System design for a wide-color-gamut TV-sized AMOLED display

By using current technology, it is possible to design and fabricate performance-competitive TV-sized AMOLED displays. In this paper, the system design considerations are described that lead to the selection of the device architecture (including a stacked white OLED-emitting unit), the backplane technology [an amorphous Si (a-Si) backplane with compensation for TFT degradation], and module design (for long life and low cost). The resulting AMOLED displays will meet performance and lifetime requirements, and will be manufacturing cost-competitive for TV applications. A high-performance 14-in. AMOLED display was fabricated by using an in-line OLED deposition machine to demonstrate some of these approaches. The chosen OLED technologies are scalable to larger glass substrate sizes compatible with existing a-Si backplane fabs.