

# Video Signal Switcher

## BA7608N

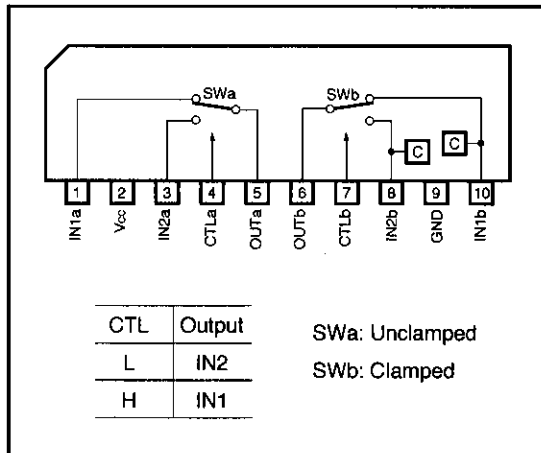
The BA7608N, developed for products like VCRs, is a switcher with 2 switching circuits, each with 2 inputs and 1 output. This IC has 1 sync tip clamp circuit and 1 non-clamping input circuit, making it ideal for switching between video and audio signals or between video and chroma signals.

●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<sub>P-P</sub> (Typ.)  
Unclamped input: 3.0V<sub>P-P</sub> (Typ.)
- 6) High switching speed (Typ. 50ns)

●Block diagram



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V <sub>CC</sub>	9	V
Power dissipation	P <sub>d</sub>	500*	mW
Operating temperature	T <sub>opr</sub>	-40~+85	°C
Storage temperature	T <sub>stg</sub>	-55~125	°C

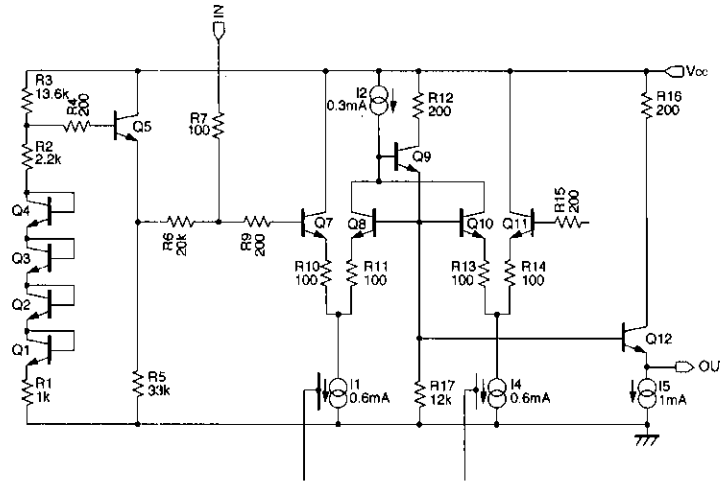
\* Reduced by 5.0mW for each increase in Ta of 1°C over 25°C.

Audio/video signal selection switches

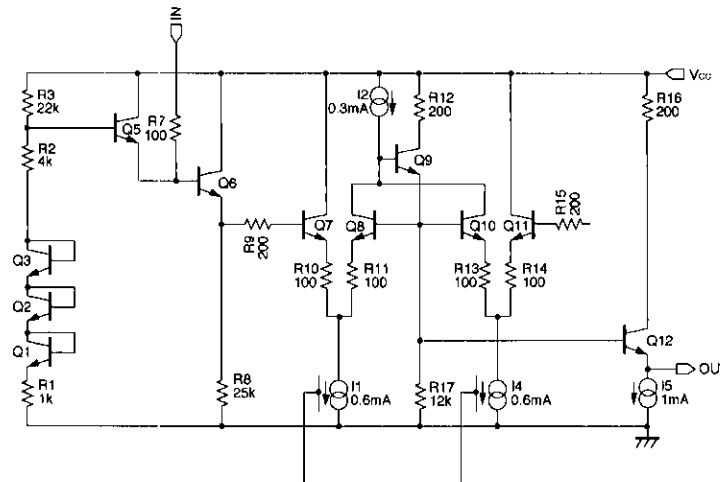
AV switches

● Input and output equivalent circuits

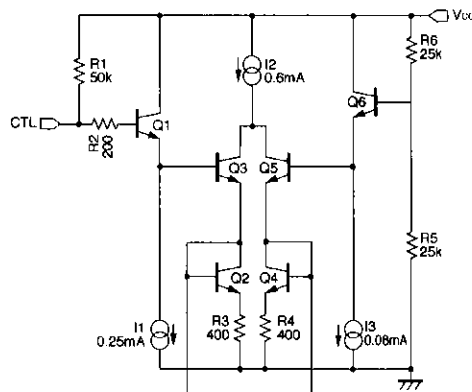
SWa



SWb



CTL



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

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

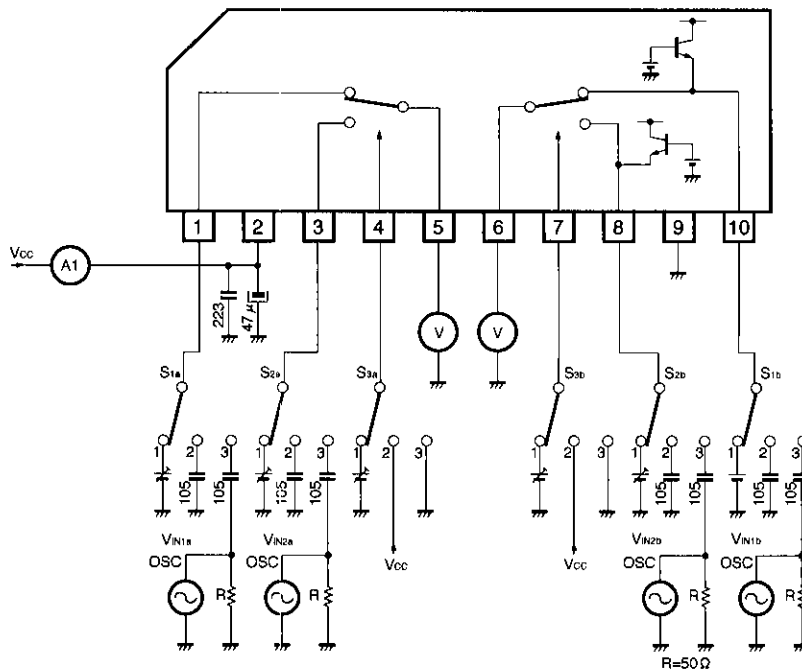


Fig.1

## ● Measurement conditions

Parameter	Symbol	Switch position						Measurement method
		S1a	S2a	S3a	S1b	S2b	S3b	
Current consumption	I <sub>cc</sub>	2	2	2	2	2	2	Ammeter
Maximum output level	In1a	V <sub>om</sub>	3	2	2	2	2	Note 1
	In2a	V <sub>om</sub>	2	3	3	2	2	
	In1b	V <sub>om</sub>	2	2	2	3	2	
	In2b	V <sub>om</sub>	2	2	2	2	3	
Voltage gain	In1a	G <sub>v</sub>	3	2	2	2	2	Note 2
	In2a	G <sub>v</sub>	2	3	3	2	2	
	In1b	G <sub>v</sub>	2	2	2	3	2	
	In2b	G <sub>v</sub>	2	2	2	2	3	
Interchannel crosstalk	In1a	C <sub>T</sub>	3	2	3	2	2	Note 3
	In2a	C <sub>T</sub>	2	3	2	2	2	
	In1b	C <sub>T</sub>	2	2	2	3	2	
	In2b	C <sub>T</sub>	2	2	2	2	3	
Frequency characteristics	In1a	G <sub>f</sub>	3	2	2	2	2	Note 4
	In2a	G <sub>f</sub>	2	3	3	2	2	
	In1b	G <sub>f</sub>	2	2	2	3	2	
	In2b	G <sub>f</sub>	2	2	2	2	3	
CTL pin threshold	CTLa	V <sub>TH</sub>	3	2	1	2	2	Note 5
	CTLb	V <sub>TH</sub>	2	2	2	3	1	
Total harmonic distortion	In1a	THD	3	2	2	2	2	Note 6
	In2a	THD	2	3	3	2	2	
Input impedance	In1a	Z <sub>in</sub>	1	2	2	2	2	Note 7
	In2a	Z <sub>in</sub>	2	1	3	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<sub>P-P</sub>).

Note 2: Input a 1V<sub>P-P</sub>, 1MHz sine wave. The voltage gain is given by  $G_v = 20 \log (V_{out}/V_{in})$ .

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

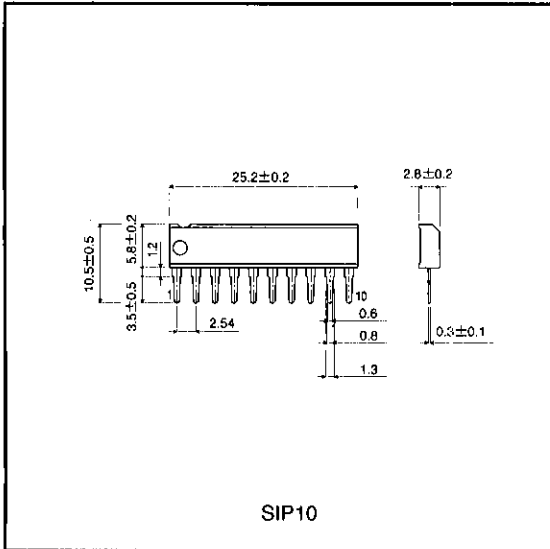
Note 4: Input 1V<sub>P-P</sub>, 1MHz and 10MHz sine waves. The frequency characteristic is given by  $G_f = 20 \log (V_{out}(f = 10\text{MHz})/V_{in}(f = 1\text{MHz}))$ .

Note 5: Input a 1V<sub>P-P</sub>, 1MHz sine wave. Reduce the CTL pin voltage from V<sub>CC</sub>. The CTL pin switching level (V<sub>TH</sub>) is the CTL pin voltage at which the V<sub>OUT</sub> level drops below 20mV<sub>P-P</sub>.

Note 6: Input a 1V<sub>P-P</sub>, 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  $\mu\text{A}$  is flowing into the input pin. Measure the input pin open-circuit voltage. The input impedance is given by  $Z = (V_{in50} - V_{in0})/50 \times 10^{-9} \Omega$ .

●External dimensions (Units: mm)



## Notes

- The contents described in this catalogue are correct as of March 1997.
- No unauthorized transmission or reproduction of this book, either in whole or in part, is permitted.
- The contents of this book are subject to change without notice. Always verify before use that the contents are the latest specifications. If, by any chance, a defect should arise in the equipment as a result of use without verification of the specifications, ROHM CO., LTD., can bear no responsibility whatsoever.
- Application circuit diagrams and circuit constants contained in this data book are shown as examples of standard use and operation. When designing for mass production, please pay careful attention to peripheral conditions.
- Any and all data, including, but not limited to application circuit diagrams, information, and various data, described in this catalogue are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO., LTD., disclaims any warranty that any use of such device shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes absolutely no liability in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices; other than for the buyer's right to use such devices itself, resell or otherwise dispose of the same; no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by ROHM CO., LTD., is granted to any such buyer.
- The products in this manual are manufactured with silicon as the main material.
- The products in this manual are not of radiation resistant design.

The products listed in this catalogue are designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment, communications devices, electrical appliances, and electronic toys). Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers, or other safety devices) please be sure to consult with our sales representatives in advance.

- **Notes when exporting**

- It is essential to obtain export permission when exporting any of the above products when it falls under the category of strategic material (or labor) as determined by foreign exchange or foreign trade control laws.
- Please be sure to consult with our sales representatives to ascertain whether any product is classified as a strategic material.