Product Document

Datasheet

DS001056

Mira220

1/2.7" 2.2MP NIR Enhanced Global Shutter Image

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Content Guide

1   General Description

Mira220 is a 2.2 MP NIR enhanced global shutter image sensor with a small 2.79 μm pixel size. It has excellent low light sensitivity made possible by a state-of-the-art stacked BSI technology. With an effective resolution of 1600 × 1400 and a maximum bit depth of 12 bits, the sensor supports on-chip operations like external triggering, windowing, horizontal or vertical mirroring. The maximum frame rate is 90 fps at full resolution and bit depth. The sensor has a MIPI CSI-2 interface to allow easy interfacing with a plethora of processors and FPGAs. On-chip registers can be accessed via the standard I²C interface for easy configuration of the sensor.

Due to its small size, configurability and high sensitivity both in visual as well as NIR, the Mira220 is well suited for 2D and 3D applications, which include Active Stereo Vision, Structured Light Vision for Robotics 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.

## 1.1   Key Benefits & Features

Figure 1:
Added Value of Using Mira220

Benefits	Features
Compact size with high resolution and bit depth	1/2.7” 1600x1400 8/10/12-bit 2.79 μm
High speed applications	90 fps global shutter with CDS
Use in low light conditions	High sensitivity
Compact size	Small die size achieved via state-of-the-art stacked BSI technology
NIR enhanced with high sensitivity	Class leading QE at 940 nm combined with high sensitivity. Industry leading PLS at 940 nm
On chip noise reduction	Digital CDS and row noise correction
Reduced off-chip processing	- On chip defect pixel detection and correction - On chip image statistics generation
Multiple Variants	Available as Mono, RGB or RGBIR variant. Orderable with AR coated or plain glass and protective film
Extended battery operation	Low power consumption

1.2 Applications

- Mobile Facial Authentication
- Active Stereo Vision
- Smart Home Appliances
- QR Readers.
- Automatic Identification and Data Capture (AIDC).

- AR/VR
- Structured Light Vision
- Drones
- Smart Wearable Devices
- SLAM for Robotics

1.3   Block Diagram

Figure 2:
Functional Blocks of Mira220
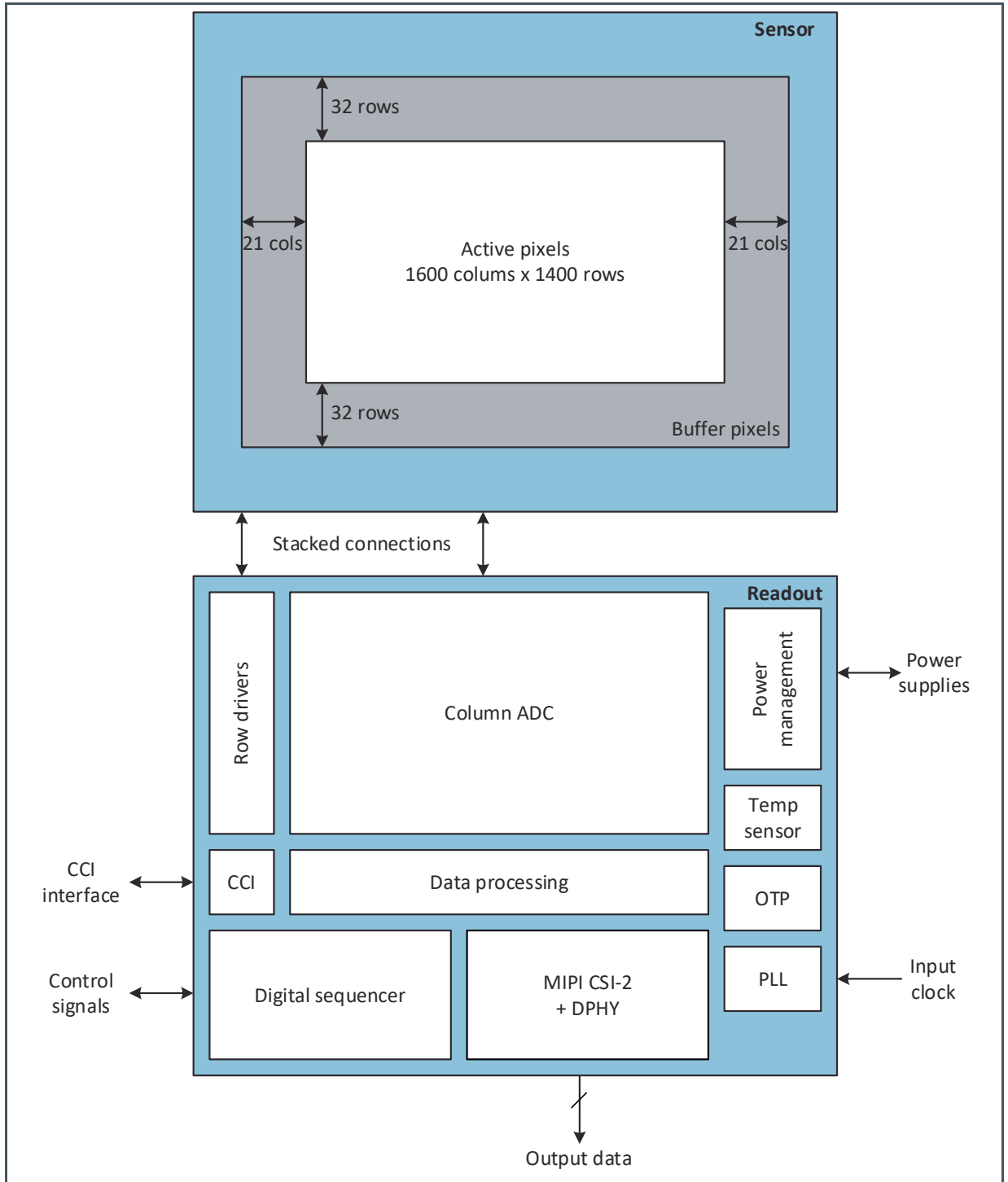
2 Typical Operating Characteristics

2.1 Electro-Optical Characteristics

Below are the typical electro-optical specifications of Mira220.

Figure 3:
Optical Features of Mira220

Parameter	Value	Remark
Active Pixels	1600 (H) × 1400 (V)	
Pixel Pitch	2.79 × 2.79 µm²	
Optical Format	1/2.7"	
Pixel Type	BSI global shutter	With fixed pattern noise correction and reset (kTC) noise canceling by correlated double sampling (CDS) coupled with high sensitivity.
Shutter Type	Pipelined global shutter	Exposure of next image during readout of the previous image.

Figure 4:
Typical Electro-Optical Characteristics

Parameter	Value	Remark
Supported Lens Chief Ray Angles (CRA)	0° to 30°	Extra wide acceptance angle of the Mira220 pixel means any lens profile with these CRA values would provide decent performance.
Quantum Efficiency (QE) Mono	95 / 56 / 36 %	550 / 850 / 940 nm
Quantum Efficiency (QE) RGB and RGBIR	76 / 85 / 80 / 56 / 36 %	450 / 530 / 605 / 850 / 940 nm

2.2 Functional Characteristics

Figure 5:
Functional Characteristics

Parameter	Value
Bit Depth	12-bit 10-bit 8-bit
Timing Generation	On-chip
Programmable Registers	Sensor parameters. e.g. Window coordinates, Timing parameters, and Exposure time
Power Consumption	168 mW | Active 30fps 40 mW | Idle 4 mW | Sleep
Data Interface Standard	MIPI CSI-2 DPHY
MIPI Outputs	2 Data 1 Clock
Output Interface Bit Rate	1.5 Gbit/s
Frame Rates	90 fps
Black Sun Protection	Yes
Temperature Sensor	Yes
Context Switching	Two register contexts

3   Revision Information

Changes from previous version to current revision v2-00	Page
Updated General Description	3
Updated Figure 1	3
Updated Figure 4	6
Updated Figure 5	7

- 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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