Plastic RFID Transponder Circuit Achieves 50 kbits-s Bit Rate

IEEE IEDM Baltimore- Holst Centre, imec and TNO presented the world-first organic transponder circuit with a bit rate of 50kbits/s. This bit rate approaches the requirements for the Electronic Product Coding (EPC) standards.

Flexible circuits offer ruggedness during processing as well as in the final product, a property which makes them appealing for new applications such as plastic RFID tags (radio frequency identification tags) for object tagging. However, for widespread application, plastic RFID technology should adhere maximally to the standard Electronic Product Code (EPC) specifications for item-level tagging. The standards require a bit rate of the order of 50 kb/s. Holst Centre, together with imec and TNO, developed an 8-bit flexible transponder circuit on foil using pentacene as semiconductor material and a high-k gate dielectric. The current drive of this technology enables a data rate of > 50 kbits/s for the circuit, which compares favorably with the above mentioned required EPC bit rate specifications. Earlier versions of such organic circuits had a bit rate limited to 1-2 kbits/s.

The Electronic Product Code or in short EPC standard has been developed for wireless identification in high-volume logistics applications like retail. It is widely used already today e.g. on pallet level logistics. The next step is to use EPC tags on package level and on a longer term target on individual items (“item-level tagging”). Organic electronic technology is a candidate for high-volume and low-cost manufacturing of simple electronic circuits. The new results demonstrate that the technology is now on the way to reach EPC compatibility.

Further information on imec can be found at www.imec.be [1].

Visit Holst Centre at www.holstcentre.com [2].

Visit TNO at www.tno.nl [3]

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[1] http://www.imec.be
[2] http://www.holstcentre.com

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