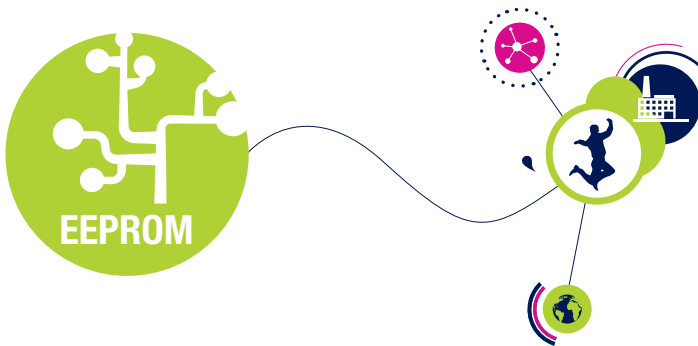


Serial EEPROM Standard & SPD series



Boost your flexibility with the world's #1
EEPROM supplier



Introduction to Standard Serial EEPROM

Serial EEPROM is the most flexible type of non-volatile memory suited for reliable parameter and code storage. Its low pin count and low power operation makes it ideal for all new wearable and mobile applications.

For the past 10 years ST's standard serial EEPROM has been ranked #1 (IHS March 2015) without any compromise on robustness and innovation. For over 20 years our experts have developed in-house the most advanced NVM processes. Today ST guarantees high cycling performance with 4 million Erase/Write cycles and 200 years of data retention.

Thanks to advanced manufacturing processes, ST has enlarged its portfolio and offers a complete range of density from 1 Kbit to 2 Mbits.

Three industry standard serial buses are supported: I²C, SPI as well as legacy Microwire.

On top of standard packages like SO8N and TSSOP8, ST is answering the market's demand with miniature packages, launching a smaller DFN5 (UFDFPN5) package (60% smaller than DFN8 2x3 mm) and an ultrathin WLCSP 4 balls package with a thickness below 0.3 mm. For System in Package (SiP), ST delivers on demand bare die products in wafer form or in cavity tape. Most demanding industrial application can rely on extended range up to 105°C.

ST also offers an embedded lockable identification page to safely store your parameters. With a specific set of instructions (read/write/lock) you can store sensitive data such as traceability, serial number, customer unique ID, etc.

IBIS and Verilog models for all products are also available from our website.



Identify and protect your sensitive data











Over 100 million cycles per device for datalogging



More parameters make your application smarter in SO8N and WLCSP

Package options

Name	Package	Overall width (max)	Overall length (max)	Overall height (max)	Pitch	Weight (mg)	Number of pins/balls	Comments
Standard								
S08N		5	6.2	1.75	1.27	80	8	
TSSOP8		3.1	6.6	1.2	0.65	34	8	
Miniature								
DFN8 (UFDFPN8)		2.1	3.1	0.6	0.5	16	8	Leadless package UFDFPN is equivalent to MLP or DFN package
DFN5 (UFDFPN5)		1.8	1.5	0.6	0.4	7	5	Leadless package UFDFPN is equivalent to MLP or DFN package. UFDFPN5 is 60% smaller than UFDFPN8
WLCSP		1.074	1.168	0.6	0.4	1.24	5	Wafer Level Chip Scale Package. Dimension of the device is die dependent. Here is an example of the 64 Kbit device.
Thin WLCSP		1.093	0.979	0.33	0.4	0.67	4 or 8	Dimension of the device is die dependent. Here is an example of the 64 Kbit device.
Ultrathin WLCSP		0.853	0.853	0.3	0.4	0.4	4	Dimension of the device is die dependent. Here is an example of the 64 Kbit device.
Bare Die							8	Dimensions, pitch and weight are die dependent

All dimensions in mm

Serial EEPROM portfolio

I2C - INDUSTRIAL +85 °C

All products are qualified from -40 to 85 °C. Supply voltage max is 5.5 V

Root part number	Storage capacity (Kbit)	Supply voltage min (V)	Clock frequency max (MHz)	Package options					BARE DIE	Specific features
				SO8N	TSSOP8	DFN8	DFN5	WL CSP		
M24C01-R	1	1.8	0.4	•	•					-
M24C02-F	2	1.7	0.4	•	•	•				-
M24C02-R	2	1.8	0.4	•	•	•				-
M24C04-F	4	1.7	0.4	•	•	•				-
M24C04-R	4	1.8	0.4	•	•	•				-
M24C08-F	8	1.7	0.4	•	•	•		•		-
M24C08-R	8	1.8	0.4	•	•	•				-
M24C16-F	16	1.7	0.4	•	•	•	•		•	-
M24C16-R	16	1.8	0.4	•	•	•				-
M24C16-DFCU ⁽¹⁾	16	1.7	1					•		Lockable Identification Page
M24C32-F	32	1.7	1	•	•	•	•	•	•	Chip enable address 000 for WL CSP and UDFPN5
M24C32-R	32	1.8	1	•	•					-
M24C32-DF	32	1.7	1	•	•	•				Lockable Identification Page
M24C32M-FCU	32	1.7	1					•		Chip enable address 100
M24C32S-FCU	32	1.7	1					•		Software write protection - Chip enable address 001
M24C32T-FCU	32	1.7	1					•		Software write protection - Chip enable address 000
M24C32-X ⁽²⁾	32	1.6	1		•	•				-
M24C64-F	64	1.7	1	•	•	•	•	•		Chip enable address 000 for WL CSP and UDFPN5

Notes:

1. no hardware, nor software write protect
2. product qualified from -20 to 85°C

I2C - INDUSTRIAL +85 °C

All products are qualified from -40 to 85 °C. Supply voltage max is 5.5 V

Root part number	Storage capacity (Kbit)	Supply voltage min (V)	Clock frequency max (MHz)	Package options						Specific features
				S08N	TSSOP8	DFN8	DFN5	WLCSP	BARE DIE	
M24C64-R	64	1.8	1	•	•					-
M24C64-DF	64	1.7	1	•	•	•		•		Lockable Identification Page
M24C64M-FCU	64	1.7	1					•		Chip enable address 100
M24C64S-FCU	64	1.7	1					•		Software write protection - Chip enable address 001
M24C64T-FCU	64	1.7	1					•		Software write protection - Chip enable address 000
M24128-BF	128	1.7	1			•	•		•	-
M24128-BR	128	1.8	1	•	•					-
M24128-DF	128	1.7	1	•	•	•		•		Lockable Identification Page
M24128S-FCU	128	1.7	1					•		Software write protection - Chip enable address 001
M24128T-FCU	128	1.7	1					•		Software write protection - Chip enable address 000
M24256-BF	256	1.7	1		•	•			•	-
M24256-BR	256	1.8	1	•	•					-
M24256-DF	256	1.7	1	•	•	•		•		Lockable Identification Page
M24512-R	512	1.8	1	•	•					-
M24512-DF	512	1.7	1	•	•	•		•	•	Lockable Identification Page
M24M01-R	1024	1.8	1	•	•					-
M24M01-DF	1024	1.7	1	•	•			•	•	Lockable Identification Page
M24M02-DR	2048	1.8	1	•				•	•	Lockable Identification Page

SPI - INDUSTRIAL +85 °C

All products are qualified from -40 to 85 °C. Supply voltage max is 5.5 V

Root part number	Storage capacity (Kbit)	Supply voltage min (V)	Clock frequency max (MHz) *	Package options					Specific features
				S08N	TSSOP8	DFN8	WL CSP	BARE DIE	
M95010-R	1	1.8	20	•	•				-
M95010-W	1	2.5	20	•	•				-
M95020-R	2	1.8	20	•	•	•			-
M95020-W	2	2.5	20	•	•				-
M95040-R	4	1.8	20	•	•	•			-
M95040-W	4	2.5	20	•	•				-
M95040-DF	4	1.7	20	•	•	•			Lockable Identification Page
M95080-R	8	1.8	20	•	•	•			-
M95080-W	8	2.5	20	•	•				-
M95080-DF	8	1.7	20		•	•			Lockable Identification Page
M95160-R	16	1.8	20	•	•	•			-
M95160-W	16	2.5	20	•	•				-
M95160-DF	16	1.7	20	•	•	•		•	Lockable Identification Page
M95320-R	32	1.8	20	•	•	•			-
M95320-W	32	2.5	20	•	•				-
M95320-DF	32	1.7	20	•		•			Lockable Identification Page
M95640-R	64	1.8	20	•	•	•			-
M95640-W	64	2.5	20	•	•				-
M95640-DF	64	1.7	20	•	•	•	•		Lockable Identification Page
M95128-R	128	1.8	20	•	•	•			-
M95128-W	128	2.5	20	•					-
M95128-DF	128	1.7	20	•	•	•	•		Lockable Identification Page

* For SPI products, the clock frequency value depends on the Vcc applied. We give here the max clock frequency value specified in the datasheet

SPI - INDUSTRIAL +85 °C

All products are qualified from -40 to 85 °C. Supply voltage max is 5.5 V

Root part number	Storage capacity (Kbit)	Supply voltage min (V)	Clock frequency max (MHz) *	Package options					Specific features
				S08N	TSSOP8	DFN8	WL CSP	BARE DIE	
M95256-R	256	1.8	20	•	•	•			-
M95256-W	256	2.5	20	•	•				-
M95256-DF	256	1.7	20	•	•	•	•	•	Lockable Identification Page
M95512-R	512	1.8	16	•	•				-
M95512-W	512	2.5	16	•	•				-
M95512-DF	512	1.7	16	•	•	•	•	•	Lockable Identification Page
M95M01-R	1024	1.8	16	•	•				-
M95M01-DF	1024	1.7	16	•	•		•		Lockable Identification Page
M95M02-DR	2048	1.8	5	•			•		Lockable Identification Page

* For SPI products, the clock frequency value depends on the Vcc applied. We give here the max clock frequency value specified in the datasheet

MICROWIRE - INDUSTRIAL +85 °C

All products are qualified from -40 to 85 °C. Supply voltage max is 5.5 V

Root part number	Storage capacity (Kbit)	Supply voltage min (V)	Clock frequency max (MHz)	Package options			Specific features
				S08N	TSSOP8	DFN8	
M93C46-W	1	2.5	2	•	•		-
M93S46-W	1	2.5	2	•			Programmable Block Protection
M93C56-R	2	1.8	2	•	•		-
M93C56-W	2	2.5	2	•	•		-
M93S56-W	2	2.5	2	•			Programmable Block Protection
M93C66-R	4	1.8	2			•	-
M93C66-W	4	2.5	2	•	•		-
M93S66-W	4	2.5	2	•			Programmable Block Protection
M93C76-R	8	1.8	2		•		-
M93C76-W	8	2.5	2	•			-
M93C86-R	16	1.8	2			•	-
M93C86-W	16	2.5	2	•	•		-

I2C - INDUSTRIAL PLUS +105 °C

All products are qualified from -40 to 105 °C. Short write cycle time of 4ms. Supply voltage max is 5.5 V

Root part number	Storage capacity (Kbit)	Supply voltage min (V)	Clock frequency max (MHz)	Write time max (ms)	Package options			Specific features
					S08N	TSSOP8	DFN8	
M24C02-DRE	2	1.7	1	4	•	•		Lockable Identification Page
M24C04-DRE	4	1.7	1	4	•	•		Lockable Identification Page
M24C08-DRE	8	1.7	1	4	•	•		Lockable Identification Page
M24C16-DRE	16	1.7	1	4	•	•		Lockable Identification Page
M24C32-DRE	32	1.7	1	4	•	•		Lockable Identification Page
M24C64-DRE	64	1.7	1	4	•	•		Lockable Identification Page
M24128-DRE	128	1.7	1	4	•	•		Lockable Identification Page
M24256-DRE	256	1.7	1	4	•	•		Lockable Identification Page
M24512-DRE	512	1.7	1	4	•	•		Lockable Identification Page

SPI - INDUSTRIAL PLUS +105 °C

All products are qualified from -40 to 105 °C. Supply voltage max is 5.5 V

Root part number	Storage capacity (Kbit)	Supply voltage min (V)	Clock frequency max (MHz) *	Write time max (ms)	Package options			Specific features
					S08N	TSSOP8	DFN8	
M95040-DRE	4	1.7	20	4	•	•		Lockable Identification Page
M95080-DRE	8	1.7	20	4	•	•		Lockable Identification Page
M95160-DRE	16	1.7	20	4	•	•		Lockable Identification Page
M95320-DRE	32	1.7	20	4	•	•		Lockable Identification Page
M95640-DRE	64	1.7	20	4	•	•		Lockable Identification Page
M95128-DRE	128	1.7	20	4	•	•		Lockable Identification Page
M95256-DRE	256	1.7	20	4	•	•		Lockable Identification Page
M95512-DRE	512	1.7	16	4	•	•		Lockable Identification Page

SPD EEPROM

The M34E02-F has been designed specifically for use in DRAM DIMMs (dual interline memory modules) with serial presence detect (SPD). All the information concerning the DDR1, DDR2 or DDR3 configuration of the DRAM module (such as its access speed, size and organization) can be kept write-protected in the first half of the memory. Following the new Jedec requirements, ST has launched the M34E04 devices, which includes a 4-Kbit serial EEPROM organized as 4 lockable blocks of 128 bytes each (512 bytes of total memory).

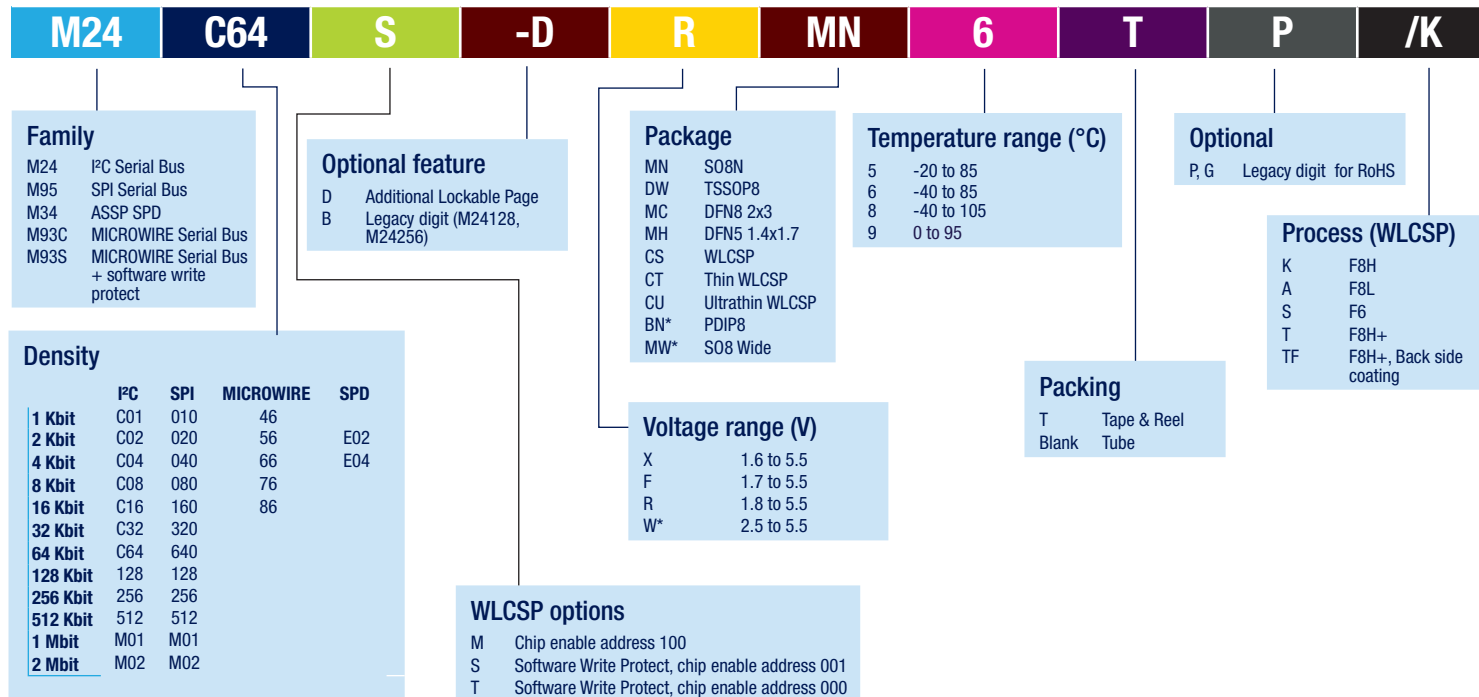
M34E04 devices have been designed specifically for use in DDR4 DRAM DIMMs (Dual Inline Memory Modules) with Serial Presence Detect. All the information concerning the DRAM module configuration (such as its access speed, size, organization) can be kept write-protected in one or more memory blocks. M34E04 devices are compliant with JEDEC EE1004 and compatible with previous M34E02-F device thanks to page selection commands.

Serial interface	Part number	Storage capacity (kbit)	Supply voltage min (V)	Clock frequency max (MHz)	Temperature range (°C)	Package options			Specific features
						S08N	TSSOP8	DFN8	
I2C	M34E02-F	2	1.7	1	-40, +85		•	•	Data lock for lower 128 byte block
I2C	M34E04	4	1.7	1	0, +95			•	Data lock by block of 128 bytes
I2C	M34E04B	4	1.7	1	0, +95			•	Data lock by block of 128 bytes - No hardware write control



Check out more information on our website at www.st.com/spdeeprom

Ordering information



Notes:

* NRND : Not recommended for new design

Not all combinations are available

For bare die ordering information, please contact your nearest ST Sales Office.

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