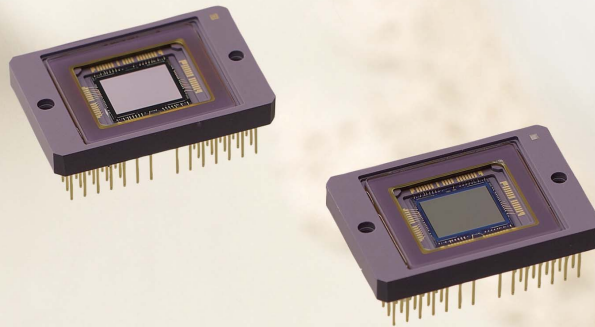


ICX674ALG/ ICX674AQG

Diagonal 10.972 mm (Type 2/3) 2.83M-Effective Pixel Black-and-White and Color CCD Image Sensors Support Full HD 1080p Video and Output Channel Count Switching



In addition to the existing demands for higher pixel counts and higher frame rates, the demands for full HD format appropriate for video applications have been increasing recently in the industrial camera market. Sony has now released the ICX674ALG (black and white) and the ICX674AQG (color) 2.8M-pixel progressive scan method CCD image sensors. These devices include four output circuit channels and provide full HD video output (1080p at 60 frame/s). The output channel switching structure allows the number of output channels to be switched according to the required frame rate. Furthermore, these devices provide high sensitivity, not only to visible light, but into the near infrared region as well due to the "EXview HAD CCD II" structure.

- Diagonal 10.972 mm (Type 2/3) 2.83M-effective pixel progressive scan method CCD image sensors
- Supports switching the number of output channels
- Extensive set of drive modes
- High-sensitivity achieved, even in the near infrared region

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 ICX674ALG/AQG are diagonal 10.972 mm (Type 2/3) 2.83M-effective pixel CCD image sensors designed for use in industrial cameras. They include output channel count switching support and an extensive set of drive modes.

Output Channel Count Switching

These products include vertical transfer registers that can transfer charge in both directions as well as horizontal transfer registers.

By changing the vertical and horizontal transfer register drive timing and by switching the charge transfer direction according to the required frame rate, these devices support single-channel output, horizontal division 2-channel output, vertical division 2-channel output, and horizontal and vertical division 4-channel output. (See figure 1.)

Extensive Set of Drive Modes

These devices achieve high frame rates by including four output circuit channels that can be operated at a horizontal drive frequency of 54 MHz and by adopting an electrode structure that makes high-speed charge transfer by the vertical transfer register possible. When 4-channel output is used, these devices are capable of 50 frame/s output in progressive scan method, and of 60 frame/s output in both vertical 1212-line cropping mode that supports UXGA display and in vertical 1092-line crop mode that supports full HD video.

These image sensors can support a wide range of customer needs by combining these

diverse drive modes with multichannel output switching.

High Sensitivity Achieved, Even in the Near Infrared Region

The newly-developed ICX674ALG/AQG CCD image sensors achieve high sensitivity including the near infrared region by adopting the "EXview HAD CCD II" technology, which evolves the Sony "EXview HAD CCD" even further by adopting the "Super HAD CCD II"* technology. (See figure 2 and table 2.)

These new devices can also be used in security camera applications that can take advantage of their high sensitivity in the near infrared region.

*: See the Featuring section in CX-NEWS, Volume 52.

V O I C E

This is a device that was created by a project team working together to create a commercial product that implements an output channel switching structure and strives for high sensitivity even in the near infrared region.

I strongly recommend that you look into this product, which combines the latest technology with the fervor of the developers.

Figure 1 Output Channel Count/Frame Rate Relationship

Readout Modes

Drive mode	Output channels	Output pin V _{OUT}	Horizontal drive frequency [MHz]	Frame rate [frame/s]
Progressive scan Active: 1932H × 1452V	1	1	54	15
	2	1/2	↑	25
	2	1/3	↑	30
	4	1/2/3/4	↑	50
Vertical cropping mode Active: 1612H × 1212V Active: 1932H × 1092V	1	1	↑	18
	2	1/2	↑	30
	2	1/3	↑	33.75
	4	1/2/3/4	↑	60

Pixel Array Structure

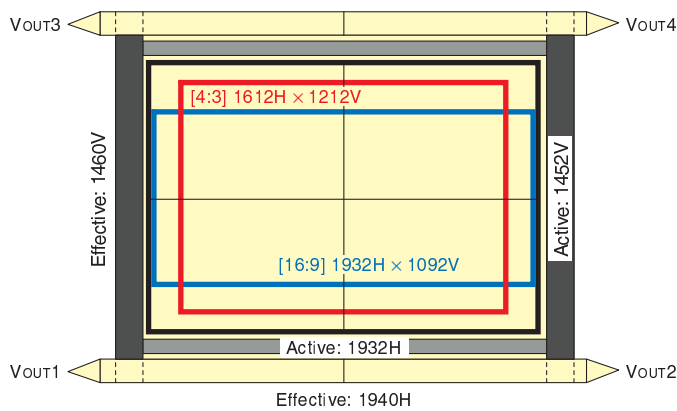


Figure 2 Spectral Sensitivity Characteristics

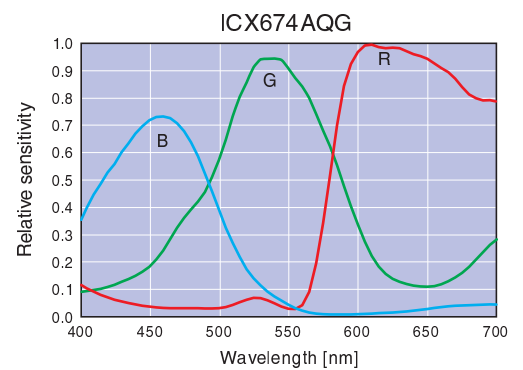
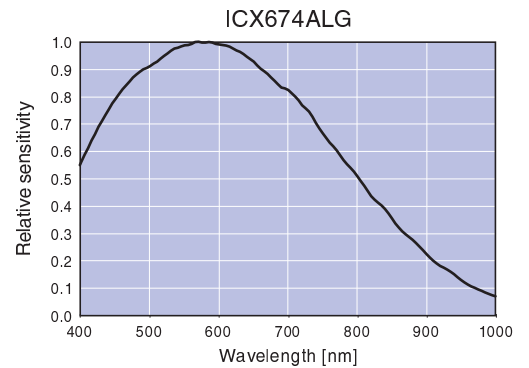


Table 1 Device Structure

Item	ICX674ALG	ICX674AQG
Image size	Diagonal 10.972 mm (Type 2/3)	←
Transfer method	Progressive scan interline transfer method	←
Total number of pixels	2020H × 1476V Approx. 2.98M pixels	←
Number of effective pixels	1940H × 1460V Approx. 2.83M pixels	←
Number of active pixels	1932H × 1452V Approx. 2.81M pixels	←
Unit cell size	4.54 μm (H) × 4.54 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 MHz	←
Package	68-pin Ceramic PGA	←

Table 2 Image Sensor Characteristics

Item	ICX674ALG	ICX674AQG	Remarks
Sensitivity	Typ. 950 mV (F8.0)	800 mV (G signal, F5.6)	3200 K, 706 cd/m ² 1/30 s accumulation
Saturation signal	Min. 800 mV	←	T _a = 60 °C
Smear	Typ. -105 dB (F8.0)	-105 dB (F5.6)	V/10 method