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 ºC 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

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.
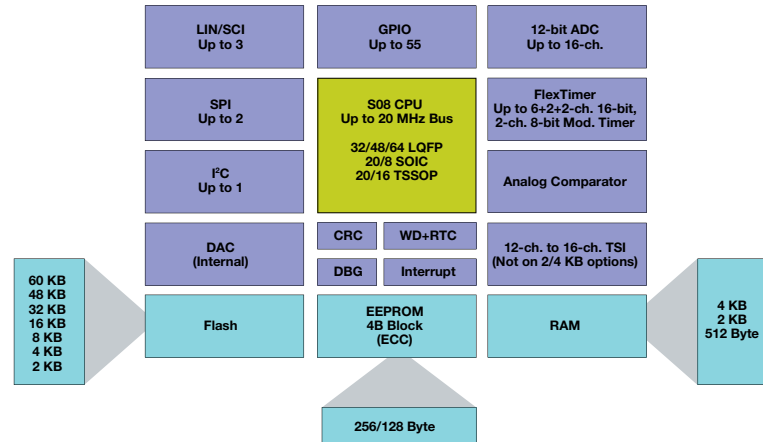**freescale.com/CodeWarrior**

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

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
Memory Combination	
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
Robust GPIO and High Drive Capability	
Up top 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
16-ch., 12-bit SAR ADC	
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
16-ch. Touch-Sensing Interface (Not on S08RNA2/4)	
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
Feature-Rich Integration	
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, I²C	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