No.2733

LA7270, 7270M

Monolithic Linear IC

VHS VTR Playback Head Amplifier Recording Amplifier (Hi-Fi Audio Use)

Functions and Features

(Functions)
- 2-channel playback head amp
- 1-channel recording amp
- PB : 1 head select switch
- REC : 2 head select switches

(Features)
- Designed for 2 heads
- On-chip driver transistor permitting direct recording (current type)
- On-chip head select switches (2 types) facilitating printed circuit pattern design of a set
- Load variations cause less recording current variations because of recording amp of constant-current type.
  (Maximum recording current : 60mAp-p)

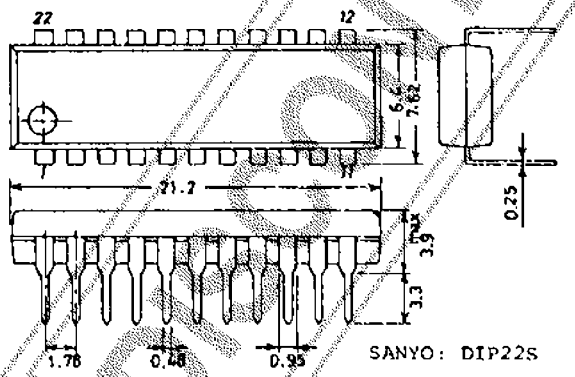
Maximum Ratings at Ta = 25°C

				unit
Maximum Supply Voltage	V_{CC} max		(PB) 7.0	V
			(REC) 14.0	V
Allowable Power Dissipation	Pd max	Ta = 65°C	(DIP) 840	mW
Operating Temperature	Topg		−10 to +65	°C
Storage Temperature	Tstg		−40 to +150	°C

Operating Conditions at Ta = 25°C

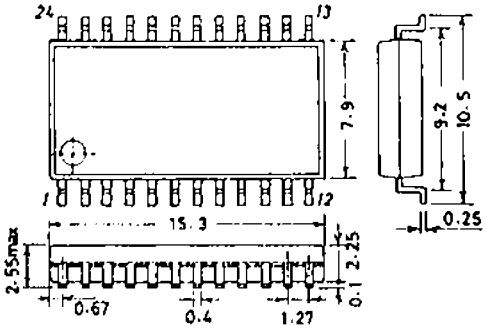
			unit
Recommended Supply Voltage	V_{CC}	(PB) 5.0	V
		(REC) 12.0	V
Operating Voltage Range	V_{CC} op	(PB) 4.5 to 5.5	V
		(REC) 10 to 13	V

Case Outline 3059-D22SIC (unit : mm) [LA7270]



SANYO : DIP22S

Case Outline 3108-M24IC (unit : mm) [LA7270M]

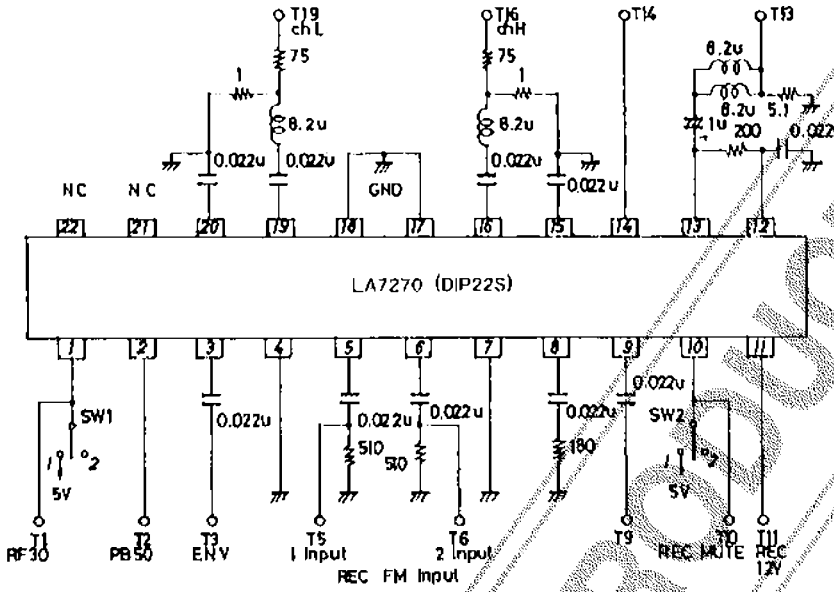


SANYO : MFP24D

Specifications and information herein are subject to change without notice.

SANYO Electric Co.,Ltd. Semiconductor Overseas Marketing Div.
Natsume Bldg., 18-6, 2-chome, Yushima, Bunkyo-ku, TOKYO 113 JAPAN

LA7270 Test Circuit



Operating Characteristics at Ta = 25°C

Characteristic		Symbol	Input	Output	Test Conditions	SW1	SW2	min	typ	max	unit
(PB Mode)			T2		PB + 5V	RF	REC MUTE				
Current Dissipation		Iccp	T2		Pin 2 flow-in current	1		9	12	15	mA
Voltage Gain	CH1	$G_{VP}(1)$	T19	T3	Vi = 38mVpp f = 1MHz	2		66.5	69.5	62.5	dB
	CH2	$G_{VP}(2)$	T16	T3		1					
Voltage Gain Difference		ΔG_{VP}			$G_{VP}(1) - (2)$			−1.0	0	1.0	dB
Equivalent Input Noise Voltage	CH1	$V_{NI}(1)$		T3	$\frac{Vout}{G_{VP}(1),(2)}$ after 2.0MHz L.P.F.	2			1.1	1.6	μV rms
	CH2	$V_{NI}(2)$		T3		1					
Frequency Characteristic	CH1	$\Delta Vfp(1)$	T19	T3	Vi = 38mVpp f = 100k, 7MHz $\frac{2MHz}{100kHz}$ output ratio	2		−1.0	0		dB
	CH2	$\Delta Vfp(2)$	T16	T3		1					
2nd Harmonic Distortion	CH1	$V_{HDP}(1)$	T19	T3	Vi = 38mVpp f = 2MHz $\frac{4M\ component}{2M\ component}$ output ratio	2			−40	−35	dB
	CH2	$V_{HDP}(2)$	T6	T3		1					
Maximum Output Level	CH1	$V_{OMP}(1)$	T19	T3	Vi = 1MHz Output level when 3rd distortion is −30dB.	2		0.8	1.0		Vpp
	CH2	$V_{OMP}(2)$	T16	T3		1					
Crosstalk	CH1	$V_{CR}(1)$	T16	T3	Vi = 38mVpp f = 4MHz $\frac{Vout}{G_{VP}(1),(2)}$ output ratio	2			−40	−35	dB
	CH2	$V_{CR}(2)$	T16	T3		1					
Output DC Offset		ΔV_{ODC}		Pin 3	Output pin DC voltage difference	2→1		−100	0	100	mV

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Characteristic		Symbol	Input	Output	Test Conditions	SW1	SW2	min	typ	max	unit
(REC Mode)			T11		REC+12V	RF	REC MUTE				
Current Dissipation		IccR	T11		Pin 11 flow-in current		2		54.0	64.0	mA
Voltage Gain	1	$G_{VR}(1)$	T5	T13	Vi=300mVpp f=2MHz		2	−8.0	−6.0	−4.0	dB
	2	$G_{VR}(2)$	T6	T13	Vi=300mVpp f=2MHz		2	−8.0	−6.0	−4.0	
Frequency Characteristic	1	$\Delta V_{fR}(1)$	T5	T13	Vi=300mVpp f=1MHz,2MHz $\frac{2M}{1M}$ output ratio		2	−1.0	−0.5	1.0	dB
	2	$\Delta V_{fR}(2)$	T6	T13			2				
2nd Harmonic Distortion	1	$V_{HDR}(1)$	T5	T13	Vout=50mApp f=2MHz $\frac{4M, 6M \text{ component}}{2M \text{ component}}$ output ratio		2		−40	−35	dB
	2	$V_{HDR}(2)$	T6	T13			2				
Maximum Output Level	1	$V_{OMP}(1)$	T5	T13	f=2MHz Output level when 2rd distortion is −40dB.		2	40	50		mApp
	2	$V_{OMP}(2)$	T6	T13			2				
Muting Attenuation	1	$V_{MR}(1)$	T5	T13	Vi=300mVpp f=2MHz $\frac{Vout}{G_{VR}(1),(2)}$ output ratio		1		−50	−45	dB
	2	$V_{MR}(2)$	T6	T13			1				
Y/C MIX Amp Voltage Gain	1	G(1)	T5	T9	Vi=300mVpp f=2MHz			8.0	10.5	13.0	dB
	2	G(2)	T6	T9	Vi=300mVpp f=2MHz						
(Switch Tr) ON Resistance											
ON Resistance of SW turned ON at PB		$RP_{ON}(14)$		Pin 14	PB mode ※1 Difference between DC voltage at 1mA flow-in and DC voltage at 2mA flow-in				6	10	Ω
ON Resistance of SW turned ON at REC	CH1	$RR_{ON}(19)$		Pin 19	REC mode ※1 Difference between DC voltage at 1mA flow-in and DC voltage at 2mA flow-in				7	10	Ω
	CH2	$RR_{ON}(16)$		Pin 16							
Switch Tr Leakage Current											
Leakage Current of SW Tr turned ON at PB		$I_L(14)$		Pin 14	REC mode Flow-in current when ±5V is applied			−2	0	2	μA

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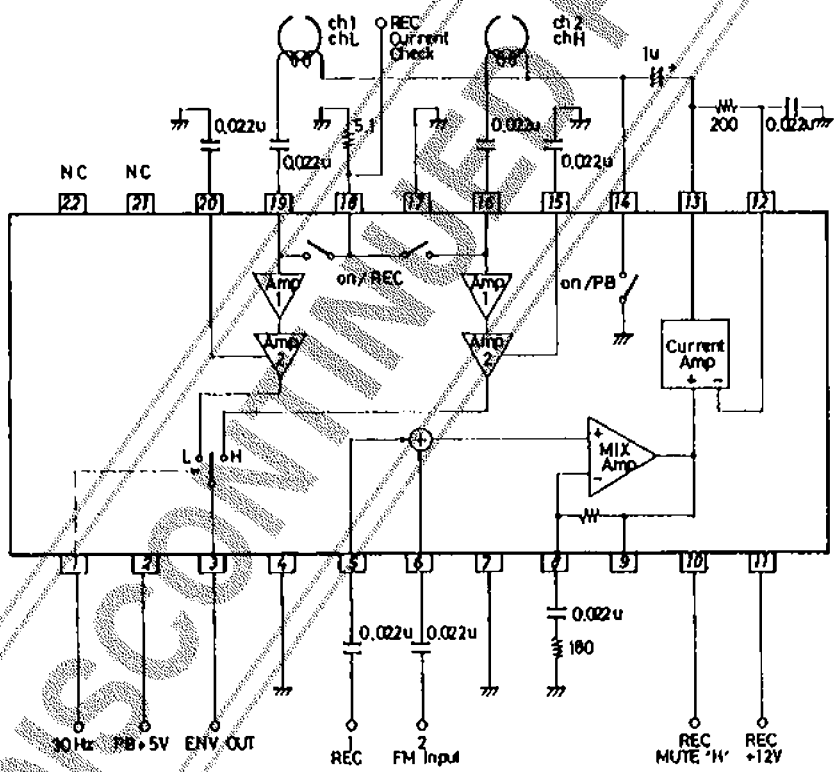
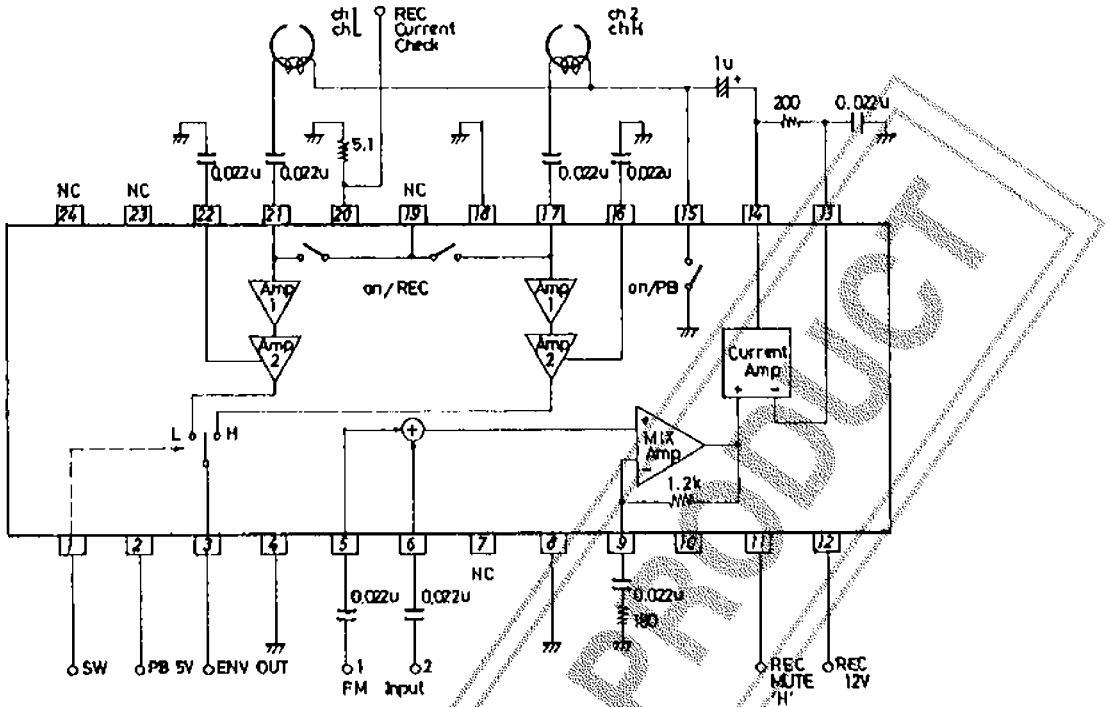
Characteristic	Symbol	Input	Output	Test Conditions	SW1	SW2	min	typ	max	unit
Control Pin (Threshold Level)										
RF Switch (Threshold Level)	SW RF(1)	T1		CH1→CH2 changeover voltage	※		2.6		5.0	V
	SW RF(2)			CH2→CH1 changeover voltage			0		0.8	
REC Muting Switch Threshold Level	SW MUTE(1)	T10		T10 voltage when T13 output waveform disappears		※	2.6		5.0	V
	SW MUTE(2)			T10 voltage when T13 output waveform appears			0		0.8	

※1 Let the ON resistance to be obtained be x,
$2x$(mV) at 2mA flow-in x(mV) at 1mA flow-in
Therefore, difference $2x - x = x$ is the ON resistance.

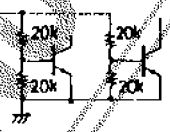
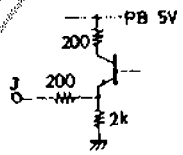
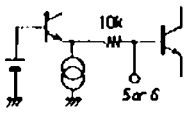
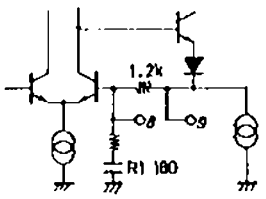
LA7270 (DIP22S) Block Diagram



LA7270M (MFP24) Block Diagram



Pin Description

Pin No.	Function	Standard Potential	Input/Output Configuration	Remarks
1	RF 30Hz control pin			"L": CH1 at open state or 0.8V or less "H": CH2 at 2.5 to 5.0V
2	PB+5V	5.0 (V)		12mA typ.
3	Preamp output	2.3 (V)		Connect R=2kΩ externally when the output line is routed around.
4	Preamp GND	0 (V)		
5 6	REC amp input	6.7 (V)		
7	REC amp GND	0 (V)		
8	REC Y/C MIX amp feedback pin	5.9 (V)		The gain of Y/C MIX amp depends on R1. (Example) R1 : 180Ω=10.5dB
9	REC Y/C MIX amp output	5.9 (V)		

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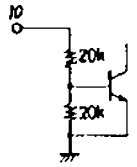
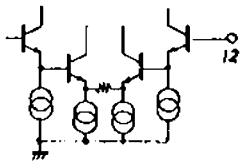
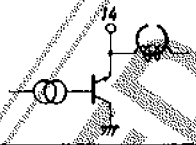
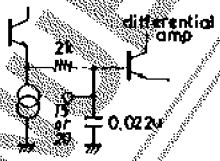
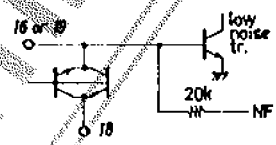
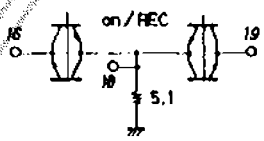
Pin No.	Function	Standard Potential	Input/Output Configuration	Remarks
10	REC muting control pin			"L": Muting OFF at open state or 0.8V or less "H": Muting ON at 2.5V to 5.0V
11	REC+12V	12.0 (V)		Typ.
12	REC current amp feedback pin	5.9 (V)		
13	REC current amp output pin	5.9 (V)		Max. REC current: 60mAp-p (2ch)
14	Pin for switch Tr turned ON at PB			ON resistance : 6 to 10kΩ
15 22	Preamp bypass capacitor	1.9 (V)		
16 19	Preamp input	0.65 (V)		Rin ≒ 400Ω Cin ≒ 25 to 35p
17	Pre GND	0 (V)		
18				Switch Tr ON resistance : 7 to 10Ω
21 22	N.C			