

High Resolution Diagonal 8.93 mm (Type 1/1.8) 3.24M-pixel Digital Still Camera CCD

ICX252AK (complementary color, DIP) ICX252AKF (complementary color, SOP) ICX252AQ (primary color, DIP) ICX252AQF (primary color, SOP)

As the digital still camera becomes more popular, there are now increasing demands for higher resolution in the printed output. To respond, Sony has developed the ICX252AK/AKF/AQ/AQF interlaced CCDs that provide 3.24-million effective pixels for diagonal 8.93 mm (Type 1/1.8) optical systems.

In addition to the high resolution provided by 3.24-million effective pixels, the ICX252 series achieves high sensitivity.

Additionally, these CCDs provide a high frame rate readout mode and an AF mode to increase the speed of the feedback to the LCD finder and the AE/AF control systems.

- **High resolution**
Provides 3.24-million effective pixels (2088H × 1550V)
- **High sensitivity**
Complementary color version: 320 mV (Y)
Primary color version: 270 mV (G)
- **High frame rate readout mode**
(30 frame/s)
- **AF mode** (60 frame/s, 120 frame/s)

The ICX252AK/AKF/AQ/AQF are diagonal 8.93 mm (Type 1/1.8) 3.24-million effective pixel CCD image sensors that were developed for use in high resolution digital still cameras. When used with a mechanical shutter it allows the acquisition of high-resolution images. Table 1 presents the structure of the ICX252 series.

■ High Resolution

Sony achieved an effective pixel count of 3.24-million pixels (2088H × 1550V) in a diagonal 8.93 mm (Type 1/1.8) optical system by developing a unit cell with 3.45 μm square. This allows this device to achieve horizontal and vertical resolutions of approximately 1200 TV lines. (See photograph 1.)

■ High Sensitivity

Sony has improved the collimation characteristics by optimizing both the shape as well as the fine fabrication used to create the on-chip microlenses. This allows the ICX252 to achieve sensitivities of 320 mV (complementary color) and 270 mV (primary color) despite miniaturization of the unit cell. (See table 2.)

■ High Frame Rate Readout Mode and AF Mode

In addition to a high frame rate readout mode effective for LCD finder display area switching and for acquiring the control data for AE/AF and other functions, the ICX252 also supports even higher speed AF modes. By extracting only part of the effective 257 lines provided by the high frame rate readout mode, the AF modes are able to output either 60 frames per second (AF mode 1) or 120 frames per second (AF mode 2). Feedback to the AF control system can be made even faster by using these AF modes.

■ Timing Generator IC

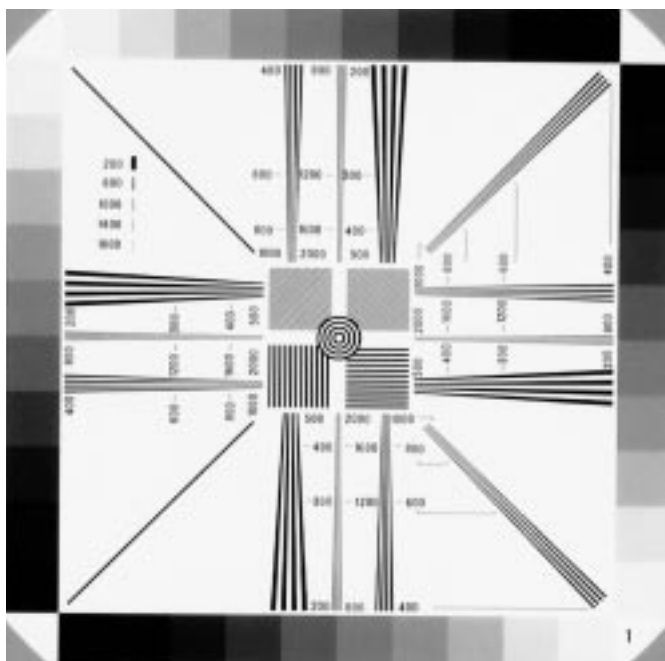
Sony provides the CXD2492R timing generator IC that includes a built-in vertical clock driver for driving these CCDs. The CXD2492R supports high frame rate readout mode, AF mode 1, and AF mode 2. (See figure 2.)

V O I C E

“More pixels!” To respond to this request, we have now developed a 3-megapixel CCD. This provides even higher resolution and can create images even closer to photograph quality. I’m convinced that anyone who uses this device will be more than satisfied and strongly recommend that you try it in your camera products.

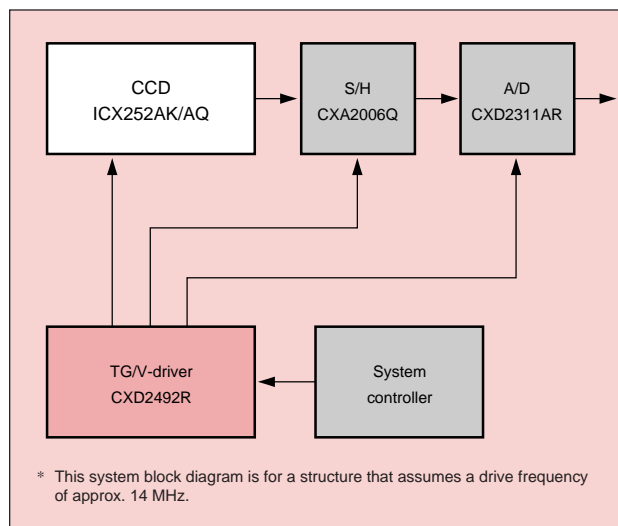


New Products



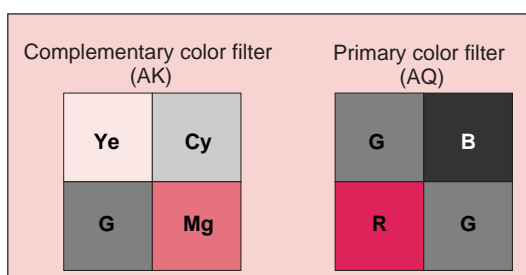
* This figure is an enlargement of a photograph of the central section of an "ITE High-Precision High-Resolution Chart."

■ Photograph 1 Resolution Chart



* This system block diagram is for a structure that assumes a drive frequency of approx. 14 MHz.

■ Figure 2 System Block Diagram



■ Figure 1 Color Filter Arrangement

■ Table 1 Device Structure

Item	
Image size	Diagonal 8.93 mm (Type 1/1.8)
Transfer system	Frame readout interline transfer system
Total pixels	Approx. 3.34 M (2140H × 1560V)
Effective pixels	Approx. 3.24 M (2088H × 1550V)
Recommended recording pixels	Approx. 3.15 M (2048H × 1536V), aspect ratio 4:3
Unit cell size	3.45 μm (H) × 3.45 μm (V) square pixels
Horizontal drive frequency	18.0 MHz
Package	20-pin plastic DIP/SOP with a 1.27-mm lead pitch
Package dimensions	13.8 mm (H) × 12.0 mm (V) × 2.9 mm (t) (excluding lead)

■ Table 2 Image Sensor Characteristics

Item	Typical values	Remarks
Sensitivity	ICX252AK: 320 mV (Y signal) ICX252AQ: 270 mV (G signal)	3200K, 706 cd/m ² , F5.6, 1/30 s accumulation
Sensor saturation signal	450 mV	During frame readout
Smear	Standard mode: -94 dB High frame rate readout mode: -84 dB	None when a mechanical shutter is used
Frame rate	Standard mode: 4.28 frame/s	
	High frame rate readout mode: 30 frame/s	257-line output
	AF mode 1: 60 frame/s	106-line output
	AF mode 2: 120 frame/s	36-line output