S08SG 8-bit Microcontrollers

S08SG Family of 8-bit Microcontrollers

Enter S08 with room to grow

Overview

Freescale Semiconductor's 8-bit SG family of microcontrollers (MCUs) is a general purpose MCU for general market applications. Freescale's S08SG32 is available as an option for space-constrained applications in high temperature environments up to 150°C Ta (limited to 155°C Tj). The SG family is easy to design into an application because of its non-intrusive, single wire background debug module (BDM), which allows for register readings without stopping execution on the chip. This reduces development time, since changes can be made while in application and in real time. It also allows debug access in constrained locations. The SG family helps to lower cost, save board space and improve quality with on-chip components by eliminating the need for external crystal, LVI circuit, voltage regulator, I/O mux, watchdog circuit, ADC and development tools. Pin-compatible with the EL and SL families, SG family offers stepwise scalability without major board redesign or long, expensive development times.

Freescale's S08 core is particularly attractive for automotive applications. Multiple stop modes, along with wait and standby modes, will help achieve new thresholds in low-power performance under a variety of operating conditions. The S08 core allows efficient, compact, modular coding with full 16-bit stack-pointer and stack-relative addressing, which permits various instruction sizes and enables memory interface in multiple mechanisms and addressing modes. With the S08 CPU running at 40 MHz, MCUs are able to quickly accomplish a task and go back to sleep. Quick execution translates into power savings, which allows you to add more embedded content while keeping within your power budgets.

Application Segments	Application Examples
Roof	Sensor, light sensor, light control, sun roof
High-Temperature, Space-Constrained Applications	Engine watchdogs, oil level sensor, clutch position sensor, fan control, pump control, diesel glow plug, real-time clock
Steering Wheel	Cruise control, wiper, turning light, climate control, radio
Seat	Seat position motors, occupancy sensor, control panel
Engine	Sensors, small motors
Climate	Small motors, control panel
Door	Mirror, central ECU, mirror switch, window lift, seat control switch, door lock

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High-Temperature, Space-Constrained Benefits

S08SG has a maximum ambient temperature of 150°C for 32 KB and 16 KB flash sizes. This allows for:

1. Electrical replacement of mechanical components in high-temperature environments
2. Movement of remote electrical components closer to high-temperature locations
3. Cost-saving efforts to reduce mechanical cooling elements (fans, cooling coils and heat sinks)
4. Use of synthetic oils at high temperatures

Note: high-temperature versions of the SG family require a different part number and are priced differently than standard SG devices.

Development Tools

SG8 Demonstration Board (DEMO9S08SG8): MSRP $59
LIN Daughter Board (DEMO9S08LIN): MSRP $35
SG32 Demonstration Board (DEMO9S08SG32): MSRP $69
Programming Adapter (PAS08W1628T28): MSRP $195
BDM Multilink (USBMULTILINKBDME): MSRP $99
Cyclone Pro (M68CYCLONEPROE): MSRP $499
CodeWarrior®—visit **www.freescale.com/codewarrior** for details
Emulation Support (ICE) (on-chip support)

Root Part Number	Flash	RAM	Analog (ADC)	UART	SPI	I²C	Timer	Clock	Pin Count	Additional Features	Operating Voltage	Max Ambient Temp
9S08SG32	32 KB	1 KB	Up to 16-ch., 10-bit ADC, 1 Comparator	1xSCI	1	1	2-ch.+ 2-ch.	ICS	28, 20, 16	40 MHz CPU, Watchdog OSC/Timer, COP, LVI, ICE, BDM, POR, KBI, Temp Sensor	2.7 to 5.5	up to 150°C
9S08SG16	16 KB	1 KB	Up to 16-ch., 10-bit ADC, 1 Comparator	1xSCI	1	1	2-ch.+ 2-ch.	ICS	28, 20, 16	40 MHz CPU, Watchdog OSC/Timer, COP, LVI, ICE, BDM, POR, KBI, Temp Sensor	2.7 to 5.5	up to 150°C
9S08SG8	8 KB	512B	Up to 12-ch., 10-bit ADC, 1 Comparator	1xSCI	1	1	Up to 2-ch. +2-ch.	ICS	20, 16, 8	40 MHz CPU, Watchdog OSC/Timer, COP, LVI, ICE, BDM, POR, KBI, Temp Sensor	2.7 to 5.5	up to 125°C
9S08SG4	4 KB	256B	Up to 12-ch., 10-bit ADC, 1 Comparator	1xSCI	1	1	Up to 2-ch. +2-ch.	ICS	20, 16, 8	40 MHz CPU, Watchdog OSC/Timer, COP, LVI, ICE, BDM, POR, KBI, Temp Sensor	2.7 to 5.5	up to 125°C

Note: CPU speed for temperatures above 125°C is 36 MHz.

Package Options

8-Lead SOIC

16-Lead TSSOP

20-Lead TSSOP

28-Lead TSSOP

Note: SG high-temperature versions are only offered in 16-TSSOP and 28-TSSOP.

Learn More: For current information about Freescale products and documentation, please visit **www.freescale.com/automotive**.

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