

Technology Commercialization Opportunity

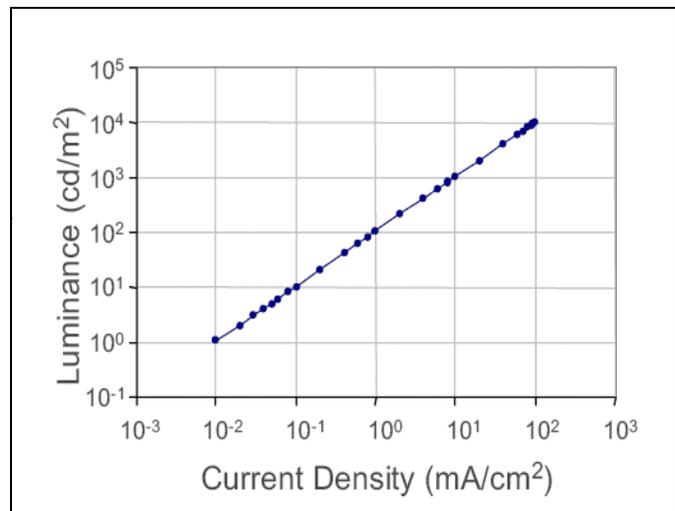
OLED Displays - Advanced Integrated Circuit Driver Technology

Inventor(s): Robert J. Bowman, Professor of Electrical Engineering; Christopher Nassar, Ph.D. EE.

Technology Description

Organic light emitting diode (OLED) display technology has been attracting much attention in recent years as it holds great promise in areas such as reduced display thickness, weight, and power consumption, along with improved response speed, and direct emission while providing good contrast, high resolution, a broad color gamut, and a wide viewing angle. There are challenges including brightness uniformity, parasitic capacitance, and lifetime. Lifetime issues have been addressed with superior packaging techniques. The remaining issues of brightness uniformity and parasitic line capacitance are related to the limitations of the integrated circuit OLED driver technology that has evolved from LCD driver technology.

The OLED device exhibits inter-electrode capacitance which can influence turn on time but with proper drive techniques OLED response is about 500 times faster than LCD technology. The threshold voltage to stimulate emission is roughly 2 volts for each organic stack in the OLED device but OLED device forward bias voltage increases as the device ages. To maintain accuracy in the current drive over time the OLED current source must exhibit high output impedance. OLED luminance is very linear with applied forward current density over a range of four decades as shown in the adjacent figure with an operational upper limit of 10 mA/cm².



Circuit architectures which provide precise current drive offer the best possibility for OLED grayscale control.

The RIT advanced OLED driver technology has been designed and applied to address the physical properties of OLED display panels, and results in OLED displays with superior display quality. This technology addresses each of the issues mentioned above and provides precise, uniform, OLED current drive (and hence, luminance as in the above figure) with fast settling time.

Keywords: Organic light emitting device (OLED), integrated circuit, display driver, liquid crystal display (LCD), current drive, settling time.

Technology Readiness

Advanced OLED Display Driver Technology is available for commercial integration.

Idea	Concept	Prototype	Alpha Version	Beta Version	Released
------	---------	-----------	---------------	--------------	----------

The developers of Advanced OLED Display Driver Technology will work with licensees to finalize the integration of the technology into display driver modules.

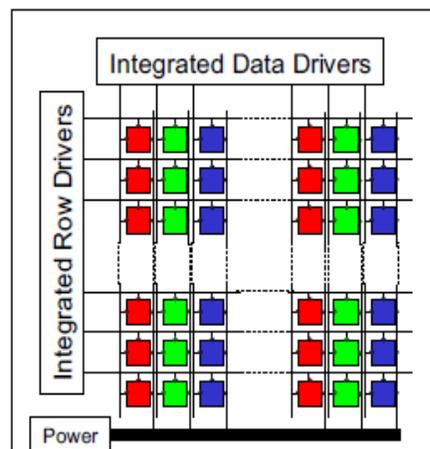
Intellectual Property

Advanced OLED Display Driver Technology is the subject of one issued and one published and pending U.S. patent applications, one trade secret disclosure and copyrighted design documents. The patented applications are entitled:

- “Derivative Sampled, Fast Settling Time Current Driver” US 8,508,522
- The trade secret disclosure is entitled, “Fast Settling, Wide Dynamic Range, Precision Current, OLED Driver Based on a Binary Search Algorithm”
- Know-how, “Methods and Apparatus for Producing Precision Current Over a Wide Dynamic Range” (Was US 20100201671)

Applications

Low power integrated circuit drivers, used in active matrix display architectures like that shown at the right for OLED displays, are found in small portable devices such as cellular phones, mp3 players, digital camera, shavers, game players, and car audio displays. Normal power OLED drivers are used for applications in television screen and large display panels. The OLED Display market is projected to exceed 3 Billion USD by 2013.



Target Customers

- Portable display manufacturers (cellular phones, mp3 players, digital camera, shavers, game players, and car audio)
- Large screen display manufacturers (advertising displays, television screens)
- Display module manufacturers
- Engineering companies that develop integrated circuit display drivers.

Opportunity

RIT's Intellectual Property Management Office (IPMO) is interested in working with those parties who are qualified and interested in the commercialization of this suite of Advanced OLED Display Driver Technologies. Arrangement types include licensing the application to existing organizations or new organizations that have expertise in the field or related fields.

Contact

Those interested in learning more about this opportunity should contact:

Mr. William E. Bond, Director of Intellectual Property Management at RIT (585) 475-2986

bill.bond@rit.edu

Please refer to IDs 2007-011, 2007-009, 2008-019; 042116