Video signal switcher
BA7602 / BA7602F

The BA7602 and BA7602F are switching ICs developed for use in VCRs. Each contains three two-channel analog multiplexers. They feature a large dynamic range, and wide operating frequency range, and are suitable for switching audio and video signals.
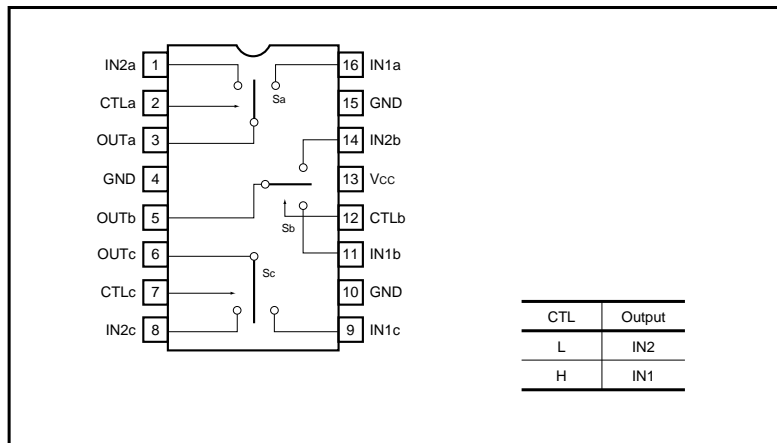
●Applications
Video cassette recorders and televisions

●Features
1) Three 2-input / 1-output switches.
2) 5V power supply.
3) Low power consumption (70mW Typ.).
4) Excellent frequency characteristics (10MHz, 0dB Typ.).
5) Wide dynamic range (3.1V$_{P-P}$ Typ.).
6) High input impedance (20kΩ Typ.).
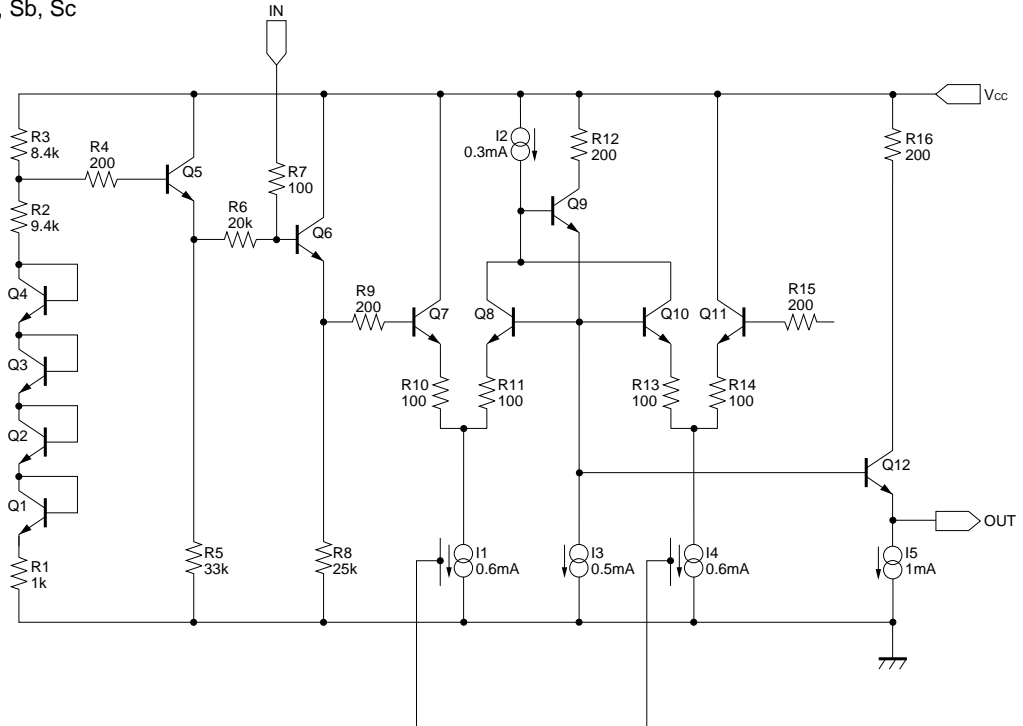7) Fast switching speed (50ns Typ.).

●Block diagram

CTL	Output
L	IN2
H	IN1

●Absolute maximum ratings (Ta = 25°C)

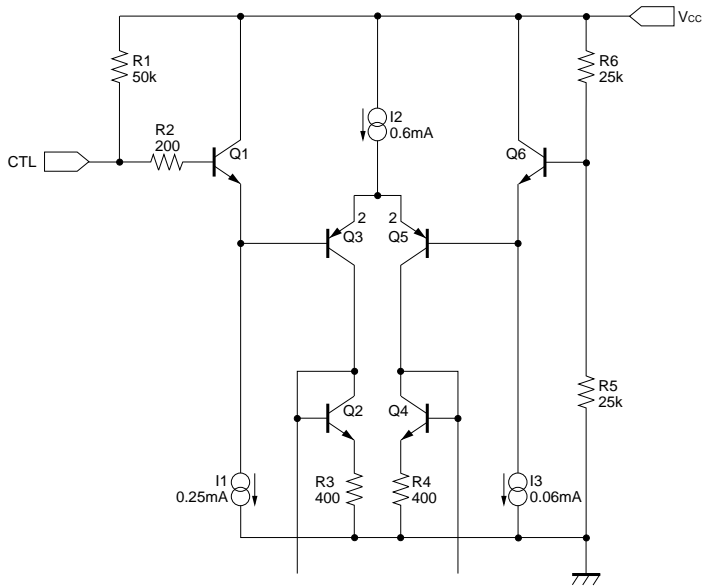| Parameter	Symbol	Limits	Unit
Power supply voltage	V$_{CC}$	9	V
Power dissipation	Pd	500*	mV
Operating temperature	Topr	− 40 ~ + 85	°C
Storage temperature	Tstg	− 55 ~ + 125	°C

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

●Equivalent circuits

Sa, Sb, Sc

CTL

ROHM

●Electrical characteristics (unless otherwise noted, Ta = 25°C, Vcc = 5.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	V_{CC}	4.5	5.0	5.5	V	—
Supply current	I_{CC}	—	14.0	20.5	mA	—
Maximum output level	V_{om}	2.8	3.1	—	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}
Input impedance	Z_{IN}	14	20	26	kΩ	—
CTL pin switch level	V_{TH}	20	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	3.27	9	3.27
2	4.91	10	0
3	1.84	11	3.27
4	0	12	4.91
5	1.84	13	5.00
6	1.84	14	3.27
7	4.91	15	0
8	3.27	16	3.27

Electrical characteristics

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

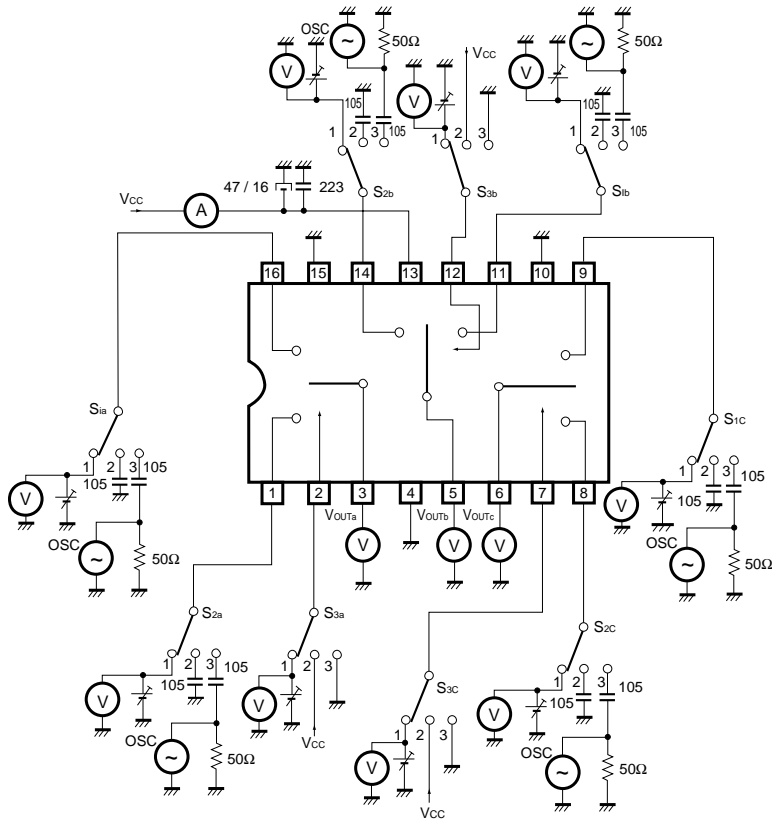The input coupling capacitor values should be 0.1μF to 1μF.

●Measurement circuit

Fig.1

●Measurment conditions

Parameter	Symbol	Switch settings									Measurement method
		S$_{1a}$	S$_{2a}$	S$_{3a}$	S$_{1b}$	S$_{2b}$	S$_{3b}$	S$_{1c}$	S$_{2c}$	S$_{3c}$	
Current dissipation	I$_{CC}$	2	2	2	2	2	2	2	2	2	
Maximum output level	I$_{N1a}$ V$_{Om}$	3	2	2	2	2	2	2	2	2	f = 1kHz THD = 0.5% Note 1
	I$_{N2a}$ V$_{Om}$	2	3	3	2	2	2	2	2	2	
	I$_{N1b}$ V$_{Om}$	2	2	2	3	2	2	2	2	2	
	I$_{N2b}$ V$_{Om}$	2	2	2	2	3	3	2	2	2	
	I$_{N1c}$ V$_{Om}$	2	2	2	2	2	2	3	2	2	
	I$_{N2c}$ V$_{Om}$	2	2	2	2	2	2	2	3	3	
Voltage gain	I$_{N1a}$ G$_V$	3	2	2	2	2	2	2	2	2	f = 1kHz V = 1V$_{P-P}$ Note 2
	I$_{N2a}$ G$_V$	2	3	3	2	2	2	2	2	2	
	I$_{N1b}$ G$_V$	2	2	2	3	2	2	2	2	2	
	I$_{N2b}$ G$_V$	2	2	2	2	3	3	2	2	2	
	I$_{N1c}$ G$_V$	2	2	2	2	2	2	3	2	2	
	I$_{N2c}$ G$_V$	2	2	2	2	2	2	2	3	3	
Interchannel crosstalk	I$_{N1a}$ C$_T$	2	3	2	2	2	2	2	2	2	f = 4.43MHz V = 1V$_{PP}$ Note 3
	I$_{N2a}$ C$_T$	3	2	3	2	2	2	2	2	2	
	I$_{N1b}$ C$_T$	2	2	2	2	3	2	2	2	2	
	I$_{N2b}$ C$_T$	2	2	2	3	2	3	2	2	2	
	I$_{N1c}$ C$_T$	2	2	2	2	2	2	2	3	2	
	I$_{N2c}$ C$_T$	2	2	2	2	2	2	3	2	3	
Frequency characteristic	I$_{N1a}$ G$_f$	3	2	2	2	2	2	2	2	2	f = 10M / f = 1M V = 1V$_{PP}$ Note 4
	I$_{N2a}$ G$_f$	2	3	3	2	2	2	2	2	2	
	I$_{N1b}$ G$_f$	2	2	2	3	2	2	2	2	2	
	I$_{N2b}$ G$_f$	2	2	2	2	3	3	2	2	2	
	I$_{N1c}$ G$_f$	2	2	2	2	2	2	3	2	2	
	I$_{N2c}$ G$_f$	2	2	2	2	2	2	2	3	3	
CTL pin switching level	CTLa V$_{TH}$	3	2	1	2	2	2	2	2	2	Note 5
	CTLb V$_{TH}$	2	2	2	3	2	1	2	2	2	
	CTLc V$_{TH}$	2	2	2	2	2	2	3	2	1	
Input impedance	I$_{N1a}$ Z$_{IN}$	1	2	2	2	2	2	2	2	2	Note 6
	I$_{N2a}$ Z$_{IN}$	2	1	3	2	2	2	2	2	2	
	I$_{N1b}$ Z$_{IN}$	2	2	2	1	2	2	2	2	2	
	I$_{N2b}$ Z$_{IN}$	2	2	2	2	1	3	2	2	2	
	I$_{N1c}$ Z$_{IN}$	2	2	2	2	2	2	1	2	2	
	I$_{N2c}$ Z$_{IN}$	2	2	2	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 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$_{OUT}$ (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 Vout level drops below 20mV$_{P-P}$.

Note 6: Measure the input pin voltage V$_{IN50}$ when a current of DC50μA 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 × 10^{-6} [Ω].

●External dimensions (Units: mm)

BA7602

19.4 ± 0.3

16   9

6.5 ± 0.3

1   8

0.51Min.

4.25 ± 0.3

3.2 ± 0.2

2.54

0.5 ± 0.1

7.62

0.3 ± 0.1

0° ~ 15°

DIP16

BA7602F

10.0 ± 0.2

16   9

6.2 ± 0.3

4.4 ± 0.2

1   8

1.5 ± 0.1

0.11

1.27

0.4 ± 0.1

0.3Min.

0.15 ± 0.1

0.15

SOP16