Structure : Silicon Monolithic Integrated Circuit

Product name : Broadband Triple Circuits Video Signal Switchers

Type : **BA7657S, BA7657F**

Features :
1) Operates on 5 V single power supply.
2) Built-in wide-range RGB signal switches. (fc = 230 MHz,-3dB)
3) Built-in switching circuit for HD signal and VD signal.
4) Built-in separation circuit for synchronization signal superposed on G signal.

○Absolute Maximum Ratings (Ta=25℃)

Parameter		Symbol	Limits	Unit
Supply voltage		VCC	8.0	V
Power dissipation	BA7657S	Pd	1200 *1	mW
	BA7657F		550 *2	
Operating temperature		Topr	-25～+75	℃
Storage temperature		Tstg	-55～+125	℃

*1) Deratings is done at 12mW/℃ above Ta=25℃.
*2) Deratings is done at 5.5mW/℃ above Ta=25℃.

○Operating Range (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	VCC	4.5	5.0	5.5	V

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

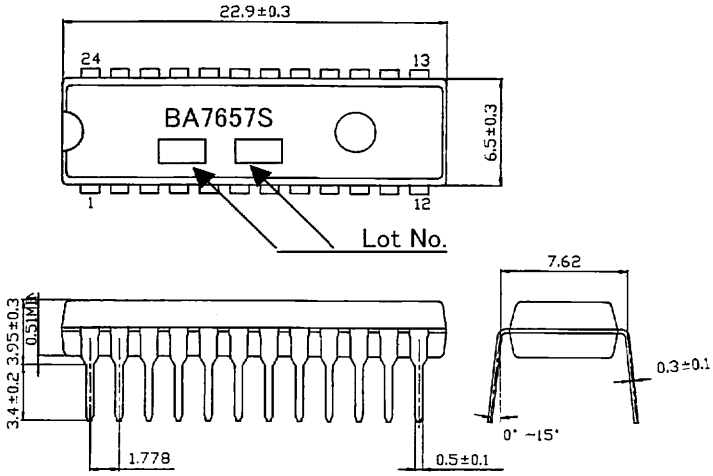
Application example

The product described in this specification is designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment, communications devices, electrical appliances, and electronic toys). Should you intend to use this product with equipment or devices which require an extremely high level or reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices),please be sure to consult with our sales representative in advance.

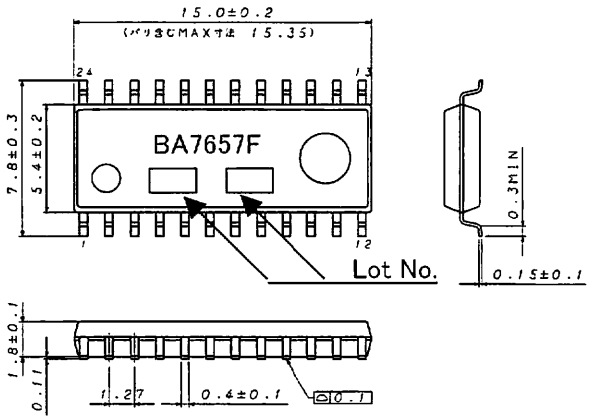
○Electrical characteristics (Unless otherwise noted, Ta=25℃、Vcc=5.0V)

Parameter	Symbol	Specifications			Unit	Conditions
		Min.	Typ.	Max.		
Circuit current	ICC	20	35	50	mA	
〈Analog SW block〉						
Maximum output level	Vom	2.8	—	—	VP-P	f=1kHz
Voltage gain	Gv	-1.0	-0.5	0	dB	f=1MHz,VIN=1VP-P
Input pin voltage gain differential	ΔGvI	-0.2	0	0.2	dB	f=10MHz,VIN=1VP-P
Inter block voltage gain differential	ΔGvB	-0.2	0	0.2	dB	f=1MHz,VIN=1VP-P
Input pin cross talk1	CTI1	—	-50	-40	dB	f=1MHz,VIN=1VP-P
Interblock crosstalk1	CTB1	—	-50	-40	dB	f=10MHz,VIN=1VP-P
Input pin cross talk2	CTI2	—	-30	-15	dB	f=230kHz, VIN=1VP-P
Interblock crosstalk2	CTB2	—	-30	-15	dB	f=230MHz,VIN=1VP-P
Frequency characteristic	Gf	-6	-3	-1	dB	f=1MHz/230MHz, VIN=1VP-P
Input pin frequency differential	ΔGfI	-1	0	+1	dB	f=1MHz/100MHz, VIN=1VP-P
Interblock frequency characteristic differential	ΔGfB	-1	0	+1	dB	f=1MHz/100MHz, VIN=1VP-P
〈Digital SW block〉						
"H" level input voltage	VIH	1.8	—	—	V	
"L" level input voltage	VIL	—	—	1.2	V	
"H" level input current	IIH	80	100	130	μA	VIN=5.0V
"L" level input current	IIL	-3	-1	—	μA	VIN=0V
Rise time	tr	—	30	50	ns	
Fall time	tf	—	30	50	ns	
Rise delay time	trd	—	50	80	ns	
Fall delay time	tfd	—	30	50	ns	
"H" level output voltage	VOH	3.0	3.7	—	V	
"L" level output voltage	VOL	—	0.2	0.4	V	
"H" level output current	IOH	-400	—	—	μA	
"L" level output current	IOL	5	—	—	mA	
〈Synchronization signal separation block〉						
Minimum SYNC separation level	VSMin.	-50	—	50	mVP-P	
"H" level output voltage	VOH	4.5	5.0	—	V	
"L" level output voltage	VOL	—	0.2	0.5	V	
"L" level output current	IOL	2	—	—	mA	
Rise time	tr	—	80	130	ns	
Fall time	tf	—	30	80	ns	
Rise delay time	trd	—	100	150	ns	
Fall delay time	tfd	—	100	150	ns	
〈Control block〉						
"H" level output voltage	VIH	1.8	—	—	V	
"L" level output voltage	VIL	—	—	1.2	V	
"H" level output current	IIH	80	100	130	μA	
"L" level output current	IIL	-3	-1	—	μA	

○Outer dimensions

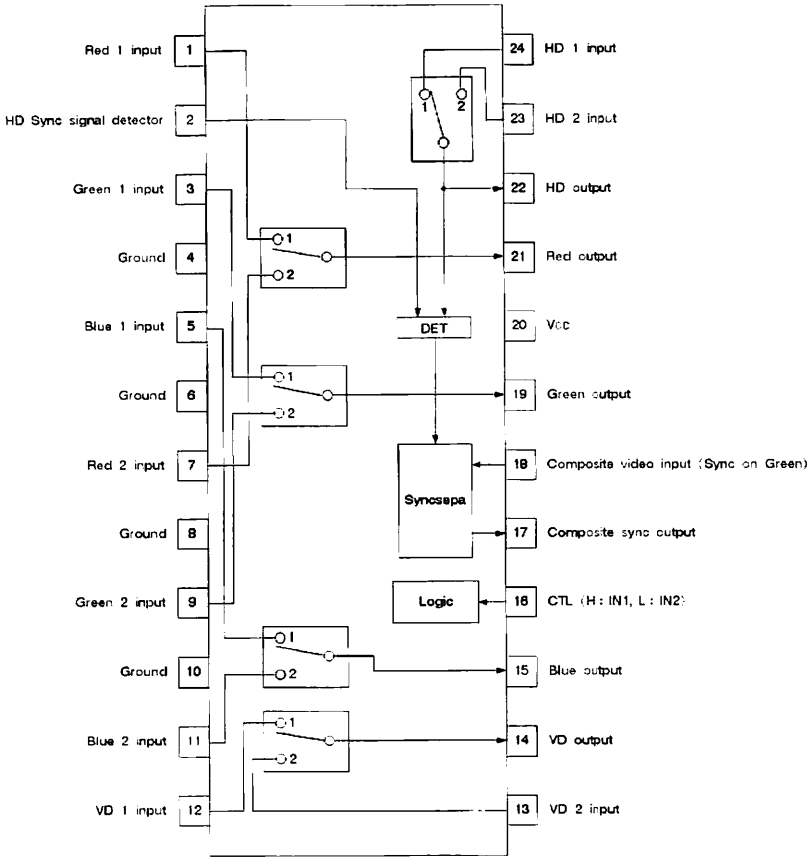


SDIP24 (Unit: mm)



SOP24 (Unit: mm)

○Block diagram
BA7657S, BA7657F



○Pin number and pin name
BA7657S, BA7657F

Pin No.	Pin name
1	Red 1 input
2	HD Sync signal detector
3	Green 1 input
4	Ground
5	Blue 1 input
6	Ground
7	Red 2 input
8	Ground
9	Green 2 input
10	Ground
11	Blue 2 input
12	VD 1 input
13	VD 2 input
14	VD output
15	Blue output
16	CTL(H : IN1 ,L : IN2)
17	Composite sync output
18	Composite video input (Sync on Green)
19	Green output
20	Vcc
21	Red output
22	HD output
23	HD 2 input
24	HD 1 input

○Cautions on use

1) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.

2) GND potential
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.

3) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.

4) Shorts between pins and miss-installation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is miss-installed and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.

5) Operation in strong magnetic fields
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

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