SPC58 C-line
automotive MCUs for car body and security applications

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SPC58 C

Introduction

BRING HIGH PERFORMANCE, RUGGEDNESS, AND SAFETY TO CAR BODY AND SECURITY APPLICATIONS

The SPC58 C-line is a new family of automotive microcontrollers that heralds the advent of more secure and connected cars.

The high level of scalability allows the SPC58 family to perfectly address the ever-growing need for in-car automotive networks with high bandwidth and strong in-vehicle security. The wide portability of applications from SPC56 to SPC58 ensures high reuse of existing software, development tools, and hardware experience.

The devices combine Ethernet and ISO CAN FD communication interfaces with the latest Hardware Security Module (HSM) technology to ensure functional integrity of the car's Electronic Control Units (ECUs), intrusion detection, and protection against malicious attacks.

ST's in-house embedded Flash (eFlash) 40nm process technology is ideal to integrate high performance and outstanding automotive-grade reliability in very small packages, enabling car gateways and body modules to be smarter, smaller, and lighter.

The SPC58 family, optimized for car body and security applications, offers a highly scalable line of products with industry-leading benefits, including:

- ASIL-B (Automotive Safety Integrity Level) compliance
- The highest number of ISO CAN FD and Ethernet communication channels
- Boostes the performance of previous-generation solutions, thanks to the multi-core architecture, higher system frequency, faster memory access time, local RAM, 2x I-Cache, 2x prefetch buffer
- The state-of-the-art 40nm Flash technology enables high integration and performance in very small packages – as few as 32 pins
- Perfect companion MCU for telematics or camera applications
- Perfect solution for stand-alone and integrated in-car gateways
- Assured security via the built-in HSM and related security firmware that ensure the highest protection against malicious attacks

APPLICATIONS

- Body Control Module
- Smart Junction Box
- Gateway
- Comfort Module
- Door Module
- Seat Module
- Lighting
- Battery Management
- Control Panel

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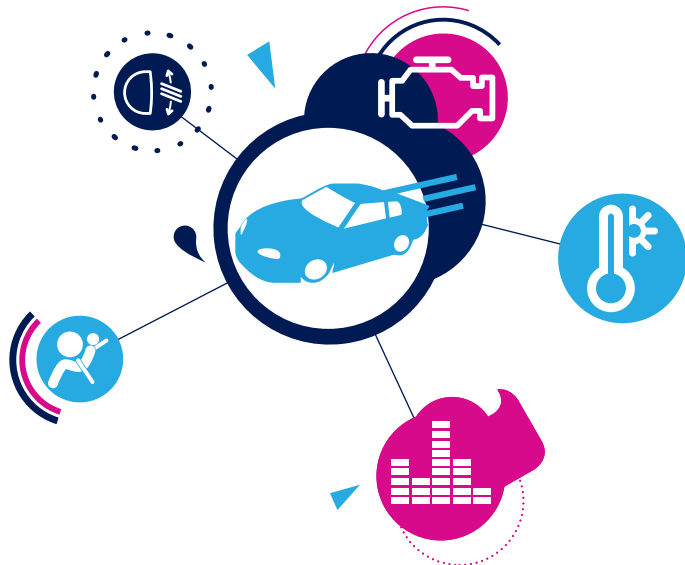
Chorus 4M SPC58ECXX

CORE

- Up to 2x180 MHz Power Architecture™ ISA e200z4 Core (VLE)
  - Dual Issue Core with Floating Point Unit
  - 8 k-Instruction Cache, 4 k-Data Cache
 - 64 k Local d-RAM

MEMORY

- Up to 4 MB RWW Flash with ECC
- 4x 32 KB Data Flash with ECC
- Up to 512 KB RAM (384 k SRAM, 2x 64 k Local d-RAM) with ECC

I/O

- Up to 8x ISO CAN FD
- Up to 18x LINFlex
- 1x Ethernet (100 Mb/s, time stamping, AVB, IPv6 Checksum)
- Dual Channel FlexRay (10 MB/s, 128 buffers)
- Up to 8x DSPI, 1x I²C 2x 32 ch eMIOS
- 64 ch CTU (Cross Triggering Unit)
- Up to 95 channel ADC
  - 3x 12-bit ADC
  - 1x 12-bit ADC Supervisor
  - 1x 10-bit Standby ADC

SYSTEM

- SSWU (Smart Standby Wake-up)
- Security Module: HSM (Evita Medium)
- FM-PLL
- MPU
- 64 Channel eDMA Controller
- 2x CRC Unit
- Fault Collection & Control Unit (incl. error pin)
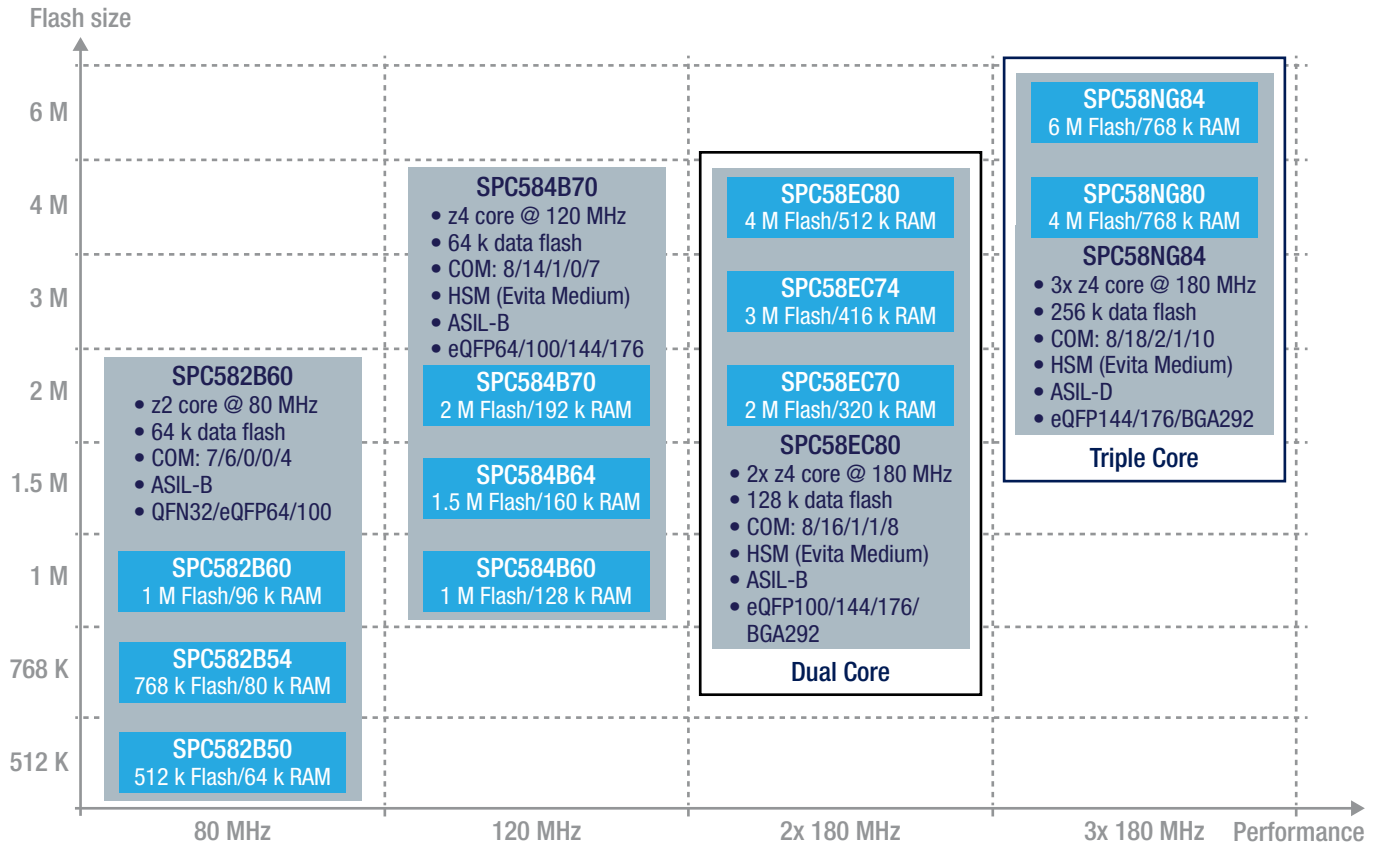- 2x PIT/1x STM/1x RTC/API
- Nexus IEEE-ISTO 5001-2010 Class 3+
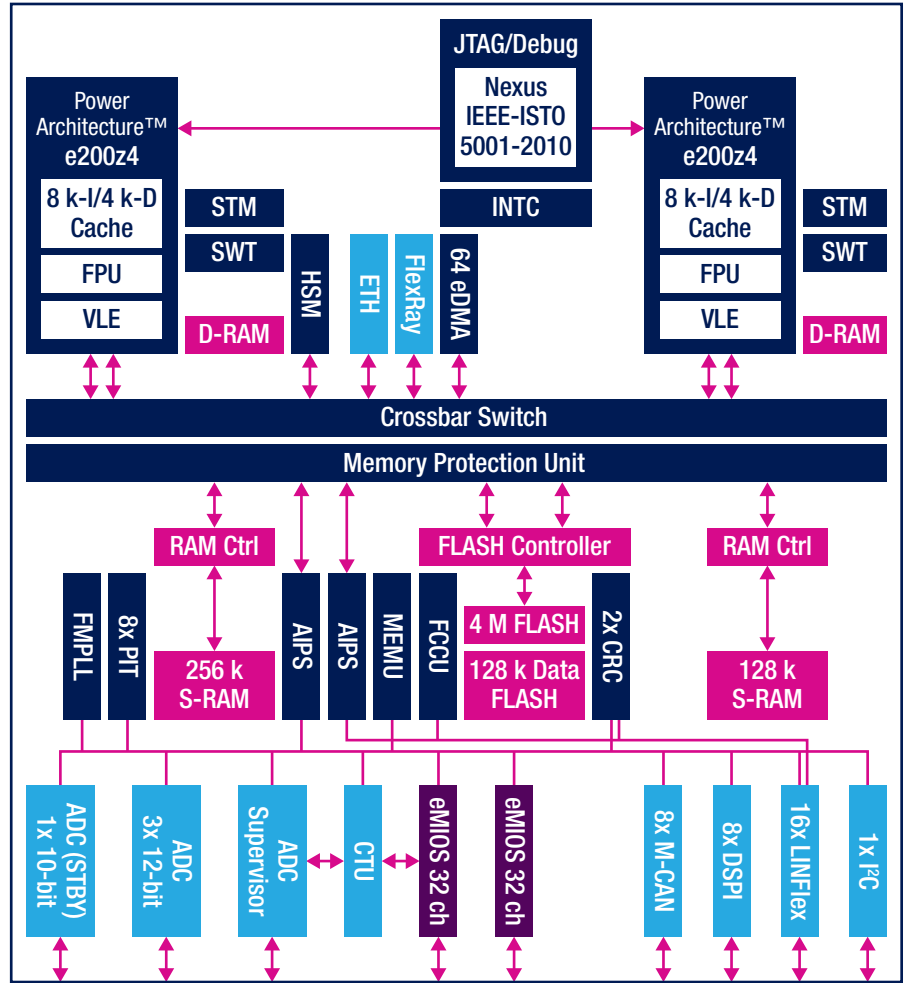
Freq. max	Voltage	Tamb	ASIL	I/O	Package
180 MHz	5 V/3.3 V	-40/+125° C	B	215	eTQFP64/100/144 eLQFP176 LFBGA292

Chorus 32-bit MCU

Flash size

Chart axis (Flash size vs Performance):

SPC582B60
- z2 core @ 80 MHz
- 64 k data flash
- COM: 7/6/0/0/4
- ASIL-B
- QFN32/eQFP64/100

SPC582B60
1 M Flash/96 k RAM

SPC582B54
768 k Flash/80 k RAM

SPC582B50
512 k Flash/64 k RAM

SPC584B70
- z4 core @ 120 MHz
- 64 k data flash
- COM: 8/14/1/0/7
- HSM (Evita Medium)
- ASIL-B
- eQFP64/100/144/176

SPC584B70
2 M Flash/192 k RAM

SPC584B64
1.5 M Flash/160 k RAM

SPC584B60
1 M Flash/128 k RAM

SPC58EC80
4 M Flash/512 k RAM

SPC58EC74
3 M Flash/416 k RAM

SPC58EC70
2 M Flash/320 k RAM

SPC58EC80
- 2x z4 core @ 180 MHz
- 128 k data flash
- COM: 8/16/1/1/8
- HSM (Evita Medium)
- ASIL-B
- eQFP100/144/176/BGA292

Dual Core

SPC58NG84
6 M Flash/768 k RAM

SPC58NG80
4 M Flash/768 k RAM

SPC58NG84
- 3x z4 core @ 180 MHz
- 256 k data flash
- COM: 8/18/2/1/10
- HSM (Evita Medium)
- ASIL-D
- eQFP144/176/BGA292

Triple Core

Performance axis: 80 MHz | 120 MHz | 2x 180 MHz | 3x 180 MHz → Performance

COM: CAN/LIN/ETH/FR/SPI

EMBEDDED MEMORY AND PERFORMANCE

- Up to 6 MB of Flash memory and 768 Kbytes of RAM
- Single-, dual- and triple-core platform @ 180 MHz
- Data and instruction cache as well as local data RAM to avoid wait-states at maximum frequency

RICH SET OF AUTOMOTIVE NETWORK PROTOCOLS

- Up to 8x CAN with ISO CAN FD
- Up to 2x Ethernet 10/100Mb/s
- FlexRay dual channel
- Up to 18x LIN interfaces

PERIPHERALS

- eMIOS timer with 64 ch combined with Cross Triggering Unit
- ADC: Up to 4x12-bit/1x 12-bit supervisor/ 1x 10-bit Standby
- Up to 10 SPI interfaces

MISCELLANEOUS

- Security: HSM

DEVELOPMENT TOOLCHAIN

A complete development toolchain solution is available; note that the compiler, debugger and programmers of previous families (SCP56 and SPC57) can be reused. For more details, refer to www.st.com/spc5