

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.

Wfine CCD™

- 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.)

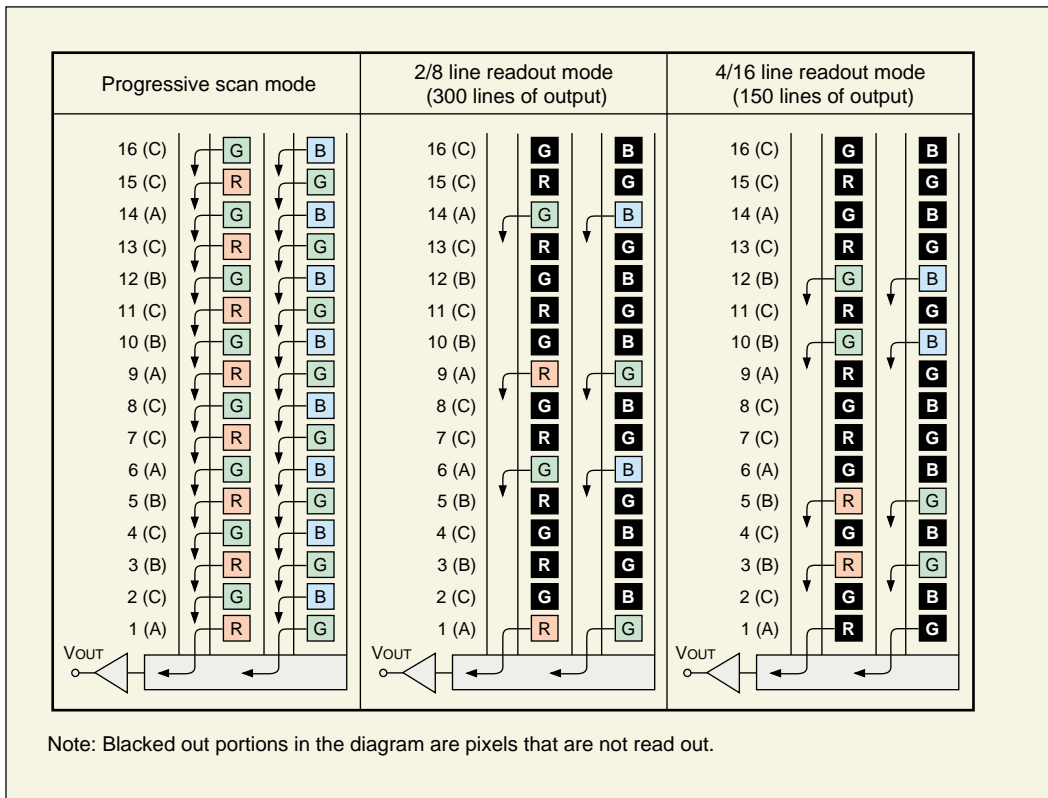
■ Timing Generator IC

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.)

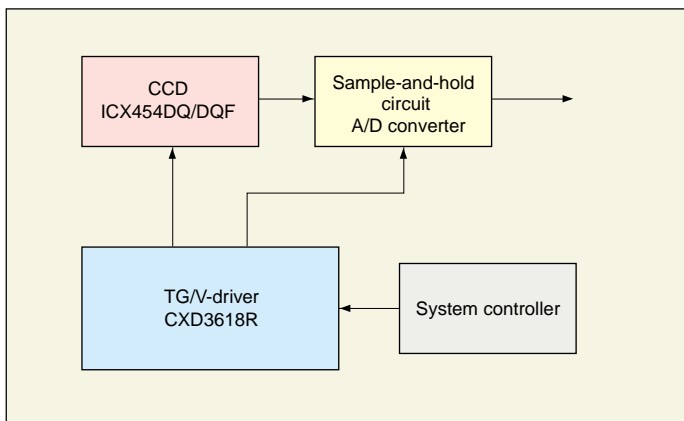
* Wfine CCD and the Wfine logo are registered trademarks of Sony Corporation. Represents a CCD adopting progressive scan, primary color filter and square pixel.

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