

# Wfine CCD for High-Resolution Digital Still Cameras 1/2-Inch 1.45M-Pixel Progressive Scan Color CCD

## Wfine CCD™ ICX205AK

There are now increasing needs for megapixel and higher pixel counts in the digital still camera area, which previously used 330k-pixel class VGA resolution devices.

Sony has now developed the industry's highest pixel count CCD product. This device is a 1.45-million pixel device and features progressive scan in a 1/2-inch optical size device.

This device, the ICX205AK, uses Sony's Super HAD CCD technology and primary color mosaic filters to achieve high sensitivity, low smear, and excellent color reproductivity.

Furthermore, the ICX205AK provides a high frame rate readout mode that supports vertical scan rate (30 fps) four times that possible in full progressive scan mode.

- **Wfine CCD**
  - Progressive scan
  - Primary color filters
  - Square pixels
- **Number of effective pixels: 1.45M (1392 (H) × 1040 (V))**
- **High sensitivity and low smear (–100 dB)**
- **High frame rate readout mode that allows images to be acquired at 30 fps by line selection.**

\* : Wfine CCD is a trademark of Sony Corporation.

The ICX205AK is a 1/2-inch 1.45M-pixel progressive scan CCD image sensor that was developed for high-resolution digital still camera applications. It allows full-frame still images to be acquired without either a mechanical shutter or a frame memory. Figure 2 shows the block diagram of the ICX205AK CCD, and table 1 lists its device structure.

### ■ Wfine CCD

#### 1) Progressive scan

Since this technique allows all pixels' signals to be output independently in the identical exposures, it can achieve high vertical resolutions.

#### 2) Primary color filters

As compared to the use of complementary color filters, primary color filters provide superior color reproductivity.

#### 3) Square pixels

The adoption of square pixels makes image processing significantly easier and allows the acquisition of distortion-free images.

### ■ High Sensitivity and Low Smear

Optimization of the pixel pattern and the form of the on-chip microlenses allows the ICX205AK to achieve high sensitivity despite the reduction of the unit pixel to a 4.65- $\mu$ m square. Furthermore, the achievement of a smear characteristic of –100 dB means that the ICX205AK CCD image sensor achieves both excellent basic characteristics as well as high resolution. (See table 2.)

### ■ High Frame Rate Readout Mode

The ICX205AK provides a high frame rate readout mode, in which 2 of every 8 lines are read out. This mode outputs 256 of the vertical lines over the whole effective imaging area and allows a frame to be read out in 1/4 the time (about 1/30 second) required for a progressive scan mode. This mode provides faster feedback to the control system and flicker-free image monitoring. (See figure 3.)

### ■ Timing Generator ICs Are Available

The CXD2460R CCD drive timing generator IC, which includes a built-in vertical driver circuit and that also supports high frame rate readout mode, was developed at the same time. (See figure 4.)

## V O I C E

I am confident that the ICX205AK CCD can contribute to the creation of high-resolution, high-performance digital still cameras that meet current market needs. Try this product if you need images that are as good as those provided by normal silver chloride photograph.



New  
Products

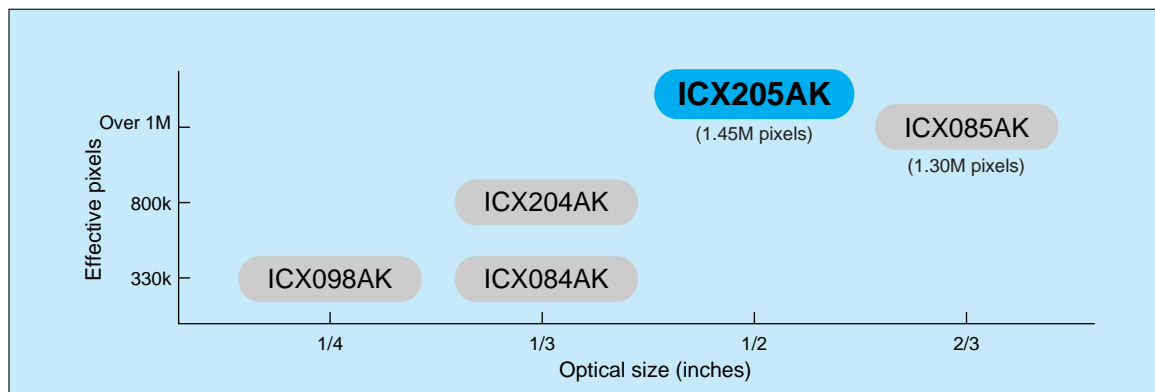


Figure 1 Wfine CCD Product Line

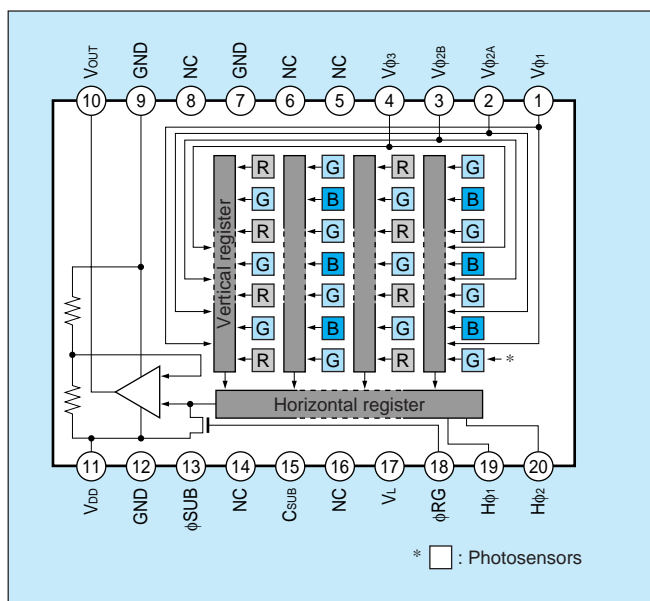
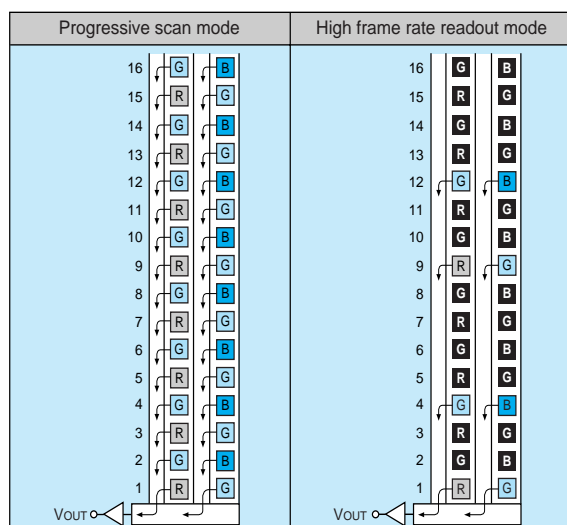


Figure 2 ICX205AK Block Diagram and Pin Configuration



Note: The black areas in the figure are pixels that are not read out.  
In high frame rate readout mode, pixels are read out starting with line 1.

Figure 3 ICX205AK High Frame Rate Readout Mode

Table 1 ICX205AK Device Structure

Item	ICX205AK
Optical size	1/2-inch format
Format	4 : 3
Transfer method	Progressive scan
Total number of pixels	1434 (H) × 1050 (V) approx. 1.50M pixels
Number of effective pixels	1392 (H) × 1040 (V) approx. 1.45M pixels
Number of active pixels	1360 (H) × 1024 (V) approx. 1.40M pixels
Color coding	Primary color mosaic filters
Chip size	7.6mm (H) × 6.2mm (V)
Unit cell size	4.65 μm (H) × 4.65 μm (V) Square pixels
Horizontal drive frequency	14.3MHz
Package	20pin DIP (Cer-DIP)

Table 2 ICX205AK Image Characteristics

Item	ICX205AK	Remarks
G sensitivity (F 5.6)	400mV	3200K, 706 cd/m <sup>2</sup> 1/30 s accumulation
Sensor saturation signal	450mV	
Smear (F 5.6)	-100dB	V/10 method, progressive scan output, no electronic shutter
Frame rate	Progressive scan mode	7.5frame/s
	High frame rate readout mode	30frame/s

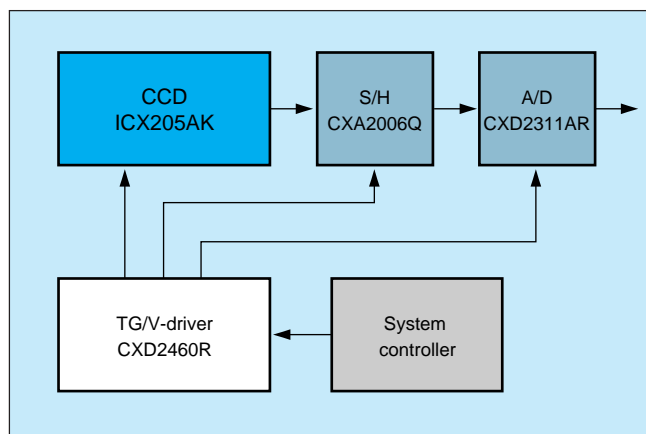


Figure 4 ICX205AK System Block Diagram