

Multi-Cell Gap Design for TFT LCD

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Abstract

In spite of the PC monitor, the color shift performances and image quality under larger oblique view angles have become a very important issue for the LCD TVs. The pixel electrodes with different widths in each sub-pixel have been proposed in Yoon et al. [1] to improve the color characteristics. By using this concept, liquid crystal possesses multi threshold voltages within one pixel. Except from changing the ITO electrode size in each sub-pixel, it also can be reached by changing the cell gap in each sub-pixel to improve the drawback of color shift in oblique view angle. The so-called multi-cell gap technique has been proposed through coating an organic layer [2~4] on the TFT substrate to vary the cell gap in each sub-pixel. The other method to improve the color shift is to change the color thickness for each R, G, and B sub-pixel in color filters [5]. In order to improve the color performance in oblique view angle and keep the white color chromaticity simultaneously, a proper color thickness design for color filter was proposed in this paper.

The color shift measurements of pure colors for the designed cell structure are shown in Figs. 1. From the Fig. 1, the color shift of pure color for each R,G,B and white modes are very similar between conventional and multi-cell gap design. The color shift measurements for mix color modes are shown in Figs. 2. As shows in Fig. 2, it can be verified that the designed multi-cell structure with excellent color shift performance in mix color.

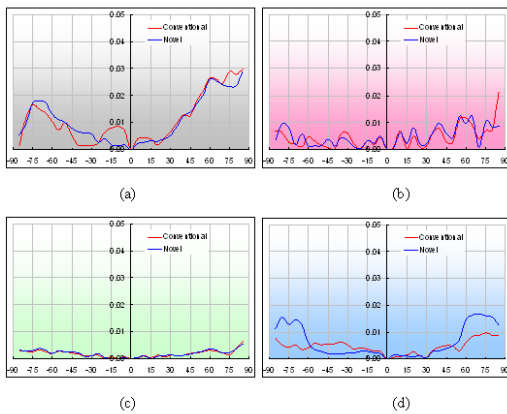


Figure 1 The color shift for pure color

(a) W (b) R (c) G (d) B

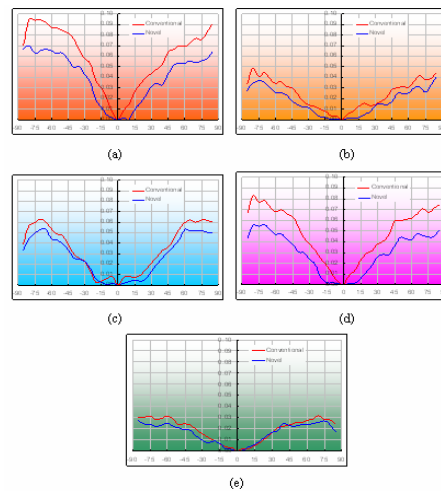


Figure 2 The color shift for mix color

(a) Dark Skin (b) Light Skin (c) Sky Blue (d) Claret Red (e) Foliage

References

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