

High Picture Quality 3.4 cm (1.35-Type) 1.05M-dot Wide XGA HDTV Projector LCD for the Coming Digital Age

LCX037BL

As the trend towards digital TV broadcasting accelerates, the needs for large screen high picture quality displays are growing rapidly. The HDTV LCD projector is expected to become one of the mainstays of this area.

To respond to these hopes, Sony has now developed a new 3.4 cm (1.35-Type) 720P digital HDTV LCD that adopts Sony's unique high picture quality circuit technology and optimal pixel design technology.

This device, the LCX037BL, is an HDTV front projector LCD, a device that will be indispensable for home theater displays in the digital age.

- Achieves high transmittance (17%) as a 3.4 cm (1.35-Type) 1.05M-dot wide XGA LCD.
- Improved contrast and completely horizontal crosstalk-free due to display the adoption of the Dot-Line inversion drive method.
- Vertical crosstalk-free up to the HD format due to the adoption of the 2STEP dot sequential precharge method.
- Brightness shading-free due to the adoption of OCS (on-chip spacer) technology.
- Vertical crosstalk-free due to adoption of a high light resistance device structure (DMS*¹)
- Up/down and/or right/left inversion functions
- Built-in input level conversion circuits

■ 3.4 cm (1.35-Type) LCD for 720P Digital HDTV

Sony has achieved an aperture ratio of 52% and an optical transmittance of 17% in a wide XGA display (1366H × 768V) LCD with 1.05M dots. Achieving this required the introduction of a unique new Sony-developed structure (DMS), the development and introduction of a new fabrication process, and the use of high-precision LCD orientation technology. As a result, this device can provide bright fine-grained display of digital HDTV broadcasts, and can create bright but subtle pictures even on a large screen.

■ High Picture Quality Achieved

By adopting Sony's unique newly-developed picture quality improving "Dot-Line inversion drive method," complete crosstalk-free is achieved. (See figure 1.) Due to this drive technology and an optimized pixel design that reduces the amount of light leaking around pixels, Sony was able to improve the contrast to over 350:1 when VSIG = ±5.0 V. Furthermore, to achieve vertical crosstalk-free display even for video formats such as HDTV that have an extremely short blanking period, Sony developed the new 2STEP dot sequential precharge drive method. (See figure 2.) The LCX037BL achieves high uniformity while supporting even higher brightness levels by using both the high light resistance DMS structure and the OCS (on-chip spacer) structure in the surface of the device structure. (See figure 3.) Additionally, by using the CXD3503R color shading correction IC, end products can provide fine-grained correction not only for the color shading due to the LCD panel itself, but also that due to the optical system. This allows end products to provide excellent image uniformity.

■ Ease of Use

At the same time, Sony has also developed the new CXD3504R as a system IC for the LCX037BL, which adopts a new drive method. A system structure consisting of the CXA3512R high-voltage sample-and-hold IC, which has an excellent reputation, and the CXD2467AQ, which integrates both a programmable TG and RGB drivers on a single chip, can create an environment that can take full advantage of the characteristics of this LCD panel. (See figure 4.)

*1 DMS: Dual Metal Shield

V O I C E

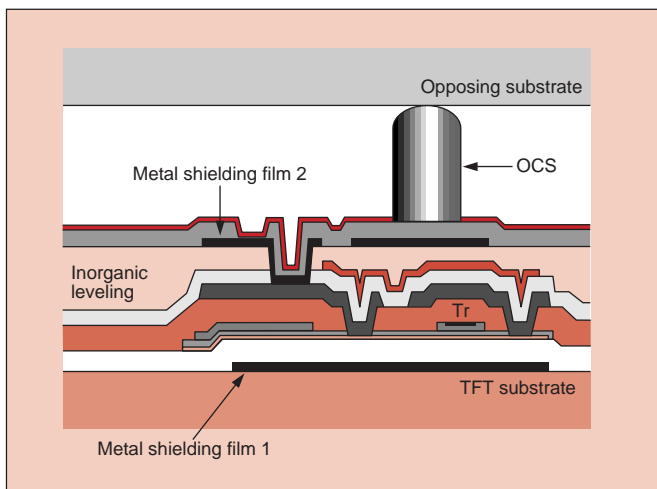
We developed the LCX037BL with the goal of achieving the superb picture quality required to satisfy the home theater market. We developed a new LCD drive technique, a new device structure, and a new system IC for this product. All of us in the development team strove to improve the LCD characteristics as much as possible. We are confident that the LCX037BL will be rated number one in the home theater market.



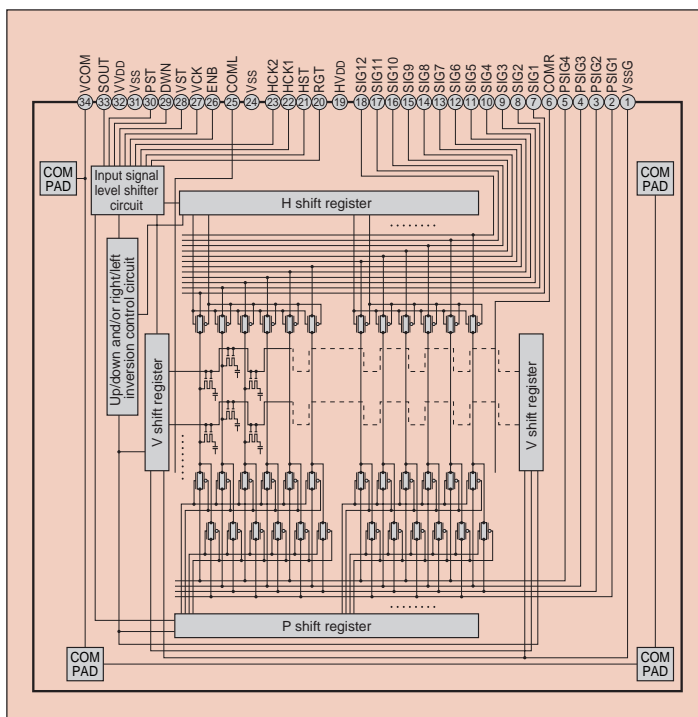
New Products

	Line inversion	Dot inversion	Dot-Line inversion
	Vg1 H H H H H Vg2 L L L L L Vg3 H H H H H Vg4 L L L L L	Vg1 H L H L Vg2 L H L H Vg3 H L H L Vg4 L H L H	Vg1 H H H H H Vg2 L L L L L Vg3 H H H H H Vg4 L L L L L Vg5 H H H H H Vg6 L L L L L
Aperture ratio	Good (52%)	Inferior (32%)	Good (52%)
Picture quality (Including horizontal crosstalk)	Fair	Good	Good

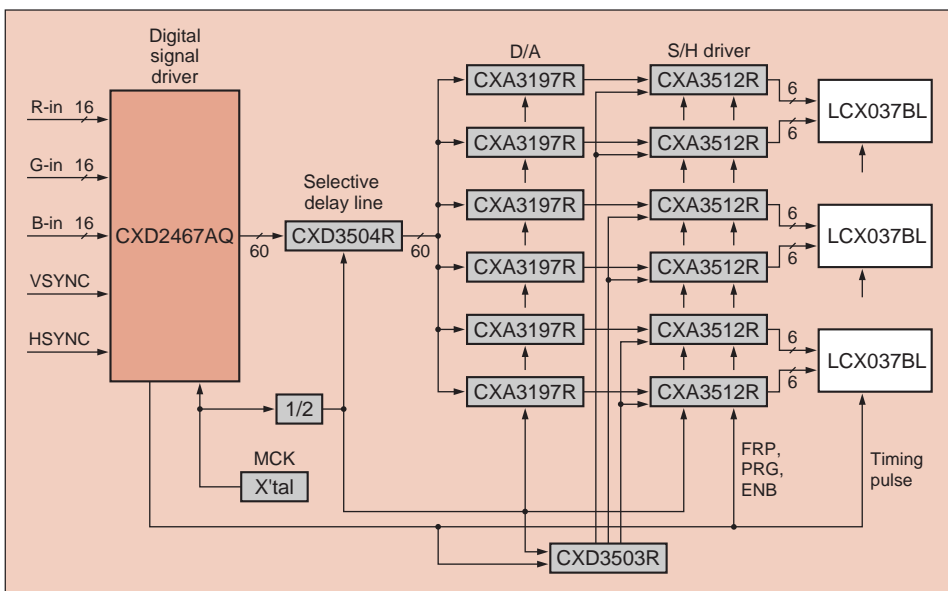
■ Figure 1 Dot-Line Inversion Drive Method



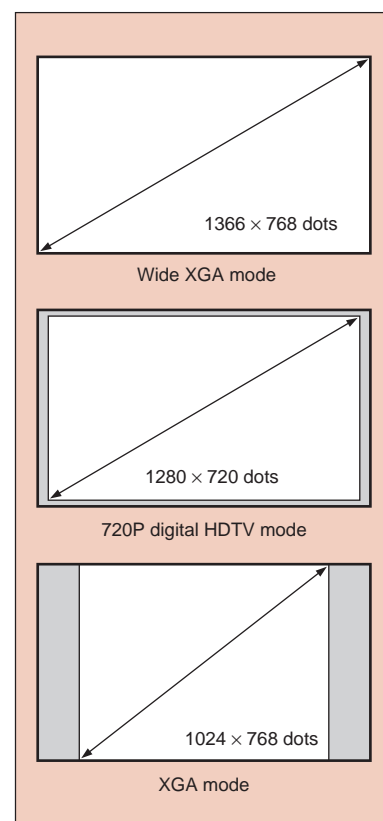
■ Figure 3 TFT Cross Section Structure



■ Figure 2 LCX037BL Panel Block Diagram



■ Figure 4 LCX037BL System Block Diagram



■ Figure 5 Display Correspondences