

# LI8020SA

34.9mm Diagonal 246MP CMOS Sensor on 228pin QFP with 1.5µm Square Pixels at 5.0fps

## DESCRIPTION

LI8020SA is a CMOS type solid-state imaging sensor having a size equivalent to APS-H, and a square pixel arrangement with 246 million effective pixels.

An all pixel progressive reading of 5.0 fps is possible by the 16 channel digital signal outputs.

A rolling electronic shutter function is provided for controlling electric charge accumulation periods.

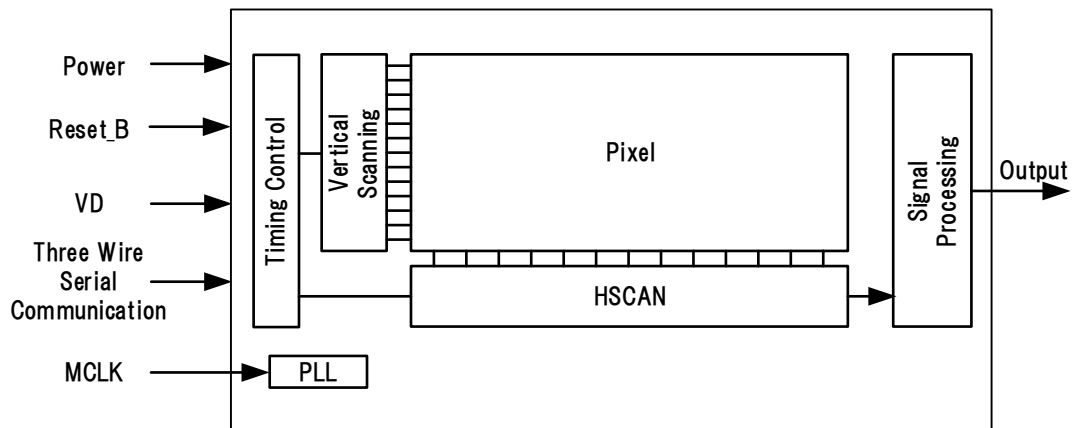
LI8020SA captures stunning detail 125 times greater than full high definition resolution and 30 times that of 4K resolution. This CMOS sensor also supports features such as ROI readout function and sub-sampling readout function, it can realize faster framerate.

\*LI8020SA series consists of LI8020SAM (monochrome), LI8020SAC (color).

## FEATURES

- LI8020SAM: Monochrome sensor
- LI8020SAC: Color sensor (RGB on-chip color filter)
- Rolling shutter, Slit Rolling shutter
- Recording screen size: APS-H or equivalent (29.35 mm x 18.88 mm)
- Number of effective pixels: 19568 x 12588 (Horizontal x Vertical)
- Pixel size: 1.5 µm x 1.5 µm
- Number of output channels: Data 16 lanes, Clock 4 lanes
- Output format: LVDS/SLVS output, 810 Mbps @10 bit (recommended), 972 Mbps @12 bit
- Main clock frequency: 81 MHz (Recommended)
- Region of Interest (ROI) readout function (Vertically and Horizontally)
- Full area readout: 5 fps\*, 8K4K readout: 24 fps\*, 4K2K readout: 30 fps\*, FHD readout: 60 fps\* (\*@10 bit)
- Vertically sub-sampling readout function (1/1, 1/3, 1/5, 1/7, and 1/9)
- Analog gain: 0 dB, 6 dB, and 12 dB (-6 dB for evaluation)
- Serial communication
- Saturation: 5,400 e
- Sensitivity of LI8020SAM: 11,000 e/lx/sec
- Sensitivity of LI8020SAC (Green): 4,600 e/lx/sec
- Quantum efficiency of LI8020SAM: 61 % @wavelength 513 nm (peak), 60 % @wavelength 525 nm
- Quantum efficiency (Green) of LI8020SAC: 39 % @wavelength 518 nm (peak), 39 % @wavelength 525 nm
- Dark Random Noise: 3.8 e-rms @12 dB
- Dark Current: 0.1 e/sec @0°C, 13 e/sec @60°C
- Power consumption: 2.0 W (under recommended operating conditions)
- Power supply voltage: 1.2 V, 3.3 V and 3.5 V
- 228pin ceramic QFP
- Package size: 43.7 mm x 36.4 mm x 3.97 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