

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

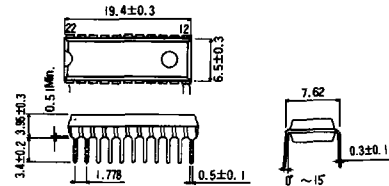
- two preamplifiers
- chroma output amplifier
- FM output amplifier, including AGC circuit
- envelope detection circuit
- Y-C mixer
- current driven record amplifier
- channel selection switch
- playback and record select switch to allow use of two heads
- available in SDIP22 and SSOP-A24 packages
- 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

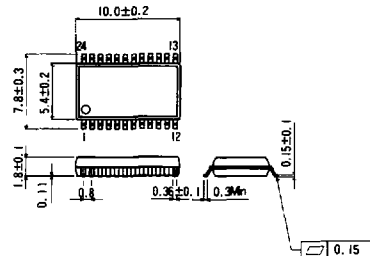
- video cassette recorders

Dimensions (Units : mm)

BA7172S (SDIP22)

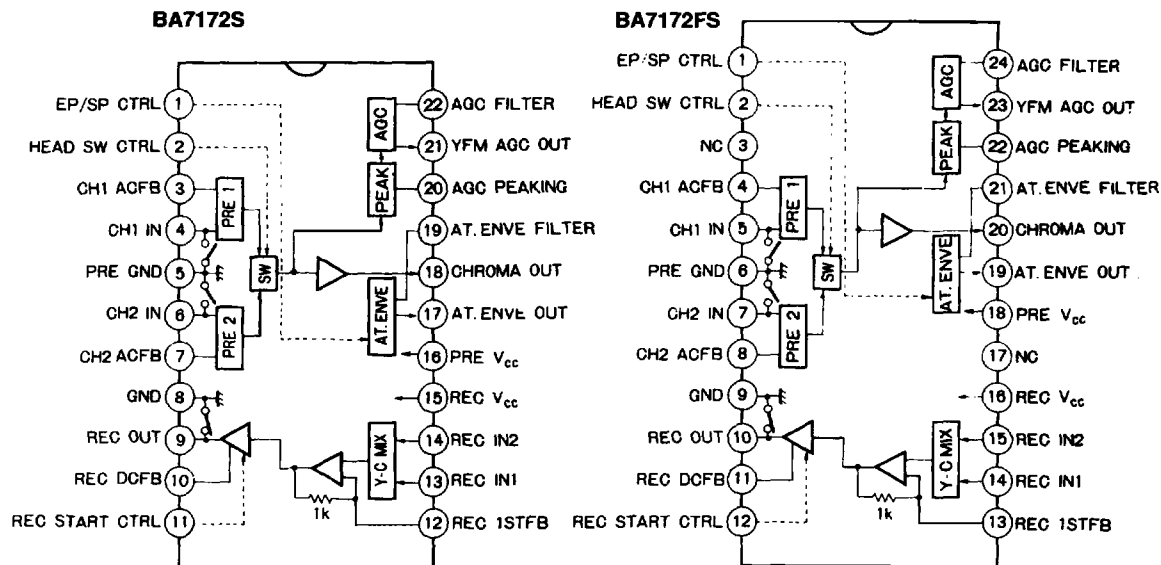


BA7172FS (SSOP-A24)



BA7172S, BA7172FS Preamp 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	1370	mW	Reduce power by 13.7 mW/°C for each degree above 25°C
	BA7172FS	1000		Reduce power by 10.0 mW/°C for each degree above 25°C. Mounted on a 90 × 50 × 1.6 mm glass epoxy PCB
Operating temperature	T_{opr}	-20 ~ +65	°C	
Storage temperature	T_{stg}	-55 ~ +150	°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
Play back system						
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	μV_{rms}	
AGC output amplitude	V_{AGC}	230	280	330	mV_{pk-pk}	$V_{IN} = 0.3\text{ mV}_{pk-pk}$
AGC control sensitivity	ΔV_{AGC}	-1	1	3	dB	$V_{IN} = 0.15 \sim 0.6\text{ mV}_{pk-pk}$
AGC frequency characteristic	ΔG_{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	Ω	
Recording system						
Quiescent current—REC	$I_{Q(R)}$		34	52	mA	
Maximum current output	I_{RM}	35			mA_{pk-pk}	
Recording current secondary distortion	2HDR		-45	-38	dB	$I_R = 28\text{ mA}_{pk-pk}$
Cross modulation	CMD_R		-45	-38	dB	4 MHz \pm 629 KHz
Recording current frequency characteristic	ΔI_{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	Ω	

Figure 1 Application example 1—BA7172S

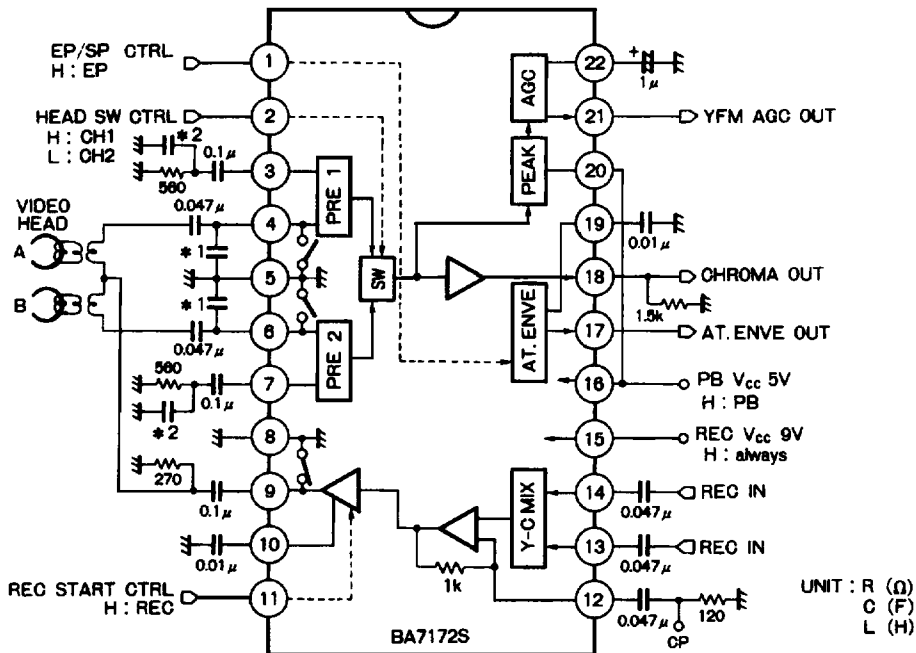
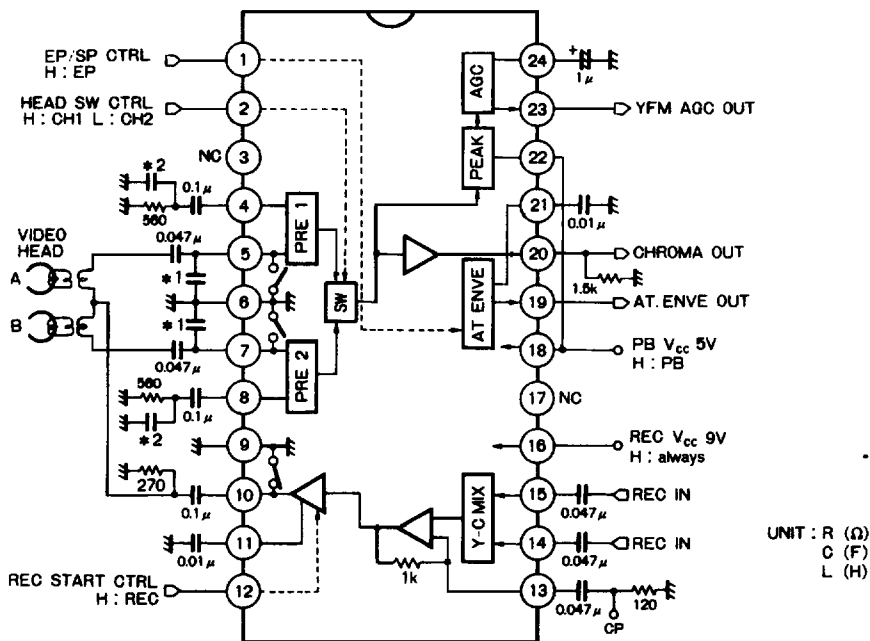


Figure 2 Application example 2—BA7172FS



Control pin logic

Record/playback mode switch

Playback mode switching is performed by using the PRE VCC pin (pin 16, BA7125: 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