

am^u Mira220

Datasheet

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Mira220 1/2.7” 2.2MP NIR enhanced global shutter image

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

Table 1: Added value of using Mira220

Benefits	Features
Compact size with high resolution and bit depth	• 1/2.7” • 1600 x 1400 • 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

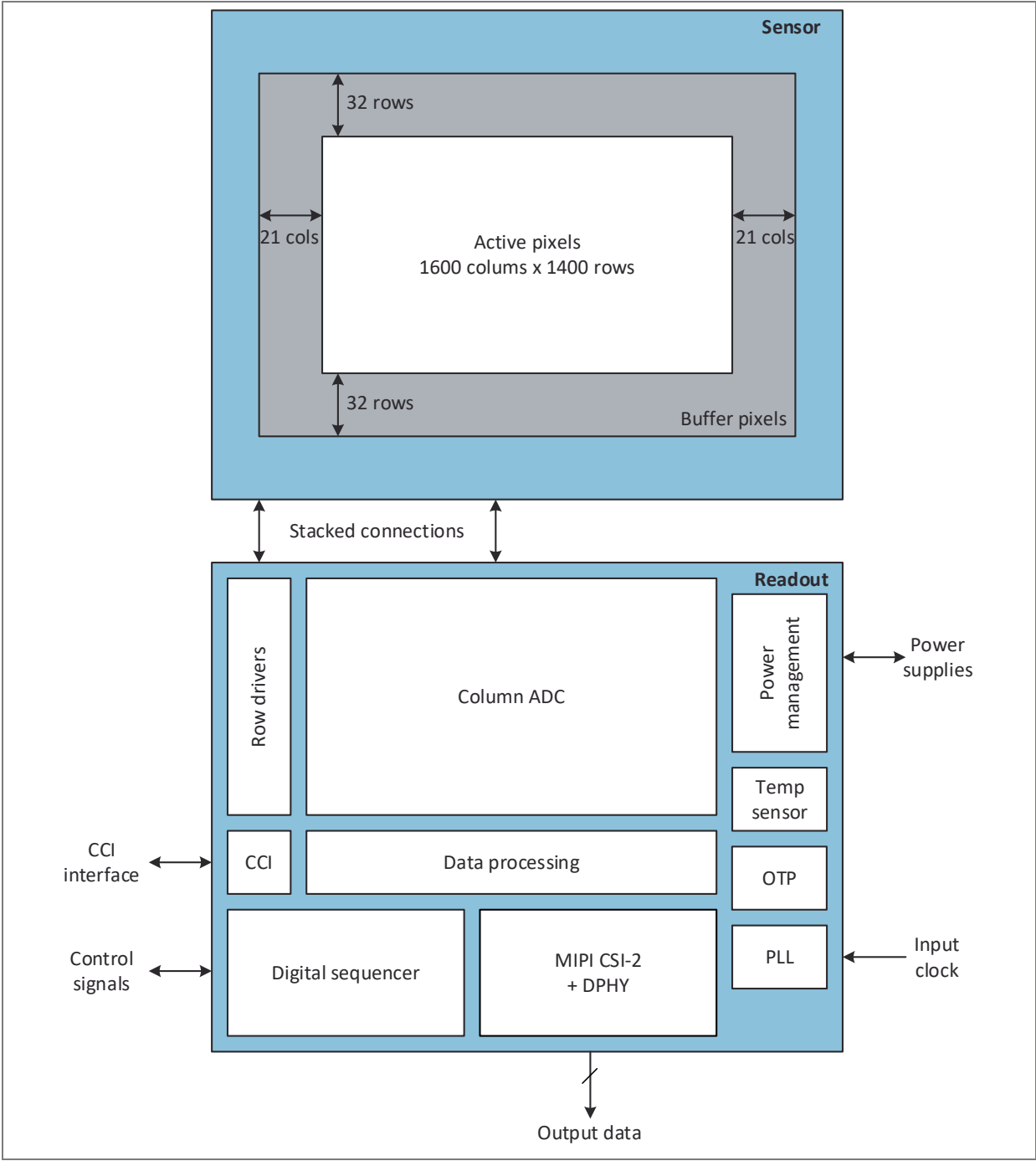
Benefits	Features
Reduced off-chip processing	- On-chip defect pixel detection and correction - On-chip image statistics generation
Multiple variants	Available as Mono, RGB or RGBIR variant. Orderable with AR coated or plain glass and protective film
Extended battery operation	Low power consumption

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 1: Functional blocks of Mira220



2 Ordering information

Product code	Ordering code	Type	Package	Glass	Protective film	Delivery form	MOQ
Mira220-2QM1WP	509780018 Q65114A0086	Mono	CSP	Plain	Yes	Tape and Reel	Multiples of 2000
Mira220-2QM1WA	509780022 Q65114A0087	Mono	CSP	AR	Yes	Tape and Reel	Multiples of 2000
Mira220-2QM1WO	509780037 Q65113A5069	Mono	CSP	Plain	No	Tape and Reel	Multiples of 2000
Mira220-2QC1WP	509780027 Q65113A5403	RGB	CSP	Plain	Yes	Tape and Reel	Multiples of 2000
Mira220-2QC1WA	509780029 Q65113A5404	RGB	CSP	AR	Yes	Tape and Reel	Multiples of 2000
Mira220-2QC1WO	509780038 Q65113A5405	RGB	CSP	Plain	No	Tape and Reel	Multiples of 2000
Mira220-2QI1WP	509780034 Q65113A5408	RGBIR	CSP	Plain	Yes	Tape and Reel	Multiples of 2000
Mira220-2QI1WA	509780036 Q65113A5409	RGBIR	CSP	AR	Yes	Tape and Reel	Multiples of 2000
Mira220-2QI1WO	509780039 Q65113A5410	RGBIR	CSP	Plain	No	Tape and Reel	Multiples of 2000
Mira220-2QM1D0	509780015 Q65114A0085	Mono	RW	-	-	Reconstructed Wafer	Contact Sales
Mira220-2QC1D0	509780024 Q65113A5399	RGB	RW	-	-	Reconstructed Wafer	Contact Sales
Mira220-2QI1D0	509780031 Q65113A5406	RGBIR	RW	-	-	Reconstructed Wafer	Contact Sales
Mira220-2QM1WP	509780042 Q65113A5999	Mono	CSP	Plain	Yes	Tape and Reel	Multiples of 500
Mira220-2QM1WA	509780043 Q65113A6000	Mono	CSP	AR	Yes	Tape and Reel	Multiples of 500
Mira220-2QC1WP	509780044 Q65113A5997	RGB	CSP	Plain	Yes	Tape and Reel	Multiples of 500
Mira220-2QC1WA	509780045 Q65113A5998	RGB	CSP	AR	Yes	Tape and Reel	Multiples of 500
Mira220-2QI1WP	509780046 Q65113A5995	RGBIR	CSP	Plain	Yes	Tape and Reel	Multiples of 500
Mira220-2QI1WA	509780047 Q65113A5996	RGBIR	CSP	AR	Yes	Tape and Reel	Multiples of 500
Mira220-2QM1WP	509780018 Q65114A0086	Mono	CSP	Plain	Yes	Tape and Reel	Multiples of 2000

3 Typical operating characteristics

3.1 Electro-optical characteristics

Below are the typical electro-optical specifications of Mira220.

Table 2: Optical features of Mira220

Parameter	Value	Remark
Active pixels	1600 (H) × 1400 (V)	
Pixel pitch	2.79 × 2.79 μm ²	
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.

Table 3: 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)	94 / 55 / 36 %	550 / 850 / 940 nm

3.2 Functional characteristics

Table 4: Functional characteristics

Parameter	Value
Bit depth	12-bit
	10-bit
	8-bit
Timing generation	On-chip

Parameter	Value
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

4 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
Datasheet	Production	Information in this datasheet is based on products in ramp-up to full production or full production which conform to specifications in accordance with the terms of ams-OSRAM AG standard warranty as given in the General Terms of Trade

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- 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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