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The "Ferros" Would Be Proud Of This New NVM

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In ancient Egypt, the Horus of Gold represented a form of a pharaoh's name most typically thought to mean "superior to his foes" and associated with eternity. These qualities would be highly desirable in any nonvolatile memory (NVM) product. Now suppose you could take a standard serial flash memory and add virtually unlimited endurance and the ability to perform write operations at bus speed. That's right—no write delays after data reaches the memory device, and nearly endless stamina.

How can this be accomplished with flash memory? It can't, unless you change the material and structure of the underlying device. Replace the flash-based cells with ferroelectric-based cells and you get ferroelectric RAM (FRAM). Unlike serial flash, FRAM can perform write operations at bus speed. Out are the typical write delays associated with flash, and in is the ability to conduct the next bus cycle without any data polling.

Ramtron's FRAM-based, 2-Mbit (256 by 8) FM25H20 can be accessed using an industrystandard serial peripheral interface (SPI) or SPI bus. It provides 10 years of data retention and 100 trillion (10¹⁴) read/write cycles. Also, it alleviates the overhead and complexities of using serial flash.

FRAM offers orders of magnitude more endurance than serial flash while using less power. The FM25H20 draws a sleep current of 3 μ A and a standby current of 80 μ A. Additionally, it requires less than 10 mA for read/write operations at 40 MHz. So if your next design will require frequent or rapid write capability or you need to lower your power profile, consider using FRAM. Potential applications include very small storage devices that require many write cycles and industrial controls that may not tolerate the longer write times of serial flash.

"The 2-Mbit serial FRAM is a natural extension for our metering and printer customers who want to increase data-collection capacity in their next-generation applications without increasing board space. The FM25H20 offers our half-megabit serial FRAM customers quadruple the memory in the same small footprint," says Duncan Bennett, Ramtron's strategic manager. "In addition to enhancing existing systems, this technological development moves FRAM into a range of new markets that require a low-power memory in a very constrained space, such as portable medical devices."

Samples of the FM25H20 are available in an eight-pin, 5.0- by 6.0-mm RoHS-compliant (Restrictions on Hazardous Substances) thin dual-inline flat (TDFN) package (footprint compatible with SOIC-8) in an industrial temperature range of -40°C to 85°C ([see the figure](#)). Pricing starts at \$10.20 for quantities of 10,000 units.

RAMTRON www.ramtron.com



The FM25H20 comes in a TDFN that complies with the European Union's Restrictions on Hazardous Substances and is compatible with the SOIC-8 footprint.