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## Kovio, printed silicon and maybe a semiconductor renaissance

Contributed by Maciej Bajkowski  
Thursday, 13 August 2009

Now and then a company comes along that is developing a technology so unique that it has the potential of completely changing the way we think about how things get done. Case in point, Kovio Inc., a semiconductor startup based out of Milpitas, California. Several years after spinning out from the MIT Media Laboratory, the company has been pursuing printed silicon electronics and slowly but surely the hard work seems to be bearing fruit. Back in October, Kovio announced the world's first printed silicon RFID platform for item-level intelligence, which utilized printed ICs operating at 13.56 MHz, that contained 128 bits of read-only memory as well as an integrated capacitor. In July of this year, the company was able to raise an additional \$20 million in Series E venture capital funding from a myriad of Venture Capitalists (VCs), to begin volume shipments of their RF Barcodes which can be integrated into various consumer products such as nutrition information on food items, tickets, and so on. In addition, Kovio has been collecting awards left and right, including the 2009 Red Herring 100 North America and IDTechEx Printed Electronics Awards. The advantages of printed silicon are numerous, including lower fabrication costs as opposed to traditional silicon technology, high customization potential, and a rapid time to market. Obviously, performance levels are not comparable to high-end silicon processes, but the innovation here is Kovio's proprietary silicon based ink, depicted below, and process technology that makes low-cost printed silicon based products a reality, such as the RF barcodes that the company is currently pursuing. Software developers are probably licking their chops, thinking about all the applications they will be able to build on top of the printed silicon once it penetrates the market. But what if this was only the beginning? What if a few years from now anyone could design a basic system and print it as easily as one can print a piece of paper today? If a substantial amount of copies were needed, one could take the design to a place similar to a printing/copying center, such as FedEx Office, and make a few thousand copies. Only for millions of copies one would need to consider foundries. Let's be honest, most designs do not need to operate in the GHz realm. If the common person could sit down, design a system, and bring it into the real world by simply printing it, similar to how graphics artist and designers work today, the creativity of individuals would be unleashed. Just maybe this would lead to a semiconductor renaissance where the actual design and function would matter more than the latest process node on which it was fabricated.