AN3327K

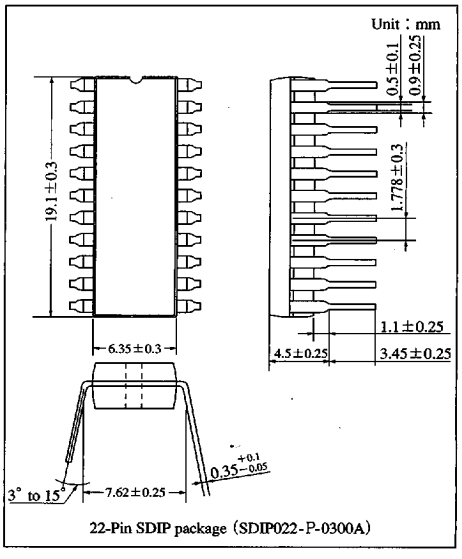
Hi-Fi Audio Recording/Playback Amplifier IC for VCR

■ Overview

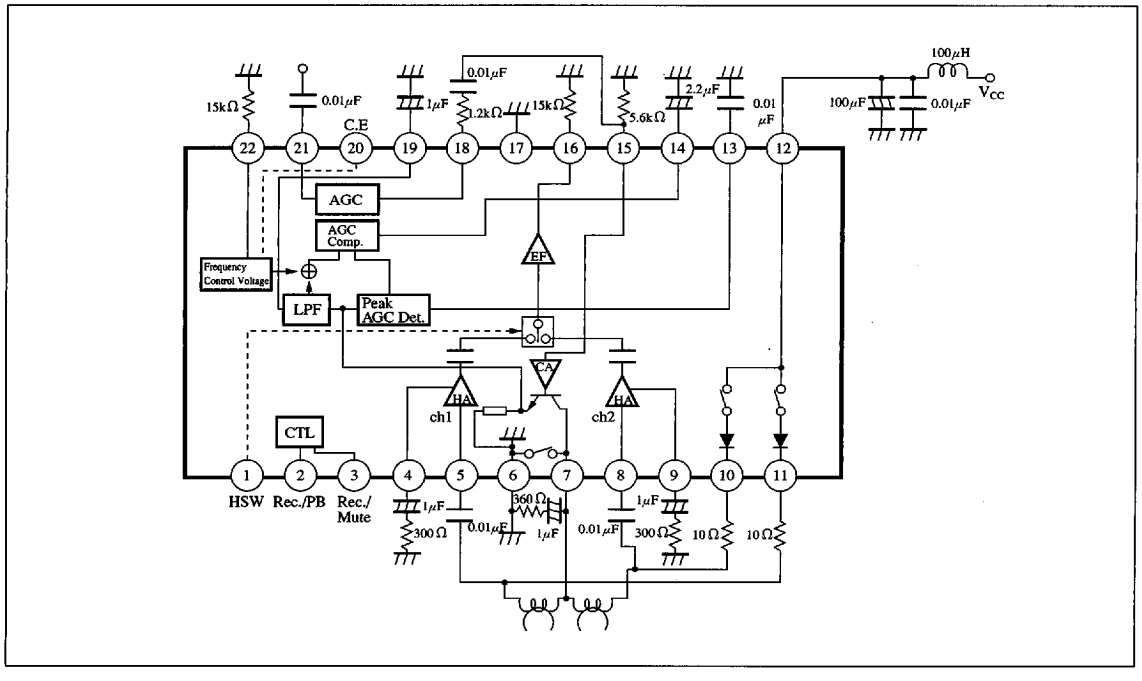
The AN3327K is a Hi-Fi audio recording/playback amplifier IC for VCR. As it includes a recording AGC circuit, external recording current adjustment is needless.

■ Features

- Low operating voltage : V_{CC}=5.0V
- Built-in recording AGC
- Head switch



■ Block Diagram



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■ Pin Descriptions

Pin No.	Pin name	Pin No.	Pin name
1	Head switch	12	Main V_{CC}
2	Record/Playback switch	13	Peak detection
3	Record/mute switch	14	AGC detection
4	CH 1 damping	15	Rec. current amp. input
5	CH 1 Playback input	16	Playback output
6	GND1	17	GND2
7	Recording output	18	Rec AGC output
8	CH 2 playback input	19	Rec output LPF
9	CH 2 damping	20	Current emphasis switch
10	Recording V_{CC1}	21	Recording input
11	Recording V_{CC2}	22	AGC level control

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage (1)	V_{CC}	6.0	V
Supply current (2)	I_{CC}	————	mA
Power dissipation Note 2)	P_D	1000	mW
Operating ambient temperature Note 1)	T_{opr}	−20 to +70	℃
Storage temperature Note 1)	T_{stg}	−55 to +150	℃

Note 1) Ta=25℃ except operating ambient temperature and storage temperatures.
Note 2) Allowable power dissipation of the package at Ta=70℃.

■ Recommended Operating Range (Ta=25℃)

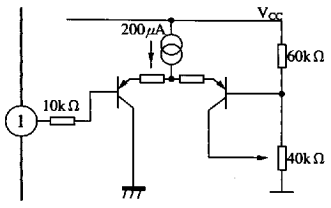
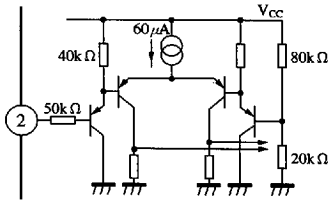
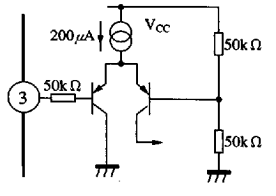
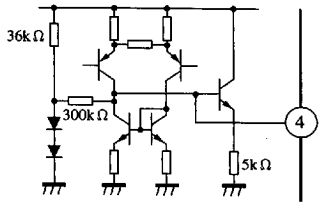
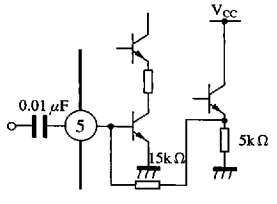
Parameter	Symbol	Range
Operating supply voltage range	V_{CC}	4.5V to 5.5V

■ Electrical Characteristics (Ta=25±2℃)

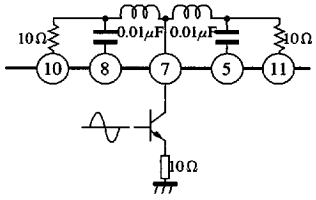
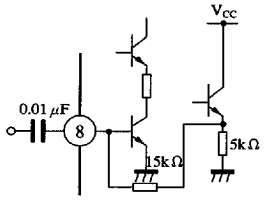
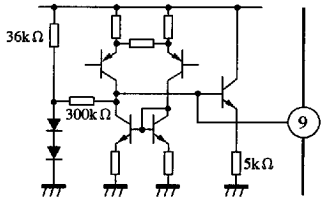
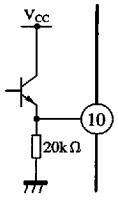
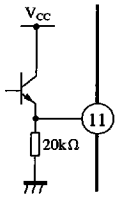
Parameter	Symbol	Condition	min	typ	max	Unit
Rec circuit current	I_{REC}	V_{CC}=5V	49	—	87	mA
Rec AGC level	I_{AGC}	V_{CC}=5V, V_{IN}=300mV_{P-P}, f=2MHz	19.5	—	28.5	mA_{P-P}
Rec AGC control characteristics	ΔI_{AGC}	V_{CC}=5V, f=2MHz V_{IN}=300mV_{P-P}±3dB	−1	—	1	dB
Rec current 2nd harmonics distortion	$D_{R\,2f}$	V_{CC}=5V, V_{IN}=300mV_{P-P}, f=2MHz	—	—	−35	dB
Rec mode holding voltage	$V_{S\,Rec}$	V_{CC}=5V, Pin② voltage measurement	1.7	—	5	V
Rec Mute holding voltage	$V_{S\,Mute}$	V_{CC}=5V, Pin③ voltage measurement	0	—	1.8	V
Rec Over Rec holding voltage (1)	$V_{S\,OVER1}$	Voltage measurement at Pin⑳ at V_{CC}=5V, Over-Rec	3.2	—	5	V
Rec Over Rec holding voltage (2)	$V_{S\,OVER2}$	Voltage measurement at Pin⑳ at V_{CC}=5V, not over-Rec	0	—	1.8	V
Rec current emphasis	I_{OVER}	V_{CC}=5V	1.7	—	2.7	dB
PB circuit current	I_{PB}	V_{CC}=5V	18	—	32	mA
PB CH 1 gain	G_1	V_{CC}=5V, Pin⑤ input : 100 μV_{P-P}, f=2MHz	65	—	75	dB
PB CH 2 gain	G_2	V_{CC}=5V, Pin⑧ input : 100 μV_{P-P}, f=2MHz	65	—	75	dB
PB input conversion noise CH 1	N_1	V_{CC}=5V	—	—	1	μVrms
PB input conversion noise CH 2	N_2	V_{CC}=5V	—	—	1	μVrms
PB mode holding voltage	$V_{S\,PB}$	V_{CC}=5V, Pin② voltage measurement	0	—	0.5	V
PB HSW threshold voltage	$V_{S\,HSW}$	V_{CC}=5V, Pin① voltage measurement	1.4	—	2.8	V
PB DC unbalance	ΔV_{OFFSET}	V_{CC}=5V	—	—	20	mV_{P-P}
Rec circuit current	I_{REC}	V_{CC}=5V	—	(68)	—	mA
Rec AGC level	I_{AGC}	V_{CC}=5V, V_{IN}=300mV_{P-P}, f=2MHz	—	(24)	—	mA_{P-P}
Rec AGC control characteristics	ΔI_{AGC}	V_{CC}=5V, f=2MHz V_{IN}=300mV_{P-P}±3dB	—	(0)	—	dB
Rec current 2nd harmonics distortion	$D_{R\,2f}$	V_{CC}=5V, V_{IN}=300mV_{P-P}, f=2MHz	—	(−50)	—	dB
Rec/PB threshold voltage	$V_{TH\,RP}$	V_{CC}=5V, Pin② voltage measurement	—	(1)	—	V
Rec/Mute threshold voltage	$V_{TH\,RM}$	V_{CC}=5V, Pin③ voltage measurement	—	(2.5)	—	V
Rec/Over Rec threshold voltage	$V_{TH\,OVER}$	V_{CC}=5V, Pin⑳ voltage measurement	—	(2.5)	—	V
Rec current emphasis	I_{OVER}	V_{CC}=5V	—	(2.2)	—	dB
PB circuit current	I_{PB}	V_{CC}=5V	—	(25)	—	mA
PB CH 1 gain	G_1	V_{CC}=5V, Pin⑤ input : 100 μV_{P-P}, f=2MHz	—	(70)	—	dB
PB CH 2 gain	G_2	V_{CC}=5V, Pin⑧ input : 100 μV_{P-P}, f=2MHz	—	(70)	—	dB
PB input conversion noise CH 1	N_1	V_{CC}=5V	—	(0.65)	—	μVrms
PB input conversion noise CH 2	N_2	V_{CC}=5V	—	(0.65)	—	μVrms
PB crosstalk CH 1 → CH 2	CT1	V_{CC}=5V, Pin⑤ input : 100 μV_{P-P}, f=2MHz	—	(−40)	—	dB
PB crosstalk CH 2 → CH 1	CT2	V_{CC}=5V, Pin⑧ input : 100 μV_{P-P}, f=2MHz	—	(−40)	—	dB
PB CH 1 output 2nd harmonics distortion	$D_{PB\,2f-1}$	V_{CC}=5V, Pin⑤ input : 100 μV_{P-P}, f=2MHz	—	(−50)	—	dB
PB CH 2 output 2nd harmonics distortion	$D_{PB\,2f-2}$	V_{CC}=5V, Pin⑧ input : 100 μV_{P-P}, f=2MHz	—	(−50)	—	dB
PB HSW threshold voltage	$V_{TH\,HSW}$	V_{CC}=5V, Pin① voltage measurement	—	(2)	—	V
PB DC unbalance	ΔV_{OFFSET}	V_{CC}=5V	—	(0)	—	V_{P-P}
Cross modulation distortion 0.4MHz component in Rec.	$CMD_{0.4}$	V_{CC}=5V, Pin㉑ input : 1.7MHz 300mV_{P-P}, 1.3MHz 95mV_{P-P}	—	(−52)	—	dB
Cross modulation distortion 0.9MHz component in Rec.	$CMD_{0.9}$	V_{CC}=5V, Pin㉑ input : 1.7MHz 300mV_{P-P}, 1.3MHz 95mV_{P-P}	—	(−52)	—	dB

Note) The characteristics value in parentheses is not a guaranteed value, but reference one on design.

■ Pin Descriptions

Pin No.	Function	Waveform	Equivalent circuit	Remarks
1	Head switch	When CH1 is output input Pin⑤ 2.7 to 5V When CH2 is output input Pin⑧ 0 to 1.3V		Select the output CH by Pin①. When the pin is left open, ch 1 is output.
2	Record/Playback switching	Recording (and mute) 1.7 to 5V Playback 0 to 0.5V		Voltage at Pin② selects recording or playback. When the pin is left open, recording is selected. Switching between recording and mute is done by Pin③.
3	Record/mute switching	Rec 3.2 to 5V Mute 0 to 1.7V		Voltage at Pin③ selects recording or mute. When the pin is left open, recording is selected.
4	Ch 1 damping	Rec ——— 1.2V Mute ——— 1.2V PB ——— 1.6V		———
5	Ch 1 Playback input	Rec ——— 0.4V Mute ——— 0.4V PB ~~~ 0.7V		———
6	GND1	———	———	———

■ Pin Descriptions (cont.)

Pin No.	Function	Waveform	Equivalent circuit	Remarks
7	Recording output	Rec — 3.7V Mute — 3.7V PB — GND		—
8	Ch 2 playback input	Rec — 0.4V Mute — 0.4V PB — 0.7V		—
9	Ch 2 damping	Rec — 1.2V Mute — 1.2V PB — 1.6V		—
10	Recording V_{CC1}	Rec — 3.9V Mute — 3.9V PB — GND		—
11	Recording V_{CC2}	Rec — 3.9V Mute — 3.9V PB — GND		—
12	Main V_{CC}	—	—	—

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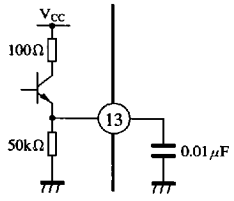
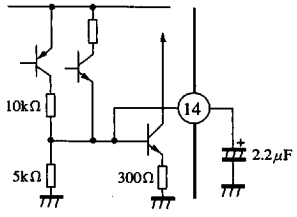
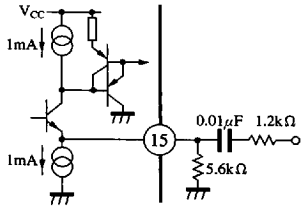
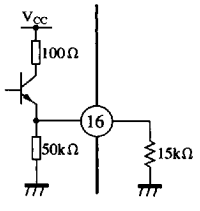
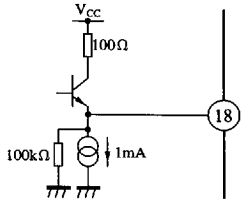
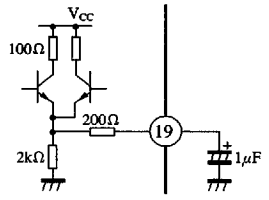
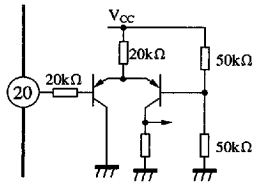
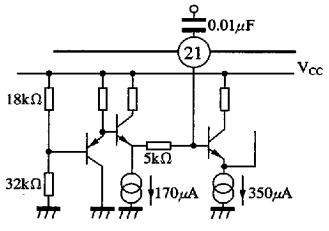
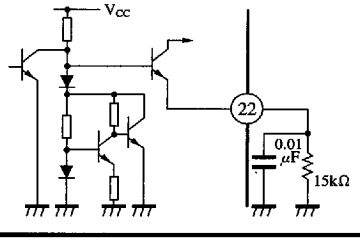
■ Pin Descriptions (cont.)

Pin No.	Function	Waveform	Equivalent circuit	Remarks
13	Peak detection	Rec — 2.1V Mute — 2.1V PB — GND		—
14	AGC detection	Rec — Depends on the input at Pin㉑ Mute — 0.7V PB — 0.7V		—
15	Rec. current amp. input	Rec — 1.67V Mute — 1.67V PB — GND		—
16	Playback output	Rec — GND Mute — GND PB — 2.4V		—
17	GND2	—	—	—
18	AGC output	Rec — 2.9V Mute — 2.9V PB — 1.6V		—

■ Pin Descriptions (cont.)

Pin No.	Function	Waveform	Equivalent circuit	Remarks
19	Rec output LPF capacitor	Rec ——— 2.1V Mute ——— 2.1V PB ——— 1.7V		———
20	Current emphasis switching	At recording. 0 to 1.8V At over Rec. 3.2 to 5V		Voltage at Pin㉑ selects over-recording or normal recording. When the pin is left open, over-recording is selected.
21	Recording input	Rec ~ 3.2V Mute ~ 3.2V PB ——— 3.2V		———
22	AGC level control	Rec ——— 1.4V Mute ——— 1.4V PB ——— GND		———