

Cutting Costs, and Circuit Boards, Down to Size

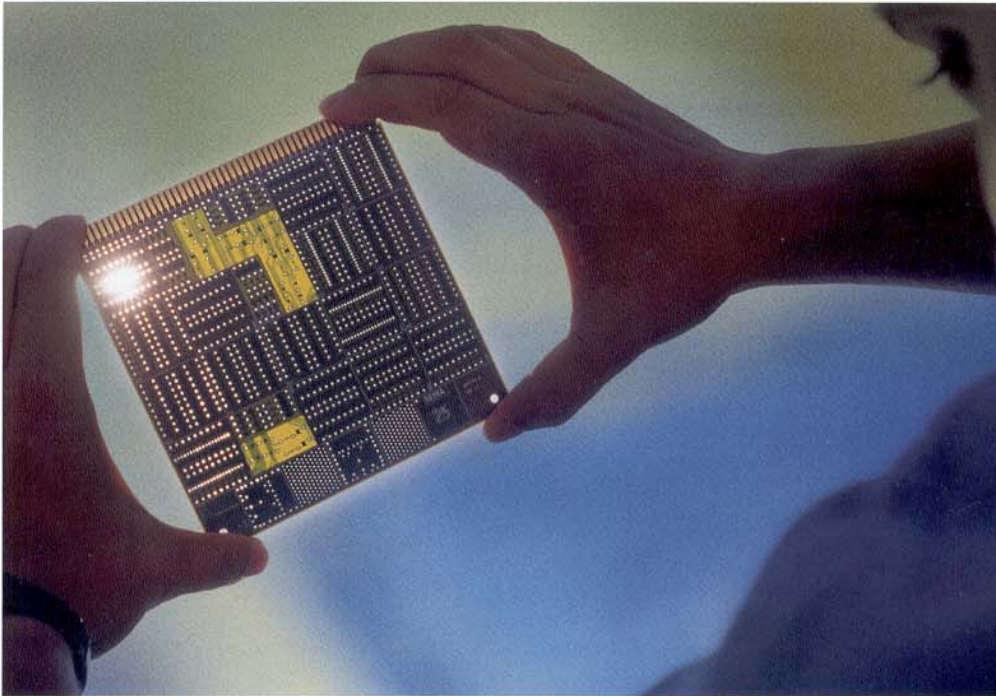


PHOTO BY JOHN T. CONSOLI

New electronic circuit boards called embedded passives hold standard electronic components like resistors and capacitors inside the printed board.

NEW SOFTWARE developed by a faculty member in the Clark School of Engineering can help electronics manufacturers redesign printed circuit boards to improve performance, save space and decrease overall weight.

The software tool offers a detailed cost-analysis of embedded passives, an emerging technology that integrates passive components like resistors and capacitors into the interior layers of a printed circuit board, as opposed to the traditional method of soldering them to the board's exterior.

"Embedded passives are on the threshold of becoming mainstream in the electronics industry," says Peter Sandborn, an associate professor of mechanical engineering who developed the software. Sandborn says that most handheld telecommunications applications and other devices that have size and weight considerations "will undoubtedly go to embedded passives in the next few years."

The cost-analysis tool allows R&D specialists to digitally describe a traditional electronics system using discrete passives—the term used for

resistors and capacitors soldered onto a circuit board—and then redesign the system by converting some or all of the discreet passives to embedded passives. The software provides detailed cost estimations that include both current and projected costs of electronic components, Sandborn says, and also gives size and weight projections to help design engineers maximize space considerations.

The software was developed in partnership with the National Center for Manufacturing Sciences' Advanced Embedded Passives Consortium, a collaborative R&D effort co-funded by industry and the National Institute of Standards and Technology, or NIST. The consortium includes major telecommunications and electronics manufacturers such as DuPont, Nortel and Merix, with industry and the NIST Advanced Technology Program providing funding for developing the software.

Part of making the software functional and user friendly, Sandborn says, was working with the embedded passives consortium. "The biggest challenge was in getting realistic [cost] numbers," he says. "By partnering with research and development experts from companies such as DuPont and Nortel, I was able to get very accurate input on what is being used in industry right now, and what the needs for the future are." —Tom Ventsias