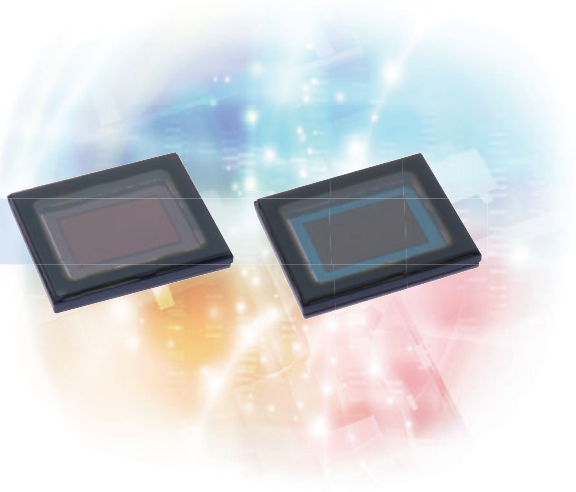
SONY

IMX249LLJ/IMX249LQJ

Diagonal 13.4mm (Type 1/1.2) 2.35M-Effective Pixel
Monochrome and Color CMOS Image Sensors



CMOS Image Sensors with Global Shutter Function for Industrial Use

In such cases where a high-speed moving subject is to be shot with standard CMOS Image sensors, flash band phenomenon will occur and it might be a problem especially for the fields of ITS (Intelligent Traffic Systems) use. The new sensors feature a global shutter function and able to capture a high-speed moving image without focal plane distortion.

- Global shutter function
- Max frame rate : 30 frame/s (12 bit)
- Trigger mode (able to control accumulation time by external pulse)
- A variety of operating modes (V inversion output and multiple frame set output mode)

Exmor

* Exmor is a registered trademark or trademark of Sony Group Corporation or its affiliates. The Exmor is a version of Sony's high performance CMOS image sensor with high-speed processing, low noise and low power dissipation by using column-parallel A/D conversion.

Pregius

* Pregius is a registered trademark or trademark of Sony Group Corporation or its affiliates. The Pregius is global shutter pixel technology for active pixel-type CMOS image sensors that use Sony's low-noise CCD structure, and realizes high picture quality.

Global Shutter Function

For industrial use, it is required to capture the exact shape of a high-speed moving subject. The existing CMOS image sensors have a rolling shutter as the electronic shutter function; therefore, flash band phenomenon was inevasible in principle. (See photograph 1.) A new pixel with analog memory was developed for the IMX249LLJ/LQJ and eliminated generation of the focal plane distortion by enabling to scan all pixel signals at once (referred to as "global shutter function" below). The sensors accomplished high-picture quality combining with the column-parallel A/D conversion technology used for the existing Sony's CMOS Image sensors. (See photograph 2.)

Trigger Mode

The IMX249LLJ/LQJ are equipped with trigger mode, and the external pulse can control accumulation time. The sensors also have a pulse output function to indicate respective conditions during shutter operation and can be coordinated with peripheral circuits.

A Variety of Operating Modes

The IMX249LLJ/LQJ have internal register settings which can switch vertical scan direction (normal/inverted) of the sensors and support 2 frame set output mode utilizing high-speed frame rate. In this 2 frame set output mode, separate exposure time can be set for 2 consecutive frames, and each set of 2 frames can be handled as 1 set to automatically output consecutive images. This mode can generate a picture with a wide dynamic range as a result of the combination of multiple frames. Also the sensors support all-pixel scan (WUXGA) and full HD scan mode as the image data output format.

＜photograph 1＞ Shooting with flash lightFlash Band Image

IMX249LQJ（Global Shutter）

The existing type（Rolling Shutter）

＜Photograph 2＞ Sample Images

Condition: 2000 lx F5.6 (Full HD image ADC 12 bit mode, 60 frame/s, internal gain 0 dB)

IMX249LLJ

IMX249LQJ

＜Table 1＞ Device Structure

Item		IMX249LLJ/IMX249LQJ
Image size		Diagonal 13.4 mm (Type 1/1.2) (WUXGA mode) Diagonal 13.0 mm (Type 1/1.23) (full HD mode)
Number of effective pixels		1936 (H) × 1216 (V) Approx. 2.35M pixels
Unit cell size		5.86 µm (H) × 5.86 µm (V)
Optical blacks	Horizontal	Front: 0 pixels, rear: 0 pixels
	Vertical	Front: 10 pixels, rear: 0 pixels
Input drive frequency		37.125 MHz / 74.25 MHz
Package		118-pin LGA
Power supply voltage V_{DD} (Typ.)		3.3 V / 1.8 V / 1.2 V

＜Table 2＞ Image Sensor Characteristics

Item		IMX249LLJ/IMX249LQJ	Remarks
sensitivity	Typ.	825mV (F8.0 Monochrome) / 1000mV (F5.6 color)	1/30s accumulation
Saturation signal	Min.	850 mV	Tj = 60 °C

＜Table 3＞ Basic Drive Mode

Drive mode	Number of recommended recording pixels	ADC	Frame rate
All-pixel scan (WUXGA)	1920 (H) × 1200 (V) Approx. 2.30M pixels	12 bit	30 frame/s
Full HD	1920 (H) × 1080 (V) Approx. 2.07M pixels	12 bit	30 frame/s

Image Sensors for Industrial Applications:
https://www.sony.net/cis-industry