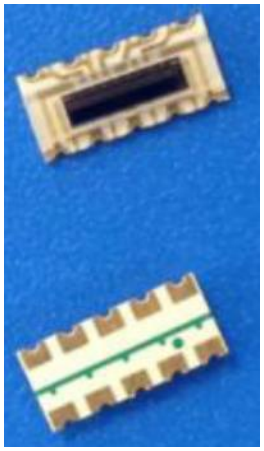
Opto-Electronic Components

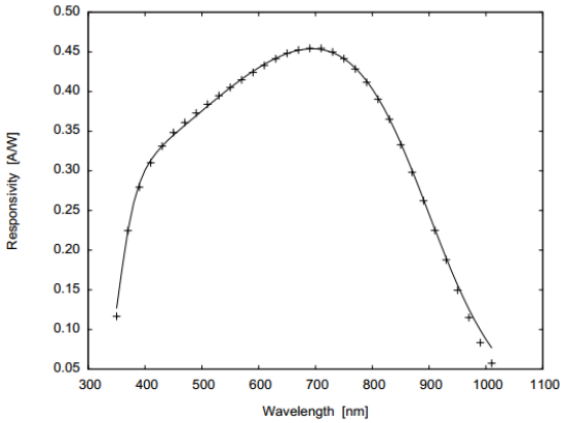
Stand 02.07.2018

LINE SCAN IMAGE SENSOR IC OCD256/512

ARRAY



TYPICAL SPECTRAL RESPONSE



DESCRIPTION

The OCD256/512 Linear Image Sensor consists of an array of high performance, low dark
current photo-diode pixels. The sensor features sample and hold capability, selectable resolution and advanced power management. The device can operate at voltages as low as 3V making it ideal for portable applications. A key feature over traditional CCD technology is that the device can be read and re-read non-destructively, allowing the user to maximize signal to noise and dynamic range.

FEATURES

* Low cost compared to CCD multi-chip systems
* High sensitivity
* High signal-to-noise ratio (SNR)
* Single supply operation, 3,0 – 3,6 V
* Selectable resolution of 256 or 512 pixels
* Non-destructive read capability, extremely low noise capable via signal averaging
* 1.0KHz to 20MHz operation
* Control signal for reset of shift register, pixels, integration period and start of readout.
* Completely integrated timing and control
* Gain Mode (X1, X2, X5, X10)

OVERVIEW ASPECTS

Pixel Type	Linear Image Sensor photo diode
Array Size	1 x 512
Pixel Size (Pitch)	7,80 um X 500 um
Imaging Active Area	3993 um X 500 um
Output	10 KOhm output impedance analog into 5 pF max.

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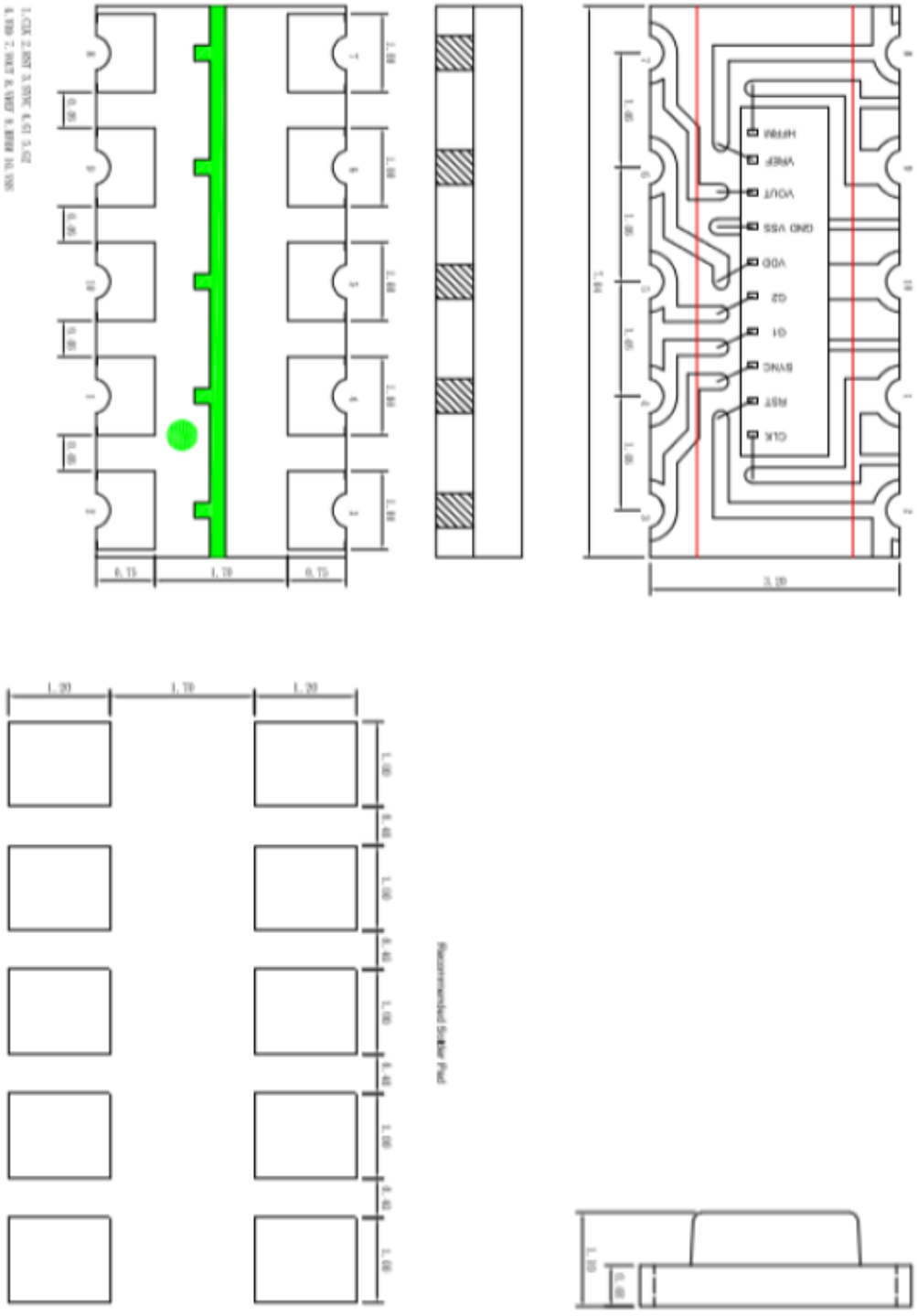
Outline Image



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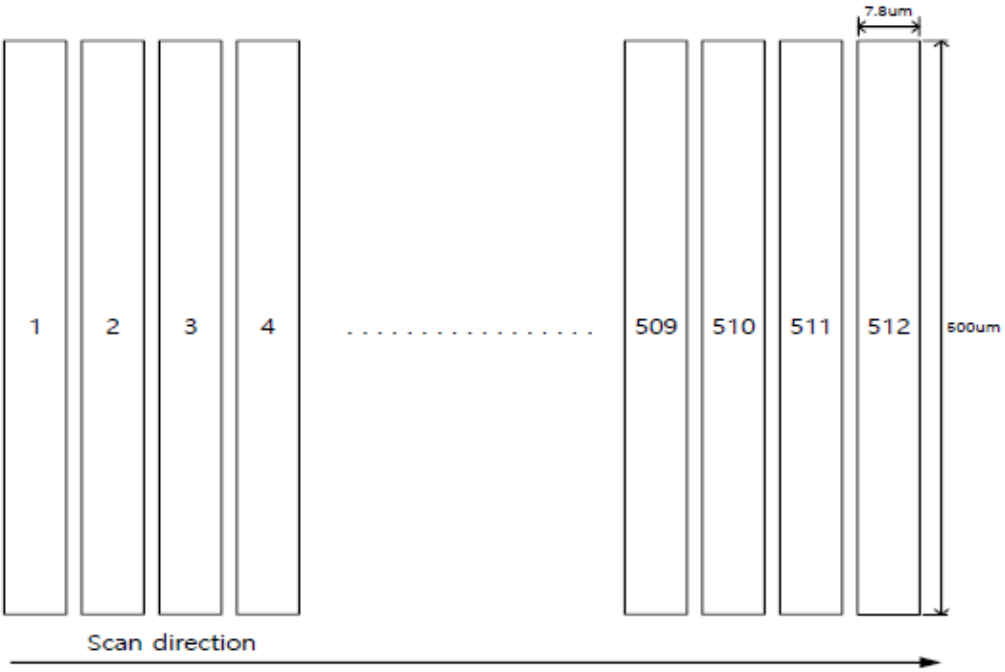
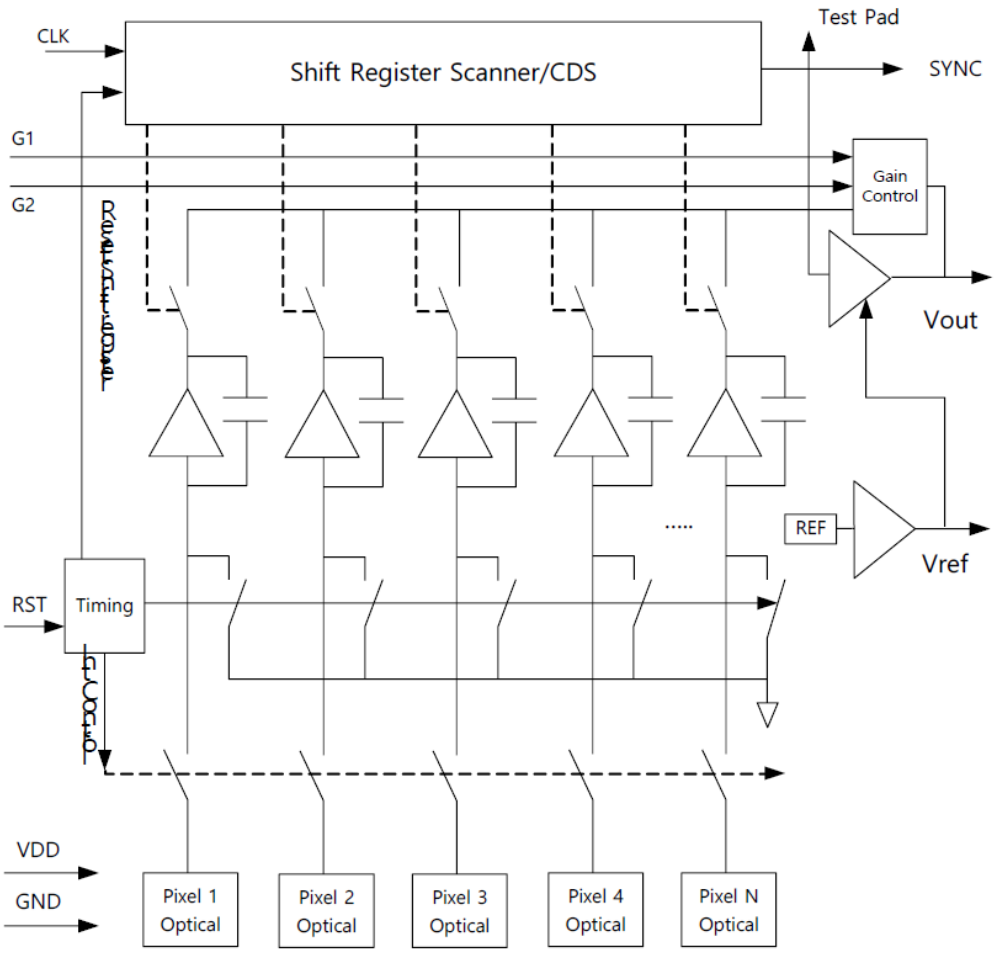
PIXEL SIZE & SCAN DIRECTION



BLOCK DIAGRAM



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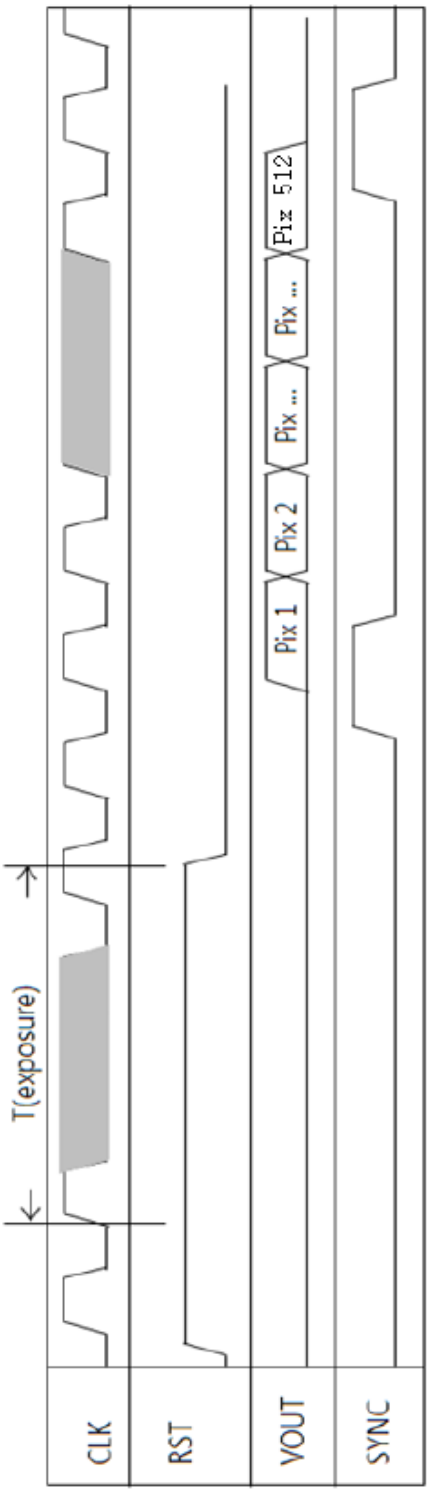
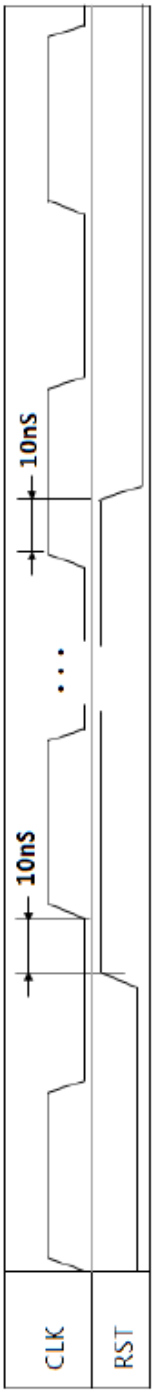
TIMING DIAGRAM



1. CLK
2. RST
3. VOUT : Pixel Output signal. After the RST goes low, the pixel data goes out with SYNC signal.
4. SYNC : Indicate the start /end of pixel data.



1. Minimum RST duration is 1 clock.
2. The CLK and RST Timing details are shown above, at least 10ns hold time required.

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ELECTRO-OPTICAL CHARACTERISTICS

Ta = +24°C, 51,2 Hz read rate, light color temperature of 5300K, 5pF load and VDD = 3,3V unless noted otherwise.

Parameter	Test Condition	Min	Typ	Max	Units
Supply voltage, VDD		3.0	3.3	3.6	V
Supply current			24		mA
Input high level	*(3)	2.5			V
Input low level				0.7	V
CLK low pulse width	Readout	6			µs
CLK high pulse width		3,7			µs
Set up time, /CLK	/CLK Falling		0,1	0,5	ns
Hold time, / CLK	/CLK falling		0,2		ns
Video setting time		tbd.			µs
Analog output impedance			10		KOhm
Output voltage at saturation			3.1		V
Output voltage at dark	Analog Out		1.3		V
$V_{BLKRef.}$	Current sink			1,0	mA
Linearity per Pixel	5% ≈ 70% avg.	0,5	3	5.0	% Sat
	@ +60°C			5.0	% Sat
Pixel nonuniformity dark	*(1)	17			mV rms
Dark Signal	5µs integration time		25		mVrms
Dynamic range (rms)	*(2) V_{sat}/RMS Noise			58	dB
Conversion gain, efficiency			1.068		uV/e-
Full well			2,69M		e-
Absolute QE	675nm		65		%
Sensitivity	555nm		3,87		V/lux-s
Read noise	*(2) 100 KHz		2		mV rms
Spectral response		350		1000	nm
Peak sensitivity wavelength			680		nm
Image lag		0,1	1,0	3.0	% Sat

NOTE 1: Vrms of N samples is calculated as

$$V_{rmse} = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(V_i - |V_i|)^2}$$

NOTE 2: Dynamic range defined as the Output Voltage at Saturation minus Output Voltage at Dark to Read Noise ratio.

NOTE 3: Amplitude of I/O voltages must not exceed the supply voltage, VDD.

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