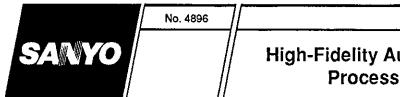
LA7256



High-Fidelity Audio Signal Record/Playback Processing Circuit for VCR Products

Overview

The LA7256 provides the record and playback amplification functions required for high-fidelity audio signal processing in VCR systems. The record system supports S-VHS and over-recording, and also supports the provision of an adjustment-free record current by using a constant-current regulated output scheme incorporating an AGC circuit. The playback system consists of a high-gain preamplifier with a small DC offset, and includes a built-in EP gain increasing function.

Functions

- · Preamplifier (two channels)
- · RF switching between CH1 and CH2
- Record AGC amplifier (for over-recording and S-VHS)
- · Constant-current regulated output record amplifier
- Buffer amplifier that can be used in both record and playback

Features

- · Minimal number of required external components
- The playback amplifier output DC offset is small.
- · Built-in EP mode gain emphasis
- Record AGC that handles three modes (for an adjustment-free record current)
- Built-in buffer amplifier that can be used to construct an active filter.

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max	,	7.0	٧
Allowable power dissipation	Pd max	Ta≤65°C	700	mW
Operating temperature	Topr		-10 to +65	•c
Storage temperature	Tstg		-55 to +150	°C

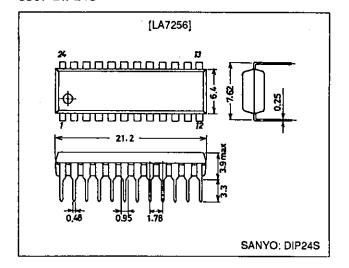
Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	Vcc		5.0	٧
Operating supply voltage range	V _{CC} op		4.5 to 5.5	٧

Package Dimensions

unit: mm

3067-DIP24S



Operating Characteristics at Ta = 25°C, V_{CC} = 5 V, in the specified test circuit

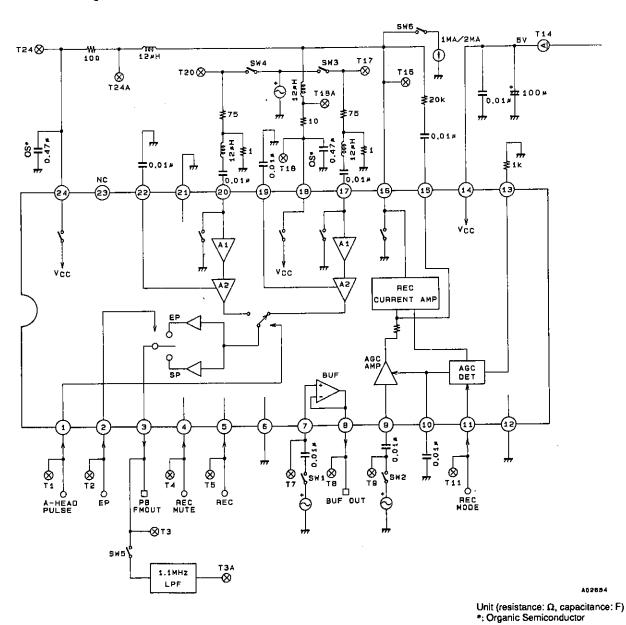
Parameter	Symbol	Conditions	min	typ	max	Unit
[Playback Mode]	,,,,,				,	
Circuit current	ICCP	No input: the pin 14 influx current	13	18	23	mA
Voltage gain, CH1	G _{VP1}	Pin 20 input = 100 μ Vp-p, f = 1.5 MHz, pin 1 = low: measure the pin 3 output.	72.5	75.5	78.5	dB
Voltage gain, CH2	G _{VP2}	Pin 17 input = 100 μVp-p, f = 1.5 MHz, pin 1 = high: measure the pin 3 output.	72.5	75.5	78.5	dB
Voltage gain difference	∆G _{VP}	G _{VP1} - G _{VP2}	-2	0	+2	dB
EP gain emphasis	ΔG _E ρ	Pin 20 input = 100 μVp-p, f = 1.5 MHz, pin 1 = low: the ratio of the pin 3 outputs when pin 2 is high/low	1.7	2.4	3.1	dB
Frequency characteristics, CH1	·f _{P1}	Pin 20 input = 100 μVp-p, pin 1 = low: the difference in the levels on pin 3 when f = 2.2 MHz and 1.0 MHz	-3.0	-1.0	0	dΒ
Frequency characteristics, CH2	f _{P2}	Pin 17 input = 100 μVp-p, f = 1.5 MHz, pin 1 = high: the difference in the levels on pin 3 when f = 2.2 MHz and 1.0 MHz	-3.0	-1.0	. 0	dB
Crosstalk CH1 to CH2	CT _{1 → 2}	Pin 17 input = 0, pin 20 input = $100 \mu Vp$ -p, $f = 1.5 MHz$: the difference in the pin 3 output levels when pin 1 goes from low to high		-40	-35	dB
Crosstalk CH2 to CH1	CT _{2→1}	Pin 20 input = 0, pin 17 output = 100 μVp-p, f = 1.5 MHz: the difference in the pin 3 output levels when pin 1 goes from high to low		-40	-35	dB
Equivalent input noise voltage CH1	V _{NP1}	With pin 20 grounded through 0.01 μ F and 1 Ω , pin 1 = low: the pin 3 noise in input equivalent*1		0.8	1.0	μVrms
Equivalent input noise voltage CH2	V _{NP2}	With pin 17 grounded through 0.01 μ F and 1 Ω , pin 1 = high: the pin 3 noise in input equivalent ²¹		0.8	1.0	μVrms
Second harmonic distortion CH1	2THD ₁	Pin 20 input = 100 μVp-p, f = 1.5 MHz, pin 1 = low: the second harmonic in the pin 3 output		-50	-40	dB
Second harmonic distortion CH2	2THD ₂	Pin 17 input = 100 μVp-p, f = 1.5 MHz, pin 1 = high: the second harmonic in the pin 3 output		-50	-40	dB
Maximum output voltage CH1	V _{OMP1}	With the pin 20 input varying, f = 1.5 MHz, pin 1 = low: when the pin 3 third harmonic distortion is -30 dB	2.0			Vp-p
Maximum output voltage CH2	V _{OMP2}	With the pin 17 input varying, f = 1.5 MHz, pin 1 = high: when the pin 3 third harmonic distortion is -30 dB	2.0			V p-р
Output DC offset 1	ΔV _{ODC1}	Pin 17 and 20 inputs = 0, pin 1 = low, pin 2 = low (SP): the difference in the pin 3 DC level when pin 1 goes from low to high	-30	0	+30	mV
Output DC offset 2	_∇ Λ ^{ODC5}	Pin 17 and 20 inputs = 0, pin 1 = low, pin 2 = high (EP): the difference in the pin 3 DC level when pin 1 goes from low to high	50	0	+50	mV
Head switching: CH1 hold voltage	V _{HS1}	The pin 1 DC voltage required to operate CH1	0 .		1.0	V
Head switching: CH2 hold voltage	V _{HS2}	The pin 1 DC voltage required to operate CH2	3.0		Vcc	V
Playback mode switch on resistance	R _{SW}	Calculate from the voltage difference on pin 16 when the pin 16 influx current is 1 mA and 2 mA.		4.0	6.0	Ω
SP hold voltage	V ₂ SP	The pin 2 voltage required to hold SP mode	0		1.0	V
EP hold voltage	V ₂ EP	The pin 2 voltage required to hold EP mode	3.0		V _{CC}	V
PB hold voltage	V _{5L}	The pin 5 voltage required to hold PB mode	0		1.0	v
[Record Mode]	 	No single the sign of the sign	A.E	60	81	mA.
Circuit current	ICCR	No signal, the pin 14 influx current Pin 9 input = 180 mVp-p, f = 1.5 MHz:	45	63	"	mA
Output current	lor	measure the pin 16 output	48	53	58	mAp-p
AGC control characteristics 1	ΔV _{AGC1}	Pin 9 input = 90 and 180 mVp-p, f = 1.5 MHz: the ratio of the pin 16 output levels	-0.5	-0.2		dB
AGC control characteristics 2	ΔV _{AGC2}	Pin 9 input = 360 and 180 mVp-p, f = 1.5 MHz: the ratio of the pin 16 output levels		0.2	0.5	dB
Cross modulation distortion 0.4 MHz component	CMD ₀₄	For a pin 9 input*2, the 0.4 MHz spurious signal in the pin 16 output current			-40	dB
Cross modulation distortion 0.9 MHz component	CMD ₀₉	For a pin 9 input*2, the 0.9 MHz spurious signal in the pin 16 output current			-40	dB

Note: 1. Measure the input noise voltage after passing the pin 3 output (playback FM output) through a 1.1 MHz low-pass filter.

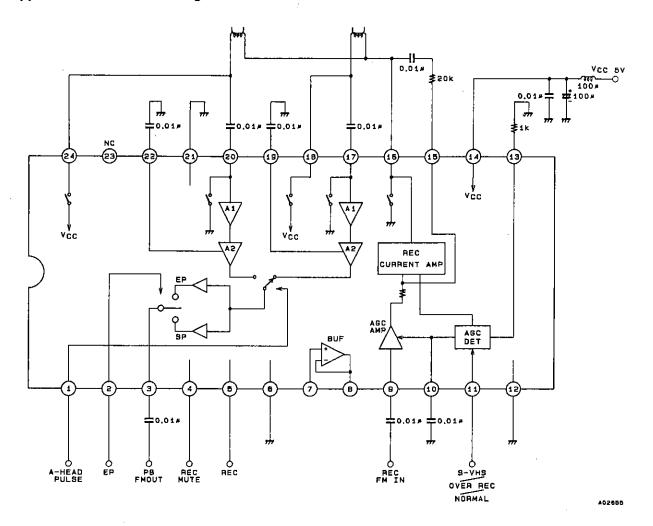
2. 1.3 MHz (70 mVp-p) + 1.7 MHz (180 mVp-p)

Parameter	Symbol	Conditions	min	typ	max	Unit
Over-record hold voltage	V _{11M}	The pin 11 DC voltage for over-record mode	1.5		3.0	٧
Over-record current ratio	lo-ov	Pin 9 input = 180 mVp-p, f = 1.5 MHz, pin 11 = middle level: measure the pin 16 output current	1.7	2.2	2.7	dB
S-VHS hold voltage	V _{11H}	The pin 11 DC voltage for S-VHS mode	3.5		V _{CC}	٧
S-VHS current ratio	I _{O-SV}	Pin 9 input = 180 mVp-p, f = 1.5 MHz, pin 11 = high: measure the pin 16 output current	-2.0	-2.6	-3.2	dB
Record mute hold voltage 1	V _{4L}	The pin 4 DC voltage when record muting is off	0		1.0	V
Record mute hold voltage 2	V _{4H}	The pin 4 DC voltage when record muting is on	3.0		V _{CC}	٧
Mute attenuation	I _{OR} , M _U	Pin 9 input = 180 mVp-p, f = 1.5 MHz, pin 4 = high: measure the pin 16 output current			-40	dB
Record hold voltage	V _{5H}	The pin 5 voltage required to hold record mode	3.0		V _{CC}	V
[Built-in Buffer]						
Buffer I/O DC offset	ΔV _{BUF}		-10		+10	m∨
Buffer frequency characteristics	f _{BUF}	Pin 9 input = 180 mVp-p, f = 1/10 MHz	-1		+1	dB

Test Circuit Diagram



Application Circuit Block Diagram



Unit (resistance: Ω , capacitance: F)

Pin Functions

2 ESISP 2 SOK 0 3 OK 0 3 OK 0 4 REC MUTE 3 OK 0 3 OK 0 3 OK 0 4 REC MUTE 4 REC MUTE 5 OK 0 3 OK 0 3 OK 0 4 SOK 0 4 SOK 0 4 SOK 0 5 OK 0 4 SOK 0 5 OK 0 5 OK 0 4 SOK 0 5 OK 0 5 OK 0 5 OK 0 6 SOK 0	Pin No.	Symbol	Pin internal equivalent circuit	Function
2 ESISP Low: 0 to 1.0 V → SP High: 3.0 to V _{CC} → EP A02850 Low: 0 to 1.0 V → Mule off High: 3.0 to V _{CC} → Mule on REC MUTE SOK 0 A02850 Low: 0 to 1.0 V → Mule off High: 3.0 to V _{CC} → Mule on Low: 0 to 1.0 V → Mule off High: 3.0 to V _{CC} → Mule on	1	A-HEAD PULSE	30kû\$ \$5kû	Low: 0 to 1.0 V \rightarrow CH1 High: 3.0 to V _{CC} \rightarrow CH2
3 PB-FM OUT A02658 REC MUTE A02658 Low: 0 to 1.0 V \rightarrow Mute off High: 3.0 to V _{CC} \rightarrow Mute on The second se	2	ES/SP	30kû\$ \$5kû	Low: 0 to 1.0 V \rightarrow SP High: 3.0 to V _{CC} \rightarrow EP
4 REC MUTE 30 k a \Rightarrow 5 k a Low: 0 to 1.0 V \rightarrow Mute off High: 3.0 to V _{CC} \rightarrow Mute on 5 REC 5 NA 30 k a \Rightarrow 2 k a Low: 0 to 1.0 V \rightarrow PB High: 3.0 to V _{CC} \rightarrow REC	3	PB-FM OUT	(3) -W 400#A	
5 REC Sok 2 ₹ 2k2 Low: 0 to 1.0 V → PB High: 3.0 to V _{CC} → REC	4	REC MUTE	30k0 ₹ ₹5k0	Low: 0 to 1.0 V \rightarrow Mute off High: 3.0 to V _{CC} \rightarrow Mute on
6 GND Ground for the playback output stage and record circuits	5	REC	30kû\$ \$2kû	Low: 0 to 1.0 V → PB High: 3.0 to V _{CC} → REC
	6	GND		Ground for the playback output stage and record circuits

Pin No.	Symbol	Pin internal equivalent circuit	Function
7	BUFF IN	7 1000 50kg W 200#A 1/2VCC	
8	BUFF OUT	B 200#A A02662	DC voltage = 1/2 V _{CC}
9	REC FM IN	9 5kg 100g W W A02563	Record amplifier input
10	AGC FILT	10 W 10kΩ ₹15kΩ	Detects the record amplifier AGC detector output
11	REC MODÉ	1100kg 100 mA 100 mA A02865	Low: 0 to 1.0 V → Normal Middle: 1.5 to 3.0 V → Over-record High: 3.5 V to V _{CC} → S-VHS
12	REC OUT GND		Ground for the record output circuits
L	1	<u> </u>	<u> </u>

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Pin No.	Symbol	Pin internal equivalent circuit	Function
13	REC-CURR-ADJ	ACCESS	Converts the record output current output to a voltage
14	v _{cc}		
15	REC BIAS	800 #A 0 1.6 mA REC OUT AGC Amp 5000 15 W 1.5 mA 800 #A	Input block for the record current amplifier
16	REC OUT	PB ON AO2668	Switch for record current output and playback mode on On in PB mode
17	CH2-IN	10 k 2 REC ON W	Playback amplifier CH2 input
18	PSW2	30kΩ \$50kΩ 40kΩ \$50kΩ	CH2 head current supply

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Pin No.	Symbol	Pin internal equivalent circuit	Function		
19	FILT2	1000 1.5k0 1.5k0 1.5k0 1.5k0 1.5k0	Generates the playback amplifier CH2 DC bias.		
20	CH1-IN	20 REC ON A02672	Playback amplifier CH1 input		
21	PB GND		Ground for the playback amplifier		
22	FILT1	1000 € 1.5k Q B00 µA ₹10k Q A02673	Generates the playback amplifier CH1 DC bias.		
23	NC				
24	PSW1	30kΩ 350kΩ 40kΩ 350kΩ	Record amplifier CH2 head current supply		

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