

# HA118041NT

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## Playback Preamp and Recording Amplifier for VCR's

HA118041NT includes a recording preamplifier and recording amplifier for two-head video cassette recorders. Operating voltage is 5 V.

### Functions

- 2-channel playback preamplifier
- 2-channel recording amplifier (including driver)
- FM peaking amplifier
- FM AGC
- FM phase equalizer
- Mute circuit for recording

### Features

- Low playback amplifier input capacitance of 24 pF
- Operating power supply voltage of REC 5 V/PB 5 V (simultaneous supply not possible, switch function provided)
- Constant-current output system of recording amplifier provides stable output, even under external load fluctuation.
- FM peaking pin allows external setting of the peak value.
- On-chip FM phase equalizer provides easy configuration with outside circuits.
- REC equalizer pin allows external recording frequency characteristic compensation.
- On-chip playback/record switching transistor reduces the number of peripherals for simplified board design.

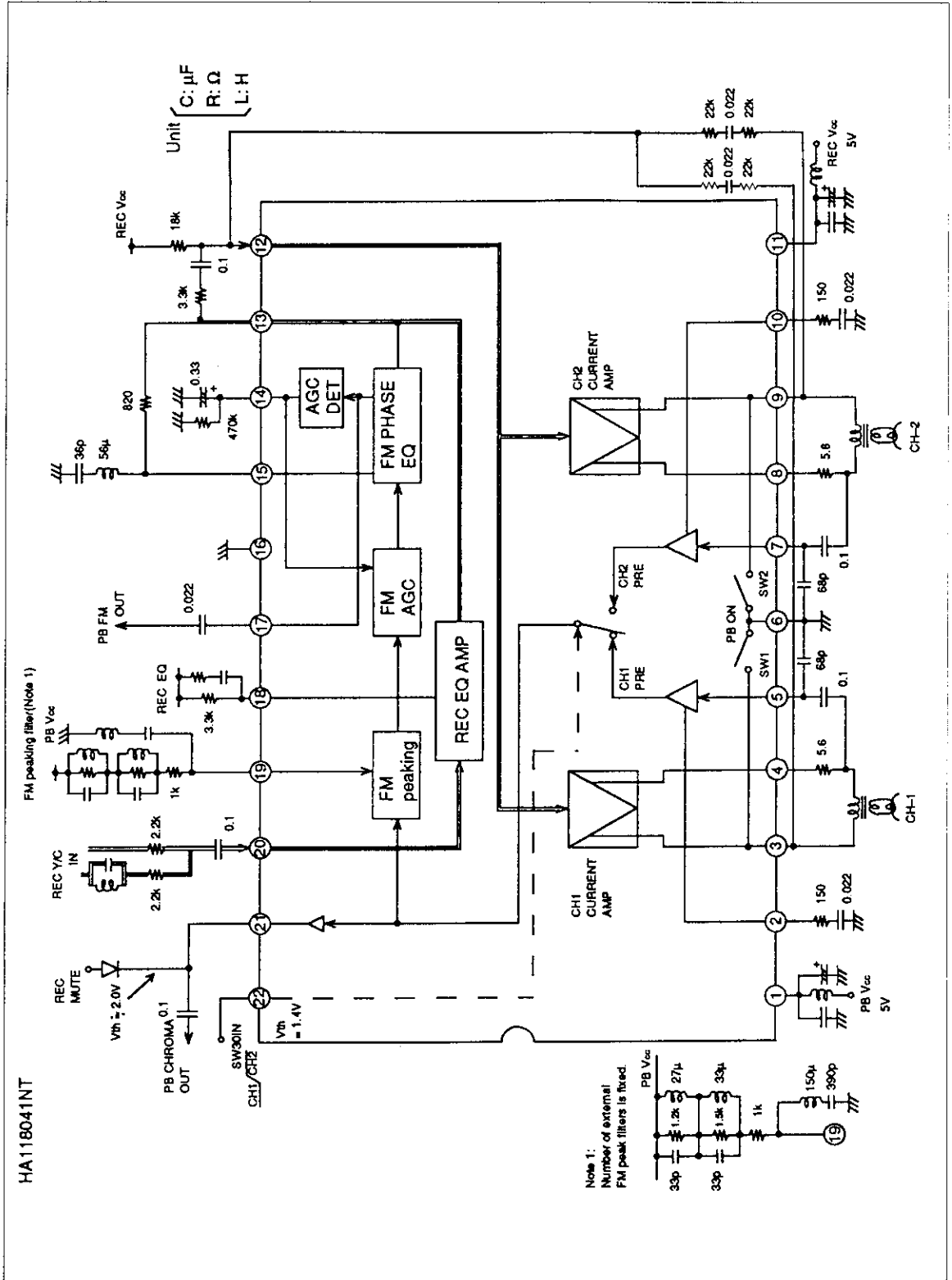
### Ordering Information

Type No.	Package
HA118041NT	22-pin 300 mil plastic shrink DIP


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## Block Diagram



## Pin Description


 Top: REC mode  
 Bottom: PB mode

Pin No.	Function Name	Standard DC Voltage (V)	Signal Type	Signal Level	I/O Format Impedance ( $\Omega$ )	Remarks
1	PB Vcc					
2	CH1 Preamplifier Q. ADJ pin	0 2.2			1.5 k	
3	CH1 current amplifier output 1  SW1	4.0 0	REC Y + C DC	6 Vpp max	Collector of transistor	
4	CH1 current amplifier output 2	4.1 0			Emitter of transistor	
5	CH1 Preamplifier input	0 0.7	PB Y + C	0.2 mVpp (1 mVpp max)		
6	Cascode amplifier GND					
7	CH2 preamplifier input	0 0.7	PB Y + C	0.2 mVpp (1 mVpp max)		
8	CH2 current amplifier output 2	4.1 0			Emitter of transistor	
9	CH2 current amplifier output 1  SW2	4.0 0	REC Y + C DC	6 Vpp max	Collector of transistor	
10	CH2 preamplifier Q. ADJ pin	0 2.2			1.5 k	
11	REC Vcc					
12	Current amplifier input	1.65 0	DC		Emitter of transistor	Note 1

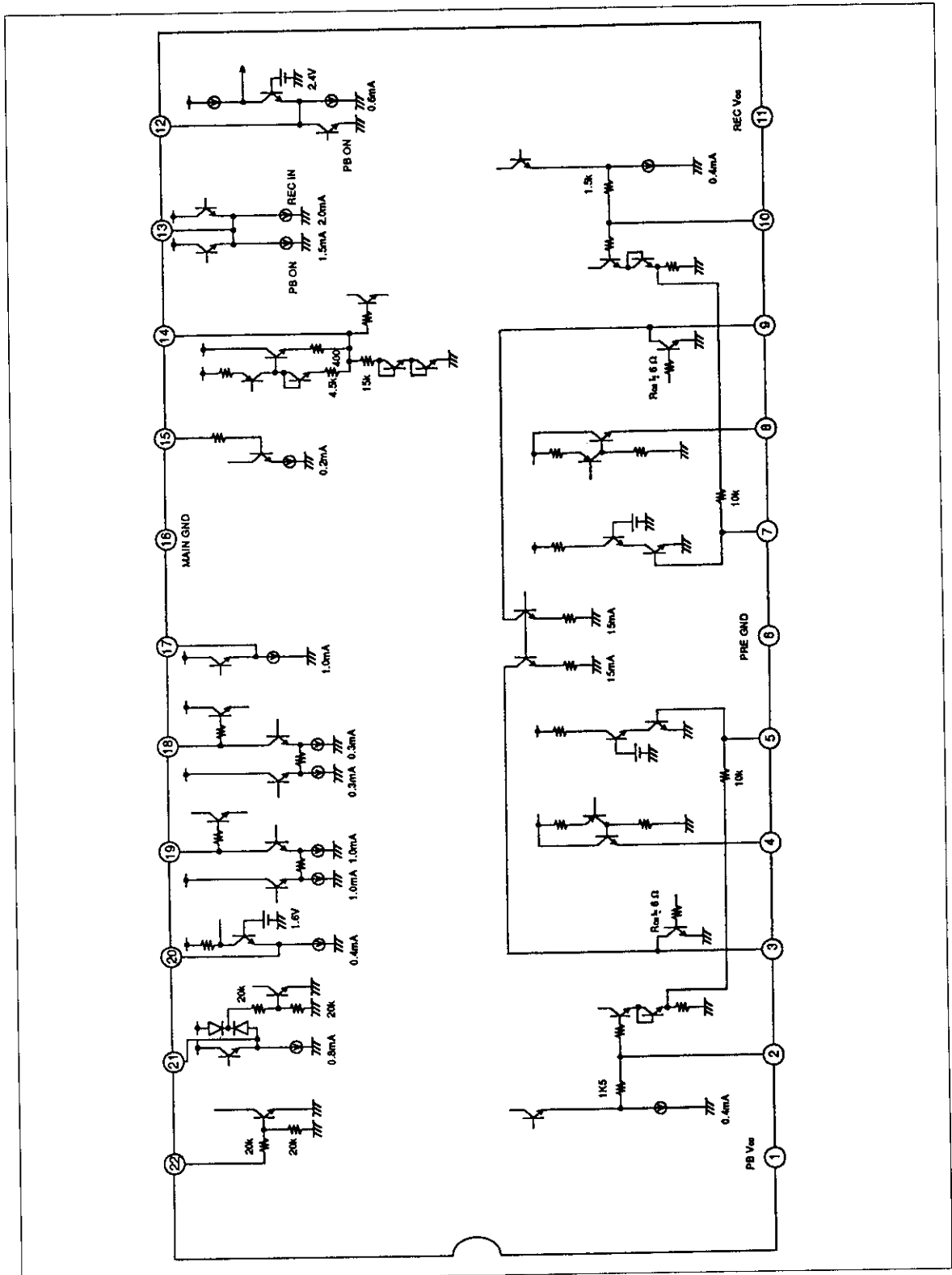
Note 1: Current amplifier driver idling current is set by a resistor connected externally at pin 12.  
 Standard: for 18k $\Omega$ , 15 mA 14 k $\Omega$  to 22 k $\Omega$  (18 mA to 12 mA).

# HA118041NT

## Pin Description (cont)

Pin No.	Function Name	Standard DC Voltage (V)	Top: REC mode		I/O Format Impedance ( $\Omega$ )	Remarks
			Signal Type	Signal Level		
13	REC EQ amplifier output	2.6	REC Y + C	0.5 Vpp	Emitter follower	
	FM equalizer filter 1	1.9	PBY	70 m Vpp		
14	AGC filter	0	DC		15 k	
		1.4				
15	FM equalizer filter 2	2.6			Base of transistor	
		1.9				
16	GND					
17	PB FM output	0	PB - Y	0.4 Vpp	Emitter follower	
		2.6				
18	REC equalizer filter	4.0			Collector of transistor	
		0				
19	FM peaking filter	0		R <sub>L</sub> = 1 k $\Omega$ 70 m Vpp	Collector of transistor	
		4.0				
20	REC Y.C input	0.9			Emitter of transistor	
		0				
21	REC mute signal input;	-	H level: mute	V <sub>th</sub> = 2.0 V	20 k/40 k	H/L
	PB chrominance output	3.1	PB Y + C	0.14 Vpp		
22	SW30 input		H level: CH2	V <sub>th</sub> = 1.4 V	20 k	H level
			L level: CH1		40 k	L level

Input/Output Circuit



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## Electrical Characteristics (Ta = 25 °C)

Item	Symbol	Min	Typ	Max	Unit	Test Condition	Application Terminal	Note
PB current consumption	Icp		24		mA	Incurrent at pin 1 (CH1)	1	
Preamplifier gain	Gvp	53.5	56	58.5	dB	Pin 5 and 7 input; Vin = 0.2 mVpp; f = 4 MHz	21	
Preamplifier frequency characteristic	ΔGvf		-1.0		dB	Pin 5 and 7 input; Vin = 0.2 mVpp; 10 MHz/600 kHz level ratio	21	
Preamplifier interchannel crosstalk	CTp	—	-43		dB	Vin = 0.5 mVpp f = 4 MHz	21	
Preamplifier interchannel gain differential	ΔGp	-1.0	0	+1.0	dB	Vin = 0.2 mVpp f = 4 MHz	21	
Preamplifier interchannel output DC offset	VoF	-50	0	+50	mV		21	
PB head SW TRS ON resistance	Rcs	—	6		Ω	f = 4 MHz	9	
Head amplifier switch threshold	VTHH		1.4		V	22	21	
AGC output level	VAGC	250	300	350	mV	Pin 19 input; Vin = 70 m Vpp; f = 4 MHz	17	
AGC control characteristics 1	ΔVAGC	0	+0.3	+1.0	dB	Vin = 0.16 Vpp/70 m Vpp level ratio	17	
AGC control characteristics 2	ΔVAGC	-1.0	-0.3	0	dB	Vin = 13 mVpp/70 m Vpp level ratio	17	
REC current consumption	IcR		42		mA	Incurrent at pin 11 (MUTE OFF)	11	
Maximum recording current	ILM		19	—	mApp	L = 8.2 μH; f = 4 MHz; secondary distortion -40 dB; pin 20 input	Between 3 and 4 Between 8 and 9	(1)
Current amp current gain	Gi		38		dB		↓	
Interchannel current gain differential	ΔIc	-1.0	0	+1.0	dB	Interchannel level differential when IL = 10 mApp; f = 4 MHz	Between 3 and 4 Between 8 and 9	
Crosstalk during REC MUTE	CTR	—	-45	—	dB	Level ratio when IL = 20 mApp; f = 4 MHz and during MUTE.	↓	

Electrical Characteristics (Ta = 25 °C) (cont)

Item	Symbol	Min	Typ	Max	Unit	Test Condition	Application Terminal	Note
REC MUTE switching threshold	V <sub>THM</sub>	—	2.0	—	V	21		
REC equalizer amp gain	G <sub>VEQ</sub>	—	8.3	—	dB	Pin 20 input; Vin = 0.5 Vpp; f = 4 MHz	13	

Note: Do not apply voltage to REC V<sub>CC</sub> and PB V<sub>CC</sub> simultaneously.  
 (1): HA118041NT's recording amplifier uses feedback damping to compensate for the frequency characteristic peak generated by head resonance. The maximum recording current noted above is for the following conditions:  
 Load L = 8.2 μH  
 Damping resistance = 22 kΩ + 22 kΩ





