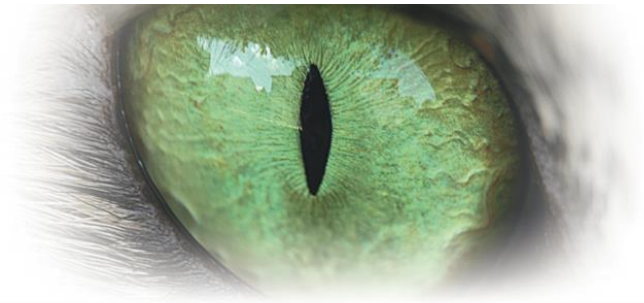


CMV50000

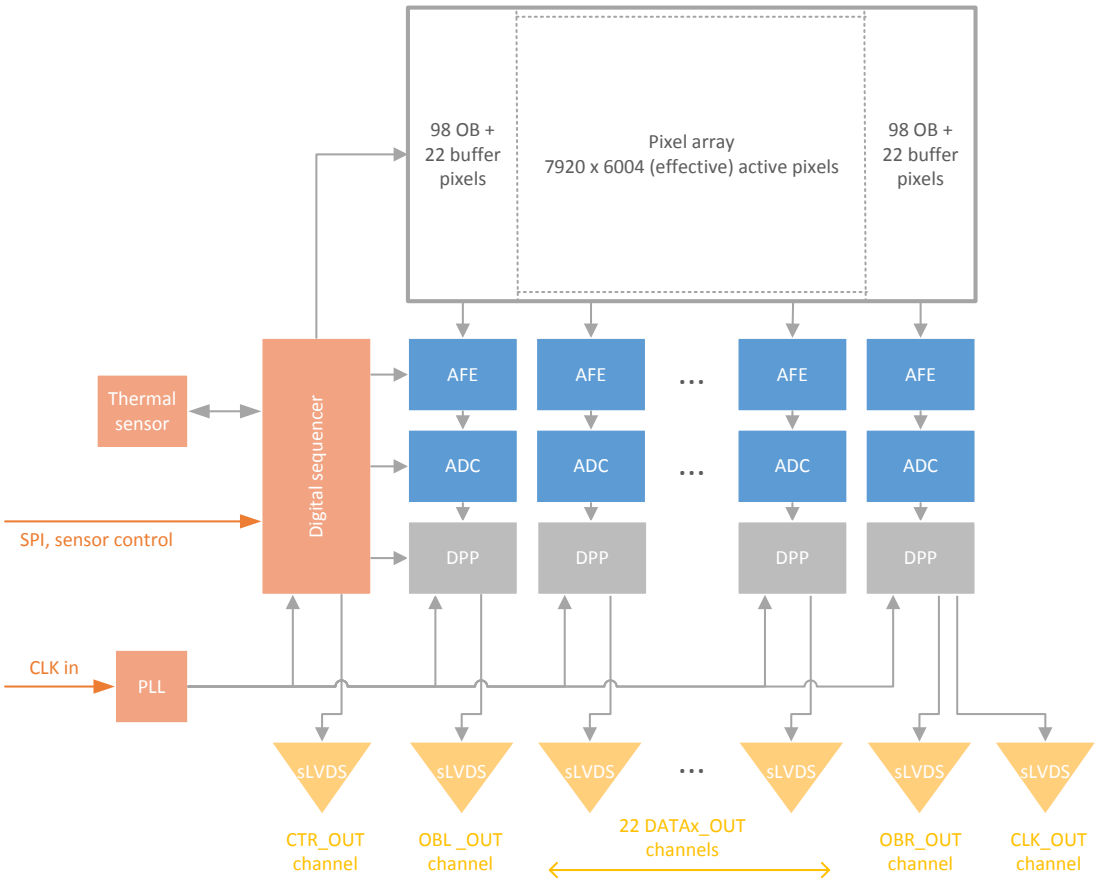
High speed global shutter machine vision sensor

The CMV50000 is a high speed CMOS image sensor with 7920 x 6004 effective pixels (47.5Mp) developed for machine vision and video applications. The image array consists of 4.6µm pipelined 8T global shutter pixels which allow exposure during read out, while performing true CDS (Correlated Double Sampling) operation. The image sensor has 22 12bit sub-LVDS data outputs. The image sensor also integrates a programmable analog gain amplifier and offset regulation. Each output channel runs up to 830 Mbps maximum which results in 30 fps frame rate at full resolution in 12 bit. Higher frame rates can be achieved in row-windowing mode or row-subsampling mode. These modes are all programmable using the SPI interface. All internal exposure and read out timings are generated by a programmable on-board sequencer. External triggering and exposure programming is also possible. Extended optical dynamic range can be achieved by a dual exposure HDR mode.

Key Features

- Global shutter pixel
- Effective resolution of 7920 x 6004 pixels
- 12-bit A/D conversion
- Framerate up to 30 fps in 12-bit mode, full frame
  - Up to 60 fps in subsampled readout mode
  - Up to 10 vertical windows for ROI and higher framerates
- Binning for increased SNR and DR
- Analog gain control
- Digital gain control per color channel
- Automatic black offset correction
- Row noise/FPN reduction based on OB pixel data
- Pipelined operation (exposure of next frame during read out)
- Digital sequencer: Handles the low-level timing for pixel and read out control
- On-chip supply regulators
- On-chip thermal sensor
- Various exposure and readout modes
  - Subsampling mode
  - Binning mode
  - High-dynamic range mode (dual exposure)
  - Triggered, internal, external, streaming
- SPI interface for configuration and software control
  - Reduce power consumption and dissipation
- sub-LVDS:
  - 22 data channels (up to 830Mbps)
    - Reduced number of outputs (lower power consumption)
  - 1 output clock channel
  - 2 OB channels
    - Optional, allows to do external OB correction
  - 1 control channel
- On-chip PLL
  - Generates all internally required clock frequencies
  - From a single input clock frequency
- Standard 141pin PGA package

Sensor Architecture



Basic specifications

- 7920 x 6004 4.6µm 8T global shutter pixels
- 35mm Full Frame optical format (full resolution: 36.43 x 27.62mm)
- Temporal noise: 8.5e
- Full well capacity: 14000e (binning: 58000e)
- Dynamic range: 64dB (binning: 68dB)
- SNR: 41.4dB (binning: 47.6dB)
- FPN: <0.20% rms of full swing
- PRNU: <1.5% rms
- PLS: 1/20000
- QE: 60% at 520nm
- Power consumption: 3.05W
- Frame rates:
  - 30fps @ 7920x6004
  - 60fps @ 3960x3002 (Subsampling)
  - 30fps @ 3960x3002 (Binning, improved SNR and DR)
  - 40fps @ 8k UHD (ROI: 7680x4320)
  - 40fps @ 4k UHD (ROI: 3960x2160) (Binning, improved SNR and DR)
- Higher fps with subsampling or reduced vertical ROI
- 141 pins PGA ceramic package
- Operating temperature range: -30°C to 70°C

Please address all product enquiries to:
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