

Video signal switcher for AV amplifiers

BA7626 / BA7626F

The BA7626 and BA7626F are video signal switches that contain two five-channel analog multiplexers for switching chroma and audio signals, and two wide-band 6dB amplifiers. 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 desk players). Input switching and VCR record switching can be done independently. The inputs are terminated with 20k Ω resistors, and are suitable for switching chroma and audio signals.

●Applications

AV amplifiers (audio signals and S-pin chroma signals) and video selectors

●Features

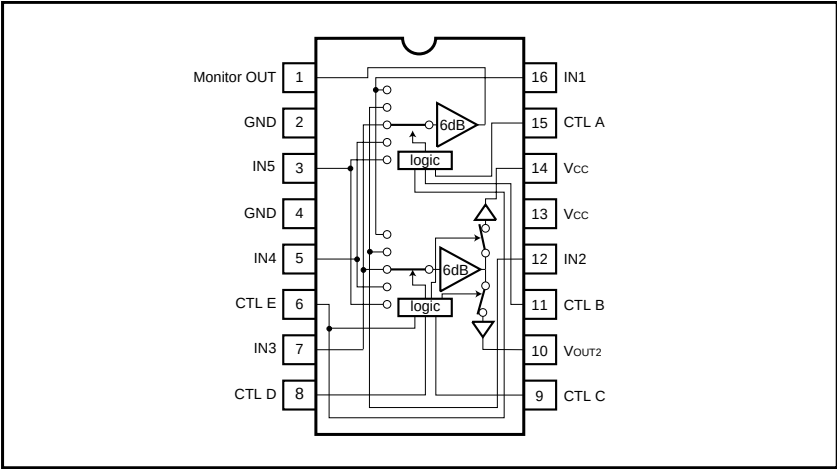
- 1) 5-input / 3-output switches.
- 2) 20k Ω input impedance.
- 3) Built-in 6dB amplifiers.
- 4) 5V supply voltage.

●Absolute maximum ratings (Ta = 25°C)

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

* Reduced by 5.0mW 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 (unless otherwise noted, $T_a=25^\circ\text{C}$ and $V_{CC} = 5\text{V}$)

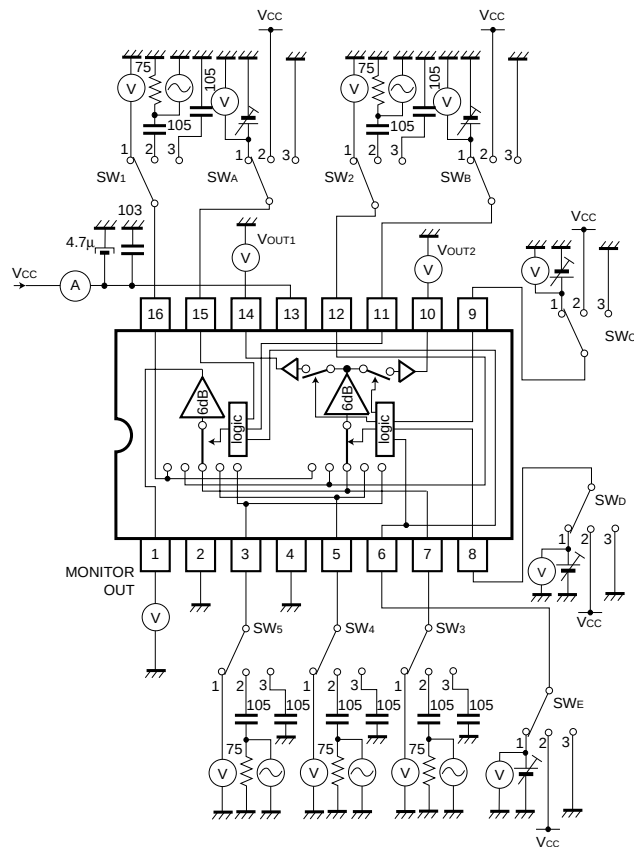
Pin No.	Pin name	Standard voltage (no input signal)	Equivalent input / output circuit
3 5 7 12 16	IN5 IN4 IN3 IN2 IN1	3.6V	
6 8 9 11 15	CTL E CTL D CTL C CTL B CTL A	0.6V	
1	MONOUT	2.0V	
10 14	VOUT2 VOUT1	2.0V	

●Electrical characteristics (unless otherwise noted, Ta = 25°C and VCC = 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}	2.3	2.5	—	V _{P-P}	f = 1kHz, THD = 0.5%
Voltage gain	G _V	5.7	6.2	6.7	dB	f = 1MHz, 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}
Input impedance	Z _{IN}	16	20	24	kΩ	—
CTL pin switch level	V _{TH}	2.2	—	3.3	V	—

○Not designed for radiation resistance.

●Measurement circuit



● 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	
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 _{r1} - 2MON	2	3	3	3	3	2	3	*	*	*	Note 3
	C _{r1} - 3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	C _{r1} - 4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C _{r1} - 5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C _{r2} - 1MON	3	2	3	3	3	3	3	*	*	*	
	C _{r2} - 3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	C _{r2} - 4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C _{r2} - 5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C _{r3} - 1MON	3	3	2	3	3	3	3	*	*	*	
	C _{r3} - 2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	C _{r3} - 4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C _{r3} - 5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	C _{r4} - 1MON	3	3	3	2	3	3	3	*	*	*	
	C _{r4} - 2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	C _{r4} - 3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	C _{r4} - 5MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	C _{r5} - 1MON	3	3	3	3	2	3	3	*	*	*	
	C _{r5} - 2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	C _{r5} - 3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	C _{r5} - 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	3	2	↓	
	V _{om} 4OUT1	↓	↓	3	2	3	↓	↓	2	2	3	
	V _{om} 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	

● Measurement conditions

Parameter	Symbol	Switch settings										Measure- ment 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										Measure- ment 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 _{r1} - 2OUT2	2	3	3	3	3	*	*	2	3	*	Note 3
	C _{r1} - 3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C _{r1} - 4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C _{r1} - 5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C _{r2} - 1OUT2	3	2	3	3	3	*	*	3	3	*	
	C _{r2} - 3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C _{r2} - 4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C _{r2} - 5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C _{r3} - 1OUT2	3	3	2	3	3	*	*	3	3	*	
	C _{r3} - 2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C _{r3} - 4OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	3	
	C _{r3} - 5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C _{r4} - 1OUT2	3	3	3	2	3	*	*	3	3	*	
	C _{r4} - 2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C _{r4} - 3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C _{r4} - 5OUT2	↓	↓	↓	↓	↓	↓	↓	2	2	2	
	C _{r5} - 1OUT2	3	3	3	3	2	*	*	3	3	*	
	C _{r5} - 2OUT2	↓	↓	↓	↓	↓	↓	↓	2	3	↓	
	C _{r5} - 3OUT2	↓	↓	↓	↓	↓	↓	↓	3	2	↓	
	C _{r5} - 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 pin switching level	V _{THA}	2	3	3	3	3	1	3	*	*	*	Note 6
	V _{THB}	3	↓	2	↓	↓	3	1	↓	↓	↓	
	V _{THC}	2	↓	3	↓	↓	*	*	1	3	↓	
	V _{THD}	3	↓	2	↓	↓	↓	↓	3	1	↓	
	V _{THE}	↓	↓	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}.

The diagram shows a 14-pin integrated circuit (IC) labeled 'MONOUT'. The pins are numbered 1 through 14. The circuit includes several input and control pins, a power supply section, and output pins. The inputs are labeled IN1, IN2, IN3, IN4, and IN5. The control pins are labeled CTL A, CTL B, CTL C, CTL D, and CTL E. The power supply section includes a 5.0V source, a 103μF capacitor, and a 47μF capacitor. The output pins are labeled Vout1, Vout2, OUT, and IN1. The circuit is connected to a TV, VTR, and LD (Laser Disc) input. The circuit includes various resistors (100Ω, 470Ω, 75Ω, 2.2Ω) and capacitors (470μF, 103μF, 47μF).