

# ILX521A

The ILX521A, which was developed targeted for the market for miniature scanners with a small number of pixels, such as pen scanners and print head scanners, achieves the improvement most desired by this market, package miniaturization, by adopting Sony's first clear molded package. At the same time, it achieves both a reduction in the component count and a simplification of the power supply system by incorporating both clock driver and sample-and-hold functions in the same package and by achieving single 5-V drive, including supply voltage.

- Clear molded package adopted
- Single 5-V power supply
- Effective pixel size:  $14\ \mu\text{m} \times 14\ \mu\text{m}$
- Number of effective pixels: 256
- On-chip clock driver
- On-chip sample-and-hold circuit
- Single-sided readout system adopted
- Maximum operating frequency: 2 MHz

## ■ Clear Molded Package Adopted

The ILX521A is a linear sensor that is appropriate not only for print head scanners and pen scanners for use with personal computers and dedicated word processors, but also for a wide range of miniature low-pixel-count products including, for example, toys, which are seeing an increasing level of electronic sophistication. To achieve the package miniaturization that is essential for products for the miniature equipment market, the ILX521A achieves a package size of  $11.43\ \text{mm} \times 6.4\ \text{mm}$  (in a 12-pin SDIP package) that is the smallest package for this class device by adopting Sony's first clear molded package. This product delivers a spectral sensitivity, one of the characteristic evaluation items for linear sensors, that is equivalent to that of the glass-enclosed products currently in mass production. Figure 1 shows the spectral sensitivity of the ILX521A.

## ■ On-Chip Peripheral Circuits

Since the ILX521A includes timing generator and clock driver circuits built in, it can be driven directly from a 5-Vp-p logic system. Furthermore, the internal sample-and-hold circuit can be enabled or disabled to match the needs of the application simply by setting the level of the sample-and-hold switching pin. This can lead to both a reduction in the number of external components and a reduction in the number of input clock lines and can contribute to printed circuit board miniaturization and the simplification of the external circuits. The ILX521A can operate from a single 5-V power supply, and achieves the low power consumption of 25 mW (typical). Figures 2 and 3 show the block diagram and an application circuit example. Table 1 lists the electro-optical characteristics of the ILX521A.

## ■ Single-Sided Readout System Adopted

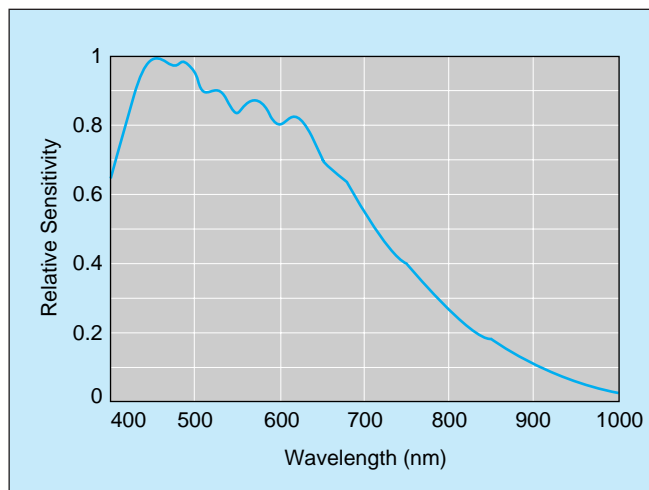
Linear sensors can be divided into two types: those that read out the sensor signal charges for the even and odd pixels in opposite directions (the dual-sided readout system) and those that read on the sensor signal charges for all pixels in the same direction (the single-sided readout system). In the dual-sided readout system, the CCD analog shift register transfer pulse frequency is set to 1/2 that of the reset pulse frequency, and a data rate that is 1/2 the clock pulse frequency exists within the device. As a result, a DC level difference between the even and odd pixels is created. In the single-sided readout system, on the other hand, the CCD analog shift register transfer pulse frequency and the reset pulse frequency are the same, and it is not possible for a DC level difference between the even and odd pixels to be created logically. Since the ILX521A adopts the single-sided readout system, it provides signals with no DC level difference between the even and odd pixels.

## V O I C E

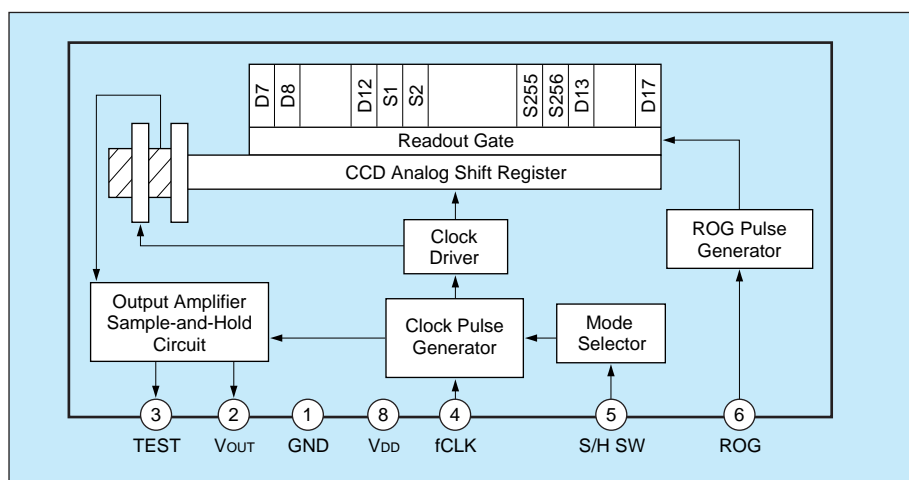
The ILX521A is a Sony's first linear sensor that adopts a clear molded package and that was developed for the market for devices with a small number of pixels. Sony plans to continue to develop linear sensors that can open new markets and new packages that meet market needs.



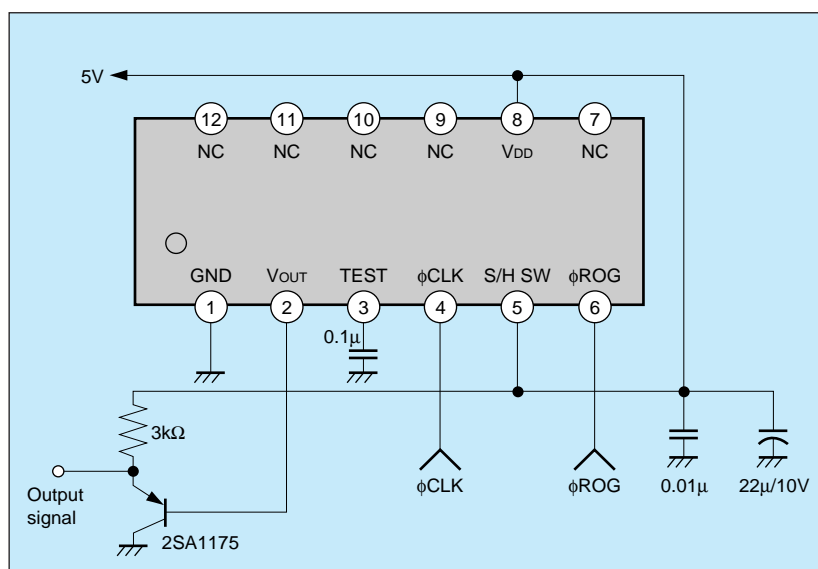
# New Products



■ Figure 1 ILX521A Spectral Sensitivity Characteristics (for a specific sample)



■ Figure 2 ILX521A Block Diagram



■ Figure 3 ILX521A Application Circuit Example  
(Without internal sample-and-hold circuit )

■ Table 1 ILX521A Electro-Optical Characteristics

Item	Symbol	Typ.	Unit
Sensitivity	R	18.0	V/(lx•s)
Sensitivity non-uniformity	PRNU	5.0	%
Saturation output voltage	VSAT	0.8	V
Dark voltage average	VDRK	3.0	mV
Residual image	IR	0.01	%
Current consumption	IVDD	5.0	mA
Total transfer efficiency	TTE	98.0	%
Offset level	Vos	3.8	V

Ta = 25°C, VDD = 5 V, data rate = 1 MHz,  
without internal sample-and-hold circuit mode,  
light source = 3200 K, using a CM-500S IR-cut filter  
(t = 1 mm)