S32G2 SAFE AND SECURE VEHICLE NETWORK PROCESSORS

S32G2 combines hardware security, ASIL D safety, high-performance real-time and application processing, and network acceleration for service-oriented gateways, domain controllers and safety co-processors.

TARGET APPLICATIONS

- Central gateways that require acceleration for deterministic networking and processor offloading and embedded security for emerging over-the-air services

- Service-oriented gareways and vehicle computers that require high-performance application processing with isolation to rapidly deploy new safe and secure services

- Domain controllers that require high-performance real-time and application processing to support ECU consolidation, network protocol translation and local domain control

- Safety co-processors that require ASIL D functional safety processing with network connectivity and PCI Express® for data sharing with other components and central mass storage

- Designed and manufactured to our proven automotive practices, and with an embedded hardware security engine (HSE), the S32G2 processors satisfy developers' needs for high performance, safety, security and reliability.

ENABLEMENT TOOLS

- Hardware Board Support
  - NXP S32G2-VNP-RDB reference design board
  - NXP S32G-VNP-GLDBOX (GoldBox)
  - MicroSys miriac™ SBC-S32G274A with SoM
- Linux® BSP
- Real Time Drivers (RTD) including AUTOSAR® MCAL

- S32 Design Studio IDE
  - GNU tools, debugger, configuration tools (IVT, DCD, DDR), FreeRTOS™ SDK and flash programmer
- Firmware for hardware accelerators (HSE, LLCE, PFE)
- Premium Security software option
- Inter Platform Communications Framework (IPCF)
- Software integration reference examples
- Supported by POSIX-compliant operating systems, AUTOSAR Adaptive Platform, and hypervisors
- Supported by NXP S32 Debug Probe and multiple third-party debuggers
- S32 Safety Software Framework (SAF)
- S32G Vehicle Integration Platform (GoldVIP)
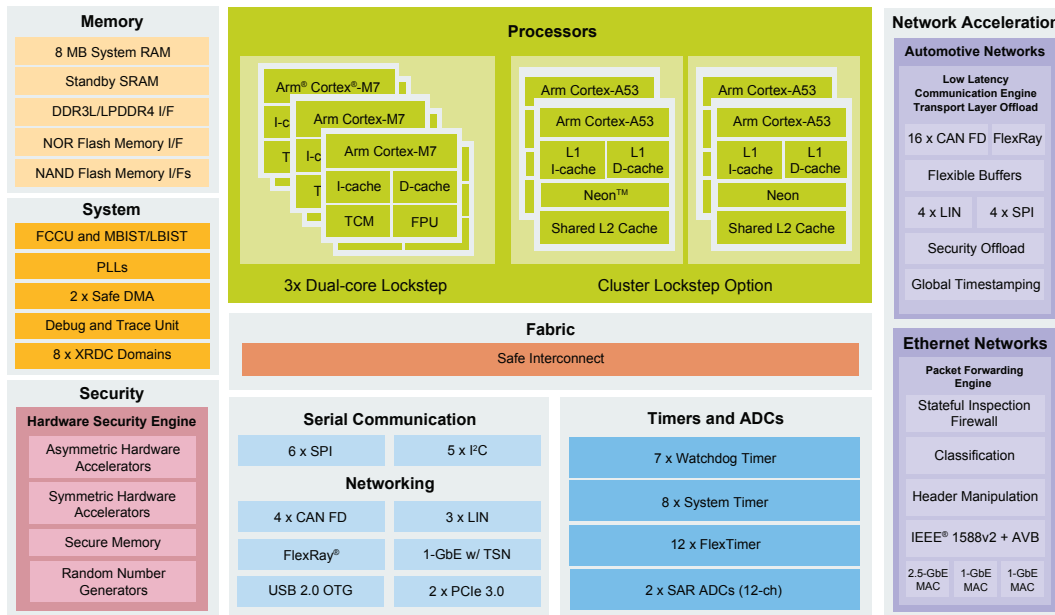
SAFEASSURE® FUNCTIONAL SAFETY PROGRAM

Functional safety. Simplified.

Our SafeAssure functional safety program is designed to help system manufacturers more easily achieve system compliance with International Standards Organization (ISO) 26262 and International Electrotechnical Commission (IEC) 61508 functional safety standards. The program highlights our hardware and software solutions that are optimally designed to support functional safety implementations and come with a rich set of enablement collateral.

For more information, visit **www.nxp.com/SafeAssure**.

S32G274A BLOCK DIAGRAM

Memory
- 8 MB System RAM
- Standby SRAM
- DDR3L/LPDDR4 I/F
- NOR Flash Memory I/F
- NAND Flash Memory I/Fs

System
- FCCU and MBIST/LBIST
- PLLs
- 2 x Safe DMA
- Debug and Trace Unit
- 8 x XRDC Domains

Security
- Hardware Security Engine
- Asymmetric Hardware Accelerators
- Symmetric Hardware Accelerators
- Secure Memory
- Random Number Generators

Processors

Arm® Cortex®-M7 | Arm Cortex-M7 | Arm Cortex-M7
I-c | I-c | I-cache | D-cache
T | T | TCM | FPU
3x Dual-core Lockstep

Arm Cortex-A53 | Arm Cortex-A53
Arm Cortex-A53 | Arm Cortex-A53
L1 I-cache | L1 D-cache | L1 I-cache | L1 D-cache
Neon™ | Neon
Shared L2 Cache | Shared L2 Cache
Cluster Lockstep Option

Fabric
- Safe Interconnect

Serial Communication
- 6 x SPI
- 5 x I²C

Networking
- 4 x CAN FD
- 3 x LIN
- FlexRay®
- 1-GbE w/ TSN
- USB 2.0 OTG
- 2 x PCIe 3.0

Timers and ADCs
- 7 x Watchdog Timer
- 8 x System Timer
- 12 x FlexTimer
- 2 x SAR ADCs (12-ch)

Network Acceleration

Automotive Networks
Low Latency Communication Engine Transport Layer Offload
- 16 x CAN FD | FlexRay
- Flexible Buffers
- 4 x LIN | 4 x SPI
- Security Offload
- Global Timestamping

Ethernet Networks
Packet Forwarding Engine
- Stateful Inspection Firewall
- Classification
- Header Manipulation
- IEEE® 1588v2 + AVB
- 2.5-GbE MAC | 1-GbE MAC | 1-GbE MAC

S32G2 SAFE AND SECURE VEHICLE NETWORK PROCESSORS

Key Features	Benefits
Designed and manufactured to satisfy automotive reliability and ISO 26262 ASIL D functional safety requirements	Helps accelerate development of functional safety applications, including advanced driver assistance systems (ADAS) and autonomous drive systems
Quad Arm Cortex-A53 cores with Arm Neon™ technology organized in two clusters of two cores with optional cluster lockstep	Supports high-performance processing and high-level operating systems for service-oriented gateways, ECU consolidation and safety applications
Triple Arm Cortex-M7 dual-core lockstep cores	Supports real-time processing and safety operating systems for safe processing and ECU consolidation
Low Latency Communication Engine (LLCE)	Helps enable deterministic automotive networks and offloads processors to focus on value-add services
Packet Forwarding Engine (PFE)	Provides high-performance stateful firewall, classification and header manipulation and offloads processors to focus on value-add services
Advanced functional safety hardware and software	Supports fail-operational fault recovery with capability through detection, isolation and resolution of faults without system shutdown
Hardware Security Engine (HSE)	Helps to accelerate security services to offload processors and network accelerators and helps provide protection against IP theft and cyber security attacks
AEC-Q100 Grade 2 device (-40°C to 105°C)	Supports a wide range of automotive applications

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