S32K39/37/36 Microcontrollers for Electrification Applications

S32K39-37-36

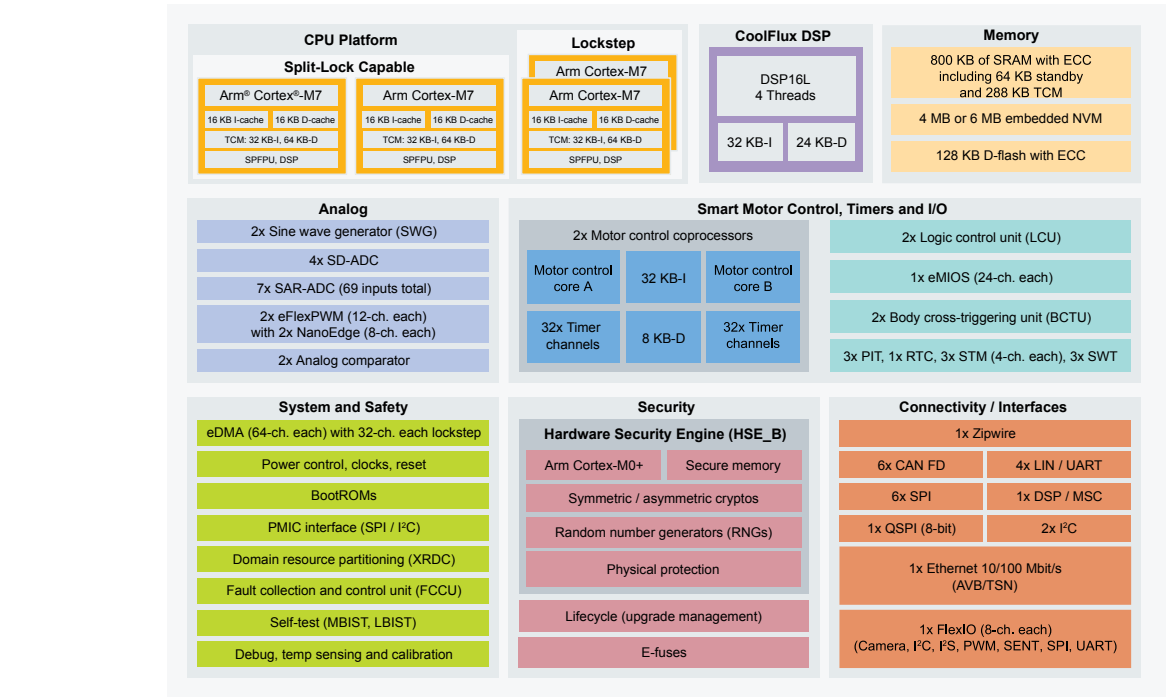
Last Updated: May 15, 2025

S32K39-37-36 is a purpose-built device addressing the new electric vehicle (EV) needs with a compelling combination of performance, integration, networking, security and functional safety capabilities.

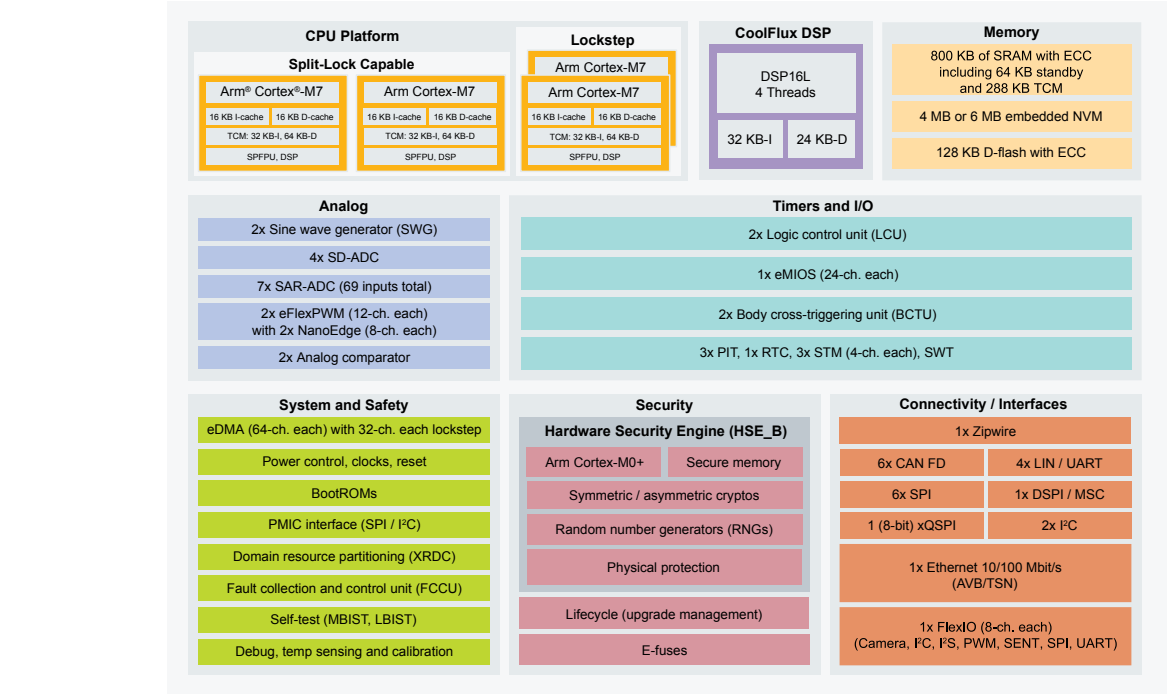
S32K39-36 has enough compute power to support up to one six-phase or two three-phase motors controlled by over 200 kHz control loops, while hosting AI/ML algorithms or other monitoring applications. It supports remote smart actuation applications using Time-Sensitive Networking (TSN) Ethernet for new zonal vehicle architectures. It also reduces system cost with ASIL D software resolver and analog integration.

The S32K37 high-compute capabilities are ideal for high-end battery management systems (BMS) applications.

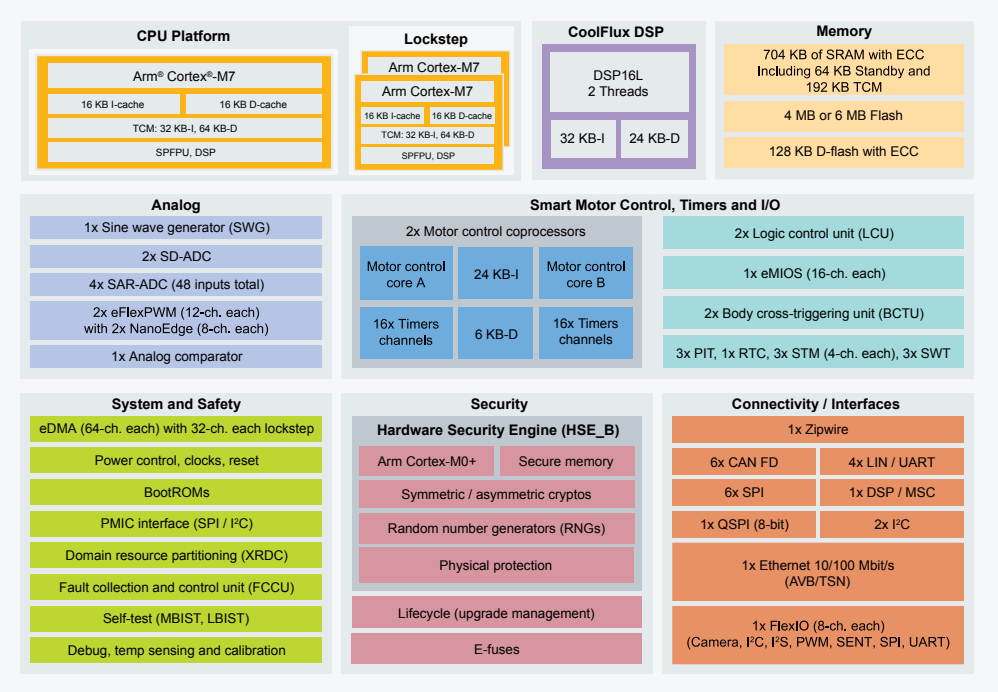
S32K39 Microcontrollers Block Diagram



S32K37 Microcontrollers Block Diagram



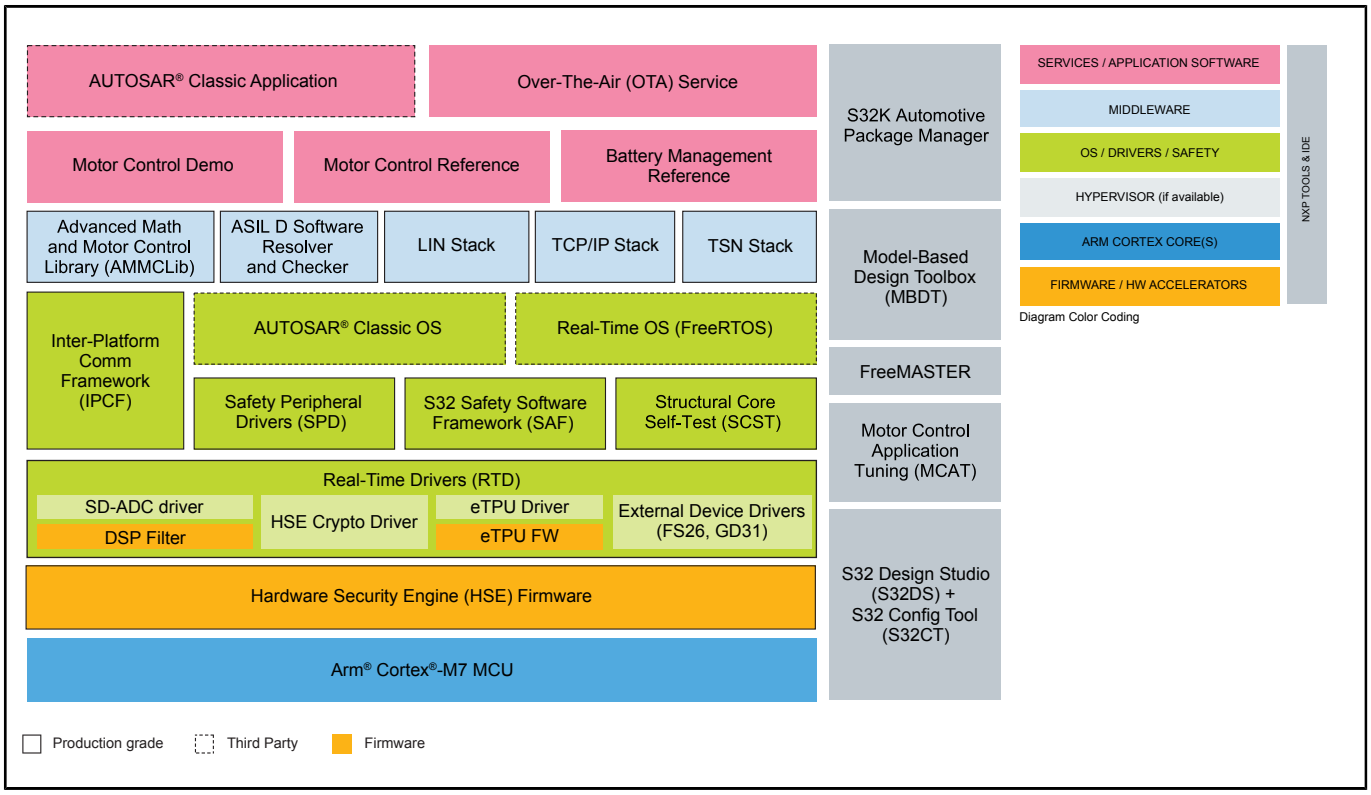
S32K36 Microcontrollers Block Diagram



S32K39 Family Features 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					

S32K39/37/36 Software Enablement Block Diagram



View additional information for S32K39/37/36 Microcontrollers for Electrification Applications.

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