

# BA7172S BA7172FS

## Amplifier, video signal, 2-channel

The BA7172S and BA7172FS are ICs used as preamplifiers and recording amplifiers for video cassette recorders.

Each IC includes

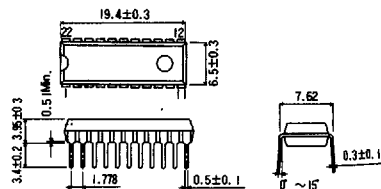
- two preamplifiers
- chroma output amplifier
- FM output amplifier, including AGC circuit
- envelope detection circuit
- Y-C mixer
- current driven record amplifier
- channel selection switch
- playback and record select switch to allow use of two heads
- available in SDIP22 and SSOP-A24 packages
- low input capacitance and low noise preamplifier ( $V_{NIN} = 0.4 \mu V_{rms}$ )
- wide bandwidth preamplifier and main REC amplifier
- built in channel select and PRE/REC switches

### Applications

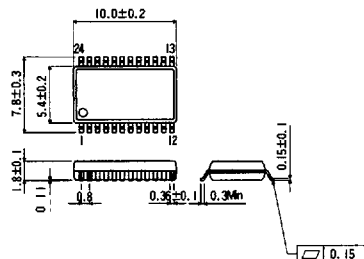
- video cassette recorders

### Dimensions (Units : mm)

#### BA7172S (SDIP22)

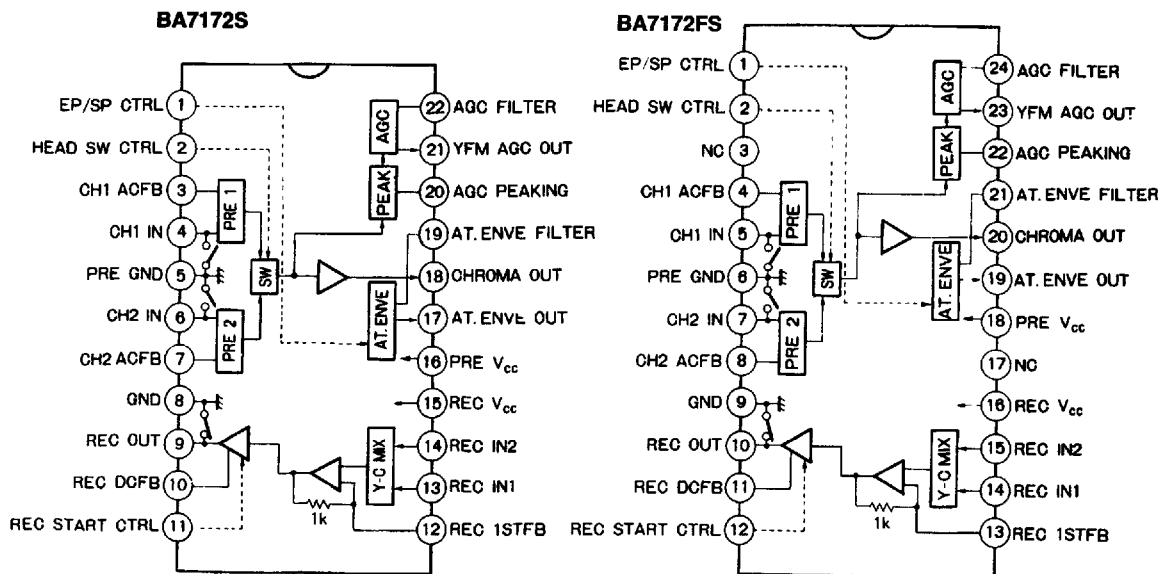


#### BA7172FS (SSOP-A24)



# BA7172S, BA7172FS Preamplifier and recording amplifier

## Block diagram



## Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Limits	Unit	Conditions
Power supply		$V_{CC}$	7 (PRE) 10 (REC)	V	
Power dissipation	BA7172S	$P_d$	1370	mW	Reduce power by 13.7 mW/ $^\circ\text{C}$ for each degree above $25^\circ\text{C}$
	BA7172FS		1000		Reduce power by 10.0 mW/ $^\circ\text{C}$ for each degree above $25^\circ\text{C}$ . Mounted on a $90 \times 50 \times 1.6$ mm glass epoxy PCB
Operating temperature		$T_{opr}$	$-20 \sim +65$	$^\circ\text{C}$	
Storage temperature		$T_{stg}$	$-55 \sim +150$	$^\circ\text{C}$	

## BA7172S recommended operating conditions ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Min	Typical	Max	Unit
Power supply (playback)	$V_{CC(P)}$	4.5	5.0	5.5	V
Power supply (record)	$V_{CC(R)}$	8.5	9.0	9.5	V

**Note:** If PRE  $V_{CC}$ , REC  $V_{CC}$  and REC START CTRL are all set HIGH simultaneously, the PRE and REC amplifier and head switch systems are turned on simultaneously, and a large current flows as a result. To prevent this large current draw, which can damage the IC, pins 11, 15, 16 (BA7125S) or pins 12, 16, 18 (BA7125FS) should not be set HIGH simultaneously. HIGH is defined as a voltage greater than 0.5 V.

**BA7172S electrical characteristics (unless otherwise noted,  $T_a = 25^\circ\text{C}$ ,  
 $V_{CC} = 5\text{ V (PRE)}$ ,  $= 9\text{ V (REC)}$ ,  $f = 4\text{ MHz}$ )**

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
<b>Play back system</b>						
Quiescent current—PB	$I_{Q(P)}$		28	43	mA	
Voltage gain	$G_{VP}$	48	55	60	dB	$V_{IN} = 0.3\text{ mV}_{pk-pk}$
Maximum chroma output level	$V_{OMC}$	1.2	1.5		$V_{pk-pk}$	
Cross talk	CT		-35	-33	dB	
Input conversion noise	$V_{NIN}$		0.4	1.2	$\mu V_{rms}$	
AGC output amplitude	$V_{AGC}$	230	280	330	$mV_{pk-pk}$	$V_{IN} = 0.3\text{ mV}_{pk-pk}$
AGC control sensitivity	$\Delta V_{AGC}$	-1	1	3	dB	$V_{IN} = 0.15 \sim 0.6\text{ mV}_{pk-pk}$
AGC frequency characteristic	$\Delta G_{VAf}$	-2	2	4	dB	8 MHz/1MHz
HEAD switching threshold	$V_{TH2}$	2.0		3.0	V	
ENVE detection output SP	$V_{EN-S2}$	3.2	3.7	4.2	V	$V_{OUT} = 300\text{ mV}_{pk-pk}$
ENVE detection output EP	$V_{EN-E2}$	3.3	3.8	4.3	V	$V_{OUT} = 200\text{ mV}_{pk-pk}$
EP/SP switching threshold	$V_{TH1}$	0.2		1.5	V	
PRE SW ON resistance	$R_{ON9}$		5	15	$\Omega$	
<b>Recording system</b>						
Quiescent current—REC	$I_{Q(R)}$		34	52	mA	
Maximum current output	$I_{RM}$	35			$mA_{pk-pk}$	
Recording current secondary distortion	$2HD_R$		-45	-38	dB	$I_R = 28\text{ mA}_{pk-pk}$
Cross modulation	$CMD_R$		-45	-38	dB	4 MHz $\pm 629\text{ KHz}$
Recording current frequency characteristic	$\Delta I_{Rf}$	-4	-1	+2	dB	8 MHz/1 MHz
REC START switching threshold	$V_{TH11}$	1.5		3.5	V	
REC SW ON resistance	$R_{ON4,6}$		10	15	$\Omega$	

# BA7172S, BA7172FS Preamplifier and recording amplifier

Figure 1 Application example 1—BA7172S

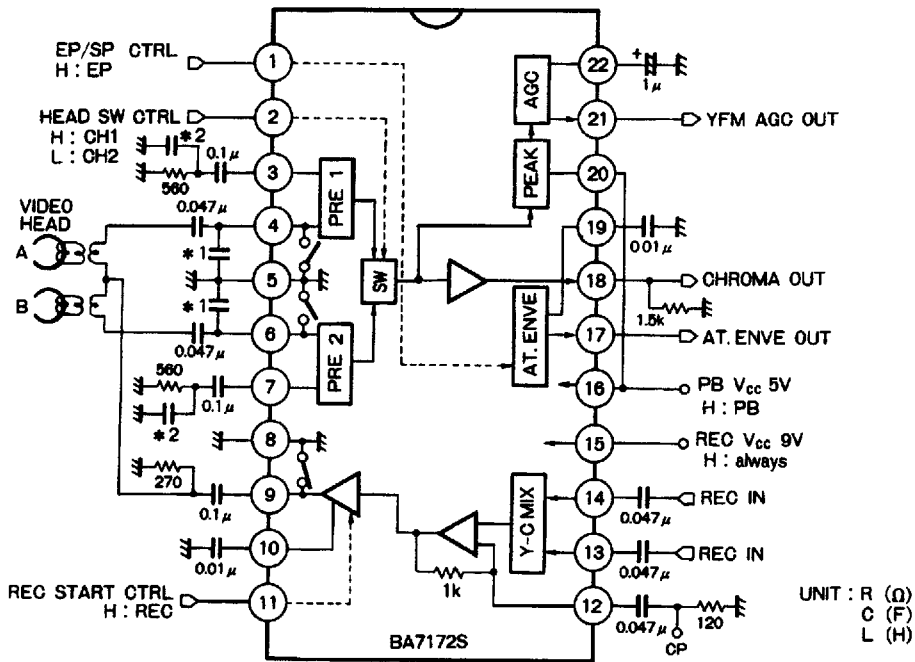
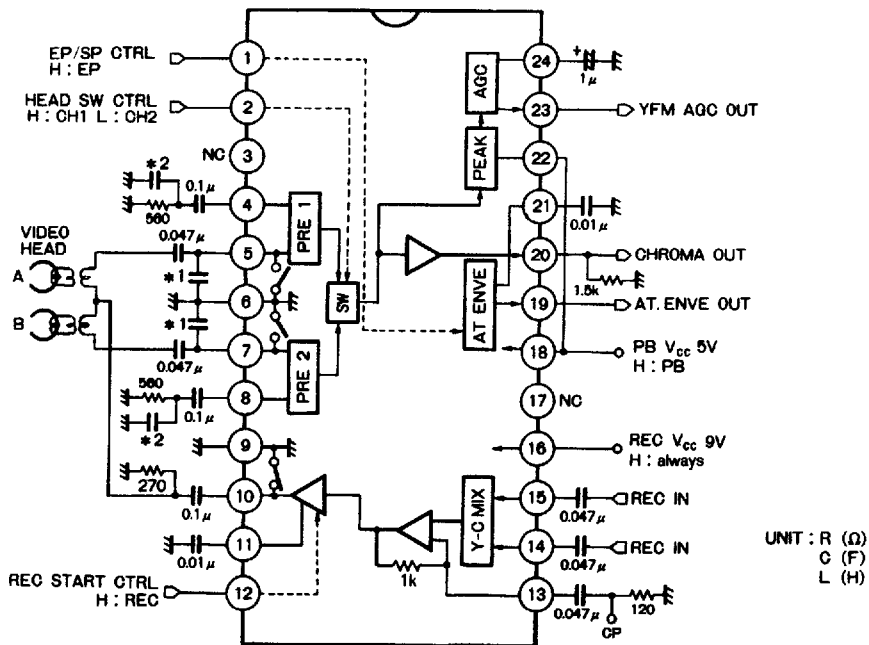


Figure 2 Application example 2—BA7172FS



**Control pin logic****Record/playback mode switch**

Playback mode switching is performed by using the PRE VCC pin (pin 16, BA712S: pin 18; BA7172FS). Switching to record mode is performed by using the REC START CTRL pin (BA7172S: 11 pin: BA7172FS: 12 pin).

The REC VCC pin (pin 15, BA7172S: pin 16, BA7172FS) must be kept HIGH at all times (with  $V_{CC}$  applied).

See note in Recommended operating conditions on page 74.

Pin name			Mode	Function		
PRE VCC	REC VCC	REC START		PRE amp	AT enve	REC amp
HIGH	HIGH	LOW	Playback	On	On	Off
LOW	HIGH	LOW		Off	Off	Off
LOW	HIGH	HIGH	Record	Off	Off	On
HIGH	HIGH	HIGH	See note in recommended operating conditions on page 74.			

**Playback head switch**

Playback input selection (head switching) is performed using the HEAD SW CTRL pin (pin 2).

Pin name	Function
HEAD SW	
HIGH	Channel 1 (Preamplifier pin 4 IN)
LOW	Channel 2 (Preamplifier pin 6 IN)

**Playback envelope detection gain switch**

The playback AT.ENVE gain is switched by using the EP/SP CTRL pin (pin 1).

Pin name	Mode	AT ENVE gain
EP/SP		
HIGH	EP	Typical +4.0 dB
LOW	SP	Typical