PRESS RELEASE

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OLED microdisplays as high-precision optical fingerprint sensors

Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, a leading provider for research and development in the field of OLED-on-Silicon applications, presents a high-resolution fingerprint-sensor at SID Display Week 2017, from May 23-25 2017 in Los Angeles/USA at the German Pavilion, booth no. 623.

Fraunhofer FEP has been developing various application-specific OLED microdisplays based on OLED-on-silicon technology successfully for many years. This unique technology enables the high-precision integration of an OLED as light source on a microchip. Moreover this microchip can be designed with further sensor elements, e.g. photodiodes. By this, objects can be illuminated and at the same time the reflected light detected and analyzed. Such microdisplays can be integrated into interactive data eyeglasses as a "bi-directional microdisplay": the tiny display projects the information for augmented-reality applications whereas the camera function detects the viewing direction – thus the content can be controlled by eye-movements.

The fingerprint sensor uses this bidirectional functionality of light-emission and –detection as well: the finger gets illuminated and the reflected light will be detected and analyzed.

Bernd Richter, deputy division manager for OLED microdisplays and sensors at Fraunhofer FEP explains: "We have used an extra-thin encapsulation for the chip of this fingerprint sensor. Thereby the distance between finger and image sensor has been minimized and the fingerprint can be captured excellently. Thus, an additional imaging optics is not necessary for this application."

The first prototype has a native resolution of 1600 dpi – this is three times more than typically required by the FBI. This high spatial resolution enables the identification even of smallest sweat pores beside the typical papillary lines, which can be used to increase the security.

One of the most promising applications of this new kind of sensor is the user verification in mobile devices. Because of the particularly high resolution in comparison to the typically used capacitive fingerprint sensors these devices are much less vulnerable to so-called spoofing (the manipulation by "false fingers").

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Another nice side effect is the opportunity for using the active area as a normal display e.g. for branding, displaying logos or notifications.

Fraunhofer FEP at SID Display Week 2017

Symposium
Friday, May 26, 2017 / 10:40 am – 12:00 pm / room 515 a
Session 77: OLED Displays II (OLEDs)

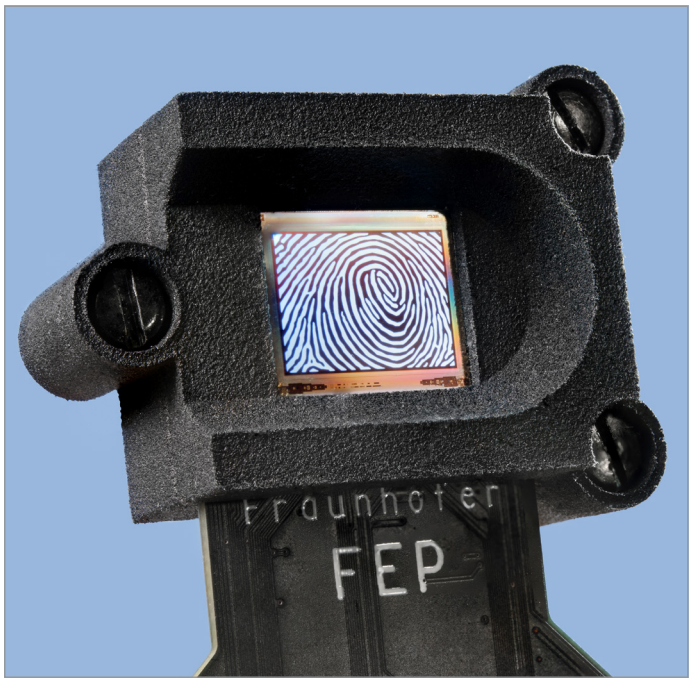
Invited Paper:
Ultra-Low Power OLED Microdisplay for Extended Battery Life in Near-to-Eye Displays
Dr. Uwe Vogel, Fraunhofer FEP, Dresden, Germany

Poster Session
Thursday, May 25, 2017 / 05:00 – 8:00 pm / Petree Hall
P.175: Direct Electron-Beam Micropatterning and Thermal Annealing of OLED Devices
Elisabeth Bodenstein, Fraunhofer FEP, Dresden, Germany

Exhibitor-Forum
Thursday, May 25, 2017, West halls AB
Session F8: OLEDs (09:15 – 10:15 am)

F8.2: OLED Microdisplay with Embedded Optical Fingerprint Sensor
Peter König, Fraunhofer FEP, Dresden, Germany

F8.3: OLED Micropatterning by Electron Beam Ablation
Elisabeth Bodenstein, Fraunhofer FEP, Dresden, Germany



High-resolution OLED-on-silicon fingerprint sensor
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The **Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP** works on innovative solutions in the fields of vacuum coating, surface treatment as well as organic semiconductors. The core competences electron beam technology, sputtering and plasma-activated deposition, high-rate PECVD as well as technologies for the organic electronics and IC/system design provide a basis for these activities. Thus, Fraunhofer FEP offers a wide range of possibilities for research, development and pilot production, especially for the processing, sterilization, structuring and refining of surfaces as well as OLED microdisplays, organic and inorganic sensors, optical filters and flexible OLED lighting. Our aim is to seize the innovation potential of the electron beam, plasma technology and organic electronics for new production processes and devices and to make it available for our customers.