

# AN3336SB

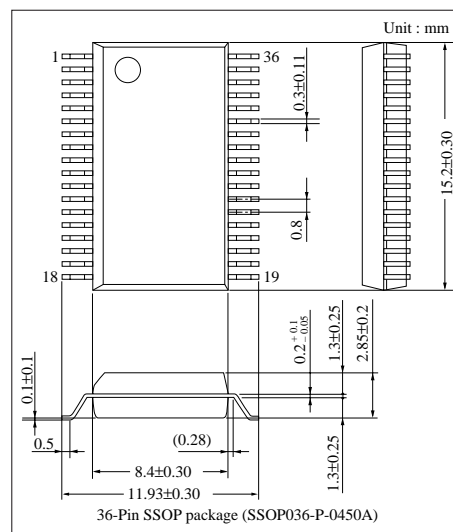
## 4-Head VCR Recording/Playback Amplifier IC

### Overview

The AN3336SB is a recording/playback amplifier IC for 4-head VCR. It includes RF-AGC, automatic tracking I/O, and envelope comparing circuit.

### Features

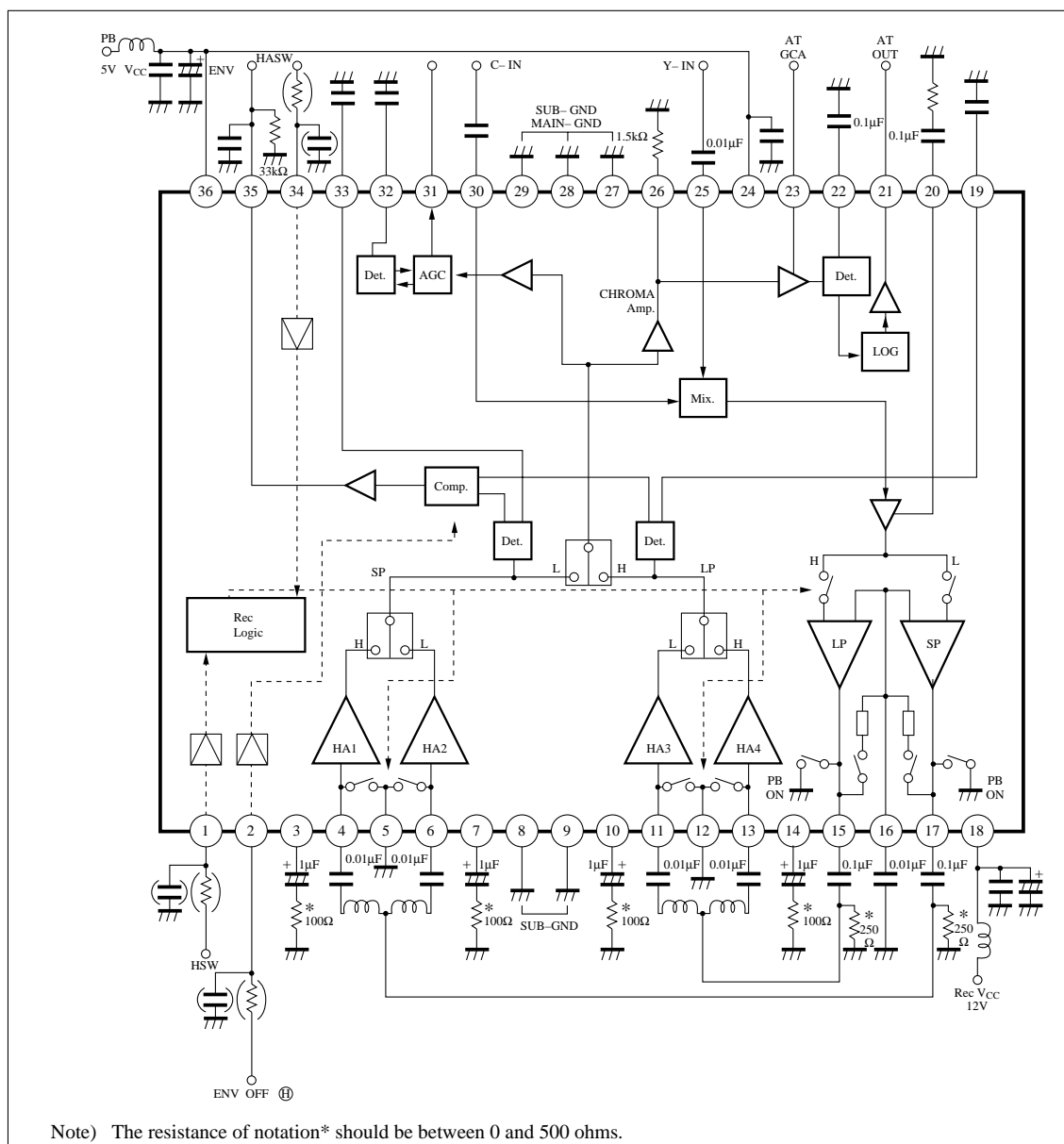
- Playback  $V_{CC} = 5.0V$ , recording  $V_{CC} = 12V$
- Built-in RF-AGC circuit
- Built-in automatic tracking I/O circuit
- Built-in envelope comparing circuit



### Pin Descriptions

Pin No.	Pin name	Pin No.	Pin name
1	Head switching	19	Envelope detector capacitor for ch 3 and ch 4
2	Envelope ON/OFF switching	20	Peaking for recording
3	Ch 1 head amp. damping	21	Automatic tracking output
4	Ch 1 head amp. input	22	Automatic tracking detector capacitor
5	Small-signal ground	23	Automatic tracking control
6	Ch 2 head amp. input	24	Automatic tracking $V_{CC}$
7	Ch 2 head amp. damping	25	Rec. Y-input
8	Sub-ground	26	Chroma output
9	Sub-ground	27	Sub-ground
10	Ch 3 head amp. damping	28	Sub-ground
11	Ch 3 head amp. input	29	Sub-ground
12	Small-signal ground	30	Recording C-input
13	Ch 4 head amp. input	31	AGC output
14	Ch 4 head amp. damping	32	AGC detector capacitor
15	Rec. current amp. (LP) output	33	Envelope detector capacitor for ch 1 and ch 2
16	Rec. feedback	34	Head amp. switching
17	Rec. current amp. (SP) output	35	ENV output, recording bias
18	Rec. $V_{CC}$	36	Playback $V_{CC}$

# ■ Block Diagram



# ■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage (1)	PB $V_{CC}$	6	V
Supply current (2)	Rec $V_{CC}$	13	V
Power dissipation <sup>Note 2)</sup>	$P_D$	440	mW
Operating ambient temperature <sup>Note 1)</sup>	$T_{opr}$	-20 to +70	°C
Storage temperature <sup>Note 1)</sup>	$T_{stg}$	-55 to +125	°C

Note 1)  $T_a=25^{\circ}\text{C}$  for except ambient temperature and storage temperatures.

Note 2) Allowable power dissipation of the package at  $T_a=70^{\circ}\text{C}$ .

### ■ Recommended Operating Range (Ta=25°C)

Parameter	Symbol	Range
Operating supply voltage range (1)	PBV <sub>CC</sub>	4.5V to 5.5V
Operating supply voltage range (2)	RecV <sub>CC</sub>	8.5V to 12.5V

### ■ Electrical Characteristics (Ta=25±2°C)

Parameter	Symbol	Condition	min	typ	max	Unit
PB circuit current	I <sub>36</sub>	PB V <sub>CC</sub> =5V	—	—	56	mA
CH 1 gain	G <sub>4-26</sub>	PB V <sub>CC</sub> =5V	53	—	61	dB
CH 2 gain	G <sub>6-26</sub>	PB V <sub>CC</sub> =5V	53	—	61	dB
CH 3 gain	G <sub>11-26</sub>	PB V <sub>CC</sub> =5V	53	—	61	dB
CH 4 gain	G <sub>13-26</sub>	PB V <sub>CC</sub> =5V	53	—	61	dB
HSW change-over sensitivity	S <sub>1</sub>	PB V <sub>CC</sub> =5V	—	—	3.8	V
HASW change-over sensitivity	S <sub>34</sub>	PB V <sub>CC</sub> =5V	—	—	3.8	V
AGC output amplitude	V <sub>4-31</sub>	PB V <sub>CC</sub> =5V	130	—	270	mV <sub>P-P</sub>
AGC control sensitivity	ΔV <sub>4-31</sub>	PB V <sub>CC</sub> =5V	—	—	3.0	dB
HSW DC unbalance (I)	HSW <sub>26 (I)</sub>	PB V <sub>CC</sub> =5V	—	—	100	mV <sub>P-P</sub>
HSW DC unbalance (II)	HSW <sub>26 (II)</sub>	PB V <sub>CC</sub> =5V	—	—	100	mV <sub>P-P</sub>
HASW DC unbalance (I)	HASW <sub>26 (I)</sub>	PB V <sub>CC</sub> =5V	—	—	100	mV <sub>P-P</sub>
HASW DC unbalance (II)	HASW <sub>26 (II)</sub>	PB V <sub>CC</sub> =5V	—	—	100	mV <sub>P-P</sub>
Input conversion noise (1)	N <sub>4-26</sub> /G <sub>4-26</sub>	PB V <sub>CC</sub> =5V	—	—	1.0	μVrms
Input conversion noise (2)	N <sub>6-26</sub> /G <sub>6-26</sub>	PB V <sub>CC</sub> =5V	—	—	1.0	μVrms
Input conversion noise (3)	N <sub>11-26</sub> /G <sub>11-26</sub>	PB V <sub>CC</sub> =5V	—	—	1.0	μVrms
Input conversion noise (4)	N <sub>13-26</sub> /G <sub>13-26</sub>	PB V <sub>CC</sub> =5V	—	—	1.0	μVrms
Auto-tracking output at no-input	V <sub>21min.</sub>	PB V <sub>CC</sub> =4.8V	—	—	1.0	V
Auto tracking max. output	V <sub>21max.</sub>	PB V <sub>CC</sub> =4.8V	3.8	—	—	V
ENV output amplitude	V <sub>35</sub>	PB V <sub>CC</sub> =5V	3.5	—	—	V <sub>P-P</sub>
Rec. circuit current	I <sub>18</sub>	Rec V <sub>CC</sub> =12V	—	—	48	mA
SP Y-Rec. current output	I <sub>17</sub>	Rec V <sub>CC</sub> =12V	17	—	32	mA <sub>P-P</sub>
LP Y-Rec. current output ratio	I <sub>15</sub> /I <sub>17</sub>	Rec V <sub>CC</sub> =12V	-2.5	—	2.5	dB
SP 8MHz f characteristics ratio	I <sub>17H</sub> /I <sub>17</sub>	Rec V <sub>CC</sub> =12V	-4	—	—	dB
LP 8MHz f characteristics ratio	I <sub>15H</sub> /I <sub>15</sub>	Rec V <sub>CC</sub> =12V	-4	—	—	dB
Rec. chroma output ratio	I <sub>17C</sub> /I <sub>17</sub>	Rec V <sub>CC</sub> =12V	-15	—	-7	dB
PB circuit current	I <sub>36</sub>	PB V <sub>CC</sub> =5V	—	(43)	—	mA
CH 1 gain	G <sub>4-26</sub>	PB V <sub>CC</sub> =5V	—	(57)	—	dB
CH 2 gain	G <sub>6-26</sub>	PB V <sub>CC</sub> =5V	—	(57)	—	dB
CH 3 gain	G <sub>11-26</sub>	PB V <sub>CC</sub> =5V	—	(57)	—	dB
CH 4 gain	G <sub>13-26</sub>	PB V <sub>CC</sub> =5V	—	(57)	—	dB
AGC output amplitude	V <sub>4-31</sub>	PB V <sub>CC</sub> =5V	—	(200)	—	mV <sub>P-P</sub>
Rec circuit current	I <sub>18</sub>	Rec V <sub>CC</sub> =12V	—	(33)	—	mA
SP Y-Rec. current output	I <sub>17</sub>	Rec V <sub>CC</sub> =12V	—	(12)	—	mA <sub>P-P</sub>
Rec. chroma output ratio	I <sub>17C</sub> /I <sub>17</sub>	Rec V <sub>CC</sub> =12V	—	(-12)	—	dB
Rec. current 2nd harmonics distortion	D <sub>2f</sub>	Rec V <sub>CC</sub> =12V	—	(-43)	—	dB
Cross-modulation relative level	D <sub>M</sub>	Rec V <sub>CC</sub> =12V	—	(-48)	—	dB
Auto tracking SP output voltage (1)	V <sub>21SP1</sub>	PB V <sub>CC</sub> =4.8V, Vin=400mV <sub>P-P</sub>	(3.4)	—	(3.9)	V
Auto tracking SP output voltage (2)	V <sub>21SP2</sub>	PB V <sub>CC</sub> =4.8V, Vin=100mV <sub>P-P</sub>	(1.5)	—	(2.5)	V
Auto tracking LP output voltage difference	V <sub>21LP</sub> -V <sub>21SP2</sub>	PB V <sub>CC</sub> =4.8V	(0.1)	—	(0.5)	V

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

## ■ Functional Descriptions

### 1. Playback mode

- Pin36 (playback  $V_{CC}$ ) = 5V typ. (Pins15 and 17 are grounded internally)
- Pin18 (recording  $V_{CC}$ ) = open

#### (1) Selecting a head amplifier output channel

	Channel	Input pin	Head SW Pin1	HASW Pin34
SP	1	4	H	L
	2	6	L	L
LP	3	11	L	H
	4	13	H	H

#### (2) Starting the envelope comparator

Env. ON/OFF SW Pin2	Open	Low (special playback)
Env. comparator	Inactive	Active

#### (3) Automatic tracking interface

Pin24 (automatic tracking  $V_{CC}$ ) = 5V typ.

HASW(Pin24)	Automatic tracking
High	LP
Low	SP

- When the SP mode of the automatic tracking interface switches to the LP mode, the gain of the amplifier increases 5.5dB.
- When the gain control voltage at Pin23 increases, the gain of the circuit increases.

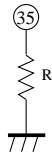
2. Recording mode

Pin18 (recording  $V_{CC}$ ) =12V typ.

Pin36 (playback  $V_{CC}$ )  
Pin24 (automatic tracking  $V_{CC}$ ) } Opened or grounded

Pin35 : Recording internal bias current control

How to control :



- When the external resistance decreases, the internal circuit bias current ( $I_{total}$ ) increases.
- R should be 27 to 33k $\Omega$ .

○ HASW control at Pin34

HASW Pin34	SP output	LP output	Pin11,13	Pin4,6	Pin19
H	OFF	active	GND	Diode	Open
L	active	OFF	Diode	GND	GND

■ Reference

