

S32R47 imaging radar processor for high-resolution sensing enabling L2+ autonomous driving and beyond



S32R47 is a radar application microprocessor unit (MPU) that enables advanced next – generation imaging radar and meets demanding safety and security requirements.

The chip contains a dedicated high performance radar processing platform with integrated AI/ML capabilities opening up new possibilities for improved execution efficiency. The S32R43 part is a complimentary subset of the S32R47 device, providing a scalable range of imaging radar chips to address diverse market needs.

The chips are highly software compatible with NXP's S32R41, S32R45 imaging radar processors and the SAF85xx SoC product family.

Target applications

Automotive

- Imaging radar
- Urban pilot
- Highway pilot
- Adaptive cruise control
- Autonomous emergency breaking
- Park assist

Industrial

- Industrial and agricultural radar
- Advanced robotics

Key features

- Performance CPUs
 - 4x Arm® Cortex®-A53, with Neon and FPU @ 1200 MHz
- Realtime CPU
 - 3x Arm Cortex-M7 (lock-step configuration) with FPU @ 400 MHz
- Radar processing
 - 2x SPT 3.8 @ 600 MHz (16-way complex, four threads) BBE32EP, 600 MHz
 - 2x post processing accelerator (KQ8PPA 1 and KQ8PPA 2)
- Memory
 - 4Flash memory: QuadSPI (SDR 133 MHz, DDR 80 MHz)
 - DRAM: LPDDR5 4800 (up to 6400), supports LPDDR4 and LPDDR4X
 - Internal memory: 8MB SRAM with ECC and memory protection
- Connectivity
 - 4x MIPI-CSI2 Receiver
 - 1x PCIe
 - 1x LINFlexD
 - 2x FlexCAN
 - 5x SPI
 - 3x I²C
 - 3x SGMII, 100/1000/2500 Mbps, MACsec support
- Safety
 - ISO 26262 ASIL B/D
- Security
 - HSE_M, MACsec support for Ethernet
- Package
 - 15 x 15 mm² 548 FCPBGA @ 0.5 mm pitch
- Temperature
 - -40 to +150Tj (Grade 1)

Software and tools

- Hardware
 - S32R47 Evaluation Kit
- Software
 - Real-time drivers package AUTOSAR MCAL23.11
 - HSE firmware – HSE provides OTA update capability and ISO 21434 ready
 - Safety Application Framework SDK
 - Inter-process communication framework
 - Linux® BSP
 - Radar SDK – Radar software development kit with standard algorithms support”
 - S32 Design Studio
 - S32 compilers (GCC, WindRiver DIAB, Greenhills)
 - S32 Radar QKIT
 - Debuggers – NXP S32 debugger probe, (Lauterbach T32, Tasking)

Benefits

- Up to twice the radar processing performance compared to previous imaging radar generation
- Optimized power consumption for imaging radar applications
- New post-processing accelerator with dedicated tool chain simplifies application programming
- The S32R47 and S32R43 portfolio offers scalable imaging radar performance while being software and pin compatible
- Designed to meet ISO 26262 ASIL B/D and part of the NXP SafeAssure program that helps create safe designs
- S32R47 and S32R43 meet NXP edgelock standards through its HSE-M and Hardware MACsec support
- Developed in a certified process compliant with the ISO/SAE 21434 Road vehicles – Cybersecurity engineering standard

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