A1 PROs

Ai1001S

Vertical Clock Driver for Camera System

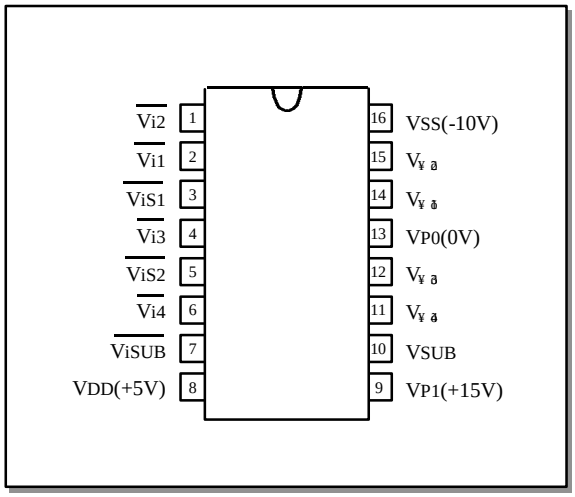
Description

The *Ai1001S* is a clock driver for the vertical resister 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)

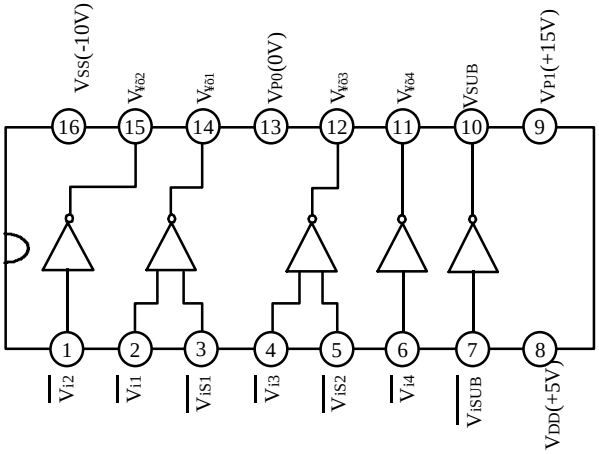
Absolute Maximum Ratings (Ta = 25¡ É)

Parameter	Symbol	Rating	Unit
Supply voltage	Vss V_{DD}, V_{P0}, V_{P1}	Reference voltage Vss£ 0.3 to Vss+35	V V
Input voltage	V_I	Vss£ 0.3 to V_{DD}+0.3	V
Output voltage	V¥ ä, V¥ ä V¥ ä, V¥ ä, V_{Sub}	Vss£ 0.3 to VP0+0.3 Vss£ 0.3 to VP1+0.3	V V
Operating temperature	T_{OPR}	-25 to +85	¡ É
Storage temperature	T_{STG}	-40 to +125	¡ É

Recommended Operating Conditions

Parameter	Symbol	Rating	Unit
Supply Voltage	VDD VP0 VP1	Vss +15 Vss +10 Vss +25	V V V
Operating temperature	T_{OPR}	-20 to +75	¡ É

Block Diagram



Truth Table

Input				Output		
$\overline{V_{i\,1,3}}$	$\overline{V_{i\,S\,1,2}}$	$\overline{V_{i\,2,4}}$	$\overline{V_{i\,SUB}}$	$V_{¥ ã,3}$	$V_{¥ ã,4}$	V_{SUB}
L L H H	L H L H			VP1 VP0 *Z VSS		
		L H			VP0 VSS	
			L H			VP1 VSS

* Z is high impedance.

Pin Description

No.	Symbol	I/O	Description
1	$\overline{Vi2}$	I	Output control ($V_{¥ ã}$)
2	$\overline{Vi1}$	I	Output control ($V_{¥ ã}$)
3	$\overline{ViS1}$	I	Output control ($V_{¥ ã}$)
4	$\overline{Vi3}$	I	Output control ($V_{¥ ã}$)
5	$\overline{ViS2}$	I	Output control ($V_{¥ ã}$)
6	$\overline{Vi4}$	I	Output control ($V_{¥ ã}$)
7	$\overline{ViSUB}$	I	Output control (VSUB)
8	V_{DD}	-	Power supply (+5V)
9	V_{P1}	-	Power supply (+15V)
10	V_{SUB}	O	Output (2 level : VP1, VSS)
11	$V_{¥ ä}$	O	Output (2 level : VP0, VSS)
12	$V_{¥ ã}$	O	Output (3 level : VP1, VP0, VSS)
13	V_{P0}	-	Power supply (0V)
14	$V_{¥ á}$	O	Output (3 level : VP1, VP0, VSS)
15	$V_{¥ â}$	O	Output (2 level : VP0, VSS)
16	V_{SS}	-	Power supply (-10V)

DC Characteristics

(T_A=25¡ ÉV$_{DD}$ = 5V, V_{SS} = -10V, VP0 = 0V, VP1 = 15V)

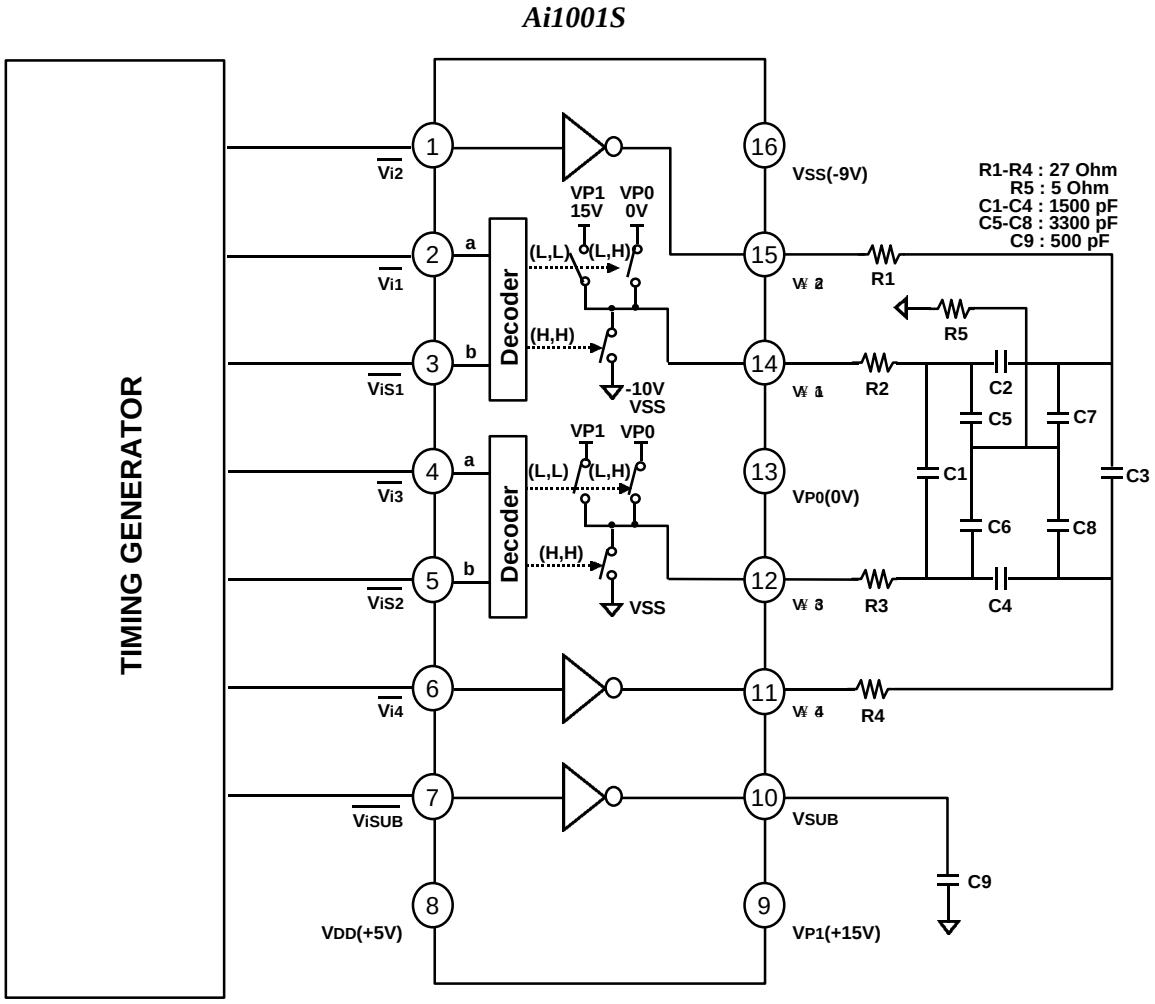
Item	Symbol	Test Condition	Min	Typ	Max	Unit
Input high voltage	V_{IP1}		3.5			V
Input low voltage	V_{ISS}				1.5	V
Output high voltage	V¥ ð1	I¥ ð1 = - 20 § Ë	14.9	15		V
Output middle voltage	V¥ ð0	I¥ ð0 = - 20 § Ë		0	0.1	V
Output middle voltage	V¥ ð0	I¥ ð0 = 20 § Ë	-0.1	0		V
Output low voltage	V¥ ßS	I¥ ßS = 20 § Ë		-10	-9.9	V
Input current	I_{IN}			1.0		§ Ë
Power supply current	I_{PD}			0.3	0.5	§ Ì
Power supply current	I_{PI}			0.15	0.3	§ Ì
Power supply current	I_{P0}			4.5	5.0	§ Ì

Switching Characteristics

(See the Test Circuit T_A = 25¡ ÉVP1=15V, VP0=0V, V_{DD}=5V, VSS= -10V)

Item	Symbol	Conditions	Max.	Min.	Unit
Output Current	I_L	V¥ ñ to V¥ ñ = -9.5V	-25		§ Ì
Output Current	I_{M1}	V¥ ñ to V¥ ñ = -0.5V		10	§ Ì
Output Current	I_{M2}	V¥ ñ, V¥ ñ = 0.5V	-9		§ Ì
Output Current	I_H	V¥ ñ, V¥ ñ = 14.5V		12	§ Ì
Output Current	I_{SL}	V_{SUB} = -9.5V	-12		§ Ì
Output Current	I	V_{SUB} = 14.5V		12	§ Ì
Rise time VSS ¡ æVP0	T_{TLM}	V¥ ñ to V¥ ñ = -0.5V after input transient	1000		ns
Fall time VP0 ¡ æVSS	T_{TML}	V¥ ñ = -9.5V after input transient	1000		ns
Rise time VP0 ¡ æVP1	T_{TMH}	V¥ ñ = 14V after input transient	1000		ns
Fall time VP1 ¡ æVP0	T_{THM}	V¥ ñ = 1V after input transient	1000		ns
Rise time VP0 ¡ æVP1	T_{TLHH}	V_{SUB} = 14V	200		ns
Fall time VP1 ¡ æVSS	T_{THHL}	V_{SUB} = -9.5V	200		ns
Coupling amplitude (middle level)	V_{COM}	V¥ ñ to V¥ ñ	0.5		V
Coupling amplitude (low level)	V_{COL}	V¥ ñ to V¥ ñ	0.5		V

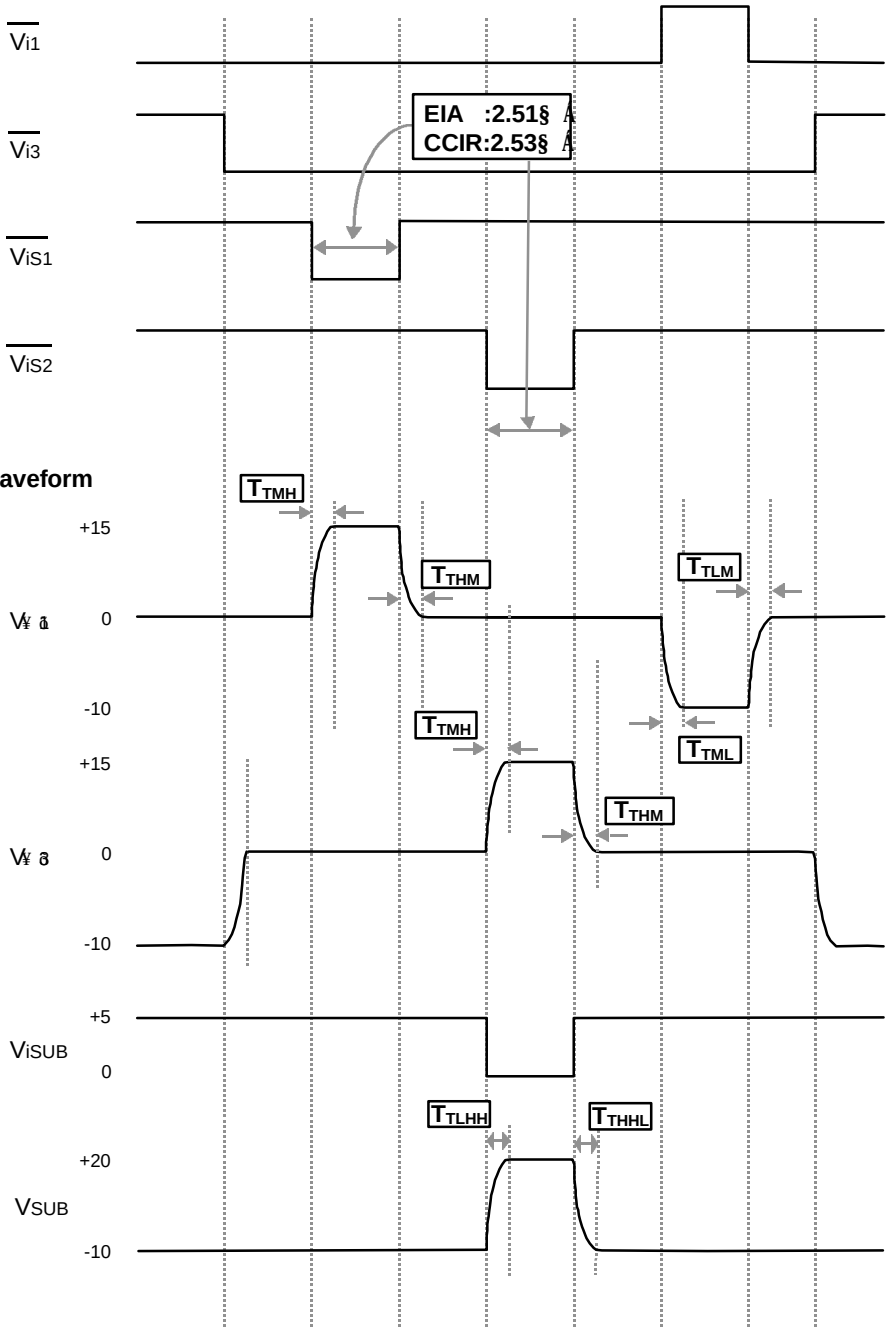
Test Circuit



***(L, H) means the on-status of the switch when a = "L", b = "H".**

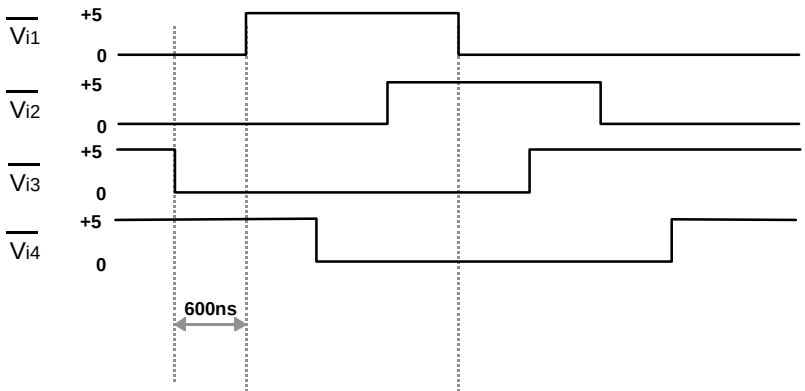
Test Circuit I/O Waveform Diagram

Input waveform

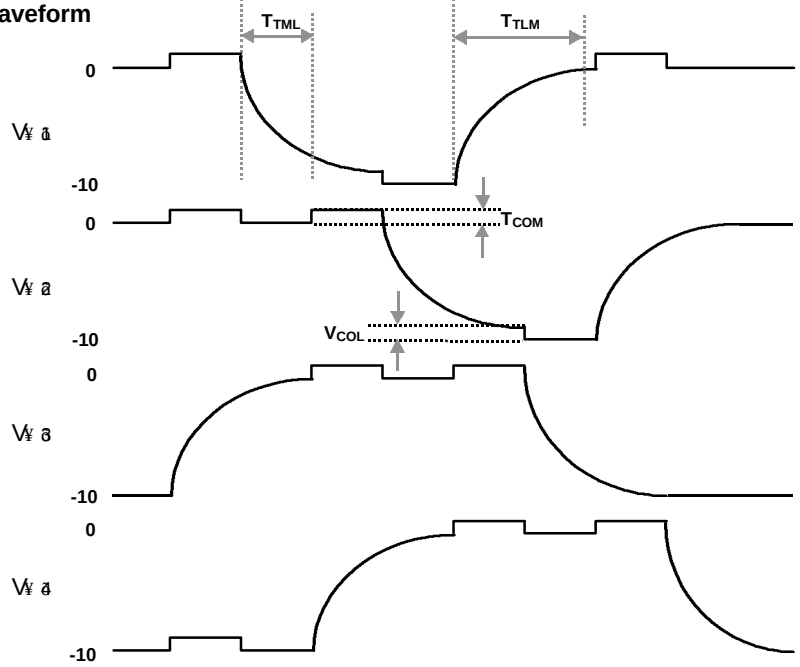


Output waveform

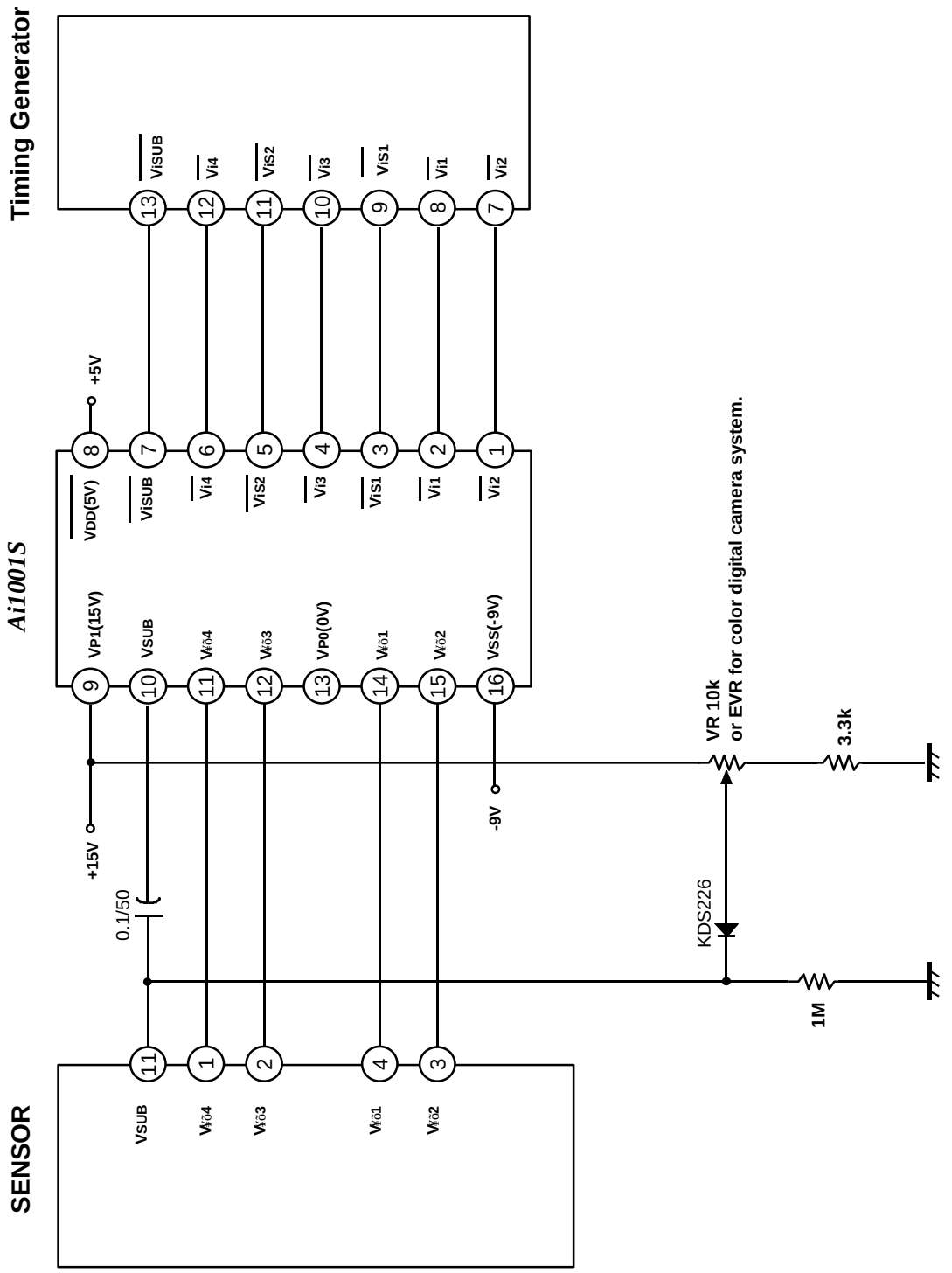
Input waveform
(Repeat Cycle 15.7kHz)



Output waveform



Application Circuit



Package Dimension (*Ai1001S* : 16 PIN SSOP)

UNIT = inch (mm)

