Monolithic Linear IC

LA7411,7411M

Playback Amplifier and Record Amplifier

Overview

The LA7411 and LA7411M are playback and record amplifier IC for two-head VHS VCRs. When used in conjunction with the video signal processing ICs of the LA7420/30 series, it is possible to eliminate the need to adjust the Y/C record current.

Functions

- 2-channel playback amplifier.
- 1-channel record amplifier.
- REC/PB mode switching head switch circuit.
- Envelope wave detection (for auto-tracking).

Features

- The record amplifier provides stable record characteristics in constant current drive mode, which is able to withstand load fluctuations. In addition, the built-in AGC eliminates the need to adjust the record current.
- Designed to share printed circuit boards with the LA7416/7416M (for 4-head systems).





3112-MFP24S

unit : mm



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SANYO Electric Co.,Ltd. Semiconductor Company TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Specifications

Maximum Ratings at Ta = 25 $^{\circ}$ C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max		7.0	V
Allowable power dissipation	Pd max	Ta ≦65 ∘C	700	mW
Operating temperature	Topr		-10 to +65	
Storage temperature	Tstg	and the second se	-40 to +150	Der 1

*: LA7411M Pd max value which represents the value when mounted on the board.

Operating Conditions at Ta = 25 $^{\circ}$ C

Parameter	Symbol	Conditions Ratings Unit
Recommended supply voltage	V _{CC}	5.0 V
Operating supply voltage range	V _{CC} op	4/8 to 5.5 V
Electrical Characteristics at Ta	a = 25 °C	

Electrical Characteristics at Ta = 25 °C

Parameter		Symbol	Input	Output	Conditions	T1	T2	min	typ	max	Unit
[PB Mode]				and and a second	T12: 5.0 V	ÉP/SP	SW30				
				See Start	T10. Open	and the second se	MUTE				
				J.J.	T4: Open (PB)	di di	à				
Current consumption		ICCP	j.	and the second second	Pin 12	and the second second	0	14	18	22	mA
				2	input current	19 ³⁷					
Voltage gain L	CH1	G _{VP1}	T17A	T7A	$V_1 = 38 \text{ mVp-p}$	f.	0	56.5	59.5	62.5	dB
Voltage gain H	CH2	G _{VP2}	T20A	T7A	J = I MHZ		2.5	56.5	59.5	62.5	dB
Voltage gain difference	1	∆G _{VP1}	1 A	NE M	GVP1 — GVP2			-1	0	+1	dB
Equivalent input	CH1	V _{NIN} 1	/T17A	T7A	After 1.1 MHz		0		1.1	1.5	μVrms
noise voitage	CH2	V _{NIN} 2	T20A	T7A	VOUT/QVP1.2		2.5		1.1	1.5	μVrms
Frequency characteristics	CH1	ΔVfp1	T17A	TZA	V _I = 38 mVp-p, f = 7 MHz		0	-2.5	+1		dB
	CH2	_*∆Vfp2	T20A	5 T7A	V _{OUT} /G _{VP1,2}		2.5	-2.5	+1		dB
Secondary	CH1	V _{HDP} 1	T17A	T7Å	V _I = 38 mVp-p,		0		-40	-35	dB
harmonic distortion	Star and a	r sille Altaca		and the second	f = 4 MHz						
	CH2	Viuno2	T20A	1 7A			2.5		-40	-35	dB
1		"NHERT -		AND STREET	4 M component						
Moximum output loval		And Distance of the	T178	Τ 7Λ			0	1.0	1.2		\/n n
		VOMPI						1.0	1.2		vp-p
			and the second		tertiary distortion						
	CH2	V _{OMP} 2	720A	T7A	of the output is		2.5	1.0	1.2		Vp-р
setter after skill		63560 J	and the second se		–30 dB						
Cross-talk	CH1	V _{CR} 1	T20A	T7A	V _I = 38 mVp-p,		0		-40	-35	dB
(Note 1)	Passa A				f = 4 MHz						9
1 8 4	CH2	VCR ²	117A	I7A	VOUT/GVP1,2		2.5		-40	-35	dB
Output DC offset				T7	CH1-CH2		0	-100	0	+100	mV
		J J ODC .					2.5		Ĵ		
Envelope wave detection	Striff.			T5	T5 DC voltage	0	0	0	0.8	15	V
output pin voltage	State of the second	I FEINV			with no input			Ŭ	0.0	1.0	v
Envelope wave detection volt	ade		T17A	T5	f = 4 MHz,	0	0	2.0	2.5	3.0	V
SP1	and the second second				T7A: Adjusted to						
and the second second	¢ ²				175 mVp-p						
Envelope wave detection volt	age	V _{ENVSP} 2	T17A	T5	f = 4 MHz,	0	0	4.5	4.8	5.0	V
SP2					T7A: Adjusted to						
					450 mVp-p						
Envelope wave detection volt	age	V _{ENVEP} 1	T17A	T5	f = 4 MHz,	5.0	0	2.0	2.5	3.0	V
EP1					17A: Adjusted to						
				1	125 mVp-p	1	1				

Note 1: Status where input stage L (8.2 $\mu H)$ is shorted "*" represents output pins.

Electrical Characteristics at Ta = 25 $^{\circ}C$

				0 111		-				
Parameter	Symbol	Input	Output	Conditions	110	12	min	typ	max	Unit
Envelope wave detection voltage	V _{ENVEP} 2	T17A	T5	f = 4 MHz,	5.0	0	4.5	4.8	5.0	V
EP2				T7A: Adjusted to						
				350 mVp-p			1 the second			
ON resistance of SW-Tr which is	R _{PON} 14		P-14	DC difference		6	and all in the	4.0	6.0	Ω
turned ON in PB mode				measured for 1		and the second se	ji v	New Street		
				mA. 2 mA		all and		N. S. Stringer	ALL SCOTTON	
				current inflow		and the second	Ĩ		ر مورد الموني الموني المانية . مريد المريد الموني المريد ا	
Threshold level EP/SP	EPS-1		T1		*		17	2.	500	V
			T1		* 3	2			1.0	V V
	EF 3-2				a de la		0.0	:06587	<u>در ا</u>	× v
Threshold level SW30	SW30-1		12	Lch \rightarrow Hch	all		1.2		5.0	V
	SW30-2		T2	Hch \rightarrow Lch		* *	0.0	F.	0.8	V
[REC Mode]				T12: 5.0 V	REC	SW30	2000 C.	and the second se		
				T3: 5.0 V	Adj2	MUTE		and the second sec	7	
				T4: 5.0 V(REC)	1. STAG					
Current consumption				Pin 12	Open	0	38	/46	54	mA
				input c urrent			all	a State of the sta		
REC AGC	Vp	Τ 8Δ	T184	f – 4 MH 2	Onen	0	116	123	130	m\/n-n
	^v R			$1 - 4 \mu m / 2 = 1$	- uperr		10	125	150	l mob-b
		TOA	TIOA			0		0.5	10	-10
AGC Amp	^{ΔV} AGC ¹	18A	118A	$f \neq 4$ MHZ,	Open	0.4	J. R. L.	0.5	1.0	ав
control characteristics 1			۵. ا	$v_{\rm F} = 400 \text{mvp-p}$		A B	·			
			A CONTRACTOR			and the state				
				VRSP EP Patro		j j				
AGC Amp	∆V _{AGC} 2	18A	118A	t = 4 MHz.	Open	0	-1.0	-0.5		dB
control characteristics 2			and the second s	$V_{l} = 100 \text{ mVp-p}$	A A	-				
			AND ROOM	Output level/	A Car					
				VRSP, EP ratio						
AGC Amp	ΔV_{FR}	T8A	T18A	1 🖷 1, M, 7 MHz 🦯	Open	0	-4.0	-3.0	-2.0	dB
frequency characteristics (Note 2)		and the second second		V _I = 200 mVp-p						
		The second se		7 MHz/1 MHż,						
		di di	38 <u>19</u>	output ratio						
AGC Amp	ΔV _{HDR}	T8A	T18A	⊈= 4 MHz, /	Open	0		-45	-40	dB
secondary harmonic level	and the second se	/ 🧠		V _I = 200 mVp-p						
	State State	ða.	1900	8 M.component						
	and the second second			4 M component						
	and the second second	199		output ratio						
AGC Amp	WOMP	TRA	T18A	f = 4 MHz	Adi.	0	20	22		mAp-p
maximum output level (Note 3)			er .	output level when		-				
	1. 8		See Marine State	secondary						
J. A.	l'Albert		and the second	distortion of the						
	1997 M 1998	ile.	all's gan	output is -35 dB						
	AN	ΤοΛ	τ10Λ		Onon	5.0		45	40	dD
mute attenuation	∆ VMR			1 = 4 V T Z,	Open	5.0		-40	-40	
	ALCONT OF ACCOUNTS	and the set	1	v = 200 mvp-p						
/ / «		A St.		Vpop co ratio						
PEC	× × · · · ·	T#A	T10A	TEA. F _ E20 LU-	Onon	0		15	40	dP
	CY CY	NA NA		10A. 1 = 029 KHZ,	Open			-40	-40	UD
mixed modulation restrice loss		1		v = 300 mvp-p T70.f = 4 MHz						
	ار کر	Tev	T19A	$V_1 = 200 \text{ m}/\text{n-n}$	Open	0		_15	_40	dP
// %s.)		IOA		(4 M+629 k)/4 M	Open			-40	-40	
				output ratio						
ON resistance of SW-Tr which we	B		P-17	DC difference				40	60	0
turned ON in REC mode	KON''		1 - 17	measured for				0	0.0	<u>``</u>
			D 20	$1 \text{ m}\Delta 2 \text{ m}\Delta$				4.0	60	0
// 1996 1	TRON∠∩		F-20	current inflow				4.0	0.0	52
			T 2			*	0.4		5.0	\
REC INUTE INTESNOID LEVEL	MUIE-1		12			Î	3.4		5.0	V
	L			UN						
	MUTE-2		T2	MUTE ON \rightarrow		*	0.0		3.0	V
				OFF						
REC/PB threshold level of a	SW			T4: Control			2.2		5.0	V
and the second se	REC/PB			voltage						

Note 2: Apply approximately 1.8 V DC to the AGC wave detection filter pin (pin 9) and fix the amplifier gain for measurement. Note 3: Apply DC voltage to T10 (REC CUR. ADJ2) and adjust the output level. Note : Use a resistor with a tolerance of \pm 1.0% between pins 11 and 12.

"*" represents output pins.

Test Circuit Diagram



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