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Structure : Silicon Monolithic Integrated Circuit
 Product name : Sync. Separator/Sync. Detector IC for Multi-Sync. Monitor

Type : **BA7078AF, BA7078AS**

- Features :
- 1) Single 5V power supply operation and low power consumption
 - 2) Built-in synchronization signal existence and polarity detection functions
 - 3) Adjustable clamp pulse width and front edge or back edge selectable as output position
 - 4) Vertical synchronization separation based on horizontal frequency tracking can separate from 1H
 - 5) Few externally attached components

○Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	Vcc	7.0	V
Power dissipation	Pd	^{*1} 450(BA7078AF)	mW
		^{*2} 600(BA7078AS)	
Operating temperature	Topr	-25~+75	°C
Storage temperature	Tstg	-55~+125	°C

^{*1} Deratings is done at 4.5mW/°C above Ta=25°C.

^{*2} Deratings is done at 6.0mW/°C above Ta=25°C.

○Operating range (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Vcc	4.75	5.0	5.25	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, $V_{CC}=5V$, $T_a=25^{\circ}C$)

Parameter	Symbol	Limits			Unit	Conditions
		Min.	Typ.	Max.		
Quiescent circuit current	I_{CC}	21	30	39	mA	
VDRV output voltage "H"	V VDH	4.5	5.0	—	V	
VDRV output voltage "L"	V VDL	—	0.2	0.5	V	
VDRV output current "L"	I VDL	8	—	—	mA	
VDRV rising delay time	trdVD	—	280	450	ns	VSYNC IN
HDRV output voltage "H"	V HDH	4.5	5.0	—	V	
HDRV output voltage "L"	V HDL	—	0.2	0.5	V	
HDRV output current "L"	I HDL	8	—	—	mA	
HDRV rising delay time 1	trdHD1	—	65	115	ns	C/HSYNC IN
HDRV rising delay time 2	trdHD2	—	95	145	ns	VIDEO IN
CLAMP output voltage "H"	V CPH	4.5	5.0	—	V	
CLAMP output voltage "L"	V CPL	—	0.2	0.5	V	
CLAMP output current "L"	I CPL	8	—	—	mA	
CLAMP rising delay time 1	trdCP1	—	75	125	ns	front edge
CLAMP rising delay time 2	trdCP2	—	95	145	ns	back edge
Synchronization detection Output voltage "H"	V DH	4.5	5.0	—	V	
Synchronization detection Output voltage "L"	V DL	—	0.2	0.5	V	
Synchronization detection Output current "L"	I DL	3	—	—	mA	
Synchronization detection output impedance	Z oD	7	10	13	k Ω	
Minimum synchronization separation level	V SMin.	—	—	0.2	V _{P-P}	

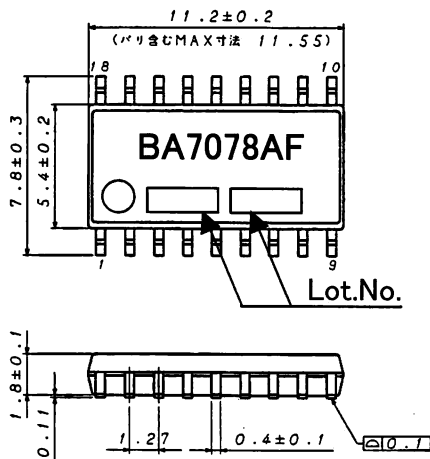
○Electrical characteristics (Unless otherwise noted, $V_{CC}=5V$, $T_a=25^\circ C$)

Parameter	Symbol	Limits			Unit
		Min.	Typ.	Max.	
HSCTL "H" threshold voltage	V tHSH	2.5	—	—	V
HSCTL "L" threshold voltage	V tHSL	—	—	1.5	V
CPSEL "H" threshold voltage	V tCPH	3.8	—	—	V
CPSEL "L" threshold voltage	V tCPL	—	—	1.2	V

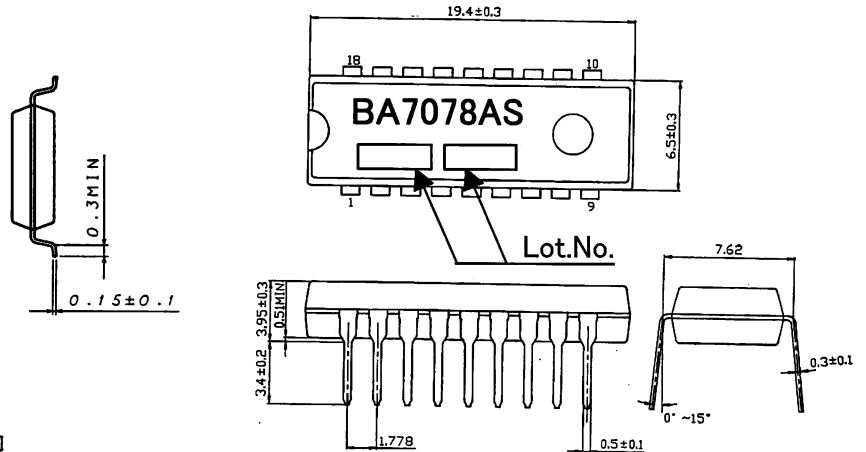
○Input signal range

Parameter	Vert. separate sync	Hor. separate sync	Composite sync	Sync on Video
Polarity	Posi. / Neg.	Posi. / Neg.	Posi. / Neg.	Neg.
Amplitude (Sync) : Vs (Video) : Vv	1.0~5.0V _{P-P}	1.0~5.0V _{P-P}	1.0~5.0V _{P-P}	0.2~0.6V _{P-P} 0~2.1V _{P-P}
Vert. sync frequency range : fV	40~200Hz	—	40~200Hz	40~200Hz
Vert. sync pulse width range : pwV	8.0μs~ Duty35%	—	* 1HMin.~ 400μs	* 1HMin.
Hor. sync frequency range : fH	—	15k~200kHz	15k~200kHz	15k~200kHz
Hor. sync pulse width range : pwH	—	94ns~Duty35%	94ns~Duty15%	Duty15%Max.

○Outer dimensions



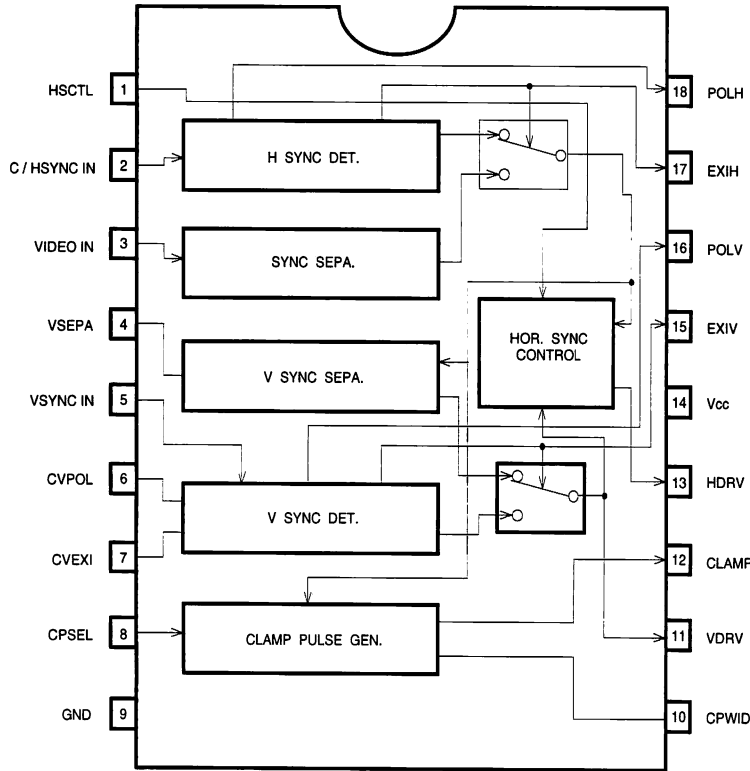
SOP18 (Unit:mm)



SDIP18 (Unit:mm)

○Block diagram

○Pin number and pin name



Pin No.	Pin name
1	HSCTL
2	C/HSYNC IN
3	VIDEO IN
4	VSEPA
5	VSYNC IN
6	CVPOL
7	CVEXI
8	CPSEL
9	GND
10	CPW1D
11	VDRV
12	CLAMP
13	HDRV
14	VCC
15	EX1V
16	POLV
17	EXIH
18	POLH

○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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