

**SANYO**

No. 5108

**LA7411,7411M****Playback Amplifier and Record Amplifier  
for VHS VCRs****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**

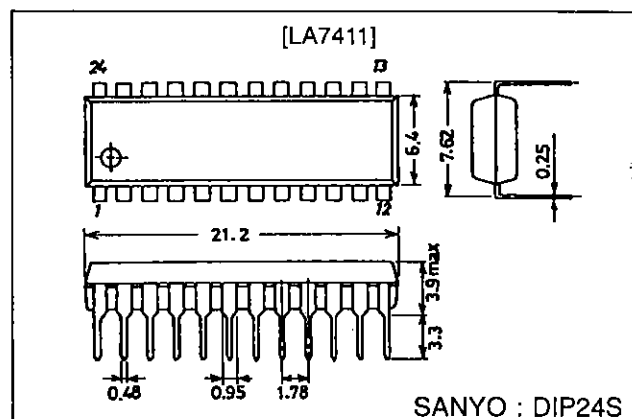
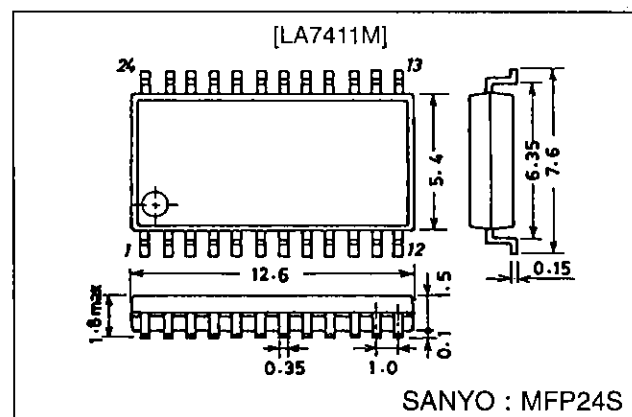
- 2-channel playback amplifier.
- 1-channel record amplifier.
- REC/PB mode switching head switch circuit.
- Envelope wave detection (for auto-tracking).

**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).

**Package Dimensions**

unit : mm

**3067-DIP24S****3112-MFP24S****Specifications****Maximum Ratings at Ta = 25 °C**

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CCmax</sub>		7.0	V
Allowable power dissipation	Pd max	Ta ≤ 65 °C	700	mW
			*500	mW
Operating temperature	Topr		-10 to +65	°C
Storage temperature	Tstg		-40 to +150	°C

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

## LA7411,7411M

### Operating Conditions at Ta = 25 °C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>		5.0	V
Operating supply voltage range	V <sub>CCOP</sub>		4.8 to 5.5	V

### Electrical Characteristics at Ta = 25 °C

Parameter	Symbol	Input	Output	Conditions	T1	T2	min	typ	max	Unit	
[PB Mode]				T12: 5.0 V T10: Open T4: Open (PB)	EP/SP	SW30 MUTE					
Current consumption	I <sub>CCP</sub>			Pin 12 input current		0	14	18	22	mA	
Voltage gain L	CH1	G <sub>VP1</sub>	T17A	T7A	V <sub>I</sub> = 38 mVp-p f = 1 MHz	0	56.5	59.5	62.5	dB	
Voltage gain H	CH2	G <sub>VP2</sub>	T20A	T7A		2.5	56.5	59.5	62.5	dB	
Voltage gain difference		ΔG <sub>VP1</sub>			G <sub>VP1</sub> - G <sub>VP2</sub>		-1	0	+1	dB	
Equivalent input noise voltage	CH1	V <sub>NIN1</sub>	T17A	T7A	After 1.1 MHz LPF	0		1.1	1.5	μVrms	
	CH2	V <sub>NIN2</sub>	T20A	T7A	V <sub>OUT</sub> /G <sub>VP1,2</sub>	2.5		1.1	1.5	μVrms	
Frequency characteristics	CH1	ΔVfp1	T17A	T7A	V <sub>I</sub> = 38 mVp-p, f = 7 MHz	0	-2.5	+1		dB	
	CH2	ΔVfp2	T20A	T7A	V <sub>OUT</sub> /G <sub>VP1,2</sub> output ratio	2.5	-2.5	+1		dB	
Secondary harmonic distortion	CH1	V <sub>HDP1</sub>	T17A	T7A	V <sub>I</sub> = 38 mVp-p, f = 4 MHz 8 M component	0		-40	-35	dB	
	CH2	V <sub>HDP2</sub>	T20A	T7A	4 M component output ratio	2.5		-40	-35	dB	
Maximum output level	CH1	V <sub>OMP1</sub>	T17A	T7A	f = 1 MHz Output level when tertiary distortion of the output is -30 dB	0	1.0	1.2		Vp-p	
	CH2	V <sub>OMP2</sub>	T20A	T7A		2.5	1.0	1.2		Vp-p	
Cross-talk (Note 1)	CH1	V <sub>CR1</sub>	T20A	T7A	V <sub>I</sub> = 38 mVp-p, f = 4 MHz	0		-40	-35	dB	
	CH2	V <sub>CR2</sub>	T17A	T7A	V <sub>OUT</sub> /G <sub>VP1,2</sub> output ratio	2.5		-40	-35	dB	
Output DC offset		ΔV <sub>ODC1</sub>		T7	CH1-CH2	0 2.5	-100	0	+100	mV	
Envelope wave detection output pin voltage		V <sub>ENV</sub>		T5	T5 DC voltage with no input	0	0	0	0.8	1.5	V
Envelope wave detection voltage SP1		V <sub>ENVSP1</sub>	T17A	T5	f = 4 MHz, T7A: Adjusted to 175 mVp-p	0	0	2.0	2.5	3.0	V
Envelope wave detection voltage SP2		V <sub>ENVSP2</sub>	T17A	T5	f = 4 MHz, T7A: Adjusted to 450 mVp-p	0	0	4.5	4.8	5.0	V
Envelope wave detection voltage EP1		V <sub>ENVEP1</sub>	T17A	T5	f = 4 MHz, T7A: Adjusted to 125 mVp-p	5.0	0	2.0	2.5	3.0	V
Envelope wave detection voltage EP2		V <sub>ENVEP2</sub>	T17A	T5	f = 4 MHz, T7A: Adjusted to 350 mVp-p	5.0	0	4.5	4.8	5.0	V
ON resistance of SW-Tr which is turned ON in PB mode		R <sub>PON14</sub>		P-14	DC difference measured for 1 mA, 2 mA current inflow			4.0	6.0	Ω	
Threshold level EP/SP		EPS-1		T1	SP → EP	*		1.7	5.0	V	
		EPS-2		T1	EP → SP	*		0.0	1.3	V	
Threshold level SW30		SW30-1		T2	Lch → Hch		*	1.2	5.0	V	
		SW30-2		T2	Hch → Lch		*	0.0	0.8	V	

Note 1: Status where input stage L (8.2 μH) is shorted

“\*” represents output pins.

## LA7411,7411M

### Electrical Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Input	Output	Conditions	T10	T2	min	typ	max	Unit
[REC Mode]				T12: 5.0 V T3: 5.0 V T4: 5.0 V(REC)	REC Adj2	SW30 MUTE				
Current consumption	$I_{CCP}$			Pin 12 input current	Open	0	38	46	54	mA
REC AGC Amp output level	$V_R$	T8A	T18A	$f = 4\text{ MHz}$ $V_1 = 200\text{ mVp-p}$	Open	0	116	123	130	mVp-p
AGC Amp control characteristics 1	$\Delta V_{AGC1}$	T8A	T18A	$f = 4\text{ MHz}$ , $V_1 = 400\text{ mVp-p}$ Output level/ $V_{RSP, EP}$ ratio	Open	0		0.5	1.0	dB
AGC Amp control characteristics 2	$\Delta V_{AGC2}$	T8A	T18A	$f = 4\text{ MHz}$ , $V_1 = 100\text{ mVp-p}$ Output level/ $V_{RSP, EP}$ ratio	Open	0	-1.0	-0.5		dB
AGC Amp frequency characteristics (Note 2)	$\Delta V_{FR}$	T8A	T18A	$f = 1\text{ M}, 7\text{ MHz}$ $V_1 = 200\text{ mVp-p}$ 7 MHz/1 MHz, output ratio	Open	0	-4.0	-3.0	-2.0	dB
AGC Amp secondary harmonic level	$\Delta V_{HDR}$	T8A	T18A	$f = 4\text{ MHz}$ , $V_1 = 200\text{ mVp-p}$ 8 M component <u>4 M component</u> output ratio	Open	0		-45	-40	dB
AGC Amp maximum output level (Note 3)	$\Delta V_{OMR}$	T8A	T18A	$f = 4\text{ MHz}$ , output level when secondary distortion of the output is -35 dB	Adj.	0	20	22		mAp-p
AGC Amp mute attenuation	$\Delta V_{MR}$	T8A	T18A	$f = 4\text{ MHz}$ , $V_1 = 200\text{ mVp-p}$ Output level/ $V_{RSP, EP}$ ratio	Open	5.0		-45	-40	dB
REC AGC Amp mixed modulation relative level	$\Delta V_{CY}$	T7A	T18A	T6A: $f = 629\text{ kHz}$ , $V_1 = 360\text{ mVp-p}$ T7A: $f = 4\text{ MHz}$ , $V_1 = 200\text{ mVp-p}$ (4 M±629 k)/4 M output ratio	Open	0		-45	-40	dB
		T8A	T18A	$V_1 = 200\text{ mVp-p}$ (4 M±629 k)/4 M output ratio	Open	0		-45	-40	dB
ON resistance of SW-Tr which is turned ON in REC mode	$R_{RON17}$		P-17	DC difference measured for 1 mA, 2 mA current inflow				4.0	6.0	$\Omega$
	$R_{RON20}$		P-20					4.0	6.0	$\Omega$
REC MUTE threshold level	MUTE-1		T2	MUTE OFF → ON		*	3.4		5.0	V
	MUTE-2		T2	MUTE ON → OFF		*	0.0		3.0	V
REC/PB threshold level	SW REC/PB			T4: Control voltage			2.2		5.0	V

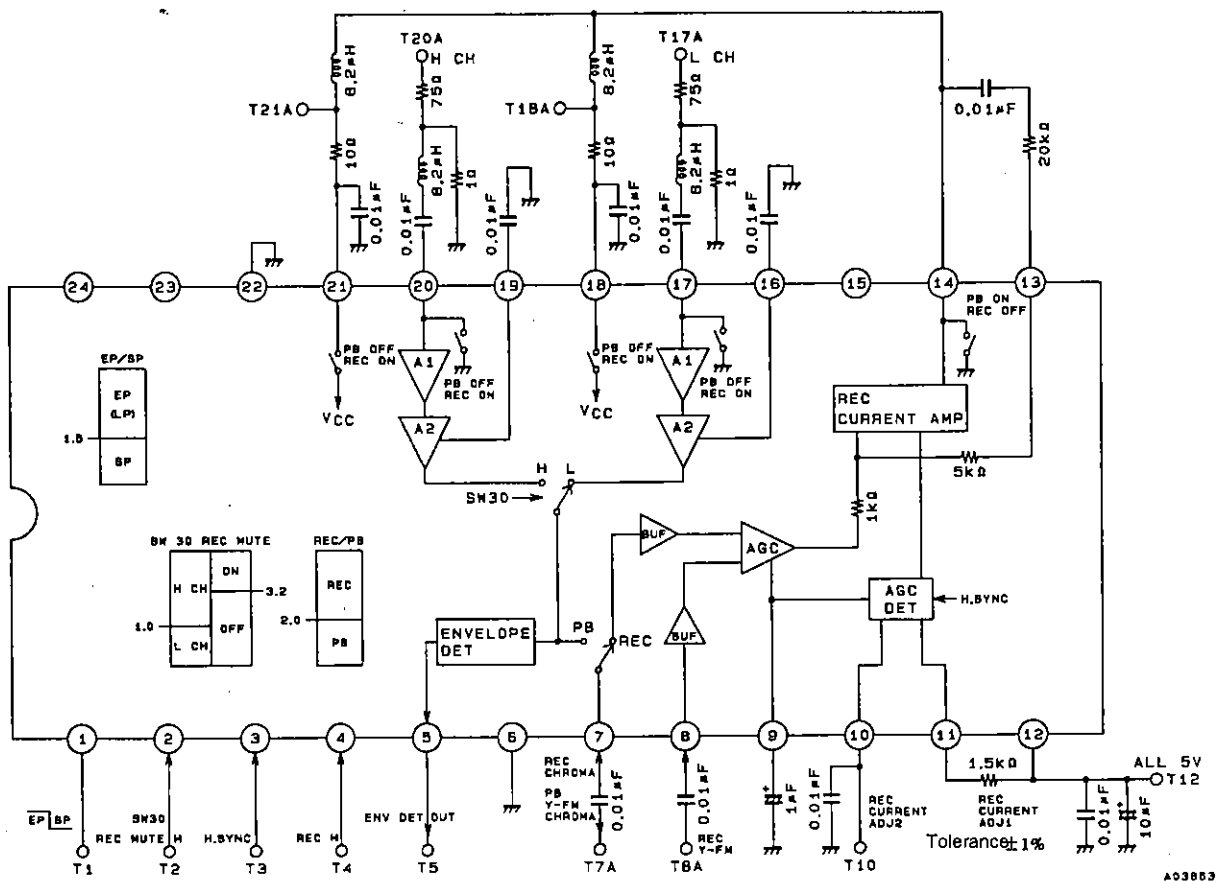
Note 2: Apply approximately 1.8 V DC to the AGC wave detection filter pin (pin 9) and fix the amplifier gain for measurement.

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.

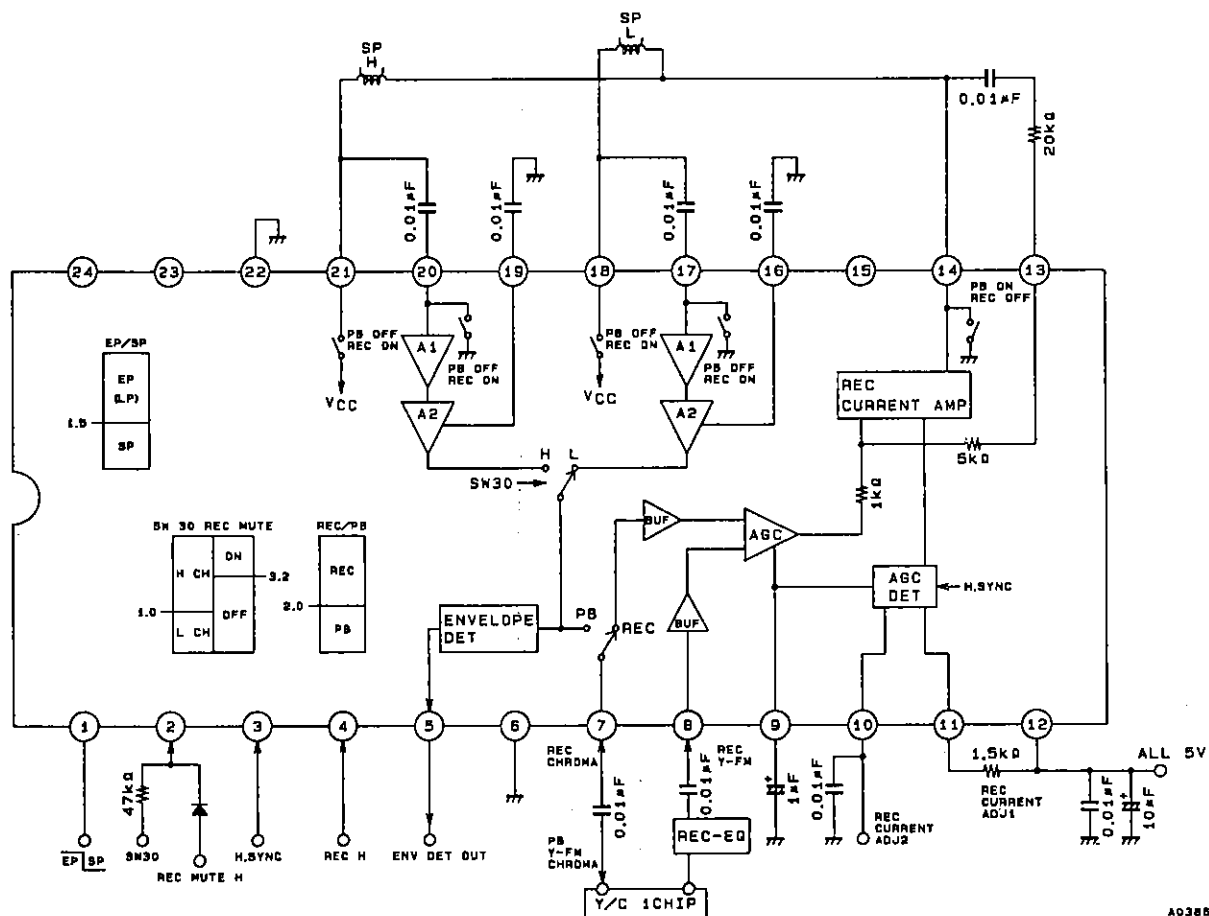
“\*” represents output pins.

Test Circuit Diagram



A03883

Sample Application Circuit



A03882

- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
  - ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use:
  - ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of June, 1995. Specifications and information herein are subject to change without notice.