

# Video signal switcher for AV amplifiers

## BA7625

The BA7625 is a video signal switch that contains two five-channel analog multiplexers and wide-band 6dB amplifiers. It is designed for use in video cassette recorders. By simply adding transistor buffers to the outputs, it is possible to construct a record / playback switch for two record / playback VCRs, and three video playback machines (eg. laser disk players). Input switching and VCR record switching can be done independently. The BA7625 has sync-tip clamp inputs which are ideal for switching video signals.

### ●Applications

AV amplifiers and video selectors

### ●Features

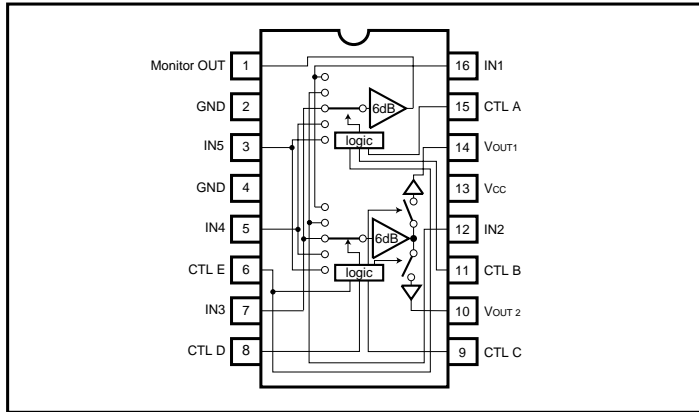
- |                                 |                             |
|---------------------------------|-----------------------------|
| 1) 5-input / 3-output switches. | 3) Built-in 6dB amplifiers. |
| 2) Sync-tip clamp inputs.       | 4) 5V supply voltage.       |

### ●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>	- 25 ~ + 70	°C
Storage temperature	T <sub>stg</sub>	- 55 ~ + 125	°C

\* Reduced by 5mW for each increase in Ta of 1°C over 25°C.

●Block diagram



●Truth table

A	B	E	Monitor OUT
L	L	*	IN1
H	L	*	IN2
L	H	*	IN3
H	H	L	IN4
H	H	H	IN5

C	D	E	V <sub>OUT1</sub>
L	L	*	—
H	L	*	IN2
L	H	*	IN3
H	H	L	IN4
H	H	H	IN5

C	D	E	V <sub>OUT2</sub>
L	L	*	IN1
H	L	*	—
L	H	*	IN3
H	H	L	IN4
H	H	H	IN5

Note 1: \* indicates "don't care" (H or L).

●Equivalent input / output circuits

Input circuit	Waveform
<p><b>IN1 ~ IN5</b></p>	
<p><b>CTLA ~ CTLE</b></p>	
<p><b>Monitor OUT</b></p>	
<p><b>VOUT1, VOUT2</b></p>	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	Vcc	4.5	5.0	5.5	V	—
Supply current	Icc	—	15.0	20.0	mA	—
Maximum output level	Vom	2.6	2.9	—	V <sub>P-P</sub>	f = 1kHz, THD = 0.5%
Voltage gain	G <sub>V</sub>	5.7	6.2	6.7	dB	f = MHz, V <sub>IN</sub> = 1V <sub>P-P</sub>
Interchannel crosstalk	C <sub>T</sub>	—	-65	-45	dB	f = 4.43MHz, V <sub>IN</sub> = 1V <sub>P-P</sub>
Mute level	CTM	—	-35	-25	dB	f = 4.43MHz, V <sub>IN</sub> = 1V <sub>P-P</sub>
Frequency characteristic	G <sub>f</sub>	-3	0	3	dB	10MHz / 1MHz, V <sub>IN</sub> = 1V <sub>P-P</sub>
CTL pin switch level	V <sub>TH</sub>	2.2	—	3.3	V	—

○Not designed for radiation resistance.

●Measurement circuit

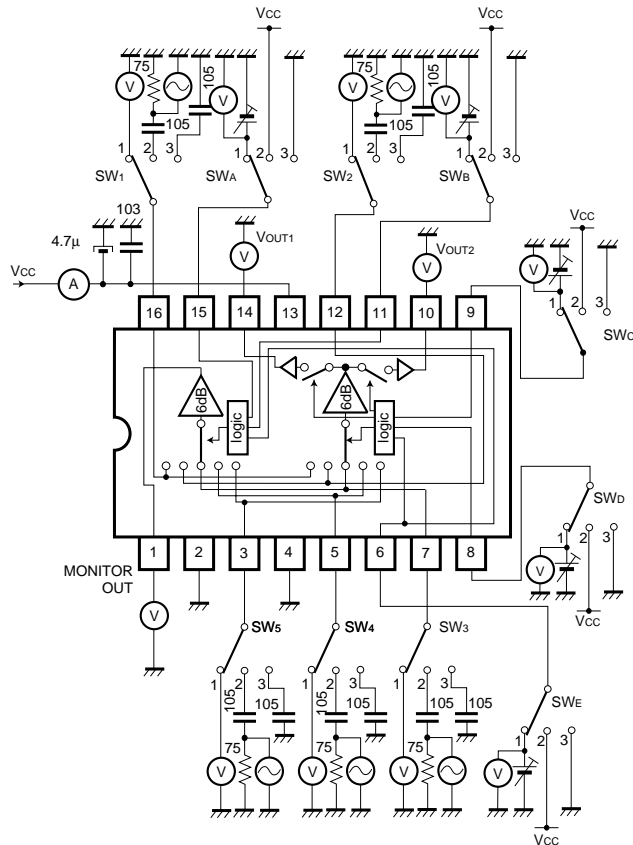


Fig.1

## ●Measurement conditions

Parameter	Symbol	Switch settings										Measurement method
		SW <sub>1</sub>	SW <sub>2</sub>	SW <sub>3</sub>	SW <sub>4</sub>	SW <sub>5</sub>	SW <sub>A</sub>	SW <sub>B</sub>	SW <sub>C</sub>	SW <sub>D</sub>	SW <sub>E</sub>	
Current dissipation	I <sub>cc</sub>	3	3	3	3	3	2	2	2	2	2	—
Monitor OUT maximum output level	V <sub>om</sub> 1MON	2	3	3	3	3	3	3	*	*	*	Note 1
	V <sub>om</sub> 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	V <sub>om</sub> 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	V <sub>om</sub> 4MON	↓	↓	3	2	↓	2	2	↓	↓	3	
	V <sub>om</sub> 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
Monitor OUT voltage gain	G <sub>v</sub> 1MON	2	3	3	3	3	3	3	*	*	*	Note 2
	G <sub>v</sub> 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	G <sub>v</sub> 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	G <sub>v</sub> 4MON	↓	↓	3	2	↓	2	2	↓	↓	3	
	G <sub>v</sub> 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
Monitor OUT interchannel crosstalk	C <sub>T1</sub> -2MON	2	3	3	3	3	2	3	*	*	*	Note 3
	C <sub>T1</sub> -3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	C <sub>T1</sub> -4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C <sub>T1</sub> -5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C <sub>T2</sub> -1MON	3	2	3	3	3	3	3	*	*	*	
	C <sub>T2</sub> -3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	C <sub>T2</sub> -4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C <sub>T2</sub> -5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C <sub>T3</sub> -1MON	3	3	2	3	3	3	3	*	*	*	
	C <sub>T3</sub> -2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	C <sub>T3</sub> -4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C <sub>T3</sub> -5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C <sub>T4</sub> -1MON	3	3	3	2	3	3	3	*	*	*	
	C <sub>T4</sub> -2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	C <sub>T4</sub> -3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	C <sub>T4</sub> -5MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
C <sub>T5</sub> -1MON	3	3	3	3	2	3	3	*	*	*		
C <sub>T5</sub> -2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓		
C <sub>T5</sub> -3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓		
C <sub>T5</sub> -4MON	↓	↓	↓	↓	↓	2	2	↓	↓	2		
Monitor OUT frequency characteristic	G <sub>f</sub> 1MON	2	3	3	3	3	3	3	*	*	*	Note 4
	G <sub>f</sub> 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	G <sub>f</sub> 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	G <sub>f</sub> 4MON	↓	↓	3	2	↓	2	2	↓	↓	3	
	G <sub>f</sub> 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
V <sub>OUT1</sub> maximum output level	V <sub>om</sub> 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 1
	V <sub>om</sub> 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	V <sub>om</sub> 4OUT1	↓	↓	3	2	3	↓	↓	2	2	3	
	V <sub>om</sub> 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	

Parameter	Symbol	Switch settings										Measurement method
		SW <sub>1</sub>	SW <sub>2</sub>	SW <sub>3</sub>	SW <sub>4</sub>	SW <sub>5</sub>	SW <sub>A</sub>	SW <sub>B</sub>	SW <sub>C</sub>	SW <sub>D</sub>	SW <sub>E</sub>	
V <sub>OUT1</sub> voltage gain	G <sub>V</sub> 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 2
	G <sub>V</sub> 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	G <sub>V</sub> 4OUT1	↓	↓	3	2	3	↓	↓	2	2	3	
	G <sub>V</sub> 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	
V <sub>OUT1</sub> interchannel crosstalk	C <sub>T1</sub> -2OUT1	2	3	3	3	3	*	*	3	3	*	Note 3
	C <sub>T1</sub> -3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C <sub>T1</sub> -4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C <sub>T1</sub> -5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C <sub>T2</sub> -1OUT1	3	2	3	3	3	*	*	3	3	*	
	C <sub>T2</sub> -3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C <sub>T2</sub> -4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C <sub>T2</sub> -5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C <sub>T3</sub> -1OUT1	3	3	2	3	3	*	*	3	3	*	
	C <sub>T3</sub> -2OUT1	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C <sub>T3</sub> -4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C <sub>T3</sub> -5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C <sub>T4</sub> -1OUT1	3	3	3	2	3	*	*	3	3	*	
	C <sub>T4</sub> -2OUT1	↓	↓	↓	↓	↓	↓	↓	3	3	↓	
	C <sub>T4</sub> -3OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	↓	
	C <sub>T4</sub> -5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C <sub>T5</sub> -1OUT1	3	3	3	3	2	*	*	3	3	*	
	C <sub>T5</sub> -2OUT1	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C <sub>T5</sub> -3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C <sub>T5</sub> -4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
V <sub>OUT1</sub> frequency characteristic	G <sub>f</sub> 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 4
	G <sub>f</sub> 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	G <sub>f</sub> 4OUT1	↓	↓	3	2	↓	↓	↓	2	2	3	
	G <sub>f</sub> 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	
V <sub>OUT2</sub> maximum output level	V <sub>om</sub> 1OUT2	2	3	3	3	3	*	*	3	3	*	Note 1
	V <sub>om</sub> 3OUT2	3	2	↓	↓	↓	↓	↓	3	2	↓	
	V <sub>om</sub> 4OUT2	↓	3	↓	2	↓	↓	↓	2	2	3	
	V <sub>om</sub> 5OUT2	↓	↓	↓	3	2	↓	↓	2	2	2	
V <sub>OUT2</sub> voltage gain	G <sub>V</sub> 1OUT2	2	3	3	3	3	*	*	3	3	*	Note 2
	G <sub>V</sub> 3OUT2	3	2	↓	↓	↓	↓	↓	3	2	↓	
	G <sub>V</sub> 4OUT2	↓	3	↓	2	↓	↓	↓	2	2	3	
	G <sub>V</sub> 5OUT2	↓	↓	↓	3	2	↓	↓	2	2	2	

Parameter	Symbol	Switch settings										Measurement method
		SW <sub>1</sub>	SW <sub>2</sub>	SW <sub>3</sub>	SW <sub>4</sub>	SW <sub>5</sub>	SW <sub>A</sub>	SW <sub>B</sub>	SW <sub>C</sub>	SW <sub>D</sub>	SW <sub>E</sub>	
V <sub>OUT2</sub> interchannel crosstalk	C <sub>T1</sub> -2OUT2	2	3	3	3	3	*	*	2	3	*	Note 3
	C <sub>T1</sub> -3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C <sub>T1</sub> -4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C <sub>T1</sub> -5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C <sub>T2</sub> -1OUT2	3	2	3	3	3	*	*	3	3	*	
	C <sub>T2</sub> -3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C <sub>T2</sub> -4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C <sub>T2</sub> -5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C <sub>T3</sub> -1OUT2	3	3	2	3	3	*	*	3	3	*	
	C <sub>T3</sub> -2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C <sub>T3</sub> -4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C <sub>T3</sub> -5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C <sub>T4</sub> -1OUT2	3	3	3	2	3	*	*	3	3	*	
	C <sub>T4</sub> -2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C <sub>T4</sub> -3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C <sub>T4</sub> -5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C <sub>T5</sub> -1OUT2	3	3	3	3	2	*	*	3	3	*	
	C <sub>T5</sub> -2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C <sub>T5</sub> -3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C <sub>T5</sub> -4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
V <sub>OUT2</sub> frequency characteristic	G <sub>f</sub> 1OUT1	2	3	3	3	3	*	*	3	3	*	Note 4
	G <sub>f</sub> 3OUT1	3	3	2	↓	↓	↓	↓	3	2	↓	
	G <sub>f</sub> 4OUT1	↓	↓	3	2	↓	↓	↓	2	2	3	
	G <sub>f</sub> 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	
Mute level	CTM V <sub>OUT1</sub>	2	3	3	3	3	*	*	3	3	*	Note 5
	CTM V <sub>OUT2</sub>	↓	↓	↓	↓	↓	↓	↓	2	↓	↓	
CTL switching level	V <sub>TH A</sub>	2	3	3	3	3	1	3	*	*	*	Note 6
	V <sub>TH B</sub>	3	↓	2	↓	↓	3	1	↓	↓	↓	
	V <sub>TH C</sub>	2	↓	3	↓	↓	*	*	1	3	↓	
	V <sub>TH D</sub>	3	↓	2	↓	↓	↓	↓	3	1	↓	
	V <sub>TH E</sub>	↓	↓	3	2	↓	2	2	*	*	1	

Note 1: Connect a distortion meter to the output, and input a  $f = 1\text{kHz}$  sine wave. Adjust the input 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 (in dB) 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 (in dB) is given by  $CT = 20 \log (V_{OUT} / V_{IN}) + 6$ .

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

Note 5: Input a 1V<sub>P-P</sub>, 4.43MHz sine wave. The mute level is given by  $CTM = 20 \log (V_{OUT} / V_{IN}) + 6$  (dB).

Note 6: Input a 1V<sub>P-P</sub>, 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<sub>OUT</sub> level drops below 10mV<sub>P-P</sub>.

●Application example

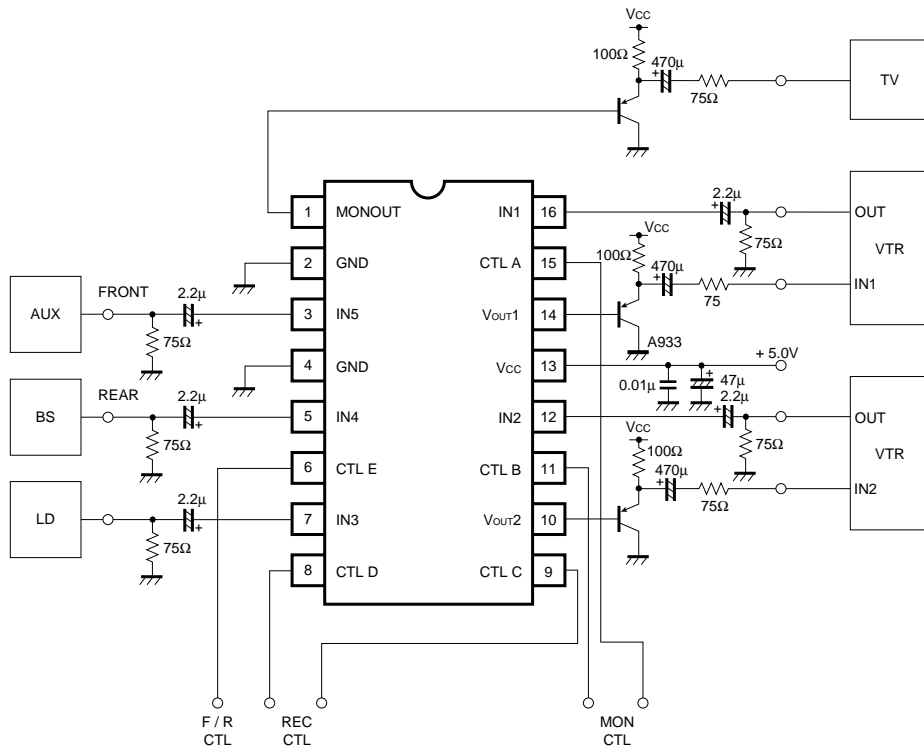


Fig.2

●External dimensions (Units: mm)

