



## High speed sensor for 3D machine vision and metrology

### Description

The viimagic 9221 / 22 is a high performance CMOS image sensor for highest quality demands. Thanks to the low light performance and its high dynamic range the sensor copes smoothly with difficult lighting conditions. Applications in high speed imaging like optical metrology and 3D-measurement provide its own challenges to the sensor technology. The trigger mode allows for synchronization with external lighting sources. In particular various triangulation methods or measurements are supported by flexible control and read out schemes.

The viimagic CMOS image sensor assures brilliant, low-noise images with natural color reproduction even in situations with critical light conditions. The reliable sensor with high sensitivity, 2/3" HD resolution (1920 x 1080 pixel) is capable of capturing still or motion images suitable for high quality requirements.



The viimagic 9221 / 22 CMOS image sensor allows a non-contacting three-dimensional shape measurement.

Targeted for high performance applications:  
optical metrology, 3D machine vision

- HDTV
- High dynamic range, low noise
- Low power
- High sensitivity
- up to p120 in DDS mode at full resolution
- LVDS interfaces
- High speed global shutter
- Region of interest (ROI)
- External trigger mode

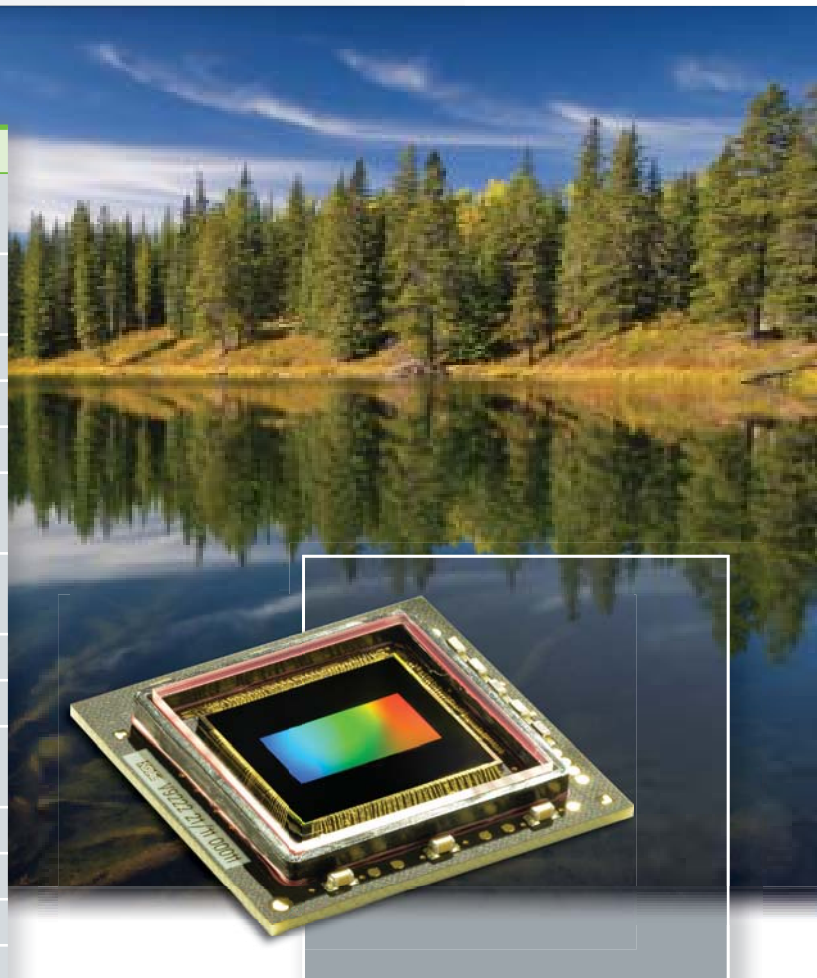
Parameter	Typical Values
Array format	Total: 2112 H x 1124 V Active: 2068 H x 1100 V
Effective image area	Total: 10.56 mm x 5.62 mm Active: 10.34 mm x 5.50 mm
Optical format	2/3" (1920 x 1080 pixel)
Pixel size	5 µm x 5 µm
Video outputs	4 x 2 LVDS
Frame rate (at full resolution)	24, 25, 30, ... 120 fps DDS 24, 25, 30, ... 240 fps CDS
Dynamic range	Linear Mode: > 60 dB High dynamic mode: > 120 dB
Electronic shutter	Global/Rolling shutter
Sensitivity	6 V/lux sec (@ 560 nm)
Video SNR	57 dB (Green 3 Lux, BW=0.4 ... 30 MHz)
Quantum efficiency	55 %
Random noise	< 6e (in dark area)
Full well capacity	16ke
FPN	6e (with digital double sampling)
PRNU	< 1.0 %
Supply voltage <sup>1</sup>	3.3V, 1.8V (1.9V)
Power consumption <sup>1</sup>	1.1 W (@ 60 fps/DDS, 2.5V)
Operating temperature	-20° C ... +75° C
Package	BGA-108 (27 mm x 27 mm) 81 functional pins

Key performance data partly depends on operation modes.

<sup>1</sup>For power optimization it is possible to operate LVDS transmitters at 2.5V.  
For system clock operation above 85MHz use 1.9V for ADC supply voltage.

## Features

- CMOS image sensor of HD resolution
- (1920 x 1080 pixel) (2048 x 1080 pixel)
- Quadruple on-chip 12-bit A / D converters
- Equivalent pixel clock: 600 MHz (maximal)
- Region of interest
- Variable pixel clock rate, flexible scanning schemes
- µ-lens for improved sensitivity
- Programmable gain
- Programmable rolling shutter or global shutter
- Selectable readout modes
  - High speed analog double sampling
  - Best performing correlated digital double sampling (DDS)



## Contact information:

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