NXP RoadLINK® SAF5400 V2X 802.11P SAFETY MODEM

NXP® V2X technology enables carmakers to increase vehicle safety on the road today.

- The NXP RoadLINK SAF5400/V110 second-generation V2X solution supports global DSRC standards as defined in Europe, North America and Korea. It provides a high-performance ECDSA verification engine, MRC antenna diversity and remote antenna control (compensator).

- The SAF5300/SAF5400 transceiver with integrated software-defined radio processor provides a system solution for vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) applications. It covers V2X applications all over the world with high-quality communication performance and an AEC-Q100 grade 2 qualification.

- The SAF5300/SAF5400 is available in a ball grid array (LFBGA249, 12 x 12 mm) package that occupies a small printed circuit board (PCB) real estate and is suitable for multilayered PCBs.

- The transceiver is an integrated RFCMOS chip combined with the baseband processor performing the digital (de) modulation (PHY) and medium access control (MAC) handling.

FEATURES

- Global standard support: Compliant with IEEE® 802.11p, IEEE 1609.4, ETSI EN 302663, ETSI EN 302571

- Scalable solution for single- and dual-channel applications, including channel switching and true concurrent channel with MRC antenna diversity

- High transceiver quality based on software-defined algorithms

- ECDSA verification: 2000 messages/sec (Brainpool/NIST curves 256 bits)

- Configurable secure booting from host or from external serial flash

- Embedded RF transceiver calibration enabling faster end-of-line testing

- Interfaces included for RF and active antenna (Compensator) handling

- Integrated support for remote active antenna, compensator reference design available

- Diagnostics interfaces available to detect and provide status information (antenna diagnostics for example)

- Qualified in accordance with AEC-Q100 grade 2

- Host interfaces supported: SDIO, SPI

TARGET APPLICATIONS

The RoadLINK® SAF5300/SAF5400 chip targets V2V and V2I applications which require reliable communication even at high speeds or without line-of-sight visibility.

DIFFERENT VARIANTS ARE AVAILABLE:

- SAF5300/V110: single channel, single antenna

- SAF5400/V110: single channel, dual antenna

- All variants are pin/package/software compatible

PRODUCT SPECIFICATIONS

- Supported frequency band: 5.850 to 5.925 MHz

- 10 MHz modulation BW

- 0 dBm linear OFDM transmit power

- 33 dB TX gain control

- 6 dB noise figure (5.9 GHz)

- 78 dB RX gain control

- RX gain settling time < 100 ns

- TX EVM at 5.9 GHz better than -32 dB

- Nominal reference frequency is 40 MHz

- 2000+ RX packets/second

- 100 Mbit/sec host interface

- Booting time 500 ms (in secure mode)

- 1.6 V analog supply

- 1.8 – 3.3 V I/O supply

- 1.2 V digital supply

SAF5400 BLOCK DIAGRAM
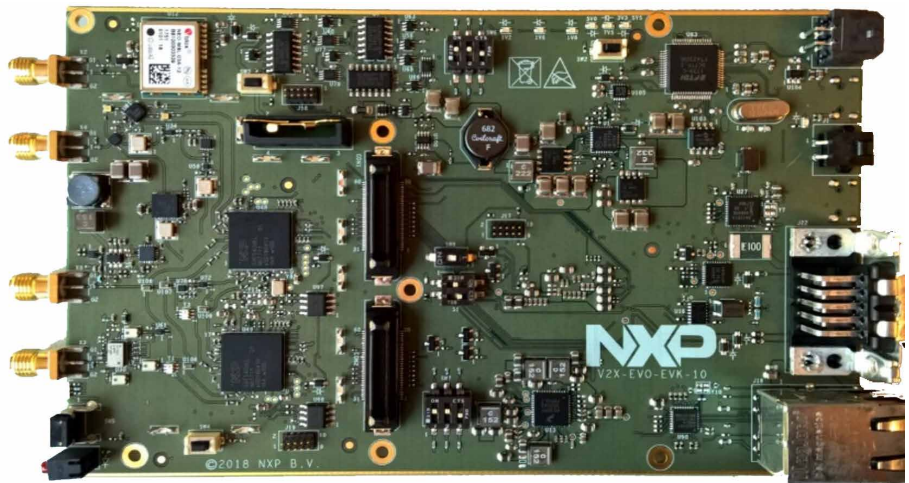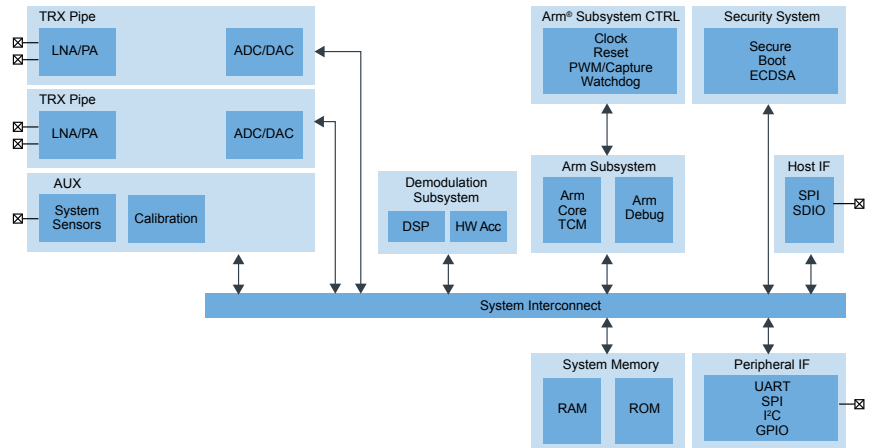
The EVK is designed to fit small form factors for improved integration into cars and roadside units.

DEVELOPMENT TOOLS

- The latest RoadLINK® evaluation kit features the second-generation V2X SAF5400 one-chip that can support two antennas for 802.11p communication and a high-performance security engine to verify all messages received.

- Two SAF5400 chips are included to support concurrent dual-channel communication with MRC diversity for safety.

- Includes the SXF1800 secure element for secure storage of keys and certificates as well for signing outgoing messages. NXP's i.MX 6UL application processor is integrated to run V2X stacks and applications.

PARTNERS

NXP's V2X solutions provide a dedicated API on the logical link controller level. NXP provides a software-stack-agnostic V2X solution and is collaborating with all leading V2X software vendors.

RoadLINK