75Ω driver with Y / C MIX circuit

BA7664FV

The BA7664FV is a 75Ω driver with a 6dB amplifier and a Y / C MIX circuit. The 75Ω driver is capable of driving a load sufficient for two circuits, as well as being equipped with a sag correction function which reduces the capacitance of the output coupling capacitor. The IC comes in the compact 8-pin SSOP-B package. The composite Y signal input pin is sync chip clamped input, while the chrominance input pin is bias input. An internal power-saving circuit is also included which provides an output muting function and output pin shorting protection.

●Applications

Video cameras, electronic cameras and others

●Features

1) The compact 8-pin SSOP-B package is used.
2) Operates at a low power consumption (60mW Typ.).
3) Internal Y / C MIX circuit.
4) Internal output muting circuit.
5) Internal power-saving circuit.
6) Internal output protection circuit.
7) Internal sag correction function makes it possible to reduce the capacitance of the output coupling capacitor.
8) A load sufficient for two circuits can be driven.

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{CC}	8	V
Power dissipation	Pd	350	mW
Operating temperature	T_{opr}	– 25 ~ + 75	°C
Storage temperature	T_{stg}	– 55 ~ + 125	°C

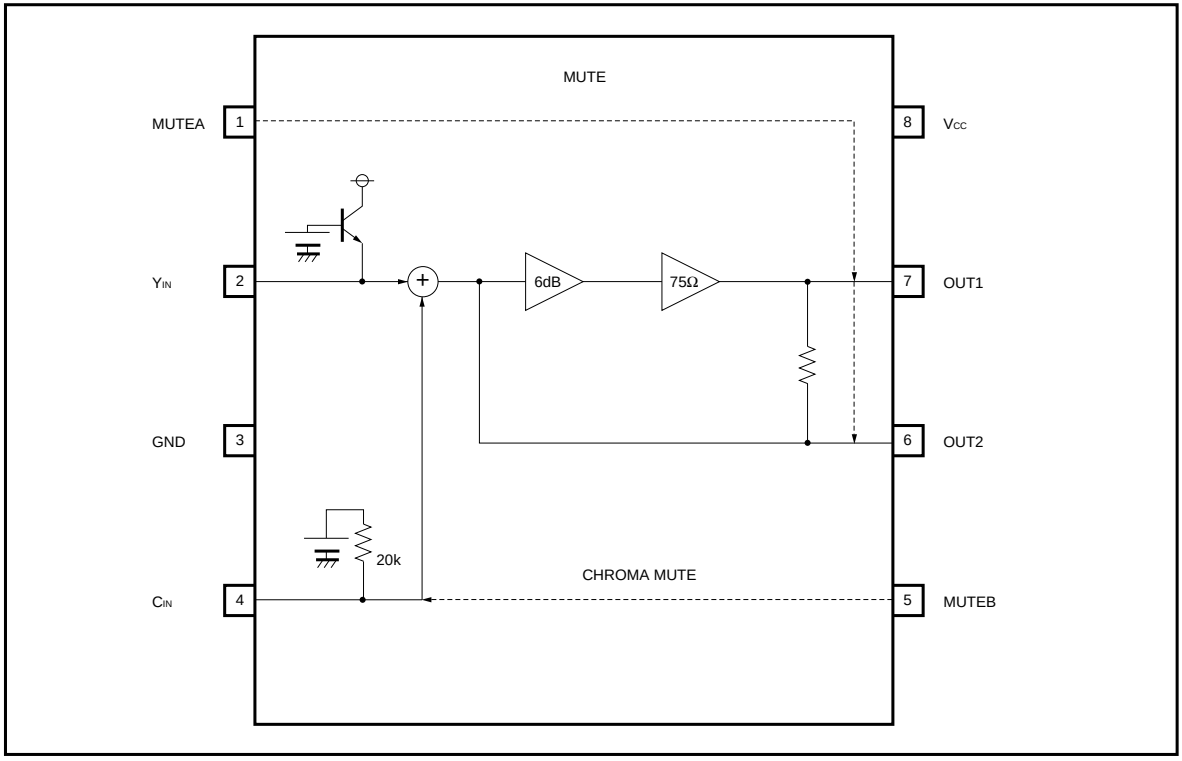
∗ Reduced by 3.5mW for each increase in Ta of 1°C over 25°C

●Recommended operating conditions (Ta = 25°C)

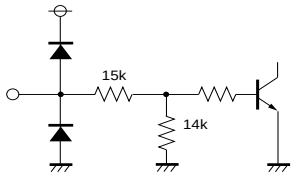
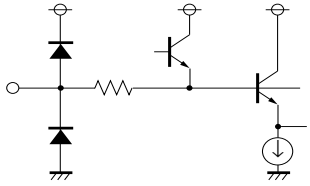
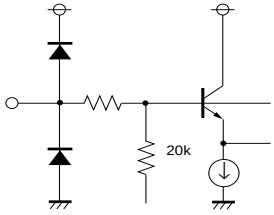
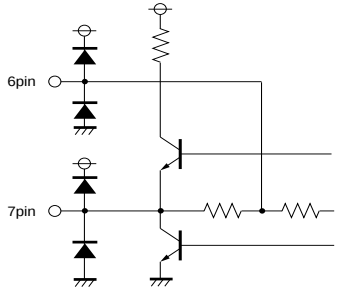
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating power supply voltage	V_{CC}	4.5	5.0	5.5	V

∗Not designed for radiation resistance.

●Block diagram



●Pin descriptions and input / output circuits

Pin. No	Pin name	IN	OUT	Reference potential	Equivalent circuit	Pin description
1 5	MUTEA MUTEB	○	—	—		Muting control If MUTEA (pin 1) is set to HIGH, the output is muted. If MUTEB (pin 8) is set to HIGH, only the chrominance signal is muted. (The Y signal is output without being muted.)
2	Y_{IN}	○	—	2.0V		Signal input This is the input pin for composite Y signals, and is sync chip clamped input.
3	GND	—	—	0V		Ground
4	C_{IN}	○	—	2.0V		Signal input This is the input pin for chrominance signals, and is bias-type input. The input impedance is 20kΩ.
6 7	MIXOUT2 MIXOUT1	—	○	0.9V 0.95V		Signal output These are the Y / C MIX signal output. Pin 6 is the pin for sag correction. If pin 7 is set to 0.2V or less, the protective circuit is triggered and the power-saving mode is accessed.
8	V_{CC}	—	—	5.0V		Power supply

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Circuit current	I_{CC}	6.1	12.2	18.3	mA	With no signal
Max. output level	V_{om}	2.6	3.0	—	V_{P-P}	f = 1kHz,THD = 1%V_{02}
Voltage gain	G_V	– 1.0	– 0.2	0.6	dB	f = 4.43MHz / V_{01}
Frequency characteristic	G_F	– 1.5	– 0.5	0.5	dB	f = 7MHz / 1MHz,1V_{P-P} / V_{01}
Muting attenuation	M_T	—	– 60	—	dB	f = 4.43MHz,1V_{P-P} / V_{01}
Muting switching high level	V_{THH}	2.2	—	V_{CC}	V	—
Muting switching low level	V_{THL}	0	—	0.7	V	—
Input impedance	Z_{IN}	16	20	24	kΩ	Chrominance input pin (pin 7)
Circuit current when muted	I_{MUTE}	—	1.3	2.6	mA	MUTEA “H”

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential gain	DG	—	1.0	2.0	%	V_{IN} = 1.0V_{P-P} reference staircase signal
Differential phase	DP	—	0.5	2.0	DEG	V_{IN} = 1.0V_{P-P} reference staircase signal

●Mute switch mode settings

• MUTEA (1pin)

H	MUTE
L	NORMAL

• MUTEB (5pin)

H	CHROMA MUTE
L	NORMAL

●Measurement circuit

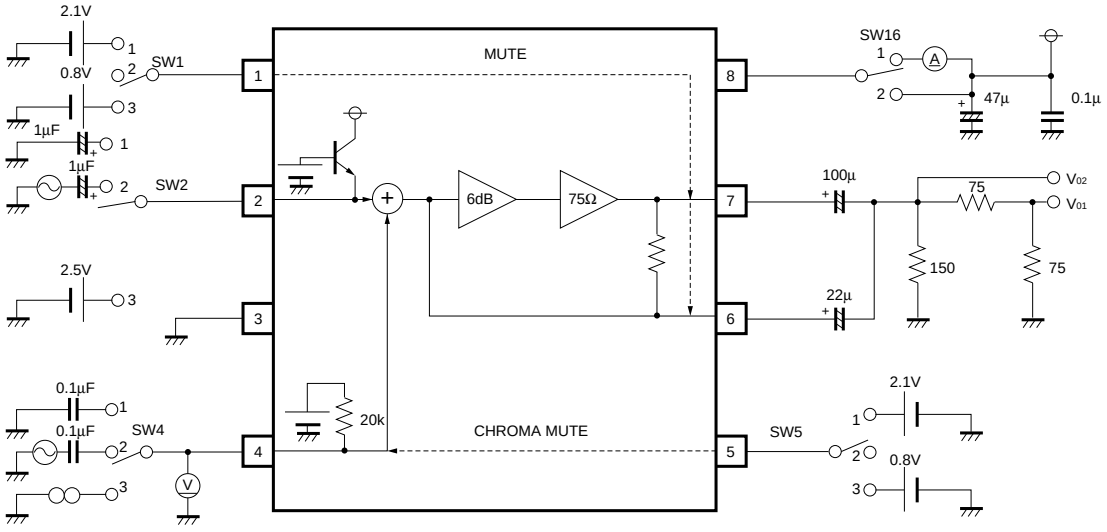


Fig.1

●Measurement conditions

Parameter		Symbol	SW Conditions					Measurement method
			1	2	4	5	8	
Circuit current		I_{CC}	2	1	1	2	1	∗1
Max. output level		V_{OM}	3	2	1	3	2	∗2
Voltage gain	Y→OUT	G_{V1}	3	2	1	3	2	∗3
	C→OUT	G_{V2}	3	3	2	3	2	∗3
Frequency characteristic		G_F	3	1	2	3	2	∗4
Muting attenuation		M_T	1	2	1	3	2	∗5
Chroma muting attenuation		M_{TC}	3	3	2	1	2	∗5
Input impedance		Z_{IN}	3	1	3	3	2	∗6
Circuit current when muted		I_{MUTE}	1	1	1	2	1	∗7

∗ The muting switching level is substituted by carrying out the above measurement at H = 2.1V, L = 0.8V.

Measurement method

∗1 Measure the circuit current when no signal is present.

∗2 Apply a sine wave of f = 1kHz to the input, and adjust the input level so that the output distortion is 1%.
At this time, set the output voltage to the maximum output level of V_{OM} [V_{P-P}].

∗3 Measure the output V_O [V_{P-P}] with a sine wave of f = 4.43MHz, 1V_{P-P} applied to the input.
Voltage gain G_V is: $G_V = 20 \text{ Log } (V_O / V_{IN})$ [dB]

∗4 Measure the outputs V_{O7} and V_{O1} [V_{P-P}] each with sine waves of f = 7MHz, 1V_{P-P} and f = 1MHz, 1V_{P-P} applied to the input.
Voltage frequency G_F is: $G_F = 20 \text{ Log } (V_{O7} / V_{O1})$ [dB]

∗5 Measure the output V_O [V_{P-P}] with a sine wave of f = 4.43MHz, 1V_{P-P} applied to the input.
The muting attenuation M_T is: $M_T = 20 \text{ Log } (V_O / V_{IN})$ [dB]

∗6 Measure the input voltage V_{INSO} [V] and the open voltage of the input V_{INO} [V] when 50μA is introduced.
The input impedance Z_{IN} is: $Z_{IN} = |V_{INSO} – V_{INO}| / 50 \times 1000$ [kΩ]

∗7 Measure the circuit current when MUTEA (pin 1) is HIGH.

●Application examples

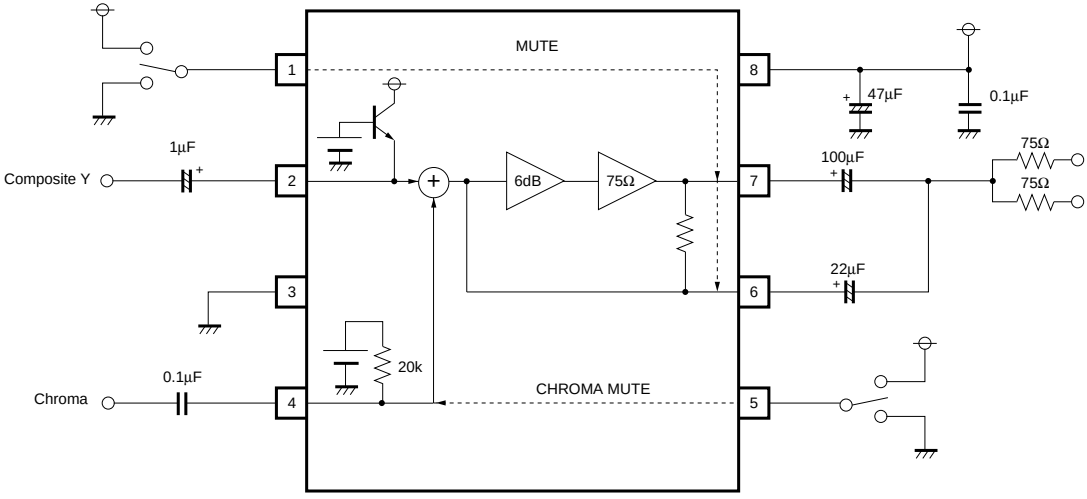


Fig.2

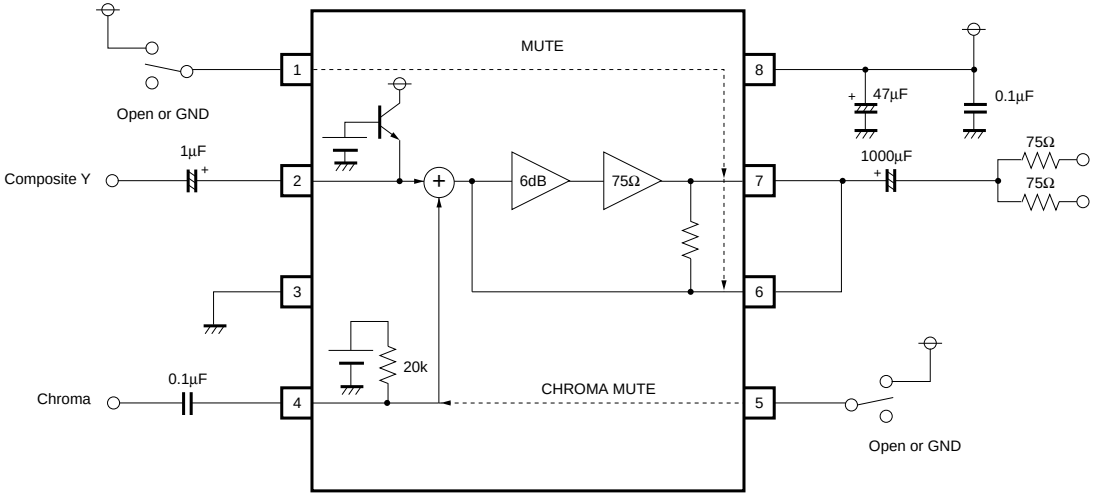
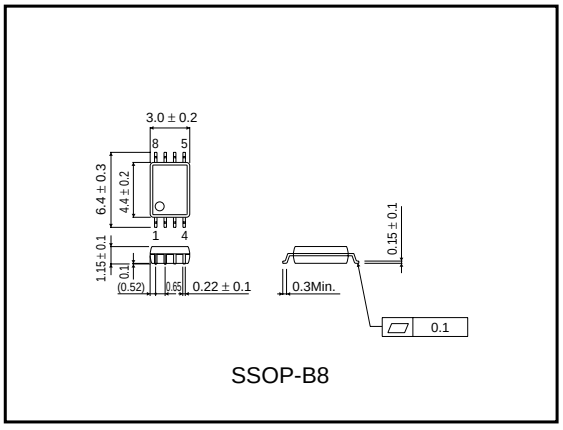


Fig.3

●External dimensions (Units: mm)



SSOP-B8