Highly uniform thin film transistors for high performance AM-OLED displays

Technology #m04-077

Thin film transistors used in active matrix organic light-emitting diode displays (AM-OLEDs) require uniform crystalline microstructures that prevent variations in light emission and performance over the display area. However, current production methods are unable to prepare films that are sufficiently uniform for use in high performance AM-OLED devices. This technology uses sequential lateral solidification (SLS) to reduce both the number and appearance of non-uniformities, enabling production of AM-OLED displays and other electronic devices requiring highly uniform thin films.

Sequential lateral solidification with configured laser beam widths produces uniform thin films while maintaining high throughput.

Uniform thin semiconductor films are produced using line scan sequential lateral solidification with excimer lasers. By adjusting the laser beam width to crystallize the entire width of the film with one pass, this technology reduces the number of laser pulses required to prepare the film and reduces variations in the crystal microstructure compared to conventional approaches. As a result, this technology may be used to prepare highly uniform thin films with high throughput.

Lead Inventor:

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Applications:

- Production of highly uniform thin-film semiconductors
- Production of high performance AM-OLED displays

Advantages:

- Produce highly uniform thin-film semiconductors and transistors while maintaining high throughput
**Patent Information:**

- Patent Issued (US 8,221,544)
- Patent Issued (US 8,617,313)

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