

## Ramtron claims industry first with 4Mb nonvolatile FRAM chip



Engineering samples of the FM22L16 are available now; full volume production is slated for Q4. (Photo: Ramtron Intl.)

Mar. 14, 2007 -- [Ramtron International Corp.](#), Colorado Springs, CO, has launched what it calls the semiconductor industry's highest density Ferroelectric Random-Access Memory (FRAM) device, the [FM22L16](#). The chip, says Ramtron, provides quadruple the memory capacity previously available.

The FM22L16 is a 4Mb, 3-volt, parallel nonvolatile RAM in a 44-pin thin small outline plastic (TSOP) package that promises fast access, virtually unlimited read/write cycles, and low power consumption. Pin-compatible with asynchronous static RAM (SRAM), the FM22L16 targets industrial control systems such as robotics, network and data storage applications, multi-function printers, auto navigation systems and other SRAM-based system designs.

The FM22L16 is based on a 130-nanometer CMOS manufacturing process that Texas Instruments and Ramtron developed together. "The FM22L16 moves FRAM technology onto a mainstream and proven process node from TI that offers many new stand-alone and integrated product opportunities," explains Ramtron Vice President Mike Alwais. "This introduction positions FRAM as an ideal nonvolatile memory solution with potential to alter the memory landscape." Only two additional mask steps have been used to embed the non-volatile FRAM module within the standard CMOS 130nm logic process.

Boasting a 55ns access time and a 110ns cycle time, the FM22L16 promises reading and writing at bus speed with endurance of at least  $1e14$  (100-trillion) writes. It draws 18mA of power at full speed, 150uA in standby, and less than 5uA in sleep mode. It was designed as a drop-in replacement for standard asynchronous SRAMs, but does not require a battery for data backup and promises improved reliability because of its monolithic form.

By moving to a 130nm process, TI and Ramtron are able to deliver the smallest commercial FRAM cells available, measuring 0.71 microns square, and enabling a higher memory density than SRAM. "These developments are important in the advancement of systems that require low power, nonvolatile memory, fast and reliable data protection before power down and/or unlimited write endurance," says Ramtron.

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