



Newsletter 12/2011

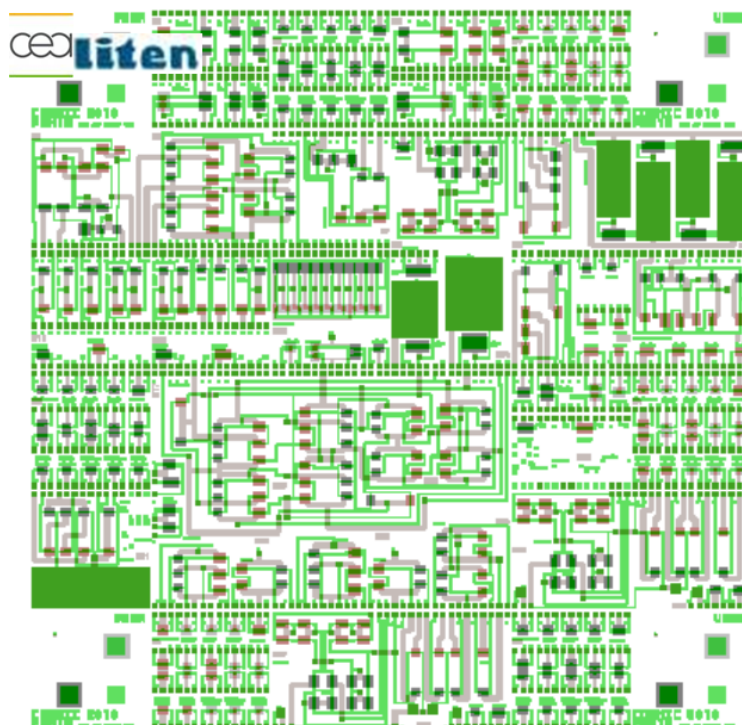
Status on Sheet-To-Sheet Printed Complementary oTFT Technology

The challenge in COSMIC is to reach a stable and robust manufacturing process on plastic film substrates, where different manufacturing platforms are addressed : Wafer carrier based approaches for highly complex circuits as well as sheet and roll processing for large area or high-volume applications.

At the end of the second year of the project the first full printed CMOS flow has been frozen on the CEA-Liten Sheet-To-Sheet technology platform. Significant breakthroughs have been obtained to freeze this technological process flow with good performance in coherence with the targeted applications of the project.

- Best N-type and P-type semiconductor materials have been selected, optimized and integrated in a real monolithic CMOS flow, achieving closely matched carrier mobilities of $\mu_n \sim 0.5$ and $\mu_p \sim 1$, in accordance with the initial objectives of the COSMIC projects.
- First foils with both type OTFT and simple CMOS circuit, have then been printed; optimization of specific surface treatments, both for the PEN substrate and the source-drain gold electrodes have been the key to minimize contact resistances of the transistors, together with scaling down the gate dielectric. This has improved the dynamic performance and minimized the dispersion of device characteristics. Ring oscillators are proofing this with a frequency of 1.2 kHz, corresponding to a stage delay of 60 μ s. Based on these development the Design Rules Manual has been fixed.
- Based on these frozen processes flow, Tue, CNR and ST partners have defined first compact models for the CMOS devices allowing to edit the Design Tool Kit for this printed CMOS flow.

COSMIC S2S CMOS
Design of Process Evaluation Module



COSMIC Workshop 2012 - *Advances in Manufacturing of Organic Electronics*

Besides its research efforts the COSMIC consortium organizes different events for dissemination of project results on a regular basis. Our next COSMIC workshop focuses manufacturing as one of the key issues to bring organic electronics into applications. The workshop targets engineers active in organic and large area electronics as well as students interested in this field.

The workshop is hosted by Eindhoven University of Technology and takes place on

Date: **Friday, 3. Feb. 2012**

Time: **10:00 -15:00**

Location: "Zwarte Doos" conference centre
Campus of the Eindhoven University of Technology, Eindhoven
[link to map](#)

Program and Presenters:

Martin van Neer, TNO:

Dimensional stability during fabrication of flexible electronic on polymer substrates

Gerwin Gelinck, TNO:

Low temperature semiconductors: opportunities and challenges

Jan Genoe, IMEC:

FPD like process flows for flexible electronics - process challenges and cost structure

Romain Coppard, CEA:

Full Printed Electronics on Large Area Flexible Substrate at CEA Liten

Waqas Syed, Fraunhofer EMFT:

oTFT Processing for Roll-to-Roll Technology

Erik van Veenendaal, Polymervision:

Organic Electronics applied to rollable displays

Alasdair Campbell, Imperial College: title t. b. a

Due to financial support by the European Commission participation in this workshop is free of charge. However for organizational purposes advance registration is required. To register, please use preferably our online registration form under <https://register.emft.fraunhofer.de/cosmic/>

For more information see
www.project-cosmic.eu