

Serial Non-Volatile Memories

Serial EEPROM, Serial Flash
and Application Specific Standard Products

www.st.com/eeprom



TELECOM - AUTOMOTIVE - COMPUTER PERIPHERALS - CONSUMER - INDUSTRIAL



STMicroelectronics
More Intelligent Solutions



Serial Non-Volatile Memories

A Broad Range

Serial Non-Volatile Memories are the most flexible type of non-volatile memories, featuring Byte level write, without the need to erase the data before writing a new value. This makes them ideal for parameter storage.

The new fast high density EEPROMs and Serial Flash allow code storage, saving board space and reducing pin count.

Serial Flash families feature "sector erase/page programming" and "page erase/page programming". This enables a finer storage granularity compared to standard Flash, but doesn't match the byte level granularity performance of serial EEPROM.

Serial non-volatile memories are present in a large range of applications where small size and low cost are essential, such as cellular phones, printers, car radios, camcorders and set-top boxes.

The booming telecommunications market relies heavily on EEPROMs, due to their energy optimization and improved user-friendliness of cell-phone handsets, DECTs, telephones and modems.

For consumer applications, ST's serial non-volatile memories take full advantage of the company's many years experience in this market. ST is a significant player in the automotive field, as well as in the fast changing computer & peripheral market, both of which are prime users of non-volatile memories.

Technology and Products

ST has a dynamic roadmap for the development of both process technology and serial non-volatile devices.

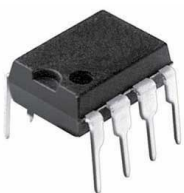
The EEPROM road map will reach a 0.35 μ technology in the year 2002/03 and will have the capability to produce EEPROM up to 1 Mbit density and above should the market require this. The Serial Flash road map, on the other hand, will reach 0.18n technology and will have the capability to produce competitive Serial Flash in-line with market requirements.

ST's large portfolio in serial non-volatile memories extends from low-density 256 bits up to 8 Mbit. All ST's serial non-volatile memories are supported by datasheets, application notes and VHDL behavioral description files, making them easy to use and implement.

Most serial non-volatile memories are available in 5 different voltage ranges: 4.5V to 5.5V, 2.5V to 5.5V, 2.7V to 3.6V, 1.8V to 5.5V and 1.8V to 3.6V..

The target endurance of EEPROMs is over 1 million erase cycles with more than 40 years data retention.

ST offers a wide range of packages including PSDIP, TSSOP, SO and the advanced LGA and SBGA (Chip Scale Package).



PSDIP8



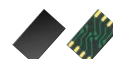
TSSOP8



SO8N



SO8W



LGA

actual size: 8x4 mm



SBGA

actual size: 1.7x1.9 mm

Package illustrations are not to scale.

Serial Non-Volatile Memories

Serial EEPROM

I²C, SPI and MICROWIRE® Buses

ST EEPROM products are the standard of reference in the industry, built with sub-micron technology and providing leading performances. The range includes: serial access EEPROMs with low cost, 400 kHz, 2-wire I²C buses and densities up to 1 Mbit; fast 1 MHz MICROWIRE bus types with densities from 256 bit to 16 Kbit; and very fast 5 MHz SPI bus types with densities up to 1 Mbit.

I²C

I²C types are the most suitable for applications with multiple devices on the bus and where fast bus speed is not required.

The bus operates at a clock speed of 400 kHz and supports a supply voltage down to 1.8V.

Serial EEPROM, I²C Bus, 4.5-5.5V, 2.5-5.5V (-W), 1.8-5.5V (-R) and 1.8-3.6V (-S)

Size	Ref	Description	Packages
1Kb	M24C01	1Kb (x8), 400kHz, 5ms Write time	PSDIP8, S08, TSSOP8
1Kb	M24C01-W	1Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, TSSOP8
1Kb	M24C01-R	1Kb (x8), 100kHz, 10ms Write time	PSDIP8, S08, TSSOP8
2Kb	M24C02	2Kb (x8), 400kHz, 5ms Write time	PSDIP8, S08, TSSOP8
2Kb	M24C02-W	2Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, TSSOP8
2Kb	M24C02-R	2Kb (x8), 100kHz, 10ms Write time	PSDIP8, S08, TSSOP8
4Kb	M24C04	4Kb (x8), 400kHz, 5ms Write time	PSDIP8, S08, TSSOP8
4Kb	M24C04-W	4Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, TSSOP8
4Kb	M24C04-R	4Kb (x8), 100kHz, 10ms Write time	PSDIP8, S08, TSSOP8
8Kb	M24C08	8Kb (x8), 400kHz, 5ms Write time	PSDIP8, S08, TSSOP8
8Kb	M24C08-W	8Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, TSSOP8
8Kb	M24C08-R	8Kb (x8), 100kHz, 10ms Write time	PSDIP8, S08, TSSOP8
16Kb	M24C16	16Kb (x8), 400kHz, 5ms Write time	PSDIP8, S08, TSSOP8
16Kb	M24C16-W	16Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, TSSOP8
16Kb	M24C16-R	16Kb (x8), 100kHz, 10ms Write time	PSDIP8, SBGA5, S08, TSSOP8
16Kb	M24C16-S	16Kb (x8), 400kHz, 10ms Write time	SBGA
32Kb	M24C32	32Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, S08 Wide, TSSOP8
32Kb	M24C32-W	32Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, S08 Wide, TSSOP8
32Kb	M24C32-S	32Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, S08 Wide, TSSOP8
64Kb	M24C64	64Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, S08 Wide, TSSOP8
64Kb	M24C64-W	64Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, S08 Wide, TSSOP8
64Kb	M24C64-S	64Kb (x8), 400kHz, 10ms Write time	PSDIP8, S08, S08 Wide, TSSOP8
128Kb	M24128	128Kb (x8), 400kHz, 10ms Write time, no Chip Enable	PSDIP8, S08
128Kb	M24128-W	128Kb (x8), 400kHz, 10ms Write time, no Chip Enable	PSDIP8, S08
128Kb	M24128B	128Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, S08, TSSOP14
128Kb	M24128B-W	128Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, S08, TSSOP14
128Kb	M24128B-S	128Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, S08, TSSOP14

Serial Non-Volatile Memories

Serial EEPROM, I²C Bus, 4.5-5.5V, 2.5-5.5V (-W), 1.8-5.5V (-R) and 1.8-3.6V (-S)

Size	Ref	Description	Packages
256Kb	M24256	256Kb (x8), 400kHz, 10ms Write time, no Chip Enable	PSDIP8, SO8 Wide
256Kb	M24256-W	256Kb (x8), 400kHz, 10ms Write time, no Chip Enable	PSDIP8, SO8 Wide
256Kb	M24256A	256Kb (x8), 400kHz, 10ms Write time, 2 Chip Enables	PSDIP8, SO8, SO8 Wide, TSSOP14
256Kb	M24256A-W	256Kb (x8), 400kHz, 10ms Write time, 2 Chip Enables	PSDIP8, SBG47, SO8, SO8 Wide, TSSOP14
256Kb	M24256B	256Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, SO8, TSSOP8
256Kb	M24256B-W	256Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, SBG48, SO8, TSSOP8
256Kb	M24256B-S	256Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, SBG48, SO8, TSSOP8
512Kb	M24512	512Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, LGA8,SO8W, SBGA
512Kb	M24512-W	512Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, LGA8,SO8W, SBGA
512Kb	M24512-S	512Kb (x8), 400kHz, 10ms Write time, 3 Chip Enables	PSDIP8, LGA8, SBGA
1Mb	M24M01	1Mb (x8), 400kHz, 10ms Write time, 3 Chip Enables	LGA8
1Mb	M24M01-W	1Mb (x8), 400kHz, 10ms Write time, 3 Chip Enables	LGA8
1Mb	M24M01-S	1Mb (x8), 400kHz, 10ms Write time, 3 Chip Enables	LGA8

SPI

For those applications that require a high-speed transfer rate, the SPI bus is preferable. With speed up to 5 MHz available now and densities from 512 Kbit to 1 Mbit available soon, this bus is rapidly gaining market acceptance. SPI EEPROM also provide a HOLD input, which allows the bus master to freeze the data transfer at any time without data loss. In addition, the memory array can be write protected when driving the Write Protect pin.

Serial EEPROM, SPI Bus, High Speed Clock, 4.5-5.5V, 2.7-5.5V (-V) and 2.5-5.5V (-W)

Size	Ref	Description	Packages
1Kb	M95010	1Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP8
1Kb	M95010-W	1Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP8
2Kb	M95020	2Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP8
2Kb	M95020-W	2Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP8
4Kb	M95040	4Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP8
4Kb	M95040-W	4Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP8
8Kb	M95080	8Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8
8Kb	M95080-W	8Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8
16Kb	M95160	16Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8
16Kb	M95160-W	16Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, SBGA8
32Kb	M95320	32Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8
32Kb	M95320-W	32Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8
64Kb	M95640	64Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP14
64Kb	M95640-W	64Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP14
128Kb	M95128	128Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP14
128Kb	M95128-W	128Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8, TSSOP14
256Kb	M95256	256Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8 Wide
256Kb	M95256-V	256Kb (x8), 5MHz, 10ms Write, Block Write Protection	PSDIP8, SO8 Wide
256Kb	M95256-W	256Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8 Wide
512Kb	M95512	512Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8 Wide
512Kb	M95512-W	512Kb (x8), 2MHz, 10ms Write, Block Write Protection	PSDIP8, SO8 Wide
1Mb	M95M01	1Mb (x8), 2MHz, 10ms Write, Block Write Protection	LGA8

Serial Non-Volatile Memories

MICROWIRE®

EEPROMs for the MICROWIRE bus are available in densities from 256 bits to 16 Kbit. This bus is widely used in current applications with the trend moving towards the SPI bus.

Serial EEPROM, MICROWIRE® Bus, 4.5-5.5V, 2.5-5.5V (-W)

Size	Ref	Description	Packages
256b	M93C06	256b (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08
256b	M93C06-W	256b (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08
1Kb	M93C46	1Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08
1Kb	M93C46-W	1Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08, TSSOP8
1Kb	M93S46	1Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PSDIP8, S08
1Kb	M93S46-W	1Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PSDIP8, S08
2Kb	M93C56	2Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08
2Kb	M93C56-W	2Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08, TSSOP8
2Kb	M93S56	2Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PSDIP8, S08
2Kb	M93S56-W	2Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PSDIP8, S08
4Kb	M93C66	4Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08
4Kb	M93C66-W	4Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08, TSSOP8
4Kb	M93S66	4Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PSDIP8, S08
4Kb	M93S66-W	4Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PSDIP8, S08
8Kb	M93C76	8Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08
8Kb	M93C76-W	8Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08
16Kb	M93C86	16Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08
16Kb	M93C86-W	16Kb (x8/x16), 1MHz, 10ms Write time	PSDIP8, S08

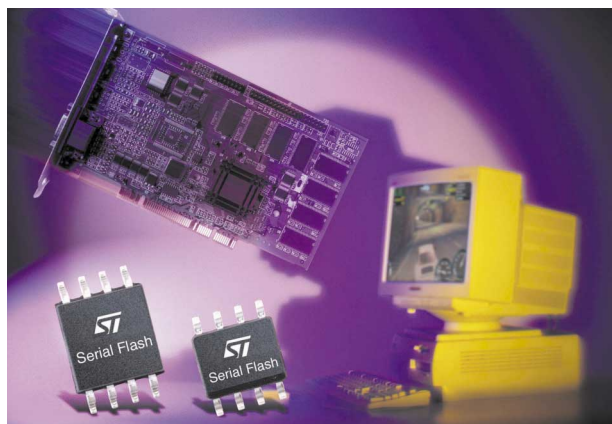
Serial Flash: a high speed, low voltage family in an 8 pin package

ST's family of high-speed low-voltage Serial Flash memories features a four-wire SPI-compatible interface and provide guaranteed compatibility with future higher and lower density devices. Running at 20 MHz or above, they set the industry speed record for serial non-volatile memories.

The Serial Flash is available in 2 versions: "sector erase/page programming" and "page erase/page programming", which are complementary subfamilies. These address different target markets, defined by the memory function requested (code versus parameters storage) and the granularity/cost trade off chosen by the customer (sector versus page erase).

The high speed serial solution creates added-value for applications requiring fast download of code, such as personal computer add-on cards, including graphic cards, SCSI cards and network cards, hard disk drives, digital cameras, DVDs, cellular phones, fax, answering machines and car radio.

By moving towards a serial architecture, pins can be freed on the chipset to enable either more features for the customer end product or a cheaper global solution. This benefits all applications with large sets of parameters, which rarely need to be updated (voice recording, signature recognition, data streaming, etc.).



Serial Non-Volatile Memories

Serial Flash, SPI Bus, High Speed Clock, Sector Erase, 2.7-3.6V (-V)

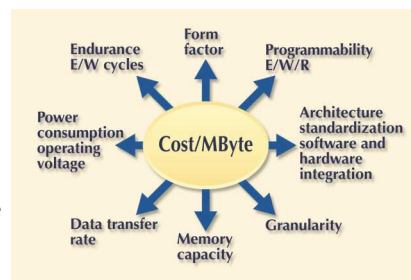
Size	Ref	Description	Packages
512Kb	M25P05-V	Sector erasable, 512Kb (x8), 20MHz, 2 Sectors, 128 Byte page	S08
1Mb	M25P10-V	Sector erasable, 1Mb (x8), 20MHz, 4 Sectors, 128 Byte page	S08
2Mb	M25P20-V	Sector erasable, 2Mb (x8), 25 MHz, 4 Sectors, 256 Byte page	S08
2Mb	M25PE20-V	Page erasable, 2Mb (x8), 25MHz, 4 Sectors, 256 Byte page	S08
4Mb	M25P40-V	Sector erasable, 4Mb (x8), 20MHz, 4 Sectors, 256 Byte page	S08
4Mb	M25PE40-V	Page erasable, 4Mb (x8), 25MHz, 4 Sectors, 256 Byte page	S08W
8Mb	M25P80-V	Sector erasable, 8Mb (x8), 20MHz, 4 Sectors, 256 Byte page	S08W

Key feature and benefits:

- Reduce pin count (on ASIC)
- Save space on printed circuit board
- Low cost 8 pin packages
- Ease of use / less instructions
- Save time at download
- Save time on production line
- Increase system speed
- Fast and easy programming on production line
- Low consumption (Deep Power Down mode)

ASSP (Application Specific Standard Products)

Application Specific Standard Products provide optimal features, each targeted at a given application. Such optimized solutions are already used in CRT monitors, DRAM modules and analog cards (ACR). ASSPs provide designers with an improved overall cost and performance and are built on a common non-volatile technology platform, allowing multiple memory types - EPROM, Flash, EEPROM. The ASSP product range offers various types of interfaces: serial (I²C, SPI, MICROWIRE buses), RF contactless access and customized.



Application Specific Standard Products, 4.5V-5.5V, 2.5V-5.5V (-W), 2.2-5.5V (-L)

Size	Ref	Description	Packages
384b	M34C00	3 x128b Serial I2C for e-Tags	S08, TSS0P8
1Kb	ST24FC21	1Kb (x8), Dual Mode Serial Compatible with VESA 2.0 Plug and Play	PSDIP8, S08
1Kb	ST24FW21	1Kb (x8), Dual Mode Serial Compatible with VESA 2.0 Plug and Play	PSDIP8, S08
1Kb	ST24LC21	1Kb (x8), Dual Mode Serial Compatible with VESA 1.0 Plug and Play	PSDIP8, S08
2Kb	M34C02-W	2Kb (x8), Serial I ² C for DIMM serial Presence Detect	PSDIP8, S08, TSS0P8
2Kb	M34C02-L	2Kb (x8), Serial I ² C for DIMM serial Presence Detect	PSDIP8, S08, TSS0P8
2Kb	M34C02-	2Kb (x8), Serial I ² C for DIMM serial Presence Detect	PSDIP8, S08, TSS0P8
2Kb	M34A02	2Kb (x8), Serial I ² C for ACR PC Cards	S08, TSS0P8
8Kb	M35080	8Kb (x8), Serial SPI with Unidirectional counters	S08
16Kb	M24164	16Kb (x8), 400kHz, 10ms Write, Write Control 3 Chip Enables	PSDIP8, S08
16Kb	M24164-W	16Kb (x8), 400kHz, 10ms Write, Write Control 3 Chip Enables	PSDIP8, S08
16Kb	ST24E16*	16Kb (x8), 100kHz, 10ms Write, WC, Block Write Protection	PSDIP8, S08
16Kb	ST25E16*	16Kb (x8), 100kHz, 10ms Write, WC, Block Write Protection	PSDIP8, S08
64Kb	M34D64-W	64Kb, (x8), 400kHz, Hardware WC Top Memory quarter	S08

* Two address Bytes

Custom Products

Custom requests can be supported by modifying the interface and protocol, logic, partitioned memory blocks and access control to support specific form factors. Such a solution might be a contactless product. Products designed on particular requests and/or for a special purpose, provide designers with the means to incorporate or protect intellectual property by integrating custom features or by providing security. For example, ST produces EEPROM modules for authentication of ink and tape cartridges.

Serial Non-Volatile Memories

Serial Non-Volatile Memories in all High Tech Applications

Many new applications require Serial EEPROM and Serial Flash devices, especially in the following market segments: Automotive (engines, dashboards, car radios, airbags and ABS), Telecom (GSM, phones, answering machines, fax, modems, networking), Consumer (TV, set-top boxes, monitors, camcorders, audio MP3) and Computer (hard disk drivers, motherboards, CD-ROMs, modems, keyboards, printers).

Automotive

The automotive market is a key target for ST Serial Non-Volatile Memories. ST has built a strong leadership in Serial EEPROM for this market by meeting the stringent requirements of car makers for applications such as engine management, ABS, airbags, car radios, odometers and telematics.

ST's leading position in Serial Non-Volatile Memories for the Automotive market is based upon quality, support and a broad range portfolio including:

- Standard Serial Non-Volatile Memories (EEPROM and Flash technologies), from 1 Kbit to 8 Mbit, with SPI, I²C and MICROWIRE buses.
- Automotive products operating at the -40/+125°C temperature range; available in SPI, I²C and MICROWIRE bus versions and tested according to High Reliability Certified Flow.
- Bare die devices for the Automotive market, tested at 125°C and 150°C using Known Good Die program; available in SPI, I²C and MICROWIRE bus versions.



Consumer

ST Serial Non-Volatile Memories cover a wide spectrum of digital consumer applications. By working with the world leading consumer system manufacturers, ST is deeply involved in the process of performance enhancement and integration of these applications.

ST has become a leading supplier to the consumer segment, offering a broad range portfolio widely used for digital TVs, set-top boxes, DVDs, audio MP3 and camcorders:

- 1.8V-5.5V 1 Kbit to 16 Kbit I²C EEPROMs are very cost-effective for Remote Control applications.
- 4 Kbit to 16 Kbit I²C EEPROMs bring flexibility for channel frequency and user setting storage in TVs. The EEPROM size can be defined at the last moment and can be upgraded to a higher density when needed.
- 32 Kbit to 256 Kbit I²C EEPROMs are common choices for high end TV, DTV, set-top boxes and DVD.
- When fast access is required in MP3 players or camcorders, 64 Kbit to 256 Kbit SPI EEPROMs are the best option, with a possible migration to Serial Flash.
- When space is limited new SBGA (Chip Scale Package) packages provide the answer: 16 Kbit I²C (M24C16-S) in advanced DVD, 16 Kbit SPI (M95160-W) in camcorders.



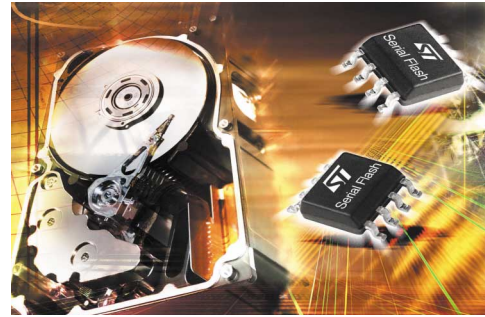
Serial Non-Volatile Memories

Computer and Peripherals

The evolution of computers and peripherals depends essentially on progresses within the semiconductor industry. The introduction of high-speed processors demanding more memory, as well as new, lower cost PCs and printer solutions, is stimulating the semiconductor market and is driving Serial Non-Volatile Memories product portfolio development towards more added-value solutions.

ST brings its know-how and long experience in this field, to provide a range of memories for CD-ROMs, keyboards, DVD-ROMs, motherboards, graphics cards, monitors, processor boards and modems. Computer applications often use standard memories but they may also use Application Specific Standard Products:

ASSP Product	Applications
ST24XY21	Monitor
M34C02	DRAM Module
M34A02	Advanced PC Communications Riser



Telecom

ST Serial Non-Volatile Memories have over 10 years' successful experience in the telecom segment. The telecom market is mainly driven by mobile phones, but also by important applications, such as corded and cordless phones, base stations, networking and switching, where numerous parameters need to be stored. These include RF parameter settings, serial numbers, last called numbers, usage restrictions, short numbers, message services, diaries, production data and identification, etc. In mobile applications, I²C and SPI buses are often used with high density EEPROM (up to 1Mb). 2 Kbit to 64 Kbit densities are commonly utilized in corded and cordless applications, with a supply voltage of 1.8V in the DECT field. Low-density devices are mainly used in networking and base stations. In terms of packaging, the TSSOP8 and the LGA8 are very attractive for the cellular market, whereas the SO8 Narrow remains the standard for all other applications. Serial Flash products with "page erase/page programming" are the ideal solution for Telecom applications that require higher densities for parameter storage:



- Fax, answering machine.
- Smart cellular phones with email, PDA and fax functions.
- Image and text data, user settings, voice memo in mobile.
- Telephone line cards, routers and network interface cards.

Industrial

Serial EEPROM is also well adapted to non-volatile parameter storage (manufacturing settings, data logs, user settings) in motor control, instruments, programmable controllers, healthcare products, power/gas meters and access cards. Just pick the right bus, the right density and the right power supply from the largest serial EEPROM portfolio. The M34C00 and M34C02 are particularly noteworthy as they provide a user-lockable area and 100% safe storage of manufacturing settings.



© Copyright 2001 STMicroelectronics. Printed in Italy.

The STMicroelectronics corporate logo is a registered trademark of the STMicroelectronics group of companies. All other names are the property of their respective owners.

For selected STMicroelectronics sales offices fax:

France +33 1 55489569; Germany +49 89 4605454; Italy +39 02 8250449; Japan +81 3 57838216; Singapore +65 4820240;
Sweden +46 8 7504950; Switzerland +41 22 9292900; United Kingdom and Eire +44 1628 890391; USA +1 781 861 2678

Full product information at www.st.com

ORDER CODE: BREEPROM/0401

