

# Renesas EEPROM Product Outline

April 3, 2024

Standard Memory Products Section,  
Standard Products Department, Standard Products Division,  
Analog & Connectivity Product Group,  
Renesas Electronics Corporation

EEPROM-2024-E-0403-1

# Memory Products Portfolio

- “One-Renesas” provides optimum memory solutions to various application fields

Memory Types	Products	Sources
Low Power SRAM	<ul style="list-style-type: none"> <li>■ (5V, 3V) 256Kb, 1Mb, 4Mb</li> <li>■ (3V) 2Mb, 8Mb, 16Mb, 32Mb, 64Mb</li> </ul>	Renesas
Asynchronous Fast SRAM	<ul style="list-style-type: none"> <li>■ (5V, 3.3V) 4Mb</li> <li>■ (5V) 16Kb, 64Kb, 256Kb</li> <li>■ (5V, 3.3V) 1Mb</li> <li>■ (3.3V) 4Mb</li> </ul>	former IDT
Synchronous SRAM	<ul style="list-style-type: none"> <li>■ Pipeline Burst / Flow-through : 4Mb, 9Mb</li> <li>■ Zero Bus Turnaround (ZBT) : 4Mb, 9Mb, 18Mb</li> </ul>	former IDT
Specialty Memory	<ul style="list-style-type: none"> <li>■ Multi-Port (5V, 3.3V, 2.5V) 8Kb ~ 36Mb</li> <li>■ FIFO (5V, 3.3V, 2.5V) 2Kb ~ 9Mb</li> </ul>	former IDT
EEPROM	<ul style="list-style-type: none"> <li>■ Serial I/F: I2C, SPI (1.8V ~ 5.5V) 2Kb ~ 512Kb</li> </ul>	Renesas
SPI NOR Flash	<ul style="list-style-type: none"> <li>■ Standard Products: (1.8V) 8Mb ~ 128Mb (3V) 256Kb ~ 128Mb (1.8 ~ 3V, Wide Vcc) 256Kb ~ 32Mb</li> <li>■ System-Enhancing Products: Fusion / FusionHD 512Kb~32Mb / DataFlash 2Mb~64Mb / Ultra-Low Energy 1Mb~4Mb</li> </ul>	former Dialog

Covered by this Material

# Advantages: Renesas EEPROM

## 1. High reliability by MONOS technology

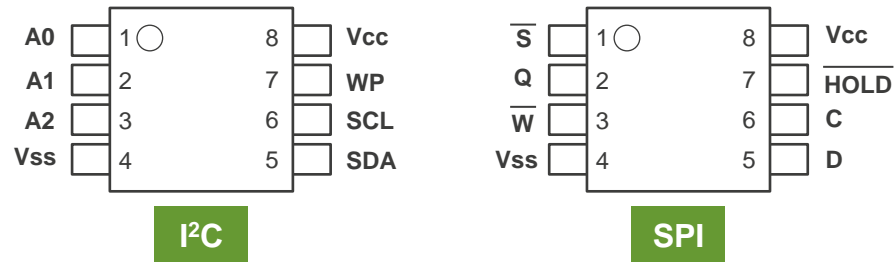
- ✓ More than 30 years of production, from 3um-process to date
- ✓ Distinguished Erase/Write endurance

## 2. Stable supply and long-term support

- ✓ PLP (Product Longevity Program) Applicable\*

## 3. Wide variety of product lineup

- ✓ Serial EEPROM : 2Kb to 512Kb for both I<sup>2</sup>C and SPI



Pin Arrangement : 8-pin SOP / 8-pin TSSOP (Top View)

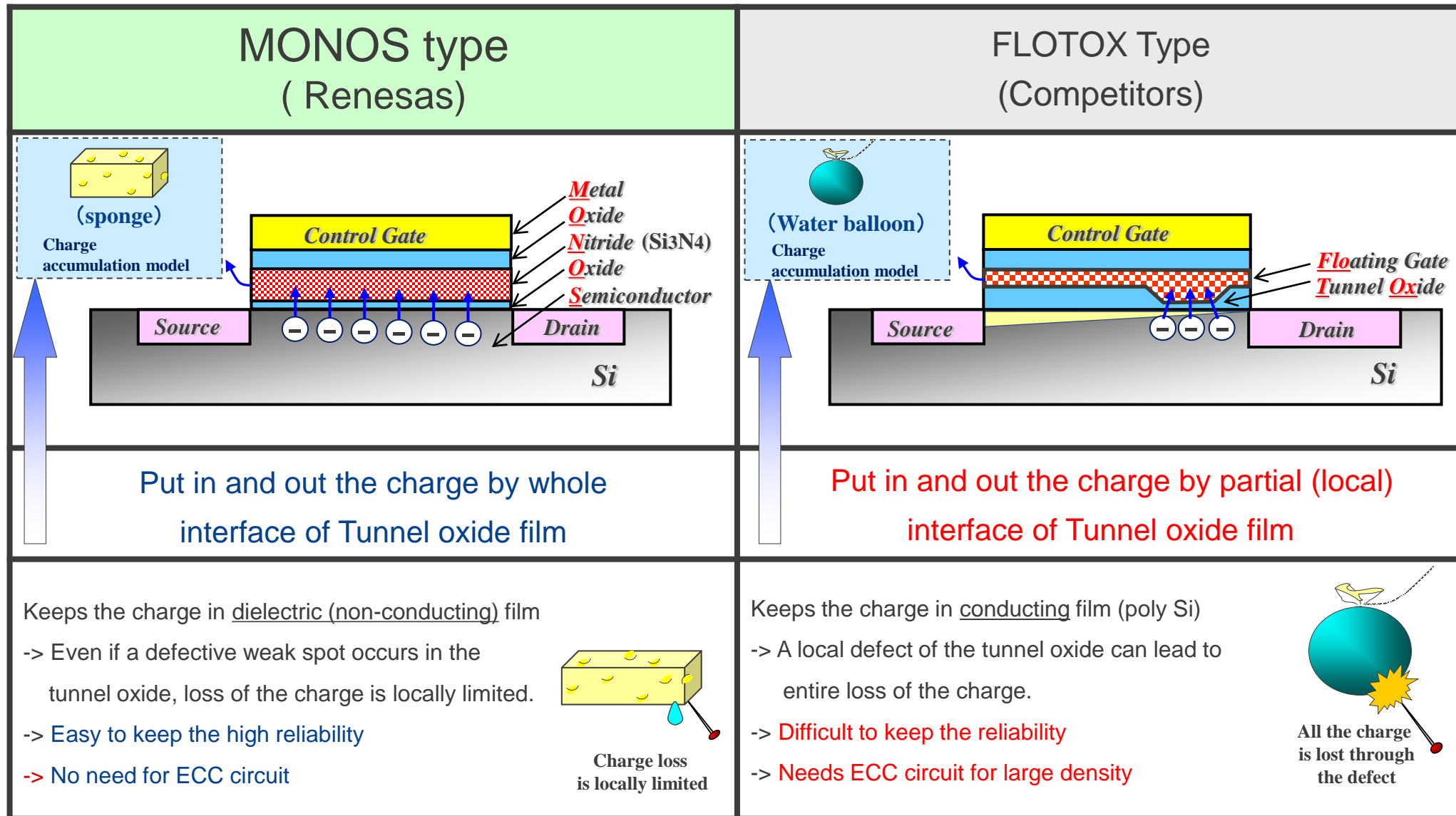


Product **Longevity** Program

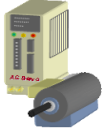




























\* Contact us for the applicable part names.



# High Reliability of MONOS type

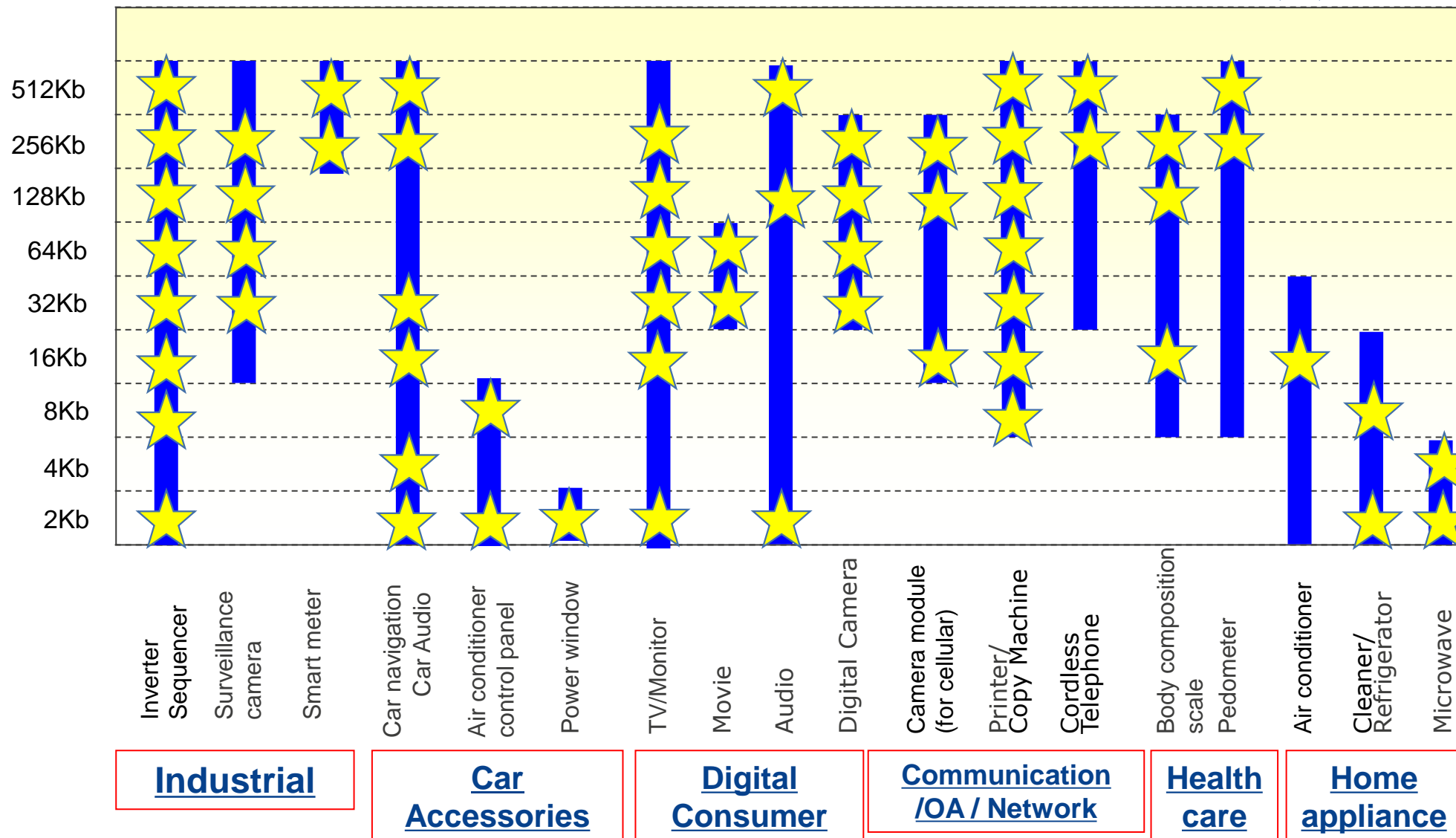


# EEPROM Applications

Industrial					Consumer			
Factory automation	Energy system	Communication infrastructure	POS system	Car accessory (non-driveline) Navigation, etc.	Healthcare equipment	Consumer electronics	Office automation apparatus	Gaming
  	  	  	 	  	  	   	  	    

# Track Records of Renesas EEPROM

★ Use case by application/density



# Winning Combinations

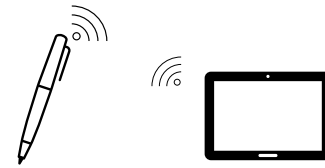
Winning combinations to accelerate  
your application design

Analog + Power + Embedded Processing + Connectivity



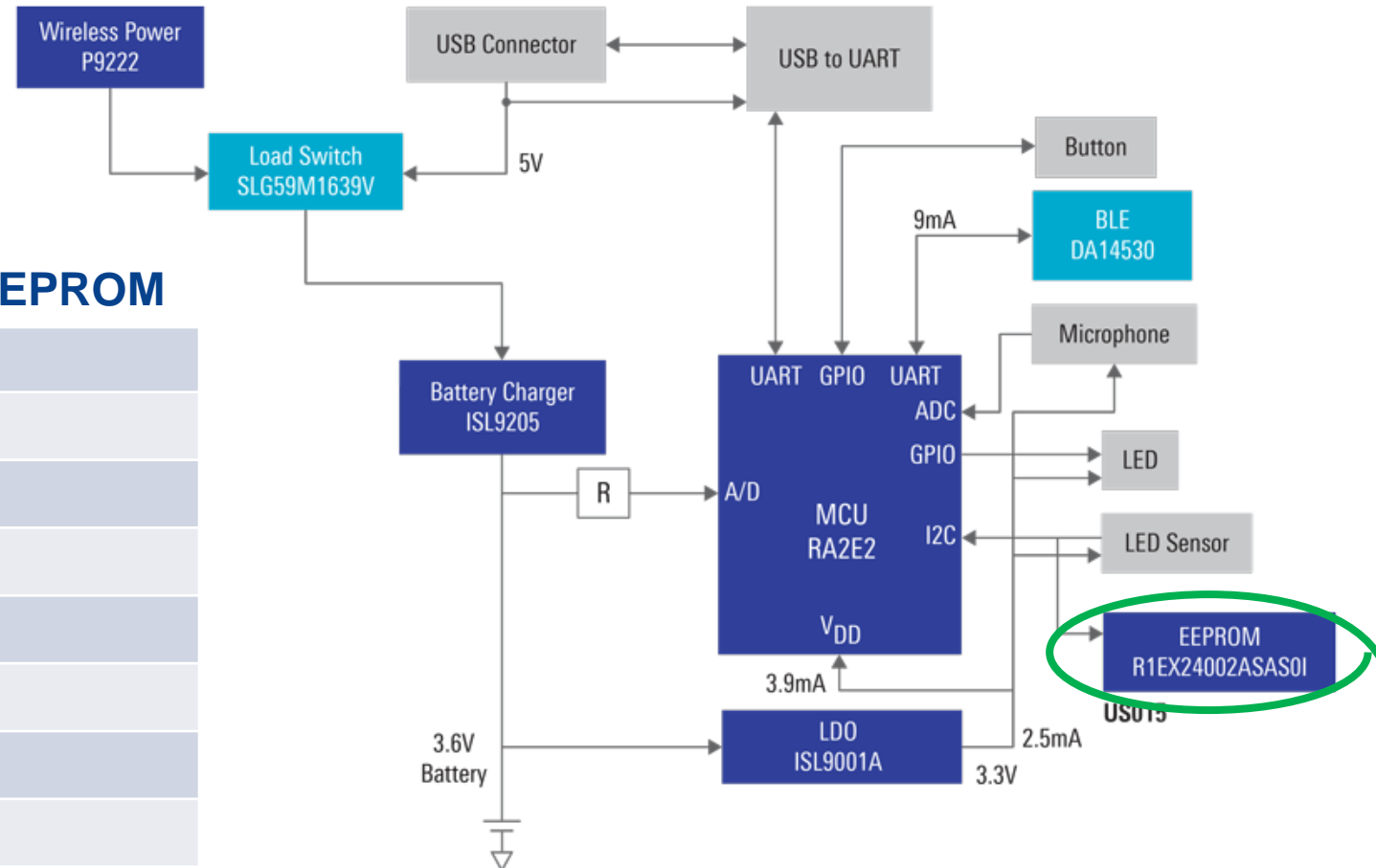
Application	EEPROM Product	Renesas Website
Smart Pen	R1EX24002ASAS0I	<a href="#">Smart Pen   Renesas</a>
Single-Board Computer (SBC) Solution Featuring RZ/G2L MPU	R1EX24002ASAS0I	<a href="#">Single-board Computer (SBC) Solution Featuring RZ/G2L MPU   Renesas</a>
Wireless Electronic Gaming Table	R1EX24016ASAS0I	<a href="#">Wireless Electronic Gaming Table   Renesas</a>
Gigabit Industrial Ethernet System-on-Module	R1EX24016ASAS0I	<a href="#">Gigabit Industrial Ethernet System-on-Module (SoM) Solution   Renesas</a>
High Throughput Wi-Fi 6 Router	R1EX24016ATAS0I	<a href="#">High Throughput Wi-Fi 6 Router   Renesas</a>
1-Phase power meter	R1EX25512ATA00I	<a href="#">1-Phase Power Meter   Renesas</a>

# Renesas EEPROM in smart pen



- The LED and detector record's the pen's movement
- The IR LED is invisible, so the user will not be distracted by any light while writing
- Bluetooth® Low Energy (LE) on the pen would transfer the digital data from the pen to a computer or tablet
- An EEPROM on board will store the writing in memory for transfer to a notebook
- Buttons for audio recording to start and to power on/off the pen

This smart pen system is used to record human handwriting and store a copy in a digital format. The pen uses one IR LED to emit light onto the paper and an LED sensor to detect the reflection. The sensor will allow the movement of the pen's pattern to be detected and record what is written.



## Packed with Renesas content including EEPROM

Renesas Part	Type
DA14530	Low Power BLE
R1EX24002ASAS0I	EEPROM
ISL9001A	LDO
SLG59M1639V	Switch
RA2E2	Microcontroller
ISL9205	Battery Charger
ISL920	Power Receiver



## 2 Wire Interface - Easy to Implement Serial EEPROM Lineup (I<sup>2</sup>C)

Part Name (Product Series)	Density	Interface	Package (pinout)		Max Clock	Operating Voltage	Operating Temperature	Erase/Write Endurance (cycles)
			SOP (8)	TSSOP (8)				
R1EX24002A	2Kb	I2C	✓	✓	400KHz	1.8 V ~ 5.5 V	-40°C ~ 85°C	1,000K (25°C) 100K (85°C)
R1EX24004A	4Kb	I2C	✓	✓				
R1EX24008A	8Kb	I2C	✓	✓				
R1EX24016A	16Kb	I2C	✓	✓				
R1EX24032A	32Kb	I2C	✓	✓				
R1EX24064A	64Kb	I2C	✓	✓				
R1EX24128B	128Kb	I2C	✓	✓	400KHz	1.8 V ~ 5.5 V	-40°C ~ 85°C	1,000K
R1EX24256B	256Kb	I2C	✓	✓	1MHz*Note	1.8 V ~ 5.5 V	-40°C ~ 85°C	1,000K
R1EX24512B	512Kb	I2C	✓	✓				

\*Note: 1MHz (2.5V ~ 5.5V) / 400KHz (1.8V ~ 5.5V)

## With Faster Interface

# Serial EEPROM Lineup (SPI)

Part Name (Product Series)	Density	Interface	Package (pinout)		Max Clock	Operating Voltage	Operating Temperature	Erase/Write Endurance (cycles)
			SOP (8)	TSSOP (8)				
R1EX25002A	2Kb	SPI	✓	✓	5MHz*Note	1.8 V ~ 5.5 V	-40°C ~ 85°C	1,000K (25°C) 100K (85°C)
R1EX25004A	4Kb	SPI	✓	✓				
R1EX25008A	8Kb	SPI	✓	✓				
R1EX25016A	16Kb	SPI	✓	✓				
R1EX25032A	32Kb	SPI	✓	✓				
R1EX25064A	64Kb	SPI	✓	✓				
HN58X25128	128Kb	SPI	✓					
HN58X25256	256Kb	SPI	✓					
R1EX25512A	512Kb	SPI	✓	✓				

\*Note: 5MHz (2.5V ~ 5.5V) / 3MHz (1.8V ~ 5.5V)

# Serial EEPROM Part Name

## R1E X 24 064 A SA S0 I #S0

RENESAS EEPROM

Operating Voltage

<b>X</b>	1.8 ~ 5.5V
<b>V</b>	2.5 ~ 5.5V

Interface

<b>24</b>	I2C
<b>25</b>	SPI

Memory Density

<b>002</b>	2Kb	<b>128</b>	128Kb
<b>004</b>	4Kb	<b>256</b>	256Kb
<b>008</b>	8Kb	<b>512</b>	512Kb
<b>016</b>	16Kb		
<b>032</b>	32Kb		
<b>064</b>	64Kb		

Chip Generation

<b>A</b>	A mask
<b>B</b>	B mask

Environmental / Packing specs

	Package Material		Tape & Reel (pcs / reel)	
			SOP (8)	TSSOP (8)
<b>#S0</b>	Pb-free	Au-wire	2,500	3,000
<b>#U0</b>	Pb-free, Halogen-free	Au-wire	2,500	3,000
<b>#K0</b>	Pb-free, Halogen-free	Cu-wire	4,000	

Operating Temperature

<b>I</b>	Industrial: -40 ~ 85°C
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Function

<b>S0</b>	I2C
<b>00</b>	SPI

Package

<b>SA</b>	8pin SOP
<b>TA</b>	8pin TSSOP

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[Renesas.com](https://www.renesas.com)