

Highly Efficient Transflective Liquid Crystal Display Having In-Cell Functional Optical Films

Yong-Woon Lim, Yong-Sang Ryu, Kyung-Mo Koo, Sin-Doo Lee

*School of Electrical Engineering #32, Seoul National University,
Kwanak P.O.Box 34, Seoul 151-600, Korea*

We proposed a multi-twisted-nematic (MTN) transflective liquid crystal (LC) display having imprinted multi-functional optical films as a retarder and a patterned dye-polarizer in a single gap configuration as shown in Fig. 1(a). For fabricating MTN LC mode, the LC cell is composed of both a patterned dye-polarizer and a unique aligned retarder fabricated by using imprinting technique [1] inside of cell substrates. In addition, the geometrically generated microstructures of the surface of two in-cell functional films have a self-aligning capability of injected LCs in the LC cell due to Berreman effect [2]. As shown in Fig. 1(b), this device is expected to have high transmittance and high reflectance simultaneously. Moreover, the imprinting technique based on a liquid crystalline polymer and dichroic dyes is a simple and versatile technique.

References

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- (2) Y.-W. Lim, C.-H. Kwak, and S.-D. Lee *J. Nanosci. Nanotechnol.* **2008**, 8, 4775.

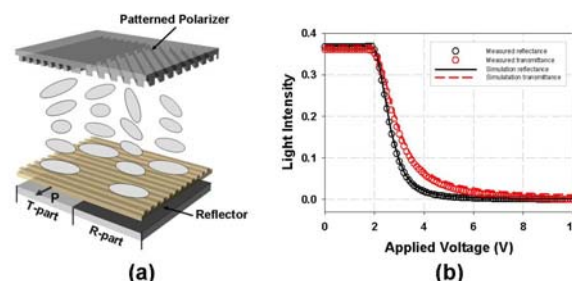


Figure 1. (a) The schematic diagram and (b) electro-optic results of our transflective LC cell.