Product summary

UBX-P3

802.11p V2X chip

S

Standard

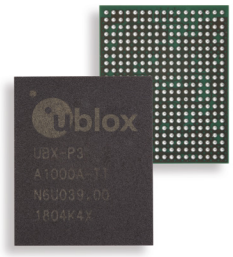
Professional

Automotive

Smallest V2X chip

- Compact 9 x 11 x 1.04 mm V2X chip
- Co-packed power management unit
- Integrated ECDSA verification engine
- Diversity for robustness and full coverage around the vehicle
- Operating temperature of -40 °C to +105 °C
- Low power consumption – less than 1 W
- Supports smart antenna deployment

9.0 × 11.0 × 1.04 mm



Product description

UBX-P3 is a compact chip that provides full 802.11p functionality for V2X applications. The chip operates on the 5.9 GHz frequency band. UBX-P3 is fully compliant with IEEE WAVE and ETSI V2X requirements. The chip supports diversity in both transmit and receive directions, thus providing vehicles full coverage with no “dead” areas.

The UBX-P3 chip features an Ethernet host interface, which allows maximal flexibility in placing the chip in a vehicle, independent of the distance from the host processor. It also offers a solution for smart antennas and distributed systems in the vehicle.

The UBX-P3 chip has superior RF performance and a robust design, making it ideal for operation in harsh environments. The chip is fully qualified in accordance with the highly demanding AEC-Q100 grade 2 specification.

Key features

- Supports V2X standards including:
  - IEEE 802.11-2012, IEEE/WAVE (for US)
  - ETSI ITS G5 standards EN 302 663 (for EU)
- Frequency band: 5.9 GHz
- Channel width: 10/20 MHz
- Tx-mask IEEE 802.11p Class C (5 GHz band)
- Operation modes:
  - 802.11p single channel
  - 802.11p single channel with diversity
- Data rates up to 27 Mbit/s (10 MHz channel) and 54 Mbit/s (20 MHz channel)
- ECDSA verification supporting NIST/Brainpool curves, with a minimum throughput of 1000 verifications/sec
- Secure boot from a host CPU or an external flash memory
- Power management unit in the package
- PPS interface for synchronization with GNSS receivers

	UBX-P3
Grade	
Automotive	•
Professional	
Standard	
Radio	
Wi-Fi IEEE 802.11 standards	p
Channel width [MHz]	10/20
Rx/Tx diversity	•
Antenna type	2p
OS support	
Android / Linux (from u-blox)	Linux
QNX (via third party)	o
Interfaces	
High-speed UART	4
Ethernet (RGMII/MII/Reverse MII)	1
I^2C	1
Quad SPI and Octal SPI	1
SDIO [version]	v3
GPIO	20
PPS	1
Features	
Antenna diversity	•
Single channel operation	•
Security Acceleration Engine	•

2p = 2 pins

o = On request

UBX-P3

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Features

Wi-Fi standards	IEEE 802.11p
Frequency bands	5.9 GHz (Channels 172-184)
Antenna	2 antenna pins (5.9 GHz band)
Transmitter	Single channel and diversity (Cyclic Shift Diversity) Supports configurable Root-Raised Cosine windowing for pulse shaping Tx Output power: -3 dBm
Receiver	Single channel and diversity Sensitivity (indicative): -97 dBm (MCS0 - 1 Rx Antenna) -100 dBm (MCS0 - 2 Rx Antennas)
Clock	TCXO 52 MHz
Embedded power management chip	
Security	Security acceleration for ECC implementing the ECDSA algorithm Compliant with 1609.2 IEEE/WAVE (for US) and ETSI TS-103-097 (for EU)
Auxiliary ADC	For transmit power control and antenna diagnostics

Software features

Operational modes	V2X single channel with Tx/Rx diversity Channel switching support (1609.4) Congestion control (DCC) metrics reporting Timing synchronization support
Host support	Linux, QNX, host SDK, drivers, and libraries
Security	Secure boot

Interfaces

Host	1 Ethernet (RGMII/MII/Reverse MII) 1 SDIO v3.0, speed up to 200 Mbit/s
Flash interface	1 Quad/Octal SPI
GNSS interface	1 I^2C, normal and fast modes 4 UART, speed up to 4 Mbit/s 1 PPS
Other interfaces	20 GPIOs 1 RESET

Package

Dimensions	9.0 x 11.0 x 1.04 mm
Mounting	FCBGA, 357 pins

Environmental data, quality & reliability

Operating temperature	–40 °C to +105 °C
Storage temperature	TBD
Humidity	MSL 3 (Planned)
RoHS compliant (lead-free) and green (no halogens)	
Automotive qualification according to AEC-Q100 Grade 2	
Manufactured in ISO/TS 16494 certified production sites	

Electrical data

Voltage supply	3.3 V
Power consumption	1 W (max)

Certifications and approvals*

Europe (ETSI Radio Equipment Directive (RED))
USA (FCC CFR parts 15, 90 (RSU), and 95 (OBU))

* Pending approvals

Support products

Evaluation Kit	UBX-P3021 Development Platform with Computer on Module (CoM) interfaces supporting various host CPUs

Product variants

UBX-P3011-BA	V2X chip, automotive grade with single antenna
UBX-P3021-BA	V2X chip, automotive grade with dual antenna, single channel with diversity

Further information

For contact information, see www.u-blox.com/contact-us.

For more product details and ordering information, see the product data sheet.