Datasheet

DS001066

Mira050

1/7” Compact 0.5 MP NIR Enhanced Global Shutter Image

v1-01 • 2023-Feb-20

Content Guide

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 and Special Features

Figure 1:
Typical Specifications Mira050

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 x 768 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	
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

Figure 2:
Special Features

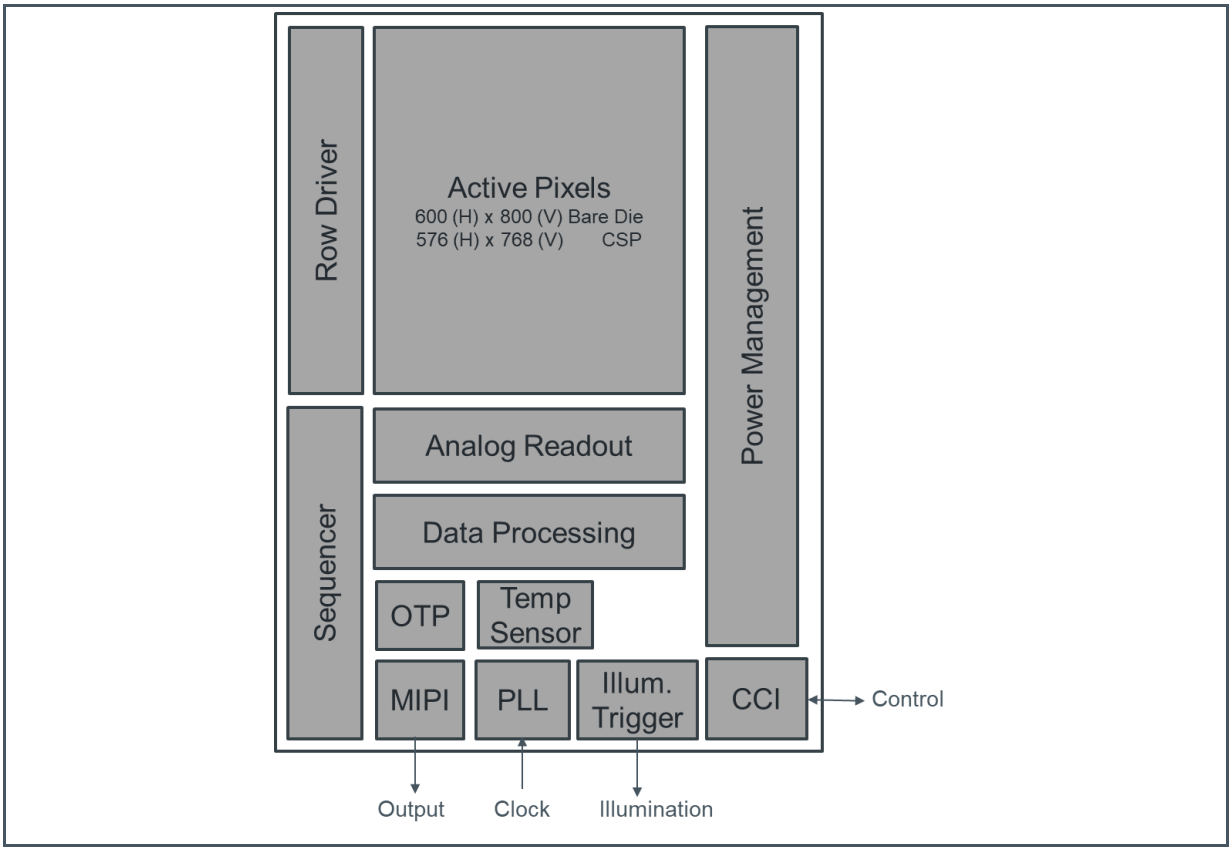
Features	Benefits
Programmable registers	Programming of window coordinates, timing parameters, exposure time, mirror, flipping, cropping.
High sensitivity and NIR enhanced pixel	High sensitivity and compact pixel size achieved via state of the art BSI technology with NIR enhancement resulting in less 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 3:
Functional Blocks of Mira050



5 Ordering Information

Product Code	Ordering Code	Package	Delivery Form	Delivery Quantity
Mira050-1QM1D0	511930021 Q65113A5663	Reconstructed Wafer (bare die)	R/W	Multiples of 3418
Mira050-1QM1WB	511930019 Q65113A5422	CSP	Tray	Multiples of 120

6 Revision Information

Changes from previous version to current revision v1-01	Page
Initial short datasheet	
Removed “Remarks” for “ADC Modes” under Figure 1	4

- 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.

7 Legal Information

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