

Optical plate-free low signal-to-noise 3D display using micro striped-LED arrays

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We demonstrate the alternative technological way to exhibit 3-dimensional display by utilizing micro striped-LED light sources. In a parallax barrier scheme for autostereoscopic display, barrier plate (optical plate) is required in front of LCD back light unit (BLU) to give a vision parallax between two eyes. However, parallax barrier causes reduction of transmittance from BLU and is an additional optical component that is desirable if removed.

In this work, we substituted parallax barrier-BLU with micro striped-LED arrays to form autostereoscopic viewing zone for 3D displays, thereby eliminating optical-plate and simplifying the module structures. Developed display size is ~4" in diagonal and is composed of several micro striped-LED sources arrayed longitudinally by bonding package. The width of striped-LED is ~25 μm and interspacing between adjacent LED stripes is 462 μm (center-to-center). We tried micrometer-scale translational adjustment to align accurately individual striped-LED to longitudinal pixels for best 3D realization. We also produced and played 4-view demo video using striped-LEDs to check the 3D display quality by measuring crosstalk between adjacent viewing zones. The measurement results and discussions will be presented.

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