

## Screen-printed series-connected solar cell module

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Preliminary data on the fabrication of in situ series connected polymer solar cells are presented. The active layer consisted of poly(3-hexylthiophene) (P3HT) and [6,6]-phenyl-C<sub>61</sub> butyric acid methyl ester (PCBM). The devices have the structure of indium-tin oxide (ITO)/poly(3,4-ethylenedioxythiophene) (PEDOT):poly(styrene sulfonate) (PSS)/P3HT:PCBM/Al. All the processes but the deposition of aluminium cathode layer employed screen-printing technique. Chloroform was used as solvent for the screen-printing process of active layer.

Nine individual solar cells with an active area of 1 cm<sup>2</sup> were fabricated by one screen print step. Every three cells were connected in series in situ as a group. On one substrate, there are three groups. For one group, the series connection of three individual cells gave a solar cell module measuring 12 mm×50 mm (6 cm<sup>2</sup>). The active area was 50% of the total area. The remaining 50% of the area was used for interconnections between cells to make sure efficient current extraction and low connection resistance.

With the described architecture, the module gave an open circuit voltage ( $V_{oc}$ ) of 1.77V, a short circuit current ( $I_{sc}$ ) of 7.8 mA, a fill factor (FF) of 52% and a power conversion efficiency ( $\eta$ ) of 2.38% under AM1.5 illumination with an incident light intensity of 1000 W/m<sup>2</sup>.