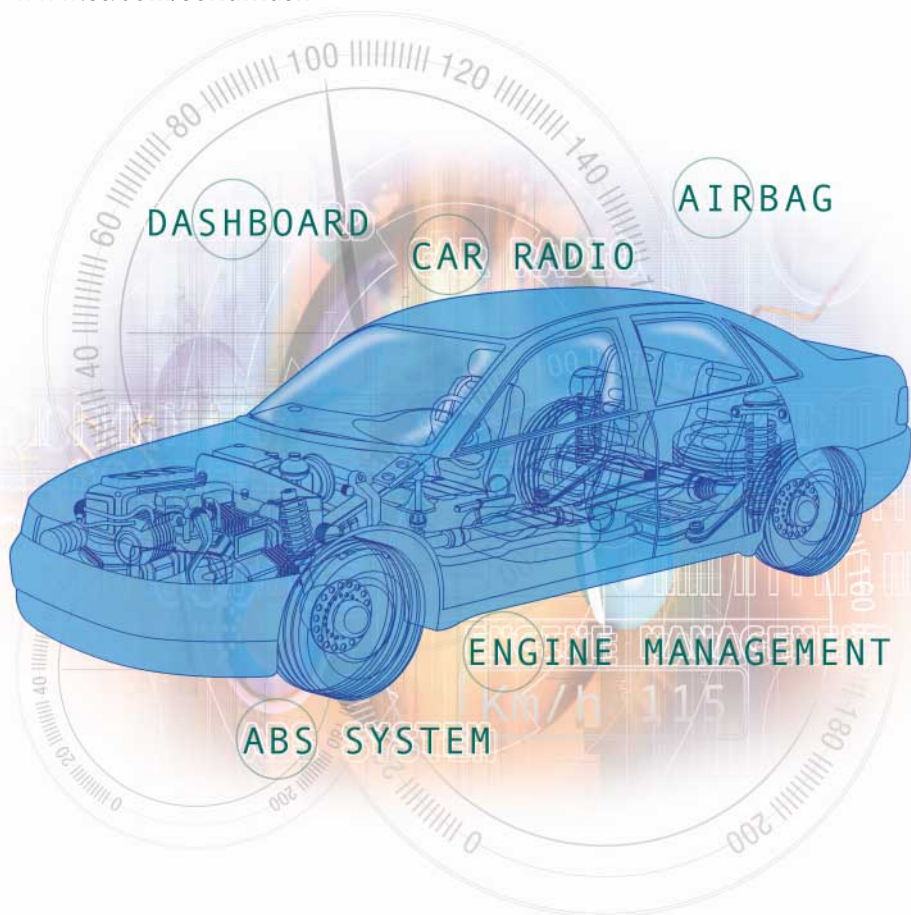


# Serial EEPROM and Serial Flash for Automotive Applications

[www.st.com/eeeprom](http://www.st.com/eeeprom)

[www.st.com/serialflash](http://www.st.com/serialflash)



## Selection Guide

STMicroelectronics  
More Intelligent Solutions



## A broad standard product range

ST offers a wide standard Non-Volatile Memories portfolio based on serial architecture, well-suited for parameter, data and code storage for all Automotive applications.

Serial Non-Volatile Memories include

- **Serial EEPROMs** with the 400kHz I<sup>2</sup>C low cost, 2-wire bus and densities up to 1Mb, fast 1MHz Microwire® bus types at densities from 256 bit to 16 Kbit and very fast 5MHz and 10MHz SPI bus types with densities up to 512 Kbit;
- the new emerging **Serial Flash** family with "sector erase/page programming" (code storage) and "page erase/page programming" (data storage) allowing a finer storage granularity compared with standard Flash. With densities from 512Kb to 8Mb and with a high speed 20MHz SPI bus, serial Flash devices offer lower pin counts, fewer tracks, smaller boards and reduced costs.

	1Kb...16Kb	32Kb...256Kb	512Kb	1Mb	2Mb	4Mb	8Mb
Code storage				Serial Flash M25Pxx Page/sector alterability SPI bus			
Parameter/data storage	Serial EEPROM Byte alterability I <sup>2</sup> C, Microwire® and SPI buses				Serial Flash M25PExx Byte/page alterability SPI bus		

## Serial EEPROM and Serial Flash for Automotive

On top of its standard products, ST provides to automotive customers a complete portfolio, meeting technical and quality requirements of safety and powertrain applications:

- High temperature devices (-40°C/+125°C temperature range) in SPI, I<sup>2</sup>C and Microwire® buses (see details below), tested according to High Reliability Certified Flow.
- Bare die devices for Automotive, tested at 125°C and 150°C with Known Good Die program in SPI, I<sup>2</sup>C and Microwire® buses.

The new Serial Flash Family will also integrate these requirements in the future range.

### Serial EEPROM for Automotive

	1Kb	2Kb	4Kb	8Kb	16Kb	32Kb	64Kb	128Kb	256Kb
<b>MICROWIRE®</b>	<b>M93C46</b>	<b>M93C56</b>	<b>M93C66</b>	<b>M93C76</b>	<b>M93C86</b>				
4.5-5.5V @ -40°C/+125°C	HRCF ✓	✓	✓	✓	✓				
Bare die @ 125°C, 150°C			✓						
<b>SPI</b>	<b>M95010</b>	<b>M95020</b>	<b>M95040</b>	<b>M95080</b>	<b>M95160</b>	<b>M95320</b>	<b>M95640</b>	<b>M95128</b>	<b>M95256</b>
4.5-5.5V @ -40°C/+125°C	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.5-5.5V @ -40°C/+125°C	HRCF		✓	✓	✓				
Bare die @ 125°C, 150°C		✓	✓	✓	✓	✓			
<b>I<sup>2</sup>C</b>	<b>M24C01</b>	<b>M24C02</b>	<b>M24C04</b>	<b>M24C08</b>	<b>M24C16</b>	<b>M24C32</b>	<b>M24C64</b>	<b>M24128</b>	<b>M24256</b>
4.5-5.5V @ -40°C/+125°C	HRCF ✓	✓	✓	✓	✓				
Bare die @ 125°C, 150°C		✓	✓		✓				

### Serial Flash for Automotive

	512Kb	1Mb	2Mb	4Mb	8Mb
<b>SPI (code storage)</b>	<b>M25P05</b>	<b>M25P10</b>	<b>M25P20</b>	<b>M25P40</b>	<b>M25P80</b>
2.7-3.6 @ -40°C/+85°C	✓	✓	✓	*	*
2.7-3.6 @ -40°C/+125°C	**	**	**	**	**
<b>SPI (data storage)</b>			<b>M25PE20</b>	<b>M25PE40</b>	<b>M25PE80</b>
2.7-3.6 @ -40°C/+85°C			*	*	*
2.7-3.6 @ -40°C/+125°C			**	**	**

\* Available in 2002 \*\* Contact your local sales office for availability

## Key information

### DIFFUSION and ELECTRIC WAFER SORT PLANT:

- Rousset (France) for Automotive grade products (-40°C/+125°C, -40°C/+150°C)
- 6 inch wafers
- Technology: CMOS 0.9µ to 0.6µ

### TESTING FLOW:

- High Reliability Certified Flow for packaged parts  
(See HRCF Quality note QNEE9801 on the Web at [www.st.com/EEPROM](http://www.st.com/EEPROM))
- Known Good Die Program at 125°C and 150°C for bare die devices

### ASSEMBLY AND TEST:

- Muar (Malaysia) S08
- Shenzhen (China) S08, PDIP8 (See SO & Tape and Reel note at our web address)

### SURFTAPE FOR BARE DIE TAPE and REEL:

- 7 inch Reel
- 2500 dice per Reel

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

Size	Ref	Description	Packages	-40°C to 125°C Pack	-40°C to 125°C Bare Die	-40°C to 150°C Bare Die
1Kb	M95010	1Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓		
2Kb	M95020	2Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓		
4Kb	M95040	4Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓	✓	*
4Kb	M95040-W	4Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓		
8Kb	M95080	8Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓	✓	✓
8Kb	M95080-W	8Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓	✓	✓
16Kb	M95160	16Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓	✓	✓
16Kb	M95160-W	16Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓		
32Kb	M95320	32Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓	✓	✓
64Kb	M95640	64Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	✓		
128Kb	M95128	128Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	*		
256Kb	M95256	256Kb (x8), 2MHz, 10ms Write, Block Write Protection	PDIP8, S08	*		

\* Available in 1Q02 - Please contact EEPROM Marketing for more information

## Serial EEPROM, I<sup>2</sup>C Bus, 4.5-5.5V

Size	Ref	Description	Packages	-40°C to 125°C Pack	-40°C to 125°C Bare Die	-40°C to 150°C Bare Die
1Kb	M24C01	1Kb (x8), 400kHz, 10ms Write time	PDIP8, S08	✓		
2Kb	M24C02	2Kb (x8), 400kHz, 10ms Write time	PDIP8, S08	✓	✓	✓
4Kb	M24C04	4Kb (x8), 400kHz, 10ms Write time	PDIP8, S08	✓	✓	✓
8Kb	M24C08	8Kb (x8), 400kHz, 10ms Write time	PDIP8, S08	✓		
16Kb	M24C16	16Kb (x8), 400kHz, 10ms Write time	PDIP8, S08	✓	✓	

# Serial EEPROM for Automotive Applications

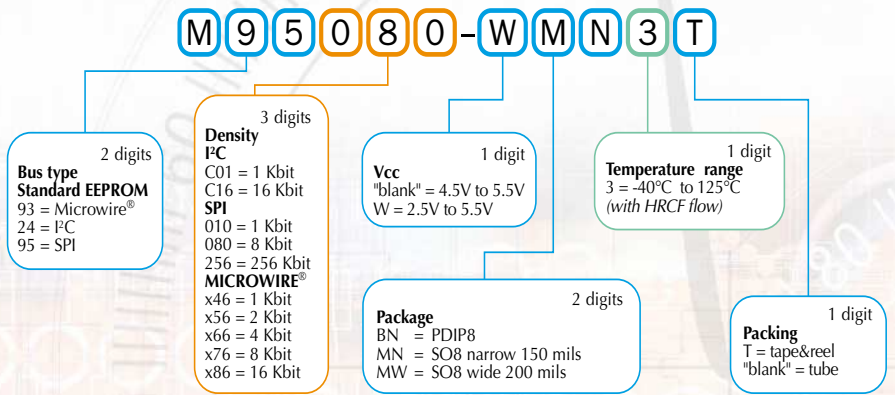
## Serial EEPROM, MICROWIRE® Bus, 4.5-5.5V

Size	Ref	Description	Packages	-40°C to 125°C Pack	-40°C to 125°C Bare Die	-40°C to 150°C Bare Die
1Kb	M93C46	1Kb (x8/x16), 1MHz, 10ms Write time	PDIP8, SO8	✓		
1Kb	M93S46	1Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PDIP8, SO8	✓		
2Kb	M93C56	2Kb (x8/x16), 1MHz, 10ms Write time	PDIP8, SO8	✓		
2Kb	M93S56	2Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PDIP8, SO8	✓		
4Kb	M93C66	4Kb (x8/x16), 1MHz, 10ms Write time	PDIP8, SO8	✓	✓	*
4Kb	M93S66	4Kb (x16), 1MHz, 10ms Write time, Block Write Protection	PDIP8, SO8	✓		
8Kb	M93C76	8Kb (x8/x16), 1MHz, 10ms Write time	PDIP8, SO8	✓		
16Kb	M93C86	16Kb (x8/x16), 1MHz, 10ms Write time	PDIP8, SO8	✓		

\* Available in 1Q02 - Please contact EEPROM Marketing for more information

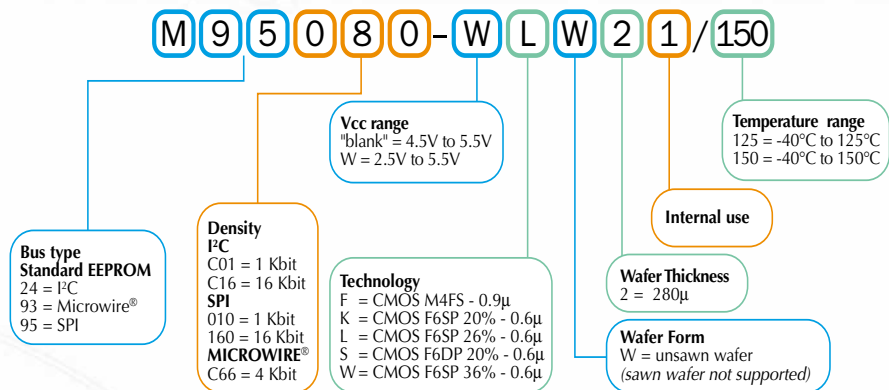
## Ordering Information

### Automotive EEPROM Salestypes Codification Scheme

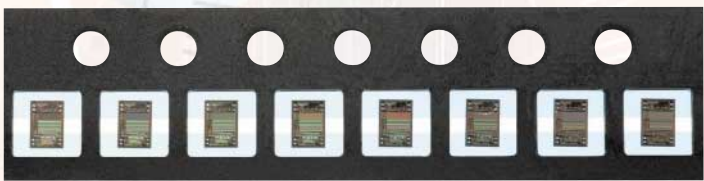
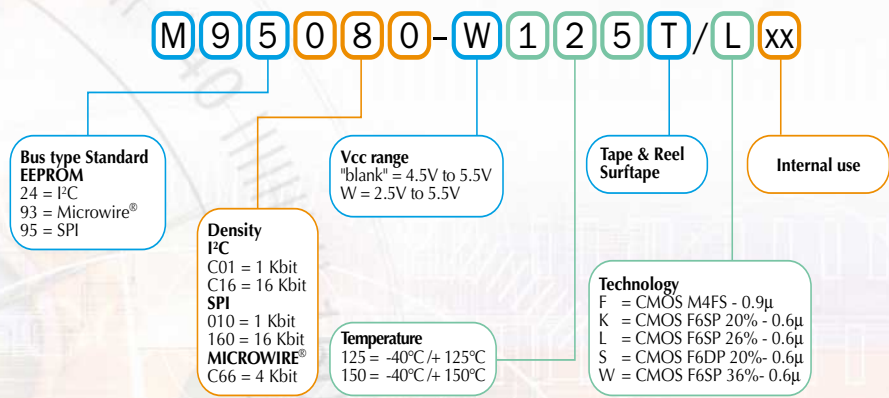


# Serial EEPROM for Automotive Applications

## Bare Die Codification Scheme - Wafer Form



## Bare Die Codification Scheme - Tape and Reel



Surftape Tape & Reel



Serial EEPROM for Automotive  
are available in wafer form and in the following packages:



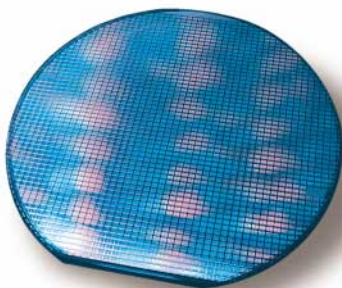
**PDIP8**



**S08N**



**S08W**



### **Wafer form**

Wafer diameter: 6 inches (150 mm)

Wafer thickness: 280μ

Wafers are shipped unsawn, packed in an appropriate box (collective packing)



### **Surftape Tape & Reel**

Reel diameter: 7 inches (175 mm)

Dices are packed in Tape & Reel  
with surftape



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**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;  
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