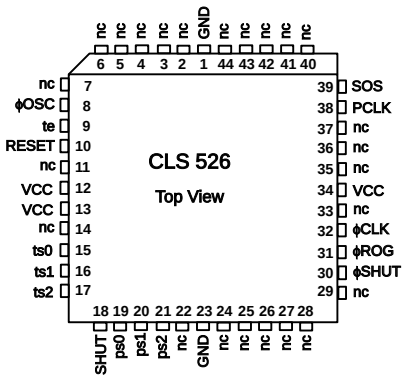
CLS 526

ccd linescan controller



Key Features:

- CCD Linescan controller
- Designed for Sony ILX 526
- All clock signals included.
- Start of frame output.
- Selectable exposure time.

Overview:

The CLS 526 is an easy to use, complete ccd linescan controller, designed for the SONY ILX 526 linescan sensor.

For operation the CLS 526 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 526 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 526 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 526 CCD-sensor the CLS 526 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

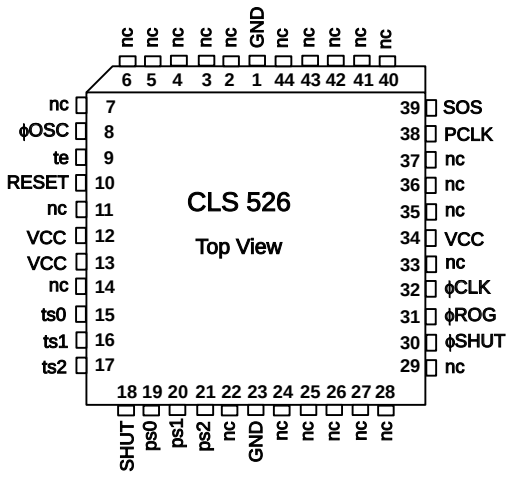
DC Characteristics

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 (typ. 120 mA)

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	18	SHUT
ts1	16	21	ps2
ts0	15	20	ps1
te	9	20	ps0

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.
SHUT	IN	Shutter on, low active.
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
ϕSHUT	30

Pinout description:

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

Power

Connections:

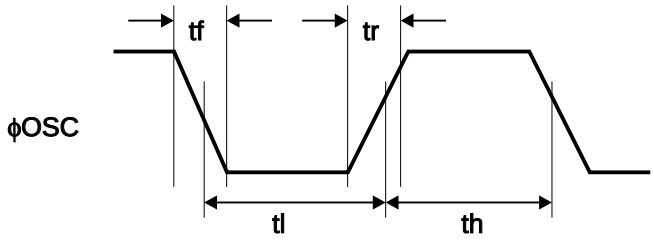
Signal	Pin
GND	1
GND	23
VCC	12
VCC	13
VCC	34

Pinout description:

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

ϕOsc Timing

To meet the ILX 526 timing reqirements, use 8 MHz input clock. To get the minimum clock frequency of 100 KHz, use a 6.4 MHz input clock frequency.



Item	Symbol	Min.	Typ.	Max.	Unit
ϕOSC pulse Duty *1	-	-	50	-	%
ϕOSC pulse rise / fall time	tr, tf	0	10	30	ns
ϕOSC frequency	-	6.4	8	8	MHz

*1 100 x th / (tl + th)

Exposure timer control

Note: For timing details see t16, page 7

SHUT = 1 (open)				SHUT = 0			
ts2	ts1	ts0	exposure time	ts2	ts1	ts0	exposure time
1	1	1	14 τ	1	1	1	3136 τ
1	1	0	23 τ	1	1	0	6208 τ
1	0	1	47 τ	1	0	1	12352 τ
1	0	0	94 τ	1	0	0	24640 τ
0	1	1	188 τ	0	1	1	49216 τ
0	1	0	384 τ	0	0	0	extern
0	0	1	768 τ				
0	0	0	1535 τ				

Note) τ is the period of ϕCLK (τ=1 µs at 1 MHz).

Pixelclock control

ps2	ps1	ps0	ϕCLK	(at 8 MHz ϕCLK)
1	1	1	1/8 ϕOsc	(1 MHz)
1	1	0	1/16 ϕOsc	(500 KHz)
1	0	1	1/32 ϕOsc	(250 KHz)
1	0	0	1/64 ϕOsc	(125 kHz)

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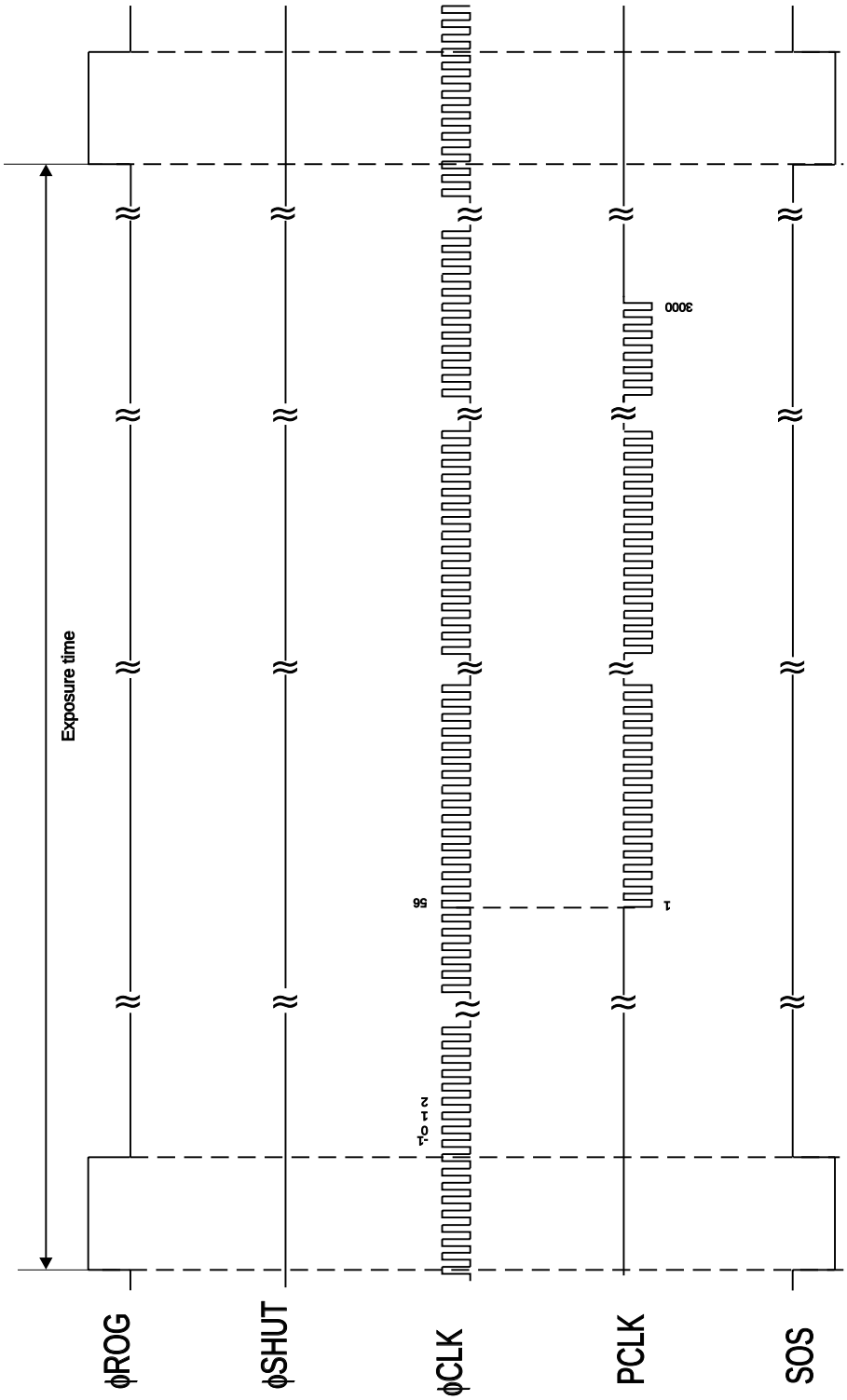
Clock Timing Diagram

(SHUT = 0)



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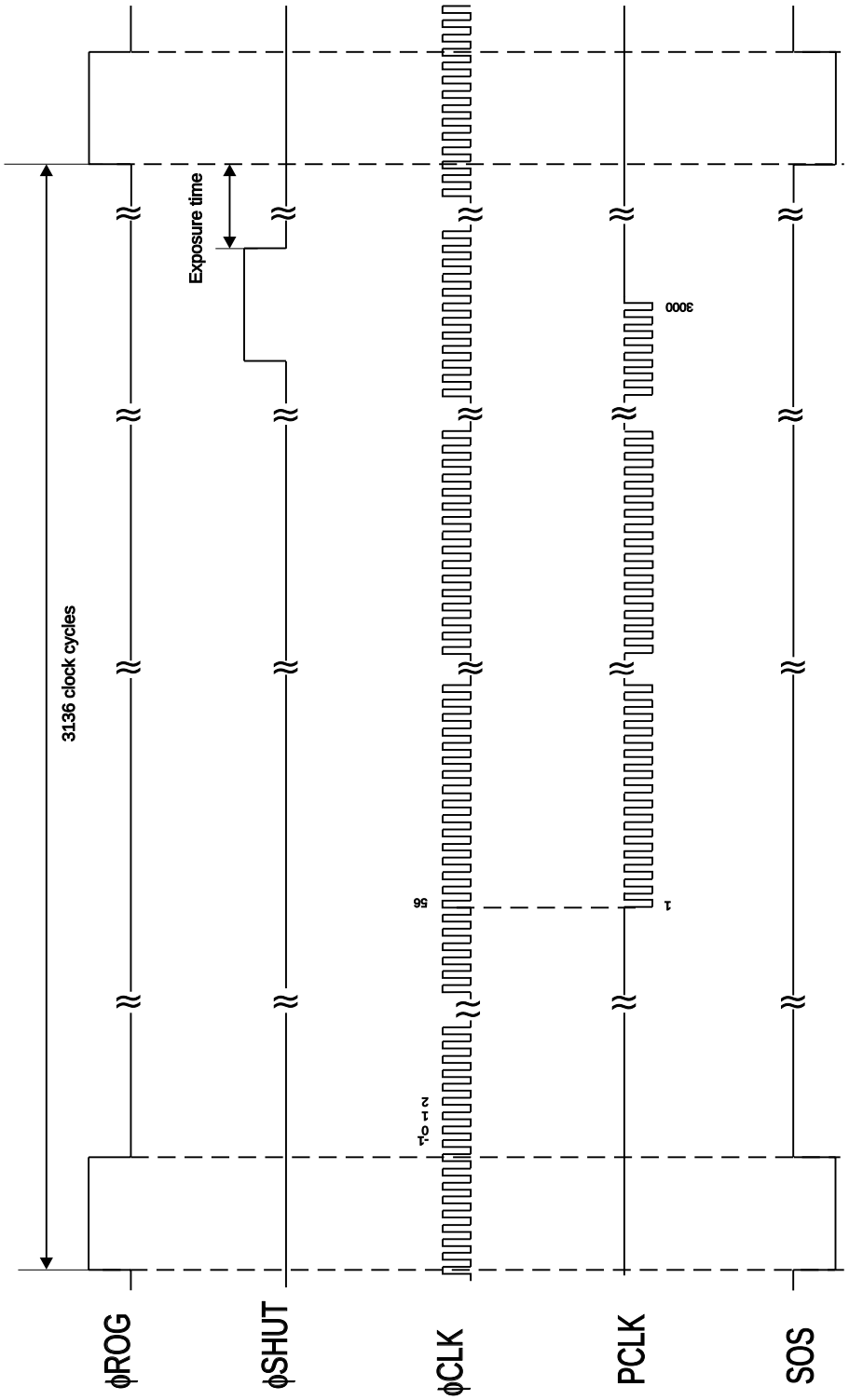
Clock Timing Diagram

(SHUT = 1)



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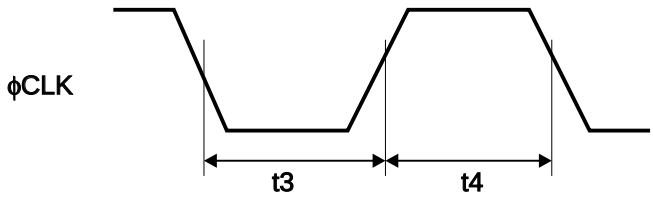
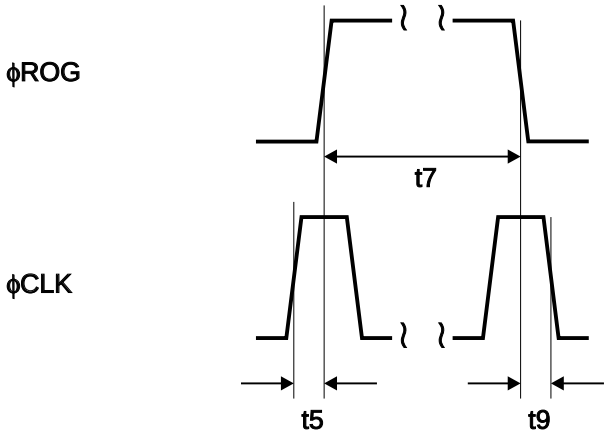
ϕClock Timing



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

*1 100 x t4 / (t3 + t4)

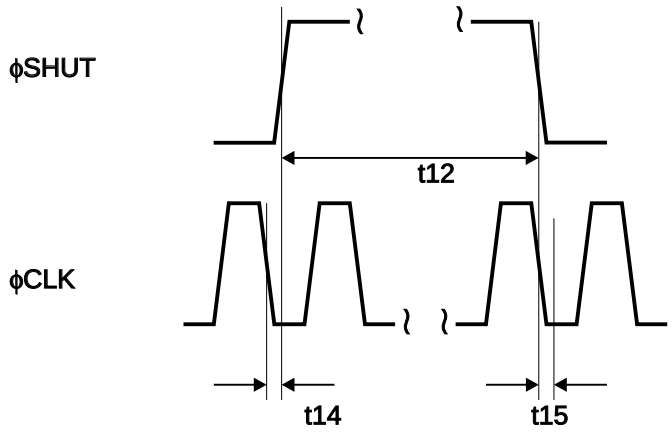
ϕROG, ϕCLK Timing



Item	Symbol	Min.	Typ.	Max.	Unit
ϕROG ϕCLK pulse timing 1	t5	-	(1/4)τ	-	ns
ϕROG ϕCLK pulse timing 2	t9	-	(1/4)τ	-	ns
ϕROG pulse period	t7	-	8τ	-	ns

Note) τ is the period of ϕCLK.

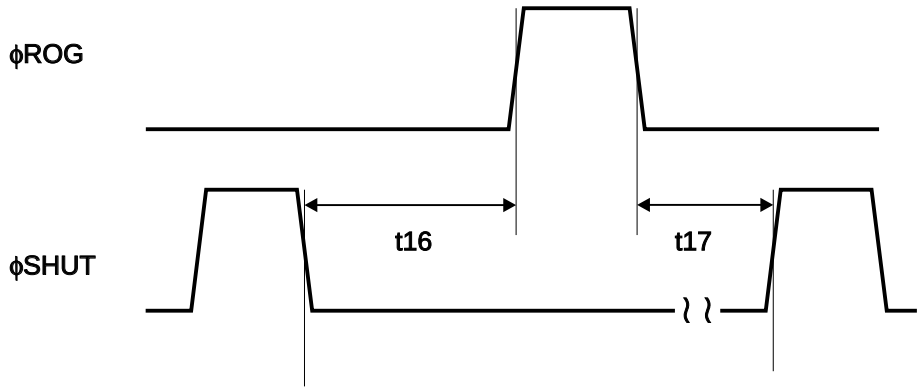
ϕSHUT, ϕCLK Timing



Item	Symbol	Min.	Typ.	Max.	Unit
ϕSHUT pulse period	t12	-	8 τ	-	ns
ϕSHUT ϕCLK pulse timing 1	t14	-	200	-	ns
ϕSHUT ϕCLK pulse timing 2	t15	-	200	-	ns

Note) τ is the period of ϕCLK.Input frequency = 8 MHz

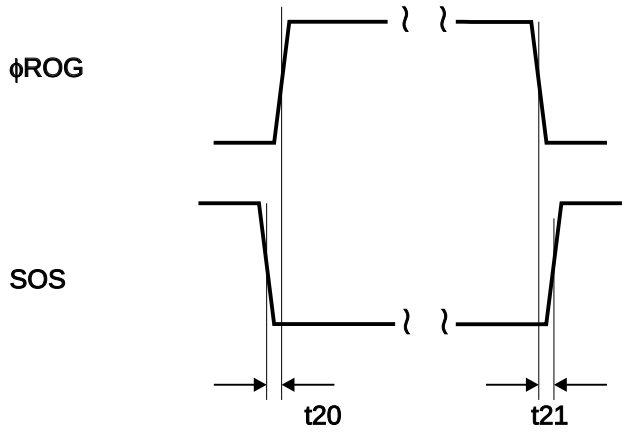
ϕROG, ϕSHUT Timing



Item	Symbol	Min.	Typ.	Max.	Unit
ϕROG ϕSHUT pulse timing 1	t16	10 τ	-	1500 τ	ns
ϕROG ϕSHUT pulse timing 2	t17	1500 τ	-	-	ns

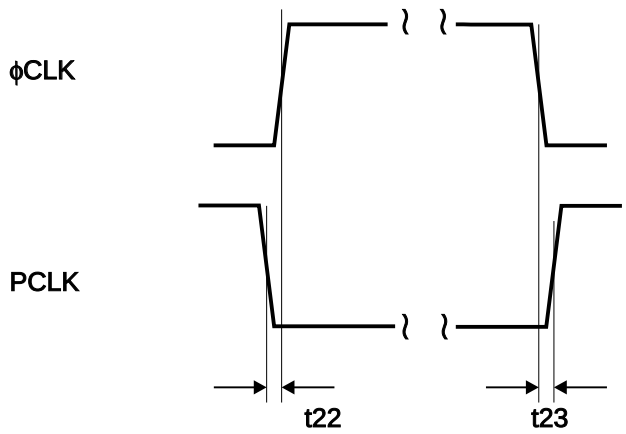
Note) τ is the period of ϕCLK. For t16, see page 3 for selectable shutter time.

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

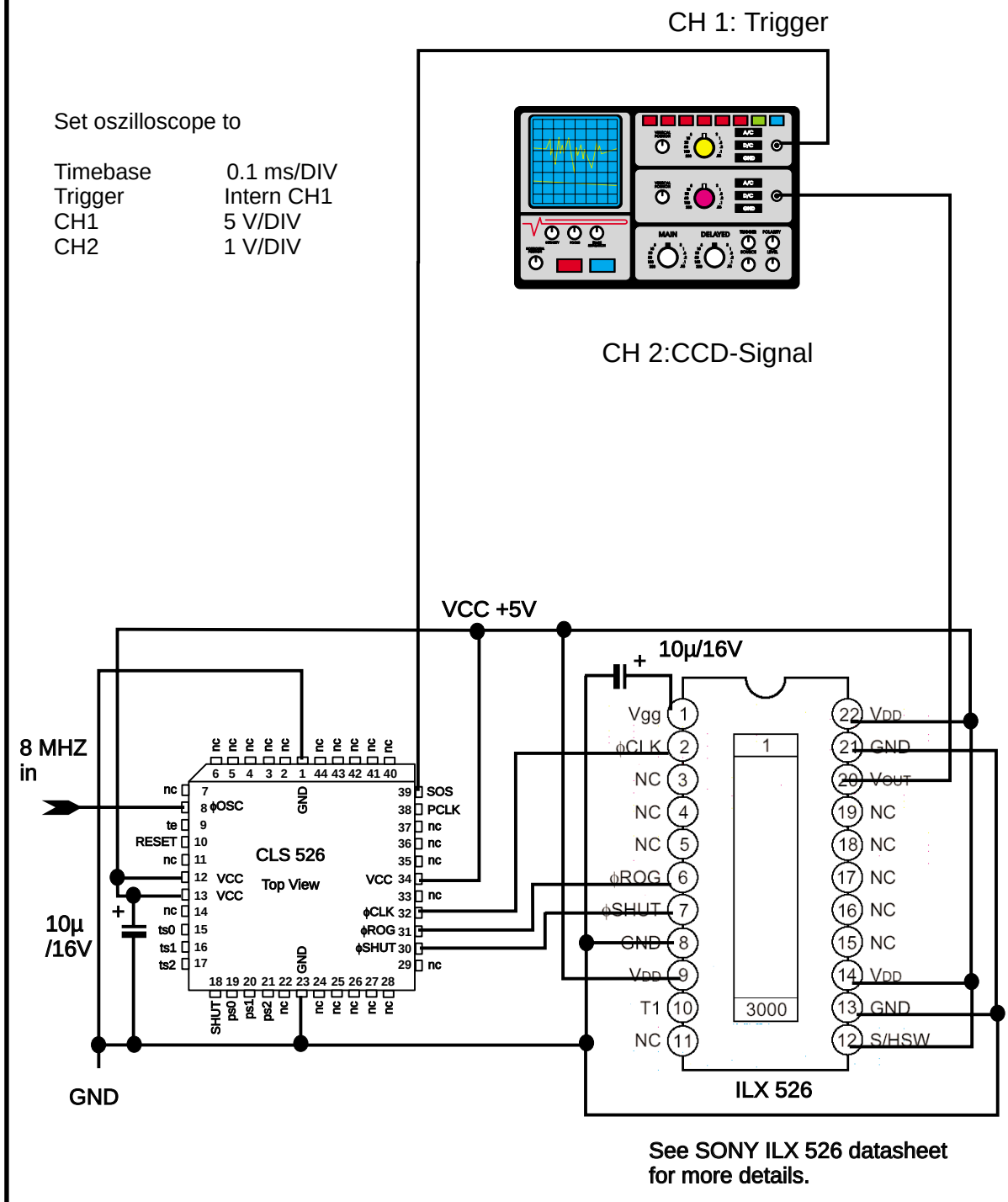


Fig. 1 Test circuit