Highest Luminance 1.3-Inch Full XGA Data Display LCD
1.3-Inch 786,000-Dot XGA LCD

LCX023AL

Recently, in addition to their earlier use for presentations, data projectors have also begun to be used for displaying CAD/CAM data on large screens, for group design analyses, and as an educational multimedia presentation tool for training and classrooms. As a result, even higher resolutions are desired in these devices. The LCX023AL introduced here is the highest-resolution model in our well-received line of 1.3-inch LCD units and supports all display formats up to and including XGA (786,000 dots).

The LCX023AL is the definitive miniature high-luminance data projector LCD, since it achieves the industry's highest transmittivity of 20% (and an aperture ratio of 56%) due to the use of new Sony-developed device structures and fabrication processes.

- **Full XGA display in a 1.3-inch LCD**
- **Achievement of the industry's highest transmittivity of 20% (aperture ratio: 56%) in a 1.3-inch LCD**
- **Supports all XGA frequencies (65 to 95 MHz)**
- **High light resistance pixel design for intensities of up to 850 ANSI lm**
- **Circuits with improved uniformity for cross talk-free and ghost-free display**
- **XGA/SVGA/VGA/NTSC/PAL multi-format display supported in the system ICs**
- **Built-in level-shifter circuit**

Highest Transmittivity in its Class

The LCX023AL, while featuring 768,000 dots, 1.6 times the number provided by earlier 1.3-inch LCDs, achieves an aperture ratio of 56% and a transmittivity of 20%, which is at the same level as the industry's highest transmittivity for SVGA devices of the same size. This performance was achieved by developing and adopting new device structures and new process technologies unique to Sony.

V O I C E

After developing VGA and SXGA panels, we have now succeeded in developing an XGA panel, which provides both the highest resolution in our 1.3-inch panel product line and the industry's highest transmittivity. These were achieved by introducing new device structures and new process technologies. Sony's high-temperature polysilicon LCD technology is improved each time we develop a new type of product, and performance continues to improve. This technology now provides the industry's highest performance. I am sure that you will be more than satisfied by this performance.

Significantly Improved Image Quality

The LCX023AL adopts a Sony-developed uniformity improvement circuit to achieve cross talk-free and ghost-free display even at the high XGA resolution and at high luminance . It also includes a video signal sample-and-hold phase control circuit to achieve high-resolution display.

This allows smooth XGA characters to be projected at the same luminance as earlier systems simply by exchanging the LCD panel in an existing 1.3-inch optical system product. Additionally, the adoption of high light resistance pixel design for increased high luminance allows the LCX023AL to achieve excellent subjective image characteristics with, for example, no cross talk, at intensities up to 850 ANSI lm. (According to Sony internal testing.)

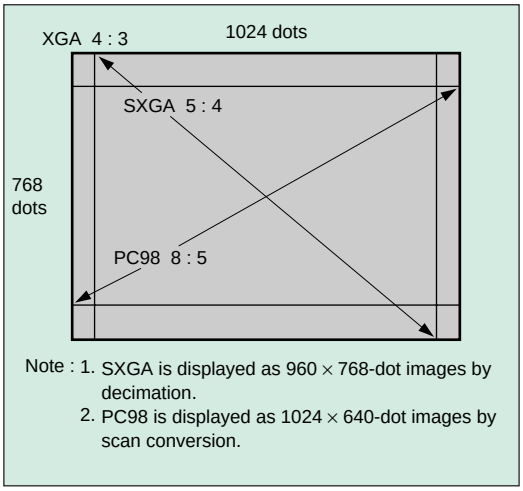
Multi-Format Display

Source material in any of the XGA, SVGA, VGA, NTSC, and PAL formats can be easily displayed at full screen size by combining the LCX023AL with a Sony-developed scan converter IC. This combination results in stunningly beautiful display with no information loss. The LCX023AL panel itself also includes a function for displaying a black frame at the edges of the image corresponding to the aspect ratio of the image being displayed. The use of this function allows LCX023AL-based projectors to easily display areas corresponding to the SXGA 5:4 aspect ratio or the NEC PC98 8:5 aspect ratio at the center of the screen.

Ease of Use

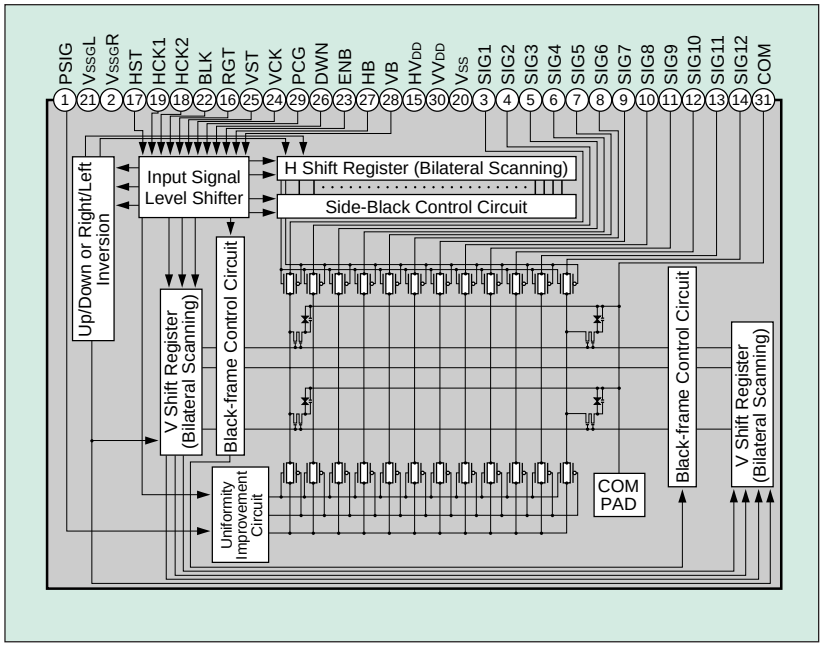
To support their use in a wide variety of applications, Sony projector LCD panels include up/down and/or right/left inversion functions and also built-in level shifter circuits to allow external drive using 5-V signals and suppress undesired radiation. The LCX023AL also incorporates in the panel newly-developed horizontal driver circuits that provide a large margin against ghosting. By using Sony system ICs, end products with a minimal number of adjustment points can be created. The LCX023AL is provided in a package with external dimensions identical to those of the earlier Sony 1.3-inch VGA and SVGA products, thus allowing the same optical system to be used.

New Products

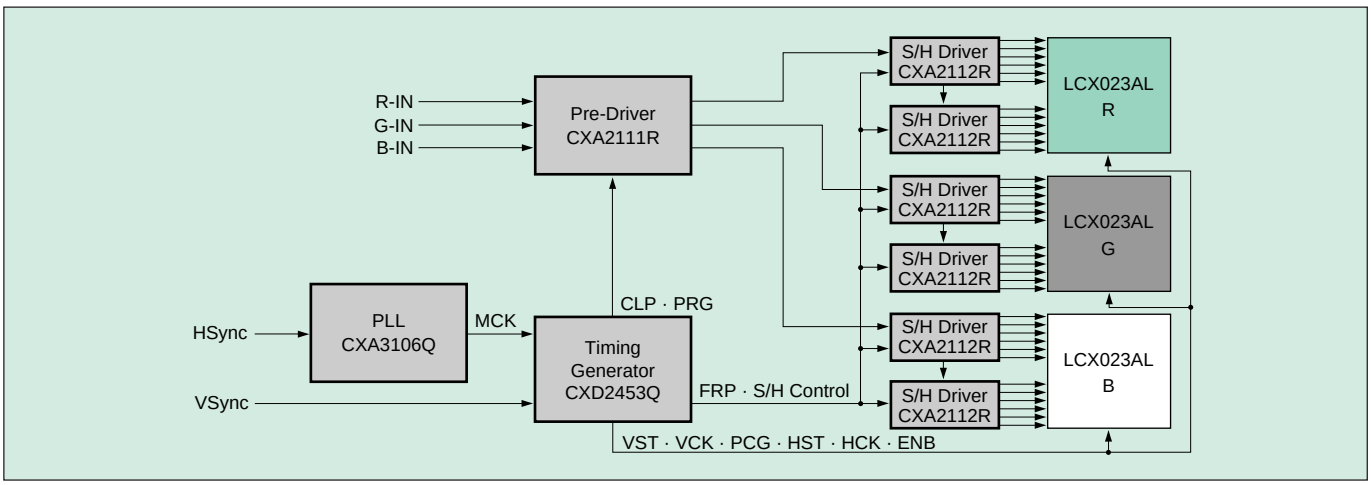


Note : 1. SXGA is displayed as 960 × 768-dot images by decimation.
2. PC98 is displayed as 1024 × 640-dot images by scan conversion.

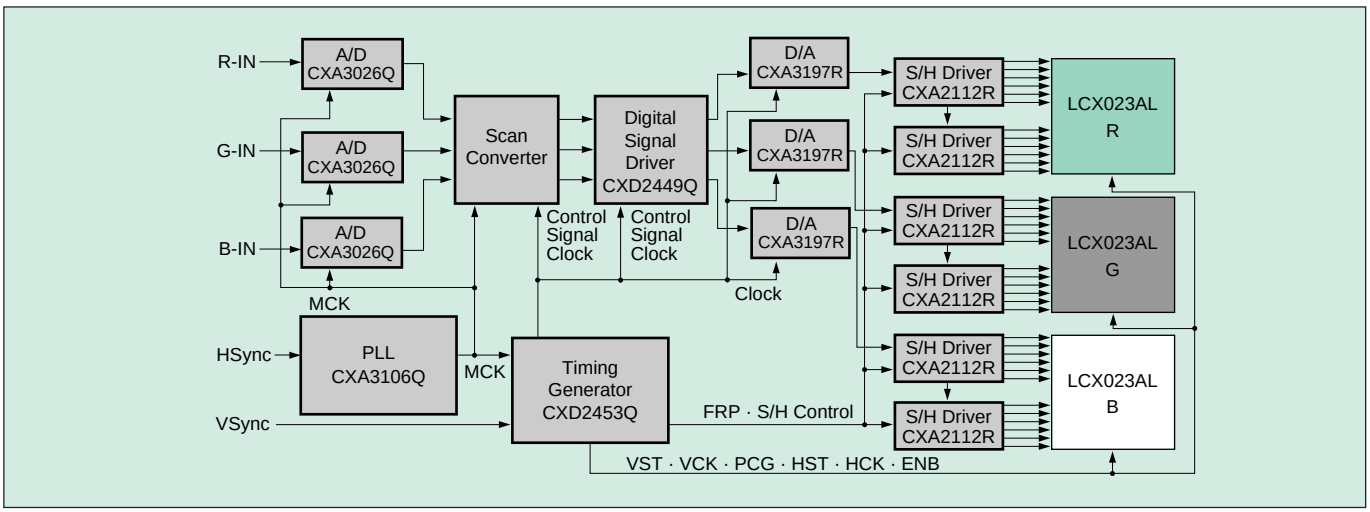
■ **Figure 1 Multi-Format Display Support**



■ **Figure 2 LCX023AL Block Diagram**



■ **Figure 3 LCX023AL System Block (Analog)**



■ **Figure 4 LCX023AL System Block (Digital)**