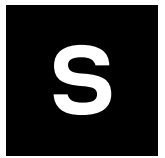


Product Summary

UBX-P3

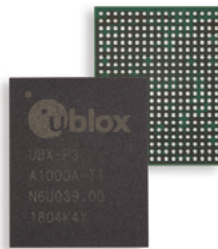


DSRC/802.11p V2X and Wi-Fi chip

Smallest concurrent dual-channel V2X chip

- Compact 9 x 11 x 1.04 mm V2X chip
- Co-packed power management unit
- Concurrent dual channel / 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

The UBX-P3 is a compact Wi-Fi chip that provides full 802.11p functionality for V2X applications. The chip operates on both 5.9 GHz and 760 MHz frequency bands. The UBX-P3 is fully compliant with IEEE WAVE, ETSI V2X, and ARIB T-109M requirements and enables concurrent reception on two 802.11p channels. 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)
 - ARIB STD-T109 (Japan)
- Frequency bands: 760 MHz, 5 GHz, and 5.9 GHz
- Channel width: 10/20 MHz (for V2X), 20 MHz (for 802.11a)
- Tx-mask IEEE 802.11p Class C (5 GHz band)
- Operation modes:
 - 802.11p single channel with diversity
 - 802.11p dual channel without diversity
 - 802.11a (5 GHz band only) station mode
- Data rates up to 27 Mbs (10 MHz channel) and 54 Mbs (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 communication with GNSS receivers

| | UBX-P3 |
|-----------------------------------|--------|
| Grade | |
| Automotive | • |
| Professional | |
| Standard | |
| Radio | |
| Wi-Fi IEEE 802.11 standards | p/a |
| Channel width [MHz] | 10/20 |
| Rx/Tx diversity | • |
| Antenna type | 3a |
| 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 ² C | 1 |
| Quad SPI and Octal SPI | 1 |
| SDIO [version] | v3 |
| GPIO | 20 |
| PPS | 1 |
| SPI | 1 |
| Features | |
| Antenna diversity | • |
| Single channel operation | • |
| Concurrent dual-channel operation | • |
| Security Acceleration Engine | • |

3a = 2 pins for 11p/11a, 1 pin for 760 MHz ITS JPN, if included

o = On request



Features

| | |
|--------------------------------|--|
| Wi-Fi standards | IEEE 802.11 a/p |
| Frequency bands | 5 GHz (Channels 36-165) 5.9 GHz (Channels 172-184) 760 MHz |
| Antenna | 2 antenna pins (5 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): -98 dBm (MCS0 - 1 Rx Antenna) -100.2 dBm (MCS0 - 2 Rx Antennas) |
| Clock | TCXO 26/49.58/52 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

| | |
|-------------------------|--|
| Wi-Fi operational modes | 802.11 a station V2X single and dual (concurrent) channel Channel switching support (1609.4) Congestion control (DCC) metrics reporting Timing synchronization support |
| Host support | Linux, QNX, AUTOSAR host SDK, drivers, and libraries |
| Security | Secure boot |

Interfaces

| | |
|------------------|---|
| Host | 1 Ethernet (RGMII/MII/Reverse MII) 1 SDIO v3.0, speed up to 200 Mbps 1 SPI, speed up to 24 Mbps |
| Flash interface | 1 Quad/Octal SPI |
| GNSS interface | 1 I ² C, normal and fast modes 4 UART, speed up to 4 Mbs 1 PPS |
| Other interfaces | 20 GPIOs 1 RESET |

Further information

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

For more product details and ordering information, see the [product data sheet](#).

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)) |
| Japan (Giteki) |

* Pending approvals

Support products

| | |
|----------------|--|
| Evaluation Kit | UBX-P3031 Development Platform with Computer on Module (CoM) interfaces supporting various host CPUs |
|----------------|--|

Product variants

| | |
|--------------|--|
| UBX-P3011-BA | V2X chip, automotive grade chip with one single antenna |
| UBX-P3021-BA | V2X chip, automotive grade chip with dual antenna, single channel with diversity |
| UBX-P3031-BA | V2X chip, automotive grade chip with dual antenna, concurrent dual channel without diversity |

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