Video Signal Switcher
BA7608N

The BA7608N, developed for products like VCRs, is a switcher with 2 switching circuits, each with 2 inputs and 1 output. This IC has 1 sync tip clamp circuit and 1 non-clamping input circuit, making it ideal for switching between video and audio signals or between video and chroma signals.

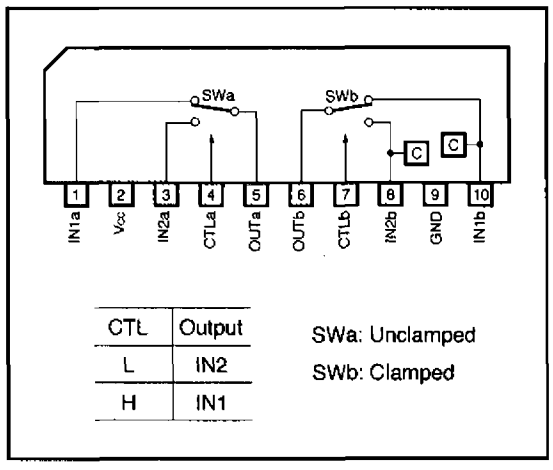
●Applications

TVs and VCRs

●Features

1)2-input / 1-output switches (one sync tip clamp input circuit and one non-clamping input circuit), each with 2 inputs and 1 output
2)5V supply voltage
3)Lower power consumption (Typ. 42mW)
4)Excellent frequency characteristics (Typ. 10MHz, 0dB)
5)Wide dynamic range
Clamped input: 2.9V_{P-P} (Typ.)
Unclamped input: 3.0V_{P-P} (Typ.)
6)High switching speed (Typ. 50ns)

●Block diagram



CTL	Output
L	IN2
H	IN1

SWa: Unclamped
SWb: Clamped

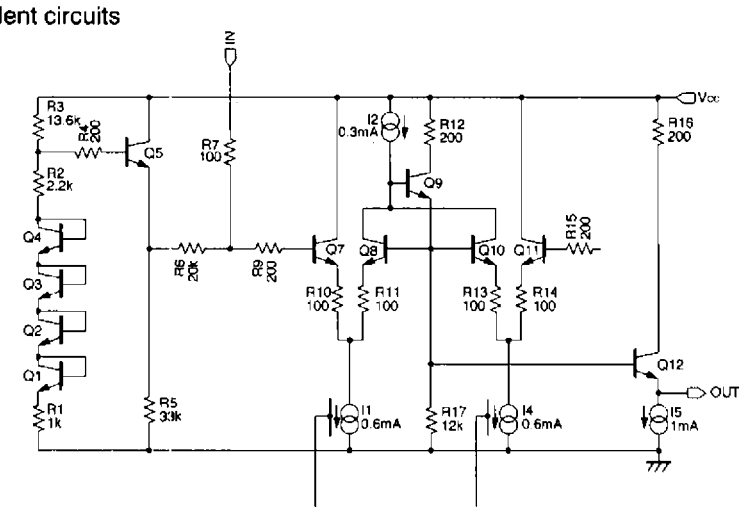
●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	9	V
Power dissipation	Pd	500 *	mW
Operating temperature	Topr	−40～+85	℃
Storage temperature	Tstg	−55～125	℃

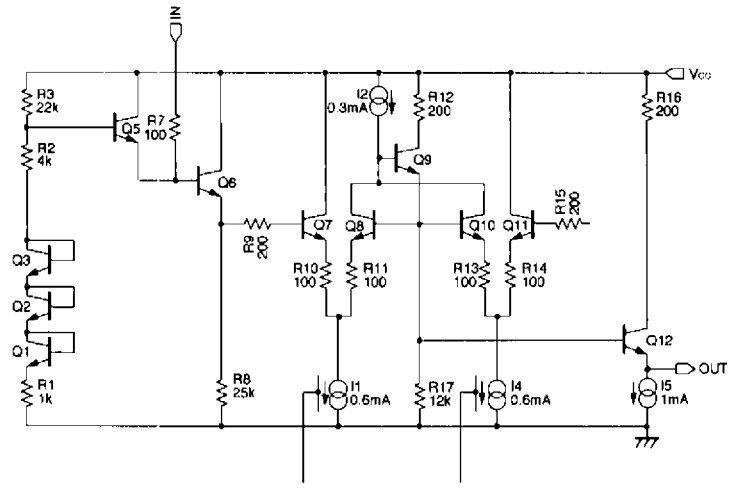
* Reduced by 5.0mW for each increase in Ta of 1°C over 25°C.

●Input and output equivalent circuits

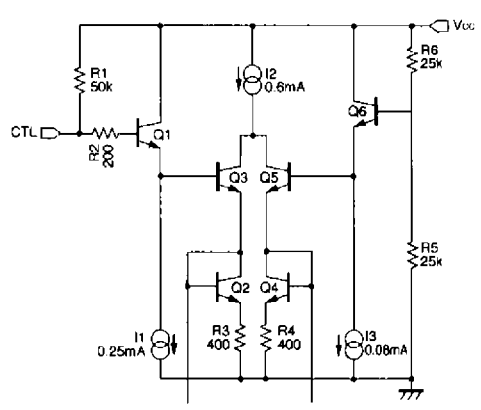
SWa



SWb



CTL



●Electrical characteristics (unless otherwise noted, Ta=25℃, Vcc=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	V_{CC}	4.5	5.0	5.5	V	−
Circuit current	I_{CC}	−	8.4	13.0	mA	−
Maximum output level 1	Vom	2.6	2.9	−	V_{P-P}	f=1kHz, THD=0.5%, clamped
Maximum output level 2	Vom	2.7	3.0	−	V_{P-P}	f=1kHz, THD=0.5%, unclamped
Voltage gain	G_V	−0.5	0	0.5	dB	f=1MHz, Vin=1V_{P-P}
Interchannel crosstalk	G_T	−	−65	−	dB	f=4.43MHz, Vin=1V_{P-P}
Frequency characteristics	Gf	−3	0	1	dB	10MHz / 1MHz, Vin=1V_{P-P}
Input impedance	Z_{IN}	14	20	26	kΩ	Unclamped
Total harmonic distortion	THD	−	0.007	−	%	f=1kHz, 1V_{P-P}, unclamped
CTL pin switching level	V_{TH}	2.0	2.5	3.0	V	−

Note: Refer to the measurement circuit given in Fig. 1.

●Reference data

Pin DC voltage (reference)

Units : Vdc

Pin No.	Pin voltage
1	2.48
2	5.00
3	2.48
4	4.91
5	1.76
6	0.65
7	4.91
8	2.05
9	0
10	2.05

Note: The voltage are for reference only.

Electrical characteristics

Reference data	Min.	Typ.	Max.	Unit
Sink chip clamp level	1.20	1.54	1.95	Vdc
Input impedance (unclamped)	−	20	−	kΩ
Input impedance (clamped)	−	1.7	−	MΩ
Output impedance	−	30	−	Ω

The input coupling capacitor values should be 0.1 μF to 1 μF.

●Measurement circuit

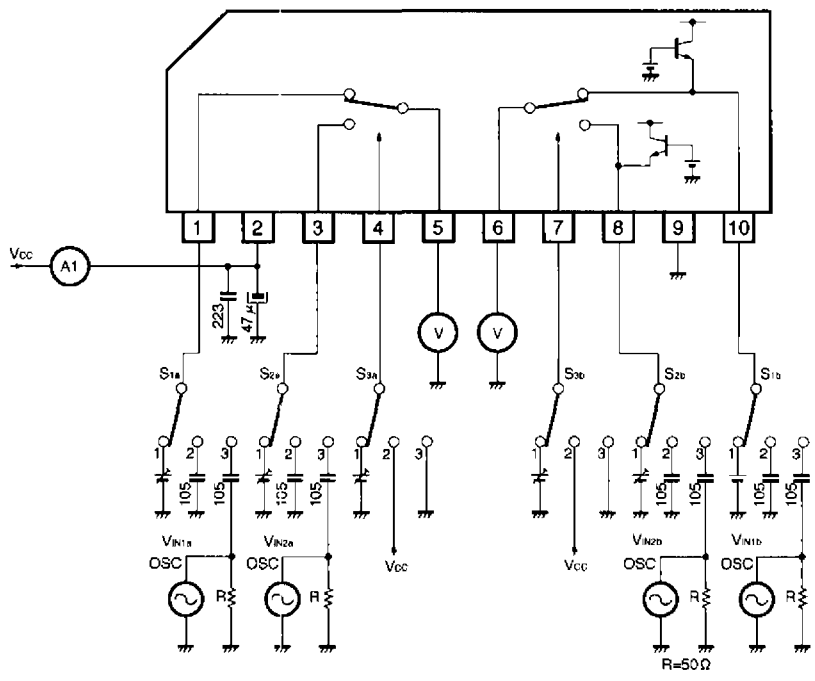


Fig.1

●Measurement conditions

Parameter		Symbol	Switch position						Measurement method
			S_{1a}	S_{2a}	S_{3a}	S_{1b}	S_{2b}	S_{3b}	
Current consumption		Icc	2	2	2	2	2	2	Ammeter
Maximum output level	In1a	Vom	3	2	2	2	2	2	Note 1
	In2a	Vom	2	3	3	2	2	2	
	In1b	Vom	2	2	2	3	2	2	
	In2b	Vom	2	2	2	2	3	3	
Voltage gain	In1a	Gv	3	2	2	2	2	2	Note 2
	In2a	Gv	2	3	3	2	2	2	
	In1b	Gv	2	2	2	3	2	2	
	In2b	Gv	2	2	2	2	3	3	
Interchannel crosstalk	In1a	C_T	3	2	3	2	2	2	Note 3
	In2a	C_T	2	3	2	2	2	2	
	In1b	C_T	2	2	2	3	2	3	
	In2b	C_T	2	2	2	2	3	2	
Frequency character--istics	In1a	Gf	3	2	2	2	2	2	Note 4
	In2a	Gf	2	3	3	2	2	2	
	In1b	Gf	2	2	2	3	2	2	
	In2b	Gf	2	2	2	2	3	3	
CTL pin threshold	CTLa	V_{TH}	3	2	1	2	2	2	Note 5
	CTLb	V_{TH}	2	2	2	3	2	1	
Total harmonic distortion	In1a	THD	3	2	2	2	2	2	Note 6
	In2a	THD	2	3	3	2	2	2	
Input impedance	In1a	Zin	1	2	2	2	2	2	Note 7
	In2a	Zin	2	1	3	2	2	2	

Note 1: Connect a distortion meter to the output, and input a f = 1kHz sine wave. Adjust the output level until the output distortion is 0.5%. This output voltage at this time is the maximum output level Vom (V_{P-P}).

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

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

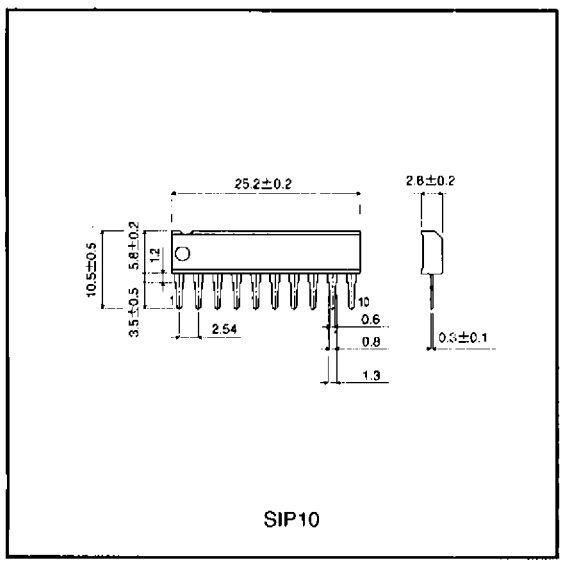
Note 4: Input $1V_{P-P}$, 1MHz and 10MHz sine waves. The frequency characteristic is given by Gf = 20 log (V_{OUT}(f = 10MHz)/V_{IN} (f = 1MHz)).

Note 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 $20mV_{P-P}$.

Note 6: Input a $1V_{P-P}$, 1kHz sine wave and measure the total-harmonic distortion of the output using a total-harmonic distortion meter.

Note 7: Measure the input pin voltage V_{IN50} when a current of DC50 μA is flowing into the input pin. Measure the input pin open-circuit voltage. The input impedance is given by Z = (V_{IN50} - V_{IN0})/50×10^{-9} Ω.

●External dimensions (Units: mm)



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