

XGA Data Projector LCD Product Line

Featuring the Industry's Highest Optical Transmittance in 1.8, 2.3, and 3.3 cm Size Panels

LCX023ELT/EMT LCX029CNT/CPT, CRT/CST LCX038ART/AST

Due to the increasingly widespread use of data projectors, there are now even stronger desires for brighter and higher resolution projectors. To respond to these desires, Sony has developed a product line of 786K-dot XGA data projector LCDs based on the unique Sony-developed DMS structure and taking full advantage of high light resistance technology and a newly-developed high aperture ratio structure. All three sizes, 1.8 cm (0.7-type), 2.3 cm (0.9-type), and 3.3 cm (1.3-type), achieve the highest brightness in their size class in the industry, and can be used in a wide range of applications, from mobile PC-based presentations to conference rooms, and even in large conference halls.

- These devices achieve the highest optical transmittance in their size class
1.8 cm (0.7-type): 21% (typ.)
- Dual Metal Shield (DMS) structure adopted
- Aspherical high efficiency microlenses incorporated
- Improved uniformity due to the adoption of the OCS (On Chip Spacer) structure
- Built-in crosstalk-free and ghost-free circuits
- Up/down and/or right/left inversion functions, input level shifter circuits
- Antidust glass structure adopted

■ Highest Optical Transmittance in Their Class Achieved

By adopting Sony's unique DMS structure, a newly-developed high aperture ratio structure, and aspheric microlenses (with ML) these products achieve the greatest brightness of any devices in their respective size class. The 1.8 cm (0.7-type) models achieve an aperture ratio of 42% and an optical transmittance of 21% (with ML), the 2.3 cm (0.9-type) models achieve an aperture ratio of 54% and an optical transmittance of 26% (with ML), and the 3.3 cm (1.3-type) models achieve an aperture ratio of 67% and an optical transmittance of 30% (with ML). For the 2.3 cm (0.9-type) models this corresponds to an improvement by a factor of 1.2 over conventional products. To improve the light resistance, we developed the DMS structure used in previous products even further, and achieved light resistances of 1000 ANSI lm in the 0.7-type models, 1500 ANSI lm in the 0.9-type models, and 3000 ANSI lm in the 1.3-type models. In particular, the LCX038ART/AST is the industry's first 1.8 cm (0.7-type) XGA data projector LCD, and can be used to implement ultraportable data projectors. (See table 1.)

V O I C E

To respond to our customers desires for even brighter images with even higher picture quality, we are simultaneously releasing three new XGA data projector LCDs, a high-brightness 1.3-type device, a 0.9-type device, and a 0.7-type device. All of us on this project team grappled with the main development issues, which were to achieve both high optical transmittance and high light resistance. We are convinced that Sony's customers will be fully satisfied with this new lineup of XGA LCD products for use in applications from ultrasmall mobile projectors to high picture quality portable projectors.

■ **High-picture Quality Achieved**

The three model types in this release all adopt the TFT circuit technology developed in Sony's previous data projector LCD products, and achieve crosstalk-free and ghost-free display. The device structure is a high-brightness structure consisting of a high light resistance DMS structure and an OCS structure, and achieves excellent uniformity. Furthermore, by adopting this device structure and the CXD3503R color shading correction IC, it is possible to correct not only for color shading in the LCD panel itself, but also for color shading in the illumination system, and

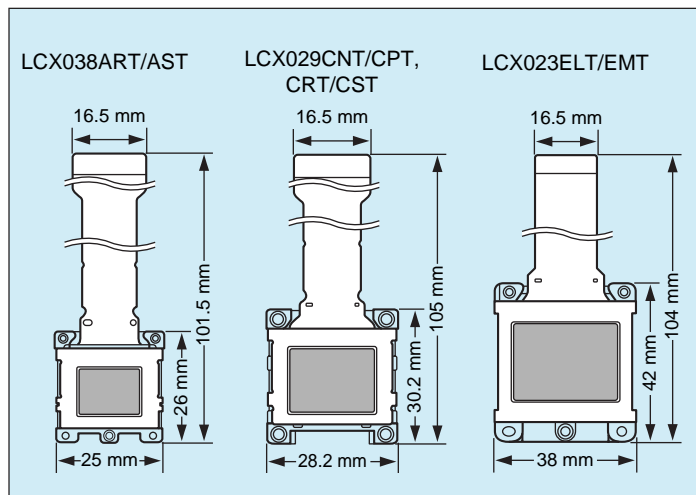
thus these devices can achieve high-picture quality images with greater evenness. All three of the model types in this release feature a contrast of 400:1 (typical), which was achieved by optimizing both the LCD design and the LCD orientation technology.

■ Ease of Use

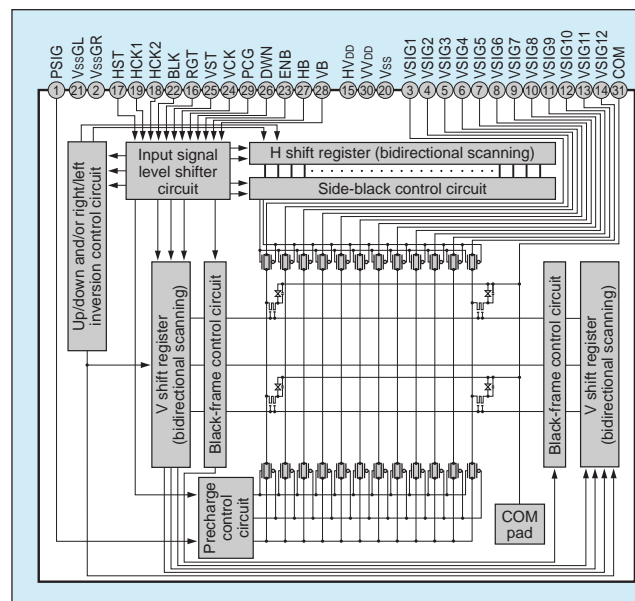
To support a wide range of applications, Sony data projector LCDs include both up/down and/or right/left inversion functions and input level shifter circuit to allow 5 V drive of the timing system. Related Sony products create an environment that allows users to get the best performance from the characteristics provided by the LCDs themselves. These products include, for the analog system, the CXA2111R signal driver and the CXA3512R high voltage drive sample-and-hold IC, which has been well-received by the market, and the CXD2467AQ, which integrates a programmable TG and RGB drivers on a single chip as the digital system structure.



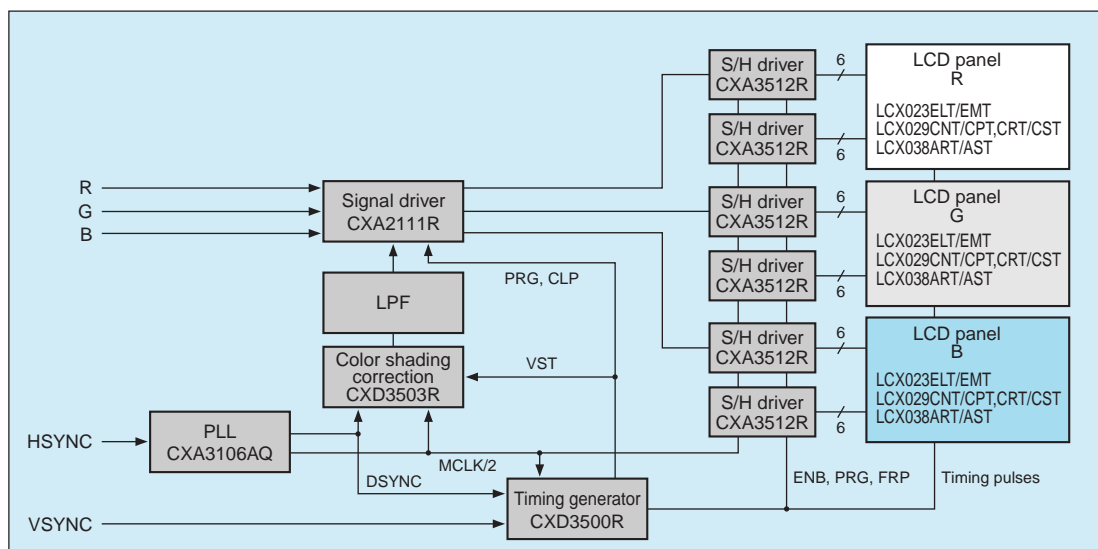
New
Products



■ Figure 1 XGA Panel Dimension Specifications Comparison



■ Figure 2 Panel Block Diagram



■ Figure 3 System Block Diagram

■ Table 1 XGA Panel Specifications Comparison

Product name	LCX038*	LCX029*	LCX023*	LCX017
With ML	ART/AST	CRT/CST	EMT	
No ML		CNT/CPT	ELT	DLT
Screen size	1.8 cm (0.7-Type) XGA, high aperture ratio	2.3 cm (0.9-Type) XGA, high aperture ratio	3.3 cm (1.3-Type) XGA, high aperture ratio	4.6 cm (1.8-Type) XGA
Number of dots	1,024 (H) × 768 (V) (786,000)	1,024 (H) × 768 (V) (786,000)	1,024 (H) × 768 (V) (786,000)	1,024 (H) × 768 (V) (786,000)
Outer dimensions	25 mm (H) × 26 mm (V)	28.2 mm (H) × 30.2 mm (V)	38 mm (H) × 42 mm (V)	50 mm (H) × 56 mm (V)
Dot pitch	14 μm × 14 μm	18 μm × 18 μm	26 μm × 26 μm	36 μm × 36 μm
Aperture ratio	42%	54%	67%	70%
Optical transmittance	21%	26% (With ML) 18% (No ML)	30% (With ML) 23% (No ML)	24%
Light resistance	1,000 ANSI lm	1,500 ANSI lm	3,000 ANSI lm	6,000 ANSI lm
Antidust glass	Built in	Built in	Built in	Built in

* Under development