

# 3-channel 75Ω driver with Y / C MIX

## BA7665FS

The BA7665FS has three 75Ω driver circuits with 6dB amplifiers, and includes a Y / C MIX circuit. The IC can provide a 75Ω drive with a composite Y signal, C signal, or a Y / C MIX signal. Dual-circuit drive capacity for each load is provided, and a sag compensation function is provided to allow use of smaller coupling capacitors.

The composite Y signal input is a sync-tip clamp input, and the chroma input is a biased input.

The three channels can be simultaneously muted, or the chroma signal only (in the case of C / Y output, only Y is output), and output short circuit protection and power save circuits are also provided.

### ●Applications

Digital AV equipment, DVD and DVC players

### ●Features

- 1) Y / C MIX circuit.
- 2) Low power consumption (typ. 130mW).
- 3) Output mute circuit.
- 4) Power save circuit.
- 5) Output protection circuit.
- 6) Sag compensation circuit allows small output coupling capacitors.
- 7) Two-circuit drive possible for loads.
- 8) Compact SSOP-A 16-pin package.

### ●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V <sub>cc</sub>	8	V
Power dissipation	P <sub>d</sub>	650*	mW
Operating temperature	T <sub>opr</sub>	- 25 ~ + 75	°C
Storage temperature	T <sub>stg</sub>	- 55 ~ + 125	°C

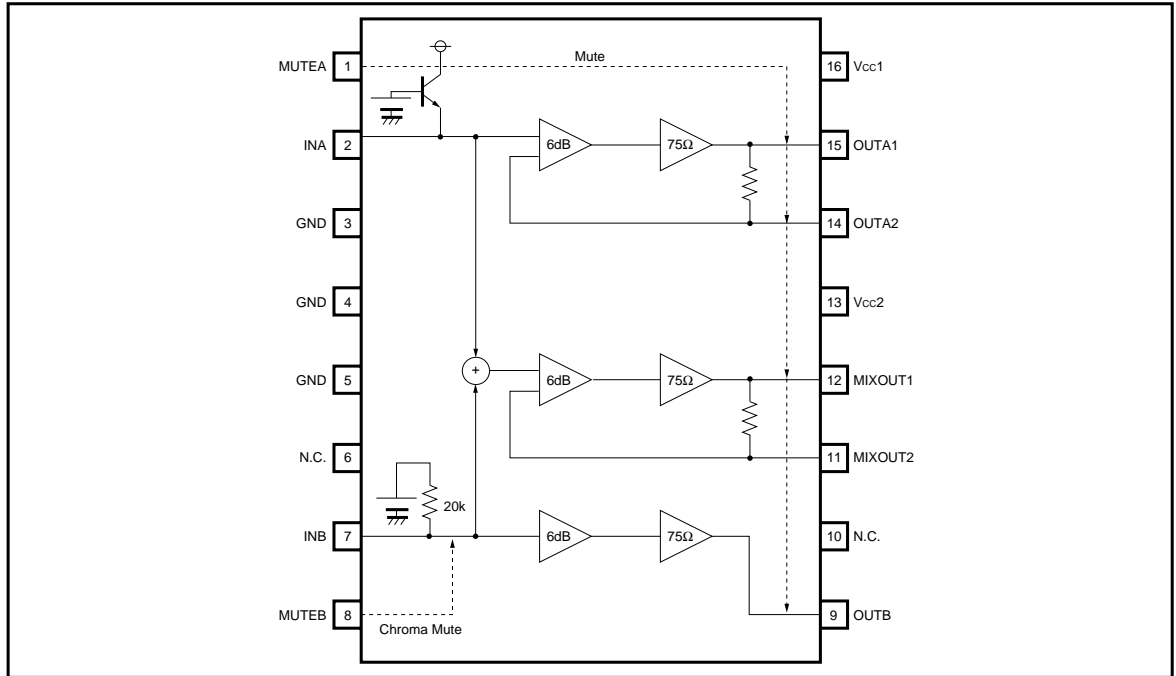
\* Reduced by 6.5mW for each increase in Ta of 1°C over 25°C.

### ●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V <sub>cc</sub>	4.5	5.0	5.5	V

○ Not designed for radiation resistance.

●Block diagram



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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Circuit current	I <sub>CC</sub>	13.0	26.0	39.0	mA	No signal
Maximum output level	V <sub>OM</sub>	2.6	3.0	—	V <sub>P-P</sub>	f = 1kHz, THD = 1 %
Frequency characteristics	G <sub>f</sub>	-1.0	0.0	1.0	dB	f = 7MHz / 1MHz, 1V <sub>P-P</sub>
Inter channel crosstalk	C <sub>T</sub>	—	-60	—	dB	f = 4.43MHz, 1V <sub>P-P</sub>
Mute attenuation	M <sub>T</sub>	—	-60	—	dB	f = 4.43MHz, 1V <sub>P-P</sub>
Mute switch high level	V <sub>THH</sub>	2.5	—	V <sub>CC</sub>	V	
Mute switch low level	V <sub>THL</sub>	0	—	1.0	V	
Input impedance	Z <sub>IN</sub>	16	20	24	kΩ	Chroma input pin (pin 7)

● Measurement circuit

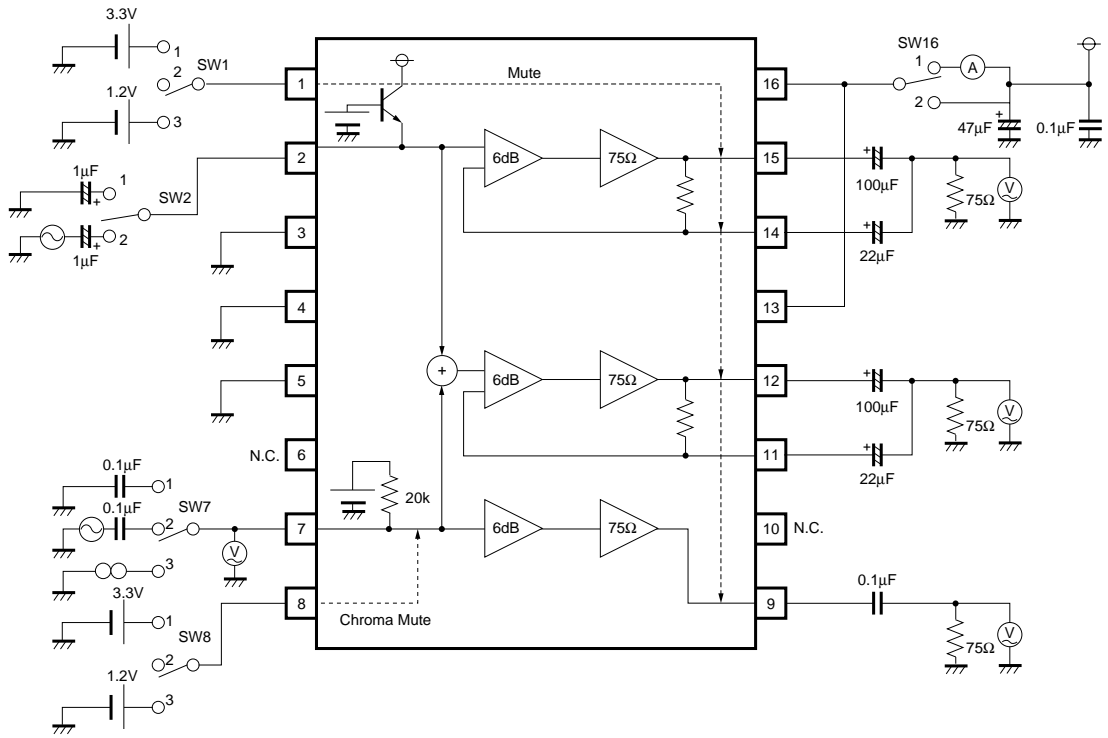


Fig.1

## ● Measurement conditions

Parameter		Symbol	Switch conditions					Measurement method
			SW <sub>1</sub>	SW <sub>2</sub>	SW <sub>7</sub>	SW <sub>8</sub>	SW <sub>16</sub>	
Circuit current		I <sub>CC</sub>	2	1	1	2	1	Note 1
Maximum output level	OUTA	V <sub>OM1</sub>	3	2	1	3	2	Note 2
	MIXOUT	V <sub>OM2</sub>	3	2	1	3	2	
	OUTB	V <sub>OM3</sub>	3	1	2	3	2	
Frequency characteristics	OUTA	G <sub>F1</sub>	3	2	1	3	2	Note 3
	MIXOUT	G <sub>F2</sub>	3	2	1	3	2	
	OUTB	G <sub>F3</sub>	3	1	2	3	2	
Crosstalk	OUTB→OUTA	G <sub>T1</sub>	3	1	2	3	2	Note 4
	OUTA→OUTB	G <sub>T2</sub>	3	2	1	3	2	
Mute attenuation	OUTA	M <sub>T1</sub>	1	2	1	3	2	Note 5
	MIXOUT	M <sub>T2</sub>	1	2	1	3	2	
	OUTB	M <sub>T3</sub>	1	1	2	3	2	
Chroma mute attenuation	MIXOUT	M <sub>TC1</sub>	3	1	2	1	2	Note 5
	OUTB	M <sub>TC2</sub>	3	1	2	1	2	
Input impedance	—	Z <sub>IN</sub>	3	1	3	3	2	Note 6
Voltage gain	OUTA	G <sub>V1</sub>	3	2	1	3	2	Note 7
	MIXOUT	G <sub>V2</sub>	3	2	1	3	2	
	OUTB	G <sub>V3</sub>	3	1	2	3	2	
Inter-channel voltage gain differential	—	ΔG <sub>Vc</sub>	—	—	—	—	—	Note 8

\* The mute switch level was substituted by using H = 2.4V and L = 1.1V for the above measurements.

## Measurement method

Note 1: Measure the quiescent current.

Note 2: Connect a distortion meter to the output, and input a f = 1kHz sine wave.

Adjust the output level until the output distortion is 1%. The output voltage at this time is the maximum output level V<sub>OM</sub> [V<sub>P-P</sub>].

Note 3: Input 1V<sub>P-P</sub>, 7MHz and 1MHz sine waves, and measure the corresponding outputs V<sub>O7</sub> and V<sub>O1</sub>. The frequency characteristic is given by

$$G_F = 20 * \log (V_{O7} / V_{O1}) \text{ [dB]}.$$

Note 4: Input a 1V<sub>P-P</sub>, 4.43MHz sine wave, and measure the output V<sub>O</sub> [V<sub>P-P</sub>]. The interchannel crosstalk is given by C<sub>T</sub> = 20 \* Log (V<sub>O</sub> / V<sub>IN</sub>) [dB].

Note 5: Input a 1V<sub>P-P</sub>, 4.43MHz sine wave, and measure the output V<sub>O</sub> [V<sub>P-P</sub>]. The mute attenuation is given by

$$M_T = 20 * \log (V_O / V_{IN}) \text{ [dB]}.$$

Note 6: Measure the input pin voltage V<sub>IN50</sub> when a current of DC50μA is flowing into the input pin. Measure the input pin open-circuit voltage.

The input impedance is given by

$$Z_{IN} = |V_{IN50} - V_{IN0}| / 50 * 10^3 \text{ [k}\Omega\text{]}.$$

Note 7: Input a 1V<sub>P-P</sub>, 4.43MHz sine wave, and measure the output V<sub>O</sub> [V<sub>P-P</sub>]. The voltage gain is given by

$$G_V = 20 * \log (V_O / V_{IN}) \text{ [dB]}.$$

Note 8: ΔG<sub>Vc</sub> = |G<sub>V1</sub> - G<sub>V2</sub>| [dB]

●Guaranteed design values (unless otherwise noted, Ta = 25°C, Vcc = 5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Voltage gain	G <sub>v</sub>	5.5	6.0	6.5	dB	f = 4.43MHz, 1V <sub>P-P</sub>
Interchannel voltage gain	ΔG <sub>v</sub>	- 0.5	0.0	0.5	dB	f = 100kHz, 1V <sub>P-P</sub>

●Mute SW mode settings

• MUTEA (1pin)

H	3ch MUTE
L	NORMAL

• MUTE B (8pin)

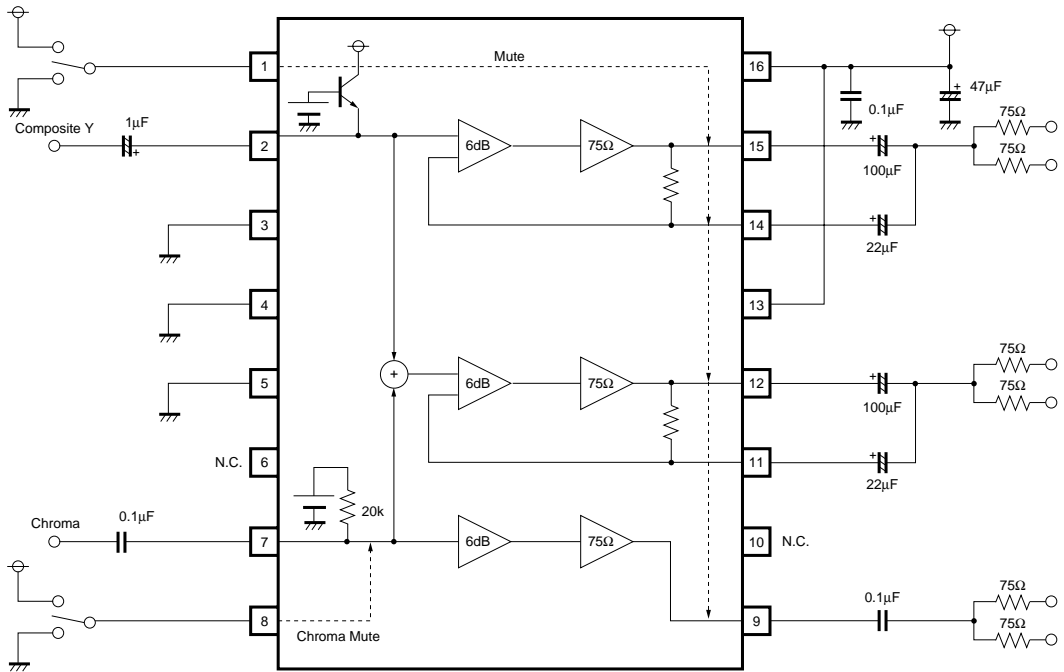
H	CHROMA MUTE
L	NORMAL

●Pin descriptions and equivalent I / O circuits

Pin. No	Pin name	IN	OUT	Standard potential	Equivalent I / O circuit	Pin description
1 8	MUTEA MUTE B	○	—	—		Mute control pin  When MUTE A (pin 1) goes high, all three channels are muted at the same time. When MUTE B (pin 8) goes high, OUTB and the MIXOUT chroma signals are muted.
2	INA	○	—	2.0V		Signal input pin  This is the input pin for the composite Y signal (sync-tip clamp input).
3 4 5	GND	—	—	0V		Ground pin
7	INB	○	—	2.0V		Signal input pin  Bias-type input pin for the chroma signal. The input impedance is 20kΩ.

Pin. No	Pin name	IN	OUT	Standard voltage	Equivalent I / O circuit	Pin description
9	OUTB	—	○	2.4V		<p>Signal output pin</p> <p>Chroma signal output pin. When this drops below 0.2V, the protection circuit operates and the IC enters power save mode.</p>
11 12	MIXOUT2 MIXOUT1	—	○	0.9V 0.95V		<p>Signal output pin</p> <p>Y / C signal output pin. Pin 11 is the sag compensation pin. When pin 12 is taken below 0.2V, the protection circuit operates and the IC enters power save mode.</p>
14 15	OUTA2 OUTA1	—	○	0.9V 0.95V		<p>Signal output pin</p> <p>Composite Y signal output pin. Pin 14 is the sag compensation pin. When pin 15 is taken below 0.2V, the protection circuit operates and the IC enters power save mode.</p>
13 16	Vcc2 Vcc1	—	—	5.0V 5.0V		<p>Power supply pin</p> <p>Vcc1 and Vcc2 are not connected internally. Use with them connected externally.</p>

●Application example



When you will not use the sag compensation function

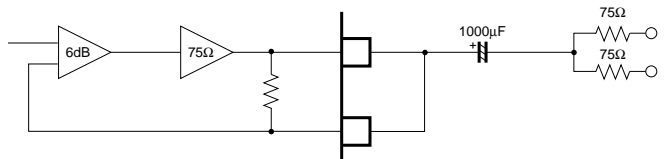


Fig.2

●External dimensions (Units: mm)

