S32K3 Microcontrollers for Automotive General Purpose

S32K3

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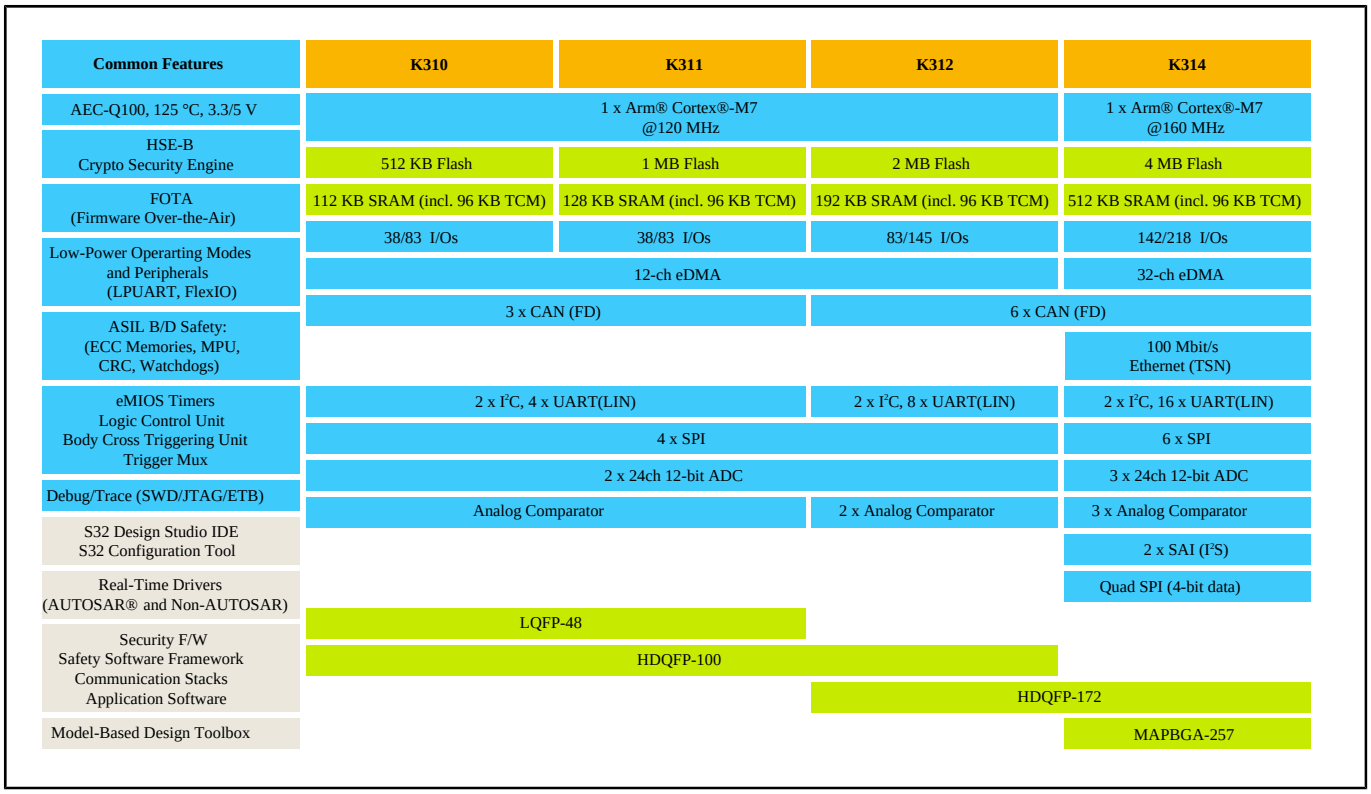
The S32K3 Family of 32-bit microcontrollers (MCUs) offers Arm® Cortex®-M7-based MCUs in single, dual and lockstep core configurations. S32K3 Family offers scalability in number of cores, memory and peripherals, ensuring high-performance and functional safety compliant with ISO 26262 up to ASIL D.

S32K3 Family provides a comprehensive end-to-end solution for development and production. S32K3 MCUs feature a hardware security engine (HSE) with NXP firmware, enable firmware over-the-air (FOTA) updates and include ISO 26262 compliant Real-Time Drivers (RTD) suitable for both AUTOSAR® and non-AUTOSAR applications.

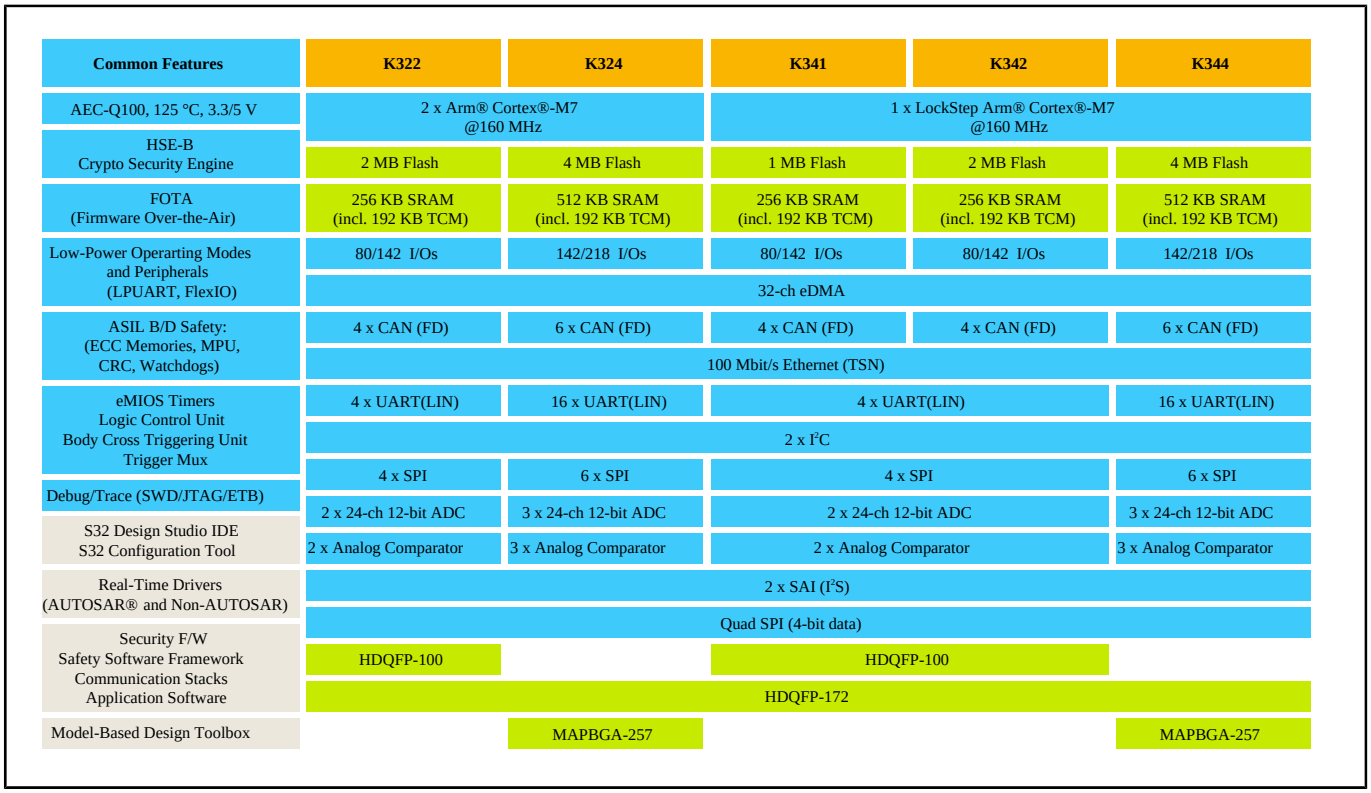
Through compatibility with the NXP S32 Automotive Platform, S32K3 Family enables seamless software reuse and flexibility across applications in body, zone control and electrification.

S32K3 MCUs are available in various package types, including MAPBGA, LQFP and HDQFP, providing flexibility in integration and design. Also, the NXP HDQFP package reduces the package footprint by up to 55 % compared to a standard QFP package.

S32K3 Family Features Part 1 Block Diagram



S32K3 Family Features Part 2 Block Diagram



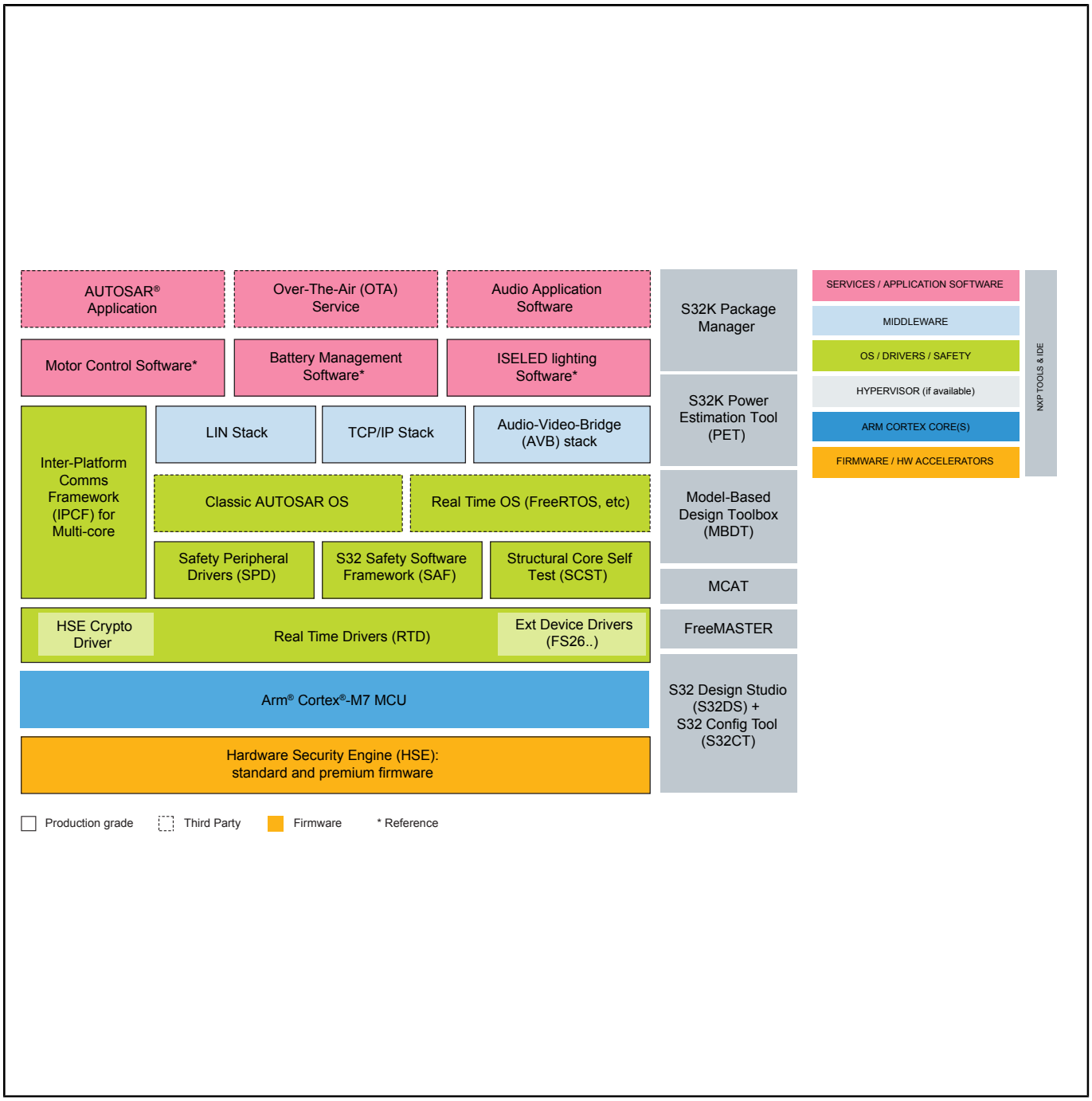
S32K3 Family Features Part 3 Block Diagram

Common Features	K364	K366	K374	K376	K394	K396
AEC-Q100, 125 °C, 3.3/5 V	1 x LockStep + 1 Arm® Cortex®-M7 @320 MHz		1 x LockStep + 2 x Split-Lock Arm® Cortex®-M7 @320 MHz			
HSE_B Crypto Security Engine	2 x motor control coprocessor (2x 16ch)				2 x motor control coprocessor (2x 32ch)	
FOTA (Firmware Over-the-Air)	4 MB Flash	6 MB Flash	4 MB Flash	6 MB Flash	4 MB Flash	6 MB Flash
Low-Power Operarting Modes and Peripherals (LPUART, FlexIO)	704 KB SRAM (incl. 192 KB TCM)		800 KB SRAM (incl. 288 KB TCM)			
ASIL D Safety: (ECC Memories, MPU, CRC, Watchdogs)	127/ 209+8LVDS I/Os					
eMIOS Timers Logic Control Unit Body Cross Triggering Unit Trigger Mux	64-ch eDMA with 32ch LockStep					
Debug/Trace (SWD/JTAG/ETB)	6 x CAN (FD)					
S32 Design Studio IDE S32 Configuration Tool	100 Mbit/s Ethernet (AVB/TSN)					
Real-Time Drivers (AUTOSAR® and Non-AUTOSAR)	ZipWire					
Security F/W Safety Software Framework Communication Stacks Application Software	6 x SPI, 4x UART(LIN), 2 x I²C					
ASIL-D SW Resolver, IPCF, MBDT	2x 12-ch eFlexPWM with NanoEdge (8-ch each high-resolution PWM)					
	2 x sigma-delta ADC with programmable DSP		4 x sigma-delta ADC with programmable DSP			
	4 x 12-bit SAR-ADC (48 inputs)		7 x 12-bit SAR-ADC (69 inputs)			
	2x Sine Wave Generator, 2 x Analog Comparator					
	Quad SPI (8-bit data width, SDR and DDR mode)					
	LQFP-EP-176					
	MAPBGA-289					

S32K3 Family Features Part 4 Block Diagram

Common Features	K328	K338	K348	K358	K388	K389*
AEC-Q100, 125 °C, 3.3/5 V	2 x Arm® Cortex®-M7 @240 MHz	3 x Arm® Cortex®-M7 @240 MHz	1 x LockStep Arm® Cortex®-M7 @240 MHz	1 x LockStep + 1 Arm® Cortex®-M7 @240 MHz	1 x LockStep + 3 or 2 x LockStep + 1 Arm® Cortex®-M7 @320 MHz	1 x LockStep + 3 or 2 x LockStep + 1 Arm® Cortex®-M7 @300 MHz
HSE-B Crypto Security Engine	8 MB Flash					12 MB Flash
FOTA (Firmware Over-the-Air)	1152 KB SRAM (incl. 192 TCM)	1152 KB SRAM (incl. 384 TCM)	1152 KB SRAM (incl. 192 TCM)	1152 KB SRAM (incl. 384 TCM)		2304 KB SRAM (incl. 384 TCM)
Low-Power Operarting Modes and Peripherals (LPUART, FlexIO)	137/235 I/Os				202 I/Os	321 I/Os
ASIL B/D Safety: (ECC Memories, MPU, CRC, Watchdogs)	32-ch eDMA					
eMIOS Timers Analog Comparator Logic Control Unit Body Cross Triggering Unit Trigger Mux	8 x CAN (FD)					12 x CAN (FD)
Debug/Trace (SWD/JTAG/ETB)	1 Gbit/s Ethernet (TSN)				2x 1 Gbit/s Ethernet (TSN)	
S32 Design Studio IDE S32 Configuration Tool	2 x I²C, 16 x UART(LIN)					
Real-Time Drivers (AUTOSAR® and Non-AUTOSAR)	6 x SPI					
Security F/W Safety Software Framework Communication Stacks Application Software	3 x 24-ch 12-bit ADC					
Model-Based Design Toolbox	2 x SAI (I²S)					
	Quad SPI (8-bit data width, SDR and DDR mode)				Quad SPI (4-bit data)	
	uSDHC (SDIO)					
	HDQFP-EP-172					
	MAPBGA-289					
	*S32K389 feature set is under evaluation and subject to change.					MAPBGA-437

S32K3 Software Ecosystem Block Diagram



View additional information for S32K3 Microcontrollers for Automotive General Purpose.

Note: The information on this document is subject to change without notice.