Video signal switcher
BA7607/BA7607F

The BA7607 and BA7607F are switching ICs developed for use in VCRs. Each contains three two-channel analog multiplexers. As two of the switches have sync-tip clamp inputs and the other one has non-clamped inputs these ICs are ideal for switching audio, video and chroma signals.

●Applications
VCRs and TVs

●Features
1)Three 2-input / 1-output switches (two with sync-tip clamped inputs, the other one non-clamped).
2)5V power supply.
3)Low power consumption (62.5mW Typ.).

4)Excellent frequency characteristics (10MHz, 0dB Typ.).
5)Wide dynamic range (clamped input: 2.9V$_{P-P}$ Typ., non-clamped input: 3.0V$_{P-P}$ Typ.).
6)Fast switching speed (50ns Typ.).

●Block diagram

CTL	Output
L	IN2
H	IN1

S$_a$, S$_b$: clamped input
S$_c$: non-clamped input
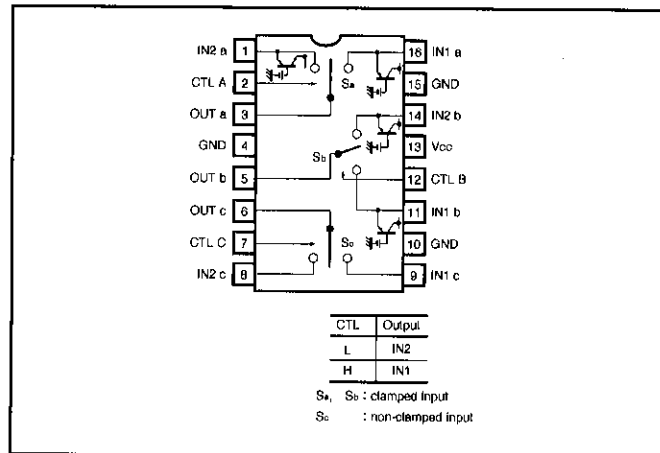
●Absolute maximum ratings (Ta=25℃)

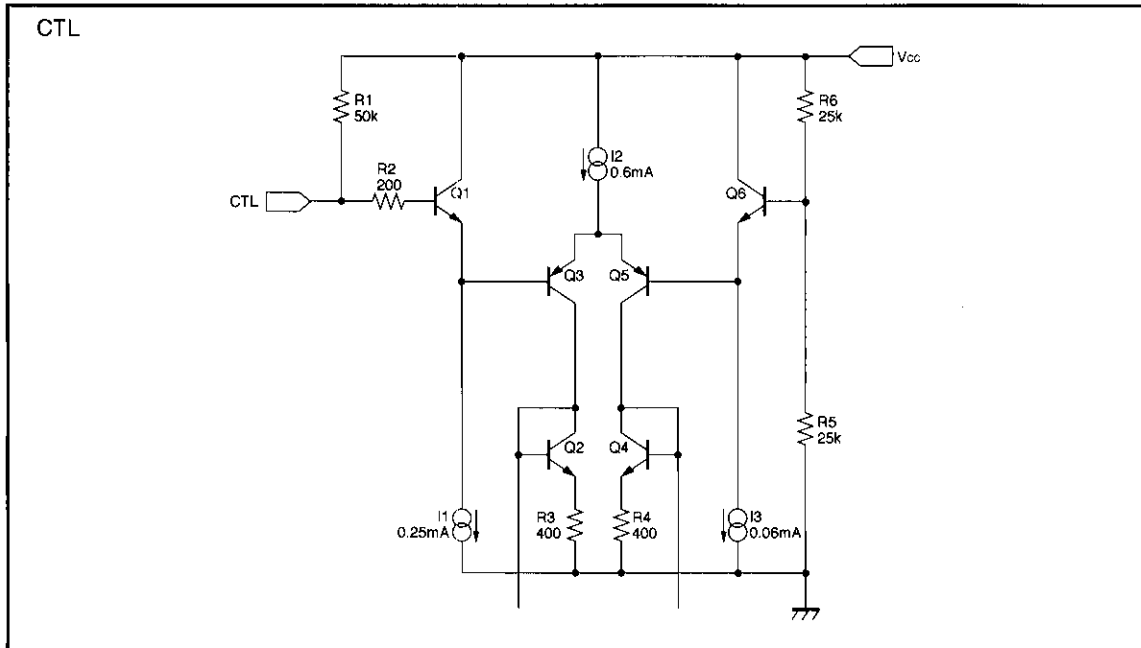| Parameter	Symbol	Limits	Unit
Power supply voltage	V$_{CC}$	9	V
Power dissipation	Pd	500 *	mW
Operating temperature	Topr	−40〜85	℃
Storage temperature	Tstg	−55〜125	℃

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

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●Equivalent circuits
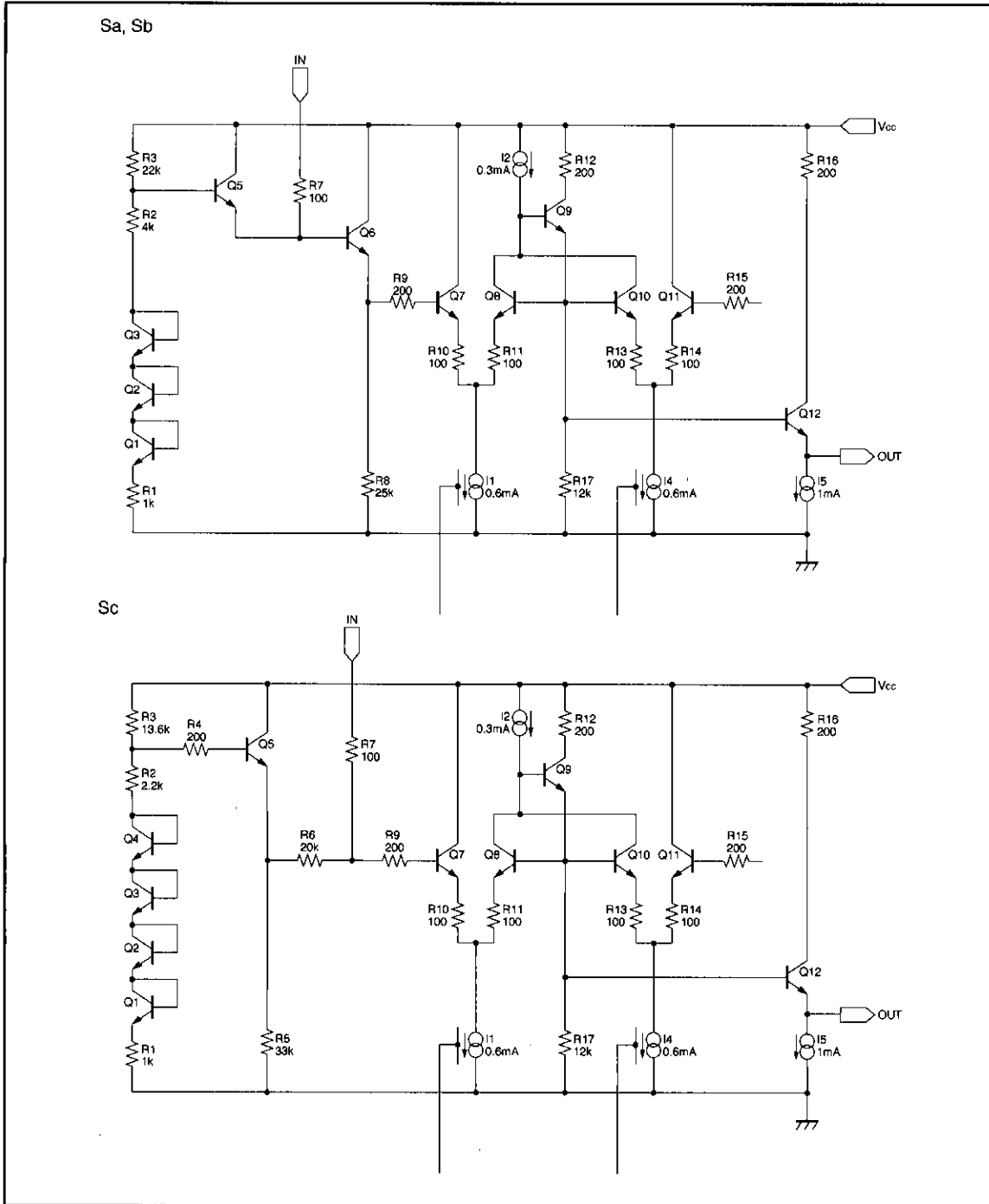
Audio/video signal selection switches

AV switches

●Equivalent circuits

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CTL
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●Electrical characteristics (Unless otherwise specified Ta=25℃ and Vcc=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	V_{CC}	4.5	5.0	5.5	V	—
Circuit current	I_{CC}	—	12.5	17.0	mA	—
Maximum output level 1	V_{om}	2.6	2.9	—	V_{P-P}	f=1kHz, THD=0.5%, clamped input
Maximum output level 2	V_{om}	2.7	3.0	—	V_{P-P}	f=1kHz, THD=0.5%, non-clamped input
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 characteristic	G_f	−3	0	1	dB	10MHz / 1MHz, V_{in}=1V_{P-P}
Input impedance	Z_{IN}	14	20	26	kΩ	non-clamped input
Total-harmonic distortion	THD	—	0.007	—	%	f=1kHz, 1V_{P-P}, non-clamped input
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	9	2.48
2	4.91	10	0
3	0.65	11	2.05
4	0	12	4.91
5	0.65	13	5.00
6	1.76	14	2.05
7	4.91	15	0
8	2.48	16	2.05

Electrical characteristics

Parameter	Min.	Typ.	Max.	Unit
Sync tip clamp level	0.49	0.65	0.80	Vdc
Input impedance (no clamp)	—	20k	—	Ω
Input impedance (with clamp)	—	1.7M	—	Ω
Output impedance	—	30	—	Ω

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

Audio/video signal selection switches

AV switches

●Measurement circuit

Fig.1

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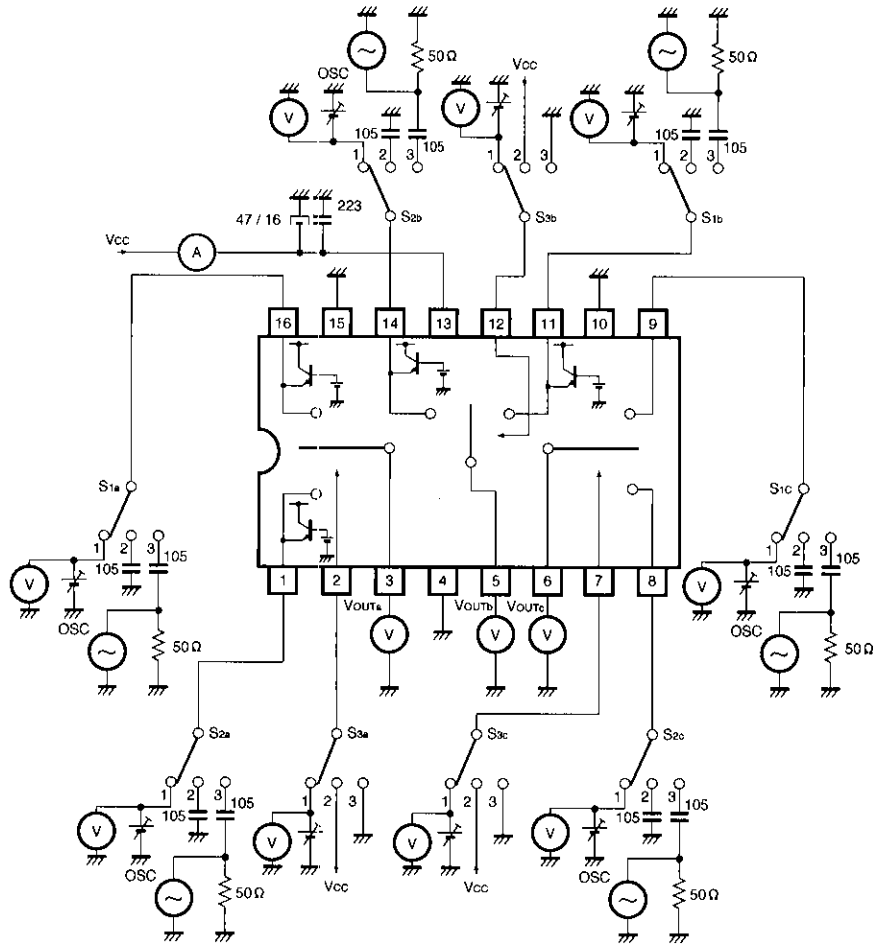
●Measurement conditions

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 consumption		I_{CC}	2	2	2	2	2	2	2	2	2	
Maximum output level	In1 a	V_{om}	3	2	2	2	2	2	2	2	2	f=1kHz, THD=0.5% Note 1
	In2 a	V_{om}	2	3	3	2	2	2	2	2	2	
	In1 b	V_{om}	2	2	2	3	2	2	2	2	2	
	In2 b	V_{om}	2	2	2	2	3	3	2	2	2	
	In1 c	V_{om}	2	2	2	2	2	2	3	2	2	
	In2 c	V_{om}	2	2	2	2	2	2	2	3	3	
Voltage gain	In1 a	G_V	3	2	2	2	2	2	2	2	2	f=1MHz, V=1Vp-p Note 2
	In2 a	G_V	2	3	3	2	2	2	2	2	2	
	In1 b	G_V	2	2	2	3	2	2	2	2	2	
	In2 b	G_V	2	2	2	2	3	3	2	2	2	
	In1 c	G_V	2	2	2	2	2	2	3	2	2	
	In2 c	G_V	2	2	2	2	2	2	2	3	3	
Interchannel crosstalk	In1 a	C_T	2	3	2	2·	2	2	2	2	2	f=4.43MHz, V=1Vp-p Note 3
	In2 a	C_T	3	2	3	2	2	2	2	2	2	
	In1 b	C_T	2	2	2	2	3	2	2	2	2	
	In2 b	C_T	2	2	2	3	2	3	2	2	2	
	In1 c	C_T	2	2	2	2	2	2	2	3	2	
	In2 c	C_T	2	2	2	2	2	2	3	2	3	
Frequency characteristic	In1 a	G_f	3	2	2	2	2	2	2	2	2	f=10M / f=1M, V=1Vp-p Note 4
	In2 a	G_f	2	3	3	2	2	2	2	2	2	
	In1 b	G_f	2	2	2	3	2	2	2	2	2	
	In2 b	G_f	2	2	2	2	3	3	2	2	2	
	In1 c	G_f	2	2	2	2	2	2	3	2	2	
	In2 c	G_f	2	2	2	2	2	2	2	3	3	
CTL pin switching level	CTL a	V_{TH}	3	2	1	2	2	2	2	2	2	Note 5
	CTL b	V_{TH}	2	2	2	3	2	1	2	2	2	
	CTL c	V_{TH}	2	2	2	2	2	2	3	2	1	
Input impedance	In1 c	Z_{IN}	2	2	2	2	2	2	1	2	2	Note 6
	In2 c	Z_{IN}	2	2	2	2	2	2	2	1	3	
Total-harmonic distortion	In1 c	THD	2	2	2	2	2	2	3	2	2	Note 7
	In2 c	THD	2	2	2	2	2	2	2	3	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 (VP-P).

Note 2: Input a 1Vp-p, 1MHz sine wave. The voltage gain is given by G_V = 20 log (VOUT/VIN).

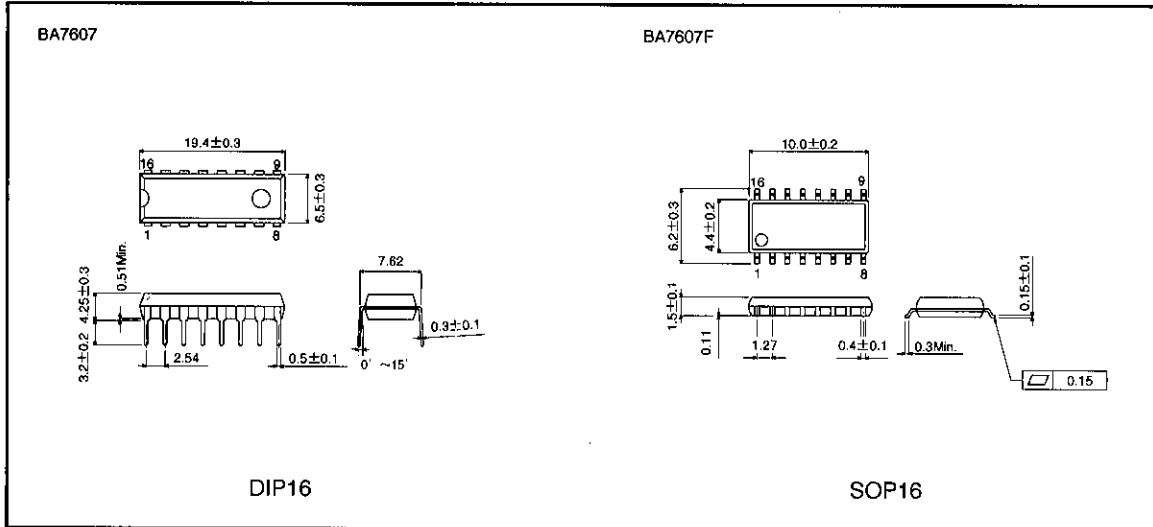Note 3: Input a 1Vp-p, 4.43MHz sine wave. The interchannel crosstalk is given by C_T = 20 log (VOUT/VIN).

Note 4: Input 1Vp-p, 1MHz and 10MHz sine waves. The frequency characteristic is given by G_f = 20 log (VOUT (f = 10MHz)/VIN (f = 1MHz)).

Note 5: Input a 1Vp-p, 1MHz sine wave. Reduce the CTL pin voltage from VCC. The CTL pin switching level (VTH) is the CTL pin voltage at which the VOUT level drops below 20mVP-P.

Note 6: Measure the input pin voltage VIN50 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 = (VIN50 - VIN0)/50 × 10^{-6} Ω.

Note 7: Input a 1Vp-p, 1kHz sine wave and measure the total-harmonic distortion of the output using a total-harmonic distortion meter.

Audio/video signal selection switches

AV switches

●External dimensions (Units: mm)

BA7607

BA7607F

19.4±0.3

6.5±0.3

16

9

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

10.0±0.2

16

9

1

8

6.2±0.3

4.4±0.2

1.5±0.1

0.11

1.27

0.4±0.1

0.3Min.

0.15±0.1

0.15

SOP16

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Notes

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