

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 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.

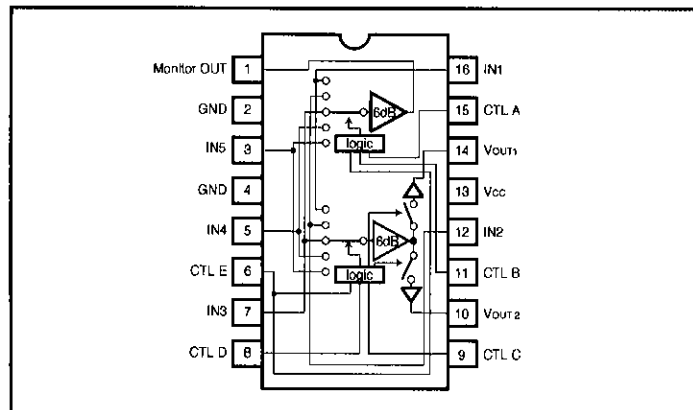
● Applications

AV amplifiers and video selectors

● Features

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

● Block diagram



Video signal selection switches

AV switches

● 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	VOUT1
L	L	*	—
H	L	*	IN2
L	H	*	IN3
H	H	L	IN4
H	H	H	IN5

C	D	E	VOUT2
L	L	*	IN1
H	L	*	—
L	H	*	IN3
H	H	L	IN4
H	H	H	IN5

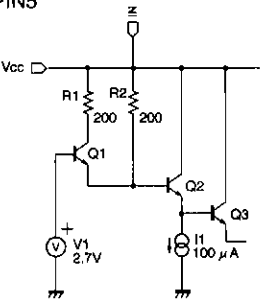
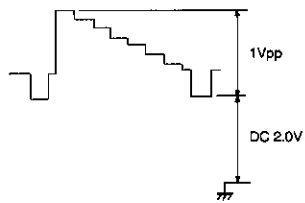
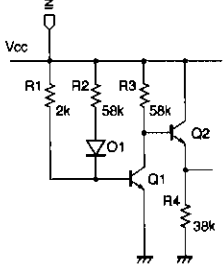
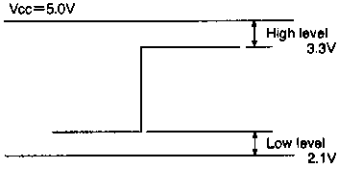
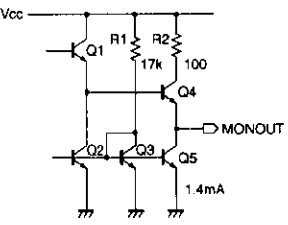
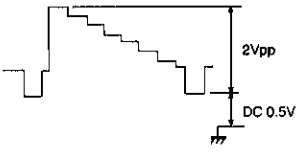
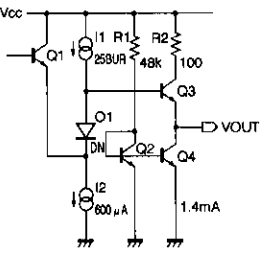
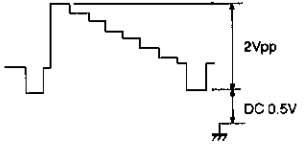
Note 1: * indicates "don't care" (H or L).

● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	9	V
Power dissipation	P _d	500 *	mW
Operating temperature	T _{opr}	-25~70	°C
Storage temperature	T _{stg}	-55~125	°C

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

●Equivalent input / output circuits

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

Video signal selection switches

AV switches

●Electrical characteristics (Unless otherwise specified Ta=25°C 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}	—	15.0	20.0	mA	—
Maximum output level	V _{om}	2.6	2.9	—	V _{P-P}	f=1kHz, THD=0.5%
Voltage gain	G _v	5.7	6.2	6.7	dB	f=MHz, V _{IN} =1V _{P-P}
Interchannel crosstalk	CT	—	-65	-45	dB	f=4.43MHz, V _{IN} =1V _{P-P}
Mute level	CTM	—	-35	-25	dB	f=4.43MHz, V _{IN} =1V _{P-P}
Frequency characteristic	G _f	-3	0	3	dB	10MHz / 1MHz, V _{IN} =1V _{P-P}
CTL pin switch level	V _{TH}	2.2	—	3.3	V	—

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●Measurement circuit

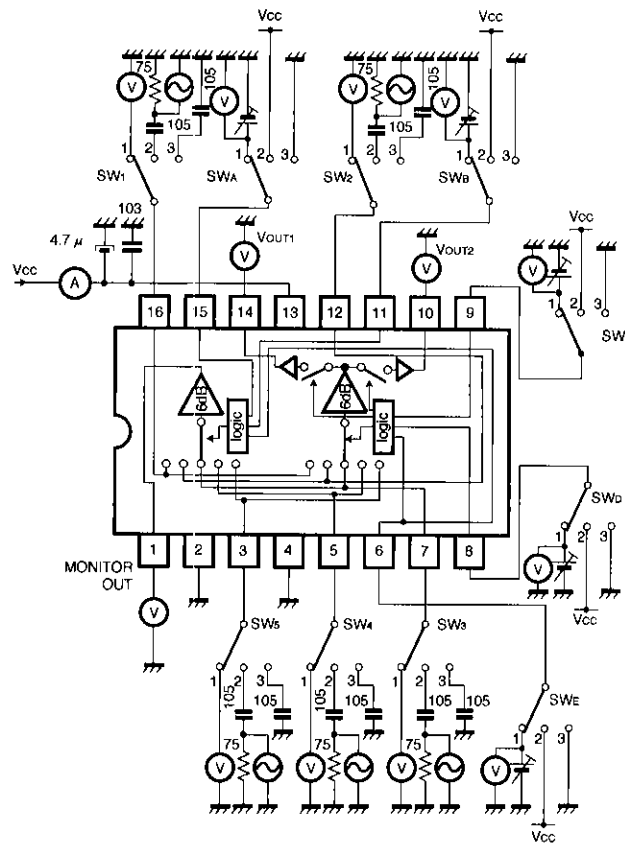


Fig.1

●Measurement conditions

Parameter	Symbol	Switch settings										Measurement method
		SW ₁	SW ₂	SW ₃	SW ₄	SW ₅	SW _A	SW _B	SW _C	SW _D	SW _E	
Current consumption	I _{CC}	3	3	3	3	3	2	2	2	2	2	
Monitor OUT maximum output level	V _{om} 1MON	2	3	3	3	3	3	3	*	*	*	Note 1
	V _{om} 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	V _{om} 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	V _{om} 4MON	↓	↓	3	2	2	2	2	↓	↓	3	
	V _{om} 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
Monitor OUT voltage gain	G _v 1MON	2	3	3	3	3	3	3	*	*	*	Note 2
	G _v 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	G _v 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	G _v 4MON	↓	↓	3	2	2	2	2	↓	↓	3	
	G _v 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
Monitor OUT interchannel crosstalk	CT1-2MON	2	3	3	3	3	2	3	*	*	*	Note 3
	CT1-3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	CT1-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	CT1-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	CT2-1MON	3	2	3	3	3	3	3	*	*	*	
	CT2-3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	CT2-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	CT2-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	CT3-1MON	3	3	2	3	3	3	3	*	*	*	
	CT3-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	CT3-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	CT3-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	CT4-1MON	3	3	3	2	3	3	3	*	*	*	
	CT4-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	CT4-3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	CT4-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	CT5-1MON	3	3	3	3	2	3	3	*	*	*	
	CT5-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	CT5-3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	CT5-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
Monitor OUT frequency characteristic	G _f 1MON	2	3	3	3	3	3	3	*	*	*	Note 4
	G _f 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	G _f 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	G _f 4MON	↓	↓	3	2	↓	2	2	↓	↓	3	
	G _f 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
V _{OUT1} maximum output level	V _{om} 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 1
	V _{om} 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	V _{om} 4OUT1	↓	↓	3	2	3	↓	↓	2	2	3	
	V _{om} 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	

Video signal selection switches

AV switches

● Measurement conditions

Parameter	Symbol	Switch settings										Measurement method
		SW ₁	SW ₂	SW ₃	SW ₄	SW ₅	SW _A	SW _B	SW _C	SW _D	SW _E	
V _{OUT1} voltage gain	Gv 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 2
	Gv 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	Gv 4OUT1	↓	↓	3	2	3	↓	↓	2	2	3	
	Gv 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	
V _{OUT1} interchannel crosstalk	CT1-2OUT1	2	3	3	3	3	*	*	3	3	*	Note 3
	CT1-3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	CT1-4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	CT1-5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	CT2-1OUT1	3	2	3	3	3	*	*	3	3	*	
	CT2-3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	CT2-4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	CT2-5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	CT3-1OUT1	3	3	2	3	3	*	*	3	3	*	
	CT3-2OUT1	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	CT3-4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	CT3-5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
V _{OUT1} frequency characteristic	Gr 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 4
	Gr 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	Gr 4OUT1	↓	↓	3	2	3	↓	↓	2	2	3	
	Gr 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	
V _{OUT2} maximum output level	V _{om} 1OUT2	2	3	3	3	3	*	*	3	3	*	Note 1
	V _{om} 3OUT2	3	2	↓	↓	↓	↓	↓	3	2	↓	
	V _{om} 4OUT2	↓	3	↓	2	↓	↓	↓	2	2	3	
	V _{om} 5OUT2	↓	↓	↓	3	2	↓	↓	2	2	2	
V _{OUT2} voltage gain	Gv 1OUT2	2	3	3	3	3	*	*	3	3	*	Note 2
	Gv 3OUT2	3	2	↓	↓	↓	↓	↓	3	2	↓	
	Gv 4OUT2	↓	3	↓	2	↓	↓	↓	2	2	3	
	Gv 5OUT2	↓	↓	↓	3	2	↓	↓	2	2	2	

Parameter	Symbol	Switch settings										Measurement method
		SW ₁	SW ₂	SW ₃	SW ₄	SW ₅	SW _A	SW _B	SW _C	SW _D	SW _E	
V _{OUT2} interchannel crosstalk	CT1-2OUT2	2	3	3	3	3	*	*	2	3	*	Note 3
	CT1-3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	CT1-4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	CT1-5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	CT2-1OUT2	3	2	3	3	3	*	*	3	3	*	
	CT2-3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	CT2-4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	CT2-5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	CT3-1OUT2	3	3	2	3	3	*	*	3	3	*	
	CT3-2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	CT3-4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	CT3-5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	CT4-1OUT2	3	3	3	2	3	*	*	3	3	*	
	CT4-2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	CT4-3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	CT4-5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	CT5-1OUT2	3	3	3	3	2	*	*	3	3	*	
	CT5-2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	CT5-3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	CT5-4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
V _{OUT2} frequency characteristic	Gf 1OUT1	2	3	3	3	3	*	*	3	3	*	Note 4
	Gf 3OUT1	3	3	2	↓	↓	↓	↓	3	2	↓	
	Gf 4OUT1	↓	↓	3	2	↓	↓	↓	2	2	3	
	Gf 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	
Mute level	CTM V _{OUT1}	2	3	3	3	3	*	*	3	3	*	Note 5
	CTM V _{OUT2}	↓	↓	↓	↓	↓	↓	↓	2	↓	↓	
CTL switching level	V _{TH A}	2	3	3	3	3	1	3	*	*	*	Note 6
	V _{TH B}	3	↓	2	↓	↓	3	1	↓	↓	↓	
	V _{TH C}	2	↓	3	↓	↓	*	*	1	3	↓	
	V _{TH D}	3	↓	2	↓	↓	↓	↓	3	1	↓	
	V _{TH E}	↓	↓	3	2	↓	2	2	*	*	1	

Note 1: Connect a distortion meter to the output, and input a f = 1kHz 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} (VP-P).

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

Note 3: Input a 1VP-P, 4.43MHz sine wave. The interchannel crosstalk (in dB) is given by $CT = 20 \log (V_{OUT}/V_{IN}) + 6$.

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

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

Note 6: Input a 1VP-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 10mVP-P.

Video signal selection switches

AV switches

●Application example

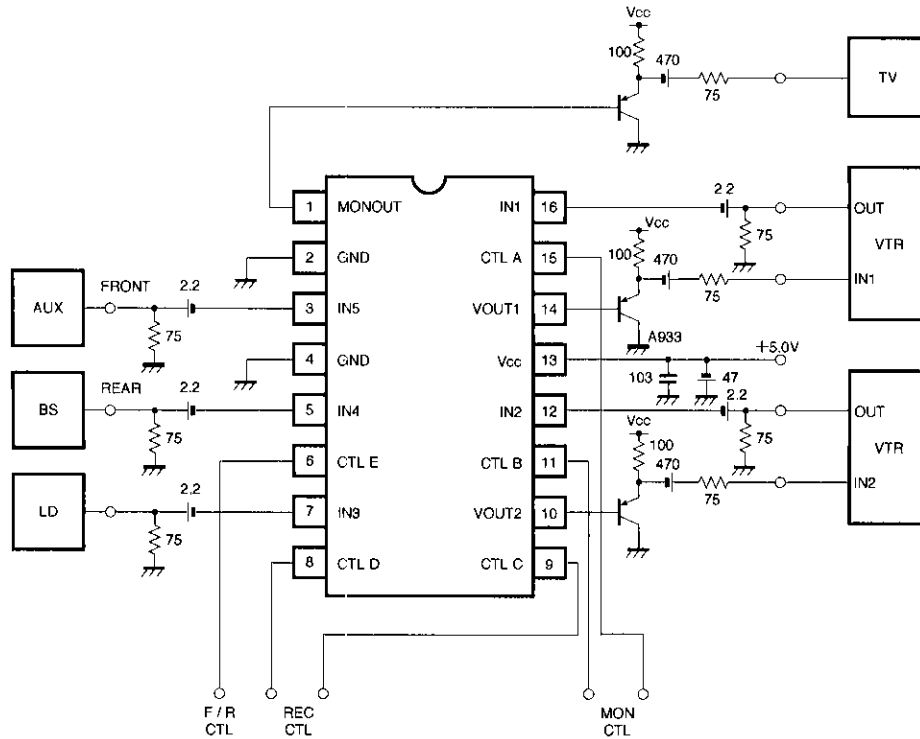
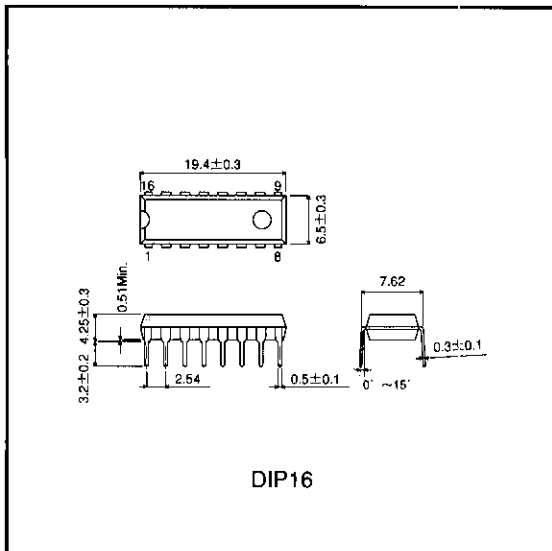


Fig.2

●External dimensions (Units: mm)



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