



8-bit Automotive MCUs

## S08RN Family

### Target Applications

- LIN nodes
- User interface
- Actuators, sensors
- HVAC
- Electric BLDC motor control
- Remote keyless entry/immobilizer
- Capacitive touch-button replacement
- Power conversion
- Lighting controls

### Overview

The 8-bit S08RN MCU family is a simple, powerful offering of scalable and pin-compatible devices. These 5-volt devices enable capacitive touch control and precise power conversion for BLDC motors or LED control and are suitable for automotive applications in environments up to 125 °C ambient temperature.

The S08RN family utilizes the existing S08 core, IP and tools for easy migration from existing 8-bit S08 products. The feature-rich S08RN MCUs integrate a multichannel touch-sensing interface (TSI), FlexTimer with a 6-ch. motor PWM, analog comparator and EEPROM with error correction code (ECC) to simplify designs and help reduce system costs.

The scalable S08RN family provides a wide range of memory/package options, allowing easy, pin-compatible migration within the family. The family includes slew rate and drive strength control for EMI/EMC compliance, as well as filtering on I/O pins to help withstand noisy environments. Internal clock generators internalize clock noise, while an independent hardware watchdog monitors the system.

The S08RN family also includes a built-in 16-bit CRC engine for data validation. Integrated peripherals simplify PCB design and a broad portfolio of options help to reduce BOM costs.

In addition, the S08RN family is supported by our affordable, easy-to-use Tower System development platform.

### Development Tools

#### S08RN60 Tower System Module and Kit

The Freescale Tower System is a modular development platform designed to save you months of development time through rapid prototyping and tool re-use.

[freescale.com/Tower](http://freescale.com/Tower)

#### CodeWarrior Development Studio V10.x

CodeWarrior Development Studio for Microcontrollers is a suite of tools that supports software development for our automotive S08, S12X and MPC56xx families.

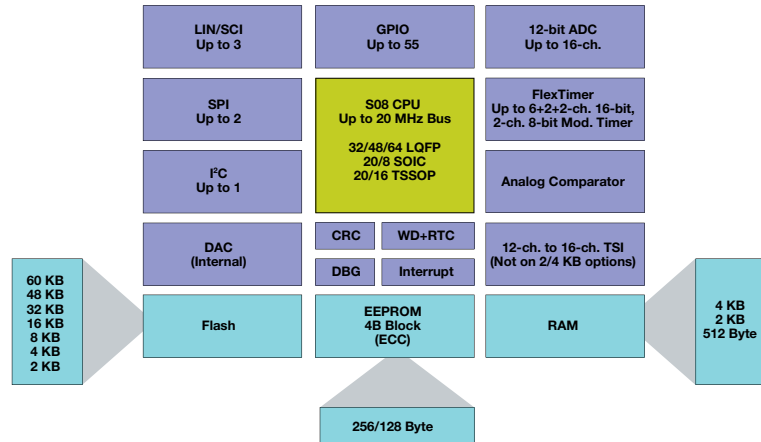
[freescale.com/CodeWarrior](http://freescale.com/CodeWarrior)

#### Processor Expert

Designers can further accelerate application development Processor Expert, an award-winning rapid application development tool integrated into the CodeWarrior tool suite.

[freescale.com/ProcessorExpert](http://freescale.com/ProcessorExpert)

## S08RN Family



## Package Options

| Family        | Package Options                               |
|---------------|-----------------------------------------------|
| S08RN60/48/32 | 64 LQFP, 48 LQFP, 32 LQFP                     |
| S08RN(A)16/8  | 48 LQFP, 32 LQFP, 20 SOIC, 20 TSSOP, 16 TSSOP |
| S08RNA4/2     | 20 TSSOP, 16 TSSOP, 8 SOIC                    |

## S08RN Features and Benefits

| Features                                                                                | Benefits                                                                                        |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Memory Combination</b>                                                               |                                                                                                 |
| Increased flash/RAM ratio (4 KB RAM in RN60)                                            | Easy for C coding                                                                               |
| On-chip EEPROM with 500 KB–1 MB write/erase cycle                                       | Simplifies the system design for data logging and recording                                     |
| <b>Robust GPIO and High Drive Capability</b>                                            |                                                                                                 |
| Up to 55 GPIO with filtering in 64-pin                                                  | Simplifies external circuit design                                                              |
| Up to eight pins with 20 mA sink drive capability                                       | Saves external components for high current driving of FETs or LEDs                              |
| Two pins with true open drain                                                           | Provides design flexibility for different voltage levels                                        |
| <b>16-ch., 12-bit SAR ADC</b>                                                           |                                                                                                 |
| Linear successive approximation algorithm with up to 12-bit resolution                  | Enables fast and accurate analog measurement                                                    |
| Up to 16-ch. single-ended external analog inputs                                        | Flexible routine of input signals to improve overall EMC performance                            |
| 12-bit, 10-bit and 8-bit modes, eight-deep result FIFO                                  | Improves MCU core efficiency with ADC FIFO                                                      |
| Single or continuous conversion (automatic return to idle after single conversion)      | Increases options for software implementation with less intervention                            |
| <b>16-ch. Touch-Sensing Interface (Not on S08RNA2/4)</b>                                |                                                                                                 |
| Dedicated hardware module to sense touch input, minimum software intervention           | Simplifies external circuit on touch-sensing design                                             |
| Functional in all power modes (run, wait and low-power stop), wake-up capable from stop | Low-power touch-sensing capability                                                              |
| Designed for operation in harsh environments with high sensitivity                      | Provides robustness and reliability                                                             |
| Highly configurable through hardware and software                                       | Ease of use for tuning and customization                                                        |
| <b>Feature-Rich Integration</b>                                                         |                                                                                                 |
| 6-ch. + 2-ch. + 2-ch. Flex Timer; 2 x MTIM                                              | PWM with deadtime insertion for sensorless BLDC motor control and power conversion applications |
| Real-time clock                                                                         | Helpful for any task scheduling functions, periodic wake-up MCU from stop mode                  |
| 3 x SCI, 2 x SPI, I <sup>2</sup> C                                                      | Choice of various communication interfaces                                                      |
| Enhanced watchdog and programmable CRC                                                  | Offloads CPU for integrity check                                                                |
| High accuracy internal clock                                                            | Eliminates external clock source                                                                |

For information about the S08RN family, visit [freescale.com/S08RN](http://freescale.com/S08RN)