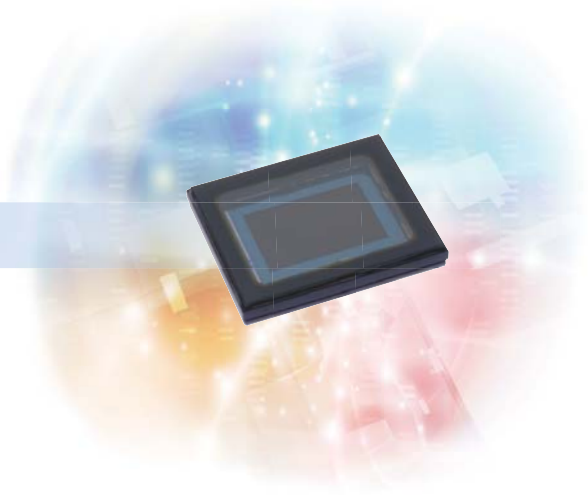
SONY

IMX302LQJ

Diagonal 13.4mm (Type 1/1.2) 2.35M-Effective Pixel 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, focal plane distortion will occur and it might be a problem especially for the fields of industrial 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 : 64.1fps (12bit)
- A variety of operating modes (V inversion output and multiple frame set output mode)

Exmor

* Exmor is a trademark of Sony Corporation. 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 trademark of Sony Corporation. 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, focal plane distortion was inevasible in principle. A new pixel with analog memory was developed for the IMX302LQJ and eliminated generation of the focal plane distortion by enabling to scan all pixel signals at once (referred to as "global shutter function" below). (See photograph 1.) 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.)

High Frame Rate

For industrial use, it is required to capture the sequence of high-speed moving subject; therefore, frame rate is equally important as global shutter function. The IMX302LQJ optimized the internal circuit and adopted LVDS 4ch output, and then realized high-speed imaging by achieving high frame rate with a maximum 64.1 frame/s using 12 bit ADC. (See table 3.)

A Variety of Operating Modes

The IMX302LQJ 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＞ Moving Object Image

Global Shutter　　Rolling Shutter

＜Photograph 2＞ Sample Images

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

IMX302LQJ

＜Table 1＞ Device Structure

Item		IMX302LQJ
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		IMX302LQJ	Remarks
sensitivity	Typ.	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	64.1 frame/s
Full HD	1920 (H) × 1080 (V) Approx. 2.07M pixels	12 bit	60 frame/s