

ICX685CQZ

High-Resolution High-Sensitivity Diagonal 9.310 mm (Type 1/1.7) 10.17M-Effective Pixel Color CCD for Consumer Digital Still Cameras



In addition to the existing needs for even higher resolution in compact consumer digital still cameras, there are now increasing needs for improved high sensitivity and higher dynamic range.

Sony has now developed the ICX685CQZ diagonal 9.310 mm (Type 1/1.7) 10.17M-effective pixel interline CCD, which, by taking full advantage of Sony's unique fine pixel fabrication technologies, achieves the industry's top class of sensitivity characteristics while maintaining a high pixel count.

This device is also capable of high-sensitivity consecutive still image capture of images with about 2.54M pixels by adding four pixels, two horizontally and two vertically, in frame readout mode (1/4 still image).

- Diagonal 9.310 mm (Type 1/1.7) 10.17M effective pixels
- Pixel size: 2.030 μm unit pixel
- Eight-field readout
- Horizontal divided into fourths output
- Horizontal 3-phase drive

The ICX685CQZ is a diagonal 9.310 mm (Type 1/1.7) 10.17M-effective pixel square pixel array interline CCD that was developed for compact consumer digital still cameras. By adopting a new allocation structure between the horizontal and vertical registers and a horizontal divided into fourths readout structure, the ICX685CQZ is capable of high-speed output with the pixel count divided by four. (See table 2.) Compared to the existing Sony ICX665/675 series diagonal 7.705 mm (Type 1/2.3) 10.17M-effective pixel CCDs, the ICX685CQZ achieves significant improvements in device characteristics. It is optimal for the high-sensitivity high-resolution digital still camera area.

The Industry's Top Class for Picture Quality

The ICX685CQZ achieves the industry's top class for picture quality as a CCD for consumer compact digital still cameras. (See photograph 1.) In the luminance signal, it features a signal-to-noise ratio improved by about one f stop over current devices. (See figure 1.) It achieves the industry's top class with its high sensitivity and wide dynamic range, with a sensitivity improved by 2 \times (+6 dB) and a saturation signal improved by 1.7 \times (+4.7 dB). Furthermore, Sony increased the ratio of the area occupied by the sensor within the unit pixel by structural optimizations, improved the condensing efficiency with a new condensing structure, and adopted the latest noise reduction technology. As a result, not only were the sensitivity and saturation characteristics improved, but smear characteristics even better than those in current products were achieved as well. (See table 2.)

High-Sensitivity, High-Speed Still Imaging

To capture the critical moment beautifully and quickly, Sony included a new high-frame-rate "frame readout mode (1/4 still image)" in the ICX685CQZ. This new mode makes it possible to continuously capture still images with a size of about 2.54M pixels at

the high speed of 6.983 frame/s, and with high sensitivity by using the horizontal 2-pixel addition function in horizontal divided into fourths mode and the vertical register 2-pixel vertical addition function. (See table 2.)

Readout Modes

In addition to frame readout mode, which can acquire the full 10.17M-effective pixel high-sensitivity still images and the previously mentioned frame readout mode (1/4 still image), which is capable of continuous high-sensitivity imaging at high speed, the ICX685CQZ also provides a readout mode (mode 1), which can acquire VGA resolution images at 30 frame/s, and a readout mode (mode 2), which can acquire images at the high frame rate of 60 frame/s. (See table 2.)

V O I C E

To respond to the market desires for high sensitivity, we developed a Type 1/1.7 10.17M-effective pixel CCD. As a result of working together as a team to take the greatest possible advantage of Sony's fine fabrication technology, we achieved a high sensitivity twice that of existing products. This CCD achieves the industry's highest class of sensitivity for use in consumer compact digital still cameras. I strongly recommend that you look into this product.

Photograph 1 Imaging Examples (ISO 1600)

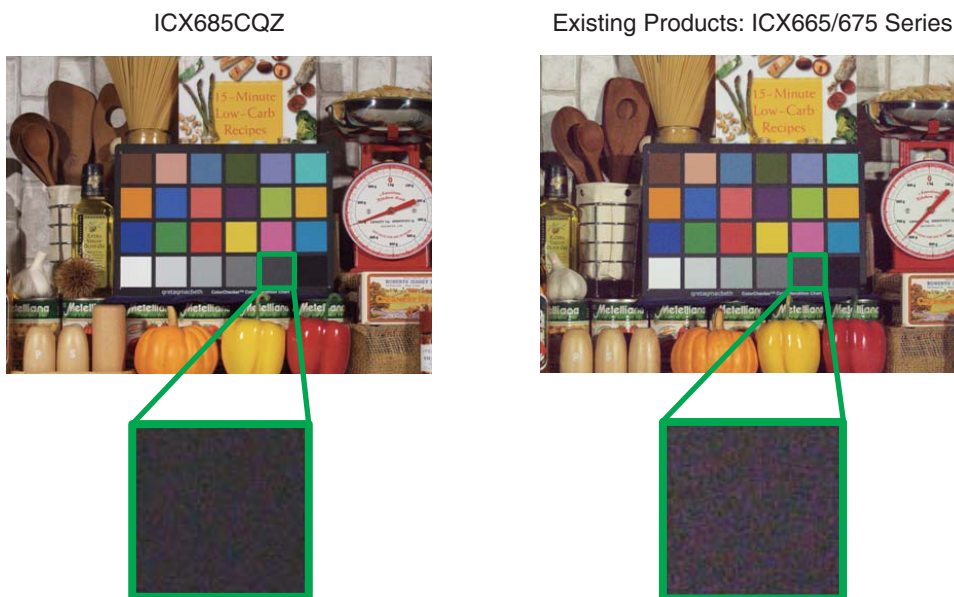


Figure 1 Luminance Signal S/N

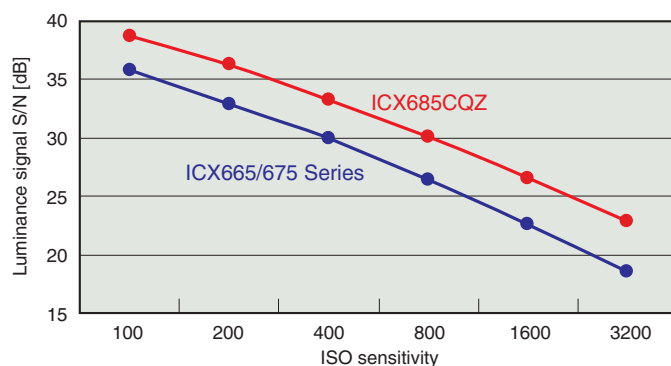


Table 1 Device Structure

Item	ICX685CQZ	
Image size	Diagonal 9.310 mm (Type 1/1.7)	
Transfer method	Frame readout interline transfer method	
Readout method	Vertical	8-field readout
	Horizontal	3-phase drive, divided into fourths
Total number of pixels	Approx. 10.40M (3744H × 2778V)	
Number of effective pixels	Approx. 10.17M (3684H × 2760V)	
Number of active pixels	Approx. 10.09M (3672H × 2748V)	
Number of recommended recording pixels (Aspect ratio: 4:3)	Approx. 9.98M (3648H × 2736V)	
Unit cell size	2.030 μm (H) × 2.030 μm (V)	
Horizontal drive frequency	38 MHz	
Package	50-pin QFN (Ceramic)	

Table 2 Image Sensor Characteristics

Item	ICX685CQZ	Remarks	
Sensitivity (G signal)	330 mV (Typ.)	3200K, 706 cd/m ² , 1/30 s accumulation, F5.6	
Saturation signal	800 mV (Min.)	Ta = 60°C, per pixel	
Smear	-90.0 dB (Typ.)	None when a mechanical shutter is used, V/10 method, F5.6	
Frame rate	Frame readout mode	2.052 frame/s	Number of output lines: 2760 lines
	Frame readout mode (1/4 still image)	6.983 frame/s	Number of output lines: 1380 lines
	Mode 1 *1	30 frame/s	Number of output lines: 690 lines
	Mode 2 *1	60 frame/s	Number of output lines: 172 lines

*1 With horizontal addition

Note: This device was designed for use in consumer digital still cameras and may not be appropriate for other applications. Contact your Sony representative for consultation when considering this product for use in other applications.