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) 75Ω×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℃)

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	℃

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

○Operating Range

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

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

○Electrical characteristics（Ta= 25℃, 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	—	Vpp	f=10 kHz, THD = 1.0% C, Py/G(BIAS), Pb/B,Pr/R
Output dynamic range 2	V_{OM2}	2.4	2.8	—	Vpp	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_{VCPr}	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_{VCVIN}	5.6	6	6.4	dB	CVIN：f=1MHz, 1Vpp
Y-CV(SEL3="H")	G_{VYCV}	5.6	6	6.4	dB	YIN：f=1MHz, 1Vpp
Y	G_{VY}	5.6	6	6.4	dB	YIN：f=1MHz, 1Vpp
Py/G (CLAMP/BIAS)	G_{VPY}	5.6	6	6.4	dB	Py/G IN：f=1MHz, 1Vpp
Pb/B	G_{VPb}	5.6	6	6.4	dB	Pb/B IN：f=1MHz, 1Vpp
Pr/R	G_{VPr}	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	fin=100k/6.75MHz, 1Vpp
	f12	—	-33	-25	dB	fin=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 fin=100k/13.5MHz, 1Vpp
	f22	—	-30	-23	dB	LPF13.5MHz fin=100k/54MHz, 1Vpp
Crosstalk	CT	—	-60	-50	dB	fin=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
S-DCOUT Voltage M	V_{SDCM}	1.9	2.1	2.3	V	RL=10kΩ+100kΩ S1=L,S2=H S1=H,S2=H
S-DCOUT Voltage 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

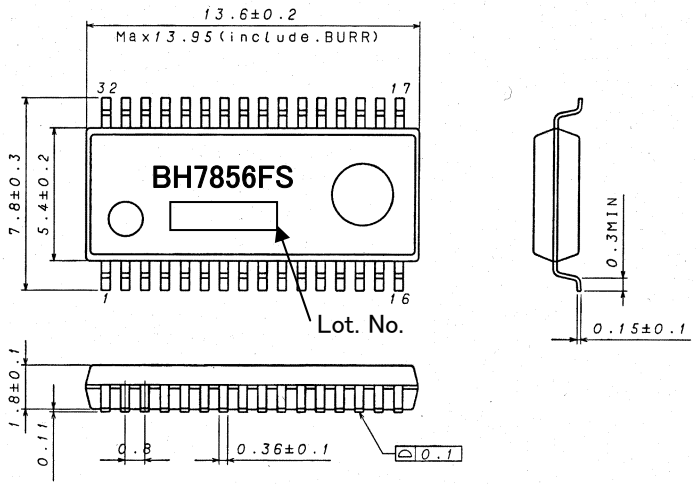


Fig.1 Outer dimensions SSOP-A32(Unit : mm)

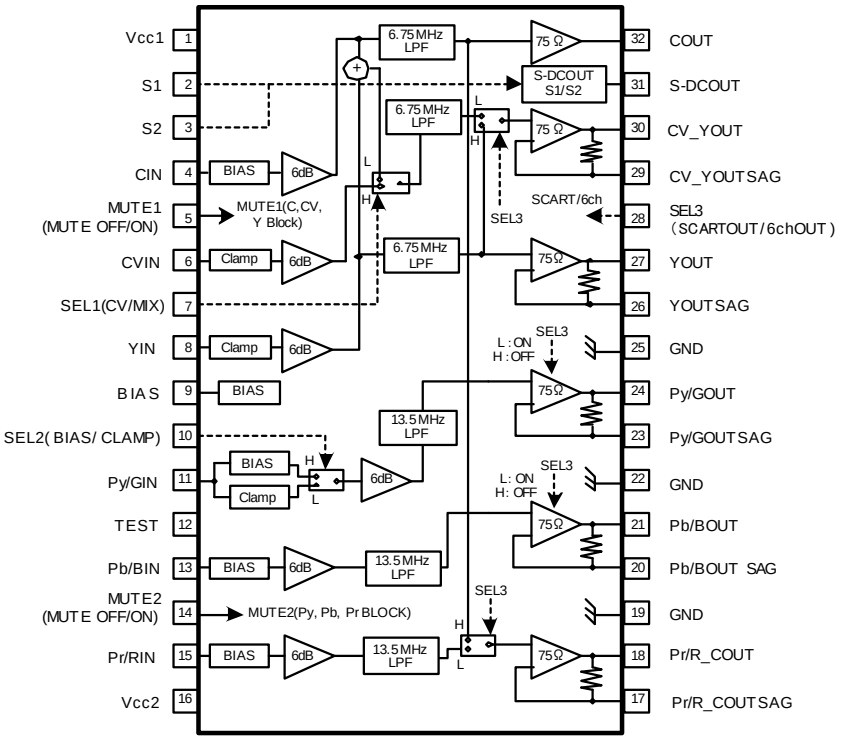
○Operation mode table

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	×	×	×	×	×	×
2	L	L	L	H	×	×	×	×	×	×
3	L	L	H	L	×	×	×	×	×	×
4	L	L	H	H	×	×	×	×	×	×
5	L	H	L	L	×	×	×	Py/G IN	Pb/B IN	Pr/R IN
6	L	H	L	H	×	×	×	×	×	×
7	L	H	H	L	×	×	×	Py/G IN	Pb/B IN	Pr/R IN
8	L	H	H	H	×	×	×	×	×	×
9	H	L	L	L	CIN	YC MIX	YIN	×	×	×
10	H	L	L	H	CIN	YIN	YIN	×	×	CIN
11	H	L	H	L	CIN	CV IN	YIN	×	×	×
12	H	L	H	H	CIN	YIN	YIN	×	×	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	×	×	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	×	×	CIN

＊When SEL3="H", Py,Pb,Pr block power on without MUTE2="H", but Py and Pb block are no signal output.
＊"×" 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

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

○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

○ 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 75Ω 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 75Ω resistance as short as possible.
If these cautions is not observed in board layout, connect a capacitor (0.01μF~0.1μF) as short as possibl

Notes

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