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_{CC}	8	V
Power dissipation	Pd	650*	mW
Operating temperature	Topr	– 25 ~ + 75	°C
Storage temperature	Tstg	– 55 ~ + 125	°C

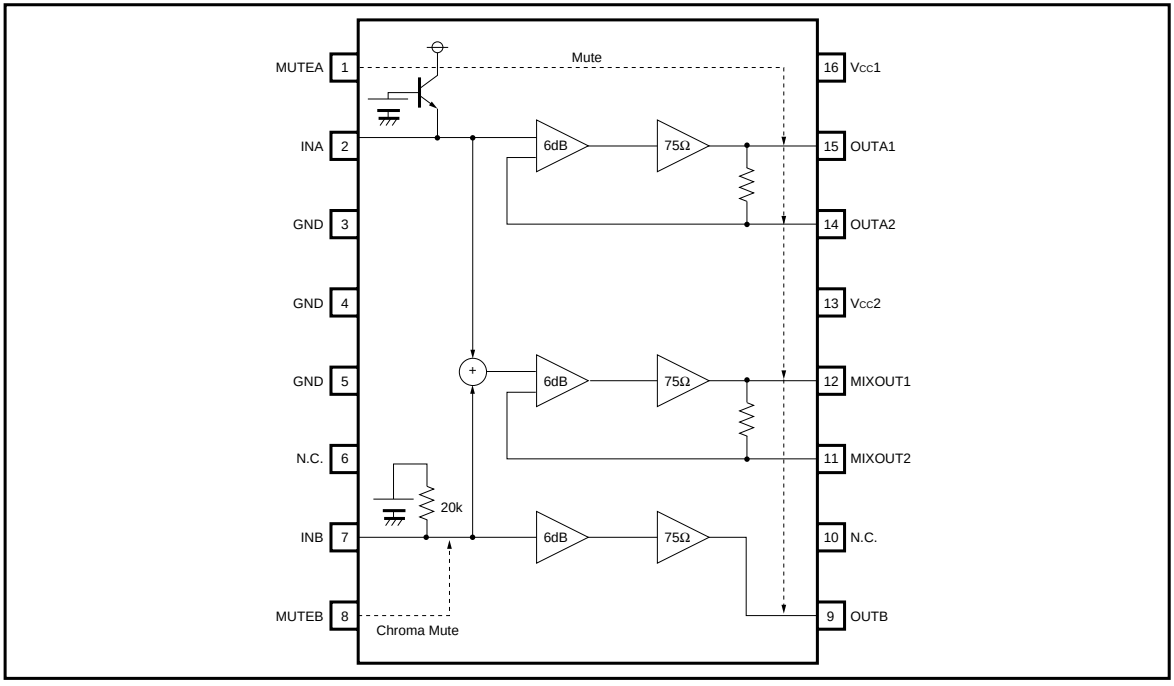
* Reduced by 6.5mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{CC}	4.5	5.0	5.5	V

○ Not designed for radiation resistance.

●Block diagram



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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Circuit current	I_{CC}	13.0	26.0	39.0	mA	No signal
Maximum output level	V_{om}	2.6	3.0	—	V_{P-P}	f = 1kHz, THD = 1 %
Frequency characteristics	G_f	– 1.0	0.0	1.0	dB	f = 7MHz / 1MHz, $1V_{P-P}$
Inter channel crosstalk	C_T	—	– 60	—	dB	f = 4.43MHz, $1V_{P-P}$
Mute attenuation	M_T	—	– 60	—	dB	f = 4.43MHz, $1V_{P-P}$
Mute switch high level	V_{THH}	2.5	—	V_{CC}	V	
Mute switch low level	V_{THL}	0	—	1.0	V	
Input impedance	Z_{IN}	16	20	24	kΩ	Chroma input pin (pin 7)

●Measurement circuit

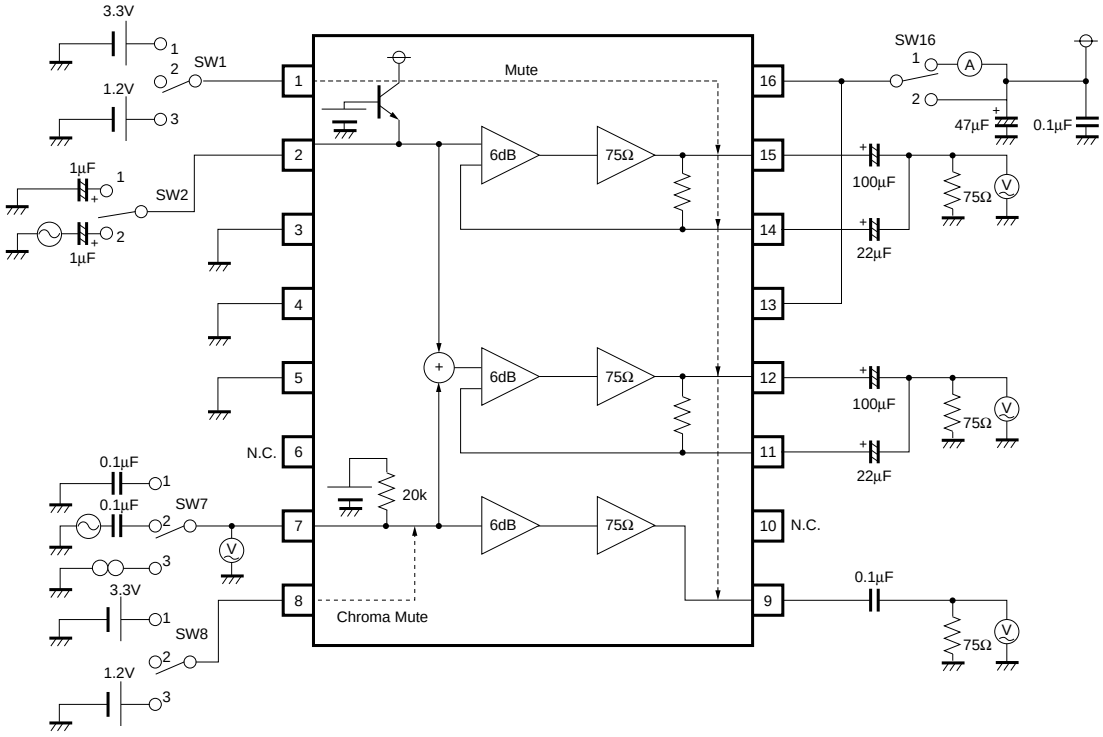


Fig.1

●Measurement conditions

Parameter		Symbol	Switch conditions					Measurement method
			SW_1	SW_2	SW_7	SW_8	SW_{16}	
Circuit current		I_{CC}	2	1	1	2	1	Note 1
Maximum output level	OUTA	V_{OM1}	3	2	1	3	2	Note 2
	MIXOUT	V_{OM2}	3	2	1	3	2	
	OUTB	V_{OM3}	3	1	2	3	2	
Frequency characteristics	OUTA	G_{F1}	3	2	1	3	2	Note 3
	MIXOUT	G_{F2}	3	2	1	3	2	
	OUTB	G_{F3}	3	1	2	3	2	
Crosstalk	OUTB→OUTA	G_{T1}	3	1	2	3	2	Note 4
	OUTA→OUTB	G_{T2}	3	2	1	3	2	
Mute attenuation	OUTA	M_{T1}	1	2	1	3	2	Note 5
	MIXOUT	M_{T2}	1	2	1	3	2	
	OUTB	M_{T3}	1	1	2	3	2	
Chroma mute attenuation	MIXOUT	M_{TC1}	3	1	2	1	2	Note 5
	OUTB	M_{TC2}	3	1	2	1	2	
Input impedance	—	Z_{IN}	3	1	3	3	2	Note 6
Voltage gain	OUTA	G_{V1}	3	2	1	3	2	Note 7
	MIXOUT	G_{V2}	3	2	1	3	2	
	OUTB	G_{V3}	3	1	2	3	2	
Inter-channel voltage gain differential	—	ΔG_{VC}	—	—	—	—	—	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_{OM} [V_{P-P}].

Note 3: Input 1V_{P-P}, 7MHz and 1MHz sine waves, and measure the corresponding outputs V_{O7} and V_{O1}. The frequency characteristic is given by
$G_F = 20 * \text{Log} (V_{O7} / V_{O1})$ [dB].

Note 4: Input a 1V_{P-P}, 4.43MHz sine wave, and measure the output Vo [V_{P-P}] The interchannel crosstalk is given by $C_T = 20 * \text{Log} (V_O / V_{IN})$ [dB].

Note 5: Input a 1V_{P-P}, 4.43MHz sine wave, and measure the output Vo [V_{P-P}] The mute attenuation is given by
$M_T = 20 * \text{Log} (V_O / V_{IN})$ [dB].

Note 6: Measure the input pin voltage $V_{IN}50$ when a current of DC50μA is flowing into the input pin. Measure the input pin open-circuit voltage.
The input impedance is given by
$Z_{IN} = | V_{IN50} - V_{IN0} | / 50 * 10^3$ [kΩ].

Note 7: Input a 1V_{P-P}, 4.43MHz sine wave, and measure the output V_O [V_{P-P}] The voltage gain is given by
$Gv = 20 * \log (V_O / V_{IN})$ [dB].

Note 8: $\Delta G_{VC} = | G_{V1} - G_{V2} |$ [dB]

●Guaranteed design values (unless otherwise noted, Ta = 25°C, V_{CC} = 5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Voltage gain	G_V	5.5	6.0	6.5	dB	f = 4.43MHz, $1V_{P-P}$
Interchannel voltage gain	ΔG_V	– 0.5	0.0	0.5	dB	f = 100kHz, $1V_{P-P}$

●Mute SW mode settings

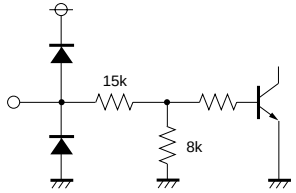
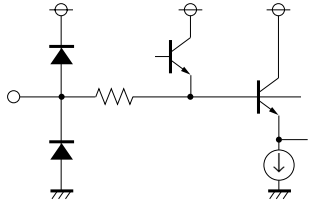
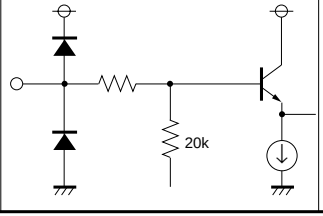
• MUTEA (1pin)

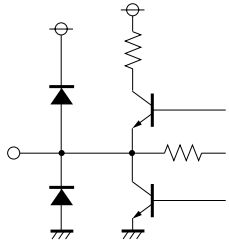
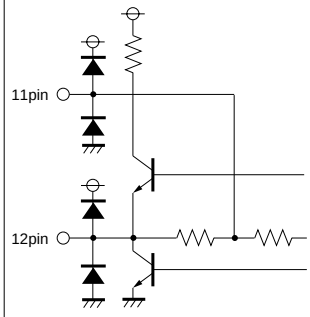
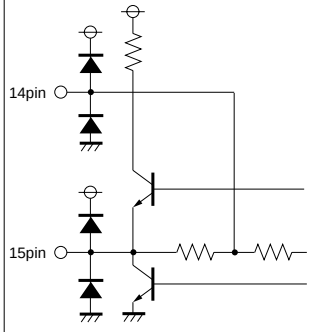
H	3ch MUTE
L	NORMAL

• MUTEB (8pin)

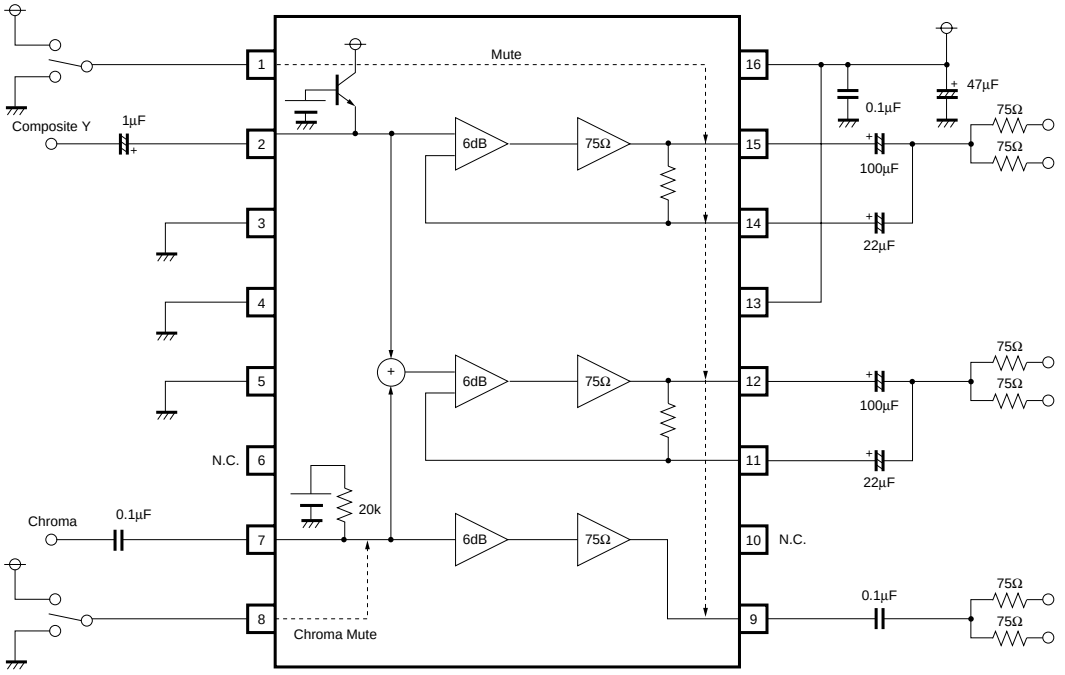
H	CHROMA MUTE
L	NORMAL

●Pin descriptions and equivalent I / O circuits

Pin. No	Pin name	IN	OUT	Standard potential	Equivalent I / O circuit	Pin description
1 8	MUTEA MUTEB	○	—	—		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		Signal output pin Chroma signal output pin. When this drops below 0.2V, the protection circuit operates and the IC enters power save mode.
11 12	MIXOUT2 MIXOUT1	—	○	0.9V 0.95V		Signal output pin 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.
14 15	OUTA2 OUTA1	—	○	0.9V 0.95V		Signal output pin 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.
13 16	$V_{CC}2$ $V_{CC}1$	—	—	5.0V 5.0V		Power supply pin $V_{CC}1$ and $V_{CC}2$ are not connected internally. Use with them connected externally.

●Application example



When you will not use the sag compensation function

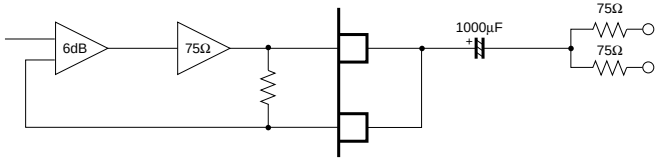
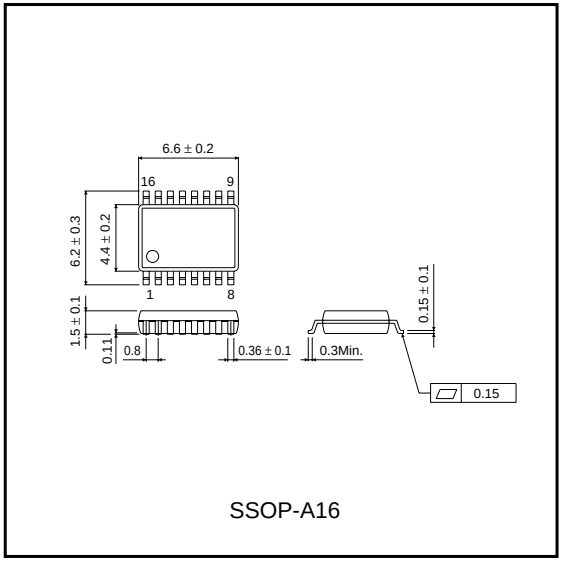


Fig.2

●External dimensions (Units: mm)



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