

High-resolution 5.07M-pixel Diagonal 11 mm (Type 2/3)
Digital Still Camera Color CCD

ICX282AK (complementary color, DIP) ICX282AKF (complementary color, SOP) ICX282AQ (primary color, DIP) ICX282AQF (primary color, SOP)

In the rapidly growing digital still camera market, the desires for even higher CCD resolutions remain strong.

Sony has now developed the ICX282AK/AKF/AQ/AQF family of diagonal 11 mm (Type 2/3) 5.07-million pixel CCDs.

In addition to the high resolution provided by the 5.07-million effective pixels of the ICX282AK/AKF/AQ/AQF, these devices also provide excellent basic characteristics, such as saturation signal level, sensitivity, and smear.

Furthermore, in addition to an increased number of pixels, these devices also feature an extensive set of readout modes, such as 2× speed, 8× speed, and center scanning to support imaging objects under a wide range of conditions.

- High resolution Provides 5.07-million effective pixels (2588H × 1960V)
- New miniature packages (DIP/SOP)
- Extensive set of readout modes
- Excellent basic characteristics

The ICX282AK/AKF/AQ/AQF is a diagonal 11 mm (Type 2/3) 5.07-million effective pixel CCD image sensors that were designed for use in high-resolution consumer digital still cameras. High-resolution images can be captured by using a mechanical shutter. Table 1 presents the device structure of the ICX282AK/AKF/AQ/AQF pixel.

■ High Resolution

Sony achieved a diagonal 11 mm (Type 2/3) 5.07-million pixel (2588H × 1960V) device by developing a 3.4 μm

unit pixel. This allows the device to achieve both horizontal and vertical resolutions of approximately 1500 TV lines. (See photograph 1.)

■ New Miniature Packages (DIP/SOP)

To support further miniaturization and even thinner forms in digital still cameras, Sony developed new high-precision plastic packages for Type 2/3 optical systems. These packages were reduced in size by about 1/3 (in volume) over earlier Sony packages, and the thickness was reduced by 10%. In addition to a DIP type package, Sony also provides these devices in an SOP package appropriate for surface mounting. (See figure 2.)

■ Extensive Set of Readout Modes

These devices provide an 8× speed readout mode output that allows 30 frame per second readout for image verification with an LCD finder, AF (autofocus) control, and AE (auto-exposure) control. These devices also provide a 2× speed mode that provides a double frame rate 1.25-million pixel mode that is new with these devices. These modes include the following.

- (1) Progressive scan output mode that allows high-speed shutter operation
- (2) Additive mode that provides high

sensitivity and a wide dynamic range (twice standard mode)

These CCDs also provide center scanning and other readout modes to improve the frame rate when electronic zoom is used, and thus allow imaging objects under a variety of conditions.

■ Excellent Basic Characteristics

These devices are based on the technologies developed for Sony's Type 1/1.8 3.24-million pixel CCDs (3.45 μm cell size) with additional optimizations and improvements. Despite the larger number of pixels and larger optical system, these devices achieve characteristics equivalent to those of 3.24-million pixel CCDs, including a saturation signal of 450 mV, a sensitivity of 270 mV (primary color)/320 mV (complementary color), and a smear value of -90 dB. (See table 2.)

■ Timing Generator IC

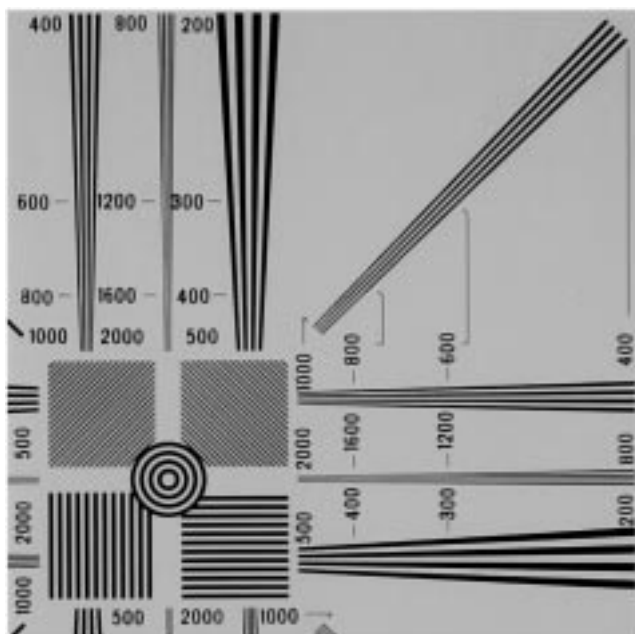
Sony provides the CXD2498R timing generator IC for drive that includes built-in vertical and horizontal drivers. This IC supports the 2× speed, 8× speed, and center scanning readout modes.

V O I C E

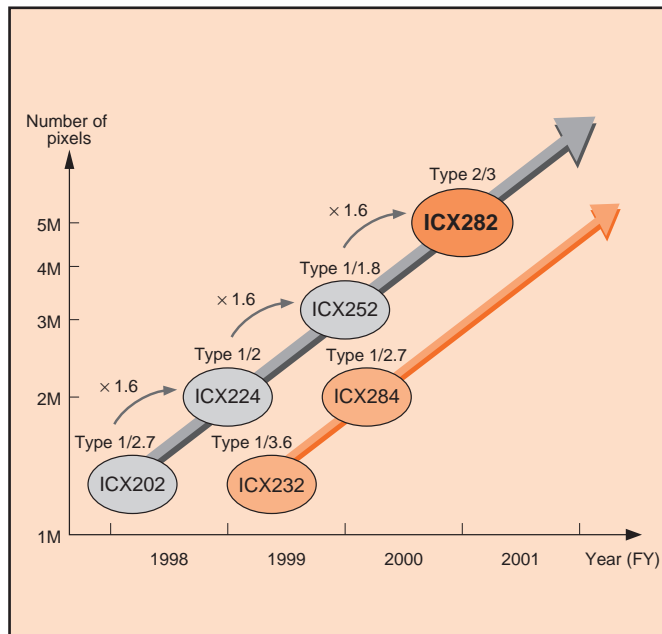
"More pixels!" To respond to this request, we have now developed a line of 5-million pixel CCDs. These device can truly achieve photographic quality. Not only do these devices provide more pixels, they also feature an extensive set of readout modes to support imaging objects under an even wider range of conditions, and thus are optimal for high-end products. I strongly recommend that you look into these devices.



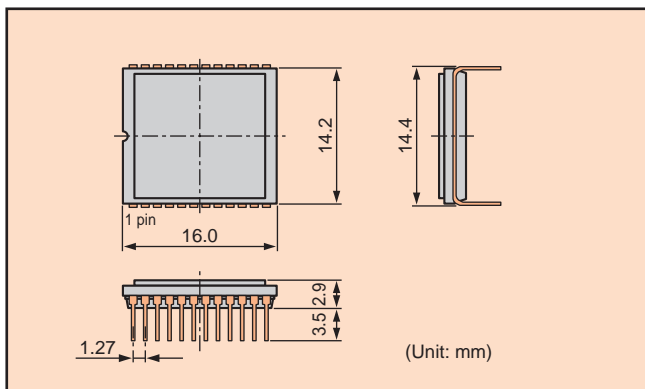
New Products



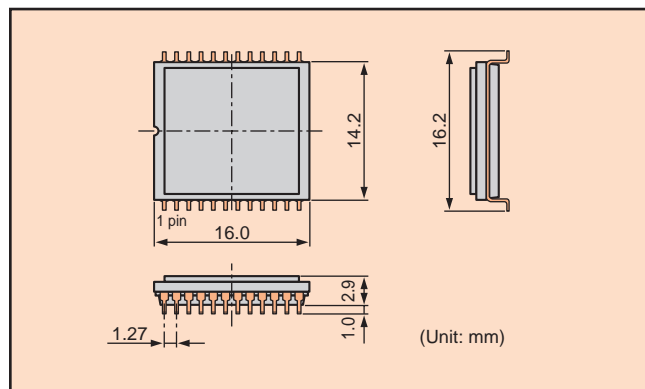
■ Photograph 1 Resolution Chart



■ Figure 1 Digital Still Camera CCDs



■ Figure 2-1 Package Dimensions (DIP)



■ Figure 2-2 Package Dimensions (SOP)

■ Table 1 Device Structure

Item	ICX282AK/AKF/AQ/AQF
Image size	Diagonal 11 mm (Type 2/3)
Format	4 : 3
Transfer method	Frame readout interline transfer method
Total number of pixels	Approx. 5.24 M (2658H × 1970V)
Number of effective pixels	Approx. 5.07 M (2588H × 1960V)
Number of active pixels	Approx. 5.02 M (2580H × 1944V)
Number of recommended recording pixels	Approx. 4.92 M (2560H × 1920V)
Unit cell size	3.4 μm (H) × 3.4 μm (V)
Horizontal drive frequency	22.5 MHz
Package	AK/AQ : 24-pin DIP (plastic) AKF/AQF : 24-pin SOP (plastic)

■ Table 2 Image Sensor Characteristics/Readout Modes

Item	Typical values	Remarks	
Sensitivity	ICX282AK/AKF: 320 mV (Y signal) ICX282AQ/AQF: 270 mV (G signal)	3200 K, 706 cd/m ² , F5.6, 1/30 s accumulation	
Saturation signal	450 mV	During frame readout	
Smear	Standard mode	-90 dB	
	8× speed mode	-78 dB	None when a mechanical shutter is used
Frame rate	Standard mode	3.75 frame/s	Effective 1960-line output
	2× speed mode (1)	7.49 frame/s	Effective 980-line output
	2× speed mode (2)	6.66 frame/s	Effective 980-line output
	8× speed mode	29.97 frame/s	Effective 245-line output
	Center scanning mode (1)	14.985 frame/s	Effective 484-line output
	Center scanning mode (2)	26.35 frame/s	Effective 246-line output
	Center scanning mode (3)	7.02 frame/s	Effective 968-line output
	Center scanning mode (4)	11.988 frame/s	Effective 492-line output
AF mode (1)	59.94 frame/s	Effective 104-line output	
AF mode (2)	119.88 frame/s	Effective 34-line output	