

RAMTRON F-RAM Memory and Processor Companions



Memory

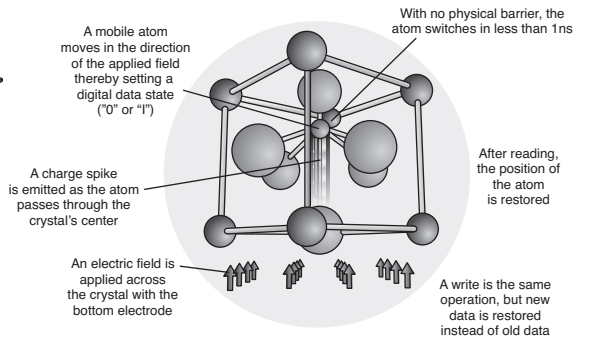
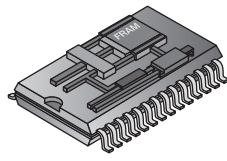
Ramtron

RAMTRON F-RAM (FERROELECTRIC RANDOM ACCESS MEMORY) MEMORY

F-RAM offers a unique set of features relative to other semiconductor technologies. Traditional mainstream semiconductor memories can be divided into two primary categories—volatile and nonvolatile. Volatile memories include SRAM (static random access memory) and DRAM (dynamic random access memory). SRAMs and DRAMs lose their contents after power is removed from the electronic system. RAM type devices are very easy to use, and are high performing, but they share the annoying quirk of losing their mind when the lights go out.

Non-volatile memories do not lose their contents when power is removed. However all of the mainstream non-volatile memories share a common ancestry that derives from ROM (read only memory) technology. As you might guess, something called read only memory is not easy to write, in fact it's impossible. All of its descendants make it very difficult to write new information into them. They include technologies EPROM (almost obsolete now), EEPROM, and Flash. ROM based technologies are very slow to write, wear out after being written a small number of times, and use a large amount of power to write.

F-RAM offers features consistent with a RAM technology, but is non-volatile like a ROM technology. F-RAM bridges the gap between the two categories and creates something completely new—a non-volatile RAM. When an electric field is applied to a ferroelectric crystal, the central atom moves in the direction of the field. As the atom moves within the crystal, it passes through an energy barrier, causing a charge spike. Internal circuits sense the charge spike and set the memory. If the electric field is removed from the crystal, the central atom stays in position, preserving the state of the memory. Therefore, the F-RAM memory needs no periodic refresh and when power fails, F-RAM memory retains its data. It's fast, and doesn't wear out!



Serial F-RAM

The 2-wire interface is a widely used Master, multi-slave protocol using a serial clock (SCL) and a serial data line (SDA). Multiple memory devices can reside on the 2-wire bus by using the device select pins A0-A2 on selected parts. The 2-wire protocol is designed for multi-drop applications as well.

Features:

- Industry standard protocol (2-wire & SPI)
- Low standby current
- Low power consumption
- High Endurance Read/Writes
- NoDelay™ Writes
- Direct hardware replacement for EEPROM

◆ Surface Mount Device

For quantities greater than listed, call for quote.

MOUSER STOCK NO.	Ramtron Part No.	Case Type	Density	Organization	Max. Bus Speed (MHz)	Temperature Range (°C)	Supply Voltage (V)	Price Each			
								1	25	100	500
IPC Interface											
◆ 877-FM24CL04-G	FM24CL04-G	SOIC-8	4K	512 x 8	1	-40 to +85	2.7 - 3.65	1.19	1.13	1.03	.972
◆ 877-FM24CL16-DG	FM24CL16-DG	DFN-8	16K	2K x 8	1	-40 to +85	2.7 - 3.65	1.71	1.54	1.40	1.28
SPI Interface											
◆ 877-FM25H20-DG	FM25H20-DG	DFN-8, 5.0x6.0mm	2M	256K x 8	40	-40 to +85	2.7 - 3.6	18.93	17.04	15.49	14.20

High-Speed Low Power

◆ Surface Mount Device

For quantities greater than listed, call for quote.

MOUSER STOCK NO.	Ramtron Part No.	Case Type	Density	Organization	Max. Bus Speed (MHz)	Temperature Range (°C)	Supply Voltage (V)	Price Each			
								1	25	100	500
IPC -Wire Interface											
◆ 877-FM24V02-G	FM24V02-G	SOIC-8	256K	32K x 8	3.4	-40 to +85	2.0 - 3.6	6.12	5.84	5.28	5.00
◆ 877-FM24V05-G	FM24V05-G	SOIC-8	512K	64K x 8	3.4	-40 to +85	2.0 - 3.6	10.69	10.21	9.23	8.75
◆ 877-FM24V10-G	FM24V10-G	SOIC-8	1M	128K x 8	3.4	-40 to +85	2.0 - 3.6	12.91	12.33	11.15	10.57
IPC -Wire Interface With Device ID											
◆ 877-FM24VN10-G	FM24VN10-G	SOIC-8	1M	128K x 8	3.4	-40 to +85	2.0 - 3.6	13.30	12.69	11.48	10.88
SPI Interface											
◆ 877-FM25V02-G	FM25V02-G	SOIC-8	256K	32K x 8	40	-40 to +85	2.0 - 3.6	6.01	5.73	5.19	4.91
◆ 877-FM25V05-G	FM25V05-G	SOIC-8	512K	64K x 8	40	-40 to +85	2.0 - 3.6	10.69	10.21	9.23	8.75
◆ 877-FM25V10-G	FM25V10-G	SOIC-8	1M	128K x 8	40	-40 to +85	2.0 - 3.6	12.91	12.33	11.15	10.57
SPI Interface With Device ID											
◆ 877-FM25VN10-G	FM25VN10-G	SOIC-8	1M	128K x 8	40	-40 to +85	2.0 - 3.6	13.29	12.68	11.48	10.87

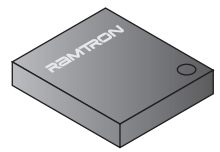
MAXARIAS WIRELESS FRAM MEMORY WITH GEN2 RFID

Features:

- 4/8/16-Kilobit Nonvolatile Ferroelectric RAM
- Organized as 256/512/1024 x 16 bits
- Virtually unlimited read/write endurance (>1E14)
- 20-year data retention
- Symmetrical read/write operation
- Advanced, highly reliable ferroelectric process
- EPC Global Gen-2 RFID protocol UHF frequency range (860MHz-960MHz)

Interface and Security Features:

- EPC Class 1 Gen2 (ISO18000-6C) RFID Compliant Interface (revision 1.2.0)
- EPC 192-Bit Memory Block Configured as:
 - 96-Bit Electronic Product Code™ (EPC),
 - 32-Bit Access Password
 - 32-Bit KILL Password
 - 32-Bit TID Memory (Factory Programmed and Locked). This EPC Code memory is part of the F-RAM memory bank
- Standard EPC commands for Inventory, Read, Write and Erase features
- Kill command



For quantities greater than listed, call for quote.

MOUSER STOCK NO.	Ramtron Part No.	Case Type	Description	Price Each			
				1	50	100	500
877-WM71008NBSD-DA	WM71008-NBSD-DA	UDFN-8	8Kb F-RAM Wireless Memory with Gen2 Access	6.86	6.00	5.33	4.80
877-WM71004NBSD-DA	WM71004-NBSD-DA	UDFN-8	4Kb F-RAM Wireless Memory with Gen2 Access	6.66	5.83	5.18	4.66
877-WM71016NBSD-DA	WM71016-NBSD-DA	UDFN-8	16Kb F-RAM Wireless Memory with Gen2 Access	6.86	6.00	5.33	4.80
877-WM72016NBSD-DS	WM72016-NBSD-DS	UDFN-8	16Kb F-RAM Wireless Memory with Serial Port and Gen2 Access	7.06	6.18	5.49	4.94
877-WM71000NBSD-SA	WM71000-NBSD-SA	SOIC-8	AFE Chip (no memory) with Gen2 Access	1.71	1.50	1.33	1.20
877-WM71000NBSD-DA	WM71000-NBSD-DA	3x3 DFN	AFE Chip (no memory) with Gen2 Access	1.71	1.50	1.33	1.20

PROCESSOR COMPANIONS

Ramtron's Processor Companion is a complete support and peripheral solution with highly integrated functions for processor-based systems. Never before has a solution combined the fast read/write performance and unlimited endurance of nonvolatile F-RAM (ferroelectric random access memory) with a real-time clock (RTC), processor supervisor and other common peripherals. In addition to memory and a RTC, these devices include commonly needed CPU support functions such as programmable low-VDD reset, programmable watchdog timer, nonvolatile event counter, lockable 64-bit serial number area and early power-fail warning (NMI) interrupt. Complementary but distinct functions share a common 2-wire interface eliminating the need for multiple devices.

Features:

- High integration device replaces multiple parts
- Serial non-volatile memory
- Real-time clock (RTC)
- Low voltage reset
- Watchdog timer
- Early power-fail warning interrupt/NMI
- Two 16-bit event counters
- Serial number with write-lock for security



◆ Surface Mount Device

For quantities greater than listed, call for quote.

MOUSER STOCK NO.	Ramtron Part No.	Case Type	Memory	RTC	RTC Alarm	Power Monitor	Watch Dog Timer	Early Power Fail	Serial Number	Battery Switch Over	Event Detect	Supply Voltage (V)	Price Each			
													1	25	100	500
◆ 877-FM31L272-G	FM31L272-G	SOIC-14	4K	Yes	No	Yes	Yes	Yes	Yes	Yes	Count	2.7 - 3.6	4.64	4.43	4.01	3.80
◆ 877-FM31L276-G	FM31L276-G	SOIC-14	64K	Yes	No	Yes	Yes	Yes	Yes	Yes	Count	2.7 - 3.6	6.05	5.78	5.23	4.95
◆ 877-FM31276-G	FM31276-G	SOIC-14	64K	Yes	No	Yes	Yes	Yes	Yes	Yes	Count	4.0 - 5.5	6.05	5.78	5.23	4.95

