

High-Resolution 4.11M-Pixel Diagonal 7.18 mm (Type 1/2.5) Color CCD
for Consumer Digital Still Cameras Supports VGA Moving Picture Imaging

ICX498B Series

The trends towards higher pixel counts and miniaturization in the digital still camera market are creating powerful demands for higher picture quality and further miniaturization in the CCD image sensors used in these cameras.

To respond to these needs, Sony has continued to push forward with CCD image sensor development that stresses basic CCD performance. Sony has now solidified its lead in the consumer digital still camera CCD world by adding these newly-developed Type 1/2.5 CCD image sensors to the already extensive Sony CCD lineup.

- Diagonal 7.18 mm (Type 1/2.5)
Provides 4.11M effective pixels
(2344H × 1752V)
- Smear output: -95 dB
- High saturation signal: 460 mV
- Supports VGA moving picture mode
- New miniature package: SON

The ICX498BQA, ICX498BQF, and ICX498NQV (the ICX498B Series) are diagonal 7.18 mm (Type 1/2.5) 4.11M-effective pixel CCD image sensors for high-resolution consumer digital still cameras. The ICX498B Series was developed specifically for reduced smear. Table 1 lists the ICX498B Series device structure and table 2 lists the imaging characteristics.

■ Low Smear Characteristics

Smear is a phenomenon that occurs when an extremely strong light source, such as the sun or a car headlight, appears in the image. Smear appears as lines of noise emanating vertically from the light source. Smear is a phenomenon characteristic of CCDs and occurs due to the signal charge transport. For still picture imaging, smear can be reduced by using a mechanical shutter or special drive methods, but these techniques cannot be used during moving picture imaging. Thus it is desirable in cur-

rent video CCDs to improve the smear characteristics of the device itself. Sony has always worked to develop CCDs that can create natural noise-free images similar to what the human eye sees even in VGA moving picture imaging. As part of that ongoing effort, Sony has now, by taking full advantage of Sony's unique fine fabrication technologies, succeeded in reducing smear by -9 dB (about 1/3.2) over earlier Sony products, achieving smear levels of -95 dB in still picture mode and -92 dB in VGA moving picture mode. (See photograph 1.)

■ High Saturation Signal

To increase the dynamic range in the ICX498B Series, Sony has adopted the same 3-field readout method used in the ICX432 Series. This allows finer feature sizes to be used in the vertical transfer block, thus allowing the photodiode area to be enlarged. In conjunction with other improvements, this allows the ICX498B Series to achieve a saturation signal of 460 mV.

■ New Thin-Form Package: SON

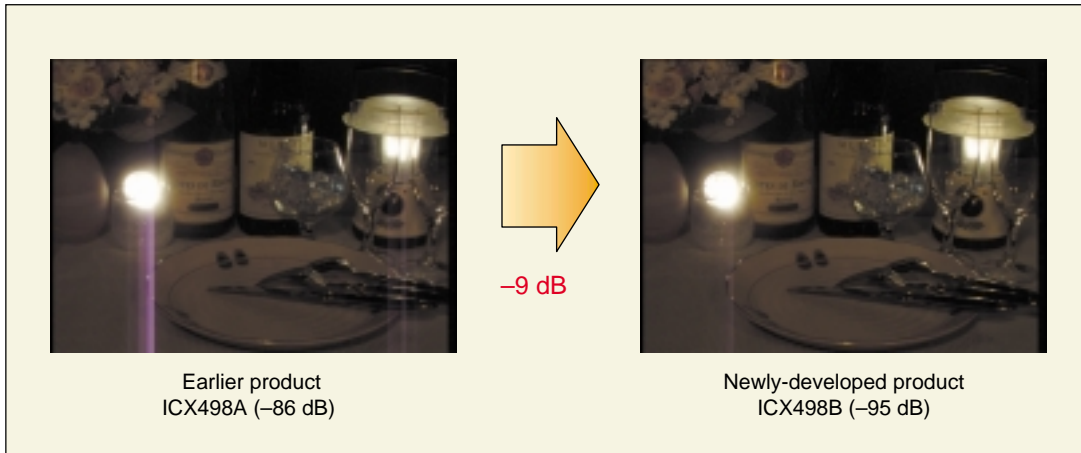
In addition to the conventional DIP and SOP packages, Sony also provides this sensor in the newly-developed SON thin-form package. (See figure 1.) This allows end products to be made even thinner. Users can select a package that matches their needs from the extensive set of package options in the ICX498B Series.

■ Timing Generator IC

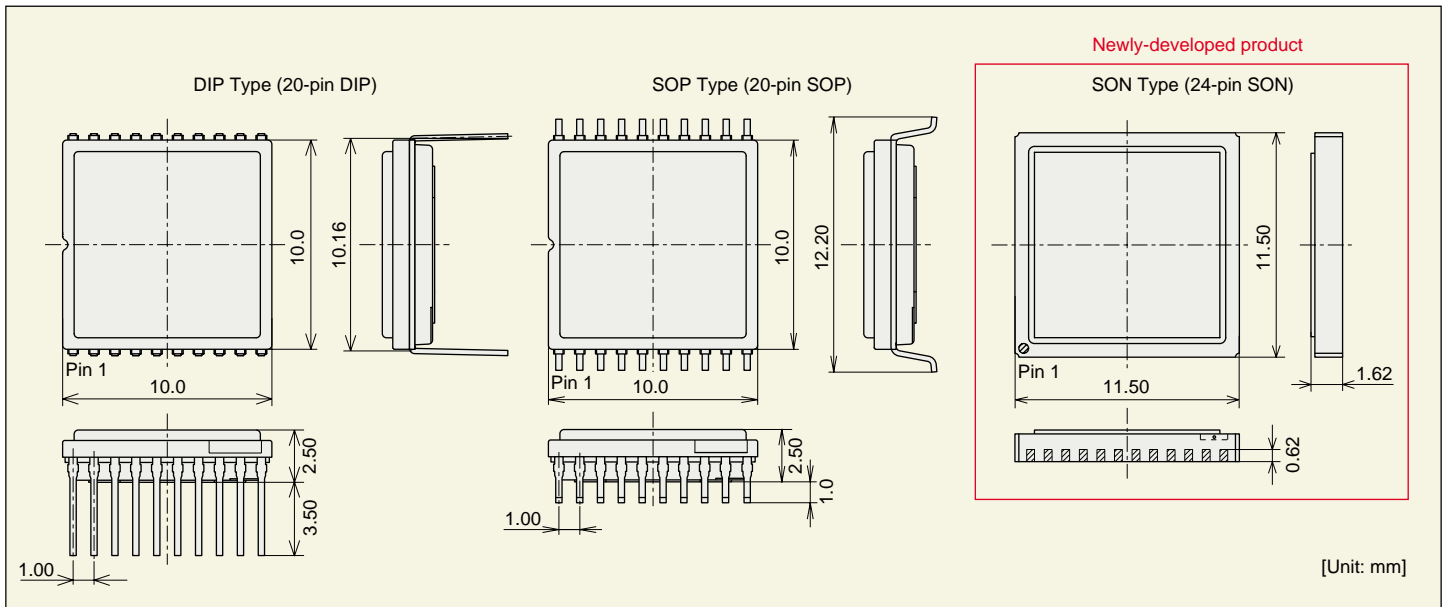
Sony also provides the CXD3631GA timing generator IC that includes built-in horizontal and vertical drivers for the ICX498B Series devices. In addition to a VGA equivalent moving picture mode, this IC series also supports a high frame rate readout mode and an AF mode as well.

V O I C E

The ICX498B Series, which features a high saturation signal and low smear, has arrived. It supports a wide range of moving picture modes, including VGA mode, and can contribute to achieving fully satisfactory images in the rapidly growing digital still camera market.



■ Photograph 1 Comparison of Smear Characteristics



■ Figure 1 Package Dimensions

■ Table 1 Device Structure

Item	ICX498B
Image size	Diagonal 7.18 mm (Type 1/2.5)
Transfer method	Frame readout interline transfer method
Readout method	3-field readout
Total number of pixels	Approx. 4.23M (2396H × 1766V)
Number of effective pixels	Approx. 4.11M (2344H × 1752V)
Number of active pixels	Approx. 3.95M (2304H × 1716V)
Number of recommended recording pixels (aspect ratio: 4:3)	Approx. 3.87M (2272H × 1704V)
Unit cell size	2.5 μm (H) × 2.5 μm (V)
Horizontal drive frequency	27 MHz
Package	BQA : 20-pin Plastic/Metal DIP BQF : 20-pin Plastic/Metal SOP NQV : 24-pin Ceramic SON

■ Table 2 Imaging Characteristics

Item	ICX498B	Remarks
Sensitivity (G signal)	210 mV	3200K, 706 cd/m ² , 1/30 s accumulation, F5.6
Saturation signal	Frame readout mode	460 mV
	4/6-line readout mode*	260 mV
	4/12-line readout mode*	260 mV
Smear (F5.6)	Frame readout mode	-95 dB
	4/6-line readout mode*	-92 dB
	4/12-line readout mode*	-86 dB
Frame rate	Frame readout mode	4.28 frames/s
	4/6-line readout mode*	30 frames/s
	4/12-line readout mode*	30 frames/s

*: 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 on other applications.