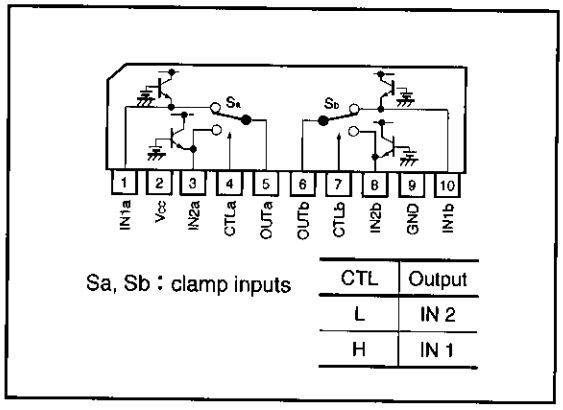
# Video signal switcher
## BA7605N

The BA7605N is a switching ICs developed for use in VCRs. It has two two-channel analog multiplexers with a large dynamic range, and wide operating frequency range. The switches have sync-tip clamped inputs and are ideal for switching video signals.

### ●Applications
Video cassette recorders and televisions

### ●Features
1)Two 2-input / 1-output switches.
2)Sync-tip clamped inputs.
3)5V power supply.
4)Low power consumption (42mW Typ.).
5)Excellent frequency characteristics (10MHz, 0dB Typ.).
6)Wide dynamic range (2.9$V_{P-P}$ Typ.).
7)Fast switching speed (50ns Typ.).

### ●Block diagram




Sa, Sb : clamp inputs

| CTL | Output |
|---|---|
| L | IN 2 |
| H | IN 1 |

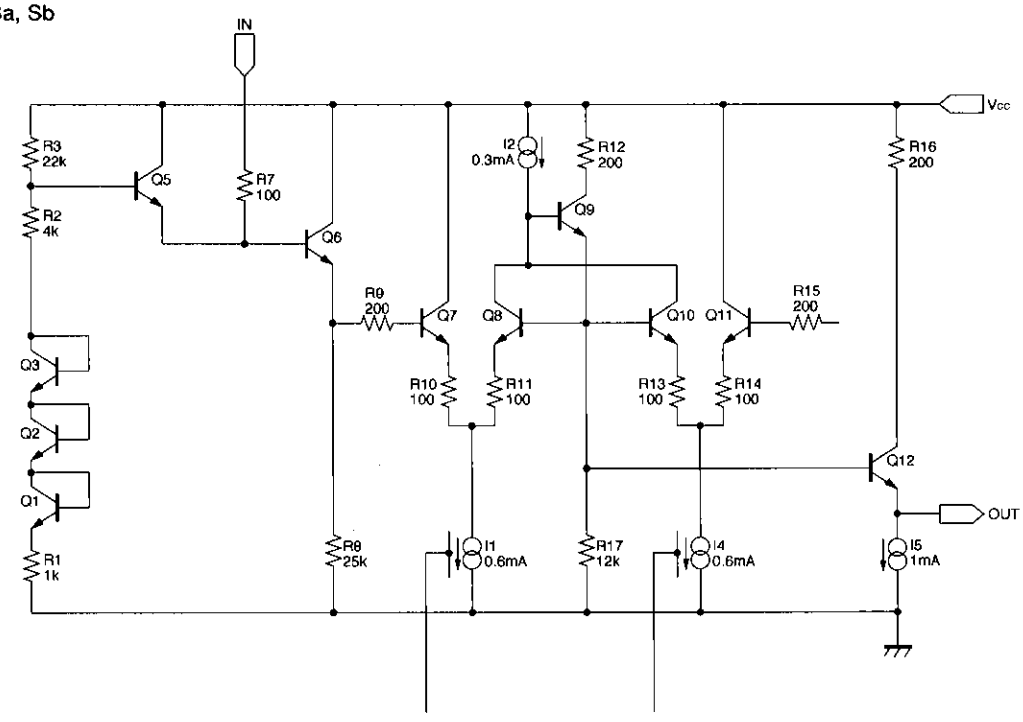
### ●Absolute maximum ratings (Ta=25℃)

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

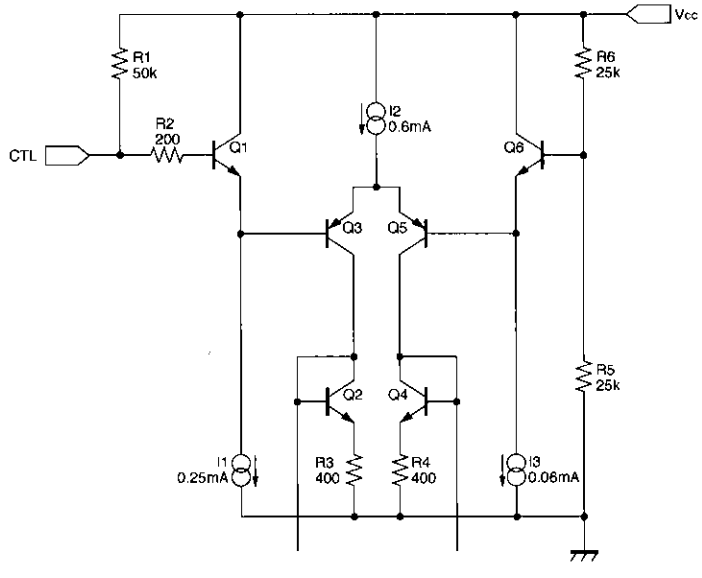
* Reduced by 5.0mW for each increase in Ta of 1°C over 25°C.

●Equivalent circuits

Sa, Sb




CTL



●Electrical characteristics (Unless otherwise specified Ta=25℃ and $V_{CC}$=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 | 10.0 | mA | — |
| Maximum output level | $V_{om}$ | 2.6 | 2.9 | — | $V_{P-P}$ | f=1kHz, THD=0.5% |
| Voltage gain | $G_V$ | −0.5 | 0 | 0.5 | dB | f=1MHz, $V_{IN}$=1$V_{P-P}$ |
| Interchannel crosstalk | $C_T$ | — | −65 | — | dB | f=4.43MHz, $V_{IN}$=1$V_{P-P}$ |
| Frequency characteristic | $G_f$ | −3 | 0 | 1 | dB | 10MHz / 1MHz, $V_{IN}$=1$V_{P-P}$ |
| CTL pin switch level | $V_{TH}$ | 2.0 | 2.5 | 3.0 | V | — |

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

●Reference data

Pin DC voltages (reference values)

Units: Vdc

| Pin No. | DC voltage | Pin No. | DC voltage |
|---|---|---|---|
| 1 | 2.05 | 6 | 0.65 |
| 2 | 5.00 | 7 | 4.91 |
| 3 | 2.05 | 8 | 2.05 |
| 4 | 4.91 | 9 | 0 |
| 5 | 0.65 | 10 | 2.05 |

Electrical characteristics

| Parameter | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|
| Sync tip clamp level | 0.49 | 0.65 | 0.80 | Vdc |
| Input impedance (with clamp) | — | 1.7M | — | Ω |
| Output impedance | — | 30 | — | Ω |

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

●Measurement circuit

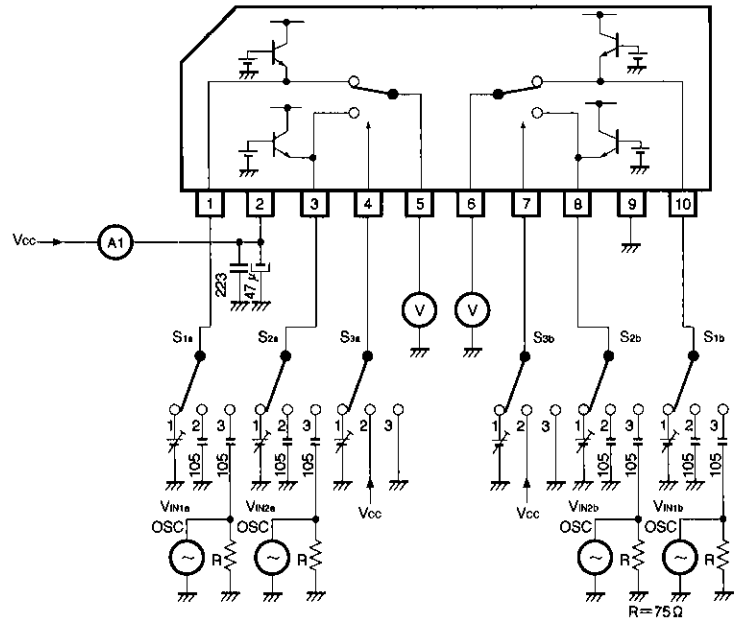



Fig.1

## ●Measurement conditions

| Parameter | | Symbol | Switch settings | | | | | | Measurement method |
|---|---|---|---|---|---|---|---|---|---|
| | | | $S_{1a}$ | $S_{2a}$ | $S_{3a}$ | $S_{1b}$ | $S_{2b}$ | $S_{3b}$ | |
| 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 | |
| Inter-channel crosstalk | In1a | $C_T$ | 2 | 3 | 2 | 2 | 2 | 2 | Note 3 |
| | In2a | $C_T$ | 3 | 2 | 3 | 2 | 2 | 2 | |
| | In1b | $C_T$ | 2 | 2 | 2 | 2 | 3 | 2 | |
| | In2b | $C_T$ | 2 | 2 | 2 | 3 | 2 | 3 | |
| Frequency characteristic | 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 switching level | CTLa | $V_{TH}$ | 3 | 2 | 1 | 2 | 2 | 2 | Note 5 |
| | CTLb | $V_{TH}$ | 2 | 2 | 2 | 3 | 2 | 1 | |

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

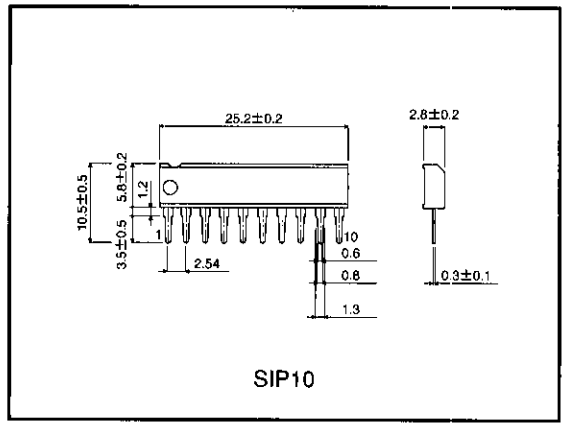
Note 2: Input a $1V_{P-P}$, 1MHz sine wave. The voltage gain is given by $G_V = 20 \log (V_{OUT}/V_{IN})$.

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 = 10MHz)/$V_{IN}$ (f = 1MHz)).

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 $20mV_{P-P}$.

## ●External dimensions (Units: mm)




SIP10

## 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.