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 whitch are ideal for switching video signals.
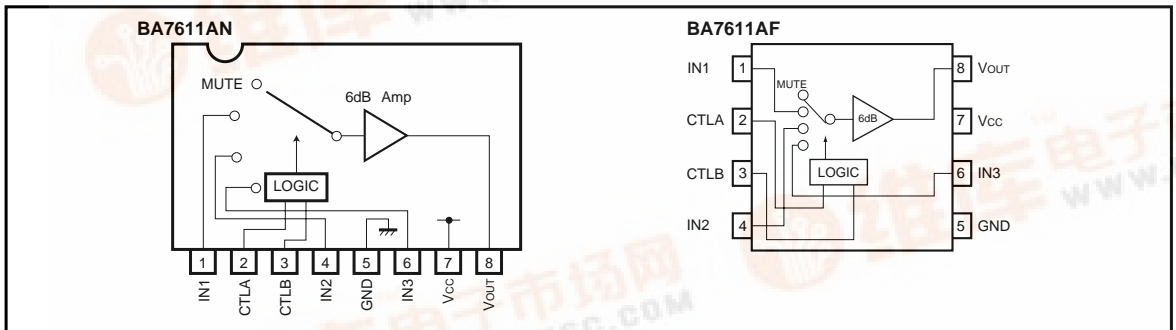
● Applications

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_{P-P} 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)

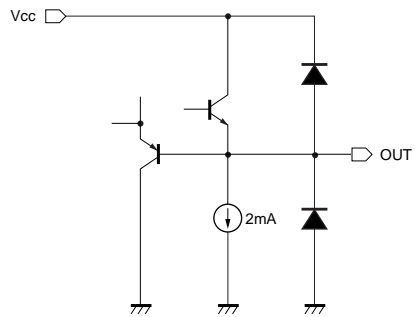| Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	13.5	V
Power dissipation	Pd	900[*1] (SIP8) / 550[*2] (SOP8)	mW
Operating temperature	Topr	− 25 ~ + 75	°C
Storage temperature	Tstg	− 55 ~ + 125	°C

∗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
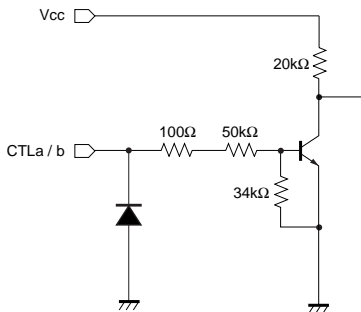
CLAMP INPUT

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_{CC}	4.5	—	13.0	V	—	Fig.4
Supply current	I_{CC}	—	10.5	15.5	mA	—	Fig.4
Maximum output level	V_{om}	3.0	3.5	—	V_{P-P}	f = 1kHz, THD = 0.5%	Fig.4
Voltage gain	G_V	5.5	6.0	6.5	dB	f = 1MHz, V_{IN} = 1.0V_{P-P}	Fig.4
Interchannel crosstalk	C_T	—	– 65	—	dB	f = 4.43MHz, V_{IN} = 1.0V_{P-P}	Fig.4
Frequency characteristic	C_f	– 3.0	0	1.0	dB	f = 10MHz / 1MHz, V_{IN} = 1.0V_{P-P}	Fig.4
CTL pin switch level A	V_{TH-A}	1.0	2.0	3.0	V	—	Fig.4
CTL pin switch level B	V_{TH-B}	1.0	2.0	3.0	V	—	Fig.4

○Not designed for radiation resistance.

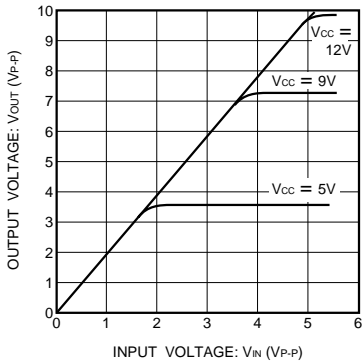●Electrical characteristic curves

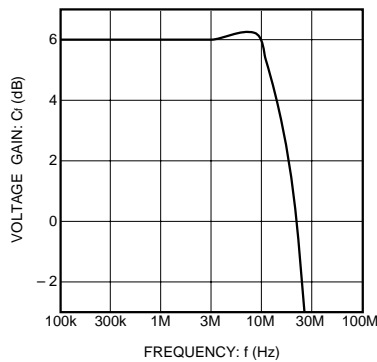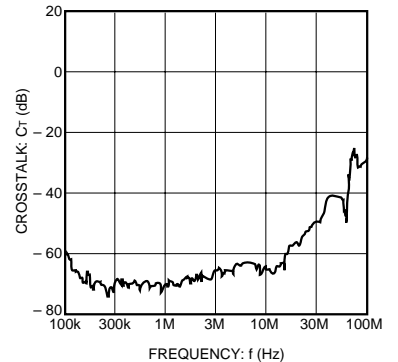Fig. 1 V_{IN} vs. V_{OUT} (f = 1kHz)

Fig. 2 Frequency characteristics
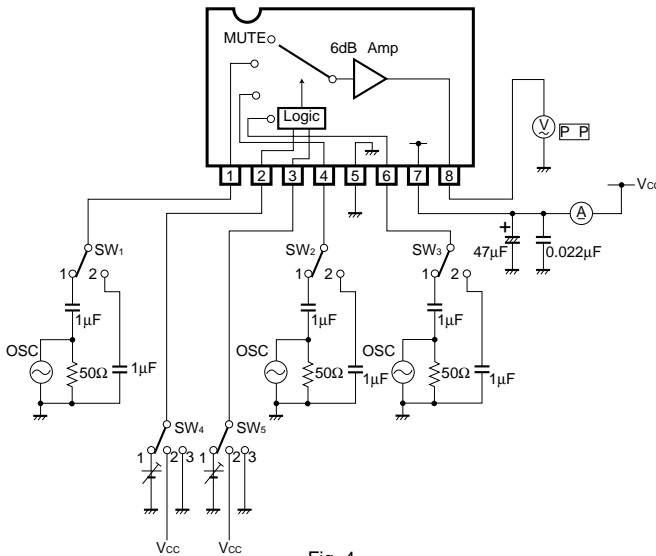

Fig. 3 Interchannel crosstalk

●Measurement circuit

Fig. 4

●Measurement conditions

Parameter		Symbol	Switch settings					Measurement method
			SW$_1$	SW$_2$	SW$_3$	SW$_4$	SW$_5$	
Current dissipation		I$_{CC}$	2	2	2	2	2	Ammeter
Maximum output level	I$_{N1}$	V$_{om}$	1	2	2	3	3	f = 1kHz, THD = 0.5% ∗1
	I$_{N2}$	V$_{om}$	2	1	2	3	2	
	I$_{N3}$	V$_{om}$	2	2	1	2	3	
Voltage gain	I$_{N1}$	G$_V$	1	2	2	3	3	f = 1MHz, V = 1V$_{P-P}$ ∗2
	I$_{N2}$	G$_V$	2	1	2	3	2	
	I$_{N3}$	G$_V$	2	2	1	2	3	
Interchannel crosstalk	I$_{N1}$→I$_{N2}$	C$_T$	1	2	2	3	2	f = 4.43MHz V = 1V$_{P-P}$ ∗3
	I$_{N1}$→I$_{N3}$	C$_T$	1	2	2	2	3	
	I$_{N1}$→MUTE	C$_T$	1	2	2	2	2	
	I$_{N2}$→I$_{N3}$	C$_T$	2	1	2	2	3	
	I$_{N2}$→MUTE	C$_T$	2	1	2	2	2	
	I$_{N3}$→MUTE	C$_T$	2	2	1	2	2	
Frequency characteristic	I$_{N1}$	G$_f$	1	2	2	3	3	f = 10MHz f = 1MHz V = 1V$_{P-P}$ ∗4
	I$_{N2}$	G$_f$	2	1	2	3	2	
	I$_{N3}$	G$_f$	2	2	1	2	3	
CTL pin switching level	CTLa	V$_{TH}$	2	2	1	1	3	∗5
	CTLb	V$_{TH}$	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$_{om}$ (V$_{P-P}$).

∗2: Input a 1V$_{P-P}$, 1MHz sine wave. The voltage gain is given by G$_V$ = 20 log (V$_{OUT}$ / V$_{IN}$).

∗3: Input a 1V$_{P-P}$, 4.43MHz sine wave. The interchannel crosstalk is given by C$_T$ = 20 log (V$_{OUT}$ / V$_{IN}$).

∗4: Input 1V$_{P-P}$, 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$_{P-P}$, 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 20mV$_{P-P}$.

●External dimensions (Units: mm)

BA7611AN

SIP8

BA7611AF

SOP8