

Will SOI Provide a Knockout Punch?

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As the battle between power and performance rages on, the semiconductor industry may see a serious contender enter the ring: silicon-on-insulator (SOI) technology.

While SOI has been around for a while, Phoenix-based Semico Research Corp. projects that this technology will box out standard CMOS technology. Indeed, Semico expects CMOS to continue to improve, but the real challenge today is in controlling leakage and power dissipation.

The market research firm asserted in a report that SOI has been shown to reduce power-usage leakage at a given circuit speed because SOI circuits can operate at lower voltages with the same performance as bulk CMOS technology.

To date, however, SOI represents only 3 percent of total wafer sales and even less in terms of production wafers.

"SOI production wafer demand will grow at a CAGR of over 60 percent over the next five years," said Joanne Itow, managing director at Semico, in a statement. "While SOI is more costly than CMOS, as of today, I have not seen a solution that provides the kind of performance and power results that SOI can produce.

"The adoption of SOI for volume applications will depend on the availability of quality SOI wafers and the alternative solutions that are discovered for processing semiconductor products at 45nm and 32nm technologies," Itow added.

SOI technology traditionally has been leveraged in markets where switching speed and/or power are more critical. The Semico report pegs new designs for lower-power handheld computing and communication devices as potential applications for SOI. Still other markets, such as diagnostics and controls for automotive and other combustion engines, may look to tap this technology for SOI devices' ability to operate in elevated temperatures, the report said.

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