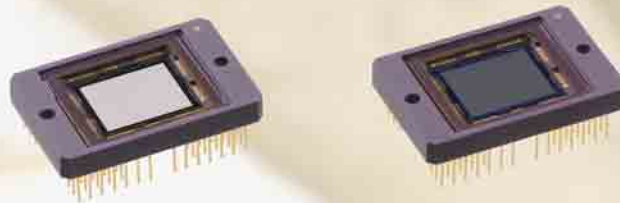


# ICX814ALG/ ICX814AQQ

## Diagonal 15.972 mm (Type 1) 9.19M-Effective Pixel Black-and-White and Color CCD Image Sensors with Output Channel Count Switching for Both High Sensitivity and High Resolution



In the industrial camera market, there is an increasing need for high sensitivity, high frame rates as well as high resolution. Sony has now released the ICX814ALG (black and white) and the ICX814AQQ (color) with a high resolution of 9.2M pixels, built-in 4-channel multi output and a progressive scan mode that supports full HD video output.

With the same optical system, package and pin configuration as the current ICX694ALG and the ICX694AQQ\*<sup>1</sup> (Type 1, 6.1M pixels), compatibility is maintained providing a path to even higher pixel counts and higher resolutions.

The ICX674ALG and the ICX674AQQ\*<sup>2</sup> (Type 2/3, 2.8M pixels) also share the same package size and pin configuration. In progressive scan mode, 9.19M-effective pixels can be output for all 4 channels at 18 frame/s.

\*1: See the New Products section in CX-NEWS, Volume 65.

\*2: See the New Products section in CX-NEWS, Volume 62.

- Diagonal 15.972 mm (Type 1) 9.19M-effective pixel progressive scan method CCD image sensors
- Extensive set of drive modes
- Both high sensitivity and high resolution extending into near infrared light region
- Compatibility with ICX674ALG/ICX674AQQ and ICX694ALG/ICX694AQQ

### EXview HAD CCD II™

\* "EXview HAD CCD II" is a trademark of Sony Corporation. The "EXview HAD CCD II" is a CCD image sensor that realizes sensitivity (typical) of 1000 mV or more per 1  $\mu\text{m}^2$  (Color: F5.6/BW: F8 in 1 s accumulation equivalent) and improves light efficiency by including near infrared light region as a basic structure of Sony's "EXview HAD CCD".

The ICX814ALG and the ICX814AQQ are diagonal 15.972 mm (Type 1) 9.19M-effective pixel CCD image sensors designed for industrial and traffic monitoring cameras. Output channel switching provides an extensive set of drive modes. These new image sensors also provide high resolution thanks to a higher pixel count.

#### Extensive Set of Drive Modes

Like the current Sony products, the ICX694ALG and the ICX694AQQ, the ICX814ALG and the ICX814AQQ come with

output circuits capable of operating at a 54 MHz horizontal drive frequency and use a vertical register electrode configuration that enables high-speed charge transfers to deliver high frame rates.

Changes in drive timing enables switching between single-channel output, horizontal division 2-channel output, vertical division 2-channel output, horizontal and vertical division 4-channel output depending on the frame rate. In progressive scan mode and 4-channel output, all 9.19M-effective pixels can be output at 18 frame/s. The vertical 1092-line cropping mode supports full HD and provides 36 frame/s output. (See figure 1.)

These image sensors can support a wide range of customer needs by combining these diverse drive modes with output channel switching. For example, the vertical 1092-line cropping mode is ideal for traffic monitoring cameras that require horizontal resolution in observing multiple lanes of traffic and other types of cameras with similar needs. Progressive scan mode is well suited to monitoring intersections where a single camera must cover a wide area.

#### Both High Sensitivity and High Resolution Extending into Near Infrared Light Region

As large optical sensors – diagonal 15.972 mm (Type 1) – that have 9.19M-effective pixels, the ICX814ALG and the ICX814AQQ achieve both high sensitivity and high resolution. And since they employ the "EXview HAD CCD II" structure, they also offer high

sensitivity in the near infrared region. (See figure 2 and table 2.)

The high near infrared sensitivity of the sensors make them ideal not only in industrial cameras, but for day and night surveillance cameras and for cameras operating under near infrared light sources. The sensors are also perfect for microscopes and other high-sensitivity and high-resolution applications.

#### Compatibility with ICX674ALG/ICX674AQQ and ICX694ALG/ICX694AQQ

The ICX814ALG and the ICX814AQQ have the same optical configuration, package as and share the pin configuration of the ICX694ALG and the ICX694AQQ, the current Sony products. In fact, the new image sensors also come in the same package size and pin configuration as the ICX674ALG and the ICX674AQQ. Sony is striving for ease of use through compatibility with the current Sony products.

### V O I C E

Sony developed the 9.19M-effective pixel Type 1 CCD image sensors to satisfy the market demand for high sensitivity and high resolution.

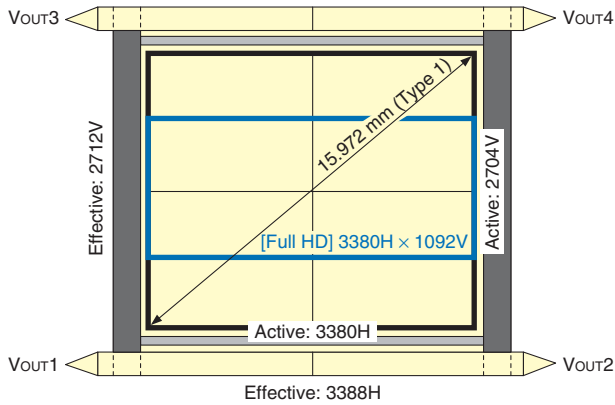
In order to make the high-sensitivity and high-resolution devices more user friendly, Sony made the ICX814 pin compatible with the current Sony products, the ICX674 and the ICX694 product lines. Sony is convinced that maintaining compatibility will meet a variety of customer needs. Be sure to consider these high-performance image sensors for your next product.

**Figure 1** Output Channel Count /Frame Rate Relationship

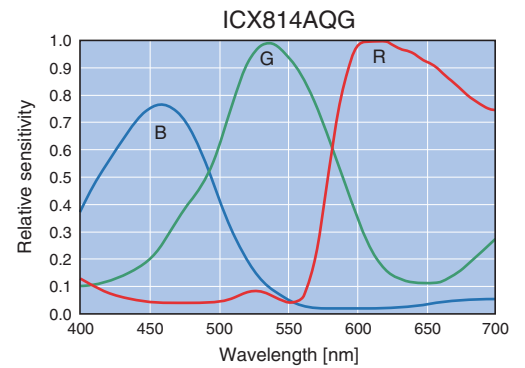
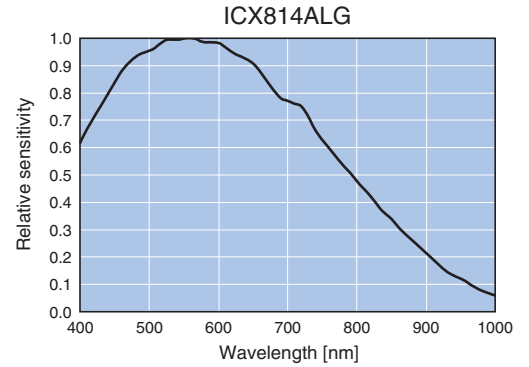
Readout Modes

Drive mode	Output channels	Output pin V <sub>OUT</sub>	Horizontal drive frequency [MHz]	Frame rate [frame/s]
Progressive scan Active: 3380H × 2704V	1	1	54	5
	2	1/2	↑	9
	2	1/3	↑	10
	4	1/2/3/4	↑	18
1092-line vertical cropping Active: 3380H × 1092V	1	1	↑	11
	2	1/2	↑	18
	2	1/3	↑	22
	4	1/2/3/4	↑	36

Pixel Array Structure



**Figure 2** Spectral Sensitivity Characteristics



**Table 1** Device Structure

Item	ICX814ALG	ICX814AQQ	
Image size	Diagonal 15.972 mm (Type 1)	←	
Transfer method	Square pixel type progressive scan method	←	
Total number of pixels	3468H × 2728V Approx. 9.46M pixels	←	
Number of effective pixels	3388H × 2712V Approx. 9.19M pixels	←	
Number of active pixels	3380H × 2704V Approx. 9.14M pixels	←	
Unit cell size	3.69 μm (H) × 3.69 μm (V)	←	
Optical blacks	Horizontal	Front: 40 pixels (per channel)	←
	Vertical	Front: 8 pixels (per channel)	←
Number of dummy bits	Horizontal: front 1 (per channel), vertical: none	←	
Horizontal drive frequency	54.0 MHz	←	
Package	68-pin high-precision ceramic package	←	

**Table 2** Image Sensor Characteristics

Item	ICX814ALG	ICX814AQQ	Remarks
Sensitivity	Typ. 660 mV (F8.0)	580 mV (G signal, F5.6)	3200K, 706 cd/m <sup>2</sup> 1/30 s accumulation
Saturation signal	Min. 520 mV	←	T <sub>j</sub> = 60°C
Smear	Typ. -105 dB (F8.0)	←	V/10 method