Mira050

Datasheet

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Mira050 0.5 MP NIR-enhanced high speed global shutter image sensor

1 General description

Mira050 is a compact 0.5 MP Near IR enhanced global shutter image sensor designed for 2D and 3D consumer and industrial machine vision applications. The sensor has a small 2.79 µm pixel size with high sensitivity made possible by a state of the art BSI technology. The sensor has a MIPI CSI-2 interface to allow easy interfacing with a plethora of processors and FPGAs. Due to its small size, configurability and high sensitivity both in visual as well as NIR, the Mira050 is well suited for 2D and 3D applications, which include Active Stereo Vision, Structured Light Vision and AR/VR. High sensitivity in NIR enables increased measurement range and allows overall system power consumption optimization which is key for battery powered consumer and industrial applications.

2 Specifications & special features

Table 1: Key specifications

Parameter	Value	Remark
Active pixels	576 (H) x 768 (V) CSP 600 (H) x 800 (V) Bare Die	On CSP the addressable area is 600 x 800 but only 576 x768 is useable.
Pixel	2.79 µm × 2.79 µm	BSI stacked technology with high NIR sensitivity. Low noise and low cross talk
Optical format	1/7”	
Dimensions	2.25 mm x 2.75 mm – Die 2.29 mm x 2.83 mm – CSP	Active area 60% of total.
Shutter type	Voltage domain pipelined global shutter	Possibility of exposure of next image during readout of the previous image.
Quantum efficiency (QE)	94 / 56 / 36 %	550 / 850 / 940 nm Mono
Supported lens chief ray angle (CRA)	0° to 30°	Extra wide acceptance angle of the Mira050 pixel means any lens profile with these CRA values can be used.
ADC modes	8-bit | 10-bit | 10-bit HS | 12-bit	

Parameter	Value	Remark
Max frames per second full resolution	120 fps	All ADC modes
Analog gain	1x → 4x step: 2x 1x → 16x step: 2x 1x → 4x step: 3% 1x → 32x step: 2x 1x → 16x step: 3%	12-bit | 10-bit HS (Default mode) 10-bit (Default mode) 10-bit HS (Fine gain mode) 8-bit (Default mode) 8-bit (Fine gain mode)
Digital gain	1x → 16x step: 1/16x	8-bit |10-bit | 10-bit HS | 12-bit
Data interface	MIPI CSI-2 v1.3 DPHY v1.2 1 Data lane | 1 Clock lane	1.5 Gbps with data scrambling support

Table 2: Special features

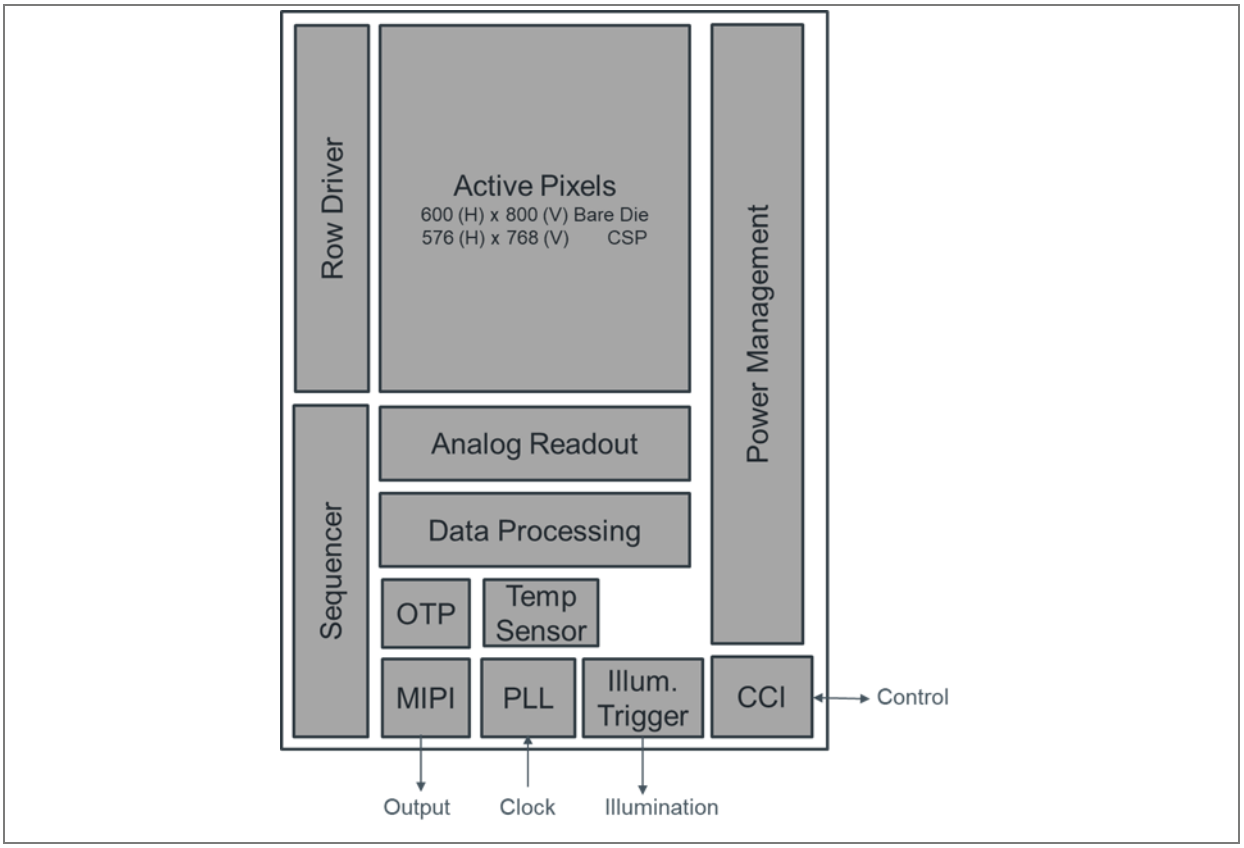
Features	Benefits
Programmable registers	Programming of window coordinates, timing parameters, exposure time, mirror, flipping, cropping
High sensitivity and NIR enhanced pixel	High sensitivity and compact pixel size achieved via state of the art BSI technology with NIR enhancement resulting in less power hungry illuminators
Context switching	Two register contexts for on the fly configuration changes
On-chip processing	Defect pixel detection and correction Image statistics generation Event detection In pixel background light cancellation Digital pixel binning Black sun protection Flexible ROI selection
On-chip advanced power management	Smart powering of on chip blocks with respect to frame rate and exposure time resulting in extended battery life
On-chip temperature sensor	Accurate temperature reading on junction temperature
Illumination synchronization trigger	Accurate timing between illumination and actual exposure

3 Applications

- Facial authentication for mobile devices and points of payments.
- Active stereo and structured light vision (Robotics and other applications).
- Eye, head, hand, environment tracking for AR/VR.

4 Block diagram

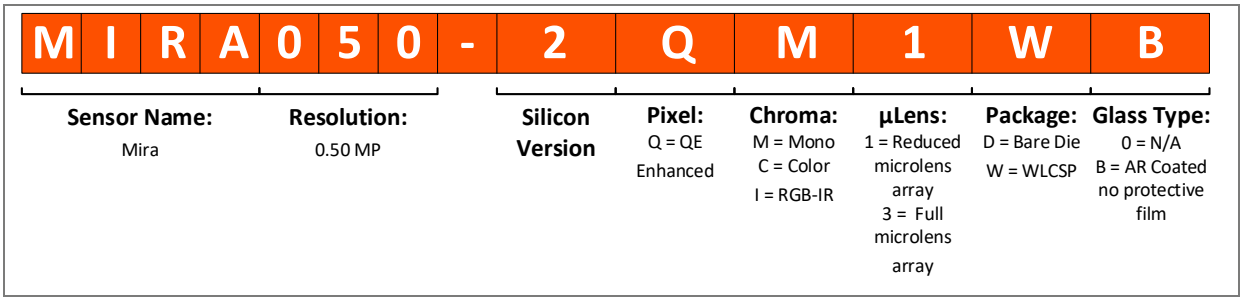
Figure 1: Functional blocks of Mira050



5 Ordering information

Product code	Ordering code	Package	Delivery form	Color filter	Delivery quantity
Mira050-2QM3D0	Q65113A8201	Reconstructed wafer (bare die)	R/W	None	Upon Request
Mira050-2QM1WB	Q65113A8197	CSP	CSP	None	Multiples of 120
Mira050-2QC3D0	Q65113A8203	Reconstructed wafer (bare die)	R/W	RGB	Upon Request
Mira050-2QC1WB	Q65113A8202	CSP	CSP	RGB	Multiples of 120
Mira050-2QI3D0	Q65113A8205	Reconstructed wafer (bare die)	R/W	RGB-IR	Upon Request
Mira050-2QI1WB	Q65113A8204	CSP	CSP	RGB-IR	Multiples of 120

Figure 2: Product code description



6 Revision information

Document status	Product status	Definition
Product Preview	Pre-development	Information in this datasheet is based on product ideas in the planning phase of development. All specifications are design goals without any warranty and are subject to change without notice
Preliminary Datasheet	Pre-production	Information in this datasheet is based on products in the design, validation or qualification phase of development. The performance and parameters shown in this document are preliminary without any warranty and are subject to change without notice
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Changes from previous released version to current revision v5-00	Page
Removed unnecessary information from Ordering information	6
Added code description	6

- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.

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