

Structure : Silicon Monolithic Integrated Circuit

Product name : 6ch Video driver (for DVD)

Type : **BH7856FS**

Outer dimensions : Fig.1 SSOP-A32 (Plastic Package)

Block diagram : Fig.2

Feature :

- 1) Built in LPF with characteristics suited to DVD players and recorders
(Y, C, Y/C MIX : 6.75MHz, Py/G ,Pb/B, and Pr/R : 13.5MHz)
- 2) Built in 6ch video driver (Y, C, Y/C MIX, Py/G, Pb/B, and Pr/R)
- 3) 75 Ω × 2 Driver (Y, C, Y/C MIX,Py/G, Pb/B and Pr/R)
- 4) Built in MUTE switch (double as power save function)
- 5) Built in S1/S2 circuit
- 6) Built in selection switch for SCART connector (CVBS,R or C,Y output)

○Absolute Maximum Ratings(Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|---------------------------|--------|--------------|------|
| Supply Voltage | VccMAX | 6.0 | V |
| Power Dissipation | Pd | 1.35 *1 | W |
| Terminal applied voltage | Vin | -0.3~Vcc+0.3 | V |
| Storage Temperature Range | Tstg | -55 ~ +125 | °C |

*1 When mounted on a 100mm × 100mm × 1.6mm PCB board, the rated values are reduced at 13.5mW/°C when temperature exceeds 25°C. (Glass epoxy substrate)

○Operating Range

| Parameter | Symbol | Limits | Unit |
|-----------------------------|--------|-------------|------|
| Supply Voltage | Vcc | +4.5 ~ +5.5 | V |
| Operation Temperature Range | Topr | -40 ~ +85 | °C |

* This product is not designed for protection against radioactive rays.

○Electrical characteristics (Ta= 25°C, Vcc=5.0V Unless otherwise specified)

| Parameter | Symbol | Specification | | | Unit | Testing condition | |
|--|-------------------------------|-------------------|------|-----|-----------------|--|---------------------------------------|
| | | Min | Typ | Max | | | |
| Circuit current 1 | I _{CC1} | 50 | 75 | 100 | mA | No signal 6ch Active MODE | |
| Circuit current 2 | I _{CC2} | 25 | 45 | 65 | mA | No signal Mute1 ON (C,Y,CV system) | |
| Circuit current 3 | I _{CC3} | 15 | 35 | 55 | mA | No signal Mute2 ON (Py/G, Pb/B, Pr/R system) | |
| Circuit current 4 | I _{CC4} | 1 | 2.5 | 5 | mA | No signal Mute1 & Mute2 ON | |
| Output dynamic range 1 | V _{OM1} | 2.4 | 3.0 | — | V _{pp} | f=10 kHz, THD = 1.0% C, Py/G(BIAS), Pb/B,Pr/R | |
| Output dynamic range 2 | V _{OM2} | 2.4 | 2.8 | — | V _{pp} | f=10 kHz, THD = 1.0% CV,Y,MIX, Py/G(CLAMP) | |
| Voltage gain C | G _{VC} | 5.6 | 6 | 6.4 | dB | CIN : f=3.58MHz, 1Vpp | |
| C-Pr/R(SEL3="H") | G _{VCP_r} | 5.6 | 6 | 6.4 | dB | CIN : f=3.58MHz, 1Vpp | |
| MIX(C) | G _{VMIXC} | 5.6 | 6 | 6.4 | dB | CIN : f=3.58MHz, 1Vpp | |
| MIX(Y) | G _{VMIXY} | 5.6 | 6 | 6.4 | dB | YIN : f=1MHz, 1Vpp | |
| CV | G _{V_{CV}IN} | 5.6 | 6 | 6.4 | dB | CVIN : f=1MHz, 1Vpp | |
| Y-CV(SEL3="H") | G _{V_{YCV}} | 5.6 | 6 | 6.4 | dB | YIN : f=1MHz, 1Vpp | |
| Y | G _{V_Y} | 5.6 | 6 | 6.4 | dB | YIN : f=1MHz, 1Vpp | |
| Py/G (CLAMP/BIAS) | G _{V_{Py}} | 5.6 | 6 | 6.4 | dB | Py/G IN : f=1MHz, 1Vpp | |
| Pb/B | G _{V_{Pb}} | 5.6 | 6 | 6.4 | dB | Pb/B IN : f=1MHz, 1Vpp | |
| Pr/R | G _{V_{Pr}} | 5.6 | 6 | 6.4 | dB | Pr/R IN : f=1MHz, 1Vpp | |
| Frequency Characteristics 1 (CIN, CVIN, YIN) | f11 | -1.5 | -0.5 | 0.5 | dB | f _{in} =100k/6.75MHz, 1Vpp | |
| | f12 | — | -33 | -25 | dB | f _{in} =100k/27MHz, 1Vpp | |
| Frequency Characteristics 2 (Py/G IN, Pb/B IN, Pr/R IN) | f21 | -1.5 | -0.5 | 0.5 | dB | LPF13.5MHz f _{in} =100k/13.5MHz, 1Vpp | |
| | f22 | — | -30 | -23 | dB | LPF13.5MHz f _{in} =100k/54MHz, 1Vpp | |
| Crosstalk | CT | — | -60 | -50 | dB | f _{in} =4.43MHz, 1Vpp | |
| MUTE attenuation | MT | — | -60 | -50 | dB | CIN : f = 4.43MHz, 1Vpp YIN,CVIN,Py/GIN,Pb/BIN,Pr/RIN : f=1MHz, 1Vpp | |
| S-DCOUT Voltage | L | V _{SDCL} | — | 0.1 | 0.5 | V | RL=10kΩ +100kΩ S1=L,S2=L |
| | M | V _{SDCM} | 1.9 | 2.1 | 2.3 | V | RL=10kΩ +100kΩ S1=L,S2=H S1=H,S2=H |
| | H | V _{SDCH} | 4.3 | 4.6 | — | V | RL=10kΩ +100kΩ S1=H,S2=L |
| MUTE Control Voltage | V _{THH} | 2.0 | — | VCC | V | MUTE OFF | |
| | V _{THL} | GND | — | 0.7 | V | MUTE ON | |

| Parameter | Symbol | Specification | | | Unit | Testing condition |
|---|------------------|---------------|-----|-----|------|---|
| | | Min | Typ | Max | | |
| SEL1 (CV /MIX) Control Voltage | V _{THH} | 2.0 | — | VCC | V | CV MODE CVIN→CV_Y OUT |
| | V _{THL} | GND | — | 0.7 | V | MIX MODE CIN,YIN→CV_Y OUT |
| SEL2 (BIAS/CLAMP) Control Voltage | V _{THH} | 2.0 | — | VCC | V | BIAS MODE Py/G IN→Py/G OUT |
| | V _{THL} | GND | — | 0.7 | V | CLAMP MODE Py/G IN→Py/G OUT |
| SEL3 (SCART OUT/6ch OUT) Control Voltage | V _{THH} | 2.0 | — | VCC | V | SCART OUT MODE YIN→CV_Y OUT CIN→Pr/R_C OUT |
| | V _{THL} | GND | — | 0.7 | V | 6ch OUT MODE CVIN→CV_Y OUT Pr/R IN→Pr/R_C OUT |
| S1/S2 Control Voltage | V _{THH} | 2.0 | — | VCC | V | High |
| | V _{THL} | GND | — | 0.7 | V | Low |
| Control terminal Input current | I _{IH} | — | — | 155 | μA | VH= 4.5V |
| | I _{IL} | — | — | 20 | μA | VL = 0.4V |

○Outer dimensions

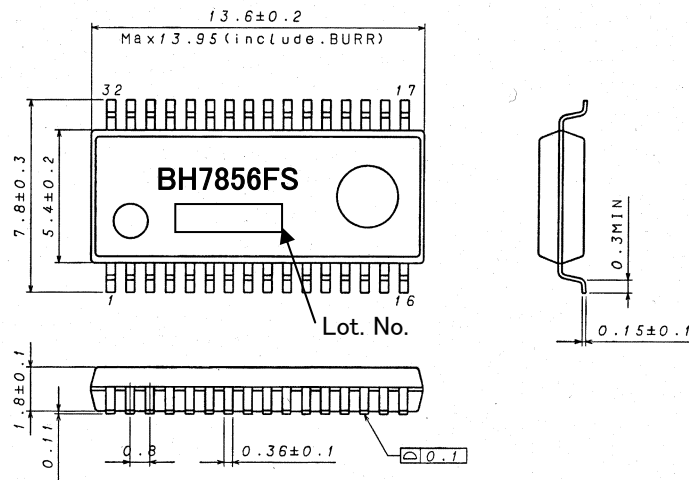


Fig.1 Outer dimensions SSOP-A32(Unit : mm)

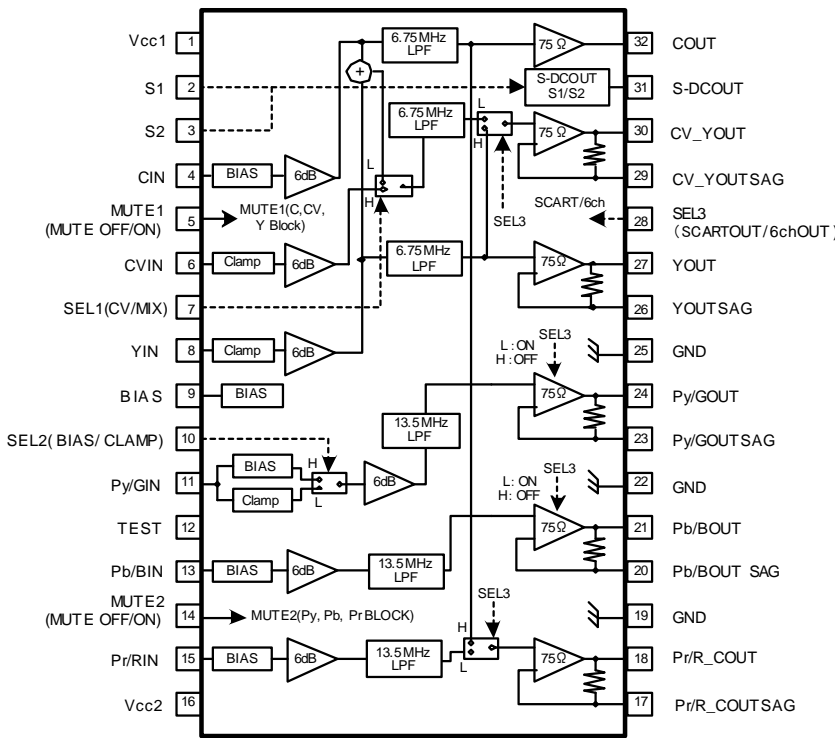
○Operation mode table

Table.1 Operation mode table

| Operation Mode | MUTE1 | MUTE2 | SEL1 | SEL3 | Output Signal | | | | | |
|----------------|-------|-------|------|------|---------------|----------|------|----------|----------|------------|
| | | | | | COUT | CV_Y OUT | YOUT | Py/G OUT | Pb/B OUT | Pr/R_C OUT |
| 1 | L | L | L | L | x | x | x | x | x | x |
| 2 | L | L | L | H | x | x | x | x | x | x |
| 3 | L | L | H | L | x | x | x | x | x | x |
| 4 | L | L | H | H | x | x | x | x | x | x |
| 5 | L | H | L | L | x | x | x | Py/G IN | Pb/B IN | Pr/R IN |
| 6 | L | H | L | H | x | x | x | x | x | x |
| 7 | L | H | H | L | x | x | x | Py/G IN | Pb/B IN | Pr/R IN |
| 8 | L | H | H | H | x | x | x | x | x | x |
| 9 | H | L | L | L | CIN | YC MIX | YIN | x | x | x |
| 10 | H | L | L | H | CIN | YIN | YIN | x | x | CIN |
| 11 | H | L | H | L | CIN | CV IN | YIN | x | x | x |
| 12 | H | L | H | H | CIN | YIN | YIN | x | x | CIN |
| 13 | H | H | L | L | CIN | YC MIX | YIN | Py/G IN | Pb/B IN | Pr/R IN |
| 14 | H | H | L | H | CIN | YIN | YIN | x | x | CIN |
| 15 | H | H | H | L | CIN | CV IN | YIN | Py/G IN | Pb/B IN | Pr/R IN |
| 16 | H | H | H | H | CIN | YIN | YIN | x | x | CIN |

* When SEL3="H", Py,Pb,Pr block power on without MUTE2="H", but Py and Pb block are no signal output.
* "x" express no output. And other output signal from input pin written in table.

○Block diagram



*12pin is for the test. Please short the test pin to GND.

Fig.2 Block diagram

○Pin number/Pin name

| No. | Pin name |
|-----|--------------------------|
| 1 | Vcc1 |
| 2 | S1 |
| 3 | S2 |
| 4 | CIN |
| 5 | MUTE1(OFF/ON) |
| 6 | CV IN |
| 7 | SEL1(CV/MIX) |
| 8 | Y IN |
| 9 | BIAS |
| 10 | SEL2(BIAS/CLAMP) |
| 11 | Py/G IN |
| 12 | TEST |
| 13 | Pb/B IN |
| 14 | MUTE2(OFF/ON) |
| 15 | Pr/R IN |
| 16 | Vcc2 |
| 17 | Pr/R_C OUT SAG |
| 18 | Pr/R_C OUT |
| 19 | GND |
| 20 | Pb/B OUT SAG |
| 21 | Pb/B OUT |
| 22 | GND |
| 23 | Py/G OUT SAG |
| 24 | Py/G OUT |
| 25 | GND |
| 26 | YOUT SAG |
| 27 | YOUT |
| 28 | SEL3 (SCART OUT/6ch OUT) |
| 29 | CV_Y OUT SAG |
| 30 | CV_Y OUT |
| 31 | S-DCOUT |
| 32 | COUT |

Table.2 Control pin function

| Pin name | State | Function |
|----------|-------|---------------------------------|
| SEL1 | H | CVIN—CV_Y OUTPUT MODE |
| | L | MIX(CIN,YIN)—CV_Y OUTPUT MODE |
| SEL2 | H | BIAS MODE (Py/G INPUT) |
| | L | CLAMP MODE (Py/G INPUT) |
| SEL3 | H | SCART OUTPUT MODE |
| | L | 6ch OUTPUT MODE |
| MUTE1 | H | C, CV, Y BLOCK MUTE OFF |
| | L | C, CV, Y BLOCK MUTE |
| MUTE2 | H | Py/G, Pb/B, Pr/R BLOCK MUTE OFF |
| | L | Py/G, Pb/B, Pr/R BLOCK MUTE |

○ Cautions on use

(1) Absolute maximum ratings

This IC may be damaged if the absolute maximum ratings for the applied voltage, temperature range, or other parameters are exceeded. Therefore, avoid using a voltage or temperature that exceeds the absolute maximum ratings. If it is possible that absolute maximum ratings will be exceeded, use fuses or other physical safety measures and determine ways to avoid exceeding the IC's absolute maximum ratings.

(2) GND voltage

Make setting of the potential of the GND terminal so that it will be maintained at the minimum in any operating state. Furthermore, check to be sure no terminals are at a potential lower than the GND voltage including an actual electric transient.

(3) Thermal design

Ensure sufficient margins to the thermal design by taking in to account the allowable power dissipation during actual use modes.

(4) Shorting between pins and mounting errors

When mounting the IC chip on a board, be very careful to set the chip's orientation and position precisely.

When the power is turned on, the IC may be damaged if it is not mounted correctly.

The IC may also be damaged if a short occurs (due to a foreign object, etc.) between two pins, between a pin and the power supply, or between a pin and the GND.

(5) Operation in strong magnetic fields

Note with caution that operation faults may occur when this IC operates in a strong magnetic field.

(6) Place the power supply bypass capacitor as close as possible to the Vcc pin (PIN1, PIN16).

(7) When not using a sag correction circuit

Connect the sag correction pin and output pin as closely as possible.

There is a danger of high frequency oscillation.

Also make the distance from the output pin (OUT pin, SAG pin) to the 75 Ω resistance as short as possible.

(8) When using a sag correction circuit

Make the length of the output pin (OUT pin, SAG pin) and capacitor as short as possible.

There is a danger of high frequency oscillation.

Also make the distance from the output pin (OUT pin, SAG pin) to the 75 Ω resistance as short as possible.

If these cautions is not observed in board layout, connect a capacitor (0.01 μF-0.1 μF) as short as possible

Notes

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