AT24RF08C

RFID ASSET IDENTIFICATION 8K EEPROM

FEATURES

- Dual-port nonvolatile memory – RFID and serial interfaces
- Two-wire serial interface
  - -Compatible with a standard AT24C08 serial EEPROM
  - -Programmable access protection to limit reads or writes from either port
  - -Lock/unlock function, coil connection detection
- RFID interface
  - -125 kHz carrier frequency for long-range access
  - -Two-wire connection to external coil antenna and tuning capacitor
  - -Multi-tag management to handle several tags in the field at once
  - -12 RFID commands for tag control and memory read/write
  - -ID write and lock from RFID port
  - -Ultra-low power single-bit write – 25 µA
- Highly-reliable EEPROM memory
  - -8 Kbits (1 Kbytes), organized as 8 blocks of 128 bytes each
  - -16-byte page write, 10 ms write time
  - -10 years retention, 100K write cycle endurance
- -40°C to +85°C operation, 2.4V to 5.5V supply, 8-lead JEDEC SOIC package

The AT24RF08C functions as a dual-access EEPROM, with both a wired serial port and a wireless RFID port used to access the memory. Access permissions are set from the serial interface side to isolate blocks of memory from improper access. The RFID interface can be powered solely from the attached coil antenna, permitting remote reads and writes of the device when Vcc is not applied. The AT24RF08C is intended to be pin-compatible with standard serial EEPROM devices except for pins 1, 2 and 3, which are address pins in the standard part. Connection of an external coil antenna and optional tuning capacitor, normally via a two conductor wire, is all that is required to complete the RFID hardware requirements.

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EEPROM Organization

The EEPROM memory is broken up into eight blocks of 1 Kbits (128 bytes) each. Within each block, the memory is physically organized into eight pages of 128 bits (16 bytes) each. In some instances, accesses take place on a 32-bit (four-byte) word basis. In addition to these 8Kbits, there are two more 128-bit pages that are used to store the access protection and ID information. A total of 8448 bits of EEPROM memory are available on the AT24RF08C. Access protection (both read and write) is organized on a block basis for blocks 1 through 7 and on a page and block basis for block 0. Protection information for these blocks and pages is stored in one of the additional pages of EEPROM memory that is addressed separately from the main data storage array. The ID value is located in the ID page of the EEPROM, the second of the additional 16-byte pages. Writes from the serial port may include from 1 to 16 bytes at a time. Accesses to the EEPROM from the RFID port are on either a word (32 bits) or page (128 bits) basis only. The EEPROM memory offers an endurance of 100,000 write cycles per byte, with 10-year data retention.

Applications

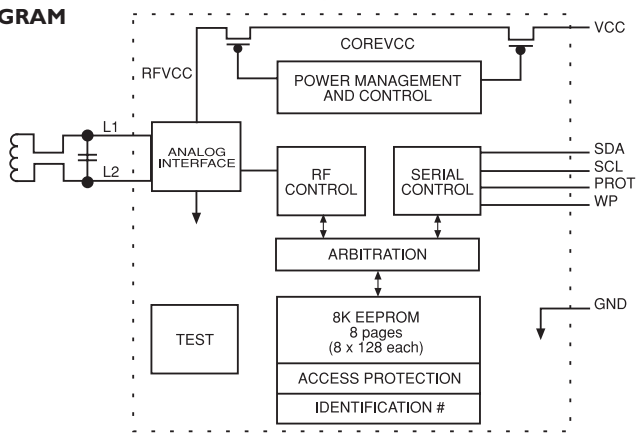
PC Manufacturing Trackability: During manufacture, the RFID tag keeps track of important configuration data. Important information, such as processor speed, memory size, disk space and BIOS version, can be stored for reference. Because RFID is contactless and does not require external power, the tag can be written to or queried at any time during build up process. Finished product can be interrogated, through the shipping carton, to verify configuration. Because an AT24RF08C tag is dual port and able to be connected to the motherboard, once the PC is installed into a network, the administrator can remotely query new PCs and determine its configuration.

PC Asset Identification: Once a PC is installed into a larger network, it becomes extremely difficult to identify and track, particulary for periodic physical inventory checks. PCs with RFID installed allow the capital asset manager to take a physical inventory of not only the PC box but the assets installed inside. Taking inventory involves only the use of a hand-held reader, not requiring the removal of the PC cover to see inside.

PC Security: When installed on a laptop PC, a doorway reader can identify and keep track of which PCs are entering and leaving the building. When RFID is included in an individual's security badge, both the PC and badge can be identified at a doorway, and authorizations for asset removal can be checked automatically. RFID can be a deterrent to theft and keep track of assets leaving a site.

Other valuables such as laser printers, digital projectors and laser printers, digital projectors and lab equipment can be protected using RFID.

Block Diagram



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