

SANYO	No.2867A	LA7330,7330M,7331N
		Monolithic Linear IC
Chroma Signal Processor for VHS VTR Use		

Overview

The LA7330,7331N are small-sized, multifunctional ICs that contain VHS VTR chroma signal processing circuitry in shrink type DIP24S packages. Since the package is made so small as DIP24S and a minimum number of external parts is required, the LA7330,7331N occupy much less space on the board, thus facilitating VTR set design. The chroma section is made adjustment-free (except REC chroma level), thus streamlining VTR set manufacture. The LA7331N is opposite to the LA7330 in head switch pulse polarity. The LA7330M is a miniflat package version of the LA7330.

Features

- Designed for NTSC/PAL/MESECAM systems
- Adjustment-free chroma section (except REC chroma level)
- Small-sized package (DIP24S and MFP24S)
- Minimum number of external parts required
- LPF usable for REC/PB
- Multifunction

2f_{SC} generator for CCD drive
 Function to select APC loop input signal passed/not passed through comb filter
 BGP output
 3rd lock protector of VX₀

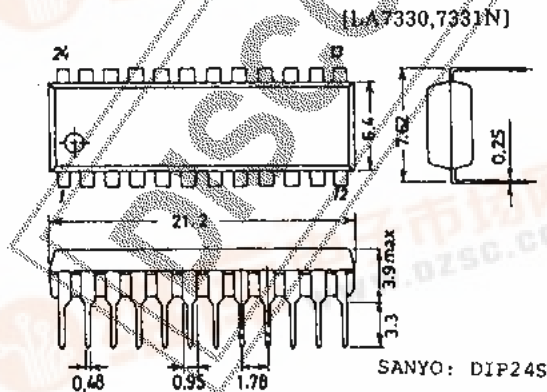
Maximum Ratings at Ta = 25°C

Parameter	Symbol	Value	unit
Maximum Supply Voltage	V _{CC} max	7.0	V
Allowable Power Dissipation	P _d max (Ta ≤ 65°C)	LA7330,7331N: 850 LA7330M: 470	mW
Operating Temperature	T _{opg}	-10 to +65	°C
Storage Temperature	T _{stg}	-40 to +150	°C

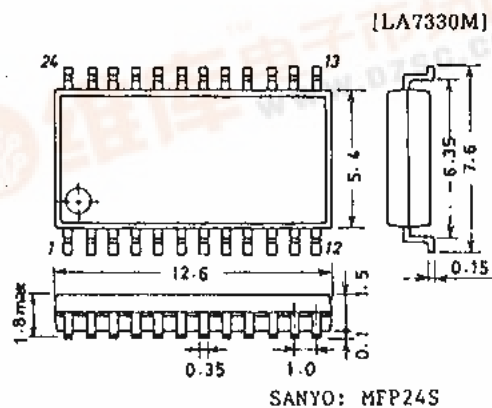
Operating Conditions at Ta = 25°C

Parameter	Symbol	Value	unit
Recommended Supply Voltage	V _{CC}	5.0	V
Operating Voltage Range	V _{CC} op	4.8 to 5.2	V

Case Outline 3067-D24SIC
(unit: mm)



Case Outline 3112-IC
(unit: mm)



Specifications and information herein are subject to change without notice.

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Operating Characteristics at T _a = 25°C, V _{CC} = 5.0V				min	typ	max	unit
REC Current Dissipation	I _{CC} (R)			49	62	75	mA
REC Output Level	V _o (R)			75	110	145	mVp-p
REC,ACC Characteristic	ΔV _o (R)	Input ±6dB		-0.5	±0.1	+0.5	dB
ACC Killer Input Level	V _{ACK}			-25	-22	-19	dB
VXO Control Sensitivity	S _{VXO}			3.1	4.6	6.9	Hz/mV
VXO Oscillation Level	V _{VXO} (R)			0.77	1.01	1.19	Vp-p
Subconverter Output Level	V _{SUB}			97	122	147	mVp-p
BGP Delay Time	t _D				3.35		μs
BGP Width	t _w				4.9		μs
REC,APC Pull-in Range	Δf _{APC}			±350			Hz
REC,AFC Pull-in Range	Δf _{AFC}			±1.0			kHz
VCO Control Sensitivity	S _{VCO}			0.75	1.06	1.38	kHz/mV
PB Current Dissipation	I _{CC} (P)			51	64	77	mA
PB Output Level	V _o (P)			340	390	450	mVp-p
PB ACC Characteristic	ΔV _o (P)	Input ±6dB		-0.5		+0.5	dB
PB Main Converter	CL (P)	5.06MHz component			-38	-33	dB
Carrier Leak							
PB XO Output Level	V _{xo} (P)			640	680	840	mVp-p
PB XO Free-running Frequency	f _{XO} (f)	Difference from 4433619Hz		-9	0	+9	Hz
2f _{SC} Output Amplitude	V _{2fSC}			300	430	560	mVp-p
Burst Emphasis Amount	G _{BE}	NTSC mode		5.5	6.0	6.5	dB
Burst De-emphasis Amount	G _{BD}	NTSC mode		-5.8	-5.55	-5.3	dB
PAL/NTSC Select Voltage	V _{P/N}			1.0	1.35	1.7	V
NTSC/SECAM Select Voltage	V _{N/S}			3.2	3.55	3.9	V

LA7330 Mode Guide

MODE		NTSC	PAL	MESECAM
N/P/S control (pin①)		M (2~3V)	L (0~1V)	H (4~5V)
VCO frequency		320fH	321fH	321fH
VCO control	REC	AFC	AFC	AFC
	PB	APC	APC	
VXO control	REC	APC*1	APC*1	free run
	PB	free run	free run	
PB APC loop	SP	after COMB*2	before COMB	
	LP	after COMB	after COMB	
	EP			
APC killer, ID		○	○	OFF
4-phase shift (rotation)	1CH (LOW)	Leads 90° every hour.	STOP	STOP
	2CH (High)	Lags 90° every hour.	Lags 90° every hour.	
4-phase shift clock	REC	H.SYNC	H.SYNC	
	PB	DPLL	DPLL	
	①pin: ②	H.SYNC	H.SYNC	
Burst emphasis, de-emphasis	SP	○		
	LP			
	EP	○		
SLD mask (inhibit)	①pin: ③ ACC killer	Not masked	Not masked	
	Other than above	Masked during 19H period from SW pulse edge		

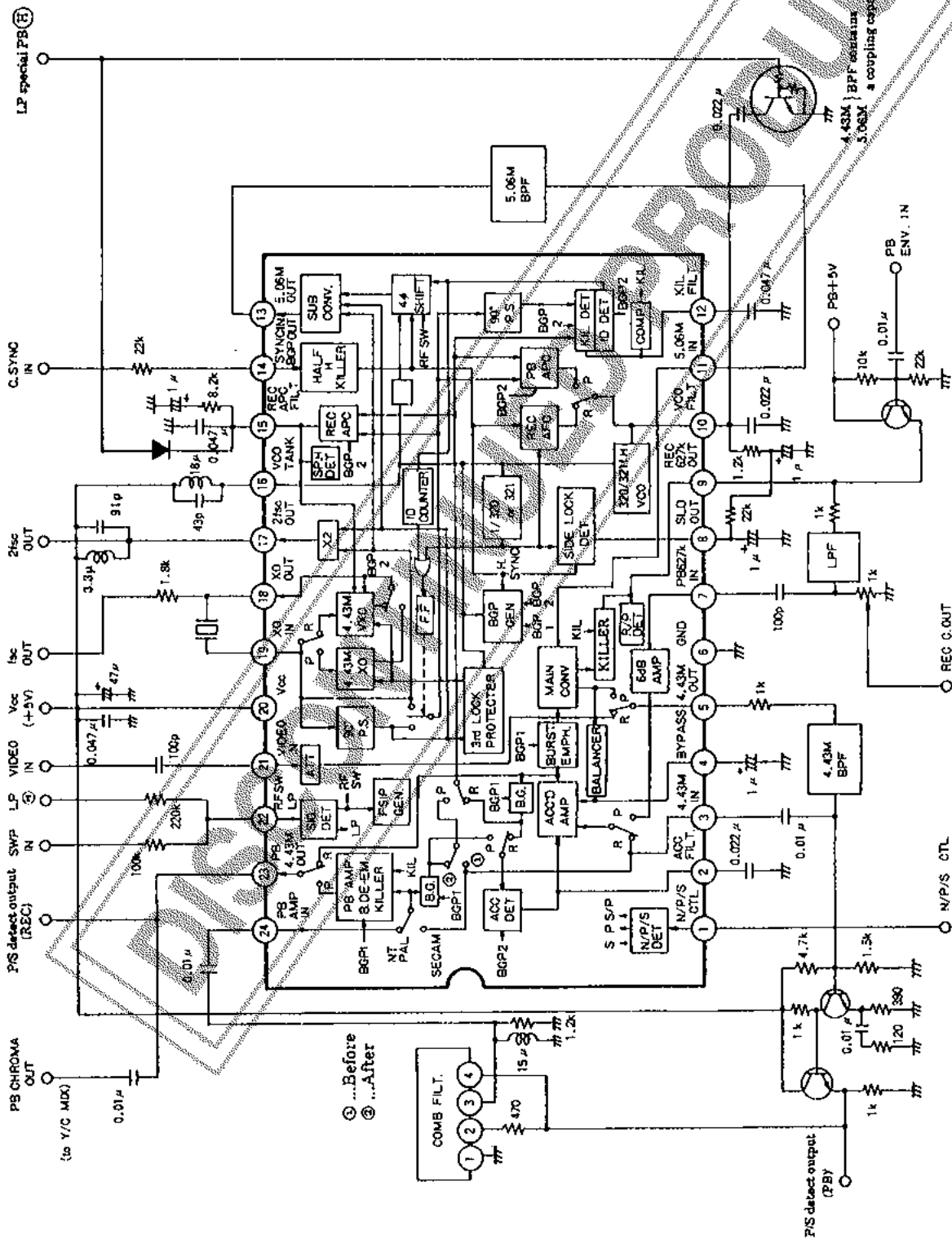
* 1 Free-running at ACC killer mode (no signal, B&W, weak input)

* 2 For 2-head use, it is desirable to select "before COMB". (Pin 21 control)

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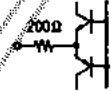
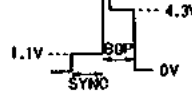
1. The comb amp and SLD output resistor are connected externally.
2. In the MESECAM mode, the video signal does not pass through the comb filter, but is processed inside the IC.
3. In the REC mode, pin 23 functions as REC ACC output pin.
4. The input impedance of pin 24 (PB amp input) is approximately 11.5k Ω .
5. In the PB killer mode, pin 23 is brought to GND level.

Equivalent Circuit Block Diagram and Sample Peripheral Circuit (PAL/MESECAM Systems)



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LA7330,7331N Pin Description

Pin No.	Pin Name	I/O Configuration	DCV(typ.)	ACV(typ.)	Remarks
1	N/P/S CONTROL	PNP Tr. base input	PAL 0 to 1V NTSC 2 to 3V SECAM 4 to 5V		
2	ACC FILTER	Output 2kΩ	REC 1.4V PB 1.7 to 2.0V		
3	REC CHROMA IN	Input 10kΩ	3.2V	REC 70mVp-p PB 100mVp-p (burst level)	fsc BPF output is connected.
4	DC FEEDBACK FILTER	Current drive	2.5V		
5	BPF DRIVE	E.F. (sink current 1mA)	REC 1.6V PB 2.6V	REC 180mVp-p PB 400mVp-p (burst level)	REC: CHROMA + ΔY PB: MAIN CONV.OUT
6	GND				
7	PB CHROMA IN	Input 10kΩ	3.2V	200mVp-p (burst level)	PB pre-amp output passed through LPF is applied.
8	SLD OUT	Current drive	2.7V		If VCO OSC frequency deviates from a specified value, correction output is delivered.
9	REC CHROMA OUT R/P SW CNT	E.F. (sink current 0.4mA)	Color 1.9V Killer 1.0V PB mode at 2.1V or more	440mVp-p (burst level)	REC MAIN CONV.OUT
10	VCO FILTER	Current drive	2.7V		REC AFC filter PB APC filter
11	CONV. CARRIER IN	Input 1kΩ	2.6V	120mVp-p	
12	KILLER FILTER	Current drive	Color 1.9V Killer 3.1V		Threshold: V _{CC} /2
13	SUB CONV. OUT	Output 1kΩ	4.6V	250mVp-p	Low spurious interference due to operational type. No filter matching resistor required.
14	COMP. SYNC IN/BGP OUT				
15	REC APC FILTER	Current drive	2.3V Special PB mode at 3.8V or more		
16	VCO TANK	Output 2kΩ	5.0V	600mVp-p	

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Pin No.	Pin Name	I/O Configuration	DCV(typ.)	ACV(typ.)	Remarks
17	2f _{SC} OUT	Output 3kΩ	5.0V	430mVp-p	CCD drive clock 2f _{SC} output. LC are connected to prevent spurious interference and compensate stray capacitance. Left open or connected to V _{CC} when not used.
18	XO OUT	E.F.	REC 3.1V PB 2.4V	REC 1.01Vp-p PB 680mVp-p	Crystal oscillator's crystal drive. Supplies f _{SC} to servo circuit through resistor.
19	XO IN	Input REC 2kΩ PB 500Ω	4.0V	REC 1.04Vp-p PB 800mVp-p	Signal passed through crystal is applied. Not necessary to adjust free-running frequency at PB mode.
20	V _{CC}		5.0V		
21	REC VIDEO IN	Input 15kΩ	1.6V	REC 240mVp-p (burst level)	When pulled up to V _{CC} using 4.7kΩ resistor and diode, APC loop not passed through comb filter can be supplied to phase detector.
22	SW PULSE IN LP CONTROL IN	PNP Tr. base input			SW pulse threshold is 1/2V _{CC} . When the lowest potential of pulse on pin 22 is 0.8V or less, SP/EP mode is entered; and when 1.3V or more, LP mode is entered.
23	CHROMA OUT	E.F. (sink current 1mA)	REC 2.4V PB Color 2.0V Killer 0V	REC 270mVp-p PB 390mVp-p (burst level)	REC: ACC'D AMP OUT PB: PB CHROMA AMP OUT (to Y/C MIX)
24	PB AMP IN	Input 11.5kΩ	PB 3.4V	120mVp-p (burst level)	Signal passed through comb filter is applied.

The application circuit diagrams and circuit constants herein are included as an example and provide no guarantee for designing equipment to be mass-produced.
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