



## 4x4 opto sensor with amplifiers

### Advance information DELTA-OPTO4X4

#### Features

- Number of active pixels: 16
- Pixel height: 475  $\mu\text{m}$
- Pixel pitch: 480  $\mu\text{m}$
- Pixels can be bundled in parallel to make a 2x2 array
- SPI configurable register set-up
- Visible and near IR sensitive photo diodes
- 4 on-chip low noise TIAs for continuous analog output
- Up to 1 MHz bandwidth
- Up to 1 M $\Omega$  programmable TIA amplification
- Externally controlled sample hold functionality
- Programmable difference amplifier x5 to x40
- Direct difference measurement on selected photodiodes
- 3.3 V single supply operation (functionality down to 2 V)
- 400 mV to 1.4 V buffered analog output
- Very low power standby mode ( $< 1 \mu\text{A}$ )
- 2 programmable amplifiers from x2 to x25
- Analog output amplifier for driving capacitive loads
- Simple control
- Dark current below 0.3  $\mu\text{A}$
- TIA input referred noise @20kHz BW below 0.5  $\mu\text{A}$

#### Technology

Portable to other 180 nm CMOS with Schottky diodes  
Proven in silicon SMIC 180 nm

#### Description

The DELTA Microelectronics 4x4 Image Sensor Chip (DELTA-OPTO4X4) is a small diode array with different amplifiers for continuous analog measurement and analog signal processing of the on-chip photodiodes.

Small electro-optical detection systems can be implemented with this chip or parts of this chip.

The gains of the different amplifier are configurable by a SPI interface and the system can be set in different modes e.g. power sample hold mode.

DELTA-OPTO4X4 is fully compatible with standard low-cost CMOS process. The digital interface is 3.3 V making it easy to combine external lock-in amplifiers and/or external CPU with ADC for a variety of demonstrators.

This IP has been proven in silicon in standard CMOS 0.18  $\mu\text{m}$  process and can easily be ported to other standard digital process. Using a standard 0.18  $\mu\text{m}$  process it is easy to add all types of digital and/or analog circuitry e.g. CPU, RAM, ROM, ADC, NFC communication etc.

#### Applications

- Backlight monitoring
- Fluorescence based sensor systems
- Movement measurement
- Position detection
- Light curtain
- Proximity sensor
- Colour detection

For further information please contact us

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## Architecture overview of Opto-ASIC with a 4x4 on-chip sensors

