Press information

PolyIC GmbH & Co. KG: 10th September 2008

A new CosMOS of circuits for printed electronics

CMOS circuitry eases the circuit design process; this is a known fact from the silicon semiconductor industries. This is even truer when printing electronics. Therefore, PolyIC coordinated the project “CosMOS” which was funded by the German Federal Ministry of Education and Research (BMBF) to produce CMOS-like organic circuits. Within this project, for the first time ever, organic circuits based upon two different kinds of organic transistor types were produced in a roll-to-roll process. In the laboratory, a first prototype of an organic transponder was fabricated. The particular about this transponder is that the data is stored in an organic CMOS chip.

Integrated circuits based on conductive and semi-conductive organic molecules have been a subject in R&D for several years now. The status quo of the development is applications like transponder for radio frequency identification (RFID). PolyIC offers first printed RFID products in its product line PolyID®. The advantage compared to conventional silicon is that the organic materials are soluble. Thus, conductive, semi-conductive and insulating organic materials can be combined layer by layer in a high-speed roll-to-roll printing process (gravure, offset printing and so forth) into low-cost and mile-long organic circuitry.

The aim of this funded project “Development of CMOS-like organic circuitry – CosMOS”, which started three years ago and now concluded successfully, was the advancement of existent processes and materials for printing of integrated organic circuits that are based on two different transistor types. Furthermore, another aim of the project was the development of prototypes that demonstrate the suitability of such circuits for simple RFID applications.

The project was carried out together with the Chair for Computer-Aided Circuit Design (Prof. Glauert) of the Friedrich-Alexander-University of Erlangen-Nuremberg. After three years of intensive research and development, the results were presented at the final meeting. The most outstanding result is an organic ring oscillator circuit in which two different organic transistors were used. The organic layers of these transistors were produced in a fast roll-to-

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roll process. Another exceptional result is the production of an organic CMOS transponder with several bits memory capacity. The CMOS transponder was read out on a reader at the standard carrier frequency of 13.56 MHz with a reading distance of several centimetres.

The findings of the project can now flow into the work of the succeeding project “MaDriX”, which is about the development of a second generation of organic circuitry. Within this new project, PolyIC works together with four companies and several universities as well as research institutes.

PolyIC GmbH & Co. KG

PolyIC is a leading developer of polymer electronics technology and a future supplier of printed electronic products and components. PolyIC will provide products for high volume low cost applications based on organic semiconductors.
PolyIC uses its expertise in materials, new adapted chip design methods and mass production processes (roll-to-roll printing) for the development of this new technology.
The leading application for PolyIC is RFID (radio frequency identification). The technology of the company has the potential to be used in various electronics applications being thin, flexible, robust and low-cost. PolyIC is a member of EPCglobal – an organization for standardizing the use of RFID in the industries.
PolyIC is a founding member of the Organic Electronics Association, a working group under the umbrella of the VDMA (Verband Deutscher Maschinen- und Anlagenbau). Since 2008 PolyIC is a member of AIM-D e.V., an association for automatic identification and mobile data capture.

PolyIC GmbH & Co. KG was set up in November 2003 as a joint venture between Leonhard Kurz GmbH & Co. KG (51%, hot stamping and coating) and Siemens AG (49%, electronics) for the development and production of printed polymer electronics. PolyIC is headquartered in Fürth on the premises of Leonhard Kurz Stiftung & Co. KG.
PolyIC’s webpage is accessible at www.polyic.com

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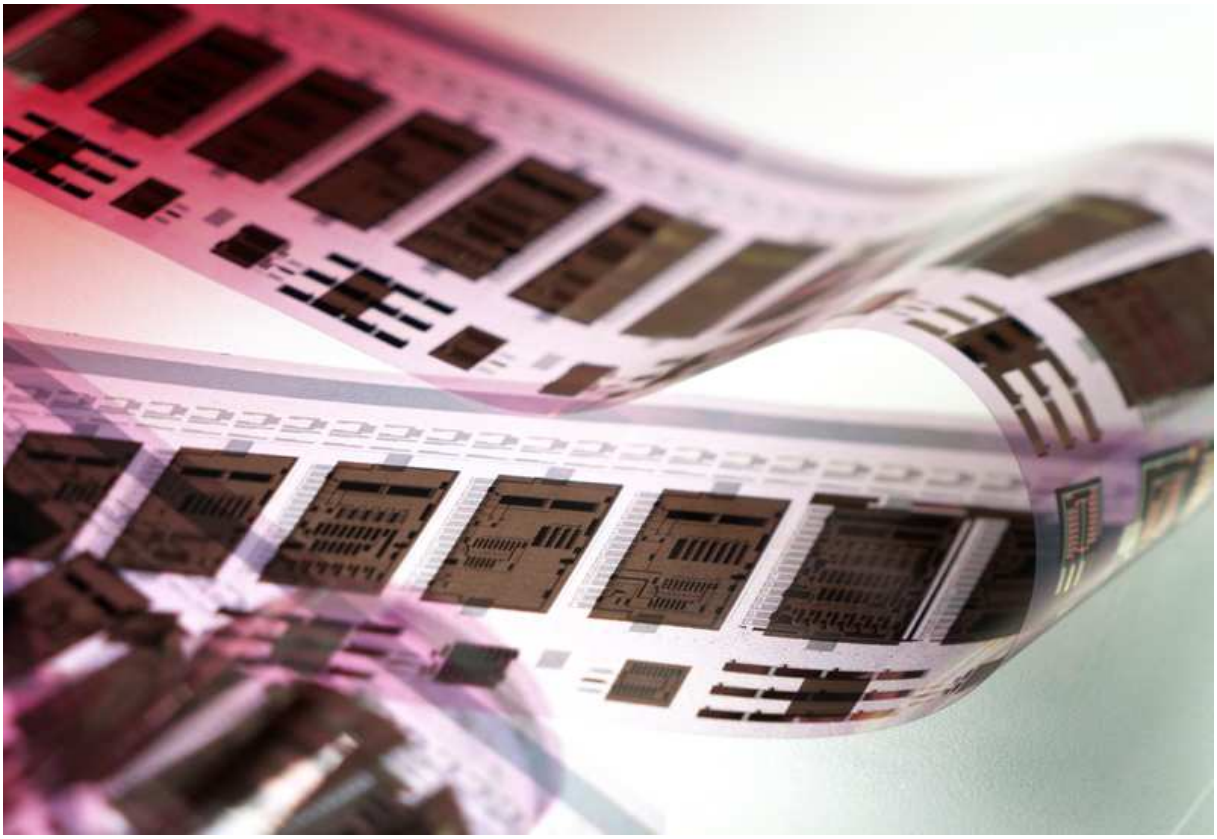
Print-quality images are available for download at: http://www.polyid.de/en/press-images.php



Mile long printed logic circuits for RFID tags

PolyIC GmbH & Co. KG

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