Novel smart and high-speed CMOS optical imager for analyzing and optimizing fast motion processes in various industrial fields. Based on an optical line sensor capable of acquiring simultaneously and in a single shot white, red, green and blue (WRGB) lines at an ultra-high rate of 200'000 frames/sec.

Applications
- High-speed motion processes control (extruded profile, postal control, code reader, etc.)
- High performance colour sorting systems.
- Surface inspection of various material / pieces (metal, paper, film, etc.)
- General purpose high-speed machine vision process control, etc.

Pixel array & readout path
- 4 rows (WRGB) * 320 col. array, 24 um 5T pixels with programmable full-well.
- Separate high (50 ke- full well) & low sensitivity (200 ke- full well) lines of pixel for high measuring dynamic.
- Low reading noise and large SNR to reveal low contrasted images on white and dark substrates.
- Two pixels resolution within same sensor : 8 & 24 um to allow compromise between resolution and measurement sensitivity up to 200'000 fps.
- Shutter from 0.5 μsec to 13 msec (in 0.2 μsec steps)
- On-chip column parallel prog.-gain CDS & 10-bit ADC

Programmability
- On-chip frame sequencer (with external trigger)
- Individual programmable exposure time per line

Interfaces
- 2 data ports, 10-bit width @ 82 MHz (DDR)
- Serial interface (command registers, etc.)

Supplies
- 3.3 V (pixel field) and 1.8 V (analog & digital)

Sensor size
- Custom 1621-pin CLGA packaged
- Housing dimensions [L x W x H] 27.90 x 30.32 x 3.5 mm

Ultra high-speed optical sensor is covered by patents issued or pending. Information in this document is subject to change without notice.
Small size module embedding the sensor plus one FPGA, for local data processing. The module assures digital control & readout electronic of the CMOS at 256 MPixels/sec (10 bits data) over CoaXPress® link.

**Processing means:**
- FPGA Spartan 6 (download of firmware via CoaXPress)
- Flash memory
- 2 x 4 DACs
- Temperature sensor

**Interface**
- CoaXPress® 3 Gb/s camera data over 1 coaxial cable together with 13 W of 24 V power (up to 100 meters)
- Bidirectional transmission (3 Gb/s download; 20 Mb/s upload)
- Trigger / synchro event transmitted via CoaXPress

**Power consumption**
- 24 V DC, < 3 W at full speed (through CoaXPress)

**Size**
- 28 x 60 mm board (could be supplied in an enclosure)

960 x 960 pixel image; 2D code image taken at 2000 fps

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