

# Featuring

## “Super HAD CCD II” Achieves Significant Performance Increases for Security Camera Applications

Achieves high sensitivity

Achieves both improved spectral sensitivity characteristics and light resistance

Compatibility with Sony’s current products

The number of cases in which crime scene security camera videos lead to the arrest of the perpetrator is increasing. In our changing social environment in which crime is increasing, the demand for security cameras has been growing rapidly.

Security cameras are used 24 hours a day, 365 days a year in a wide range of environments. As a result, the performance and reliability of these cameras has come to be seen as extremely important, especially the light resistance characteristics, which allow their use in environments in which the cameras are subject to long periods of intensely bright ambient light.

Furthermore, security cameras also need to clearly image events that occur in places so dark that it is hard to see with the naked eye. Thus sensitivity in low ambient light conditions is seen as the most important characteristic for security cameras.

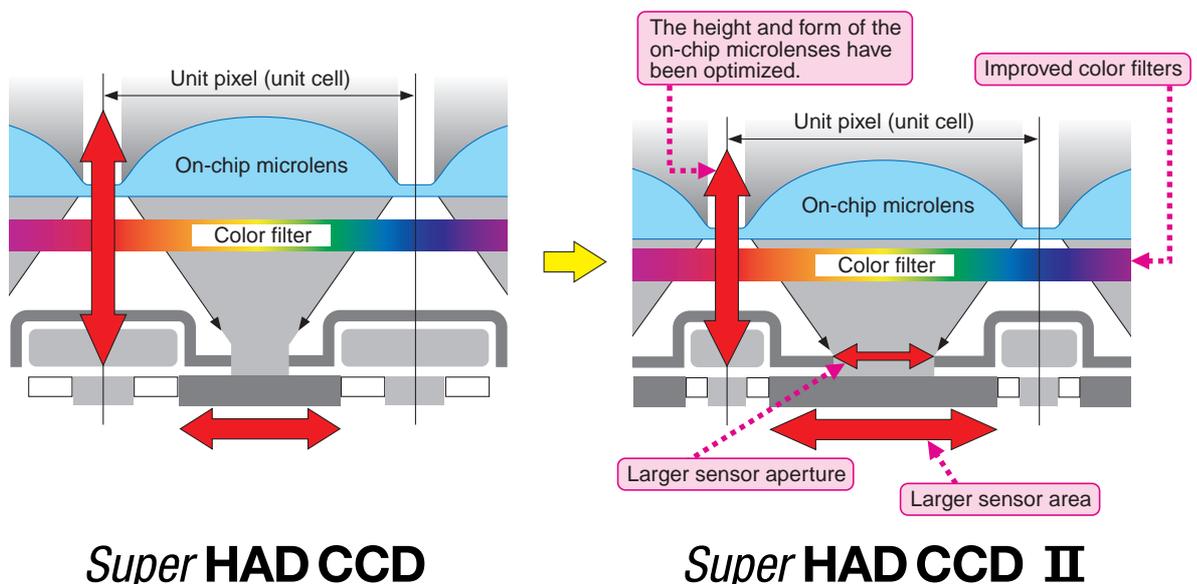
Sony CCDs have maintained an industry-leading share in security camera applications, and the Sony “Super HAD CCD”, which boasts high sensitivity, is well-known in the industry and widely used in security camera applications.

Sony has now improved the sensitivity of the existing Sony security camera “Super HAD CCD” and developed the new “Super HAD CCD II”. This article introduces the features of the “Super HAD CCD II” device.

## Super HAD CCD II

\*: “Super HAD CCD” and *Super HAD CCD* are trademarks of Sony Corporation.

**Figure 1** “Super HAD CCD II” Elemental Technologies that Improve Sensitivity



## Achieving High Sensitivity

As we mentioned at the beginning of this article, constantly striving for high sensitivity and even lower noise is important in the security camera field.

By introducing the forming and design technologies fostered in the finer pixel sizes used in recent years, Sony was able to improve the CCD structure in the "Super HAD CCD II" and achieve a sensitivity of 1000 mV or higher per square micron (F5.6 for color sensors, F8 for black and white, 1 s accumulation time). This corresponds to a +6 dB improvement over Sony's current products. In particular, the percentage of light focused on the photodiode was increased significantly by increasing the aperture size and improving the form and height of the microlenses. Sony also succeeded in suppressing the reduction in focusing ratio that occurs when the lens is used at its wide open F number.

Furthermore, the photosensor area was increased making highly efficient optoelectronic conversion possible. (See figure 1.)

## Achieving both Improved Spectral Sensitivity Characteristics and Light Resistance

While achieving high sensitivity in the "Super HAD CCD II", we also designed this device with concern for color reproduction.

By adopting new complementary color pigment materials in the color filters, we increased the blue (short wavelength) sensitivity and achieved balanced spectral sensitivity characteristics.

These spectral sensitivity characteristics lead to reduced color noise.

Furthermore, this new device maintains the strong light resistance of the proven current ICX408AK/409AK products. Even in locations subject to strong ambient illumination for extended periods, the color filters remain strongly resistant to fading.

## Compatibility with Sony's Current Products

Security camera products have an extremely long life; in some cases the same model will be sold for over ten years. Therefore, compatibility of the parts used is an extremely important factor in this product area. These new devices maintain the same image size, pixel count, drive timing, package, and pin arrangement as Sony's current products, while improving sensitivity by over +6 dB compared to those products.

Due to this compatibility, customers can create new models without changing the design simply by switching to a new CCD.

Furthermore, in addition to the same 5.0 V (Typ.) as the current products, the ICX638AKA/639AKA additionally support 3.3 V (Typ.) as the drive voltage for the horizontal transfer clock and reset gate clock. Thus these devices maintain compatibility with existing product models while at the same time contributing to lower power in new models.

**Figure 2** Characteristics Comparison

