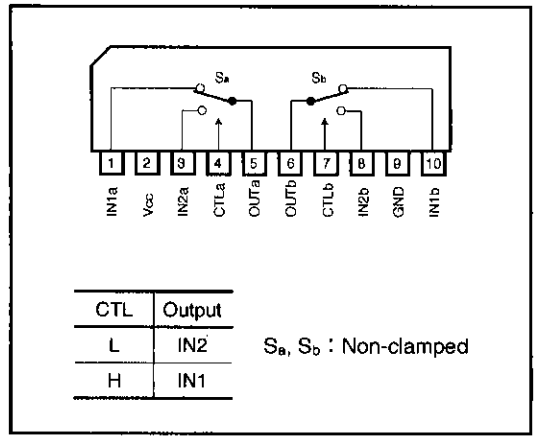
Video signal switcher
BA7604N

The BA7604N is switching ICs developed for use in VCRs. It has two-channel analog multiplexers, and features wide dynamic range, and wide operating frequency range, and is suitable for switching audio and video signals.

●Applications
VCRs and TVs

●Features
1)Two 2-input / 1-output switches.
2)5V power supply.
3)Low power consumption (42mW Typ.).
4)Excellent frequency characteristics (10MHz, 0dB Typ.).
5)Wide dynamic range (3.0Vp-p Typ.).
6)High input impedance (20kΩ Typ.).
7)Fast switching speed (50ns Typ.).

●Block diagram



CTL	Output
L	IN2
H	IN1

S_a, S_b : Non-clamped

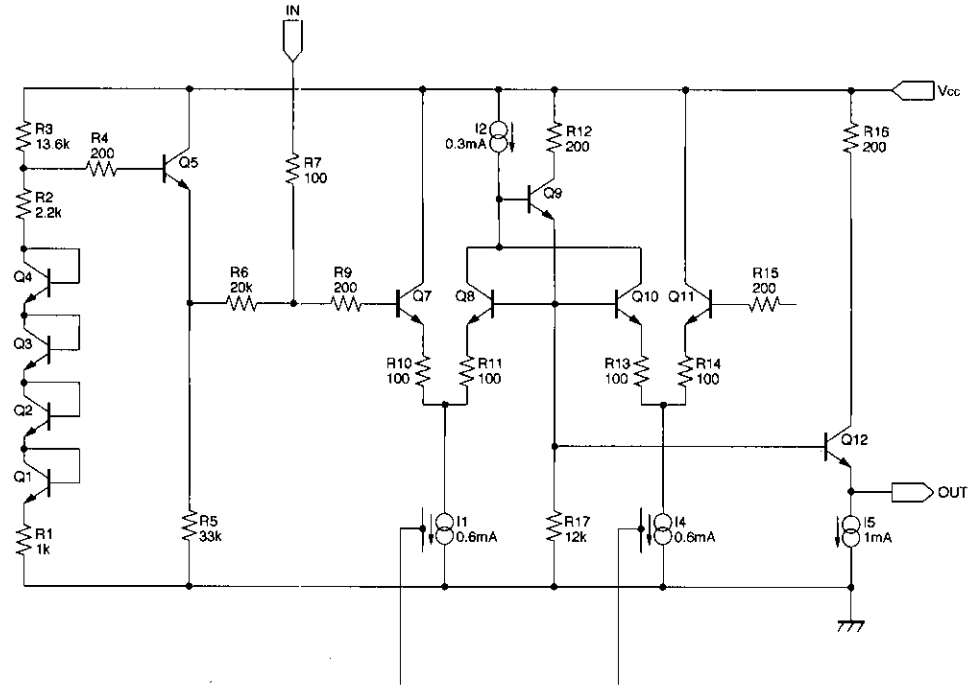
●Absolute maximum ratings (Ta=25℃)

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	℃

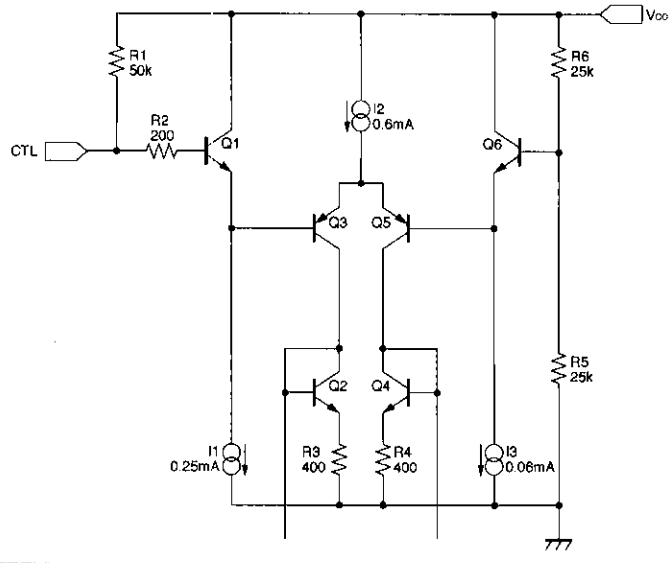
* Reduced by 5.0mW for each increase in Ta of 1°C over 25°C.

●Equivalent circuits

Sa, Sb



CTL



●Electrical characteristics (Unless otherwise specified Ta=25℃ and Vcc=5.0V)

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	V_{om}	2.7	3.0	—	V_{P-P}	f=1kHz, THD=0.5%
Voltage gain	G_V	−0.5	0	0.5	dB	f=1MHz, V_{IN}=1V_{P-P}
Interchannel crosstalk	C_T	—	−65	—	dB	f=4.43MHz, V_{IN}=1V_{P-P}
Frequency characteristic	G_f	−3	0	1	dB	10MHz / 1MHz, V_{IN}=1V_{P-P}
Total-harmonic distortion	THD	—	0.007	—	%	f=1MHz, V_{IN}=1V_{P-P}
CTL pin switch level	V_{TH}	2.0	2.5	3.0	V	—
Input impedance	Z_{IN}	14	20	26	kΩ	—

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	2.48	6	1.76
2	5.00	7	4.91
3	2.48	8	2.48
4	4.91	9	0
5	1.76	10	2.48

Electrical characteristics

Parameter	Min.	Typ.	Max.	Unit
Input impedance (no clamp)	—	20k	—	Ω
Output impedance	—	30	—	Ω

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

●Measurement circuit

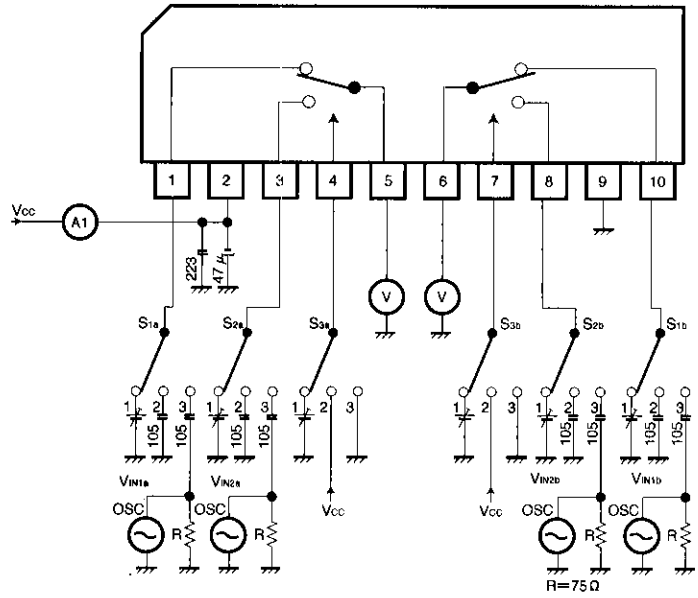


Fig.1

●Measurement conditions

Parameter		Symbol	Switch settings						Measurement method
			S_{1a}	S_{2a}	S_{3a}	S_{1b}	S_{2b}	S_{3b}	
Current consumption		Icc	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	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	
Total-harmonic distortion	In1a	THD	3	2	2	2	2	2	Note 6
	In2a	THD	2	3	3	2	2	2	
	In1b	THD	2	2	2	3	2	2	
	In2b	THD	2	2	2	2	3	3	
Input impedance	In1a	Z_{IN}	1	2	2	2	2	2	Note 7
	In2a	Z_{IN}	2	1	3	2	2	2	
	In1b	Z_{IN}	2	2	2	1	2	2	
	In2b	Z_{IN}	2	2	2	2	1	3	

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 Vom (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 $C_T = 20 \log (V_{OUT}/V_{IN})$.

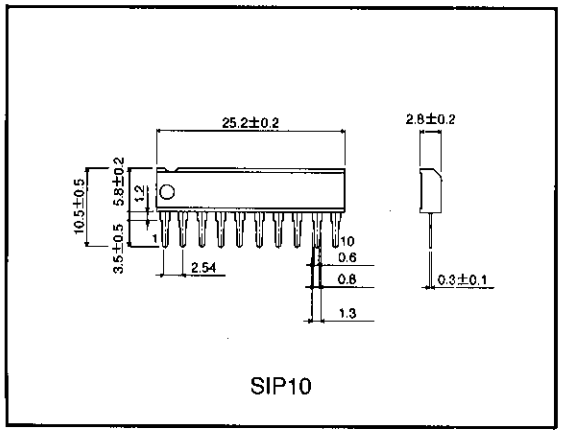
Note 4: Input $1V_{P-P}$, 1MHz and 10MHz sine waves. The frequency characteristic is given by $G_f = 20 \log (V_{OUT}(f = 10MHz)/V_{IN}(f = 1MHz))$.

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 $20mV_{P-P}$.

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 μA is flowing into the input pin. Measure the input pin open-circuit voltage. The input impedance is given by $Z = (V_{IN50} - V_{IN0})/50 \times 10^{-6}$ Ω.

●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.