

Low voltage blue-phase liquid crystal display with triple-penetrating fringe fields

Abstract

A low voltage polymer-stabilised blue-phase liquid crystal display (PSBP-LCD) with triple-penetrating fringe fields (TPFF) is proposed. The PSBP-LCD employs in-plane switching (IPS) electrodes and two etched substrates to generate the TPFF. These fields including strong horizontal electric fields are symmetrically distributed across the entire LC layer, so large phase retardation along the beam path is accumulated. As a result, the proposed structure successfully reduces the operating voltage below 10 V. Moreover, the proposed structure can obtain a wider viewing angle and a higher transmittance than the traditional IPS structure because of the generated multi-domain structures in the etched areas.