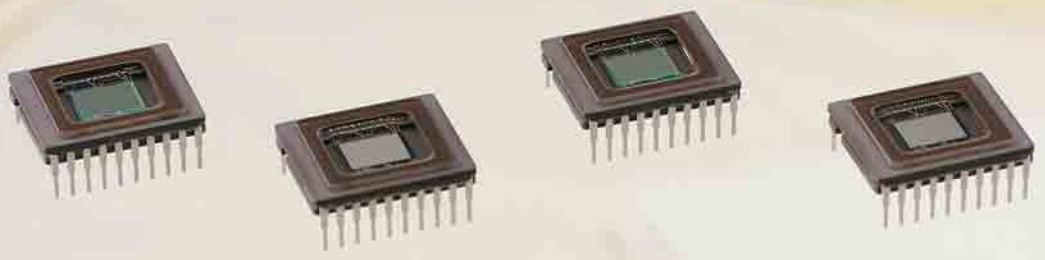
High-Sensitivity "EXview HAD CCD II" Security Camera and Industrial Applications CCD Image Sensors

ICX828AKA/ALA Diagonal 8 mm (Type 1/2) Approx. 380K Effective Pixels

ICX829AKA/ALA Diagonal 8 mm (Type 1/2) Approx. 440K Effective Pixels



"High sensitivity" is an essential requirement in sensors for surveillance camera applications. Compared to Sony's existing ICX428AK/AL and ICX429AK/AL products, the ICX828AKA/ALA and ICX829AKA/ALA of this release feature significantly improved sensitivity achieved through improved condensing and an optimized photodiode configuration.

- Diagonal 8 mm (Type 1/2)
- ICX828AKA/ALA: NTSC
- ICX829AKA/ALA: PAL
- High sensitivity (+6 dB over existing Sony products)
- Compatibility with existing Sony products

***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 μm² (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 ICX828AKA/ALA and ICX829AKA/ALA are CCD image sensors mainly designed for security and industrial camera applications. These devices feature improved characteristics compared to the existing Sony ICX428AK/AL and ICX429AK/AL.
Both the ICX828AKA/ALA and ICX829AKA/ALA maintain the same low-smear level while boosting the saturation signal level. In addition, they have substantially greater sensitivity, the most valued characteristic in a security camera application.

High Sensitivity

Adopting Sony's "EXview HAD CCD II" technology, the ICX828AKA/ALA and ICX829AKA/ALA of this release provide a significantly improved focusing of light onto the photodiodes due to an increased aperture ratio and an improved upper section structure. Thanks to these improvements, the new products have approximately 6 dB greater sensitivity, a vast improvement over the existing ICX428AK/AL and ICX429AK/AL. Furthermore, 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.

High Dynamic Range

The saturation characteristics of the new products are also 1.4 times greater than that of the existing ICX428AK/AL and ICX429AK/AL resulting in a high dynamic range.
Another improvement in the ICX828AKA/ALA and ICX829AKA/ALA is a widening of the area of CCD signal output relative to obtained light intensity, which has led to improved linearity characteristics. As a result, the linearity area can be enlarged almost up to saturation signal level, another improvement over the ICX428AK/AL and ICX429AK/AL.

Compatibility with Existing Sony Products

In these new products, Sony has achieved compatibility by making the image size, pixel count, drive timing, package, and pin assignment the same as in existing products (the ICX428AK/AL and ICX429AK/AL).
Users of the existing ICX428AK/AL and ICX429AK/AL should check the performance of the ICX828AKA/ALA and ICX829AKA/ALA.

V O I C E

The development of this device focused on sensitivity, the most essential requirement of a security camera application. The joint effort of the product members managed to double the sensitivity of the new products over existing devices.
Users are strongly recommended to take a closer look at these CCD image sensors that boast the industry's highest sensitivity.

Figure 1 Spectral Sensitivity Characteristics

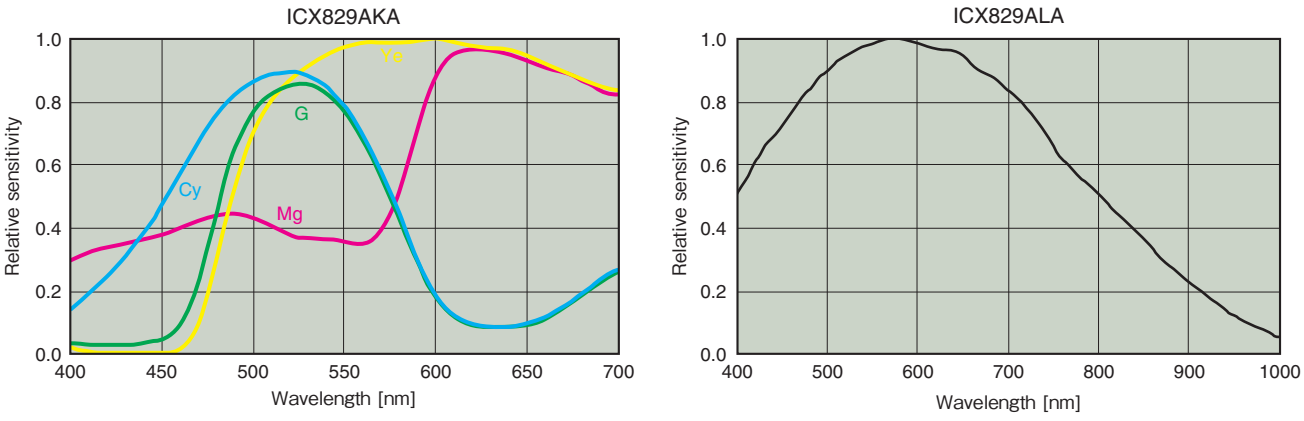


Table 1 Device Structure

Item		ICX828AKA ICX828ALA	ICX428AK ICX428AL	ICX829AKA ICX829ALA	ICX429AK ICX429AL
Image size		Diagonal 8 mm (Type 1/2)	←	←	←
Transfer method		Interline transfer method	←	←	←
Total number of pixels		811H × 508V Approx. 410K pixels	←	795H × 596V Approx. 470K pixels	←
Number of effective pixels		768H × 494V Approx. 380K pixels	←	752H × 582V Approx. 440K pixels	←
Unit cell size		8.4 µm (H) × 9.8 µm (V)	←	8.6 µm (H) × 8.3 µm (V)	←
Optical blacks	Horizontal	Front: 3 pixels, rear: 40 pixels	←	←	←
	Vertical	Front: 12 pixels, rear: 2 pixels	←	←	←
Number of dummy bits		Horizontal: front 22, vertical: front 1 (Only in even fields)	←	←	←
Horizontal drive frequency		14.32 MHz	←	14.19 MHz	←
Package		20-pin DIP (Cer-DIP)	←	←	←

Table 2 Image Sensor Characteristics

Item		ICX828AKA ICX828ALA	ICX428AK ICX428AL	ICX829AKA ICX829ALA	ICX429AK ICX429AL	Remarks
Sensitivity	Typ.	3200 mV (F5.6) 2800 mV (F8)	1600 mV (F5.6) 1400 mV (F8)	3200 mV (F5.6) 2800 mV (F8)	1600 mV (F5.6) 1400 mV (F8)	1/60 s or 1/50 s accumulation
Saturation signal	Min.	1400 mV	1000 mV	1400 mV	1000 mV	Tj = 60°C
Smear	Typ.	–120 dB –126 dB	–120 dB –126 dB	–120 dB –126 dB	–120 dB –126 dB	V/10 method