

Video Signal Switcher

BA7608N

The BA7608N, developed for products like VCRs, is a switcher with 2 switching circuits, each with 2 inputs and 1 output. This IC has 1 sync tip clamp circuit and 1 non-clamping input circuit, making it ideal for switching between video and audio signals or between video and chroma signals.

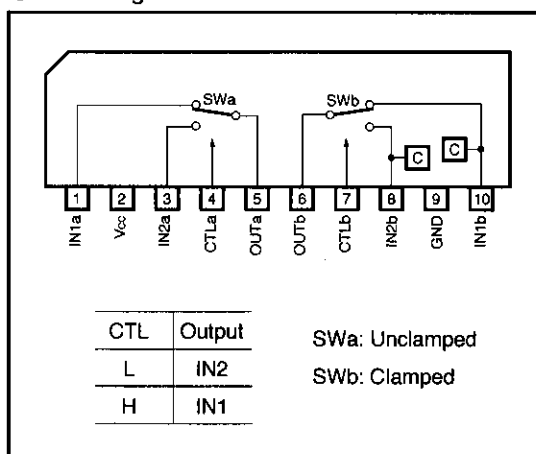
●Applications

TVs and VCRs

●Features

- 1) 2-input / 1-output switches (one sync tip clamp input circuit and one non-clamping input circuit), each with 2 inputs and 1 output
- 2) 5V supply voltage
- 3) Lower power consumption (Typ. 42mW)
- 4) Excellent frequency characteristics (Typ. 10MHz, 0dB)
- 5) Wide dynamic range
 - Clamped input: 2.9V_{P-P} (Typ.)
 - Unclamped input: 3.0V_{P-P} (Typ.)
- 6) High switching speed (Typ. 50ns)

●Block diagram



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	9	V
Power dissipation	Pd	500 *	mW
Operating temperature	Topr	-40~+85	°C
Storage temperature	Tstg	-55~125	°C

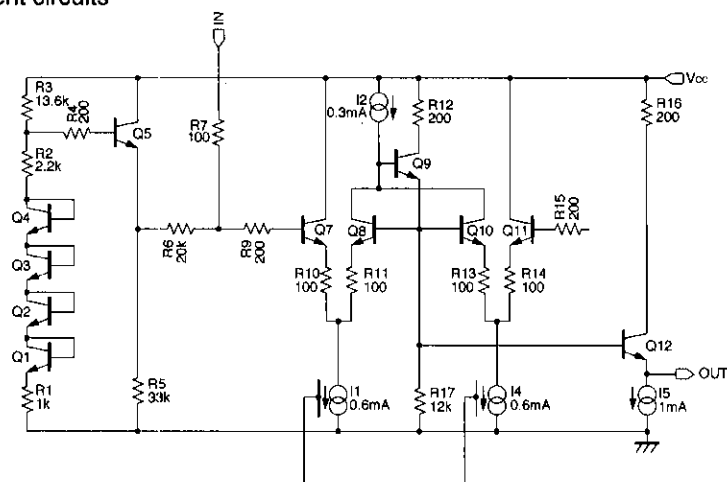
* Reduced by 5.0mW for each increase in Ta of 1°C over 25°C.

Audio/video signal selection switches

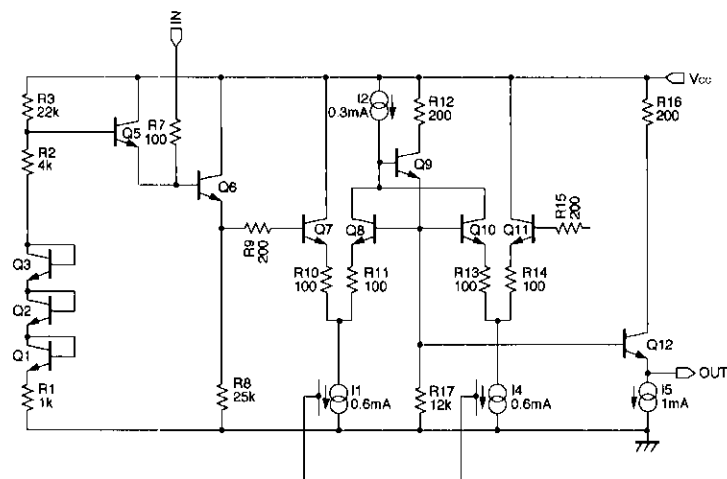
AV switches

- Input and output equivalent circuits

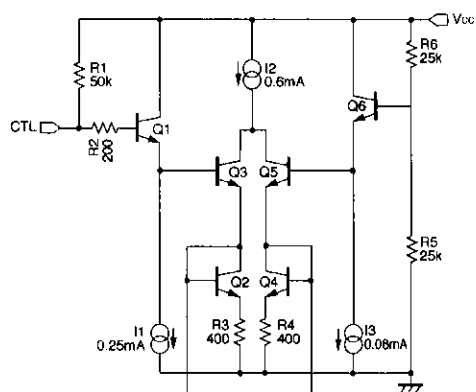
SWa



SWb



CTL



●Electrical characteristics (unless otherwise noted, Ta=25°C, Vcc=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	V _{CC}	4.5	5.0	5.5	V	—
Circuit current	I _{CC}	—	8.4	13.0	mA	—
Maximum output level 1	V _{OM}	2.6	2.9	—	V _{P-P}	f=1kHz, THD=0.5%, clamped
Maximum output level 2	V _{OM}	2.7	3.0	—	V _{P-P}	f=1kHz, THD=0.5%, unclamped
Voltage gain	G _V	−0.5	0	0.5	dB	f=1MHz, V _{IN} =1V _{P-P}
Interchannel crosstalk	G _T	—	−65	—	dB	f=4.43MHz, V _{IN} =1V _{P-P}
Frequency characteristics	G _f	−3	0	1	dB	10MHz / 1MHz, V _{IN} =1V _{P-P}
Input impedance	Z _{IN}	14	20	26	kΩ	Unclamped
Total harmonic distortion	THD	—	0.007	—	%	f=1kHz, 1V _{P-P} , unclamped
CTL pin switching level	V _{TH}	2.0	2.5	3.0	V	—

Note: Refer to the measurement circuit given in Fig. 1.

●Reference data

Pin DC voltage (reference)

Units : Vdc

Pin No.	Pin voltage
1	2.48
2	5.00
3	2.48
4	4.91
5	1.76
6	0.65
7	4.91
8	2.05
9	0
10	2.05

Note: The voltage are for reference only.

Electrical characteristics

Reference data	Min.	Typ.	Max.	Unit
Sink chip clamp level	1.20	1.54	1.95	Vdc
Input impedance (unclamped)	—	20	—	kΩ
Input impedance (clamped)	—	1.7	—	MΩ
Output impedance	—	30	—	Ω

The input coupling capacitor values should be 0.1 μF to 1 μF.

● Measurement circuit

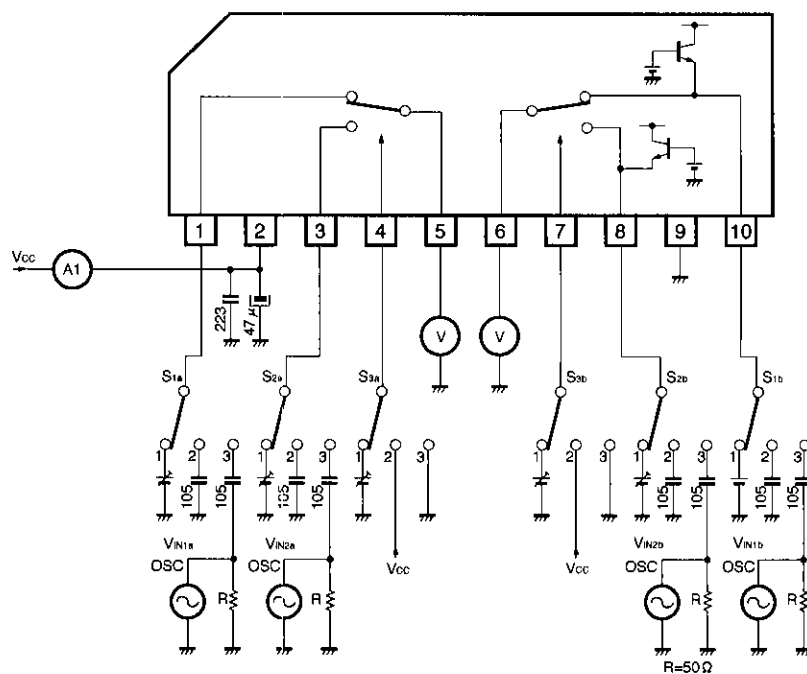


Fig.1

● Measurement conditions

Parameter		Symbol	Switch position						Measurement method
			S1a	S2a	S3a	S1b	S2b	S3b	
Current consumption		I _{CC}	2	2	2	2	2	2	Ammeter
Maximum output level	In1a	V _{OM}	3	2	2	2	2	2	Note 1
	In2a	V _{OM}	2	3	3	2	2	2	
	In1b	V _{OM}	2	2	2	3	2	2	
	In2b	V _{OM}	2	2	2	2	3	3	
Voltage gain	In1a	G _V	3	2	2	2	2	2	Note 2
	In2a	G _V	2	3	3	2	2	2	
	In1b	G _V	2	2	2	3	2	2	
	In2b	G _V	2	2	2	2	3	3	
Interchannel crosstalk	In1a	C _T	3	2	3	2	2	2	Note 3
	In2a	C _T	2	3	2	2	2	2	
	In1b	C _T	2	2	2	3	2	3	
	In2b	C _T	2	2	2	2	3	2	
Frequency characteristics	In1a	G _f	3	2	2	2	2	2	Note 4
	In2a	G _f	2	3	3	2	2	2	
	In1b	G _f	2	2	2	3	2	2	
	In2b	G _f	2	2	2	2	3	3	
CTL pin threshold	CTL _A	V _{TH}	3	2	1	2	2	2	Note 5
	CTL _B	V _{TH}	2	2	2	3	2	1	
Total harmonic distortion	In1a	THD	3	2	2	2	2	2	Note 6
	In2a	THD	2	3	3	2	2	2	
Input impedance	In1a	Z _{IN}	1	2	2	2	2	2	Note 7
	In2a	Z _{IN}	2	1	3	2	2	2	

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

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

Note 3: Input a 1V_{P-P}, 4.43MHz sine wave. The interchannel crosstalk is given by $C_T = 20 \log (V_{OUT}/V_{IN})$.

Note 4: Input 1V_{P-P}, 1MHz and 10MHz sine waves. The frequency characteristic is given by $G_f = 20 \log (V_{OUT}(f = 10\text{MHz})/V_{IN} (f = 1\text{MHz}))$.

Note 5: Input a 1V_{P-P}, 1MHz sine wave. Reduce the CTL pin voltage from V_{CC} . The CTL pin switching level (V_{TH}) is the CTL pin voltage at which the V_{OUT} level drops below 20mV_{P-P}.

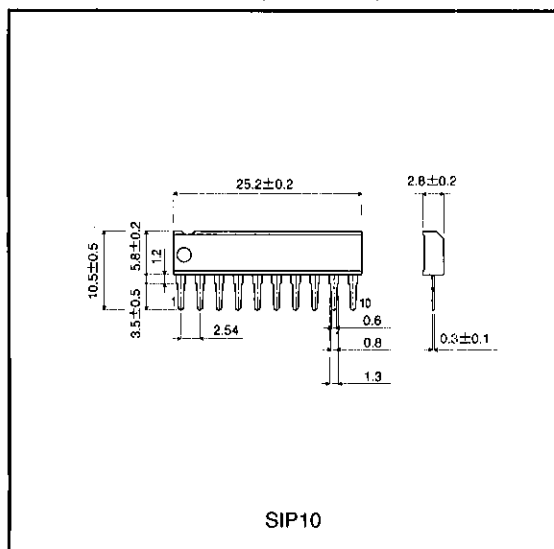
Note 6: Input a 1V_{P-P}, 1kHz sine wave and measure the total-harmonic distortion of the output using a total-harmonic distortion meter.

Note 7: Measure the input pin voltage V_{IN50} when a current of $DC50\mu A$ is flowing into the input pin. Measure the input pin open-circuit voltage. The input impedance is given by $Z = (V_{IN50} - V_{IN0})/50 \times 10^{-9} \Omega$.

Audio/video signal selection switches

AV switches

●External dimensions (Units: mm)



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