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Organic non-volatile memories from ferroelectric phase separated blends KAMAL ASADI, University of Groningen, DAGO DE LEEUW, Philips Research Labs, The Netherlands, BERT DE BOER, PAUL BLOM, University of Groningen — Ferroelectric polarisation is an attractive physical property for non-volatile binary switching. The functionality of the targeted memory should be based on resistive switching. Conductivity and ferroelectricity however cannot be tuned independently. The challenge is to develop a storage medium in which the favourable properties of ferroelectrics such as bistability and non-volatility can be combined with the beneficial properties provided by semiconductors such as conductivity and rectification. In this contribution we present an integrated solution by blending semiconducting and ferroelectric polymers into phase separated networks. The polarisation field of the ferroelectric modulates the injection barrier at the semiconductor–metal contact. This combination allows for solution-processed non-volatile memory arrays with a simple cross-bar architecture that can be read-out non-destructively. Based on this general concept a non-volatile, reversible switchable Schottky diode with relatively fast programming time of shorter than 100 microseconds, long information retention time of longer than 10days, and high programming cycle endurance with non-destructive read-out is demonstrated.

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