

# Video signal switcher

## BA7611AN / BA7611AF

The BA7611AN and BA7611AF are a three-channel analog multiplexers with built-in mute and a 6dB amplifier. The ICs designed for use in video cassette recorders. It features a large dynamic range and wide operating frequency range, and have sync-tip clamp inputs which are ideal for switching video signals.

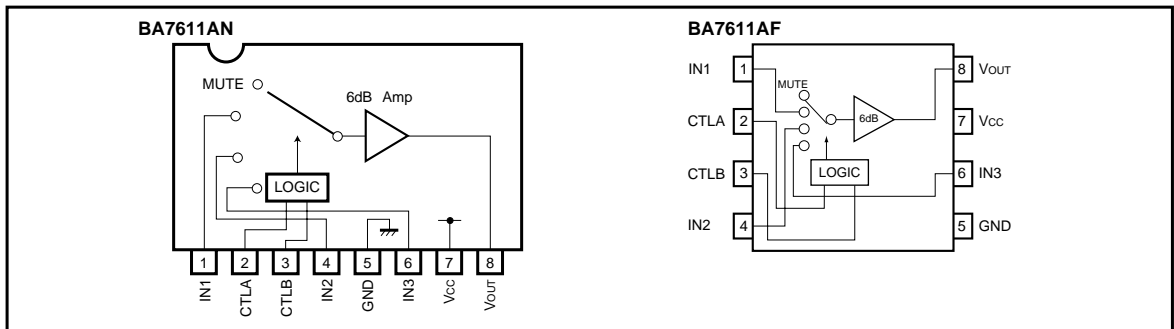
●Applications

Video cassette recorders and televisions

●Features

- 1) 3-input / 1-output switches.
- 2) Built-in 6dB amplifier.
- 3) Built-in mute.
- 4) Sync-tip clamp inputs.
- 5) Wide operating supply voltage range (4.5V to 13.0V).
- 6) Low power consumption (50mW Typ.).
- 7) Excellent frequency characteristics (10MHz, 0dB Typ.).
- 8) Wide dynamic range (3.5V<sub>P-P</sub> Typ.).
- 9) Low interchannel crosstalk (– 65dB Typ., f = 4.43MHz).

●Block diagram



●Truth table

CTL - A	CTL - B	OUT
L (OPEN)	L (OPEN)	IN1
L (OPEN)	H	IN2
H	L (OPEN)	IN3
H	H	MUTE

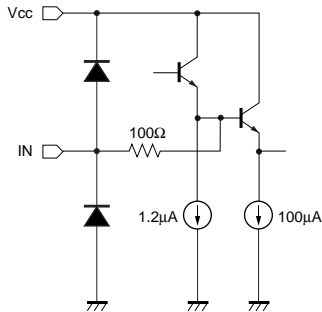
●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	13.5	V
Power dissipation	Pd	900*1 (SIP8) / 550*2 (SOP8)	mW
Operating temperature	Topr	- 25 ~ + 75	°C
Storage temperature	Tstg	- 55 ~ + 125	°C

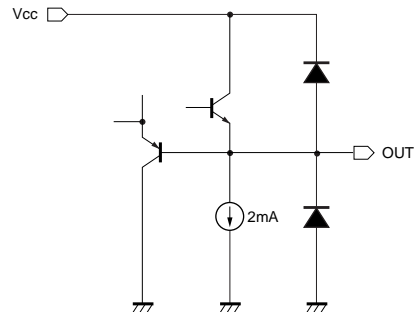
\*1 Reduced by 9mW for each increase in Ta of 1°C over 25°C.  
 \*2 Reduced by 5.5mW for each increase in Ta of 1°C over 25°C.

●Equivalent circuits

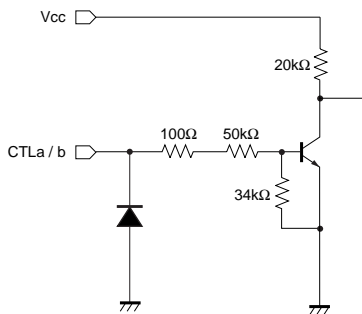
CLAMP INPUT



OUTPUT



CTLa / CTLb



Note:  
 Input bias current 1μA [Typ.]  
 Output impedance 20Ω [Typ.]

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Operating voltage	V <sub>CC</sub>	4.5	—	13.0	V	—	Fig.4
Supply current	I <sub>CC</sub>	—	10.5	15.5	mA	—	Fig.4
Maximum output level	V <sub>om</sub>	3.0	3.5	—	V <sub>P-P</sub>	f = 1kHz, THD = 0.5%	Fig.4
Voltage gain	G <sub>V</sub>	5.5	6.0	6.5	dB	f = 1MHz, V <sub>IN</sub> = 1.0V <sub>P-P</sub>	Fig.4
Interchannel crosstalk	C <sub>T</sub>	—	-65	—	dB	f = 4.43MHz, V <sub>IN</sub> = 1.0V <sub>P-P</sub>	Fig.4
Frequency characteristic	C <sub>f</sub>	-3.0	0	1.0	dB	f = 10MHz / 1MHz, V <sub>IN</sub> = 1.0V <sub>P-P</sub>	Fig.4
CTL pin switch level A	V <sub>TH-A</sub>	1.0	2.0	3.0	V	—	Fig.4
CTL pin switch level B	V <sub>TH-B</sub>	1.0	2.0	3.0	V	—	Fig.4

○Not designed for radiation resistance.

●Electrical characteristic curves

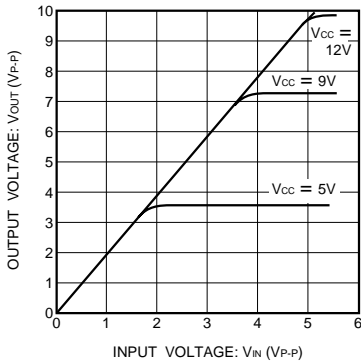


Fig. 1 V<sub>IN</sub> vs. V<sub>OUT</sub> (f = 1kHz)

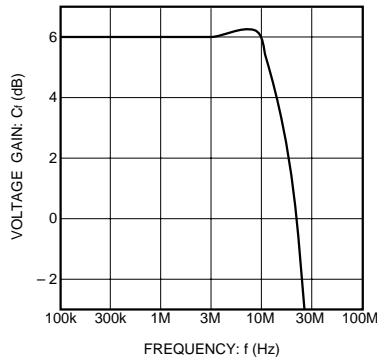


Fig. 2 Frequency characteristics

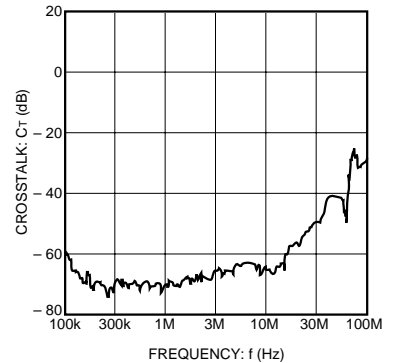


Fig. 3 Interchannel crosstalk

●Measurement circuit

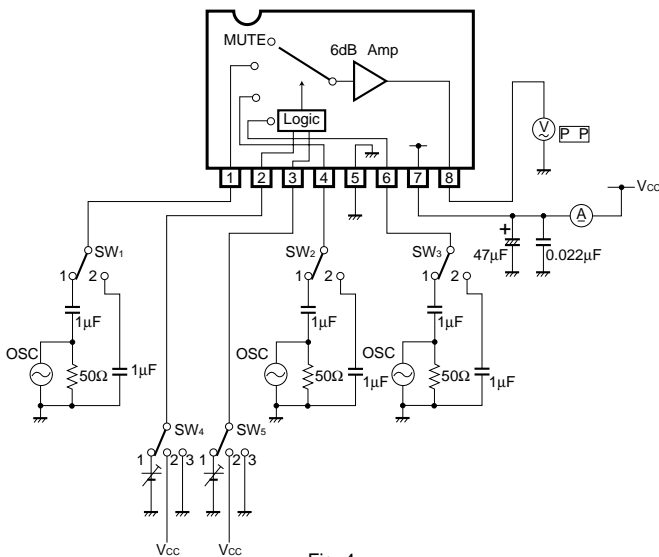


Fig. 4

●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>	
Current dissipation		I <sub>CC</sub>	2	2	2	2	2	Ammeter
Maximum output level	IN1	V <sub>om</sub>	1	2	2	3	3	f = 1kHz, THD = 0.5% * 1
	IN2	V <sub>om</sub>	2	1	2	3	2	
	IN3	V <sub>om</sub>	2	2	1	2	3	
Voltage gain	IN1	G <sub>V</sub>	1	2	2	3	3	f = 1MHz, V = 1V <sub>P-P</sub> * 2
	IN2	G <sub>V</sub>	2	1	2	3	2	
	IN3	G <sub>V</sub>	2	2	1	2	3	
Interchannel crosstalk	IN1→IN2	C <sub>T</sub>	1	2	2	3	2	f = 4.43MHz V = 1V <sub>P-P</sub> * 3
	IN1→IN3	C <sub>T</sub>	1	2	2	2	3	
	IN1→MUTE	C <sub>T</sub>	1	2	2	2	2	
	IN2→IN3	C <sub>T</sub>	2	1	2	2	3	
	IN2→MUTE	C <sub>T</sub>	2	1	2	2	2	
	IN3→MUTE	C <sub>T</sub>	2	2	1	2	2	
Frequency characteristic	IN1	G <sub>f</sub>	1	2	2	3	3	f = 10MHz f = 1MHz V = 1V <sub>P-P</sub> * 4
	IN2	G <sub>f</sub>	2	1	2	3	2	
	IN3	G <sub>f</sub>	2	2	1	2	3	
CTL pin switching level	CTLa	V <sub>TH</sub>	2	2	1	1	3	* 5
	CTLb	V <sub>TH</sub>	2	1	2	3	1	

\*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<sub>om</sub> (V<sub>P-P</sub>).

\*2: Input a 1V<sub>P-P</sub>, 1MHz sine wave. The voltage gain is given by  $G_V = 20 \log (V_{OUT} / V_{IN})$ .

\*3: Input a 1V<sub>P-P</sub>, 4.43MHz sine wave. The interchannel crosstalk is given by  $C_T = 20 \log (V_{OUT} / V_{IN})$ .

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

\*5: Input a 1V<sub>P-P</sub>, 1MHz sine wave. Reduce the CTL pin voltage from V<sub>CC</sub>.

The CTL pin switching level (V<sub>TH</sub>) is the CTL pin voltage at which the V<sub>OUT</sub> level drops below 20mV<sub>P-P</sub>.

●External dimensions (Units: mm)

