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Details, datasheet, quote on part number: FM1808-70-P

Part	FM1808-70-P
Category	Memory => FRAM (Ferroelectric RAM) => Parallel FRAM
Title	Parallel FRAM
Description	Density = 256Kbit ;; Interface = Parallel ;; Speed = 70ns ;; VDD = 5V
Company	Ramtron Corporation
Datasheet	Download FM1808-70-P datasheet (/datasheets/parts/datasheet/393/FM1808-70-P-pdf.php)
Cross ref.	Similar parts: CY14E256LA-SZ45XI

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Features, Applications

Features
256Kbit Ferroelectric Nonvolatile RAM Organized x 8 bits High Endurance 10 Billion (1010) Read/Writes 10 year Data Retention NoDelayTM Writes Advanced High-Reliability Ferroelectric Process Superior to BBSRAM Modules No Battery Concerns Monolithic Reliability True Surface Mount Solution, No Rework Steps Superior for Moisture, Shock, and Vibration Resistant to Negative Voltage Undershoots SRAM & EEPROM Compatible JEDEC 32Kx8 SRAM & EEPROM pinout 70 ns Access Time 130 ns Cycle Time Low Power Operation 25 mA Active Current 20 µA Standby Current Industry Standard Configuration Industrial Temperature C 28-pin SOIC or DIP

Description

The a 256-kilobit nonvolatile memory employing an advanced ferroelectric process. A ferroelectric random access memory or FRAM is nonvolatile but operates in other respects as a RAM. It provides data retention for 10 years while eliminating the reliability concerns, functional disadvantages and system design complexities of battery-backed SRAM (BBSRAM). Fast write timing and high write endurance make FRAM superior to other types of nonvolatile memory. In-system operation of the FM1808 is very similar to other RAM devices. Minimum read- and writecycle times are equal. The FRAM memory, however, is nonvolatile due to its unique ferroelectric memory process. Unlike BBSRAM, the is a truly monolithic nonvolatile memory. It provides the same functional benefits of a fast write without the disadvantages associated with modules and batteries or hybrid memory solutions. These capabilities make the FM1808 ideal for nonvolatile memory applications requiring frequent or rapid writes in a bytewide environment. The availability of a true surface-mount package improves the manufacturability of new designs, while the DIP package facilitates simple design retrofits. Device specifications are guaranteed over an industrial temperature range to +85°C.

Ordering Information 70 ns access, 28-pin plastic DIP 70 ns access, 28-pin SOIC
This product conforms to specifications per the terms of the Ramt ron standard warranty. Production processing does not necessarily include testing of all parameters.

Ramtron International Corporation 1850 Ramtron Drive, Colorado Springs, (719) 481-7000, Fax (719) 481-7058 www.ramtron.com

Description Address: The 15 address lines select one of 32,768 bytes in the FRAM array. The address value is latched on the falling edge of /CE. Data: 8-bit bi-directional data bus for accessing the FRAM array. Chip Enable: /CE selects the device when low. Asserting /CE low causes the address to be latched internally. Address changes that occur after /CE goes low will be ignored until the next falling edge occurs. Output Enable: Asserting /OE low causes the FM1808 to drive the data bus when valid data is available. Deasserting /OE high causes the DQ pins to be tri-stated. Write Enable: Asserting /WE low causes the FM1808 to write the contents of the data bus to the address location latched by the falling edge of /CE. Supply Voltage: 5V Ground

Function Standby/Precharge Latch Address (and Begin Write if /WE=low) Read Write
The is a bytewide FRAM memory. The memory array is logically organized x 8 and is accessed using an industry standard parallel interface. All data written to the part is immediately nonvolatile with no delay. Functional operation of the FRAM memory is the same as SRAM type devices, except the FM1808 requires a falling edge of /CE to start each memory cycle.

Read Operation A read operation begins on the falling edge of /CE. At this time, the address bits are latched and a memory cycle is initiated. Once started, a full memory cycle must be completed internally even if /CE goes inactive. Data becomes available on the bus after the access time has been satisfied. After the address has been latched, the address value may be changed upon satisfying the hold time parameter. Unlike an SRAM, changing address values will have no effect on the memory operation after the address is latched. The FM1808 will drive the data bus when /OE is asserted low. If /OE is asserted after the memory access time has been satisfied, the data bus will be driven with valid data. If /OE is asserted prior to completion of the memory access, the data bus will not be driven until valid data is available. This feature minimizes supply current in the system by eliminating transients caused by invalid data being driven onto the bus. When /OE is inactive the data bus will remain tri-stated. Write Operation Writes occur in the FM1808 in the same time interval as reads. The FM1808 supports both /CEand /WE-controlled write cycles. In all cases, the address is latched on the falling edge of /CE. In a /CE controlled write, the /WE signal is asserted prior to beginning the memory cycle. That is, /WE is low when /CE falls. In this case, the part begins the memory cycle as a write. The FM1808 will not drive the data bus regardless of the state of /OE. In a /WE controlled write, the memory cycle begins on the falling edge of /CE. The /WE signal falls after the falling edge of /CE. Therefore, the memory cycle begins as a read. The data bus will be driven according to the state of /OE until /WE falls. The timing of both /CE- and /WE-controlled write cycles is shown in the electrical specifications. Write access to the array begins asynchronously after the memory cycle is initiated. The write access terminates on the rising edge of /WE or /CE, whichever is first. Data set-up time, as shown in the electrical specifications, indicates the interval during which data cannot change prior to the end of the write access. Unlike other truly nonvolatile memory technologies, there is no write delay with FRAM. Since the read

Users access 32,768 memory locations each with 8 data bits through a parallel interface. The complete 15-bit address specifies each of the 32,768 bytes uniquely. Internally, the memory array is organized into 32 blocks of 8Kb each. The 5 most-significant address lines decode one of 32 blocks. This block segmentation has no effect on operation, however the user may wish to group data into blocks by its endurance characteristics as explained on page 4. The cycle time is the same for read and write memory operations. This simplifies memory controller logic and timing circuits. Likewise the access time is the same for read and write memory operations. When /CE is deasserted high, a precharge operation begins, and is required of every memory cycle. Thus unlike SRAM, the access and cycle times are not equal. Writes occur immediately at the end of the access with no delay. Unlike an EEPROM, it is not necessary to poll the device for a ready condition since writes occur at bus speed. Note that the FM1808 has no special power-down requirements. It will not block user access and it contains no power-management circuits other than a simple internal power-on reset. It is the user's responsibility to ensure that VDD remains within datasheet tolerances to prevent incorrect operation. Also proper voltage level and timing relationships between VDD and /CE must be maintained in powerup and power-down events.

The FM1808 is designed to operate in a manner similar to other bytewide memory products. For users familiar with BBSRAM, the performance is comparable but the bytewide interface operates in a slightly different manner as described below. For users familiar with EEPROM, the obvious differences result from the higher write performance of FRAM technology including NoDelay writes and much higher write endurance.


FM1808
256Kb Bytewide FRAM Memory
RAMTRON

Related products with the same datasheet

FM1808-70-S (/datasheets/parts/datasheet/393/FM1808-70-S.php)

Some Part number from the same manufacture Ramtron Corporation

FM1808-70-S (/datasheets/parts/datasheet/393/FM1808-70-S.php) Density = 256Kbit ;; Interface = Parallel ;; Speed = 70ns ;; VDD = 5V

FM18L08 (/datasheets/parts/datasheet/393/FM18L08.php) Density = 256Kbit ;; Interface = Parallel ;; Speed = 70ns ;; VDD = 3.0V - 3.6V

FM2212J-15 (/datasheets/parts/datasheet/393/FM2212J-15.php)

FM24C04 (/datasheets/parts/datasheet/393/FM24C04.php) 4Kb Fram Serial Memory

FM24C04A (/datasheets/parts/datasheet/393/FM24C04A.php) Density = 4Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 5V

FM24C16 (/datasheets/parts/datasheet/393/FM24C16.php) 16Kb Fram Serial Memory

FM24C16A (/datasheets/parts/datasheet/393/FM24C16A.php) Density = 16Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 5V

FM24C256 (/datasheets/parts/datasheet/393/FM24C256.php) Density = 256Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 5V

FM24C256-S (/datasheets/parts/datasheet/393/FM24C256-S.php) 256Kb Fram Serial Memory

FM24C256-SE (/datasheets/parts/datasheet/393/FM24C256-SE.php) Density = 256Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 5V

FM24C256SE (/datasheets/parts/datasheet/393/FM24C256SE.php)

FM24C64 (/datasheets/parts/datasheet/393/FM24C64.php) Density = 64Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 5V

FM24CL04 (/datasheets/parts/datasheet/393/FM24CL04.php) Density = 4Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 2.7-3.6V

FM24CL16 (/datasheets/parts/datasheet/393/FM24CL16.php) Density = 16Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 2.7 -3.6V

FM24CL64 (/datasheets/parts/datasheet/393/FM24CL64.php) Density = 64Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 2.7 -3.6V

FM25040 (/datasheets/parts/datasheet/393/FM25040.php) Density = 4Kbit ;; Interface = Spi Mode 0 ;; Speed = 2.1MHz ;; VDD = 5V

FM25160 (/datasheets/parts/datasheet/393/FM25160.php) 16Kb Fram Serial Memory

FM25160-P (/datasheets/parts/datasheet/393/FM25160-P.php)

FM25160-S (/datasheets/parts/datasheet/393/FM25160-S.php) 16Kb Fram Serial Memory.

FM25640 (/datasheets/parts/datasheet/393/FM25640.php) Density = 64Kbit ;; Interface = Spi Mode 0&3 ;; Speed = 5MHz ;; VDD = 5V

FM25640-P (/datasheets/parts/datasheet/393/FM25640-P.php) 64Kb Fram Serial Memory.

FM24C16A : Serial FRAM Density = 16Kbit ;; Interface = 2-Wire ;; Speed = 1MHz ;; VDD = 5V

FM573 :

FM24C64_05 : 64Kb FRAM Serial Memory

FM25256B-G : 256kb FRAM Serial 5V Memory

FM25V01-G : Memory Integrated Circuit (ics) FRAM Tube 2 V ~ 3.6 V; IC FRAM 128KBIT 40MHZ SRL 8SOIC Specifications: Memory Type: FRAM ; Memory Size: 128K (16K x 8) ; Speed: 40MHz ; Interface: SPI Serial ; Package / Case: 8-SOIC (0.154", 3.90mm Width) ; Packaging: Tube ; Voltage - Supply: 2 V ~ 3.6 V ; Operating Temperature: -40°C ~ 85°C ; Format - Memory: RAM ; Lead Free Status: Lead Free ; RoHS S

FM24W256-G : Memory Integrated Circuit (ics) FRAM Tube 2.7 V ~ 5.5 V; IC FRAM 256KBIT I2C 1MHZ 8SOIC Specifications: Memory Type: FRAM ; Memory Size: 256K (32K x 8) ; Speed: 1MHz ; Interface: I²C, 2-Wire Serial ; Package / Case: 8-SOIC (0.154", 3.90mm Width) ; Packaging: Tube ; Voltage - Supply: 2.7 V ~ 5.5 V ; Operating Temperature: -40°C ~ 85°C ; Format - Memory: RAM ; Lead Free Status:

FM31L278-GTR : Specialized Ic Integrated Circuit (ics); IC MEMORY Specifications: Lead Free Status: Lead Free ; RoHS Status: RoHS Compliant

FM24V01-G : F-RAM IIC FRAM 128k 2.0V Ramtron Serial FRAM Nonvolatile Memory Devices combine the nonvolatile data storage capability of ROM with the benefits of RAM, which include a high number of high speed read and write cycles and low power consumption. Serial FRAM Nonvolatile Memory Devices feature various interfaces and densities,

WM71008-6-DGTR : Rfid Transponders, Tag Rf/if And Rfid; RFID 8KBIT F-RAM MEM GEN-2 Specifications: RF Type: Read / Write ; Package / Case: 8-UDFN Exposed Pad ; Frequency: 860 ~ 960MHz ; Features: EPC UHF GEN 2 ; Packaging: Tape & Reel (TR) ; Lead Free Status: Lead Free ; RoHS Status: RoHS Compliant

0-C (/datasheets/parts_0_c.php) D-L (/datasheets/parts_d_l.php) M-R (/datasheets/parts_m_r.php) S-Z (/datasheets/parts_s_z.php)
Datasheet begin, distributors inventory

1 (/datasheets/parts/1/index.php) 2 (/datasheets/parts/2/index.php) 3 (/datasheets/parts/3/index.php) 4 (/datasheets/parts/4/index.php) 5 (/datasheets/parts/5