

120MXSM, 120MXSC, 120MXSI

35.5mm Diagonal 122MP CMOS Sensor on 188pin PGA with 2.2 μ m Square Pixels at 9.4fps

DESCRIPTION

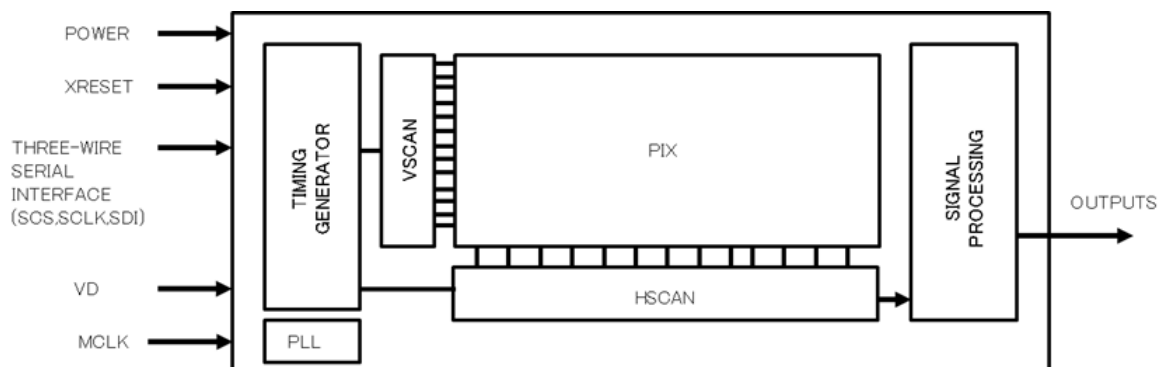
The 120MXS series is a CMOS type solid-state imaging sensor having a size equivalent to APS-H, and a square pixel arrangement with 122 million effective pixels. An all pixel progressive reading of 9.4 fps is possible by the 28 channel digital signal outputs. A rolling electronic shutter function is provided for controlling electric charge accumulation periods.

*120MXS series consists of 120MXSC (color), 120MXSM (monochrome) and 120MXSI (RGBIR).

FEATURES

- 120MXSM: Monochrome sensor
- 120MXSC: Color sensor (RGB on-chip color filter)
- 120MXSI: RGBIR sensor (RGB IR on-chip color filter)
- Rolling shutter
- Record screen size: APS-H or equivalent (29.20mm x 20.19mm)
- Number of effective pixels: 13272 x 9176 (Horizontal x Vertical)
- Pixel size: 2.2 μ m x 2.2 μ m
- Number of output channels: Data 28 lanes, Clock 14 lanes
- Output format: 720 Mbps in LVDS output 9.4 fps @10 bit
- Main clock frequency: 45 MHz (Recommended)
- All pixel progressive reading function, reading function for the Region of Interest (ROI) Readout (Vertically)
- Vertically intermittent reading function (1/1, 1/2*, 1/3, 1/5, 1/7, and 1/15)
 - * Read (1/2) mode only available for 120MXSM.
- Built in column amplifier (Pre-amplifier gain mode: x0.5, x1, x2, x4, and x8)
- Serial communication
- Saturation: 10,000 [e] @gain x0.5
- Sensitivity of 120MXSM: 20,000 [e/lx/sec]
- Sensitivity of 120MXSC(Green): 10,000 [e/lx/sec]
- Sensitivity of 120MXSI(Green): 10,000 [e/lx/sec]
- Quantum efficiency of 120MXSM: 51% @ wavelength 550nm
- Quantum efficiency (Green) of 120MXSC: 41% @ wavelength 550nm
- Quantum efficiency (IR) of 120MXSI: 9% @ wavelength 850nm
- Dark Random Noise: 2.3 [e rms] @gain x8
- Dark Current: 8.1 [e/sec] @gain x8, 60°C
- Power consumption: 2.5 W (under recommended operating conditions)
- Power supply voltage: 1.7 V, 3.5 V
- 188pin ceramic PGA
- Package size: 55.00 mm x 47.80 mm x 4.49 mm (External electrodes are not included)

FUNCTIONAL BLOCK DIAGRAM



| | 250MP | | 120MP | | | 5MP Global shutter | | | | | | 1/1.8" 2.1MP HDR | 1" 12MP |
|---|---|------------|--|------------|----------------|--|------------|----------------|---|------------|----------------|------------------------------|-------------------------------------|
| | LI8020SAC | LI8020SAM | 120MXSC | 120MXSM | 120MXSI | LI5010SAC | LI5010SAM | LI5010SAI | LI5020SAC | LI5020SAM | LI5020SAI | LI7050SAC | LI7030SAC |
| Filter Type | RGB | Monochrome | RGB | Monochrome | RGB-NIR | RGB | Monochrome | RGB-NIR | RGB | Monochrome | RGB-NIR | RGB | RGB |
| Sensitivity (e-/lx/sec) | 4,600 (Green) | 11,000 | 10,000 (Green) | 20,000 | 10,000 (Green) | 30,000 (Green) | 47,000 | 30,000 (Green) | 30,000 (Green) | 54,000 | 30,000 (Green) | 55,000 (Green) | 22,000 |
| Dark Random Noise | 3.8 erms @ 12dB | | 2.3e rms @ gain x8, Room Temperature | | | 2.6e rms @ Analog gain x1 | | | 2.6e rms @ Analog gain x1 | | | 1.1e rms @ room temperature | 2.6e rms @ 4K3K, 24fps(12bit) |
| Saturation | 5,400 [e] (@6dB) | | 10,000 [e] (@gain x0.5) | | | 12,000e – Dynamic Range Priority Mode (@ Analog gain 0 dB) | | | 12,000e – Dynamic Range Priority Mode (@ Analog gain 0 dB) | | | 30,000 [e] (@gainx1) | 25,000 [e] |
| | | | | | | 7,000e – Frame Rate Priority Mode (@ Analog gain 0 dB) | | | 7,000e – Frame Rate Priority Mode (@ Analog gain 0 dB) | | | | |
| Resolution (megapixels) | 250 | | 122 | | | 5 | | | 5 | | | 2.12 | 12 |
| Effective Pixels (Horizontal xVertical) | 19568 x 12588 | | 13272 x 9176 | | | 2592 x 2056 | | | 2592 x 2056 | | | 1936 x 1096 | 4004 x 3000 |
| Sensor Size | APS-H (29.35mm x 18.88mm) | | APS-H (29.22mm x 20.20mm) | | | Approx. 2/3 inch (8.8mm x 7.0mm) | | | Approx. 2/3 inch (8.8mm x 7.0mm) | | | 1/1.8 inch (7.94mm x 4.49mm) | 1 inch (12.8mm x 9.6mm) |
| Pixel Size | 1.5µm x 1.5µm | | 2.2µm x 2.2µm | | | 3.4µm x 3.4µm | | | 3.4µm x 3.4µm | | | 4.1 µ m x 4.1 µ m | 3.2µm x 3.2µm |
| Maximum Frame Rate | 5 fps | | 9.4 fps | | | 60fps – Dynamic Range Priority Mode | | | 60fps – Dynamic Range Priority Mode | | | 60fps | 4K3K video at 24 fps (12bit) |
| | | | | | | 120fps – Frame Rate Priority Mode | | | 120fps – Frame Rate Priority Mode | | | 30 fps (HDR) | 4K2K video at 60 fps (10bit) |
| Shutter Type | Rolling | | Rolling | | | Global electronic shutter function | | | Global electronic shutter function | | | Rolling | Rolling |
| I/F | LVDS | | LVDS | | | LVDS | | | LVDS | | | MIPI CSI-2 | LVDS |
| Power Consumption (Type) | 2.0W (under recommended operating conditions) | | 2.5 W (under recommended operating conditions) | | | 500mW (all pixels @ 120 fps) | | | 510mW (all pixels @ 120 fps) 440mW (all pixels @ 42 fps)Low Power mode | | | 320mW (all pixels @ 60 fps) | 540 mW @4K2K readout, 60fps (10bit) |

The contents of this specification are subject to change without notice