AMOLED compensation circuit patent analysis
OLED, a self-light-emitting diode, has been touted as the next big thing in display technology for its exceptional properties including no need for a backlight, wide viewing angle, quick responding speed and low current consumption. In particular, LG unveiled the world’s first 55-inch flat OLED TV in early 2013 followed by 55-inch curved OLED TV in April. With Samsung joining the fray with its latest 55-inch curved OLED TV, a fierce competition is expected in the OLED TV industry.

In anticipation of the OLED TV market coming into full bloom next year and encroaching the LCD TV market, developing mass production technology for OLED panels will soon emerge as a major issue. Extensive R&D efforts are under way to refine the OLED manufacturing process, namely, TFT backplane, color patterning, encapsulation and driving circuit. Especially, a lot of research has centered on the development of compensation circuit, as threshold voltage and IR-drop reduce the luminance of a driving TFT for an AMOLED display.

OLED is a current driving circuit whose luminance properties are extremely sensitive to current changes. Driving TFTs for each pixel circuit of an AMOLED display can have different threshold voltages, which undermines the consistency of luminance of the panel.

In addition, when a VDD line passes each pixel circuit, it creates an IR-drop, resulting in a gradual decrease in pixel luminance towards the bottom of the panel that requires compensation.

This report examines a number of selected U.S. patents, analyzes patent application trends and patents filed by major companies and pinpoints key patents and new technology patents, offering a wide array of in-depth analyses. These analyses are expected to help keep pace with development trends for an AMOLED pixel driving circuit technology that compensates the threshold voltage and IR-drop as well as key patented technologies.

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Lead Analyst

Ian Lim - Senior Analyst

Ian Lim is responsible for the analysis of the display industry and technology at IHS. With extensive experience in patent research and analysis for the display industry, Ian has published a number of patent reports, particularly on emerging display technologies and new products.

He also creates monthly Patent Watch market brief, primarily on OLED and flexible technologies, that analyzes and provides information on new patents, key technology/product patents, and patent disputes.

Prior to joining IHS in 2011, Ian worked in the patent research and consulting field at several companies, including Infobase (now Sewonbiz), a patent information provider, where he worked as a patent researcher. He has more than six years of experience in patent research, which spans various technology and product areas.

He received a Bachelor’s degree in Chemical Engineering from Inha University.

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IHS Electronics & Media combines market, technology and supply chain analysis and forecasts at every operational step of the electronics value chain from strategy, planning and analysis to product design and development and supply chain management.

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Key Patent Analysis

Out of 244 U.S. patents, those listed in the top 50 issued patents in terms of the number of forward citations were selected as key patents and subjected to an in-depth analysis: technology development trends, overview of key patents and case analysis.

New Technology Patent Analysis

Out of 244 U.S. patents, 39 patents (29 published and 10 issued) applied in more than three countries for the past five years were selected as new technology patents and subjected to an in-depth analysis: technology development trends, overview of new technology patents and case analysis.

Table of Contents

1. Patent analysis overview
   - Analysis background
   - Scope and method of patent analysis
   - Use of patent information

2. Technology overview
   - AMOLED technology overview
   - Vth and IR-Drop of AMOLED

3. Analysis of patent application trend
   - Patent application trend by year
   - Patent application trend by technology
   - Status of assignees

4. Key patent analysis (50 Patents)
   - Key patent selection
   - Key patent status
   - Technology development trends
   - Key patent abstracts
   - Key patent embodiments

5. Analysis of new technology patents (39 Patents)
   - Selection of new technology patents
   - Status of new technology patents
   - Technology development trends
   - Abstracts of new technology patents
   - Embodiments of new technology patents

6. Conclusion
   - AMOLED market outlook
   - Summary of patent application trend
   - Patent competitiveness by major company
   - Conclusion and implications

7. Appendix
   - Patent list by company (244 Patents)