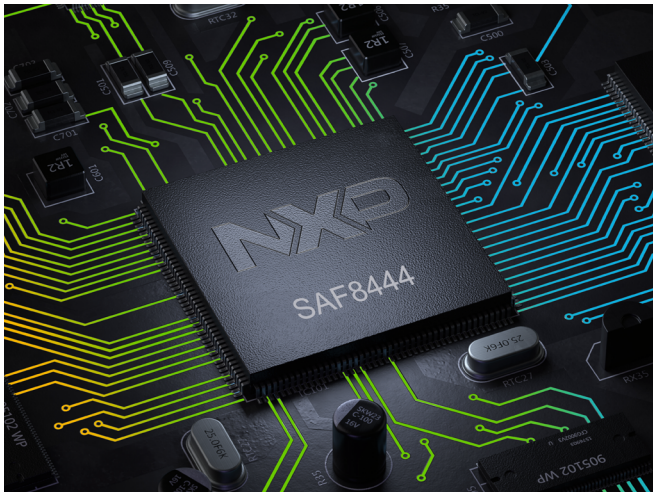
Automotive radar SoC for next-generation front and corner radar applications

The SAF8444 is an optimized automotive FMCW radar SoC derived from the SAF85xx, designed to enable cost- and power-efficient radar sensors for mainstream automotive applications. Operating from 76 to 81 GHz, it integrates a 28 nm RFCMOS radar transceiver with embedded radar processing based on Arm® Cortex®-A53 and Cortex-M7 cores, radar signal processors and DSP, supporting short-, medium- and long-range radar sensing in a compact form factor.



Key features

- High performance safe compute
  - Arm Cortex- A53 @ 320 MHz
  - Arm Cortex- M7 with @ 320 MHz
- Radar processing acceleration
  - SPT 3.5 (SAF8444H), SPT 3.4 (SAF8444E) @ 320 MHz with integrated BBE32 Vector DSP
- Onboard memory
  - up to 4 MB SRAM with ECC
- Small package
  - Launcher-in-package (LiP), footprint 11.95 mm x 14.00 mm
- Highly integrated transceiver
  - Operates in 76 to 81 GHz band
- Wide bandwidth
  - Effective chirp bandwidth up to 4 GHz
- High-performance RF transceiver
  - Improved power output
  - Low noise figure
  - Low phase noise
- Flexible interfaces
  - SGMII Gbit Ethernet 10/100/1000 Mbit/s
  - LinFlexD/Uart, CAN-FD
- Functional safety
  - Developed in accordance with ISO 26262 SEoOC methodology, supporting ASIL B applications Built-in functional safety monitoring circuit
- Automotive quality
  - AEC-Q100 Grade 1, -40 °C to 150 °C junction temperature
- Future proof security
  - Hardware security engine (HSE) EVITA Full, SHE+, ISO/SAE 21434 compliant

Target appllications

- Adaptive cruise control
- Autonomous emergency braking
- Blind spot detection
- Front cross-traffic alert
- Rear cross-traffic alert
- Lane change assistance
- Park assist
- Door open warning
- Front collision warning

Software and tools list

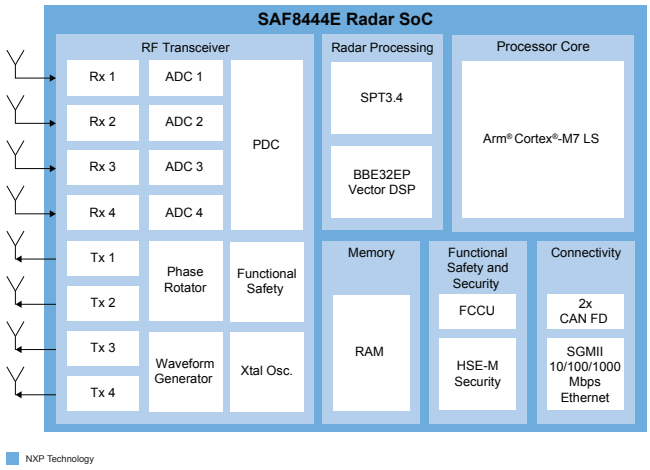
Hardware

- SAF8444 evaluation kit

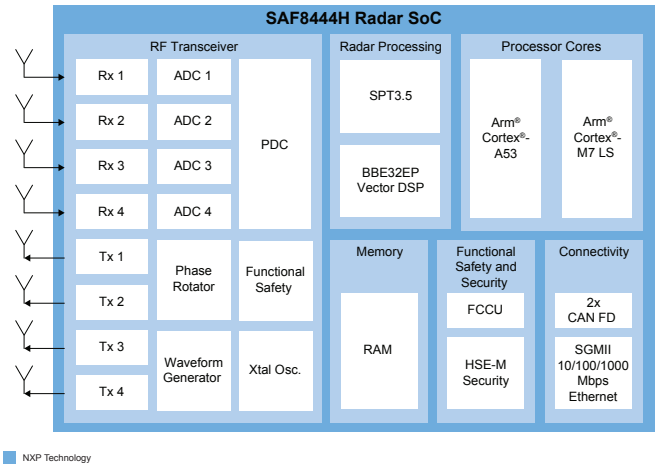
Software

- Real-time drivers packag
- HSE firmware
  - HSE provides OTA update capability and ISO 21434 ready
- Safety cmework SDK
- Inter-process communication framework
- 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

SAF8444E block diagram



SAF8444H block diagram



List of benefits

- Lower power dissipation compared to previous generation
- Allows for plastic housing of the radar sensor
- Enhanced vehicle integration flexibility
- Enables advanced parking mode operation
- Provides robust radar functionality via advanced interference mitigation techniques

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