



Description

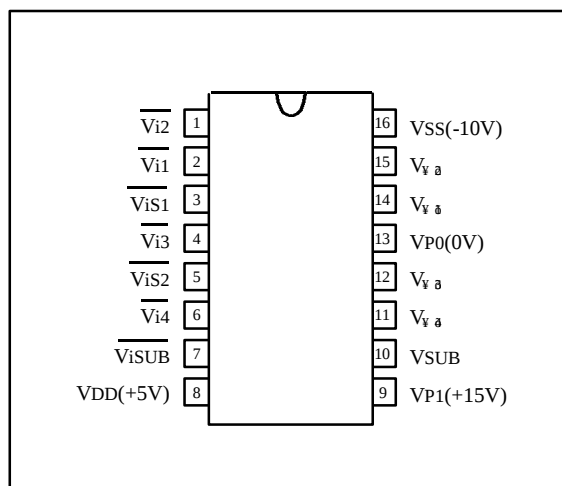
The Ai1001S is a clock driver for the vertical resistor drive of CCD.

Ai1001S is well suited for the B/W or color CCD camera and camcorder in NTSC or PAL camera system.

Feature

- 4 channel vertical clock driver and 1 channel substrate driver.
- Implemented with high voltage(+50V) and high performance CMOS process.

Pin Configuration



**16 PIN SOP / SSOP
(Top View)**

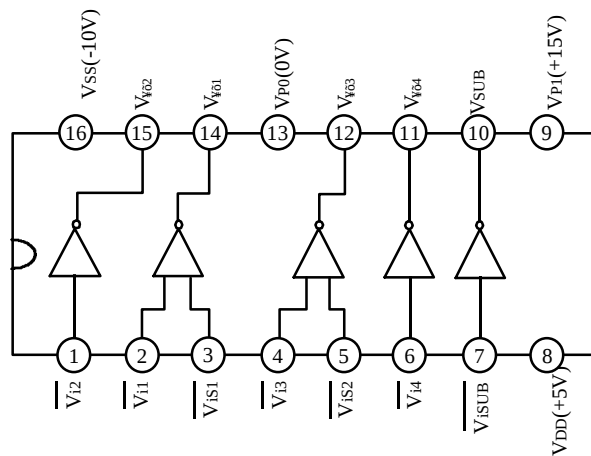
Absolute Maximum Ratings (Ta = 25; ħ)

Parameter	Symbol	Rating	Unit
Supply voltage	V _{SS} V _{DD} , V _{P0} , V _{P1}	Reference voltage V _{SS} ± 0.3 to V _{SS} +35	V V
Input voltage	V _I	V _{SS} ± 0.3 to V _{DD} +0.3	V
Output voltage	V _{Va} , V _{Va} V _{Va} , V _{Va} , V _{Sub}	V _{SS} ± 0.3 to V _{P0} +0.3 V _{SS} ± 0.3 to V _{P1} +0.3	V V
Operating temperature	T _{OPR}	-25 to +85	°C
Storage temperature	T _{STG}	-40 to +125	°C

Recommended Operating Conditions

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{DD} V _{P0} V _{P1}	V _{SS} +15 V _{SS} +10 V _{SS} +25	V V V
Operating temperature	T _{OPR}	-20 to +75	°C

Block Diagram



Truth Table

Input				Output		
$\overline{V_{i1,3}}$	$\overline{V_{iS1,2}}$	$\overline{V_{i2,4}}$	$\overline{V_{iSUB}}$	$V_{\# 3}$	$V_{\# 4}$	V_{SUB}
L	L			VP1		
L	H			VP0		
H	L			*Z		
H	H			VSS		
		L			VP0	
		H			VSS	
			L			VP1
			H			VSS

* Z is high impedance.

Pin Description

No.	Symbol	I/O	Description
1	$\overline{V_{i2}}$	I	Output control ($V_{\# a}$)
2	$\overline{V_{i1}}$	I	Output control ($V_{\# b}$)
3	$\overline{V_{iS1}}$	I	Output control ($V_{\# b}$)
4	$\overline{V_{i3}}$	I	Output control ($V_{\# a}$)
5	$\overline{V_{iS2}}$	I	Output control ($V_{\# a}$)
6	$\overline{V_{i4}}$	I	Output control ($V_{\# a}$)
7	$\overline{V_{iSUB}}$	I	Output control (V_{SUB})
8	VDD	-	Power supply (+5V)
9	VP1	-	Power supply (+15V)
10	VSUB	O	Output (2 level : VP1, VSS)
11	$V_{\# a}$	O	Output (2 level : VP0, VSS)
12	$V_{\# b}$	O	Output (3 level : VP1, VP0, VSS)
13	VP0	-	Power supply (0V)
14	$V_{\# a}$	O	Output (3 level : VP1, VP0, VSS)
15	$V_{\# b}$	O	Output (2 level : VP0, VSS)
16	VSS	-	Power supply (-10V)

DC Characteristics

($T_A=25^\circ\text{C}$, $V_{DD}=5\text{V}$, $V_{SS}=-10\text{V}$, $V_{P0}=0\text{V}$, $V_{P1}=15\text{V}$)

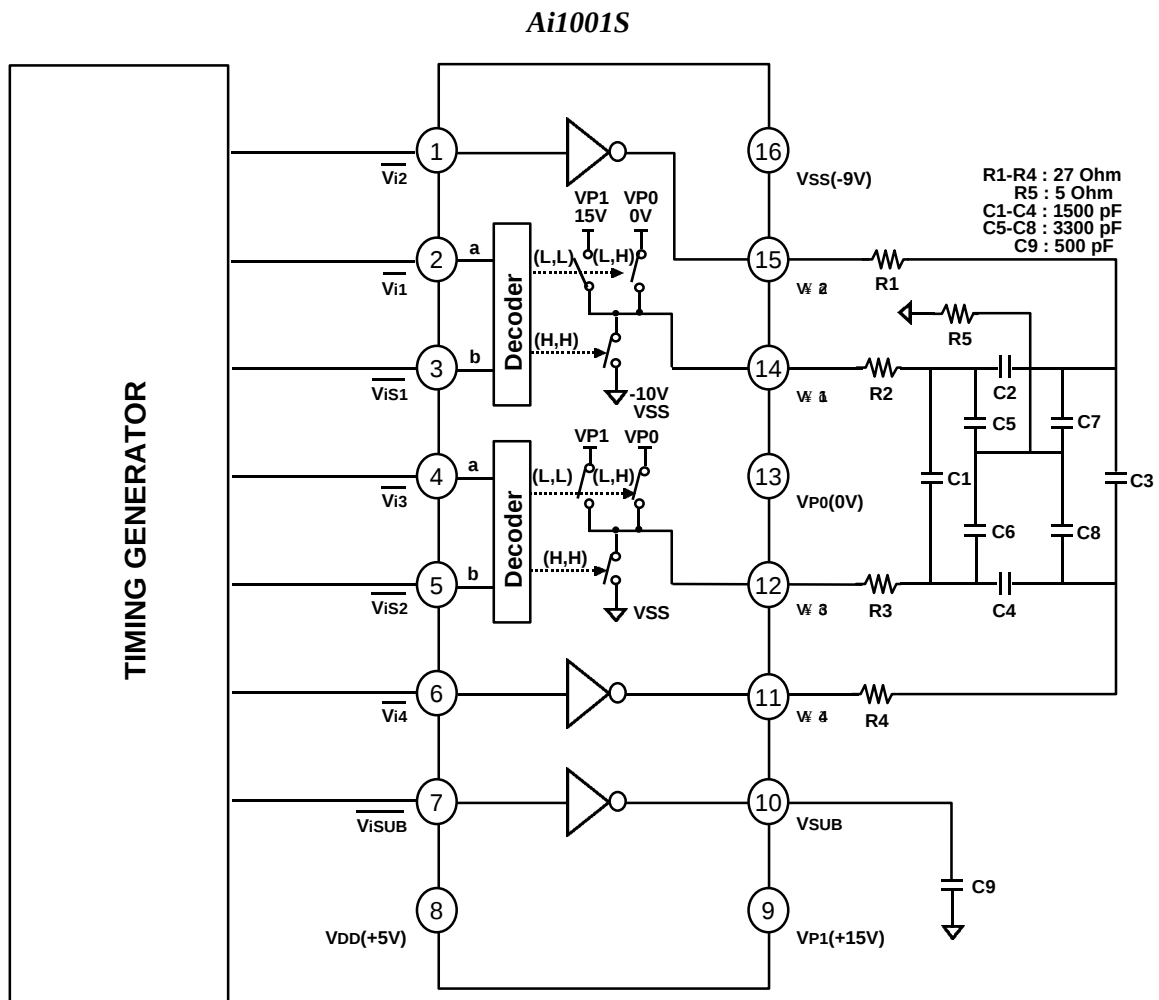
Item	Symbol	Test Condition	Min	Typ	Max	Unit
Input high voltage	V_{IP1}		3.5			V
Input low voltage	V_{ISS}				1.5	V
Output high voltage	V_{OH1}	$I_{OH1} = -20\ \mu\text{A}$	14.9	15		V
Output middle voltage	V_{OM0}	$I_{OM0} = -20\ \mu\text{A}$		0	0.1	V
Output middle voltage	V_{OM0}	$I_{OM0} = 20\ \mu\text{A}$	-0.1	0		V
Output low voltage	V_{OL0}	$I_{OL0} = 20\ \mu\text{A}$		-10	-9.9	V
Input current	I_{IN}			1.0		μA
Power supply current	I_{PD}			0.3	0.5	μA
Power supply current	I_{PI}			0.15	0.3	μA
Power supply current	I_{P0}			4.5	5.0	μA

Switching Characteristics

(See the Test Circuit $T_A = 25^\circ\text{C}$, $V_{P1}=15\text{V}$, $V_{P0}=0\text{V}$, $V_{DD}=5\text{V}$, $V_{SS}=-10\text{V}$)

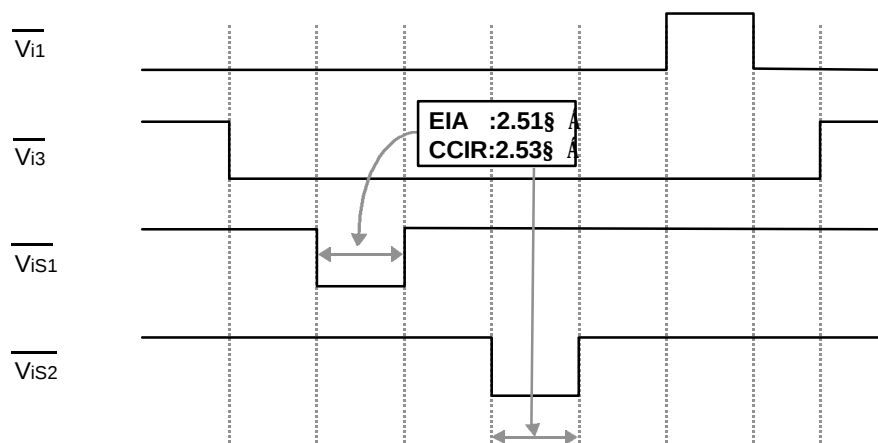
Item	Symbol	Conditions	Max.	Min.	Unit
Output Current	I_L	V_{OH1} to $V_{OL0} = -9.5\text{V}$	-25		μA
Output Current	I_{M1}	V_{OH1} to $V_{OM0} = -0.5\text{V}$		10	μA
Output Current	I_{M2}	V_{OH1} , $V_{OL0} = 0.5\text{V}$	-9		μA
Output Current	I_H	V_{OH1} , $V_{OL0} = 14.5\text{V}$		12	μA
Output Current	I_{SL}	$V_{SUB} = -9.5\text{V}$	-12		μA
Output Current	I	$V_{SUB} = 14.5\text{V}$		12	μA
Rise time $V_{SS} \rightarrow V_{P0}$	T_{TLM}	V_{OH1} to $V_{OM0} = -0.5\text{V}$ after input transient	1000		ns
Fall time $V_{P0} \rightarrow V_{SS}$	T_{TML}	$V_{OH1,3} = -9.5\text{V}$ after input transient	1000		ns
Rise time $V_{P0} \rightarrow V_{P1}$	T_{TMH}	$V_{OH1,3} = 14\text{V}$ after input transient	1000		ns
Fall time $V_{P1} \rightarrow V_{P0}$	T_{THM}	$V_{OH1,3} = 1\text{V}$ after input transient	1000		ns
Rise time $V_{P0} \rightarrow V_{P1}$	T_{TLHH}	$V_{SUB} = 14\text{V}$	200		ns
Fall time $V_{P1} \rightarrow V_{SS}$	T_{THHL}	$V_{SUB} = -9.5\text{V}$	200		ns
Coupling amplitude (middle level)	V_{COM}	V_{OH1} to V_{OM0}	0.5		V
Coupling amplitude (low level)	V_{COL}	V_{OH1} to V_{OL0}	0.5		V

Test Circuit

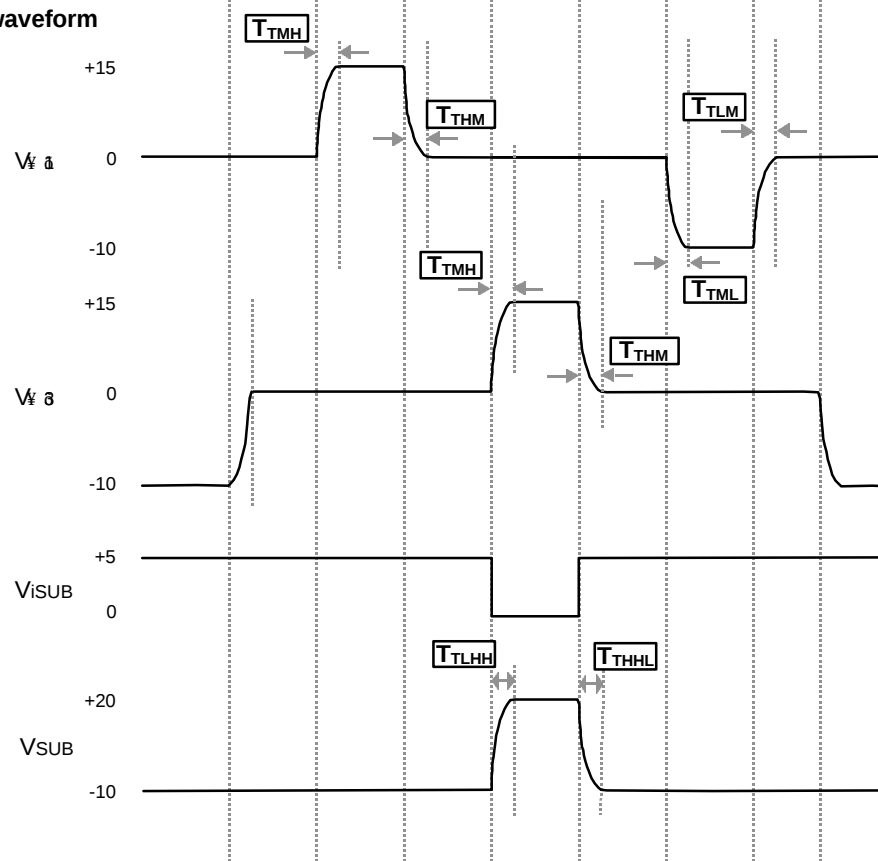


Test Circuit I/O Waveform Diagram

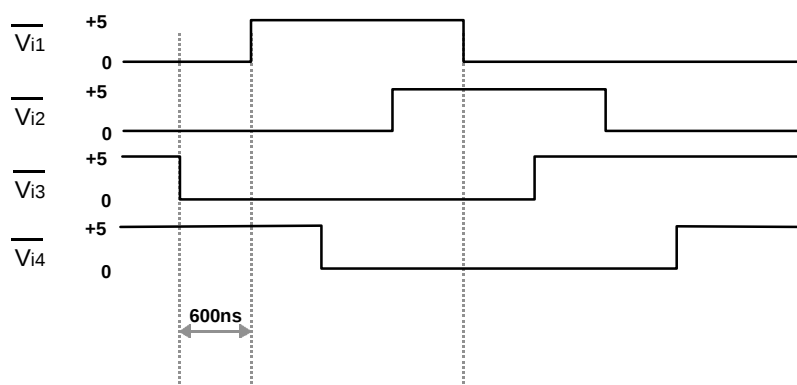
Input waveform



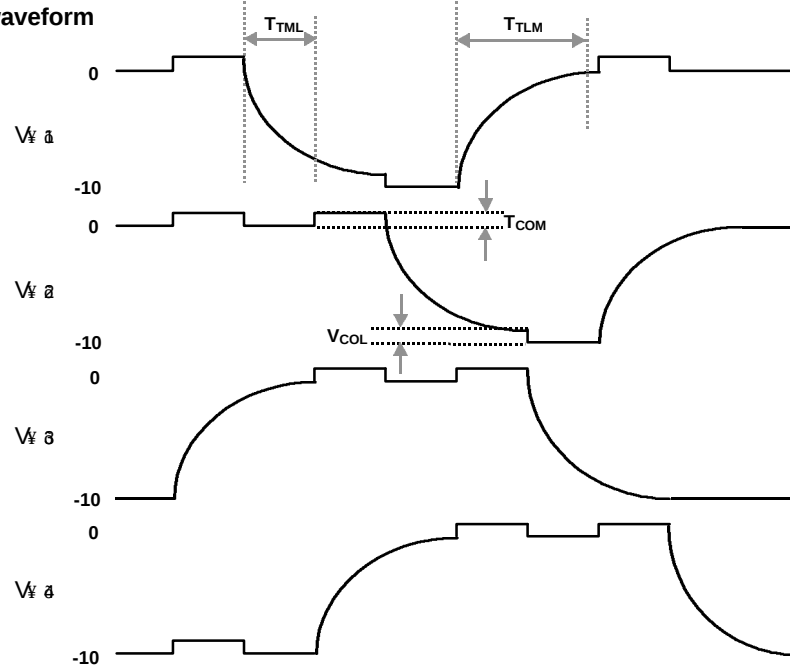
Output waveform



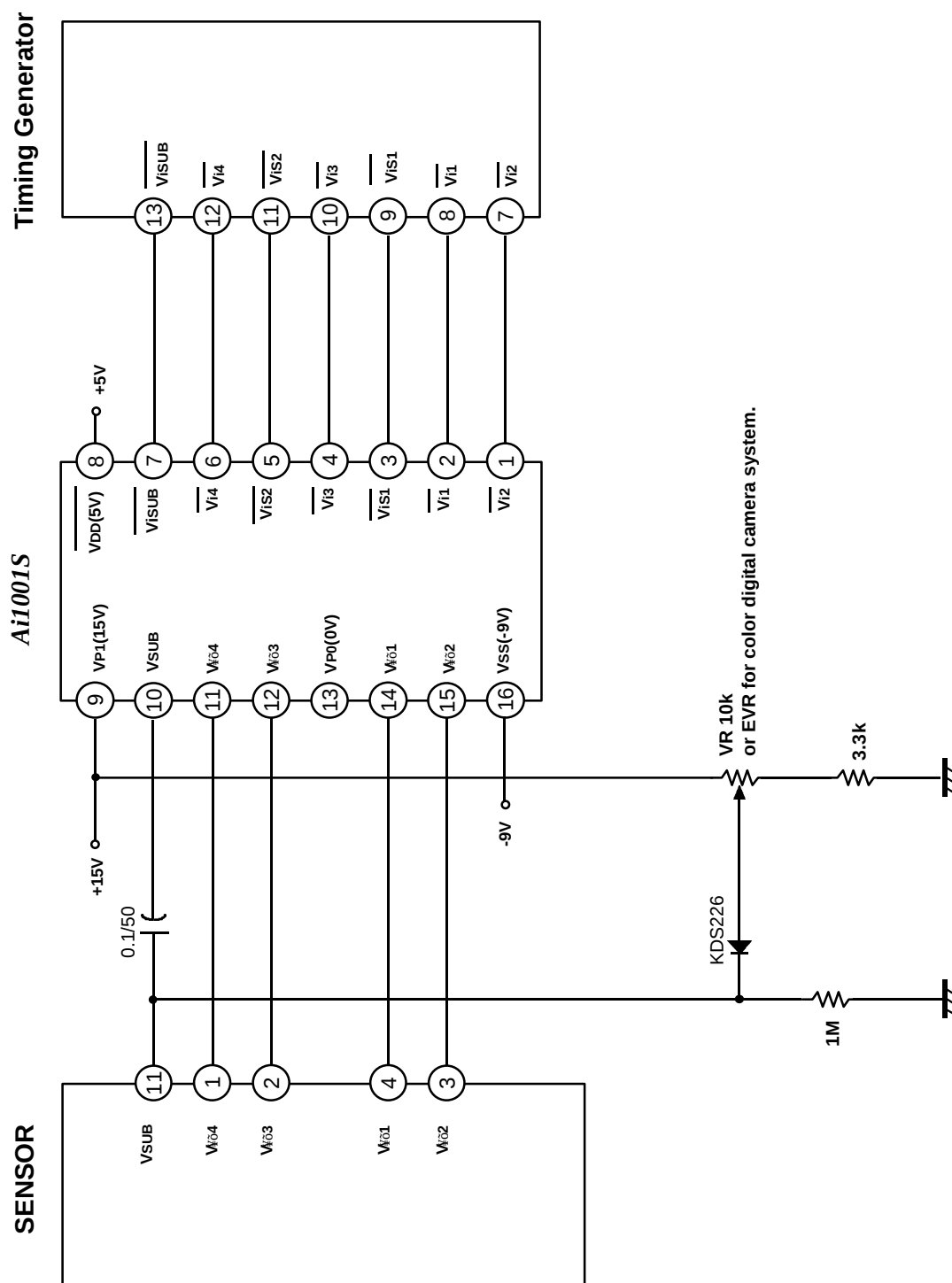
Input waveform
(Repeat Cycle 15.7kHz)



Output waveform



Application Circuit



Package Dimension (Ai1001S : 16 PIN SSOP)

UNIT = inch (mm)

