

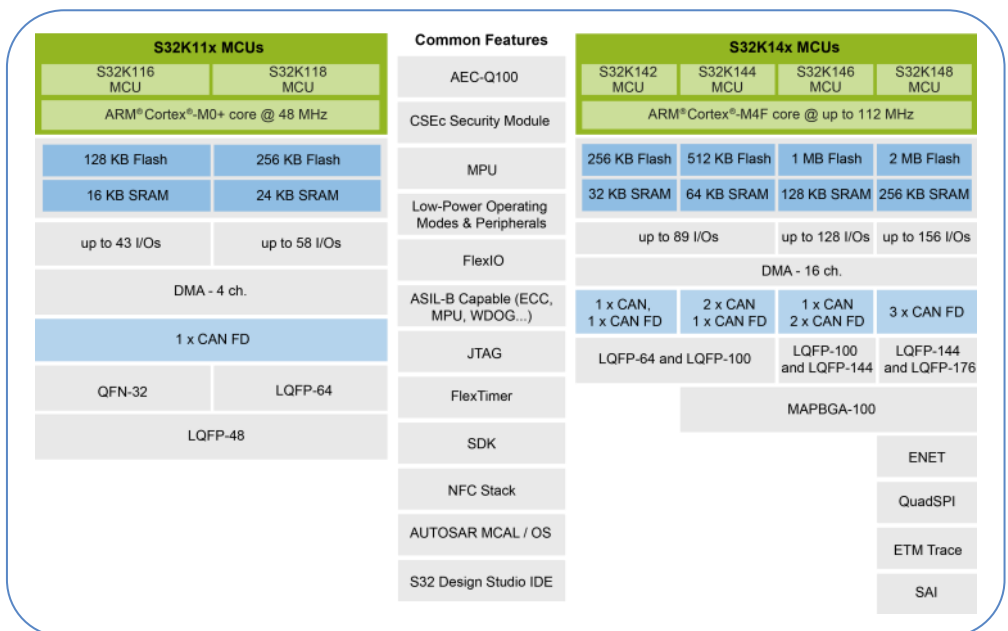
# S32K1 Microcontrollers Family for General Purpose Automotive Applications

Automotive MCUs based on ARM Cortex-M technology with security, safety, low-power and full automotive grade software

The S32K1 family of 32-bit automotive AEC-Q100 qualified MCUs combines a breakthrough suite of automotive grade tools and software with a scalable family of ARM® Cortex®-M based MCUs built on future-proof features. S32K1 MCUs are included in NXP's Product Longevity Program which guarantees a minimum of 15 years assured supply.

- ▶ Maximize reuse – 6 hardware & software compatible MCU families from 128 KB to 2 MB, 32 – 176 pin, AEC-Q100 qualified up to 125 °C (Ta)
- ▶ Future proof features – ARM Cortex-M4F / M0+ cores, ISO CAN FD, CSEc hardware security (SHE compliant), ASIL-B functional safety, ultra-low power
- ▶ Minimize software complexity – S32 Design Studio IDE, Automotive Grade Software Development Kit (SDK), third party ecosystem support

## S32K1 MCU FAMILY BLOCK DIAGRAM



[www.nxp.com/S32K](http://www.nxp.com/S32K)



## TARGET APPLICATIONS

- ▶ Body control
- ▶ Climate control (HVAC)
- ▶ Windows/door/sun-roof
- ▶ Exhaust gas after-treatment
- ▶ PMSM/BLDC motor control
- ▶ Powertrain companion chip
- ▶ Passive safety
- ▶ Park assistance
- ▶ Immobilizer
- ▶ Touch sensing
- ▶ Motorcycle CDI/EFI
- ▶ Battery Management
- ▶ Pump/fan controller
- ▶ Airbag
- ▶ Infotainment connection module
- ▶ Gateway
- ▶ General purpose automotive
- ▶ Industrial automation and sensing
- ▶ Avionics
- ▶ Medical

## S32K1 MCU FAMILY SPECIFICATIONS

Cores	ARM Cortex-M4 w/ FPU ARM Cortex-M0+	Speed	64/80/112 MHz 48/64 MHz
Flash & RAM	Up to 2 MB with ECC Up to 256 KB with ECC	EEPROM	FlexMemory – fast, high w/e endurance, variable size/cycles
Connectivity	ISO CAN-FD (up to 8 Mbps w/ 64 byte msg), IEEE1588 ENET, FlexIO, UART, SPI, IIC, SAI	Low-Power	Multi RUN/WAIT/STOP modes & IRC combinations, LP Timers/Serial Communications/ Analog, 90nm TFS flash technology
Safety	ISO26262 ASIL-B, ECC on Flash & RAM, MPU, CRC, Core Self Test Libs.	Security	CSEc (Crypto. Services Engine - compressed) – SHE compliant, AES-128, uniqueID, secure boot
Temp	-40 to 125 °C (Ta) Grade 1, AEC-Q100, 2.7-5.5 V	Packages	32 QFN, 48/64/100/144/176 LQFP, 100 MAPBGA

Part number	Core / Freq.	Flash / RAM (KB)	Features	Package	Availability (Samples / Production)
PS32K144UAT0VLHA	ARM Cortex-M4, 112MHz	512KB / 64KB	CAN-FD, FlexIO, CSEc Security, Max RAM	64 LQFP	March 2017 / June 2017
PS32K144UAT0VLLA				100 LQFP	March 2017 / June 2017
PS32K144UAT0VMHA				100 MBGA	June 2017 / Sept 2017

## DEVELOPMENT TOOLS

- ▶ S32 Design Studio IDE
  - Free of charge, zero code limit, Eclipse based, supports GCC & 3rd party compilers
  - Compatible with AMMC LIB (Advanced Math & Motor Control Library)

[www.nxp.com/S32DS](http://www.nxp.com/S32DS)

- ▶ NXP S32K Software Development Kit (SDK)
  - Free of charge, Automotive grade, production ready
  - MISRA & SPICE Level 3 compliant low-level drivers for all MCU peripherals
  - FreeRTOS operating system
- ▶ Evaluation Board S32K144EVB-Q100
  - Arduino™ UNO footprint-compatible with plug-in shield board support
  - SBC UJA1169, LIN PHY TJA1027
  - Easy access to all the MCU I/O pins for prototyping
  - On-chip connectivity for CAN, LIN, UART/SCI
  - Flexible power supply options - microUSB or external 12 V power supply

## PARTNERS

- ▶ ARM
- ▶ Keil®
- ▶ IAR Systems
- ▶ Green Hills®
- ▶ Wind River
- ▶ ARCCORE
- ▶ AUTOSAR
- ▶ Cosmic Software
- ▶ Vector
- ▶ Elektorbit
- ▶ MathWorks®
- ▶ FreeRTOS



**S32K144EVB EVALUATION BOARD**

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