

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 2.2 $\mu$ m x 2.2 $\mu$ m 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.

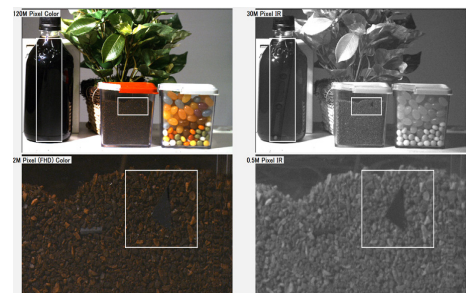


### Optimized Pixel Design

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.



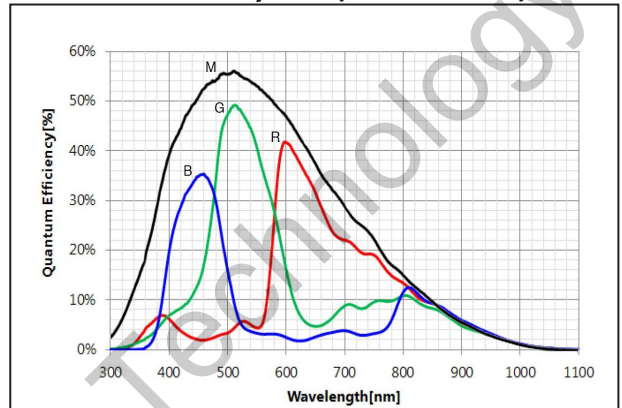
## 120 MP Ultra High Resolution CMOS Sensor

Product Sheet

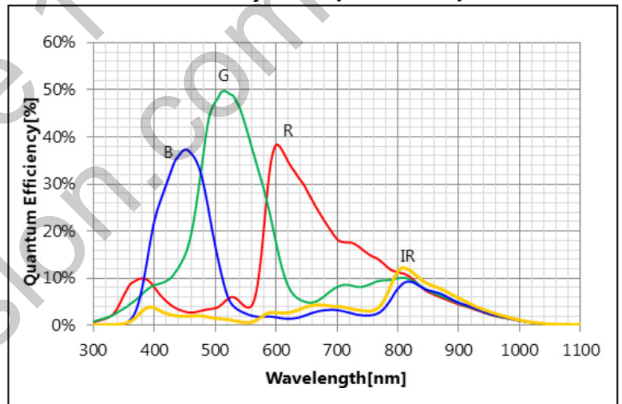
### Specifications

|   | 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)



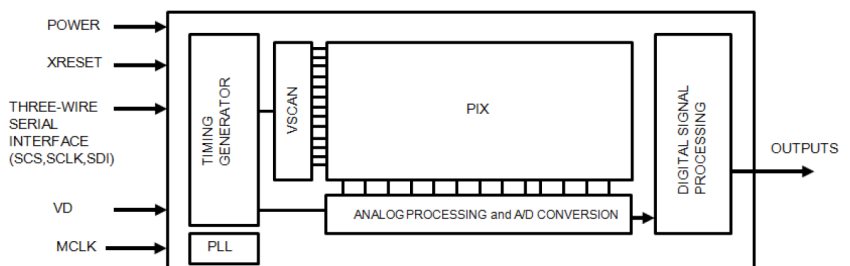
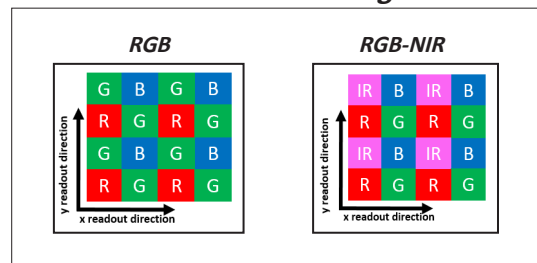
### Quantum Efficiency Plot (RGB-NIR)



### Applications

- 3D Metrology
- Aerial Mapping
- Aeronautic Imaging
- Digital Archiving
- Document Scanning
- Flat Panel Display Inspection
- Intelligent Traffic Systems (ITS)
- Wide Area Surveillance
- Machine Vision
- Medical Imaging
- Packaging & Inspection
- Scientific Research
- Security

### Pixel Color Filter Arrangement



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