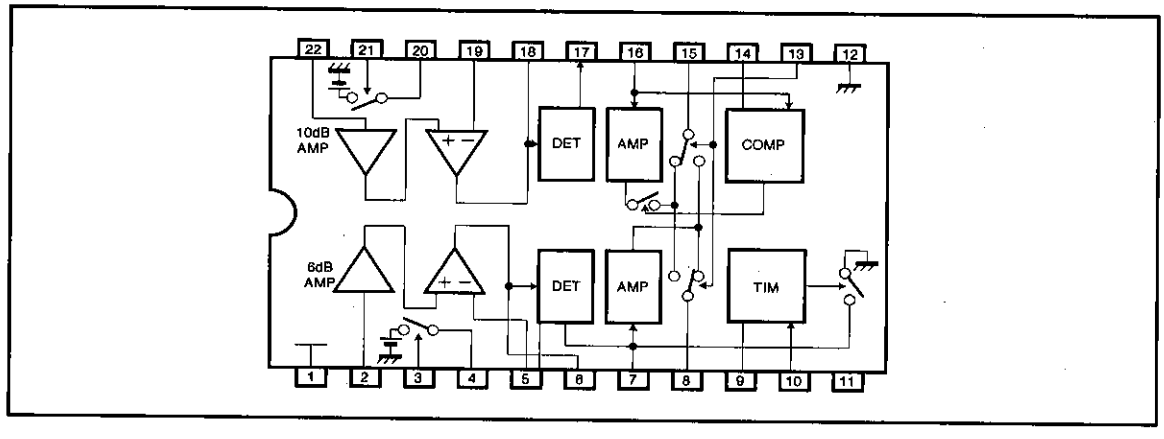
VCR auto tracking interface
BA7047S

The BA7047S is a microcomputer-interface IC for VCR auto-tracking. It includes two input amplifiers, a peak detector circuit, output amplifiers and a comparator timing circuit. The IC outputs the peak detection output for input video and audio FM signals.

●Applications
VHS video cassette recorders

●Features
1)Inverting input pin and internal switch allow construction of different types of filters.
2)Built-in output switching allows both audio and video signals to be processed using one A / D port.
3)A built-in comparator detects presence or absence of Hi-Fi audio.
4)A timing circuit suppresses the effects of head switching noise.

●Block diagram



●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Applied voltage	Vcc	8	V
Power dissipation	Pd	500 *	mW
Operating temperature	Topr	−25~70	℃
Storage temperature	Tstg	−55~125	℃

* Reduced by 5.0mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating voltage	Vcc	4.5	5.0	5.5	V

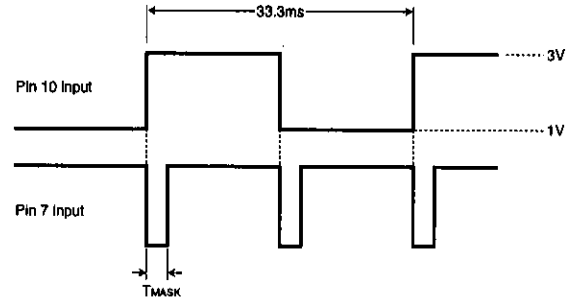


Fig. 1 Pin 7 and pin 10 input waveforms

●Electrical characteristics (Unless otherwise specified Ta=25℃ and Vcc=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Circuit current	I_{CC}	9.0	14.0	19.0	mA		
6dB amplifier voltage gain	G_6	3.5	6.0	8.0	dB	f=1MHz, V_{in}=0.5V_{P-P}	
6dB amplifier frequency characteristic	F_6	−0.5	+1.0	+2.5	dB	7MHz / 1MHz, V_{in}=0.5V_{P-P}	
10dB amplifier voltage gain	G_{10}	7.0	10.0	12.0	dB	f=1MHz, V_{in}=0.5V_{P-P}	
10dB amplifier frequency characteristic	F_{10}	−2.0	+0.0	+2.0	dB	5MHz / 1MHz, V_{in}=0.5V_{P-P}	
Detector characteristic V1	V_7	−	0.25	0.30	V	V_{in}=0.0V_{P-P}	
Detector characteristic V2	V_{7-I}	0.9	1.2	1.4	V	f=7.0MHz, V_{in}=1.0V_{P-P}	
Detector characteristic A1	V_{17}	−	0.25	0.30	V	V_{in}=1.0V_{P-P}	
Detector characteristic A2	V_{17-I}	0.9	1.2	1.4	V	f=0.5MHz, V_{in}=1.0V_{P-P}	
Output amplifier characteristic V1	V_{80-LI}	1.50	1.75	2.00	V	V_{in}=1.0V	
Output amplifier characteristic V2	V_{80-HI}	4.7	4.9	5.0	V	V_{in}=3.0V	
Output amplifier characteristic A1	V_{150-LI}	1.50	1.75	2.00	V	V_{in}=1.0V	
Output amplifier characteristic A2	V_{150-HI}	4.7	4.9	5.0	V	V_{in}=3.0V	
Switch impedance V-OFF	Z_{4-OFF}	20k	100k	∞	Ω	f=1.0MHz, V_{in}=0.5V_{P-P}	
Switch impedance A-OFF	Z_{20-OFF}	20k	100k	∞	Ω	f=1.0MHz, V_{in}=0.5V_{P-P}	Fig.7
Switch impedance V-ON	Z_{4-ON}	−	50	90	Ω	f=1.0MHz, V_{in}=0.5V_{P-P}	
Switch impedance A-ON	Z_{20-ON}	−	50	90	Ω	f=1.0MHz, V_{in}=0.5V_{P-P}	
Overall characteristic V	V_{6D-O}	1.00	1.55	2.10	V	f=1.0MHz, V_{in}=0.5V_{P-P}	
Overall characteristic A	V_{15D-O}	1.80	2.70	3.40	V	f=1.0MHz, V_{in}=0.5V_{P-P}	
Output switching V-F	V_{6-F}	0.50	0.75	1.00	V	V−V_{in}=0.5V, A−V_{in}=1.0V	
Output switching A-F	V_{15-F}	2.50	2.75	3.00	V	V−V_{in}=0.5V, A−V_{in}=1.5V	
Output switching V-R	V_{6-R}	2.50	2.75	3.00	V	V−V_{in}=0.5V, A−V_{in}=1.5V	
Output switching A-R	V_{15-R}	0.50	0.75	1.00	V	V−V_{in}=0.5V, A−V_{in}=1.5V	
Comparator level	V_{14}	0.5	1.0	1.5	V	R=10kΩ, V_{in}=0.0V	
Hysteresis	H_{14}	5	10	15	%	R=10kΩ, V_{in}=2.0V	
Mask time interval	T_{MASK}	60	120	180	μs	C=2200pF	
Switching voltage	V_{th}	1.0	2.0	3.0	V		

◎Not designed for radiation resistance.

●Electrical characteristic curves

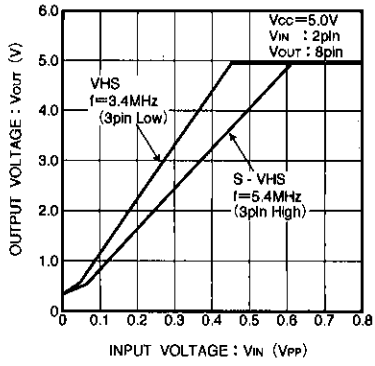


Fig. 2 Input voltage vs. output detector voltage characteristic

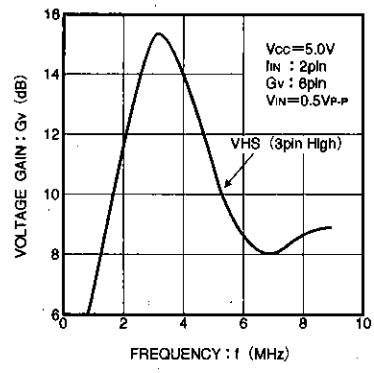


Fig. 3 Voltage gain vs. frequency characteristic (VHS)

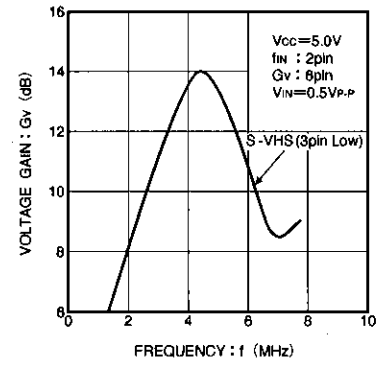


Fig. 4 Voltage gain vs. frequency characteristic(S-VHS)

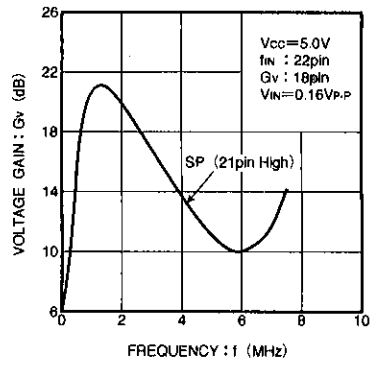


Fig. 5 Voltage gain vs. frequency characteristic (SP)

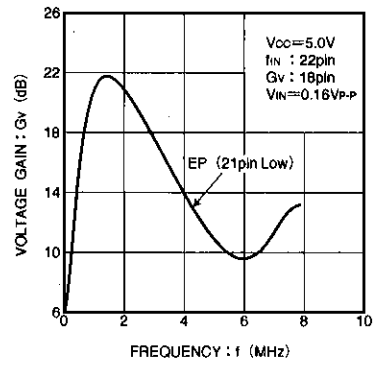


Fig. 6 Voltage gain vs. frequency characteristic (EP)

●Measurement circuit

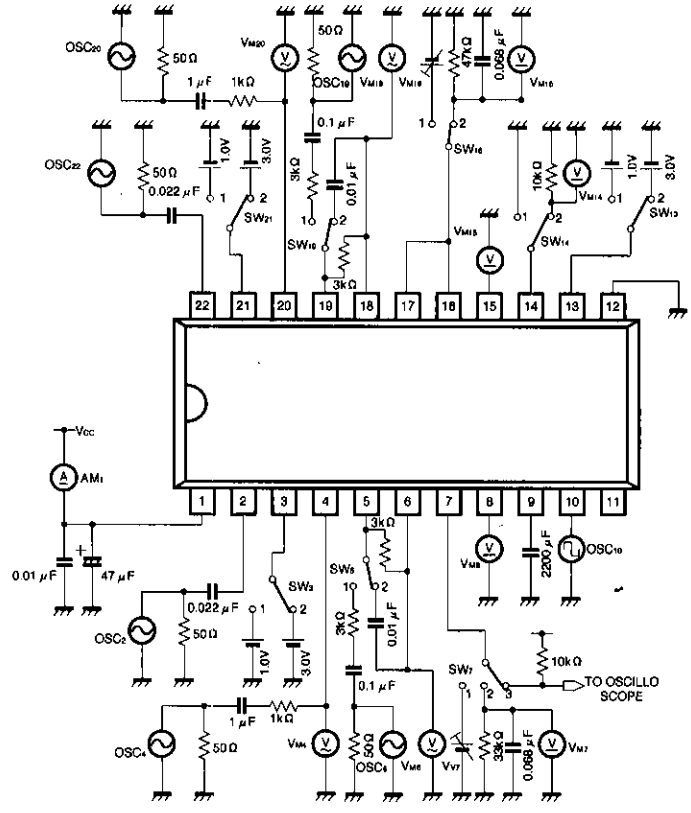


Fig.7

●Pin description

Pin No.	Name	Pin No.	Name
1	Vcc	12	GND
2	VIDEO FM IN	13	OUT CTL
3	$\overline{\text{VHS}}$ / S - VHS CTL	14	LEVEL CTL
4	V. SW	15	A. EMV OUT
5	V. IN-	16	A. EMV IN
6	V. OUT	17	A. DET
7	V. DET	18	A. OUT
8	V. EMV OUT	19	A. IN -
9	TIME ADJ	20	A. SW
10	D. FF IN	21	$\overline{\text{EP}}$ / SP CTL
11	NC	22	AUDIO FM IN

●Truth table

3,21 pin	4,20 pin
HIGH	OFF
LOW	ON

13 pin	Output selection
HIGH	Pin 16 input to pin 15 output/pin 7 input to pin 8 output
LOW	Pin 16 input to pin 8 output/pin 7 input to pin 15 output

●Application example

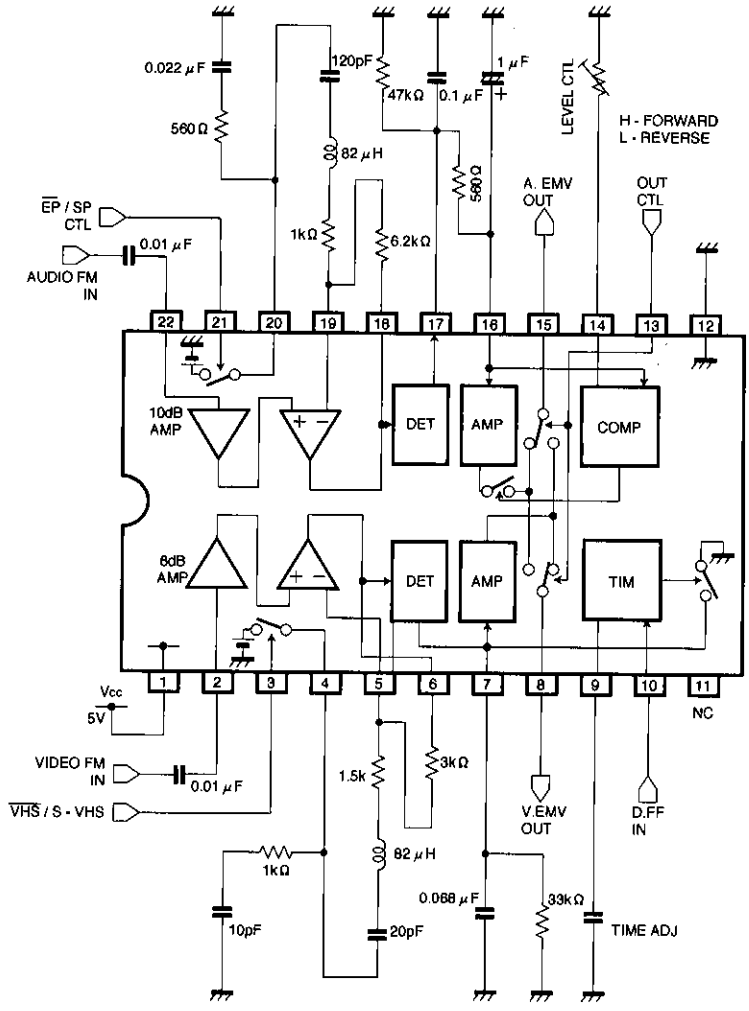
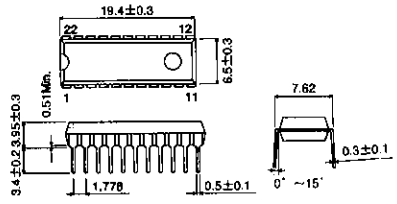


Fig.8

●External dimensions (Units: mm)



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