

Video signal switcher

BA7612N / BA7612F

The BA7612N and BA7613F are three-channel analog multiplexers with built-in mute, 6dB amplifier and 75Ω driver. The ICs designed for use in video cassette recorders, and feature a large dynamic range and wide operating frequency range. All inputs are terminated with 20kΩ (Typ.) input impedance.

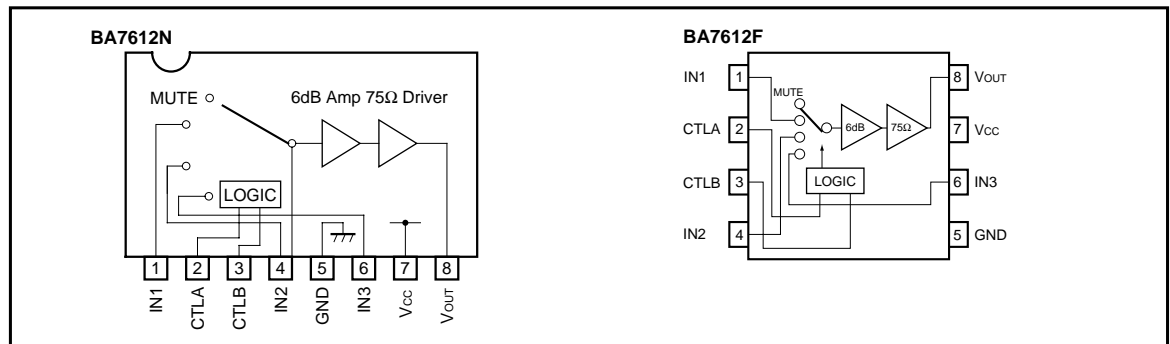
●Applications

Video cassette recorders and televisions

●Features

- 1) 3-input / 1-output switches.
- 2) Built-in 6dB amplifier and 75Ω driver.
- 3) Built-in mute.
- 4) Large input impedance (20kΩ Typ.).
- 5) Wide operating supply voltage range
(4.5V ~ 13.0V BA7612N)
(4.5V ~ 9.5V BA7613F).
- 6) Low power dissipation (103mW 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	V _{CC}	*113.5 / *210.0	V
Power dissipation	P _d	*1900*3 / *2550*4	mW
Operating temperature	T _{opr}	– 25 ~ + 75	°C
Storage temperature	T _{stg}	– 55 ~ + 125	°C

*1 BA7612N

*2 BA7612F

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

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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage range	V _{CC}	4.5	—	13.0	V	BA7612F is Max.9.5V
Supply current	I _{CC}	—	20.5	29.0	mA	
Maximum output level	V _{om}	3.0	3.5	—	V _{P-P}	f = 1kHz, THD = 0.5%
Voltage gain	G _V	5.5	6.0	6.5	dB	f = 1MHz, V _{IN} = 1.0V _{P-P}
Interchannel crosstalk	C _T	—	– 65	—	dB	f = 4.43MHz, V _{IN} = 1.0V _{P-P}
Frequency characteristic	C _f	– 3.0	0	1.0	dB	f = 10MHz / 1MHz, V _{IN} = 1.0V _{P-P}
Input impedance	Z _{IN}	14	20	26	kΩ	
CTL pin switching level A	V _{TH-A}	1.0	2.0	3.0	V	
CTL pin switching level B	V _{TH-B}	1.0	2.0	3.0	V	

○Not designed for radiation resistance.

● Measurement circuit

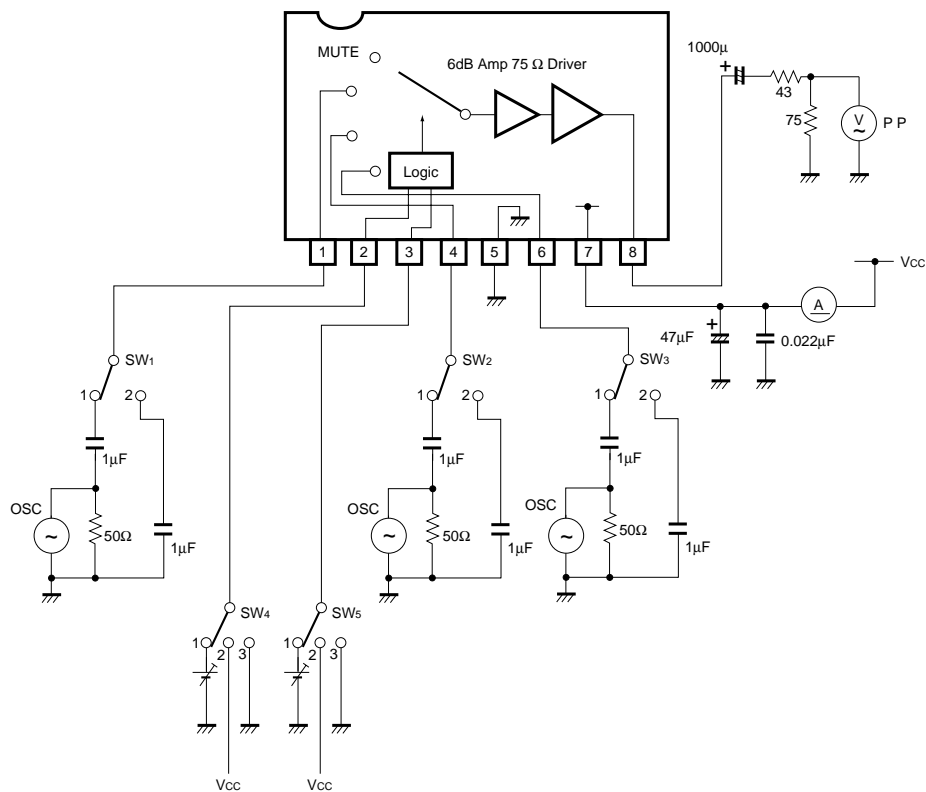


Fig. 1

● Measurement conditions

Parameter		Symbol	Switch settings					Measurement method
			SW ₁	SW ₂	SW ₃	SW ₄	SW ₅	
Current dissipation		I _{CC}	2	2	2	2	2	Ammeter
Maximum output level	IN ₁	V _{om}	1	2	2	3	3	f = 1kHz THD = 0.5% *1
	IN ₂	V _{om}	2	1	2	3	2	
	IN ₃	V _{om}	2	2	1	2	3	
Voltage gain	IN ₁	G _V	1	2	2	3	3	f = 1MHz, V = 1V _{P-P} *2
	IN ₂	G _V	2	1	2	3	2	
	IN ₃	G _V	2	2	1	2	3	
Interchannel crosstalk	IN ₁ →IN ₂	C _T	1	2	2	3	2	f = 4.43MHz, V = 1V _{P-P} *3
	IN ₁ →IN ₃	C _T	1	2	2	2	3	
	IN ₁ →MUTE	C _T	1	2	2	2	2	
	IN ₂ →IN ₃	C _T	2	1	2	2	3	
	IN ₂ →MUTE	C _T	2	1	2	2	2	
	IN ₃ →MUTE	C _T	2	2	1	2	2	
Frequency characteristic	IN ₁	G _f	1	2	2	3	3	f = 10MHz / f = 1MHz, V = 1V _{P-P} *4
	IN ₂	G _f	2	1	2	3	2	
	IN ₃	G _f	2	2	1	2	3	
CTL pin switching level	CTL _a	V _{TH}	2	2	1	1	3	*5
	CTL _b	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 multiplied by 2 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 $G_V = 20 \log (V_{OUT} / V_{IN}) + 6$.

*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 $G_f = 20 \log (V_{OUT} (f = 10\text{MHz}) / V_{OUT} (f = 1\text{MHz}))$.

*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}.

● Electrical characteristic curves

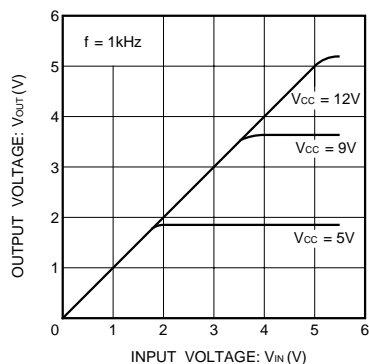


Fig. 2 V_{IN} vs. V_{OUT} characteristics (f = 1kHz)

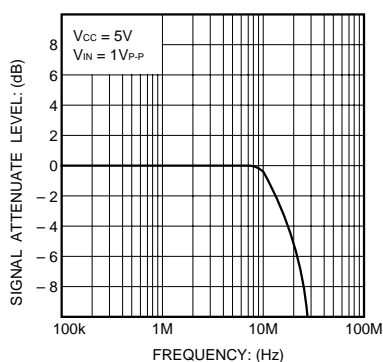


Fig. 3 Frequency characteristics

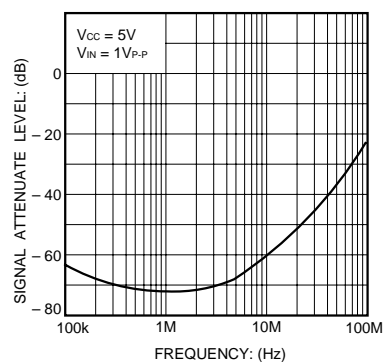
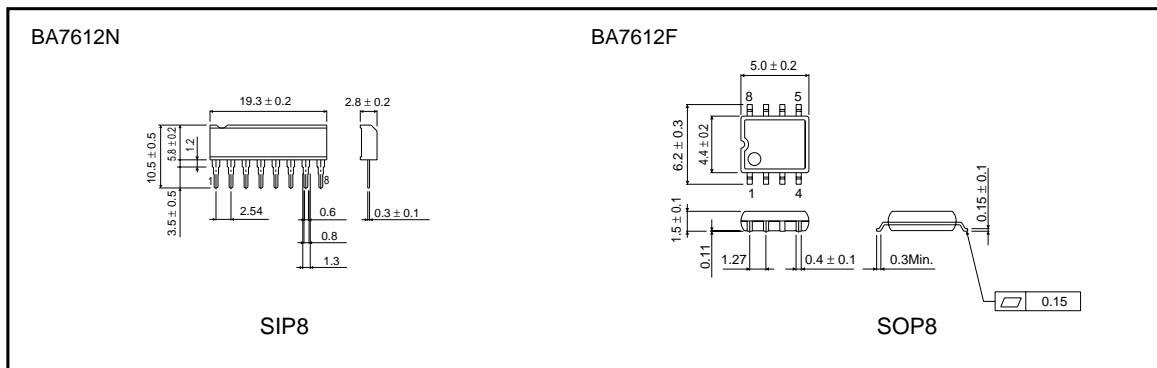


Fig. 4 Interchannel crosstalk

●Operation notes

The output impedance is approximately 32Ω . Therefore, to ensure output matching, connect an external resistor of 43Ω .

●External dimensions (Units: mm)



Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document use silicon as a basic material.
Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).

Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

About Export Control Order in Japan

Products described herein are the objects of controlled goods in Annex 1 (Item 16) of Export Trade Control Order in Japan.

In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.