

**SANYO**

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.

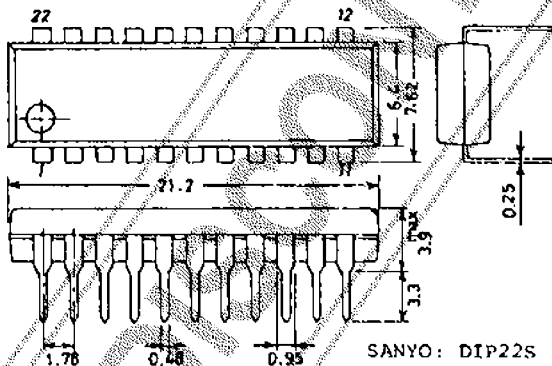
(Maximum recording current : 60mA<sub>p-p</sub>)**Maximum Ratings at Ta = 25°C**

Maximum Supply Voltage	V <sub>CC</sub> max		unit
		(PB) 7.0	V
		(REC) 14.0	V
Allowable Power Dissipation	P <sub>d</sub> max	(DIP) 840	mW
Operating Temperature	T <sub>opg</sub>	-10 to +65	°C
Storage Temperature	T <sub>stg</sub>	-40 to +150	°C

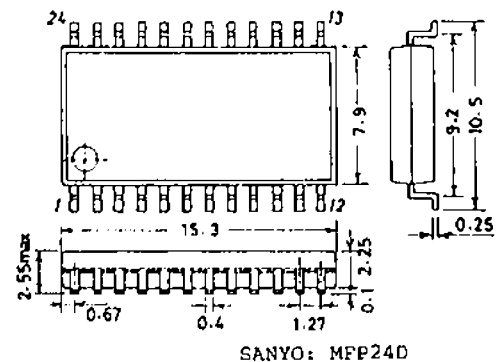
**Operating Conditions at Ta = 25°C**

Recommended Supply Voltage	V <sub>CC</sub>		unit
		(PB) 5.0	V
		(REC) 12.0	V
Operating Voltage Range	V <sub>CC</sub> op		
		(PB) 4.5 to 5.5	V
		(REC) 10 to 13	V

Case Outline 3059-D22S1C  
(unit : mm) [LA7270]



Case Outline 3108-M241C  
(unit : mm) [LA7270M]



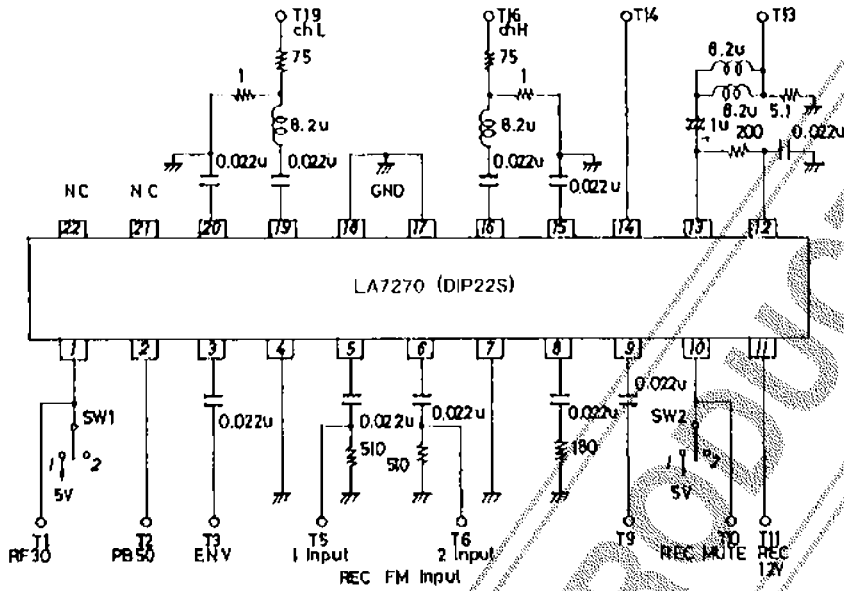
The application circuit diagrams and circuit constants herein are included as an example and provide no guarantee for designing equipment to be mass-produced.  
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N248TA, TS No.2733-1/6

LA7270 Test Circuit



Operating Characteristics at T<sub>a</sub> = 25°C

Characteristic	Symbol	Test Conditions		min	typ	max	unit
		Input	Output				
(PB Mode)		T2					
Current Dissipation	I <sub>ccp</sub>	T2		PB + 5V	RF	REC MUTE	
				Pin 2 flow-in current	1		9 12 15 mA
Voltage Gain	CH1	G <sub>Vp(1)</sub>	T19	T3	2		56.5 69.5 62.5 dB
	CH2	G <sub>Vp(2)</sub>	T16	T3	1		
Voltage Gain Difference	ΔG <sub>Vp</sub>			G <sub>Vp(1)</sub> - (2)			-1.0 0 1.0 dB
Equivalent Input Noise Voltage	CH1	V <sub>Ni(1)</sub>		T3	2		1.1 1.5 μV rms
	CH2	V <sub>Ni(2)</sub>		T3	1		
Frequency Characteristic	CH1	ΔV <sub>fp(1)</sub>	T19	T3	2		-1.0 0 dB
	CH2	ΔV <sub>fp(2)</sub>	T16	T3	1		
2nd Harmonic Distortion	CH1	V <sub>h2(1)</sub>	T19	T3	2		-40 -35 dB
	CH2	V <sub>h2(2)</sub>	T6	T3	1		
Maximum Output Level	CH1	V <sub>OMP(1)</sub>	T19	T3	2		0.8 1.0 V <sub>pp</sub>
	CH2	V <sub>OMP(2)</sub>	T16	T3	1		
Crosstalk	CH1	V <sub>CR(1)</sub>	T16	T3	2		-40 -35 dB
	CH2	V <sub>CR(2)</sub>	T16	T3	1		
Output DC Offset	ΔV <sub>ONC</sub>		Pin 3		2→1		-100 0 100 mV

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Characteristic		Symbol	Test Conditions		min	typ	max	unit
			Input	Output				
(REC Mode)			T11		REC + 12V	RF	REC MUTE	
Current Dissipation		I <sub>ccR</sub>	T11		Pin 11 flow-in current		2	54.0 64.0 mA
Voltage Gain	1	G <sub>VR(1)</sub>	T5	T13	V <sub>i</sub> = 300mVpp f = 2MHz		2	-8.0 -6.0 -4.0 dB
	2	G <sub>VR(2)</sub>	T6	T13	V <sub>i</sub> = 300mVpp f = 2MHz		2	-8.0 -6.0 -4.0 dB
Frequency Characteristic	1	ΔV <sub>IR(1)</sub>	T5	T13	V <sub>i</sub> = 300mVpp f = 1MHz, 2MHz 2M		2	-1.0 -0.5 1.0 dB
	2	ΔV <sub>IR(2)</sub>	T6	T13	1M output ratio		2	
2nd Harmonic Distortion	1	V <sub>HDR(1)</sub>	T5	T13	V <sub>out</sub> = 50mApp f = 2MHz		2	-40 -35 dB
	2	V <sub>HDR(2)</sub>	T6	T13	4M, 6M component 2M component output ratio		2	
Maximum Output Level	1	V <sub>OMP(1)</sub>	T5	T13	f = 2MHz Output level when 2nd distortion is -40dB.		2	40 50 uApp
	2	V <sub>OMP(2)</sub>	T6	T13			2	
Muting Attenuation	1	V <sub>MR(1)</sub>	T5	T13	V <sub>i</sub> = 300mVpp f = 2MHz V <sub>out</sub>		1	-50 -45 dB
	2	V <sub>MR(2)</sub>	T6	T13	G <sub>VR(1),(2)</sub> output ratio		1	
Y/C MIX Amp Voltage Gain	1	G(1)	T5	T9	V <sub>i</sub> = 300mVpp f = 2MHz			8.0 10.5 13.0 dB
	2	G(2)	T6	T9	V <sub>i</sub> = 300mVpp f = 2MHz			
(Switch Tr) ON Resistance								
ON Resistance of SW turned ON at PB		R <sub>PON(14)</sub>		Pin 14	PI 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	R <sub>RON(19)</sub>		Pin 19	REC mode *1 Difference between DC voltage at 1mA flow-in and DC voltage at 2mA flow-in			7 10 Ω
	CH2	R <sub>RON(16)</sub>		Pin 16				
Switch Tr Leakage Current								
Leakage Current of SW Tr turned ON at PB		I <sub>L(14)</sub>		Pin 14	REC mode Flow-in current when ±5V is applied			-2 0 2 μA

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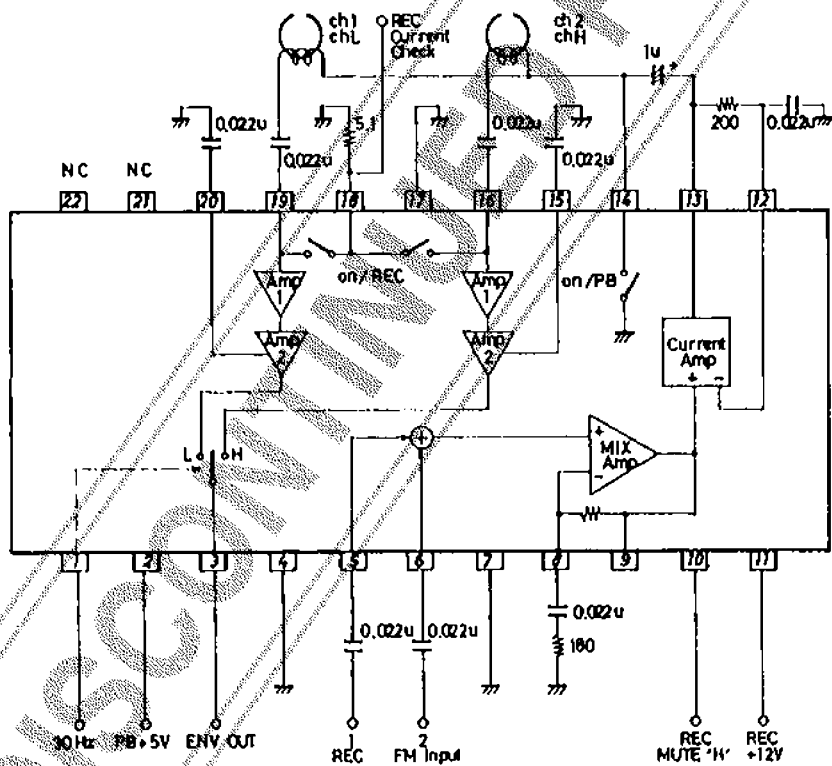
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Characteristic	Symbol			Test Conditions	SW1	SW2	min	typ	max	unit
		Input	Output							
Control Pin (Threshold Level)										
RF Switch (Threshold Level)	SW RF(1)	T1		CH1→CH2 changeover voltage	※		2.6		5.0	V
	SW RF(2)			CH2→CH1 changeover voltage		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			

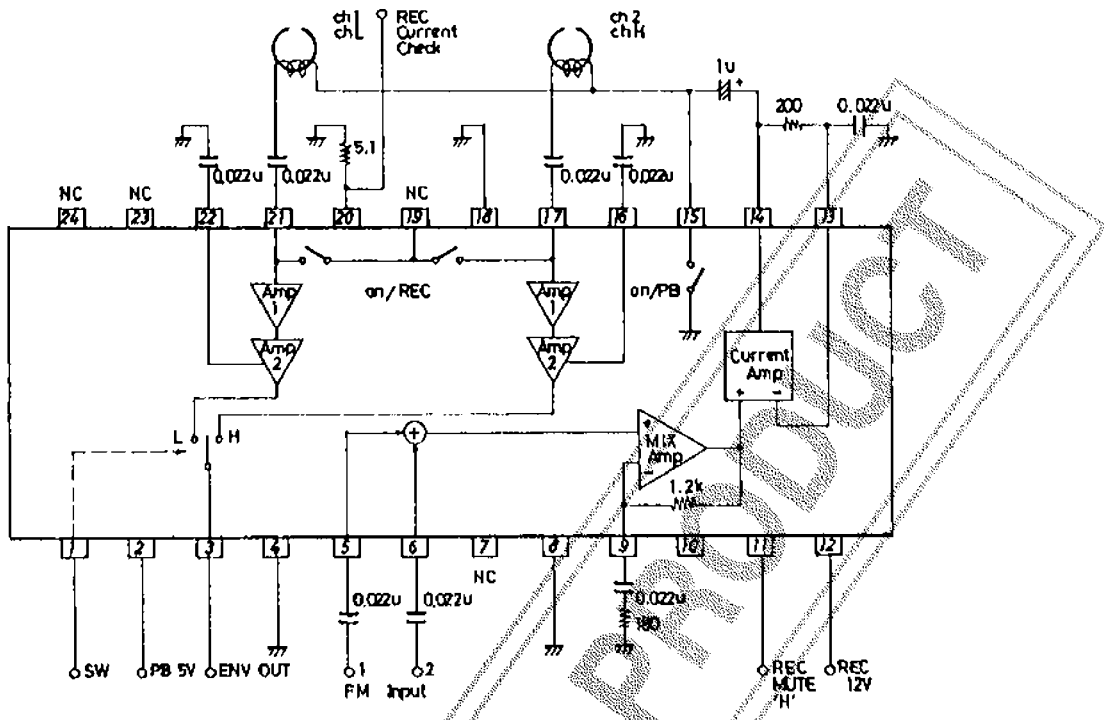
※1 Let the ON resistance to be obtained be  $x$ ,  
 $2x(\text{mV})$  at  $2\text{mA}$  flow-in  $x(\text{mV})$  at  $1\text{mA}$  flow-in  
 Therefore, difference  $2x - x = x$  is the ON resistance.

## LA7270 (DIP22S) Block Diagram



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LA7270M (MFP24) Block Diagram



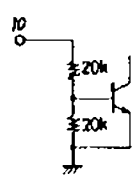
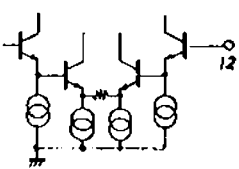
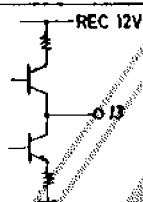
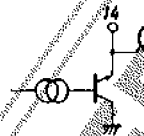
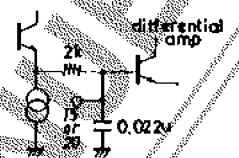
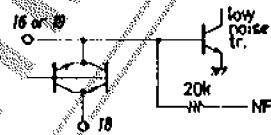
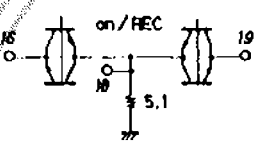
Pin Description

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	REC amp input	6.7 (V)		
6				
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: 60mA <sub>p-p</sub> (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)		$R_{in} \approx 400\Omega$ $C_{in} \approx 25$ to $35p$
17	Pre GND	0 (V)		
18				Switch Tr ON resistance : 7 to 10Ω
21 22	N.C			