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 arecord / 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

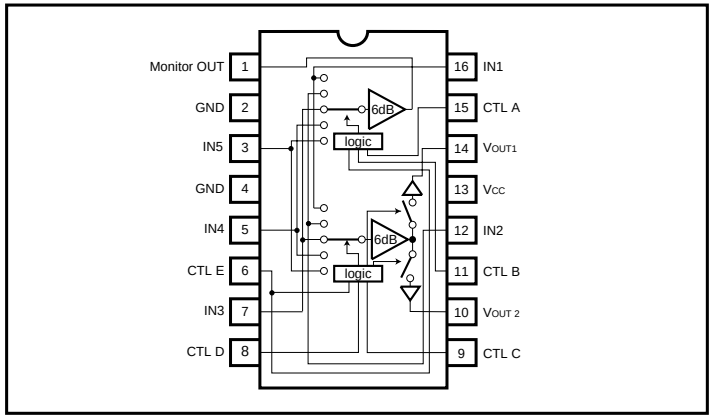
1) 5-input / 3-output switches.
2) Sync-tip clamp inputs.
3) Built-in 6dB amplifiers.
4) 5V supply voltage.

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{CC}	9	V
Power dissipation	Pd	500*	mW
Operating temperature	Topr	– 25 ~ + 70	°C
Storage temperature	Tstg	– 55 ~ + 125	°C

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

●Block diagram



●Truth table

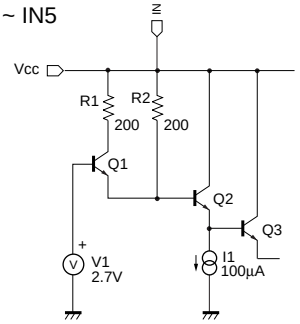
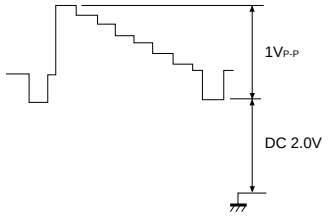
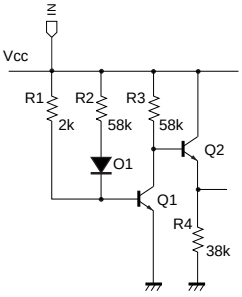
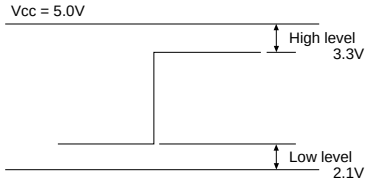
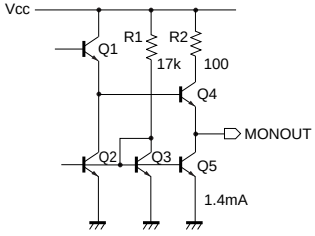
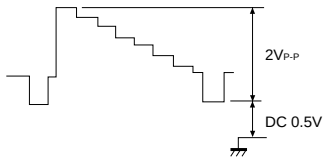
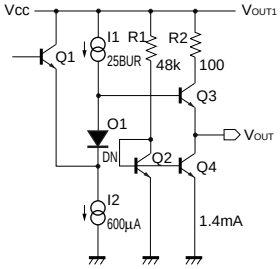
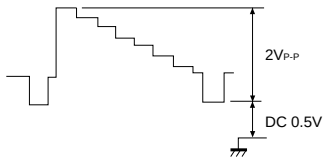
A	B	E	Monitor OUT
L	L	∗	IN1
H	L	∗	IN2
L	H	∗	IN3
H	H	L	IN4
H	H	H	IN5

C	D	E	V_{OUT1}
L	L	∗	—
H	L	∗	IN2
L	H	∗	IN3
H	H	L	IN4
H	H	H	IN5

C	D	E	V_{OUT2}
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
IN1 ~ IN5 	
CTLA ~ CTLE 	
Monitor OUT 	
VOUT1 , VOUT2 	

●Electrical characteristics (unless otherwise noted, Ta = 25°C and V_{CC} = 5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	V_{CC}	4.5	5.0	5.5	V	—
Supply 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	C_T	—	– 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	—

○Not designed for radiation resistance.

●Measurement circuit

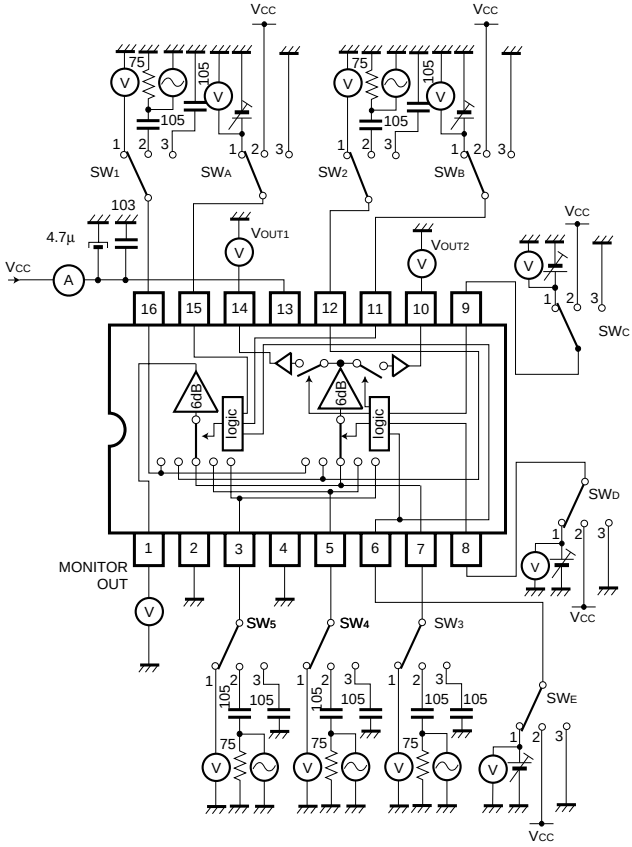


Fig.1

●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 dissipation	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	↓	↓	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	↓	↓	3	
	G_V 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
Monitor OUT interchannel crosstalk	C_T1-2MON	2	3	3	3	3	2	3	*	*	*	Note 3
	C_T1-3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	C_T1-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C_T1-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C_T2-1MON	3	2	3	3	3	3	3	*	*	*	
	C_T2-3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	C_T2-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C_T2-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C_T3-1MON	3	3	2	3	3	3	3	*	*	*	
	C_T3-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	C_T3-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C_T3-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C_T4-1MON	3	3	3	2	3	3	3	*	*	*	
	C_T4-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	C_T4-3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	C_T4-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C_T5-1MON	3	3	3	3	2	3	3	*	*	*	
	C_T5-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	C_T5-3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	C_T5-4MON	↓	↓	↓	↓	↓	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	

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	G_V 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 2
	G_V 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	G_V 4OUT1	↓	↓	3	2	3	↓	↓	2	2	3	
	G_V 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	
V_{OUT1} interchannel crosstalk	C_T1-2OUT1	2	3	3	3	3	*	*	3	3	*	Note 3
	C_T1-3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C_T1-4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C_T1-5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C_T2-1OUT1	3	2	3	3	3	*	*	3	3	*	
	C_T2-3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C_T2-4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C_T2-5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C_T3-1OUT1	3	3	2	3	3	*	*	3	3	*	
	C_T3-2OUT1	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C_T3-4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C_T3-5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C_T4-1OUT1	3	3	3	2	3	*	*	3	3	*	
	C_T4-2OUT1	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C_T4-3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C_T4-5OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C_T5-1OUT1	3	3	3	3	2	*	*	3	3	*	
	C_T5-2OUT1	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C_T5-3OUT1	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C_T5-4OUT1	↓	↓	↓	↓	↓	↓	↓	2	2	3	
V_{OUT1} frequency characteristic	G_f 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 4
	G_f 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	G_f 4OUT1	↓	↓	3	2	↓	↓	↓	2	2	3	
	G_f 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	G_V 1OUT2	2	3	3	3	3	*	*	3	3	*	Note 2
	G_V 3OUT2	3	2	↓	↓	↓	↓	↓	3	2	↓	
	G_V 4OUT2	↓	3	↓	2	↓	↓	↓	2	2	3	
	G_V 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	C_T1-2OUT2	2	3	3	3	3	*	*	2	3	*	Note 3
	C_T1-3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C_T1-4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C_T1-5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C_T2-1OUT2	3	2	3	3	3	*	*	3	3	*	
	C_T2-3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C_T2-4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C_T2-5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C_T3-1OUT2	3	3	2	3	3	*	*	3	3	*	
	C_T3-2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C_T3-4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C_T3-5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C_T4-1OUT2	3	3	3	2	3	*	*	3	3	*	
	C_T4-2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C_T4-3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C_T4-5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C_T5-1OUT2	3	3	3	3	2	*	*	3	3	*	
	C_T5-2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C_T5-3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C_T5-4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
V_{OUT2} frequency characteristic	G_f 1OUT1	2	3	3	3	3	*	*	3	3	*	Note 4
	G_f 3OUT1	3	3	2	↓	↓	↓	↓	3	2	↓	
	G_f 4OUT1	↓	↓	3	2	↓	↓	↓	2	2	3	
	G_f 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} (V_{P-P}).
Note 2: Input a $1V_{P-P}$, 1MHz sine wave. The voltage gain (in dB) 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 (in dB) is given by $C_T = 20 \log (V_{OUT} / V_{IN}) + 6$.
Note 4: Input $1V_{P-P}$, 1MHz and 10MHz sine waves. The frequency characteristic (in dB) is given by $G_f = 20 \log (V_{OUT}$ (f = 10MHz) / V_{OUT} (f = 1MHz)).
Note 5: Input a $1V_{P-P}$, 4.43MHz sine wave. The mute level is given by CTM = $20 \log (V_{OUT} / V_{IN}) + 6$ (dB).
Note 6: 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 $10mV_{P-P}$.

●Application example

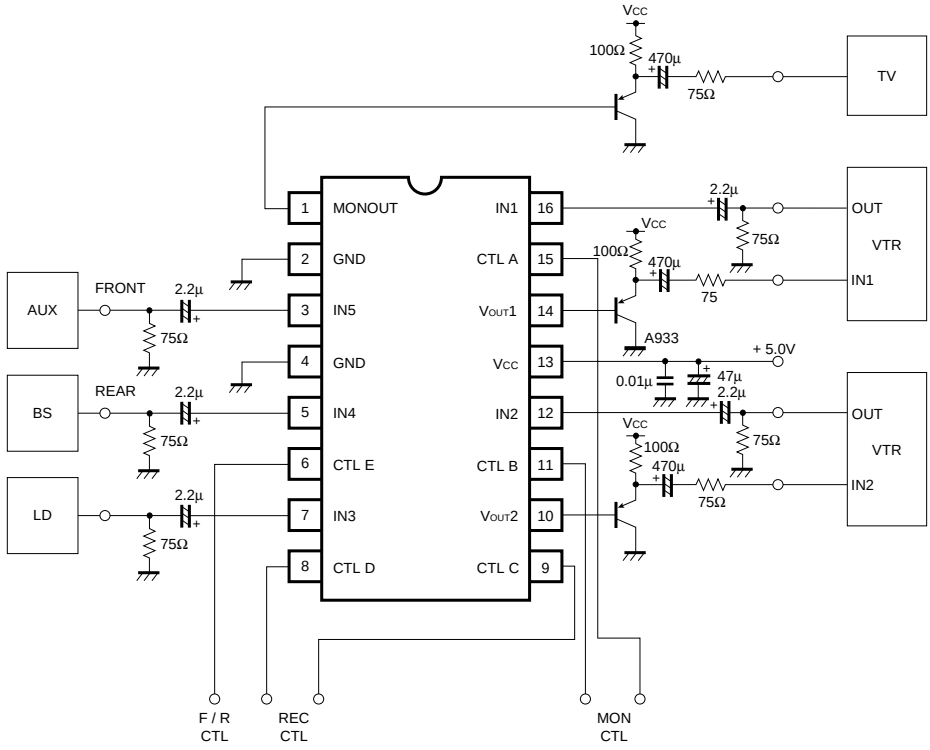
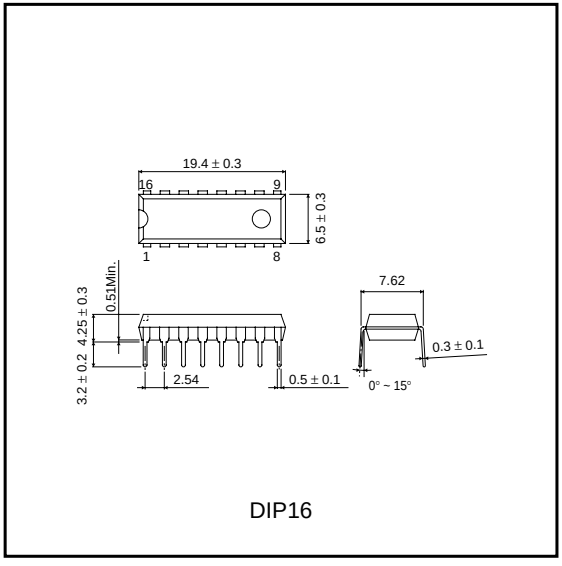


Fig.2

●External dimensions (Units: mm)



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