Progressive Scan 2.04M-Pixel Diagonal 6.72 mm (Type 1/2.7)
Digital Still Camera CCD

ICX454DQ
ICX454DQF

The trend towards diversification in the digital still camera market is accelerating. In addition to the current ICX284 Series (frame readout 2.02M-pixel diagonal 6.64 mm (Type 1/2.7) color CCDs), Sony has now developed the new ICX454DQ and ICX454DQF progressive scan color CCDs. Since these devices adopt a progressive scan method, they allow the use of high-speed shutters and enable system simplification, end product miniaturization, and thinner form factors and respond to a wide range of market needs.

WfineCCD™

- **ICX454DQ: Primary color filters, 18-pin DIP package**
  ICX454DQF: Primary color filters, 18-pin SOP package
- **Progressive scan CCDs**
- **Diagonal 6.72 mm (Type 1/2.7)**
  2.04M effective pixels (1648H × 1240V)
- **High sensitivity: 330 mV (G signal)**
- **High frame rate readout modes (Approx. 30 frames/s, approx. 60 frames/s)**

The ICX454DQ and ICX454DQF are diagonal 6.72 mm (Type 1/2.7), 2.04M–pixel CCD image sensors that were developed for digital still cameras. Table 1 shows the device structure of the ICX454DQ and ICX454DQF.

Progressive Scan CCD

Since these devices can output all the pixel signals from the same exposure independently and sequentially, only simple signal processing is required and a simple system structure can be used. Furthermore, these devices provide an electronic shutter that supports imaging at 1/1000s and even shorter times, and thus are optimal for cameras for sports photography and similar applications.

High Sensitivity

Sony optimized the pixel pattern and shapes of the on-chip microlenses to achieve the high sensitivity of 330 mV despite these devices having a small 3.275 µm square unit pixel. (See table 2.) These devices adopt RGB mosaic filters for superlative color reproduction.

High Frame Rate Readout Modes

These devices can provide 30 and 60 frames/s outputs by selecting the number of vertical pixels read out. These modes are useful for verifying the image in an LCD finder or recording a video signal. (See figure 1.)

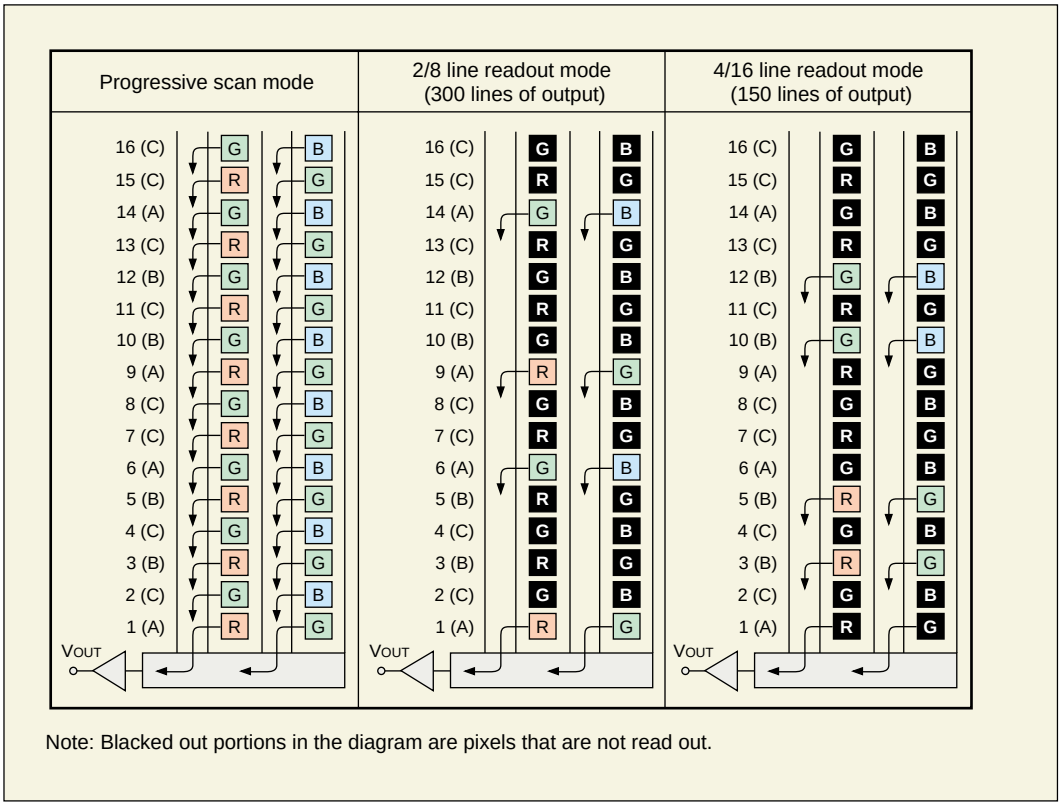
Timing Generator IC

Along with these devices, Sony also provides the CXD3618R timing generator IC that includes on-chip vertical drivers and supports high frame rate readout. (See figure 2.)

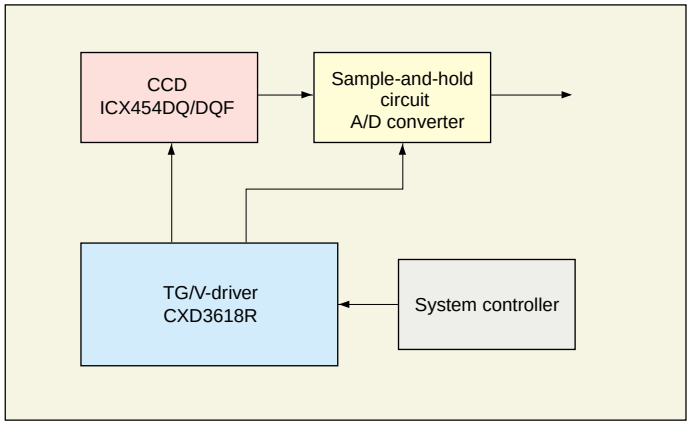
* Wfine CCD and the Wfine logo are registered trademarks of Sony Corporation.
Represents a CCD adopting progressive scan, primary color filter and square pixel.

V O I C E

In developing these products we aimed for a balanced feature set to create a CCD that would be easy to use in the increasingly diverse digital still camera market. I am quite satisfied that these products meet those goals, and feel it was worth the effort. I strongly recommend that you consider these CCDs for your next camera product.



■ **Figure 1 ICX454DQ/DQF Readout Modes**



■ **Figure 2 ICX454DQ/DQF System Block Diagram**

■ **Table 1 Device Structure**

Item	ICX454DQ/DQF
Image size	Diagonal 6.72 mm (Type 1/2.7)
Format	4:3
Transfer method	Progressive scan interline transfer method
Total number of pixels	Approx. 2.11M (1690H × 1250V)
Number of effective pixels	Approx. 2.04M (1648H × 1240V)
Number of active pixels	Approx. 2.02M (1640H × 1232V)
Chip size	6.38 mm (H) × 5.26 mm (V)
Unit cell size	3.275 µm (H) × 3.275 µm (V)
Horizontal drive frequency	22.5 MHz
Package	18-pin plastic DIP/SOP

■ **Table 2 Image Sensor Characteristics**

Item		ICX454DQ/DQF	Remarks
Sensitivity (G signal)		330 mV	3200K, 706 cd/m^2, F/5.6, 1/30 s accumulation
Saturation signal		400 mV	Ta = 60°C
Smear (F/5.6)		–90 dB	V/10 method
Frame rate	Progressive scan mode	8.563 frames/s	
	2/8 line readout mode	29.97 frames/s	
	4/16 line readout mode	59.94 frames/s	