120 MP Ultra High Resolution CMOS Sensor
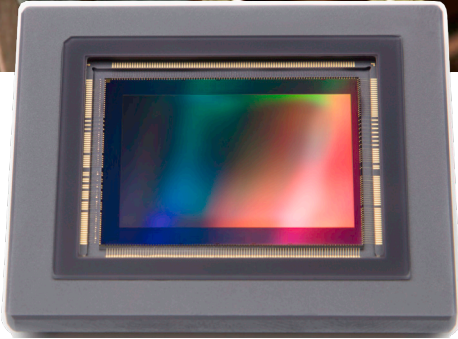
The 120MXS is an ultra-high resolution CMOS sensor with 13272 x 9176 effective pixels. It has a size equivalent to APS-H (29.2mm x 20.2mm), and a square pixel arrangement of 2.2µm x 2.2µm with 122 million effective pixels. Ultra-high-resolution is made possible by parallel signal processing, which reads signals at high speed from multiple pixels. All pixel progressive reading of 9.4 fps is made possible by 28 digital signal output channels. It is available in RGB, RGB-NIR, or in monochrome with twice the sensitivity.

Ultra High Resolution and Speed

By incorporating close to the same number of pixels as receptors in the human eye, the 120MXS captures remarkable detail 60 times greater than full high definition standards. By sharing a floating diffusion capacitance between four pixels instead of one, less space is required for the readout circuitry. This allows for larger photodiode sizes with an improved signal-to-noise ratio, without the trade off of long readout speeds.


Optimized Pixel Design

The sensors small pixels bring the potential for light to leak from pixel to pixel, which is known as crosstalk. When this happens, it can create color shading and inaccurate color representation that degrades image quality. To mitigate crosstalk, a wire layer has been incorporated into the sensor structure between each pixel. This creates a boundary that surrounds the pixel and keeps light from leaking between them.
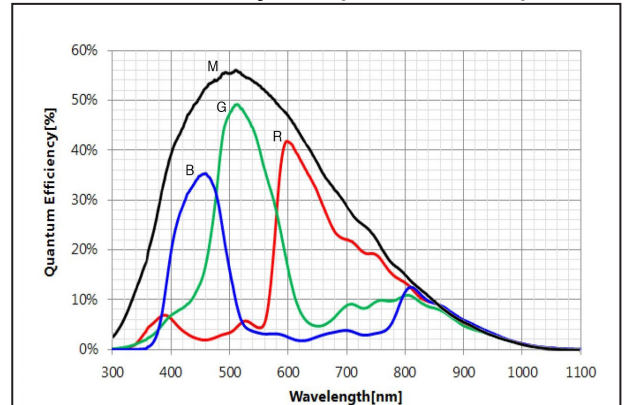
RGB-NIR Pixel Filter

By replacing one of the green filters on a standard color CMOS sensor with a Near Infra-Red (NIR) filter, image processing from this sensor allows for the separation of visible and NIR wavelengths. Discrete analysis of these bands from a single image simplifies dual sensor systems by reducing size, weight, and power (SWaP) requirements, provides added capabilities to systems that can benefit from the additional band, and enhances current solutions already detecting in both the NIR and visible wavelengths such as precision agriculture with the benefit of 120MP resolution.
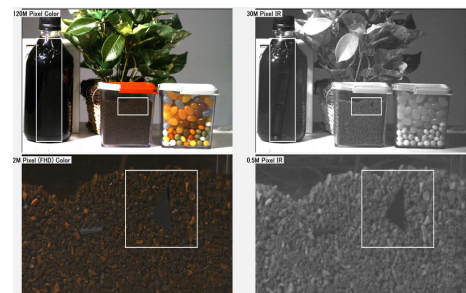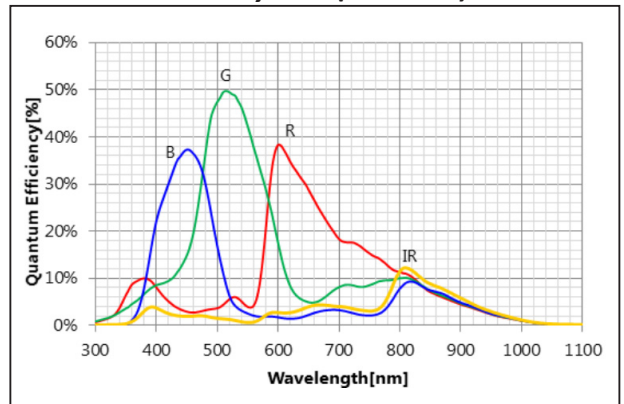
Specifications

	120MXSC	120MXSI	120MXSM
Filter Type	RGB	RGB-NIR	Monochrome
Sensitivity (e/lx/sec)	10,000	10,000	20,000
Sensor Size	29.2mm x 20.2mm		
Number of Effective Pixels	13272h x 9176v		
Pixel Size	2.2μm x 2.2μm		
Scan Type	Progressive Scan		
Shutter	Rolling Shutter		
Maximum Frame Rate (All Pixels)	9.4 fps		
Resistor Control Type	Three Wire Serial Communication		
Package Type	188pin ceramic PGA		
Saturation	10,000 e @gain x0.5		
Conversion Gain	0.083 LSB/e- @ Gain x1		
	0.67 LSB/e- @ Gain x8		
Dark Random Noise (Room Temp)	2.3e rms @ gain x8		
Dark Current	8.1e/sec @ gain x8, 60°C		
Drive Frequency	45MHz		
Output Channels	Data 28 lanes, Clock 14 lanes		
Output Format	720Mbps in LVDS output 9.4fps @ 10 bit		
Column Amplifier Gains	x0.5, x1, x2, x4, x8		
Power Consumption	2.5W		
Power Supply Voltage	1.7 V, 3.5 V		
Package Size (External Electrodes Not Included)	55.0mm x 47.8mm x 4.49mm		

Quantum Efficiency Plot (Mono & RGB)

Quantum Efficiency Plot (RGB-NIR)

Accessories

Evaluation Kit	
Hardware Included	Camera, Power Supply, USB / GPIO Cables
Filter Type	RGB, Mono, or RGB-NIR
Interface	USB 3.1
Lens Mount	F-Mount
Design Assets (with NDA)	• Sensor board electrical design files • VHDL code for the FPGA
Sensor Socket	

Available from Andon Electronics
- 24-00661-188-284K-R27-L14 (Thru-Hole Socket)
- 24-00661-188-284K-R27-L14-HS1 (Heat Sink Socket, Thru-Hole)
- 24-00661-188-281K-R27-L14 (Surface Mount Socket)
- 24-00661-188-RB338K-R27-L14 (Rollerball® Surface Mount Socket)

Applications

- 3D Metrology
- Aerial Mapping
- Aeronautic Imaging
- Digital Archiving
- Document Scanning
- Flat Panel Display Inspection
- Life Sciences
- Machine Vision
- Medical Imaging
- Packaging & Inspection
- Scientific Research
- Security
- Wide Area Surveillance

For more information visit https://canon-cmos-sensors.com