dB
Main linear emphasis Characteristics (2)	GME2	T20A	T18	With V_{IN} a 50mVp-p 2MHz sine wave, measure the ratio of the levels on T20A and T18, and take the difference with GEMP. (Y-TEST)		13.1	13.6	14.1	dB
White clipping level	LWC	T38A	T18	With V_{IN} a 1.0Vp-p 100% white video signal, measure the white clipping level on T18. (Y-TEST)	Serial 0 1		 185 195		%

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Parameter	Symbol	In	Out	Conditions		Ratings min	Ratings typ	Ratings max	Unit
Dark clipping level	LDC	T38A	T18	With V_{IN} a 1.0Vp-p 100% white video signal, measure the dark clipping level on T18. (Y-TEST)	Serial 0 1		 -52 -57.5		%

PB Mode Y

Parameter	Symbol	In	Out	Conditions		Ratings min	Ratings typ	Ratings max	Unit
Current dissipation (PB)	$I_{CC}P$			measure the sum of currents flowing into pins 40, 16, 58, 87, 75.		190	210	230	mA
Dropout compensation Period	TDOC	T74 T20A	T29	T74: 4MHz 300mVp-p sine wave T20A: 0.5Vp-p video signal The time between the instant the T74A input set to and the point T29 output is restored.		10.5	12.5	14.5	H
DOC characteristics	GDOC	T74 T20A	T29	T74: 4MHz 300mVp-p sine wave T20A: 0.5Vp-p video signal The I/0 response 5H after the T74A input is set to 0.		-1.5	0	1.5	dB
PB Y level	V-YOUT	T74	T29	DEV = 1.0MHz PB Y level when input FM signal.		2.00	2.10	2.20	Vp-p
Over all Y level	R/P-OUT	T74	T29	R/P-Y level, PB-Y level		1.93	2.10	2.27	Vp-p
FM demodulator linearity	LDEM	T74	T21	$LDEM = \frac{VDEM4-(VDEM3+VDEM5)/2}{VDEM5-VDEM3} \times 100$ *VDEM4 = DC: T21 (Input 4MHz, 300mVp-p)		-3.5	0	+3.5	%
Carrier leakage	CL	T74	T21	Measure the ratio of the 4MHz component on T21 and SDEM.				-35	dB
PB YNR characteristics	PYNR	T20A	T29	Measure the ratio of the 32fH component and 32.5fH.	Serial 00 (OFF) 01 (STD) 10 (MID) 11 (STG)		 0 -3.2 -8.2 -11.8		dB
DOC level	LDOC	T74	T29	Measure the level of D.O.C when 300mVp-p is set to 0Db with V_{IN} = 4MHz.			-16		dB
DOC stop level	LDOS	T74	T29	Measure the level when D.O.C stops when the V_{IN} = 4MHz signal is entered.			100		mVp-p
Nonlinear de-emphasis characteristics (1)	GNLDE1	T20A	T29	With V_{IN} a 50% white video +2MHz 158mVp-p sine wave, measure the I/O response. (Y-TEST)	Serial 01: MAX 10: TYP 11: MIN	-3.5	-2.5	-1.5	dB
Nonlinear de-emphasis characteristics (2)	GNLDE2	T20A	T29	f = 2MHz, 50mVp-p (Y-TEST)	Serial 01: MAX 10: TYP 11: MIN	-6.0	-4.5	-3.0	dB
Double noisecanceller characteristics (1)	GWNC1	T20A	T29	f = 1.4MHz, 158mVp-p	Serial 000: MIN 100: TYP 111: MAX	-3.5	-2.5	-1.5	dB
Double noisecanceller characteristics (2)	GWNC2	T20A	T29	f = 1.4MHz, 50mVp- p	Serial 000: MIN 100: TYP 111: MAX	-12	-10	-8	dB
Double noisecanceller characteristics (3)	GWNC3	T20A	T29	f = 1.4MHz, 15.8mVp-p	Serial 000: MIN 100: TYP 111: MAX	-15	-13	-11	dB
PIC-CTL Hard MAX	GPH1	T20A	T29	f = 2.5MHz, 158mVp-p		6.0	7.0	8.0	dB
PIC-CTL Soft MAX	GPSF	T20A	T29	f = 2.5MHz, 158mVp-p		-8.8	-6.8	-4.8	dB
Sync separator output level	VSYP	T20A	T28	With V_{IN} a 0.5Vp-p video signal, measure the output pulse wave height on T28.		4.0	4.2	4.4	Vp-p

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Parameter	Symbol	In	Out	Conditions	Ratings			Unit
					min	typ	max	
Sync separator output pulse width	PWSYP	T20A	T28	With V_{IN} a 0.5Vp-p video signal, measure the output pulse width on T28.	4.35	4.65	4.95	μs
H-Sync output level	VHSYP	T20A	T27	With V_{IN} 0.5Vp-p video signal, measure the output pulse wave height on T27.	4.0	4.2	4.4	Vp-p
H-Sync output pulse width	PWHSYP	T20A	T27	With V_{IN} a 0.5Vp-p video signal, measure the output pulse width on T27.		5.0		μs
Sync tip level Pedestal level white level	LVOR	T20A	T29	With V_{IN} a 100% white 0.5 Vp-p signal, measure the sync tip and pedestal and white levels on T29 video output, and take these as LSYN LPED LWHT, respectively.				
Quasi-V insertion level	ΔVDP	T20A	T29	Measure the T29 DC voltage with 4.7V applied to T26, and take this to be LVDP, and compute the difference with LSYN measured above. ΔVDP = LSYN-LVDP		0		mV
Quasi-H insertion level	ΔHDP	T20A	T29	Measure the T29 DC voltage with 3.6V applied to T26, and take this to be LHDP, and compute the difference with LPED measured above. ΔHDP = LPED-LHDP		-100		mV
White insertion level	ΔWHP	T20A	T29	Measure the T29 DC voltage with 2.6V applied to T26,and take this to be LWHP, and compute the difference with LWHT measured ΔWHP = LWHT-LWHP		-1450		mV
Edge insertion level	ΔEGP	T20A	T29	Measure the T29 DC voltage with 1.5V applied to T26,and take this to be LEGP, and compute the difference with LPED measured ΔWHP = LPED-LEGP		-100		mV
4V regulator	VREG		T39	Measure the T39 DC level.	3.9	4.0	4.1	V

REC Mode EQ

Parameter	Symbol	In	Out	Conditions	Ratings			Unit
					min	typ	max	
REC EQ characteristics 1	GREQ1	T17A	T12	With V_{IN} a CW 2MHz, 300mVp-p signal, measure the input/output response.		-4.5		dB
REC EQ characteristics 2	GREQ2	T17A	T12	With V_{IN} a CW 4MHz, 300mVp-p signal, measure the input/output response, and take the difference with GREQ1.		-2.7		dB
REC EQ 2'nd distortion	HREQ	T17A	T12	Measure the second harmonic in the above conditions.		-40	-35	dB
REC EQ characteristics 3	GREQ3	T17A	T12	With V_{IN} a CW 750kHz, 400mVp-p signal, measure the input/output response.			-20	dB

PB Mode EQ

Parameter	Symbol	In	Out	Conditions	Ratings			Unit
					min	typ	max	
PB EQ characteristics 1 *Serial-control	GPEQ1	T74	T18	With V_{IN} a CW 4MHz 300mVp-p signal, measure the input/output response.	1.5	3.0	4.5	dB
PB EQ 2'nd distortion	HPEQ	T74	T18	Measure the second harmonic in the above condition.		-40	-30	dB
PB EQ Low-Trap characteristics 1 *Serial control	FPEQ1	T74	T18	V_{IN} =300mVp-p Measure the Low-band Trap frequency and gain. (Using network analyzer)	Serial 00 (650k) 01 (800k) 10 (1.1M) 11 (500k)		 -25 -25 -25 -25	dB

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Parameter	Symbol	In	Out	Conditions	Ratings min	Ratings typ	Ratings max	Unit
PB EQ High-Trap characteristics 2 *Serial control	FPEQ2	T74	T18	V_{IN} =300mVp-p Measure the High-band Trap frequency and gain. (Using network analyzer)	Serial 00 (10M) 01 (9M) 10 (8M) 11 (7M)	 	 -25 -25 -25 -25	dB

REC Mode Chroma

Parameter	Symbol	In	Out	Conditions		Ratings min	Ratings typ	Ratings max	Unit
REC chroma low frequency conversion output level	VOR-72	T38A	T72	With V_{IN} the standard color bar signal (1Vp-p), measure the burst level on T72.	Serial 00 01 10 11		 225 190 160 135		mVp-p
Burst emphasis NTSC MODE	GBE	T38A	T72	With V_{IN} the standard color bar signal(1Vp-p), calculate the ratio of the T72 burst levels for SP/EP and LP modes.		5.5	6.0	6.5	dB
VXO oscillation level PAL MODE	VVXO-RP	T38A	T69A	With V_{IN} the standard color bar signal (1Vp-p), measure the T69A output amplitude with an FET probe.		300	500	700	mVp-p
VXO oscillation level NTSC MODE	VVXO-RN	T38A	T67A	With V_{IN} the standard color bar signal (1Vp-p), measure the T67A output amplitude with an FET probe.		300	500	700	mVp-p
REC ACC Characteristics (1)	ACCR1	T38A	T72	With V_{IN} the standard color bar signal (1Vp-p), increase only the chroma signal level by +6dB, measure the T72 burst level, and calculate its ratio with VOR-2.			+0.2	+0.5	dB
REC ACC characteristics (2)	ACCR2	T38A	T72	With V_{IN} the standard color bar signal (1Vp-p), decrease only the chroma signal level by -6dB, measure the T72 burst level, and calculate its ratio with VOR-2.		-0.5	-0.1		dB
REC ACC killer-on input level	VACCK-ON	T38A	T72	With V_{IN} the standard color bar signal (1Vp-p), decrease the chroma signal and measure the input burst level at the point that T72 output ceases. Calculate the ratio of this value with the standard input level.			-26		dB
REC ACC killer-on output level	VOACCK	T38A	T72	Measure the T72 output level with a spectrum analyzer in the killer state of the above item and calculate its ratio with VOR-2.			-60	-50	dB
REC ACC killer restored input level	VACCK-OFF	T38A	T72	From the killer state of the above item gradually increase the input chroma level and T72 output reappears. Calculate its ratio with the standard input level.			-20		dB
REC APC pull-in range (1) PAL MODE	ΔfNAPC1	T38A	T72	Input a signal consisting of a 4.43361875MHz, 300mVp-p CW added to a 50% white signal. After confirming that a signal is output from T72, increase the CW frequency until T72 output ceases. Now slowly reduce the CW frequency, and let f1 be the frequency at which T72 output reappears. ΔfNAPC1 = f1-4433618.75 (Hz)		300			Hz
REC APC pull-in range (2) PAL MODE	ΔfNAPC2	T38A	T72	As in the previous item, decrease the CW frequency until T72 output ceases. Now, slowly increase the CW frequency and let f2 be the frequency at which T72 output reappears. ΔfAPC2 = f2-4433618.75 (Hz)				-300	Hz

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Parameter	Symbol	In	Out	Conditions	Ratings			Unit
					min	typ	max	
REC APC pull-in range (1) NTSC MODE	ΔfAPC1	T38A	T72	Input a signal consisting of a 4.4336MHz CW added to a 50% white signal. After confirming that a signal is output from T72, increase the CW frequency until T72 output ceases. Now slowly reduce the CW frequency, and let f1 be the frequency at which T72 output reappears. ΔfAPC1 = f1-4433619 (Hz)	300			Hz
REC APC pull-in range (2) NTSC MODE	ΔfAPC2	T38A	T72	As in the previous item, decrease the CW frequency until T72 output ceases. Now, slowly increase the CW frequency and let f2 be the frequency at which T72 output reappears. ΔfAPC2 = f2-4433619 (Hz)			-300	Hz
REC AFC pull-in range (1)	ΔfAFC1	T38A	T62	Input a 300mVp-p, 15.6kHz, 5μs width pulse train (negative polarity). After increasing the pulse train frequency until the T62 wave form is disrupted, decrease the frequency until the T62 wave form returns to normal and let f1 be that frequency. ΔfAFC1 = f1-15.625 (kHz)	1.0			kHz
REC AFC pull-in range (2)	ΔfAFC2	T38A	T62	With the initial conditions of the previous item, decrease the pulse train frequency until the output is disrupted, then increase the frequency until the output returns to normal, and let f2 be that frequency. ΔfAFC2 = f2-15.625 (kHz)		-2.5	-1.0	kHz
The ratio of the REC chroma level and FM modulator output level 1 PAL MODE	C/FM1	T38A	T72 T12	The ratio of 100% chroma's level which was converted to low band and FM modulator output level. *Serial Gr6: ---- --00,Gr7: ---- --00		-8		dB
The ratio of the REC chroma level and FM modulator output level 1 NTSC MODE	C/FM2	T38A	T72 T12	The ratio of 100% chroma's level which was converted to low band and FM modulator output level. *Serial Gr6:---- --00,Gr7:---- --00		-8		dB
PILOT BURST Amplitude	LPB	T38A	T72	The amplitude of pilot burst which was inserted in recording.		100		mVp-p
PILOT BURST Phase	PPB	T38A	T72	The phase of pilot burst which was inserted in recording.		270		deg

PB Mode Chroma

Parameter	Symbol	In	Out	Conditions	Ratings			Unit
					min	typ	max	
PB chroma video output level PAL MODE	PVop-29	T74A T20A	T29	Input a chroma signal that is a lower frequency converted chroma noise test signal (SP mode, burst 50mVp-p) to T74A. Input a 4MHz 300mVp-p sine wave to T74A, and a 50% white signal to T20A. Measure the burst level on T29.	490	580	670	mVp-p
PB chroma video output level NTSC MODE	Nvop-29	T74A T20A	T29	Input a chroma signal that is a lower frequency converted chroma noise test signal (SP mode, burst 100mVp-p) to T74A. Input a 4MHz 300mVp-p sine wave to T74A, and a 50% white signal to T20A. Measure the burst level on T29.	490	580	670	mVp-p
PB chroma pin 72 output level	Vop-72	T74A T20A	T72	Measure the burst level with the same conditions as those for PVop-72.		280		mVp-p
PB ACC characteristics (1)	ACCP1	T74A T20A	T72	With the conditions used for PVop-29, increase the input chroma level by +6dB, measure the burst level on T72, and calculate the ratio with Vop-72.		+0.5	+0.8	dB
PB ACC characteristics (2)	ACCP2	T74A T20A	T72	With the conditions used for PVop-29, decrease the input chroma level by -6dB, measure the burst level on T72, and calculate the ratio with Vop-13.	-0.5	-0.2		dB

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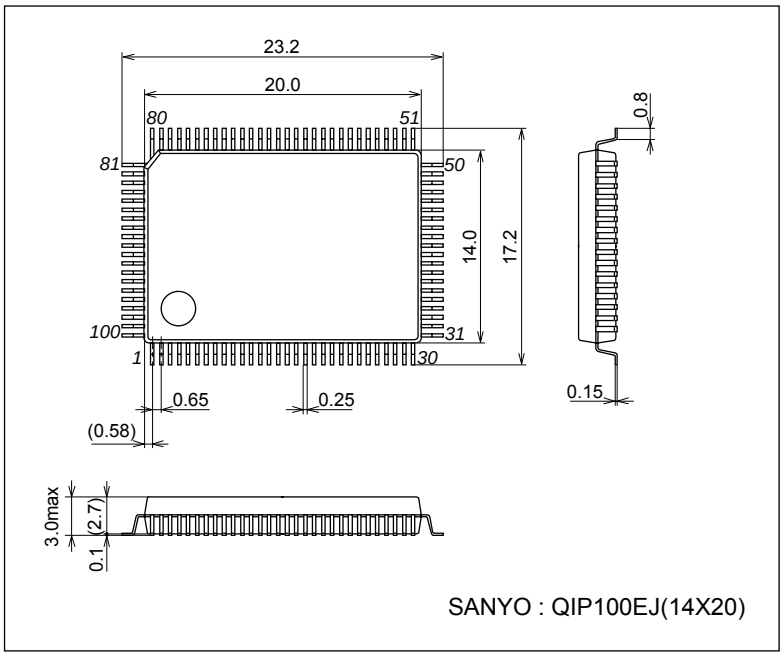
Parameter	Symbol	In	Out	Conditions	Ratings min	Ratings typ	Ratings max	Unit
PB killer-on input level	VACK-P	T74A T20A	T72	With the conditions used for Vop-29, the input chroma level until output from T72 cease and measure the input burst level at that point. (Calculate the ratio with the standard input 50mVp-p signal)			-25	dB
PB killer-on chroma output level	VOACK-P	T74A T20A	T29	Measure the T29 chroma output with a spectrum analyzer in the killer state of the previous item. Calculate its ratio with PVop-29.		-44	-40	dB
PB main converter carrier leakage	CLP	T74A T20A	T29	With the conditions used for PVop-29, measure the T29 with a spectrum analyzer, and calculate the ratio of the 4.43MHz component and the 5.06MHz carrier leakage component.		-40	-33	dB
Burst de-emphasis NTSC MODE	GBD	T1A T10A T63A	T13	Input a 3.58MHz 200mVp-p CW to T63A and a 4MHz 300mVp-p CW to T1A. Input a 50% white signal to T10A. Calculate the ratio of T13 burst period output level and the output level during other periods. Serial 0 1		 -5.0 -5.5		dB
PB XO output level PAL MODE	VXO-PP		T69A	In PB mode, measure the output level on T69 with an FET probe.	300	500	700	mVp-p
PB XO output level NTSC MODE	VXO-PN		T67A	In PB mode, measure the output level on T67 with an FET probe.	300	500	700	mVp-p
PB XO oscillator frequency deviation PAL MODE	ΔfXOP		T69A	In PB mode, let f be the measured frequency on T69. ΔfXOP = f-4433619 (Hz)	-9	0	+9	Hz
PB XO oscillator frequency deviation NTSC MODE	ΔfXON		T67A	In PB mode, let f be the measured frequency on T67. ΔfXON = f - 3579545(Hz)	-7	0	+7	Hz
NTSC → PAL conversion V axis Burst level	VBNAP	T1A T10A	T27	Input a chroma signal that is a lower frequency converted chroma noise test signal (SP mode, burst 100mVp-p) to T1A. Input a 4MHz 300mVp-p sine wave to T1A, and a 50% white signal to T10A. Measure the T27-45° Burst level, and take the ratio with the PVOP-27.	-2	-1	0	dB
NTSC → PAL conversion Ratio of the Burst level	ΔB-NAP	T1A T10A	T27	With the same condition above, measure the Burst level, and take the ratio with VBNAP.	-2	0	2	dB
PB Chroma 2nd harmonic distortion	PTHD2	T1A T10A	T27	With the conditions used for PVOP-27, measure the T27 with a spectrum analyzer, and calculate the ratio of the 4.43MHz component and the 8.86MHz component.			-25	dB

Package Dimensions

unit: mm

3252A



Electrical Characteristics at Ta = 25°C, V_{CC} = 5.0V, f=1kHz, 0dBv=1.0Vrms

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current dissipation (EE)	$I_{CC}E$	No signal	8.4	10.5	12.6	mA
Current dissipation (PB)	$I_{CC}P$	No signal	8.4	10.5	12.6	mA
Current dissipation (REC)	$I_{CC}R$	No signal	9.6	12.0	14.4	mA
[PB AMP]						
Open loop circuit voltage gain	VGOE	V_{IN}=-70dBv	58	64	70	dB
Input conversion noise voltage	VNIE	Rg=620Ω, DIN Audio filter	0.1	1.0	2.0	μVrms
[LINE AMP]						
Voltage gain (PB input)	VGLP	V_{IN}=-30dBv	23.0	23.5	24.0	dB
Voltage gain (LINE1 input)	VGLR1	V_{IN}=-30dBv	23.0	23.5	24.0	dB
Voltage gain (LINE2 input)	VGLR2	V_{IN}=-30dBv	23.0	23.5	24.0	dB
Voltage gain (LINE3 input)	VGLR3	V_{IN}=-30dBv	23.0	23.5	24.0	dB
Distortion	THDL	V_{IN}=-30dBv	0.01	0.1	0.5	%
Output noise voltage	VNOL	Rg=1kΩ, DIN Audio filter	-80.0	-74.0	-70.5	dBv
Maximum output voltage	VOML	THD=1%	0.8	0.9	1.0	Vrms
ALC mode output voltage	VOA	V_{IN}=-28dBv	-7	-6	-5	dBv
ALC mode distortion	THDA	V_{IN}=-28dBv	0.01	0.1	0.5	%
ALC effect	ALC	V_{IN}=from -28dBv to -8dBv	0	1	3	dB
[REC AMP]						
Voltage gain	VGR	V_{IN}=-20dBv	13.5	14.0	14.5	dB
Distortion	THDR	V_{IN}=-20dBv	0.001	0.1	0.5	%
Maximum output voltage	VOMR	THD=1%	0.8	0.9	1.0	Vrms
[MUTE]						
MUTE attenuation value (LINE1)	MA1	V_{IN}=-10dBv	80	90	120	dB
MUTE attenuation value (LINE2)	MA2	V_{IN}=-10dBv	80	90	120	dB
MUTE attenuation value (LINE3)	MA3	V_{IN}=-10dBv	80	90	120	dB
MUTE attenuation value (PB)	MPB	V_{IN}=-10dBv	80	90	120	dB
[AUTO BIAS]						
Recording bias voltage	VBIAS	Each head uses a center value of impedance.	270	300	330	mV
Recording bias control voltage	VCTL	Each head uses a center value of impedance.	2.9	3.2	3.5	V

CCD Block

Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Clock input Voltage	VCLK		300	500	1000	mVp-p
Clock input frequency				3.579545		MHz
Chrominance signal Input Voltage	V_{IN}-C			350	500	mVp-p
Luminance signal Input Voltage	V_{IN}-Y			400	572	mVp-p

Control Pin (pin 44, pin 56)

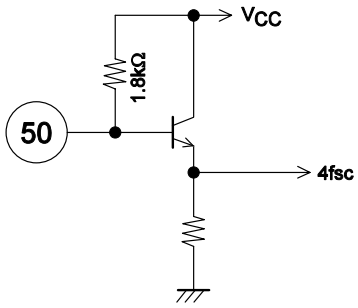
Pin44 CCD-M-CTL	Pin56 CCD-NT-CTL	System	Chrominance signal delay time (CCD bits)	Luminance signal delay time (CCD bits)
Low	Low	PAL/GBIN	2H (1833.5)+0H (1.5)	1H (913)
Low	High			
High	Low	PAL/M	2H (1821.5)+0H (1.5)	1H (907)
High	High	NTSC/M	1H (911.5)+0H (1.5)	1H (907)

Control Voltage

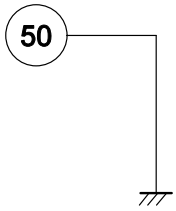
Low/High	Symbol	Min	Typ	Max	Unit
Low	VL	-0.3	0.0	0.7	V
High	VH	2.0	5.0	VCC	V

Description of the 4FSC Pin

When using

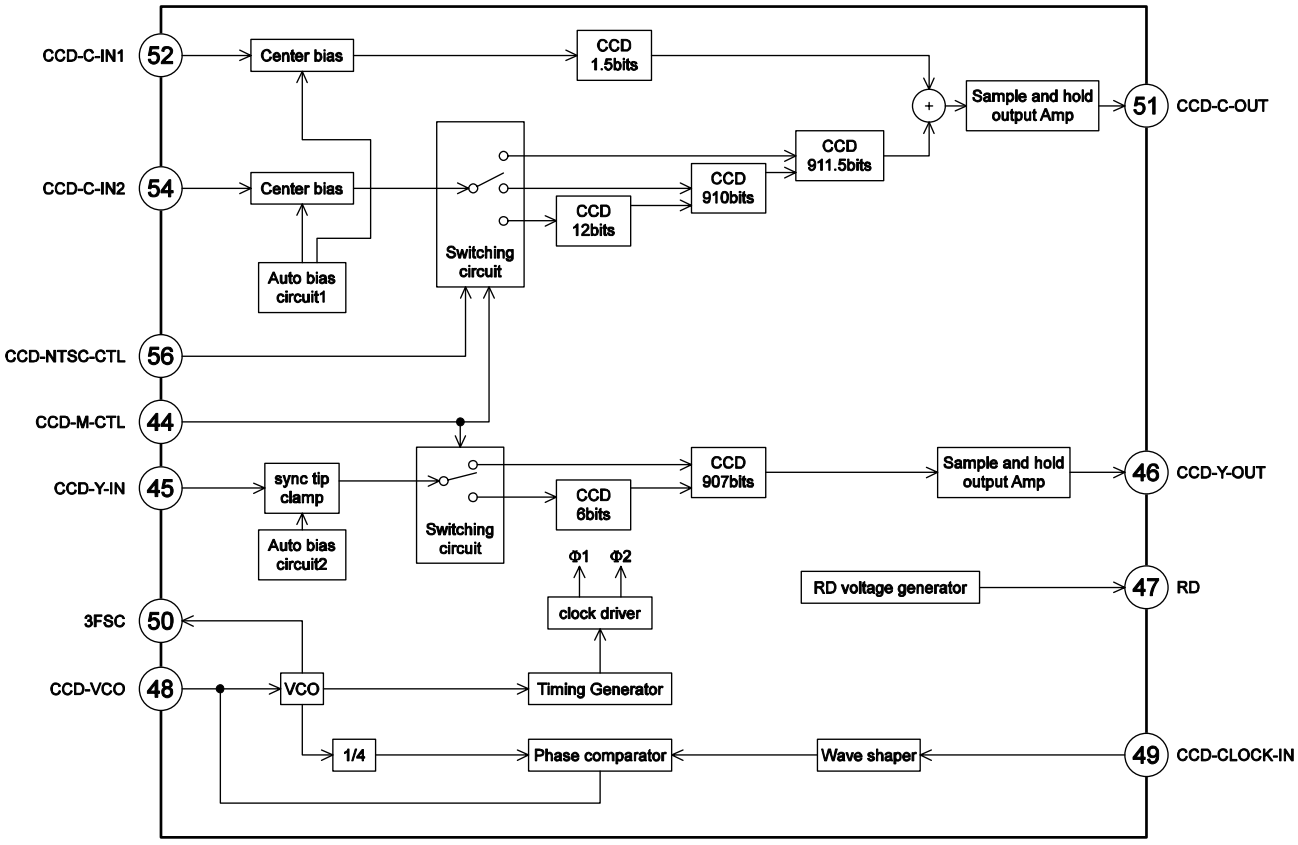


When no using



Discontinued

Block Diagram



Head Amplifier

Parameter	Symbol	In	Out	Conditions			Ratings			Unit
							min	typ	max	
PB mode				T87: 5.0V T30: OPEN	T11A	T11B				
Current dissipation	IHCCP			Pin 87 inflow current	0	0		39	(47)	mA
Voltage gain			T74	V_{IN} = 0.4mVp-p						dB
SP-L CH1	Gvp1	T91A		F = 4MHz	0	0	(58)	60.0	(62)	
SP-H CH2	Gvp2	T88A			5.0	0	(58)	60.0	(62)	
EP-L CH3	Gvp3	T85A			0	5.0	(58)	60.0	(62)	
EP-H CH4	Gvp4	T82A			5.0	5.0	(58)	60.0	(62)	
Difference of voltage gain 1	ΔGvp1			Gvp1-Gvp2			-1	0	+1	dB
Difference of voltage gain 2	ΔGvp2			Gvp3-Gvp4			-1	0	+1	dB
Difference of gain between mode	ΔGvp3			Gvp3-Gvp1			-1	0	+1	dB
Frequency Characteristics			T74	V_{IN} = 300mVp-p The ratio of the V_{IN} = 38mVp-p, f = 7MHz			(-1)	0	(+1)	dB
CH1	ΔVfp1	T91A		output and Gvp1, 2, 3, 4.	0	0				
CH2	ΔVfp2	T88A			5.0	0				
CH3	ΔVfp3	T85A			0	5.0				
CH4	ΔVfp4	T82A			5.0	5.0				
Secondary harmonic distortion			T74	V_{IN} = 300mVp-p The ratio of 8MHz (second component) of					-40	dB
CH1	VHDP1	T91A		the V_{IN} = 38mVp-p, f = 4MHz output and	0	0				
CH2	VHDP2	T88A		4MHz (first component).	5.0	0				
CH3	VHDP3	T85A			0	5.0				
CH4	VHDP4	T82A			5.0	5.0				
Maximum output level			T74	As f = 1MHz, the output level of which			1.0	1.2		Vp-p
CH1	VOMP1	T82A		become -30dB as the ratio of output 3MHz	0	0				
CH2	VOMP2	T85A		(third component) and 1MHz (first	5.0	0				
CH3	VOMP3	T88A		component).	0	5.0				
CH4	VOMP4	T91A			5.0	5.0				
Cross talk SP1 CH1	VCR1	T82A T85A T88A	T74	The ratio of output of V_{IN} = 38mVp-p, f = 4MHz and Gvp1.	0	0			-35	dB
Cross talk SP2 CH2	VCR2	T82A T85A T91A	T74	The ratio of output of V_{IN} = 38mVp-p, f = 4MHz and Gvp2.	5.0	0			-35	dB
Cross talk EP1 CH3	VCR3	T82A T88A T91A	T74	The ratio of output of V_{IN} = 38mVp-p, f = 4MHz and Gvp3.	0	5.0			-35	dB
Cross talk EP2 CH4	VCR4	T85A T88A T91A	T74	The ratio of output of V_{IN} = 38mVp-p, f = 4MHz and Gvp4.	5.0	5.0			-35	dB
Equivalent input noise voltage		No INPUT SIGNAL	T74	INPUT 90 CONNECTED TO INPUT 91 88 89 84 85 82 83 f = 4MHz BW=10kHz	0 5 0 5	0 0 5 5		0.6	0.2	nV/√Hz
Equivalent input current noise		No INPUT SIGNAL	T74	90, 91 open 88, 89 84, 85 82, 83	0 5 0 5	0 0 5 5		1.7	2.0	pA/√Hz

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Parameter	Symbol	In	Out	Conditions			Ratings min	Ratings typ	Ratings max	Unit
Output DC off set	ΔVODC1		T74	CH1-	0	0	-150	0	+150	mV
				CH2	5.0	0				
	ΔVODC2			CH3-	0	5.0				
				CH4	5.0	5.0				
	ΔVODC3			CH1-	0	0				
				CH3	0	5.0				
	ΔVODC4			CH2-	5.0	0				
				CH4	5.0	5.0				
	ΔVODC5			CH1-	0	0				
				CH4	5.0	5.0				
	ΔVODC6			CH2-	0	0				
				CH3	5.0	5.0				
Envelope detection output terminal voltage	VENV		T93	T93 DC when no input.	0	0		0.8	1.0	V
Envelope detection output terminal voltage SP1	VENV1	T91A	T93	When input f=4MHz, T93 DC as become 175mVp-p, for T74 output level. 100mVp-p DC DIFFERENCE TO VENV	0 0 5 5	0 5 0 5	0.5	5		V
Envelope detection output terminal voltage SP2	VENV4	T91A	T93	When input f = 4MHz, T93 400mVp-p, for T74 output level.	0 0 5 5	0 5 0 5		3.1		V
Envelope detection output terminal voltage EP1	VENV6	T85A	T93	When input f = 4MHz, T93 125mVp-p, for T74 output level.	0 .0 5 5	0 5 0 5		4.5		V
Envelope detection output terminal voltage EP2	VENV7	T85A	T93	When input f=4MHz, T93 DC as become 300mVp-p, for T74 output level. 750mVp-p DC DIFFERENCE TO VENV6	0	5.0	0.2			V
Comparator output voltage 1	VCOMP1	T91A	T94	T94 DC voltage when V_{IN} = 38mVp-p, f = 4MHz.	0	0		1.0	1.2	V
Comparator output voltage 2	VCOMP2	T85A	T94	T94DC voltage when V_{IN} = 38mVp-p, f = 4MHz.	5.0	0	4.5	4.8		V

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For operating the RF-SW and HA-SW, it’s necessary to input the video signal to T20A.
And also confirm the output signal of T28.

Continued from preceding page.

Parameter	Symbol	In	Out	Conditions		Ratings			Unit
						min	typ	max	
Recording mode				T87: 5.0V T30: 5.0V	T11B				
Current dissipation	IHCCR			Pin 87 inflow current.	0		48	(58)	mA
Rec AGC Amp output current	VRSP VREP	T12A	T89A T83A	Output level when V_{IN} = 300mVp-p, f = 4MHz		12.0	13.5	15.1	mAp-p
Difference of gain between mode	ΔGVR			VRSP/VREP			1.7		dB
REC AGC AMP control characteristics 1	ΔVAGC1-SP ΔVAGC1-EP	T12A	T89A T83A	As f = 4MHz, the output level/VRSP, EP When V_{IN} = 700mVp-p.	0 5.0		0.5		dB
REC AGC AMP control characteristics 2	ΔVAGC2-SP ΔVAGC2-EP	T12A	T89A T83A	As f = 4MHz, the output Level/VRSP, EP when V_{IN} = 100mVp-p.	5.0		0.5		dB
REC AGC AMP Frequency characteristics	ΔVFRS ΔVFRE	T12A	T89A T83A	As V_{IN} = 300mVp-p, the output ratio when f is 1M, 7MHz 7MHz/1MHz (Note 1)	5.0				dB
REC AGC AMP second harmonic distortion	ΔVHDRS ΔVHDRE	T12A	T89A T83A	15mApp/ each head The ratio of the 8M (second component) V_{IN} = 300mVp-p, f = 4MHz output and 4M (first component).	0 5.0		-40	-36	dB
REC AGC AMP maximum output level	ΔVHDRS ΔVHDRE	T12A	T89A T83A	The output level which become -35dB of f = 4MHz second distortion.	0 5.0	20			mAp-p
REC AGC AMP attenuate volume of mute	ΔVMRS ΔVMRE	T12A	T89A T83A	Output level/VRSP, EP When V_{IN} = 300mVp-p, f = 4MHz via pin 30	0 5.0		-45		dB
REC AGC AMP Mixed modulation relative level	ΔVCYS ΔVCYE	T12A, T71A	T89A T83A	T12A: V_{IN} = 300mVp-p, f = 4MHz, T71A: V_{IN} = 1.5Vp-p, f = 629kHz (4M±629K)/4M ratio of output	0 5.0		-40		dB

Similarly to the case of the PB mode, HA-SW (EP/SP) changeover is synchronized to rise of H-SYNC in the REC mode.
Before changeover,
Check by applying the video signal (Vp-p) to T38A if H-SYNC is correctly output to T28.

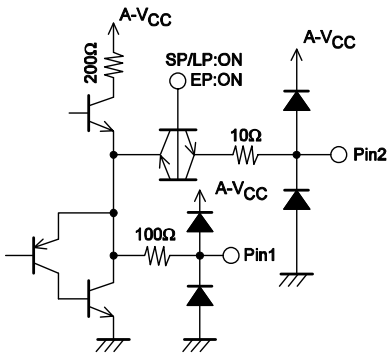
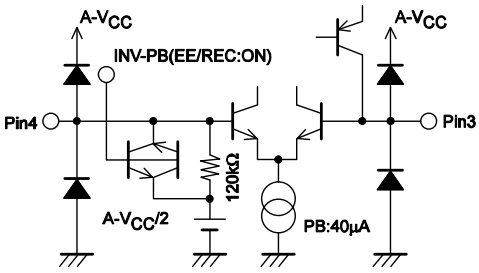
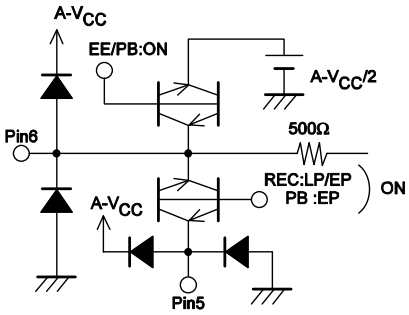
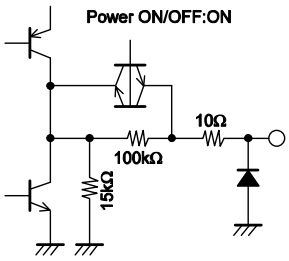
(Note 1) Apply about 1.8 DC volt to the AGC detection filter pin (pin92) to fix AGC-AMP-GAIN

Note 1. To measure REC-AGC-AMP, C-sync must be fixed to HIGH. Connect T38A, T36A, and T34A of the VIDEO input pin to ground in the REC mode

2. Use a resistor of pin 94 to ground with the accuracy of ±1.0%

For operating the HA-SW, it's necessary to input the video signal to T20A.
And also confirm the output signal of T28.

Pin Functions

Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
1	EQ-OUT	REC: A-V_{CC}/2		
		PB: A-V_{CC}/2	CW: 95mVp-p	
2	EQ-SW2	REC: A-V_{CC}/2		
		PB: A-V_{CC}/2	CW: 95mVp-p	
3	EQ-NFB	REC: A-V_{CC}/2		
		PB: A-V_{CC}/2	CW: 1mVp-p	
4	EQ-IN	REC: A-V_{CC}/2		
		PB: A-V_{CC}/2	CW: 1mVp-p	
5	EQ-SW1	REC: A-V_{CC}/2.	CW: 1.4Vp-p +70kHz: 850mVp-p	
		PB: A-V_{CC}/2	SP/LP: IMAGINATION GND EP: CW: 1mVp-p	
6	AUTO- BIAS-IN	REC: A-V_{CC}/2	CW: 1.4Vp-p +70kHz: 850mVp-p	
		PB: A-V_{CC}/2	IMAGINATION GND	
7	AUDIO- REC-OUT	REC: A-V_{CC}/2	CW: 1.4Vp-p	
		PB: A-V_{CC}/2		
8 9 83 89	GND			

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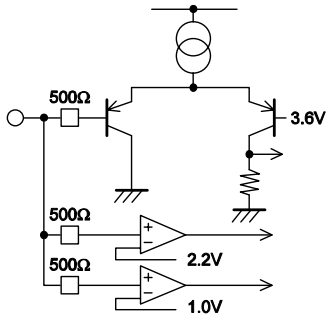
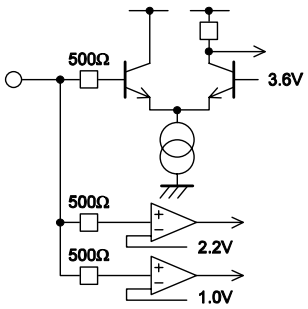
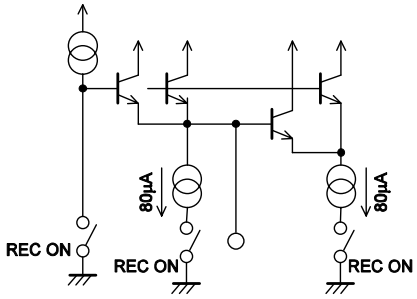
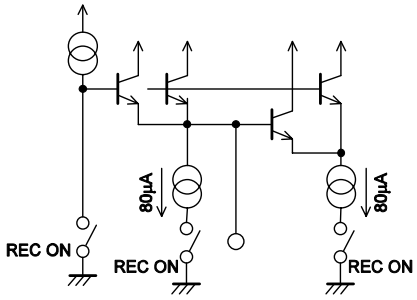
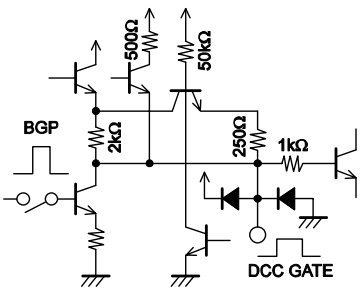
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
10	MUTE C-ROT			
11	RF-SW HA-SW			
12	PORECEQ	REC: 2.0V	FM: 350mVp-p	
		PB: 4.2V		
13	FM-AGC-FILT	REC: 1.5V		
		PB: 1.5V		
14	ACC-FILT	REC: 1.7V	DC	
		PB: 1.5V	DC	

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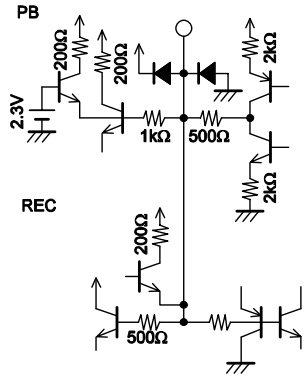
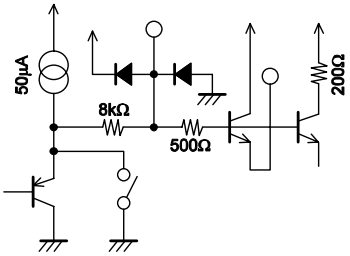
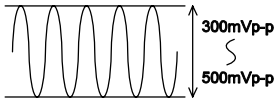
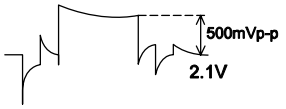
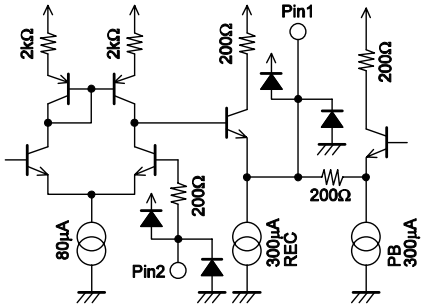
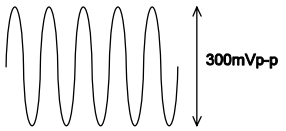
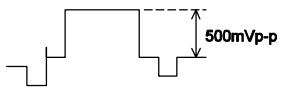
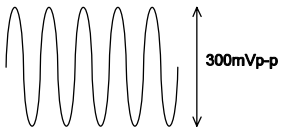
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
15	REC-AGC-TC1	REC: 2.2V	DC	
	PB BALANCER	PB: 2.2V	DC	
16	Y-V_{CC}-5V	5V	DC	
17	PB-FM-IN2	REC: 0.05V		
		PB: 3V	PB-Y-FM 	
18	EMPHASIS-OUT	REC: 2.1V		
		PB: 1.8V		
19	MAIN-EMPHAFILT	REC: 2.1V		
		PB: 2.1V		

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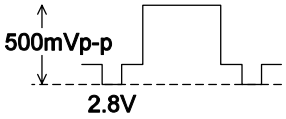
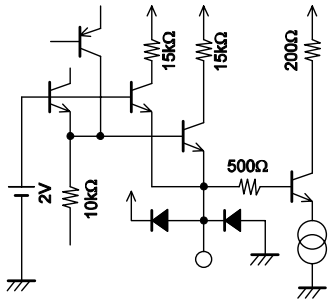
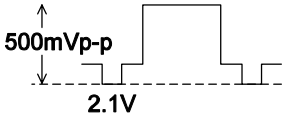
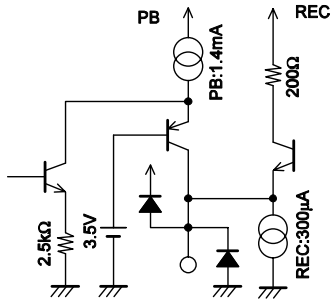
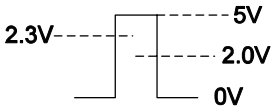
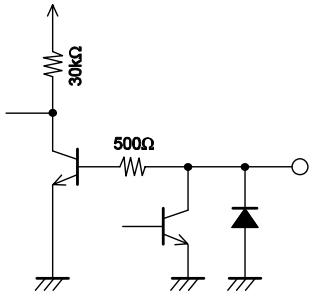
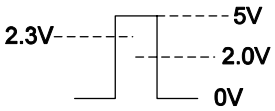
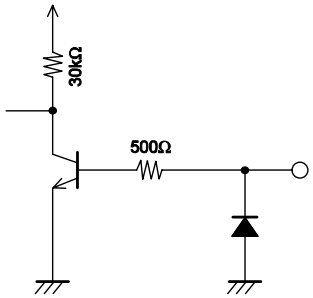
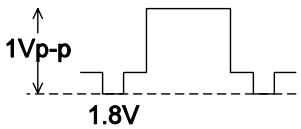
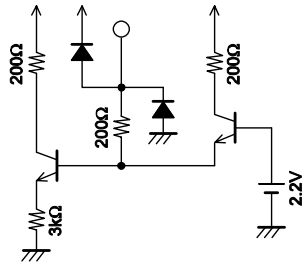
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
20	CLAMP-IN	REC: 2.8V PB: 2.8V		
21	MAIN-DEEMPHA-OUT	REC: 2.1V PB: 2.1V		
22	Y-GND			
23	SERIAL CLOCK-IN	REC: PB:		
24	SERIAL DATA-IN	REC: PB:		
25	BLUE-BACK-IN	REC: 1.8V PB: 1.8V		

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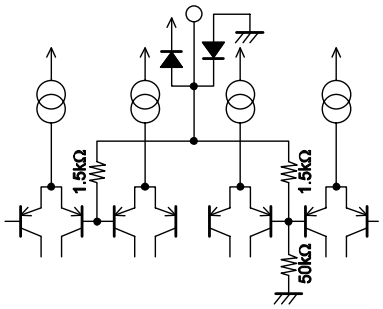
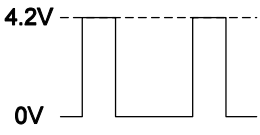
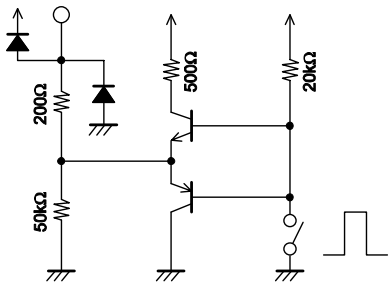
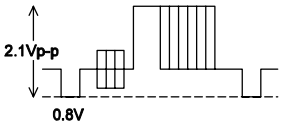
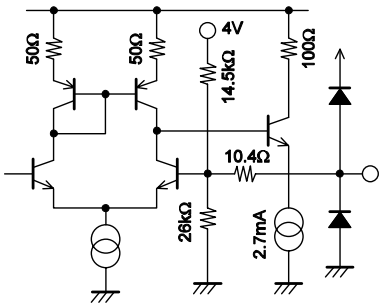
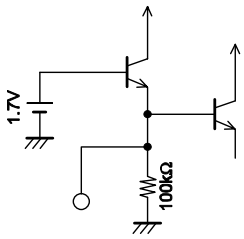
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
26	QV/QH-INS	REC: 0.0V PB:	0 to 0.8V: THROUGH 1.2 to 1.8V: BLACK INS 2.4 to 2.8V: WHITE HIS 3.4 to 3.8V: BLACK INS 3.9 to V_{CC}: QV INS	
27 28	H.SYNC-OUT C.SYNC-OUT	REC: PB:		
29	VIDEO-OUT	REC: SYNC 0.8V PB: SYNC 0.8V		
30	PEQCTL	REC: 0 or 5V PB: 1.0V		

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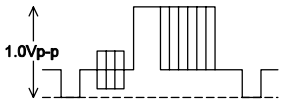
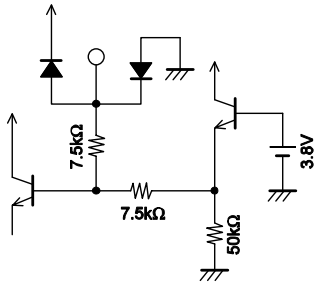
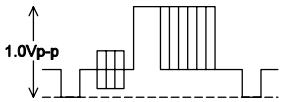
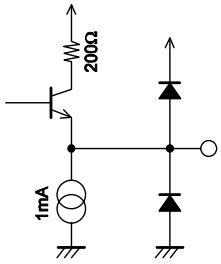
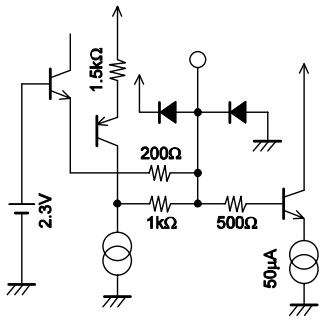
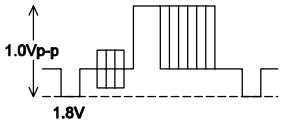
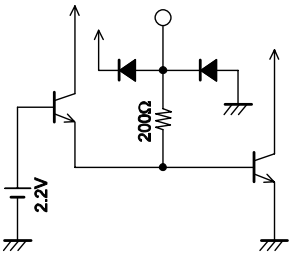
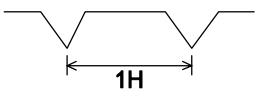
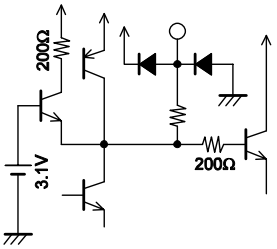
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
31	VIDEO-AGC-IN	REC: 2.1V PB: 2.1V		
32	VIDEO-SW-OUT	REC: 1.8V PB: 1.8V		
33	AGC-TC2	REC: 2.0V PB: 2.0V	DC DC	
34 36 38	VIDEO-IN3 VIDEO-IN2 VIDEO-IN1	REC: 1.8V PB: 1.8V		
35	AFC2-FILT	REC: 3.5V PB: 3.5V		

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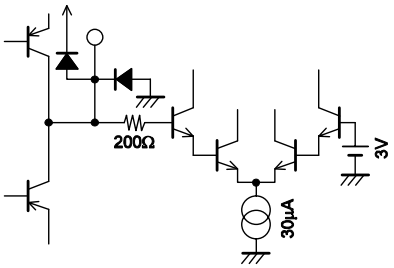
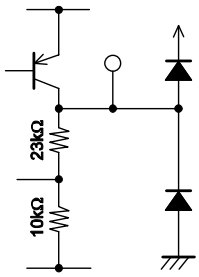
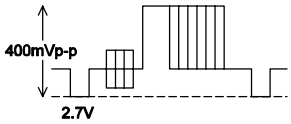
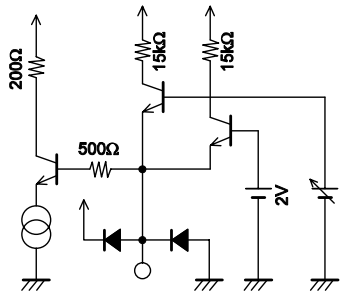
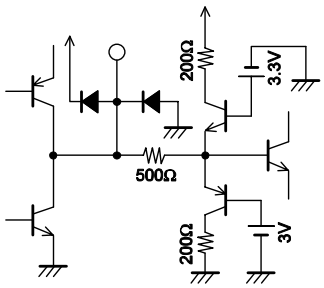
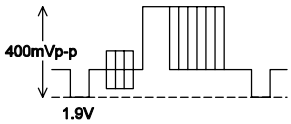
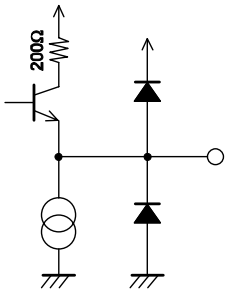
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
37	SYNC DET-FILT	REC: 4.9V NO-SIG.: 0.3V	DC	
		PB: 4.9V NO-SIG.: 0.3V	DC	
39	REG4.0	REC: 4V	DC	
		PB: 4V		
40	ALWAYS-5V	5.0V	DC	
41	1HDL-IN	REC: 2.7V		
		PB: 2.7V		
42	VCA-FILT	REC: 3.0		
43	VCA-OUT	REC: 1.9V		
		PB: 1.9		

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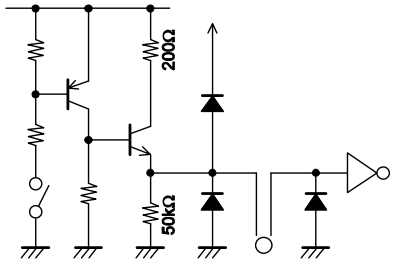
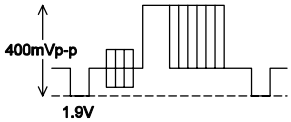
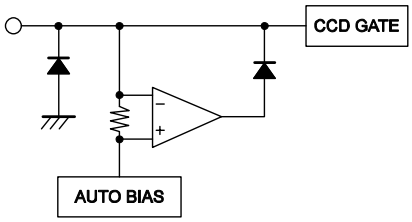
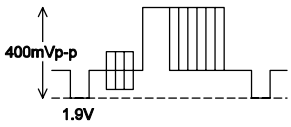
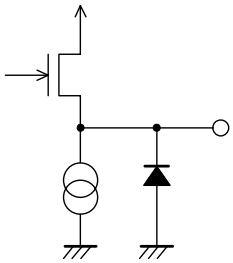
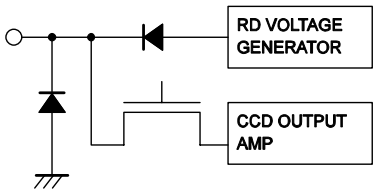
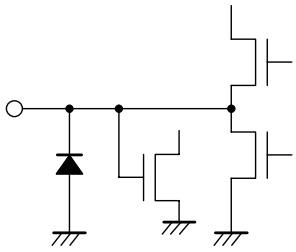
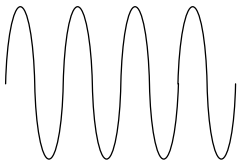
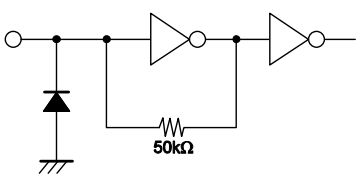
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
44	570: 600Hz OUT 590: PB H OUT ↓ For LA7339	REC/PB	DC M (60Hz): High 4.3V Expect above: Low * Selected 4.43 only mode PB mode: High	
45	CCD-Y-IN	REC: 1.8V PB: 1.8V		
46	CCD-Y-OUT			
47	RD	REC: 9.0V PB: 9.0V	DC DC	
48	CCD-VCO FILT	REC: 2.3V PB: 2.3V	DC DC	
49	CCD-CLOCK-IN	REC: 1.2V PB: 1.2V		

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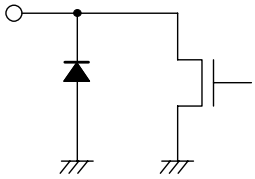
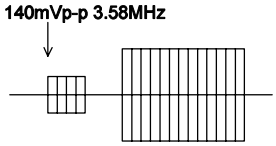
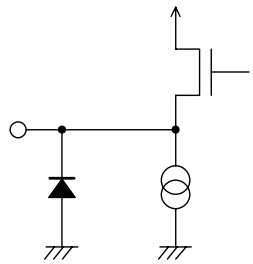
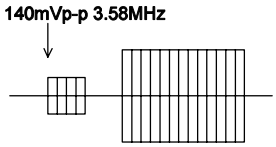
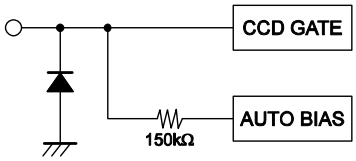
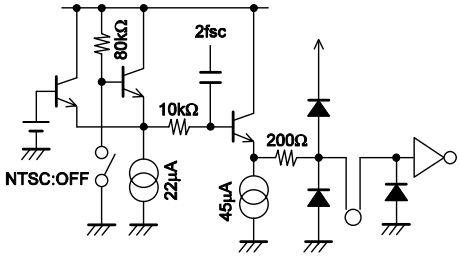
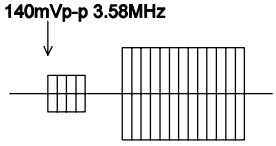
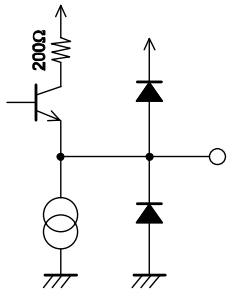
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
50	4FSC-OUT	REC: 0V		
		PB :0V		
51	CCD-C-OUT	REC: 1.9V		
		PB: 1.9V		
52 54	CCD-C-IN1 CCD-C-IN2	REC: 2.4V		
		PB: 2.4V		
53	CCD-GND			
55	CCD-V_{CC}-5V	5.0V	DC	
56	CCD-NT-CTL +2fsc-OUT	REC/PB	DC NTSC: High 3.5V Excepted above: Low (0.5V)	
			2Fsc 250mVp-p	
57 59	C-DL-OUT C-0H-OUT	REC: 3.4V		
		PB: 3.4V		
58	C-V_{CC}-5V	5.0V	DC	

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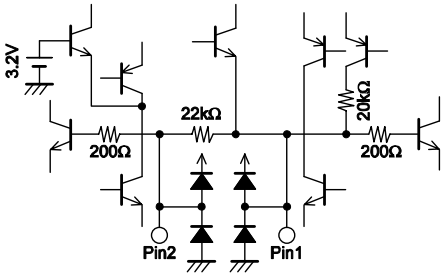
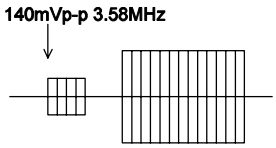
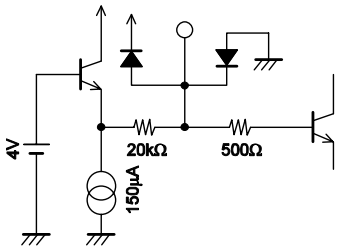
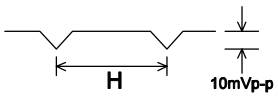
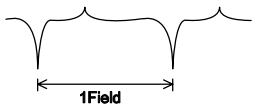
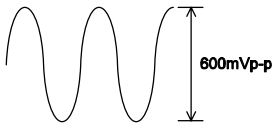
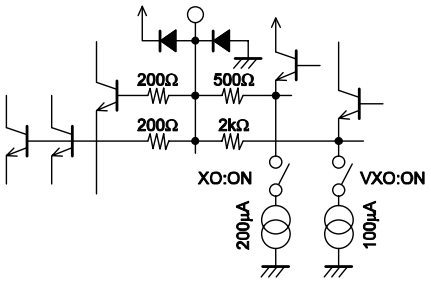
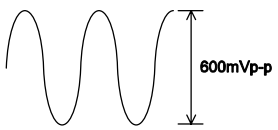
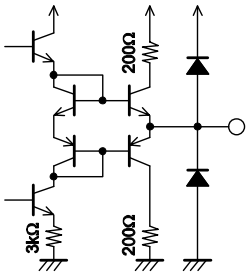
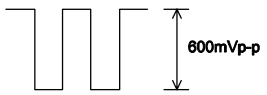
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
60	SLD-FILT	REC: 3.5V	DC	
		PB: 3.5V	DC	
61	A-COMB-IN	REC: 3.3V		
		PB: 3.3V		
62	AFC/APC-FILT	REC: 3.5V		See pin 60
		PB: 3.5V		
63	VXO/XO-IN1 3.58M NTSC	REC: 4.0V		
		PB: 4.0V		
64 66	VXO/XO-OUT1 VXO/XO-OUT2	REC: 2.2V		
		PB: 2.2V		

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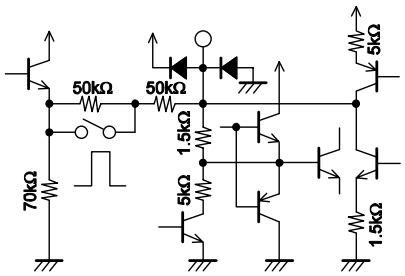
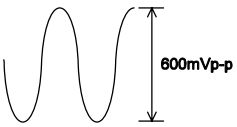
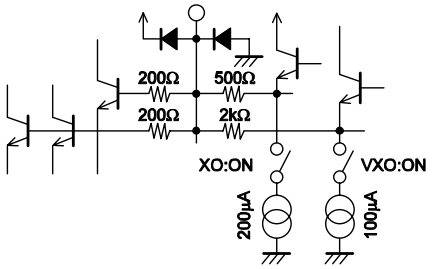
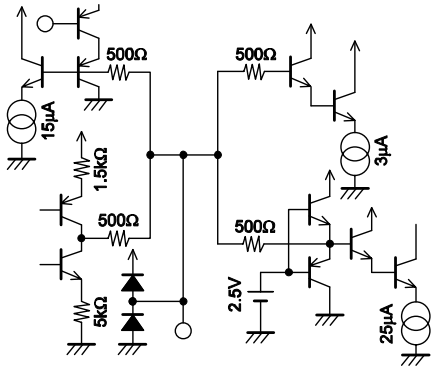
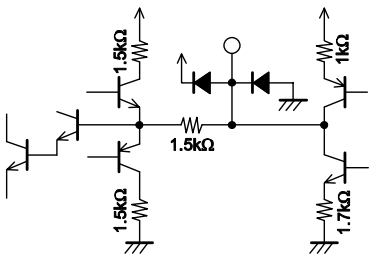
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
65	REC APC-FILT	REC: 2.4V	DC	
		PB: 2.4V	DC	
67	VXO/XO-IN1 PAL/BGI. M.N	REC: 4.0V		
		PB: 4.0V		
68	C-GND			
69	NO-OPERATION			
70	KILL-FILT	REC: 2.0V	DC	
		PB: 2.0V	DC	

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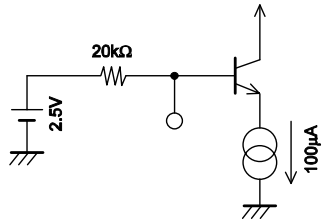
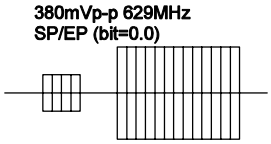
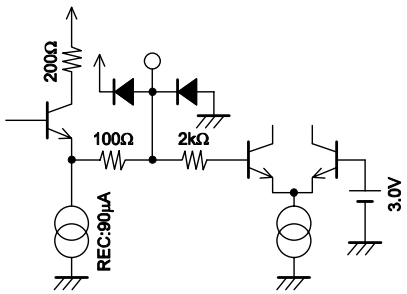
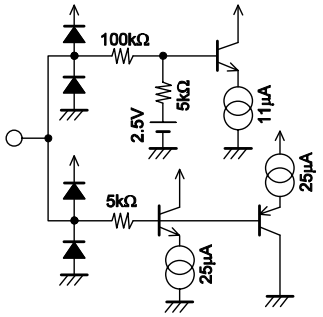
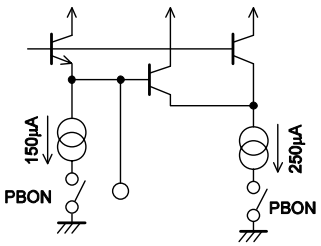
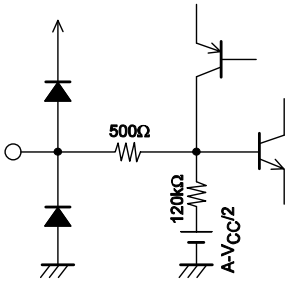
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
71	PIREC-C	REC: 2.5V	REC chroma	
		PB: 2.5V	PB chroma	
72	REC-C-OUT	REC: 2.5V		
		PB: 0.3V		
73	NO-OPERATION			
74	POPBFMMN			
		PB: 2.0V	FM 300mVp-p	
75	A-V_{CC}	5.0V	DC	
76 78 80	AUDIO-IN AUDIO-IN2 AUDIO-IN3	REC: A-V_{CC}/2	CW: 95mVp-p	
		PB: A-V_{CC}/2		

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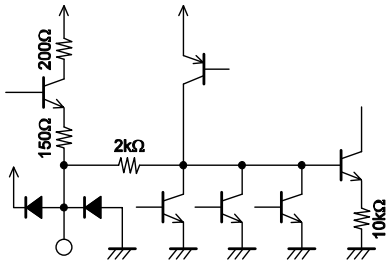
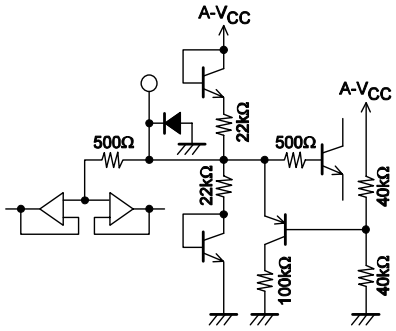
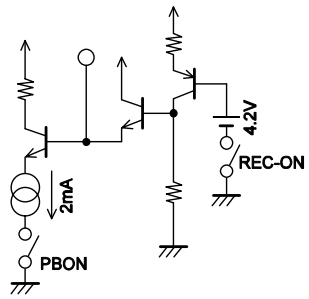
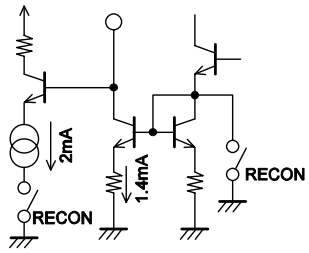
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
77	ALC-DET-FILTER	REC:	Detected DC voltage	
		PB: 0V		
79	VREF	REC: A-V_{CC}/2	DC	
		PB: A-V_{CC}/2	DC	
81 86	H.A GND			
82 91	PIPBSPL+ PIPBFPH+	REC: 4.1V		
		PB: 1.8V	0.5mVp-p	
84 90	PIPBSP PIPBEP	REC: 4.1V	SP 13mAp-p EP 10mAp-p	
		PB: 1.8V	0.5mVp-p	

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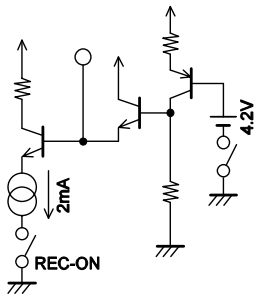
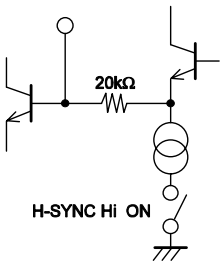
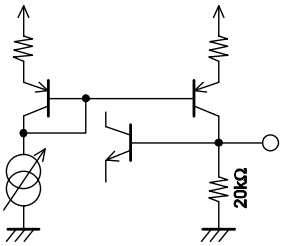
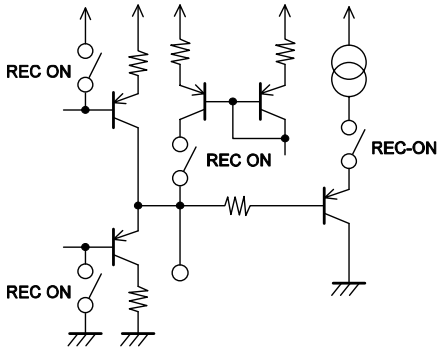
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
85 88	PIPBSPH+ PIPBEPL+	REC: 4.1V		
		PB: 1.8V	0.5mVp-p	
87	H.A V_{CC}	5.0V	DC	
92	PHRDTFL	REV: 1.6V	DC	
		PB:		
93	POENVDET	REC:		
		PB: 0.5 to 4.9V	DC	
94	PIRADJI	REC: 0.7V	FM 500mVp-p	
		PB: When Trick 0.5V or 4.5V	HASW control DC output in trick mode	
95	A.GND	REC: 0V		
		PB: 0V		

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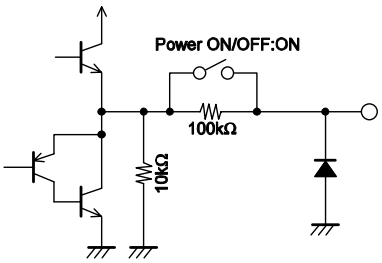
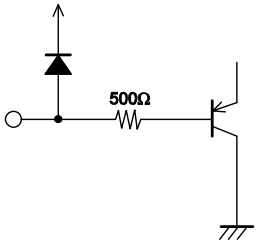
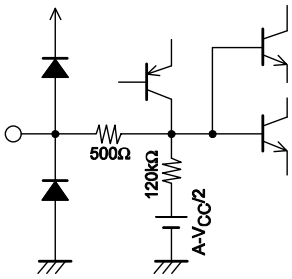
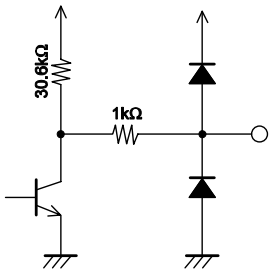
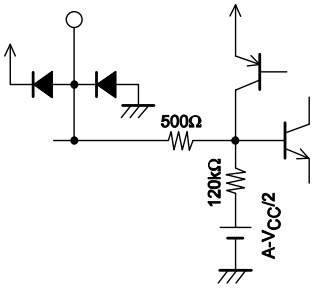
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
96	AUDIO LINE-OUT	REC: A-V_{CC}/2	CW: 1.4Vp-p	
		PB: A-V_{CC}/2	CW: 1.4Vp-p	
97	ALC-DET-IN	REC: 0.0V	CW: 650mVp-p	
		PB: 0.0V		
98	AUDIO-REC-IN	REC: A-V_{CC}/2	CW: 650mVp-p	
		PB: A-V_{CC}/2		
99	AUTO-BIAS-OUT (AUTO-BIAS)	REC: 4.3V	DC	
		PB: 5.0V	DC	
	HEAD-SW-CTL (NO-AUTO-BIAS)	REC: 7.5V	DC	
		PB:0V	DC	
100	AUDIO-PB-IN (AUTO-BIAS)	REC: A-V_{CC}/2	HALF WAVE RECTIFIED +A-V_{CC}/2	
		PB: A-V_{CC}/2	CW: 95mVp-p	
	AUDIO-PB-IN (NO-AUTO-BIAS)	REC: A-V_{CC}/2	DC	
		PB: A-V_{CC}/2	CW: 95mVp-p	

SERIAL Control Table

ADDRESS	8	7	6	5	4	3	2	1		
							0	0	VIDEO REC	
							0	1	VIDEO PB	
							1	0	VIDEO EE	*
							1	1	VIDEO REC PUASE (BIT TEST ON)	
Group 1					0	0			REC: V IN-1	*
					0	1			REC: V IN-2	
					1	0			REC: V IN-3	
MODE-1					1	1			REC: Y/C SEP IN (INJ UP)	
						0			PB: ANR OFF	*
						1			PB: ANR ON	
					0				PB: Y/C MIX ON	*
					1				PB: Y/C MIX OFF	
			0	0					AUDIO REC	
			0	1					AUDIO PB	
			1	0					AUDIO EE	*
			1	1					PROHIBIT (Y-TEST MODE)	
	0	0							A IN-1	*
	0	1							A IN-2	
	1	0							A IN-3	
	1	1							PROHIBIT (INJ DOWN SELECT)	

ADDRESS	8	7	6	5	4	3	2	1		
							0	0	NTSC/M	
							0	1	PAL-GBI, N/EM	*
							1	0	PAL-M/M	
							1	1	PROHIBIT	
Group 2						0			Y-3.58MHz	
						1			Y-4.43MHz	*
					0				C-3.58MHz	
SYSTEM					1				C-4.43MHz	*
			0	0					AUTO KILLER	*
			0	1					FORCED COLOR	
			1	0					FORCED KILLER	
			1	1					PROHIBIT (INJ U/D & T-TEST SELECT)	
		0							NORMAL MODE	*
		1							BLUE BACK MODE (T-TEST)	
	0								REC: Pilot burst 270 DEG/PB : ENV DET SENS = LOW	*
	1								REC: Pilot burst 90 DEG/PB : ENV DET SENS = HIGH	

ADDRESS	8	7	6	5	4	3	2	1		
								0	NORMAL VXO	*
								1	FORCED XO	
							0		DOC OFF/REC-EQ: STEEP	
							1		DOC AUTO/REC-EQ: STEEPNESS	*
Group 3						0			FIX	*
						1			PROHIBIT	
					0				FIX	*
MODE-2					1				PROHIBIT	
			0	0					SP (VIDEO) & CARRIER SHIFT OFF	*
			0	1					LP (VIDEO)	
			1	0					EP (VIDEO)	
			1	1					SP (VIDEO) & CARRIER SHIFT ON	
	0	0							SP (AUDIO)	*
	0	1							LP (AUDIO)	
	1	0							EP (AUDIO)	
	1	1							PROHIBIT (F-TEST MODE)	

ADDRESS	8	7	6	5	4	3	2	1		
							0	0	YNR/LNC OFF *2	*
							0	1	YNR/LNC STANDARD *2	
							1	0	YNR/LNC MIDIUM *2	
							1	1	YNR/LNC STRONG *2	
Group 4						0			YNR MODE	*
						1			LNC MODE	
			0	0	0				NC1 CTL/DETAIL CTL-1 LIM = MIN	*
NR			0	0	1				NC1 CTL/DETAIL CTL-2	
			0	1	0				NC1 CTL/DETAIL CTL-3	
			0	1	1				NC1 CTL/DETAIL CTL-4	
			1	0	0				NC1 CTL/DETAIL CTL-5	
			1	0	1				NC1 CTL/DETAIL CTL-6	
			1	1	0				NC1 CTL/DETAIL CTL-7	
			1	1	1				NC1 CTL/DETAIL CTL-8 LIM = MAX	
	0	0							Y DELAY -80N	
	0	1							Y DELAY 0N	*
	1	0							Y DELAY 80N	
	1	1							Y DELAY 160N	

ADDRESS	8	7	6	5	4	3	2	1		
							0	0	PB EQ F0. 6.0M	
							0	1	PB EQ F0. 5.5M	*
							1	0	PB EQ F0. 5.0M	
							1	1	PB EQ F0. 4.5M	
Group 5					0	0			R/P EQ TRAP: 500k+650k	
					0	1			R/P EQ TRAP: 500k+800k	*
					1	0			R/P EQ TRAP: 500k+1.1M	
EQ					1	1			R/P EQ TRAP: 500k	
			0	0					PB EQ PEAK-Narrow/REC EQ SLOPE-GENTLE	
			0	1					PB EQ PEAK-2/REC EQ SLOPE-2	
			1	0					PB EQ PEAK-3/REC EQ SLOPE-3	*
			1	1					PB EQ PEAK-Wide/REC EQ SLOPE-STEEP	
	0	0							PB EQ H-TRAP 10MHz/REC EQ H-TRAP 10MHz	
	0	1							PB EQ H-TRAP 9MHz/REC EQ H-TRAP 9MHz	*
	1	0							PB EQ H-TRAP 8MHz/REC EQ H-TRAP 8MHz	
	1	1							PB EQ H-TRAP 7MHz/REC EQ H-TRAP 7MHz	

ADDRESS	8	7	6	5	4	3	2	1		
								0	CHILD LOCK OFF	*
								1	CHILD LOCK ON	
							0		PHASE ALTERNATOR ON ; PAL ONLY	*
							1		PHASE ALTERNATOR OFF ; PAL ONLY	
Group 6						0			NORMAL PB	
						1			TRICK PB	*
					0				APC LOOP BEFORE	*
at PB					1				APC LOOP AFTER	
MODE				0					NO OPERATION	*
				1					NO OPERATION	
	0	0	0						PIC CTL -6dB / soft	
	0	0	1						PIC CTL -4dB	
	0	1	0						PIC CTL -2dB	
	0	1	1						PIC CTL 0dB	
	1	0	0						PIC CTL 0dB	*
	1	0	1						PIC CTL +2dB	
	1	1	0						PIC CTL +4dB	
	1	1	1						PIC CTL +6dB/sharp	

ADDRESS	8	7	6	5	4	3	2	1		
							0	0	REC FM LEVEL -1.8dB	*
							0	1	REC FM LEVEL -0.9dB	
							1	0	REC FM LEVEL 0dB	
							1	1	REC FM LEVEL +0.9dB	
						0			WC 195%	
Group 6						1			WC 185%	*
					0				NORMAL MODE	*
					1				SYNC CARRIER OUT MODE	
at REC	0	0	0	0					REC CURRENT-1/MIN	
MODE	0	0	0	1					REC CURRENT-2	
	0	0	1	0					REC CURRENT-3	
	0	0	1	1					REC CURRENT-4	
	0	1	0	0					REC CURRENT-5	
	0	1	0	1					REC CURRENT-6	
	0	1	1	0					REC CURRENT-7	
	0	1	1	1					REC CURRENT-8	
	1	0	0	0					REC CURRENT-9/TYP	*
	1	0	0	1					REC CURRENT-10	
	1	0	1	0					REC CURRENT-11	
	1	0	1	1					REC CURRENT-12	
	1	1	0	0					REC CURRENT-13	
	1	1	0	1					REC CURRENT-14	
	1	1	1	0					REC CURRENT-15	
	1	1	1	1					REC CURRENT-16/MAX	

ADDRESS	8	7	6	5	4	3	2	1		
							0	0	REC C LEVEL 0dB/PB NORMAL	*
							0	1	REC C LEVEL -1.5dB/PB NAP	
							1	0	REC C LEVEL -3.0dB/PB BALA-MOD	
							1	1	REC C LEVEL -4.5dB/PB PROHIBIT (NO-OPERATION)	
Group 7						0			CG NORMAL/PB BST DE-EM -5.0dB	*
						1			CG STOP/PB BST DE-EM -5.5dB	
					0				NORMAL	*
LEVEL CTL					1				PROHIBIT (T-TEST)	
				0					BGP=INTERVAL	*
				1					BGP=CONTINUE	
			0						SYNC SLICE LEVEL=SYNC TIP SIDE	*
			1						SYNC SLICE LEVEL=PEDESTAL SIDE	
	0	0							NL OFF	*
	0	1							NL STRONG	
	1	0							NL MIDIUM	
	1	1							NL STANDARD	

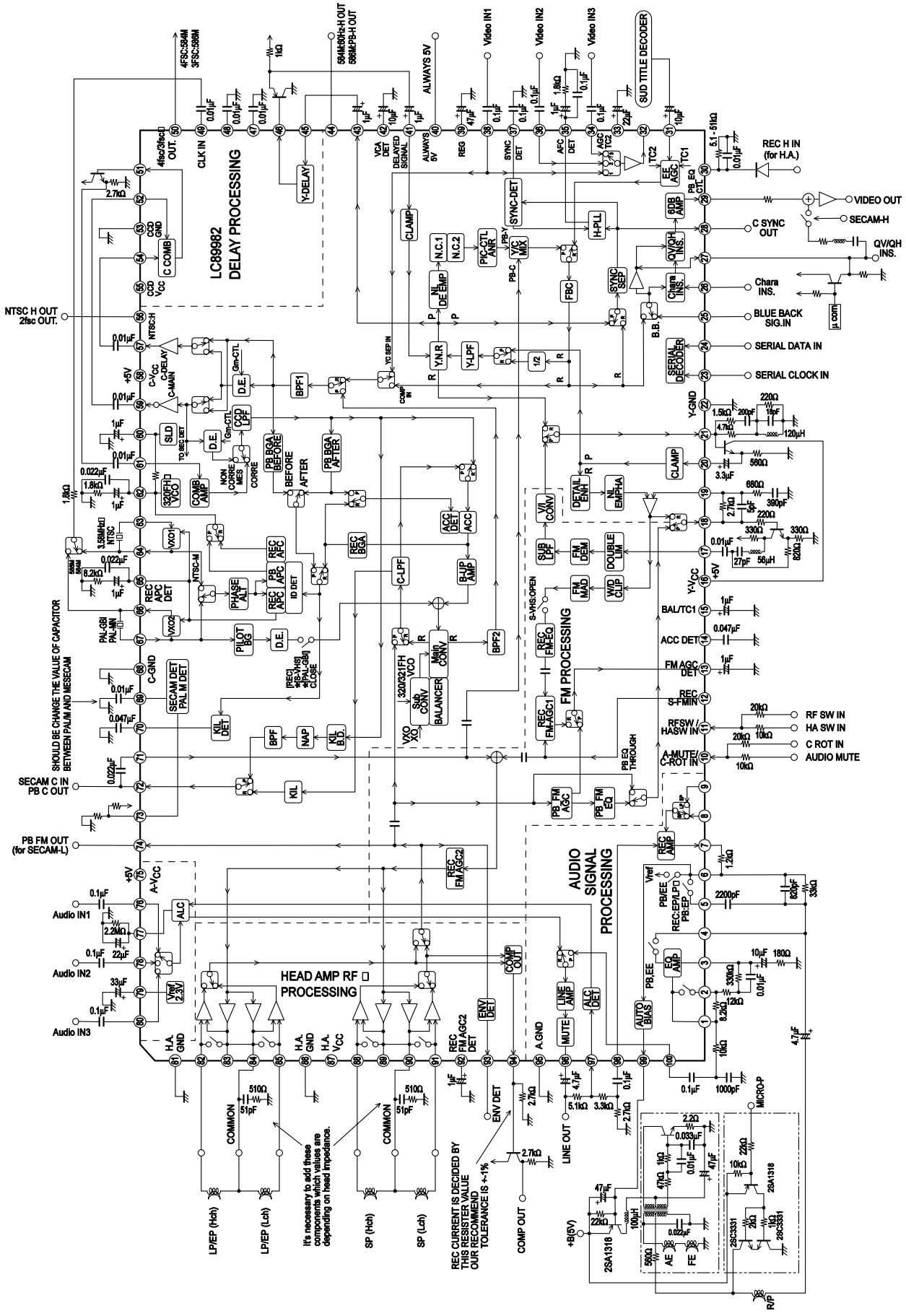
ADDRESS	8	7	6	5	4	3	2	1		
							0	0	Y-LPF Chroma-Trap: ON	*
							0	1	PROHIBIT	
							1	0	PROHIBIT	
							1	1	Y-LPF Chroma-Trap: OFF	
Group 8						0			EQ Low-Chroma-Trap: OFF	*
						1			EQ Low-Chroma-Trap: ON	
				0	0				CAR 3.4/3.8MHz-MODE	*
OTHERS				0	1				PROHIBIT	
				1	0				PROHIBIT	
				1	1				CAR 4.4MHz-MODE	
			0						AUDIO AUTO BIAS (FIX)	*
			1						PROHIBIT	
		0							EXTERMAL EQ	*
		1							INTERNAL EQ	
	0								NORMAL	*
	1								SVHS	

Contents:

- (*) mark shows initial condition.
- PROHIBIT, ( ) mark shows test mode control. Cannot use their bits, except test mode.
- SLAVE ADDRESS is [1110 001].
- SDA OUT DATA (BIT-7): SYNC DET OUT, (BIT-5 TO BIT-2) KILLER OUT, V-LATCH RESULT (for Group-6), V-LATCH RESULT (for Group-5), ACC-KIL OUT
- This LSI is controlled by auto address increment mode.
- This LSI has V-latch system. (controlled by RF-SW pulse)
  V-latch items: Gr5 and Gr6 (all bits)
- 2 On REC-LNC mode, we recommend LNC-OFF or LNC STANDARD mode.
- In case PAL-LP mode, audio is desirable to select EP mode.

Discontinued

Sample Application



Discontinued

Test Circuits