75Ω driver IC with 3 internal circuits

BA7622 / BA7622F

The BA7622 and BA7622F are 75Ω driver-ICs developed for use in video equipment. The ICs include three 75Ω driver circuits, two of which have sync-tip clamp inputs. The other driver has a biased input terminated with a 20kΩ resistor. Each output can drive two loads (75Ω×2).

●Applications

Video cassette recorders, televisions and camcorders

●Features

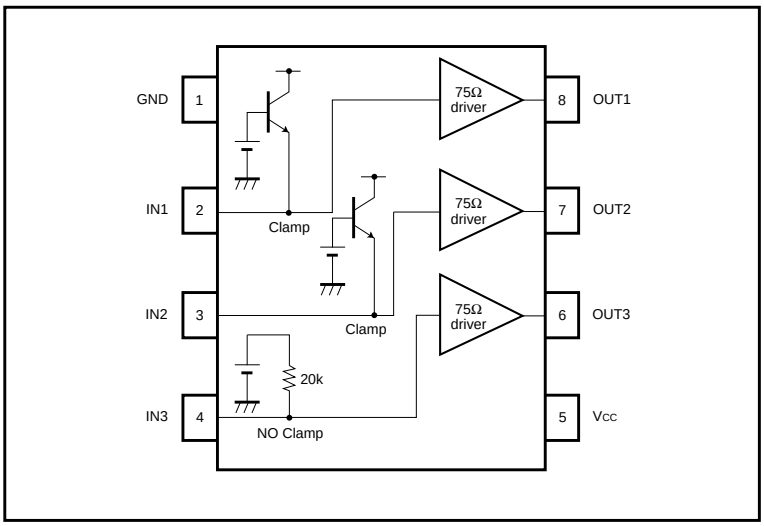
1) Two built-in clamp circuits.
2) Simultaneous drive of Y, C and composite video signals possible.
3) Each output can drive two loads.

●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Power supply voltage		V_{CC}	8.0	V
Power dissipation	BA7622	Pd	800 *1	mW
	BA7622F		550 *2	
Operating temperature		Topr	−25 ~ +75	°C
Storage temperature		Tstg	−55 ~ +125	°C

∗1 Reduced by 8.0mW for each increase in Ta of 1°C over 25°C. (BA7622)
∗2 Reduced by 5.5mW for each increase in Ta of 1°C over 25°C. (BA7622F)

●Block diagram



●Pin descriptions

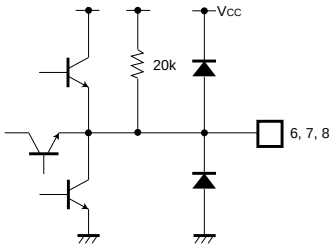
Pin No.	Pin name	Function
1	GND	Ground connection
2	IN1	Clamp input Input composite video or the Y signal separated from Y / C.
3	IN2	Clamp input Input composite video or the Y signal separated from Y / C.
4	IN3	Biased input Input the chroma signal. Terminated with a 20kΩ resistor.
5	V_{CC}	Power supply
6	OUT3	Biased output Output for the signal input to IN3. When connected to earth a protection circuit operates, and the IC enters power-save mode.
7	OUT2	Clamped output Output for the signal input to IN2. When connected to earth a protection circuit operates, and the IC enters power-save mode.
8	OUT1	Clamped output Output for the signal input to IN1. When connected to earth a protection circuit operates, and the IC enters power-save mode.

●Electrical characteristics (unless otherwise noted, Ta = 25°C and V_{CC} = 5V, and load is two system drive)

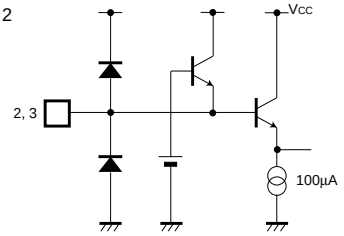
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	V_{CC}	4.5	5.0	5.5	V	–
Circuit current	I_{CC}	–	23.6	35.4	mA	No signal
Maximum output level	V_{om}	2.8	3.3	–	V_{P-P}	f=1kHz, THD=1.0%
Voltage gain	Gv	–1.2	–0.6	0	dB	f=1MHz, V_{IN}=2.0V_{P-P}
Frequency characteristics	Gf	–3	0	1.3	dB	10MHz / 1MHz, V_{IN}=1.0V_{P-P}
Differential gain 75Ω drive 1	DG1	–	0.4	1.0	%	V_{IN}=2.0V_{P-P}, standard staircase signal
Differential phase 75Ω drive 1	DP1	–	0.4	1.0	deg	V_{IN}=2.0V_{P-P}, standard staircase signal
Differential gain 75Ω drive 2	DG2	–	0.7	2.0	%	V_{IN}=2.0V_{P-P}, standard staircase signal
Differential phase 75Ω drive 2	DP2	–	0.7	2.0	deg	V_{IN}=2.0V_{P-P}, standard staircase signal
Interchannel crosstalk	C_T	–	–60	–	dB	f=4.43MHz, V_{IN}=2.0V_{P-P}
Input impedance (V_{IN}3)	Z_{IN}3	17	20	23	kΩ	–
Total-harmonic distortion (V_{IN}3)	T_{HD}32	–	0.1	0.5	%	f=1kHz, V_{IN}=1.0V_{P-P}

●Input / output circuits

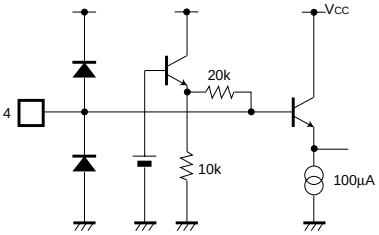
OUT1, 2, 3



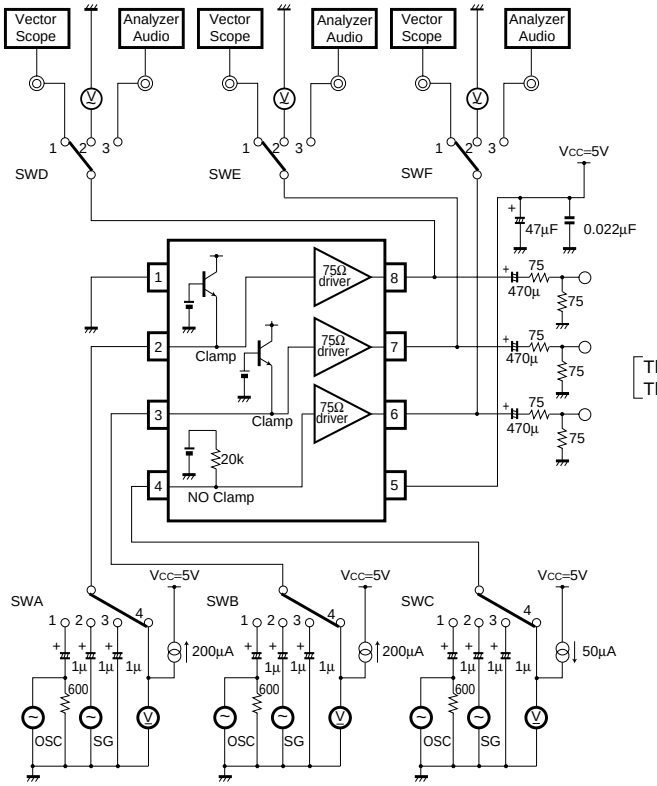
IN1, 2



IN3



●Measurement circuit



The circuit for driving one 75Ω output load.
The circuit for driving two 75Ω output loads is as.

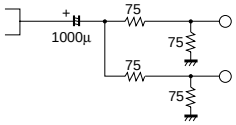


Fig.1

●Measurement conditions

Parameter	Symbol	IN1	IN2	IN3	OUT1	OUT2	OUT3	Conditions
		SWA	SWB	SWC	SWD	SWE	SWF	
Current dissipation	I_{CC}	3	3	3	×	×	×	–
Maximum output level	$V_{om}12$	1	3	3	3	×	×	∗1
	$V_{om}22$	3	1	3	×	3	×	
	$V_{om}32$	3	3	1	×	×	3	
Voltage gain	G_V12	1	3	3	3	×	×	∗2
	G_V22	3	1	3	×	3	×	
	G_V32	3	3	1	×	×	3	
Frequency characteristic	f12	1	3	3	3	×	×	–
	f22	3	1	3	×	3	×	
	f32	3	3	1	×	×	3	
Interchannel crosstalk	C_T112	1	3	3	×	3	×	–
	C_T113	1	3	3	×	×	3	
	C_T211	3	1	3	3	×	×	
	C_T213	3	1	3	×	×	3	
	C_T311	3	3	1	3	×	×	
	C_T312	3	3	1	×	3	×	
Input resistance	$Z_{IN}3$	3	3	4	×	×	×	∗3
Total-harmonic distortion	$T_{HD}12$	1	3	3	3	×	×	∗4
	$T_{HD}22$	3	1	3	×	3	×	
	$T_{HD}32$	3	3	1	×	×	3	

× : Any of switches 1, 2, or 3 possible.

∗1: Connect a distortion meter to the output, and input a f=1kHz sine wave. Adjust the input level until the output distortion is 0.5%. This output voltage at this time is the maximum output level V_{om} (V_{P-P}).

∗2: Input a 2.0V_{P-P}, 1MHz sine wave. The voltage gain is given by G_V=20 log (V_{OUT} / V_{IN}).

∗3: Measure the input pin voltage $V_{IN}50$ when a current of DC50μA is flowing into the input pin. Measure the input pin open-circuit voltage $V_{IN}0$. The input impedance is given by $Z=(V_{IN}50 - V_{IN}0) / 50\times10^{-6}$[Ω].

∗4: Input a 1.0V_{P-P}, 1kHz sine wave. Connect a distortion meter to the output and measure the total-harmonic distortion.

●Application example

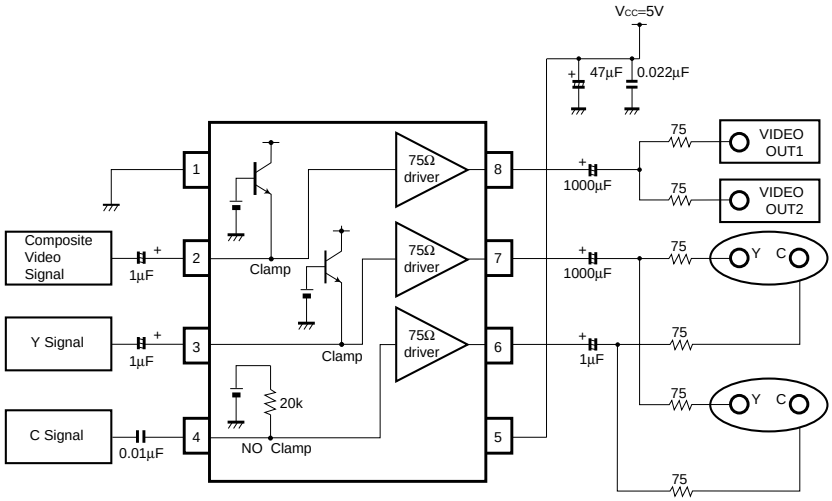


Fig.2

●Electrical characteristic curves

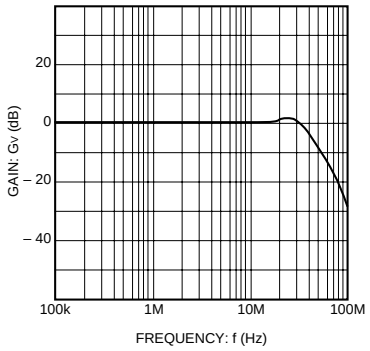


Fig. 3 Frequency characteristic

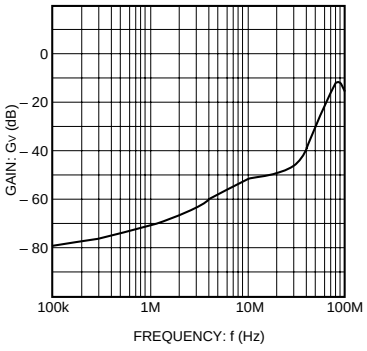


Fig. 4 Crosstalk

●External dimensions (Units : mm)