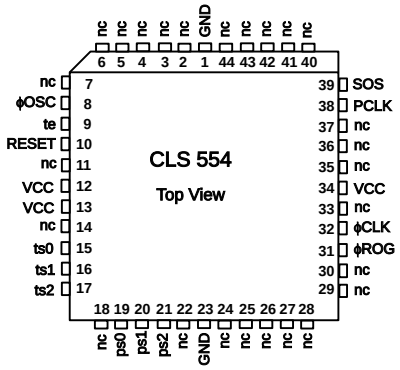
CLS 554

ccd linescan controller



Key Features:

- CCD Linescan controller
- Designed for Sony ILX 554A
- All clock signals included.
- Start of frame output.
- Selectable exposure time.

Overview:

The CLS 554 is an easy to use, complete ccd linescan controller, designed for the SONY ILX 554 linescan sensor.

For operation the CLS 554 requires power +5 V only, and a 8 MHz TTL or CMOS clock input signal. Additional logic is not required.

To provide more flexibility, the CLS 554 has an interface to control exposure time and pixel clock. All inputs are connected to internal pull up resistors, so they can left unconnected if not required.

Interface:

The CLS 554 linescan controller includes all CCD-timing signals including pixel clock and exposure control.

The digital interface provides user selectable pixel clock and exposure time. An output for pixel clock and start of frame facilitates the operation with an additional frame grabber.

With an additional oscilloscope and a Sony IILX 554A CCD-sensor the CLS 554 converts to a complete very low cost CCD-linescan camera with display. (See the application on the last page).

Absolute Maximum Ratings

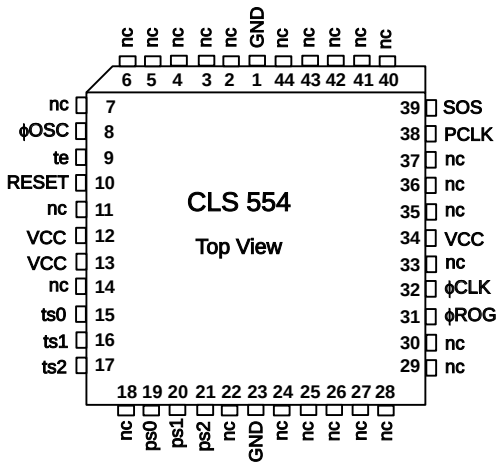
VCC Supply voltage	- 0.5 V to + 6 V
Input voltage applied	- 0.5 to Vcc + 0.5 V
Digital output current	0 to 5 mA
Storage temperature	- 20 to 150 °C
Operating temperature	0 to 50 °C

DC Characteristics

Output low voltage (8 mA)	0.4V
Output high voltage (-4 mA)	2.4V
Input pullup current	-0.15 mA
Input low Voltage (max)	0.8 V
Input high voltage (min)	2.0V
Power requirements:	+5V 200mA

khs instruments

Pin Configuration



44-Pin PLCC Pinout Diagram

User Interface

Connections:

Signal	Pin	Pin	Signal
SOS	39	10	Reset
PCLK	38	8	ϕOSC
ts2	17	21	ps2
ts1	16	20	ps1
ts0	15	20	ps0
te	9		

All inputs: 50 K pull up to VCC.

Pinout description:

Pin Name	Pin Type	Pin Description
SOS	OUT	Start of scan output, low active.
PCLK	OUT	Pixelclock output, low active.
ts0..ts1	IN	Exposure control.
te	IN	Exposure control external.
ps0..ps1	IN	Pixelclock control.
ϕOSC	IN	Oscillator input
Reset	IN	CCD asynchron reset low active
nc	NC	Do not connect!

CCD Interface

Connections:

Signal	Pin
ϕCLK	32
ϕROG	31

Pinout description:

Pin Name	Pin Type	Pin Description
ϕCLK	OUT	Clock pulse
ϕROG	OUT	Readout gate pulse

Power

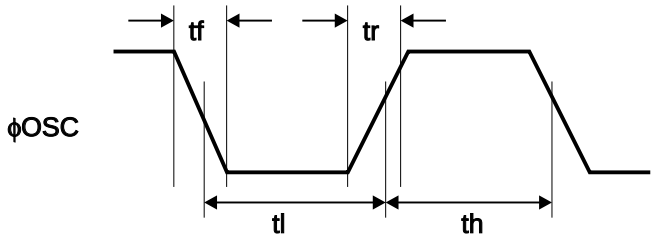
Connections:

Signal	Pin
GND	1
GND	23
VCC	12
VCC	13
VCC	34

Pinout description:

Pin Name	Pin Type	Pin Description
GND	Power	Power Ground.
VCC	Power	Power + 5 V.

ϕOsc Timing



Item	Symbol	Min.	Typ.	Max.	Unit
ϕOSC pulse Duty *1	-	-	50	-	%
ϕOSC pulse rise / fall time	tr, tf	0	10	20	ns
ϕOSC frequency	-	-	8	8	MHz

*1 100 x th / (tl + th)

Exposure timer control

Note: For timing details see t16, page 4

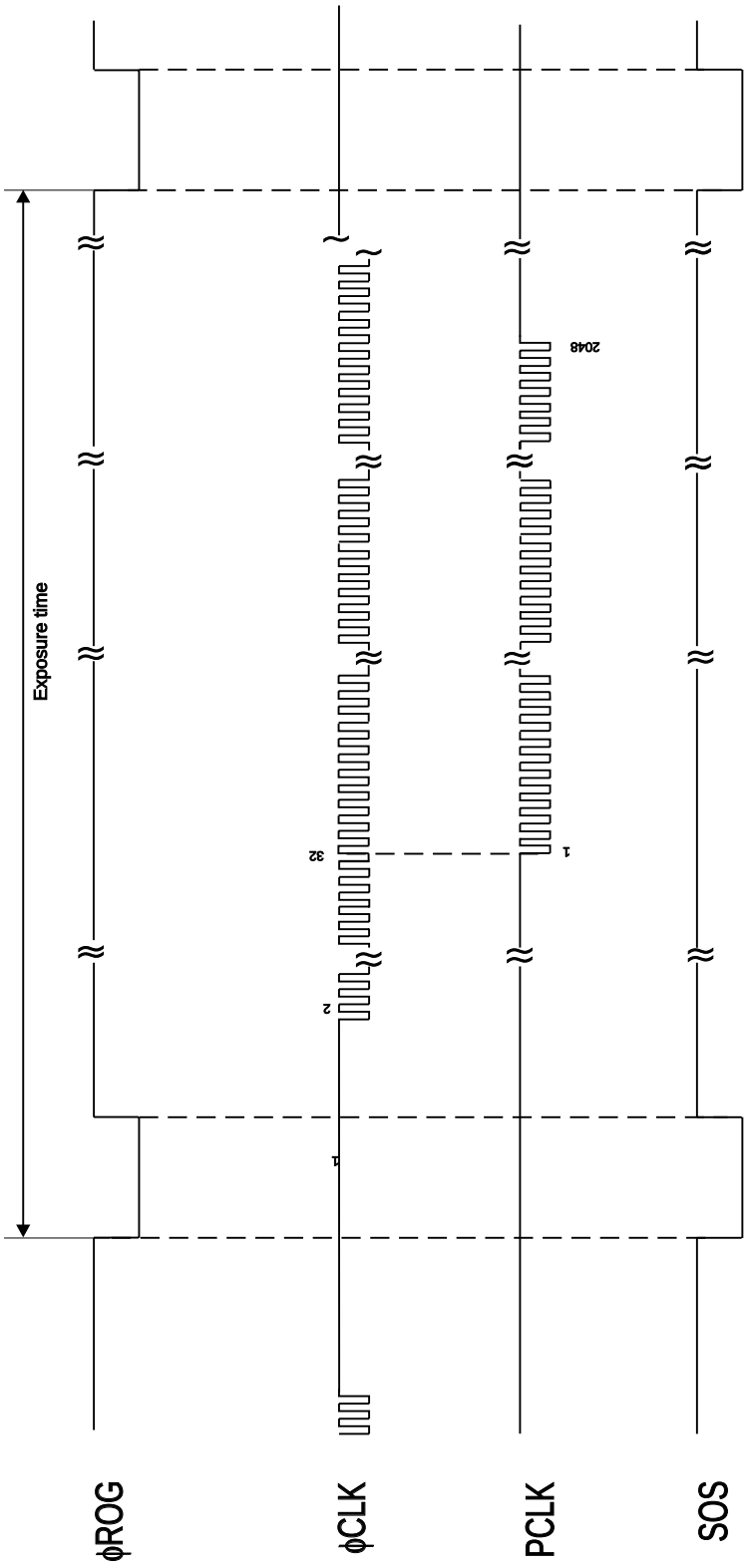
ts2	ts1	ts0	exposure time
1	1	1	2088 τ
1	1	0	4096 τ
1	0	1	8192 τ
1	0	0	16384 τ
0	1	1	32768 τ
0	1	0	65536 τ
0	0	0	extern

Note) τ is the period of ϕCLK (τ = 500 ns at 8 MHz).

Pixelclock control

ps2	ps1	ps0	ϕCLK	(at 8 MHz ϕCLK)
1	1	1	1/4 ϕOsc	(2.0 MHz)
1	1	0	1/8 ϕOsc	(1.0 MHz)
1	0	1	1/16 ϕOsc	(0.5 MHz)
1	0	0	1/32 ϕOsc	(0.25MHz)

Clock Timing Diagram



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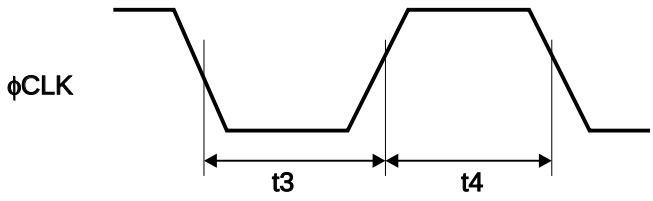
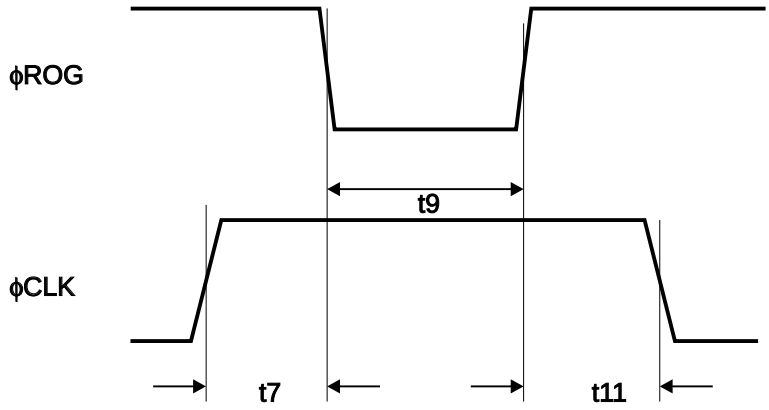
ϕClock Timing



Item	Symbol	Min.	Typ.	Max.	Unit
ϕCLK pulse Duty *1	-	-	50	-	%

*1 100 x t4 / (t3 + t4)

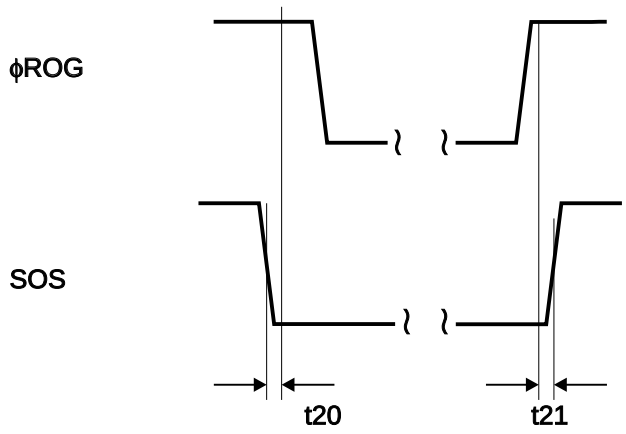
ϕROG, ϕCLK Timing



Item	Symbol	Min.	Typ.	Max.	Unit
ϕROG ϕCLK pulse timing 1	t7	-	10 τ	-	ns
ϕROG ϕCLK pulse timing 2	t11	-	6 τ	-	ns
ϕROG pulse period	t9	-	9 τ	-	ns

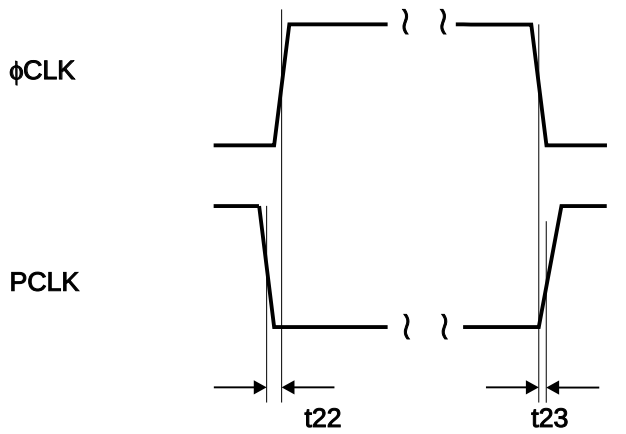
Note) τ is the period of ϕCLK.

ϕROG, SOS Timing



Item	Symbol	Min.	Typ.	Max.	Unit
ϕROG SOS pulse timing 1	t20	-10	0	10	ns
ϕROG SOS pulse timing 2	t21	-10	0	10	ns

ϕCLK, PCLK Timing



Item	Symbol	Min.	Typ.	Max.	Unit
ϕCLK PCLK pulse timing 1	t22	-10	0	10	ns
ϕCLK PCLK pulse timing 2	t23	-10	0	10	ns

Application

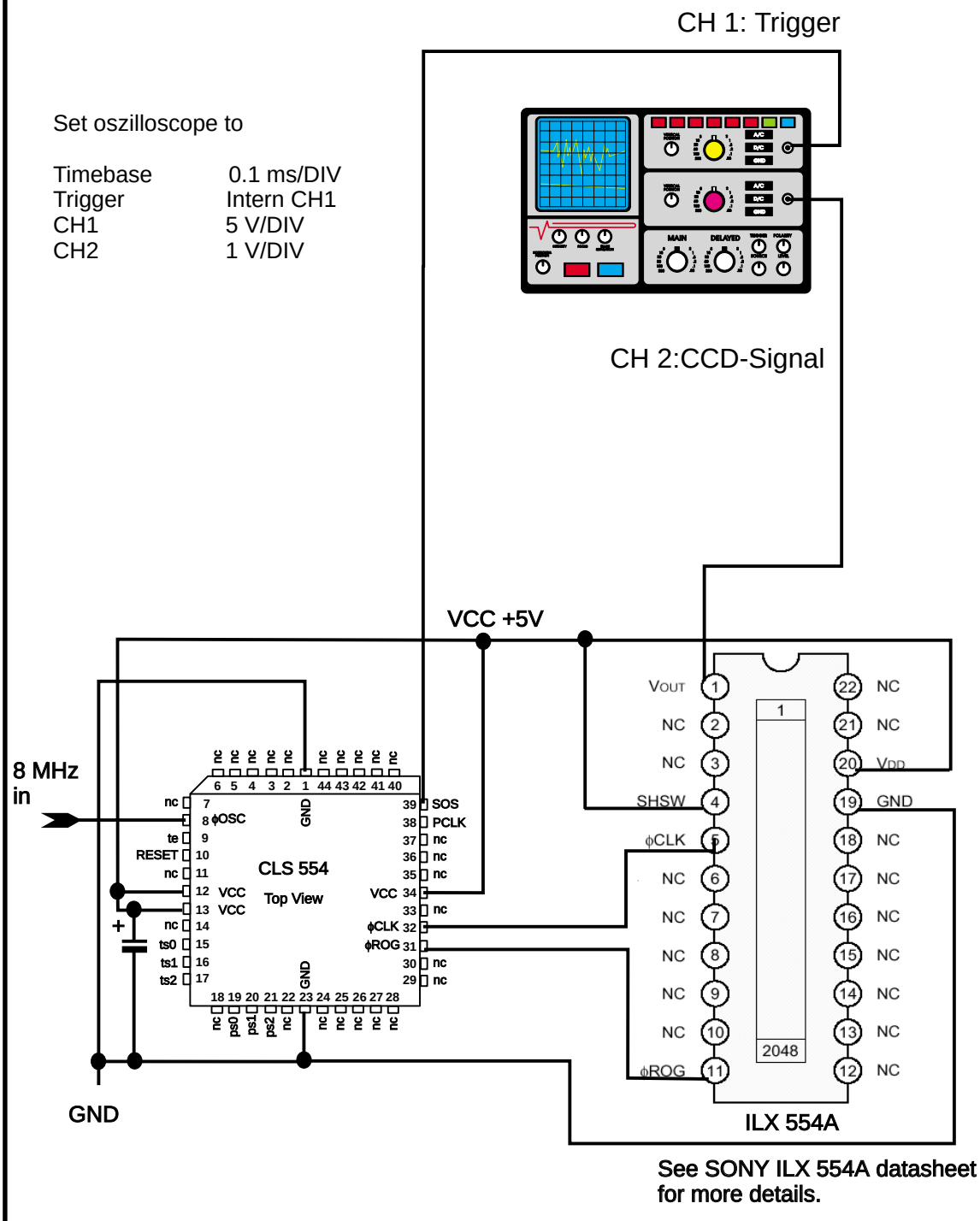


Fig. 1 Test circuit